

The Collaborative Research Network (CRN) program is a new, 5-year initiative (1999-2003) of the IAI that will establish 14 global-change-research networks in the Americas. The program has been designed to enable investigation of a wide range of pressing topics in the area of global environmental change. The networks will be multinational and multidisciplinary in nature, each involving the participation of scientists from institutions of at least four IAI member countries and, in most cases, the participation of both natural and social scientists.

The expected benefits of the program include (1) an improved understanding of regional global-change phenomena; (2) the production of relevant information for policy- and decision-makers; (3) the expansion of scientific capacity in the region; and (4) increased multinational collaboration in addressing global-change issues.

The 14 networks involve the participation of over 150 scientists and nearly 100 institutions of 16 IAI member countries. The overall investment for the 5-year duration of the program is approximately US\$ 11 million. The groundwork for this unique initiative was laid out in 1994, when IAI (through its Start-up Grant program) invested nearly US\$ 2 million to support a series of global-change-research planning meetings and science-capacity-building efforts involving 37 groups of scientists across the Americas.

The CRN Program is designed not only to support research and capacity-building activities, but also to encourage synergistic efforts among governmental and non-governmental science organizations located throughout the Americas. Effectively addressing regional global-change issues requires an active scientific network that crosses national and regional boundaries. The resources of the CRN are intended to be used as a "glue," bringing together individuals and groups that have been working independently and allowing them to work as a team. To ensure the long-term sustainability of these teams, additional resources will be sought from national, regional, and international organizations, including the private sector.

## The IAI Collaborative Research Network Program

*Each CRN project meets well-established standards of scientific excellence, and carries a very strong potential for building scientific capacity in the Americas*

## The 14 research networks that compose the CRN program are listed below.

### A continuación, se presenta un listado de las 14 redes de investigación que componen el programa CRN.

#### ***Biogeochemical Cycles under Land Use Change in the Semiarid Americas***

*IAI award: US\$ 818,000*

Tiessen, Holm (University of Saskatchewan-**CANADA**); Stewart, J. W. B. (University of Saskatchewan-**CANADA**); Estelrich, Daniel (Universidad Nacional de La Pampa-**ARGENTINA**); Salcedo, Ignacio H. (Universidade Federal de Pernambuco-**BRAZIL**); Sampaio, Everardo V. S. B. (Universidade Federal de Pernambuco-**BRAZIL**); Jimenez-Osornio, Juan J. (Universidad Autónoma de Yucatan-**MEXICO**); Cuevas, Elvira (Instituto Venezolano de Investigaciones Científicas-**VENEZUELA**)

#### ***The Assessment of Present, Past, and Future Climate Variability in the Americas from Treeline Environments***

*IAI award: US\$ 820,000*

Luckman, Brian H. (The University of Western Ontario-**CANADA**); Boninsegna, José A. (Dendrochronology Laboratory-**ARGENTINA**); Aravena, Juan Carlos (Universidad de Chile-**CHILE**); Bautista, Jaime Argollo (Universidad Mayor de San Andrés-**BOLIVIA**); Biondi, Franco (University of California-**USA**); Diaz, Henry F. (National Oceanic and Atmospheric Administration-**USA**); Hughes, Malcolm K. (The University of Arizona-**USA**); Jacoby, Gordon C. (Columbia University-**USA**); Lara, Antonio (Universidad Austral de Chile-**CHILE**); Roig, Fidel A. (Instituto Argentino de Nivología, Glaciología y Ciencias Ambientales -**ARGENTINA**); Smith, Dan (University of Victoria-**CANADA**); Stahle, David W. (University of Arkansas-**USA**); Villalba, Ricardo (Instituto Argentino de Nivología, Glaciología y Ciencias Ambientales -**ARGENTINA**); Thompson, Lonnie (Ohio State University-**USA**); Villanueva Diaz, José (Instituto Nacional de Investigaciones Forestales, Agrícolas y Pecuarias-**MEXICO**)

#### ***Cattle Ranching, Land Use and Deforestation in Brazil, Peru, and Ecuador***

*IAI award: US\$ 658,284*

Wood, Charles H. (University of Florida-**USA**); Tourrand, Jean François (Universidade Federal do Pará-**BRAZIL**); Bastos da Veiga, Jonas (Empresa Brasileira de Pesquisas Agropecuárias-**BRAZIL**); Olmedo, Jorge Grijalva (Instituto Nacional de Investigaciones Agropecuarias-**ECUADOR**); Berrocal, Milthon Muñoz (Universidad Nacional Agraria de La Selva-**PERU**); Coomes, Oliver (McGill University-**CANADA**); Sant'Ana de Menezes, Ronei (Grupo de Pesquisa e Extensão em Sistemas Agroflorestais do Acre-**BRAZIL**)

#### ***The Role of Biodiversity and Climate in the Functioning of Ecosystems: A Comparative Study of Grasslands, Savannas, and Forests.***

*IAI award: US\$ 819,826*

Sala, Osvaldo (Universidad de Buenos Aires-**ARGENTINA**); Oesterheld, Martin (Universidad de Buenos Aires-**ARGENTINA**); Armesto, Juan (Universidad de Chile-**CHILE**); Dirzo, Rodolfo (Universidad Nacional Autónoma de México-**MEXICO**); Jackson, Robert (Duke University-**USA**); Altesor, Alice (Universidad de la República-**URUGUAY**); Baruch, Zdravko (Universidad Simón Bolívar-**VENEZUELA**); Aguiar, Martín (Universidad de Buenos Aires-**ARGENTINA**); Austin, Amy

(Universidad de Buenos Aires-**ARGENTINA**); Frank, Douglas A. (Syracuse University-**USA**); Paruelo, José (Universidad de Buenos Aires-**ARGENTINA**)

***Enhanced Ultraviolet-B Radiation in Natural Ecosystems as an Added Perturbation due to Ozone Depletion***

*IAI award: US\$ 820,000*

Vernet, Maria (Scripps Institution of Oceanography-**USA**); Diaz, Susana (Centro Austral de Investigaciones Científicas-**ARGENTINA**); Zagarese, Horacio (Universidad del Comahue-**ARGENTINA**); Pedroni, Jorge (Universidad de la Patagonia-**ARGENTINA**); Tocho, Jorge (Universidad de la Patagonia-**ARGENTINA**); Paladini, Alejandro (Instituto de Genética y Biotecnología-**ARGENTINA**); Momo, Fernando (Universidad Nacional del Luján-**ARGENTINA**); Ferreyra, Gustavo (Instituto Antártico Argentino-**ARGENTINA**); Costa, Cesar (Universidade de Rio Grande-**BRAZIL**); Giansella, Sonia (Universidade de São Paulo-**BRAZIL**); Demers, Serge (Université du Québec-**CANADA**); DeMora, Stephen (Université du Québec-**CANADA**); Fuenzalida, Humberto (Universidad de Chile-**CHILE**); Cabrera, Sergio (Universidad de Chile-**CHILE**); Lovengreen, Charlotte (Universidad Austral de Chile-**CHILE**); Zamorano, Felix (Universidad de Magallanes-**CHILE**); Valderrama Vergara, Victor (Universidad de Magallanes-**CHILE**); Soto, Doris (Universidad Austral de Chile-**CHILE**); Koch, Eva (University of Maryland-**USA**); Van dan Belt, Marjan (Ecological Economics Research and Applications-**USA**); Morris, Donald (Lehigh University-**USA**); Hargreaves, Bruce (Lehigh University-**USA**); Armstrong, Roy (University of Puerto Rico-**USA**); Booth, Charles R. (Biospherical Instruments Incorporated-**USA**)

***ENSO Disaster Risk Management in Latin America: A Proposal for the Consolidation of a Regional Network for Comparative Research, Information, and Training from a Social Perspective***

*IAI award: US\$ 808,920*

Franco, Eduardo (The Network for Social Studies on Disaster Prevention in Latin America: La Red-**PERU**); Herzer, Hilda (Centro de Estudios Sociales y Ambientales-**ARGENTINA**); Barbosa, Marx Prestes (Universidade Federal da Paraíba-**BRAZIL**); Velázquez, Andrés (Universidad del Valle-**COLOMBIA**); Lavell, Allan (Facultad Latinoamericana de Ciencias Sociales-**COSTA RICA**); Zevallos, Othón (Escuela Politécnica Nacional-**ECUADOR**); García Acosta, Virginia (Centro de Investigaciones y Estudios Superiores en Atropología Social-**MEXICO**); Oliver-Smith, Anthony (University of Florida-**USA**)

***Multi-Objective Study of Climate Variability for Impact Mitigation in the Trade Convergence Climate Complex Region***

*IAI award: US\$ 809,600*

Cornejo, Pilar (Centro del Agua del Trópico Húmedo para América Latina y el Caribe-**PANAMA**); Glantz, Michael (National Center for Atmospheric Research-**USA**); de Groot, Nicolas J. P. M. (Centro del Agua del Trópico Húmedo para América Latina y el Caribe-**PANAMA**); Morgan, Luis A. (Centro del Agua del Trópico Húmedo para América Latina y el Caribe-**PANAMA**); Kulshreshtha, Surenda N. University of Saskatchewan-**CANADA**); Cid Serrano, Luis (University of Concepción - **CHILE**); Sanchez, Jairo Eduardo (Instituto de Hidrología, Meteorología y Estudios Ambientales - **COLOMBIA**); Pabon C., José Daniel (Instituto de Hidrología, Meteorología y Estudios Ambientales - **COLOMBIA**); Montealegre B., José Edgar (Instituto de Hidrología, Meteorología y Estudios Ambientales - **COLOMBIA**); Alfaro, Eric J. (Universidad de Costa Rica - **COSTA RICA**); Calderón Velásquez, Jorge (Escuela Superior Politécnica del Litoral - **ECUADOR**); Santos, José Luis (Escuela Superior Politécnica del Litoral - **ECUADOR**); Ulloa, Edwin (Universidad Espíritu





Santo - **ECUADOR**); Collado, Jaime (Mexican Institute of Water Technology - **MEXICO**); Villalobos, Ángel (Mexican Institute of Water Technology - **MEXICO**); Velasco, Israel (Mexican Institute of Water Technology - **MEXICO**); Aldave Mátar, Roberto (Mexican Institute of Water Technology - **MEXICO**); González, Ricardo (Universidad Tecnológica de Panamá - **PANAMA**); Him, Carlos (Universidad de Panamá - **PANAMA**); Lorlesse, Aristides (Instituto Nacional de Recursos Naturales Renovables - **PANAMA**); Franceschi, Paulina (Universidad Santa María la Antigua - **PANAMA**); Castro, Ligia (Instituto Conmemorativo Corgas - **PANAMA**); Leaman, Kevin (Rosenstiel School of Marine and Atmospheric Science - **USA**); Enfield, David (National Oceanic and Atmospheric Administration - **USA**); Donoso, María C. (Centro del Agua del Trópico Humedo para América Latina y el Caribe - **PANAMA**)

***Estudio Comparativo de los Efectos de Cambios Globales sobre la Vegetación de Dos Ecosistemas: Alta Montaña y Sabana Tropical***

Silva, Juan (Universidad de Los Andes-**VENEZUELA**); Cavelier, Jaime (Universidad de Los Andes-**COLOMBIA**); Klink, Carlos (Universidade de Brasília-**BRAZIL**); Gonzalez, Juan (Instituto Miguel Lillo-**ARGENTINA**);

***Andean Amazon Rivers Analysis and Monitoring (AARAM) Project***

McClain, Michael E. (Florida International University-**USA**); Llerena, Carlos A. (Universidad Nacional Agraria La Molina-**PERU**); Krusche, Alex Vladimir (Universidade de São Paulo-**BRAZIL**); Quintanilla Aguirre, Jorge (Universidad Mayor de San Andrés-**BOLIVIA**); Ruiz, José Efraín (Universidad de Los Andes-**COLOMBIA**); Galárraga Sánchez, Remigio (Escuela Politécnica Nacional-**ECUADOR**)

***Diagnostics and Prediction of Climate Variability and Human Health Impacts in the Tropical Americas***

Confalonieri, Ulisses E. C. (Fundação Oswaldo Cruz-**BRAZIL**); Diaz, Henry F. (National Oceanic and Atmospheric Administration-**USA**); Aron, Joan L. (Science Communication Studies-**USA**); Poveda, German (Universidad Nacional de Colombia-**COLOMBIA**); Santos-Burgoa, Carlos (Instituto de Salud, Ambiente y Trabajo-**MEXICO**); Chen, Anthony (University of the West Indies-**JAMAICA**); Zimmerman, Robert H. (Science Communication Studies - **USA**); Pulwarty, Roger S. (University of Colorado - **USA**); Wiener, John D. (University of Colorado - **USA**); Rubio-Palis, Yasmin (Escuela de Malariología y Saneamiento Ambiental - **VENEZUELA**)

***Development of a Collaborative Research Network for the Study of Regional Climate Variability and Changes, their Prediction and Impact in the MERCOSUR Area***

Nuñez, Mario N. (Universidad de Buenos Aires-**ARGENTINA**); Barros, Vicente (Universidad de Buenos Aires-**ARGENTINA**); Berri, Guillermo (Universidad de Buenos Aires-**ARGENTINA**); Nicolini, Matilde (Consejo Nacional de Investigación Científica y Técnica-**ARGENTINA**); Vargas, Walter M. (Consejo Nacional de Investigación Científica y Técnica - **ARGENTINA**); Vera, Carolina S. (Consejo Nacional de Investigación Científica y Técnica - **ARGENTINA**); Ambrizzi, Tercio (Universidade

de São Paulo-**BRAZIL**); Grimm, Alice M. (Universidade Federal do Paraná-**BRAZIL**); Nobre, Carlos (Centro de Previsão de Tempo e Estudos Climáticos-**BRAZIL**); Marengo, José (Centro de Previsão de Tempo e Estudos Climáticos -**BRAZIL**); Cavalcanti, Iracema (Centro de Previsão de Tempo e Estudos Climáticos -**BRAZIL**); Dias, Maria Asunção Silva (Universidade de São Paulo-**BRAZIL**); Dias, Pedro Leite Silva (Universidade de São Paulo-**BRAZIL**); Grassi, Benjamin (Universidad Nacional de Asunción-**PARAGUAY**); Coronel, Genaro (Universidad Nacional de Asunción-**PARAGUAY**); Bidegain Dorelo, Mario (Universidad de la Republica-**URUGUAY**); Caffera, Ruben Mario (Universidad de la Republica-**URUGUAY**); Berbery, Ernesto H. (University of Maryland-**USA**); Diaz, Henry (National Oceanic and Atmospheric Administration-**USA**); Liebmann, Brant (National Oceanic and Atmospheric Administration-**USA**); Podestá, Guillermo P. (University of Miami-**USA**)

### ***South Atlantic Climate Changes (SACC): An International Consortium for the Study of Global and Climate Changes in the Western South Atlantic***

*IAI award: US\$ 819,000*

Campos, Edmo José Dias (Universidade de São Paulo-**BRAZIL**); Piola, Alberto R. (Servicio de Hidrografía Naval-**ARGENTINA**); Labraga, Juan C. (Consejo Nacional de Investigación Científica y Técnica -**ARGENTINA**); Lorenzetti, João A. (Instituto Nacional de Pesquisas Espaciais-**BRAZIL**); Nobre, Paulo (Centro de Previsão de Tempo e Estudos Climáticos-**BRAZIL**); Martinez, Carlos M. (Universidad de la República-**URUGUAY**); Bleck, Rainer (University of Miami-**USA**); Matano, Ricardo P. (Oregon State University-**USA**)

### ***An Eastern Pacific Consortium for Research on Global Change in Coastal and Oceanic Regions***

*IAI award: US\$ 820,000*

Baumgartner, Timothy R. (Centro de Investigación Científica y de Educación Superior de Ensenada-**MEXICO**); Mackas, David (Institute of Ocean Sciences-**CANADA**); Platt, Trevor (Bedford Institute of Oceanography-**CANADA**); Freeland, Howard (Institute of Ocean Sciences-**CANADA**); Atkinson, Larry (Old Dominion University-**USA**); Graham, Nick (Scripps Institution of Oceanography-**USA**); Strub, Ted (Oregon State University-**USA**); Pulwarty, Roger (University of Colorado-**USA**); Leon Coto, Sandra (Universidad Nacional de Costa Rica-**COSTA RICA**); Brenes Rodriguez, Carlos (Universidad Nacional de Costa Rica-**COSTA RICA**); Enriquez, Roberto (Pronatura Peninsula de Baja California-**MEXICO**); Lara Lara, José Ruben (Centro de Investigación Científica y de Educación Superior de Ensenada -**MEXICO**); Tarazona Barboza, Juan (Universidad Nacional Mayor de San Marcos-**PERU**); Daneri, Giovanni (Universidad del Mar-**CHILE**); Ulloa Q., Osvaldo (Universidad de Concepción-**CHILE**); Quiñonez, Renato (Universidad de Concepción-**CHILE**); Botero, Leonor (Instituto Colombiano para el Desarrollo de la Ciencia y la Tecnología-**COLOMBIA**); Gaibor, Nikita (Instituto Nacional de Pesca-**ECUADOR**); Cedeno, Ivan (Instituto Nacional de Pesca-**ECUADOR**)

### ***Climate Variability and its Impacts in the Mexican, Central American, and Caribbean Region***

*IAI award: US\$ 293,300*

Magaña Rueda, Victor (Universidad Nacional Autónoma de Mexico-**MEXICO**); Mooers, Christopher N. K. (University of Miami-**USA**); Amador Astúa, Jorge (Universidad de Costa Rica-**COSTA RICA**); Zhang, Chidong (University of Miami-**USA**); Ambrizzi, Tercio (Universidade de São Paulo-**BRAZIL**)

Each of the projects has a regional focus, is highly interdisciplinary, and involves multinational collaboration. Besides meeting well-established standards of scientific excellence, each project carries a very strong potential for building scientific capacity in the Americas. Most of them explicitly link policy and science and will produce data relevant to the four major themes of the IAI's Science Agenda, as discussed below briefly.

### ***Understanding Climate Variability in the Americas***

Seven of the CRN projects focus on either the science or the human dimensions of climate variability, both of which have strong implications for society. Collectively, the seven projects cover much of Central and South America. Three of them—those led by Victor Magaña (Mexico), Mario Nuñez (Argentina), and Pilar Cornejo (Panama)—are concerned specifically with the near-term climate variability of target regions within the Americas. A fourth project—that led by Edmo Campos (Brazil)—is exploring the linkage between surface temperature changes in the Atlantic and climate variability in the Americas, which is not well understood. The fifth project, under the leadership of Brian Luckman (Canada), is piecing together a 500-year picture of climate variability in the Americas on the basis of the tree-ring record. Finally, two projects—one coordinated by Eduardo Franco (Peru) and one by Ulisses Confalonieri (Brazil), which have strong human-dimension components—are examining in detail the implications of ENSO-related climate variability on disaster management and human health.

### ***Comparative Studies of Ecosystems, Biodiversity, Land Use, and Water Resources in the Americas***

The CRN program also includes studies that compare global change phenomena in many diverse environments, both coastal and terrestrial. Timothy Baumgartner (Mexico), for example, is leading a project that employs several teams of scientists working to understand the implications of global change for the coastal resources of the Eastern Pacific. At the same time, four other studies, led by Juan Silva (Venezuela), Osvaldo Sala (Argentina), Michael McClain (USA), and Holm Tiessen (Canada), will be advancing our knowledge of various global changes in terrestrial ecosystems, including those brought about by changes in land use. Osvaldo Sala, for example, is examining explicit connections between ecosystem health and biodiversity. A project led by Charles Wood (USA) focuses on understanding the social factors behind modifications in land use and land cover, which are now recognized as major drivers of global change, especially in the Amazon.

Finally, Maria Vernet (USA) and collaborators are developing a research network for assessing the ecological impact of increased UV-B radiation to South American ecosystems.



### ***Changes in the Composition of the Atmosphere, Oceans, and Fresh Waters***

Two projects also encompass issues relevant to this theme: Maria Vernet's project is studying the effects on ecosystems of changes in the ozone layer, and Michael McClain's project is investigating biogeochemical cycles in rivers in the Amazonian highlands, on the flanks of the Andes Mountains.

### ***Integrated Assessment, Human Dimensions, and Applications***

The human-dimensions element is an essential component of global-change research. Most of the CRN projects explicitly include this component, but—as already mentioned—three of them are especially strong in this regard. Eduardo Franco is leading a team of social and natural scientists in an effort to improve the management of ENSO-related disasters in the South American countries; Ulisses Confalonieri's project is looking into the close linkages between human health and climate variability in impoverished communities in South America; and Charles Wood's project is attempting to better understand why people in the Amazon region make the land-use decisions that they do.

In summary, the CRN will be a major global-change-research program in the Americas. It is unique in that it focuses both on scientific excellence and on multinational collaboration and capacity building. We are confident that this 5-year program will not only advance the Science Agenda of the IAI and significantly strengthen scientific capacity in global change research in the Americas, but—perhaps even more important—it will lead to the production of information of great value to policy- and decision-makers.