

## Global change research and capacity-building in the Americas: the Inter-American Institute for Global Change Research

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Although to most people the term 'global change' means climate change resulting from the addition of greenhouse gases to the atmosphere, global change is actually much more than that. Of equal if not even greater importance than changes in climate are land-use and land-cover changes, biotic invasions, loss of biodiversity, and water and air pollution. In all of these ways, we are changing the earth and earth-system processes at an accelerating and alarming rate.

All of these areas of global change, moreover, are interconnected; and all are ultimately the result of worldwide population growth coupled with growing levels of consumption. While the specific consequences and even the root causes may be debated, few can fail to observe that the planet is being changed in important ways. Dramatic examples of the consequences abound — including, most recently, the devastating mud flows in Venezuela in December 1999, the terrible effects of Hurricane Mitch in Central America, and the prolonged and regular droughts affecting northeastern Brazil. In each of these cases, climate is not the only factor; land-use practices have set the stage for the environmental and human disasters.

The research questions of the next century will centre upon how and in what ways the planet is changing and the best ways of coping with this change. Understanding the implications of change for the water cycle will be a particularly critical component of this research. The Inter-American Institute for Global Change Research (IAI) recognizes that, to effectively address these questions, there must be a well-trained international community of 'global change scientists' as well as a strong spirit of collaboration within this community. The IAI has been working actively to create such a community in the Americas since 1994. In particular, the Institute has initiated a number of projects to improve understanding of regional and global water issues.

The IAI is an intergovernmental organization that is supported jointly by its 18 member countries within the Americas. Resources provided to the IAI are distributed throughout the science community for the support of workshops, research, training courses, and the building of scientific capacity in areas related to global change. Since 1996 the IAI has invested more than \$16M in the global change science community of the Americas.

As the IAI continues to develop its particular role as a global change funding organization, the theme of collaborative effort reaffirms its importance. Indeed, for multinational research projects in the global change arena, the IAI is one of very few possible sources of funding. Similarly, the IAI strives to encourage interdisciplinary collaboration, which has been equally strong at least in terms of the natural sciences — climatologists, hydrologists, oceanographers, agriculturists, and ecologists routinely work together on projects of common interest. But if natural scientists of various disciplines have found a common

language and common ground in the global change sciences, the connection between the natural and social scientists has been much more tenuous. The Institute continues to strongly emphasize and encourage interactions of this nature.

The building of scientific capacity has also been a major theme of the IAI, especially in regard to the training of young scientists in the Americas. In addition to assisting graduate- and post-graduate-level students to participate actively in research, the IAI also funds several shorter-term and more focused training programs. An example is the IAI Summer Institute, which brings together around 20 young natural and social scientists to focus on a global change topic of regional relevance. In the summer of 1999, the topic was climate variability; this summer, the topic is related to changes in land use and land cover.

Another major theme, or goal, of the IAI has been to serve as a bridge between the science community and the policy community. The Institute has supported projects that are strongly relevant to the development and application of policy. Very few IAI-supported projects could be classified as basic research — and even those that generate considerable new information are generally quite policy-related as well.

To spur the development of the active, international scientific network needed to effectively address regional global change issues, the IAI

initiated two major grants programs. First, through the *Initial Science Program (ISP)*, 39 grants were awarded between 1996 and 1998, for a total of some \$4.5M. The most recent — and definitely most ambitious — grants program, the *Collaborative Research Network (CRN)*, was created to help scientists and scientific institutions work together, as an integrated 'network', on a common global change issue of regional importance. Over the next five years the IAI will be investing at least \$10M in this program, which will support 14 interdisciplinary research projects involving a total of nearly 200 investigators and an equal number of institutions.

The IAI's agenda is a broad one, encompassing many issues and areas of inquiry related to global change. In the past, a high priority has been given to water issues, and most certainly that priority will be even higher in the future. Water-related projects supported by the IAI have included assessments of the impact of climate variability on hydropower and on agriculture; characteristics of precipitation in the Amazon Basin; and hydrologic and biogeochemical cycles in semi-arid grasslands, savannas, and tropical forests of the Americas. Although of great value, these projects only scratch the surface of the work that needs to be done. The IAI looks forward to a future of even greater activity and productivity in the pursuit of good global change science and the strengthening of the science community working in this area.