

**IAI Directorate Report
to the
Twenty Fourth Conference of the Parties,
for the period of June 2015 - May 2016**

Science, Research, and Funding Alliances

The **Small Grants for Collaborative Research in the Americas** (SGP-CRA) was closed in December 2015. 76 researchers from 53 institutions of 13 of the IAI's 19 member countries worked collaboratively advancing the best research activities of the previous CRN2 on South Atlantic oceanography, tropical cyclones, hydrology and water security in Andean drylands, land use and agricultural climate-related issues, and the ecology of tropical dry forests throughout the Americas. The IAI guided and monitored these projects between Jan. 2011 to the end of 2015. All projects delivered excellent results and methodological advances documented in high impact publications.

Application of results to policy making yielded significant insights with reach that goes beyond academic understanding. SGP-CRA 2048 contributed to the implementation of cyclone models providing real-time forecasts of land-falling hurricanes in Baja California; and a decision tool for coastal risk reduction was produced by SGP-CRA 2050 by integrating biophysical and socio-economic factors contributing to coastal vulnerability and resilience in an index covering 25 Caribbean countries. Findings from SGP-CRA 2047 and from SGP-CRA 2076 informed 2 legislative processes in Argentina, leading to the passing of the Law for the Protection of Glaciers and the Law for Marine Conservation, respectively. SGP-CRA 2060 supported small Meso-America coffee growers for facing global change in the context of trade certification programs. SGP-CRA 2031 changed the popular understanding or the causes of flooding in the South American Southern dry pampas, and contributed towards a land use planning that treats groundwater as part of decision making on land use by stakeholders sharing a same landscape.

The quality of the work is also attested by the total funding leveraged by these projects: US\$ 26 million on an original investment by the grant of US\$ 2,750,000. The program also provided opportunities for training and professional development to 197 students that received scholarships, for a total of US\$847,979.58 between 2012 and 2015. In addition, 400 students participated in training activities and workshops funded by projects.

List of SGP-CRA projects:

SGP-CRA005: "Information Flows and Policy: Towards an integrated assessment of water security under Global Change in the Americas" PI: Christopher Scott, University of Arizona, USA. Countries: USA, Chile, Argentina, Mexico.

SGP-CRA2015: "Functional Biodiversity Effects on Changing Ecosystem Processes and Services and Sustainability: an Interdisciplinary Approach". PI: Sandra Diaz, Instituto Multidisciplinario de Biología Vegetal (CONICET-Universidad Nacional de Córdoba), Arg. Countries: Argentina, Costa Rica, Bolivia, USA.

SGP-CRA2021: "Understanding the human, biophysical and political dimensions of tropical primary and secondary dry forests in the Americas". PI: Arturo Sanchez-Azofeifa, University of Alberta, Canada. Countries: Canada, Brazil, Costa Rica, Mexico.

SGP-CRA2031: “Land use change in the Rio de la Plata Basin: Linking biophysical and human factors to predict trends, assess impacts, and support viable land use strategies for the future”. PI: Esteban Jobbágy, Univ. de Buenos Aires, Argentina. Countries: Argentina, USA, Uruguay, Paraguay.

SGP-CRA2047: “Documenting, understanding and projecting changes in the hydrological cycle in the American Cordillera”. PI: Brian Luckman, University of Western Ontario, Canada. Countries: Canada, USA, Mexico, Chile, Argentina.

SGP-CRA2048: “Tropical cyclones: current characteristics and potential changes under a warmer climate”. PI: Graciela de Raga, Universidad Nacional Autónoma de Mexico. Countries: Mexico, Chile, USA, Panama.

SGP-CRA2050: “Paleotempestology of the Caribbean Region: A Multi-proxy, Multi-site Study of the Spatial and Temporal Variability of Caribbean Hurricane Activity” Kam-biu Liu, Louisiana State University. Countries: USA, Costa Rica.

SGP-CRA2060: “Effective Adaptation Strategies and Risk Reduction towards Economic and Climate Shocks: Lessons from the Coffee Crisis in Mesoamerica”. PI: Edwin Castellanos, Universidad del Valle, Guatemala. Countries: Guatemala, Costa Rica, Mexico, USA, Nicaragua

SGP-CRA2076: “SACC: An International Consortium for the Study of the Oceanic Related Global and Climate Changes in South America”. PI: Alberto Piola, Servicio de Hidrografía Naval, Argentina. Countries: Argentina, Brazil, Chile, USA, Uruguay

In addition to the usual research communication activities of all IAI projects, the closing SGP-CRA offered material for two audiovisual communication products aimed at inspiring critical thinking in public and political dialog on climate-related issues:

- "El Rio Nuevo" (“The New River”), a 50 minutes duration documentary is being produced by SGP-CRA 3031 (PI Jobbágy) presenting the case of a series of new water courses that have abruptly carved the semiarid plains of central Argentina over the last three decades. The velocity and magnitude of this landscape transformation is puzzling scientists and challenging farmers. This film shows how local farming communities and researchers perceive these transformations and react to them. It shows the research process developed, its motivations, and the approach used, revealing new knowledge and emerging uncertainties. The avant-premiere of this documentary is scheduled for August 2016. A fragment is available at: <https://www.youtube.com/watch?v=qJFrs3ojQSM>

- "Meat production in dry forests of the Americas: forests, pastures and livestock" is a 29 minute documentary that integrates results from SGP-CRA 2015, SGP-CRA 2021 and SGP-CRA 2031, and also from CRN3025 and CRN3095. It presents the dry forest biome, and examines meat production systems in dry forests of the Americas. Analyses of specific meat production systems in the Argentinean Gran Chaco and Brazilian Cerrado are used for reflecting on ways of sustainable integration of forest, pastures and livestock production. The distribution of the documentary through educational, academic, media and web is scheduled for the second half of 2016.

The **Third Collaborative Research Network Program (CRN3)** was initiated in November 2012 and will run through 2018. 17 PIs and 95 co-investigators and 90 institutions from 15 of the IAI's 19 member countries work in 17 international research networks addressing global change phenomena in their societal context in multi-country, multidisciplinary collaborations, while fostering closer links between science and decision making. Scholarships have been granted to 264 students for a total of US\$ 929,198, adding to other 295 students that were trained in CRN3 projects. The total additional funding leveraged by CRN3 projects since Year 1 is of US\$ 23.5 million.

CRN3 comprises two sets of projects:

Ten major networks funded with between US\$ 700,000 and US\$ 1,000,000 that resulted from two CRN3 initial calls. They cover a broad range of climate-related atmospheric, terrestrial and marine global change issues thorough the continent:

CRN3005: “Nitrogen Cycling in Latin America: Drivers, Impacts and vulnerabilities”. PI: Jean Pierre Ometto, Instituto Nacional de Pesquisas Espaciais, INPE, Brazil. Countries: Brazil, Argentina, Bolivia, Chile, Mexico, USA, Venezuela.

CRN 3025: “Tropi-Dry II: Enhancing knowledge exchange for conservation and management of tropical dry forests in the Americas”. Arturo Sanchez-Azofeifa, University of Alberta; Ca. Countries: Canada, Brazil, Costa Rica, Mexico.

CRN 3035: “Towards usable climate science – Informing sustainable decisions and provision of climate services to the agriculture and water sectors of southeastern South America”. PI: Cecilia Hidalgo, Universidad de Buenos Aires, Arg. Countries: Argentina, Brazil, Paraguay, USA.

CRN 3036: “LUCIA” - Land use, climate and infections in Western Amazonia”. PI: Alisson Barbieri, UFMG/CEDEPLAR. Brazil. Countries: Brazil, Ecuador, Peru, USA.

CRN 3038: “Sensing the America's Freshwater Ecosystem Risk (SAFER) from climate change”. PI: Gerardo M E Perillo, Instituto Argentino de Oceanografía (CONICET-UNS), Arg. Countries: Argentina, Canada, Chile, Colombia, Uruguay, USA

CRN 3056: “Innovative Science and Influential Policy Dialogues for Water Security in the Arid Americas”. PI: Christopher Scott, University of Arizona. C

CRN 3070: “Variability of Ocean Ecosystems around South America (VOCES)”. PI: Alberto Piola, Servicio de Hidrografía Naval, Arg. Countries: Argentina, Brazil, Chile, Peru, Uruguay, USA.

CRN 3076: “Effects of Anthropogenic Habitat Perturbation on Rodent Population Dynamics and Risk of Rodent-Borne Diseases”. PI: Daniel Bausch (PI), Tulane University, USA. Countries: USA, Bolivia, Peru, Paraguay

CRN 3094: “Assessment of marine ecosystem services at the Latin-American antares time-series network”. PI: Milton Kampel, Instituto Nacional de pesquisas Espaciais (INPE), Brazil. Countries: Brazil, Argentina, Colombia, Chile, Mexico, Peru, USA, Venezuela.

CRN 3095: “Bridging Ecosystem Services and Territorial Planning (BEST-P)”. PI: José M. Paruelo.

LART-IFEVA. Facultad de Agronomía and CONICET, Argentina. Countries: Argentina, Chile, Mexico, Uruguay

Seven smaller “Science Integration” projects funded with between US\$ 98,000 and US\$ 180,000 for 1 to 3 years of research were implemented in 2014 to address specific gaps in competences for developing interdisciplinary global change science:

CRN3097: “Intensive Training Program in Management of Social-Ecological Systems to Support Decision Making”. PI: Patricia Balvanera, UNAM, Mexico.

CRN3101: “Advancing Good Practices in Building Interdisciplinarity: Moving Towards User-Oriented Science”. Joint-PIs: Marcelo Saguier, FLACSO, Argentina, and Andrea Gerlak, University of Arizona, USA.

CRN3102: “Interdisciplinary science and development integration for adaptation to water scarcity in the Comahue region, Argentina”. Ana Maria Murgida, Univ. de Buenos Aires, Argentina.

CRN3105: “Interdisciplinary Science Team Skill Building Through the Study of Socioecological Impacts from Bioenergy Development across the Americas”. PI: Kathleen Halvorsen, Michigan Technological University, USA.

CRN3106: “Transferring climate knowledge in the science-policy interface for adaptation to drought in Uruguay”. Gabriela Cruz, Univ. de la República, Uruguay.

CRN3107: “Interdisciplinary Research to Improve Information Provision for Decision Making”. Jacob van Etten, Biodiversity International, Costa Rica.

CRN3108: “Coping with hydrological risk in megacities: collaborative planning framework for the Mexico City Metropolitan Area”. Luis Bojórquez Tapia, UNAM, Mexico.

CRN3 is a highly ambitious program in terms of science integration. The selection process required three calls, each strengthening the requirements for interdisciplinarity and research that aims to support decision-making. Close monitoring and sustained guidance from the

Directorate - with advice from the Scientific Advisory Committee (SAC) - were necessary to promote science integration on a project-by-project and case-by-case basis. Three and a half years into CRN3 research work, this effort has resulted in the CRN3 program making considerable progress towards an increased interdisciplinarity and solution-oriented research:

- Use of social sciences concepts and tools, such as the analysis of social actors' relationship with ecosystem services, discriminating between different stakeholders as "affecters" and "beneficiaries" of ecosystems, as in CRN3094, CRN3095 and CRN3038. Analyses of vulnerability to drought made by CRN3056 are carried out according to types of actors, for differentiating sensitivities and identifying adaptation opportunities that suit different stakeholders. CRN3108 unveils values, goals, perceptions, knowledge, and preferences that underpin risk-related decision-making.
- Analysis of ecological and human variables are used by CRN3025 to assess conservation-development interactions and to feed econometric models evaluating drivers of deforestation in tropical dry forests, as influenced by government environmental and development policies (i.e., parks, parks buffers, and payments)
- Agent based modeling help integrate the sciences by for instance combining entomological, environmental and human modules to simulate the spreading of insect-borne disease such as malaria, dengue or leishmaniasis (CRN3036).
- Such integration provides knowledge usable to affect policy as in CRN3070, which contributed an ecosystem approach to a fisheries co-management program in Uruguay, resulting in the reopening of the yellow clam fishery in Rocha after a decade-long closure.
- Stakeholders involved in research facilitate science-for-policy outreach but also science-from policy inreach processes in the opposite direction. It is the case of stakeholders from the water, energy, agriculture, urban, mining and other industry sectors of Chilean basins contributing to CRN3056 revisiting drought definitions to make it operational, and addressing water issues from a complex water-food-energy nexus perspective.
- By mobilizing regional climate and sectoral (water, agricultural) knowledge and by providing climate services to intermediate and end users, CRN3035 has created new institutional spaces that allow partnership between the Southern South American climate services community, including the national meteorological services of five countries.
- By reconciling ecosystem, economic and social considerations to map and change societal values on freshwater ecosystem services, CRN3038 translated its research results into an integrated freshwater management plan in which local actors agree on assessments and actions. Similarly, CRN3076 contributes to social learning and social transformation by supporting Amazonian communities in "lifepans" that identify and characterize the problems affecting them, establishing priorities and planning for achieving community goals.

A CRN3 researchers meeting was held in December 2015. The meeting provided a learning opportunity at the individual, team and organizational levels. Small science integration networks results and insights provided real, practical guidance on key issues on the evolution towards interdisciplinarity. The exchange of experiences of implementing CRN3 projects covered networking, team design and team building; factors for motivation and commitment; administrative and scientific challenges of international collaborative networks; events and processes that favored interdisciplinarity and stakeholder involvement; design flexibility and integration of policy demands; and the role of and needs for capacity building to facilitate complex interdisciplinary networks. The researcher workshop confirmed the effectiveness of IAI strategies for facilitating networked science: fostering learning by researchers as part of project development, helping with networking and teamwork across disciplines during project review and implementation, and the emphasis on problems and solutions that are

communicable to decision makers. It also exposed the importance of introducing interdisciplinarity in early stages of research development, as it is more difficult to achieve if pursued later. Senior researchers emphasized the important contributions of students and young scholars in implementing innovative and collaborative work. The workshop itself demanded intense researcher involvement and motivation to analyze the demands of complex networking.

2015 was the first year of activity of the **CONICET-IAI projects**. The Argentinean Scientific Research Council (CONICET) established a fund of US\$ 200,000 to supplement the research activities of the Argentinean teams involved in CRN3 networks over 4 years. The IAI received 9 proposals, and applied criteria of scientific excellence and social relevance to select the best 7 projects addressing specific relevant issues on marine, terrestrial and atmospheric global change issues not included in the CRN3s proposals. The IAI has monitored the first year of activity of these projects, from January to December 2015. CONICET funding found teams already working under CRN3s, which facilitated a quick start and compliance with the proposed working plans.

List of CONICET-IAI projects:

CONICET-IAI 3005 “Network capacity building in the Americas: theoretical and practical applications of human impact on N cycling in Argentina”. PI: A. Austin. IFEVA-CONICET.

CONICET-IAI 3094 “Evaluación del sistema de los carbonatos en el contexto de la acidificación oceánica en la serie de tiempo EPEA (Mar Argentino)”. PI: V. Lutz. INIDEP-IIMYC.

CONICET-IAI 3056 “Articulación inter-redes para la producción de conocimiento estratégico. Transponiendo las fronteras del Cambio Ambiental Global desde las ciencias sociales”. Joint-PIs: P. Mussetta and F. Martin. INCIHUSA-CONICET.

CONICET-IAI 3038 “Influencias climáticas y antrópicas en los lagos de la cuenca del río Senguer: hacia soluciones consensuadas con los actores sociales y toma-dores de decisión”. PI: G. Perillo. IADO.

CONICET-IAI 3070 “The relative ecosystem service of frontal areas in the South West Atlantic Large Marine Ecosystem”. PI: A. Piola. SHN and UMI-IFAECI.

CONICET-IAI 3035 “Elaboración de índices de excesos/déficit hídricos orientados a la actividad agropecuaria, basados en la humedad del suelo”. PI: A. Saulo. CIMA.

CONICET-IAI 3095 “Tipos funcionales de socio-ecosistemas: una alternativa para la zonificación del territorio en procesos de planificación y ordenamiento”. PI: J.M. Paruelo. LART-IFEVA-CONICET.

A **proposal for small grants** has been submitted to the National Science Foundation. It takes up themes of adaptation and ecosystem services in response to CoP22 resolutions and the resulting UNFCCC statements. An innovative program design capitalizes on lessons learned in science integration, including IAI-provided capacity building for aiding interdisciplinarity, team building and networking in the first stages of project development.

The Directorate continued promoting the initiative of the **Inter-American Forum for Cooperation in Global Change Research**, aimed at linking national funding agencies amongst each other and with the IAI in a multilateral funding mechanism that is based on the experience of the Belmont Forum. The text of the agreement developed jointly by the Directorate and the Argentina's CONICET was examined by the legal department of São Paulo State's FAPESP (a Belmont member). The text was shared with the funding agencies of the IAI member countries, which are analyzing feasibility within their administrative systems. The goal is that the Inter-American Forum offers program options that parallel and expand the current, largely NSF funded international IAI grants.