

**IAI Directorate Report
to the
Twenty Second Conference of the Parties,
for the period of July 2013 - June 2014**

1. Science, Research and Research Communication

Two science network grants were active during the year.

The **Small Grants for Collaborative Research** in the Americas is in its final year with 9 projects involving 13 of the IAI's 19 member countries, with 76 researchers in 53 institutions. 96 students have been involved in research; 59 of those received scholarships (a total of US\$ 249,000) from projects. 111 students participated in training activities and workshops funded by projects. The total additional funding leveraged by the individual grantees in the program is US\$ 13,440,000 on an original investment by the grant of US\$ 2,600,000.

The **Third Collaborative Research Network Program (CRN3)** was initiated in November 2012 and will run through 2018. During the year, all remaining Collaborative Research Network proposals were reviewed, revised in accordance with SAC recommendations and the science priorities set by the IAI, and finalized into grant agreements. This represents the end of a two-year effort by the directorate and the SAC in shaping research projects to address global change problems with interdisciplinary approaches and a view to decision making. The program's 17 projects resulted from three separate selections: 1. based on the initial call for proposals, 2. following a subsequent call addressing Ecosystem Services, that was designed specifically to promote joint proposals between natural and human sciences, and 3. the selection of a set of smaller grants to address interdisciplinarity, and best practices for the construction of interdisciplinary and intersectoral teams. The series of evolving calls for proposals, which received often good disciplinary external reviews but highly critical panel evaluations have shown that the major issue in the CRNs is the lack of capacity to frame global change problems collaboratively from the perspectives of natural and human sciences. The Directorate required extensive adjustments in several projects, to reinforce the social dimensions and improve the interdisciplinary integration needed for the research problems addressed.

In the selection process, scientists who had participated in CRN proposals were asked to provide guidance to others and to institutions of science governance towards improving the generation and mobilization of knowledge in interdisciplinary problem and solution oriented projects. The resulting projects will aid the IAI and others in developing the interdisciplinary science needed to address complex global change problems. The resulting 7 smaller projects on Science Integration, funded with between US\$ 100,000 and 200,000, are just starting operations. In addition to a specific problem orientation these projects will document a self-reflective analysis of their applied interdisciplinary approach. The entire CRN3 program is therefore now operational. This represents a science investment by the National Science Foundation of USD 11 million.

The initial group of 10 full CRN3 projects involves 111 investigators in 68 institutions in 14 IAI member countries. 120 students have participated in workshops

by these projects, and 76 students are involved in research, 41 of them with scholarships. The total additional funding leveraged during the first year was approximately US\$ 2,300,000. In addition, a *co-funding agreement* was developed with **CONICET (Argentina)**. Under this agreement which is designed to promote the inclusion of Argentine researchers in international programs, CRN projects will receive CONICET co-funding grants between 2014 and 2017. Under the terms of the agreement, 7 CRN projects that include Argentine researchers, and which receive a total funding of US\$1,600,000 from CRN3, will receive additional CONICET grants of US\$ 200,000 in total. This agreement provides a significant opportunity for linking national science funding to the IAI's international networks.

Tropi-Dry is one of the highly successful CRN projects that has been refunded and it is now directing its efforts towards information management and policy relevance (Enviro-NET). Taking the experience of Costa Rica in conservation, progress was made in the description and the analysis of Payment for Ecosystem Services (PES) initiatives: exploration of location variables, analysis of migration and other demographic variables, and econometric analysis of the impacts of PES using matching methods and regression. Analysis of the efficacy of conservation units in avoiding deforestation in tropical dry forests was conducted for the north of Minas Gerais, Brazil, using matching methods to compare deforestation before and after the establishment of conservation units.

The project has had considerable policy impact. In April 2014, the Costa Rican President Laura Chinchilla initiated a project to design and build its first national satellite, to be launched in 2016. A Tropi-Dry investigator, Julio Cesar Calvo, Dean of the Technological Institute of Costa Rica is in charge of the associated scientific mission. This satellite will stream CO₂ and climate data in real time from the Santa Rosa National Park in Guanacaste. Integration with Tropi-Dry wireless sensors to measure carbon fluxes in the tropical dry forests of Costa Rica establishes Santa Rosa as a worldwide research SuperSite in the same category as those handled by AUSNET in Australia. In Mexico, Tropi-Dry data on Carbon fluxes have been delivered to the Mexico National Forest Commission which is using them to develop collaborative projects as part of its REDD+ Program.

The IAI and Tropi-Dry are organizing a technology and capacity-building event with the Government of Peru to be held during the UNFCCC COP-20 in December 2014. The event will launch the first Enviro-NET site in Peru, and train local investigators on this advanced platform for management and analysis of environment data. Science, technology and technology-transfer will be some of the issues covered at UNFCCC COP-20, to be held in Lima, Peru.

The Collaborative Research Network CRN3038 on ***Sensing Freshwater Ecosystem Risk from Climate Change***, has expanded to add a stakeholder-oriented study on the socio-environmental evolution of the Sauce Grande River Basin in Argentina. Following the main hypothesis of the project, it analyzes how the effects of climate variability and anthropogenic intervention (i.e., urban, agricultural and livestock activities) are impacting on the watershed, and also, how changes in the basin impact the living conditions of populations in the basin and beyond the watershed which depend on the water conditions of the river. The research team works with stakeholders and decision makers to jointly analyze the problems affecting communities and economic activities.

Stakeholder involvement and the monitoring and assessment of water quality was to be funded with an FAO grant, but negotiations broke down over legal issues such as the IAI requirement for free and open access to data and attribution of authorship. Since important stakeholder interactions were involved, the Directorate decided that this project component should not be dropped, and the policy oriented part of the project was also included in the NSF-funded portion of the CRN.

This highlights a fundamental issue in taking on problem-oriented research: many agencies are still governed by the principle that the payer owns the information. It also highlights the importance of careful planning and constancy in the involvement of stakeholders if the IAI's credibility at the science-policy interface is to be maintained.

An important issue in the region is establishing base lines for global change research. The network (CRN3035) on climate services has started the compilation of *historical daily weather information* issued from meteorological stations in Brazil, Paraguay and Argentina, and is applying quality control protocols to those series. For this, it is using open-source programming so it can develop a platform for much wider efforts of data recovery on the continent.

The ongoing MacArthur Foundation-funded project “*Climate-related vulnerability and risk assessments and improved decision making processes for conservation and land use planning in two Andean biodiversity hotspots*” is led directly by the IAI Directorate in a pattern very different from the research networks in which the IAI provides funding and arms-length oversight. It investigates near-term climate change trends, land-use patterns, biodiversity patterns and gradients, the vulnerability of species and ecosystems to changes in historical climatic conditions, as well as local perceptions of climate variability and change. The study in the 2 original trans-boundary study areas (Nariño/Carchi and Puno/La Paz) has been expanded to third site in Los Nevados Natural Park in the Colombian central Andes with contributions from the Escuela de Ingeniería de Antioquia in Colombia and the International Research Institute for Climate and Society (IRI).

The project has developed a GIS-based Andean climate wizard from observed and simulated climate data for the full Tropical Andean region and the trans-boundary regions under study (local scale). The Andean climate wizard better represents the complex Andean topography, where strong altitudinal differences in the long-term trends of ambient temperatures are both observed and predicted by atmospheric general circulation models. In order to assess uncertainty in climate change projections, digital sensor data are now being combined with climate reconstructions from dendrochronologies, and with 50-year records from weather stations.

Georeferenced databases on the known distribution of species in selected taxonomic groups (ca. 2900 species in total) for the project's study areas have been completed. Distribution maps were modeled for all species by ecosystem and altitudinal range. These maps are now being overlaid with the Andean climate wizard to obtain the required input for the climate change exposure module of the NatureServe Climate Change Vulnerability Index (CCVI). Data bases for biological/ecological attributes required for evaluating all species with the NatureServe Climate Change Vulnerability Index (CCVI) have been completed. An analysis of statistically-significant abrupt changes in the mean of monthly NDVI values (GLCF GIMMS

global NDVI data published by the University of Maryland) between 1981 and 2006 is also complete.

Two IAI projects had an opportunity to explore European program initiatives. Following a lead by the Argentinean government, the IAI is participating in an European Union funded project, ENSOCIO-LA, for EU - Latin America cooperation on climate action, resource efficiency and raw materials. The IAI highlighted its projects on climate services and on land use - hydrology interactions, for their potential global interest. Argentina's representative to the IAI is taking a lead in this European initiative.

IAI projects on hydrology and water management in the Andes disseminated their research findings through two webinars (1) on vulnerability and adaptation of dryland Andean rural communities, organized by UNEP's REGATTA (Regional Gateway for Technology Transfer and Climate Change Action in Latin America and the Caribbean) in November 2013; and (2) on vulnerability and climate change impact, organized by Practical Actions and PNUMA REGATTA in April, 2014. The IAI group also contributed to the 10th Annual Meeting of the Red Iberoamericana de Oficinas de Cambio Climático (RIOCC) in Santiago de Chile in October, 2013;

These projects also contributed to UNESCO's "Climate Change Impacts in Major Mountainous Regions of the World" initiative. Dendroclimatology, dendrochronology and hydrological modeling helped explain recent forest disturbances, glacial retreat, variations in Andean snow pack and stream flows, and the implications on water availability for human use. Decreasing water supply contrasted with the growing demand for domestic water and irrigation, increasing the imbalance between supply and demand. This imbalance affects social groups with different degrees of vulnerability, and is strongly linked to patterns of development. Local governance systems influence adaptation options and capabilities.

These results provided content to the regional level science-policy discussion animated by CONDESAN (Consortio para el Desarrollo de la Ecorregión Andina) in its "Taller Regional Diálogo Andino entre la Ciencia y la Política" (Quito, Ecuador, June). Resulting recommendations were adapted the diverse political and institutional styles in the Region and their role in increasing or reducing local resilience to global environmental change.

The IAI, CONICET, CONACYT of Mexico, FAPESP of São Paulo State, and the National Science Foundation are developing an initiative to promote *collaborative global change science funding* in the region. A meeting of funding agencies in the Americas has been called for August 11, 2014, prior to the CoP in Mexico City. The purpose of the meeting is to design mechanisms for co-funding international research programs on issues of global change, that respect the agencies' own interests and funding rules while facilitating the multilateral collaboration needed to address global change and its socioeconomic implications.

Linking IAI science to new global initiatives

IAI's mandate for global change research is problem oriented and interdisciplinary. The amalgamation of the global change programs IGBP, IHDP and Diversitas, with participation by WCRP into a new global program "**Future Earth**" generated a global entity with a broad interdisciplinary mandate very similar to the IAI's. As part of the

development of Future earth's global secretariat, IAI therefore offered to provide the regional link for Latin America, and potentially all of the American Continent. This proposal has been accepted. In a joint initiative with CONICET of Argentina, CONACYT of Mexico, FAPESP of São Paulo State, Brazil, the IAI is now part of the task of developing a global, inclusive, equitable science governance initiative to guide global change research for the future.

The IAI's Scientific Director is on the Scientific Committee of The Comparative Research Programme on Poverty (CROP) of the International Social Science Council (ISSC) hosted by the University of Bergen, Norway. CROP's 2014 Scientific Meeting explored synergies between poverty studies and global change research and reinforced the sustainability dimensions of the research. The involvement with CROP adds to a series of contacts with the International Social Science Council (ISSC) which will help in strengthening the social component of future IAI science.

2. Capacity Building

The first of the Professional Development Seminars on *Modeling Strategies and Decision-Support Tools for the Management of Complex Socio-Ecological Systems* was held 24-28 March, 2014 in Antigua, Guatemala. This was a joint activity with the Universidad del Valle de Guatemala and the University of Chicago at Illinois. IAI investigators and a SAC member served as co-organizers, lecturers and the host. The Secretary of Science and Technology of Guatemala, and universities of Brazil, Canada, Mexico and the USA provided co-funding for their participants. Twenty five scientists, practitioners and government officials from 14 countries discussed techniques for 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 organized themselves into 7 multinational and multidisciplinary working teams to formulate project proposals for the IAI's Seed Grant Program (TISG). A review committee has evaluated the 7 proposals and provided feedback to further strengthen proposals. All groups have been invited to work on a full proposal which will be submitted at the second seminar in Panama in August 2014. On a field trip Lake Atitlán, participants experienced the complexity of the real socioecological problem of the lake's water quality. They visited 4 groups of social actors in the region: a municipal authority (mayor of Panajachel), a representative from the national authority in the Lake (basin administrator - AMSCLAE), the coordinator of the private association of local hotel owners (Asociación Todos por el Lago), and researchers from a local university (Centro de Estudios Atitlán/Universidad del Valle) who have carried out research with local communities. Through these diverse perspectives and the dialogue with local groups participants realized the fragility of local institutional arrangements and the challenges to governance. At the same time, they perceived the opportunities for science-policy interactions in addressing the complexity of the lake's socioecological problem.

IAI and the Economic Commission for Latin American and the Caribbean (ECLAC) published the book *“Urban Responses to Climate Change in Latin America”* in December 2013. This publication is the result of a previous training event and of the MoU signed by both organizations in 2011. More than 30 scientists, urban planners

and decision makers contributed to the book with its multidimensional approach to a key theme of development and growth of this century. The publication serves as a methodological guide and an analytical tool that facilitates the design and implementation of strategies and actions to meet the challenge of climate change in urban areas. The book was launched officially at Mexico's Instituto Nacional de Ecología y Cambio Climático (INECC) in December, 2013 (see <http://www.inecc.gob.mx/ord-ecol-objetivo/1178-dgioece-libruccal>). Over 50 government officials, policy and decision makers, and academics attended the event. The publication is available in print and in electronic versions, in Spanish at: http://www.iai.int/index.php?option=com_content&view=article&id=24&Itemid=73

During 2013-2014 four seed grants have been approved for funding and are under development. These projects result from the two *Colloquia on Knowledge Integration at the Science-Policy Interface* held in November 2012 (Dominican Republic) and April 2013 (Ecuador). The projects involve 24 professionals, from 10 IAI member countries, with a total IAI funding of US\$ 84,170:

1. Lessons learned on reducing the negative effects of extreme hydrometeorological events on agricultural systems. PI: José Luis Santos - Escuela Superior Politécnica del Litoral (ESPOL), Ecuador, with participants from: Colombia (1), Brazil (1), Chile (1), Argentina (2)
2. Institutional capacities of response to extreme rainfall events in small coastal tourism and artisanal fishing-based economies: Case studies in Brazil, Mexico, and Dominican Republic. PI: Arturo Ruiz-Luna - Centro de Investigación en Alimentación y Desarrollo, Mexico, with participants from: Dominican Republic (1), Brazil (2), Mexico (1)
3. Developing an operational research framework to assess local flood response capacities: A case study of a rural coastal community in Ecuador. PI: Anna M. Stewart Ibarra - Center for Global Health & Translational Science, SUNY Upstate Medical University, USA, with participants from: Ecuador (5), Bolivia (1), Dominican Republic (1).
4. Is my city ready for climate change? Science-policy framework to foster climate change adaptation in LAC cities. PI: Fernando Aragón-Durand, Mexico, with participants from: Chile (1), Colombia (1), Dominican Republic (1), Uruguay (1)

Upcoming capacity building and new initiatives

Several capacity building events are being prepared for August-September 2014. The second of the “*Professional Development Seminar on Modeling Strategies and Decision-Support Tools for the Management of Complex Socio-Ecological Systems*” will be held 18-22 August, 2014 in Panama City, Panama.

The dissemination meeting of the IAI-MacArthur foundation project results “*Climate-related vulnerability and risk assessments and improved decision making processes for conservation and land use planning in two Andean biodiversity hotspots*” will be held in the 4 participating Andean countries in 2014: 8 September in La Paz, Bolivia; 15 September in Lima, Peru; 22 September in Quito, Ecuador; and 29 September in Bogotá, Colombia. together with these events, 4 workshops will be held to train approximately 100 Andean professionals coming from government agencies, universities, conservation and civil society NGOs on the use of the methodology developed by the IAI research team. The training workshops will be held 9-10

September in La Paz, Bolivia; 12-13 September in Lima, Peru; 23-24 September in Quito, Ecuador; and 26-27 September in Bogotá, Colombia.

In February 2014 the IAI submitted a new training proposal to NSF for US\$ 400,000 to support 4 capacity building activities during the period 2014-2017. Activities will target participants coming from the natural and social sciences, policy and decision makers from the public and private sectors, environmental practitioners and other social actors. The seminars will explore: 1) Transdisciplinary Scientific Team Management Skills; 2) Managing Ecosystems Services from Tropical Forests; 3) Ecohealth Approach for the Andean countries; and 4) Impacts of Climate Change and Variability on Human Health in the MERCOSUR countries (which will contribute to the development of a new PhD Program on Health and Environmental Sciences at the University of Entre Rios). A fifth activity addressing Resilience to Risk in Rural Areas through Climate Index Insurance and Agricultural Zoning for Climatic Risks is being explored in collaboration with the World Bank and the São Paulo Research Foundation (FAPESP).

3. Science-Policy Linkages

Over the past years, IAI has contributed to the scientific input the UNFCCC, and since the establishment of the IPBES, is also actively engaged in this new process. In October 2013, the IAI participated in the UNFCCC “Workshop on technical and scientific aspects of ecosystems with high-carbon reservoirs not covered by other agenda items under the Convention”. This provided an opportunity for a young researcher from the Tropi-Dry network, Sandra Duran, to highlight the role of biodiversity in maintaining carbon stocks. Changes in biodiversity may influence carbon gains and losses in an ecosystem. Studies have shown that the relation between biodiversity and carbon varies across ecosystem types and that biodiversity can have positive or negative effects on carbon storage. For example, liana abundance can decrease carbon stocks in humid forests, whereas in other ecosystems, depending on the type, a richness of species is accompanied by higher carbon stocks. In mature and secondary savannas, carbon stocks are highest under mixed-species stands. Biodiversity can also help to identify tipping points of an ecosystem. The report of this workshop and presentations are available at:

http://unfccc.int/science/workshops_meetings/items/7797.php

The IAI has encouraged the participation of young researchers in meetings of the Conventions whenever possible, to develop a new generation of policy-aware scientists, to showcase the importance of IAI capacity-building, and to provide opportunities to young scientists from Latin America to present their research in international policy fora.

The IAI is continuing its engagement in the Research Dialogue of the *Subsidiary Body for Scientific and Technological Advice (SBSTA)* to the United Nations Framework Convention on Climate Change (UNFCCC). The IAI's Program Manager (Ione Anderson) introduced Arturo Sanchez-Azofeifa of the TropiDry project to SBSTA-40, in June 2014 to present latest data linking forest phenological changes to climate change, particularly changes in precipitation: although dry forests in the Americas are going through changes, they are highly resilient and may be more

resilient to droughts than forests in more humid zones. This could mean that tropical dry forests are more efficient at utilizing scarce water than other ecosystems and that they will be the survivors in a hotter, drier world. In addition, these forests can be used to monitor ecosystem drought resilience globally. The presentation is available at: unfccc4.metafusion.com/kongresse/sb40/templ/play.php?id_kongresssession=8028&theme=unfccc

Both the IAI Program Manager and the Science-Policy Consultant attended the second plenary session of the *Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES)* in Antalya, Turkey, in December 2013. The IAI hosted a side-event on biodiversity and ecosystem services to discuss knowledge gaps and research priorities and develop areas of collaboration between IAI and IPBES. IAI investigator Sandra Diaz spoke on the importance of understanding what aspects of biodiversity are useful for different social actors, concluding that ecosystem governance is an indispensable element to protect and sustainably manage biodiversity and its social actors. IAI SAC Member Harold Mooney described how an IAI-IPBES partnership could aid in knowledge generation, capacity-building, communication and policy-science interface and how the IAI model of regional collaboration on global change issues conducted in an integrated manner, with targeted solutions to policy challenges - a model that resonates with the vision of IPBES. Salvatore Arico of UNESCO cited the UNESCO-IAI collaboration model as one way for IPBES to build on existing structures, in response to the IPBES Busan Outcomes, which concluded that IPBES should “collaborate with existing initiatives on biodiversity and ecosystem services, including multilateral environment agreements, UN Bodies and networks of scientists and knowledge holders, to address gaps and build upon their work, while avoiding duplication”. The event was attended by delegates of IAI member countries and participants from other organizations.

Following an invitation by the IPBES for nomination of experts to task forces and expert groups, the IAI nominated 8 experts. Three of those have been selected for the following task forces: Assessment on Pollination and Pollinators (CRN3025 co-PI Mario Marcos do Espirito Santo); Methodology on Values of Biodiversity (CRA2015 co-PI Daniel Caceres) and Expert Group on Policy Support Tools (IAI Science-Policy consultant Nicolas Lucas).

CoP 21 provided input to the new science-policy process that was to be associated with the Science-Policy Directorate in Buenos Aires. In the absence of staff and activities in this office, several important issues were addressed by the existing IAI directorate and its science-policy consultant who has been engaged by the IAI since 2012:

The Directorate provided support to the EC in the production of the terms of reference for the Science-Policy Advisory Committee.

The Directorate established contact with and between IAI country representatives and IPBES focal points in preparation for IAI’s participation at the Second Session of the Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES).

On the occasion of the release of the first IPCC-5 report in September 2013, requests were sent by the IAI consultant to scientists of IAI-funded projects to provide comments that linked their work to those reports. Responses are now systematized and a second round of requests will be sent upon the second and third IPCC-5 reports. The last IPCC release will happen in October 2014, by which time IAI will have

produced a communication product that highlights the Institute's research in the context of these influential reports.

The Directorate has established contacts with the World Bank office for Agriculture and Rural Development in Latin America and the Caribbean, for collaboration in the design and implementation of a capacity building project on rural social resilience and index based climate insurance for agriculture.

Ongoing negotiations with the UNESCO office for South America on a Regional Center for Climate Change and Decision Making are resulting in a new initiative to evaluate stakeholder engagement in the development of science-policy activities. Options for closer collaborations in a consortium involving UNESCO, an NGO, Avina, and a research institute in Uruguay, SARAS2, are being evaluated by a consultant engaged by Canada's IDRC.

4. Directorate operations

Much time and energy was expended on the relocation of staff and the executive directorate to Montevideo. At the time of this report, the office in Montevideo is functional, the Science Director has joined the staff from Argentina and 4 key personnel have completed their move to Montevideo. One local assistant has been hired by the IAI, and IT facilities are being re-established by a short term consultant. Principal server operations are outsourced in Buenos Aires. Due to delays in Uruguayan contracting none of the local staff has joined the team and 4 support staff continue in Brazil. There have been no concrete steps in establishing the Science Development office of the Directorate. The office space for the Science-Policy Liaison office has been renovated by the IAI, but no staff has been placed. As this report shows, none of this institutional restructuring has affected operations in research support or capacity building. IAI has embarked on significant new activities: the active involvement with IPBES, the bid for regional support of Future Earth, new alliances with UNESCO, ICSU and others to develop science-policy initiatives.

Linked to the high visibility capacity building program Marcella Ohira developed new contacts with member country governments:

In Jamaica, December 2014, with the Permanent Secretary and Chief Technical Director of the Ministry of Water Land Environment and Climate Change.

In Guatemala, March 2014, with the Secretariat for Science & Technology, - SENACYT, and with the Vice-Minister of Environment.

In Panama, April 2014, with ANAM, the Ministry of Foreign Affairs, the Secretariat of Science and Technology – SENACYT, and the Instituto Conmemorativo Gorgas de Estudios de la Salud – ICGES.

In Peru, June 2014, with the Servicio Nacional de Meteorología y hidrología del Perú, and with several program divisions of CONCYTEC.