

Exploring the Many Aspects of Global Warming

Spring Semester 2016 Seminar, 3 units.

Atmospheric Science 8900, Derby Hall 1116, Thursday, 2:15 -5 pm.

Global warming is one of the greatest challenges facing society in the coming decades. This seminar will encourage students to explore its many facets. We will begin with a high level scientific overview of the physical basis for the warming of Earth. How do contemporary climate changes compare with those from the past? And what are the projections for 2050 and 2100? In the wake of the UN Climate Change Conference (Conference of Parties 21 or COP21) in Paris in December 2015, we will consider how practical it is to reduce the human emissions of greenhouse gases to keep the global temperature increase below 2°C higher than preindustrial levels. What are the obstacles to action? And are there legitimate reasons not to act? We will have a facilitated simulation of the COP21 meeting where teams of seminar students will negotiate commitment positions representing the plurality of interests shaping global climate change policy. Can drastic climate change still be mitigated? We will survey some of the proposed geoengineering approaches designed to limit future global temperature rise, such as carbon sequestration, iron fertilization of the Southern Ocean, and the use of space-borne reflectors to decrease incoming solar radiation. How practical or misguided are these proposed solutions? Next, we will explore how society can adapt to the predicted increase in the severity of weather and climate extremes such as droughts, heatwaves, flashfloods, sea level rise, and hurricanes. How can the impacts of these extremes be lessened for Ohio? What kinds of urban planning can be used to avoid the greatest impacts? What actions have the largest metropolises (like London and New York City) taken to adapt to rising sea level? We will conclude the seminar by exploring some other social and political aspects of global warming. For example, climate change has already been shown to negatively impact human health, and is now viewed as a direct threat to national security.

We will make extensive use of invited speakers. Student participation will include the COP21 simulation, participation in debates, presentations, and a term paper of one's choosing on some aspect of global warming.

Syllabus

Instructor: David Bromwich

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Office Hours: By appointment.

General Information:

Seminar: Thursday 2:15 a.m. – 5:00 p.m., Derby Hall 1116.

Class Website: <http://polarmet.osu.edu/> - click Atmospheric Science 8900, Spring 2016

Thursdays 2016

January 14: Past climate change

January 21: Present Climate Change, the Anthropocene, ocean acidification, coral bleaching, etc.

January 28: Future projections

February 4: Overview of COP21.

February 11: COP21 simulation.

February 18: Carbon dioxide removal and sequestration.

February 25: Cooling the Earth by reflecting sunlight.

March 3: Urban planning for droughts, heatwaves, and flash floods

March 10: Urban planning for sea level rise, severe winter storms, and intense hurricanes

March 17: Spring Break

March 24: Climate change, food production and human health

March 31: Climate change and national defense.

April 7: Political dimensions of global warming and tactics used by skeptics of Global Warming

April 14: Pope Francis' Encyclical on the Environment

April 21: Contemporary topics: Keystone Pipeline Cancellation, Exxon Climate Change Probe, etc.

Student Participation and Grading:

Each student will need to make a 30 minute presentation on a selected topic (TBD) summarizing contemporary literature and the key debates with 15 minutes for discussion. 3 students per afternoon. Worth 25% of final grade.

Attendance and participation, especially in COP21 simulation: 25%.

Term paper is worth 50% of final grade on a global warming topic of your choice. Due on April 21.