



## 10 | International Research and Cooperation

Global change research, modeling, and observations from institutions based in the United States contribute to and benefit from a number of ongoing international activities. CCSP, the individual agencies that comprise CCSP, its various interagency working groups, and, in particular, the Interagency Working Group on International Research and Cooperation participate in and provide support for a variety of international research activities that collectively cover the broad spectrum of global environmental change research.

Through such active participation and leadership, CCSP and the large community of U.S. scientists supported by or associated with it truly has a global reach. Activities in which the United States is involved include supporting global environmental change research programs including, but not limited to, those that operate under the aegis of the International Council for Science (ICSU); supporting international assessments, particularly the Intergovernmental Panel on Climate Change (IPCC); supporting regional global change research networks; playing an active role in informal international organizations that are involved with the advancement of global environmental

change research; and participating in and in many cases leading international efforts to advance coordination and cooperation around observation of the Earth.

Individual CCSP agencies support international activities that are aligned with their goals or missions. In some cases, an agency will be given the lead for a particular effort for the Federal government; this may involve intra- and/or interagency coordination as well as funding, including in-kind support, depending upon the organization. CCSP is also a vehicle for communication and coordination, both within the Federal government and with the broader scientific community, of global change-related information and input to various international organizations. This support includes work with the Department of State at a variety of levels, but particularly with respect to the IPCC and the United Nations Framework Convention on Climate Change (UNFCCC) as well as bilateral arrangements in climate change science and technology.

The United States, through CCSP, also participates actively in informal activities that are dedicated to coordinating and fostering international global environmental change

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research. One such organization is the International Group of Funding Agencies for Global Change Research (IGFA). IGFA serves as a direct link to the international global change research programs and serves as a way for representatives from CCSP to interact informally with representatives from other countries who have as their responsibility funding of global change research.

CCSP provides the core of the U.S. portion of funding for coordination of international global change research. This includes support for IPCC Working Group I U.S.-hosted Technical Support Unit, which will have completed its work as of 1 September 2008. The Department of State is currently involved in international deliberations regarding selection of host nations for the Working Groups comprising the Fifth Assessment Report. CCSP support is also provided to the partner programs of the Earth System Science Partnership (ESSP) including the SyTem for Analysis, Research, and Training (START). The National Science Foundation on behalf of CCSP manages U.S. support for regional global change research networks, including the Inter-American Institute for Global Change Research (IAI), the Asia-Pacific Network (APN), and the African Network for Earth System Science (AfricanNESS).

The international global change research programs continue to provide sound frameworks for core research projects, capacity building programs, and regional networks. These programs include the World Climate Research Programme (WCRP), the International Geosphere-Biosphere Programme (IGBP), the International Human Dimensions Programme (IHDP), DIVERSITAS (an international biodiversity science program), ESSP, and START. The key regional programs are APN, IAI, AfricanNESS, and several regional programs under the START umbrella (Southeast Asia Regional Centre, Temperate East Asia Regional Committee, etc.). These regional programs, due to their ability to bring together national networks of global change scientists in an international setting, are increasingly being called upon to provide input to international organizations, international assessments, and other activities.

These programs are also highly effective at developing linkages between national networks of scientists, between disciplines, and developing capacity in young scientists and scientists from developing countries. One of the means they utilize is extensive in-person Open Science Conferences (OSCs), congresses, workshops, and other activities.

OSCs bring together the wider science community focused on a specific topic, program, or programs to encourage dialog, connections, communication, and cooperation. They also assist in charting the course for the overarching efforts of the organizing program(s).

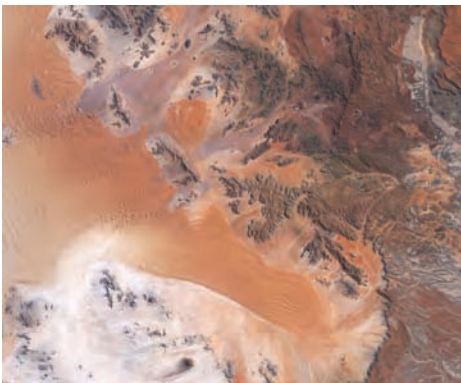


## Highlights of Recent Research and Plans for FY 2009

Congresses bring together the intellectual leadership of these programs including scientific committees, national committees for core projects of individual programs, and the staff and leaders of the central secretariats. These meetings encourage high-level dialog among the leaders of the programs, encourage development of interdisciplinary/inter-project cooperation, and help these organizations coherently implement their overall strategies.

Workshops cover a wide spectrum of activities. They may be large-scale, such as the START Young Scientists Meeting that took place prior to the ESSP OSC in 2006. They may also be smaller, focused meetings, such as the 2005 AfricanNESS Workshop, in which a pan-African group convened to begin to develop an overall framework and agenda for regional global environmental change cooperation in Africa. They also include activities focused on closely related topics such as the 2007 meeting of IPCC authors and climate experts organized by the Global Climate Observing System (GCOS), WCRP, and IGBP to discuss gaps and research needs based on analysis of the IPCC Fourth Assessment Report.

The programs assign a high priority to developing scientific capacity both in terms of young scientists and in terms of involving and fostering scientists from less-developed countries. The programs themselves, particularly through IAI and START, fund young scientist meetings and advanced training institutes all over the world. This involves bringing scientists from less-developed countries to some of the best facilities in the world and bringing top-tier global environmental change scientists to meetings and workshops throughout the developed and less-developed world. The programs, by convening many of their meetings in less-developed countries, are also developing capacity across the spectrum in those countries. While many programs are working to take advantage of the ever-increasing access to broadband communications (including e-mail, video conferencing, podcasts, social networking, etc.) the importance of in-person interactions such as those described above cannot be overemphasized.



The CCSP Interagency Working Group on International Research and Cooperation facilitates the centralized operations of and U.S. participation in the international global change research programs by serving as a channel through which “glue money” is provided to these programs. The glue money provided by CCSP and individual agencies facilitates leadership by U.S. scientists in these organizations and advances overall U.S. global change research, modeling, and observations. The U.S. funding leverages substantial funding of these programs by other countries (that in most cases is of the order of two or three times the funding provided by the United States).

The following sections describe highlights of recent activities as well as future plans of these international global change research programs and of related interagency international efforts. For more detailed information about some of these activities, see Chapter 15 of the *Strategic Plan for the U.S. Climate Change Science Program*.

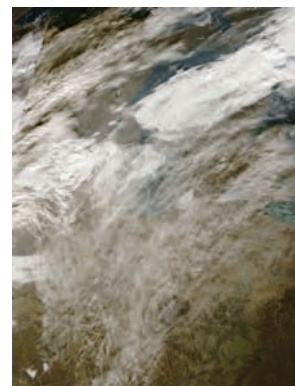
## HIGHLIGHTS OF RECENT ACTIVITIES

*Aviation-Climate Change Research Initiative.* The Aviation-Climate Change Research Initiative (ACCRI) was developed with the objective of improving the state of scientific knowledge and addressing key knowledge gaps while making the best practical use of available science and modeling capability to quantify the climate impacts of aviation. ACCRI coordinates the research efforts supported by the Federal Aviation Administration (FAA) Office of Environment and Energy and the NASA Earth Science Research Division (ESRD) as well as the NASA Applied Sciences Program (ASP), with the involvement of other Federal agencies.

Demand for air travel is projected to grow substantially. Studies based on previous passenger and cargo loads have shown that emissions from air travel as compared to other sources have been relatively small. However, concern has been raised regarding the impact of emissions from the projected increase in air traffic. To address these issues and to meet future aviation demand, the Joint Planning and Development Office of the United States developed the *Next Generation Air Transportation System (NextGen): Integrated Plan*. During June 2006, FAA and NASA jointly sponsored a workshop on the Impacts of Aviation on Climate Change to assess and document the present state of knowledge on this subject. The report documenting the recommendations and findings of this workshop is available at [web.mit.edu/aeroastro/partner/reports/climatewrksp-rpt-0806.pdf](http://web.mit.edu/aeroastro/partner/reports/climatewrksp-rpt-0806.pdf).

ACCRI developed subject-specific white papers on key areas (covering various aspects of aviation-related climate impacts) that provided a focused, indepth review of the present understanding of the scientific principles, uncertainties, and gaps, and the present state of modeling capability based on the best current scientific knowledge of each. In 2008, a select group of scientists were convened to discuss and integrate the findings from all the white papers into a composite report on the research required to improve the state of knowledge in this area. In addition, this meeting provided suggestions for designing scenarios for impact assessment simulations and analyses using the best modeling tools and modules (and their integration). A report is expected in late 2008.

*Bilateral Cooperation in Climate Change Science and Technology.* Since June 2001, the United States has launched bilateral climate partnerships with 15 countries and



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regional organizations that, combined with the United States, account for almost 80% of global greenhouse gas emissions. For more information on the bilateral and regional climate partnerships, visit [state.gov/g/oes/climate/c22820.htm](http://state.gov/g/oes/climate/c22820.htm). Partnerships have been established with Australia, Brazil, Canada, China, Central America (Belize, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, and Panama), the European Union, Germany, India, Italy, Japan, Mexico, New Zealand, the Republic of Korea, the Russian Federation, and South Africa. These bilateral initiatives seek to build on key elements of CCSP and the Climate Change Technology Program, including research, observations, data management and distribution, and capacity building. These partnerships now encompass 474 individual activities. Successful joint projects have been initiated in areas such as climate change science; clean and advanced energy technologies; carbon capture, storage, and sequestration; and policy approaches to reducing greenhouse gas emissions. The United States is also assisting key developing countries in efforts to build the scientific and technological capacity needed to address climate change.

Two ongoing objectives for the bilateral activities will be continued advancement of results-oriented programs and the fostering of substantive policy dialogs within all of the bilateral climate change partnerships. In order to broaden U.S. cooperative efforts to advance a practical and effective global response to climate change, the United States will expand outreach and support to the developing country community, utilizing a regional approach where feasible.



*DIVERSITAS.* DIVERSITAS recently established a new core project called bioGENESIS. BioGENESIS aims to develop tools for discovering, documenting, and navigating various aspects of biodiversity including elucidating the temporal and spatial aspects of how and why biodiversity evolved. The premise of the project is that study of development and evolution of biodiversity may eventually provide us with insights as to how populations and species may respond to a variety of perturbations, including global environmental change. In 2007, DIVERSITAS also conducted a series of international consultations on the development of an International Mechanism of Scientific Expertise on Biodiversity (IMoSEB). These consultations were designed to collect input from countries around the globe as to their needs and capabilities related to a global observation network for biodiversity (see [diversitas-international.org](http://diversitas-international.org)).

*Earth System Science Partnership.* The ESSP—a cooperative, interdisciplinary international scientific effort (see [essp.org](http://essp.org))—continues to implement its four core projects on food, water, carbon, and human health in the context of global environmental change. Although the program is relatively new, scientists involved with its core projects are already producing excellent results and giving an international voice to the ESSP regarding assessments, carbon cycle science, and other areas.<sup>1,2,3</sup> ESSP established a Scientific Committee that is intended to help guide the activities and overall direction

of the organization, and is currently developing a business plan to guide the program and aid it in the realization of its mission and goals. ESSP, its partner programs, and other global environmental change networks (APN and IAI) were invited to participate in a meeting with the Chair of UNFCCC's Subsidiary Body for Science and Technological Advice (SBSTA) and a number of country representatives to explore how SBSTA might facilitate a more effective dialog between the Parties and the research programs.

*Future Climate Change Research and Observations.* GCOS, with WCRP and IGBP, co-sponsored a workshop on Future Climate Change Research and Observations—held 4-6 October 2007, in Sydney, Australia—in which IPCC authors from Working Groups I and II and climate experts associated with the three sponsoring organizations participated. Based on a survey of IPCC authors' assessment of gaps, research needs, and observational needs resulting from the IPCC's Fourth Assessment Report, the workshop participants produced a set of suggestions for priority areas in research and observations that could significantly advance the science of global environmental change. The recommendations include improving and augmenting connections between global circulation models and regional models. Also recognized was the need for the climate change modeling community to improve its communication and cooperation with the community that assesses climate impacts and designs adaptation measures. Data, particularly from developing countries, were recognized as a challenge especially in terms of testing regional models. A model intercomparison project, similar to the Coupled Carbon Cycle Climate Model Intercomparison Project (C<sup>4</sup>MIP), was recommended as a way to advance the science of regional climate change.

*Group on Earth Observations.* Ministers and officials from over 100 governments and international organizations assembled 28-30 November 2007, in Cape Town, South Africa, to advance an internationally agreed plan for building a Global Earth Observation System of Systems (GEOSS). Ministers continued to support the Group on Earth Observations (GEO) Work Plan and noted the considerable progress made since the approval of GEO in 2005 and described in the *GEO Report on Progress 2007*. They confirmed that, *inter alia*:

- The sustained operation of terrestrial, oceanic, airborne, and space-based observation networks is critical for informed decisionmaking.
- Data interoperability is critical for the improvement and expansion of observational, modeling, data assimilation, and prediction capabilities.
- Continued research and development activities and coherent planning are essential for future observation systems.

Ministers also supported establishing a process to reach consensus on the implementation of Data Sharing Principles for GEOSS and stated that the success of GEOSS depended on a commitment by all GEO partners to work together to ensure timely, global, and



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open access to data and products. Partners in the Integrated Global Observing Strategy (IGOS-P) reaffirmed their long-term support for the IGOS-P Themes and reconfirmed their approval of transferring the themes to GEO (see <earthobservations.org>). The international recognition, political support, and momentum enjoyed by GEO were seen as truly value-added components to the robust history of IGOS achievements.

*Inter-American Institute for Global Change Research.* IAI was recently reviewed by an external committee of distinguished international experts convened by the American Association for the Advancement of Science (AAAS; see <aaas.org/programs/centers/sd/aaas\_IAIreport\_0607.pdf> for the report). The review committee found that IAI has so far produced high-quality, world-class science, and that it is effective in achieving its goals because it has become more collaborative and its projects are increasingly being led by Latin American scientists. The review committee also found that the data and information system was not realizing its goal—that is, to serve science and society and inform action. Finally, the committee found that IAI science, while increasingly interdisciplinary, did not have a strong enough emphasis on the links between environmental change and human activity. The Committee recommended that IAI maintain and, where possible, improve upon its demonstrated dedication to scientific excellence; incorporate new research around regionally relevant topics, such as risk, vulnerability, and adaptation; continue to foster regional cooperation through synthesis and other activities; develop and implement a plan to upgrade the IAI data and information system; and incorporate new research that studies “feedbacks between human activities and global and regional environmental changes.”

IAI was granted funds from Canada’s International Development Research Centre (IDRC) for research on land use, hydrology, and climate in the La Plata Basin, and from the MacArthur Foundation for assessment of research and institutional needs to cope with the effects of climate change on Andean biodiversity. It is also receiving increasing recognition in the region, and was invited to present findings at meetings of the region’s Agriculture and Environment Ministers. See <iai.int> for more information.

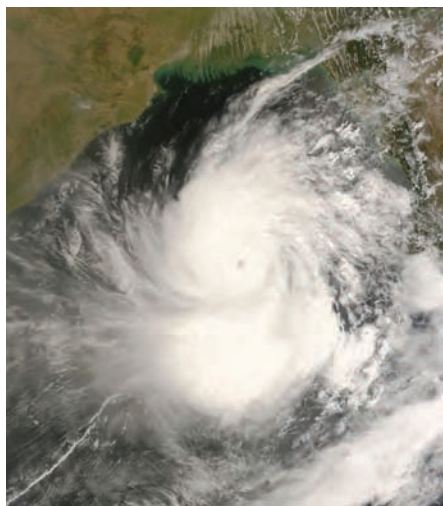
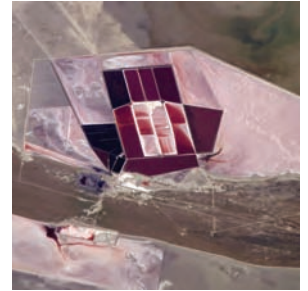
*International Geosphere-Biosphere Programme.* IGBP (see <igbp.net>) has established a new core project called Analysis, Integration, and Modeling of the Earth System (AIMES), which evolved from the Global Analysis, Integrations, and Modeling Task Force (GAIM). AIMES, hosted by the National Center for Atmospheric Research (NCAR), focuses on quantifying the role of human perturbations of biogeochemical cycles, as well as on the overall function of biogeochemical cycles, including interactions and feedbacks with the physical climate system. IGBP, with WCRP, drafted and submitted a white paper to the IPCC regarding modeling strategies for future assessments. IGBP scientists also contributed significantly to international assessments (80 for the IPCC Fourth Assessment Report and seven co-authors of the Millennium Ecosystem Assessment).



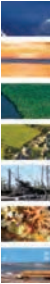
*International Human Dimensions Programme.* IHDP—jointly sponsored by ICSU, the International Social Science Council (ISSC), and the United Nations University (UNU)—released its *Strategic Plan 2007-2015* (see <ihdp.org>). This new science plan emphasizes integration of the well-established ESSP core projects, cross-cutting themes, and advancing development of improved methodologies.

*SyTem for Analysis, Research, and Training.* START is making the transition from its first-generation effort in research-driven capacity building to the next (see <www.start.org>). The first-generation effort was based on the largely disciplinary efforts of the research programs, while the second responds to the development of ESSP and its cross-cutting projects on food, water, health, and carbon, and to the entry of new partners, such as overseas development agencies. The second-generation effort also responds to the present and growing need, demonstrated by all of the programs and broadly in governments across the globe, to more closely connect global environmental change research to society at appropriate temporal and spatial scales. By doing so, it is expected that this research may meaningfully inform decisions and policy development with the ultimate objective being to advance progress on the Millennium Development Goals.

In 2007, START continued to synthesize results from the Assessments of Impacts and Adaptation to Climate Change (AIACC) program. This effort has resulted in several synthesis books and an AIACC report to the Global Environment Facility (GEF) and the United Nations Environment Programme (UNEP). Final reports from 24 regional assessments have been or are expected to be completed and posted on START’s web site in 2008. START also administered numerous capacity-building activities including sponsoring regional science planning, conducting several institutes, and organizing a young scientists meeting. The program also sponsored Ph.D. fellowships, small grants for researchers in Africa and Asia, and provided many young scientist awards.



*U.S.-Japan Liaison Group on Geosciences and Environment.* During 2008, the United States hosts the 12th U.S.-Japan Workshop on Global Change Research. The theme for this workshop, in Boulder, Colorado, is “Long-term Projection, Near-term Prediction, Extreme Events Projection and Observations.” This activity brings together top modelers from the United States and Japan to discuss recent research accomplishments, identify gaps in knowledge, and identify unique ways in which U.S. and Japanese researchers may cooperate in order to advance the field.

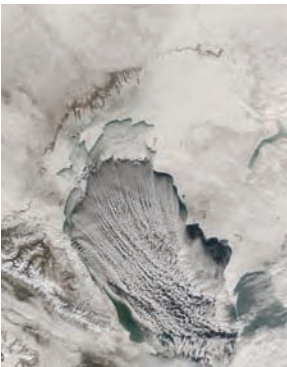




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*World Climate Research Programme.* In collaboration with IGBP and GCOS, in October 2007, WCRP convened a workshop to address the gaps and uncertainties identified in the IPCC Fourth Assessment Report in developing future observation and research requirements. The motivation for this workshop was to improve analyses of climate change risk and adaptation measures, reducing vulnerability to a changing climate. The third WCRP International Conference on Reanalysis took place in late January 2008, following an initiative by WCRP, the Japan Meteorological Agency, the Central Research Institute of Electric Power Industry, and the University of Tokyo. A reanalysis is a comprehensive global, multi-decadal data set on a regular grid generated by the latest numerical modeling and assimilation techniques to synthesize together past observations. Reanalysis data have consistent technical quality over decades and provide vital context to many types of meteorological and climatological research and applications as well as provide important insights into the usefulness and value of the climate observing system. WCRP also convened the first Workshop on Seasonal Prediction in Barcelona, Spain, in June 2007. The main objective of the workshop was to make an assessment of current skill in seasonal prediction, with particular emphasis on surface temperature and precipitation. A WCRP Workshop on Global Prediction of the Cryosphere took place in October 2007, to identify gaps in current understanding of how sea ice, ice shelves, glaciers, snow cover, lake ice, river ice, permafrost, and the large ice sheets of Greenland and Antarctica might change in future. These—and the four WCRP core projects CLIVAR, GEWEX, CLiC, and SPARC—are a few of the many WCRP international activities in support of climate research. See [wcrp.wmo.int](http://wcrp.wmo.int) for more information.

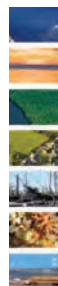
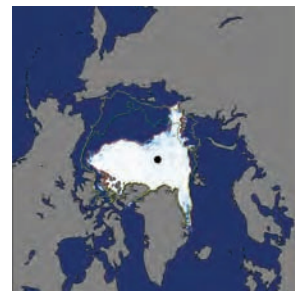
### HIGHLIGHTS OF PLANS FOR FY 2009



*Arctic Observing Network.* The Arctic is experiencing unprecedented system-wide change; change that has few equals elsewhere on Earth. This change has global implications and continued changes will have significant regional and global environmental and societal consequences. The dramatic recession of Arctic sea ice cover that took place in summer 2007 is one example illustrating the enormous scale of recent Arctic change, but the *Arctic Climate Impact Assessment*, released in 2005, highlights potential impacts of changes in the sea ice cover as well as many other environmental parameters (see [www.eol.ucar.edu/projects/aon-cadis](http://www.eol.ucar.edu/projects/aon-cadis) and [www.acia.uaf.edu](http://www.acia.uaf.edu)). Monitoring polar climate and understanding its feedbacks are key priorities described in the CCSP Strategic Plan.

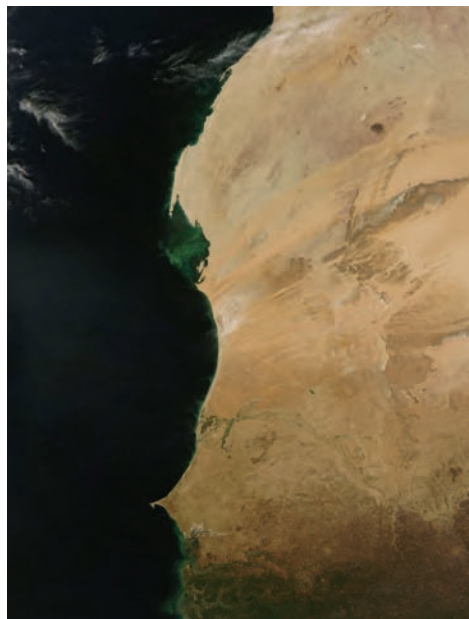
A recent National Research Council (NRC) report, *Towards an Integrated Arctic Observing Network*, concluded that current Arctic observing systems are not capable of characterizing the change that is now in motion and they do not provide the data necessary to enable scientific synthesis and modeling studies that are essential for

better understanding the regional and global causes and consequences of Arctic change. CCSP supports creation of a comprehensive Arctic Observing Network (AON). NSF along with the twelve other Federal agencies that make up the Interagency Arctic Research Policy Committee (IARPC) are engaged in a wide range of Arctic-observing activities. Together they are implementing an interagency activity entitled the Study of Environmental Arctic Change (SEARCH; see <arcus.org/search>) to better understand climate change as identified in the *Arctic Climate Impact Assessment*. AON is also being put forth as a U.S. contribution to a multi-nation, pan-Arctic observing network. It will represent a lasting legacy of the International Polar Year (IPY) and will contribute to broader international goals surrounding the establishment of GEOSS and the Global Ocean Observation System (GOOS).



*Aviation-Climate Change Research Initiative.* Based on the 2008 composite report, model simulations and analyses will be performed to quantify climate impacts of aviation. A multi-model and multi-team approach will be adopted to support this activity. Long-term research activities will be implemented as needed during 2009 and beyond. These research activities will address key information gaps and make practical use of improved scientific knowledge and modeling capability to help characterize and mitigate aviation’s climate impact.

*African Network on Earth System Science.* Since its inception in 2005, AfricanNESS has developed a science plan that will serve as a roadmap for sustained regional global environmental change research in Africa. AfricanNESS, with the ICSU Regional Office for Africa and facilitated by IGBP, released a merged science plan in 2008. The merging of these science plans is the result of several years of parallel effort and significant community participation. It is hoped that the merged science plan will be widely accepted and implemented. Many challenges remain, but in those challenges lie significant opportunities to advance science globally. One is finding ways to rebalance and develop research capacity. The science plan focused on four cross-cutting areas: food and nutritional security, water resources, health, and ecosystem integrity. A significant number of global environmental change researchers currently in Africa could contribute to AfricaNESS projects.



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*Atlantic Interoperability Initiative for Reducing Emissions.* The Atlantic Interoperability Initiative for Reducing Emissions (AIRE) partnership is a collaboration of the European Commission, FAA, airlines, and aviation industry partners working together to speed development and implementation of environmentally friendly new technologies and operational procedures that reduce engine exhaust emissions and associated noise. Approximately 2 to 3% of overall global greenhouse gas emissions can be attributed to aviation; expected traffic growth may increase this contribution. To counter this effect, AIRE will demonstrate maturing air traffic control infrastructure technologies that will reduce release of aircraft engine exhaust emissions through improved system efficiency and/or operations. These technologies are being demonstrated for each unique segment of flight operations: ground/surface taxi movements, oceanic (en route) cruise, and arrival landing operations. The overall objective is to enhance surface movement operational efficiency, save fuel, and reduce engine exhaust emissions and associated noise for international flight operations using the system advances identified. Collaborative demonstration flights should begin in FY 2009.



*DIVERSITAS.* DIVERSITAS will continue to advance international biodiversity science through cooperation with U.S. agencies and international organizations, and contributions to international conventions. DIVERSITAS expects to continue to work with NASA as the lead for the biodiversity task of GEOSS that involves development of a science plan and implementation strategy for a global biodiversity observing system. It is expected that once this plan is completed near the end of 2008, attention will be turned to implementation of the observing system. DIVERSITAS will continue its collaboration with the Convention on Biological Diversity (CBD). In the margins of the CBD 9th Conference of the Parties (COP9). DIVERSITAS, together with the International Union of Biological Science (IUBS) and the German government, organized a 3-day scientific conference, leading to a formal declaration to COP9 delegates (Bonn, May 2008). The second DIVERSITAS Open Science Conference is scheduled for 13 to 16 October 2009, in Cape Town, South Africa.

*Earth System Science Partnership.* A review of ESSP was recently commissioned by ICSU and IGFA at the request of its partner programs. Given that the program is still relatively new and has undergone substantive recent changes, the review focuses on providing strategic advice as to options for its future development. The report will be released in 2008. ESSP expects to continue to implement its core projects on carbon, waters, health, and food; continue implementation of the Monsoon Asia Regional Study; and to develop and release a business plan. The Scientific Committee will also have an increasing role in development of the overall program, including realization of its mission and goals.

ESSP agreed to convene a regular series of seminars at each SBSTA meeting. The topics of the seminars would be developed collaboratively between ESSP, SBSTA, and

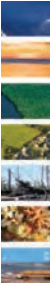
the UNFCCC Parties. The seminars would be followed by a discussion session in which the Parties and the research community would have an opportunity for dialog. All agreed that IPCC should remain the primary assessment mechanism for UNFCCC, but these seminars would be an effective way to facilitate regular information exchange between the Parties and the research community. In addition to the meeting, ESSP (spearheaded by WCRP) organized a side event entitled “Connecting Earth System Science Research to Climate Change Policy.” The side event featured four seminars on different aspects of climate change research and connections to society.

*Inter-American Institute for Global Change Research.* The Minister of the Environment of the Dominican Republic will host an IAI Strategic Planning session in 2008 to chart out the Institute’s next decade, and preliminary drafting sessions are underway with input from the Member Countries and the IAI’s Scientific Advisory Committee. Together with APN, IAI will meet with the Chair of SBSTA to facilitate dialog between the international research programs and the UNFCCC Parties. IAI, together with IGBP and ICSU, are also consulting with the Amazon Treaty Organization (OTCA) on a similar issue for the Amazon Basin.

IAI is in the midst of planning a second IAI-NCAR Colloquium for the second half of 2008 on “Seasonality and Water Resources in the Western Hemisphere,” to be held in Mendoza, Argentina. The IAI’s successful Training Institutes series continue with intensive sessions on Information Management (Panama, February 2008), Adaptation Risks (side event to Central American Presidential Summit, Honduras, May 2008), Semi-Arid Water Management (Brazil, October 2008), and Urban Responses to Climate Change (Chile, spring 2009).

Discussions with the United Kingdom’s Department for International Development (DFID) will continue on water and health projects, and may be linked with the IAI-IDRC project to consolidate findings from several IAI research networks and develop new plans linked to national priorities for science and capacity building for climate change and adaptation.

IAI will continue discussions with the IGFA agencies on strategies to stably fund relevant international global change programs and avoid ‘double-dipping’ when these programs apply for funds from both the IGFA agencies and the regional institutes funded by the same agencies.



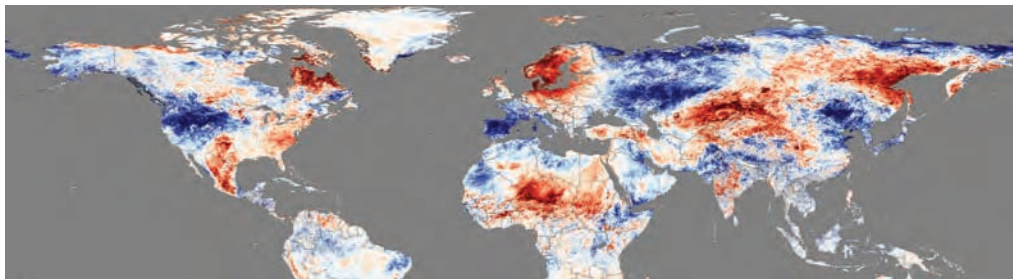
## Highlights of Recent Research and Plans for FY 2009

*International Geosphere-Biosphere Programme.* IGBP held its Fourth Congress, “Sustainable Livelihoods in a Changing Earth System,” in Cape Town, South Africa, 5-9 May 2008. Anticipated participants include the Steering Committee, the Scientific Steering Committees, National Committees, partners, and African stakeholders. The meeting had many objectives but was primarily aimed at improving linkages, communication, and integration across all IGBP efforts. The meeting also explored the connections between environmental change and development on a regional basis in Africa.

It is expected that a review of the IGBP, concurrent with that of the WCRP, co-sponsored by ICSU and IGFA, will begin in the FY 2009 time frame.

*International Human Dimensions Programme.* IHDP is currently undergoing a synthesis effort for its Industrial Transformation (IT) and Global Environmental Change and Human Security (GECHS) projects. The program has applied new cross-cutting themes including vulnerability, resilience and adaptation, governments and institutions, social learning and knowledge, and thresholds and transitions. At the same time, IHDP has also applied a new focus on methodologies that will cut across all of its core projects. The program will focus on enhancing statistical methods, improving simulations, incorporating case studies and narratives, and applying systems analysis, as well as configuration and comparative analysis. Overall, IHDP will emphasize more involvement with international assessments including IPCC and enhancing linkages with major social science research themes and communities.

*Northern Eurasia Earth Science Partnership Initiative.* The Northern Eurasia Earth Science Partnership Initiative (NEESPI) is an External Project of the IGBP (see <[neespi.org](http://neespi.org)>). It is a multidisciplinary program of internationally supported Earth systems science research focusing on issues in northern Eurasia relevant to regional and global scientific and decisionmaking communities. Northern Eurasia is undergoing significant changes associated with a rapidly warming climate in this region and with important changes in governmental structures since the early 1990s and their associated influences on land use and the environment across this broad expanse of the Earth. The NEESPI research strategy intends to capitalize on a variety of remote-sensing and other tools. NEESPI will implement a general modeling framework that links socioeconomic factors with



models such as crop, pollution, land use, ecosystem, and climate with observational data to address the key research questions within northern Eurasia:

- How will future human actions affect the Northern Eurasia and global ecosystems?
- What will be the consequences of global changes for the regional environment, the economy, and the quality of life in northern Eurasia?

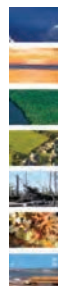
Currently, over 100 NEESPI projects involve about 400 investigators from 30 countries, including the United States, the Russian Federation, the People's Republic of China, the European Union, Japan, and Canada. NEESPI scientists are active within several IPY activities on cold land processes studies, terrestrial hydrology, atmospheric aerosols, and biospheric processes. NEESPI has also established several Focus Research Centers on specific themes and Regional Focus Research Centers in northern Eurasia.

*Monsoon Asia Integrated Regional Study.* The Monsoon Asia Integrated Regional Study (MAIRS) is an Integrated Regional Study project under ESSP that includes IGBP, IHDP, WCRP, and DIVERSITAS components. The region of monsoon Asia covers South, Southeast, and East Asia. With the highest population density of any comparable region of the world, this region has experienced one of the most rapid environmental changes in the past decade and is likely to undergo further rapid economic development in the coming years. Human activities in the monsoon Asia region significantly affect environmental conditions, both regionally and globally.

The goal of MAIRS is to better understand how human activities in the region are interacting with and altering the natural variability of atmospheric, terrestrial, and marine components of the monsoon system; to contribute to the provision of a sound scientific basis for sustainable development in monsoon Asia; and to develop a predictive capability for estimating changes in global-regional linkages in the Earth system and to project the consequences of such changes.

NASA has provided support for the MAIRS program by soliciting proposals studying the regions within the MAIRS domain and by supporting MAIRS logistics. A NASA-MAIRS joint meeting is planned for the fall of 2008.

*Polar Earth Observing Network.* The Polar Earth Observing Network (POLENET) will provide ground-based seismic and Global Positioning System (GPS) observing networks in Antarctica and a GPS network in Greenland (see <polenet.org>). POLENET is designed to directly measure solid earth phenomena needed to eliminate sources of uncertainty in satellite-derived measurements and models. The observing network is



## Highlights of Recent Research and Plans for FY 2009



intended to serve as a lasting legacy of IPY and will contribute significantly to ongoing assessments of climate change. It also contributes to broader international goals surrounding the establishment of GEOSS.

*SysTem for Analysis, Research, and Training.* In 2008 and beyond, START will continue its collaboration with its co-sponsors on its Advancing Capacity to Support Climate Change Adaptation (ACCCA) program. Fourteen projects have been funded and are underway. Five additional projects are under review. START will also continue its new African Climate Change Fellowship program, sponsored by the IDRC's Climate Change Adaptation in Africa program. START is also developing many collaborations with organizations such as the Stockholm Environment Institute, APN and IAI, IHDP, and IGBP at its upcoming Congress in South Africa.

*World Climate Research Programme.* WCRP, as decided by the Joint Scientific Committee, has as its highest priority the implementation of its cross-cutting activities. These activities include study of monsoons, anthropogenic climate change, atmospheric chemistry and climate, sea-level rise, decadal climate predictability, and IPY. WCRP has also welcomed a new director who started in the beginning of 2008. It is expected that a review of the program, co-sponsored by ICSU and IGFA, will begin in the FY 2009 time frame.

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