



WyGISC Geospatial Forums – Fall 2008

THEME: BIOGEOGRAPHY

Fridays - 12:00pm - 1:00pm, AG C 316

*** Biogeography theme-based talks

9/5: Dr. Stephen T. Jackson, Professor, BOTANY & Director, PROGRAM IN ECOLOGY

***---*Biogeography: what is it, where did it come from, and where is it going?*

Biogeography is a diverse, dispersed, and undisciplined discipline that draws from a number of life, environmental, and earth sciences. It emerged from 17th Century natural theology, achieved initial syntheses with the work of Humboldt and others in the 19th Century, atomized in the 20th century into a variety of often-conflicting subdisciplines, and is now groping for unity and integration across its vast intellectual territory. Biogeographic knowledge and theory will be invaluable in coming to grips with global change in the coming decades.

9/12: Dr. Bryan Shuman, Assistant Professor, GEOLOGY AND GEOPHYSICS

***---*A Tale of Two Ecotones: Patterns and Processes of Climate-Induced Change along Grassland-Forest Borders in Central North America over the Past 2000 Years*

Future climate change is expected to shift biogeographic patterns especially along ecological boundaries (ecotones) such as between grassland and forest regions. However, any responses to climate will be mediated by other factors such as human land-use and natural disturbances like wildfire. This talk will compare the interactions among climate, disturbances (fire) and vegetation pattern along two different ecotones at the eastern and western margins of the Great Plains. Sedimentary evidence of past droughts from each region (Minnesota and Colorado) are compared with fossil pollen and charcoal that track vegetation and fire histories. Such data from Minnesota are also compared with simulations of regional change using the regional forest model LANDIS II. The results show surprising relationships in both regions that point to the complex nature of potential future changes.

9/19: Dr. Thomas Minckley, Assistant Professor, BOTANY

***---*Vegetation history of Southeast Wyoming*

The record of environmental change from the crest of the Snowy Range to the surrounding basins shows the transition from steppe to forest over the past 14,000 years. The timing of these changes provides insight into how floras respond to climatic changes in the past.

9/26: Dr. Mark Clementz, Assistant Professor, GEOLOGY AND GEOPHYSICS

***---*Reconstructing Wyoming's Ancient Ecosystems: Paleontological and Geochemical Evidence of Ecosystem Change over the Last 65 Million Years*

The wealth of fossil material in Wyoming makes it an ideal region of study for paleontologists interested in reconstructing the past diversity and composition of North American terrestrial ecosystems. Combined with recent advances in geochemical analyses, researchers have made considerable strides towards understanding the connections between ecosystems, evolution and climate change during the Cenozoic. This talk will serve as a review of some of the major discoveries to come out of this work and highlight future directions in this field of research.

10/3: Dr. Olga Wilhelmi, Scientist, National Center for Atmospheric Research

---GIS in weather, climate and impacts

This presentation will provide an overview of the GIS activities at the National Center for Atmospheric Research (NCAR), discuss progress in integration of GIS with atmospheric data and models across scales and in GIS applications in research on weather, climate and society. Examples will include spatial analysis of societal vulnerability to flash flooding and excessive heat in urban areas. Next steps in integration of quantitative and qualitative information in a GIS will be discussed.

10/10: Dr. Steve Miller, Professor and Head, BOTANY

****---Biogeography of Fungi--examples at different scales*

The biogeography of fungi has been examined at several scales from local, regional and continental. Examples of such studies from the Miller lab and the literature will be discussed.

10/17: Dr. Todd Surovell, Assistant Professor, ANTHROPOLOGY

****--- Global spatio-temporal patterning in proboscidean (elephants, mammoths, and mastodons) exploitation and extinctions*

One million years ago, proboscideans occupied most of Africa, Europe, Asia, and the Americas. Today, wild elephants are only found in portions of sub-Saharan Africa and South Asia. Although the causes of global Pleistocene extinctions in the order Proboscidea remain unresolved, the most common explanations involve climatic change and or human hunting. In this talk, I test the overkill and climate-change hypotheses using global archaeological spatiotemporal patterning in proboscidean kill-scavenge sites.

10/31: Dr. George Jones, Wyoming Natural Diversity Database

*-***-- Wyoming's Modern Vegetation Types and the Influence of Climate and Geologic Substrate in Controlling Their Distribution*

Wyoming is a great place to observe and study patterns in vegetation, from the contrast between low-elevation desert shrublands and nearby, high-elevation forests, to the distribution of plants within an individual stand. Whether you are interested primarily in the former broad view or in the latter detailed view depends on what questions you want to answer. This talk will focus mainly on the broad view -- the current distribution of vegetation types and the influence of climate and geologic substrate on that distribution. We also will look at several ways in which Wyoming's vegetation has been classified, and some tools used for studying vegetation patterns.

11/7: Mr. Mark Lesser, Doctoral Candidate, BOTANY

****---Spatial Genetics: Using genetics to assess population structure and growth in a geographic context*

I will explore the use of population genetics in a spatial setting (landscape genetics) looking at how this goes beyond traditional population genetics and can be used in fine-scale biogeography. I will give an overview of techniques, the statistical tools available and potential issues with the field. Additionally, I will show how a temporal dimension can also be added to the spatial context allowing us to assess how populations grow and expand through time.

11/14: Mr. Doug Keinath, Wyoming Natural Diversity Database

****--- Wyoming's Current Wildlife Distributions: Biological Mechanisms and Methods of Study*

CANCELLED

11/19: Dr. Carl Reed, Chief Technical Officer, Open Geospatial Consortium

--- Geographic Information Systems: Moving to the Geospatial Web (GIS DAY KEYNOTE TALK)

For more information, please visit the WyGISC web site at: www.uwyo.edu/wyview