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COUNTRY REPORT OF ITALY v. 5

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COUNTRY REPORT OF ITALY

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Summary

The geospatial data are now recognized as a key component for the development of the society. Market development and new jobs depend upon the availability of geospatial information. In the coming years this information is going to play a central role in many themes such as: the process of reorganization and modernization of the public administration (at local, regional and national level) in the management of land resources and environmental services of public interest; the development of applications involving the use of common geographic references and access to various available geospatial database and finally the creation and dissemination of new media necessary to implement and favor capacity building, both education 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, the need to evaluate the 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 and updates the first Report issued in 2011.

The governance of geospatial information

Overall political/administrative system in Italy.

The Italian Republic is a unitary parliamentary republic in Southern Europe. Power is divided in three: the Executive, the Legislative, and the Juridical.

The President of the Republic is the Head of the State and represents the national unity; he is elected by the two Chambers of the Parliament in joint sessions, plus representatives by Regions, for a period of seven years at the end of which, in principle, he can be re-elected. He must be a native-born Italian citizen and over 50 years of age. He has the power to appoint the Prime Minister, as well as five judges of the Constitutional Court. He presides over the Supreme Law Council; this allows him to veto bills and send them to parliament for new inspection.

The Executive power is in the hands of the Council of the Ministers, presided over by the President of the Counsel (the Prime Minister). The Legislative Power is executed by the Parliament (Congress), which is divided in Senate and Chamber (the House). The two wings of the Parliament are almost identical, and perform virtually the same functions. While the Senate is smaller in size and technically a little older in age, it is nonetheless very similar to the Chamber (House). The Judiciary Power is handled by the Magistrates (Judges), whose duty is to implement the laws. Judges are not voted in, but are selected through public selection, based on exams and internal evaluation committees.

Geospatial Information Management institutional arrangement

In Italy geo-spatial information is held by many organizations that collect, produce or manage geo-spatial data according to their institutional responsibilities.

Let us first mention the five organic cartographic main Institutions, who have the task of producing the official cartography (Law February 2, 1960, n. 68):

• Geographical Military Institute (IGM)

• Naval Hydrographic Institute (IIM)

• Air Force Geo-topographic Information Centre (CIGA)

• Revenue Agency, former Real Estate and Land Registry Agency

• Institute for the Environmental Protection and Research (ISPRA).

In addition to this first group there are a large number of Organizations and Administrations, producers / managers of geographic data, such as:

• Ministry of the Environment, Territory and Sea (MATTM)

• Ministry of Agriculture, Food and Forestry (MIPAAF)

• Ministry of Infrastructures and Transports

• Ministry of Cultural Heritage and Activities (MIBACT)

• Ministry of Economic Development (MISE)

• Department of Civil Protection (DPC)

• Regions and Autonomous Provinces

• Metropolitan Cities and Municipalities

• Agency for Agricultural Payments (AGEA)

• National Institute of Statistics (ISTAT)

• Research institutions (Universities, CNR, etc.).

• Basin Authorities

• National System for Environmental Protection (ISPRA / ARPA / APPA).

The acquisition and/or the management of geo-spatial data by public authorities is related essentially to its institutional role often distributed among multiple parties.

There are also many public and/or private entities now providers of public services (ENEL, the Italian Mail and related services Structure, RFI, ANAS, ENI, ACEA, etc.) They hold or manage large volumes of data that are directly relevant and compose an overall framework of a consistent information asset, particularly fragmented, ensuring numerous public activities relevant to the territory.

The Agency for Italy Digital (AGID) is instead the competent body, on a national basis, as regards advertising, availability and searching metadata about geo-spatial data and related services.

The Ministry of the Environment has been identified as the Authority for the implementation of the INSPIRE Directive in Italy and uses ISPRA, its in house research institute, as a coordination structure.

Data of general interest

1 Priority layers DB

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

2 Topographic DB (at large and very large scale)

Database produced according to the Intesa GIS specifications. The layers of information covered include: geodetic information, photogrammetric and meta-information; traffic, mobility and transport characteristics; traffic management and addresses; hydrography, topography, vegetation, technological networks, cartographic administrative areas, areas of relevance.

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

IGM produces DB at medium scale, DBSN (National Synthesis Data Base) with a schema specification complaint with the other national large scale database. The layers typically are: transportation, hydrography, administrative boundaries, built-up areas, vegetation, geomorphologic elements, industries, services, elevation items and quality data.

For DBSN, with the schema specification has been established the level of detail, therefore the five parameters that identify it, are: the conceptual scheme, the semantic resolution, the geometrical resolution, the geometrical precision and the granularity.

4 Oceanographic DB

Physical conditions of oceans (currents, salinity, wave height, etc..) and sea sands divided into regions and sub-regions with common characteristics.

5 Regional technical numeric map

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

6 Topographic maps – IGM

Official maps produced by IGMI:

- map series 25V 1:25,000 scale Rome40 - Gauss-Boaga (no update available);
- map series 100 "Il Foglio" 1:100,000 scale Rome40 - Gauss-Boaga (no update available);
- map series 25 and 25DB 1:25,000 scale ED50 - UTM;
- map series M792 1:50,000 scale coordinate system ED50 - UTM.

7 Chorographic maps – IGM

Official maps produced by IGMI:

- map series 250 1:250,000 scale to cover Italian regions (no update available);
- map series 1501 JOG/G 1:250,000 scale WGS84 - UTM;
- map series 1404 1:500,000 scale WGS84;
- map series 1301 1:1,000,000 scale WGS84.

8 Coordinate systems

In Italy the geo-spatial information is referenced in the ETRS89 geodetic reference system, in the realization ETRF 2000 epoch 2008.0. Coordinates used are plane coordinates in the Gauss representation applied to a single zone for the whole country (Fuso Italia), characterized by the following boundary conditions:

- Central meridian: 12 ° East of Greenwich;

- Scaling factor on the central meridian: 0.9985

- North False origin: 0;

- East False origin: 7000 km

9 Geodetic networks and monographs of geodetic elements

Italy has realized on its territory:

- a National Dynamics Network (RDN) consisting of 135 GNSS stations homogeneously distributed with a spacing of 80 km; monographic data and coordinates are published on the official website and free of access; the accuracy of the positions is about 1 cm;

- the IGM95 geodetic network, consisting of 5000 points, materialized with doilies metal with variable density: in some areas a point every 7 km, in other areas, a point every 20 km; the accuracy of the positions is about 5 cm;

- the geodesic "classical" network consisting of 20.000 trigonometric points, with precision of the decimeter;

- the high precision levelling network consisting of 20.000 benchmarks with a spacing of 1 km along the main roads; the accuracy of the positions is about 1 mm/km.

10 Sampling frames of grids

Not available.

11 DB grid

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

12 Assess grids

Italy has lots of grids with regular step, 5' in latitude 7' 30" in longitude, covering the whole country, containing the differences between the systems ROMA40, ED50, ETRF89 and GRS80, and allow any transformation between the previous reference systems.

It also has a grid with regular step, 2' in latitude for 2' in longitude, which contains the differences between ellipsoidal (ETRF 2000) and geodic heights.

13 Toponomastic Archive

IGMI maintain one of the archive containing the identification (names) of the geographic places as reported in the base map coverage at 1:25,000 scale

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 of the 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 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 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 the 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 the European Habitat Directive 92/43/CEE

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

31 Parks and Protected Areas

Their geographical extension is defined according to 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 22nd 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 22nd 2004, n.42)

34 Digital Height Model

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

35 Orographic data

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

36 Coverage and use of the ground Maps

They show the ground land 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

It is a "scale corrected" aerial image, depicting ground features in their exact ground positions, in which distortion caused by the camera and the flight characteristics and relief displacement have been corrected using photogrammetric techniques.

39 Satellite Orto-photos

It is a "scale corrected" satellite image, depicting ground features in their exact ground positions, in which distortion caused by the sensor and flight characteristics and relief displacement have been corrected using photogrammetric techniques.

40 Images non Ortho-rectified

Images of the Earth surface obtained by remote sensing techniques acquired by satellite sensors, aerial sensors, drone sensors or other sensors.

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 and 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 to 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 no 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 and can have different kinds of use. Their 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 the 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 medical 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, which are permanent or temporary, providing hospitality and food.

67 Structures for leisure and sport

Localization of structures offering leisure 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 hydrocarbons and/or materials of primary importance are treated or extracted.

75 Farming

Localization of specific properties and their characteristics 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 quality 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, 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 specific limitations indicated by L. 431/85.

83 Areas under limitations affected by fire

They concern 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 20th2003 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, April28th 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 constituents of the coastal shore show 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.

111   Official Nautical Publications and Charts (Traditional and ENC) – IIM
- map series "Berthing/Harbour/Approach" 1:5.000/1:10.000 (ETRF2000 – ETRS89)
- map series "Approach/Littoral" 1:30.000/1:50.000 (ETRF2000 – ETRS89)
- map series "Littoral/Coastal" 1:100.000 (ETRF2000 – ETRS89)
- map series "Coastal" 1:250.000 (ETRF2000 – ETRS89)
- map series "smaller scale" 1:1.000.000 (ETRF2000 – ETRS89)

Various Nautical Publication (Sailing Directions, List of Lights and Fog Signals, List of Radio Signals, Nautical Almanac, Tide Tables, etc.).

112   Official Bathymetric Mine Charts – IIM

map series "Bathymetric Mine" 1:250.000 (ETRF2000 – ETRS89)

113   Tide Gauge Network

The IIM contributes to the Italian Tide Gauge Network sharing sea level data from 4 Tide Gauge Stations:
- two long-time-period tide stations (Genoa and Brindisi), provided with a state of the art radar and a digital gauges;
- two more recent tide gauge stations (Gioia Tauro and Augusta).
- all are connected through GSM network to the IIM;
- the data centre provides to store, verify and validate the various sets of data.

The Tide gauge station located in Genoa is among the oldest in the Mediterranean, collecting sea level data since 1884. In 1956 the Italian Geodetic Commission, using a range of 10 years of measurements (1937-1946) established the average level of the sea in Genoa as the reference point for the conventional Mean Sea Level (MSL) of the Italian Height Leveling Network.

The IIM ensures the annual production and distribution of the periodical publication "Tide Tables" (I.I. 3133), in order to disseminate tidal prediction to mariners for the safety of navigation purposes.

The data recorded at the tidal stations are exchanged with HOs and National Research Center/Institutes. The IIM is planning a future integration of its tide-gauge stations in the ISPRA Tide-gauge network in order to give accessibility to the tidal data from the ISPRA web portal and EuroGOOS/EMODNET portal.

Technical rules on spatial data

Art. 59 of Legislative Decree no. 7 March 2005 n. 82, Digital Administration Code, set up the Committee for the technical rules on the spatial data. Its aim: defining and proposing technical regulations (to be adopted with special measures) for the collection of spatial data sets, its documentation, availability, accessibility and the sharing of data between the central and local governments.

In addition, the Committee is responsible for proposing rules and costs for the use/reuse of spatial data, in a coherent and harmonized manner with the relevant legislation and with the objectives of e-Government policies.

In the first three years of activity (from 2007 to 2010), the Committee has issued the following technical specifications:

1. Use of cadastral data between the information systems of all the public administrations;

2. Definition of the content and procedures for setting up and updating of the National Catalogue for spatial data, with the simultaneous identification and definition of the data of general interest that need to be documented in the Catalogue itself ;

3. collection, documentation and sharing of digital ortho-imagery at a nominal scale of 1:10000, with reference to applications as mapping and thematic scopes;

4. Adoption of the National Geodetic Reference System, in line with the European reference system;

5. Collection and definition of the content of the geo-topographic Database, for a consistent and structured representation of the main layers of geographic information.

The technical specifications referred to in point (1) have been adopted by the Decree of the Director of the territories on November 13, 2007; those ones referred to in points (2), (3), (4) and (5) have been adopted by the decree of the Minister for Public Administration and innovation on November 10, 2011, in consultation with the Minister of the Environment, Land and Sea.

In 2011 the Committee's activities were suspended, pending the renewal of the components. Meanwhile, given the increasing focus on geographical information, the Agency for Digital Italy, AgID, has launched an initiative aimed at maintaining the specifications already produced and defining new technical rules in the field of GI, consistent with those ones developed in the context of the INSPIRE directive.

Specifically, in 2015 the following activities have been completed:
- The definition of technical specification on utility networks;
- The definition of the data model of the national information system of the utility infrastructures (named SINFI, Sistema Nazionale Federato delle Infrastrutture);
- The revision of the technical specification on geo-topographical database.

The draft versions of those specifications were prepared by the competent WGs, even taking into account the equivalent data specifications defined in the INSPIRE context. A public consultation was launched a on that draft versions collecting comments and proposed changes from the stakeholders. The WGs

analyzed the comments received and provided a resolution, including the accepted proposals in the final version of the specifications, being published.

Under that initiative, some working groups have been set up, involving both Public Administrations/Agencies interested and experts/stakeholders working in the field, with the aim of supporting the interoperability, the exchange and sharing of spatial data, increasingly required and used in administrative procedures, particularly those ones related to the implementation of the Digital Agenda.

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 data bases on local coverage.
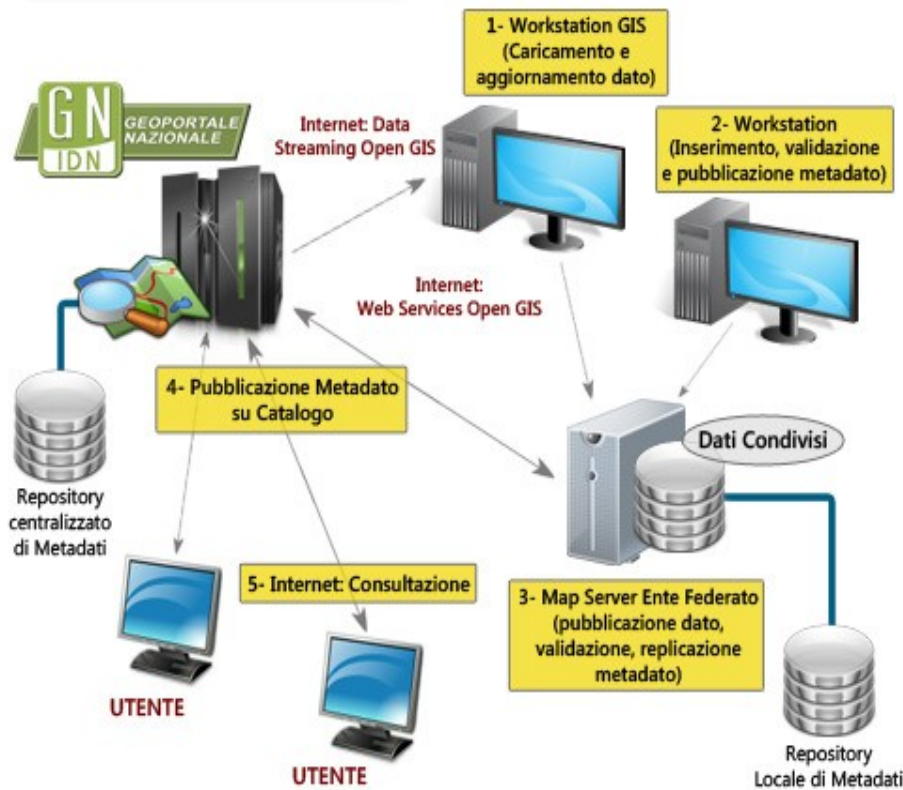
Functional architecture of the cartographic cooperating System

The CCS, consistently with the "vision" of the Spatial Data Infrastructure (SDI) Project INSPIRE, is 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-data.

Applications generated 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 (Map Server+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 Tool Box (Desk Top GIS).

Functional architecture of the CCS project
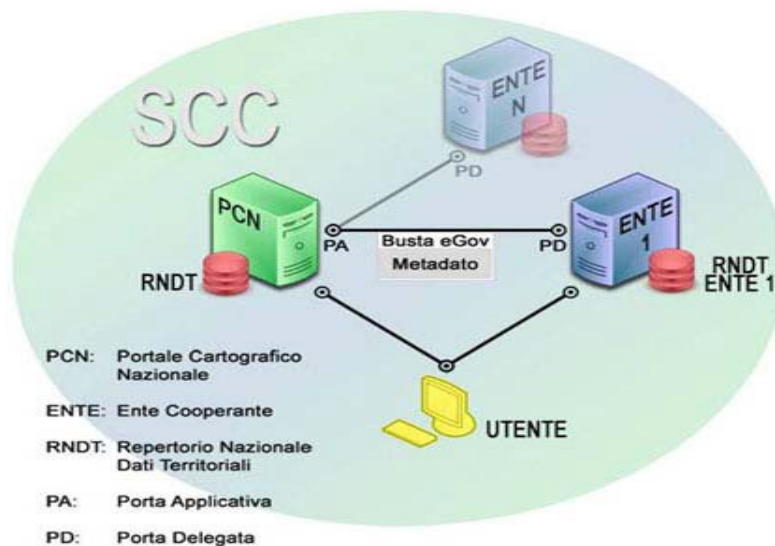
State of the project

The CCS project started in 2003 with the creation of new EDC in all countries of the European 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 reference cartographic system dated October 12th 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 wide 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, who ever 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 WMS, WFS and WCS available services, allowing the data to be inter-operational.

At the moment the layers 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;
- Ortho photo data;

- Geological data;
- CORINE Land Cover.

The National Cartographic Portal is therefore a very useful instrument for:
- public administrators as a fundamental support to planning, running and controlling the territory;
- schools, for teaching history, geography, natural science and all subjects that require technical maps;
- 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;
- 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.

The National Catalogue for Spatial Data.

Art. 59 of the Digital Administration Code established the National Catalogue for spatial data (Repertorio Nazionale dei Dati Territoriali – RNDT[1]), managed by the Agency for Digital Italy (AGID). The Catalogue collects metadata for spatial data sets and spatial data services managed by the public authorities, in order to facilitate their advertising and to ensure the availability and the discovery service related to the implementation of the INSPIRE Directive (Directive 2007/2/EC).

The National Catalogue was implemented by AGID; it is consistent with the technical requirements defined in the Decree of the Italian Minister for Public Administration and with the INSPIRE Regulation and technical guidelines as regards metadata and interoperability of services.

The Catalogue serves the two functions typical of a catalogue:
- the collection of metadata prepared by the administrations, by different modes (on-line editor, XML file upload, harvesting according to the CSW standard);
- the discovery via webgis and catalog services according to the CSW standard for all the stakeholders, both public and private.

The Catalogue is also declared as a database of national interest and is expected to re-use part of the platform of intelligent communities.

In 2015, the Catalogue has been included in the national PSI infrastructure, referring to the European framework of the public sector information. That infrastructure is composed of the following catalogues:
- the general data portal (dati.gov.it);
- the Catalogue for spatial data (rndt.gov.it)
- the catalogue of services, under construction.

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[1] http://www.rndt.gov.it

In that context, the national Catalogue for spatial data has been harvested by the European Data Portal, whose beta version was published on November 2015 (the version 1.0 will be released in early 2016).

In addition, a call for tender was launched for the design and the implementation of a new version of the Catalogue in the context of the shared infrastructures of the Italian Public Connectivity System.

SNIPC (National Integrated System of Civil Protection).

Context

The "Civil Protection" is the set of activities put in place to protect the integrity of life, property, settlements and the environment from damages or risk of damage arising from disasters: risk prediction and prevention, rescue of affected populations, confronting and overcoming the emergency and mitigation of risks.

The Italian National Civil Protection Service has as the following institutional components: the central government of the State, the Regions and Autonomous Provinces, Provinces, municipalities and mountain communities, the National Fire Department, the Armed Forces, the Police, the National Forestry Corps, the scientific community, the Italian Red Cross, the structures of the National Health Service, voluntary organizations, the National Mountain and Alpine Rescue Corps form the operating structures.

The National Service operates at a central, regional and local level, in compliance with the principle of subsidiarity. The local context of our country, subject to a variety of risks, makes a civil protection system necessary which, in every area, ensures the presence of human resources, facilities and operational capabilities able to intervene quickly in case of emergency, but also to operate for prevention and, as far as possible, predict potential disasters.

The first response to an emergency, whatever the nature and extent of the event, needs to be guaranteed at the local level, from the municipal structure, which is the closest institution to the citizen. The first head of civil protection in each municipality is, therefore, the Mayor. But when the event cannot be met by means available to the municipality, the higher levels are activated through an integrated and coordinated action: the Province, the Prefecture, the Region, up to the involvement of the State in the event of a national emergency.

The strength of such a complex system of competences is the guidance and coordination entrusted to the President of the Council of Ministers, which makes use of the Civil Protection Department.

The System

In this context the **SNIPC (National Integrated System of Civil Protection)** has been implemented and it includes a number of geospatial technologies and tools used both for Emergency Preparedness and in Emergency Response.

The SNIPC project has been developed by the Civil Protection Department. The technological partner being **Leonardo-Finmeccanica** (one of Italy's main industrial groups, leader in the high technology sector, and ranks amongst the main groups worldwide operating in the Aerospace, Defense and Security sectors) joined with the Italian National Council of Research - CNR, (since 2004 a Competence Center that deals with Earth observation; with its design and implementation based on Information Management Systems, used to quickly share geospatial information, especially in emergency scenarios).

The main component of the SNIPC system is SITDPC (Geospatial Information System of the Civil Protection department). It consists of a complex Hardware/Software Architecture that performs the various levels of Spatial Data Infrastructure of which the Department of Civil Protection actually make use.

Functional goals and achievements

Specific emergency plans are needed by Civil Protection structures to be ready for tackling and managing an emergency. These identify the objectives that must be followed through to organize a suitable response by the Civil Protection when the event occurs. An **emergency plan** prepares structured deployment of men and means for intervention, organized logically and coordinated in time.

The cognitive base for sizing resources to be sent into the field is made up of **damage scenarios;** in other words tools that forecast possible damage and consequent effects on the population. These scenarios are calculated using territorial exposure and vulnerability data and based on reference events deemed to be more likely to occur depending on the selected time interval.

Assessment of these scenarios, not limited to an estimate of the triggering event, but focused directly on immediate loss assessment, is particularly important for the tasks that the Civil Protection Department must carry out.

Knowledge about a "damage scenario" allows a territorial picture to be drawn up of the area involved in the event, therefore providing important information such as the localization and extension of the worst hit area, whether transport networks, communication media and distribution lines are working, in addition to the expected losses in terms of human lives, the injured, the homeless, collapsed and damaged buildings and relative economic damage, with obvious repercussions on Civil Protection activity, for both emergency planning and management.

In the former case, the information permits identification and description of the reference event/s with a view to sizing human resources, materials to be used and their allocation within the plan.

In this context, the **Civil Protection Department provides support to Regional Authorities** for the latter's planning and policies for smaller local bodies, provincial and municipal authorities and mountain communities, supplying information regarding impact on the territory for one or more reference events with corresponding different levels of Civil Protection plan activation.

Whereas in the latter case, the information immediately provides a description of the actual event and its impact on the territory, to support emergency aid.

The SNIPC System is currently used by the Civil Protection Department for emergencies and to provide support to regional and local authorities. Hazard and vulnerability assessment methods, practically the same for all the tools, have been designed to meet a need for pragmatic supply of a response that can be used by Civil Protection operators on both a national and local level.

Technical notes

An overview of a complex system which realizes an Enterprise Spatial Data Infrastructure is given by the logical block diagram presented below:
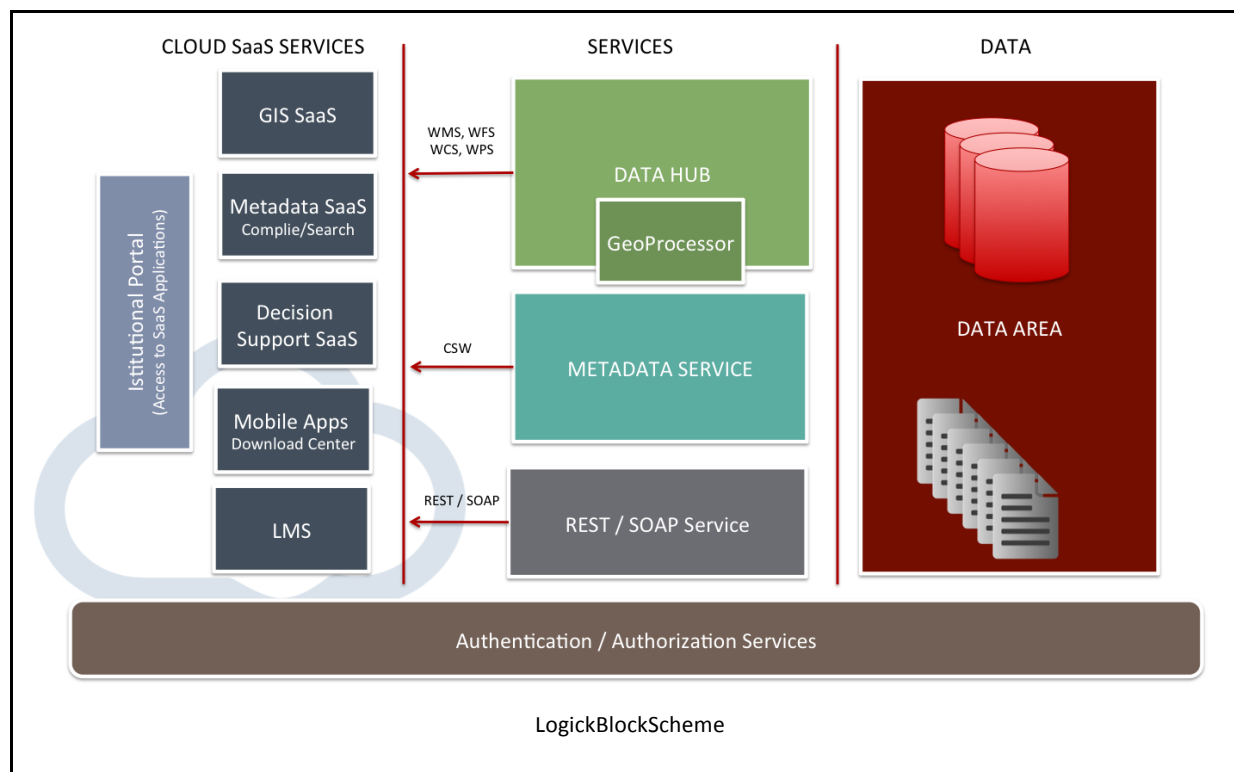
In this scheme it is evident a division into four main areas:

1) **CLOUD SaaS Services:**

Set of applications accessible by users as services. All the applications, accessible as a cloud service, enjoy High Scalability implementation of the components:

- **GIS SaaS:** web-GIS platform for creating, browsing, querying and managing Projects Map. Work through use of web services OGC Compliant (WMS, WFS, WCS, CSW) and interacts with the service area.
- **Metadata SaaS**: application for compiling metadata, presents editing masks that allow authorized users to edit the set of metadata. The metadata thus constructed will be delivered as a service OGCCSW (Catalog Service for the Web) from the Services.
- **Decision Support System**: Application that implements logical combination of query data to obtain paintings geographic information in the form of reports and thematic maps. It can be an extension of GIS accessible only to particular classes of users.

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- **Mobile App Center**: Set of mobile apps for the spatial information management. They allow the collect interview and acquire data on site using smartphones and tablets.
- **Learning Management System**: It delivers services and web learning objects for training.

2) **SERVICES**

Large set of Web Services provided by the SDI, usable, if authorized, by:

- Applications layer SaaS Cloud Services
- Clients and External Applications

- **Data HUB**. Scalable infrastructure for the provision of mapping services, meet the standards of the 'Open Geospatial Consortium (OGC®) WMS (Web Map Service), WFS (Web Feature Service), WCS (Web Coverage Service). It also allows theming of geographic maps provided in WMS through the application of the standard SLD (Style Layer Description).
- **GeoProcessor.** Module that instantiates Web Process Services (WPS) and implements numerous "Application Profile" (AP), service profiles data processing Geographic Information. The module Geo-Processor can be integrated into Data HUB to facilitate interactions with the data it manages and allowing the user to avoid sending the entire data to be processed within the service request.
- **Metadata Service.** Server component responsible for the delivery of services OGC® CSW with methods GetCapabilities, DescribeRecord, GetRecordById, getRecords and Transaction. Therefore sets discovery service data through consultation metadata, corresponding to the most common profiles of metadata (FGDC - Federal Geographic Data Committee, Dublin Core, ISO - International Organization for Standardization, ISO 19115/19139 for dataset, ISO 19119/19139 for services , NAP - North American Profile, INSPIRE - Infrastructure for Spatial Information in Europe, data sets and services.)
- **REST/SOAP Interfaces**. Stack of support services for queries on geographical databases. Implements the protocol SOAP (Simple Object Access Protocol) defining a data structure for the exchange of messages between applications. Uses HTTP as the transport protocol, but is not limited nor bound to it, since it may very well use other transport protocols. Also implements interface Restful to map the typical CRUD (create, read, update, delete a resource) and methods HTTP POST -> Create (Create a new resource), GET -> Read (Gets an existing resource), PUT -> Update (Update a resource or changes its status), DELETE -> Delete (Delete a resource)

3) **DATA**

Unique infrastructure to store geographic (vector and raster) and alphanumeric data. It Opens an interfaces for the SERVICE layer of the infrastructure and consists of two sub-infrastructures:

- **geo-database Cluster.** Implemented by DBMS Post-greSQL with Post-GIS spatial extension allows the management of spatial databases. The structure is scalable through clustering of multiple server nodes with Streaming Replication mechanisms for alignment of nodes and Connection Pooling and Load Balancing for the distribution of the query nodes and for the management of the pool of the connections required by the application. The usage of NoSQL database is also included to have fat services on dynamic data throughout the REST Services interfaces.
- **File System Storage Area.** Structure File System dedicated to the storage of raster coverages.

Implementable as a NFS resource (Network File System) available from servers that implement layer SERVICES, who need to communicate with the RAW data for the construction and delivery of services to map or processing.

4) **AUTHENTICATION & AUTHORIZATION.**

Transverse layer, exposes authentication services and interfacing to the Identity Management components. Implements system of SSO (Single Sign On) by the generation and validation of Cookies and Tokens for direct access to resources (Service Ticket Management) and access to services through another application (SaaS Proxy Ticket Management)

System scalability

All these areas are implemented using a cluster approach: more nodes, with load balancing, share the amount of service requests.

National Military Research Plans.

The Italian Defense Staff participates in the DGIWG (Defense Geospatial Information Working Group). DGIWG is the multi-national body responsible for geospatial standardization for the defense organizations of member nations; it supports the requirements of NATO and the other alliances that its member nations participate in, including UN.

Under the National Plan of Military Research, a number of Projects have been carried on, focusing on geospatial information, safety, security and big data, including new studies on social networks.

INTEGRO project

An important example of the project implemented under the National Plan of Military Research, is the INTEGRO (Italian National inTeroperability Environmental manaGeR for defense geOspital data) Project for the CII (Centro Intelligence Interforze)

The INTEGRO project's objective is the analysis of the functional requirements and the implementation of a prototype of operating DNSDI (Defense National Spatial Data Infrastructure) in a military environment, applying the results of the geoSDI research program in the field of the systems for the interoperability of geospatial data. Furthermore the project aims to develop web application extension for the management of geo-localized information, adding specific functionalities to the geoSDI platform, thus making it operational prototype in the military through the development of software extension (widgets).

Specific goals of the INTEGRO Project can be summarized as:

a) To make available the geoSDI framework, having the necessary components to store geospatial data, to exchange via web services (OGC standards) and to visualize in order to create a dynamic digital maps.

b) To allow secure system interaction between the INTEGRO and the OSINT (System of collection of information by consulting publicly available sources) systems, adopting solutions that are not intrusive to OSINT.

c) To help the management of the positions of OSINT geoNews, their research and display on the map, assigning specific security privileges on the system INTEGRO.

The work was carried out aimed at optimizing the performance of existing technologies, the establishment of new functional requirements and their new implementations of software components.

Technological components executing the integration with the system OSINT (in production at the Centro Intelligence Interforze) have also been developed and introduced. These allow to apply a

LogicBlock Schema of INTEGRO SDI
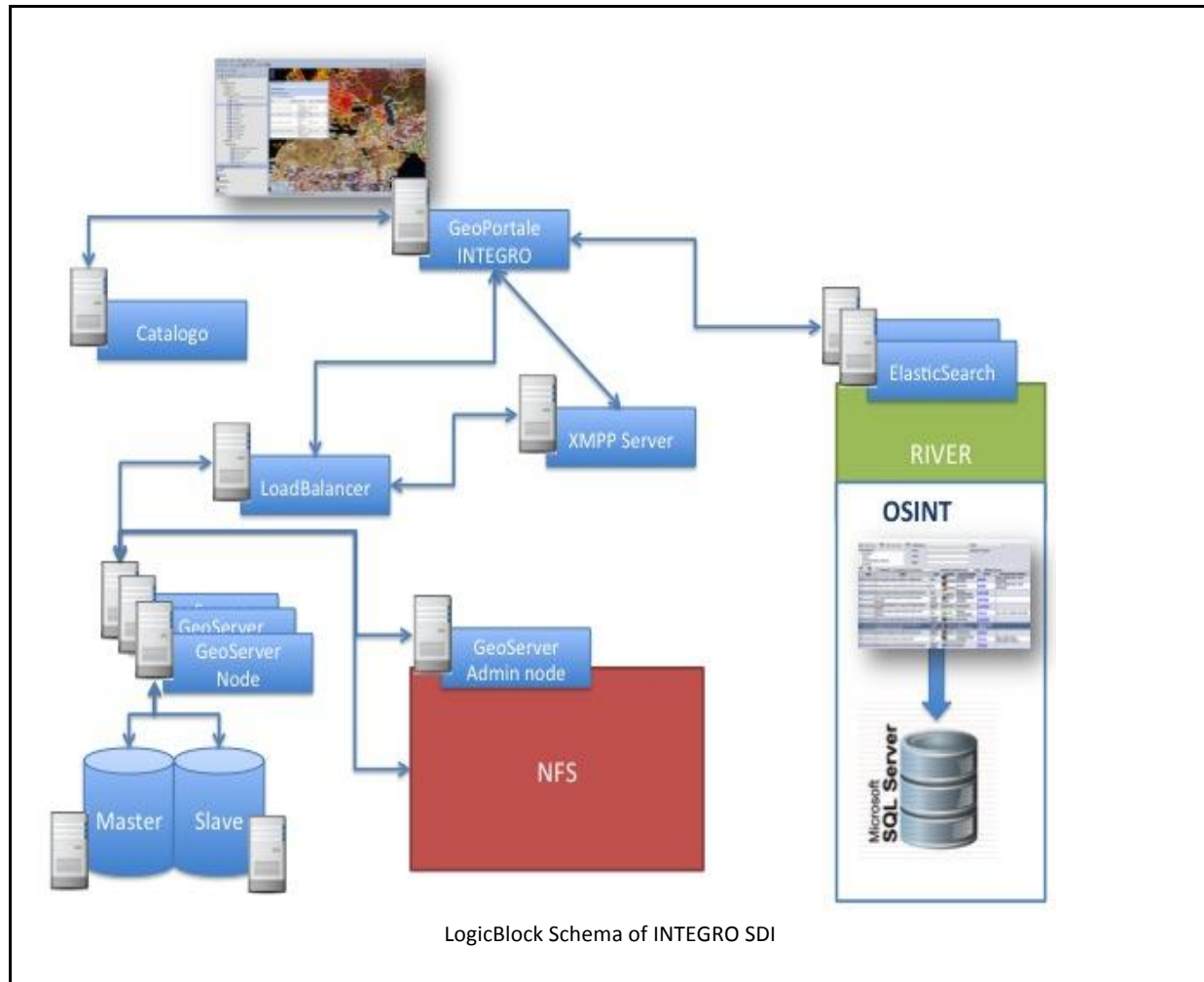
spatial connotation to each of the notifications included in OSINT, so they can be displayed and analyzed within the INTEGRO system in an integrated manner with other managed spatial information with it treated.

The system has been developed from the basic open source platform (such as GeoServer, Geo-Platform, GeoSDI, PostGIS, Elastic) with an approach that has a high degree of scalability: the set of logical components can be implemented in different ways, depending on the expected load, the amount of data to be treated, the performance to be obtained.

Geographic System and Dashboard for National Fire Corps

The National Fire Corps is developing a System for the cartographic management of its interventions. All incoming calls to the 115-call-center end up on a map and the status of operations is automatically updated. The outcome indicates the status of the alert (request of help, the team was sent or is on the spot, the action is in progress or closed and the team is back home).

These prototypes are leading to an important change in the management of interventions by the National Fire Corps, as well as providing a powerful tool for geo-statistical analysis.

Such prototypes have been carried out implementing a system responsible for:

- "Listen" to the Atom Feed CAP (Common Alerting Protocol) of a Regional Command of Fire Corps
- Refine the geolocation of a calls for interventions
- Store geolocated items in an enterprise search engine to allow indexing, querying real time and streaming
- Offer a geographical interface for the display of all the alerts and for the the monitoring of the state of the process for the interventions
- Providing an integrated view of the information managed through the CAP system with information provided by third party systems

The list of activecalls for intervention

The geographicdashboard

Information Management System for WFP and Civil Protection in Palestine

H.E.L.P. Early Warning System and Dashboard

On the occasion of the international response to the earthquake emergency in Haiti (2010), the UN WFP (World Food Program) used the Italian national information system of Civil Protection, SNIPC (made available to meet emergency needs).

This experience caught the interest of WFP, to use something similar in collaboration with the Palestinian Civil Defense as an early warning system to warn experts when certain conditions occur, such as earthquakes, weather dangerous potential landslides and floods; using open data, real time processing are triggered to assess where problems may occur related to the various types of risk and the population potentially involved.

Another important development is taking place as part of the cooperation agreement between Italy and UN WFP: since in Palestine WFP operates directly when there are natural disasters (it strongly supports the local civil protection), the immediate knowledge of critical conditions is crucial.

H.E.L.P is an **Early Warning System and Dashboard** built for the prevention, mitigation and assessment of disasters, be they earthquakes, fires, or meteorological systems. It was built to be easily manageable, customizable and accessible to all users, to facilitate humanitarian and governmental response. In its essence it is an emergency preparedness tool, which can be used for decision making for a better level of mitigation and response on any level. Risks or disasters are not events under our control, rather, they are situations to which we can better manage with a framework based on preparedness.

This is exactly what HELP offers: it plays a main role in the cycle of early warning and risk (Preparedness, Risk, Mitigation, and Resilience). It provides information in real time on events and hazards, allowing for the possibility to analyze the situation and find a solution whose outcomes protects the most lives and has the least economic impact.

The H.E.L.P. EarlyWarning System Dashboard
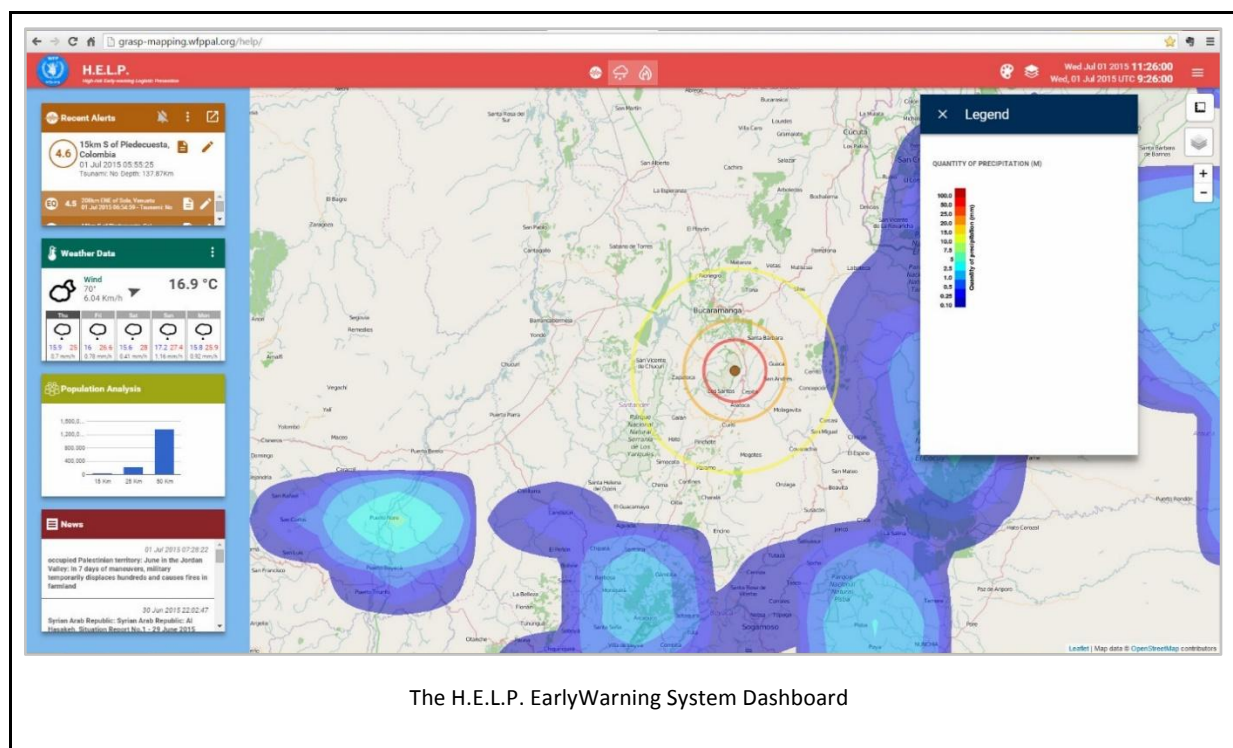
HELP was born as WFP (The World Food Program) and CNR (National Research Council of Italy) entered into a Cooperation Agreement concerning the development of a Geo-Spatial Data Infrastructure System for the Palestinian Civil Defense with the aim of building an enhanced preparedness capacity in Palestine.

HELP allows users, such as Information managers or Government officials to target their audience, understand their needs, and develop high-impact prevention and decision making solutions which are practical, flexible, relevant, responsive and timely. As a system it does not duplicate or replace others, rather, it adds value to operation needs from headquarter to field levels globally.

This emergency preparedness tool and tool kit was built to be a framework to support Governments whose objective is to protect their population. HELP provides a service to governments to support their preparedness and response, to monitor hazards, and how risks can impact life on all levels; with this tool users will be able to mitigate the event and respond to the results of hazards with efficiency. A means to react to risks with methods of resilience integrated into the means of response and development.

A console, map-based, gives the situation with regard to different themes (earthquake, floods, snow, drought, etc.) and, **using open source and open access data**, **real time processing are triggered** to assess where problems may occur related to the various types of risk and the population potentially involved.

From a technical point of view, the system includes a **modular Back End**, that is responsible to:

- **Scan** the configured sources/services (Early Warning Source)
- **Check** if a risk event occurred
- **Store** the event details into an Internal Database (NoSQLjson structured)
- **Expose** a REST API to get the event details
- do some **processing** to determine:
- an estimation of the amount of population involved with reference to Population Data and Risk / Exposition / Vulnerability Data
- **Send** an Email **Alert** to a configured list of users, including Basic information about the event and a link to the Early Warning Web Interface (on the event).
- Prepare and serve the package of all the information related to an Early Warning Event displayed by the Early Warning Web Interface.

The EarlyWarning System BackendModules
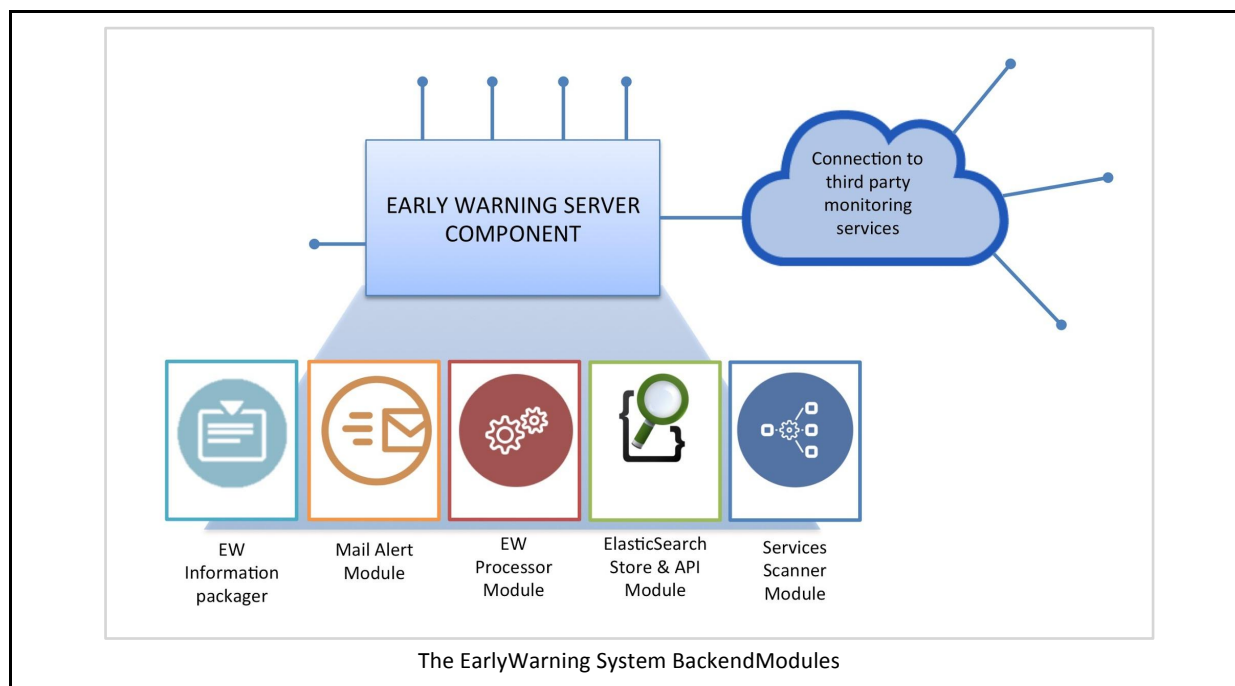
Fleet Management and Geo-fencing

In the context of the Cooperation Agreement between the CNR (National Council of Research) and the World Food Program, a Spatial Data Infrastructure in the Palestinian Country Office has been implemented to manage all the geospatial data in the country.

On top of this stack, a tracking service was also implemented (also using mobile technologies) for trucks, allowing to monitor real-time map of the movements of the trucks of the WFP. In this way the WFP can know a monitor the real time position of the tracks delivering the WFP humanitarian aids.

This has been accompanied by a *geofence* service, which allows to send automatic email alerts when a tracked vehicle passes (moves in, goes in, comes out, etc.) in defined areas "of interest".

GeofencingPossibilities
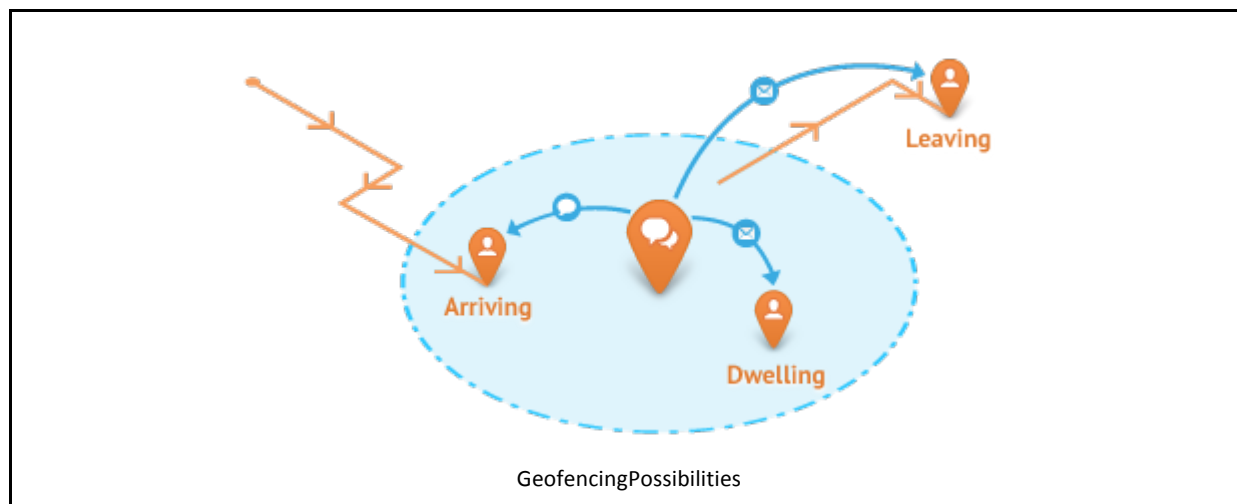
By installing a mobile app, a device can send its location to a server. If the position of the device transits in specific areas (controlled by an administrator) the system generates an alert message (delivered via email to a configurable list) that alerts the mouvements regarding the controlled area.


Geofencing Mobile App
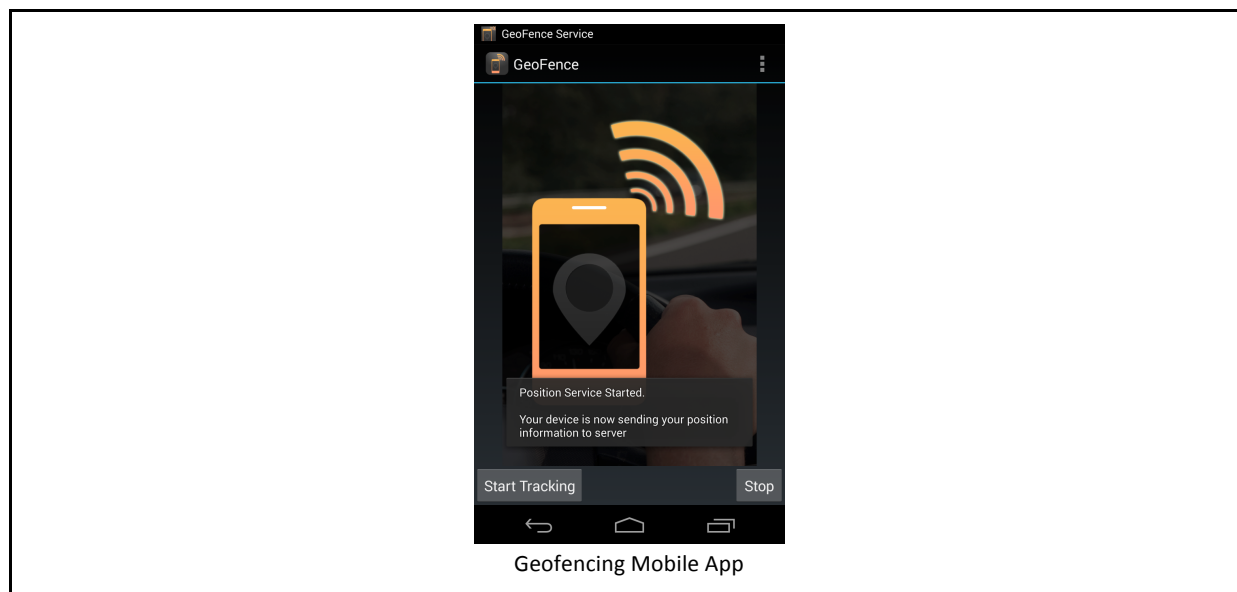
On the Information Management System, developed inside the Cooperation Agreement between the CNR and WFP, the administrator users can:

- draw on the map area to be subjected to geofencing
- select from the list of registered devices which one has to be controlled by the geofencing
- indicate the list of e-mail which must be the alerted when one of the devices selected triggers a geofencing alert message

Here are some illustrations as examples:

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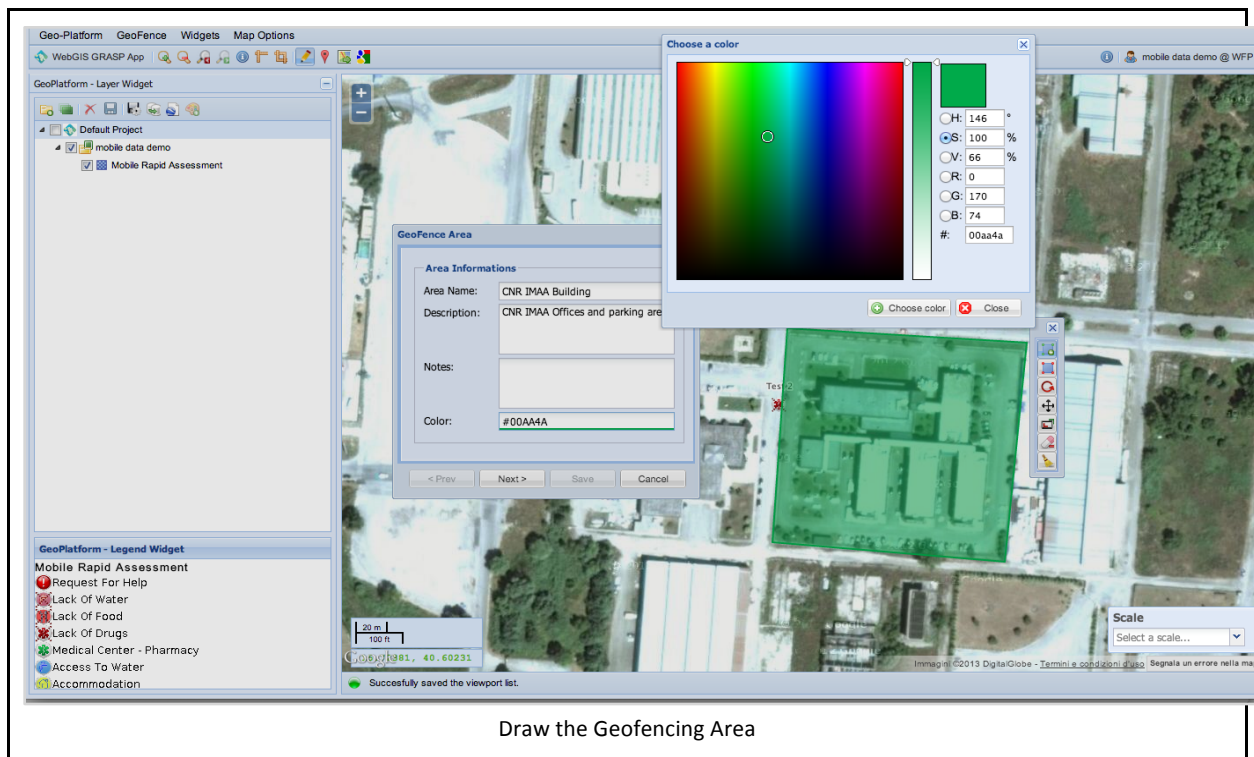
Draw the Geofencing Area
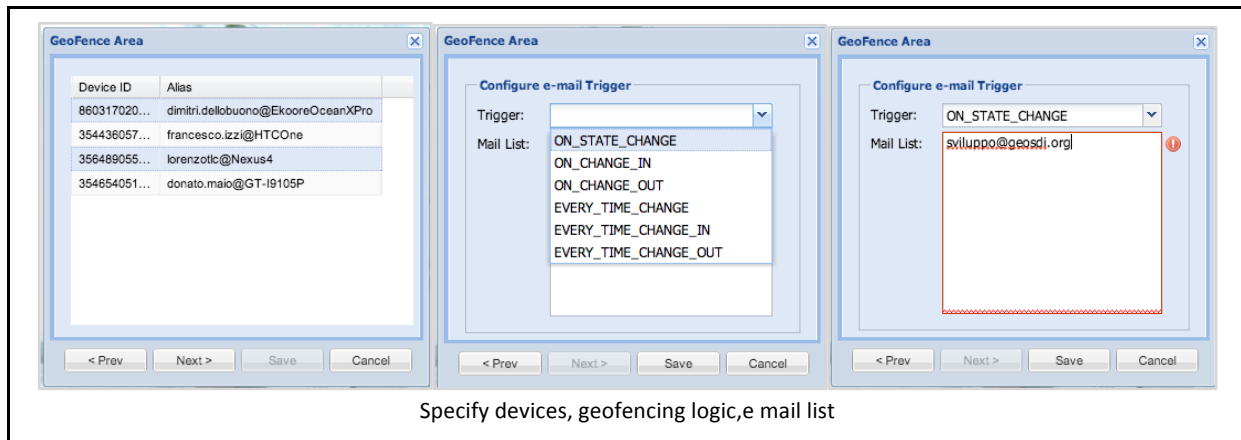
Specify devices, geofencing logic,e mail list
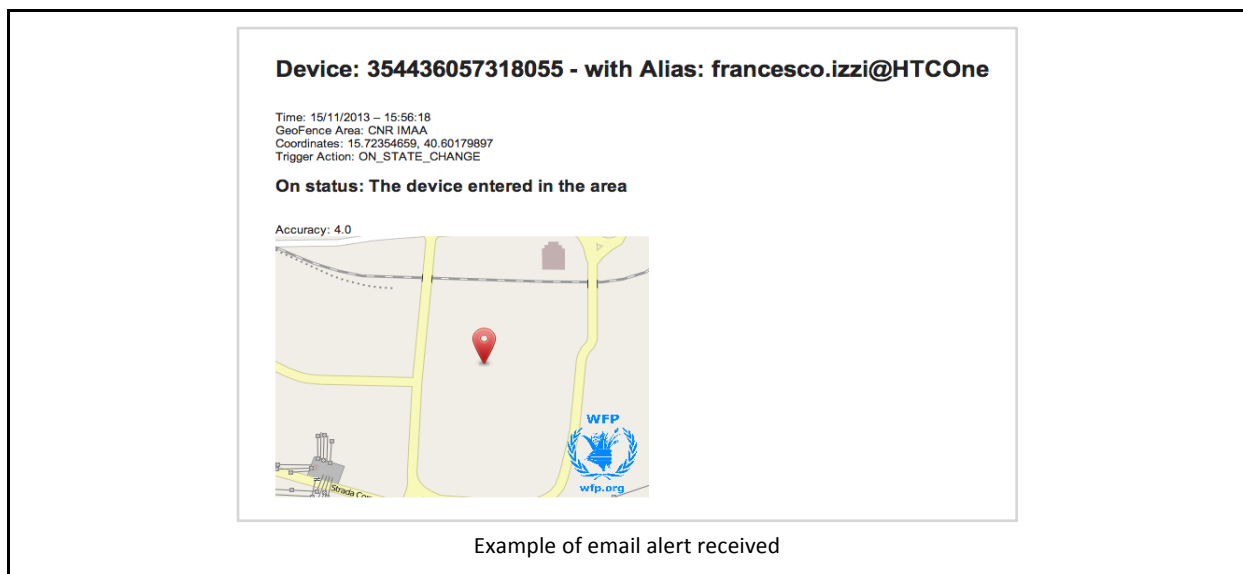
Example of email alert received

MITO (Multimedia Information for Territorial Objects)

In 2013 the Italian Ministry for Education, University and Research banned calls to tenders to enhance the development of the research system through Structural Strengthening projects.

The MITO Project (Multimedia Information for Territorial Objects) has been financed with 10 million euro. In this context five Universities and ISPRA (Institute for the Protection and Environmental Research) implemented a distributed architecture for the management of geospatial multimedia objects. This was achieved developing an application based on Geo-Platform Framework aimed at cooperation between people and between institutions in study and research contexts.

Rich collaboration features such as wikis, forums, calendars and documents are smartly integrated around activity streams, social networking and workspaces and geospatial tools.

Special geo-location services allow to give a position to all the multimedia objects (documents, pictures, videos …), storing the information into an enterprise search engine, spatially enabled and geo-json object oriented.

The MITO Platform allows also to create collaboration workspaces for teams or projects where can be share documents, tasks, events, wikis maps and more.

The collaboration work-spaces can be open or closed, private or public so that work-space administrators can manage members and the applications that are available.
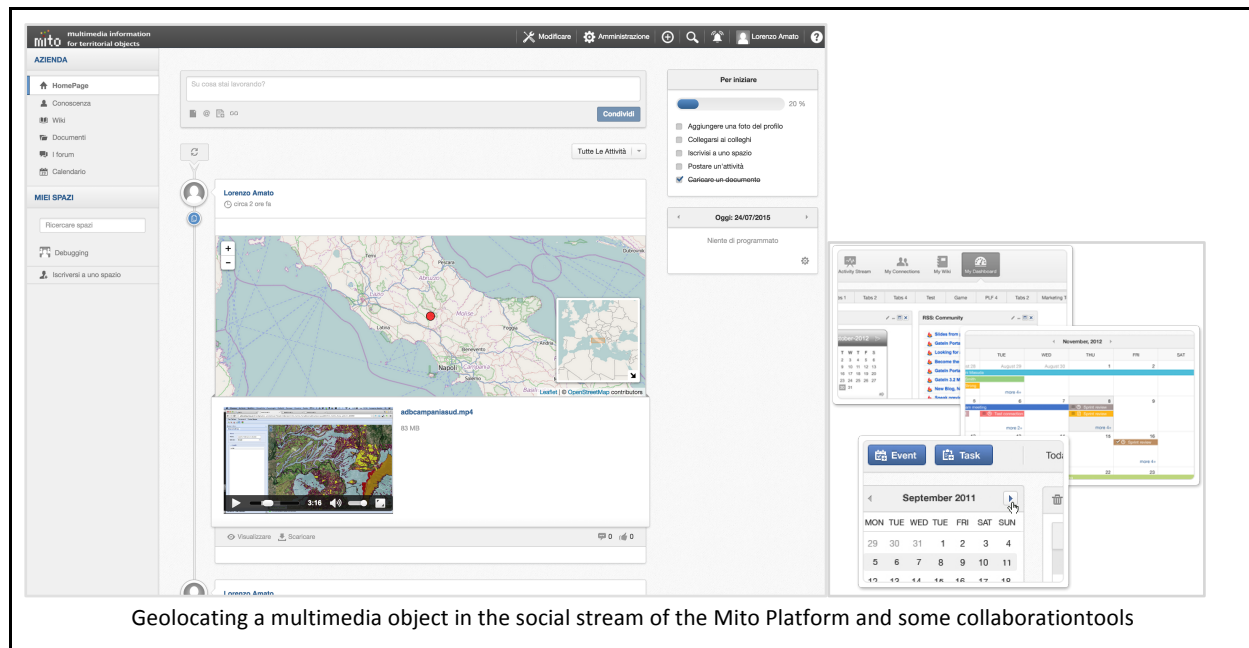
Geolocating a multimedia object in the social stream of the Mito Platform and some collaborationtools

The platform is being used for different applications: from the management of University degree programs to the National System of Biodiversity of ISPRA (Institute for the Protection and Environmental Research)

An example of Biodiversity search map created using the MITO Platform
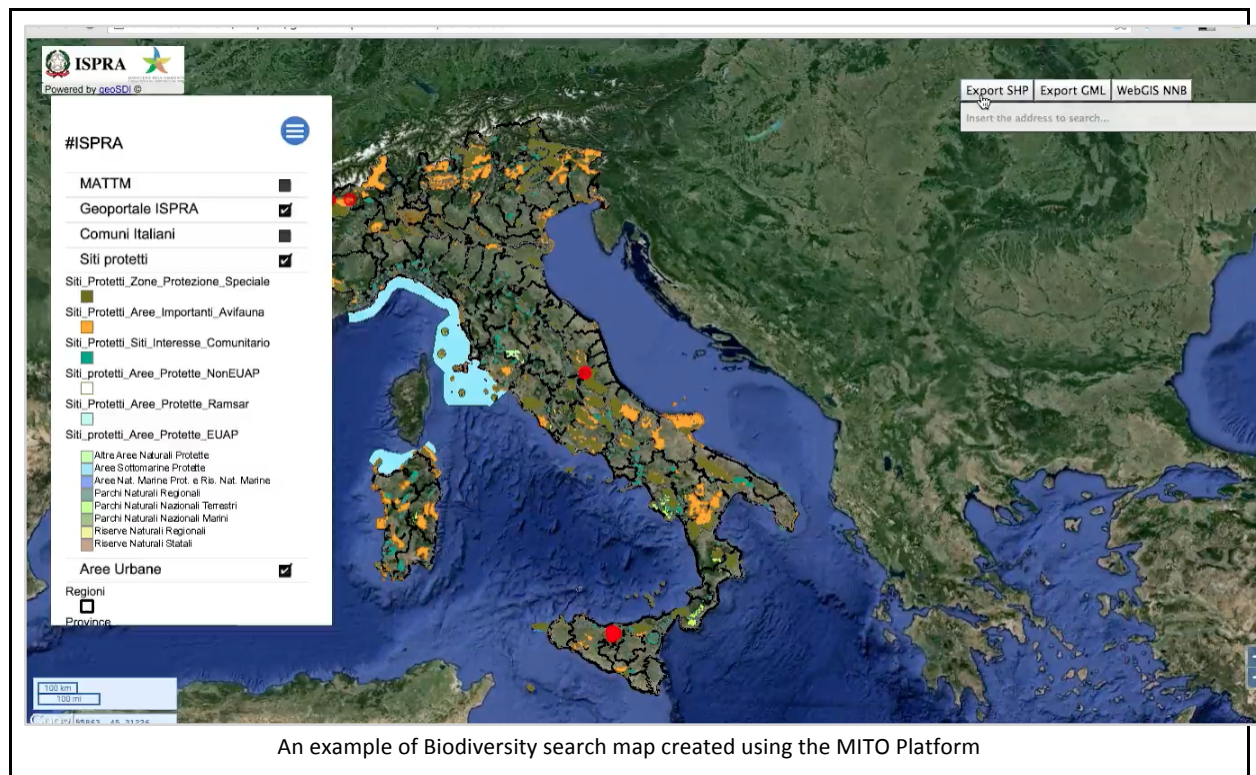
The integration of statistical and geospatial information

Users are increasingly demanding for more sophisticated statistics to describe and analyse the society and the economy; moreover since 'things happen somewhere', most of statistical data are related to places and can be geo-referenced (or location-enabled).

The integration of statistical and geospatial information will enhance both the production and the analysis and dissemination of statistical information. In the last two decades the availability and the use of geospatial information linked to statistical data became a crucial element for planning, monitoring and developing projects and policies of different kinds (environmental, economic, social, and cultural) and for achieving the targets of the digital agenda. That has been widely recognized and even international bodies encourage and support initiatives of geo-referencing and geo-coding statistical data. In that context UN-GGIM-Europe is active with the two working groups: WG-A, Core Data and WG-B, Data Integration.

- Work Group A *deals with core data specifications and quality, production issues, funding and data availability.*
- Work Group B *deals with the integration of geospatial data with other information in order to supply services to users. It will supply the three following deliverables and will carry out the associated tasks:*
    1) *Definition of the priority user needs for combinations of data*
    2) *Recommendation for methods implementing the prioritised combinations of data*
    3) *Recommendation about how to manage side-effects induced by data combinations.*

ISTAT and GeoSpatial information

Istat, the Italian National Statistics Institute, is formally involved in the UN-GGIM-Europe initiative and in the working group B.2, Data Integration, to produce the recommendations for methods implementing the prioritized combination of data, together with other UN member states national statistics institutes and mapping and cadastral agencies:

http://un-ggim-europe.org/content/wg-b-data-integration

At European level Istat is involved in the adoption of the INSPIRE directive. INSPIRE, Infrastructure for Spatial Information in the European Community, is driving in the direction of enhance the European Statistics System through the harmonization of statistical units and population distribution. INSPIRE gives directives and specifications to EU member states to share geospatial information through discovery, viewing and download services published on standard National Spatial Data Infrastructure (NSDI).

The Digit PA role

At national level Digit PA, the national Agency supervising the adoption of the digital code for public institutions in Italy in terms of geospatial information, defined the rules for "cataloguing territorial data" for public institutions. Digit PA implemented a National Repertoire for Territorial Data (Repertorio Nazionale Dati Territoriali - RNDT) geo-portal to which public institutions have to contribute to make geospatial information discoverable and interoperable. ISTAT is contributing to the RNDT geoportal.

Extraordinary Plan of Environmental Remote Sensing

The Extraordinary Plan of Environmental Remote Sensing (EPRS-E), pursuant to Law 179,31[st] 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 Defense (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 geospatial information necessary for the creation of high-value elaborates. The data are 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 database representative of the national territory with particular emphasis on its configuration and its relation to the environment.

It has a database with very high resolution, 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 radar Interferometric techniques and the classification of these data in the data base of the National Geo-portal(NG).

The database is 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 has been 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 refer to 1996 and was decided following the increase in the use of survey methods with satellite observation, in particular the GPS. As reference system it was chosen the ETRS89, recently adopted by Europe, in the realization ETRF89, the only available at that time.

The reference was materialized through the establishment of a special geodetic network called IGM95 entirely determined by GPS differential method, and made in the first time of 1230 points, which covered the country with a spacing of 20 km, then the network has been incremented up to the present about 2.000 points. Many regions have been furtherly incremented with another 3000 points with spacing of 7 km. The precision of the three-dimensional points IGM95, with high confidence level, is about 5 cm.

In order to support the evolution of GPS techniques, for which the precision of IGM95 was no longer sufficient, such as the Real Time Kinematic Network (NRTK), the IGM has developed in 2008 a new geodetic network: the National Dynamic Network (RDN), characterized by uncertainty in the position of the points less than 1 cm in the plan and less than 1.5 cm in height.

The RND consisted of 99 GNSS permanent stations covering the whole national territory with an average distance variable between 100 and 150 km, and sending daily update to the Computing Centre of the IGM geodetic service.

The calculation was performed in the realization ETRF 2000 (then 2008.0) of the ETRS89 System, adopted by IGM from 1 January 2009. In the spring of that year the RDN was presented to the EUREF and accepted as European densification of "B" category. Italy adopted the Reference ETRF2000 epoch 2008.0 by Ministerial Decree of 10 November 2011 and the RDN is the materialization the official national system. Since 2008, the network was continuously monitored with weekly calculations, resulting in a series of solutions that, after five years (2008-2012), made it possible to carry out a first calculation of the speed of the sites. The absolute speed of the Italian stations, refer to the ITRS System, were on average 0.028 m/ yr, perfectly in line with the data provided of 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 database 25K* (Topo DB25), in order to produce, by derivation, also the national *Toponymic database 50K* (Topo DB50).

In practice, while the Topo DB 25K (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 Topo DB 50K is the result of an interactive process deriving from the Topo DB 25K.

It consists of all existing toponyms of topographic maps of Italy at 1:50000 scale.

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 organize all available toponymic data to be loaded in the Euro Geo Names database.

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

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

The Revenue Agency and Geospatial Information

From 1 December 2012 the Italian Revenue Agency has incorporated the Real Estate and Land Registry Agency (Agenzia del Territorio), as provided for in Article 23 quater of Decree-Law number 95 of 2012.

The Italian Revenue Agency has the role of "*National Cartographic Body*" as established by the Law n. 68/1960.

As National Cartographic Authority is responsible for the management of the high scale cartographic national system and its continuous updating.

The cartographical system of the Cadastre is complete and homogeneous all over the national territory. It is based on high-scale maps

- 240.000 maps   scale 1:2000
- 30.000   maps   scale 1:1000
- 30.000   maps   scale 1:4000

It is directly related to the administrative census DB of the Land Cadastre by a single, unique identifier: the parcel number.

The Cadastral mapping, geographic basis of S.I.T. (Integrated Territory System)

The cadastral mapping system has in charge about:
- 85,4 milions parcels
- 18 milions buildings
- 62,8 milions residential units.
- 53   milions property owners

For the cadastral mapping has been adopted the compliant representation UTM-WGS84 – ETRF2000 as established by INSPIRE Directive, consequently it is interoperable with other kind of space data, external to the Cadastre.

The cadastral mapping system gets updated in real time automatically by professionals through a telematic infrastructure and an organizational concept based on software application *Pregeo 10*.

It's integrated with a high resolution ortho imagery (GSD : 20 cm) and with the National road maps DB.

Also, the Agency is at work to execute the INSPIRE Directive. Its execution is completed in relation to metadata of cadastral dataset, in fact they can be researched through the *National Territorial Data Repertory* managed by AG.I.D.(Agenzia per l'Italia Digitale).

Furthermore has yet realized the WMS services and at the moment the activities to get them available are in progress.