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GEOG 446N.01: Biogeography

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GEOGRAPHY 446N: BIOGEOGRAPHY

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Introduction

The subject of biogeography overlaps several disciplines. As a consequence of this overlap, there are several approaches to **Biogeography**, each with its own philosophy and methodology. In this course the emphasis is on the **historical** aspects of biogeography: the changing patterns of plant and animal distribution in space and time. Special attention is given to the biogeography of individual taxa rather than groups of species or communities.

Geographers' approaches to biogeography differ from the perspectives of biogeographers in Biology, Botany or Zoology. Here, we pay particular attention to the **external controls** of plant and animal distributions, and how these controls have changed through time. As far as the time scale is concerned, most of the course will focus on the relatively recent (in a geological sense) past, specifically the *Quaternary Era*. Quaternary biogeography is especially interesting because this period of earth history has been characterized by major changes in climate. Also, this has been the period during which our own species has had such an important influence on the biogeography of so many other species.

The course is a general interest and natural science course. Geography 102, Introduction to Physical Geography, is listed as a prerequisite; please consult the instructor if you have not taken this course or its equivalent. Students without any background in biology will have to catch up with extra readings during the first few weeks of the semester. Students with some training in earth science, climatology, or anthropology will have a head start for later portions of the course.

Grades will be based on three short assignments (combined these count 15% of the semester total), one midterm exam (20%), one final exam (25%), and one research paper (35%).

Readings

The MacDonald textbook, *Biogeography* (1st edition), is the only required text. The books listed below (on 24-hour reserve at the Mansfield Library) are useful supplementary sources.

Begon, M., J.L.Harper, and C.R.Townsend, 1996, *Ecology: Individuals, Populations, and Communities (3rd edition)*. Sunderland, MA: Sinauer.

Brown

Cox, C.B., and P.D.Moore, 1993, *Biogeography: An Ecological and Evolutionary Approach*. Oxford: Blackwell Science.

Diamond, J., 1997, *Guns, Germs, and Steel: The Fates of Human Societies*. New York: Norton.

Heiser, C.B., Jr., 1990, *Seed to Civilization: The Story of Food*. Cambridge: Harvard.

Quammen, D., 1996, *The Song of the Dodo*. New York: Simon and Schuster.

Roberts, N., 1998, *The Holocene: An Environmental History (2nd edition)*. Oxford: Blackwell.

Sauer, J.D., 1988, *Plant Migration: The Dynamics of Geographic Patterning in Seed Plant Species*. Berkeley: University of California Press.

Weiner, J., 1994, *The Beak of the Finch: A Story of Evolution in Our Time*. New York: Alfred A. Knopf.

In addition to the text, selected chapters and journal articles will be recommended (and occasionally required) reading. Supplemental reading lists will be made available for each of the

major themes in the course; these readings will be on electronic and traditional reserve in the Mansfield Library.

Course Outline

This schedule for Fall 2002 is subject to adjustment depending on guest lecturers, students' interests, etc. Readings: chapter assignments are from MacDonald, 2002; additional reading lists are shown in italics

- I. Introduction to Biogeography (Weeks 1-2; chapters 1,2,6)
 - A. Ecology and Biogeography; Review of Different Approaches; Terms & Definitions
 - B. Global Biogeography Overview (Biomes)
 - C. Distribution and Abundance

- II. Ecology & Distribution Patterns (Weeks 3-5; chapters 3,4,5, and part of 14)
 - A. Limiting Factors (*Reading List 1: Controls of Biological Distributions*)
 1. Physical (Climatic, Edaphic, Hydrological)
 2. Biological (Competition, Predation, Symbiosis & Mutualism)
 - B. Diversity Gradients & Patterns (*Reading List 2: Species Diversity*)
 - C. Disturbance

- III. Historical Biogeography (Weeks 6-8, chapters 7,8,9,10, and part of 13)
 - A. Change over "Geologic Time"
Consequences of Plate Tectonics, Climatic Change and Extraterrestrial Impacts
 - B. Speciation and Extinction
 - C. Dispersal and Colonization; Migrations; Events of the Late Quaternary Period
(*Reading List 3: Paleoecology*)
 - D. Late Quaternary Environments of Western North America

- IV. Island Biogeography (Weeks 9-10, chapters 14,15) (*Reading List 4: Islands*)
 - A. Island Characteristics & Classification
 - B. Speciation and Extinction on Islands

- V. Human Impacts and Biodiversity (Weeks 11-15; chapters 12,15)
(*Reading List 5: The Holocene: Humans & Biological Invasions*)
 - A. Domestication - Agricultural Origins
 - B. Invasions - Weeds, Pests, and Diseases
 - C. Range Reductions and Extinctions
 - D. Global Change - Past, Present, and Future

Important Dates:

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| September 16 (Monday) | Assignment 1 due (<i>National Geographic</i> "Wild World") |
| September 23 (Monday) | Last day to drop/add classes |
| October 4 (Friday) | Assignment 2 due (Field-based observations) |
| October 7 (Monday) | Library research session (meet at Mansfield) |
| October 21 (Monday) | Midterm Exam |
| October 28 (Monday) | Assignment 3 due (Paper Proposals) |
| December 9(Monday) | Papers Due |
| December 20 (Friday) | Final Exam, 8:00-10:00 (last day of finals week) |