



AAAS Schedule

MSU Attendees

Faculty

Daniel Bronstein – CARRS
Tom Dietz - Sociology
Jack Harkema - Pathobiology
Anil Jain – Computer Sci & Eng
Frank Lupi – Ag Econ and FW
Jennifer Olson – Geography
Peggy Ostrum – Zoology
Phil Robertson – Crop and Soil Science
Scott Swinton – Ag Econ

Students

David Bidwell – Sociology
Kim HillerConnell – Human Env & Des*
Nikki Lamp – Fisheries and Wildlife
Rachael Shwom – Sociology*
Wei Zhang – Ag Econ*

* = poster presentation

Friday February 17, 2006

8:30AM-10:00AM

Adaptive Environmental Management: The Valles Caldera Experience

TRACK: Sustainability and Resource Management

ORGANIZERS: Dinah Bear, President's Council on Environmental Quality;
Daniel Bronstein, Michigan State University

PARTICIPANTS: Thomas Swetman (Speaker), University of Arizona
The Valles Caldera Landscape: Establishing Science-Based Adaptive Management at VCNP and the Challenges in Building Science- Management

Daniel Bronstein (Moderator), Michigan State University

James Gosz (Speaker), University of New Mexico and Valles Caldera Trust
The Promise and Potential of Valles Caldera Science in the Context of Regional and National Science Programs

Robert Parmenter (Speaker), Valles Caldera National Monument
Current Research, Inventory, and Monitoring Programs

SYNOPSIS: In 2000, the U.S. Congress established the Valles Caldera National Preserve, an 89,000-acre federal property in northern New Mexico. The Preserve's major geological feature, a gigantic collapsed caldera, was formed about 1.22 million years ago and has, through the ensuing centuries, developed into a unique, beautiful, and relatively self-contained ecosystem. The Preserve is administered by the Valles Caldera Trust, a federal agency with a unique mission. The Trust has, from its inception, been determined to emphasize science, monitoring, and adaptive management as part of its decision-making process. The Trust's progress in implementing both its science program and its procedures to implement the National Environmental Policy Act (NEPA) has significant implications for federal land managers. The issue of whether and how adaptive management can be integrated into the NEPA process is a topic of considerable discussion, both within the federal government and by the numerous constituents who depend on federal lands, whether for their livelihood, recreation, or other activities. Many advocates of adaptive management are skeptical that it can actually be implemented, doubting that agencies can muster the will and resources to implement monitoring necessary to make adaptive management work on the ground. This panel will first discuss the mission of the Preserve and its geographical and historical setting and explain the context of the current debate over NEPA and adaptive management. Scientists familiar with the work on the Preserve will then describe the philosophical and policy discussions about adaptive management, including the hurdles and evolving nature of the experience, how the current science programs are being conducted in the context of requirements for openness, transparency and meeting the needs of the decision makers on the Board. The presentation will conclude with a discussion on what the Valles Caldera National Preserve landscape and science programs, both basic and applied, offer for national-scale research and cutting edge management-science partnerships.

10:30AM – NOON

New Approaches to Paleontological Investigation

TRACK: Earth, Atmosphere and Oceans

ORGANIZERS: Mary Higby Schweitzer, North Carolina State University; Jack Horner, Museum of the Rockies

PARTICIPANTS: Jack Horner (Speaker), Museum of the Rockies
Osteohistology in Dinosaur Research

Hans Larsson (Speaker), Mc Gill University, Canada
Development and Evolution of Dinosaurs: New Opportunities for Ancient Bones

Tim Rowe (Speaker), University of Texas, Austin
Digital Morphology: Informatics Infrastructure for Analyzing 3-D Form

Peggy Ostrom (Speaker), Michigan State University
Defining the Limits of Biomolecular Survival: Approaches and Perspectives

Nels Peterson (Speaker), Museum of the Rockies,
Montana State University
The Technological Future of Field Data Collection

Larry Witmer (Speaker), Ohio University
Fleshing Out Dinosaurs: Implications of Brain, Ear, and Nose Structure

Mary Higby Schweitzer (Speaker), North Carolina State University
Analyses of Dinosaur Soft Tissues

SYNOPSIS: New, innovative, and highly sensitive technologies have recently been applied to fossil specimens, allowing recovery of data never before possible that has yielded new information about long-extinct animals and the world in which they lived. This symposium highlights some of these analytical advances, and illustrates new ways to interpret the lifestyles, relationships, physiologies and reproductive strategies of fossil taxa. Concepts in evolution and development (evo-devo), chemical and molecular analytical data, phylogenetics, and computer modeling will be discussed.

Saturday February 18, 2006

9:45AM-11:15AM

Harvesting Ecosystem Services for Agriculture

TRACK: Animals Plants and Food

ORGANIZERS: **Scott Swinton, Michigan State University; Frank Lupi, Michigan State University; G. Philip Robertson, Michigan State University**

PARTICIPANTS: **Frank Lupi** (Moderator), Michigan State University

Scott Swinton (Speaker), Michigan State University
Cost-Effective Ecosystem Service Production from Row-Crop Agriculture

Stephen Swallow (Speaker), University of Rhode Island
Recreational and Aesthetic Ecosystem Services from Agriculture in the Densely Populated Northeast

Kris Havstad (Speaker), U.S. Department of Agriculture
Ecosystem Services from Grazed Rangeland in the Arid and Semi-Arid West

Anthony Janetos (Speaker), H. John Heinz III Center for Science,
Economics, and the Environment
Ecosystem Services from U.S. Cropland: What We Know and What We Need to Know

SYNOPSIS: This symposium will explore the grand challenge of harvesting more ecosystem services from agriculture than food and fiber alone. The Millennium Ecosystem Assessment and the National Research Council's report on valuing ecosystem, covering half of the land in the conterminous 48 states, about evenly divides between livestock and crop production. Agriculture can cause deterioration and contamination of important natural resources, but improved management can drastically mitigate those damages while augmenting another benefits. Examples of agricultural ecosystem services that can be enhanced by suitable management include outdoor recreation, sequestration of atmospheric carbon into soils and bioremediation of contaminated lands. The human importance and value of these services will vary with both biophysical and socioeconomic settings. Speakers will explore what we know and what we need to know about ecosystem services offered by different crop and livestock production systems, how to measure the worth of these services, and what changes will be need if society wishes to harvest more of them.

5:00 – 6:30 PM

SPECIAL EVENT: Salute to Rachelle Hollander – retiring program officer at NSF for Ethics and Values in Science and Technology

Renaissance Grand Hotel, co-sponsored by MSU ESPP

Sunday February 19, 2006

10:30AM – NOON

Risk and Society

TRACK: Science Policy

ORGANIZERS: Eugene A. Rosa, Washington State University; Thomas Dietz, Michigan State University

PARTICIPANTS: Richard Moss (Speaker), U.S. Climate Change Science Program
Climate Change

Scott Atran (Speaker), Centre National de la Recherche Scientifique and University of Michigan
Terrorism

Eugene A. Rosa (Speaker), Washington State University
Concepts of Risk and Risk Policy

Ortwin Renn (Speaker), University of Stuttgart, Germany
(*Co-Presenting with Eugene A. Rosa*)

Susanne C. Moser (Speaker), National Center for Atmospheric Research
Risk, Policy, and the Public

SYNOPSIS: Risk punctuates modern society and is central to national and international policies. This symposium looks across types of risk to identify key themes in societal concern with risk. We focus on two of the most difficult and pervasive risks facing the 21st century: climate change and terrorism. Two panelists will discuss the character of these risks, societal responses to them and the lessons that can be learned. Two other panelist presentations will integrate these ideas, focusing concepts of risk and their relationship to risk policy. We will identify and highlight the emerging science of risk that integrates across specific risk domains. The interactive format will allow significant time for open discussion with the audience.

Monday February 20, 2006

9:45AM-12:45PM

Space Matters! Spatial Dimensions of Complex Interactions Between People and the Natural Environment

TRACK: Environment, Ecology and Energy

ORGANIZERS: Daniel Brown, University of Michigan; So-Min Cheong, University of Kansas

PARTICIPANTS: Thomas Baerwald (Moderator), National Science Foundation

Richard Aspinall (Speaker), Arizona State University
Landscape Representation for Coupled Modeling of Human and Natural Systems

Stephen Walsh (Speaker), University of North Carolina, Chapel Hill
Scenarios of Land Use and Cover Change Using Spatial

Simulation models

Jennifer Olson (Speaker), Michigan State University
Multiscale Analysis of the Linkages between Human and Biophysical Processes

Marina Alberti (Speaker), University of Washington
Urban Landscapes as Emergent Phenomena of Complex Human-Natural Systems

Daniel Brown (Speaker), University of Michigan
Modeling Human-Landscape Interactions at Michigan's Urban-Rural Fringe

David McGinnis (Speaker), Montana State University, Billings
Complexity Across Boundaries: Climate, Humans, and Elk Ecology Near Yellowstone

SYNOPSIS: Across natural and social science disciplines, locationally explicit understanding of interactions among human and natural systems has become an important challenge. Difficulties arise because the conceptual models within various disciplines are limited in the face of spatial heterogeneity and spatial interactions within systems. However, place-based research provides important opportunities for interdisciplinary communication and collaboration. Taking on the challenge of understanding the spatial aspects of human-environmental problems creates an opportunity to better understand the interaction between human and natural systems. By describing the spatially explicit approaches that underlie successful interdisciplinary work on human-environment interactions, we provide demonstrations of how we are extending disciplinary concepts and approaches and undertaking interdisciplinary collaborations in environmental sustainability. Speakers will explore the roles of geographic space and spatial models in research projects on bio-complexity in coupled human and natural systems. Related scientific advances include: exploration of the causes and effects of land-use and land-cover patterns and trends observable from space; development of spatially explicit explanatory and predictive models, including agent-based models, that are calibrated to data that represent processes of human-environment interaction; examination of interactions between the spatial scales at which human and ecological processes operate, including those of possible policy interventions, and the scales of observed patterns and their effects; and analyses of emergent patterns from complex processes and the role of feedbacks, including those associated with spatial interactions, and path dependence generating those patterns. Speakers also will address the contributing roles of spatial analysis and modeling methodologies in their investigations.

9:45AM-12:45PM

Strengthening the Basis of Biometric Identification and Authentication

TRACK: Information Technology and Computing

ORGANIZERS: Peter B. Imrey, Cleveland Clinic Foundation

PARTICIPANTS: Peter B. Imrey (Moderator), Cleveland Clinic Foundation

Anil K. Jain (Speaker), Michigan State University
Biometrics: Applications, Challenges, and Opportunities?

Joseph P. Campbell (Speaker), Massachusetts Institute of Technology
Statistical Methods and Challenges in Speaker Recognition

Stephen E. Feinberg (Speaker), Carnegie Mellon University
Can We Rely on Biometrics for Authentication and Identification?

Patrick Grother (Speaker), National Institute of Standards and Technology
Sample Quality Algorithms in Facial Recognition and Other Biometric Identification Systems

Geof H. Givens (Speaker), Colorado State University
Statistical Approaches to Performance Evaluation of Biometric Algorithms

David Scott (Speaker), Rice University
Understanding Feature Spaces for Biometrics Applications

Peter B. Imrey (Speaker), Cleveland Clinic Foundation
Discussion: The Two Biometrics

SYNOPSIS: International terrorism has greatly increased interest in biometric systems that automatically identify individuals, or certify claimed identity, using physical and/or behavioral characteristics. More routine commercial and security uses of such systems are also increasing fairly rapidly. However, unresolved scientific issues in both the development and evaluation of biometric identification and authentication systems abound. Many involve statistical questions relating to population distributions, uniqueness, and stability of biometric measurements; how best to model system noise; and appropriate scope and design of experiments to evaluate performance. Since data acquisition techniques reduce most biometric characteristics to images, some scientists view biometric identification and authentication as a special class of pattern recognition problems. Others tend to view the various image acquisition and analysis techniques as components of complex systems requiring holistic approaches. This session will bring together academic computer science, statistical (including biostatistical), and systems perspectives on the current state of the science of biometric identification and

authentication. Increasing development and thrust to deployment of biometric technologies have largely been spurred by concerns of the law enforcement community and government agencies, and industry responses to these needs. The session will attempt to address what needs to be done to strengthen the scientific underpinnings of this area, to more closely unite forensic science and mainstream science so the public can be assured that biometric systems, once deployed, are valid and accurate. A particular focus will be on how statistical methods can be more fully incorporated into biometric systems research and evaluation.