Biodiversity on a Changing Planet

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Instructor:

Prof. Jenny McGuire, Schools of Biological Science and Earth and Atmospheric Sciences

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Office hours: TBD

Course materials: No textbook required. Some required papers will be provided.

Course website: You will need to access additional materials on the Canvas course management site for our course at **https://canvas.gatech.edu** (you log in using your GT username and password, just like for email). Class notes, labs, grades, the syllabus, and other information will be posted regularly.

Class meetings:

Lectures: Monday/Wednesday 11:15-12:05

Lab: Friday 11:15-2:00

Pre-requisites:

BIOL 1510 or EAS 1600 or permission of the instructor

Grading: No tests – this is a lab-based class that is focused on analysis and integration.

Lab Attendance & Participation:	10%
Lab Reports:	45%

Project Proposal:	5%
Final Presentation:	10%
Final Project:	30%

Rationale: Why do plants and animals live where they do and how will they respond to changing environmental conditions? This course will explore scientific approaches to untangle the dynamic interactions between landscapes, climate, and biodiversity. In it, we will use real data to examine the fundamental principles of landscape ecology and biogeography. We will practice the techniques used to map and analyze spatial ecological patterns in dynamic settings. Through this course, students will gain marketable GIS skills while simultaneously learning how to formulate spatial hypotheses about ecological processes. At the end of the course, students will develop independent projects, in which they formulate hypotheses about spatial interactions between abiotic and biotic factors and test those hypotheses using real data.

Learning Objectives:

- Identify drivers of modern biodiversity patterns
- Describe likely responses to environmental change, including human land use changes and climate change
- Become adept at using spatially explicit computational tools (e.g. ArcGIS, species distribution models, corridor models)
- Formulate and test spatial ecological hypotheses
- Independently analyze a spatially explicit dataset

Lab format: There will be 4, two-week, paired labs during the main part of the class. Labs will involve manipulating real species, climate, and landscape data to observe and demonstrate principles that have been discussed during lectures. During the first lab of each pair, students will be responsible for working through a guided lab, writing up results, and completing thinking questions in preparation for the second lab. At the beginning of each “Hypotheses and tests” lab, students will form groups to discuss the thinking questions and formulate hypotheses that they would like to test using the data. At the end of each two-week lab, there will be a lab write-up that integrates material from the lecture and the lab. Lab reports will be due at the start of the lab the following week. Graduate students will have some additional questions.

Participation*:* Participation is absolutely critical to success in this class. Unapproved absences will

affect both your participation grade and your grade for that project. That said, I will of course accommodate institute-approved absences (travel, medical, etc.). This will typically be done with a make-up, partially supervised lab session or with additional work analyzing and preparing data from the lab. Get in touch with me as soon as possible if you know of an impending absence or as soon after an absence as possible.

Final Projects: Final projects will be five weeks long including two lecture periods during which we will present and discuss project proposals, four in-lab data collection and analysis days, and final lab presentations during the final lab section. Projects will require addition out-of-class time, likely including data collection and analysis during these weeks. There will be intermediate steps required (presentation of idea, literature search, preliminary data) during those weeks. However there will not be other requirements for the class during that time. The final project should draw upon the methods and theory you learned in the core labs and from the primary literature. The final projects will culminate in a longer formal report in scientific format and a presentation during the finals lab period for the class (there will be no final exam).

Conduct: You occasionally form groups of 3-4 during the semester to discuss hypotheses that you will test using data from lab. You may work together throughout the lab and will likely perform similar analyses, **but each student must write out a description individually.** The instructor will also evaluate participation during the lab period and discussions.

Throughout the course, you are expected to adhere to the student Code of Conduct. The most common problem in this type of class is plagiarism, both intentional and unintentional. Any time information or data are incorporated based on a published source, that source must be referenced. Any time words are used verbatim, the source must be referenced and quoted. Copying from resources or other students, even copying and then changing wording is not allowed except for the shared work materials exempted above (results and data plots).

Americans with Disabilities Act: Students with disabilities needing academic accommodation should 1) register with and provide documentation to the Office of Disability Services (**http://disabilityservices.gatech.edu/** **(http://disabilityservices.gatech.edu/)**), 2) bring a letter to the instructor during the first week of class indicating and describing the need for accommodation. This syllabus and other class materials are available in alternative format upon request.