



Geog 4/521: Climate Variability and Change

Winter 2018, 10:00-11:20a, MW, 206 Condon Hall, CRN 27406 (421) 27408 (521)

(GEOG 4/521 Advanced Climatology, Topic: Climate Variability and Change, repeatable when topic changes.)

Instructor: Patrick J. Bartlein, 154 Condon Hall, x6-4967, bartlein@uoregon.edu, office hours: 2:00-3:30p Th.

Overview: Climate varies. This fundamental aspect of the behavior of the climate system can have major societal impacts, but it also makes it difficult to exactly project the impact that humans are currently having on climate. The aim of this course is to review the nature of the climate system and why it varies over time, emphasizing those variations that make one year different from another, as well as those that have taken place over decades, centuries and millennia.

By the end of the course, you will be able to 1) understand day-to-day variations of weather, 2) the longer-term, seasonal and interannual climate variations weather variations are embedded in, 3) the nature of longer-term climate variations, and 4) how to "diagnose" the controls of climate variations in a particular region using on-line resources.

Grading: Undergraduates: Two take-home exams (40% each) due at the end of the fifth and ninth week of class, and a project that involves the analysis of on-line climate data (20%), presented in the last week of class, and with a short (3-4 p.) writeup due during exam week. Graduates: Two exams (35% each) and a project that involves the analysis of on-line climate data (20%) (schedule as above), plus an annotated bibliography on a topic related to the diagnosis of climatic anomalies in a particular region (10%).

Readings: .pdfs of book chapters and articles supporting each lecture will be available on the Canvas web page.

Lecture Topics:

- Overview of climate variations
- Climate system components
- Atmospheric circulation and surface weather
- Reanalysis data sets
- Introduction to ESRL PSD interactive web pages
- Recent interannual climate variations
- ENSO and teleconnections
- Other modes of interannual climate variability
- Decadal climate variations
- 20th century climate variations
- Attribution of 20th century climate variations
- Climate variations of the last millennium
- Controls of climate variations of the last millennium
- Centennial and millennial-scale climate variations
- Holocene climate variations
- Abrupt climate changes
- Controls of abrupt changes
- The IPCC assessments
- The US National Climate Assessment

