

GEOGRAPHY 148 - BIOGEOGRAPHY

Instructor: Roger Byrne, 109 McCone Hall
Office Hours: Tu 2.00 – 3.30 pm or by appointment
email arbyrne@berkeley.edu

Introduction

Biogeography is a borderline subject that overlaps several disciplines. It follows, therefore, that there are several approaches to Biogeography, each with its own philosophy and methodology. In this course the emphasis will be on historical themes, the changing patterns of plant and animal distribution in space and time. Special attention will be given to the biogeography of individual taxa rather than groups of species or communities. This course differs from courses given in Botany and Zoology insofar as particular attention is given 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 geologically recent past: the Quaternary Era. The Quaternary is a subdivision of the geological time scale that includes the last 2.5 million years. Quaternary Biogeography is especially interesting because this time period was characterized by major changes in climate. Also, it is during this period that our own species has had such an important influence on the biogeography of so many other species. The course is a general interest course and as such has no specific prerequisites. Students without any background in biology will have to catch up with extra readings during the first few weeks.

Lecture Outline

- I. **Introduction to Biogeography** - 2 lectures
 1. What is Biogeography? A review of Different Approaches
 2. The Autecological Approach
 - i. Species concepts
 - ii. Ecotypes
- II. **Contemporary Distribution Patterns** - 6 lectures
 1. Distribution and Abundance
 2. The Problem of Scale
 3. Limiting Factors
 - i. Physical (Climatic, Edaphic, Hydrological)
 - ii. Biological (Competition, Predation, Symbiosis)
 4. Diversity Gradients
 5. Convergent Evolution
- III. **Island Biogeography** - 3 lectures
 1. Insular Vulnerability
 2. Equilibrium Theory
- IV. **Historical Biogeography** - 17 lectures
 1. Tertiary Biogeography
 - i. Climatic Change and its Consequences
Origin of the Deserts
Deciduous Forest Disjunctions
 - ii. "Continental Drift" and its Consequences
Wallace's Realms
The Great American Interchange

(Over)

2. Quaternary Biogeography
 - i. Climatic Change and its Consequences
 - The Refugium Debate
 - Extinction of the Megafauna
 - ii. Human Impacts
 - Domestication - Agricultural Origins
 - Invasions - Weeds, pests, and diseases
 - Range Reductions and Extinctions

V. Review and Synthesis

Readings

The Cox and Moore text is the only required text for the course, although the other books listed below are strongly recommended.

Cox, C. B., and P. B. Moore

2000 *Biogeography. An Ecological and Evolutionary Approach* (7th edition).
Blackwell, Boston and Palo Alto.

Crosby, A. W.

1986 *Ecological Imperialism: The Biological Expansion of Europe, 900 – 1900*. Cambridge University Press, New York.

Guthrie, R. D.

1990 *Frozen Fauna of the Mammoth Steppe*. University of Chicago Press, Chicago.

Ornduff, R., P. M. Faber and T. Keeler-Wolf

2003 *Introduction to California Plant Life* (Revised Edition). University of California Press, Berkeley.

Course Grade

As this is a 4 unit course, a term paper is optional. Those students who do elect to write a term paper are not required to take the mid-term. Term papers may deal with any theme related to the biogeography and ecology of plants or animals. The production of web based term papers is encouraged. The term paper is due on the last day of lectures, Friday December 8th. The course grade will be determined as follows:

Either or	Midterm	33.3% and	Final	66.7%
	Term Paper	50.0% and	Final	50.0%

The mid-term will be held in class on Tuesday March 11th.

Course Website

<http://128.32.101.24/~148/Index.htm>