

Advanced Topics in Environmental Studies: Carbon, Climate & Sea Level

Prof. Don Barber (*he, him, his pronouns*) dbarber@brynmawr.edu

Class meetings: **Tues and Thurs 8:40 am – 10:00 am**

Meets in **Park Sci Bldg., room 159**

Don's office: **Park Sciences, room 366**

office hours: **TBA**

This seminar explores recently published biogeochemical research on Earth's short-term carbon cycle with a focus on climate system feedbacks associated with sea-level change. We emphasize impacts of sea-level rise on coastal environments and coastal communities, and evaluate strategies for adaptation in the face of these impacts.

Depending how far we get (re)familiarizing ourselves with the fundamentals of the global carbon cycle, climate change, and sea-level variability, we may delve farther into the role of coastal wetlands on carbon uptake and burial. Through weekly student-led discussions, we will examine how these topics are studied by biogeochemists and other scientists, attempt to synthesize current knowledge, and identify unresolved questions and issues.

All required readings will be provided as PDF files, or via web links, on Moodle.

Responsibilities

Students will read and discuss book chapters and scientific journal papers on the topic; lead seminar discussions; compile, analyze and plot carbon, climate and sea level data; write individual term papers that focus on sub-topics within the course purview; and present your results to the class.

Learning Goals

Content: By the end of the seminar, students should be more familiar with **1)** past, present and future changes in climate and sea level that have been observed, or are expected in future, due to carbon cycle perturbations; **2)** the types of chemical, geological and biological measurements used to investigate climate and the carbon cycle; **3)** the observed or hypothesized feedbacks among carbon cycling, climate and sea level; and **4)** how those feedbacks and other processes may affect the sustainability of coastal ecosystems on various timescales.

Skills: In addition to the content knowledge gained, students' should improve their ability to **1)** read, analyze and critique scientific papers; **2)** extract and manipulate scientific data from a range of sources; and **3)** analyze and visually present data (*e.g.*, as plots, maps or other graphics) and discuss their interpretations of their data analyses.

Assessment Activities

weighting for final grade

1. Students will **attend class** prepared to discuss the assigned readings and **participate** by asking and answering questions and **collaborate** with others in class to gather and **share** info needed to advance discussion. **10%**
2. Occasionally there may be data-gathering, number-crunching and/or graph-plotting **homework exercises** that each student will need to complete outside of class, using software such as Microsoft Excel (*includes Carbonator in-class climate modeling*). **20%**
3. Each student will **lead seminar discussion** of one or more topical journal articles. The student leading discussion that week should present key supporting visuals from the paper. (*this includes end-of-semester presentations on research topic summary*). **30%**
4. Each student will write an **8-10 page** (double-spaced) **research paper** on some facet of **carbon cycling, climate** and/or **sea-level** science (regional, temporal, methodological, etc.). Topics will be developed in consultation with the instructor. The paper is in lieu of a final exam and is due by the end of first exam week (i.e., senior work deadline). **40%**

100%

Anti-Racism Policy

I acknowledge the racist history of our academic institutions and my disciplinary education in earth and environmental sciences. Because of this racist history, I was never trained in how to be anti-racist. Therefore it is up to me to learn how to be a better anti-racist in my work as well as all facets of my life. I am doing my best to teach myself. Part of this involves being open to constructive criticism from students and thus I pledge to carefully listen to and reflect on any such feedback I receive. I will then work to implement changes that would make this course more anti-racist.

Accommodations

Bryn Mawr College is committed to providing equal access to students with a documented disability. Students needing academic accommodations for disability must first register with Access Services. Students may phone **610-526-7516** to make an appointment with the **Access Services Director** to begin this confidential process. Once registered, students should schedule an appointment with one of the instructors as early in the semester as possible to share the verification form and make appropriate arrangements. Please note that accommodations are not retroactive and require advance notice to implement. For more info, see the Access Services website: www.brynmawr.edu/access-services/ Any student who has a disability-related need to record video or audio of this class first must speak to the course instructor. All class members will be made aware if and when this class may be recorded.