



Professional Development Seminar on Modeling Strategies and Decision-Support Tools for the Management of Complex Socio-Ecological Systems

*Antigua, Guatemala – 24-28 March, 2014 and
Panama City, Panama – 18-22 August 2014*

What?

The Inter-American Institute for Global Change Research (IAI), the Universidad del Valle de Guatemala, and the University of Illinois at Chicago announce a Professional Development Seminar (PDS) on the use of modeling strategies and tools to aid management decisions on socio-ecological systems. Participating scientists, practitioners and stakeholders will get hands-on experience in modeling complex societal and environmental problems, from the formulation of research questions that are policy relevant to the communication of useful results to diverse audiences and knowledge users. Participants will organize themselves into working groups to formulate projects and develop proposals; the groups will have the opportunity to compete for IAI funding for a collaborative project under the Seed Grant Program. The PDS will involve two sessions, each one a week long. The first session will be held 23-28 March 2014 in Antigua, Guatemala; the second session will be held 17-22 August 2014 in Panama City, Panama. Between sessions, participants will interact among themselves and with IAI staff and Institute instructors through Internet-based tools.

Why?

Addressing complex societal and environmental issues of the 21st century (e.g., preserving natural capital in food production, adapting to and mitigating climate change, accessing safe drinking water and sanitation) demands novel technologies, innovative policies, and integrative science dealing with complex socio-ecological problems. Simulation models are a common approach to integrating disciplinary perspectives and stakeholder values around such problems. Models provide a way to synthesize, codify, and organize different forms of knowledge into a coherent framework. They encourage thinking about causal relationships, and they allow researchers, practitioners, and stakeholders to collectively explore how a target system may respond under a variety of scenarios. This is useful for joint discussions and decisions addressing complex socio-ecological problems.

Who?

Up to 25 participants from IAI member countries (Argentina, Bolivia, Brazil, Canada, Chile, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, Guatemala, Jamaica, Mexico, Panama, Paraguay, Peru, United States, Uruguay and Venezuela) covering a diversity of roles in decision-making and research communities including: (1) decision-makers from different tiers of government working on global change related issues; (2) professionals from hydrology, climate, land use, health, sociology, geography and policy sciences; (3) stakeholders - NGOs, community organizations, businesses, managers and practitioners; and (4) early career scientists and technical experts.

Objectives and content

First PDS session: The first session will focus on the use of modeling tools as a way of structuring multiple disciplinary approaches, organizing knowledge, and identifying gaps. Participants will get hands-on experience in rigorous problem definition and explicit formulation of research/policy questions as a transparent, negotiated process involving scientists, practitioners and stakeholders. By their nature, modeling projects that involve complex socio-ecological systems with many interacting components lend themselves to multiple foci. During problem definition, experts often show a bias towards their own areas of expertise and different stakeholders frequently have various perceptions of a problem. The PDS will emphasize that the choice of focus and research/policy questions is a negotiation process that must be approached with openness, dialogue and respect for alternative views.

A second important skill is the selection of an appropriate level of analytical detail. Participants will be exposed to the tradeoffs involved in the definition of detail for a model – that is, what should be included, what should be left out.

Three types of approaches widely used in research on complex socio-ecological systems will be reviewed: (1) data-based, (2) system-dynamics, and (3) agent-based models. Data-based modeling may involve input-output models (e.g., life-cycle analysis), or statistical relationships. Systems-dynamics modeling is used when systems can be conceptually represented as stocks and flows. Agent-based modeling allows for explicit representation of space and time, and interactions within and across scales. Participants will receive guidance on the criteria for selection and use of these tools, that is, when to use each type of tool and what features of the target system guide this choice. These criteria form the basis for appropriate conceptualization of the problem, the target system, and the research question. Conceptual modeling and problem definition will constitute the core of this session. The final important skill to develop in this first session is proposal writing, which will be applied to develop letters of intent for the grant program.

Intersession: Between the first and second sessions, groups established during the first session will work to refine the initial research concepts developed in the letters of intent to develop a full proposal. The working groups will interact through discussion groups or electronic fora, and “meet” virtually (about once a month) with IAI staff and PDS leaders to review progress in project development. Virtual meetings also may include additional tutoring on the use of modeling tools.

Second PDS session: Modeling tools introduced during the first session will be discussed in greater detail, and use of each technique will be illustrated for specific complex natural/human systems (e.g., water sustainability in light of land-use and land-cover change due to agricultural expansion and intensification and/or urbanization). Because the ultimate goal of modeling is to aid policy and behavioral decisions, participants will develop the skills to communicate the research questions identified by the working groups and justify the approach chosen to a broad audience. Moreover, groups will work on completing full proposals to the grant program.

The Grant Program: During the first session, participants will organize into working groups. Each group will develop a brief (2-3 pages) “concept note” (or letter of intent) identifying a research question and proposing a possible approach to address the issue. These concept notes will be the first step towards development of research proposals to be submitted to the grant program which will fund about four projects in a US\$ 10,000-20,000 range for up to 12 months. Successful proposals will involve (i) a clearly formulated research question that is policy-relevant and commensurate with the time and funds available, and (ii) a well-designed research plan that may include some of the multidisciplinary approaches and methods discussed during the PDS. The grant program aims to allow participants to join other IAI research networks and continue engaging with colleagues, strengthen and foster multinational and multidisciplinary collaboration, and promote application of the research ideas and knowledge imparted in the training.

Application Information:

Language requirement: The program will be carried out in both English and in Spanish. Therefore, applicants must be proficient in one and have a sound understanding of the other language in order to understand, communicate, and participate actively.

Application process: Applications must be submitted only on line. Application requirements and procedures are available at <https://iaisrv1.iai.int/twiki/bin/view/PDS2014/WebHome>

Applications are due **December 2nd, 2013 at 16:00 São Paulo, Brazil, time.**

Participation in the first session does not automatically qualify for the second session. Acceptance for the second session will be communicated only after the first session.