Conservation Controversies Literature Seminar

Cornell University, NTRES 6140, 2 credits
Fall 2021, Tuesdays at 1255-225pm in 160 Mann Library (MNL160, Stern Seminar Room)

First class Tues August 31, 2021
Last class Tues December 7, 2021
Course website: https://blogs.cornell.edu/concontops2021/

Instructors:
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Overview:
In this literature seminar, we will discuss a suite of contentious conservation topics, exploring different sides of the scientific debate surrounding these issues and exploring feedbacks among science, policy, management, and public perceptions. The objective of the class is to encourage students to think critically about the science behind conservation issues and be aware of the complex manner in which conservation issues are communicated across scientists, decision makers, and the public. The class will be divided into four topic sessions:

- Global fisheries: ecological disturbance regime versus food system
- Greening cities: what is the scope for green infrastructure in urban biodiversity conservation
- What counts as 'conserved'? Moving Biden's 30x30 commitment from aspiration to action
- Arctic Ocean: is sustainable management possible in the new frontier?

Diversity, Equity, Inclusiveness and Justice in Conservation
We will also discuss the Diversity, Equity, Inclusion and Justice context within each of the four conservation controversies topic areas.

Class logistics and discussion facilitation:
Each topic session is made up of a three-week module. In the first and second weeks, we will explore the scientific debate surrounding a conservation issue through assigned readings and in-class discussion. Subsequently, the third week in a module will encompass an in class discussion exercise on the conservation issue led by student groups.

Each student will self-assign to one of the four topic modules as discussion facilitators. Student facilitator duties include:

- Prepare discussion points for topics addressed in the first and second weeks of each module and lead class discussion; discussion points could include provocative questions, methodological questions, key implications for society, key uncertainties, etc…
- Design an in-class discussion exercise for the last week for each subject module (e.g. in-class debate, draft scientific press release on an issue, organize an outside expert speaker for a Q&A session, etc…).

Grading is Satisfactory/Unsatisfactory and will be assessed by in-class attendance and participation.

Syllabus with anticipated readings

First class meeting (8/31/21): course overview and student group assignments

Topic 1 -- Global fisheries: ecological disturbance regime versus food system

Week 1 (9/7/21): Fisheries as ecological disturbance regimes—are MPAs the answer to global fisheries reform?

Cabral RB, et al. (2020) A global network of marine protected areas for food. *PNAS*, 117:28134–28139. doi: 10.1073/pnas.2000174117 [and rebuttals therein]

Kriegl M, et al. (2021) Marine protected areas: at the crossroads of nature conservation and fisheries management. *Frontiers in Marine Science*, 8:676264. doi: 10.3389/fmars.2021.676264

Sala E, et al. (2021) Protecting the global ocean for biodiversity, food and climate. *Nature*, 592:397-402. doi: 10.1038/s41586-021-03371-z

Optional:

White C, Costello C (2014) Close the high seas to fishing? *PLoS Biology*, 12:e1001826. doi: 10.1371/journal.pbio.1001826

Week 2 (9/14/21): Fisheries as food systems—solutions for sustainable fisheries

Hilborn R, et al. (2020) Effective fisheries management instrumental in improving fish stock status. *PNAS*, 117:2218-2224. doi: 10.1073/pnas.1909726116

Melnychuk M, et al. (2021) Identifying management actions that promote sustainable fisheries. *Nature Sustainability*, 4:440-449. doi: 10.1038/s41893-020-00668-1

Heilpern SH, et al. (2021) Substitution of inland fisheries with aquaculture and chicken undermines human nutrition in the Peruvian Amazon. *Nature Food*, 2:192-197. doi: 10.1038/s43016-021-00242-8

Optional:

Costello C, et al. (2020) The future of food from the sea. *Nature*, 588:95-100. doi: 10.1038/s41586-020-2616-y

Hilborn R, Banobi J, Hall SJ, Pucylowki T, Walsworth TE. 2018. The environmental cost of animal source foods. *Frontiers in Ecology and the Environment*, 16:329-335. doi: 10.1002/fee.1822

Week 3 (9/21/21): How can we increase diversity and inclusiveness in conservation science?

Abernthey EF, et al. (2019) Diverse, equitable, and inclusive scientific societies: progress and opportunities in the Society for Freshwater Science. *Freshwater Science*, 39:363-376. doi: 10.1086/709129

Penaluna B et al. (2017) Nine proposed action areas to enhance diversity and inclusion in the American Fisheries Society. *Fisheries*, 42:399-402. doi: 10.1080/03632415.2017.1345549

Optional:

Arismendi I, Penaluna B (2016) Examining diversity inequities in fisheries science: a call to action. *Bioscience*, 66:584-591. doi: 10.1093/biosci/biw041

Topic 2 -- Greening cities: what is the scope for green infrastructure in urban biodiversity conservation

Week 1 (9/28/21): Are urban ecosystems sources or sinks; remedies or placebos; environmental improvement; or greenwashing and gentrification?

Kowarik I (2011) Novel urban ecosystems, biodiversity, and conservation. *Environmental Pollution* 159: 1974-1983. doi: 10.1016/j.envpol.2011.02.022

Filazzola A, Shrestha N, MacIvor JS (2019) The contribution of constructed green infrastructure to urban biodiversity: a synthesis and meta-analysis. *Journal of Applied Ecology* 56:2131-2143. doi: 10.1111/1365-2664.13475

Checker M (2011) Wiped out by the "greenwave": environmental gentrification and the paradoxical politics of urban sustainability. *City & Society* 23:210-229. doi: 10.1111/j.1548-744X.2011.01063.x.

Week 2 (10/5/21): Essential services, contributions, and inequities

McDonald R, et al. (2020) Research gaps in knowledge of the impact of urban growth on biodiversity. *Nature Sustainability* 3:16-24. doi: 10.1038/s41893-019-0436-6

Spotswood EN, et al. (2021) The biological deserts fallacy: cities in their landscapes contribute more than we think to regional biodiversity. *BioScience* 71:148-160. doi: 10.1093/biosci/biaa155

McDonald RI, et al. (2021) The tree cover and temperature disparity in U.S. urbanized areas: quantifying the association with income across 5,723 communities. *PLoS ONE* 16:e0249715. doi: 10.1371/journal.pone.0249715

Optional:

Mariela Fernandez M, Harris B, Rose J (2021) Greensplaining environmental justice: a narrative of race, ethnicity, and justice in urban greenspace development. *Journal of Race, Ethnicity and the City*. In press. doi: 10.1080/26884674.2021.1921634

Sharifi E et al. (2020). Climate change adaptation and carbon emissions in green urban spaces: case study of Adelaide. *Journal of Cleaner Production* 254:120035. doi: 10.1016/j.jclepro.2020.120035

Week 3 (10/19/21, n.b. 10/12/21 is a holiday): Green cities: sensible remedies, going vertical, green equity and community well-being

Hartig T, Kahn PH (2016) Living in cities, naturally. *Science* 352:938-940. doi: 10.1126/science.aaf3759

Chen C, et al. (2020). Walls offer potential to improve urban biodiversity. *Scientific Reports* 10:1-10. doi: 10.1038/s41598-020-66527-3

Jenkins A, Keeffe G, Hall N (2015) Planning urban food production into today's cities. *Future of Food: Journal on Food, Agriculture and Society* 3:35-47. Available online at: https://www.thefutureoffoodjournal.com/index.php/FOFJ/article/view/120

Rigolon A, et al. (2020) More than "just green enough": helping park professionals achieve equitable greening and limit environmental gentrification. *Journal of Park & Recreation Administration* 38:29–54. doi: 10.18666/JPRA-2019-9654

<u>Topic 3 -- What counts as 'conserved'? Moving Biden's 30x30 commitment from aspiration to action.</u>

Week 1 (10/26/21): Biden's pledge to conserve 30% of US land and water by 2030

Conserving and restoring America the Beautiful. May 2021. Available online at: https://www.doi.gov/sites/doi.gov/files/report-conserving-and-restoring-america-the-beautiful-2021.pdf (*The Biden Administration report that fleshes out the Executive Order*)

Dinerstein E, et al. (2019) A global deal for nature: guiding principles, milestones, and targets," *Science Advances* 5: eaaw2869 doi: 10.1126/sciadv.aaw2869. (*An article that partly motivated the Executive Order)*

Grijalva R, et al. 2021. Letter to President Biden about the 30x30 plan from House Natural Resources Committee. Available online at: https://naturalresources.house.gov/letter-to-president-biden-on-

strengthening-america-the-beautiful-for-climate-change (*Recommendations from House on how the plan can be improved)*

Optional:

Lee-Ashley, M. et al. (2019) How much nature should America keep? Center for American Progress. Available online at: https://www.americanprogress.org/issues/green/reports/2019/08/06/473242/much-nature-america-keep/ (*the report that helped to motivate Biden's 30x30 executive order)*

Waldron, A., et al. (2020). Protecting 30% of the planet for nature: Costs, benefits and economic implications. [Executive Summary] Available online at: https://helda.helsinki.fi/bitstream/handle/10138/326470/Waldron_Report_FINAL_sml.pdf?sequence=1&isAllowed=y

Agrawal, A. et al. (2021). Open Letter to Waldron et al. Available online at: https://openlettertowaldronetal.wordpress.com/

Xu H, et al. (2021) Ensuring effective implementation of the post-2020 global biodiversity targets. *Nature Ecology & Evolution* 5:411-418. doi: 10.1038/s41559-020-01375-y

Week 2 (11/2/21): Scientific perspectives on the value of different forms of conservation

Fischer J, et al. (2014) Land sparing versus land sharing: moving forward. *Conservation Letters* 7:149-157. doi: 10.1111/conl.12084

Cohen-Shacham E, et al (2019) Core principles for successfully implementing and upscaling Nature-based solutions. *Environmental Science and Policy* 98:20-29. doi: 10.1016/j.envsci.2019.04.014

Wintle BA, et al. (2019) Global synthesis of conservation studies reveals the importance of small habitat patches for biodiversity. *PNAS* 116:909-914. doi: 10.1073/pnas.1813051115

Optional:

Briscoe T (2021). Conservationists see rare nature sanctuaries; Black farmers see a legacy bought out from under them. Propublica, online article available at: https://www.propublica.org/article/conservationists-see-rare-nature-sanctuaries-black-farmers-see-a-legacy-bought-out-from-under-them [last accessed Oct 28,2021]

Green R, et al. (2005) Farming and the fate of wild nature. *Science* 307:550-555.

Kremen C (2015) Reframing the land-sparing/land-sharing debate for biodiversity conservation. *Annals of the New York Academy of Sciences* 1355. doi: 10.1111/nyas.12845

Phalan BT (2018) What have we learned from the land sparing-sharing model? *Sustainability* 10:1760. doi: 10.3390/su10061760

Week 3 (11/9/21): Messaging, engagement, and inclusion

Dawson N, Martin A, Danielsen F (2018) Assessing equity in protected area governance to promote just and effective conservation. *Conservation Letters* 11:1-8. doi: 10.1111/conl.12388

American Stewards of Liberty. (2021) Guide to fight the 30x30 land grab. Available online at: https://americanstewards.us/wp-content/uploads/2021/05/Guide-to-Fight-30-x-30-print-v3.pdf (*Anti-30x30 messaging)*

Treuer, D. (2021, April 12). Return the National Parks to the Tribes. The Atlantic. https://www.theatlantic.com/magazine/archive/2021/05/return-the-national-parks-to-the-tribes/618395/

Optional:

Schell CJ, et al. (2020) The ecological and evolutionary consequences of systemic racism in urban environments. *Science* 369:1446. doi: 10.1126/science.aay4497 (*a review that provides evidence for the interconnectedness between environmental justice and ecological conditions)*

Topic 4 -- Arctic Ocean: is sustainable management possible in the new frontier?

Week 1 (11/16/21): Overview of an ice-based universe – The Arctic Ecosystem and its' climate-driven changes

McClelland JW, et al. (2012) The Arctic Ocean estuary. *Estuaries and Coasts* 35:353-368. doi: 10.1007/s12237-010-9357-3 (A*n easy-to-read overview of the Arctic biophysical environment*)

Box JE, et al. (2019). Key indicators of Arctic climate change 1971-2017. *Environmental Research Letters* 14:045010. doi: 10.1088/1748-9326/aafc1b (*Comprehensive, but more technical summary*)

Christiansen JS, Mecklenburg CW, Karamushko OV (2014) Arctic marine fishes and fisheries in light of climate change. *Global Change Biology* 20:352-359. doi: 10.1111/gcb.12395 (*easy to read*)

Smith PA, et al. (2020) Status and trends of tundra birds across the circumpolar Arctic. Ambio 49:732-7489. doi: 10.1007/s13280-019-01308-5 (easy to read, nice overview)

Optional: Additional considerations regarding biogeochemistry and carbon

Parmentier F-JW, et al. (2017) A synthesis of the arctic terrestrial and marine carbon cycles under pressure from a dwindling cryosphere. *Ambio* 4653-69. doi: 10.1007/s13280-016-0872-8

Week 2 (11/23/21): Indigenous Peoples of the Arctic – How to adapt to a warming world

Huntington HP, Quakenbush LT, Nelson M (2017) Evaluating the effects of climate change on indigenous marine mammal hunting in northern and western Alaska using traditional knowledge. *Frontiers in Marine Science* 4:Article 319. doi: 10.3389/fmars.2017.00319 (*terrestrial wildlife*)

Callaghan TV, et al. (2020). Improving dialogue among researchers, local and indigenous peoples and decision-makers to address issues of climate change in the North. Ambio 49:1161-1178. doi: 10.1007/s13280-019-01277-9 (*Siberia focused, but nicely captures indigenous perspectives*)

Manrique DR, Corral S, Pereira AG (2018) Climate-related displacements of coastal communities in the Arctic: Engaging traditional knowledge in adaptation strategies and policies. *Environmental Science and Policy* 85: 90-100. doi: 10.1016/j.envsci.2018.04

Optional: Some additional considerations

Davidson R, et al. (2011) Arctic parasitology: why should we care. *Trends in Parasitology* 27:239-245. doi: 10.1016/j.pt.2011.02.001

Frainer AR, et al. (2017) Climate-driven changes in functional biogeography of Arctic marine fish communities. *PNAS* 114:12202-12207. doi: 10.1073/pnas.1706080114 (*comprehensive fisheries summary but more technical*)

Week 3 (11/30/21): Framework for management - international geopolitics, spatial planning, and policy

Barry TB, et al. (2020) The Arctic Council: an agent of change? *Global Environmental Change* 63:102099. doi: 10.1016/j.gloenvcha.2020.102099

Young OR (2019) It is time for a reset in Arctic governance? *Sustainability* 1111:4497. doi: 10.3390/su11164497

Chapin III FS (2015). Ecosystem stewardship: a resilience framework for Arctic conservation. *Global Environmental Change* 34:207-217. doi: 10.1016/j.gloenvcha.2015.07.003

Kaiser BA, Fernandez LM, Vestregaard N (2016) The future of the marine Arctic: environmental and resource economic development issues. *The Polar Journal*, volume 6. doi: 10.1080/2154896X.2016.1171004

Optional: Tools and techniques for Arctic planning

Edwards R, Evans A (2017). The challenges of marine spatial planning in the Arctic: Results from the ACCESS program. *Ambio* 46(Suppl. 3):S486-496. doi: 10.1007/s13280-017-0959-x (*Actually demonstrates an online planning tool.*)

Sethi SA, Hollmen T (2015) Conceptual models for marine and freshwater systems in Alaska: flexible tools for research planning, prioritization and communication. *Arctic* 68:422-434. doi: 10.14430/arctic4521

Optional: Additional readings on Arctic management.

Crepin AS, Karcher M, Gascard JC (2017) Arctic climate change, economy and society (ACCESS): integrated perspectives. Ambio 46(suppl.3): S341-S354. doi: 10.1007/s13280-017-0953-3 (*Nice overview*)

Palma DA, et al. (2019) Cruising the marginal ice zone: climate change and Arctic tourism. *Polar Geography* 42:215-235. doi: 10.1080/1088937X.2019.1648585 (*More on tourism*)

Harris PT, et al. (2018) Arctic marine conservation is not prepared for the coming melt. *ICES Journal of Marine Science* 75:61-71. doi: 10.1093/icesjms/fsx153 (*Interesting perspective outlining Marine Protected Areas relative to submarine geomorphological features*).

Final class meeting (12/7/21): closing remarks