

ENV 506 – Sustainability Science WEEKLY READING SCHEDULE – Winter 2019

Readings assigned for class each day is listed here. Readings listed are either from the textbooks assigned for this class (Rockström & Klum 2015; Senge et al. 2010; Steinberg 2015) or are posted on D2L as links or PDF documents (see Content >> Weekly Reading Schedule). Complete sources are listed in this reading list followed by a note about what type of document non-textbook readings are in [brackets]. *Optional readings are listed in italics.*

This printed list is provided at the beginning of the quarter as a convenience only and may change slightly. Please refer to D2L during the quarter for up-to-date information, deadlines, etc., and email me with any questions.

Week 1 – Course overview, Introduction to the challenges of sustainability

Page 1-55 (Preface thru ch. 1) in: Rockström, J. & Klum, M. (2015). *Big World Small Planet: Abundance Within Planetary Boundaries*, New Haven, CT: Yale. (*Hereafter: Rockström & Klum 2015*)

Seager, T.P. (2008). The sustainability spectrum and the sciences of sustainability. *Business Strategy and the Environment*, 17(7), pp.444–453. [scientific article]

Ruben, A. (2016, Jan 20). “How to read a scientific paper.” *Science*, doi:10.1126/science.caredit.a1600012. Retrieved from <https://www.sciencemag.org/careers/2016/01/how-read-scientific-paper> [Science news article]

Pain, E. (2016, Mar 21). “How to (seriously) read a scientific paper.” *Science*, doi: 10.1126/science.caredit.a1600047. Retrieved from <https://www.sciencemag.org/careers/2016/03/how-seriously-read-scientific-paper> [Science news article]

Week 2 – Environmental limits, Planetary boundaries, The Anthropocene

Rockström & Klum (2015) p. 59-111 (thru ch. 4)

Stockholm Resilience Centre. (2015). *Planetary Boundaries: A Safe Operating Space for Humanity*, Stockholm, Sweden. 2pp. <http://www.stockholmresilience.org/download/18.6d8f5d4d14b32b2493577/1459560273797/SOS+for+Business+2015.pdf>. [briefing paper]

Waters, C.N., et al. (2016). The Anthropocene is functionally and stratigraphically distinct from the Holocene. *Science*, 351(6269), p.aad2622-aad2622. [scientific article]

Optional: Rockström, J., et al. (2009). Planetary boundaries: Exploring the safe operating space for humanity. Ecology & Society, 14, art. 32. [scientific article that originally introduced the planetary boundaries concept]

Optional: Steffen, W., et al. (2015). Planetary Boundaries: Guiding human development on a changing planet. Science, 347, 1259855. doi:10.1126/science.1259855 [scientific article; 2015 planetary boundaries update]

Week 3 – Applications of the planetary boundaries

Rockström & Klum (2015) p. 114-179 (thru ch. 8)

O’Neill, D., Fanning, A.L., Lamb, W.F., & Steinberger, J.K. (2018). A good life for all within planetary boundaries. *Nature Sustainability*, 1, pp.88-95. [scientific article]

Whitehead, G., Walker, B., & Perego, P. (2012). Planetary boundaries: Ecological foundations for corporate sustainability. *Journal of Management Studies*, 50, art. 2. doi: 10.1111/j.1467-6486.2012.01073.x [scientific article]

Furlong, H. (2016). Study: Companies failing to report their impact against planetary boundaries. *Stakeholder Trends and Insights: Sustainable Brands Issue in Focus*, Sustainable Brands, http://www.sustainablebrands.com/news_and_views/stakeholder_trends_insights/hannah_furlong/study_companies_failing_report_their_impac [blog post]

Optional: O’Neill, D. (2018, Feb 5). *Behind the paper: Living well, within planetary boundaries*. *Nature Research Sustainability Community*. Retrieved from <https://sustainabilitycommunity.nature.com/users/81832-daniel-o-neill/posts/29930-living-well-within-planetary-boundaries> [blog post about O’Neill et al. 2018 article]

Optional: Robèrt, K.H., Broman, G.I. & Basile, G. (2013). *Analyzing the concept of planetary boundaries from a strategic sustainability perspective: How does humanity avoid tipping the planet?* *Ecology and Society*, 18(2), art. 5 [scientific article]

Planetary Boundaries Presentations & Paper due via D2L Submissions before class

Week 4 – Thinking critically about the normative & positive aspects of sustainability

United Nations. (2015). “Sustainable Development Goals.” Retrieved from <https://www.un.org/sustainabledevelopment/sustainable-development-goals/> [website; browse through the pages on each of the 17 SDGs]

Keitsch, M. (2018). Structuring ethical interpretations of the sustainable development goals-Concepts, implications and progress. *Sustainability*, 10, 829. 9pp. doi:10.3390/su10030829

Chapter 1 in: Steinberg, P.F. (2015). *Who Rules the Earth? How social rules shape our planet and our lives*, Oxford, UK: Oxford University Press. (Hereafter: Steinberg 2015)

Bashir, N.Y., Lockwood, P., Chasteen, A.L., Nadolny, D., & Noyes, I. (2013). The ironic impact of activists: Negative stereotypes reduce social change influence. *European Journal of Social Psychology*, 43, pp.614–626. doi:10.1002/ejsp.1983

Group Discussion # 1 re: Human growth (aka, Population):

Abel, G.J., Barakat, B., KC, S., & Lutz, W. (2016). Meeting the Sustainable Development Goals leads to lower world population growth. *PNAS*, 113, pp.14294–14299. doi:10.1073/pnas.1611386113 [scientific article]

Week 5 – Systems thinking introduction

Steinberg (2015) ch. 3

Chapters 1-8 in: Senge, P. et al. (2010). *The Necessary Revolution: How Individuals and Organizations are Working Together to Create a Sustainable World*, New York: Crown Publishing. (Hereafter Senge et al. 2010)

Group Discussion # 2 re: Climate:

Steffen, W., et al. (2018). Trajectories of the Earth System in the Anthropocene. *PNAS* 115, pp.8252–8259. doi:10.1073/pnas.1810141115 [scientific article]

Week 6 – Mapping interactions & flows in systems

Senge et al. (2010) ch. 12-13

WWF. (2016). “Chapter 3: Exploring Root Causes,” (pp.88-105 [PDF pp.46-54]), in: *Living Planet Report 2016: Risk and resilience in a new era*, Gland, Switzerland. Retrieved from http://awsassets.panda.org/downloads/lpr_living_planet_report_2016.pdf.

TBD selection (see D2L) from: Stroh, D.P. (2015). *Systems Thinking for Social Change*. Chelsea Green Publishing, White River Junction, Vermont.

Meadows, Donella H. (2008). Chapter 6: “Leverage Points—Places to intervene in a system.” (pp.145-165), in: *Thinking in Systems: A primer* (ed. Wright, D.). Chelsea Green Publishing, White River Junction, Vermont.

Group Discussion # 3 re: Ecosystems:

TBD – see D2L

Evaluation Paper due via D2L Submissions – also turn in printed copy during class, please

Week 7 – Scales, complexity, resilience

(Some of the following readings will be optional; check D2L closer to the week of class to see which)

Senge et al. (2010) ch. 15-18

Holling, C.S. (2001). Understanding the complexity of economic, ecological, and social systems. *Ecosystems*, 4, pp.390–405. doi:10.1007/s10021-001-0101-5 [scientific article]

Folke, C. (2006). Resilience: The emergence of a perspective for social–ecological systems analyses. *Global Environmental Change*, 16, pp.253–267. doi:10.1016/j.gloenvcha.2006.04.002 [scientific article]

Cash, D.W., et al. (2006). Scale and Cross-Scale Dynamics: Governance and Information in a Multilevel World. *Ecology & Society*, 11(2), art. 8, 12pp. [scientific article]

Liu, J., et al. (2007). Coupled human and natural systems. *Ambio*, 36(8), pp.639–649. [scientific article]

Group Discussion # 4 re: Surprise & Uncertainty:

TBD – see D2L

Week 8 – Transformations, trade-offs, synergies

Senge et al. (2010) ch. 14

Dangerman, A.T.C.J. & Schellnhuber, H.J. (2013). Energy systems transformation. *PNAS*, 110(7), pp.E549-58. [scientific article]

Fuso Nerini, F., et al. (2018). Mapping synergies and trade-offs between energy and the Sustainable Development Goals. *Nature Energy*, 3, pp.10–15. doi:10.1038/s41560-017-0036-5 [scientific article]

Steinberg (2015) ch. 5

Final Paper Outline and Annotated Bibliography due via D2L Submissions

Week 9 – Change & disruption

Senge et al. (2010) ch. 9-11 & ch. 21-24 (*Optional: ch. 25-28*)

Chapter 8 in: Gilding, P. (2011). *The Great Disruption: Why the climate crisis will bring on the end of shopping and the birth of a new world*, New York, NY: Bloomsbury Press. [book chapter]

Optional: WWF. (2018). “Chapter 4: Aiming higher: What future do we want?” (pp.108-129 [PDF pp.56-66]), in: Living Planet Report 2018: Aiming higher, Gland, Switzerland. Retrieved from https://wwf.panda.org/knowledge_hub/all_publications/living_planet_report_2018/

Reflective Journaling due D2L Submissions

Week 10 – Steady state economies, Closing the loop

Senge et al. (2010) ch. 19-20

Rockström & Klum (2015) p.181-195 (finish book)

Steinberg (2015) ch. 9

O’Neill, D.W. (2012). Measuring progress in the degrowth transition to a steady state economy. *Ecological Economics*, 84, pp.221–231. [scientific article]

Finals Week

No in-class meeting

Final Paper due at end of scheduled final exam period (Wed, Mar 21, 9 pm) via D2L Submissions