

Long-term Environmental Change

Geography 430/530: Fall 2012
8:30-9:50 Tuesday/Thursday, 245 Lillis

Instructor: Aquila Flower, aquila@uoregon.edu, 217 Pacific Hall
Office hours Tuesdays, 10:00-11:00 and Thursdays 1:00-2:00.

Course overview: Climate and the pattern of life on Earth has changed continuously for millions of years resulting in the landscapes we know today. Records of past environmental changes have been assembled from a variety of different paleoenvironmental indicators. This course focuses on the methods used for paleoenvironmental reconstruction, how Earth's climate has varied over a range of different time scales, how the biota, especially vegetation, has varied in concert with climate, and the theories that have emerged to explain those variations. Emphasis will be placed on data synthesis and use of models to help understand the mechanisms underlying change in natural systems.

Prerequisites: Geog 321 (Climatology) Geog 322 (Geomorphology) or Geog 323 (Biogeography)

Format and grading: Lectures and discussions in class. Grade is based on a mid-term and final exam, a field-trip report, an annotated bibliography focusing on the history of environmental change for a particular region, and attendance and in-class participation. Attendance and in-class participation will be assessed using a variety of in-class activities including short quizzes, written responses to readings, and small group discussions. There will be a mandatory field trip on a Saturday to the Oregon Coast Range. The field trip will occur towards the end of the course so that you can apply in the field the material that we covered in class. Both exams and the annotated bibliography must be completed to receive a passing grade. Students enrolled in Geog 530 will complete a full research paper instead of the annotated bibliography. All students will give brief presentations of their research projects at the end of the term.

Final grade for students in 430 will be assessed as: Exam 1: 25%, Exam 2: 30%; Bibliography: 30%; Class participation/attendance: 10%; Field Trip Report: 5%.

Final grade for students in 530 will be assessed as: Exam 1: 20%, Exam 2: 25%; Research paper: 40%; Class participation/attendance: 10%; Field Trip Report: 5%.

Academic dishonesty policies will be enforced (see: <http://studentlife.uoregon.edu/judicial/conduct/sai.htm>).

Required Texts:

1. William Ruddiman. 2007. **Earth's Climate, Past and Future. 2nd Edition.** W.H. Freeman.
2. Various recent journal articles will be available on BlackBoard.

Date	Class	Topic	Assignments
Sep 25	1	Introduction	
Sep 27	2	Overview of the climate system	Ch. 1
Oct 2	3	Climate archives/proxies	Ch. 2
Oct 4	4	Tectonic-scale environmental change	Ch. 3 & 4
Oct 9	5	Cenozoic environments	Ch. 5, Zachos
Oct 11	6	Orbital-scale climate change	Ch. 7, <i>proposals</i>
Oct 16	7	Orbital climate controls	Ch. 8 & 9
Oct 18	8	Orbital-scale changes in greenhouse gases	Ch. 10, Petit, <i>draft</i>
Oct 23	9	Mid-term Exam	
Oct 25	10	The Last Glacial Maximum	Ch. 12
Oct 30	11	The last Deglaciation	Ch. 13, Whitlock
Nov 1	12	Millennial oscillations & abrupt changes	Ch. 14, Alley
Nov 6	13	Humans and preindustrial climate	Ch. 15, Ruddiman
Nov 8	14	Climate during the last 1000 years	Ch. 16, Mann
Nov 13	15	Tree-ring records	Cook, Fritts
Nov 15	16	Climate during the last 150 years	Ch. 17, 18
Nov 17		Saturday Field Trip	
Nov 20	17	Future climate change	Ch. 19, IPCC
Nov 22	18	Thanksgiving: No Class	
Nov 26	19	Presentations	<i>Bibliographies due</i>
Nov 29	20	Presentations and review	
Dec 6		8:00 am Final Exam	