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**COUNTRY REPORT OF ITALY\***

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# **COUNTRY REPORT OF ITALY**

## **1. Summary**

The geospatial data are now recognized as a key component for the development of society, in relation to the prospects of market development and new jobs as they depend upon the availability of geospatial information on the network. In the coming years, geospatial information is going to play a central role in many themes such as: the process of reorganization and modernization of public administration, local, regional and national, concerning the management of land resources and environmental services of public interest; the development of many applications that involve the use of common geographic references and access to various available geospatial databases and finally the creation and dissemination of new media necessary to capacity building, both scholastic and professional. In this context, it is evident the need of using the wealth of information and experience already available, but it is also evident, at the same time, to evaluate the identification of profound changes in the manner and time required for data acquisition, their certification, their updating. The commitment, therefore, is to provide the appropriate conditions to ensure the availability of a minimum set of geospatial data that correspond to those of more widespread use for most users.

The present document summarizes the main activities developed by Italy in the fields of geospatial information as carried out by different stakeholders.

## **2. The governance of geospatial information**

The Italian legislation individuates five Cartographic Organs of State (Law 2 February 1960, n. 68): IGM-Military Geographic Institute, the Navy Hydrographic Institute-IIM, the Aeronautical Geo-topographic Information Centre-CIGA, the Agency for Territory and the Geological Survey (now part of ISPRA – Ministry of the Environment, Land and Sea). In addition there operate also various Agencies and national and regional structures, which produce geographic information and maps of various kinds, in a context of norms and rules not always clear and consistent.

A Decree dated 10 November 2011 has set the technical rules to define the content of the National Spatial Data Repository, and the procedure for the its first creation and updating. It also defines the procedures for access, communication and the population Repertoire by Public Administrations, in line with Directive 2007/2/EC (INSPIRE) and Regulation (EC) n. 1205/2008 of the European Commission's December 3, 2008.

The following table lists the data of general interest (and their definitions) that Administrations are required to document in the National Spatial Data Repository according to technical rules defined in the above mentioned Decree.

### **Data of general interest:**

#### **1 DB of priority layers**

Database built according to the specifications identified in the Agreement between State, Regions, Local Authorities on Geographic Information Systems (Intesa GIS). Composed of the information layers Traffic, Railway Road, Hydrography, Areas administrative centers and settlements.

## **2 Topographic DB (at large and very large scale)**

Database produced according to the Intesa GIS spec's and the like. The layers of information covered include: geodetic information, photogrammetric and meta-information; traffic, mobility and transport properties; Traffic management and addresses; hydrography, topography, vegetation, technological networks, and significant places, written cartographic administrative areas, areas of relevance.

## **3 Topographic DB (at medium scale - 1:25.000 to 1:50.000)**

IGM map databases produced to their specifications. The layers of information typically covered include: transport, hydrography, administrative boundaries, natural, built elements, vegetation, geomorphological elements, industries, services, elevation items and quality data, uniform thematic, describing its special geographical with the corresponding attributes.

## **4 Oceanographic DB**

Physical conditions of oceans (currents, salinity, wave height, etc..) and seas and saline water bodies divided into regions and sub-regions with common characteristics.

## **5 Regional technical numeric map**

Detailed topographic map based on coordinates archives which describe the geometry of the objects and codes able to identify their kind. It represents the official large scale basic cartography. According to the national rules it is the duty of Regions and Autonomous Provinces.

## **6 Topographic maps – IGM**

They are the official national maps with 1:25.000 and 1:100.000 scale; they are derived from the 1:25.000 map. They are the IGM duty.

## **7 Chorographic maps – IGM**

They show regions and/or large territories with scales between 1:100.000 and 1:1.000.000. As an example the “Map of Italy” is the corographic map produced by IGM with a 1:250.000 scale; other examples are the map “Il Mondo (the World) 1404 series 500 and “Series 1000DB-Il Mondo (the World) 1301-1

## **8 Coordinate systems**

They are used to uniquely assess the territorial information in the space as a whole of (x,y,z) coordinates and/or latitude, longitude, elevation based on a geodetic horizontal and vertical datum

## **9 Geodetic networks and monographs of geodetic elements**

They are a network of points whose coordinates are known respect to a common geodetic reference system; they are utilized to obtain a correct dimension and orientation of the topo-cartographic datum concerning a quite large area and related monographies. They include and network such as IGM 95 and those at regional level

## **10 Sampling frames of grids**

They are used either to select groups of points which will be sampled or to produce statistical information at territorial level

## **11 DB grid**

Grid used to evaluate underwater ground with a defined and constant scale which depends from the sampling scale

## **12 Assess grids**

They are a uniform grid with regular cells useful to freeze and transfer the coordinates from a reference system to another one

## **13 Toponomastic Archive**

An archive containing the identification (names) of the geographic places

## **14 Administrative boundaries**

Territorial boundaries within which the jurisdiction relative to a specific administrative function is applied: they are individuated both by the National Constitution and by the D. Lgs. 267/2000. They are: regions, provinces, municipalities, metropolitan towns, mountain communities, island communities, any possible ad hoc merging of districts and any merging of sub-entities of municipalities

## **15 National Water and base-line**

The national waters represent the portion of the national territory subject directly to the national government and which, added to the regions represent the complete Italian Republic territory. The base-line indicates the formal line from which the national waters are measured (DPR 816/77); it includes the coastal maps at any necessary scale and the littoral maps.

## **16 Limits of the basin Authority**

The national territory is divided in hydrographic basins which are classified as: national relevance, interregional and regional relevance (Law 183/89)

## **17 Limits of “Improvement” Consortia**

They indicate the geographic boundaries of the Consortia which are created under specific regional deliberation according to art. 59, R.D. 13/2/1933 n.215

## **18 ASL and medical Districts Boundaries**

ASL (Azienda Sanitaria Locale) represents a group of hospitals or medical centers; the boundaries indicate the portion of territory pertaining to a single entity

## **19 Addresses and streets numbers**

The localization of accesses is based on the identification of the full address (name of the street or square and specific street number) as indicated in the municipality street archive; if necessary identification number of the specific apartment

## **20 Streets Archive**

Archive of streets and squares of every place including the necessary geographic identification

## **21 Cadaster parcels**

A portion of land or construction, geometrically identified, located in a specific municipality, which is a property of an owner, characterized by a specific subject of activity and having an identified tax income

## **22 Connection networks**

Networks allowing the movement of persons and goods: roads, railways, rivers and basins, air, maritime movements. It contains the geographical representation with the pertinent infrastructures including also the maps of ports and harbors.

## **23 Hydrographic frame**

The global rainfall lines and rivers of any importance present within a basin; it includes both natural and artificial frames.

## **24 Hydrographic basins**

An area delimited by mountains or hills acting as a water-sharing; in the area do flow all the surface waters (rivers and/or lakes) finally arriving to the coast with different possible mouths, estuary and delta.

## **25 Water Basins**

They indicate the geometry and/or the characteristics of “surface” water locations (lakes, ponds, marshes, lagoons, artificial lakes); the maps of lakes at different scales are also considered in this item.

## **26 Springs**

Natural water outcomes, relevant in rate, which comes out in a permeable material as the piezometer surface of the water layer crosses the topographic surface.

## **27 Glaciers**

They indicate the surface of glaciers, ice depositories which are formed on the mountains and at high latitude due to snow accumulation and its subsequent re-crystallization

## **28 Underground water**

Water being below ground surface in the permanent saturation zone directly in contact with either the ground or the underground (Directive 2000/60/CE)

## **29 Hydrologic Archives**

Archives of monographs reporting information about hydrologic items or structures of some hydrological interest.

## **30 Sites of European Community Interest, SIC, Areas of Special Protection, ZPS**

SIC: areas defined to maintain or recover a specific natural habitat or a specific animal species according to Habitat Directive 92/43/CE

ZPS: territories/areas found as the most suitable to preserve birds species as individuated by the Birds Directive 79/409/CEE; they include areas individuated by Regions (pSIC and pZPS)

## **31 Parks and Protected Areas**

Their geographical extension is defined following the classification of the Framework Law 394/91; they are: national parks, regional natural parks, natural reserves (ground, rivers, basins and marine) as well as all the protected areas as identified by the regional laws on the subject.

## **32 Archeological and/or paleontological sites**

They are areas characterized either by the presence of fossile remnants or by prehistoric or ancient remnants (D. Lgs. January 22<sup>nd</sup> 2004, n.42)

## **33. Cultural environmental goods**

Any good, construction or other presenting an interest in art, history, archeology, ethno-anthropology, archive, bibliography; and any other item identified by law as a potential proof of civilization validity (D. Lgs January 22<sup>nd</sup> 2004, n. 42)

## **34 Digital Height Model**

Digital representation of the ground morphology; they include DTM, DEM, DSM, DTED types and similar ones.

### **35 Orographic data**

They represent the reliefs of a territory, both those on the ground and those submarine such as level curves, quoted points, bathymetry and so on.

### **36 Coverage and use of the ground Maps**

They show the ground cover and use characteristics; it includes CORINE Land Cover Project Maps.

### **37 Thematic Maps of vegetation coverage**

They show the different kinds of vegetation such as, for example, Vegetation Map, Forest Map, Trees Map and so on.

### **38 Airplane Ortho-photos**

They are the result of a put back of images obtained by satellite observations

### **39 Satellite Ortho-photos**

They are the result of a put back of images obtained by satellite observations

### **40 Images non ortho-rectified**

Images of the Earth surface obtained by remote sensing techniques obtained from airplane platforms, satellite platforms or other instruments non ortho-rectified.

### **41 Further Remote Sensing data**

Other territorial data obtained by airplane, satellite platforms or other sensors.

### **42 Geological Map**

Cartographic information concerning the stratigraphy, the age, the petrographic properties of the geological elements which are investigated; this relating to the genesis and interactions with surroundings rocks by means of conventional symbols and colors indicated on the corresponding topographic base.

### **43 Geo-thematic Maps**

They are the geo-morphologic, geo-lithological and hydro-geologic maps.

### **44 Structural Model**

It represents the schematic cartography of the structural unities at a regional scale as well as of the main tectonic elements.

### **45 Geological soundings Archives**

Archives reporting the stratigraphy of geologic soundings performed deeper than 30 meters.

### **46 Cadastral registration sections**

Portions of the municipality area which identify the minimum territorial unity suitable to collect cadastral data for municipalities

### **47 Area with presence of population**

Area of various dimensions, indicated by a specific name, where there are one or more houses which can be grouped or dispersed.

### **48 Area with the presence of work activities**

Area situated externally of a town where there are present local unities larger than 10, or characterized by a number of workers larger than 200; they must be in the vicinity of streets,

squares or similar structures being separated by a maximum distance not longer than 200 meters.

#### **49 Grid sampling frame**

It is used to select samples of points to be submitted to a statistical analysis or used to produce territorial statistical information.

#### **50 Further statistic Units**

Other kinds of units, different from those taken into consideration from Cadastral Sections and from places, used in statistics analyses.

#### **51 Buildings**

Structures which are uniform, with a specific manufacturing which can have different kinds of use. Its geographic location is represented by points or by a polygonal area indicating the ground coverage.

#### **52 Soil Maps**

It represents the synthesis document obtained by the pedologic analysis; it is a basic instrument to provide the first indications of soils attitude.

#### **53 Position and slope measures map**

It contains all information regarding the orientation versus the sun, slopes and any other characteristic concerning the surface configuration and its orientation.

#### **54 Ground use Map**

It indicates the classification of primary use of soils which are grouped according to uniform characteristics: i.e., industrial, residential, commercial etc..

#### **55 Zone assessment of the urban territory**

The urban area is divided in portions expected to serve different functions following the planning of the urban and territorial instruments.

#### **56 Black water purifiers and manifolds**

Localize plants and infrastructures operating to collect and purify water.

#### **57 Centers for materials collection, destruction and recover**

Geographical identification of areas where to install structures able to securely collect, destroy and recover different materials.

#### **58 Hospitals and medicine centers**

Localization of specific structures where host and care ill and blessed people.

#### **59 Health care Structures and Districts**

Localization of the structures which organize health care in their territory assuring high level medical services.

#### **60 Pharmacies**

Localize structures where medicines are sold.

#### **61 Schools**

Localize institutions operating to provide education and instruction.

**62 Marine Technological Networks**

Localize underwater structures which distribute and collect energy, gas and telecom.

**63 Ground Technological Networks**

Localize structures on the ground which distribute and collect energy, gas, water and telecom.

**64 Civil Protection operational structures locations**

Localization of the Civil Protection structures which provide the direction, the coordination and the production of services to support and assist the population in occasion of any kind of emergencies.

**65 Institutional locations**

Localization of the sites hosting the Italian Institutions.

**66 Hosting Structures**

Localization of structures, permanent or temporary, providing hospitality and food.

**67 Structures for leisure and sport**

**Localization of structures offering relax and sport activities.**

**68 Environmental measurement stations and networks**

Stations aimed to measure the presence, the effects or the level of pollutants in air or water, the level both of noise, radiation, subsidence or changes in vegetation.

**69 Data of Environmental Monitoring**

Archives of the environmental monitoring measurements.

**70 National accelerometric network**

Network of stations where medium and high intensity earthquakes are detected and measured (ground acceleration).

**71. National Seismic network**

Stations and networks where the current seismic activity is detected and measured (ground movements)

**72 Structures for water and hydro-carbons sounding**

Localization of sounding structures for water and hydro-carbons of industrial interest

**73 High risk industrial plants**

Localization of industrial plants where high risks, though with low probability, are possible thus generating disastrous effects.

**74 Marine Pads**

Localization of marine pads where hydro-carbons and/or materials of primary importance are treated or extracted.

**75 Farming**

Localization of specific possessions and their characteristic in which, private or public owners operate in agriculture, agro-food, forestry, breed animals and every activity is performed for commerce.

**76 Water production structures for agriculture**

Localization and characteristics of irrigation structures.



**77 High quality wine territories, DOC, IGT**

Localization and characterization of territories where wine is produced, included those responding to specific stringent constraints.

**78 Fishing and fish breeding plants**

**Localization and characteristics of plants dedicated to fishing or fish breeding or similar activities.**

**79 Population aggregated data of administrative and/or statistical units**

Archives containing data and statistical and demographic studies related to portions of the territory down to the minimum size of units as defined by the current legislation.

**80 Hydro-geologic limitations**

Indication of areas submitted to hydro-geologic limitations as from R.D.L. 3267/23 and regional forestry laws.

**81 Landscape, archeological and architectural constraints**

Indication of areas submitted to the limitations indicated by D.L. 42/2004 and further modifications 156/2006.

**82. Environment “Constraint”**

Indication of areas submitted to the limitations indicated by L. 431/85.

**83 Areas under limitations affected by fire**

They concerns areas affected by fires and listed by Law 353/2000 (fire cadaster).

**84 Seismic classification of Municipalities**

List of the Municipalities pertaining to one of the 4 “seismic zones” identified in Italy which require special construction norms following OPCM n.3274, March 20<sup>th</sup> 2003 and further regional assessments.

**85 Waste stocking Area**

Areas where different kinds of waste are stocked, Law 101/2008.

**86 Other areas under limitations or needing to follow special rules**

Areas under limitations or special rules due to specific norms.

**87 Acoustic territorial classification**

Identification of areas with acoustic pollution as defined by the Plan following Law 447/95 and further modifications as well as regional laws.

**88 Hydro-geologic risk and connected dangers (floods, landslides, overflows)**

Indication of potential danger and hydro-geologic risks related to the Hydro-geologic Assessment Plans, Law 180/98 and further modifications and integrations.

**89 Seismic identification parameters following the norms (ag, FO, Tc)**

New technical norms to be followed in building construction, Decree 14/01/2008

**90 Maps of the seismic risk at national territory scale**

Maps indicating the peak horizontal ground acceleration (ag) and the spectral values for different recover periods (PCM Ord. 3519, April 28<sup>th</sup> 2006, attach 1b) to be used in the new technical norms for buildings as approved by D. Min. 14/01/2008.

**91 Magnitudo and distance of Italian municipalities disaggregated seismic risk map**

Average and modal values as obtained by disaggregating the risk with periods of 475 years.

**92 Seismic risk maps of the Italian Municipalities**

Representation of the yearly estimated loss.

**93 Italian Municipalities seismic vulnerability Maps**

Maps indicating the number of houses and relative resident population per class of seismic vulnerability.

**94 Alert areas due to hydro-geologic and hydraulic risk**

Areas characterized by an homogeneous meteo-hydrologic response when affected by the occurrence of a specific kind of risk.

**95 Volcanic risk**

Representation of areas presenting a different degree of volcanic risk within the National Emergency Plan

**96 Coastal erosion**

Delimitation of areas potentially risking to be affected by coastal storms and progressive loss of material due to the action of the sea.

**97 Fire risk**

Delimitation of areas potentially risking fires according to statistical evidence and land characteristics correlated with anthropic presence (persons and goods).

**98 Avalanches, Snow/Ice sliding**

Representation, on a topographic base, of areas of maximum risk of snow/ice slides phenomena occurred in the past on the territory.

**99 Meteorological stations, sensors, radar, measuring points etc.**

Inventory of meteorological stations, sensors, radars, measuring points finalized to perform measurements of the atmosphere physical conditions.

**100 Hydro-meteorological measure stations**

Localization and archives of atmospheric, climatologic and meteorological measurements.

**101 Physiographic Units**

Representation of Units where the material which constitutes the coastal shore shows movements limited within the Unit itself or present exchanges with the near surroundings which are not affected by the remaining portion of coastal shore.

**102 Habitat**

Representation of areas assuring environmental conditions suited for life of animals and vegetation.

**103 Naturalistic Catalog**

Species, habitat and phyto-kenosis data bank having a conservation interest.

**104 Forestry Archive**

Monograph archive of researches aimed to know the entity and quality of the national forest resources.

**105 Areas with presence of fauna species**

Distribution of the animal species on the national territory.

**106 Areas with presence of vegetation species**

Distribution of the vegetation species on the national territory.

**107 Wind Maps and Archive**

Data bank and information about the distribution of wind resources on the territory; used to identify areas potentially suitable for energy exploitation.

**108 Quarries and mines**

Localization and characterization of plants and sites suitable to extract minerals.

**109 Historical Maps**

Reproduction, in a digital format, of ancient maps and charts; they include maps of towns, maps of the Italian nations before the country unification, atlas tables and general maps of Italy.

**110 Historical Military Maps**

Reproduction, in a digital format, of ancient/old military maps and charts.

**3. National Programs – Achievements and Challenges****The Cartographic Cooperating System (CCS)**

The General Direction of Soil Protection of the Ministry of the Environment, Land and Sea, for several years has extended the CCS to all Central and local agencies with specific projects. CCS is the National Spatial Data Infrastructure (NSDI) made consistently in accordance with the European INSPIRE directive and the standards of Digit PA.

The CCS is based on the following principles; adoption of:

- the European Directive INSPIRE;
- the specific techniques indicated in the Applicative Cooperation Digit PA for the physical interchange of metadata;
- the specific techniques of the RNDT Digit PA for the creation of metadata;
- the specific techniques of the cartographic reference system for the system of the space coordinates of shared data;
- the specific technique indicated in the Open GIS Consortium for the interoperability of GIS systems.

The project aims at the creation of an infrastructure through which all levels of the Central and local Public Administration can be informed about maps available on our territory through the National cartographic Portal and then share the informative levels made available by various agencies through the CCS and without the physical transfer of data.

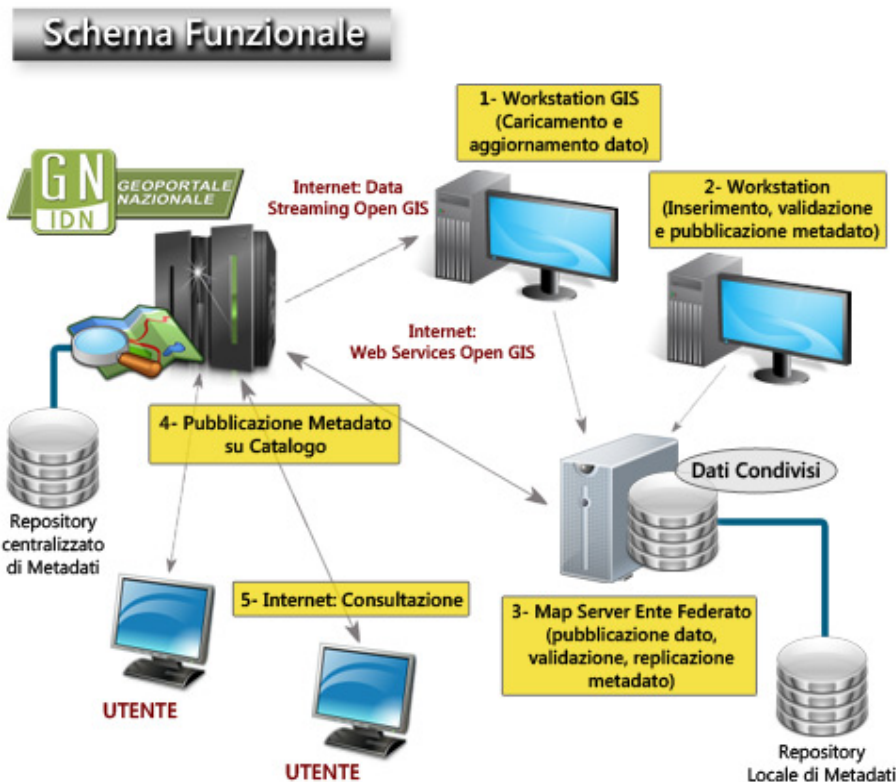
This allows to know the available maps on the territory with an accompanying set of information from the fields covered by the Directory; in this way all the participating agencies are able to plan the acquisition of data and to communicate the next acquisition. The result is a rationalization of costs for the benefit of a larger and more different availability of data.

The central and local administration will be able to plan, run and control the territory in detail as required in their tasks through all CCS geographic data, both current and future, concerning main territorial and environmental themes.

## The National Spatial Data Infrastructure

The CCS is a technological infrastructure supporting the efficient exchange of geospatial, territorial and environmental meta-information, characterized by a central entity, the National cartographic Portal (PNC), which collects all the meta-information and peripheral entities data. CCS provides services and allows to access a national informative wealth and to expand them to European and international partners through the Project INSPIRE.

The idea of this approach was to build a cooperative information system where heterogeneous information systems could share the same conceptual model and level of participation in the network. The CCS portal hosts a series of informative layers and databases with national coverage, called " Cartographic Reference base" (CRB), the cooperating agencies host the informative layers and databases on local coverage.



### Functional architecture of the cartographic cooperating System

The CCS is, consistently with the "vision" of the Spatial Data Infrastructure (SDI) Project INSPIRE, an open infrastructure. It is interoperable and cooperative for access and distribution of products based on geospatial and territorial information through a range of on-line services.

The structure of the National Geo-portal is such that for any datum made available there is also a meta-datum in a national catalogue whose function is to offer a range of information in support of the data itself.

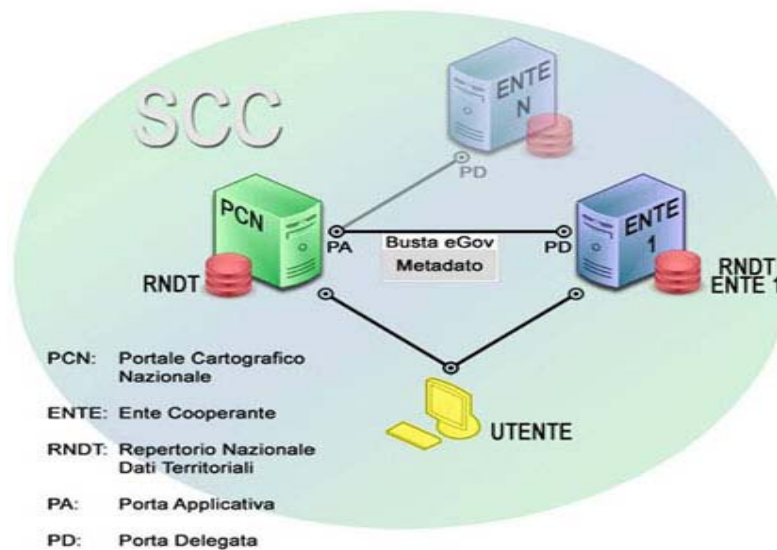
The structure of this information complies with the specifications of the National Directory of territorial Data of Digit PA (NDTD). A specific software application (the Metadata Manager), whose role is to allow the management of a local database of metadata, allows to update and send them to NDTD. The task of the individual peripheral nodes is to ensure the correct compilation of the meta-datum.

## Applications made by the Project

CCS has produced several software applications on Open Source technology:

- WEBGIS are a series of modules to visualize on the web data, management and publishing services, according to the OGC (MapServer + PHP).
- Metadata Manager complete of any function for preparation and submission, according to the specifications of the envelope Digit PA e-government (Postgres + PHP).
- Adb Too IBox (Desk Top GIS).

## Functional architecture of the CCS project



## State of project

The SCC project started in 2003 with the creation of new EDC in all countries of the Objective 1 regions and all the National Dock Authority, Interregional and Regional. In November 2008 started the new phase project that would extend to 50 municipalities of the Objective 1 regions adding additional 100 municipalities of non-Objective 1 regions.

## The National Geo-portal (NG)

The NG allows the visualization and use of National maps that have been produced following an agreement between the State and Regions about the reference cartographic system dated 12<sup>th</sup> October 2000.

The strategic aim of NG is to promote and diffuse the use of the Informative Territorial Systems, allowing access to the environmental information of the territory to a widespread public, including non-experts, taking into consideration all the projects and activities that are now in course at a National and European level.

Let's think of a big National Library whose shelves are full of books regarding subjects of all kinds, whoever wishes to satisfy a curiosity, acquire further knowledge, study a subject in depth or find

elements on which to base a research, can freely access the whole library and find the volumes that are of most interest to him.

We can imagine the NG as a “library” on the web whose shelves contain all the maps of the Italian territory that are available concerning territorial and environmental themes.

The maps that form the Cartographic base of reference have sets of data that are homogeneous and easy to understand, compare and exchange the content; this information gives life to the National repertory of territorial Data.

These maps are organized for cooperation between the various public Administration and also for a wider peripheral network of local Administrations that all interact with the Ministry of the Environment.

The NG allows everyone accessing to internet - students, researchers, administrators, and the general public - to see and freely use any maps that may be of interest choosing them as they were extracted from a library shelf.

There are two types of possible users of the NG. The first group are persons simply interested in visually consulting available maps. The second group are persons needing to elaborate territorial and environmental data, available on the Portal, for professional or academic reasons. They can do this thanks to the following services, wms, wfs and wcs, that are available and allow the data to be inter-operational.

At the moment the strata of maps available which can be superimposed are:

- Black and white and color photo;
- IGM cartography;
- Digital model of the landscape;
- Toponyms;
- Administrative limits;
- Protected areas;
- Soil description;
- Plan of the territory;
- Sea bathymetry;
- Coastal erosion risk;
- Physical map of the coasts;
- Railways;
- Orthophoto dates;
- Geologic data;
- CORINE Land Cover.

The National Cartographic Portal is therefore a very useful instrument:

- For public administrators it is a fundamental support to planning, running and controlling the territory;
- For schools, for teaching history, geography, natural science and all subjects that require technical maps;
- In universities and scientific institution because it constitutes a catalogue containing all available information concerning the territory and the environment from the same source and at no cost;
- Also for the safeguard of the environment, for the conservation of archeological sites, historical, artistic and architectural sites, allowing an exact delimitation of the site in the territory.

### **Extraordinary Plan of Environmental Remote Sensing**

The Extraordinary Plan of Environmental Remote Sensing (EPRS-E), pursuant to Law 179, 31<sup>st</sup> July 2002 art. 27, is an agreement program between the Ministry of Environment and Territory of

the Sea (METS), Chairperson of the Council of Ministers - Department of Civil Protection (DCP) and the Ministry of Defence (MD) in agreement with the Regions and Autonomous Provinces.

The main aim of this plan is to create and make available to the public administration the spatial information necessary for the creation of high-value elaborate.

The data will be obtained from remote processes, or from remote capture of data on the territory and the environment.

The Extraordinary Plan of Environmental Remote Sensing undertakes, for the first time, the establishment of a data base representative of the national territory with particular emphasis on its configuration and its relation to the environment.

A database with very high resolution, high value, obtained by using the most advanced technologies flying on satellite and aircraft platforms.

In particular, the project involves the acquisition of data produced by remote sensing observations performed with laser-scanning LiDAR and Interferometric techniques and the classification of these data in the database of the National Geo-portal (NG).

The database will be a valuable contribution to the Government decisions on the territory, particularly supporting the activities of topography, mapping and digital photogrammetry, three-dimensional modeling, Geographic Information Systems and, above all, the Information Systems Supporting decisions.

The first aim of the EPRS-E is to create, as quickly as possible, a most comprehensive database to support decision making in all areas subject to hydrogeological risk and encourage the sharing of a "data set" of methodologies and results incorporating both the " set of data "already implemented or being implemented by the central government or local authorities.

## **Global Reference System**

In Italy the first adoption of the Global Reference System dates to 1996; it was decided after the emergence of GPS survey methods that are already available since several years at a scientific level, and were also increasingly commonplace in technical activities.

The IGM at this time, particularly in view of this innovation, has completed the work for the establishment of the geodetic network IGM95 entirely determined by GPS and the methodology established by about 1200 points uniformly distributed over the country with an interval of about 20 km.

The network IGM95 was indeed the materialisation of the global system in the country allowing precise positioning satellite by means of short-distance translocation. It was chosen carefully from the outset to align the EUREF system that had given Europe a few years earlier (1989) and that was already used by most European countries.

This is the system ETRS89 (European Terrestrial Reference System 1989), which was adopted in the construction ETRF89 (European Terrestrial Reference Frame 1989), the only one available at that time.

IGM, aware of the importance of giving the nation a Reference in line with the times and adapted to modern technologies, has prepared the project in 2006 to define a new system whose work began in spring of 2007. The reference chosen is the most recent realization of the ETRS89 system: namely the ETRF2000 2008.0 at the time.

In reality this is not a true change of system but a change of realization in the same system: from ETRF89 to ETRF2000; however, the coordinates of the points, even if only slightly, change. The value of this changes assume importance only in geodetic problems, not in the mapping and GIS.

The differences are however very small: the maximum doesn't exceed 13 cm in planimetry and 22 cm in height, in both cases with mean values of around 5 cm.

For which concerns the previous points IGM95 acquired on 1st January 2009, then with the coordinates in the suystem ETRF89, it is worth to note that they can be upgraded free of charge via the website all'ETRF2000 IGM: *[www.igmi.org](http://www.igmi.org) - Geodetic Service - Update the coordinates of points IGM95.*

The Decree of November 10<sup>th</sup> 2011 introduces a significant innovation in the field of spatial information, since, for the first time in Italy, the National Geodetic System is officially used throughout the Public Administration. In this area of expertise in fact, the consistency of data is an important goal which, eliminating ambiguities, makes it really effective the exchange of information between various Government departments.

IGM has long enabled a site dedicated to the National Network Dynamics ([www.igmi.org](http://www.igmi.org) - *Geodetic Service - New site RDN*), available in the monographs of every stations.

By the end of the year this service will be finally completed as expected by EUREF.

### **Standardization of geographical names**

Within the framework of the UN Work Program, Italy, through the IGMI, led a campaign in the field to increase and update the current *Toponymic data base 25K* (TopoDB25), in order to produce, by derivation, also the national *Toponymic data base 50K* (TopoDB50).

In practice, while the TopoDB25K (dated 1996 and consisting of about 750000 geographical names extracted from topographic maps of Italy at scale 1:25000) was built through cartographic activities and direct reconnaissance, with an updating process based on the comparison between the Italian topographic map sheets at 1:25000 and 1:50000 scales, the TopoDB50K is the result of an interactive process deriving from the TopoDB25K.

It consists of all existing toponyms of topographic maps of Italy at 1:50000 scale. Actually, it is nearly complete with the goal to finish the work by the end of 2012.

Concerning the legislative aspects, it is worth recording that, on June 2008, the Italian Parliament has decreed the suppression of the “Permanent Committee charged of direction of toponymic revision of Map of Italy” (created by the law n. 605/1949).

In consequence of such political decision and in order to maintain the permanent toponymic functions within the competences of IGMI, as National Mapping Agency, it was decided (in March 2012) to create the “Commission for the Italian Official Toponymy”.

Furthermore IGMI has started the procedures of authorization for the adhesion of Italy to the EUROGEONAMES, setting up a specific Working Group to organise all available toponymic data to be loaded in the Euro Geo Names data base.

Beside these initiatives, other activities have been conducted as follows:

- Signing of special cooperation agreements between IGMI and the Italian Regions/ Autonomous Provinces in the field of geographical information;
- Cooperation with schools and academic organizations for didactic activities in the field of geographical names.