

The Changing Arctic: Arctic Ecology in the 21st Century



The Arctic is Earth's most rapidly warming biome. It is also home to massive carbon reservoirs and diverse biological adaptations to extreme elements, as well as oil extraction and vanishing sea ice. We will examine how climate change is impacting the biodiversity, ecophysiology, and biogeochemistry of this crucial biome, and as a result, the rest of the world.

COURSE LOGISTICS

Instructor: Prof. Mary Heskell (she/her); mheskel@macalester.edu

Class: MWF 10:50-11:50 AM

Office Hours: Thursday morning- make appt via this [link](#).

Texts: All readings, articles, and media will be made available through Moodle.

Email Policy: I will respond to emails promptly between 9AM-5PM on weekdays; emails received after 5PM will be answered the following morning. I often cannot answer emails over the weekend, so please plan accordingly.

Out of class work expectations: Readings, lecture watching, and daily assignments should take ~1-2 hrs. Longer assignments and group work may require more time to be scheduled. If you are having trouble working in a group setting due to work or class scheduling conflicts, let me know.

SHOWING UP & BEING PRESENT:

Please come to class, 'show up', stay engaged, and support each other. If you are struggling, please contact me or a classmate to share how you can be better supported. Attendance is expected unless you have 'out of your control' situations like illness, emergencies, field trips, and team events. If you miss class, you are responsible for all the content missed.

LEARNING GOALS

As an upper-level biology course, Arctic Ecology aims to challenge students to improve their science communication skills through varied written, spoken, and visual presentations. Students will also be challenged to synthesize content across systems and create novel hypotheses about current and future impacts of change at a species, community, ecosystem, and landscape scales.

1. Interpret, critique, and evaluate scientific and general audience articles.
2. Connect major drivers of environmental and ecological change in the Arctic and hypothesize outcomes based on theory, first principles, and experimental evidence from the literature.
3. Deeply consider and evaluate topics of interest in Arctic Ecology through the production of a scientific/informational poster.
4. Identify recent issues in the Arctic and interpret for a general audience.
5. Write about complex scientific concepts in multiple tones and voices for different audiences.

6. Build confidence in discussing concepts in class, asking probing questions, and encouraging the engagement of peers.
7. Effectively communicate ideas through conceptual diagrams, writings, visual and spoken presentations.
8. Build community with peers, create an environment of learning that de-emphasizes individual success and promotes collective support.

ASSESSMENTS

Quizzes: short, targeted quizzes will ask you to make connections across content covered in the previous week -including group work, discussions, primary literature, and lectures. You are expected to take these independently, but can use resources available to you (ie - open book). These Quizzes will be graded and are aimed to help you synthesize concepts. Quizzes will be available on moodle or in person, and will take ~30 minutes.

'1-Pager' Reports (3 total): Communicating effectively about nuanced topics is exceedingly important in science and one of the hardest parts of the work! We will have discussions on papers and media and topics through our class. During the course of the semester choose 3 of the topics we covered to write a *1-page, single spaced response to*. This will include 4 references to primary literature, and you can use the ones we used in class. Work on making your writing synthetic and critical, not just a summary. They will be due roughly every 3 weeks to cover the previous 3 weeks' topics (your choice on topic).

Arctic Current Events Small Group Presentations: Early in the semester, students will work in groups of 3 on a topic of Arctic Science that has been in the news in the past 1-2 years. Students will create a short 6-minute presentation together that will emphasize different perspectives on the issue.

Interdisciplinary Arctic Essay - Students will select a complex topic that interests them and write a concise, essay (2-3 single spaced pages) that covers at least three different themes related to that topic: Our class covers roughly 6 Themes total: Climate, Humans, Development/Built Environment, Plants & Soils, Marine/Aquatic Systems, and Animals.

- First pick a region or topic of interest (ex: seal hunting and climate change in Greenland)
- You will pick 3 themes to delve into for your essay that are related to your topic.
- Each essay will have 3-4 references per theme.
- We will do a staggered submission for this which will include peer and professor feedback

Poster on your Essay Topic: The last week of class will showcase our topics through a poster presentation across two days. You will have time to work in class on your individual posters then present your work to the class in an informal manner.

Book Club: This year, we will read "Floating Coast" as a class on the Environmental history of the Bering Strait. Groups of 2-3 will sign up to lead the Book Club discussion and create questions and prompts for the rest of the class.

Assessment	Due	Points	%
Quizzes	See Calendar (x3)	40 each, 120 total	20
1-Pager Reports	Following Friday (x4)	40 each; 160 total	27
Current Event Group Presentation	TBA	20	3
Essay	2 Submission Dates	120	15 %
Poster	Last week of class	120	15 %
Attendance / Group Participation		60	10 %
Book Club Responses & Leading	night before book club		10 %

Total Points Possible: 600

100-94	A	Dates to remember for grading options If you are interested in knowing what your current grade is, please contact Mary or attend Office Hours. Moodle grades are often "off" given the complexities of Moodle - so not great to go by those alone. Also, a hard reminder that grades are over-emphasized, and the whole point of this and all classes is to learn, understand, and grow.
90-93	A-	
87-89	B+	
84-86	B	
80-83	B-	
77-79	C+	
74-76	C	
70-73	C-	

Learning environment and inclusivity. A foremost responsibility while leading this class is to make sure every student feels comfortable, welcome, and able to succeed. The course is structured to promote inclusivity and the ability for everyone to thrive. My goal is to promote an inclusive learning environment where diverse perspectives are recognized, respected, and seen as a source of strength. Part of that effort includes a recognition that all humans have implicit biases, and it is our responsibility to do our best to identify them in ourselves and take actions to mediate them. If something in or about this class makes you feel unwelcome, please see me, your advisor, a professor you trust, or a college administrator.

Names and pronouns. You should be addressed in the manner that you prefer. If you want to make sure I address you with a particular name and/or pronoun please let me know.

Title IX. Macalester College is committed to providing a *safe learning environment* for all students that is free of discrimination, sexual harassment, sexual assault, domestic violence, dating violence, and stalking. Further details are explained in the college's Title IX regulations (<https://www.macalester.edu/titleix/>). If you, or someone you know, experiences a Title IX violation, know that Macalester has staff trained to support you. Macalester faculty members are "responsible employees," which means that if you tell me about a Title IX violation, I must share that information with the Title IX Coordinator. Still, you will control how your case is handled, including whether or not you wish to pursue a formal complaint. Our goal is to make sure you are aware of the range of options available to you and have access to the resources you need (Title IX Office, 651-696-6258).

Accessibility. All students are entitled to fair and equitable access to the learning opportunities in this course. If there are aspects of the instruction or design of this course that result in barriers to your inclusion or to accurate assessment of achievement, please notify me as soon as possible. Students are also welcome to contact the

disability service office to discuss a range of options to removing barriers in the course, including accommodations (contact Disability Services, 651-696-6275 or disabilityservices@macalester.edu). Once you have a letter of accommodations, please see me so that we can implement an action plan. Furthermore, I know that at times personal issues, stress, health problems or life circumstances may impact your ability to perform academically. Please contact the Office of Student Affairs at 651-696-6220 (studentaffairs@macalester.edu) for support and ask them to get in touch with your instructors.

Other means of support:

- For class and personal concerns → Contact me via email or Student Hours
- Need additional writing support → Check out the MAX Center for writing tutors or Works in Progress peer review program
- Do you have a known schedule conflict with the class meetings due to work? All work will be able to make up independently. Similarly, deadlines can be flexible. Please let me know promptly, so all group meetings can be adjusted as needed.
- Absence due to religious observance → Please let me know you will be observing ahead of time, so that you can obtain course materials ahead of the absence.
- Do you need to sleep? Of course you do. Take care of yourself. If you are feeling overwhelmed about the scheduling or pace of this course, please let me know.