Reading List – Special Topics: Global Change & Ecosystems
(To be regularly updated)

**Red* *indicates assigned reading/viewing*

Introduction (Global Change, Ecosystem Processes)

Vitousek PM (1992) Global environmental change: an introduction. *Annual Review of Ecology and Systematics* 23:1-14.

Vitousek PM et al. (1997) Human domination of Earth's Ecosystems. *Science* 277:494-499.

Vitousek PM (1994) Beyond global warming: ecology and global change. *Ecology* 75(7):1861-1876.

Vitousek PM et al. (1986) Human appropriation of the products of photosynthesis. Bioscience 36:368-373.

Climate Confusion:

Nathanial Rich (2018) "Losing Earth: The decade we almost stopped climate change" *New York Times* (Aug 1, 2018)

Causes & Evidence for Global Change, Opportunities & Solutions

Intergovernmental Panel on Climate Change (IPCC) Assessment Reports:
(These authoritative, consensus documents provide useful, periodic reviews of the science related to climate change, but are thin on biospheric aspects of global change)

IPCC 2021: AR6 Climate Change 2021:The Physical Science Basis. (other AR6 reports are due out in 2022, and some are available in preprint form at https://www.ipcc.ch/assessment-report/ar6/

IPCC 2014: Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [(Core Writing Team, RK Pachauri, LA Meyer (eds.)]. IPCC, Geneva, Switzerland, 151 pp. https://archive.ipcc.ch/report/ar5/syr/

IPCC 2007 – 4th Assessment report

Videos:

Johan Rockström's lecture on planetary boundaries: what are acceptable limits to global change? (18:11)
http://www.ted.com/talks/johan_rockstrom_let_the_environment_guide_our_development.html

Naomi Klein's interview with Bill Moyers on capitalism and climate change (31:51)
http://billmoyers.com/episode/full-show-hurricanes-capitalism-democracy/

Anthony Leiserowitz's interview with Bill Moyers: "Ending the silence on climate change" (46:23)
http://environment.yale.edu/climate/

Papers:

Azar C, Rodhe H (1997) Targets for stabilization of atmospheric CO_2. Science 276:1818-1819.

Brundtland GH (1997) The scientific underpinning of policy. Science 277:457. [editorial]

Costanza R, Patten BC (1995) Defining and predicting sustainability. Ecological Economics. 15:193-196.

Rockström J. et al. (2009) A safe operating space for humanity. *Nature.* 461:472-475.

Running SR (2012) A measurable planetary boundary for the biosphere. *Science* 337:1458-1459.

Erb, Karl-Heinze et al. (2013) Pushing the planetary boundaries (Letter to *Science*). *Science* 338:1419-1420.

Newell P, Paterson (1998) A climate for business: global warming, the state, and capital. Review of International Political Economy. 4: 679-703.

Running SR & Smith WK (2013) Pushing the planetary boundaries (Response to Letter). *Science* 338:1420.

Schneider SH (1989) The greenhouse effect: science and policy. *Science* 243:771-781

Steffen W, Richardson K, Rockström J, Cornell SE, Fetzer I, Bennett EM, Biggs R, Carpenter SR, deVries W, deWit CA & Folke C (2015) Planetary boundaries: Guiding human development on a changing planet. *Science*, 347(6223): 1259855.

Communicating Science

Altemeyer RA (2006) *The Authoritarians.*
https://theauthoritarians.org/Downloads/TheAuthoritarians.pdf

Baron N. (2010) *Escape from the Ivory Tower. A Guide to Making your Science Matter.* Island Press. (Discusses the Message Box). For an excerpt, see:
https://docs.wixstatic.com/ugd/e58a91_0cd1a62de358406eba9faec6c90f05f5.pdf

Leiserowitz A, Mailbach E, Roser-Renouf C, Feinerg G, Rosenthal S (2015) Global Warming's Six Americas, March 2015, Yale University and George Mason University. New Haven, CT: Yale Program on Climate Change Communication
https://cdn.americanprogress.org/wp-content/uploads/issues/2009/05/pdf/6americas.pdf

The Message Box: http://blog.uvm.edu/mpespeni/files/2015/08/MessageBox.pdf

Arctic Ecosystems

Andresen, C. G., & Lougheed, V. L. (2015). Disappearing Arctic tundra ponds: Fine-scale analysis of surface hydrology in drained thaw lake basins over a 65 year period (1948-2013). *Journal of Geophysical Research: Earth Surface*, *120*(3), 466-479. 10.1002/2014JG002778

Arrigo et al. (2008) Impact of a shrinking Arctic ice cover on marine primary production. *Geophys. Res. Lett.* 35, L19603, doi:10.1029/2008GL035028

Barber et al. (2008) The changing climate of the Arctic. *Arctic* 61 (Suppl. 1): 7-26.

Bhatt U, Walker D, Webber P, et al. Circumpolar Arctic Tundra Vegetation Change Is Linked to Sea Ice Decline. *Earth Interactions* [online]. August 2010;14(8):1-20.

Blok et al. (2010) Shrub expansion may reduce summer permafrost thaw in Siberian tundra. *Global Change Biology*. 16, 1296-1305

Chapin FS III, et al. 2005. Role of land-surface changes in arctic summer warming. *Science* **310**, 657-660 DOI: 10.1126/science.1117368

Hudson, JG, Henry GR, & Cornwell WK (2011). Taller and larger: shifts in Arctic tundra leaf traits after 16 years of experimental warming. *Global Change Biology*, *17*(2), 1013-1021. doi:10.1111/j.1365-2486.2010.02294.x

Huemmrich et al. 2010 Tundra Carbon Balance Under Varying Temperature and Moisture Regimes. *Journal of Geophysical Research.* 115, G00I02, doi:10.1029/2009JG001237

Mack MC, Bret-Harte MS, Hollingsworth TN, Jandt RR, Schuur EAG, Shaver GR, Verbyla DL (2011) Carbon loss from an unprecedented Arctic tundra wildfire. *Nature* 475:489-492 doi:10.1038/nature10283

Moore, S. E., & Huntington, H. P. (2008). Arctic marine mammals and climate change: impacts and resilience. *Ecological Applications*, *18*(sp2), S157-S165.

Myneni RB, Keeling CD, Tucker CJ, Asrar G, Nemani RR (1997) Increased plant growth in the northern high latitudes from 1981 to 1991. *Nature* 386:698-702.

Schuur EAG, Vogel JG, Crummer KG, Lee H, Sickman JO, Osterkamp TE (2009) The effect of permafrost thaw on old carbon release and net carbon exchange from tundra. *Nature* 459: 556-559. doi:10.1038/nature08031

Schuur et al. (2008) Vulnerability of permafrost carbon to climate change: Implications for the global carbon cycle, *BioScience* 58: 701-714

Schuur et al. 2011 The high risk of permafrost thaw. *Nature.* 480:32-33.

Schuur, E. A. G., et al. (2015). Climate change and the permafrost carbon feedback. Nature, vol. 520, pp. 171–179., doi:10.1038/nature14338.

Smith et al. (2005) Recent trends from Canadian permafrost thermal monitoring network sites. *Permafrost and Periglacial Processes*. 16: 19-30

Smith LC, Sheng Y, MacDonald GM, Hinzman LD (2005) Disappearing Arctic lakes. *Science* 308:1429

Walker MD et al. (2006) Plant community responses to experimental warming across the tundra biome. PNAS 103:1342-1346

Walter et al. (2007) Methane bubbling from northern lakes: present and future contributions to the global methane budget. *Phil. Trans. R. Soc. A*, 365: 1657-1676

Boreal Ecosystems

Adam AA, Blarquez O, Girardin MP, Hély C, Tinquaut F, El Guellab A, Valsecchi V, Terrier A, Bremond L, Genries A, Gauthier S (2012) Control of the multimillenial wildfire size in boreal North America by spring climatic conditions. *Proceedings of*

the National Academy of Sciences 109(51): 20966-20970. doi:10.1073/pnas.1203467109

Betts RA (2000) Offset of the potential carbon sink from boreal forestation by decreases in surface albedo. *Nature* 408: 187-190.

Coogan et al. (2019) Scientists' warning of wildfire – a Canadian perspective. Can. J. For. Res. 49:1015-1023. https://doi.org/10.1139/cjfr-2019-0094.

Frelich LE, Hale CM, Scheu S, Holdsworth AR, Heneghan L, Bohlen PJ, Reich PB (2006) Earthworm invasion into previously earthworm-free temperate and boreal forests. *Biological Invasions*. DOI 10.1007/s10530-006-9019-3.

Goetz SJ, Bunn AG, Fiske GJ, Houghton RA (2005) Satellite-observed photosynthetic trends across boreal North America associated with climate and fire disturbance. *Proceedings of the National Academy of Sciences*. 102(38):13521-13525. doi: 10.1073/pnas.0506179102

Gauthier S, Bernier P, Kuuluvainen T, Shvidenko AZ, Schepaschenko DG (2015) Boreal forest health and global change. *Science* 349 (6250): 819-822. DOI: 10.1126/science.aaa9092

Hanes et al. (2019) Fire-regime changes in Canada over the last half century. *Canadian Journal of Forest Research*. 49(3):256-269. https://doi.org/10.1139/cjfr-2018-0293.

Kelly EN, Short JW, Schindler DW, Hodson PV, Ma Mingsheng, Kwan AK, Fortin BL (2009) Oil sands development contributes polycyclic aromatic compounds to the Athabasca River and its tributaries. *Proceedings of the National Academy of Sciences* 106(52): 22346-22351. doi: 10.1073/pnas.0912050106

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Reich et al. (2015) Geographic range predicts photosynthetic and growth response to warming in co-occurring tree species. Nature Climate Change. 5:148-152.

Rooney RC, Bayley SE, Schindler DW (2012) Oil sands mining and reclamation cause massive loss of peatland and stored carbon. *Proceedings of the National Academy of Sciences* 109: 4933-4937

Schindler D. (2010) Tar sands need solid science. *Nature* 468:499-501

Schindler DW, Lee PG (2010) Comprehensive conservation planning to protect biodiversity and ecosystem services in Canadian boreal regions under a warming climate and increasing exploitation. *Biological Conservation* 143: 1571–1586

Weber, M.G., & Flannigan, M.D. (1997). Canadian boreal forest ecosystem structure and function in a changing climate: impact on fire regimes. *Environmental Reviews*, *5*(3-4), 145-166. https://doi.org/10.1139/a97-008

Emerging Diseases/Tropical Ecosystems

Garrett L(1994) *The Coming Plague: Newly Emerging Diseases in a World out of Balance.* Farrar, Straus and Giroux, New York. (A popular book by Laurie Garrett, a well-known science writer, on the links between environmental disruption and diseases).

Patz et al. (2000) Effects of environmental change on emerging parasitic diseases. International Journal for Parasitology 30 1395-1405

Tropical Ecosystems

Avissar & Werth (2005) Global hydroclimatological teleconnections resulting from tropical deforestation. *Journal of Hydrometeorology*. 6:134-145

Baccini, A., W. Walker, L. Carvalho, M. Farina, D. Sulla-Menashe, R.A. Houghton. 2017. Tropical forests are a net carbon source based on aboveground measurements of gain and loss. *Science*. 358(6360): 230-234. DOI: 10.1126/science.aam5962.

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Davidson EA, de Araújo AC, Artaxo P, Balch JK, Brown IF, Bustamante MMC, Coe MT, DeFries RS, Keller M, Longo M, Munger JW, Schroeder W, Soares-Filho BS, Souza CM, Wofsy SC (2012) The Amazon basin in transition, *Nature*, 481: 321-328, 2012.

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Laurance et al. (1997) Biomass collapse in Amazonian forest fragments. *Science*. 278:1117-1118.

Laurance et al. (2006) Rapid decay of tree-community composition in Amazonian forest fragments. *Proceedings of the National Academy of Sciences* 103:19010-19014.

Laurance (2006) Have we overstated the tropical biodiversity crisis? *Trends in Ecology & Evolution*. 22(2):65-70

Laurance et al. (2011) The fate of Amazonian forest fragments: A 32-year investigation. *Biological Conservation*. 144:56-67.

Laurance WF, and GB Williamson (2001) Positive feedback among forest fragmentation, drought, and climate change in the Amazon. *Conservation Biology.* 15:1529-1535.

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Ecological Economics

Costanza et al. (1997) The value of the world's ecosystem services and natural capital. *Nature* 387:253-260.

Foley et al. (2005) Global consequences of land use. *Science* 309:570-574

Marine & Aquatic Ecosystems

Arrigo et al. (2008) Impact of a shrinking Arctic ice cover on marine primary production. *Geophys. Res. Lett.* 35, L19603, doi:10.1029/2008GL035028
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Barnett et al. (2007) Human-induced changes in the hydrology of western United States. *Science* 319:1080-1083

Baker AC, Glynn PW, Riegl B (2008) Climate change and coral reef bleaching: an ecological assessment of long-term impacts, recovery trends and future outlook. *Estuarine, Coastal and Shelf Science* 80:435-471.

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Hoegh-Guldberg et al. (2007) Coral Reefs Under Rapid Climate Change and Ocean Acidification. *Science* 318:1737-1742

Harley CDG et al. (2006) The impact of climate change in coastal marine ecosystems. Ecology Letters. 9: 228–241

Hughes TP et al. (2017) Coral reefs in the Anthropocene. *Nature*. 546: 82-90

Lyons et al. (2014) Macroalgal blooms alter community structure and primary productivity in marine ecosystems. Global Change Biology 20: 2712-2724.

McCauley DJ, et al. (2015) Marine defaunation: animal loss in the global ocean. *Science* 347 (6219):247, 1255641-1 DOI: 10.1126/science.1255641

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Saunders M, Leon J, Callaghan D *et al.* (2014) Interdependency of tropical marine ecosystems in response to climate change. *Nature Clim Change* 4, 724–729

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Smith SV, Buddemeier RW (1992) Global change and coral reef ecosystems. *Ann. Rev. Ecol. Syst.* 23:89-118.

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Vorosmarty et al. (2000) Global water resources: vulnerability from climate change and population growth. *Science* 289:284-288

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Changing Hydrology

Barnett et al. (2007) Human-induced changes in the hydrology of western United States. *Science* 319:1080-1083

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Yi Y, Kimball JS, Reichle RH (2014) Spring hydrology determines summer net carbon uptake in northern ecosystems. *Environ. Res. Lett.* 9: 064003(11pp). doi:10.1088/1748-9326/9/6/064003

Wang et al. (2012) Drylands ecohydrology and climate change: critical issues and technical advances. Hydrol. Earth Syst. Sci. 16, 2585–2603, doi:10.5194/hess-16-2585-2012

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Nitrogen Cycle Perturbations

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Rabalais et al (2007) Sediments tell the history of eutrophication and hypoxia in the northern Gulf of Mexico. *Ecological Applications*, 17:S129-S143.

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Bauer et al. (2013) The changing carbon cycle of the coastal ocean. *Nature* 504:61-70, doi:10.1038/nature12857.

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Schimel D (2007) Carbon cycle conundrums. *Proceedings of the National Academy of Sciences* 104(47):18353-18354

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Land Use/Land Cover Change

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314:1130-1132. DOI: 10.1126/science.1132075

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Agricultural Impacts

Adams RM, Rosenzweig C, Peart RM, Ritchie JT, McCarl BA, Glyer JD, Curry B, Jones JW, Boote KJ, Allen LH Jr. (1990) Global climate change and US agriculture. *Nature* 345:219-224.*

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