**Reference list for BIOL 416 Terrestrial Ecosystems Fall 2023**

**Ecosystem Ecology core and reference papers:**

Costanza, R., R. dArge, et al. 1997. The value of the world's ecosystem services and natural capital. *Nature* 387(6630): 253-260.

Elser, J.J., and E. Bennett. 2011. A broken biogeochemical cycle.  Nature 478: 29-31.

Holling, 2001. Understanding the Complexity of Economic, Ecological, and Social Systems. Ecosystems (2001) 4: 390–405

Levin, S. A. 1992. The problem of pattern and scale in ecology. *Ecology* 73: 1943-1967

Odum, E. 1969. The Strategy of Ecosystem Development. *Science* 164: 262-270

O'Geen, A. T., 2013. Soil Water Dynamics. *Nature Education Knowledge* 4(5):9. <https://www.nature.com/scitable/knowledge/library/soil-water-dynamics-103089121/>

Potapov, A. et al, 2022. Feeding habits and multifunctional classification of soil-associated consumers from protists to vertebrates. Biological Reviews 97(3): 1057-1117. <https://onlinelibrary.wiley.com/doi/full/10.1111/brv.12832>

Potapov, A., 2022. Multifunctionality of belowground food webs: resource, size and spatial energy channels. Biological Reviews <https://onlinelibrary.wiley.com/doi/epdf/10.1111/brv.12857>

Steffen W. et al 2015. The trajectory of the Anthropocene: The Great Acceleration. *The Anthropocene Review* 1–18.

Vitousek PM, Howarth RW. 1991. Nitrogen Limitation on Land and in the Sea - How Can It Occur. *Biogeochemistry* 13:87-115

Vitousek et al, 1997. Human-dominated Ecosystems – *Science* 272:494-499

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**Agroecosystem and Global Food Demand papers:**

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Barbieri et al. 2021. Global option space for organic agriculture is delimited by nitrogen availability. *Nature Food* 2:363–372.

De Schutter, O. 2010. On the Right to Food. United Nations General Assembly Human Rights Council Report A/HRC/16/49.

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Foley, J et al. 2011. Solutions for a cultivated planet. *Nature*. 478: 337–342

Garnett, et al. 2013. Sustainable Intensification in Agriculture: Premises and Policies. *Science* 341:33-34.

Godfray, H.C.J. 2015. The debate over sustainable intensification. *Food Security* 7:199-208.

Gomeiro et al 2011. Environmental Impact of Different Agricultural Management Practices: Conventional vs. Organic Agriculture. *Critical Reviews in Plant Sciences*, 30:95–124, 2011

Hurtado-Barroso, S et al. 2019. Organic food and the impact on human health. *Critical Reviews in Food Science and Nutrition*, 59:4, 704-714, DOI: 10.1080/10408398.2017.1394815

Kendell, H.W. and Pimentel, D. 1994. Constraints on the Expansion of the Global Food Supply. *Ambio* 23 (3): 198-205.

Loos et al. 2014. Putting meaning back into “sustainable intensification”. *Frontiers in Ecology and Environment* 12(6):356-361.

Maeder, P. et al. 2002. Soil Fertility and Biodiversity in Organic Farming. *Science* 296, 1694

Mueller ND et al. 2012. Closing yield gaps though nutrient and water management. *Nature* 490: 254–57.

Naylor, R.L. 2009. Managing Food Production Systems for Resilience. In: Chapin, F.S. III, Kofinas, G.P. and Folke C. (2009). Principles of Earth System Stewardship – Resilience-based Natural Resource Management in a Changing World. Springer. <https://link.springer.com/chapter/10.1007/978-0-387-73033-2_12>

Pimental, D. et al. 2005. Environmental, Energetic, and Economic Comparisons of Organic and Conventional Farming Systems. *Bioscience* 55(7):573-582.

Ponisio et al. 2015. Diversification practices reduce organic to conventional yield gap. *Proceedings Royal Society B*. 282(1799): 1-7.

Scarborough, P. et al., 2023. Vegans, vegetarians, fish-eaters and meat-eaters in the UK show discrepant environmental impacts. Nature Food 4:565–574

Searchinger, T., et al. 2013. Creating a Sustainable Food Future – The Great Balancing Act. World Resources Institute Working Paper 2013.

Searchinger T. et al. 2018. Creating a Sustainable Food Future: A menu of solutions. World Resource Institute. [https://files.wri.org/d8/s3fs-public/creating-sustainable-foodfuture\_2.pdf](Searchinger%20T.%20et%20al.%202018.%20Creating%20a%20Sustainable%20Food%20Future%3A%20A%20menu%20of%20solutions.%20World%20Resource%20Institute%20https%3A/files.wri.org/d8/s3fs-public/creating-sustainable-foodfuture_%202.pdf)

Seufert et al. 2017. Many shades of gray—The context-dependent performance of organic agriculture. *Science Advances* 3(3): 1-14

Therond, O. et al. 2017. A new analytical framework of farming system and agriculture model diversities. A review. *Agronomy and Sustainable Development* 37:21. DOI 10.1007/s13593-017-0429-7

Tilman, D. et al. 2002. Agricultural sustainability and intensive production practices. *Nature* 418:671-677.

Tilman, D. et al. 2012. Global food demand and the sustainable intensification

of agriculture. *PNAS* 108(50):20260-20264.

Trewevas, A. 2001. Urban myths of organic farming. *Nature* 410:409-410.

Wezel, et al, 2014. Agroecological practices for sustainable agriculture. A review. *Agron. Sustain. Dev.* 34:1–20

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

Brady N.C. 2001 The Nature and Properties of Soils. 13th edn. Prentice Hall.

Brady and Weil. 2010. Elements of the Nature and Properties of Soils 3 edn. Pearson

Chapin, F. S., III., P. A. Matson, et al. 2011. Principles of Terrestrial Ecosystem Ecology. 2nd edition. New York, Springer.

Chapin, F.S. III, Kofinas, G.P. and Folke C. 2009. Principles of Earth System Stewardship – Resilience-based Natural Resource Management in a Changing World. Springer.

Coleman, D.C., D.A.J. Crossley, and P.F. Hendrix, Fundamentals of Soil Ecology. 2nd ed. 2004, Amsterdam: Elsevier.

Jacobsen, M. C., R. J. Charlson, et al. 2000. Earth System Science - From Biogeochemical Cycles to Global Change. Amsterdam, Academic Press.

Jenny, H. 1994. Factors of Soil Formation – A system of Quantitative Pedology

Montgomery, C. 2007. Dirt: The erosion of civilisations. University of California Press.

Paul, E.A. 2015. Soil Microbiology, Ecology and Biochemistry. 4th edn. Academic Press.

Pollan, M. 2006. The Omnivore’s Dilemma. Bloomsbury.

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

Schlesinger, W. H. 1997. Biogeochemistry - An Analysis of Global Change. San Diego, Academic Press.

Sheldrake, M. 2021. Entangled Life: How Fungi Make Our Worlds, Change Our Minds & Shape Our Futures

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

Wolfe, D. 2001. Tales from the Underground. Cambridge, Perseus Publishing.

Wright, R. 2004. A Short History of Progress. New York, Carroll and Graf.

Yong, W. 2016. I Contain Multitudes.

**Indigenous perspectives:**

**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/>

**Interesting electronic media links (bolded titles particularly recommended):**

**Food Inc.** Documentary film about the industrialisation of food production. Excellent. HIGHLY RECOMMENDED. Available via Queen’s library video collection entitled Criterion on Demand at <https://media3-criterionpic-com.proxy.queensu.ca/htbin/wwform/006?T=AL111097>

 **The Other Inconvenient Truth** – Jonathan Foley (17 min)

 <https://www.youtube.com/watch?v=1US4jjWtua8>.

Future of Food: A Plan to Feed the World – Jonathan Foley (8 min) <https://www.youtube.com/watch?v=Spgo4nNYsuQ>

Future of Food: Food Security in an Insecure World. A panel discussion (48 min) <https://www.youtube.com/watch?v=8jvRB8U8vEw>

Future of Food: Why Sustainable Food Systems Matter. A panel discussion (52 min) <https://www.youtube.com/watch?v=YEGISWTEgyU>

Just Eat It. An excellent documentary video on the food waste issue

<http://www.foodwastemovie.com/about/>

**Hijacked Future**. An excellent Canadian documentary on the increasing dependency on global seed producing corporations to supply and control our food supply. <https://www.youtube.com/watch?v=3IgAe2bdoAc>

Feeding9Billion Challenge. A fantastic educational initiative out of the University of Guelph. <https://feeding9billion.com/>

Feeding Nine Billion Video 1: Introducing Solutions to the Global Food Crisis by Dr. Evan Fraser (Univ. of Guelph)<https://www.youtube.com/watch?v=raSHAqV8K9c>

The Food of the Future. A stimulating documentary outlining alternative/unusual food items that are likely to become very common in the future. <https://www.youtube.com/watch?v=KpCgzk_4Yp8>

Dutch Institute of Food and Design exhibition on the Future of Food: [https://ingeniumcanada.org/newsroom/new-exhibition-challenges-visitors-to-imagine-the-future-of-food](https://can01.safelinks.protection.outlook.com/?url=https%3A%2F%2Fingeniumcanada.org%2Fnewsroom%2Fnew-exhibition-challenges-visitors-to-imagine-the-future-of-food&data=02%7C01%7Cgroganp%40queensu.ca%7Cef57dddc0c9d418faa0208d7355ce0ee%7Cd61ecb3b38b142d582c4efb2838b925c%7C1%7C0%7C637036545338593710&sdata=MhOTi1slRnSxtXhSdQUwTddjPPq6wG3C8nHUOzIGQPc%3D&reserved=0) ; [https://thedifd.com/about-us/](https://can01.safelinks.protection.outlook.com/?url=https%3A%2F%2Fthedifd.com%2Fabout-us%2F&data=02%7C01%7Cgroganp%40queensu.ca%7Cef57dddc0c9d418faa0208d7355ce0ee%7Cd61ecb3b38b142d582c4efb2838b925c%7C1%7C1%7C637036545338583707&sdata=e8pqc9v2H50PyEqWg9guxJiQ3D2wXbbnNdaqeLmkxAg%3D&reserved=0)

GMOs: <https://www.youtube.com/watch?v=ynyB2fNn8kQ> ; <https://www.youtube.com/watch?v=EzEr23XJwFY>

Agroforestry: <https://www.youtube.com/watch?v=pP5tZc9JIg&list=PL450D8DF5E91BEF76&index=17>  (introduces benefits of agroforestry as well as some societal barriers that hinder the current success of agroforestry); <https://www.youtube.com/watch?v=dbRSSYB3nSI> (some concerns facing implementation of novel technologies that increase crop yields in regions of Africa)

EOS August 2023 article: Index Suggests That Half of Nitrogen Applied to Crops Is Lost

[https://eos.org/articles/index-suggests-that-half-of-nitrogen-applied-to-crops-is-lost&utm\_campaign=ealert](https://eos.org/articles/index-suggests-that-half-of-nitrogen-applied-to-crops-is-lost%26utm_campaign%3Dealert)

Organic food and certification issue: <https://www.youtube.com/watch?v=7g77Wrn_j_Y>

Hydroponics for tomato production: [The Future of Farming: Hydroponic Tomatoes](https://www.youtube.com/watch?v=bRyBKWqLzI8)

Meat production and consumption: <https://www.ted.com/talks/allan_savory_how_to_green_the_world_s_deserts_and_reverse_climate_change#t-763944>

Cowspiracy. Documentary film. <http://documentary-movie.com/cowspiracy-the-sustainability-secret/>

A Place at the Table (90 min documentary on food insecurity in the U.S.) <http://www.magpictures.com/aplaceatthetable/> (Trailer: https://www.youtube.com/watch?v=DKOiT1vY7v0)

Food for the Rest of Us <https://www.foodfortherestofus.org>

Organic farming is 'much worse' for the climate than conventional food production

 <https://bigthink.com/surprising-science/does-organic-food-harm-the-environment?rebelltitem=1#rebelltitem1>

Industrial Agriculture – Union of Concerned Scientists <https://www.ucsusa.org/food_and_agriculture/our-failing-food-system/industrial-agriculture/hidden-costs-of-industrial.html>

University of California at Berkeley food institute: <http://food.berkeley.edu/>

Cornell Soil Testing Services: <http://soilhealth.cals.cornell.edu/testing-services/individual-soil-analyses/>

Joel Salatin TED Talk: Cows, Carbon and Climate <https://www.youtube.com/watch?v=4Z75A_JMBx4>

Local Kingston-based organisations addressing food supply, accessibility and quality issues:

Loving Spoonful <https://www.lovingspoonful.org>

Martha’s Table <http://www.marthastable.ca>

Elaine Power’s op ed critiquing food banks as a solution to food insecurity: [https://www.theglobeandmail.com/opinion/its-time-to-close-canadas-food-banks/article587889/](https://can01.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.theglobeandmail.com%2Fopinion%2Fits-time-to-close-canadas-food-banks%2Farticle587889%2F&data=02%7C01%7Cgroganp%40queensu.ca%7C80f34a2a4a0041343e8408d73e9277f5%7Cd61ecb3b38b142d582c4efb2838b925c%7C1%7C0%7C637046671160377832&sdata=Kp1h%2BZV6rOxXs%2FUslir4UULH74NINInRc2LVoit855M%3D&reserved=0)

**The Biggest Little Farm** (documentary about a city couple who leave regular life to develop a sustainable farm). Available via Queen’s library video collection entitled Criterion on Demand at <https://media3-criterionpic-com.proxy.queensu.ca/htbin/wwform/006?T=110082E>

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

**Depth of Field: Films About Farming**. NFU - [watch the first 7 short docs](https://can01.safelinks.protection.outlook.com/?url=https%3A%2F%2Fnfu.us10.list-manage.com%2Ftrack%2Fclick%3Fu%3D0915ae271f92e1eaaddfdd157%26id%3D4ccb7d8f56%26e%3D1f254de6dc&data=05%7C02%7Cgroganp%40queensu.ca%7C1a05398da1fe411d1df108dc03bfc005%7Cd61ecb3b38b142d582c4efb2838b925c%7C1%7C0%7C638389369307825376%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C3000%7C%7C%7C&sdata=xmKfpud9gPt9lGBBCOiuEL4%2F3dqy6gqHp1RV72KGzUY%3D&reserved=0)

**Local farms and kitchen gardens we may visit during the course:**

Forman farms – Charlie Forman - [http://formanfarms.ca](http://formanfarms.ca/)

Salt of the Earth farm – Charles Summers - [https://saltofkingston.com](https://saltofkingston.com/)

Bob Donaldson’s farm - Seeley’s Bay (dairy, corn, soyabean...)

Bellevue House Kitchen Gardens: <https://www.pc.gc.ca/en/lhn-nhs/on/bellevue>

Ironwood farm <http://www.ironwoodorganics.ca>

Ravensfield farm – Titia Posthuma- <http://www.ravensfield.ca>

Limestone Creamery: <https://limestonecreamery.deliverybizpro.com/home.php>

**High quality relevant journals:**

[Agriculture, Ecosystems and Environment](http://www.journals.elsevier.com/agriculture-ecosystems-and-environment/)

[Bioscience](http://www.bioone.org/bioone/?request=get-journals-list&issn=0006-3568)

[Ecological Applications](http://www.esajournals.org/loi/ecap)

[Ecosystems](http://link.springer.com/journal/10021)

[Environmental Research Letters](http://iopscience.iop.org/1748-9326/)

[Frontiers in Ecology and Environment](http://www.frontiersinecology.org/front/)

[Global Change Biology](http://www.blackwell-synergy.com/Journals/member/institutions/issuelist.asp?journal=gcb)

[Global Environmental Change: Human and Policy Dimensions](http://www.journals.elsevier.com/global-environmental-change/)

[Issues in Ecology - Ecological Society of America](http://www.esa.org/esa/?page_id=1638)

[Nature](http://www.nature.com/)

[Proceedings of the National Academy of Sciences (PNAS)](http://www.pnas.org/)

[Science](http://www.sciencemag.org/)

**Resource links:**

Ecological Farmers Association of Ontario (<https://conference.efao.ca)>

[The Greening of Canadian Agriculture - MacDonald Laurier Institute](http://www.macdonaldlaurier.ca/files/pdf/The-Greening-of-Canadian-Agriculture-November-2012.pdf)

[Ecological Society of America](http://www.esa.org/esa/)

[British Ecological Society - Public Policy Initiative](http://www.britishecologicalsociety.org/public-policy/)

[Intergovernmental Panel on Climate Change](http://www.ipcc.ch/)

[National Farmers Union 2023 report on Canada’s GHG emissions from agriculture](https://www.nfu.ca/agricultural-ghg-emissions-a-comprehensive-analysis-new-nfu-report/?mc_cid=8403cceb83&mc_eid=1f254de6dc)

**Internships and Volunteering on Farms:**

<http://wwoof.net/> - volunteering opportunities on organic farms. This is a great way to travel and gain experience.

<http://craftontario.ca/regions/> - This organization lists formal full season internships across Ontario on ecological farms, not the business side but either of these options could be great ways to gain on the ground experience. I would suggest working on a bigger farm to get a sense of the industry. I know many of the farms so if you are considering this option get in touch.

**Resources on the foundations of sustainable farming:**

* [www.soilandhealth.org](http://www.soilandhealth.org/)
* <http://www.bionutrient.org/library/soil-nutrition-conference-archive>
* <http://www.nofamass.org/resources/nofa-conference-audio-project>

**Gaining Qualifications**

<http://ccaontario.com/> - This is a straightforward accreditation achieved through a combination of relevant post-secondary study and an exam. It is orientated towards advising for farmers on crops and production.

**Organizations**

Ecological Farmers Association of Ontario:  <https://efao.ca/>  - An affordable organization with a newsletter and AMAZING resource library of agricultural books that you can access for free by ordering on-line and having them shipped to your door. And you ship them back, all free with membership. They also offer workshops and farmer - to - farmer mentorship programs.

Canadian Organic Growers: cog.ca - A national organization promoting organic and sustainable farming, quarterly magazine and events, network.

The Innovative Farmers Association of Ontario <http://www.ifao.com/>

Organic Agriculture Center of Canada: <https://www.dal.ca/faculty/agriculture/oacc/en-home.html>