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8 June 2020

CONFERENCE OF THE PARTIES TO THE INTER-AMERICAN INSTITUTE FOR GLOBAL CHANGE RESEARCH
Twenty-eighth meeting
Videoconference, 19 August 2020
Agenda item 12

Revisions to the Scientific Agenda

1. This document has been prepared by the Scientific Advisory Committee (SAC) and the Science-Policy Advisory Committee (SPAC) with the assistance of the IAI Directorate.

Background

2. Article III of the *Agreement establishing the Inter-American Institute for Global Change Research* stipulates that:

> *…the Institute shall have an evolving Scientific Agenda, reflecting an appropriate balance among biogeographical areas of scientific importance; an integration of scientific, economic and sociological research; and shall focus on such regional issues as the Conference of the Parties shall determine.*

3. Article III lists 7 areas of initial research:

   a. The study of tropical ecosystems and biogeochemical cycles;
   b. The study of the impacts of climate change on biodiversity;
   c. The study of El Niño Southern Oscillation and interannual climate variability;
   d. The study of ocean/atmosphere/land interactions in the intertropical Americas;
   e. Comparative studies of oceanic, coastal and estuarine processes in temperate zones;
   f. Comparative studies of temperate terrestrial ecosystems; and,
   g. High latitude processes

4. The Conference of the Parties, at its 5th meeting (CoP-5, Montevideo, 1998) adopted Decision V/6 which revised the Scientific Agenda by consolidating the initial 7 areas of research into 4 areas:

    a. Understanding climate variability in the Americas;
    b. Comparative studies of ecosystems, biodiversity, land use and water resources in the Americas;
    c. Changes in the composition of the atmosphere, oceans, and fresh waters; and,
    d. Integrated assessment, human dimensions and applications.

5. At its at its 18th meeting (Mendoza, Argentina, 2003), the SAC reviewed these four topical areas and established two working groups of members to re-draft the descriptive paragraphs under each of the topical areas.

6. The draft revised Scientific Agenda[1], was presented to the Conference of the Parties at its 10th meeting (CoP-10, Boulder, 2003) for its consideration. The revisions proposed by the SAC were adopted by the CoP through Decision X/11.

7. At its 27th meeting (Brasilia, Brazil, 2019), the Conference of the Parties discussed revisions to the Scientific Agenda recommended by the SAC and the SPAC. The revisions proposed were adopted by CoP-27 through Decision XXVII/4.

8. CoP-27 (Brasilia, Brazil) also adopted Decision XXVII/5 which instructed the SAC and the SPAC *to further revise and update the IAI Scientific Agenda in line with the IAI Strategic Plan to better reflect transdisciplinary research and science with special attention to human issues and systems*.

Current situation

9. During the 2019-2020 intersessional period, the SAC and the SPAC, with the assistance of the IAI Directorate, and pursuant to Article VII, paragraph 4(a) of the *Agreement*[2], reviewed the Agenda in light of Decision XXVII/5 and proposed revisions to the text.

10. The final draft of the revised Scientific Agenda is attached as Annex II to the present document. All the proposed changes to the Agenda are shown with track changes.

Recommendation

[1] See Addendum_document 7, no. EC-XVII-CoP-X (http://www.iai.int/wp-content/uploads/7_addendum_AP.pdf)

[2] *Make recommendations to the Conference of the Parties regarding the Scientific Agenda, long-range plans and annual program of the Institute.*

11. The Conference of the Parties is invited to consider adopting the draft decision contained in Annex I to the present document.

Annex I

Draft decisions of the Conference of the Parties

Scientific Agenda

Directed to the Conference of the Parties

XXVII/XX . The Conference of the Parties are invited to adopt the revised IAI Scientific Agenda.

Annex II

The IAI Scientific Agenda

Adopted at the

28th meeting of the Conference of the Parties to the

Inter-American Institute for Global Change

Research 5-6 June 2019, Brasilia, Brazil,

19 August 2020

THE IAI SCIENTIFIC AGENDA

The primary objective of the IAI is to encourage scientific research beyond the scope of national programs by advancing comparative and focused studies based on global change issues important to the region as a whole. Our mission is to develop the capacity of understanding the integrated impact of global change on regional and continental environments in the Americas and to promote collaborative research and informed action at all levels for the benefit of society and the environment. In its approach, the IAI pursues the principles ofOur vision is to encourage and support the joint collaboration of scientists, decision makers, local communities, indigenous groups, and other groups impacted by global change in the Americas to address and communicate critical issues associated with global change.

> The term **global change** is used to refer to the interactions of biological, chemical, physical and social processes that regulate changes in the functioning of the Earth system, including the particular ways in which these changes are influenced by and impact on human activities.

The IAI pursues scientific excellence, international cooperation and the full and open exchange of scientific information relevant to Global Environmental Change (GEC). Our

~~vision, therefore, is to encourage and support the joint collaboration of scientists, stakeholders, and decision makers of the Americas to address and communicate critical issues associated with GEC.~~global change through the following **foundational principles** (IAI/COP/27/14 Strategic Plan): transdisciplinary science, participatory and inclusive design, innovative and solution based science, multi-scalar analysis and integration, open data/science, scientific outreach and knowledge mobilization, alignment with environmental governance frameworks, where appropriate, and strengthening capacities across the science-policy interface.

IAI supports science that improves the Americas' ability to cope with and thrive under global change, making a positive impact towards the sustainability of the region in the following strategic areas (IAI/COP/27/14 Strategic Plan, Theme II - Science for the Sustainability of the Americas): reduction of poverty and inequality; improving food, water, and energy security; climate change adaptation and mitigation; improved human health and wellbeing; conservation and restoration of biodiversity and ecosystems; clean air, water and soil.

The Agreement establishing the IAI stated that the Scientific Agenda should be dynamic and should evolve to ~~permanently~~continually incorporate new scientific priorities and to address changes based on the needs of the region's countries. At present, four broadly defined, and interrelated, research ~~foci~~themes have been identified by the IAI. ~~These are:~~The aforementioned foundational principles and strategic areas should guide research conducted under each theme.

1. **Understanding the Human Dimensions and Policy Implications of Global Change, Climate Variability and Land Use**

The focus of this theme is to investigate the dynamic interactions of human society, global change, climate variability and land use. Research should address the complex interactions between wild and anthropogenic ecosystems, impact on the IAI's strategic areas and multiscalar policy implications. Transdisciplinary topics listed in this theme cut across the other three themes.

Topics included in the theme, but not limited to:

- Participatory decision making, institutional capacity, co-design of policies, strategic policy and territorial planning instruments, and other governance mechanisms to improve sustainability.
- Governance, empowerment and social organization in social groups -- linkages with sustainability, best practices, effective models.
- Creation of enabling and suitable environments to support scaling up and mainstreaming of transdisciplinary and sustainability actions.
- Creation/promotion of innovative incentive mechanisms that encourage adoption of sustainable practices.
- Indigenous and local knowledge and worldview with respect to global change, wellbeing, equitable intergenerational action, and other cross cutting topics.

- The role of gender in global environmental change.
- Health and environmental linkages with emphasis on emerging epidemics, climate-sensitive diseases, vector-borne diseases, zoonoses, the consequences of poverty, and strategies to reduce health inequalities.
- Increased vulnerability of human settlements due to global change, climate ~~v~~variability, and land use.
- Sustainability of wild and anthropogenic ecosystems under conditions of urbanization.
- Changes in food systems; potential actions for increasing food security and nutrition.
- ~~-~~Implications for conservation and biodiversity strategies under condition of global economic and environmental change.
- Effects of global change, climate variability and land use on natural disaster occurrences, mitigation strategies, and policies that limit loss of life and property.
- Impact of global change and climate variability on fisheries and fishers; strategies for limiting socio-economic impacts.
- Identification of factors that contribute to resilience of natural ecosystems; conservation strategies to promote resilience.
- Effects of global change, climate variability and land use on water supply, freshwater flows, and security of water for human multiple uses.
- Effects of global change, climate variability and land use on energy security.

2. Understanding Climate Change and Variability in the Americas and their impact on key managed and natural systems.

The focus of this theme is to monitor, document, and understand the causes and impacts associated with climate variability and climate change in the Americas, and their ~~links~~linkages to ~~changes in natural systems and societal impacts~~the strategic areas with a view to provide better information for decision-making processes and policy actions. The goals are to understand the role of the ocean-land-atmosphere interactions in the climate system~~,~~ to determine the key processes that cause climatic variability and climate change, from sub-seasonal ~~to~~(seasonal) through decadal to multi-decadal time scales~~, and~~; to apply the insight gained by these findings to improve weather and climate predictions, and to reduce the uncertainties related to climate change projections and their ~~impacts~~regional and local impacts. This knowledge can guide adaptation efforts in the region.

Topics included in this ~~area~~theme, but not limited to:

- Tropical Atlantic Variability (TAV), Madden-Julian Oscillation (MJO), El Niño-Southern Oscillation (ENSO) and other forms of low-frequency climate variability, such as decadal variations (Atlantic Multidecadal Oscillation (AMO~~),~~) and Pacific Decadal Oscillation (PDO~~)) ,~~) and their teleconnections to key processes and impacts in the Americas (e.g., tropical cyclones, monsoons, droughts, heat waves, other extreme events).

- Climate variability across temporal scales to improve weather and climate predictions and to reduce the uncertainties related to climate change projections and their impacts.

- Short- and long-term ocean variability, including abrupt climate change, and its influence on climate and weather of the surrounding continents.

- Variability of the American Monsoon systems.

- Ocean/land/atmosphere interactions and hydrology, including atmospheric mesoscale processes.

- Global and regional changes in the water cycle.

- Aerosol impact on climate change and variability.

- Climate change and variability at regional scales: regional forcing mechanisms, model intercomparisons (statistical and dynamical downscaling models), future scenarios, extreme events, impacts, vulnerability and adaptation.

- Environmental changes in the past.
- Detection and attribution studies of extreme weather and climate events (e.g., droughts, tropical cyclones) and their impacts on key sectors for the region.

- Past climate change.

- Development of the Americas component for a Global Climate Observing System for climate.

- AI Climate change adaptation and mitigation actions, including understanding the causes and means to reduce vulnerability in the region.

3. Studies of EcosystemEcosystems, Biodiversity, Land Use and Cover, and Water Resources in the Americas

The IAI encouragesfocus of this theme is research on comparative and integrated analyses of the effects of Global Environmental Change on naturalglobal change on wild and anthropogenic systemsecosystems and processes among tropical, temperate and cold latitude systems. Sponsored work shouldThe goals are to increase our knowledge of the drivers and dynamics of variability, and the impacts of such variability on food security, biodiversity and the provision of ecological goods and services.the strategic areas. Research is expected to include work in terrestrial (including urban) and freshwater, coastal and oceanic environments; and work that integrates across the land/sea interface will be promoted.

Topics included in this ~~area~~theme, but not limited to:

- ~~-~~Impacts of global change on biodiversity~~,~~ and ecosystem services including species and genetic biodiversity ~~- both~~ of ~~natural systems and agricultural systems.~~wild and anthropogenic ecosystems (e.g., agriculture, aquaculture, silviculture, urban areas).
- Comparative studies of resilience of wild and anthropogenic ecosystems, key species, and important ~~agricultural systems~~ecosystem services to global change.
- Comparative studies of changes in land use and/or coastal/marine/freshwater resource use.
- Prediction and documentation of estuarine changes due to changes in freshwater inflows as well as changes in watershed land use and cover.
- ~~-~~Climate change and ~~habitat~~land use/ land cover change impacts on species and ecosystem services across the Americas~~.~~
- ~~-~~Impacts of sea water acidification and desalinization in marine biodiversity, ecosystem services and production.
- ~~-~~Generation, assessment, monitoring and dissemination of relevant information for scaling up/out actions related to the sustainable management of biodiversity and forests linked to territory management~~.~~
- ~~-~~Flows of agro-ecosystem services to sustain food production and livelihoods via sustainable land management.
- ~~-~~Multiscalar baseline assessments of land degradation indicators.
- ~~-~~Participatory assessment of sustainable land management practices that avoid and reduce land degradation and restore ecosystems, reduce emissions and improve the provision of ecosystem services.
- ~~-~~Scenarios and modeling in biodiversity, ecosystem services and human ~~well being~~well-being using the natures future framework.
- ~~-~~Interlinkages among biodiversity, water, food, and health in the context of climate change.
- ~~-~~Underlying causes of biodiversity loss, determinants of transformative change and options for achieving the 2050 vision for biodiversity.
- ~~-~~The role of indigenous and local knowledge to sustain nature's benefits to people.

4. **Understanding Global Change Modulations of the Composition of the Atmosphere, Oceans and Fresh Waters**

The focus of this theme is on observing, documenting and understanding processes that modify the chemical composition of the atmosphere, inland waters and oceans ~~in a manner that affects productivity and human welfare. A multidisciplinary approach to this research area is expected.~~and the impacts and interactions with the strategic areas.

Topics included in this ~~area~~theme, but not limited to:

- Effects of air pollution and rain water quality on natural and managed ecosystems~~.~~, including urban ecosystems.
- Aerosol impact on climate change and variability.
- Impact of mega-cities on regional climate.
- Regional and global air pollution: ~~Transport~~transport and impacts.
- High latitude processes and ozone depletion.
- Comparative studies of regional air and water pollution.
- Biogeochemical processes (including the carbon cycle) and ecosystem hydrology.
- Greenhouse gases, atmospheric and terrestrial processes, including the carbon cycle, and their impact on climate change.
- Coastal processes and water pollution.

~~5. Understanding the Human Dimensions and Policy Implications of Global Change, Climate Variability and Land Use~~

~~The focus of this theme is to research the dynamic interaction of global change, climate variability and land use -- their impact on human health, welfare and activities which depend on the productivity, diversity and functioning of ecosystems, including regions particularly vulnerable to rapid~~

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~~warming, such as cold regions. The emphasis of the research is on projects that address the complex interactions between natural and socio-economic systems through interdisciplinary approaches. The objective is to inform public policies that improve sustainability of natural and agricultural systems and ensure human welfare.~~

~~area:~~

- ~~Health and environmental issues with emphasis on vector-borne diseases.~~
- ~~Increased vulnerability of human settlements due to global change, climate variability, and land use.~~
- ~~Sustainability of natural and human systems in rapid urbanizations.~~
- ~~Changes in food systems; potential actions for increasing food security and nutrition.~~
- ~~Global environmental and economic change and biodiversity; implications for conservation strategies.~~
- ~~Effects of GEC, climate variability and land use on natural disaster occurrences, mitigation strategies, and policies that limit loss of life and property.~~
- ~~Impact of GEC and climate variability on fisheries and fishers; strategies for limiting socio-economic impacts.~~
- ~~Identification of factors that contribute to resilience of natural ecosystems; conservation strategies to promote resilience.~~
- ~~Effects of GEC, climate variability and land use on water supply, freshwater flows, and security of water for human uses.~~
- ~~Participatory environmental~~ Spatiotemporal distribution of pollution over natural and anthropogenic landscapes, with implications for ecosystem health, human health, and inequalities.
- Integrated coastal and marine ecosystems facing global changes and impacts on local communities and ecosystem services
- Adaptation measurements of the productive economic sectors of coastal and marine systems facing global changes
- Coastal and marine governance and decision- making under scenarios of extreme and abrupt changes.