



GeoSemantica Technology Overview



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About MAP:GAC

The Multinational Andean Project: Geoscience for Andean Communities (MAP:GAC) is a six year geoscience project focusing on geological hazards in Andean communities, and managed by the National Geoscience Agencies of Argentina, Bolivia, Canada, Colombia, Ecuador, Peru and Venezuela. The project is partially funded by the Canadian International Development Agency (CIDA) and administered by the Geological Survey of Canada (GSC).

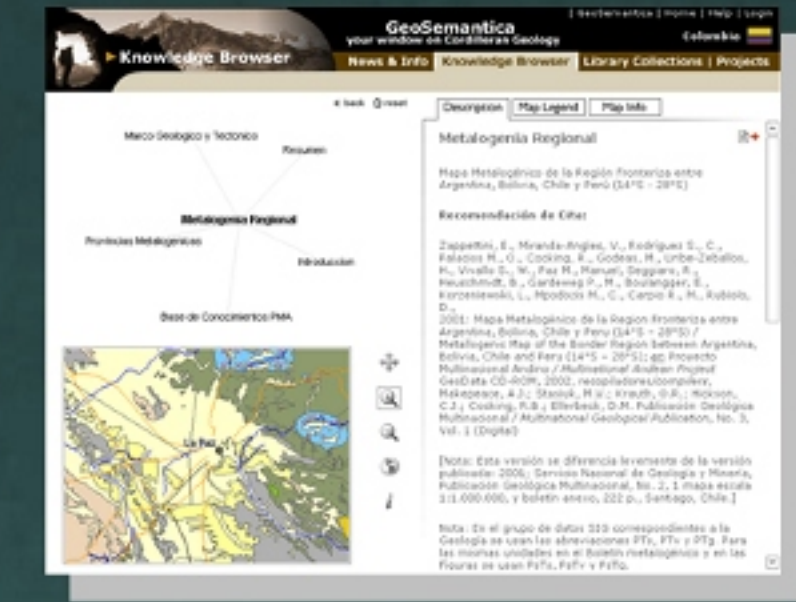
The Project goal is to improve the quality of life for people of the Andes by reducing the impact of geological hazards (earthquakes, landslides, and volcanoes). Through the project, updated and integrated geoscience and geospatial information on natural hazards will be provided for land use planning and natural hazard reduction.

For more information visit: <http://www.pma-map.com>

About GeoSemantica

As a digital library prototype, GeoSemantica aims at developing awareness and understanding of geologic hazard issues within the member countries of the MAP:GAC project. Specifically, the GeoSemantica initiative creates a focused digital library framework to help promote the integration of geologic information for the purposes of collaboration between MAP:GAC member countries.

Knowledge Browser



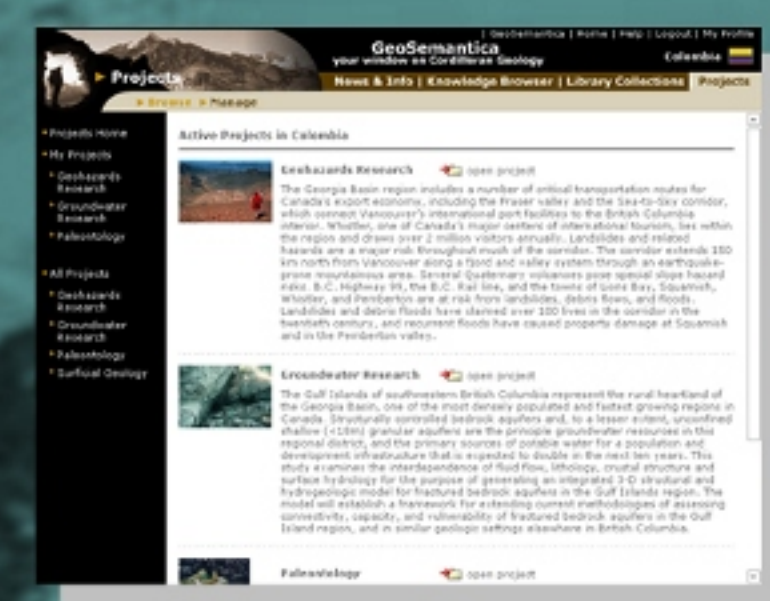
The Knowledge Browser module helps the user transform information into knowledge through the integration of semantic networks, Web GIS and hypermedia to provide a rich and multi-faceted context for exploring ideas and issues within the MAP:GAC project. Concepts in the semantic web are linked to objects in the Web-GIS and hypermedia frames through the use of a Thinkmap™ Java Applet and dynamic database queries. The organization of these concepts in a semantic network promotes the understanding of linkages and relationships between concepts. As concepts are selected from the semantic network, related spatial data and documentation can be viewed.

News & Information

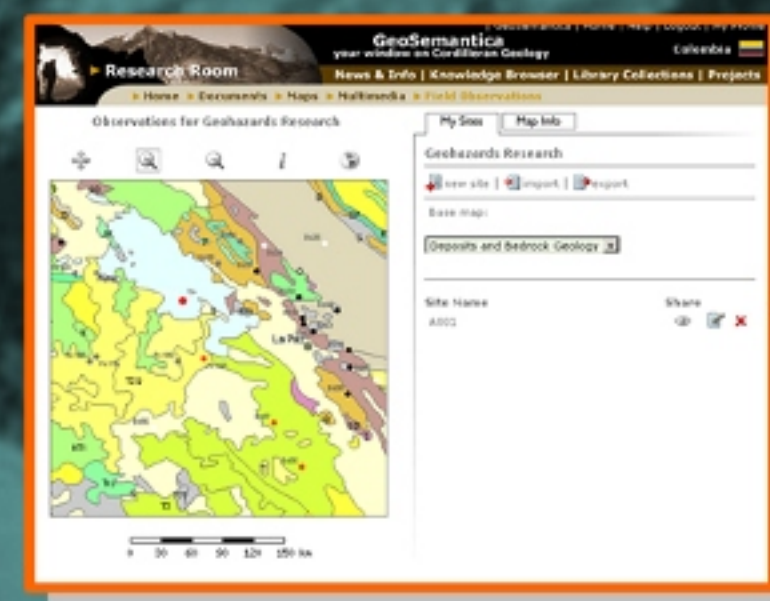
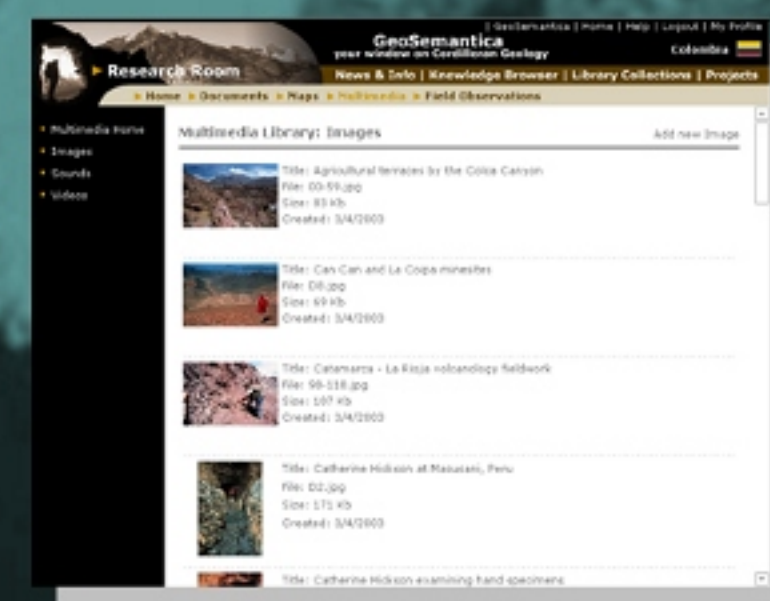
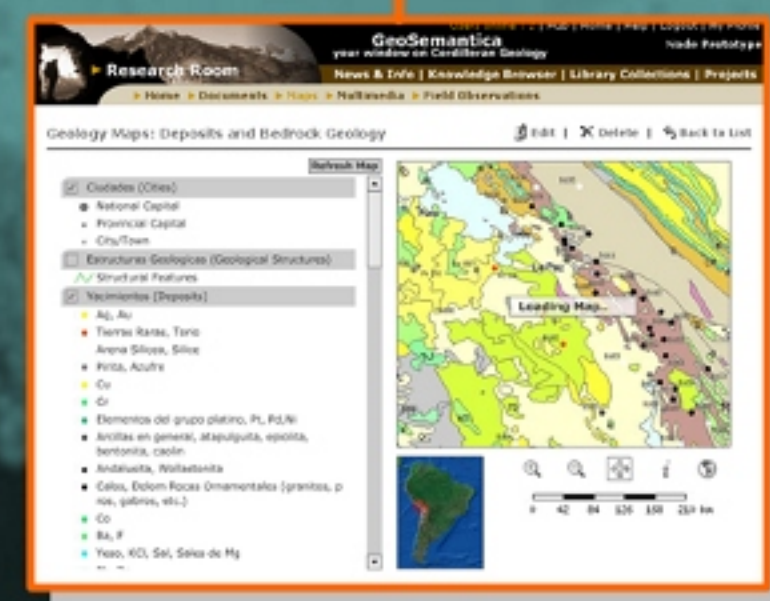
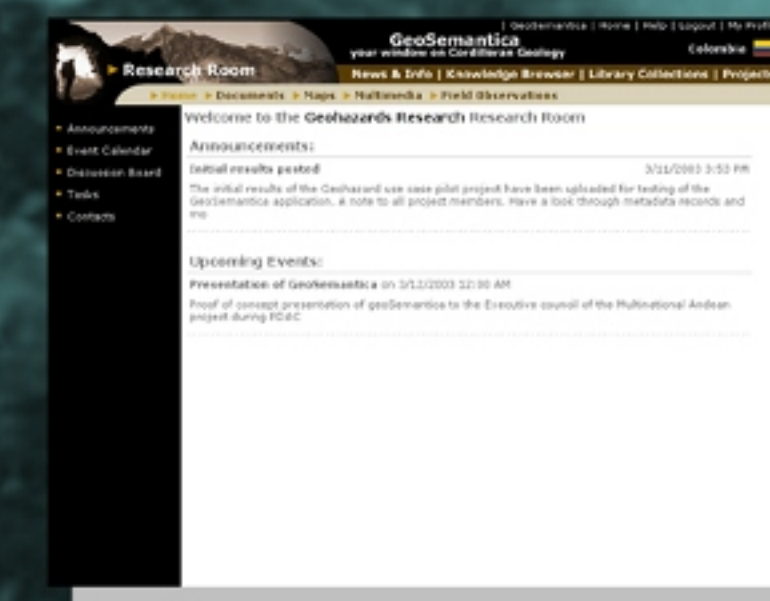


As a forum to learn and explore hazards-related issues, the News and Information module provides current news stories and a vast array of website resources. News content in the module is updated automatically by syndicated Internet news sources. Website resources in the module are organized under earth science headings. By selecting a heading of interest, all associated websites are available for viewing.

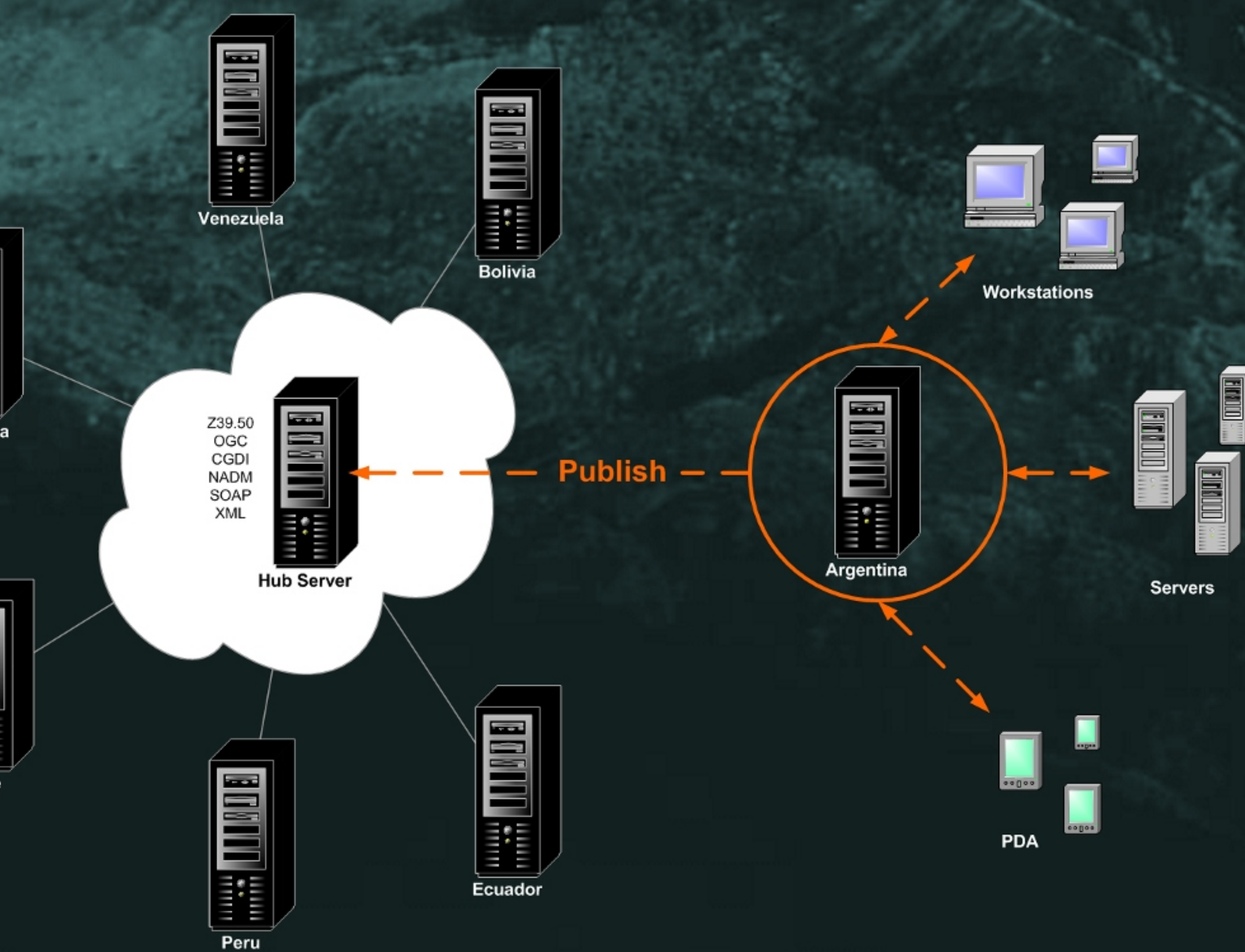
Projects



Research Room



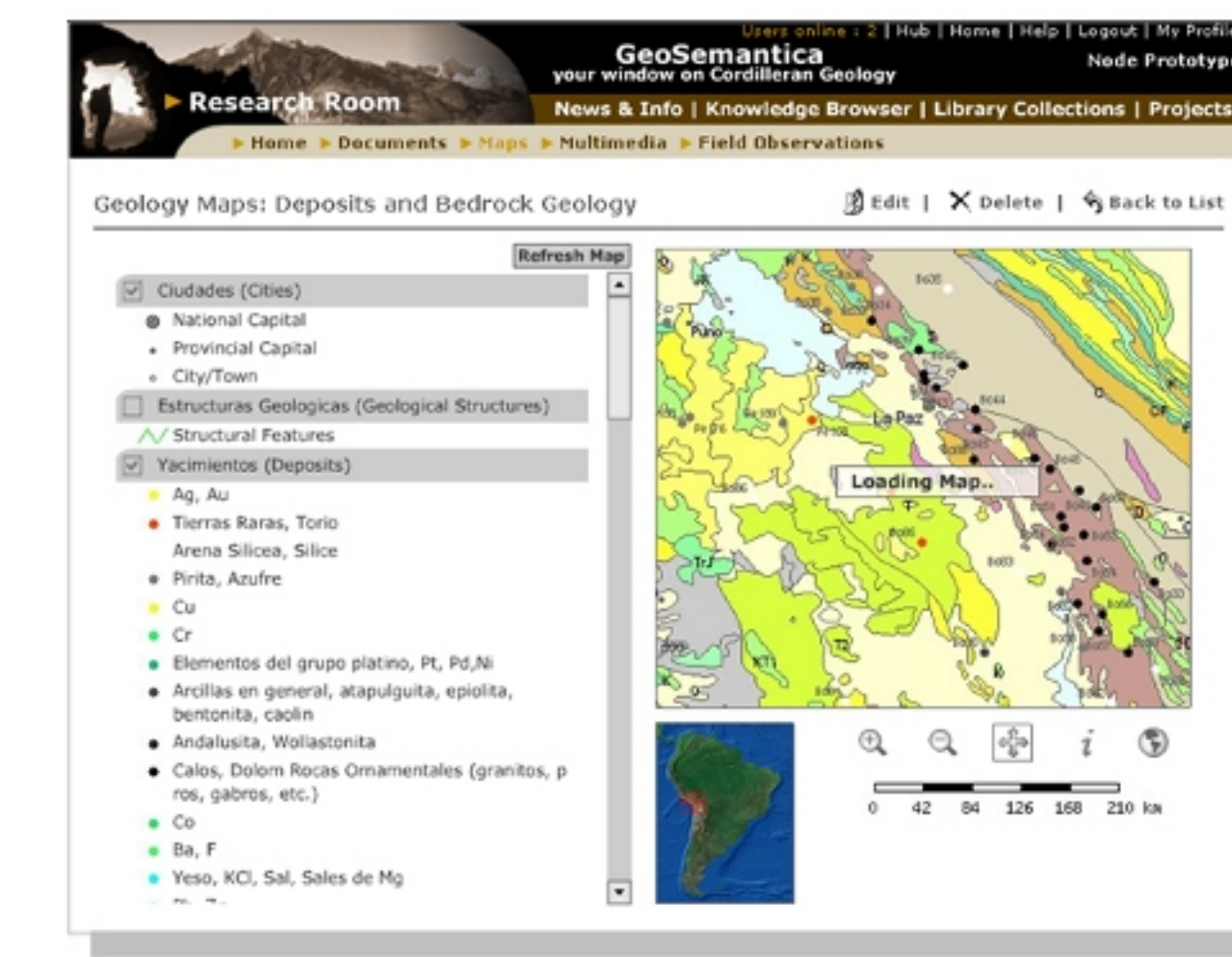
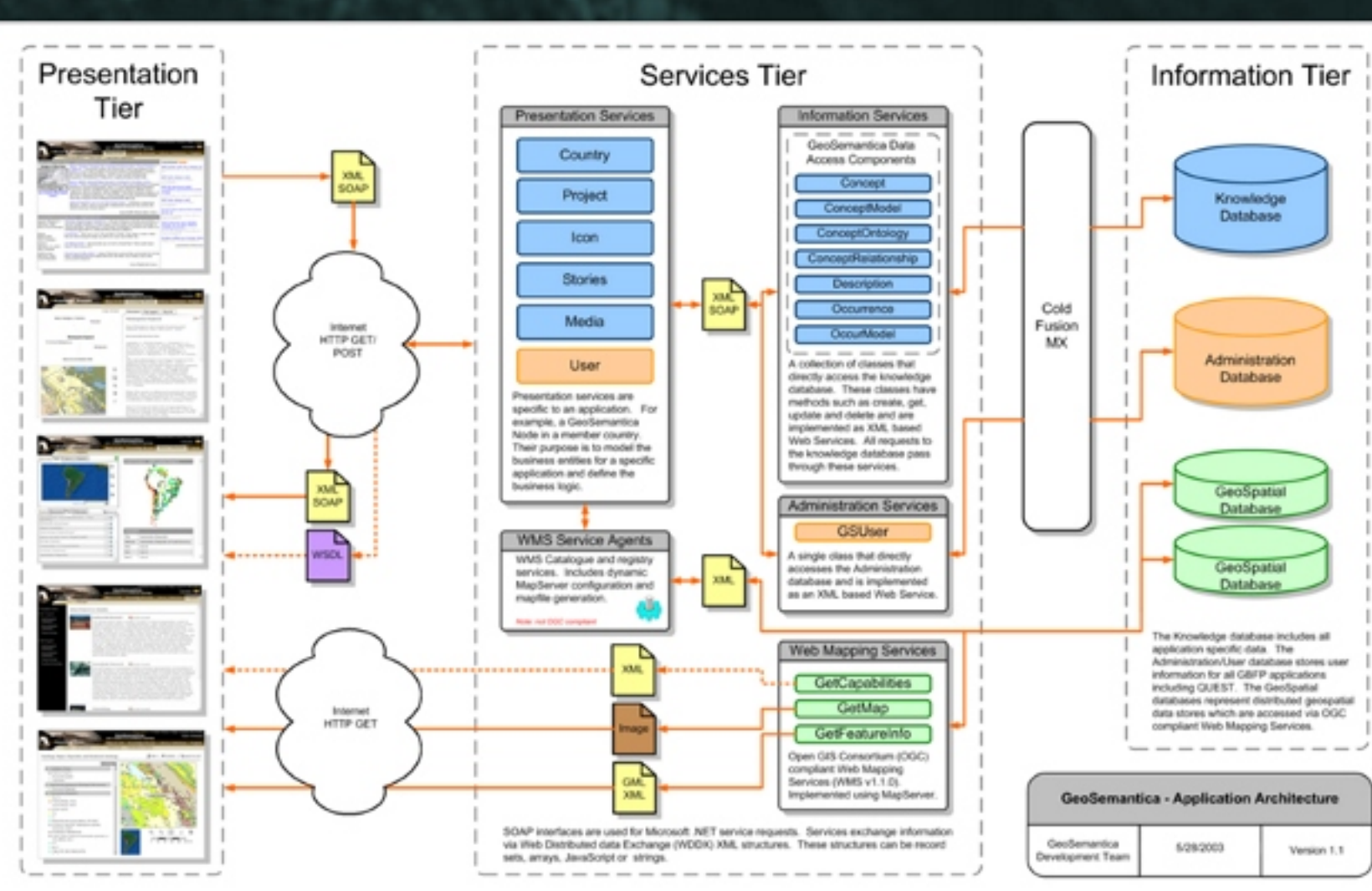
As a meeting and collaboration point for members of projects within MAP:GAC member countries, the Projects and Research Room modules allow researchers to stay updated on project progression and status. The Research Room provides project members with the ability to organize project information, manage and share documents and enables efficient collaboration. Access to project workgroups and content is limited to project members. The project leader administers each individual project site.



Library Collections



The Library Collections module provides access to existing web-enabled information sources in a distributed networked environment to promote the integration of information to support access, discovery and the generation of new ideas.



Map based collaboration using OGC Web Mapping Services

The Map Library module of the Research Room allows users to post their custom maps in a common area to be viewed by all project members. A Flash interface is provided for viewing, and the owner of the map can edit the map using a more typical HTML interface.

In order to post a map to the Map Library, a user first needs to create a custom map in the Library Collections module. Here, they will search the data collection, select map layers they desire, and then add them to their library cart. At this point, they will enter the "Explore" mode and the WMS Service Agents will dynamically generate a MapFile from the contents of their cart. This map file can be edited from the HTML viewer, and when the user is satisfied with it, they can save it to their custom map collection. It is from this collection that a user can select a map to post to the Map Library, making it immediately viewable by all project members.

The "Viewer" interface uses Flash as a rich interface that provides increased functionality with near zero cross-browser compatibility problems. Similar to a standard HTML interface, Flash stores all of the current MapServer variables (extents, etc) in the client, ready to be passed to the MapServer engine when the user interacts with the map. In this case, a PHP/MapScript page receives these variables, performs all spatial manipulations required, and sends a stream of value pairs back to the Flash client. The Flash client then dynamically loads the rendered image (jpg), and updates the interface. There is a speed advantage to this system, as the entire interface does not have to be reloaded with each map request.

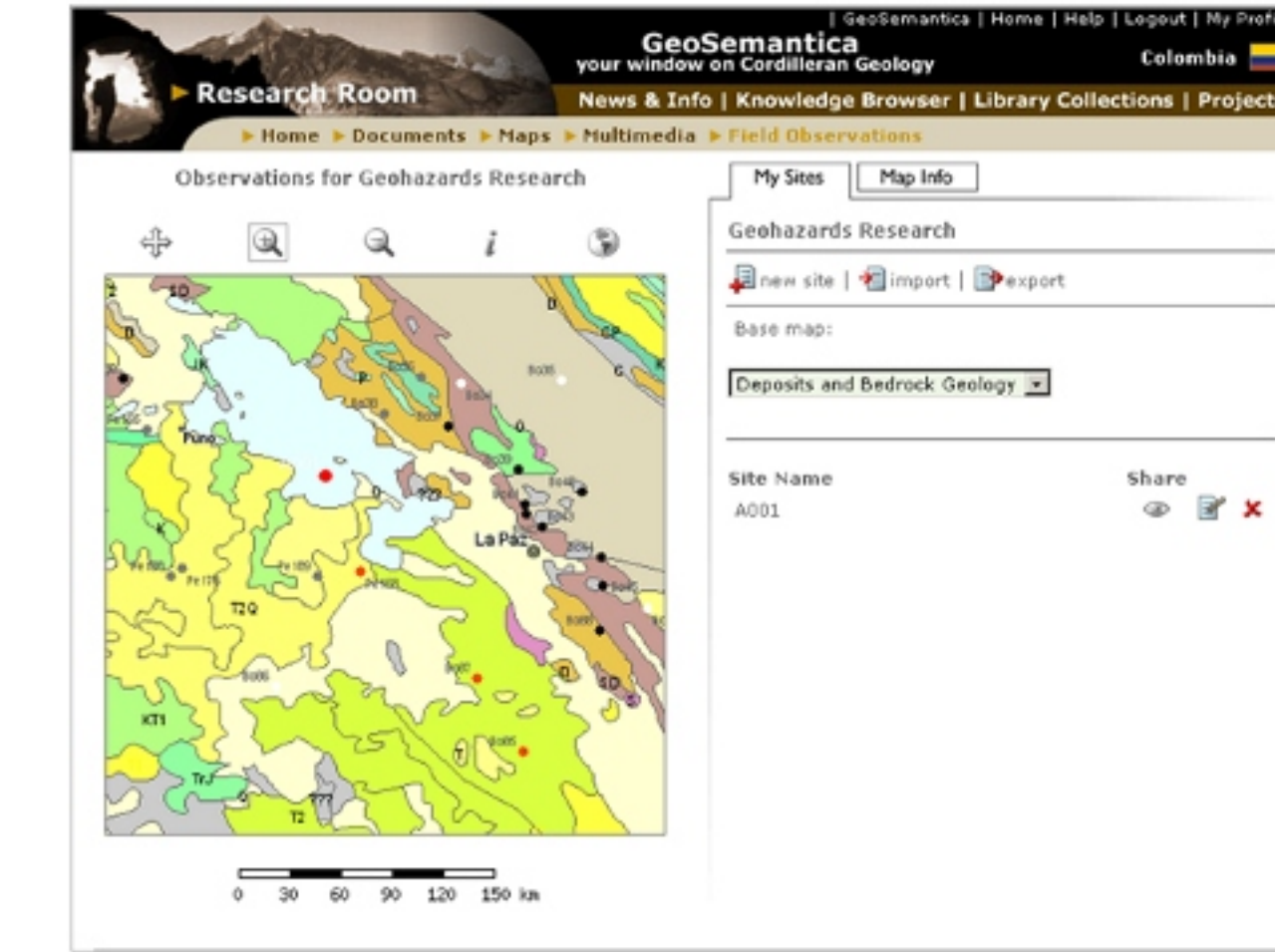
Editing can be done only by the user who originally posted the map. In order to edit, the user is taken to a more standard HTML interface. Here the user can easily reorder or remove layers from the map, as well as add new layers from their library cart. They can also change which layers are displayed by default, and set the default extents of the map. The changes to the MapFile are performed by ColdFusion. When the user chooses to alter a map, the current MapFile and requested operation are sent to a ColdFusion template, which reads through the MapFile and performs the required operation (reorder, remove, or add). The updated MapFile is sent back to the HTML client, and the new map is displayed.

Future development will focus on acquiring the same functionality using Flash with the CGI MapServer, as well as experimenting with the .swf output available with MapServer 3.7.

To download the source-code for a sample Flash/PHP-MapScript MapServer application visit this link: <http://132.156.108.209/FlashMap/FlashMapServer.html>



Web based authoring



The Field Observations module of the Research Room allows users to import, export and create spatial data. The application presents the user with a list of relevant base maps to choose from, which are closely tied to the maps stored in the Map Library.

Each point on the map represents a geological sample site that a user has created. The creation process involves having the user fill out a HTML form of typical sample site information, and attaching any multimedia files (images, video, or sound) associated with the site. Spatial coordinates can either be entered manually into the form, or digitized directly on the map.

All of the sample site information is stored in a database. In order to always display the most current sample site collection, a simple point shapefile is generated from the database for each map request.

The import utility allows a user to upload a comma delimited file consisting of spatial coordinates and sample site station numbers. Once uploaded, the user can then edit the rest of the sample site info, using the same HTML forms as before.

The export utility allows a user to export their sample sites. The spatial data is written into a shapefile and all associated attribute data is written into a corresponding dbf. These files are grouped into a zip file, and made available for download to the user.

Integrated search and discovery using Z39.50 and OGC Web Mapping Services

There are three main components to library collections module: 1) Creating a search filter, 2) Viewing search results 3) Accessing Information. Filtered searches are performed by specifying a region, source and keyword. Once the filtered search has been initiated, the metadata content of the library catalogue is queried and the titles of the search results are categorized and displayed as documents, multimedia or maps. The user can delete a result if it is not appropriate to the desired search, add a result to a library cart (which allows access to the result on a later visit to the site) or view an abstract and other related metadata information.

