

Ecology & the Environment

BIO/ENVI 170 & Lab

Fall 2024

MACALESTER COLLEGE



ANIKA BRATT, PhD (she/her)

abratt@macalester.edu

Office hours: Mondays 12-1

Wednesdays 2:15-3:15

Theater atrium

COURSE INFORMATION

Lecture: MWF; 1:10-2:10 PM; Theater 200

TA: Seth Lorezen (he/him)

slorenze@macalester.edu

Office hours: Wednesdays and Fridays

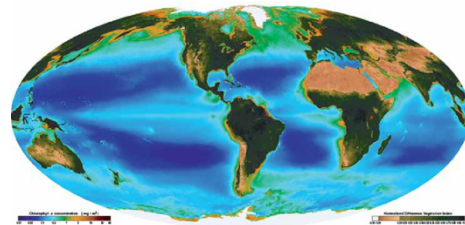
10am-12pm, Smail Gallery

COURSE OVERVIEW

Ecology and the Environment serves Biology and Environmental Studies majors as well as minors. During the semester, we dive into a range of topics to study how species, populations, communities, ecosystems, and biomes function. The course will emphasize biological nutrient and energy cycling, population dynamics, animal and plant species interactions, disturbances and responses to disturbances, and ecology in urban and agricultural landscapes. We will examine Ecology under four 'lenses': ***Climate Change, Environmental Justice, Land Use, and Ecosystem Services***. These lenses provide critical insight into how scientists, policymakers, land managers, and other stakeholders evaluate complex ecological and environmental systems.

MATERIALS

- There is no textbook.
- Primary literature, popular science articles, and media will be made available on Moodle.
- We will use Google Sheets and R/RStudio to analyze datasets.
- All course materials will be made available through Moodle.



WHAT QUESTIONS DRIVE ECOLOGY?

- What are the common patterns, processes, and drivers across different species, communities, and ecosystems? What environmental and biological variables drive differences between species, communities, and ecosystems?
- How do climate change & land use change impact ecological processes and functions?
- What will future ecosystems look like and how will they function?
- How can science and Environmental Justice inform each other?
- What services do ecosystems provide and how do they vary across systems?
- Do 'pristine' ecosystems exist?

OUR LEARNING GOALS

- Work productively in groups and create supportive, effective communities based on open communication, engagement, and sharing of responsibilities.
- Present information confidently through graphic, written, and spoken forms.
- Develop effective preparation, study, and review habits for different assessments.
- Be able to teach new content learned in class to peers and non-peers.
- Connect and synthesize ecological and environmental science content and ideas.
- Engage in and help develop a collaborative, supportive learning environment.
- Read and critically synthesize and evaluate primary literature.
- Measure, collect, organize, and analyze new ecological data.
- Synthesize and present original data in groups.
- Evaluate ecological case studies and research through different 'critical lenses'.
- Connect processes associated with climate change and land use change to predict likely outcomes of ecosystems.

COURSE ASSESSMENTS / GRADING

Assessment	Due	%
Attend 2 EnviroThursdays or Bio Seminars	End of term	2%
MiniQuizzes*	Weekly on Mondays	11%
Discussion Questions*	Weekly on Wednesdays	11%
Data Sheets*	Weekly on Fridays	11%
Lab Activities	Variable	15%
Distributed Exams*	Fridays in class, biweekly	30%
Case Study Essay	11/15	10%
Case Study Infographic	12/4 (to print)	10%
Case Study Group Presentation	12/9 or 12/11	3%
Case Study review of other groups	12/11	2%

**1 will be dropped*

BRIEF ASSESSMENT DESCRIPTIONS

EnviroThursdays & Bio Seminars

You are required to attend one [EnviroThursday](#) and one [Bio Seminar](#) (2 total) over the course of the semester. Both are held over the noon hour on Thursdays. You can choose which ones to attend. Submit a short (one paragraph) write-up of the seminar you attend, including what you learned and what surprised you to Moodle. These must be submitted by the last day of class to receive credit.

MiniQuizzes - MiniQuizzes are short quizzes (~5 min) that will take place in class on Mondays, meant to ensure comprehension of any reading materials. Following the quiz, an interactive

lecture will provide an opportunity to change answers and correct any misunderstandings. *They are graded C/NC. 1 will be dropped.*

Primary Literature Discussion Questions – On Wednesdays we will be responding to primary literature, including small group discussion and answering questions afterward, engaging with a topic up for debate, or reflecting on a visitor’s guest lecture in class. *They are graded C/NC.*

DataSheets – DataSheets are active learning activities in class on Fridays in which you will engage with data to answer a question. *They are graded C/NC. 1 will be dropped.*

Distributed Exams (DEs) – Instead of big tests, small tests will occur biweekly on Fridays. They are open-note and will be submitted via Moodle. *DEs are for credit and graded for correctness.* The lowest DE will be dropped.

Case Study Analysis & Infographic - Groups will tackle case studies representing environmental issues around the world.

- (1) Individual Case Study Essay: Within groups, groups will assign a critical lens (so that all 4 lenses are covered by the group) with which to evaluate the case study, and then will choose a ‘supporting lens’ from the remaining three. Based on the two critical lenses, students will individually analyze the system drawing from ~5 references. The analysis will describe the system briefly, identify and describe the stakeholders involved, and then assess the case study based on their two lenses. The analysis will be 750 words, and will include a reference list.
- (2) Case Study groups will develop and create a visual infographic representing the case study (more specific details on Moodle). The infographic will be visually striking and communicate and inform facts about the system to a broad audience.
- (3) Case Study Presentation: Teams will present their infographic, guiding the class through what they learned for ~6 minutes. Based on these, the rest of the class will complete a worksheet to summarize what they learned.

Extensions

In lieu of extensions, multiple assignments will be dropped: 1 MiniQuiz (Mondays), 1 Discussion Questions (Wednesday), 1 Datasheet (Friday), and 1 Distributed Exam (covers 2 weeks of content). If any deadlines pose conflicts with your life or other classes, talk to Anika about alternative deadlines *at least 24 hours* before the deadline.

WEEKLY ROUTINES, NORMS AND EXPECTATIONS

Minute Mingle!

At the start of each class, we will meet each other in random groups of 2-3. This is your chance to listen and learn about your peers and discuss silly topics.

Check Ins, Office Hours, and supporting each other’s learning

This is an introductory class, and many of you are cultivating practices that you will carry on to upper level courses. You are also busy with activities, clubs, jobs, family and friend responsibilities, and figuring out who you are and what you want to be. We expect you all to be

respectful, and kind to each other and use this course as an opportunity to model best practices of student interactions. We strongly encourage you to do “check ins” during office hours. These will let us figure out what is working and not working for you and develop plans for success. It is also an opportunity to share your goals in and out of the class individually and in small groups.

Out of class work expectations

Readings and daily assignments should take ~1.5+ hrs per class period. Longer assignments and group work will require more time to be scheduled. If you are having trouble working in a group setting due to work or class scheduling conflicts, let us know as soon as possible.

Developing your voice in science

Science requires a balance of courage and humility – this is as true for undergraduates as it is for researchers at leading institutions. You need courage and confidence to pursue and develop new ideas and approaches, confidence to critique others’ ideas, and confidence to follow your curiosity. But science also requires humility – identifying limitations, asking for advice, help and guidance, accepting appropriate criticism from others, and reflecting on potential improvement. Science is a process of realizing you don’t have all the answers, seeking information from other sources, and developing new questions to build on existing experience.

COURSE ENVIRONMENT AND RESOURCES

Learning environment and inclusivity. Our goal is to promote an inclusive learning environment where diverse perspectives are recognized, respected, and contribute to our strength as a class. If something in or about this class makes you feel unwelcome, please see Anika, the TA, or a college administrator.

Names and pronouns. You should be addressed in the manner that you prefer. If you want to make sure we address you with a particular name and/or pronoun please let us know through the pre-class survey.

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 us about a Title IX violation, we 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) including, if you wish, confidential sources on campus who are not subject to the mandatory reporting requirement (see list of “Confidential On-Campus Support” at <https://www.macalester.edu/violenceprevention/support/>).

Accessibility. We want all students to have 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 us as soon as possible. Students are also welcome to contact the Center for Disability Resources to discuss a range of options to removing barriers in the course, including accommodations (contact the Center for Disability Resources, 651-696-6248 or disabilityresources@macalester.edu). Once you have a letter of accommodations, please see us so that we can implement an action plan. Furthermore, we 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.

Macalester Academic Excellence (MAX) Center. The [MAX Center](#) supports students so that they can do their best possible academic work. The MAX Center focuses on: A) the disciplines of math, science, and writing; B) the skills required for good time-management and study habits; C) building a culturally diverse learning community; and D) academic accommodations for students with documented disabilities. *We offer extra credit for students who document their use of this resource.*

Other helpful information to support your experience in the class:

- **Concerns on content or experience in the class** → contact Anika or TA before/after class; attend office hours (group or solo by appt).
- **Are you unable to attend any activities due to an unexpected event (sickness, family issue, schedule)** → Contact Anika or TA by email as soon as possible to set up a time to talk about options.
- **Absence due to religious observance** → Please let us 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 us know.**

Overview of weekly schedule

Day of week →	<i>Monday:</i> Learning & Practice	<i>Wednesday:</i> Primary Literature	<i>Friday:</i> Data day! / Assessment	
What will we do?	In-class Mini-Quiz Lecture	In-class group discussion of paper	In-class exploration of data	Distributed exams (roughly bi-weekly on Fridays)
Pre-class prep	Reading & supporting media on Moodle			Prepare and review for DEs
What do I need to submit?	Mini-Quiz	Discussion questions	Datasheet	Distributed Exam

Detailed Schedule

Week	Dates	Topic	Due
1	9/3-6	Introduction to the course	
2	9/9-13	What is Ecology? Intro to primary literature and data	
3	9/16-20	Earth as Habitat	Distributed Exam*(DE) #1
4	9/23-27	Populations & Communities	
5	9/30-10/4	Biodiversity	DE#2
6	10/7-11	Species Interactions	
7	10/14-18	Introduce case study project (Monday & Wednesday) <i>Fall break (no class Friday)</i>	
8	10/21-25	Trophic Systems	DE#3
9	10/28-11/1	Primary Production	
10	11/4-8	Global Carbon Cycle VOTE! on Nov. 5th	DE#4
11	11/11-15	Agricultural Ecosystems	Individual case study essay (11/15)
12	11/18-22	Urban Ecology	DE#5
13	11/25-29	Infographic work day (Monday) <i>Thanksgiving break (no class Wed-Fri)</i>	
14	12/2-6	Infographic work day (Monday) Semester wrap up	Printed Infographic (submitted for printing by 12/4)
15	12/9-11	Infographic presentations (Monday, Wednesday)	DE#6 (due 12/18)

*Distributed Exams will take place during class on Fridays. They are open note but all answers should be your own.