**The Biology of Sustainability:**

**(BIOL 510, 2024)**

This list will be updated through the course and changes will be highlighted in yellow.

**Required course textbook:**

Barash, D.P. 2014. Buddhist Biology. Ancient Eastern Wisdom Meets Modern Western Science. Oxford University Press.

**Recommended journal papers:**

Aarssen, Lonnie W. (2013). Will Empathy Save Us? Biological Theory 7(3):211-217.

Barnosky et al, 2011. Has the Earth’s sixth mass extinction already arrived? *Nature* 471:51-57.

Bartlett, C. et al, 2012. Two-Eyed Seeing and other lessons learned within a co-learning journey of bringing together indigenous and mainstream knowledges and ways of knowing. [Journal of Environmental Studies and Sciences](https://www.researchgate.net/publication/journal/Journal-of-Environmental-Studies-and-Sciences-2190-6483) 2(4): 331–34. DOI:[10.1007/s13412-012-0086-8](http://dx.doi.org/10.1007/s13412-012-0086-8); <https://ceaa-acee.gc.ca/050/documents/p80156/132968E.pdf>

Bradshaw et al, 2014. Human population reduction is not a quick fix for environmental problems. *Proceedings of the National Academy of Sciences* 111(46):16610-16615.

Bradshaw et al, 2021. Underestimating the Challenges of Avoiding a Ghastly Future. *Frontiers in Conservation Science* 1:615419.  <https://doi.org/10.3389/fcosc.2020.615419>

Broadhead L-A, Howard S. Confronting the contradictions between Western and Indigenous science: a critical perspective on Two-Eyed Seeing. AlterNative: An International Journal of Indigenous Peoples. 2021;17(1):111-119. doi:10.1177/1177180121996326. <https://journals.sagepub.com/doi/full/10.1177/1177180121996326>

Ceballos et al, 2017. Biological annihilation via the ongoing sixth mass extinction signaled by vertebrate population losses and declines. *PNAS* 114 (30) E6089-E6096; <https://doi.org/10.1073/pnas.1704949114>

Ceballos et al, 2020. Vertebrates on the brink as indicators of biological annihilation and the sixth mass extinction. *PNAS*117 (24) 13596- 13602; <https://doi.org/10.1073/pnas.1922686117>

Diaz, S. et al 2019. Pervasive human-driven decline of life on Earth points to the need for transformative change. *Science* 366(6471), eaax3100.

Ericson et al, 2014. Mindfulness and sustainability. Ecological Economics 104:73-79.

Grogan, P. 2013. Our Anthropocene Future - What can biology tell us? *Free Inquiry*. February/March issue. Vol. 32(2):16-19. Council for Secular Humanism. New York. This paper is available directly at: <https://www.queensu.ca/terrestrial-ecosystem-ecology/sites/webpublish.queensu.ca.teelwww/files/files/Publications%20and%20Outreach/FreeInquiry.pdf> .

Hermes, J. and Rimanoczy, I. 2018. Deep learning for a sustainability mindset. *The International Journal of Management Education* 16, 460-467.

Kates, R., et al. 2005. What is Sustainable Development? *Environment* 47(3): 8-21.

Mazzocchi, F. 2020. A deeper meaning of sustainability: Insights from Indigenous Knowledge. *Anthropocene Review* 7(1): 77-93

Ripple, W.J. et al. 2017. World Scientists’ Warning to Humanity: A Second Notice. *BioScience*, 67(12), 1026–1028. <https://academic.oup.com/bioscience/article/67/12/1026/4605229>

Ripple, W.J. et al. 2020. World Scientists’ Warning of a Climate Emergency. BioScience, 70(1), 8–12. <https://doi.org/10.1093/biosci/biz088>

Ripple, W.J., et al. 2021. World Scientists’ Warning of a Climate Emergency 2021. BioScience, 71(9), 894–898. <https://academic.oup.com/bioscience/article/71/9/894/6325731>

Steffen, W., et al 2015. The trajectory of the Anthropocene: the great acceleration. The Anthropocene Review, 2(1), 81-98.

Vitousek et al, 1997. Human domination of Earth’s ecosystems. *Science* 272:494-499.

Wamsler, C et al., 2018. [Mindfulness in sustainability science, practice, and teaching](https://link.springer.com/content/pdf/10.1007/s11625-017-0428-2.pdf). Sustainability Science, 13(1) 143–162.

**Books (I have copies of these if you cannot locate them in the library):**

Aarssen, L. 2015. What are we?  Exploring the evolutionary roots of our future. Especially Chapter 12 – Becoming the solution.

Batchelor, S. 1998. Buddhism without Beliefs – A contemporary guide to awakening. Riverhead

Dalai-Lama. 2006. The Universe in a Single Atom: The Convergence of Science and Spirituality. Harmony.

Diamond, J. 1991. The Third Chimpanzee: The Evolution and Future of the Human Animal

Harari, YN. 2015. Sapiens:  A Brief History of Humankind

Hochschild, A. 2005. Bury the Chains: Prophets and Rebels in the Fight to Free an Empire's Slaves. Mariner books

Homer-Dixon, T. (2006). The Upside of Down: Catastrophe, Creativity and the Renewal of Civilisation. Island Press.

Kimmerer, R. W. 2013. Braiding Sweetgrass: Indigenous wisdom, scientific knowledge

and the teachings of plants. Milkwood books.

Macy, J and Johnstone, C. 2012. Active Hope : How to Face the Mess We're in without Going Crazy. New World Library.

McKibben, B. 2006. The End of Nature. Random House.

Nhat Hanh, T. 1992. Peace Is Every Step - The Path of Mindfulness in Everyday Life. Bantam Books.

Ponting, C. (2007). A New Green History of the World: The Environment and the collapse of great civilisations. 2nd edition. Penguin.

Schumacher, E.F. (1973). Small is Beautiful – A Study of Economics as if People Mattered. Abacus.

Suzuki, D. and H. Dressel (2010). More Good News: Real solutions to the global eco-crisis. Vancouver, Greystone.

Suzuki, S. (2006). Zen Mind, Beginner’s Mind. Shambhala, Boulder.

Wright, R. (2004). A Short History of Progress. New York, Carroll and Graf. (An excellent and very readable description of the rises and falls of earlier civilisations, and the major over-riding causes). As an alternative to reading, you could listen to the 2004 CBC Massey lectures of this book: <https://www.cbc.ca/radio/ideas/the-2004-cbc-massey-lectures-a-short-history-of-progress-1.2946872>

**Indigenous perspectives (some ideas to get us started):**

**The Words That Come Before All Else** (Thanksgiving Address) are an ancient supplication of the indigenous Six Nations peoples of Northeastern North America, the Mohawks, Onondaga, Oneida, Cayuga, Seneca and Tuscarora. The address is not a prayer but expresses gratitude and empathic connection to all of creation. The Words Before All Else are the words that Haudenosaunee  (Ho doe na show knee) people speak before ceremonial and governmental gatherings and some people speak it to start and end their days. The words address the People, Earth Mother, The Waters, Fish, Plants, Food Plants, Medicine Herbs, Trees, Birds, Four Winds, Thunderers, Sun, Grandfather Moon, Stars, Enlightened Teachers, and The Creator. Each element of the natural world is spoke to and thanked for their contributions to all life. These words bind us and promote empathy with all creation. <https://donnallong.com/sustainable-living/words-before-all-else/>; <https://www.smithsonianmag.com/blogs/national-museum-american-indian/2018/11/22/haudenosaunee-thanksgiving-address/>;

<https://americanindian.si.edu/environment/pdf/01_02_Thanksgiving_Address.pdf>

Haudenosaunee information and education websites: <https://www.haudenosauneeconfederacy.com/who-we-are/> https://americanindian.si.edu/sites/1/files/pdf/education/HaudenosauneeGuide.pdf

**Colonization Road:** The path of reconciliation is long and winding – An excellent documentary on the history and impacts on settler colonisation on Canadian indigenous communities (CBC Documentaries PointOfView) <https://www.youtube.com/watch?v=u03qLJ50bf4>

Kimmerer, R. Queen’s Dept of Biology webinar: What does the Earth ask of Us? Dr. Robin Wall Kimmerer (Nov. 12th, 2020). Queen’s Dept of Biology webinar: <https://www.youtube.com/watch?v=KAoBJa61-D0>

Little Bear, Leroy. Rethinking our Science: Blackfoot Metaphysics Waiting in the Wings. Reflections by a Blackfoot. (April 20, 2021). Queen’s Dept of Biology webinar: <https://www.youtube.com/watch?v=YWH6RTgLRaU>

Cajete, Gregory. Native Ecology: An interview on Dr. Cajete’s book Look to the Mountain (Accessible through the Queen’s library service Omni)

<https://digital-films-com.proxy.queensu.ca/p_ViewVideo.aspx?xtid=56718>

Rekindling Traditions project coordinated by Glen Aikenhead. The project had a similar mandate to ours, creating culturally responsive unit plans linking Indigenous ways of knowing and being with Saskatchewan Science Outcomes. <https://education.usask.ca/ccstu/>

Glen Aikenhead’s webinar on insights and practical advice regarding how to integrate Indigenous knowledge into science education. (July 8, 2021). Queen’s Dept of Biology webinar:  [https://youtu.be/rfMLj\_IXYcU](https://can01.safelinks.protection.outlook.com/?url=https%3A%2F%2Fyoutu.be%2FrfMLj_IXYcU&data=04%7C01%7Cgroganp%40queensu.ca%7C1ca2a52d447f4140058108d9464b04d2%7Cd61ecb3b38b142d582c4efb2838b925c%7C1%7C0%7C637618111233419821%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C1000&sdata=E%2FEWNNa1CcsQaRNs0HKbtlsKDPc%2FZ%2FWL%2BiuVs%2B0hgMo%3D&reserved=0)

Queen’s University Indigenous websites:

<https://www.queensu.ca/indigenous/>

<https://www.queensu.ca/indigenous/ways-knowing/cultural-services>

Queen’s Truth and Reconciliation website: <https://www.queensu.ca/provost/committees-and-reports/truth-and-reconciliation-commission-task-force>

Extending the Rafters: Truth and Reconciliation Commission Task Force Final Report (Queen’s University)

[https://www.queensu.ca/provost/sites/webpublish.queensu.ca.provwww/files/files/Comittees/TRC%20Reports/(WEB%20VERSION)%20Final%20Report%20of%20the%20Truth%20and%20Reconciliation%20Commission%20Task%20Force.pdf](https://www.queensu.ca/provost/sites/webpublish.queensu.ca.provwww/files/files/Comittees/TRC%20Reports/%28WEB%20VERSION%29%20Final%20Report%20of%20the%20Truth%20and%20Reconciliation%20Commission%20Task%20Force.pdf)

Tuck E, and Yang K.W. 2012. Decolonization is not a metaphor. *Decolonization: Indigeneity, Education & Society* 1(1),1-40. <https://www.researchgate.net/publication/277992187_Decolonization_Is_Not_a_Metaphor/link/57aa1a4e08ae3765c3b4988b/download>

Robinson D., Hill, J et al. 2019. Rethinking the Practice and Performance of Indigenous Land Acknowledgement. *Canadian Theatre Review*, Volume 177, pp. 20-30. <https://uwaterloo.ca/faculty-association/sites/ca.faculty-association/files/uploads/files/rethinking_the_practice_and_performance_of_indigenous_land_acknowledgement_a.pdf>

Michael Doxtater. Queen’s National Scholar October 2019 SNID seminar: Lecture 3 - The Adoption of Canada into the Long House of Many Nations

<https://stream.queensu.ca/Playlist/p6M3WtGo?destinationID=kKude6yc00O0pprOBbb46g&contentID=6k8g9t9IGEerrA_SSdku7Q&pageIndex=1&pageSize=10>

Center for Native Peoples and the Environment: <https://www.esf.edu/nativepeoples/>

UN Declaration on the Rights of Indigenous Peoples: <https://www.un.org/development/desa/indigenouspeoples/declaration-on-the-rights-of-indigenous-peoples.html>

**Other interesting electronic media links:**

**Surviving progress** (2011) Used to be available via Queen’s library video collection (NFB) at: <https://www-nfb-ca.proxy.queensu.ca/film/surviving-progress/>

**A Life on Our Planet** (2020)~80 minute documentary by David Attenborough (available on Netflix <https://www.netflix.com/browse?jbv=80216393> , and <http://www.documentarymania.com/player.php?title=David%20Attenborough:%20A%20Life%20on%20Our%20Planet>)

**The Call of the Mountain**: Arne Naess and the Deep Ecology Movement (full version ~ 50 mins) <https://www.youtube.com/watch?v=Wf3cXTAqS2M>

**Forget Taking Shorter Showers** –Putting personal versus organizational level change into context:  <https://www.youtube.com/watch?v=m2TbrtCGbhQ>

The ‘**Pale Blue Dot’**, and Carl Sagan quote:

<https://www.planetary.org/explore/space-topics/earth/pale-blue-dot.html>

<https://solarsystem.nasa.gov/resources/536/voyager-1s-pale-blue-dot/>

**8th Fire**- A four part CBC curio series (Indigenous in the City; It’s time; Whose land is it anyway?; At the Crossroads; Lighting the 8th fire; available on the internet and via the Queen’s library video link at: <https://curio-ca.proxy.queensu.ca/en/catalog/4359490c-b4b2-4404-a5b5-e18309974cb5>

<https://curio-ca.proxy.queensu.ca/en/catalog/409deca5-c6b8-4257-a676-fc890397b22a>

https://curio-ca.proxy.queensu.ca/en/catalog/4500d1ea-4703-41e8-bb85-9c7e42766d3b

Richard Dawkins interviews Satish Kumar on **science and spirituality** (Enemies of Reason Uncut Interviews – 38 minutes) <https://www.youtube.com/watch?v=19Sqt-zqmrk>

**Will we survive this century?** TedTalk by Martin Rees who served as Britain’s Astronomer Royal (14 minute talk) <http://www.ted.com/talks/lang/eng/martin_rees_asks_is_this_our_final_century.html>

Jared Diamond on why societies collapse (20 minute talk) <http://www.ted.com/talks/jared_diamond_on_why_societies_collapse.html>

What a way to go – life at the end of empire. Highly rated documentary film (2 hours) <http://topdocumentaryfilms.com/what-a-way-to-go-life-at-the-end-of-empire/>

<http://theconversation.com/how-mindfulness-can-help-the-shift-towards-a-more-sustainable-society-79127>

The Stockholm Resilience Centre – Sustainability Science for Biosphere Stewardship <https://www.stockholmresilience.org>

Manufactured landscapes. A really excellent documentary film (~ 1.5 hours) about the work of photographer Edward Burtynsky as he observed social and industrial activities in China and elsewhere. Available via Queen’s library video collection and <http://www.youtube.com/watch?v=SZnZOe_tKCs&feature=related>

Anthropocene – The Human Epoch. A new documentary film by Burtynsky et al. <https://nowtoronto.com/movies/tiff2018/tiff-review-anthropocene-the-human-epoch/>

<https://theanthropocene.org/film/>

Future Earth: <https://futureearth.org>

Center for Applied Cultural Evolution: https://culturalevolutioncenter.org/about-us/

Camus, A. 1942. The Myth of Sisyphus – <http://schmieder.fmp-berlin.info/collectibles/pdf/sisyphos_eng.pdf>

Russell, B. 1903. A Free Man’s Worship. <http://bertrandrussellsocietylibrary.org/br-pe/br-pe-ch2.html> ; <http://www.academia.edu/1278006/Bertrand_Russell_A_Free_Mans_Worship>

Cutts, S. 2017. Happiness. The story of a rodent's unrelenting quest for happiness and fulfillment. <https://vimeo.com/244405542>; <https://www.youtube.com/watch?v=e9dZQelULDk>

*Kanehsatake: 270 Years of Resistance* is a documentary film about the Oka demonstration that was a major political and social crisis in Canada in 1990. It is available via the Queen’s library video collection for the National Film Board of Canada (NFB) at: <https://www.nfb.ca/film/kanehsatake_270_years_of_resistance/?ctlgsrc=mr>

**Recent undergraduate courses with lots of relevant material and reference links:**

<https://www.queensu.ca/terrestrial-ecosystem-ecology/teaching/biol-510-biology-sustainability/biol-510-biology-sustainability-fall-2022>

<https://www.queensu.ca/terrestrial-ecosystem-ecology/teaching/biol-510-biology-sustainability/biol-510-biology-sustainability-0>

<https://www.queensu.ca/terrestrial-ecosystem-ecology/teaching/biol-510-biology-sustainability/biol-510-biology-sustainability>

<https://www.queensu.ca/terrestrial-ecosystem-ecology/teaching/biol-510-biology-sustainability/biol-510-biogeochemistry-and-global-change>

<https://www.queensu.ca/terrestrial-ecosystem-ecology/teaching/biol-510-biology-sustainability/biogeochemistry-and-global-change-material-2017>

<https://www.queensu.ca/terrestrial-ecosystem-ecology/teaching/biol-510-biology-sustainability/biogeochemistry-and-global-change-material-2016>