

EEOB 700 Biogeography

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Rationale: Biogeography is a field of study where patterns of biodiversity are elucidated. It is a comparative science where processes of evolution are superimposed on processes of geology, global climate change, and ecological parameters to study the past and present distributions of organisms.

Objectives: To introduce students to the types of comparative data used to elucidate patterns of distribution, including an overview of phylogenetic systematics and phylogeography, plate tectonics, the fossil record, and patterns of disjunction. The historical context of the development of biogeography as a scientific discipline will be presented, including the controversial debates that have contributed to our current understanding of biogeographic patterns (e.g., continental drift; evolution theory; phenetics vs. cladistics). Another objective of the course will be to consider conservation biology in a biogeographic context.

Textbook: Brown, J. H., and M. V. Lomolino. 1998. Biogeography, 2nd Edition. Sinauer Associates, Inc. Sunderland, Mass.

Grading:

Midterm I: 100 pts
Midterm II: 100 pts
Final Exam: 100 pts

In class presentations: 120 pts (each student will review a 2 - 5 current articles on biogeography, write a short review of the subject presented in the articles and do an inclass presentation).

Syllabus for EEOB 700, Winter 2005

Week 1: Historical Overview of Biogeography

History of global exploration, Pre-Darwinian and Post-Darwinian contributions, Developments of 20th Century; Ecological Setting for Biodiversity
Ch 1 - 3; pp 1 - 60

Week 2: Patterns of Biodiversity

Ranges and Distributions of Organisms, Overview of Biomes
Ch 4 - 5; pp 61 -134

Week 3: Historical Patterns of Global Change

Earth's Tectonic History, Patterns of Effects of Glaciation, Developments During Pleistocene and Holocene
Ch 6 - 7; pp 135 -222

Week 4: Speciation and Extinction

Review of species concepts, speciation, micro- vs macroevolution, adaptive radiation, extinction, species selection
Ch 8; pp 223 -260

MIDTERM I: Friday, January 28

Week 5: Distributions of Organisms

Dispersal, Endemism, Disjunctions, Biogeographic Regions and Provinces
Ch 9 - 10; pp 261 - 324

Week 6: Reconstructing Biogeographic Histories

Introduction to Systematics, The Fossil Record, Centers of Origins, Vicariance Biogeography, Phylogeography
Ch 11 - 12; pp 325 - 365

Week 7: Island Biogeography

Historical overview, Island Patterns, Evolutionary Trends on Islands
Ch 13 - 14; pp 369 - 447

Week 8: Species Diversity in Continental and Marine Habitats

Patterns of Diversity for Single Species and Multispecies Assemblages, Biotic Interchange, Maintenance of Distinct Biotas
Ch 15 - 16; pp 449 -530

MIDTERM II: Friday, February 25

Week 9: Applied Biogeography

The Biodiversity Crisis, Geography of Extinctions, Invasive Species, Biogeography of Humans
Ch 17 - 18; pp 533 - 612

Week 10: Applied Biogeography Continued

Technological and Conceptual Advances in Biogeography, Management and Conservation
Ch 19; pp 613 - 624

FINAL EXAM: Wednesday, March 16: 7:30 TO 9:18 A.M.

Calendar

- Week 1: Jan 3, 5, 7
Lectures 1 - 3
- Week 2: Jan 10, 12, 14
Lectures 4 - 6
- Week 3: Jan 19, 21
Lecture 7, Recitation 1
(MLK Day on Jan 17 - no class)
- Week 4: Jan 24, 26, 28
Lecture 8, Recitation 2, Midterm I
- Week 5: Jan 31, Feb 2, 4
Lectures 9 - 10, Recitation 3
- Week 6: Feb 7, 9, 11
Lectures 11 - 12, Recitation 4
- Week 7: Feb 14, 16, 18
Lectures 13 - 14, Recitation 5
- Week 8: Feb 21, 23, 25
Lecture 15, Recitation, 6, Midterm II
- Week 9: Feb 28, Mar 2, 4,
Lectures 16 - 17, Recitation 7
- Week 10: Mar 7, 9, 11
Lectures 18 - 19, Recitation 8
- Final Exam: Mar 16, 7:30 - 9:18 a.m.

Protocol for in-class presentations

Two or three students per recitation will present a summary of research on any topic in biogeography. The research will encompass two to five recent articles on a similar theme. Assignments for a particular recitation period will be made at the beginning of the second week of the term, which means that students who are early in the roster need to be working ahead of the game.

Articles must be approved by me at least one week in advance of your assigned recitation schedule. See me if you are having trouble choosing appropriate articles. On article that is the main focus of the presentation needs to be made available in a pdf for the rest of the class. The presenter should be prepared to answer questions posed by the class.

Format for the presentation:

A powerpoint presentation must be used. I expect an overview of the article to be presented, including the relevant background information leading to the current study. For example, if you are presenting a paper on the biogeography of tribe Cheloneae, I would expect you to present an historical overview of the work that was done before the current paper during the introductory remarks in order to set the stage for the paper you are reviewing.

You will have 20 minutes to present your summary of the paper with 5 minutes afterwards for questions. Use tables and figures where appropriate to illustrate the major points of the paper. Use an outline summarizing the major points of the paper.

We will follow a presentation schedule similar to one at a national meeting of a scientific society. You will have 20 minutes for the presentation and five minutes for questions. Approximately one minute before your time is up, I will signal you that you should wrap your presentation up as soon as possible. You will be start losing points on your presentation when the 20 minute time limit has been reached and you're not yet finished. For example, you can expect to lose 5 points if your presentation takes 21 minutes. The amount of points lost will depend on the length of time you go over the limit.

In addition to the recitation presentation, each student will write a short summary paper (1 - 3 pages) about the articles, similar to what would be written in a review paper in a scientific journal. Grading of recitation assignments:

Article choice made on time	10 points
In-class presentation	60 points
Written review and summary	50 points
Total	120 points