

Ecology & the Environment

BIO/ENVI 170 & Lab Fall 2020/Mod1 MACALESTER COLLEGE



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EcoTeam meetings: weekly 3:40-4:30
Individual meetings: by appt – email me!
All meetings on Zoom or outside/socially
distanced.

COURSE INFORMATION

Class Block: 1-4:30PM M-F*

*We won't be meeting for this whole length of time,
but this is the assigned time for the class.

Synchronous activities will occur between 2-3:30.

Contributes to the Food, Agriculture & Society concentration

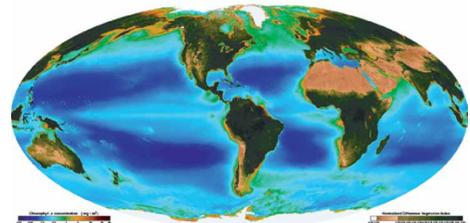
COURSE OVERVIEW

Ecology and the Environment serves Biology and Environmental Studies majors as well as all interested in macrosystem biology. 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 response 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, policy makers, land managers, and other stakeholders evaluate complex ecological and environmental systems.

Lab meetings will not occur as a second part of the course, but rather asynchronously on Monday.

MATERIALS

- There is no textbook.
- Primary literature, popular science articles, and media will be made available on Moodle.
- We will use Google Sheets and potentially 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? Should they be 'spared' or 'shared'?

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	Points	%
Check Ins	At least 3 during semester	5 pt, 3x; pts = 15	3%
MiniQuizzes (MQ)	Weekly on Tuesdays	5 pt, 6x; pts = 30	6%
RDRR	Friday/Sunday by midnight	10 pt, 4x; pts = 40	8%
Doc Discussion Qs	Sunday by midnight	10 pt, 3x; pts = 30	6%
Data Sheets	Thursday by midnight	10 pt, 6x = 60	12%
Labs	Following Monday by midnight	10 pt, 4x = 40	8%
Distributed Exams	Thursday, weekly	25 pt, 6x = 150	30%
Case Study Web Infographic			
- Website	Oct 18	50 pt	10%
- Instagram Story			
Case Study Essay	Oct 21	50 pt	10%
Case Study Group Presentation	Oct 19 or Oct 20	20 pt	4%
Case Study Synthesis of other groups' projects	Oct 19-20 th	15 pt	3%

Total Points Possible = 500

ASSESSMENT DESCRIPTIONS

Check Ins - 'Checks Ins' are individual and/or group meetings with that will occur through the semester to talk about yourself, your progress in the class, any questions you have on content or expectations, and how you are doing generally. These can take place during our weekly EcoTeam meetings (3:40-4:30) or at another arranged time. The first Check In will occur during the first week of class over Zoom. You will sign up for a 10-minute meeting time. Prior to the first meeting, you will complete a short survey that will let me know about you. You will need to schedule at least 2 more meetings after that – one before spring break, and one after. It's credit for catching up!

MiniQuizzes - Miniquizzes are short quizzes that will take place in class on Tuesdays. After completing the quiz (~10 min), students will work in small groups to discuss answers, after which we will discuss them as a class. They are ungraded (C/NC).

Reading, Discussion, Reflection Responses (RDRR) – RDRR are broken up into three parts and accompany primary literature and other longer-form reading. After reading the paper independently, you will write a reading response on the RDRR form in response to a specific prompt/question. On Friday, you will meet with your groups and discussion your reading responses (each EcoTeam member has a different prompt. As a group, you will summarize your responses and add those to your form. Finally, after the discussion, reflect on how your perspective has been shifted through discussion and what was clarified and what remains a challenge. Due on Sunday night.

Distributed Exams – Instead of big tests, we are doing weekly small tests on Thursday. You will be allotted double time (2 questions at 10 min/q = 20 min x 2 = 40 min) to complete the DT. DTs are for credit and graded. They will occur on Moodle.

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

- (1) Case Study groups will develop and create a visual infographic representing the case study that will be displayed via a website (more specific details in a separate document). The infographic website will be visually striking and communicate and inform facts about the system to a broad audience. A secondary aspect will be using this to make an informative Instagram story/4 slide infographic that will be shared on the class Instagram account (@ecology170_at_mac).
- (2) Case Study Presentation: Teams will 'present' via a recorded or live presentation, guiding the class through what they learned for ~10 minutes. Based on these, the rest of the class will complete a synthesis response of this work to turn in (a series of open-ended questions).
- (3) Individual Case Study Essay: Within groups, students will be randomly assigned a critical lens 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 3-5 references. The analysis will describe the system briefly, identify and describe stakeholders involved, and then assess the case study based on their two lenses. The Analysis will 750 words, and will include a reference list.

EcoActivities!

These are ungraded, unmonitored suggested activities to get you outside, or thinking outside the confines of an online class. Take a walk, watch a documentary, draw, listen to a podcast or album.

WEEKLY ROUTINES, NORMS, AND EXPECTATIONS

Minute Mingle!

At the start of each synchronous class, we will meet each other in random Breakout rooms 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

You will be in this class for many hours this module and working hard out of class too! 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. I 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. Individual and group Check Ins 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+ hrs. 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 me know as soon as possible. ***We are especially mindful of how the pandemic has impacted our lives, and the expectation is to extend grace and generosity to everyone.***

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, 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. My 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 me, a TA, 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 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 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) 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. I 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 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.

Recording policy. In order to accommodate students who will not be able to attend synchronous class meetings during this module, I plan to record our synchronous class sessions in a manner consistent with Macalester’s classroom recording policy. I will share these recordings in a password-protected (and not public) place. If you download any class recordings, you must store them in a password-protected location or on a password-protected site. Please note that the recording policy clearly states that you may not share, replicate, or publish any class recording, in whole or in part, or use any of the recordings for any purpose besides knowing what happened during the class period, without my written approval. If I use any recorded content from any of our classes for purposes beyond our class, I will – in accordance with the policy – obtain your written permission to do so.

Other helpful information to support your experience in the class:

- **Concerns on content or experience in the class** → contact me or a TA before/after class; attend office hours (group or solo by appt); email to set up a time to meet over Zoom.
- **Need additional writing support** → Check out MAX Center for writing tutors or Works in Progress peer review program
- **Are you unable to attend synchronous activities due to an unexpected event (sickness, family issue, schedule)** → Contact me or a TA by email as soon as possible to set up a time to talk about options.
- **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.**
- **Many additional questions will be addressed by the FAQ on Moodle.**

Overview of our weekly schedule!

<u>What is this day?</u>	Monday: Lab Day!	Tuesday: Learning & Practice	Wednesday: Exploring Data!	Thursday: Learning & Assessment	Funky Friday*: Digging deeper
<u>What do students do on this day?</u>	Async lab activity	Async video lectures Sync individual & group work (MQ)	Sync group work	Async lectures Sync group work Sync (solo) DEs	Sync group discussion (or sync stream of documentary)
Pre-class prep	Short reading on a “big question”	Reading & supporting media on Moodle		Reading & supporting media on Moodle	Read primary literature paper
Async 1-2 PM	Short intro lecture leading into Big Question (recorded, async) Intro to this week’s lab (recorded, 10-20 min)	Lecture 1 (~30 min) Lecture 2 (~30 min)	1.5 hr for lab time	Lecture 3 (~30 min) Lecture 4 (~30 min)	Reading response (RDRR) EcoActivity!
Sync 2-3:30 PM	(No synchronous activity) 1.5 hr for lab time	Minute Mingle (3 min) EcoTeam meet up for review of content (with guided prompts) (20 min) MiniQuiz (solo, 10 min) MQ review (in random pairs 10 min) Review MQ as a whole class (10 min)	Minute Mingle (3 min) Data Worksheet (30-45 min) Data Worksheet review with EcoTeam (30 min) Turn in Thurs PM.	Minute Mingle (3 min) 20 minute review time (whole class), Prof open response to question list Distributed Exam (30-40 min)	Minute Mingle (3 min) RDRR - EcoTeam Discussion (30-40 min) Whole class thoughts (20 min) Reflection after class (RDRR due Sunday) OR Formal Friday Doc Watch & Doc Discussion Qs
EcoTeam Check Ins (3:40-4:30)	No meeting today	EcoTeam 1 (10 min) EcoTeam 2 (10 min) EcoTeam 3 (10 min) EcoTeam 4 (10 min)	EcoTeam 5 (10 min) EcoTeam 6 (10 min) EcoTeam 7 (10 min)	No meeting today	EcoTeam 8 (10 min) EcoTeam 9 (10 min) EcoTeam 10 (10 min)
What do I need to submit?	Lab from the previous week due Monday	MQ in two text colors	Data Worksheet	Distributed Exam	RDRR – or – Doc Discussion Qs

Calendar of our class module! (Tentative, see Moodle for most up-to-date activities)

BIG QUESTION	M Weekly Welcome & Lab	T Learning & Practice	W Exploring Data!	R Learning & Assessment	F Digging Deeper
			9/2 Welcome & Syllabus L1: Lenses Day 1 Check Ins (Day 1)	9/9 L2: Lenses Day 2 DataSheet Practice – Amazonia Check Ins (Day 2)	9/10 L3: Earth as habitat: Climate & Biomes Check Ins (Day 3)
How does carbon flow through ecosystems?	Labor Day No Class	9/8 L4: Primary Production & Rubisco L5: The Carbon Cycle Team Review of L1-L5 MQ Lab 1 Intro	9/9 DataSheet 1 – Keeling Curve	9/10 L6: Life Histories, Distribution L7: TBA Distributed Exam 1(L1-L5)	9/11 Discussion on Mammoth DQs due Sunday
How do we assess a population?	9/14 Intro to Lab 2 - Populations Time for lab Lab 1 due	9/15 L8: Growth & Extinction & Modeling Populations L9: Disease Ecology Team Review of L6-L9 MQ	9/16 DataSheet 2 - Populations	9/17 L10: Species Interactions, Competition & Niches Distributed Exam 2 (L6-L9)	9/18 Primary lit & Discussion (RDRR)
How are communities organized?	9/21 Intro to Lab 3 on Biodiversity Time for lab Lab 2 due	9/22 L11: Trophic Systems & Cascades L12: Biodiversity & Complexity Team Review of L10-L12 MQ	9/23 DataSheet 3- Yellowstone	9/24 Distributed Exam 3 (L10-L12)	9/25 Watch “Serengeti Rules” & Discussion Qs

How do ecosystems change?	9/28 Intro to Lab 4: AgWeek Preview Lab Introduce Case Studies Time for lab Lab 3 due	9/29 L13: Succession & Disturbance L14: Island Biogeography and Habitat Fragmentation Team Review of L13-L14 MQ	9/30 Data Sheet 4- Succession	10/1 L15: Climate Change & Nutrient Cycling Distributed Exam 4 (L13-L14)	10/2 Primary lit review & discussion (RDRR)
How have humans shaped ecosystems? Agriculture & Urban Systems	10/5 No Lab this week - Work on Case Study Lab 4 due	10/6 L16: Agriculture 1 L17: Agriculture 2 Team Review of L15-L17 MQ	10/7 Data Sheet 5– Global Agriculture and Climate Change	10/8 L18: Urban Ecology Distributed Exam 5 (L15-L17)	10/9 No RDRR today! Data Sheet 6 -Urban Ecology & Redlining
How have humans shaped ecosystems sustainably?:	10/12 No Lab this week - Work on Case Study	10/13 L19: TEK lecture L20: RWK talk from ESA Team Review of L18-L20 MQ	10/14 Data Sheet 7 – TEK and Conservation	10/15 L21: Ocean Conservation & Sustainability (Ayanna Johnson seminar) Distributed Exam 6 (L18-L20)	10/16 Tending Nature Doc Discussion Qs
FINAL WEEK!	10/19 Case Study Presentations (1-5)	10/20 Case Study Presentations (6-10)	10/21 Case Study Essay due	10/22	10/23