

## WH.402 Climate Change Science Seminar

### Climate Change Science: Facts, Questions, Controversies and Communication

Instructors: Sarah Das ([sdas@whoi.edu](mailto:sdas@whoi.edu)) and Sloan Coats ([scoats@whoi.edu](mailto:scoats@whoi.edu))

#### Course details

6 Credits

Offered every other year.

Next offered Fall 2018

Class time 90 minutes, once a week, time/day TBD

#### Course description

Introduces students to many of the “big questions” driving climate change research. The course is centered on the reading and discussion of cutting-edge research papers and synthesis reports but will also include readings and discussions related to processes and methods for critically evaluating and communicating climate science. This seminar will give students (1) a fundamental interdisciplinary understanding of the most critical issues motivating climate research today and (2) experience with the most important, yet often overlooked, skills one should attain as a scientist: reading, writing, speaking, synthesizing, and critical thinking.

#### General Structure

- 5 Main scientific topics will be covered with ~2 classes/topic (see below).
- Additional topic of communicating climate change science will be covered in 2 classes with invited speakers including a science policy expert (TBD) and a science journalist (TBD). Past guests have included, for example, Susan Solomon (MIT), Eli Kintisch (Science Magazine), Heather Goldstone (WGBH).
- Final classes will involve group presentations of their final project (see below).

#### Required Reading Assignments

Weekly readings will be assigned ~1 week before each class. We will either provide copies of the reading in the class drop box, or provide a link to the document if it is available online. We also welcome additional suggestions from you for readings. You are required to read the assignments and come prepared to discuss them, irrespective of whether your group is presenting the topic the next week.

#### Required Writing Assignments: *1 page to be handed in weekly at the start of class.*

Write a 3-part synthesis (1 page **total**) of ONE article or resource on this week's topic (your choice from the list that will be provided).

The goal is to distill the message down in order of descending complexity:

- a) a half page summary
- b) a few sentences (~elevator conversation)
- c) a tweet (~headline/sound-bite)

In addition to practicing scientific writing at various levels, this assignment is meant to help focus your thoughts, raise questions you may have, and allow you to come prepared for full participation in class.

## **Required Class Participation**

As this class is a seminar, your individual preparation, attendance and participation is a mandatory part of taking this course. In addition, students will be working in small groups (of 2-4 depending on class size), with one group presenting material ~every other class.

## **Student Group presentations**

Your group will start the class with a ~30-45 minute presentation (powerpoint) that will include coverage of these sub-topics (as they relate to climate change and the week's main topic):

- (a) background science basics
- (b) measurement and attribution of change
- (c) controversy (scientific and/or policy) over this topic

You should organize the group activity between yourselves. One possibility is each of you takes an initial stab at preparing material/slides on one sub-topic (for example if there are 3 people in a group and 3 subtopics) but please be sure to bring this all together before the class to make sure that the length & scope is appropriate. For example, we expect in many cases the material for (a) & (b) will be more substantial than for (c).

## **Final Project**

Students working in groups will present a final project that synthesizes one (or more) aspects of climate change to a non-scientific audience. Possible venues include the web, the Cape Cod Natural History Museum, the MIT Museum, a school audience, You Tube, etc.

## **Topics**

- Topic 1: Greenhouse Gases + warming
- Topic 2: Carbon Cycle + Ocean Acidification
- Topic 3: Cryosphere and Sea Level Rise I
- Topic 4: Abrupt Climate Change
- Topic 5: Hydrologic Cycle
- Topic 6: Extreme Events

## **Class structure for each topic**

### **Class A –**

- Expert Presentation
- Discussion (including assigned reading)

### **Class B –**

- Student Group Presentation – science, attribution, controversy, solution
- Discussion (including assigned reading)