

**WELCOME TO GEOGRAPHY/BOTANY 338: ENVIRONMENTAL BIOGEOGRAPHY**  
Fall 2015

Schedule: Mon & Wed 2:30-3:45, Humanities 1641

Credits: 3

Instructor: Professor Erika Marín-Spiotta

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Office: Science Hall 223

Office Hours: TBD or by appointment

Note: This course fulfills the Biological Science breadth requirement.

**COURSE DESCRIPTION:**

This course takes an ecosystems approach to understand how physical -- climate, geologic history, soils -- and biological -- physiology, evolution, extinction, dispersal, competition, predation -- factors interact to affect the past, present and future distribution of terrestrial biomes and all levels of biodiversity: ecosystems, species and genes. A particular focus will be placed on the role of disturbance and to recent human-driven climatic and land-cover changes and biological invasions on differences in historical and current distributions of global biodiversity.

**COURSE GOALS:**

- To learn patterns and mechanisms of local to global gene, species, ecosystem and biome distributions
- To learn how past, current and future environmental change affect biogeography
- To learn how humans affect geographic patterns of biodiversity
- To learn how to apply concepts from biogeography to current environmental problems
- To learn how to read and interpret the primary literature, that is, scientific articles in peer-reviewed journals.

**COURSE POLICY:**

I expect you to attend all lectures and will record attendance. If you miss three or more lectures without first alerting me, you will automatically lose your 20 points of participation. Please respect your fellow students, professor, and guest speakers and turn off the ringers on your cell phones and refrain from texting during class time. Non-class-related internet or computer use is not allowed during the class period. It is distracting to your fellow students.

**REQUIRED READING:** All readings will be posted as PDFs on Learn@UW

- Quammen, D. 1996. The Song of the Dodo: Island Biogeography in an Age of Extinction. Touchstone Simon & Schuster, NY. (Selections).
- Selected research articles and book chapters as posted on Learn@UW

Supplementary texts (on reserve in the Geography library, Science Hall 2nd floor):

- Biogeography - An Ecological and Evolutionary Approach by Cox and Moore
- (Blackwell Pub)
- Biogeography 3rd Edition by Lomolino, Riddle and Brown (Sinauer)
- Biogeography - Space, Time and Life by MacDonald (Wiley)

- Foundations of Biogeography ed. by Lomolino, Sax and Brown (Chicago Press)
- Principles of Terrestrial Ecosystem Ecology by F.S. Chapin III, P.A. Matson, and H.A. Mooney (Springer)
- Physical Geography, A Landscape Appreciation. McKnight and Hess (Pearson Prentice Hall)

### **EVALUATION:**

Final letter grade is based on a percentage of points you earn out of a possible 200.

Exam 1: 40 points (20% of your grade)

Exam 2: 40 points (20%)

Exam 3: 40 points (20%)

Paper Outline: 5 points (2.5%)

Term Paper: 40 points (20%)

Peer-Review: 5 points (2.5%)

Reading Reflections: 10 points (5%)

Participation during in-class discussions and attendance: 20 points (10%)

There will be no extra credit.

### **EXAMS:**

Exams will cover material from lectures, assigned readings, and in-class discussion and will consist of multiple choice, definition, short answer, and essay questions designed to gauge the extent students have acquired a basic literacy in biogeographical concepts. The third exam will predominantly focus on the last third of the course material, but students should be aware that the topics in biogeography build upon each other and so links to materials in previous lectures will be expected. There is no exam during finals week.

### **TERM PAPER:**

All paper topics should be approved by the instructor. Papers will be peer-reviewed by one of your classmates before final submission. Instructions will be provided when paper topics are due. All submissions are to be word-processed in 12-point font, double-spaced, left-justified and uploaded into the Dropbox on the Learn@UW website. Provide citations for all data and arguments that are not your own. In scientific articles, it is usual practice to paraphrase results or conclusions from other articles as long as the exact wording is not copied and the original authors are given proper credit. The use of direct quotations is very uncommon unless the exact wording is necessary to prove a point. Please see separate paper instructions document.

### **UNDERGRADUATE STUDENTS:**

Write a 6-page paper on the biogeography of a particular species, genus or family, and provide its current and historical patterns and mechanisms of distribution, conservation status, and life history (including important biological interactions and environmental requirements).

### **GRADUATE STUDENTS:**

Write a 12-page paper on a controversy in Biogeography and state the problem, trace its origins in the literature, provide arguments on opposing sides from the peer-reviewed literature, and what implications it has on current thinking and practice in conservation or sustainable use.

Suggested Journals with Biogeographic Content:

Ecography; Journal of Biogeography; Diversity and Distributions; Global Ecology and Biogeography; Progress in Physical Geography; Global Change Biology; Proceedings of the National Academy of Sciences; Nature; Science; Trends in Ecology & Evolution; Conservation Biology; American Naturalist; Annual Reviews in Ecology and Systematics; Biodiversity and Conservation; Biological Journal of the Linnean Society; Ecology; Ecological Applications; Molecular Ecology

Tips on How to Read a Scientific Paper

[www.biochem.arizona.edu/classes/bioc568/papers.htm](http://www.biochem.arizona.edu/classes/bioc568/papers.htm)

[www.bio.unc.edu/faculty/Khogan/HowToReadAScientificPaper.ppt](http://www.bio.unc.edu/faculty/Khogan/HowToReadAScientificPaper.ppt)

**SHORT ASSIGNMENTS:**

During the semester, you will be asked to submit a brief summary of a research or news article to complement lecture material.

**PARTICIPATION:**

I encourage in-class discussions of the lecture material and readings. Most class periods will consist of a 50 minute lecture and 25 minute discussion. In order to make this as productive and enjoyable as possible, I expect everybody to participate. Thus, you need to have read the papers ahead of time, bring questions, and complete assignments as given. On those days that we discuss a reading, each student must come prepared to share an opening discussion statement about the reading.

**QUESTIONS:**

Students who ask questions tend to be able to build connections between course topics and fare better on exams. I am happy to entertain questions during lectures. At the beginning of each class period I will devote time for questions on any material from previous lectures. I will also answer questions submitted by email and on the Learn@UW course discussion board. I expect you to let me know if any of the material is confusing either in person before or after class, by email, or in my office hours. Feedback is welcome at any time.

**ACADEMIC INTEGRITY:**

Academic honesty requires that the course work (drafts, reports, exams, papers) a student presents to an instructor honestly and accurately indicates the student's own academic efforts. Please review the university's guidelines on proper conduct:

<http://students.wisc.edu/saja/misconduct/UWS14.html>

Some examples of academic misconduct (from the website) include: cutting and pasting text from articles or from the web without quotation marks or proper citation and paraphrasing from the web without crediting the source. When in doubt about how to properly cite something, come talk to me.

<u>Week</u>	<u>Date</u>	<u>Topic</u>	<u>Term Paper Schedule</u>
1	Wed 2-Sep	1 Welcome and introduction to biogeography	
2	Mon 7-Sep	<i>No Class- Labor Day</i>	
	Wed 9-Sep	2 Requirements for life: Biological context	
3	Mon 14-Sep	3 Requirements for life: Biological context	
	Wed 16-Sep	4 Requirements for life: Physical environments	
4	Mon 21-Sep	5 Requirements for life: Physical environments	
	Wed 23-Sep	6 Geographic distributions: Biomes	
5	Mon 28-Sep	7 Biological interactions & Trophic dynamics	<i>Topic of Paper Due</i>
	Wed 30-Sep	8 Biological interactions & Disturbance	
6	Mon 5-Oct	9 <b>EXAM 1</b>	
	Wed 7-Oct	10 Species ranges	
7	Mon 12-Oct	11 Species ranges and dispersal	
	Wed 14-Oct	12 Evolution and speciation	
8	Mon 19-Oct	13 Speciation and extinction	<i>Paper Outline Due</i>
	Wed 21-Oct	14 Changing earth geography	
9	Mon 26-Oct	15 Quaternary climate change	
	Wed 28-Oct	16 Biogeographic realms	
10	Mon 2-Nov	17 Phylogeography & biodiversity	
	Wed 4-Nov	18 Phylogeography & biodiversity	
11	Mon 9-Nov	19 <b>EXAM 2</b>	
	Wed 11-Nov	20 Island biogeography	
12	Mon 16-Nov	21 Conservation biogeography	<i>Paper Draft Due to Peer</i>
	Wed 18-Nov	22 Humans as a biogeographic force: Domestication	
13	Mon 23-Nov	23 Humans as a biogeographic force: Agriculture	
	Wed 25-Nov	<i>No class- Happy Thanksgiving</i>	<i>Peer Review Due</i>
14	Mon 30-Nov	24 Climate change & disease biogeography	
	Wed 2-Dec	25 Biogeography in a changing world	
15	Mon 7-Dec	26 New topics in biogeography	
	Wed 8-Dec	27 <b>EXAM 3</b>	<i>Final Paper Due</i>