

D.3.1: report on user requirements for the EuroGEOSS Forestry operating capacity

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These are Dublin Core metadata elements. See for more details and examples <http://www.dublincore.org/>

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ACRONYMS AND ABBREVIATIONS

Abbreviation	Name
ADC	Architecture and Data
AIP-2	Architecture Implementation Pilot, Phase 2
AOC	Advanced Operating Capacity
CIF	Climate Investment Funds
CSR	Components and Services Registry
DOPA	Digital Observatory of Protected Areas
DoW	Description of Work
E2EDA ER	End to End Discovery and Access Engineering Report
GCI	GEOSS Common Infrastructure
IOC	Initial Operating Capacity
JRC	Joint Research Centre
OWS	OGC Web Services
SBA	Societal Benefit Area
SIR	Standards Registry System
SWG	Scenario Working Group
UIC	User Interface Committee
UNEP	United Nations Environment Programme.
WCMC	World Conservation Monitoring Centre
WCS	Web Coverage Service
WFS	Web Feature Service
WG	Working Group
WMS	Web Mapping Service
WP	Work Package

1 INTRODUCTION

The aim of this document is to describe with adequate detail the proposed approach for the creation of an agreed set of Forestry Use Scenarios & Use Cases, detailing and deriving the User Functional requirements necessary to be considered for the EuroGEOSS Forest Capacity system. The methodology used builds on that adopted by the GEOSS Architecture Interoperability Pilot 2 (AIP-2). In practice, the process of Definition of User Requirements is an iterative process, of which this is the first round, with others to follow during the life time of the project as the systems evolve, and new requirements emerge.

For the purpose of this first round, Section 2 provides an overview of the existing situation and of the basic requirements in respect to the European Forest Data Centre (EFDAC), Section 3 outlines some Use Scenarios, from which high level Functional Requirements are derived. More detailed Use Case that formalise the Scenarios and become the basis for more detailed Functional Requirements will follow in subsequent stages of the project.

The outcomes of this analysis are useful not only to the EuroGEOSS project but also potentially to GEOSS as a whole since Forestry is not per se one of the GEO Societal Benefit Areas (SBAs) but it is folded under the GEOSS Ecosystems SBA (Agriculture, Fisheries and Forestry), and no Forestry theme descriptions (scenarios, use cases, requirements, etc) are currently available under any of the GEOSS scenario working groups.

2 SYNTHESIS OF THE EXISTING SITUATION

2.1 Systems

This section reports the existing situation of the Forestry Systems deployed at JRC, i.e. EFDAC and EFICP (European Forestry Information Community Platform). Further details including the systems by other partners in the project are provided in the Annex.

Table 1: Current situation EFDAC

WP3 – Forestry Operation Capacities (EFDAC)		
Questions	Answers	Notes
Does your system/tool use International Standards for Metadata (e.g. ISO 19115 application profiles, Dublin Core application profile, ...)? a) if Yes, which ones? Since when? b) if No, do you use other Best Practices for metadata (e.g. Darwin, THREDDS, ...)? Which ones? Do you have plans to use International Standards for metadata? Which ones?	Metadata for datasets and services are inserted in a commercial metadata catalogue (ConTerra) that is compliant with ISO19115, recommended by INSPIRE. Metadata for documents, projects and links are inserted in a JRC developed custom catalogue (Content Management System) adapted to specific requirements. The technical platform reads metadata from these catalogues in order to provide browse and search capabilities into the inserted metadata. ISO19115 is used since 2007. Since	Metadata for documents, projects and links (non spatial) is non standard metadata which includes some core elements of Dublic Core. The implementation of minimum set of Dublin Core elements is foreseen in the future for

<p>Does your system/tool use International Standards for expressing and formalizing Quality Metadata ?</p> <p>a) if Yes, which ones? Since when?</p> <p>b) if No, do you use other Best Practices for Quality metadata? Which ones? Do you have plans to use International Standards for Quality metadata? Which ones?</p>	<p>2009 metadata are inserted using INSPIRE schema. The new TerraCatalogue 2.3 version provides the possibility to insert metadata using ISO 19115 or INSPIRE schema.</p> <p>EFDAC uses ISO 19115 and INSPIRE, the corresponding metadata entry tools provides the possibility (INSPIRE even requests) to input information about the lineage, which is actually the description of the processes on metadata quality. In addition to standards and metadata entry tools the quality control process is performed by metadata specialists. The insert, update and edit of metadata are restricted only to authorized persons. The quality control is performed periodically during the input, update and check process by authorized persons.</p>
<p>Does your system/tool use International Standards for Web Services interfaces (e.g. OGC Web Services: WMS, WCS, WFS, CSW, WPS, SOS, ...)?</p> <p>a) if Yes, which ones? Since when?</p> <p>b) if No, do you use other Best Practices for Web Service interfaces (e.g. DiGIR, OPeNDAP, ...)? Which ones? Do you have plans to use International Standards for Web Service interfaces? Which ones?</p>	<p>We use the following OGC specifications: WMS, WFS, WCS, CSW (SLD and WPS is planned to be used in the future), GeoRSS.</p> <p>In addition, some analysis applications and other web services are available including some tiled WMS according to OSGEO WMS-C proposal</p>
<p>If you use OGC Web Services, which version (e.g. OGC WMS 1.1 or WMS 1.3 or other)?</p> <p>a) Which software and hardware to you use to supply these services (server)?</p> <p>b) Which software and hardware to you use to consume these services (client)?</p> <p>c) Are these services available across the Internet? If Yes where?</p>	<p>OGC Web Services Versions: WMS 1.1.0 and 1.3.0 GeoRSS.</p> <p>We use MapServer on a RHEL5 virtual machine. PHP MapScript and PHP for wrapping the services. A customized version of OpenLayers integrated into Joomla CMS is what we use to display the data. RHEL5 virtual machine with TerraCatalog 2.3. and a custom application as client interface for the catalogue using Java Servlet. We do not offer public services yet.</p>
<p>Which type of data do you handle with the implemented Web Services?</p>	<p>Raster satellite imagery, model outputs in Oracle spatial grid format, shape files.</p>
<p>Which map projections do you use?</p>	<p>Data can be accessed in the following map projections and reference systems: EPSG:4326 (WGS84) EPSG:3035 (LAEA) EPSG:90091 (Spherical Mercator)</p>

<p>Which type of data encoding do you handle with the implemented Web Services (e.g. binary:CF-netCDF, XML:GML, binary:HDF, XML:GeoSciML,)?</p>	<p>Projection, AKA Google/Web map projection) Services Output Formats: WMS JPEG, PNG, GIF WFS XML:GML CSW: XML</p>
<p>Have you encountered any problems with implemented international standards/best practices in term of limits or ambiguities of specification, of performance, of product metadata definition... ? Please describe them and how you solved them</p>	<p>No We implement WMS-C, for there is no definitive OGC specification yet.</p>
<p>Does your system/tool use Modeling procedures? a) if Yes, which ones? Since when? b) if No, do you have plans to use Modeling procedures? Which ones?</p>	
<p>Does your system/tool use Workflow procedures? a) if Yes, which ones? Since when? b) if No, do you have plans to use Workflow procedures? Which ones?</p>	

Table 2: Current situation EFICP

WP3 – Forestry Operation Capacities (EFICP)		
Questions	Answers	Notes
<p>Does your system/tool use International Standards for Metadata (e.g. ISO 19115 application profiles, Dublin Core application profile, ...)? a) if Yes, which ones? Since when? b) if No, do you use other Best Practices for metadata (e.g. Darwin, THREDDS, ...)? Which ones? Do you have plans to use International Standards for metadata? Which ones?</p>	<p>Metadata catalogue (IONIC Catalog 2.3.5) uses the EbRIM application profile (ebRIM profile 2.0/2.5). Metadata records use the 15 element set of Dublin Core plus enhancements and extensions with some ISO19115 elements. Metadata regarding the statistical forestry indicators is supported using the SDMX 2.0 format. Metadata acquire using OpenSearch 1.1 Draft3, Time and Geo Extensions protocol, in RSS 2.0 format, is supported. System is online since 2007/2008.</p>	<p>EFICP includes a set of harvesting components capable of acquiring metadata records from OAI-PMH systems (Dublin core elements) , SDMX systems and ISO 19115 AP catalogues (including distributed searches and real time queries). OpenSearch RSS systems are also included in the EFICP harvesting capabilities.</p>
<p>Does your system/tool use International Standards for expressing and formalizing Quality Metadata ? a) if Yes, which ones? Since when? b) if No, do you use other Best Practices for Quality metadata? Which ones? Do you have plans to use International Standards for Quality metadata? Which ones?</p>	<p>The EFICP system includes a metadata editor for its catalogue, as a management tool for authorized users according to profiles. Metadata records inserted by authorized users (with the “metadata” profile) are kept in a temporary evaluation and staging area and are not directly inserted into the catalogue repository. The quality insurance on the metadata records is performed by the users with the “Moderator” profile. These users are</p>	

<p>Does your system/tool use International Standards for Web Services interfaces (e.g. OGC Web Services: WMS, WCS, WFS, CSW, WPS, SOS, ...)?</p> <p>a) if Yes, which ones? Since when?</p> <p>b) if No, do you use other Best Practices for Web Service interfaces (e.g. DiGIR, OPeNDAP, ...)? Which ones? Do you have plans to use International Standards for Web Service interfaces? Which ones?</p>	<p>responsible for the approval of new metadata records or modifications on the existing ones. Only after Moderator's approval the metadata records are inserted (modified) into the EFICP catalogue.</p> <p>OGC Web Services: WMS, WFS, CSW, SLD (internally) OpenSearch with Time and Geo Extensions OAI-PMH RSS SDMX System is online since 2007/2008.</p>
<p>If you use OGC Web Services, which version (e.g. OGC WMS 1.1 or WMS 1.3 or other)?</p> <p>a) Which software and hardware to you use to supply these services (server)?</p> <p>b) Which software and hardware to you use to consume these services (client)?</p> <p>c) Are these services available across the Internet? If Yes where?</p>	<p>The OaS versions are:</p> <p>WMS 1.0.0 & 1.1.1 WFS 1.0.0 WCS 1.0.0 ebRIM profile 2.0/2.5 CSW 2.0.0</p> <p>Other services versions:</p> <p>RSS 1 & 2 SDMX 2.0 OAI-PMH 1.0 & 2.0 OpenSearch 1.1 Draft3</p> <p>Server is running Linux Red Hat ES 5 OS over a 2xDual Core CPU and 8Gb RAM, RAID hardware box.</p> <p>Clients are regular internet browsers, Internet Explorer 6+ and FireFox 2+.</p> <p>System Internet address is: http://eficp.jrc.ec.europa.eu/EFICP/</p>
<p>Which type of data do you handle with the implemented Web Services?</p>	<p>Raster satellite imagery and vector data via consuming WMS and WFS services. Shape and Oracle Spatial data via local WMS/WFS services. EbRIM metadata via CSW interfaces.</p>
<p>Which map projections do you use?</p>	<p>EPSG:4326, WGS84 EPSG:32630, WGS 84 / UTM zone 30N EPSG:32631, WGS 84 / UTM zone 31N EPSG:32632, WGS 84 / UTM zone 32N EPSG:27582, NTF (Paris) / Lambert II EPSG:2062, Madrid 1870 / Spain EPSG:3003, Monte Mario / Italy 1 EPSG:3004, Monte Mario / Italy 2</p>

<p>Which type of data encoding do you handle with the implemented Web Services (e.g. binary:CF-netCDF, XML:GML, binary:HDF, XML:GeoSciML,)?</p>	<p>EPSG:3035, ETRS89 / ETRS-LAEA</option></p> <p>Services Output Formats: WMS JPEG, PNG, GIF WFS XML:GML CSW: XML</p>
<p>Have you encountered any problems with implemented international standards/best practices in term of limits or ambiguities of specification, of performance, of product metadata definition... ? Please describe them and how you solved them</p>	<p>Catalogue interoperability CSW ISO AP vs ebRIM AP. The necessity of creating a middleware for adaptation/transformation of CSW EbRIM AP responses into CSW ISO AP.</p>
<p>Does your system/tool use Modeling procedures? a) if Yes, which ones? Since when? b) if No, do you have plans to use Modeling procedures? Which ones?</p>	<p>SDMX abstract model used for modelling the forest indicators. System is online using SDMX since 2008.</p>
<p>Does your system/tool use Workflow procedures? a) if Yes, which ones? Since when? b) if No, do you have plans to use Workflow procedures? Which ones?</p>	<p>No.</p>

2.2 Requirements of different user categories/organizations

This section is dedicated to be complementary on the questionnaires section where a general overview of current systems, data collections, current gaps and main user's requirements are identified per user categories and/or organizations.

Organization: JRC

Current systems:

European Forest Data Centre – EFDAC

Success in the conception, development, implementation, monitoring and further improvement of environmental policies depends crucially on the availability of robust data on the state of the environment, pressures, impacts and responses. In order to ensure the provision of robust data and information on the state of the environment for the development of environmental policies at European Union level, the European Commission Directorate-General Environment (ENV), Joint Research Centre (JRC) and Eurostat, with the European Environment Agency (EEA), all together called "Group of four" (Go4), have agreed at the end of 2005 the establishment of "Environmental Data Centres".

As part of the joint system and covering the thematic aspects of forests and forest related applications in EU, the European Forest Data Centre (EFDAC) has been established within the JRC to constitute the primary focal point for information on forest related issues. The role and features of EFDAC evolves in line with the setting up of the Shared Environmental Information System (SEIS).

The EFDAC hosted by the Joint Research Centre (JRC) of the European Commission has been established to supply European Union decision-makers with processed, quality checked and timely policy relevant forest data and information within the EU. The EFDAC in

long-term should bring the added value integrating and building bridges to the decision makers and the society.

During the EFDAC development process several important policy initiatives related to information systems have been launched which substantially influence and drive the EFDAC development and architecture (e.g. INSPIRE and SEIS). Since these processes and initiatives are still in development, EFDAC is constantly evolving to meet the new standards, and guidelines.

The recently established EFDAC provides a gateway to data holdings and information on forest resources in Europe. In addition, the EFDAC supports the generation of value-added forest indicators on sustainable forest management on the basis of data collected by the Member States. The EFDAC resides in meta-data and data servers outside JRC, therefore the EFDAC technical platform is targeted to be interoperable with such external nodes for the exchange of meta-data and data. The framework for such interoperability is set by the INSPIRE Directive. Developing the EFDAC technical platform the core issues is to make it compliant with the relevant INSPIRE Implementing Rules and interoperable with other INSPIRE systems, in particular the EU-Geoportal.

The EFDAC is built on the basis of existing systems, such as the European Forest Fire Information System (EFFIS), the Forest Focus database, the European Forest Information and Communication Platform (EFICP) as well as integrates tools and applications developed by JRC (EFDAC MapViewer, EFDAC Metadata Catalogue and it's management system, application of European Forest Resources, application handling forest dominant tree species distribution and current / future tree habitat suitability maps, etc.). Therefore the integration of existing datasets, tools and applications ensuring the overall system's interoperability is the main challenge and goal for the further development of EFDAC.

Table 3: Tools and instruments developed in JRC for data search, discovery and access

Title of the EFDAC component
<p>Metadata Catalogue</p> <p>The EFDAC technical platform allows the insertion and publication of meta-data in a JRC-central catalogue for a number of different resource types (datasets, services, applications, documents, reports, projects, and links). Such a platform currently consists of a lightweight system that allows users through the web to browse and search for forest resources from a local catalogue of metadata. The metadata catalogue is being populated with metadata of JRC in-house data and is built around a metadata model that, for geo-spatial data, is compliant with INSPIRE specifications (currently there are 47 datasets, 6 services/applications, 29 documents, 19 projects and 53 links). The metadata management interface gives the user the possibility to search metadata by forest subthemes or resources types. Through the metadata record the user can directly access the data source.</p>

Forest map/patterns & forest condition

The customized web map service (WMS/OGC) that allows the user to visualize and navigate the main forest related geo-datasets stored at the JRC. The datasets that are currently handled by the service are grouped into the categories *forest map*, *forest patterns* and *forest condition*. The data can be viewed and navigated either as original raster maps or as thematic maps derived aggregating the original data at different administrative levels (from country level to NUTS 3). In addition to map navigation, the service supports a number of functions such as querying, selection, gazetteer, auto-identify and pdf generation and the view of several soil layers requested through WMS from European soil data centre. Forest condition maps derived from the Forest Focus Data Platform which contains all the forest monitoring data (atmospheric pollution in forests, etc) since 1987 until 2006.

European Forest Fire Information System (EFFIS)

The European Forest Fire Information System handles extensive datasets produced by the JRC and the country individual fire data (approx. 1.8 mill. records). EFFIS provides with updated and reliable information on wild land fires in Europe and consists of the following applications: 1) Current situation (daily updates of hotspots and burned areas, fire danger forecasts), 2) Advanced analysis (rapid damage assessment, fire damage assessment, burnt areas emissions, fuel map, etc.); 3) Fire history (database on forest fires), and 4) Fire News.

European Forest Resources

The application (the customized web map service) allows the user to visualize and navigate the main forest resources related datasets derived from National Forest Inventories (NFI) and international forest data sources (for instance: MCPFE, FAO.). The data can be viewed using the set of forest indicators (for instance: Forest area, Ownership, Forest type, Age Class Distribution, Growing stock, etc.). The first version of EFRIS allows visualizing the forest resources data for limited set of forest indicators and countries (up to 15 NFI and MCPFE, FAO data of the year 2005) while in the future it is planned to increase the data scope.

Tree species distribution/ suitability maps

The application (the customized web map service) allows the user to visualize and navigate dominant tree species distribution as well as actual and future species habitat suitability maps of 30 main tree species according to the different climate model projections (CCCMA, CSIRO, HADCM3, ENS), scenarios and year (2000, 2020, 2050, 2080).

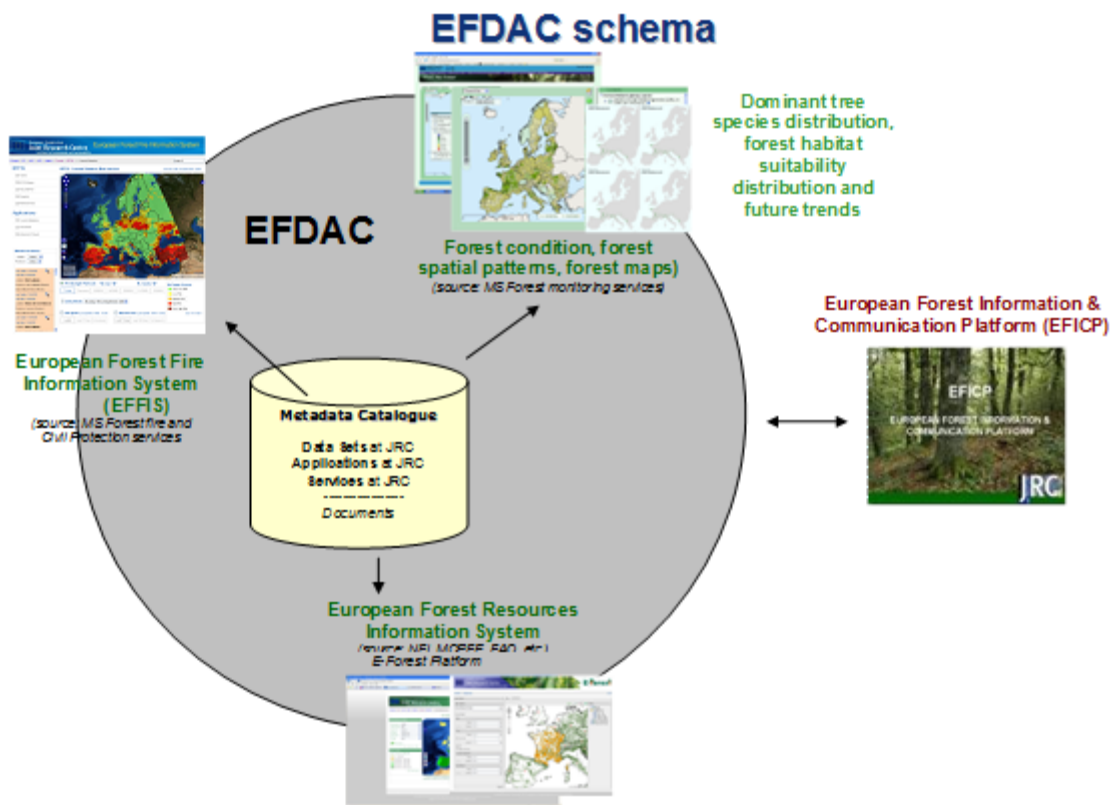
EFICP (European Forest Information and Communication Platform)

In addition to all mentioned EFDAC elements, the EFDAC provides the access to the platform of external forest data systems which is being piloted by EU members, therefore at the moment it is accessible only by them (the user name and password is required). This platform is based on the EFICP (European Forest Information and Communication Platform) initiative and allows for the search, access, view, analysis, and download of a wide range of forest related information derived from National Forest Inventories (NFI) as well as other international forest data providers. EFICP gives the possibility to find NFI

(National Forest Inventory) data from EU countries by NUTS 3 level as well as international forest data from FAO and MCPFE. The data series varies from country to country but fall within the scope of 1990 - 2008.

The structure (scheme) of the EFDAC framework is presented below:

Figure 1: JRC EFDAC framework



TREES-3 Project

The TREES-3 (and FOREST) project(s) of the JRC aim at estimating tree cover changes at continental and regional levels for the Tropical belt and European continent for the periods 1990-2000-2005 based on a systematic sample of medium resolution satellite imagery. The project is carried out in a collaborative partnership with FAO and is intended to support Remote Sensing Survey of the FRA 2010. An operational system is being developed by JRC for the processing and tree cover change assessment of a large set of multi-temporal medium resolution imagery covering the Tropical and Europe (e.g. about 4 000 sample sites of 20x20 km size for the tropics and about 2 000 sample sites of 10x10 km size for European continent).

Figure 2: JRC TREES-3 input data for Forest Change Maps (sample)

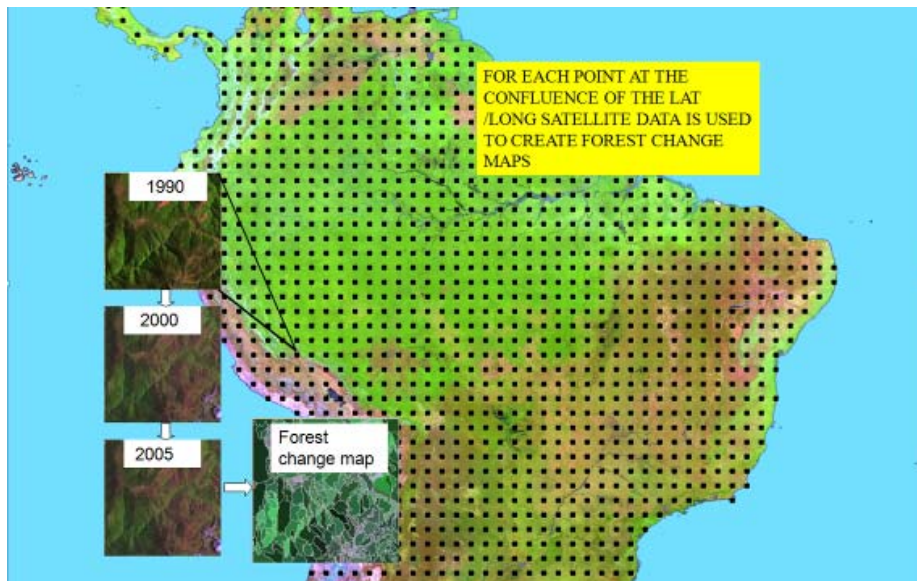
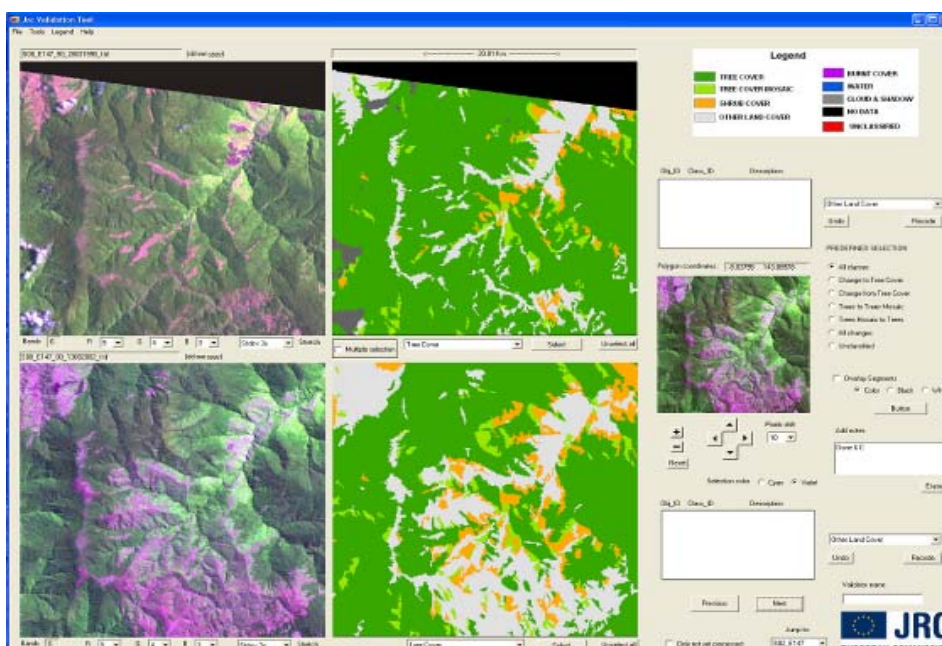


Figure 3: JRC TREES-3 Project back-office validation tool (sample)



Data Collections:

See the details in Annex.

Currents gaps:

The transversal situation is that many datasets with forestry information are available but not published via a catalogue system and/or not available via standard OGC web services, i.e. WMS, WFS and WCS and eventually CSW.

Main user requirements:

The JRC identified the main user requirements to be a common Map Viewer which collects data from available forest systems (TREES, EFDAC components, etc.) and to make EFDAC metadata catalogue as the central point accessing and harvesting metadata from other systems.

Specifically for the TREES-3 project it is identified as a general requirement to make the TREES database accessible through an interface to the outside, i.e. OWS services, eventually with a user front-end application.

Organization: Spanish Local / Regional / National datasets and web services

Current systems and Data Collections:

Spanish Spatial Data Infrastructure - IDEE

Spanish Spatial Data Infrastructure (IDEE), with a national Geoportal opened in 2004, is built upon the contribution of a wide community of actors from academia, public and private sector, growing and cooperating for more than five years.

At present, IDEE can be considered a mature and consistent collective project, supported mainly by the National and Regional Spanish governments, with more than 80 nodes publishing more than 500 Web services and 6,000 layers of data available covering all themes in INSPIRE Annexes I and II. A set of nine different services following OGC specifications, ISO standards and INSPIRE principles has been implemented in the national node: WMS, CSW, Gazetteer, WFS, WCS, WMC, SLD, WCTS and WPS.

From the organizational point of view, all that activity is coordinated by the Working Group for IDEE, established in 2002 by the National Geographic High Council (“Consejo Superior Geográfico”), a collegiate body coordinating all the agencies producing geographic data. IGN works as NGHC Technical Secretariat, taking care of NSDI (IDEE) fostering and setting up.

To achieve their objectives IGN and NGHC have four main action lines:

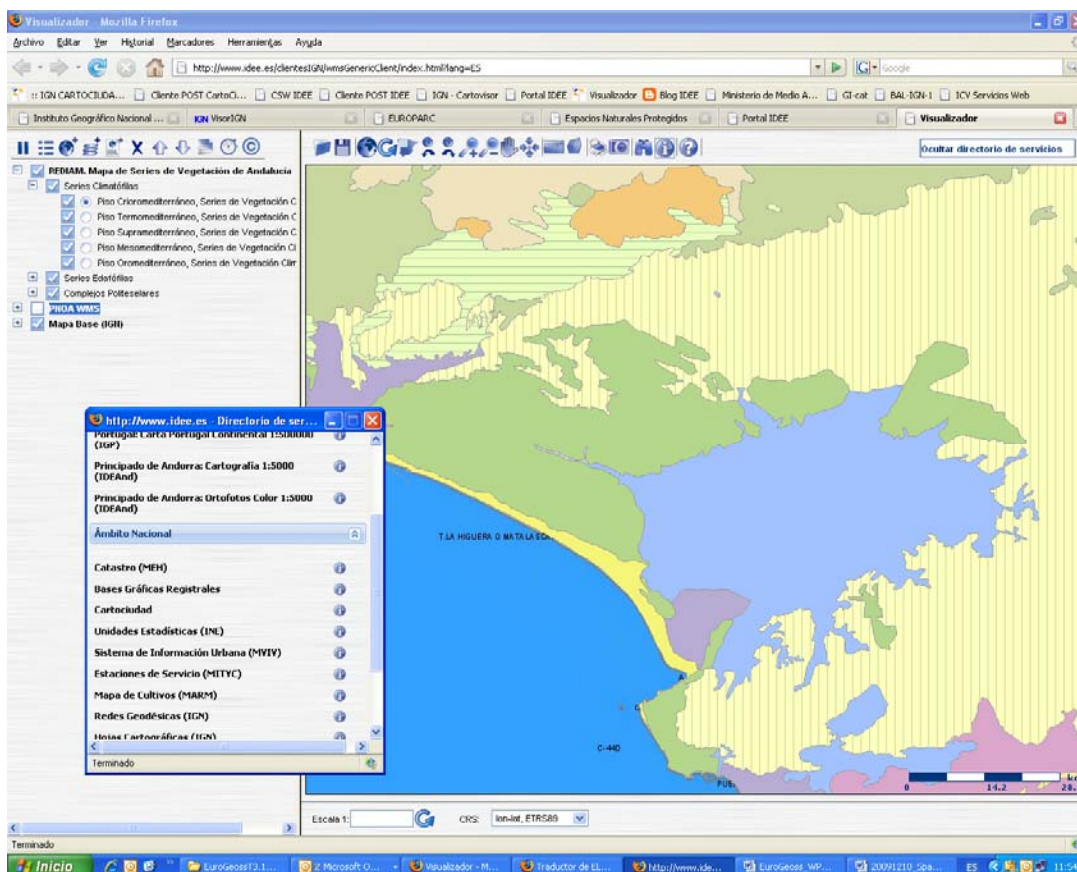
- Implementation of IDEE Geoportal itself (<http://www.idee.es>), designing web pages, developing OGC services and clients, chaining and structuring those services in a web site, adding the information needed to use them properly and publishing documents and news to outreach SDI technology.
- Promotion of SDI technology and fostering of SDI community in Spain, giving talks, presentations and conferences, advising more than 50 different entities each year about how to implement and use geoportals and OGC services.
- Cooperation with other SDI initiatives at national, European and global level: INSPIRE, EuroGeographics, CEN, ISO, GSDI, UNSDI, OGC, ICA.
- Cooperation among governmental bodies from the three administration levels in data production and harmonisation. By means of National Projects among the National Government and Regional Governments as: MNE (Spanish Gazetteer Model), PNOA (National Plan for Aerial Orthophotography), SIOSE (Spanish Land Cover & Land Use Information System), CartoCiudad, etc.

The philosophy of the project is based on collaboration and cooperation as a new way of work and produce results as a consequence of globalization and a new ethic based on sharing resources and solidarity.

Through the IDEE Geoportal, apart from other applications and services, the IDEE Map Viewer can be easily accessed. This Map Viewer allows overlaying geographical data (thematic maps, orthophotos, geodetic networks, etc.), published on the Internet via standard web services, in order to create new maps, supporting different data formats and coordinate systems, being located in different servers, geographically distributed, and belonging to different organizations and institutions.

The data provided via web services can be added by choosing one of the default map servers already in the Map Viewer or introducing the corresponding URL. These web services have to comply with the OGC specifications relating to Web Map Services (ISO 19128 “Geographic information — Web map server interface”).

Figure 4: IDEE Map Viewer



In Spanish SDI portal there are two catalogues implemented using standard web services (CSW 2.0.2 CORE AP compliant) already available. Still under development, they are expected to comply with ISO19115/19119 Application Profile shortly.

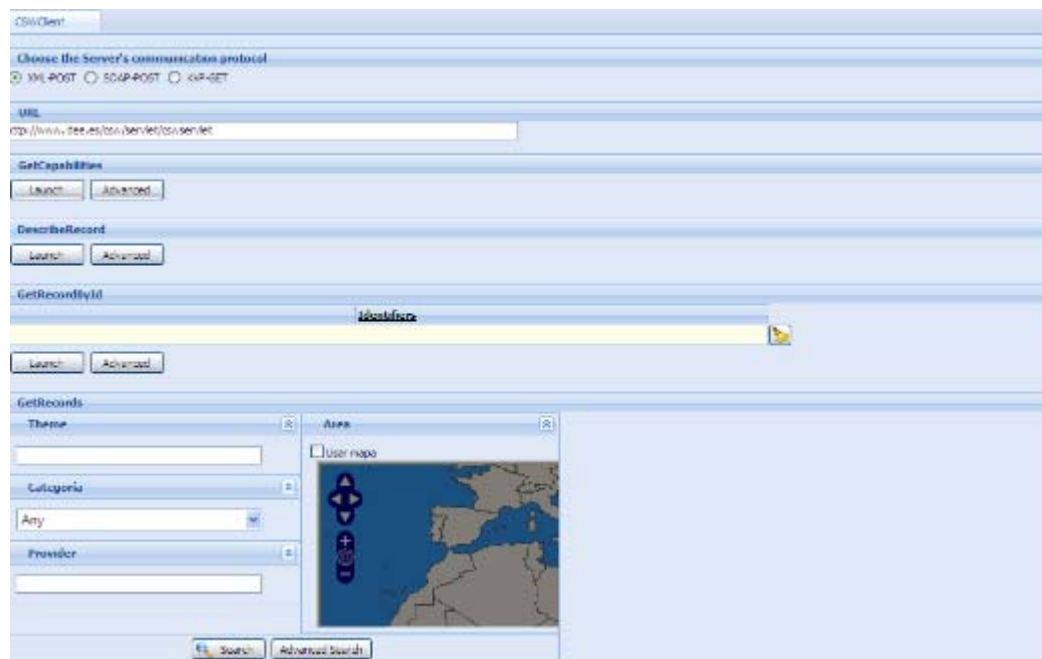
- A catalogue of geographic information web services, which contain so far more than 300 records (services from IGN/CNIG and other administrations and organisations at

different level) and are expected to have soon more than 700 from services of other national organisations, as well as regional and local web services.

(<http://www.idee.es/cswServicesSearch/servlet/cswservlet>)

- A catalogue of geographic information datasets, which contains more than 40,000 records because it provides not only cartographical series but also their units: given every unit of the National Topographic Map of Spain at 1:25,000 and 1:50,000 are registered we have a big amount of records. However, public users only can access the series information. So far, only resources from IGN/CNIG and Catalonian Mapping Agency (ICC) are included, but it is expected to be completed with datasets from other national, regional and local organisations (<http://www.idee.es/csw/servlet/cswservlet>)

Figure 5: IDEE Client Catalogue (Beta version)



IGN/CNIG is not only the main node of distribution and displaying data and services, but also data providers as well: CLC (Corine Land Cover) or PNOA (National Airborne Orthophotography Plan), are projects carried out by IGN/CNIG. Next year a new Land Use and Land Cover Information System of Spain will be launched, coordinated by IGN/CNIG with the active cooperation of the Autonomous Regions and other National organisations.

CORINE Land Cover 2000- CLC2000

CLC2000 covers the activities of photo interpretation and mapping of land use changes. This project is being carried out by Regional Governments under the supervision of IGN / CNIG. The products obtained are the basis of land use data for 2000 and the database changes in land use during the decade 1990-2000.

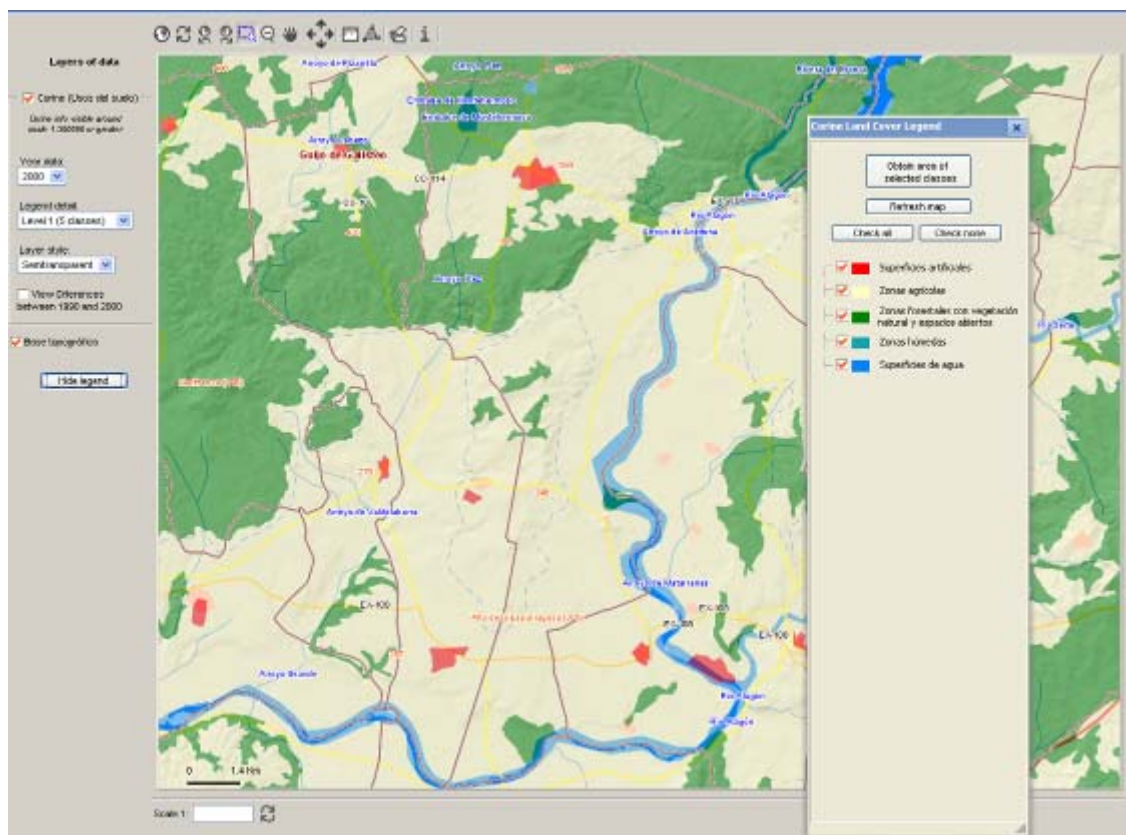
Based on the data provided by CLC Project, an OGC WMS has been implemented (<http://www.idee.es/wms/IGN-Corine/IGN-Corine>), and a web application, <http://www.idee.es/clientesIGN/corineClient/index.html?lang=ES>, which allows users to obtain information about the land cover in Spain: services based on data from the Corine Land Cover project (1990 and 2000) as well as reference data (i.e. administrative

boundaries). This application expects to be, apart from being a useful source of data about the land cover in Spain, an example of how the different services of an SDI can be used for other purposes rather than the visualization of maps just by using a simple browser.

The queries can be made in two scope areas: municipality, or navigating in an interactive map until defining the area (in an appropriate scale related to the CLC project). Once that has been selected the user can:

- Display land cover information from the CLC project on a topographical map, with three levels of detail.
- Display the area of interest with the cover selected.
- Obtain a report with the area occupied by each use class in the area of interest.

Figure 6: CORINE Land Cover Application



Spanish National Plan for Aerial Orthophoto - PNOA

At the beginning of the 21st century, Spain faces very important challenges for sustainable development: significant infrastructure expansion and huge urban and tourist-oriented residential pressures need to be fitted into a structure of adequate environmental impact evaluation and minimization.

In 2004, IGN decided to apply INSPIRE's principles ("Information should be captured only once") and proposed public organizations to join a common orthophoto production project that would serve different needs, consolidating the requirements of all them. This would save money, reduce duplication of effort, and foster derived vector database harmonization and convergence.

In accordance with the decentralized organization of Spain into 19 Regional Governments (RGs) - Comunidades Autónomas - PNOA (Spanish National Plan for Aerial Orthophoto) was defined from the beginning as a decentralized yet coordinated project. Through a hard negotiation process PNOA was launched, deciding to set minimum requirements for the entire territory of Spain for the 2004-2007 period: 50 cm pixel size color aerial flight, digital elevation model (DEM), 50 cm pixel size digital colour orthophotos with 1 m rmse in X,Y and an updating period of 2 years. These specifications allow for 1:10,000 topographic mapping and satisfy most of the needs detected in the definition phase of the project.

For 2008-2011, it has been decided to increase the resolution while keeping the two-year update period. To maintain a reasonable budget, alternate 25 cm/50 cm coverages were recommended.

Both RGs and national ministries have set up and are improving web portals and web services for public access to all this data. Images are served through Internet services by ad hoc portals and are also integrated in Spanish SDI (IDEE) through WMS standard services: <http://www.idee.es/wms/PNOA/PNOA>.

EUROPARC - Spain

EUROPARC-Spain is the Spanish Section of the EUROPARC Federation (Federation of Nature and National Parks of Europe), a pan-European body formed by organisations dedicated to nature conservation in 38 countries.

All the administrations in charge of planning and managing protected natural areas participate in EUROPARC-Spain, i.e. the Ministry of Environment, other national administrations as well as regional and local administrations. Its main goal consists of acting as an observatory for the evolution and the state of the issue of protected areas in Spain.

The general objectives of EUROPARC-Spain are as follows:

- To act as an observatory for the evolution and the state of the issue of protected areas in the Spanish State.
- To facilitate the exchange and dissemination of information.
- To contribute to enhancing the protected areas as social and environmental services in sectorial policies.
- To promote professionalization and qualifications for the staff at protected areas.
- To collaborate with public administrations on the matter of Protected Areas and work alongside other organisations with common objectives at national and international levels.
- To contribute to the maturity and professionalization of the pan- European organisation EUROPARC, to which it belongs, ensuring coordination and the exchange and dissemination of information at international level.

The URL of the cartographic viewer developed under this project is <http://opengis.uab.es/wms/europarc/> which is based on standards according to INSPIRE. There the Spanish protected natural areas are displayed and linked to the information stored in the EUROPARC-Spain database. The information at this web site has been provided by different public administrations responsible for the planning and management of protected natural areas. This initiative aims to contribute to a better understanding of protected natural

areas by making the access to information about them easier and available to all citizens. More details on: <http://www.europarc-es.org/>

Figure 7: EUROPARC-Spain Viewer



A collaborative Spanish-Portuguese SDI: Observatorio Territorial Alentejo-Extremadura - OTALEX

Spanish and Portuguese NSDI have carried out some actions to be actually interoperable in levels such as technical and organizational collaboration, cross-border projects and clients' interoperability with the intention of collaborating and getting more outcomes in the next years.

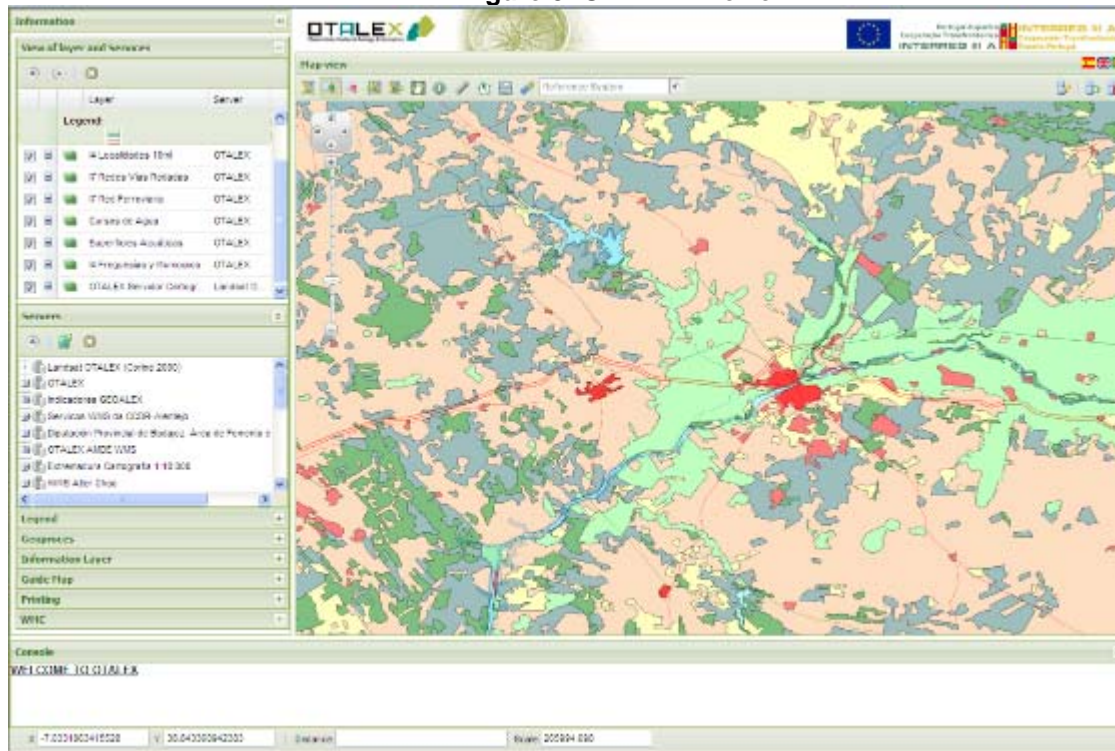
The result is a virtual Iberian SDI integrated by a set of standard web services supported by a transnational community that shares experiences, knowledge and information. This Portuguese-Spanish environment can be considered a good test-bed for studying how INSPIRE's principles can be put in practice regarding NSDI pragmatic and organizational interoperability, in order to test different solutions, identify problems and find further interoperability requirements.

One example of the Iberian cross-border projects is OTALEX SDI (<http://www.ideotalex.eu/>). The aim of OTALEX (Observatorio Territorial Alentejo-Extremadura) project is the study and the representation of an area comprising the Alentejo region in Portugal and Extremadura Autonomous Region in Spain. This initiative provides a set of technologies that simplifies the presentation and representation of this border area.

The OTALEX SDI includes standard services such as WMS, WCS, WFS and Gazetteer which provide geographical and statistical data from each partner involved in the two countries.

This project undertakes one of the first cross-border area SDI as a real project, not as a test, and integrating national, regional and local levels within its system. This project has required a great deal of consensus and harmonisation reached by the nine members on both sides of the border.

Figure 8: OTALEX Viewer



Please check the section “Summary on other questionnaires (**Error! Reference source not found.**) where detailed tables of these and other Spanish datasets and web services are depicted and illustrated.

Currents gaps:

There are many datasets with forestry information available but not all of them are actually published via catalogue systems being some of them not yet available via standard OGC web services, i.e. WMS, WFS and WCS and eventually CSW.

3 SCENARIOS

3.1 Use Scenarios

To elicit the Use Scenarios we have adopted the templates used in the GEOSS AIP-2. These use-scenarios (implemented in the scope of EuroGEOSS Forest capacity) shall consider the identified disciplinary and multi-disciplinary requirements, as well as multi-scale scenarios. The methodology keeps in line with the GEOSS AIP approach, where each Use Scenario will originate one or more Use cases, which are specified in order to implement the scenarios, based on the EuroGEOSS multidisciplinary Interoperability Architecture. The Use Cases will be developed in subsequent stages of the project.

Forest Fires Scenario

Table 4: Forest Fires Scenario Description

Brief Summary
<p>Extreme forest fire disasters are increasingly frequent events around the globe. The growing severity of fire disasters are a consequence of increased vulnerability of the natural environment and societies. The social, economic and environmental costs of forest fires are very high, often leaving many thousands of people homeless and displaced, without income due to loss of local livelihood by the fire, and in many cases millions of people affected by negative long-term health impacts caused by fire emissions. Forest fires are very complex phenomena which can rapidly devastate large forest areas and cause the loss of biodiversity. There is also widespread awareness that the risk may increase as a result of climate change.</p> <p>Forest fires analysis and strategic planning in combating the forest fires require the development of information systems, datasets and services which could interact and communicate with each other considering the large number of existing data on local, national, regional and global level. The use of applications and available computer tools combining different sources can improve the quality of the analysis and predict the spread of forest fires in an attempt to prevent or reduce major loss as well as damage to the environment.</p> <p>Although forest fire information and early warning systems exist at global, European as well as national scale, it is difficult to combine datasets and information from different sources in order to have the clear, detailed and coordinate picture about forest fires.</p> <p>The main purpose is the improvement and establishment of inter-connection among the systems and data structure about forest fires as well as identification of options and interfaces in order to take benefit from data and products available at global, regional and national levels.</p>
Community Objectives
<p>EuroGEOSS demonstrates the added value to the scientific community and society of making existing systems and applications interoperable and used within the GEOSS and INSPIRE frameworks. EuroGEOSS therefore focuses primarily on the application areas, and the multi-disciplinary interoperability aspects to opening them up, linking them, and making them GEOSS components. EuroGEOSS will demonstrate that this process increases access to new forms of data and services in forestry area, and as a result allows scientists to address new scientific questions, or address old questions in new and better ways.</p>

Experts on forest fires from the Commission and the competent national authorities are steadily in contact to exchange the lessons learnt from previous fires and to contribute to the European Forest Fire Information System EFFIS managed by the Joint Research Centre, which has become the most efficient forecasting and assessment tool in the field of disasters. Together, the European Commission and the Member States continue looking for suitable and efficient ways to avoid unnecessary fire impacts.

The European Forest Fire Information System (EFFIS) can contribute to GEOSS initiative on Wildland Fire Warning System providing fire danger forecasts and analyses of forest fire damages for the pan-European area and GMES projects in the area of emergency response.

Implementation of interoperability with global, regional and local datasets and services related to forest fires could increase the effectiveness of the European Forest Fire Information System (EFFIS) and could contribute to the reaching the Community goals in preventing and informing the public on forest fires danger, forest fires as well as supply the Commission services with robust and broader data on forest fires.

Actors

Global Earth Observation System of Systems (GEOSS).

The Joint Research Centre. The Land Management and Natural Hazard (LMNH) Unit in particular its action related to monitoring the state of European forests (FOREST) and responsible for European Forest Fire Information System (EFFIS).

Universitat Jaume I de Castellon – Spain. The Centre for Interactive Visualization (CeVI) is a research centre of the Department of Information Systems at University Jaume I.

Centro Nacional de Información Geográfica (CNIG) - Spain. Assigned to Ministry of Public Works and Transports through National Geographic Institute of Spain, which coordinates the Spatial Data Infrastructure of Spain (IDEE), a collective project with more than 80 nodes publishing and integrating more than 500 Web services and 6,000 layers of data and metadata covering all themes in INSPIRE Annexes I and II, following OGC specifications, ISO standards and INSPIRE principles. This initiative allows users to locate, identify and access geospatial information produced in Spain on the Internet.

Empresa de Serviços e Desenvolvimento de Software, S.A. – Portugal (EDISOFT). Specialized Portuguese company that offers technologically advanced software solutions and highly qualified IT consulting services

End – users. Forest fires experts, forest managers, forest and environmental researchers and modelers, educational users, individual personal users.

Context and pre-conditions

The GEOSS initiative on Wildland Fire Warning System is planned to operate as a coordinated network of regional systems using existing remotely-sensed and ground-based data networks, and new forecasting and fire danger risk models to provide improved prediction capabilities, analysis tools, and response support. The system will operate from global to local level, with rapid information dissemination via dedicated networks.

In order to ensure the provision of robust data and information on the state of the environment for the development of related policies at European Union level, the European Commission

Directorate-General Environment (ENV), Joint Research Center (JRC) and Eurostat, with the European Environment Agency (EEA), all together called “Group of four” (Go4), have agreed at the end of 2005 the establishment of “Environmental Data Centres”. The EFDAC hosted by the Joint Research Center (JRC) of the European Commission has been established to supply European Union decision-makers with processed, quality checked and timely policy relevant forest data and information within the EU.

The recently established EFDAC provides a gateway to data holdings and information on forest resources in Europe. In addition, the EFDAC supports the generation of value-added forest indicators on sustainable forest management on the basis of data collected by the Member States. The EFDAC is built on the basis of existing systems, such as the European Forest Fire Information System (EFFIS), the Forest Focus database, the European Forest Information and Communication Platform (EFICP) as well as integrates tools and applications developed by JRC (EFDAC MapViewer, EFDAC Metadata Catalogue and its management system).

The European Forest Fire Information System (EFFIS) has been established by the Joint Research Centre (JRC) and the Directorate General for Environment (DG ENV) of the European Commission (EC) to support the services in charge of the protection of forests against fires in the EU and neighbouring countries, and also to provide the EC services and the European Parliament with information on forest fires in Europe. EFFIS addresses forest fires in Europe in a comprehensive way, providing EU level assessments from pre-fire to post-fire phases, thus supporting fire prevention, preparedness, fire fighting and post-fire evaluations. The core of EFFIS consists of a scientific and technical infrastructure at the JRC doing research on forest fires and operating a web based platform. In addition EFFIS is supported by a network of Experts on Forest Fires from 22 EU countries that meet regularly with the EC services. Other than the on-line web based system, a huge EU fire database is maintained within EFFIS; furthermore, reports on forest fires in Europe are produced yearly.

The current warming climate trend in the Mediterranean region makes it vulnerable to forest fires and reduces the capability of Mediterranean forests to accommodate the fires as well as further aggravates the risk of forest fires. As a result of the intensification of forest fires, the capacity of the Mediterranean ecosystems to naturally regenerate in many areas has been reduced, while extensive areas are being affected by biodiversity loss, soil erosion and water scarcity. Portugal and Spain are among the Mediterranean countries the most affected by forest fires, therefore in order to test inter-connectivity and interoperability of the forest related datasets and services the datasets and services available in Portugal and Spain are being considered for testing purposes. There are many datasets, services and other forest information available in Portugal and Spain on local, regional and national level, which could be accessible through web services.

The following web services and datasets from Portugal and Spain (national, regional and local level) could be used and others could be identified later:

National / Spain

- OTALEX (Observatorio Territorial Alentejo-Extremadura)
- CORINE Land Cover
- National Airborne Orthophotography Plan

Regional / Spain

- Landscapes Map of Andalucía.
- Ecological and Forestry Inventory of Catalonia
- Rioja Spatial Data Infrastructure WMS

Local / Spain

- Forest Cartography of La Palma
- Forest Cartography of Tenerife

Other available datasets, web services on forest fires from Spain and Portugal will be identified at later stages.

Scenario Events

(use cases are derived from scenario steps described below)

step	description
1	National forest fire expert (for instance from Spain) or GEOSS user through WMS services searches and accesses forest fire maps and layers available in European Forest Fire Information System (EFFIS), for instance: information on forest fire danger forecast, results of analyses of forest fire damages for the pan-European area, maps of burned biomass and atmospheric emissions in EU, fuel map of Europe, etc.
2	The user of European Forest Fire Information System (EFFIS) through WMS services accesses selects and visualizes geographical and forest fires thematic information from national, regional and local level in Spain / Portugal as well as other general and thematic resources from GEOSS initiative on Wildland Fire Warning System, Fire Information for Resource Management System (FIRMS).
3	Using web services (WMS/WFS) the end – user through a catalogue selects the forest fires data from different systems (WFWS, FIRMS, EFFIS, and Portuguese / Spanish systems) and combine them (within the common Map Viewer) with different forestry thematic layers and forest inventory statistics.
4	Forest fire expert searches (CSW/WMS/WFS) and selects through a catalogue the forest fire thematic layers and within the common Map Viewer uses them for various analysis and research purposes, for instance: calculation of burnt area, fire danger in area of interest (for instance certain regions in Spain / Portugal); evaluation of accuracy of the results according to different data sources. In addition the combination of forest fire layers with other forestry thematic layers could be used to evaluate and analyze the impact of forest fires to biodiversity, protected areas, tree species distribution.
5	The end–user combining the forest fire thematic layers from different sources produces the additional layers and exports /saves them locally.

Post-Conditions

N/A

Special Requirements

N/A

References

<http://www.idee.es>
<http://www.ideotalex.eu/>
<http://efdac.jrc.ec.europa.eu/>
<http://effis.jrc.ec.europa.eu/index.php>
<http://forest.jrc.ec.europa.eu/>
<http://www.edisoft.pt>

Forest Change Mapping Scenario

Table 5: Forest Change Mapping Scenario Description

Brief Summary
<p>Development, implementation, monitoring and further improvement of environmental policies depend crucially on the availability of robust data on the state of the environment, pressures, impacts and responses. Forest data and other related information play a very important role in making decisions and defining environmental policies. Forest sector becomes the cross-cutting issue related to other themes like climate change, energy, biodiversity, deforestation and land management, etc. Therefore the forest data contribute to the development of other cross - sectorial policies as well as to the development of various analysis, models, and scenarios related to environment. Hence it is not enough to have robust and available forest data and information at local (national) level but it is more crucial to have them at regional as well as global levels which allow the decision makers to have the clear picture about environmental processes, causes, tendencies and possible solutions. Consequently the forest related information becomes essential for policy makers and from local to global organizations. However, information on forest resources is often scattered, incomplete and unreliable. Most of these deficiencies are due to the lack of inter-connection among the systems and data structures established at the local, regional and global levels.</p> <p>Forest change is of great concern for land use decision makers and conservation communities. Quantitative and spatial forest change information is critical for addressing many pressing issues, including global climate change, carbon budgets, biodiversity, protected areas and sustainability.</p> <p>The main goal of this scenario is to improve present knowledge of the extent of and change in tropical and boreal forest cover on continental / European / national scale and reduce uncertainties in global estimates of forest cover change. The improvement and establishment of inter-connection among the systems and data structures at the local, regional and global levels will give the possibility to have the forest cover and forest cover change data and combine them with existing forest maps, layers and forest data on local, regional and global levels using them for various models, analysis and research.</p>
Community Objectives
<p>EuroGEOSS demonstrates the added value to the scientific community and society of making existing systems and applications interoperable and used within the GEOSS and INSPIRE frameworks. EuroGEOSS therefore focuses primarily on the application areas, and the multi-disciplinary interoperability aspects to opening them up, linking them, and making them GEOSS components. EuroGEOSS will demonstrate that this process increases access to new forms of data and services in forestry area, and as a result allows scientists to address new scientific questions, or address old questions in new and better ways.</p> <p>Forests cover over 30% of the territory of the 27 Member States of the European Union. The maintenance and enhancement of the forest ecosystem is widely recognized as one of the main goals in preserving Europe's environment. The community goal is to improve present knowledge of the extent of and change in European forest cover within global context and to provide information to European Commission services in support to the definition of policies and other decision making on forestry and environmental issues.</p> <p>Information of the spatial distribution of European forests is needed for forest protection and conservation, forest resource analysis, climate change research and other forest related</p>

applications. There are several efforts of mapping forests at different, from regional to pan-European, scales. The regional efforts vary also in level of detail, sources of information, forest definition and target groups. Therefore, their use on global/ regional/ national levels for various scientific, policy and reporting purposes is a crucial issue.

Actors

The Joint Research Centre. The Land Management and Natural Hazard (LMNH) Unit in particular its action related to monitoring the state of European forests (FOREST) and responsible for European Forest Data Center (EFDAC) as well as The Global Environment Monitoring (GEM) Unit in particular its action monitoring terrestrial ecosystems in EU development-assistance priority areas (TREES-3 project).

Universitat Jaume I de Castellon – Spain. The Centre for Interactive Visualization (CeVI) is a research centre of the Department of Information Systems at University Jaume I.

Centro Nacional de Información Geográfica (CNIG) - Spain. Assigned to Ministry of Public Works and Transports through National Geographic Institute of Spain, which coordinates the Spatial Data Infrastructure of Spain (IDEE), a collective project with more than 80 nodes publishing and integrating more than 500 Web services and 6,000 layers of data and metadata covering all themes in INSPIRE Annexes I and II, following OGC specifications, ISO standards and INSPIRE principles. This initiative allows users to locate, identify and access geospatial information produced in Spain on the Internet.

Empresa de Serviços e Desenvolvimento de Software, S.A. – Portugal (EDISOFT). Specialized Portuguese company that offers technologically advanced software solutions and highly qualified IT consulting services

End – users. Forest managers, experts, forest and environmental researchers and modelers, educational users, individual personal users.

Context and pre-conditions

Several initiatives have dealt with the collection of forestry information, from the global level of FAO reports, through the more detailed TBRFA (Temperate and Boreal Forest Resources Assessment), to the European, national, regional and local levels. These existing global datasets (FAO, CIFOR, WCMC, FIRMS, etc.) in combination of satellite images could bring the added value in interpreting and validating the forest cover. However, at the moment, most of the mentioned global datasets are not available or accessible through information systems or internet tools / applications.

Research groups at the Joint Research Centre (JRC) are developing methods for monitoring forest cover resources from a global perspective. The TREES-3 and FOREST projects of the JRC aim at estimating tree cover changes at continental and regional levels for the Tropical belt and European continent for the periods 1990-2000-2005 based on a systematic sample of medium resolution satellite imagery. The project is carried out in a collaborative partnership with FAO and is intended to support Remote Sensing Survey of the FRA 2010. An operational system is being developed by JRC for the processing and tree cover change assessment of a large set of multi-temporal medium resolution imagery covering the Tropical and Europe (e.g. about 4 000 sample sites of 20x20 km size for the tropics and about 2 000 sample sites of 10x10 km size for European continent).

In order to ensure the provision of robust data and information on the state of the environment for the development of environmental policies at European Union level, the European Commission Directorate-General Environment (ENV), Joint Research Center (JRC) and Eurostat, with the European Environment Agency (EEA), all together called "Group of four" (Go4), have agreed at the end of 2005 the establishment of "Environmental Data Centres". The EFDAC hosted by the Joint Research Center (JRC) of the European Commission has been established to supply European Union decision-makers with processed, quality checked and timely policy relevant forest data and information within the EU.

The recently established EFDAC provides a gateway to data holdings and information on forest resources in Europe. In addition, the EFDAC supports the generation of value-added forest indicators on sustainable forest management on the basis of data collected by the Member States. The EFDAC technical platform is targeted to be interoperable with external nodes for the exchange of metadata and data. The framework for such interoperability is set by the INSPIRE Directive. The EFDAC is built on the basis of existing systems, such as the European Forest Fire Information System (EFFIS), the Forest Focus database, the European Forest Information and Communication Platform (EFICP) as well as integrates tools and applications developed by JRC (EFDAC MapViewer, EFDAC Metadata Catalogue and it's management system).

In order to assess inter-connectivity and interoperability of the forest related datasets and services the datasets and services available in Spain are being considered for testing purposes. There are many datasets, services and other forest information available in Spain on local, regional and national level, which could be accessible through web services.

Web services and datasets suggested using from Spain (national, regional and local level)

National / Spain

- CORINE Land Cover
- EUROPARC-Spain
- National Airborne Orthophotography Plan

Regional / Spain

- Landscapes Map of Andalucía.
- Biodiversity Map of Andalucía
- Vegetation Map of Andalucía
- Ecological and Forestry Inventory of Catalonia
- Web Map Server of Biodiversity data bank of Catalonia
- Bioatlas of Balearic Islands
- Rioja Spatial Data Infrastructure WMS
- Vegetation Map of Canarias

Local / Spain

- Forest Cartography of La Palma
- Forest Cartography of Tenerife
- Digital Cartography for the National Park of Doñana Monitoring

For Continental / Tropic level the following dataset are being considered

- Forest change maps 1990-2000-2005 (Tropics / Africa)
- Land cover change around and within the protected area (Tropics / Africa)
- FAO, CIFOR, WCMC, FIRMS datasets

For European level the following datasets are being considered to use. Some of them are under construction and will be available 2010:

Europe

- European forest map (1990 - 2000 - 2006), forest cover change in Europe (*forest maps 1990, 2006 are under construction or final development and will be available 2010*)
- European forest type map (2006) (*under construction, should be available 2010*)
- Dominant tree species distribution / habitats suitability maps in Europe

The following maps are being developed within Framework Contract launched by JRC for the provision of data and services awarded to a consortium of 9 partners on the basis of specific contracts (SC) based on requests issued by the JRC. It is foreseen to develop these maps in 2010:

- Species richness in Europe on 1x1km INSPIRE grid (number of different tree species per grid)
- Tree Stand Global Composition in Europe on 1x1km INSPIRE grid (majority of coniferous and broadleaves)
- Occurrence / presence of main tree species in Europe on 1x1km INSPIRE grid

Scenario Events

(use cases are derived from scenario steps described below)

step	description
1	National forest experts through the web interface query (WMS/WFS) the TREES database of images and other global or regional forestry-related data sets (in – situ forest measurements FAO, CIFOR) and validate TREES database (database of forest change maps) using the query results. National forest experts correct and update the forest change maps and make the results accessible through the web services (through WMS).
2	Forest/vegetation experts through the web interface query (WMS/WFS) other global data sets (WCMC, OFAC, FIRMS) and update the protected areas database (vegetation maps) in conjunction with the query results. Forest experts analyze, correct and update maps of land cover around and within the protected area in database.
3	Using the web services (WMS/WFS) end-users search and access through a catalogue a geographical and forestry thematic information from national, regional and local level in Spain.
4	End-users through a catalogue (CSW/WMS/WFS) select and access a forest cover maps throughout the specific regions (for instance: Tropic, Africa, Europe) and time period (1990 – 2000- 2005).
5	Using web services (CSW/WMS/WFS) end–users search and select the forest cover maps and combine them with available forestry thematic layers and forest inventory statistics in the common web interface (Map Viewer), for instance: forest type, species richness, number of different tree species, tree stand global composition, occurrence / presence of tree species, tree species distribution / habitats suitability maps, protected areas, biodiversity, forest indicators, etc.
6	The end–users combining the different forestry thematic layers produce the additional layers and export/save them locally.
7	The end–users through a catalogue search (CSW/WMS/WFS) and select the available forest maps and thematic layers desired to compute the different models. The selected maps and layers through the common web interface (Map Viewer) are used for various analysis and models, for instance: providing

	estimates of the rates of forest cover change on global / continental and regional scale, evaluating the impact of forest change on protected areas, biodiversity, and tree species distribution as well as for various Area Production Models (APM), LUCS models.
Post-Conditions	
N/A	
Special Requirements	
N/A	
References	
http://www.ideo.es http://www.ideoalex.eu/ http://www.euoparc-es.org/ http://efdac.jrc.ec.europa.eu/ http://effis.jrc.ec.europa.eu/index.php http://forest.jrc.ec.europa.eu/ http://www.edisoft.pt	

3.2 Requirements

The final step of this document is the identification of the initial EuroGEOSS Forest Capacity functional requirements. These are derived from the steps (basic flow) highlighted in the Use Scenarios described in the previous Section.

Table 6: Forestry Functional Requirements

UFR	Description	Related Scenario & Use Case
1	Metadata requirements	-
1.1	Resources shall be described via metadata records stored in a common catalogue.	
1.2	Metadata records shall be used to discover resources via catalogue search mechanisms.	
2	Discovering Services requirements	-
2.1	Users shall be able to query the Metadata catalogue in order to discover (registered) resources (e.g.: datasets, services, etc)	
2.2	Users shall be able to build search criteria (i.e. using a filter) in order to query metadata catalogue on available forest resources (data).	
2.3	Expert Users shall be able to publish WMS services with the results of the validation of TREES database.	

UFR	Description	Related Scenario & Use Case
2.4	Users shall be able to search the metadata catalogue for resources that belong to local, regional, national and global data levels.	
2.5	Expert Users shall be able to publish forestry related WMS and WFS Services.	
3	Access Services requirements	-
3.1	Users shall be able to access a WMS entry point via a Map Viewer interface.	
3.2	Users shall be able to access a WFS entry point via a Map Viewer interface.	
3.3	Users shall be able to access a metadata catalogue CSW entry point using a portal front-end. (see reqs. 2.1 & 2.2)	
4	Querying and Viewing Data requirements	-
4.1	Users shall be able to build search criteria in order to query available forest data.	
4.2	Users shall be able to select the datasets (layers) available as the result of the query (see reqs. 2.2 & 4.1) and see them on the Map Viewer.	
4.3	Users shall be able to combine data from different WMS/WFS forest available services at local (country), regional (European) and global (world) levels.	
4.4	Users shall be able to save the map context for later use.	
4.7	Users shall be able to create additional layers using a combination of different datasets from different services (see req. 4.3).	
4.6	Users shall be able to download/export a combined dataset (data from several services – see req. 4.7) with forest data and save it locally.	
5	Data Management	
5.1	Experts Users shall be able to update and validate the (internal) TREES database using forest related WMS and/or WFS services.	
5.2	Experts Users shall be able to update the land cover maps from protected areas database using forest related WMS and/or WFS services.	
6	Data Quality requirements	-
6.1	TBD	

These initial requirements will be taken into account in the development of the Initial Operating Capability of EuroGEOSS.

4 ANNEXES

Forest Fires

Table 7: Technical Questionnaire on Forest Fires information

Product Identification		Maps of burned biomass and atmospheric emissions in EU	Burned area maps - Rapid Damage Assessment	Burned area maps - Damage Assessment	Forest fire danger maps - Danger Forecast	Forest fire statistics in EU	Fuel Map of Europe
Product							
Country		Europe	Europe	Europe	Europe	Europe	Europe
Owner		EU Commission, JRC	EU Commission, JRC	EU Commission, JRC	EU Commission, JRC	EU Commission, JRC	EU Commission, JRC
Already on a metadata catalogue							
No							
	Data generator						
	Version (final, draft)						
	Production date (dd/mm/yyyy)						
	Existing updates (yes, no)						
	Type and frequency of update (If YES)						
	Can product and corresponding information be published via the EuroGEOSS Forestry Portal portal? (yes, no)						

	General dataset description (free text)						
	Purpose of the data						
	Keywords						
	Use constraints						
	Citation requirements						
	Point of contact : organisation, contact person, email, telephone, fax						
	Time period						
Yes							
	Which system's catalogue	Commercial metadata catalogue (ConTerra 2.3.) compliant with ISO19115	Commercial metadata catalogue (ConTerra 2.3.) compliant with ISO19115	Commercial metadata catalogue (ConTerra 2.3.) compliant with ISO19115	Commercial metadata catalogue (ConTerra 2.3.) compliant with ISO19115	Commercial metadata catalogue (ConTerra 2.3.) compliant with ISO19115	Commercial metadata catalogue (ConTerra 2.3.) compliant with ISO19115
	Catalogue URL and protocol (if harvestable)?	CSW 2.0.2 (not published yet)	CSW 2.0.2 (not published yet)	CSW 2.0.2 (not published yet)	CSW 2.0.2 (not published yet)	CSW 2.0.2 (not published yet)	CSW 2.0.2 (not published yet)
Data – technical description							
	Data description	Maps of burned biomass and atmospheric emissions in EU	Burned area maps - Rapid Damage Assessment	Burned area maps - Damage Assessment	Forest fire danger maps - Danger Forecast	Forest fire statistics in EU	Fuel Map of Europe
	Data (digital or analogue)	digital	digital	digital	digital	digital	digital
	Geometry (point, line, polygon, raster)	Polygon	Polygon	Polygon	Raster		Polygon
	Geographic projection	EPSG:4326,	EPSG:4326,	EPSG:4326,	EPSG:4326,		EPSG:3035

	EPSG:3035	EPSG:3035, EPSG:900913	EPSG:3035, EPSG:900913	EPSG:3035, EPSG:900913		
Geographic coordinate system	WGS84 dd, LAEA mt,	WGS84 dd, LAEA mt, Mercator mt	WGS84 dd, LAEA mt, Mercator mt	WGS84 dd, LAEA mt, Mercator mt		LAEA mt
Spatial extent of data (international, national, regional)	Europe / regional	Europe / regional: EU25 + Northern African/Med Area	Europe / regional: EU25 + Northern African/Med Area	Europe / regional: EU25 + Northern African/Med Area	Europe / regional	Europe / regional
Existing data format/GIS or Database platform	Oracle Spatial	SHP	SHP	Oracle Spatial		Oracle Spatial
Available data format for end users	OWS, SHP	SHP, OWS	SHP, OWS	OWS		OWS, tiff
Comments						
Data – attribute description						
Attributes description per Data description	Maps of burned biomass and atmospheric emissions in EU	Burned area maps - Rapid Damage Assessment	Burned area maps - Damage Assessment	Forest fire danger maps - Danger Forecast	Forest fire statistics in EU	Fuel Map of Europe
Identify scale (for polygons, lines)/density (points)/ resolution (raster)	250 mt equivalent nominal scale	250 mt equivalent nominal scale	250 mt equivalent nominal scale	45 and 36 km equivalent nominal scale		100 mt equivalent nominal scale
Attribute theme identification (= data name)	Forest fires	Forest fires	Forest fires	Forest fires	Forest fires	Forest fires
May be for each attribute: name, alias, type, width, precision and visibility scale?						
Classification system (if relevant)						
Forest survey/Forest data						

interpretation methodology used (if relevant)							
Analytical methods (if relevant)							
Comments							
Web services							
Web Service description		Maps of burned biomass and atmospheric emissions in EU	Burned area maps - Rapid Damage Assessment	Burned area maps - Damage Assessment	Forest fire danger maps - Danger Forecast	Forest fire statistics in EU	Fuel Map of Europe
If metadata/data exists (identified above) and no service is yet available to publish it, it is foreseen to implement one in the future? If yes, when?			Foreseen 2010	Foreseen 2010	Foreseen 2010		
The service is part of an existing system or application already in place (yes/no)		Yes	Yes	Yes	Yes		Yes
Yes							
	Name of Application or System	EFFIS	EFFIS	EFFIS	EFFIS		EFFIS
	URL address	http://effis-viewer.jrc.ec.europa.eu/	http://effis.jrc.ec.europa.eu/	http://effis.jrc.ec.europa.eu/	http://effis.jrc.ec.europa.eu/		http://effis-viewer.jrc.ec.europa.eu/
Web link (URL address)							
GIS technology (underneath)							
Type of service (exposed)							

Search/Discovery Service	Protocols						
	Versions						
	Metadata types						
	Restrictions (if any)						
Viewing Service (WMS/WCS)	Protocols						
	Versions						
	Data types						
	Restrictions (if any)						
	SLD support						
Download Service (WFS)	Protocols						
	Versions						
	Data Types						
	Restrictions (if any)						
Transformation	Protocols						

Service (WPS)						
	Versions					
	Types of Transformation available					
Point of contact for the web services: organisation, contact person, email, telephone, fax		effis@jrc.ec.europa.eu	effis@jrc.ec.europa.eu	effis@jrc.ec.europa.eu	effis@jrc.ec.europa.eu	effis@jrc.ec.europa.eu
Comments						

Forest Focus

Table 8: Technical Questionnaire on Forest Focus information

Product Identification					
Product	Forest Focus Database	Forest Focus Level 1 Database	Forest Focus Level 2 Database	Mean plot defoliation at NUTS level 3 for Europe	Mean plot discoloration at NUTS level 3 for Europe
Country	Europe	Europe	Europe	Europe	Europe
Owner	EU Commission, JRC	EU Commission, JRC	EU Commission, JRC	EU Commission, JRC	EU Commission, JRC
Already on a metadata catalogue					
No					
	Data generator				
	Version (final, draft)				
	Production date (dd/mm/yyyy)				

	Existing updates (yes, no)					
	Type and frequency of update (If YES)					
	Can product and corresponding information be published via the EuroGEOSS Forestry Portal portal? (yes, no)					
	General dataset description (free text)					
	Purpose of the data					
	Keywords					
	Use constraints					
	Citation requirements					
	Point of contact : organisation, contact person, email, telephone, fax					
	Time period					
Yes						
	Which system's catalogue	Commercial metadata catalogue (ConTerra 2.3.) compliant with ISO19115	Commercial metadata catalogue (ConTerra 2.3.) compliant with ISO19115	Commercial metadata catalogue (ConTerra 2.3.) compliant with ISO19115	Commercial metadata catalogue (ConTerra 2.3.) compliant with ISO19115	Commercial metadata catalogue (ConTerra 2.3.) compliant with ISO19115
	Catalogue URL and protocol (if harvestable)?	CSW 2.0.2 (not published yet)	CSW 2.0.2 (not published yet)	CSW 2.0.2 (not published yet)	CSW 2.0.2 (not published yet)	CSW 2.0.2 (not published yet)
Data – technical description						
	Data description	Forest Focus	Forest Focus	Forest Focus	Mean plot	Mean plot

	Database	Level 1 Database	Level 2 Database	defoliation at NUTS level 3 for Europe	discoloration at NUTS level 3 for Europe
Data (digital or analogue)	digital	digital	digital	digital	digital
Geometry (point, line, polygon, raster)	point	point	point	polygon	polygon
Geographic projection	Not projected	Not projected	Not projected	Not projected	Not projected
Geographic coordinate system	WGS84 / ETRS84	WGS84 / ETRS84	WGS84 / ETRS84	WGS84 / ETRS84	WGS84 / ETRS84
Spatial extent of data (international, national, regional)	Europe / regional	Europe / regional	Europe / regional	Europe / regional	Europe / regional
Existing data format/GIS or Database platform	Oracle	Oracle	Oracle	Oracle	Oracle
Available data format for end users	XML	XML	XML	XML	XML
Comments					
Data – attribute description					
Attributes description per Data description	Forest Focus Database	Forest Focus Level 1 Database	Forest Focus Level 2 Database	Mean plot defoliation at NUTS level 3 for Europe	Mean plot discoloration at NUTS level 3 for Europe
Identify scale (for polygons, lines)/density (points)/ resolution (raster)	Points	Points: systematic arrangement on 16km grid	Points at selected positions	Aggregated at NUTS 0,1,2,3 level	Aggregated at NUTS 0,1,2,3 level
Attribute theme identification (= data name)		Crown Condition	Crown Condition Soil Condition Soil Solution Foliar Chemistry Growth and Yield	average defoliation level (in % of crown) observed in the plots	average discoloration level (in % of crown) observed in the plots

			Deposition Meteorology Phenology Air Quality Ozone Injury Litter Fall		
May be for each attribute: name, alias, type, width, precision and visibility scale?		>40 attributes for CC. Needs to be more specific on attribute	There are too many of them to mention here. Needs to be more specific on attribute.		
Classification system (if relevant)	There are too many of them to mention here. Needs to be more specific on attribute.	There are too many of them to mention here. Needs to be more specific on attribute.	There are too many of them to mention here. Needs to be more specific on attribute.		
Forest survey/Forest data interpretation methodology used (if relevant)				minimum 3 trees of the required genus or species must be present in the plot	minimum 3 trees of the required genus or species must be present in the plot
Analytical methods (if relevant)	Every attribute could have the analytical method. There are too many of them to mention here. Needs to be more specific on attribute.	Every attribute could have the analytical method. There are too many of them to mention here. Needs to be more specific on attribute.	Every attribute could have the analytical method. There are too many of them to mention here. Needs to be more specific on attribute.		

Comments		Monitoring surveys with different characteristics and repeat periods. Access to original datasets for authorized persons is restricted by a Login/Password system.	Access to original datasets for authorized persons is restricted by a Login/Password system.	Access to original datasets for authorized persons is restricted by a Login/Password system.	Access to original datasets for authorized persons is restricted by a Login/Password system.	Access to original datasets for authorized persons is restricted by a Login/Password system.
Web services						
Web Service description		Forest Focus Database	Forest Focus Level 1 Database	Forest Focus Level 2 Database	Mean plot defoliation at NUTS level 3 for Europe	Mean plot discoloration at NUTS level 3 for Europe
If metadata/data exists (identified above) and no service is yet available to publish it, it is foreseen to implement one in the future? If yes, when?		Data disseminated through dedicated Web application available to authorized users.				
The service is part of an existing system or application already in place (yes/no)						
Yes						
	Name of Application or System					

URL address						
Web link (URL address)						
GIS technology (underneath)						
Type of service (exposed)						
Search/Discovery Service	Protocols					
	Versions					
	Metadata types					
	Restrictions (if any)					
Viewing Service (WMS/WCS)	Protocols					
	Versions					
	Data types					
	Restrictions (if any)					
	SLD support					
Download Service (WFS)	Protocols					
	Versions					

	Data Types					
	Restrictions (if any)					
Transformation Service (WPS)	Protocols					
	Versions					
	Types of Transformation available					
Point of contact for the web services: organisation, contact person, email, telephone, fax						
Comments						

Forest Map

Table 9: Technical Questionnaire on Forest Map information

Product Identification			
Product	Forest/Non-Forest Map 1990	Forest/Non-Forest Map 2000	Forest/Non-Forest Map 2006
Country	Europe	Europe	Europe
Owner	EU Commission, JRC	EU Commission, JRC	EU Commission, JRC

Already on a metadata catalogue				
No				
	Data generator			
	Version (final, draft)			
	Production date (dd/mm/yyyy)			
	Existing updates (yes, no)			
	Type and frequency of update (If YES)			
	Can product and corresponding information be published via the EuroGEOSS Forestry Portal portal? (yes, no)			
	General dataset description (free text)			
	Purpose of the data			
	Keywords			
	Use constraints			
	Citation requirements			
	Point of contact : organisation, contact person, email, telephone, fax			
	Time period			
Yes				
	Which system's catalogue	Commercial metadata catalogue (ConTerra 2.3.) compliant with	Commercial metadata catalogue (ConTerra 2.3.) compliant with	Commercial metadata catalogue (ConTerra 2.3.) compliant with

		ISO19115	ISO19115	ISO19115
	Catalogue URL and protocol harvestable)? (if)	CSW 2.0.2 (not published yet)	CSW 2.0.2 (not published yet)	CSW 2.0.2 (not published yet)
Data – technical description				
	Data description	Forest/Non-Forest Map 1990	Forest/Non-Forest Map 2000	Forest/Non-Forest Map 2006
	Data (digital or analogue)	Digital	Digital	digital
	Geometry (point, line, polygon, raster)	Raster	Raster	raster
	Geographic projection			
	Geographic coordinate system	ETRS89 /ETRS-LAEA	ETRS89 /ETRS-LAEA	ETRS89 /ETRS-LAEA
	Spatial extent of data (international, national, regional)	Europe / regional	Europe / regional	Europe / regional
	Existing data format/GIS or Database platform			
	Available data format for end users	GeoTIFF	GeoTIFF	GeoTIFF
	Comments	Under final development, will be available 2010		Will be available 2010
Data – attribute description				
	Attributes description per Data description	Forest/Non-Forest Map 1990	Forest/Non-Forest Map 2000	Forest/Non-Forest Map 2006
	Identify scale (for polygons, lines)/density (points)/resolution	spatial resolution: 25m	spatial resolution: 25m	spatial resolution: 25m

(raster)			
Attribute theme identification (= data name)			
May be for each attribute: name, alias, type, width, precision and visibility scale?			
Classification system (if relevant)	Classes: forest, non-forest, clouds/snow, no data;	Classes: forest, non-forest, clouds/snow, no data;	Classes: forest, non-forest, clouds/snow, no data;
Forest survey/Forest data interpretation methodology used (if relevant)	Method: automatic classification performed with an in-house algorithm	Method: automatic classification performed with an in-house algorithm	Method: automatic classification performed with an in-house algorithm
Analytical methods (if relevant)			
Comments			
Web services			
Web Service description	Forest/Non-Forest Map 1990	Forest/Non-Forest Map 2000	Forest/Non-Forest Map 2006
If metadata/data exists (identified above) and no service is yet available to publish it, it is foreseen to implement one in the future? If yes, when?		2010	
The service is part of an existing system or application already in place (yes/no)			

Yes				
	Name of Application or System			
	URL address			
Web link (URL address)				
GIS technology (underneath)				
Type of service (exposed)				
Search/Discovery Service	Protocols			
	Versions			
	Metadata types			
	Restrictions (if any)			
Viewing Service (WMS/WCS)	Protocols			
	Versions			
	Data types			
	Restrictions (if any)			
	SLD support			

Download Service (WFS)	Protocols			
	Versions			
	Data Types			
	Restrictions (if any)			
Transformation Service (WPS)	Protocols			
	Versions			
	Types of Transformation available			
Point of contact for the web services: organisation, contact person, email, telephone, fax				
Comments				

Forest Rends Map

Table 10: Technical Questionnaire on Forest Rends Map information

Product Identification	
Product	Actual and future species habitat suitability / distribution maps
Country	Europe
Owner	EU Commission, JRC
Already on a metadata catalogue	
No	
Data generator	
Version (final, draft)	
Production date (dd/mm/yyyy)	
Existing updates (yes, no)	
Type and frequency of update (If YES)	
Can product and corresponding information be published via the EuroGEOSS Forestry Portal portal? (yes, no)	
General dataset description (free text)	
Purpose of the data	
Keywords	
Use constraints	
Citation requirements	
Point of contact : organisation, contact	

	person, email, telephone, fax	
	Time period	
Yes		
	Which system's catalogue	Commercial metadata catalogue (ConTerra 2.3.) compliant with ISO19115
	Catalogue URL and protocol (if harvestable)?	CSW 2.0.2 (not published yet)
Data – technical description		
Data description	Actual and future species habitat suitability / distribution maps	
Data (digital or analogue)	Digital	
Geometry (point, line, polygon, raster)	raster	
Geographic projection	LAEA	
Geographic coordinate system	UTM	
Spatial extent of data (international, national, regional)	Europe / regional	
Existing data format/GIS or Database platform		
Available data format for end users	GeoTiff	
Comments		
Data – attribute description		
Attributes description per Data description	Forest Focus Database	
Identify scale (for polygons,	1000 meter	

lines)/density (points)/ resolution (raster)	
Attribute theme identification (= data name)	biota
May be for each attribute: name, alias, type, width, precision and visibility scale?	
Classification system (if relevant)	
Forest survey/Forest data interpretation methodology used (if relevant)	
Analytical methods (if relevant)	Classification/ regression
Comments	
Web services	
Web Service description	Actual and future species habitat suitability / distribution maps
If metadata/data exists (identified above) and no service is yet available to publish it, it is foreseen to implement one in the future? If yes, when?	2010
The service is part of an existing system or application already in place (yes/no)	
Yes	
	Name of Application or

	System	
	URL address	
Web link (URL address)		
GIS technology (underneath)		
Type of service (exposed)		
Search/Discovery Service	Protocols	
	Versions	
	Metadata types	
	Restrictions (if any)	
Viewing Service (WMS/WCS)	Protocols	
	Versions	
	Data types	
	Restrictions (if any)	
	SLD support	
Download Service (WFS)	Protocols	

	Versions	
	Data Types	
	Restrictions (if any)	
Transformation Service (WPS)	Protocols	
	Versions	
	Types of Transformation available	
Point of contact for the web services: organisation, contact person, email, telephone, fax		
Comments		

Forest Resources

Table 11: Technical Questionnaire on Forest Resources information

Product Identification	
Product	European Forest Recourses
Country	Europe
Owner	EU Commission, JRC
Already on a metadata catalogue	
No	

	Data generator	
	Version (final, draft)	
	Production date (dd/mm/yyyy)	
	Existing updates (yes, no)	
	Type and frequency of update (If YES)	
	Can product and corresponding information be published via the EuroGEOSS Forestry Portal portal? (yes, no)	
	General dataset description (free text)	
	Purpose of the data	
	Keywords	
	Use constraints	
	Citation requirements	
	Point of contact : organisation, contact person, email, telephone, fax	
	Time period	
Yes		
	Which system's catalogue	Commercial metadata catalogue (ConTerra 2.3.) compliant with ISO19115
	Catalogue URL and protocol (if harvestable)?	CSW 2.0.2 (not published yet)

Data – technical description	
Data description	European Forest Recourses
Data (digital or analogue)	Digital
Geometry (point, line, polygon, raster)	
Geographic projection	
Geographic coordinate system	
Spatial extent of data (international, national, regional)	Europe / regional
Existing data format/GIS or Database platform	Oracle Spatial
Available data format for end users	Pdf
Comments	
Data – attribute description	
Attributes description per Data description	European Forest Recourses
Identify scale (for polygons, lines)/density (points)/ resolution (raster)	Aggregated on NUTS 0,1,2,3 levels
Attribute theme identification (= data name)	Forest inventory, forest resources
May be for each attribute: name, alias, type, width, precision and visibility scale?	
Classification system (if relevant)	18 forest indicators (at the moment presented only 5)
Forest survey/Forest data interpretation methodology used (if	

relevant)		
Analytical methods (if relevant)		
Comments		
Web services		
Web Service description		European Forest Recourses
If metadata/data exists (identified above) and no service is yet available to publish it, it is foreseen to implement one in the future? If yes, when?		
The service is part of an existing system or application already in place (yes/no)		
Yes		
	Name of Application or System	
	URL address	
Web link (URL address)		
GIS technology (underneath)		
Type of service (exposed)		
Search/Discovery Service	Protocols	
	Versions	

	Metadata types	
	Restrictions (if any)	
Viewing Service (WMS/WCS)	Protocols	
	Versions	
	Data types	
	Restrictions (if any)	
	SLD support	
Download Service (WFS)	Protocols	
	Versions	
	Data Types	
	Restrictions (if any)	
Transformation Service (WPS)	Protocols	
	Versions	
	Types of Transformation	

	available	
Point of contact for the web services: organisation, contact person, email, telephone, fax		
Comments		

Spatial Pattern Indicators

Table 12: Technical Questionnaire on Forest Spatial Pattern Indicators information

Product Identification			
Product	European Forest Spatial Pattern 1990	European Forest Spatial Pattern 2000	Forest pattern, fragmentation and connectivity indicators
Country	Europe	Europe	Europe
Owner	EU Commission, JRC	EU Commission, JRC	EU Commission, JRC
Already on a metadata catalogue			
No			
Data generator			
Version (final, draft)			
Production date (dd/mm/yyyy)			
Existing updates (yes, no)			
Type and frequency of update (If YES)			
Can product and corresponding			

	information be published via the EuroGEOSS Forestry Portal portal? (yes, no)			
	General dataset description (free text)			
	Purpose of the data			
	Keywords			
	Use constraints			
	Citation requirements			
	Point of contact : organisation, contact person, email, telephone, fax			
	Time period			
Yes				
	Which system's catalogue	Commercial metadata catalogue (ConTerra 2.3.) compliant with ISO19115	Commercial metadata catalogue (ConTerra 2.3.) compliant with ISO19115	Commercial metadata catalogue (ConTerra 2.3.) compliant with ISO19115
	Catalogue URL and protocol harvestable)? (if	CSW 2.0.2 (not published yet)	CSW 2.0.2 (not published yet)	CSW 2.0.2 (not published yet)
Data – technical description				
	Data description	European Forest Spatial Pattern 1990	European Forest Spatial Pattern 2000	Forest pattern, fragmentation and connectivity indicators
	Data (digital or analogue)	digital	digital	digital
	Geometry (point, line, polygon,	raster	raster	polygon

raster)			
Geographic projection	LAEA	LAEA	LAEA
Geographic coordinate system	ETRS-1989	ETRS-1989	ETRS-1989
Spatial extent of data (international, national, regional)	Europe / regional	Europe / regional	Europe / regional
Existing data format/GIS or Database platform	Raster	Raster	ESRI-Shape
Available data format for end users	TIFF	TIFF	ESRI-Shape
Comments	mathematical morphology based software GUIDOS	mathematical morphology based software GUIDOS	Several indicator layers (see below). Measures are implemented in GIS and used three methods (see below). Data are from CORINE Land Cover (100 m spatial resolution, 25 ha minimum mapping unit) of years 1990 and 2000.
Data – attribute description			
Attributes description per Data description	European Forest Spatial Pattern 1990	European Forest Spatial Pattern 2000	Forest pattern, fragmentation and connectivity indicators
Identify scale (for polygons, lines)/density (points)/resolution (raster)	100 m raster from Corine Land Cover forest mask	25 m from JRC forest mask and 100 m raster from Corine Land Cover forest mask	Polygons (NUTS level2 or 3 depending on countries) Each measure was local but aggregated per province (NUTS 2/3)
Attribute theme identification (= data name)			Several shape layers with attribute tables depending on forest pattern query within

			EFDAC map viewer
May be for each attribute: name, alias, type, width, precision and visibility scale?			
Classification system (if relevant)	It contains 7 forest pattern classes: 1) "core forest", 2) "edge of core, 3) "edge of perforation" (inside core patches), 4) "branch", 5) "connection: loop", 6) "connection: bridge" (between core patches), and 7) "islet" (small forest patch). Edge was 100m width	It contains 7 forest pattern classes: 1) "core forest", 2) "edge" of core, 3) "edge of perforation" (inside core patches), 4) "branch", 5) "connection: loop", 6) "connection: bridge" (between core patches), and 7) "islet" (small forest patch). Edge was depending on dataset 25m or 100m width	Indicators are on the forest cover pattern, the interior part of the forest (the core forest or natural forest landscape pattern depending on method), the edge pattern (including forest /non forest interface types), and forest connectivity (intra-connectivity or forest amount and inter-patch distance). Single year indicators layers categories: forest cover, forest pattern classes, core forest, edge forest, forest connectivity. Change in time indicators layers categories: change of forest, change of core forest, change of edge forest and change of forest connectivity during a timeframe.
Forest survey/Forest data interpretation methodology used (if relevant)	The method is based on mathematical morphological image filtering techniques. Core forest is the interior part of a forest patch minus a 100m	The method is based on mathematical morphological image filtering techniques. Core forest is the interior part of a forest patch minus a	The scale of observation of pattern is defined by the data input. Here data are from CORINE Land Cover (100 m spatial resolution, 25 ha minimum mapping unit) of years 1990 and 2000. Time frame for change indicators are 10 years or so.

	edge width.	100m (or 25m) edge width.	Indicators provide a European-wide snap-shot of provinces where changes in spatial pattern occurred (like unstable forest pattern, loss of forest in natural context, loss of core forest, core forest fragmentation, forest connectivity loss). Both areas and forest proportions should be considered for interpretation of the measures. It is assumed that ecological impacts of spatial pattern processes are more likely in provinces with significant changes. The study cannot be conclusive without complementary field-based data on forest quality.
Analytical methods (if relevant)			Measures are implemented in GIS and used three methods : software GUIDOS (100 m edge), a landscape mosaic index (50 ha neighbourhood) and the equivalent connectivity area index derived from the Conefor Sensinode software (dispersal distances 1km, 5km, 10km, 25km).
Comments			
Web services			
Web Service description	Forest/Non-Forest Map 1990	Forest/Non-Forest Map 2000	Forest/Non-Forest Map 2006
If metadata/data exists (identified above) and no service is yet available			

to publish it, it is foreseen to implement one in the future? If yes, when?				
The service is part of an existing system or application already in place (yes/no)				
Yes				
	Name of Application or System			
	URL address			
Web link (URL address)				
GIS technology (underneath)				
Type of service (exposed)				
Search/Discovery Service	Protocols			
	Versions			
	Metadata types			
	Restrictions (if any)			
Viewing Service (WMS/WCS)	Protocols			
	Versions			

	Data types			
	Restrictions (if any)			
	SLD support			
Download Service (WFS)	Protocols			
	Versions			
	Data Types			
	Restrictions (if any)			
Transformation Service (WPS)	Protocols			
	Versions			
	Types of Transformation available			
Point of contact for the web services: organisation, contact person, email, telephone, fax				
Comments				

TREES-3

Table 13: Technical Questionnaire on TREES-3 information

Product Identification	
Product	Satellite imagery and Forest cover maps for TREES sample sites
Country	Tropical countries (+ potentially Russia / Mongolia)
Owner	European Commission, JRC
Already on a metadata catalogue	
No	
Data generator	For each sample site there will be several satellite images in GeoTIFF format + a forest map generated in shp format
Version (final, draft)	Presently draft versions.
Production date (dd/mm/yyyy)	Continuous production (because 4,000 sites to process and analyse in a semi-automatic way) Final versions expected by end of 2010 (Tropics) and 2011 (Russia).
Existing updates (yes, no)	Once the final version will be available, there will not be updates. Year 2010 will be processed last.
Type and frequency of update (If YES)	
Can product and corresponding information be published via the EuroGEOSS Forestry Portal? (yes, no)	Yes – when the final products will be available and results would have been published in scientific literature, the product can be published via the EuroGEOSS Forestry Portal
General dataset description (free text)	Satellite imagery and Forest cover maps for circa 4,000 sample sites (size 20 km x 20 km) in the Tropics (+ potentially 1,500 in Russia) for 3 dates (year 1990, 2000 and 2005-2010). Some further info is available at: http://bioval.jrc.ec.europa.eu/TREES/
Purpose of the data	Estimate forest cover change
Keywords	
Use constraints	See: http://bioval.jrc.ec.europa.eu/TREES/terms.php

	Citation requirements	
	Point of contact : organisation, contact person, email, telephone, fax	Frédéric Achard Global Forest Resource Monitoring Project (TREES-3) Joint Research Centre of the European Commission Address : CCR / TP 440, I-21027 Ispra (VA), Italy tel: +39-0332-78-5545 fax: +39-0332-78-9073 E-mail: frederic.achard(at)jrc.ec.europa.eu
	Time period	
Yes		
	Which system's catalogue	Note that our intention is to create a metadata catalogue in 2010 and to follow spatial / GIS standards like ISO19115. Any suggestion in this respect will be welcomed.
	Catalogue URL and protocol (if harvestable)?	(not published yet)
Data description		
	Data (digital or analogue)	Digital
	Geometry (point, line, polygon, raster)	Raster (satellite imagery) and polygon (forest maps)
	Geographic projection	UTM for satellite imagery and Lat/long (ie 'geographic' projection) for maps
	Geographic coordinate system	
	Spatial extent of data (international, national, regional)	International
	Existing data format/GIS or Database platform	Yes
	Available data format for end users	GeoTIFF for satellite imagery and Shapefile for forest maps
	Comments	
Attributes description per Data description		
	Identify scale (for polygons,	Scale: 5ha 'Minimum mapping Unit' for Polygons

lines)/density (points)/ resolution (raster)	spatial resolution: 30m for satellite imagery
Attribute theme identification (= data name)	
May be for each attribute: name, alias, type, width, precision and visibility scale?	
Classification system (if relevant)	Thematic Land cover classes: Tree cover (forest), Shrub, other vegetation cover, water, clouds, no data;
Forest survey/Forest data interpretation methodology used (if relevant)	interpretation methodology: (i) initial automatic classification (labelling) using E-Cognition and a in-house spectral library, (ii) then visual validation of Land cover classes by experts (in-house or externals)
Analytical methods (if relevant)	
Comments	
Web Service description	
If metadata/data exists (identified above) and no service is yet available to publish it, it is foreseen to implement one in the future? If yes, when?	A web service is foreseen – to be developed in 2010 (around the end of 2010). A pilot Web site has been already developed (for illustrative purpose). See: http://bioval.jrc.ec.europa.eu/TREES/proc/page.php Note that FAO will publish a similar (but different) dataset – partly based on JRC inputs – see FAO RSS portal at: http://www.fao.org/forestry/fra/58438/en/
The service is part of an existing system or application already in place (yes/no)	No
Yes	
Name of Application or System	

	URL address	
Web link (URL address)		
GIS technology (underneath)		
Type of service (exposed)		
Search/Discovery Service	Protocols	
	Versions	
	Metadata types	
	Restrictions (if any)	
Viewing Service (WMS/WCS)	Protocols	
	Versions	
	Data types	
	Restrictions (if any)	
	SLD support	
Download Service (WFS)	Protocols	

	Versions	
	Data Types	
	Restrictions (if any)	
Transformation Service (WPS)	Protocols	
	Versions	
	Types of Transformation available	
Point of contact for the web services: organisation, contact person, email, telephone, fax		
Comments		

National Data Sets

Table 14: Technical Questionnaire on Spanish National and Interregional information

SPANISH NATIONAL DATASETS AND WEB SERVICES REGARDING FORESTRY (AND RELATED TOPICS)

Spatial Dataset (brief description)	Supplier	Spatial scale	Temporal resolution	OGC (WMS) service	OGC (WFS) service	Downloading services	Contacts	Observations
				(if exists, provide URL for getCapabilities)	(if exists, provide URL for getCapabilities)	(type and format of data download)		
CORINE Land Cover	Instituto Geográfico Nacional	1/100,000	1990, 2000	http://www.idee.es/wms/IGN-Corine/IGN-Corine?		gif, png, jpeg	idee@ign.es	Includes Corine90, Corine2000 and the changes from period 1990-2000
National Airborne Orthophotography Plan (Plan Nacional de Ortofotografía Aérea)	Instituto Geográfico Nacional	1/20,000	2006	http://www.idee.es/wms/PNOAP/NOA?		gif, png, jpeg	idee@ign.es	This WMS covers with orthophotographies the whole country. It can be very interesting in order to carry out some qualitative analysis as well as a background.
National Crops Map 1980- 1990 (Mapa de Cultivos 1980-1990)	Ministerio de Medio Ambiente y Medio Rural y Marino.	1/50,000	1980-1990	http://wms.marm.es/sig/MapaCultivos/wms.aspx?		png, png24, gif, jpeg,tiff, wbmp, svg+xml	-	
National Crops Map - 2000-2009 (Mapa de Cultivos Actualización 2000-2009)	Ministerio de Medio Ambiente y Medio Rural y Marino.	1/50,000	2000-2008	http://wms.marm.es/sig/CultivosActualizacion/wms.aspx?		png, png24, gif, jpeg,tiff, wbmp, svg+xml	-	

<p>EUROPARC-Spain (Federación de Parques Nacionales Naturales de Europa - Sección España)</p>	<p>Europarc Federation - Spanish Section in collaboration with Fundación Biodiversidad and Ministerio de Medio Ambiente y Medio Rural y Marino, with datasets from different public administrations.</p>	<p>It depends on the dataset.</p>	<p>It depends on the dataset.</p>	<p>http://www.opengis.uab.es/cgi-bin/europarc/MiraMon5_0.cgi?</p>		<p>gif, png, jpeg</p>	<p>oficina@europarc-es.org</p>	<p>Includes several layers of information about protected areas provided by the different public administrations of Spain: CLC2000, Landsat images, Toponyms regarding protected areas, National Parks and Nature Reserves, Spanish microreservers, Spanish SCIs, Spanish SPAs, etc.</p>
<p>Forest Map of Spain (Mapa Forestal de España)</p>	<p>Ministerio de Medio Ambiente y Medio Rural y Marino - Dirección General de Medio Natural y Política Forestal</p>	<p>1/50,000</p>	<p>1997-2006</p>	<p>http://servicios2.mma.es/wmsconnector/com.esri.wms.Esrimap/BIODIV_MFE?</p>		<p>gif, png, jpeg</p>	<p>brfranco@mma.es</p>	<p>This map is carried out in periods of 10 years, covering 5 province per year. The downloading is not free. It still does not cover Andalucía Region. The information from Canarias: http://servicios2.mma.es/wmsconnector/com.esri.wms.Esrimap/BIODIV_MFE28?. It is not available at each scale: only at scales bigger than 1:50,000.</p>

<p>Protected Natural Areas of Spain (Espacios Naturales Protegidos)</p>	<p>Ministerio de Medio Ambiente y Medio Rural y Marino - Dirección General de Medio Natural y Política Forestal</p>	<p>1/50,000</p>	<p>2007-2008</p>	<p>http://servicios2.mma.es/wmsconnector/com.esri.wms.Esrimap/BIODIV_ENP?</p>		<p>gif, png, jpeg</p>	<p>brfranco@mma.es</p>	<p>The downloading is free - in SHP format. The information from Canarias: http://servicios2.mma.es/wmsconnector/com.esri.wms.Esrimap/BIODIV_ENP28. Not sure if it works correctly at this time.</p>
<p>RedNatura2000 of Spain</p>	<p>Ministerio de Medio Ambiente y Medio Rural y Marino - Dirección General de Medio Natural y Política Forestal</p>	<p>1/50,000</p>	<p>1997-2007</p>	<p>http://servicios2.mma.es/wmsconnector/com.esri.wms.Esrimap/BIODIV_RED_NATURA?</p>		<p>gif, png, jpeg</p>	<p>brfranco@mma.es</p>	<p>Among its layers, there are Protected Areas, SCI and a SPA data layers regarding RedNatura 2000. Downloading is free in SHP format. The information from Canarias: http://servicios2.mma.es/wmsconnector/com.esri.wms.Esrimap/BIODIV_RED_NATURA28. It is not available at each scale: only at scales bigger than 1:2,500,000.</p>

INTERREGIONAL DATASETS AND WEB SERVICES REGARDING FORESTRY (AND RELATED TOPICS)								
Spatial Dataset (brief description)	Supplier	Spatial scale	Temporal resolution	OGC (WMS) service (if exists, provide URL for getCapabilities)	OGC (WFS) service (if exists, provide URL for getCapabilities)	Downloading services (type and format of data download)	Contacts	Observations
OTALEX (Observatorio Territorial Alentejo-Extremadura)	Spanish and Portuguese Regional and National Administrations		2007	http://62.175.255.25:8081/geoserver/wms?		png, png24, gif, jpeg,tiff, wbmp, svg+xml	-	Spanish-Portuguese SDI project with a CLC layer among others. More info in the mail.

Regional Datasets

Table 15: Technical Questionnaire on Spanish Regional Information

SPANISH REGIONAL DATASETS AND WEB SERVICES REGARDING FORESTRY (AND RELATED TOPICS)								
Spatial Dataset (brief description)	Supplier	Spatial scale	Temporal resolution	OGC (WMS) service	OGC (WFS) service	Downloading services	Contacts	Observations
				(if exists, provide URL for getCapabilities)	(if exists, provide URL for getCapabilities)	(type and format of data download)		
ANDALUCÍA								
Vegetation series map of Andalucía (Mapa de Series de Vegetación de Andalucía)	Consejería de Medio Ambiente of Junta de Andalucía	1/400,000	2004	http://www.juntadeandalucia.es/medioambiente/mapwms/REDIAM_Series_Vegetacion_Andalucia?		png, png24, gif, jpeg,tiff, wbmp, svg+xml	rediam.cma@juntadeandalucia.es	
Land Use and Vegetation Coverage Map of Andalucía 1999 (Mapa de Usos y Coberturas Vegetales del Suelo de Andalucía 1999)	Consejería de Medio Ambiente of Junta de Andalucía	1/400,000 1/50,000	1999	http://www.juntadeandalucia.es/medioambiente/mapwms/REDIAM_Usos_Suelo_Vegetacion_Andalucia_1999?		png, png24, gif, jpeg,tiff, wbmp, svg+xml	rediam.cma@juntadeandalucia.es	
Natural Vegetation Map of Andalucía (Mapa de Vegetación Natural de Andalucía)	Consejería de Medio Ambiente of Junta de Andalucía		1999	http://www.juntadeandalucia.es/medioambiente/mapwms/REDIAM_Vegetacion_Natural_Andalucia?		png, png24, gif, jpeg,tiff, wbmp, svg+xml	rediam.cma@juntadeandalucia.es	In this dataset the forestry resources of Andalucía are highlighted, because it was created using the dataset #2 and the National

								Forestry Map.
Landscapes Map of Andalucía (Mapa de Paisajes de Andalucía)	Consejería de Medio Ambiente de Junta de Andalucía	1/400,000	1995 ?	http://www.juntadeandalucia.es/medioambiente/mapwms/REDIAM_Paisajes_Andalucia?		png, png24, gif, jpeg,tiff, wbmp, svg+xml	rediam.cma@juntadeandalucia.es	One of the layers available is the forestry coverage.
Land Use Capacity Map of Andalucía (Mapa de Capacidad de Uso de Suelo de Andalucía)	Consejería de Medio Ambiente de Junta de Andalucía			http://www.juntadeandalucia.es/medioambiente/mapwms/REDIAM_Capacidad_Uso_Andalucia?		png, png24, gif, jpeg,tiff, wbmp, svg+xml	rediam.cma@juntadeandalucia.es	It can be of interest if some studies about improductive land are going to be carried out.
Biodiversity Map of Andalucía (Mapa de Biodiversidad de Andalucía)	Consejería de Medio Ambiente de Junta de Andalucía	1/400,000		http://www.juntadeandalucia.es/medioambiente/mapwms/REDIAM_Biodiversidad_Andalucia?		png, png24, gif, jpeg,tiff, wbmp, svg+xml	rediam.cma@juntadeandalucia.es	It reflects the diversity, variation and the relative abundance of species and habitats. I think it can be very interesting because includes vegetation and fauna biodiversity information.
CANARIAS								
Vegetation Map of the Canary Islands (Mapa de Vegetación de	Gobierno de Canarias	Based on 1/20,000 Topographic Maps and	It depends on the island: from 1998 to	http://idecan2.grafcan.es/ServicioWMS/Vegetacion?		png, gif	info@grafcan.com	

Canarias)		1/5,000 orthophotos	2003 with a partial revision in 2009					
Crops Map of the Canary Islands (Mapa de Cultivos de Canarias)	Gobierno de Canarias	Initially 1/5,000, recently 1/2,000	It depends on the island: from 2002 to 2005	http://idecan2.grafcan.es/ServicioWMS/Cultivos?		png, gif	info@grafcan.com	Reference Dates: El Hierro: 2005. La Palma: 2002. La Gomera: 2003. Tenerife: 2004. Gran Canaria: 2005. Fuerteventura: 2003. Lanzarote: 2004
Land Cover Map of the Canary Islands (Mapa de Ocupación del Suelo)	Gobierno de Canarias	Based on 1/18000 photogrammetric flight	2002	http://idecan2.grafcan.es/ServicioWMS/MOS?		png, gif	info@grafcan.com	
Protected Natural Areas Boundaries (Límites de Espacios Naturales Protegidos)	Gobierno de Canarias		Depending on every protected area	http://idecan2.grafcan.es/ServicioWMS/EspNat?		png, gif, png24	info@grafcan.com	
Sites of Community Importance (SCI) of the Canary Islands (Lugares de Importancia Comunitaria (LIC) de Canarias)	Gobierno de Canarias		2008	http://idecan2.grafcan.es/ServicioWMS/LIC?		png, gif, png25	info@grafcan.com	Contains the sites which, in the biogeographical region or regions to which it belongs, contributes significantly to the maintenance or restoration at a favourable conservation status of a natural habitat type or of a species

								and/or contributes significantly to the maintenance of biological diversity within the biogeographic region or regions concerned.
Protected Natural Areas Management Plan (Ordenación de Espacios Naturales Protegidos)	Gobierno de Canarias		Depending on every protected area	http://idecan2.grafcan.es/ServicioWMS/ENP_ORD?		png, gif	info@grafcan.com	
Special Protection Area (SPA) (Zonas de Especial Protección para las Aves (ZEPA))	Gobierno de Canarias		2008	http://idecan2.grafcan.es/ServicioWMS/ZEPA?		png, gif, png25	info@grafcan.com	Natural areas of singular relevance for the conservation of threatened wild birds, according to the 79/409/CEE Directive and subsequent modifications.
CASTILLA Y LEÓN								
Corine Land Cover of Castilla y León	Consejería de Fomento of Junta de Castilla y León.	1/100,000	2000	http://www.sitcyl.jcyl.es:80/wms/com.esri.wms.Esrimap/CorineLC2000		png, gif, tif, bmp, jpeg	corgonor@jcyl.es	
Natural Areas (Espacios Naturales)	Consejería de Medio Ambiente of			http://www.sitcyl.jcyl.es:80/wms/com.esri.wms.Esrimap/EspaciosNaturales		png, gif, tif, bmp, jpeg	corgonor@jcyl.es	

	Junta de Castilla y León.							
CATALUÑA								
Ecological and Forestry Inventory of Catalonia (Inventario Forestal y Ecológico de Cataluña)	CREAF- Universitat Autònoma de Catalunya			http://www.creaf.uab.es/cgi-bin/MiraMon5_0.cgi?		gif, png, jpeg	joan.maso@uab.es	In this WMS there are three different layers: the Ecological and Forestry Inventory layer, the Land Cover layer and the Crops and Land Use layer.
Web Map Server of Biodiversity data bank of Catalonia (WMS del Banco de Datos de Biodiversidad de Cataluña)	Generalitat de Catalunya and Universitat de Barcelona			http://biodiver.bio.ub.es/biowms/serviciflora? http://biodiver.bio.ub.es/biowms/servicein?		jpeg, png, gif	xfont@ub.edu	Very interesting data bank with a multilinguistic geoportal.
NAVARRA								
Spatial Data Infrastructure of Navarra (IDENA)	Gobierno de Navarra - TRACASA		It depends on the dataset	http://idena.navarra.es/ogc/wms.aspx		png, jpeg	webmaster.idena@tracasa.es	In this WMS there are a number of layers regarding geographic information. With respect to forestry, there is a vegetation series layer, some Land Use and Crops layers, some protected areas layers, and others regarding biodiversity.

VALENCIA								
Habitats of Valencia (Habitats de la Comunidad Valenciana)	Conselleria de Medi Ambient, Aigua, Urbanisme i Habitatge of Generalitat Valenciana	1/50,000	1997	http://orto.cth.gva.es/wmsconnector/com.esri.wms.Esrimap/wms_habitats		png, jpeg	cartografia_ctv@gva.es	Metadata describing the dataset according ISO19115 are accessible, but only in Spanish and Valencian. Only the web service is available, the access to the dataset is restricted.
Detailed Forestry Inventory of Valencia (Inventario forestal de la Comunitat Valenciana (detallada))	Conselleria de Medi Ambient, Aigua, Urbanisme i Habitatge of Generalitat Valenciana	1/10,000	2007	http://orto.cth.gva.es/wmsconnector/com.esri.wms.Esrimap/wms_invfor?		png, jpeg	cartografia_ctv@gva.es	Metadata describing the dataset according ISO19115 are accessible, but only in Spanish and Valencian. Only the web service is available, the access to the dataset is restricted.
Less Detailed Forestry Inventory of Valencia (Inventario forestal de la Comunitat Valenciana (grosera))	Conselleria de Medi Ambient, Aigua, Urbanisme i Habitatge of Generalitat Valenciana	1/200,000	2007	http://orto.cth.gva.es/wmsconnector/com.esri.wms.Esrimap/wms_invfor?		png, jpeg	cartografia_ctv@gva.es	Metadata describing the dataset according ISO19115 are accessible, but only in Spanish and Valencian. Only the web service is available, the access to the dataset is restricted.

Sites of Community Importance (SCI) Valencia (Lugares de Importancia Comunitaria (LIC) Valencia)	Conselleria de Medi Ambient, Aigua, Urbanisme i Habitatge of Generalitat Valenciana	1/50,000	2001	http://orto.cth.gva.es/wmsconnector/com.esri.wms.Esrimap/wms_lis?		png, jpeg	cartografia_ctv@gva.es	Metadata describing the dataset according ISO19115 are accessible, but only in Spanish and Valencian. Only the web service is available, the access to the dataset is restricted.
Flora Microreserves of Valencia (Microrreservas de flora de la Comunidad Valenciana)	Conselleria de Medi Ambient, Aigua, Urbanisme i Habitatge of Generalitat Valenciana	1/10,000	2005-2009	http://orto.cth.gva.es/wmsconnector/com.esri.wms.Esrimap/wms_microrreservas?		png, jpeg	cartografia_ctv@gva.es	Metadata describing the dataset according ISO19115 are accessible, but only in Spanish and Valencian. Only the web service is available, the access to the dataset is restricted. This WMS shows the areas corresponding to threatened and reare botanic species in Valencia.
Nature Reserves Valencia (Parques Naturales Valencia)	Conselleria de Medi Ambient, Aigua, Urbanisme i Habitatge of Generalitat Valenciana	1/10,000	1987-2007	http://orto.cth.gva.es/wmsconnector/com.esri.wms.Esrimap/wms_parques_naturales?		png, jpeg	cartografia_ctv@gva.es	Metadata describing the dataset according ISO19115 are accessible, but only in Spanish and Valencian. Only the web service is available, the access to the dataset is restricted.

<p>Woodland managed by Conselleria de Medi Ambient, Aigua, Urbanisme i Habitatge of GV-National Forest Information for Valencia (Montes gestionados por la C.M.A.A.U.V. - Información forestal nacional)</p>	<p>Conselleria de Medi Ambient, Aigua, Urbanisme i Habitatge of Generalitat Valenciana</p>	<p>Depending on the dataset</p>	<p>1997-2006</p>	<p>http://orto.cth.gva.es/wmsconnector/com.esri.wms.Esrimap/wms_montesgcmaauv?</p>		<p>png, jpeg</p>	<p>cartografia_ctv@gva.es</p>	<p>Metadata describing the dataset according ISO19115 are accessible, but only in Spanish and Valencian. Only the web service is available, the access to the dataset is restricted. This WMS contains some layers: the National Forestry Inventory N° 3 and National Forestry Map at 1/50,000 - restricted to Valencia area- and the information regarding woodlands managed by CMAAUV at 1/10,000</p>
<p>Gazetteer Service of Valencia - WFS SGM 1.2 (Servicio Nomenclator C.M.A. - WFS-MNE v1.2)</p>	<p>Conselleria de Medi Ambient, Aigua, Urbanisme i Habitatge of Generalitat Valenciana</p>	<p>Depending on the dataset</p>	<p>Depending on the dataset</p>		<p>http://nomenclator.cma.gva.es/deegree-wfs/services?</p>	<p>xml, gml 3.1.1</p>	<p>asistenciagis2.ctv@gva.es</p>	<p>It allows queries by name, coordinates, municipality and entity. A web client - search engine like- is provided in order to simplify the query. In the geoportal there are as well some examples of how to invoke the service via HTTP GET and POST.</p>

ISLAS BALEARES								
Bioatlas (Bioatles)	Conselleria de Mobilitat i Ordenació del Territori of Govern de les Illes Balears	1x1 km and 5x5 km		http://ideib.caib.es/pub_ideib/public/TEMATIC-BIOATLES/MapServer/WMSServer?		bmp, jpeg, tiff, png, gif, svg + xml	sitibsa@sitibsa.com	Forestry inventory of the Balearic Islands with 5x5 km and 1x1 km spatial resolution
Hidrology (Hidrologia)	Conselleria de Mobilitat i Ordenació del Territori of Govern de les Illes Balears			http://ideib.caib.es/pub_ideib/public/TEMATIC-HIDROLOGIA/MapServer/WMSServer?		bmp, jpeg, tiff, png, gif, svg + xml	sitibsa@sitibsa.com	WMS with three layers group: subterranean and superficial hidrology and drainage network. One of the layers available covers the bank forestry.
LA RIOJA								
Rioja Spatial Data Infrastructure WMS (WMS IDERioja)	Dirección General de Política Territorial of Gobierno de La Rioja	Depending on the dataset	Depending on the dataset	http://wms.larioja.org/request.asp		png, jpeg	sig@larioja.org	Regional WMS with several thematic layers of interest: Forestry Map, SCIs, Protected Areas, CLC, Nature reserves, etc. All is documented with Metadata ISO 19115. Forestry layer at 1/10,000 scale and reference date 2002.
MURCIA								
Territorial Information System of Murcia (SIT Murcia)	Consejería de Obras Públicas y Ordenación del Territorio, D.G. de	1/5,000		http://massotti.carm.es/wmsconnector/com.esri.wms.Esrimap/wms		png, gif, tif, jpeg, bmp	-	Among its layers, there are Protected Areas, SIC and a SPA data layers regarding

	Territorio y Vivienda of Región de Murcia							RedNatura 2000. SPA data from 2005.
RedNatura 2000 of Murcia (RedNatura 2000 de la Región de Murcia)	Consejería de Agricultura y Agua, Dirección General de Patrimonio Natural y Biodiversidad of Región de Murcia			http://mirto.medioambiente.carm.es:8080/wmsconnector/com.esri.wms.Esrimap?ServiceName=rednaturaortos		png, gif, tif, jpeg	medioambiente@listas.carm.es	Among its layers, there are Protected Areas, SIC and a SPA data layers regarding RedNatura 2000. SPA data from 2005.

Local datasets

Table 16: Technical Questionnaire on Spanish Local Information

SPANISH LOCAL DATASETS AND WEB SERVICES REGARDING FORESTRY (AND RELATED TOPICS)								
Spatial Dataset (brief description)	Supplier	Spatial scale	Temporal resolution	OGC (WMS) service (if exists, provide URL for getCapabilities)	OGC (WFS) service (if exists, provide URL for getCapabilities)	Downloading services (type and format of data download)	Contacts	Observations
ANDALUCÍA								
Digital Cartography for the National Park of Doñana Monitoring (Cartografía Digital de Seguimiento del Parque Nacional de Doñana)	Laboratorio de Sistemas de Información Geográfica y Teledetección de la Estación Biológica de Doñana (CSIC)			http://mercurio.ebd.csic.es/cgi-bin/seguimiento/MiraMon5_0.cgi?		gif, png, jpeg	rdiaz@ebd.csic.es	This WMS provides different layers about forestry, fauna, etc., related to Doñana.
CANARIAS								
Forest Cartography of La Palma (Cartografía Forestal de la Isla de La Palma)	Cabildo Insular de La Palma			http://www.mapasdelapalma.es/cgi-bin/mapserv?map=/home/cabildo/maps/wms_cabildo_forestal.map		png, png24, gif, jpeg,tiff, wbmp, svg+xml	sig@cablapalma.es	Forestry data from different sources (Regional government, local government, etc.) restricted to La Palma island. It provides forest fire information as well. Reference dates: 1999, 2000 and 2005.

Protected Areas of La Palma (Áreas protegidas de La Palma)	Cabildo Insular de La Palma			http://www.mapasdelapalma.es/cgi-bin/mapserv?map=/var/www/maps/cabildo/wms_cabildo_areas_prottegidas.map		png, png24, gif, jpeg,tiff, wbmp, svg+xml	sig@cablapalma.es	Some layers are directly provided by the local administration (National Parks and Marine Reserves)
Vegetation Map of La Palma (Mapa de Vegetación de La Palma)	Cabildo Insular de La Palma			http://www.mapasdelapalma.es/cgi-bin/mapserv?map=/var/www/maps/cabildo/wms_cabildo_vegetacion.map		png, png24, gif, jpeg,tiff, wbmp, svg+xml	sig@cablapalma.es	Information from IDECanarias, restricted to La Palma island.
Forest Cartography of Tenerife (Cartografía Forestal Cabildo Tenerife)	Cabildo de Tenerife		2008	http://atlastenerife.es/MAPSERV/ER/cgi-bin/mapserv_VIS-00000198.exe?			atlas@tenerife.es	
Potential Vegetation of Tenerife (Vegetación Potencial del Cabildo de Tenerife)	Cabildo de Tenerife		2003	http://atlastenerife.es/MAPSERV/ER/cgi-bin/mapserv_VIS-00000195.exe?			atlas@tenerife.es	
Habitats of Tenerife	Cabildo de Tenerife		2006	http://atlastenerife.es/MAPSERV/ER/cgi-bin/mapserv_VIS-00000186.exe			atlas@tenerife.es	
Special Protection Area (SPA) of Tenerife (Zonas de Especial Protección para las Aves (ZEPA))	Cabildo de Tenerife		2007	http://atlastenerife.es/MAPSERV/ER/cgi-bin/mapserv_VIS-00000204.exe			atlas@tenerife.es	



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Project title: EuroGEOSS, a European approach to GEOSS
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