

Global Catastrophe since 1750

William Rankin (william.rankin@yale.edu)

Spring 2022

Lectures: MW 10:30–11:20am

Discussion Section: 50 minutes per week

Bill's office hours: Zoom, by appointment



Description

Climate change. Overfishing. The hole in the ozone layer. Mass Extinction. Nuclear winter. For over two hundred years, the earth and environmental sciences have played a central role in cultural and political debates about potential threats to the planet and the influence of humanity on the earth's natural systems. At the same time, they have also been crucial in exploring, harnessing, understanding, and safeguarding our home. This course explores this longstanding tension between control and catastrophe.

We will focus on four major questions cutting across several scientific disciplines: the history and future of the earth, the exploitation and conservation of natural resources, predicting and influencing the weather, and the earth as home. In each of these units, we will look at several decades of discovery and debate. We will ask how evidence about the earth's past, present, or future is presented, what kinds of predictive tools are seen as trustworthy, and the nature of scientific (and cultural) consensus.

Assignments

Every student must read all readings for the weekly discussion section and **participate** actively and often. Two persuasive essays in the form of newspaper **Op-Eds** will be due at the end of the first and third units; prompts will be given from material covered in class. There will be an in-class **midterm exam** on March 7th covering the first half of the course. The **final exam** will also be held on May 2nd at 2pm. (In special cases students may instead write a research paper. Advance approval will be required by April 13th.)

Your grade will be determined as follows:

Section participation	20%
Op-eds	20%
Midterm Exam	25%
Final Exam	35%

This Is a Class for Everyone

I want to make sure that all students feel welcome and have whatever accommodations are necessary to get the most out of the class. This means that we all need to be respectful of others' views, backgrounds, and goals. It also means that you should feel free to contact me if there's anything I can do to facilitate your learning, whether coordinated by Student Accessibility Services or not.

SCHEDULE

Note:

*All readings are required. Readings will be discussed in section **after** each week's lectures.*

*Books marked with an **asterisk** (*) are available as e-books through Orbis, but may be purchased.*

All other readings are available on the website.

*Be sure to check **www.bookfinder.com** for best prices (new and used).*

Introductory Lecture will be available on January 26

PART I: THE HISTORY AND FUTURE OF THE EARTH

January 28 and 31 – The Controversy of Deep Time

Fossils and the Flood

Catastrophe and Uniformity

Martin Rudwick, "The Shape and Meaning of Earth History," in *God and Nature: Historical Essays and the Encounter between Christianity and Science*, edited by David C. Lindberg and Ronald Numbers (Berkeley: University of California Press, 1986), pp. 296–321.

William Buckland, *Geology and Mineralogy, Considered With Reference to Natural Theology* (London, 1836), table of contents and pp. 1–33.

NOTE: No section this week. Readings will be discussed next week.

February 2 – The Age of the Earth Debates

Darwin, Thomson, and Radioactivity

Stephen Jay Gould, "False Premise, Good Science," *Natural History* 92 (Oct 1983), pp. 20–26.

B. C. Shipley, "'Had Lord Kelvin a Right?': John Perry, Natural Selection and the Age of the Earth, 1894–1895," in *The Age of the Earth: From 4004 BC to AD 2002*, edited by C. L. E. Lewis and S. J. Knell (London: The Geological Society, 2001), pp. 91–106.

NOTE: Section this week will cover all the readings for weeks 1 and 2.

Week of February 7 – Neo-Uniformitarianism and Neo-Catastrophism

Continental Drift and Its Discontents

Plate Tectonics, Mass Extinctions, and Evidence

– OP-ED DUE THIS WEEK ON FRIDAY, 11:59pm –

Naomi Oreskes. Read the introduction to *The Rejection of Continental Drift* (1999), then "The Rejection of Continental Drift," *Historical Studies in the Physical and Biological Sciences* 18 (1988), pp. 311–348, then the conclusion to *The Rejection of Continental Drift*.

Ronald Doel, Tanya Levin, and Mason Marker, "Extending Modern Cartography to the Ocean Depths: Military Patronage, Cold War Priorities, and the Heezen–Tharp Mapping Project, 1952–1959," *Journal of Historical Geography* 32 (2006), pp. 605–626.

PART II: EXPLOITATION AND CONSERVATION OF RESOURCES

Week of February 14 – Scientific Exploration of Land and Sea

Science and Capitalism

The Earth Sciences as a Government Service

Paul Lucier, *Scientists and Swindlers: Consulting On Coal and Oil in America, 1820–1890*

(Baltimore: Johns Hopkins University Press, 2008), introduction, chapter 1, chapter 10, and epilogue.

J. P. Lesley, "Obituary Notice of Charles Albert Ashburner," *Proceedings of the American Philosophical Society* 28 (Jan–June 1890), pp. 53–59.

Helen Rozwadowski, *Fathoming the Ocean: The Discovery and Exploration of the Deep Sea*

(Cambridge: Harvard University Press, 2005). Read the conclusion first, then chapters 2 and 3.

Week of February 21 – The Bounty and Crisis of the Sea

Salmon – The Fish are Gone, Can Science Save Us?

Cod and Tuna – Quotas, Territory, and Uncertainty

* Joseph E. Taylor III, *Making Salmon: An Environmental History of the Northwest Fisheries Crisis* (Seattle: University of Washington Press, 1999), preface, introduction, chapters 3, 4, 7, and 8.

Theodore C. Bestor, "Supply-Side Sushi: Commodity, Market, and the Global City,"

American Anthropologist 103 (March 2001), pp. 76–95.

Week of February 28 – The Finitude of Fossil Fuels

Petroleum Geology and Mineral Rights

Peak Oil

Tyler Priest, "Extraction Not Creation: The History of Offshore Petroleum in the Gulf of Mexico," *Enterprise & Society* 8 (June 2007), pp. 227–267.

Daniel Yergin, *The Quest: Energy, Security, and the Remaking of the Modern World* (New York: Penguin, 2011), introduction and chapters 11 and 12.

Week of March 7

March 7, 10:30–11:20am: MIDTERM EXAM

PART III: PREDICTING AND INFLUENCING THE WEATHER

March 9 — Weather and Data

Weather Maps and Data Overload

James Fleming, “Storms, Strikes, and Surveillance: The U.S. Army Signal Office, 1861–1891,” *Historical Studies in the Physical and Biological Sciences* 30 (2000), 315–32.

Mark Monmonier, *Air Apparent* (Chicago: University of Chicago Press, 1999), chapters 1 and 3.

Week of March 14 – Predicting the Weather

The Determinists’ Dream

Numerical Forecasting and the Limits of Predictability

* Kristine Harper, *Weather by the Numbers: The Genesis of Modern Meteorology* (Cambridge: MIT Press, 2008), introduction and chapters 4, 5, 6, and 8.

Sidney Shalett, “Electronics to Aid Weather Figuring,” *New York Times*, 11 Jan 1946, p. 12.

Gary Alan Fine, *Authors of the Storm: Meteorologists and the Culture of Prediction* (Chicago: University of Chicago Press, 2007), chapter 5.

SPRING BREAK

Week of March 28 – Global Warming

The Greenhouse Effect, From Ice Ages to Global Warming

Skeptics, Economics, and Social Construction

* Spencer Weart, *The Discovery of Global Warming* (Cambridge: Harvard University Press, 2003), preface, chapters 5, 7, and “reflections.”

Paul Edwards, “Representing the Global Atmosphere: Computer Models, Data, and Knowledge about Climate Change,” in C. Miller and P. Edwards, eds., *Changing the Atmosphere: Expert Knowledge and Environmental Governance* (Cambridge: MIT Press, 2001), pp. 31–66.

Naomi Oreskes, Erik Conway, and Matt Shindell, “From Chicken Little to Dr. Pangloss: William Nierenberg, Global Warming, and the Social Deconstruction of Scientific Knowledge,” *Historical Studies in the Natural Sciences* 38 (2008), pp. 109–152.

Bjørn Lomborg, *The Skeptical Environmentalist* (Cambridge: Cambridge University Press, 2001), pp. 258–259, 305–312, 318–324.

PART IV: EARTH AS HOME

Week of April 4 – Biogeography

The Humboldtian Embrace of Nature

Wallace, Darwin, and Evolutionary Geography

– OP-ED DUE THIS WEEK ON FRIDAY, 11:59pm –

Janet Browne, *The Secular Ark: Studies in the History of Biogeography* (New Haven: Yale University Press, 1983), chapters 1, 7, 8, and conclusion.

Diane Paul, “Darwin, Social Darwinism, and Eugenics,” in *The Cambridge Companion to Darwin* (Cambridge: Cambridge University Press, 2003), pp. 214–239.

Week of April 11 – Ecology

Cooperation or Competition?

The Eternal Optimism of Human Ecology

Donald Worster, *Nature's Economy: A History of Ecological Ideas* (Cambridge: Cambridge University Press, 1977), preface and part 4.

Volker M. Welter, *Biopolis: Patrick Geddes and the City of Life* (Cambridge: MIT Press, 2002), introduction and chapter 3.

Robert E. Park, “Human Ecology,” *American Journal of Sociology* 42 (July 1936), pp. 1–15.

Week of April 18 – Planetary Unity and Planetary Destruction

Pollution, Risk, and Environmentalism

The Ozone Hole, Nuclear Winter, and the Age of Catastrophe

Peder Anker, “Buckminster Fuller as Captain of Spaceship Earth,” *Minerva* 45 (2007), pp. 417–434.

Carl Sagan, *Pale Blue Dot: A Vision of the Human Future in Space* (New York: Random House, 1994), introduction, chapters 1, 2, 14, 21, 22.

Paul Crutzen and John Birks, “The Atmosphere after a Nuclear War: Twilight at Noon,” *Ambio* 11 (1982), pp. 114–125.

Reiner Grundmann, “Ozone and Climate: Scientific Consensus and Leadership,” *Science, Technology, & Human Values* 31 (Jan 2006), pp. 73–101.

Week of April 25

Where Do We Go From Here?

April 27, 10:30–11:20am: Final Exam Review Session

Elizabeth Kolbert, “The Lost World: The Mastodon’s Molars,” *New Yorker*, 16 Dec 2013.

Elizabeth Kolbert, “The Lost World: Fossils of the Future,” *New Yorker*, 23 Dec 2013.

– FINAL EXAM IS SCHEDULED FOR 2 PM ON MONDAY, MAY 2 –