

## **Global Spatial Data Infrastructure. Fifth Conference**

### **US Geological Survey Conference Presentation**

**Title:** Development of a Regional Clearinghouse for the Dissemination of Integrated Information on Natural Hazards in Central America

**Authors:** Eric van Praag, Larry L. Tieszen, Diego Pedreros

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#### **Project Background:**

The infrastructure and rich natural resource base in several Central American countries, already stressed from the effects of rapidly changing land use and growing human population pressure, suffered a major setback owing to the impact of Hurricane Mitch in October 1998. The immediate emergency response united national efforts with those of international relief and donor organizations. Subsequent to the emergency relief response, the region has been faced with the task of restoring damaged infrastructure and developing more effective management practices and warning systems to mitigate the risk of future disasters.

It was immediately recognized, during the disaster, that decisionmakers were hampered by a lack of integrated information on natural hazards and threats to natural resources, particularly information in a geographically consistent format and in useful and easily understandable forms. Early international meetings

identified the need for regional cooperation, access to data, the importance of transboundary issues, and some level of data integration. Furthermore, it was recognized that disasters were not uncommon in the region and that they were exacerbated by existing land management practices.

Accordingly, as part of a broad U.S. Government interagency effort to respond to the needs of national partners in the reconstruction of the affected countries, the U.S. Geological Survey (USGS) organized a multidisciplinary program to gather, integrate, and deliver useful data and information as quickly as possible and to enhance the national agencies' capabilities to generate and effectively use these information products.

As part of this initiative, the USGS/Earth Resources Observation Systems Data Center (EDC) and national partner institutions are promoting a regional clearinghouse system using the Federal Geographic Data Committee metadata standard to describe, access, and disseminate geospatial data through the Internet in Honduras, Guatemala, Nicaragua, and El Salvador. The main purpose of this project is to improve the availability of geospatial data related to natural disasters. The project will also strive for the dissemination of all national geospatial data and will promote the development of national spatial data infrastructures and of a regional spatial data infrastructure. These regional activities are clearly an outgrowth of earlier developments in Latin America funded mainly by the Inter-American Development Bank and

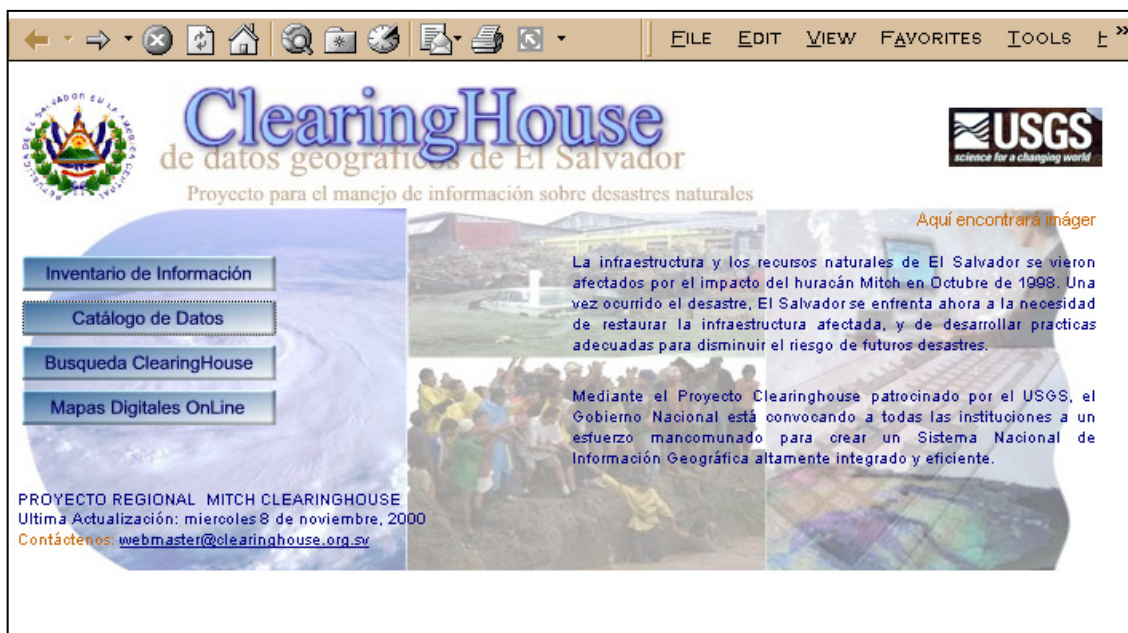
implemented by the Pan American Institute of Geography and History in the “Atlas of the Americas” project.

**Project Description:**

The project will develop two types of products: a Metadata Geospatial data Catalog for each participating country, searchable through the WEB and FGDC and ISO compliant; national Clearinghouse WEB sites for disaster data dissemination. The products are developed by the national participating institutions; with the technical support, capacity building and hardware and software needed being provided by the USGS.

The first participating institutions were selected on the basis of their involvement with geospatial data creation and/or dissemination. Agencies like the national geographic institutes, environmental institutions and development NGOs were the first to join the project. In each country a national project coordinator was hired half time to coordinate project activities – with the exception of Honduras where permanent USGS project staff are based, and at least one agency with dedicated Internet connectivity was selected in each country to host the main national Clearinghouse server. The strategic and operative decisions in each country are taken by a National Project Steering Committee with representatives from all national participating institutions and the USGS.

Training has been provided in the following topics: 1) Clearinghouse technologies and metadata development; 2) WEB Site design and development; 3) Use of GIS as a disaster relief tool; 4) Serving maps and geospatial data through the WEB. To date more than 20 professionals have been trained in each topic by the project in each country - with Guatemala having organized their own Clearinghouse training workshop with project trainees acting as qualified trainers; and more than 200 validated metadata records have been produced by each country, mostly covering the following topics: basic cartography, environment, municipal subjects, satellite images, aerial photography, hazard maps.



*Graphic shows the home page of a country Clearinghouse WEB Site*

Some of the main project activities are:

1. Development of Institutional Metadata Development Plans at all participating institutions. This plan guides metadata creation in each institution.

2. Development of national metadata catalogs – using the FGDC Isite software.
3. Development of national Clearinghouse WEB sites.
4. Development of institutional digital data inventories by all participating institutions. These will be featured in the national Clearinghouse WEB Sites, and will contain direct links to their corresponding metadata records.
5. Adaptation of disaster-related documents and databases to be hosted in the Clearinghouse WEB Sites.
6. Development – human and technological resources permitting - of Internet Map Server capabilities at selected Clearinghouse nodes.



*Graphic shows the catalog page of a country Clearinghouse WEB Site with metadata links*

The goal of the project is to provide a one-stop shop for users of disaster information. Because the disaster data concept is so broad, the project has

strived to disseminate most of the available national spatial data through the Clearinghouse system. The project is expanding the concept of the traditional Clearinghouse node that used to support a metadata search catalog only, by developing a WEB page that contains several complementary features: data inventories, browse graphics for selected data sets, institutional profiles with brief descriptions of the institution's data holdings, on-line mapping capabilities, data download section. The user not only gets a feeling for the data described by the metadata catalog, but can also view the data inventories (including data which may not yet have metadata developed for it), view some maps on-line or even download some maps or satellite images.

**Project challenges and opportunities:**

A Clearinghouse system success clearly depends on the willingness of partners to share their data and to trust that the Clearinghouse system will provide a mechanism for protecting data ownership and copyright, and somehow penalize unlawful use or distribution of Clearinghouse-based data. Issues like these are hard to foresee or implement, but turn out to be of paramount importance for establishing a Clearinghouse system.

A Clearinghouse system offers a great opportunity for reliable, fast and cost-effective data dissemination, and the benefits are well known and documented. Notwithstanding, there are matters of concern when establishing such a system, the prominent ones in Central America being:

1. Some participating institutions view data sharing as a threat rather than an opportunity;
2. The government's participation remains strong, with low representation from private industry, the scientific or the NGO community;
3. There is low technological capacity in project areas at all participating countries, and the need to rely on the technical support provided by outside organizations;
4. Enough Internet bandwidth in the region to properly support some of the more advanced Clearinghouse services envisioned is currently lacking.
5. Project ownership by some national institutions and a just appraisal of project benefits by senior management remains weak.

To address some of the previous issues - and in line with worldwide efforts - the project team and national partner institutions are promoting the development of a National Spatial Data Infrastructure (NSDI) at participating Central American countries, and the idea of linking these initiatives through a regional Central American clearinghouse system. This effort will entail a more permanent undertaking, and will guarantee that the Clearinghouse system now being established remains dynamic. The present project could lay the ground for such an initiative, and it is pointing this way by its work with the International Center for Tropical Agriculture (CIAT) in Colombia, by sponsoring and helping to organize NSDI workshops at some participating countries, as the Center for Management and Distribution of Geographic Information in Honduras (CIGEO)

– a center which the USGS is helping establish – recently demonstrated by their support in staging the first NSDI National Meeting in Honduras.

It is hoped that in the long run the Clearinghouse system will not only assist the expert user, but will also provide the common citizen with a reliable source of information.