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Fall 2016

Environmental Science & Policy
Smith College

ENV 275: Decoding the Experts

Modeling the Impact of Climate Change

Course Objectives

This course has three primary objectives. First, you will gain an understanding of the scientific and economic models of future climate impacts. We will begin by reading about how the climate models used in the IPCC forecasts work, what assumptions underlie the models, and what drives the large uncertainties in the forecasts. We will then turn to how these forecasts are embedded in economic Integrated Assessments Models (IAMs) used to forecast the costs of climate change and the impacts of various policies to reduce emissions or adapt to changing temperatures. Again, the focus will be on learning what assumptions drive these models and how differing assumptions lead to different projections.

The second course objective is to learn how to read, understand and critique technical information produced by experts with training we do not share. While our primary reading material is designed to be accessible to non-experts, it is not straightforward. You will learn to identify difficult and confusing sections of the readings, ask clear and focused questions about the material, develop a set of questions you want to investigate in more detail to deepen your understanding of the material, and carry out the research necessary to build this improved understanding.

The final course objective is to communicate this newly developed understanding to others, in both a detailed paper and a shorter communication targeted to a general audience of your choosing.

Grading

Your grade in this course has several components.

- 10% Participation in online discussion via annotations and responses to classmates' annotations
- 10% Participation in class discussion
- 5% Discussion report and summary
- 10% Climate Casino review
- 30% Research project
    - 5% Group report summary
    - 20% Individual report*
    - 5% Presentation of report
- 20% Technical summary and assessment
- 15% Public outreach communication**

*Groups have the option to produce a single group research report and receive a single group grade if all group members agree.
**Students have the option to work with up to two other classmates on the public outreach communication if they choose.

Course Schedule

The class meets T Th 10:30-11:50am in Seelye 204. My office hours are M 3-4pm and Th 2:30-3:30 pm in my office (Seelye 305).

College guidelines dictate that each week, you should expect to spend roughly 9 hours outside of class in addition to the 3 hours in class for a 4-credit class. In this course outline, I have indicated roughly how I anticipate you dividing that time among different tasks. The time guidelines are of necessity averages and some students will find that they need to spend more or less time to complete the work.

Note: There will be no class session on Tues 9/13. It is possible that we will also not meet on one of the two days the last week of September.

Week 1 (9/8-9/9): Introduction

Weeks 2-7 (9/12-10/21): Reading the experts

For the first part of the semester, we will read and discuss sections of the IPCC AR5 report focused on climate models and economist William Nordhaus's book Climate Casino. It is available electronically through JSTOR via the Smith library and we will be working with PDFs of the chapters. If you find it at all difficult to read material closely in electronic format, I highly encourage you to purchase a physical copy of the book. It is available in the bookstore and on Amazon and is relatively inexpensive (roughly $15 on Amazon).

Each week you will read and annotate a selection from these works using an online social annotation program called Classroom Salon. The readings are fairly dense and you should be reading very closely. On average, students will spend roughly four-five hours reading and annotating the selection. In addition to creating your own annotations, you should be participating in the group discussion via our annotation program. Plan to spend another 3-4 hours reading and responding to your classmates' annotations over the course of the week.

In general, you will be expected to read and annotate the week's readings before class on Tuesday. During class on Tuesday, we will discuss the reading and work to identify common points of confusion and questions that need further investigation. Between our class sessions, you will be reading and responding to your classmates' online comments. On Thursday, we will continue the discussion from earlier in the week as needed, but also take time to reflect back on our growing list of questions. Have some prior questions been answered by this week's reading? Have new questions and priorities emerged?

Students will take turns acting as recorders for these discussion sessions, producing a summary of the day's discussion and questions to share with classmates. Plan to spend one to two hours writing up your summary when you act as recorder.

At the end of this phase of the course, each student will write a review of Climate Casino. It will both summarize the main arguments of the book and review the success (or lack thereof) in communicating its arguments to a non-technical audience. The review is due on 10/28.

Weeks 8-12 (10/25-11/17) Research

On October 25, we will divide our research agenda into specific research projects. Teams will take on each topic and conduct additional research to help the class develop and deepen its

understanding of our previous readings. Teams will be encouraged to further divide the research project into individual pieces, but remain in regular contact about their findings. The bulk of students' outside time in this phase will be devoted to these research projects, but each week we will also read and discuss articles responding to either the IPCC model efforts or Nordhaus' work. We will also devote class time to research team meetings individually, a weekly check-in with me for each group, and class updates on interesting findings.

Each group will submit a research report consisting of a jointly produced summary and detailed individual reports on 11/15. Reports will be turned in to me and shared with the rest of the class. On 11/15 and 11/17, class sessions will be devoted to oral presentations of this research.

Preliminary reading list for this phase

Maslin, M. and Austin, P., 2012. Uncertainty: Climate models at their limit? *Nature*, *486*(7402), pp.183-184.

Metcalf, G.E. and Stock, J., 2015. The Role of Integrated Assessment Models in Climate Policy: A User's Guide and Assessment. *The Harvard Project on Climate Agreements Discussion Paper*, pp.15-68.

Pindyck, R.S., 2013. Climate change policy: What do the models tell us? *Journal of Economic Literature*, *51*(3), pp.860-872.

Ackerman, F., DeCanio, S.J., Howarth, R.B. and Sheeran, K., 2009. Limitations of integrated assessment models of climate change. *Climatic change*, *95*(3-4), pp.297-315.

Weeks 13-15 (11/17-12/15) Communication

When we return from Thanksgiving, we will turn to communicating our newly developed understanding of climate modeling to others. Students will devote the bulk of their outside class time (roughly six to eight hours per work) working on their two major writing assignments. Readings in this phase of the course will be shorter.

Technical Summary and Assessment

Students will write an 8-10 page paper on the question "What can we learn from integrated assessment models?" Students will discuss what integrated assessment models are, their strengths and weaknesses and make an argument about their usefulness (or not) in the debate about climate change.

A draft of this paper is due on Dec. 6 and the final version is due on the last day of exams (Dec. 22).

Public Outreach Communication

For this assignment, students will pick one particular aspect of integrated assessment models they think is particularly important for the general public to understand. They will then identify a particular audience and craft an outreach communication designed to reach this audience. During class sessions, students will produce a communication plan explaining how their communication is tailored to reach their particular audience. Students have considerable latitude in identifying the form of their final communication. Possible formats include: op-eds, brochures, videos, podcasts, infographics, social media campaigns, and websites. Students will have the option, but

not the obligation, to work in groups on this assignment. The final communication is due on the last day of class.

Preliminary reading list for this phase:

Climate Change in the American Mind, March 2015 *Yale Project on Climate Change Communication*

"Explaining Theories of Persuasion" Ch. 5 in Dainton, *Applying Communication Theory for Professional Life*

Kahan, Dan M. and Peters, Ellen and Dawson, Erica Cantrell and Slovic, Paul, "Motivated Numeracy and Enlightened Self-Government" (September 3, 2013). *Yale Law School, Public Law Working Paper No. 307.* Available at SSRN: http://ssrn.com/abstract=2319992 or http://dx.doi.org/10.2139/ssrn.2319992