

BIBLIOGRAPHY

- Abbott, D. M. (2017a). Some Fundamental Issues in Geoethics. In *Geoethics at the Heart of All Geoscience. Annals of Geophysics*, 60(7). <https://doi.org/10.4401/ag-7407>.
- Abbott, D. M. (2017b). Brief History and Application of Enforceable Professional Geoscience Ethics Codes. In *Scientific Integrity and Ethics: With Applications to the Geosciences* (pp. 91–109). Special Publications 73. Washington, DC: American Geophysical Union; Hoboken, NJ: Wiley. <https://doi.org/10.1002/9781119067825.ch7>.
- Abd-El Monsef, H., Smith, S. E., & Darwish, K. (2015). Impacts of the Aswan High Dam After 50 Years. *Water Resources Management*, 29(6), 1873–1885. <https://doi.org/10.1007/s11269-015-0916-z>.
- Aceves-Bueno, E., Adeleye, A. S., Bradley, D., Tyler Brandt, W., Callery, P., Feraud, M., et al. (2015). Citizen Science as an Approach for Overcoming Insufficient Monitoring and Inadequate Stakeholder Buy-In in Adaptive Management: Criteria and Evidence. *Ecosystems*, 18(3), 493–506. <https://doi.org/10.1007/s10021-015-9842-4>.
- Adger, W. N., Arnell, N. W., & Tompkins, E. L. (2005). Successful Adaptation to Climate Change Across Scales. *Global Environmental Change*, 15(2), 77–86. <https://doi.org/10.1016/j.gloenvcha.2004.12.005>.
- Albarelo, D. (2015). Communicating Uncertainty: Managing the Inherent Probabilistic Character of Hazard Estimates. In *Geoethics: The Role and Responsibility of Geoscientists* (pp. 111–116). Geological Society of London, Special Publications 419. <https://doi.org/10.1144/SP419.9>.

- Allan, M. (2015). Geotourism: An Opportunity to Enhance Geoethics and Boost Geoheritage Appreciation. In *Geoethics: The Role and Responsibility of Geoscientists* (pp. 25–29). Geological Society of London, Special Publications 419. <https://doi.org/10.1144/SP419.20>.
- Allenby, B. R., & Sarewitz, D. (2011). *The Techno-Human Condition* (240pp.). Cambridge: MIT Press. ISBN 9780262015691.
- Allington, R., & Fernandez-Fuentes, I. (2014). The Roles and Responsibilities of Engineering Geologists and Other Geoscientists in Serving Society and Protecting the Public—An Overview of International Approaches to Ensuring Effective and Ethical Professional Practice. In *Engineering Geology for Society and Territory—Volume 7, Education, Professional Ethics and Public Recognition of Engineering Geology* (pp. 131–134). Cham: Springer International Publishing. https://doi.org/10.1007/978-3-319-09303-1_25.
- Almeida, A., & Vasconcelos, C. (2015). Geoethics: Master's Students Knowledge and Perception of Its Importance. *Research in Science Education*, 45(6), 889–906. <https://doi.org/10.1007/s11165-014-9449-3>.
- Arroyo, K. K. (2017). Creative Policymaking: Taking the Lessons of Creative Placemaking to Scale. *Artivate: Journal of Arts Innovation and Entrepreneurship*, 6(2), 58–72.
- Arvanitidis, N., Boon, J., Nurmi, P., & Di Capua, G. (2017). *White Paper on Responsible Mining*. IAPG—International Association for Promoting Geoethics. <http://www.geoethics.org/wp-responsible-mining>.
- Asafu-Adjaye, J., Blomqvist, L., Brand, S., Brook, B., Defries, R., Ellis, E., et al. (2015). *An Ecomodernist Manifesto* (31pp.). Oakland: Breakthrough Institute. <http://www.ecomodernism.org/manifesto>.
- Audouin, M., Preiser, R., Nienaber, S., Downsborough, L., Lanz, J., & Mavengahama, S. (2013). Exploring the Implications of Critical Complexity for the Study of Social-Ecological Systems. *Ecology and Society*, 18(3), 12. <https://doi.org/10.5751/ES-05434-180312>.
- Auster, P. J., Fujita, R., Kellert, S. R., Avise, J., Campagna, C., Cuker, B., et al. (2009). Developing an Ocean Ethic: Science, Utility, Aesthetics, Self-Interest, and Different Ways of Knowing. *Conservation Biology*, 23(1), 233–235. <https://doi.org/10.1111/j.1523-1739.2008.01057.x>.
- Autin, W. J. (2016). Multiple Dichotomies of the Anthropocene. *The Anthropocene Review*, 3(3), 218–230. <https://doi.org/10.1177/2053019616646133>.
- Ball, P. (2005, March 7). The Earth Moves Most for Humans. *Nature*. <https://doi.org/10.1038/news050307-2>.
- Banerjee, B. (2011). The Limitations of Geoengineering Governance. In *A World of Uncertainty*. *Stanford Journal of Law, Science Policy*, 4(11), 15–36. <https://www-cdn.law.stanford.edu/wp-content/uploads/2018/05/banerjee.pdf>.

- Barbier, M., Reitz, A., Pabortsava, K., Wölfl, A.-C., Hahn, T., & Whoriskey, F. (2018). Ethical Recommendations for Ocean Observation. *Advances in Geosciences*, 45, 343–361. <https://doi.org/10.5194/adgeo-45-343-2018>.
- Barnosky, A. D., Hadly, E. A., Bascompte, J., Berlow, E. L., Brown, J. H., Fortelius, M., et al. (2012). Approaching a State Shift in Earth's Biosphere. *Nature*, 486, 52–58. <https://doi.org/10.1038/nature11018>.
- Barry, A., Born, G., & Weszkalnys, G. (2008). Logics of Interdisciplinarity. *Economy and Society*, 37(1), 20–49. <https://doi.org/10.1080/03085140701760841>.
- Bauer, P., Thorpe, A., & Brunet, G. (2015). The Quiet Revolution of Numerical Weather Prediction. *Nature*, 525, 47–55. <https://doi.org/10.1038/nature14956>.
- Bauman, W. (2015). Climate Weirding and Queering Nature: Getting Beyond the Anthropocene. *Religions*, 6(2), 742–754. <https://doi.org/10.3390/rel6020742>.
- Becker, C. U. (2012). *Sustainability Ethics and Sustainability Research* (138pp.). Dordrecht: Springer Netherlands. ISBN 978-94-007-2284-2. <https://doi.org/10.1007/978-94-007-2285-9>.
- Begon, M. (2017). Mike Begon: Winning Public Arguments as Ecologists: Time for a New Doctrine? *Trends in Ecology & Evolution*, 32(6), 394–396. <https://doi.org/10.1016/j.tree.2017.03.009>.
- Bergthaller, H., Emmett, R., Johns-Putra, A., Kneitz, A., Lidström, S., McCorristine, S., et al. (2014). Mapping Common Ground: Ecocriticism, Environmental History, and the Environmental Humanities. *Environmental Humanities*, 5(1), 261–276. <https://doi.org/10.1215/22011919-3615505>.
- Berkes, F. (2006). From Community-Based Resource Management to Complex Systems: The Scale Issue and Marine Commons. *Ecology and Society*, 11(1), 45. <https://doi.org/10.5751/ES-01431-110145>.
- Bernal, J. D. (1939). *The Social Function of Science* (482pp.). London: George Routledge & Sons. <https://archive.org/details/in.ernet.dli.2015.188098>.
- Betsill, M. M. (2001). Mitigating Climate Change in US Cities: Opportunities and Obstacles. *Local Environment*, 6(4), 393–406. <https://doi.org/10.1080/13549830120091699>.
- Beven, K. J., Almeida, S., Aspinall, W. P., Bates, P. D., Blazkova, S., Borgomeo, E., et al. (2018a). Epistemic Uncertainties and Natural Hazard Risk Assessment—Part 1: A Review of Different Natural Hazard Areas. *Natural Hazards and Earth System Sciences*, 18, 2741–2768. <https://doi.org/10.5194/nhess-18-2741-2018>.
- Beven, K. J., Aspinall, W. P., Bates, P. D., Borgomeo, E., Goda, K., Hall, J. W., et al. (2018b). Epistemic Uncertainties and Natural Hazard Risk Assessment—Part 2: What Should Constitute Good Practice? *Natural Hazards and Earth System Sciences*, 18, 2769–2783. <https://doi.org/10.5194/nhess-18-2769-2018>.

- Biermann, F. (2014). *Earth System Governance: World Politics in the Anthropocene* (288pp.). Cambridge: MIT Press. ISBN 9780262028226.
- Biermann, F., Abbott, K., Andresen, S., Backstrand, K., Bernstein, S., Betsill, M. M., et al. (2012). Navigating the Anthropocene: Improving Earth System Governance. *Science*, 335(6074), 1306–1307. <https://doi.org/10.1126/science.1217255>.
- Biggs, R. (Oonsie), Rhode, C., Archibald, S., Kunene, L. M., Mutanga, S. S., Nkuna, N., et al. (2015). Strategies for Managing Complex Social-Ecological Systems in the Face of Uncertainty: Examples from South Africa and Beyond. *Ecology and Society*, 20(1), 52. <https://doi.org/10.5751/ES-07380-200152>.
- Bilham, R. (2015). Mmax: Ethics of the Maximum Credible Earthquake. In *Geoethics: Ethical Challenges and Case Studies in Earth Sciences* (pp. 119–140). Waltham, MA: Elsevier. <https://doi.org/10.1016/B978-0-12-799935-7.00011-3>.
- Biro, A. (2015). The Good Life in the Greenhouse? Autonomy, Democracy, and Citizenship in the Anthropocene. *Telos*, 2015(172), 15–37. <https://doi.org/10.3817/0915172015>.
- Blankenship, J. D. (2018). Midcentury Geohumanities: J. B. Jackson and the “Magazine of Human Geography.” *GeoHumanities*, 4(1), 26–44. <https://doi.org/10.1080/2373566X.2017.1386075>.
- Bobrowsky, P. T. (2013). Presidential Address. *Geoscience Canada*, 40, 235–241.
- Bobrowsky, P., Cronin, V., Di Capua, G., Kieffer, S., & Peppoloni, S. (2017). The Emerging Field of Geoethics. In *Scientific Integrity and Ethics: With Applications to the Geosciences* (pp. 175–212). Special Publications 73. Washington, DC: American Geophysical Union; Hoboken, NJ: Wiley. <https://doi.org/10.1002/9781119067825.ch11>.
- Bodansky, D. (2013). The Who, What, and Wherefore of Geoengineering Governance. *Climatic Change*, 121, 539–551. <https://doi.org/10.1007/s10584-013-0759-7>.
- Boettcher, M., & Schäfer, S. (2017). Reflecting Upon 10 Years of Geoengineering Research: Introduction to the Crutzen+10 Special Issue. *Earth's Future*, 5, 266–277. <https://doi.org/10.1002/2016EF000521>.
- Bohle, M. (2015). Simple Geoethics: An Essay on Daily Earth Science. In *Geoethics: The Role and Responsibility of Geoscientists* (pp. 5–12). Geological Society of London, Special Publications 419. <https://doi.org/10.1144/SP419.3>.
- Bohle, M. (2016). Handling of Human-Geosphere Intersections. *Geosciences*, 6(1), 3. <https://doi.org/10.3390/geosciences6010003>.
- Bohle, M. (2017). Ideal-Type Narratives for Engineering a Human Niche. *Geosciences*, 7(1), 18. <https://doi.org/10.3390/geosciences7010018>.

- Bohle, M. (2018). One Realm: Thinking Geoethically and Guiding Small-Scale Fisheries? *The European Journal of Development Research*, 1–39. <https://doi.org/10.1057/s41287-018-0146-3>.
- Bohle, M., & Ellis, E. C. (2017). Furthering Ethical Requirements for Applied Earth Science. In *Geoethics: At the Heart of All Geoscience. Annals of Geophysics*, 60(7). <https://doi.org/10.4401/ag-7401>.
- Bohle, M., Sibilla, A., & Casals I Graels, R. (2017). A Concept of Society-Earth-Centric Narratives. In *Geoethics: At the Heart of All Geoscience. Annals of Geophysics*, 60(7). <https://doi.org/10.4401/ag-7358>.
- Boland, M. A., & Mogk, D. (2017). The American Geosciences Institute Guidelines for Ethical Professional Conduct. In *Scientific Integrity and Ethics: With Applications to the Geosciences* (pp. 55–66). Special Publications 73. Washington, DC: American Geophysical Union; Hoboken, NJ: Wiley. <https://doi.org/10.1002/9781119067825.ch4>.
- Bonneuil, C., & Fressoz, J.-B. (2013). *L'événement Anthropocène - La terre, l'histoire et nous* (320pp.). Paris: Le Seuil. ISBN 978-2021135008.
- Bonney, R., Shirk, J. L., Phillips, T. B., Wiggins, A., Ballard, H. L., Miller-Rushing, A. J., et al. (2014). Next Steps for Citizen Science. *Science*, 343(6178), 1436–1437. <https://doi.org/10.1126/science.1251554>.
- Boon, J. (2015). *Corporate Social Responsibility, Relationships and the Course of Events in Mineral Exploration—An Exploratory Study*. <https://curve.carleton.ca/6c6598d4-c436-409e-9ba1-40dea2d37d2c>.
- Botero, C. A., Gardner, B., Kirby, K. R., Bulbulia, J., Gavin, M. C., & Gray, R. D. (2014). The Ecology of Religious Beliefs. *Proceedings of the National Academy of Sciences*, 111(47), 16784–16789. <https://doi.org/10.1073/pnas.1408701111>.
- Braje, T. J. (2015). Earth Systems, Human Agency, and the Anthropocene: Planet Earth in the Human Age. *Journal of Archaeological Research*, 23(4), 369–396. <https://doi.org/10.1007/s10814-015-9087-y>.
- Braje, T. J., & Erlandson, J. M. (2013). Looking Forward, Looking Back: Humans, Anthropogenic Change, and the Anthropocene. *Anthropocene*, 4, 116–121. <https://doi.org/10.1016/j.ancene.2014.05.002>.
- Brennetot, A. (2010). Pour une geoethique. Elements d'analyse des conceptions de la justice spatiale. *Espace Géographique*, 39(1), 75–88.
- Brennetot, A. (2011). Les géographes et la justice spatiale: Généalogie d'une relation compliquée. *Annales de Géographie*, 119(678), 115–134.
- Bronk, D. W. (1975). The National Science Foundation: Origins, Hopes, and Aspirations. *Science*, 188(4187), 409–414.
- Brown, A. (2012). *Just Enough: Lessons in Living Green from Traditional Japan*. North Clarendon: Tuttle Publishing. ISBN 978-1-4629-1179-0.

- Brown, P. G., & Schmidt, J. J. (2014). Living in the Anthropocene: Business as Usual, or Compassionate Retreat? In *State of the World 2014* (pp. 63–71). Washington, DC: Island Press. https://doi.org/10.5822/978-1-61091-542-7_6.
- Brown, S., Nicholls, R. J., Hanson, S., Brundrit, G., Dearing, J. A., Dickson, M. E., et al. (2014). Shifting Perspectives on Coastal Impacts and Adaptation. *Nature Climate Change*, 4(9), 752–755. <https://doi.org/10.1038/nclimate2344>.
- Brown, A. G., Tooth, S., Bullard, J. E., Thomas, D. S. G., Chiverrell, R. C., Plater, A. J., et al. (2017). The Geomorphology of the Anthropocene: Emergence, Status and Implications. *Earth Surface Processes and Landforms*, 42(1), 71–90. <https://doi.org/10.1002/esp.3943>.
- Bugge, M., Hansen, T., & Klitkou, A. (2016). What Is the Bioeconomy? A Review of the Literature. *Sustainability*, 8(7), 691. <https://doi.org/10.3390/su8070691>.
- Buhmann, K. (2016). Public Regulators and CSR: The ‘Social Licence to Operate’ in Recent United Nations Instruments on Business and Human Rights and the Juridification of CSR. *Journal of Business Ethics*, 136(4), 699–714. <https://doi.org/10.1007/s10551-015-2869-9>.
- Bunge, M. A. (1989). *Treaties on Basic Philosophy—Ethics: The Good and the Right* (Vol. 8, XVI, 428pp.). Dordrecht: Springer Netherlands. ISBN 978-94-009-2601-1.
- Bunge, M. A. (2017). *Doing Science: In the Light of Philosophy* (244pp.). Singapore: World Scientific. ISBN 978-9813202764. <https://doi.org/10.1142/10333>.
- Buytaert, W., Zulkafli, Z., Grainger, S., Acosta, L., Alemie, T. C., Bastiaensen, J., et al. (2014). Citizen Science in Hydrology and Water Resources: Opportunities for Knowledge Generation, Ecosystem Service Management, and Sustainable Development. *Frontiers in Earth Science*, 2, 1–21. <https://doi.org/10.3389/feart.2014.00026>.
- Cairney, P. (2016). *The Politics of Evidence-Based Policy Making*. London: Palgrave Pivot. ISBN 978-1-137-51780-7. <https://doi.org/10.1057/978-1-137-51781-4>.
- Campbell, L. M., Gray, N. J., Fairbanks, L., Silver, J. J., Gruby, R. L., Dubik, B. A., et al. (2016). Global Oceans Governance: New and Emerging Issues. *Annual Review of Environment and Resources*, 41(1), 517–543. <https://doi.org/10.1146/annurev-environ-102014-021121>.
- Cardinale, B. J., Duffý, J. E., Gonzalez, A., Hooper, D. U., Perrings, C., Venail, P., et al. (2012). Biodiversity Loss and Its Impact on Humanity. *Nature*, 486, 59–67. <https://doi.org/10.1038/nature11148>.
- Carpentier, J., Lebrun, F., & Arrignon, J.-P. (1992). *Histoire de l'Europe* (p. 620). Paris: Editions du Seuil.

- Cashion, T., Al-Abdulrazzak, D., Belhabib, D., Derrick, B., Divovich, E., Moutopoulos, D. K., et al. (2018). Reconstructing Global Marine Fishing Gear Use: Catches and Landed Values by Gear Type and Sector. *Fisheries Research*, 206, 57–64. <https://doi.org/10.1016/j.fishres.2018.04.010>.
- Castree, N. (2017). Speaking for the ‘People Disciplines’: Global Change Science and Its Human Dimensions. *The Anthropocene Review*, 4(3), 160–182. <https://doi.org/10.1177/2053019617734249>.
- Castree, N., Adams, W. M., Barry, J., Brockington, D., Büscher, B., Corbera, E., et al. (2014). Changing the Intellectual Climate. *Nature Climate Change*, 4(9), 763–768. <https://doi.org/10.1038/nclimate2339>.
- Catlin, K. A. (2016). Archaeology for the Anthropocene: Scale, Soil, and the Settlement of Iceland. *Anthropocene*, 15, 13–21. <https://doi.org/10.1016/j.ancene.2015.12.005>.
- Chakrabarty, D. (2009). The Climate of History: Four Theses. *Critical Inquiry*, 35(2), 197–222. <https://doi.org/10.1086/596640>.
- Chakrabarty, D. (2015). The Anthropocene and the Convergence of Histories. *The Anthropocene and the Global Environmental Crisis: Rethinking Modernity in a New Epoch* (pp. 32–43). London: Routledge.
- Chakrabarty, D. (2016). Whose Anthropocene? A Response. *RCC Perspectives*, 2, 101–114. <http://www.jstor.org/stable/26241365>.
- Chakrabarty, D. (2017). The Politics of Climate Change Is More Than the Politics of Capitalism. *Theory, Culture & Society*, 34(2–3), 25–37. <https://doi.org/10.1177/0263276417690236>.
- Cherkashin, A. K., & Sklyanova, I. P. (2016). The Manifestation of the Principles of Geoeological Ethics: Environmental Approach. *Geography and Natural Resources*, 37(3), 271–280. <https://doi.org/10.1134/S1875372816030112>.
- Chew, S., & Sarabia, D. (2016). Nature-Culture Relations: Early Globalization, Climate Changes, and System Crisis. *Sustainability*, 8(1), 78. <https://doi.org/10.3390/su8010078>.
- Christensen, S. Y., Meganck, M., & Delahousse, B. (Eds.). (2007). *Philosophy in Engineering* (430pp.). Arhus: Academica. ISBN-13: 978-87-7675-454-9.
- Chuenpagdee, R., & Jentoft, S. (2013). Assessing Governability—What’s Next. In *Governability of Fisheries and Aquaculture: Theory and Applications* (pp. 335–349). Dordrecht: Springer Netherlands. https://doi.org/10.1007/978-94-007-6107-0_18.
- Chung, S. Y., Ehrenfreund, P., Rummel, J. D., & Peter, N. (2010). Synergies of Earth Science and Space Exploration. *Advances in Space Research*, 45(1), 155–168. <https://doi.org/10.1016/j.asr.2009.10.025>.
- Clark, N., & Gunaratnam, Y. (2017). Earthing the Anthropos? From ‘Socializing the Anthropocene’ to Geologizing the Social. *European Journal of Social Theory*, 20(1), 146–163. <https://doi.org/10.1177/1368431016661337>.

- Cocco, M., Cultrera, G., Amato, A., Braun, T., Cerase, A., Margheriti, L., et al. (2015). The L'Aquila Trial. In *Geoethics: The Role and Responsibility of Geoscientists* (pp. 43–55). Geological Society of London, Special Publications 419. <https://doi.org/10.1144/SP419.13>.
- Connolly, W. E. (2017). *Facing the Planetary: Entangled Humanism and the Politics of Swarming* (240pp.). Durham: Duke University Press Books. ISBN 978-0822363415.
- Conway, D., & Schipper, E. L. F. (2011). Adaptation to Climate Change in Africa: Challenges and Opportunities Identified from Ethiopia. *Global Environmental Change*, 21, 227–237. <https://doi.org/10.1016/j.gloenvcha.2010.07.013>.
- Corner, A. J., & Pidgeon, N. F. (2010). Geoengineering the Climate: The Social and Ethical Implications. *Environment: Science and Policy for Sustainable Development*, 52(1), 24–37. <https://doi.org/10.1080/00139150903479563>.
- Crampton, J. (1995). The Ethics of GIS. *Cartography and Geographic Information Systems*, 22(1), 84–89. <https://doi.org/10.1080/152304095782540546>.
- Cronin, V. S. (2017). Facilitating a Geoscience Student's Ethical Development. In *Scientific Integrity and Ethics: With Applications to the Geosciences* (pp. 267–291). Special Publications 73. Washington, DC: American Geophysical Union; Hoboken, NJ: Wiley. <https://doi.org/10.1002/9781119067825.ch14>.
- Cuomo, C. J. (2017). The Anthropocene: Foregone or Premature Conclusion? Examining the Ethical Implications of Naming a New Epoch. *Earth: The Science Behind the Headlines*, 10–11. <https://www.earthmagazine.org/article/comment-anthropocene-foregone-or-premature-conclusion-examining-ethical-implications-naming>.
- Cutchin, M. P. (2002). Ethics and Geography: Continuity and Emerging Syntheses. *Progress in Human Geography*, 26(5), 656–664. <https://doi.org/10.1191/0309132502ph393pr>.
- Dalby, S. (2016). Framing the Anthropocene: The Good, the Bad and the Ugly. *Anthropocene Review*, 3(1), 33–51. <https://doi.org/10.1177/2053019615618681>.
- Dangendorf, S., Marcos, M., Wöppelmann, G., Conrad, C. P., Frederikse, T., & Riva, R. (2017). Reassessment of 20th Century Global Mean Sea Level Rise. *Proceedings of the National Academy of Sciences*, 114(23), 5946–5951. <https://doi.org/10.1073/pnas.1616007114>.
- Dare, M. (Lain), Schirmer, J., & Vanclay, F. (2014). Community Engagement and Social Licence to Operate. *Impact Assessment and Project Appraisal*, 32(3), 188–197. <https://doi.org/10.1080/14615517.2014.927108>.

- David, P. A., & Foray, D. (2002). An Introduction to the Economy of the Knowledge Society. *International Social Science Journal*, 54(171), 9–23. <https://doi.org/10.1111/1468-2451.00355>.
- De Rubeis, V., Sbarra, P., Sebaste, B., & Tosi, P. (2015). Earthquake Ethics Through Scientific Knowledge, Historical Memory and Societal Awareness: The Experience of Direct Internet Information. In *Geoethics: The Role and Responsibility of Geoscientists* (pp. 103–110). Geological Society of London, Special Publications 419. <https://doi.org/10.1144/SP419.7>.
- Descola, P. (1986). *La Nature Domestique: Symbolism et praxis dans l'écologie des Achuar* (452pp.). Paris: Éditions de la Maison des sciences de l'homme. ISBN 978-2-7351-1057-5.
- Descola, P. (2011). *L'écologie des autres: L'anthropologie et la question de la nature* (112pp.). Paris: Editions Quæ. ISBN 978-2759224661. <https://doi.org/10.3917/quae.desco.2011.01.0001>.
- Di Baldassarre, G., Viglione, A., Carr, G., Kuil, L., Yan, K., Brandimarte, L., et al. (2015). Debates-Perspectives on Socio-Hydrology: Capturing Feedbacks Between Physical and Social Processes. *Water Resources Research*, 51(6), 4770–4781. <https://doi.org/10.1002/2014WR016416>.
- Di Capua, G., & Peppoloni, S. (2014). Geoethical Aspects in the Natural Hazards Management. In *Engineering Geology for Society and Territory—Volume 7, Education, Professional Ethics and Public Recognition of Engineering Geology* (pp. 59–62). Cham: Springer International Publishing. https://doi.org/10.1007/978-3-319-09303-1_11.
- Di Capua, G., Peppoloni, S., & Bobrowsky, P. T. (2017). The Cape Town Statement on Geoethics. In *Geoethics: At the Heart of All Geoscience. Annals of Geophysics*, 60(7). <https://doi.org/10.4401/ag-7553>.
- Diamond, J. (2005). *Collapse: How Societies Choose to Fail or Succeed [Survive]* (608pp.). Reprint edition in 2011. New York: Viking Penguin. ISBN 978-0241958681.
- DiBiase, D., Harvey, F., Goranson, C., & Wright, D. (2012). The GIS Professional Ethics Project: Practical Ethics for GIS Professionals. In *Teaching Geographic Information Science and Technology in Higher Education* (pp. 199–209). Chichester, UK: Wiley. <https://doi.org/10.1002/9781119950592.ch14>.
- Diekmann, S., & Peterson, M. (2013). The Role of Non-epistemic Values in Engineering Models. *Science and Engineering Ethics*, 19(1), 207–218. <https://doi.org/10.1007/s11948-011-9300-4>.
- Dirección de Hidrografía. (1863). Conferencia de Bruselas y modelo del extracto del diario meteorológico. In *Anuario de la Direction de Hidrografía* (pp. 191–205). Liberal, Madrid: Imp. de T. Forteney.

- Dolce, M., & Di Bucci, D. (2015). Risk Management: Roles and Responsibilities in the Decision-Making Process. In *Geoethics: Ethical Challenges and Case Studies in Earth Sciences* (pp. 211–221). Waltham, MA: Elsevier. <https://doi.org/10.1016/B978-0-12-799935-7.00018-6>.
- Donia, N. (2013). Aswan High Dam Reservoir Management System. *Journal of Hydroinformatics*, 15(4), 1491–1510. <https://doi.org/10.2166/hydro.2013.003>.
- Douglas, H. (2009). *Science, Policy, and the Value-Free Ideal* (256pp.). Pittsburgh, PA: University of Pittsburgh Press. ISBN 978-0822960263.
- Douglas, H. (2017). Science, Values, and Citizens. In *Eppur si muove: Doing History and Philosophy of Science with Peter Machamer* (pp. 83–96). Cham: Springer International Publishing Imprint Springer. https://doi.org/10.1007/978-3-319-52768-0_6.
- Druguet, E., Passchier, C. W., Pennacchioni, G., & Carreras, J. (2013). Geoethical Education: A Critical Issue for Geoconservation. *Episodes*, 36(1), 11–18.
- Duarte, C. M. (2014). Global Change and the Future Ocean: A Grand Challenge for Marine Sciences. *Frontiers in Marine Science*, 1, 1–16. <https://doi.org/10.3389/fmars.2014.00063>.
- Durand, G. (1960). *Les structures anthropologiques de l'imaginaire: introduction à l'archétypologie générale* (1e éd., 512pp.). Paris: Presses Universitaires de France.
- Edenhofer, O., & Kowarsch, M. (2015). Cartography of Policy Paths: A Model for Solution-Oriented Environmental Assessments. *Environmental Science & Policy*, 51, 56–64. <https://doi.org/10.1016/j.envsci.2015.03.017>.
- Egré, D., & Milewski, J. C. (2002). The Diversity of Hydropower Projects. *Energy Policy*, 30(14), 1225–1230. [https://doi.org/10.1016/S0301-4215\(02\)00083-6](https://doi.org/10.1016/S0301-4215(02)00083-6).
- Ehrlich, P. R., Kareiva, P. M., & Daily, G. C. (2012). Securing Natural Capital and Expanding Equity to Rescale Civilization. *Nature*, 486, 68–73. <https://doi.org/10.1038/nature11157>.
- Eitzel, M. V., Cappadonna, J. L., Santos-Lang, C., Duerr, R. E., Virapongse, A., West, S. E., et al. (2017). Citizen Science Terminology Matters: Exploring Key Terms. *Citizen Science: Theory and Practice*, 2(1), 1. <https://doi.org/10.5334/cstp.96>.
- El-Chichakli, B., von Braun, J., Lang, C., Barben, D., & Philp, J. (2016). Policy: Five Cornerstones of a Global Bioeconomy. *Nature*, 535(7611), 221–223. <https://doi.org/10.1038/535221a>.
- Ellis, E. C., & Haff, P. K. (2009). Earth Science in the Anthropocene: New Epoch, New Paradigm, New Responsibilities. *EOS*, 90(49), 473. <https://doi.org/10.1029/2009EO490006>.

- Ellis, E. C. (2011). Anthropogenic Transformation of the Terrestrial Biosphere. *Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences*, 369(1938), 1010–1035. <https://doi.org/10.1098/rsta.2010.0331>.
- Ellis, E. C. (2015). Ecology in an Anthropogenic Biosphere. *Ecological Monographs*, 85(3), 287–331. <https://doi.org/10.1890/14-2274.1>.
- Ellis, E. C., Kaplan, J. O., Fuller, D. Q., Vavrus, S., Klein Goldewijk, K., & Verburg, P. H. (2013). Used Planet: A Global History. *Proceedings of the National Academy of Sciences*, 110(20), 7978–7985. <https://doi.org/10.1073/pnas.1217241110>.
- Ellis, E. C., Richerson, P. J., Mesoudi, A., Svenning, J.-C., Odling-Smee, J., & Burnside, W. R. (2016). Evolving the Human Niche. *Proceedings of the National Academy of Sciences*, 113(31), E4436–E4436. <https://doi.org/10.1073/pnas.1609425113>.
- Elmqvist, T., Bai, X., Frantzeskaki, N., Griffith, C., Maddox, D., McPhearson, T., et al. (Eds.). (2018). *Urban Planet: Knowledge Towards Sustainable Cities*. Cambridge: Cambridge University Press. ISBN 978-1316647554. <https://doi.org/10.1017/9781316647554>.
- El Zein, A., Airey, D., Bowden, P., & Clarkeburn, H. (2008). Sustainability and Ethics as Decision Making Paradigms in Engineering Curricula. *International Journal of Sustainability in Higher Education*, 9(2), 170–182. <https://doi.org/10.1108/14676370810856314>.
- Erlandson, J. M., & Braje, T. J. (2013). Archeology and the Anthropocene. *Anthropocene*, 4, 1–7. <https://doi.org/10.1016/j.ancene.2014.05.003>.
- Ernout, A., & Meillet, A. (1994). *Dictionnaire étymologique de la langue Latine*. Paris: Klincksieck. ISBN 978-2252033593.
- Fabietti, U., & Remotti, F. (1997). *Dizionario di Antropologia*. Bologna: Zanichelli.
- Falck, W. E. (2016). Social Licencing in Mining-Between Ethical Dilemmas and Economic Risk Management. *Mineral Economics*, 29(2–3), 97–104. <https://doi.org/10.1007/s13563-016-0089-0>.
- Fiedler, J. W., & Conrad, C. P. (2010). Spatial Variability of Sea Level Rise Due to Water Impoundment Behind Dams. *Geophysical Research Letters*, 37(12), L12603, 1–6. <https://doi.org/10.1029/2010GL043462>.
- Finney, S. C., & Edwards, L. E. (2016). The “Anthropocene” Epoch: Scientific Decision or Political Statement? *GSA Today*, 26(3), 4–10. <https://doi.org/10.1130/GSATG270A.1>.
- Fischer, J., Gardner, T. A., Bennett, E. M., Balvanera, P., Biggs, R., Carpenter, S., et al. (2015). Advancing Sustainability Through Mainstreaming a Social-Ecological Systems Perspective. *Current Opinion in Environmental Sustainability*, 14, 144–149. <https://doi.org/10.1016/j.cosust.2015.06.002>.

- Foley, S. F., Gronenborn, D., Andreac, M. O., Kadereit, J. W., Esper, J., Scholz, D., et al. (2013). The Palaeoanthropocene—The Beginnings of Anthropogenic Environmental Change. *Anthropocene*, 3, 83–88. <https://doi.org/10.1016/j.ancene.2013.11.002>.
- Follett, R., & Strezov, V. (2015). An Analysis of Citizen Science Based Research: Usage and Publication Patterns. *PLoS One*, 10(11), e0143687. <https://doi.org/10.1371/journal.pone.0143687>.
- Fox, T. A., & Chapman, L. (2011). Engineering Geo-Engineering. *Meteorological Applications*, 18(1), 1–8. <https://doi.org/10.1002/met.245>.
- Foresta Martin, F., & Peppoloni, S. (2017). Geoethics in Science Communication: The Relationship Between Media and Geoscientists. In *Geoethics: At the Heart of All Geoscience*. *Annals of Geophysics*, 60(7). <https://doi.org/10.4401/ag-7410>.
- Frankenberg, E., Sikoki, B., Sumantri, C., Suriastini, W., & Thomas, D. (2013). Education, Vulnerability, and Resilience After a Natural Disaster. *Ecology and Society*, 18(2), 16. <https://doi.org/10.5751/ES-05377-180216>.
- Fressoz, J.-B. (2012). *L'Apocalypse joyeuse - Une histoire du risque technologique* (320pp.). Paris: L'univers historique and Le Seuil. ISBN 978-2021056983.
- Fuentes, A. (2016). The Extended Evolutionary Synthesis, Ethnography, and the Human Niche: Toward an Integrated Anthropology. *Current Anthropology*, 57(S13), S13–S26. <https://doi.org/10.1086/685684>.
- Fuentes, A. (2017). Human Niche, Human Behaviour, Human Nature. *Interface Focus*, 7(5), 20160136. <https://doi.org/10.1098/rsfs.2016.0136>.
- Galaz, V., Moberg, F., Olsson, E.-K., 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., Biermann, F., Crona, B., Loorbach, D., Folke, C., Olsson, P., et al. (2012). 'Planetary Boundaries'—Exploring the Challenges for Global Environmental Governance. *Current Opinion in Environmental Sustainability*, 4(1), 80–87. <https://doi.org/10.1016/j.cosust.2012.01.006>.
- Gardiner, S. M. (2004). Ethics and Global Climate Change*. *Ethics*, 114(3), 555–600. <https://doi.org/10.1086/382247>.
- Gaur, V. K. (2015). Geoethics: Tenets and Praxis: Two Examples from India. In *Geoethics: Ethical Challenges and Case Studies in Earth Sciences* (pp. 141–160). Amsterdam: Elsevier. <https://doi.org/10.1016/B978-0-12-799935-7.00012-5>.
- Gawthrop, W. (2015). Corporate Money Trumps Science. In *Geoethics: Ethical Challenges and Case Studies in Earth Sciences* (pp. 161–168). Amsterdam: Elsevier. <https://doi.org/10.1016/B978-0-12-799935-7.00013-7>.
- Geological Society of America (GSA). (1997). *Presidential Conference (1997). Report on Conference on "Ethics in the Geosciences"*. Welches, OR.

- George, A. (2000). *The Epic of Gilgamesh: A New Translation* (288pp.). London: Penguin Classics. ISBN 978-0140447217.
- Gibson-Graham, J. K., & Roelvink, G. (2010). An Economic Ethics for the Anthropocene. *Antipode*, 41(S1), 320–346. <https://doi.org/10.1111/j.1467-8330.2009.00728.x>.
- Gill, J. C. (2016). Building Good Foundations: Skills for Effective Engagement in International Development. In *Geoscience for the Public Good and Global Development: Toward a Sustainable Future* (pp. 1–8). Geological Society of America, Special Papers 520. [https://doi.org/10.1130/2016.2520\(01\)](https://doi.org/10.1130/2016.2520(01)).
- Gill, J. C., & Bullough, F. (2017). Geoscience Engagement in Global Development Frameworks. In *Geoethics: At the Heart of All Geoscience. Annals of Geophysics*, 60(7). <https://doi.org/10.4401/ag-7460>.
- Gluckman, P. (2014). Policy: The Art of Science Advice to Government. *Nature*, 507(7491), 163–165. <https://doi.org/10.1038/507163a>.
- Godin-Beckmann, S. (2013). Évolution de la couche d’ozone sous l’effet du protocole de Montréal et du changement climatique. *La Météorologie*, 80, 59–66. <https://doi.org/10.4267/2042/48795>.
- Golden, J. S., Virdin, J., Nowacek, D., Halpin, P., Benneer, L., & Patil, P. G. (2017). Making Sure the Blue Economy Is Green. *Nature Ecology & Evolution*, 1(2), 0017. <https://doi.org/10.1038/s41559-016-0017>.
- Goldsmith, E., Allen, R., Allaby, M., Davol, J., & Lawrence, S. (1972). *Planspiel zum Überleben*. Stuttgart: Deutsche Verlags-Anstalt. ISBN 978-3421026385.
- Gordijn, B., & ten Have, H. (2012). Ethics of Mitigation, Adaptation and Geoen지니어ing. *Medicine, Health Care and Philosophy*, 15(1), 1–2. <https://doi.org/10.1007/s11019-011-9374-4>.
- Gordon, J. E. (2018). Geoheritage, Geotourism and the Cultural Landscape: Enhancing the Visitor Experience and Promoting Geoconservation. *Geosciences*, 8(4), 136. <https://doi.org/10.3390/geosciences8040136>.
- Grey, F., Wyler, D., Fröhlich, J., & Maes, K. (2016). *Citizen Science at Universities: Trends, Guidelines and Recommendations*. <https://www.leru.org/publications/citizen-science-at-universities-trends-guidelines-and-recommendations#>.
- Groulx, P., Kirkwood, D., & Lebel, D. (2017). Building Bridges Through Science: Increased Geoscience Engagement with Canada’s Northern Communities. In *Geoethics: At the Heart of All Geoscience. Annals of Geophysics*, 60(7). <https://doi.org/10.4401/ag-7512>.
- Grunwald, A. (2015). The Imperative of Sustainable Development: Elements of an Ethics of Using Georesources Responsibly. In *Geoethics: Ethical Challenges and Case Studies in Earth Sciences* (pp. 25–35). Amsterdam: Elsevier. <https://doi.org/10.1016/B978-0-12-799935-7.00003-4>.
- Gundersen, L. C. (Ed.). (2017a). *Scientific Integrity and Ethics: With Applications to the Geosciences*. Special Publications 73. Washington, DC: American Geophysical Union; Hoboken, NJ: Wiley. ISBN: 978-1-119-06778-8. <https://doi.org/10.1002/9781119067825>.

- Gundersen, L. C. (2017b). Scientific Integrity and Ethical Considerations for the Research Data Life Cycle. In *Scientific Integrity and Ethics: With Applications to the Geosciences* (pp. 133–153). Special Publications 73. Washington, DC: American Geophysical Union; Hoboken, NJ: Wiley. <https://doi.org/10.1002/9781119067825.ch9>.
- Gundersen, L. C., & Townsend, R. (2015). Formulating the American Geophysical Union's Scientific Integrity and Professional Ethics Policy. In *Geoethics: Ethical Challenges and Case Studies in Earth Sciences* (pp. 83–93). Amsterdam: Elsevier. <https://doi.org/10.1016/B978-0-12-799935-7.00008-3>.
- Haff, P. K. (2014). Humans and Technology in the Anthropocene: Six Rules. *The Anthropocene Review*, 1(2), 126–136. <https://doi.org/10.1177/2053019614530575>.
- Haff, P. K. (2014b). Technology as a Geological Phenomenon: Implications for Human Well-Being. In *A Stratigraphical Basis for the Anthropocene* (pp. 301–309). Geological Society of London, Special Publications 395. <https://doi.org/10.1144/SP395.4>.
- Halbe, J., Adamowski, J., & Pahl-Wostl, C. (2015). The Role of Paradigms in Engineering Practice and Education for Sustainable Development. *Journal of Cleaner Production*, 106, 272–282. <https://doi.org/10.1016/j.jclepro.2015.01.093>.
- Hall, N., Lacey, J., Carr-Cornish, S., & Dowd, A.-M. (2015). Social Licence to Operate: Understanding How a Concept Has Been Translated into Practice in Energy Industries. *Journal of Cleaner Production*, 86, 301–310. <https://doi.org/10.1016/j.jclepro.2014.08.020>.
- Hämäläinen, T. J. (2015). Governance Solutions for Wicked Problems: Metropolitan Innovation Ecosystems as Frontrunners to Sustainable Well-Being. *Technology Innovation Management Review*, 5(10), 31–41. <http://doi.org/10.22215/timreview/935>.
- Hamilton, C. (2013). No, We Should Not Just 'At Least Do the Research'. *Nature*, 496(7444), 139. <https://doi.org/10.1038/496139a>.
- Hamilton, C. (2017). *Defiant Earth—The Fate of Humans in the Anthropocene* (200pp). Cambridge: Wiley, Polity Press. ISBN 978-1509519750.
- Hamilton, C., & Grinevald, J. (2015). Was the Anthropocene Anticipated? *The Anthropocene Review*, 2(1), 59–72. <https://doi.org/10.1177/2053019614567155>.
- Hamilton, C., Bonneuil, C., & Gemenne, F. (2015). Thinking the Anthropocene. In *The Anthropocene and the Global Environmental Crisis: Rethinking Modernity in a New Epoch* (pp. 1–13). London: Routledge. ISBN 978-1138821231.
- Han, H. (2015). Virtue Ethics, Positive Psychology, and a New Model of Science and Engineering Ethics Education. *Science and Engineering Ethics*, 21(2), 441–460. <https://doi.org/10.1007/s11948-014-9539-7>.

- Hansson, S. O. (Ed.) (2015). *The Role of Technology in Science: Philosophical Perspectives*. Part of the Philosophy of Engineering and Technology Book Series (POET, Vol. 18). Dordrecht: Springer Netherlands. ISBN 978-94-017-9761-0. <https://doi.org/10.1007/978-94-017-9762-7>.
- Haraway, D. (2015). Anthropocene, Capitalocene, Plantationocene, Chthulucene: Making Kin. *Environmental Humanities*, 6(1), 159–165. <https://doi.org/10.1215/22011919-3615934>.
- Hardin, G. (1968). The Tragedy of the Commons. *Science*, 162(3859), 1243–1248. <https://doi.org/10.1126/science.162.3859.1243>.
- Harley, J. (1990). Cartography, Ethics and Social Theory. *Cartographica: The International Journal for Geographic Information and Geovisualization*, 27(2), 1–23. <https://doi.org/10.3138/C211-1512-0603-XJ14>.
- Harley, J. B. J. (1991). Can There Be a Cartographic Ethics? *Cartographic Perspectives*, 10, 9–16. <http://www.cartographicperspectives.org/index.php/journal/article/view/cp10-harley/1093>.
- Hartwick, E. (1998). Geographies of Consumption: A Commodity-Chain Approach. *Environment and Planning D: Society and Space*, 16(4), 423–437. <https://doi.org/10.1068/d160423>.
- Häusler, H. (2018). Did Anthropogeology Anticipate the Idea of the Anthropocene? *The Anthropocene Review*, 5(9), 69–86. <https://doi.org/10.1177/2053019617742169>.
- Hauser, O. P., Rand, D. G., Peysakhovich, A., & Nowak, M. A. (2014). Cooperating with the Future. *Nature*, 511, 220–223. <https://doi.org/10.1038/nature13530>.
- Hawkins, H., Cabeen, L., Callard, F., Castree, N., Daniels, S., DeLyser, D., et al. (2015). What Might GeoHumanities Do? Possibilities, Practices, Publics, and Politics. *GeoHumanities*, 1(2), 211–232. <https://doi.org/10.1080/2373566X.2015.1108992>.
- Hazen, R. M. (2012). *The Story of Earth: The First 4.5 Billion Years, from Stardust to Living Planet* (306pp.). New York, NY: Viking Penguin Group. ISBN 978-1-101-58068-4.
- Head, B. W., & Xiang, W.-N. (2016). Why Is an APT Approach to Wicked Problems Important? *Landscape and Urban Planning*, 154, 4–7. <https://doi.org/10.1016/j.landurbplan.2016.03.018>.
- Heede, R. (2014). Tracing Anthropogenic Carbon Dioxide and Methane Emissions to Fossil Fuel and Cement Producers, 1854–2010. *Climatic Change*, 122(1–2), 229–241. <https://doi.org/10.1007/s10584-013-0986-y>.
- Henrich, J. (2015). *The Secret of Our Success: How Culture Is Driving Human Evolution, Domesticating Our Species, and Making Us Smarter* (445pp.). Princeton: Princeton University Press. ISBN 978-0691166858.
- 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>.

- Hocke, P. (2015). Nuclear Waste Repositories and Ethical Challenges. In *Geoethics: Ethical Challenges and Case Studies in Earth Sciences* (pp. 359–367). Amsterdam: Elsevier. <https://doi.org/10.1016/B978-0-12-799935-7.00029-0>.
- Holm, P., Adamson, J., Huang, H., Kirdan, L., Kitch, S., McCalman, I., et al. (2015). Humanities for the Environment—A Manifesto for Research and Action. *Humanities*, 4(4), 977–992. <https://doi.org/10.3390/h4040977>.
- Homer-Dixon, T., Walker, B., Biggs, R., Crépin, A.-S., Folke, C., Lambin, E. F., et al. (2015). Synchronous Failure: The Emerging Causal Architecture of Global Crisis. *Ecology and Society*, 20(3), 6. <https://doi.org/10.5751/ES-07681-200306>.
- Hostettler, D. (2015). Mining in Indigenous Regions: The Case of Tampuan, Philippines. In *Geoethics: Ethical Challenges and Case Studies in Earth Sciences* (pp. 371–380). Amsterdam: Elsevier. <https://doi.org/10.1016/B978-0-12-799935-7.00030-7>.
- Hourdequin, M. (2015). *Environmental Ethics—From Theory to Practice* (256pp.). London: Bloomsbury Academic. ISBN 9781472510983.
- Hughes, T. P., Barnes, M. L., Bellwood, D. R., Cinner, J. E., Cumming, G. S., Jackson, J. B. C., et al. (2017). Coral Reefs in the Anthropocene. *Nature*, 546, 82–90. <https://doi.org/10.1038/nature22901>.
- Hulme, M. (2009). *Why We Disagree About Climate Change: Understanding Controversy, Inaction and Opportunity* (428pp.). Cambridge: Cambridge University Press. ISBN 978-0521727327.
- Hulme, M. (2011). Meet the Humanities. *Nature Climate Change*, 1(4), 177–179. <https://doi.org/10.1038/nclimate1150>.
- Hulme, M. (2014). Climate Change and Virtue: An Apologetic. *Humanities*, 3(3), 299–312. <https://doi.org/10.3390/h3030299>.
- Hyder, K., Townhill, B., Anderson, L. G., Delany, J., & Pinnegar, J. K. (2015). Can Citizen Science Contribute to the Evidence-Base That Underpins Marine Policy? *Marine Policy*, 59, 112–120. <https://doi.org/10.1016/j.marpol.2015.04.022>.
- Ickert, J., & Stewart, I. S. (2016). From Geoscientific “Matters of Fact” to Societal “Matters of Concern”: A Transdisciplinary Training Approach to Communicating Earthquake Risk in Istanbul (Turkey). *Natural Hazards and Earth System Sciences*, 16(1), 1.
- Ingram, M., Ingram, H., & Lejano, R. (2015). Environmental Action in the Anthropocene: The Power of Narrative Networks. *Journal of Environmental Policy & Planning*, 1–16. <https://doi.org/10.1080/1523908X.2015.1113513>.
- Innes, J. E., & Booher, D. E. (2016). Collaborative Rationality as a Strategy for Working with Wicked Problems. *Landscape and Urban Planning*, 154, 8–10. <https://doi.org/10.1016/j.landurbplan.2016.03.016>.

- Jacobs, J. R. (2014). The Precautionary Principle as a Provisional Instrument in Environmental Policy: The Montreal Protocol Case Study. *Environmental Science and Policy*, 37, 161–171. <https://doi.org/10.1016/j.envsci.2013.09.007>.
- Jaeckel, A., Gjerde, K. M., & Ardron, J. A. (2017). Conserving the Common Heritage of Humankind—Options for the Deep-Seabed Mining Regime. *Marine Policy*, 78, 150–157. <https://doi.org/10.1016/j.marpol.2017.01.019>.
- Jax, K., Barton, D. N., Chan, K. M. A., de Groot, R., Doyle, U., Eser, U., et al. (2013). Ecosystem Services and Ethics. *Ecological Economics*, 93, 260–268. <https://doi.org/10.1016/j.ecolecon.2013.06.008>.
- Jentoft, S. (2014). Walking the Talk: Implementing the International Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries. *Maritime Studies*, 13(1), 16. <https://doi.org/10.1186/s40152-014-0016-3>.
- Jentoft, S., Chuenpagdee, R., Barragán-Paladines, M. J., & Franz, N. (Eds.). (2017). *The Small-Scale Fisheries Guidelines* (Vol. 14). Cham: Springer International Publishing. ISBN 978-3-319-55073-2. <https://doi.org/10.1007/978-3-319-55074-9>.
- Johnson, B. L. (2003). Ethical Obligations in a Tragedy of the Commons. *Environmental Values*, 12(3), 271–287. <https://www.jstor.org/stable/30301928>.
- Johnson, D. D. P. (2016). Hand of the Gods in Human Civilization. *Nature*, 530, 285–287. <https://doi.org/10.1038/nature16879>.
- Jonas, H. (1984). *The Imperative of Responsibility* (263pp.). Chicago: University of Chicago Press. ISBN 0-226-40597-4.
- Kagan, J. (2009). *The Three Cultures—Natural Sciences, Social Sciences and the Humanities in the 21st Century*. Cambridge: Cambridge University Press.
- Kauffman, J., & Lee, K.-M. (Eds.). (2013). *Handbook of Sustainable Engineering* (1298pp.). Dordrecht: Springer Netherlands. ISBN 978-1-4020-8938-1.
- Keighren, I. M. (2005). Geosophy, Imagination, and Terrae Incognitae: Exploring the Intellectual History of John Kirtland Wright. *Journal of Historical Geography*, 31(3), 546–562. <https://doi.org/10.1016/j.jhg.2004.04.004>.
- Keighren, I. M. (2017). History and Philosophy of Geography I. *Progress in Human Geography*, 41(5), 638–647. <https://doi.org/10.1177/0309132516653285>.
- Kirby, K., & Houle, F. A. (2004). Ethics and the Welfare of the Physics Profession. *Physics Today*, 57(11), 42–46. <https://doi.org/10.1063/1.1839376>.
- Klein, R. J. T. (2011). Adaptation to Climate Change: More Than Technology. In *Climate: Global Change and Local Adaptation* (pp. 157–168). NATO Science for Peace and Security Series C: Environmental Security. Dordrecht: Springer, Netherlands. https://doi.org/10.1007/978-94-007-1770-1_9.

- Kleinmans, M. G., Buskes, C. J. J., & de Regt, H. W. (2010). Philosophy of Earth Science. In *Philosophies of the Sciences* (pp. 213–236). Oxford, UK: Wiley-Blackwell. <https://doi.org/10.1002/9781444315578.ch9>.
- Kohlberg, L. (1981). *The Philosophy of Moral Development: Moral Stages and the Idea of Justice* (441pp.). San Francisco: Harper & Row Limited. ISBN 978-0060647605.
- Kopnina, H. (2014). Environmental Justice and Biospheric Egalitarianism: Reflecting on a Normative-Philosophical View of Human-Nature Relationship. *Earth Perspectives*, 1, 8. <https://doi.org/10.1186/2194-6434-1-8>.
- Korobova, E., & Romanov, S. (2014). Ecogeochemical Exploration of Noosphere in Light of Ideas of V.I. Vernadsky. *Journal of Geochemical Exploration*, 147(A), 58–64. <https://doi.org/10.1016/j.gexplo.2014.01.024>.
- Kowarsch, M. (2016). *A Pragmatist Orientation for the Social Sciences in Climate Policy* (Vol. 323). Cham: Springer International. ISBN 978-3-319-43279-3. <https://doi.org/10.1007/978-3-319-43281-6>.
- Kowarsch, M., Garard, J., Rioussel, P., Lenzi, D., Dorsch, M. J., Knopf, B., et al. (2016). Scientific Assessments to Facilitate Deliberative Policy Learning. *Palgrave Communications*, 2, 16092. <https://doi.org/10.1057/palcomms.2016.92>.
- Kramer, D. B., Hartter, J., Boag, A. E., Jain, M., Stevens, K., Nicholas, K. A., et al. (2017). Top 40 Questions in Coupled Human and Natural Systems (CHANS) Research. *Ecology and Society*, 22(2), 44. <https://doi.org/10.5751/ES-09429-220244>.
- Krausmann, F., Erb, K.-H., Gingrich, S., Haberl, H., Bondeau, A., Gaube, V., et al. (2013). Global Human Appropriation of Net Primary Production Doubled in the 20th Century. *Proceedings of the National Academy of Sciences of the United States of America*, 110(25), 10324–10329. <https://doi.org/10.1073/pnas.1211349110>.
- Krauss, W. (2015). Anthropology in the Anthropocene: Sustainable Development, Climate Change and Interdisciplinary Research. In *Grounding Global Climate Change. Contributions from the Social and Cultural Sciences* (pp. 59–76). Dordrecht: Springer. <https://doi.org/10.1007/978-94-017-9322-3>.
- Kullenberg, C., & Kasperowski, D. (2016). What Is Citizen Science?—A Scientometric Meta-Analysis. *PLoS One*, 11(1), e0147152. <https://doi.org/10.1371/journal.pone.0147152>.
- Kunnas, J. (2012). The Theory of Justice in a Warming Climate. *Electronic Green Journal*, 1(34). <http://www.escholarship.org/uc/item/38m9n5kn>.
- Kunnas, J. (2017). Storytelling: From the Early Anthropocene to the Good or the Bad Anthropocene. *The Anthropocene Review*, 4(2), 136–150. <https://doi.org/10.1177/2053019617725538>.

- Landes, D. S. (2003). *The Unbound Prometheus: Technological Change and Industrial Development in Western Europe from 1750 to the Present*. Cambridge: Cambridge University Press. ISBN 9780511819957. <https://doi.org/10.1017/CBO9780511819957>.
- Langmuir, C., & Broecker, W. (2012). *How to Build a Habitable Planet: The Story of Earth from the Big Bang to Humankind* (718pp.). Princeton: Princeton University Press. ISBN 978-0691140063.
- Lanza, T. (2014). Promoting Geo-Awareness to Make Citizens the First Watchers of the Territory. In *Engineering Geology for Society and Territory—Volume 7, Education, Professional Ethics and Public Recognition of Engineering Geology* (pp. 85–88). Cham: Springer International Publishing. https://doi.org/10.1007/978-3-319-09303-1_16.
- Latour, B. (2013, February 18–28). *Facing Gaia: Six Lectures on the Political Theology of Nature* (120pp.). Gifford Lectures on Natural Religion, Edinburgh. <http://www.bruno-latour.fr/sites/default/files/downloads/GIFFORD-ASSEMBLED.pdf>.
- Latour, B. (2015). *Face à Gaia Huit conférences sur le Nouveau Régime Climatique* (398pp.). Paris: Editions La Découverte. ISBN 978-2359251081.
- Lawrence, M. G., Schäfer, S., Muri, H., Scott, V., Oschlies, A., Vaughan, N. E., et al. (2018). Evaluating Climate Geoengineering Proposals in the Context of the Paris Agreement Temperature Goals. *Nature Communications*, 9(1), 3734. <https://doi.org/10.1038/s41467-018-05938-3>.
- Lear, L. J. (1993). Rachel Carson's Silent Spring. *Environmental History Review*, 17(2), 23–48. <https://doi.org/10.2307/3984849>.
- Leopold, A. (1949). *A Sand County Almanac*. Oxford: Oxford University Press. ISBN 978-0-19-505928-1. <http://www.umag.cl/facultades/williams/wp-content/uploads/2016/11/Leopold-1949-ASandCountyAlmanac-complete.pdf>.
- Leys, W. A. R. (1952). The Scientist's Code of Ethics. *Physics Today*, 10–15. <http://www.nhn.ou.edu/~johnson/Education/Capstone/Ethics/1952-ScientistsCodeofEthics-PhysicsToday-2004.pdf>.
- Liddell, H. G., & Scott, R. (1996). *A Greek-English Lexicon*. Oxford, UK: Clarendon Press. ISBN 978-0198642268.
- Lieberman, M. D. (2013). *Social: Why Our Brains Are Wired to Connect* (384pp.). New York: Crown Publishers. ISBN 978-0307889096.
- Limaye, S. D. (2015). Geoethics and Geohazards: A Perspective from Low-Income Countries, an Indian Experience. In *Geoethics: Ethical Challenges and Case Studies in Earth Sciences* (pp. 409–417) Amsterdam: Elsevier. <https://doi.org/10.1016/B978-0-12-799935-7.00033-2>.
- Linton, J., & Budds, J. (2014). The Hydrosocial Cycle: Defining and Mobilizing a Relational-Dialectical Approach to Water. *Geoforum*, 57, 170–180. <https://doi.org/10.1016/j.geoforum.2013.10.008>.

- Liu, J., Dietz, T., Carpenter, S. R., Alberti, M., Folke, C., Moran, E., et al. (2007). Complexity of Coupled Human and Natural Systems. *Science*, 317(5844), 1513–1516. <https://doi.org/10.1126/science.1144004>.
- Liu, B., Wang, N., Chen, M., Wu, X., Mo, D., Liu, J., et al. (2017). Earliest Hydraulic Enterprise in China, 5,100 Years Ago. *Proceedings of the National Academy of Sciences*, 114(52), 13637–13642. <https://doi.org/10.1073/pnas.1710516114>.
- Liverman, D. (2009). Communicating Geological Hazards: Educating, Training and Assisting Geoscientists in Communication Skills. In *Geophysical Hazards* (pp. 41–55). Part of the International Year of Planet Earth Book Series (IYPE). Dordrecht: Springer Netherlands. https://doi.org/10.1007/978-90-481-3236-2_4.
- Lloyd, W. F. (1833). *Two Lectures on the Checks of Population*. Oxford: Oxford University Press. http://philosophy.lander.edu/intro/articles/lloyd_commons.pdf.
- Lofstedt, R. (2015). Effective Risk Communication and CCS: The Road to Success in Europe. *Journal of Risk Research*, 18(6), 675–691. <https://doi.org/10.1080/13669877.2015.1017831>.
- Lorimer, J. (2017). The Anthro-Scene: A Guide for the Perplexed. *Social Studies of Science*, 47(1), 117–142. <https://doi.org/10.1177/0306312716671039>.
- Lövbrand, E., Beck, S., Chilvers, J., Forsyth, T., Hedrén, J., Hulme, M., et al. (2015). Who Speaks for the Future of Earth? How Critical Social Science Can Extend the Conversation on the Anthropocene. *Global Environmental Change*, 32, 211–218. <https://doi.org/10.1016/j.gloenvcha.2015.03.012>.
- Lovelock, J. E. (1979). *Gaia: A New Look at Life on Earth* (157pp.). Oxford: Oxford University Press. ISBN 9780192176653.
- Lucchesi, S., & Giardino, M. (2012). The Role of Geoscientists in Human Progress. In *Geoethics and Geological Culture. Reflections from the Geoitalia Conference 2011*. *Annals of Geophysics*, 55(3). <https://doi.org/10.4401/ag-5535>.
- Lucchesi, S. (2017). Geosciences at the Service of Society: The Path Traced by Antonio Stoppani. In *Geoethics: At the Heart of All Geoscience*. *Annals of Geophysics*, 60(7). <https://doi.org/10.4401/ag-7413>.
- Lynam, T., & Brown, K. (2012). Mental Models in Human-Environment Interactions: Theory, Policy Implications, and Methodological Explorations. *Ecology and Society*, 17(3), 3–5. <https://doi.org/10.5751/ES-04257-170324>.
- Lynch, P. (2008). The Origins of Computer Weather Prediction and Climate Modeling. *Journal of Computational Physics*, 227(7), 3431–3444. <https://doi.org/10.1016/j.jcp.2007.02.034>.
- Lynn, W. S. (1998a). Animals, Ethics and Geography. In *Animal Geographies: Place, Politics and Identity in the Nature-Culture Borderlands* (pp. 280–298).

- London: Verso. <http://www.williamlynn.net/pdf/lynn-1998-animals-ethics-geography.pdf>.
- Lynn, W. S. (1998b). Contested Moralities: Animals and Moral Value in the Dear/Symanski Debate. *Philosophy & Geography*, 1(2), 223–242. <https://doi.org/10.1080/13668799808573646>.
- Lynn, W. S. (2000). *Geoethics: Ethics, Geography and Moral Understanding* (Dissertation). University of Minnesota, Minnesota. <http://philpapers.org/rec/LYNGEG>.
- Malanima, P. (2010). *Europäische Wirtschaftsgeschichte 10–19. Jahrhundert* (493pp.). Wien and Köln: Weimar Böhlau Verlag. ISBN 978-3825233778.
- Marone, E., & Marone, L. (2014). A Road Map for a Deontological Code for Geoscientists Dealing with Natural Hazards. In *Engineering Geology for Society and Territory—Volume 7, Education, Professional Ethics and Public Recognition of Engineering Geology* (pp. 45–48). Cham: Springer International Publishing. https://doi.org/10.1007/978-3-319-09303-1_8.
- Marone, E., & Marone, L. (2018). UNCLOS Framework of Ocean Governance: Ethical Dimensions. In *The Future of Ocean Governance and Capacity Development Essays in Honor of Elisabeth Mann Borgese (1918-2002)* (pp. 34–39). Halifax: International Ocean Institute-Canada. https://doi.org/10.1163/9789004380271_008.
- Marone, E., & Peppoloni, S. (2017). Ethical Dilemmas in Geosciences. We Can Ask, But, Can We Answer? In *Geoethics: At the Heart of All Geoscience. Annals of Geophysics*, 60(7). <https://doi.org/10.4401/ag-7445>.
- Marone, E., Camargo, R., & Salcedo-Castro, J. (2015a). Communicating Natural Hazards: Marine Extreme Events and the Importance of Variability and Forecast Errors. In *Geoethics: The Role and Responsibility of Geoscientists* (pp. 125–131). Geological Society of London, Special Publications 419. <https://doi.org/10.1144/SP419.17>.
- Marone, E., Carneiro, J. C., Cintra, M. M., Ribeiro, A., Cardoso, D., & Stellfeld, C. (2015b). Extreme Sea Level Events, Coastal Risks, and Climate Changes: Informing the Players. In *Geoethics: Ethical Challenges and Case Studies in Earth Sciences* (pp. 273–302). Amsterdam: Elsevier. <https://doi.org/10.1016/B978-0-12-799935-7.00023-X>.
- Martínez-Frías, J. (2008). Geoethics: Proposal of a Geosciences-Oriented Formal Definition and Future Planetary Perspectives. *TIERRA: Spanish Thematic Network of Earth and Planetary Sciences*. http://tierra.rediris.es/documentos/Geoethics_Tierra_Network_2008.pdf.
- Martínez-Frías, J., González, J. L., & Pérez, F. R. (2011). Geoethics and Deontology: From Fundamentals to Applications in Planetary Protection. *Episodes*, 34(4), 257–262.
- Matteucci, R., Gosso, G., Peppoloni, S., Piacente, S., & Wasowski, J. (2014). The “Geoethical Promise”: A Proposal. *Episodes*, 37(3), 190–191.

- Maury, M. F. (1858). *Geographie Physique de la Mer* (Librairie). Paris: J. Correar.
- Mayer, T. (2015). Research Integrity: The Bedrock of the Geosciences. In *Geoethics: Ethical Challenges and Case Studies in Earth Sciences* (pp. 71–81). Amsterdam: Elsevier. <https://doi.org/10.1016/B978-0-12-799935-7.00007-1>.
- McNie, E. C., Parris, A., & Sarewitz, D. (2016). Improving the Public Value of Science: A Typology to Inform Discussion, Design and Implementation of Research. *Research Policy*, 45(4), 884–895. <https://doi.org/10.1016/j.respol.2016.01.004>.
- McPhaden, M. (2017). American Geophysical Union Adopts and Implements a New Scientific Integrity and Professional Ethics Policy. In *Scientific Integrity and Ethics: With Applications to the Geosciences* (pp. 67–76). Special Publications 73. Washington, DC: American Geophysical Union; Hoboken, NJ: Wiley. <https://doi.org/10.1002/9781119067825.ch5>.
- Mee, L. (2012). Between the Devil and the Deep Blue Sea: The Coastal Zone in an Era of Globalisation. *Estuarine, Coastal and Shelf Science*, 96, 1–8. <https://doi.org/10.1016/j.ecss.2010.02.013>.
- Meller, C., Schill, E., Bremer, J., Kolditz, O., Bleicher, A., Benighaus, C., et al. (2018). Acceptability of Geothermal Installations: A Geoethical Concept for GeoLab. *Geothermics*, 73, 133–145. <https://doi.org/10.1016/j.geothermics.2017.07.008>.
- Mensing, S., Tunno, I., Cifani, G., Passigli, S., Noble, P., Archer, C., et al. (2016). Human and Climatically Induced Environmental Change in the Mediterranean During the Medieval Climate Anomaly and Little Ice Age: A Case from Central Italy. *Anthropocene*, 15, 49–59. <https://doi.org/10.1016/j.ancene.2016.01.003>.
- Miller, M. L., & Kirk, J. (1992). Marine Environmental Ethics. *Ocean and Coastal Management*, 17(3–4), 237–251. [https://doi.org/10.1016/0964-5691\(92\)90012-A](https://doi.org/10.1016/0964-5691(92)90012-A).
- Moffat, K., & Zhang, A. (2014). The Paths to Social Licence to Operate: An Integrative Model Explaining Community Acceptance of Mining. *Resources Policy*, 39(1), 61–70. <https://doi.org/10.1016/j.resourpol.2013.11.003>.
- Moffat, K., Lacey, J., Zhang, A., & Leipold, S. (2016). The Social Licence to Operate: A Critical Review. *Forestry*, 89(5), 477–488. <https://doi.org/10.1093/forestry/cpv044>.
- Mogk, D. W. (2017). Geoethics and Professionalism: The Responsible Conduct of Scientists. In *Geoethics at the Heart of All Geoscience*. *Annals of Geophysics*, 60(7). <https://doi.org/10.4401/ag-7584>.
- Mogk, D. W., Geissman, J. W., & Brucker, M. Z. (2017). Teaching Geoethics Across the Geoscience Curriculum. Why, When, What, How, and Where? In *Scientific Integrity and Ethics: With Applications to the Geosciences* (pp. 231–265). Special Publications 73. Washington, DC: American Geophysical Union; Hoboken, NJ: Wiley. <https://doi.org/10.1002/9781119067825.ch13>.

- Moiseev, N. N. (1989). The Study of the Noosphere-Contemporary Humanism. *International Social Science Journal*, 122, 595–606.
- Mokyr, J. (2016a). Institutions and the Origins of the Great Enrichment. *Atlantic Economic Journal*, 44(2), 243–259. <https://doi.org/10.1007/s11293-016-9496-4>.
- Mokyr, J. (2016b). *A Culture of Growth: The Origins of the Modern Economy* (400pp.). Princeton: Princeton University Press. ISBN 978-0691168883.
- Monastersky, R. (2015). Anthropocene: The Human Age. *Nature*, 519(7542), 144–147. <https://doi.org/10.1038/519144a>.
- Moores, E. M. (1997). Geology and Culture: A Call for Action. *GSA Today*, 7(1), 7–11.
- Morton, O. (2015). *The Planet Remade—How Geoengineering Could Change the World* (440pp.). Princeton: Princeton University Press. ISBN 978-0691148250.
- Mouchang, Y. U. (2011). Geoscience Ethics: Turn of Geoscience Towards Humanism. *Journal of Shanghai Normal University (Philosophy & Social Sciences)*, 2011(3), 5–16.
- Mucciarelli, M. (2015). Some Comments on the First Degree Sentence of the “L’Aquila Trial”. In *Geoethics: Ethical Challenges and Case Studies in Earth Sciences* (pp. 205–210). Amsterdam: Elsevier. <https://doi.org/10.1016/B978-0-12-799935-7.00017-4>.
- Murphy, C., Gardoni, P., Bashir, H., Harris, C. E., & Masad, E. (2015). *Engineering Ethics for a Globalized World*. Part of the Philosophy of Engineering and Technology Book Series (POET, Vol. 22). Cham: Springer International Publishing. ISBN 978-3-319-18259-9. <https://doi.org/10.1007/978-3-319-18260-5>.
- Murray, F. B., & Hufnagel, P. (1979). Review: Gruber, H. E., Vonèche, J. (1977): The Essential Piaget. *Educational Researcher*, 8(11), 20–21. <https://doi.org/10.2307/1174291>.
- Ness, B., Zondervan, R., Isgren, E., O’Byrne, D., Jerneck, A., & Ness, B. (2017). The Taskforce on Conceptual Foundations of Earth System Governance: Sustainability Science. *Challenges in Sustainability*, 5(1). <https://doi.org/10.12924/cis2017.05010001>.
- Neuberg, J. (2015). Thoughts on Ethics in Volcanic Hazard Research. In *Geoethics: Ethical Challenges and Case Studies in Earth Sciences* (pp. 305–312). Amsterdam: Elsevier. <https://doi.org/10.1016/B978-0-12-799935-7.00024-1>.
- Newton, A., Carruthers, T. J. B., & Icely, J. (2012). The Coastal Syndromes and Hotspots on the Coast. *Estuarine, Coastal and Shelf Science*, 96, 39–47. <https://doi.org/10.1016/j.ecss.2011.07.012>.
- Nickless, E. (2017). Delivering Sustainable Development Goals: The Need for a New International Resource Governance Framework. In *Geoethics: At the Heart of All Geoscience*. *Annals of Geophysics*, 60(7). <https://doi.org/10.4401/ag-7426>.

- Nurmi, P. A. (2017). Green Mining—A Holistic Concept for Sustainable and Acceptable Mineral Production. In *Geoethics: At the Heart of All Geoscience. Annals of Geophysics*, 60(7). <https://doi.org/10.4401/ag-7420>.
- Oldfield, J. D., & Shaw, D. J. B. (2006). V.I. Vernadsky and the Noosphere Concept: Russian Understandings of Society-Nature Interaction. *Geoforum*, 37(1), 145–154. <https://doi.org/10.1016/j.geoforum.2005.01.004>.
- Olsson, P., Moore, M.-L., Westley, F. R., & McCarthy, D. D. P. (2017). The Concept of the Anthropocene as a Game-Changer: A New Context for Social Innovation and Transformations to Sustainability. *Ecology and Society*, 22(2), 31. <https://doi.org/10.5751/ES-09310-220231>.
- Orlove, B. (2003). How People Name Seasons. In *Weather, Climate, Culture* (pp. 121–140). Oxford and New York: Berg Publishers. ISBN 978-1859736975.
- Ott, K. (2014). Institutionalizing Strong Sustainability: A Rawlsian Perspective. *Sustainability*, 6(2), 894–912. <https://doi.org/10.3390/su6020894>.
- Owen, J. R., & Kemp, D. (2013). Social Licence and Mining: A Critical Perspective. *Resources Policy*, 38(1), 29–35. <https://doi.org/10.1016/j.resourpol.2012.06.016>.
- Pagel, M. (2012). *Wired for Culture: Origins of the Human Social Mind* (432pp.). New York: W. W. Norton. ISBN 978-0393344202.
- Palsson, G., Szerszynski, B., Sörlin, S., Marks, J., Avril, B., Crumley, C., et al. (2013). Reconceptualizing the ‘Anthropos’ in the Anthropocene: Integrating the Social Sciences and Humanities in Global Environmental Change Research. *Environmental Science & Policy*, 28, 3–13. <https://doi.org/10.1016/j.envsci.2012.11.004>.
- Paul, H. (2018). The Scientific Self: Reclaiming Its Place in the History of Research Ethics. *Science and Engineering Ethics*, 24(5), 1379–1392. <https://doi.org/10.1007/s11948-017-9945-8>.
- Paul, J. D., Buytaert, W., Allen, S., Ballesteros-Cánovas, J. A., Bhusal, J., Cieslik, K., et al. (2018). Citizen Science for Hydrological Risk Reduction and Resilience Building. *Wiley Interdisciplinary Reviews: Water*, 5(1), e1262. <https://doi.org/10.1002/wat2.1262>.
- Pauly, D., & Zeller, D. (2016). Catch Reconstructions Reveal That Global Marine Fisheries Catches Are Higher Than Reported and Declining. *Nature Communications*, 7, 10244. <https://doi.org/10.1038/ncomms10244>.
- Pearson, P. N., & Palmer, M. R. (2000). Atmospheric Carbon Dioxide Concentrations Over the Past 60 Million Years. *Nature*, 406, 695–699. <https://doi.org/10.1038/35021000>.
- Peppoloni, S. (2012). Ethical and Cultural Value of the Earth Sciences. Interview with Prof. Giulio Giorello. In *Geoethics and Geological Culture. Reflections from the Geoitalia Conference 2011* (pp. 343–346). *Annals of Geophysics*, 55(3). <https://doi.org/10.4401/ag-5755>.

- Peppoloni, S. (Ed.). (2018). *Spreading Geoethics Through the Languages of the World. Translations of the Cape Town Statement on Geoethics*. International Association for Promoting Geoethics (IAPG). <https://doi.org/10.13140/rg.2.2.23282.40645>.
- Peppoloni, S., & Di Capua, G. (2012). Geoethics and Geological Culture: Awareness, Responsibility and Challenges. In *Geoethics and Geological Culture. Reflections from the Geoitalia Conference 2011* (pp. 335–341). *Annals of Geophysics*, 55(3). <https://doi.org/10.4401/ag-6099>.
- Peppoloni, S., & Di Capua, G. (2015a). The Meaning of Geoethics. In *Geoethics: Ethical Challenges and Case Studies in Earth Sciences* (pp. 3–14). Amsterdam: Elsevier. <https://doi.org/10.1016/B978-0-12-799935-7.00001-0>.
- Peppoloni, S., & Di Capua, G. (Eds.). (2015b). *Geoethics, the Role and Responsibility of Geoscientists* (187pp.). Geological Society of London, Special Publications 419. ISBN 978-1-86239-726-2. <https://doi.org/10.1144/SP419.0>.
- Peppoloni, S., & Di Capua, G. (2016). Geoethics: Ethical, Social, and Cultural Values in Geosciences Research, Practice, and Education. In *Geoscience for the Public Good and Global Development: Toward a Sustainable Future* (pp. 17–21). Geological Society of America, Special Papers 520. [https://doi.org/10.1130/2016.2520\(03\)](https://doi.org/10.1130/2016.2520(03)).
- Peppoloni, S., & Di Capua, G. (2017a). Geoethics: Ethical, Social and Cultural Implications in Geosciences. In *Geoethics: At the Heart of All Geosciences*. *Annals of Geophysics*, 60(7). <https://doi.org/10.4401/ag-7473>.
- Peppoloni, S., & Di Capua, G. (2017b, August 7–11). Geoethical Considerations in Disaster Risk Reduction. In *Proceedings of the XX Argentine Geological Congress*. San Miguel de Tucuman, Argentina. <https://www.earth-prints.org/handle/2122/10888>.
- Peppoloni, S., & Di Capua, G. (2018). Ethics. In *Encyclopedia of Engineering Geology* (pp. 1–5). Encyclopedia of Earth Sciences Series. Cham: Springer. https://doi.org/10.1007/978-3-319-12127-7_115-1.
- Peppoloni, S., Bobrowsky, P., & Di Capua, G. (2015). Geoethics: A Challenge for Research Integrity in Geosciences. In *Integrity in the Global Research Arena*. (pp. 287–294). Singapore: World Scientific. https://doi.org/10.1142/9789814632393_0035.
- Peppoloni, S., Di Capua, G., Bobrowsky, P. T., & Cronin, V. S. (Eds.). (2017). Geoethics: At the Heart of All Geoscience. *Annals of Geophysics*, 60(7). <https://www.annalsofgeophysics.eu/index.php/annals/issue/view/537>.
- Pereira, L. M., Hichert, T., Hamann, M., Preiser, R., & Biggs, R. (2018). Using Futures Methods to Create Transformative Spaces: Visions of a Good Anthropocene in Southern Africa. *Ecology and Society*, 23(1), 19. <https://doi.org/10.5751/ES-09907-230119>.

- Pievani, T. (2012). Geoethics and Philosophy of Earth Sciences: The Role of Geophysical Factors in Human Evolution. In *Geoethics and Geological Culture. Reflections from the Geoitalia Conference 2011* (pp. 349–353). *Annals of Geophysics*, 55(3). <https://doi.org/10.4401/ag-5579>.
- Pievani, T. (2015). Humans Place in Geophysics: Understanding the Vertigo of Deep Time. In *Geoethics: Ethical Challenges and Case Studies in Earth Sciences* (pp. 57–67). Waltham, MA: Elsevier. <https://doi.org/10.1016/B978-0-12-799935-7.00006-X>.
- Pizzorusso, A. (1996). Leonardo's Geology: The Authenticity of the "Virgin of the Rocks". *Leonardo*, 29(3), 197. <https://doi.org/10.2307/1576245>.
- Pizzorusso, A. (2015). *Tweeting Da Vinci* (244pp.). New York, NY: Da Vinci Press. ISBN 978-1940613000.
- Pollitt, C. (2016). Debate: Climate Change—The Ultimate Wicked Issue. *Public Money & Management*, 36(2), 78–80. <https://doi.org/10.1080/09540962.2016.1118925>.
- Pölzler, T. (2017). On the Contribution of Philosophical and Geoscientific Inquiry to Geoethics (qua Applied Ethics). In *Geoethics: At the Heart of All Geoscience. Annals of Geophysics*, 60(7). <https://doi.org/10.4401/ag-7507>.
- Potthast, T. (2015). Toward an Inclusive Geoethics—Commonalities of Ethics in Technology, Science, Business, and Environment. In *Geoethics: Ethical Challenges and Case Studies in Earth Sciences* (pp. 49–56). Amsterdam: Elsevier. <https://doi.org/10.1016/B978-0-12-799935-7.00005-8>.
- Powell, J., Nash, G., & Bell, P. (2013). GeoExposures: Documenting Temporary Geological Exposures in Great Britain Through a Citizen-Science Web site. *Proceedings of the Geologists' Association*, 124(4), 638–647. <https://doi.org/10.1016/j.jpgeola.2012.04.004>.
- Preiser, R., Pereira, L. M., & Biggs, R. (Oonise). (2017). Navigating Alternative Framings of Human-Environment Interactions: Variations on the Theme of 'Finding Nemo.' *Anthropocene*, 20, 83–87. <https://doi.org/10.1016/j.ancene.2017.10.003>.
- Preiser, R., Biggs, R., De Vos, A., & Folke, C. (2018). Social-Ecological Systems as Complex Adaptive Systems: Organizing Principles for Advancing Research Methods and Approaches. *Ecology and Society*, 23(4), 46.
- Press, F. (2008). Earth Science and Society. *Nature*, 451, 301–303. <https://doi.org/10.1038/nature06595>.
- Proctor, J. D. (1998). Geography, Paradox and Environmental Ethics. *Progress in Human Geography*, 22(2), 234–255. <https://doi.org/10.1191/030913298667632852>.
- ProGEO. (2017). *Geodiversity, Geoheritage & Geoconservation—The ProGEO Simple Guide*. ProGEO—The European Association for the Conservation of the Geological Heritage. https://www.iucn.org/sites/dev/files/progeo_leaflet_en_2017.pdf.

- Purdy, J. (2015). *After Nature: A Politics for the Anthropocene* (326pp.). Cambridge, MA: Harvard University Press. ISBN 978-0674368224.
- Purzycki, B. G., Apicella, C., Atkinson, Q. D., Cohen, E., McNamara, R. A., Willard, A. K., et al. (2016). Moralistic Gods, Supernatural Punishment and the Expansion of Human Sociality. *Nature*, 530, 327–330. <https://doi.org/10.1038/nature16980>.
- Raab, T., & Frodeman, R. (2002). What Is It Like to Be a Geologist? A Phenomenology of Geology and Its Epistemological Implications. *Philosophy & Geography*, 5(1), 69–81. <https://doi.org/10.1080/10903770120116840>.
- Ramírez, F., & Seco, A. (2012). Civil Engineering at the Crossroads in the Twenty-First Century. *Science and Engineering Ethics*, 18(4), 681–687. <https://doi.org/10.1007/s11948-011-9258-2>.
- Rayner, S., Heyward, C., Kruger, T., Pidgeon, N., Redgwell, C., & Savulescu, J. (2013). The Oxford Principles. *Climatic Change*, 121, 499–512. <https://doi.org/10.1007/s10584-012-0675-2>.
- Ren, H., Chen, Y.-C., Wang, X. T., Wong, G. T. F., Cohen, A. L., DeCarlo, T. M., et al. (2017). 21st-Century Rise in Anthropogenic Nitrogen Deposition on a Remote Coral Reef. *Science*, 356(6339), 749–752. <https://doi.org/10.1126/science.aal3869>.
- Reyers, B., Nel, J. L., O'Farrell, P. J., Sitas, N., & Nel, D. C. (2015). Navigating Complexity Through Knowledge Coproduction: Mainstreaming Ecosystem Services into Disaster Risk Reduction. *Proceedings of the National Academy of Sciences*, 112(24), 7362–7368. <https://doi.org/10.1073/pnas.1414374112>.
- Rickards, L. A. (2015a). Critiquing, Mining and Engaging Anthropocene Science. *Dialogues in Human Geography*, 5(3), 337–342. <https://doi.org/10.1177/2043820615613263>.
- Rickards, L. A. (2015b). Metaphor and the Anthropocene: Presenting Humans as a Geological Force. *Geographical Research*, 53(3), 280–287. <https://doi.org/10.1111/1745-5871.12128>.
- Riede, F., Andersen, P., & Price, N. (2016). Does Environmental Archaeology Need an Ethical Promise? *World Archaeology*, 48(4), 466–481. <https://doi.org/10.1080/00438243.2016.1192483>.
- Riede, F., Vestergaard, C., & Fredensborg, K. H. (2016b). A Field Archaeological Perspective on the Anthropocene. *Antiquity*, 90(354), e7. <https://doi.org/10.15184/aqy.2016.183>.
- Riesch, H., & Potter, C. (2014). Citizen Science as Seen by Scientists: Methodological, Epistemological and Ethical Dimensions. *Public Understanding of Science*, 23(1), 107–120. <https://doi.org/10.1177/0963662513497324>.
- Ripple, W. J., Wolf, C., Newsome, T. M., Galetti, M., Alamgir, M., Crist, E., et al. (2017). World Scientists' Warning to Humanity: A Second Notice. *BioScience*, 67(12), 1026–1028. <https://doi.org/10.1093/biosci/bix125>.

- Roberts, J. M. (1997). *The Penguin History of Europe* (752pp.). London and New York: Penguin Book. ISBN 978-0140265613.
- Roberts, R. (2012). Narrative Ethics. *Philosophy Compass*, 7(3), 174–182. <https://doi.org/10.1111/j.1747-9991.2011.00472.x>.
- Rockström, J., Steffen, W., Noone, K., Persson, A., Chapin III, F. S., Lambin, E. F., et al. (2009). A Safe Operating Space for Humanity. *Nature*, 461, 472–475. <https://doi.org/10.1038/461472a>.
- Roco, M. C., & Bainbridge, W. S. (2013). The New World of Discovery, Invention, and Innovation: Convergence of Knowledge, Technology, and Society. *Journal of Nanoparticle Research*, 15, 1946. <https://doi.org/10.1007/s11051-013-1946-1>.
- Rosol, C., Nelson, S., & Renn, J. (2017). Introduction: In the Machine Room of the Anthropocene. *The Anthropocene Review*, 4(1), 2–8. <https://doi.org/10.1177/2053019617701165>.
- Rosol, C., Steininger, B., Renn, J., & Schlögl, R. (2018). On the Age of Computation in the Epoch of Humankind. *Nature Outlook*, 1–5. <https://www.nature.com/articles/d42473-018-00286-8>.
- Rotblat, S. J. (1999). A Hippocratic Oath for Scientists. *Science*, 286(5444), 1475. <https://doi.org/10.1126/science.286.5444.1475>.
- Rozzi, R., Chapin III, F. S., Callicott, J. B., Pickett, S. T. A., Power, M. E., Armesto, J. J., et al. (Eds.). (2015). *Earth Stewardship: Linking Ecology and Ethics in Theory and Practice* (Vol. 2). Cham: Springer. ISBN 978-3-319-12132-1. <https://doi.org/10.1007/978-3-319-12133-8>.
- Ruddiman, W. F. (2005). How Did Humans First Alter Global Climate? *Scientific American*, 292(3), 46–53. <https://doi.org/10.1038/scientificamerican0305-46>.
- Ruddiman, W. F. (2013). The Anthropocene. *Annual Review of Earth and Planetary Sciences*, 41(1), 45–68. <https://doi.org/10.1146/annurev-earth-050212-123944>.
- Salvatore, S., Fini, V., Mannarini, T., Veltri, G. A., Avdi, E., Battaglia, F., et al. (2018a). Symbolic Universes Between Present and Future of Europe. First Results of the Map of European Societies' Cultural Milieu. *PLoS One*, 13(1), e0189885. <https://doi.org/10.1371/journal.pone.0189885>.
- Salvatore, S., Mannarini, T., Avdi, E., Battaglia, F., Cremaschi, M., Fini, V., et al. (2018b). Globalization, Demand of Sense and Enemization of the Other: A Psychocultural Analysis of European Societies' Sociopolitical Crisis. *Culture and Psychology*. <https://doi.org/10.1177/1354067X18779056>.
- Sánchez Guitián, N. (2013). La aceptación social del tracking desde la geoética. *Revista de Obras Publicas*, 160(3544), 61–64.
- Sayre, N. F. (2012). The Politics of the Anthropogenic. *Annual Review of Anthropology*, 41(1), 57–70. <https://doi.org/10.1146/annurev-anthro-092611-145846>.

- Scheiber, H. N. (2018). The “Commons” Discourse on Marine Fisheries Resources: Another Antecedent to Hardin’s “Tragedy”. *Theoretical Inquiries in Law*, 19(2), 489–505. <https://doi.org/10.1515/til-2018-0025>.
- Schimel, D., Hibbard, K., Costa, D., Cox, P., & Van Der Leeuw, S. (2015). Analysis, Integration and Modeling of the Earth System (AIMES): Advancing the Post-disciplinary Understanding of Coupled Human-Environment Dynamics in the Anthropocene. *Anthropocene*, 12(2015), 99–106. <https://doi.org/10.1016/j.ancene.2016.02.001>.
- Schmidt, J. J., Brown, P. G., & Orr, C. J. (2016). Ethics in the Anthropocene: A Research Agenda. *The Anthropocene Review*, 3(3), 188–200. <https://doi.org/10.1177/2053019616662052>.
- Schoon, M., & Van Der Leeuw, S. (2015). The Shift Toward Social-Ecological Systems Perspectives: Insights into the Human-Nature Relationship. *Natures Sciences Sociétés*, 23(2), 166–174. <https://doi.org/10.1051/nss/2015034>.
- Schwab, M., & von Storch, H. (2018). Developing Criteria for a Stakeholder-Centred Evaluation of Climate Services: The Case of Extreme Event Attribution for Storm Surges at the German Baltic Sea. *Meteorology Hydrology and Water Management*, 6(1), 27–35. <https://doi.org/10.26491/mhwm/76702>.
- Schwägerl, C. (2014). *The Anthropocene—The Human Era and How It Shapes Our Planet* (235pp.). Santa Fe, NM: Synergetic Press. ISBN 978-0907791546.
- Seddon, G. (1996). Thinking Like a Geologist: The Culture of Geology. Mawson Lecture 1996. *Australian Journal of Earth Sciences*, 43, 487–495.
- Seitzinger, S., Gaffney, O., Brasseur, G., Broadgate, W., Ciais, P., Claussen, M., et al. (2015). International Geosphere-Biosphere Programme and Earth System Science: Three Decades of Co-Evolution. *Anthropocene*, 12(2015), 3–16. <https://doi.org/10.1016/j.ancene.2016.01.001>.
- Semerano G. M. (2007). *Le Origini della Cultura Europea: Dizionari Etimologici* (Vol. 2) (2 Tomi). Firenze: Olschki. ISBN 978-8822242334.
- Shaw, R. (2017). Knowing Homes and Writing Worlds? Ethics of the ‘Eco-’, Ethics of the ‘Geo-’ and How to Light a Planet. *Geografiska Annaler: Series B, Human Geography*, 99(2), 128–142. <https://doi.org/10.1080/04353684.2017.1311469>.
- Shearman, R. (1990). The Meaning and Ethics of Sustainability. *Environmental Management*, 14(1), 1–8. <https://doi.org/10.1007/BF02394014>.
- Sibilla, P. (2012). *Approdi e Percorsi: Saggi di antropologia alpina*. Biblioteca di «Lares» (Vol. 65, 226pp.). Firenze: Olschki. ISBN 978-8822261489.
- Silver, J. J., Gray, N. J., Campbell, L. M., Fairbanks, L. W., & Gruby, R. L. (2015). Blue Economy and Competing Discourses in International Oceans Governance. *The Journal of Environment & Development*, 24(2), 135–160. <https://doi.org/10.1177/1070496515580797>.

- Silvertown, J. (2009). A New Dawn for Citizen Science. *Trends in Ecology and Evolution*, 24(9), 467–471. <https://doi.org/10.1016/j.tree.2009.03.017>.
- Sirocko, F. (2012). *Wetter, Klima, Menschheitsentwicklung: Von der Eiszeit bis ins 21. Jahrhundert* (208pp.). Darmstadt: Wiss. Buchgesellschaft Theiss. ISBN 978-3534255207.
- Sivapalan, M., Savenije, H. H. G., & Blöschl, G. (2012). Socio-Hydrology: A New Science of People and Water. *Hydrological Processes*, 26(8), 1270–1276. <https://doi.org/10.1002/hyp.8426>.
- Sivapalan, M. (2015). Debates-Perspectives on Socio-Hydrology: Changing Water Systems and the “Tyranny of Small Problems”—Socio-Hydrology. *Water Resources Research*, 51(6), 4795–4805. <https://doi.org/10.1002/2015WR017080>.
- Sklair, L. (2017). Sleepwalking Through the Anthropocene. *The British Journal of Sociology*, 68(4), 775–784. <https://doi.org/10.1111/1468-4446.12304>.
- Slangen, A. B. A., Adloff, F., Jevrejeva, S., Leclercq, P. W., Marzeion, B., Wada, Y., et al. (2016). A Review of Recent Updates of Sea-Level Projections at Global and Regional Scales. *Surveys in Geophysics*, 38(1), 385–406. <https://doi.org/10.1007/s10712-016-9374-2>.
- Smil, V. (2007). Global Material Cycles. In *Encyclopedia of Earth*. Washington, DC: Environmental Information Coalition, National Council for Science and the Environment. https://editors.eol.org/eoearth/wiki/Global_material_cycles.
- Smith, B. D., & Zeder, M. A. (2013). The Onset of the Anthropocene. *Anthropocene*, 4, 8–13. <https://doi.org/10.1016/j.ancene.2013.05.001>.
- Solomon, S., Ivy, D. J., Kinnison, D., Mills, M. J., Neely, R. R., & Schmidt, A. (2016). Emergence of Healing in the Antarctic Ozone Layer. *Science*, 353(6296), 269–274. <https://doi.org/10.1126/science.aae0061>.
- Song, X.-P., Hansen, M. C., Stehman, S. V., Potapov, P. V., Tyukavina, A., Vermote, E. F., et al. (2018). Global Land Change from 1982 to 2016. *Nature*, 560, 639–643. <https://doi.org/10.1038/s41586-018-0411-9>.
- Sörlin, S. (2012). Environmental Humanities: Why Should Biologists Interested in the Environment Take the Humanities Seriously? *BioScience*, 62(9), 788–789. <https://doi.org/10.1525/bio.2012.62.9.2>.
- Sparrow, R. (1999). The Ethics of Terraforming. *Environmental Ethics*, 21(3), 227–245. <https://doi.org/10.5840/enviroethics199921315>.
- Srbulov, M. (2014). *Practical Guide to Geo-Engineering: With Equations, Tables, Graphs and Check Lists*. Part of the Geotechnical, Geological and Earthquake Engineering Book Series (GGEE, Vol. 29, 370pp.). Dordrecht: Springer Netherlands. ISBN 978-94-017-8637-9.
- Stefanovic, I. L. (2015). Geoethics: Reenvisioning Applied Philosophy. In *Geoethics: Ethical Challenges and Case Studies in Earth Sciences* (pp. 15–23). Amsterdam: Elsevier. <https://doi.org/10.1016/B978-0-12-799935-7.00002-2>.
- Steffen, W., Grinevald, J., Crutzen, P., & McNeill, J. (2011). The Anthropocene: Conceptual and Historical Perspectives. *Philosophical Transactions of the Royal*

- Society A: Mathematical, Physical and Engineering Sciences*, 369(1938), 842–867. <https://doi.org/10.1098/rsta.2010.0327>.
- Steffen, W., Persson, Å., Deutsch, L., Zalasiewicz, J., Williams, M., Richardson, K., et al. (2011). The Anthropocene: From Global Change to Planetary Stewardship. *AMBIO*, 40, 739–761. <https://doi.org/10.1007/s13280-011-0185-x>.
- Steffen, W., Broadgate, W., Deutsch, L., Gaffney, O., & Ludwig, C. (2015). The Trajectory of the Anthropocene: The Great Acceleration. *The Anthropocene Review*, 2(1), 81–98. <https://doi.org/10.1177/2053019614564785>.
- Steffen, W., Leinfelder, R., Zalasiewicz, J., Waters, C. N., Williams, M., Summerhayes, C., et al. (2016). Stratigraphic and Earth System Approaches to Defining the Anthropocene. *Earth's Future*, 4(8), 324–345. <https://doi.org/10.1002/2016EF000379>.
- Steffen, W., Rockström, J., Richardson, K., Lenton, T. M., Folke, C., Liverman, D., et al. (2018). Trajectories of the Earth System in the Anthropocene. *Proceedings of the National Academy of Sciences*, 115(33), 8252–8259. <https://doi.org/10.1073/pnas.1810141115>.
- Steneck, N. H., Mayer, T., Anderson, M. S., & Kleinert, S. (2017). The Origin, Objectives, and Evolution of the World Conferences on Research Integrity. In *Scientific Integrity and Ethics: With Applications to the Geosciences* (pp. 1–14). Special Publications 73. Washington, DC: American Geophysical Union; Hoboken, NJ: Wiley. <https://doi.org/10.1002/9781119067825.ch1>.
- Sternberg, R. (2008). Hydropower: Dimensions of Social and Environmental Coexistence. *Renewable and Sustainable Energy Reviews*, 12(6), 1588–1621. <https://doi.org/10.1016/j.rser.2007.01.027>.
- Stewart, I. S., & Nield, T. (2013). Earth Stories: Context and Narrative in the Communication of Popular Geoscience. *Proceedings of the Geologists' Association*, 124(4), 699–712. <https://doi.org/10.1016/j.pgeola.2012.08.008>.
- Stewart, I. S., & Gill, J. C. (2017). Social Geology—Integrating Sustainability Concepts into Earth Sciences. *Proceedings of the Geologists' Association*, 128(2), 165–172. <https://doi.org/10.1016/j.pgeola.2017.01.002>.
- Stewart, I. S., Ickert, J., & Lacassin, R. (2017). Communication Seismic Risk: The Geoethical Challenges of a People-Centred, Participatory Approach. In *Geoethics: At the Heart of All Geoscience*. *Annals of Geophysics*, 60(7). <https://doi.org/10.4401/ag-7593>.
- Stewart, I. S., & Lewis, D. (2017). Communicating Contested Geoscience to the Public: Moving from 'Matters of Fact' to 'Matters of Concern'. *Earth-Science Reviews*, 174, 122–133. <https://doi.org/10.1016/j.earscirev.2017.09.003>.
- Stilgoe, J. (2016). Geoengineering as Collective Experimentation. *Science and Engineering Ethics*, 22(3), 851–869. <https://doi.org/10.1007/s11948-015-9646-0>.

- Stoddard, E. W., & Cornwell, G. H. (2003). Peripheral Visions: Towards a Geoethics of Citizenship. *Liberal Education*, 89(3), 44–51. <http://aacu.org/publications-research/periodicals/peripheral-visions-towards-geoethics-citizenship>.
- Strauss, S. (2003). Weather Wise: Speaking Folklore to Science in Leukerbad. In S. Strauss & B. S. Orlove (Eds.), *Weather, Climate, Culture* (pp. 39–59). Oxford and New York: Berg Publishers. ISBN 9781859736975.
- Sutcliffe, J., Hurst, S., Awadallah, A. G., Brown, E., & Hamed, K. (2016). Harold Edwin Hurst: The Nile and Egypt, Past and Future. *Hydrological Sciences Journal*, 61(9), 1557–1570. <https://doi.org/10.1080/02626667.2015.1019508>.
- Syvitski, J. P. M., Kettner, A. J., Overeem, I., Hutton, E. W. H., Hannon, M. T., Brakenridge, G. R., et al. (2009). Sinking Deltas Due to Human Activities. *Nature Geoscience*, 2, 681–686. <https://doi.org/10.1038/ngeo629>.
- Tarolli, P., Sofia, G., & CAO, W. (2018). The Geomorphology of the Human Age. In *Encyclopedia of the Anthropocene* (pp. 35–43). Oxford: Elsevier. <https://doi.org/10.1016/B978-0-12-809665-9.10501-4>.
- Tengö, M., Brondizio, E. S., Elmqvist, T., Malmer, P., & Spierenburg, M. (2014). Connecting Diverse Knowledge Systems for Enhanced Ecosystem Governance: The Multiple Evidence Base Approach. *AMBIO*, 43(5), 579–591. <https://doi.org/10.1007/s13280-014-0501-3>.
- Termeer, C. J. A. M., Dewulf, A., Karlsson-Vinkhuyzen, S. I., Vink, M., & van Vliet, M. (2016). Coping with the Wicked Problem of Climate Adaptation Across Scales: The Five R Governance Capabilities. *Landscape and Urban Planning*, 154, 11–19. <https://doi.org/10.1016/j.landurbplan.2016.01.007>.
- Tickell, C. (2011). Societal Responses to the Anthropocene. *Philosophical Transactions. Series A, Mathematical, Physical, and Engineering Sciences*, 369(1938), 926–932. <https://doi.org/10.1098/rsta.2010.0302>.
- Tinti, S., Armigliato, A., Pagnoni, G., & Zaniboni, F. (2015). Geoethical and Social Aspects of Warning for Low-Frequency and Large-Impact Events Like Tsunamis. In *Geoethics: Ethical Challenges and Case Studies in Earth Sciences* (pp. 175–192). Amsterdam: Elsevier. <https://doi.org/10.1016/B978-0-12-799935-7.00015-0>.
- Tuana, N. (2017). Understanding Coupled Ethical-Epistemic Issues Relevant to Climate Modeling and Decision Support Science. In *Scientific Integrity and Ethics: With Applications to the Geosciences* (pp. 1–14). Special Publications 73. Washington, DC: American Geophysical Union; Hoboken, NJ: Wiley. <https://doi.org/10.1002/9781119067825.ch1>.
- Tubman, S. C., & Escobar-Wolf, R. (2016). The Geoscientist as International Community Development Practitioner: On the Importance of Looking and listening. In *Geoscience for the Public Good and Global Development: Toward a*

- Sustainable Future* (pp. 9–16). Geological Society of America, Special Papers 520. [https://doi.org/10.1130/2016.2520\(02\)](https://doi.org/10.1130/2016.2520(02)).
- Turner II, B. L., Esler, K. J., Bridgewater, P., Tewksbury, J., Sitas, N., Abrahams, B., et al. (2016). Socio-Environmental Systems (SES) Research: What Have We Learned and How Can We Use This Information in Future Research Programs. *Current Opinion in Environmental Sustainability*, 19, 160–168. <https://doi.org/10.1016/j.cosust.2016.04.001>.
- Uhrqvist, O., & Linnér, B.-O. (2015). Narratives of the Past for Future Earth: The Historiography of Global Environmental Change Research. *The Anthropocene Review*, 2(2), 159–173. <https://doi.org/10.1177/2053019614567543>.
- United Nations. (2013). *World Social Science Report 2013* (612pp.). Paris: UNESCO. OECD Publishing. ISBN 9789264203419. <https://doi.org/10.1787/9789264203419-en>.
- Van Gessel, S. F., Hinsby, K., Stanley, G., Tulstrup, J., Schavemaker, Y., Piessens, K., et al. (2017). Geological Services Towards a Sustainable Use and Management of the Subsurface: A Geoethical Imperative. In *Geoethics: At the Heart of All Geoscience. Annals of Geophysics*, 60(7). <https://doi.org/10.4401/ag-7500>.
- Vann-Sander, S., Clifton, J., & Harvey, E. (2016). Can Citizen Science Work? Perceptions of the Role and Utility of Citizen Science in a Marine Policy and Management Context. *Marine Policy*, 72, 82–93. <https://doi.org/10.1016/j.marpol.2016.06.026>.
- Vayena, E., & Tasioulas, J. (2015). “We the Scientists”: A Human Right to Citizen Science. *Philosophy & Technology*, 28(3), 479–485. <https://doi.org/10.1007/s13347-015-0204-0>.
- Veland, S., & Lynch, A. H. (2016). Scaling the Anthropocene: How the Stories We Tell Matter. *Geoforum*, 72, 1–5. <https://doi.org/10.1016/j.geoforum.2016.03.006>.
- Veland, S. (2017). Transcending Ontological Schisms in Relationships with Earth, Water, Air, and Ice. *Weather, Climate, and Society*, 9(3), 607–619. <https://doi.org/10.1175/WCAS-D-16-0123.1>.
- Vervoort, J., & Gupta, A. (2018). Anticipating Climate Futures in a 1.5 °C Era: The Link Between Foresight and Governance. *Current Opinion in Environmental Sustainability*, 31, 104–111. <https://doi.org/10.1016/j.cosust.2018.01.004>.
- Victor, D. G. (2008). On the Regulation of Geoengineering. *Oxford Review of Economic Policy*, 24(2), 322–336. <https://doi.org/10.1093/oxrep/grn018>.
- Victor, D. G. (2015). Climate Change: Embed the Social Sciences in Climate Policy. *Nature*, 520(7545), 27–29. <https://doi.org/10.1038/520027a>.
- Vidas, D. (2011). The Anthropocene and the International Law of the Sea. *Philosophical Transactions of the Royal Society A: Mathematical, Physical and*

- Engineering Sciences*, 369(1938), 909–925. <https://doi.org/10.1098/rsta.2010.0326>.
- Viollet, P.-L. (2000). *L'hydraulique dans les civilisations anciennes: 5000 ans d'histoire* (374pp.). Paris: Presses Ponts et Chaussées. ISBN 2-85978-335-0.
- von Storch, H., Emeis, K., Meinke, I., Kannen, A., Matthias, V., Ratter, B. M. W., et al. (2015). Making Coastal Research Useful—Cases from Practice. *Oceanologia*, 57(1), 3–16. <https://doi.org/10.1016/j.oceano.2014.09.001>.
- Wachinger, G., Renn, O., Begg, C., & Kuhlicke, C. (2013). The Risk Perception Paradox: Implications for Governance and Communication of Natural Hazards. *Risk Analysis*, 33, 1049–1065. <https://doi.org/10.1111/j.1539-6924.2012.01942.x>.
- Walker, B., Gunderson, L., Kinzig, A., Folke, C., Carpenter, S., & Schultz, L. (2006). A Handful of Heuristics and Some Propositions for Understanding Resilience in Social-Ecological Systems. *Ecology and Society*, 11(1), 13. <http://www.ecologyandsociety.org/vol11/iss1/art13/>.
- Walton, T., & Shaw, W. S. (2015). Living with the Anthropocene Blues. *Geoforum*, 60, 1–3. <https://doi.org/10.1016/j.geoforum.2014.12.014>.
- Ward, P. (2009). *The Medea Hypothesis: Is Life on Earth Ultimately Self-Destructive?* (208pp.). Princeton: Princeton University Press. ISBN 978-0-691-13075-0.
- Waterman, A. T. (1960). National Science Foundation: A Ten-Year Résumé. *Science*, 131(3410), 1341–1354.
- Waters, C. N., Zalasiewicz, J., Summerhayes, C., Barnosky, A. D., Poirier, C., Galuszka, A., et al. (2016). The Anthropocene Is Functionally and Stratigraphically Distinct from the Holocene. *Science*, 351(6269), aad2622. <https://doi.org/10.1126/science.aad2622>.
- WCED. (1987). *World Commission on Environment and Development: Our Common Future*. Oxford and New York: Oxford University Press. ISBN 978-0-19-282080-8.
- Weber, M. (1919). *Politik als Beruf - Gesinnungsethik vs. Verantwortungsethik*. Translation in English: https://www.academia.edu/26954620/Politics_as_Vocation.pdf.
- Weber, J. (2005). Container Shipping in the European Ranges and the Potential Viability of the Newcomer Jade-Weser Port. *Ocean Yearbook Online*, 19(1), 336–356. <https://doi.org/10.1163/22116001-90000274>.
- Wessel, G. R. (2016). Beyond Sustainability: A Restorative Approach for the Mineral Industry. In *Geoscience for the Public Good and Global Development: Toward a Sustainable Future* (pp. 45–55). Geological Society of America, Special Papers 520. [https://doi.org/10.1130/2016.2520\(06\)](https://doi.org/10.1130/2016.2520(06)).
- Weston, A. (1987). Forms of Gaian Ethics. *Environmental Ethics*, 9(3), 217–230. <https://doi.org/10.5840/enviroethics1987933>.

- Whitbeck, C. (2004). Trust and the Future of Research. *Physics Today*, 57(11), 48–53. <https://doi.org/10.1063/1.1839377>.
- Whitehouse, H., & McCavely, R. M. (2005). *Mind and Religion—Psychological and Cognitive Foundation of Religiosity* (278pp.). Oxford, UK: AltaMira Press. ISBN 978-0759106192.
- Wilderer, P. A., Grambow, M., & Meng, W. (2013). Sustainable Earth System Engineering: Incentives and Perspectives. In *Handbook of Sustainable Engineering* (pp. 195–209). Dordrecht: Springer Netherlands. https://doi.org/10.1007/978-1-4020-8939-8_47.
- Williams, B. M., McEntee, C., Hanson, B., & Townsend, R. (2017). The Role for a Large Scientific Society in Addressing Harassment and Work Climate Issues. In *Geoethics: At the Heart of All Geoscience. Annals of Geophysics*, 60(7). <https://doi.org/10.4401/ag-7441>.
- Wilson, E. O. (2012). *The Social Conquest of Earth* (352pp.). New York: Liveright Publishing Corporation. ISBN 978-0871403636.
- Wilson, E. O. (2014). *The Meaning of Human Existence* (208pp.). New York: Liveright Publishing Corporation. ISBN 978-0871401007.
- Wolfe, D. (1957). National Science Foundation the First Six Years. *Science*, 126(3269), 335–3343.
- Wong, C. M. L., & Lockie, S. (2018). Sociology, Risk and the Environment: A Material-Semiotic Approach. *Journal of Risk Research*, 21(9), 1077–1092. <https://doi.org/10.1080/13669877.2017.1422783>.
- Woo, K. S. (2017). Role of IUCN WCPA Geoheritage Specialist Group for Geoheritage Conservation and Recognition of World Heritage Sites, Global Geoparks and Other Protected Areas. *Geophysical Research Abstracts*, 19, EGU2017-1137.
- Wright, J. K. (1947). Terrae Incognitae: The Place of the Imagination in Geography. *Annals of the Association of American Geographers*, 37(1), 1–15.
- Wright, C., Nyberg, D., Rickards, L., & Freund, J. (2018). Organizing in the Anthropocene. *Organization*, 25(4), 455–471. <https://doi.org/10.1177/1350508418779649>.
- Wu, Y., Polvani, L. M., & Seager, R. (2013). The Importance of the Montreal Protocol in Protecting Earth's Hydroclimate. *Journal of Climate*, 26(12), 4049–4068. <https://doi.org/10.1175/JCLI-D-12-00675.1>.
- Wyssession, M. E., LaDue, N., Budd, D. A., Campbell, K., Conklin, M., Kappel, E., et al. (2012). Developing and Applying a Set of Earth Science Literacy Principles. *Journal of Geoscience Education*, 60(2), 95–99. <https://doi.org/10.5408/11-248.1>.
- Wyss, M. (2015). Shortcuts in Seismic Hazard Assessments for Nuclear Power Plants Are Not Acceptable. In *Geoethics: Ethical Challenges and Case Studies in Earth Sciences* (pp. 169–174). Amsterdam: Elsevier. <https://doi.org/10.1016/B978-0-12-799935-7.00014-9>.

- Wyss, M., & Peppoloni, S. (Eds.). (2015). *Geoethics: Ethical Challenges and Case Studies in Earth Sciences* (450pp.). Amsterdam: Elsevier. ISBN 9780127999357. <https://doi.org/10.1016/C2013-0-09988-4>.
- Zalasiewicz, J., Waters, C. N., Williams, M., Barnosky, A. D., Cearreta, A., Crutzen, P., et al. (2015). When Did the Anthropocene Begin? A Mid-Twentieth Century Boundary Level Is Stratigraphically Optimal. *Quaternary International*, 383, 196–203. <https://doi.org/10.1016/j.quaint.2014.11.045>.
- Zalasiewicz, J., Waters, C. N., Wolfe, A., Barnosky, A., Cearreta, A., Edgeworth, M., et al. (2017). Making the Case for a Formal Anthropocene Epoch: An Analysis of Ongoing Critiques. *Newsletters on Stratigraphy*, 50(2), 205–226. <https://doi.org/10.1127/nos/2017/0385>.
- Zdanowicz, C. M., Zielinski, G. A., & Germani, M. S. (1999). Mount Mazama Eruption: Calendrical Age Verified and Atmospheric Impact Assessed. *Geology*, 27(7), 621–624. [https://doi.org/10.1130/0091-7613\(1999\)027<0621:MMECAV>2.3.CO;2](https://doi.org/10.1130/0091-7613(1999)027<0621:MMECAV>2.3.CO;2).
- Zen, E.-A. (1993). The Citizen-Geologist.pdf. *GSA Today*, 3(1), 2–3.
- Zhang, X., Davidson, E. A., Mauzerall, D. L., Searchinger, T. D., Dumas, P., & Shen, Y. (2015). Managing Nitrogen for Sustainable Development. *Nature*, 528, 51–59. <https://doi.org/10.1038/nature15743>.
- Zografos, C. (2017). Flows of Sediment, Flows of Insecurity: Climate Change Adaptation and the Social Contract in the Ebro Delta, Catalonia. *Geoforum*, 80, 49–60. <https://doi.org/10.1016/j.geoforum.2017.01.004>.

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