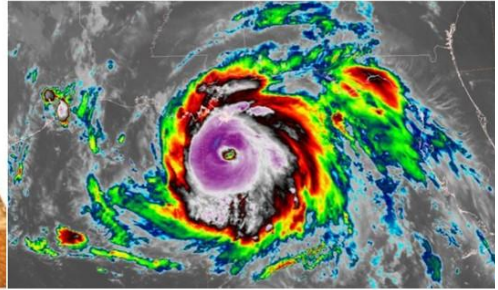
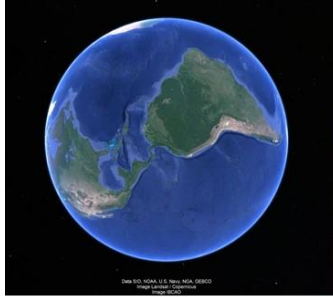


# GEOG 294: EARTH AND THE ENVIRONMENT: ELEMENTS OF PHYSICAL GEOGRAPHY



Planet Earth, a land-form, hurricane Ida

**Fall 2022**

## Hello and welcome!

I'm Dr. Xavier Haro-Carrión (he / him; you can call me Xavier if you wish), your course instructor, who is eager to help you understand some fundamental knowledge of Physical Geography!

Email me at [xharocar@macalester.edu](mailto:xharocar@macalester.edu)  
Visit me in **CARN 104F**

Your TA will be Nicholai Jost-Epp  
Email him at [njostep@macalester.edu](mailto:njostep@macalester.edu)  
Nicholai will held office hours in TBD

## Course learning outcomes

- Locate and analyze Earth's major geophysical features and processes.
- Relate Earth's geophysical configuration with Earth's surface processes, such as seasons and climate.
- Analyze how geophysical features and processes affect life on Earth.
- Explore interactions between Earth's systems and the human realm.
- Examine how (tools and lines of thought) geographers study these processes.

## Course Description

This course introduces the student to an area of study that brings together and interrelates patterns and processes that drive Earth's physical environments, including human interactions with the physical environment. Among other topics, we will learn about the principles and mechanisms of climate and weather, water resources, landforms, earth surface processes, landscapes, vegetation, and ecosystems at global and regional scales. We will also learn how the spatial and temporal patterns of these processes are interpreted and understood using maps produced from Geographic Information Systems (GIS), Global Position System (GPS) and satellite imagery. Using selected studies we will also examine the social forces that shape

many of these systems to gain a broader understanding of the socio-environmental interconnections of these physical environments.

## Meeting times and office hours

Time	Monday	Tuesday	Wednesday	Thursday	Friday
08:00-10:00					
1:20-2:50					
3:00 – 4:00					

	<b>Class times</b>
	<b>Instructor Office hours</b>
	<b>TA Office hours</b>

## Textbooks

Lave, Biermann, S. N., & Lave, R. (Eds.). (2018). The Palgrave Handbook of Critical Physical Geography (1st ed. 2018). Springer International Publishing : Imprint: Palgrave Macmillan. <https://doi.org/10.1007/978-3-319-71461-5>

Reynolds, S. J. et al. (2021). Exploring physical geography (Third Edition). McGraw-Hill Education.

## Course details

### Structure

While the Covid-19 emergency forced us to have more than a year of on-line instruction, it also offered an opportunity to explore different approaches to engage more with class content and to facilitate the student learning experience. Building on this experience, I will adopt various teaching approaches during this semester. Some classes will follow a “flip-classroom model”, where students will prepare the material prior to class and come prepared to explore topics in greater depth. Other classes will follow a “blending learning model”, where some material will be prepared in advance and will be partially accompanied by lectures and others will follow a more traditional lecture-based form of content delivery.

### Class Activities

Most classes we will have associated class activity / exercises including exit tickets, opening questions, previous class summaries, paper discussions, quizzes of previous class topics, etc. All these activities will serve to review class content continuously, increase and promote class participation, build a community together and maintain a sense of connection and

commitment to one another. Because these activities will happen almost daily, they will also serve to account for attendance.

Some of the activities planned in class will involve the use of Google Earth. Students will be asked to bring their computers and have Google Earth installed. The software needs 200 MB of free hard-disk space and a RAM of at least 128 MB (very likely your computer will fulfill these requirements). Details will be provided in class.

I recognize that there are unavoidable circumstances that sometimes make it impossible for you to attend class and therefore participate in every single class activity. To accommodate these events, the lowest grade of class activities will be dropped and not considered in the final computation of your Class Activities grade.

### **Critical Physical Geography Discussions**

We will have five class discussions that involve case-studies of critical physical geography (we'll learn during the first week of classes what critical physical geography is). These discussions are intended to be deeper and longer discussions about the application of physical geography to societal (broadly defined) issues. We will be using various class discussion approaches including philosophical chairs, pinwheel discussions, Socratic seminars, etc. Typically, you will be asked to prepare something (e.g. a questionnaire) before class and then use that material in class. Details will be provided during the semester before each discussion. It will be difficult to make-up class discussions, so I encourage you to plan in advance if you need to be absent any of these days.

### **Exams**

Exams (a mid-term and a final) will consist of short answers, essays, figures' interpretation and applied problem-solving questions. Both exams will be close notes in-class. The midterm exam will cover all topics studied until that point in the semester and the final will cover 65% of topics covered in the last half of the semester and 35% of topics covered in the first half of the semester.

My intention with the exams is to test your knowledge about the topics covered while developing some soft skills such as the ability to work under time-limited settings and potentially stressful scenarios. We all respond differently to these types of circumstances, so I am always open to consider options to make exam-taking as easier as possible including scheduling your exam outside of class in the Max Center or moving the proposed exam date to better accommodate it to other academic commitments.

### **Podcast**

You will do a podcast in this class, which will account for a large percentage of your final grade. You will pick the general topic for your podcast based on the various topics studied in class, but you will narrow it down to a specific case study--a geophysical process, event or feature. We will work during the course of the semester to define your topic and work on this assignment and we will be supported by the Digital Liberal Arts (DLA) center of Macalester.

Here are some sources you will likely use during the entire semester that you should start exploring as soon as you can: [Mac Digital](#) is the general webpage of the Digital Liberal Arts (DLA) at Macalester, and [Podcasting](#) talks specifically about podcasts and lists all the resources that you'll have available at Macalester to do your podcast.

### **Fieldwork**

We will have one field exercise during the semester. Jointly with Geog 254: Geography of Environmental Hazards, we will visit various areas in and around the Twin Cities to appreciate closely some geographic features and make some educated inferences about geographic processes associated with them (we technically live in a watershed, so there are tons of things to see nearby!). Fieldwork will happen on a Saturday (see Detailed Weekly schedule at the end of this document for details) and you'll be required to prepare a post fieldwork report.

## **Course policies and support**

### **Resources**

All course material, including lecture slides, readings and book chapters, will be made available on Moodle. We will use Moodle to complete and turn in assignments due outside our regular class schedule and keep track of all grades.

### **Attendance**

Attendance plays an essential role in learning; you are warmly invited, encouraged, and expected to attend all class meetings. Attendance will be factored through in-class activities, which typically cannot be made-up. Exceptions to this policy include participation in academic or sport activities, illnesses, or other circumstances.

Students may wish to take part in religious observances that occur during this semester. If you have a religious observance/practice that conflicts with your participation in the course, please contact me before the end of the first two weeks of classes.

### **Late Assignments**

Late assignments will be accepted with a **10% drop on the final grade for each 24-hour period that it is late**. However, I encourage you to talk to me in advance if you are experiencing problems of any time that might require accommodations to this policy.

### **Office Hours**

I will hold regular office hours to discuss questions, issues or concerns about the class in detail. If your schedule conflicts with posted office hours, we can schedule a different meeting time. Outside of class and office hours, email is the best way to contact me. I respond to email as soon as possible, but I mostly respond during work hours (8:00 am to 4:00 pm on weekdays).

## **Diversity**

I acknowledge that at least some of the scientific content of this class has been historically built on a small subset of privileged voices. Therefore there may be both overt and covert biases in the material due to the lens with which it was written. Integrating a diverse set of experiences is important for a more comprehensive understanding of science and I am working continuously to enhance the diversity of bibliographic sources used in this class. In addition to course content, I am also committed to creating a learning environment that supports a diversity of thoughts, perspectives and experiences, and to honor your identities including race, gender, class, nationality, religion, etc. Please contact me (in person or electronically) or submit anonymous feedback if you have any suggestions to improve the quality of the course materials and enhance diversity and inclusion.

## **Disabilities**

I am committed to ensuring access to course content for all students, including those with disabilities. If you are encountering barriers to your learning that we can mitigate, please bring them to my attention. I will be happy to work with you to ensure your success in the class.

Reasonable accommodations are available for students with documented disabilities. Contact the Disability Services office by emailing [disabilityservices@macalester.edu](mailto:disabilityservices@macalester.edu) or calling 651-696-6874 to schedule an appointment to discuss your individual needs.

## **Well-Being**

Here at Macalester, you are encouraged to make your well-being a priority throughout this semester and your career here. Investing time into taking care of yourself will help you engage more fully in your academic experience. Remember that beyond being a student, you are a human being carrying your own experiences, thoughts, emotions, and identities with you. It is important to acknowledge any stressors you may be facing, which can be mental, emotional, physical, financial, etc., and how they can have an academic impact. I encourage you to remember that you have a body with needs. In the classroom, drink water, use the restroom, and step out if you are upset and need a break. Please do what is necessary so long as it does not impede your or others' ability to be mentally and emotionally present in the course. Outside of the classroom, sleep, moving your body, and connecting with others can be strategies to help you be resilient at Macalester. If you are having difficulties maintaining your well-being, please don't hesitate to contact me and/or find support from other resources on the following page.

## **Academic Support**

Personalized tutoring, academic support and study skills are available at the Macalester Academic Excellence (MAX) at: <https://www.macalester.edu/max/#/0>. These resources are there to help you and I encourage you to make good use of them.

## **Academic Integrity**

Students are expected to complete and turn in their own work and to follow established academic practices regarding proper use and citation of materials and ideas that are not their

own. Engaging in cheating or plagiarism will result in a failing grade in this class. More information is available about Macalester's academic integrity at: <https://www.macalester.edu/academicprograms/academicpolicies/academicintegrity/>

**Title IX**

Macalester is committed to providing a safe and open learning and living environment for all students, staff, and faculty. Any community member experiencing sexual harassment, sexual violence, relationship violence, or stalking, is encouraged to seek help and support. Please be aware that as a faculty member, I need to report disclosure about sexual harassment, sexual misconduct, relationship violence, and stalking to the Title IX Office. The purpose of this report is to ensure that anyone experiencing harm receives the resources and support they need. I will keep this information private and it will not be shared beyond this required report. You can contact Macalester's Title IX Coordinator directly at [titleixordinator@macalester.edu](mailto:titleixordinator@macalester.edu).

**Grading**

Assignment	Points
Class Activities	30% (averaged)
Podcast	20%
CFG Discussions	20% (4% each)
Field exercise	8%
Midterm	10%
Final	12%

Scale Letter	Range
A	93.0% to 100 %
A-	90.0% to < 93.0 %
B+	87.0% to < 90.0 %
B	83.0% to < 87.0 %
B-	80.0% to < 83.0 %
C+	77.0% to < 80.0 %
C	73.0% to < 77.0 %
C-	70.0% to < 73.0 %
D+	67.0% to < 70.0 %
D	63.0% to < 67.0 %
D-	60.0% to < 63.0 %
F	0.0% to < 60.0 %

## Detailed Weekly Schedule

**Note:** This weekly schedule includes topics and readings only. Specific assignments associated with different readings will be posted in Moodle one week before class. If no assignment is posted, assume an in-class assignment related to that reading will likely happen.

**Disclaimer:** This schedule represents my current plan and objectives. We will certainly cover the major topics detailed in this schedule. However, details such as readings and specific dates will be defined and adjusted as we progress in the semester with the goal of enhancing your learning experience.

### Week 1: Welcome & Introduction

September 1<sup>st</sup>

**Learning outcome:**

- Learn what this class is about, including topics, fieldwork, class participants, etc.

**Thursday:**

- *Before class:* read this syllabus

### Week 2: What's Physical Geography and Critical Physical Geography?

September 6<sup>th</sup> and 8<sup>th</sup>

**Learning outcome:**

- Learn what the fields of Physical Geography and Critical Physical Geography study.
- Introducing Google Earth.

**Tuesday:**

- *Before class:* read Lave et al. Introducing Critical Physical Geography. In: Lave et al. (Eds.). (2018). The Palgrave Handbook of Critical Physical Geography and Reynolds et al. (2021). Chapter One: The Nature of Physical Geography. Topics 1.1 to 1.2.

**Thursday:**

- Bring a computer for Google Earth exercise.

### Week 3: Atmosphere – Solar Energy and Balance

September 13<sup>th</sup> to 15<sup>th</sup>

**Learning outcome:**

- Understand how solar energy drives virtually all major global processes.

**Tuesday:**

- *Before class:* Reynolds et al. (2021). Chapter One: The Nature of Physical Geography. Topics 1.3 to 1.14.

**Thursday:**

- *Before class:* Reynolds et al. (2021). Chapter Two: Atmospheric Energy and Matter.

**Week 4: Atmosphere – Atmospheric motion and moisture**

September 20<sup>th</sup> and 22<sup>nd</sup>

**Learning outcome:**

- Analyze how global processes change as a function of Earth’s atmosphere motion.
- Understand how water in the atmosphere controls weather and climate.

**Tuesday:**

- Weekly details to be updated

**Thursday:**

- Weekly details to be updated

**Readings:**

Reynolds et al. (2021). Chapter Three: Atmospheric Motion and Four: Atmospheric Moisture.

**Week 5: Atmosphere and Hydrosphere – Weather and Climate**

September 27<sup>th</sup>, 29<sup>th</sup> and October 1<sup>st</sup>

**Learning outcome:**

- Examine the interactions between the ocean, which covers 70% of Earth’s surface, and the atmosphere.
- Learn about climates around the world.

**Tuesday:**

- Weekly details to be updated

**Thursday:**

- Weekly details to be updated

**Readings:**

Reynolds et al. (2021). Chapter Six: Atmospheric-Cryosphere Interactions and Seven: Climates Around the World.

**Saturday:**

Joint Field work with Environmental Hazards class.

**Week 6: Hydrosphere – Water Resources**

October 4<sup>th</sup>, and 6<sup>th</sup>

**Learning outcome:**



- Analyze how surface and groundwater interact and how it impacts people.

**NOTE:** I will be in a conference this week. Activities will be remote or in charge of Nicholai.

**Tuesday:**

- *Before class:* Reynolds et al. (2021). Chapter Eight: Water Resources.

**Thursday:**

- Bill Moseley (Geography) talk on drought and food security in Africa. Title TBD

### Week 7: Hydrosphere – Water Resources CFG Case Study

October 11<sup>th</sup> and 13<sup>th</sup>

**Learning outcome:**

- Evaluate a Critical Physical Geography case study of water resources.

**Tuesday:**

- *Before class:* Read Ashmore, P. Transforming Toronto's Rivers: A Socio-Geomorphic Perspective. In: Lave et al. (Eds.). (2018). The Palgrave Handbook of Critical Physical Geography

**Thursday:**

- Mid-course evaluations.

### Week 8: Midterm

October 18th

- Tuesday: Midterm.

### Week 9: Lithosphere – Geomorphology: Tectonic Processes and Glacial Landforms

October 25<sup>th</sup> and 27<sup>th</sup>

**Learning outcome:**

- Introduce basic concepts of geomorphology and explore the theory of plate tectonics and study glaciers.

**Tuesday:**

- Reynolds et al. (2021). Chapter Nine: Understanding Landscapes, Ten: Plate Tectonics and Regional Features and Fourteen: Plate Glaciers and Glacial Landforms.

**Thursday:**

- *Before class:* read Knitter et al. Critical Physical Geography in Practice: Landscape Archeology. In: Lave et al. (Eds.). (2018). The Palgrave Handbook of Critical Physical Geography.

### Week 10: Lithosphere – Weathering and Soils

November 1<sup>st</sup> and 3<sup>rd</sup>

#### Learning outcome:

- Continue examining basic concepts of geomorphology, with emphasis on glaciers.
- Study processes related to the breakdown of surface materials, with emphasis on the production of soils.

#### Tuesday:

- Kelly MacGregor (Geology) talk on glaciers and other cool geology stuff. Title TBD

#### Thursday:

- *Before class:* Reynolds et al. (2021). Chapter Twelve: Weathering and Mass Wasting and Sixteen: Soils.

### Week 11: Biosphere – Biogeography and Ecosystems

November 8<sup>th</sup> and 10<sup>th</sup>

#### Learning outcome:

- Introduce key aspects that define Biosphere, the realm of life, including ecosystems, biogeography and key cycles.

#### Tuesday:

- *Before class:* read Egel-Di Mauro, A. Soils in Ecosocial Contexts: Soil pH and Social Relations of Power in a Northern Drava Floodplain Agricultural Area. In: Lave et al. (Eds.). (2018). The Palgrave Handbook of Critical Physical Geography.

#### Thursday:

- *Before class:* Reynolds et al. (2021). Chapter Seventeen: Ecosystems and Biochemical Cycles and Eighteen: Biomes.

### Week 12: Biosphere – Biomes of the World

November 15<sup>th</sup> and 17<sup>th</sup>

#### Learning outcome:

- Learn about the different biomes of Earth.
- Through the study of two case studies, we will evaluate Critical Physical Geography approaches to study animals and plants.

#### Tuesday:

- *Before class:* Reynolds et al. (2021). Chapter Eighteen: Biomes.

**Thursday:**

- *Before class:* read Dufour et al. Mapping Ecosystem Services: From Biophysical Processes to (Mis)Uses. In: Lave et al. (Eds.). (2018). The Palgrave Handbook of Critical Physical Geography.

**Week 13: Biosphere – CFG Case Studies**November 22<sup>nd</sup>**Learning outcome:**

- Test our knowledge of the material covered in class

**Tuesday:**

- Final exam.

**Week 14: Biosphere – CFG Case Studies and Podcast week**November 29<sup>th</sup> and December 1<sup>st</sup>**Learning outcome:**

- Through the study of two case studies, we will evaluate Critical Physical Geography approaches to study animals and plants.

**Tuesday reading:**

- *Before class:* read Goldman, M.J. Circulating Wildlife: Capturing the Complexity of Wildlife Movements in the Tarangire Ecosystem in Northern Tanzania from a Mixed Method, Multiply Situated Perspective. In: Lave et al. (Eds.). (2018). The Palgrave Handbook of Critical Physical Geography.

**Thursday:**

- Podcast work

**Week 15: Final Week**December 6<sup>th</sup> and 8<sup>th</sup>

- Tuesday: Course Evaluations, podcast presentations and end-of-class party.
- Thursday: Podcast presentations and end-of-class party.