

Literature list for course Seminar on "Earth system science for sustainability studies" GEOF347, autumn 2017:

We will jointly read a series of publications, each presented by a - different - participant of the course. All papers belong to an overall topic. Depending on the number of participants, we will either select more papers later on, or limit the amount of papers, or give each participant more than 1 paper to summarise. We will discuss this jointly at the beginning of the course in order to find an agreement which works well in practice.

The presentations (oral, PowerPoint slides) should not just describe the paper in question. The presenters should take the following items into account:

- Describe the general subject and topic; give background so that all get an easy entry into the paper.
- Explain jargon; possibly add a glossary at the end of your presentation to clarify some terminology.
- Explore also some of the papers cited in the specific paper for the presentation and possibly add figures/arguments from those papers as well.
- Describe methods, results, discussion, and conclusion.
- Add a critical appraisal of the paper (does it make sense, what does it well, where are weak points).

Contact in case of questions: Christoph Heinze (christoph.heinze@uib.no)

*Overall topic in autumn 2017: **Planetary boundaries and safe operating spaces.***

Preliminary list of papers to be dealt with (update will come at beginning of course):

General/central topic:

Rockström, J., W. Steffen, K. Noone, Å. Persson, F. S. III Chapin, E. Lambin, T. M. Lenton, M. Scheffer, C. Folke, H. J. Schellnhuber, B. Nykvist, C. A. de Wit, T. Hughes, S. van der Leeuw, H. Rodhe, S. Sörlin, P. K. Snyder, R. Costanza, U. Svedin, M. Falkenmark, L. Karlberg, R. W. Corell, V. J. Fabry, J. Hansen, B. Walker, D. Liverman, K. Richardson, P. Crutzen, and J. Foley 272009, Planetary Boundaries: Exploring the Safe Operating Space for Humanity, *Ecol. Soc.*, 14(2), 32 <http://www.ecologyandsociety.org/vol14/iss2/art32/>.
& Appendix: Supplementary Information, 22 pages.

In addition: Rockström et al., 2009, (Feature) A safe operating space for humanity, *Nature*, 472-475.

Steffen, W., K. Richardson, J. Rockström, S. E. Cornell, I. Fetzer, E. M. Bennett, R. Biggs, S. R. Carpenter, W. de Vries, C. A. de Wit, C. Folke, D. Gerten, J. Heinke, G. M. Mace, L. M. Persson, V. Ramanathan, B. Reyers, S. Sörlin, 2015, Planetary boundaries: Guiding human development on a changing planet, *Science*, 347(6223), article 1259855, DOI: 10.1126/science.1259855.
& Supplementary material, 42 pages, www.sciencemag.org/cgi/content/full/science.1259855/DC1

Climate change:

Hansen, J., M. Sato, P. Kharecha, D. Beerling, R. Berner, V. Masson-Delmotte, M. Pagani, M. Raymo, D. L. Royer, and J. C. Zachos, 2008, Target Atmospheric CO₂: Where Should Humanity Aim? *The Open Atmospheric Science Journal*, 2008, 2, 217-231.

Ocean acidification:

Norström, A. V., M. Nyström, J.-B. Jouffray, et al., 2016

Guiding coral reef futures in the Anthropocene, *Frontiers in Ecology and the Environment*, Volume: 14 Issue: 9 Pages: 490-498.

CONTINUED ON FOLLOWING PAGE!!!

Stratospheric ozone:

D. J. Erickson III, B. Sulzberger, R. G. Zepp, and A. T. Austind, 2105, Effects of stratospheric ozone depletion, solar UV radiation, and climate change on biogeochemical cycling: interactions and feedbacks, *Photochem. Photobiol. Sci.*, 2015, 14, 127-148.

Biogeochemical fluxes of N and P (possibly also O₂):

Carpenter, S. R., and E. M. Bennett, 2011, Reconsideration of the planetary boundary for phosphorus, *Environ. Res. Lett.* 6 (2011) 014009 (12pp) doi:10.1088.

De Vries, W., J. Kros, C. Kroeze, and S. P. Seitzinger, 2013, Assessing planetary and regional nitrogen boundaries related to food security and adverse environmental impacts, *Current Opinion in Environmental Sustainability* 2013, 5:392–402.

Aerosol loading:

Ernst, W. G., 2012, Overview of naturally occurring Earth materials and human health concerns, *Journal of Asian Earth Sciences* 59 (2012) 108–126.

Cohen, A. J., H. R. Anderson, B. Ostro, K. D. Pandey, M. Krzyzanowski, N. Künzli, K. Gutschmidt, A. Pope, I. Romieu, J. M. Samet, and K. Smith, The Global Burden of Disease Due to Outdoor Air Pollution, *Journal of Toxicology and Environmental Health, Part A*, 68:13-14, 1301-1307, DOI: 10.1080/15287390590936166 To link to this article: <http://dx.doi.org/10.1080/15287390590936166>.

Fresh water:

Bogardi, J. J., B. M. Fekete, and C. J. Vörösmarty, 2013, Planetary boundaries revisited: a view through the 'water lens', *Current Opinion in Environmental Sustainability* 2013, 5:581–589.

Bogardi, J. J., D. Dudgeon, R. Lawford, E. Flinderbusch, A. Meyn, C. Pahl-Wostl, K. Vielhauer, and Charles Vörösmarty, Water security for a planet under pressure: interconnected challenges of a changing world call for sustainable solutions, *Current Opinion in Environmental Sustainability* 2012, 4:35–43.

Smakhtin, V., C. Revenga, and P. Döll, 2004, A Pilot Global Assessment of Environmental Water Requirements and Scarcity, *Water International*, 29:3, 307-317, DOI: 10.1080/02508060408691785 To link to this article: <http://dx.doi.org/10.1080/02508060408691785>.

Land use change:

Foley, J. A., N. Ramankutty, K. A. Brauman, E. S. Cassidy, J. S. Gerber, M. Johnston, N. D. Mueller, C. O'Connell, D. K. Ray, P. C. West, C. Balzer, E. M. Bennett, S. R. Carpenter, J. Hill, C. Monfreda, S. Polasky, J. Rockström, J. Sheehan, S. Siebert, D. Tilman, and D. P. M. Zaks, 2011, Solutions for a cultivated planet, *Nature*, 478(337), doi:10.1038/nature10452.

Krausmann, F., K.-H. Erb, S. Gingrich, H. Haberl, A. Bondeau, V. Gaube, C. Lauk, C. Plutzer, and T. D. Searchinger, 2013, Global human appropriation of net primary production doubled in the 20th century, *PNAS*, 110(25), 10324–10329 www.pnas.org/cgi/doi/10.1073/pnas.1211349110.
Newbold, T., L. N. Hudson, A. P. Arnell, S. Contu, A. De Palma, S. Ferrier, S. L. L. Hill, A. J. Hoskins, Igor Lysenko, H. R. P. Phillips, V. J. Burton, C. W. T. Chng, S. Emerson, D. Gao, G. Pask-Hale, J. Hutton, Martin Jung, K. Sanchez-Ortiz, B. I. Simmons, S. Whitmee, H. Zhang, J. P. W. Scharlemann, and A. Purvis, 2016, Has land use pushed terrestrial biodiversity beyond the planetary boundary? A global assessment, *Science*, 353(6296), 288-291.

Biodiversity:

Mace, G. M., B. Reyers, R. Alkemade, R. Biggs, F. S. Chapin III, S. E. Cornell, Sandra Díaz, S. Jennings, P. Leadley, P. J. Mumby, A. Purvis, R. J. Scholes, A. W. R. Seddon, M. Solan, W. Steffen, and G. Woodward, 2014, Approaches to defining a planetary boundary for biodiversity, *Global Environmental Change*, 28, pages 289-297.

CONTINUED ON FOLLOWING PAGE!!!

Chemical pollution:

Diamond, M. I., C. A. deWit, S. Molander, M. Scheringer, T. Backhaus, R. Lohmann, R. Arvidsson, Å. Bergman, M. Hauschild, I. Holoubek, L. Persson, N. Suzuki, M. Vighi, C. Zetzsch, 2015, Exploring the planetary boundary for chemical pollution, *Environment International*, 78, 8-15, & Supplementary Materials.

Jahnke, A., H. P. H. Arp, B. I. Escher, B. Gewert, E. Gorokhova, D. Kühnel, M. Ogonowski, A. Potthoff, C. Rummel, M. Schmitt-Jansen, E. Toorman, and M. MacLeod, 2017, Reducing Uncertainty and Confronting Ignorance about the Possible Impacts of Weathering Plastic in the Marine Environment, *Environ. Sci. Technol. Lett.* 2017, 4, 85–90.

Critical appraisal:

Hanekamp, J. C., 2016, Unravelling the Planetary Boundaries Discourse – Scientism and Utopian Thought, *Journal of Contingencies and Crisis Management*, 24(2), 4 pp., DOI: 10.1111/1468-5973.12103.

Cornell, S., 2009, On the System Properties of the Planetary Boundaries, *Ecology and Society* 17(1): r2, 3 pages, <http://dx.doi.org/10.5751/ES-04731-1701r02>.

(Some useful references are also cited in the following paper, which is on N cycling: De Vries, W., J. Kros, C. Kroeze, and S. P. Seitzinger, 2013, Assessing planetary and regional nitrogen boundaries related to food security and adverse environmental impacts, *Current Opinion in Environmental Sustainability* 2013, 5:392–402.)