

GGR 305 H1S 2017
Biogeography
 Syllabus and Class Schedule

Instructor: Dr. Nina Hewitt, nina.hewitt@utoronto.ca; Sidney Smith Hall 5061
 Thurs 5-6 pm; 8-9 pm, and *by appointment*
Lectures: Thursdays, 6:00-8:00 pm, SS 2110
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Course Description

Biogeography is the study of the distribution of plants and animals on the earth's surface, and the historical, ecological, and human factors responsible. Generally, it is concerned with fundamental processes of evolution, extinction, and dispersal. It asks such questions as: Why are placental mammals dominant in Eurasia and North America while marsupials dominate Australia? Why do Australia and Africa share the same plant families? Why are there so many insect, microbe, and plant species in the tropics and why do their numbers decrease towards the poles? What allows a plant species to live where it does, and what prevents its colonization elsewhere? How are plant and animal distributions today different from in the past, and what implications does this have for their abilities to respond to global changes? Why have islands sustained so many extinctions relative to mainlands and what are the implications for mainland species conservation? This course explores these and similar questions. The goal is to introduce the field of biogeography, understand biodiversity patterns and processes across earth, and how this knowledge can help maintain biological systems in human-dominated, 21st century landscapes. We will explore biogeographic themes through lecture, readings from texts and pivotal scholarly articles, classroom discussion, and research assignments.

Course Objectives

- ✓ Explaining patterns of species distributions in terms of physical, ecological and historical controls
- ✓ Understanding the role of processes that operate at geological and evolutionary time scales (e.g., plate tectonic effects, speciation, extinction) in the above
- ✓ Regional analysis of human impacts on species and landscapes from the Pleistocene to the modern era
- ✓ Hypotheses testing of biogeographical question (e.g., testing predictions of effects of ecosystem fragmentation on species populations; testing effects of reserve size on species richness)
- ✓ Basic data manipulation, graphical representation, interpretation and analysis
- ✓ Effective scientific report writing and critical analysis of scholarly literature

Required Text and Readings:

1. Cox, C.B., P.D. Moore and R. Ladle (2016) *Biogeography: An ecological and evolutionary approach* *9th Ed. Wiley, NJ (available in the U of T Bookstore). * The earlier, 8th edition (2010) is also acceptable.
2. Supplemental readings consist of a series of book chapters and journal articles, most of which will be available through the course website on Blackboard. A schedule of most of these weekly readings with page numbers is provided below; Additional ones may be announced in lecture.

Readings and Lectures

Lecture notes will be posted on the course website. Note that these are simple outlines and do not substitute for class attendance (see below). Readings should either be done prior to or immediately following the class for which they are scheduled. Reading material is designed to challenge your knowledge and assumptions, as well as to inform you. You are expected to struggle through difficult aspects of the readings, although you are not expected to come to class an expert on those topics. Class meetings are there to assist you with difficult aspects of readings and address your questions. In many cases, the readings I have chosen are interesting and accessible (e.g., Gould, Quammen, Flannery are thoroughly enjoyable). Articles from academic journals and may be somewhat more challenging, but will enhance your academic experience and mastery of the subject matter.

Assignments

To further our understanding of biogeographical phenomena, you will complete 2 written Assignments. These will be research-related and pertain to course topics. Basic knowledge of graphing will be involved in examining and describing simple datasets. Familiarity with Excel is advantageous. The TA will be happy to assist students needing this. Assignments must be handed in to the professor by the beginning of the class on the due date indicated. Assignments not submitted in class must be turned in via the Drop Box located outside of the Geography Main Office (Sidney Smith Hall 5047). You can only submit assignments to the Drop Box weekdays, during business hours, between 9am and 5pm sharp. To be safe, you should get your assignment there before 4:45pm. Drop Box assignments will be date stamped only. If you expect delays in getting to the main office, we will accept an emailed copy in advance of the hard copy, and your work will be dated from the time the file is received. Late work will be assessed a penalty of 5% per day including weekends. Late work will not be accepted after the date it is handed back to the class. Please notify me if you are having difficulties with assignments so that I can help you early in the process. Additional information on the assignment format will be provided in class. (Pay careful attention to the format specified, as students who ignore it needlessly lose points!).

Attendance

It is important that you attend classes. My slides are not intended to be distance-learning tools, nor a substitute for complete lecture notes. Students who attend classes have a better understanding and enjoyment of their courses than those with weak attendance, and achieve better grades. I will routinely take attendance to keep track. Students are responsible for announcements or changes to the syllabus made while they are absent.

Tests

The midterm test will take place during class on Thursday, February 16, and will consist of multiple choice, short answer and short discussion questions. The final exam will follow the same format and will be held during the exam period in April. It will place emphasis on material covered after the midterm. Information from the textbook and other resources *not* directly covered in class or in the assignments will *not* be tested on exams. Additional details, including a list of study topics and tips, will be provided on Blackboard one week before the test/exam.

Do not miss tests. Accommodation will be made only in the case of a *serious* documented emergency. In the event of such an emergency the student must notify the professor by email, and no later than 1 week after the missed test. The professor will determine whether a makeup test is warranted, pending proper documentation. This includes a U of T medical certificate signed by your physician, available online at: <http://www.illnessverification.utoronto.ca>). In the event of *serious* non-medical extenuating circumstances, students should also notify the professor in advance and provide supporting documentation from their college registrar's office.

Accessibility and Academic Honesty

The University of Toronto is committed to accessibility. If you require accommodations or have any accessibility concerns, please visit <http://studentlife.utoronto.ca/accessibility> or contact disability.services@utoronto.ca

Please remember the seriousness with which the University of Toronto treats academic dishonesty of any form. Plagiarism is quoting or paraphrasing the work of an author, including that of fellow students, without proper citation. Quotation marks are required when using an author's words. This is true whether the student is submitting a formal paper or a hand-written summary. It is a serious academic offense to submit work under your own name that has been written by someone else. Please ask your TA or me if you have any questions about academic integrity. Also, refer to the University's Code of Behaviour on Academic Matters: www.governingcouncil.utoronto.ca/policies/behaveac.htm, the rules section of the Arts and Science Calendar: http://www.artsandscience.utoronto.ca/ofr/calendar/Rules_&_Regulations.html and the 'How not to plagiarize' website: <http://www.writing.utoronto.ca/advice/using-sources/how-not-to-plagiarize>

Evaluation

Assignment 1	15 % (due Feb 9, at the beginning of class)
Assignment 2	20 % (due Mar 23, at the beginning of class)
Term Test	25 % (Feb 16, in class)
Final Exam	40 %

Class Schedule:

Date	Topic	Readings
Jan 5	<u>Introduction</u> : Historical vs Ecological Biogeography; Range Limits; Physical Setting and Intro to Biomes	CM Ch 2 (skim) and Ch 3
12	<u>Historical Biogeography</u> : Immigration and Evolution with an Oceanic Island Focus; Intro A1	CM Ch 8; Quammen j MacDonald pp. 228-234 Krause 2010
19	Island Evolution, continued ed.; pp. 175-194 in 8 th ed.)	CM Ch 6 (background theory: pp.____ in 9 th
26	Plate Tectonics and Biotic Changes	CM Ch 5, 10
Feb 02	Development of Flora and Fauna Today; Focus: Great American Exchange in SA-NA; Dryland Envmnts. (A1 due)	CM Ch 11, Gould (d), Flannery (b)
9	-Midterm Test -	Study topics on Blackboard, Feb 10
23	Reading Week – no classes	
Mar 2	The Quaternary and Emergence of Humans; Intro A2 Hand back test	CM Ch 12, Pielou (i), Davis & Shaw (a)
9	Premodern Humans and Megafauna Extinctions	CM Ch 13, Flannery (c), MacDonald (g)
16	<u>Ecological Biogeography</u> : Modern Extinction ----- Virtual tutorial* : Ecosystem Fragmentation – listen by Mar 23	Quammen (k) Hewitt (e)
23	Discuss VL ; Biodiversity patterns, Hotspots, Coldspots (A2 due)	Chap 4, Kareiva (f); Myers et al. (h)
30	Global Change (Shifting Climate, Invasive Species) & Associated Policy Dilemmas	CM Ch 14, Ch 2, pp. 71-78, Skim: IPCC; Hewitt et al. 2011 (abstract)

* A pre-recorded 'Virtual tutorial' will be posted on Blackboard a week prior to discussion of it (MP3 audio-file and accompanying slide set)

Keep in Mind That:

I reserve the right to alter the schedule of topics and readings. Changes will be announced in class and students are responsible for keeping abreast of any and all changes, including announcements made while the student was absent or tardy. Students agree to accept and comply with these requirements by choosing to remain enrolled in the course.

Supplementary Readings:

- Davis, M. B. and R. G. Shaw (2001). Range shifts and adaptive responses to quaternary climate change. *Science* 292: 673-679.
- Flannery, T. (1991). *The Future Eaters*. Braziller, Melbourne Australia. Pp. 75-101 (Australian geological history and its flora and fauna; resource poverty and high diversity).
- Flannery, T. (1991). *Ibid*. Pp. 137-43; 180-207 (Emergence of an Exterminator Species: Human Origins and Megafaunal Extinctions).
- Gould, S.J. (1980). Ch 28: Sticking up for Marsupials. In *The Panda's Thumb*.
- Hewitt, N. (2009). Forest Fragmentation. In, B. Warf (ed.) *Encyclopedia of Geography*. Sage Publ.
- Kareiva P, Marvier M. (2003). Conserving biodiversity coldspots. *American Scientist* 91: 344-351.
- MacDonald et al. (2012). Pattern of Woolly mammoth extinction in Beringia. *Nature Communications* 3.
- Myers N, Mittermeier RA, Mittermeier CG, da Fonseca GAB, Kent J. 2000. Biodiversity hotspots for conservation priorities. *Nature* 403: 853-858.
- Pielou, E.C. (1992). Pp. 90-102. *After the Ice Age*, U. Chicago Press, Chicago.
- Quammen, D. (1996). *The Song of the Dodo: Island Biogeography in an Age of Extinctions*. Touchstone. Pp. 75-80; 413-31; 436-441; 457-463; 478-485. (Island Biogeography, Dan Simberloff; tropical forest fragments and Saki monkeys).
- Quammen, D. (1996) *Ibid*. Pp. 262-75; 289-96; 380-1. (Rarity, island species, extinction).

Plus: any additional readings listed in the schedule and announced to in lecture.

GGR 305 is a Green Course. Please remember to double-side your assignments, as well as any other course materials you print (lecture slides). For additional information, consult the [Sustainability Office's website](#)