



# SDI FOR THE ISLAND OF LA PALMA, SPAIN

THE SPATIAL DATA INFRASTRUCTURE OF THE ISLAND OF LA PALMA INVOLVES COLLABORATION, TRAINING AND INFORMATION DISSEMINATION

One of the basic building blocks for Spatial Data Infrastructure (SDI) is establishing cooperation between the various producers, integrators and users of data. In the case of the SDI of La Palma, the Cabildo Insular de La Palma, as the governing body of the SDI, is well aware of this challenge and is mitigating it by establishing a framework of mutual cooperation agreements with the various public administration entities in the island:

- National agencies (National Park, Marine Reserve, etc.)
- Regional Government of the Canary Islands and its subordinated public enterprises
- 14 municipalities
- Development agency, parishes, Biosphere Reserve, trade associations
- Rural development associations
- Companies

The agreements promote a variety of courses of action, such as:

- to promote and develop the Geographic Information System and Spatial Data Infrastructure of the island of La Palma,
- to promote the training of technicians in the use of management tools and processing of geographic information,
- to coordinate mapping of the Island of La Palma and map production,
- to exchange spatial information as required by the various sectors of the economy and society, and achieve optimal use of information gathered by both,
- to promote modernization of public administration and local authorities and improve the quality of services to citizens,

- to introduce a geographic aspect to society as an element increasingly indispensable in the analysis, planning and management of the island's territory,
- to utilize the spatial information as infrastructure for development, and
- to promote the exchange of initiatives and experiences with other territories.

### Knowledge Portal [www.siglapalma.es](http://www.siglapalma.es)

In order to create a common course of action a web portal of knowledge and interaction resources was developed, [www.siglapalma.es](http://www.siglapalma.es), using open source software and the Joomla content manager system. The portal links the various actors, data and tools, and serves as a hub for networking, training and dissemination. Acknowledging the need for training, in line with creating the portal various related courses were offered to technicians in public administration. By means of the portal all registered users are informed of all developments related to spatial data in the island of La Palma.

The next sections describes the latest actions taken in Phase II of the SDI development (2007-2008), the subject of which was dissemination and promotion of the SDI among users.

### Gazetteer Service

A gazetteer service was implemented, allowing the user to locate a site or geographical feature by its name. With this service the user enters the name of a feature; the system returns the location, using coordinates, of the feature in question. Additionally, the query by name lets the user set additional criteria such as the spatial extent to search, or the type of feature within a list available (river, mountain, populated place, ...). This tool also allows searching for place names in external services (e.g. the National Gazetteer of IGN). The gazetteer service conforms to the Open Geospatial Consortium standards and interoperability specifications. The service was implemented using the Deegree, a software framework for SDIs conforming to Open Geospatial Consortium and ISO/TC211 standards. Deegree is an open source project licensed under a GNU/GPL license. The gazetteer server is based on a WFS-G and is available at the URL: <http://213.172.37.189:8080/deegree-wfsg/wfsg?>. In the geoportal [www.mapasdelapalma.es](http://www.mapasdelapalma.es) a search tab has been added, providing the search function to the user.

### Catalog Service

Currently a catalog service is being developed, enabling the publication of and search for information that describes data (metadata), services, applications and in general all types of resources. Catalog services are required to provide search, access and management capabilities on the resources registered within an SDI.

The catalog service enables the discovery, access and use of geospatial information provided by the SDI. The service is being implemented according to the Open Geospatial Consortium specifications for interoperable catalog services as well as the ISO 19115 standard. It is based on the Geonetwork software developed by the United Nations FAO. The service runs in a Servlet/JSP container and has a user interface via Web browser for configuration, namely, to add XML metadata from files. It basically consists of a DBMS that manages the Metadata Catalog (an orderly and coherent set of geospatial metadata) to respond to online requests, with certain criteria specified in the query, allowing the user to search and access to the content. The catalog service also includes a set of thesauri, to facilitate the organization and retrieval of information in a consistent manner. The thesaurus concept allows for the construction, search and display of a hierarchy of information, maintaining uniformity in the naming of attributes and characteristics of geographic entities, thus contributing to preserve the quality of the data.

The catalog service can be used by searching or by exploring an information hierarchy. The information provided allows a user to assess whether the data are suitable for their needs before proceed-



FIGURE 1. Knowledge portal at [www.siglapalma.es](http://www.siglapalma.es)



FIGURE 2. Gazetteer at [www.mapasdelapalma.es](http://www.mapasdelapalma.es)

ing to viewing or downloading data. User frustration stemming from not finding the required content is directly related to the catalog quality, making the catalog service crucial to the success of the SDI project. Thus the catalog service, along with its contents (metadata standards), is regarded a key component for the launch of an 'SDI node' in accordance with the INSPIRE (Infrastructure for Spatial Information in the European Community) recommendations and other relevant international standards. The catalog server and its associated database are the SDI components least visible for the SDI user. The catalog service of La Palma is based on OGC CSW (Catalogue Service for the Web) and is available at the URL <http://213.172.37.189:8080/geonetwork/srv/es/csw>. In the geoportal [www.mapasdelapalma.es](http://www.mapasdelapalma.es) a search tab for searching the catalog has been made available.

### WCS Service (Web Coverage Service)

The WCS, an acronym for Web Coverage Service, also is an OGC service. The objective of WCS is to provide information in the form of a coverage. A coverage is an object or feature that relates locations to attribute values within a limited space; examples of this are raster images, satellite imagery and a digital elevation matrix.

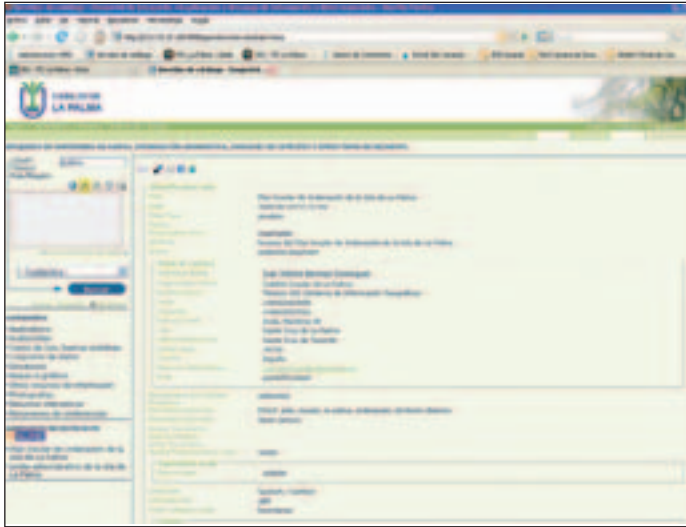


FIGURE 3. Catalog manager, customized Geonetwork

While a WMS returns a static map (image data) as a representation of the data, a WCS returns data with its original semantics, that is, the data itself. The Cabildo of La Palma offers various layers of information as WCS, allowing users skilled in GIS to analyze the data more efficiently. The WCS implementation at the SDI La Palma aims to provide various layers, like Orthophoto, infrared, etc, in a way that it can be used with advanced client software like gvSIG. This service is not aimed at users of the Geoportal, but at users who wish to access information with advanced GIS tools for their own data analysis. The WCS is currently undergoing tests.

**WMS and WCS services are currently available in [www.siglapalma.es](http://www.siglapalma.es)**

WCS services available are:

- Elevation
- Aspect
- Hillshade
- Solar Radiation
- ASTER satellite images
- Orthophoto 2007
- Orthophoto 2006
- Orthophoto 2002
- Orthophoto 1998
- Orthophoto 1996

**Content management for the geoportal and WMS**

For proper operation of the SDI, with the goal of avoiding vendor lock-in, the Cabildo Insular de La Palma contracted the SDI unit of the Cabildo of La Palma with the development work for a content management system to manage the geoportal content and related WMS services. The management application for the SDI of the Cabildo of La Palma allows to control and manage data in the SDI and to publish maps on [www.mapasdelapalma.es](http://www.mapasdelapalma.es). Spatial data is published using standard WMS (Web Map Server) services, dynamically producing maps from spatial data for visualization and query of geographical information. The WMS publication facility utilizes a server running the map server software (UMN Mapserver) and holds the respective spatial data.

The management application for the SDI runs in a web browser (Internet Explorer 6.0, Mozilla Firefox 1.0). To access the management application the users have to open a specific URL on which they select the map service they want to manage and authenticate with their username and password. The application has a side menu on the left that allows the user to access the various options and a central pane displaying the current data. In the upper right the user ID of the current user is displayed.

The following sections describe Phase II of the SDI development (2008-2009).

**Improvements in the geoportal**

The work intended for this latest phase, currently being carried out,

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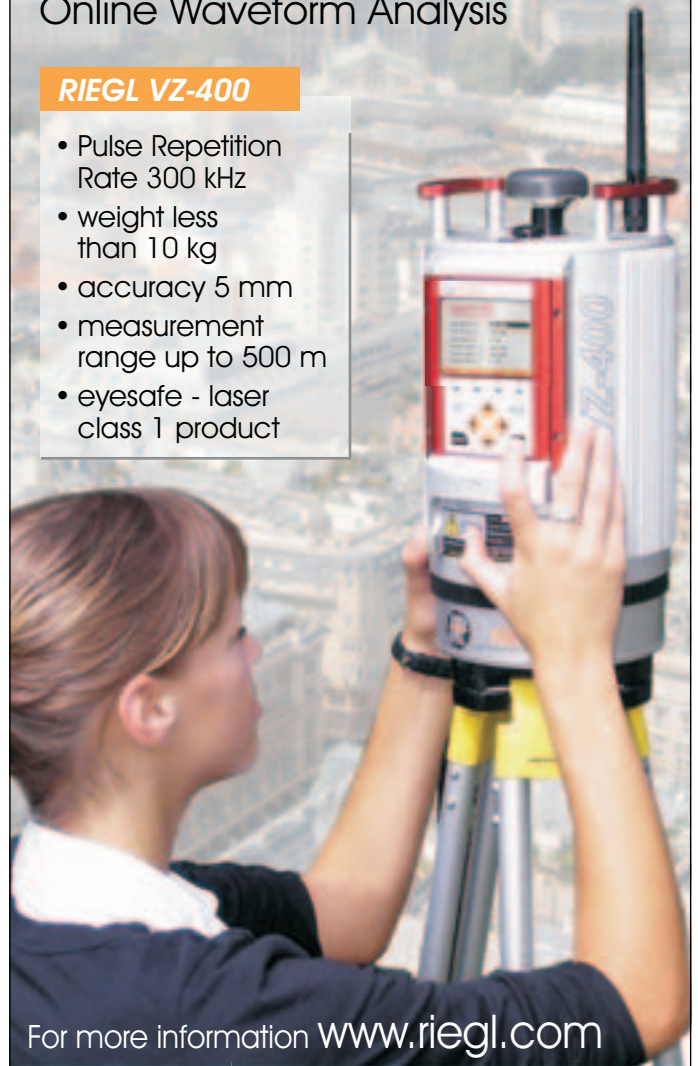
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FIGURE 4. Content management application



FIGURE 5. Education applications

aims to improve the geoportal [www.mapasdelapalma.es](http://www.mapasdelapalma.es). Among others, the tasks comprise:

**Multilingual interface** - The Geoportal of the Cabildo of La Palma will have multi-lingual capabilities, making it available in Spanish and English. From the geoportal users can choose their preferred language, using a flag icon, causing the interface to appear in the respective language. It includes, in addition to the translation of the interface, the translation of the help that appears when the help icon is clicked.

**Multi-resolution interface** - When accessing the geoportal the user can select a screen resolution, causing the interface to be adapted to the selected resolution

**Transparency** - From the geoportal management application there will be a tool to set the transparency with which a layer is displayed.

### Advanced Search Engines

New search tools are to be incorporated within the geoportal, adding value to the existing searches by street, place name and catalog. With the new search tools the user can locate a specific location, for example cadastral data (polygon, parcel of land, cadastral reference), or coordinates in X/Y, UTM.

### Citizen communication tool (SDI 2.0)

Within the Geoportal of the Cabildo of La Palma a new tool will be developed that allows citizens to contact the administrator of the

Geoportal (SDI2.0). The citizen can mark the location of an incident on a map and enter a description of the incident on a form, which collects a range of data, e.g. the type of incident (via a drop-down form), description of the incident, date, name, phone, e-mail.

### Educational Application

This application is part of the online training and dissemination facilities for the Geographical Information Systems of the Cabildo of La Palma. After the GIS and SDI have been developed in the 3 phases outlined above, further work will be carried out to introduce a "geographic culture" as complementary and increasingly essential. This will include the development of an interactive CD/DVD to disseminate geographic information among user groups external to the SDI, mainly schools, helping pupils to better know and understand our environment and to introduce them to geographic information technologies.

The CD/DVD comprises the following contents:

**Games.** These are question-answer games with content related to geographical topics. They encourage the pupil to work with maps and demonstrate his/her geographical knowledge.

**Thematic Maps.** These are a set of "View" documents from which the pupil accesses various thematic maps (of the island of La Palma, the Canary Islands, Spain, etc.).

**gvSIG:** A simplified version of the gvSIG software is provided, allowing pupils to work with their own data (Views, tables and maps). Simplifying the software removes barriers and increases acceptance.

### Conclusions

The SDI of the Cabildo Insular de La Palma is moving towards offering better services, diversification of the already existing query tools, and public participation; all with the aims of enabling better communication with citizens, adequate exploitation of data, and easy management by technical staff. In all activities the utilization Free and Open Source Software, following international standards (Open Geospatial Consortium) and respecting interoperability in line with the European INSPIRE initiative were key criteria, making the SDI future-proof and optimizing the return on the limited budgets. The stakeholders in the SDI opted for technological independence increasingly significant in Spain, and adhered recommendations and regulations.

### References

- [1] SDI of the Cabildo Insular de La Palma <http://www.mapasdelapalma.es>
- [2] GIS portal of the Cabildo Insular de La Palma: <http://www.siglapalma.es>
- [3] INSPIRE portal: <http://www.ec-gis.org/inspire/>
- [4] Open Geospatial Consortium: <http://www.opengeospatial.org/>
- [5] GNU / GPL License: <http://www.gnu.org/copyleft/gpl.html>
- [6] IDEE portal: <http://www.idee.es/>
- [7] MapServer: <http://mapserver.gis.umn.edu/>
- [8] Geonetwork: <http://sourceforge.net/projects/geonetwork>
- [9] gvSIG project: <http://www.gvsig.gva.es/>
- [10] MapBuilder: <http://communitymapbuilder.org/>

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