

Integrative Approaches to Climate, Water, Ecosystems and Society: Projecting Impacts, Communicating Uncertainty, Working Toward Decisions and Adaptation

Location (TBD)

Overview

In around 2007, the discourse on climate change in the U.S. and countries in the Americas shifted from “Is this real and, if so, what is going to happen?” to “How can we best meet the challenges of inevitable climate changes, in the face of extreme uncertainty?” To address the latter question, there has been a trend toward framing the issue in terms of adaptation to inevitable climate changes. To fill a void in climate change policy, water and ecosystem managers, and city conservation and planning departments have been in the forefront of action, and framing key questions for science needs and use in decision-making. Whereas water issues are fittingly at the center of concern for the arid Americas, ecosystem adaptation issues are notably complex — involving multiple moving targets at the interface between land use and water allocation decisions. Moreover, ecosystem adaptation questions are pre-conditioned by an array of societal attitudes and conflicts over environmental regulations and priorities for ecosystem services and wildlife, for example.

This PASI aims to bring together scientists from a variety of disciplines to stimulate thought and convey training about integrated scientific approaches to quantifying climate-water-ecosystem-society issues. The unifying frames for discussion will be adaptation to climate change and ecosystem services. A central aim is to view science process, state-of-the-art knowledge, and science products through the lens of decision-maker needs. Thus, introducing biophysical scientists to approaches to effectively communicate and interact with decision makers and resource management professionals is a key focus of training. Another central aim is to introduce scientists to multiple modeling platforms and approaches to projecting climate, water and ecosystem changes, as well as integrative modeling approaches to answer questions pertaining to resource management and policy decisions. In addition to gaining familiarity with modeling approaches and tools, PASI instructors will home in on issues pertaining to uncertainty: quantifying uncertainty in models, and communicating uncertainty to decision-makers – in a way that simultaneously informs, elucidates key issues, enhances trust, and leads to action.

Foci:

- Water and Ecosystem Services
- Integrated modeling approaches for science and decision support
- Integration of sciences related to major impacts and adaptation
- Translation of science for application to decision-making
 - Ability to critically examine approaches for scientists to engage, interact, and collaborate with decision makers at a range of levels, identify effective approaches, and recognize the barriers to engagement and collaboration between scientists and decision makers. This includes an understanding and critical evaluation of the contexts for decision making and the role that science plays in informing policy, as well as the ability to effectively communicate scientific information, orally, graphically, and/or in writing to a broad range of audiences.

Gregg Garfin - Pan-American Advanced Studies Institute Proposal Sketch - 2/26/2011

Outputs:

- Lecture presentations: Powerpoint, Webinars
 - Q&A with remote participants
- Summary notes/fact sheets
- White paper with recommendations develop a program for Integrated Sciences and Decision-Making in the Americas, with applications to enhance integrated modeling for water and ecosystem services, and to enhance fruitful interactions between biophysical scientists and decision-makers
 - Proposal outline for Integrated Sciences and Decision-Making in the Americas program

Outcomes:

- Capacity building for future scientists
- Networking among participants
- Links to existing NSF-related proposal programs: IAI, DMUU, CNHS
- Cross-linkages with national climate and weather services and resource management agencies

Organizing Committee (TBD)

Syllabus/Speakers (Suggestions)

Focus 1: Modeling

- Climate modeling/Andrew Weaver (U. Victoria, Canada), _____ (Brazil?)
- Climate system/Hugo Hidalgo (Univ. de Costa Rica)
- Hydrologic modeling/Rene Lobato (SMN, IMTA, Mexico), Howard Wheeler (U. Sask., Canada)
- Ecosystem modeling/Dominique Bachelet (U.S.)
- Paleoclimate/Ricardo Villalba (Dendrochronology Lab, Argentina), Connie Woodhouse (UA, U.S.)

Focus 2: Integration

- Uncertainty/Linda Mearns (NCAR, U.S.), Rob Lempert (Rand, U.S.), Grainger Morgan (Carnegie Mellon, U.S.)
- Projecting impacts
 - Floods/____(Argentina, Brazil)
 - Species change/
 - Agriculture/
 - Risk Assessment/Francisco Meza (Pontificia Universidad Catolica de Chile, Chile)
- Ecosystem services
 - Remote sensing integration/Michael Hill (U. North Dakota, U.S.)
 - Concepts and applications/Laura Lopez-Hoffman (UA, U.S.)

Focus 3: Interface between science and decision-making

- ISD theory/Patricia Gober (U. Sask., Canada, ASU, U.S.), Connie Woodhouse (UA, U.S.)
- Working with decision-makers/Gregg Garfin (UA, U.S.), Patrick McCarthy (TNC, U.S.)
- Climate services for water and ecosystems/Carlos Gay (UNAM, Mexico) or Rene Lobato (SMN, Mexico)

Focus 4: Training

- Integrative modeling tools
 - GIS-based
 - ARC platforms
 - SWAT – Soil and Water Analysis Tool
 - Operations models
 - CCSM
 - VIC
- Decision Support Systems
 - Stella-based
 - INVEST
 - MCAS-S (Australia)

Focus 5: Collaborative Writing

- White paper
- Fact sheets