OUR CHANGING PLANET

List of literatures

Readings for course sessions are numbered and related basic and additional references are also presented.

Earth as a system - a history (teacher: Ola Uhrqvist)

1. Steffen, W., Richardson, K., Rockström, J., Schellnhuber, H. J., Dube, O. P., Dutreuil, S., ... & Lubchenco, J. (2020). The emergence and evolution of Earth System Science. Nature Reviews Earth & Environment, 1(1), 54-63.
2. Hornborg, A. (2020). The World-System and the Earth System. Journal of World-Systems Research, 26(2), 184-202.

Earth system components and behaviour (teacher: Sepehr Shakeri Yekta)

Basic

- Meadows DH, Thinking in Systems: a primer London ; Sterling, VA :Earthscan, 2009 (chapter 1)

Required

3. Jacobson, M., Charlson, R. J., Rodhe, H., & Orians, G. H. (2000). Earth system science: From biogeochemical cycles to global changes (Chapter 1). Available online via Liu's library
4. Bice, D. M. (2001), Using STELLA models to explore the dynamics of Earth systems: experimenting with Earth's climate system using a simple climate model, Journal of Geoscience Education, 49: 170-181
5. Getting started with STELLA, Tutorial (available on Lisam) – *only if you are not familiar with STELLA models.*

Additional

- Lenton, Timothy. Earth system science: a very short introduction. Vol. 464. Oxford University Press, 2016 (Chapters 1, 2, 3 and 4)
- Bice, D. M. Exploring the Dynamics of Earth Systems - a guide to constructing and experimenting with computer models of Earth systems using STELLA https://personal.ems.psu.edu/~dmb53/DaveSTELLA/entrance.htm
- Bice, D.M., (2006) STELLA modeling as a tool for understanding the dynamics of earth systems, in Manduca, C.A., and Mogk, D.W., eds., Earth and Mind: How Geologists Think and Learn about the Earth: Geological Society of America Special Paper 413, p. 171–185

Biogeochemical cycles and Global environmental change – Climate (teacher: David Bastviken)

Basic

- https://www.khanacademy.org/science/biology/ecology/biogeochemical-cycles/a/introduction-to-biogeochemical-cycles
- https://www.khanacademy.org/science/biology/ecology/biogeography/a/climate
- https://www.khanacademy.org/science/ap-college-environmental-science/x0b0e430a38ebd23f:global-change/x0b0e430a38ebd23f:greenhouse-effect/v/greenhouse-effect-and-greenhouse-gases
- Explore the domain of https://climate.nasa.gov/

Required

6. https://www.researchgate.net/publication/237824648_Global_Biogeochemical_Cycles_and_the_Physical_Climate_System
7. IPCC, (2013) Summary for Policymakers. In: Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the

Intergovernmental Panel on Climate Change [Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA. https://www.ipcc.ch/site/assets/uploads/2018/02/WG1AR5_SPM_FINAL.pdf

8. Figures and tables in: IPCC, (2021) Summary for Policymakers. In: Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Masson-Delmotte, V., P. Zhai, A. Pirani, S. L. Connors, C. P√©an, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M. I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J.B.R. Matthews, T. K. Maycock, T. Waterfield, O. Yelek√ßi, R. Yu and B. Zhou (eds.)]. Cambridge University Press. In Press https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_SPM.pdf

Additional

- Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor and H.L (eds.) (2007) Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge Kingdom and New York, NY, USA. http://ipcc.ch/publications_and_data/ar4/wg1/en/contents.html (Chapter 7.3)
- Ciais, P., C. Sabine, G. Bala, L. Bopp, V. Brovkin, J. Canadell, A. Chhabra, R. DeFriesGalloway, M. Heimann, C. Jones, C. Le Quéré, R.B. Myneni, S. Piao and P. Thornton, Carbon and Other Biogeochemical Cycles. In: Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA. http://www.climatechange2013.org/report/full-report/
- Schmittner A. 2018. Introduction to Climate Science. Download for free at https://open.oregonstate.education/climatechange/

Planetary boundaries (teacher: Alex Enrich Prast)

9. Rockström, J., Steffen, W., Noone, K., Persson, Å., Chapin, F.S., Lambin, E.F., Lenton, T.M., Scheffer, M., Folke, C., Schellnhuber, H.J., Nykvist, B., de Wit, C.A., Hughes, T., van der Leeuw, S., Rodhe, H., Sörlin, S., Snyder, P.K., Costanza, R., Svedin, U., Falkenmark, M., Karlberg, L., Corell, R.W., Fabry, V.J., Hansen, J., Walker, B., Liverman, D., Richardson, K., Crutzen, P., Foley, J.A., 2009. A safe operating space for humanity. Nature 461, 472–475. https://doi.org/10.1038/461472a

10. Steffen, W., Richardson, K., Rockström, J., Cornell, S.E., Fetzer, I., Bennett, E.M., Biggs, R., Carpenter, S.R., De Vries, W., De Wit, C.A., Folke, C., Gerten, D., Heinke, J., Mace, G.M., Persson, L.M., Ramanathan, V., Reyers, B., Sörlin, S., 2015. Planetary boundaries: Guiding human development on a changing planet. Science (80-.). 347. https://doi.org/10.1126/science.1259855

Global feedbacks (teacher: Alex Enrich Prast)

11. Bonan, G.B., 2008. Forests and climate change: Forcings, feedbacks, and the climate benefits of forests. Science (80-.). 320, 1444–1449. https://doi.org/10.1126/science.1155121

12. Gatti, L. V., Basso, L.S., Miller, J.B., Gloor, M., Gatti Domingues, L., Cassol, H.L.G., Tejada, G., Aragão, L.E.O.C., Nobre, C., Peters, W., Marani, L., Arai, E., Sanches, A.H., Corrêa, S.M., Anderson, L., Von Randow, C., Correia, C.S.C., Crispim, S.P.,

Neves, R.A.L., 2021. Amazonia as a carbon source linked to deforestation and climate change. Nature 595, 388–393. https://doi.org/10.1038/s41586-021-03629-6

Global Environmental Change - Continents and oceans (teacher: Joyanto Routh)

13. Monroe and Wicander (2014). The Changing Earth - Exploring Geology and Evolution (7th ed). Academic Cengage. (Skim chapters 1, 2, 4, 6, 7, 19)
14. Holland and Turekian (2006) Treatise on Geochemistry (volume 6). The Oceans and Marine Geochemistry. (Skim Chapters 6.04+6.18, 6.19, 6.06)

Observational vs experimental approaches in sustainability studies (teacher: Teresia Svensson)

Basic reading on study approaches (Below are texts as a support to be acquainted with the study approaches, observation and experiments in science. There are a number of texts describing scientific methods and approaches and these are just examples of the vast literature.)

- Öberg G (2010) Interdisciplinary environmental studies. Chapter 8

Required:

15. Lindenmayer, D and Likens GE (2010) The science and application of ecological monitoring. Biological Conservation. 143: 1317-1328.
16. Cunningham R and Lindemayer (2017) Approaches to landscape scale inference and study design. Curr Landscape Ecol Rep. 2:42–50

Additional:

- Lovett, GM, Burns, DA, Driscoll, CT, Jenkins, JC, Mitchell, MJ, Rustad, LE, Likens, GE, Haeuber, R, Shanley, JB. (2007) Who needs environmental monitoring? Front. Ecol. Environ. 5: 253-260
- Estes, L., Elsen, P.R., Treuer, T. et al. The spatial and temporal domains of modern ecology. Nat Ecol Evol 2, 819–826 (2018). https://doi.org/10.1038/s41559-018-0524-4

Ethics and global environmental change (teacher: Veronica Brodén Gyberg)

Required

17. Fischer et al (2019) Carbon-binding biomass or a diversity of useful trees? (Counter)topographies of carbon forestry in Uganda, ENE: Nature and Space, Vol. 2(1) 178–199
18. Magnan et al (2016) Addressing the risk of maladaptation to climate change, WIRES Climate Change https://doi.org/10.1002/wcc.409

Advanced

- Kalt (2021) Jobs vs. climate justice? Contentious narratives of labor and climate movements in the coal transition in Germany, Environmental Politics, DOI: 10.1080/09644016.2021.1892979 (optional)
- Juhola et al (2016) Redefining maladaptation, Environmental Science and Policy, Vol.55(1) 135-140
- Byskov et al (2021) An agenda for ethics and justice in adaptation to climate change, Climate and development, Vol.13 (1) 1-9 https://doi.org/10.1080/17565529.2019.1700774

Assesing contamination and risk (teacher: Joyanto Routh)

Required

19. Chakraborty et al. (2015). A Review of Groundwater Arsenic in the Bengal Basin, Bangladesh and India: from Source to Sink. Current Pollution Report 1, 220-247. (**for seminar**)
20. Sharma et al. (2014) Review of arsenic contamination, exposure through water and food and low cost mitigation options for rural areas. Applied Geochemistry 41, 11-33. (**for seminar**)
21. Hossain et al. (2014) Sediment color tool for targeting arsenic-safe aquifers for the installation of shallow drinking water tubewells. Science of Total Environment 493, 615-625. (The lab will further delve into the As contamination issue and how it can be quickly assessed. For understanding the underlying concept for field-based As analyses as a semi-quantitative screening tool read this article). (**for lab**)

Additional

- Kabata-Pendias, A. (2010) Trace elements in soils and plants. CRC Press (A good reference text on the subject of trace element contamination).
- Trace metal risks (case studies in China)
    - Chan, W.S., Routh, J., Luo, C., Dario, M., Miao, Y., Luo, D., Wei, L. (2021) Metal accumulation in aquatic organisms and health risks near an acid mine-affected site in south China. Environmental Geochemistry and Health https://doi.org/10.1007/s10653-021-00923-0
    - Luo, C., Routh, J., Dario, M., Sarkar, S., Wei, L., Lao, D., Liu, Y. (2020) Distribution and mobilization of heavy metals at an acid mine drainage-affected region in South China. Science of Total Environment 724, 138122.