

IAI Scientific Advisory Committee (SAC)
Report to the Conference of the Parties
SAC Chair: Frank Muller-Karger
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The SAC regrets the tragic events of the recent past that affect the Americas. The earthquakes that occurred in the coastal zone of Ecuador in April 2016 were devastating to many families, with loss of life and large impacts to the way of living. Various disease outbreaks throughout the region, including those caused by Zika, Chikungunya, Dengue Fever, and other viruses as well as bacteria, are affecting an increasing number of people. Increasing incidence of extreme droughts and floods are affecting the economy, human health, and ecosystem services in different parts of the Americas. The severe threat of loss of water, or the loss of good water quality due to causes as varied as harmful algal blooms and pollution continue to affect our region. In many cases, these factors have a multiplicative negative effect, which is much larger than simply the sum of losses due to individual events. As proclaimed by the global science agencies in 2016 (G-Science Academies Statement 2016): *“Decision makers need better tools to understand impacts of these types of crises, cope with natural hazards, respond to technological breakdown, and apply lessons from past experiences to improve emergency preparedness and capacities to manage crises.”*

This is a critical time for the IAI CoP to develop priority research themes that quickly respond to regional needs, to establish closer communications links with the IAI Directorate, the SAC, and the SPAC, and to support the IAI to develop strategies for increased capacity building, build resiliency in large and small communities, and develop solutions that help the region generate more jobs and improve the quality of life for millions of people.

The SAC seeks closer communications with the CoP during the coming year of 2016-2017 to address these issues actively and in a focused way. The SAC therefore recommends the following:

- 1) That the CoP members find the time and mechanism to focus on the identification and prioritization of themes that require integrated natural and social science research to co-develop solutions with stakeholders in the region; this activity should start during the CoP meeting to be held in Santiago de Chile and should take place at every subsequent CoP meeting. The SAC provides a list of themes of clear and present interest to the region in this report below.
- 2) Publication and use of IAI results:
 - a. CoP members should consider including IAI results and publications in their regular reporting to the various conventions to which they are party to, such as the CBD, UNFCCC (INDCs), etc.
 - b. The IAI needs to improve and accelerate the implementation of lists of publication of results from all IAI-managed projects.
- 3) The IAI release a call for proposals for new projects, including new CRN projects, in the 2017 timeframe. This requires that the IAI Directorate submit a proposal for funding these projects to CoP member countries in the 2016-2017 timeframe and no later than March 2017 in order to release a public call for proposals by October 2017.

- 4) That the CoP members contribute to the funding of the projects identified through a call for proposals as priority. The IAI Directorate has developed a model for co-funding based on the successful Belmont Forum, and the SAC recommends adoption of such a model by CoP member countries.
- 5) That future calls for proposals be restructured. While the CRN flagship proposals are having a substantial impact in creating networks in the Americas, and while they are leading to societally-relevant results, the 5 to 7-year time between calls for proposals is too long. All new proposals should be directed to areas of priority identified by the CoP in consultation with the SAC and the SPAC. The SAC recommends that:
 - a. IAI calls for proposals be restructured to be more frequent (perhaps every year to every two years)
 - b. IAI calls for proposals include several tiers:
 - b.i. Funding and timing: from large multi-year (e.g. 3 to 5 year projects; million-dollar-scale), mid-scale projects (2-3 years; hundreds of thousands of dollars), and small grants (<1 to 2 years; tens to hundred thousand dollars).
 - b.ii. Integrate disciplines into new basic or applied science.
 - b.iii. Synthesis projects that focus on aggregating, curating, and using existing information, including data and knowledge generated by previous IAI grants.
- 6) That parties to the CoP remain engaged with the IAI between annual Conferences through the Executive Council. The SAC emphasizes again the wish to exercise this mechanism to engage members of the CoP to fulfill the 'advisory' role of the SAC to the IAI.
- 7) That the IAI work collaboratively with representatives to the CoP to organize and participate in joint workshops scheduled between CoP meetings to converge on priority research areas and strategies, and capacity building focus. The SAC has identified a number of general areas of importance to discuss jointly with members of the CoP and the SPAC, with the intent of defining specific science priorities for the next 1-5 years. The SAC recommends that this prioritization take place in the second half of 2016. These general areas of importance are listed in this document, below.
- 8) The CoP work jointly with the IAI Directorate, the SAC and the SPAC to define strategies to communicate results of the research to CoP countries and stakeholders. The interaction between the CoP and the IAI bodies will then be more fruitful, as the SAC, working with the SPAC can help provide solutions to the recommended themes in developing focus areas in the calls for proposals for new IAI projects.

The members of the SAC feel that the IAI must continue to conduct high-quality research in an interdisciplinary model that is unique. The SAC congratulates the IAI Directorate for their continuing efforts in supporting natural and social science research and capacity building programs throughout the Americas. This work brings our research communities closer together and lead to higher standards of excellence in research, and ultimately to a higher quality of living for our communities throughout the Americas. The IAI Directorate conducted exemplary management and leadership in spite of numerous obstacles derived from the separation of administrative offices in three separate countries.

The SAC commends the IAI Directorate for their efforts to continue several activities that build the scientific capacity and resiliency of the Americas. The SAC and IAI Directorate continue to implement a strategy of interdisciplinary work for IAI programs. The IAI funds strong social and natural research to address the needs of decision-makers and other stakeholders in the region, and promotes capacity building that facilitates the joint work of natural and social scientists. Over the past year,

the SAC has helped review gaps and accomplishments in these programs.

The work of the IAI continues to attract the attention of other countries and regions around the world, including high-level organizing groups like Future Earth, the Belmont Forum, the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), and the United Nations Framework Convention on Climate Change, among several. These organizations see the IAI as an example of how social and natural sciences can be combined to lead to policy-relevant solutions.

The SAC wishes to send a strong message to the CoP that the model of science integration being implemented by the IAI is the way of the future. We emphasize again this year that the “socialization” of the IAI in Latin America will require the support of the CoP. The members of the CoP and member country representatives play unique and very important roles in disseminating the results and successes of the IAI.

The SAC commends the IAI Directorate for its efforts to have the more successful research teams share their experience and methods with those IAI projects that are still in the early stages of such efforts. A mechanism used to do this was a mid-term meeting of researchers from all CRN3 projects held in Buenos Aires in December 2015. This meeting was a training workshop to help all teams that resulted in an individual, team and organizational learning process.

The SAC again notes to the CoP that there is at present no regional framework or infrastructure to host and serve data and other products to countries, decision makers, or the public of the region. There is no ‘service’ that distributes products to communities that may benefit from the knowledge generated by IAI programs. The IAI is starting to engage in a dialogue with the Group on Earth Observations (GEO) to address this need across a number of themes. These themes are included under the AmeriGEOSS¹ initiative (<https://www.earthobservations.org/activity.php?id=53>).

A data and products services framework needs to be planned and built in partnership between members of the CoP, the IAI and other regional and local entities. Such a facility would serve data, products and results beyond the CRN projects or the life of these projects. The CoP should plan and assist in developing the solution for this serious shortcoming in our region.

The SAC continues the dialogue between its members and the Directorate on how to optimize future calls for proposals, how to evaluate science and its impacts beyond publishing, what capacity building is needed, how to communicate IAI efforts better, how the Directorate can function better, and how to improve the understanding of the relationship between SAC and SPAC. The SAC maintains an active and healthy relationship with the IAI Director and the Directorate Staff, holding monthly cross-continent teleconferences as possible, in addition to the annual in-person meetings.

The SAC met in person in Palisades, New York (USA), between May 11-13, 2016, jointly with the SPAC, the IAI Directorate, and representatives of Future Earth and AmeriGEOSS. During this meeting, members of the SAC suggested **several areas that require multidisciplinary research** and that are

¹ The AmeriGEOSS initiative will focus its efforts in four Societal Benefit Areas (SBA’s), selected and prioritized by the Americas Caucus of GEO members. These areas include: agriculture, associated with climate variability, climate change, and food security; disaster risk reduction, particularly for data exchange associated with early warnings and for the generation of regional products of early warnings; water, associated with the management approach of water resources and data management; and biodiversity and Ecosystem Monitoring including biodiversity observation in coastal, marine, and continental habitats, in the context of capacity building for better monitoring, management, and maintenance of ecosystems and biodiversity they support; also to predict future changes.

based on clear and present needs in the region. The goal was to inform the SAC, SPAC, IAI Directorate staff, and members of the CoP of topics of importance to jointly discuss and converge on priorities for new calls for proposals in 2017.

The SAC thus requests a forum to discuss these items of importance with members of the CoP and the SPAC, with the intent of jointly defining specific science priorities for research and capacity building for the next 1-5 years. The SAC recommends that this prioritization take place in the second half of 2016.

In the spirit of Future Earth's broad areas², the UN Sustainable Development Goals (defined in September 2015) could be a guide to develop focused proposals. Similarly, the issues of vulnerability, adaptation, and mitigation identified by the IPCC in relation to climate change and climate variability, as well as those coming from IPBES work program related to biodiversity and ecosystem services, are relevant for the Americas.³

Topics of enhanced relevance for the region include: 1) the food-water-energy nexus, particularly food security issues not only associated with climate variability; water, water as a security driver, and research associated with the management approach of water resources and data management; 2) disaster risk reduction (DRR), especially in relation to the role of multiple stressors, the promotion of inter-disciplinary research between natural/applied sciences and humanities/social sciences, the understanding of disaster occurrence mechanisms, and the design/maintenance of infrastructure and its functions⁴; 3) changes in production and consumption patterns (ecosystem services, energy, food, water, etc.); this provides links to programs such as those sponsored by the Belmont Forum; and 4) coastal, marine, freshwater, and terrestrial biodiversity⁵. Additionally, incorporating demography as an underlying aspect integrated with the societally-relevant research could benefit integrative research.

These topics could be combined with a focus on particular boundary ecosystems, such as coastal areas (marine, freshwater, wetlands, coral reefs, etc.) and ice-water boundaries⁶; or ecosystem

² These areas are: dynamic earth, global sustainability development and transformations towards sustainability (<http://www.futureearth.org/science>)

³ These topics include, among others: impacts of 1.5 degree temperature increase. Feasible economic and technical pathways to stay within this limit (requested by IPCC); effects of increased climate variability on systems of production, livelihoods, food security (agriculture, aquaculture, etc.) and bioenergy; effects of temperature increase on biodiversity including pests and vectors, particularly on mountain ecosystems; integration of ancestral and indigenous knowledge in adaptation processes; extreme events and disaster reduction; information systems for early warning and insurance; and adaptation in urban environments, and its interaction with other urbanization problems.

⁴ Other aspects of disaster: Evaluating disaster impact on socio-economic activities as well as social vulnerabilities conditions to cope with disasters, and analyzing human perceptions from the viewpoint of behavioral science. Promotion of trans-disciplinary cooperation, which enables the social implementation of science and technology for disaster risk reduction, for example through collaboration with Future Earth and national efforts, to secure sustainable development. Data exchange associated with monitoring and for the generation of regional products of early warnings.

⁵ A focus on biodiversity should ideally be able to bridge science and local knowledge to understand the social, economic, and environmental impacts of biodiversity and ecosystem services associated with climate change and increasing vulnerability risks of disasters (coastal, urban, peri-urban, and other areas of interest); to develop and implement projects on biodiversity status and trends assessments; and to contribute to capacity building in the region for active participation in major international assessments, especially IPBES assessments.

⁶ Examples of research questions include: What are the sources and sinks of organic matter in coastal and nearshore environments?; How do these compounds affect ecological processes, and specifically, coastal resources?; How do these

services (provision of fresh water; Nutrient and carbon cycling, biodiversity; Flood and erosion control; Cultural amenities)

The following **capacity building** activities need to be continued and accelerated:

- a. Professional development activities for graduate students, and early- and mid-career scientists;
- b. Support of interdisciplinary research projects;
- c. Address new technologies, such as environmental DNA (eDNA); remote sensing time-series, etc.

The SAC recommends that the mini-grants programs focused on proposal development be continued. This will require member country contributions. Capacity-building efforts need to be fully integrated into the science programs and it would be useful for the SAC to better understand the needs of each IAI country member in capacity building.

In summary, over the past year the SAC worked on the following items:

1) CRN3 program review:

The SAC discussed progress in the CRN3 projects. CRN3 project results were discussed with IAI Directorate staff during the meeting of the SAC with the IAI Directorate held in New York during May 11-13, 2015. The SAC was briefed on the various strategies used by different projects to integrate social and natural sciences; this has been an admirable effort led by the staff of the IAI Directorate.

SAC members Claudia Natenzon and Alicia Fernandez Cirelli observed CRN3 progress during the CRN3 researchers meeting of Dec. 2015 in Buenos Aires. An update of the state of projects was done jointly with the IAI Directorate during the SAC meeting in Palisades, NY, in May 2016. It showed reactions to previous feedback and confirmed advances in CRN3's level of science integration: more use of social sciences concepts and tools, increased interdisciplinarity, and active science-policy links.

The SAC also continues to discuss "lessons learned" on the IAI proposal review process. SAC members confirm that it is important that future calls for proposals take these lessons into consideration: 1. Future projects should avoid the add-on of social scientists at the end; they need to involve the social science community and social relevance of the project from the beginning. 2. The science community needs to be prepared a priori to do what is required by IAI; this may require training teams of social and natural scientists, jointly with policy makers, to identify problems and design interdisciplinary research programs to find solutions and support during the proposal writing stage.

The SAC also recommends that external reviewers should be compensated in future reviews. Similarly, SAC members and other researchers that actively participate in capacity building programs as instructors should be provided a modest honorarium.

2) Linkages between the IAI and other international programs:

The SAC assists the IAI in improving its strategies for better integrated science and innovation. SAC members continue to be involved in efforts to better link the IAI with Future Earth, the IPBES, the Group on Earth Observations (GEO), the Ramsar Convention on wetlands (Convention on Wetlands of International Importance Especially as Waterfowl Habitat), and progress on a Belmont Forum-like

processes and variables affect water quality and other factors relevant to social-economic well being?; How can communities prepare and build resilience?

coordination model within the Americas.

The SAC will continue to analyze how to identify topics of regional importance for the Americas.

3) Science-Policy Advisory Committee (SPAC):

The SAC has sought to maintain an active participation in the development of the framework for a SPAC. SAC members see the need for a close integration and communication between the SPAC and the SAC.

The SAC and SPAC chairs will communicate frequently (once every 1-3 months), and members from both committees will have communications at least twice per year, with one in-person joint meeting.

4) IAI Capacity Building.

Marcella Ohira provided a comprehensive overview of the extensive capacity building programs carried out by the IAI. The IAI is doing an admirable job in conducting these programs and in training stakeholders in the region to integrate various disciplines in formulating research programs and in improving decision-support approaches.

SAC members continue to support the efforts of the IAI in capacity building and define solutions together to problems presented by decision-makers.

5) SAC membership:

Per IAI statutes, the CoP needs to have a SAC with 10 members. Two vacancies need to be filled by the CoP in its 2016 conference, and two additional positions are eligible for renewal. The members of the CoP have received separate notifications on this topic.

6) Implementation of the IAI Strategic Plan:

The IAI SAC continues to make significant progress in implementing the IAI Strategic Plan. The implementation of the CRN3 teams and projects and IAI Training Institute activities provide the mechanism to implement the strategic plan.

7) IAI Restructuring and the SAC role:

The SAC continues to provide advice and support to the IAI Directorate and the Executive Council as needed in the process of developing and implementing the new IAI administrative structure. The SAC requests the active participation of the CoP in implementing a functioning structure for the IAI Directorate Office.

The IAI SAC expects to be informed about the activities of these various offices. The SAC will also help as needed in facilitating the interaction between these offices, defining and carrying out research agendas of the IAI, and will work with the international research, applications and education communities and with the public in general to make the integrated IAI offices a success.

8) Next SAC meeting:

The Humboldt Institute in Bogota, Colombia, offered to host the next SAC/SPAC/IAI Directorate meeting during the week of April 24-28 2017.