

IAI Directorate Report to the twentieth Conference of the Parties, 2012 for the period of July 2011 - May 2012

1. Science and Research

The **Second Collaborative Research Network (CRNII), 2005-2012** will end in August.

The numbers: 180 investigators in 97 institutions and 18 countries

9 of the 13 networks are led by institutions and investigators in Latin America

USD 10,324,000 have been provided by the US National Science Foundation for 5-years.

Total funding leveraged in the program was approximately 27.6 million.

As of April 2012, 1510 degree students are part of the projects, 704 received scholarships from the grant. 1491 students participated in training events and workshops promoted by CRNII projects. The networks have produced 273 peer-reviewed journal articles and 72 books or book chapters

NSF funding made available through IAI has allowed investigators to conduct science that would not be possible otherwise since most national funding agencies restrict use of funds to nationals: PIs commented that IAI programs have made a clear difference in the development of the regional capacity by supporting early career scientists through training courses and scholarships of up to 4-5 years. The CRN grants provided international cohesion and outreach to teams that were therefore successful in raising local support amounting to US\$ 27.6 million. Several program participants have commented on the extraordinary cost-effectiveness of the CRNs. Interactions among projects with related research have produced close collaboration in thematic clusters, whose benefits are greater than the sum of its parts. The Small Grants Program for Human Dimensions provided additional social perspectives to the CRN clusters, permitting more comprehensive analyses, comparative studies and interactions with stakeholders.

In the process of **Cross-program synthesis**, the Directorate held a workshop in August 2011 on decision processes of conservation vs. land cover change in semi-arid environments of Brazil and Argentina. This involved projects on land use, ecosystem function, climate modelling, rural development and institutional analysis. Since the 1980s much low-intensity grazing land in the La Plata basin has been turned into market-oriented production of cereals and oilseeds for feed, food and biofuel. Market signals together with trends of increasing rainfall have driven the expansion of industrial-scale soybean production in much of the Southern Cone. The resulting substantial regional development and creation of wealth was accompanied by collateral effects: decreases in soil and vegetation carbon stocks and therefore increased C emissions; changes in the structures of agricultural production systems (fewer, larger farms, more land leases) and resulting migration to towns and cities; changes in regional climate (explained by models of land surface - weather interactions); and increased flooding risk in the flat plains of the Pampas and Chaco (explained by both more rainfall and lower moisture use under arable agriculture than under permanent plant cover).

Climate change in the basin is seen in rising temperatures, changed rainfall regimes and a higher frequency of extreme weather events. Increased rainfall has favoured expansion soy beans into semi-arid areas which are affected by interannual and inter-decadal climate

variations. New climate models that integrate seasonal variations in land cover change have shown feed-backs from land cover to regional climate mediated by changes in albedo and surface roughness.

Critical challenges are to link large-scale descriptions of land use changes from satellite imagery or top-down modelling techniques with analysis of decision-making, adaptation, learning, and social interactions. A tighter integration between natural and human processes, including enhanced social modelling, should explore such links in future. Research needs include a broader spectrum of scientific expertise, as well as the early and meaningful involvement of social actors.

There is little appreciation of rural regions of the La Plata basin as a cultural space that sustains different types of livelihoods. Social cohesion of rural areas may well depend on alternatives that would allow smallholders to buffer against unfavorable years. Crop insurance, longer repayment periods for agricultural loans to accommodate climate cycles, economic alternatives for rural employment are needed to increase resilience. In the words of one participant, an “agro-sociological zoning” (by analogy to agro-ecological zones) will be necessary - based for instance on the realization that regardless of biophysical processes, C sequestration depends entirely on societies' willingness to maintain sequestering ecosystems.

The detailed analysis of the La Plata region was facilitated by The **IDRC project “Land-use change, biofuels and rural development in the La Plata Basin”**, which was conducted by the IAI directorate and linked four research teams from CRN and SGP-HD projects to quantify environmental, social, institutional and economic drivers and consequences of land use change in the five countries of the basin. One important finding was that although sugar cane for biofuel production plays a large role in Brazil, agricultural expansion, particularly of soybean remains largely independent of the biofuel sector, depending on the international feed markets. The agricultural expansion is driven by increased global demand; technological advances of minimum-tillage based on herbicide resistant GM soy beans; and economies of scale in new production modes on large land holdings or leased lands. The advance of large agribusinesses has profoundly changed the rural production structure creating but also concentrating wealth resulting in growing inequalities.

Lifecycle assessments of the effectiveness of corn ethanol produced on new agricultural lands to offset carbon emissions showed a positive carbon offset only after some 50 years, because of soil carbon losses upon land conversion.

"Networking the networks" across CRNII projects has been successful. CRN2021 has been deploying towers to measure phenology and environmental parameters in tropical dry forests. It has installed the same towers for CRN2031 and CRN2015 in temperate dry forest and agricultural settings in Argentina, and has trained students and investigators in their use. The new data sets have been uploaded to the CRN2021 web site <http://enviro-net.info/>. With the help of CRN2021, wireless sensor networks, a total of 15 optical phenology towers are now operational in Argentina, Brazil, Costa Rica and Mexico, well beyond the original tropical dry forest focus.

Investigators from CRN2015 and CRN2005 provided evidence to the parliament of Cordoba Province in Argentina during the debate of a new forest protection law (Ley de Protección del Bosque Nativo). Investigators highlighted the importance of secondary forests and mixed species-rich shrub lands as sources of multiple ecosystem benefits for subsistence

farmers and society, and the need to protect them from the expansion of intensive agriculture. This theme will be explored further in the IAI synthesis.

CRN2014 and CRN2021 have collaborated closely, linking above and below-ground biodiversity, and expanding the fungal work of CRN2014 to tropical dry forest. Below-ground diversity appears to impart drought resistance to the plant community, and understanding these synergies is an important step towards understanding ecosystem resilience under climate stress.

The collaboration between CRN2031 on land use change in the Rio de la Plata Basin and CRN2094 on the impacts of land cover and land use changes on the hydroclimate of the La Plata Basin, has spawned a vigorous debate on the climate effects of land cover change, and to what degree they counteract the climate benefits of biofuel production. IAI brought this debate to the UNFCCC at SBSTA-34 to bring the importance of regional climate change to the Convention's attention.

Two projects on tropical cyclones are collaborating, having extended the paleo-hurricane work of CRN2050 to the Pacific coastal regions of CRN 2048. The results of this collaboration were presented at the UNFCCC COP-16 in Cancun.

Running international networks has been a challenge for several PIs, despite the Directorate's continued support and trouble-shooting. Coordination of contracts and transfer of funds between the Grantee and co-PI institutions was singled-out as the main challenge faced by project administrators. PIs suggested that IAI should sign subawards directly with co-PIs to facilitate the transfer of funds, but this runs counter the capacity building mandate of the IAI, which includes developing institutional capacities to be able to administer international research networks.

As the **communication of research output** for informed decision making took on importance in the final year of the CRNII, the Directorate has engaged a science writer to develop story-lines together with investigators to aim project output at educated lay audiences. An article appeared in the April 2012 *Scientific American* blog on work by Esteban Jobbágy and other scientists supported by the IAI on the hydrological effects of ongoing land conversion in the La Plata basin. The article is available on the IAI website.

Small Grant projects for the Human Dimensions (SGP-HD), 2006-2011 closed in August 2011.

The numbers: 43 investigators in 29 institutions and 10 countries

USD 1,390,000 were provided by the US National Science Foundation.

USD 4,500,000 of complementary funding have been raised by the projects

91 degree students are part of the projects, 62 of whom received scholarships from the grant, totalling US\$ 444,250. In addition 444 students participated in training events

To date the projects have produced 25 peer-reviewed journal articles, 6 books or book chapters.

SGP-HD was an experiment, to link human dimensions research to the IAI's natural science-dominated CRNs. It has demonstrated that knowledge from natural sciences for informed decision making and policy must consider the impact of natural conditions on societies, and that neither natural nor human dimensions research alone will be adequate to develop adaptive capacities of societies under global change.

The SGP-HD and its integration with the CRN program resulted in substantial science output, and significant progress towards making the IAI's program more interdisciplinary and policy relevant. Part of this progress is the establishment of a Center of Excellence on Water Security that links natural and human sciences, policy and management and will serve as a think tank for future initiatives. The center resulted from the strengths of three HD projects that analyzed water availability in the context of needs, resource access, institutions and communities' capacity to adapt to changing availability and need, and that developed communication strategies to link scientific knowledge to managers and decision processes. These HD projects were associated with CRNs on reconstructions of past Andean climate and hydrology, on agriculture and land-use change, and on tropical cyclones affecting the semi-arid regions of Mexico and the South-western US.

The Program **succeeded in linking interests and establishing collaborations between natural and human disciplines**. Examples of its impacts are: 1) the realization of natural scientist working on hurricane physics and prediction that cyclones, normally seen as disasters, have positive impacts on aquifer recharge. As a result, civil defence practices in Mexico now provide structures promoting rainwater infiltration as part of responses to hurricanes. 2) a realization that climate predictions based on GCM down-scaling are only effective for predicting water security if integrated with a quantification of actual threats and vulnerabilities at sub-basin scale. 3) on clearly human-driven environmental impacts, such as urban contamination and the effects of land-use change, the program has developed research jointly with stakeholders, which provided for a direct dialogue with decision makers and managers. 4) several projects have developed communications: bulletins, press, television, stakeholder meetings, joint research planning and analysis, internet-based decision support, that have resulted in sustained impact on decision making. An evaluation of institutional capacities to link scientific information, societal vulnerabilities and adaptation will be further developed in future IAI programs.

Mac Arthur Foundation: “Impacts of climate change on biodiversity in the tropical Andes: climate-related risk, vulnerability, and decision making tools for conservation planning”

The goal of the project is to provide the tropical Andean countries of Bolivia, Colombia, Ecuador and Peru with a standard methodology for estimating climate change risks for biodiversity at local scales by conducting case studies in two selected binational study areas on existing climate gradients, short- to medium-term (10-20 years) climate change trends, biodiversity and land-use patterns, climate change perceptions of local communities, and the vulnerability of species and ecosystems to climate change. To achieve this goal the IAI works with 9 partner organizations and 14 additional collaborating institutions in the Andes and in the USA. To date, activities of the climate component included the use of complex numerical models to determine climate trends, and the compilation and preliminary trend analysis of weather station data, sea surface temperature and global circulation models data in collaboration with national meteorological services and CIIFEN. To compensate for low weather station density the research teams have deployed meteorological data loggers along a 4000-m elevational gradient in the study areas, which collect data at hourly intervals. In addition, ring widths of several tree species with high dendrochronological potential are used to estimate climate conditions and changes of the past 200 years. The biodiversity team compiled georeferenced data bases on the distribution of bioindicator species as proxies to

examine ecosystem diversity and its vulnerability to climate change. Simultaneously, the researchers identified focal ecosystems based on the ecosystem atlas published in 2009 by the Comunidad Andina de Naciones. A knowledge gap analysis then pinpointed those ecosystems and elevational belts with insufficient biodiversity data, to be targeted by rapid biological assessment expeditions in all 4 countries. The sensitivity of species to climate change is being evaluated with the NatureServe Climate Change Vulnerability Index. This is accompanied by some 500 structured interviews on the perceptions of climate change vulnerability, risks and the provisioning of ecosystem services in local communities.

2. New Awards - 2012-2018

The IAI has received two new NSF awards:

Small Grants for Collaborative Research in the Americas (SGP-CRA): US \$2,757,237 will be disbursed during 2012-2014 for 9 projects selected from 13 submissions made from existing CRNII and SGP-HD were selected to receive this Opportunity Grant to develop their most innovative and interdisciplinary science further: CRN2015 (Sandra Diaz, Argentina), CRN2021 (Arturo Sanchez-Azofeifa, Canada), CRN2031 (Esteban Jobbagy, Argentina), CRN2047 (Brian Luckman, Canada), CRN2048 (Graciela Binimelis De Raga, Mexico), CRN2050 (Kam-Biu Liu, USA), CRN2060 (Edwin Castellanos, Guatemala), CRN2076 (Alberto Piola, Argentina) and SGP-HD005 (Chris Scott, USA). The projects engage 17 countries. Sub-awards have been signed and projects are working.

Third Round of Collaborative Research Network Program (CRN3): US\$ 10.5 million will be disbursed during 2012-2018 in 8-10 projects to generate scientific knowledge on global change and its societal implications; to make that knowledge accessible to decision makers; to develop partnerships between research institutions and other organizations for joint research application and outreach activities; and to link the research networks to the IAI capacity-building programs that bring together scientists, managers, and policy makers.

The call for CRN3 project proposals encouraged US participants to strengthen the CRN's international networks through links with NSF's Partnerships for International Research and Education (PIRE). São Paulo State's funding agency FAPESP has made co-funding opportunities available to successful CRN3 proposals involving researchers from that Brazilian state

CRN3 Selection was based on an open call for letters of intent in September 2011. 88 eligible letters of intent were received, and the IAI Scientific Advisory Committee (SAC) selected 32 teams to develop full proposals. 26 full proposals were received in March 2012 and peer reviewed by mail and panel review. The panel recommended 6 proposals outright for funding and made recommendations that will be used to enhance 3-5 further projects.

3. Capacity Building

A Workshop on **climatic and environmental vulnerability in the La Plata basin:** case studies of agricultural intensification using GIS and crop models (July 19-22, 2011,

Montevideo, Uruguay) was organized jointly by the IAI, the Centro Interdisciplinario de Respuesta al Cambio y Variabilidad Climática, the Faculty of Agronomy of Uruguay's Universidad de la República and the Municipality of Montevideo. The workshop was held at the request of the participants at the Training Institute on Land Use Change Analysis and Water and Food Security in the La Plata Basin Region (April, 2011, Asunción, Paraguay) to provide further training on GIS and crop modelling. Case studies from Uruguay were presented as related to agriculture intensification and issues of sustainability, urban growth and the growing demand for food and crop export, as well as their socioeconomic and environmental impacts. Presentations discussed the intensive use of natural resources and spatial expansion and specialization of production systems. One conclusion was that current agricultural production systems make important contributions to the economies of countries but they are unsustainable in the long term. Alternatives presented were rotations between arable agriculture and pastures designed to protect soils, and urban and peri-urban agriculture for vulnerable segments of the population. Participants learned to use geo-processing techniques to identify environmental changes, including spatial techniques and analysis of demographic data using a historical data set of the city of Montevideo provided by Uruguay's National Statistics Institute. Exercises demonstrated how participants can obtain, process and evaluate satellite data for LUCC and hydrological studies. Satellite images were shown as examples in the evaluation and mapping of sugar cane, coffee and irrigated rice in Brazil. Moreover, the workshop explored crop modelling (e.g. Decision Support System for Agrotechnology Transfer) and agricultural productivity and water use based on the experiences of the CRN project on Land use change in the Rio de la Plata Basin. 24 young scientists from 7 nations attended.

A Training Institute on **Climate and Health** was held from November 7-18, 2011 in Piriápolis, Uruguay in partnership with the International Research Institute for Climate and Society (IRI), Mercosur's Intergovernmental Commission for Environmental Health and Labor, and the Pan American Health Organization (PAHO). The Training Institute was largely funded with resources from NSF and co-sponsored by Uruguay's Ministry of Health and the National Meteorological Service, PAHO, IRI and Canada's International Development Research Centre (IDRC). Several ministries of health and meteorological services from Latin America provided travel funds for their participants. The Training Institute improved local and regional capacity to use climate information for health-related interventions, contributing to the Mercosur Strategy to Protect Human Health from Climate Change, as agreed by Ministers of Health in 2009. 22 professionals from 9 countries came from ministries of health, meteorological services, municipalities, climate change adaptation programs, universities, research centers, and NGOs. Three projects arising from this training were approved for funding under the Seed Grant program:

1) "Strengthening technical and scientific capabilities of Ecuador, Panama and Peru to the development of applications in the area of climate and health". Participating countries: Panama, Peru and Ecuador. US\$ 20,000

2) "Climate variability and its likely impact on the health of cities in Latin America: Buenos Aires, Santiago, Montevideo, Salto and Manaus". Participating countries: Argentina, Brazil, Chile, Uruguay. US\$ 27,300

3) "Diagnostic performance of diseases related to climate variability in the border between Brazil and Uruguay". Participating countries: Brazil and Uruguay. US\$ 10,940

The IAI is working with UN CEPAL on an editorial forum (October 28-30, 2012, Buenos Aires, Argentina) for the development of a publication addressing **Urban Responses to Climate Change**. This is a follow up to the Training Institute on Cities and Climate Change (November, 2010, Santiago, Chile).

IAI-INPE/CPTEC Research Internship Program - Three young scientists from Argentina, Colombia and Peru participated in the program from July 2011-January 2012. Two of them came from the Training Institute on seasonal climate prediction. Projects were on rain forecasting based on different statistical methods, mathematical models and expert systems to predict stream flow, and on seasonal crop forecasting. The latter was co-funded by the International Potato Center (CIP). For July 2012-January 2013 the IAI will support 2 scientists to work on regional circulation models and seasonal forecasting. Participants in the internships come from Argentina, Colombia, Peru, and Venezuela.

New training initiatives

In September, 2011, the IAI's new Interdisciplinary Training Program was approved with US\$ 820,000 by the US National Science Foundation (NSF). The program consists of 5 Training Institutes and Colloquia (2011-2014) on **climate and public health; governance, risk, vulnerability and adaptation; water resource management; and research analysis tools including the modelling of complex human/natural systems**. Participants will be natural and social scientists, policy-makers, environmental practitioners and other stakeholders. As part of the activities, training in proposal writing will be provided, to disburse Seed Grants to groups of participants for active follow-up to the training events and development of collaborative networks.

Two Colloquia on Knowledge Integration at the **Science-Policy Interface** are planned for 2012 and 2013 on integration of scientific data and knowledge for risk assessment, mapping, decision making and governance at the science-policy interface. The first will be held in the Dominican Republic and the second in Ecuador. Partner organizations are the National Corporation for Atmospheric Research (NCAR), Ministerio de Medio Ambiente y Recursos Naturales, Universidad Nacional Pedro Henríquez Ureña of the Dominican Republic and Pontificia Universidad Católica and Ministerio del Ambiente of Ecuador.

Three training institutes are being prepared for July 2012-June 2013. The first will be on **Adaptive Management of Water Resources** under Climate Change in Vulnerable River Basins (October 8-17, 2012, La Serena, Chile) co-organized with IAI's Center of Excellence for Water Security (AQUASEC – University of Arizona and Pontificia Universidad Católica de Chile), and the Water Center for Arid and Semiarid Zones of Latin America and the Caribbean (CAZALAC). The Training Institute is co-sponsored by CAZALAC with US\$20,000 from the Flemish government. The program will explore the increasing pressure on water resources, especially in arid and semiarid regions, climate change, hydroclimatic variability, population growth, urbanization, rising demand for food, societal vulnerability and ecosystem water needs. The IAI expects to provide seed grants for participants to join the AQUASEC network, strengthen and foster multinational and multidisciplinary collaboration, and promote application of research ideas and knowledge imparted in the training.

4. Communicating science globally

During the past year, the IAI has communicated its emerging research results to delegates at UNFCCC meetings:

UNFCCC COP-17 - Durban, South Africa - December 2011

The IAI hosted a side-event during COP-17 on “Blue carbon research: biological, physical, chemical processes in oceanic carbon sinks and sources”. Based on project findings from the Consortium for the study of ocean related global and climate changes in South America (SACC) research in the South Atlantic (CRN2076), speakers discussed how ocean circulation affects blue carbon: the links between biological carbon sequestration, chemical absorption, physical transport and possible re-release to the atmosphere; and what this implies for carbon management options. Speakers were: Alberto Piola and Edmo Campos (CRN2076) Christopher Sabine (US-NOAA) and Pedro Monteiro (CSIR South Africa).

CRN2076 research is identifying the physical and biological mechanisms that control the biological production and the exchanges of CO₂ between the ocean and the atmosphere on the Patagonian shelf and neighboring western South Atlantic Ocean. This is providing an understanding of regional carbon sources and sinks to inform policy-makers on possible mitigation approaches. The Patagonia shelf may play a special role in the global CO₂ balance because its nutrient supply and carbon sequestration depend on a permanent upwelling caused by ocean currents, rather than on seasonal winds as is the case of the most productive marine regions.

A short film was produced for the event and can be viewed on the IAI website. News of CRN2076 research and the side-event appeared in blogs around the world. An article featuring this project was published in the International Innovation, a global dissemination resource for the scientific, technology and research communities. The article is also available on the IAI website.

Fostering international cooperation in marine science

Interdisciplinary collaboration is vital for world-class ocean research. **Dr Patrizia Abdallah** and **Dr Alberto Piola** explain how their research unites the environmental and human dimensions of climate variability in the western South Atlantic to produce holistic solutions to challenges in the region

area and its effects on fisheries. Within the SACC, the HD work helped integrate natural and social science, and improve knowledge on the interactions between climate change, fisheries and the wellbeing of fisheries. Introducing a human dimensions subproject to the SACC has significantly widened the scope of the project, incorporated capacity building in social sciences, and facilitated the transfer of knowledge from the natural sciences to decision and policy makers.

be expected from the modified wind patterns. This is a first step towards prediction, but the biogeochemical models still require substantial improvements.

This SACC consortium has been in effect for just over a decade. How has the project evolved during that time?

The initial phase of the SACC consortium focused on large-scale variability of the ocean circulation. Our studies highlighted the significance of continental shelves and their interaction with the deep ocean. Consequently the consortium expanded the study region and now includes

Could you begin by describing the objectives and long-term goals of the South Atlantic Climate Change (SACC) consortium?
The SACC consortium is a Collaborative

The negative consequences of climate change on our ecosystems are widely reported, but are there any positive changes

SBSTA-36 – Bonn, Germany - May 2012

In response to an invitation by the 35th Session of the Subsidiary Body for Scientific and Technological Advice (SBSTA) to provide information on sources, sinks and reservoirs of greenhouse gases from coastal and marine ecosystems, the IAI presented CRN2076 research findings at SBSTA-36, contained in document FCCC/SBSTA/2012/MISC.3. A webcast of the IAI presentation at the SBSTA-36 Research Dialogue can be found on the UNFCCC website:

http://unfccc4.metafusion.com/kongresse/sb36/templ/play.php?id_kongresssession=5092&theme=unfccc.

Research on the Southern Brazilian Sea was also discussed at a **Convention on Biological Diversity** workshop in Recife, Brazil in February 2012, following a request from CBD COP-10 for a series of regional workshops to be held on Ecologically or Biologically Significant Marine Areas (EBSAs). The workshop concluded with the adoption of the southern Brazilian seas as an EBSA and a recommendation for the organization of a workshop involving other partners for the SW Atlantic.

CRN2076 Principal Investigator Alberto Piola is one of the speakers at the Science-Policy Dialogue to be held on June 27th.

Rio+20 – Rio de Janeiro, Brazil - June 2012

The IAI's will participate as an observer intergovernmental organization at the upcoming United Nations Conference on Sustainable Development (Rio+ 20). An article featuring research outcomes of SGP-HD014, led by Clyde Fraisse, has been published in the RioPlus Business magazine. The magazine, developed by the three Rio Conventions Secretariats (Convention on Biological Diversity, UN Convention to Combat Desertification and the UN Framework Convention on Climate Change) highlights the role and potential of the business and investment community in contributing to sustainable development. The article is available on the IAI website. Clyde Fraisse also presents an introduction to IAI's strategies for stakeholder involvement in Rio as part of the *Side Event # 15* session sponsored by the *U.S. National Science and Technology Council-CENR-Subcommittee for Disaster Reduction (SDR)*.

Presentations by directorate staff

November 10-11, 2011, Cambio Climático: el desafío ambiental del siglo XXI, III Jornadas Interdisciplinarias de Cambio Climático de la Universidad de Buenos Aires (PIUBACC).

Holm Tiessen: "El cambio global está cambiando la manera de hacer ciencia"

December 14-15, 2011, INTA, Buenos Aires, Argentina, Taller sobre seguros climáticos paramétricos en sistema de producción agrícola y ganadera de la Argentina. Mesa de diálogo entre científicos y actores del sector agropecuario.

March 7-9, 2012, Berlin, Germany: workshop "Co-Designing Knowledge across scientific fields, national borders and user groups" Marcella Ohira gave a presentation on IAI experience in interdisciplinary training.

March 20-22, 2012, Villa de Leyva, Colombia: Marcella presented the work of the IAI projects on climate change and biodiversity in the Andes at the MacArthur workshop "Lessons Learned and Future Directions in Climate Change Adaptation Investment";

April 16, 2012, XIX Congreso Latinoamericano y XXIII Congreso Argentino de la Ciencia del Suelo. Holm Tiessen: "Pensando en 2050: Demandas y desafíos para el manejo y uso de los suelos". Mar del Plata, Argentina

May 16-18, 2012 National Academies Symposium, "Science, Innovation, and Partnerships for Sustainability Solutions". Holm Tiessen: "Science for Sustainability: Case Studies of National and International Research". Washington-DC, USA

June 8-10, 2012, Jena, Germany: Conference on Sustainability. Marcella Ohira talked about IAI's capacity building program in fostering integrated research.

5. Data and Information System and Information Technology

The DIS contract with Oak Ridge National Laboratory (ORNL) was renewed until 2015. Services will be provided on a cost reimbursement basis consistent with funding release. The objective of the system remains the same, but new features were included in the agreement. As before, standards of interoperability are maintained. Currently there are 953 metadata on the system, mostly from CRN2 and SGP-HD scientific production.

A new main server was installed with more memory and disk space and a totally open-source operational system. The website is under constant update, with emphasis on science information and events. Site use is being monitored with Google Analytics, and is not always satisfactory. Additional efforts will be needed to enhance communication. The Twiki site is being updated in order to improve the distribution of information during meetings and events. The Training Institute websites are optimized following Twiki principles. Selection and inscriptions for the Training Institutes are fully automated and linked to databases, so information can easily be retrieved. The CRN3 solicitation, pre-proposal screening, and full proposal selection processes were all automated on the IAI IT system and the CRN3 selection was successfully concluded with a panel distributed throughout the continent.

The IAI web site, communications, up- and downloads have suffered throughout the year from extremely slow and variable connectivity. Connectivity has deteriorated over recent years throughout INPE's network and the loop on which IAI is connected is particularly degraded. The network is to be updated, but nothing has been done. Connection problems have been made worse as the IAI building suffered from repeated power cuts, commonly during weekends. Despite large, expensive, and constantly maintained no-break systems, repeated lengthy outages have on many occasions overwhelmed the system and affected the servers. On several occasions, a server had to be rebuilt and restored from backups to recover system functionality. This has hampered remote operations since mail server, twiki and website have suffered interruptions. Staff has resorted to holding important teleconferences from home. Since the server interfaces with many different operating systems, this has for instance resulted in several thousand emails being re-delivered marked as unread – causing several day's work load to restore adequate filing.

6. Directorate operations, staffing and taxation and issues

Irregularities and discontinuities in contracting staff, and unjustified tax demands continue to dog operations of the Directorate and seriously affect present and past IAI staff.

Staff provided by Brazil

a. In Jan. 2012, Star Segur, which at the time managed the IAI staff contracts, blocked the benefit cards of the employees without notice. Other problems recurred throughout the year, including errors in payroll, late salary payments, late payroll document release (in breach of Brazilian legal requirements). Such problems were often resolved with the help of INPE

administrators, but required constant attention by both IAI and INPE personnel. Staff hired under this arrangement are: Anita Soares, Roseli Luz, Mariana Toledo and Antônio de Oliveira.

b. Luciana Londe resigned from IAI in January 2012 due to the insecurity of the staff contracts. This is the third resignation of qualified support staff in 2 years

c. Staff was notified in Feb. 2012 that their contracts would be terminated at the end of March, 2012. Because of irregular rates/tariffs applied by Star Segur, the Brazilian Government opened an inquiry which resulted in convictions and terminated the contract on March 31, 2012.

d. From April 1, IAI staff continued working voluntarily without employment contract for 11 days. On April 11, 2012 the INPE director signed a retroactive emergency contract with BS Services Ltd. for a 6 month period

e. Mariana Toledo was hired on February 2012 to replace Luciana Londe, accepting employment in full knowledge of the uncertainties of IAI staff contracting. The staffing issues have been recurrent despite efforts by INPE to regularize employment. Roseli Luz, who has worked with the IAI for 5 years has been laid off and rehired 7 times.

i. Feb. 2012: Brazilian professional staff were forced to accept a system under which they individually pay and report their taxes as if they were self-employed. This was necessary to prevent an escalation of the issues surrounding tax demands against the IAI and its employees on taxes already paid.

Income Tax Issues

a. Jan. 2012: Two senior staff members were ordered by the Revenue Service to deliver all accounts and tax information for analysis based on an assertion that their records do not match employer records. Another affected staff member was informed that she was also being audited and that all income taxes, already deducted at source and paid by IAI, would be charged to her. Even one former staff member who had left the IAI because of uncertainties surrounding employment and contracts, has had his tax return frozen pending investigation. In 2009, after 15 years, the Brazilian Revenue Service recognized the IAI as an international organization, regularizing the position of the IAI. Since then, it refuses to reconcile the payment records between taxes required to be deducted at source and paid by IAI and the Revenue Service records linked to individual staff.

b. Jan. 2012: The IAI representative was told by the Revenue Service that staff should register for independent tax service in 2012 to avoid future problems with withholding taxes and declarations. This implies that the employees are treated as if self-employed. It does not resolve the issues of the taxes paid at the source by IAI for 2010 and 2011.

c. IAI withholds and pays taxes to the Brazilian government for the 3 employees involved for approximately US\$ 92,000 per year. The Brazilian contribution to IAI is currently US\$ 110,000. At this point there is a total of about US\$300,000 back taxes and fines that are being demanded for taxes that have already been paid.

e. These taxation issues remain unresolved since 2010 despite numerous attempts by IAI and its staff to clarify and rectify the situation. They follow upon illegal tax demands by São Paulo state on tax exempt diplomatic vehicles that were made in 2008, led to a threat of suspending the IAI's banking license and took until September 2010 to resolve.

Host country Communications – attempts to facilitate operations through HCA amendments

a. in Dec. 2009 - a letter was sent to the Brazilian Representative asking to change the way Brazilian staff is hired for the IAI, to resolve instabilities in contracting. This was followed by a letter to MCT and MRE suggesting minimal necessary changes to the HCA which might allow IAI to do its own hiring and avoid the difficulties with subcontracting that has plagued operations since 2004.

b. in Mar. 2010 - a letter was sent to MRE to explore alternatives for resolving staffing issues. This was based on a detailed legal analysis by IAI outlining all possible options under Brazilian law.

c. in June 2010 a verbal communication by MCT on the occasion of the Brasilia CoP indicated that the proposed changes to the HCA "should not constitute a problem".

d. in July 2010 a legal opinion from MCT appears to open a way to resolve staffing issues but was invalidated by a subsequent (Aug. 2010) legal opinion from INPE. After this, no further replies, follow-up or resolution of HCA or staffing issues occurred.

g. The HCA proposal presented by Brazil as part of the CoP discussion on the location of the Directorate suggests to hire IAI support staff as temporary civil servants "if there is an exceptional public interest". Staff is to be hired by public competition. IAI involvement in the process is not explained. There is no mention in the proposal that such temporary civil servants cannot be re-hired until 2 years have passed after the end of the contract. This would institutionalize staffing instability and still provide no clear means for IAI to select needed competencies.

Other Staff developments

The scientific assistant director, Christopher Martius took leave from the IAI in October and resigned in December 2011, following discussions on the adequacy of his management of science projects and reporting requirements.

Nicolas Lucas, a policy specialist who previously worked on the Millennium assessment, has temporarily joined the IAI in Argentina in October 2011, to leading the current science synthesis and policy communication efforts and prepare the science-policy event for the 20th CoP.

John Stewart, IAI's former interim director, has temporarily re-joined IAI from his home in Canada in September 2011 to replace the science assistant director in the implementation of CRN3.

7. Country contacts

In addition to ongoing negotiations with the Argentinean and Uruguayan representatives do develop the new hosting arrangements, several government contacts were linked to high-visibility training events, conducted by the Assistant Director for Capacity Building, Marcella Ohira.

Peru: October 2011 meetings with Ken Takahashi, Science Director of the Instituto Geofísico del Perú (IGP) and alternate country representative to the IAI, with Wilar Gamarra Molina, President of the Servicio Nacional de Meteorología e Hidrología del Perú, and the Vice-

minister of Strategic Development of Natural Resources of the Ministry of the Environment, Hugo Cabieses Cubas.

Ecuador: April 2012, meetings with Mercy Borbor Cordova, Vice-Minister of the Environment, and with Héctor Rodríguez, Under-Secretary General for Science, Technology and Innovation (SENESCYT), Rossana Caicedo, Director of International Affairs and Juan Carlos Moreno, Director of Science Research.

Dominican Republic: William Firmin, from the Ministerio de Medio Ambiente y Recursos Naturales, is collaborating in the organization of the Colloquium 2012 next November.

Uruguay: Luis Santos, Director of the Climate Change Unit of the Environment Ministry of Uruguay is collaborating in the development of a training workshop on the use of the Index of Usefulness of Practices for Adaptation (IUPA) to be held in Montevideo in the second semester of 2012.