Bio*G*eography

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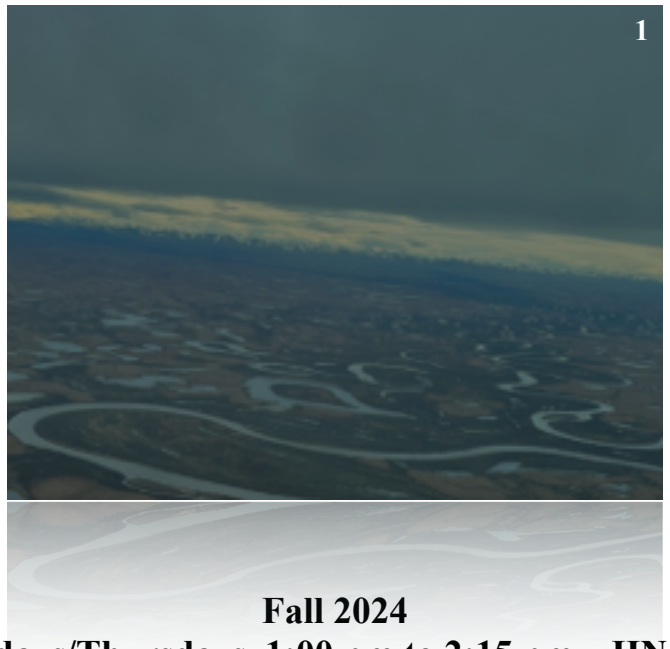

Fall 2024
Mondays/Thursdays, 1:00 pm to 2:15 pm – HN 1022
Undergraduate PGEOG 31300
Graduate PGEOG 70160

HUNTER COLLEGE
Department of Geography and Environmental Science

Instructor Information:
-Instructor: Enrique Lanz Oca
-E-mail: enriquelanzoca@gmail.com
-Office Hours: Thursdays, 11:30am – 12:30pm

Course Information:
3-credit course

Course Description:

This course is an introduction to the biogeography, the identification, description, interpretation and explanation of spatial patterns of biological diversity. Prerequisites include an introductory Physical Geography course (PGEOG 130, GEOL 105, GEOL 180, or GEOG 226). The course provides a basic, but comprehensive background in the subject at the global scale. Lectures emphasize the understanding and application of historic, geographic and ecological principles.

[1] View of Quinhagak (Alaska)

Modus Operandi for the Class:

The class will be "**in-person**." However, in case of an emergency, we may switch to "hybrid" mode (using Zoom).

Required Materials:

There will be no textbook. The course will include assigned materials that are available through articles, texts, chapters, films, and audios. These materials are available in the section "Course Materials" on Blackboard. Where indicated on the syllabus, materials will be found online.

Course Objectives:

Upon completion of this course, the students will have…

1. An understanding of the theoretical foundations, history and patterns of animal and plant distribution, speciation, extinction, dispersal and immigration of biodiversity on Earth.
2. Integrated geophysical history (i.e., plate tectonics, soil formation and climate change) with ecological processes (dispersion, immigration, speciation and extinction) in order to create a holistic understanding of life distribution patterns.
3. Completed a Final Group Report about a particular case of ecological restoration in the NYC's area. In order to achieve this, students will collect and analyze data to identify the selected areas's main environmental impacts, as well as elaborate possible mitigation/solutions strategies for environmental concerns.

Student Learning Outcomes:

Upon completion of this course, students will be able to…

1. Acquire broad knowledge of the Earth environment, using a systems approach to identify and describe its history, components, their functions and interactions at multiple spatial and temporal scales as well as the natural forces that have created the current spatial distribution of life on earth.
2. Describe and explain plant and animal speciation, extinction, dispersal and immigration and explain variation in historical distribution patterns of life across different regions of the earth.
3. Comprehend the most prevalent environmental impacts caused by our civilization and think about possible measures capable of promoting a more sustainable society environmentally speaking.
4. Gather, measure, synthesize and evaluate data from diverse sources using visual, analytical and statistical approaches to describe and interpret relationships, trends and make predictions about future changes.
5. Communicate effectively in the language of the discipline, incorporating written, oral and visual methods. Students will communicate to audiences ranging from scientific to policy oriented. Students will be prepared to become active, informed citizens ready to have an impact on society.

The attainment of these learning outcomes will be assessed especially through your writing assignments, exams, scientific projects (e. g. Group work), class participation as well as fieldwork and outdoor activities (e. g. tree planting, coastal clean-ups, etc.).

Note: (for the graduate students): The attainment of these course-specific learning outcomes will be also evaluated through the writing assignments (Literature Review), group projects (report), fieldwork, presentations, and class participation. However, the writing assignments will be more extensive in terms of number of pages and references used as well as more academic orientation.

Course Assignments. This course will be based upon:

Undergraduates

ASSIGNMENTS	% for the Final Grade	CHARACTERISTICS/ REQUIREMENTS
GROUP PROJECT Report (based on a 7-8 student group)	**40**	-At least 50 pages; 5 references -Around 7 pages per student
Presentations	**5**	Each group will present their Group Report section in class.
Groups Walking Tour	**10**	Each group will be responsible for presenting updates on their topic during a walking tour of the selected site.
Mid-Term and Final Exams	**30**	Multiple Choice Questions
Fieldwork Notebook	**5**	Every student will be responsible of elaborating a fieldwork notebook through the semester.
Class Participation	**10**	In-class activities
***Eco*Credits Report/s**	**Extra-credit**	-Participation in different outdoor activities (e. g. tree planting)

Graduates

ASSIGNMENTS	% for the Final Grade	CHARACTERISTICS/ REQUIREMENTS
GROUP PROJECT Report (based on a 7-8 student group)	**35**	-At least 50 pages; 5 references -Around 7 pages per student
Coordinator Group Work (Final COMPLETE Report)	**15**	Graduate students will be responsible of the coordination of her/his/their group.
Abstract	**5**	The Graduate students will be the main responsibles for writing the abstract of her/his/their respective Group Report.
Presentations	**5**	Each group will present their Group Report section in class.
Groups Walking Tour	**5**	Each group will be responsible for presenting updates on their topic during a walking tour of the selected site.
Literature Review Document	**10**	At least 5 References (Individual activity).
Mid-Term and Final Exams	**15**	Multiple Choice Questions
Fieldwork Notebook	**5**	Every student will be responsible of elaborating a fieldwork notebook through the semester.
Class Participation	**5**	In-class activities
***Eco*Credits Report/s**	**Extra-Credit**	-Participation in different outdoor activities (e. g. tree planting)

Final letter grades will be assigned based on the CUNY grading policy that can be found in the online undergraduate catalog available at: http://catalog.hunter.cuny.edu/.

Key points about these assignments:

1. You will receive feedback for the Proposal (Final Report) and Abstract/Literature Review (graduate students)
2. You will have the opportunity to re-write the Proposal of the Final Research Paper.
3. **A complete description of the assignments is located in Appendix 1** at the end of the Syllabus.
4. You can find the due dates for all of the assignments in the Course Content and Calendar section of the syllabus (see below).

Course Policies:

Attendance:

I will take attendance at every class meeting. You should arrive in class on time and stay for the entire session. If you will miss class for any reason, you should discuss this with me ahead of time. You are responsible for any material you may miss. You are allowed five hours of absence, not five days. A low attendance could determine the distinction between an "F" or "WU" grade. Finally, the tardiness generates constant interruptions of the class. The continuous tardiness could generate a reduction of points for the final grade. **DO NOT BE LATE IN CLASS**.

Incompletes:

I do not give incompletes (IN) except under the most extraordinary and documented medical emergencies. No late assignments will be accepted. Without a valid medical excuse, you will receive a grade of zero (0) on any assignment missed. If, for a valid medical emergency, you do miss an assignment, you must contact me within 48 hours of the missed assignment and present acceptable documentary evidence for your absence. At the time of the request, you must also complete a Contract to Resolve an Incomplete Grade in consultation with me. We will agree on what needs to be completed and when it will be due and, if you meet the mutually agreed upon conditions, your course grade will be recomputed and a new grade, if appropriate, will be submitted. I will allow only one semester in which you can resolve the IN/FIN. After that time no request will be considered. The contract form is available in the Department of Geography office, HN 1006, during normal business hours or in OneStop on the 2nd floor of the North Building.

To receive a CR/NC you must have completed all course requirements and have requested the CR/NC option no later than the last scheduled lecture. That means all written assignments, quizzes, exams (including the final exam) must have been completed. If you choose this option, then all grades above 70% will be assigned CR and 69.9% and below will be assigned NC unless you choose the assigned D option for grades between 60 and 69.9. Finally, CR/CN is only available to undergraduate students. More information is available at http://www.hunter.cuny.edu/advising/how-to/file-credit-no-credit-cr-nc

Classroom Electronics Use:

I permit the use of laptops and tablets **ONLY** for the purpose of taking notes during lecture and discussion. All other personal electronics should be turned off or set to silent before entering the classroom. Absolutely no texting is allowed during class. Any use of electronics beyond their permitted use is a disruption to the class and will be treated accordingly.

Hunter College Policy on Academic Integrity:

Hunter College regards acts of academic dishonesty (e.g., plagiarism, cheating on examinations, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. The College is committed to enforcing CUNY Policy on Academic Integrity and will pursue cases of academic dishonesty according to the Hunter College Academic Integrity Procedures. Plagiarism, dishonesty, or cheating in any portion of the work required for this course will be punished to the full extent allowed according

to Hunter College. Being in college requires discipline, collegiality, and overall honesty. Although knowledge is an accumulation of ideas from different people and epochs that you can use, you have to do so under certain conditions. If you are going to use another's ideas you have to identify their names and works. If you don't, it is called 'plagiarism,' and that is illegal. Plagiarism is the presentation of someone else's ideas, words or artistic, scientific, or technical work as one's own. Using the idea or work of another is permissible only when the original author is identified. Paraphrasing and summarizing, as well as direct quotations, require citations of the original source. Plagiarism may be intentional or unintentional. Lack of dishonest intent does not necessarily absolve a student of responsibility for plagiarism. Students who are unsure how and when to provide documentation are advised to consult with their instructors.

ADA Policy:

In compliance with the American Disability Act of 1990 (ADA) and with Section 504 of the Rehabilitation Act of 1973, Hunter College is committed to ensuring educational parity and accommodations for all students with documented disabilities and/or medical conditions. It is recommended that all students with documented disabilities (Emotional, Medical, Physical, and/or Learning) consult the Office of AccessABILITY, located in Room E1124, to secure necessary academic accommodations. For further information and assistance, please call: (212-772-4857)TTY or (212-650-3230). Students requiring special consideration during the exams must make arrangements with the Office of Accessibility and tell your instructor of the arrangements.

Hunter College Policy on Sexual Misconduct:

"In compliance with the CUNY Policy on Sexual Misconduct, Hunter College reaffirms the prohibition of any sexual misconduct, which includes sexual violence, sexual harassment, and gender-based harassment retaliation against students, employees, or visitors, as well as certain intimate relationships. Students who have experienced any form of sexual violence on or off campus (including CUNY-sponsored trips and events) are entitled to the rights outlined in the Bill of Rights for Hunter College.

1. Sexual Violence: Students are strongly encouraged to immediately report the incident by calling 911, contacting NYPD Special Victims Division Hotline (646-610-7272) or their local police precinct, or contacting the College's Public Safety Office (212-772-4444).
1. All Other Forms of Sexual Misconduct: Students are also encouraged to contact the College's Title IX Campus Coordinator, Dean John Rose (jtrose@hunter.cuny.edu or 212-650-3262) or Colleen Barry (colleen.barry@hunter.cuny.edu or 212-772-4534) and seek complimentary services through the Counseling and Wellness Services Office, Hunter East 1123.

CUNY Policy on Sexual Misconduct Link: Sexual Misconduct Policy (cuny.edu)

Collaboration with the Greenbelt Society

Educate/Engage/Empower

https://www.instagram.com/greenbeltsociety/

Our course works and participates in close collaboration with the Greenbelt Society, a group formed by a diverse group of professionals, faculty, alumni and students affiliated with the Department of Geography and Environmental Science at Hunter College in NYC. The outdoor activities are organized in collaboration with the Greenbelt as well as The NYC Parks Department and other organizations such as the American Littoral Society. Our mission is to provide a platform for members to actively participate in projects, events and other activities in environmental science and sustainable development. We seek to promote intellectual and professional development through discussion, interdisciplinary collaboration and external networks. You can participate or be a member of the group.

The outdoor events will be announced during the semester.

Course Contents and Calendar:

Week 1

August 29th (Thursday): Introduction, Science/Traditional Knowledge
1. Syllabus Presentation
2. What is Science? And the Scientific Method?
3. Science, BioGeography and Traditional Knowledge (TK)
4. Group Report Project (Phase 1): a. Forming of the Groups b. Thinking about The Study Area

Week 2:

Sept. 2nd (Monday): NO CLASS

Sept. 5th (Thursday): Nature, Its Ideologies and the Development of BioGeography
1. What is Nature?
2. Origins and Development of BioGeography
4. Group Report Project (Phase 2): Thinking about The Study Area

Week 3:

Sept. 9th (Monday): Geographic Foundations and the Spatial Distribution of the Species 1
1. From Climate, to Soils and Time
2. Geographic Range and Ecological niche
3. Limits of the Geographic Range: from Physical Factors to Disturbance/Time to Organisms Interaction: Competition, Predation, Mutualism

Sept. 12th (Thursday): Foundations of the Spatial Distribution of the Species 2
3. What are Aerography and Ecogeography?
4. Group Report Project (Phase 3): Research Questions and Objectives

Week 4:

Sept. 16th (Monday): Spatial Distribution of Communities 1
1. Communities, Ecosystems, and Biomes
2. Planetary Biomes: From the Taiga to the Mountain Tropical Biomes
3. Aquatic, Coastal and Wetlands Ecosystems

Sept. 19th (Thursday): Spatial Distribution of Communities 2: Quinhagak (Alaska)
1. Study Case: Quinhagak (Alaska) and the Subarctic Tundra
4. Group Report Project (Phase 4): Literature Review

Week 5:

Sept. 23rd (Monday): *Sub*BioGeographical Dimensions
1. What are the *Sub*BioGeographical Dimensions?
2. Deep-Dwelling Microbes, Fungi-Arboreal Connection, and Dark Oxygen
3. BioGeographical Scenarios in the Antarctic Subglacial Lakes

4. **AI Experimental Activity**: Using an AI program, we (in groups) will visualize and explain what type of biogeographical conditions could exist in some hypothetical biogeographical scenarios such as,
(a) Jupiter's Ocean-World Moon Europa
(b) The Arctic Ocean without sea ice and animals like Polar Bears.
See Appendix 1 for more information.

Sept. 26th (Thursday): Group Report Project (Phase 5): Methodology and Materials

Week 6:

Sept. 30th (Monday): Biogeographic Processes

1. Dispersal

2. Immigration

3. Study Case: Wildebeest (gnu) and the Tundra Caribou

Oct. 3rd (Thursday): NO CLASS

Week 7:

Oct. 7th (Monday): Speciation and Extinction

1. Do Species *really* Exist?

2. Speciation, Diversification, and Extinction

Oct. 10th (Thursday):

Group Report Project (Phase 6): Intellectual Contribution

Week 8:

Oct. 14th (Monday): NO CLASS

Oct. 15th (Tuesday): Classes following Monday Schedule):

The Spatial Analysis of the Biogeographical Diversity 1

1. Basic Vision of the Geographic Patterns

2. Endemism and Provincialism

3. Biographic Disjunction

Oct. 17th (Thursday): The Spatial Analysis of the Biogeographical Diversity 2

1. The Biotic Dimension: Distinct and Exchange

4. Group Report Project (Phase 7): Figures and Tables

Week 9:

Oct. 21st (Monday): MID-TERM EXAM
Oct. 24th (Thursday):
Group Report Project (Phase 8): FIELDWORK

Week 10:

Oct. 28th (Monday): Island Biogeography 1
Due LITERATURE REVIEW (for graduates)
1. Types of Island
2, Arrival, Survival, and Adaptation
Oct. 31rd (Thursday): Island Biogeography 2
1. The Theory of Island Biogeography
Group Report Project (Phase 9): Identification of the Main Environmental Impacts and Consequences

Week 11:

Nov. 4th (Monday): The Planetary Machines: Tectonics and Its Biogeography Impacts 1
1. Alfred Wegener and the Continental Drift
2. What is the Tectonic Plate Theory?
3. The Tectonic Dynamics and its Biogeographic Consequences 1
Nov. 7th (Thursday): The Planetary Machines: Tectonics and Its Biogeography Impacts 2
1. The Tectonic Dynamics and its Biogeographic Consequences 2
2. Did Tectonics Influence the beginning of Life?
3. Group Report Project (Phase 10): Strategies and Solutions

Week 12:

Nov. 11th (Monday): The Last 400 Million of Biogeographic Stories 1
1. Biogeographical Changes and Continents Moving
2. The Earliest Mammals and Flowering Plants (Gymnosperms/Angiosperms)
Nov. 14th (Thursday): The Last 400 Million of Biogeographic Stories 2
1. Visualizing the Early Biomes
2**. Group Report Project (Phase 11):**

Week 13:

Nov. 18th (Monday): The Pleistocene and its Biogeographical Impacts 1
1. The Glacial/Interglacial Periods of the Pleistocene
2. Biogeographic Impacts of the Pleistocene Climate Cycles
Nov. 21st (Thursday): The Pleistocene and its Biogeographical Impacts 2
1. Glacial Refugia and Megafauna Extinctions
Group Report Project (Phase 12): Final Review of the Report

Sunday (Nov. 24th): DUE the FINAL GROUP REPORTS

Week 14:

Nov. 25th (Monday): The Emergency of Humans
1. From *Sahelanthropus tchadensis* to *Homo sapiens sapiens* through *neanderthalensis*
2. The Origins of the Agriculture Revolution
3. The Ecological Impact of Human Culture
Nov. 28th (Thursday): NO CLASS; THANKSGIVING

Week 15:

Dec. 2nd (Monday): The Anthropocene and The Conservation Biogeography
1. Is the Anthropocene *just* a Human Vision?
2. The Biodiversity Crisis
3. Potential Strategies and Solutions: Study Case: The Elwha River Restoration Project
Dec. 5th (Thursday): WALKING TOUR OF THE GROUPS (STUDY AREA)

Saturday (Dec. 7th): DUE the COMPLETE FINAL GROUP REPORTS

Week 16:

Dec. 9th (Monday):
1. Presentations of the Final Report Project
2. Discussion of the Report
3. Checking the Scientific/Fieldwork Notebook (in class)

Dec. 12th (Thursday): Final BioGeographical Meditations
1. From Bhutan's Constitution to The Bali Principles
2. Iceland's Glacier Funerals and Norway's Doomsday Seeds Vault
3. Carl Sagan's "Blue Dot".
4. Should Rivers have "Rights"?

Week 17:

Dec. 19th (Thursday): FINAL EXAM 1:45 – 3:45 pm

Required Materials (by week)

Week 1

August 29th (Thursday): Introduction, Science/Traditional Knowledge

-Bradford, Alina (2015). "Science & the Scientific Method: A Definition." *Livescience* (March 30). Available at http://www.livescience.com/20896-science-scientific-method.html

-Chapter 1, "The Science of Biogeography" [read pages 4-8]. In *Biogeography* (4th Edition). Mark V. Lomolino et al.

-*Cosmos Magazine* (2018, April 24). "When Science Meets Art." Available on https://cosmosmagazine.com/society/when-science-meets-art/

-Nicholas, George (2018). "It's taken thousands of years, but Western science is finally catching up to Traditional Knowledge." *The Conversation* (February 14). Available on https://theconversation.com/its-taken-thousands-of-years-but-western-science-is-finally-catching-up-to-traditional-knowledge-90291

Week 2: Nature, Its Ideologies and the Development of BioGeography

Sept. 5th (Thursday):

Chapter 1, "The History of Biogeography." [read pages 4-10]. In *Biogeography: An Ecological and Evolutionary Approach* (9th edition). Barry Cox et al.

-Williams, Raymond (1980). "Ideas of Nature" in *Problems in Materialism and Culture.* London: Verso.

Week 3: Foundations of the Spatial Distribution of the Species 1

Sept. 9th (Monday) and Sept. 12th (Thursday)

-Chapter 3, "The Geographic Template" [read pages 49-69]. In *Biogeography* (4th Edition). Mark V. Lomolino et al.

-Chapter 4, "Distributions of Species." In *Biogeography* (4th Edition). Mark V. Lomolino et al.

Week 4: Spatial Distribution of Communities

Sept. 16th (Monday) and Sept. 19th (Thursday)

-Chapter 5, "Distributions of Communities." In *Biogeography* (4th Edition). Mark V. Lomolino et al.

-Geodiode (n. d.). "The Tundra Climate - Secrets of World Climate #11." Available at https://www.youtube.com/watch?v=pNxgY4Ru3gs&t=302s

-"Tour of Quinhagak, Alaska" [video]. Available at https://www.facebook.com/LowerKuskokwimSchoolDistrict/videos/tour-of-quinhagak-alaska/343672546507570/

Further Materials:

-Geodiode (n. d.). "Biomes: The Living Landscapes of Earth." [Series of videos]. Available at https://www.youtube.com/playlist?list=PLu83ZzwRbQvIvhdkLCT2EvKNWb1F-KWs7

Week 5: *Sub*BioGeographical Dimensions

Sept. 30th (Monday):

-Scientific American

a. (August 20, 2014). "Life Found 800 Meters Down in Antarctic Subglacial Lake" at https://www.scientificamerican.com/article/life-found-800-meters-down-in-antarctic-subglacial-lake/

b. (June 21, 2024). "Out of Sight, 'Dark Fungi' Run the World from the Shadows" at https://www.scientificamerican.com/article/mysterious-dark-fungi-are-lurking-everywhere/

-The Conversation (Feb. 13, 2023). "Do trees really stay in touch via a 'wood-wide web'? Here's what the evidence says" available online.

-*The Guardian* (2024). "'Dark oxygen' in depths of Pacific Ocean could force rethink about origins of life." (July 22). Available at https://www.theguardian.com/environment/article/2024/jul/22/dark-oxygen-in-depths-of-pacific-ocean-could-force-rethink-about-origins-of-life

-*The New York Times* (June 24, 2024). "The Mysterious, Deep-Dwelling Microbes That Sculpt Our Planet."

-Vox (June 18, 2024). "There's a secret wildlife wonderland hidden in the US — and it's in danger" at https://www.vox.com/down-to-earth/355114/salamander-wildlife-biodiversity-appalachia-us-climate-change-wildlife

Further Materials:

-Sweetman, Andrew et al. (2024). "Evidence of dark oxygen production at the abyssal seafloor." *Nature Geoscience*. Available at https://www.nature.com/articles/s41561-024-01480-8

Week 6: Biogeographic Processes
Sept. 30th (Monday):
-Chapter 6, "Dispersion and Immigration." In *Biogeography* (4th Edition). Mark V. Lomolino et al.
-"Caribau Migration" [video]. Available at https://www.youtube.com/watch?v=r6jcqCm5C1Q
-"The Great Wildebeest Migration | Full Series | Wild Animals Documentary." [Video]. Available at https://www.youtube.com/watch?v=Gt93IiBN7Tk

Week 7: Speciation and Extinction
Oct. 7th (Monday) and Oct. 10th (Thursday):
-Chapter 7, "Speciation and Extinction." In *Biogeography* (4th Edition). Mark V. Lomolino et al.
-*The New York Times* (2024). What Is a Species, Anyway?
Further Materials:
-*Forbes* (2017). "The Existence Of Different Species Is A Scientific Construct, Not An Argument Against Evolution." Available at https://www.forbes.com/sites/quora/2017/04/27/the-existence-of-different-species-is-a-scientific-construct-not-an-argument-against-evolution/

Week 8: The Spatial Analysis of the Biogeographical Diversity
Oct. 15th (Tuesday) and Oct. 17th (Thursday):-Chapter 10, "The Geography of Diversification." In *Biogeography* (4th Edition). Mark V. Lomolino et al.

Week 9:
Oct. 21st (Monday) and Oct. 24th (Thursday)
-Mid-Term Exam and Fieldwork

Week 10: Island Biogeography
Oct. 28th (Monday): and Oct. 31st (Thursday):
-Chapter 7, "Life, Death, and the Evolution of the Islands." In *Biogeography: An Ecological and Evolutionary Approach* (9th edition). Barry Cox et al.

Week 11: The Planetary Machines: Tectonics and Its Biogeography Impacts
Nov. 4th (Monday) and Nov. 7th (Thursday)
-Chapter 8, "The Changing Earth." In *Biogeography* (4th Edition). Mark V. Lomolino et al.
-*Phys.org* (2024). "Did Earth's multicellular life depend on plate tectonics?" Available at https://phys.org/news/2024-05-earth-multicellular-life-plate-tectonics.html

Week 12: The Last 400 Million of Biogeographic Stories
Nov. 11th (Monday) and Nov. 14th (Thursday):
-Chapter 10, "Patterns in the Past." In *Biogeography: An Ecological and Evolutionary Approach* (9th edition). Barry Cox et al.

Week 13: The Pleistocene and its Biogeographical Impacts
Nov. 18th (Monday) and Nov. 21st (Thursday)
-Chapter 9, "Glaciation and Biogeographic Dynamics of the Pleistocene." In *Biogeography* (4th Edition). Mark V. Lomolino et al.

Week 14:
Nov. 25th (Monday):
-Chapter 13, "The Human Intrusion." "The Emergency of Humans." In *Biogeography: An Ecological and Evolutionary Approach* (9th edition). Barry Cox et al.

Week 15:
Dec. 2nd (Monday): The Anthropocene and The Conservation Biogeography
-Chapter 14, "Conservation Biogeography." In *Biogeography: An Ecological and Evolutionary Approach* (9th edition). Barry Cox et al.
-Olympic National Park (n. d.). "Restoration of the Elwha River: Restoring the Elwha River Webisode Series." [series of videos]. Available at https://www.nps.gov/olym/learn/nature/restorationoftheelwha.htm
-*The Guardian* (2024). "Geologists reject declaration of Anthropocene epoch." Available at https://www.theguardian.com/science/2024/mar/22/geologists-reject-declaration-of-anthropocene-epoch
Further Materials:
-The International Union of Geological Sciences (IUGS). "Anthropocene." Available at https://www.iugs.org/_files/ugd/f1fc07_40d1a7ed58de458c9f8f24de5e739663.pdf?index=true

Week 16:
Dec. 12th (Tuesday): Final Biogeographical Meditations:
-**"**Bali Principles of Climate Justice.**"** Available at https://www.ejnet.org/ej/bali.pdf
-PBS (2023). Global Seed Vault becomes more important as climate changes" [video]. Available at https://www.pbs.org/video/doomsday-vault-1680643128/
-Sagan, Carl (n. d.). "Carl Sagan's Pale Blue Dot Official" [video]. Available at https://education.nationalgeographic.org/resource/anthropocene/
-TED (2016). "This Country isn't just carbon neutral-it's carbon negative." [Video]. Available online.
-*The Guardian* (2018). "Iceland holds funeral for first glacier lost to climate change.". Available at https://www.theguardian.com/world/2019/aug/19/iceland-holds-funeral-for-first-glacier-lost-to-climate-change
-*The Guardian* (2021). "Should rivers have the same rights as people?" Available at https://www.theguardian.com/environment/2021/jul/25/rivers-around-the-world-rivers-are-gaining-the-same-legal-rights-as-people

Appendix 1: A Detailed Description of the Assignments

List of Assignments:

-Final Group Report:

1. Final Group Report (Final Document)
2. Abstract
3. Oral Presentation
4. Walking Tour of the Research Area

-Literature Review:

-Mid-Term and Final Exams

-Fieldwork Notebook:

-Class Participation:

-Extra-Activities:

1. AI Experimental Activity
2. Eco-Credits

Description of Scaffolding Process of High-Stakes Assignments
All high-stakes assignments are scaffolded in the following manner. These scaffolding processes are indicated also in the Course Content and Calendar section (see below):

The Final Group Report
The completion of this project will be implemented through various steps and revisions:

Step 1: The students begin to select a list of potential research or study areas such as the Newtown Creek or the Bronx River Restoration Project.

Step 2: Construction of research question/s connected to the topic and how to collect scientific data.

Step 3: Construction of the diverse sections of the Report such as Literature Review, Methodology, Intellectual Contribution.

Step 4: Feedback and revision of each of these sections

Step 5: Elaboration of the first draft of the Report.

These first five steps are implemented through commentaries posted by email as well as in brief conversations in class, as indicated in the section Course Content and Calendar.

Step 6: Second draft of the final report. All students who wish to have revisions of their final report should meet with the instructor (email or Zoom) to see where and how the final paper could be improved.

Step 7: Presentation of the Final Report.

-Final Group Report:

This assignment is composed of 4 parts: The Final Group Report Document, the Abstract, a Presentation, and the Walking Tour.

1. Final Group Report: The Ecological Restoration Project

The principal objective of the entire class is the elaboration of a 'Final Report' that analyzes a particular case of Ecological Restoration in the New York City Metropolitan area. Some possible examples could be…

a. The Newtown Creek Ecological Restoration
b. The Gowanus Canal Ecological Restoration Project
c. The Bronx River
d. The Marine Park

In this assignment the students will participate together in the analysis of this case. In order to complete this Report, we will divide the class in around 2 groups. Each group (at least one student will be a graduate student), will be focused on a specific impact that that particular site is currently experiencing. Thus, for example, group 1 would focus on the analysis of water pollution on a wetland area and group 2 on plant invasive species and sea level rise (see Figure 1). Moreover, these groups design potential mitigation strategies and solutions to 'reconstruct' ecologically this area. Each group will elaborate a report of that particular topic following the guidelines (sample of the structure) shown below. Every group (7-8 students) will create a

document of at least 50-60 pages. And then, these two groups will integrate their reports into the **Final Complete Report** at the end of the semester. In order to coordinate these group activities, each graduate student from every group will form part of a Coordinator Group (see Figure 1). Finally, these two two groups will organize a tour to the study area.

Main tasks of Graduate Students:

1. Coordinate the internal group operations and transmit them to the other groups
2. Complete the common sections for the Final Report: Introduction, Literature Review, Methodology, Intellectual Contribution, and Conclusion.
3. Elaborate the Abstract of the Final Report
4. Meet with the instructors during the semester (giving updates)

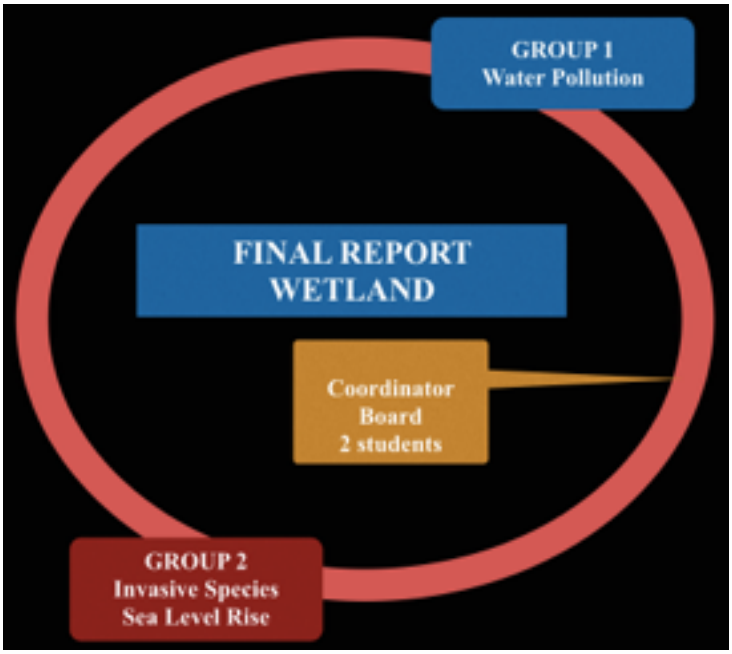

Figure 1 (general View of the Final Report)

Structure of the Group Report:

-Introduction
-Research Questions and Objectives
-Literature Review
-Studied Area and Ecological/Historical Evolution of the area
-Identification of the main Problem/s (air pollution)

-Consequences
-Possible Mitigation Measurement/Solutions
-Methodology and Materials
-Intellectual Contribution/Significance
-Conclusion
-Bibliography

1. Introduction: section of the proposal that illustrates the principal theme of the investigation through a short background of the topic. For instance, **"**Since the 1990s renewable energy projects have become visible features of our landscapes. Countries such as Denmark, Germany or Spain have regions possess an extraordinary density of renewable projects in their territories.**"**

2. Research questions and objectives: section that exposes the main research objectives and question/s used by the student to investigate the topic. For example, **"**I will explore in this work those environmental impacts caused by wind farm facilities in North Dakota, putting special attention on the visual integration of wind turbines in the landscape. To study this relation, I will try to answer the following questions: what type of sociopolitical and environmental impacts do renewable energy projects generate? How have local communities accepted this type of energy plants?**"**

3. Literature review: part of the proposal where the student demonstrates her/his knowledge about some of the main scholars**'** works and arguments analyzing this topic. Examples: **"**Whereas Peter Smith and Lucas Felman (2014) have analyzed the impact of the new wind farm projects in Europe, Leonardo Sanprocio and his research team (2013) have analyzed the environmental consequences of solar and wind projects in the Southwest of United States.**"**

4. Studied Area and Ecological/Historical Evolution of the area
Section where one describes the main geographical and ecological characteristics of the selected. Moreover, this part should include a description of the historical evolution of the area. This historical description would facilitate a more adequate final visualization of the current situation of the territory (e. g. the transformation of a wetland area into a dumping site).

5. Identification of the main Problem/s
Part where the main problems or negative issues are identified. For example, the dumping and draining activities in a wetland area.

6. Consequences

Description of the main consequences generated by those processes.

7. Potential Mitigation Strategies/Solutions

This is one of most fundamental pieces of the Final Report because it represents a crucial component of the course: we are not 'just' analyzing entities of environmental issues, but overall agencies that facilitate the design and implementation of mitigation strategies and solutions. Considering again the wetland example, we not only would analyze how that ecosystem has been negatively impacted by dumping operations and draining activities, but also elaborate possible solutions to transform this area again into a healthy wetland.

8. Methodology and Materials: the student displays in this section all of those methods that will be managed for data collection. These methods can be classified in two categories:

a. Primary sources: information obtained directly by the student: experiments, interviews, direct observation, etc.

b. Secondary sources: articles, books, websites, films, or audios.

9. Intellectual contribution: In this section the student demonstrates the importance or significance of her/his work. For instance, **"**This work is crucial because it will contribute to the understanding of those environmental and cultural impacts caused by the renewable projects.**"**

10. Conclusion: Summary of the paper proposal.

11. Bibliography, Works Cited, or References section

Citation Styles: A completed description of the different citation styles can be found at The University of Pittsburgh (2020). **"**Citation Styles: APA, MLA, Chicago, Turabian, IEEE: Home**"** Available on https://pitt.libguides.com/citationhelp

2. Abstract (for Graduates):

Section that describes shortly, precisely, and efficiently the main components of a paper: background of the topic, research focus, thesis, and methods. Most of the abstracts have around 250 words and are composed by three sections:

-Title

-Main Text

-Key words: between three and four words that reflect precisely the main key points of the

investigation.

You can find some guidelines in this link https://writingcenter.gmu.edu/guides/writinganabstract.

Sample: Abstract for the American Association of Geographers Conference (AAG): "Climate Change Denial and the Tragedy of North America's Dams"

With approximately 90,000 big dams, the United States has more dams than nearly any other country. It is commonly recognized that these dams, largely built between the 1930s and the 1960s, are in a state of disrepair; in fact, 80 percent of U.S. dams will reach their life span by 2020. This condition is exasperated by unprecedented changes in climatic patterns. Climate change is accelerating dam vulnerability and boosting the risk of collapse. In California, the Oroville dam, the tallest dam in the United States, nearly collapsed due to the unusual amount of winter precipitation in 2017. In Puerto Rico, the Guajataca Dam, hit hard by hurricane Maria, also nearly collapsed in 2018. And in March 14, 2019, the Spencer Dam did collapse, making it the first dam ever to be destroyed by ice chunks. Despite the undeniable influence of the weather, some entities still reject climate change as a factor threatening dam infrastructure, asserting that the managerial negligence of public institutions and the aging status of dams are the only causes of this decay. This paper exposes how two main ideologies have contributed to the current rejection of climate as a factor in dams' vulnerability. First, the engineering profession still produces engineers who are taught to observe nature mechanically, without recognizing the changing ecological scenario. Second, some conservative agencies, in an effort to convince the public that public institutions and infrastructures do not and cannot function, erase climatic influence from their descriptions.
Keywords: Dams, climate change, engineering, and conservatism

3. Oral Presentation of the Final Research Paper and Group Work:
You can use programs such as PowerPoint or others to present your research paper
-Undergraduate students: around 10-15 minutes
-Graduate students: around 15-20 minutes

4. Walking Tour
Both groups will be responsible of organizing a tour of its topic in situ. All of the groups will go to the area at the same time.

-Literature Review (For Graduate Students):

Using at least 5 references, the graduate students will analyze a specific topic related to biogeographic processes.

Note: The students will receive feedback for the Group Report, the Literature Review document, and the abstract (just for the graduate students).

-Two Exams: Mid-Term and Final Exams:

These exam will be completed in class. The exams will be composed of a set of multiple-choice questions. These questions will be divided in two categories:

1. The question has "just" one correct answer
2. The choice could be either "All of them" or "None of them"

Sample of a Multiple-Choice question:

1. Choose the correct answer about the Earth's shape:

a. The Earth is a sphere with flattened poles
b. The Earth is a perfect sphere
c. It is a flat planet moving around the sun
d. The Earth is not planet, but a moon

-Fieldwork Notebook:

You will complete a notebook where you will practice how to take notes, drawing, painting, and other fieldwork activities. You will collect information from class and outdoor. The notebook is a fundamental tool for any geographer or environmental scientists. At the end of the semester (see Calendar) the teacher will review your notebook in class. See below two samples from Feliz Rodriguez de la Fuente's "Cuadernos de Campo." See two samples below.

-Class Participation (Indoor):
Class participation is fundamental for your success in this class and includes all of the following: class discussion, Blackboard posts, group activities, fieldwork, outdoor actives (e. g. tree planting, hiking, coastal clean ups, etc.), and attendance. You need to study the "Materials" every week (check each class in the syllabus) in order to prepare the class.

-Extra-Activities:
1.AI Experimental Activity (Sept. 23rd (Monday): Every group will use an artificial intelligence (AI) program to visualize a new ecosystem or biome. A potential case could be the rewilding of an area (e. g. Siberia and Mammoths), the transformation of an ecosystem, or the visualization of Jupiter's oceanic moon of Europa, as an underground oceanic world. The figure below is prototype generated by an AI. It depicts a futuristic world of the Arctic Ocean where a polar bear has become a sort of an amphibian organism. The students will design, explain and analyze this virtual creation.

2.*Eco*Credits (Extra-Credit)
Our course in collaboration with the Greenbelt Society (https://www.instagram.com/greenbeltsociety/), and institutions such as NYC Parks will be organizing diverse outdoor activities such as coastal clean-ups during this semester. Every activity represents a number of credits called ***Eco*Credits**. The bigger the number of outdoor activities, the bigger the amount of *Eco*Credits or extra-credit will be. Students will have to report each of the activity. How? Just a brief description of what you did, where, when, and how (see below the the Report sample). The objective of these activities is not just learn about environmental issues, but also contribute to mitigate and restore sensitive ecological areas as well as elaborate solutions for those particular scenarios. The students will become not only direct observers, but also active participants in the resolution of ecological issues. Some examples could be,

1. Coastal Clean-Ups:
    a. Ecological Restoration of coastal areas, marshes and rivers: planting coastal-marsh species such as Spartina or removing of invasive species.
    b. Clean-ups and maintenance of green infrastructure such as bioswales.
2. Tree Planting Activities
3. Hiking Tours such as the Hudson Valley or the Harriman State Park.

4. You may consider activities organized by yourself or collaborating with other institutions. Various examples,
a. How to expand or start your food-waste for compost in your home.
b. How to reduce the amount of energy in your home
c. Or just participating in clean-ups by yourself.
See a Sample below

Sample of a Eco-Credit REPORT

Name:	
Last Name:	
Type of Zone:	(e. g. urban, rural, suburb, marsh, etc.)
Location of the Activity:	(e. g. neighborhood, county, state)
Area/Surface of the site:	(e. g. 400 sq. feet)
Date/Time	
Type of Activity	(e. g. coastal clean-up, coastal restoration, bioswales cleaning, etc)
General Description of the Activity	If you participated in a costal clean-up activity, include data/information about the institution that organized this operation, what you did, how much plastic you collected. You could include photos or maps. ~1 page