

"SHARING ENVIRONMENTAL INFORMATION: ISSUES OF OPEN ENVIRONMENTAL DATA IN LATIN AMERICA".

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The Inter-American Institute for Global Change Research (IAI) is an international institution supported by 19 countries in the Americas dedicated to foster scientific research, international collaboration and creation of networks and full and open exchange of scientific information. In general terms, the institute was conceived because of the need for an international non-governmental and non-profit institution whose main objective would be to support scientific development in the Americas, focusing on the challenge of global environmental and climate changes, as well as be dedicated to pursuing the principles of scientific excellence.

In 1992 during the United Nations Conference on Environment and Development (RIO92), global change matter was perceived as one important and critical theme facing the world. Several aspects had driven the discussions on that time, like physical and socioeconomic evidences of global change, changes in rainfall patterns and trends, biodiversity, deforestation, human integration within the environment and changes due to such integration, and other examples. The IAI was created to act as an intergovernmental entity to address global change issues with a regional mandate. It was officially established through an agreement signed in Montevideo, Uruguay on May 13th, 1992. The institute operates as a funding agency, issuing open calls to the scientific communities and creating scientific opportunities for different groups of researchers in the Americas.

In general, all countries recognize that global environmental and climate changes represent a threat to a great number of their activities such as agriculture, cattle breeding, fishing and tourism as well as the interaction of man with environment. Furthermore, climate events such as floods, hurricanes, tornadoes and aridity directly affect city infrastructure and require governments to undertake specific actions to prevent, protect against and solve such problems. On the other hand, environmental and climate changes may also bring benefits to some communities, for example changes in air circulation in the atmosphere may increase rainfall in semi-arid regions, improving the quality of the soil and as a result increasing grain production.

During the last years, the Inter-American Institute for Global Change Research has supported and developed different multidisciplinary activities with the direct or indirect participation of various American countries and of more than 1300 researchers in several scientific projects. These activities generate a great number of results such as papers, presentations, administrative, policy and statistical reports, etc. Such results contribute directly or indirectly to the identification of solutions for the problems caused by global environmental and climate changes. Serving as an example of this we can quote two projects hereafter.

The first one is project SACC, South-Atlantic Climate Change Consortium. This project was implemented as a collaborative resource network with researchers representing 5 countries, Argentina, Brazil, Uruguay, Chile and USA. The main objective of this project was coordinate and enhance resources in the participant countries in order to advance the understanding of coupled

effects of global change and climate variability on oceanic, atmospheric and terrestrial ecosystems of the Western South Atlantic region.

Researchers from this project have studied exchange processes between deep ocean and the Patagonian shelf in order to identify trends in ocean circulations and ocean biota. With that matter in mind, they have determined the influence of currents and direct relations in fishery production, as well as the biodiversity of that marine environment. Since that region is a very important fishery area with about two million tons of fish and squid landed by year (3% of world production), this research was extremely important for the fishing businesses of that region, and therefore very useful. This research have contributed directly for the building of a more sustainable and reliable fishing businesses.

Another example is project TROPDRY, Human Ecological and Biophysical Dimensions of Tropical Dry Forests. This project was also implemented as a collaborative resource network with researchers from different countries, like Canada, Mexico, USA, Costa Rica, Cuba, Venezuela and Brazil. The main objective of this project was understanding ecology and diversity of Tropical Dry Forests region located in the northern part of the states of Minas Gerais in Brazil. Also the project aimed to know better the climatic and socioeconomic drivers of development and degradation of that region, in order to document trends on the biota of Tropical Dry Forests areas.

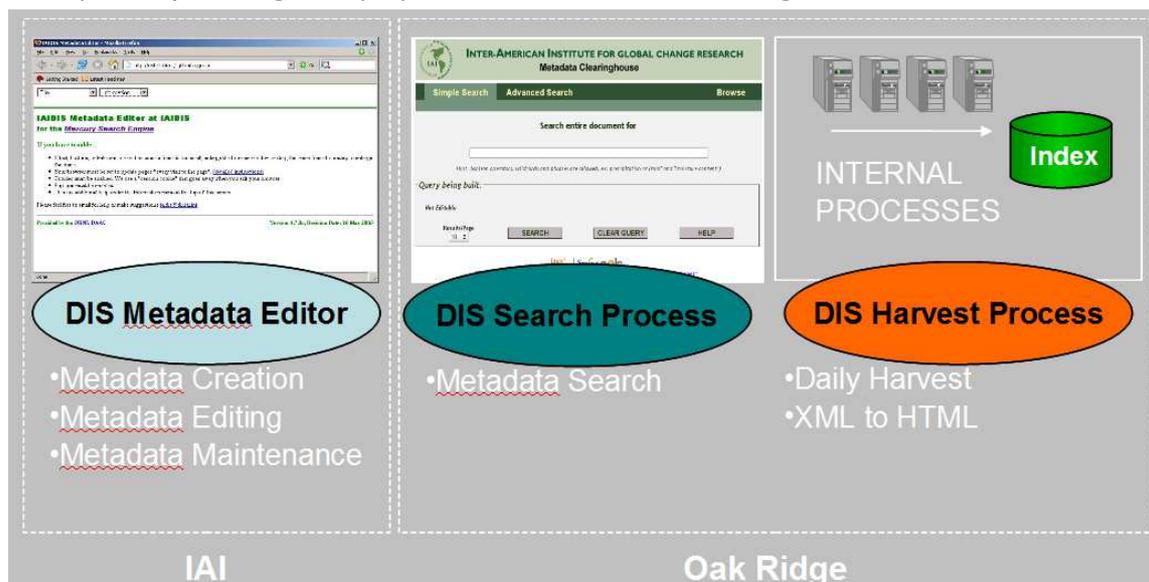
Researchers from this project have presented years of data on the forest, like remote sensing data, ground observations, satellite data in order to better understand the region and its biological trends. As a directly consequence of these studies, thousands of hectares of tropical dry forests in that region are now safe from logging and deforestation.

Using information from TROPDRY, the members of the Superior Court of Minas Gerais overturned a state law that altered the status of more than 16,000 square kilometers (6,000 square miles) of tropical dry forests. If that law was put into practice, it had contributed directly for deforestation, the non-sustainable use of that region and the loss of these forests would threat biodiversity and ecosystem services, including weather regulation and water production in Brazil's second-largest watershed, the São Francisco River.

These two examples above, show the importance of having scientific information being translated into policies, environmental reports, and statistical analysis documents in order to help environment as a whole. It is precisely in this area that the data and information system (IAI-DIS) of the Inter-American Institute for Global Change Research has its conceptual foundations. Its main goal is to group information in an organized and standardized way, in order to make this information available for the scientific communities via an internet website and allow people, specially researchers, to find information about the institute's scientific production and use such information within their own research, as well as use information to solve practical problems, like the examples showed before.

The main motivation in creating a system like that, is because we observed that many data produced within our projects began to be hidden as time passed and consequently information were lost. We observed that is was a challenge to obtain information from different sources of data located in several places, and it was necessary to have a system that would allow us to have all this stuff structured. A second point of motivation was based on the roots of the institute, when we tried to fulfill the full and open exchange of scientific information mandate in order to increase the understanding of global change phenomena. With that in mind, we began to search for mechanisms that could allow us to implement that solutions and the system were born. The IAI-DIS is an Internet-based data and information system focusing on data dissemination and

contribution. The system has 3 mechanisms (metadata editor, search and retrieval process and harvest process) that together proportionate the fulfillment of its goals.



The system is being active since 1999 and during this period several reformulations and add-ons were made. Currently the system is based on the Mercury system, developed by the Oak Ridge National Laboratory (ORNL), and each day there is a “harvesting” process running from Oak Ridge that update the database. There are approximately 950 metadata created on the system.

Metadata are references to real data which may be available electronically or not or may be accessed locally or remotely. The reference is based on specific fields which classify and organize information according to different criteria. Giving a more detail information, these metadata are XML files created by a specific tool, which are used as base information for the index creation, and captures the basic characteristics of a data or information resource. It represents the who, what, when, where, why and how of the resource. Metadata records include core elements such as title, abstract, publication data, geographic elements such as geographic location.

We based our XML files on the FGDC/CSDGM, Federal Geographic Data Committee/Content Standard for Digital Geo-spatial Metadata with some changes and adaptations. CSDGM is the current US Federal metadata standard and since the IAI-DIS structure is similar to Mercury solution, from US Oak Ridge National Laboratory, we decided to follow these standards since the beginning. As soon as the index is updated (once a day), that information is open for all people, that can use the “search and retrieval process” to look for specific information produced within our scientific projects. In terms of data diffusion, as we take part on the Mercury Consortium, from US Oak Ridge National Laboratory, we can reach other institutions through their structure. Since several projects from different institutions are using Mercury structure, both of them can share information and also XML files in order to create a unique repository. Examples of institutions using Mercury are ORNL Distributed Active Center, US Geological Survey, DataOne, Large Scale Biosphere-Atmosphere Experiment in Amazonia (LBA), among others.

As a conclusion for our work, we can quote that the adoption of a system like IAI-DIS contributed for the better understanding of what we have and what we produce in terms of data and information. Also, there is a better integration between our researchers, and consequently the creation of collaborative networks are favored. As a final positive point, we can quote that our “legacy” is preserved and information can be reached after years of project closure.

References:

<http://www.iai.int>, <http://disbr1.iai.int>, <http://mercury.ornl.gov/iai>, <http://mercury.ornl.gov>, <http://www.fgdc.gov>, <http://www.fgdc.gov/metadata/geospatial-metadata-standards#csdgm>

