Global Tipping Points

Report 2023

Led by:

University of Exeter | Global Systems Institute

Funded by:

BEZOS EARTH FUND

References

Armstrong McKay, D. I., Staal, A., Abrams, J. F., Winkelmann, R., Sakschewski, B., Loriani, S., Fetzer, I., Cornell, S. E., Rockström, J., & Lenton, T. M. (2022). Exceeding 1.5 C global warming could trigger multiple climate tipping points. Science, 377(6611), eabn7950. https://doi.org/https://doi.org/10.1126/science.abn7950

Barbrook-Johnson, P., Sharpe, S., Pasqualino, R., de Moura, P., Nijsee, F., Vercoulen, P., Clark, A., Peñasco, C., Anadon, L., & Mercure, J. (n.d.). New Economic Models of Energy Innovation and Transition: Addressing New Questions and Providing Better Answers. 2023. https://eeist.co.uk/eeist-reports/new-economic-models-of-energy-innovation-and-transition/

Bennett, E. M., Solan, M., Biggs, R., McPhearson, T., Norström, A. V., Olsson, P., Pereira, L., Peterson, G. D., Raudsepp⊠Hearne, C., & Biermann, F. (2016). Bright spots: seeds of a good Anthropocene. Frontiers in Ecology and the Environment, 14(8), 441–448. https://doi.org/https://doi.org/10.1002/fee.1309

Biggs, R., Carpenter, S. R., & Brock, W. A. (2009). Turning back from the brink: detecting an impending regime shift in time to avert it. Proceedings of the National Academy of Sciences, 106(3), 826–831. https://doi.org/https://doi.org/10.1073/pnas.0811729106

Dakos, V. (2019). Ecological Transitions: Regime Shifts, Thresholds and Tipping Points. Oxford Bibliographies in Environmental Science. Oxford Bibliographies in Environmental Science.

Eker, S., & Wilson, C. (2022). System Dynamics of Social Tipping Processes. https://doi.org/10.1073/pnas.0811729106

Farmer, J. D., Hepburn, C., Ives, M. C., Hale, T., Wetzer, T., Mealy, P., Rafaty, R., Srivastav, S., & Way, R. (2019). Sensitive intervention points in the post-carbon transition. Science, 364(6436), 132–134. https://doi.org/https://doi.org/10.1126/science.aaw7287

Fesenfeld, L. P., Schmid, N., Finger, R., Mathys, A., & Schmidt, T. S. (2022). The politics of enabling tipping points for sustainable development. One Earth, 5(10), 1100–1108. https://linkinghub.elsevier.com/retrieve/pii/S2590332222004821

Folke, C. (2016). Resilience (republished). Ecology and Society, 21(4). https://www.ecologyandsociety.org/vol21/iss4/art44/

Gilio-Whitaker, D. (2019). As long as grass grows: The Indigenous fight for environmental justice, from colonization to Standing Rock. Beacon Press.

Gladwell, M. (2002). The tipping point: how little things can make a big difference (1st Back Bay pbk. ed). Back Bay Books.

Gupta, J., Liverman, D., Prodani, K., Aldunce, P., Bai, X., Broadgate, W., Ciobanu, D., Gifford, L., Gordon, C., & Hurlbert, M. (2023). Earth system justice needed to identify and live within Earth system boundaries. Nature Sustainability, 1–9. https://doi.org/https://doi.org/10.1038/s41893-023-01064-1

Hepburn, C., Allas, T., Cozzi, L., Liebreich, M., Skea, J., Whitmarsh, L., Wilkes, G., & Worthington, B. (2020). Sensitive intervention points to achieve net-zero emissions. Report of the Policy Advisory Group of the Committee on Climate Change.

Lenton, T. (2016). Earth system science: A very short introduction (Vol. 464). Oxford University Press.

Lenton, T. M., Benson, S., Smith, T., Ewer, T., Lanel, V., Petykowski, E., Powell, T. W., Abrams, J. F., Blomsma, F., & Sharpe, S. (2022). Operationalising positive tipping points towards global sustainability. Global Sustainability, 5, e1.

Lenton, T. M., Held, H., Kriegler, E., Hall, J. W., Lucht, W., Rahmstorf, S., & Schellnhuber, H. J. (2008). Tipping elements in the Earth's climate system. Proceedings of the National Academy of Sciences, 105(6), 1786–1793. https://doi.org/https://doi.org/10.1073/pnas.0705414105

Maciejewski, K., Biggs, R., & Rocha, J. C. (2019). 15 Regime shifts in social-ecological systems. Handbook on Resilience of Socio-Technical Systems, 274.

Mealy, P., Barbrook-Johnson, P., Ives, M., Srivastav, S., & Hepburn, C. (2023). Sensitive Intervention Points: A strategic approach to climate action. Oxford Review of Economic Policy.

Meadows, D. (1999) Leverage Points: Places to Intervene in a System. The Sustainability Institute,https://1a0c26.p3cdn2.secureserver.net/wp-content/userfiles/Leverage_Points.pdf

Meldrum, M., Pinnell, L., Brennan, K., Romani, M., Sharpe, S., & Lenton, T. (2023). The Breakthrough Effect: How to trigger a cascade of tipping points to accelerate the net zero transition. https://www.systemiq.earth/wp-content/uploads/2023/01/The-Breakthrough-Effect.pdf

Milkoreit, M. (2023). Social tipping points everywhere?—Patterns and risks of overuse. Wiley Interdisciplinary Reviews: Climate Change, 14(2), e813. https://wires.onlinelibrary.wiley.com/doi/10.1002/wcc.813

Milkoreit, M., Hodbod, J., Baggio, J., Benessaiah, K., Calderón-Contreras, R., Donges, J. F., Mathias, J.-D., Rocha, J. C., Schoon, M., & Werners, S. E. (2018). Defining tipping points for social-ecological systems scholarship—an interdisciplinary literature review. Environmental Research Letters, 13(3), 033005. https://doi.org/10.1088/1748-9326/aaa75

Moser, S., Meerow, S., Arnott, J., & Jack-Scott, E. (2019). The turbulent world of resilience: interpretations and themes for transdisciplinary dialogue. Climatic Change, 153(1–2), 21–40. https://doi.org/10.1007/s10584-018-2358-0

Otto, I. M., Donges, J. F., Cremades, R., Bhowmik, A., Hewitt, R. J., Lucht, W., Rockström, J., Allerberger, F., McCaffrey, M., & Doe, S. S. (2020). Social tipping dynamics for stabilizing Earth's climate by 2050. Proceedings of the National Academy of Sciences, 117(5), 2354–2365. https://doi.org/10.1073/pnas.1900577117

Parsons, B. (2001). Using complexity science concepts when designing system interventions and evaluations. Ft. Collins, CO InSites, 1996.

Patterson, J., Schulz, K., Vervoort, J., Van Der Hel, S., Widerberg, O., Adler, C., Hurlbert, M., Anderton, K., Sethi, M., & Barau, A. (2017). Exploring the governance and politics of transformations towards sustainability. Environmental Innovation and Societal Transitions, 24, 1–16. https://doi.org/10.1016/j.eist.2016.09.001

Pereira, L. M., Karpouzoglou, T., Frantzeskaki, N., & Olsson, P. (2018). Designing transformative spaces for sustainability in social-ecological systems. Ecology and Society, 23(4). https://www.jstor.org/stable/26796848

Raworth, K. (2017). Doughnut economics: seven ways to think like a 21st-century economist. Chelsea Green Publishing.

Ritchie, P. D., Alkhayuon, H., Cox, P. M., & Wieczorek, S. (2023). Rate-induced tipping in natural and human systems. Earth System Dynamics, 14(3), 669–683. https://doi.org/https://doi.org/10.5194/esd-14-669-2023

Rockström, J., Gupta, J., Qin, D., Lade, S. J., Abrams, J. F., Andersen, L. S., Armstrong McKay, D. I., Bai, X., Bala, G., Bunn, S. E., Ciobanu, D., DeClerck, F., Ebi, K., Gifford, L., Gordon, C., Hasan, S., Kanie, N., Lenton, T. M., Loriani, S., … Zhang, X. (2023). Safe and just Earth system boundaries. Nature, 619(7968), 102–111. https://doi.org/10.1038/s41586-023-06083-8

Rogers, E.M., (1962). Diffusion of innovations. Diffusion of innovations

Salomaa, A., & Juhola, S. (2020). How to assess sustainability transformations: a review. Global Sustainability, 3, e24. https://doi.org/https://doi.org/10.1017/sus.2020.17

Scheffer, M. (2020). Critical transitions in nature and society (Vol. 16). Princeton University Press.

Scheffer, M., Bascompte, J., Brock, W. A., Brovkin, V., Carpenter, S. R., Dakos, V., Held, H., Van Nes, E. H., Rietkerk, M., & Sugihara, G. (2009). Early-warning signals for critical transitions. Nature, 461(7260), 53–59. https://doi.org/https://doi.org/10.1038/nature08227

Smith, S. R. (2023). Enabling a political tipping point for rapid decarbonisation in the United Kingdom. EGUsphere, 2023, 1–21. https://doi.org/https://doi.org/10.5194/egusphere-2023-1674

United Nations Office for Disaster Risk Reduction (UNDRR) (2019). Global assessment report on disaster risk reduction. United Nations Office for Disaster Risk Reduction (UNDRR).

Whyte, K. (2020). Too late for indigenous climate justice: Ecological and relational tipping points. Wiley Interdisciplinary Reviews: Climate Change, 11(1), e603. https://doi.org/https://doi.org/10.1002/wcc.603

Whyte, K. (2021). Against crisis epistemology. In Routledge handbook of critical indigenous studies (pp. 52–64). Routledge.
Winkelmann, R., Donges, J. F., Smith, E. K., Milkoreit, M., Eder, C., Heitzig, J., Katsanidou, A., Wiedermann, M., Wunderling, N., & Lenton, T. M. (2022). Social tipping processes towards climate action: a conceptual framework. Ecological Economics, 192, 107242. https://doi.org/10.1016/j.ecolecon.2021.107242
Zografos, C., & Robbins, P. (2020). Green sacrifice zones, or why a green new deal cannot ignore the cost shifts of just transitions. One Earth, 3 (5), 543–546. https://doi.org/https://doi.org/10.1016/j.oneear.2020.10.012

Section 1

Earth system tipping points

Section lead coordinating authors:
David I. Armstrong McKay, Sina Loriani
Reviewers:
John Dearing, Carl Folke, Matthew T. Huber, Charles Koven, Caroline Muller, Timothy Naish, Stefan Rahmstorf, Ashwin K. Seshadri, Simon Willcock

References

Armstrong McKay, D.I., Staal, A., Abrams, J.F., Winkelmann, R., Sakschewski, B., Loriani, S., Fetzer, I., Cornell, S.E., Rockström, J. and Lenton, T.M. (2022) 'Exceeding 1.5°C global warming could trigger multiple climate tipping points', Science, 377(6611), p. eabn7950. https://doi.org/10.1126/science.abn7950

Boers, N. (2021) 'Observation-based early-warning signals for a collapse of the Atlantic Meridional Overturning Circulation', Nature Climate Change, 11(8), pp. 680–688. https://doi.org/10.1038/s41558-021-01097-4

Boers, N. and Rypdal, M. (2021) 'Critical slowing down suggests that the western Greenland Ice Sheet is close to a tipping point', Proceedings of the National Academy of Sciences, 118(21), p. e2024192118. https://doi.org/10.1073/pnas.2024192118

Böhm, E., Lippold, J., Gutjahr, M., Frank, M., Blaser, P., Antz, B., Fohlmeister, J., Frank, N., Andersen, M.B. and Deininger, M. (2015) 'Strong and deep Atlantic meridional overturning circulation during the last glacial cycle', Nature, 517(7532), pp. 73–76. https://doi.org/10.1038/nature14059

Boulton, C.A., Lenton, T.M. and Boers, N. (2022) 'Pronounced loss of Amazon rainforest resilience since the early 2000s', Nature Climate Change, 12(3), pp. 271–278. https://doi.org/10.1038/s41558-022-01287-8

Christ, A.J., Bierman, P.R., Schaefer, J.M., Dahl-Jensen, D., Steffensen, J.P., Corbett, L.B., Peteet, D.M., Thomas, E.K., Steig, E.J., Rittenour, T.M., Tison, J.-L., Blard, P.-H., Perdrial, N., Dethier, D.P., Lini, A., Hidy, A.J., Caffee, M.W. and Southon, J. (2021) 'A multimillion-year-old record of Greenland vegetation and glacial history preserved in sediment beneath 1.4 km of ice at Camp Century', Proceedings of the National Academy of Sciences, 118(13), p. e2021442118. https://doi.org/10.1073/pnas.2021442118

Dinerstein, E., Olson, D., Joshi, A., Vynne, C., Burgess, N.D., Wikramanayake, E., Hahn, N., Palminteri, S., Hedao, P., Noss, R., Hansen, M., Locke, H., Ellis, E.C., Jones, B., Barber, C.V., Hayes, R., Kormos, C., Martin, V., Crist, E., Sechrest, W., Price, L., Baillie, J.E.M., Weeden, D., Suckling, K., Davis, C., Sizer, N., Moore, R., Thau, D., Birch, T., Potapov, P., Turubanova, S., Tyukavina, A., De Souza, N., Pintea, L., Brito, J.C., Llewellyn, O.A., Miller, A.G., Patzelt, A., Ghazanfar, S.A., Timberlake, J., Klöser, H., Shennan-Farpón, Y., Kindt, R., Lillesø, J.-P.B., Van Breugel, P., Graudal, L., Voge, M., Al-Shammari, K.F. and Saleem, M. (2017) 'An Ecoregion-Based Approach to Protecting Half the Terrestrial Realm', BioScience, 67(6), pp. 534–545. https://doi.org/10.1093/biosci/bix014

Ditlevsen, P. and Ditlevsen, S. (2023) 'Warning of a forthcoming collapse of the Atlantic meridional overturning circulation', Nature Communications, 14(1), p. 4254. https://doi.org/10.1038/s41467-023-39810-w

Ellis, E.C., Gauthier, N., Klein Goldewijk, K., Bliege Bird, R., Boivin, N., Díaz, S., Fuller, D.Q., Gill, J.L., Kaplan, J.O., Kingston, N., Locke, H., McMichael, C.N.H., Ranco, D., Rick, T.C., Shaw, M.R., Stephens, L., Svenning, J.-C. and Watson, J.E.M. (2021) 'People have shaped most of terrestrial nature for at least 12,000 years', Proceedings of the National Academy of Sciences, 118(17), p. e2023483118. https://doi.org/10.1073/pnas.2023483118

Feldmann, J. and Levermann, A. (2015) 'Collapse of the West Antarctic Ice Sheet after local destabilization of the Amundsen Basin', Proceedings of the National Academy of Sciences, 112(46), pp. 14191–14196. https://doi.org/10.1073/pnas.1512482112

Folke, C., Biggs, R., Norström, A., Reyers, B. and Rockström, J. (2016) 'Social-ecological resilience and biosphere-based sustainability science', Ecology and Society, 21(3). https://doi.org/10.5751/ES-08748-210341

Folke, C., Polasky, S., Rockström, J., Galaz, V., Westley, F., Lamont, M., Scheffer, M., Österblom, H., Carpenter, S.R., Chapin, F.S., Seto, K.C., Weber, E.U., Crona, B.I., Daily, G.C., Dasgupta, P., Gaffney, O., Gordon, L.J., Hoff, H., Levin, S.A., Lubchenco, J., Steffen, W. and Walker, B.H. (2021) 'Our future in the Anthropocene biosphere', Ambio, 50(4), pp. 834–869. https://doi.org/10.1007/s13280-021-01544-8

Garbe, J., Albrecht, T., Levermann, A., Donges, J.F. and Winkelmann, R. (2020) 'The hysteresis of the Antarctic Ice Sheet', Nature, 585(7826), pp. 538–544. https://doi.org/10.1038/s41586-020-2727-5

IPCC (2021) Annex VII: Glossary. https://doi.org/10.1017/9781009157896.022.2215

Joughin, I., Smith, B.E. and Medley, B. (2014) 'Marine Ice Sheet Collapse Potentially Under Way for the Thwaites Glacier Basin, West Antarctica', Science, 344(6185), pp. 735–738. https://doi.org/10.1126/science.1249055

Keith, D.A., Ferrer-Paris, J.R., Nicholson, E., Bishop, M.J., Polidoro, B.A., Ramirez-Llodra, E., Tozer, M.G., Nel, J.L., Mac Nally, R., Gregr, E.J., Watermeyer, K.E., Essl, F., Faber-Langendoen, D., Franklin, J., Lehmann, C.E.R., Etter, A., Roux, D.J., Stark, J.S., Rowland, J.A., Brummitt, N.A., Fernandez-Arcaya, U.C., Suthers, I.M., Wiser, S.K., Donohue, I., Jackson, L.J., Pennington, R.T., Iliffe, T.M., Gerovasileiou, V., Giller, P., Robson, B.J., Pettorelli, N., Andrade, A., Lindgaard, A., Tahvanainen, T., Terauds, A., Chadwick, M.A., Murray, N.J., Moat, J., Pliscoff, P., Zager, I. and Kingsford, R.T. (2022) 'A function-based typology for Earth's ecosystems', Nature, 610(7932), pp. 513–518. https://doi.org/10.1038/s41586-022-05318-4

Kump, L.R., Kasting, J.F. and Crane, R.G. (1999) The Earth System. New Jersey: Prentice Hall

Lenton, T.M. (2016) Earth System Science: A Very Short Introduction. Oxford University Press. https://doi.org/10.1093/actrade/9780198718871.001.0001

Lenton, T.M., Held, H., Kriegler, E., Hall, J.W., Lucht, W., Rahmstorf, S. and Schellnhuber, H.J. (2008) 'Tipping elements in the Earth's climate system', Proceedings of the National Academy of Sciences, 105(6), pp. 1786–1793. https://doi.org/10.1073/pnas.0705414105

Rignot, E., Mouginot, J., Morlighem, M., Seroussi, H. and Scheuchl, B. (2014) 'Widespread, rapid grounding line retreat of Pine Island, Thwaites, Smith, and Kohler glaciers, West Antarctica, from 1992 to 2011', Geophysical Research Letters, 41(10), pp. 3502–3509. https://doi.org/10.1002/2014GL060140

Robinson, A., Calov, R. and Ganopolski, A. (2012) 'Multistability and critical thresholds of the Greenland ice sheet', Nature Climate Change, 2(6), pp. 429–432. https://doi.org/10.1038/nclimate1449

Scheffer, M., Bascompte, J., Brock, W.A., Brovkin, V., Carpenter, S.R., Dakos, V., Held, H., van Nes, E.H., Rietkerk, M. and Sugihara, G. (2009) 'Early-warning signals for critical transitions', Nature, 461(7260), pp. 53–59. https://doi.org/10.1038/nature08227

Rockström, J. and Tuinenburg, O.A. (2020) 'Hysteresis of tropical forests in the 21st century', Nature Communications, 11(1), p. 4978. https://doi.org/10.1038/s41467-020-18728-7

Turney, C.S.M., Fogwill, C.J., Golledge, N.R., McKay, N.P., van Sebille, E., Jones, R.T., Etheridge, D., Rubino, M., Thornton, D.P., Davies, S.M., Ramsey, C.B., Thomas, Z.A., Bird, M.I., Munksgaard, N.C., Kohno, M., Woodward, J., Winter, K., Weyrich, L.S., Rootes, C.M., Millman, H., Albert, P.G., Rivera, A., van Ommen, T., Curran, M., Moy, A., Rahmstorf, S., Kawamura, K., Hillenbrand, C.-D., Weber, M.E., Manning, C.J., Young, J. and Cooper, A. (2020) 'Early Last Interglacial ocean warming drove substantial ice mass loss from Antarctica', Proceedings of the National Academy of Sciences, 117(8), pp. 3996–4006. https://doi.org/10.1073/pnas.1902469117

Waibel, M.S., Hulbe, C.L., Jackson, C.S. and Martin, D.F. (2018) 'Rate of Mass Loss Across the Instability Threshold for Thwaites Glacier Determines Rate of Mass Loss for Entire Basin', Geophysical Research Letters, 45(2), pp. 809–816. https://doi.org/10.1002/2017GL076470

Wang, S., Foster, A., Lenz, E.A., Kessler, J.D., Stroeve, J.C., Anderson, L.O., Turetsky, M., Betts, R., Zou, S., Liu, W., Boos, W.R. and Hausfather, Z. (2023) 'Mechanisms and Impacts of Earth System Tipping Elements', Reviews of Geophysics, 61(1), p. e2021RG000757. https://doi.org/10.1029/2021RG000757

Chapter 2.1 References

Abbot, D.S. and Tziperman, E. (2008) 'Sea ice, high-latitude convection, and equable climates', Geophysical Research Letters, 35(3). https://doi.org/10.1029/2007GL032286

Abbot, D.S., Walker, C.C. and Tziperman, E. (2009) 'Can a Convective Cloud Feedback Help to Eliminate Winter Sea Ice at High CO2 Concentrations?', Journal of Climate, 22(21), pp. 5719–5731. https://doi.org/10.1175/2009JCLI2854.1

Abernathey, R.P., Cerovecki, I., Holland, P.R., Newsom, E., Mazloff, M. and Talley, L.D. (2016) 'Water-mass transformation by sea ice in the upper branch of the Southern Ocean overturning', Nature Geoscience, 9(8), pp. 596–601. https://doi.org/10.1038/ngeo2749

Adusumilli, S., Fricker, H.A., Medley, B., Padman, L. and Siegfried, M.R. (2020) 'Interannual variations in meltwater input to the Southern Ocean from Antarctic ice shelves', Nature Geoscience, 13(9), pp. 616–620. https://doi.org/10.1038/s41561-020-0616-z

AMAP (2017) Snow, Water, Ice and Permafrost in the Arctic (SWIPA) 2017. Oslo, Norway: Arctic Monitoring and Assessment Programme (AMAP), p. xiv + 269 pp. https://www.amap.no/documents/doc/snow-water-ice-and-permafrost-in-the-arctic-swipa-2017/1610 (Accessed: 12 October 2023)

Arias, P.A., Bellouin, N., Coppola, E., Jones, R.G., Krinner, G., Marotzke, J., Naik, V., Palmer, M.D., Plattner, G.-K., Rogelj, J., Rojas, M., Sillmann, J., Storelvmo, T., Thorne, P.W., Trewin, B., Achuta Rao, K., Adhikary, B., Allan, R.P., Armour, K., Bala, G., Barimalala, R., Berger, S., Canadell, J.G., Cassou, C., Cherchi, A., Collins, W., Collins, W.D., Connors, S.L., Corti, S., Cruz, F., Dentener, F.J., Dereczynski, C., Di Luca, A., Diongue Niang, A., Doblas-Reyes, F.J., Dosio, H. Douville, A., Engelbrecht, F., Eyring, V., Fischer, E., Forster, P., Fox-Kemper, B., Fuglestvedt, J.S., Fyfe, J.C., Gillett, N.P., Goldfarb, L., Gorodetskaya, I., Gutierrez, J.M., Hamdi, R., Hawkins, E., Hewitt, H.T., Hope, P., Islam, A.S., Jones, C., Kaufman, D.S., Kopp, R.E., Kosaka, Y., Kossin, J., Krakovska, S., Lee, J.-Y., Li, J., Mauritsen, T., Maycock, T.K., Meinshausen, M., Min, S.-K., Monteiro, P.M.S., Ngo-Duc, T., Otto, F., Pinto, I., Pirani, A., Raghavan, K., Ranasinghe, R., Ruane, A.C., Ruiz, L., Sallée, J.-B., Samset, B.H., Sathyendranath, S., Seneviratne, S.I., Sörensson, A.A., Szopa, S., Takayabu, I., Tréguier, A.-M., van den Hurk, B., Vautard, R., von Schuckmann, K., Zaehle, S., Zhang, X., and Zickfeld, K. (2021) 'Technical Summary', in Climate Change 2021 – The Physical Science Basis: Working Group I Contribution to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge: Cambridge University Press, pp. 35–144. https://doi.org/10.1017/9781009157896.002

Armitage, T.W.K. and Kwok, R. (2021) 'SWOT and the ice-covered polar oceans: An exploratory analysis', Advances in Space Research, 68(2), pp. 829–842. https://doi.org/10.1016/j.asr.2019.07.006

Armour, K.C., Eisenman, I., Blanchard-Wrigglesworth, E., McCusker, K.E. and Bitz, C.M. (2011) 'The reversibility of sea ice loss in a state-of-the-art climate model', Geophysical Research Letters, 38(16). https://doi.org/10.1029/2011GL048739

Arthern, R.J. and Williams, C.R. (2017) 'The sensitivity of West Antarctica to the submarine melting feedback', Geophysical Research Letters, 44(5), pp. 2352–2359. https://doi.org/10.1002/2017GL072514

Bahr, D.B., Dyurgerov, M. and Meier, M.F. (2009) 'Sea-level rise from glaciers and ice caps: A lower bound', Geophysical Research Letters, 36(3). https://doi.org/10.1029/2008GL036309

Bamber, J.L., Griggs, J.A., Hurkmans, R.T.W.L., Dowdeswell, J.A., Gogineni, S.P., Howat, I., Mouginot, J., Paden, J., Palmer, S., Rignot, E. and Steinhage, D. (2013) 'A new bed elevation dataset for Greenland', The Cryosphere, 7(2), pp. 499–510. https://doi.org/10.5194/tc-7-499-2013

Bassis, J.N. and Jacobs, S. (2013) 'Diverse calving patterns linked to glacier geometry', Nature Geoscience, 6(10), pp. 833–836. https://doi.org/10.1038/ngeo1887

Bassis, J.N. and Walker, C.C. (2011) 'Upper and lower limits on the stability of calving glaciers from the yield strength envelope of ice', Proceedings of the Royal Society A: Mathematical, Physical and Engineering Sciences, 468(2140), pp. 913–931. https://doi.org/10.1098/rspa.2011.0422

Bathiany, S., Notz, D., Mauritsen, T., Raedel, G. and Brovkin, V. (2016) 'On the Potential for Abrupt Arctic Winter Sea Ice Loss', Journal of Climate, 29(7), pp. 2703–2719. https://doi.org/10.1175/JCLI-D-15-0466.1

Bertram, R.A., Wilson, D.J., van de Flierdt, T., McKay, R.M., Patterson, M.O., Jimenez-Espejo, F.J., Escutia, C., Duke, G.C., Taylor-Silva, B.I. and Riesselman, C.R. (2018) 'Pliocene deglacial event timelines and the biogeochemical response offshore Wilkes Subglacial Basin, East Antarctica', Earth and Planetary Science Letters, 494, pp. 109–116. https://doi.org/10.1016/j.epsl.2018.04.054

Blackburn, T., Edwards, G.H., Tulaczyk, S., Scudder, M., Piccione, G., Hallet, B., McLean, N., Zachos, J.C., Cheney, B. and Babbe, J.T. (2020) 'Ice retreat in Wilkes Basin of East Antarctica during a warm interglacial', Nature, 583(7817), pp. 554–559. https://doi.org/10.1038/s41586-020-2484-5

Blasco, J., Tabone, I., Moreno-Parada, D., Robinson, A., Alvarez-Solas, J., Pattyn, F. and Montoya, M. (2023) 'Antarctic Tipping points triggered by the mid-Pliocene warm climate', Climate of the Past Discussions, pp. 1–29. https://doi.org/10.5194/cp-2023-76

Bochow, N., Poltronieri, A., Robinson, A., Montoya, M., Rypdal, M. and Boers, N. (2023) 'Overshooting the critical threshold for the Greenland ice sheet', Nature, 622(7983), pp. 528–536. https://doi.org/10.1038/s41586-023-06503-9

Bosson, J.B., Huss, M., Cauvy-Fraunié, S., Clément, J.C., Costes, G., Fischer, M., Poulenard, J. and Arthaud, F. (2023) 'Future emergence of new ecosystems caused by glacial retreat', Nature, 620(7974), pp. 562–569. https://doi.org/10.1038/s41586-023-06302-2

Box, J.E., Fettweis, X., Stroeve, J.C., Tedesco, M., Hall, D.K. and Steffen, K. (2012) 'Greenland ice sheet albedo feedback: thermodynamics and atmospheric drivers', The Cryosphere, 6(4), pp. 821–839. https://doi.org/10.5194/tc-6-821-2012

Broeke, M.R. van den, Munneke, P.K., Noël, B., Reijmer, C., Smeets, P., Berg, W.J. van de and Wessem, J.M. van (2023) 'Contrasting current and future surface melt rates on the ice sheets of Greenland and Antarctica: Lessons from in situ observations and climate models', PLOS Climate, 2(5), p. e0000203. https://doi.org/10.1371/journal.pclm.0000203

Brown, J., Jr, O.J.F., Heginbottom, J.A. and Melnikov, E.S. (1997) Circum-Arctic map of permafrost and ground-ice conditions, Circum-Pacific Map. 45. U.S. Geological Survey. https://doi.org/10.3133/cp45

Bulthuis, K., Arnst, M., Sun, S. and Pattyn, F. (2019) 'Uncertainty quantification of the multi-centennial response of the Antarctic ice sheet to climate change', The Cryosphere, 13(4), pp. 1349–1380. https://doi.org/10.5194/tc-13-1349-2019

Buri, P., Pellicciotti, F., Steiner, J.F., Miles, E.S. and Immerzeel, W.W. (2016) 'A grid-based model of backwasting of supraglacial ice cliffs on debris-covered glaciers', Annals of Glaciology, 57(71), pp. 199–211. https://doi.org/10.3189/2016AoG71A059

Burke, E.J., Chadburn, S.E., Huntingford, C. and Jones, C.D. (2018) 'CO2 loss by permafrost thawing implies additional emissions reductions to limit warming to 1.5 or 2 °C', Environmental Research Letters, 13(2), p. 024024. https://doi.org/10.1088/1748-9326/aaa138

Burke, E.J., Ekici, A., Huang, Y., Chadburn, S.E., Huntingford, C., Ciais, P., Friedlingstein, P., Peng, S. and Krinner, G. (2017) 'Quantifying uncertainties of permafrost carbon–climate feedbacks', Biogeosciences, 14(12), pp. 3051–3066. https://doi.org/10.5194/bg-14-3051-2017

Burke, E.J., Zhang, Y. and Krinner, G. (2020) 'Evaluating permafrost physics in the Coupled Model Intercomparison Project 6 (CMIP6) models and their sensitivity to climate change', The Cryosphere, 14(9), pp. 3155–3174. https://doi.org/10.5194/tc-14-3155-2020

Canadell, J.G., Monteiro, P.M.S., Costa, M.H., Cunha, L.C. da, Cox, P.M., Eliseev, A.V., Henson, S., Ishii, M., Jaccard, S., Koven, C., Lohila, A., Patra, P.K., Piao, S., Rogelj, J., Syampungani, S., Zaehle, S. and Zickfeld, K. (2021) 'Chapter 5: Global Carbon and other Biogeochemical Cycles and Feedbacks', in V. Masson-Delmotte, P. Zhai, A. Pirani, S.L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M.I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J.B.R. Matthews, T.K. Maycock, T. Waterfield, O. Yelekçi, R. Yu, and

B. Zhou (eds) Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Repor. Cambridge University Press

Capron, E., Govin, A., Feng, R., Otto-Bliesner, B.L. and Wolff, E.W. (2017) 'Critical evaluation of climate syntheses to benchmark CMIP6/PMIP4 127 ka Last Interglacial simulations in the high-latitude regions', Quaternary Science Reviews, 168, pp. 137–150. https://doi.org/10.1016/j.quascirev.2017.04.019

Carrivick, J.L. and Tweed, F.S. (2016) 'A global assessment of the societal impacts of glacier outburst floods', Global and Planetary Change, 144, pp. 1–16. https://doi.org/10.1016/j.gloplacha.2016.07.001

Chadburn, S.E., Burke, E.J., Cox, P.M., Friedlingstein, P., Hugelius, G. and Westermann, S. (2017) 'An observation-based constraint on permafrost loss as a function of global warming', Nature Climate Change, 7(5), pp. 340–344. https://doi.org/10.1038/nclimate3262

Chambers, C., Greve, R., Obase, T., Saito, F. and Abe-Ouchi, A. (2022) 'Mass loss of the Antarctic ice sheet until the year 3000 under a sustained late-21st-century climate', Journal of Glaciology, 68(269), pp. 605–617. https://doi.org/10.1017/jog.2021.124

Chandler, D. and Langebroek, P. (2021) 'Southern Ocean sea surface temperature synthesis: Part 2. Penultimate glacial and last interglacial', Quaternary Science Reviews, 271, p. 107190. https://doi.org/10.1016/j.quascirev.2021.107190

Christ, A.J., Bierman, P.R., Schaefer, J.M., Dahl-Jensen, D., Steffensen, J.P., Corbett, L.B., Peteet, D.M., Thomas, E.K., Steig, E.J., Rittenour, T.M., Tison, J.-L., Blard, P.-H., Perdrial, N., Dethier, D.P., Lini, A., Hidy, A.J., Caffee, M.W. and Southon, J. (2021) 'A multimillion-year-old record of Greenland vegetation and glacial history preserved in sediment beneath 1.4 km of ice at Camp Century', Proceedings of the National Academy of Sciences, 118(13), p. e2021442118. https://doi.org/10.1073/pnas.2021442118

Clark, P.U., Shakun, J.D., Marcott, S.A., Mix, A.C., Eby, M., Kulp, S., Levermann, A., Milne, G.A., Pfister, P.L., Santer, B.D., Schrag, D.P., Solomon, S., Stocker, T.F., Strauss, B.H., Weaver, A.J., Winkelmann, R., Archer, D., Bard, E., Goldner, A., Lambeck, K., Pierrehumbert, R.T. and Plattner, G.-K. (2016) 'Consequences of twenty-first-century policy for multi-millennial climate and sea-level change', Nature Climate Change, 6(4), pp. 360–369. https://doi.org/10.1038/nclimate2923

Clarke, J., Huntingford, C., Ritchie, P. and Cox, P. (2021) 'The compost bomb instability in the continuum limit', The European Physical Journal Special Topics, 230(16), pp. 3335–3341. https://doi.org/10.1140/epjs/s11734-021-00013-3

Clerc, F., Minchew, B.M. and Behn, M.D. (2019) 'Marine Ice Cliff Instability Mitigated by Slow Removal of Ice Shelves', Geophysical Research Letters, 46(21), pp. 12108–12116. https://doi.org/10.1029/2019GL084183

Compagno, L., Huss, M., Miles, E.S., McCarthy, M.J., Zekollari, H., Dehecq, A., Pellicciotti, F. and Farinotti, D. (2022) 'Modelling supraglacial debris-cover evolution from the single-glacier to the regional scale: an application to High Mountain Asia', The Cryosphere, 16(5), pp. 1697–1718. https://doi.org/10.5194/tc-16-1697-2022

Cook, C.P., van de Flierdt, T., Williams, T., Hemming, S.R., Iwai, M., Kobayashi, M., Jimenez-Espejo, F.J., Escutia, C., González, J.J., Khim, B.-K., McKay, R.M., Passchier, S., Bohaty, S.M., Riesselman, C.R., Tauxe, L., Sugisaki, S., Galindo, A.L., Patterson, M.O., Sangiorgi, F., Pierce, E.L., Brinkhuis, H., Klaus, A., Fehr, A., Bendle, J.A.P., Bijl, P.K., Carr, S.A., Dunbar, R.B., Flores, J.A., Hayden, T.G., Katsuki, K., Kong, G.S., Nakai, M., Olney, M.P., Pekar, S.F., Pross, J., Röhl, U., Sakai, T., Shrivastava, P.K., Stickley, C.E., Tuo, S., Welsh, K. and Yamane, M. (2013) 'Dynamic behaviour of the East Antarctic ice sheet during Pliocene warmth', Nature Geoscience, 6(9), pp. 765–769. https://doi.org/10.1038/ngeo1889

Cook, J.M., Hodson, A.J., Taggart, A.J., Mernild, S.H. and Tranter, M. (2017) 'A predictive model for the spectral "bioalbedo" of snow', Journal of Geophysical Research: Earth Surface, 122(1), pp. 434–454. https://doi.org/10.1002/2016JF003932

Cook, J.M., Tedstone, A.J., Williamson, C., McCutcheon, J., Hodson, A.J., Dayal, A., Skiles, M., Hofer, S., Bryant, R., McAree, O., McGonigle, A., Ryan, J., Anesio, A.M., Irvine-Fynn, T.D.L., Hubbard, A., Hanna, E., Flanner, M., Mayanna, S., Benning, L.G., van As, D., Yallop, M., McQuaid, J.B., Gribbin, T. and Tranter, M. (2020) 'Glacier algae accelerate melt rates on the south-western Greenland Ice Sheet', The Cryosphere, 14(1), pp. 309–330. https://doi.org/10.5194/tc-14-309-2020

Coulon, V., Bulthuis, K., Whitehouse, P.L., Sun, S., Haubner, K., Zipf, L. and Pattyn, F. (2021) 'Contrasting Response of West and East Antarctic Ice Sheets to Glacial Isostatic Adjustment', Journal of Geophysical Research: Earth Surface, 126(7), p. e2020JF006003. https://doi.org/10.1029/2020JF006003

De Rydt, J., Reese, R., Paolo, F.S. and Gudmundsson, G.H. (2021) 'Drivers of Pine Island Glacier speed-up between 1996 and 2016', The Cryosphere, 15(1), pp. 113–132. https://doi.org/10.5194/tc-15-113-2021

DeConto, R.M. and Pollard, D. (2003) 'Rapid Cenozoic glaciation of Antarctica induced by declining atmospheric CO2', Nature, 421(6920), pp. 245–249. https://doi.org/10.1038/nature01290

DeConto, R.M. and Pollard, D. (2016) 'Contribution of Antarctica to past and future sea-level rise', Nature, 531(7596), pp. 591–597. https://doi.org/10.1038/nature17145

DeConto, R.M., Pollard, D., Alley, R.B., Velicogna, I., Gasson, E., Gomez, N., Sadai, S., Condron, A., Gilford, D.M., Ashe, E.L., Kopp, R.E., Li, D. and Dutton, A. (2021) 'The Paris Climate Agreement and future sea-level rise from Antarctica', Nature, 593(7857), pp. 83–89. https://doi.org/10.1038/s41586-021-03427-0

Dehecq, A., Gourmelen, N., Gardner, A.S., Brun, F., Goldberg, D., Nienow, P.W., Berthier, E., Vincent, C., Wagnon, P. and Trouvé, E. (2019) 'Twenty-first century glacier slowdown driven by mass loss in High Mountain Asia', Nature Geoscience, 12(1), pp. 22–27. https://doi.org/10.1038/s41561-018-0271-9

Dmitrenko, I.A., Kirillov, S.A., Tremblay, L.B., Kassens, H., Anisimov, O.A., Lavrov, S.A., Razumov, S.O. and Grigoriev, M.N. (2011) 'Recent changes in shelf hydrography in the Siberian Arctic: Potential for subsea permafrost instability', Journal of Geophysical Research: Oceans, 116(C10). https://doi.org/10.1029/2011JC007218

Doblas-Reyes, F.J., Sörensson, A.A., Almazroui, M., Dosio, A., Gutowski, W.J., Haarsma, R., Hamdi, R., Hewitson, B., Kwon, W.-T., Lamptey, B.L., Maraun, D., Stephenson, T.S., Takayabu, I., Terray, L., Turner, A. and Zuo, Z. (2021) 'Chapter 10: Linking global to regional climate change', in V. Masson-Delmotte, P. Zhai, A. Pirani, S.L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M.I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J.B.R. Matthews, T.K. Maycock, T. Waterfield, O. Yelekçi, R. Yu, and B. Zhou (eds) Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press

Docquier, D., Fuentes-Franco, R., Koenigk, T. and Fichefet, T. (2020) 'Sea Ice—Ocean Interactions in the Barents Sea Modeled at Different Resolutions', Frontiers in Earth Science, 8. https://www.frontiersin.org/articles/10.3389/feart.2020.00172 (Accessed: 16 October 2023)

Drijfhout, S., Bathiany, S., Beaulieu, C., Brovkin, V., Claussen, M., Huntingford, C., Scheffer, M., Sgubin, G. and Swingedouw, D. (2015) 'Catalogue of abrupt shifts in Intergovernmental Panel on Climate Change climate models', Proceedings of the National Academy of Sciences, 112(43), pp. E5777–E5786. https://doi.org/10.1073/pnas.1511451112

Edwards, T.L., Brandon, M.A., Durand, G., Edwards, N.R., Golledge, N.R., Holden, P.B., Nias, I.J., Payne, A.J., Ritz, C. and Wernecke, A. (2019) 'Revisiting Antarctic ice loss due to marine ice-cliff instability', Nature, 566(7742), pp. 58–64. https://doi.org/10.1038/s41586-019-0901-4

Eisenman, I. (2010) 'Geographic muting of changes in the Arctic sea ice cover', Geophysical Research Letters, 37(16). https://doi.org/10.1029/2010GL043741

Eisenman, I. and Wettlaufer, J.S. (2009) 'Nonlinear threshold behavior during the loss of Arctic sea ice', Proceedings of the National Academy of Sciences, 106(1), pp. 28–32. https://doi.org/10.1073/pnas.0806887106

Engels, A., Marotzke, J., Gresse, E., López-Rivera, A., Pagnone, A.

and Wilkens, J. (2023) Hamburg Climate Futures Outlook: The plausibility of a 1.5°C limit to global warming - social drivers and physical processes. Universität Hamburg. https://www.fdr.uni-hamburg.de/record/11230 (Accessed: 16 October 2023)

van Everdingen, R.O. (2005) MULTI-LANGUAGE GLOSSARY of PERMAFROST and RELATED GROUND-ICE TERMS. International Permafrost Association (IPA).

Fabbri, S., Hauschild, M.Z., Lenton, T.M. and Owsianiak, M. (2021) 'Multiple Climate Tipping Points Metrics for Improved Sustainability Assessment of Products and Services', Environmental Science & Technology, 55(5), pp. 2800–2810. https://doi.org/10.1021/acs.est.0c02928

Favier, L., Durand, G., Cornford, S.L., Gudmundsson, G.H., Gagliardini, O., Gillet-Chaulet, F., Zwinger, T., Payne, A.J. and Le Brocq, A.M. (2014) 'Retreat of Pine Island Glacier controlled by marine ice-sheet instability', Nature Climate Change, 4(2), pp. 117–121. https://doi.org/10.1038/nclimate2094

Feldmann, J. and Levermann, A. (2015) 'Collapse of the West Antarctic Ice Sheet after local destabilization of the Amundsen Basin', Proceedings of the National Academy of Sciences, 112(46), pp. 14191–14196. https://doi.org/10.1073/pnas.1512482112

Fox-Kemper, B., Hewitt, H.T., Xiao, C., Aðalgeirsdóttir, G., Drijfhout, S.S., Edwards, T.L., Golledge, N.R., Hemer, M., Kopp, R.E., Krinner, G., Mix, A., Notz, D., Nowicki, S., Nurhati, I.S., Ruiz, L., Sallée, J.-B., Slangen, A.B.A. and Yu, Y. (2021) 'Chapter 9: Ocean, Cryosphere and Sea Level Change', in V. Masson-Delmotte, P. Zhai, A. Pirani, S.L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M.I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J.B.R. Matthews, T.K. Maycock, T. Waterfield, O. Yelekçi, R. Yu, and B. Zhou (eds) Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press

Fretwell, P., Pritchard, H.D., Vaughan, D.G., Bamber, J.L., Barrand, N.E., Bell, R., Bianchi, C., Bingham, R.G., Blankenship, D.D., Casassa, G., Catania, G., Callens, D., Conway, H., Cook, A.J., Corr, H.F.J., Damaske, D., Damm, V., Ferraccioli, F., Forsberg, R., Fujita, S., Gim, Y., Gogineni, P., Griggs, J.A., Hindmarsh, R.C.A., Holmlund, P., Holt, J.W., Jacobel, R.W., Jenkins, A., Jokat, W., Jordan, T., King, E.C., Kohler, J., Krabill, W., Riger-Kusk, M., Langley, K.A., Leitchenkov, G., Leuschen, C., Luyendyk, B.P., Matsuoka, K., Mouginot, J., Nitsche, F.O., Nogi, Y., Nost, O.A., Popov, S.V., Rignot, E., Rippin, D.M., Rivera, A., Roberts, J., Ross, N., Siegert, M.J., Smith, A.M., Steinhage, D., Studinger, M., Sun, B., Tinto, B.K., Welch, B.C., Wilson, D., Young, D.A., Xiangbin, C. and Zirizzotti, A. (2013) 'Bedmap2: improved ice bed, surface and thickness datasets for Antarctica', The Cryosphere, 7(1), pp. 375–393. https://doi.org/10.5194/tc-7-375-2013

Fyke, J., Sergienko, O., Löfverström, M., Price, S. and Lenaerts, J.T.M. (2018) 'An Overview of Interactions and Feedbacks Between Ice Sheets and the Earth System', Reviews of Geophysics, 56(2), pp. 361–408. https://doi.org/10.1029/2018RG000600

Gabbi, J., Huss, M., Bauder, A., Cao, F. and Schwikowski, M. (2015) 'The impact of Saharan dust and black carbon on albedo and long-term mass balance of an Alpine glacier', The Cryosphere, 9(4), pp. 1385–1400. https://doi.org/10.5194/tc-9-1385-2015

Garbe, J., Albrecht, T., Levermann, A., Donges, J.F. and Winkelmann, R. (2020) 'The hysteresis of the Antarctic Ice Sheet', Nature, 585(7826), pp. 538–544. https://doi.org/10.1038/s41586-020-2727-5

Gardner, A.S., Moholdt, G., Scambos, T., Fahnstock, M., Ligtenberg, S., van den Broeke, M. and Nilsson, J. (2018) 'Increased West Antarctic and unchanged East Antarctic ice discharge over the last 7 years', The Cryosphere, 12(2), pp. 521–547. https://doi.org/10.5194/tc-12-521-2018

Gasser, T., Kechiar, M., Ciais, P., Burke, E.J., Kleinen, T., Zhu, D., Huang, Y., Ekici, A. and Obersteiner, M. (2018) 'Path-dependent reductions in CO2 emission budgets caused by permafrost carbon release', Nature Geoscience, 11(11), pp. 830–835. https://doi.org/10.1038/s41561-018-0227-0

Gasson, E., DeConto, R.M., Pollard, D. and Levy, R.H. (2016) 'Dynamic Antarctic ice sheet during the early to mid-Miocene', Proceedings of the National Academy of Sciences, 113(13), pp. 3459–3464. https://doi.org/10.1073/pnas.1516130113

Golledge, N.R., Clark, P.U., He, F., Dutton, A., Turney, C.S.M., Fogwill, C.J., Naish, T.R., Levy, R.H., McKay, R.M., Lowry, D.P., Bertler, N. a. N., Dunbar, G.B. and Carlson, A.E. (2021) 'Retreat of the Antarctic Ice Sheet During the Last Interglaciation and Implications for Future Change', Geophysical Research Letters, 48(17), p. e2021GL094513. https://doi.org/10.1029/2021GL094513

Golledge, N.R., Keller, E.D., Gomez, N., Naughten, K.A., Bernales, J., Trusel, L.D. and Edwards, T.L. (2019) 'Global environmental consequences of twenty-first-century ice-sheet melt', Nature, 566(7742), pp. 65–72. https://doi.org/10.1038/s41586-019-0889-9

Golledge, N.R., Kowalewski, D.E., Naish, T.R., Levy, R.H., Fogwill, C.J. and Gasson, E.G.W. (2015) 'The multi-millennial Antarctic commitment to future sea-level rise', Nature, 526(7573), pp. 421–425. https://doi.org/10.1038/nature15706

Golledge, N.R., Levy, R.H., McKay, R.M. and Naish, T.R. (2017) 'East Antarctic ice sheet most vulnerable to Weddell Sea warming', Geophysical Research Letters, 44(5), pp. 2343–2351. https://doi.org/10.1002/2016GL072422

Gomez, N., Mitrovica, J.X., Huybers, P. and Clark, P.U. (2010) 'Sea level as a stabilizing factor for marine-ice-sheet grounding lines', Nature Geoscience, 3(12), pp. 850–853. https://doi.org/10.1038/ngeo1012

Goosse, H., Arzel, O., Bitz, C.M., de Montety, A. and Vancoppenolle, M. (2009) 'Increased variability of the Arctic summer ice extent in a warmer climate', Geophysical Research Letters, 36(23). https://doi.org/10.1029/2009GL040546

Grant, G.R., Naish, T.R., Dunbar, G.B., Stocchi, P., Kominz, M.A., Kamp, P.J.J., Tapia, C.A., McKay, R.M., Levy, R.H. and Patterson, M.O. (2019) 'The amplitude and origin of sea-level variability during the Pliocene epoch', Nature, 574(7777), pp. 237–241. https://doi.org/10.1038/s41586-019-1619-z

Gregory, J.M., George, S.E. and Smith, R.S. (2020) 'Large and irreversible future decline of the Greenland ice sheet', The Cryosphere, 14(12), pp. 4299–4322. https://doi.org/10.5194/tc-14-4299-2020

Gregory, J.M., Stott, P.A., Cresswell, D.J., Rayner, N.A., Gordon, C. and Sexton, D.M.H. (2002) 'Recent and future changes in Arctic sea ice simulated by the HadCM3 AOGCM', Geophysical Research Letters, 29(24), pp. 28-1-28–4. https://doi.org/10.1029/2001GL014575

Grosse, G., Jones, B. and Arp, C. (2013) '8.21 Thermokarst Lakes, Drainage, and Drained Basins', in J.F. Shroder (ed.) Treatise on Geomorphology. San Diego: Academic Press, pp. 325–353. https://doi.org/10.1016/B978-0-12-374739-6.00216-5

Gudmundsson, G.H., Krug, J., Durand, G., Favier, L. and Gagliardini, O. (2012) 'The stability of grounding lines on retrograde slopes', The Cryosphere, 6(6), pp. 1497–1505. https://doi.org/10.5194/tc-6-1497-2012

Haeberli, W. and Hoelzle, M. (1995) 'Application of inventory data for estimating characteristics of and regional climate-change effects on mountain glaciers: a pilot study with the European Alps', Annals of Glaciology, 21, pp. 206–212. https://doi.org/10.3189/S0260305500015834

Hankel, C. and Tziperman, E. (2021) 'The Role of Atmospheric Feedbacks in Abrupt Winter Arctic Sea Ice Loss in Future Warming Scenarios', Journal of Climate, 34(11), pp. 4435–4447. https://doi.org/10.1175/JCLI-D-20-0558.1

Haseloff, M. and Sergienko, O.V. (2018) 'The effect of buttressing on grounding line dynamics', Journal of Glaciology, 64(245), pp. 417–431. https://doi.org/10.1017/jog.2018.30

Hill, E.A., Urruty, B., Reese, R., Garbe, J., Gagliardini, O., Durand, G., Gillet-Chaulet, F., Gudmundsson, G.H., Winkelmann, R., Chekki, M., Chandler, D. and Langebroek, P.M. (2023) 'The stability of present-day Antarctic grounding lines – Part 1: No indication of marine ice sheet instability in the current geometry', The Cryosphere, 17(9), pp. 3739–3759. https://doi.org/10.5194/tc-17-3739-2023

Hjort, J., Karjalainen, O., Aalto, J., Westermann, S., Romanovsky, V.E., Nelson, F.E., Etzelmüller, B. and Luoto, M. (2018) 'Degrading permafrost puts Arctic infrastructure at risk by mid-century', Nature Communications, 9(1), p. 5147. https://doi.org/10.1038/s41467-018-07557-4

Hjort, J., Streletskiy, D., Doré, G., Wu, Q., Bjella, K. and Luoto, M. (2022) 'Impacts of permafrost degradation on infrastructure', Nature Reviews Earth & Environment, 3(1), pp. 24–38. https://doi.org/10.1038/s43017-021-00247-8

Hock, Regine, Bliss, A., Marzeion, B., Giesen, R.H., Hirabayashi, Y., Huss, M., Radić, V. and Slangen, A.B.A. (2019) 'GlacierMIP – A model intercomparison of global-scale glacier mass-balance models and projections', Journal of Glaciology, 65(251), pp. 453–467. https://doi.org/10.1017/jog.2019.22

Hock, R., Rasul, G., Adler, C., Cáceres, B., Gruber, S., Hirabayashi, Y., Jackson, M., Kääb, A., Kang, S., Kutuzov, S., Milner, A., Molau, U., Morin, S., Orlove, B. and Steltzer, H.I. (2019) 'Chapter 2: High Mountain Areas', in H.-O. Pörtner, D.C. Roberts, V. Masson-Delmotte, P. Zhai, M. Tignor, E. Poloczanska, K. Mintenbeck, A. Alegría, M. Nicolai, A. Okem, J. Petzold, B. Rama, and N.M. Weyer (eds) IPCC Special Report on the Ocean and Cryosphere in a Changing Climate, pp. 131–202.

Hoffman, J.S., Clark, P.U., Parnell, A.C. and He, F. (2017) 'Regional and global sea-surface temperatures during the last interglaciation', Science, 355(6322), pp. 276–279. https://doi.org/10.1126/science.aai8464

Hollesen, J., Matthiesen, H., Møller, A.B. and Elberling, B. (2015) 'Permafrost thawing in organic Arctic soils accelerated by ground heat production', Nature Climate Change, 5(6), pp. 574–578. https://doi.org/10.1038/nclimate2590

Höning, D., Willeit, M., Calov, R., Klemann, V., Bagge, M. and Ganopolski, A. (2023) 'Multistability and Transient Response of the Greenland Ice Sheet to Anthropogenic CO2 Emissions', Geophysical Research Letters, 50(6), p. e2022GL101827. https://doi.org/10.1029/2022GL101827

Hugelius, G., Loisel, J., Chadburn, S., Jackson, R.B., Jones, M., MacDonald, G., Marushchak, M., Olefeldt, D., Packalen, M., Siewert, M.B., Treat, C., Turetsky, M., Voigt, C. and Yu, Z. (2020) 'Large stocks of peatland carbon and nitrogen are vulnerable to permafrost thaw', Proceedings of the National Academy of Sciences, 117(34), pp. 20438–20446. https://doi.org/10.1073/pnas.1916387117

Hugelius, G., Strauss, J., Zubrzycki, S., Harden, J.W., Schuur, E. a. G., Ping, C.-L., Schirrmeister, L., Grosse, G., Michaelson, G.J., Koven, C.D., O'Donnell, J.A., Elberling, B., Mishra, U., Camill, P., Yu, Z., Palmtag, J. and Kuhry, P. (2014) 'Estimated stocks of circumpolar permafrost carbon with quantified uncertainty ranges and identified data gaps', Biogeosciences, 11(23), pp. 6573–6593. https://doi.org/10.5194/bg-11-6573-2014

Hugonnet, R., McNabb, R., Berthier, E., Menounos, B., Nuth, C., Girod, L., Farinotti, D., Huss, M., Dussaillant, I., Brun, F. and Kääb, A. (2021) 'Accelerated global glacier mass loss in the early twenty-first century', Nature, 592(7856), pp. 726–731. https://doi.org/10.1038/s41586-021-03436-z

Huss, M. and Hock, R. (2018) 'Global-scale hydrological response to future glacier mass loss', Nature Climate Change, 8(2), pp. 135–140. https://doi.org/10.1038/s41558-017-0049-x

Hutchinson, D.K., Coxall, H.K., Lunt, D.J., Steinthorsdottir, M., de Boer, A.M., Baatsen, M., von der Heydt, A., Huber, M., Kennedy-Asser, A.T., Kunzmann, L., Ladant, J.-B., Lear, C.H., Moraweck, K., Pearson, P.N., Piga, E., Pound, M.J., Salzmann, U., Scher, H.D., Sijp, W.P., Śliwińska, K.K., Wilson, P.A. and Zhang, Z. (2021) 'The Eocene–Oligocene transition: a review of marine and terrestrial proxy data, models and model–data comparisons', Climate of the Past, 17(1), pp. 269–315. https://doi.org/10.5194/cp-17-269-2021

Huybrechts, P. (1994) 'Formation and disintegration of the Antarctic ice sheet', Annals of Glaciology, 20, pp. 336–340. https://doi.org/10.3189/1994AoG20-1-336-340

Iizuka, M., Seki, O., Wilson, D.J., Suganuma, Y., Horikawa, K., van de Flierdt, T., Ikehara, M., Itaki, T., Irino, T., Yamamoto, M., Hirabayashi, M., Matsuzaki, H. and Sugisaki, S. (2023) 'Multiple episodes of ice loss from the Wilkes Subglacial Basin during the Last Interglacial', Nature Communications, 14(1), p. 2129. https://doi.org/10.1038/s41467-023-37325-y

Intergovernmental Panel on Climate Change (IPCC) (2021) Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. Edited by V. Masson-Delmotte, P. Zhai, A. Pirani, S.L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M.I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J.B.R. Matthews, T.K. Maycock, T. Waterfield, O. Yelekçi, R. Yu, and B. Zhou. Cambridge University Press

Jahn, A. (2018) 'Reduced probability of ice-free summers for 1.5 °C compared to 2 °C warming', Nature Climate Change, 8(5), pp. 409–413. https://doi.org/10.1038/s41558-018-0127-8

Jakobs, C.L., Reijmer, C.H., Smeets, C.J.P.P., Trusel, L.D., Berg, W.J. van de, Broeke, M.R. van den and Wessem, J.M. van (2020) 'A benchmark dataset of in situ Antarctic surface melt rates and energy balance', Journal of Glaciology, 66(256), pp. 291–302. https://doi.org/10.1017/jog.2020.6

James, R.H., Bousquet, P., Bussmann, I., Haeckel, M., Kipfer, R., Leifer, I., Niemann, H., Ostrovsky, I., Piskozub, J., Rehder, G., Treude, T., Vielstädte, L. and Greinert, J. (2016) 'Effects of climate change on methane emissions from seafloor sediments in the Arctic Ocean: A review', Limnology and Oceanography, 61(S1), pp. S283–S299. https://doi.org/10.1002/lno.10307

Jóhannesson, T., Raymond, C. and Waddington, E. (1989) 'Time-Scale for Adjustment of Glaciers to Changes in Mass Balance', Journal of Glaciology, 35(121), pp. 355–369. https://doi.org/10.3189/S002214300000928X

Joughin, I., Smith, B.E. and Medley, B. (2014) 'Marine Ice Sheet Collapse Potentially Under Way for the Thwaites Glacier Basin, West Antarctica', Science, 344(6185), pp. 735–738. https://doi.org/10.1126/science.1249055

Kääb, A., Bazilova, V., Leclercq, P.W., Mannerfelt, E.S. and Strozzi, T. (2023) 'Global clustering of recent glacier surges from radar backscatter data, 2017–2022', Journal of Glaciology, pp. 1–9. https://doi.org/10.1017/jog.2023.35

Kääb, A., Berthier, E., Nuth, C., Gardelle, J. and Arnaud, Y. (2012) 'Contrasting patterns of early twenty-first-century glacier mass change in the Himalayas', Nature, 488(7412), pp. 495–498. https://doi.org/10.1038/nature11324

Kääb, A., Jacquemart, M., Gilbert, A., Leinss, S., Girod, L., Huggel, C., Falaschi, D., Ugalde, F., Petrakov, D., Chernomorets, S., Dokukin, M., Paul, F., Gascoin, S., Berthier, E. and Kargel, J.S. (2021) 'Sudden large-volume detachments of low-angle mountain glaciers – more frequent than thought?', The Cryosphere, 15(4), pp. 1751–1785. https://doi.org/10.5194/tc-15-1751-2021

Kachuck, S.B., Martin, D.F., Bassis, J.N. and Price, S.F. (2020) 'Rapid Viscoelastic Deformation Slows Marine Ice Sheet Instability at Pine Island Glacier', Geophysical Research Letters, 47(10), p. e2019GL086446. https://doi.org/10.1029/2019GL086446

Kaser, G., Großhauser, M. and Marzeion, B. (2010) 'Contribution potential of glaciers to water availability in different climate regimes', Proceedings of the National Academy of Sciences, 107(47), pp. 20223–20227. https://doi.org/10.1073/pnas.1008162107

Khvorostyanov, D.V., Krinner, G., Ciais, P., Heimann, M. and Zimov, S.A. (2008) 'Vulnerability of permafrost carbon to global warming. Part I: model description and role of heat generated by organic matter decomposition', Tellus B, 60(2), pp. 250–264. https://doi.org/10.1111/j.1600-0889.2007.00333.x

Kim, Y.-H., Min, S.-K., Gillett, N.P., Notz, D. and Malinina, E. (2023) 'Observationally-constrained projections of an ice-free Arctic even under a low emission scenario', Nature Communications, 14(1), p. 3139. https://doi.org/10.1038/s41467-023-38511-8

King, M.D., Howat, I.M., Candela, S.G., Noh, M.J., Jeong, S., Noël, B.P.Y., van den Broeke, M.R., Wouters, B. and Negrete, A. (2020) 'Dynamic ice loss from the Greenland Ice Sheet driven by sustained glacier retreat', Communications Earth & Environment, 1(1), pp. 1–7. https://doi.org/10.1038/s43247-020-0001-2

Kleinen, T. and Brovkin, V. (2018) 'Pathway-dependent fate of permafrost region carbon', Environmental Research Letters, 13(9), p. 094001. https://doi.org/10.1088/1748-9326/aad824

Kloenne, U., Nauels, A., Pearson, P., DeConto, R.M., Findlay, H.S., Hugelius, G., Robinson, A., Rogelj, J., Schuur, E.A.G., Stroeve, J. and Schleussner, C.-F. (2023) 'Only halving emissions by 2030 can minimize risks of crossing cryosphere thresholds', Nature Climate Change, 13(1), pp. 9–11. https://doi.org/10.1038/s41558-022-01566-4

Knight, J. and Harrison, S. (2014) 'Mountain glacial and paraglacial environments under global climate change: lessons from the past, future directions and policy implications', Geografiska Annaler: Series A, Physical Geography, 96(3), pp. 245–264. https://doi.org/10.1111/geoa.12051

Kochtitzky, W. and Copland, L. (2022a) 'Retreat of Northern Hemisphere Marine-Terminating Glaciers, 2000–2020', Geophysical Research Letters, 49(3), p. e2021GL096501. https://doi.org/10.1029/2021GL096501

Kochtitzky, W., Copland, L., Van Wychen, W., Hugonnet, R., Hock, R., Dowdeswell, J.A., Benham, T., Strozzi, T., Glazovsky, A., Lavrentiev, I., Rounce, D.R., Millan, R., Cook, A., Dalton, A., Jiskoot, H., Cooley, J., Jania, J. and Navarro, F. (2022b) 'The unquantified mass loss of Northern Hemisphere marine-terminating glaciers from 2000–2020', Nature Communications, 13(1), p. 5835. https://doi.org/10.1038/s41467-022-33231-x

Köhler, P., Knorr, G. and Bard, E. (2014) 'Permafrost thawing as a possible source of abrupt carbon release at the onset of the Bølling/Allerød', Nature Communications, 5(1), p. 5520. https://doi.org/10.1038/ncomms6520

Koven, C.D., Ringeval, B., Friedlingstein, P., Ciais, P., Cadule, P., Khvorostyanov, D., Krinner, G. and Tarnocai, C. (2011) 'Permafrost carbon-climate feedbacks accelerate global warming', Proceedings of the National Academy of Sciences, 108(36), pp. 14769–14774. https://doi.org/10.1073/pnas.1103910108

Landy, J.C., Dawson, G.J., Tsamados, M., Bushuk, M., Stroeve, J.C., Howell, S.E.L., Krumpen, T., Babb, D.G., Komarov, A.S., Heorton, H.D.B.S., Belter, H.J. and Aksenov, Y. (2022) 'A year-round satellite sea-ice thickness record from CryoSat-2', Nature, 609(7927), pp. 517–522. https://doi.org/10.1038/s41586-022-05058-5

Langer, M., von Deimling, T.S., Westermann, S., Rolph, R., Rutte, R., Antonova, S., Rachold, V., Schultz, M., Oehme, A. and Grosse, G. (2023) 'Thawing permafrost poses environmental threat to thousands of sites with legacy industrial contamination', Nature Communications, 14(1), p. 1721. https://doi.org/10.1038/s41467-023-37276-4

Lantuit, H., Overduin, P.P., Couture, N., Wetterich, S., Aré, F., Atkinson, D., Brown, J., Cherkashov, G., Drozdov, D., Forbes, D.L., Graves-Gaylord, A., Grigoriev, M., Hubberten, H.-W., Jordan, J., Jorgenson, T., Ødegård, R.S., Ogorodov, S., Pollard, W.H., Rachold, V., Sedenko, S., Solomon, S., Steenhuisen, F., Streletskaya, I. and Vasiliev, A. (2012) 'The Arctic Coastal Dynamics Database: A New Classification Scheme and Statistics on Arctic Permafrost Coastlines', Estuaries and Coasts, 35(2), pp. 383–400. https://doi.org/10.1007/s12237-010-9362-6

Larour, E., Seroussi, H., Adhikari, S., Ivins, E., Caron, L., Morlighem, M. and Schlegel, N. (2019) 'Slowdown in Antarctic mass loss from solid Earth and sea-level feedbacks', Science, 364(6444), p. eaav7908. https://doi.org/10.1126/science.aav7908

Lavergne, T., Sørensen, A.M., Kern, S., Tonboe, R., Notz, D., Aaboe, S., Bell, L., Dybkjær, G., Eastwood, S., Gabarro, C., Heygster, G., Killie, M.A., Brandt Kreiner, M., Lavelle, J., Saldo, R., Sandven, S. and Pedersen, L.T. (2019) 'Version 2 of the EUMETSAT OSI SAF and ESA CCI sea-ice concentration climate data records', The Cryosphere, 13(1), pp. 49–78. https://doi.org/10.5194/tc-13-49-2019

Lehner, F., Born, A., Raible, C.C. and Stocker, T.F. (2013) 'Amplified Inception of European Little Ice Age by Sea Ice–Ocean–Atmosphere Feedbacks', Journal of Climate, 26(19), pp. 7586–7602. https://doi.org/10.1175/JCLI-D-12-00690.1

Lenaerts, J.T.M., Lhermitte, S., Drews, R., Ligtenberg, S.R.M., Berger, S., Helm, V., Smeets, C.J.P.P., Broeke, M.R. van den, van de Berg, W.J., van Meijgaard, E., Eijkelboom, M., Eisen, O. and Pattyn, F. (2017) 'Meltwater produced by wind–albedo interaction stored in an East Antarctic ice shelf', Nature Climate Change, 7(1), pp. 58–62. https://doi.org/10.1038/nclimate3180

Lenton, T.M. (2012) 'Arctic Climate Tipping Points', AMBIO, 41(1), pp. 10–22. https://doi.org/10.1007/s13280-011-0221-x

Lenton, T.M., Held, H., Kriegler, E., Hall, J.W., Lucht, W., Rahmstorf, S. and Schellnhuber, H.J. (2008) 'Tipping elements in the Earth's climate system', Proceedings of the National Academy of Sciences, 105(6), pp. 1786–1793. https://doi.org/10.1073/pnas.0705414105

Levermann, A. and Winkelmann, R. (2016) 'A simple equation for the melt elevation feedback of ice sheets', The Cryosphere, 10(4), pp. 1799–1807. https://doi.org/10.5194/tc-10-1799-2016

Levy, R., Harwood, D., Florindo, F., Sangiorgi, F., Tripati, R., von Eynatten, H., Gasson, E., Kuhn, G., Tripati, A., DeConto, R., Fielding, C., Field, B., Golledge, N., McKay, R., Naish, T., Olney, M., Pollard, D., Schouten, S., Talarico, F., Warny, S., Willmott, V., Acton, G., Panter, K., Paulsen, T., Taviani, M., and SMS Science Team (2016) 'Antarctic ice sheet sensitivity to atmospheric CO2 variations in the early to mid-Miocene', Proceedings of the National Academy of Sciences, 113(13), pp. 3453–3458. https://doi.org/10.1073/pnas.1516030113

Li, C., Notz, D., Tietsche, S. and Marotzke, J. (2013) 'The Transient versus the Equilibrium Response of Sea Ice to Global Warming', Journal of Climate, 26(15), pp. 5624–5636. https://doi.org/10.1175/JCLI-D-12-00492.1

Li, X., Rignot, E., Mouginot, J. and Scheuchl, B. (2016) 'Ice flow dynamics and mass loss of Totten Glacier, East Antarctica, from 1989 to 2015', Geophysical Research Letters, 43(12), pp. 6366–6373. https://doi.org/10.1002/2016GL069173

Linsbauer, A., Frey, H., Haeberli, W., Machguth, H., Azam, M.F. and Allen, S. (2016) 'Modelling glacier-bed overdeepenings and possible future lakes for the glaciers in the Himalaya—Karakoram region', Annals of Glaciology, 57(71), pp. 119–130. https://doi.org/10.3189/2016AoG71A627

Liu, Z., Pagani, M., Zinniker, D., DeConto, R., Huber, M., Brinkhuis, H., Shah, S.R., Leckie, R.M. and Pearson, A. (2009) 'Global Cooling During the Eocene-Oligocene Climate Transition', Science, 323(5918), pp. 1187–1190. https://doi.org/10.1126/science.1166368

Mahlstein, I. and Knutti, R. (2012) 'September Arctic sea ice predicted to disappear near 2°C global warming above present', Journal of Geophysical Research: Atmospheres, 117(D6). https://doi.org/10.1029/2011JD016709

Maksym, T. (2019) 'Arctic and Antarctic Sea Ice Change: Contrasts, Commonalities, and Causes', Annual Review of Marine Science, 11(1), pp. 187–213. https://doi.org/10.1146/annurev-marine-010816-060610

Malles, J.-H., Maussion, F., Ultee, L., Kochtitzky, W., Copland, L., Myers, P. and Marzeion, B. (2023) Simulating northern hemisphere glacier – ocean interactions using the Open Global Glacier Model and the Nucleus for European Modelling of the Ocean. EGU23-7295. Copernicus Meetings. https://doi.org/10.5194/egusphere-egu23-7295

Marín-Moreno, H., Minshull, T.A., Westbrook, G.K., Sinha, B. and Sarkar, S. (2013) 'The response of methane hydrate beneath the seabed offshore Svalbard to ocean warming during the next three centuries', Geophysical Research Letters, 40(19), pp. 5159–5163. https://doi.org/10.1002/grl.50985

Marzeion, B., Hock, R., Anderson, B., Bliss, A., Champollion, N., Fujita, K., Huss, M., Immerzeel, W.W., Kraaijenbrink, P., Malles, J.-H., Maussion, F., Radić, V., Rounce, D.R., Sakai, A., Shannon, S., van de Wal, R. and Zekollari, H. (2020) 'Partitioning the Uncertainty of Ensemble Projections of Global Glacier Mass Change', Earth's Future, 8(7), p. e2019EF001470. https://doi.org/10.1029/2019EF001470

Marzeion, B., Kaser, G., Maussion, F. and Champollion, N. (2018) 'Limited influence of climate change mitigation on short-term glacier mass loss', Nature Climate Change, 8(4), pp. 305–308. https://doi.org/10.1038/s41558-018-0093-1

McGuire, A.D., Lawrence, D.M., Koven, C., Clein, J.S., Burke, E., Chen, G., Jafarov, E., MacDougall, A.H., Marchenko, S., Nicolsky, D., Peng, S., Rinke, A., Ciais, P., Gouttevin, I., Hayes, D.J., Ji, D., Krinner, G., Moore, J.C., Romanovsky, V., Schädel, C., Schaefer, K., Schuur, E.A.G. and Zhuang, Q. (2018) 'Dependence of the evolution of carbon dynamics in the northern permafrost region on the trajectory of climate change', Proceedings of the National Academy of Sciences, 115(15), pp. 3882–3887. https://doi.org/10.1073/pnas.1719903115

Medley, B. and Thomas, E.R. (2019) 'Increased snowfall over the Antarctic Ice Sheet mitigated twentieth-century sea-level rise', Nature Climate Change, 9(1), pp. 34–39. https://doi.org/10.1038/s41558-018-0356-x

Mengel, M. and Levermann, A. (2014) 'Ice plug prevents irreversible

discharge from East Antarctica', Nature Climate Change, 4(6), pp. 451–455. https://doi.org/10.1038/nclimate2226

Meredith, M., Sommerkorn, M., Cassotta, S., Derksen, C., Ekaykin, A., Hollowed, A., Kofinas, G., Mackintosh, A., Melbourne-Thomas, J., Muelbert, M.M.C., Ottersen, G., Pritchard, H., and Schuur, E.A.G. (2019) 'Chapter 3: Polar regions', in IPCC Special Report on the Ocean and Cryosphere in a Changing Climate. Cambridge, UK and New York, NY, USA: Cambridge University Press, pp. 203–320. https://www.ipcc.ch/srocc/chapter/chapter-3-2/ (Accessed: 23 October 2023)

Mernild, S.H., Lipscomb, W.H., Bahr, D.B., Radić, V. and Zemp, M. (2013) 'Global glacier changes: a revised assessment of committed mass losses and sampling uncertainties', The Cryosphere, 7(5), pp. 1565–1577. https://doi.org/10.5194/tc-7-1565-2013

Miesner, F., Overduin, P.P., Grosse, G., Strauss, J., Langer, M., Westermann, S., Schneider von Deimling, T., Brovkin, V. and Arndt, S. (2023) 'Subsea permafrost organic carbon stocks are large and of dominantly low reactivity', Scientific Reports, 13(1), p. 9425. https://doi.org/10.1038/s41598-023-36471-z

Miles, B.W.J., Jordan, J.R., Stokes, C.R., Jamieson, S.S.R., Gudmundsson, G.H. and Jenkins, A. (2021) 'Recent acceleration of Denman Glacier (1972–2017), East Antarctica, driven by grounding line retreat and changes in ice tongue configuration', The Cryosphere, 15(2), pp. 663–676. https://doi.org/10.5194/tc-15-663-2021

Milillo, P., Rignot, E., Rizzoli, P., Scheuchl, B., Mouginot, J., Bueso-Bello, J.L., Prats-Iraola, P. and Dini, L. (2022) 'Rapid glacier retreat rates observed in West Antarctica', Nature Geoscience, 15(1), pp. 48–53. https://doi.org/10.1038/s41561-021-00877-z

Miner, K.R., D'Andrilli, J., Mackelprang, R., Edwards, A., Malaska, M.J., Waldrop, M.P. and Miller, C.E. (2021) 'Emergent biogeochemical risks from Arctic permafrost degradation', Nature Climate Change, 11(10), pp. 809–819. https://doi.org/10.1038/s41558-021-01162-y

Miner, K.R., Turetsky, M.R., Malina, E., Bartsch, A., Tamminen, J., McGuire, A.D., Fix, A., Sweeney, C., Elder, C.D. and Miller, C.E. (2022) 'Permafrost carbon emissions in a changing Arctic', Nature Reviews Earth & Environment, 3(1), pp. 55–67. https://doi.org/10.1038/s43017-021-00230-3

Morlighem, M., Rignot, E., Binder, T., Blankenship, D., Drews, R., Eagles, G., Eisen, O., Ferraccioli, F., Forsberg, R., Fretwell, P., Goel, V., Greenbaum, J.S., Gudmundsson, H., Guo, J., Helm, V., Hofstede, C., Howat, I., Humbert, A., Jokat, W., Karlsson, N.B., Lee, W.S., Matsuoka, K., Millan, R., Mouginot, J., Paden, J., Pattyn, F., Roberts, J., Rosier, S., Ruppel, A., Seroussi, H., Smith, E.C., Steinhage, D., Sun, B., Broeke, M.R.V.D., Ommen, T.D.V., Wessem, M.V. and Young, D.A. (2020) 'Deep glacial troughs and stabilizing ridges unveiled beneath the margins of the Antarctic ice sheet', Nature Geoscience, 13(2), pp. 132–137. https://doi.org/10.1038/s41561-019-0510-8

Morlighem, M., Williams, C.N., Rignot, E., An, L., Arndt, J.E., Bamber, J.L., Catania, G., Chauché, N., Dowdeswell, J.A., Dorschel, B., Fenty, I., Hogan, K., Howat, I., Hubbard, A., Jakobsson, M., Jordan, T.M., Kjeldsen, K.K., Millan, R., Mayer, L., Mouginot, J., Noël, B.P.Y., O'Cofaigh, C., Palmer, S., Rysgaard, S., Seroussi, H., Siegert, M.J., Slabon, P., Straneo, F., van den Broeke, M.R., Weinrebe, W., Wood, M. and Zinglersen, K.B. (2017) 'BedMachine v3: Complete Bed Topography and Ocean Bathymetry Mapping of Greenland From Multibeam Echo Sounding Combined With Mass Conservation', Geophysical Research Letters, 44(21), p. 11,051-11,061. https://doi.org/10.1002/2017GL074954

Muilwijk, M., Nummelin, A., Heuzé, C., Polyakov, I.V., Zanowski, H. and Smedsrud, L.H. (2023) 'Divergence in Climate Model Projections of Future Arctic Atlantification', Journal of Climate, 36(6), pp. 1727–1748. https://doi.org/10.1175/JCLI-D-22-0349.1

Naegeli, K. and Huss, M. (2017) 'Sensitivity of mountain glacier mass balance to changes in bare-ice albedo', Annals of Glaciology, 58(75pt2), pp. 119–129. https://doi.org/10.1017/aog.2017.25

Naish, T., Powell, R., Levy, R., Wilson, G., Scherer, R., Talarico, F., Krissek, L., Niessen, F., Pompilio, M., Wilson, T., Carter, L., DeConto, R., Huybers, P., McKay, R., Pollard, D., Ross, J., Winter, D., Barrett, P., Browne, G., Cody, R., Cowan, E., Crampton, J., Dunbar, G., Dunbar, N., Florindo, F., Gebhardt, C., Graham, I., Hannah, M., Hansaraj, D., Harwood, D., Helling, D., Henrys, S., Hinnov, L., Kuhn, G., Kyle, P., Läufer, A., Maffioli, P., Magens, D., Mandernack, K., McIntosh, W., Millan, C., Morin, R., Ohneiser, C., Paulsen, T., Persico, D., Raine, I., Reed, J., Riesselman, C., Sagnotti, L., Schmitt, D., Sjunneskog, C., Strong, P., Taviani, M., Vogel, S., Wilch, T. and Williams, T. (2009) 'Obliquity-paced Pliocene West Antarctic ice sheet oscillations', Nature, 458(7236), pp. 322–328. https://doi.org/10.1038/nature07867

Natali, S.M., Holdren, J.P., Rogers, B.M., Treharne, R., Duffy, P.B., Pomerance, R. and MacDonald, E. (2021) 'Permafrost carbon feedbacks threaten global climate goals', Proceedings of the National Academy of Sciences, 118(21), p. e2100163118. https://doi.org/10.1073/pnas.2100163118

Naughten, K.A., Holland, P.R. and De Rydt, J. (2023) 'Unavoidable future increase in West Antarctic ice-shelf melting over the twenty-first century', Nature Climate Change, pp. 1–7. https://doi.org/10.1038/s41558-023-01818-x

Needell, C. and Holschuh, N. (2023) 'Evaluating the Retreat, Arrest, and Regrowth of Crane Glacier Against Marine Ice Cliff Process Models', Geophysical Research Letters, 50(4), p. e2022GL102400. https://doi.org/10.1029/2022GL102400

Nitzbon, J., Deimling, T.S. von, Aliyeva, M., Chadburn, S.E., Grosse, G., Laboor, S., Lee, H., Lohmann, G., Steinert, N., Stuenzi, S., Werner, M., Westermann, S. and Langer, M. (2023) 'No respite from permafrost-thaw impacts in absence of a global tipping point' [Preprint]. https://eartharxiv.org/repository/view/5986/ (Accessed: 16 October 2023)

Nitzbon, J., Westermann, S., Langer, M., Martin, L.C.P., Strauss, J., Laboor, S. and Boike, J. (2020) 'Fast response of cold ice-rich permafrost in northeast Siberia to a warming climate', Nature Communications, 11(1), p. 2201. https://doi.org/10.1038/s41467-020-15725-8

Noël, B., van Kampenhout, L., Lenaerts, J.T.M., van de Berg, W.J. and van den Broeke, M.R. (2021) 'A 21st Century Warming Threshold for Sustained Greenland Ice Sheet Mass Loss', Geophysical Research Letters, 48(5), p. e2020GL090471. https://doi.org/10.1029/2020GL090471

Notz, D. (2009) 'The future of ice sheets and sea ice: Between reversible retreat and unstoppable loss', Proceedings of the National Academy of Sciences, 106(49), pp. 20590–20595. https://doi.org/10.1073/pnas.0902356106

Notz, D. and Bitz, C.M. (2017) 'Sea ice in Earth system models', in Sea Ice. John Wiley & Sons, Ltd, pp. 304–325. https://doi.org/10.1002/9781118778371.ch12

Notz, D. and Community, S. (2020) 'Arctic Sea Ice in CMIP6', Geophysical Research Letters, 47(10), p. e2019GL086749. https://doi.org/10.1029/2019GL086749

Notz, D. and Stroeve, J. (2016) 'Observed Arctic sea-ice loss directly follows anthropogenic CO2 emission', Science, 354(6313), pp. 747–750. https://doi.org/10.1126/science.aag2345

Obu, J. (2021) 'How Much of the Earth's Surface is Underlain by Permafrost?', Journal of Geophysical Research: Earth Surface, 126(5), p. e2021JF006123. https://doi.org/10.1029/2021JF006123

O'Connor, F.M., Boucher, O., Gedney, N., Jones, C.D., Folberth, G.A., Coppell, R., Friedlingstein, P., Collins, W.J., Chappellaz, J., Ridley, J. and Johnson, C.E. (2010) 'Possible role of wetlands, permafrost, and methane hydrates in the methane cycle under future climate change: A review', Reviews of Geophysics, 48(4). https://doi.org/10.1029/2010RG000326

Oerlemans, J. (1981) 'Some basic experiments with a vertically-integrated ice sheet model', Tellus, 33(1), pp. 1–11. https://doi.org/10.3402/tellusa.v33i1.10690

Olefeldt, D., Goswami, S., Grosse, G., Hayes, D., Hugelius, G., Kuhry, P., McGuire, A.D., Romanovsky, V.E., Sannel, A.B.K., Schuur, E. a. G. and Turetsky, M.R. (2016) 'Circumpolar distribution and carbon storage of thermokarst landscapes', Nature Communications, 7(1), p. 13043. https://doi.org/10.1038/ncomms13043

Otosaka, I.N., Shepherd, A., Ivins, E.R., Schlegel, N.-J., Amory, C., van den Broeke, M.R., Horwath, M., Joughin, I., King, M.D., Krinner, G., Nowicki, S., Payne, A.J., Rignot, E., Scambos, T., Simon, K.M., Smith, B.E., Sørensen, L.S., Velicogna, I., Whitehouse, P.L., A, G., Agosta, C., Ahlstrøm, A.P., Blazquez, A., Colgan, W., Engdahl, M.E., Fettweis, X., Forsberg, R., Gallée, H., Gardner, A., Gilbert, L., Gourmelen,

N., Groh, A., Gunter, B.C., Harig, C., Helm, V., Khan, S.A., Kittel, C., Konrad, H., Langen, P.L., Lecavalier, B.S., Liang, C.-C., Loomis, B.D., McMillan, M., Melini, D., Mernild, S.H., Mottram, R., Mouginot, J., Nilsson, J., Noël, B., Pattle, M.E., Peltier, W.R., Pie, N., Roca, M., Sasgen, I., Save, H.V., Seo, K.-W., Scheuchl, B., Schrama, E.J.O., Schröder, L., Simonsen, S.B., Slater, T., Spada, G., Sutterley, T.C., Vishwakarma, B.D., van Wessem, J.M., Wiese, D., van der Wal, W. and Wouters, B. (2023) 'Mass balance of the Greenland and Antarctic ice sheets from 1992 to 2020', Earth System Science Data, 15(4), pp. 1597–1616. https://doi.org/10.5194/essd-15-1597-2023

Overduin, P.P., Schneider von Deimling, T., Miesner, F., Grigoriev, M.N., Ruppel, C., Vasiliev, A., Lantuit, H., Juhls, B. and Westermann, S. (2019) 'Submarine Permafrost Map in the Arctic Modeled Using 1-D Transient Heat Flux (SuPerMAP)', Journal of Geophysical Research: Oceans, 124(6), pp. 3490–3507. https://doi.org/10.1029/2018JC014675

Paolo, F.S., Fricker, H.A. and Padman, L. (2015) 'Volume loss from Antarctic ice shelves is accelerating', Science, 348(6232), pp. 327–331. https://doi.org/10.1126/science.aaa0940

Pattyn, F. and Morlighem, M. (2020) 'The uncertain future of the Antarctic Ice Sheet', Science, 367(6484), pp. 1331–1335. https://doi.org/10.1126/science.aaz5487

Pegler, S.S. (2018) 'Suppression of marine ice sheet instability', Journal of Fluid Mechanics, 857, pp. 648–680. https://doi.org/10.1017/jfm.2018.742

Pfeffer, W.T. (2007) 'A simple mechanism for irreversible tidewater glacier retreat', Journal of Geophysical Research: Earth Surface, 112(F3). https://doi.org/10.1029/2006JF000590

Pihl, E., Alfredsson, E., Bengtsson, M., Bowen, K.J., Broto, V.C., Chou, K.T., Cleugh, H., Ebi, K., Edwards, C.M., Fisher, E., Friedlingstein, P., Godoy-Faúndez, A., Gupta, M., Harrington, A.R., Hayes, K., Hayward, B.M., Hebden, S.R., Hickmann, T., Hugelius, G., Ilyina, T., Jackson, R.B., Keenan, T.F., Lambino, R.A., Leuzinger, S., Malmaeus, M., McDonald, R.I., McMichael, C., Miller, C.A., Muratori, M., Nagabhatla, N., Nagendra, H., Passarello, C., Penuelas, J., Pongratz, J., Rockström, J., Romero-Lankao, P., Roy, J., Scaife, A.A., Schlosser, P., Schuur, E., Scobie, M., Sherwood, S.C., Sioen, G.B., Skovgaard, J., Obregon, E.A.S., Sonntag, S., Spangenberg, J.H., Spijkers, O., Srivastava, L., Stammer, D.B., Torres, P.H.C., Turetsky, M.R., Ukkola, A.M., Vuuren, D.P. van, Voigt, C., Wannous, C. and Zelinka, M.D. (2021) 'Ten new insights in climate science 2020 – a horizon scan', Global Sustainability, 4, p. e5. https://doi.org/10.1017/sus.2021.2

Pollard, D. and DeConto, R.M. (2005) 'Hysteresis in Cenozoic Antarctic ice-sheet variations', Global and Planetary Change, 45(1), pp. 9–21. https://doi.org/10.1016/j.gloplacha.2004.09.011

Pollard, D., DeConto, R.M. and Alley, R.B. (2015a) 'Potential Antarctic Ice Sheet retreat driven by hydrofracturing and ice cliff failure', Earth and Planetary Science Letters, 412, pp. 112–121. https://doi.org/10.1016/j.epsl.2014.12.035

Pollard, D., DeConto, R.M. and Alley, R.B. (2015b) 'Potential Antarctic Ice Sheet retreat driven by hydrofracturing and ice cliff failure', Earth and Planetary Science Letters, 412, pp. 112–121. https://doi.org/10.1016/j.epsl.2014.12.035

Pollard, D., DeConto, R.M. and Alley, R.B. (2018) 'A continuum model (PSUMEL1) of ice mélange and its role during retreat of the Antarctic Ice Sheet', Geoscientific Model Development, 11(12), pp. 5149–5172. https://doi.org/10.5194/gmd-11-5149-2018

Purich, A. and Doddridge, E.W. (2023) 'Record low Antarctic sea ice coverage indicates a new sea ice state', Communications Earth & Environment, 4(1), pp. 1–9. https://doi.org/10.1038/s43247-023-00961-9

Rantanen, M., Karpechko, A.Y., Lipponen, A., Nordling, K., Hyvärinen, O., Ruosteenoja, K., Vihma, T. and Laaksonen, A. (2022) 'The Arctic has warmed nearly four times faster than the globe since 1979', Communications Earth & Environment, 3(1), pp. 1–10. https://doi.org/10.1038/s43247-022-00498-3

Reagan, M.T. and Moridis, G.J. (2007) 'Oceanic gas hydrate instability and dissociation under climate change scenarios', Geophysical Research Letters, 34(22). https://doi.org/10.1029/2007GL031671

Reese, R., Garbe, J., Hill, E.A., Urruty, B., Naughten, K.A., Gagliardini, O., Durand, G., Gillet-Chaulet, F., Gudmundsson, G.H., Chandler, D., Langebroek, P.M. and Winkelmann, R. (2023) 'The stability of present-day Antarctic grounding lines – Part 2: Onset of irreversible retreat of Amundsen Sea glaciers under current climate on centennial timescales cannot be excluded', The Cryosphere, 17(9), pp. 3761–3783. https://doi.org/10.5194/tc-17-3761-2023

Reese, R., Gudmundsson, G.H., Levermann, A. and Winkelmann, R. (2018) 'The far reach of ice-shelf thinning in Antarctica', Nature Climate Change, 8(1), pp. 53–57. https://doi.org/10.1038/s41558-017-0020-x

Ridley, J., Gregory, J.M., Huybrechts, P. and Lowe, J. (2010) 'Thresholds for irreversible decline of the Greenland ice sheet', Climate Dynamics, 35(6), pp. 1049–1057. https://doi.org/10.1007/s00382-009-0646-0

Ridley, J.K., Lowe, J.A. and Hewitt, H.T. (2012) 'How reversible is sea ice loss?', The Cryosphere, 6(1), pp. 193–198. https://doi.org/10.5194/tc-6-193-2012

Rignot, E., Casassa, G., Gogineni, P., Krabill, W., Rivera, A. and Thomas, R. (2004) 'Accelerated ice discharge from the Antarctic Peninsula following the collapse of Larsen B ice shelf', Geophysical Research Letters, 31(18). https://doi.org/10.1029/2004GL020697

Rignot, E., Mouginot, J., Morlighem, M., Seroussi, H. and Scheuchl, B. (2014) 'Widespread, rapid grounding line retreat of Pine Island, Thwaites, Smith, and Kohler glaciers, West Antarctica, from 1992 to 2011', Geophysical Research Letters, 41(10), pp. 3502–3509. https://doi.org/10.1002/2014GL060140

Rignot, E., Mouginot, J., Scheuchl, B., van den Broeke, M., van Wessem, M.J. and Morlighem, M. (2019) 'Four decades of Antarctic Ice Sheet mass balance from 1979–2017', Proceedings of the National Academy of Sciences, 116(4), pp. 1095–1103. https://doi.org/10.1073/pnas.1812883116

Rintoul, S.R., Silvano, A., Pena-Molino, B., van Wijk, E., Rosenberg, M., Greenbaum, J.S. and Blankenship, D.D. (2016) 'Ocean heat drives rapid basal melt of the Totten Ice Shelf', Science Advances, 2(12), p. e1601610. https://doi.org/10.1126/sciadv.1601610

Ritchie, P.D.L., Clarke, J.J., Cox, P.M. and Huntingford, C. (2021) 'Overshooting tipping point thresholds in a changing climate', Nature, 592(7855), pp. 517–523. https://doi.org/10.1038/s41586-021-03263-2

Robel, A.A. and Banwell, A.F. (2019) 'A Speed Limit on Ice Shelf Collapse Through Hydrofracture', Geophysical Research Letters, 46(21), pp. 12092–12100. https://doi.org/10.1029/2019GL084397

Robinson, A., Calov, R. and Ganopolski, A. (2012) 'Multistability and critical thresholds of the Greenland ice sheet', Nature Climate Change, 2(6), pp. 429–432. https://doi.org/10.1038/nclimate1449

Rounce, D.R., Hock, R., Maussion, F., Hugonnet, R., Kochtitzky, W., Huss, M., Berthier, E., Brinkerhoff, D., Compagno, L., Copland, L., Farinotti, D., Menounos, B. and McNabb, R.W. (2023) 'Global glacier change in the 21st century: Every increase in temperature matters', Science, 379(6627), pp. 78–83. https://doi.org/10.1126/science.abo1324

Ruppel, C. (2015) 'Permafrost-Associated Gas Hydrate: Is It Really Approximately 1 % of the Global System?', Journal of Chemical & Engineering Data, 60(2), pp. 429–436. https://doi.org/10.1021/je500770m

Ruppel, C.D. and Kessler, J.D. (2017) 'The interaction of climate change and methane hydrates', Reviews of Geophysics, 55(1), pp. 126–168. https://doi.org/10.1002/2016RG000534

Sayedi, S.S., Abbott, B.W., Thornton, B.F., Frederick, J.M., Vonk, J.E., Overduin, P., Schädel, C., Schuur, E.A.G., Bourbonnais, A., Demidov, N., Gavrilov, A., He, S., Hugelius, G., Jakobsson, M., Jones, M.C., Joung, D., Kraev, G., Macdonald, R.W., McGuire, A.D., Mu, C., O'Regan, M., Schreiner, K.M., Stranne, C., Pizhankova, E., Vasiliev, A., Westermann, S., Zarnetske, J.P., Zhang, T., Ghandehari, M., Baeumler, S., Brown, B.C. and Frei, R.J. (2020) 'Subsea permafrost carbon stocks and climate change sensitivity estimated by expert assessment', Environmental Research Letters, 15(12), p. 124075. https://doi.org/10.1088/1748-9326/abcc29

Scambos, T.A., Bohlander, J.A., Shuman, C.A. and Skvarca, P. (2004) 'Glacier acceleration and thinning after ice shelf collapse in the Larsen B embayment, Antarctica', Geophysical Research Letters, 31(18). https://doi.org/10.1029/2004GL020670

Schaefer, K., Lantuit, H., Romanovsky, V.E., Schuur, E.A.G. and Witt,

R. (2014) 'The impact of the permafrost carbon feedback on global climate', Environmental Research Letters, 9(8), p. 085003. https://doi.org/10.1088/1748-9326/9/8/085003

Schellnhuber, H.J., Rahmstorf, S. and Winkelmann, R. (2016) 'Why the right climate target was agreed in Paris', Nature Climate Change, 6(7), pp. 649–653. https://doi.org/10.1038/nclimate3013

Schlemm, T., Feldmann, J., Winkelmann, R. and Levermann, A. (2022) 'Stabilizing effect of mélange buttressing on the marine ice-cliff instability of the West Antarctic Ice Sheet', The Cryosphere, 16(5), pp. 1979–1996. https://doi.org/10.5194/tc-16-1979-2022

Schoof, C. (2007) 'Ice sheet grounding line dynamics: Steady states, stability, and hysteresis', Journal of Geophysical Research: Earth Surface, 112(F3). https://doi.org/10.1029/2006JF000664

Schröder, L., Horwath, M., Dietrich, R., Helm, V., van den Broeke, M.R. and Ligtenberg, S.R.M. (2019) 'Four decades of Antarctic surface elevation changes from multi-mission satellite altimetry', The Cryosphere, 13(2), pp. 427–449. https://doi.org/10.5194/tc-13-427-2019

Schuur, E. a. G., McGuire, A.D., Schädel, C., Grosse, G., Harden, J.W., Hayes, D.J., Hugelius, G., Koven, C.D., Kuhry, P., Lawrence, D.M., Natali, S.M., Olefeldt, D., Romanovsky, V.E., Schaefer, K., Turetsky, M.R., Treat, C.C. and Vonk, J.E. (2015) 'Climate change and the permafrost carbon feedback', Nature, 520(7546), pp. 171–179. https://doi.org/10.1038/nature14338

Schuur, E.A.G., Abbott, B.W., Commane, R., Ernakovich, J., Euskirchen, E., Hugelius, G., Grosse, G., Jones, M., Koven, C., Leshyk, V., Lawrence, D., Loranty, M.M., Mauritz, M., Olefeldt, D., Natali, S., Rodenhizer, H., Salmon, V., Schädel, C., Strauss, J., Treat, C. and Turetsky, M. (2022) 'Permafrost and Climate Change: Carbon Cycle Feedbacks From the Warming Arctic', Annual Review of Environment and Resources, 47(1), pp. 343–371. https://doi.org/10.1146/annurev-environ-012220-011847

Schwinger, J., Asaadi, A., Goris, N. and Lee, H. (2022) 'Possibility for strong northern hemisphere high-latitude cooling under negative emissions', Nature Communications, 13(1), p. 1095. https://doi.org/10.1038/s41467-022-28573-5

Seroussi, H., Nakayama, Y., Larour, E., Menemenlis, D., Morlighem, M., Rignot, E. and Khazendar, A. (2017) 'Continued retreat of Thwaites Glacier, West Antarctica, controlled by bed topography and ocean circulation', Geophysical Research Letters, 44(12), pp. 6191–6199. https://doi.org/10.1002/2017GL072910

Shakun, J.D., Corbett, L.B., Bierman, P.R., Underwood, K., Rizzo, D.M., Zimmerman, S.R., Caffee, M.W., Naish, T., Golledge, N.R. and Hay, C.C. (2018) 'Minimal East Antarctic Ice Sheet retreat onto land during the past eight million years', Nature, 558(7709), pp. 284–287. https://doi.org/10.1038/s41586-018-0155-6

Shen, Q., Wang, H., Shum, C.K., Jiang, L., Hsu, H.T. and Dong, J. (2018) 'Recent high-resolution Antarctic ice velocity maps reveal increased mass loss in Wilkes Land, East Antarctica', Scientific Reports, 8(1), p. 4477. https://doi.org/10.1038/s41598-018-22765-0

Shepherd, A., Gilbert, L., Muir, A.S., Konrad, H., McMillan, M., Slater, T., Briggs, K.H., Sundal, A.V., Hogg, A.E. and Engdahl, M.E. (2019) 'Trends in Antarctic Ice Sheet Elevation and Mass', Geophysical Research Letters, 46(14), pp. 8174–8183. https://doi.org/10.1029/2019GL082182

Shepherd, A., Ivins, E., Rignot, E., Smith, B., Broeke, M. van den, Velicogna, I., Whitehouse, P., Briggs, K., Joughin, I., Krinner, G., Nowicki, S., Payne, T., Scambos, T., Schlegel, N., A, G., Agosta, C., Ahlstrøm, A., Babonis, G., Barletta, V.R., Bjørk, A.A., Blazquez, A., Bonin, J., Colgan, W., Csatho, B., Cullather, R., Engdahl, M.E., Felikson, D., Fettweis, X., Forsberg, R., Hogg, A.E., Gallee, H., Gardner, A., Gilbert, L., Gourmelen, N., Groh, A., Gunter, B., Hanna, E., Harig, C., Helm, V., Horvath, A., Horwath, M., Khan, S., Kjeldsen, K.K., Konrad, H., Langen, P.L., Lecavalier, B., Loomis, B., Luthcke, S., McMillan, M., Melini, D., Mernild, S., Mohajerani, Y., Moore, P., Mottram, R., Mouginot, J., Moyano, G., Muir, A., Nagler, T., Nield, G., Nilsson, J., Noël, B., Otosaka, I., Pattle, M.E., Peltier, W.R., Pie, N., Rietbroek, R., Rott, H., Sørensen, L.S., Sasgen, I., Save, H., Scheuchl, B., Schrama, E., Schröder, L., Seo, K.W., Simonsen, S.B., Slater, T., Spada, G., Sutterley, T., Talpe, M., Tarasov, L., Berg, W.J. van de, Wal, W. van der, Wessem, M. van, Vishwakarma, B.D., Wiese, D., Wilton, D., Wagner, T., Wouters, B. and Wuite, J. (2020) 'Mass balance of the Greenland Ice Sheet from 1992 to 2018', Nature, 579(7798), pp. 233–239. https://doi.org/10.1038/s41586-019-1855-2

Smedsrud, L.H., Muilwijk, M., Brakstad, A., Madonna, E., Lauvset, S.K., Spensberger, C., Born, A., Eldevik, T., Drange, H., Jeansson, E., Li, C., Olsen, A., Skagseth, Ø., Slater, D.A., Straneo, F., Våge, K. and Årthun, M. (2022) 'Nordic Seas Heat Loss, Atlantic Inflow, and Arctic Sea Ice Cover Over the Last Century', Reviews of Geophysics, 60(1), p. e2020RG000725. https://doi.org/10.1029/2020RG000725

Smith, D.M., Eade, R., Andrews, M.B., Ayres, H., Clark, A., Chripko, S., Deser, C., Dunstone, N.J., García-Serrano, J., Gastineau, G., Graff, L.S., Hardiman, S.C., He, B., Hermanson, L., Jung, T., Knight, J., Levine, X., Magnusdottir, G., Manzini, E., Matei, D., Mori, M., Msadek, R., Ortega, P., Peings, Y., Scaife, A.A., Screen, J.A., Seabrook, M., Semmler, T., Sigmond, M., Streffing, J., Sun, L. and Walsh, A. (2022) 'Robust but weak winter atmospheric circulation response to future Arctic sea ice loss', Nature Communications, 13(1), p. 727. https://doi.org/10.1038/s41467-022-28283-y

Steffen, W., Rockström, J., Richardson, K., Lenton, T.M., Folke, C., Liverman, D., Summerhayes, C.P., Barnosky, A.D., Cornell, S.E., Crucifix, M., Donges, J.F., Fetzer, I., Lade, S.J., Scheffer, M., Winkelmann, R. and Schellnhuber, H.J. (2018) 'Trajectories of the Earth System in the Anthropocene', Proceedings of the National Academy of Sciences, 115(33), pp. 8252–8259. https://doi.org/10.1073/pnas.1810141115

Stokes, C.R., Sanderson, J.E., Miles, B.W.J., Jamieson, S.S.R. and Leeson, A.A. (2019) 'Widespread distribution of supraglacial lakes around the margin of the East Antarctic Ice Sheet', Scientific Reports, 9(1), p. 13823. https://doi.org/10.1038/s41598-019-50343-5

Strozzi, T., Paul, F., Wiesmann, A., Schellenberger, T. and Kääb, A. (2017) 'Circum-Arctic Changes in the Flow of Glaciers and Ice Caps from Satellite SAR Data between the 1990s and 2017', Remote Sensing, 9(9), p. 947. https://doi.org/10.3390/rs9090947

Sutter, J., Eisen, O., Werner, M., Grosfeld, K., Kleiner, T. and Fischer, H. (2020) 'Limited Retreat of the Wilkes Basin Ice Sheet During the Last Interglacial', Geophysical Research Letters, 47(13), p. e2020GL088131. https://doi.org/10.1029/2020GL088131

Sutter, J., Gierz, P., Grosfeld, K., Thoma, M. and Lohmann, G. (2016) 'Ocean temperature thresholds for Last Interglacial West Antarctic Ice Sheet collapse', Geophysical Research Letters, 43(6), pp. 2675–2682. https://doi.org/10.1002/2016GL067818

Tebaldi, C., Debeire, K., Eyring, V., Fischer, E., Fyfe, J., Friedlingstein, P., Knutti, R., Lowe, J., O'Neill, B., Sanderson, B., van Vuuren, D., Riahi, K., Meinshausen, M., Nicholls, Z., Tokarska, K.B., Hurtt, G., Kriegler, E., Lamarque, J.-F., Meehl, G., Moss, R., Bauer, S.E., Boucher, O., Brovkin, V., Byun, Y.-H., Dix, M., Gualdi, S., Guo, H., John, J.G., Kharin, S., Kim, Y., Koshiro, T., Ma, L., Olivié, D., Panickal, S., Qiao, F., Rong, X., Rosenbloom, N., Schupfner, M., Séférian, R., Sellar, A., Semmler, T., Shi, X., Song, Z., Steger, C., Stouffer, R., Swart, N., Tachiiri, K., Tang, Q., Tatebe, H., Voldoire, A., Volodin, E., Wyser, K., Xin, X., Yang, S., Yu, Y. and Ziehn, T. (2021) 'Climate model projections from the Scenario Model Intercomparison Project (ScenarioMIP) of CMIP6', Earth System Dynamics, 12(1), pp. 253–293. https://doi.org/10.5194/esd-12-253-2021

The IMBIE Team, Shepherd, A., Velicogna, I., Ivins, E., Rignot, E., Smith, B., van den Broeke, M., Scambos, T., Whitehouse, P., Briggs, K., Joughin, I., Krinner, G., Nowicki, S., Payne, T., Ahlstrøm, A., Schlegel, N., A, G., Agosta, C., Felikson, D., Babonis, G., Barletta, V., Blazquez, A., Bonin, J., Csatho, B., Cullather, R., The IMBIE team, Fettweis, X., Forsberg, R., Gallee, H., Gardner, A., Gilbert, L., Groh, A., Gunter, B., Hanna, E., Harig, C., Helm, V., Horvath, A., Horwath, M., Khan, S., Kjeldsen, K.K., Konrad, H., Langen, P., Lecavalier, B., Loomis, B., Luthcke, S., McMillan, M., Melini, D., Mernild, S., Mohajerani, Y., Moore, P., Mouginot, J., Moyano, G., Muir, A., Nagler, T., Nield, G., Nilsson, J., Noel, B., Otosaka, I., Pattle, M.E., Peltier, W.R., Pie, N., Rietbroek, R., Rott, H., Sandberg-Sørensen, L., Sasgen, I., Save, H., Scheuchl, B., Schrama, E., Schröder, L., Seo, K.-W., Simonsen, S., Slater, T., Spada, G., Sutterley, T., Talpe, M., Tarasov, L., van de Berg, W.J., van der Wal, W., van Wessem, M., Vishwakarma, B.D., Wiese, D. and Wouters, B. (2018) 'Mass balance of the Antarctic Ice Sheet from 1992 to 2017', Nature, 558(7709), pp. 219–222. https://doi.org/10.1038/s41586-018-0179-y

Thomas, Z.A., Jones, R.T., Turney, C.S.M., Golledge, N., Fogwill, C., Bradshaw, C.J.A., Menviel, L., McKay, N.P., Bird, M., Palmer, J., Kershaw, P., Wilmshurst, J. and Muscheler, R. (2020) 'Tipping elements and amplified polar warming during the Last Interglacial', Quaternary Science Reviews, 233, p. 106222. https://doi.org/10.1016/j.quascirev.2020.106222

Tietsche, S., Notz, D., Jungclaus, J.H. and Marotzke, J. (2011) 'Recovery mechanisms of Arctic summer sea ice', Geophysical Research Letters, 38(2). https://doi.org/10.1029/2010GL045698

Truffer, M., Kääb, A., Harrison, W.D., Osipova, G.B., Nosenko, G.A., Espizua, L., Gilbert, A., Fischer, L., Huggel, C., Craw Burns, P.A. and Lai, A.W. (2021) 'Chapter 13 - Glacier surges', in W. Haeberli and C. Whiteman (eds) Snow and Ice-Related Hazards, Risks, and Disasters (Second Edition). Elsevier (Hazards and Disasters Series), pp. 417–466. https://doi.org/10.1016/B978-0-12-817129-5.00003-2

Trusel, L.D., Frey, K.E., Das, S.B., Munneke, P.K. and van den Broeke, M.R. (2013) 'Satellite-based estimates of Antarctic surface meltwater fluxes', Geophysical Research Letters, 40(23), pp. 6148–6153. https://doi.org/10.1002/2013GL058138

Turetsky, M.R., Abbott, B.W., Jones, M.C., Anthony, K.W., Olefeldt, D., Schuur, E.A.G., Grosse, G., Kuhry, P., Hugelius, G., Koven, C., Lawrence, D.M., Gibson, C., Sannel, A.B.K. and McGuire, A.D. (2020) 'Carbon release through abrupt permafrost thaw', Nature Geoscience, 13(2), pp. 138–143. https://doi.org/10.1038/s41561-019-0526-0

Turner, J., Orr, A., Gudmundsson, G.H., Jenkins, A., Bingham, R.G., Hillenbrand, C.-D. and Bracegirdle, T.J. (2017) 'Atmosphere-ocean-ice interactions in the Amundsen Sea Embayment, West Antarctica', Reviews of Geophysics, 55(1), pp. 235–276. https://doi.org/10.1002/2016RG000532

Turney, C.S.M., Fogwill, C.J., Golledge, N.R., McKay, N.P., van Sebille, E., Jones, R.T., Etheridge, D., Rubino, M., Thornton, D.P., Davies, S.M., Ramsey, C.B., Thomas, Z.A., Bird, M.I., Munksgaard, N.C., Kohno, M., Woodward, J., Winter, K., Weyrich, L.S., Rootes, C.M., Millman, H., Albert, P.G., Rivera, A., van Ommen, T., Curran, M., Moy, A., Rahmstorf, S., Kawamura, K., Hillenbrand, C.-D., Weber, M.E., Manning, C.J., Young, J. and Cooper, A. (2020) 'Early Last Interglacial ocean warming drove substantial ice mass loss from Antarctica', Proceedings of the National Academy of Sciences, 117(8), pp. 3996–4006. https://doi.org/10.1073/pnas.1902469117

Van Breedam, J., Goelzer, H. and Huybrechts, P. (2020) 'Semi-equilibrated global sea-level change projections for the next 10 000 years', Earth System Dynamics, 11(4), pp. 953–976. https://doi.org/10.5194/esd-11-953-2020

de Vrese, P. and Brovkin, V. (2021) 'Timescales of the permafrost carbon cycle and legacy effects of temperature overshoot scenarios', Nature Communications, 12(1), p. 2688. https://doi.org/10.1038/s41467-021-23010-5

de Vrese, P., Stacke, T., Kleinen, T. and Brovkin, V. (2021) 'Diverging responses of high-latitude CO2 and CH4 emissions in idealized climate change scenarios', The Cryosphere, 15(2), pp. 1097–1130. https://doi.org/10.5194/tc-15-1097-2021

Wagner, T.J.W. and Eisenman, I. (2015) 'How Climate Model Complexity Influences Sea Ice Stability', Journal of Climate, 28(10), pp. 3998–4014. https://doi.org/10.1175/JCLI-D-14-00654.1

Walter Anthony, K., Daanen, R., Anthony, P., Schneider von Deimling, T., Ping, C.-L., Chanton, J.P. and Grosse, G. (2016) 'Methane emissions proportional to permafrost carbon thawed in Arctic lakes since the 1950s', Nature Geoscience, 9(9), pp. 679–682. https://doi.org/10.1038/ngeo2795

Walter Anthony, K., Schneider von Deimling, T., Nitze, I., Frolking, S., Emond, A., Daanen, R., Anthony, P., Lindgren, P., Jones, B. and Grosse, G. (2018) '21st-century modeled permafrost carbon emissions accelerated by abrupt thaw beneath lakes', Nature Communications, 9(1), p. 3262. https://doi.org/10.1038/s41467-018-05738-9

Wang, Seaver, Foster, A., Lenz, E.A., Kessler, J.D., Stroeve, J.C., Anderson, L.O., Turetsky, M., Betts, R., Zou, S., Liu, W., Boos, W.R. and Hausfather, Z. (2023) 'Mechanisms and Impacts of Earth System Tipping Elements', Reviews of Geophysics, 61(1), p. e2021RG000757. https://doi.org/10.1029/2021RG000757

Wang, Shaoyin, Liu, J., Cheng, X., Yang, D., Kerzenmacher, T., Li, X., Hu, Y. and Braesicke, P. (2023) 'Contribution of the deepened Amundsen sea low to the record low Antarctic sea ice extent in February 2022', Environmental Research Letters, 18(5), p. 054002. https://doi.org/10.1088/1748-9326/acc9d6

Weber, M.E., Golledge, N.R., Fogwill, C.J., Turney, C.S.M. and Thomas, Z.A. (2021) 'Decadal-scale onset and termination of Antarctic ice-mass loss during the last deglaciation', Nature Communications, 12(1), p. 6683. https://doi.org/10.1038/s41467-021-27053-6

Weertman, J. (1974) 'Stability of the Junction of an Ice Sheet and an Ice Shelf', Journal of Glaciology, 13(67), pp. 3–11. https://doi.org/10.3189/S0022143000023327

Whitehouse, P.L., Gomez, N., King, M.A. and Wiens, D.A. (2019) 'Solid Earth change and the evolution of the Antarctic Ice Sheet', Nature Communications, 10(1), p. 503. https://doi.org/10.1038/s41467-018-08068-y

Wilkenskjeld, S., Miesner, F., Overduin, P.P., Puglini, M. and Brovkin, V. (2022) 'Strong increase in thawing of subsea permafrost in the 22nd century caused by anthropogenic climate change', The Cryosphere, 16(3), pp. 1057–1069. https://doi.org/10.5194/tc-16-1057-2022

Wilson, D.J., Bertram, R.A., Needham, E.F., van de Flierdt, T., Welsh, K.J., McKay, R.M., Mazumder, A., Riesselman, C.R., Jimenez-Espejo, F.J. and Escutia, C. (2018) 'Ice loss from the East Antarctic Ice Sheet during late Pleistocene interglacials', Nature, 561(7723), pp. 383–386. https://doi.org/10.1038/s41586-018-0501-8

Winkelmann, R., Levermann, A., Ridgwell, A. and Caldeira, K. (2015) 'Combustion of available fossil fuel resources sufficient to eliminate the Antarctic Ice Sheet', Science Advances, 1(8), p. e1500589. https://doi.org/10.1126/sciadv.1500589

Winton, M. (2006) 'Does the Arctic sea ice have a tipping point?', Geophysical Research Letters, 33(23). https://doi.org/10.1029/2006GL028017

Winton, M. (2008) 'Sea Ice–Albedo Feedback and Nonlinear Arctic Climate Change', in Arctic Sea Ice Decline: Observations, Projections, Mechanisms, and Implications. American Geophysical Union (AGU), pp. 111–131. https://doi.org/10.1029/180GM09

Winton, M. (2011) 'Do Climate Models Underestimate the Sensitivity of Northern Hemisphere Sea Ice Cover?', Journal of Climate, 24(15), pp. 3924–3934. https://doi.org/10.1175/2011JCLI4146.1

Wunderling, N., Donges, J.F., Kurths, J. and Winkelmann, R. (2021) 'Interacting tipping elements increase risk of climate domino effects under global warming', Earth System Dynamics, 12(2), pp. 601–619. https://doi.org/10.5194/esd-12-601-2021

Wunderling, N., von der Heydt, A., Aksenov, Y., Barker, S., Bastiaansen, R., Brovkin, V., Brunetti, M., Couplet, V., Kleinen, T., Lear, C.H., Lohmann, J., Roman-Cuesta, R.M., Sinet, S., Swingedouw, D., Winkelmann, R., Anand, P., Barichivich, J., Bathiany, S., Baudena, M., Bruun, J.T., Chiessi, C.M., Coxall, H.K., Docquier, D., Donges, J.F., Falkena, S.K.J., Klose, A.K., Oburu, D., Rocha, J., Rynders, S., Steinert, N.J. and Willeit, M. (2023) 'Climate tipping point interactions and cascades: A review', EGUsphere, pp. 1–45 [Preprint]. https://doi.org/10.5194/egusphere-2023-1576

Yumashev, D., Hope, C., Schaefer, K., Riemann-Campe, K., Iglesias-Suarez, F., Jafarov, E., Burke, E.J., Young, P.J., Elshorbany, Y. and Whiteman, G. (2019) 'Climate policy implications of nonlinear decline of Arctic land permafrost and other cryosphere elements', Nature Communications, 10(1), p. 1900. https://doi.org/10.1038/s41467-019-09863-x

Zhang, C. and Li, S. (2023) 'Causes of the record-low Antarctic sea-ice in austral summer 2022', Atmospheric and Oceanic Science Letters, p. 100353. https://doi.org/10.1016/j.aosl.2023.100353

Zickfeld, K., Arora, V.K. and Gillett, N.P. (2012) 'Is the climate response to CO2 emissions path dependent?', Geophysical Research Letters, 39(5). https://doi.org/10.1029/2011GL050205

Chapter 1.3 References

Abis, B. and Brovkin, V. (2017) 'Environmental conditions for alternative tree-cover states in high latitudes', Biogeosciences, 14(3), pp. 511–527. https://doi.org/10.5194/bg-14-511-2017

Abrams, J.F., Huntingford, C., Williamson, M.S., Armstrong McKay, D.I., Boulton, C.A., Buxton, J., Sakschewski, B., Loriani, S., Zimm,

C., Winkelmann, R. and Lenton, T.M. (Accepted) 'Committed global warming risks triggering multiple climate tipping points', Earth's Future. https://doi.org/10.1029/2022EF003250

Acácio, V., Holmgren, M., Rego, F., Moreira, F. and Mohren, G.M.J. (2009) 'Are drought and wildfires turning Mediterranean cork oak forests into persistent shrublands?', Agroforestry Systems, 76(2), pp. 389–400. https://doi.org/10.1007/s10457-008-9165-y

Adame, M.F., Connolly, R.M., Turschwell, M.P., Lovelock, C.E., Fatoyinbo, T., Lagomasino, D., Goldberg, L.A., Holdorf, J., Friess, D.A., Sasmito, S.D., Sanderman, J., Sievers, M., Buelow, C., Kauffman, J.B., Bryan-Brown, D. and Brown, C.J. (2021) 'Future carbon emissions from global mangrove forest loss', Global Change Biology, 27(12), pp. 2856–2866. https://doi.org/10.1111/gcb.15571

Adhikari, P.L., White, J.R., Maiti, K. and Nguyen, N. (2015) 'Phosphorus speciation and sedimentary phosphorus release from the Gulf of Mexico sediments: Implication for hypoxia', Estuarine, Coastal and Shelf Science, 164, pp. 77–85. https://doi.org/10.1016/j.ecss.2015.07.016

Aguiar, M.R. and Sala, O.E. (1999) 'Patch structure, dynamics and implications for the functioning of arid ecosystems', Trends in Ecology & Evolution, 14(7), pp. 273–277. https://doi.org/10.1016/S0169-5347(99)01612-2

Aleman, J.C., Fayolle, A., Favier, C., Staver, A.C., Dexter, K.G., Ryan, C.M., Azihou, A.F., Bauman, D., te Beest, M., Chidumayo, E.N., Comiskey, J.A., Cromsigt, J.P.G.M., Dessard, H., Doucet, J.-L., Finckh, M., Gillet, J.-F., Gourlet-Fleury, S., Hempson, G.P., Holdo, R.M., Kirunda, B., Kouame, F.N., Mahy, G., Gonçalves, F.M.P., McNicol, I., Quintano, P.N., Plumptre, A.J., Pritchard, R.C., Revermann, R., Schmitt, C.B., Swemmer, A.M., Talila, H., Woollen, E. and Swaine, M.D. (2020) 'Floristic evidence for alternative biome states in tropical Africa', Proceedings of the National Academy of Sciences, 117(45), pp. 28183–28190. https://doi.org/10.1073/pnas.2011515117

Alheit, J. and Niquen, M. (2004) 'Regime shifts in the Humboldt Current ecosystem', Progress in Oceanography, 60(2), pp. 201–222. https://doi.org/10.1016/j.pocean.2004.02.006

Allen, C.D., Macalady, A.K., Chenchouni, H., Bachelet, D., McDowell, N., Vennetier, M., Kitzberger, T., Rigling, A., Breshears, D.D., Hogg, E.H. (Ted), Gonzalez, P., Fensham, R., Zhang, Z., Castro, J., Demidova, N., Lim, J.-H., Allard, G., Running, S.W., Semerci, A. and Cobb, N. (2010) 'A global overview of drought and heat-induced tree mortality reveals emerging climate change risks for forests', Forest Ecology and Management, 259(4), pp. 660–684. https://doi.org/10.1016/j.foreco.2009.09.001

Allen, K., Dupuy, J.M., Gei, M.G., Hulshof, C., Medvigy, D., Pizano, C., Salgado-Negret, B., Smith, C.M., Trierweiler, A., Bloem, S.J.V., Waring, B.G., Xu, X. and Powers, J.S. (2017) 'Will seasonally dry tropical forests be sensitive or resistant to future changes in rainfall regimes?', Environmental Research Letters, 12(2), p. 023001. https://doi.org/10.1088/1748-9326/aa5968

Alongi, D.M., Murdiyarso, D., Fourqurean, J.W., Kauffman, J.B., Hutahaean, A., Crooks, S., Lovelock, C.E., Howard, J., Herr, D., Fortes, M., Pidgeon, E. and Wagey, T. (2016) 'Indonesia's blue carbon: a globally significant and vulnerable sink for seagrass and mangrove carbon', Wetlands Ecology and Management, 24(1), pp. 3–13. https://doi.org/10.1007/s11273-015-9446-y

Amaral, C., Poulter, B., Lagomasino, D., Fatoyinbo, T., Taillie, P., Lizcano, G., Canty, S., Silveira, J.A.H., Teutli-Hernández, C., Cifuentes-Jara, M., Charles, S.P., Moreno, C.S., González-Trujillo, J.D. and Roman-Cuesta, R.M. (2023) 'Drivers of mangrove vulnerability and resilience to tropical cyclones in the North Atlantic Basin', Science of The Total Environment, 898, p. 165413. https://doi.org/10.1016/j.scitotenv.2023.165413

do Amaral Camara Lima, M., Bergamo, T.F., Ward, R.D. and Joyce, C.B. (2023) 'A review of seagrass ecosystem services: providing nature-based solutions for a changing world', Hydrobiologia, 850(12), pp. 2655–2670. https://doi.org/10.1007/s10750-023-05244-0

Amir, H. (2022) Status and trends of hard coral cover derived from long-term monitoring sites in the Maldives: 1998-2021. Maldives Marine Research Institute.

Andersen, E.M. and Steidl, R.J. (2019) 'Woody plant encroachment restructures bird communities in semiarid grasslands', Biological Conservation, 240, p. 108276. https://doi.org/10.1016/j.biocon.2019.108276

Andersen, T., Carstensen, J., Hernández-García, E. and Duarte, C.M. (2009) 'Ecological thresholds and regime shifts: approaches to identification', Trends in Ecology & Evolution, 24(1), pp. 49–57. https://doi.org/10.1016/j.tree.2008.07.014

Anderson, N.J., Heathcote, A.J., Engstrom, D.R., and GLOBOCARB DATA CONTRIBUTORS (2020) 'Anthropogenic alteration of nutrient supply increases the global freshwater carbon sink', Science Advances, 6(16), p. eaaw2145. https://doi.org/10.1126/sciadv.aaw2145

Anderson, T.R., Hessen, D.O., Gentleman, W.C., Yool, A. and Mayor, D.J. (2022) 'Quantifying the roles of food intake and stored lipid for growth and development throughout the life cycle of a high-latitude copepod, and consequences for ocean carbon sequestration', Frontiers in Marine Science, 9. https://www.frontiersin.org/articles/10.3389/fmars.2022.928209 (Accessed: 20 October 2023)

Anoszko, E., Frelich, L.E., Rich, R.L. and Reich, P.B. (2022) 'Wind and fire: Rapid shifts in tree community composition following multiple disturbances in the southern boreal forest', Ecosphere, 13(3), p. e3952. https://doi.org/10.1002/ecs2.3952

Archibald, S. and Hempson, G.P. (2016) 'Competing consumers: contrasting the patterns and impacts of fire and mammalian herbivory in Africa', Philosophical Transactions of the Royal Society B: Biological Sciences, 371(1703), p. 20150309. https://doi.org/10.1098/rstb.2015.0309

Archibald, S., Roy, D.P., Van WILGEN, B.W. and Scholes, R.J. (2009) 'What limits fire? An examination of drivers of burnt area in Southern Africa', Global Change Biology, 15(3), pp. 613–630. https://doi.org/10.1111/j.1365-2486.2008.01754.x

Arias-Ortiz, A., Serrano, O., Masqué, P., Lavery, P.S., Mueller, U., Kendrick, G.A., Rozaimi, M., Esteban, A., Fourqurean, J.W., Marbà, N., Mateo, M.A., Murray, K., Rule, M.J. and Duarte, C.M. (2018) 'A marine heatwave drives massive losses from the world's largest seagrass carbon stocks', Nature Climate Change, 8(4), pp. 338–344. https://doi.org/10.1038/s41558-018-0096-y

Armstrong McKay, D.I., Cornell, S.E., Richardson, K. and Rockström, J. (2021) 'Resolving ecological feedbacks on the ocean carbon sink in Earth system models', Earth System Dynamics, 12(3), pp. 797–818. https://doi.org/10.5194/esd-12-797-2021

Armstrong McKay, D.I., Staal, A., Abrams, J.F., Winkelmann, R., Sakschewski, B., Loriani, S., Fetzer, I., Cornell, S.E., Rockström, J. and Lenton, T.M. (2022) 'Exceeding 1.5°C global warming could trigger multiple climate tipping points', Science, 377(6611), p. eabn7950. https://doi.org/10.1126/science.abn7950

Au, J., Bloom, A.A., Parazoo, N.C., Deans, R.M., Wong, C.Y.S., Houlton, B.Z. and Magney, T.S. (2023) 'Forest productivity recovery or collapse? Model-data integration insights on drought-induced tipping points', Global Change Biology, 29(19), pp. 5652–5665. https://doi.org/10.1111/gcb.16867

Bailey, S.N., Elliott, G.P. and Schliep, E.M. (2021) 'Seasonal temperature–moisture interactions limit seedling establishment at upper treeline in the Southern Rockies', Ecosphere, 12(6), p. e03568. https://doi.org/10.1002/ecs2.3568

Ban, S.S., Graham, N.A.J. and Connolly, S.R. (2014) 'Evidence for multiple stressor interactions and effects on coral reefs', Global Change Biology, 20(3), pp. 681–697. https://doi.org/10.1111/gcb.12453

Ban, Z., Hu, X. and Li, J. (2022) 'Tipping points of marine phytoplankton to multiple environmental stressors', Nature Climate Change, 12(11), pp. 1045–1051. https://doi.org/10.1038/s41558-022-01489-0

Barlow, J., França, F., Gardner, T.A., Hicks, C.C., Lennox, G.D., Berenguer, E., Castello, L., Economo, E.P., Ferreira, J., Guénard, B., Gontijo Leal, C., Isaac, V., Lees, A.C., Parr, C.L., Wilson, S.K., Young, P.J. and Graham, N.A.J. (2018) 'The future of hyperdiverse tropical ecosystems', Nature, 559(7715), pp. 517–526. https://doi.org/10.1038/s41586-018-0301-1

Barnosky, A.D., Hadly, E.A., Bascompte, J., Berlow, E.L., Brown, J.H., Fortelius, M., Getz, W.M., Harte, J., Hastings, A., Marquet, P.A., Martinez, N.D., Mooers, A., Roopnarine, P., Vermeij, G., Williams,

J.W., Gillespie, R., Kitzes, J., Marshall, C., Matzke, N., Mindell, D.P., Revilla, E. and Smith, A.B. (2012) 'Approaching a state shift in Earth's biosphere', Nature, 486(7401), pp. 52–58. https://doi.org/10.1038/nature11018

Barnosky, A.D., Matzke, N., Tomiya, S., Wogan, G.O.U., Swartz, B., Quental, T.B., Marshall, C., McGuire, J.L., Lindsey, E.L., Maguire, K.C., Mersey, B. and Ferrer, E.A. (2011) 'Has the Earth's sixth mass extinction already arrived?', Nature, 471(7336), pp. 51–57. https://doi.org/10.1038/nature09678

Barros, F. de V., Bittencourt, P.R.L., Brum, M., Restrepo-Coupe, N., Pereira, L., Teodoro, G.S., Saleska, S.R., Borma, L.S., Christoffersen, B.O., Penha, D., Alves, L.F., Lima, A.J.N., Carneiro, V.M.C., Gentine, P., Lee, J.-E., Aragão, L.E.O.C., Ivanov, V., Leal, L.S.M., Araujo, A.C. and Oliveira, R.S. (2019) 'Hydraulic traits explain differential responses of Amazonian forests to the 2015 El Niño-induced drought', New Phytologist, 223(3), pp. 1253–1266. https://doi.org/10.1111/nph.15909

Bartenfelder, A., Kenworthy, W.J., Puckett, B., Deaton, C. and Jarvis, J.C. (2022) 'The Abundance and Persistence of Temperate and Tropical Seagrasses at Their Edge-of-Range in the Western Atlantic Ocean', Frontiers in Marine Science, 9. https://www.frontiersin.org/articles/10.3389/fmars.2022.917237 (Accessed: 19 October 2023)

Bastiaansen, R., Dijkstra, H.A. and Heydt, A.S. von der (2022) 'Fragmented tipping in a spatially heterogeneous world', Environmental Research Letters, 17(4), p. 045006. https://doi.org/10.1088/1748-9326/ac59a8

Bastin, J.-F., Finegold, Y., Garcia, C., Mollicone, D., Rezende, M., Routh, D., Zohner, C.M. and Crowther, T.W. (2019) 'The global tree restoration potential', Science, 365(6448), pp. 76–79. https://doi.org/10.1126/science.aax0848.

Battaglia, G. and Joos, F. (2018) 'Hazards of decreasing marine oxygen: the near-term and millennial-scale benefits of meeting the Paris climate targets', Earth System Dynamics, 9(2), pp. 797–816. https://doi.org/10.5194/esd-9-797-2018

Baudena, M., Santana, V.M., Baeza, M.J., Bautista, S., Eppinga, M.B., Hemerik, L., Garcia Mayor, A., Rodriguez, F., Valdecantos, A., Vallejo, V.R., Vasques, A. and Rietkerk, M. (2020) 'Increased aridity drives post-fire recovery of Mediterranean forests towards open shrublands', New Phytologist, 225(4), pp. 1500–1515. https://doi.org/10.1111/nph.16252

Beaugrand, G. (2015) 'Theoretical basis for predicting climate-induced abrupt shifts in the oceans', Philosophical Transactions of the Royal Society B: Biological Sciences, 370(1659), p. 20130264. https://doi.org/10.1098/rstb.2013.0264

Beaugrand, G., Balembois, A., Kléparski, L. and Kirby, R.R. (2022) 'Addressing the dichotomy of fishing and climate in fishery management with the FishClim model', Communications Biology, 5(1), pp. 1–13. https://doi.org/10.1038/s42003-022-04100-6

Beaugrand, G., Conversi, A., Atkinson, A., Cloern, J., Chiba, S., Fonda-Umani, S., Kirby, R.R., Greene, C.H., Goberville, E., Otto, S.A., Reid, P.C., Stemmann, L. and Edwards, M. (2019) 'Prediction of unprecedented biological shifts in the global ocean', Nature Climate Change, 9(3), pp. 237–243. https://doi.org/10.1038/s41558-019-0420-1

Beaugrand, G., Conversi, A., Chiba, S., Edwards, M., Fonda-Umani, S., Greene, C., Mantua, N., Otto, S.A., Reid, P.C., Stachura, M.M., Stemmann, L. and Sugisaki, H. (2015) 'Synchronous marine pelagic regime shifts in the Northern Hemisphere', Philosophical Transactions of the Royal Society B: Biological Sciences, 370(1659), p. 20130272. https://doi.org/10.1098/rstb.2013.0272

Beckage, B., Ellingwood, C., and University of Vermont (2009) 'Fire Feedbacks with Vegetation and Alternative Stable States', Complex Systems, 18(1), pp. 159–173. https://doi.org/10.25088/ComplexSystems.18.1.159

Beckett, H., Staver, A.C., Charles-Dominique, T. and Bond, W.J. (2022) 'Pathways of savannization in a mesic African savanna–forest mosaic following an extreme fire', Journal of Ecology, 110(4), pp. 902–915. https://doi.org/10.1111/1365-2745.13851

Benyon, R.G., Inbar, A., Sheridan, G.J. and Lane, P.N.J. (2023) 'Critical climate thresholds for fire in wet, temperate forests', Forest Ecology and Management, 537, p. 120911. https://doi.org/10.1016/j.foreco.2023.120911

Berdugo, M., Delgado-Baquerizo, M., Soliveres, S., Hernández-Clemente, R., Zhao, Y., Gaitán, J.J., Gross, N., Saiz, H., Maire, V., Lehmann, A., Rillig, M.C., Solé, R.V. and Maestre, F.T. (2020) 'Global ecosystem thresholds driven by aridity', Science, 367(6479), pp. 787–790. https://doi.org/10.1126/science.aay5958

Berdugo, M., Gaitán, J.J., Delgado-Baquerizo, M., Crowther, T.W. and Dakos, V. (2022) 'Prevalence and drivers of abrupt vegetation shifts in global drylands', Proceedings of the National Academy of Sciences, 119(43), p. e2123393119. https://doi.org/10.1073/pnas.2123393119

Berdugo, M., Kéfi, S., Soliveres, S. and Maestre, F.T. (2017) 'Plant spatial patterns identify alternative ecosystem multifunctionality states in global drylands', Nature Ecology & Evolution, 1(2), pp. 1–10. https://doi.org/10.1038/s41559-016-0003

Berdugo, M., Soliveres, S., Kéfi, S. and Maestre, F.T. (2019) 'The interplay between facilitation and habitat type drives spatial vegetation patterns in global drylands', Ecography, 42(4), pp. 755–767. https://doi.org/10.1111/ecog.03795

Berenguer, E., Lennox, G.D., Ferreira, J., Malhi, Y., Aragão, L.E.O.C., Barreto, J.R., Del Bon Espírito-Santo, F., Figueiredo, A.E.S., França, F., Gardner, T.A., Joly, C.A., Palmeira, A.F., Quesada, C.A., Rossi, L.C., de Seixas, M.M.M., Smith, C.C., Withey, K. and Barlow, J. (2021) 'Tracking the impacts of El Niño drought and fire in human-modified Amazonian forests', Proceedings of the National Academy of Sciences, 118(30), p. e2019377118. https://doi.org/10.1073/pnas.2019377118

Bergstrom, D.M., Wienecke, B.C., van den Hoff, J., Hughes, L., Lindenmayer, D.B., Ainsworth, T.D., Baker, C.M., Bland, L., Bowman, D.M.J.S., Brooks, S.T., Canadell, J.G., Constable, A.J., Dafforn, K.A., Depledge, M.H., Dickson, C.R., Duke, N.C., Helmstedt, K.J., Holz, A., Johnson, C.R., McGeoch, M.A., Melbourne-Thomas, J., Morgain, R., Nicholson, E., Prober, S.M., Raymond, B., Ritchie, E.G., Robinson, S.A., Ruthrof, K.X., Setterfield, S.A., Sgrò, C.M., Stark, J.S., Travers, T., Trebilco, R., Ward, D.F.L., Wardle, G.M., Williams, K.J., Zylstra, P.J. and Shaw, J.D. (2021) 'Combating ecosystem collapse from the tropics to the Antarctic', Global Change Biology, 27(9), pp. 1692–1703. https://doi.org/10.1111/gcb.15539

Bestelmeyer, B.T., Duniway, M.C., James, D.K., Burkett, L.M. and Havstad, K.M. (2013) 'A test of critical thresholds and their indicators in a desertification-prone ecosystem: more resilience than we thought', Ecology Letters, 16(3), pp. 339–345. https://doi.org/10.1111/ele.12045

Bestelmeyer, B.T., Ellison, A.M., Fraser, W.R., Gorman, K.B., Holbrook, S.J., Laney, C.M., Ohman, M.D., Peters, D.P.C., Pillsbury, F.C., Rassweiler, A., Schmitt, R.J. and Sharma, S. (2011) 'Analysis of abrupt transitions in ecological systems', Ecosphere, 2(12), p. art129. https://doi.org/10.1890/ES11-00216.1

Beyer, H.L., Kennedy, E.V., Beger, M., Chen, C.A., Cinner, J.E., Darling, E.S., Eakin, C.M., Gates, R.D., Heron, S.F., Knowlton, N., Obura, D.O., Palumbi, S.R., Possingham, H.P., Puotinen, M., Runting, R.K., Skirving, W.J., Spalding, M., Wilson, K.A., Wood, S., Veron, J.E. and Hoegh-Guldberg, O. (2018) 'Risk-sensitive planning for conserving coral reefs under rapid climate change', Conservation Letters, 11(6), p. e12587. https://doi.org/10.1111/conl.12587

Bhargava, R. and Friess, D.A. (2022) 'Previous Shoreline Dynamics Determine Future Susceptibility to Cyclone Impact in the Sundarban Mangrove Forest', Frontiers in Marine Science, 9. https://www.frontiersin.org/articles/10.3389/fmars.2022.814577 (Accessed: 19 October 2023)

Biggs, R., Carpenter, S.R. and Brock, W.A. (2009) 'Turning back from the brink: Detecting an impending regime shift in time to avert it', Proceedings of the National Academy of Sciences, 106(3), pp. 826–831. https://doi.org/10.1073/pnas.0811729106

Bindoff, N.L., Cheung, W.W.L., Kairo, J.G., Aristegui, J., Guinder, V.A., Hallberg, R., Hilmi, N., Jiao, N., Karim, M.S., Levin, L., O'Donoghue, S., Purca Cuicapusa, S.R., Rinkevich, B., Suga, T., Tagliabue, A. and Williamson, P. (19AD) 'Changing Ocean, Marine Ecosystems, and Dependent Communities', in IPCC Special Report on the Ocean and Cryosphere in a Changing Climate. Cambridge: Cambridge University Press, pp. 447–588. https://doi.org/10.1017/9781009157964.007

Bland, L.M., Rowland, J.A., Regan, T.J., Keith, D.A., Murray, N.J.,

Lester, R.E., Linn, M., Rodríguez, J.P. and Nicholson, E. (2018) 'Developing a standardized definition of ecosystem collapse for risk assessment', Frontiers in Ecology and the Environment, 16(1), pp. 29–36. https://doi.org/10.1002/fee.1747

Blenckner, T. and Niiranen, S. (2013) '4.16 - Biodiversity – Marine Food-Web Structure, Stability, and Regime Shifts', in R.A. Pielke (ed.) Climate Vulnerability. Oxford: Academic Press, pp. 203–212. https://doi.org/10.1016/B978-0-12-384703-4.00423-8

Boada, J., Arthur, R., Alonso, D., Pagès, J.F., Pessarrodona, A., Oliva, S., Ceccherelli, G., Piazzi, L., Romero, J. and Alcoverro, T. (2017) 'Immanent conditions determine imminent collapses: nutrient regimes define the resilience of macroalgal communities', Proceedings of the Royal Society B: Biological Sciences, 284(1851), p. 20162814. https://doi.org/10.1098/rspb.2016.2814

Bond, W.J. and Midgley, G.F. (2012) 'Carbon dioxide and the uneasy interactions of trees and savannah grasses', Philosophical Transactions of the Royal Society B: Biological Sciences, 367(1588), pp. 601–612. https://doi.org/10.1098/rstb.2011.0182

Bongaerts, P. and Smith, T.B. (2019) 'Beyond the "Deep Reef Refuge" Hypothesis: A Conceptual Framework to Characterize Persistence at Depth', in Y. Loya, K.A. Puglise, and T.C.L. Bridge (eds) Mesophotic Coral Ecosystems. Cham: Springer International Publishing (Coral Reefs of the World), pp. 881–895. https://doi.org/10.1007/978-3-319-92735-0_45

Boström, B. and Pettersson, K. (1982) 'Different patterns of phosphorus release from lake sediments in laboratory experiments', Hydrobiologia, 91(0), pp. 415–429. https://doi.org/10.1007/PL00020032

Boulton, C.A., Booth, B.B.B. and Good, P. (2017) 'Exploring uncertainty of Amazon dieback in a perturbed parameter Earth system ensemble', Global Change Biology, 23(12), pp. 5032–5044. https://doi.org/10.1111/gcb.13733.

Boulton, C.A., Lenton, T.M. and Boers, N. (2022) 'Pronounced loss of Amazon rainforest resilience since the early 2000s', Nature Climate Change, 12(3), pp. 271–278. https://doi.org/10.1038/s41558-022-01287-8

Brabrand, Å., Faafeng, B.A. and Moritz Nilssen, J.P. (1990) 'Relative Importance of Phosphorus Supply to Phytoplankton Production: Fish Excretion versus External Loading', Canadian Journal of Fisheries and Aquatic Sciences, 47(2), pp. 364–372. https://doi.org/10.1139/f90-038

Brando, P.M., Balch, J.K., Nepstad, D.C., Morton, D.C., Putz, F.E., Coe, M.T., Silvério, D., Macedo, M.N., Davidson, E.A., Nóbrega, C.C., Alencar, A. and Soares-Filho, B.S. (2014) 'Abrupt increases in Amazonian tree mortality due to drought–fire interactions', Proceedings of the National Academy of Sciences, 111(17), pp. 6347–6352. https://doi.org/10.1073/pnas.1305499111

Breitburg, D., Levin, L.A., Oschlies, A., Grégoire, M., Chavez, F.P., Conley, D.J., Garçon, V., Gilbert, D., Gutiérrez, D., Isensee, K., Jacinto, G.S., Limburg, K.E., Montes, I., Naqvi, S.W.A., Pitcher, G.C., Rabalais, N.N., Roman, M.R., Rose, K.A., Seibel, B.A., Telszewski, M., Yasuhara, M. and Zhang, J. (2018) 'Declining oxygen in the global ocean and coastal waters', Science, 359(6371), p. eaam7240. https://doi.org/10.1126/science.aam7240

Brienen, R.J.W., Caldwell, L., Duchesne, L., Voelker, S., Barichivich, J., Baliva, M., Ceccantini, G., Di Filippo, A., Helama, S., Locosselli, G.M., Lopez, L., Piovesan, G., Schöngart, J., Villalba, R. and Gloor, E. (2020) 'Forest carbon sink neutralized by pervasive growth-lifespan trade-offs', Nature Communications, 11(1), p. 4241. https://doi.org/10.1038/s41467-020-17966-z

Brierley, C.M. and Fedorov, A.V. (2016) 'Comparing the impacts of Miocene–Pliocene changes in inter-ocean gateways on climate: Central American Seaway, Bering Strait, and Indonesia', Earth and Planetary Science Letters, 444, pp. 116–130. https://doi.org/10.1016/j.epsl.2016.03.010

Brook, B.W., Ellis, E.C., Perring, M.P., Mackay, A.W. and Blomqvist, L. (2013) 'Does the terrestrial biosphere have planetary tipping points?', Trends in Ecology & Evolution, 28(7), pp. 396–401. https://doi.org/10.1016/j.tree.2013.01.016

Bunting, P., Rosenqvist, A., Hilarides, L., Lucas, R.M., Thomas, N., Tadono, T., Worthington, T.A., Spalding, M., Murray, N.J. and Rebelo, L.-M. (2022) 'Global Mangrove Extent Change 1996–2020: Global Mangrove Watch Version 3.0', Remote Sensing, 14(15), p. 3657. https://doi.org/10.3390/rs14153657

Buras, A., Rammig, A. and Zang, C.S. (2020) 'Quantifying impacts of the 2018 drought on European ecosystems in comparison to 2003', Biogeosciences, 17(6), pp. 1655–1672. https://doi.org/10.5194/bg-17-1655-2020

Burke, L., Reytar, K., Spalding, M. and Perry, A. (2011) Reefs at Risk Revisited. World Resouces Institute. https://www.wri.org/research/reefs-risk-revisited (Accessed: 19 October 2023)

Burrell, A., Kukavskaya, E., Baxter, R., Sun, Q. and Barrett, K. (2021) 'Post-fire Recruitment Failure as a Driver of Forest to Non-forest Ecosystem Shifts in Boreal Regions', in J.G. Canadell and R.B. Jackson (eds) Ecosystem Collapse and Climate Change. Cham: Springer International Publishing (Ecological Studies), pp. 69–100. https://doi.org/10.1007/978-3-030-71330-0_4

Burrell, A.L., Evans, J.P. and De Kauwe, M.G. (2020) 'Anthropogenic climate change has driven over 5 million km2 of drylands towards desertification', Nature Communications, 11(1), p. 3853. https://doi.org/10.1038/s41467-020-17710-7

Bustamante, M.M.C., de Brito, D.Q., Kozovits, A.R., Luedemann, G., de Mello, T.R.B., de Siqueira Pinto, A., Munhoz, C.B.R. and Takahashi, F.S.C. (2012) 'Effects of nutrient additions on plant biomass and diversity of the herbaceous-subshrub layer of a Brazilian savanna (Cerrado)', Plant Ecology, 213(5), pp. 795–808. https://doi.org/10.1007/s11258-012-0042-4

Canadell, J.G., Monteiro, P.M.S., Costa, M.H., Cunha, L.C. da, Cox, P.M., Eliseev, A.V., Henson, S., Ishii, M., Jaccard, S., Koven, C., Lohila, A., Patra, P.K., Piao, S., Rogelj, J., Syampungani, S., Zaehle, S. and Zickfeld, K. (2021) 'Chapter 5: Global Carbon and other Biogeochemical Cycles and Feedbacks', in V. Masson-Delmotte, P. Zhai, A. Pirani, S.L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M.I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J.B.R. Matthews, T.K. Maycock, T. Waterfield, O. Yelekçi, R. Yu, and B. Zhou (eds) Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Repor. Cambridge University Press

Cano, I.M., Shevliakova, E., Malyshev, S., John, J.G., Yu, Y., Smith, B. and Pacala, S.W. (2022) 'Abrupt loss and uncertain recovery from fires of Amazon forests under low climate mitigation scenarios', Proceedings of the National Academy of Sciences, 119(52), p. e2203200119. https://doi.org/10.1073/pnas.2203200119

Cardinale, B.J., Matulich, K.L., Hooper, D.U., Byrnes, J.E., Duffy, E., Gamfeldt, L., Balvanera, P., O'Connor, M.I. and Gonzalez, A. (2011) 'The functional role of producer diversity in ecosystems', American Journal of Botany, 98(3), pp. 572–592. https://doi.org/10.3732/ajb.1000364

Cardoso, A.W., Archibald, S., Bond, W.J., Coetsee, C., Forrest, M., Govender, N., Lehmann, D., Makaga, L., Mpanza, N., Ndong, J.E., Koumba Pambo, A.F., Strydom, T., Tilman, D., Wragg, P.D. and Staver, A.C. (2022) 'Quantifying the environmental limits to fire spread in grassy ecosystems', Proceedings of the National Academy of Sciences, 119(26), p. e2110364119. https://doi.org/10.1073/pnas.2110364119

Carlson, P.R., Yarbro, L.A., Kaufman, K.A. and Mattson, R.A. (2010) 'Vulnerability and resilience of seagrasses to hurricane and runoff impacts along Florida's west coast', Hydrobiologia, 649(1), pp. 39–53. https://doi.org/10.1007/s10750-010-0257-0

Carnicer, J., Vives-Ingla, M., Blanquer, L., Méndez-Camps, X., Rosell, C., Sabaté, S., Gutiérrez, E., Sauras, T., Peñuelas, J. and Barbeta, A. (2021) 'Forest resilience to global warming is strongly modulated by local-scale topographic, microclimatic and biotic conditions', Journal of Ecology, 109(9), pp. 3322–3339. https://doi.org/10.1111/1365-2745.13752.

Carpenter, S.R. (2005) 'Eutrophication of aquatic ecosystems: Bistability and soil phosphorus', Proceedings of the National Academy of Sciences, 102(29), pp. 10002–10005. https://doi.org/10.1073/pnas.0503959102

Carpenter, S.R. and Kitchell, J.F. (1988) 'Consumer Control of Lake Productivity: Large-scale experimental manipulations reveal complex interactions among lake organisms', BioScience, 38(11), pp.

764–769. https://doi.org/10.2307/1310785
Carpenter, S.R., Kitchell, J.F. and Hodgson, J.R. (1985) 'Cascading Trophic Interactions and Lake Productivity: Fish predation and herbivory can regulate lake ecosystems', BioScience, 35(10), pp. 634–639. https://doi.org/10.2307/1309989.
Carpenter, S.R., Ludwig, D. and Brock, W.A. (1999) 'Management of Eutrophication for Lakes Subject To Potentially Irreversible Change', Ecological Applications, 9(3), pp. 751–771. https://doi.org/10.1890/1051-0761(1999)009[0751:MOEFLS]2.0.CO;2
Carr, J.A., D'Odorico, P., McGlathery, K.J. and Wiberg, P.L. (2012) 'Modeling the effects of climate change on eelgrass stability and resilience: future scenarios and leading indicators of collapse', Marine Ecology Progress Series, 448, pp. 289–301. https://www.jstor.org/stable/24875864 (Accessed: 19 October 2023)
Carr, M.-E., Friedrichs, M.A.M., Schmeltz, M., Noguchi Aita, M., Antoine, D., Arrigo, K.R., Asanuma, I., Aumont, O., Barber, R., Behrenfeld, M., Bidigare, R., Buitenhuis, E.T., Campbell, J., Ciotti, A., Dierssen, H., Dowell, M., Dunne, J., Esaias, W., Gentili, B., Gregg, W., Groom, S., Hoepffner, N., Ishizaka, J., Kameda, T., Le Quéré, C., Lohrenz, S., Marra, J., Mélin, F., Moore, K., Morel, A., Reddy, T.E., Ryan, J., Scardi, M., Smyth, T., Turpie, K., Tilstone, G., Waters, K. and Yamanaka, Y. (2006) 'A comparison of global estimates of marine primary production from ocean color', Deep Sea Research Part II: Topical Studies in Oceanography, 53(5), pp. 741–770. https://doi.org/10.1016/j.dsr2.2006.01.028
Case, M.F., Wigley, B.J., Wigley-Coetsee, C. and Carla Staver, A. (2020) 'Could drought constrain woody encroachers in savannas?', African Journal of Range & Forage Science, 37(1), pp. 19–29. https://doi.org/10.2989/10220119.2019.1697363
Casini, M., Hjelm, J., Molinero, J.-C., Lövgren, J., Cardinale, M., Bartolino, V., Belgrano, A. and Kornilovs, G. (2009) 'Trophic cascades promote threshold-like shifts in pelagic marine ecosystems', Proceedings of the National Academy of Sciences, 106(1), pp. 197–202. https://doi.org/10.1073/pnas.0806649105
Ceballos, G., Ehrlich, P.R., Barnosky, A.D., García, A., Pringle, R.M. and Palmer, T.M. (2015) 'Accelerated modern human–induced species losses: Entering the sixth mass extinction', Science Advances, 1(5), p. e1400253. https://doi.org/10.1126/sciadv.1400253
Charles-Dominique, T., Staver, A.C., Midgley, G.F. and Bond, W.J. (2015) 'Functional differentiation of biomes in an African savanna/forest mosaic', South African Journal of Botany, 101, pp. 82–90. https://doi.org/10.1016/j.sajb.2015.05.005
Charney, J., Stone, P.H. and Quirk, W.J. (1975) 'Drought in the Sahara: A Biogeophysical Feedback Mechanism', Science, 187(4175), pp. 434–435. https://doi.org/10.1126/science.187.4175.434
Charney, J.G. (1975) 'Dynamics of deserts and drought in the Sahel', Quarterly Journal of the Royal Meteorological Society, 101(428), pp. 193–202. https://doi.org/10.1002/qj.49710142802
Chavez, F.P., Ryan, J., Lluch-Cota, S.E. and Ñiquen C., M. (2003) 'From Anchovies to Sardines and Back: Multidecadal Change in the Pacific Ocean', Science, 299(5604), pp. 217–221. https://doi.org/10.1126/science.1075880
Cherlet, M., Hutchinson, C., Reynolds, J., Hill, J., Sommer, S. and von Maltitz, G. (eds) (2018) World Atlas of Desertification. Luxembourg: Publication Office of the European Union. https://data.europa.eu/doi/10.2760/9205 (Accessed: 18 October 2023)
Cingolani, A.M., Noy-Meir, I. and Díaz, S. (2005) 'Grazing Effects on Rangeland Diversity: A Synthesis of Contemporary Models', Ecological Applications, 15(2), pp. 757–773. https://doi.org/10.1890/03-5272
Claussen, M., Dallmeyer, A. and Bader, J. (2017) 'Theory and Modeling of the African Humid Period and the Green Sahara', in Oxford Research Encyclopedia of Climate Science. https://doi.org/10.1093/acrefore/9780190228620.013.532
Claussen, M., Kubatzki, C., Brovkin, V., Ganopolski, A., Hoelzmann, P. and Pachur, H.-J. (1999) 'Simulation of an abrupt change in Saharan vegetation in the Mid-Holocene', Geophysical Research Letters, 26(14), pp. 2037–2040. https://doi.org/10.1029/1999GL900494
Cochrane, M.A., Alencar, A., Schulze, M.D., Souza, C.M., Nepstad, D.C., Lefebvre, P. and Davidson, E.A. (1999) 'Positive Feedbacks in the Fire Dynamic of Closed Canopy Tropical Forests', Science, 284(5421), pp. 1832–1835. https://doi.org/10.1126/science.284.5421.1832
Conley, D.J., Humborg, C., Rahm, L., Savchuk, O.P. and Wulff, F. (2002) 'Hypoxia in the Baltic Sea and Basin-Scale Changes in Phosphorus Biogeochemistry', Environmental Science & Technology, 36(24), pp. 5315–5320. https://doi.org/10.1021/es025763w
Conversi, A., Dakos, V., Gårdmark, A., Ling, S., Folke, C., Mumby, P.J., Greene, C., Edwards, M., Blenckner, T., Casini, M., Pershing, A. and Möllmann, C. (2015) 'A holistic view of marine regime shifts', Philosophical Transactions of the Royal Society B: Biological Sciences, 370(1659), p. 20130279. https://doi.org/10.1098/rstb.2013.0279
Conversi, A., Umani, S.F., Peluso, T., Molinero, J.C., Santojanni, A. and Edwards, M. (2010) 'The Mediterranean Sea Regime Shift at the End of the 1980s, and Intriguing Parallelisms with Other European Basins', PLOS ONE, 5(5), p. e10633. https://doi.org/10.1371/journal.pone.0010633
Cooley, S., Schoeman, D., Bopp, L., Boyd, P., Donner, S., Ghebrehiwet, D.Y., Ito, S.-I., Kiessling, W., Martinetto, P., Ojea, E., Racault, M.-F., Rost, B. and Skern-Mauritzen, M. (2023) 'Chapter 3: Oceans and Coastal Ecosystems and their Services', in Climate Change 2022 – Impacts, Adaptation and Vulnerability: Working Group II Contribution to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. 1st edn. Cambridge, UK and New York, NY, USA: Cambridge University Press, pp. 379–550. https://doi.org/10.1017/9781009325844.005
Cooper, G.S., Willcock, S. and Dearing, J.A. (2020) 'Regime shifts occur disproportionately faster in larger ecosystems', Nature Communications, 11(1), p. 1175. https://doi.org/10.1038/s41467-020-15029-x.
Costa, M.H., Borma, L.S., Brando, P.M., Marengo, J.A., Saleska, S.R. and Gatti, L.V. (2021) 'Chapter 7: Biogeophysical Cycles: Water Recycling, Climate Regulation', in Science Panel for the Amazon, Amazon Assessment Report 2021. 1st edn. Edited by C. Nobre, A. Encalada, E. Anderson, F. H. Roca Alcazar, M. Bustamante, C. Mena, M. Peña-Claros, G. Poveda, J. P. Rodriguez, S. Saleska, S. E. Trumbore, A. Val, L. Villa Nova, R. Abramovay, A. Alencar, A. C. Rodriguez Alzza, D. Armenteras, P. Artaxo, S. Athayde, H. T. Barretto Filho, J. Barlow, E. Berenguer, F. Bortolotto, F. D. A. Costa, M. H. Costa, N. Cuvi, P. Fearnside, J. Ferreira, B. M. Flores, S. Frieri, L. V. Gatti, J. M. Guayasamin, S. Hecht, M. Hirota, C. Hoorn, C. Josse, D. M. Lapola, C. Larrea, D. M. Larrea-Alcazar, Z. Lehm Ardaya, Y. Malhi, J. A. Marengo, J. Melack, M. Moraes R., P. Moutinho, M. R. Murmis, E. G. Neves, B. Paez, L. Painter, A. Ramos, M. C. Rosero-Peña, M. Schmink, P. Sist, H. Ter Steege, P. Val, H. Van Der Voort, M. Varese, and G. Zapata-Ríos. UN Sustainable Development Solutions Network (SDSN). https://doi.org/10.55161/KKHX1998
Cramer, K.L., Jackson, J.B.C., Donovan, M.K., Greenstein, B.J., Korpanty, C.A., Cook, G.M. and Pandolfi, J.M. (2020) 'Widespread loss of Caribbean acroporid corals was underway before coral bleaching and disease outbreaks', Science Advances, 6(17), p. eaax9395. https://doi.org/10.1126/sciadv.aax9395
Creed, I.F., Bergström, A.-K., Trick, C.G., Grimm, N.B., Hessen, D.O., Karlsson, J., Kidd, K.A., Kritzberg, E., McKnight, D.M., Freeman, E.C., Senar, O.E., Andersson, A., Ask, J., Berggren, M., Cherif, M., Giesler, R., Hotchkiss, E.R., Kortelainen, P., Palta, M.M., Vrede, T. and Weyhenmeyer, G.A. (2018) 'Global change-driven effects on dissolved organic matter composition: Implications for food webs of northern lakes', Global Change Biology, 24(8), pp. 3692–3714. https://doi.org/10.1111/gcb.14129
Cunillera-Montcusí, D., Beklioğlu, M., Cañedo-Argüelles, M., Jeppesen, E., Ptacnik, R., Amorim, C.A., Arnott, S.E., Berger, S.A., Brucet, S., Dugan, H.A., Gerhard, M., Horváth, Z., Langenheder, S., Nejstgaard, J.C., Reinikainen, M., Striebel, M., Urrutia-Cordero, P., Vad, C.F., Zadereev, E. and Matias, M. (2022) 'Freshwater salinisation: a research agenda for a saltier world', Trends in Ecology & Evolution, 37(5), pp. 440–453. https://doi.org/10.1016/j.tree.2021.12.005
Dakos, V. (2019) 'Ecological Transitions: Regime Shifts, Thresholds and Tipping Points', Oxford Bibliographies [Preprint]. https://doi.org/10.1093/OBO/9780199363445-0108
D'Angioli, A.M., Giles, A.L., Costa, P.B., Wolfsdorf, G., Pecoral, L.L.F.,

Verona, L., Piccolo, F., Sampaio, A.B., Schmidt, I.B., Rowland, L., Lambers, H., Kandeler, E., Oliveira, R.S. and Abrahão, A. (2022) 'Abandoned pastures and restored savannas have distinct patterns of plant–soil feedback and nutrient cycling compared with native Brazilian savannas', Journal of Applied Ecology, 59(7), pp. 1863–1873. https://doi.org/10.1111/1365-2664.14193

Dantas, V. de L., Hirota, M., Oliveira, R.S. and Pausas, J.G. (2016) 'Disturbance maintains alternative biome states', Ecology Letters, 19(1), pp. 12–19. https://doi.org/10.1111/ele.12537

D'Antonio, C.M. and Vitousek, P.M. (1992) 'Biological Invasions by Exotic Grasses, the Grass/Fire Cycle, and Global Change', Annual Review of Ecology and Systematics, 23(1), pp. 63–87. https://doi.org/10.1146/annurev.es.23.110192.000431

Darling, E.S., McClanahan, T.R., Maina, J., Gurney, G.G., Graham, N.A.J., Januchowski-Hartley, F., Cinner, J.E., Mora, C., Hicks, C.C., Maire, E., Puotinen, M., Skirving, W.J., Adjeroud, M., Ahmadia, G., Arthur, R., Bauman, A.G., Beger, M., Berumen, M.L., Bigot, L., Bouwmeester, J., Brenier, A., Bridge, T.C.L., Brown, E., Campbell, S.J., Cannon, S., Cauvin, B., Chen, C.A., Claudet, J., Denis, V., Donner, S., Estradivari, Fadli, N., Feary, D.A., Fenner, D., Fox, H., Franklin, E.C., Friedlander, A., Gilmour, J., Goiran, C., Guest, J., Hobbs, J.-P.A., Hoey, A.S., Houk, P., Johnson, S., Jupiter, S.D., Kayal, M., Kuo, C., Lamb, J., Lee, M.A.C., Low, J., Muthiga, N., Muttaqin, E., Nand, Y., Nash, K.L., Nedlic, O., Pandolfi, J.M., Pardede, S., Patankar, V., Penin, L., Ribas-Deulofeu, L., Richards, Z., Roberts, T.E., Rodgers, K.S., Safuan, C.D.M., Sala, E., Shedrawi, G., Sin, T.M., Smallhorn-West, P., Smith, J.E., Sommer, B., Steinberg, P.D., Sutthacheep, M., Tan, C.H.J., Williams, G.J., Wilson, S., Yeemin, T., Bruno, J.F., Fortin, M.-J., Krkosek, M. and Mouillot, D. (2019) 'Social–environmental drivers inform strategic management of coral reefs in the Anthropocene', Nature Ecology & Evolution, 3(9), pp. 1341–1350. https://doi.org/10.1038/s41559-019-0953-8

Darnis, G., Robert, D., Pomerleau, C., Link, H., Archambault, P., Nelson, R.J., Geoffroy, M., Tremblay, J.-É., Lovejoy, C., Ferguson, S.H., Hunt, B.P.V. and Fortier, L. (2012) 'Current state and trends in Canadian Arctic marine ecosystems: II. Heterotrophic food web, pelagic-benthic coupling, and biodiversity', Climatic Change, 115(1), pp. 179–205. https://doi.org/10.1007/s10584-012-0483-8

Daskalov, G.M., Boicenco, L., Grishin, A.N., Lazar, L., Mihneva, V., Shlyakhov, V.A. and Zengin, M. (2017) 'Architecture of collapse: regime shift and recovery in an hierarchically structured marine ecosystem', Global Change Biology, 23(4), pp. 1486–1498. https://doi.org/10.1111/gcb.13508

Daskalov, G.M., Grishin, A.N., Rodionov, S. and Mihneva, V. (2007) 'Trophic cascades triggered by overfishing reveal possible mechanisms of ecosystem regime shifts', Proceedings of the National Academy of Sciences, 104(25), pp. 10518–10523. https://doi.org/10.1073/pnas.0701100104

Dekker, S.C., Rietkerk, M. and Bierkens, M.F.P. (2007) 'Coupling microscale vegetation–soil water and macroscale vegetation–precipitation feedbacks in semiarid ecosystems', Global Change Biology, 13(3), pp. 671–678. https://doi.org/10.1111/j.1365-2486.2007.01327.x.

Delgado-Baquerizo, M., Doulcier, G., Eldridge, D.J., Stouffer, D.B., Maestre, F.T., Wang, J., Powell, J.R., Jeffries, T.C. and Singh, B.K. (2020) 'Increases in aridity lead to drastic shifts in the assembly of dryland complex microbial networks', Land Degradation & Development, 31(3), pp. 346–355. https://doi.org/10.1002/ldr.3453

Delgado-Baquerizo, M., Eldridge, D.J., Maestre, F.T., Karunaratne, S.B., Trivedi, P., Reich, P.B. and Singh, B.K. (2017) 'Climate legacies drive global soil carbon stocks in terrestrial ecosystems', Science Advances, 3(4), p. e1602008. https://doi.org/10.1126/sciadv.1602008

Delgado-Baquerizo, M., Maestre, F.T., Gallardo, A., Bowker, M.A., Wallenstein, M.D., Quero, J.L., Ochoa, V., Gozalo, B., García-Gómez, M., Soliveres, S., García-Palacios, P., Berdugo, M., Valencia, E., Escolar, C., Arredondo, T., Barraza-Zepeda, C., Bran, D., Carreira, J.A., Chaieb, M., Conceição, A.A., Derak, M., Eldridge, D.J., Escudero, A., Espinosa, C.I., Gaitán, J., Gatica, M.G., Gómez-González, S., Guzman, E., Gutiérrez, J.R., Florentino, A., Hepper, E., Hernández, R.M., Huber-Sannwald, E., Jankju, M., Liu, J., Mau, R.L., Miriti, M., Monerris, J., Naseri, K., Noumi, Z., Polo, V., Prina, A., Pucheta, E., Ramírez, E., Ramírez-Collantes, D.A., Romão, R., Tighe, M., Torres, D., Torres-Díaz, C., Ungar, E.D., Val, J., Wamiti, W., Wang, D. and Zaady, E. (2013) 'Decoupling of soil nutrient cycles as a function of aridity in global drylands', Nature, 502(7473), pp. 672–676. https://doi.org/10.1038/nature12670

Dexter, K.G., Pennington, R.T., Oliveira-Filho, A.T., Bueno, M.L., Silva de Miranda, P.L. and Neves, D.M. (2018) 'Inserting Tropical Dry Forests Into the Discussion on Biome Transitions in the Tropics', Frontiers in Ecology and Evolution, 6. https://www.frontiersin.org/articles/10.3389/fevo.2018.00104 (Accessed: 16 October 2023)

Diaz, R.J. and Rosenberg, R. (2008) 'Spreading Dead Zones and Consequences for Marine Ecosystems', Science, 321(5891), pp. 926–929. https://doi.org/10.1126/science.1156401

van Dijk, G., Lamers, L.P.M., Loeb, R., Westendorp, P.-J., Kuiperij, R., van Kleef, H.H., Klinge, M. and Smolders, A.J.P. (2019) 'Salinization lowers nutrient availability in formerly brackish freshwater wetlands; unexpected results from a long-term field experiment', Biogeochemistry, 143(1), pp. 67–83. https://doi.org/10.1007/s10533-019-00549-6

Dinerstein, E., Olson, D., Joshi, A., Vynne, C., Burgess, N.D., Wikramanayake, E., Hahn, N., Palminteri, S., Hedao, P., Noss, R., Hansen, M., Locke, H., Ellis, E.C., Jones, B., Barber, C.V., Hayes, R., Kormos, C., Martin, V., Crist, E., Sechrest, W., Price, L., Baillie, J.E.M., Weeden, D., Suckling, K., Davis, C., Sizer, N., Moore, R., Thau, D., Birch, T., Potapov, P., Turubanova, S., Tyukavina, A., de Souza, N., Pintea, L., Brito, J.C., Llewellyn, O.A., Miller, A.G., Patzelt, A., Ghazanfar, S.A., Timberlake, J., Klöser, H., Shennan-Farpón, Y., Kindt, R., Lillesø, J.-P.B., van Breugel, P., Graudal, L., Voge, M., Al-Shammari, K.F. and Saleem, M. (2017) 'An Ecoregion-Based Approach to Protecting Half the Terrestrial Realm', BioScience, 67(6), pp. 534–545. https://doi.org/10.1093/biosci/bix014

Dixon, A.M., Forster, P.M., Heron, S.F., Stoner, A.M.K. and Beger, M. (2022) 'Future loss of local-scale thermal refugia in coral reef ecosystems', PLOS Climate, 1(2), p. e0000004. https://doi.org/10.1371/journal.pclm.0000004

D'Odorico, P., Caylor, K., Okin, G.S. and Scanlon, T.M. (2007) 'On soil moisture–vegetation feedbacks and their possible effects on the dynamics of dryland ecosystems', Journal of Geophysical Research: Biogeosciences, 112(G4), p. 2006JG000379. https://doi.org/10.1029/2006JG000379

D'Odorico, P., Okin, G.S. and Bestelmeyer, B.T. (2012) 'A synthetic review of feedbacks and drivers of shrub encroachment in arid grasslands', Ecohydrology, 5(5), pp. 520–530. https://doi.org/10.1002/eco.259

Donato, D.C., Kauffman, J.B., Murdiyarso, D., Kurnianto, S., Stidham, M. and Kanninen, M. (2011) 'Mangroves among the most carbon-rich forests in the tropics', Nature Geoscience, 4(5), pp. 293–297. https://doi.org/10.1038/ngeo1123

Dosio, A., Jury, M.W., Almazroui, M., Ashfaq, M., Diallo, I., Engelbrecht, F.A., Klutse, N.A.B., Lennard, C., Pinto, I., Sylla, M.B. and Tamoffo, A.T. (2021) 'Projected future daily characteristics of African precipitation based on global (CMIP5, CMIP6) and regional (CORDEX, CORDEX-CORE) climate models', Climate Dynamics, 57(11), pp. 3135–3158. https://doi.org/10.1007/s00382-021-05859-w

Downing, J.A., Polasky, S., Olmstead, S.M. and Newbold, S.C. (2021) 'Protecting local water quality has global benefits', Nature Communications, 12(1), p. 2709. https://doi.org/10.1038/s41467-021-22836-3

Drijfhout, S., Bathiany, S., Beaulieu, C., Brovkin, V., Claussen, M., Huntingford, C., Scheffer, M., Sgubin, G. and Swingedouw, D. (2015) 'Catalogue of abrupt shifts in Intergovernmental Panel on Climate Change climate models', Proceedings of the National Academy of Sciences, 112(43), pp. E5777–E5786. https://doi.org/10.1073/pnas.1511451112

Drüke, M., Sakschewski, B., von Bloh, W., Billing, M., Lucht, W. and Thonicke, K. (2023) 'Fire may prevent future Amazon forest recovery after large-scale deforestation', Communications Earth & Environment, 4(1), pp. 1–10. https://doi.org/10.1038/s43247-023-00911-5

Duarte, B., Martins, I., Rosa, R., Matos, A.R., Roleda, M.Y., Reusch, T.B.H., Engelen, A.H., Serrão, E.A., Pearson, G.A., Marques, J.C., Caçador, I., Duarte, C.M. and Jueterbock, A. (2018) 'Climate

Change Impacts on Seagrass Meadows and Macroalgal Forests: An Integrative Perspective on Acclimation and Adaptation Potential', Frontiers in Marine Science, 5. https://www.frontiersin.org/articles/10.3389/fmars.2018.00190 (Accessed: 19 October 2023)

Duke, N. (2023) '15. More intense severe tropical cyclones in recent decades cause greater impacts on mangroves bordering Australia's Great Barrier Reef', in E. Wolanski and M.J. Kingsford (eds) Oceanographic Processes of Coral Reefs: Physical and Biological Links in the Great Barrier Reef. 2nd edn. Boca Raton: CRC Press.

Duke, N.C. (2017b) 'Mangrove Floristics and Biogeography Revisited: Further Deductions from Biodiversity Hot Spots, Ancestral Discontinuities, and Common Evolutionary Processes', in V.H. Rivera-Monroy, S.Y. Lee, E. Kristensen, and R.R. Twilley (eds) Mangrove Ecosystems: A Global Biogeographic Perspective: Structure, Function, and Services. Cham: Springer International Publishing, pp. 17–53. https://doi.org/10.1007/978-3-319-62206-4_2

Duke, N.C., Field, C., Mackenzie, J.R., Meynecke, J.-O., Wood, A.L., Duke, N.C., Field, C., Mackenzie, J.R., Meynecke, J.-O. and Wood, A.L. (2019) 'Rainfall and its possible hysteresis effect on the proportional cover of tropical tidal-wetland mangroves and saltmarsh–saltpans', Marine and Freshwater Research, 70(8), pp. 1047–1055. https://doi.org/10.1071/MF18321

Duke, N.C., Hutley, L.B., Mackenzie, J.R. and Burrows, D. (2021) 'Processes and Factors Driving Change in Mangrove Forests: An Evaluation Based on the Mass Dieback Event in Australia's Gulf of Carpentaria', in J.G. Canadell and R.B. Jackson (eds) Ecosystem Collapse and Climate Change. Cham: Springer International Publishing (Ecological Studies), pp. 221–264. https://doi.org/10.1007/978-3-030-71330-0_9

Duke, N.C., Kovacs, J.M., Griffiths, A.D., Preece, L., Hill, D.J.E., Oosterzee, P. van, Mackenzie, J., Morning, H.S., Burrows, D., Duke, N.C., Kovacs, J.M., Griffiths, A.D., Preece, L., Hill, D.J.E., Oosterzee, P. van, Mackenzie, J., Morning, H.S. and Burrows, D. (2017a) 'Large-scale dieback of mangroves in Australia's Gulf of Carpentaria: a severe ecosystem response, coincidental with an unusually extreme weather event', Marine and Freshwater Research, 68(10), pp. 1816–1829. https://doi.org/10.1071/MF16322

Duke, N.C., Mackenzie, J.R., Canning, A.D., Hutley, L.B., Bourke, A.J., Kovacs, J.M., Cormier, R., Staben, G., Lymburner, L. and Ai, E. (2022) 'ENSO-driven extreme oscillations in mean sea level destabilise critical shoreline mangroves—An emerging threat', PLOS Climate, 1(8), p. e0000037. https://doi.org/10.1371/journal.pclm.0000037

Dunic, J.C., Brown, C.J., Connolly, R.M., Turschwell, M.P. and Côté, I.M. (2021) 'Long-term declines and recovery of meadow area across the world's seagrass bioregions', Global Change Biology, 27(17), pp. 4096–4109. https://doi.org/10.1111/gcb.15684

Edmunds, P.J. and Gray, S.C. (2014) 'The effects of storms, heavy rain, and sedimentation on the shallow coral reefs of St. John, US Virgin Islands', Hydrobiologia, 734(1), pp. 143–158. https://doi.org/10.1007/s10750-014-1876-7

Ehleringer, J. and Björkman, O. (1977) 'Quantum Yields for CO 2 Uptake in C 3 and C 4 Plants: Dependence on Temperature, CO 2 , and O 2 Concentration', Plant Physiology, 59(1), pp. 86–90. https://doi.org/10.1104/pp.59.1.86

Ellis, E.C., Gauthier, N., Klein Goldewijk, K., Bliege Bird, R., Boivin, N., Díaz, S., Fuller, D.Q., Gill, J.L., Kaplan, J.O., Kingston, N., Locke, H., McMichael, C.N.H., Ranco, D., Rick, T.C., Shaw, M.R., Stephens, L., Svenning, J.-C. and Watson, J.E.M. (2021) 'People have shaped most of terrestrial nature for at least 12,000 years', Proceedings of the National Academy of Sciences, 118(17), p. e2023483118. https://doi.org/10.1073/pnas.2023483118

Elser, J.J., Andersen, T., Baron, J.S., Bergström, A.-K., Jansson, M., Kyle, M., Nydick, K.R., Steger, L. and Hessen, D.O. (2009) 'Shifts in Lake N:P Stoichiometry and Nutrient Limitation Driven by Atmospheric Nitrogen Deposition', Science, 326(5954), pp. 835–837. https://doi.org/10.1126/science.1176199

Elwell, H.A. and Stocking, M.A. (1976) 'Vegetal cover to estimate soil erosion hazard in Rhodesia', Geoderma, 15(1), pp. 61–70. https://doi.org/10.1016/0016-7061(76)90071-9

Emmerton, C.A., Lesack, L.F.W. and Vincent, W.F. (2008) 'Mackenzie River nutrient delivery to the Arctic Ocean and effects of the Mackenzie Delta during open water conditions', Global Biogeochemical Cycles, 22(1). https://doi.org/10.1029/2006GB002856

Erfanian, A., Wang, G., Yu, M. and Anyah, R. (2016) 'Multimodel ensemble simulations of present and future climates over West Africa: Impacts of vegetation dynamics', Journal of Advances in Modeling Earth Systems, 8(3), pp. 1411–1431. https://doi.org/10.1002/2016MS000660

Esquivel-Muelbert, A., Baker, T.R., Dexter, K.G., Lewis, S.L., Brienen, R.J.W., Feldpausch, T.R., Lloyd, J., Monteagudo-Mendoza, A., Arroyo, L., Álvarez-Dávila, E., Higuchi, N., Marimon, B.S., Marimon-Junior, B.H., Silveira, M., Vilanova, E., Gloor, E., Malhi, Y., Chave, J., Barlow, J., Bonal, D., Davila Cardozo, N., Erwin, T., Fauset, S., Hérault, B., Laurance, S., Poorter, L., Qie, L., Stahl, C., Sullivan, M.J.P., ter Steege, H., Vos, V.A., Zuidema, P.A., Almeida, E., Almeida de Oliveira, E., Andrade, A., Vieira, S.A., Aragão, L., Araujo-Murakami, A., Arets, E., Aymard C, G.A., Baraloto, C., Camargo, P.B., Barroso, J.G., Bongers, F., Boot, R., Camargo, J.L., Castro, W., Chama Moscoso, V., Comiskey, J., Cornejo Valverde, F., Lola da Costa, A.C., del Aguila Pasquel, J., Di Fiore, A., Fernanda Duque, L., Elias, F., Engel, J., Flores Llampazo, G., Galbraith, D., Herrera Fernández, R., Honorio Coronado, E., Hubau, W., Jimenez-Rojas, E., Lima, A.J.N., Umetsu, R.K., Laurance, W., Lopez-Gonzalez, G., Lovejoy, T., Aurelio Melo Cruz, O., Morandi, P.S., Neill, D., Núñez Vargas, P., Pallqui Camacho, N.C., Parada Gutierrez, A., Pardo, G., Peacock, J., Peña-Claros, M., Peñuela-Mora, M.C., Petronelli, P., Pickavance, G.C., Pitman, N., Prieto, A., Quesada, C., Ramírez-Angulo, H., Réjou-Méchain, M., Restrepo Correa, Z., Roopsind, A., Rudas, A., Salomão, R., Silva, N., Silva Espejo, J., Singh, J., Stropp, J., Terborgh, J., Thomas, R., Toledo, M., Torres-Lezama, A., Valenzuela Gamarra, L., van de Meer, P.J., van der Heijden, G., van der Hout, P., Vasquez Martinez, R., Vela, C., Vieira, I.C.G. and Phillips, O.L. (2019) 'Compositional response of Amazon forests to climate change', Global Change Biology, 25(1), pp. 39–56. https://doi.org/10.1111/gcb.14413

Fagan, M.E., Kim, D.-H., Settle, W., Ferry, L., Drew, J., Carlson, H., Slaughter, J., Schaferbien, J., Tyukavina, A., Harris, N.L., Goldman, E. and Ordway, E.M. (2022) 'The expansion of tree plantations across tropical biomes', Nature Sustainability, 5(8), pp. 681–688. https://doi.org/10.1038/s41893-022-00904-w

Favier, C. (2004) 'Percolation model of fire dynamic', Physics Letters A, 330(5), pp. 396–401. https://doi.org/10.1016/j.physleta.2004.07.053

Feller, I.C., Friess, D.A., Krauss, K.W. and Lewis, R.R. (2017) 'The state of the world's mangroves in the 21st century under climate change', Hydrobiologia, 803(1), pp. 1–12. https://doi.org/10.1007/s10750-017-3331-z

Fettig, C.J., Runyon, J.B., Homicz, C.S., James, P.M.A. and Ulyshen, M.D. (2022) 'Fire and Insect Interactions in North American Forests', Current Forestry Reports, 8(4), pp. 301–316. https://doi.org/10.1007/s40725-022-00170-1

Filbee-Dexter, K. and Wernberg, T. (2018) 'Rise of Turfs: A New Battlefront for Globally Declining Kelp Forests', BioScience, 68(2), pp. 64–76. https://doi.org/10.1093/biosci/bix147

Flannigan, M., Cantin, A.S., de Groot, W.J., Wotton, M., Newbery, A. and Gowman, L.M. (2013) 'Global wildland fire season severity in the 21st century', Forest Ecology and Management, 294, pp. 54–61. https://doi.org/10.1016/j.foreco.2012.10.022

Flores, B.M. and Holmgren, M. (2021) 'White-Sand Savannas Expand at the Core of the Amazon After Forest Wildfires', Ecosystems, 24(7), pp. 1624–1637. https://doi.org/10.1007/s10021-021-00607-x

Folke, C., Biggs, R., Norström, A., Reyers, B. and Rockström, J. (2016) 'Social-ecological resilience and biosphere-based sustainability science', Ecology and Society, 21(3). https://doi.org/10.5751/ES-08748-210341

Folke, C., Carpenter, S., Walker, B., Scheffer, M., Elmqvist, T., Gunderson, L. and Holling, C.S. (2004) 'Regime Shifts, Resilience, and Biodiversity in Ecosystem Management', Annual Review of Ecology, Evolution, and Systematics, 35(1), pp. 557–581. https://doi.org/10.1146/annurev.ecolsys.35.021103.105711

Folke, C., Polasky, S., Rockström, J., Galaz, V., Westley, F., Lamont, M., Scheffer, M., Österblom, H., Carpenter, S.R., Chapin, F.S., Seto, K.C., Weber, E.U., Crona, B.I., Daily, G.C., Dasgupta, P., Gaffney,

O., Gordon, L.J., Hoff, H., Levin, S.A., Lubchenco, J., Steffen, W. and Walker, B.H. (2021) 'Our future in the Anthropocene biosphere', Ambio, 50(4), pp. 834–869. https://doi.org/10.1007/s13280-021-01544-8.

Forzieri, G., Dakos, V., McDowell, N.G., Ramdane, A. and Cescatti, A. (2022) 'Emerging signals of declining forest resilience under climate change', Nature, 608(7923), pp. 534–539. https://doi.org/10.1038/s41586-022-04959-9

Foster, M.S. and Schiel, D.R. (2010) 'Loss of predators and the collapse of southern California kelp forests (?): Alternatives, explanations and generalizations', Journal of Experimental Marine Biology and Ecology, 393(1), pp. 59–70. https://doi.org/10.1016/j.jembe.2010.07.002

Francis, C.F. and Thornes, J.B. (1990) 'Runoff hydrographs from three Mediterranean vegetation cover types.', Vegetation and erosion. Processes and environments., pp. 363–384. https://www.cabdirect.org/cabdirect/abstract/19911959169 (Accessed: 18 October 2023)

Frank, K.T., Petrie, B., Leggett, W.C. and Boyce, D.G. (2016) 'Large scale, synchronous variability of marine fish populations driven by commercial exploitation', Proceedings of the National Academy of Sciences, 113(29), pp. 8248–8253. https://doi.org/10.1073/pnas.1602325113

Frelich, L.E. and Reich, P.B. (2010) 'Will environmental changes reinforce the impact of global warming on the prairie–forest border of central North America?', Frontiers in Ecology and the Environment, 8(7), pp. 371–378. https://doi.org/10.1890/080191

Friedlingstein, P., O'Sullivan, M., Jones, M.W., Andrew, R.M., Gregor, L., Hauck, J., Le Quéré, C., Luijkx, I.T., Olsen, A., Peters, G.P., Peters, W., Pongratz, J., Schwingshackl, C., Sitch, S., Canadell, J.G., Ciais, P., Jackson, R.B., Alin, S.R., Alkama, R., Arneth, A., Arora, V.K., Bates, N.R., Becker, M., Bellouin, N., Bittig, H.C., Bopp, L., Chevallier, F., Chini, L.P., Cronin, M., Evans, W., Falk, S., Feely, R.A., Gasser, T., Gehlen, M., Gkritzalis, T., Gloege, L., Grassi, G., Gruber, N., Gürses, Ö., Harris, I., Hefner, M., Houghton, R.A., Hurtt, G.C., Iida, Y., Ilyina, T., Jain, A.K., Jersild, A., Kadono, K., Kato, E., Kennedy, D., Klein Goldewijk, K., Knauer, J., Korsbakken, J.I., Landschützer, P., Lefèvre, N., Lindsay, K., Liu, J., Liu, Z., Marland, G., Mayot, N., McGrath, M.J., Metzl, N., Monacci, N.M., Munro, D.R., Nakaoka, S.-I., Niwa, Y., O'Brien, K., Ono, T., Palmer, P.I., Pan, N., Pierrot, D., Pocock, K., Poulter, B., Resplandy, L., Robertson, E., Rödenbeck, C., Rodriguez, C., Rosan, T.M., Schwinger, J., Séférian, R., Shutler, J.D., Skjelvan, I., Steinhoff, T., Sun, Q., Sutton, A.J., Sweeney, C., Takao, S., Tanhua, T., Tans, P.P., Tian, X., Tian, H., Tilbrook, B., Tsujino, H., Tubiello, F., van der Werf, G.R., Walker, A.P., Wanninkhof, R., Whitehead, C., Willstrand Wranne, A., Wright, R., Yuan, W., Yue, C., Yue, X., Zaehle, S., Zeng, J. and Zheng, B. (2022) 'Global Carbon Budget 2022', Earth System Science Data, 14(11), pp. 4811–4900. https://doi.org/10.5194/essd-14-4811-2022

Frieler, K., Meinshausen, M., Golly, A., Mengel, M., Lebek, K., Donner, S.D. and Hoegh-Guldberg, O. (2013) 'Limiting global warming to 2 °C is unlikely to save most coral reefs', Nature Climate Change, 3(2), pp. 165–170. https://doi.org/10.1038/nclimate1674

Friess, D.A., Adame, M.F., Adams, J.B. and Lovelock, C.E. (2022) 'Mangrove forests under climate change in a 2°C world', WIREs Climate Change, 13(4), p. e792. https://doi.org/10.1002/wcc.792

Fu, W., Randerson, J.T. and Moore, J.K. (2016) 'Climate change impacts on net primary production (NPP) and export production (EP) regulated by increasing stratification and phytoplankton community structure in the CMIP5 models', Biogeosciences, 13(18), pp. 5151–5170. https://doi.org/10.5194/bg-13-5151-2016

Galloway, A.W.E., Gravem, S.A., Kobelt, J.N., Heady, W.N., Okamoto, D.K., Sivitilli, D.M., Saccomanno, V.R., Hodin, J. and Whippo, R. (2023) 'Sunflower sea star predation on urchins can facilitate kelp forest recovery', Proceedings of the Royal Society B: Biological Sciences, 290(1993), p. 20221897. https://doi.org/10.1098/rspb.2022.1897

Gao, Y., Zhong, B., Yue, H., Wu, B. and Cao, S. (2011) 'A degradation threshold for irreversible loss of soil productivity: a long-term case study in China', Journal of Applied Ecology, 48(5), pp. 1145–1154. https://doi.org/10.1111/j.1365-2664.2011.02011.x

Gatti, L.V., Basso, L.S., Miller, J.B., Gloor, M., Gatti Domingues, L., Cassol, H.L.G., Tejada, G., Aragão, L.E.O.C., Nobre, C., Peters, W., Marani, L., Arai, E., Sanches, A.H., Corrêa, S.M., Anderson, L., Von Randow, C., Correia, C.S.C., Crispim, S.P. and Neves, R.A.L. (2021) 'Amazonia as a carbon source linked to deforestation and climate change', Nature, 595(7867), pp. 388–393. https://doi.org/10.1038/s41586-021-03629-6

Gerten, D., Lucht, W., Ostberg, S., Heinke, J., Kowarsch, M., Kreft, H., Kundzewicz, Z.W., Rastgooy, J., Warren, R. and Schellnhuber, H.J. (2013) 'Asynchronous exposure to global warming: freshwater resources and terrestrial ecosystems', Environmental Research Letters, 8(3), p. 034032. https://doi.org/10.1088/1748-9326/8/3/034032

Gimeno, L., Eiras-Barca, J., Durán-Quesada, A.M., Dominguez, F., van der Ent, R., Sodemann, H., Sánchez-Murillo, R., Nieto, R. and Kirchner, J.W. (2021) 'The residence time of water vapour in the atmosphere', Nature Reviews Earth & Environment, 2(8), pp. 558–569. https://doi.org/10.1038/s43017-021-00181-9

Girardin, C.A.J., Jenkins, S., Seddon, N., Allen, M., Lewis, S.L., Wheeler, C.E., Griscom, B.W. and Malhi, Y. (2021) 'Nature-based solutions can help cool the planet — if we act now', Nature, 593(7858), pp. 191–194. https://doi.org/10.1038/d41586-021-01241-2

Gold, Z.J., Pellegrini, A.F.A., Refsland, T.K., Andrioli, R.J., Bowles, M.L., Brockway, D.G., Burrows, N., Franco, A.C., Hallgren, S.W., Hobbie, S.E., Hoffmann, W.A., Kirkman, K.P., Reich, P.B., Savadogo, P., Silvério, D., Stephan, K., Strydom, T., Varner, J.M., Wade, D.D., Wills, A. and Staver, A.C. (2023) 'Herbaceous vegetation responses to experimental fire in savannas and forests depend on biome and climate', Ecology Letters, 26(7), pp. 1237–1246. https://doi.org/10.1111/ele.14236

Goldberg, L., Lagomasino, D., Thomas, N. and Fatoyinbo, T. (2020) 'Global declines in human-driven mangrove loss', Global Change Biology, 26(10), pp. 5844–5855. https://doi.org/10.1111/gcb.15275

Gómez-González, S., Ojeda, F. and Fernandes, P.M. (2018) 'Portugal and Chile: Longing for sustainable forestry while rising from the ashes', Environmental Science & Policy, 81, pp. 104–107. https://doi.org/10.1016/j.envsci.2017.11.006

Good, P., Harper, A., Meesters, A., Robertson, E. and Betts, R. (2016) 'Are strong fire–vegetation feedbacks needed to explain the spatial distribution of tropical tree cover?', Global Ecology and Biogeography, 25(1), pp. 16–25. https://doi.org/10.1111/geb.12380

Green, A.E., Unsworth, R.K.F., Chadwick, M.A. and Jones, P.J.S. (2021) 'Historical Analysis Exposes Catastrophic Seagrass Loss for the United Kingdom', Frontiers in Plant Science, 12. https://www.frontiersin.org/articles/10.3389/fpls.2021.629962 (Accessed: 19 October 2023)

Guirado, E., Delgado-Baquerizo, M., Martínez-Valderrama, J., Tabik, S., Alcaraz-Segura, D. and Maestre, F.T. (2022) 'Climate legacies drive the distribution and future restoration potential of dryland forests', Nature Plants, 8(8), pp. 879–886. https://doi.org/10.1038/s41477-022-01198-8

Hagger, V., Worthington, T.A., Lovelock, C.E., Adame, M.F., Amano, T., Brown, B.M., Friess, D.A., Landis, E., Mumby, P.J., Morrison, T.H., O'Brien, K.R., Wilson, K.A., Zganjar, C. and Saunders, M.I. (2022) 'Drivers of global mangrove loss and gain in social-ecological systems', Nature Communications, 13(1), p. 6373. https://doi.org/10.1038/s41467-022-33962-x

Hammond, W.M., Williams, A.P., Abatzoglou, J.T., Adams, H.D., Klein, T., López, R., Sáenz-Romero, C., Hartmann, H., Breshears, D.D. and Allen, C.D. (2022) 'Global field observations of tree die-off reveal hotter-drought fingerprint for Earth's forests', Nature Communications, 13(1), p. 1761. https://doi.org/10.1038/s41467-022-29289-2

Hansen, M.C., Potapov, P.V., Moore, R., Hancher, M., Turubanova, S.A., Tyukavina, A., Thau, D., Stehman, S.V., Goetz, S.J., Loveland, T.R., Kommareddy, A., Egorov, A., Chini, L., Justice, C.O. and Townshend, J.R.G. (2013) 'High-Resolution Global Maps of 21st-Century Forest Cover Change', Science, 342(6160), pp. 850–853. https://doi.org/10.1126/science.1244693

Hansson, A., Dargusch, P. and Shulmeister, J. (2021) 'A review of modern treeline migration, the factors controlling it and the implications for carbon storage', Journal of Mountain Science, 18(2), pp. 291–306. https://doi.org/10.1007/s11629-020-6221-1

Heinze, C., Blenckner, T., Martins, H., Rusiecka, D., Döscher, R., Gehlen,

M., Gruber, N., Holland, E., Hov, Ø., Joos, F., Matthews, J.B.R., Rødven, R. and Wilson, S. (2021) 'The quiet crossing of ocean tipping points', Proceedings of the National Academy of Sciences, 118(9), p. e2008478118. https://doi.org/10.1073/pnas.2008478118

Hennenberg, K.J., Fischer, F., Kouadio, K., Goetze, D., Orthmann, B., Linsenmair, K.E., Jeltsch, F. and Porembski, S. (2006) 'Phytomass and fire occurrence along forest–savanna transects in the Comoé National Park, Ivory Coast', Journal of Tropical Ecology, 22(3), pp. 303–311. https://doi.org/10.1017/S0266467405003007

Henson, S.A., Laufkötter, C., Leung, S., Giering, S.L.C., Palevsky, H.I. and Cavan, E.L. (2022) 'Uncertain response of ocean biological carbon export in a changing world', Nature Geoscience, 15(4), pp. 248–254. https://doi.org/10.1038/s41561-022-00927-0

Herbert, E.R., Boon, P., Burgin, A.J., Neubauer, S.C., Franklin, R.B., Ardón, M., Hopfensperger, K.N., Lamers, L.P.M. and Gell, P. (2015) 'A global perspective on wetland salinization: ecological consequences of a growing threat to freshwater wetlands', Ecosphere, 6(10), p. art206. https://doi.org/10.1890/ES14-00534.1

Herbert-Read, J.E., Thornton, A., Amon, D.J., Birchenough, S.N.R., Côté, I.M., Dias, M.P., Godley, B.J., Keith, S.A., McKinley, E., Peck, L.S., Calado, R., Defeo, O., Degraer, S., Johnston, E.L., Kaartokallio, H., Macreadie, P.I., Metaxas, A., Muthumbi, A.W.N., Obura, D.O., Paterson, D.M., Piola, A.R., Richardson, A.J., Schloss, I.R., Snelgrove, P.V.R., Stewart, B.D., Thompson, P.M., Watson, G.J., Worthington, T.A., Yasuhara, M. and Sutherland, W.J. (2022) 'A global horizon scan of issues impacting marine and coastal biodiversity conservation', Nature Ecology & Evolution, 6(9), pp. 1262–1270. https://doi.org/10.1038/s41559-022-01812-0

Hessen, D.O., Andersen, T., Armstrong McKay, D., Kosten, S., Meerhoff, M., Pickard, A. and Spears, B. (2023) 'Lake ecosystem tipping points and climate feedbacks'. Copernicus GmbH. https://doi.org/10.5194/esd-2023-22

Hesterberg, S.G., Jackson, K. and Bell, S.S. (2022) 'Climate drives coupled regime shifts across subtropical estuarine ecosystems', Proceedings of the National Academy of Sciences, 119(33), p. e2121654119. https://doi.org/10.1073/pnas.2121654119

Higgins, S.I., Bond, W.J. and Trollope, W.S.W. (2000) 'Fire, Resprouting and Variability: A Recipe for Grass-Tree Coexistence in Savanna', Journal of Ecology, 88(2), pp. 213–229. https://www.jstor.org/stable/2648525 (Accessed: 17 October 2023)

Higgins, S.I., Conradi, T., Kruger, L.M., O'Hara, R.B. and Slingsby, J.A. (2023) 'Limited climatic space for alternative ecosystem states in Africa', Science, 380(6649), pp. 1038–1042. https://doi.org/10.1126/science.add5190

Higgins, S.I. and Scheiter, S. (2012) 'Atmospheric CO2 forces abrupt vegetation shifts locally, but not globally', Nature, 488(7410), pp. 209–212. https://doi.org/10.1038/nature11238

Hillebrand, H., Donohue, I., Harpole, W.S., Hodapp, D., Kucera, M., Lewandowska, A.M., Merder, J., Montoya, J.M. and Freund, J.A. (2020) 'Thresholds for ecological responses to global change do not emerge from empirical data', Nature Ecology & Evolution, 4(11), pp. 1502–1509. https://doi.org/10.1038/s41559-020-1256-9

Hirota, M., Flores, B.M., Betts, R., Borma, L.S., Esquivel-Muelbert, A., Jakovac, C., Lapola, D.M., Montoya, E., Oliveira, R.S. and Sakschewski, B. (2021) 'Chapter 24: Resilience of the Amazon forest to global changes: Assessing the risk of tipping points', in Science Panel for the Amazon, Amazon Assessment Report 2021. 1st edn. Edited by C. Nobre, A. Encalada, E. Anderson, F. H. Roca Alcazar, M. Bustamante, C. Mena, M. Peña-Claros, G. Poveda, J. P. Rodriguez, S. Saleska, S. E. Trumbore, A. Val, L. Villa Nova, R. Abramovay, A. Alencar, A. C. Rodriguez Alzza, D. Armenteras, P. Artaxo, S. Athayde, H. T. Barretto Filho, J. Barlow, E. Berenguer, F. Bortolotto, F. D. A. Costa, M. H. Costa, N. Cuvi, P. Fearnside, J. Ferreira, B. M. Flores, S. Frieri, L. V. Gatti, J. M. Guayasamin, S. Hecht, M. Hirota, C. Hoorn, C. Josse, D. M. Lapola, C. Larrea, D. M. Larrea-Alcazar, Z. Lehm Ardaya, Y. Malhi, J. A. Marengo, J. Melack, M. Moraes R., P. Moutinho, M. R. Murmis, E. G. Neves, B. Paez, L. Painter, A. Ramos, M. C. Rosero-Peña, M. Schmink, P. Sist, H. Ter Steege, P. Val, H. Van Der Voort, M. Varese, and G. Zapata-Ríos. UN Sustainable Development Solutions Network (SDSN). https://doi.org/10.55161/QPYS9758

Hirota, M., Holmgren, M., Van Nes, E.H. and Scheffer, M. (2011) 'Global Resilience of Tropical Forest and Savanna to Critical Transitions', Science, 334(6053), pp. 232–235. https://doi.org/10.1126/science.1210657

Hlásny, T., König, L., Krokene, P., Lindner, M., Montagné-Huck, C., Müller, J., Qin, H., Raffa, K.F., Schelhaas, M.-J., Svoboda, M., Viiri, H. and Seidl, R. (2021) 'Bark Beetle Outbreaks in Europe: State of Knowledge and Ways Forward for Management', Current Forestry Reports, 7(3), pp. 138–165. https://doi.org/10.1007/s40725-021-00142-x

Hock, K., Wolff, N.H., Ortiz, J.C., Condie, S.A., Anthony, K.R.N., Blackwell, P.G. and Mumby, P.J. (2017) 'Connectivity and systemic resilience of the Great Barrier Reef', PLOS Biology, 15(11), p. e2003355. https://doi.org/10.1371/journal.pbio.2003355

Hodapp, D., Borer, E.T., Harpole, W.S., Lind, E.M., Seabloom, E.W., Adler, P.B., Alberti, J., Arnillas, C.A., Bakker, J.D., Biederman, L., Cadotte, M., Cleland, E.E., Collins, S., Fay, P.A., Firn, J., Hagenah, N., Hautier, Y., Iribarne, O., Knops, J.M.H., McCulley, R.L., MacDougall, A., Moore, J.L., Morgan, J.W., Mortensen, B., La Pierre, K.J., Risch, A.C., Schütz, M., Peri, P., Stevens, C.J., Wright, J. and Hillebrand, H. (2018) 'Spatial heterogeneity in species composition constrains plant community responses to herbivory and fertilisation', Ecology Letters, 21(9), pp. 1364–1371. https://doi.org/10.1111/ele.13102

Hoegh-Guldberg, O., Jacob, D., Taylor, M., Bindi, M., Brown, S., Camilloni, I., Diedhiou, A., Djalante, R., Ebi, K.L., Engelbrecht, F., Guiot, J., Hijioka, Y., Mehrotra, S., Payne, A., Seneviratne, S.I., Thomas, A., Warren, R. and Zhou, G. (2018) 'Impacts of 1.5oC Global Warming on Natural and Human Systems', in Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty. Cambridge, UK and New York, NY, USA: Cambridge University Press, pp. 175–312. https://www.ipcc.ch/sr15/chapter/chapter-3/ (Accessed: 16 October 2023)

Hoffmann, W.A., Adasme, R., Haridasan, M., T. de Carvalho, M., Geiger, E.L., Pereira, M.A.B., Gotsch, S.G. and Franco, A.C. (2009) 'Tree topkill, not mortality, governs the dynamics of savanna–forest boundaries under frequent fire in central Brazil', Ecology, 90(5), pp. 1326–1337. https://doi.org/10.1890/08-0741.1

Holling, C.S. (1973) 'Resilience and Stability of Ecological Systems', Annual Review of Ecology and Systematics, 4(1), pp. 1–23. https://doi.org/10.1146/annurev.es.04.110173.000245

Holmgren, M., Hirota, M., van Nes, E.H. and Scheffer, M. (2013) 'Effects of interannual climate variability on tropical tree cover', Nature Climate Change, 3(8), pp. 755–758. https://doi.org/10.1038/nclimate1906

Holmgren, M., Lin, C.-Y., Murillo, J.E., Nieuwenhuis, A., Penninkhof, J., Sanders, N., van Bart, T., van Veen, H., Vasander, H., Vollebregt, M.E. and Limpens, J. (2015) 'Positive shrub–tree interactions facilitate woody encroachment in boreal peatlands', Journal of Ecology, 103(1), pp. 58–66. https://doi.org/10.1111/1365-2745.12331

Holmgren, M., López, B.C., Gutiérrez, J.R. and Squeo, F.A. (2006) 'Herbivory and plant growth rate determine the success of El Niño Southern Oscillation-driven tree establishment in semiarid South America', Global Change Biology, 12(12), pp. 2263–2271. https://doi.org/10.1111/j.1365-2486.2006.01261.x

Holmgren, M. and Scheffer, M. (2001) 'El Niño as a Window of Opportunity for the Restoration of Degraded Arid Ecosystems', Ecosystems, 4(2), pp. 151–159. https://doi.org/10.1007/s100210000065

Holmgren, M., Stapp, P., Dickman, C.R., Gracia, C., Graham, S., Gutiérrez, J.R., Hice, C., Jaksic, F., Kelt, D.A., Letnic, M., Lima, M., López, B.C., Meserve, P.L., Milstead, W.B., Polis, G.A., Previtali, M.A., Richter, M., Sabaté, S. and Squeo, F.A. (2006) 'Extreme climatic events shape arid and semiarid ecosystems', Frontiers in Ecology and the Environment, 4(2), pp. 87–95. https://doi.org/10.1890/1540-9295(2006)004[0087:ECESAA]2.0.CO;2

Honda, E.A. and Durigan, G. (2016) 'Woody encroachment and its consequences on hydrological processes in the savannah', Philosophical Transactions of the Royal Society B: Biological Sciences, 371(1703), p. 20150313. https://doi.org/10.1098/rstb.2015.0313

Hopcroft, P.O. and Valdes, P.J. (2021) 'Paleoclimate-conditioning reveals a North Africa land–atmosphere tipping point', Proceedings of the National Academy of Sciences, 118(45), p. e2108783118. https://doi.org/10.1073/pnas.2108783118

Horppila, J., Keskinen, S., Nurmesniemi, M., Nurminen, L., Pippingsköld, E., Rajala, S., Sainio, K. and Estlander, S. (2023) 'Factors behind the threshold-like changes in lake ecosystems along a water colour gradient: The effects of dissolved organic carbon and iron on euphotic depth, mixing depth and phytoplankton biomass', Freshwater Biology, 68(6), pp. 1031–1040. https://doi.org/10.1111/fwb.14083

Houk, P., Yalon, A., Maxin, S., Starsinic, C., McInnis, A., Gouezo, M., Golbuu, Y. and van Woesik, R. (2020) 'Predicting coral-reef futures from El Niño and Pacific Decadal Oscillation events', Scientific Reports, 10(1), p. 7735. https://doi.org/10.1038/s41598-020-64411-8

Huang, B., Hu, X., Fuglstad, G.-A., Zhou, X., Zhao, W. and Cherubini, F. (2020) 'Predominant regional biophysical cooling from recent land cover changes in Europe', Nature Communications, 11(1), p. 1066. https://doi.org/10.1038/s41467-020-14890-0

Huang, J., Yu, H., Guan, X., Wang, G. and Guo, R. (2016) 'Accelerated dryland expansion under climate change', Nature Climate Change, 6(2), pp. 166–171. https://doi.org/10.1038/nclimate2837

Hubau, W., Lewis, S.L., Phillips, O.L., Affum-Baffoe, K., Beeckman, H., Cuní-Sanchez, A., Daniels, A.K., Ewango, C.E.N., Fauset, S., Mukinzi, J.M., Sheil, D., Sonké, B., Sullivan, M.J.P., Sunderland, T.C.H., Taedoumg, H., Thomas, S.C., White, L.J.T., Abernethy, K.A., Adu-Bredu, S., Amani, C.A., Baker, T.R., Banin, L.F., Baya, F., Begne, S.K., Bennett, A.C., Benedet, F., Bitariho, R., Bocko, Y.E., Boeckx, P., Boundja, P., Brienen, R.J.W., Brncic, T., Chezeaux, E., Chuyong, G.B., Clark, C.J., Collins, M., Comiskey, J.A., Coomes, D.A., Dargie, G.C., de Haulleville, T., Kamdem, M.N.D., Doucet, J.-L., Esquivel-Muelbert, A., Feldpausch, T.R., Fofanah, A., Foli, E.G., Gilpin, M., Gloor, E., Gonmadje, C., Gourlet-Fleury, S., Hall, J.S., Hamilton, A.C., Harris, D.J., Hart, T.B., Hockemba, M.B.N., Hladik, A., Ifo, S.A., Jeffery, K.J., Jucker, T., Yakusu, E.K., Kearsley, E., Kenfack, D., Koch, A., Leal, M.E., Levesley, A., Lindsell, J.A., Lisingo, J., Lopez-Gonzalez, G., Lovett, J.C., Makana, J.-R., Malhi, Y., Marshall, A.R., Martin, J., Martin, E.H., Mbayu, F.M., Medjibe, V.P., Mihindou, V., Mitchard, E.T.A., Moore, S., Munishi, P.K.T., Bengone, N.N., Ojo, L., Ondo, F.E., Peh, K.S.-H., Pickavance, G.C., Poulsen, A.D., Poulsen, J.R., Qie, L., Reitsma, J., Rovero, F., Swaine, M.D., Talbot, J., Taplin, J., Taylor, D.M., Thomas, D.W., Toirambe, B., Mukendi, J.T., Tuagben, D., Umunay, P.M., van der Heijden, G.M.F., Verbeeck, H., Vleminckx, J., Willcock, S., Wöll, H., Woods, J.T. and Zemagho, L. (2020) 'Asynchronous carbon sink saturation in African and Amazonian tropical forests', Nature, 579(7797), pp. 80–87. https://doi.org/10.1038/s41586-020-2035-0

Hughes, T.P., Anderson, K.D., Connolly, S.R., Heron, S.F., Kerry, J.T., Lough, J.M., Baird, A.H., Baum, J.K., Berumen, M.L., Bridge, T.C., Claar, D.C., Eakin, C.M., Gilmour, J.P., Graham, N.A.J., Harrison, H., Hobbs, J.-P.A., Hoey, A.S., Hoogenboom, M., Lowe, R.J., McCulloch, M.T., Pandolfi, J.M., Pratchett, M., Schoepf, V., Torda, G. and Wilson, S.K. (2018) 'Spatial and temporal patterns of mass bleaching of corals in the Anthropocene', Science, 359(6371), pp. 80–83. https://doi.org/10.1126/science.aan8048

Hughes, T.P., Carpenter, S., Rockström, J., Scheffer, M. and Walker, B. (2013) 'Multiscale regime shifts and planetary boundaries', Trends in Ecology & Evolution, 28(7), pp. 389–395. https://doi.org/10.1016/j.tree.2013.05.019

Hughes, T.P., Kerry, J.T., Álvarez-Noriega, M., Álvarez-Romero, J.G., Anderson, K.D., Baird, A.H., Babcock, R.C., Beger, M., Bellwood, D.R., Berkelmans, R., Bridge, T.C., Butler, I.R., Byrne, M., Cantin, N.E., Comeau, S., Connolly, S.R., Cumming, G.S., Dalton, S.J., Diaz-Pulido, G., Eakin, C.M., Figueira, W.F., Gilmour, J.P., Harrison, H.B., Heron, S.F., Hoey, A.S., Hobbs, J.-P.A., Hoogenboom, M.O., Kennedy, E.V., Kuo, C., Lough, J.M., Lowe, R.J., Liu, G., McCulloch, M.T., Malcolm, H.A., McWilliam, M.J., Pandolfi, J.M., Pears, R.J., Pratchett, M.S., Schoepf, V., Simpson, T., Skirving, W.J., Sommer, B., Torda, G., Wachenfeld, D.R., Willis, B.L. and Wilson, S.K. (2017) 'Global warming and recurrent mass bleaching of corals', Nature, 543(7645), pp. 373–377. https://doi.org/10.1038/nature21707

Hughes, T.P., Kerry, J.T., Baird, A.H., Connolly, S.R., Dietzel, A., Eakin, C.M., Heron, S.F., Hoey, A.S., Hoogenboom, M.O., Liu, G., McWilliam, M.J., Pears, R.J., Pratchett, M.S., Skirving, W.J., Stella, J.S. and Torda, G. (2018) 'Global warming transforms coral reef assemblages', Nature, 556(7702), pp. 492–496. https://doi.org/10.1038/s41586-018-0041-2

International Congress and Convention Association (ICCA) Consortium (2021) Territories of Life: 2021 Report. ICCA Consortium. https://report.territoriesoflife.org/ (Accessed: 20 October 2023).

Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) (2019) Global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. https://zenodo.org/records/6417333 (Accessed: 13 October 2023)

Intergovernmental Panel on Climate Change (IPCC) (2019) Climate Change and Land: IPCC Special Report on Climate Change, Desertification, Land Degradation, Sustainable Land Management, Food Security, and Greenhouse Gas Fluxes in Terrestrial Ecosystems. Cambridge University Press.

IPCC (2022a) Climate Change 2022: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge, UK and New York, NY, USA: Cambridge University Press, p. 3056. doi.org/10.1017/9781009325844

IPCC (2022b) Global Warming of 1.5°C: IPCC Special Report on Impacts of Global Warming of 1.5°C above Pre-industrial Levels in Context of Strengthening Response to Climate Change, Sustainable Development, and Efforts to Eradicate Poverty. Cambridge: Cambridge University Press. https://doi.org/10.1017/9781009157940

Jackson, R.B., Jobbágy, E.G., Avissar, R., Roy, S.B., Barrett, D.J., Cook, C.W., Farley, K.A., le Maitre, D.C., McCarl, B.A. and Murray, B.C. (2005) 'Trading Water for Carbon with Biological Carbon Sequestration', Science, 310(5756), pp. 1944–1947. https://doi.org/10.1126/science.1119282

Jackson, R.L., Gabric, A.J., Cropp, R. and Woodhouse, M.T. (2020) 'Dimethylsulfide (DMS), marine biogenic aerosols and the ecophysiology of coral reefs', Biogeosciences, 17(8), pp. 2181–2204. https://doi.org/10.5194/bg-17-2181-2020

Jaeger, E.B. and Seneviratne, S.I. (2011) 'Impact of soil moisture–atmosphere coupling on European climate extremes and trends in a regional climate model', Climate Dynamics, 36(9), pp. 1919–1939. https://doi.org/10.1007/s00382-010-0780-8

James, R.K., Keyzer, L.M., van de Velde, S.J., Herman, P.M.J., van Katwijk, M.M. and Bouma, T.J. (2023) 'Climate change mitigation by coral reefs and seagrass beds at risk: How global change compromises coastal ecosystem services', Science of The Total Environment, 857, p. 159576. https://doi.org/10.1016/j.scitotenv.2022.159576

Jarvis, D.S. and Kulakowski, D. (2015) 'Long-term history and synchrony of mountain pine beetle outbreaks in lodgepole pine forests', Journal of Biogeography, 42(6), pp. 1029–1039. https://doi.org/10.1111/jbi.12489.Jeppesen, E., Kristensen, P., Jensen, J.P., Søndergaard, M., Mortensen, E. and Lauridsen, T. (1991) 'Recovery resilience following a reduction in external phosphorus loading of shallow, eutrophic Danish lakes: duration, regulating factors and methods for overcoming resilience', Memorie dell'Istituto Italiano di Idrobiologia, 48, pp. 127–148. https://www.academia.edu/12937212/Recovery_resilience_following_a_reduction_in_external_phosphorus_loading_of_shallow_eutrophic_Danish_lakes_duration_regulating_factors_and_methods_for_overcoming_resilience (Accessed: 19 October 2023)

Jeppesen, E., Søndergaard, M., Jensen, J.P., Havens, K.E., Anneville, O., Carvalho, L., Coveney, M.F., Deneke, R., Dokulil, M.T., Foy, B., Gerdeaux, D., Hampton, S.E., Hilt, S., Kangur, K., Köhler, J., Lammens, E.H. h. r., Lauridsen, T.L., Manca, M., Miracle, M.R., Moss, B., Nõges, P., Persson, G., Phillips, G., Portielje, R., Romo, S., Schelske, C.L., Straile, D., Tatrai, I., Willén, E. and Winder, M. (2005) 'Lake responses to reduced nutrient loading – an analysis of contemporary long-term data from 35 case studies', Freshwater Biology, 50(10), pp. 1747–1771. https://doi.org/10.1111/j.1365-2427.2005.01415.x

Jimenez, J.A., Lugo, A.E. and Cintron, G. (1985) 'Tree Mortality in Mangrove Forests', Biotropica, 17(3), pp. 177–185. https://doi.

org/10.2307/2388214
Jiménez-Muñoz, J.C., Mattar, C., Barichivich, J., Santamaría-Artigas, A., Takahashi, K., Malhi, Y., Sobrino, J.A. and Schrier, G. van der (2016) 'Record-breaking warming and extreme drought in the Amazon rainforest during the course of El Niño 2015–2016', Scientific Reports, 6(1), p. 33130. https://doi.org/10.1038/srep33130
Jónasdóttir, S.H., Visser, A.W., Richardson, K. and Heath, M.R. (2015) 'Seasonal copepod lipid pump promotes carbon sequestration in the deep North Atlantic', Proceedings of the National Academy of Sciences, 112(39), pp. 12122–12126. https://doi.org/10.1073/pnas.1512110112
Jouffray, J.-B., Blasiak, R., Norström, A.V., Österblom, H. and Nyström, M. (2020) 'The Blue Acceleration: The Trajectory of Human Expansion into the Ocean', One Earth, 2(1), pp. 43–54. https://doi.org/10.1016/j.oneear.2019.12.016
Kaijser, W., Kosten, S. and Hering, D. (2019) 'Salinity tolerance of aquatic plants indicated by monitoring data from the Netherlands', Aquatic Botany, 158, p. 103129. https://doi.org/10.1016/j.aquabot.2019.103129
Karlsson, J., Byström, P., Ask, J., Ask, P., Persson, L. and Jansson, M. (2009) 'Light limitation of nutrient-poor lake ecosystems', Nature, 460(7254), pp. 506–509. https://doi.org/10.1038/nature08179
Karp, A.T., Uno, K.T., Berke, M.A., Russell, J.M., Scholz, C.A., Marlon, J.R., Faith, J.T. and Staver, A.C. (2023) 'Nonlinear rainfall effects on savanna fire activity across the African Humid Period', Quaternary Science Reviews, 304, p. 107994. https://doi.org/10.1016/j.quascirev.2023.107994
Kéfi, S., Rietkerk, M., Alados, C.L., Pueyo, Y., Papanastasis, V.P., ElAich, A. and de Ruiter, P.C. (2007) 'Spatial vegetation patterns and imminent desertification in Mediterranean arid ecosystems', Nature, 449(7159), pp. 213–217. https://doi.org/10.1038/nature06111
Kéfi, S., Rietkerk, M., Roy, M., Franc, A., de Ruiter, P.C. and Pascual, M. (2011) 'Robust scaling in ecosystems and the meltdown of patch size distributions before extinction', Ecology Letters, 14(1), pp. 29–35. https://doi.org/10.1111/j.1461-0248.2010.01553.x
Kéfi, S., Saade, C., Berlow, E.L., Cabral, J.S. and Fronhofer, E.A. (2022) 'Scaling up our understanding of tipping points', Philosophical Transactions of the Royal Society B: Biological Sciences, 377(1857), p. 20210386. https://doi.org/10.1098/rstb.2021.0386
Keith, D.A., Ferrer-Paris, J.R., Nicholson, E., Bishop, M.J., Polidoro, B.A., Ramirez-Llodra, E., Tozer, M.G., Nel, J.L., Mac Nally, R., Gregr, E.J., Watermeyer, K.E., Essl, F., Faber-Langendoen, D., Franklin, J., Lehmann, C.E.R., Etter, A., Roux, D.J., Stark, J.S., Rowland, J.A., Brummitt, N.A., Fernandez-Arcaya, U.C., Suthers, I.M., Wiser, S.K., Donohue, I., Jackson, L.J., Pennington, R.T., Iliffe, T.M., Gerovasileiou, V., Giller, P., Robson, B.J., Pettorelli, N., Andrade, A., Lindgaard, A., Tahvanainen, T., Terauds, A., Chadwick, M.A., Murray, N.J., Moat, J., Pliscoff, P., Zager, I. and Kingsford, R.T. (2022) 'A function-based typology for Earth's ecosystems', Nature, 610(7932), pp. 513–518. https://doi.org/10.1038/s41586-022-05318-4
Kelly, S.J., Popova, E., Aksenov, Y., Marsh, R. and Yool, A. (2020) 'They Came From the Pacific: How Changing Arctic Currents Could Contribute to an Ecological Regime Shift in the Atlantic Ocean', Earth's Future, 8(4), p. e2019EF001394. https://doi.org/10.1029/2019EF001394
Kendrick, G.A., Nowicki, R.J., Olsen, Y.S., Strydom, S., Fraser, M.W., Sinclair, E.A., Statton, J., Hovey, R.K., Thomson, J.A., Burkholder, D.A., McMahon, K.M., Kilminster, K., Hetzel, Y., Fourqurean, J.W., Heithaus, M.R. and Orth, R.J. (2019) 'A Systematic Review of How Multiple Stressors From an Extreme Event Drove Ecosystem-Wide Loss of Resilience in an Iconic Seagrass Community', Frontiers in Marine Science, 6. https://www.frontiersin.org/articles/10.3389/fmars.2019.00455 (Accessed: 19 October 2023)
Kolus, H.R., Huntzinger, D.N., Schwalm, C.R., Fisher, J.B., McKay, N., Fang, Y., Michalak, A.M., Schaefer, K., Wei, Y., Poulter, B., Mao, J., Parazoo, N.C. and Shi, X. (2019) 'Land carbon models underestimate the severity and duration of drought's impact on plant productivity', Scientific Reports, 9(1), p. 2758. https://doi.org/10.1038/s41598-019-39373-1
Kooperman, G.J., Chen, Y., Hoffman, F.M., Koven, C.D., Lindsay, K., Pritchard, M.S., Swann, A.L.S. and Randerson, J.T. (2018) 'Forest response to rising CO2 drives zonally asymmetric rainfall change over tropical land', Nature Climate Change, 8(5), pp. 434–440. https://doi.org/10.1038/s41558-018-0144-7
Krauss, K.W., McKee, K.L., Lovelock, C.E., Cahoon, D.R., Saintilan, N., Reef, R. and Chen, L. (2014) 'How mangrove forests adjust to rising sea level', New Phytologist, 202(1), pp. 19–34. https://doi.org/10.1111/nph.12605
Kukla, T., Ahlström, A., Maezumi, S.Y., Chevalier, M., Lu, Z., Winnick, M.J. and Chamberlain, C.P. (2021) 'The resilience of Amazon tree cover to past and present drying', Global and Planetary Change, 202, p. 103520. https://doi.org/10.1016/j.gloplacha.2021.103520
Kulmatiski, A. and Beard, K.H. (2013) 'Woody plant encroachment facilitated by increased precipitation intensity', Nature Climate Change, 3(9), pp. 833–837. https://doi.org/10.1038/nclimate1904
Kump, L.R., Kasting, J.F. and Crane, R.G. (1999) The Earth System. New Jersey: Prentice Hall
Kuntzemann, C.E., Whitman, E., Stralberg, D., Parisien, M.-A., Thompson, D.K. and Nielsen, S.E. (2023) 'Peatlands promote fire refugia in boreal forests of northern Alberta, Canada', Ecosphere, 14(5), p. e4510. https://doi.org/10.1002/ecs2.4510
Lade, S.J., Wang-Erlandsson, L., Staal, A. and Rocha, J.C. (2021) 'Empirical pressure-response relations can benefit assessment of safe operating spaces', Nature Ecology & Evolution, 5(8), pp. 1078–1079. https://doi.org/10.1038/s41559-021-01481-5
Langan, L., Higgins, S.I. and Scheiter, S. (2017) 'Climate-biomes, pedo-biomes or pyro-biomes: which world view explains the tropical forest–savanna boundary in South America?', Journal of Biogeography, 44(10), pp. 2319–2330. https://doi.org/10.1111/jbi.13018
Lapola, D.M., Pinho, P., Barlow, J., Aragão, L.E.O.C., Berenguer, E., Carmenta, R., Liddy, H.M., Seixas, H., Silva, C.V.J., Silva-Junior, C.H.L., Alencar, A.A.C., Anderson, L.O., Armenteras, D., Brovkin, V., Calders, K., Chambers, J., Chini, L., Costa, M.H., Faria, B.L., Fearnside, P.M., Ferreira, J., Gatti, L., Gutierrez-Velez, V.H., Han, Z., Hibbard, K., Koven, C., Lawrence, P., Pongratz, J., Portela, B.T.T., Rounsevell, M., Ruane, A.C., Schaldach, R., da Silva, S.S., von Randow, C. and Walker, W.S. (2023) 'The drivers and impacts of Amazon forest degradation', Science, 379(6630), p. eabp8622. https://doi.org/10.1126/science.abp8622
Laurion, I., Vincent, W.F., MacIntyre, S., Retamal, L., Dupont, C., Francus, P. and Pienitz, R. (2010) 'Variability in greenhouse gas emissions from permafrost thaw ponds', Limnology and Oceanography, 55(1), pp. 115–133. https://doi.org/10.4319/lo.2010.55.1.0115
Le Nohaïc, M., Ross, C.L., Cornwall, C.E., Comeau, S., Lowe, R., McCulloch, M.T. and Schoepf, V. (2017) 'Marine heatwave causes unprecedented regional mass bleaching of thermally resistant corals in northwestern Australia', Scientific Reports, 7(1), p. 14999. https://doi.org/10.1038/s41598-017-14794-y
Leakey, A.D.B., Ainsworth, E.A., Bernacchi, C.J., Rogers, A., Long, S.P. and Ort, D.R. (2009) 'Elevated CO2 effects on plant carbon, nitrogen, and water relations: six important lessons from FACE', Journal of Experimental Botany, 60(10), pp. 2859–2876. https://doi.org/10.1093/jxb/erp096
Lenton, T.M., Held, H., Kriegler, E., Hall, J.W., Lucht, W., Rahmstorf, S. and Schellnhuber, H.J. (2008) 'Tipping elements in the Earth's climate system', Proceedings of the National Academy of Sciences, 105(6), pp. 1786–1793. https://doi.org/10.1073/pnas.0705414105
Lenton, T.M. and Williams, H.T.P. (2013) 'On the origin of planetary-scale tipping points', Trends in Ecology & Evolution, 28(7), pp. 380–382. https://doi.org/10.1016/j.tree.2013.06.001
Levine, N.M., Zhang, K., Longo, M., Baccini, A., Phillips, O.L., Lewis, S.L., Alvarez-Dávila, E., Segalin de Andrade, A.C., Brienen, R.J.W., Erwin, T.L., Feldpausch, T.R., Monteagudo Mendoza, A.L., Nuñez Vargas, P., Prieto, A., Silva-Espejo, J.E., Malhi, Y. and Moorcroft, P.R. (2016) 'Ecosystem heterogeneity determines the ecological resilience of the Amazon to climate change', Proceedings of the National Academy of Sciences, 113(3), pp. 793–797. https://doi.org/10.1073/pnas.1511344112
Li, Y., Baker, J.C.A., Brando, P.M., Hoffman, F.M., Lawrence, D.M., Morton, D.C., Swann, A.L.S., Uribe, M. del R. and Randerson, J.T. (2023) 'Future increases in Amazonia water stress from CO2 physiology and deforestation', Nature Water, 1(9), pp. 769–777.

https://doi.org/10.1038/s44221-023-00128-y
Lian, X., Piao, S., Chen, A., Huntingford, C., Fu, B., Li, L.Z.X., Huang, J., Sheffield, J., Berg, A.M., Keenan, T.F., McVicar, T.R., Wada, Y., Wang, X., Wang, T., Yang, Y. and Roderick, M.L. (2021) 'Multifaceted characteristics of dryland aridity changes in a warming world', Nature Reviews Earth & Environment, 2(4), pp. 232–250. https://doi.org/10.1038/s43017-021-00144-0
Ling, S.D., Scheibling, R.E., Rassweiler, A., Johnson, C.R., Shears, N., Connell, S.D., Salomon, A.K., Norderhaug, K.M., Pérez-Matus, A., Hernández, J.C., Clemente, S., Blamey, L.K., Hereu, B., Ballesteros, E., Sala, E., Garrabou, J., Cebrian, E., Zabala, M., Fujita, D. and Johnson, L.E. (2015) 'Global regime shift dynamics of catastrophic sea urchin overgrazing', Philosophical Transactions of the Royal Society B: Biological Sciences, 370(1659), p. 20130269. https://doi.org/10.1098/rstb.2013.0269
Liu, B., Liang, Y., He, H.S., Liu, Z., Ma, T. and Wu, M.M. (2022) 'Wildfire affects boreal forest resilience through post-fire recruitment in Northeastern China', Ecological Indicators, 145, p. 109705. https://doi.org/10.1016/j.ecolind.2022.109705
Liu, T., Chen, Dean, Yang, L., Meng, J., Wang, Z., Ludescher, J., Fan, J., Yang, S., Chen, Deliang, Kurths, J., Chen, X., Havlin, S. and Schellnhuber, H.J. (2023) 'Teleconnections among tipping elements in the Earth system', Nature Climate Change, 13(1), pp. 67–74. https://doi.org/10.1038/s41558-022-01558-4
Lloret, F. and Batllori, E. (2021) 'Climate-Induced Global Forest Shifts due to Heatwave-Drought', in J.G. Canadell and R.B. Jackson (eds) Ecosystem Collapse and Climate Change. Cham: Springer International Publishing (Ecological Studies), pp. 155–186. https://doi.org/10.1007/978-3-030-71330-0_7
Lloyd, J., Bird, M.I., Vellen, L., Miranda, A.C., Veenendaal, E.M., Djagbletey, G., Miranda, H.S., Cook, G. and Farquhar, G.D. (2008) 'Contributions of woody and herbaceous vegetation to tropical savanna ecosystem productivity: a quasi-global estimate', Tree Physiology, 28(3), pp. 451–468. https://doi.org/10.1093/treephys/28.3.451
Loehle, C., Li, B.-L. and Sundell, R.C. (1996) 'Forest spread and phase transitions at forest-prairie ecotones in Kansas, U.S.A.', Landscape Ecology, 11(4), pp. 225–235. https://doi.org/10.1007/BF02071813
Longo, M., Knox, R.G., Levine, N.M., Alves, L.F., Bonal, D., Camargo, P.B., Fitzjarrald, D.R., Hayek, M.N., Restrepo-Coupe, N., Saleska, S.R., da Silva, R., Stark, S.C., Tapajós, R.P., Wiedemann, K.T., Zhang, K., Wofsy, S.C. and Moorcroft, P.R. (2018) 'Ecosystem heterogeneity and diversity mitigate Amazon forest resilience to frequent extreme droughts', New Phytologist, 219(3), pp. 914–931. https://doi.org/10.1111/nph.15185
Lovelock, C.E., Cahoon, D.R., Friess, D.A., Guntenspergen, G.R., Krauss, K.W., Reef, R., Rogers, K., Saunders, M.L., Sidik, F., Swales, A., Saintilan, N., Thuyen, L.X. and Triet, T. (2015) 'The vulnerability of Indo-Pacific mangrove forests to sea-level rise', Nature, 526(7574), pp. 559–563. https://doi.org/10.1038/nature15538
Lovelock, C.E., Feller, I.C., Reef, R., Hickey, S. and Ball, M.C. (2017) 'Mangrove dieback during fluctuating sea levels', Scientific Reports, 7(1), p. 1680. https://doi.org/10.1038/s41598-017-01927-6
Lovelock, C.E., Fourqurean, J.W. and Morris, J.T. (2017) 'Modeled CO2 Emissions from Coastal Wetland Transitions to Other Land Uses: Tidal Marshes, Mangrove Forests, and Seagrass Beds', Frontiers in Marine Science, 4. https://www.frontiersin.org/articles/10.3389/fmars.2017.00143 (Accessed: 19 October 2023)
Lu, M. and Hedin, L.O. (2019) 'Global plant-symbiont organization and emergence of biogeochemical cycles resolved by evolution-based trait modelling', Nature Ecology & Evolution, 3(2), pp. 239–250. https://doi.org/10.1038/s41559-018-0759-0
Lugo, A.E. (1980) 'Mangrove Ecosystems: Successional or Steady State?', Biotropica, 12(2), pp. 65–72. https://doi.org/10.2307/2388158
Ma, L., Yang, L., Chang, Q., Wang, S., Guan, C., Chen, N. and Zhao, C. (2023) 'Alternative tree-cover states of dryland ecosystems: Inconsistencies between global and continental scales', Agricultural and Forest Meteorology, 337, p. 109497. https://doi.org/10.1016/j.agrformet.2023.109497
Maberly, S.C., O'Donnell, R.A., Woolway, R.I., Cutler, M.E.J., Gong, M., Jones, I.D., Merchant, C.J., Miller, C.A., Politi, E., Scott, E.M., Thackeray, S.J. and Tyler, A.N. (2020) 'Global lake thermal regions shift under climate change', Nature Communications, 11(1), p. 1232. https://doi.org/10.1038/s41467-020-15108-z
Maciejewski, K., Biggs, R. and Rocha, J.C. (2019) 'Regime shifts in social-ecological systems', in Handbook on Resilience of Socio-Technical Systems. Edward Elgar Publishing, pp. 274–295. https://china.elgaronline.com/edcollchap/edcoll/9781786439369/9781786439369.00021.xml (Accessed: 13 October 2023)
MacLeod, K., Koch, M.S., Johnson, C.R. and Madden, C.J. (2023) 'Resilience of recruiting seagrass (Thalassia testudinum) to porewater H2S in Florida Bay', Aquatic Botany, 187, p. 103650. https://doi.org/10.1016/j.aquabot.2023.103650
Macreadie, P.I., Costa, M.D.P., Atwood, T.B., Friess, D.A., Kelleway, J.J., Kennedy, H., Lovelock, C.E., Serrano, O. and Duarte, C.M. (2021) 'Blue carbon as a natural climate solution', Nature Reviews Earth & Environment, 2(12), pp. 826–839. https://doi.org/10.1038/s43017-021-00224-1
Maestre, F.T., Delgado-Baquerizo, M., Jeffries, T.C., Eldridge, D.J., Ochoa, V., Gozalo, B., Quero, J.L., García-Gómez, M., Gallardo, A., Ulrich, W., Bowker, M.A., Arredondo, T., Barraza-Zepeda, C., Bran, D., Florentino, A., Gaitán, J., Gutiérrez, J.R., Huber-Sannwald, E., Jankju, M., Mau, R.L., Miriti, M., Naseri, K., Ospina, A., Stavi, I., Wang, D., Woods, N.N., Yuan, X., Zaady, E. and Singh, B.K. (2015) 'Increasing aridity reduces soil microbial diversity and abundance in global drylands', Proceedings of the National Academy of Sciences, 112(51), pp. 15684–15689. https://doi.org/10.1073/pnas.1516684112
Malhi, Y., Gardner, T.A., Goldsmith, G.R., Silman, M.R. and Zelazowski, P. (2014) 'Tropical Forests in the Anthropocene', Annual Review of Environment and Resources, 39(1), pp. 125–159. https://doi.org/10.1146/annurev-environ-030713-155141
Malik, A., Fensholt, R. and Mertz, O. (2015) 'Economic Valuation of Mangroves for Comparison with Commercial Aquaculture in South Sulawesi, Indonesia', Forests, 6(9), pp. 3028–3044. https://doi.org/10.3390/f6093028
Marbà, N., Jordà, G., Bennett, S. and Duarte, C.M. (2022) 'Seagrass Thermal Limits and Vulnerability to Future Warming', Frontiers in Marine Science, 9. https://www.frontiersin.org/articles/10.3389/fmars.2022.860826 (Accessed: 19 October 2023)
Marengo, J.A., Nobre, C.A., Tomasella, J., Oyama, M.D., Oliveira, G.S. de, Oliveira, R. de, Camargo, H., Alves, L.M. and Brown, I.F. (2008) 'The Drought of Amazonia in 2005', Journal of Climate, 21(3), pp. 495–516. https://doi.org/10.1175/2007JCLI1600.1
Marengo, J.A., Tomasella, J., Alves, L.M., Soares, W.R. and Rodriguez, D.A. (2011) 'The drought of 2010 in the context of historical droughts in the Amazon region', Geophysical Research Letters, 38(12). https://doi.org/10.1029/2011GL047436
Martin, R., Schlüter, M. and Blenckner, T. (2020) 'The importance of transient social dynamics for restoring ecosystems beyond ecological tipping points', Proceedings of the National Academy of Sciences, 117(5), pp. 2717–2722. https://doi.org/10.1073/pnas.1817154117
Maxwell, S.L., Fuller, R.A., Brooks, T.M. and Watson, J.E.M. (2016) 'Biodiversity: The ravages of guns, nets and bulldozers', Nature, 536(7615), pp. 143–145. https://doi.org/10.1038/536143a
May, R.M. (1977) 'Thresholds and breakpoints in ecosystems with a multiplicity of stable states', Nature, 269(5628), pp. 471–477. https://doi.org/10.1038/269471a0
Mayer, M., Prescott, C.E., Abaker, W.E.A., Augusto, L., Cécillon, L., Ferreira, G.W.D., James, J., Jandl, R., Katzensteiner, K., Laclau, J.-P., Laganière, J., Nouvellon, Y., Paré, D., Stanturf, J.A., Vanguelova, E.I. and Vesterdal, L. (2020) 'Tamm Review: Influence of forest management activities on soil organic carbon stocks: A knowledge synthesis', Forest Ecology and Management, 466, p. 118127. https://doi.org/10.1016/j.foreco.2020.118127
Mayor, A.G., Bautista, S., Rodriguez, F. and Kéfi, S. (2019) 'Connectivity-Mediated Ecohydrological Feedbacks and Regime Shifts in Drylands', Ecosystems, 22(7), pp. 1497–1511. https://doi.org/10.1007/s10021-019-00366-w
Mayor, Á.G., Kéfi, S., Bautista, S., Rodríguez, F., Cartení, F. and Rietkerk, M. (2013) 'Feedbacks between vegetation pattern and resource loss dramatically decrease ecosystem resilience and

restoration potential in a simple dryland model', Landscape Ecology, 28(5), pp. 931–942. https://doi.org/10.1007/s10980-013-9870-4
Mayor, A.G., Valdecantos, A., Vallejo, V.R., Keizer, J.J., Bloem, J., Baeza, J., González-Pelayo, O., Machado, A.I. and de Ruiter, P.C. (2016) 'Fire-induced pine woodland to shrubland transitions in Southern Europe may promote shifts in soil fertility', Science of The Total Environment, 573, pp. 1232–1241. https://doi.org/10.1016/j.scitotenv.2016.03.243
Mayor, D.J., Cook, K.B., Anderson, T.R., Belcher, A., Jenkins, Lindeque, P., Tarling, G.A. and Pond, D. (2020) 'Marine Copepods, The Wildebeest of the Ocean', Frontiers for Young Minds. https://kids.frontiersin.org/articles/10.3389/frym.2020.00018 (Accessed: 20 October 2023)
McKenzie, L.J., Nordlund, L.M., Jones, B.L., Cullen-Unsworth, L.C., Roelfsema, C. and Unsworth, R.K.F. (2020) 'The global distribution of seagrass meadows', Environmental Research Letters, 15(7), p. 074041. https://doi.org/10.1088/1748-9326/ab7d06
McPherson, M.L., Finger, D.J.I., Houskeeper, H.F., Bell, T.W., Carr, M.H., Rogers-Bennett, L. and Kudela, R.M. (2021) 'Large-scale shift in the structure of a kelp forest ecosystem co-occurs with an epizootic and marine heatwave', Communications Biology, 4(1), pp. 1–9. https://doi.org/10.1038/s42003-021-01827-6
McWhorter, J.K., Halloran, P.R., Roff, G., Skirving, W.J., Perry, C.T. and Mumby, P.J. (2022) 'The importance of 1.5°C warming for the Great Barrier Reef', Global Change Biology, 28(4), pp. 1332–1341. https://doi.org/10.1111/gcb.15994
Meerhoff, M., Audet, J., Davidson, T.A., De Meester, L., Hilt, S., Kosten, S., Liu, Z., Mazzeo, N., Paerl, H., Scheffer, M. and Jeppesen, E. (2022) 'Feedback between climate change and eutrophication: revisiting the allied attack concept and how to strike back', Inland Waters, 12(2), pp. 187–204. https://doi.org/10.1080/20442041.2022.2029317
Mekonnen, Z.A., Riley, W.J., Berner, L.T., Bouskill, N.J., Torn, M.S., Iwahana, G., Breen, A.L., Myers-Smith, I.H., Criado, M.G., Liu, Y., Euskirchen, E.S., Goetz, S.J., Mack, M.C. and Grant, R.F. (2021) 'Arctic tundra shrubification: a review of mechanisms and impacts on ecosystem carbon balance', Environmental Research Letters, 16(5), p. 053001. https://doi.org/10.1088/1748-9326/abf28b
Menéndez, P., Losada, I.J., Torres-Ortega, S., Narayan, S. and Beck, M.W. (2020) 'The Global Flood Protection Benefits of Mangroves', Scientific Reports, 10(1), p. 4404. https://doi.org/10.1038/s41598-020-61136-6
Messager, M.L., Lehner, B., Grill, G., Nedeva, I. and Schmitt, O. (2016) 'Estimating the volume and age of water stored in global lakes using a geo-statistical approach', Nature Communications, 7(1), p. 13603. https://doi.org/10.1038/ncomms13603
Meyer, S.T., Ptacnik, R., Hillebrand, H., Bessler, H., Buchmann, N., Ebeling, A., Eisenhauer, N., Engels, C., Fischer, M., Halle, S., Klein, A.-M., Oelmann, Y., Roscher, C., Rottstock, T., Scherber, C., Scheu, S., Schmid, B., Schulze, E.-D., Temperton, V.M., Tscharntke, T., Voigt, W., Weigelt, A., Wilcke, W. and Weisser, W.W. (2018) 'Biodiversity–multifunctionality relationships depend on identity and number of measured functions', Nature Ecology & Evolution, 2(1), pp. 44–49. https://doi.org/10.1038/s41559-017-0391-4
Middleton, N., Thomas, D. and UNEP (1992) World Atlas of Desertification. Edward Arnold : https://digitallibrary.un.org/record/246740 (Accessed: 18 October 2023)
Möllmann, C., Cormon, X., Funk, S., Otto, S.A., Schmidt, J.O., Schwermer, H., Sguotti, C., Voss, R. and Quaas, M. (2021) 'Tipping point realized in cod fishery', Scientific Reports, 11(1), p. 14259. https://doi.org/10.1038/s41598-021-93843-z
Möllmann, C. and Diekmann, R. (2012) 'Chapter 4 - Marine Ecosystem Regime Shifts Induced by Climate and Overfishing: A Review for the Northern Hemisphere', in G. Woodward, U. Jacob, and E.J. O'Gorman (eds) Advances in Ecological Research. Academic Press (Global Change in Multispecies Systems Part 2), pp. 303–347. https://doi.org/10.1016/B978-0-12-398315-2.00004-1
Monteith, D.T., Henrys, P.A., Hruška, J., de Wit, H.A., Krám, P., Moldan, F., Posch, M., Räike, A., Stoddard, J.L., Shilland, E.M., Pereira, M.G. and Evans, C.D. (2023) 'Long-term rise in riverine dissolved organic carbon concentration is predicted by electrolyte solubility theory', Science Advances, 9(3), p. eade3491. https://doi.org/10.1126/sciadv.ade3491
Montoya, J.M., Donohue, I. and Pimm, S.L. (2018) 'Planetary Boundaries for Biodiversity: Implausible Science, Pernicious Policies', Trends in Ecology & Evolution, 33(2), pp. 71–73. https://doi.org/10.1016/j.tree.2017.10.004
Mora, J.L. and Lázaro, R. (2013) 'Evidence of a threshold in soil erodibility generating differences in vegetation development and resilience between two semiarid grasslands', Journal of Arid Environments, 89, pp. 57–66. https://doi.org/10.1016/j.jaridenv.2012.10.005
Muñiz-Castillo, A.I., Rivera-Sosa, A., Chollett, I., Eakin, C.M., Andrade-Gómez, L., McField, M. and Arias-González, J.E. (2019) 'Three decades of heat stress exposure in Caribbean coral reefs: a new regional delineation to enhance conservation', Scientific Reports, 9(1), p. 11013. https://doi.org/10.1038/s41598-019-47307-0
Nemani, R.R., Keeling, C.D., Hashimoto, H., Jolly, W.M., Piper, S.C., Tucker, C.J., Myneni, R.B. and Running, S.W. (2003) 'Climate-Driven Increases in Global Terrestrial Net Primary Production from 1982 to 1999', Science, 300(5625), pp. 1560–1563. https://doi.org/10.1126/science.1082750
Nes, E.H. van, Arani, B.M.S., Staal, A., Bolt, B. van der, Flores, B.M., Bathiany, S. and Scheffer, M. (2016) 'What Do You Mean, "Tipping Point"?', Trends in Ecology & Evolution, 31(12), pp. 902–904. https://doi.org/10.1016/j.tree.2016.09.011
Nes, E.H. van, Staal, A., Hantson, S., Holmgren, M., Pueyo, S., Bernardi, R.E., Flores, B.M., Xu, C. and Scheffer, M. (2018) 'Fire forbids fifty-fifty forest', PLOS ONE, 13(1), p. e0191027. https://doi.org/10.1371/journal.pone.0191027
Neukermans, G., Oziel, L. and Babin, M. (2018) 'Increased intrusion of warming Atlantic water leads to rapid expansion of temperate phytoplankton in the Arctic', Global Change Biology, 24(6), pp. 2545–2553. https://doi.org/10.1111/gcb.14075
Nicholson, S.E., Tucker, C.J. and Ba, M.B. (1998) 'Desertification, Drought, and Surface Vegetation: An Example from the West African Sahel', Bulletin of the American Meteorological Society, 79(5), pp. 815–830. https://doi.org/10.1175/1520-0477(1998)079<0815:DDASVA>2.0.CO;2
Nieto-Quintano, P., Mitchard, E.T.A., Odende, R., Batsa Mouwembe, M.A., Rayden, T. and Ryan, C.M. (2018) 'The mesic savannas of the Bateke Plateau: carbon stocks and floristic composition', Biotropica, 50(6), pp. 868–880. https://doi.org/10.1111/btp.12606
Nobre, C.A., Sampaio, G., Borma, L.S., Castilla-Rubio, J.C., Silva, J.S. and Cardoso, M. (2016) 'Land-use and climate change risks in the Amazon and the need of a novel sustainable development paradigm', Proceedings of the National Academy of Sciences, 113(39), pp. 10759–10768. https://doi.org/10.1073/pnas.1605516113.
Norberg, J., Blenckner, T., Cornell, S.E., Petchey, O.L. and Hillebrand, H. (2022) 'Failures to disagree are essential for environmental science to effectively influence policy development', Ecology Letters, 25(5), pp. 1075–1093. https://doi.org/10.1111/ele.13984
Norby, R.J. and Zak, D.R. (2011) 'Ecological Lessons from Free-Air CO2 Enrichment (FACE) Experiments', Annual Review of Ecology, Evolution, and Systematics, 42(1), pp. 181–203. https://doi.org/10.1146/annurev-ecolsys-102209-144647
Nordlund, L.M., Koch, E.W., Barbier, E.B. and Creed, J.C. (2016) 'Seagrass Ecosystem Services and Their Variability across Genera and Geographical Regions', PLOS ONE, 11(10), p. e0163091. https://doi.org/10.1371/journal.pone.0163091
Nowicki, M., DeVries, T. and Siegel, D.A. (2022) 'Quantifying the Carbon Export and Sequestration Pathways of the Ocean's Biological Carbon Pump', Global Biogeochemical Cycles, 36(3), p. e2021GB007083. https://doi.org/10.1029/2021GB007083
Nowicki, R.J., Thomson, J.A., Burkholder, D.A., Fourqurean, J.W. and Heithaus, M.R. (2017) 'Predicting seagrass recovery times and their implications following an extreme climate event', Marine Ecology Progress Series, 567, pp. 79–93. https://doi.org/10.3354/meps12029
Noy-Meir, I. (1975) 'Stability of Grazing Systems: An Application of Predator-Prey Graphs', Journal of Ecology, 63(2), pp. 459–481. https://doi.org/10.2307/2258730
Nyström, M., Folke, C., Moberg, F., Nyström, M., Folke, C., Moberg, F., Nyström, M., Folke, C. and Moberg, F. (2000) 'Coral reef disturbance and resilience in a human-dominated environment',

Trends in Ecology & Evolution, 15(10), pp. 413–417. https://doi.org/10.1016/S0169-5347(00)01948-0

Obura, D., Gudka, M., Samoilys, M., Osuka, K., Mbugua, J., Keith, D.A., Porter, S., Roche, R., van Hooidonk, R., Ahamada, S., Araman, A., Karisa, J., Komakoma, J., Madi, M., Ravinia, I., Razafindrainibe, H., Yahya, S. and Zivane, F. (2022) 'Vulnerability to collapse of coral reef ecosystems in the Western Indian Ocean', Nature Sustainability, 5(2), pp. 104–113. https://doi.org/10.1038/s41893-021-00817-0

Ockenden, M.C., Hollaway, M.J., Beven, K.J., Collins, A.L., Evans, R., Falloon, P.D., Forber, K.J., Hiscock, K.M., Kahana, R., Macleod, C.J.A., Tych, W., Villamizar, M.L., Wearing, C., Withers, P.J.A., Zhou, J.G., Barker, P.A., Burke, S., Freer, J.E., Johnes, P.J., Snell, M.A., Surridge, B.W.J. and Haygarth, P.M. (2017) 'Major agricultural changes required to mitigate phosphorus losses under climate change', Nature Communications, 8(1), p. 161. https://doi.org/10.1038/s41467-017-00232-0

Olefeldt, D., Hovemyr, M., Kuhn, M.A., Bastviken, D., Bohn, T.J., Connolly, J., Crill, P., Euskirchen, E.S., Finkelstein, S.A., Genet, H., Grosse, G., Harris, L.I., Heffernan, L., Helbig, M., Hugelius, G., Hutchins, R., Juutinen, S., Lara, M.J., Malhotra, A., Manies, K., McGuire, A.D., Natali, S.M., O'Donnell, J.A., Parmentier, F.-J.W., Räsänen, A., Schädel, C., Sonnentag, O., Strack, M., Tank, S.E., Treat, C., Varner, R.K., Virtanen, T., Warren, R.K. and Watts, J.D. (2021) 'The Boreal–Arctic Wetland and Lake Dataset (BAWLD)', Earth System Science Data, 13(11), pp. 5127–5149. https://doi.org/10.5194/essd-13-5127-2021

Oliveira, R.S., Eller, C.B., Barros, F. de V., Hirota, M., Brum, M. and Bittencourt, P. (2021) 'Linking plant hydraulics and the fast–slow continuum to understand resilience to drought in tropical ecosystems', New Phytologist, 230(3), pp. 904–923. https://doi.org/10.1111/nph.17266

Opdal, A.F., Andersen, T., Hessen, D.O., Lindemann, C. and Aksnes, D.L. (2023) 'Tracking freshwater browning and coastal water darkening from boreal forests to the Arctic Ocean', Limnology and Oceanography Letters, 8(4), pp. 611–619. https://doi.org/10.1002/lol2.10320

Osman, M.B., Tierney, J.E., Zhu, J., Tardif, R., Hakim, G.J., King, J. and Poulsen, C.J. (2021) 'Globally resolved surface temperatures since the Last Glacial Maximum', Nature, 599(7884), pp. 239–244. https://doi.org/10.1038/s41586-021-03984-4

Österblom, H., Hansson, S., Larsson, U., Hjerne, O., Wulff, F., Elmgren, R. and Folke, C. (2007) 'Human-induced Trophic Cascades and Ecological Regime Shifts in the Baltic Sea', Ecosystems, 10(6), pp. 877–889. https://doi.org/10.1007/s10021-007-9069-0

Oziel, L., Baudena, A., Ardyna, M., Massicotte, P., Randelhoff, A., Sallée, J.-B., Ingvaldsen, R.B., Devred, E. and Babin, M. (2020) 'Faster Atlantic currents drive poleward expansion of temperate phytoplankton in the Arctic Ocean', Nature Communications, 11(1), p. 1705. https://doi.org/10.1038/s41467-020-15485-5.

Pan, Y., Birdsey, R.A., Fang, J., Houghton, R., Kauppi, P.E., Kurz, W.A., Phillips, O.L., Shvidenko, A., Lewis, S.L., Canadell, J.G., Ciais, P., Jackson, R.B., Pacala, S.W., McGuire, A.D., Piao, S., Rautiainen, A., Sitch, S. and Hayes, D. (2011) 'A Large and Persistent Carbon Sink in the World's Forests', Science, 333(6045), pp. 988–993. https://doi.org/10.1126/science.1201609

Parry, I.M., Ritchie, P.D.L. and Cox, P.M. (2022) 'Evidence of localised Amazon rainforest dieback in CMIP6 models', Earth System Dynamics, 13(4), pp. 1667–1675. https://doi.org/10.5194/esd-13-1667-2022

Pauchard, A., García, R.A., Peña, E., González, C., Cavieres, L.A. and Bustamante, R.O. (2008) 'Positive feedbacks between plant invasions and fire regimes: Teline monspessulana (L.) K. Koch (Fabaceae) in central Chile', Biological Invasions, 10(4), pp. 547–553. https://doi.org/10.1007/s10530-007-9151-8

Pausata, F.S.R., Gaetani, M., Messori, G., Berg, A., Souza, D.M. de, Sage, R.F. and deMenocal, P.B. (2020) 'The Greening of the Sahara: Past Changes and Future Implications', One Earth, 2(3), pp. 235–250. https://doi.org/10.1016/j.oneear.2020.03.002

Peng, C., Ma, Z., Lei, X., Zhu, Q., Chen, H., Wang, W., Liu, S., Li, W., Fang, X. and Zhou, X. (2011) 'A drought-induced pervasive increase in tree mortality across Canada's boreal forests', Nature Climate Change, 1(9), pp. 467–471. https://doi.org/10.1038/nclimate1293

Peñuelas, J., Ciais, P., Canadell, J.G., Janssens, I.A., Fernández-Martínez, M., Carnicer, J., Obersteiner, M., Piao, S., Vautard, R. and Sardans, J. (2017) 'Shifting from a fertilization-dominated to a warming-dominated period', Nature Ecology & Evolution, 1(10), pp. 1438–1445. https://doi.org/10.1038/s41559-017-0274-8

Perry, C.T., Murphy, G.N., Kench, P.S., Smithers, S.G., Edinger, E.N., Steneck, R.S. and Mumby, P.J. (2013) 'Caribbean-wide decline in carbonate production threatens coral reef growth', Nature Communications, 4(1), p. 1402. https://doi.org/10.1038/ncomms2409

Phillips, O.L., Aragão, L.E.O.C., Lewis, S.L., Fisher, J.B., Lloyd, J., López-González, G., Malhi, Y., Monteagudo, A., Peacock, J., Quesada, C.A., van der Heijden, G., Almeida, S., Amaral, I., Arroyo, L., Aymard, G., Baker, T.R., Bánki, O., Blanc, L., Bonal, D., Brando, P., Chave, J., de Oliveira, Á.C.A., Cardozo, N.D., Czimczik, C.I., Feldpausch, T.R., Freitas, M.A., Gloor, E., Higuchi, N., Jiménez, E., Lloyd, G., Meir, P., Mendoza, C., Morel, A., Neill, D.A., Nepstad, D., Patiño, S., Peñuela, M.C., Prieto, A., Ramírez, F., Schwarz, M., Silva, J., Silveira, M., Thomas, A.S., Steege, H. ter, Stropp, J., Vásquez, R., Zelazowski, P., Dávila, E.A., Andelman, S., Andrade, A., Chao, K.-J., Erwin, T., Di Fiore, A., C., E.H., Keeling, H., Killeen, T.J., Laurance, W.F., Cruz, A.P., Pitman, N.C.A., Vargas, P.N., Ramírez-Angulo, H., Rudas, A., Salamão, R., Silva, N., Terborgh, J. and Torres-Lezama, A. (2009) 'Drought Sensitivity of the Amazon Rainforest', Science, 323(5919), pp. 1344–1347. https://doi.org/10.1126/science.1164033

Phillips, O.L., van der Heijden, G., Lewis, S.L., López-González, G., Aragão, L.E.O.C., Lloyd, J., Malhi, Y., Monteagudo, A., Almeida, S., Dávila, E.A., Amaral, I., Andelman, S., Andrade, A., Arroyo, L., Aymard, G., Baker, T.R., Blanc, L., Bonal, D., de Oliveira, Á.C.A., Chao, K.-J., Cardozo, N.D., da Costa, L., Feldpausch, T.R., Fisher, J.B., Fyllas, N.M., Freitas, M.A., Galbraith, D., Gloor, E., Higuchi, N., Honorio, E., Jiménez, E., Keeling, H., Killeen, T.J., Lovett, J.C., Meir, P., Mendoza, C., Morel, A., Vargas, P.N., Patiño, S., Peh, K.S.-H., Cruz, A.P., Prieto, A., Quesada, C.A., Ramírez, F., Ramírez, H., Rudas, A., Salamão, R., Schwarz, M., Silva, J., Silveira, M., Ferry Slik, J.W., Sonké, B., Thomas, A.S., Stropp, J., Taplin, J.R.D., Vásquez, R. and Vilanova, E. (2010) 'Drought–mortality relationships for tropical forests', New Phytologist, 187(3), pp. 631–646. https://doi.org/10.1111/j.1469-8137.2010.03359.x

Pierret, A. and Lacombe, G. (2018) 'Hydrologic regulation of plant rooting depth: Breakthrough or observational conundrum?', Proceedings of the National Academy of Sciences, 115(12), pp. E2669–E2670. https://doi.org/10.1073/pnas.1801721115

Pillay, R., Venter, M., Aragon-Osejo, J., González-del-Pliego, P., Hansen, A.J., Watson, J.E. and Venter, O. (2022) 'Tropical forests are home to over half of the world's vertebrate species', Frontiers in Ecology and the Environment, 20(1), pp. 10–15. https://doi.org/10.1002/fee.2420

Pinsky, M.L., Jensen, O.P., Ricard, D. and Palumbi, S.R. (2011) 'Unexpected patterns of fisheries collapse in the world's oceans', Proceedings of the National Academy of Sciences, 108(20), pp. 8317–8322. https://doi.org/10.1073/pnas.1015313108

Plaisance, L., Caley, M.J., Brainard, R.E. and Knowlton, N. (2011) 'The Diversity of Coral Reefs: What Are We Missing?', PLOS ONE, 6(10), p. e25026. https://doi.org/10.1371/journal.pone.0025026

Portmann, R., Beyerle, U., Davin, E., Fischer, E.M., De Hertog, S. and Schemm, S. (2022) 'Global forestation and deforestation affect remote climate via adjusted atmosphere and ocean circulation', Nature Communications, 13(1), p. 5569. https://doi.org/10.1038/s41467-022-33279-9

Potapov, P., Hansen, M.C., Laestadius, L., Turubanova, S., Yaroshenko, A., Thies, C., Smith, W., Zhuravleva, I., Komarova, A., Minnemeyer, S. and Esipova, E. (2017) 'The last frontiers of wilderness: Tracking loss of intact forest landscapes from 2000 to 2013', Science Advances, 3(1), p. e1600821. https://doi.org/10.1126/sciadv.1600821

Pranindita, A., Wang-Erlandsson, L., Fetzer, I. and Teuling, A.J. (2022) 'Moisture recycling and the potential role of forests as moisture source during European heatwaves', Climate Dynamics, 58(1), pp. 609–624. https://doi.org/10.1007/s00382-021-05921-7

Prăvălie, R., Bandoc, G., Patriche, C. and Sternberg, T. (2019) 'Recent changes in global drylands: Evidences from two major aridity databases', CATENA, 178, pp. 209–231. https://doi.org/10.1016/j.

catena.2019.03.016
Prince, S.D., Wessels, K.J., Tucker, C.J. and Nicholson, S.E. (2007) 'Desertification in the Sahel: a reinterpretation of a reinterpretation', Global Change Biology, 13(7), pp. 1308–1313. https://doi.org/10.1111/j.1365-2486.2007.01356.x
Rahel, F.J. and Olden, J.D. (2008) 'Assessing the Effects of Climate Change on Aquatic Invasive Species', Conservation Biology, 22(3), pp. 521–533. https://doi.org/10.1111/j.1523-1739.2008.00950.x
Rao, M.P., Davi, N.K., Magney, T.S., Andreu-Hayles, L., Nachin, B., Suran, B., Varuolo-Clarke, A.M., Cook, B.I., D'Arrigo, R.D., Pederson, N., Odrentsen, L., Rodríguez-Catón, M., Leland, C., Burentogtokh, J., Gardner, W.R.M. and Griffin, K.L. (2023) 'Approaching a thermal tipping point in the Eurasian boreal forest at its southern margin', Communications Earth & Environment, 4(1), pp. 1–10. https://doi.org/10.1038/s43247-023-00910-6
regimeshifts.org (no date) Regime Shifts DataBase. https://www.regimeshifts.org/ (Accessed: 13 October 2023)
Reich, P.B., Bermudez, R., Montgomery, R.A., Rich, R.L., Rice, K.E., Hobbie, S.E. and Stefanski, A. (2022a) 'Even modest climate change may lead to major transitions in boreal forests', Nature, 608(7923), pp. 540–545. https://doi.org/10.1038/s41586-022-05076-3
Reich, P.B., Bermudez, R., Montgomery, R.A., Rich, R.L., Rice, K.E., Hobbie, S.E. and Stefanski, A. (2022b) 'Even modest climate change may lead to major transitions in boreal forests', Nature, 608(7923), pp. 540–545. https://doi.org/10.1038/s41586-022-05076-3
Reid, P.C. and Beaugrand, G. (2012) 'Global synchrony of an accelerating rise in sea surface temperature', Journal of the Marine Biological Association of the United Kingdom, 92(7), pp. 1435–1450. https://doi.org/10.1017/S0025315412000549
Reynolds, J.F., Smith, D.M.S., Lambin, E.F., Turner, B.L., Mortimore, M., Batterbury, S.P.J., Downing, T.E., Dowlatabadi, H., Fernández, R.J., Herrick, J.E., Huber-Sannwald, E., Jiang, H., Leemans, R., Lynam, T., Maestre, F.T., Ayarza, M. and Walker, B. (2007) 'Global Desertification: Building a Science for Dryland Development', Science, 316(5826), pp. 847–851. https://doi.org/10.1126/science.1131634
Reynolds, S.A. and Aldridge, D.C. (2021) 'Global impacts of invasive species on the tipping points of shallow lakes', Global Change Biology, 27(23), pp. 6129–6138. https://doi.org/10.1111/gcb.15893
Richards, D.R. and Friess, D.A. (2016) 'Rates and drivers of mangrove deforestation in Southeast Asia, 2000–2012', Proceedings of the National Academy of Sciences, 113(2), pp. 344–349. https://doi.org/10.1073/pnas.1510272113
Rietkerk, M., Bastiaansen, R., Banerjee, S., van de Koppel, J., Baudena, M. and Doelman, A. (2021) 'Evasion of tipping in complex systems through spatial pattern formation', Science, 374(6564), p. eabj0359. https://doi.org/10.1126/science.abj0359
Rietkerk, M., Ketner, P., Burger, J., Hoorens, B. and Olff, H. (2000) 'Multiscale soil and vegetation patchiness along a gradient of herbivore impact in a semi-arid grazing system in West Africa', Plant Ecology, 148(2), pp. 207–224. https://doi.org/10.1023/A:1009828432690
Riina, O.H., Rodrigo Duno de Stefano, Gerardo Aymard, Ricarda (2006) 'Flora and Vegetation of the Venezuelan Llanos: A Review', in Neotropical Savannas and Seasonally Dry Forests. CRC Press.
Rillig, M.C., van der Heijden, M.G.A., Berdugo, M., Liu, Y.-R., Riedo, J., Sanz-Lazaro, C., Moreno-Jiménez, E., Romero, F., Tedersoo, L. and Delgado-Baquerizo, M. (2023) 'Increasing the number of stressors reduces soil ecosystem services worldwide', Nature Climate Change, 13(5), pp. 478–483. https://doi.org/10.1038/s41558-023-01627-2
Rocha, J.C., Peterson, G.D. and Biggs, R. (2015) 'Regime Shifts in the Anthropocene: Drivers, Risks, and Resilience', PLOS ONE, 10(8), p. e0134639. https://doi.org/10.1371/journal.pone.0134639
Rockström, J., Beringer, T., Hole, D., Griscom, B., Mascia, M.B., Folke, C. and Creutzig, F. (2021) 'We need biosphere stewardship that protects carbon sinks and builds resilience', Proceedings of the National Academy of Sciences, 118(38), p. e2115218118. https://doi.org/10.1073/pnas.2115218118
Rockström, J., Richardson, K., Steffen, W. and Mace, G. (2018) 'Planetary Boundaries: Separating Fact from Fiction. A Response to Montoya et al.', Trends in Ecology & Evolution, 33(4), pp. 233–234. https://doi.org/10.1016/j.tree.2018.01.010
Rodríguez, F., Mayor, Á.G., Rietkerk, M. and Bautista, S. (2018) 'A null model for assessing the cover-independent role of bare soil connectivity as indicator of dryland functioning and dynamics', Ecological Indicators, 94, pp. 512–519. https://doi.org/10.1016/j.ecolind.2017.10.023
Rogeau, M.-P., Barber, Q.E. and Parisien, M.-A. (2018) 'Effect of Topography on Persistent Fire Refugia of the Canadian Rocky Mountains', Forests, 9(6), p. 285. https://doi.org/10.3390/f9060285
Romero-Uribe, H.M., López-Portillo, J., Reverchon, F. and Hernández, M.E. (2022) 'Effect of degradation of a black mangrove forest on seasonal greenhouse gas emissions', Environmental Science and Pollution Research, 29(8), pp. 11951–11965. https://doi.org/10.1007/s11356-021-16597-1
Rosentreter, J.A., Laruelle, G.G., Bange, H.W., Bianchi, T.S., Busecke, J.J.M., Cai, W.-J., Eyre, B.D., Forbrich, I., Kwon, E.Y., Maavara, T., Moosdorf, N., Najjar, R.G., Sarma, V.V.S.S., Van Dam, B. and Regnier, P. (2023) 'Coastal vegetation and estuaries are collectively a greenhouse gas sink', Nature Climate Change, 13(6), pp. 579–587. https://doi.org/10.1038/s41558-023-01682-9
Rotbarth, R., Van Nes, E.H., Scheffer, M., Jepsen, J.U., Vindstad, O.P.L., Xu, C. and Holmgren, M. (2023) 'Northern expansion is not compensating for southern declines in North American boreal forests', Nature Communications, 14(1), p. 3373. https://doi.org/10.1038/s41467-023-39092-2
Ruslan, N.F.N., Goh, H.C., Hattam, C., Edwards-Jones, A. and Moh, H.H. (2022) 'Mangrove ecosystem services: Contribution to the well-being of the coastal communities in Klang Islands', Marine Policy, 144, p. 105222. https://doi.org/10.1016/j.marpol.2022.105222
Sabatini, F.M., Keeton, W.S., Lindner, M., Svoboda, M., Verkerk, P.J., Bauhus, J., Bruelheide, H., Burrascano, S., Debaive, N., Duarte, I., Garbarino, M., Grigoriadis, N., Lombardi, F., Mikoláš, M., Meyer, P., Motta, R., Mozgeris, G., Nunes, L., Ódor, P., Panayotov, M., Ruete, A., Simovski, B., Stillhard, J., Svensson, J., Szwagrzyk, J., Tikkanen, O.-P., Vandekerkhove, K., Volosyanchuk, R., Vrska, T., Zlatanov, T. and Kuemmerle, T. (2020) 'Protection gaps and restoration opportunities for primary forests in Europe', Diversity and Distributions, 26(12), pp. 1646–1662. https://doi.org/10.1111/ddi.13158
Safranyik, L., Carroll, A.L., Régnière, J., Langor, D.W., Riel, W.G., Shore, T.L., Peter, B., Cooke, B.J., Nealis, V.G. and Taylor, S.W. (2010) 'Potential for range expansion of mountain pine beetle into the boreal forest of North America', The Canadian Entomologist, 142(5), pp. 415–442. https://doi.org/10.4039/n08-CPA01
Saintilan, N., Horton, B., Törnqvist, T.E., Ashe, E.L., Khan, N.S., Schuerch, M., Perry, C., Kopp, R.E., Garner, G.G., Murray, N., Rogers, K., Albert, S., Kelleway, J., Shaw, T.A., Woodroffe, C.D., Lovelock, C.E., Goddard, M.M., Hutley, L.B., Kovalenko, K., Feher, L. and Guntenspergen, G. (2023) 'Widespread retreat of coastal habitat is likely at warming levels above 1.5 °C', Nature, 621(7977), pp. 112–119. https://doi.org/10.1038/s41586-023-06448-z
Saintilan, N., Khan, N.S., Ashe, E., Kelleway, J.J., Rogers, K., Woodroffe, C.D. and Horton, B.P. (2020) 'Thresholds of mangrove survival under rapid sea level rise', Science, 368(6495), pp. 1118–1121. https://doi.org/10.1126/science.aba2656
Sakschewski, B., von Bloh, W., Drüke, M., Sörensson, A.A., Ruscica, R., Langerwisch, F., Billing, M., Bereswill, S., Hirota, M., Oliveira, R.S., Heinke, J. and Thonicke, K. (2021) 'Variable tree rooting strategies are key for modelling the distribution, productivity and evapotranspiration of tropical evergreen forests', Biogeosciences, 18(13), pp. 4091–4116. https://doi.org/10.5194/bg-18-4091-2021
Salazar, L.F. and Nobre, C.A. (2010) 'Climate change and thresholds of biome shifts in Amazonia', Geophysical Research Letters, 37(17). https://doi.org/10.1029/2010GL043538
Salvatteci, R., Field, D., Gutiérrez, D., Baumgartner, T., Ferreira, V., Ortlieb, L., Sifeddine, A., Grados, D. and Bertrand, A. (2018) 'Multifarious anchovy and sardine regimes in the Humboldt Current System during the last 150 years', Global Change Biology, 24(3), pp. 1055–1068. https://doi.org/10.1111/gcb.13991
Salvatteci, R., Schneider, R.R., Galbraith, E., Field, D., Blanz, T., Bauersachs, T., Crosta, X., Martinez, P., Echevin, V., Scholz, F. and Bertrand, A. (2022) 'Smaller fish species in a warm and oxygen-poor Humboldt Current system', Science, 375(6576), pp. 101–104. https://doi.org/10.1126/science.abj0270

Samhouri, J.F., Levin, P.S. and Ainsworth, C.H. (2010) 'Identifying Thresholds for Ecosystem-Based Management', PLOS ONE, 5(1), p. e8907. https://doi.org/10.1371/journal.pone.0008907

Sampaio, G., Shimizu, M.H., Guimarães-Júnior, C.A., Alexandre, F., Guatura, M., Cardoso, M., Domingues, T.F., Rammig, A., von Randow, C., Rezende, L.F.C. and Lapola, D.M. (2021) 'CO2 physiological effect can cause rainfall decrease as strong as large-scale deforestation in the Amazon', Biogeosciences, 18(8), pp. 2511–2525. https://doi.org/10.5194/bg-18-2511-2021

Sankaran, M., Hanan, N.P., Scholes, R.J., Ratnam, J., Augustine, D.J., Cade, B.S., Gignoux, J., Higgins, S.I., Le Roux, X., Ludwig, F., Ardo, J., Banyikwa, F., Bronn, A., Bucini, G., Caylor, K.K., Coughenour, M.B., Diouf, A., Ekaya, W., Feral, C.J., February, E.C., Frost, P.G.H., Hiernaux, P., Hrabar, H., Metzger, K.L., Prins, H.H.T., Ringrose, S., Sea, W., Tews, J., Worden, J. and Zambatis, N. (2005) 'Determinants of woody cover in African savannas', Nature, 438(7069), pp. 846–849. https://doi.org/10.1038/nature04070

Santana-Falcón, Y., Yamamoto, A., Lenton, A., Jones, C.D., Burger, F.A., John, J.G., Tjiputra, J., Schwinger, J., Kawamiya, M., Frölicher, T.L., Ziehn, T. and Séférian, R. (2023) 'Irreversible loss in marine ecosystem habitability after a temperature overshoot', Communications Earth & Environment, 4(1), pp. 1–14. https://doi.org/10.1038/s43247-023-01002-1

Save Maldives Campaign and Neykurendhoo Island Council (2020) Report for #SaveNeykurendhooKandoofaa for activities funded by the Commonwealth Human Ecology Council (CHEC)

Scheffer, M., Bascompte, J., Brock, W.A., Brovkin, V., Carpenter, S.R., Dakos, V., Held, H., van Nes, E.H., Rietkerk, M. and Sugihara, G. (2009) 'Early-warning signals for critical transitions', Nature, 461(7260), pp. 53–59. https://doi.org/10.1038/nature08227

Scheffer, M., Carpenter, S., Foley, J.A., Folke, C. and Walker, B. (2001) 'Catastrophic shifts in ecosystems', Nature, 413(6856), pp. 591–596. https://doi.org/10.1038/35098000

Scheffer, M., Hirota, M., Holmgren, M., Van Nes, E.H. and Chapin, F.S. (2012) 'Thresholds for boreal biome transitions', Proceedings of the National Academy of Sciences, 109(52), pp. 21384–21389. https://doi.org/10.1073/pnas.1219844110

Scheffer, M., Hosper, S.H., Meijer, M.-L., Moss, B. and Jeppesen, E. (1993) 'Alternative equilibria in shallow lakes', Trends in Ecology & Evolution, 8(8), pp. 275–279. https://doi.org/10.1016/0169-5347(93)90254-M

Scheffer, M. and van Nes, E.H. (2007) 'Shallow lakes theory revisited: various alternative regimes driven by climate, nutrients, depth and lake size', Hydrobiologia, 584(1), pp. 455–466. https://doi.org/10.1007/s10750-007-0616-7

Schlesinger, W.H., Reynolds, J.F., Cunningham, G.L., Huenneke, L.F., Jarrell, W.M., Virginia, R.A. and Whitford, W.G. (1990) 'Biological Feedbacks in Global Desertification', Science, 247(4946), pp. 1043–1048. https://doi.org/10.1126/science.247.4946.1043

Schorn, S., Ahmerkamp, S., Bullock, E., Weber, M., Lott, C., Liebeke, M., Lavik, G., Kuypers, M.M.M., Graf, J.S. and Milucka, J. (2022) 'Diverse methylotrophic methanogenic archaea cause high methane emissions from seagrass meadows', Proceedings of the National Academy of Sciences, 119(9), p. e2106628119. https://doi.org/10.1073/pnas.2106628119

Schröder, A., Persson, L. and De Roos, A.M. (2005) 'Direct experimental evidence for alternative stable states: a review', Oikos, 110(1), pp. 3–19. https://doi.org/10.1111/j.0030-1299.2005.13962.x

Schumacher, D.L., Keune, J., Dirmeyer, P. and Miralles, D.G. (2022) 'Drought self-propagation in drylands due to land–atmosphere feedbacks', Nature Geoscience, 15(4), pp. 262–268. https://doi.org/10.1038/s41561-022-00912-7

Schwartzlose, R.A., Alheit, J., Bakun, A., Baumgartner, T.R., Cloete, R., Crawford, R.J.M., Fletcher, W.J., Green-Ruiz, Y., Hagen, E., Kawasaki, T., Lluch-Belda, D., Lluch-Cota, S.E., MacCall, A.D., Matsuura, Y., Nevárez-Martínez, M.O., Parrish, R.H., Roy, C., Serra, R., Shust, K.V., Ward, M.N. and Zuzunaga, J.Z. (1999) 'Worldwide large-scale fluctuations of sardine and anchovy populations', South African Journal of Marine Science, 21(1), pp. 289–347. https://doi.org/10.2989/025776199784125962

Seidl, R., Thom, D., Kautz, M., Martin-Benito, D., Peltoniemi, M., Vacchiano, G., Wild, J., Ascoli, D., Petr, M., Honkaniemi, J., Lexer, M.J., Trotsiuk, V., Mairota, P., Svoboda, M., Fabrika, M., Nagel, T.A. and Reyer, C.P.O. (2017) 'Forest disturbances under climate change', Nature Climate Change, 7(6), pp. 395–402. https://doi.org/10.1038/nclimate3303

Seneviratne, S.I., Corti, T., Davin, E.L., Hirschi, M., Jaeger, E.B., Lehner, I., Orlowsky, B. and Teuling, A.J. (2010) 'Investigating soil moisture–climate interactions in a changing climate: A review', Earth-Science Reviews, 99(3), pp. 125–161. https://doi.org/10.1016/j.earscirev.2010.02.004

Senf, C., Buras, A., Zang, C.S., Rammig, A. and Seidl, R. (2020) 'Excess forest mortality is consistently linked to drought across Europe', Nature Communications, 11(1), p. 6200. https://doi.org/10.1038/s41467-020-19924-1

Serrano, O., Gómez-López, D.I., Sánchez-Valencia, L., Acosta-Chaparro, A., Navas-Camacho, R., González-Corredor, J., Salinas, C., Masque, P., Bernal, C.A. and Marbà, N. (2021) 'Seagrass blue carbon stocks and sequestration rates in the Colombian Caribbean', Scientific Reports, 11(1), p. 11067. https://doi.org/10.1038/s41598-021-90544-5

Setter, R.O., Franklin, E.C. and Mora, C. (2022) 'Co-occurring anthropogenic stressors reduce the timeframe of environmental viability for the world's coral reefs', PLOS Biology, 20(10), p. e3001821. https://doi.org/10.1371/journal.pbio.3001821

Sguotti, C., Blöcker, A.M., Färber, L., Blanz, B., Cormier, R., Diekmann, R., Letschert, J., Rambo, H., Stollberg, N., Stelzenmüller, V., Stier, A.C. and Möllmann, C. (2022) 'Irreversibility of regime shifts in the North Sea', Frontiers in Marine Science, 9. https://www.frontiersin.org/articles/10.3389/fmars.2022.945204 (Accessed: 20 October 2023)

Sguotti, C., Otto, S.A., Frelat, R., Langbehn, T.J., Ryberg, M.P., Lindegren, M., Durant, J.M., Chr. Stenseth, N. and Möllmann, C. (2019) 'Catastrophic dynamics limit Atlantic cod recovery', Proceedings of the Royal Society B: Biological Sciences, 286(1898), p. 20182877. https://doi.org/10.1098/rspb.2018.2877

Shanahan, T.M., McKay, N.P., Hughen, K.A., Overpeck, J.T., Otto-Bliesner, B., Heil, C.W., King, J., Scholz, C.A. and Peck, J. (2015) 'The time-transgressive termination of the African Humid Period', Nature Geoscience, 8(2), pp. 140–144. https://doi.org/10.1038/ngeo2329

Sheppard, C., Sheppard, A. and Fenner, D. (2020) 'Coral mass mortalities in the Chagos Archipelago over 40 years: Regional species and assemblage extinctions and indications of positive feedbacks', Marine Pollution Bulletin, 154, p. 111075. https://doi.org/10.1016/j.marpolbul.2020.111075

Short, F.T., Kosten, S., Morgan, P.A., Malone, S. and Moore, G.E. (2016) 'Impacts of climate change on submerged and emergent wetland plants', Aquatic Botany, 135, pp. 3–17. https://doi.org/10.1016/j.aquabot.2016.06.006

Silvério, D.V., Brando, P.M., Balch, J.K., Putz, F.E., Nepstad, D.C., Oliveira-Santos, C. and Bustamante, M.M.C. (2013) 'Testing the Amazon savannization hypothesis: fire effects on invasion of a neotropical forest by native cerrado and exotic pasture grasses', Philosophical Transactions of the Royal Society B: Biological Sciences, 368(1619), p. 20120427. https://doi.org/10.1098/rstb.2012.0427

Sim, L.L., Chambers, J.M. and Davis, J.A. (2006) 'Ecological regime shifts in salinised wetland systems. I. Salinity thresholds for the loss of submerged macrophytes', Hydrobiologia, 573(1), pp. 89–107. https://doi.org/10.1007/s10750-006-0267-0

Singh, C., Wang-Erlandsson, L., Fetzer, I., Rockström, J. and Ent, R. van der (2020) 'Rootzone storage capacity reveals drought coping strategies along rainforest-savanna transitions', Environmental Research Letters, 15(12), p. 124021. https://doi.org/10.1088/1748-9326/abc377

Sitters, J., Holmgren, M., Stoorvogel, J.J. and López, B.C. (2012) 'Rainfall-Tuned Management Facilitates Dry Forest Recovery', Restoration Ecology, 20(1), pp. 33–42. https://doi.org/10.1111/j.1526-100X.2010.00761.x

Slik, J.W.F., Arroyo-Rodríguez, V., Aiba, S.-I., Alvarez-Loayza, P., Alves, L.F., Ashton, P., Balvanera, P., Bastian, M.L., Bellingham, P.J., van den Berg, E., Bernacci, L., da Conceição Bispo, P., Blanc, L., Böhning-Gaese, K., Boeckx, P., Bongers, F., Boyle, B., Bradford, M., Brearley, F.Q., Breuer-Ndoundou Hockemba, M., Bunyavejchewin,

S., Calderado Leal Matos, D., Castillo-Santiago, M., Catharino, E.L.M., Chai, S.-L., Chen, Y., Colwell, R.K., Chazdon, R.L., Clark, C., Clark, D.B., Clark, D.A., Culmsee, H., Damas, K., Dattaraja, H.S., Dauby, G., Davidar, P., DeWalt, S.J., Doucet, J.-L., Duque, A., Durigan, G., Eichhorn, K.A.O., Eisenlohr, P.V., Eler, E., Ewango, C., Farwig, N., Feeley, K.J., Ferreira, L., Field, R., de Oliveira Filho, A.T., Fletcher, C., Forshed, O., Franco, G., Fredriksson, G., Gillespie, T., Gillet, J.-F., Amarnath, G., Griffith, D.M., Grogan, J., Gunatilleke, N., Harris, D., Harrison, R., Hector, A., Homeier, J., Imai, N., Itoh, A., Jansen, P.A., Joly, C.A., de Jong, B.H.J., Kartawinata, K., Kearsley, E., Kelly, D.L., Kenfack, D., Kessler, M., Kitayama, K., Kooyman, R., Larney, E., Laumonier, Y., Laurance, S., Laurance, W.F., Lawes, M.J., Amaral, I.L. do, Letcher, S.G., Lindsell, J., Lu, X., Mansor, A., Marjokorpi, A., Martin, E.H., Meilby, H., Melo, F.P.L., Metcalfe, D.J., Medjibe, V.P., Metzger, J.P., Millet, J., Mohandass, D., Montero, J.C., de Morisson Valeriano, M., Mugerwa, B., Nagamasu, H., Nilus, R., Ochoa-Gaona, S., Onrizal, Page, N., Parolin, P., Parren, M., Parthasarathy, N., Paudel, E., Permana, A., Piedade, M.T.F., Pitman, N.C.A., Poorter, L., Poulsen, A.D., Poulsen, J., Powers, J., Prasad, R.C., Puyravaud, J.-P., Razafimahaimodison, J.-C., Reitsma, J., dos Santos, J.R., Roberto Spironello, W., Romero-Saltos, H., Rovero, F., Rozak, A.H., Ruokolainen, K., Rutishauser, E., Saiter, F., Saner, P., Santos, B.A., Santos, F., Sarker, S.K., Satdichanh, M., Schmitt, C.B., Schöngart, J., Schulze, M., Suganuma, M.S., Sheil, D., da Silva Pinheiro, E., Sist, P., Stevart, T., Sukumar, R., Sun, I.-F., Sunderland, T., Suresh, H.S., Suzuki, E., Tabarelli, M., Tang, J., Targhetta, N., Theilade, I., Thomas, D.W., Tchouto, P., Hurtado, J., Valencia, R., van Valkenburg, J.L.C.H., Van Do, T., Vasquez, R., Verbeeck, H., Adekunle, V., Vieira, S.A., Webb, C.O., Whitfeld, T., Wich, S.A., Williams, J., Wittmann, F., Wöll, H., Yang, X., Adou Yao, C.Y., Yap, S.L., Yoneda, T., Zahawi, R.A., Zakaria, R., Zang, R., de Assis, R.L., Garcia Luize, B. and Venticinque, E.M. (2015) 'An estimate of the number of tropical tree species', Proceedings of the National Academy of Sciences, 112(24), pp. 7472–7477. https://doi.org/10.1073/pnas.1423147112

Smit, I.P.J. and Prins, H.H.T. (2015) 'Predicting the Effects of Woody Encroachment on Mammal Communities, Grazing Biomass and Fire Frequency in African Savannas', PLOS ONE, 10(9), p. e0137857. https://doi.org/10.1371/journal.pone.0137857

Smith, C., Baker, J.C.A. and Spracklen, D.V. (2023) 'Tropical deforestation causes large reductions in observed precipitation', Nature, 615(7951), pp. 270–275. https://doi.org/10.1038/s41586-022-05690-1

Smith, J.G. and Tinker, M.T. (2022) 'Alternations in the foraging behaviour of a primary consumer drive patch transition dynamics in a temperate rocky reef ecosystem', Ecology Letters, 25(8), pp. 1827–1838. https://doi.org/10.1111/ele.14064

Smith, L.C., Sheng, Y., MacDonald, G.M. and Hinzman, L.D. (2005) 'Disappearing Arctic Lakes', Science, 308(5727), pp. 1429–1429. https://doi.org/10.1126/science.1108142

Sondergaard, M., Jensen, P.J. and Jeppesen, E. (2001) 'Retention and Internal Loading of Phosphorus in Shallow, Eutrophic Lakes', The Scientific World Journal, 1, pp. 427–442. https://doi.org/10.1100/tsw.2001.72

Souter, D., Planes, S., Wicquart, J., Logan, M., Obura, D. and Staub, F. (eds) (2021) Status of Coral Reefs of the World 2020. Global Coral Reef Monitoring Network (GCRMN) and International Coral Reef Initiative (ICRI). https://doi.org/10.59387/WOTJ9184 (Accessed: 19 October 2023)

SPA (2021) Amazon Assessment Report 2021. Science Panel for the Amazon. https://www.theamazonwewant.org/amazon-assessment-report-2021/ (Accessed: 13 October 2023)

Spake, R., Barajas-Barbosa, M.P., Blowes, S.A., Bowler, D.E., Callaghan, C.T., Garbowski, M., Jurburg, S.D., van Klink, R., Korell, L., Ladouceur, E., Rozzi, R., Viana, D.S., Xu, W.-B. and Chase, J.M. (2022) 'Detecting Thresholds of Ecological Change in the Anthropocene', Annual Review of Environment and Resources, 47(1), pp. 797–821. https://doi.org/10.1146/annurev-environ-112420-015910.

Spears, B.M., Futter, M.N., Jeppesen, E., Huser, B.J., Ives, S., Davidson, T.A., Adrian, R., Angeler, D.G., Burthe, S.J., Carvalho, L., Daunt, F., Gsell, A.S., Hessen, D.O., Janssen, A.B.G., Mackay, E.B., May, L., Moorhouse, H., Olsen, S., Søndergaard, M., Woods, H. and Thackeray, S.J. (2017) 'Ecological resilience in lakes and the conjunction fallacy', Nature Ecology & Evolution, 1(11), pp. 1616–1624. https://doi.org/10.1038/s41559-017-0333-1

Staal, A., Fetzer, I., Wang-Erlandsson, L., Bosmans, J.H.C., Dekker, S.C., van Nes, E.H., Rockström, J. and Tuinenburg, O.A. (2020) 'Hysteresis of tropical forests in the 21st century', Nature Communications, 11(1), p. 4978. https://doi.org/10.1038/s41467-020-18728-7

Staal, A., Tuinenburg, O.A., Bosmans, J.H.C., Holmgren, M., van Nes, E.H., Scheffer, M., Zemp, D.C. and Dekker, S.C. (2018) 'Forest-rainfall cascades buffer against drought across the Amazon', Nature Climate Change, 8(6), pp. 539–543. https://doi.org/10.1038/s41558-018-0177-y

Staver, A.C., Archibald, S. and Levin, S. (2011) 'Tree cover in sub-Saharan Africa: Rainfall and fire constrain forest and savanna as alternative stable states', Ecology, 92(5), pp. 1063–1072. https://doi.org/10.1890/10-1684.1

Staver, A.C., Archibald, S. and Levin, S.A. (2011) 'The Global Extent and Determinants of Savanna and Forest as Alternative Biome States', Science, 334(6053), pp. 230–232. https://doi.org/10.1126/science.1210465

Steinman, A.D. and Spears, B.M. (2020) Internal phosphorus loading in lakes: causes, case studies, and management. Plantation, Florida: J. Ross Publishing. https://nora.nerc.ac.uk/id/eprint/529457/ (Accessed: 19 October 2023)

Steinthorsdottir, M., Coxall, H.K., de Boer, A.M., Huber, M., Barbolini, N., Bradshaw, C.D., Burls, N.J., Feakins, S.J., Gasson, E., Henderiks, J., Holbourn, A.E., Kiel, S., Kohn, M.J., Knorr, G., Kürschner, W.M., Lear, C.H., Liebrand, D., Lunt, D.J., Mörs, T., Pearson, P.N., Pound, M.J., Stoll, H. and Strömberg, C. a. E. (2021) 'The Miocene: The Future of the Past', Paleoceanography and Paleoclimatology, 36(4), p. e2020PA004037. https://doi.org/10.1029/2020PA004037

Sternberg, L. (2001) 'Savanna–forest hysteresis in the tropics', Global Ecology and Biogeography, 10(4), pp. 369–378. https://doi.org/10.1046/j.1466-822X.2001.00243.x

Stevens, N., Bond, W., Feurdean, A. and Lehmann, C.E.R. (2022) 'Grassy Ecosystems in the Anthropocene', Annual Review of Environment and Resources, 47(1), pp. 261–289. https://doi.org/10.1146/annurev-environ-112420-015211

Stevens, N., Lehmann, C.E.R., Murphy, B.P. and Durigan, G. (2017) 'Savanna woody encroachment is widespread across three continents', Global Change Biology, 23(1), pp. 235–244. https://doi.org/10.1111/gcb.13409

Stevens-Rumann, C.S., Prichard, S.J., Whitman, E., Parisien, M.-A. and Meddens, A.J.H. (2022) 'Considering regeneration failure in the context of changing climate and disturbance regimes in western North America', Canadian Journal of Forest Research, 52(10), pp. 1281–1302. https://doi.org/10.1139/cjfr-2022-0054

Strack, A., Jonkers, L., C. Rillo, M., Hillebrand, H. and Kucera, M. (2022) 'Plankton response to global warming is characterized by non-uniform shifts in assemblage composition since the last ice age', Nature Ecology & Evolution, 6(12), pp. 1871–1880. https://doi.org/10.1038/s41559-022-01888-8

Strömberg, C.A.E. and Staver, A.C. (2022) 'The history and challenge of grassy biomes', Science, 377(6606), pp. 592–593. https://doi.org/10.1126/science.add1347

Strydom, T., Smit, I.P.J., Govender, N., Coetsee, C., Singh, J., Davies, A.B. and van Wilgen, B.W. (2023) 'High-intensity fires may have limited medium-term effectiveness for reversing woody plant encroachment in an African savanna', Journal of Applied Ecology, 60(4), pp. 661–672. https://doi.org/10.1111/1365-2664.14362

Sully, S., Burkepile, D.E., Donovan, M.K., Hodgson, G. and van Woesik, R. (2019) 'A global analysis of coral bleaching over the past two decades', Nature Communications, 10(1), p. 1264. https://doi.org/10.1038/s41467-019-09238-2

Sweet, W.V. and Park, J. (2014) 'From the extreme to the mean: Acceleration and tipping points of coastal inundation from sea level rise', Earth's Future, 2(12), pp. 579–600. https://doi.org/10.1002/2014EF000272

Tabares, X., Zimmermann, H., Dietze, E., Ratzmann, G., Belz, L., Vieth-Hillebrand, A., Dupont, L., Wilkes, H., Mapani, B. and Herzschuh,

U. (2020) 'Vegetation state changes in the course of shrub encroachment in an African savanna since about 1850 CE and their potential drivers', Ecology and Evolution, 10(2), pp. 962–979. https://doi.org/10.1002/ece3.5955

Taillie, P.J., Roman-Cuesta, R., Lagomasino, D., Cifuentes-Jara, M., Fatoyinbo, T., Ott, L.E. and Poulter, B. (2020) 'Widespread mangrove damage resulting from the 2017 Atlantic mega hurricane season', Environmental Research Letters, 15(6), p. 064010. https://doi.org/10.1088/1748-9326/ab82cf

Tátrai, I., Boros, G., György, Á.I., Mátyás, K., Korponai, J., Pomogyi, P., Havasi, M. and Kucserka, T. (2009) 'Abrupt shift from clear to turbid state in a shallow eutrophic, biomanipulated lake', Hydrobiologia, 620(1), pp. 149–161. https://doi.org/10.1007/s10750-008-9625-4

Tavares, J.V., Oliveira, R.S., Mencuccini, M., Signori-Müller, C., Pereira, L., Diniz, F.C., Gilpin, M., Marca Zevallos, M.J., Salas Yupayccana, C.A., Acosta, M., Pérez Mullisaca, F.M., Barros, F. de V., Bittencourt, P., Jancoski, H., Scalon, M.C., Marimon, B.S., Oliveras Menor, I., Marimon, B.H., Fancourt, M., Chambers-Ostler, A., Esquivel-Muelbert, A., Rowland, L., Meir, P., Lola da Costa, A.C., Nina, A., Sanchez, J.M.B., Tintaya, J.S., Chino, R.S.C., Baca, J., Fernandes, L., Cumapa, E.R.M., Santos, J.A.R., Teixeira, R., Tello, L., Ugarteche, M.T.M., Cuellar, G.A., Martinez, F., Araujo-Murakami, A., Almeida, E., da Cruz, W.J.A., del Aguila Pasquel, J., Aragão, L., Baker, T.R., de Camargo, P.B., Brienen, R., Castro, W., Ribeiro, S.C., Coelho de Souza, F., Cosio, E.G., Davila Cardozo, N., da Costa Silva, R., Disney, M., Espejo, J.S., Feldpausch, T.R., Ferreira, L., Giacomin, L., Higuchi, N., Hirota, M., Honorio, E., Huaraca Huasco, W., Lewis, S., Flores Llampazo, G., Malhi, Y., Monteagudo Mendoza, A., Morandi, P., Chama Moscoso, V., Muscarella, R., Penha, D., Rocha, M.C., Rodrigues, G., Ruschel, A.R., Salinas, N., Schlickmann, M., Silveira, M., Talbot, J., Vásquez, R., Vedovato, L., Vieira, S.A., Phillips, O.L., Gloor, E. and Galbraith, D.R. (2023) 'Basin-wide variation in tree hydraulic safety margins predicts the carbon balance of Amazon forests', Nature, 617(7959), pp. 111–117. https://doi.org/10.1038/s41586-023-05971-3

Te Wierik, S.A., Keune, J., Miralles, D.G., Gupta, J., Artzy-Randrup, Y.A., Gimeno, L., Nieto, R. and Cammeraat, L.H. (2022) 'The Contribution of Transpiration to Precipitation Over African Watersheds', Water Resources Research, 58(11), p. e2021WR031721. https://doi.org/10.1029/2021WR031721

Terhaar, J., Lauerwald, R., Regnier, P., Gruber, N. and Bopp, L. (2021) 'Around one third of current Arctic Ocean primary production sustained by rivers and coastal erosion', Nature Communications, 12(1), p. 169. https://doi.org/10.1038/s41467-020-20470-z

Terrer, C., Jackson, R.B., Prentice, I.C., Keenan, T.F., Kaiser, C., Vicca, S., Fisher, J.B., Reich, P.B., Stocker, B.D., Hungate, B.A., Peñuelas, J., McCallum, I., Soudzilovskaia, N.A., Cernusak, L.A., Talhelm, A.F., Van Sundert, K., Piao, S., Newton, P.C.D., Hovenden, M.J., Blumenthal, D.M., Liu, Y.Y., Müller, C., Winter, K., Field, C.B., Viechtbauer, W., Van Lissa, C.J., Hoosbeek, M.R., Watanabe, M., Koike, T., Leshyk, V.O., Polley, H.W. and Franklin, O. (2019) 'Nitrogen and phosphorus constrain the CO2 fertilization of global plant biomass', Nature Climate Change, 9(9), pp. 684–689. https://doi.org/10.1038/s41558-019-0545-2

Teufel, B. and Sushama, L. (2019) 'Abrupt changes across the Arctic permafrost region endanger northern development', Nature Climate Change, 9(11), pp. 858–862. https://doi.org/10.1038/s41558-019-0614-6

Teuling, A.J., Taylor, C.M., Meirink, J.F., Melsen, L.A., Miralles, D.G., van Heerwaarden, C.C., Vautard, R., Stegehuis, A.I., Nabuurs, G.-J. and de Arellano, J.V.-G. (2017) 'Observational evidence for cloud cover enhancement over western European forests', Nature Communications, 8(1), p. 14065. https://doi.org/10.1038/ncomms14065

Teutli Hernández, C., Herrera-Silveira, J.A., Cisneros-de la Cruz, D.J. and Roman-Cuesta, R.M. (2020) Mangrove ecological restoration guide: Lessons learned. Mainstreaming Wetlands into the Climate Agenda: A multilevel approach (SWAMP). CIFOR/CINVESTAV-IPN/UNAM-Sisal/PMC, p. 42. https://doi.org/10.17528/cifor/008170

Thom, D. (2023) 'Natural disturbances as drivers of tipping points in forest ecosystems under climate change – implications for adaptive management', Forestry: An International Journal of Forest Research, 96(3), pp. 305–315. https://doi.org/10.1093/forestry/cpad011

Thom, D., Taylor, A.R., Seidl, R., Thuiller, W., Wang, J., Robideau, M. and Keeton, W.S. (2021) 'Forest structure, not climate, is the primary driver of functional diversity in northeastern North America', Science of The Total Environment, 762, p. 143070. https://doi.org/10.1016/j.scitotenv.2020.143070

Thonicke, K., Billing, M., von Bloh, W., Sakschewski, B., Niinemets, Ü., Peñuelas, J., Cornelissen, J.H.C., Onoda, Y., van Bodegom, P., Schaepman, M.E., Schneider, F.D. and Walz, A. (2020) 'Simulating functional diversity of European natural forests along climatic gradients', Journal of Biogeography, 47(5), pp. 1069–1085. https://doi.org/10.1111/jbi.13809

Thrane, J.-E., Hessen, D.O. and Andersen, T. (2014) 'The Absorption of Light in Lakes: Negative Impact of Dissolved Organic Carbon on Primary Productivity', Ecosystems, 17(6), pp. 1040–1052. https://doi.org/10.1007/s10021-014-9776-2

Tranvik, L.J., Downing, J.A., Cotner, J.B., Loiselle, S.A., Striegl, R.G., Ballatore, T.J., Dillon, P., Finlay, K., Fortino, K., Knoll, L.B., Kortelainen, P.L., Kutser, T., Larsen, Soren., Laurion, I., Leech, D.M., McCallister, S.L., McKnight, D.M., Melack, J.M., Overholt, E., Porter, J.A., Prairie, Y., Renwick, W.H., Roland, F., Sherman, B.S., Schindler, D.W., Sobek, S., Tremblay, A., Vanni, M.J., Verschoor, A.M., von Wachenfeldt, E. and Weyhenmeyer, G.A. (2009) 'Lakes and reservoirs as regulators of carbon cycling and climate', Limnology and Oceanography, 54(6part2), pp. 2298–2314. https://doi.org/10.4319/lo.2009.54.6_part_2.2298

Tuinenburg, O.A., Theeuwen, J.J.E. and Staal, A. (2020) 'High-resolution global atmospheric moisture connections from evaporation to precipitation', Earth System Science Data, 12(4), pp. 3177–3188. https://doi.org/10.5194/essd-12-3177-2020

Turetsky, M.R., Abbott, B.W., Jones, M.C., Anthony, K.W., Olefeldt, D., Schuur, E.A.G., Grosse, G., Kuhry, P., Hugelius, G., Koven, C., Lawrence, D.M., Gibson, C., Sannel, A.B.K. and McGuire, A.D. (2020) 'Carbon release through abrupt permafrost thaw', Nature Geoscience, 13(2), pp. 138–143. https://doi.org/10.1038/s41561-019-0526-0

Turschwell, M.P., Connolly, R.M., Dunic, J.C., Sievers, M., Buelow, C.A., Pearson, R.M., Tulloch, V.J.D., Côté, I.M., Unsworth, R.K.F., Collier, C.J. and Brown, C.J. (2021) 'Anthropogenic pressures and life history predict trajectories of seagrass meadow extent at a global scale', Proceedings of the National Academy of Sciences, 118(45), p. e2110802118. https://doi.org/10.1073/pnas.2110802118.

United Nations Environment Programme (UNEP) (2020) Projections of Future Coral Bleaching Conditions using IPCC CMIP6 models: Climate Policy Implications, Management Applications, and Regional Seas Summaries. United Nations Environment Programme. http://www.unep.org/resources/report/projections-future-coral-bleaching-conditions-using-ipcc-cmip6-models-climate (Accessed: 19 October 2023)

Valiela, I., Bowen, J.L. and York, J.K. (2001) 'Mangrove Forests: One of the World's Threatened Major Tropical Environments', BioScience, 51(10), p. 807. https://doi.org/10.1641/0006-3568(2001)051[0807:MFOOTW]2.0.CO;2.

Van de Wouw, P., Echeverría, C., Rey-Benayas, J.M. and Holmgren, M. (2011) 'Persistent Acacia savannas replace Mediterranean sclerophyllous forests in South America', Forest Ecology and Management, 262(6), pp. 1100–1108. https://doi.org/10.1016/j.foreco.2011.06.009

Velasco Hererra, V.M., Soon, W., Pérez-Moreno, C., Velasco Herrera, G., Martell-Dubois, R., Rosique-de la Cruz, L., Fedorov, V.M., Cerdeira-Estrada, S., Bongelli, E. and Zúñiga, E. (2022) 'Past and future of wildfires in Northern Hemisphere's boreal forests', Forest Ecology and Management, 504, p. 119859. https://doi.org/10.1016/j.foreco.2021.119859

Veldman, J.W., Aleman, J.C., Alvarado, S.T., Anderson, T.M., Archibald, S., Bond, W.J., Boutton, T.W., Buchmann, N., Buisson, E., Canadell, J.G., Dechoum, M. de S., Diaz-Toribio, M.H., Durigan, G., Ewel, J.J., Fernandes, G.W., Fidelis, A., Fleischman, F., Good, S.P., Griffith, D.M., Hermann, J.-M., Hoffmann, W.A., Le Stradic, S., Lehmann, C.E.R., Mahy, G., Nerlekar, A.N., Nippert, J.B., Noss, R.F., Osborne, C.P., Overbeck, G.E., Parr, C.L., Pausas, J.G.,

Pennington, R.T., Perring, M.P., Putz, F.E., Ratnam, J., Sankaran, M., Schmidt, I.B., Schmitt, C.B., Silveira, F.A.O., Staver, A.C., Stevens, N., Still, C.J., Strömberg, C.A.E., Temperton, V.M., Varner, J.M. and Zaloumis, N.P. (2019) 'Comment on "The global tree restoration potential"', Science, 366(6463), p. eaay7976. https://doi.org/10.1126/science.aay7976.

Veldman, J.W., Buisson, E., Durigan, G., Fernandes, G.W., Le Stradic, S., Mahy, G., Negreiros, D., Overbeck, G.E., Veldman, R.G., Zaloumis, N.P., Putz, F.E. and Bond, W.J. (2015) 'Toward an old-growth concept for grasslands, savannas, and woodlands', Frontiers in Ecology and the Environment, 13(3), pp. 154–162. https://doi.org/10.1890/140270

Vercelloni, J., Caley, M.J. and Mengersen, K.L. (2020) 'Thresholds of Coral Cover That Support Coral Reef Biodiversity', in K.L. Mengersen, P. Pudlo, and C.P. Robert (eds) Case Studies in Applied Bayesian Data Science: CIRM Jean-Morlet Chair, Fall 2018. Cham: Springer International Publishing (Lecture Notes in Mathematics), pp. 385–398. https://doi.org/10.1007/978-3-030-42553-1_16

Veron, J.E.N., Hoegh-Guldberg, O., Lenton, T.M., Lough, J.M., Obura, D.O., Pearce-Kelly, P., Sheppard, C.R.C., Spalding, M., Stafford-Smith, M.G. and Rogers, A.D. (2009) 'The coral reef crisis: The critical importance of<350ppm CO2', Marine Pollution Bulletin, 58(10), pp. 1428–1436. https://doi.org/10.1016/j.marpolbul.2009.09.009

Vert-pre, K.A., Amoroso, R.O., Jensen, O.P. and Hilborn, R. (2013) 'Frequency and intensity of productivity regime shifts in marine fish stocks', Proceedings of the National Academy of Sciences, 110(5), pp. 1779–1784. https://doi.org/10.1073/pnas.1214879110

Vicente-Serrano, S.M., Zouber, A., Lasanta, T. and Pueyo, Y. (2012) 'Dryness is accelerating degradation of vulnerable shrublands in semiarid Mediterranean environments', Ecological Monographs, 82(4), pp. 407–428. https://doi.org/10.1890/11-2164.1

Vindstad, O.P.L., Jepsen, J.U., Ek, M., Pepi, A. and Ims, R.A. (2019) 'Can novel pest outbreaks drive ecosystem transitions in northern-boreal birch forest?', Journal of Ecology, 107(3), pp. 1141–1153. https://doi.org/10.1111/1365-2745.13093

Walker, B., Holling, C.S., Carpenter, S. and Kinzig, A. (2004) 'Resilience, Adaptability and Transformability in Social–ecological Systems', Ecology and Society, 9(2). https://doi.org/10.5751/ES-00650-090205

Walker, B. and Meyers, J. (2004) 'Thresholds in Ecological and Social–Ecological Systems: a Developing Database', Ecology and Society, 9(2). https://doi.org/10.5751/ES-00664-090203

Walker, B. and Salt, D. (2012) Resilience Practice: Building Capacity to Absorb Disturbance and Maintain Function. Washington, DC: Island Press/Center for Resource Economics. https://doi.org/10.5822/978-1-61091-231-0

Walters, C. and Kitchell, J.F. (2001) 'Cultivation/depensation effects on juvenile survival and recruitment: implications for the theory of fishing', Canadian Journal of Fisheries and Aquatic Sciences, 58(1), pp. 39–50. https://doi.org/10.1139/f00-160

Wang, R., Dearing, J.A. and Langdon, P.G. (2022) 'Critical Transitions in Lake Ecosystem State May Be Driven by Coupled Feedback Mechanisms: A Case Study from Lake Erhai, China', Water, 14(1), p. 85. https://doi.org/10.3390/w14010085

Wang, S., Foster, A., Lenz, E.A., Kessler, J.D., Stroeve, J.C., Anderson, L.O., Turetsky, M., Betts, R., Zou, S., Liu, W., Boos, W.R. and Hausfather, Z. (2023) 'Mechanisms and Impacts of Earth System Tipping Elements', Reviews of Geophysics, 61(1), p. e2021RG000757. https://doi.org/10.1029/2021RG000757

Wang, S., Zhang, Y., Ju, W., Chen, J.M., Ciais, P., Cescatti, A., Sardans, J., Janssens, I.A., Wu, M., Berry, J.A., Campbell, E., Fernández-Martínez, M., Alkama, R., Sitch, S., Friedlingstein, P., Smith, W.K., Yuan, W., He, W., Lombardozzi, D., Kautz, M., Zhu, D., Lienert, S., Kato, E., Poulter, B., Sanders, T.G.M., Krüger, I., Wang, R., Zeng, N., Tian, H., Vuichard, N., Jain, A.K., Wiltshire, A., Haverd, V., Goll, D.S. and Peñuelas, J. (2020) 'Recent global decline of CO2 fertilization effects on vegetation photosynthesis', Science, 370(6522), pp. 1295–1300. https://doi.org/10.1126/science.abb7772.

Wang, X., Edwards, R.L., Auler, A.S., Cheng, H., Kong, X., Wang, Y., Cruz, F.W., Dorale, J.A. and Chiang, H.-W. (2017) 'Hydroclimate changes across the Amazon lowlands over the past 45,000 years', Nature, 541(7636), pp. 204–207. https://doi.org/10.1038/nature20787

Ward, B.A. (2019) 'Mixotroph ecology: More than the sum of its parts', Proceedings of the National Academy of Sciences, 116(13), pp. 5846–5848. https://doi.org/10.1073/pnas.1902106116

Warren, R., Price, J., Graham, E., Forstenhaeusler, N. and VanDerWal, J. (2018) 'The projected effect on insects, vertebrates, and plants of limiting global warming to 1.5°C rather than 2°C', Science, 360(6390), pp. 791–795. https://doi.org/10.1126/science.aar3646

Watson, A.J., Lenton, T.M. and Mills, B.J.W. (2017) 'Ocean deoxygenation, the global phosphorus cycle and the possibility of human-caused large-scale ocean anoxia', Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences, 375(2102), p. 20160318. https://doi.org/10.1098/rsta.2016.0318

Waycott, M., Duarte, C.M., Carruthers, T.J.B., Orth, R.J., Dennison, W.C., Olyarnik, S., Calladine, A., Fourqurean, J.W., Heck, K.L., Hughes, A.R., Kendrick, G.A., Kenworthy, W.J., Short, F.T. and Williams, S.L. (2009) 'Accelerating loss of seagrasses across the globe threatens coastal ecosystems', Proceedings of the National Academy of Sciences, 106(30), pp. 12377–12381. https://doi.org/10.1073/pnas.0905620106

Westberry, T., Behrenfeld, M.J., Siegel, D.A. and Boss, E. (2008) 'Carbon-based primary productivity modeling with vertically resolved photoacclimation', Global Biogeochemical Cycles, 22(2). https://doi.org/10.1029/2007GB003078

Weyhenmeyer, G.A., Jeppesen, E., Adrian, R., Arvola, L., Blenckner, T., Jankowski, T., Jennings, E., Nõges, P., Nõges, T. and Straile, D. (2007) 'Nitrate-depleted conditions on the increase in shallow northern European lakes', Limnology and Oceanography, 52(4), pp. 1346–1353. https://doi.org/10.4319/lo.2007.52.4.1346

Whitman, E., Parisien, M.-A., Thompson, D.K. and Flannigan, M.D. (2019) 'Short-interval wildfire and drought overwhelm boreal forest resilience', Scientific Reports, 9(1), p. 18796. https://doi.org/10.1038/s41598-019-55036-7

Wieczorkowski, J.D. and Lehmann, C.E.R. (2022) 'Encroachment diminishes herbaceous plant diversity in grassy ecosystems worldwide', Global Change Biology, 28(18), pp. 5532–5546. https://doi.org/10.1111/gcb.16300

Wieczynski, D.J., Moeller, H.V. and Gibert, J.P. (2023) 'Mixotrophic microbes create carbon tipping points under warming', Functional Ecology, 37(7), pp. 1774–1786. https://doi.org/10.1111/1365-2435.14350.

Wilkinson, C.R. (1999) 'Global and local threats to coral reef functioning and existence: review and predictions', Marine and Freshwater Research, 50(8), pp. 867–878. https://doi.org/10.1071/mf99121

Wilkinson, C.R. (2004) Status of coral reefs of the world : 2004. Vol. 1. Australian Institute of Marine Science (AIMS), AU. https://portals.iucn.org/library/node/8583 (Accessed: 19 October 2023)

Willcock, S., Cooper, G.S., Addy, J. and Dearing, J.A. (2023) 'Earlier collapse of Anthropocene ecosystems driven by multiple faster and noisier drivers', Nature Sustainability, pp. 1–12. https://doi.org/10.1038/s41893-023-01157-x

Williams, W.D. (1999) 'Salinisation: A major threat to water resources in the arid and semi-arid regions of the world', Lakes & Reservoirs: Science, Policy and Management for Sustainable Use, 4(3–4), pp. 85–91. https://doi.org/10.1046/j.1440-1770.1999.00089.x

Wilson, S.S., Furman, B.T., Hall, M.O. and Fourqurean, J.W. (2020) 'Assessment of Hurricane Irma Impacts on South Florida Seagrass Communities Using Long-Term Monitoring Programs', Estuaries and Coasts, 43(5), pp. 1119–1132. https://doi.org/10.1007/s12237-019-00623-0

Winter, A.-M., Vasilyeva, N. and Vladimirov, A. (2023) 'Spawner weight and ocean temperature drive Allee effect dynamics in Atlantic cod, Gadus morhua: inherent and emergent density regulation', Biogeosciences, 20(17), pp. 3683–3716. https://doi.org/10.5194/bg-20-3683-2023

de Wit, H.A., Valinia, S., Weyhenmeyer, G.A., Futter, M.N., Kortelainen, P., Austnes, K., Hessen, D.O., Räike, A., Laudon, H. and Vuorenmaa, J. (2016) 'Current Browning of Surface Waters Will Be Further Promoted by Wetter Climate', Environmental Science & Technology Letters, 3(12), pp. 430–435. https://doi.org/10.1021/acs.

estlett.6b00396
Woolway, R.I., Kraemer, B.M., Lenters, J.D., Merchant, C.J., O'Reilly, C.M. and Sharma, S. (2020) 'Global lake responses to climate change', Nature Reviews Earth & Environment, 1(8), pp. 388–403. https://doi.org/10.1038/s43017-020-0067-5.
Woolway, R.I., Sharma, S. and Smol, J.P. (2022) 'Lakes in Hot Water: The Impacts of a Changing Climate on Aquatic Ecosystems', BioScience, 72(11), pp. 1050–1061. https://doi.org/10.1093/biosci/biac052
WWF (2022) Living Planet Report 2022 – Building a nature-positive society. WWF, Zoological Society of London. https://livingplanet.panda.org/en-GB/ (Accessed: 13 October 2023)
Xu, Z., Mason, J.A., Xu, C., Yi, S., Bathiany, S., Yizhaq, H., Zhou, Y., Cheng, J., Holmgren, M. and Lu, H. (2020) 'Critical transitions in Chinese dunes during the past 12,000 years', Science Advances, 6(9), p. eaay8020. https://doi.org/10.1126/sciadv.aay8020
Yao, F., Livneh, B., Rajagopalan, B., Wang, J., Crétaux, J.-F., Wada, Y. and Berge-Nguyen, M. (2023) 'Satellites reveal widespread decline in global lake water storage', Science, 380(6646), pp. 743–749. https://doi.org/10.1126/science.abo2812
Ye, J.-S., Delgado-Baquerizo, M., Soliveres, S. and Maestre, F.T. (2019) 'Multifunctionality debt in global drylands linked to past biome and climate', Global Change Biology, 25(6), pp. 2152–2161. https://doi.org/10.1111/gcb.14631
Yool, A., Popova, E.E. and Coward, A.C. (2015) 'Future change in ocean productivity: Is the Arctic the new Atlantic?', Journal of Geophysical Research: Oceans, 120(12), pp. 7771–7790. https://doi.org/10.1002/2015JC011167
Zeebe, R.E., Ridgwell, A. and Zachos, J.C. (2016) 'Anthropogenic carbon release rate unprecedented during the past 66 million years', Nature Geoscience, 9(4), pp. 325–329. https://doi.org/10.1038/ngeo2681
Zeeman, B.J., Lunt, I.D. and Morgan, J.W. (2014) 'Can severe drought reverse woody plant encroachment in a temperate Australian woodland?', Journal of Vegetation Science, 25(4), pp. 928–936. https://doi.org/10.1111/jvs.12153
Zemp, D.C., Schleussner, C.-F., Barbosa, H.M.J., van der Ent, R.J., Donges, J.F., Heinke, J., Sampaio, G. and Rammig, A. (2014) 'On the importance of cascading moisture recycling in South America', Atmospheric Chemistry and Physics, 14(23), pp. 13337–13359. https://doi.org/10.5194/acp-14-13337-2014
Zemp, D.C., Schleussner, C.-F., Barbosa, H.M.J., Hirota, M., Montade, V., Sampaio, G., Staal, A., Wang-Erlandsson, L. and Rammig, A. (2017) 'Self-amplified Amazon forest loss due to vegetation-atmosphere feedbacks', Nature Communications, 8(1), p. 14681. https://doi.org/10.1038/ncomms14681
Zhang, J., Feng, Y., Maestre, F.T., Berdugo, M., Wang, J., Coleine, C., Sáez-Sandino, T., García-Velázquez, L., Singh, B.K. and Delgado-Baquerizo, M. (2023) 'Water availability creates global thresholds in multidimensional soil biodiversity and functions', Nature Ecology & Evolution, 7(7), pp. 1002–1011. https://doi.org/10.1038/s41559-023-02071-3
Zhang, Q., Barnes, M., Benson, M., Burakowski, E., Oishi, A.C., Ouimette, A., Sanders-DeMott, R., Stoy, P.C., Wenzel, M., Xiong, L., Yi, K. and Novick, K.A. (2020) 'Reforestation and surface cooling in temperate zones: Mechanisms and implications', Global Change Biology, 26(6), pp. 3384–3401. https://doi.org/10.1111/gcb.15069
Zhang, Y., Gentine, P., Luo, X., Lian, X., Liu, Y., Zhou, S., Michalak, A.M., Sun, W., Fisher, J.B., Piao, S. and Keenan, T.F. (2022) 'Increasing sensitivity of dryland vegetation greenness to precipitation due to rising atmospheric CO2', Nature Communications, 13(1), p. 4875. https://doi.org/10.1038/s41467-022-32631-3
Zhang, Y., Keenan, T.F. and Zhou, S. (2021) 'Exacerbated drought impacts on global ecosystems due to structural overshoot', Nature Ecology & Evolution, 5(11), pp. 1490–1498. https://doi.org/10.1038/s41559-021-01551-8
Zhou, Y., Bomfim, B., Bond, W.J., Boutton, T.W., Case, M.F., Coetsee, C., Davies, A.B., February, E.C., Gray, E.F., Silva, L.C.R., Wright, J.L. and Staver, A.C. (2023) 'Soil carbon in tropical savannas mostly derived from grasses', Nature Geoscience, 16(8), pp. 710–716. https://doi.org/10.1038/s41561-023-01232-0
Zhou, Y., Singh, J., Butnor, J.R., Coetsee, C., Boucher, P.B., Case, M.F., Hockridge, E.G., Davies, A.B. and Staver, A.C. (2022) 'Limited increases in savanna carbon stocks over decades of fire suppression', Nature, 603(7901), pp. 445–449. https://doi.org/10.1038/s41586-022-04438-1
Zhu, Z., Piao, S., Myneni, R.B., Huang, M., Zeng, Z., Canadell, J.G., Ciais, P., Sitch, S., Friedlingstein, P., Arneth, A., Cao, C., Cheng, L., Kato, E., Koven, C., Li, Y., Lian, X., Liu, Y., Liu, R., Mao, J., Pan, Y., Peng, S., Peñuelas, J., Poulter, B., Pugh, T.A.M., Stocker, B.D., Viovy, N., Wang, X., Wang, Y., Xiao, Z., Yang, H., Zaehle, S. and Zeng, N. (2016) 'Greening of the Earth and its drivers', Nature Climate Change, 6(8), pp. 791–795. https://doi.org/10.1038/nclimate3004

Chapter 1.4. References

Ali, H., Modi, P., & Mishra, V. (2019). Increased flood risk in Indian sub-continent under the warming climate. Weather and Climate Extremes, 25, 100212. https://doi.org/10.1016/j.wace.2019.100212
Armstrong McKay, D. I., Staal, A., Abrams, J. F., Winkelmann, R., Sakschewski, B., Loriani, S., Fetzer, I., Cornell, S. E., Rockström, J., & Lenton, T. M. (2022). Exceeding 1.5°C global warming could trigger multiple climate tipping points. Science, 377(6611), eabn7950. https://doi.org/10.1126/science.abn7950
Arnold, N. P., & Randall, D. A. (2015). Global-scale convective aggregation: Implications for the Madden-Julian Oscillation. Journal of Advances in Modeling Earth Systems, 7(4), 1499–1518. https://doi.org/10.1002/2015MS000498
Bacon, S., Gould, W. J., & Jia, Y. (2003). Open-ocean convection in the Irminger Sea. Geophysical Research Letters, 30(5). https://doi.org/10.1029/2002GL016271
Bartusek, S., Kornhuber, K., & Ting, M. (2022). 2021 North American heatwave amplified by climate change-driven nonlinear interactions. Nature Climate Change, 12(12), Article 12. https://doi.org/10.1038/s41558-022-01520-4
Bellomo, K., Clement, A., Mauritsen, T., Rädel, G., & Stevens, B. (2014). Simulating the Role of Subtropical Stratocumulus Clouds in Driving Pacific Climate Variability. Journal of Climate, 27(13), 5119–5131. https://doi.org/10.1175/JCLI-D-13-00548.1
Bellomo, K., Meccia, V. L., D'Agostino, R., Fabiano, F., Larson, S. M., von Hardenberg, J., & Corti, S. (2023). Impacts of a weakened AMOC on precipitation over the Euro-Atlantic region in the EC-Earth3 climate model. Climate Dynamics, 61(7), 3397–3416. https://doi.org/10.1007/s00382-023-06754-2
Berkelhammer, M., Sinha, A., Stott, L., Cheng, H., Pausata, F. s. r., & Yoshimura, K. (2012). An Abrupt Shift in the Indian Monsoon 4000 Years Ago. In Climates, Landscapes, and Civilizations (pp. 75–88). American Geophysical Union (AGU). https://doi.org/10.1029/2012GM001207
Blackport, R., & Screen, J. A. (2020). Insignificant effect of Arctic amplification on the amplitude of midlatitude atmospheric waves. Science Advances, 6(8), eaay2880. https://doi.org/10.1126/sciadv.aay2880
Bloch-Johnson, J., Pierrehumbert, R. T., & Abbot, D. S. (2015). Feedback temperature dependence determines the risk of high warming. Geophysical Research Letters, 42(12), 4973–4980. https://doi.org/10.1002/2015GL064240
Boer, G. J. (2000). A study of atmosphere-ocean predictability on long time scales. Climate Dynamics, 16(6), 469–477. https://doi.org/10.1007/s003820050340
Boers, N. (2021). Observation-based early-warning signals for a collapse of the Atlantic Meridional Overturning Circulation. Nature Climate Change, 11(8), Article 8. https://doi.org/10.1038/s41558-021-01097-4
Boers, N., Marwan, N., Barbosa, H. M. J., & Kurths, J. (2017). A deforestation-induced tipping point for the South American monsoon system. Scientific Reports, 7(1), Article 1. https://doi.org/10.1038/srep41489
Böhm, E., Lippold, J., Gutjahr, M., Frank, M., Blaser, P., Antz, B., Fohlmeister, J., Frank, N., Andersen, M. B., & Deininger, M. (2015). Strong and deep Atlantic meridional overturning circulation during the last glacial cycle. Nature, 517(7532), Article 7532. https://doi.org/10.1038/nature14059
Bollasina, M. A., Ming, Y., & Ramaswamy, V. (2011). Anthropogenic

Aerosols and the Weakening of the South Asian Summer Monsoon. Science, 334(6055), 502–505. https://doi.org/10.1126/science.1204994

Bonnet, R., Boucher, O., Deshayes, J., Gastineau, G., Hourdin, F., Mignot, J., Servonnat, J., & Swingedouw, D. (2021). Presentation and Evaluation of the IPSL-CM6A-LR Ensemble of Extended Historical Simulations. Journal of Advances in Modeling Earth Systems, 13(9), e2021MS002565. https://doi.org/10.1029/2021MS002565

Boos, W. R., & Storelvmo, T. (2016). Near-linear response of mean monsoon strength to a broad range of radiative forcings. Proceedings of the National Academy of Sciences, 113(6), 1510–1515. https://doi.org/10.1073/pnas.1517143113

Borah, P. J., Venugopal, V., Sukhatme, J., Muddebihal, P., & Goswami, B. N. (2020). Indian monsoon derailed by a North Atlantic wavetrain. Science, 370(6522), 1335–1338. https://doi.org/10.1126/science.aay6043

Born, A., & Stocker, T. F. (2014). Two Stable Equilibria of the Atlantic Subpolar Gyre. Journal of Physical Oceanography, 44(1), 246–264. https://doi.org/10.1175/JPO-D-13-073.1

Born, A., Stocker, T. F., & Sandø, A. B. (2016). Transport of salt and freshwater in the Atlantic Subpolar Gyre. Ocean Dynamics, 66(9), 1051–1064. https://doi.org/10.1007/s10236-016-0970-y

Boucher, O., Halloran, P. R., Burke, E. J., Doutriaux-Boucher, M., Jones, C. D., Lowe, J., Ringer, M. A., Robertson, E., & Wu, P. (2012). Reversibility in an Earth System model in response to CO2 concentration changes. Environmental Research Letters, 7(2), 024013. https://doi.org/10.1088/1748-9326/7/2/024013

Bower, A., Lozier, S., Biastoch, A., Drouin, K., Foukal, N., Furey, H., Lankhorst, M., Rühs, S., & Zou, S. (2019). Lagrangian Views of the Pathways of the Atlantic Meridional Overturning Circulation. Journal of Geophysical Research: Oceans, 124(8), 5313–5335. https://doi.org/10.1029/2019JC015014

Broecker, W. S., Denton, G. H., Edwards, R. L., Cheng, H., Alley, R. B., & Putnam, A. E. (2010). Putting the Younger Dryas cold event into context. Quaternary Science Reviews, 29(9), 1078–1081. https://doi.org/10.1016/j.quascirev.2010.02.019

Brovkin, V., Brook, E., Williams, J. W., Bathiany, S., Lenton, T. M., Barton, M., DeConto, R. M., Donges, J. F., Ganopolski, A., McManus, J., Praetorius, S., de Vernal, A., Abe-Ouchi, A., Cheng, H., Claussen, M., Crucifix, M., Gallopín, G., Iglesias, V., Kaufman, D. S., … Yu, Z. (2021). Past abrupt changes, tipping points and cascading impacts in the Earth system. Nature Geoscience, 14(8), Article 8. https://doi.org/10.1038/s41561-021-00790-5

Buckley, M. W., & Marshall, J. (2016). Observations, inferences, and mechanisms of the Atlantic Meridional Overturning Circulation: A review. Reviews of Geophysics, 54(1), 5–63. https://doi.org/10.1002/2015RG000493

Bulgin, C. E., Mecking, J. V., Harvey, B. J., Jevrejeva, S., McCarroll, N. F., Merchant, C. J., & Sinha, B. (2023). Dynamic sea-level changes and potential implications for storm surges in the UK: A storylines perspective. Environmental Research Letters, 18(4), 044033. https://doi.org/10.1088/1748-9326/acc6df

Caballero, R., & Carlson, H. (2018). Surface Superrotation. Journal of the Atmospheric Sciences, 75(10), 3671–3689. https://doi.org/10.1175/JAS-D-18-0076.1

Caballero, R., & Huber, M. (2010). Spontaneous transition to superrotation in warm climates simulated by CAM3. Geophysical Research Letters, 37(11). https://doi.org/10.1029/2010GL043468

Caballero, R., & Huber, M. (2013). State-dependent climate sensitivity in past warm climates and its implications for future climate projections. Proceedings of the National Academy of Sciences, 110(35), 14162–14167. https://doi.org/10.1073/pnas.1303365110

Caesar, L., McCarthy, G. D., Thornalley, D. J. R., Cahill, N., & Rahmstorf, S. (2021). Current Atlantic Meridional Overturning Circulation weakest in last millennium. Nature Geoscience, 14(3), Article 3. https://doi.org/10.1038/s41561-021-00699-z

Caesar, L., Rahmstorf, S., Robinson, A., Feulner, G., & Saba, V. (2018). Observed fingerprint of a weakening Atlantic Ocean overturning circulation. Nature, 556(7700), Article 7700. https://doi.org/10.1038/s41586-018-0006-5

Cai, B., Edwards, R. L., Cheng, H., Tan, M., Wang, X., & Liu, T. (2008). A dry episode during the Younger Dryas and centennial-scale weak monsoon events during the early Holocene: A high-resolution stalagmite record from southeast of the Loess Plateau, China. Geophysical Research Letters, 35(2). https://doi.org/10.1029/2007GL030986

Cai, W., Wang, G., Dewitte, B., Wu, L., Santoso, A., Takahashi, K., Yang, Y., Carréric, A., & McPhaden, M. J. (2018). Increased variability of eastern Pacific El Niño under greenhouse warming. Nature, 564(7735), Article 7735. https://doi.org/10.1038/s41586-018-0776-9

Callahan, C. W., & Mankin, J. S. (2023). Persistent effect of El Niño on global economic growth. Science, 380(6649), 1064–1069. https://doi.org/10.1126/science.adf2983

Campos, M. C., Chiessi, C. M., Prange, M., Mulitza, S., Kuhnert, H., Paul, A., Venancio, I. M., Albuquerque, A. L. S., Cruz, F. W., & Bahr, A. (2019). A new mechanism for millennial scale positive precipitation anomalies over tropical South America. Quaternary Science Reviews, 225, 105990. https://doi.org/10.1016/j.quascirev.2019.105990

Cao, J., Wang, H., Wang, B., Zhao, H., Wang, C., & Zhu, X. (2022). Higher Sensitivity of Northern Hemisphere Monsoon to Anthropogenic Aerosol Than Greenhouse Gases. Geophysical Research Letters, 49(20), e2022GL100270. https://doi.org/10.1029/2022GL100270

Capotondi, A., Wittenberg, A. T., Newman, M., Lorenzo, E. D., Yu, J.-Y., Braconnot, P., Cole, J., Dewitte, B., Giese, B., Guilyardi, E., Jin, F.-F., Karnauskas, K., Kirtman, B., Lee, T., Schneider, N., Xue, Y., & Yeh, S.-W. (2015). Understanding ENSO Diversity. Bulletin of the American Meteorological Society, 96(6), 921–938. https://doi.org/10.1175/BAMS-D-13-00117.1

Carlson, A. E. (2013a). PALEOCLIMATE | The Younger Dryas Climate Event. In S. A. Elias & C. J. Mock (Eds.), Encyclopedia of Quaternary Science (Second Edition) (pp. 126–134). Elsevier. https://doi.org/10.1016/B978-0-444-53643-3.00029-7

Carlson, A. E. (2013b). PALEOCLIMATE | The Younger Dryas Climate Event. In S. A. Elias & C. J. Mock (Eds.), Encyclopedia of Quaternary Science (Second Edition) (pp. 126–134). Elsevier. https://doi.org/10.1016/B978-0-444-53643-3.00029-7

Carvalho, L. M. V., Jones, C., Posadas, A. N. D., Quiroz, R., Bookhagen, B., & Liebmann, B. (2012). Precipitation Characteristics of the South American Monsoon System Derived from Multiple Datasets. Journal of Climate, 25(13), 4600–4620. https://doi.org/10.1175/JCLI-D-11-00335.1

Chang, P., Zhang, S., Danabasoglu, G., Yeager, S. G., Fu, H., Wang, H., Castruccio, F. S., Chen, Y., Edwards, J., Fu, D., Jia, Y., Laurindo, L. C., Liu, X., Rosenbloom, N., Small, R. J., Xu, G., Zeng, Y., Zhang, Q., Bacmeister, J., … Wu, L. (2020). An Unprecedented Set of High-Resolution Earth System Simulations for Understanding Multiscale Interactions in Climate Variability and Change. Journal of Advances in Modeling Earth Systems, 12(12), e2020MS002298. https://doi.org/10.1029/2020MS002298

Charney, J. G. (1975). Dynamics of deserts and drought in the Sahel. Quarterly Journal of the Royal Meteorological Society, 101(428), 193–202. https://doi.org/10.1002/qj.49710142802

Charney, J., Stone, P. H., & Quirk, W. J. (1975). Drought in the Sahara: A Biogeophysical Feedback Mechanism. Science, 187(4175), 434–435. https://doi.org/10.1126/science.187.4175.434

Chaudhary, C., Richardson, A. J., Schoeman, D. S., & Costello, M. J. (2021). Global warming is causing a more pronounced dip in marine species richness around the equator. Proceedings of the National Academy of Sciences, 118(15), e2015094118. https://doi.org/10.1073/pnas.2015094118

Chen, Z., Zhou, T., Zhang, L., Chen, X., Zhang, W., & Jiang, J. (2020). Global Land Monsoon Precipitation Changes in CMIP6 Projections. Geophysical Research Letters, 47(14), e2019GL086902. https://doi.org/10.1029/2019GL086902

Cherchi, A., Terray, P., Ratna, S. B., Sankar, S., Sooraj, K. P., & Behera, S. (2021). Chapter 8 - Indian Ocean Dipole influence on Indian summer monsoon and ENSO: A review. In J. Chowdary, A. Parekh, & C. Gnanaseelan (Eds.), Indian Summer Monsoon Variability (pp. 157–182). Elsevier. https://doi.org/10.1016/B978-0-12-822402-1.00011-9

Chevuturi, A., Klingaman, N. P., Turner, A. G., & Hannah, S. (2018). Projected Changes in the Asian-Australian Monsoon Region in 1.5°C and 2.0°C Global-Warming Scenarios. Earth's Future, 6(3), 339–358.

https://doi.org/10.1002/2017EF000734
Chiessi, C. M., Mulitza, S., Pätzold, J., Wefer, G., & Marengo, J. A. (2009). Possible impact of the Atlantic Multidecadal Oscillation on the South American summer monsoon. Geophysical Research Letters, 36(21). https://doi.org/10.1029/2009GL039914
Claret, M., Galbraith, E. D., Palter, J. B., Bianchi, D., Fennel, K., Gilbert, D., & Dunne, J. P. (2018). Rapid coastal deoxygenation due to ocean circulation shift in the northwest Atlantic. Nature Climate Change, 8(10), Article 10. https://doi.org/10.1038/s41558-018-0263-1
Climate Prediction Center: ENSO Diagnostic Discussion. (n.d.). Retrieved October 26, 2023, from https://www.cpc.ncep.noaa.gov/products/analysis_monitoring/enso_advisory/ensodisc.html
Climate-Driven Ecosystem Succession in the Sahara: The Past 6000 Years | Science. (n.d.). Retrieved October 26, 2023, from https://www.science.org/doi/abs/10.1126/science.1154913
Collins, J. A., Prange, M., Caley, T., Gimeno, L., Beckmann, B., Mulitza, S., Skonieczny, C., Roche, D., & Schefuß, E. (2017). Rapid termination of the African Humid Period triggered by northern high-latitude cooling. Nature Communications, 8(1), Article 1. https://doi.org/10.1038/s41467-017-01454-y
Copernicus Climate Change Service. (2019). ERA5 monthly averaged data on single levels from 1979 to present [dataset]. ECMWF. https://doi.org/10.24381/CDS.F17050D7
Coumou, D., Di Capua, G., Vavrus, S., Wang, L., & Wang, S. (2018). The influence of Arctic amplification on mid-latitude summer circulation. Nature Communications, 9(1), Article 1. https://doi.org/10.1038/s41467-018-05256-8
Cruz, F. W., Burns, S. J., Karmann, I., Sharp, W. D., Vuille, M., Cardoso, A. O., Ferrari, J. A., Silva Dias, P. L., & Viana, O. (2005). Insolation-driven changes in atmospheric circulation over the past 116,000 years in subtropical Brazil. Nature, 434(7029), Article 7029. https://doi.org/10.1038/nature03365
Curtis, P. E., Ceppi, P., & Zappa, G. (2020). Role of the mean state for the Southern Hemispheric jet stream response to CO2 forcing in CMIP6 models. Environmental Research Letters, 15(6), 064011. https://doi.org/10.1088/1748-9326/ab8331
Dai, A., Luo, D., Song, M., & Liu, J. (2019). Arctic amplification is caused by sea-ice loss under increasing CO2. Nature Communications, 10(1), Article 1. https://doi.org/10.1038/s41467-018-07954-9
Dallmeyer, A., Claussen, M., Lorenz, S. J., Sigl, M., Toohey, M., & Herzschuh, U. (2021). Holocene vegetation transitions and their climatic drivers in MPI-ESM1.2. Climate of the Past, 17(6), 2481–2513. https://doi.org/10.5194/cp-17-2481-2021
de Carvalho, L. M. V., & Cavalcanti, I. F. A. (2016). The South American Monsoon System (SAMS). In L. M. V. de Carvalho & C. Jones (Eds.), The Monsoons and Climate Change: Observations and Modeling (pp. 121–148). Springer International Publishing. https://doi.org/10.1007/978-3-319-21650-8_6
Deep learning reconstruction of Atlantic Meridional Overturning Circulation strength validates ongoig twenty-first century decline. (2023a, October 2). https://doi.org/10.21203/rs.3.rs-3377545/v1
Deep learning reconstruction of Atlantic Meridional Overturning Circulation strength validates ongoig twenty-first century decline. (2023b, October 2). https://doi.org/10.21203/rs.3.rs-3377545/v1
Deep learning reconstruction of Atlantic Meridional Overturning Circulation strength validates ongoig twenty-first century decline. (2023c, October 2). https://doi.org/10.21203/rs.3.rs-3377545/v1
deMenocal, P., Ortiz, J., Guilderson, T., Adkins, J., Sarnthein, M., Baker, L., & Yarusinsky, M. (2000). Abrupt onset and termination of the African Humid Period: Rapid climate responses to gradual insolation forcing. Quaternary Science Reviews, 19(1), 347–361. https://doi.org/10.1016/S0277-3791(99)00081-5
Dima, M., & Lohmann, G. (2010). Evidence for Two Distinct Modes of Large-Scale Ocean Circulation Changes over the Last Century. Journal of Climate, 23(1), 5–16. https://doi.org/10.1175/2009JCLI2867.1
DiNezio, P. N., Clement, A. C., Vecchi, G. A., Soden, B. J., Kirtman, B. P., & Lee, S.-K. (2009). Climate Response of the Equatorial Pacific to Global Warming. Journal of Climate, 22(18), 4873–4892. https://doi.org/10.1175/2009JCLI2982.1
Ditlevsen, P., & Ditlevsen, S. (2023). Warning of a forthcoming collapse of the Atlantic meridional overturning circulation. Nature Communications, 14(1), Article 1. https://doi.org/10.1038/s41467-023-39810-w
Douville, H., Raghavan, K., Renwick, J., Allan, R. P., Arias, P. A., Barlow, M., Cerezo-Mota, R., Cherchi, A., Gan, T. Y., Gergis, J., Jiang, D., Khan, A., Pokam Mba, W., Rosenfeld, D., Tierney, J., & Zolina, O. (2021). Chapter 6: Water Cycle Changes. In Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press.
Dpblas-Reyes, F., Sörensson, A. A., Almazroui, M., Dosio, A., Gutowski, W. J., Haarsma, R., Hamdi, R., Hewitson, B., Kwon, W.-T., Lamptey, B. L., Maraun, D., Stephenson, T. S., Takayabu, I., Terray, L., Turner, A., & Zuo, Z. (2021). Chapter 10: Linking Global to Regional Climate Change. In V. Masson-Delmotte, P. Zhai, A. Pirani, S. L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M. I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J. B. R. Matthews, T. K. Maycock, T. Waterfield, O. Yelekçi, R. Yu, & B. Zhou (Eds.), Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Repor. Cambridge University Press.
Drijfhout, S., Bathiany, S., Beaulieu, C., Brovkin, V., Claussen, M., Huntingford, C., Scheffer, M., Sgubin, G., & Swingedouw, D. (2015). Catalogue of abrupt shifts in Intergovernmental Panel on Climate Change climate models. Proceedings of the National Academy of Sciences, 112(43), E5777–E5786. https://doi.org/10.1073/pnas.1511451112
Drijfhout, S., Gleeson, E., Dijkstra, H. A., & Livina, V. (2013). Spontaneous abrupt climate change due to an atmospheric blocking–sea-ice–ocean feedback in an unforced climate model simulation. Proceedings of the National Academy of Sciences, 110(49), 19713–19718. https://doi.org/10.1073/pnas.1304912110
Drijfhout, S., Oldenborgh, G. J. van, & Cimatoribus, A. (2012). Is a Decline of AMOC Causing the Warming Hole above the North Atlantic in Observed and Modeled Warming Patterns? Journal of Climate, 25(24), 8373–8379. https://doi.org/10.1175/JCLI-D-12-00490.1
Druckenmiller, M. L., Moon, T. A., Thoman, R. L., Ballinger, T. J., Berner, L. T., Bernhard, G. H., Bhatt, U. S., Bjerke, J. W., Box, J. E., Brown, R., Cappelen, J., Christiansen, H. H., Decharme, B., Derksen, C., Divine, D., Drozdov, D. S., Chereque, A. E., Epstein, H. E., Farquharson, L. M., … Ziel, R. (2021). The Arctic. Bulletin of the American Meteorological Society, 102(8), S263–S316. https://doi.org/10.1175/BAMS-D-21-0086.1
Dukhovskoy, D. S., Yashayaev, I., Chassignet, E. P., Myers, P. G., Platov, G., & Proshutinsky, A. (2021). Time Scales of the Greenland Freshwater Anomaly in the Subpolar North Atlantic. Journal of Climate, 34(22), 8971–8987. https://doi.org/10.1175/JCLI-D-20-0610.1
Fedorov, A. V., Brierley, C. M., Lawrence, K. T., Liu, Z., Dekens, P. S., & Ravelo, A. C. (2013). Patterns and mechanisms of early Pliocene warmth. Nature, 496(7443), 43–49. https://doi.org/10.1038/nature12003
Fedorov, A. V., Burls, N. J., Lawrence, K. T., & Peterson, L. C. (2015). Tightly linked zonal and meridional sea surface temperature gradients over the past five million years. Nature Geoscience, 8(12), Article 12. https://doi.org/10.1038/ngeo2577
Fedorov, A. V., Dekens, P. S., McCarthy, M., Ravelo, A. C., deMenocal, P. B., Barreiro, M., Pacanowski, R. C., & Philander, S. G. (2006). The Pliocene Paradox (Mechanisms for a Permanent El Niño). Science, 312(5779), 1485–1489. https://doi.org/10.1126/science.1122666
Fedorov, A. V., Hu, S., Wittenberg, A. T., Levine, A. F. Z., & Deser, C. (2020). ENSO Low-Frequency Modulation and Mean State Interactions. In El Niño Southern Oscillation in a Changing Climate (pp. 173–198). American Geophysical Union (AGU). https://doi.org/10.1002/9781119548164.ch8
Feingold, G., Koren, I., Yamaguchi, T., & Kazil, J. (2015). On the reversibility of transitions between closed and open cellular convection. Atmospheric Chemistry and Physics, 15(13), 7351–7367. https://doi.org/10.5194/acp-15-7351-2015
Feulner, G., Rahmstorf, S., Levermann, A., & Volkwardt, S. (2013). On the Origin of the Surface Air Temperature Difference between the

Hemispheres in Earth's Present-Day Climate. Journal of Climate, 26(18), 7136–7150. https://doi.org/10.1175/JCLI-D-12-00636.1
Florindo-López, C., Bacon, S., Aksenov, Y., Chafik, L., Colbourne, E., & Holliday, N. P. (2020). Arctic Ocean and Hudson Bay Freshwater Exports: New Estimates from Seven Decades of Hydrographic Surveys on the Labrador Shelf. Journal of Climate, 33(20), 8849–8868. https://doi.org/10.1175/JCLI-D-19-0083.1
Fontela, M., Pérez, F. F., Mercier, H., & Lherminier, P. (2020). North Atlantic Western Boundary Currents Are Intense Dissolved Organic Carbon Streams. Frontiers in Marine Science, 7. https://www.frontiersin.org/articles/10.3389/fmars.2020.593757
Fox-Kemper, B., Hewitt, H. T., Xiao, C., Aðalgeirsdóttir, G., Drijfhout, S. S., Edwards, T. L., Golledge, N. R., Hemer, M., Kopp, R. E., Krinner, G., Mix, A., Notz, D., Nowicki, S., Nurhati, I. S., Ruiz, L., Sallée, J.-B., Slangen, A. B. A., & Yu, Y. (2021). Chapter 9: Ocean, Cryosphere and Sea Level Change. In V. Masson-Delmotte, P. Zhai, A. Pirani, S. L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M. I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J. B. R. Matthews, T. K. Maycock, T. Waterfield, O. Yelekçi, R. Yu, & B. Zhou (Eds.), Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press.
Frajka-Williams, E., Ansorge, I. J., Baehr, J., Bryden, H. L., Chidichimo, M. P., Cunningham, S. A., Danabasoglu, G., Dong, S., Donohue, K. A., Elipot, S., Heimbach, P., Holliday, N. P., Hummels, R., Jackson, L. C., Karstensen, J., Lankhorst, M., Le Bras, I. A., Lozier, M. S., McDonagh, E. L., … Wilson, C. (2019). Atlantic Meridional Overturning Circulation: Observed Transport and Variability. Frontiers in Marine Science, 6. https://www.frontiersin.org/articles/10.3389/fmars.2019.00260
Francis, J. A., & Vavrus, S. J. (2015). Evidence for a wavier jet stream in response to rapid Arctic warming. Environmental Research Letters, 10(1), 014005. https://doi.org/10.1088/1748-9326/10/1/014005
Fröb, F., Olsen, A., Becker, M., Chafik, L., Johannessen, T., Reverdin, G., & Omar, A. (2019). Wintertime fCO2 Variability in the Subpolar North Atlantic Since 2004. Geophysical Research Letters, 46(3), 1580–1590. https://doi.org/10.1029/2018GL080554
Gadgil, S. (2018). The monsoon system: Land–sea breeze or the ITCZ? Journal of Earth System Science, 127(1), 1. https://doi.org/10.1007/s12040-017-0916-x
Galaasen, E. V., Ninnemann, U. S., Irvalı, N., Kleiven, H. (Kikki) F., Rosenthal, Y., Kissel, C., & Hodell, D. A. (2014). Rapid Reductions in North Atlantic Deep Water During the Peak of the Last Interglacial Period. Science, 343(6175), 1129–1132. https://doi.org/10.1126/science.1248667
García-Ibáñez, M. I., Bates, N. R., Bakker, D. C. E., Fontela, M., & Velo, A. (2021). Cold-water corals in the Subpolar North Atlantic Ocean exposed to aragonite undersaturation if the 2 °C global warming target is not met. Global and Planetary Change, 201, 103480. https://doi.org/10.1016/j.gloplacha.2021.103480
Geen, R., Bordoni, S., Battisti, D. S., & Hui, K. (2020). Monsoons, ITCZs, and the Concept of the Global Monsoon. Reviews of Geophysics, 58(4), e2020RG000700. https://doi.org/10.1029/2020RG000700
Gent, P. R. (2018). A commentary on the Atlantic meridional overturning circulation stability in climate models. Ocean Modelling, 122, 57–66. https://doi.org/10.1016/j.ocemod.2017.12.006
Giannini, A., Salack, S., Lodoun, T., Ali, A., Gaye, A. T., & Ndiaye, O. (2013). A unifying view of climate change in the Sahel linking intra-seasonal, interannual and longer time scales. Environmental Research Letters, 8(2), 024010. https://doi.org/10.1088/1748-9326/8/2/024010
Grothe, P. R., Cobb, K. M., Liguori, G., Di Lorenzo, E., Capotondi, A., Lu, Y., Cheng, H., Edwards, R. L., Southon, J. R., Santos, G. M., Deocampo, D. M., Lynch-Stieglitz, J., Chen, T., Sayani, H. R., Thompson, D. M., Conroy, J. L., Moore, A. L., Townsend, K., Hagos, M., … Toth, L. T. (2020). Enhanced El Niño–Southern Oscillation Variability in Recent Decades. Geophysical Research Letters, 47(7), e2019GL083906. https://doi.org/10.1029/2019GL083906
Gupta, A. K., Anderson, D. M., & Overpeck, J. T. (2003). Abrupt changes in the Asian southwest monsoon during the Holocene and their links to the North Atlantic Ocean. Nature, 421(6921), Article 6921. https://doi.org/10.1038/nature01340
Ha, K.-J., Moon, S., Timmermann, A., & Kim, D. (2020). Future Changes of Summer Monsoon Characteristics and Evaporative Demand Over Asia in CMIP6 Simulations. Geophysical Research Letters, 47(8), e2020GL087492. https://doi.org/10.1029/2020GL087492
Haine, T. W. N., Curry, B., Gerdes, R., Hansen, E., Karcher, M., Lee, C., Rudels, B., Spreen, G., de Steur, L., Stewart, K. D., & Woodgate, R. (2015). Arctic freshwater export: Status, mechanisms, and prospects. Global and Planetary Change, 125, 13–35. https://doi.org/10.1016/j.gloplacha.2014.11.013
Halloran, P. R., Booth, B. B. B., Jones, C. D., Lambert, F. H., McNeall, D. J., Totterdell, I. J., & Völker, C. (2015). The mechanisms of North Atlantic CO2 uptake in a large Earth System Model ensemble. Biogeosciences, 12(14), 4497–4508. https://doi.org/10.5194/bg-12-4497-2015
Hawkins, E., Smith, R. S., Allison, L. C., Gregory, J. M., Woollings, T. J., Pohlmann, H., & de Cuevas, B. (2011). Bistability of the Atlantic overturning circulation in a global climate model and links to ocean freshwater transport. Geophysical Research Letters, 38(10). https://doi.org/10.1029/2011GL047208
Haywood, J. M., Jones, A., Bellouin, N., & Stephenson, D. (2013). Asymmetric forcing from stratospheric aerosols impacts Sahelian rainfall. Nature Climate Change, 3(7), Article 7. https://doi.org/10.1038/nclimate1857
Heede, U. K., & Fedorov, A. V. (2021). Eastern equatorial Pacific warming delayed by aerosols and thermostat response to CO2 increase. Nature Climate Change, 11(8), Article 8. https://doi.org/10.1038/s41558-021-01101-x
Heede, U. K., & Fedorov, A. V. (2023a). Colder Eastern Equatorial Pacific and Stronger Walker Circulation in the Early 21st Century: Separating the Forced Response to Global Warming From Natural Variability. Geophysical Research Letters, 50(3), e2022GL101020. https://doi.org/10.1029/2022GL101020
Heede, U. K., & Fedorov, A. V. (2023b). Towards understanding the robust strengthening of ENSO and more frequent extreme El Niño events in CMIP6 global warming simulations. Climate Dynamics, 61(5), 3047–3060. https://doi.org/10.1007/s00382-023-06856-x
Henson, S. A., Cael, B. B., Allen, S. R., & Dutkiewicz, S. (2021). Future phytoplankton diversity in a changing climate. Nature Communications, 12(1), Article 1. https://doi.org/10.1038/s41467-021-25699-w
Henson, S. A., Laufkötter, C., Leung, S., Giering, S. L. C., Palevsky, H. I., & Cavan, E. L. (2022). Uncertain response of ocean biological carbon export in a changing world. Nature Geoscience, 15(4), Article 4. https://doi.org/10.1038/s41561-022-00927-0
Hersbach, H., Bel, B., Berrisford, P., Blavati, G., Horányi, A., Muñoz Sabater, J., Nicolas, J., Peubey, C., Radu, R., Rozum, I., Schepers, D., Simmons, A., Soci, C., Dee, D., & Thépaut, J.-N. (2023). ERA5 monthly averaged data on single levels from 1940 to present. Copernicus Climate Change Service (C3S) Climate Data Store (CDS), (Accessed on 25-10-2023). https://doi.org/10.24381/cds.f17050d7
Heuzé, C. (2020). Antarctic Bottom Water and North Atlantic Deep Water in CMIP6 models [Preprint]. Deep Ocean/Numerical Models/All Geographic Regions/Temperature, Salinity and Density Fields. https://doi.org/10.5194/os-2020-66
Hopcroft, P. O., & Valdes, P. J. (2021). Paleoclimate-conditioning reveals a North Africa land-atmosphere tipping point. Proceedings of the National Academy of Sciences of the United States of America, 118(45), e2108783118. https://doi.org/10.1073/pnas.2108783118
Hou, A., Bahr, A., Raddatz, J., Voigt, S., Greule, M., Albuquerque, A. L., Chiessi, C. M., & Friedrich, O. (2020). Insolation and Greenhouse Gas Forcing of the South American Monsoon System Across Three Glacial-Interglacial Cycles. Geophysical Research Letters, 47(14), e2020GL087948. https://doi.org/10.1029/2020GL087948
Hrudya, P. H., Varikoden, H., & Vishnu, R. (2021). A review on the Indian summer monsoon rainfall, variability and its association with ENSO and IOD. Meteorology and Atmospheric Physics, 133(1), 1–14. https://doi.org/10.1007/s00703-020-00734-5
Hsu, P., Li, T., Luo, J.-J., Murakami, H., Kitoh, A., & Zhao, M. (2012). Increase of global monsoon area and precipitation under global warming: A robust signal? Geophysical Research Letters, 39(6).

https://doi.org/10.1029/2012GL051037
Hsu, P., Li, T., Murakami, H., & Kitoh, A. (2013). Future change of the global monsoon revealed from 19 CMIP5 models. Journal of Geophysical Research: Atmospheres, 118(3), 1247–1260. https://doi.org/10.1002/jgrd.50145
Hu, S., & Fedorov, A. V. (2017). The extreme El Niño of 2015–2016 and the end of global warming hiatus. Geophysical Research Letters, 44(8), 3816–3824. https://doi.org/10.1002/2017GL072908
Huang, B., Thorne, P. w., Banzon, V. F., Boyer, T., Chepurin, G., Lawrimore, J. H., Menne, M. J., Smith, T. M., Vose, R. S., & Zhang, H.-M. (2017). NOAA Extended Reconstructed Sea Surface Temperature (ERSST), Version 5. NOAA National Centers for Environmental Information, Accessed on 2023-10-25 from NOAA/ESRL/PSD at their website https://www.esrl.noaa.gov/psd/. https://doi.org/doi:10.7289/V5T72FNM
Intergovernmental Panel On Climate Change. (2023). Climate Change 2021 – The Physical Science Basis: Working Group I Contribution to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change (1st ed.). Cambridge University Press. https://doi.org/10.1017/9781009157896
Jackson, L. C. (2013). Shutdown and recovery of the AMOC in a coupled global climate model: The role of the advective feedback. Geophysical Research Letters, 40(6), 1182–1188. https://doi.org/10.1002/grl.50289
Jackson, L. C., Alastrué de Asenjo, E., Bellomo, K., Danabasoglu, G., Haak, H., Hu, A., Jungclaus, J., Lee, W., Meccia, V. L., Saenko, O., Shao, A., & Swingedouw, D. (2023). Understanding AMOC stability: The North Atlantic Hosing Model Intercomparison Project. Geoscientific Model Development, 16(7), 1975–1995. https://doi.org/10.5194/gmd-16-1975-2023
Jackson, L. C., Kahana, R., Graham, T., Ringer, M. A., Woollings, T., Mecking, J. V., & Wood, R. A. (2015). Global and European climate impacts of a slowdown of the AMOC in a high resolution GCM. Climate Dynamics, 45(11), 3299–3316. https://doi.org/10.1007/s00382-015-2540-2
Jackson, L. C., & Wood, R. A. (2018). Hysteresis and Resilience of the AMOC in an Eddy-Permitting GCM. Geophysical Research Letters, 45(16), 8547–8556. https://doi.org/10.1029/2018GL078104
Jin, Q., & Wang, C. (2017). A revival of Indian summer monsoon rainfall since 2002. Nature Climate Change, 7(8), Article 8. https://doi.org/10.1038/nclimate3348
Jones, C., & Carvalho, L. M. V. (2013). Climate Change in the South American Monsoon System: Present Climate and CMIP5 Projections. Journal of Climate, 26(17), 6660–6678. https://doi.org/10.1175/JCLI-D-12-00412.1
Jones, C., Liddicoat, S., & Wiltshire, A. (2020). MOHC UKESM1.0-LL model output prepared for CMIP6 CDRMIP esm-ssp534-over [dataset]. Earth System Grid Federation. https://doi.org/10.22033/ESGF/CMIP6.12203
Kageyama, M., Merkel, U., Otto-Bliesner, B., Prange, M., Abe-Ouchi, A., Lohmann, G., Ohgaito, R., Roche, D. M., Singarayer, J., Swingedouw, D., & X Zhang. (2013). Climatic impacts of fresh water hosing under Last Glacial Maximum conditions: A multi-model study. Climate of the Past, 9(2), 935–953. https://doi.org/10.5194/cp-9-935-2013
Katzenberger, A., Schewe, J., Pongratz, J., & Levermann, A. (2021). Robust increase of Indian monsoon rainfall and its variability under future warming in CMIP6 models. Earth System Dynamics, 12(2), 367–386. https://doi.org/10.5194/esd-12-367-2021
Kelly, L. T., Giljohann, K. M., Duane, A., Aquilué, N., Archibald, S., Batllori, E., Bennett, A. F., Buckland, S. T., Canelles, Q., Clarke, M. F., Fortin, M.-J., Hermoso, V., Herrando, S., Keane, R. E., Lake, F. K., McCarthy, M. A., Morán-Ordóñez, A., Parr, C. L., Pausas, J. G., … Brotons, L. (2020). Fire and biodiversity in the Anthropocene. Science, 370(6519), eabb0355. https://doi.org/10.1126/science.abb0355
Kelly, S. J., Popova, E., Aksenov, Y., Marsh, R., & Yool, A. (2020). They Came From the Pacific: How Changing Arctic Currents Could Contribute to an Ecological Regime Shift in the Atlantic Ocean. Earth's Future, 8(4), e2019EF001394. https://doi.org/10.1029/2019EF001394
Kennedy, D., Parker, T., Woollings, T., Harvey, B., & Shaffrey, L. (2016). The response of high-impact blocking weather systems to climate change. Geophysical Research Letters, 43(13), 7250–7258. https://doi.org/10.1002/2016GL069725
Kilbourne, K. H., Wanamaker, A. D., Moffa-Sanchez, P., Reynolds, D. J., Amrhein, D. E., Butler, P. G., Gebbie, G., Goes, M., Jansen, M. F., Little, C. M., Mette, M., Moreno-Chamarro, E., Ortega, P., Otto-Bliesner, B. L., Rossby, T., Scourse, J., & Whitney, N. M. (2022). Atlantic circulation change still uncertain. Nature Geoscience, 15(3), Article 3. https://doi.org/10.1038/s41561-022-00896-4
Koelling, J., Atamanchuk, D., Karstensen, J., Handmann, P., & Wallace, D. W. R. (2022). Oxygen export to the deep ocean following Labrador Sea Water formation. Biogeosciences, 19(2), 437–454. https://doi.org/10.5194/bg-19-437-2022
Konare, A., Zakey, A. S., Solmon, F., Giorgi, F., Rauscher, S., Ibrah, S., & Bi, X. (2008). A regional climate modeling study of the effect of desert dust on the West African monsoon. Journal of Geophysical Research: Atmospheres, 113(D12). https://doi.org/10.1029/2007JD009322
Kornhuber, K., & Tamarin-Brodsky, T. (2021). Future Changes in Northern Hemisphere Summer Weather Persistence Linked to Projected Arctic Warming. Geophysical Research Letters, 48(4), e2020GL091603. https://doi.org/10.1029/2020GL091603
Kucharski, F., Zeng, N., & Kalnay, E. (2013). A further assessment of vegetation feedback on decadal Sahel rainfall variability. Climate Dynamics, 40(5), 1453–1466. https://doi.org/10.1007/s00382-012-1397-x
Kuhlbrodt, T., Titz, S., Feudel, U., & Rahmstorf, S. (2001). A simple model of seasonal open ocean convection. Ocean Dynamics, 52(1), 36–49. https://doi.org/10.1007/s10236-001-8175-3
Kumar, S. K., & Seshadri, A. K. (2022). Origins and suppression of bifurcation phenomena in lower-order monsoon models. Earth System Dynamics Discussions, 1–19. https://doi.org/10.5194/esd-2022-30
Kwiatkowski, L., Torres, O., Bopp, L., Aumont, O., Chamberlain, M., Christian, J. R., Dunne, J. P., Gehlen, M., Ilyina, T., John, J. G., Lenton, A., Li, H., Lovenduski, N. S., Orr, J. C., Palmieri, J., Santana-Falcón, Y., Schwinger, J., Séférian, R., Stock, C. A., … Ziehn, T. (2020). Twenty-first century ocean warming, acidification, deoxygenation, and upper-ocean nutrient and primary production decline from CMIP6 model projections. Biogeosciences, 17(13), 3439–3470. https://doi.org/10.5194/bg-17-3439-2020
Latif, M., Sun, J., Visbeck, M., & Hadi Bordbar, M. (2022). Natural variability has dominated Atlantic Meridional Overturning Circulation since 1900. Nature Climate Change, 12(5), Article 5. https://doi.org/10.1038/s41558-022-01342-4
Lawman, A. E., Di Nezio, P. N., Partin, J. W., Dee, S. G., Thirumalai, K., & Quinn, T. M. (2022). Unraveling forced responses of extreme El Niño variability over the Holocene. Science Advances, 8(9), eabm4313. https://doi.org/10.1126/sciadv.abm4313
Leconte, J., Forget, F., Charnay, B., Wordsworth, R., & Pottier, A. (2013). Increased insolation threshold for runaway greenhouse processes on Earth-like planets. Nature, 504(7479), Article 7479. https://doi.org/10.1038/nature12827
Lee, J.-Y., Marotzke, J., Bala, G., Cao, L., Corti, S., Dunne, J. P., Engelbrecht, F., Fischer, E., Fyfe, J. C., Jones, C., Maycook, A., Mutemi, J., Ndiaye, O., Panickal, S., & Zhou, T. (2021). Chapter 4: Future Global Climate: Scenario-based Projections and Near-term Information. In Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press.
Lee, J.-Y., & Wang, B. (2014). Future change of global monsoon in the CMIP5. Climate Dynamics, 42(1), 101–119. https://doi.org/10.1007/s00382-012-1564-0
Lehner, F., Born, A., Raible, C. C., & Stocker, T. F. (2013). Amplified Inception of European Little Ice Age by Sea Ice–Ocean–Atmosphere Feedbacks. Journal of Climate, 26(19), 7586–7602. https://doi.org/10.1175/JCLI-D-12-00690.1
Lenton, T. M., Held, H., Kriegler, E., Hall, J. W., Lucht, W., Rahmstorf, S., & Schellnhuber, H. J. (2008). Tipping elements in the Earth's climate system. Proceedings of the National Academy of Sciences, 105(6), 1786–1793. https://doi.org/10.1073/pnas.0705414105

Levermann, A., & Born, A. (2007). Bistability of the Atlantic subpolar gyre in a coarse-resolution climate model. Geophysical Research Letters, 34(24). https://doi.org/10.1029/2007GL031732

Levermann, A., Schewe, J., Petoukhov, V., & Held, H. (2009). Basic mechanism for abrupt monsoon transitions. Proceedings of the National Academy of Sciences, 106(49), 20572–20577. https://doi.org/10.1073/pnas.0901414106

Lewis, S. C., LeGrande, A. N., Kelley, M., & Schmidt, G. A. (2010). Water vapour source impacts on oxygen isotope variability in tropical precipitation during Heinrich events. Climate of the Past, 6(3), 325–343. https://doi.org/10.5194/cp-6-325-2010

L'Heureux, M. L., Tippett, M. K., Kumar, A., Butler, A. H., Ciasto, L. M., Ding, Q., Harnos, K. J., & Johnson, N. C. (2017). Strong Relations Between ENSO and the Arctic Oscillation in the North American Multimodel Ensemble. Geophysical Research Letters, 44(22), 11,654-11,662. https://doi.org/10.1002/2017GL074854

Liebmann, B., & Mechoso, C. R. (2011). The south american monsoon system. In The Global Monsoon System: Vol. Volume 5 (pp. 137–157). WORLD SCIENTIFIC. https://doi.org/10.1142/9789814343411_0009

Lin, P., Pickart, R. S., Heorton, H., Tsamados, M., Itoh, M., & Kikuchi, T. (2023). Recent state transition of the Arctic Ocean's Beaufort Gyre. Nature Geoscience, 16(6), Article 6. https://doi.org/10.1038/s41561-023-01184-5

Liu, W., Fedorov, A. V., Xie, S.-P., & Hu, S. (2020). Climate impacts of a weakened Atlantic Meridional Overturning Circulation in a warming climate. Science Advances, 6(26), eaaz4876. https://doi.org/10.1126/sciadv.aaz4876

Liu, W., Xie, S.-P., Liu, Z., & Zhu, J. (2017). Overlooked possibility of a collapsed Atlantic Meridional Overturning Circulation in warming climate. Science Advances, 3(1), e1601666. https://doi.org/10.1126/sciadv.1601666

Lloret, F., & Batllori, E. (2021). Climate-Induced Global Forest Shifts due to Heatwave-Drought. In J. G. Canadell & R. B. Jackson (Eds.), Ecosystem Collapse and Climate Change (pp. 155–186). Springer International Publishing. https://doi.org/10.1007/978-3-030-71330-0_7

Lobelle, D., Beaulieu, C., Livina, V., Sévellec, F., & Frajka-Williams, E. (2020). Detectability of an AMOC Decline in Current and Projected Climate Changes. Geophysical Research Letters, 47(20), e2020GL089974. https://doi.org/10.1029/2020GL089974

Lohmann, J., & Ditlevsen, P. D. (2021). Risk of tipping the overturning circulation due to increasing rates of ice melt. Proceedings of the National Academy of Sciences, 118(9), e2017989118. https://doi.org/10.1073/pnas.2017989118

Ma, S., & Zhou, T. (2016). Robust Strengthening and Westward Shift of the Tropical Pacific Walker Circulation during 1979–2012: A Comparison of 7 Sets of Reanalysis Data and 26 CMIP5 Models. Journal of Climate, 29(9), 3097–3118. https://doi.org/10.1175/JCLI-D-15-0398.1

Marshall, J., Donohoe, A., Ferreira, D., & McGee, D. (2014). The ocean's role in setting the mean position of the Inter-Tropical Convergence Zone. Climate Dynamics, 42(7), 1967–1979. https://doi.org/10.1007/s00382-013-1767-z

Mauritsen, T., & Stevens, B. (2015). Missing iris effect as a possible cause of muted hydrological change and high climate sensitivity in models. Nature Geoscience, 8(5), Article 5. https://doi.org/10.1038/ngeo2414

McGee, D., deMenocal, P. B., Winckler, G., Stuut, J. B. W., & Bradtmiller, L. I. (2013). The magnitude, timing and abruptness of changes in North African dust deposition over the last 20,000yr. Earth and Planetary Science Letters, 371–372, 163–176. https://doi.org/10.1016/j.epsl.2013.03.054

McManus, J. F., Francois, R., Gherardi, J.-M., Keigwin, L. D., & Brown-Leger, S. (2004). Collapse and rapid resumption of Atlantic meridional circulation linked to deglacial climate changes. Nature, 428(6985), Article 6985. https://doi.org/10.1038/nature02494

McPhaden, M. J. (Ed.). (2020). El Niño southern oscillation in a changing climate (First edition). Wiley-American Geophysical Union.

Mecking, J. V., Drijfhout, S. S., Jackson, L. C., & Andrews, M. B. (2017). The effect of model bias on Atlantic freshwater transport and implications for AMOC bi-stability. Tellus A: Dynamic Meteorology and Oceanography, 69(1), 1299910. https://doi.org/10.1080/16000870.2017.1299910

Mecking, J. V., Drijfhout, S. S., Jackson, L. C., & Graham, T. (2016). Stable AMOC off state in an eddy-permitting coupled climate model. Climate Dynamics, 47(7), 2455–2470. https://doi.org/10.1007/s00382-016-2975-0

Michel, S. L. L., Swingedouw, D., Ortega, P., Gastineau, G., Mignot, J., McCarthy, G., & Khodri, M. (2022). Early warning signal for a tipping point suggested by a millennial Atlantic Multidecadal Variability reconstruction. Nature Communications, 13(1), Article 1. https://doi.org/10.1038/s41467-022-32704-3

Moffa-Sánchez, P., Moreno-Chamarro, E., Reynolds, D. J., Ortega, P., Cunningham, L., Swingedouw, D., Amrhein, D. E., Halfar, J., Jonkers, L., Jungclaus, J. H., Perner, K., Wanamaker, A., & Yeager, S. (2019). Variability in the Northern North Atlantic and Arctic Oceans Across the Last Two Millennia: A Review. Paleoceanography and Paleoclimatology, 34(8), 1399–1436. https://doi.org/10.1029/2018PA003508

Mohtadi, M., Prange, M., Oppo, D. W., De Pol-Holz, R., Merkel, U., Zhang, X., Steinke, S., & Lückge, A. (2014). North Atlantic forcing of tropical Indian Ocean climate. Nature, 509(7498), Article 7498. https://doi.org/10.1038/nature13196

Mohtadi, M., Prange, M., & Steinke, S. (2016). Palaeoclimatic insights into forcing and response of monsoon rainfall. Nature, 533(7602), Article 7602. https://doi.org/10.1038/nature17450

Morrill, C., Overpeck, J. T., & Cole, J. E. (2003). A synthesis of abrupt changes in the Asian summer monsoon since the last deglaciation. The Holocene, 13(4), 465–476. https://doi.org/10.1191/0959683603hl639ft

Mulitza, S., Chiessi, C. M., Schefuß, E., Lippold, J., Wichmann, D., Antz, B., Mackensen, A., Paul, A., Prange, M., Rehfeld, K., Werner, M., Bickert, T., Frank, N., Kuhnert, H., Lynch-Stieglitz, J., Portilho-Ramos, R. C., Sawakuchi, A. O., Schulz, M., Schwenk, T., … Zhang, Y. (2017). Synchronous and proportional deglacial changes in Atlantic meridional overturning and northeast Brazilian precipitation. Paleoceanography, 32(6), 622–633. https://doi.org/10.1002/2017PA003084

Muller, C., Yang, D., Craig, G., Cronin, T., Fildier, B., Haerter, J. O., Hohenegger, C., Mapes, B., Randall, D., Shamekh, S., & Sherwood, S. C. (2022). Spontaneous Aggregation of Convective Storms. Annual Review of Fluid Mechanics, 54(1), 133–157. https://doi.org/10.1146/annurev-fluid-022421-011319

Myers, T. A., Mechoso, C. R., Cesana, G. V., DeFlorio, M. J., & Waliser, D. E. (2018). Cloud Feedback Key to Marine Heatwave off Baja California. Geophysical Research Letters, 45(9), 4345–4352. https://doi.org/10.1029/2018GL078242

Naughten, K. A., Holland, P. R., & De Rydt, J. (2023). Unavoidable future increase in West Antarctic ice-shelf melting over the twenty-first century. Nature Climate Change, 1–7. https://doi.org/10.1038/s41558-023-01818-x

Neukermans, G., Oziel, L., & Babin, M. (2018). Increased intrusion of warming Atlantic water leads to rapid expansion of temperate phytoplankton in the Arctic. Global Change Biology, 24(6), 2545–2553. https://doi.org/10.1111/gcb.14075

New, A. L., Smeed, D. A., Czaja, A., Blaker, A. T., Mecking, J. V., Mathews, J. P., & Sanchez-Franks, A. (2021). Labrador Slope Water connects the subarctic with the Gulf Stream. Environmental Research Letters, 16(8), 084019. https://doi.org/10.1088/1748-9326/ac1293

Orihuela-Pinto, B., England, M. H., & Taschetto, A. S. (2022). Interbasin and interhemispheric impacts of a collapsed Atlantic Overturning Circulation. Nature Climate Change, 12(6), Article 6. https://doi.org/10.1038/s41558-022-01380-y

Osman, M. B., Coats, S., Das, S. B., McConnell, J. R., & Chellman, N. (2021). North Atlantic jet stream projections in the context of the past 1,250 years. Proceedings of the National Academy of Sciences, 118(38), e2104105118. https://doi.org/10.1073/pnas.2104105118

Osman, M. B., Das, S. B., Trusel, L. D., Evans, M. J., Fischer, H., Grieman, M. M., Kipfstuhl, S., McConnell, J. R., & Saltzman, E. S. (2019). Industrial-era decline in subarctic Atlantic productivity. Nature, 569(7757), Article 7757. https://doi.org/10.1038/s41586-019-1181-8

Otterman, J. (1974). Baring High-Albedo Soils by Overgrazing: A

Hypothesized Desertification Mechanism. Science, 186(4163), 531–533. https://doi.org/10.1126/science.186.4163.531
Oudar, T., Cattiaux, J., & Douville, H. (2020). Drivers of the Northern Extratropical Eddy-Driven Jet Change in CMIP5 and CMIP6 Models. Geophysical Research Letters, 47(8), e2019GL086695. https://doi.org/10.1029/2019GL086695
Oziel, L., Baudena, A., Ardyna, M., Massicotte, P., Randelhoff, A., Sallée, J.-B., Ingvaldsen, R. B., Devred, E., & Babin, M. (2020). Faster Atlantic currents drive poleward expansion of temperate phytoplankton in the Arctic Ocean. Nature Communications, 11(1), Article 1. https://doi.org/10.1038/s41467-020-15485-5
Paik, S., An, S.-I., Min, S.-K., King, A. D., & Shin, J. (2023). Hysteretic Behavior of Global to Regional Monsoon Area Under CO2 Ramp-Up and Ramp-Down. Earth's Future, 11(7), e2022EF003434. https://doi.org/10.1029/2022EF003434
Pausata, F. S. R., Li, C., Wettstein, J. J., Kageyama, M., & Nisancioglu, K. H. (2011). The key role of topography in altering North Atlantic atmospheric circulation during the last glacial period. Climate of the Past, 7(4), 1089–1101. https://doi.org/10.5194/cp-7-1089-2011
Petoukhov, V., Rahmstorf, S., Petri, S., & Schellnhuber, H. J. (2013). Quasiresonant amplification of planetary waves and recent Northern Hemisphere weather extremes. Proceedings of the National Academy of Sciences, 110(14), 5336–5341. https://doi.org/10.1073/pnas.1222000110
Qasmi, S., & Ribes, A. (2022). Reducing uncertainty in local temperature projections. Science Advances, 8(41), eabo6872. https://doi.org/10.1126/sciadv.abo6872
Rahmstorf, S. (2001). A simple model of seasonal open ocean convection. Ocean Dynamics, 52(1), 26–35. https://doi.org/10.1007/s10236-001-8174-4
Rahmstorf, S., Box, J. E., Feulner, G., Mann, M. E., Robinson, A., Rutherford, S., & Schaffernicht, E. J. (2015). Exceptional twentieth-century slowdown in Atlantic Ocean overturning circulation. Nature Climate Change, 5(5), Article 5. https://doi.org/10.1038/nclimate2554
Rahmstorf, S., Crucifix, M., Ganopolski, A., Goosse, H., Kamenkovich, I., Knutti, R., Lohmann, G., Marsh, R., Mysak, L. A., Wang, Z., & Weaver, A. J. (2005). Thermohaline circulation hysteresis: A model intercomparison. Geophysical Research Letters, 32(23). https://doi.org/10.1029/2005GL023655
Regan, H. C., Lique, C., & Armitage, T. W. K. (2019). The Beaufort Gyre Extent, Shape, and Location Between 2003 and 2014 From Satellite Observations. Journal of Geophysical Research: Oceans, 124(2), 844–862. https://doi.org/10.1029/2018JC014379
Rhein, M., Steinfeldt, R., Kieke, D., Stendardo, I., & Yashayaev, I. (2017). Ventilation variability of Labrador Sea Water and its impact on oxygen and anthropogenic carbon: A review. Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences, 375(2102), 20160321. https://doi.org/10.1098/rsta.2016.0321
Riboldi, J., Lott, F., D'Andrea, F., & Rivière, G. (2020). On the Linkage Between Rossby Wave Phase Speed, Atmospheric Blocking, and Arctic Amplification. Geophysical Research Letters, 47(19), e2020GL087796. https://doi.org/10.1029/2020GL087796
Richardson, K., Steffen, W., Lucht, W., Bendtsen, J., Cornell, S. E., Donges, J. F., Drüke, M., Fetzer, I., Bala, G., von Bloh, W., Feulner, G., Fiedler, S., Gerten, D., Gleeson, T., Hofmann, M., Huiskamp, W., Kummu, M., Mohan, C., Nogués-Bravo, D., … Rockström, J. (2023). Earth beyond six of nine planetary boundaries. Science Advances, 9(37), eadh2458. https://doi.org/10.1126/sciadv.adh2458
Ridge, S. M., & McKinley, G. A. (2021). Ocean carbon uptake under aggressive emission mitigation. Biogeosciences, 18(8), 2711–2725. https://doi.org/10.5194/bg-18-2711-2021
Rockström, J., Gupta, J., Qin, D., Lade, S. J., Abrams, J. F., Andersen, L. S., Armstrong McKay, D. I., Bai, X., Bala, G., Bunn, S. E., Ciobanu, D., DeClerck, F., Ebi, K., Gifford, L., Gordon, C., Hasan, S., Kanie, N., Lenton, T. M., Loriani, S., … Zhang, X. (2023). Safe and just Earth system boundaries. Nature, 619(7968), Article 7968. https://doi.org/10.1038/s41586-023-06083-8
Rodríguez-Fonseca, B., Mohino, E., Mechoso, C. R., Caminade, C., Biasutti, M., Gaetani, M., Garcia-Serrano, J., Vizy, E. K., Cook, K., Xue, Y., Polo, I., Losada, T., Druyan, L., Fontaine, B., Bader, J., Doblas-Reyes, F. J., Goddard, L., Janicot, S., Arribas, A., … Voldoire, A. (2015). Variability and Predictability of West African Droughts: A Review on the Role of Sea Surface Temperature Anomalies. Journal of Climate, 28(10), 4034–4060. https://doi.org/10.1175/JCLI-D-14-00130.1
Rousi, E., Kornhuber, K., Beobide-Arsuaga, G., Luo, F., & Coumou, D. (2022). Accelerated western European heatwave trends linked to more-persistent double jets over Eurasia. Nature Communications, 13(1), Article 1. https://doi.org/10.1038/s41467-022-31432-y
Roxy, M. K., Ritika, K., Terray, P., Murtugudde, R., Ashok, K., & Goswami, B. N. (2015). Drying of Indian subcontinent by rapid Indian Ocean warming and a weakening land-sea thermal gradient. Nature Communications, 6(1), Article 1. https://doi.org/10.1038/ncomms8423
Sanchez Goñi, M. F., & Harrison, S. P. (2010a). Millennial-scale climate variability and vegetation changes during the Last Glacial: Concepts and terminology. Quaternary Science Reviews, 29(21), 2823–2827. https://doi.org/10.1016/j.quascirev.2009.11.014
Sanchez Goñi, M. F., & Harrison, S. P. (2010b). Millennial-scale climate variability and vegetation changes during the Last Glacial: Concepts and terminology. Quaternary Science Reviews, 29(21), 2823–2827. https://doi.org/10.1016/j.quascirev.2009.11.014
Sarnthein, M., Stattegger, K., Dreger, D., Erlenkeuser, H., Grootes, P., Haupt, B. J., Jung, S., Kiefer, T., Kuhnt, W., Pflaumann, U., Schäfer-Neth, C., Schulz, H., Schulz, M., Seidov, D., Simstich, J., Kreveld, S. van, Vogelsang, E., Völker, A., & Weinelt, M. (2001a). Fundamental Modes and Abrupt Changes in North Atlantic Circulation and Climate over the last 60 ky—Concepts, Reconstruction and Numerical Modeling. In P. Schäfer, W. Ritzrau, M. Schlüter, & J. Thiede (Eds.), The Northern North Atlantic: A Changing Environment (pp. 365–410). Springer. https://doi.org/10.1007/978-3-642-56876-3_21
Sarnthein, M., Stattegger, K., Dreger, D., Erlenkeuser, H., Grootes, P., Haupt, B. J., Jung, S., Kiefer, T., Kuhnt, W., Pflaumann, U., Schäfer-Neth, C., Schulz, H., Schulz, M., Seidov, D., Simstich, J., Kreveld, S. van, Vogelsang, E., Völker, A., & Weinelt, M. (2001b). Fundamental Modes and Abrupt Changes in North Atlantic Circulation and Climate over the last 60 ky—Concepts, Reconstruction and Numerical Modeling. In P. Schäfer, W. Ritzrau, M. Schlüter, & J. Thiede (Eds.), The Northern North Atlantic: A Changing Environment (pp. 365–410). Springer. https://doi.org/10.1007/978-3-642-56876-3_21
Schewe, J., Levermann, A., & Cheng, H. (2012). A critical humidity threshold for monsoon transitions. Climate of the Past, 8(2), 535–544. https://doi.org/10.5194/cp-8-535-2012
Schmittner, A., Brook, E. J., & Ahn, J. (2007). Impact of the ocean's Overturning circulation on atmospheric CO2. In Ocean Circulation: Mechanisms and Impacts—Past and Future Changes of Meridional Overturning (pp. 315–334). American Geophysical Union (AGU). https://doi.org/10.1029/173GM20
Schneider, T., Kaul, C. M., & Pressel, K. G. (2019). Possible climate transitions from breakup of stratocumulus decks under greenhouse warming. Nature Geoscience, 12(3), Article 3. https://doi.org/10.1038/s41561-019-0310-1
Schulz, von Rad, Erlenkeuser, & von Rad. (1998). Correlation between Arabian Sea and Greenland climate oscillations of the past 110,000 years. Nature, 393(6680), Article 6680. https://doi.org/10.1038/31750
Schwinger, J., Asaadi, A., Goris, N., & Lee, H. (2022). Possibility for strong northern hemisphere high-latitude cooling under negative emissions. Nature Communications, 13(1), Article 1. https://doi.org/10.1038/s41467-022-28573-5
Screen, J. A., & Simmonds, I. (2013). Exploring links between Arctic amplification and mid-latitude weather. Geophysical Research Letters, 40(5), 959–964. https://doi.org/10.1002/grl.50174
Seager, R., Henderson, N., & Cane, M. (2022). Persistent Discrepancies between Observed and Modeled Trends in the Tropical Pacific Ocean. Journal of Climate, 35(14), 4571–4584. https://doi.org/10.1175/JCLI-D-21-0648.1
Seeley, J. T., & Wordsworth, R. D. (2021). Episodic deluges in simulated hothouse climates. Nature, 599(7883), Article 7883. https://doi.org/10.1038/s41586-021-03919-z

Serreze, M. C., & Meier, W. N. (2019). The Arctic's sea ice cover: Trends, variability, predictability, and comparisons to the Antarctic. Annals of the New York Academy of Sciences, 1436(1), 36–53. https://doi.org/10.1111/nyas.13856

Seshadri, A. K. (2017). Energetics and monsoon bifurcations. Climate Dynamics, 48(1), 561–576. https://doi.org/10.1007/s00382-016-3094-7

Sgubin, G., Swingedouw, D., Drijfhout, S., Mary, Y., & Bennabi, A. (2017). Abrupt cooling over the North Atlantic in modern climate models. Nature Communications, 8(1), Article 1. https://doi.org/10.1038/ncomms14375

Shanahan, T. M., McKay, N. P., Hughen, K. A., Overpeck, J. T., Otto-Bliesner, B., Heil, C. W., King, J., Scholz, C. A., & Peck, J. (2015). The time-transgressive termination of the African Humid Period. Nature Geoscience, 8(2), 140–144. https://doi.org/10.1038/ngeo2329

Shepherd, A., Ivins, E., Rignot, E., Smith, B., van den Broeke, M., Velicogna, I., Whitehouse, P., Briggs, K., Joughin, I., Krinner, G., Nowicki, S., Payne, T., Scambos, T., Schlegel, N., A, G., Agosta, C., Ahlstrøm, A., Babonis, G., Barletta, V. R., … The IMBIE Team. (2020). Mass balance of the Greenland Ice Sheet from 1992 to 2018. Nature, 579(7798), Article 7798. https://doi.org/10.1038/s41586-019-1855-2

Shepherd, T. G. (2019). Storyline approach to the construction of regional climate change information. Proceedings of the Royal Society A: Mathematical, Physical and Engineering Sciences, 475(2225), 20190013. https://doi.org/10.1098/rspa.2019.0013

Sherwood, S. C., Webb, M. J., Annan, J. D., Armour, K. C., Forster, P. M., Hargreaves, J. C., Hegerl, G., Klein, S. A., Marvel, K. D., Rohling, E. J., Watanabe, M., Andrews, T., Braconnot, P., Bretherton, C. S., Foster, G. L., Hausfather, Z., von der Heydt, A. S., Knutti, R., Mauritsen, T., … Zelinka, M. D. (2020). An Assessment of Earth's Climate Sensitivity Using Multiple Lines of Evidence. Reviews of Geophysics, 58(4), e2019RG000678. https://doi.org/10.1029/2019RG000678

Solmon, F., Mallet, M., Elguindi, N., Giorgi, F., Zakey, A., & Konaré, A. (2008). Dust aerosol impact on regional precipitation over western Africa, mechanisms and sensitivity to absorption properties. Geophysical Research Letters, 35(24). https://doi.org/10.1029/2008GL035900

Spooner, P. T., Thornalley, D. J. R., Oppo, D. W., Fox, A. D., Radionovskaya, S., Rose, N. L., Mallett, R., Cooper, E., & Roberts, J. M. (2020). Exceptional 20th Century Ocean Circulation in the Northeast Atlantic. Geophysical Research Letters, 47(10), e2020GL087577. https://doi.org/10.1029/2020GL087577

Srokosz, M., Baringer, M., Bryden, H., Cunningham, S., Delworth, T., Lozier, S., Marotzke, J., & Sutton, R. (2012). Past, Present, and Future Changes in the Atlantic Meridional Overturning Circulation. Bulletin of the American Meteorological Society, 93(11), 1663–1676. https://doi.org/10.1175/BAMS-D-11-00151.1

Stager, J. C., Ryves, D. B., Chase, B. M., & Pausata, F. S. R. (2011). Catastrophic Drought in the Afro-Asian Monsoon Region During Heinrich Event 1. Science, 331(6022), 1299–1302. https://doi.org/10.1126/science.1198322

Steffen, W., Richardson, K., Rockström, J., Cornell, S. E., Fetzer, I., Bennett, E. M., Biggs, R., Carpenter, S. R., de Vries, W., de Wit, C. A., Folke, C., Gerten, D., Heinke, J., Mace, G. M., Persson, L. M., Ramanathan, V., Reyers, B., & Sörlin, S. (2015). Planetary boundaries: Guiding human development on a changing planet. Science, 347(6223), 1259855. https://doi.org/10.1126/science.1259855

Stommel, H. (1961). Thermohaline Convection with Two Stable Regimes of Flow. Tellus, 13(2), 224–230. https://doi.org/10.1111/j.2153-3490.1961.tb00079.x

Swingedouw, D., Bily, A., Esquerdo, C., Borchert, L. F., Sgubin, G., Mignot, J., & Menary, M. (2021). On the risk of abrupt changes in the North Atlantic subpolar gyre in CMIP6 models. Annals of the New York Academy of Sciences, 1504(1), 187–201. https://doi.org/10.1111/nyas.14659

Swingedouw, D., Houssais, M.-N., Herbaut, C., Blaizot, A.-C., Devilliers, M., & Deshayes, J. (2022). AMOC Recent and Future Trends: A Crucial Role for Oceanic Resolution and Greenland Melting? Frontiers in Climate, 4. https://www.frontiersin.org/articles/10.3389/fclim.2022.838310

Swingedouw, D., Ifejika Speranza, C., Bartsch, A., Durand, G., Jamet, C., Beaugrand, G., & Conversi, A. (2020). Early Warning from Space for a Few Key Tipping Points in Physical, Biological, and Social-Ecological Systems. Surveys in Geophysics, 41(6), 1237–1284. https://doi.org/10.1007/s10712-020-09604-6

Terhaar, J., Torres, O., Bourgeois, T., & Kwiatkowski, L. (2021). Arctic Ocean acidification over the 21st century co-driven by anthropogenic carbon increases and freshening in the CMIP6 model ensemble. Biogeosciences, 18(6), 2221–2240. https://doi.org/10.5194/bg-18-2221-2021

The combined impact of global warming and AMOC collapse on the Amazon Rainforest. (2023, May 31). https://doi.org/10.21203/rs.3.rs-2673317/v1

The weakening summer circulation in the Northern Hemisphere mid-latitudes | Science. (n.d.). Retrieved October 26, 2023, from https://www.science.org/doi/10.1126/science.1261768

Tierney, J. E., Haywood, A. M., Feng, R., Bhattacharya, T., & Otto-Bliesner, B. L. (2019). Pliocene Warmth Consistent With Greenhouse Gas Forcing. Geophysical Research Letters, 46(15), 9136–9144. https://doi.org/10.1029/2019GL083802

Timmermann, A., An, S.-I., Kug, J.-S., Jin, F.-F., Cai, W., Capotondi, A., Cobb, K. M., Lengaigne, M., McPhaden, M. J., Stuecker, M. F., Stein, K., Wittenberg, A. T., Yun, K.-S., Bayr, T., Chen, H.-C., Chikamoto, Y., Dewitte, B., Dommenget, D., Grothe, P., … Zhang, X. (2018). El Niño–Southern Oscillation complexity. Nature, 559(7715), Article 7715. https://doi.org/10.1038/s41586-018-0252-6

Trenberth, K. E., Stepaniak, D. P., & Caron, J. M. (2000). The Global Monsoon as Seen through the Divergent Atmospheric Circulation. Journal of Climate, 13(22), 3969–3993. https://doi.org/10.1175/1520-0442(2000)013<3969:TGMAST>2.0.CO;2

Tziperman, E., & Farrell, B. (2009). Pliocene equatorial temperature: Lessons from atmospheric superrotation. Paleoceanography, 24(1). https://doi.org/10.1029/2008PA001652

van Westen, R. M., Kliphuis, M., & Dijkstra, H. A. (2023). New Physics-Based Early Warning Signal shows AMOC is on Tipping Course (arXiv:2308.01688). arXiv. https://doi.org/10.48550/arXiv.2308.01688

Venancio, I. M., Shimizu, M. H., Santos, T. P., Lessa, D. O., Portilho-Ramos, R. C., Chiessi, C. M., Crivellari, S., Mulitza, S., Kuhnert, H., Tiedemann, R., Vahlenkamp, M., Bickert, T., Sampaio, G., Albuquerque, A. L. S., Veiga, S., Nobre, P., & Nobre, C. (2020). Changes in surface hydrography at the western tropical Atlantic during the Younger Dryas. Global and Planetary Change, 184, 103047. https://doi.org/10.1016/j.gloplacha.2019.103047

Vera, C., Higgins, W., Amador, J., Ambrizzi, T., Garreaud, R., Gochis, D., Gutzler, D., Lettenmaier, D., Marengo, J., Mechoso, C. R., Nogues-Paegle, J., Dias, P. L. S., & Zhang, C. (2006). Toward a Unified View of the American Monsoon Systems. Journal of Climate, 19(20), 4977–5000. https://doi.org/10.1175/JCLI3896.1

Wang, B., Biasutti, M., Byrne, M. P., Castro, C., Chang, C.-P., Cook, K., Fu, R., Grimm, A. M., Ha, K.-J., Hendon, H., Kitoh, A., Krishnan, R., Lee, J.-Y., Li, J., Liu, J., Moise, A., Pascale, S., Roxy, M. K., Seth, A., … Zhou, T. (2021). Monsoons Climate Change Assessment. Bulletin of the American Meteorological Society, 102(1), E1–E19. https://doi.org/10.1175/BAMS-D-19-0335.1

Wang, B., & Ding, Q. (2008). Global monsoon: Dominant mode of annual variation in the tropics. Dynamics of Atmospheres and Oceans, 44(3), 165–183. https://doi.org/10.1016/j.dynatmoce.2007.05.002

Wang, B., Jin, C., & Liu, J. (2020). Understanding Future Change of Global Monsoons Projected by CMIP6 Models. Journal of Climate, 33(15), 6471–6489. https://doi.org/10.1175/JCLI-D-19-0993.1

Wang, B., Liu, J., Kim, H.-J., Webster, P. J., & Yim, S.-Y. (2012). Recent change of the global monsoon precipitation (1979–2008). Climate Dynamics, 39(5), 1123–1135. https://doi.org/10.1007/s00382-011-1266-z

Wang, G., Eltahir, E. A. B., Foley, J. A., Pollard, D., & Levis, S. (2004). Decadal variability of rainfall in the Sahel: Results from the coupled GENESIS-IBIS atmosphere-biosphere model. Climate Dynamics, 22(6), 625–637. https://doi.org/10.1007/s00382-004-0411-3

Wang, S., Foster, A., Lenz, E. A., Kessler, J. D., Stroeve, J. C., Anderson, L. O., Turetsky, M., Betts, R., Zou, S., Liu, W., Boos, W. R., & Hausfather, Z. (2023). Mechanisms and Impacts of Earth System

Tipping Elements. Reviews of Geophysics, 61(1), e2021RG000757. https://doi.org/10.1029/2021RG000757
Wara, M. W., Ravelo, A. C., & Delaney, M. L. (2005). Permanent El Niño-like conditions during the Pliocene warm period. Science (New York, N.Y.), 309(5735), 758–761. https://doi.org/10.1126/science.1112596
Weijer, W., Cheng, W., Drijfhout, S. S., Fedorov, A. V., Hu, A., Jackson, L. C., Liu, W., McDonagh, E. L., Mecking, J. V., & Zhang, J. (2019). Stability of the Atlantic Meridional Overturning Circulation: A Review and Synthesis. Journal of Geophysical Research: Oceans, 124(8), 5336–5375. https://doi.org/10.1029/2019JC015083
White, R. H., Kornhuber, K., Martius, O., & Wirth, V. (2022). From Atmospheric Waves to Heatwaves: A Waveguide Perspective for Understanding and Predicting Concurrent, Persistent, and Extreme Extratropical Weather. Bulletin of the American Meteorological Society, 103(3), E923–E935. https://doi.org/10.1175/BAMS-D-21-0170.1
Wieners, C. E., Dijkstra, H. A., & de Ruijter, W. P. M. (2019). The interaction between the Western Indian Ocean and ENSO in CESM. Climate Dynamics, 52(9), 5153–5172. https://doi.org/10.1007/s00382-018-4438-2
Wills, R. C. J., Dong, Y., Proistosecu, C., Armour, K. C., & Battisti, D. S. (2022). Systematic Climate Model Biases in the Large-Scale Patterns of Recent Sea-Surface Temperature and Sea-Level Pressure Change. Geophysical Research Letters, 49(17), e2022GL100011. https://doi.org/10.1029/2022GL100011
Wirth, V., & Polster, C. (2021). The Problem of Diagnosing Jet Waveguidability in the Presence of Large-Amplitude Eddies. Journal of the Atmospheric Sciences, 78(10), 3137–3151. https://doi.org/10.1175/JAS-D-20-0292.1
Wood, R. A., Rodríguez, J. M., Smith, R. S., Jackson, L. C., & Hawkins, E. (2019). Observable, low-order dynamical controls on thresholds of the Atlantic meridional overturning circulation. Climate Dynamics, 53(11), 6815–6834. https://doi.org/10.1007/s00382-019-04956-1
World Meteorological Organization declares onset of El Niño conditions. (2023, July 3). https://public.wmo.int/en/media/press-release/world-meteorological-organization-declares-onset-of-el-ni%C3%B1o-conditions
Xie, S.-P., Deser, C., Vecchi, G. A., Ma, J., Teng, H., & Wittenberg, A. T. (2010). Global Warming Pattern Formation: Sea Surface Temperature and Rainfall. Journal of Climate, 23(4), 966–986. https://doi.org/10.1175/2009JCLI3329.1
Xue, Y. (1997). Biosphere feedback on regional climate in tropical North Africa. Quarterly Journal of the Royal Meteorological Society, 123(542), 1483–1515. https://doi.org/10.1002/qj.49712354203
Yan, M., & Liu, J. (2019). Physical processes of cooling and mega-drought during the 4.2 ka BP event: Results from TraCE-21ka simulations. Climate of the Past, 15(1), 265–277. https://doi.org/10.5194/cp-15-265-2019
Yashayaev, I., & Loder, J. W. (2016). Recurrent replenishment of Labrador Sea Water and associated decadal-scale variability. Journal of Geophysical Research: Oceans, 121(11), 8095–8114. https://doi.org/10.1002/2016JC012046
Yool, A., Popova, E. E., & Coward, A. C. (2015). Future change in ocean productivity: Is the Arctic the new Atlantic? Journal of Geophysical Research: Oceans, 120(12), 7771–7790. https://doi.org/10.1002/2015JC011167
Zappa, G., & Shepherd, T. G. (2017). Storylines of Atmospheric Circulation Change for European Regional Climate Impact Assessment. Journal of Climate, 30(16), 6561–6577. https://doi.org/10.1175/JCLI-D-16-0807.1
Zeng, N., Neelin, J. D., Lau, K.-M., & Tucker, C. J. (1999). Enhancement of Interdecadal Climate Variability in the Sahel by Vegetation Interaction. Science, 286(5444), 1537–1540. https://doi.org/10.1126/science.286.5444.1537
Zhang, P., Jeong, J.-H., Yoon, J.-H., Kim, H., Wang, S.-Y. S., Linderholm, H. W., Fang, K., Wu, X., & Chen, D. (2020). Abrupt shift to hotter and drier climate over inner East Asia beyond the tipping point. Science, 370(6520), 1095–1099. https://doi.org/10.1126/science.abb3368
Zhang, R., & Thomas, M. (2021). Horizontal circulation across density surfaces contributes substantially to the long-term mean northern Atlantic Meridional Overturning Circulation. Communications Earth & Environment, 2(1), Article 1. https://doi.org/10.1038/s43247-021-00182-y
Zhao, C., Liu, X., Ruby Leung, L., & Hagos, S. (2011). Radiative impact of mineral dust on monsoon precipitation variability over West Africa. Atmospheric Chemistry and Physics, 11(5), 1879–1893. https://doi.org/10.5194/acp-11-1879-2011
Zhou, J., & Lau, K.-M. (1998). Does a Monsoon Climate Exist over South America? Journal of Climate, 11(5), 1020–1040. https://doi.org/10.1175/1520-0442(1998)011<1020:DAMCEO>2.0.CO;2
Zhu, C., Liu, Z., Zhang, S., & Wu, L. (2023). Likely accelerated weakening of Atlantic overturning circulation emerges in optimal salinity fingerprint. Nature Communications, 14(1), Article 1. https://doi.org/10.1038/s41467-023-36288-4
Zickfeld, K., Knopf, B., Petoukhov, V., & Schellnhuber, H. J. (2005). Is the Indian summer monsoon stable against global change? Geophysical Research Letters, 32(15). https://doi.org/10.1029/2005GL022771
Zika, J. D., Skliris, N., Blaker, A. T., Marsh, R., Nurser, A. J. G., & Josey, S. A. (2018). Improved estimates of water cycle change from ocean salinity: The key role of ocean warming. Environmental Research Letters, 13(7), 074036. https://doi.org/10.1088/1748-9326/aace42

Chapter 1.5 References

Armstrong McKay, D.I., Staal, A., Abrams, J.F., Winkelmann, R., Sakschewski, B., Loriani, S., Fetzer, I., Cornell, S.E., Rockström, J. and Lenton, T.M. (2022) 'Exceeding 1.5 C global warming could trigger multiple climate tipping points', Science, 377(6611), p. Eabn7950. https://doi.org/10.1126/science.abn7950
Årthun, M., Eldevik, T., Smedsrud, L., Skagseth, Ø. and Ingvaldsen, R. (2012) 'Quantifying the influence of Atlantic heat on Barents Sea ice variability and retreat', Journal of Climate, 25(13), pp. 4736–4743. https://doi.org/10.1175/JCLI-D-11-00466.1
Ayarzagüena, B., Ineson, S., Dunstone, N.J., Baldwin, M.P. and Scaife, A.A. (2018) 'Intraseasonal effects of el niño–southern oscillation on North Atlantic climate', Journal of Climate, 31(21), pp. 8861–8873. https://doi.org/10.1175/JCLI-D-18-0097.1
Bakker, P., Schmittner, A., Lenaerts, J., Abe-Ouchi, A., Bi, D., van den Broeke, M., Chan, W.-L., Hu, A., Beadling, R., Marsland, S., and others (2016) 'Fate of the Atlantic Meridional Overturning Circulation: Strong decline under continued warming and Greenland melting', Geophysical Research Letters, 43(23), pp. 12–252. https://doi.org/10.1002/2016GL070457
Barker, S., Chen, J., Gong, X., Jonkers, L., Knorr, G. and Thornalley, D. (2015) 'Icebergs not the trigger for North Atlantic cold events', Nature, 520(7547), pp. 333–336. https://doi.org/10.1038/nature14330
Barker, S. and Knorr, G. (2007) 'Antarctic climate signature in the Greenland ice core record', Proceedings of the National Academy of Sciences, 104(44), pp. 17278–17282. https://doi.org/10.1073/pnas.0708494104
Barker, S. and Knorr, G. (2016) 'A paleo-perspective on the AMOC as a tipping element', PAGES Magazine, 24(1), pp. 14–15. https://doi.org/10.22498/pages.24.1.14
Barker, S. and Knorr, G. (2021) 'Millennial scale feedbacks determine the shape and rapidity of glacial termination', Nature Communications, 12(1), p. 2273. https://doi.org/10.1038/s41467-021-22388-6
Bastiaansen, R., Doelman, A., Eppinga, M.B. and Rietkerk, M. (2020) 'The effect of climate change on the resilience of ecosystems with adaptive spatial pattern formation', Ecology Letters, 23(3), pp. 414–429. https://doi.org/10.1111/ele.13449
Baudena, M., Tuinenburg, O.A., Ferdinand, P.A. and Staal, A. (2021) 'Effects of land-use change in the Amazon on precipitation are likely underestimated', Global Change Biology, 27(21), pp. 5580–5587. https://doi.org/10.1111/gcb.15810
Bellomo, K., Meccia, V.L., D'Agostino, R., Fabiano, F., Larson, S.M., von Hardenberg, J. and Corti, S. (2023) 'Impacts of a weakened AMOC on precipitation over the Euro-Atlantic region in the EC-Earth3 climate model', Climate Dynamics, pp. 1–20. https://doi.org/10.1007/s00382-023-06754-2

Berk, J. van den, Drijfhout, S. and Hazeleger, W. (2021) 'Circulation adjustment in the Arctic and Atlantic in response to Greenland and Antarctic mass loss', Climate Dynamics, 57(7–8), pp. 1689–1707. https://doi.org/10.1007/s00382-021-05755-3

Boulton, C.A., Lenton, T.M. and Boers, N. (2022) 'Pronounced loss of Amazon rainforest resilience since the early 2000s', Nature Climate Change, 12(3), pp. 271–278. https://doi.org/10.1038/s41558-022-01287-8

Brönnimann, S., Xoplaki, E., Casty, C., Pauling, A. and Luterbacher, J. (2007) 'ENSO influence on Europe during the last centuries', Climate Dynamics, 28, pp. 181–197. https://doi.org/10.1007/s00382-006-0175-z

Brovkin, V., Brook, E., Williams, J.W., Bathiany, S., Lenton, T.M., Barton, M., DeConto, R.M., Donges, J.F., Ganopolski, A., McManus, J., and others (2021) 'Past abrupt changes, tipping points and cascading impacts in the Earth system', Nature Geoscience, 14(8), pp. 550–558. https://doi.org/10.1038/s41561-021-00790-5

Burke, K.D., Williams, J.W., Chandler, M.A., Haywood, A.M., Lunt, D.J. and Otto-Bliesner, B.L. (2018) 'Pliocene and Eocene provide best analogs for near-future climates', Proceedings of the National Academy of Sciences, 115(52), pp. 13288–13293. https://doi.org/10.1073/pnas.1809600115

Cai, W., Borlace, S., Lengaigne, M., Van Rensch, P., Collins, M., Vecchi, G., Timmermann, A., Santoso, A., McPhaden, M.J., Wu, L., and others (2014) 'Increasing frequency of extreme El Niño events due to greenhouse warming', Nature Climate Change, 4(2), pp. 111–116. https://doi.org/10.1038/nclimate2100

Cai, W., Santoso, A., Collins, M., Dewitte, B., Karamperidou, C., Kug, J.-S., Lengaigne, M., McPhaden, M.J., Stuecker, M.F., Taschetto, A.S., and others (2021) 'Changing El Niño–Southern oscillation in a warming climate', Nature Reviews Earth & Environment, 2(9), pp. 628–644. https://doi.org/10.1038/s43017-021-00199-z

Cai, W., Santoso, A., Wang, G., Yeh, S.-W., An, S.-I., Cobb, K.M., Collins, M., Guilyardi, E., Jin, F.-F., Kug, J.-S., and others (2015) 'ENSO and greenhouse warming', Nature Climate Change, 5(9), pp. 849–859. https://doi.org/10.1038/nclimate2743

Campos, M.C., Chiessi, C.M., Prange, M., Mulitza, S., Kuhnert, H., Paul, A., Venancio, I.M., Albuquerque, A.L.S., Cruz, F.W. and Bahr, A. (2019) 'A new mechanism for millennial scale positive precipitation anomalies over tropical South America', Quaternary Science Reviews, 225, p. 105990. https://doi.org/10.1016/j.quascirev.2019.105990

Casas-Prat, M. and Wang, X.L. (2020) 'Projections of extreme ocean waves in the Arctic and potential implications for coastal inundation and erosion', Journal of Geophysical Research: Oceans, 125(8), p. e2019JC015745. https://doi.org/10.1029/2019JC015745

Chemison, A., Defrance, D., Ramstein, G. and Caminade, C. (2022) 'Impact of an acceleration of ice sheet melting on monsoon systems', Earth System Dynamics, 13(3), pp. 1259–1287. https://doi.org/10.5194/esd-13-1259-2022

Chemke, R., Ming, Y. and Yuval, J. (2022) 'The intensification of winter mid-latitude storm tracks in the Southern Hemisphere', Nature Climate Change, 12(6), pp. 553–557. https://doi.org/10.1038/s41558-022-01368-8

Cheng, H., Edwards, R.L., Sinha, A., Spötl, C., Yi, L., Chen, S., Kelly, M., Kathayat, G., Wang, X., Li, X., and others (2016) 'The Asian monsoon over the past 640,000 years and ice age terminations', Nature, 534(7609), pp. 640–646. https://doi.org/10.1038/nature18591

Chiessi, C.M., Mulitza, S., Paul, A., Pätzold, J., Groeneveld, J. and Wefer, G. (2008) 'South Atlantic interocean exchange as the trigger for the Bølling warm event', Geology, 36(12), pp. 919–922. https://doi.org/10.1130/G24979A.1.

Ciemer, C., Winkelmann, R., Kurths, J. and Boers, N. (2021) 'Impact of an AMOC weakening on the stability of the southern Amazon rainforest', The European Physical Journal Special Topics, 230, pp. 3065--3073. https://doi.org/10.1140/epjs/s11734-021-00186-x

Clement, A.C. and Peterson, L.C. (2008) 'Mechanisms of abrupt climate change of the last glacial period', Reviews of Geophysics, 46(4). https://doi.org/10.1029/2006RG000204

Cobb, K.M., Westphal, N., Sayani, H.R., Watson, J.T., Di Lorenzo, E., Cheng, H., Edwards, R. and Charles, C.D. (2013) 'Highly variable el Niño–southern oscillation throughout the holocene', Science (New York, N.Y.), 339(6115), pp. 67–70. https://doi.org/10.1126/science.1228246

Coxall, H.K., Huck, C.E., Huber, M., Lear, C.H., Legarda-Lisarri, A., O'regan, M., Sliwinska, K.K., Van De Flierdt, T., De Boer, A.M., Zachos, J.C., and others (2018) 'Export of nutrient rich northern component water preceded early oligocene antarctic glaciation', Nature Geoscience, 11(3), pp. 190–196. https://doi.org/10.1038/s41561-018-0069-9

Coxall, H.K., Wilson, P.A., Pälike, H., Lear, C.H. and Backman, J. (2005) 'Rapid stepwise onset of Antarctic glaciation and deeper calcite compensation in the Pacific Ocean', Nature, 433(7021), pp. 53–57. https://doi.org/10.1038/nature03135

Crawford, A., Stroeve, J., Smith, A. and Jahn, A. (2021) 'Arctic open-water periods are projected to lengthen dramatically by 2100', Communications Earth & Environment, 2(1), p. 109. https://doi.org/10.1038/s43247-021-00183-x

Daron, J.D. and Stainforth, D.A. (2013) 'On predicting climate under climate change', Environmental Research Letters, 8(3), p. 034021. https://doi.org/10.1088/1748-9326/8/3/034021

Deb, P., Orr, A., Bromwich, D.H., Nicolas, J.P., Turner, J. and Hosking, J.S. (2018) 'Summer drivers of atmospheric variability affecting ice shelf thinning in the Amundsen Sea Embayment, West Antarctica', Geophysical Research Letters, 45(9), pp. 4124–4133. https://doi.org/10.1029/2018GL077092

Defrance, D., Ramstein, G., Charbit, S., Vrac, M., Famien, A.M., Sultan, B., Swingedouw, D., Dumas, C., Gemenne, F., Alvarez-Solas, J., and others (2017) 'Consequences of rapid ice sheet melting on the Sahelian population vulnerability', Proceedings of the National Academy of Sciences, 114(25), pp. 6533–6538. https://doi.org/10.1073/pnas.1619358114

Dekker, M.M., von Der Heydt, A.S. and Dijkstra, H.A. (2018) 'Cascading transitions in the climate system', Earth System Dynamics, 9(4), pp. 1243–1260. https://doi.org/10.5194/esd-9-1243-2018

Delworth, T.L., Zeng, F., Vecchi, G.A., Yang, X., Zhang, L. and Zhang, R. (2016) 'The North Atlantic Oscillation as a driver of rapid climate change in the Northern Hemisphere', Nature Geoscience, 9(7), pp. 509–512. https://doi.org/10.1038/ngeo2738

Docquier, D. and Koenigk, T. (2021) 'A review of interactions between ocean heat transport and Arctic sea ice', Environmental Research Letters, 16(12), p. 123002. https://doi.org/10.1088/1748-9326/ac30be

Drüke, M., von Bloh, W., Petri, S., Sakschewski, B., Schaphoff, S., Forkel, M., Huiskamp, W., Feulner, G. and Thonicke, K. (2021) 'CM2Mc-LPJmL v1. 0: biophysical coupling of a process-based dynamic vegetation model with managed land to a general circulation model', Geoscientific Model Development, 14(6), pp. 4117–4141. https://doi.org/10.5194/gmd-14-4117-2021

Duque-Villegas, M., Salazar, J.F. and Rendón, A.M. (2019) 'Tipping the ENSO into a permanent El-Niño can trigger state transitions in global terrestrial ecosystems.', Earth System Dynamics, 10(4). https://doi.org/10.5194/esd-10-631-2019

Favier, L., Durand, G., Cornford, S.L., Gudmundsson, G.H., Gagliardini, O., Gillet-Chaulet, F., Zwinger, T., Payne, A. and Le Brocq, A.M. (2014) 'Retreat of Pine Island Glacier controlled by marine ice-sheet instability', Nature Climate Change, 4(2), pp. 117–121. https://doi.org/10.1038/nclimate2094

Fletcher, W.J., Goni, M.F.S., Allen, J.R., Cheddadi, R., Combourieu-Nebout, N., Huntley, B., Lawson, I., Londeix, L., Magri, D., Margari, V., and others (2010) 'Millennial-scale variability during the last glacial in vegetation records from Europe', Quaternary Science Reviews, 29(21–22), pp. 2839–2864. https://doi.org/10.1016/j.quascirev.2009.11.015

Frieler, K., Meinshausen, M., Golly, A., Mengel, M., Lebek, K., Donner, S. and Hoegh-Guldberg, O. (2013) 'Limiting global warming to 2 C is unlikely to save most coral reefs', Nature Climate Change, 3(2), pp. 165–170. https://doi.org/10.1038/nclimate1674

Ganopolski, A. and Rahmstorf, S. (2001) 'Rapid changes of glacial climate simulated in a coupled climate model', Nature, 409(6817), pp. 153–158. https://doi.org/10.1038/35051500

Gatti, L.V., Basso, L.S., Miller, J.B., Gloor, M., Gatti Domingues, L., Cassol, H.L., Tejada, G., Aragão, L.E., Nobre, C., Peters, W., and others (2021) 'Amazonia as a carbon source linked to deforestation

and climate change', Nature, 595(7867), pp. 388–393. https://doi.org/10.1038/s41586-021-03629-6
Gildor, H. and Tziperman, E. (2003) 'Sea-ice switches and abrupt climate change', Philosophical Transactions of the Royal Society of London. Series A: Mathematical, Physical and Engineering Sciences, 361(1810), pp. 1935–1944. https://doi.org/10.1098/rsta.2003.1244
Gomez, N., Weber, M.E., Clark, P.U., Mitrovica, J.X. and Han, H.K. (2020) 'Antarctic ice dynamics amplified by Northern Hemisphere sea-level forcing', Nature, 587(7835), pp. 600–604. https://doi.org/10.1038/s41586-020-2916-2
Grigoriev, M. (2019) 'Coastal retreat rates at the Laptev Sea key monitoring sites', PANGAEA. doi: https://doi. org/10.1594/PANGAEA, 905519. https://doi.org/10.1594/PANGAEA.905519
Häggi, C., Chiessi, C.M., Merkel, U., Mulitza, S., Prange, M., Schulz, M. and Schefuß, E. (2017) 'Response of the Amazon rainforest to late Pleistocene climate variability', Earth and Planetary Science Letters, 479, pp. 50–59. https://doi.org/10.1016/j.epsl.2017.09.013
Henry, L., McManus, J., Curry, W., Roberts, N., Piotrowski, A. and Keigwin, L. (2016) 'North Atlantic ocean circulation and abrupt climate change during the last glaciation', Science (New York, N.Y.), 353(6298), pp. 470–474. https://doi.org/10.1126/science.aaf5529
Hooker, J.J., Collinson, M.E. and Sille, N.P. (2004) 'Eocene–Oligocene mammalian faunal turnover in the Hampshire Basin, UK: calibration to the global time scale and the major cooling event', Journal of the Geological Society, 161(2), pp. 161–172. https://doi.org/10.1144/0016-764903-091
Hošeková, L., Eidam, E., Panteleev, G., Rainville, L., Rogers, W.E. and Thomson, J. (2021) 'Landfast ice and coastal wave exposure in northern Alaska', Geophysical Research Letters, 48(22), p. e2021GL095103. https://doi.org/10.1029/2021GL095103
Houk, P., Yalon, A., Maxin, S., Starsinic, C., McInnis, A., Gouezo, M., Golbuu, Y. and Van Woesik, R. (2020) 'Predicting coral-reef futures from el niño and pacific decadal oscillation events', Scientific Reports, 10(1), p. 7735. https://doi.org/10.1038/s41598-020-64411-8
Hughes, T.P., Anderson, K.D., Connolly, S.R., Heron, S.F., Kerry, J.T., Lough, J.M., Baird, A.H., Baum, J.K., Berumen, M.L., Bridge, T.C., and others (2018) 'Spatial and temporal patterns of mass bleaching of corals in the Anthropocene', Science (New York, N.Y.), 359(6371), pp. 80–83. https://doi.org/10.1126/science.aan8048
Hughes, T.P., Carpenter, S., Rockström, J., Scheffer, M. and Walker, B. (2013) 'Multiscale regime shifts and planetary boundaries', Trends in Ecology & Evolution, 28(7), pp. 389–395. https://doi.org/10.1016/j.tree.2013.05.019
Hutchinson, D.K., Coxall, H.K., Lunt, D.J., Steinthorsdottir, M., De Boer, A.M., Baatsen, M., von der Heydt, A., Huber, M., Kennedy-Asser, A.T., Kunzmann, L., and others (2020) 'The Eocene-Oligocene transition: a review of marine and terrestrial proxy data, models and model-data comparisons', Climate of the Past Discussions, 2020, pp. 1–71. https://doi.org/10.5194/cp-17-269-2021
Irrgang, A.M., Bendixen, M., Farquharson, L.M., Baranskaya, A.V., Erikson, L.H., Gibbs, A.E., Ogorodov, S.A., Overduin, P.P., Lantuit, H., Grigoriev, M.N., and others (2022) 'Drivers, dynamics and impacts of changing Arctic coasts', Nature Reviews Earth & Environment, 3(1), pp. 39–54. https://doi.org/10.1038/s43017-021-00232-1
Jackson, L., Kahana, R., Graham, T., Ringer, M., Woollings, T., Mecking, J. and Wood, R. (2015) 'Global and European climate impacts of a slowdown of the AMOC in a high resolution GCM', Climate Dynamics, 45(11), pp. 3299–3316. https://doi.org/10.1007/s00382-015-2540-2
Jackson, L.C. and Wood, R.A. (2018) 'Timescales of AMOC decline in response to fresh water forcing', Climate Dynamics, 51(4), pp. 1333–1350. https://doi.org/10.1007/s00382-017-3957-6
Jehn, F.U., Schneider, M., Wang, J.R., Kemp, L. and Breuer, L. (2021) 'Betting on the best case: Higher end warming is underrepresented in research', Environmental Research Letters, 16(8), p. 084036. https://doi.org/10.1088/1748-9326/ac13ef
Jiménez-Muñoz, J.C., Mattar, C., Barichivich, J., Santamaría-Artigas, A., Takahashi, K., Malhi, Y., Sobrino, J.A. and Schrier, G. van der (2016) 'Record-breaking warming and extreme drought in the Amazon rainforest during the course of El Niño 2015–2016', Scientific Reports, 6(1), p. 33130. https://doi.org/10.1038/srep33130
Joughin, I., Smith, B.E. and Medley, B. (2014) 'Marine ice sheet collapse potentially under way for the Thwaites Glacier Basin, West Antarctica', Science (New York, N.Y.), 344(6185), pp. 735–738. https://doi.org/10.1126/science.1249055
Kanner, L.C., Burns, S.J., Cheng, H. and Edwards, R.L. (2012) 'High-latitude forcing of the South American summer monsoon during the last glacial', Science (New York, N.Y.), 335(6068), pp. 570–573. https://doi.org/10.1126/science.1213397
Kemp, L., Xu, C., Depledge, J., Ebi, K.L., Gibbins, G., Kohler, T.A., Rockström, J., Scheffer, M., Schellnhuber, H.J., Steffen, W., and others (2022) 'Climate Endgame: Exploring catastrophic climate change scenarios', Proceedings of the National Academy of Sciences, 119(34), p. E2108146119. https://doi.org/10.1073/pnas.2108146119
Kim, H.-J., An, S.-I., Park, J.-H., Sung, M.-K., Kim, D., Choi, Y. and Kim, J.-S. (2023) 'North Atlantic Oscillation impact on the Atlantic Meridional Overturning Circulation shaped by the mean state', npj Climate and Atmospheric Science, 6(1), p. 25. https://doi.org/10.1038/s41612-023-00354-x
Kleinen, T., Gromov, S., Steil, B. and Brovkin, V. (2023) 'Atmospheric methane since the last glacial maximum was driven by wetland sources', Climate of the Past, 19(5), pp. 1081–1099. https://doi.org/10.5194/cp-19-1081-2023
Klose, A.K., Karle, V., Winkelmann, R. and Donges, J.F. (2020) 'Emergence of cascading dynamics in interacting tipping elements of ecology and climate', Royal Society Open Science, 7(6), p. 200599. https://doi.org/10.1098/rsos.200599
Klose, A.K., Wunderling, N., Winkelmann, R. and Donges, J.F. (2021) 'What do we mean,"tipping cascade"?', Environmental Research Letters, 16(12), p. 125011. https://doi.org/10.1088/1748-9326/ac3955
Knorr, G. and Lohmann, G. (2007) 'Rapid transitions in the Atlantic thermohaline circulation triggered by global warming and meltwater during the last deglaciation', Geochemistry, Geophysics, Geosystems, 8(12). https://doi.org/10.1029/2007GC001604
Köhler, P., Knorr, G. and Bard, E. (2014) 'Permafrost thawing as a possible source of abrupt carbon release at the onset of the Bølling/Allerød', Nature Communications, 5(1), p. 5520. https://doi.org/10.1038/ncomms6520
Kopp, R.E., Mitrovica, J.X., Griffies, S.M., Yin, J., Hay, C.C. and Stouffer, R.J. (2010) 'The impact of Greenland melt on local sea levels: a partially coupled analysis of dynamic and static equilibrium effects in idealized water-hosing experiments: a letter', Climatic Change, 103, pp. 619–625. https://doi.org/10.1007/s10584-010-9935-1
Krawczyk, H., Zinke, J., Browne, N., Struck, U., McIlwain, J., O'Leary, M. and Garbe-Schönberg, D. (2020) 'Corals reveal ENSO-driven synchrony of climate impacts on both terrestrial and marine ecosystems in northern Borneo', Scientific Reports, 10(1), p. 3678. https://doi.org/10.1038/s41598-020-60525-1
Kretschmer, M., Coumou, D., Donges, J.F. and Runge, J. (2016) 'Using causal effect networks to analyze different Arctic drivers of midlatitude winter circulation', Journal of Climate, 29(11), pp. 4069–4081. https://doi.org/10.1175/JCLI-D-15-0654.1
Kriegler, E., Hall, J.W., Held, H., Dawson, R. and Schellnhuber, H.J. (2009) 'Imprecise probability assessment of tipping points in the climate system', Proceedings of the National Academy of Sciences, 106(13), pp. 5041–5046. https://doi.org/10.1073/pnas.0809117106
Kukla, T., Ahlström, A., Maezumi, S.Y., Chevalier, M., Lu, Z., Winnick, M.J. and Chamberlain, C.P. (2021) 'The resilience of Amazon tree cover to past and present drying', Global and Planetary Change, 202, p. 103520. https://doi.org/10.1016/j.gloplacha.2021.103520
Le Nohaïc, M., Ross, C.L., Cornwall, C.E., Comeau, S., Lowe, R., McCulloch, M.T. and Schoepf, V. (2017) 'Marine heatwave causes unprecedented regional mass bleaching of thermally resistant corals in northwestern Australia', Scientific Reports, 7(1), p. 14999. https://doi.org/10.1038/s41598-017-14794-y
Lear, C.H., Bailey, T.R., Pearson, P.N., Coxall, H.K. and Rosenthal, Y. (2008) 'Cooling and ice growth across the Eocene-Oligocene transition', Geology, 36(3), pp. 251–254. https://doi.org/10.1130/G24584A.1
Lee, J.-Y., Marotzke, J., Bala, G., Cao, L., Corti, S., Dunne, J.P., Engelbrecht, F., Fischer, E., Fyfe, J.C., Jones, C., and others (2021)

Future global climate: scenario-based projections and near-term information (pp. 553-672). Cambridge University Press. https://doi.org/10.1017/9781009157896.006

Lenton, T.M., Rockström, J., Gaffney, O., Rahmstorf, S., Richardson, K., Steffen, W. and Schellnhuber, H.J. (2019) 'Climate tipping points—too risky to bet against', Nature, 575, pp. 592–595. https://doi.org/10.1038/d41586-019-03595-0

Li, C., Battisti, D.S. and Bitz, C.M. (2010) 'Can North Atlantic sea ice anomalies account for Dansgaard–Oeschger climate signals?', Journal of Climate, 23(20), pp. 5457–5475. https://doi.org/10.1175/2010JCLI3409.1

Li, Q., Marshall, J., Rye, C.D., Romanou, A., Rind, D. and Kelley, M. (2023) 'Global climate impacts of greenland and antarctic meltwater: A comparative study', Journal of Climate, 36(11), pp. 3571–3590. https://doi.org/10.1175/JCLI-D-22-0433.1

Liljedahl, A.K., Boike, J., Daanen, R.P., Fedorov, A.N., Frost, G.V., Grosse, G., Hinzman, L.D., Iijma, Y., Jorgenson, J.C., Matveyeva, N., and others (2016) 'Pan-Arctic ice-wedge degradation in warming permafrost and its influence on tundra hydrology', Nature Geoscience, 9(4), pp. 312–318. https://doi.org/10.1038/ngeo2674

Liu, T., Chen, Dean, Yang, L., Meng, J., Wang, Z., Ludescher, J., Fan, J., Yang, S., Chen, Deliang, Kurths, J., and others (2023) 'Teleconnections among tipping elements in the Earth system', Nature Climate Change, 13(1), pp. 67–74. https://doi.org/10.1038/s41558-022-01558-4

Liu, W., Fedorov, A.V., Xie, S.-P. and Hu, S. (2020) 'Climate impacts of a weakened atlantic meridional overturning circulation in a warming climate', Science Advances, 6(26), p. Eaaz4876. https://doi.org/10.1126/sciadv.aaz4876

Liu, Z., Otto-Bliesner, B., He, F., Brady, E., Tomas, R., Clark, P., Carlson, A., Lynch-Stieglitz, J., Curry, W., Brook, E., and others (2009) 'Transient simulation of last deglaciation with a new mechanism for Bølling-Allerød warming', Science (New York, N.Y.), 325(5938), pp. 310–314. https://doi.org/10.1126/science.1171041

Lohmann, J. (2019) 'Prediction of dansgaard-oeschger events from greenland dust records', Geophysical Research Letters, 46(21), pp. 12427–12434. https://doi.org/10.1029/2019GL085133

Lohmann, J. and Ditlevsen, P.D. (2021) 'Risk of tipping the overturning circulation due to increasing rates of ice melt', Proceedings of the National Academy of Sciences, 118(9), p. E2017989118. https://doi.org/10.1073/pnas.2017989118

Lough, J., Anderson, K. and Hughes, T. (2018) 'Increasing thermal stress for tropical coral reefs: 1871–2017', Scientific Reports, 8(1), p. 6079. https://doi.org/10.1038/s41598-018-24530-9

Lovejoy, T.E. and Nobre, C. (2018) 'Amazon tipping point', Science Advances, 4(2), p. Eaat2340. https://doi.org/10.1126/sciadv.aat2340

MacAyeal, D.R. (1993) 'Binge/purge oscillations of the Laurentide ice sheet as a cause of the North Atlantic's Heinrich events', Paleoceanography, 8(6), pp. 775–784. https://doi.org/10.1029/93PA02200

Mahendra, N., Chowdary, J.S., Darshana, P., Sunitha, P., Parekh, A. and Gnanaseelan, C. (2021) 'Interdecadal modulation of interannual ENSO-Indian summer monsoon rainfall teleconnections in observations and CMIP6 models: Regional patterns', International Journal of Climatology, 41(4), pp. 2528–2552. https://doi.org/10.1002/joc.6973

Manabe, S. and Stouffer, R.J. (1995) 'Simulation of abrupt climate change induced by freshwater input to the North Atlantic Ocean', Nature, 378(6553), pp. 165–167. https://doi.org/10.1038/378165a0

Marcott, S.A., Bauska, T.K., Buizert, C., Steig, E.J., Rosen, J.L., Cuffey, K.M., Fudge, T., Severinghaus, J.P., Ahn, J., Kalk, M.L., and others (2014) 'Centennial-scale changes in the global carbon cycle during the last deglaciation', Nature, 514(7524), pp. 616–619. https://doi.org/10.1038/nature13799

Martrat, B., Grimalt, J.O., Shackleton, N.J., de Abreu, L., Hutterli, M.A. and Stocker, T.F. (2007) 'Four climate cycles of recurring deep and surface water destabilizations on the Iberian margin', Science (New York, N.Y.), 317(5837), pp. 502–507. https://doi.org/10.1126/science.1139994

Masson-Delmotte, V.P., Zhai, A., Pirani, S.L., Connors, C., Péan, S., Berger, N., Caud, Y., Chen, L., Goldfarb, M.I., Gomis, M., Huang, K., Leitzell, E., Lonnoy, J.B.R., Matthews, T.K., Maycock, T., Waterfield, O., Yelekci, R.Y. and Zhou, B. (eds.) (2021) Climate change 2021: The physical science basis. Contribution of working group I to the sixth assessment report of the intergovernmental panel on climate change. Cambridge University Press. https://doi.org/10.1017/9781009157896

McGowan, H. and Theobald, A. (2023) 'Atypical weather patterns cause coral bleaching on the Great Barrier Reef, Australia during the 2021–2022 La Niña', Scientific Reports, 13(1), p. 6397. https://doi.org/10.1038/s41598-023-33613-1

McManus, J.F., Francois, R., Gherardi, J.-M., Keigwin, L.D. and Brown-Leger, S. (2004) 'Collapse and rapid resumption of Atlantic meridional circulation linked to deglacial climate changes', Nature, 428(6985), pp. 834–837. https://doi.org/10.1038/nature02494

McPhaden, M.J., Zebiak, S.E. and Glantz, M.H. (2006) 'ENSO as an integrating concept in earth science', Science (New York, N.Y.), 314(5806), pp. 1740–1745. https://doi.org/10.1126/science.1132588

Mecking, J., Drijfhout, S.S., Jackson, L.C. and Graham, T. (2016) 'Stable AMOC off state in an eddy-permitting coupled climate model', Climate Dynamics, 47, pp. 2455–2470. https://doi.org/10.1007/s00382-016-2975-0

Mitrovica, J.X., Gomez, N. and Clark, P.U. (2009) 'The sea-level fingerprint of West Antarctic collapse', Science (New York, N.Y.), 323(5915), pp. 753–753. https://doi.org/10.1126/science.1166510

Muñiz-Castillo, A.I., Rivera-Sosa, A., Chollett, I., Eakin, C.M., Andrade-Gómez, L., McField, M. and Arias-González, J.E. (2019) 'Three decades of heat stress exposure in Caribbean coral reefs: a new regional delineation to enhance conservation', Scientific Reports, 9(1), p. 11013. https://doi.org/10.1038/s41598-019-47307-0

Murphy, J.M., Sexton, D.M., Barnett, D.N., Jones, G.S., Webb, M.J., Collins, M. and Stainforth, D.A. (2004) 'Quantification of modelling uncertainties in a large ensemble of climate change simulations', Nature, 430(7001), pp. 768–772. https://doi.org/10.1038/nature02771

Nian, D., Bathiany, S., Ben-Yami, M., Blaschke, L., Hirota, M., Rodrigues, R. and Boers, N. (2023) 'The combined impact of global warming and AMOC collapse on the Amazon Rainforest', ResearchSquare [preprint], https://www.researchsquare.com/article/rs-2673317/ https://www.researchsquare.com/article/rs-2673317/v1[Preprint]. https://doi.org/10.21203/rs.3.rs-2673317/v1

Nicolas, J.P., Vogelmann, A.M., Scott, R.C., Wilson, A.B., Cadeddu, M.P., Bromwich, D.H., Verlinde, J., Lubin, D., Russell, L.M., Jenkinson, C., and others (2017) 'January 2016 extensive summer melt in West Antarctica favoured by strong El Niño', Nature Communications, 8(1), p. 15799. https://doi.org/10.1038/ncomms15799

Niederdrenk, A.L. and Notz, D. (2018) 'Arctic sea ice in a 1.5°C warmer world', Geophysical Research Letters, 45(4), pp. 1963–1971. https://doi.org/10.1002/2017GL076159

Nielsen, D.M., Dobrynin, M., Baehr, J., Razumov, S. and Grigoriev, M. (2020) 'Coastal erosion variability at the southern Laptev Sea linked to winter sea ice and the Arctic Oscillation', Geophysical Research Letters, 47(5), p. e2019GL086876. https://doi.org/10.1029/2019GL086876

Nielsen, D.M., Pieper, P., Barkhordarian, A., Overduin, P., Ilyina, T., Brovkin, V., Baehr, J. and Dobrynin, M. (2022) 'Increase in Arctic coastal erosion and its sensitivity to warming in the twenty-first century', Nature Climate Change, 12(3), pp. 263–270. https://doi.org/10.1038/s41558-022-01281-0

Nilsson-Kerr, K., Anand, P., Sexton, P., Leng, M., Misra, S., Clemens, S. and Hammond, S. (2019) 'Role of Asian summer monsoon subsystems in the inter-hemispheric progression of deglaciation', Nature Geoscience, 12(4), pp. 290–295. https://doi.org/10.1038/s41561-019-0319-5

Nitzbon, J., Westermann, S., Langer, M., Martin, L.C., Strauss, J., Laboor, S. and Boike, J. (2020) 'Fast response of cold ice-rich permafrost in northeast Siberia to a warming climate', Nature Communications, 11(1), p. 2201. https://doi.org/10.1038/s41467-020-15725-8

Nobre, C.A., Sampaio, G., Borma, L.S., Castilla-Rubio, J.C., Silva, J.S. and Cardoso, M. (2016) 'Land-use and climate change risks in the Amazon and the need of a novel sustainable development paradigm', Proceedings of the National Academy of Sciences, 113(39), pp. 10759–10768. https://doi.org/10.1073/pnas.1605516113

North Greenland Ice Core Project members (NGRIP) (2004) 'High-resolution record of Northern Hemisphere climate extending into the last interglacial period', Nature, 431(7005), pp. 147–151. https://doi.org/10.1038/nature02805

Novello, V.F., Cruz, F.W., Vuille, M., Stríkis, N.M., Edwards, R.L., Cheng, H., Emerick, S., De Paula, M.S., Li, X., Barreto, E. de S., and others (2017) 'A high-resolution history of the south american monsoon from last glacial maximum to the holocene', Scientific Reports, 7(1), p. 44267. https://doi.org/10.1038/srep44267

Obura, D.O., Bigot, L. and Benzoni, F. (2018) 'Coral responses to a repeat bleaching event in Mayotte in 2010', PeerJ, 6, p. E5305. https://doi.org/10.7717/peerj.5305

Onarheim, I.H., Eldevik, T., Årthun, M., Ingvaldsen, R.B. and Smedsrud, L.H. (2015) 'Skillful prediction of Barents Sea ice cover', Geophysical Research Letters, 42(13), pp. 5364–5371. https://doi.org/10.1002/2015GL064359

Orihuela-Pinto, B., England, M.H. and Taschetto, A.S. (2022) 'Interbasin and interhemispheric impacts of a collapsed atlantic overturning circulation', Nature Climate Change, 12(6), pp. 558–565. https://doi.org/10.1038/s41558-022-01380-y

Palacio-Castro, A.M., Smith, T.B., Brandtneris, V., Snyder, G.A., van Hooidonk, R., Maté, J.L., Manzello, D., Glynn, P.W., Fong, P. and Baker, A.C. (2023) 'Increased dominance of heat-tolerant symbionts creates resilient coral reefs in near-term ocean warming', Proceedings of the National Academy of Sciences, 120(8), p. E2202388120. https://doi.org/10.1073/pnas.2202388120

Pandey, P., Dwivedi, S., Goswami, B. and Kucharski, F. (2020) 'A new perspective on ENSO-Indian summer monsoon rainfall relationship in a warming environment', Climate Dynamics, 55, pp. 3307–3326. https://doi.org/10.1007/s00382-020-05452-7

Pedersen, R.A. and Christensen, J.H. (2019) 'Attributing Greenland warming patterns to regional Arctic sea ice loss', Geophysical Research Letters, 46(17–18), pp. 10495–10503. https://doi.org/10.1029/2019GL083828

Pedro, J.B., Jochum, M., Buizert, C., He, F., Barker, S. and Rasmussen, S.O. (2018) 'Beyond the bipolar seesaw: Toward a process understanding of interhemispheric coupling', Quaternary Science Reviews, 192, pp. 27–46. https://doi.org/10.1016/j.quascirev.2018.05.005

Polyakov, I.V., Pnyushkov, A.V., Alkire, M.B., Ashik, I.M., Baumann, T.M., Carmack, E.C., Goszczko, I., Guthrie, J., Ivanov, V.V., Kanzow, T., and others (2017) 'Greater role for Atlantic inflows on sea-ice loss in the Eurasian Basin of the Arctic Ocean', Science (New York, N.Y.), 356(6335), pp. 285–291. https://doi.org/10.1126/science.aai8204

Pörtner, H.-O., Roberts, D.C., Masson-Delmotte, V., Zhai, P., Tignor, M., Poloczanska, E. and Weyer, N. (2019) 'The ocean and cryosphere in a changing climate', IPCC special report on the ocean and cryosphere in a changing climate, 1155. https://doi.org/10.1017/9781009157964

Prado, L.F., Wainer, I., Chiessi, C.M., Ledru, M.-P. and Turcq, B. (2013) 'A mid-Holocene climate reconstruction for eastern South America', Climate of the Past, 9(5), pp. 2117–2133. https://doi.org/10.5194/cp-9-2117-2013

Rietkerk, M., Bastiaansen, R., Banerjee, S., van de Koppel, J., Baudena, M. and Doelman, A. (2021) 'Evasion of tipping in complex systems through spatial pattern formation', Science (New York, N.Y.), 374(6564), p. Eabj0359. https://doi.org/10.1126/science.abj0359

Rocha, J.C., Peterson, G., Bodin, Ö. and Levin, S. (2018) 'Cascading regime shifts within and across scales', Science (New York, N.Y.), 362(6421), pp. 1379–1383. https://doi.org/10.1126/science.aat7850

Runge, J., Nowack, P., Kretschmer, M., Flaxman, S. and Sejdinovic, D. (2019) 'Detecting and quantifying causal associations in large nonlinear time series datasets', Science Advances, 5(11), p. Eaau4996. https://doi.org/10.1126/sciadv.aau4996

Runge, J., Petoukhov, V., Donges, J.F., Hlinka, J., Jajcay, N., Vejmelka, M., Hartman, D., Marwan, N., Paluš, M. and Kurths, J. (2015) 'Identifying causal gateways and mediators in complex spatio-temporal systems', Nature Communications, 6(1), pp. 1–10. https://doi.org/10.1038/ncomms9502

Ruth, U., Bigler, M., Röthlisberger, R., Siggaard-Andersen, M.-L., Kipfstuhl, S., Goto-Azuma, K., Hansson, M.E., Johnsen, S.J., Lu, H. and Steffensen, J.P. (2007) 'Ice core evidence for a very tight link between North Atlantic and east Asian glacial climate', Geophysical Research Letters, 34(3). https://doi.org/10.1029/2006GL027876

Sadai, S., Condron, A., DeConto, R. and Pollard, D. (2020) 'Future climate response to Antarctic Ice Sheet melt caused by anthropogenic warming', Science Advances, 6(39), p. Eaaz1169. https://doi.org/10.1126/sciadv.aaz1169

Sadatzki, H., Maffezzoli, N., Dokken, T.M., Simon, M.H., Berben, S.M., Fahl, K., Kjær, H.A., Spolaor, A., Stein, R., Vallelonga, P., and others (2020) 'Rapid reductions and millennial-scale variability in Nordic Seas sea ice cover during abrupt glacial climate changes', Proceedings of the National Academy of Sciences, 117(47), pp. 29478–29486. https://doi.org/10.1073/pnas.2005849117

Schleussner, C.-F., Lissner, T.K., Fischer, E.M., Wohland, J., Perrette, M., Golly, A., Rogelj, J., Childers, K., Schewe, J., Frieler, K., and others (2016) 'Differential climate impacts for policy-relevant limits to global warming: the case of 1.5 C and 2 C', Earth System Dynamics, 7(2), pp. 327–351. https://doi.org/10.5194/esd-7-327-2016

Schneider, T., Kaul, C.M. and Pressel, K.G. (2019) 'Possible climate transitions from breakup of stratocumulus decks under greenhouse warming', Nature Geoscience, 12(3), pp. 163–167. https://doi.org/10.1038/s41561-019-0310-1

Schoof, C. (2007) 'Ice sheet grounding line dynamics: Steady states, stability, and hysteresis', Journal of Geophysical Research: Earth Surface, 112(F3), pp. 1–19. https://doi.org/10.1029/2006JF000664

Scott, R.C., Nicolas, J.P., Bromwich, D.H., Norris, J.R. and Lubin, D. (2019) 'Meteorological drivers and large-scale climate forcing of West Antarctic surface melt', Journal of Climate, 32(3), pp. 665–684. https://doi.org/10.1175/JCLI-D-18-0233.1

Seidov, D., Stouffer, R.J. and Haupt, B.J. (2005) 'Is there a simple bi-polar ocean seesaw?', Global and Planetary Change, 49(1–2), pp. 19–27. https://doi.org/10.1016/j.gloplacha.2005.05.001

Sévellec, F., Fedorov, A.V. and Liu, W. (2017) 'Arctic sea-ice decline weakens the Atlantic meridional overturning circulation', Nature Climate Change, 7(8), pp. 604–610. https://doi.org/10.1038/nclimate3353

Sinet, S., von der Heydt, A. and Dijkstra, H. (2023) 'AMOC stabilization under the interaction with tipping polar ice sheets', Geophysical Research Letters, 50(2), p. e2022GL100305. https://doi.org/10.1029/2022GL100305

Solomon, A., Heuzé, C., Rabe, B., Bacon, S., Bertino, L., Heimbach, P., Inoue, J., Iovino, D., Mottram, R., Zhang, X., and others (2021) 'Freshwater in the arctic ocean 2010–2019', Ocean Science, 17(4), pp. 1081–1102. https://doi.org/10.5194/os-2020-113

Srivastava, G., Chakraborty, A. and Nanjundiah, R.S. (2019) 'Multidecadal see-saw of the impact of ENSO on Indian and West African summer monsoon rainfall', Climate Dynamics, 52, pp. 6633–6649. https://doi.org/10.1007/s00382-018-4535-2

Staal, A., Fetzer, I., Wang-Erlandsson, L., Bosmans, J.H., Dekker, S.C., van Nes, E.H., Rockström, J. and Tuinenburg, O.A. (2020) 'Hysteresis of tropical forests in the 21st century', Nature Communications, 11(1), pp. 1–8. https://doi.org/10.1038/s41467-020-18728-7

Staal, A., Tuinenburg, O.A., Bosmans, J.H., Holmgren, M., van Nes, E.H., Scheffer, M., Zemp, D.C., Dekker, S.C., and others (2018) 'Forest-rainfall cascades buffer against drought across the Amazon', Nature Climate Change, 8(6), pp. 539–543. https://doi.org/10.1038/s41558-018-0177-y

Stainforth, D.A., Downing, T.E., Washington, R., Lopez, A. and New, M. (2007) 'Issues in the interpretation of climate model ensembles to inform decisions', Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences, 365(1857), pp. 2163–2177. https://doi.org/10.1098/rsta.2007.2073

Steffen, W., Rockström, J., Richardson, K., Lenton, T.M., Folke, C., Liverman, D., Summerhayes, C.P., Barnosky, A.D., Cornell, S.E., Crucifix, M., and others (2018) 'Trajectories of the Earth System in the Anthropocene', Proceedings of the National Academy of Sciences, 115(33), pp. 8252–8259. https://doi.org/10.1073/pnas.1810141115

Stouffer, R.J., Seidov, D. and Haupt, B.J. (2007) 'Climate response to external sources of freshwater: North Atlantic versus the Southern Ocean', Journal of Climate, 20(3), pp. 436–448. https://doi.org/10.1175/JCLI4015.1

Stouffer, R.J., Yin, J., Gregory, J., Dixon, K., Spelman, M., Hurlin,

W., Weaver, A., Eby, M., Flato, G., Hasumi, H., and others (2006) 'Investigating the causes of the response of the thermohaline circulation to past and future climate changes', Journal of Climate, 19(8), pp. 1365–1387. https://doi.org/10.1175/JCLI3689.1

Sun, Y., Clemens, S.C., Morrill, C., Lin, X., Wang, X. and An, Z. (2012) 'Influence of Atlantic meridional overturning circulation on the East Asian winter monsoon', Nature Geoscience, 5(1), pp. 46–49. https://doi.org/10.1038/ngeo1326

Swingedouw, D., Braconnot, P. and Marti, O. (2006) 'Sensitivity of the Atlantic Meridional Overturning Circulation to the melting from northern glaciers in climate change experiments', Geophysical Research Letters, 33(7). https://doi.org/10.1029/2006GL025765

Swingedouw, D., Fichefet, T., Goosse, H. and Loutre, M.-F. (2009) 'Impact of transient freshwater releases in the Southern Ocean on the AMOC and climate', Climate Dynamics, 33, pp. 365–381. https://doi.org/10.1007/s00382-008-0496-1

Swingedouw, D., Fichefet, T., Huybrechts, P., Goosse, H., Driesschaert, E. and Loutre, M.-F. (2008) 'Antarctic ice-sheet melting provides negative feedbacks on future climate warming', Geophysical Research Letters, 35(17). https://doi.org/10.1029/2008GL034410

Swingedouw, D., Rodehacke, C.B., Behrens, E., Menary, M., Olsen, S.M., Gao, Y., Mikolajewicz, U., Mignot, J. and Biastoch, A. (2013) 'Decadal fingerprints of freshwater discharge around Greenland in a multi-model ensemble', Climate Dynamics, 41, pp. 695–720. https://doi.org/10.1007/s00382-012-1479-9

Tigchelaar, M., von Der Heydt, A. and Dijkstra, H. (2011) 'A new mechanism for the two-step ⊠ 18 O signal at the Eocene-Oligocene boundary', Climate of the Past, 7(1), pp. 235–247. https://doi.org/10.5194/cp-7-235-2011

Timmermann, A., An, S.-I., Kug, J.-S., Jin, F.-F., Cai, W., Capotondi, A., Cobb, K.M., Lengaigne, M., McPhaden, M.J., Stuecker, M.F., and others (2018) 'El Niño–southern oscillation complexity', Nature, 559(7715), pp. 535–545. https://doi.org/10.1038/s41586-018-0252-6

Timmermann, A., Okumura, Y., An, S.-I., Clement, A., Dong, B., Guilyardi, E., Hu, A., Jungclaus, J., Renold, M., Stocker, T.F., and others (2007) 'The influence of a weakening of the Atlantic meridional overturning circulation on ENSO', Journal of Climate, 20(19), pp. 4899–4919. https://doi.org/10.1029/2023GL103025

Toumoulin, A., Tardif, D., Donnadieu, Y., Licht, A., Ladant, J.-B., Kunzmann, L. and Dupont-Nivet, G. (2022) 'Evolution of continental temperature seasonality from the Eocene greenhouse to the Oligocene icehouse–a model–data comparison', Climate of the Past, 18(2), pp. 341–362. https://doi.org/10.5194/cp-18-341-2022

Veron, J.E., Hoegh-Guldberg, O., Lenton, T.M., Lough, J.M., Obura, D.O., Pearce-Kelly, P., Sheppard, C.R., Spalding, M., Stafford-Smith, M.G. and Rogers, A.D. (2009) 'The coral reef crisis: The critical importance of <350 ppm CO2', Marine Pollution Bulletin, 58(10), pp. 1428–1436. https://doi.org/10.1016/j.marpolbul.2009.09.009

Vettoretti, G. and Peltier, W.R. (2016) 'Thermohaline instability and the formation of glacial North Atlantic super polynyas at the onset of Dansgaard-Oeschger warming events', Geophysical Research Letters, 43(10), pp. 5336–5344. https://doi.org/10.1002/2016GL068891

Via, R.K. and Thomas, D.J. (2006) 'Evolution of Atlantic thermohaline circulation: Early Oligocene onset of deep-water production in the North Atlantic', Geology, 34(6), pp. 441–444. https://doi.org/10.1130/G22545.1

de Vrese, P., Georgievski, G., Gonzalez Rouco, J.F., Notz, D., Stacke, T., Steinert, N.J., Wilkenskjeld, S. and Brovkin, V. (2023) 'Representation of soil hydrology in permafrost regions may explain large part of inter-model spread in simulated Arctic and subarctic climate', The Cryosphere, 17(5), pp. 2095–2118. https://doi.org/10.5194/tc-17-2095-2023

Wang, G., Cai, W., Gan, B., Wu, L., Santoso, A., Lin, X., Chen, Z. and McPhaden, M.J. (2017) 'Continued increase of extreme El Niño frequency long after 1.5 C warming stabilization', Nature Climate Change, 7(8), pp. 568–572. https://doi.org/10.1038/nclimate3351

Wang, S., Foster, A., Lenz, E.A., Kessler, J.D., Stroeve, J.C., Anderson, L.O., Turetsky, M., Betts, R., Zou, S., Liu, W., and others (2023) 'Mechanisms and impacts of Earth system tipping elements', Reviews of Geophysics, 61(1), p. e2021RG000757. https://doi.org/10.1029/2021RG000757

Wang, X., Auler, A.S., Edwards, R.L., Cheng, H., Cristalli, P.S., Smart, P.L., Richards, D.A. and Shen, C.-C. (2004) 'Wet periods in northeastern Brazil over the past 210 kyr linked to distant climate anomalies', Nature, 432(7018), pp. 740–743. https://doi.org/10.1038/nature03067

Wassenburg, J.A., Vonhof, H.B., Cheng, H., Martínez-García, A., Ebner, P.-R., Li, X., Zhang, H., Sha, L., Tian, Y., Edwards, R.L., and others (2021) 'Penultimate deglaciation Asian monsoon response to North Atlantic circulation collapse', Nature Geoscience, 14(12), pp. 937–941. https://doi.org/10.1038/s41561-021-00851-9

Weaver, A.J., Saenko, O.A., Clark, P.U. and Mitrovica, J.X. (2003) 'Meltwater pulse 1A from antarctica as a trigger of the bølling-allerød warm interval', Science (New York, N.Y.), 299(5613), pp. 1709–1713. https://doi.org/10.1126/science.1081002

Weertman, J. (1974) 'Stability of the junction of an ice sheet and an ice shelf', Journal of Glaciology, 13(67), pp. 3–11. https://doi.org/10.3189/S0022143000023327

Wengel, C., Lee, S.-S., Stuecker, M.F., Timmermann, A., Chu, J.-E. and Schloesser, F. (2021) 'Future high-resolution El Niño/Southern oscillation dynamics', Nature Climate Change, 11(9), pp. 758–765. https://doi.org/10.1038/s41558-021-01132-4

Winkelmann, R., Donges, J.F., Smith, E.K., Milkoreit, M., Eder, C., Heitzig, J., Katsanidou, A., Wiedermann, M., Wunderling, N. and Lenton, T.M. (2022) 'Social tipping processes towards climate action: a conceptual framework', Ecological Economics, 192, p. 107242. https://doi.org/10.1016/j.ecolecon.2021.107242

Wunderling, N., Donges, J.F., Kurths, J. and Winkelmann, R. (2021a) 'Interacting tipping elements increase risk of climate domino effects under global warming', Earth System Dynamics, 12(2), pp. 601–619. https://doi.org/10.5194/esd-12-601-2021

Wunderling, N., von der Heydt, A., Aksenov, Y., Barker, S., Bastiaansen, R., Brovkin, V., Brunetti, M., Couplet, V., Kleinen, T., Lear, C.H., Lohmann, J., Roman-Cuesta, R.M., Sinet, S., Swingedouw, D., Winkelmann, R., Anand, P., Barichivich, J., Bathiany, S., Baudena, M., Bruun, J.T., Chiessi, C.M., Coxall, H.K., Docquier, D., Donges, J.F., Falkena, S.K.J., Klose, A.K., Obura, D., Rocha, J., Rynders, S., Steinert, N.J. and Willeit, M. (2023a) 'Climate tipping point interactions and cascades: A review', EGUsphere, pp. 1–45. https://doi.org/10.5194/egusphere-2023-1576.

Wunderling, N., Krönke, J., Wohlfarth, V., Kohler, J., Heitzig, J., Staal, A., Willner, S., Winkelmann, R. and Donges, J.F. (2021b) 'Modelling nonlinear dynamics of interacting tipping elements on complex networks: the PyCascades package', The European Physical Journal Special Topics, 230(14–15), pp. 3163–3176.

Wunderling, N., Staal, A., Sakschewski, B., Hirota, M., Tuinenburg, O.A., Donges, J.F., Barbosa, H.M. and Winkelmann, R. (2022) 'Recurrent droughts increase risk of cascading tipping events by outpacing adaptive capacities in the Amazon rainforest', Proceedings of the National Academy of Sciences, 119(32), p. E2120777119. https://doi.org/10.1073/pnas.2120777119

Wunderling, N., Willeit, M., Donges, J.F. and Winkelmann, R. (2020a) 'Global warming due to loss of large ice masses and Arctic summer sea ice', Nature Communications, 11(1), pp. 1–8. https://doi.org/10.1038/s41467-020-18934-3

Wunderling, N., Winkelmann, R., Rockström, J., Loriani, S., Armstrong McKay, D.I., Ritchie, P.D., Sakschewski, B. and Donges, J.F. (2023b) 'Global warming overshoots increase risks of climate tipping cascades in a network model', Nature Climate Change, 13(1), pp. 75–82. https://doi.org/10.1038/s41558-022-01545-9

Zemp, D.C., Schleussner, C.-F., Barbosa, H.M., Hirota, M., Montade, V., Sampaio, G., Staal, A., Wang-Erlandsson, L. and Rammig, A. (2017) 'Self-amplified Amazon forest loss due to vegetation-atmosphere feedbacks', Nature Communications, 8(1), pp. 1–10. https://doi.org/10.1038/ncomms14681

Zhang, N., Feng, M., Hendon, H.H., Hobday, A.J. and Zinke, J. (2017) 'Opposite polarities of ENSO drive distinct patterns of coral bleaching potentials in the southeast Indian Ocean', Scientific Reports, 7(1), p. 2443. https://doi.org/10.1038/s41598-017-02688-y

Zhang, X., Lohmann, G., Knorr, G. and Purcell, C. (2014) 'Abrupt glacial climate shifts controlled by ice sheet changes', Nature, 512(7514), pp. 290–294. https://doi.org/10.1038/nature13592

Zular, A., Sawakuchi, A.O., Chiessi, C.M., d'Horta, F.M., Cruz, F.W.,

Dematthê, J.A.M., Ribas, C.C., Hartmann, G.A., Giannini, P.C.F. and Soares, E.A.A. (2019) 'The role of abrupt climate change in the formation of an open vegetation enclave in northern Amazonia during the late Quaternary', Global and Planetary Change, 172, pp. 140–149. https://doi.org/10.1016/j.gloplacha.2018.09.006

Chapter 1.6 References

Arellano-Nava, B. et al. (2022) 'Destabilisation of the Subpolar North Atlantic prior to the Little Ice Age', Nature Communications, 13(1). https://doi.org/10.1038/s41467-022-32653-x

Armstrong McKay, D.I. et al. (2022) 'Exceeding 1.5°C global warming could trigger multiple climate tipping points', Science, 377(6611). https://doi.org/10.1126/science.abn7950

Aschwanden, A. et al. (2019) 'Contribution of the Greenland Ice Sheet to sea level over the next millennium', Sci. Adv., 5(6) https://doi.org/10.1126/sciadv.aav9396

Ashwin, P. et al. (2012) 'Tipping points in open systems: Bifurcation, noise-induced and rate-dependent examples in the climate system', Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences, 370(1962), pp. 1166–1184. https://doi.org/10.1098/rsta.2011.0306

Bathiany, S. et al. (2016a) 'Statistical indicators of Arctic sea-ice stability-prospects and limitations', Cryosphere, 10(4), pp. 1631–1645. https://doi.org/10.5194/tc-10-1631-2016

Bathiany, S. et al. (2016b) 'On the Potential for Abrupt Arctic Winter Sea Ice Loss', American Meteorological Society. https://doi.org/10.1175/JCLI-D-15-0466.1

Ben-Yami, M. et al. (2023) 'Uncertainties too large to predict tipping times of major Earth system components'. https://doi.org/10.48550/arXiv.2309.08521

Berdugo, M., Kéfi, S., Soliveres, S. and Maestre, F.T., 2017. Plant spatial patterns identify alternative ecosystem multifunctionality states in global drylands. Nature ecology & evolution, 1(2), p.0003.

Blaschke, L.L. et al. (2023) Spatial correlation increase in single-sensor satellite [Preprint]. https://doi.org/10.48550/arXiv.2310.18540

Boerlijst, M.C., Oudman, T. and Roos, A.M. de (2013) 'Catastrophic Collapse Can Occur without Early Warning: Examples of Silent Catastrophes in Structured Ecological Models', PLoS ONE, 8(4). https://doi.org/10.1371/journal.pone.0062033

Boers, N. (2021) 'Observation-based early-warning signals for a collapse of the Atlantic Meridional Overturning Circulation', Nature Climate Change, 11(8), pp. 680–688. https://doi.org/10.1038/s41558-021-01097-4

Boers, N. and Rypdal, M. (2021) 'Critical slowing down suggests that the western Greenland Ice Sheet is close to a tipping point'. https://doi.org/10.1073/pnas.2024192118

Bojinski, S. et al. (2014) 'The concept of essential climate variables in support of climate research, applications, and policy', Bulletin of the American Meteorological Society, 95(9), pp. 1431–1443. https://doi.org/10.1175/BAMS-D-13-00047.1

Boulton, C.A., Allison, L.C. and Lenton, T.M. (2014) 'Early warning signals of atlantic meridional overturning circulation collapse in a fully coupled climate model', Nature Communications, 5. https://doi.org/10.1038/ncomms6752

Boulton, C.A., Good, P. and Lenton, T.M. (2013) 'Early warning signals of simulated Amazon rainforest dieback', Theoretical Ecology, 6(3), pp. 373–384. https://doi.org/10.1007/s12080-013-0191-7

Boulton, C.A. and Lenton, T.M. (2015) 'Slowing down of North Pacific climate variability and its implications for abrupt ecosystem change', Proceedings of the National Academy of Sciences of the United States of America, 112(37), pp. 11496–11501. https://doi.org/10.1073/pnas.1501781112

Boulton, C.A., Lenton, T.M. and Boers, N. (2022) 'Pronounced loss of Amazon rainforest resilience since the early 2000s', Nature Climate Change, 12(3), pp. 271–278. https://doi.org/10.1038/s41558-022-01287-8

Bury, T.M. et al. (2021) 'Deep learning for early warning signals of tipping points', PNAS, 118(39). https://doi.org/10.1073/pnas.2106140118

Cavaliere, M. et al. (2016) 'Detecting the Collapse of Cooperation in Evolving Networks', Scientific Reports, 6. https://doi.org/10.1038/srep30845

Dakos, V. et al. (2008) Slowing down as an early warning signal for abrupt climate change. https://doi.org/10.1073/pnas.0802430105

Dakos, V. et al. (2023) 'Tipping Point Detection and Early-Warnings in climate, ecological, and human systems', Earth System Dynamics [Preprint]. https://doi.org/10.5194/egusphere-2023-1773

Dakos, V., Nes, E.H. van and Scheffer, M. (2013) 'Flickering as an early warning signal', Theoretical Ecology, 6(3), pp. 309–317. https://doi.org/10.1007/s12080-013-0186-4

Deb, S. et al. (2022) 'Machine learning methods trained on simple models can predict critical transitions in complex natural systems', Royal Society Open Science, 9(2). https://doi.org/10.1098/rsos.211475

Ditlevsen, P. and Ditlevsen, S. (2023) 'Warning of a forthcoming collapse of the Atlantic meridional overturning circulation', Nature Communications, 14(1). https://doi.org/10.1038/s41467-023-39810-w

Ditlevsen, P.D. and Johnsen, S.J. (2010) 'Tipping points: Early warning and wishful thinking', Geophysical Research Letters, 37(19). https://doi.org/10.1029/2010GL044486

Donges, J.F. et al. (2009) 'The backbone of the climate network', EPL, 87(4). https://doi.org/10.1209/0295-5075/87/48007

Dylewsky Daniel, Lenton Timothy M., Scheffer Marten, Bury Thomas M., Fletcher Christopher G., Anand Madhur and Bauch Chris T. (2023) Universal early warning signals of phase transitions in climate systems J. R. Soc. Interface https://doi.org/10.1098/rsif.2022.0562

Ebert-Uphoff, I. and Deng, Y. (2012) 'Causal discovery for climate research using graphical models', Journal of Climate, 25(17), pp. 5648–5665. https://doi.org/10.1175/JCLI-D-11-00387.1

Eisenman, I. (2010) 'Geographic muting of changes in the Arctic sea ice cover', Geophysical Research Letters, 37(16). https://doi.org/10.1029/2010GL043741

Eisenman, I. and Wettlaufer, J.S. (2009) 'Nonlinear threshold behavior during the loss of Arctic sea ice', PNAS, 106(1): 28–32. https://doi.org/10.1073/pnas.0806887106

Ferrell, R.A. (1970) Decoupled-mode Dynamic Scaling Theory of the Binary-Liquid Phase Transition., Soviet Phys. Usp. https://doi.org/10.1103/PhysRevLett.24.1169

Forzieri, G. et al. (2022) 'Emerging signals of declining forest resilience under climate change', Nature, 608(7923), pp. 534–539. https://doi.org/10.1038/s41586-022-04959-9

Goosse, H. et al. (2009) 'Increased variability of the Arctic summer ice extent in a warmer climate', Geophysical Research Letters, 36(23). https://doi.org/10.1029/2009GL040546

Guttal, V. and Jayaprakash, C. (2008) 'Changing skewness: An early warning signal of regime shifts in ecosystems', Ecology Letters, 11(5), pp. 450–460. https://doi.org/10.1007/s12080-008-0033-1

Hardenberg, J. von et al. (2001) 'Diversity of vegetation patterns and desertification', Physical Review Letters, 87(19), pp. 198101-1-198101-4. https://doi.org/10.1103/PhysRevLett.87.198101

Hawkins, E. et al. (2011) 'Bistability of the Atlantic overturning circulation in a global climate model and links to ocean freshwater transport', Geophysical Research Letters, 38(10). https://doi.org/10.1029/2011GL047208

Held, H. and Kleinen, T., 2004. Detection of climate system bifurcations by degenerate fingerprinting. Geophysical Research Letters, 31(23). https://doi.org/10.1029/2004GL020972

Kang, J. et al. (2015) 'A rational strategy for the realization of chain-growth supramolecular polymerization', Science, 347(6222), pp. 646–651. https://doi.org/10.1126/science.aaa4249

Kawasaki, K., 1966. Diffusion constants near the critical point for time-dependent Ising models. I. Physical Review, 145(1), p.224. https://doi.org/10.1103/PhysRev.145.224

Kéfi, S. et al. (2007) 'Spatial vegetation patterns and imminent desertification in Mediterranean arid ecosystems', Nature, 449(7159), pp. 213–217. https://doi.org/10.1038/nature06111

Kéfi, S. et al. (2011) 'Robust scaling in ecosystems and the meltdown of patch size distributions before extinction', Ecology Letters, 14(1), pp. 29–35. https://doi.org/10.1111/j.1461-0248.2010.01553.x

Kéfi, S. et al. (2014) 'Early warning signals of ecological transitions: Methods for spatial patterns', PLoS ONE, 9(3). https://doi.org/10.1371/journal.pone.0092097

Klose, A.K. et al. (2021) 'What do we mean, "tipping cascade"?',

Environmental Research Letters, 16(12). https://doi.org/10.1088/1748-9326/ac3955
Kubo, R. (1966) The fluctuation-dissapation theorem. doi.org/10.1088/0034-4885/29/1/306
Kuehn, C. (2013) 'A mathematical framework for critical transitions: Normal forms, variance and applications', Journal of Nonlinear Science, 23(3), pp. 457–510. https://doi.org/10.1007/s00332-012-9158-x
Lade, S.J. and Gross, T. (2012) 'Early warning signals for critical transitions: A generalized modeling approach', PLoS Computational Biology, 8(2). https://doi.org/10.1371/journal.pcbi.1002360
Lenton, T.M. et al. (2008) Tipping elements in the Earth's climate system. https://doi.org/10.1073/pnas.0705414105
Lever, J.J., van de Leemput, I.A., Weinans, E., Quax, R., Dakos, V., van Nes, E.H., Bascompte, J. and Scheffer, M., 2020. Foreseeing the future of mutualistic communities beyond collapse. Ecology letters, 23(1), pp.2-15. https://doi.org/10.1111/ele.13401
Levermann, A. and Winkelmann, R. (2016) 'A simple equation for the melt elevation feedback of ice sheets', Cryosphere, 10(4), pp. 1799–1807. https://doi.org/10.5194/tc-10-1799-2016
Livina, V.N. and Lenton, T.M. (2013) 'A recent tipping point in the Arctic sea-ice cover: Abrupt and persistent increase in the seasonal cycle since 2007', Cryosphere, 7(1), pp. 275–286. https://doi.org/10.5194/tc-7-275-2013
Lu, Z. et al. (2021) 'Early Warning of the Pacific Decadal Oscillation Phase Transition Using Complex Network Analysis', Geophysical Research Letters, 48(7). https://doi.org/10.1029/2020GL091674
Lutes, O.S., Clayton, D.A. and Kawasaki, K. (1966) Diffusion Constants near the Critical Point for Time-Dependent Ising Models. I.
Mantuna, N.J. and Hare, S.R. (2002) 'The Pacific Decadal Oscillation', Journal of Oceanography, 58, pp. 35–44. https://doi.org/10.1023/A:1015820616384
Mayfield, R.J. et al. (2020) 'Metrics of structural change as indicators of chironomid community stability in high latitude lakes', Quaternary Science Reviews, 249. https://doi.org/10.1016/j.quascirev.2020.106594
Merryfield, W.J., Holland, M.M. and Monahan, A.H. (2008) 'Multiple Equilibria and Abrupt Transitions in Arctic Summer Sea Ice Extent', Arctic Sea Ice Decline: Observations, Projections, Mechanisms, and Implications (eds E.T. DeWeaver, C.M. Bitz and L.-.-B. Tremblay). https://doi.org/10.1029/180GM11
Miloslavich, P. et al. (2018) 'Essential ocean variables for global sustained observations of biodiversity and ecosystem changes', Global Change Biology, 24(6), pp. 2416–2433. https://doi.org/10.1111/gcb.14108
Moon, W. and Wettlaufer, J.S. (2011) 'A low-order theory of Arctic sea ice stability', EPL, 96(3). https://doi.org/10.1209/0295-5075/96/39001
Noël, B. et al. (2017) 'A tipping point in refreezing accelerates mass loss of Greenland's glaciers and ice caps', Nature Communications, 8. https://doi.org/10.1038/ncomms14730
Nowack, P. et al. (2020) 'Causal networks for climate model evaluation and constrained projections', Nature Communications, 11(1). https://doi.org/10.1038/s41467-020-15195-y
Parry, I.M., Ritchie, P.D.L. and Cox, P.M. (2022) 'Evidence of localised Amazon rainforest dieback in CMIP6 models', Earth System Dynamics, 13(4), pp. 1667–1675. https://doi.org/10.5194/esd-13-1667-2022
Pereira, H. M., et al. (2013) 'Essential biodiversity variables', Science 339, 277-278. https://doi.org/10.1126/science.1229931
Rietkerk, M. et al. (2002) Self-Organization of Vegetation in Arid Ecosystems, The American Naturalist 160(4) pp. 524–530. https://doi.org/10.1086/342078
Rietkerk, M. and Van de Koppel, J., (2008). Regular pattern formation in real ecosystems. Trends in ecology & evolution, 23(3), pp.169-175 https://doi.org/10.1016/j.tree.2007.10.013
Rietkerk, M., Bastiaansen, R., Banerjee, S., van de Koppel, J., Baudena, M. and Doelman, A., 2021. Evasion of tipping in complex systems through spatial pattern formation. Science, 374(6564) doi.org/10.1126/science.abj0359
Ritchie, P.D.L. et al. (2022) 'Increases in the temperature seasonal cycle indicate long-term drying trends in Amazonia', Communications Earth and Environment, 3(1). https://doi.org/10.1038/s43247-022-00528-0
Ritchie, P. and Sieber, J., (2016). Early-warning indicators for rate-induced tipping. Chaos: An Interdisciplinary Journal of Nonlinear Science, 26(9). https://doi.org/10.1063/1.4963012
Rosier, S.H.R. et al. (2021) 'The tipping points and early warning indicators for Pine Island Glacier, West Antarctica', Cryosphere, 15(3), pp. 1501–1516. https://doi.org/10.5194/tc-15-1501-2021
Ryan, J.C. et al. (2019) Greenland Ice Sheet surface melt amplified by snowline migration and bare ice exposure, Sci. Adv. https://doi.org/10.1126/sciadv.aav3738
Scheffer, M., Bascompte, J., Brock, W.A., Brovkin, V., Carpenter, S.R., Dakos, V., Held, H., Van Nes, E.H., Rietkerk, M. and Sugihara, G., 2009. Early-warning signals for critical transitions. Nature, 461(7260), pp.53-59
Setty, S., Cramwinckel, M.J., van Nes, E.H., van de Leemput, I.A., Dijkstra, H.A., Lourens, L.J., Scheffer, M. and Sluijs, A., 2023. Loss of Earth system resilience during early Eocene transient global warming events. Science advances, 9(14), p.eade5466. https://doi.org/10.1126/sciadv.ade5466
Sinet, S., Heydt, A.S. von der and Dijkstra, H.A. (2023) 'AMOC Stabilization Under the Interaction With Tipping Polar Ice Sheets', Geophysical Research Letters, 50(2). https://doi.org/10.1029/2022GL100305.
Smith, T., Zotta, R.M., Boulton, C.A., Lenton, T.M., Dorigo, W. and Boers, N., (2023) Reliability of resilience estimation based on multi-instrument time series. Earth System Dynamics, 14(1), pp.173-183. https://doi.org/10.5194/esd-14-173-2023
Thorndike, A.S. et al. (1975) 'The thickness distribution of sea ice', Journal of Geophysical Research, 80(33), pp. 4501–4513. https://doi.org/10.1029/jc080i033p04501
Tirabassi, G. et al. (2014) 'Interaction network based early-warning indicators of vegetation transitions', Ecological Complexity, 19, pp. 148–157. https://doi.org/10.1016/j.ecocom.2014.06.004
Tsonis, A.A. and Roebber, P.J. (2004) 'The architecture of the climate network', Physica A: Statistical Mechanics and its Applications, 333(1–4), pp. 497–504. https://doi.org/10.1016/j.physa.2003.10.045
Villa Martín, P., Bonachela, J.A., Levin, S.A. and Muñoz, M.A., 2015. Eluding catastrophic shifts. Proceedings of the National Academy of Sciences, 112(15), pp.E1828-E1836. https://doi.org/10.1073/pnas.1414708112
Wagner, T.J.W. and Eisenman, I. (2015) 'False alarms: How early warning signals falsely predict abrupt sea ice loss', Geophysical Research Letters, 42(23), pp. 10333–10341. https://doi.org/10.1002/2015GL066297
Wang, R. et al. (2012) 'Flickering gives early warning signals of a critical transition to a eutrophic lake state', Nature, 492(7429), pp. 419–422. https://doi.org/10.1038/nature11655
Wang, R., Dearing, J.A., Doncaster, C.P., Yang, X., Zhang, E., Langdon, P.G., Yang, H., Dong, X., Hu, Z., Xu, M. and Zhao, Y., 2019. Network parameters quantify loss of assemblage structure in human□impacted lake ecosystems. Global Change Biology, 25(11), pp.3871-3882. https://doi.org/10.1111/gcb.14776
Weinans, E., Lever, J.J., Bathiany, S., Quax, R., Bascompte, J., Van Nes, E.H., Scheffer, M. and Van De Leemput, I.A., 2019. Finding the direction of lowest resilience in multivariate complex systems. Journal of the Royal Society Interface, 16(159), p.20190629. https://doi.org/10.1098/rsif.2019.0629
Weinans, E. et al. (2021) 'Evaluating the performance of multivariate indicators of resilience loss', Scientific Reports, 11(1). https://doi.org/10.1038/s41598-021-87839-y
Williamson, M. S., Bathiany, S., and Lenton, T. M. (2016) 'Early warning signals of tipping points in periodically forced systems', Earth Syst. Dynam., 7, 313–326. https://doi.org/10.5194/esd-7-313-2016
Wissel, C. (1984) A Universal Law of the Characteristic Return Time near Thresholds, pp. 101–107. https://doi.org/10.1007/BF00384470
Yin, Z. et al. (2016) 'Network based early warning indicators of vegetation changes in a land-atmosphere model', Ecological Complexity, 26, pp. 68–78. https://doi.org/10.1016/j.ecocom.2016.02.004.

Chapter 1.7 References

Climate Action Tracker (2022) The CAT Thermometer. Climate Analytics and NewClimate Institute. https://climateactiontracker.org/global/cat-thermometer/ (Accessed: 24 October 2023)

International Energy Agency (IEA) (2023) World Energy Outlook 2023. https://www.iea.org/reports/world-energy-outlook-2023 (Accessed: 24 October 2023)

Meinshausen, M., Lewis, J., McGlade, C., Gütschow, J., Nicholls, Z., Burdon, R., Cozzi, L. and Hackmann, B. (2022) 'Realization of Paris Agreement pledges may limit warming just below 2 °C', Nature, 604(7905), pp. 304–309. https://doi.org/10.1038/s41586-022-04553-z

Section 2

Tipping point impacts

Section lead coordinating authors:

Jesse F. Abrams, Steven J. Lade, Jonathan F. Donges and Joshua E. Buxton

Reviewers:

Luke Kemp, Richard Mann, Michael Mäs, Coleen Vogel

References: Chapter 2.1

Centeno, M. A., Nag, M., Patterson, T. S., Shaver, A., & Windawi, A. J. (2015). The Emergence of Global Systemic Risk. Annual Review of Sociology, 41(1), 65–85. https://doi.org/10.1146/annurev-soc-073014-112317

Juhola, S., Filatova, T., Hochrainer-Stigler, S., Mechler, R., Scheffran, J., & Schweizer, P.-J. (2022). Social tipping points and adaptation limits in the context of systemic risk: Concepts, models and governance. Frontiers in Climate, 4, 1009234. https://doi.org/10.3389/fclim.2022.1009234.

Kemp, L., Xu, C., Depledge, J., Ebi, K. L., Gibbins, G., Kohler, T. A., Rockström, J., Scheffer, M., Schellnhuber, H. J., Steffen, W., & Lenton, T. M. (2022). Climate Endgame: Exploring catastrophic climate change scenarios. Proceedings of the National Academy of Sciences, 119(34), e2108146119. https://doi.org/10.1073/pnas.2108146119

Sillmann, J., Christensen, I., Hochrainer-Stigler, S., Huang-Lachmann, J., Juhola, S., Kornhuber, K., Mahecha, M., Mechler, R., Reichstein, M., Ruane, A.C., Schweizer, P.-J. and Williams, S. (2022). ISC-UNDRR-RISK KAN Briefing note on systemic risk. International Science Council. Paris, France https://doi.org/10.24948/2022.01

References: Chapter 2.2

Alahmad, B., Khraishah, H., Althalji, K., Borchert, W., Al-Mulla, F., & Koutrakis, P. (2023). Connections Between Air Pollution, Climate Change, and Cardiovascular Health. The Canadian Journal of Cardiology, 39(9), 1182–1190. https://doi.org/10.1016/j.cjca.2023.03.025

Alfieri, L., Bisselink, B., Dottori, F., Naumann, G., De Roo, A., Salamon, P., Wyser, K., & Feyen, L. (2017). Global projections of river flood risk in a warmer world. Earth's Future, 5(2), 171–182. https://doi.org/10.1002/2016EF000485

Alves De Oliveira, B. F., Bottino, M. J., Nobre, P., & Nobre, C. A. (2021). Deforestation and climate change are projected to increase heat stress risk in the Brazilian Amazon. Communications Earth & Environment, 2(1), 207. https://doi.org/10.1038/s43247-021-00275-8

Armstrong McKay, D. I., Staal, A., Abrams, J. F., Winkelmann, R., Sakschewski, B., Loriani, S., Fetzer, I., Cornell, S. E., Rockström, J., & Lenton, T. M. (2022). Exceeding 1.5°C global warming could trigger multiple climate tipping points. Science, 377(6611), eabn7950. https://doi.org/10.1126/science.abn7950

Bailey, R. T., Barnes, K., & Wallace, C. D. (2016). Predicting Future Groundwater Resources of Coral Atoll Islands. Hydrological Processes, 30(13), 2092–2105. https://doi.org/10.1002/hyp.10781

Banks-Leite, C., Pardini, R., Tambosi, L. R., Pearse, W. D., Bueno, A. A., Bruscagin, R. T., Condez, T. H., Dixo, M., Igari, A. T., Martensen, A. C., & Metzger, J. P. (2014). Using ecological thresholds to evaluate the costs and benefits of set-asides in a biodiversity hotspot. Science, 345(6200), 1041–1045. https://doi.org/10.1126/science.1255768.

Barbour, E. J., Adnan, M. S. G., Borgomeo, E., Paprocki, K., Khan, M. S. A., Salehin, M., & Hall, J. W. (2022). The unequal distribution of water risks and adaptation benefits in coastal Bangladesh. Nature Sustainability, 5(4), 294–302. https://doi.org/10.1038/s41893-021-00846-9

Barlow, J., Lennox, G. D., Ferreira, J., Berenguer, E., Lees, A. C., Nally, R. M., Thomson, J. R., Ferraz, S. F. D. B., Louzada, J., Oliveira, V. H. F., Parry, L., Ribeiro De Castro Solar, R., Vieira, I. C. G., Aragão, L. E. O. C., Begotti, R. A., Braga, R. F., Cardoso, T. M., De Oliveira, R. C., Souza Jr, C. M., … Gardner, T. A. (2016). Anthropogenic disturbance in tropical forests can double biodiversity loss from deforestation. Nature, 535(7610), 144–147. https://doi.org/10.1038/nature18326

Barnes, E. A., & Screen, J. A. (2015). The impact of Arctic warming on the midlatitude jet-stream: Can it? Has it? Will it? WIREs Climate Change, 6(3), 277–286. https://doi.org/10.1002/wcc.337.

Beermann, S., Dobler, G., Faber, M., Frank, C., Habedank, B., Hagedorn, P., Kampen, H., Kuhn, C., Nygren, T., Schmidt-Chanasit, J., Schmolz, E., Stark, K., Ulrich, R. G., Weiss, S., & Wilking, H. (2023). Impact of climate change on vector- and rodent-borne infectious diseases. Journal of Health Monitoring, 8(Suppl 3), 33–61. https://doi.org/10.25646/11401.

Bellomo, K., Angeloni, M., Corti, S., & von Hardenberg, J. (2021). Future climate change shaped by inter-model differences in Atlantic meridional overturning circulation response. Nature Communications, 12(1), 3659. https://doi.org/10.1038/s41467-021-24015-w.

Benton, T., Fairweather, D., Graves, A., Harris, J., Jones, A., Lenton, T., Norman, R., O'Riordan, T., Pope, E., & Tiffin, R. (2017). Environmental tipping points and food system dynamics: Main report. http://dspace.stir.ac.uk/handle/1893/24796.

Benton, T. G. (2020). Running AMOC in the farming economy. Nature Food, 1(1), 22–23. https://doi.org/10.1038/s43016-019-0017-x.

Betts, R. A. (1999). Self-beneficial effects of vegetation on climate in an ocean-atmosphere general circulation model. Geophysical Research Letters, 26(10), 1457–1460. https://doi.org/10.1029/1999GL900283.

Betts, R., Sanderson, M., & Woodward, S. (2008). Effects of large-scale Amazon forest degradation on climate and air quality through fluxes of carbon dioxide, water, energy, mineral dust and isoprene. Philosophical Transactions of the Royal Society B: Biological Sciences, 363(1498), 1873–1880. https://doi.org/10.1098/rstb.2007.0027

Bezner Kerr, R., T. Hasegawa, R. Lasco, I. Bhatt, D. Deryng, A. Farrell, H. Gurney-Smith, H. Ju, S. Lluch-Cota, F. Meza, G. Nelson, H. Neufeldt, and P. Thornton, (2022). Food, Fibre, and Other Ecosystem Products. In: Climate Change 2022: Impacts, Adaptation, and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [H.-O. Pörtner, D.C. Roberts, M. Tignor, E.S. Poloczanska, K. Mintenbeck, A. Alegría, M. Craig, S. Langsdorf, S. Löschke, V. Möller, A. Okem, B. Rama (eds.)]. Cambridge University Press, Cambridge, UK and New York, NY, USA, pp. 713-906, https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter05.pdf.

Boers, N., Marwan, N., Barbosa, H. M. J., & Kurths, J. (2017). A deforestation-induced tipping point for the South American monsoon system. Scientific Reports, 7(1), 41489. https://doi.org/10.1038/srep41489.

Brayshaw, D. J., Woollings, T., & Vellinga, M. (2009). Tropical and Extratropical Responses of the North Atlantic Atmospheric Circulation to a Sustained Weakening of the MOC. Journal of Climate, 22(11), 3146–3155. https://doi.org/10.1175/2008JCLI2594.1.

Buckley, M. W., & Marshall, J. (2016). Observations, inferences, and mechanisms of the Atlantic Meridional Overturning Circulation: A review. Reviews of Geophysics, 54(1), 5–63. https://doi.org/10.1002/2015RG000493.

Calder, P. C. (2021). Nutrition and immunity: lessons for COVID-19. European Journal of Clinical Nutrition, 75(9), 1309–1318. https://doi.org/10.1038/s41430-021-00949-8

Caminade, C., McIntyre, K. M., & Jones, A. E. (2019). Impact of recent and future climate change on vector-borne diseases. Annals of the New York Academy of Sciences, 1436(1), 157–173. https://doi.org/10.1111/nyas.13950.

Caretta, M.A., A. Mukherji, M. Arfanuzzaman, R.A. Betts, A. Gelfan, Y. Hirabayashi, T.K. Lissner, J. Liu, E. Lopez Gunn, R. Morgan, S. Mwanga, and S. Supratid (Ed.). (2023). Water. In Climate Change 2022 – Impacts, Adaptation and Vulnerability: Working Group II Contribution to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change (pp. 551–712). Cambridge University Press. https://doi.org/10.1017/9781009325844.006.

Cascio, W. E. (2018). Wildland fire smoke and human health. Science of The Total Environment, 624, 586–595. https://doi.org/10.1016/j.scitotenv.2017.12.086.

Castellanos, E., M.F. Lemos, L. Astigarraga, N. Chacón, N. Cuvi, C. Huggel, L. Miranda, M. Moncassim Vale, J.P. Ometto, P.L. Peri, J.C. Postigo, L. Ramajo, L. Roco, and M. Rusticucci. (2023). Central and South America. In: Climate Change 2022: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change (1st ed.). Cambridge University Press. https://doi.org/10.1017/9781009325844.

Chadburn, S. E., Burke, E. J., Cox, P. M., Friedlingstein, P., Hugelius, G., & Westermann, S. (2017). An observation-based constraint on permafrost loss as a function of global warming. Nature Climate Change, 7(5), 340–344. https://doi.org/10.1038/nclimate3262.

Challinor, Andy, & Benton, Tim G. (2021). Technical Report Chapter 7: International Dimensions. https://www.ukclimaterisk.org/wp-content/uploads/2021/06/CCRA3-Chapter-7-FINAL.pdf

Chang, P., Zhang, R., Hazeleger, W., Wen, C., Wan, X., Ji, L., Haarsma, R. J., Breugem, W.-P., & Seidel, H. (2008). Oceanic link between abrupt changes in the North Atlantic Ocean and the African monsoon. Nature Geoscience, 1(7), 444–448. https://doi.org/10.1038/ngeo218.

Charlson, F., Ali, S., Benmarhnia, T., Pearl, M., Massazza, A., Augustinavicius, J., & Scott, J. G. (2021). Climate Change and Mental Health: A Scoping Review. International Journal of Environmental Research and Public Health, 18(9), 4486. https://doi.org/10.3390/ijerph18094486.

Chemison, A., Ramstein, G., Tompkins, A. M., Defrance, D., Camus, G., Charra, M., & Caminade, C. (2021). Impact of an accelerated melting of Greenland on malaria distribution over Africa. Nature Communications, 12(1), 3971. https://doi.org/10.1038/s41467-021-24134-4.

Chen, G., Guo, Y., Yue, X., Tong, S., Gasparrini, A., Bell, M. L., Armstrong, B., Schwartz, J., Jaakkola, J. J. K., Zanobetti, A., Lavigne, E., Nascimento Saldiva, P. H., Kan, H., Royé, D., Milojevic, A., Overcenco, A., Urban, A., Schneider, A., Entezari, A., … Li, S. (2021). Mortality risk attributable to wildfire-related PM2·5 pollution: a global time series study in 749 locations. The Lancet Planetary Health, 5(9), e579–e587. https://doi.org/10.1016/S2542-5196(21)00200-X.

Chen, J., & Mueller, V. (2018). Coastal climate change, soil salinity and human migration in Bangladesh. Nature Climate Change, 8(11), 981–985. https://doi.org/10.1038/s41558-018-0313-8.

Cissé, G., R. McLeman, H. Adams, P. Aldunce, K. Bowen, D. Campbell-Lendrum, S. Clayton, K.L. Ebi, J. Hess, C. Huang, Q. Liu, G. McGregor, J. Semenza, and M.C. Tirado, (2022). Health, Wellbeing, and the Changing Structure of Communities. In: Climate Change 2022: Impacts, Adaptation, and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [H.-O. Pörtner, D.C. Roberts, M. Tignor, E.S. Poloczanska, K. Mintenbeck, A. Alegría, M. Craig, S. Langsdorf, S. Löschke, V. Möller, A. Okem, B. Rama (eds.)]. Cambridge University Press, Cambridge, UK and New York, NY, USA, pp. 1041-1170, https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter07.pdf

Cohn, A. S., Bhattarai, N., Campolo, J., Crompton, O., Dralle, D., Duncan, J., & Thompson, S. (2019). Forest loss in Brazil increases maximum temperatures within 50 km. Environmental Research Letters, 14(8), 084047. https://doi.org/10.1088/1748-9326/ab31fb.

Cooley, S., D. Schoeman, L. Bopp, P. Boyd, S. Donner, D.Y. Ghebrehiwet, S.-I. Ito, W. Kiessling, P. Martinetto, E. Ojea, M.-F. Racault, B. Rost, and M. Skern-Mauritzen, (2022). Ocean and Coastal Ecosystems and their Services. In: Climate Change 2022: Impacts, Adaptation, and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [H.-O. Pörtner, D.C. Roberts, M. Tignor, E.S. Poloczanska, K. Mintenbeck, A. Alegría, M. Craig, S. Langsdorf, S. Löschke, V. Möller, A. Okem, B. Rama (eds.)]. Cambridge University Press, Cambridge, UK and New York, NY, USA, pp. 379-550, https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_FinalDraft_Chapter03.pdf

Covert, H. H., Abdoel Wahid, F., Wenzel, S. E., & Lichtveld, M. Y. (2023). Climate change impacts on respiratory health: exposure, vulnerability, and risk. Physiological Reviews, 103(4), 2507–2522. https://doi.org/10.1152/physrev.00043.2022.

d'Amour, C. B., Wenz, L., Kalkuhl, M., Steckel, J. C., & Creutzig, F. (2016). Teleconnected food supply shocks. Environmental Research Letters, 11(3), 035007. https://doi.org/10.1088/1748-9326/11/3/035007.

Defrance, D., Ramstein, G., Charbit, S., Vrac, M., Famien, A. M., Sultan, B., Swingedouw, D., Dumas, C., Gemenne, F., Alvarez-Solas, J., & Vanderlinden, J.-P. (2017). Consequences of rapid ice sheet melting on the Sahelian population vulnerability. Proceedings of the National Academy of Sciences, 114(25), 6533–6538. https://doi.org/10.1073/pnas.1619358114.

Deutloff, J. E., Held, H., & Lenton, T. M. (2023). The risky middle of the road – probabilities of triggering climate tipping points and how they increase due to tipping points within the Earth's carbon cycle [Preprint]. Climate change/Biosphere/atmosphere interactions/Idealized models. https://doi.org/10.5194/egusphere-2023-1469.

Dos Santos, S., Adams, E. A., Neville, G., Wada, Y., De Sherbinin, A., Mullin Bernhardt, E., & Adamo, S. B. (2017). Urban growth and water access in sub-Saharan Africa: Progress, challenges, and emerging research directions. Science of The Total Environment, 607–608, 497–508. https://doi.org/10.1016/j.scitotenv.2017.06.157.

Dutton, A., Carlson, A. E., Long, A. J., Milne, G. A., Clark, P. U., DeConto, R., Horton, B. P., Rahmstorf, S., & Raymo, M. E. (2015). Sea-level rise due to polar ice-sheet mass loss during past warm periods. Science, 349(6244), aaa4019. https://doi.org/10.1126/science.aaa4019.

Dvorak, A. C., Solo-Gabriele, H. M., Galletti, A., Benzecry, B., Malone, H., Boguszewski, V., & Bird, J. (2018). Possible impacts of sea level rise on disease transmission and potential adaptation strategies, a review. Journal of Environmental Management, 217, 951–968. https://doi.org/10.1016/j.jenvman.2018.03.102

Ebi, K. L., Vanos, J., Baldwin, J. W., Bell, J. E., Hondula, D. M., Errett, N. A., Hayes, K., Reid, C. E., Saha, S., Spector, J., & Berry, P. (2021). Extreme Weather and Climate Change: Population Health and Health System Implications. Annual Review of Public Health, 42(1), 293–315. https://doi.org/10.1146/annurev-publhealth-012420-105026

Esquivel-Muelbert, A., Galbraith, D., Dexter, K. G., Baker, T. R., Lewis, S. L., Meir, P., Rowland, L., Costa, A. C. L. D., Nepstad, D., & Phillips, O. L. (2017). Biogeographic distributions of neotropical trees reflect their directly measured drought tolerances. Scientific Reports, 7(1), 8334. https://doi.org/10.1038/s41598-017-08105-8

Flores, B. M., & Holmgren, M. (2021). White-Sand Savannas Expand at the Core of the Amazon After Forest Wildfires. Ecosystems, 24(7), 1624–1637. https://doi.org/10.1007/s10021-021-00607-x

Flores, B. M., Staal, A., Jakovac, C. C., Hirota, M., Holmgren, M., & Oliveira, R. S. (2020). Soil erosion as a resilience drain in disturbed tropical forests. Plant and Soil, 450(1), 11–25. https://doi.org/10.1007/s11104-019-04097-8

Fox-Kemper, B., H.T. Hewitt, C. Xiao, G. Aðalgeirsdóttir, S.S. Drijfhout, T.L. Edwards, N.R. Golledge, M. Hemer, R.E. Kopp, G. Krinner, A. Mix, D. Notz, S. Nowicki, I.S. Nurhati, L. Ruiz, J.-B. Sallée, A.B.A. Slangen, and Y. Yu. (2023). 2021: Ocean, Cryosphere and Sea Level Change. In Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change (1st ed.). Cambridge University Press. https://doi.org/10.1017/9781009157896

Garcia-Tigreros, F., Leonte, M., Ruppel, C. D., Ruiz-Angulo, A., Joung, D. J., Young, B., & Kessler, J. D. (2021). Estimating the Impact of Seep Methane Oxidation on Ocean pH and Dissolved Inorganic Radiocarbon Along the U.S. Mid-Atlantic Bight. Journal of Geophysical Research: Biogeosciences, 126(1), e2019JG005621. https://doi.org/10.1029/2019JG005621

Garry, S., & Checchi, F. (2020). Armed conflict and public health: into the 21st century. Journal of Public Health, 42(3), e287–e298. https://doi.org/10.1093/pubmed/fdz095

Gasser, T., Kechiar, M., Ciais, P., Burke, E. J., Kleinen, T., Zhu, D., Huang, Y., Ekici, A., & Obersteiner, M. (2018). Path-dependent reductions in CO2 emission budgets caused by permafrost carbon release. Nature Geoscience, 11(11), 830–835. https://doi.org/10.1038/s41561-018-0227-0

Gaupp, F. (2020). Extreme Events in a Globalized Food System. One Earth, 2(6), 518–521. https://doi.org/10.1016/j.oneear.2020.06.001

Gomes, V. H. F., Vieira, I. C. G., Salomão, R. P., & Ter Steege, H. (2019). Amazonian tree species threatened by deforestation and climate change. Nature Climate Change, 9(7), 547–553. https://doi.org/10.1038/s41558-019-0500-2

Gosling, S. N., & Arnell, N. W. (2016). A global assessment of the impact of climate change on water scarcity. Climatic Change, 134(3), 371–385. https://doi.org/10.1007/s10584-013-0853-x

Haarsma, R. J., Selten, F. M., & Drijfhout, S. S. (2015). Decelerating Atlantic meridional overturning circulation main cause of future west European summer atmospheric circulation changes. Environmental Research Letters, 10(9), 094007. https://doi.org/10.1088/1748-9326/10/9/094007

Hanlon, H., Palmer, M., & Betts, R. (2021). Effect of Potential Climate Tipping Points on UK Impacts. MetOffice Hadley Centre, UK https://www.ukclimaterisk.org/wp-content/uploads/2021/06/Effect-of-Potential-Climate-Tipping-Points-on-UK-Impacts.pdf

Hauer, M. E. (2017). Migration induced by sea-level rise could reshape the US population landscape. Nature Climate Change, 7(5), 321–325. https://doi.org/10.1038/nclimate3271

Hauer, M. E., Fussell, E., Mueller, V., Burkett, M., Call, M., Abel, K., McLeman, R., & Wrathall, D. (2019). Sea-level rise and human migration. Nature Reviews Earth & Environment, 1(1), 28–39. https://doi.org/10.1038/s43017-019-0002-9

Heinze, C., Blenckner, T., Martins, H., Rusiecka, D., Döscher, R., Gehlen, M., Gruber, N., Holland, E., Hov, Ø., Joos, F., Matthews, J. B. R., Rødven, R., & Wilson, S. (2021). The quiet crossing of ocean tipping points. Proceedings of the National Academy of Sciences, 118(9), e2008478118. https://doi.org/10.1073/pnas.2008478118

Higgins, S. I., Conradi, T., & Muhoko, E. (2023). Shifts in vegetation activity of terrestrial ecosystems attributable to climate trends. Nature Geoscience, 16(2), 147–153. https://doi.org/10.1038/s41561-022-01114-x

Hirota, M., Flores, B. M., Betts, R., Borma, L. S., Esquivel-Muelbert, A., Jakovac, C., Lapola, D. M., Montoya, E., Oliveira, R. S., & Sakschewski, B. (2021). Chapter 24: Resilience of the Amazon forest to global changes: Assessing the risk of tipping points. In C. Nobre, A. Encalada, E. Anderson, F. H. Roca Alcazar, M. Bustamante, C. Mena, M. Peña-Claros, G. Poveda, J. P. Rodriguez, S. Saleska, S. E. Trumbore, A. Val, L. Villa Nova, R. Abramovay, A. Alencar, A. C. Rodriguez Alzza, D. Armenteras, P. Artaxo, S. Athayde, ... G. Zapata-Ríos (Eds.), Amazon Assessment Report 2021 (1st ed.). UN Sustainable Development Solutions Network (SDSN). https://doi.org/10.55161/QPYS9758

Hjort, J., Karjalainen, O., Aalto, J., Westermann, S., Romanovsky, V. E., Nelson, F. E., Etzelmüller, B., & Luoto, M. (2018). Degrading permafrost puts Arctic infrastructure at risk by mid-century. Nature Communications, 9(1), 5147. https://doi.org/10.1038/s41467-018-07557-4

Hjort, J., Streletskiy, D., Doré, G., Wu, Q., Bjella, K., & Luoto, M. (2022). Impacts of permafrost degradation on infrastructure. Nature Reviews Earth & Environment, 3(1), 24–38. https://doi.org/10.1038/s43017-021-00247-8

Hu, A., Meehl, G. A., Han, W., & Yin, J. (2009). Transient response of the MOC and climate to potential melting of the Greenland Ice Sheet in the 21st century. Geophysical Research Letters, 36(10), L10707. https://doi.org/10.1029/2009GL037998

Hugelius, G., Loisel, J., Chadburn, S., Jackson, R. B., Jones, M., MacDonald, G., Marushchak, M., Olefeldt, D., Packalen, M., Siewert, M. B., Treat, C., Turetsky, M., Voigt, C., & Yu, Z. (2020). Large stocks of peatland carbon and nitrogen are vulnerable to permafrost thaw. Proceedings of the National Academy of Sciences, 117(34), 20438–20446. https://doi.org/10.1073/pnas.1916387117

IPCC, (2019). IPCC Special Report on the Ocean and Cryosphere in a Changing Climate [H.-O. Pörtner, D.C. Roberts, V. Masson-Delmotte, P. Zhai, M. Tignor, E. Poloczanska, K. Mintenbeck, A. Alegría, M. Nicolai, A. Okem, J. Petzold, B. Rama, N.M. Weyer (eds.)]. Cambridge University Press, Cambridge, UK and New York, NY, USA, 755 pp. https://doi.org/10.1017/9781009157964.

Jackson, L. C., Kahana, R., Graham, T., Ringer, M. A., Woollings, T., Mecking, J. V., & Wood, R. A. (2015). Global and European climate impacts of a slowdown of the AMOC in a high resolution GCM. Climate Dynamics, 45(11–12), 3299–3316. https://doi.org/10.1007/s00382-015-2540-2

Jacob, D., Goettel, H., Jungclaus, J., Muskulus, M., Podzun, R., & Marotzke, J. (2005). Slowdown of the thermohaline circulation causes enhanced maritime climate influence and snow cover over Europe. Geophysical Research Letters, 32(21), L21711. https://doi.org/10.1029/2005GL023286

Khan, A. E., Ireson, A., Kovats, S., Mojumder, S. K., Khusru, A., Rahman, A., & Vineis, P. (2011). Drinking Water Salinity and Maternal Health in Coastal Bangladesh: Implications of Climate Change. Environmental Health Perspectives, 119(9), 1328–1332. https://doi.org/10.1289/ehp.1002804

Khanom, T. (2016). Effect of salinity on food security in the context of interior coast of Bangladesh. Ocean & Coastal Management, 130, 205–212. https://doi.org/10.1016/j.ocecoaman.2016.06.013

Kienert, H., & Rahmstorf, S. (2012). On the relation between Meridional Overturning Circulation and sea-level gradients in the Atlantic. Earth System Dynamics, 3(2), 109–120. https://doi.org/10.5194/esd-3-109-2012

Knapp, C. N., & Trainor, S. F. (2015). Alaskan stakeholder-defined research needs in the context of climate change. Polar Geography, 38(1), 42–69. https://doi.org/10.1080/1088937X.2014.999844

Kornhuber, K., Lesk, C., Schleussner, C. F., Jägermeyr, J., Pfleiderer, P., & Horton, R. M. (2023). Risks of synchronized low yields are underestimated in climate and crop model projections. Nature Communications, 14(1), 3528. https://doi.org/10.1038/s41467-023-38906-7

Kulp, S. A., & Strauss, B. H. (2019). New elevation data triple estimates of global vulnerability to sea-level rise and coastal flooding. Nature Communications, 10(1), 4844. https://doi.org/10.1038/s41467-019-12808-z

Kummu, M., De Moel, H., Salvucci, G., Viviroli, D., Ward, P. J., & Varis, O. (2016). Over the hills and further away from coast: global geospatial patterns of human and environment over the 20th–21st centuries. Environmental Research Letters, 11(3), 034010. https://doi.org/10.1088/1748-9326/11/3/034010

Kwiatkowski, L., Naar, J., Bopp, L., Aumont, O., Defrance, D., & Couespel, D. (2019). Decline in Atlantic Primary Production Accelerated by Greenland Ice Sheet Melt. Geophysical Research Letters, 46(20), 11347–11357. https://doi.org/10.1029/2019GL085267

Lane, K., Charles-Guzman, K., Wheeler, K., Abid, Z., Graber, N., & Matte, T. (2013). Health Effects of Coastal Storms and Flooding in Urban Areas: A Review and Vulnerability Assessment. Journal of Environmental and Public Health, 2013, 1–13. https://doi.org/10.1155/2013/913064

Langer, M., Von Deimling, T. S., Westermann, S., Rolph, R., Rutte, R., Antonova, S., Rachold, V., Schultz, M., Oehme, A., & Grosse, G. (2023). Thawing permafrost poses environmental threat to thousands of sites with legacy industrial contamination. Nature Communications, 14(1), 1721. https://doi.org/10.1038/s41467-023-37276-4

Lapola, D. M., Pinho, P., Barlow, J., Aragão, L. E. O. C., Berenguer, E., Carmenta, R., Liddy, H. M., Seixas, H., Silva, C. V. J., Silva-Junior, C. H. L., Alencar, A. A. C., Anderson, L. O., Armenteras, D., Brovkin, V., Calders, K., Chambers, J., Chini, L., Costa, M. H., Faria, B. L., ... Walker, W. S. (2023). The drivers and impacts of Amazon forest degradation. Science, 379(6630), eabp8622. https://doi.org/10.1126/science.abp8622

Lapola, D. M., Pinho P., Quesada, C.A., Strassburg, B. B. N., Rammig, A., Kruijt, B., Brown, F., Jean P. Ometto, H. B., Premebida, A., Marengo, J.A., Vergara, W., Nobre, C.A. (2018) Limiting the high impacts of Amazon forest dieback with no-regrets science and policy action. Proceedings of the National Academy of Sciences, 115(46), 11671-11679.

Laurance, S. G. W., Stouffer, P. C., & Laurance, W. F. (2004). Effects of Road Clearings on Movement Patterns of Understory Rainforest Birds in Central Amazonia. Conservation Biology, 18(4), 1099–1109. https://doi.org/10.1111/j.1523-1739.2004.00268.x

Laurian, A., Drijfhout, S. S., Hazeleger, W., & Van Den Hurk, B. (2010). Response of the Western European climate to a collapse of the thermohaline circulation. Climate Dynamics, 34(5), 689–697. https://doi.org/10.1007/s00382-008-0513-4

Lemieux, A., Colby, G. A., Poulain, A. J., & Aris-Brosou, S. (2022). Viral spillover risk increases with climate change in High Arctic lake sediments. Proceedings of the Royal Society B: Biological Sciences, 289(1985), 20221073. https://doi.org/10.1098/rspb.2022.1073

Levermann, A., Griesel, A., Hofmann, M., Montoya, M., & Rahmstorf, S. (2005). Dynamic sea level changes following changes in the thermohaline circulation. Climate Dynamics, 24(4), 347–354. https://doi.org/10.1007/s00382-004-0505-y

Link, P. M., & Tol, R. S. J. (2009). Economic impacts on key Barents Sea fisheries arising from changes in the strength of the Atlantic thermohaline circulation. Global Environmental Change, 19(4), 422–433. https://doi.org/10.1016/j.gloenvcha.2009.07.007

Little, C. M., Hu, A., Hughes, C. W., McCarthy, G. D., Piecuch, C. G., Ponte, R. M., & Thomas, M. D. (2019). The Relationship Between U.S. East Coast Sea Level and the Atlantic Meridional Overturning Circulation: A Review. Journal of Geophysical Research: Oceans, 124(9), 6435–6458. https://doi.org/10.1029/2019JC015152

Liu, T., Chen, D., Yang, L., Meng, J., Wang, Z., Ludescher, J., Fan, J., Yang, S., Chen, D., Kurths, J., Chen, X., Havlin, S., & Schellnhuber, H. J. (2023). Teleconnections among tipping elements in the Earth system. Nature Climate Change, 13(1), 67–74. https://doi.org/10.1038/s41558-022-01558-4

Lorbacher, K., Dengg, J., Böning, C. W., & Biastoch, A. (2010). Regional Patterns of Sea Level Change Related to Interannual Variability and Multidecadal Trends in the Atlantic Meridional Overturning Circulation*. Journal of Climate, 23(15), 4243–4254. https://doi.org/10.1175/2010JCLI3341.1

Loring, P. A., & Gerlach, S. C. (2009). Food, culture, and human health in Alaska: an integrative health approach to food security. Environmental Science & Policy, 12(4), 466–478. https://doi.org/10.1016/j.envsci.2008.10.006

Magnan, A. K., Oppenheimer, M., Garschagen, M., Buchanan, M. K., Duvat, V. K. E., Forbes, D. L., Ford, J. D., Lambert, E., Petzold, J., Renaud, F. G., Sebesvari, Z., Van De Wal, R. S. W., Hinkel, J., & Pörtner, H.-O. (2022). Sea level rise risks and societal adaptation benefits in low-lying coastal areas. Scientific Reports, 12(1), 10677. https://doi.org/10.1038/s41598-022-14303-w

Marzin, C., Kallel, N., Kageyama, M., Duplessy, J.-C., & Braconnot, P. (2013). Glacial fluctuations of the Indian monsoon and their relationship with North Atlantic climate: new data and modelling experiments. Climate of the Past, 9(5), 2135–2151. https://doi.org/10.5194/cp-9-2135-2013

Maslakov, A., Sotnikova, K., Gribovskii, G., & Evlanov, D. (2022). Thermal Simulation of Ice Cellars as a Basis for Food Security and Energy Sustainability of Isolated Indigenous Communities in the Arctic. Energies, 15(3), 972. https://doi.org/10.3390/en15030972

Math, S. B., Nirmala, M. C., Moirangthem, S., & Kumar, N. C. (2015). Disaster Management: Mental Health Perspective. Indian Journal of Psychological Medicine, 37(3), 261–271. https://doi.org/10.4103/0253-7176.162915

Mazhar, S., Pellegrini, E., Contin, M., Bravo, C., & De Nobili, M. (2022). Impacts of salinization caused by sea level rise on the biological processes of coastal soils - A review. Frontiers in Environmental Science, 10. https://www.frontiersin.org/articles/10.3389/fenvs.2022.909415

McGuire, A. D., Lawrence, D. M., Koven, C., Clein, J. S., Burke, E., Chen, G., Jafarov, E., MacDougall, A. H., Marchenko, S., Nicolsky, D., Peng, S., Rinke, A., Ciais, P., Gouttevin, I., Hayes, D. J., Ji, D., Krinner, G., Moore, J. C., Romanovsky, V., … Zhuang, Q. (2018). Dependence of the evolution of carbon dynamics in the northern permafrost region on the trajectory of climate change. Proceedings of the National Academy of Sciences, 115(15), 3882–3887. https://doi.org/10.1073/pnas.1719903115

McLeman, R. A. (2011). Settlement abandonment in the context of global environmental change. Global Environmental Change, 21, S108–S120. https://doi.org/10.1016/j.gloenvcha.2011.08.004

Miner, K. R., D'Andrilli, J., Mackelprang, R., Edwards, A., Malaska, M. J., Waldrop, M. P., & Miller, C. E. (2021). Emergent biogeochemical risks from Arctic permafrost degradation. Nature Climate Change, 11(10), 809–819. https://doi.org/10.1038/s41558-021-01162-y

Morlighem, M., Williams, C. N., Rignot, E., An, L., Arndt, J. E., Bamber, J. L., Catania, G., Chauché, N., Dowdeswell, J. A., Dorschel, B., Fenty, I., Hogan, K., Howat, I., Hubbard, A., Jakobsson, M., Jordan, T. M., Kjeldsen, K. K., Millan, R., Mayer, L., … Zinglersen, K. B. (2017). BedMachine v3: Complete Bed Topography and Ocean Bathymetry Mapping of Greenland From Multibeam Echo Sounding Combined With Mass Conservation. Geophysical Research Letters, 44(21). https://doi.org/10.1002/2017GL074954

Myers-Smith, I. H., Kerby, J. T., Phoenix, G. K., Bjerke, J. W., Epstein, H. E., Assmann, J. J., John, C., Andreu-Hayles, L., Angers-Blondin, S., Beck, P. S. A., Berner, L. T., Bhatt, U. S., Bjorkman, A. D., Blok, D., Bryn, A., Christiansen, C. T., Cornelissen, J. H. C., Cunliffe, A. M., Elmendorf, S. C., … Wipf, S. (2020). Complexity revealed in the greening of the Arctic. Nature Climate Change, 10(2), 106–117. https://doi.org/10.1038/s41558-019-0688-1

Natali, S. M., Holdren, J. P., Rogers, B. M., Treharne, R., Duffy, P. B., Pomerance, R., & MacDonald, E. (2021). Permafrost carbon feedbacks threaten global climate goals. Proceedings of the National Academy of Sciences, 118(21), e2100163118. https://doi.org/10.1073/pnas.2100163118

Neumann, B., Vafeidis, A. T., Zimmermann, J., & Nicholls, R. J. (2015). Future Coastal Population Growth and Exposure to Sea-Level Rise and Coastal Flooding - A Global Assessment. PLOS ONE, 10(3), e0118571. https://doi.org/10.1371/journal.pone.0118571

Nichols, G., Lake, I., & Heaviside, C. (2018). Climate Change and Water-Related Infectious Diseases. Atmosphere, 9(10), 385. https://doi.org/10.3390/atmos9100385

Nitzbon, J., Schneider Von Deimling, T., Aliyeva, M., Chadburn, S., Grosse, G., Laboor, S., Lee, H., Lohmann, G., Steinert, N., Stuenzi, S., Werner, M., Westermann, S., & Langer, M. (2023). No respite from permafrost-thaw impacts in absence of a global tipping point [Preprint]. Biogeochemistry. https://doi.org/10.31223/X55X08

Science Panel for the Amazon (2021). Executive Summary of the Amazon Assessment Report 2021. C. Nobre, A. Encalada, E. Anderson, F.H. Roca Alcazar, M. Bustamante, C. Mena, M. Peña-Claros, G. Poveda, J.P. Rodriguez, S. Saleska, S. Trumbore, A.L. Val, L. Villa Nova, R. Abramovay, A. Alencar, A.C.R. Alzza, D. Armenteras, P. Artaxo, S. Athayde, H.T. Barretto Filho, J. Barlow, E. Berenguer, F. Bortolotto, F.A. Costa, M.H. Costa, N. Cuvi, P.M. Fearnside, J. Ferreira, B.M. Flores, S. Frieri, L.V. Gatti, J.M. Guayasamin, S. Hecht, M. Hirota, C. Hoorn, C. Josse, D.M. Lapola, C. Larrea, D.M. Larrea-Alcazar, Z. Lehm Ardaya, Y. Malhi, J.A. Marengo, M.R. Moraes, P. Moutinho, M.R. Murmis, E.G. Neves, B. Paez, L. Painter, A. Ramos, M.C. Rosero-Peña, M. Schmink, P. Sist, H. ter Steege, P. Val, H. van der Voort, M. Varese, Zapata-Ríos (eds.) United Nations Sustainable Development Solutions Network, New York, USA. https://www.theamazonwewant.org/spa_publication/amazon-assessment-report-2021/

Nova, N., Athni, T. S., Childs, M. L., Mandle, L., & Mordecai, E. A. (2022). Global Change and Emerging Infectious Diseases. Annual Review of Resource Economics, 14(1), 333–354. https://doi.org/10.1146/annurev-resource-111820-024214

Oliveira, B. F. A. D., Jacobson, L. D. S. V., Perez, L. P., Silveira, I. H. D., Junger, W. L., & Hacon, S. D. S. (2020). Impacts of heat stress conditions on mortality from respiratory and cardiovascular diseases in Brazil. Sustentabilidade Em Debate, 11(3), 297–330. https://doi.org/10.18472/SustDeb.v11n3.2020.33970

O'Neill, B. C., Oppenheimer, M., Warren, R., Hallegatte, S., Kopp, R. E., Pörtner, H. O., Scholes, R., Birkmann, J., Foden, W., Licker, R., Mach, K. J., Marbaix, P., Mastrandrea, M. D., Price, J., Takahashi, K., Van Ypersele, J.-P., & Yohe, G. (2017). IPCC reasons for concern regarding climate change risks. Nature Climate Change, 7(1), 28–37. https://doi.org/10.1038/nclimate3179

Oppenheimer, M., B.C. Glavovic , J. Hinkel, R. van de Wal, A.K. Magnan, A. Abd-Elgawad, R. Cai, M. Cifuentes-Jara, R.M. DeConto, T. Ghosh, J. Hay, F. Isla, B. Marzeion, B. Meyssignac, and Z. Sebesvari. (2019). 2019: Sea Level Rise and Implications for Low-Lying Islands, Coasts and Communities. In: IPCC Special Report on the Ocean and Cryosphere in a Changing Climate. https://www.ipcc.ch/site/assets/uploads/sites/3/2019/11/08_SROCC_Ch04_FINAL.pdf

Palinkas, L. A., & Wong, M. (2020). Global climate change and mental health. Current Opinion in Psychology, 32, 12–16. https://doi.org/10.1016/j.copsyc.2019.06.023

Pan, L., Powell, E. M., Latychev, K., Mitrovica, J. X., Creveling, J. R., Gomez, N., Hoggard, M. J., & Clark, P. U. (2021). Rapid postglacial rebound amplifies global sea level rise following West Antarctic Ice Sheet collapse. Science Advances, 7(18), eabf7787. https://doi.org/10.1126/sciadv.abf7787

Parsons, L. A., Yin, J., Overpeck, J. T., Stouffer, R. J., & Malyshev, S. (2014). Influence of the Atlantic Meridional Overturning Circulation on the monsoon rainfall and carbon balance of the American tropics. Geophysical Research Letters, 41(1), 146–151. https://doi.org/10.1002/2013GL058454

Pawlak, K., & Kołodziejczak, M. (2020). The Role of Agriculture in Ensuring Food Security in Developing Countries: Considerations in the Context of the Problem of Sustainable Food Production. Sustainability, 12(13), 5488. https://doi.org/10.3390/su12135488

Pinho, P. F., Marengo, J. A., & Smith, M. S. (2015). Complex socio-ecological dynamics driven by extreme events in the Amazon. Regional Environmental Change, 15(4), 643–655. https://doi.org/10.1007/s10113-014-0659-z

Ramasamy, R., & Surendran, S. N. (2011). Possible impact of rising sea levels on vector-borne infectious diseases. BMC Infectious Diseases, 11(1), 18. https://doi.org/10.1186/1471-2334-11-18

Rantanen, M., Karpechko, A. Yu., Lipponen, A., Nordling, K., Hyvärinen, O., Ruosteenoja, K., Vihma, T., & Laaksonen, A. (2022). The Arctic has warmed nearly four times faster than the globe since 1979. Communications Earth & Environment, 3(1), 168. https://doi.org/10.1038/s43247-022-00498-3

Ritchie, P. D. L., Smith, G. S., Davis, K. J., Fezzi, C., Halleck-Vega, S., Harper, A. B., Boulton, C. A., Binner, A. R., Day, B. H., Gallego-Sala, A. V., Mecking, J. V., Sitch, S. A., Lenton, T. M., & Bateman, I. J. (2020). Shifts in national land use and food production in Great Britain after a climate tipping point. Nature Food, 1(1), 76–83. https://doi.org/10.1038/s43016-019-0011-3

Rockström, J., Gupta, J., Qin, D., Lade, S. J., Abrams, J. F., Andersen, L. S., Armstrong McKay, D. I., Bai, X., Bala, G., Bunn, S. E., Ciobanu, D., DeClerck, F., Ebi, K., Gifford, L., Gordon, C., Hasan, S., Kanie, N., Lenton, T. M., Loriani, S., Zhang, X. (2023). Safe and just Earth system boundaries. Nature, 619(7968), 102–111. https://doi.org/10.1038/s41586-023-06083-8

Ruv Lemes, M., Sampaio, G., Fisch, G., Alves, L. M., Maksic, J., Guatura, M., & Shimizu, M. (2023). Impacts of atmospheric CO_2 increase and Amazon deforestation on the regional climate: A water budget modelling study. International Journal of Climatology, 43(3), 1497–1513. https://doi.org/10.1002/joc.7929

Salas, R. N., & Jha, A. K. (2019). Climate change threatens the achievement of effective universal healthcare. BMJ, l5302. https://doi.org/10.1136/bmj.l5302

Sandeep, N., Swapna, P., Krishnan, R., Farneti, R., Prajeesh, A. G., Ayantika, D. C., & Manmeet, S. (2020). South Asian monsoon response to weakening of Atlantic meridional overturning circulation in a warming climate. Climate Dynamics, 54(7–8), 3507–3524. https://doi.org/10.1007/s00382-020-05180-y

Schaefer, K., Elshorbany, Y., Jafarov, E., Schuster, P. F., Striegl, R. G., Wickland, K. P., & Sunderland, E. M. (2020). Potential impacts of mercury released from thawing permafrost. Nature Communications, 11(1), 4650. https://doi.org/10.1038/s41467-020-18398-5

Schellnhuber, Hans Joachim, and Maria A. Martin. (2014). Climate-system tipping points and extreme weather events. Pontifical Academy of Sciences and Pontifical Academy of Social Sciences: Sustainable Humanity, Sustainable Nature: Our Responsibility. https://www.pas.va/content/dam/casinapioiv/pas/pdf-volumi/extra-series/es_41/es41-schellnhuber.pdf

Schmittner, A. (2005). Decline of the marine ecosystem caused by a reduction in the Atlantic overturning circulation. Nature, 434(7033), 628–633. https://doi.org/10.1038/nature03476

Schuur, E. A. G., Abbott, B. W., Commane, R., Ernakovich, J., Euskirchen, E., Hugelius, G., Grosse, G., Jones, M., Koven, C., Leshyk, V., Lawrence, D., Loranty, M. M., Mauritz, M., Olefeldt, D., Natali, S., Rodenhizer, H., Salmon, V., Schädel, C., Strauss, J., … Turetsky, M. (2022). Permafrost and Climate Change: Carbon Cycle Feedbacks From the Warming Arctic. Annual Review of Environment and Resources, 47(1), 343–371. https://doi.org/10.1146/annurev-environ-012220-011847

Schuur, E. A. G., & Mack, M. C. (2018). Ecological Response to Permafrost Thaw and Consequences for Local and Global Ecosystem Services. Annual Review of Ecology, Evolution, and Systematics, 49(1), 279–301. https://doi.org/10.1146/annurev-ecolsys-121415-032349

Schuur, E. A. G., McGuire, A. D., Schädel, C., Grosse, G., Harden, J. W., Hayes, D. J., Hugelius, G., Koven, C. D., Kuhry, P., Lawrence, D. M., Natali, S. M., Olefeldt, D., Romanovsky, V. E., Schaefer, K., Turetsky, M. R., Treat, C. C., & Vonk, J. E. (2015). Climate change and the permafrost carbon feedback. Nature, 520(7546), 171–179. https://doi.org/10.1038/nature14338

Siegert, M., Alley, R. B., Rignot, E., Englander, J., & Corell, R. (2020). Twenty-first century sea-level rise could exceed IPCC projections for strong-warming futures. One Earth, 3(6), 691–703. https://doi.org/10.1016/j.oneear.2020.11.002

Simpson, D. M., Weissbecker, I., & Sephton, S. E. (2011). Extreme Weather-Related Events: Implications for Mental Health and Well-Being. In I. Weissbecker (Ed.), Climate Change and Human Well-Being (pp. 57–78). Springer New York. https://doi.org/10.1007/978-1-4419-9742-5_4

Siriwardhana, C., & Stewart, R. (2013). Forced migration and mental health: prolonged internal displacement, return migration and resilience. International Health, 5(1), 19–23. https://doi.org/10.1093/inthealth/ihs014

Sorensen, C., & Hess, J. (2022). Treatment and Prevention of Heat-Related Illness. The New England Journal of Medicine, 387(15), 1404–1413. https://doi.org/10.1056/NEJMcp2210623

Spector, J. T., Masuda, Y. J., Wolff, N. H., Calkins, M., & Seixas, N. (2019). Heat Exposure and Occupational Injuries: Review of the Literature and Implications. Current Environmental Health Reports, 6(4), 286–296. https://doi.org/10.1007/s40572-019-00250-8

Stickler, C. M., Coe, M. T., Costa, M. H., Nepstad, D. C., McGrath, D. G., Dias, L. C. P., Rodrigues, H. O., & Soares-Filho, B. S. (2013). Dependence of hydropower energy generation on forests in the Amazon Basin at local and regional scales. Proceedings of the National Academy of Sciences, 110(23), 9601–9606. https://doi.org/10.1073/pnas.1215331110

Stouffer, R. J., Yin, J., Gregory, J. M., Dixon, K. W., Spelman, M. J., Hurlin, W., Weaver, A. J., Eby, M., Flato, G. M., Hasumi, H., Hu, A., Jungclaus, J. H., Kamenkovich, I. V., Levermann, A., Montoya, M., Murakami, S., Nawrath, S., Oka, A., Peltier, W. R., … Weber, S. L. (2006). Investigating the Causes of the Response of the Thermohaline Circulation to Past and Future Climate Changes. Journal of Climate, 19(8), 1365–1387. https://doi.org/10.1175/JCLI3689.1

Suhrcke, M., Stuckler, D., Suk, J. E., Desai, M., Senek, M., McKee, M., Tsolova, S., Basu, S., Abubakar, I., Hunter, P., Rechel, B., & Semenza, J. C. (2011). The Impact of Economic Crises on Communicable Disease Transmission and Control: A Systematic Review of the Evidence. PLOS ONE, 6(6), e20724. https://doi.org/10.1371/journal.pone.0020724

Tauhid Ur Rahman, M., Rasheduzzaman, Md., Habib, M. A., Ahmed, A., Tareq, S. M., & Muniruzzaman, S. M. (2017). Assessment of fresh water security in coastal Bangladesh: An insight from salinity, community perception and adaptation. Ocean & Coastal Management, 137, 68–81. https://doi.org/10.1016/j.ocecoaman.2016.12.005

The IMBIE team. (2018). Mass balance of the Antarctic Ice Sheet from 1992 to 2017. Nature, 558(7709), 219–222. https://doi.org/10.1038/s41586-018-0179-y

Turner, M. G., Baker, W. L., Peterson, C. J., & Peet, R. K. (1998). Factors Influencing Succession: Lessons from Large, Infrequent Natural Disturbances. Ecosystems, 1(6), 511–523. https://doi.org/10.1007/s100219900047

Vellinga, M., & Wood, R. A. (2008). Impacts of thermohaline circulation shutdown in the twenty-first century. Climatic Change, 91(1), 43–63. https://doi.org/10.1007/s10584-006-9146-y

Vidas, D., Freestone, D., & McAdam, J. (2015). International Law And Sea Level Rise: The New ILA Committee. ILSA Journal of International & Comparative Law, 21(2), 157–167. https://nsuworks.nova.edu/ilsajournal/vol21/iss2/9

Vincent, W. F., Lemay, M., & Allard, M. (2017). Arctic permafrost landscapes in transition: towards an integrated Earth system approach. Arctic Science, 3(2), 39–64. https://doi.org/10.1139/as-2016-0027

Wang, H., Zuo, Z., Qiao, L., Zhang, K., Sun, C., Xiao, D., Lin, Z., Bu, L., & Zhang, R. (2022). Frequency of the winter temperature extremes over Siberia dominated by the Atlantic Meridional Overturning Circulation. Npj Climate and Atmospheric Science, 5(1), 84. https://doi.org/10.1038/s41612-022-00307-w

Wang, S., Foster, A., Lenz, E. A., Kessler, J. D., Stroeve, J. C., Anderson, L. O., Turetsky, M., Betts, R., Zou, S., Liu, W., Boos, W. R., & Hausfather, Z. (2023). Mechanisms and Impacts of Earth System Tipping Elements. Reviews of Geophysics, 61(1), e2021RG000757. https://doi.org/10.1029/2021RG000757

Ward Jones, M. K., Schwoerer, T., Gannon, G. M., Jones, B. M., Kanevskiy, M. Z., Sutton, I., St. Pierre, B., St. Pierre, C., Russell, J., & Russell, D. (2022). Climate-driven expansion of northern agriculture must consider permafrost. Nature Climate Change, 12(8), 699–703. https://doi.org/10.1038/s41558-022-01436-z

World Health Organisation (2011). Sanitation and hygiene. https://iris.who.int/handle/10665/370541

Zemp, D. C., Schleussner, C.-F., Barbosa, H. M. J., Hirota, M., Montade, V., Sampaio, G., Staal, A., Wang-Erlandsson, L., & Rammig, A. (2017). Self-amplified Amazon forest loss due to vegetation-atmosphere feedbacks. Nature Communications, 8(1), 14681. https://doi.org/10.1038/ncomms14681

Zhang, R., & Delworth, T. L. (2005). Simulated Tropical Response to a Substantial Weakening of the Atlantic Thermohaline Circulation. Journal of Climate, 18(12), 1853–1860. https://doi.org/10.1175/JCLI3460.1

References: Chapter 2.3

Abou-Chadi, T., & Krause, W. (2020). The Causal Effect of Radical Right Success on Mainstream Parties' Policy Positions: A Regression Discontinuity Approach. British Journal of Political Science, 50(3), 829–847. https://doi.org/10.1017/S0007123418000029

Agius, C., Rosamond, A. B., & Kinnvall, C. (2020). Populism, Ontological Insecurity and Gendered Nationalism: Masculinity, Climate Denial and Covid-19. Politics, Religion & Ideology, 21(4), 432–450. https://doi.org/10.1080/21567689.2020.1851871

Allen, T. F., Tainter, J. A., & Hoekstra, T. W. (2003). Supply-side sustainability. Columbia University Press.

Aquino, G., Guo, W., & Wilson, A. (2019). Nonlinear Dynamic Models of Conflict via Multiplexed Interaction Networks. https://doi.org/10.48550/ARXIV.1909.12457

Atwoli, L., Muhia, J., & Merali, Z. (2022). Mental health and climate change in Africa. BJPsych International, 19(4), 86–89. https://doi.org/10.1192/bji.2022.14

Avis, W. (2020). War economy in North East Nigeria. Publisher: Institute of Development Studies. 734_War_Economy_in_North_East_Nigeria.pdf (ids.ac.uk)

Babb, N. (2021). Baby won't you please come home": Studying ethnoracial segregation trends in New Orleans pre and Post Hurricane Katrina. Journal of Public and International Affairs. Jpia. Princeton. Edu/News/Baby-Wont-You-Please-Come-Home-Studying-Ethnoracial-Segregation-Trends-New-Orleans-Pre-and-Post.

Bacani, B. (2016). New financing approaches, instruments and opportunities that address the risks of loss and damage. 2016 Forum of the UNFCCC Standing Committee on Finance 5-6 September 2016, Manila,. https://www.google.com/url?q=https://unfccc.int/files/adaptation/application/pdf/unep_fi_-_butch_bacani_(sep_2016,_manila)_(final)_(1).pdf&sa=D&source=docs&ust=1698348316931772&usg=AOvVaw3wXfYmA8eXP3pZHxCMgWos

Baele, S., Brace, L., & Ging, D. (2023a). A Diachronic Cross-Platforms Analysis of Violent Extremist Language in the Incel Online Ecosystem. Terrorism and Political Violence, 1–24. https://doi.org/10.1080/09546553.2022.2161373

Baele, S., Brace, L., & Ging, D. (2023b). A Diachronic Cross-Platforms Analysis of Violent Extremist Language in the Incel Online Ecosystem. Terrorism and Political Violence, 1–24. https://doi.org/10.1080/09546553.2022.2161373

Banda, K. K., & Cluverius, J. (2018). Elite polarization, party extremity, and affective polarization. Electoral Studies, 56, 90–101. https://doi.org/10.1016/j.electstud.2018.09.009

Barfuss, W., Donges, J. F., Vasconcelos, V. V., Kurths, J., & Levin, S. A. (2020). Caring for the future can turn tragedy into comedy for long-term collective action under risk of collapse. Proceedings of the National Academy of Sciences, 117(23), 12915–12922. https://doi.org/10.1073/pnas.1916545117

Battiston, S., Mandel, A., Monasterolo, I., Schütze, F., & Visentin, G. (2017a). A climate stress-test of the financial system. Nature Climate Change, 7(4), 283–288. https://doi.org/10.1038/nclimate3255

Battiston, S., Mandel, A., Monasterolo, I., Schütze, F., & Visentin, G. (2017b). A climate stress-test of the financial system. Nature Climate Change, 7(4), 283–288. https://doi.org/10.1038/nclimate3255

Belgioioso, M., Costalli, S., & Gleditsch, K. S. (2021). Better the Devil You Know? How Fringe Terrorism Can Induce an Advantage for Moderate Nonviolent Campaigns. Terrorism and Political Violence, 33(3), 596–615. https://doi.org/10.1080/09546553.2018.1559836

Boas, I., Farbotko, C., Adams, H., Sterly, H., Bush, S., Van Der Geest, K., Wiegel, H., Ashraf, H., Baldwin, A., Bettini, G., Blondin, S., De Bruijn, M., Durand-Delacre, D., Fröhlich, C., Gioli, G., Guaita, L., Hut, E., Jarawura, F. X., Lamers, M., … Hulme, M. (2019). Climate migration myths. Nature Climate Change, 9(12), 901–903. https://doi.org/10.1038/s41558-019-0633-3

Bomberg, E. (2021). The environmental legacy of President Trump. Policy Studies, 42(5-6), 628–645. https://doi.org/10.1080/01442872.2021.1922660

Brown, A. R. (2022). Environmental anomie and the disruption of physical norms during disaster. Current Sociology, 001139212211293. https://doi.org/10.1177/00113921221129316

Bruun, J. T., Allen, J. I., & Smyth, T. J. (2017a). Heartbeat of the S outhern O scillation explains ENSO climatic resonances. Journal of Geophysical Research: Oceans, 122(8), 6746–6772. https://doi.org/10.1002/2017JC012892

Buhaug, H., Nordkvelle, J., Bernauer, T., Böhmelt, T., Brzoska, M., Busby, J. W., Ciccone, A., Fjelde, H., Gartzke, E., Gleditsch, N. P., Goldstone, J. A., Hegre, H., Holtermann, H., Koubi, V., Link, J. S. A., Link, P. M., Lujala, P., O-Loughlin, J., Raleigh, C., … Von Uexkull, N. (2014). One effect to rule them all? A comment on climate and conflict. Climatic Change, 127(3–4), 391–397. https://doi.org/10.1007/s10584-014-1266-1

Buhaug, H., & Von Uexkull, N. (2021). Vicious Circles: Violence, Vulnerability, and Climate Change. Annual Review of Environment and Resources, 46(1), 545–568. https://doi.org/10.1146/annurev-environ-012220-014708

Burden, B. C., Fletcher, J. M., Herd, P., Jones, B. M., & Moynihan, D. P. (2017). How Different Forms of Health Matter to Political Participation. The Journal of Politics, 79(1), 166–178. https://doi.org/10.1086/687536

Burke, M., Hsiang, S. M., & Miguel, E. (2015). Global non-linear effect of temperature on economic production. Nature, 527(7577), 235–239. https://doi.org/10.1038/nature15725

Burns, J., Collin, P., & Blanchard, M. (2008). Preventing youth disengagement and promoting engagement. https://doi.org/10.4225/50/557E201418C49

Burns, J. K. (2015). Poverty, inequality and a political economy of mental health. Epidemiology and Psychiatric Sciences, 24(2), 107–113. https://doi.org/10.1017/S2045796015000086

Bursztyn, L., Egorov, G., & Fiorin, S. (2020). From Extreme to Mainstream: The Erosion of Social Norms. American Economic Review, 110(11), 3522–3548. https://doi.org/10.1257/aer.20171175

Busching, R., & Krahé, B. (2018). The Contagious Effect of Deviant Behavior in Adolescence: A Longitudinal Multilevel Study. Social Psychological and Personality Science, 9(7), 815–824. https://doi.org/10.1177/1948550617725151

Caldecott, B., Clark, A., Koskelo, K., Mulholland, E., & Hickey, C. (2021). Stranded Assets: Environmental Drivers, Societal Challenges, and Supervisory Responses. Annual Review of Environment and Resources, 46(1), 417–447. https://doi.org/10.1146/annurev-environ-012220-101430

Capisani, S. (2021). Livability and a Framework for Climate Mobilities Justice. Philosophy and Public Issues - Filosofia E Questioni Pubbliche 11 (1):217-262

Carbó Valverde, S., Chinazzi, M., Fagiolo, G., Lux, T., Martín Oliver, A., Montagna, M., & Rodríguez Fernández, F. (2015). Banking integration and financial crisis: some recent developments, chapter 4 Systemic Risk, Contagion, and Financial Networks: A Survey (I. Arribas & E. Tortosa-Ausina, Eds.; 1.a ed). Fundación BBVA.

Carleton, T. A. (2017). Crop-damaging temperatures increase suicide rates in India. Proceedings of the National Academy of Sciences, 114(33), 8746–8751. https://doi.org/10.1073/pnas.1701354114

Carleton, T. A., & Hsiang, S. M. (2016). Social and economic impacts of climate. Science, 353(6304), aad9837. https://doi.org/10.1126/science.aad9837

Carvajal, L., & Pereira, I. (2010). Evidence on the link between migration, climate shocks, and adaptive capacity. In Risk, Shocks, and Human Development: On the Brink (pp. 257–283). Springer.

Chadefaux, T. (2015) The Triggers of War: Disentangling the Spark from the Powder Keg (April 28, 2015). Available at SSRN: https://ssrn.com/abstract=2409005 or http://dx.doi.org/10.2139/ssrn.2409005

Chinazzi, M. & Fagiolo, G. In Banking Integration and Financial Crisis: Some Recent Developments
eds Fernández, I. A. & Tortosa, E.) Ch. 4 (Fundacion BBVA 2015).
Banking Integration and Financial Crisis: Some Recent Developments (fbbva.es)Clayton, S., Manning, C., Krygsman, K., & Speiser, M. (2017). Mental health and our changing climate: Impacts, implications, and guidance. Washington, DC: American Psychological Association and EcoAmerica. https://www.preventionweb.net/publication/mental-health-and-our-changing-climate-impacts-implications-and-guidance
Clement, V., Rigaud, K. K., de Sherbinin, A., Jones, B., Adamo, S., Schewe, J., Sadiq, N., & Shabahat, E. (2021). Groundswell part 2. Publisher: World Bank, Washington, DC Groundswell Part 2: Acting on Internal Climate Migration (worldbank.org)
Cohen-Cole, E., & Fletcher, J. M. (2008). Detecting implausible social network effects in acne, height, and headaches: longitudinal analysis. BMJ, 337(dec04 2), a2533–a2533. https://doi.org/10.1136/bmj.a2533
Cole, J. C., Gillis, A., Linden, S. V. D., Cohen, M., & Vandenbergh, M. (2023). Social Psychological Perspectives on Political Polarization: Insights and Implications for Climate Change [Preprint]. PsyArXiv. https://doi.org/10.31234/osf.io/xz6wk
Constantino, S. M., Sparkman, G., Kraft-Todd, G. T., Bicchieri, C., Centola, D., Shell-Duncan, B., Vogt, S., & Weber, E. U. (2022). Scaling Up Change: A Critical Review and Practical Guide to Harnessing Social Norms for Climate Action. Psychological Science in the Public Interest, 23(2), 50–97. https://doi.org/10.1177/15291006221105279
Crawford, N. C. (2019). Pentagon fuel use, climate change, and the costs of war. Watson Institute, Brown University.
Crona, B., Folke, C., & Galaz, V. (2021). The Anthropocene reality of financial risk. One Earth, 4(5), 618–628.Publisher: Elsevier
Curcio, D., Gianfrancesco, I., & Vioto, D. (2023). Climate change and financial systemic risk: Evidence from US banks and insurers. Journal of Financial Stability, 66, 101132. https://doi.org/10.1016/j.jfs.2023.101132
Dafermos, Y., Nikolaidi, M., & Galanis, G. (2018). Climate Change, Financial Stability and Monetary Policy. Ecological Economics, 152, 219–234. https://doi.org/10.1016/j.ecolecon.2018.05.011
Daggett, C. (2018). Petro-masculinity: Fossil Fuels and Authoritarian Desire. Millennium: Journal of International Studies, 47(1), 25–44. https://doi.org/10.1177/0305829818775817
Daoudy, M. (2021). Rethinking the Climate–Conflict Nexus: A Human–Environmental–Climate Security Approach. Global Environmental Politics, 1–22. https://doi.org/10.1162/glep_a_00609
Daoudy, M., Sowers, J., & Weinthal, E. (2022). What is climate security? Framing risks around water, food, and migration in the Middle East and North Africa. WIREs Water, 9(3), e1582. https://doi.org/10.1002/wat2.1582
Darian-Smith, E. (2023). Entangled Futures: Big Oil, Political Will, and the Global Environmental Movement. Perspectives on Global Development and Technology, 21(5–6), 403–425. https://doi.org/10.1163/15691497-12341640
de Klerk, L., Shmurak, A., Gassan-Zade, O., Shlapak, M., Tomliak, K., & Korthuis, A. (2022). Climate Damage Caused by Russia's war in Ukraine. Initiative on GHG accounting of war. https://climatefocus.com/wp-content/uploads/2022/11/ClimateDamageinUkraine.pdf
De La Sablonnière, R., & Taylor, D. M. (2020). A social change framework for addressing collective action: introducing collective inertia. Current Opinion in Psychology, 35, 65–70. https://doi.org/10.1016/j.copsyc.2020.03.006
Diffenbaugh, N. S., & Burke, M. (2019). Global warming has increased global economic inequality. Proceedings of the National Academy of Sciences, 116(20), 9808–9813. https://doi.org/10.1073/pnas.1816020116
Döring, S., & Hall, J. (2023). Drought exposure decreases altruism with salient group identities as key moderator. Nature Climate Change, 13(8), 856–861. https://doi.org/10.1038/s41558-023-01732-2
Duffy, M. E., Twenge, J. M., & Joiner, T. E. (2019). Trends in Mood and Anxiety Symptoms and Suicide-Related Outcomes Among U.S. Undergraduates, 2007–2018: Evidence From Two National Surveys. Journal of Adolescent Health, 65(5), 590–598. https://doi.org/10.1016/j.jadohealth.2019.04.033
Dunlap, R. E., McCright, A. M., & Yarosh, J. H. (2016). The Political Divide on Climate Change: Partisan Polarization Widens in the U.S. Environment: Science and Policy for Sustainable Development, 58(5), 4–23. https://doi.org/10.1080/00139157.2016.1208995
European Central Bank (ECB). (2021). Financial Stability review, Climate-related risks to financial stability, pp.100-114, May 2021. Frankfurt am Mai. Financial Stability Review, May 2021 (europa.eu)
Ehret, S., Constantino, S. M., Weber, E. U., Efferson, C., & Vogt, S. (2022). Group identities can undermine social tipping after intervention. Nature Human Behaviour, 6(12), 1669–1679. https://doi.org/10.1038/s41562-022-01440-5
Ekberg, K., Forchtner, B., Hultman, M., & Jylhä, K. M. (2022). Climate obstruction: How denial, delay and inaction are heating the planet. Routledge, London
European Systemic Risk Board (ESRB). (2020). Positively green: Measuring climate change risks to financial stability, European Systemic Risk Board, European System of Financial Supervision,. Positively green: measuring climate change risks to financial stability (europa.eu)
Fairbrother, M. (2017). Environmental attitudes and the politics of distrust. Sociology Compass, 11(5), e12482. https://doi.org/10.1111/soc4.12482
Fehr, E., Fischbacher, U., & Gächter, S. (2002). Strong reciprocity, human cooperation, and the enforcement of social norms. Human Nature, 13(1), 1–25. https://doi.org/10.1007/s12110-002-1012-7
Feinberg, M., Willer, R., & Kovacheff, C. (2020). The activist's dilemma: Extreme protest actions reduce popular support for social movements. Journal of Personality and Social Psychology, 119(5), 1086–1111. https://doi.org/10.1037/pspi0000230
Ferrara, E. (2017). Contagion dynamics of extremist propaganda in social networks. Information Sciences, 418–419, 1–12. https://doi.org/10.1016/j.ins.2017.07.030
Ferreira, M. A. M., Leite, Y. L. R., Junior, C. C., & Vicente, C. R. (2023). Impact of climate change on public health in Brazil. Public Health Challenges, 2(1), e62. https://doi.org/10.1002/puh2.62
Flores, A., Cole, J. C., Dickert, S., Eom, K., Jiga-Boy, G. M., Kogut, T., Loria, R., Mayorga, M., Pedersen, E. J., Pereira, B., Rubaltelli, E., Sherman, D. K., Slovic, P., Västfjäll, D., & Van Boven, L. (2022). Politicians polarize and experts depolarize public support for COVID-19 management policies across countries. Proceedings of the National Academy of Sciences, 119(3), e2117543119. https://doi.org/10.1073/pnas.2117543119
Folke, C., Carpenter, S. R., Walker, B., Scheffer, M., Chapin, T., & Rockström, J. (2010). Resilience Thinking: Integrating Resilience, Adaptability and Transformability. Ecology and Society, 15(4), art20. https://doi.org/10.5751/ES-03610-150420
Frank, S., Gusti, M., Havlík, P., Lauri, P., DiFulvio, F., Forsell, N., Hasegawa, T., Krisztin, T., Palazzo, A., & Valin, H. (2021). Land-based climate change mitigation potentials within the agenda for sustainable development. Environmental Research Letters, 16(2), 024006. https://doi.org/10.1088/1748-9326/abc58a
Freedom House. (2022). Freedom in the World 2022. The Global Expansion of Authoritarian Rule. Washington D.C. https://freedomhouse.org/sites/default/files/2022-02/FIW_2022_PDF_Booklet_Digital_Final_Web.pdf
Fritsche, I., Cohrs, J. C., Kessler, T., & Bauer, J. (2012). Global warming is breeding social conflict: The subtle impact of climate change threat on authoritarian tendencies. Journal of Environmental Psychology, 32(1), 1–10. https://doi.org/10.1016/j.jenvp.2011.10.002
Financial Stability Board (FSB). (2020). The Implications of Climate Change for Financial Stability, Financial Stability Board, November 2020. The implications of climate change for financial stability - Financial Stability Board (fsb.org)
FSB and NGFS. (2022). Climate Scenario Analysis by Jurisdictions — Initial findings and lessons. https://www.fsb.org/wp-content/uploads/P151122.pdf

Fussell, E., Curtis, K. J., & DeWaard, J. (2014). Recovery migration to the City of New Orleans after Hurricane Katrina: a migration systems approach. Population and Environment, 35(3), 305–322. https://doi.org/10.1007/s11111-014-0204-5

Fussell, E., Sastry, N., & VanLandingham, M. (2010). Race, socioeconomic status, and return migration to New Orleans after Hurricane Katrina. Population and Environment, 31(1–3), 20–42. https://doi.org/10.1007/s11111-009-0092-2

Gadarian, S. K. (2010). The Politics of Threat: How Terrorism News Shapes Foreign Policy Attitudes. The Journal of Politics, 72(2), 469–483. https://doi.org/10.1017/S0022381609990910

Gai, P., & Kapadia, S. (2010). Contagion in financial networks. Proceedings of the Royal Society A: Mathematical, Physical and Engineering Sciences, 466(2120), 2401–2423. https://doi.org/10.1098/rspa.2009.0410

Galaz García, C., Bagstad, K. J., Brun, J., Chaplin-Kramer, R., Dhu, T., Murray, N. J., Nolan, C. J., Ricketts, T. H., Sosik, H. M., Sousa, D., Willard, G., & Halpern, B. S. (2023). The future of ecosystem assessments is automation, collaboration, and artificial intelligence. Environmental Research Letters, 18(1), 011003. https://doi.org/10.1088/1748-9326/acab19

Galaz, V., Crona, B., Dauriach, A., Scholtens, B., & Steffen, W. (2018). Finance and the Earth system – Exploring the links between financial actors and non-linear changes in the climate system. Global Environmental Change, 53, 296–302. https://doi.org/10.1016/j.gloenvcha.2018.09.008

Ge, Q., Hao, M., Ding, F., Jiang, D., Scheffran, J., Helman, D., & Ide, T. (2022a). Modelling armed conflict risk under climate change with machine learning and time-series data. Nature Communications, 13(1), 2839. https://doi.org/10.1038/s41467-022-30356-x

Go, M. H. (2018). The tale of a two-tiered city: Community civic structure and spatial inequality in post-Katrina New Orleans. Journal of Urban Affairs, 40(8), 1093–1114. https://doi.org/10.1080/07352166.2018.1490151

Goldberg, R. F., & Vandenberg, L. N. (2019). Distract, delay, disrupt: examples of manufactured doubt from five industries. Reviews on Environmental Health, 34(4), 349–363. https://doi.org/10.1515/reveh-2019-0004

Green, J., Druckman, J. N., Baum, M. A., Lazer, D., Ognyanova, K., & Perlis, R. H. (2023). Depressive symptoms and conspiracy beliefs. Applied Cognitive Psychology, 37(2), 332–359. https://doi.org/10.1002/acp.4011

Guo, W., Gleditsch, K., & Wilson, A. (2018). Retool AI to forecast and limit wars. Nature, 562(7727), 331–333. https://doi.org/10.1038/d41586-018-07026-4

Guo, W., Sun, S., & Wilson, A. (2023). Exploring Potential Causal Models for Climate-Society-Conflict Interaction: Proceedings of the 8th International Conference on Complexity, Future Information Systems and Risk, 69–76. https://doi.org/10.5220/0011968400003485

Haidt, J. Twenge, J. Rausch, Z.. (2010). Adolescent mood disorders since 2010. Adolescent Mood Disorders since 2010: A Collaborative Review. Retrieved 25 October 2023, from https://docs.google.com/document/d/1diMvsMeRphUH7E6D1d_J7R6WbDdgnzFHDHPx9HXzR5o/edit?usp=embed_facebook

Hamideh, S., Sen, P., & Fischer, E. (2022). Wildfire impacts on education and healthcare: Paradise, California, after the Camp Fire. Natural Hazards, 111(1), 353–387. https://doi.org/10.1007/s11069-021-05057-1

Haraldson, H. (2004). Introduction to system thinking and causal loop diagrams. https://www.researchgate.net/profile/Hoerdur-Haraldsson/publication/258261003_Introduction_to_system_thinking_and_causal_loop_diagrams/links/5bcceed6458515f7d9d01e81/Introduction-to-system-thinking-and-causal-loop-diagrams.pdf

Harris, D. (2022). How the war in Ukraine derails future climate negotiations: Can we put ourselves back on track for COP27? Oxford Policy. https://www.opml.co.uk/blog/how-war-ukraine-derails-future-climate-negotiations-back-track-cop2

Hauer, M. E., Fussell, E., Mueller, V., Burkett, M., Call, M., Abel, K., McLeman, R., & Wrathall, D. (2019). Sea-level rise and human migration. Nature Reviews Earth & Environment, 1(1), 28–39. https://doi.org/10.1038/s43017-019-0002-9

Hetherington, M. J., & Weiler, J. D. (2009). Authoritarianism and polarization in American politics. Cambridge University Press.

Hetherington, M., & Suhay, E. (2011). Authoritarianism, Threat, and Americans' Support for the War on Terror: AUTHORITARIANISM, THREAT, AND THE WAR ON TERROR. American Journal of Political Science, 55(3), 546–560. https://doi.org/10.1111/j.1540-5907.2011.00514.x

Hickman, C., Marks, E., Pihkala, P., Clayton, S., Lewandowski, R. E., Mayall, E. E., Wray, B., Mellor, C., & Van Susteren, L. (2021). Climate anxiety in children and young people and their beliefs about government responses to climate change: a global survey. The Lancet Planetary Health, 5(12), e863–e873. https://doi.org/10.1016/S2542-5196(21)00278-3

Hoffarth, M. R., & Hodson, G. (2016). Green on the outside, red on the inside: Perceived environmentalist threat as a factor explaining political polarization of climate change. Journal of Environmental Psychology, 45, 40–49. https://doi.org/10.1016/j.jenvp.2015.11.002

Homer-Dixon, T. (1999). Environment, scarcity, and violence. Princeton University Press.

Horton, R. M., De Sherbinin, A., Wrathall, D., & Oppenheimer, M. (2021). Assessing human habitability and migration. Science, 372(6548), 1279–1283. https://doi.org/10.1126/science.abi8603

Holling, C. S., Gunderson, L. H., & Ludwig, D. (2002). In quest of a theory of adaptive change. In C. S. Holling & L. H. Gunderson (Eds.), Panarchy: Understanding Transformations in Human and Natural Systems (pp. 3–24). Island Press.

Hsiang, S., Kopp, R., Jina, A., Rising, J., Delgado, M., Mohan, S., Rasmussen, D. J., Muir-Wood, R., Wilson, P., Oppenheimer, M., Larsen, K., & Houser, T. (2017). Estimating economic damage from climate change in the United States. Science, 356(6345), 1362–1369. https://doi.org/10.1126/science.aal4369

Hsiang, S. M., & Meng, K. C. (2014). Reconciling disagreement over climate–conflict results in Africa. Proceedings of the National Academy of Sciences, 111(6), 2100–2103. https://doi.org/10.1073/pnas.1316006111

Huddy, L., & Feldman, S. (2011). Americans respond politically to 9/11: Understanding the impact of the terrorist attacks and their aftermath. American Psychologist, 66(6), 455–467. https://doi.org/10.1037/a0024894

Hulme, M., Biermann, F., & Boas, I. (2008). Climate refugees: cause for a new agreement? Environment, 50(6), 50, 50-54, https://doi.org/10.3200/ENVT.50.6.50-54

Ide, T., Johnson, M. F., Barnett, J., Krampe, F., Le Billon, P., Maertens, L., Von Uexkull, N., & Vélez-Torres, I. (2023). The Future of Environmental Peace and Conflict Research. Environmental Politics, 32(6), 1077–1103. https://doi.org/10.1080/09644016.2022.2156174

International Monitory fund (IMF). (2020). Global Financial Stability Report: Markets in the Time of COVID-19, International Monetary Fund, Chapter 5: Climate Change: Physical Risk and Equity Prices. https://www.imf.org/en/Publications/GFSR/Issues/2020/04/14/global-financial-stability-report-april-2020#Chapter5

Intergovernmental Panel On Climate Change (IPCC). (2022). Climate Change 2022 – Impacts, Adaptation and Vulnerability: Working Group II Contribution to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change (1st ed.). Cambridge University Press. https://doi.org/10.1017/9781009325844

Institute for Democracy and Electoral Assistance (IDEA). (2022). The Global State of Democracy 2022 Forging Social Contracts in a Time of Discontent. https://www.idea.int/democracytracker/sites/default/files/2022-11/the-global-state-of-democracy-2022.pdf

Jackson, J. C., Van Egmond, M., Choi, V. K., Ember, C. R., Halberstadt, J., Balanovic, J., Basker, I. N., Boehnke, K., Buki, N., Fischer, R., Fulop, M., Fulmer, A., Homan, A. C., Van Kleef, G. A., Kreemers, L., Schei, V., Szabo, E., Ward, C., & Gelfand, M. J. (2019). Ecological and cultural factors underlying the global distribution of prejudice. PLOS ONE, 14(9), e0221953. https://doi.org/10.1371/journal.pone.0221953

Jermacane, D., Waite, T. D., Beck, C. R., Bone, A., Amlôt, R., Reacher, M., Kovats, S., Armstrong, B., Leonardi, G., James Rubin, G., & Oliver, I. (2018). The English National Cohort Study of Flooding and Health: the change in the prevalence of psychological morbidity at year two. BMC Public Health, 18(1), 330. https://doi.org/10.1186/s12889-018-5236-9

Johnson, C. A., & Krishnamurthy, K. (2010). Dealing with displacement: Can "social protection" facilitate long-term adaptation to climate change? Global Environmental Change, 20(4), 648–655. https://doi.org/10.1016/j.gloenvcha.2010.06.002

Judge, M., Kashima, Y., Steg, L., & Dietz, T. (2023). Environmental Decision-Making in Times of Polarization. Annual Review of Environment and Resources, 48(1), annurev-environ-112321-115339. https://doi.org/10.1146/annurev-environ-112321-115339

Jylhä, K. M., & Hellmer, K. (2020). Right-Wing Populism and Climate Change Denial: The Roles of Exclusionary and Anti-Egalitarian Preferences, Conservative Ideology, and Antiestablishment Attitudes. Analyses of Social Issues and Public Policy, 20(1), 315–335. https://doi.org/10.1111/asap.12203

Kakinuma, K., Puma, M. J., Hirabayashi, Y., Tanoue, M., Baptista, E. A., & Kanae, S. (2020). Flood-induced population displacements in the world. Environmental Research Letters, 15(12), 124029. https://doi.org/10.1088/1748-9326/abc586

Kedward, K., Ryan-Collins, J., & Chenet, H. (2023). Biodiversity loss and climate change interactions: financial stability implications for central banks and financial supervisors. Climate Policy, 23(6), 763–781. https://doi.org/10.1080/14693062.2022.2107475

Keen, S. (2021). The appallingly bad neoclassical economics of climate change. Globalizations, 18(7), 1149–1177. https://doi.org/10.1080/14747731.2020.1807856

Kelley, C. P., Mohtadi, S., Cane, M. A., Seager, R., & Kushnir, Y. (2015). Climate change in the Fertile Crescent and implications of the recent Syrian drought. Proceedings of the National Academy of Sciences, 112(11), 3241–3246. https://doi.org/10.1073/pnas.1421533112

Kemp, L., Xu, C., Depledge, J., Ebi, K. L., Gibbins, G., Kohler, T. A., Rockström, J., Scheffer, M., Schellnhuber, H. J., Steffen, W., & Lenton, T. M. (2022). Climate Endgame: Exploring catastrophic climate change scenarios. Proceedings of the National Academy of Sciences, 119(34), e2108146119. https://doi.org/10.1073/pnas.2108146119

Kester, J., & Sovacool, B. K. (2017). Torn between war and peace: Critiquing the use of war to mobilize peaceful climate action. Energy Policy, 104, 50–55. https://doi.org/10.1016/j.enpol.2017.01.026

Kimmel, M. S. (2018). Healing from hate: How young men get into-and out of-violent extremism. University of California Press

Kintisch, E. (2016). The lost norse. Science, 354(6313), 696–701. https://doi.org/10.1126/science.354.6313.69Kiyotaki, N., & Moore, J. (2002). Balance-Sheet Contagion. American Economic Review, 92(2), 46–50. https://doi.org/10.1257/000282802320188989

Kolmes, S. A. (2008). The Social Feedback Loop. Environment: Science and Policy for Sustainable Development, 50(2), 57–58. https://doi.org/10.3200/ENVT.50.2.57-58

Koubi, V. (2019a). Climate Change and Conflict. Annual Review of Political Science, 22(1), 343–360. https://doi.org/10.1146/annurev-polisci-050317-070830

Kousser, T., & Tranter, B. (2018). The influence of political leaders on climate change attitudes. Global Environmental Change, 50, 100–109. https://doi.org/10.1016/j.gloenvcha.2018.03.005

Krishnamurthy, P. K. (2012). Disaster-induced migration: Assessing the impact of extreme weather events on livelihoods. Environmental Hazards, 11(2), 96–111. https://doi.org/10.1080/17477891.2011.609879

Lamperti, F., Bosetti, V., Roventini, A., & Tavoni, M. (2019a). The public costs of climate-induced financial instability. Nature Climate Change, 9(11), 829–833. https://doi.org/10.1038/s41558-019-0607-5

Lawrence, J., Blackett, P., & Cradock-Henry, N. A. (2020). Cascading climate change impacts and implications. Climate Risk Management, 29, 100234. https://doi.org/10.1016/j.crm.2020.100234

Lenton, T. M. (2011). Early warning of climate tipping points. Nature Climate Change, 1(4), 201–209. https://doi.org/10.1038/nclimate1143

Lenton, T. M., Xu, C., Abrams, J. F., Ghadiali, A., Loriani, S., Sakschewski, B., Zimm, C., Ebi, K. L., Dunn, R. R., Svenning, J.-C., & Scheffer, M. (2023). Quantifying the human cost of global warming. Nature Sustainability, 6(10), 1237–1247. https://doi.org/10.1038/s41893-023-01132-6

Lettinga, N., Jacquet, P. O., André, J.-B., Baumand, N., & Chevallier, C. (2020). Environmental adversity is associated with lower investment in collective actions. PLOS ONE, 15(7), e0236715. https://doi.org/10.1371/journal.pone.0236715

Mach, K. J., Kraan, C. M., Adger, W. N., Buhaug, H., Burke, M., Fearon, J. D., Field, C. B., Hendrix, C. S., Maystadt, J.-F., O'Loughlin, J., Roessler, P., Scheffran, J., Schultz, K. A., & Von Uexkull, N. (2019). Climate as a risk factor for armed conflict. Nature, 571(7764), 193–197. https://doi.org/10.1038/s41586-019-1300-6

Macy, M. W., Ma, M., Tabin, D. R., Gao, J., & Szymanski, B. K. (2021). Polarization and tipping points. Proceedings of the National Academy of Sciences, 118(50), e2102144118. https://doi.org/10.1073/pnas.2102144118

Magrin, G. (2016). The disappearance of Lake Chad: history of a myth. Journal of Political Ecology, 23(1). https://doi.org/10.2458/v23i1.20191

Malm, A. (2021). How to blow up a pipeline. Verso Books.

Mann, M. E. (2021). The new climate war: The fight to take back our planet. PublicAffairs.

Marcucci, G., Mazzuto, G., Bevilacqua, M., Ciarapica, F. E., & Urciuoli, L. (2022). Conceptual model for breaking ripple effect and cycles within supply chain resilience. Supply Chain Forum: An International Journal, 23(3), 252–271. https://doi.org/10.1080/16258312.2022.2031275

Martinich, J., & Crimmins, A. (2019). Climate damages and adaptation potential across diverse sectors of the United States. Nature Climate Change, 9(5), 397–404. https://doi.org/10.1038/s41558-019-0444-6

Mäs, M., & Opp, K.-D. (2016). When is ignorance bliss? Disclosing true information and cascades of norm violation in networks. Social Networks, 47, 116–129. https://doi.org/10.1016/j.socnet.2016.05.004

McLeman, R. (2018). Thresholds in climate migration. Population and Environment, 39(4), 319–338. https://doi.org/10.1007/s11111-017-0290-2

Mercure, J.-F., Pollitt, H., Viñuales, J. E., Edwards, N. R., Holden, P. B., Chewpreecha, U., Salas, P., Sognnaes, I., Lam, A., & Knobloch, F. (2018). Macroeconomic impact of stranded fossil fuel assets. Nature Climate Change, 8(7), 588–593. https://doi.org/10.1038/s41558-018-0182-1

Miller, D. S. (2016). Public trust in the aftermath of natural and na-technological disasters: Hurricane Katrina and the Fukushima Daiichi nuclear incident. International Journal of Sociology and Social Policy, 36(5/6), 410–431. https://doi.org/10.1108/IJSSP-02-2015-0030

Mueller, V., Gray, C., & Kosec, K. (2014). Heat stress increases long-term human migration in rural Pakistan. Nature Climate Change, 4(3), 182–185. https://doi.org/10.1038/nclimate2103

Muñoz, J., & Anduiza, E. (2019). 'If a fight starts, watch the crowd': The effect of violence on popular support for social movements. Journal of Peace Research, 56(4), 485–498. https://doi.org/10.1177/0022343318820575

Neumann, B., Vafeidis, A. T., Zimmermann, J., & Nicholls, R. J. (2015). Future Coastal Population Growth and Exposure to Sea-Level Rise and Coastal Flooding - A Global Assessment. PLOS ONE, 10(3), e0118571. https://doi.org/10.1371/journal.pone.0118571

Organisation for Economic Co-Operation and Development (OECD). (2021). Global pension statistics. https://www.oecd.org/pensions/globalpensionstatistics.htm

Oginni, S. O., Opoku, M. P., & Alupo, B. A. (2020). Terrorism in the Lake Chad Region: Integration of Refugees and Internally Displaced Persons. Journal of Borderlands Studies, 35(5), 725–741. https://doi.org/10.1080/08865655.2018.1457975

Ojeda, C. (2015). Depression and Political Participation*. Social Science Quarterly, 96(5), 1226–1243. https://doi.org/10.1111/ssqu.12173

Okpara, U. T., Stringer, L. C., & Dougill, A. J. (2017). Using a novel climate–water conflict vulnerability index to capture double exposures in Lake Chad. Regional Environmental Change, 17(2), 351–366. https://doi.org/10.1007/s10113-016-1003-6

Okpara, U. T., Stringer, L. C., Dougill, A. J., & Bila, M. D. (2015). Conflicts about water in Lake Chad: Are environmental, vulnerability and security issues linked? Progress in Development Studies, 15(4), 308–325. https://doi.org/10.1177/1464993415592738

Parodi, K. B., Holt, M. K., Green, J. G., Porche, M. V., Koenig, B., & Xuan, Z. (2022). Time trends and disparities in anxiety among adolescents, 2012–2018. Social Psychiatry and Psychiatric Epidemiology, 57(1), 127–137. https://doi.org/10.1007/s00127-021-02122-9

Paz, L. V., Viola, T. W., Milanesi, B. B., Sulzbach, J. H., Mestriner, R. G., Wieck, A., & Xavier, L. L. (2022). Contagious depression: Automatic mimicry and the mirror neuron system - A review. Neuroscience & Biobehavioral Reviews, 134, 104509. https://doi.org/10.1016/j.neubiorev.2021.12.032

Piff, P. K., Stancato, D. M., Côté, S., Mendoza-Denton, R., & Keltner, D. (2012). Higher social class predicts increased unethical behavior. Proceedings of the National Academy of Sciences, 109(11), 4086–4091. https://doi.org/10.1073/pnas.1118373109

Polk, M. (2011). Institutional Capacity-building in Urban Planning and Policy-making for Sustainable Development: Success or Failure? Planning Practice and Research, 26(2), 185–206. https://doi.org/10.1080/02697459.2011.560461

IPCC, 2022: Summary for Policymakers [H.-O. Pörtner, D.C. Roberts, E.S. Poloczanska, K. Mintenbeck, M. Tignor, A. Alegría, M. Craig, S. Langsdorf, S. Löschke, V. Möller, A. Okem (eds.)]. In: Climate Change 2022: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [H.-O. Pörtner, D.C. Roberts, M. Tignor, E.S. Poloczanska, K. Mintenbeck, A. Alegría, M. Craig, S. Langsdorf, S. Löschke, V. Möller, A. Okem, B. Rama (eds.)]. Cambridge University Press, Cambridge, UK and New York, NY, USA, pp. 3–33, doi:10.1017/9781009325844.001

Rafaty, R. (2018). Perceptions of Corruption, Political Distrust, and the Weakening of Climate Policy. Global Environmental Politics, 18(3), 106–129. https://doi.org/10.1162/glep_a_00471

Rantanen, M., Karpechko, A. Yu., Lipponen, A., Nordling, K., Hyvärinen, O., Ruosteenoja, K., Vihma, T., & Laaksonen, A. (2022). The Arctic has warmed nearly four times faster than the globe since 1979. Communications Earth & Environment, 3(1), 168. https://doi.org/10.1038/s43247-022-00498-3

Rockström, J., Gupta, J., Qin, D., Lade, S. J., Abrams, J. F., Andersen, L. S., Armstrong McKay, D. I., Bai, X., Bala, G., Bunn, S. E., Ciobanu, D., DeClerck, F., Ebi, K., Gifford, L., Gordon, C., Hasan, S., Kanie, N., Lenton, T. M., Loriani, S., … Zhang, X. (2023). Safe and just Earth system boundaries. Nature, 619(7968), 102–111. https://doi.org/10.1038/s41586-023-06083-8

Ross, A. R., Modi, M., Paresky, P., Jussim, L., Harrell, B., Goldenberg, A., Goldenberg, P., Finkelstein, D., Farmer, J., & Holden, K. (2021). A contagion of institutional distrust: Viral disinformation of the COVID vaccine and the road to reconciliation. Rutgers Miller Center for Community Protection and Resilience. Rutges NCRI_Anti-Vaccination_v5.pdf (rutgers.edu)

Roukny, T., Bersini, H., Pirotte, H., Caldarelli, G., & Battiston, S. (2013). Default Cascades in Complex Networks: Topology and Systemic Risk. Scientific Reports, 3(1), 2759. https://doi.org/10.1038/srep02759

Russo, S., Mirisola, A., Dallago, F., & Roccato, M. (2020). Facing natural disasters through the endorsement of authoritarian attitudes. Journal of Environmental Psychology, 68, 101412. https://doi.org/10.1016/j.jenvp.2020.101412

Sakaguchi, K., Varughese, A., & Auld, G. (2017). Climate Wars? A Systematic Review of Empirical Analyses on the Links between Climate Change and Violent Conflict. International Studies Review, 19(4), 622–645. https://doi.org/10.1093/isr/vix022

Sampaio, A. (2022). Conflict economies and urban systems in the Lake Chad Region. https://globalinitiative.net/wp-content/uploads/2022/11/Lake-Chad.9Nov-web-copy.pdf

Sampaio, G., Nobre, C., Costa, M. H., Satyamurty, P., Soares-Filho, B. S., & Cardoso, M. (2007). Regional climate change over eastern Amazonia caused by pasture and soybean cropland expansion. Geophysical Research Letters, 34(17), L17709. https://doi.org/10.1029/2007GL030612

Scartozzi, C. M. (2021). Reframing Climate-Induced Socio-Environmental Conflicts: A Systematic Review. International Studies Review, 23(3), 696–725. https://doi.org/10.1093/isr/viaa064

Scatà, M., Di Stefano, A., La Corte, A., & Liò, P. (2018). Quantifying the propagation of distress and mental disorders in social networks. Scientific Reports, 8(1), 5005. https://doi.org/10.1038/s41598-018-23260-2

Scheffran, J., Brzoska, M., Kominek, J., Link, P. M., & Schilling, J. (2012). Climate Change and Violent Conflict. Science, 336(6083), 869–871. https://doi.org/10.1126/science.1221339

Schneider, C. R., & Van Der Linden, S. (2023). Social norms as a powerful lever for motivating pro-climate actions. One Earth, 6(4), 346–351. https://doi.org/10.1016/j.oneear.2023.03.014

Selby, J., Dahi, O. S., Fröhlich, C., & Hulme, M. (2017). Climate change and the Syrian civil war revisited. Political Geography, 60, 232–244. https://doi.org/10.1016/j.polgeo.2017.05.007

Semieniuk, G., Holden, P. B., Mercure, J.-F., Salas, P., Pollitt, H., Jobson, K., Vercoulen, P., Chewpreecha, U., Edwards, N. R., & Viñuales, J. E. (2022). Stranded fossil-fuel assets translate to major losses for investors in advanced economies. Nature Climate Change, 12(6), 532–538. https://doi.org/10.1038/s41558-022-01356-y

Sharpe, S. (2023a). Five Times Faster: Rethinking the Science, Economics, and Diplomacy of Climate Change (1st ed.). Cambridge University Press. https://doi.org/10.1017/9781009326506

Sillmann, J. Soppel,S. Russo, S (2019) Climate Extremes and Their Implications for Impact and Risk Assessment. Elsevier ent

Simpson, B., Willer, R., & Feinberg, M. eds. (2022). Radical flanks of social movements can increase support for moderate factions. PNAS Nexus, 1(3), pgac110. https://doi.org/10.1093/pnasnexus/pgac110

Skinner, E. B., Glidden, C. K., MacDonald, A. J., & Mordecai, E. A. (2023). Human footprint is associated with shifts in the assemblages of major vector-borne diseases. Nature Sustainability, 6(6), 652–661. https://doi.org/10.1038/s41893-023-01080-1

Smith, D. N., & Hanley, E. (2018). The Anger Games: Who Voted for Donald Trump in the 2016 Election, and Why? Critical Sociology, 44(2), 195–212. https://doi.org/10.1177/0896920517740615

Snow, D. A., Soule, S. A., Kriesi, H., & McCammon, H. J. (Eds.). (2018). The Wiley Blackwell Companion to Social Movements (1st ed.). Wiley. https://doi.org/10.1002/9781119168577

Solow, A. R. (2013). A call for peace on climate and conflict. Nature, 497(7448), 179–180. https://doi.org/10.1038/497179a

Sovacool, B. K., & Dunlap, A. (2022). Anarchy, war, or revolt? Radical perspectives for climate protection, insurgency and civil disobedience in a low-carbon era. Energy Research & Social Science, 86, 102416. https://doi.org/10.1016/j.erss.2021.102416

Spaiser, V., Dunn, K., Milner, P., & Moore, J. (2022). The Effects of Communicating Climate Change Threat: Mobilization or Polarization? [Preprint]. PsyArXiv. https://doi.org/10.31234/osf.io/qftvc

Spaiser, V., Juhola, S., Constantino, S. M., Guo, W., Watson, T., Sillmann, J., Craparo, A., Basel, A., Bruun, J. T., Krishnamurthy, K., Scheffran, J., Pinho, P., Okpara, U. T., Donges, J. F., Bhowmik, A., Yasseri, T., Safra De Campos, R., Cumming, G. S., Chenet, H., … Abrams, J. F. (2023). Negative Social Tipping Dynamics Resulting from and Reinforcing Earth System Destabilisation [Preprint]. Climate change/Human/Earth system interactions/Other methods. https://doi.org/10.5194/egusphere-2023-1475

Stal M (2009): Case study report on Mozambique for the environmental change and forced migration scenarios project. In: EACH-FOR Environmental Change and Forced Migration Scenarios. D.3.4. Synthesis Report. p.40-41. https://rosamartinez.org/wp-content/uploads/2015/11/Migraciones-y-Cambio-Climatico_EACHFOR.pdf

Staal, A., Flores, B. M., Aguiar, A. P. D., Bosmans, J. H. C., Fetzer, I., & Tuinenburg, O. A. (2020). Feedback between drought and deforestation in the Amazon. Environmental Research Letters, 15(4),

044024. https://doi.org/10.1088/1748-9326/ab738e
Stanley, S. K., & Wilson, M. S. (2019). Meta-analysing the association between social dominance orientation, authoritarianism, and attitudes on the environment and climate change. Journal of Environmental Psychology, 61, 46–56. https://doi.org/10.1016/j.jenvp.2018.12.002
Stanley, S. K., Wilson, M. S., & Milfont, T. L. (2017). Exploring short-term longitudinal effects of right-wing authoritarianism and social dominance orientation on environmentalism. Personality and Individual Differences, 108, 174–177. https://doi.org/10.1016/j.paid.2016.11.059
Stechemesser, A., Levermann, A., & Wenz, L. (2022). Temperature impacts on hate speech online: evidence from 4 billion geolocated tweets from the USA. The Lancet Planetary Health, 6(9), e714–e725. https://doi.org/10.1016/S2542-5196(22)00173-5
Stewart, A. J., McCarty, N., & Bryson, J. J. (2020). Polarization under rising inequality and economic decline. Science Advances, 6(50), eabd4201. https://doi.org/10.1126/sciadv.abd4201
Stoddard, I., Anderson, K., Capstick, S., Carton, W., Depledge, J., Facer, K., Gough, C., Hache, F., Hoolohan, C., Hultman, M., Hällström, N., Kartha, S., Klinsky, S., Kuchler, M., Lövbrand, E., Nasiritousi, N., Newell, P., Peters, G. P., Sokona, Y., … Williams, M. (2021). Three Decades of Climate Mitigation: Why Haven't We Bent the Global Emissions Curve? Annual Review of Environment and Resources, 46(1), 653–689. https://doi.org/10.1146/annurev-environ-012220-011104
Sultana, F. (2022a). The unbearable heaviness of climate coloniality. Political Geography, 99, 102638. https://doi.org/10.1016/j.polgeo.2022.102638
Sun, S. C., Jin, B., Wei, Z., & Guo, W. (2022). Revealing the Excitation Causality between Climate and Political Violence via a Neural Forward-Intensity Poisson Process. Proceedings of the Thirty-First International Joint Conference on Artificial Intelligence, 5171–5177. https://doi.org/10.24963/ijcai.2022/718
Tafere, M. (2018). Forced displacements and the environment: Its place in national and international climate agenda. Journal of Environmental Management, 224, 191–201. https://doi.org/10.1016/j.jenvman.2018.07.063
Taylor, B. (2019). Alt-right ecology. 2019). The Far Right and the Environment: Politics, Discourse and Communication, 275–292. In Forchtner, B (2019) The Far Right and the Environment. Politics, Discourse and communication, Routledge, London
Teymoori, A., Bastian, B., & Jetten, J. (2017). Towards a Psychological Analysis of Anomie. Political Psychology, 38(6), 1009–1023. https://doi.org/10.1111/pops.12377
Thalheimer, L., & Oh, W. S. (2023). An inventory tool to assess displacement data in the context of weather and climate-related events. Climate Risk Management, 40, 100509. https://doi.org/10.1016/j.crm.2023.100509
Thøgersen, J. (2008). Social norms and cooperation in real-life social dilemmas. Journal of Economic Psychology, 29(4), 458–472. https://doi.org/10.1016/j.joep.2007.12.004
Thomas, A., Theokritoff, E., Lesnikowski, A., Reckien, D., Jagannathan, K., Cremades, R., Campbell, D., Joe, E. T., Sitati, A., Singh, C., Segnon, A. C., Pentz, B., Musah-Surugu, J. I., Mullin, C. A., Mach, K. J., Gichuki, L., Galappaththi, E., Chalastani, V. I., Ajibade, I., … Global Adaptation Mapping Initiative Team. (2021). Global evidence of constraints and limits to human adaptation. Regional Environmental Change, 21(3), 85. https://doi.org/10.1007/s10113-021-01808-9
Tompkins, E. (2015). A Quantitative Reevaluation of Radical Flank Effects within Nonviolent Campaigns. In P. G. Coy (Ed.), Research in Social Movements, Conflicts and Change (Vol. 38, pp. 103–135). Emerald Group Publishing Limited. https://doi.org/10.1108/S0163-786X20150000038004
Townshend, I., Awosoga, O., Kulig, J., & Fan, H. (2015). Social cohesion and resilience across communities that have experienced a disaster. Natural Hazards, 76(2), 913–938. https://doi.org/10.1007/s11069-014-1526-4
Trust, S., Sanjay, J., Lendon, T. & Oliver, J. (2023). The Emperor's New Climate Scenarios. Limitations and assumptions of commonly used climate-change scenarios in financial services. Report. Institute and Faculty of Actuaries & University of Exeter. https://actuaries.org.uk/media/qeydewmk/the-emperor-s-new-climate-scenarios.pdf
Uenal, F., Sidanius, J., Roozenbeek, J., & Van Der Linden, S. (2021). Climate change threats increase modern racism as a function of social dominance orientation and ingroup identification. Journal of Experimental Social Psychology, 97, 104228. https://doi.org/10.1016/j.jesp.2021.104228
Van Nes, E. H., Arani, B. M. S., Staal, A., Van Der Bolt, B., Flores, B. M., Bathiany, S., & Scheffer, M. (2016). What Do You Mean, 'Tipping Point'? Trends in Ecology & Evolution, 31(12), 902–904. https://doi.org/10.1016/j.tree.2016.09.011
Vihma, A., Reischl, G., & Nonbo Andersen, A. (2021). A Climate Backlash: Comparing Populist Parties' Climate Policies in Denmark, Finland, and Sweden. The Journal of Environment & Development, 30(3), 219–239. https://doi.org/10.1177/10704965211027748
Vivekananda, J., Wall, M., Sylvestre, F., and Nagarajan, C. (2019). horing Up Stability – Addressing Climate and Fragility Risks in the Lake Chad Region. Berlin: Adelphi. https://www.google.com/url?q=https://adelphi.de/en/publications/shoring-up-stability&sa=D&source=docs&ust=1698348316923168&usg=AOvVaw3HUPpoe4oabFr-g3NzFhNZ
Walker, B., Crépin, A.-S., Nyström, M., Anderies, J. M., Andersson, E., Elmqvist, T., Queiroz, C., Barrett, S., Bennett, E., Cardenas, J. C., Carpenter, S. R., Chapin, F. S., De Zeeuw, A., Fischer, J., Folke, C., Levin, S., Nyborg, K., Polasky, S., Segerson, K., … Vincent, J. R. (2023). Response diversity as a sustainability strategy. Nature Sustainability, 6(6), 621–629. https://doi.org/10.1038/s41893-022-01048-7
Watson, T., Lenton, T., & De Campos, R. S. (2023). The climate change, conflict and migration nexus: A holistic view. Climate Resilience and Sustainability, 2(2), e250. https://doi.org/10.1002/cli2.50
Weber, L., & Peek, L. (Eds.). (2012). Displaced: Life in the Katrina Diaspora. University of Texas Press. https://doi.org/10.7560/735774
Winkler, H. (2019). The effect of income inequality on political polarization: Evidence from European regions, 2002–2014. Economics & Politics, 31(2), 137–162. https://doi.org/10.1111/ecpo.12129
Youngblood, M. (2020). Extremist ideology as a complex contagion: the spread of far-right radicalization in the United States between 2005 and 2017. Humanities and Social Sciences Communications, 7(1), 49. https://doi.org/10.1057/s41599-020-00546-3

References: Chapter 2.4

Aragão, L. E. O. C., Anderson, L. O., Fonseca, M. G., Rosan, T. M., Vedovato, L. B., Wagner, F. H., Silva, C. V. J., Silva Junior, C. H. L., Arai, E., Aguiar, A. P., Barlow, J., Berenguer, E., Deeter, M. N., Domingues, L. G., Gatti, L., Gloor, M., Malhi, Y., Marengo, J. A., Miller, J. B., … Saatchi, S. (2018). 21st Century drought-related fires counteract the decline of Amazon deforestation carbon emissions. Nature Communications, 9(1), 536. https://doi.org/10.1038/s41467-017-02771-y

Armstrong McKay, D. I., Staal, A., Abrams, J. F., Winkelmann, R., Sakschewski, B., Loriani, S., Fetzer, I., Cornell, S. E., Rockström, J., & Lenton, T. M. (2022). Exceeding 1.5°C global warming could trigger multiple climate tipping points. Science, 377(6611), eabn7950. https://doi.org/10.1126/science.abn7950

Barrett, S., & Dannenberg, A. (2014). Sensitivity of collective action to uncertainty about climate tipping points. Nature Climate Change, 4(1), 36–39. https://doi.org/10.1038/nclimate2059

Bartelet, H. A., Barnes, M. L., & Cumming, G. S. (2023a). Microeconomic adaptation to severe climate disturbances on Australian coral reefs. Ambio, 52(2), 285–299. https://doi.org/10.1007/s13280-022-01798-w

Bartelet, H. A., Barnes, M. L., & Cumming, G. S. (2023b). Microeconomic adaptation to severe climate disturbances on Australian coral reefs. Ambio, 52(2), 285–299. https://doi.org/10.1007/s13280-022-01798-w

Bellwood, D. R., Pratchett, M. S., Morrison, T. H., Gurney, G. G., Hughes, T. P., Álvarez-Romero, J. G., Day, J. C., Grantham, R., Grech, A., Hoey, A. S., Jones, G. P., Pandolfi, J. M., Tebbett, S. B., Techera, E., Weeks, R., & Cumming, G. S. (2019). Coral reef conservation in the Anthropocene: Confronting spatial mismatches and prioritizing functions. Biological Conservation, 236, 604–615. https://doi.org/10.1016/j.biocon.2019.05.056

Bentley, R. A., Maddison, E. J., Ranner, P. H., Bissell, J., Caiado, C. C. S., Bhatanacharoen, P., Clark, T., Botha, M., Akinbami, F., Hollow, M., Michie, R., Huntley, B., Curtis, S. E., & Garnett, P. (2014). Social tipping points and Earth systems dynamics. Frontiers in Environmental Science, 2. https://doi.org/10.3389/fenvs.2014.00035

Blei, D. M. (2012). Probabilistic topic models. Communications of the ACM, 55(4), 77–84. https://doi.org/10.1145/2133806.2133826

Bose, K. S., & Sarma, R. H. (1975). Delineation of the intimate details of the backbone conformation of pyridine nucleotide coenzymes in aqueous solution. Biochemical and Biophysical Research Communications, 66(4), 1173–1179. https://doi.org/10.1016/0006-291x(75)90482-9

Boulton, C. A., Lenton, T. M., & Boers, N. (2022). Pronounced loss of Amazon rainforest resilience since the early 2000s. Nature Climate Change, 12(3), 271–278. https://doi.org/10.1038/s41558-022-01287-8

Brovkin, V., Brook, E., Williams, J. W., Bathiany, S., Lenton, T. M., Barton, M., DeConto, R. M., Donges, J. F., Ganopolski, A., McManus, J., Praetorius, S., De Vernal, A., Abe-Ouchi, A., Cheng, H., Claussen, M., Crucifix, M., Gallopín, G., Iglesias, V., Kaufman, D. S., … Yu, Z. (2021a). Past abrupt changes, tipping points and cascading impacts in the Earth system. Nature Geoscience, 14(8), 550–558. https://doi.org/10.1038/s41561-021-00790-5

Brovkin, V., Brook, E., Williams, J. W., Bathiany, S., Lenton, T. M., Barton, M., DeConto, R. M., Donges, J. F., Ganopolski, A., McManus, J., Praetorius, S., De Vernal, A., Abe-Ouchi, A., Cheng, H., Claussen, M., Crucifix, M., Gallopín, G., Iglesias, V., Kaufman, D. S., … Yu, Z. (2021b). Past abrupt changes, tipping points and cascading impacts in the Earth system. Nature Geoscience, 14(8), 550–558. https://doi.org/10.1038/s41561-021-00790-5

Cannon, S. E., Aram, E., Beiateuea, T., Kiareti, A., Peter, M., & Donner, S. D. (2021). Coral reefs in the Gilbert Islands of Kiribati: Resistance, resilience, and recovery after more than a decade of multiple stressors. PLOS ONE, 16(8), e0255304. https://doi.org/10.1371/journal.pone.0255304

Carpenter, S., Brock, W., & Hanson, P. (1999). Ecological and Social Dynamics in Simple Models of Ecosystem Management. Conservation Ecology, 3(2). https://doi.org/10.5751/ES-00122-030204

Carter, R., Choularton, R., Ferdinand, T., Ding, H., Ginoya, N., & Preethan, P. (2021). Food Systems at Risk: Transformative Adaptation for Long-Term Food Security. https://www.wri.org/research/food-systems-risk

Cattaneo, C., & Peri, G. (2016). The migration response to increasing temperatures. Journal of Development Economics, 122, 127–146. https://doi.org/10.1016/j.jdeveco.2016.05.00

Cooper, T. F., Gilmour, J. P., & Fabricius, K. E. (2009). Bioindicators of changes in water quality on coral reefs: review and recommendations for monitoring programmes. Coral Reefs, 28(3), 589–606. https://doi.org/10.1007/s00338-009-0512-x

Costanza, R., De Groot, R., Sutton, P., Van Der Ploeg, S., Anderson, S. J., Kubiszewski, I., Farber, S., & Turner, R. K. (2014). Changes in the global value of ecosystem services. Global Environmental Change, 26, 152–158. https://doi.org/10.1016/j.gloenvcha.2014.04.002

Crona, B. I., Basurto, X., Squires, D., Gelcich, S., Daw, T. M., Khan, A., Havice, E., Chomo, V., Troell, M., Buchary, E. A., & Allison, E. H. (2016). Towards a typology of interactions between small-scale fisheries and global seafood trade. Marine Policy, 65, 1–10. https://doi.org/10.1016/j.marpol.2015.11.016

Cumming, G. S., Adamska, M., Barnes, M. L., Barnett, J., Bellwood, D. R., Cinner, J. E., Cohen, P. J., Donelson, J. M., Fabricius, K., Grafton, R. Q., Grech, A., Gurney, G. G., Hoegh-Guldberg, O., Hoey, A. S., Hoogenboom, M. O., Lau, J., Lovelock, C. E., Lowe, R., Miller, D. J., … Wilson, S. K. (2023). Research priorities for the sustainability of coral-rich western Pacific seascapes. Regional Environmental Change, 23(2), 66. https://doi.org/10.1007/s10113-023-02051-0

Cumming, G. S., Southworth, J., Rondon, X. J., & Marsik, M. (2012). Spatial complexity in fragmenting Amazonian rainforests: Do feedbacks from edge effects push forests towards an ecological threshold? Ecological Complexity, 11, 67–74. https://doi.org/10.1016/j.ecocom.2012.03.002

Darling, E. S., McClanahan, T. R., & Côté, I. M. (2013). Life histories predict coral community disassembly under multiple stressors. Global Change Biology, 19(6), 1930–1940. https://doi.org/10.1111/gcb.12191

Deloitte Access Economics. (2013). Economic Contribution of the Great Barrier Reef. https://www.dcceew.gov.au/sites/default/files/documents/gbr-economic-contribution.pdf

Demirsu, I., & Cihangir-Tetik, D. (2019). Constructing the Partnership with Turkey on the Refugee Crisis: EU Perceptions and Expectations. Journal of Balkan and Near Eastern Studies, 21(6), 625–642. https://doi.org/10.1080/19448953.2018.1506291

Dun, O. (2009). Linkages between flooding, migration and resettlement: Viet Nam case study report for EACH-FOR Projectstudy report for EACH-FOR Projec. University of WollongongUniver. https://environmentalmigration.iom.int/sites/g/files/tmzbdl1411/files/documents/Linkages%20between%20flooding%20migration%20and%20resettlement_%20Viet%20Nam%20c.pdf

Dun, O., & Gemenne, F. (2008). Defining 'environmental migration' | Forced Migration Review. Forced Migration Review. https://www.fmreview.org/climatechange/dun-gemenne

Eddy, T. D., Lam, V. W. Y., Reygondeau, G., Cisneros-Montemayor, A. M., Greer, K., Palomares, M. L. D., Bruno, J. F., Ota, Y., & Cheung, W. W. L. (2021). Global decline in capacity of coral reefs to provide ecosystem services. One Earth, 4(9), 1278–1285. https://doi.org/10.1016/j.oneear.2021.08.016

Filatova, T., Polhill, J. G., & Van Ewijk, S. (2016). Regime shifts in coupled socio-environmental systems: Review of modelling challenges and approaches. Environmental Modelling & Software, 75, 333–347. https://doi.org/10.1016/j.envsoft.2015.04.003

Franzke, C. L. E., Ciullo, A., Gilmore, E. A., Matias, D. M., Nagabhatla, N., Orlov, A., Paterson, S. K., Scheffran, J., & Sillmann, J. (2022). Perspectives on tipping points in integrated models of the natural and human Earth system: cascading effects and telecoupling. Environmental Research Letters, 17(1), 015004. https://doi.org/10.1088/1748-9326/ac42fd

Giulioni, G., Di Giuseppe, E., Toscano, P., Miglietta, F., & Pasqui, M. (2019). A Novel Computational Model of the Wheat Global Market with an Application to the 2010 Russian Federation Case. Journal of Artificial Societies and Social Simulation, 22(3), 4. DOI: 10.18564/jasss.4063. https://www.jasss.org/22/3/4.html

Gleick, P. H. (2014). Water, Drought, Climate Change, and Conflict in Syria. Weather, Climate, and Society, 6(3), 331–340. https://www.jstor.org/stable/24907379

Gleick, P. H. (2017). Climate, water, and conflict: Commentary on Selby et al. 2017. Political Geography, 60, 248–250. https://doi.org/10.1016/j.polgeo.2017.06.009

Grantham, R., Álvarez-Romero, J. G., Mills, D. J., Rojas, C., & Cumming, G. S. (2021). Spatiotemporal determinants of seasonal gleaning. People and Nature, 3(2), 376–390. https://doi.org/10.1002/pan3.10179

Grootendorst, M. (2022). BERTopic: Neural topic modeling with a class-based TF-IDF procedure. https://doi.org/10.48550/ARXIV.2203.05794

Groundstroem, F., & Juhola, S. (2021). Using systems thinking and causal loop diagrams to identify cascading climate change impacts on bioenergy supply systems. Mitigation and Adaptation Strategies for Global Change, 26(7), 29. https://doi.org/10.1007/s11027-021-09967-0

Haldane, A. G., & May, R. M. (2011). Systemic risk in banking ecosystems. Nature, 469(7330), 351–355. https://doi.org/10.1038/nature09659

Helbing, D. (2013). Globally networked risks and how to respond. Nature, 497(7447), 51–59. https://doi.org/10.1038/nature12047

Hemley, R., & Kohler, B. E. (1977). Electronic structure of polyenes related to the visual chromophore. A simple model for the observed band shapes. Biophysical Journal, 20(3), 377–382. https://doi.org/10.1016/S0006-3495(77)85556-2

Hoegh-Guldberg, O., Pendleton, L., & Kaup, A. (2019). People and the changing nature of coral reefs. Regional Studies in Marine Science, 30, 100699. https://doi.org/10.1016/j.rsma.2019.100699

Hughes, T. P., Kerry, J. T., Álvarez-Noriega, M., Álvarez-Romero, J. G., Anderson, K. D., Baird, A. H., Babcock, R. C., Beger, M., Bellwood, D. R., Berkelmans, R., Bridge, T. C., Butler, I. R., Byrne, M., Cantin, N. E., Comeau, S., Connolly, S. R., Cumming, G. S., Dalton, S. J., Diaz-Pulido, G., … Wilson, S. K. (2017). Global warming and recurrent mass bleaching of corals. Nature, 543(7645), 373–377. https://doi.org/10.1038/nature21707

Ide, T., Johnson, M. F., Barnett, J., Krampe, F., Le Billon, P., Maertens, L., Von Uexkull, N., & Vélez-Torres, I. (2023). The Future of Environmental Peace and Conflict Research. Environmental Politics, 32(6), 1077–1103. https://doi.org/10.1080/09644016.2022.2156174

Inam, A., Adamowski, J., Halbe, J., & Prasher, S. (2015). Using causal loop diagrams for the initialization of stakeholder engagement in soil salinity management in agricultural watersheds in developing countries: A case study in the Rechna Doab watershed, Pakistan. Journal of Environmental Management, 152, 251–267. https://doi.org/10.1016/j.jenvman.2015.01.052

International Organisation for migration (IOM). (2023). About Migration. Retrieved 24 September 2023, from https://www.iom.int/about-migration

IOM. (2023). Environmental Migration. https://environmentalmigration.iom.int/environmental-migration

Johnstone, S., & Mazo, J. (2011). Global Warming and the Arab Spring. Survival, 53(2), 11–17. https://doi.org/10.1080/00396338.2011.571006

Juhola, S., Filatova, T., Hochrainer-Stigler, S., Mechler, R., Scheffran, J., & Schweizer, P.-J. (2022a). Social tipping points and adaptation limits in the context of systemic risk: Concepts, models and governance. Frontiers in Climate, 4, 1009234. https://doi.org/10.3389/fclim.2022.1009234

Kaizu, T., & Margolius, H. S. (1975). Studies on rat renal cortical cell kallikrein. I. Separation and measurement. Biochimica Et Biophysica Acta, 411(2), 305–315. https://doi.org/10.1016/0304-4165(75)90310-4

Kapsar, K., Hovis, C., Bicudo Da Silva, R., Buchholtz, E., Carlson, A., Dou, Y., Du, Y., Furumo, P., Li, Y., Torres, A., Yang, D., Wan, H., Zaehringer, J., & Liu, J. (2019). Telecoupling Research: The First Five Years. Sustainability, 11(4), 1033. https://doi.org/10.3390/su11041033

Kath, J., Craparo, A., Fong, Y., Byrareddy, V., Davis, A. P., King, R., Nguyen-Huy, T., van Asten, P. J. A., Marcussen, T., Mushtaq, S., Stone, R., & Power, S. (2022). Vapour pressure deficit determines critical thresholds for global coffee production under climate change. Nature Food, 3(10), 871–880. https://doi.org/10.1038/s43016-022-00614-8

Kelley, C., Mohtadi, S., Cane, M., Seager, R., & Kushnir, Y. (2017). Commentary on the Syria case: Climate as a contributing factor. Political Geography, 60, 245–247. https://doi.org/10.1016/j.polgeo.2017.06.013

Klose, A. K., Wunderling, N., Winkelmann, R., & Donges, J. F. (2021a). What do we mean, 'tipping cascade'? Environmental Research Letters, 16(12), 125011. https://doi.org/10.1088/1748-9326/ac3955

Klose, A. K., Wunderling, N., Winkelmann, R., & Donges, J. F. (2021b). What do we mean, 'tipping cascade'? Environmental Research Letters, 16(12), 125011. https://doi.org/10.1088/1748-9326/ac3955

Kominek, J., & Jurgen, S. (2011). Cascading Processes and Path Dependency in Social Networks: Working Paper CLISEC-12. University of Hamburg Research Group Climate Change and Security. https://core.ac.uk/download/pdf/210681427.pdf

Kuehn, C., Martens, E. A., & Romero, D. M. (2014). Critical transitions in social network activity. Journal of Complex Networks, 2(2), 141–152. https://doi.org/10.1093/comnet/cnt022

Lam, V. W. Y., Allison, E. H., Bell, J. D., Blythe, J., Cheung, W. W. L., Frölicher, T. L., Gasalla, M. A., & Sumaila, U. R. (2020). Climate change, tropical fisheries and prospects for sustainable development. Nature Reviews Earth & Environment, 1(9), 440–454. https://doi.org/10.1038/s43017-020-0071-9

Lapola, D. M., Pinho, P., Barlow, J., Aragão, L. E. O. C., Berenguer, E., Carmenta, R., Liddy, H. M., Seixas, H., Silva, C. V. J., Silva-Junior, C. H. L., Alencar, A. A. C., Anderson, L. O., Armenteras, D., Brovkin, V., Calders, K., Chambers, J., Chini, L., Costa, M. H., Faria, B. L., … Walker, W. S. (2023). The drivers and impacts of Amazon forest degradation. Science, 379(6630), eabp8622. https://doi.org/10.1126/science.abp8622

Lawrence, J., Blackett, P., & Cradock-Henry, N. A. (2020). Cascading climate change impacts and implications. Climate Risk Management, 29, 100234. https://doi.org/10.1016/j.crm.2020.100234

Lenton, T. M., & Ciscar, J.-C. (2013). Integrating tipping points into climate impact assessments. Climatic Change, 117(3), 585–597. https://doi.org/10.1007/s10584-012-0572-8

Lenton, T. M., Rockström, J., Gaffney, O., Rahmstorf, S., Richardson, K., Steffen, W., & Schellnhuber, H. J. (2019). Climate tipping points — too risky to bet against. Nature, 575(7784), 592–595. https://doi.org/10.1038/d41586-019-03595-0

Liu, T., Chen, D., Yang, L., Meng, J., Wang, Z., Ludescher, J., Fan, J., Yang, S., Chen, D., Kurths, J., Chen, X., Havlin, S., & Schellnhuber, H. J. (2023). Teleconnections among tipping elements in the Earth system. Nature Climate Change, 13(1), 67–74. https://doi.org/10.1038/s41558-022-01558

Lovejoy, T. E., & Nobre, C. (2018). Amazon Tipping Point. Science Advances, 4(2), eaat2340. https://doi.org/10.1126/sciadv.aat2340

Mackie, E., Jesse.F., A., Boland, E., Gilbert, A., Guo, W., Lenton, T., & Shuckburgh, E. (2020). Climate aware and resilient national security: Challenges for the 21st Century. Alan Turing Institute. Alan Turing Institute. https://www.turing.ac.uk/news/publications/climate-aware-and-resilient-national-security-challenges-21st-century

Magel, J. M. T., Dimoff, S. A., & Baum, J. K. (2020). Direct and indirect effects of climate change-amplified pulse heat stress events on coral reef fish communities. Ecological Applications, 30(6), e02124. https://doi.org/10.1002/eap.2124

Magrin, G., & Montclos, M. (2018). Crisis and development : the lake Chad region and Boko Haram- fdi:010086274- Horizon. Horizon Pleins Textes. https://www.documentation.ird.fr/hor/fdi:010086274

Makar, A. B., McMartin, K. E., Palese, M., & Tephly, T. R. (1975). Formate assay in body fluids: application in methanol poisoning. Biochemical Medicine, 13(2), 117–126. https://doi.org/10.1016/0006-2944(75)90147-7

McLeman, R., Wrathall, D., Gilmore, E., Thornton, P., Adams, H., & Gemenne, F. (2021). Conceptual framing to link climate risk assessments and climate-migration scholarship. Climatic Change, 165(1–2), 24. https://doi.org/10.1007/s10584-021-03056-6

Mellin, C., Hicks, C. C., Fordham, D. A., Golden, C. D., Kjellevold, M., MacNeil, M. A., Maire, E., Mangubhai, S., Mouillot, D., Nash, K. L., Omukoto, J. O., Robinson, J. P. W., Stuart-Smith, R. D., Zamborain-Mason, J., Edgar, G. J., & Graham, N. A. J. (2022). Safeguarding nutrients from coral reefs under climate change. Nature Ecology & Evolution, 6(12), 1808–1817. https://doi.org/10.1038/s41559-022-01878-w

Mitchard, E. T. A. (2018). The tropical forest carbon cycle and climate change. Nature, 559(7715), 527–534. https://doi.org/10.1038/s41586-018-0300-2

Moat, H. S., Curme, C., Avakian, A., Kenett, D. Y., Stanley, H. E., & Preis, T. (2013a). Quantifying Wikipedia Usage Patterns Before Stock Market Moves. Scientific Reports, 3(1), 1801. https://doi.org/10.1038/srep01801

Nagarajan, C., Pohl, B., Rüttinger, L., Sylvestre, F., Vivekananda, J., Wall, M., & Wolfmaier, S. (2018). Climate-fragility profile: lake Chad basin. Berlin: Adelphi, 32.

Nawrotzki, R. J., & Bakhtsiyarava, M. (2017). International Climate Migration: Evidence for the Climate Inhibitor Mechanism and the Agricultural Pathway. Population, Space and Place, 23(4), e2033. https://doi.org/10.1002/psp.2033

Nepstad, D. C., Stickler, C. M., Filho, B. S.-, & Merry, F. (2008). Interactions among Amazon land use, forests and climate: prospects for a near-term forest tipping point. Philosophical Transactions of the Royal Society B: Biological Sciences, 363(1498), 1737–1746. https://doi.org/10.1098/rstb.2007.0036

Neuman, Y., Nave, O., & Dolev, E. (2011). Buzzwords on their way to a tipping-point: A view from the blogosphere. Complexity, 16(4), 58–68. https://doi.org/10.1002/cplx.20347

Nobre, C. A., Sampaio, G., Borma, L. S., Castilla-Rubio, J. C., Silva, J. S., & Cardoso, M. (2016). Land-use and climate change risks in the Amazon and the need of a novel sustainable development paradigm. Proceedings of the National Academy of Sciences, 113(39), 10759–10768. https://doi.org/10.1073/pnas.1605516113

Otto, I. M., Donges, J. F., Cremades, R., Bhowmik, A., Hewitt, R. J., Lucht, W., Rockström, J., Allerberger, F., McCaffrey, M., Doe, S. S. P., Lenferna, A., Morán, N., Van Vuuren, D. P., & Schellnhuber, H. J. (2020). Social tipping dynamics for stabilizing Earth's climate by 2050. Proceedings of the National Academy of Sciences, 117(5), 2354–2365. https://doi.org/10.1073/pnas.1900577117

Owen, G. (2020). What makes climate change adaptation effective? A systematic review of the literature. Global Environmental Change, 62, 102071. https://doi.org/10.1016/j.gloenvcha.2020.102071

Paes, O. (2022). The Amazon rainforest and the global–regional politics of ecosystem governance. Oxford University Press. https://academic.oup.com/ia/article/98/6/2077/6765180?login=false

Pescaroli, G., & Alexander, D. (2018). Understanding Compound, Interconnected, Interacting, and Cascading Risks: A Holistic Framework. Risk Analysis, 38(11), 2245–2257. https://doi.org/10.1111/risa.13128

Podesta, J. (2019, July 25). The climate crisis, migration, and refugees. Brookings. https://www.brookings.edu/articles/the-climate-crisis-migration-and-refugees/

Renn, O., Lucas, K., Haas, A., & Jaeger, C. (2019). Things are different today: the challenge of global systemic risks. Journal of Risk Research, 22(4), 401–415. https://doi.org/10.1080/13669877.2017.1409252

Reydon, B. P., Fernandes, V. B., & Telles, T. S. (2020). Land governance as a precondition for decreasing deforestation in the Brazilian Amazon. Land Use Policy, 94, 104313. https://doi.org/10.1016/j.landusepol.2019.104313

Reyer, C. P. O., Brouwers, N., Rammig, A., Brook, B. W., Epila, J., Grant, R. F., Holmgren, M., Langerwisch, F., Leuzinger, S., Lucht, W., Medlyn, B., Pfeifer, M., Steinkamp, J., Vanderwel, M. C., Verbeeck, H., & Villela, D. M. (2015). Forest resilience and tipping points at different spatio-temporal scales: approaches and challenges. Journal of Ecology, 103(1), 5–15. https://doi.org/10.1111/1365-2745.12337

Rocha, J. C. (2022). Ecosystems are showing symptoms of resilience loss. Environmental Research Letters, 17(6), 065013. https://doi.org/10.1088/1748-9326/ac73a8

Saavedra, S., Hagerty, K., & Uzzi, B. (2011). Synchronicity, instant messaging, and performance among financial traders. Proceedings of the National Academy of Sciences, 108(13), 5296–5301. https://doi.org/10.1073/pnas.1018462108

Sanches-Pereira, A., & Gómez, M. F. (2015). The dynamics of the Swedish biofuel system toward a vehicle fleet independent of fossil fuels. Journal of Cleaner Production, 96, 452–466. https://doi.org/10.1016/j.jclepro.2014.03.019

Sayan, R. C., Nagabhatla, N., & Ekwuribe, M. (2020). Soft Power, Discourse Coalitions, and the Proposed Interbasin Water Transfer Between Lake Chad and the Congo River. Water Alternatives, 13(3). Soft Power, Discourse Coalitions, and the Proposed Interbasin Water Transfer Between Lake Chad and the Congo River (water-alternatives.org)

Scheffer, M., Bascompte, J., Brock, W. A., Brovkin, V., Carpenter, S. R., Dakos, V., Held, H., van Nes, E. H., Rietkerk, M., & Sugihara, G. (2009). Early-warning signals for critical transitions. Nature, 461(7260), 53–59. https://doi.org/10.1038/nature08227

Scheffer, M., Hosper, S. H., Meijer, M.-L., Moss, B., & Jeppesen, E. (1993). Alternative equilibria in shallow lakes. Trends in Ecology & Evolution, 8(8), 275–279. https://doi.org/10.1016/0169-5347(93)90254-M

Scheffran, J. (2016). From a Climate of Complexity to Sustainable Peace: Viability Transformations and Adaptive Governance in the Anthropocene. In: Brauch, H., Oswald Spring, Ú., Grin, J., Scheffran, J. (eds) Handbook on Sustainability Transition and Sustainable Peace . Hexagon Series on Human and Environmental Security and Peace, vol 10. Springer, Cham. https://doi.org/10.1007/978-3-319-43884-9_1

Scheffran, J., Ide, T., & Schilling, J. (2014). Violent climate or climate of violence? Concepts and relations with focus on Kenya and Sudan. The International Journal of Human Rights, 18(3), 369–390. https://doi.org/10.1080/13642987.2014.914722

Schilling, J., Hertig, E., Tramblay, Y., & Scheffran, J. (2020). Climate change vulnerability, water resources and social implications in North Africa. Regional Environmental Change, 20(1), 15. https://doi.org/10.1007/s10113-020-01597-7

Schindler, D. W., Carpenter, S. R., Chapra, S. C., Hecky, R. E., & Orihel, D. M. (2016). Reducing Phosphorus to Curb Lake Eutrophication is a Success. Environmental Science & Technology, 50(17), 8923–8929. https://doi.org/10.1021/acs.est.6b02204

Schweizer, P.-J., & Renn, O. (2019). Governance of systemic risks for disaster prevention and mitigation. Disaster Prevention and Management: An International Journal, 28(6), 862–874. https://doi.org/10.1108/DPM-09-2019-0282

Selby, J., Dahi, O. S., Fröhlich, C., & Hulme, M. (2017). Climate change and the Syrian civil war revisited. Political Geography, 60, 232–244. https://doi.org/10.1016/j.polgeo.2017.05.007

Seto, K. C., Reenberg, A., Boone, C. G., Fragkias, M., Haase, D., Langanke, T., Marcotullio, P., Munroe, D. K., Olah, B., & Simon, D. (2012). Urban land teleconnections and sustainability. Proceedings of the National Academy of Sciences, 109(20), 7687–7692. https://doi.org/10.1073/pnas.1117622109

Sillmann, J., Christensen, I., Hochrainer-Stigler, S., Huang-Lachmann, J., Juhola, S., Kornhuber, K., Mahecha, M., Mechler, R., Reichstein, M., Ruane, A.C., Schweizer, P.-J. and Williams, S. 2022. ISC-UNDRR-RISK KAN Briefing note on systemic risk, Paris, France, International Science Council, https://doi.org/10.24948/2022.01

Simpson, N. P., Mach, K. J., Constable, A., Hess, J., Hogarth, R., Howden, M., Lawrence, J., Lempert, R. J., Muccione, V., Mackey, B., New, M. G., O'Neill, B., Otto, F., Pörtner, H.-O., Reisinger, A., Roberts, D., Schmidt, D. N., Seneviratne, S., Strongin, S., … Trisos, C. H. (2021). A framework for complex climate change risk assessment. One Earth, 4(4), 489–501. https://doi.org/10.1016/j.oneear.2021.03.005

Sing Wong, A., Vrontos, S., & Taylor, M. L. (2022). An assessment of people living by coral reefs over space and time. Global Change Biology, 28(23), 7139–7153. https://doi.org/10.1111/gcb.16391

Smith, R. J., & Bryant, R. G. (1975). Metal substitutions incarbonic anhydrase: a halide ion probe study. Biochemical and Biophysical Research Communications, 66(4), 1281–1286. https://doi.org/10.1016/0006-291x(75)90498-2

Sohns, A., Ford, J. D., Adamowski, J., & Robinson, B. E. (2021). Participatory Modeling of Water Vulnerability in Remote Alaskan Households Using Causal Loop Diagrams. Environmental Management, 67(1), 26–42. https://doi.org/10.1007/s00267-020-01387-1

Stal M (2009): Case study report on Mozambique for the environmental change and forced migration scenarios project. In: EACH-FOR Environmental Change and Forced Migration Scenarios. D.3.4. Synthesis Report. p.40-41. https://rosamartinez.org/wp-content/uploads/2015/11/Migraciones-y-Cambio-Climatico_EACHFOR.pdf

Staver, A. C., Archibald, S., & Levin, S. A. (2011). The Global Extent and Determinants of Savanna and Forest as Alternative Biome States. Science, 334(6053), 230–232. https://doi.org/10.1126/science.1210465

Sternberg, T. (2012). Chinese drought, bread and the Arab Spring. Applied Geography, 34, 519–524. https://doi.org/10.1016/j.apgeog.2012.02.004

Strona, G., Beck, P. S. A., Cabeza, M., Fattorini, S., Guilhaumon, F., Micheli, F., Montano, S., Ovaskainen, O., Planes, S., Veech, J. A., & Parravicini, V. (2021). Ecological dependencies make remote reef fish communities most vulnerable to coral loss. Nature Communications, 12(1), 7282. https://doi.org/10.1038/s41467-021-27440-z

Sydney, C., & Desai, B. (2020). Policy Paper: Yemen: the implications of forced immobility. https://www.internal-displacement.org/sites/default/files/publications/documents/202006-yemen-policy-paper.pdf

Tebbett, S. B., Connolly, S. R., & Bellwood, D. R. (2023). Benthic composition changes on coral reefs at global scales. Nature Ecology & Evolution, 7(1), 71–81. https://doi.org/10.1038/s41559-022-01937-2

Thompson, C. A., Matthews, S., Hoey, A. S., & Pratchett, M. S. (2019). Changes in sociality of butterflyfishes linked to population declines and coral loss. Coral Reefs, 38(3), 527–537. https://doi.org/10.1007/s00338-019-01792-x

Van De Leemput, I. A., Hughes, T. P., Van Nes, E. H., & Scheffer, M. (2016). Multiple feedbacks and the prevalence of alternate stable states on coral reefs. Coral Reefs, 35(3), 857–865. https://doi.org/10.1007/s00338-016-1439-7

Vivekananda, J., Wall, M., Sylvestre, F., & Nagarajan, C. (2019). Shoring up Stability: Addressing Climate and Fragility risk in the lake Chad region. adelphi research gemeinnützige GmbH. https://shoring-up-stability.org/wp-content/uploads/2019/06/Shoring-up-Stability.pdf

Wismer, S., Tebbett, S. B., Streit, R. P., & Bellwood, D. R. (2019a). Spatial mismatch in fish and coral loss following 2016 mass coral bleaching. Science of The Total Environment, 650, 1487–1498. https://doi.org/10.1016/j.scitotenv.2018.09.114

Wismer, S., Tebbett, S. B., Streit, R. P., & Bellwood, D. R. (2019b). Young fishes persist despite coral loss on the Great Barrier Reef. Communications Biology, 2(1), 456. https://doi.org/10.1038/s42003-019-0703-0

Wunderling, N., Winkelmann, R., Rockström, J., Loriani, S., Armstrong McKay, D. I., Ritchie, P. D. L., Sakschewski, B., & Donges, J. F. (2023). Global warming overshoots increase risks of climate tipping cascades in a network model. Nature Climate Change, 13(1), 75–82. https://doi.org/10.1038/s41558-022-01545-9

Xu, L., Patterson, D., Levin, S. A., & Wang, J. (2023). Non-equilibrium early-warning signals for critical transitions in ecological systems. Proceedings of the National Academy of Sciences, 120(5), e2218663120. https://doi.org/10.1073/pnas.2218663120

Zemp, D. C., Schleussner, C.-F., Barbosa, H. M. J., Hirota, M., Montade, V., Sampaio, G., Staal, A., Wang-Erlandsson, L., & Rammig, A. (2017). Self-amplified Amazon forest loss due to vegetation-atmosphere feedbacks. Nature Communications, 8(1), 14681. https://doi.org/10.1038/ncomms14681

Zieba, F. W., Yengoh, G. T., & Tom, A. (2017). Seasonal Migration and Settlement around Lake Chad: Strategies for Control of Resources in an Increasingly Drying Lake. Resources, 6(3), 41. https://doi.org/10.3390/resources6030041

References: Chapter 2.5

Adrian, B., R. A. ;. Maddison, E. ;. Ranner, P. ;. Bissell, J. ;. Caiado, C. ;. Bhatanacharoen, P. ;. CLARK, Timothy, & Robert; Botha M.; Akinbami F.; Hollow M.; Michie R.; Huntley B.; Curtis S.; and Garnett P. (2014). Social tipping points and Earth systems dynamics. Frontiers in Environmental Science., 2, 1–7. https://ink.library.smu.edu.sg/cgi/viewcontent.cgi?params=/context/lkcsb_research/article/7268/&path_info=fenvs_02_00035.pdf

Bardi, U. (2019). Peak oil, 20 years later: Failed prediction or useful insight? Energy Research & Social Science, 48, 257–261. https://doi.org/10.1016/j.erss.2018.09.022

Bauch, C. T., Sigdel, R., Pharaon, J., & Anand, M. (2016). Early warning signals of regime shifts in coupled human–environment systems. Proceedings of the National Academy of Sciences, 113(51), 14560–14567. https://doi.org/10.1073/pnas.1604978113

Bieg, C., McCann, K. S., & Fryxell, J. M. (2017). The dynamical implications of human behaviour on a social-ecological harvesting model. Theoretical Ecology, 10(3), 341–354. https://doi.org/10.1007/s12080-017-0334-3

CitSci.org. (n.d.). Retrieved 3 November 2023, from https://citsci.org/

Coletto, M., Aiello, L., Lucchese, C., & Silvestri, F. (2021). On the Behaviour of Deviant Communities in Online Social Networks. Proceedings of the International AAAI Conference on Web and Social Media, 10(1), 72–81. https://doi.org/10.1609/icwsm.v10i1.14726

Dakos, V., Carpenter, S. R., Brock, W. A., Ellison, A. M., Guttal, V., Ives, A. R., Kéfi, S., Livina, V., Seekell, D. A., Van Nes, E. H., & Scheffer, M. (2012). Methods for Detecting Early Warnings of Critical Transitions in Time Series Illustrated Using Simulated Ecological Data. PLoS ONE, 7(7), e41010. https://doi.org/10.1371/journal.pone.0041010

Diks, C., Hommes, C., & Wang, J. (2019). Critical slowing down as an early warning signal for financial crises? Empirical Economics, 57(4), 1201–1228. https://doi.org/10.1007/s00181-018-1527-3

Ehret, S., Constantino, S. M., Weber, E. U., Efferson, C., & Vogt, S. (2022). Group identities can undermine social tipping after intervention. Nature Human Behaviour, 6(12), 1669–1679. https://doi.org/10.1038/s41562-022-01440-5

Ehrlich, P. (1978). The Population Bomb. Ballantine Books; Rev. https://en.wikipedia.org/w/index.php?title=The_Population_Bomb&oldid=1180522814

Farahbakhsh, I., Bauch, C. T., & Anand, M. (2022). Modelling coupled human–environment complexity for the future of the biosphere: strengths, gaps and promising directions. Philosophical Transactions of the Royal Society B: Biological Sciences, 377(1857), 20210382. https://doi.org/10.1098/rstb.2021.0382

Feng, K., Wang, T., Liu, S., Yan, C., Kang, W., Chen, X., & Guo, Z. (2021). Path analysis model to identify and analyse the causes of aeolian desertification in Mu Us Sandy Land, China. Ecological Indicators, 124, 107386. https://doi.org/10.1016/j.ecolind.2021.107386

Fernández-Giménez, M. E., Venable, N. H., Angerer, J., Fassnacht, S. R., Reid, R. S., & Khishigbayar, J. (2017). Exploring linked ecological and cultural tipping points in Mongolia. Anthropocene, 17, 46–69. https://doi.org/10.1016/j.ancene.2017.01.003

Funk, C., Davenport, F., Eilerts, G., Nourey, N. and Galu, G.,. (2018). Contrasting Kenyan resilience to drought: 2011 and 2017. [USAID Special Report.]. https://2017-2020.usaid.gov/sites/default/files/documents/1867/Kenya_Report_-_Full_Compliant.PDF

Funk, C., Shukla, S., Thiaw, W. M., Rowland, J., Hoell, A., McNally, A., Husak, G., Novella, N., Budde, M., Peters-Lidard, C., Adoum, A., Galu, G., Korecha, D., Magadzire, T., Rodriguez, M., Robjhon, M., Bekele, E., Arsenault, K., Peterson, P., … Verdin, J. (2019). Recognizing the Famine Early Warning Systems Network: Over 30 Years of Drought Early Warning Science Advances and Partnerships Promoting Global Food Security. Bulletin of the American Meteorological Society, 100(6), 1011–1027. https://doi.org/10.1175/BAMS-D-17-0233.1

Gaikwad, M., Ahirrao, S., Kotecha, K., & Abraham, A. (2022). Multi-Ideology Multi-Class Extremism Classification Using Deep Learning Techniques. IEEE Access, 10, 104829–104843. https://doi.org/10.1109/ACCESS.2022.3205744

Guo, W., Gleditsch, K., & Wilson, A. (2018). Retool AI to forecast and limit wars. Nature, 562(7727), 331–333. https://doi.org/10.1038/d41586-018-07026-4

Guo, W., Sun, S., & Wilson, A. (2023). Exploring Potential Causal Models for Climate-Society-Conflict Interaction. 69–76. https://www.scitepress.org/Link.aspx?doi=10.5220/0011968400003485

Hicks, C. C., Crowder, L. B., Graham, N. A., Kittinger, J. N., & Cornu, E. L. (2016). Social drivers forewarn of marine regime shifts. Frontiers in Ecology and the Environment, 14(5), 252–260. https://doi.org/10.1002/fee.1284

Horan, R. D., Fenichel, E. P., Drury, K. L. S., & Lodge, D. M. (2011). Managing ecological thresholds in coupled environmental–human systems. Proceedings of the National Academy of Sciences, 108(18), 7333–7338. https://doi.org/10.1073/pnas.1005431110

Ibáñez, J., Martínez, J., & Schnabel, S. (2007). Desertification due to overgrazing in a dynamic commercial livestock–grass–soil system. Ecological Modelling, 205(3–4), 277–288. https://doi.org/10.1016/j.ecolmodel.2007.02.024

Innes, C., Anand, M., & Bauch, C. T. (2013). The impact of human-environment interactions on the stability of forest-grassland mosaic ecosystems. Scientific Reports, 3(1), 2689. https://doi.org/10.1038/srep02689

Kim, J., Lee, J., Park, E., & Han, J. (2020). A deep learning model for detecting mental illness from user content on social media. Scientific Reports, 10(1), 11846. https://doi.org/10.1038/s41598-020-68764-y

Korecha, D., & Barnston, A. G. (2007). Predictability of June–September Rainfall in Ethiopia. Monthly Weather Review, 135(2), 628–650. https://doi.org/10.1175/MWR3304.1

Koschate-Reis, M., Dickens, L., Stuart, A., Naserian, E., Russo, A., & Levine, M. (2019). Predicting a Salient Social Identity from Linguistic Style [Preprint]. PsyArXiv. https://doi.org/10.31234/osf.io/zkunh

Krishnamurthy, P. K., Choularton, R. J., & Kareiva, P. (2020). Dealing with uncertainty in famine predictions: How complex events affect food security early warning skill in the Greater Horn of Africa. Global Food Security, 26, 100374. https://doi.org/10.1016/j.gfs.2020.100374

Krishnamurthy R, P. K., Fisher, J. B., Choularton, R. J., & Kareiva, P. M. (2022). Anticipating drought-related food security changes. Nature Sustainability, 5(11), 956–964. https://doi.org/10.1038/s41893-022-00962-0

Krishnamurthy R, P. K., Fisher, J. B., Schimel, D. S., & Kareiva, P. M. (2020). Applying Tipping Point Theory to Remote Sensing Science to Improve Early Warning Drought Signals for Food Security. Earth's Future, 8(3), e2019EF001456. https://doi.org/10.1029/2019EF001456

Kuehn, C., Martens, E. A., & Romero, D. M. (2014). Critical transitions in social network activity. Journal of Complex Networks, 2(2), 141–152. https://doi.org/10.1093/comnet/cnt022

Lade, S. J., Tavoni, A., Levin, S. A., & Schlüter, M. (2013). Regime shifts in a social-ecological system. Theoretical Ecology, 6(3), 359–372. https://doi.org/10.1007/s12080-013-0187-3

Milkoreit, M., Hodbod, J., Baggio, J., Benessaiah, K., Calderón-Contreras, R., Donges, J. F., Mathias, J.-D., Rocha, J. C., Schoon, M., & Werners, S. E. (2018). Defining tipping points for social-ecological systems scholarship—an interdisciplinary literature review. Environmental Research Letters, 13(3), 033005. https://doi.org/10.1088/1748-9326/aaa75

Richter, A., & Dakos, V. (2015). Profit fluctuations signal eroding resilience of natural resources. Ecological Economics, 117, 12–21. https://doi.org/10.1016/j.ecolecon.2015.05.013

Rød, E. G., Gåsste, T., & Hegre, H. (2023). A review and comparison of conflict early warning systems. International Journal of Forecasting, S0169207023000018. https://doi.org/10.1016/j.ijforecast.2023.01.001

Samitas, A., Kampouris, E., & Kenourgios, D. (2020). Machine learning as an early warning system to predict financial crisis. International Review of Financial Analysis, 71, 101507. https://doi.org/10.1016/j.irfa.2020.10150

Sampson, J., Morstatter, F., Wu, L., & Liu, H. (2016). Leveraging the Implicit Structure within Social Media for Emergent Rumor Detection. Proceedings of the 25th ACM International on Conference on Information and Knowledge Management, 2377–2382. https://doi.org/10.1145/2983323.2983697

Shipman, M. D. (2014). The limitations of social research. Routledge.

Sigdel, R., Anand, M., & Bauch, C. T. (2019). Convergence of socio-ecological dynamics in disparate ecological systems under strong coupling to human social systems. Theoretical Ecology, 12(3), 285–296. https://doi.org/10.1007/s12080-018-0394-z

Spielmann, K. A., Peeples, M. A., Glowacki, D. M., & Dugmore, A. (2016). Early Warning Signals of Social Transformation: A Case Study from the US Southwest. PLOS ONE, 11(10), e0163685. https://doi.org/10.1371/journal.pone.0163685

Swingedouw, D., Ifejika Speranza, C., Bartsch, A., Durand, G., Jamet, C., Beaugrand, G., & Conversi, A. (2020). Early Warning from Space for a Few Key Tipping Points in Physical, Biological, and Social-Ecological Systems. Surveys in Geophysics, 41(6), 1237–1284. https://doi.org/10.1007/s10712-020-09604-6

Thampi, V. A., Bauch, C. T., & Anand, M. (2019). Socio-ecological mechanisms for persistence of native Australian grasses under pressure from nitrogen runoff and invasive species. Ecological Modelling, 413, 108830. https://doi.org/10.1016/j.ecolmodel.2019.108830

Uban, A.-S., Chulvi, B., & Rosso, P. (2021). An emotion and cognitive based analysis of mental health disorders from social media data. Future Generation Computer Systems, 124, 480–494. https://doi.org/10.1016/j.future.2021.05.032

Van De Leemput, I. A., Wichers, M., Cramer, A. O. J., Borsboom, D., Tuerlinckx, F., Kuppens, P., Van Nes, E. H., Viechtbauer, W., Giltay, E. J., Aggen, S. H., Derom, C., Jacobs, N., Kendler, K. S., Van Der Maas, H. L. J., Neale, M. C., Peeters, F., Thiery, E., Zachar, P., & Scheffer, M. (2014). Critical slowing down as early warning for the onset and termination of depression. Proceedings of the National Academy of Sciences, 111(1), 87–92. https://doi.org/10.1073/pnas.1312114110

Verbesselt, J., Umlauf, N., Hirota, M., Holmgren, M., Van Nes, E. H., Herold, M., Zeileis, A., & Scheffer, M. (2016). Remotely sensed resilience of tropical forests. Nature Climate Change, 6(11), 1028–1031. https://doi.org/10.1038/nclimate3108

Wang, Y., Kaplan, N., Newman, G., & Scarpino, R. (2015). CitSci.org: A New Model for Managing, Documenting, and Sharing Citizen Science Data. PLOS Biology, 13(10), e1002280. https://doi.org/10.1371/journal.pbio.1002280

Watson, T., Lenton, T., & De Campos, R. S. (2023). The climate change, conflict and migration nexus: A holistic view. Climate Resilience and Sustainability, 2(2), e250. https://doi.org/10.1002/cli2.50

Wiedermann, M., Smith, E. K., Heitzig, J., & Donges, J. F. (2020). A network-based microfoundation of Granovetter's threshold model for social tipping. Scientific Reports, 10(1), 11202. https://doi.org/10.1038/s41598-020-67102-6

Winkelmann, R., Donges, J. F., Smith, E. K., Milkoreit, M., Eder, C., Heitzig, J., Katsanidou, A., Wiedermann, M., Wunderling, N., & Lenton, T. M. (2022). Social tipping processes towards climate action: A conceptual framework. Ecological Economics, 192, 107242. https://doi.org/10.1016/j.ecolecon.2021.107242

Section 3

Governance of Earth system tipping points

Section lead coordinating author:
Manjana Milkoreit

Reviewers:
Magnus Bengtsson, Victor Galaz, Rachel Kyte, Harro Van Asselt

References

Aakre, S., Kallbekken, S., Van Dingenen, R., & Victor, D. G. (2018). Incentives for small clubs of Arctic countries to limit black carbon and methane emissions. Nature Climate Change, 8(1), 85–90. https://doi.org/10.1038/s41558-017-0030-8

Aklin, M., & Mildenberger, M. (2020). Prisoners of the Wrong Dilemma: Why Distributive Conflict, Not Collective Action, Characterizes the Politics of Climate Change. Global Environmental Politics, 20(4), 4–27. https://doi.org/10.1162/glep_a_00578

Armitage, D., Marschke, M., & Plummer, R. (2008). Adaptive co-management and the paradox of learning. Global Environmental Change, 18(1), 86–98. https://doi.org/10.1016/j.gloenvcha.2007.07.002

Barry, B. (1997). Sustainability and Intergenerational Justice. Theoria, 44(89). https://doi.org/10.3167/004058197783593443

Bellamy, R. (2023). Public perceptions of climate tipping points. Public Understanding of Science, 09636625231177820. https://doi.org/10.1177/09636625231177820

Bennett, N. J., Blythe, J., Cisneros-Montemayor, A. M., Singh, G. G., & Sumaila, U. R. (2019). Just Transformations to Sustainability. Sustainability, 11(14), 3881. https://doi.org/10.3390/su11143881

Boyd, E., Nykvist, B., Borgström, S., & Stacewicz, I. A. (2015). Anticipatory governance for social-ecological resilience. AMBIO, 44(S1), 149–161. https://doi.org/10.1007/s13280-014-0604-x

Brunnée, J., & Streck, C. (2013). The UNFCCC as a negotiation forum: towards common but more differentiated responsibilities. Climate Policy, 13(5), 589–607. https://doi.org/10.1080/14693062.2013.822661

Bullard, R. D. (2021). Environmental Justice - Once a Footnote, Now a Headline. Harvard Environmental Law Review, 45, 243. https://heinonline.org/HOL/Page?handle=hein.journals/helr45&id=251&div=&collection=

Centeno, M. A., Nag, M., Patterson, T. S., Shaver, A., & Windawi, A. J. (2015a). The Emergence of Global Systemic Risk. Annual Review of Sociology, 41(1), 65–85. https://doi.org/10.1146/annurev-soc-073014-112317

Colenbrander, S., Pettinotti, L., & Cao, Y. (2022, June 26). A fair share of climate finance? An appraisal of past performance, future pledges and prospective contributors. ODI: Think Change. https://odi.org/en/publications/a-fair-share-of-climate-finance-an-appraisal-of-past-performance-future-pledges-and-prospective-contributors/

Duit, A., & Galaz, V. (2008). Governance and Complexity—Emerging Issues for Governance Theory. Governance, 21(3), 311–335. https://doi.org/10.1111/j.1468-0491.2008.00402.x

Elsässer, J. P., Hickmann, T., Jinnah, S., Oberthür, S., & Van De Graaf, T. (2022). Institutional interplay in global environmental governance: lessons learned and future research. International Environmental Agreements: Politics, Law and Economics, 22(2), 373–391. https://doi.org/10.1007/s10784-022-09569-4

Folke, C., Hahn, T., Olsson, P., & Norberg, J. (2005). ADAPTIVE GOVERNANCE OF SOCIAL-ECOLOGICAL SYSTEMS. Annual Review of Environment and Resources, 30(1), 441–473. https://doi.org/10.1146/annurev.energy.30.050504.144511

Folke, C., Österblom, H., Jouffray, J.-B., Lambin, E. F., Adger, W. N., Scheffer, M., Crona, B. I., Nyström, M., Levin, S. A., Carpenter, S. R., Anderies, J. M., Chapin, S., Crépin, A.-S., Dauriach, A., Galaz, V., Gordon, L. J., Kautsky, N., Walker, B. H., Watson, J. R., … de Zeeuw, A. (2019). Transnational corporations and the challenge of biosphere stewardship. Nature Ecology & Evolution, 3(10), 1396–1403. https://doi.org/10.1038/s41559-019-0978-z

Formanski, F. J., Pein, M. M., Loschelder, D. D., Engler, J.-O., Husen, O., & Majer, J. M. (2022). Tipping points ahead? How laypeople respond to linear versus nonlinear climate change predictions. Climatic Change, 175(1–2), 8. https://doi.org/10.1007/s10584-022-03459-z

Fowler, C. T. (2023). Amitav Ghosh. The Nutmeg's Curse: Parables for a Planet in Crisis. Chicago. The University of Chicago Press 2021. ISBN 9780226815459, Price $25.00 (Cloth). 339 Pages. Human Ecology, s10745-023-00428-7. https://doi.org/10.1007/s10745-023-00428-7

Frank, A. B., Collins, M. G., Levin, S. A., Lo, A. W., Ramo, J., Dieckmann, U., Kremenyuk, V., Kryazhimskiy, A., Linnerooth-Bayer, J., Ramalingam, B., Roy, J. S., Saari, D. G., Thurner, S., & von Winterfeldt, D. (2014). Dealing with femtorisks in international relations. Proceedings of the National Academy of Sciences, 111(49), 17356–17362. https://doi.org/10.1073/pnas.1400229111

Gaffney, O., & Tcholak-Antitch, Z. (2017). Global Commons Survey: Attitudes to planetary stewardship and transformation among G20 countries (p. 38). Global Commons Alliance. https://globalcommonsalliance.org/wp-content/uploads/2021/08/Global-Commons-G20-Survey-full-report.pdf

Galaz, V., Crona, B., Dauriach, A., Scholtens, B., & Steffen, W. (2018). Finance and the Earth system – Exploring the links between financial actors and non-linear changes in the climate system. Global Environmental Change, 53, 296–302. https://doi.org/10.1016/j.gloenvcha.2018.09.008

Galaz, V., Metzler, H., Daume, S., Olsson, A., Lindström, B., & Marklund, A. (2023). AI could create a perfect storm of climate misinformation (arXiv:2306.12807). arXiv. https://doi.org/10.48550/arXiv.2306.12807

Galaz, V., Olsson, P., Hahn, T., Folke, C., & Svedin, U. (2008). The Problem of Fit among Biophysical Systems, Environmental and Resource Regimes, and Broader Governance Systems: Insights and Emerging Challenges. In O. R. Young, L. A. King, & H. Schroeder (Eds.), Institutions and Environmental Change (pp. 147–186). The MIT Press. https://doi.org/10.7551/mitpress/9780262240574.003.0005

Galaz, V., Österblom, H., Bodin, Ö., & Crona, B. (2016a). Global networks and global change-induced tipping points. International Environmental Agreements: Politics, Law and Economics, 16(2), 189–221. https://doi.org/10.1007/s10784-014-9253-6

Galaz, V., Tallberg, J., Boin, A., Ituarte-Lima, C., Hey, E., Olsson, P., & Westley, F. (2017). Global Governance Dimensions of Globally Networked Risks: The State of the Art in Social Science Research. Risk, Hazards & Crisis in Public Policy, 8(1), 4–27. https://doi.org/10.1002/rhc3.12108

Gardiner, S. M. (2006). A Perfect Moral Storm: Climate Change, Intergenerational Ethics and the Problem of Moral Corruption. Environmental Values, 15(3), 397–413. https://doi.org/10.3197/096327106778226293

Gardiner, S. M. (2011). A perfect moral storm: the ethical tragedy of climate change. Oxford University Press.

Ghosh, A. (2021) 'The Nutmeg's Curse: Parables for a Planet in Crisis', in The Nutmeg's Curse. University of Chicago Press. Available at: https://doi.org/10.7208/chicago/9780226815466.

Gollier, C., & Weitzman, M. L. (2010). How should the distant future be discounted when discount rates are uncertain? Economics Letters, 107(3), 350–353. https://doi.org/10.1016/j.econlet.2010.03.001

Graham, J. D., & Wiener, J. B. (Eds.). (1995). Risk versus risk: tradeoffs in protecting health and the environment. Harvard University Press.

Gupta, A., Möller, I., Biermann, F., Jinnah, S., Kashwan, P., Mathur, V., Morrow, D. R., & Nicholson, S. (2020). Anticipatory governance of solar geoengineering: conflicting visions of the future and their links to governance proposals. Current Opinion in Environmental Sustainability, 45, 10–19. PubMed. https://doi.org/10.1016/j.cosust.2020.06.004

Gupta, J., Liverman, D., Prodani, K., Aldunce, P., Bai, X., Broadgate, W., Ciobanu, D., Gifford, L., Gordon, C., Hurlbert, M., Inoue, C. Y. A., Jacobson, L., Kanie, N., Lade, S. J., Lenton, T. M., Obura, D., Okereke, C., Otto, I. M., Pereira, L., … Verburg, P. H. (2023). Earth system justice needed to identify and live within Earth system boundaries. Nature Sustainability, 6(6), 630–638. https://doi.org/10.1038/s41893-023-01064-1

Hale, T. (2016). "All Hands on Deck": The Paris Agreement and Nonstate Climate Action. Global Environmental Politics, 16(3), 12–22. https://doi.org/10.1162/GLEP_a_00362

Hale, T., & Roger, C. (2014). Orchestration and transnational climate governance. The Review of International Organizations, 9(1), 59–82. https://doi.org/10.1007/s11558-013-9174-0

Homer-Dixon, T., Renn, O., Rockstrom, J., Donges, J. F., & Janzwood, S. (2021). A Call for An International Research Program on the Risk of a Global Polycrisis. SSRN Electronic Journal. https://doi.org/10.2139/ssrn.4058592

Homer-Dixon, T., Walker, B., Biggs, R., Crépin, A.-S., Folke, C., Lambin, E. F., Peterson, G. D., Rockström, J., Scheffer, M., Steffen, W., & Troell, M. (2015). Synchronous failure: the emerging causal architecture of global crisis. Ecology and Society, 20(3), art6. https://doi.org/10.5751/ES-07681-200306

Howard, P., & Livermore, M. A. (2019). Sociopolitical Feedbacks and Climate Change. Harvard Environmental Law Review, 43, 119. https://heinonline.org/HOL/Page?handle=hein.journals/helr43&id=123&div=&collection=

Johnstone, I. (2003). The Role of the UN Secretary-General: The Power of Persuasion Based on Law. Global Governance, 9(4), 441–458. https://www.jstor.org/stable/27800496

Jordan, A., Huitema, D., Van Asselt, H., & Forster, J. (Eds.). (2018). Governing Climate Change: Polycentricity in Action? (1st ed.). Cambridge University Press. https://doi.org/10.1017/9781108284646

Juhola, S., Filatova, T., Hochrainer-Stigler, S., Mechler, R., Scheffran, J., & Schweizer, P.-J. (2022). Social tipping points and adaptation limits in the context of systemic risk: Concepts, models and governance. Frontiers in Climate, 4, 1009234. https://doi.org/10.3389/fclim.2022.1009234

Kemp, L., Xu, C., Depledge, J., Ebi, K. L., Gibbins, G., Kohler, T. A., Rockström, J., Scheffer, M., Schellnhuber, H. J., Steffen, W., & Lenton, T. M. (2022). Climate Endgame: Exploring catastrophic climate change scenarios. Proceedings of the National Academy of Sciences, 119(34), e2108146119. https://doi.org/10.1073/pnas.2108146119

Kotzé, L. J., & Kim, R. E. (2019). Earth system law: The juridical dimensions of earth system governance. Earth System Governance, 1, 100003. https://doi.org/10.1016/j.esg.2019.100003

Kotzé, L. J., Kim, R. E., Blanchard, C., Gellers, J. C., Holley, C., Petersmann, M., Van Asselt, H., Biermann, F., & Hurlbert, M. (2022). Earth system law: Exploring new frontiers in legal science. Earth System Governance, 11, 100126. https://doi.org/10.1016/j.esg.2021.100126

Krznaric, R. (2020). The Good Ancestor: A Radical Prescription for Long-Term Thinking. The Experiment.

Lamb, W. F., Mattioli, G., Levi, S., Roberts, J. T., Capstick, S., Creutzig, F., Minx, J. C., Müller-Hansen, F., Culhane, T., & Steinberger, J. K. (2020). Discourses of climate delay. Global Sustainability, 3, e17. https://doi.org/10.1017/sus.2020.13

Laybourn, L., Evans, J., & Dyke, J. G. (2023). Derailment risk: A systems analysis that identifies risks which could derail the sustainability transition. EGUsphere, 1–15. https://doi.org/10.5194/egusphere-2023-1459

Lebel, L., Nikitina, E., Pahl-Wostl, C., & Knieper, C. (2013). Institutional Fit and River Basin Governance: a New Approach Using Multiple Composite Measures. Ecology and Society, 18(1). https://www.jstor.org/stable/26269250

Lenton, T. M. (2011). Beyond 2°C: redefining dangerous climate change for physical systems. WIREs Climate Change, 2(3), 451–461. https://doi.org/10.1002/wcc.107

Lewandowsky, S., & Van Der Linden, S. (2021). Countering Misinformation and Fake News Through Inoculation and Prebunking. European Review of Social Psychology, 32(2), 348–384. https://doi.org/10.1080/10463283.2021.1876983

Liu, J., Hull, V., Luo, J., Yang, W., Liu, W., Vina, A., Vogt, C., Xu, Z., Yang, H., Zhang, J., An, L., Chen, X., Li, S., Ouyang, Z., Xu, W., & Zhang, H. (2015). Multiple Telecouplings and Their Complex Interrelationships. Ecology and Society, 20(3). https://www.jstor.org/stable/26270254

Meyer, L. H. (Ed.). (2017). Intergenerational Justice (1st ed.). Routledge. https://doi.org/10.4324/9781315252100

Muiderman, K., Gupta, A., Vervoort, J., & Biermann, F. (2020). Four approaches to anticipatory climate governance: Different conceptions of the future and implications for the present. WIREs Climate Change, 11(6), e673. https://doi.org/10.1002/wcc.673

Muiderman, K. et al. (2023) 'Is anticipatory governance opening up or closing down future possibilities? Findings from diverse contexts in the Global South', Global Environmental Change, 81, p. 102694. Available at: https://doi.org/10.1016/j.gloenvcha.2023.102694.

Nadeau, C., Milkoreit, M., Eriksen, T. H., & Hessen, D. O. (2023). Missing the (Tipping) Point: The Role of Climate Tipping Points on Public Risk Perceptions in Norway [Preprint]. Climate change/Human/Earth system interactions/Other methods. https://doi.org/10.5194/esd-2023-23

Najam, A. (2005). Developing Countries and Global Environmental Governance: From Contestation to Participation to Engagement. International Environmental Agreements: Politics, Law and Economics, 5(3), 303–321. https://doi.org/10.1007/s10784-005-3807-6

O'Brien, K. (2018). Is the 1.5°C target possible? Exploring the three spheres of transformation. Current Opinion in Environmental Sustainability, 31, 153–160. https://doi.org/10.1016/j.cosust.2018.04.010

O'Neill, S., & Nicholson-Cole, S. (2009). "Fear Won't Do It": Promoting Positive Engagement With Climate Change Through Visual and Iconic Representations. Science Communication, 30(3), 355–379. https://doi.org/10.1177/1075547008329201

O'Riordan, T., & Jordan, A. (1995). The Precautionary Principle in Contemporary Environmental Politics. Environmental Values, 4(3), 191–212. https://doi.org/10.3197/096327195776679475

Ostrom, E. (2010). Polycentric systems for coping with collective action and global environmental change. Global Environmental Change, 20(4), 550–557. https://doi.org/10.1016/j.gloenvcha.2010.07.004

Patterson, J. J., Thaler, T., Hoffmann, M., Hughes, S., Oels, A., Chu, E., Mert, A., Huitema, D., Burch, S., & Jordan, A. (2018). Political feasibility of 1.5°C societal transformations: the role of social justice. Current Opinion in Environmental Sustainability, 31, 1–9. https://doi.org/10.1016/j.cosust.2017.11.002

Patterson, J., Schulz, K., Vervoort, J., Van Der Hel, S., Widerberg, O., Adler, C., Hurlbert, M., Anderton, K., Sethi, M., & Barau, A. (2017). Exploring the governance and politics of transformations towards sustainability. Environmental Innovation and Societal Transitions, 24, 1–16. https://doi.org/10.1016/j.eist.2016.09.001

Quay, R. (2010). Anticipatory Governance. Journal of the American Planning Association, 76(4), 496–511. https://doi.org/10.1080/01944363.2010.508428

Quintanilla, M., Josse, C., & León, A. G. (2022). The Amazon against the clock: a Regional Assessment on Where and How to protect 80% by 2025. https://amazonia80x2025.earth/amazonia-against-the-clock/

Read, R., & O'Riordan, T. (2017). The Precautionary Principle Under Fire. Environment: Science and Policy for Sustainable Development, 59(5), 4–15. https://doi.org/10.1080/00139157.2017.1350005

Rockström, J., Gupta, J., Qin, D., Lade, S. J., Abrams, J. F., Andersen, L. S., Armstrong McKay, D. I., Bai, X., Bala, G., Bunn, S. E., Ciobanu, D., DeClerck, F., Ebi, K., Gifford, L., Gordon, C., Hasan, S., Kanie, N., Lenton, T. M., Loriani, S., … Zhang, X. (2023). Safe and just Earth system boundaries. Nature, 619(7968), 102–111. https://doi.org/10.1038/s41586-023-06083-8

Roemer, J. E. (2011). The Ethics of Intertemporal Distribution in a Warming Planet. Environmental and Resource Economics, 48(3), 363–390. https://doi.org/10.1007/s10640-010-9414-1

Schweizer, P., Goble, R., & Renn, O. (2022). Social Perception of Systemic Risks. Risk Analysis, 42(7), 1455–1471. https://doi.org/10.1111/risa.13831

Scoones, I., Stirling, A., Abrol, D., Atela, J., Charli-Joseph, L., Eakin, H., Ely, A., Olsson, P., Pereira, L., Priya, R., Van Zwanenberg, P., & Yang, L. (2020). Transformations to sustainability: combining structural, systemic and enabling approaches. Current Opinion in Environmental Sustainability, 42, 65–75. https://doi.org/10.1016/j.cosust.2019.12.004

Simpson, N.P. et al. (2021) 'A framework for complex climate change risk assessment', One Earth, 4(4), pp. 489–501. Available at: https://doi.org/10.1016/j.oneear.2021.03.005.

Sjöberg, L. (2001a). Political decisions and public risk perception. Reliability Engineering & System Safety, 72(2), 115–123. https://doi.org/10.1016/S0951-8320(01)00012-6

Slobodian, L. (2019). Defending the Future: Intergenerational Equity in Climate Litigation. Georgetown Environmental Law Review, 32, 569. https://heinonline.org/HOL/Page?handle=hein.journals/gintenlr32&id=578&div=&collection=

Smessaert, J., Missemer, A., & Levrel, H. (2020). The commodification of nature, a review in social sciences. Ecological Economics, 172, 106624. https://doi.org/10.1016/j.ecolecon.2020.106624

Stirling, A. (2007). Risk, precaution and science: towards a more constructive policy debate. Talking point on the precautionary principle. EMBO Rep, 8(4), 309–315. https://doi.org/10.1038/sj.embor.7400953

Stoddard, I., Anderson, K., Capstick, S., Carton, W., Depledge, J., Facer, K., Gough, C., Hache, F., Hoolohan, C., Hultman, M., Hällström, N., Kartha, S., Klinsky, S., Kuchler, M., Lövbrand, E., Nasiritousi, N., Newell, P., Peters, G. P., Sokona, Y., … Williams, M. (2021). Three Decades of Climate Mitigation: Why Haven't We Bent the Global Emissions Curve? Annual Review of Environment and Resources, 46(1), 653–689. https://doi.org/10.1146/annurev-environ-012220-011104

United Nations Conference on Environment and Development (UNCED). (1992). Rio Declaration on Environment and Development. United Nations.

United Nations Framework Convention on Climate Change (UNFCCC). (2022). Decision 1/CP.27 Sharm el-Sheikh Implementation Plan (No. FCCC/CP/2022/10/Add.1). United Nations Framework Convention on Climate Change. https://unfccc.int/sites/default/files/resource/cop27_auv_2_cover%20decision.pdf

Van Beek, L., Milkoreit, M., Prokopy, L., Reed, J. B., Vervoort, J., Wardekker, A., & Weiner, R. (2022). The effects of serious gaming on risk perceptions of climate tipping points. Climatic Change, 170(3–4), 31. https://doi.org/10.1007/s10584-022-03318-x

Vanderheiden, S. (2008a). Atmospheric Justice. Oxford University Press. https://doi.org/10.1093/acprof:oso/9780195334609.001.0001

Vervoort, J. M., Milkoreit, M., Van Beek, L., Mangnus, A. C., Farrell, D., McGreevy, S. R., Ota, K., Rupprecht, C. D. D., Reed, J. B., & Huber, M. (2022). Not just playing: The politics of designing games for impact on anticipatory climate governance. Geoforum, 137, 213–221. https://doi.org/10.1016/j.geoforum.2022.03.009

Walker, B., Crépin, A.-S., Nyström, M., Anderies, J. M., Andersson, E., Elmqvist, T., Queiroz, C., Barrett, S., Bennett, E., Cardenas, J. C., Carpenter, S. R., Chapin, F. S., de Zeeuw, A., Fischer, J., Folke, C., Levin, S., Nyborg, K., Polasky, S., Segerson, K., … Vincent, J. R. (2023). Response diversity as a sustainability strategy. Nature Sustainability, 6(6), 621–629. https://doi.org/10.1038/s41893-022-01048-7

Weitzman, M. L. (2009). On Modeling and Interpreting the Economics of Catastrophic Climate Change. Review of Economics and Statistics, 91(1), 1–19. https://doi.org/10.1162/rest.91.1.1

Whyte, K. (2020). Too late for indigenous climate justice: Ecological and relational tipping points. WIREs Climate Change, 11(1), e603. https://doi.org/10.1002/wcc.603

World Meteorological Organization (WMO), United Nations Environment Programme, Intergovernmental Panel On Climate Change, Global Carbon Project, UK Met Office, & United Nations Office for Disaster Risk Reduction. (2022). United In Science 2022: A multi-organization high-level compilation of the most recent science related to climate change, impacts and responses (p. 80) [Digital]. WMO. https://library.wmo.int/idurl/4/58075

Young, O. R. (2012). Arctic Tipping Points: Governance in Turbulent Times. AMBIO, 41(1), 75–84. https://doi.org/10.1007/s13280-011-0227-4

Chapter 3.2

Armstrong, C., & McLaren, D. (2022). Which Net Zero? Climate Justice and Net Zero Emissions. Ethics & International Affairs, 36(4), 505–526. https://doi.org/10.1017/S0892679422000521

Armstrong McKay, David I., Arie Staal, Jesse F. Abrams, Ricarda Winkelmann, Boris Sakschewski, Sina Loriani, Ingo Fetzer, Sarah E. Cornell, Johan Rockström, and Timothy M. Lenton. 2022. "Exceeding 1.5°C Global Warming Could Trigger Multiple Climate Tipping Points." Science 377 (6611): eabn7950. https://doi.org/10.1126/science.abn7950.

Baur, S., Nauels, A., Nicholls, Z., Sanderson, B. M., & Schleussner, C.-F. (2023). The deployment length of solar radiation modification: an interplay of mitigation, net-negative emissions and climate uncertainty. Earth System Dynamics, 14(2), 367–381. https://doi.org/10.5194/esd-14-367-2023

Beer, C., Zimov, N., Olofsson, J., Porada, P., & Zimov, S. (2020). Protection of Permafrost Soils from Thawing by Increasing Herbivore Density. Scientific Reports, 10(1), 4170. https://doi.org/10.1038/s41598-020-60938-y

Biermann, F., Oomen, J., Gupta, A., Ali, S. H., Conca, K., Hajer, M. A., Kashwan, P., Kotzé, L. J., Leach, M., Messner, D., Okereke, C., Persson, Å., Potočnik, J., Schlosberg, D., Scobie, M., & VanDeveer, S. D. (2022). Solar geoengineering: The case for an international non-use agreement. WIREs Climate Change, 13(3), e754. https://doi.org/10.1002/wcc.754

Boulton, C. A., Lenton, T. M., & Boers, N. (2022). Pronounced loss of Amazon rainforest resilience since the early 2000s. Nature Climate Change, 12(3), 271–278. https://doi.org/10.1038/s41558-022-01287-8

Buck, H. J., Carton, W., Lund, J. F., & Markusson, N. (2023). Why residual emissions matter right now. Nature Climate Change, 13(4), 351–358. https://doi.org/10.1038/s41558-022-01592-2

Byers, E., Krey, V., Kriegler, E., Riahi, K., Schaeffer, R., Kikstra, J., Lamboll, R., Nicholls, Z., Sandstad, M., Smith, C., van der Wijst, K., Lecocq, F., Portugal-Pereira, J., Saheb, Y., Stromann, A., Winkler, H., Auer, C., Brutschin, E., Lepault, C., … Skeie, R. (2022). AR6 Scenarios Database (1.0). Zenodo. https://doi.org/10.5281/ZENODO.5886912 Chapter 6: Short-lived Climate Forcers. (n.d.). Retrieved 8 November 2023, from https://www.ipcc.ch/report/ar6/wg1/chapter/chapter-6/

Chen, Y., Ji, D., Zhang, Q., Moore, J. C., Boucher, O., Jones, A., Lurton, T., Mills, M. J., Niemeier, U., Séférian, R., & Tilmes, S. (2023). Northern-high-latitude permafrost and terrestrial carbon response to two solar geoengineering scenarios. Earth System Dynamics, 14(1), 55–79. https://doi.org/10.5194/esd-14-55-2023

Coady, M.D., Parry, I., Le, N.-P., Shang, B.,. (2019). Global Fossil Fuel Subsidies Remain Large: An Update Based on Country-Level Estimates. International Monetary Fund. IMF.

Corner, A., & Pidgeon, N. (2014). Geoengineering, climate change scepticism and the 'moral hazard' argument: an experimental study of UK public perceptions. Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences, 372(2031), 20140063. https://doi.org/10.1098/rsta.2014.0063

Corry, O. (2017). The international politics of geoengineering: The feasibility of Plan B for tackling climate change. Security Dialogue, 48(4), 297–315. https://doi.org/10.1177/0967010617704142

Diamond, M. S., Gettelman, A., Lebsock, M. D., McComiskey, A., Russell, L. M., Wood, R., & Feingold, G. (2022). To assess marine cloud brightening's technical feasibility, we need to know what to study—and when to stop. Proceedings of the National Academy of Sciences, 119(4), e2118379119. https://doi.org/10.1073/pnas.2118379119

Ditlevsen, P., & Ditlevsen, S. (2023). Warning of a forthcoming collapse of the Atlantic meridional overturning circulation. Nature Communications, 14(1), 4254. https://doi.org/10.1038/s41467-023-39810-w

Doherty, Rasch et al. 2023. An open letter regarding research on reflecting sunlight to reduce the risks of climate change. https://climate-intervention-research-letter.org/.

Drouet, L., Bosetti, V., Padoan, S. A., Aleluia Reis, L., Bertram, C., Dalla Longa, F., Després, J., Emmerling, J., Fosse, F., Fragkiadakis, K., Frank, S., Fricko, O., Fujimori, S., Harmsen, M., Krey, V., Oshiro, K., Nogueira, L. P., Paroussos, L., Piontek, F., … Tavoni, M. (2021). Net zero-emission pathways reduce the physical and economic risks of climate change. Nature Climate Change, 11(12), 1070–1076. https://doi.org/10.1038/s41558-021-01218-z

Egli, F., Schmid, N., & Schmidt, T. S. (2022). Backlash to fossil fuel phase-outs: the case of coal mining in US presidential elections. Environmental Research Letters, 17(9), 094002. https://doi.org/10.1088/1748-9326/ac82fe

Ekberg, K., Forchtner, B., & Hultman, M. (2023). Climate obstruction: how denial, delay and inaction are heating the planet. Routledge, Taylor & Francis Group.

Fakhraee, M., Li, Z., Planavsky, N. J., & Reinhard, C. T. (2023). A biogeochemical model of mineral-based ocean alkalinity enhancement: impacts on the biological pump and ocean carbon uptake. Environmental Research Letters, 18(4), 044047. https://doi.org/10.1088/1748-9326/acc9d4

Felgenhauer, T., Bala, G., Borsuk, M., Brune, M., Camilloni, I., Wiener, J.B., Xu, J. (2022). Solar Radiation Modification: A Risk-Risk Analysis - Summary, Carnegie Climate Governance Initiative C2G). https://www.c2g2.net/wp-content/uploads/202203-C2G-RR-Summary.pdf

Field, L., Ivanova, D., Bhattacharyya, S., Mlaker, V., Sholtz, A., Decca, R., Manzara, A., Johnson, D., Christodoulou, E., Walter, P., & Katuri, K. (2018). Increasing Arctic Sea Ice Albedo Using Localized Reversible Geoengineering. Earth's Future, 6(6), 882–901. https://doi.org/10.1029/2018EF000820

Flegal, J. A., Hubert, A.-M., Morrow, D. R., & Moreno-Cruz, J. B. (2019). Solar Geoengineering: Social Science, Legal, Ethical, and Economic Frameworks. Annual Review of Environment and Resources, 44(1), 399–423. https://doi.org/10.1146/annurev-environ-102017-030032

Gardiner, S., & McKinnon, C. (2020). The Justice and Legitimacy of Geoengineering. Critical Review of International Social and Political Philosophy, 23(5), 557–563. https://doi.org/10.1080/13698230.2019.1693157

Global Forest Watch. 2016. "Official Deforestation Data for the Brazilian Amazon. https://www.globalforestwatch.org/blog/data-and-research/official-deforestation-data-for-the-brazilian-amazon-now-available-on-global-forest-watch.

Granoff, I. (2023, May 4). The Tragedy on the Financial Horizon is Closer Than You Think. Climate Law Blog. https://www.globalforestwatch.org/blog/data-and-research/official-deforestation-data-for-the-brazilian-amazon-now-available-on-global-forest-watch.

Gupta, A., Möller, I., Biermann, F., Jinnah, S., Kashwan, P., Mathur, V., Morrow, D. R., & Nicholson, S. (2020). Anticipatory governance of solar geoengineering: conflicting visions of the future and their links to governance proposals. Current Opinion in Environmental Sustainability, 45, 10–19. https://doi.org/10.1016/j.cosust.2020.06.004

Guston, D. H. (2014). Understanding 'anticipatory governance'. Social Studies of Science, 44(2), 218–242. https://doi.org/10.1177/0306312713508669

Hale, T., Smith, S. M., Black, R., Cullen, K., Fay, B., Lang, J., & Mahmood, S. (2022). Assessing the rapidly-emerging landscape of net zero targets. Climate Policy, 22(1), 18–29. https://doi.org/10.1080/14693062.2021.2013155

Heffron, R. J. (2021). What is the "Just Transition"? In R. J. Heffron, Achieving a Just Transition to a Low-Carbon Economy (pp. 9–19). Springer International Publishing. https://doi.org/10.1007/978-3-030-89460-3_2

Heutel, G., Moreno-Cruz, J., & Shayegh, S. (2016). Climate tipping points and solar geoengineering. Journal of Economic Behavior & Organization, 132, 19–45. https://doi.org/10.1016/j.jebo.2016.07.002

Höning, D., Willeit, M., Calov, R., Klemann, V., Bagge, M., & Ganopolski, A. (2023). Multistability and Transient Response of the Greenland Ice Sheet to Anthropogenic CO_2 Emissions.

Geophysical Research Letters, 50(6), e2022GL101827. https://doi.org/10.1029/2022GL101827

Horton, J. B. (2015). The emergency framing of solar geoengineering: Time for a different approach. The Anthropocene Review, 2(2), 147–151. https://doi.org/10.1177/2053019615579922

Horton, J. B., Reynolds, J. L., Buck, H. J., Callies, D., Schäfer, S., Keith, D. W., & Rayner, S. (2018). Solar Geoengineering and Democracy. Global Environmental Politics, 18(3), 5–24. https://doi.org/10.1162/glep_a_00466

Intergovernmental Panel On Climate Change (IPPC), (2023). Climate Change 2023: Synthesis Report. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, H. Lee and J. Romero (eds.)]. IPCC, Geneva, Switzerland, pp. 35-115, doi: 10.59327/IPCC/AR6-978929169164

Intergovernmental Panel On Climate Change (IPPC), (2021). Climate Change 2021 – The Physical Science Basis: Working Group I Contribution to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change (1st ed.). Cambridge University Press. https://doi.org/10.1017/9781009157896

IPCC,(2018). Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty [Masson-Delmotte, V., P. Zhai, H.-O. Pörtner, D. Roberts, J. Skea, P.R. Shukla, A. Pirani, W. Moufouma-Okia, C. Péan, R. Pidcock, S. Connors, J.B.R. Matthews, Y. Chen, X. Zhou, M.I. Gomis, E. Lonnoy, T. Maycock, M. Tignor, and T. Waterfield (eds.)]. Cambridge University Press, Cambridge, UK and New York, NY, USA, 616 pp. https://doi.org/ 10.1017/9781009157940.

IPCC, (2014). Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, R.K. Pachauri and L.A. Meyer (eds.)]. IPCC, Geneva, Switzerland, 151 pp.

Jacques, P. J., Dunlap, R. E., & Freeman, M. (2008). The organisation of denial: Conservative think tanks and environmental scepticism. Environmental Politics, 17(3), 349–385. https://doi.org/10.1080/09644010802055576

Johnson, D., Manzara, A., Field, L. A., Chamberlin, D. R., & Sholtz, A. (2022). A Controlled Experiment of Surface Albedo Modification to Reduce Ice Melt. Earth's Future, 10(12), e2022EF002883. https://doi.org/10.1029/2022EF002883

Jordan, A., & Timothy, O. (1999). The Precautionary Principle in Contemporary Environmental Policy and Politics. In, In Protecting Public Health & The Environment: Implementing The Precautionary Principle (pp. 13–34). Island Press.

Lenton, T. (2018). Can emergency geoengineering really prevent climate tipping points? In Geoengineering our Climate? Ethics, Politics, and Governance. Routledge.

Mace, M. J. (2016). Mitigation Commitments Under the Paris Agreement and the Way Forward. Climate Law, 6(1–2), 21–39. https://doi.org/10.1163/18786561-00601002

Martin, M., & Islar, M. (2021). The 'end of the world' vs. the 'end of the month': understanding social resistance to sustainability transition agendas, a lesson from the Yellow Vests in France. Sustainability Science, 16(2), 601–614. https://doi.org/10.1007/s11625-020-00877-9

McLaren, D. (2020). Quantifying the potential scale of mitigation deterrence from greenhouse gas removal techniques. Climatic Change, 162(4), 2411–2428. https://doi.org/10.1007/s10584-020-02732-3

McLaren, D. (2012). A comparative global assessment of potential negative emissions technologies. Process Safety and Environmental Protection, 90(6), 489–500. https://doi.org/10.1016/j.psep.2012.10.005

McLaren, D (2018). Whose climate and whose ethics? Conceptions of justice in solar geoengineering modelling. Energy Research & Social Science, 44, 209–221. https://doi.org/10.1016/j.erss.2018.05.021

McLaren, Duncan. 2018. Whose climate and whose ethics? Conceptions of justice in solar geoengineering modelling. Energy Research & Social Science, 44, 209-221. https://doi.org/10.1016/j.erss.2018.05.021.

Merk, C., Pönitzsch, G., & Rehdanz, K. (2016). Knowledge about aerosol injection does not reduce individual mitigation efforts. Environmental Research Letters, 11(5), 054009. https://doi.org/10.1088/1748-9326/11/5/054009

Moore, J. C., Mettiäinen, I., Wolovick, M., Zhao, L., Gladstone, R., Chen, Y., Kirchner, S., & Koivurova, T. (2020). Targeted Geoengineering: Local Interventions with Global Implications. Global Policy, 12(S1), 108–118. https://doi.org/10.1111/1758-5899.12867

Moore, J. C., Yue, C., Zhao, L., Guo, X., Watanabe, S., & Ji, D. (2019). Greenland Ice Sheet Response to Stratospheric Aerosol Injection Geoengineering. Earth's Future, 7(12), 1451–1463. https://doi.org/10.1029/2019EF001393

Moore, M.-L., & Milkoreit, M. (2020). Imagination and transformations to sustainable and just futures. Elementa: Science of the Anthropocene, 8(1), 081. https://doi.org/10.1525/elementa.2020.081

Morgan, E. (2021, November 23). Climate change, discounting, and the tragedy of horizons - News & insight. Cambridge Judge Business School. https://www.jbs.cam.ac.uk/2021/climate-change-discounting-tragedy-of-horizons/

Morrow, D. R. (2014). Starting a Flood to Stop a Fire? Some Moral Constraints on Solar Radiation Management. Ethics, Policy & Environment, 17(2), 123–138. https://doi.org/10.1080/21550085.2014.926056

National Academies of Sciences, Engineering, and Medicine, 2021. (n.d.). Reflecting sunlight: Recommendations for solar geoengineering research and research governance. Washington DC,NASEM.

Nemet, G. F., Callaghan, M. W., Creutzig, F., Fuss, S., Hartmann, J., Hilaire, J., Lamb, W. F., Minx, J. C., Rogers, S., & Smith, P. (2018). Negative emissions—Part 3: Innovation and upscaling. Environmental Research Letters, 13(6), 063003. https://doi.org/10.1088/1748-9326/aabff4

Newell, P., & Mulvaney, D. (2013). The political economy of the 'just transition'. The Geographical Journal, 179(2), 132–140. https://doi.org/10.1111/geoj.12008

Österblom, H., Jouffray, J.-B., Folke, C., Crona, B., Troell, M., Merrie, A., & Rockström, J. (2015). Transnational Corporations as 'Keystone Actors' in Marine Ecosystems. PLOS ONE, 10(5), e0127533. https://doi.org/10.1371/journal.pone.0127533

Palter, J. B., Frölicher, T. L., Paynter, D., & John, J. G. (2018). Climate, ocean circulation, and sea level changes under stabilization and overshoot pathways to 1.5 K warming. Earth System Dynamics, 9(2), 817–828. https://doi.org/10.5194/esd-9-817-2018

Parker, A., & Irvine, P. J. (2018). The Risk of Termination Shock From Solar Geoengineering. Earth's Future, 6(3), 456–467. https://doi.org/10.1002/2017EF000735

Pellegrini, L., Arsel, M., Orta-Martínez, M., Mena, C. F., & Muñoa, G. (2021). Institutional mechanisms to keep unburnable fossil fuel reserves in the soil. Energy Policy, 149, 112029. https://doi.org/10.1016/j.enpol.2020.112029

Peres, C. A., Campos-Silva, J., & Ritter, C. D. (2023a). Environmental policy at a critical junction in the Brazilian Amazon. Trends in Ecology & Evolution, 38(2), 113–116. https://doi.org/10.1016/j.tree.2022.11.011

Poorter, L., Craven, D., Jakovac, C. C., van der Sande, M. T., Amissah, L., Bongers, F., Chazdon, R. L., Farrior, C. E., Kambach, S., Meave, J. A., Muñoz, R., Norden, N., Rüger, N., van Breugel, M., Almeyda Zambrano, A. M., Amani, B., Andrade, J. L., Brancalion, P. H. S., Broadbent, E. N., … Hérault, B. (2021). Multidimensional tropical forest recovery. Science, 374(6573), 1370–1376. https://doi.org/10.1126/science.abh3629

Pouille, C., Pouille, C., et al. (2023), "Paris-consistent climate change mitigation scenarios: A framework for emissions pathway classification in line with global mitigation objectives", OECD Environment Working Papers, No. 222, OECD Publishing, Paris, https://doi.org/10.1787/0de87ef8-en.

Rajamani, L., Jeffery, L., Höhne, N., Hans, F., Glass, A., Ganti, G., & Geiges, A. (2021). National 'fair shares' in reducing greenhouse gas emissions within the principled framework of international environmental law. Climate Policy, 21(8), 983–1004. https://doi.org/1

0.1080/14693062.2021.1970504
Rasch, P., & Doherty, S. (n.d.). An open letter regarding research on reflecting sunlight to reduce the risks of climate change. Climate Intervention Research Letter. Retrieved 5 November 2023, from https://climate-intervention-research-letter.org/
Reuters. (2023, September 6). Deforestation in Brazil's Amazon falls 66% in August. Reuters. https://www.reuters.com/business/environment/deforestation-brazils-amazon-falls-70-august-2023-09-05/
Riahi, K., Bertram, C., Huppmann, D., Rogelj, J., Bosetti, V., Cabardos, A.-M., Deppermann, A., Drouet, L., Frank, S., Fricko, O., Fujimori, S., Harmsen, M., Hasegawa, T., Krey, V., Luderer, G., Paroussos, L., Schaeffer, R., Weitzel, M., van der Zwaan, B., … Zakeri, B. (2021). Cost and attainability of meeting stringent climate targets without overshoot. Nature Climate Change, 11(12), 1063–1069. https://doi.org/10.1038/s41558-021-01215-2
Ritchie, P. D. L., Clarke, J. J., Cox, P. M., & Huntingford, C. (2021). Overshooting tipping point thresholds in a changing climate. Nature, 592(7855), 517–523. https://doi.org/10.1038/s41586-021-03263-2
Rogelj, J., Huppmann, D., Krey, V., Riahi, K., Clarke, L., Gidden, M., Nicholls, Z., & Meinshausen, M. (2019). A new scenario logic for the Paris Agreement long-term temperature goal. Nature, 573(7774), 357–363. https://doi.org/10.1038/s41586-019-1541-4
Schleussner, C.-F., Ganti, G., Rogelj, J., & Gidden, M. J. (2022). An emission pathway classification reflecting the Paris Agreement climate objectives. Communications Earth & Environment, 3(1), 1–11. https://doi.org/10.1038/s43247-022-00467-w
Science Panel for the Amazon. (2021). Amazon Assessment Report 2021. https://www.theamazonwewant.org/spa_publication/amazon-assessment-report-2021/
Skovgaard, J., & Van Asselt, H. (2019). The politics of fossil fuel subsidies and their reform: Implications for climate change mitigation. WIREs Climate Change, 10(4), e581. https://doi.org/10.1002/wcc.581
Smith, H. B., Vaughan, N. E., & Forster, J. (2022). Long-term national climate strategies bet on forests and soils to reach net-zero. Communications Earth & Environment, 3(1), 305. https://doi.org/10.1038/s43247-022-00636-x
Smith, P., Davis, S. J., Creutzig, F., Fuss, S., Minx, J., Gabrielle, B., Kato, E., Jackson, R. B., Cowie, A., Kriegler, E., Van Vuuren, D. P., Rogelj, J., Ciais, P., Milne, J., Canadell, J. G., McCollum, D., Peters, G., Andrew, R., Krey, V., … Yongsung, C. (2016). Biophysical and economic limits to negative CO2 emissions. Nature Climate Change, 6(1), 42–50. https://doi.org/10.1038/nclimate2870
Sofiev, M., Winebrake, J. J., Johansson, L., Carr, E. W., Prank, M., Soares, J., Vira, J., Kouznetsov, R., Jalkanen, J.-P., & Corbett, J. J. (2018). Cleaner fuels for ships provide public health benefits with climate tradeoffs. Nature Communications, 9(1), 406. https://doi.org/10.1038/s41467-017-02774-9
Sovacool, B. K., Baum, C. M., & Low, S. (2023). Reviewing the sociotechnical dynamics of carbon removal. Joule, 7(1), 57–82. https://doi.org/10.1016/j.joule.2022.11.008
Stirling, A. (2007). Risk, precaution and science: towards a more constructive policy debate: Talking point on the precautionary principle. EMBO Reports, 8(4), 309–315. https://doi.org/10.1038/sj.embor.7400953
Stoddard, I., Anderson, K., Capstick, S., Carton, W., Depledge, J., Facer, K., Gough, C., Hache, F., Hoolohan, C., Hultman, M., Hällström, N., Kartha, S., Klinsky, S., Kuchler, M., Lövbrand, E., Nasiritousi, N., Newell, P., Peters, G. P., Sokona, Y., … Williams, M. (2021). Three Decades of Climate Mitigation: Why Haven't We Bent the Global Emissions Curve? Annual Review of Environment and Resources, 46(1), 653–689. https://doi.org/10.1146/annurev-environ-012220-011104
Sun, T., Ocko, I. B., Sturcken, E., & Hamburg, S. P. (2021). Path to net zero is critical to climate outcome. Scientific Reports, 11(1), 22173. https://doi.org/10.1038/s41598-021-01639-y
Sutter, J., Jones, A., Frölicher, T. L., Wirths, C., & Stocker, T. F. (2023). Climate intervention on a high-emissions pathway could delay but not prevent West Antarctic Ice Sheet demise. Nature Climate Change, 13(9), 951–960. https://doi.org/10.1038/s41558-023-01738-w
Szerszynski, B., Kearnes, M., Macnaghten, P., Owen, R., & Stilgoe, J. (2013). Why Solar Radiation Management Geoengineering and Democracy Won't Mix. Environment and Planning A: Economy and Space, 45(12), 2809–2816. https://doi.org/10.1068/a45649
The Amazon We Want. (2021). Amazon Assessment Report 2021. https://www.theamazonwewant.org/amazon-assessment-report-2021/
Webster, M. A., & Warren, S. G. (2022). Regional Geoengineering Using Tiny Glass Bubbles Would Accelerate the Loss of Arctic Sea Ice. Earth's Future, 10(10), e2022EF002815. https://doi.org/10.1029/2022EF002815
Whitfield, S., Apgar, M., Chabvuta, C., Challinor, A., Deering, K., Dougill, A., Gulzar, A., Kalaba, F., Lamanna, C., Manyonga, D., Naess, L. O., Quinn, C. H., Rosentock, T. S., Sallu, S. M., Schreckenberg, K., Smith, H. E., Smith, R., Steward, P., & Vincent, K. (2021). A framework for examining justice in food system transformations research. Nature Food, 2(6), 383–385. https://doi.org/10.1038/s43016-021-00304-x
Wieners, C. E., Hofbauer, B. P., De Vries, I. E., Honegger, M., Visioni, D., Russchenberg, H. W. J., & Felgenhauer, T. (2023). Solar radiation modification is risky, but so is rejecting it: a call for balanced research. Oxford Open Climate Change, 3(1), kgad002. https://doi.org/10.1093/oxfclm/kgad002
World Meteorological Organization (WMO). (2023, May 17). WMO Global Annual to Decadal Climate Update (Target years: 2023-2027) - World | ReliefWeb. https://reliefweb.int/report/world/wmo-global-annual-decadal-climate-update-target-years-2023-2027
Wolovick, M. J., & Moore, J. C. (2018). Stopping the flood: could we use targeted geoengineering to mitigate sea level rise? The Cryosphere, 12(9), 2955–2967. https://doi.org/10.5194/tc-12-2955-2018
Wunderling, N., Winkelmann, R., Rockström, J., Loriani, S., Armstrong McKay, D. I., Ritchie, P. D. L., Sakschewski, B., & Donges, J. F. (2023). Global warming overshoots increase risks of climate tipping cascades in a network model. Nature Climate Change, 13(1), 75–82. https://doi.org/10.1038/s41558-022-01545-9
Xie, M., Moore, J. C., Zhao, L., Wolovick, M., & Muri, H. (2022). Impacts of three types of solar geoengineering on the Atlantic Meridional Overturning Circulation. Atmospheric Chemistry and Physics, 22(7), 4581–4597. https://doi.org/10.5194/acp-22-4581-2022
Zampieri, L., & Goessling, H. F. (2019). Sea Ice Targeted Geoengineering Can Delay Arctic Sea Ice Decline but not Global Warming. Earth's Future, 7(12), 1296–1306. https://doi.org/10.1029/2019EF001230References

Chapter 3.3

Abiri, N. N., Viktoria Spaiser, Joanne Hawkins, Paul Jensen, Eleonora Morganti, Amir, & Jahromi, Salma Al Arefi, Claire Richardson-Barlow, U. of. (2022). Low carbon infrastructure transition in the North of England report. University of Leeds. https://www.leeds.ac.uk/energy/doc/low-carbon-infrastructure-report

Abdala, G. (WWF), 2015. The Brazilian Amazon: challenges facing an effective policy, Brasilia. https://wwfint.awsassets.panda.org/downloads/12mar2015_wwf_livingamaz_desafiosdesmatamentobrasil_engl_web.pdf

Adger W. Neil, Pulhin Juan M., Barnett Jon, Dabelko Geoffrey D., Hovelsrud Grete K., Levy Marc, Spring Ursula Oswald, Vogel Coleen H. 2014. Human Security." In Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change, edited Field C. B., Barros V. R., Dokken D. J., Mach K. J., Mastrandrea M. D., Bilir T. E., et al. 755–791. Cambridge: Cambridge University Press. https://ar5-syr.ipcc.ch/resources/htmlpdf/WGIIAR5-Chap12_FINAL/.

Ahmed, F., Khan, M. S. A., Warner, J., Moors, E., & Terwisscha Van Scheltinga, C. (2018). Integrated Adaptation Tipping Points (IATPs) for urban flood resilience. Environment and Urbanization, 30(2), 575–596. https://doi.org/10.1177/0956247818776510

Ahmed, I., & McEvoy, D. (2014). Post-tsunami resettlement in Sri Lanka and India: site planning, infrastructure and services. International Journal of Disaster Resilience in the Built Environment, 5(1), 53–65. https://doi.org/10.1108/IJDRBE-08-2012-0028

Armstrong McKay, D. I., Staal, A., Abrams, J. F., Winkelmann, R., Sakschewski, B., Loriani, S., Fetzer, I., Cornell, S. E., Rockström, J., & Lenton, T. M. (2022). Exceeding 1.5°C global warming could trigger multiple climate tipping points. Science, 377(6611), eabn7950. https://doi.org/10.1126/science.abn7950

Arnall, A. (2019). Resettlement as climate change adaptation: what can be learned from state-led relocation in rural Africa and Asia? Climate and Development, 11(3), 253–263. https://doi.org/10.1080/17565529.2018.1442799

Barrett, S., & Dannenberg, A. (2012). Climate negotiations under scientific uncertainty. Proceedings of the National Academy of Sciences, 109(43), 17372–17376. https://doi.org/10.1073/pnas.1208417109

Bentley, R. A., Maddison, E. J., Ranner, P. H., Bissell, J., Caiado, C. C. S., Bhatanacharoen, P., Clark, T., Botha, M., Akinbami, F., Hollow, M., Michie, R., Huntley, B., Curtis, S. E., & Garnett, P. (2014). Social tipping points and Earth systems dynamics. Frontiers in Environmental Science, 2. https://doi.org/10.3389/fenvs.2014.00035

Black, R., Arnell, N. W., Adger, W. N., Thomas, D., & Geddes, A. (2013). Migration, immobility and displacement outcomes following extreme events. Environmental Science & Policy, 27, S32–S43. https://doi.org/10.1016/j.envsci.2012.09.001

BMZ. (2021). Preventing Crises, Creating Prospects, Protecting People. Report by the Commission on the Root Causes of Displacement, Berlin: Federal Ministry for Economic Cooperation and Development.

Bodin, Ö., & Crona, B. I. (2009). The role of social networks in natural resource governance: What relational patterns make a difference? Global Environmental Change, 19(3), 366–374. https://doi.org/10.1016/j.gloenvcha.2009.05.002

Bower, E. R., Badamikar, A., Wong-Parodi, G., & Field, C. B. (2023). Enabling pathways for sustainable livelihoods in planned relocation. Nature Climate Change, 13(9), 919–926. https://doi.org/10.1038/s41558-023-01753-x

Brink, E., Falla, A. M. V., & Boyd, E. (2023). Weapons of the vulnerable? A review of popular resistance to climate adaptation. Global Environmental Change, 80, 102656. https://doi.org/10.1016/j.gloenvcha.2023.102656

Broberg, M. (2020). State of Climate Law The Third Pillar of International Climate Change Law: Explaining 'Loss and Damage' after the Paris Agreement. Climate Law, 10(2), 211–223. https://doi.org/10.1163/18786561-01002004

Burkhart, K., McGrath-Horn, M. C., & Unterstell, N. (2017). Comparison of Arctic and Amazon regional governance mechanisms. Polar Geography, 40(2), 144–161. https://doi.org/10.1080/1088937X.2017.1303755

Butt, E. W., Conibear, L., Reddington, C. L., Darbyshire, E., Morgan, W. T., Coe, H., Artaxo, P., Brito, J., Knote, C., & Spracklen, D. V. (2020). Large air quality and human health impacts due to Amazon forest and vegetation fires. Environmental Research Communications, 2(9), 095001. https://doi.org/10.1088/2515-7620/abb0db

Centeno, M. A., Nag, M., Patterson, T. S., Shaver, A., & Windawi, A. J. (2015). The Emergence of Global Systemic Risk. Annual Review of Sociology, 41(1), 65–85. https://doi.org/10.1146/annurev-soc-073014-112317

D'Almeida, C., Vörösmarty, C. J., Hurtt, G. C., Marengo, J. A., Dingman, S. L., & Keim, B. D. (2007). The effects of deforestation on the hydrological cycle in Amazonia: a review on scale and resolution. International Journal of Climatology, 27(5), 633–647. https://doi.org/10.1002/joc.1475

Davenport, C., & Robertson, C. (2016, May 3). Resettling the First American 'Climate Refugees'. The New York Times. https://www.nytimes.com/2016/05/03/us/resettling-the-first-american-climate-refugees.html

Edelenbos, J., Van Buuren, A., & Klijn, E.-H. (2013). Connective Capacities of Network Managers: A comparative study of management styles in eight regional governance networks. Public Management Review, 15(1), 131–159. https://doi.org/10.1080/14719037.2012.691009

Eriksen, S., Schipper, E. L. F., Scoville-Simonds, M., Vincent, K., Adam, H. N., Brooks, N., Harding, B., Khatri, D., Lenaerts, L., Liverman, D., Mills-Novoa, M., Mosberg, M., Movik, S., Muok, B., Nightingale, A., Ojha, H., Sygna, L., Taylor, M., Vogel, C., & West, J. J. (2021). Adaptation interventions and their effect on vulnerability in developing countries: Help, hindrance or irrelevance? World Development, 141, 105383. https://doi.org/10.1016/j.worlddev.2020.105383

Feldmeyer, D., Birkmann, J., McMillan, J. M., Stringer, L., Leal Filho, W., Djalante, R., Pinho, P. F., & Liwenga, E. (2021). Global vulnerability hotspots: differences and agreement between international indicator-based assessments. Climatic Change, 169(1–2), 12. https://doi.org/10.1007/s10584-021-03203-z

Ferris, E. (2012). Internal Displacement in Africa: An Overview of Trends and Opportunities. Brookings. https://www.brookings.edu/articles/internal-displacement-in-africa-an-overview-of-trends-and-opportunities/

Ferris, E., & Weerasinghe, S. (2020). Promoting Human Security: Planned Relocation as a Protection Tool in a Time of Climate Change. Journal on Migration and Human Security, 8(2), 134–149. https://doi.org/10.1177/2331502420909305

Folke, C., Hahn, T., Olsson, P., & Norberg, J. (2005). ADAPTIVE GOVERNANCE OF SOCIAL-ECOLOGICAL SYSTEMS. Annual Review of Environment and Resources, 30(1), 441–473. https://doi.org/10.1146/annurev.energy.30.050504.144511

Franzke, C. L. E., Ciullo, A., Gilmore, E. A., Matias, D. M., Nagabhatla, N., Orlov, A., Paterson, S. K., Scheffran, J., & Sillmann, J. (2022). Perspectives on tipping points in integrated models of the natural and human Earth system: cascading effects and telecoupling. Environmental Research Letters, 17(1), 015004. https://doi.org/10.1088/1748-9326/ac42fd

Galaz, V. (2019). Time and Politics in the Anthropocene: Too Fast, Too Slow? In F. Biermann & E. Lövbrand (Eds.), Anthropocene Encounters: New Directions in Green Political Thinking (1st ed., pp. 109–127). Cambridge University Press. https://doi.org/10.1017/9781108646673.006

Galaz, V., Moberg, F., Olsson, E., Paglia, E., & Parker, C. (2011). Institutional and Political Leadership Dimensions of Cascading Ecological Crises. Public Administration, 89(2), 361–380. https://doi.org/10.1111/j.1467-9299.2010.01883.x

Galaz, V., Österblom, H., Bodin, Ö., & Crona, B. (2016). Global networks and global change-induced tipping points. International Environmental Agreements: Politics, Law and Economics, 16(2), 189–221. https://doi.org/10.1007/s10784-014-9253-6

Galaz, V., Tallberg, J., Boin, A., Ituarte-Lima, C., Hey, E., Olsson, P., & Westley, F. (2017). Global Governance Dimensions of Globally Networked Risks: The State of the Art in Social Science Research. Risk, Hazards & Crisis in Public Policy, 8(1), 4–27. https://doi.org/10.1002/rhc3.12108

Garcia, B. (2011). The Amazon from an International Law Perspective. Cambridge University Press. https://doi.org/10.1017/CBO9780511975233

Government of Fiji and GIZ. (2018). Planned Relocation Guidelines. https://cop23.com.fj/wp-content/uploads/2018/12/CC-PRG-BOOKLET-22-1.pdf.

Grimalda, G., & Tänzler, N. (2018). Social cohesion, global governance, and the future of politics: Understanding and fostering social cohesion. T20. https://www.g20-insights.org/wp-content/uploads/2018/07/TF8-8.1-Social-cohesion-Policy-Brief-Version-II.pdf

Grimm, S., & Schneider, G. (2011). Predicting social tipping points: current research and the way forward. Dt. Inst. für Entwicklungspolitik.

Haasnoot, M., Kwakkel, J. H., Walker, W. E., & Ter Maat, J. (2013). Dynamic adaptive policy pathways: A method for crafting robust decisions for a deeply uncertain world. Global Environmental Change, 23(2), 485–498. https://doi.org/10.1016/j.gloenvcha.2012.12.006

Haldane, A. G., & May, R. M. (2011). Systemic risk in banking ecosystems. Nature, 469(7330), 351–355. https://doi.org/10.1038/nature09659

Helbing, D. (2013). Globally networked risks and how to respond. Nature, 497(7447), 51–59. https://doi.org/10.1038/nature12047

Helbing, D., Brockmann, D., Chadefaux, T., Donnay, K., Blanke, U., Woolley-Meza, O., Moussaid, M., Johansson, A., Krause, J., Schutte, S., & Perc, M. (2015). Saving Human Lives: What Complexity Science and Information Systems can Contribute. Journal of Statistical Physics, 158(3), 735–781. https://doi.org/10.1007/s10955-014-1024-9

Hino, M., Field, C. B., & Mach, K. J. (2017). Managed retreat as a response to natural hazard risk. Nature Climate Change, 7(5), 364–370. https://doi.org/10.1038/nclimate3252

Homer-Dixon, T., Renn, O., Rockstrom, J., Donges, J. F., & Janzwood, S. (2021). A Call for An International Research Program on the Risk of a Global Polycrisis. SSRN Electronic Journal. https://doi.org/10.2139/ssrn.4058592

Homer-Dixon, T., Walker, B., Biggs, R., Crépin, A.-S., Folke, C., Lambin, E. F., Peterson, G. D., Rockström, J., Scheffer, M., Steffen, W., & Troell, M. (2015). Synchronous failure: the emerging causal architecture of global crisis. Ecology and Society, 20(3), art6. https://doi.org/10.5751/ES-07681-200306

Huq, S., Roberts, E., & Fenton, A. (2013). Loss and damage. Nature Climate Change, 3(11), 947–949. https://doi.org/10.1038/nclimate2026

Intergovernmental Panel On Climate Change (IPCC). (2022a). Climate Change 2022 – Impacts, Adaptation and Vulnerability: Working Group II Contribution to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change (1st ed.). Cambridge University Press. https://doi.org/10.1017/9781009325844

IPCC. (2022b). Summary for Policymakers [H.-O. Pörtner, D.C. Roberts, E.S. Poloczanska, K. Mintenbeck, M. Tignor,A. Alegría, M. Craig, S. Langsdorf, S. Löschke, V. Möller, A. Okem (eds.)]. In: Climate Change 2022: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [H.-O. Pörtner, D.C. Roberts, M. Tignor, E.S. Poloczanska, K. Mintenbeck, A. Alegría, M. Craig, S. Langsdorf, S. Löschke, V. Möller, A. Okem, B. Rama (eds.)]. Cambridge University Press, Cambridge, UK and New York,

Jean Charles Choctaw Nation. (2022). The Jean Charles Choctaw Nation: Tribal-guided and led, whole community resettlement and cultural preservation. https://static1.squarespace.com/static/5672cfb1d82d5e366e753691/t/63066872adf17070b316c9b1/1661364339115/JCCN_ongoing+resettlement+%281%29.pdf

Juhola, S., Filatova, T., Hochrainer-Stigler, S., Mechler, R., Scheffran, J., & Schweizer, P.-J. (2022). Social tipping points and adaptation limits in the context of systemic risk: Concepts, models and governance. Frontiers in Climate, 4. https://www.frontiersin.org/articles/10.3389/fclim.2022.1009234Juhola, S., Glaas, E., Linnér, B.-O., & Neset, T.-S. (2016). Redefining maladaptation. Environmental Science & Policy, 55, 135–140. https://doi.org/10.1016/j.envsci.2015.09.014

Keys, P. W., Galaz, V., Dyer, M., Matthews, N., Folke, C., Nyström, M., & Cornell, S. E. (2019). Anthropocene risk. Nature Sustainability, 2(8), 667–673. https://doi.org/10.1038/s41893-019-0327-x

Koslov, L. (2016). The Case for Retreat. Public Culture, 28(2), 359–387. https://doi.org/10.1215/08992363-3427487

Kovalevsky, D. V., Volchenkov, D., & Scheffran, J. (2021). Cities on the Coast and Patterns of Movement between Population Growth and Diffusion. Entropy, 23(8), 1041. https://doi.org/10.3390/e23081041

Kraemer, R. A. (2017). The G20 and Building Global Governance for ⊠Climate Refugees⊠. Centre for International Governance Innovation. https://www.jstor.org/stable/resrep16148

Kwadijk, J. C. J., Haasnoot, M., Mulder, J. P. M., Hoogvliet, M. M. C., Jeuken, A. B. M., Van Der Krogt, R. A. A., Van Oostrom, N. G. C., Schelfhout, H. A., Van Velzen, E. H., Van Waveren, H., & De Wit, M. J. M. (2010). Using adaptation tipping points to prepare for climate change and sea level rise: a case study in the Netherlands. WIREs Climate Change, 1(5), 729–740. https://doi.org/10.1002/wcc.64

Lamperti, F., Bosetti, V., Roventini, A., & Tavoni, M. (2019). The public costs of climate-induced financial instability. Nature Climate Change, 9(11), 829–833. https://doi.org/10.1038/s41558-019-0607-5

Leite-Filho, A. T., Costa, M. H., & Fu, R. (2020). The southern Amazon rainy season: The role of deforestation and its interactions with large-scale mechanisms. International Journal of Climatology, 40(4), 2328–2341. https://doi.org/10.1002/joc.6335

Lenton, T. M. (2011). Early warning of climate tipping points. Nature Climate Change, 1(4), 201–209. https://doi.org/10.1038/nclimate1143

Leonard, M. (2021). The age of unpeace: how connectivity causes conflict. Bantam Press.

Marshall, G. R. (2009). Polycentricity, reciprocity, and farmer adoption of conservation practices under community-based governance. Ecological Economics, 68(5), 1507–1520. https://doi.org/10.1016/j.ecolecon.2008.10.008

Martin, S. F., Weerasinghe, S. S., & Taylor, A. (Eds.). (2014). Humanitarian crises and migration: causes, consequences and responses. Routledge.

Mechler, R., & Deubelli, T. M. (2021). Finance for Loss and Damage: a comprehensive risk analytical approach. Current Opinion in Environmental Sustainability, 50, 185–196. https://doi.org/10.1016/j.cosust.2021.03.012

Mechler, R., Singh, C., Ebi, K., Djalante, R., Thomas, A., James, R., Tschakert, P., Wewerinke-Singh, M., Schinko, T., Ley, D., Nalau, J., Bouwer, L. M., Huggel, C., Huq, S., Linnerooth-Bayer, J., Surminski, S., Pinho, P., Jones, R., Boyd, E., & Revi, A. (2020). Loss and Damage and limits to adaptation: recent IPCC insights and implications for climate science and policy. Sustainability Science, 15(4), 1245–1251. https://doi.org/10.1007/s11625-020-00807-9

Milkoreit, M. (2019). Cognitive capacities for global governance in the face of complexity: the case of climate tipping points. In Global Challenges, Governance, and Complexity (pp. 274–302). Edward Elgar Publishing. https://www.elgaronline.com/edcollchap/edcoll/9781788115414/9781788115414.00023.xmlMoynihan, D. P. (2008). Learning under Uncertainty: Networks in Crisis Management. Public Administration Review, 68(2), 350–365. https://doi.org/10.1111/j.1540-6210.2007.00867.x

Muggah, R., & Whitlock, M. (2022). Reflections on the Evolution of Conflict Early Warning. Stability: International Journal of Security and Development, 10(1), 2. https://doi.org/10.5334/sta.857

Nadiruzzaman, M., Scheffran, J., Shewly, H. J., & Kley, S. (2022). Conflict-Sensitive Climate Change Adaptation: A Review. Sustainability, 14(13), 8060. https://doi.org/10.3390/su14138060

Nisbett, N., Spaiser, V., Hawkins, J., Jensen, P., Morganti, E., Abiri, A.J., Al Arefi, S. and Richardson-Barlow, C.: Low-carbon Infrastructure Transition in the North of England - Pilot Study. Report. Energy Leeds, University of Leeds, https://www.leeds.ac.uk/energy/doc/low-carbon-infrastructure-report.

Newburger, E. (2022, November 30). Biden administration grants $75 million to relocate three Native tribes away from rising oceans. CNBC.
https://www.cnbc.com/2022/11/30/feds-grant-75-million-to-move-three-native-tribes-away-from-rising-seas.htmlNyberg, D., Wright, C., & Bowden, V. (2022). Organising Responses to Climate Change: The Politics of Mitigation, Adaptation and Suffering (1st ed.). Cambridge University Press. https://doi.org/10.1017/9781009266901

Nyström, M., Jouffray, J.-B., Norström, A. V., Crona, B., Søgaard Jørgensen, P., Carpenter, S. R., Bodin, Ö., Galaz, V., & Folke, C. (2019). Anatomy and resilience of the global production ecosystem. Nature, 575(7781), 98–108. https://doi.org/10.1038/s41586-019-1712-3

Organisation for Economic Co-operation and Development (OECD). (2023). OECD Environmental Performance Reviews: Germany 2023. OECD. https://doi.org/10.1787/f26da7da-en

OECD. (2022). Climate Tipping Points: Insights for Effective Policy Action. OECD. https://doi.org/10.1787/abc5a69e-en

OECD.(2021). Managing Climate Risks, Facing up to Losses and Damages: Understanding, Reducing and Managing Risks. OECD. https://doi.org/10.1787/55ea1cc9-en

Oliver, T. H., Bazaanah, P., Da Costa, J., Deka, N., Dornelles, A. Z., Greenwell, M. P., Nagarajan, M., Narasimhan, K., Obuobie, E., Osei, M. A., & Gilbert, N. (2023). Empowering citizen-led adaptation to systemic climate change risks. Nature Climate Change, 13(7), 671–678. https://doi.org/10.1038/s41558-023-01712-6

Orazani, S. N., Reynolds, K. J., & Osborne, H. (2023). What works and why in interventions to strengthen social cohesion: A systematic review. Journal of Applied Social Psychology, 53(10), 938–995. https://doi.org/10.1111/jasp.12990

Ostrom, E. (2010). Polycentric systems for coping with collective action and global environmental change. Global Environmental Change, 20(4), 550–557. https://doi.org/10.1016/j.gloenvcha.2010.07.004

Otto, F. E. L., & Raju, E. (2023). Harbingers of decades of unnatural disasters. Communications Earth & Environment, 4(1), 280. https://doi.org/10.1038/s43247-023-00943-x

Perrow, C. (1999). Normal accidents: living with high-risk technologies. Princeton University Press.

Petzold, J., Hawxwell, T., Jantke, K., Gonçalves Gresse, E., Mirbach, C., Ajibade, I., Bhadwal, S., Bowen, K., Fischer, A. P., Joe, E. T., Kirchhoff, C. J., Mach, K. J., Reckien, D., Segnon, A. C., Singh, C., Ulibarri, N., Campbell, D., Cremin, E., Färber, L., … Garschagen, M. (2023a). A global assessment of actors and their roles in climate change adaptation. Nature Climate Change, 13(11), 1250–1257. https://doi.org/10.1038/s41558-023-01824-z

Pill, M. (2020). Planned Relocation from the Impacts of Climate Change in Small Island Developing States: The Intersection Between Adaptation and Loss and Damage. In W. Leal Filho (Ed.), Managing Climate Change Adaptation in the Pacific Region (pp. 129–149). Springer International Publishing. https://doi.org/10.1007/978-3-030-40552-6_7

Renn, O., Lucas, K., Haas, A., & Jaeger, C. (2019). Things are different today: the challenge of global systemic risks. Journal of Risk Research, 22(4), 401–415. https://doi.org/10.1080/13669877.2017.1409252

Ripple, W. J., Moomaw, W. R., Wolf, C., Betts, M. G., Law, B. E., Gregg, J., & Newsome, T. M. (2022). Six steps to integrate climate mitigation with adaptation for social justice. Environmental Science & Policy, 128, 41–44. https://doi.org/10.1016/j.envsci.2021.11.007

Risse, M. (2009). The Right to Relocation: Disappearing Island Nations and Common Ownership of the Earth. Ethics & International Affairs, 23(3), 281–300. https://doi.org/10.1111/j.1747-7093.2009.00218.x

Rudge, K. (2023). Leveraging critical race theory to produce equitable climate change adaptation. Nature Climate Change, 13(7), 623–631. https://doi.org/10.1038/s41558-023-01690-9

Ruhl, J. B. (2020). Governing Cascade Failures in Complex Social-Ecological-Technological Systems: Framing Context, Strategies, and Challenges. Vanderbilt Journal of Entertainment & Technology Law, 22(2), 407. https://scholarship.law.vanderbilt.edu/faculty-publications/1149

Schade, J. (2013). Climate Change and Planned Relocation: Risks and a Proposal for Safeguards. In T. Faist & J. Schade (Eds.), Disentangling Migration and Climate Change (pp. 183–206). Springer Netherlands. https://doi.org/10.1007/978-94-007-6208-4_8

Scheffran, J. (2008). Climate change and security. Bulletin of the Atomic Scientists, 64(2), 19–26. https://doi.org/10.1080/00963402.2008.11461141

Schipper, E. L. F. (2020). Maladaptation: When Adaptation to Climate Change Goes Very Wrong. One Earth, 3(4), 409–414. https://doi.org/10.1016/j.oneear.2020.09.014

Schlumberger, J., Haasnoot, M., Aerts, J., & De Ruiter, M. (2022). Proposing DAPP-MR as a disaster risk management pathways framework for complex, dynamic multi-risk. IScience, 25(10), 105219. https://doi.org/10.1016/j.isci.2022.105219

Schmink, M., Duchelle, A. E., Hoelle, J., Leite, F., D'oliveira, M. V. N., Vadjunec, J., Valentim, J. F., & Wallace, R. (2014, February 25). Array - CIFOR Knowledge. CIFOR. https://www.cifor.org/knowledge/publication/5093/

Schroeder, H. (2010). Agency in international climate negotiations: the case of indigenous peoples and avoided deforestation. International Environmental Agreements: Politics, Law and Economics, 10(4), 317–332. https://doi.org/10.1007/s10784-010-9138-2

Schweizer, P., Goble, R., & Renn, O. (2022). Social Perception of Systemic Risks. Risk Analysis, 42(7), 1455–1471. https://doi.org/10.1111/risa.13831

Schweizer, P.-J., & Renn, O. (2019). Governance of systemic risks for disaster prevention and mitigation. Disaster Prevention and Management: An International Journal, 28(6), 862–874. https://doi.org/10.1108/DPM-09-2019-0282

Sengupta, S., Kovalevsky, D. V., Bouwer, L. M., & Scheffran, J. (2023). Urban Planning of Coastal Adaptation under Sea-Level Rise: An Agent-Based Model in the VIABLE Framework. Urban Science, 7(3), 79. https://doi.org/10.3390/urbansci7030079

Stal, M. (2011). Flooding and Relocation: The Zambezi River Valley in Mozambique. International Migration, 49(s1). https://doi.org/10.1111/j.1468-2435.2010.00667.x

Stoddard, I., Anderson, K., Capstick, S., Carton, W., Depledge, J., Facer, K., Gough, C., Hache, F., Hoolohan, C., Hultman, M., Hällström, N., Kartha, S., Klinsky, S., Kuchler, M., Lövbrand, E., Nasiritousi, N., Newell, P., Peters, G. P., Sokona, Y., … Williams, M. (2021). Three Decades of Climate Mitigation: Why Haven't We Bent the Global Emissions Curve? Annual Review of Environment and Resources, 46(1), 653–689. https://doi.org/10.1146/annurev-environ-012220-011104

United Nations Framework Convention on Climate Change (UNFCCC). Executive Committee of the Warsaw International Mechanism for Loss and Damage (WIM ExCom). (2018). Report of the Executive Committee of the Warsaw International Mechanism for Loss and Damage associated with Climate Change Impacts [Warsaw International Mechanism for Loss and Damage]. https://unfccc.int/sites/default/files/resource/1e.pdf

Vaha, M. E. (2018). Hosting the Small Island Developing States: two scenarios. International Journal of Climate Change Strategies and Management, 10(2), 229–244. https://doi.org/10.1108/IJCCSM-10-2017-0183

Van Ginkel, K. C. H., Botzen, W. J. W., Haasnoot, M., Bachner, G., Steininger, K. W., Hinkel, J., Watkiss, P., Boere, E., Jeuken, A., De Murieta, E. S., & Bosello, F. (2020). Climate change induced socio-economic tipping points: review and stakeholder consultation for policy relevant research. Environmental Research Letters, 15(2), 023001. https://doi.org/10.1088/1748-9326/ab6395

Walker, B., Barrett, S., Polasky, S., Galaz, V., Folke, C., Engström, G., Ackerman, F., Arrow, K., Carpenter, S., Chopra, K., Daily, G., Ehrlich, P., Hughes, T., Kautsky, N., Levin, S., Mäler, K.-G., Shogren, J., Vincent, J., Xepapadeas, T., & De Zeeuw, A. (2009). Looming Global-Scale Failures and Missing Institutions. Science, 325(5946), 1345–1346. https://doi.org/10.1126/science.1175325

Woroniecki, S., Wamsler, C., & Boyd, E. (2019). The promises and pitfalls of ecosystem-based adaptation to climate change as a vehicle for social empowerment. Ecology and Society, 24(2). https://www.jstor.org/stable/26796957

Wright, J. S., Fu, R., Worden, J. R., Chakraborty, S., Clinton, N. E., Risi, C., Sun, Y., & Yin, L. (2017). Rainforest-initiated wet season onset over the southern Amazon. Proceedings of the National Academy of Sciences, 114(32), 8481–8486. https://doi.org/10.1073/pnas.1621516114

Young, O. R. (2011). Effectiveness of international environmental regimes: Existing knowledge, cutting-edge themes, and research strategies. Proceedings of the National Academy of Sciences, 108(50), 19853–19860. https://doi.org/10.1073/pnas.1111690108

Chapter 3.4

Alcamo, J. (2008). Chapter Six The SAS Approach: Combining Qualitative and Quantitative Knowledge in Environmental Scenarios. In Developments in Integrated Environmental Assessment (Vol. 2, pp. 123–150). Elsevier https://doi.org/10.1016/S1574-101X(08)00406-7

Andersson, E. (2022). The role of science in finding solutions to wicked, systemic problems: This article belongs to Ambio's 50th Anniversary Collection. Theme: Solutions-oriented research. Ambio, 51(1), 1–8. https://doi.org/10.1007/s13280-021-01525-x

Asayama, S., De Pryck, K., Beck, S., Cointe, B., Edwards, P. N., Guillemot, H., Gustafsson, K. M., Hartz, F., Hughes, H., Lahn, B., Leclerc, O., Lidskog, R., Livingston, J. E., Lorenzoni, I., MacDonald, J. P., Mahony, M., Miguel, J. C. H., Monteiro, M., O'Reilly, J., … Hulme, M. (2023). Three institutional pathways to envision the future of the IPCC. Nature Climate Change, 13(9), 877–880. https://doi.org/10.1038/s41558-023-01780-8

Barrett, S., & Dannenberg, A. (2012). Climate negotiations under scientific uncertainty. Proceedings of the National Academy of Sciences, 109(43), 17372–17376. https://doi.org/10.1073/pnas.1208417109

Barrett, S., & Dannenberg, A.. (2014). "Sensitivity of Collective Action to Uncertainty about Climate Tipping Points." Nature Climate Change 4 (1): 36–39. https://doi.org/10.1038/nclimate2059.

Beck, S. (2011). Moving beyond the linear model of expertise? IPCC and the test of adaptation. Regional Environmental Change, 11(2), 297–306. https://doi.org/10.1007/s10113-010-0136-2

Beck, S., & Oomen, J. (2021). Imagining the corridor of climate mitigation – What is at stake in IPCC's politics of anticipation? Environmental Science & Policy, 123, 169–178. https://doi.org/10.1016/j.envsci.2021.05.011

Biggs, R., Raudsepp-Hearne, C., Atkinson-Palombo, C., Bohensky, E., Boyd, E., Cundill, G., Fox, H., Ingram, S., Kok, K., Spehar, S., Tengö, M., Timmer, D., & Zurek, M. (2007). Linking Futures across Scales: a Dialog on Multiscale Scenarios. Ecology and Society, 12(1), art17. https://doi.org/10.5751/ES-02051-120117

Björnberg, K. E., Karlsson, M., Gilek, M., & Hansson, S. O. (2017). Climate and environmental science denial: A review of the scientific literature published in 1990–2015. Journal of Cleaner Production, 167, 229–241. https://doi.org/10.1016/j.jclepro.2017.08.066

Bremer, S., & Meisch, S. (2017). Co-production in climate change research: reviewing different perspectives. WIREs Climate Change, 8(6), e482. https://doi.org/10.1002/wcc.482

Brysse, K., Oreskes, N., O'Reilly, J., & Oppenheimer, M. (2013). Climate change prediction: Erring on the side of least drama? Global Environmental Change, 23(1), 327–337. https://doi.org/10.1016/j.gloenvcha.2012.10.008

Cash, D. W., Clark, W. C., Alcock, F., Dickson, N. M., Eckley, N., Guston, D. H., Jäger, J., & Mitchell, R. B. (2003). Knowledge systems for sustainable development. Proceedings of the National Academy of Sciences, 100(14), 8086–8091. https://doi.org/10.1073/pnas.1231332100

Collins, M., R. Knutti, J. Arblaster, J.-L. Dufresne, T. Fichefet, P. Friedlingstein, X. Gao, et al. (2013). "Long-Term Climate Change: Projections, Commitments and Irreversibility (Ch. 12)." In Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change, edited by IPCC. Cambridge: Cambridge University Press. http://www.climatechange2013.org/images/report/WG1AR5_Chapter12_FINAL.pdf

Compton, J., Van Der Linden, S., Cook, J., & Basol, M. (2021). Inoculation theory in the post-truth era: Extant findings and new frontiers for contested science, misinformation, and conspiracy theories. Social and Personality Psychology Compass, 15(6), e12602. https://doi.org/10.1111/spc3.12602

Cook, J. (2020). Deconstructing climate science denial. In Research Handbook on Communicating Climate Change (pp. 62–78). Edward Elgar Publishing. https://www.elgaronline.com/edcollchap/edcoll/9781789900392/9781789900392.00014.xml

Cook, J., Lewandowsky, S., & Ecker, U. K. H. (2017). Neutralizing misinformation through inoculation: Exposing misleading argumentation techniques reduces their influence. PLOS ONE, 12(5), e0175799. https://doi.org/10.1371/journal.pone.0175799

De Pryck, K., & Hulme, M. (2022). A Critical Assessment of the Intergovernmental Panel on Climate Change (1st ed.). Cambridge University Press. https://doi.org/10.1017/9781009082099

Dufva, M., Könnölä, T., & Koivisto, R. (2015). Multi-layered foresight: Lessons from regional foresight in Chile. Futures, 73, 100–111. https://doi.org/10.1016/j.futures.2015.08.010

Dunlap, R. E., & Brulle, R. J. (2020). Sources and amplifiers of climate change denial. In Research Handbook on Communicating Climate Change (pp. 49–61). Edward Elgar Publishing. https://www.elgaronline.com/edcollchap/edcoll/9781789900392/9781789900392.00013.xml

Edwards, P., Sharma-Wallace, L., Wreford, A., Holt, L., Cradock-Henry, N. A., Flood, S., & Velarde, S. J. (2019). Tools for adaptive governance for complex social-ecological systems: a review of role-playing-games as serious games at the community-policy interface. Environmental Research Letters, 14(11), 113002. https://doi.org/10.1088/1748-9326/ab4036

Ekberg, K., Forchtner, B., & Hultman, M. (2023). Climate obstruction: how denial, delay and inaction are heating the planet. Routledge, Taylor & Francis Group.

Elsawah, S., Hamilton, S. H., Jakeman, A. J., Rothman, D., Schweizer, V., Trutnevyte, E., Carlsen, H., Drakes, C., Frame, B., Fu, B., Guivarch, C., Haasnoot, M., Kemp-Benedict, E., Kok, K., Kosow, H., Ryan, M., & Van Delden, H. (2020). Scenario processes for socio-environmental systems analysis of futures: A review of recent efforts and a salient research agenda for supporting decision making. Science of The Total Environment, 729, 138393. https://doi.org/10.1016/j.scitotenv.2020.138393

Fazey, I., Schäpke, N., Caniglia, G., Hodgson, A., Kendrick, I., Lyon, C., Page, G., Patterson, J., Riedy, C., Strasser, T., Verveen, S., Adams, D., Goldstein, B., Klaes, M., Leicester, G., Linyard, A., McCurdy, A., Ryan, P., Sharpe, B., … Young, H. R. (2020). Transforming knowledge systems for life on Earth: Visions of future systems and how to get there. Energy Research & Social Science, 70, 101724. https://doi.org/10.1016/j.erss.2020.101724

Fernández Galeote, D., Rajanen, M., Rajanen, D., Legaki, N.-Z., Langley, D. J., & Hamari, J. (2021). Gamification for climate change engagement: review of corpus and future agenda. Environmental Research Letters, 16(6), 063004. https://doi.org/10.1088/1748-9326/abec05

Field, C.B., V.R. Barros, D.J. Dokken, K.J. Mach, M.D. Mastrandrea, T.E. Bilir, M. Chatterjee, et al. (2014). "Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change - Summary for Policymakers." Climate Change 2014. Cambridge, United Kingdom, and New York, NY, USA: IPCC.

Finnemore, M. (1996). National Interests in International Society. Cornell University Press. https://www.jstor.org/stable/10.7591/j.ctt1rv61rh

Fleming, K., Abad, J., Booth, L., Schueller, L., Bailis, A., Scolobig, A., Petrovic, B., Zuccaro, G., & Leone, M. F. (2020). The use of serious games in engaging stakeholders for disaster risk reduction, management and climate change adaption information elicitation. International Journal of Disaster Risk Reduction, 49, 101669. https://doi.org/10.1016/j.ijdrr.2020.101669

Flood, S., Cradock-Henry, N. A., Blackett, P., & Edwards, P. (2018). Adaptive and interactive climate futures: systematic review of 'serious games' for engagement and decision-making. Environmental Research Letters, 13(6), 063005. https://doi.org/10.1088/1748-9326/aac1c6

Franzke, C. L. E., Ciullo, A., Gilmore, E. A., Matias, D. M., Nagabhatla, N., Orlov, A., Paterson, S. K., Scheffran, J., & Sillmann, J. (2022). Perspectives on tipping points in integrated models of the natural and human Earth system: cascading effects and telecoupling. Environmental Research Letters, 17(1), 015004. https://doi.org/10.1088/1748-9326/ac42fd

Fuso Nerini, F., Sovacool, B., Hughes, N., Cozzi, L., Cosgrave, E., Howells, M., Tavoni, M., Tomei, J., Zerriffi, H., & Milligan, B. (2019). Connecting climate action with other Sustainable Development Goals. Nature Sustainability, 2(8), 674–680. https://doi.org/10.1038/s41893-019-0334-y

Gabriel, J. (2014). A scientific enquiry into the future. European Journal of Futures Research, 2(1), 31. https://doi.org/10.1007/s40309-013-0031-4

Galafassi, D., Kagan, S., Milkoreit, M., Heras, M., Bilodeau, C., Bourke, S. J., Merrie, A., Guerrero, L., Pétursdóttir, G., & Tàbara, J. D. (2018). 'Raising the temperature': the arts on a warming planet. Current Opinion in Environmental Sustainability, 31, 71–79. https://doi.org/10.1016/j.cosust.2017.12.010

Galafassi, D., Tàbara, J. D., & Heras, M. (2018). Restoring our senses, restoring the Earth. Fostering imaginative capacities through the arts for envisioning climate transformations. Elementa: Science of the Anthropocene, 6, 69. https://doi.org/10.1525/elementa.330

Galaz, V. (2014). Global environmental governance, technology and politics: the Anthropocene Gap. Edward Elgar.

Galaz, V., Moberg, F., Olsson, E., Paglia, E., & Parker, C. (2011). Institutional and political leadership dimensions of cascading ecological crises. Public Administration, 89(2), 361–380. https://doi.org/10.1111/j.1467-9299.2010.01883.x

Galende-Sánchez, E., & Sorman, A. H. (2021). From consultation toward co-production in science and policy: A critical systematic review of participatory climate and energy initiatives. Energy Research & Social Science, 73, 101907. https://doi.org/10.1016/j.erss.2020.101907

Gambhir, Ajay, Casey Cronin, Elin Matsumae, Joeri Rogelj, and Mark Workman. (2019). Using futures analysis to develop resilient climate change mitigation strategies | Grantham Institute – Climate Change and the Environment | Imperial College London. London: Grantham Institute – Climate Change and the Environment, Imperial College. https://www.imperial.ac.uk/grantham/publications/using-futures-analysis-to-develop-resilient-climate-change-mitigation-strategies.php

Grundmann, R. (2007). Climate change and knowledge politics. Environmental Politics, 16(3), 414–432. https://doi.org/10.1080/09644010701251656

Hoppe, R. (2005). Rethinking the science-policy nexus: from knowledge utilization and science technology studies to types of boundary arrangements. Poiesis & Praxis, 3(3), 199–215. https://doi.org/10.1007/s10202-005-0074-0

Hoppe, R., Wesselink, A., & Cairns, R. (2013). Lost in the problem: the role of boundary organisations in the governance of climate change. WIREs Climate Change, 4(4), 283–300. https://doi.org/10.1002/wcc.225

Hoppe Rt. (2005). Rethinking the Science-Policy Nexus: From Knowledge Utilization and Science Technology Studies to Types of Boundary Arrangements. Poiesis & Praxis 3 (3): 199–215. https://doi.org/10.1007/s10202-005-0074-0.

Hornsey, M. J., & Lewandowsky, S. (2022). A toolkit for understanding and addressing climate scepticism. Nature Human Behaviour, 6(11), 1454–1464. https://doi.org/10.1038/s41562-022-01463-y

IPCC. (2023). Synthesis Report. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, H. Lee and J. Romero (eds.)]. I. https://report.ipcc.ch/ar6syr/pdf/IPCC_AR6_SYR_LongerReport.pdf

IPCC. (2022). 2019 Climate Change and Land: IPCC Special Report on Climate Change, Desertification, Land Degradation, Sustainable Land Management, Food Security, and Greenhouse Gas Fluxes in Terrestrial Ecosystems, [P.R. Shukla, J. Skea, E. Calvo Buendia, V. Masson-Delmotte, H.- O. Pörtner, D. C. Roberts, P. Zhai, R. Slade, S. Connors, R. van Diemen, M. Ferrat, E. Haughey, S. Luz, S. Neogi, M. Pathak, J. Petzold, J. Portugal Pereira, P. Vyas, E. Huntley, K. Kissick, M. Belkacemi, J. Malley, (eds.)] (1st ed.). Cambridge University Press. https://doi.org/10.1017/9781009157988

IPCC. (2014). Summary for policymakers. In: Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Field, C.B., V.R. Barros, D.J. Dokken, K.J. Mach, M.D. Mastrandrea, T.E. Bilir, M. Chatterjee, K.L. Ebi, Y.O. Estrada, R.C. Genova, B. Girma, E.S. Kissel, A.N. Levy, S. MacCracken,P.R. Mastrandrea, and L.L. White (eds.)]. Cambridge University Press, Cambridge, United Kingdom and NewYork, NY, USA. https://www.ipcc.ch/site/assets/uploads/2018/02/ar5_wgII_spm_en.pdfIPCC. (2007). Climate Change 2007: Synthesis Report. Contribution of Working Groups I, II and III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, Pachauri, R.K and Reisinger, A. (eds.)]. (p. 104). IPCC. https://www.ipcc.ch/report/ar4/syr/

Iwaniec, D. M., Cook, E. M., Davidson, M. J., Berbés-Blázquez, M., Georgescu, M., Krayenhoff, E. S., Middel, A., Sampson, D. A., & Grimm, N. B. (2020). The co-production of sustainable future scenarios. Landscape and Urban Planning, 197, 103744. https://doi.org/10.1016/j.landurbplan.2020.103744

Jahel, C., Bourgeois, R., Bourgoin, J., Daré, W., De Lattre-Gasquet, M., Delay, E., Dumas, P., Le Page, C., Piraux, M., & Prudhomme, R. (2023). The future of social-ecological systems at the crossroads of quantitative and qualitative methods. Technological Forecasting and Social Change, 193, 122624. https://doi.org/10.1016/j.techfore.2023.122624

Jasanoff, S. (Ed.). (2004). States of Knowledge. Routledge. https://doi.org/10.4324/9780203413845

Kliskey, A. "Anaru", Williams, P., Trammell, E. J., Cronan, D., Griffith, D., Alessa, L., Lammers, R., Haro-Martí, M. E. D., & Oxarango-Ingram, J. (2023). Building trust, building futures: Knowledge co-production as relationship, design, and process in transdisciplinary science. Frontiers in Environmental Science, 11, 1007105. https://doi.org/10.3389/fenvs.2023.1007105

Lang, D. J., & Wiek, A. (2022). Structuring and advancing solution-oriented research for sustainability: This article belongs to Ambio's 50th Anniversary Collection. Theme: Solutions-oriented research. Ambio, 51(1), 31–35. https://doi.org/10.1007/s13280-021-01537-7

Latulippe, N., & Klenk, N. (2020). Making room and moving over: knowledge co-production, Indigenous knowledge sovereignty and the politics of global environmental change decision-making. Current Opinion in Environmental Sustainability, 42, 7–14. https://doi.org/10.1016/j.cosust.2019.10.010

Lazurko, A., Schweizer, V., & Armitage, D. (2023). Exploring "big picture" scenarios for resilience in social–ecological systems: transdisciplinary cross-impact balances modeling in the Red River Basin. Sustainability Science, 18(4), 1773–1794. https://doi.org/10.1007/s11625-023-01308-1

Leemans, R., & Vellinga, P. (2017). The scientific motivation of the internationally agreed 'well below 2 °C' climate protection target: a historical perspective. Current Opinion in Environmental Sustainability, 26–27, 134–142. https://doi.org/10.1016/j.cosust.2017.07.010

Lenton, T. M., Rockström, J., Gaffney, O., Rahmstorf, S., Richardson, K., Steffen, W., & Schellnhuber, H. J. (2019). Climate tipping points — too risky to bet against. Nature, 575(7784), 592–595. https://doi.org/10.1038/d41586-019-03595-0

Lewandowsky, S., & Van Der Linden, S. (2021). Countering Misinformation and Fake News Through Inoculation and Prebunking. European Review of Social Psychology, 32(2), 348–384. https://doi.org/10.1080/10463283.2021.1876983

Lundquist, C., Hashimoto, S., Denboba, M. A., Peterson, G., Pereira, L., & Armenteras, D. (2021). Operationalizing the Nature Futures Framework to catalyze the development of nature-future scenarios. Sustainability Science, 16(6), 1773–1775. https://doi.org/10.1007/s11625-021-01014-w

Mach, K. J., Lemos, M. C., Meadow, A. M., Wyborn, C., Klenk, N., Arnott, J. C., Ardoin, N. M., Fieseler, C., Moss, R. H., Nichols, L., Stults, M., Vaughan, C., & Wong-Parodi, G. (2020). Actionable knowledge and the art of engagement. Current Opinion in Environmental Sustainability, 42, 30–37. https://doi.org/10.1016/j.cosust.2020.01.002

Mangnus, A. C., Vervoort, J. M., McGreevy, S. R., Ota, K., Rupprecht, C. D. D., Oga, M., & Kobayashi, M. (2019). New pathways for governing food system transformations: a pluralistic practice-based futures approach using visioning, back-casting, and serious gaming. Ecology and Society, 24(4), art2. https://doi.org/10.5751/ES-11014-240402

Matuk, F. A., Turnhout, E., Fleskens, L., Do Amaral, E. F., Haverroth, M., & Behagel, J. H. (2020). Allying knowledge integration and co-production for knowledge legitimacy and usability: The Amazonian SISA policy and the Kaxinawá Indigenous people case. Environmental Science & Policy, 112, 1–9. https://doi.org/10.1016/j.envsci.2020.04.018

McPherson, G. R., Sirmacek, B. K., Massa, J. R., Kallfelz, W., & Vinuesa, R. (2023). The commonly overlooked environmental tipping points. Results in Engineering, 18, 101118. https://doi.org/10.1016/j.rineng.2023.101118

Milkoreit, M. (2019). Cognitive capacities for global governance in the face of complexity: the case of climate tipping points. In Global Challenges, Governance, and Complexity (pp. 274–302). Edward Elgar Publishing. https://www.elgaronline.com/edcollchap/edcoll/9781788115414/9781788115414.00023.xml

Milkoreit, M. (2015). Science and Climate Change Diplomacy: Cognitive Limits and the Need to Reinvent Science Communication. In L. S. Davis & R. G. Patman, Science Diplomacy (pp. 109–131). World Scientific. https://doi.org/10.1142/9789814440073_0006

Miller, C. (2004). Climate Science and the Making of a Global Political Order." In States of Knowledge: The Coproduction of Science and Social Ord. In Jasanoff, S, (eds) States of Knowledge: The Co-Production of Science and the Social Order. Routledge.

Norström, A. V., Cvitanovic, C., Löf, M. F., West, S., Wyborn, C., Balvanera, P., Bednarek, A. T., Bennett, E. M., Biggs, R., De Bremond, A., Campbell, B. M., Canadell, J. G., Carpenter, S. R., Folke, C., Fulton, E. A., Gaffney, O., Gelcich, S., Jouffray, J.-B., Leach, M., … Österblom, H. (2020). Principles for knowledge co-production in sustainability research. Nature Sustainability, 3(3), 182–190. https://doi.org/10.1038/s41893-019-0448-2

O'Brien, K. (2013). Global environmental change III: Closing the gap between knowledge and action. Progress in Human Geography, 37(4), 587–596. https://doi.org/10.1177/0309132512469589

Organisation for Economic Co-operation and Development (OECD). (2021). Managing Climate Risks, Facing up to Losses and Damages: Understanding, Reducing and Managing Risks. OECD. https://doi.org/10.1787/55ea1cc9-en

OECD. (2022). Climate Tipping Points: Insights for Effective Policy Action. OECD. https://doi.org/10.1787/abc5a69e-en

Pereira, L., Kuiper, J. J., Selomane, O., Aguiar, A. P. D., Asrar, G. R., Bennett, E. M., Biggs, R., Calvin, K., Hedden, S., Hsu, A., Jabbour, J., King, N., Köberle, A. C., Lucas, P., Nel, J., Norström, A. V., Peterson, G., Sitas, N., Trisos, C., … Ward, J. (2021). Advancing a toolkit of diverse futures approaches for global environmental assessments. Ecosystems and People, 17(1), 191–204. https://doi.org/10.1080/26395916.2021.1901783

Pereira, L. M., Ortuño Crespo, G., Amon, D. J., Badhe, R., Bandeira, S., Bengtsson, F., Boettcher, M., Carmine, G., Cheung, W. W. L., Chibwe, B., Dunn, D., Gasalla, M. A., Halouani, G., Johnson, D. E., Jouffray, J.-B., Juri, S., Keys, P. W., Lübker, H. M., Merrie, A. S., … Zhou, W. (2023). The living infinite: Envisioning futures for transformed human-nature relationships on the high seas. Marine Policy, 153, 105644. https://doi.org/10.1016/j.marpol.2023.105644

Pohl, C., Klein, J. T., Hoffmann, S., Mitchell, C., & Fam, D. (2021). Conceptualising transdisciplinary integration as a multidimensional interactive process. Environmental Science & Policy, 118, 18–26. https://doi.org/10.1016/j.envsci.2020.12.005

Prehofer, S., Kosow, H., Naegler, T., Pregger, T., Vögele, S., & Weimer-Jehle, W. (2021). Linking qualitative scenarios with quantitative energy models: knowledge integration in different methodological designs. Energy, Sustainability and Society, 11(1), 25. https://doi.org/10.1186/s13705-021-00298-1

Renn, O. (2022). The Systemic Risk Perspective: Social Perception of Uncertainty and Tipping Points. In P. A. Wilderer, M. Grambow, M. Molls, & K. Oexle (Eds.), Strategies for Sustainability of the Earth System (pp. 15–31). Springer International Publishing. https://doi.org/10.1007/978-3-030-74458-8_2

Sarewitz, D. (2004). How science makes environmental controversies worse. Environmental Science & Policy, 7(5), 385–403. https://doi.org/10.1016/j.envsci.2004.06.001

Schenuit, F. (2023). Staging science: Dramaturgical politics of the IPCC's Special Report on 1.5 °C. Environmental Science & Policy, 139, 166–176. https://doi.org/10.1016/j.envsci.2022.10.014

Schill, C., Lindahl, T., & Crépin, A.-S. (2015). Collective action and the risk of ecosystem regime shifts: insights from a laboratory experiment. Ecology and Society, 20(1), art48. https://doi.org/10.5751/ES-07318-200148

Schmid, P., & Betsch, C. (2019). Effective strategies for rebutting science denialism in public discussions. Nature Human Behaviour, 3(9), 931–939. https://doi.org/10.1038/s41562-019-0632-4

Shaw, A., Sheppard, S., Burch, S., Flanders, D., Wiek, A., Carmichael, J., Robinson, J., & Cohen, S. (2009). Making local futures tangible—Synthesizing, downscaling, and visualizing climate change scenarios for participatory capacity building. Global Environmental Change, 19(4), 447–463. https://doi.org/10.1016/j.gloenvcha.2009.04.002

Simpson, N. P., Mach, K. J., Constable, A., Hess, J., Hogarth, R., Howden, M., Lawrence, J., Lempert, R. J., Muccione, V., Mackey, B., New, M. G., O'Neill, B., Otto, F., Pörtner, H.-O., Reisinger, A., Roberts, D., Schmidt, D. N., Seneviratne, S., Strongin, S., … Trisos, C. H. (2021). A framework for complex climate change risk assessment. One Earth, 4(4), 489–501. https://doi.org/10.1016/j.oneear.2021.03.005

Smith, J. B., Schneider, S. H., Oppenheimer, M., Yohe, G. W., Hare, W., Mastrandrea, M. D., Patwardhan, A., Burton, I., Corfee-Morlot, J., Magadza, C. H. D., Füssel, H.-M., Pittock, A. B., Rahman, A., Suarez, A., & Van Ypersele, J.-P. (2009). Assessing dangerous climate change through an update of the Intergovernmental Panel on Climate Change (IPCC) "reasons for concern". Proceedings of the National Academy of Sciences, 106(11), 4133–4137. https://doi.org/10.1073/pnas.0812355106

Smith, J.B., H.J. Schellnhuber, M Monirul Quader Mirza, S Frankhauser, R. Leemans, L. Erda, L. Ogallo, et al. 2001. "Vulnerability to Climate Change and Reasons for Concern: A Synthesis." In Climate Change 2001: Impacts, Adaptation and Vulnerability | IPCC Working Group II Contribution to AR3, 913–67. Cambridge, United Kingdom, and New York, NY, USA: Cambridge University Press.

Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley (eds.). IPCC, 2013: Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, 1535 pp.

Tàbara, J. D., St. Clair, A. L., & Hermansen, E. A. T. (2017). Transforming communication and knowledge production processes to address high-end climate change. Environmental Science & Policy, 70, 31–37. https://doi.org/10.1016/j.envsci.2017.01.004

Tengö, M., & Andersson, E. (2022). Solutions-oriented research for sustainability: Turning knowledge into action: This article belongs to Ambio's 50th Anniversary Collection. Theme: Solutions-oriented research. Ambio, 51(1), 25–30. https://doi.org/10.1007/s13280-020-01492-9

Thompson, M. A., Owen, S., Lindsay, J. M., Leonard, G. S., & Cronin, S. J. (2017). Scientist and stakeholder perspectives of transdisciplinary research: Early attitudes, expectations, and tensions. Environmental Science & Policy, 74, 30–39. https://doi.org/10.1016/j.envsci.2017.04.006

Trutnevyte, E., Hirt, L. F., Bauer, N., Cherp, A., Hawkes, A., Edelenbosch, O. Y., Pedde, S., & Van Vuuren, D. P. (2019). Societal Transformations in Models for Energy and Climate Policy: The Ambitious Next Step. One Earth, 1(4), 423–433. https://doi.org/10.1016/j.oneear.2019.12.002

Turnhout, E., Metze, T., Wyborn, C., Klenk, N., & Louder, E. (2020). The politics of co-production: participation, power, and transformation. Current Opinion in Environmental Sustainability, 42, 15–21. https://doi.org/10.1016/j.cosust.2019.11.009

United Nations Disaster Risk Reduction (UNDR). (2022). Early warnings for all | UNDRR. http://www.undrr.org/early-warnings-for-all

United Nations Environment Programme(UNEP). (2019). Global Environment Outlook – GEO-6: Healthy Planet, Healthy People. https://wedocs.unep.org/20.500.11822/27539

Van Beek, L., Milkoreit, M., Prokopy, L., Reed, J. B., Vervoort, J., Wardekker, A., & Weiner, R. (2022). The effects of serious gaming on risk perceptions of climate tipping points. Climatic Change, 170(3–4), 31. https://doi.org/10.1007/s10584-022-03318-x

Van Beek, L., Oomen, J., Hajer, M., Pelzer, P., & Van Vuuren, D. (2022). Navigating the political: An analysis of political calibration of integrated assessment modelling in light of the 1.5 °C goal. Environmental Science & Policy, 133, 193–202. https://doi.org/10.1016/j.envsci.2022.03.024

Van Der Linden, S., Leiserowitz, A., Rosenthal, S., & Maibach, E. (2017). Inoculating the Public against Misinformation about Climate Change. Global Challenges, 1(2), 1600008. https://doi.org/10.1002/gch2.201600008

Weichselgartner, J., & Kasperson, R. (2010). Barriers in the science-policy-practice interface: Toward a knowledge-action-system in global environmental change research. Global Environmental Change, 20(2), 266–277. https://doi.org/10.1016/j.gloenvcha.2009.11.006

Wendt, A. (1992). Anarchy is what states make of it: the social construction of power politics. International Organization, 46(2), 391–425. https://doi.org/10.1017/S0020818300027764

Wiek, A., & Iwaniec, D. (2014). Quality criteria for visions and visioning in sustainability science. Sustainability Science, 9(4), 497–512. https://doi.org/10.1007/s11625-013-0208-6

Young, O. R. (2012). Arctic Tipping Points: Governance in Turbulent Times. AMBIO, 41(1), 75–84. https://doi.org/10.1007/s13280-011-0227-4

Young, O. R. (2017). Beyond Regulation: Innovative Strategies for Governing Large Complex Systems. Sustainability, 9(6), 938. https://doi.org/10.3390/su9060938

Section 4

Positive tipping points in technology, economy and society

Section lead coordinating authors:

Tom Powell, Steven R. Smith, Caroline Zimm, Emma Bailey

Reviewers:

Magnus Bengtsson, Luca Coscieme, Margot Hurlbert, Lisa Jacobson, Massimo Tavoni

Chapter References 4.1

Abson, D. J., Fischer, J., Leventon, J., Newig, J., Schomerus, T., Vilsmaier, U., Von Wehrden, H., Abernethy, P., Ives, C. D., Jager, N. W., & Lang, D. J. (2017). Leverage points for sustainability transformation. Ambio, 46(1), 30–39. https://doi.org/10.1007/s13280-016-0800-y

Akenji, L., Bengtsson, M., Toivio, V., Lettenmeier, M., Fawcett, T., Parag, T., Saheb, Y., Coote, A., Spangenberg, J. H., & Capstick, S. (2021). 1.5-degree lifestyles: Towards a fair consumption space for all. Hot or Cool. https://hotorcool.org/wp-content/uploads/2021/10/Hot_or_Cool_1_5_lifestyles_FULL_REPORT_AND_ANNEX_B.pdf

Armstrong McKay, D. I., Staal, A., Abrams, J. F., Winkelmann, R., Sakschewski, B., Loriani, S., Fetzer, I., Cornell, S. E., Rockström, J., & Lenton, T. M. (2022). Exceeding 1.5°C global warming could trigger multiple climate tipping points. Science, 377(6611), eabn7950. https://doi.org/10.1126/science.abn7950

Boyce, J. K. (2019). The case for carbon dividends. Polity Press.

Calvin, K., Dasgupta, D., Krinner, G., Mukherji, A., Thorne, P. W., Trisos, C., Romero, J., Aldunce, P., Barrett, K., Blanco, G., Cheung, W. W. L., Connors, S., Denton, F., Diongue-Niang, A., Dodman, D., Garschagen, M., Geden, O., Hayward, B., Jones, C., … Péan, C. (2023). IPCC, 2023: Climate Change 2023: Synthesis Report. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, H. Lee and J. Romero (eds.)]. IPCC, Geneva, Switzerland. Intergovernmental Panel on Climate Change (IPCC). https://doi.org/10.59327/IPCC/AR6-9789291691647

Chan, K. M. A., Boyd, D. R., Gould, R. K., Jetzkowitz, J., Liu, J., Muraca, B., Naidoo, R., Olmsted, P., Satterfield, T., Selomane, O., Singh, G. G., Sumaila, R., Ngo, H. T., Boedhihartono, A. K., Agard, J., De Aguiar, A. P. D., Armenteras, D., Balint, L., Barrington-Leigh, C., … Brondízio, E. S. (2020). Levers and leverage points for pathways to sustainability. People and Nature, 2(3), 693–717. https://doi.org/10.1002/pan3.10124

Creutzig, F., Niamir, L., Bai, X., Callaghan, M., Cullen, J., Díaz-José, J., Figueroa, M., Grubler, A., Lamb, W. F., Leip, A., Masanet, E., Mata, É., Mattauch, L., Minx, J. C., Mirasgedis, S., Mulugetta, Y., Nugroho, S. B., Pathak, M., Perkins, P., … Ürge-Vorsatz, D. (2022). Demand-side solutions to climate change mitigation consistent with high levels of well-being. Nature Climate Change, 12(1), 36–46. https://doi.org/10.1038/s41558-021-01219-y

Devine-Wright, P., Whitmarsh, L., Gatersleben, B., O'Neill, S., Hartley, S., Burningham, K., Sovacool, B., Barr, S., & Anable, J. (2022). Placing people at the heart of climate action. PLOS Climate, 1(5), e0000035. https://doi.org/10.1371/journal.pclm.0000035

Dixson-Declève, S., Gaffney, O., Ghosh, J., Randers, J., Rockström, J., & Stoknes, P. E. (2022). Earth for all: a survival guide for humanity: a report to the Club of Rome (2022), fifty years after The limits to growth (1972). New Society Publishers.

Eder, C., & Stadelmann-Steffen, I. (2023). Bringing the political system (back) into social tipping relevant to sustainability. Energy Policy, 177, 113529. https://doi.org/10.1016/j.enpol.2023.113529

Gaupp, F., Constantino, S., & Pereira, L. (2023). The role of agency in social tipping processes [Preprint]. Sustainability science/Human/Earth system interactions/Other methods. https://doi.org/10.5194/egusphere-2023-1533

Geels, F. W. (2011). The multi-level perspective on sustainability transitions: Responses to seven criticisms. Environmental Innovation and Societal Transitions, 1(1), 24–40. https://doi.org/10.1016/j.eist.2011.02.002

Gupta, J., Liverman, D., Prodani, K., Aldunce, P., Bai, X., Broadgate, W., Ciobanu, D., Gifford, L., Gordon, C., Hurlbert, M., Inoue, C. Y. A., Jacobson, L., Kanie, N., Lade, S. J., Lenton, T. M., Obura, D., Okereke, C., Otto, I. M., Pereira, L., … Verburg, P. H. (2023). Earth system justice needed to identify and live within Earth system boundaries. Nature Sustainability, 6(6), 630–638. https://doi.org/10.1038/s41893-023-01064-1

International Energy Agency (IEA). (2023). Renewable Energy Market Update - June 2023 – Analysis. IEA. https://www.iea.org/reports/renewable-energy-market-update-june-2023

IEA. (2021a). Electricity total final consumption by sector, 1971-2019. https://www.iea.org/data-and-statistics/charts/electricity-total-final-consumption-by-sector-1971-2019

IEAb. (2021b). Year-on-year change in fossil fuel production in OECD countries, 2019-2020. https://www.iea.org/data-and-statistics/charts/year-on-year-change-in-fossil-fuel-production-in-oecd-countries-2019-2020

International Panel on Climate Change (IPCC). (2023). Sections in: Climate Change 2023: Synthesis Report. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. https://www.ipcc.ch/report/ar6/syr/

Laybourn-Langton, L., Quilter-Pinner, & H., Treloar, M.,. (2021). Making Change: What Works? https://www.ippr.org/files/2021-11/making-change-what-works-october21.pdf

Leach, M., Newell, P., & Scoones, I. (2015). The Politics of Green Transformations (1st ed.). Routledge. https://doi.org/10.4324/9781315747378

Lenton, T. M., Held, H., Kriegler, E., Hall, J. W., Lucht, W., Rahmstorf, S., & Schellnhuber, H. J. (2008). Tipping elements in the Earth's climate system. Proceedings of the National Academy of Sciences, 105(6), 1786–1793. https://doi.org/10.1073/pnas.0705414105

Meadowcroft, J. (2016). Let's Get This Transition Moving! Canadian Public Policy, 42(S1), S10–S17. https://doi.org/10.3138/cpp.2015-028

Mealy, P., Barbrook-Johnson, P., Ives, M., Srivastav, S., & Hepburn, C. (2023). Sensitive Intervention Points: A strategic approach to climate action. Oxford Review of Economic Policy.https://www.inet.ox.ac.uk/files/No.-2023-15-Sensitive-Intervention-Points-a-strategic-approach-to-climate-action.pdf

Meldrum, M., Pinnell, L., Brennan, K., Romani, M., Sharpe, S., & Lenton, T. (2023). The Breakthrough Effect: How to trigger a cascade of tipping points to accelerate the net zero transition.https://www.systemiq.earth/wp-content/uploads/2023/01/The-Breakthrough-Effect.pdf

Milkoreit, M. (2023). Social tipping points everywhere?—Patterns and risks of overuse. WIREs Climate Change, 14(2), e813. https://doi.org/10.1002/wcc.813

Milkoreit, M., Hodbod, J., Baggio, J., Benessaiah, K., Calderón-Contreras, R., Donges, J. F., Mathias, J.-D., Rocha, J. C., Schoon, M., & Werners, S. E. (2018). Defining tipping points for social-ecological systems scholarship—an interdisciplinary literature review. Environmental Research Letters, 13(3), 033005. https://doi.org/10.1088/1748-9326/aaaa75

Newell, P., Twena, M., & Daley, F. (2021). Scaling behaviour change for a 1.5 degree world: Challenges and opportunities. Global Sustainability, 1–25. https://doi.org/10.1017/sus.2021.23

Nijsse, F. J. M. M., Mercure, J.-F., Ameli, N., Larosa, F., Kothari, S., Rickman, J., Vercoulen, P., & Pollitt, H. (2023). The momentum of the solar energy transition. Nature Communications, 14(1), 6542. https://doi.org/10.1038/s41467-023-41971-7

Pereira, L. M., Smith, S. R., Gifford, L., Newell, P., Smith, B., Villasante, S., Achieng, T., Castro, A., Constantino, S. M., Ghadiali, A., Vogel, C., & Zimm, C. (2023). Risks, Ethics and Justice in the governance of positive tipping points [Preprint]. Sustainability science/Human/Earth system interactions/Other methods. https://doi.org/10.5194/egusphere-2023-1454

Rammelt, C. F., Gupta, J., Liverman, D., Scholtens, J., Ciobanu, D., Abrams, J. F., Bai, X., Gifford, L., Gordon, C., Hurlbert, M., Inoue, C. Y. A., Jacobson, L., Lade, S. J., Lenton, T. M., McKay, D. I. A., Nakicenovic, N., Okereke, C., Otto, I. M., Pereira, L. M., … Zimm, C. (2023). Impacts of meeting minimum access on critical earth systems amidst the Great Inequality. Nature Sustainability, 6(2), 212–221. https://doi.org/10.1038/s41893-022-00995-5

Raworth, K. (2017). Doughnut economics: seven ways to think like a 21st century economist. Chelsea Green Publishing.

Rockström, J., Gupta, J., Qin, D., Lade, S. J., Abrams, J. F., Andersen, L. S., Armstrong McKay, D. I., Bai, X., Bala, G., Bunn, S. E., Ciobanu, D., DeClerck, F., Ebi, K., Gifford, L., Gordon, C., Hasan, S., Kanie, N., Lenton, T. M., Loriani, S., … Zhang, X. (2023). Safe and just Earth system boundaries. Nature, 619(7968), 102–111. https://doi.org/10.1038/s41586-023-06083-8

Scoones, I., Leach, M., & Newell, P. (2015). The Politics of Green Transformations (1st ed.). Routledge. https://doi.org/10.4324/9781315747378

Sharpe, S. (2023). Five Times Faster: Rethinking the Science, Economics, and Diplomacy of Climate Change (1st ed.). Cambridge University Press. https://doi.org/10.1017/9781009326506

Stadelmann-Steffen, I., Eder, C., Harring, N., Spilker, G., & Katsanidou, A. (2021). A framework for social tipping in climate change mitigation: What we can learn about social tipping dynamics from the chlorofluorocarbons phase-out. Energy Research & Social Science, 82, 102307. https://doi.org/10.1016/j.erss.2021.102307

Stoddard, I., Anderson, K., Capstick, S., Carton, W., Depledge, J., Facer, K., Gough, C., Hache, F., Hoolohan, C., Hultman, M., Hällström, N., Kartha, S., Klinsky, S., Kuchler, M., Lövbrand, E., Nasiritousi, N., Newell, P., Peters, G. P., Sokona, Y., … Williams, M. (2021). Three Decades of Climate Mitigation: Why Haven't We Bent the Global Emissions Curve? Annual Review of Environment and Resources, 46(1), 653–689. https://doi.org/10.1146/annurev-environ-012220-011104

Tàbara, J. D. (2023). Regenerative sustainability. A relational model of possibilities for the emergence of positive tipping points. Environmental Sociology, 9(4), 366–385. https://doi.org/10.1080/23251042.2023.2239538

Tàbara, J. D., & Chabay, I. (2013). Coupling Human Information and Knowledge Systems with social–ecological systems change: Reframing research, education, and policy for sustainability. Environmental Science & Policy, 28, 71–81. https://doi.org/10.1016/j.envsci.2012.11.005

Tàbara, J.D., Frantzeskaki, N., Hölscher, K., Pedde, S., Kok, K., Lamperti, F., Christensen, J. H., Jäger, J., & Berry, P. (2018). Positive tipping points in a rapidly warming world. Current Opinion in Environmental Sustainability, 31, 120–129. https://doi.org/10.1016/j.cosust.2018.01.012

Willis, R. (2020). Too hot to handle? The democratic challenge of climate change. Bristol University Press.

Chapter References 4.2

Allen, C., & Malekpour, S. (2023). Unlocking and accelerating transformations to the SDGs: a review of existing knowledge. Sustainability Science, 18(4), 1939–1960. https://doi.org/10.1007/s11625-023-01342-z

Alsop, R., Bertelsen, M. F., & Holland, J. (2006). Empowerment in practice: From analysis to implementation. World Bank Publications. https://documents.worldbank.org/en/publication/documents-reports/documentdetail/286191468315851702/empowerment-in-practice-from-analysis-to-implementation

Andersen, A. D., Geels, F. W., Coenen, L., Hanson, J., Korsnes, M., Linnerud, K., Makitie, T., Nordholm, A., Ryghaug, M., Skjolsvold, T., Steen, M., & Wiebe, K. (2023). Faster, broader, and deeper! Suggested directions for research on net-zero transitions. Oxford Open Energy, 2, oiad007. https://doi.org/10.1093/ooenergy/oiad007

Aschemann-Witzel, J., & Schulze, M. (2023). Transitions to plant-based diets: the role of societal tipping points. Current Opinion in Food Science, 51, 101015. https://doi.org/10.1016/j.cofs.2023.101015

Bandura, A. (1997). Self efficacy: the exercise of control. W H Freeman/ Times Books/ Henry Holt & Co.

Barbrook-Johnson, P., Sharpe, S., Pasqualino, R., de Moura, P., Nijsee, F., Vercoulen, P., Clark, A., Peñasco, C., Anadon, L., & Mercure, J. (2023). New Economic Models of Energy Innovation and Transition: Addressing New Questions and Providing Better Answers. https://issuu.com/universityofexeter/docs/2023iib045_-_eeist_project_summary_document_a5_sin

Bernstein, S., & Hoffmann, M. (2018). The politics of decarbonization and the catalytic impact of subnational climate experiments. Policy Sciences, 51(2), 189–211. https://doi.org/10.1007/s11077-018-9314-8

Bhowmik, A. K., McCaffrey, M. S., Ruskey, A. M., Frischmann, C., & Gaffney, O. (2020). Powers of 10: seeking 'sweet spots' for rapid climate and sustainability actions between individual and global scales. Environmental Research Letters, 15(9), 094011. https://doi.org/10.1088/1748-9326/ab9ed0

Bolderdijk, J. W., & Jans, L. (2021). Minority influence in climate change mitigation. Current Opinion in Psychology, 42, 25–30. https://doi.org/10.1016/j.copsyc.2021.02.005

Bostrom, A., Hayes, A. L., & Crosman, K. M. (2019). Efficacy, Action, and Support for Reducing Climate Change Risks. Risk Analysis, 39(4), 805–828. https://doi.org/10.1111/risa.13210

Centola, D., Becker, J., Brackbill, D., & Baronchelli, A. (2018). Experimental evidence for tipping points in social convention. Science, 360(6393), 1116–1119. https://doi.org/10.1126/science.aas8827

Chenoweth, E., & Stephan, M. J. (2011). Why civil resistance works: The strategic logic of nonviolent conflict. Columbia University Press.

Constantino, S. M., Sparkman, G., Kraft-Todd, G. T., Bicchieri, C., Centola, D., Shell-Duncan, B., Vogt, S., & Weber, E. U. (2022). Scaling Up Change: A Critical Review and Practical Guide to Harnessing Social Norms for Climate Action. Psychological Science in the Public Interest, 23(2), 50–97. https://doi.org/10.1177/15291006221105279

Eder, C., & Stadelmann-Steffen, I. (2023). Bringing the political system (back) into social tipping relevant to sustainability. Energy Policy, 177, 113529. https://doi.org/10.1016/j.enpol.2023.113529

Feldman, L., & Hart, P. S. (2016). Using Political Efficacy Messages to Increase Climate Activism: The Mediating Role of Emotions. Science Communication, 38(1), 99–127. https://doi.org/10.1177/1075547015617941

Fesenfeld, L. P., Schmid, N., Finger, R., Mathys, A., & Schmidt, T. S. (2022). The politics of enabling tipping points for sustainable development. One Earth, 5(10), 1100–1108. https://doi.org/10.1016/j.oneear.2022.09.004

Galafassi, D., Kagan, S., Milkoreit, M., Heras, M., Bilodeau, C., Bourke, S. J., Merrie, A., Guerrero, L., Pétursdóttir, G., & Tàbara, J. D. (2018). 'Raising the temperature': the arts on a warming planet. Current Opinion in Environmental Sustainability, 31, 71–79. https://doi.org/10.1016/j.cosust.2017.12.010

Gaupp, F., Constantino, S., & Pereira, L. (2023). The role of agency in social tipping processes [Preprint]. Sustainability science/Human/Earth system interactions/Other methods. https://doi.org/10.5194/egusphere-2023-1533

Geels, F. W., & Ayoub, M. (2023). A socio-technical transition perspective on positive tipping points in climate change mitigation: Analysing seven interacting feedback loops in offshore wind and electric vehicles acceleration. Technological Forecasting and Social Change, 193, 122639. https://doi.org/10.1016/j.techfore.2023.122639

Green, F. (2018). Anti-fossil fuel norms. Climatic Change, 150(1–2), 103–116. https://doi.org/10.1007/s10584-017-2134-6

Han, H. (2014). How organizations develop activists: civic associations and leadership in the 21st century. Oxford University Press.

Hebinck, A., Diercks, G., Von Wirth, T., Beers, P. J., Barsties, L., Buchel, S., Greer, R., Van Steenbergen, F., & Loorbach, D. (2022). An actionable understanding of societal transitions: the X-curve framework. Sustainability Science, 17(3), 1009–1021. https://doi.org/10.1007/s11625-021-01084-w

Köhler, J., Geels, F. W., Kern, F., Markard, J., Onsongo, E., Wieczorek, A., Alkemade, F., Avelino, F., Bergek, A., Boons, F., Fünfschilling, L., Hess, D., Holtz, G., Hyysalo, S., Jenkins, K., Kivimaa, P., Martiskainen, M., McMeekin, A., Mühlemeier, M. S., … Wells, P. (2019). An agenda for sustainability transitions research: State of the art and future directions. Environmental Innovation and Societal Transitions, 31, 1–32. https://doi.org/10.1016/j.eist.2019.01.004

Lam, A., & Mercure, J.-F. (2022). Evidence for a global electric vehicle tipping point. https://www.exeter.ac.uk/media/universityofexeter/globalsystemsinstitute/documents/Lam_et_al_Evidence_for_a_global_EV_TP.pdf

Laybourn-Langton, L., Quilter-Pinner, H., & Treloar, N. (2021). Making change: what works? Institute of Public Policy Research https://www.ippr.org/research/publications/making-change-what-works

Lenton, T. M., Benson, S., Smith, T., Ewer, T., Lanel, V., Petykowski, E., Powell, T. W. R., Abrams, J. F., Blomsma, F., & Sharpe, S. (2022). Operationalising positive tipping points towards global sustainability. Global Sustainability, 5, e1. https://doi.org/10.1017/sus.2021.30

Lockwood, M. (2013). The political sustainability of climate policy: The case of the UK Climate Change Act. Global Environmental Change, 23(5), 1339–1348. https://doi.org/10.1016/j.gloenvcha.2013.07.001

Loorbach, D., Frantzeskaki, N., & Avelino, F. (2017). Sustainability Transitions Research: Transforming Science and Practice for Societal Change. Annual Review of Environment and Resources, 42(1), 599–626. https://doi.org/10.1146/annurev-environ-102014-021340

Marshall, F., Dolley, J., & Priya, R. (2018). Transdisciplinary research as transformative space making for sustainability. Ecology and Society, 23(3).https://www.jstor.org/stable/26799132

Mealy, P., Barbrook-Johnson, P., Ives, M., Srivastav, S., & Hepburn, C. (2023). Sensitive Intervention Points: A strategic approach to climate action. Oxford Review of Economic Policy. https://www.inet.ox.ac.uk/files/No.-2023-15-Sensitive-Intervention-Points-a-strategic-approach-to-climate-action.pdf

Meldrum, M., Pinnell, L., Brennan, K., Romani, M., Sharpe, S., & Lenton, T. (2023). The Breakthrough Effect: How to trigger a cascade of tipping points to accelerate the net zero transition. https://www.systemiq.earth/wp-content/uploads/2023/01/The-Breakthrough-Effect.pdf

Milkoreit, M. (2017). Imaginary politics: Climate change and making the future. Elementa: Science of the Anthropocene, 5, 62. https://doi.org/10.1525/elementa.249

Moreno, C., Allam, Z., Chabaud, D., Gall, C., & Pratlong, F. (2021). Introducing the "15-Minute City": Sustainability, Resilience and Place Identity in Future Post-Pandemic Cities. Smart Cities, 4(1), 93–111. https://doi.org/10.3390/smartcities4010006

Newell, P., Daley, F., & Twena, M. (2022). Changing Our Ways: Behaviour Change and the Climate Crisis (1st ed.). Cambridge University Press. https://doi.org/10.1017/9781009104401

Newell, P., Twena, M., & Daley, F. (2021). Scaling behaviour change for a 1.5 degree world: Challenges and opportunities. Global Sustainability, 1–25. https://doi.org/10.1017/sus.2021.23

Nyborg, K., Anderies, J. M., Dannenberg, A., Lindahl, T., Schill, C., Schlüter, M., Adger, W. N., Arrow, K. J., Barrett, S., Carpenter, S., Chapin, F. S., Crépin, A.-S., Daily, G., Ehrlich, P., Folke, C., Jager, W., Kautsky, N., Levin, S. A., Madsen, O. J., … De Zeeuw, A. (2016). Social norms as solutions. Science, 354(6308), 42–43. https://doi.org/10.1126/science.aaf8317

O'Brien, K. (2015). Political agency: The key to tackling climate change. Science, 350(6265), 1170–1171. https://doi.org/10.1126/science.aad0267

Otto, I. M., Donges, J. F., Cremades, R., Bhowmik, A., Hewitt, R. J., Lucht, W., Rockström, J., Allerberger, F., McCaffrey, M., Doe, S. S. P., Lenferna, A., Morán, N., Van Vuuren, D. P., & Schellnhuber, H. J. (2020). Social tipping dynamics for stabilizing Earth's climate by 2050. Proceedings of the National Academy of Sciences, 117(5), 2354–2365. https://doi.org/10.1073/pnas.1900577117

Pahle, M., Burtraw, D., Flachsland, C., Kelsey, N., Biber, E., Meckling, J., Edenhofer, O., & Zysman, J. (2018). Sequencing to ratchet up climate policy stringency. Nature Climate Change, 8(10), 861–867. https://doi.org/10.1038/s41558-018-0287-6

Pereira, L. M., Smith, S. R., Gifford, L., Newell, P., Smith, B., Villasante, S., Achieng, T., Castro, A., Constantino, S. M., Ghadiali, A., Vogel, C., & Zimm, C. (2023). Risks, Ethics and Justice in the governance of positive tipping points [Preprint]. Sustainability science/Human/Earth system interactions/Other methods. https://doi.org/10.5194/egusphere-2023-1454

Plutzer, E., McCaffrey, M., Hannah, A. L., Rosenau, J., Berbeco, M., & Reid, A. H. (2016). Climate confusion among U.S. teachers. Science, 351(6274), 664–665. https://doi.org/10.1126/science.aab3907

Rockström, J., Gupta, J., Qin, D., Lade, S. J., Abrams, J. F., Andersen, L. S., Armstrong McKay, D. I., Bai, X., Bala, G., Bunn, S. E., Ciobanu, D., DeClerck, F., Ebi, K., Gifford, L., Gordon, C., Hasan, S., Kanie, N., Lenton, T. M., Loriani, S., … Zhang, X. (2023). Safe and just Earth system boundaries. Nature, 619(7968), 102–111. https://doi.org/10.1038/s41586-023-06083-8

Rogers, E. (1995). Diffusion of innovations-5th edition Free Press. New York.

Rosenbloom, D., Meadowcroft, J., & Cashore, B. (2019). Stability and climate policy? Harnessing insights on path dependence, policy feedback, and transition pathways. Energy Research & Social Science, 50, 168–178. https://doi.org/10.1016/j.erss.2018.12.009

Schmid, N., Sewerin, S., & Schmidt, T. S. (2020). Explaining Advocacy Coalition Change with Policy Feedback. Policy Studies Journal, 48(4), 1109–1134. https://doi.org/10.1111/psj.12365

Schmidt, T. S., & Sewerin, S. (2017). Technology as a driver of climate and energy politics. Nature Energy, 2(6), 17084. https://doi.org/10.1038/nenergy.2017.84

Schneider, C. R., & Van Der Linden, S. (2023). Social norms as a powerful lever for motivating pro-climate actions. One Earth, 6(4), 346–351. https://doi.org/10.1016/j.oneear.2023.03.014

Sharpe, S., & Lenton, T. M. (2021). Upward-scaling tipping cascades to meet climate goals: plausible grounds for hope. Climate Policy, 21(4), 421–433. https://doi.org/10.1080/14693062.2020.1870097

Skjølsvold, T. M., & Coenen, L. (2021). Are rapid and inclusive energy and climate transitions oxymorons? Towards principles of responsible acceleration. Energy Research & Social Science, 79, 102164. https://doi.org/10.1016/j.erss.2021.102164

Smith, S. R. (2023). Enabling a political tipping point for rapid decarbonisation in the United Kingdom [Preprint]. Climate change/Other interactions/Other methods. https://doi.org/10.5194/egusphere-2023-1674

Stadelmann-Steffen, I., Eder, C., Harring, N., Spilker, G., & Katsanidou, A. (2021). A framework for social tipping in climate change mitigation: What we can learn about social tipping dynamics from the chlorofluorocarbons phase-out. Energy Research & Social Science, 82, 102307. https://doi.org/10.1016/j.erss.2021.102307

Stern, M. J. (2018). Social Science Theory for Environmental Sustainability (Vol. 1). Oxford University Press. https://doi.org/10.1093/oso/9780198793182.001.0001

Stoddard, I., Anderson, K., Capstick, S., Carton, W., Depledge, J., Facer, K., Gough, C., Hache, F., Hoolohan, C., Hultman, M., Hällström, N., Kartha, S., Klinsky, S., Kuchler, M., Lövbrand, E., Nasiritousi, N., Newell, P., Peters, G. P., Sokona, Y., … Williams, M. (2021). Three Decades of Climate Mitigation: Why Haven't We Bent the Global Emissions Curve? Annual Review of Environment and Resources, 46(1), 653–689. https://doi.org/10.1146/annurev-environ-012220-011104

Suri, T., & Jack, W. (2016). The long-run poverty and gender impacts of mobile money. Science, 354(6317), 1288–1292. https://doi.org/10.1126/science.aah5309

Törnberg, A. (2018). Combining transition studies and social movement theory: towards a new research agenda. Theory and Society, 47(3), 381–408. https://doi.org/10.1007/s11186-018-9318-6

Weber, E. U., Constantino, S. M., & Schlüter, M. (2023). Embedding Cognition: Judgment and Choice in an Interdependent and Dynamic World. Current Directions in Psychological Science, 32(4), 328–336. https://doi.org/10.1177/09637214231159282

Winkelmann, R., Donges, J. F., Smith, E. K., Milkoreit, M., Eder, C., Heitzig, J., Katsanidou, A., Wiedermann, M., Wunderling, N., & Lenton, T. M. (2022). Social tipping processes towards climate action: A conceptual framework. Ecological Economics, 192, 107242. https://doi.org/10.1016/j.ecolecon.2021.107242

Xie, J., Sreenivasan, S., Korniss, G., Zhang, W., Lim, C., & Szymanski, B. K. (2011). Social consensus through the influence of committed minorities. Physical Review E, 84(1), 011130. https://doi.org/10.1103/PhysRevE.84.011130

Yoeli, E., Hoffman, M., Rand, D. G., & Nowak, M. A. (2013). Powering up with indirect reciprocity in a large-scale field experiment. Proceedings of the National Academy of Sciences, 110(supplement_2), 10424–10429. https://doi.org/10.1073/pnas.1301210110

Zografos, C., & Robbins, P. (2020). Green Sacrifice Zones, or Why a Green New Deal Cannot Ignore the Cost Shifts of Just Transitions. One Earth, 3(5), 543–546. https://doi.org/10.1016/j.oneear.2020.10.012

Chapter References 4.3

Creutzig, F., Niamir, L., Bai, X., Callaghan, M., Cullen, J., Díaz-José, J., Figueroa, M., Grubler, A., Lamb, W. F., Leip, A., Masanet, E., Mata, É., Mattauch, L., Minx, J. C., Mirasgedis, S., Mulugetta, Y., Nugroho, S. B., Pathak, M., Perkins, P., … Ürge-Vorsatz, D. (2022). Demand-side solutions to climate change mitigation consistent with high levels of well-being. Nature Climate Change, 12(1), 36–46. https://doi.org/10.1038/s41558-021-01219-y

Fesenfeld, L. P., Schmid, N., Finger, R., Mathys, A., & Schmidt, T. S. (2022). The politics of enabling tipping points for sustainable development. One Earth, 5(10), 1100–1108. https://doi.org/10.1016/j.oneear.2022.09.004

Geels, F. W., & Ayoub, M. (2023). A socio-technical transition perspective on positive tipping points in climate change mitigation: Analysing seven interacting feedback loops in offshore wind and electric vehicles acceleration. Technological Forecasting and Social Change, 193, 122639. https://doi.org/10.1016/j.techfore.2023.122639

Geels, F. W., Schwanen, T., Sorrell, S., Jenkins, K., & Sovacool, B. K. (2018). Reducing energy demand through low carbon innovation: A sociotechnical transitions perspective and thirteen research debates. Energy Research & Social Science, 40, 23–35. https://doi.org/10.1016/j.erss.2017.11.003

Intergovernmental Panel On Climate Change (IPCC) (Ed.). (2023). Climate Change 2022 - Mitigation of Climate Change: Working Group III Contribution to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change (1st ed.). Cambridge University Press. https://doi.org/10.1017/9781009157926

Newell, P., Twena, M., & Daley, F. (2021). Scaling behaviour change for a 1.5 degree world: Challenges and opportunities. Global Sustainability, 1–25. https://doi.org/10.1017/sus.2021.23

Trebeck, K., & Williams, J. (2019). The economics of arrival: ideas for a grown-up economy. Policy Press.

4.3.1

Allcott, H. (2011). Social norms and energy conservation. Journal of Public Economics, 95(9–10), 1082–1095. https://doi.org/10.1016/j.jpubeco.2011.03.003

Bergquist, M., Thiel, M., Goldberg, M. H., & Van Der Linden, S. (2023). Field interventions for climate change mitigation behaviors: A second-order meta-analysis. Proceedings of the National Academy of Sciences, 120(13), e2214851120. https://doi.org/10.1073/pnas.2214851120

Berner, A., Bruns, S., Moneta, A., & Stern, D. I. (2022). Do energy efficiency improvements reduce energy use? Empirical evidence on the economy-wide rebound effect in Europe and the United States. Energy Economics, 110, 105939.
https://doi.org/10.1016/j.eneco.2022.105939Bonan, J., Cattaneo, C., d'Adda, G., & Tavoni, M. (2020). The interaction of descriptive and injunctive social norms in promoting energy conservation. Nature Energy, 5(11), 900–909. https://doi.org/10.1038/s41560-020-00719-z

Brockway, P. E., Sorrell, S., Semieniuk, G., Heun, M. K., & Court, V. (2021). Energy efficiency and economy-wide rebound effects: A review of the evidence and its implications. Renewable and Sustainable Energy Reviews, 141, 110781. https://doi.org/10.1016/j.rser.2021.110781

Büchs, M., Cass, N., Mullen, C., Lucas, K., & Ivanova, D. (2023). Emissions savings from equitable energy demand reduction. Nature Energy, 8(7), 758–769. https://doi.org/10.1038/s41560-023-01283-y

Clark, A., Songli, Z., Ives, M. and Grubb, M. (2021). The New Economics of Innovation and Transition: Evaluating Opportunities and Risks. EEIST, University of Exeter. https://eeist.co.uk/eeist-reports/the-new-economics-of-innovation-and-transition-evaluating-opportunities-and-risks/#

Cohen, J., Azarova, V., Kollmann, A., & Reichl, J. (2019). Q-complementarity in household adoption of photovoltaics and electricity-intensive goods: The case of electric vehicles. Energy Economics, 83, 567–577. https://doi.org/10.1016/j.eneco.2019.08.004

Creutzig, F., Fernandez, B., Haberl, H., Khosla, R., Mulugetta, Y., & Seto, K. C. (2016). Beyond Technology: Demand-Side Solutions for Climate Change Mitigation. Annual Review of Environment and Resources, 41(1), 173–198. https://doi.org/10.1146/annurev-environ-110615-085428

Creutzig, F., Niamir, L., Bai, X., Callaghan, M., Cullen, J., Díaz-José, J., Figueroa, M., Grubler, A., Lamb, W. F., Leip, A., Masanet, E., Mata, É., Mattauch, L., Minx, J. C., Mirasgedis, S., Mulugetta, Y., Nugroho, S. B., Pathak, M., Perkins, P., … Ürge-Vorsatz, D. (2022). Demand-side solutions to climate change mitigation consistent with high levels of well-being. Nature Climate Change, 12(1), 36–46. https://doi.org/10.1038/s41558-021-01219-y

Devine-Wright, P. (2007). Reconsidering public attitudes and public acceptance of renewable energy technologies: a critical review. Beyond Nimbyism: a multidisciplinary investigation of public engagement with renewable energy technologies, 15. Online at https://geography.exeter.ac.uk/beyond_nimbyism/deliverables/bn_wp1_4.pdf
Accessed on 22 August 2023

Drummond, P., Ferraz, J.C., and Ramos, L. (n.d.). Wind Energy in the UK and Brazil. Appendix 1: The New Economics of Innovation and Transition: Evaluating Opportunities and Risks. University of Exeter. Retrieved 22 August 2023, from https://eeist.co.uk/eeist-reports/the-new-economics-of-innovation-and-transition-evaluating-opportunities-and-risks/

Du, S., Cao, G., & Huang, Y. (2022). The effect of income satisfaction on the relationship between income class and pro-environment behavior. Applied Economics Letters, 1–4. https://doi.org/10.1080/13504851.2022.2125491

European Social Survey (2020) - ESS8 - European Social Survey 2020, round 8. Welfare attitudes, Attitudes to climate change - integrated file, edition 2.2 [Data set]. Sikt - Norwegian Agency for Shared Services in Education and Research. https://doi.org/10.21338/ESS8E02_2

Eurostat. (2022). EU gas consumption down by 20.1% - Products Eurostat News - Eurostat. https://ec.europa.eu/eurostat/web/products-eurostat-news/w/DDN-20221220-3

Fanning, A. L., & O'Neill, D. W. (2019). The Wellbeing–Consumption paradox: Happiness, health, income, and carbon emissions in growing versus non-growing economies. Journal of Cleaner Production, 212, 810–821. https://doi.org/10.1016/j.jclepro.2018.11.223

Freier, J., & Von Loessl, V. (2022). Dynamic electricity tariffs: Designing reasonable pricing schemes for private households. Energy Economics, 112, 106146. https://doi.org/10.1016/j.eneco.2022.106146

Geels, F. W. (2023). Demand-side emission reduction through behavior change or technology adoption? Empirical evidence from UK heating, mobility, and electricity use. One Earth, 6(4), 337–340. https://doi.org/10.1016/j.oneear.2023.03.012

Geels, F. W., & Ayoub, M. (2023). A socio-technical transition perspective on positive tipping points in climate change mitigation: Analysing seven interacting feedback loops in offshore wind and electric vehicles acceleration. Technological Forecasting and Social Change, 193, 122639. https://doi.org/10.1016/j.techfore.2023.122639

Giotitsas, C., Nardelli, P. H. J., Williamson, S., Roos, A., Pournaras, E., & Kostakis, V. (2022). Energy governance as a commons: Engineering alternative socio-technical configurations. Energy Research & Social Science, 84, 102354. https://doi.org/10.1016/j.erss.2021.102354

Göckeritz, S., Schultz, P. W., Rendón, T., Cialdini, R. B., Goldstein, N. J., & Griskevicius, V. (2009). Descriptive normative beliefs and conservation behavior: The moderating roles of personal involvement and injunctive normative beliefs. European Journal of Social Psychology, n/a-n/a. https://doi.org/10.1002/ejsp.643

Graziano, M., & Gillingham, K. (2015). Spatial patterns of solar photovoltaic system adoption: The influence of neighbors and the built environment. Journal of Economic Geography, 15(4), 815–839. https://doi.org/10.1093/jeg/lbu036

Groenewoudt, A. C., Romijn, H. A., & Alkemade, F. (2020). From fake solar to full service: An empirical analysis of the solar home systems market in Uganda. Energy for Sustainable Development, 58, 100–111. https://doi.org/10.1016/j.esd.2020.07.004

Haegel, N. M., Atwater, H., Barnes, T., Breyer, C., Burrell, A., Chiang, Y.-M., De Wolf, S., Dimmler, B., Feldman, D., Glunz, S., Goldschmidt, J. C., Hochschild, D., Inzunza, R., Kaizuka, I., Kroposki, B., Kurtz, S., Leu, S., Margolis, R., Matsubara, K., … Bett, A. W. (2019). Terawatt-scale photovoltaics: Transform global energy. Science, 364(6443), 836–838. https://doi.org/10.1126/science.aaw1845

Horne, C., & Kennedy, E. H. (2017). The power of social norms for reducing and shifting electricity use. Energy Policy, 107, 43–52. https://doi.org/10.1016/j.enpol.2017.04.029

International Energy Agency (IEA). (2023a) Net Zero Roadmap: A Global Pathway to Keep the 1.5 °C Goal in Reach. Available at: https://iea.blob.core.windows.net/assets/d0ba63c5-9d93-4457-be03-da0f1405a5dd/NetZeroRoadmap_AGlobalPathwaytoKeepthe1.5CGoalinReach-2023Update.pdfIEA (2023a). Global CO2 emissions by sector, 2019-2022, IEA, Paris https://www.iea.org/data-and-statistics/charts/global-co2-emissions-by-sector-2019-2022

IEA (2023b), Europe's energy crisis: What factors drove the record fall in natural gas demand in 2022?, IEA, Paris https://www.iea.org/commentaries/europe-s-energy-crisis-what-factors-drove-the-record-fall-in-natural-gas-demand-in-2022

IEA (2022a), Renewables 2022, IEA, Paris https://www.iea.org/reports/renewables-2022

IEA (2022b), Heating, IEA, Paris https://www.iea.org/reports/heating

IEA (2022c), The Future of Heat Pumps, IEA, Paris https://www.iea.org/reports/the-future-of-heat-pumps

IEA (2021a). Electricity total final consumption by sector, 1971-2019, IEA, Paris https://www.iea.org/data-and-statistics/charts/electricity-total-final-consumption-by-sector-1971-2019

IEA (2021b). Year-on-year change in fossil fuel production in OECD countries, 2019-2020, IEA, Paris https://www.iea.org/data-and-statistics/charts/year-on-year-change-in-fossil-fuel-production-in-oecd-countries-2019-2020

Intergovernmental Panel On Climate Change (IPCC), & M. Pathak, R. Slade, P.R. Shukla, J. Skea, R. Pichs-Madruga, D. Ürge-Vorsatz,2022 (Eds.). (2023). Technical Summary. In Climate Change 2022 - Mitigation of Climate Change (1st ed., pp. 51–148). Cambridge University Press. https://doi.org/10.1017/9781009157926.002

IPCC, & P.R. Shukla, J. Skea, A. Reisinger, R. Slade, R. Fradera, M. Pathak, A. Al Khourdajie, M. Belkacemi, R. van Diemen, A. Hasija, G. Lisboa, S. Luz, J. Malley, D. McCollum, S. Some, P. Vyas, (Eds.). (2022). Summary for Policymakers. In Climate Change 2022 - Mitigation of Climate Change (1st ed., pp. 3–48). Cambridge University Press. https://doi.org/10.1017/9781009157926.001

IRENA. (2022a). Renewable Power Generation Costs in 2021. https//www.irena.org/publications/2022/Jul/Renewable-Power-Generation-Costs-in-2021

IRENA. (2022b). Renewable Technology Innovation Indicators: Mapping progress in costs, patents and standards, International Renewable Energy Agency. https://www.irena.org/publications/2022/Mar/Renewable-Technology-Innovation-Indicators

RIENA. (2023). Renewable capacity highlights,. https://www.irena.org/publications/2022/Jul/Renewable-Power-Generation-Costs-in-2021

Ivanova, D., Barrett, J., Wiedenhofer, D., Macura, B., Callaghan, M., & Creutzig, F. (2020). Quantifying the potential for climate change mitigation of consumption options. Environmental Research Letters, 15(9), 093001. https://doi.org/10.1088/1748-9326/ab8589

Karimirad, M., Rosa-Clot, M., Armstrong, A., & Whittaker, T. (2021). Floating solar: Beyond the state of the art technology. Solar Energy, 219, 1–2. https://doi.org/10.1016/j.solener.2021.02.034

Kavlak, G., McNerney, J., & Trancik, J. E. (2018). Evaluating the causes of cost reduction in photovoltaic modules. Energy Policy, 123, 700–710. https://doi.org/10.1016/j.enpol.2018.08.015

Kern, F., Smith, A., Shaw, C., Raven, R., & Verhees, B. (2014). From laggard to leader: Explaining offshore wind developments in the UK. Energy Policy, 69, 635–646. https://doi.org/10.1016/j.enpol.2014.02.031

Köhler, J., Geels, F. W., Kern, F., Markard, J., Onsongo, E., Wieczorek, A., Alkemade, F., Avelino, F., Bergek, A., Boons, F., Fünfschilling, L., Hess, D., Holtz, G., Hyysalo, S., Jenkins, K., Kivimaa, P., Martiskainen, M., McMeekin, A., Mühlemeier, M. S., ... Wells, P. (2019). An agenda for sustainability transitions research: State of the art and future directions. Environmental Innovation and Societal Transitions, 31, 1–32. https://doi.org/10.1016/j.eist.2019.01.004

Koide, R., Lettenmeier, M., Akenji, L., Toivio, V., Amellina, A., Khodke, A., Watabe, A., & Kojima, S. (2021). Lifestyle carbon footprints and changes in lifestyles to limit global warming to 1.5 °C, and ways forward for related research. Sustainability Science, 16(6), 2087–2099. https://doi.org/10.1007/s11625-021-01018-6

Klok, C. W., Kirkels, A. F., and Alkemade, F. (2023). Impacts, procedural processes, and local context: Rethinking the social acceptance of wind energy projects in the Netherlands. Energy Research and Social Science, 99, 103044. https://doi.org/10.1016/j.erss.2023.10304

Meckling, J. (2019). Governing renewables: Policy feedback in a global energy transition. Environment and Planning C: Politics and Space, 37(2), 317–338. https://doi.org/10.1177/2399654418777765

Meldrum, M., Pinnell, L., Brennan, K., Romani, M., Sharpe, S., & Lenton, T. (2023). The Breakthrough Effect: How to trigger a cascade of tipping points to accelerate the net zero transition.https://www.systemiq.earth/wp-content/uploads/2023/01/The-Breakthrough-Effect.pdf

Nemet, G., & Greene, J. (2022). Innovation in low-energy demand and its implications for policy. Oxford Open Energy, 1, oiac003. https://doi.org/10.1093/ooenergy/oiac003

Newell, P., Twena, M., & Daley, F. (2021). Scaling behaviour change for a 1.5 degree world: Challenges and opportunities. Global Sustainability, 1–25. https://doi.org/10.1017/sus.2021.23

Niamir, L., Kiesewetter, G., Wagner, F., Schöpp, W., Filatova, T., Voinov, A., & Bressers, H. (2020). Assessing the macroeconomic impacts of individual behavioral changes on carbon emissions. Climatic Change, 158(2), 141–160. https://doi.org/10.1007/s10584-019-02566-8

Nicolson, M. L., Fell, M. J., & Huebner, G. M. (2018). Consumer demand for time of use electricity tariffs: A systematized review of the empirical evidence. Renewable and Sustainable Energy Reviews, 97, 276–289. https://doi.org/10.1016/j.rser.2018.08.040

Nisa, C. F., Bélanger, J. J., Schumpe, B. M., & Faller, D. G. (2019). Meta-analysis of randomised controlled trials testing behavioural interventions to promote household action on climate change. Nature Communications, 10(1), 4545. https://doi.org/10.1038/s41467-019-12457-2

Otto, I. M., Donges, J. F., Cremades, R., Bhowmik, A., Hewitt, R. J., Lucht, W., Rockström, J., Allerberger, F., McCaffrey, M., Doe, S. S. P., Lenferna, A., Morán, N., Van Vuuren, D. P., & Schellnhuber, H. J. (2020). Social tipping dynamics for stabilizing Earth's climate by 2050. Proceedings of the National Academy of Sciences, 117(5), 2354–2365. https://doi.org/10.1073/pnas.1900577117

OurWorldInData (2022). Electricity production by source. Online. Available at: https://ourworldindata.org/grapher/electricity-prod-source-stacked?country=Non-OECD+%28EI%29~OECD+%28EI%29 Accessed on 22 Aug 2023

Pauw, W. P., Moslener, U., Zamarioli, L. H., Amerasinghe, N., Atela, J., Affana, J. P. B., Buchner, B., Klein, R. J. T., Mbeva, K. L., Puri, J., Roberts, J. T., Shawoo, Z., Watson, C., & Weikmans, R. (2022). Post-2025 climate finance target: how much more and how much better? Climate Policy, 22(9–10), 1241–1251. https://doi.org/10.1080/14693062.2022.2114985

Poortinga, W., Fisher, S., Bohm, G., Steg, L., Whitmarsh, L., & Ogunbode, C. (2018). European attitudes to climate change and energy. Topline results from Round 8 of the European Social Survey.

Pouran, H. M., Padilha Campos Lopes, M., Nogueira, T., Alves Castelo Branco, D., & Sheng, Y. (2022). Environmental and technical impacts of floating photovoltaic plants as an emerging clean energy technology. IScience, 25(11), 105253. https://doi.org/10.1016/j.isci.2022.105253

Richmond, A. K., & Kaufmann, R. K. (2006). Is there a turning point in the relationship between income and energy use and/or carbon emissions? Ecological Economics, 56(2), 176–189. https://doi.org/10.1016/j.ecolecon.2005.01.011

Ritchie, H., Rosado, P., & Roser, M. (2023). Emissions by sector. Our World in Data. https://ourworldindata.org/emissions-by-sector

Roberts, C., Geels, F. W., Lockwood, M., Newell, P., Schmitz, H., Turnheim, B., & Jordan, A. (2018). The politics of accelerating low-carbon transitions: Towards a new research agenda. Energy Research & Social Science, 44, 304–311. https://doi.org/10.1016/j.erss.2018.06.001

Rogers, E. (1995). Diffusion of innovations–5th edition Free Press. New York.

Rosenbloom, D., Meadowcroft, J., & Cashore, B. (2019). Stability and climate policy? Harnessing insights on path dependence, policy feedback, and transition pathways. Energy Research & Social Science, 50, 168–178. https://doi.org/10.1016/j.erss.2018.12.009

Roy, J., Dowd, A.-M., Muller, A., Pal, S., Prata, N., & Lemmet, S. (2012). Lifestyles, Well-Being and Energy. In Global Energy Assessment Writing Team (Ed.), Global Energy Assessment: Toward a Sustainable Future (pp. 1527–1548). Cambridge University Press. https://doi.org/10.1017/CBO9780511793677.027

Sewerin, S., Béland, D., & Cashore, B. (2020). Designing policy for the long term: agency, policy feedback and policy change. Policy Sciences, 53(2), 243–252. https://doi.org/10.1007/s11077-020-09391-2

Sharpe, S., & Lenton, T. M. (2021). Upward-scaling tipping cascades to meet climate goals: plausible grounds for hope. Climate Policy, 21(4), 421–433. https://doi.org/10.1080/14693062.2020.1870097
Sorrell, S., Gatersleben, B., & Druckman, A. (2020). The limits of energy sufficiency: A review of the evidence for rebound effects and negative spillovers from behavioural change. Energy Research & Social Science, 64, 101439. https://doi.org/10.1016/j.erss.2020.101439
Steg, L. (2023). Psychology of Climate Change. Annual Review of Psychology, 74(1), 391–421. https://doi.org/10.1146/annurev-psych-032720-042905
Steg, L., Shwom, R., & Dietz, T. (2018). What Drives Energy Consumers?: Engaging People in a Sustainable Energy Transition. IEEE Power and Energy Magazine, 16(1), 20–28. https://doi.org/10.1109/MPE.2017.2762379
Steg, L., & Vlek, C. (2009). Encouraging pro-environmental behaviour: An integrative review and research agenda. Journal of Environmental Psychology, 29(3), 309–317. https://doi.org/10.1016/j.jenvp.2008.10.004
Stern, D. I. (2020). How large is the economy-wide rebound effect? Energy Policy, 147, 111870. https://doi.org/10.1016/j.enpol.2020.111870
Thøgersen, J., & Crompton, T. (2009). Simple and Painless? The Limitations of Spillover in Environmental Campaigning. Journal of Consumer Policy, 32(2), 141–163. https://doi.org/10.1007/s10603-009-9101-1
Truelove, H. B., Yeung, K. L., Carrico, A. R., Gillis, A. J., & Raimi, K. T. (2016). From plastic bottle recycling to policy support: An experimental test of pro-environmental spillover. Journal of Environmental Psychology, 46, 55–66. https://doi.org/10.1016/j.jenvp.2016.03.004
Van Den Bergh, J. C. J. M. (2011). Energy Conservation More Effective With Rebound Policy. Environmental and Resource Economics, 48(1), 43–58. https://doi.org/10.1007/s10640-010-9396-z
Van Der Kam, M. J., Meelen, A. A. H., Van Sark, W. G. J. H. M., & Alkemade, F. (2018). Diffusion of solar photovoltaic systems and electric vehicles among Dutch consumers: Implications for the energy transition. Energy Research & Social Science, 46, 68–85. https://doi.org/10.1016/j.erss.2018.06.003
Voestalpine greentec steel - greentec steel. (n.d.). Retrieved 28 June 2023, from https://www.voestalpine.com/greentecsteel/en/
Wang, S., Hausfather, Z., Davis, S., Lloyd, J., Olson, E. B., Liebermann, L., Núñez-Mujica, G. D., & McBride, J. (2023). Future demand for electricity generation materials under different climate mitigation scenarios. Joule, 7(2), 309–332. https://doi.org/10.1016/j.joule.2023.01.001
Wilson, C., Kerr, L., Sprei, F., Vrain, E., & Wilson, M. (2020). Potential Climate Benefits of Digital Consumer Innovations. Annual Review of Environment and Resources, 45(1), 113–144. https://doi.org/10.1146/annurev-environ-012320-082424
Windemer, R. (2023). Acceptance should not be assumed. How the dynamics of social acceptance changes over time, impacting onshore wind repowering. Energy Policy, 173, 113363. https://doi.org/10.1016/j.enpol.2022.113363
Wolske, K. S., Gillingham, K. T., & Schultz, P. W. (2020). Peer influence on household energy behaviours. Nature Energy, 5(3), 202–212. https://doi.org/10.1038/s41560-019-0541-9

4.3.2

African Commute. (2018, May 18). The African commute: city transport trends. ASME ISHOW / IDEA LAB. https://medium.com/impact-engineered/the-african-commute-city-transport-trends-cf369e5106bd

Arnz, M., & Krumm, A. (2023). Sufficiency in passenger transport and its potential for lowering energy demand. Environmental Research Letters, 18(9), 094008. https://doi.org/10.1088/1748-9326/acea98

Asensio, O. I., Apablaza, C. Z., Lawson, M. C., Chen, E. W., & Horner, S. J. (2022). Impacts of micromobility on car displacement with evidence from a natural experiment and geofencing policy. Nature Energy, 7(11), 1100–1108. https://doi.org/10.1038/s41560-022-01135-1

Ballot, E., & Fontane, F. (2010). Reducing transportation CO_2 emissions through pooling of supply networks: perspectives from a case study in French retail chains. Production Planning & Control, 21(6), 640–650. https://doi.org/10.1080/09537287.2010.489276

Barbrook-Johnson, P., Sharpe, S., Pasqualino, R., de Moura, P.S., Nijsee, F., Vercoulen, P., Clark, A., Peñasco, C., Anadon, L.D. and Mercure, J.F. (2023). New economic models of energy innovation and transition: Addressing new questions and providing better answers. EEIST. file:///C:/Users/cm982/Downloads/New-economic-models-of-energy-innovation-and-transition_May23-1.pdf

Becker, S., Von Schneidemesser, D., Caseiro, A., Götting, K., Schmitz, S., & Von Schneidemesser, E. (2022). Pop-up cycling infrastructure as a niche innovation for sustainable transportation in European cities: An inter- and transdisciplinary case study of Berlin. Sustainable Cities and Society, 87, 104168. https://doi.org/10.1016/j.scs.2022.104168

Bhardwaj, C., Axsen, J., & McCollum, D. (2022). How to design a zero-emissions vehicle mandate? Simulating impacts on sales, GHG emissions and cost-effectiveness using the AUtomaker-Consumer Model (AUM). Transport Policy, 117, 152–168. https://doi.org/10.1016/j.tranpol.2021.12.012

Brand, C., Dons, E., Anaya-Boig, E., Avila-Palencia, I., Clark, A., De Nazelle, A., Gascon, M., Gaupp-Berghausen, M., Gerike, R., Götschi, T., Iacorossi, F., Kahlmeier, S., Laeremans, M., Nieuwenhuijsen, M. J., Pablo Orjuela, J., Racioppi, F., Raser, E., Rojas-Rueda, D., Standaert, A., … Int Panis, L. (2021). The climate change mitigation effects of daily active travel in cities. Transportation Research Part D: Transport and Environment, 93, 102764. https://doi.org/10.1016/j.trd.2021.102764

City of Cape Town. (2005). NMT Policy and Strategy Volume 1: Status Quo Assessment. https://resource.capetown.gov.za/documentcentre/Documents/City%20strategies,%20plans%20and%20frameworks/NMT_Policy_and_Strategy_Volume_1_Status_Qou_Assessment.pdf

City of Cape Town. (2017). CITY OF CAPE TOWN Cycling Strategy. https://resource.capetown.gov.za/documentcentre/Documents/City%20strategies,%20plans%20and%20frameworks/CCT_Cycling_Strategy.pdf

City of Cape Town. (2021). Comprehensive Integrated Transport Plan 2018 – 2023. https://resource.capetown.gov.za/documentcentre/Documents/City%20strategies,%20plans%20and%20frameworks/Comprehensive%20Integrated%20Transport%20Plan.pdf

Cloke, J., Layfield, R. E. (1996). The Environmental Impacts Of Traffic Management Schemes. https://www.witpress.com/Secure/elibrary/papers/UT96/UT96021FU.pdf

Climate and Development Knowledge Network (CDKN). (2021). Promoting Non-motorized Transport in Nairobi: A Study on Users, Safety and Infrastructure Trends – Africa Portal. https://africaportal.org/publication/promoting-non-motorized-transport-nairobi-study-users-safety-and-infrastructure-trends/

Creutzig, F., Jochem, P., Edelenbosch, O. Y., Mattauch, L., Vuuren, D. P. V., McCollum, D., & Minx, J. (2015). Transport: A roadblock to climate change mitigation? Science, 350(6263), 911–912. https://doi.org/10.1126/science.aac8033

Creutzig, F., Lohrey, S., & Franza, M. V. (2022). Shifting urban mobility patterns due to COVID-19: comparative analysis of implemented urban policies and travel behaviour changes with an assessment of overall GHG emissions implications. Environmental Research: Infrastructure and Sustainability, 2(4), 041003. https://doi.org/10.1088/2634-4505/ac949b

Creutzig, F., Niamir, L., Bai, X., Callaghan, M., Cullen, J., Díaz-José, J., Figueroa, M., Grubler, A., Lamb, W. F., Leip, A., Masanet, E., Mata, É., Mattauch, L., Minx, J. C., Mirasgedis, S., Mulugetta, Y., Nugroho, S. B., Pathak, M., Perkins, P., … Ürge-Vorsatz, D. (2022). Demand-side solutions to climate change mitigation consistent with high levels of well-being. Nature Climate Change, 12(1), 36–46. https://doi.org/10.1038/s41558-021-01219-y

Curtis, C., & Scheurer, J. (2017). Performance measures for public transport accessibility: Learning from international practice. Journal of Transport and Land Use, 10(1), 93–118. https://doi.org/10.5198/jtlu.2015.683

Department for Transport. (2021). Statistical Release 28 January 2021National Travel Attitudes Study: Wave 4 (Final). https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/956170/national-travel-attitudes-study-wave-4-final.pdf

Farmer, J. D., & Lafond, F. (2016). How predictable is technological progress? Research Policy, 45(3), 647–665. https://doi.org/10.1016/j.respol.2015.11.001

Feddes, F., & Lange, M. de. (2019). Bicycle city Amsterdam: how Amsterdam became the cycling capital of the world. Bas Lubberhuizen.

Geels, F. W., & Ayoub, M. (2023). A socio-technical transition perspective on positive tipping points in climate change mitigation: Analysing seven interacting feedback loops in offshore wind and electric vehicles acceleration. Technological Forecasting and Social Change, 193, 122639. https://doi.org/10.1016/j.techfore.2023.122639

Goetsch, H., & Quiros, T. (2020, August 7). COVID-19 creates new momentum for cycling and walking. We can't let it go to waste! https://blogs.worldbank.org/transport/covid-19-creates-new-momentum-cycling-and-walking-we-cant-let-it-go-waste

Hanson, S., & Jones, A. (2015). Is there evidence that walking groups have health benefits? A systematic review and meta-analysis. British Journal of Sports Medicine, 49(11), 710–715.http://dx.doi.org/10.1136/bjsports-2014-09415

International Energy Agency (IEA) (2023) Global EV Data Explorer – Data Tools. (2023, November 2). IEA. https://www.iea.org/data-and-statistics/data-tools/global-ev-data-explorer

Intergovernmental Panel On Climate Change (IPCC). (2023). Climate Change 2022 – Impacts, Adaptation and Vulnerability: Working Group II Contribution to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change (1st ed.). Cambridge University Press. https://doi.org/10.1017/9781009325844

International Transport Forum (ITF). (2023). ITF Transport Outlook 2023. OECD. https://doi.org/10.1787/b6cc9ad5-en

Jittrapirom, P., Bekius, F., & Führer, K. (2023). Visioning future transport systems with an integrated robust and generative framework. Scientific Reports, 13(1), 4316. https://doi.org/10.1038/s41598-023-30818-2

United Nations Environmental Programme (UNEP) (2018) 'Kenya prioritizes non-motorized transport to enhance road safety'. (2018, December 19). . http://www.unep.org/news-and-stories/blogpost/kenya-prioritizes-non-motorized-transport-enhance-road-safety

Kathuria, A., Parida, M., Ravi Sekhar, Ch., & Sharma, A. (2016). A review of bus rapid transit implementation in India. Cogent Engineering, 3(1), 1241168. https://doi.org/10.1080/23311916.2016.1241168

Knobloch, F., Hanssen, S. V., Lam, A., Pollitt, H., Salas, P., Chewpreecha, U., Huijbregts, M. A. J., & Mercure, J.-F. (2020). Net emission reductions from electric cars and heat pumps in 59 world regions over time. Nature Sustainability, 3(6), 437–447. https://doi.org/10.1038/s41893-020-0488-7

Kuss, P., & Nicholas, K. A. (2022). A dozen effective interventions to reduce car use in European cities: Lessons learned from a meta-analysis and transition management. Case Studies on Transport Policy, 10(3), 1494–1513. https://doi.org/10.1016/j.cstp.2022.02.001

Lam, A., & Mercure, J.-F. (2022). Evidence for a global electric vehicle tipping point. https://www.exeter.ac.uk/media/universityofexeter/globalsystemsinstitute/documents/Lam_et_al_Evidence_for_a_global_EV_TP.pdf

Lindau, L. A., Hidalgo, D., & Facchini, D. (2010). Bus Rapid Transit in Curitiba, Brazil: A Look at the Outcome After 35 Years of Bus-Oriented Development. Transportation Research Record: Journal of the Transportation Research Board, 2193(1), 17–27. https://doi.org/10.3141/2193-03

Mansoor, U., Kashifi, M. T., Safi, F. R., & Rahman, S. M. (2022). A review of factors and benefits of non-motorized transport: a way forward for developing countries. Environment, Development and Sustainability, 24(2), 1560–1582. https://doi.org/10.1007/s10668-021-01531-9

Marques, A., Peralta, M., Henriques-Neto, D., Frasquilho, D., Rubio Gouveira, É., & Gomez-Baya, D. (2020). Active Commuting and Depression Symptoms in Adults: A Systematic Review. International Journal of Environmental Research and Public Health, 17(3), 1041. https://doi.org/10.3390/ijerph17031041

Mattioli, G., Roberts, C., Steinberger, J. K., & Brown, A. (2020). The political economy of car dependence: A systems of provision approach. Energy Research & Social Science, 66, 101486. https://doi.org/10.1016/j.erss.2020.101486

Meldrum, M., Pinnell, L., Brennan, K., Romani, M., Sharpe, S., & Lenton, T. (2023). The Breakthrough Effect: How to trigger a cascade of tipping points to accelerate the net zero transition.https://www.systemiq.earth/wp-content/uploads/2023/01/The-Breakthrough-Effect.pdf

Nataraj, S., Ferone, D., Quintero-Araujo, C., Juan, A. A., & Festa, P. (2019). Consolidation centers in city logistics: A cooperative approach based on the location routing problem. International Journal of Industrial Engineering Computations, 393–404. https://doi.org/10.5267/j.ijiec.2019.1.001

National Planning Commission: Republic of South Africa. (2020). National Development Plan 2030: Our future - make it work. https://www.gov.za/sites/default/files/gcis_document/201409/ndp-2030-our-future-make-it-workr.pdf

Neves, A., Brand, C. (2019). Assessing the potential for carbon emissions savings from replacing short car trips with walking and cycling using a mixed GPS-travel diary approach. Transportation Research Part A: Policy and Practice, 123, 130–146. https://doi.org/10.1016/j.tra.2018.08.022

Newman, P. (2020). Cool planning: How urban planning can mainstream responses to climate change. Cities, 103, 102651. https://doi.org/10.1016/j.cities.2020.102651

Nieuwenhuijsen, M. J. (2021). New urban models for more sustainable, liveable and healthier cities post covid19; reducing air pollution, noise and heat island effects and increasing green space and physical activity. Environment International, 157, 106850. https://doi.org/10.1016/j.envint.2021.106850

The Organization for Economic Cooperation and Development (OECD). (2021). Transport Strategies for Net-Zero Systems by Design. OECD. https://doi.org/10.1787/0a20f779-en

Pierer, C., Creutzig, F. (2019). Star-shaped cities alleviate trade-off between climate change mitigation and adaptation. Environmental Research Letters, 14(8), 085011. https://doi.org/10.1088/1748-9326/ab2081

Pucher, J., Buehler, R. (2008). Making Cycling Irresistible: Lessons from The Netherlands, Denmark and Germany. Transport Reviews, 28(4), 495–528. https://doi.org/10.1080/01441640701806612

International Energy Agency (IEA). (2023). Transport - Energy System. (2023, November 2).https://www.iea.org/energy-system/transport

Vanovermeire, C., & Sörensen, K. (2014). Integration of the cost allocation in the optimization of collaborative bundling. Transportation Research Part E: Logistics and Transportation Review, 72, 125–143. https://doi.org/10.1016/j.tre.2014.09.009

Wang, Y., Sanchez Rodrigues, V., & Evans, L. (2015). The use of ICT in road freight transport for CO_2 reduction – an exploratory study of UK's grocery retail industry. The International Journal of Logistics Management, 26(1), 2–29. https://doi.org/10.1108/IJLM-02-2013-0021

Way, R., Ives, M. C., Mealy, P., & Farmer, J. D. (2022). Empirically grounded technology forecasts and the energy transition. Joule, 6(9), 2057–2082. https://doi.org/10.1016/j.joule.2022.08.009

Zhang, R., Fujimori, S., & Hanaoka, T. (2018). The contribution of transport policies to the mitigation potential and cost of 2 °C and 1.5 °C goals. Environmental Research Letters, 13(5), 054008. https://doi.org/10.1088/1748-9326/aabb0d

4.3.3

African Carbon Markets Initiative (ACMI). (2022). Africa Carbon Markets Initiative: Roadmap Report. https://www.seforall.org/publications/africa-carbon-markets-initiative-roadmap-report

African Union. (2023). The African Leaders Nairobi Declaration on Climate Change and Call to Action. https://au.int/sites/default/files/decisions/43124-Nairobi_Declaration_06092023.pdf

Agence de la transition écologique [ADEME]. (2018). IAA témoins : moins de gaspillage alimentaire pour plus de performance. La librairie ADEME. https://librairie.ademe.fr/consommer-autrement/897-iaa-temoins-moins-de-gaspillage-alimentaire-pour-plus-de-performance.html

Ainsworth, D., Collins, T., & d'Amico, F. (2022). Nations adopt four goals, 23 targets for 2030 in Landmark UN Biodiversity Agreement. 19, 2022–12.

Albizzati, P. F., Tonini, D., Chammard, C. B., & Astrup, T. F. (2019). Valorisation of surplus food in the French retail sector: Environmental and economic impacts. Waste Management, 90, 141–151. https://doi.org/10.1016/j.wasman.2019.04.034

Alexander. S., Meyer-Ohlendorf. L., Engelhardt, H., Fesenfeld., (2020). 'Sozial-ökologische Transformation des Ernährungssystems – Politische Interventionsmöglichkeiten auf Basis aktueller Erkenntnisse der Transformationsforschung - Abschlussbericht'. Umweltbundesamt. https://www.umweltbundesamt.de/sites/default/files/medien/479/publikationen/texte_137-2021_sozial-oekologische_transformation_des_ernaehrungssystems.pdf

Allievi, F., Antonelli, M., Dembska, K., & Principato, L. (2019). Understanding the global food system. Achieving the Sustainable Development Goals Through Sustainable Food Systems, 3–23.https://doi.org/10.1007/978-3-030-23969-5_1

Alston, J. M., & Pardey, P. G. (2014). Agriculture in the Global Economy. Journal of Economic Perspectives, 28(1), 121–146. https://doi.org/10.1257/jep.28.1.121

Armstrong McKay, D. I., Staal, A., Abrams, J. F., Winkelmann, R., Sakschewski, B., Loriani, S., Fetzer, I., Cornell, S. E., Rockström, J., & Lenton, T. M. (2022). Exceeding 1.5°C global warming could trigger multiple climate tipping points. Science, 377(6611), eabn7950. https://doi.org/10.1126/science.abn7950

Bai, Y., Costlow, L., Ebel, A., Laves, S., Ueda, Y., Volin, N., Zamek, M., & Masters, W. A. (2022). Retail prices of nutritious food rose more in countries with higher COVID-19 case counts. Nature Food, 3(5), 325–330. https://doi.org/10.1038/s43016-022-00502-1

Balmford, A., Brancalion, P. H. S., Coomes, D., Filewod, B., Groom, B., Guizar-Couti Ño, A., Jones, J. P. G., Keshav, S., Kontoleon, A., Madhavapeddy, A., Malhi, Y., Sills, E. O., Strassburg, B. B. N., Venmans, F., West, T. A. P., Wheeler, C., & Swinfield, T. (2023). Credit credibility threatens forests. Science, 380(6644), 466–467. https://doi.org/10.1126/science.adh3426

Barrett, C. B., Benton, T. G., Cooper, K. A., Fanzo, J., Gandhi, R., Herrero, M., James, S., Kahn, M., Mason-D'Croz, D., Mathys, A., Nelson, R. J., Shen, J., Thornton, P., Bageant, E., Fan, S., Mude, A. G., Sibanda, L. M., & Wood, S. (2020). Bundling innovations to transform agri-food systems. Nature Sustainability, 3(12), 974–976. https://doi.org/10.1038/s41893-020-00661-8

Benjamin, E. O., & Blum, M. (2015). Participation of Smallholders in Agroforestry Agri-Environmental Scheme: A Lesson from the Rural Mount Kenyan Region'. The Journal of Developing Areas, 49(4), 127–143. http://www.jstor.org/stable/24737367

Benjamin, E. O., Blum, M., & Punt, M. (2016). The impact of extension and ecosystem services on smallholder's credit constraint. The Journal of Developing Areas, 50(1), 333–350. https://doi.org/10.1353/jda.2016.0020

Benjamin, E. O., Ola, O., & Buchenrieder, G. (2018). Does an agroforestry scheme with payment for ecosystem services (PES) economically empower women in sub-Saharan Africa? Ecosystem Services, 31, 1–11. https://doi.org/10.1016/j.ecoser.2018.03.004

Benjamin, E. O., & Sauer, J. (2018). The cost effectiveness of payments for ecosystem services—Smallholders and agroforestry in Africa. Land Use Policy, 71, 293–302. https://doi.org/10.1016/j.landusepol.2017.12.001

Bogmans, Christian, Andrea Pescatori, and Ervin Prifti. (2022). Global Food Prices to Remain Elevated Amid War, Costly Energy, La Niña. https://www.imf.org/en/Blogs/Articles/2022/12/09/global-food-prices-to-remain-elevated-amid-war-costly-energy-la-nina

Bond, W. J., Stevens, N., Midgley, G. F., & Lehmann, C. E. R. (2019). The Trouble with Trees: Afforestation Plans for Africa. Trends in Ecology & Evolution, 34(11), 963–965. https://doi.org/10.1016/j.tree.2019.08.003

Bormann, K. J., Brown, R. D., Derksen, C., & Painter, T. H. (2018). Estimating snow-cover trends from space. Nature Climate Change, 8(11), 924–928. https://doi.org/10.1038/s41558-018-0318-3

Bundesministerium für Ernährung und Landwirtschaft (BMEL). 2022. 'Zukunftskommission Landwirtschaft'. 27 September 2022.

Buxton, J., Powell, T., Ambler, J., Boulton, C., Nicholson, A., Arthur, R., Lees, K., Williams, H., & Lenton, T. M. (2021). Community-driven tree planting greens the neighbouring landscape. Scientific Reports, 11(1), 18239. https://doi.org/10.1038/s41598-021-96973-6

Carter, N., & Jacobs, M. (2014). Explaining Radical Policy Change: The Case of Climate Change and Energy Policy Under the British Labour Government 2006–10'. Public Administration, 92(1), 125–141. https://doi.org/10.1111/padm.12046

Clark, M. A., Domingo, N. G. G., Colgan, K., Thakrar, S. K., Tilman, D., Lynch, J., Azevedo, I. L., & Hill, J. D. (2020). Global food system emissions could preclude achieving the 1.5° and 2°C climate change targets. Science, 370(6517), 705–708. https://doi.org/10.1126/science.aba7357

Corréard, V. (2023, January 22). Label anti-gaspi : 'Valoriser les bons élèves auprès des consommateurs'. L'info durable. https://www.linfodurable.fr/entreprises/valoriser-les-bons-eleves-aupres-des-consommateurs-36471

Creutzig, F., Niamir, L., Bai, X., Callaghan, M., Cullen, J., Díaz-José, J., Figueroa, M., Grubler, A., Lamb, W. F., Leip, A., Masanet, E., Mata, É., Mattauch, L., Minx, J. C., Mirasgedis, S., Mulugetta, Y., Nugroho, S. B., Pathak, M., Perkins, P., … Ürge-Vorsatz, D. (2022). Demand-side solutions to climate change mitigation consistent with high levels of well-being. Nature Climate Change, 12(1), 36–46. https://doi.org/10.1038/s41558-021-01219-y

Dagevos, H., Voordouw, J. (2013). Sustainability and meat consumption: is reduction realistic? Sustainability: Science, Practice and Policy, 9(2), 60–69. https://doi.org/10.1080/15487733.2013.11908115

Daugbjerg, C. (2003). Policy feedback and paradigm shift in EU agricultural policy: the effects of the MacSharry reform on future reform. Journal of European Public Policy, 10(3), 421–437. https://doi.org/10.1080/1350176032000085388

De Giusti, G., Kristjanson, P., & Rufino, M. C. (2019). Agroforestry as a climate change mitigation practice in smallholder farming: evidence from Kenya. Climatic Change, 153(3), 379–394. https://doi.org/10.1007/s10584-019-02390-0

De Schutter, O. (2017). The political economy of food systems reform. European Review of Agricultural Economics, 44(4), 705–731. https://doi.org/10.1093/erae/jbx009

De Schutter, O., Jacobs, N., & Clément, C. (2020). A 'Common Food Policy' for Europe: How governance reforms can spark a shift to healthy diets and sustainable food systems. Food Policy, 96, 101849. https://doi.org/10.1016/j.foodpol.2020.101849

Doelman, J. C., Beier, F. D., Stehfest, E., Bodirsky, B. L., Beusen, A. H. W., Humpenöder, F., Mishra, A., Popp, A., Van Vuuren, D. P., De Vos, L., Weindl, I., Van Zeist, W.-J., & Kram, T. (2022). Quantifying synergies and trade-offs in the global water-land-food-climate nexus using a multi-model scenario approach. Environmental Research Letters, 17(4), 045004. https://doi.org/10.1088/1748-9326/ac5766

Elmiger, B. N., Finger, R., Ghazoul, J., & Schaub, S. (2023). Biodiversity indicators for result-based agri-environmental schemes – Current state and future prospects. Agricultural Systems, 204, 103538. https://doi.org/10.1016/j.agsy.2022.103538

EU Parliament. (2023, May 10). REGULATION (EU) 2023/956 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 10th May 2023 establishing a carbon border adjustment mechanism. https://eur-lex.europa.eu/eli/reg/2023/956/oj

Farina, E. M. M. Q., Gutman, G. E., Lavarello, P. J., Nunes, R., & Reardon, T. (2005). Private and public milk standards in Argentina and Brazil. Food Policy, 30(3), 302–315. https://doi.org/10.1016/j.foodpol.2005.05.008

Fesenfeld, L. (2023). The political economy of taxing meat. Nature Food, 4(3), 209–210. https://doi.org/10.1038/s43016-023-00716-x

Fesenfeld, L., Mann, S., Meier, M., Nemecek, T., Scharrer, B., Bornemann, B., Brombach, C., Beretta, C., Bürgi, E., Grabs, J., Ingold, K., Jeanneret, P., Kislig, S., Lieberherr, E., Müller, A., Pfister, S., Schader, C., Schönberg, S., Sonnevelt, M., … Zähringer, J. (2023). Wege in die Ernährungszukunft der Schweiz - Leitfaden zu den grössten Hebeln und politischen Pfaden für ein nachhaltiges Ernährungssystem. Zenodo. https://doi.org/10.5281/ZENODO.7543576

Fesenfeld, L. P., Candel, J., & Gaupp, F. (2023). Governance principles for accelerating food systems transformation in the European Union. Nature Food. https://doi.org/10.1038/s43016-023-00850-6

Fesenfeld, L.P., Maier, M., Brazzola, N., Stolz, N., Sun, Y., & Kachi, A. (2023). How information, social norms, and experience with novel meat substitutes can create positive political feedback and demand-side policy change. Food Policy, 117, 102445. https://doi.org/10.1016/j.foodpol.2023.102445Fesenfeld, L. P., Schmid, N., Finger, R., Mathys, A., & Schmidt, T. S. (2022). The politics of enabling tipping points for sustainable development. One Earth, 5(10), 1100–1108. https://doi.org/10.1016/j.oneear.2022.09.004

Fesenfeld, L. P., Schmidt, T. S., & Schrode, A. (2018). Climate policy for short- and long-lived pollutants. Nature Climate Change, 8(11), 933–936. https://doi.org/10.1038/s41558-018-0328-1

Fesenfeld, L. P., Wicki, M., Sun, Y., & Bernauer, T. (2020). Policy packaging can make food system transformation feasible. Nature Food, 1(3), 173–182. https://doi.org/10.1038/s43016-020-0047-4

Finger, R. (2023). Digital innovations for sustainable and resilient agricultural systems. European Review of Agricultural Economics, 50(4), 1277–1309. https://doi.org/10.1093/erae/jbad021

Finger, R., Swinton, S. M., El Benni, N., & Walter, A. (2019). Precision Farming at the Nexus of Agricultural Production and the Environment. Annual Review of Resource Economics, 11(1), 313–335. https://doi.org/10.1146/annurev-resource-100518-093929

Food and Land Use Coalition (FOLU). (2021). Accelerating the 10 critical transitions: positive tipping points for food and land use systems transformation.https://www.foodandlandusecoalition.org/accelerating-the-10-critical-transitions-positive-tipping-points-for-food-and-land-use-systems-transformation/

Food and Agriculture Organization of the United Nations (FAO), E. (2019). Moving forward on food loss and waste reduction. The State of Food and Agriculture 2019. 2019. Rome: Food and Agriculture Organization of the United Nations. https://www.fao.org/policy-support/tools-and-publications/resources-details/en/c/1242090/

Food and Agriculture Organization of the United Nations. (2015a). Food Wastage Footprint & Climate Change.

Food and Agriculture Organization of the United Nations. (2015b). Transforming our world: the 2030 Agenda for Sustainable Development. https://sdgs.un.org/2030agenda

Frank, S., Gusti, M., Havlík, P., Lauri, P., DiFulvio, F., Forsell, N., Hasegawa, T., Krisztin, T., Palazzo, A., & Valin, H. (2021). Land-based climate change mitigation potentials within the agenda for sustainable development. Environmental Research Letters, 16(2), 024006. https://doi.org/10.1088/1748-9326/abc58a

Galli, F., Prosperi, P., Favilli, E., D'Amico, S., Bartolini, F., & Brunori, G. (2020). How can policy processes remove barriers to sustainable food systems in Europe? Contributing to a policy framework for agri-food transitions. Food Policy, 96, 101871. https://doi.org/10.1016/j.foodpol.2020.101871

Garnett, E. E., Balmford, A., Sandbrook, C., Pilling, M. A., & Marteau, T. M. (2019). Impact of increasing vegetarian availability on meal selection and sales in cafeterias. Proceedings of the National Academy of Sciences, 116(42), 20923–20929. https://doi.org/10.1073/pnas.1907207116

Gaupp, F. (2020). Extreme Events in a Globalized Food System. One Earth, 2(6), 518–521. https://doi.org/10.1016/j.oneear.2020.06.001

Gaupp, F., Constantino, S., & Pereira, L. (2023). The role of agency in social tipping processes [Preprint]. Sustainability science/Human/Earth system interactions/Other methods. https://doi.org/10.5194/egusphere-2023-1533

Geijer, T. (2020). Growth of meat and dairy alternatives is stirring up the European food industry. ING Think. https://think.ing.com/reports/growth-of-meat-and-dairy-alternatives-is-stirring-up-the-european-food-industry/

Gibbon, P. (2005). Human Development Report 2005, The commodity question: new thinking on old problems. Human Development Report Office (HDRO), United Nations Development Programme https://hdr.undp.org/system/files/documents/hdr2005gibbonpeter13pdf.pdf

Good Food Institute (GFI). (2021). Denmark announces 1 billion kroner for plant-based foods in historic climate agreement. https://gfieurope.org/blog/denmark-plant-based-investment-in-climate-agreement/.

GFI. (2022). Reducing the price of alternative proteins.https://gfi.org/reducing-the-price-of-alternative-proteins/

GSI (2021). Denmark announces 1 billion kroner for plant-based foods in historic climate agreement https://gfieurope.org/blog/denmark-plant-based-investment-in-climate-agreement/

Guilbert, S., Hartley, S., Lobley, M., Moseley, A., Neal, A., Wright, M., & Powell, T. (2022). The Ruby Country Net Zero Beef Farming Forum. http://blogs.exeter.ac.uk/rubycountrynetzero/files/2022/08/Ruby-Country-Net-Zero-Beef-Farming-Forum-Final-Report.pdf

Hawkes, C. (2006). Uneven dietary development: linking the policies and processes of globalization with the nutrition transition, obesity and diet-related chronic diseases. Globalization and Health, 2(1), 4. https://doi.org/10.1186/1744-8603-2-4

Herrero, M., Thornton, P. K., Mason-D'Croz, D., Palmer, J., Benton, T. G., Bodirsky, B. L., Bogard, J. R., Hall, A., Lee, B., Nyborg, K., Pradhan, P., Bonnett, G. D., Bryan, B. A., Campbell, B. M., Christensen, S., Clark, M., Cook, M. T., De Boer, I. J. M., Downs, C., … West, P. C. (2020). Innovation can accelerate the transition towards a sustainable food system. Nature Food, 1(5), 266–272. https://doi.org/10.1038/s43016-020-0074-1

International Energy Agency, International Renewable Energy Agency, & United Nations Climate Change. (2022). The Breakthrough Agenda Report 2022: Accelerating Sector Transitions Through Stronger International Collaboration. OECD. https://doi.org/10.1787/692cdb6b-en

International Energy Agency (IRENA), International Renewable Energy Agency, & United Nations Climate Change. (2022a). The Breakthrough Agenda Report 2022: Accelerating Sector Transitions Through Stronger International Collaboration. OECD. https://doi.org/10.1787/692cdb6b-en

IRENA. (2022b). Global Hydrogen Trade to Meet the 1.5°C Climate Goal . International Renewable Energy Agency, Abu Dhabi. https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2022/May/IRENA_Global_Hydrogen_Trade_Costs_2022.pdf?rev=00ea390b555046118cfe4c448b2a29dc

Kroll, C., Warchold, A., & Pradhan, P. (2019). Sustainable Development Goals (SDGs): Are we successful in turning trade-offs into synergies? Palgrave Communications, 5(1), 140. https://doi.org/10.1057/s41599-019-0335-5

Kummu, M., De Moel, H., Porkka, M., Siebert, S., Varis, O., & Ward, P. J. (2012). Lost food, wasted resources: Global food supply chain losses and their impacts on freshwater, cropland, and fertiliser use. Science of The Total Environment, 438, 477–489. https://doi.org/10.1016/j.scitotenv.2012.08.092

Lee, H., Brown, C., Seo, B., Holman, I., Audsley, E., Cojocaru, G., & Rounsevell, M. (2019). Implementing land-based mitigation to achieve the Paris Agreement in Europe requires food system transformation. Environmental Research Letters, 14(10), 104009. https://doi.org/10.1088/1748-9326/ab3744

Lenton, T. M., Benson, S., Smith, T., Ewer, T., Lanel, V., Petykowski, E., Powell, T. W. R., Abrams, J. F., Blomsma, F., & Sharpe, S. (2022). Operationalising positive tipping points towards global sustainability. Global Sustainability, 5, e1. https://doi.org/10.1017/sus.2021.30

Marshall, J.H. (2022). 'Analysing the Dynamics of "positive Tipping Points" in The International Small Group and Tree Planting Program (TIST) from a Systems Thinking Perspective'. Master of Science, University of Exeter.

Masiga M, Yankel C, Iberre C. (2012). he International small group tree planting program (TIST) Kenya. Institutional Analysis and Capacity Building of African Agricultural Carbon Projects Case Study. Copenhagen, Denmark: CCAFS. https://hdl.handle.net/10568/21216

Meadows, D. (1999). 'Leverage Points: Places to Intervene in a System'. The Donella Meadows Project, Academy for Systems Change. https://donellameadows.org/archives/leverage-points-places-to-intervene-in-a-system

Melchior, G., & Garot, G. (2019a). Evaluation de la loi n° 2016-138 du 11 février 2016 relative à la lutte contre le gaspillage alimentaire. Rapport d'information déposé en application de l'article 145-7 du Règlement par la commission des affaires économiques. Rapport n°2025. https://www.assemblee-nationale.fr/dyn/15/rapports/cion-eco/l15b2025_rapport-information.pdf

Meldrum, M., Pinnell, L., Brennan, K., Romani, M., Sharpe, S., & Lenton, T. (2023). The Breakthrough Effect: How to trigger a cascade of tipping points to accelerate the net zero transition. https://www.systemiq.earth/wp-content/uploads/2023/01/The-Breakthrough-Effect.pdf

Mokrane, S., Buonocore, E., Capone, R., & Franzese, P. P. (2023). Exploring the Global Scientific Literature on Food Waste and Loss. Sustainability, 15(6), 4757. https://doi.org/10.3390/su15064757

Morton, J. F. (2007). The impact of climate change on smallholder and subsistence agriculture. Proceedings of the National Academy of Sciences, 104(50), 19680–19685. https://doi.org/10.1073/pnas.0701855104

Niles, M. T., Ahuja, R., Barker, T., Esquivel, J., Gutterman, S., Heller, M. C., Mango, N., Portner, D., Raimond, R., Tirado, C., & Vermeulen, S. (2018). Climate change mitigation beyond agriculture: a review of food system opportunities and implications. Renewable Agriculture and Food Systems, 33(3), 297–308. https://doi.org/10.1017/S1742170518000029

The Organization for Economic Cooperation and Development (OECD). (2016). Agriculture in Sub-Saharan Africa: Prospects and challenges for the next decade (pp. 59–95). OECD. https://doi.org/10.1787/agr_outlook-2016-5-en

OECD. (2020). Towards Sustainable Land Use: Aligning Biodiversity, Climate and Food Policies. OECD. https://doi.org/10.1787/3809b6a1-en

Oliver, T. H., Boyd, E., Balcombe, K., Benton, T. G., Bullock, J. M., Donovan, D., Feola, G., Heard, M., Mace, G. M., Mortimer, S. R., Nunes, R. J., Pywell, R. F., & Zaum, D. (2018). Overcoming undesirable resilience in the global food system. Global Sustainability, 1, e9. https://doi.org/10.1017/sus.2018.9

Our World in Data (2023) 'Half of the World's Habitable Land Is Used for Agriculture'. Accessed 18 July 2023. https://ourworldindata.org/global-land-for-agriculture.

Pendrill, F., Gardner, T. A., Meyfroidt, P., Persson, U. M., Adams, J., Azevedo, T., Bastos Lima, M. G., Baumann, M., Curtis, P. G., De Sy, V., Garrett, R., Godar, J., Goldman, E. D., Hansen, M. C., Heilmayr, R., Herold, M., Kuemmerle, T., Lathuillière, M. J., Ribeiro, V., … West, C. (2022). Disentangling the numbers behind agriculture-driven tropical deforestation. Science, 377(6611), eabm9267. https://doi.org/10.1126/science.abm9267

Pharo, P., Oppenheim, J., Laderchi, C. R., & Benson, S. (2019). Growing better: Ten critical transitions to transform food and land use. Food and Land Use Coalition London FOLU, Report. https://www.foodandlandusecoalition.org/wp-content/uploads/2019/09/FOLU-GrowingBetter-GlobalReport.pdf

Poore, J., & Nemecek, T. (2018). Reducing food's environmental impacts through producers and consumers. Science, 360(6392), 987–992. https://doi.org/10.1126/science.aaq0216

Pörtner, H.-O., Scholes, R. J., Arneth, A., Barnes, D. K. A., Burrows, M. T., Diamond, S. E., Duarte, C. M., Kiessling, W., Leadley, P., Managi, S., McElwee, P., Midgley, G., Ngo, H. T., Obura, D., Pascual, U., Sankaran, M., Shin, Y. J., & Val, A. L. (2023). Overcoming the coupled climate and biodiversity crises and their societal impacts. Science, 380(6642), eabl4881. https://doi.org/10.1126/science.abl4881

Powell, T. W. R., & Lenton, T. M. (2012). Future carbon dioxide removal via biomass energy constrained by agricultural efficiency and dietary trends. Energy & Environmental Science, 5(8), 8116–8133. https://doi.org/10.1039/C2EE21592F

Ramdorai, Aditi, Christine Delivanis, Rupert Simons. (2023). DELIVERING NET ZERO IN THE FOOD SECTOR. Systemiq https://www.systemiq.earth/wp-content/uploads/2023/06/Food-white-paper.pdf

Ritchie, H. (2021). How much of global greenhouse gas emissions come from food. Our World in Data.

Ritchie, H., Reay, D. S., & Higgins, P. (2018a). Potential of Meat Substitutes for Climate Change Mitigation and Improved Human Health in High-Income Markets. Frontiers in Sustainable Food Systems, 2, 16. https://doi.org/10.3389/fsufs.2018.00016

Ritchie, H., Reay, D. S., & Higgins, P. (2018b). Potential of Meat Substitutes for Climate Change Mitigation and Improved Human Health in High-Income Markets. Frontiers in Sustainable Food Systems, 2, 16. https://doi.org/10.3389/fsufs.2018.00016

Ritchie, H., & Roser, M. (2020). Sector by sector: where do global greenhouse gas emissions come from? Our World in Data.

SAPEA. (2023). Towards sustainable food consumption: Evidence review report. Zenodo. https://doi.org/10.5281/ZENODO.8031939

Scherer, L., Behrens, P., De Koning, A., Heijungs, R., Sprecher, B., & Tukker, A. (2018). Trade-offs between social and environmental Sustainable Development Goals. Environmental Science & Policy, 90, 65–72. https://doi.org/10.1016/j.envsci.2018.10.002

Schönberger, H., Martos, J. L. G., & Styles, D. (2013). Best environmental management practice in the retail trade sector. European Commission JRC Scientific And Policy Reports. Learning from Frontrunners. https://susproc.jrc.ec.europa.eu/product-bureau/sites/default/files/inline-files/RetailTradeSector_0.pdf

Sethi, G., Bedregal, L., Cassou, E., Constantino, L., Hou, X., Jain, S., Messent, F., Morales, X., Mostafa, I., & Pascual, J. (2020). Addressing Food Loss and Waste: A Global Problem with Local Solutions.https://openknowledge.worldbank.org/entities/publication/1564bf5c-ed24-5224-b5d8-93cd62aa3611

Sparkman, G., Walton, G. M. (2017). Dynamic Norms Promote Sustainable Behavior, Even if It Is Counternormative. Psychological Science, 28(11), 1663–1674. https://doi.org/10.1177/0956797617719950

Sperling, F., Havlík, P., Denis, M., Valin, H., Palazzo, A., & Gaupp, F. (2020). IIASA–ISC Consultative Science Platform: Resilient Food Systems. Paris: Thematic Report of the International Institute for Applied Systems Analysis (IIASA), Laxenburg, and the International Science Council (ISC).https://council.science/wp-content/uploads/2020/06/IIASA-ISC-Reports-Resilient-Food-Systems.pdf.

Springmann, M., Clark, M., Mason-D'Croz, D., Wiebe, K., Bodirsky, B. L., Lassaletta, L., De Vries, W., Vermeulen, S. J., Herrero, M., Carlson, K. M., Jonell, M., Troell, M., DeClerck, F., Gordon, L. J., Zurayk, R., Scarborough, P., Rayner, M., Loken, B., Fanzo, J., … Willett, W. (2018). Options for keeping the food system within environmental limits. Nature, 562(7728), 519–525. https://doi.org/10.1038/s41586-018-0594-0

Systemiq. (2022). REducing Emissions from Fertilizer Use. https://www.systemiq.earth/wp-content/uploads/2023/07/Reducing_Emissions_from_Fertilizer_Use-ES-JK.pdf

Terasaki Hart, D. E., Yeo, S., Almaraz, M., Beillouin, D., Cardinael, R., Garcia, E., Kay, S., Lovell, S. T., Rosenstock, T. S., Sprenkle-Hyppolite, S., Stolle, F., Suber, M., Thapa, B., Wood, S., & Cook-Patton, S. C. (2023). Priority science can accelerate agroforestry as a natural climate solution. Nature Climate Change. https://doi.org/10.1038/s41558-023-01810-5

TIST. (2013). TIST Program. https://program.tist.org/about

Too Good To Go. (2023). TOO GOOD TO GO Impact Report 2022: Fighting food waste together. https://tgtg-mkt-cms-prod.s3.eu-west-1.amazonaws.com/40187/ImpactReport2022_ENG.pdf

Torma, G., & Aschemann-Witzel, J. (2023). Social acceptance of dual land use approaches: Stakeholders' perceptions of the drivers and barriers confronting agrivoltaics diffusion. Journal of Rural Studies, 97, 610–625. https://doi.org/10.1016/j.jrurstud.2023.01.014

United Nations Environment Programme (UNEP). (2021). Food Waste Index Report 2021. https://www.unep.org/resources/report/unep-food-waste-index-report-2021

United Nations Framework Convention on Climate Change. (2022).' SHARM-EL-SHEIKH ADAPTATION AGENDA.' The Global Transformations towards Adaptive and Resilient Development'. In . https://climatechampions.unfccc.int/system/sharm-el-sheikh-adaptation-agenda

United Nations Framework Convention on Climate Change. (2016). The Paris Agreement.

United Nations (UN). (2015). 'Transforming Our World: The 2030 Agenda for Sustainable Development'. https://sustainabledevelopment.un.org/index.php?menu=2361

United Nations (UN). (2019). The Future is Now: Science for Achieving Sustainable Development (GSDR 2019). https://sdgs.un.org/publications/future-now-science-achieving-sustainable-development-gsdr-2019-24576

Vallone, S., & Lambin, E. F. (2023). Public policies and vested interests preserve the animal farming status quo at the expense of animal product analogs. One Earth, 6(9), 1213–1226. https://doi.org/10.1016/j.oneear.2023.07.013

Veganuary. (2022, January 19). Veganuary 2022 is officially the biggest year yet – and still rising. Veganuary. https://veganuary.com/veganuary-2022-biggest-year-yet/

Vo-Thanh, T., Zaman, M., Hasan, R., Rather, R. A., Lombardi, R., & Secundo, G. (2021). How a mobile app can become a catalyst for sustainable social business: The case of Too Good To Go. Technological Forecasting and Social Change, 171, 120962. https://doi.org/10.1016/j.techfore.2021.120962

Walter, A., Finger, R., Huber, R., & Buchmann, N. (2017). Smart farming is key to developing sustainable agriculture. Proceedings of the National Academy of Sciences, 114(24), 6148–6150. https://doi.org/10.1073/pnas.1707462114

Weselek, A., Ehmann, A., Zikeli, S., Lewandowski, I., Schindele, S., & Högy, P. (2019). Agrophotovoltaic systems: applications, challenges, and opportunities. A review. Agronomy for Sustainable Development, 39(4), 35. https://doi.org/10.1007/s13593-019-0581-3

West, T. A. P., Wunder, S., Sills, E. O., Börner, J., Rifai, S. W., Neidermeier, A. N., Frey, G. P., & Kontoleon, A. (2023). Action needed to make carbon offsets from forest conservation work for climate change mitigation. Science, 381(6660), 873–877. https://doi.org/10.1126/science.ade3535

Willcock, S., Cooper, G. S., Addy, J., & Dearing, J. A. (2023). Earlier collapse of Anthropocene ecosystems driven by multiple faster and noisier drivers. Nature Sustainability. https://doi.org/10.1038/s41893-023-01157-x

Willett, W., Rockström, J., Loken, B., Springmann, M., Lang, T., Vermeulen, S., Garnett, T., Tilman, D., DeClerck, F., Wood, A., Jonell, M., Clark, M., Gordon, L. J., Fanzo, J., Hawkes, C., Zurayk, R., Rivera, J. A., De Vries, W., Majele Sibanda, L., … Murray, C. J. L. (2019). Food in the Anthropocene: the EAT–Lancet Commission on healthy diets from sustainable food systems. The Lancet, 393(10170), 447–492. https://doi.org/10.1016/S0140-6736(18)31788-4

World, B. (2022). State and Trends of Carbon Pricing 2022. Washington, DC: World Bank. https://doi.org/10.1596/978-1-4648-1895-0

World Food Programme. (2022). Food security implications of the Ukraine conflict. https://docs.wfp.org/api/documents/WFP-0000137707/download/?_ga=2.167658046.1020853559.1696307062-1744994484.1696307062

Chapter Reference 4.4

4.4.1

Agnew M, Pettifor H, and C, W. (2021). Lifestyles in public health, marketing and pro-enviornmental research. Tyndall Centre for Climate Change Research. https://www.navigate-h2020.eu/wp-content/uploads/2021/08/NAVIGATE-Deliverable-3.4_incl-appendices.pdf

Ajzen, I. and Fishbein, M. (2005): The Influence of Attitudes on Behavior. In: D. Albarracín, D., Johnson, B.T. and Zanna, M.P. (eds): The handbook of attitudes. New York: Psychology Press, 173-221.

Akenji, L., Bengtsson, M., Toivio, V., & Lettenmeier, M. (2021). 1.5-Degree Lifestyles: Towards A Fair Consumption Space for All. Hot or Cool Institute, Berlin. https://hotorcool.org/wp-content/uploads/2021/10/Hot_or_Cool_1_5_lifestyles_FULL_REPORT_AND_ANNEX_B.pdf

Albarracin, D., Johnson, B. T., & Zanna, M. P. (2005). The handbook of attitudes (Vol. 53). Lawrence Erlbaum Associates Mahwah, NJ.

Alexander et al. (2022): Algorithms for seeding social networks can enhance the adoption of a public health intervention in urban India. PNAS. https://doi.org/10.1073/pnas.212074211

Armstrong McKay, D. I., Staal, A., Abrams, J. F., Winkelmann, R., Sakschewski, B., Loriani, S., Fetzer, I., Cornell, S. E., Rockström, J., & Lenton, T. M. (2022). Exceeding 1.5°C global warming could trigger multiple climate tipping points. Science, 377(6611), eabn7950. https://doi.org/10.1126/science.abn7950

Barrett, S., & Dannenberg, A. (2014). Sensitivity of collective action to uncertainty about climate tipping points. Nature Climate Change, 4(1), 36–39. https://doi.org/10.1038/nclimate2059

Becken, S., Friedl, H., Stantic, B., Connolly, R. M., & Chen, J. (2021). Climate crisis and flying: social media analysis traces the rise of "flightshame". Journal of Sustainable Tourism, 29(9), 1450–1469. https://doi.org/10.1080/09669582.2020.1851699

Bernstein, S., & Hoffmann, M. (2018). The politics of decarbonization and the catalytic impact of subnational climate experiments. Policy Sciences, 51(2), 189–211. https://doi.org/10.1007/s11077-018-9314-8

Bhowmik, A. K., McCaffrey, M. S., Ruskey, A. M., Frischmann, C., & Gaffney, O. (2020). Powers of 10: Seeking 'sweet spots' for rapid climate and sustainability actions between individual and global scales. Environmental Research Letters, 15(9), 094011. https://iopscience.iop.org/article/10.1088/1748-9326/ab9ed0

Blondeel, M. (2019). Taking away a "social licence": Neo-Gramscian perspectives on an international fossil fuel divestment norm. Global Transitions, 1, 200–209. https://doi.org/10.1016/j.glt.2019.10.006

Bloomfield, A., & Scott, S. V. (Eds.). (2018). Norm antipreneurs and the politics of resistance to global normative change (First issued in paperback 2018). Routledge, Taylor & Francis Group.

Büchs, M., Cass, N., Mullen, C., Lucas, K., & Ivanova, D. (2023). Emissions savings from equitable energy demand reduction. Nature Energy, 8(7), 758–769. https://doi.org/10.1038/s41560-023-01283-y

Buckholtz, J. W., & Marois, R. (2012). The roots of modern justice: cognitive and neural foundations of social norms and their enforcement. Nature Neuroscience, 15(5), 655–661. https://doi.org/10.1038/nn.3087

Cash, D. W., Clark, W. C., Alcock, F., Dickson, N. M., Eckley, N., Guston, D. H., Jäger, J., & Mitchell, R. B. (2003). Knowledge systems for sustainable development. Proceedings of the National Academy of Sciences, 100(14), 8086–8091. https://doi.org/10.1073/pnas.1231332100

Centola, D. (2018). How Behavior Spreads: The Science of Complex Contagions. Princeton University Press. https://doi.org/10.23943/9781400890095

Centola, D., Becker, J., Brackbill, D., & Baronchelli, A. (2018). Experimental evidence for tipping points in social convention. Science, 360(6393), 1116–1119. https://doi.org/10.1126/science.aas8827

Centola, D., & Macy, M. (2007). Complex Contagions and the Weakness of Long Ties. American Journal of Sociology, 113(3), 702–734. https://doi.org/10.1086/521848

Chenoweth, E., & Stephan, M. J. (2011). Why civil resistance works: The strategic logic of nonviolent conflict. Columbia University Press.

Colvin, R. M., Kemp, L., Talberg, A., De Castella, C., Downie, C., Friel, S., Grant, W. J., Howden, M., Jotzo, F., Markham, F., & Platow, M. J. (2020). Learning from the Climate Change Debate to Avoid Polarisation on Negative Emissions. Environmental Communication, 14(1), 23–35. https://doi.org/10.1080/17524032.2019.1630463

Constantino, S. M., Sparkman, G., Kraft-Todd, G. T., Bicchieri, C., Centola, D., Shell-Duncan, B., Vogt, S., & Weber, E. U. (2022). Scaling Up Change: A Critical Review and Practical Guide to Harnessing Social Norms for Climate Action. Psychological Science in the Public Interest, 23(2), 50–97. https://doi.org/10.1177/15291006221105279

Creutzig, F., Lohrey, S., & Franza, M. V. (2022). Shifting urban mobility patterns due to COVID-19: comparative analysis of implemented urban policies and travel behaviour changes with an assessment of overall GHG emissions implications. Environmental Research: Infrastructure and Sustainability, 2(4), 041003. https://doi.org/10.1088/2634-4505/ac949b

Creutzig, F., Roy, J., Lamb, W. F., Azevedo, I. M. L., Bruine De Bruin, W., Dalkmann, H., Edelenbosch, O. Y., Geels, F. W., Grubler, A., Hepburn, C., Hertwich, E. G., Khosla, R., Mattauch, L., Minx, J. C., Ramakrishnan, A., Rao, N. D., Steinberger, J. K., Tavoni, M., Ürge-Vorsatz, D., & Weber, E. U. (2018). Towards demand-side solutions for mitigating climate change. Nature Climate Change, 8(4), 260–263. https://doi.org/10.1038/s41558-018-0121-1

Daggett, C. (2018). Petro-masculinity: Fossil Fuels and Authoritarian Desire. Millennium: Journal of International Studies, 47(1), 25–44. https://doi.org/10.1177/0305829818775817

Duscha, V., Denishchenkova, A., & Wachsmuth, J. (2019). Achievability of the Paris Agreement targets in the EU: demand-side reduction potentials in a carbon budget perspective. Climate Policy, 19(2), 161–174. https://doi.org/10.1080/14693062.2018.1471385

Ehret, S., Constantino, S. M., Weber, E. U., Efferson, C., & Vogt, S. (2022). Group identities can undermine social tipping after intervention. Nature Human Behaviour, 6(12), 1669–1679. https://doi.org/10.1038/s41562-022-01440-5

Engels, A., Marotzke, J., Gresse, E., López-Rivera, A., Pagnone, A., & Wilkens, J. (2023). Hamburg Climate Futures Outlook 2023: The plausibility of a 1.5° C limit to global warming-Social drivers and physical processes.https://www.fdr.uni-hamburg.de/record/11230

Falkenberg, M., Galeazzi, A., Torricelli, M., Di Marco, N., Larosa, F., Sas, M., Mekacher, A., Pearce, W., Zollo, F., Quattrociocchi, W., & Baronchelli, A. (2022). Growing polarization around climate change on social media. Nature Climate Change, 12(12), 1114–1121. https://doi.org/10.1038/s41558-022-01527-x

Fazey, I., Schäpke, N., Caniglia, G., Hodgson, A., Kendrick, I., Lyon, C., Page, G., Patterson, J., Riedy, C., Strasser, T., Verveen, S., Adams, D., Goldstein, B., Klaes, M., Leicester, G., Linyard, A., McCurdy, A., Ryan, P., Sharpe, B., … Young, H. R. (2020). Transforming knowledge systems for life on Earth: Visions of future systems and how to get there. Energy Research & Social Science, 70, 101724. https://doi.org/10.1016/j.erss.2020.101724

Fink, C., Schmidt, A., Barash, V., Kelly, J., Cameron, C., & Macy, M. (2021). Investigating the Observability of Complex Contagion in Empirical Social Networks. Proceedings of the International AAAI Conference on Web and Social Media, 10(1), 121–130. https://doi.org/10.1609/icwsm.v10i1.14751

Fritsche, I., Barth, M., Jugert, P., Masson, T., & Reese, G. (2018). A Social Identity Model of Pro-Environmental Action (SIMPEA). Psychological Review, 125(2), 245–269. https://doi.org/10.1037/rev0000090

Geiger, N., & Swim, J. K. (2016). Climate of silence: Pluralistic ignorance as a barrier to climate change discussion. Journal of Environmental Psychology, 47, 79–90. https://doi.org/10.1016/j.jenvp.2016.05.002

Geßner, L. (2019, March 26). Who Will Sustain Sustainable Prosperity? | Essay by Miriam Ronzoni. Centre for the Understanding of Sustainable Prosperity. https://cusp.ac.uk/themes/m/m1-7/

Gössling, S., & Humpe, A. (2023). Millionaire spending incompatible with 1.5 °C ambitions. Cleaner Production Letters, 4, 100027. https://doi.org/10.1016/j.clpl.2022.100027

Green, F. (2018). Anti-fossil fuel norms. Climatic Change, 150(1–2), 103–116. https://doi.org/10.1007/s10584-017-2134-6

Guilbeault, D., Becker, J., and Centola, D. (2018). Complex Contagions: A Decade in Review, in: Complex Spreading Phenomena in Social Systems, edited by: Lehmann, S. and Ahn, Y., Springer Nature, 3-25, https://doi.org/10.1007/978-3-319-77332-2

Harvey, F., & editor, F. H. E. (2023, September 9). Global push for commitment to phase out fossil fuels gathers pace ahead of Cop28. The Observer. https://www.theguardian.com/environment/2023/sep/09/phase-out-fossil-fuels-cop-28-un-summit-coal-oil-gas

Hertwig, R., & Grüne-Yanoff, T. (2017). Nudging and Boosting: Steering or Empowering Good Decisions. Perspectives on Psychological Science, 12(6), 973–986. https://doi.org/10.1177/1745691617702496
International Pannel on Climate Change (IPCC). (2023). AR6 Synthesis Report: Climate Change 2023. https://report.ipcc.ch/ar6syr/pdf/IPCC_AR6_SYR_LongerReport.pdf
Ivanova, D., Stadler, K., Steen-Olsen, K., Wood, R., Vita, G., Tukker, A., & Hertwich, E. G. (2016). Environmental Impact Assessment of Household Consumption. Journal of Industrial Ecology, 20(3), 526–536. https://doi.org/10.1111/jiec.12371
Jenkin, M. (2014, March 12). Crops to classrooms: how school farms are growing student engagement. The Guardian. https://www.theguardian.com/teacher-network/teacher-blog/2014/mar/12/school-farms-en
Gaging-students-curriculum-sustainability
Kaaronen, R. O., & Strelkovskii, N. (2020). Cultural Evolution of Sustainable Behaviors: Pro-environmental Tipping Points in an Agent-Based Model. One Earth, 2(1), 85–97. https://doi.org/10.1016/j.oneear.2020.01.003
Karsai M., Iñiguez G., Kaski K., Kertész J. (2014). Complex contagion process in spreading of online innovation. Journal of the Royal Society Interface, 11, 20140694. http://dx.doi.org/10.1098/rsif.2014.0694
Kenner, D. (2019). Carbon Inequality: The Role of the Richest in Climate Change (1st ed.). Routledge. https://doi.org/10.4324/9781351171328
Lamb, W. F., Mattioli, G., Levi, S., Roberts, J. T., Capstick, S., Creutzig, F., Minx, J. C., Müller-Hansen, F., Culhane, T., & Steinberger, J. K. (2020). Discourses of climate delay. Global Sustainability, 3, e17. https://doi.org/10.1017/sus.2020.13
Lehmann, S., & Ahn, Y.-Y. (Eds.). (2018). Complex Spreading Phenomena in Social Systems. Springer International Publishing. https://doi.org/10.1007/978-3-319-77332-2
Lenton, T. M. (2020). Tipping positive change. Philosophical Transactions of the Royal Society B: Biological Sciences, 375(1794), 20190123. https://doi.org/10.1098/rstb.2019.012
Lenton, T. M., Xu, C., Abrams, J. F., Ghadiali, A., Loriani, S., Sakschewski, B., Zimm, C., Ebi, K. L., Dunn, R. R., Svenning, J.-C., & Scheffer, M. (2023). Quantifying the human cost of global warming. Nature Sustainability. https://doi.org/10.1038/s41893-023-01132-6
Macintyre, T., Lotz-Sisitka, H., Wals, A., Vogel, C., & Tassone, V. (2018). Towards transformative social learning on the path to 1.5 degrees. Current Opinion in Environmental Sustainability, 31, 80–87. https://doi.org/10.1016/j.cosust.2017.12.003
Macy, J., & Johnstone, C. (2012). Active hope: how to face the mess we're in without going crazy. New World Library.
Muñoz, J., Olzak, S., & Soule, S. A. (2018). Going Green: Environmental Protest, Policy, and CO_2 Emissions in U.S. States, 1990–2007. Sociological Forum, 33(2), 403–421. https://doi.org/10.1111/socf.12422
Nardini, G., Rank-Christman, T., Bublitz, M. G., Cross, S. N. N., & Peracchio, L. A. (2021). Together We Rise: How Social Movements Succeed. Journal of Consumer Psychology, 31(1), 112–145. https://doi.org/10.1002/jcpy.1201
Nisbett, N., & Spaiser, V. (2023). Moral power of youth activists – Transforming international climate Politics? Global Environmental Change, 82, 102717. https://doi.org/10.1016/j.gloenvcha.2023.102717
Nyborg, K. (2018). Social Norms and the Environment. Annual Review of Resource Economics, 10(1), 405–423. https://doi.org/10.1146/annurev-resource-100517-023232
Nyborg, K., Anderies, J. M., Dannenberg, A., Lindahl, T., Schill, C., Schlüter, M., Adger, W. N., Arrow, K. J., Barrett, S., Carpenter, S., Chapin, F. S., Crépin, A.-S., Daily, G., Ehrlich, P., Folke, C., Jager, W., Kautsky, N., Levin, S. A., Madsen, O. J., … De Zeeuw, A. (2016). Social norms as solutions. Science, 354(6308), 42–43. https://doi.org/10.1126/science.aaf8317
Nyborg, K., & Rege, M. (2003). On social norms: the evolution of considerate smoking behavior. Journal of Economic Behavior & Organization, 52(3), 323–340. https://doi.org/10.1016/S0167-2681(03)00031-3
O'Brien, E. (2020). When Small Signs of Change Add Up: The Psychology of Tipping Points. Current Directions in Psychological Science, 29(1), 55–62. https://doi.org/10.1177/0963721419884313
O'Brien, E., & Klein, N. (2017). The tipping point of perceived change: Asymmetric thresholds in diagnosing improvement versus decline. Journal of Personality and Social Psychology, 112(2), 161–185. https://doi.org/10.1037/pspa0000070
Oldfield, J. R. (2013). Transatlantic Abolitionism in the Age of Revolution: An International History of Anti-slavery, c.1787–1820 (1st ed.). Cambridge University Press. https://doi.org/10.1017/CBO9781139344272
Ollinaho, O. I. (2016). Environmental destruction as (objectively) uneventful and (subjectively) irrelevant. Environmental Sociology, 2(1), 53–63.
https://doi.org/10.1080/23251042.2015.1114207O'Sullivan, D. J. P., O'Keeffe, G. J., Fennell, P. G., & Gleeson, J. P. (2015). Mathematical modeling of complex contagion on clustered networks. Frontiers in Physics, 3. https://doi.org/10.3389/fphy.2015.00071
Oswald, Y., Millward-Hopkins, J., Steinberger, J. K., Owen, A., & Ivanova, D. (2023). Luxury-focused carbon taxation improves fairness of climate policy. One Earth, 6(7), 884–898. https://doi.org/10.1016/j.oneear.2023.05.027
Otto, I. M., Donges, J. F., Cremades, R., Bhowmik, A., Hewitt, R. J., Lucht, W., Rockström, J., Allerberger, F., McCaffrey, M., Doe, S. S. P., Lenferna, A., Morán, N., Van Vuuren, D. P., & Schellnhuber, H. J. (2020). Social tipping dynamics for stabilizing Earth's climate by 2050. Proceedings of the National Academy of Sciences, 117(5), 2354–2365. https://doi.org/10.1073/pnas.1900577117
Pathak, M., R. Slade, P.R. Shukla, J. Skea, R. Pichs-Madruga, D. Ürge-Vorsatz, (Ed.). (2022). Technical Summary. In: Climate Change 2022: Mitigation of Climate Change. Contribution of Working Group III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. In Climate Change 2022 - Mitigation of Climate Change (1st ed., pp. 51–148). Cambridge University Press. https://doi.org/10.1017/9781009157926.002
Rammelt, C. F., Gupta, J., Liverman, D., Scholtens, J., Ciobanu, D., Abrams, J. F., Bai, X., Gifford, L., Gordon, C., Hurlbert, M., Inoue, C. Y. A., Jacobson, L., Lade, S. J., Lenton, T. M., McKay, D. I. A., Nakicenovic, N., Okereke, C., Otto, I. M., Pereira, L. M., … Zimm, C. (2022). Impacts of meeting minimum access on critical earth systems amidst the Great Inequality. Nature Sustainability, 6(2), 212–221. https://doi.org/10.1038/s41893-022-00995-5
Rockström, J., Gupta, J., Qin, D., Lade, S. J., Abrams, J. F., Andersen, L. S., Armstrong McKay, D. I., Bai, X., Bala, G., Bunn, S. E., Ciobanu, D., DeClerck, F., Ebi, K., Gifford, L., Gordon, C., Hasan, S., Kanie, N., Lenton, T. M., Loriani, S., … Zhang, X. (2023). Safe and just Earth system boundaries. Nature, 619(7968), 102–111. https://doi.org/10.1038/s41586-023-06083-8
Schaumberg, R. L., & Skowronek, S. E. (2022). Shame Broadcasts Social Norms: The Positive Social Effects of Shame on Norm Acquisition and Normative Behavior. Psychological Science, 33(8), 1257–1277. https://doi.org/10.1177/09567976221075303
Schneider, C. R., & Van Der Linden, S. (2023). Social norms as a powerful lever for motivating pro-climate actions. One Earth, 6(4), 346–351. https://doi.org/10.1016/j.oneear.2023.03.014
Séré De Lanauze, G., & Siadou-Martin, B. (2019). Dissonant cognitions: from psychological discomfort to motivation to change. Journal of Consumer Marketing, 36(5), 565–581. https://doi.org/10.1108/JCM-07-2017-2279
Smith, L. G. E., Thomas, E. F., & McGarty, C. (2015). "We Must Be the Change We Want to See in the World": Integrating Norms and Identities through Social Interaction. Political Psychology, 36(5), 543–557. https://doi.org/10.1111/pops.12180
Stiglitz, J. E., Stern, N., Duan, M., Edenhofer, O., Giraud, G., Heal, G. M., La Rovere, E. L., Morris, A., Moyer, E., Pangestu, M., Shukla, P. R., Sokona, Y., & Winkler, H. (2017). Report of the High-Level Commission on Carbon Prices. https://doi.org/10.7916/D8-W2NC-4103
Stokes, L. C. (UCSB). (2015). Replication Data for: Electoral Backlash against Climate Policy: A Natural Experiment on Retrospective Voting and Local Resistance to Public Policy. Harvard Dataverse. https://doi.org/10.7910/DVN/SDUGCC
Stoknes, P. E., & Randers, J. (2015). What we think about when we try not to think about global warming: toward a new psychology of climate action. Chelsea Green Publishing. ISBN 9781603585835
Tàbara, J. D. (2023). Regenerative sustainability. A relational model of possibilities for the emergence of positive tipping points. Environmental Sociology, 9(4), 366–385. https://doi.org/10.1080/23251042.2023.2239538
Tàbara, J. D., & Chabay, I. (2013). Coupling Human Information and Knowledge Systems with social–ecological systems change: Reframing research, education, and policy for sustainability. Environmental Science & Policy, 28, 71–81. https://doi.org/10.1016/j.envsci.2012.11.005

Tannenbaum, M. B., Hepler, J., Zimmerman, R. S., Saul, L., Jacobs, S., Wilson, K., & Albarracín, D. (2015). Appealing to fear: A meta-analysis of fear appeal effectiveness and theories. Psychological Bulletin, 141(6), 1178. https://doi.org/10.1037%2Fa0039729

Törnberg, P. (2018). Echo chambers and viral misinformation: Modeling fake news as complex contagion. PLOS ONE, 13(9), e0203958. https://doi.org/10.1371/journal.pone.0203958

Vasconcelos V.V., Levin S.A., Pinheiro F.L. (2019). Consensus and polarization in competing complex contagion processes. Journal of the Royal Society Interface, 16, 20190196. http://dx.doi.org/10.1098/rsif.2019.0196

Vowles, K., & Hultman, M. (2021). Dead White men vs. Greta Thunberg: Nationalism, Misogyny, and Climate Change Denial in Swedish far-right Digital Media. Australian Feminist Studies, 36(110), 414–431. https://doi.org/10.1080/08164649.2022.2062669

Wasow, O. (2020). Agenda Seeding: How 1960s Black Protests Moved Elites, Public Opinion and Voting. American Political Science Review, 114(3), 638–659. https://doi.org/10.1017/S000305542000009X

Wiedermann, M., Smith, E. K., Heitzig, J., & Donges, J. F. (2020). A network-based microfoundation of Granovetter's threshold model for social tipping. Scientific Reports, 10(1), 11202. https://doi.org/10.1038/s41598-020-67102-6

Willis, R. (2018). Building the political mandate for climate action. Green Alliance. https://green-alliance.org.uk/wp-content/uploads/2021/11/Building_a_political_mandate_for_climate_action.pdf

Wilson, S., Carlson, A., & Szeman, I. (Eds.). (2017). Petrocultures: Oil, Politics, Culture. McGill-Queen's University Press. https://www.jstor.org/stable/j.ctt1qft0q7

Woodly, D. R. (2015). The Politics of Common Sense: How Social Movements Use Public Discourse to Change Politics and Win Acceptance. Oxford University Press. https://doi.org/10.1093/acprof:oso/9780190203986.001.0001

Xie, J., Meng, F., Sun, J., Ma, X., Yan, G., & Hu, Y. (2021). Detecting and modelling real percolation and phase transitions of information on social media. Nature Human Behaviour, 5(9), 1161–1168. https://doi.org/10.1038/s41562-021-01090-z

Yadin, S. (2023). Fighting Climate Change through Shaming (1st ed.). Cambridge University Press. https://doi.org/10.1017/9781009256230

zen, I. and Fishbein, M. (2005): The Influence of Attitudes on Behavior. In: D. Albarracín, D., Johnson, B.T. and Zanna, M.P. (eds): The handbook of attitudes. New York: Psychology Press, 173-221.

Zhou, J. (2016). Boomerangs versus Javelins: How Polarization Constrains Communication on Climate Change. Environmental Politics, 25(5), 788–811. https://doi.org/10.1080/09644016.2016.1166602

4.4.2

Aklin, M., & Mildenberger, M. (2020). Prisoners of the Wrong Dilemma: Why Distributive Conflict, Not Collective Action, Characterizes the Politics of Climate Change. Global Environmental Politics, 20(4), 4–27. https://doi.org/10.1162/glep_a_00578

Barrett, S. (2003). Environment and statecraft: The strategy of environmental treaty-making: The strategy of environmental treaty-making. OUP Oxford.

Barrett, S., & Dannenberg, A. (2014). Sensitivity of collective action to uncertainty about climate tipping points. Nature Climate Change, 4(1), 36–39. https://doi.org/10.1038/nclimate2059

Besley, T., & Persson, T. (2023). The Political Economics of Green Transitions. The Quarterly Journal of Economics, 138(3), 1863–1906. https://doi.org/10.1093/qje/qjad006

Bhowmik, A. K., McCaffrey, M. S., Ruskey, A. M., Frischmann, C., & Gaffney, O. (2020). Powers of 10: seeking 'sweet spots' for rapid climate and sustainability actions between individual and global scales. Environmental Research Letters, 15(9), 094011. https://doi.org/10.1088/1748-9326/ab9ed0

Casoria, F., Galeotti, F., & Villeval, M. C. (2021). Perceived social norm and behavior quickly adjusted to legal changes during the COVID-19 pandemic. Journal of Economic Behavior & Organization, 190, 54–65. https://doi.org/10.1016/j.jebo.2021.07.030

Chapin, Iii, F. S. (2021). Social and environmental change in the Arctic: emerging opportunities for well-being transformations through stewardship. Ecology and Society, 26(3), art15. https://doi.org/10.5751/ES-12499-260315

Climate Action Tracker. (2023). https://climateactiontracker.org/

Constantino, S. M., Skaredina, O., & Ivanova, M. (2023). Catalytic leadership in climate change negotiations: a reply to 'Why do climate change negotiations stall? Scientific evidence and solutions for some structural problems' by Ulrich J. Frey and Jazmin Burgess. Global Discourse, 13(2), 183–190. https://doi.org/10.1332/204378921X16842177275040

Corbett, J., Xu, Y., & Weller, P. (2019). Norm entrepreneurship and diffusion 'from below' in international organisations: How the competent performance of vulnerability generates benefits for small states. Review of International Studies, 45(4), 647–668. https://doi.org/10.1017/S0260210519000068

Delivering Net Zero (DNZ). (2021). DNZ: Delivering Net Zero. Key Themes from the Academic Community. Delivering Net Zero; https://www.deliveringnetzero.org/_files/ugd/9a8b80_a07f39f27e314c5781f7b6a5a1f12b20.pdf

Eder, C., & Stadelmann-Steffen, I. (2023). Bringing the political system (back) into social tipping relevant to sustainability. Energy Policy, 177, 113529. https://doi.org/10.1016/j.enpol.2023.113529

Farmer, J. D., Hepburn, C., Ives, M. C., Hale, T., Wetzer, T., Mealy, P., Rafaty, R., Srivastav, S., & Way, R. (2019). Sensitive intervention points in the post-carbon transition. Science, 364(6436), 132–134. https://doi.org/10.1126/science.aaw7287

Finnemore, M., & Sikkink, K. (1998). International Norm Dynamics and Political Change. International Organization, 52(4), 887–917. https://doi.org/10.1162/002081898550789

Geels, F. W., & Ayoub, M. (2023). A socio-technical transition perspective on positive tipping points in climate change mitigation: Analysing seven interacting feedback loops in offshore wind and electric vehicles acceleration. Technological Forecasting and Social Change, 193, 122639. https://doi.org/10.1016/j.techfore.2023.122639

Green, F. (2018). Anti-fossil fuel norms. Climatic Change, 150(1–2), 103–116. https://doi.org/10.1007/s10584-017-2134-6

Hake, J.-F., Fischer, W., Venghaus, S., & Weckenbrock, C. (2015). The German Energiewende – History and status quo. Energy, 92, 532–546. https://doi.org/10.1016/j.energy.2015.04.027

Hale, T. (2020). Catalytic Cooperation. Global Environmental Politics, 20(4), 73–98. https://doi.org/10.1162/glep_a_00561

Heal, G., & Kunreuther, H. (2011). Tipping climate negotiations. National Bureau of Economic Research. Tipping Climate Negotiations | NBER

International Corporate Governance Network (ICGN) ICGN Statement of Shared Climate Change Responsibilities to the United Nations Climate Change Conference of the Parties 27. 5. ICGN Statement of Shared Climate Change ResponsibilitiesCOP27, November 2022.

Keohane, R. O., & Victor, D. G. (2010). The regime complex for climate change, Discussion Paper 2010-33, Cambridge, Mass.: Harvard Project on International Climate Agreements, January 2010. Perspectives on Politics, 9(1), 7–23.https://doi.org/10.1017/S1537592710004068

Kim, D. (2013). International Nongovernmental Organizations and the Global Diffusion of National Human Rights Institutions. International Organization, 67(3), 505–539. https://doi.org/10.1017/S0020818313000131

Kneuer, M. (2012). Who is greener? Climate action and political regimes: trade-offs for national and international actors. Democratization, 19(5), 865–888. https://doi.org/10.1080/13510347.2012.709686

Köhler, J., Geels, F. W., Kern, F., Markard, J., Onsongo, E., Wieczorek, A., Alkemade, F., Avelino, F., Bergek, A., Boons, F., Fünfschilling, L., Hess, D., Holtz, G., Hyysalo, S., Jenkins, K., Kivimaa, P., Martiskainen, M., McMeekin, A., Mühlemeier, M. S., … Wells, P. (2019). An agenda for sustainability transitions research: State of the art and future directions. Environmental Innovation and Societal Transitions, 31, 1–32. https://doi.org/10.1016/j.eist.2019.01.004

Kramer, M. (2022). The Dissolution of the Soviet Union. Journal of Cold War Studies, 24(1), 188–218. https://doi.org/10.1162/jcws_a_01059

Kuran, T. (1989). Sparks and prairie fires: A theory of unanticipated political revolution. Public Choice, 61(1), 41–74. https://www.jstor.org/stable/30025019

Linsenmeier, M., Mohommad, A., & Schwerhoff, G. (2023). Global benefits of the international diffusion of carbon pricing policies. Nature Climate Change, 13(7), 679–684. https://doi.org/10.1038/s41558-023-01710

Mazzucato, M. (2014). The entrepreneurial state: debunking public vs. private sector myths (Rev. ed). Anthem Press.

Mazzucato, M. (2015). The Green Entrepreneurial State. SSRN Electronic Journal. https://doi.org/10.2139/ssrn.2744602

Mealy, P., Barbrook-Johnson, P., Ives, M., Srivastav, S., & Hepburn, C. (2023). Sensitive Intervention Points: A strategic approach to climate action. Oxford Review of Economic Policy. https://www.inet.ox.ac.uk/files/No.-2023-15-Sensitive-Intervention-Points-a-strategic-approach-to-climate-action.pdf

Meckling, J., & Karplus, V. J. (2023). Political strategies for climate and environmental solutions. Nature Sustainability, 6(7), 742–751. https://doi.org/10.1038/s41893-023-01109-5

Mildenberger, M., & Tingley, D. (2019). Beliefs about Climate Beliefs: The Importance of Second-Order Opinions for Climate Politics. British Journal of Political Science, 49(4), 1279–1307. https://doi.org/10.1017/S0007123417000321

Mitchell, R. B., & Carpenter, C. (2019). Norms for the Earth: Changing the Climate on "Climate Change". Journal of Global Security Studies, 4(4), 413–429. https://doi.org/10.1093/jogss/ogz006

Mulvaney, D., & Bozuwa, J. (2023). A Progressive Take on Permitting Reform: Principles and Policies to Unleash a Faster, More Equitable Green Transition. https://rooseveltinstitute.org/publications/a-progressive-take-on-permitting-reform/

Newell, P. (2015). The Politics Of Green Transformations In Capitalism. In M. Leach, P. Newell, & I. Scoones, The Politics of Green Transformations (1st ed., pp. 68–85). Routledge. https://doi.org/10.4324/9781315747378-5

Newell, P., Daley, F., & Twena, M. (2021). Changing our ways? Behaviour change and the climate crisis The report of the Cambridge Sustainability Commission on Scaling Behaviour Change. https://rapidtransition.org/wp-content/uploads/2021/04/Cambridge-Sustainability-Commission-on-Scaling-behaviour-change-report.pdf

Oldfield, J. R. (2013). Transatlantic Abolitionism in the Age of Revolution: An International History of Anti-slavery, c.1787–1820 (1st ed.). Cambridge University Press. https://doi.org/10.1017/CBO9781139344272

Oliver, A. J., & Reeves, A. (2015). The politics of disaster relief. Emerging Trends in the Social and Behavioral Sciences: An Interdisciplinary, Searchable, and Linkable Resource, 1–8.

Park, S. (2006). Theorizing Norm Diffusion Within International Organizations. International Politics, 43(3), 342–361. https://doi.org/10.1057/palgrave.ip.8800149

Robinson, D. (2022). Ecocide — Puzzles and Possibilities. Journal of International Criminal Justice, 20(2), 313–347. https://doi.org/10.1093/jicj/mqac021

Sharpe, S. (2023). Five Times Faster: Rethinking the Science, Economics, and Diplomacy of Climate Change (1st ed.). Cambridge University Press. https://doi.org/10.1017/9781009326506

Smith, S. R. (2022). Towards an understanding of advocacy coalitions for rapid transition to net zero carbon in the United Kingdom. https://doi.org/10.15126/THESIS.900563

Stadelmann-Steffen, I., Eder, C., Harring, N., Spilker, G., & Katsanidou, A. (2021). A framework for social tipping in climate change mitigation: What we can learn about social tipping dynamics from the chlorofluorocarbons phase-out. Energy Research & Social Science, 82, 102307. https://doi.org/10.1016/j.erss.2021.102307

Stop Ecocide Foundation. (2021). Stop Ecocide Foundation: Independent Expert Panel for the Legal Definition of Ecocide, Commentary and Core Text. https://static1.squarespace.com/static/5ca2608ab914493c64ef1f6d/t/60d1e6e604fae2201d03407f/1624368879048/SE+Foundation+Commentary+and+core+text+rev+6.pdf

Stokes, L. C. (2016). Electoral Backlash against Climate Policy: A Natural Experiment on Retrospective Voting and Local Resistance to Public Policy. American Journal of Political Science, 60(4), 958–974. https://doi.org/10.1111/ajps.12220

Thacker, S., Adshead, D., Fay, M., Hallegatte, S., Harvey, M., Meller, H., O'Regan, N., Rozenberg, J., Watkins, G., & Hall, J. W. (2019). Infrastructure for sustainable development. Nature Sustainability, 2(4), 324–331. https://doi.org/10.1038/s41893-019-0256-8

Ürge-Vorsatz, D., Rosenzweig, C., Dawson, R. J., Sanchez Rodriguez, R., Bai, X., Barau, A. S., Seto, K. C., & Dhakal, S. (2018). Locking in positive climate responses in cities. Nature Climate Change, 8(3), 174–177. https://doi.org/10.1038/s41558-018-0100-6

Van Asselt, H., & Green, F. (2023). COP26 and the dynamics of anti-fossil fuel norms. WIREs Climate Change, 14(3), e816. https://doi.org/10.1002/wcc.816

Vanuatu ICJ Initiative. (2023). Vanuatu ICJ Initiative. https://www.vanuatuicj.com/

Willis, R. (2020). Too hot to handle? The democratic challenge of climate change. Bristol University Press.

Wills, R. (2018). Building the political mandate for climate action. Green Alliance. https://green-alliance.org.uk/wp-content/uploads/2021/11/Building_a_political_mandate_for_climate_action.pdf

Yankelovich, D. (2006, May 1). The Tipping Points. Foreign Affairs, 85(3). https://www.foreignaffairs.com/united-states/tipping-points

4.4.3

Ameli, N., Dessens, O., Winning, M., Cronin, J., Chenet, H., Drummond, P., Calzadilla, A., Anandarajah, G., & Grubb, M. (2021). Higher cost of finance exacerbates a climate investment trap in developing economies. Nature Communications, 12(1), 4046. https://doi.org/10.1038/s41467-021-24305-3

Arthur, W. B. (1989). Competing technologies, increasing returns, and lock-in by historical events. The Economic Journal, 99(394), 116–131. https://doi.org/10.2307/2234208

Bernanke, B. S., Gertler, M., & Gilchrist, S. (1999). The financial accelerator in a quantitative business cycle framework. Handbook of Macroeconomics, 1, 1341–1393. https://doi.org/10.1016/S1574-0048(99)10034-X

Campiglio, E., & Lamperti, F. (2021). Sustainable Finance Policy-Making: Why and How 16. European Economy, 2, 59–74. Sustainable Finance Policy-Making: Why and How - European Economy (european-economy.eu)

Campiglio, E., Lamperti, F., & Terranova, R. (2023). Believe me when I say green! Heterogeneous expectations and climate policy uncertainty. Heterogeneous Expectations and Climate Policy Uncertainty (February 2023). Centre for Climate Change Economics and Policy Working Paper, 419. Believe me when I say green! Heterogeneous expectations and climate policy uncertainty - Grantham Research Institute on climate change and the environment (lse.ac.uk)

Chenet, H. (2023) Financial institutions in the face of the environmental emergency (July 31, 2023). Available at SSRN: https://ssrn.com/abstract=4619966

Chenet, H., Ryan-Collins, J., & Van Lerven, F. (2019). Climate-related financial policy in a world of radical uncertainty: Towards a precautionary approach. UCL Institute for Innovation and Public Purpose WP, 13. Climate-Related Financial Policy in a World of Radical Uncertainty: Towards a Precautionary Approach by Hugues Chenet, Josh Ryan-Collins, Frank van Lerven :: SSRN

Crona, B., Folke, C., & Galaz, V. (2021). The Anthropocene reality of financial risk. One Earth, 4(5), 618–628. https://doi.org/10.1016/j.oneear.2021.04.016

Farmer, J. D., Hepburn, C., Ives, M. C., Hale, T., Wetzer, T., Mealy, P., Rafaty, R., Srivastav, S., & Way, R. (2019). Sensitive intervention points in the post-carbon transition. Science, 364(6436), 132–134. https://doi.org/10.1126/science.aaw7287

FTM. (2023). 'The Great Green Investment Investigation: Fossil Finance.' https://www.ftm.eu/fossil-finance

Gatti, D. D., Gallegati, M., Greenwald, B., Russo, A., & Stiglitz, J. E. (2010). The financial accelerator in an evolving credit network. Journal of Economic Dynamics and Control, 34(9), 1627–1650. https://doi.org/10.1016/j.jedc.2010.06.019

International Energy Agency (IEA) (2023) Net Zero Roadmap: A Global Pathway to Keep the 1.5 °C Goal in Reach. Available at: https://iea.blob.core.windows.net/assets/d0ba63c5-9d93-4457-be03-da0f1405a5dd/NetZeroRoadmap_AGlobalPathwaytoKeepthe1.5CGoalinReach-2023Update.pdf

Lamperti, F., Bosetti, V., Roventini, A., Tavoni, M., & Treibich, T. (2021). Three green financial policies to address climate risks. Journal of Financial Stability, 54, 100875. https://doi.org/10.1016/j.jfs.2021.100875

Lamperti, F., Dosi, G., Napoletano, M., Roventini, A., and Sapio, A. (2020). Climate change and green transitions in an agent-based integrated assessment model. Technological Forecasting and Social Change, 153, 119806. https://doi.org/10.1016/j.techfore.2019.119806

Lamperti, L., Roventini, A, (2022). Beyond climate economics orthodoxy: impacts and policies in the agent-based integrated-assessment DSK model. European Journal of Economics and Economic Policies: Intervention, 3. https://doi.org/10.4337/ejeep.2022.0096

Le Ravalec, M., Rambaud, A., & Blum, V. (2022). Taking climate change seriously: Time to credibly communicate on corporate climate performance. Ecological Economics, 200, 107542. https://doi.org/https://doi.org/10.1016/j.ecolecon.2022.107542

Mazzucato, M. (2013). The entrepreneurial state: Debunking public vs. Private Sector Myths, 1. Anthem Press

Mazzucato, M., & Semieniuk, G. (2018). Financing renewable energy: Who is financing what and why it matters. Technological Forecasting and Social Change, 127, 8–22. https://doi.org/10.1016/j.techfore.2017.05.021

Rambaud, A., & Chenet, H. (2021). How to re-conceptualise and re-integrate climate-related
finance into society through ecological accounting? Bankers, Markets & Investors, 3, 20–43.https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3725538

Rickman, J., Falkenberg, M., Kothari, S., Larosa, F., Grubb, M., & Ameli, N. (2023). The systemic challenge of phasing out fossil fuel finance [Preprint]. In Review. https://doi.org/10.21203/rs.3.rs-3121305/v1

Rickman, J., Kothari, S., Larosa, F., & Ameli, N. (2023). Investment suitability and path dependency perpetuate inequity in international mitigation finance toward developing countries. One Earth, 6(10), 1304–1314. https://doi.org/10.1016/j.oneear.2023.09.006

Robalino, D. A., & Lempert, R. J. (2000). Carrots and sticks for new technology: Abating greenhouse gas emissions in a heterogeneous and uncertain world. Integrated Assessment, 1(1), 1–19. https://doi.org/10.1023/A:1019159210781

Perez, C. (2003). Technological revolutions and financial capital. Edward Elgar Publishing.

Schmidt, T. S. (2014). Low-carbon investment risks and de-risking. Nature Climate Change, 4(4), 237–239. https://doi.org/10.1038/nclimate2112

Stern, N., & Stiglitz, J. E. (2023). Climate change and growth. Industrial and Corporate Change, 32(2), 277–303. https://doi.org/10.1093/icc/dtad008

Wieners, C., Lamperti, F., Buizza, R., Dosi, G., Roventini, A. (2023): Macroeconomic policies to stay below 2°C with sustainable growth, Technical Report, LEM Working Papers, forthcoming.

4.4.4

AECOM (2011). Energy Demand Research Project: Final Analysis. St Albans, UK, AECOM Ltd. https://www.ofgem.gov.uk/sites/default/files/docs/2011/06/energy-demand-research-project-final-analysis_0.pdf

Azarova, V., Cohen, J. J., Kollmann, A., & Reichl, J. (2020). Reducing household electricity consumption during evening peak demand times: Evidence from a field experiment. Energy Policy, 144, 111657. https://doi.org/10.1016/j.enpol.2020.111657

Baidya, S., Potdar, V., Pratim Ray, P., & Nandi, C. (2021). Reviewing the opportunities, challenges, and future directions for the digitalization of energy. Energy Research & Social Science, 81, 102243. https://doi.org/10.1016/j.erss.2021.102243

Bauer, P., Stevens, B., & Hazeleger, W. (2021). A digital twin of Earth for the green transition. Nature Climate Change, 11(2), 80–83. https://doi.org/10.1038/s41558-021-00986-y

Behavioural Insights TeamBIT (BIT). 2017. Evaluating the Nest Learning Thermostat. London, UK, Behavioural Insights Team (BIT). https://www.bi.team/publications/evaluating-the-nest-learning-thermostat/

Blanco, G., H. de Coninck, L. Agbemabiese, E. H. Mbaye Diagne, L. Diaz Anadon, Y. S. Lim, W.A. Pengue, A.D. Sagar, T. Sugiyama, K. Tanaka, E. Verdolini, J. Witajewski-Baltvilks, (2022). Innovation, technology development and transfer. In IPCC, 2022: Climate Change 2022: Mitigation of Climate Change. Contribution of Working Group III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [P.R. Shukla, J. Skea, R. Slade, A. Al Khourdajie, R. van Diemen, D. McCollum, M. Pathak, S. Some, P. Vyas, R. Fradera, M. Belkacemi, A. Hasija, G. Lisboa, S. Luz, J. Malley, (eds.)]. Cambridge University Press, Cambridge, UK and New York, NY, USA. doi: 10.1017/9781009157926.018

Ceccato, R., Baldassa, A., Rossi, R., & Gastaldi, M. (2022). Potential long-term effects of Covid-19 on telecommuting and environment: An Italian case-study. Transportation Research Part D: Transport and Environment, 109, 103401. https://doi.org/10.1016/j.trd.2022.103401

Creutzig, F., Acemoglu, D., Bai, X., Edwards, P. N., Hintz, M. J., Kaack, L. H., Kilkis, S., Kunkel, S., Luers, A., Milojevic-Dupont, N., Rejeski, D., Renn, J., Rolnick, D., Rosol, C., Russ, D., Turnbull, T., Verdolini, E., Wagner, F., Wilson, C., … Zumwald, M. (2022). Digitalization and the Anthropocene. Annual Review of Environment and Resources, 47(1), 479–509. https://doi.org/10.1146/annurev-environ-120920-100056

Creutzig, F., Franzen, M., Moeckel, R., Heinrichs, D., Nagel, K., Nieland, S., & Weisz, H. (2019). Leveraging digitalization for sustainability in urban transport. Global Sustainability, 2, e14. https://doi.org/10.1017/sus.2019.11

Creutzig, F., Niamir, L., Bai, X., Callaghan, M., Cullen, J., Díaz-José, J., Figueroa, M., Grubler, A., Lamb, W. F., Leip, A., Masanet, E., Mata, É., Mattauch, L., Minx, J. C., Mirasgedis, S., Mulugetta, Y., Nugroho, S. B., Pathak, M., Perkins, P., … Ürge-Vorsatz, D. (2022). Demand-side solutions to climate change mitigation consistent with high levels of well-being. Nature Climate Change, 12(1), 36–46. https://doi.org/10.1038/s41558-021-01219-y

Debnath, R., Creutzig, F., Sovacool, B. K., & Shuckburgh, E. (2023). Harnessing human and machine intelligence for planetary-level climate action. Npj Climate Action, 2(1), 20. https://doi.org/10.1038/s44168-023-00056-3

Digitalization for Sustainability (D4S). (2022). Digital Reset. Redirecting Technologies for the Deep Sustainability Transformation. S. Lange and T. Santarius. Berlin, Germany, TU Berlin. DOI: http://dx.doi.org/10.14279/depositonce-16187

European Commission (2020) Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee, and the Committee of the Regions. A New Industrial Strategy for Europe, COM(2020) 102 final, 10.3.2020. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52020DC0102

European Parliament (2021). The impact of teleworking and digital work on workers and society. STUDY Requested by the EMPL committee and produced by the Policy Department for Economic, Scientific and Quality of Life Policies Directorate-General for Internal Policies. https://www.europarl.europa.eu/RegData/etudes/STUD/2021/662904/IPOL_STU(2021)662904_EN.pdf

Freitag, C., Berners-Lee, M., Widdicks, K., Knowles, B., Blair, G. S., & Friday, A. (2021). The real climate and transformative impact of ICT: A critique of estimates, trends, and regulations. Patterns, 2(9), 100340. https://doi.org/10.1016/j.patter.2021.100340

Fuso Nerini, F., Fawcett, T., Parag, Y., & Ekins, P. (2021). Personal carbon allowances revisited. Nature Sustainability, 4(12), 1025–1031. https://doi.org/10.1038/s41893-021-00756-w

Galaz, V., H. Metzler, S. Daume, A. Olsson, B. Lindström, A. Marklund (2023). Climate misinformation in a climate of misinformation. Research brief. Stockholm Resilience Centre (Stockholm University) and the Beijer Institute of Ecological Economics (Royal Swedish Academy of Sciences). http://arxiv.org/abs/2306.1280

Giotitsas, C., Nardelli, P. H. J., Williamson, S., Roos, A., Pournaras, E., & Kostakis, V. (2022). Energy governance as a commons: Engineering alternative socio-technical configurations. Energy Research & Social Science, 84, 102354. https://doi.org/10.1016/j.erss.2021.102354

Global Enabling Sustainability Initiative (GESI) (2022). Digital with Purpose: Delivering a SMARTer2030. Brussels, Belgium, Global Enabling Sustainability Initiative https://gesi.org/research/gesi-digital-with-purpose-full-report

Grubler, A., Wilson, C., Bento, N., Boza-Kiss, B., Krey, V., McCollum, D. L., Rao, N. D., Riahi, K., Rogelj, J., De Stercke, S., Cullen, J., Frank, S., Fricko, O., Guo, F., Gidden, M., Havlík, P., Huppmann, D., Kiesewetter, G., Rafaj, P., … Valin, H. (2018). A low energy demand scenario for meeting the 1.5 °C target and sustainable development goals without negative emission technologies. Nature Energy, 3(6), 515–527. https://doi.org/10.1038/s41560-018-0172-6

Hargreaves, T., & Wilson, C. (2017). Smart Homes and Their Users. Springer International Publishing. https://doi.org/10.1007/978-3-319-68018-7

Heimans, J., Timms, H. (2018). New Power: How Power Works in Our Hyperconnected World--and How to Make It Work for You. Random House Audio Assets.

Intergovernmental Panel On Climate Change (IPCC). (2022) Climate Change 2022: Mitigation of Climate Change. Contribution of Working Group III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [P.R. Shukla, J. Skea, R. Slade, A. Al Khourdajie, R. van Diemen, D. McCollum, M. Pathak, S. Some, P. Vyas, R. Fradera, M. Belkacemi, A. Hasija, G. Lisboa, S. Luz, J. Malley, (eds.)]. Cambridge University Press, Cambridge, UK and New York, NY, USA. doi: 10.1017/9781009157926

Jensen, T., Holtz, G., Baedeker, C., & Chappin, É. J. L. (2016). Energy-efficiency impacts of an air-quality feedback device in residential buildings: An agent-based modeling assessment. Energy and Buildings, 116, 151–163. https://doi.org/10.1016/j.enbuild.2015.11.067

Kamargianni, M., Li, W., Matyas, M., & Schäfer, A. (2016). A Critical Review of New Mobility Services for Urban Transport. Transportation Research Procedia, 14, 3294–3303. https://doi.org/10.1016/j.trpro.2016.05.277

Kangas, H. L., Ollikka, K., Ahola, J., & Kim, Y. (2021). Digitalisation in wind and solar power technologies. Renewable and Sustainable Energy Reviews, 150, 111356. https://doi.org/10.1016/j.rser.2021.111356

Khanna, T. M., Baiocchi, G., Callaghan, M., Creutzig, F., Guias, H., Haddaway, N. R., Hirth, L., Javaid, A., Koch, N., Laukemper, S., Löschel, A., Zamora Dominguez, M. D. M., & Minx, J. C. (2021). A multi-country meta-analysis on the role of behavioural change in reducing energy consumption and CO2 emissions in residential buildings. Nature Energy, 6(9), 925–932. https://doi.org/10.1038/s41560-021-00866-x

Lenton, T. M., Benson, S., Smith, T., Ewer, T., Lanel, V., Petykowski, E., Powell, T. W. R., Abrams, J. F., Blomsma, F., & Sharpe, S. (2022). Operationalising positive tipping points towards global sustainability. Global Sustainability, 5, e1. https://doi.org/10.1017/sus.2021.30

Li, X., Zhang, C., & Zhu, H. (2023). Effect of information and communication technology on CO2 emissions: An analysis based on country heterogeneity perspective. Technological Forecasting and Social Change, 192, 122599. https://doi.org/10.1016/j.techfore.2023.122599

Maier, R., Thaller, A., & Fleiß, E. (2022). Telework: A Social Tipping Intervention for Passenger Transportation? SSRN Electronic Journal. https://doi.org/10.2139/ssrn.4226849

Malmodin, J., & Coroama, V. (2016). Assessing ICT's enabling effect through case study extrapolation — The example of smart metering. 2016 Electronics Goes Green 2016+ (EGG), 1–9. https://doi.org/10.1109/EGG.2016.7829814

Meier, E., Thorburn, P., Biggs, J., Palmer, J., Dumbrell, N., & Kragt, M. (2023). Using machine learning with case studies to identify practices that reduce greenhouse gas emissions across Australian grain production regions. Agronomy for Sustainable Development, 43(2), 29. https://doi.org/10.1007/s13593-023-00880-1

Milojevic-Dupont, N., & Creutzig, F. (2021). Machine learning for geographically differentiated climate change mitigation in urban areas. Sustainable Cities and Society, 64, 102526. https://doi.org/10.1016/j.scs.2020.102526

Nakicenovic, N., Riahi, K., Boza-Kiss, B., Busch, S., Fujimori, S., Goujon, A., Grubler, A., Hasegawa, T., Kolp, P., McCollum, D. L., Muttarak, R., Obersteiner, M., Pachauri, S., Parkinson, S., & Zimm, C. (2018). Transformations to Achieve the Sustainable Development Goals. Report prepared by The World in 2050 initiative. https://doi.org/10.22022/TNT/07-2018.15347

Nilsson, A., Wester, M., Lazarevic, D., & Brandt, N. (2018). Smart homes, home energy management systems and real-time feedback: Lessons for influencing household energy consumption from a Swedish field study. Energy and Buildings, 179, 15–25. https://doi.org/10.1016/j.enbuild.2018.08.026

Nisbett, N., & Spaiser, V. (2023). How convincing are AI-generated moral arguments for climate action? Frontiers in Climate, 5, 1193350. https://doi.org/10.3389/fclim.2023.1193350

Nature (2020). Online learning cannot just be for those who can afford its technology. Nature, 585(7826), 482–482. https://doi.org/10.1038/d41586-020-02709-3

The Organization for Economic Cooperation and Development (OECD).,International Transport Forum (ITF). (2020). Road Safety Annual Report 2020. Paris, France. https://www.itf-oecd.org/sites/default/files/docs/irtad-road-safety-annual-report-2020_0.pdf

Pratt, B. W., & Erickson, J. D. (2020). Defeat the Peak: Behavioral insights for electricity demand response program design. Energy Research & Social Science, 61, 101352. https://doi.org/10.1016/j.erss.2019.101352

Royal Society. (2020). Digital technology and the planet: Harnessing computing to achieve net zero. London, UK, The Royal Society. https://royalsociety.org/-/media/policy/projects/digital-technology-and-the-planet/digital-technology-and-the-planet-report.pdf

Satorras, M., Ruiz-Mallén, I., Monterde, A., & March, H. (2020). Co-production of urban climate planning: Insights from the Barcelona Climate Plan. Cities, 106, 102887. https://doi.org/10.1016/j.cities.2020.102887

Srivastava, A., Van Passel, S., & Laes, E. (2018). Assessing the success of electricity demand response programs: A meta-analysis. Energy Research & Social Science, 40, 110–117. https://doi.org/10.1016/j.erss.2017.12.005

Suatmadi, A. Y., Creutzig, F., & Otto, I. M. (2019). On-demand motorcycle taxis improve mobility, not sustainability. Case Studies on Transport Policy, 7(2), 218–229. https://doi.org/10.1016/j.cstp.2019.04.005

Sun, X., Betcke, T., & Strohmaier, A. (2023). Numerical aspects of Casimir energy computation in acoustic scattering (arXiv:2306.1280). arXiv. http://arxiv.org/abs/2306.01280

Verdolini, E. (2023). Interlinkages between the just ecological transition and the digital transformation. In ETUI, The European Trade Union Institute. Retrieved 10:06, July 12, 2023, from https://www.etui.org/publications/interlinkages-between-just-ecological-transition-and-digital-transformation

Verma, P., Savickas, R., Strüker, J., Buettner, S., Kjeldsen, O., and Wang, X. (2020). Digitalization: enabling the new phase of energy efficiency. DOI: https://orbit.dtu.dk/en/publications/digitalization-enabling-the-new-phase-of-energy-efficiency

Wellings, T. S., Majumdar, S., Haenggli Fricker, R., & Pournaras, E. (2023). Improving City Life via Legitimate and Participatory Policy-making: A Data-driven Approach in Switzerland. Proceedings of the 24th Annual International Conference on Digital Government Research, 23–35. https://doi.org/10.1145/3598469.3598472

Wemyss, D., Cellina, F., Grieder, M., & Schlüter, F. (2023). Looking beyond the hype: Conditions affecting the promise of behaviour change apps as social innovations for low-carbon transitions. Environmental Innovation and Societal Transitions, 47, 100702. https://doi.org/10.1016/j.eist.2023.100702

Wilson, C., Kerr, L., Sprei, F., Vrain, E., & Wilson, M. (2020). Potential Climate Benefits of Digital Consumer Innovations. Annual Review of Environment and Resources, 45(1), 113–144. https://doi.org/10.1146/annurev-environ-012320-082424

World Bank. (2014). The World Bank Annual Report 2014. The World Bank. https://doi.org/10.1596/978-1-4648-0245-4

Xia, H., Liu, Z., Efremochkina, M., Liu, X., & Lin, C. (2022). Study on city digital twin technologies for sustainable smart city design: A review and bibliometric analysis of geographic information system and building information modeling integration. Sustainable Cities and Society, 84, 104009. https://doi.org/10.1016/j.scs.2022.104009

Xu, Q., Zhong, M., & Li, X. (2022). How does digitalization affect energy? International evidence. Energy Economics, 107, 105879. https://doi.org/10.1016/j.eneco.2022.105879

Yang, H., Zhou, M., Wu, Z., Zhang, M., Liu, S., Guo, Z., & Du, E. (2022). Exploiting the operational flexibility of a concentrated solar power plant with hydrogen production. Solar Energy, 247, 158–170. https://doi.org/10.1016/j.solener.2022.10.011

4.4.5

Boulton, C. A., Buxton, J. E., & Lenton, T. M. (2023). Early opportunity signals of a tipping point in the UK's second-hand electric vehicle market [Preprint]. Antroposphere/Human/Earth system interactions/Other methods. https://doi.org/10.5194/egusphere-2023-2234

Dakos, V., Boulton, C. A., Buxton, J. E., Abrams, J. F., Armstrong McKay, D. I., Bathiany, S., Blaschke, L., Boers, N., Dylewsky, D., López-Martínez, C., Parry, I., Ritchie, P., Van Der Bolt, B., Van Der Laan, L., Weinans, E., & Kéfi, S. (2023). Tipping Point Detection and Early-Warnings in climate, ecological, and human systems [Preprint]. Biosphere and ecosystems/Human/Earth system interactions/Other methods. https://doi.org/10.5194/egusphere-2023-1773

Diks, C., Hommes, C., & Wang, J. (2019). Critical slowing down as an early warning signal for financial crises? Empirical Economics, 57(4), 1201–1228. https://doi.org/10.1007/s00181-018-1527-3

Farmer, J. D., & Lafond, F. (2016). How predictable is technological progress? Research Policy, 45(3), 647–665. https://doi.org/10.1016/j.respol.2015.11.001

Lam, A., & Mercure, J.-F. (2022). Evidence for a global electric vehicle tipping point.https://www.exeter.ac.uk/media/universityofexeter/globalsystemsinstitute/documents/Lam_et_al_Evidence_for_a_global_EV_TP.pdf

Lenain, P., et al. (2023), "Unleashing strong, digital and green growth in Viet Nam", OECD Economics Department Working Papers, No. 1770, OECD Publishing, Paris, https://doi.org/10.1787/78bcbbcd-en

Lu, Z., Yuan, N., Yang, Q., Ma, Z., & Kurths, J. (2021). Early Warning of the Pacific Decadal Oscillation Phase Transition Using Complex Network Analysis. Geophysical Research Letters, 48(7), e2020GL091674. https://doi.org/10.1029/2020GL091674

Pananos, A. D., Bury, T. M., Wang, C., Schonfeld, J., Mohanty, S. P., Nyhan, B., Salathé, M., & Bauch, C. T. (2017). Critical dynamics in population vaccinating behavior. Proceedings of the National Academy of Sciences, 114(52), 13762–13767. https://doi.org/10.1073/pnas.1704093114

Proverbio, D., Kemp, F., Magni, S., & Gonçalves, J. (2022). Performance of early warning signals for disease re-emergence: A case study on COVID-19 data. PLOS Computational Biology, 18(3), e1009958. https://doi.org/10.1371/journal.pcbi.1009958

Sharpe, S., & Lenton, T. M. (2021). Upward-scaling tipping cascades to meet climate goals: plausible grounds for hope. Climate Policy, 21(4), 421–433. https://doi.org/10.1080/14693062.2020.1870097

Tan, J. P. L., & Cheong, S. S. A. (2014). Critical slowing down associated with regime shifts in the US housing market. The European Physical Journal B, 87(2), 38. https://doi.org/10.1140/epjb/e2014-41038-1

Wen, H., Ciamarra, M. P., & Cheong, S. A. (2018). How one might miss early warning signals of critical transitions in time series data: A systematic study of two major currency pairs. PLOS ONE, 13(3), e0191439. https://doi.org/10.1371/journal.pone.0191439

Wissel, C. (1984). A universal law of the characteristic return time near thresholds. Oecologia, 65(1), 101–107. https://doi.org/10.1007/BF00384470

Chapter Reference 4.5

Agarwal, Varun, Anshu Bharadwaj, Shubhashis Dey, Ulka Kelkar, Renu Kohli, Nidhi Madan, Koyel Kumar Mandal, Apurba Mitra, and Deepthi Swamy. (2021). Modelling Decarbonisation Pathways for the Indian Economy. https://policycommons.net/artifacts/1888107/modelling-decarbonisation-pathways-for-the-indian-economy/2638088/

Bachner, G., & Bednar-Friedl, B. (2019). The Effects of Climate Change Impacts on Public Budgets and Implications of Fiscal Counterbalancing Instruments. Environmental Modeling & Assessment, 24(2), 121–142. https://doi.org/10.1007/s10666-018-9617-3

Bouaboula, H., Ouikhalfan, M., Saadoune, I., Chaouki, J., Zaabout, A., & Belmabkhout, Y. (2023). Addressing sustainable energy intermittence for green ammonia production. Energy Reports, 9, 4507–4517. https://doi.org/10.1016/j.egyr.2023.03.093

Bradford, N. (2016). Ideas and Collaborative Governance: A Discursive Localism Approach. Urban Affairs Review, 52(5), 659–684. https://doi.org/10.1177/1078087415610011

Brown, W. (2015). Undoing the Demos: Neoliberalism's Stealth Revolution. Zone Books. https://doi.org/10.2307/j.ctt17kk9p8

Burgin, A. (2012). The Great Persuasion: Reinventing Free Markets since the Depression. Harvard University Press. https://www.jstor.org/stable/j.ctt2jbpjh

Bryan Walsh. (2007, December 10). A Green Tipping Point. Time. https://content.time.com/time/world/article/0,8599,1670871,00.html

Carattini, S., & Löschel, A. (2021). Managing momentum in climate negotiations *. Environmental Research Letters, 16(5), 051001. https://doi.org/10.1088/1748-9326/abf58d

Collins, D. E., Genet, R. M., & Christian, D. (2013). Crafting a New Narrative to Support Sustainability. In Worldwatch Institute (Ed.), State of the World 2013 (pp. 218–224). Island Press/Center for Resource Economics. https://doi.org/10.5822/978-1-61091-458-1_20

Davies, W., & Gane, N. (2021). Post-Neoliberalism? An Introduction. Theory, Culture & Society, 38(6), 3–28. https://doi.org/10.1177/02632764211036722

Dryzek, J. S. (2001). Legitimacy and Economy in Deliberative Democracy. Political Theory, 29(5), 651–669. https://doi.org/10.1177/0090591701029005003Dryzek, J. S. (1998). The politics of the earth: Environmental discourses. Human Ecology Review, 5(1), 65.https://www.humanecologyreview.org/pastissues/her51/51bookreviews.pdf

Edmonds, L., Pfromm, P., Amanor-Boadu, V., Hill, M., & Wu, H. (2022). Green ammonia production-enabled demand flexibility in agricultural community microgrids with distributed renewables. Sustainable Energy, Grids and Networks, 31, 100736. https://doi.org/10.1016/j.segan.2022.100736

Eker, S., Reese, G., & Obersteiner, M. (2019). Modelling the drivers of a widespread shift to sustainable diets. Nature Sustainability, 2(8), 725–735. https://doi.org/10.1038/s41893-019-0331-1

Eker, S., & Wilson, C. (2022). System Dynamics of Social Tipping Processes.International Institute for Applied Systems Annalysis https://pure.iiasa.ac.at/id/eprint/17955/1/IIASA_SocialTippingPoints_WorkshopReport.pdf

Elliot, T. (2022). Socio-ecological contagion in Veganville. Ecological Complexity, 51, 101015. https://doi.org/10.1016/j.ecocom.2022.101015

Fesenfeld, L. P., Schmid, N., Finger, R., Mathys, A., & Schmidt, T. S. (2022). The politics of enabling tipping points for sustainable development. One Earth, 5(10), 1100–1108. https://doi.org/10.1016/j.oneear.2022.09.004

Franzke, C. L. E., Ciullo, A., Gilmore, E. A., Matias, D. M., Nagabhatla, N., Orlov, A., Paterson, S. K., Scheffran, J., & Sillmann, J. (2022). Perspectives on tipping points in integrated models of the natural and human Earth system: cascading effects and telecoupling. Environmental Research Letters, 17(1), 015004. https://doi.org/10.1088/1748-9326/ac42fd

Funk, P. (2007). Is there an expressive function of law? An empirical analysis of voting laws with symbolic fines. American Law and Economics Review, 9(1), 135–159.https://www.jstor.org/stable/42705512

Galbiati, R., Henry, E., Jacquemet, N., & Lobeck, M. (2021). How laws affect the perception of norms: Empirical evidence from the lockdown. PLOS ONE, 16(9), e0256624. https://doi.org/10.1371/journal.pone.0256624

Geels, F. W., & Ayoub, M. (2023). A socio-technical transition perspective on positive tipping points in climate change mitigation: Analysing seven interacting feedback loops in offshore wind and electric vehicles acceleration. Technological Forecasting and Social Change, 193, 122639. https://doi.org/10.1016/j.techfore.2023.122639

Gosnell, H., Gill, N., & Voyer, M. (2019). Transformational adaptation on the farm: Processes of change and persistence in transitions to 'climate-smart' regenerative agriculture. Global Environmental Change, 59, 101965. https://doi.org/10.1016/j.gloenvcha.2019.101965

Hasselmann, K., Jaeger, C., Leipold, G., Mangalagiu, D., & Tàbara, J. D. (2013). Reframing the problem of climate change: from zero sum game to win-win solutions. Routledge.

Hazlett, C., & Mildenberger, M. (2020). Wildfire Exposure Increases Pro-Environment Voting within Democratic but Not Republican Areas. American Political Science Review, 114(4), 1359–1365. https://doi.org/10.1017/S0003055420000441

Hielscher, S., Wittmayer, J. M., & Dańkowska, A. (2022). Social movements in energy transitions: The politics of fossil fuel energy pathways in the United Kingdom, the Netherlands and Poland. The Extractive Industries and Society, 10, 101073. https://doi.org/10.1016/j.exis.2022.101073

Hinkel, J., Mangalagiu, D., Bisaro, A., & Tàbara, J. D. (2020). Transformative narratives for climate action. Climatic Change, 160(4), 495–506. https://doi.org/10.1007/s10584-020-02761-y

Hochrainer-Stigler, S., Colon, C., Boza, G., Poledna, S., Rovenskaya, E., & Dieckmann, U. (2020). Enhancing resilience of systems to individual and systemic risk: Steps toward an integrative framework. International Journal of Disaster Risk Reduction, 51, 101868. https://doi.org/10.1016/j.ijdrr.2020.101868

Hoff, K., & Walsh, J. (2019). The Third Function of Law is to Transform Cultural Categories. World Bank, Washington, DC. https://doi.org/10.1596/1813-9450-8954

Hoffmann, R., Muttarak, R., Peisker, J., & Stanig, P. (2022). Climate change experiences raise environmental concerns and promote Green voting. Nature Climate Change, 12(2), 148–155. https://doi.org/10.1038/s41558-021-01263-8

International Energy Agency (IEA). (2019). The Future of Hydrogen Report prepared by the IEA for the G20, Japan Seizing today's opportunities. https://www.iea.org/reports/the-future-of-hydrogen

IEA. (2023). World Energy Investment 2023, IEA, Paris.https://www.iea.org/reports/world-energy-investment-2023

International Monetary Fund (IMF)., The Organization for Economic Cooperation and Development (OECD). (2021). Tax Policy and Climate Change: IMF/OECD Report for the G20. https://www.oecd.org/tax/tax-policy/imf-oecd-g20-report-tax-policy-and-climate-change.htm

Jaeger, C. (Ed.). (2012). Reframing the problem of climate change: from zero sum game to win-win solutions. Earthscan.

Leclère, D., Obersteiner, M., Barrett, M., Butchart, S. H. M., Chaudhary, A., De Palma, A., DeClerck, F. A. J., Di Marco, M., Doelman, J. C., Dürauer, M., Freeman, R., Harfoot, M., Hasegawa, T., Hellweg, S., Hilbers, J. P., Hill, S. L. L., Humpenöder, F., Jennings, N., Krisztin, T., … Young, L. (2020). Bending the curve of terrestrial biodiversity needs an integrated strategy. Nature, 585(7826), 551–556. https://doi.org/10.1038/s41586-020-2705-y

Lenton, T. M., Benson, S., Smith, T., Ewer, T., Lanel, V., Petykowski, E., Powell, T. W. R., Abrams, J. F., Blomsma, F., & Sharpe, S. (2022). Operationalising positive tipping points towards global sustainability. Global Sustainability, 5, e1. https://doi.org/10.1017/sus.2021.30

Logan, A. C., Berman, S. H., Berman, B. M., & Prescott, S. L. (2020). Project Earthrise: Inspiring Creativity, Kindness and Imagination in Planetary Health. Challenges, 11(2), 19. https://doi.org/10.3390/challe11020019

McAdams, R. H. (2015). The expressive powers of law: Theories and limits. Harvard University Press.

Meelen, T., Frenken, K., & Hobrink, S. (2019). Weak spots for car-sharing in The Netherlands? The geography of socio-technical regimes and the adoption of niche innovations. Energy Research & Social Science, 52, 132–143. https://doi.org/10.1016/j.erss.2019.01.023

Meldrum, M., Pinnell, L., Brennan, K., Romani, M., Sharpe, S., & Lenton, T. (2023). The Breakthrough Effect: How to trigger a cascade of tipping points to accelerate the net zero transition.https://www.systemiq.earth/wp-content/uploads/2023/01/The-Breakthrough-Effect.pdf

Mirowski, P., & Plehwe, D. (Eds.). (2015). The Road from Mont Pèlerin: The Making of the Neoliberal Thought Collective, With a New Preface. Harvard University Press. https://www.jstor.org/stable/j.ctvjghwxz

Moore, F. C., Lacasse, K., Mach, K. J., Shin, Y. A., Gross, L. J., & Beckage, B. (2022). Determinants of emissions pathways in the coupled climate–social system. Nature, 603(7899), 103–111. https://doi.org/10.1038/s41586-022-04423-8

Newell, P. (2019). Trasformismo or transformation? The global political economy of energy transitions. Review of International Political Economy, 26(1), 25–48. https://doi.org/10.1080/09692290.2018.1511448

Niamir, L., Ivanova, O., & Filatova, T. (2020). Economy-wide impacts of behavioral climate change mitigation: Linking agent-based and computable general equilibrium models. Environmental Modelling & Software, 134, 104839. https://doi.org/10.1016/j.envsoft.2020.104839

Obersteiner, M., Walsh, B., Frank, S., Havlík, P., Cantele, M., Liu, J., Palazzo, A., Herrero, M., Lu, Y., Mosnier, A., Valin, H., Riahi, K., Kraxner, F., Fritz, S., & Van Vuuren, D. (2016). Assessing the land resource–food price nexus of the Sustainable Development Goals. Science Advances, 2(9), e1501499. https://doi.org/10.1126/sciadv.1501499

Otto, I. M., Donges, J. F., Cremades, R., Bhowmik, A., Hewitt, R. J., Lucht, W., Rockström, J., Allerberger, F., McCaffrey, M., Doe, S. S. P., Lenferna, A., Morán, N., Van Vuuren, D. P., & Schellnhuber, H. J. (2020). Social tipping dynamics for stabilizing Earth's climate by 2050. Proceedings of the National Academy of Sciences, 117(5), 2354–2365. https://doi.org/10.1073/pnas.1900577117

Piggot, G. (2018). The influence of social movements on policies that constrain fossil fuel supply. Climate Policy, 18(7), 942–954. https://doi.org/10.1080/14693062.2017.1394255

Poole, R. (2008). Earthrise: how man first saw the Earth. Yale University Press.

Schmidt, T. S., & Sewerin, S. (2017). Technology as a driver of climate and energy politics. Nature Energy, 2(6), 17084. https://doi.org/10.1038/nenergy.2017.84

Schroeder, C. H. (2009). Global Warming and the problem of policy innovation: Lessons from the early environmental movement. Environmental Law., 39, 285.https://www.jstor.org/stable/43267417

Setzer, J., & Higham, C. (n.d.). Global Trends in Climate Change Litigation; 2021 Snapshot; Grantham Research Institute on Climate Change and the Environment and Centre for Climate Change Economics and Policy, London School of Economics and Political Science: London, UK, 2021. Global-Trends-in-Climate-Change-Litigation_2021-Snapshot. Pdf

Sharpe, S., & Lenton, T. M. (2021). Upward-scaling tipping cascades to meet climate goals: plausible grounds for hope. Climate Policy, 21(4), 421–433. https://doi.org/10.1080/14693062.2020.1870097

Sidelines. (2007). Nature, 449(7164), 766–766. https://doi.org/10.1038/449766a

Smith, S. R. (2023). Enabling a political tipping point for rapid decarbonisation in the United Kingdom [Preprint]. Climate change/Other interactions/Other methods. https://doi.org/10.5194/egusphere-2023-1674

Stadelmann-Steffen, I., Eder, C., Harring, N., Spilker, G., & Katsanidou, A. (2021). A framework for social tipping in climate change mitigation: What we can learn about social tipping dynamics from the chlorofluorocarbons phase-out. Energy Research & Social Science, 82, 102307. https://doi.org/10.1016/j.erss.2021.102307

Sunstein, C. R. (1996). On the expressive function of law. University of Pennsylvania Law Review, 144(5), 2021–2053.https://scholarship.law.upenn.edu/cgi/viewcontent.cgi?article=3526&context=penn_law_review

Swamy, D., Mitra, A., Agarwal, V., Mahajan, M., & Orvis, R. (2021). Pathways for Decarbonizing India's Energy Future: Scenario Analysis Using the India Energy Policy Simulator. World Resources Institute. https://doi.org/10.46830/wriwp.21.00096

Tankard, M. E., & Paluck, E. L. (2017). The Effect of a Supreme Court Decision Regarding Gay Marriage on Social Norms and Personal Attitudes. Psychological Science, 28(9), 1334–1344. https://doi.org/10.1177/0956797617709594

Temper, L., Avila, S., Bene, D. D., Gobby, J., Kosoy, N., Billon, P. L., Martinez-Alier, J., Perkins, P., Roy, B., Scheidel, A., & Walter, M. (2020). Movements shaping climate futures: A systematic mapping of protests against fossil fuel and low-carbon energy projects. Environmental Research Letters, 15(12), 123004. https://doi.org/10.1088/1748-9326/abc197

UN: Department of Economic and social Affairs. (2023). Global Sustainable Development Report (GSDR) 2023. https://sdgs.un.org/gsdr/gsdr2023

Van Vuuren, D. P., Stehfest, E., Gernaat, D. E. H. J., Van Den Berg, M., Bijl, D. L., De Boer, H. S., Daioglou, V., Doelman, J. C., Edelenbosch, O. Y., Harmsen, M., Hof, A. F., & Van Sluisveld, M. A. E. (2018). Alternative pathways to the 1.5 °C target reduce the need for negative emission technologies. Nature Climate Change, 8(5), 391–397. https://doi.org/10.1038/s41558-018-0119-8

Walsh, B. (2007, October 12). Breaking News, Analysis, Politics, Blogs, News Photos, Video, Tech Reviews. Time. https://content.time.com/time/world/article/0,8599,1670871,00.html

Way, R., Ives, M. C., Mealy, P., & Farmer, J. D. (2022). Empirically grounded technology forecasts and the energy transition. Joule, 6(9), 2057–2082. https://doi.org/10.1016/j.joule.2022.08.009

Willis, R. (2020). Too hot to handle? The democratic challenge of climate change. Bristol University Press.

Chapter Reference 4.6

Andersen, A. D., Geels, F. W., Coenen, L., Hanson, J., Korsnes, M., Linnerud, K., Makitie, T., Nordholm, A., Ryghaug, M., Skjolsvold, T., Steen, M., & Wiebe, K. (2023). Faster, broader, and deeper! Suggested directions for research on net-zero transitions. Oxford Open Energy, 2, oiad007. https://doi.org/10.1093/ooenergy/oiad007

Bain, P. G., Hornsey, M. J., Bongiorno, R., & Jeffries, C. (2012). Promoting pro-environmental action in climate change deniers. Nature Climate Change, 2(8), 600–603. https://doi.org/10.1038/nclimate1532

Bond, K., Butler-Sloss, S., Lovins, A., Speelman, L., & Topping, N. (2023). X-change: Electricity. Rocky Mountain Institute/Bezos Earth Fund. Https://Rmi.Org/Insight/x-Change-Electricity/.

Bennett, N. J. (2022). Mainstreaming Equity and Justice in the Ocean. Frontiers in Marine Science, 9. https://www.frontiersin.org/articles/10.3389/fmars.2022.873572

Bentley, R. A., Maddison, E. J., Ranner, P. H., Bissell, J., Caiado, C. C. S., Bhatanacharoen, P., Clark, T., Botha, M., Akinbami, F., Hollow, M., Michie, R., Huntley, B., Curtis, S. E., & Garnett, P. (2014). Social tipping points and Earth systems dynamics. Frontiers in Environmental Science, 2. https://doi.org/10.3389/fenvs.2014.00035

Bhambra, G. K., & Newell, P. (2022). More than a metaphor: 'climate colonialism' in perspective. Global Social Challenges Journal, 1–9. https://doi.org/10.1332/EIEM6688

Blythe, J., Silver, J., Evans, L., Armitage, D., Bennett, N. J., Moore, M., Morrison, T. H., & Brown, K. (2018). The Dark Side of Transformation: Latent Risks in Contemporary Sustainability Discourse. Antipode, 50(5), 1206–1223. https://doi.org/10.1111/anti.12405

Bond, W. J., Stevens, N., Midgley, G. F., & Lehmann, C. E. R. (2019). The Trouble with Trees: Afforestation Plans for Africa. Trends in Ecology & Evolution, 34(11), 963–965. https://doi.org/10.1016/j.tree.2019.08.003

Bonneuil, C., & Fressoz, J.-B. (2016). The shock of the Anthropocene: The earth, history and us. Verso Books.

Bottazzi, P., Wiik, E., Crespo, D., & Jones, J. P. G. (2018). Payment for Environmental "Self-Service": Exploring the Links Between Farmers' Motivation and Additionality in a Conservation Incentive Programme in the Bolivian Andes. Ecological Economics, 150, 11–23. https://doi.org/10.1016/j.ecolecon.2018.03.032

Bullock, R. C. L., Zurba, M., Parkins, J. R., & Skudra, M. (2020). Open for bioenergy business? Perspectives from Indigenous business leaders on biomass development potential in Canada. Energy Research & Social Science, 64, 101446. https://doi.org/10.1016/j.erss.2020.101446

Calvão, F., Mcdonald, C. E. A., & Bolay, M. (2021). Cobalt mining and the corporate outsourcing of responsibility in the Democratic Republic of Congo. The Extractive Industries and Society, 8(4), 100884. https://doi.org/10.1016/j.exis.2021.02.004

Chapron, G., Epstein, Y., & López-Bao, J. V. (2019). A rights revolution for nature. Science, 363(6434), 1392–1393. https://doi.org/10.1126/science.aav5601

Climate Outreach. (2020). Britain Talks Climate. https://climateoutreach.org/reports/britain-talks-climate/

Davies, M., & Oreszczyn, T. (2012). The unintended consequences of decarbonising the built environment: A UK case study. Energy and Buildings, 46, 80–85. https://doi.org/10.1016/j.enbuild.2011.10.043

De Sousa Santos, B. (2021). Postcolonialism, Decoloniality, and Epistemologies of the South. In B. De Sousa Santos, Oxford Research Encyclopedia of Literature. Oxford University Press. https://doi.org/10.1093/acrefore/9780190201098.013.1262

Dutta, T., Kim, K.-H., Uchimiya, M., Kwon, E. E., Jeon, B.-H., Deep, A., & Yun, S.-T. (2016). Global demand for rare earth resources and strategies for green mining. Environmental Research, 150, 182–190. https://doi.org/10.1016/j.envres.2016.05.052

Elsässer, J. P., Hickmann, T., Jinnah, S., Oberthür, S., & Van De Graaf, T. (2022). Institutional interplay in global environmental governance: lessons learned and future research. International Environmental Agreements: Politics, Law and Economics, 22(2), 373–391. https://doi.org/10.1007/s10784-022-09569-4

European Economic and Social Committee. (2019). Sustainable development is not a zero-sum game: We need triple win solutions. Publications Office. https://data.europa.eu/doi/10.2864/829657

Gabor, D., & Braun, B. (2023). Green macrofinancial regimes [Preprint]. SocArXiv. https://doi.org/10.31235/osf.io/4pkv8

Gaertner, S. L., & Dovidio, J. F. (2000). Reducing intergroup bias: The common ingroup identity model. Psychology Press.

Galafassi, D., Kagan, S., Milkoreit, M., Heras, M., Bilodeau, C., Bourke, S. J., Merrie, A., Guerrero, L., Pétursdóttir, G., & Tàbara, J. D. (2018). 'Raising the temperature': the arts on a warming planet. Current Opinion in Environmental Sustainability, 31, 71–79. https://doi.org/10.1016/j.cosust.2017.12.010

Geussens, K., Van Den Broeck, G., Vanderhaegen, K., Verbist, B., & Maertens, M. (2019). Farmers' perspectives on payments for ecosystem services in Uganda. Land Use Policy, 84, 316–327. https://doi.org/10.1016/j.landusepol.2019.03.020

Ghosh, A. (2021). The Nutmeg's curse: parables for a planet in crisis. Allen Lane, an imprint of Penguin Random House.

Gilio-Whitaker, D. (2019). As Long as Grass Grows: The Indigenous Fight for Environmental Justice, from Colonization to Standing Rock. Beacon Press.

Gómez-Barris, M. (2017). The Extractive Zone: Social Ecologies and Decolonial Perspectives. Duke University Press. https://doi.org/10.2307/j.ctv1220n3w

Green, J. F. (2021). Does carbon pricing reduce emissions? A review of ex-post analyses. Environmental Research Letters, 16(4), 043004. https://doi.org/10.1088/1748-9326/abdae9

Gupta, J., Liverman, D., Prodani, K., Aldunce, P., Bai, X., Broadgate, W., Ciobanu, D., Gifford, L., Gordon, C., Hurlbert, M., Inoue, C. Y. A., Jacobson, L., Kanie, N., Lade, S. J., Lenton, T. M., Obura, D., Okereke, C., Otto, I. M., Pereira, L., … Verburg, P. H. (2023). Earth system justice needed to identify and live within Earth system boundaries. Nature Sustainability, 6(6), 630–638. https://doi.org/10.1038/s41893-023-01064-1

Gupta, J., Liverman, D., Bai, X., Gordon, C., Hurlbert, M., Inoue, C. Y. A., Jacobson, L., Kanie, N., Lenton, T. M., Obura, D., Otto, I. M., Okereke, C., Pereira, L., Prodani, K., Rammelt, C., Scholtens, J., Tàbara, J. D., Verburg, P. H., Gifford, L., & Ciobanu, D. (2021). Reconciling safe planetary targets and planetary justice: Why should social scientists engage with planetary targets? Earth System Governance, 10, 100122. https://doi.org/10.1016/j.esg.2021.100122

Haberl, H., Wiedenhofer, D., Virág, D., Kalt, G., Plank, B., Brockway, P., Fishman, T., Hausknost, D., Krausmann, F., Leon-Gruchalski, B., Mayer, A., Pichler, M., Schaffartzik, A., Sousa, T., Streeck, J., & Creutzig, F. (2020). A systematic review of the evidence on decoupling of GDP, resource use and GHG emissions, part II: synthesizing the insights. Environmental Research Letters, 15(6), 065003. https://doi.org/10.1088/1748-9326/ab842a

Hernandez, D. S., & Newell, P. (2022). Oro blanco: assembling extractivism in the lithium triangle. The Journal of Peasant Studies, 49(5), 945–968. https://doi.org/10.1080/03066150.2022.2080061

Harden-Davies, H., Humphries, F., Maloney, M., Wright, G., Gjerde, K., & Vierros, M. (2020). Rights of Nature: Perspectives for Global Ocean Stewardship. Marine Policy, 122, 104059. https://doi.org/10.1016/j.marpol.2020.104059

Hayes, T., Murtinho, F., Wolff, H., López-Sandoval, M. F., & Salazar, J. (2021). Effectiveness of payment for ecosystem services after loss and uncertainty of compensation. Nature Sustainability, 5(1), 81–88. https://doi.org/10.1038/s41893-021-00804-5

Hernandez, D. S., & Newell, P. (2022). Oro blanco: assembling extractivism in the lithium triangle. The Journal of Peasant Studies, 49(5), 945–968. https://doi.org/10.1080/03066150.2022.2080061

Hickel, J., Dorninger, C., Wieland, H., & Suwandi, I. (2022). Imperialist appropriation in the world economy: Drain from the global South through unequal exchange, 1990–2015. Global Environmental Change, 73, 102467. https://doi.org/10.1016/j.gloenvcha.2022.102467

Hickel, J., & Slamersak, A. (2022). Existing climate mitigation scenarios perpetuate colonial inequalities. The Lancet Planetary Health, 6(7), e628–e631. https://doi.org/10.1016/S2542-5196(22)00092-4

Hoffman, S. M., & High-Pippert, A. (2005). Community Energy: A Social Architecture for an Alternative Energy Future. Bulletin of Science, Technology & Society, 25(5), 387–401. https://doi.org/10.1177/0270467605278880

Holmes, D. C.: Introduction to the Research handbook on communicating climate change, in: Research Handbook on Communicating Climate Change, Edward Elgar Publishing, 1–20, 2020

Huq, S., Roberts, E., & Fenton, A. (2013). Loss and damage. Nature Climate Change, 3(11), 947–949. https://doi.org/10.1038/nclimate2026
Jackson, G., N'Guetta, A., De Rosa, S. P., Scown, M., Dorkenoo, K., Chaffin, B., & Boyd, E. (2023). An emerging governmentality of climate change loss and damage. Progress in Environmental Geography, 2(1–2), 33–57. https://doi.org/10.1177/27539687221148748
James, E. (2017). Affective Ecologies: Empathy, Emotion, and Environmental Narrative. By Alexa Weik von Mossner. ISLE: Interdisciplinary Studies in Literature and Environment, 24(4), 832–833. https://doi.org/10.1093/isle/isy017
James, E. (2015). The Storyworld Accord: Econarratology and Postcolonial Narratives. UNP - Nebraska. https://doi.org/10.2307/j.ctt1d9898
Jordan, A., Huitema, D., Van Asselt, H., & Forster, J. (Eds.). (2018). Governing Climate Change: Polycentricity in Action? (1st ed.). Cambridge University Press. https://doi.org/10.1017/9781108284646
Jouffray, J.-B., Crona, B., Wassénius, E., Bebbington, J., & Scholtens, B. (2019). Leverage points in the financial sector for seafood sustainability. Science Advances, 5(10), eaax3324. https://doi.org/10.1126/sciadv.aax3324
Kenner, D. (2019). Carbon Inequality: The Role of the Richest in Climate Change (1st ed.). Routledge. https://doi.org/10.4324/9781351171328
Klinsky, S., Roberts, T., Huq, S., Okereke, C., Newell, P., Dauvergne, P., O'Brien, K., Schroeder, H., Tschakert, P., Clapp, J., Keck, M., Biermann, F., Liverman, D., Gupta, J., Rahman, A., Messner, D., Pellow, D., & Bauer, S. (2017). Why equity is fundamental in climate change policy research. Global Environmental Change, 44, 170–173. https://doi.org/10.1016/j.gloenvcha.2016.08.002
Kozicka, M., Havlík, P., Valin, H., Wollenberg, E., Deppermann, A., Leclère, D., Lauri, P., Moses, R., Boere, E., Frank, S., Davis, C., Park, E., & Gurwick, N. (2023). Feeding climate and biodiversity goals with novel plant-based meat and milk alternatives. Nature Communications, 14(1), 5316. https://doi.org/10.1038/s41467-023-40899-2
Kraxner, F., Nordström, E.-M., Havlík, P., Gusti, M., Mosnier, A., Frank, S., Valin, H., Fritz, S., Fuss, S., Kindermann, G., McCallum, I., Khabarov, N., Böttcher, H., See, L., Aoki, K., Schmid, E., Máthé, L., & Obersteiner, M. (2013). Global bioenergy scenarios – Future forest development, land-use implications, and trade-offs. Biomass and Bioenergy, 57, 86–96. https://doi.org/10.1016/j.biombioe.2013.02.003
Lam, A., & Mercure, J.-F. (2022). Evidence for a global electric vehicle tipping point. https://www.exeter.ac.uk/media/universityofexeter/globalsystemsinstitute/documents/Lam_et_al_Evidence_for_a_global_EV_TP.pdf
Latour, B. (2017). Facing Gaia: Eight lectures on the new climatic regime. John Wiley & Sons.
Leach, M., Newell, P., & Scoones, I. (2015). The Politics of Green Transformations (1st ed.). Routledge. https://doi.org/10.4324/9781315747378
Lyon, T. P., & Maxwell, J. W. (2011). Greenwash: Corporate Environmental Disclosure under Threat of Audit. Journal of Economics & Management Strategy, 20(1), 3–41. https://doi.org/10.1111/j.1530-9134.2010.00282.x
Manzetti, S., & Mariasiu, F. (2015). Electric vehicle battery technologies: From present state to future systems. Renewable and Sustainable Energy Reviews, 51, 1004–1012. https://doi.org/10.1016/j.rser.2015.07.010
McCulloch, N. (2023). Ending Fossil Fuel Subsidies (Vol. 1). Practical Action Publishing. https://doi.org/10.3362/9781788532044
Mehrabi, Z., Ellis, E. C., & Ramankutty, N. (2018). The challenge of feeding the world while conserving half the planet. Nature Sustainability, 1(8), 409–412. https://doi.org/10.1038/s41893-018-0119-8
Meinshausen, M., Lewis, J., McGlade, C., Gütschow, J., Nicholls, Z., Burdon, R., Cozzi, L., & Hackmann, B. (2022). Realization of Paris Agreement pledges may limit warming just below 2 °C. Nature, 604(7905), 304–309. https://doi.org/10.1038/s41586-022-04553-z
Meldrum, M., Pinnell, L., Brennan, K., Romani, M., Sharpe, S., & Lenton, T. (2023). The Breakthrough Effect: How to trigger a cascade of tipping points to accelerate the net zero transition.https://www.systemiq.earth/wp-content/uploads/2023/01/The-Breakthrough-Effect.pdf
Mey, F., & Diesendorf, M. (2018). Who owns an energy transition? Strategic action fields and community wind energy in Denmark. Energy Research & Social Science, 35, 108–117. https://doi.org/10.1016/j.erss.2017.10.044
Mignolo, W. D. (2021). The Politics of Decolonial Investigations. Duke University Press. https://doi.org/10.2307/j.ctv1smjncs
Newell, P., Daley, F., & Twena, M. (2022). Changing our ways: Behaviour change and the climate crisis. Cambridge University Press.
Newell, P. J., Geels, F. W., & Sovacool, B. K. (2022). Navigating tensions between rapid and just low-carbon transitions. Environmental Research Letters, 17(4), 041006. https://doi.org/10.1088/1748-9326/ac622a
Newell, P., Twena, M., & Daley, F. (2021). Scaling behaviour change for a 1.5-degree world: challenges and opportunities. Global Sustainability, 4, e22. https://doi.org/10.1017/sus.2021.23
Nijsse, F. J. M. M., Mercure, J.-F., Ameli, N., Larosa, F., Kothari, S., Rickman, J., Vercoulen, P., & Pollitt, H. (2023). The momentum of the solar energy transition. Nature Communications, 14(1), 6542. https://doi.org/10.1038/s41467-023-41971-7
Norgaard, K. M. (2011). Living in Denial: Climate Change, Emotions, and Everyday Life. The MIT Press. https://doi.org/10.7551/mitpress/9780262015448.001.0001
Obura, D. O. (2023). Thirteen steps to transformation. Nature Sustainability. https://doi.org/10.1038/s41893-023-01214-5
Olsson, P., Galaz, V., & Boonstra, W. (2014). Sustainability transformations: a resilience perspective. Ecology and Society, 19(4). https://doi.org/10.5751/ES-06799-190401
Parenti, C., & Moore, J. W. (Eds.). (2016). Anthropocene or capitalocene? nature, history, and the crisis of capitalism. PM Press.
Patterson, J. J., Thaler, T., Hoffmann, M., Hughes, S., Oels, A., Chu, E., Mert, A., Huitema, D., Burch, S., & Jordan, A. (2018). Political feasibility of 1.5°C societal transformations: the role of social justice. Current Opinion in Environmental Sustainability, 31, 1–9. https://doi.org/10.1016/j.cosust.2017.11.002
Pedroli, B., Elbersen, B., Frederiksen, P., Grandin, U., Heikkilä, R., Krogh, P. H., Izakovičová, Z., Johansen, A., Meiresonne, L., & Spijker, J. (2013). Is energy cropping in Europe compatible with biodiversity? – Opportunities and threats to biodiversity from land-based production of biomass for bioenergy purposes. Biomass and Bioenergy, 55, 73–86. https://doi.org/10.1016/j.biombioe.2012.09.054
Pereira, L. M., Gianelli, I., Achieng, T., Amon, D., Archibald, S., Arif, S., Castro, A., Chimbadzwa, T. P., Coetzer, K., Field, T.-L., Selomane, O., Sitas, N., Stevens, N., Villasante, S., Armani, M., Kimuyu, D. M., Adewumi, I. J., Ghadiali, A., Obura, D., … Sumaila, U. R. (2023). Equity and Justice should underpin the discourse on Tipping Points [Preprint]. Biosphere and ecosystems/Other interactions/Other methods. https://doi.org/10.5194/egusphere-2023-1455
Pickering, J., Coolsaet, B., Dawson, N., Suiseeya, K., Inoue, C., & Lim, M. (2022). Rethinking and Upholding Justice and Equity in Transformative Biodiversity Governance. In I. Visseren-Hamakers & M. Kok (Eds.), Transforming Biodiversity Governance (pp. 155-178). Cambridge: Cambridge University Press.
Piotrowski, Matt, & Ortiz, E. (2019). Nearing the tipping point: Drivers of deforestation in the Amazon Region. Inter-American Dialogue: Washington, WA, USA. https://www.thedialogue.org/wp-content/uploads/2019/05/Nearing-the-Tipping-Point-for-website.pdf
Rammelt, C. F., Gupta, J., Liverman, D., Scholtens, J., Ciobanu, D., Abrams, J. F., Bai, X., Gifford, L., Gordon, C., Hurlbert, M., Inoue, C. Y. A., Jacobson, L., Lade, S. J., Lenton, T. M., McKay, D. I. A., Nakicenovic, N., Okereke, C., Otto, I. M., Pereira, L. M., … Zimm, C. (2022). Impacts of meeting minimum access on critical earth systems amidst the Great Inequality. Nature Sustainability, 6(2), 212–221. https://doi.org/10.1038/s41893-022-00995-5
Raworth, K. (2017). Doughnut economics: seven ways to think like a 21st-century economist. Chelsea Green Publishing.
Rionfrancos, T., Kendall, K. K., Haugen, M., McDonald, K., Hassan, B., and Slattery, M. (2023). More Mobility Less Mining. Climate and community. https://www.climateandcommunity.org/more-mobility-less-mining
Ritchie, H. (2022). Many countries have decoupled economic growth from CO2 emissions, even if we take offshored production into account. Our World Data. https://ourworldindata.org/co2-gdp-decoupling
Rocha, J. C., Peterson, G. D., & Biggs, R. (2015). Regime Shifts in the Anthropocene: Drivers, Risks, and Resilience. PLOS ONE, 10(8), e0134639. https://doi.org/10.1371/journal.pone.0134639
Rocha, J., Lanyon, C., & Peterson, G. (2022). Upscaling the resilience assessment through comparative analysis. Global Environmental Change, 72, 102419. https://doi.org/10.1016/j.gloenvcha.2021.102419

Rockström, J., Gupta, J., Qin, D., Lade, S. J., Abrams, J. F., Andersen, L. S., Armstrong McKay, D. I., Bai, X., Bala, G., Bunn, S. E., Ciobanu, D., DeClerck, F., Ebi, K., Gifford, L., Gordon, C., Hasan, S., Kanie, N., Lenton, T. M., Loriani, S., … Zhang, X. (2023). Safe and just Earth system boundaries. Nature, 619(7968), 102–111. https://doi.org/10.1038/s41586-023-06083-8

Santos, B. de S. (2021). Postcolonialism, Decoloniality, and Epistemologies of the South. In Oxford Research Encyclopedia of Literature. https://doi.org/10.1093/acrefore/9780190201098.013.1262

Scoones, I., Stirling, A., Abrol, D., Atela, J., Charli-Joseph, L., Eakin, H., Ely, A., Olsson, P., Pereira, L., Priya, R., van Zwanenberg, P., & Yang, L. (2020). Transformations to sustainability: combining structural, systemic and enabling approaches. Current Opinion in Environmental Sustainability, 42, 65–75. https://doi.org/10.1016/j.cosust.2019.12.004

Smith, S. R., Christie, I., & Willis, R. (2020). Social tipping intervention strategies for rapid decarbonization need to consider how change happens. Proceedings of the National Academy of Sciences, 117(20), 10629–10630. https://doi.org/10.1073/pnas.2002331117

Som, T. (2023). The Nutmeg's Curse: Parables for a Planet in Crisis by Amitav Ghosh. Ariel: A Review of International English Literature, 54(2), 160–163.

Sovacool, B. K. (2021). Who are the victims of low-carbon transitions? Towards a political ecology of climate change mitigation. Energy Research & Social Science, 73, 101916. https://doi.org/10.1016/j.erss.2021.101916

Sovacool, B. K., Newell, P., Carley, S., & Fanzo, J. (2022). Equity, technological innovation and sustainable behaviour in a low-carbon future. Nature Human Behaviour, 6(3), 326–337. https://doi.org/10.1038/s41562-021-01257-8

Srinivasan, K., & Kasturirangan, R. (2016). Political ecology, development, and human exceptionalism. Geoforum, 75, 125–128. https://doi.org/10.1016/j.geoforum.2016.07.011

Steinberger, J. K., Lamb, W. F., & Sakai, M. (2020). Your money or your life? The carbon-development paradox. Environmental Research Letters, 15(4), 044016. https://doi.org/10.1088/1748-9326/ab7461

Sterman, J. D. (2002). All models are wrong: reflections on becoming a systems scientist. System Dynamics Review, 18(4), 501–531. https://doi.org/10.1002/sdr.261

Stirling, A. (2010). Keep it complex. Nature, 468(7327), 1029–1031. https://doi.org/10.1038/4681029a

Stone, L., Montes de Oca, G., & Christie, I. (2021). A Commoner's Climate Movement: Local action in theory and practice. In C. Howarth, M. Lane, & A. Slevin (Eds.), Addressing the Climate Crisis (p. 143). London. Palgrave Macmillan.

Sultana, F. (2022). The unbearable heaviness of climate coloniality. Political Geography, 99, 102638. https://doi.org/10.1016/j.polgeo.2022.102638

Tàbara, J. D., Lieu, J., Zaman, R., Ismail, C., & Takama, T. (2022). On the discovery and enactment of positive socio-ecological tipping points: insights from energy systems interventions in Bangladesh and Indonesia. Sustainability Science, 17(2), 565–571. https://doi.org/10.1007/s11625-021-01050-6

The Food and Land Use Coalition. (2021). Accelerating the 10 Critical Transitions: Positive Tipping Points for Food and Land Use Systems Transformation. https://www.foodandlandusecoalition.org/wp-content/uploads/2021/07/Positive-Tipping-Points-for-Food-and-Land-Use-Systems-Transformation.pdf

Torres, I., & Niewöhner, J. (2023). Whose energy sovereignty? Competing imaginaries of Mexico's energy future. Energy Research & Social Science, 96, 102919. https://doi.org/10.1016/j.erss.2022.102919

Trebeck, K., & Williams, J. (2019). The economics of arrival: ideas for a grown-up economy. Policy Press.

Tremmel, J. (2010). Intergenerational Justice – Scope and Limits. Intergenerational Justice Review, Vol 5, No 1 (2010): Ways to Legally Implement Intergenerational Justice. https://doi.org/10.24357/IGJR.5.1.473

United Nations (UN). (2023). Independent Group of Scientists appointed by the Secretary-General, Global Sustainable Development Report 2023: Times of crisis, times of change: Science for accelerating transformations to sustainable development. United Nations. New York. https://sdgs.un.org/gsdr/gsdr2023

United Nations. (2023). Global Sustainable Development Report (GSDR) 2023. https://sdgs.un.org/gsdr/gsdr2023

UNPFII. (2023). Permanent Forum on Indigenous Issues Report on the twenty-second session. https://documents-dds-ny.un.org/doc/UNDOC/LTD/N23/127/22/PDF/N2312722.pdf?OpenElement

van de Ven, D.-J., Mittal, S., Gambhir, A., Lamboll, R. D., Doukas, H., Giarola, S., Hawkes, A., Koasidis, K., Köberle, A. C., McJeon, H., Perdana, S., Peters, G. P., Rogelj, J., Sognnaes, I., Vielle, M., & Nikas, A. (2023). A multimodel analysis of post-Glasgow climate targets and feasibility challenges. Nature Climate Change, 13(6), 570–578. https://doi.org/10.1038/s41558-023-01661-0

Vedeld, P., Cavanagh, C., Petursson, J. G., Nakakaawa, C., Moll, R., & Sjaastad, E. (2016). The Political Economy of Conservation at Mount Elgon, Uganda: Between Local Deprivation, Regional Sustainability, and Global Public Goods. Conservation and Society, 14(3), 183–194. https://www.jstor.org/stable/26393241

Vogel, J., & Hickel, J. (2023). Is green growth happening? An empirical analysis of achieved versus Paris-compliant CO2–GDP decoupling in high-income countries. The Lancet Planetary Health, 7(9), e759–e769. https://doi.org/10.1016/S2542-5196(23)00174-2

Whyte, K. (2020). Too late for indigenous climate justice: Ecological and relational tipping points. WIREs Climate Change, 11(1), e603. https://doi.org/10.1002/wcc.603

Wiedmann, T., Lenzen, M., Keyßer, L. T., & Steinberger, J. K. (2020). Scientists' warning on affluence. Nature Communications, 11(1), 3107. https://doi.org/10.1038/s41467-020-16941-y

WRI. (2023). ClimateWatch Net Zero Tracker,. https://www.climatewatchdata.org/net-zero-tracker

Yusoff, K. (2018). A billion black Anthropocenes or none. U of Minnesota Press.

Zografos, C., & Robbins, P. (2020). Green Sacrifice Zones, or Why a Green New Deal Cannot Ignore the Cost Shifts of Just Transitions. One Earth, 3(5), 543–546. https://doi.org/10.1016/j.oneear.2020.10.012

Section coordination:

Tom Powell	GSI, University of Exeter, UK
Steven R. Smith (lead Chapter 4.1 and 4.2)	GSI, University of Exeter, UK; Centre for the Understanding of Sustainable Prosperity, University of Surrey, UK
Caroline Zimm	International Institute for Applied Systems Analysis, Austria; Earth Commission
Emma Bailey	GSI, University of Exeter, UK

Chapter Leads

Chapter Lead 4.3	Floor Alkemade	Eindhoven University of Technology, Netherlands
	Luis Martinez	Organisation for Economic Co-operation and Development (OECD)
	Lukas Fesenfeld	ETH Zurich , Switzerland; University of Bern, Switzerland
Chapter Lead 4.4	Viktoria Spaiser	Sustainability Research and Computational Social Science University of Leeds, UK
	Sara M. Constantino	Northeastern University, USA; Princeton University, USA
	Elena Verdolini	University of Brescia, Italy; European Institute on Economics and the Environment, Italy; Euro-Mediterranean Center on Climate Change, Italy
	Nadia Ameli	University College London, UK
	Joshua E. Buxton	GSI, University of Exeter, UK
	Chris A. Boulton	GSI, University of Exeter, UK
Chapter Lead 4.5	Sibel Eker	Radboud University, Netherlands; International Institute for Applied Systems Analysis, Austria
Chapter Lead 4.6	Laura Pereira	University of the Witwatersrand, South Africa; Stockholm Resilience Centre, Stockholm University, Sweden

Reviewers

Magnus Bengtsson	Policy Director, Hot or Cool Institute, Germany
Luca Coscieme	Programme Lead – Sustainable Lifestyles, Hot or Cool Institute, Germany
Lisa Jacobson	Science Officer, Earth Commission, Sweden
Mark Meldrum	Partner, Systemic, UK
Tim Hodgson (4.4.3)	Head of Research and Co-founder, Thinking Ahead Institute, UK
Margot Hurlbert (4.6)	Professor, Justice Studies / Sociology and Social Studies, University of Regina
Mike Clark (4.4.3)	Founder Director, Ario Advisory, UK

University of Exeter | Global Systems Institute

Funded by:

BEZOS EARTH FUND

Report Partners:

SYSTEMS CHANGE LAB

EARTH COMMISSION GLOBAL COMMONS ALLIANCE

SYSTEMIQ

Disclaimer:

The views expressed throughout the report are that of the authors and their individual capacities not those of their employers, institutions, or the report's funder Bezos Earth fund as a whole. All liability with respect to actions taken or not taken based on the content of this report is hereby expressly disclaimed. The content of this report is provided "as is" no representations are made that the content is error-free.

Suggested GTPR Section 4 citation:

T. Powell, S.R. Smith, C. Zimm, E. Bailey (eds) 2023, 'Section 4: Positive Tipping Points in Technology, Economy and Society' in [T. M. Lenton, D.I. Armstrong McKay, S. Loriani, J.F. Abrams, S.J. Lade, J.F. Donges, M. Milkoreit, T. Powell, S.R. Smith, C. Zimm, J.E. Buxton, E. Bailey, L. Laybourn, A. Ghadiali, J.G. Dyke (eds), 2023, The Global Tipping Points Report 2023.] University of Exeter, Exeter, UK.