



FP7 Grant Agreement N° 312450

CIPRNet

Critical Infrastructure Preparedness and Resilience Research Network

Project type: Network of Excellence (NoE)

Thematic Priority: FP7 Cooperation, Theme 10: Security

Start date of project: March 1, 2013

Duration: 48 months

D9.3 Draft training material of the DSS demonstrator system

Due date of deliverable: 31/10/2015

Actual submission date: 06/11/2015

Revision: Version 1

Italian National Agency for New Technologies, Energy and Sustainable Economic Development (ENEA)

Project co-funded by the European Commission within the Seventh Framework Programme (2007–2013)		
Dissemination Level		
PU	Public	X
PP	Restricted to other programme participants (including the Commission Services)	
RE	Restricted to a group specified by the consortium (including the Commission Services)	
CO	Confidential, only for members of the consortium (including the Commission Services)	

Author(s)	Alberto Tofani (ENEA) Maurizio Pollino (ENEA) Antonio Di Pietro (ENEA) Luisa Lavalle (ENEA)
Contributor(s)	

Security Assessment	Dominique Serafin (UCY)
Approval Date	04/11/2015
Remarks	ACCEPT, NO ISSUES.

The project CIPRNet has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement no 312450.

The contents of this publication do not reflect the official opinion of the European Union. Responsibility for the information and views expressed herein lies entirely with the authors.

TABLE OF CONTENTS

1	INTRODUCTION – RATIONALE OF THIS DOCUMENT	5
1.1	Target audience	5
1.2	Topics of the CIPRNet training event focusing on the CIPRNet DSS	5
2	TRAINING MATERIAL ON CIPRNET DSS	8
2.1	Lecture material.....	8
2.2	Exercises.....	8
3	LEARNING GOAL.....	8
	REFERENCES	8
	APPENDIX	9
	Appendix A: Agenda of the training session on Modelling, Simulation and Analysis of Critical Infrastructures.....	10
	Appendix B: geoSDI slides	12
	Appendix C: i2Sim slides.....	13
	Appendix D: Consequence Analysis slides	14

LIST OF ABBREVIATIONS

Acronym	Explanation
CI	Critical Infrastructure
CIP	Critical Infrastructure Protection
CIPRNet	Critical Infrastructure Preparedness and Resilience Research Network
DBMS	Database Management System
DSS	Decision Support System
GIS	Geographic Information System
M&S	Modeling and Simulation

1 Introduction – Rationale of this document

This document contains the draft training material on the CIPRNet Decision Support System (DSS). Then CIPRNet DSS is a platform enabling the improvement of the resilience of Critical Infrastructures (CI) by predicting physical damage (harm) scenarios produced by natural hazards, and estimating the impacts on CI in terms of service loss or reduction. In addition, the platform estimates the related consequences that such perturbations might have on the citizens, the environment, the delivery of primary services and the economy. The CIPRNet DSS aims to provide realistic predicted scenario data to operators and emergency managers in order to improve "crisis preparedness and management".

The draft training material will be used within the Training Session on “Modelling, Simulation and Analysis of Critical Infrastructures”. The Training Session aims to perform training and demonstrating activities to the Critical Infrastructures Protection (CIP) community, in order to strengthen links between different research institutions and to create common views within the CIP community. This event is the third edition of the Training Session that took place in the last two years [1] [2] and will be based on three training parts:

- **Part 1** (11th November 2015): notions and theories regarding Critical Infrastructure modelling, simulation and analysis. This part is addressed to researchers and professionals requiring a general approach to the topic;
- **Part 2** (12th November 2015): Decision Support System and Consequence Analysis. This module focuses on a description of the CIPRNet DSS developed by ENEA. This part is addressed to any type of audience, including CI operators;
- **Part 3** (13th November 2015, morning): Hands-on exercises on the DSS. This part is addressed to technicians and researchers requiring to practice with the CIPRNet DSS.

1.1 Target audience

This training event is mainly addressed to CIP researchers and experts from different research communities (European and non-European), public/governmental authorities in charge of Critical Infrastructure Protection or Civil Protection matters, and stakeholders from Critical Infrastructure operators.

1.2 Topics of the CIPRNet training event focusing on the CIPRNet DSS

The first module of the Training Session will be devoted to give the audience the basic notions and theories regarding CI modelling, simulation and analysis whereas in the following two modules the training event will focus on the CIPRNet DSS allowing the attendees to practice with the different modules of the platform.

The agenda of the training event covers the following topics:

	Title
PART 1	Geographical Information Systems for visualisation and analysis
	<ul style="list-style-type: none"> ○ Geomatics and Geographic Information Systems ○ How GIS works ○ GIS analysis and functions ○ GIS and DMBS ○ Mapping

	<ul style="list-style-type: none"> ○ WebGIS <p><i>This session focuses on the basic GIS functions and technologies and illustrates the GIS structure as a basic technique to describe interacting scenarios between natural and technological systems.</i></p> <p>Risk analysis tools for events and damages simulations</p> <ul style="list-style-type: none"> ○ DSS framework ○ Data flow and processing ○ GIS procedures ○ Vulnerability analysis ○ Earthquake event: Real time monitoring / Simulation ○ Results and discussion <p><i>This session focuses on the Decision Support System developed by ENEA in the area of risk management of CI. The DSS must be able to observe and predict an event, the harm scenario, the impacts and consequences from damages and help decision makers to compile useful information, identify critical situations and take decisions.</i></p> <p>Platforms for Large & Complex Scenarios</p> <ul style="list-style-type: none"> ○ Classification of interdependencies M&S simulation approaches ○ Possible dimensions of a scenario ○ A large scenario example ○ Modelling objectives ○ Simulation of large scenario: the solution architectural template <p><i>This session focuses on the modelling and simulation challenges of large complex scenario and illustrates the different approaches that have been proposed in literature to this end.</i></p>
PART 2	<p>Application of system of systems model for long-term impacts analysis in large scenarios</p> <ul style="list-style-type: none"> ○ CIPRNet CI Risk Assessment Workflow ○ Predicting Impacts ○ i2Sim in the loop ○ Predicting Long Term Impacts ○ Use case scenario <p><i>This session focuses on the CIPRNet CI Risk Assessment Workflow and in particular on the long-term impact analysis. The session illustrates how the i2Sim simulator (an interdependency simulator) has been used within the workflow.</i></p> <p>An Electric-SCADA based model to implement reconfiguration procedures in Electric Distribution grids</p> <ul style="list-style-type: none"> ○ Modelling Electric – SCADA Interdependencies ○ CIPRNet DSS Impact Analysis ○ From Damages to Propagation and Reactivation: a procedure to emulate the reactivation policies of an electric distribution grid operator ○ The Rome Case Study <p><i>This session provides details of a procedure implemented by ENEA to model</i></p>

	<i>the dependencies between the Distribution Electric grid and the Telecom mobile network in order to assess the impact that damages on specific CI components may provoke on the delivery of services of the two networks.</i>
PART 3	Training exercises
	<ul style="list-style-type: none"> ○ geoSDI ○ i2Sim
	<p><i>This session provides the attendees with a training of the geoSDI platform (functionalities, main features, use, etc.). They will also have the opportunity to practise the platform.</i></p> <p><i>In particular, during this session, the attendees will learn how to:</i></p> <ul style="list-style-type: none"> • <i>create a new project in geoSDI;</i> • <i>work with geoSDI: add and manage layers, execute queries, etc.</i> <p><i>Moreover, the attendees will be shown the main features of the Infrastructure Interdependency Simulator (i2Sim) such as creating and running simple models. They will be also introduced to the ENEA Consequence Analysis module (both theory and practical results).</i></p>

2 Training material on CIPRNet DSS

2.1 Lecture material

The introduction to the different parts of the CIPRNet DSS is given during the Training Session **Part 2**. The additional teaching material for the audience is divided in the following parts:

- 1) Introduction
- 2) The DSS Risk Forecast Workflow
- 3) The ENEA CI Data warehouse
- 4) The geoSDI platform
- 5) i2Sim in the loop
- 6) The DSS Consequence Analysis module

2.2 Exercises

In the exercise, the audience will see how CI data and territorial data are analysed using GIS technologies. Then, they will see how it is possible to distribute the GIS data by using web-mapping technologies. To this end, they will create a new project in geoSDI and use the main features of the platform (add and manage layers, execute queries). In the second part of the module, the attendees will have the opportunity of playing with the technologies used by ENEA to perform the impact assessment and Consequence analysis tasks.

3 Learning goal

The main learning goal of the attendees is to:

- acquire the methodologies and technologies used within CIPRNet
- understand the main modelling and simulation challenges in the field of CIP
- acquire and exercise the different “functional blocks” of the main functionality implemented in the CIPRNet DSS, that is the CI Risk Forecast Workflow

References

- [1] FP7 CIPRNet Project, Deliverable 9.1 “Training Plan”.
- [2] FP7 CIPRNet Project, Deliverable 9.82 “Courses inside the Homeland Security Master”.

Appendix

This section reports the detailed agenda of the Master Class and all slides that will be used for PART 3 Training Session.

Appendix A: Agenda of the training session on Modelling, Simulation and Analysis of Critical Infrastructures

Programme

11 November

9:30 – 10:00	Taking seats	
10:00 – 10:10	V. Rosato (ENEA)	Welcome
10:10 – 10:50	E. Rome (Fraunhofer)	Introduction to CIPRNet
10:50 – 11:30	M. Theocharidou (JRC)	From critical infrastructure (CI) protection to critical infrastructure resilience
11:30 – 12:10	E. Luijff (TNO)	Simulation of (CI): relevant applications
12:10 – 12:30	Coffee break	
12:30 – 13:10	M. Eid (CEA)	Principal modelling techniques: applications and limitations
13:10 – 13:50	R. Setola (UCBM)	Modelling and investigating dependencies of CI
13:50 – 15:00	Lunch	
15:00 – 15:40	J. Marti (UBC)	Phenomenological approaches to simulate system of systems
15:40 – 16:20	J. Voogd (TNO)	Introduction to federated simulation
16:20 – 16:40	Coffee break	
16:40 – 17:20	J. Voogd (TNO)	Verification and validation techniques
17:20 – 18:00	R. Kozik (UTP)	Cyber threats to CI

12 November (morning)

9:30 – 10:00	Taking seats	
10:10 – 10:40	E. Rome (Fraunhofer)	Modelling, simulation and analysis techniques for CIP
10:40 – 11:20	M. C. de Maggio (UCBM)	Introduction to Decision Support Systems
11:00 – 12:00	M. Pollino (ENEA)	Geographical information systems for visualisation and analysis
12:00 – 12:20	Coffee break	
12:20 – 12:40	A. Tofani (ENEA)	Platforms for Large & Complex Scenarios
12:40 – 13:00	V. Rosato (ENEA)	An overview on CIPRNet DSS design
13:50 – 15:00	Lunch	
14:00 – 14:40	A. Zijdeveld (Deltares)	Events prediction and environmental sensing

Programme

12 November (afternoon)

14:40 – 15:20	M. Pollino (ENEA)	Risk analysis tools for events and damages simulations
15:20 – 15:40	Coffee break	
15:40 – 16:20	A. di Pietro (ENEA)	An Electric-SCADA based model to implement reconfiguration procedures in Electric Distribution grids
16:20 – 16:40	A. Tofani (ENEA)	Application of system of systems model for long term impacts analysis in large scenarios
16:40 – 17:00	V. Rosato (ENEA)	Consequence Analysis and applications for supporting operator's decisions

13 November (morning)

9:00	Bus shuttle to UCBM from ENEA Headquarters	
10:00 – 10:30	Taking seats	
10:30 – 12:00	ENEA	DSS: Hands-on exercises
12:00 – 12:20	Coffee break	
12:20 – 14:00	ENEA	DSS: Hands-on exercises
14:00 – 15:00	Lunch	

Appendix B: geoSDI slides



Geo-Platform Framework by geoSDI

The first pure java Open Source framework to develop Rich Web GIS Application.



Dimitri Dello Buono
GI 2012 – Open Data Policies
Dresden, 19.05.2012



The geoSDI Programme

geoSDI is a Programme coordinated by the Italian Civil Protection Department of the Prime Minister Office



<http://www.geosdi.org>

- For implementing the Civil Protection National Spatial Data Infrastructure
- According to the provisions of the INSPIRE Directive
- Using Open Source software applications.



It is developed by the **Institute for the Methodologies of Environmental Analysis (IMAA)** of the **Italian National Research Council (CNR)** with the collaboration of most of the national civil and military institutions concerned.

The geoSDI PROJECT

geoSDI is also the name of a **complete solution** for:



- Pre-processing data for creating geoSpatial DataStores
- Managing and providing OGC Web Services (Server Side Components)
- Use OGC Web Services (Client Side Components)



The Problem

The problem that geoSDI was called to deal with:

When an emergency occurs (earthquake, landslide, flood ...) the **Civil Protection** needs to manage and coordinate the emergency intervention, with the help of maps using:

- Spatial Data
- Infrastructures Data
- Resource Data
- ...

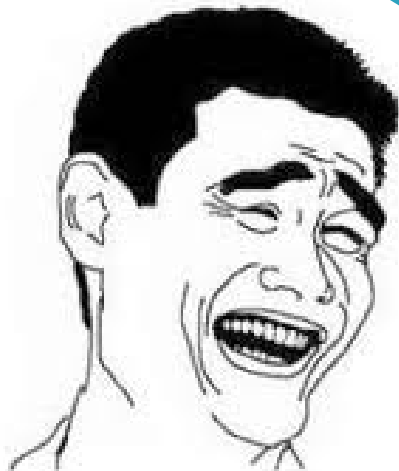
These data are often produced in different formats
and are managed locally

So the way to work with heterogeneous data is to use OGC standards
WMS – WFS - WCS

The Problem

So ...

... is this another boring
presentation on OGC
Standards
?



The Problem

The use of OGC standards allows to provide heterogeneous GeoSpatial Data as GeoSpatial Services ...



... but

HOW TO WORK WITH GEOSPATIAL SERVICES ?

This is the focus of our work

The Needs

Many open source projects for display maps are based on **JavaScript**, with problems like **Maintenance**: Maintain JavaScript code is sometimes very complex because of its structure

So we need a more powerful and flexible solution to use Java technology to build webGIS portals, which include the javascript libraries for handling maps

For this reason, the choice we made was to use **GWT (Google Web Toolkit)**, a powerful framework that can:

- transform / compile **Java code**
- and **generate Javascript** code for **any browser**.

The Solution



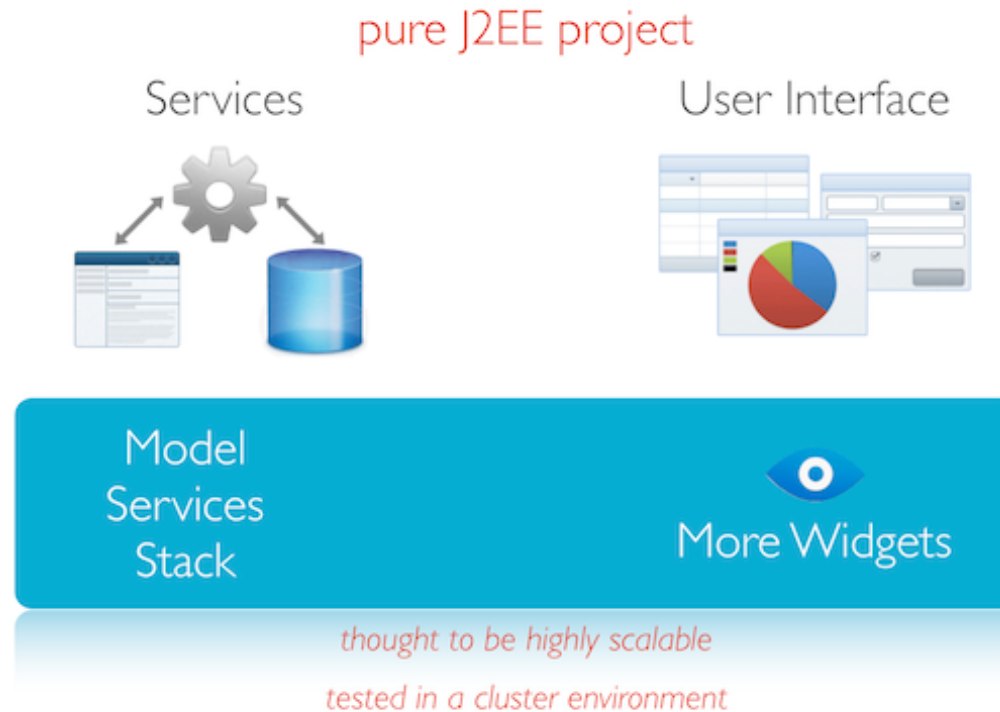
geoSDI has developed a new project
Geo-Platform Framework, the first pure java open source framework to
develop Rich Web GIS Application.

<http://code.google.com/p/geo-platform/>

Geo-Platform allows to **extend webGIS** applications **adding Widgets**,
software plugins that perform specific functions: in this way every geo-
portal is different from the others and it realizes an exact reflection of the
functional needs of the end user.

With the development of Geo-Platform Framework is now possible to
produce fast and powerful geoportals dedicated to end users.

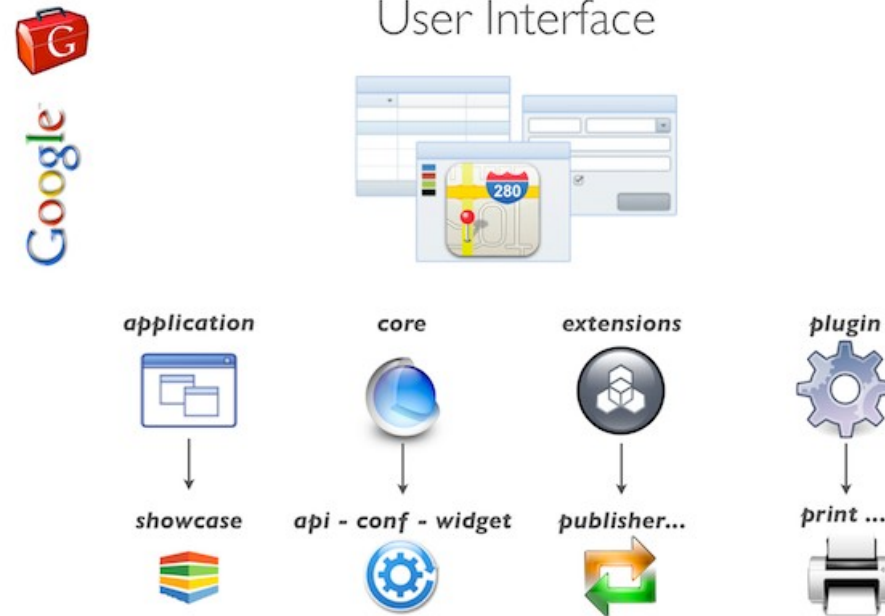
An extensible Solution



Geo-Platform Framework consists of two main modules:

- Geo-Platform Services
- Geo-Platform GUI

An extensible Solution



Geo-Platform includes the main web technologies, such as Google Web Toolkit, Openlayers, Hibernate, and adds to the versatility of javascript on the web, the power, security and control that Java technology can give.

To the **CORE side** of an application built with Geo-Platform a number of **WIDGETS** can be added **to extend** the webGIS **functionalities**.

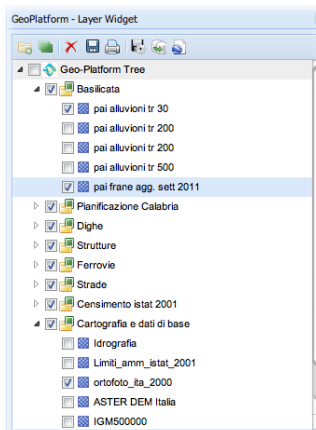
Widgets Examples



Map Feature Widget

He manages the map, working in association with other components such as toolbars and the layer tree widget. Every operation on the layer tree widget is immediately reflected on the map, for example transparencies, zIndex, style.

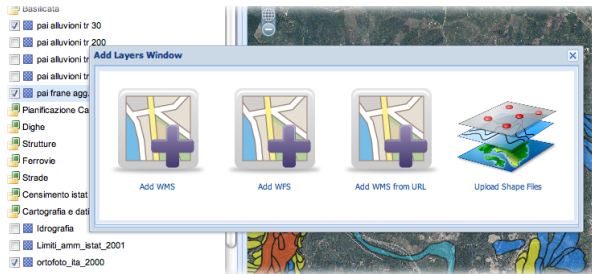
This widget gives also information about the scale of representation, geographical orientation, lat/long mouse position.



Layer Tree Widget

This is the widget for managing layers displayed on a map, which allows a truly innovative configuration: As shown in the figure, the tree allows you to view the "folder" in a nested way (unlimited nesting). This allows greater flexibility in organizing the set of layers. The toolbar exposes functionality for the management of the tree and can be extended through additional widgets with additional features..

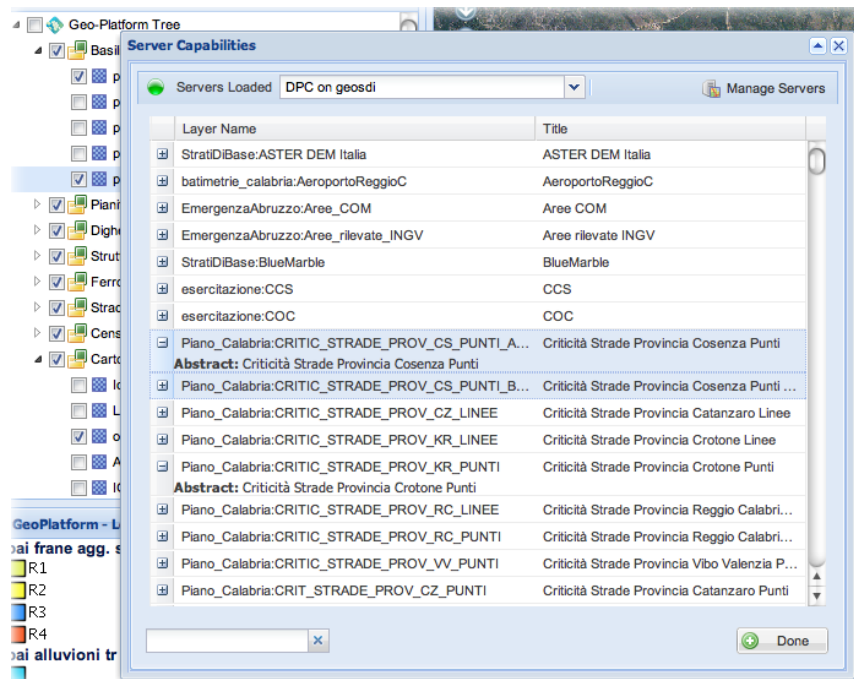
Widgets Examples



Add Layer Widget

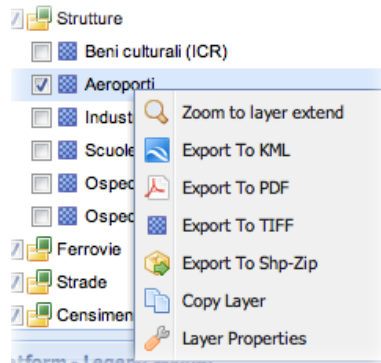
Allows creation of layers within the layer tree. Through this widget you can manage multiple data sources from which "collect" the layer to be added to the map.

The functionality of the Add Layer Widgets can be extended by adding more widgets, like uploading Shapefiles Widgets, the Widget Manage Server, the Add WMS from URL widget.



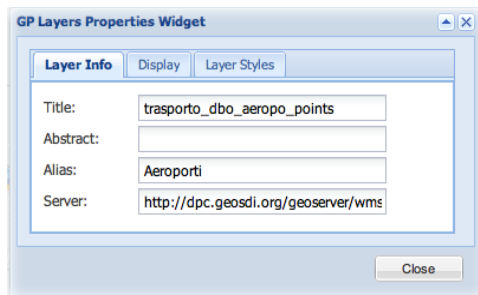
The work with layers is facilitated by: pagination of layers, the automatic extraction of the abstract, the possibility of selecting multiple layers, enhanced search and filtering the results.

Widgets Examples



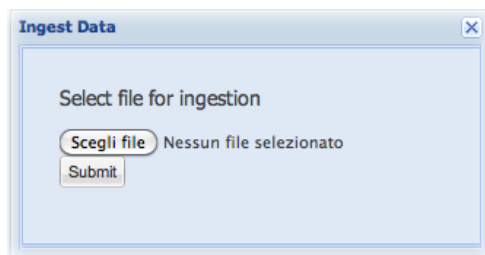
Context Menu Widget

For each layer functions are handled through the Context Menu ie: positioning the Max Extent, export to Google Earth, a quick view of the layers in PDF, export to TIFF for a higher resolution image, export to shapefile vector data, the Copy & Paste layers within layers of the tree.



Layer Properties Widget

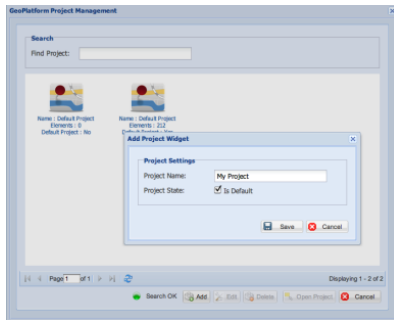
For each layer in the tree are handled a number of properties, like the visual style for the layer, the opacity of the layers in the map, the information related to the server, user preferences such as the alias to be used as a label in the tree for the level, etc..



Upload Data Widget

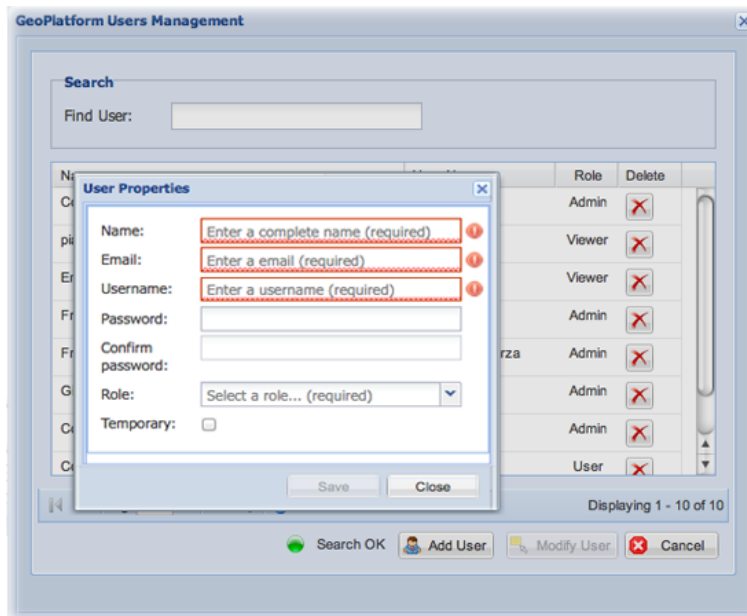
Functionality of ingestion of files, so as to make it totally transparent to the user the loading process of the physical data on the server and the service configuration. The selected file from your local disk, using web-GIS interface, it is sent to the server. The proper flow of ingestion will automatically configure the WMS-WFS services.

Widgets Examples



Manage Projects Widget

Users can directly manage their online Map Projects: through tree-export functions, can save the state of the tree and open in successive different situations (trees with different structures).



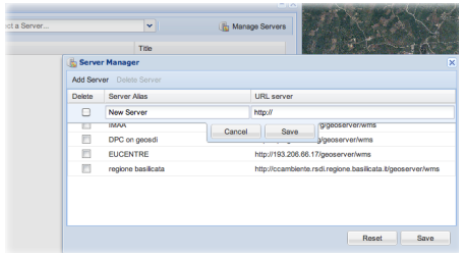
User Management Widget

The widget allows you to differentiate your application based on user profile. Users Administrators can create, edit, delete users and differentiate the functionality available to users according to various profiles (eg Viewer, User, Admin).

Widgets Examples

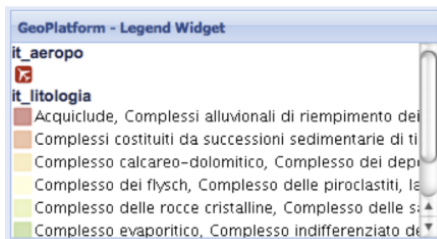
Server Management Widget

The widget works in association with the widget layer, and it manages the connection to the wms server. In particular, it allows you to connect to the web-gis a standard server WMS 1.1.1/1.3, giving the possibility to assign a name to the server and display the summary list of layers that it delivers. For each of the layers shows the summary description retrieved from the server.



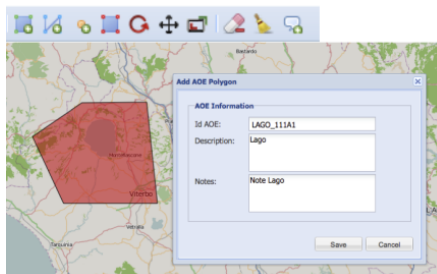
Legend Widget

The widget displays the legend for each layer depending on the viewing scale active in the map.

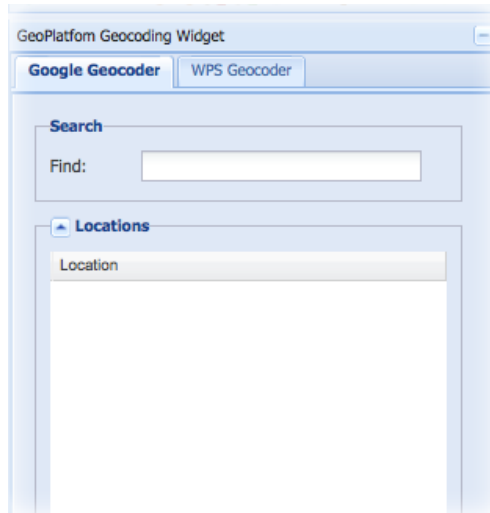


Edit Widget

The toolbar allows you to enable editing capabilities for creating and editing geometry (point, line and polygon) and associated alphanumeric information. Topological features are also displayed adjacent to the inclusion.

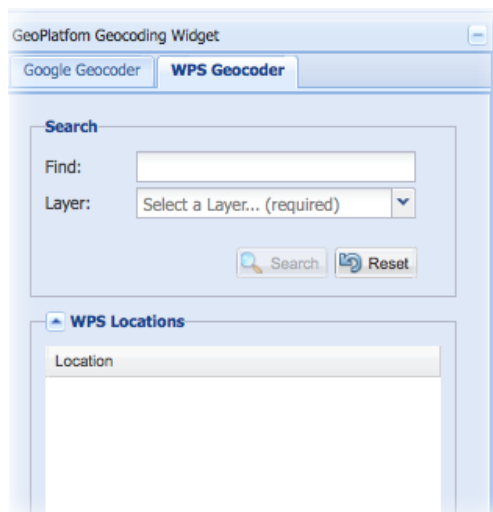


Widgets Examples



GeoCoding Widget

It gives the opportunity to locate on a map the location of any place, inserted through free text in the "Search". The widget can make use of geocoding services by external providers (eg, Google or Yahoo) or deployed from a database.



GeoCoding WPS

It gives the opportunity to locate on a map the location of any place, inserted through free text in the "Search". The widget can make use of geocoding services by **wps** providers.

Widgets Examples



Routing Widget

It has the capability to calculate the shortest path in a graph interconnected, proposing directions for getting from A to B. The shortest path, in the case shown in the figure, is based on open graph of OSM (Open Street Map) and takes account of these unique ways.

Some Video Examples

- [Work with layers and GeoCoding](#)
- [Add folder and WMS Data](#)
- [Create a Scenario and Print a Map](#)
- [Create and Edit Area of Interest](#)
- **Other videos at**
 - [Dimitri Dello Buono YouTube Channel](#)
(<http://www.youtube.com/user/MrDimitriDB>)
 - [geoSDI Video YouTube Channel](#)
(<http://www.youtube.com/user/geoSDIVideo>)
 - http://youtu.be/0Qif_4dDuso

Live Demo

The screenshot displays the GeoPlatform web application interface. The browser address bar shows the URL maps.geosdi.org/geo-portal/. The interface includes a top navigation bar with 'Geo-Platform', 'AOE', 'Widgets', and 'Map Option'. Below this is a toolbar with various map navigation and interaction tools. The main map area shows a satellite-style map of the Lazio region in Italy, with numerous blue and green markers representing data points. A legend on the right side of the map lists several base layers: OpenStreetMap, Google Normal, Google Satellite, Google Hybrid, Bing Road Layer, Bing Hybrid Layer, and Bing Aerial Layer. On the left side, there is a 'GeoPlatform - Layer Widget' containing a tree view of layers. The 'test' folder is expanded, showing a list of layers with checkboxes, including 'DE AGOSTINI 1000000', 'DE AGOSTINI 750000', 'DE AGOSTINI 250000', 'Laghi Europei', 'Limiti Amministrativi Europei', 'Strade Europee', 'Aeroporti', 'Scuole Elementari', 'Ferrovie', 'Idrografia 250000', 'it_istruzione_materne', 'Laghi', 'Limiti Comunali', 'Limiti Provinciali', 'Limiti Regionali', 'Scuole Medie', 'Scuole Pubbliche', 'Strade Italiane', 'Scuole Superiori', 'Toponimi', and 'Orto Italia'. Below the layer widget is a 'GeoPlatform - Legend Widget' showing a list of selected layers with corresponding symbols: 'Laghi Europei' (blue square), 'Limiti Amministrativi Europei' (white square), 'Strade Europee' (orange line), and 'Aeroporti' (red square). At the bottom of the map, there is a scale bar showing 10 km and 5 mi, a north arrow, and the coordinates 12.77831, 41.41585. A large orange watermark <http://maps.geosdi.org> is overlaid on the map. A status bar at the bottom indicates 'Tree elements loaded successfully.' and 'Map data ©2012 Tele Atlas Immagini ©2012 TerraMetrics - Termini e condizioni d'uso'.

Thank you

geoSDI Team

Web

www.geosdi.org

Mail

sviluppo@geosdi.org

Address

IMAA CNR, C.da S.Loja, Tito Scalo (PZ)

Italy





Geo-Platform Framework by geoSDI

The first pure java Open Source framework to develop Rich Web GIS Application.



Lorenzo Amato



The geoSDI Programme

geoSDI is a Programme coordinated by the Italian Civil Protection Department of the Prime Minister Office



<http://www.geosdi.org>

- For implementing the Civil Protection National Spatial Data Infrastructure
- According to the provisions of the INSPIRE Directive
- Using Open Source software applications.



It is developed by the **Institute for the Methodologies of Environmental Analysis (IMAA)** of the **Italian National Research Council (CNR)** with the collaboration of most of the national civil and military institutions concerned.

The geoSDI PROJECT



geoSDI is also the name of a complete solution for:

- Pre-processing data for creating geoSpatial DataStores
- Managing and providing OGC Web Services
(Server Side Components)
- Use OGC Web Services
(Client Side Components)



GeoAutomator
by geoSDI

PostgreSQL



GeoServer



GeoPlatform
by geoSDI

GeoNetwork
OpenSource

The Problem

The problem that geoSDI was called to deal with:

When an emergency occurs (earthquake, landslide, flood ...) the Civil Protection needs to manage and coordinate the emergency intervention, with the help of maps using:

- Spatial Data
- Infrastructures Data
- Resource Data
- ...

These data are often produced in different formats
and are managed locally

So the way to work with heterogeneous data is to use OGC standards
WMS – WFS - WCS

The Problem

So ...

... is this another boring
presentation on OGC
Standards
?



The Problem

The use of OGC standards allows to provide heterogeneous Geospatial Data as GeoSpatial Services ...



... but

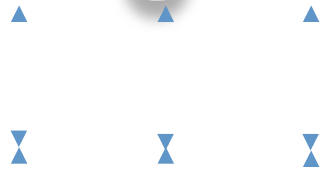
HOW TO WORK WITH GEOSPATIAL SERVICES ?

This is the focus of our work

The Problem



...Same thing,
Other picture!



OGC Web services



STORAGE / SERVER
BLACKBOX

GeoTIFF
SHP
...

Data
Acquisition

Scientific
Products
Preparation

The Needs

Many open source projects for display maps are based on JavaScript, with problems like Maintenance: Maintain JavaScript code is sometimes very complex because of its structure

So we need a more powerful and flexible solution to use Java technology to build webGIS portals, which include the javascript libraries for handling maps

For this reason, the choice we made was to use GWT (Google Web Toolkit), a powerful framework that can:

- transform / compile Java code
- and generate Javascript code for any browser.

The Solution

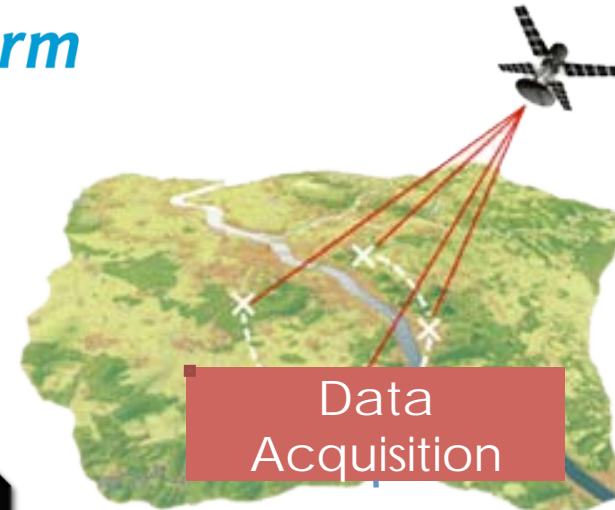
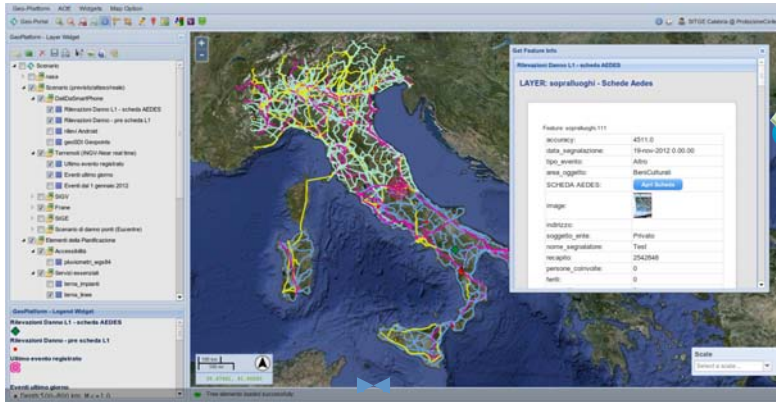


geoSDI has designed and launched the open source project Geo-Platform Framework, the first pure java open source framework to develop Rich Web GIS Application.

Geo-Platform allows to extend webGIS applications adding Widgets, software plugins that perform specific functions: in this way every geo-portal is different from the others and it realizes an exact reflection of the functional needs of the end user.

With the development of Geo-Platform Framework is now possible to produce fast and powerful geoportals dedicated to end users.

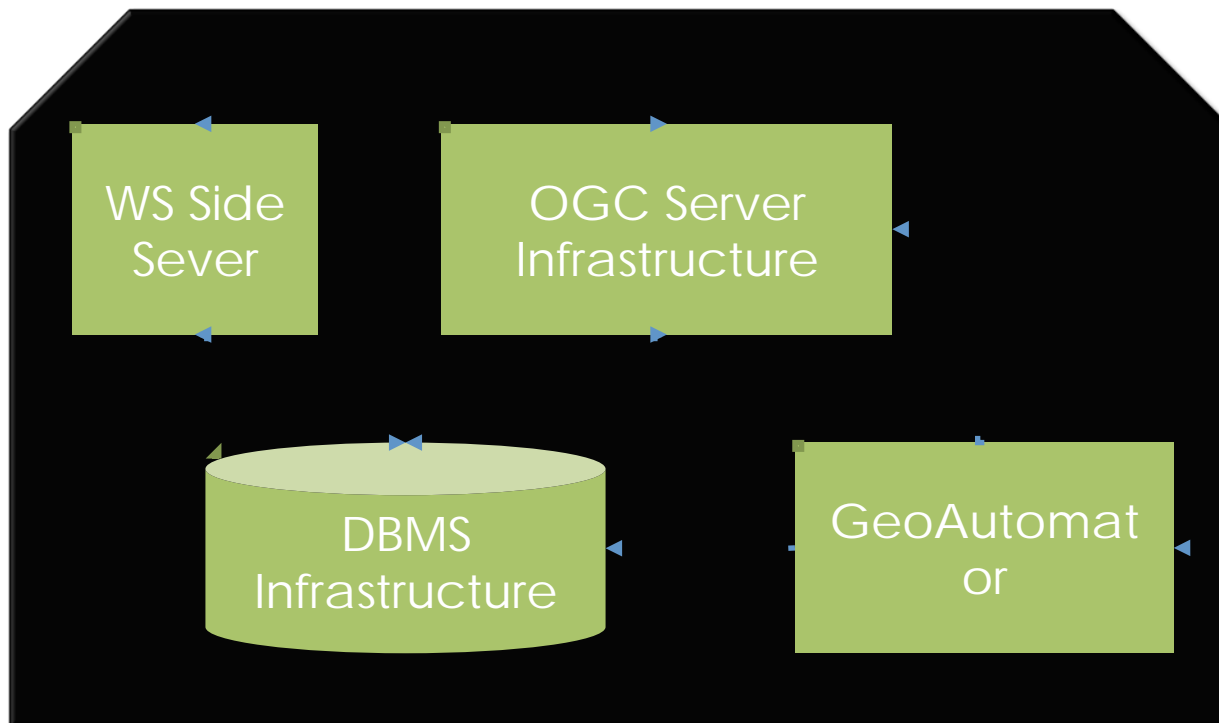
The Overall Architecture



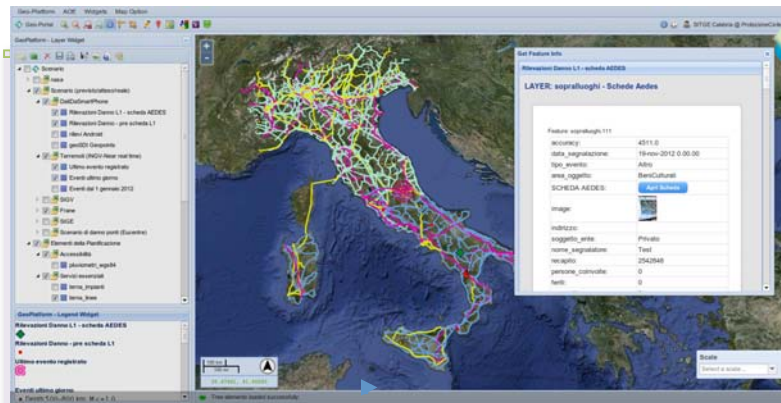
Data Acquisition

Scientific Products Preparation

GeoTIFF
SHP
...



The Overall Architecture



geoSDI BASED
INFRASTRUCTURE



Apache CXF

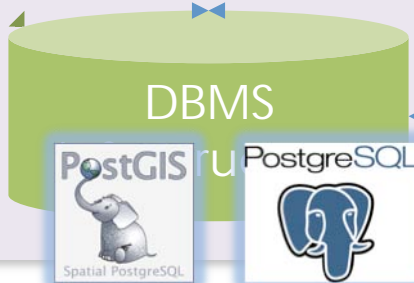
WS Side
Sever

OGC Server
Infrastructure



GeoAutomat
or

GeoTIFF
SHP
...



An extensible Solution: widgets!



- Base Layer Selection (*Google, Bing, OSM, Custom...*)
- Add WMS Layer
- Upload File (*GeoTiff, SHP, SLD, ...*)
- Manage WMS Server
- Layer Tree Panel
- Refresh Layer
- CQL Filter
- Time Filter
- Print Map
- Styler (*gestione SLD*)

- Viewports Management
- Geocoding / Reverse Geocoding (*Google, Yahoo, Custom...*)
- Map Projects Management
- Export / Import Map Projects
- User / Roles Management
- Routing on OSM Data
- Feature Editor (WFS-T)
- WPS builder
- ...
- ...

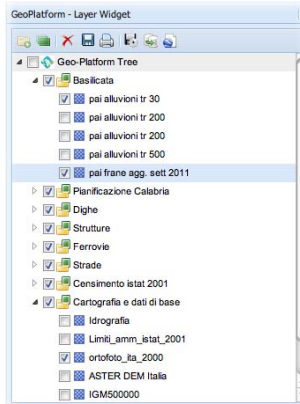
Widgets Examples



Map Feature Widget

He manages the map, working in association with other components such as toolbars and the layer tree widget. Every operation on the layer tree widget is immediately reflected on the map, for example transparencies, zIndex, style.

This widget gives also information about the scale of representation, geographical orientation, lat/long mouse position.



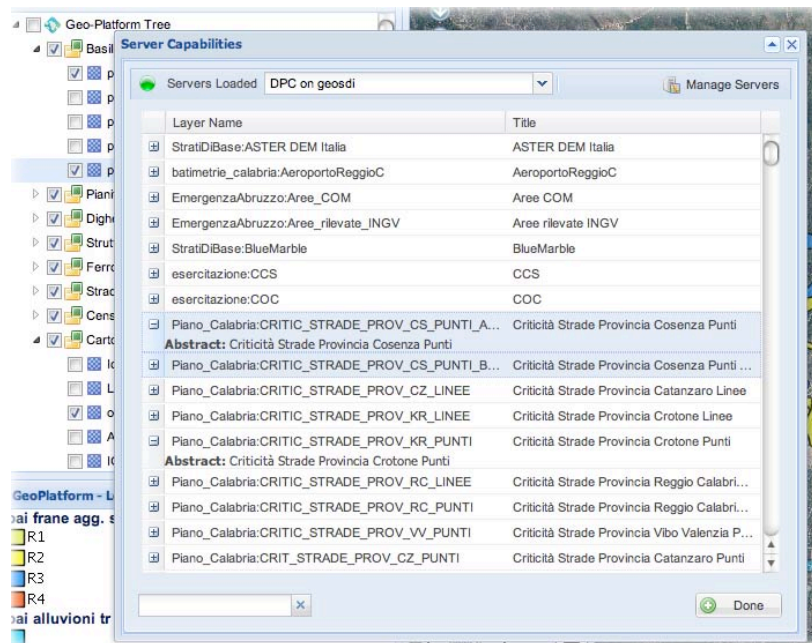
Layer Tree Widget

This is the widget for managing layers displayed on a map, which allows a truly innovative configuration:

As shown in the figure, the tree allows you to view the "folder" in a nested way (unlimited nesting). This allows greater flexibility in organizing the set of layers.

The toolbar exposes functionality for the management of the tree and can be extended through additional widgets with additional features..

Widgets Examples



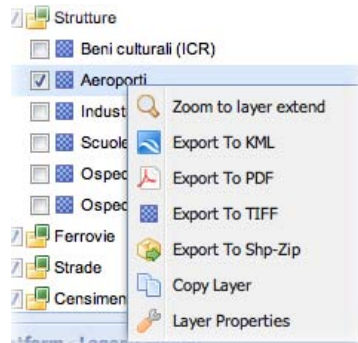
Add Layer Widget

Allows creation of layers within the layer tree. Through this widget you can manage multiple data sources from which "collect" the layer to be added to the map.

The functionality of the Add Layer Widgets can be extended by adding more widgets, like uploading Shapefiles Widgets, the Widget Manage Server, the Add WMS from URL widget.

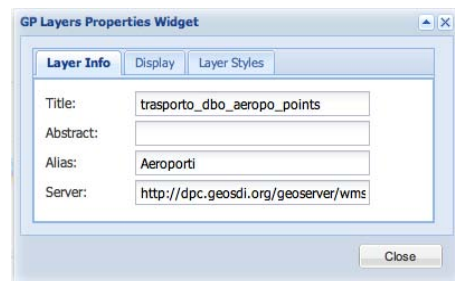
The work with layers is facilitated by: pagination of layers, the automatic extraction of the abstract, the possibility of selecting multiple layers, enhanced search and filtering the results.

Widgets Examples



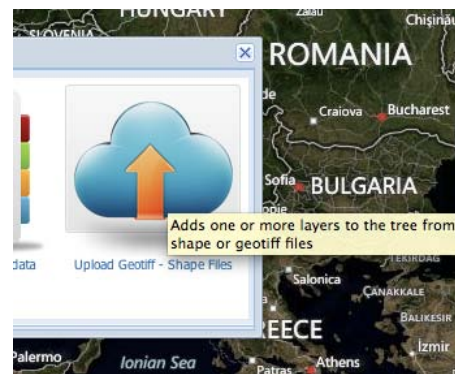
Context Menu Widget

For each layer functions are handled through the Context Menu ie: positioning the Max Extent, export to Google Earth, a quick view of the layers in PDF, export to TIFF for a higher resolution image, export to shapefile vector data, the Copy & Paste layers within layers of the tree.



Layer Properties Widget

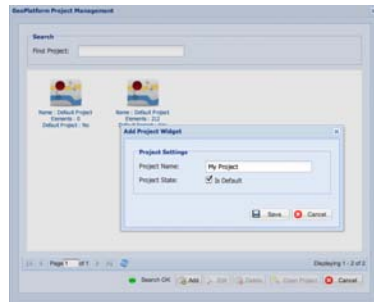
For each layer in the tree are handled a number of properties, like the visual style for the layer, the opacity of the layers in the map, the information related to the server, user preferences such as the alias to be used as a label in the tree for the level, etc..



Upload Data Widget

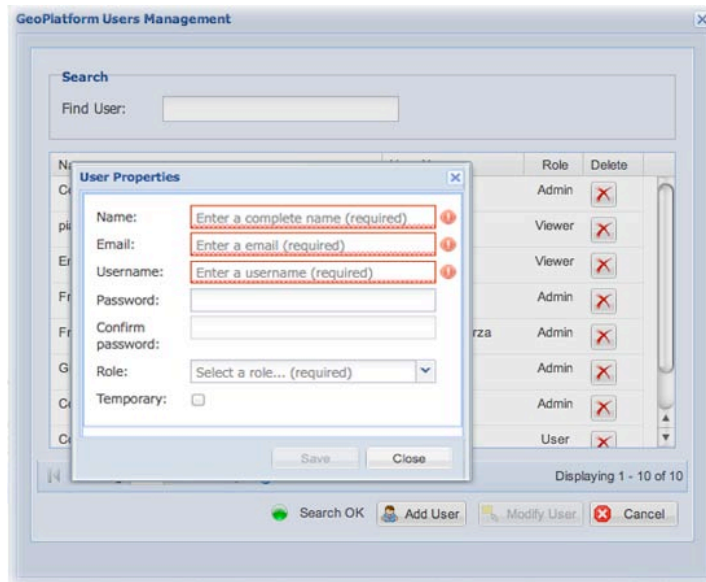
Functionality of ingestion of files, so as to make it totally transparent to the user the loading process of the physical data on the server and the service configuration. The selected file from your local disk, using web-GIS interface, it is sent to the server. The proper flow of ingestion will automatically configure the WMS-WFS services.

Widgets Examples



Manage Projects Widget

Users can directly manage their online Map Projects: through tree-export functions, can save the state of the tree and open in successive different situations (trees with different structures).



User Management Widget

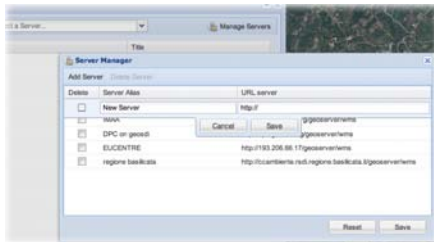
The widget allows you to differentiate your application based on user profile. Users Administrators can create, edit, delete users and differentiate the functionality available to users according to various profiles (eg Viewer, User, Admin).

Widgets Examples



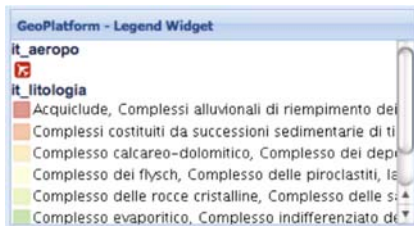
Server Management Widget

The widget works in association with the widget layer, and it manages the connection to the wms server. In particular, it allows you to connect to the web-gis a standard server WMS 1.1.1/1.3, giving the possibility to assign a name to the server and display the summary list of layers that it delivers. For each of the layers shows the summary description retrieved from the server.



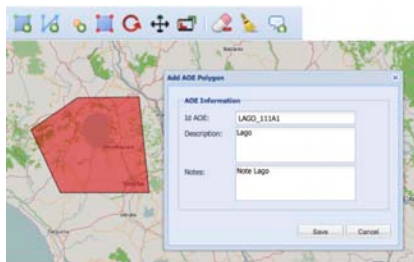
Legend Widget

The widget displays the legend for each layer depending on the viewing scale active in the map.

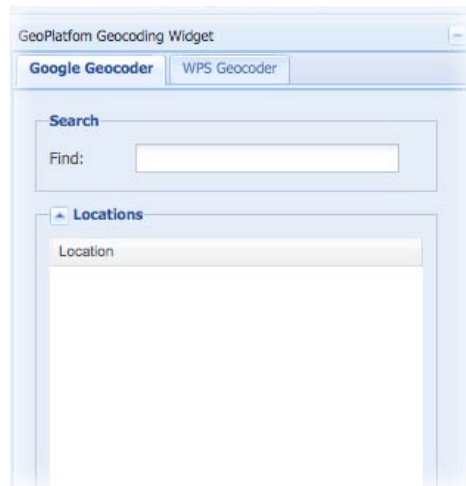


Edit Widget

The toolbar allows you to enable editing capabilities for creating and editing geometry (point, line and polygon) and associated alphanumeric information. Topological features are also displayed adjacent to the inclusion.

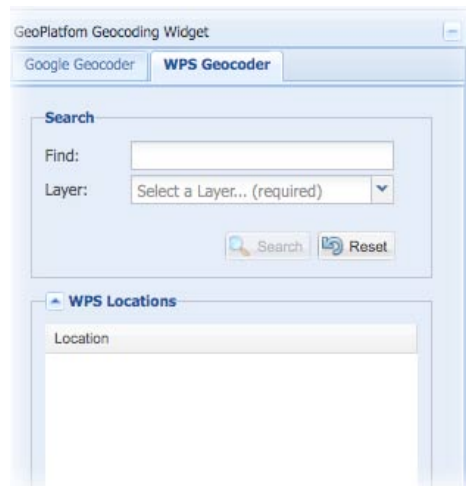


Widgets Examples



GeoCoding Widget

It gives the opportunity to locate on a map the location of any place, inserted through free text in the "Search". The widget can make use of geocoding services by external providers (eg, Google or Yahoo) or deployed from a database.



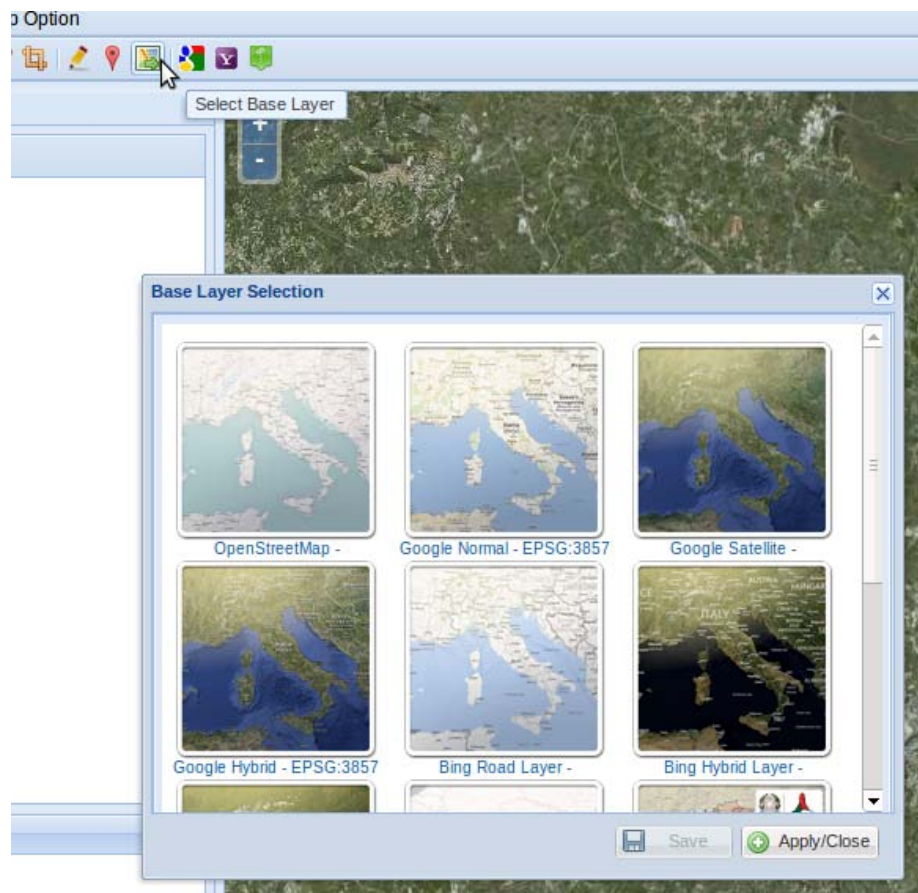
Widgets Examples



Routing Widget

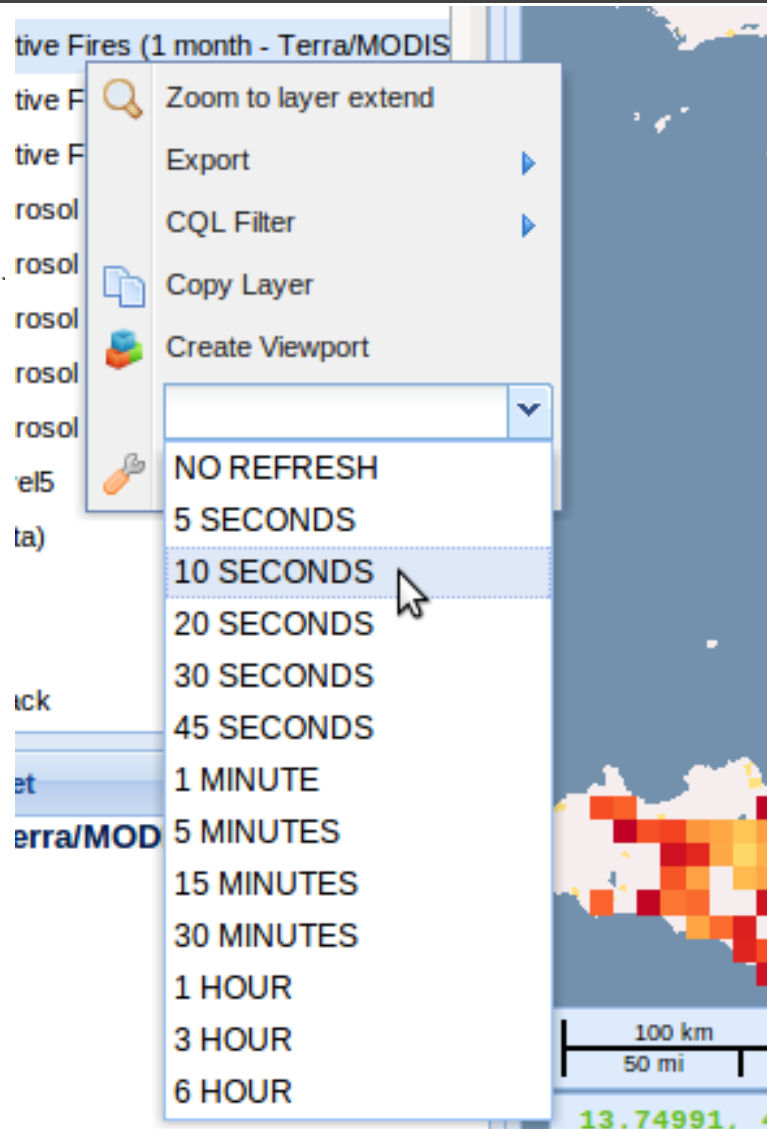
It has the capability to calculate the shortest path in a graph interconnected, proposing directions for getting from A to B. The shortest path, in the case shown in the figure, is based on open graph of OSM (Open Street Map) and takes account of these unique ways.

Widgets Examples

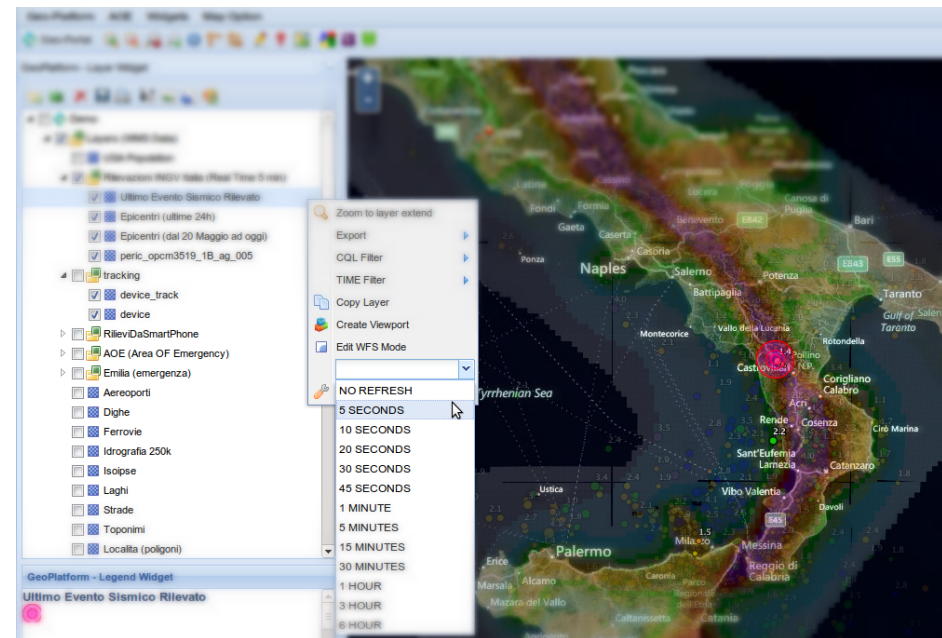


Basemap selection
Change the basemap and switch between
Spatial Reference Systems

Widgets Examples



Refresh widget
Refresh Layer visualization using XMPP
communication



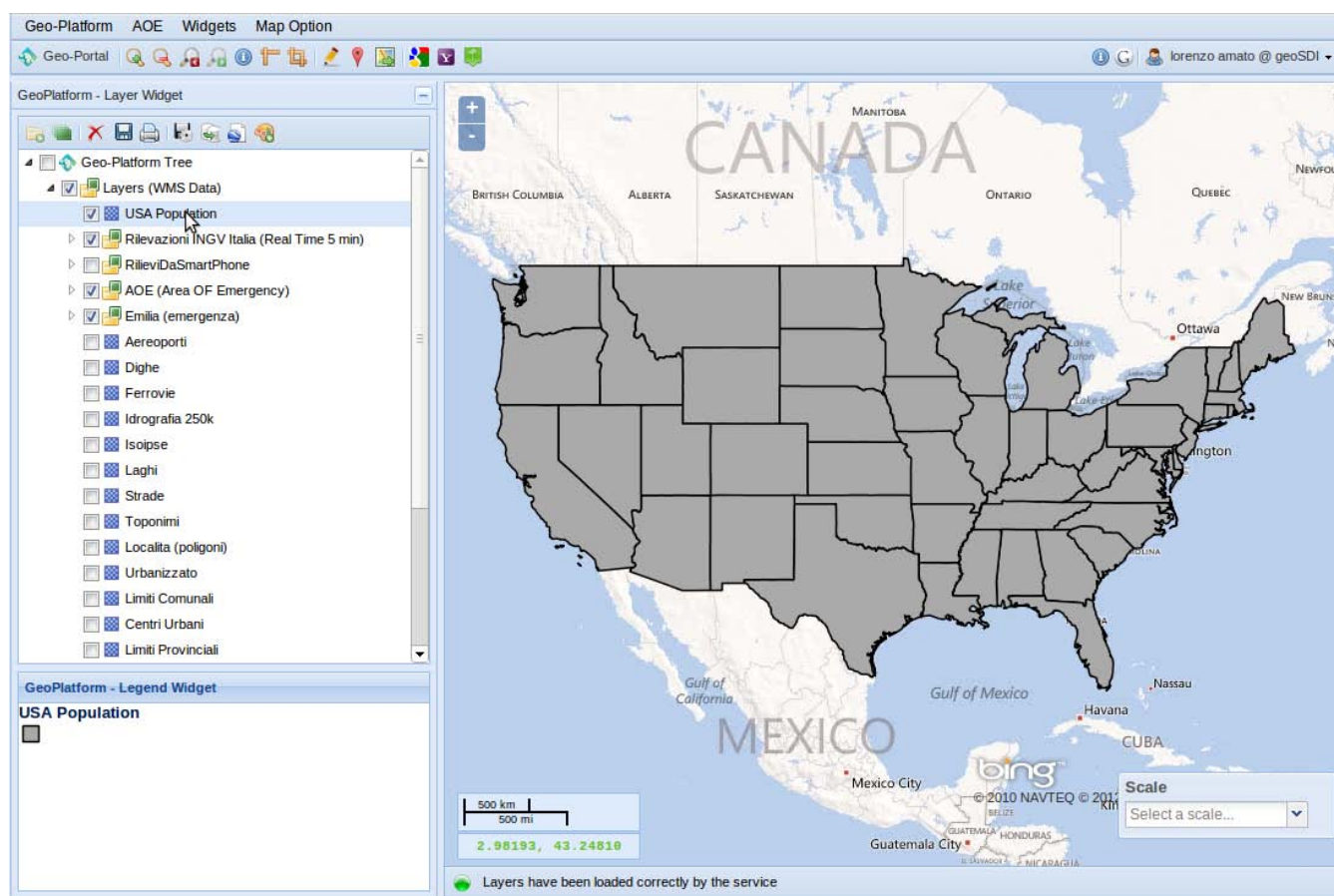
Widgets Examples



Styler widget

Create and apply map themes on data values

- Vector Symbolizer
- Raster Symbolizer

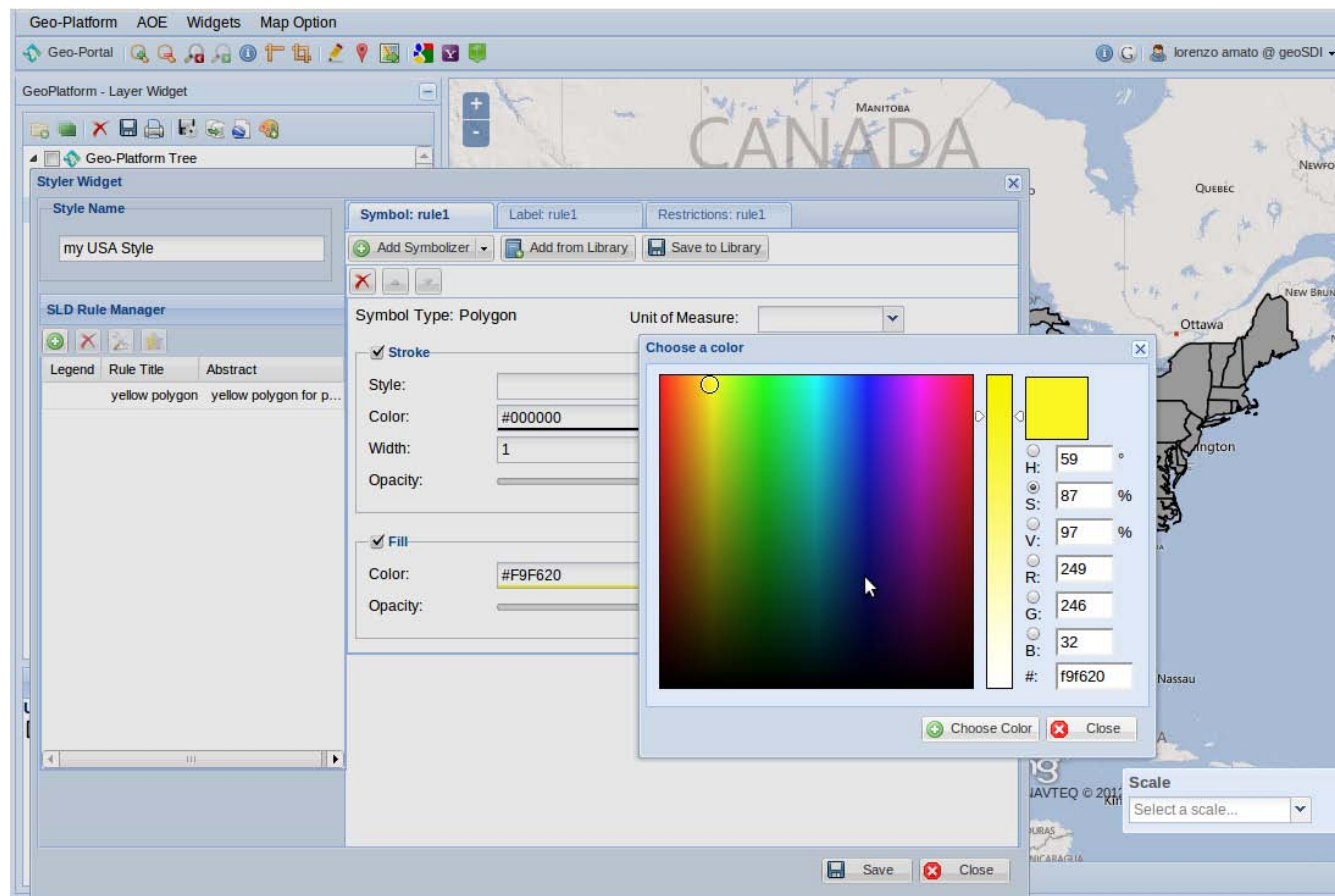


Widgets Examples



Styler widget

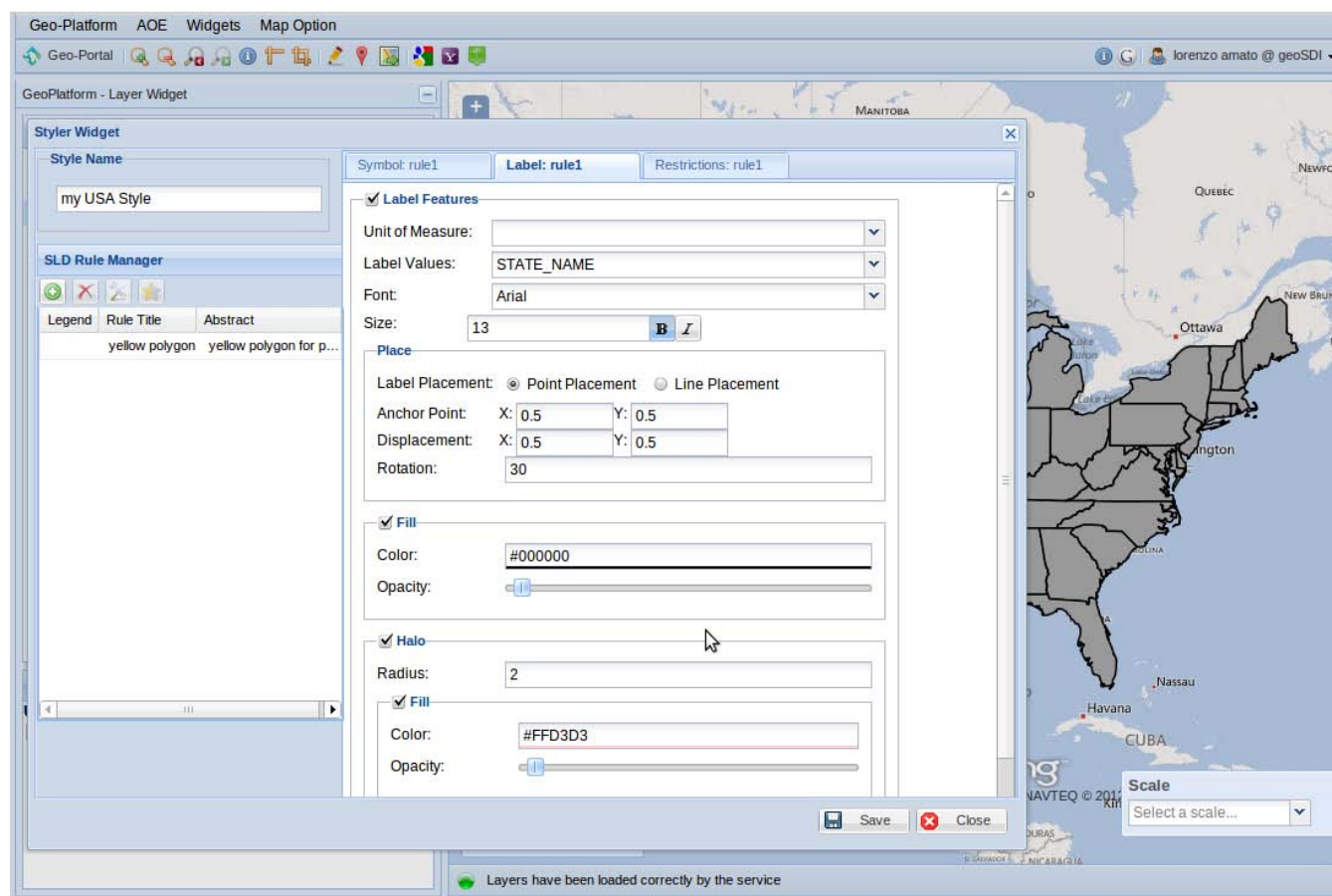
- Manage color properties for features



Widgets Examples

Styler widget

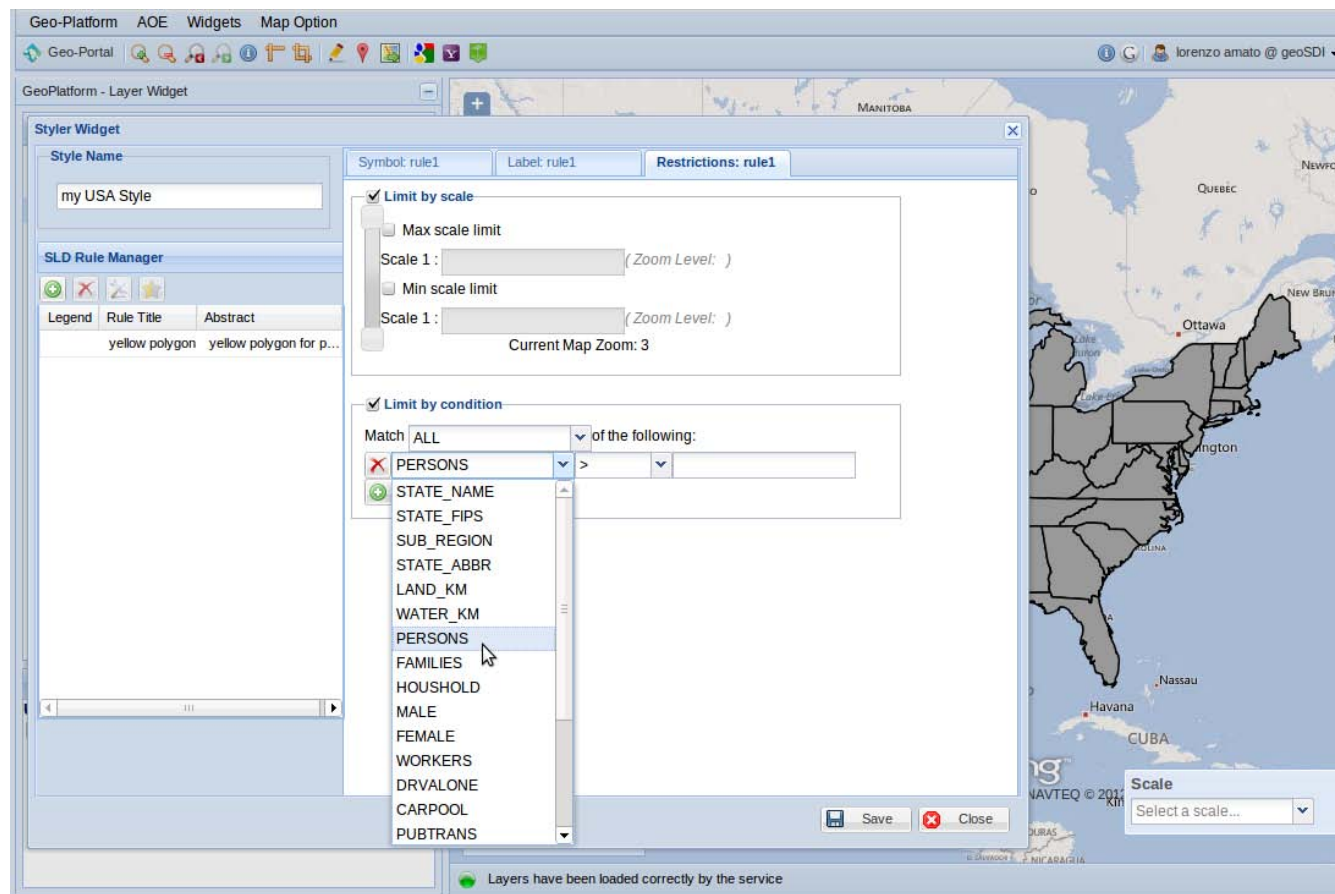
- Manage Labels



Widgets Examples

Styler widget

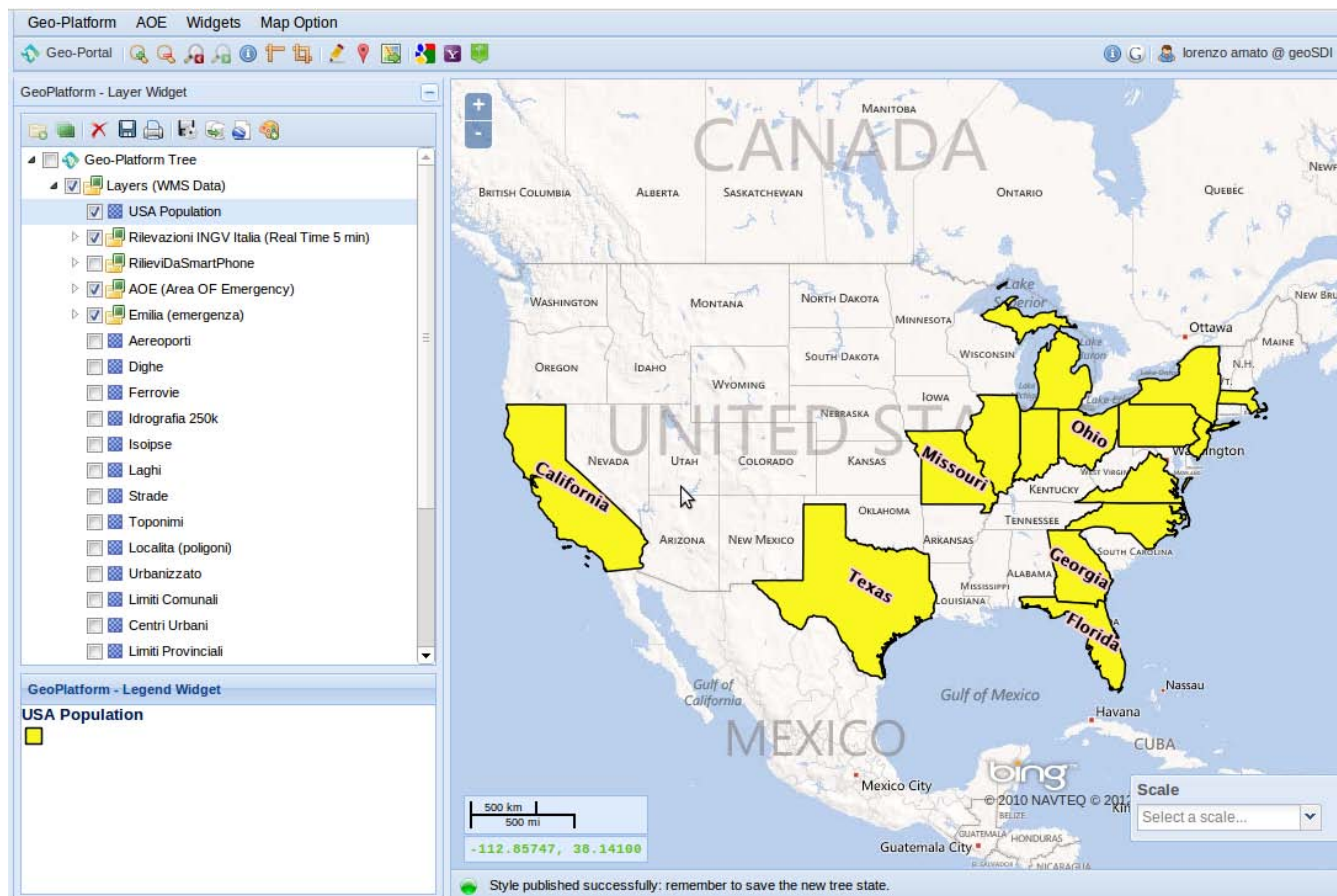
- Define Zoom and Attribute condition for applying a style rule



Widgets Examples

Styler widget

- Apply the changes and save the style



The screenshot displays the GeoPlatform web application interface. The main map shows the United States with several states highlighted in yellow: California, Texas, Missouri, Ohio, and Florida. The interface includes a menu bar at the top with options like "Geo-Portal", "AOE", "Widgets", and "Map Option". A toolbar is located below the menu bar. On the left side, there is a "GeoPlatform - Layer Widget" containing a "Geo-Platform Tree" with a list of layers such as "USA Population", "Rilevazioni INGV Italia (Real Time 5 min)", "RileviDaSmartPhone", "AOE (Area OF Emergency)", "Emilia (emergenza)", "Aeroporti", "Dighe", "Ferrovie", "Idrografia 250k", "Isoipse", "Laghi", "Strade", "Toponimi", "Localita (poligoni)", "Urbanizzato", "Limiti Comunali", "Centri Urbani", and "Limiti Provinciali". Below the layer widget is a "GeoPlatform - Legend Widget" showing the "USA Population" layer with a yellow square symbol. At the bottom of the map, there is a scale bar (500 km / 500 mi) and a scale selector dropdown menu. A status message at the bottom of the interface reads: "Style published successfully: remember to save the new tree state."

Some Video Examples



- geoSDI Video YouTube Channel
(<http://www.youtube.com/user/geoSDIVideo>)

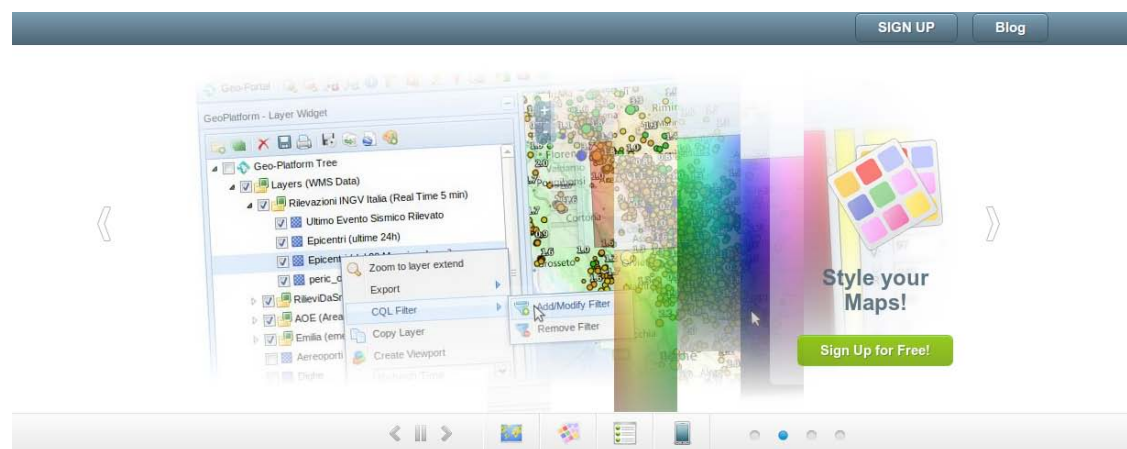


Here you can find more widget examples and many How-Tos on the usage

Live Demo



<http://test.geosdi.org>



geoSDI Online WebGIS

A geoSDI geoPortal for Test.

This is an Online WebGIS Application based on Geo-Platform Framework by geoSDI, published for **testing purpose only**.

Thank you



geoSDI Team

Web

www.geosdi.org

Mail

sviluppo@geosdi.org

Address

IMAA CNR, C.da S.Loja, Tito Scalo (PZ) Italy





GeoPlatform
by geoSDI

Geo-Platform Introduction

Dimitri Dello Buono @ geoSDI

geoSDI



CNR – IMAA

geoSDI is a Laboratory of the Institute of Methodologies for Environmental Analysis of the National Council of Research (CNR IMAA), which designs, manufactures and distributes geospatial web-based software systems, using an open source approach.



geo-platform Info

Start : **10 Oct 2010**

Licence : **GPLv3+CE**

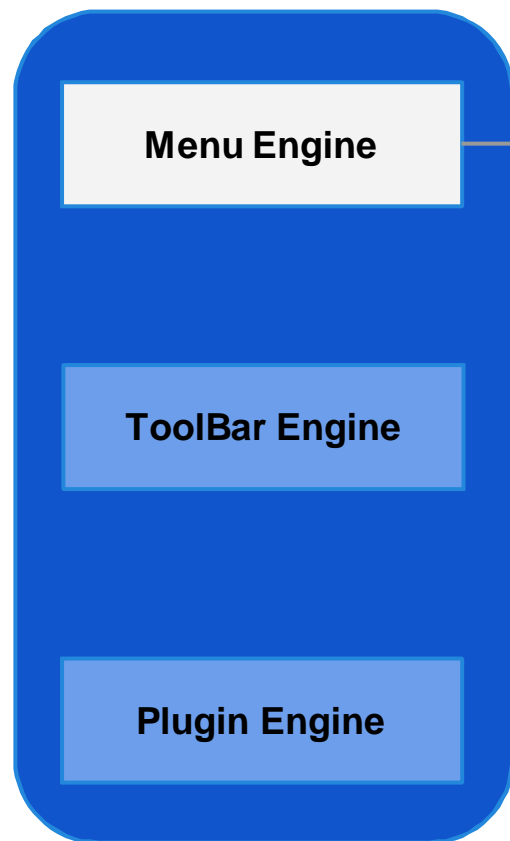
Version : **1.5**

Repo:<https://github.com/geosdi/geo-platform.git>

Modules: **100+**

65k code lines

Architettura di geo-platform (client)

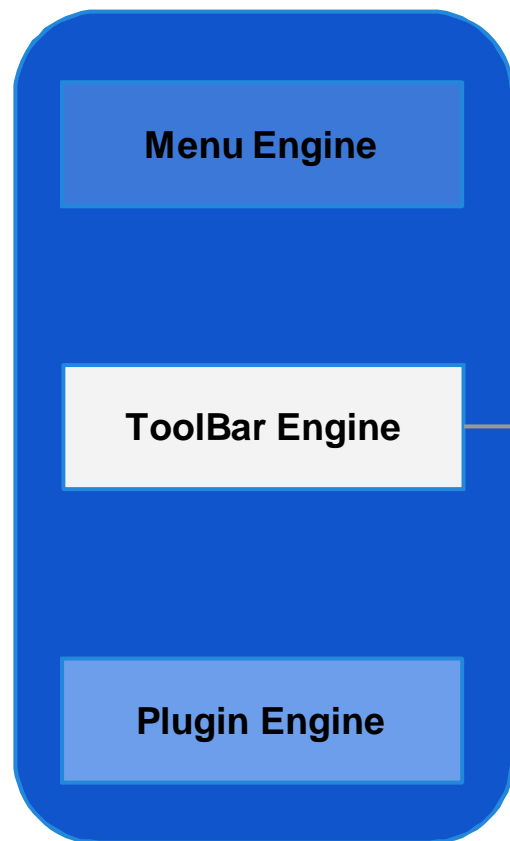


applicationContext-Menubar.xml

```
...  
  
<bean name="menuBarContainerTool"  
  class="org.geosdi.geoplatform.gui.impl.MenuBarContainerTool">  
  <property name="categories">  
    <list>  
      <ref bean="geoPlatform" />  
      <ref bean="widgets" />  
      <ref bean="aoe" />  
      <ref bean="mapOptions" />  
    </list>  
  </property>  
</bean>  
  
<bean name="geoPlatform"  
  class="org.geosdi.geoplatform.gui.configuration.menubar.MenuBarCategory">  
  <property name="text" value="Geo-Platform" />  
  <property name="enabled" value="true" />  
  <property name="order" value="10" />  
  <property name="tools">  
    <list>  
      <ref bean="manageProjects" />  
      <ref bean="manageUsers" />  
      <ref bean="manageRoles" />  
      <ref bean="separatorAbout" />  
      <ref bean="aboutGeoPlatform" />  
    </list>  
  </property>  
</bean>  
  
...
```

geo-platform Architecture (client)

applicationContext-Toolbar.xml



...

```
<bean name="infoApp"
      class="org.geosdi.geoplatform.gui.configuration.toolbar.ToolbarActionTool">
  <property name="id" value="{gpInfoApp.id}" />
  <property name="type" value="{gpInfoApp.type}" />
  <property name="enabled" value="{gpInfoApp.enabled}" />
  <property name="order" value="{gpInfoApp.order}" />
</bean>
```

...

geo-platform Architecture (server)

Available SOAP services:

<p>GPSchedulerService</p> <ul style="list-style-type: none">• checkTempAccount• sendEmailModification• sendEmailRegistration	<p>Endpoint address: http://localhost:8080/geoplatform-service/scheduler</p> <p>WSDL : http://services.geoplatform.geosdi.org/GPSchedulerServiceImplService</p> <p>Target namespace: http://services.geoplatform.geosdi.org/</p>
<p>GPWFSService</p> <ul style="list-style-type: none">• getFeature• describeFeatureType	<p>Endpoint address: http://localhost:8080/geoplatform-service/wfs</p> <p>WSDL : http://services.geoplatform.geosdi.org/GPWFSServiceImplService</p> <p>Target namespace: http://services.geoplatform.geosdi.org/</p>
<p>GPWMSService</p> <ul style="list-style-type: none">• getCapabilities• getShortServer	<p>Endpoint address: http://localhost:8080/geoplatform-service/wms</p> <p>WSDL : http://services.geoplatform.geosdi.org/GPWMSServiceImplService</p> <p>Target namespace: http://services.geoplatform.geosdi.org/</p>
<p>GeoPlatformService</p> <ul style="list-style-type: none">• updateServer• getAuthorities• saveDeletedLayerAndTreeModifications• fixCheckStatusLayerAndTreeModifications• insertMultiMessage• deleteFolder• getMessageDetail• getAccountProjectsByProjectID• saveLayerProperties• getNumberOfElementsProject• getUserDetailByUsername• getChildrenElements• insertAccountProject	<p>/core</p> 

geo-platform Architecture (server)

*geo-platform fornisce uno stack di servizi multi modulare
utile per la comunicazione con la parte client
e per rendere persistenti i dati prodotti dall'applicazione*



- Endpoint modulari
 - Avvio solo lo stack ws che mi serve
 - Scalabilità su più nodi
 - Di default viene avviato solo l'endpoint **/core**



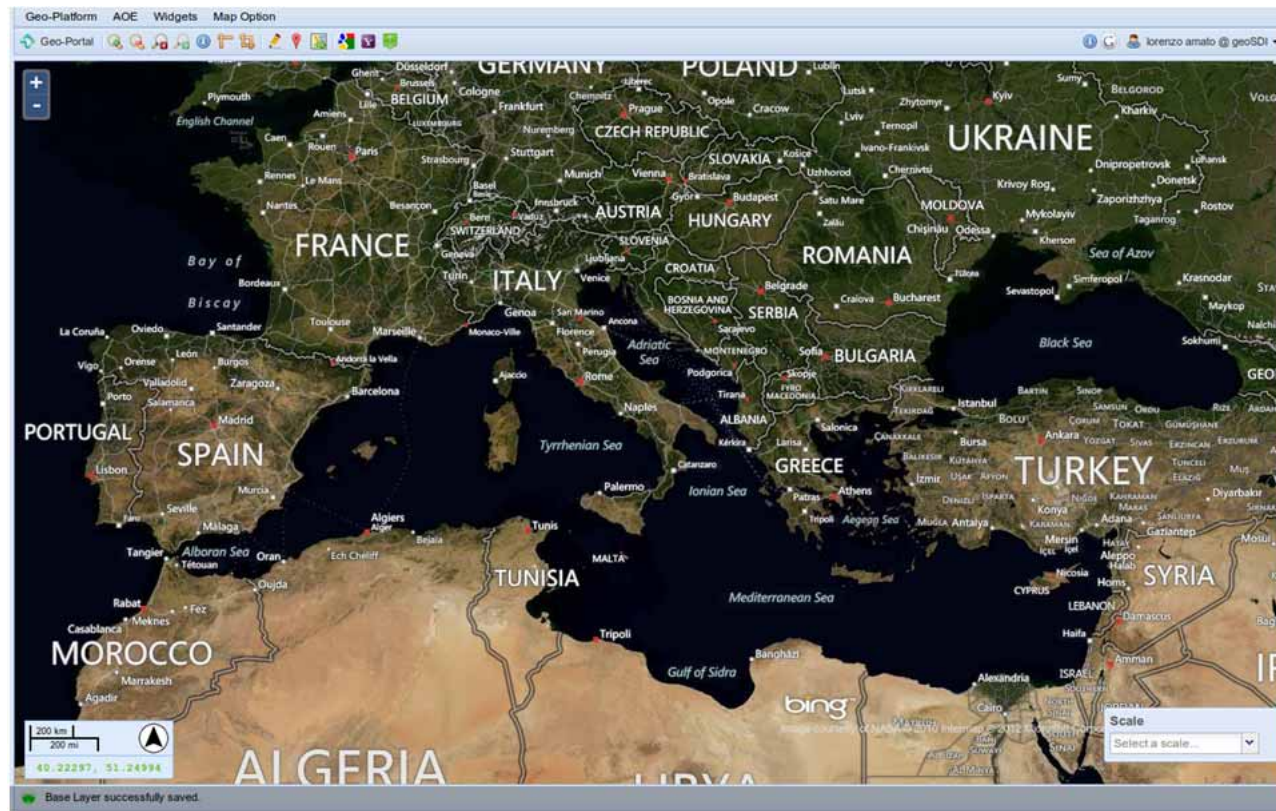
Widgets



- Base Layer Selection (*Google, Bing, OSM, Custom...*)
- Add WMS Layer
- Upload File (*GeoTiff, SHP, SLD, ...*)
- Manage WMS Server
- Layer Tree Panel
- Refresh Layer
- CQL Filter
- Time Filter
- Print Map
- Styler (*gestione SLD*)

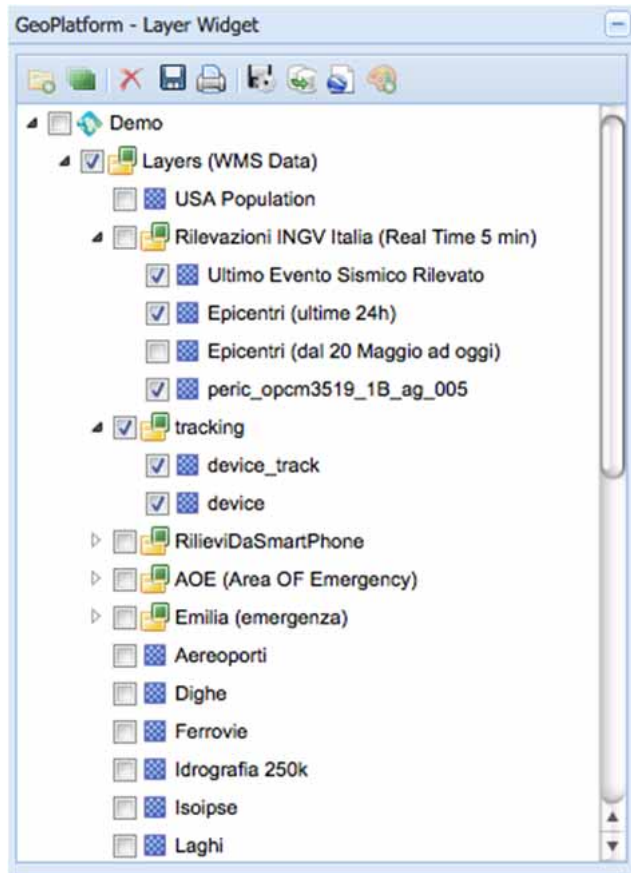
- Viewports Management
- Geocoding / Reverse Geocoding (*Google, Yahoo, Custom...*)
- Map Projects Management
- Export / Import Map Projects
- User / Roles Management
- Routing on OSM Data
- Feature Editor (WFS-T)
- WPS builder
- ...
- ...

Widget - Map Widget



Widget

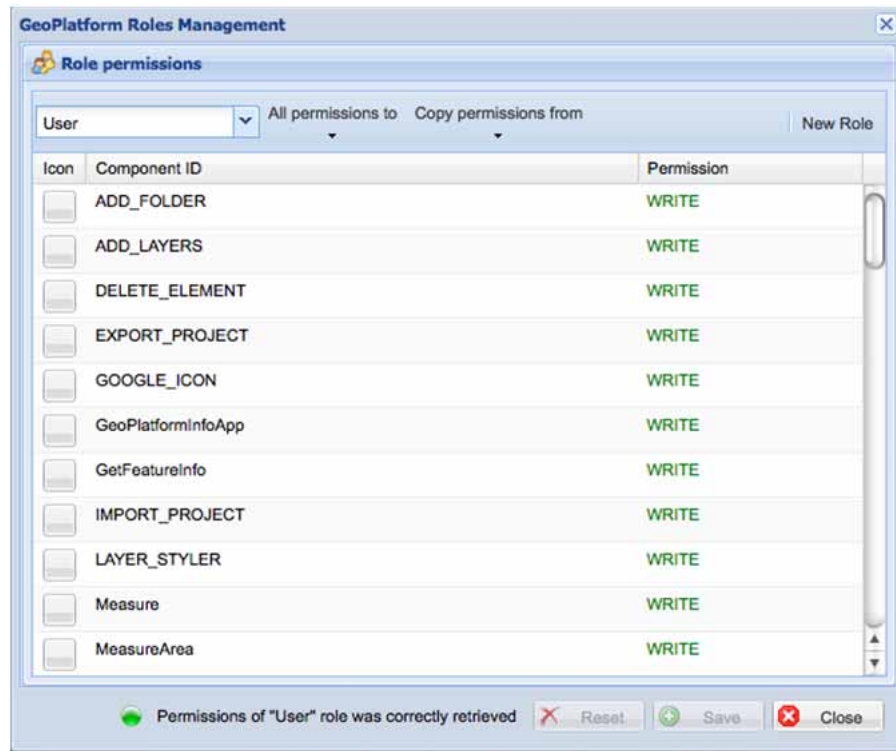
Layer tree



- Management scenarios at any level of nesting
- Drag & Drop of layers and folders
- Options on layers
- management transparency
- Management style associated
- Management Layer Name
- Export a project
- Import a project
- Saving a Project
- Copy & Paste of single and multiple layers

Users and Rules Manager

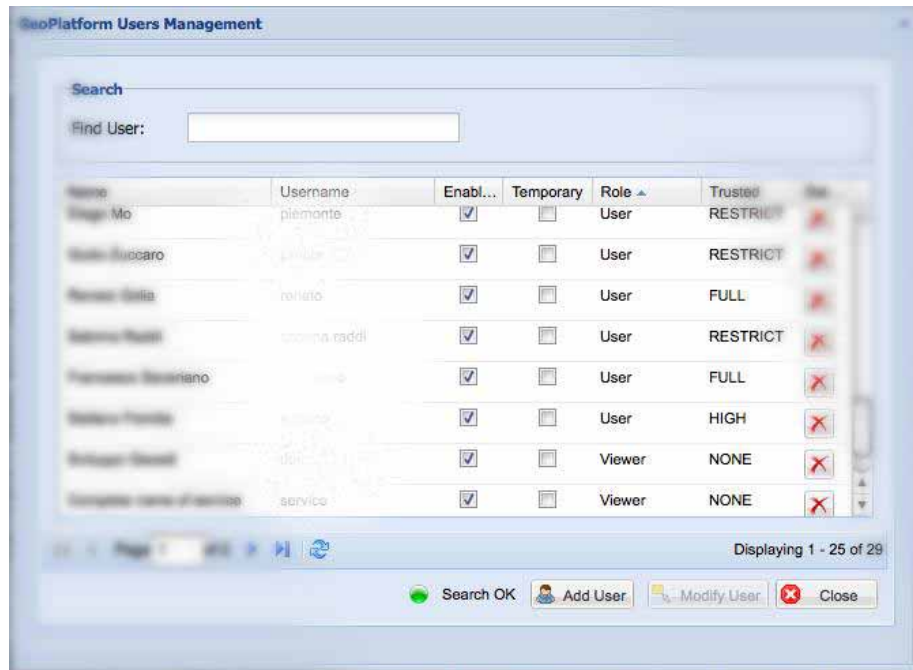
Rules Manager



- Managing permission of the components based on the role
- Creating New Roles
- Modifying existing roles

Users and Rules Manager

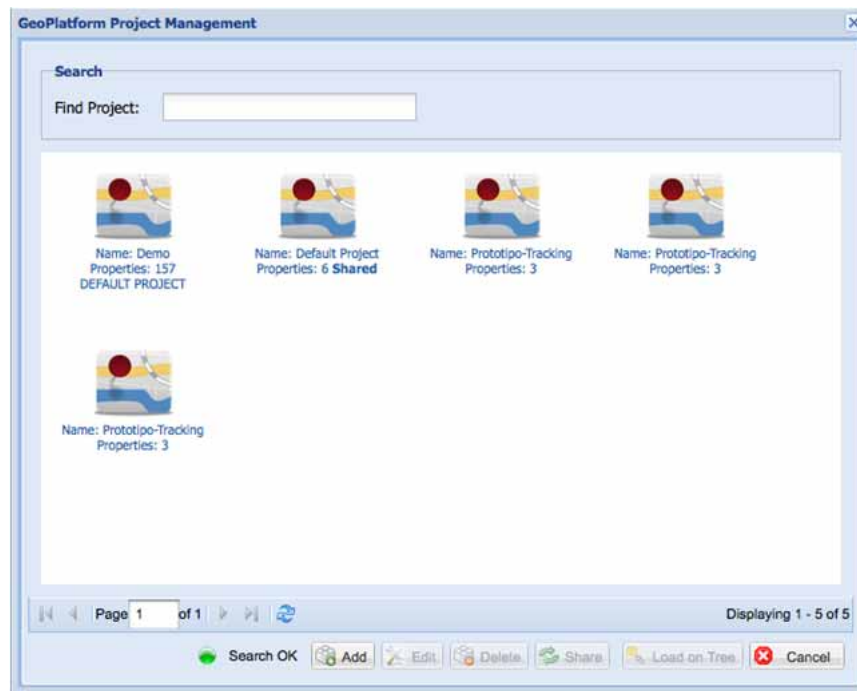
User Manager



- Creating new users
- assigning user name and password
- role assignment
- assignment of the type of user (temporary or permanent)
- assignment of trusted level
- Modifying existing roles
- Cancellation of existing users

- Concept of Organization!

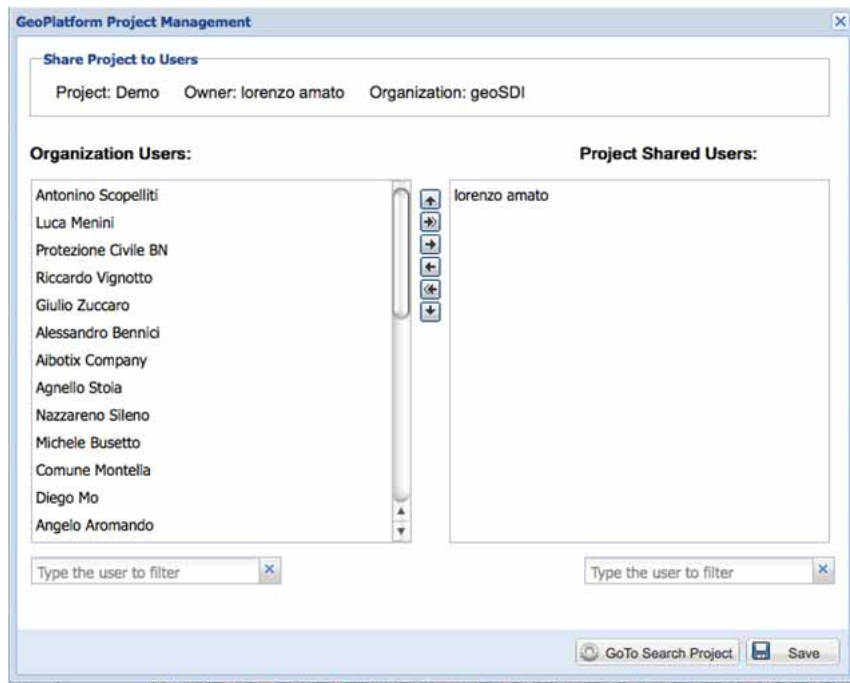
Project Manager



- Creating new projects
- Edit the project
- Change name
- Set default
- Loading onto the layer
- Cancellation of the project
- Sharing Project

Project manager – Share Proj

Share Projects



A new feature!

Currently in testing phase

Allows you to share in "READING" a project

A master -> slave 1 .. n

All changes to the effectual reference design are propagated to all slaves via XMPP client:

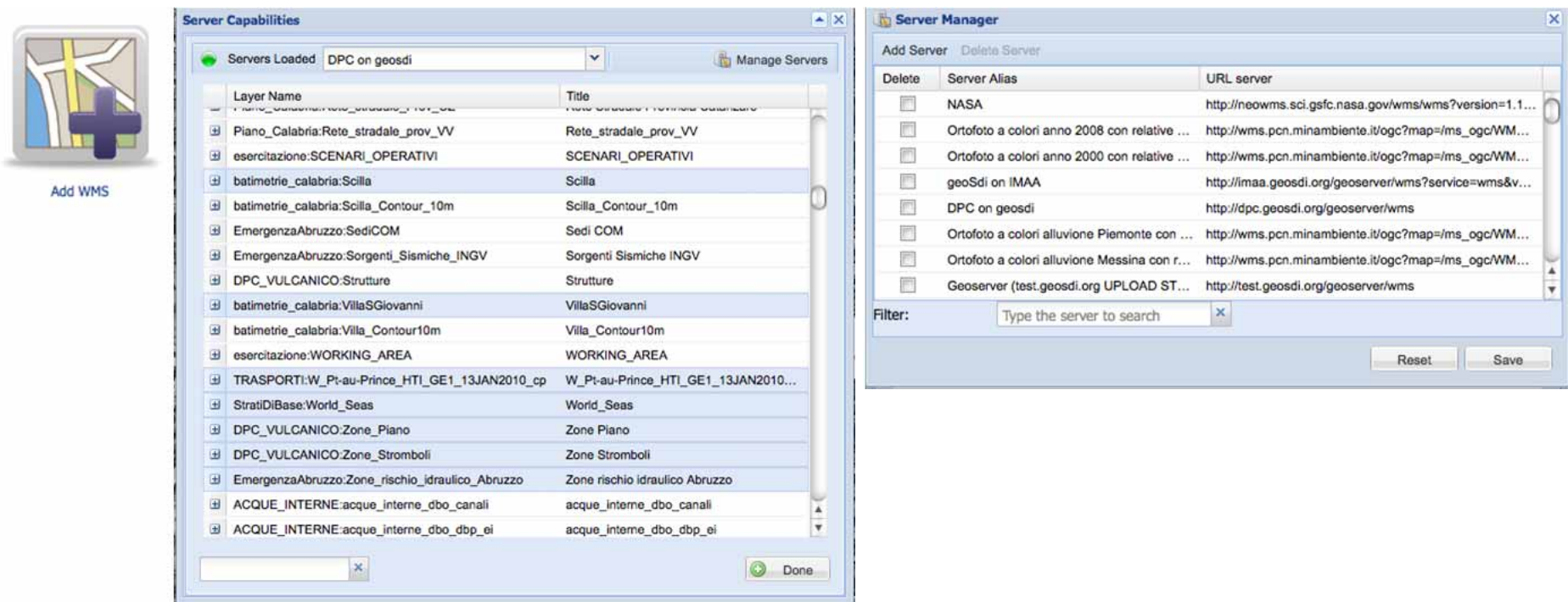
Adding layers, on / off, delete, drag & drop.

Layer Manager



- Adding a layer from a list of WMS servers
- Adding a layer from a Get-Map wms
- Adding a layer from a metadata catalog CSW
- Upload a layer of a Geotiff or Shape File

Layer Manager



The screenshot displays two windows from a GIS application. On the left is the 'Server Capabilities' window, which shows a list of available WMS layers. On the right is the 'Server Manager' window, which lists the configured WMS servers.

Server Capabilities

Layer Name	Title
Piano_Calabria:Rete_stradale_prov_VV	Rete_stradale_prov_VV
esercitazione:SCENARI_OPERATIVI	SCENARI_OPERATIVI
batimetrie_calabria:Scilla	Scilla
batimetrie_calabria:Scilla_Contour_10m	Scilla_Contour_10m
EmergenzaAbruzzo:SediCOM	Sedi COM
EmergenzaAbruzzo:Sorgenti_Sismiche_INGV	Sorgenti Sismiche INGV
DPC_VULCANICO:Strutture	Strutture
batimetrie_calabria:VillaSGiovanni	VillaSGiovanni
batimetrie_calabria:Villa_Contour10m	Villa_Contour10m
esercitazione:WORKING_AREA	WORKING_AREA
TRASPORTI:W_Pt-au-Prince_HTI_GE1_13JAN2010_cp	W_Pt-au-Prince_HTI_GE1_13JAN2010...
StratiDiBase:World_Seas	World_Seas
DPC_VULCANICO:Zone_Piano	Zone Piano
DPC_VULCANICO:Zone_Stromboli	Zone Stromboli
EmergenzaAbruzzo:Zone_rischio_idraulico_Abruzzo	Zone rischio idraulico Abruzzo
ACQUE_INTERNE:acque_interne_dbo_canali	acque_interne_dbo_canali
ACQUE_INTERNE:acque_interne_dbo_dbp_ei	acque_interne_dbo_dbp_ei

Server Manager

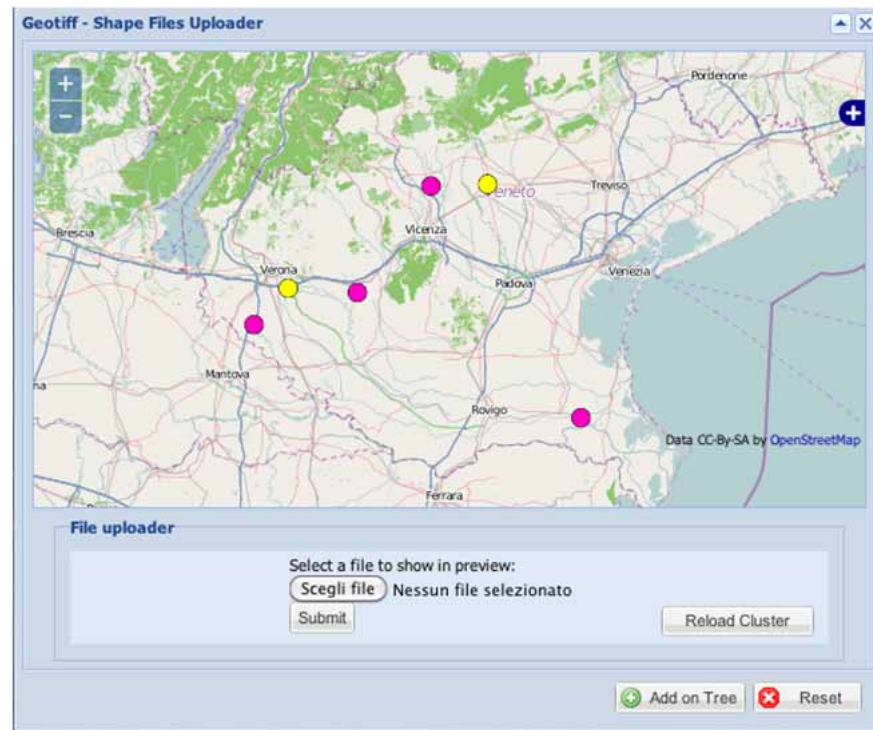
Delete	Server Alias	URL server
<input type="checkbox"/>	NASA	http://neowms.sci.gsfc.nasa.gov/wms/wms?version=1.1...
<input type="checkbox"/>	Ortofoto a colori anno 2008 con relative ...	http://wms.pcn.minambiente.it/ogc?map=/ms_ogc/WM...
<input type="checkbox"/>	Ortofoto a colori anno 2000 con relative ...	http://wms.pcn.minambiente.it/ogc?map=/ms_ogc/WM...
<input type="checkbox"/>	geoSdi on IMAA	http://imaa.geosdi.org/geoserver/wms?service=wms&v...
<input type="checkbox"/>	DPC on geosdi	http://dpc.geosdi.org/geoserver/wms
<input type="checkbox"/>	Ortofoto a colori alluvione Piemonte con ...	http://wms.pcn.minambiente.it/ogc?map=/ms_ogc/WM...
<input type="checkbox"/>	Ortofoto a colori alluvione Messina con r...	http://wms.pcn.minambiente.it/ogc?map=/ms_ogc/WM...
<input type="checkbox"/>	Geoserver (test.geosdi.org UPLOAD ST...	http://test.geosdi.org/geoserver/wms

- Selecting a WMS server
- Selecting layers to add to your tree
- Managing WMS 1.1.1 - WMS 1.3.0
- Adding Servers
- Editing server

Layer Manager



Upload Geotiff - Shape Files

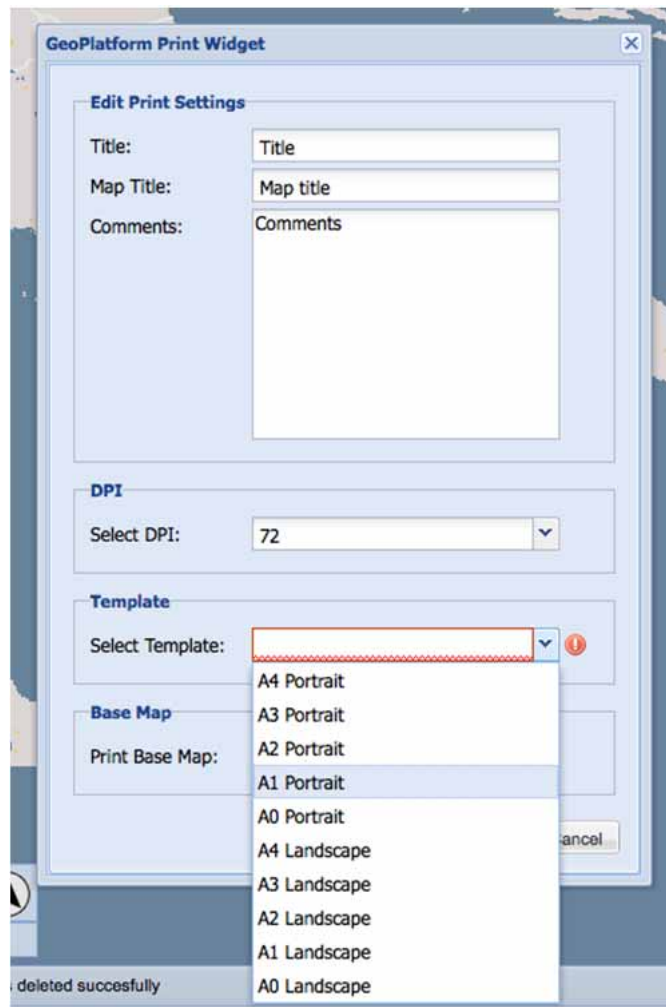


*you can upload to
GeoServer*

*The upload and
configuration is done
via REST using
GeoServer-manager*

- Selecting an archive package containing a shapefile Geotiff with possibly associated SLD
- Possibility of previewing in the preview map
- Ability to add it to the layer tree and make it available as a WMS layer

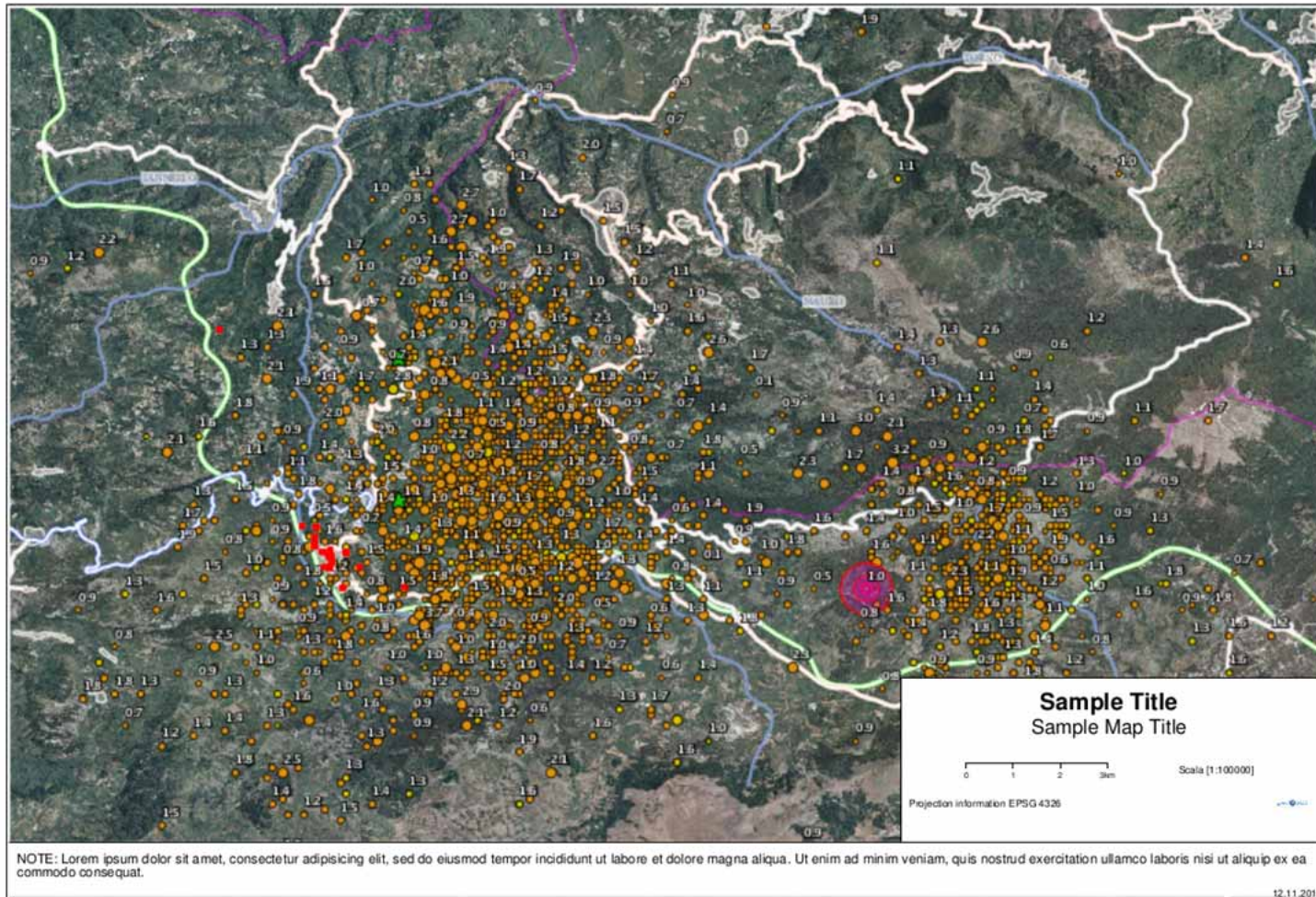
Print a map



Compiling the print template
title
map Title
Comments
Selection of PPE Printing
Selecting the print template
Select whether to print the base map

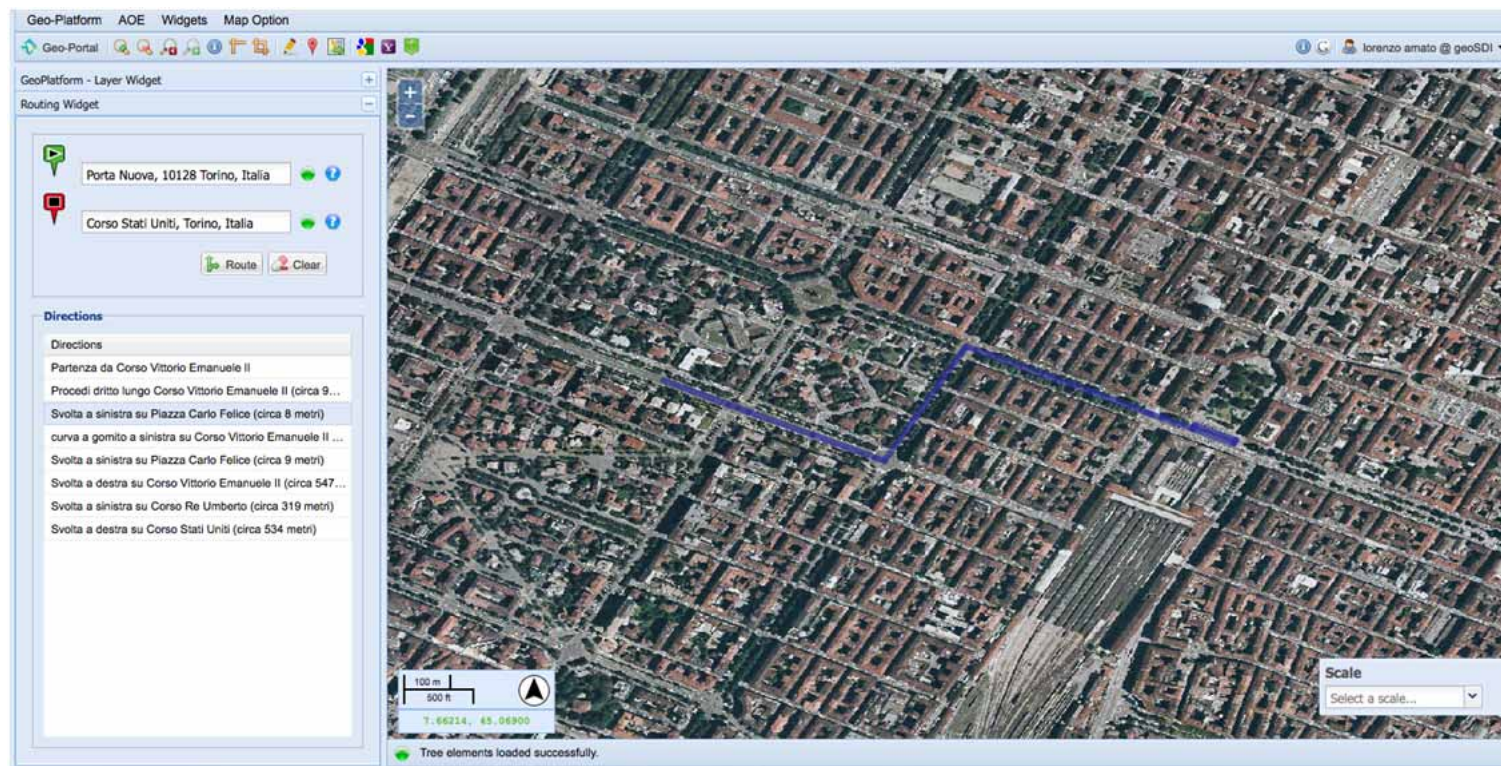
The current version is based on a servlet MapFish

Print Manager



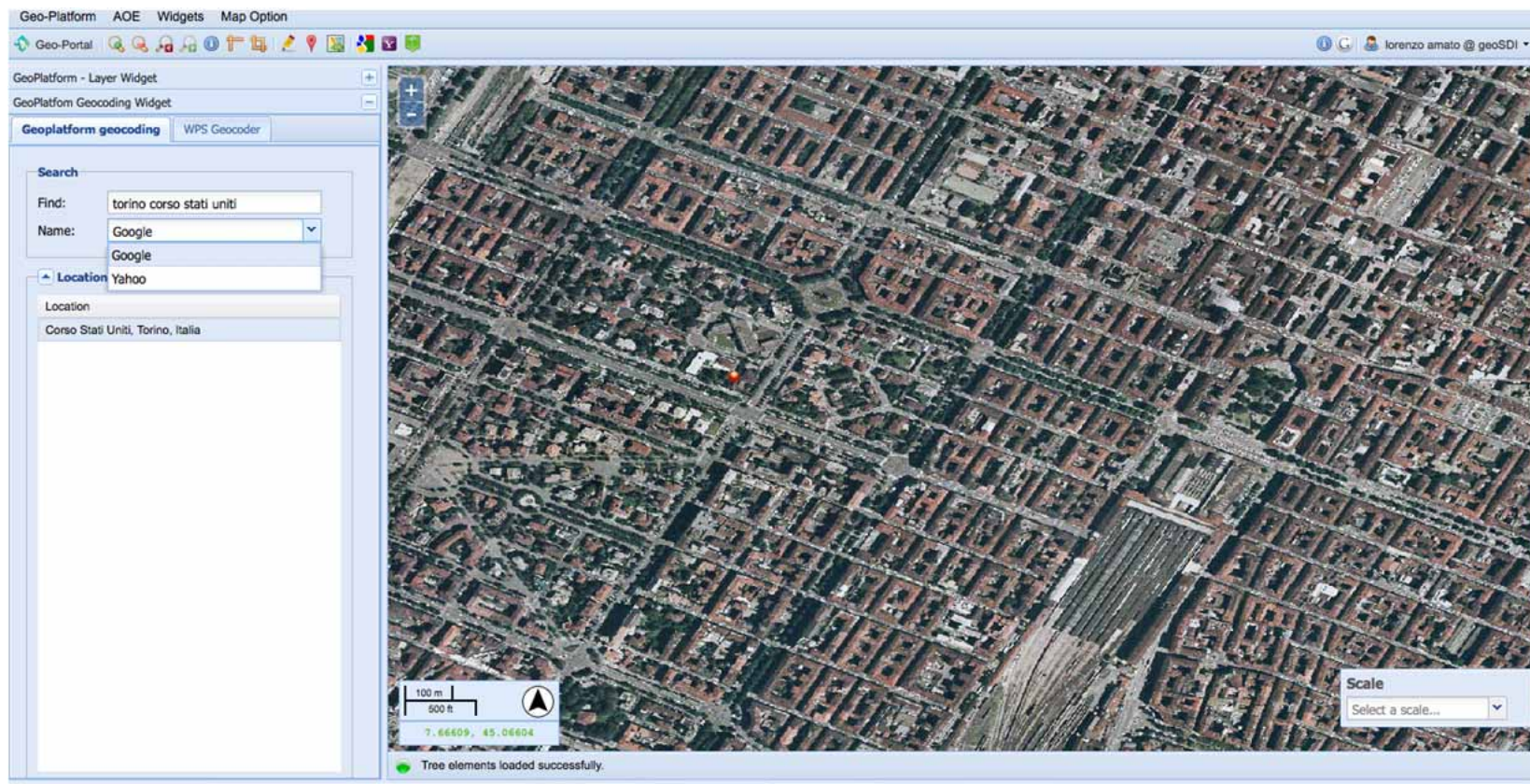
Routing on Open Street Map

- Select Start Point and End Point using Google Geocoding
- Shooting Star Algorithm on PGRouting of Open Street Map Data
- Calculation of Directions (Directions)



Geocoding

- Portion Of typing
- Provider Selection (Google, Yahoo)
- Return result list
- Click on the outcome of interest and positioning of the marker on the map



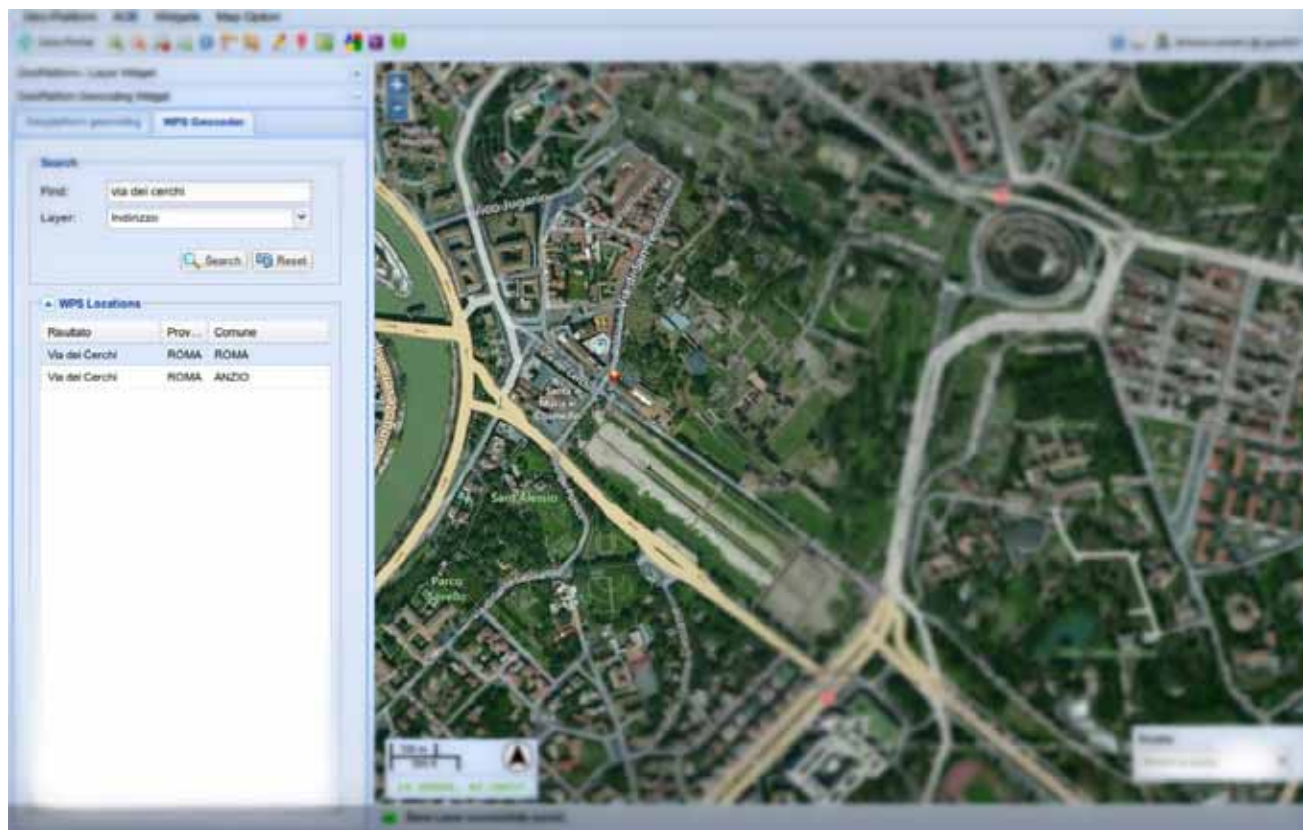
Reverse Geocoding

- Selection of the provider (google, yahoo)
- Click for map
- Return of Results



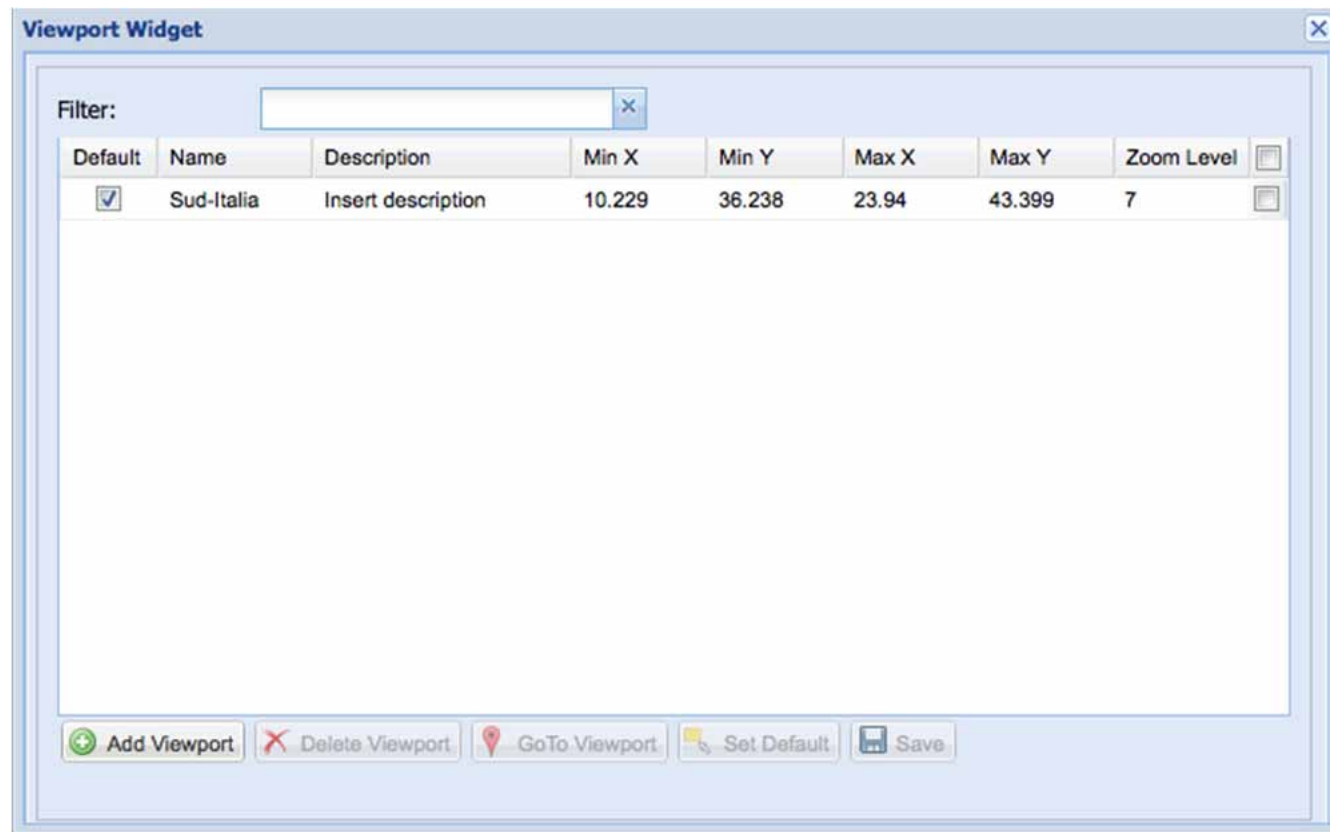
Geocoding WPS

- Type text to search
- Selecting the Layer of which require processing
- Starting the remote WPS process and presentation of results
- Click on the outcome of interest and positioning of the marker on the map

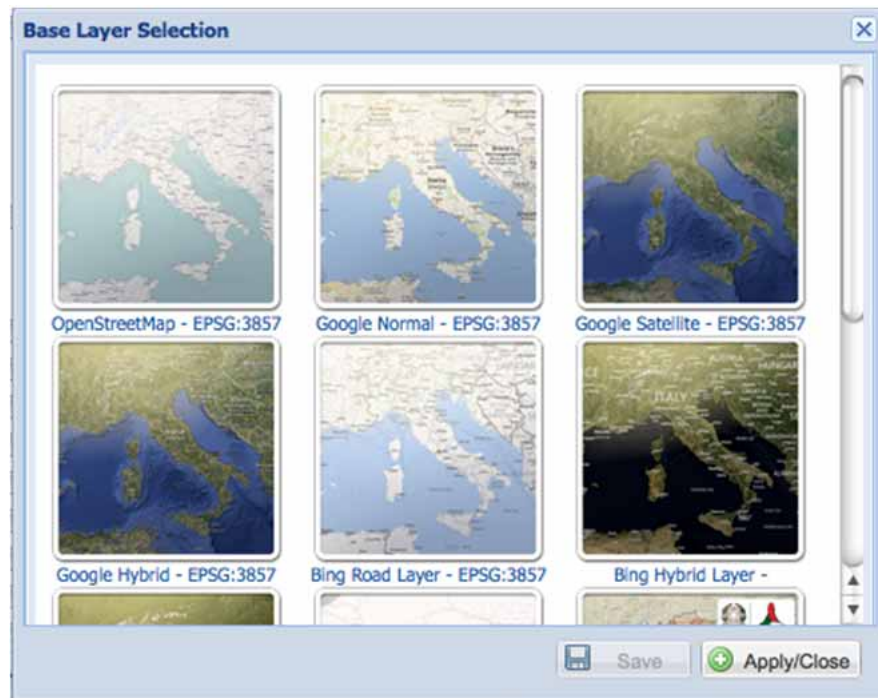


Viewport Management

- Creating viewport according to bbox zoom level shown in map
- Creating viewport to the bbox of a layer present in the tree panel
- Creating a viewport to bbox composed by the sum of bbox of layers present in a folder



Base Map Manager



- Selecting the base map provided by different providers
- Selecting the base map with different reference systems
- EPSG: 3857
- EPSG: 4326
- Apply the base map to the work session with the fly projection view the layers
- Saving the base map to make it the default in the project

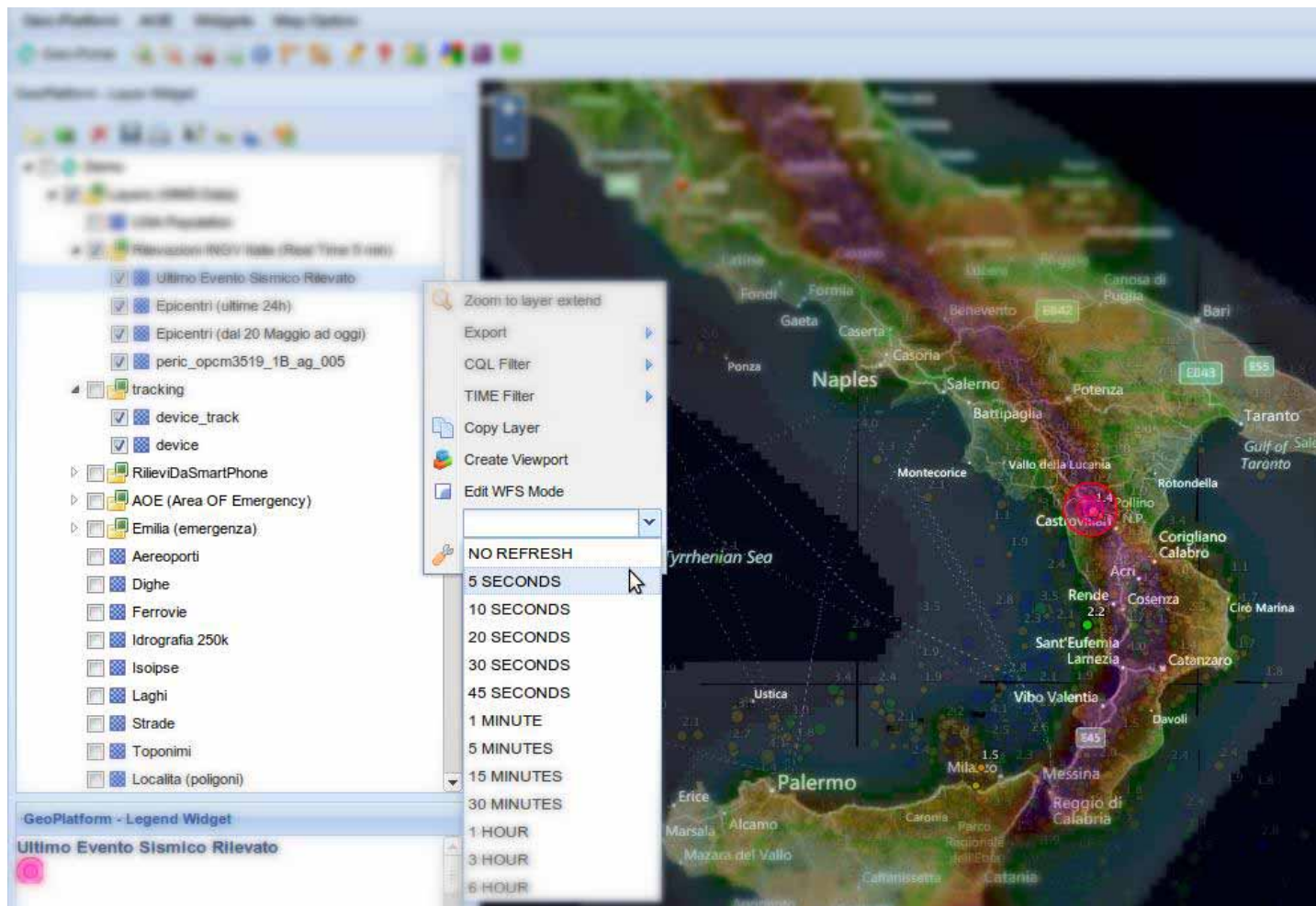
Layer Refresh (1)

- *Refresh the display of a layer with a time cadence. (eg every 60 sec)*
- *Useful for data sources that vengono updated by sensor networks (such as earthquakes ingv, rain gauges)*

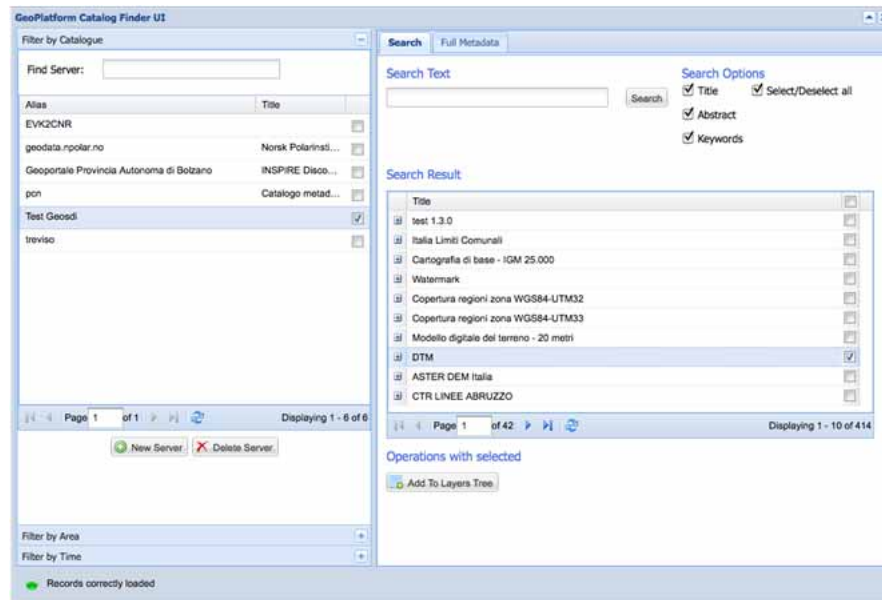
How does it work?

- *The Client you subscribe to a topic XMPP*
- *It is recorded that a scheduler Quartz reminds the client to refresh the layer (every x seconds)*
- *push notifications*

Layer Refresh (2)



Advanced Widget : Catalog Finder



- Adding Servers CSW 2.0.2
- search Text
- title
- abstract
- Keywords
- search areal
- Encluses
- is
- overlap
- outside
- time Search
- Anytime
- Temporal Extend (applied at the date of creation)
- Adding a layer to the tree panel if metadata is contained in the online resouce WMS

Advanced Widget : Styler (Raster Symbolizer)

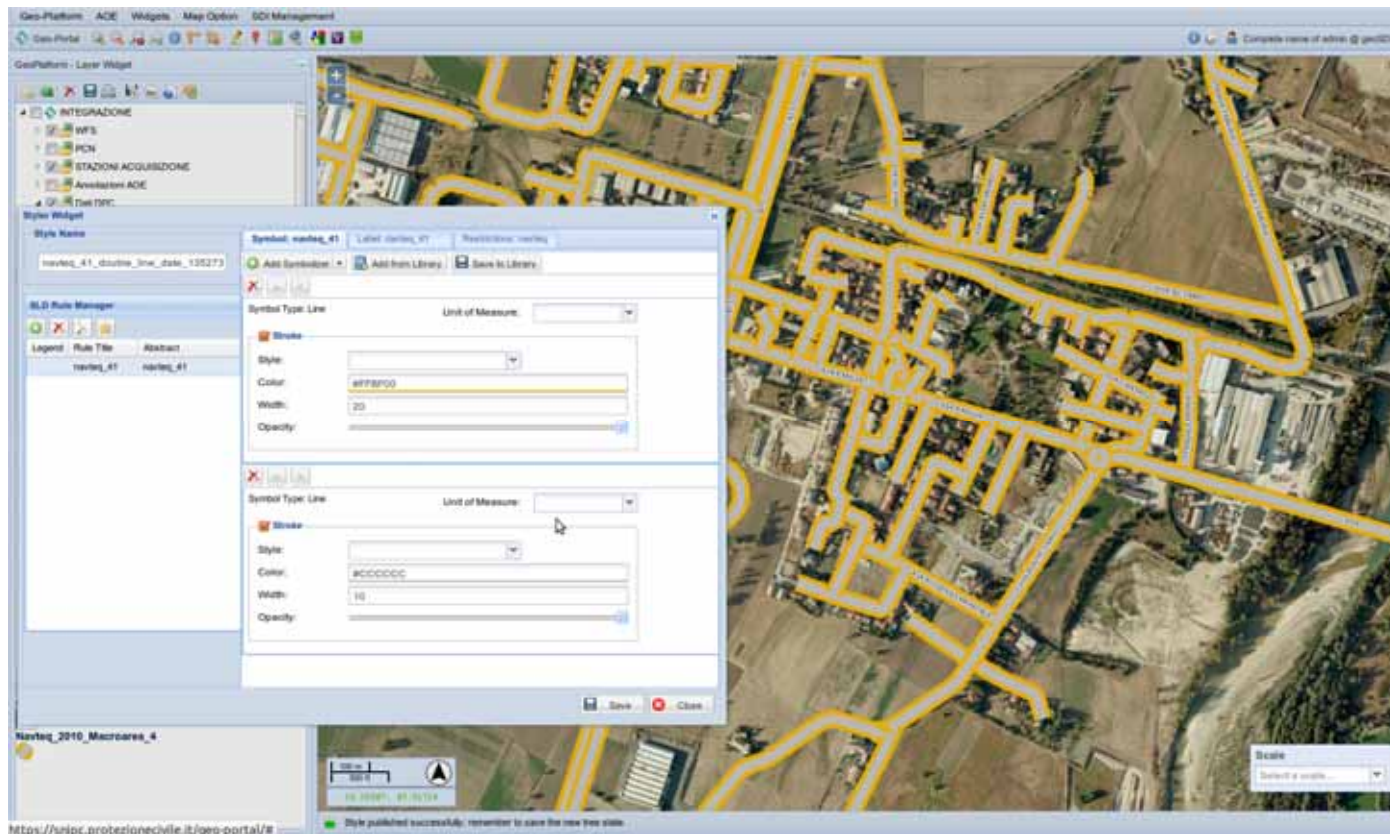
The screenshot displays the 'Color: rule1' dialog box, which is used for configuring a raster symbolizer. The dialog is divided into several sections:

- Channel Selection:** A checkbox labeled 'Channel Selection' is currently unchecked.
- Color Map:** A checkbox labeled 'Color Map' is checked. Below it, the 'Type' is set to 'ramp' and the 'Extent' checkbox is also checked.
- Legend Table:** A table with four columns: 'Color', 'Quantity', 'Label', and 'Opacity'. It lists 11 color entries, each with a corresponding quantity and opacity value. The colors transition from white to red.
- Buttons:** At the bottom of the dialog, there are three buttons: 'Add Entry', 'Delete Entry', and 'Apply'.
- Map Preview:** On the right side of the dialog, there is a vertical map preview showing a geographical area with a color ramp overlaid, demonstrating the effect of the current settings.

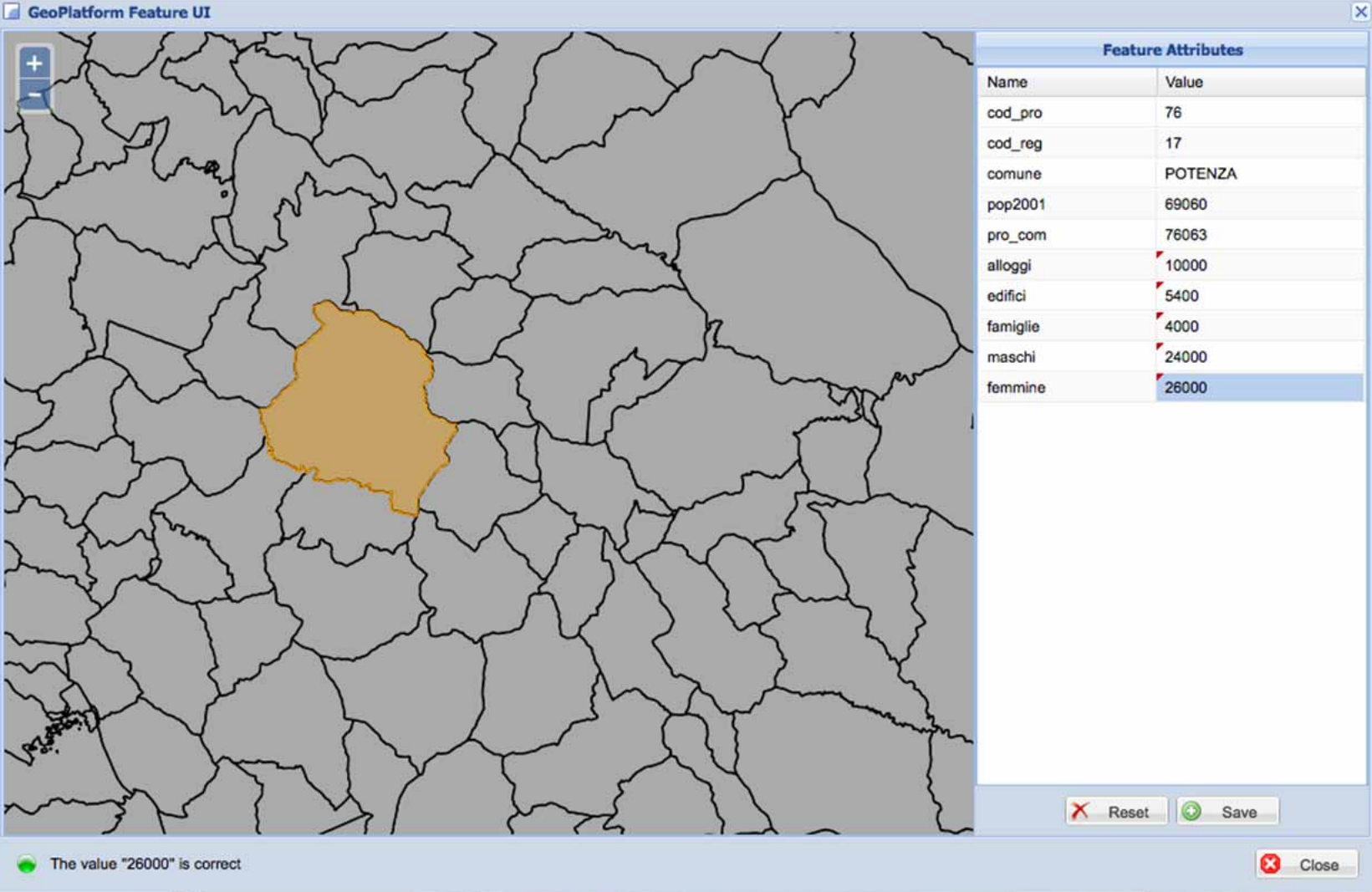
Color	Quantity	Label	Opacity
#FFFFFF	0		0
#00FC9B	1		1
#00D15E	2		1
#009611	3		1
#CFEF00	4		1
#F3F700	5		1
#F9C300	6		1
#F9A200	7		1
#FC6D00	8		1
#FC2E00	9		1
#FF006E	10		1

Advanced Widget : Styler (Vector Symbolizer)

- Esempio di creazione simbologie complesse (*costituite da più symbolizer sovrapposti*)



Advanced Widget : Editor WFS-T



The screenshot displays the GeoPlatform Feature UI editor. On the left, a map shows a highlighted orange polygon representing a geographical feature. On the right, a 'Feature Attributes' table lists various data points for this feature. The 'femmine' attribute is currently selected and highlighted in blue. At the bottom, a status bar indicates that the value '26000' is correct, and there are buttons for 'Reset', 'Save', and 'Close'.

Name	Value
cod_pro	76
cod_reg	17
comune	POTENZA
pop2001	69060
pro_com	76063
alloggi	10000
edifici	5400
famiglie	4000
maschi	24000
femmine	26000

The value "26000" is correct

Advanced Widget : WPS (process builder)

- Selection Process Remote to perform
- Inserting the input (eg layers to be processed, buffer size, ...)
- Request to perform remote job

The screenshot displays the 'WPS Operations Widget' interface. On the left, a list of operations is shown, with 'SITDPC Respect Zone' selected. The main area on the right is titled 'SITDPC Respect Zone' and contains the following configuration fields:

- Feature Class: sitdpc:comuni2001
- Respect Feature Class: sitdpc:regioni2001
- X: 1794646.3024581
- Y: 4946223.7936413
- Common EPSG: Choose EPSG...
- EPSG: EPSG:3857
- Buffer (meters): 1000

At the bottom right of the widget, there are two buttons: 'Reset' and 'Execute Process'.

Advanced Widget : WPS (process response)

- La feature collection risultante può essere aggiunta come nuovo layer
(*Pubblica automaticamente le features su geoserver utilizzando il wps gs:import*)

The screenshot shows the 'WPS Operations Widget' interface. On the left, a list of operations is displayed, with 'SITDPC Respect Zone' selected. On the right, a table titled 'SITDPC Respect Zone' shows the attribute values for the selected process. The table has two columns: 'Attribute Key' and 'Attribute Value'. The data is as follows:

Attribute Key	Attribute Value
regione	CAMPANIA
alloggi	0
edifici	0
cod_reg	15
femmine	0
ogc_fid	3
pop2001	5701931
famiglie	0
maschi	0
regione	PUGLIA
alloggi	0
edifici	0

At the bottom of the widget, there are two buttons: '< Back to Operation' and 'Publish Result on GS.'. Below the widget, a map shows the geographical context of the data, with a scale bar (100 km / 50 mi) and coordinates (17.34770, 40.53916).

geo-platform: SITDPC



SITDPC

Sistema Informativo Territoriale
Dipartimento della Protezione Civile

Accesso a geoSDI

Nome Utente

Password

Accedi



Scarica l'App Android per le segnalazioni.



Informazioni sul sistema SITDPC

L'utilizzo di SITDPC è ammesso esclusivamente nell'ambito delle attività del Servizio Nazionale di Protezione Civile, attraverso apposito account non cedibile a terzi. Medesima restrizione si applica anche alle stampe dei contenuti informativi del sistema.

Non è consentito divulgare a terzi dati, informazioni ed immagini contenuti nel sistema, se non esplicitamente autorizzato dal Dipartimento della Protezione Civile.

E' disponibile un account pubblico per la sola visualizzazione dei dati: user: **demo** - password: **demo**

geo-platform: SANF2



Accesso a SANF

Nome Utente 

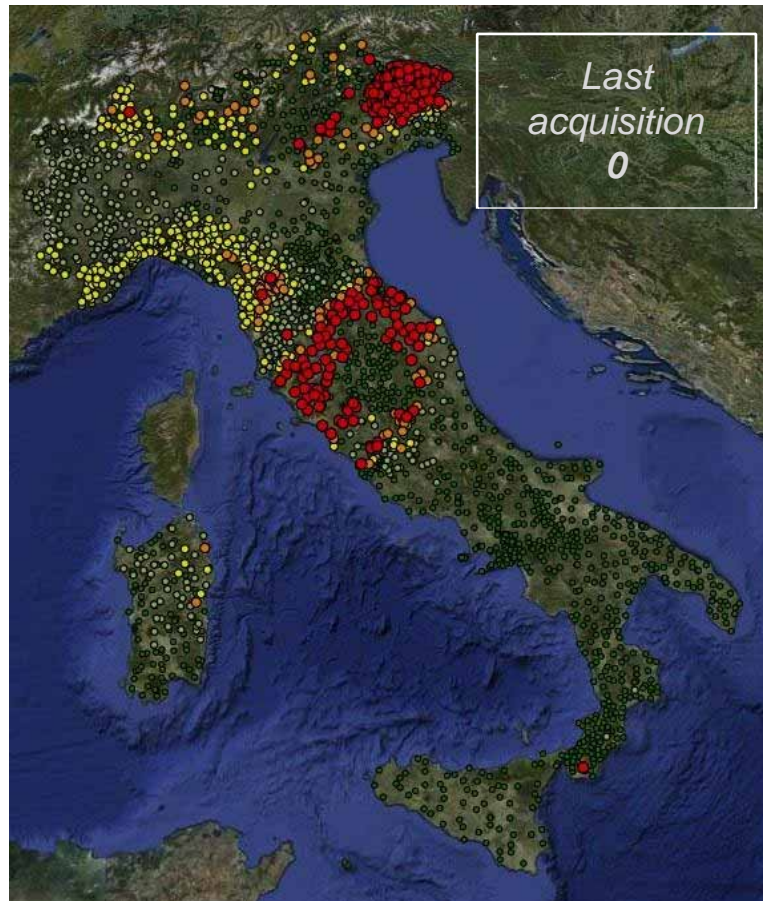
Password

Accedi

una recente applicazione

geo-platform: SANF2

Time Request



TIME FILTER EDITOR

Dimension Fixed Dimension Variable Dimension

strategy:

Dimension Size: 12

From Dimension to Display: 0

To Dimension to Display: 2012-11-12T11:30:01.000Z

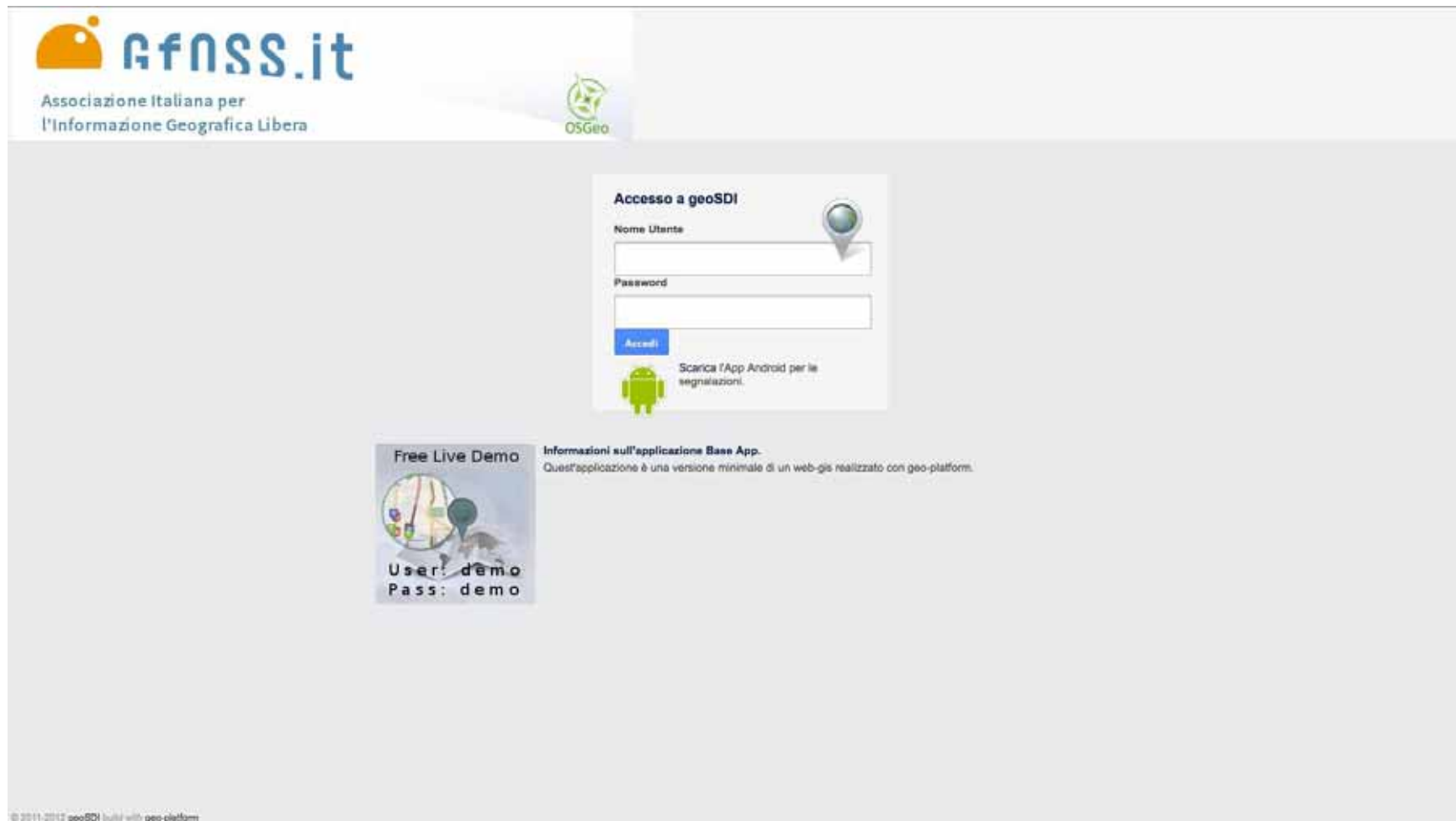
Apply Close



Future Development

- short-term
- Documentation (!)
- Showcase of the main widget
- medium term
- Introduction more faces:
- pure GWT
- GWT bootstrap
-
- Long term (end of 2013)
- Mapping full OGC services:
- WMS 1.3.0
- WFS 2.0.0 WPS 1.0.0

How to create a webgis with geo-platform



The screenshot displays the GfNSS.it website interface. At the top left, the logo for GfNSS.it is shown, with the text "Associazione Italiana per l'Informazione Geografica Libera" below it. To the right of the logo is the OSGeo logo. The main content area features a login form titled "Accesso a geoSDI". The form includes two input fields: "Nome Utente" and "Password", followed by a blue "Accedi" button. Below the button is a small Android robot icon and the text "Scarica l'App Android per le segnalazioni." To the left of the login form is a "Free Live Demo" section. It contains a small image of a map with a location pin and the text "User: demo" and "Pass: demo". Below the demo section, there is a small text block: "Informazioni sull'applicazione Base App. Quest'applicazione è una versione minimale di un web-gis realizzato con geo-platform." At the bottom left corner, there is a small copyright notice: "© 2011-2012 geoSDI built with geo-platform".

geoSDI Team



Vincenzo Cuomo
Direzione Scientifica



Dimitri Dello Buono
Direzione Strategia



Francesco Izzi
Direzione Produzione



Giuseppe La Scaleia
Responsabile
Sviluppo



Lorenzo Amato
Responsabile
Web & Mobile Area



Donato Maio
Responsabile
Sistemi in cluster

www.geosdi.org

Termini di licenza

This work is licensed under the Creative Commons Attribution- ShareAlike License. To view a copy of this license, visit <http://creativecommons.org/licenses/by-sa/1.0/> or send a letter to Creative Commons, 559 Nathan Abbott Way, Stanford, California 94305, USA.

Questo lavoro viene concesso in uso secondo i termini della licenza “Attribution-ShareAlike” di Creative Commons. Per ottenere una copia della licenza, è possibile visitare <http://creativecommons.org/licenses/by-sa/1.0/> oppure inviare una lettera all’indirizzo Creative Commons, 559 Nathan Abbott Way, Stanford, California 94305, USA.

Geo-Platform Framework

From the INSPIRE Directive to a Best Practice,
from a Best Practice to the Community

Speakers:

Dimitri Dello Buono

Lorenzo Amato



Institute of Methodologies for Environmental Analysis
National Council of Research



SUMMARY

- From the INSPIRE Directive to Best Practices
 - Technology Overview
 - Functional Features
 - INSPIRE Compliance
 - Best Practices
- Road Map
 - Implementations and Future Developments
- From a Best Practice to the Community
- Online (DEMO)
- Question & Answers



The Needs, the Idea, the Technology

From the INSPIRE Directive to Best Practices

The geoSDI Programme - since 2007

geoSDI is a Programme coordinated by the Italian Civil Protection Department of the Prime Minister Office



<http://www.geosdi.org>

- For implementing the Civil Protection National Spatial Data Infrastructure
- According to the provisions of the INSPIRE Directive
- Using Open Source software applications.



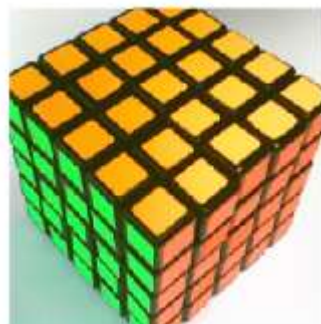
It is developed by the **Institute for the Methodologies of Environmental Analysis (IMAA)** of the **Italian National Research Council (CNR)** with the collaboration of most of the national civil and military institutions concerned.

The ISSUE and the IDEA



NOT a **SINGLE PRODUCT**
to solve **DIFFERENT PROBLEMS**

But a **SINGLE STRATEGY**
to implement **DIFFERENT SOLUTION**





GeoPlatform

by geoSDI

Geo-Platform was created to have a **FRAMEWORK** for the development of **industrial webgis**
(of course following *INSPIRE*)

From an idea of
Giuseppe La Scaleia and **Francesco Izzi**
(geoSDI Dev Area).

Development Start: about 2 years ago

Technology Overview

- The most important thing for geoSDI is to offer *enterprise SDI supports to our customers*
- We decided to create an ***enterprise framework***.
 - Open Source GPL v3
 - With modular APIs (core, wms, wfs, csw ...)
 - With a lot of ready widget
 - Scalable
 - Following the INSPIRE Directive
 - For the community ... to share our experience

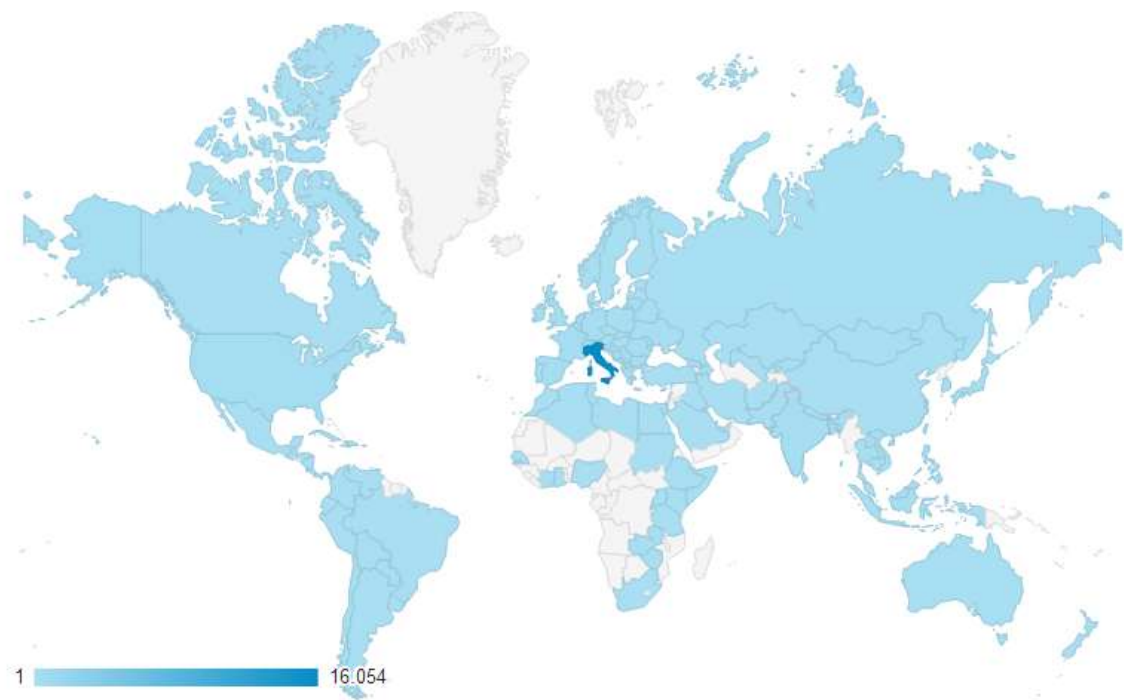
Geo-Platform Identity

- Born: **10 ottobre 2010**
- License: **GPLv3+CE**
- Stable Branch: **1.5**
- Repo: **<https://github.com/geosdi/geo-platform.git>**
- Modules: **100+**
- **470k** Lines added
- Owner: **geoSDI**

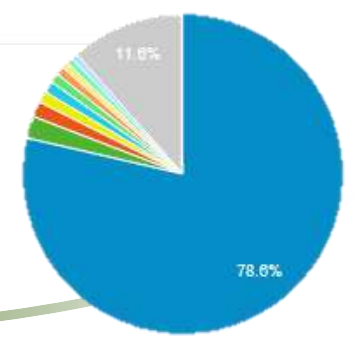


GeoPlatform
by geoSDI

Some Statistics of usage



- 1. ■ Italy
- 2. ■ United States
- 3. ■ France
- 4. ■ United Kingdom
- 5. ■ Spain
- 6. ■ Germany
- 7. ■ India
- 8. ■ Netherlands
- 9. ■ Belgium
- 10. ■ Israel



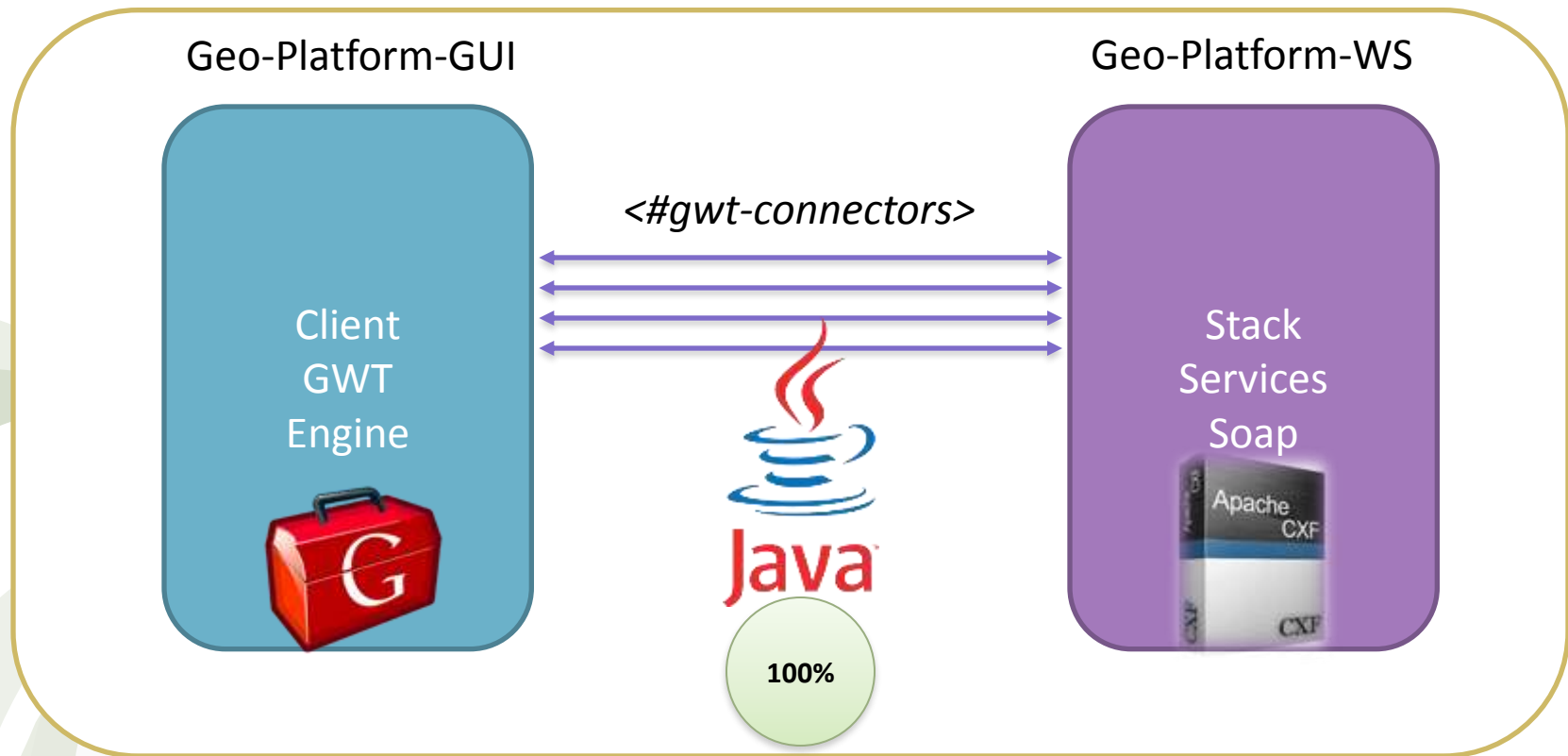
GeoPlatform
by geoSDI



The Framework for the Web Application

Technology Overview and Functional Features

Geo-Platform Client and Server



GeoPlatform
by geoSDI

An Extensible solution: WIDGETS



- Base Layer Selection (*Google, Bing, OSM, Custom...*)
- Add WMS Layer
- Upload File (*GeoTiff, SHP, SLD, ...*)
- Manage WMS Server
- Layer Tree Panel
- Refresh Layer
- CQL Filter
- Time Filter
- Print Map
- Styler (*gestione SLD*)

- Viewports Management
- Geocoding / Reverse Geocoding (*Google, Yahoo, Custom...*)
- Map Projects Management
- Export / Import Map Projects
- User / Roles Management
- Routing on OSM Data
- Feature Editor (WFS-T)
- WPS builder
- ...
- ...

Widget Examples

Map Feature Widget

He manages the map, working in association with other components such as toolbars and the layer tree widget. Every operation on the layer tree widget is immediately reflected on the map, for example transparencies, zIndex, style.

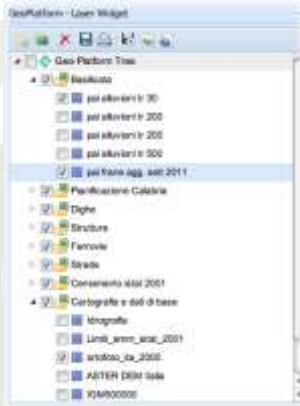
This widget gives also information about the scale of representation, geographical orientation, lat/long mouse position.



Layer Tree Widget

This is the widget for managing layers displayed on a map, which allows a truly innovative configuration: As shown in the figure, the tree allows you to view the "folder" in a nested way (unlimited nesting). This allows greater flexibility in organizing the set of layers.

The toolbar exposes functionality for the management of the tree and can be extended through additional widgets with additional features..



Widget Examples

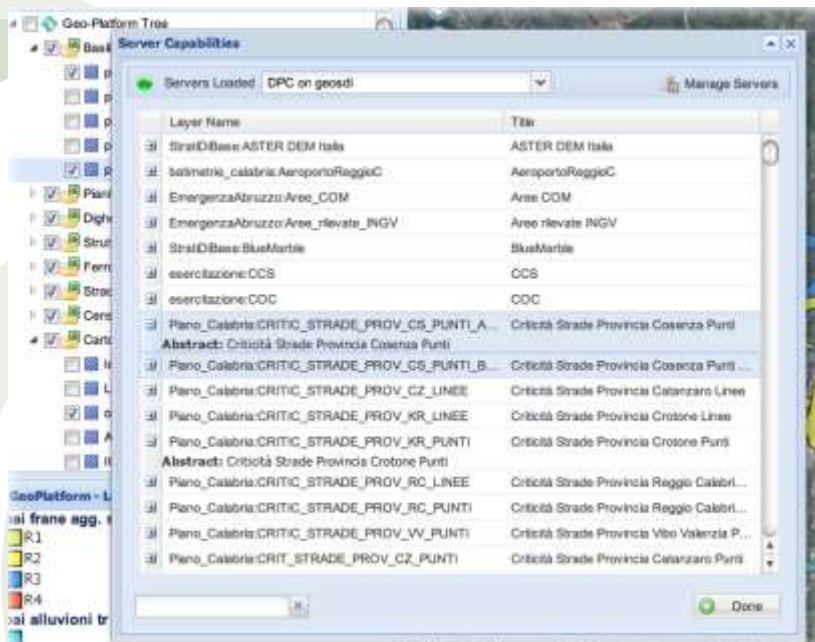


Add Layer Widget

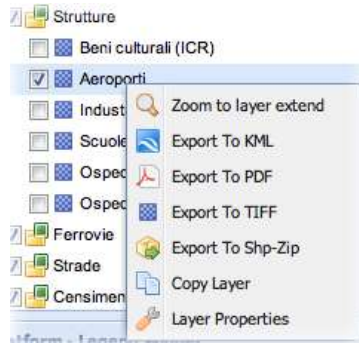
Allows creation of layers within the layer tree. Through this widget you can manage multiple data sources from which "collect" the layer to be added to the map.

The functionality of the Add Layer Widgets can be extended by adding more widgets, like uploading Shapefiles Widgets, the Widget Manage Server, the Add WMS from URL widget.

The work with layers is facilitated by: pagination of layers, the automatic extraction of the abstract, the possibility of selecting multiple layers, enhanced search and filtering the results.

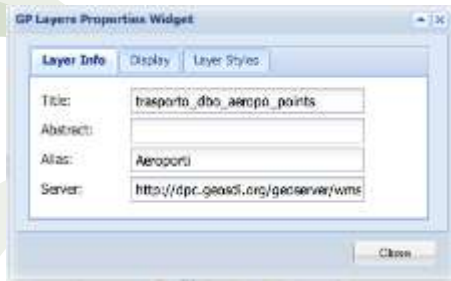


Widget Examples



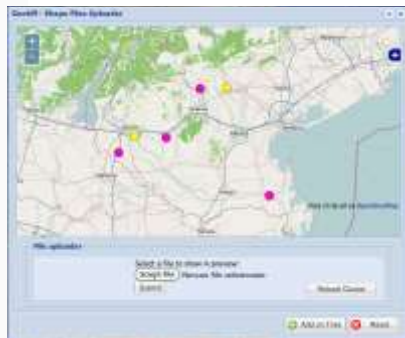
Context Menu Widget

For each layer functions are handled through the Context Menu ie: positioning the Max Extent, export to Google Earth, a quick view of the layers in PDF, export to TIFF for a higher resolution image, export to shapefile vector data, the Copy & Paste layers within layers of the tree.



Layer Properties Widget

For each layer in the tree are handled a number of properties, like the visual style for the layer, the opacity of the layers in the map, the information related to the server, user preferences such as the alias to be used as a label in the tree for the level, etc..



Upload Data Widget

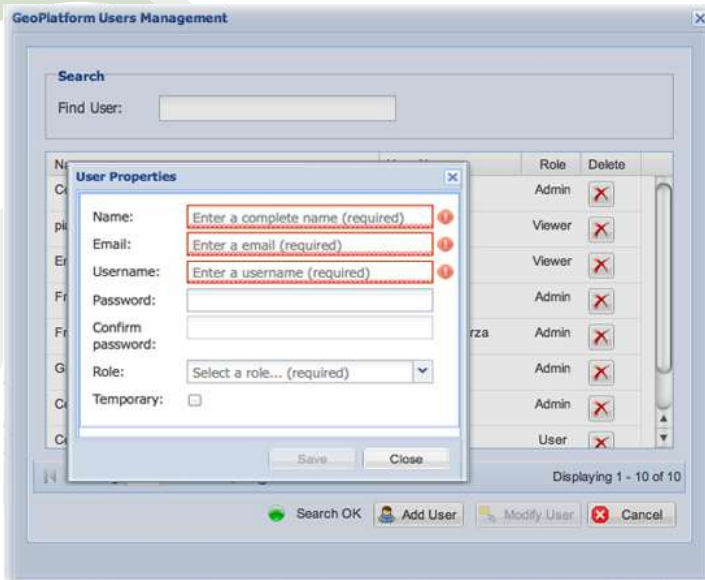
Functionality of ingestion of files, so as to make it totally transparent to the user the loading process of the physical data on the server and the service configuration. The selected file from your local disk, using web-GIS interface, it is sent to the server. The proper flow of ingestion will automatically configure the WMS-WFS services.

Widget Examples



Manage Projects Widget

Users can directly manage their online Map Projects: through tree-export functions, can save the state of the tree and open in successive different situations (trees with different structures).



User Management Widget

The widget allows you to differentiate your application based on user profile. Users Administrators can create, edit, delete users and differentiate the functionality available to users according to various profiles (eg Viewer, User, Admin).

Widget Examples

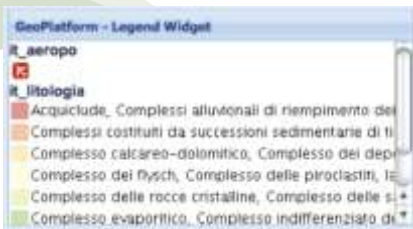
Server Management Widget

The widget works in association with the widget layer, and it manages the connection to the wms server. In particular, it allows you to connect to the web-gis a standard server WMS 1.1.1/1.3, giving the possibility to assign a name to the server and display the summary list of layers that it delivers. For each of the layers shows the summary description retrieved from the server.



Legend Widget

The widget displays the legend for each layer depending on the viewing scale active in the map.



Edit Widget

The toolbar allows you to enable editing capabilities for creating and editing geometry (point, line and polygon) and associated alphanumeric information. Topological features are also displayed adjacent to the inclusion.

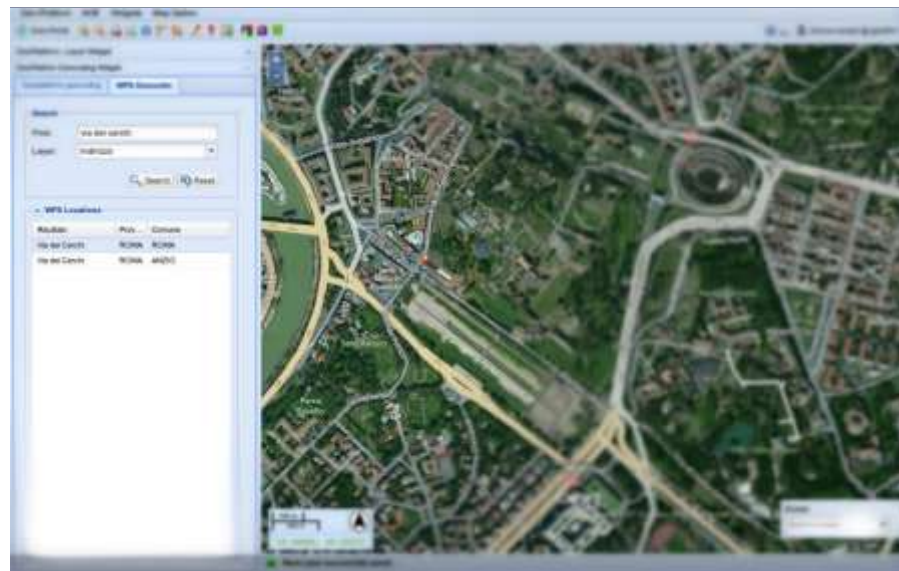


Widget Examples



GeoCoding Widget

It gives the opportunity to locate on a map the location of any place, inserted through free text in the "Search". The widget can make use of geocoding services by external providers (eg, Google or Yahoo) or deployed from a database.



Widget Examples

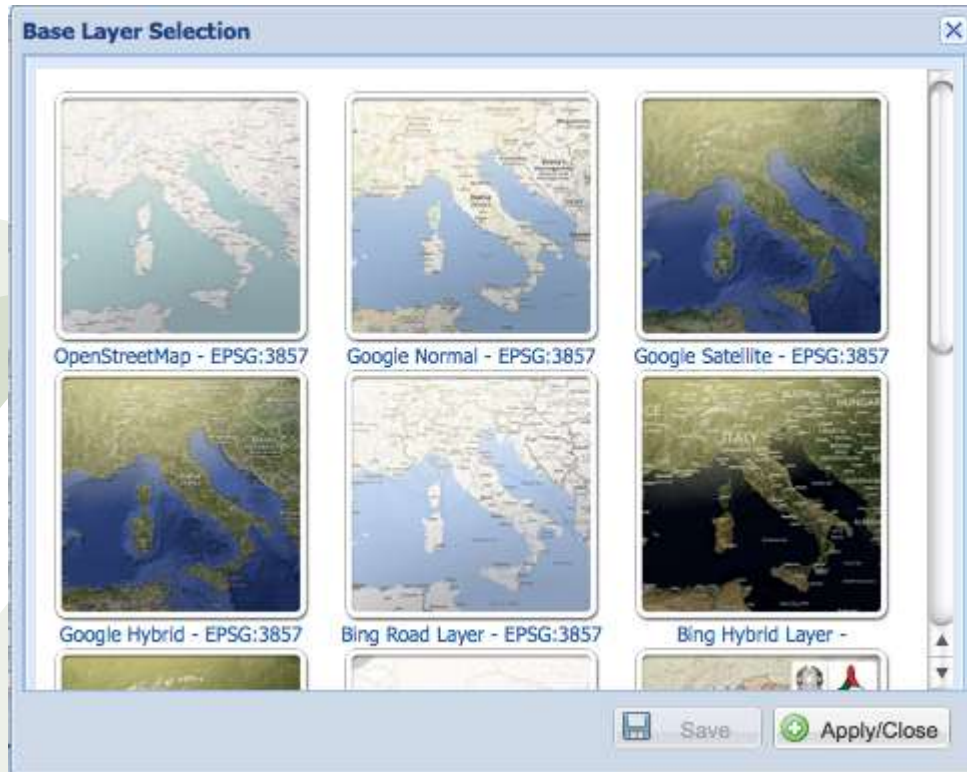


Routing Widget

It has the capability to calculate the shortest path in a graph interconnected, proposing directions for getting from A to B.

The shortest path, in the case shown in the figure, is based on open graph of OSM (Open Street Map) and takes account of these unique ways.

Widget Examples



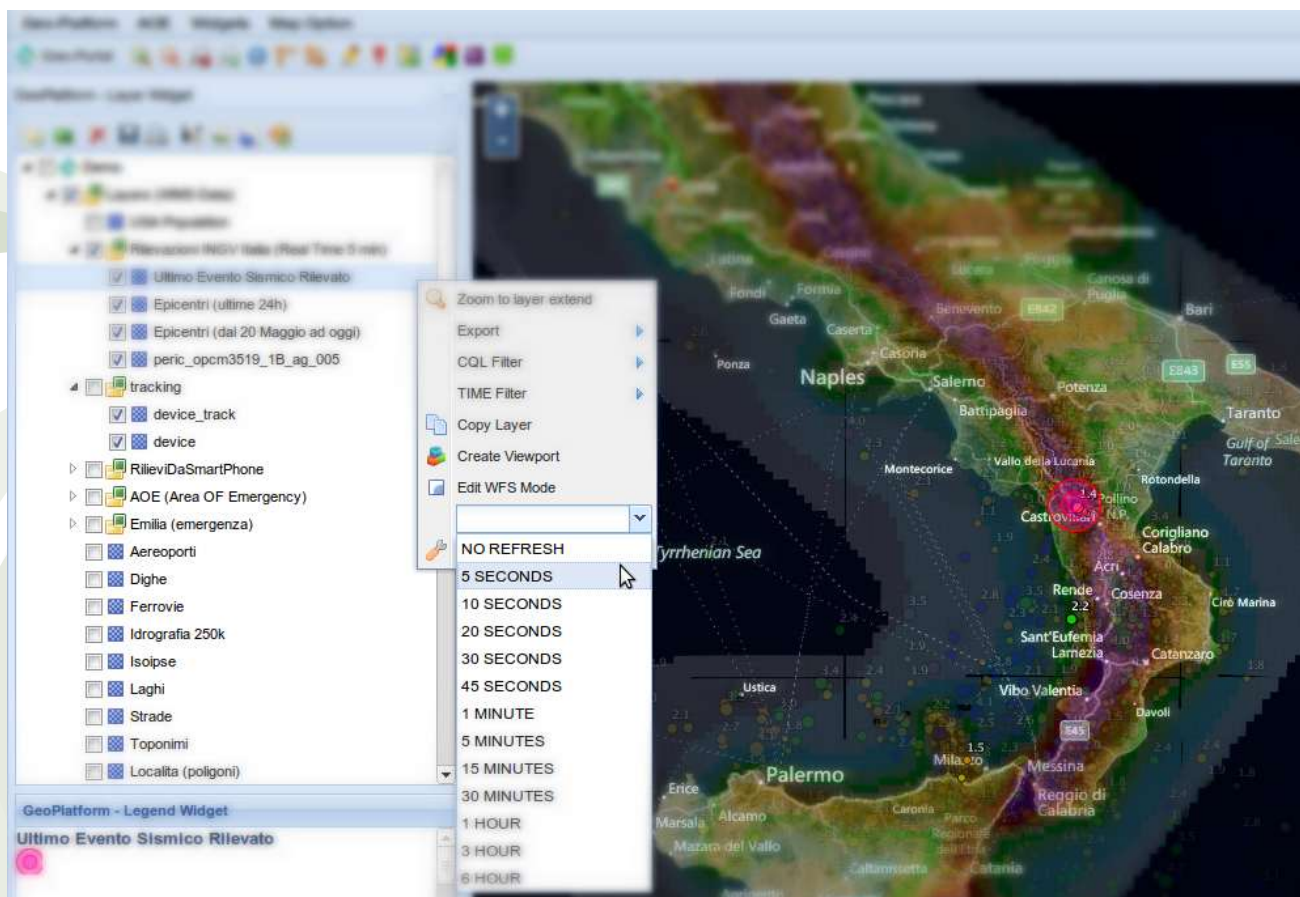
Basemap selection

Change the basemap and switch between Spatial Reference Systems

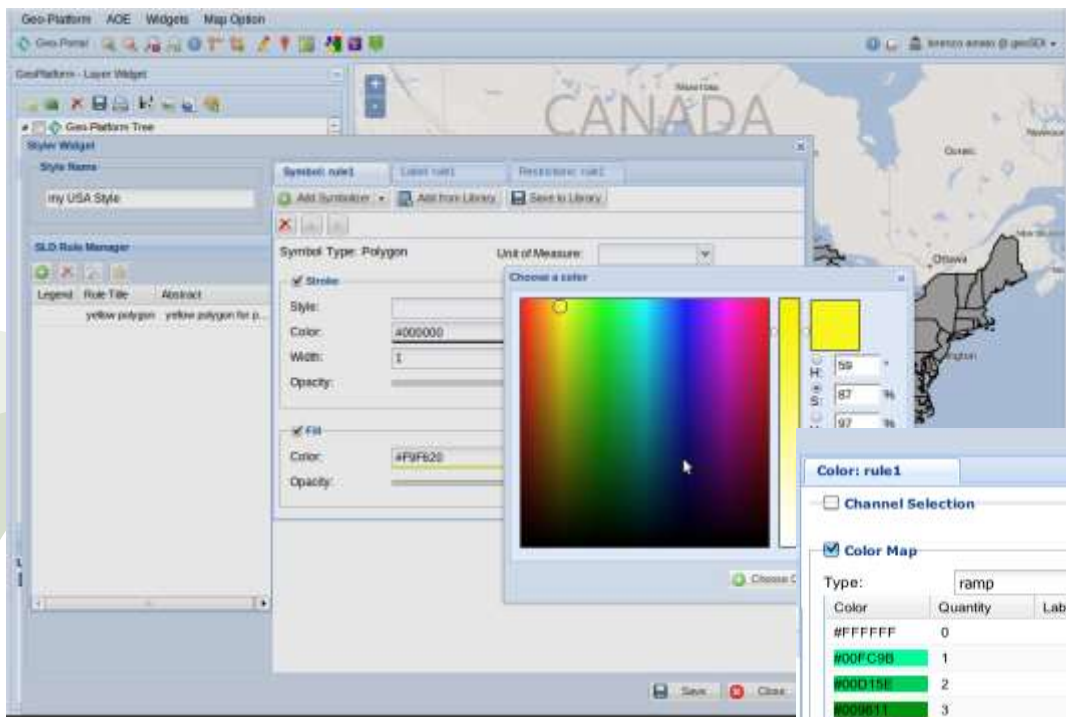
Widget Examples

Refresh widget

Refresh Layer visualization using XMPP communication



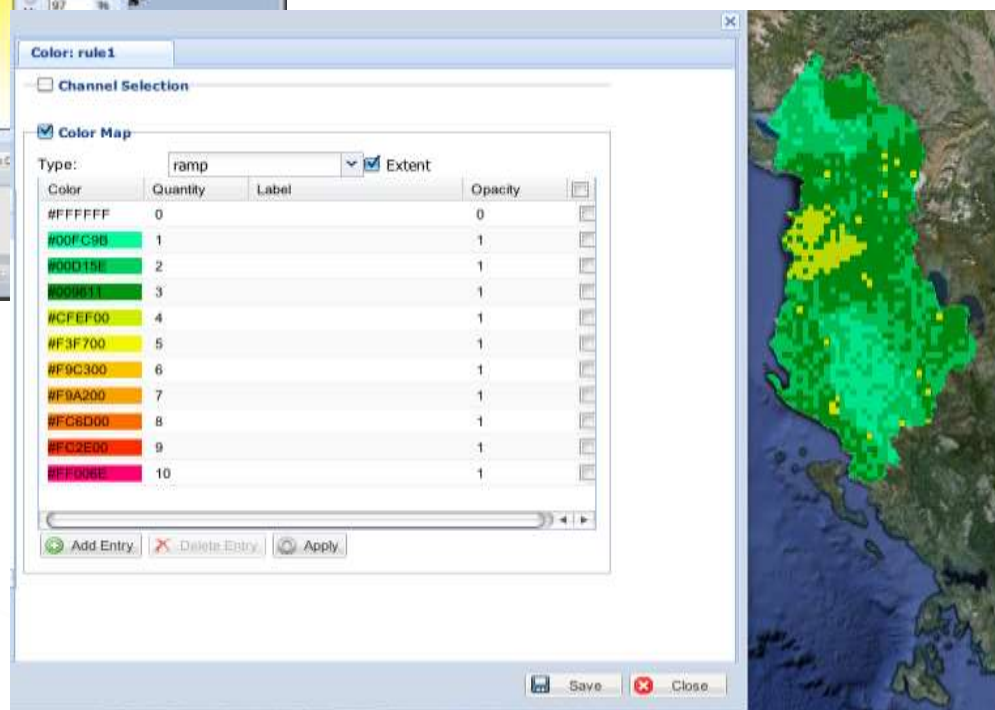
Widget Examples



Styler widget

Create and apply map themes on data values

- Vector Symbolizer
- Raster Symbolizer

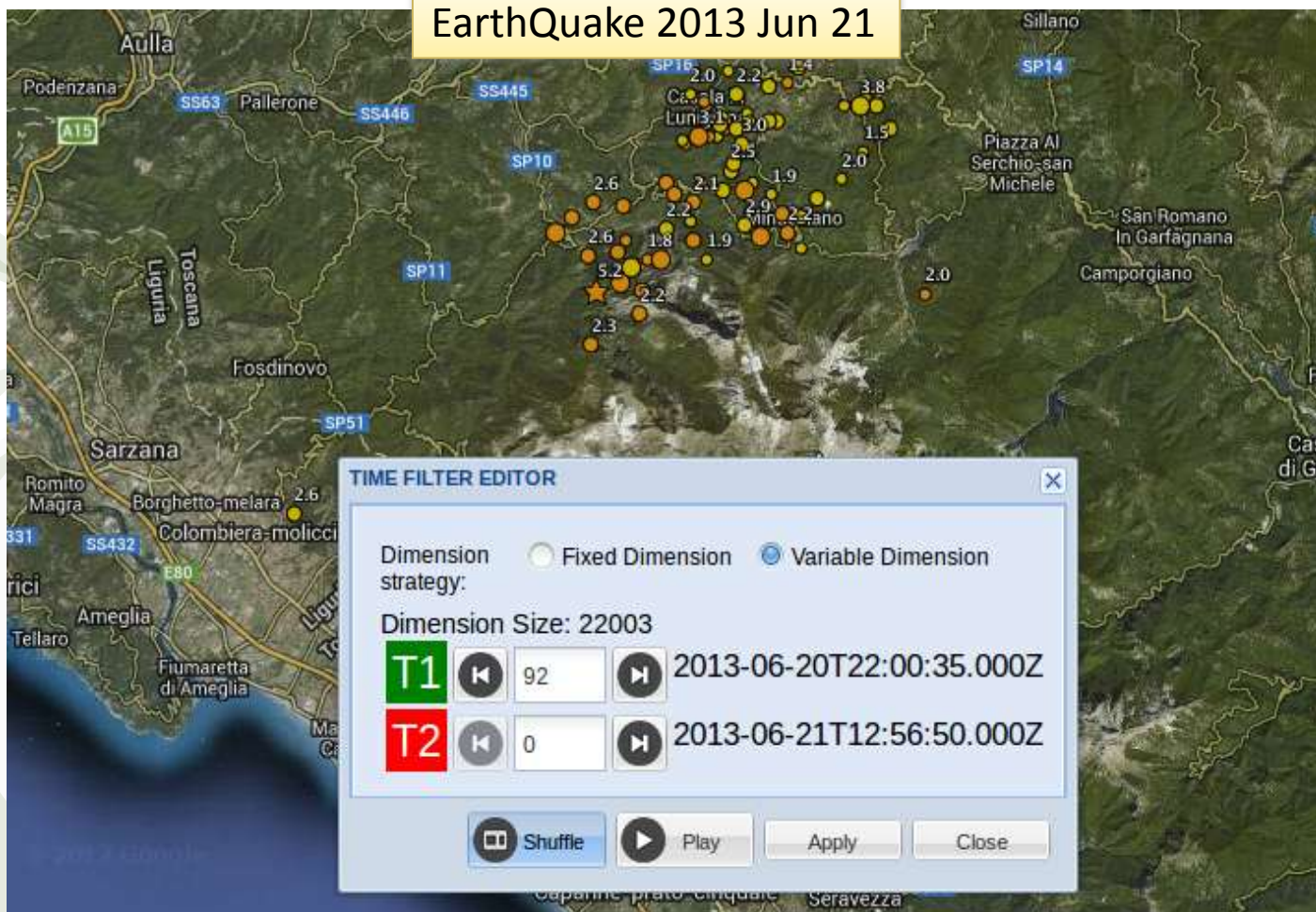


Widget Examples

Time Dimension Widget

Work dynamically with WMS Time Series.

Earthquake 2013 Jun 21

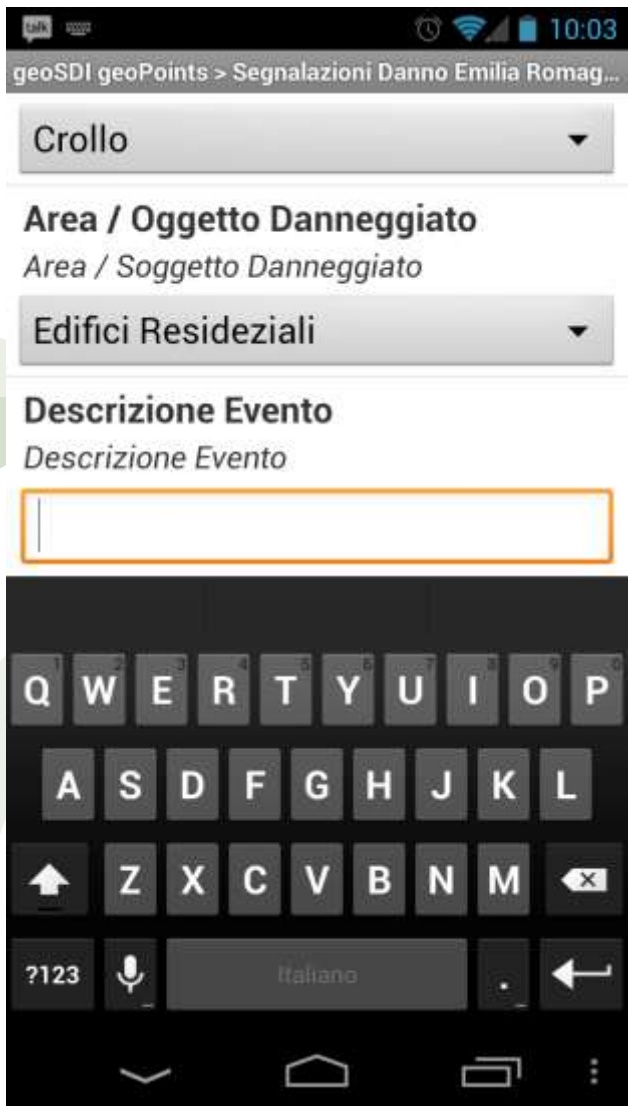


Mobile Survey



- Mobile App used for **Early Inspections**
 - to assess damage and the need for intervention
 - to organize teams to verify the practicability of the buildings
- **Contributes from:**
 - CommonPeople getting the App
 - Technician of the Civil Protection
- Collected Data are Directly stored on the Infrastructure and delivered as **OGC services**
 - **EARLY MAPPING** of the **DAMAGE SCENARIO!!**

Some Screenshots



The screenshot shows the mobile application interface for reporting an event. At the top, the status bar displays the time as 10:03 and various system icons. Below the status bar, the application title is "geoSDI geoPoints > Segnalazioni Danno Emilia Romag...". The main form consists of several sections:

- A dropdown menu with "Crollo" selected.
- A section titled "Area / Oggetto Danneggiato" with a sub-label "Area / Soggetto Danneggiato" and a dropdown menu showing "Edifici Residenziali".
- A section titled "Descrizione Evento" with a sub-label "Descrizione Evento" and an empty text input field.

A virtual keyboard is visible at the bottom of the screen, indicating that the text input field is active.

- Select the Type of Event
- Select the element **hit**

Some Screenshots



- Take a photo of the damage
- This photo will be available as a **queryable** information on the WMS MAP

Some Screenshots



- Register the position of the inspection
- uses the more precise localization between
 - Network Signal
 - GPS position

Some Screenshots



geoSDI geoPoints > Segnalazioni Emilia Romagna
Segnalazione
Nome



geoSDI geoPoints > Segnalazioni Emilia Romagna
Segnalazione
Recapito Telefonico
Recapito Telefonico



Rosso Rossi Rossetti
q w e r t y u i o p
a s d f g h j k l
↑ z x c v b n m ↵
?123 🔊 . ↵



1 2 3 -
4 5 6 ,
7 8 9 ↵
↵ 0 . ↵

- **Input other information like:**
 - Name of the person/technician reporting
 - Tel. Nuber to be recalled
 - N° of people involved in the damage
 - N° of hurted people
 - N° of dead people

Some Screenshots

The screenshot displays the GeoPlatform web application interface. On the left, the 'GeoPlatform - Layer Widget' shows a list of layers under 'Top Layers' and 'Real Time Data'. The 'Real Time Data' section includes 'INGV Sismologia' with 'Sismi Magnitudo > 3' and 'Ultimo evento' checked, and 'Sismi, Frane e PAI' with 'PCN - PAI Piani Assesto Idrog. (Solo 4326)' and 'Rischio' checked. A legend for 'Sismi Magnitudo > 3' is shown below, listing depth ranges and magnitude thresholds.

The main map area shows a topographic map with a red shaded area representing a hazard zone. A white line with yellow triangles indicates a path or boundary. A 'Server Capabilities' window is open at the top of the map. A 'Get Feature Info' popup is displayed over a feature, showing the following data:

area_oggetto	EdificiResideziali
descrizione_evento	Sisma pollino
immagine	
provincia	Ferrara
comune_modena	
comune_ferrara	Bondeno

At the bottom of the map, there is a scale bar (100 m / 200 ft), coordinates (15.98736, 39.88691), and a status message: 'Layers have been loaded correctly by the service'. A 'Scale' widget is also visible in the bottom right corner.

Some Screenshots

The screenshot displays the GeoPlatform web application interface. The browser address bar shows `geosdi.protezionecivilecalabria.it/geo-portal/`. The main map area shows a satellite view with several feature markers. A 'Get Feature Info' dialog box is open, displaying the following data:

tipo_evento	AZUO
area_oggetto	BeniCulturali
Scheda AEDES	<input type="button" value="Open"/>
image	
indirizzo	
soggetto_ente	Privato

The 'Open' button in the dialog is highlighted with a red arrow. In the background, a 'Scheda AEDES' form is visible, titled 'SCHEDA DI 1° LIVELLO DI RILEVAMENTO DANNO, PRONTO INTERVENTO E AGIBILITÀ PER EDIFICI ORDINARI NELL'EMERGENZA POST-SISMICA'. The form includes fields for:

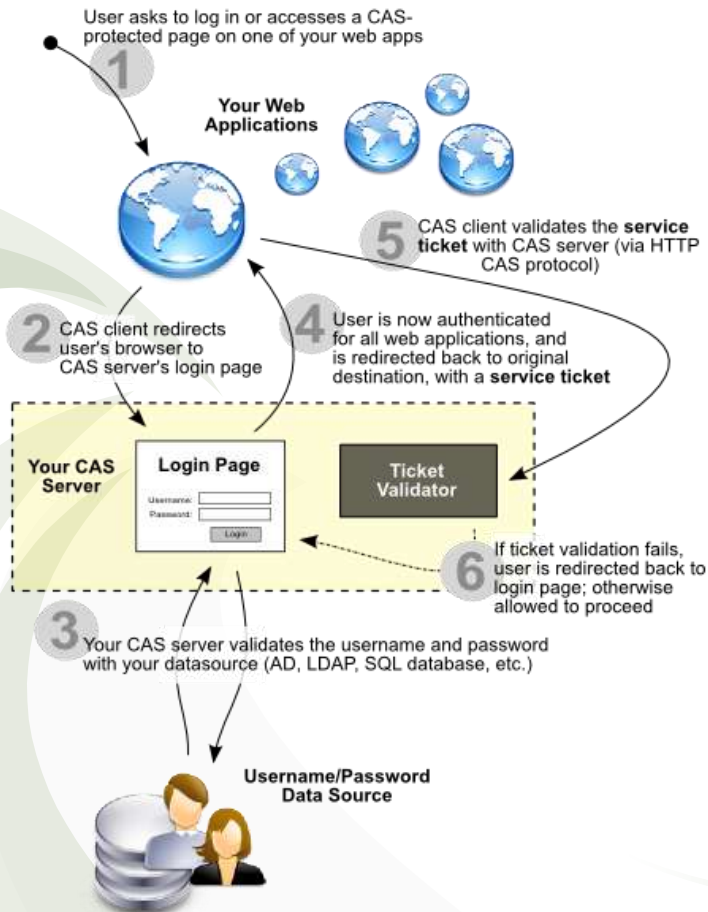
- Provincia: Cosenza
- Comune: Mommano
- Identificativo Soprallocco: Squadra 001, Scheda n. 001, Data 13/12/2012
- Identificativo Edificio: Foglio 051, Alloggio
- Indirizzo: Via, Corso, Vicolo, Piazza, Altro
- Coordinate geografiche: Lat, Long, Fuso
- Denominazione edificio o proprietario: Chiesa xpia

The map interface includes a 'Scale' widget at the bottom right with a dropdown menu set to 'Select a scale...'. A red arrow points to a feature marker on the map.

Production Features

Single sign-on

Basic CAS Authentication Mechanism



SSO functionality

Single Sign-On (SSO) means a better user experience when running a multitude of web services, each with its own means of authentication. With a SSO solution, different web services may authenticate to one authoritative source of trust, that the user needs to log in to, instead of requiring the end-user to log in into each separate service.

GeoPlatform SSO

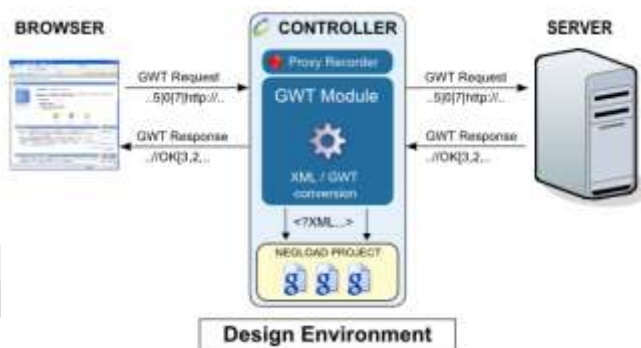
The GeoPlatform SSO technology allows users to grant access to all the Spatial Data Infrastructure without needing to authenticate using different password or log-in username on other component of the SDIs but leveraging the CAS SSO functionalities.

User Management Widget

The GeoPlatform User Management Widget was enhanced to allow the SDIs administrator to manage from a single Widget the users "ROLE" and "TRUST LEVEL" to allow or deny access to the each single application functionality **and in particularly to each spatial data accessible using the application.**

Production Features

CASifying GeoPlatform

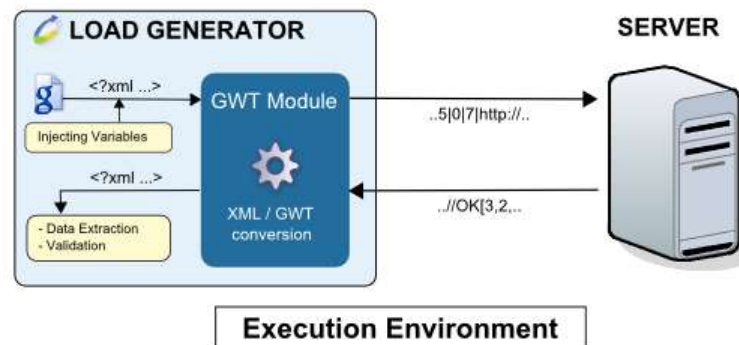


The Client architecture

Geo-platform is the first web GIS framework entirely written in Java. It takes advantages of the Google Web Toolkit framework to render the quickest Geo-Portal application to a large web GIS user's community. GWT suggests to implement a particular architecture to take benefit from the AJAX asynchronous mechanism

Proxy Ticket to the federated services

In this scenario it is necessary to formulate a new way to insert the CAS security in the GWT – geo-platform architecture. It is necessary to grant access not only to the GWT side but also to the web service endpoint using CAS proxy tickets.





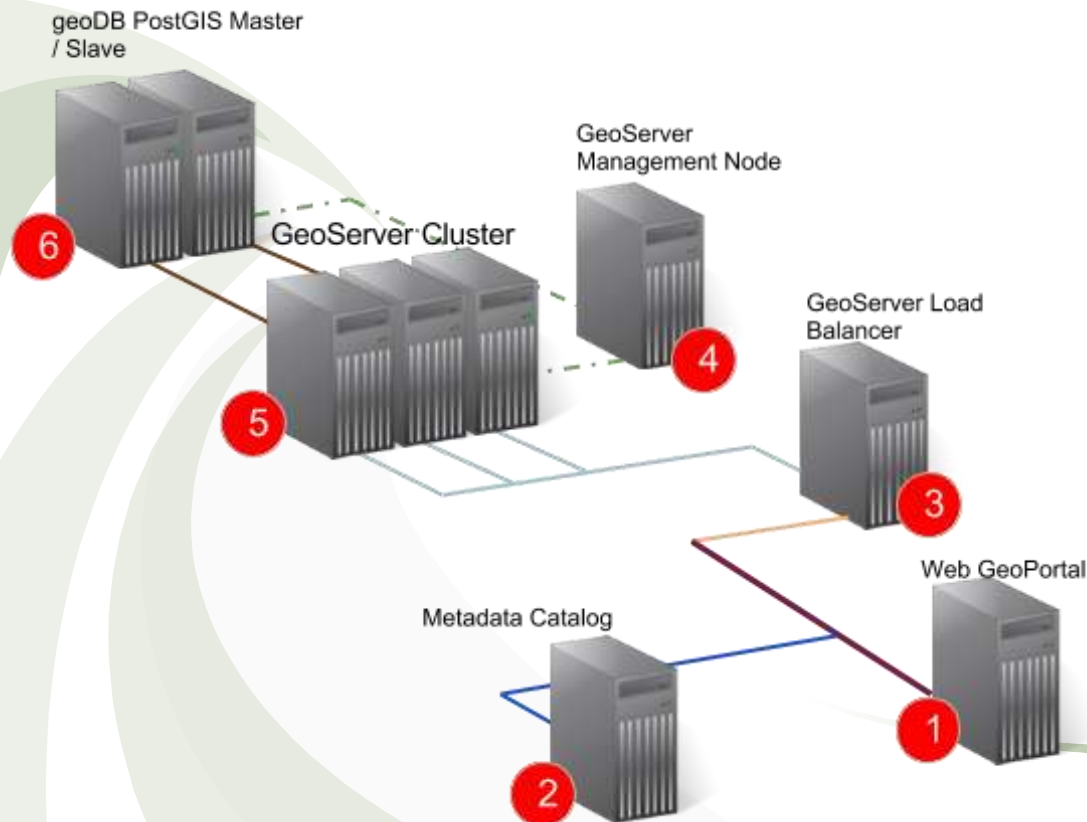
The Architecture

A Quick Overview

Clustered Architecture

- Behind the Application
 - Clustered Architecture

- High Availability (HA)
- High Performance (HP)
- Scalability
- Flexibility



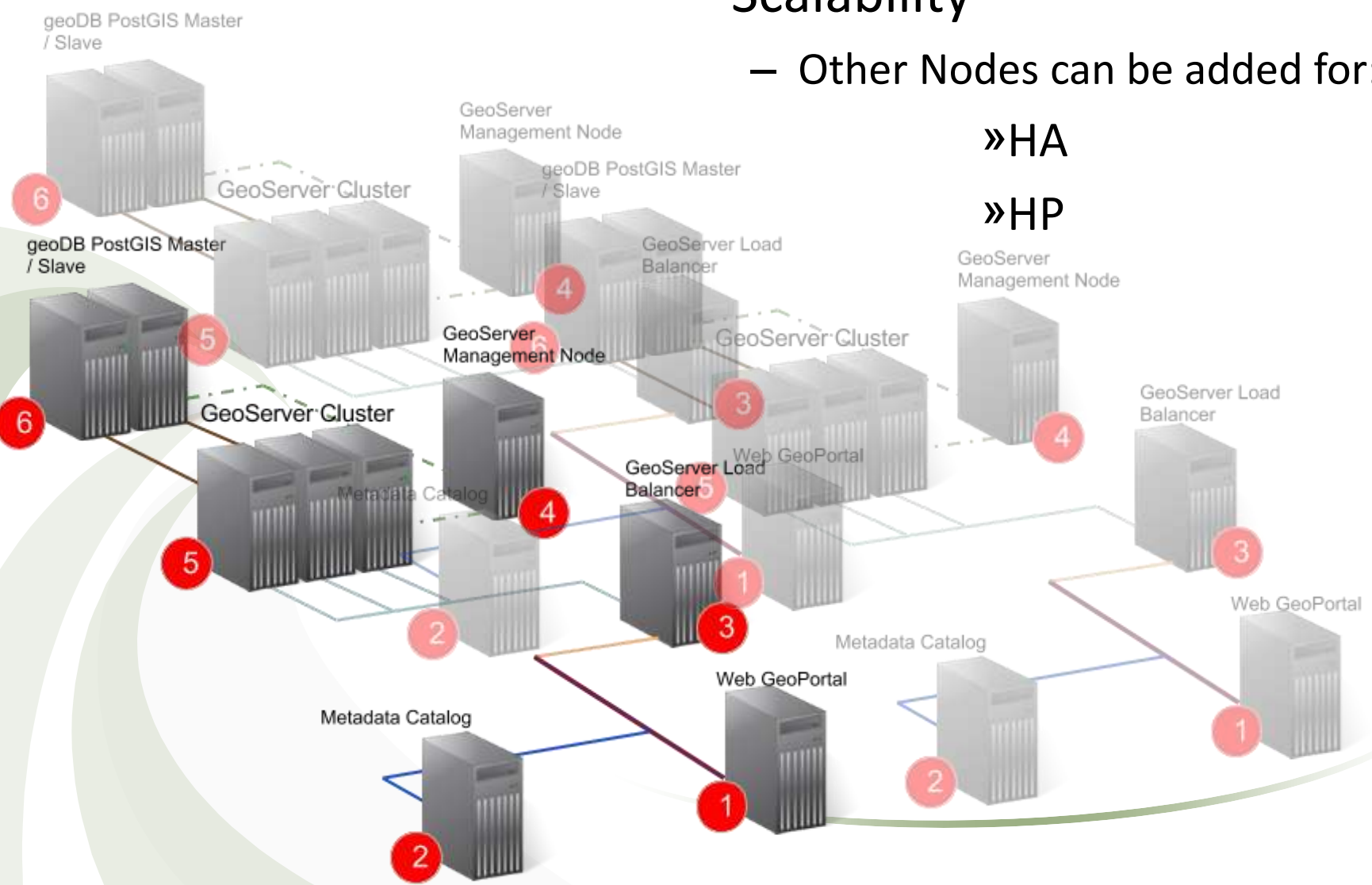
Scalability

- Scalability

- Other Nodes can be added for:

»HA

»HP



geoSDI RoadMap

- UI Refactoring
 - Our library for widget UI Rendering
- Upload Data improvements
 - Now is possible to upload only shape and geotiff add more ...
- Cluster improvements
 - A use case **GRS: GeoServer-Streaming-Replication**
 - (GSR) provides the capability to *continuously* ship and apply the Geoserver configuration. **Without needing to reload the entire catalog!** Coming soon ! On GitHub Lincese **GPL v3**



GeoPlatform
by geoSDI



Attività gio 10.47

GeoServer: Welcome - Google Chrome

localhost:8080/geoserver/web/

GeoServer

Welcome

Welcome

This GeoServer belongs to .

0 Layers [Add layers](#)

0 Stores [Add stores](#)

1 Workspaces [Create workspaces](#)

⚠ Please read the file /home/fizzi/server/tm-gs-node1/webapps/geoserver/data/security/masterpw.info and remove it afterwards. This file is a security risk.

⚠ The default user/group service should use digest password encoding.

⚠ The administrator password for this server has not been changed from the default. It is highly recommended that you change it now. Change it

🔒 Strong cryptography available

This GeoServer instance is running version **2.3-SNAPSHOT**. For more information please contact the administrator.

- Server Status
- GeoServer Logs
- Contact Information
- About GeoServer

- Layer Preview
- Workspaces
- Stores
- Layers
- Layer Groups
- Styles

- WCS
- WFS
- WMS

- Global
- JAI
- Coverage Access

- Tile Layers
- Caching Defaults
- Gridsets
- Disk Quota

- Settings
- Authentication
- Passwords
- Users, Groups, Roles
- Data
- Services

- Demos

- Tools

GeoServer: Welcome - Mozilla Firefox

localhost:8081/geoserver/web/

GeoServer

Welcome

Welcome

This GeoServer belongs to .

0 Layers [Add layers](#)

0 Stores [Add stores](#)

1 Workspaces [Create workspaces](#)

⚠ Please read the file /home/fizzi/server/tm-gs-node2/webapps/geoserver/data/security/masterpw.info and remove it afterwards. This file is a security risk.

⚠ The default user/group service should use digest password encoding.

⚠ The administrator password for this server has not been changed from the default. It is highly recommended that you change it now. Change it

🔒 Strong cryptography available

This GeoServer instance is running version **2.3-SNAPSHOT**. For more information please contact the administrator.

- Server Status
- GeoServer Logs
- Contact Information
- About GeoServer

- Layer Preview
- Workspaces
- Stores
- Layers
- Layer Groups
- Styles

- WCS
- WFS
- WMS

- Global
- JAI
- Coverage Access

- Tile Layers
- Caching Defaults
- Gridsets
- Disk Quota

- Settings
- Authentication
- Passwords
- Users, Groups, Roles
- Data
- Services

- Demos

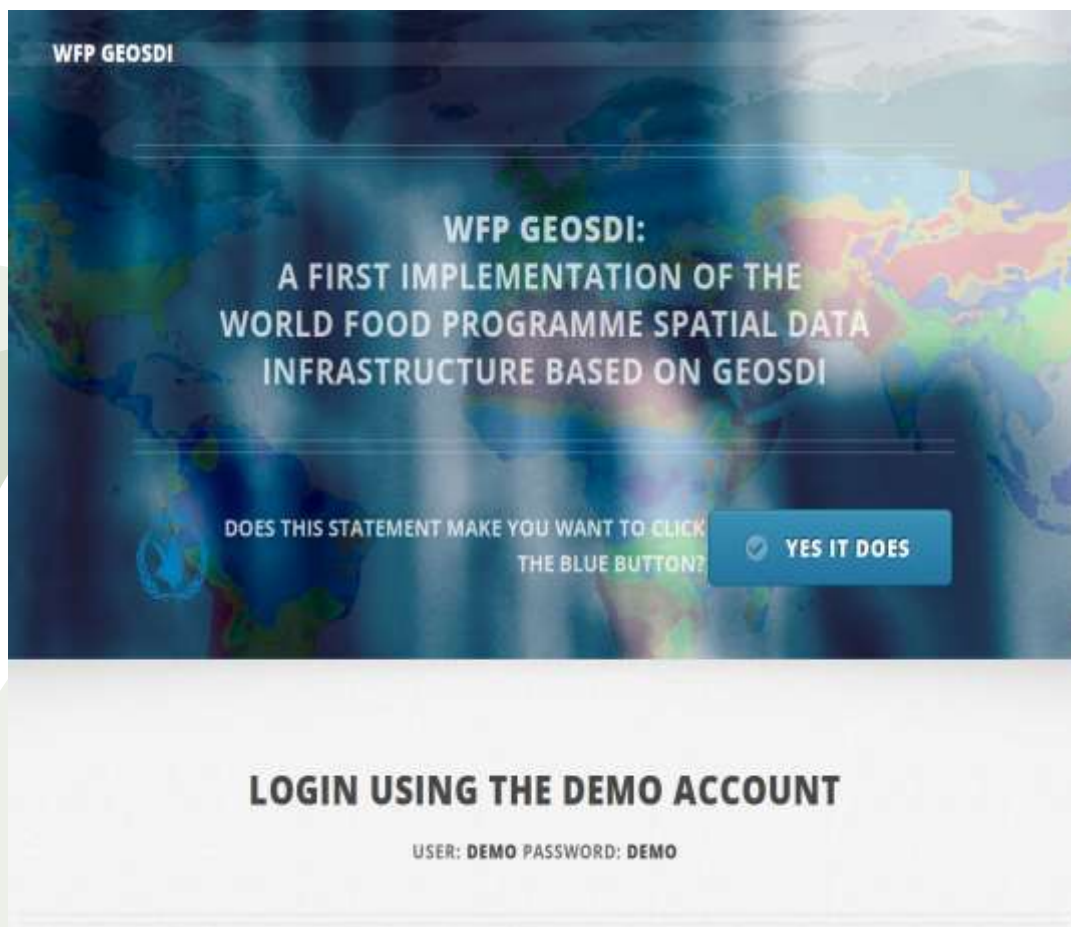
- Tools

Service	
GWC	1.0.0
WCS	1.0.0
	1.1.0
	1.1.1
WFS	1.1
	1.0.0
	1.1.0
	2.0.0
WMS	1.1.1
	1.3.0
TMS	1.0.0
WMS-C	1.1.1
WMTS	1.0.0

Use Cases and Best Practices



ONU World Food Programme (WFP)



WFP GEOSDI

WFP GEOSDI:
A FIRST IMPLEMENTATION OF THE
WORLD FOOD PROGRAMME SPATIAL DATA
INFRASTRUCTURE BASED ON GEOSDI

DOES THIS STATEMENT MAKE YOU WANT TO CLICK
THE BLUE BUTTON?

YES IT DOES

LOGIN USING THE DEMO ACCOUNT

USER: DEMO PASSWORD: DEMO

The project is in use at the United Nations - World Food Programme for the realization of the control room for the command and control of the activities of planning, prevention and emergency management in sub-Saharan Africa, particularly in Zambia.

Internet WebSite :
<http://wfp.geosdi.org>



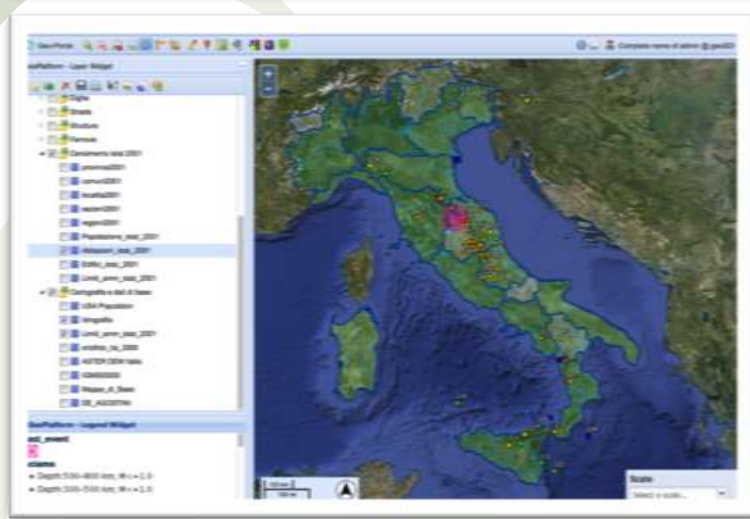
EUROMED PPRD South

The screenshot shows the website interface for the PPRD South programme. At the top, there is a navigation bar with links for Home, Programme, Partner Countries, EU and ICs, Risks, Resources, Events, News Archive, Risk Atlas, and Links. The main content area is titled 'Risk' and displays two risk scenarios: 'Earthquake Risk' and 'Landslide Risk'. Each scenario includes a 'Description' field, a 'Contents' field, and a 'View Maps' button. Below the 'View Maps' button, there is a map viewer showing a geographical area. The right sidebar contains a language selector set to 'EN', a 'NEWSLETTER' section with 'Subscribe' and 'Archive' options, an 'UPCOMING EVENTS' section with 'No current events', and two manual links: 'PPRD SOUTH TECHNICAL ASSISTANCE' and 'EURO-MEDITERRANEAN CIVIL PROTECTION OPERATIONAL MANUAL'.

The goal of the PPRD South Programme is to contribute to the improvement of the capacities of prevention, preparedness and disaster response at all levels: international, national and local levels.

Internet WebSite :
<http://www.euromedcp.eu>

National Civil Protection Dept.



- The WebGIS of the **Italian Civil Protection** for Maps Creation and Emergency Management
- OGC oriented
 - WMS
 - WFS-T
 - WCS
 - WPS
 - CSW
- Multi-User, Multi-Role Application
- Multi-Map-Project per User
- Online WMS Styler
- Geocoding Integration

Ministry of Defence



GeoSDI technologies for the creation of Spatial Data Infrastructure are included in the National Research Programme Military (PNRM) INTEGRO, (Italian National Geospatial Interoperability Environmental Manager for defense data)

geoSDI
is also involved in **DGIWG**

**Defence
Geospatial
Information
Working
Group**

Member Nations

Participating Members

- | | |
|----------------|-----------------|
| Australia | The Netherlands |
| Belgium | New Zealand |
| Canada | Norway |
| Czech Republic | Portugal |
| Denmark | South Africa |
| Estonia | Spain |
| France | Sweden |
| Germany | Turkey |
| Greece | United Kingdom |
| Italy | United States |

Associates

- | | |
|--------|---------|
| Latvia | Romania |
|--------|---------|

Local Public Administration (Example 1): Hospitality of the villages – Campania Region

[Home](#)

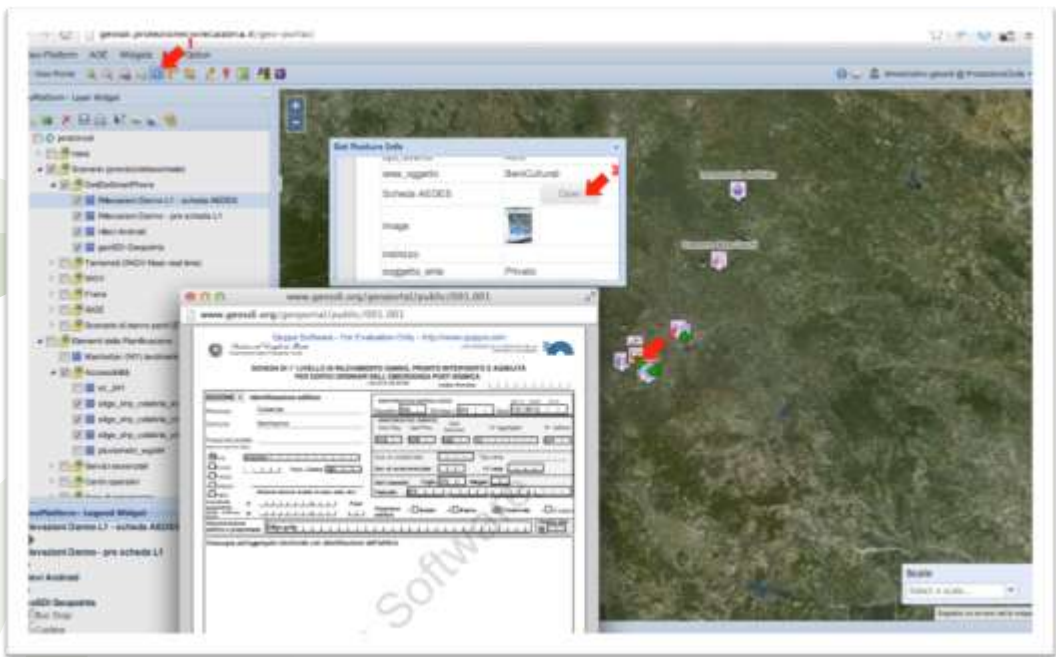
OSPITALITA' NEI BORGHI

Azioni di promozione e valorizzazione delle
eccellenze nei borghi della regione Campania



MUOVERSI NEI BORGHI	PRIMA DI PARTIRE	ANALISI AMBIENTALE SUI BORGHI
<p>Caro TURISTA Ti guidiamo passo passo</p> <p>Scarica l'applicativo smartphone android per poter raggiungere il posto di interesse più vicino a te</p> <p>Download Applicazione per palmare</p> <ul style="list-style-type: none">● Applicazione per il Turista <p>Caro OPERATORE Tienici aggiornato sui luoghi</p> <p>Scarica l'applicativo smartphone android per poter aggiungere un Punto di Interesse utile al supporto del Turista nel tuo Borgo</p> <p>Download Applicazione per palmare</p> <ul style="list-style-type: none">● Applicazione per l'Operatore <p>Downloads Documenti</p> <p>Manuali d'uso</p> <ul style="list-style-type: none">● Manuale Applicazioni per palmare● Manuale geoportale geoSDI	<p style="text-align: center;">WebGIS</p> <p>Prima di partire naviga nei borghi, utilizza le mappe messe a disposizione, controlla i tuoi luoghi e verifica la presenza dei giusti punti per la tua Sicurezza, Sanità o i punti di interesse da visitare.</p>  <p>Accesso al Geoportale di Demo (CNR IMAA - geoSDI)</p> <p>L'accesso al geoportale di demo consente la visualizzazione dei Punti di Interesse rilevati e le schede associate. Per accedere cliccare il link sottostante e utilizzare le credenziali</p> <p>user: borghi password: geodi</p> <p>Apri il GeoPortale</p> 	<p>Lo studio sui borghi</p> <p>Lo stato della copertura vegetale di un territorio, in termini di quantità, qualità e salute delle piante, è il risultato diretto delle condizioni ambientali che lo caratterizzano. Il monitoraggio della vegetazione rappresenta, quindi, uno degli strumenti fondamentali per fornire indicazioni qualitative e quantitative circa lo stato di degrado del territorio. Queste sono utili per l'individuazione delle aree salubri e per uno screening precoce delle aree vulnerabili che necessitano di adeguate strategie di risanamento.</p> <p>Questo studio si basa sull'utilizzo di dati satellitari per il monitoraggio della copertura vegetale nelle aree di interesse e comprende sia la stima delle variazioni osservate nel decennio 2000-2010 sia un'analisi spaziale del territorio relativa al 2011.</p> <p>Download documentazione scientifica</p> <ul style="list-style-type: none">● Report Breve● Short Report (English)● Report Analisi Satellitare (Approfondimento)  


Local Public Administration (Example 2) : Civil Protection – Calabria Region



Integrations with existing management tools for emergency management (SITGE)

in order to create interoperability between geo information utilizzando OGC standards.

Local Public Administration (Example 3) : Province of Lecco



The screenshot displays the "Web SIT portale cartografico" for the Province of Lecco. The page features a header with the provincial coat of arms and the text "Provincia di Lecco". A navigation menu includes "Home", "Mappa", "Informazioni", "Link Utili", and "Contatti". The main content area is titled "Home" and contains a grid of satellite map tiles. Below the map, there is a text block explaining the portal's functionality: "Attraverso questo portale è possibile visualizzare, consultare e stampare la cartografia gestita dal Sistema Informativo Territoriale (SIT) provinciale. La semplice visualizzazione della cartografia avviene accedendo alle sezioni **cartografia tematica** (tecnica in formato PDF) e **cartografia interattiva** (visualizzatore che permette la navigazione). Il **catalogo dei metadati** contiene le schede di descrizione dei dati disponibili, permettendone il download (in formato PDF)." The page also includes logos for W3C XHTML 1.0 and W3C CSS.

Research

Institute for Hydrogeological protection

National Council of Research



The screenshot displays the irpi web application interface. On the left, a map of Italy is titled "Richieste Temporalì" (Temporal Requests). A text box on the map indicates "acquisizione più recente 0" (most recent acquisition 0). The irpi logo is visible in the center. A "TIME FILTER EDITOR" dialog box is open, showing the "Dimension strategy" set to "Fixed" and "Dimension Size" set to 12. Below the dialog, two smaller map thumbnails labeled "1" and "2" are shown. In the top right corner, a separate window shows a login form titled "Accesso a SAMP" with fields for "Nome Utente" and "Password".

VIGOR Project



A project to identify **geothermal** resources and opportunities

Evaluation of **Geothermal Potential** for the South of Italy



An Agreement between the **Ministry for Economic Development** and CNR, funded in the frame of POI for RES, targeting at development of geothermal demonstration projects (power production and direct uses)





How and Where geoSDI Solutions are INSPIRE Compliant

INSPIRE Compliance

A couple of Questions



Who **IS** INSPIRE Compliant?

Who provide a **Fully**
INSPIRE Compliant
Solution?



INSPIRE Compliant Solutions

No Complete INSPIRE Compliant Solution available now !!!

GeoPlatform was born to be a Framework
for developing webGIS Solution
following INSPIRE Directive



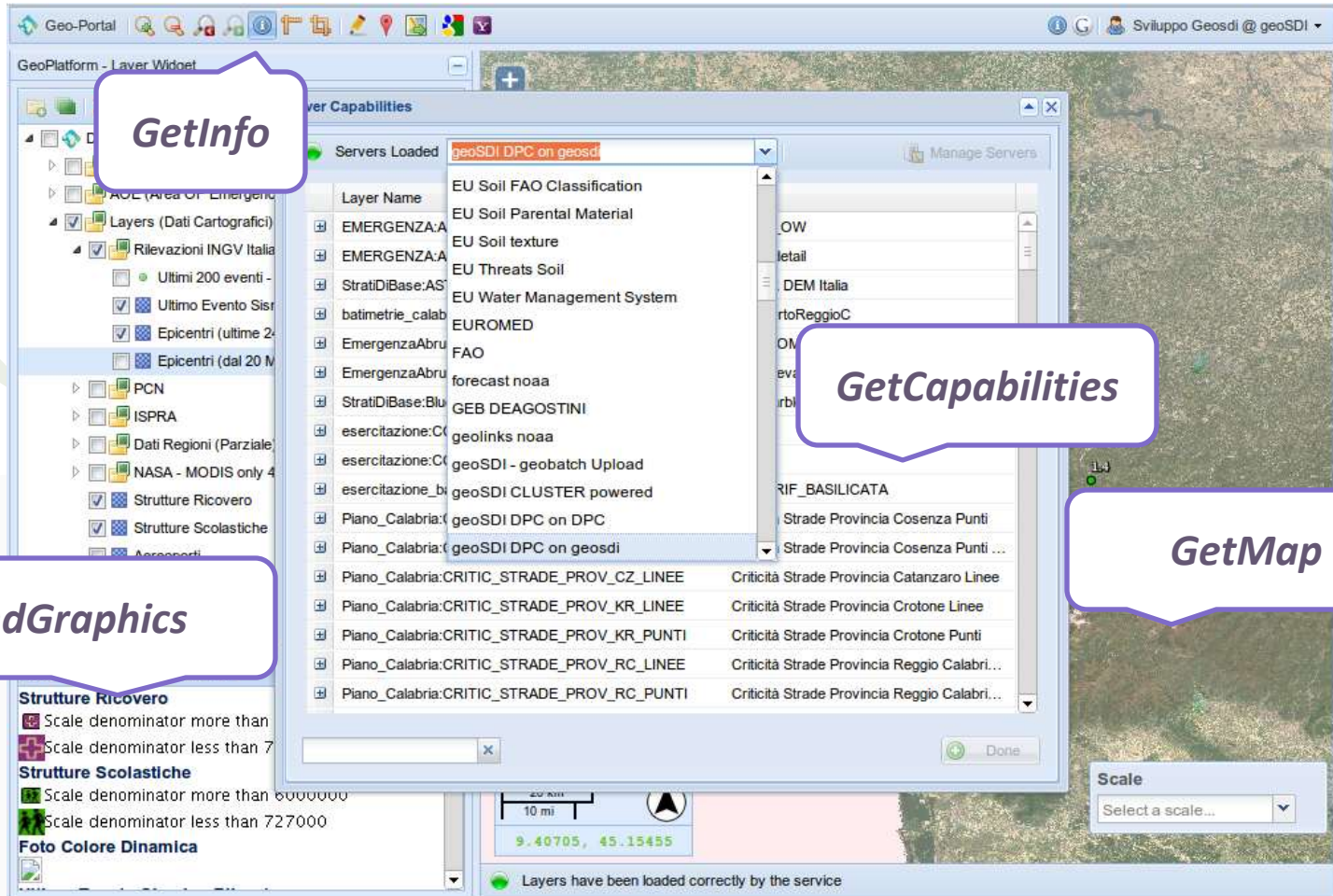
GeoPlatform INSPIRE compliant Feature

- Full **OWS OGC Services** to manage data
 - **WMS** Data Linker to manage layers data
 - **WFS-T** Editor to edit data
- **OWS CSW Multi Catalog Manager**
 - **CSW** Catalog Finder



GeoPlatform Features

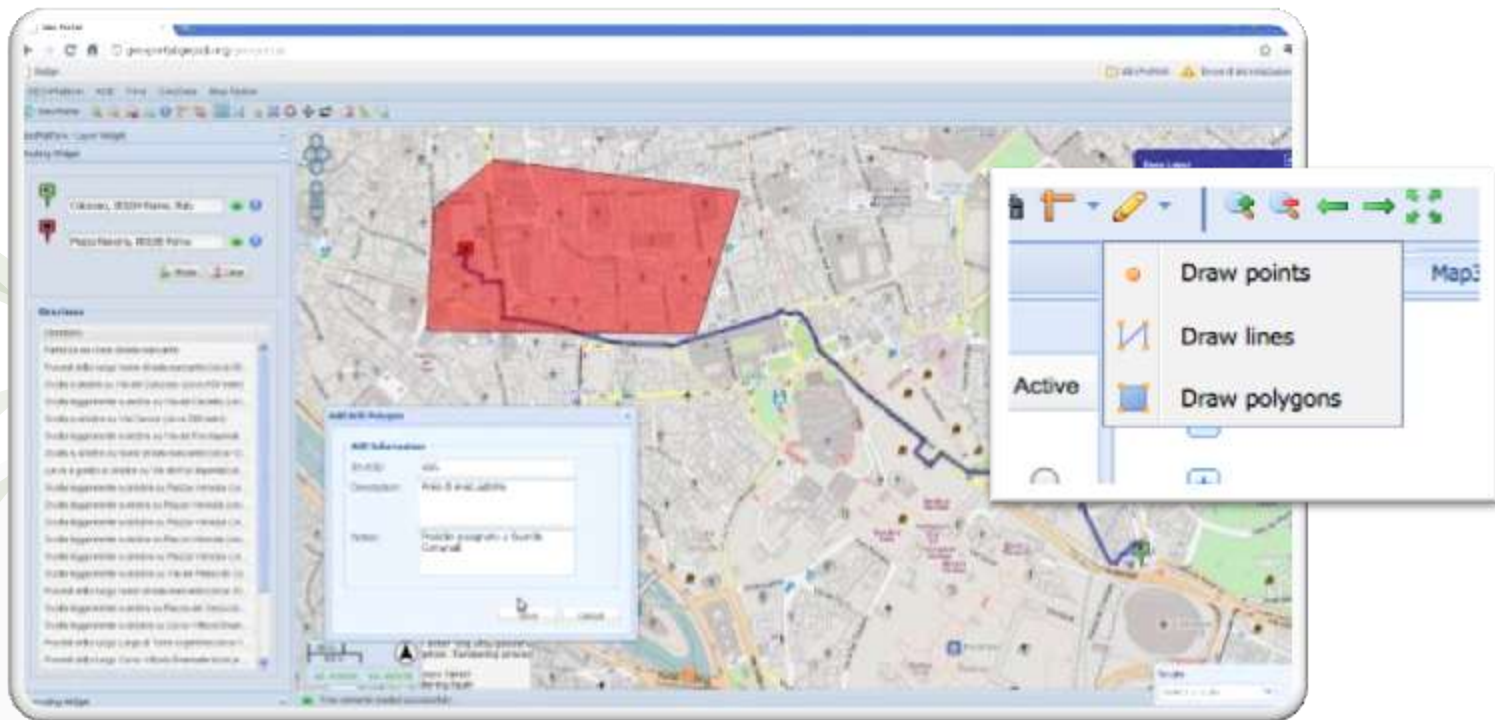
WMS Methods



GeoPlatform Features

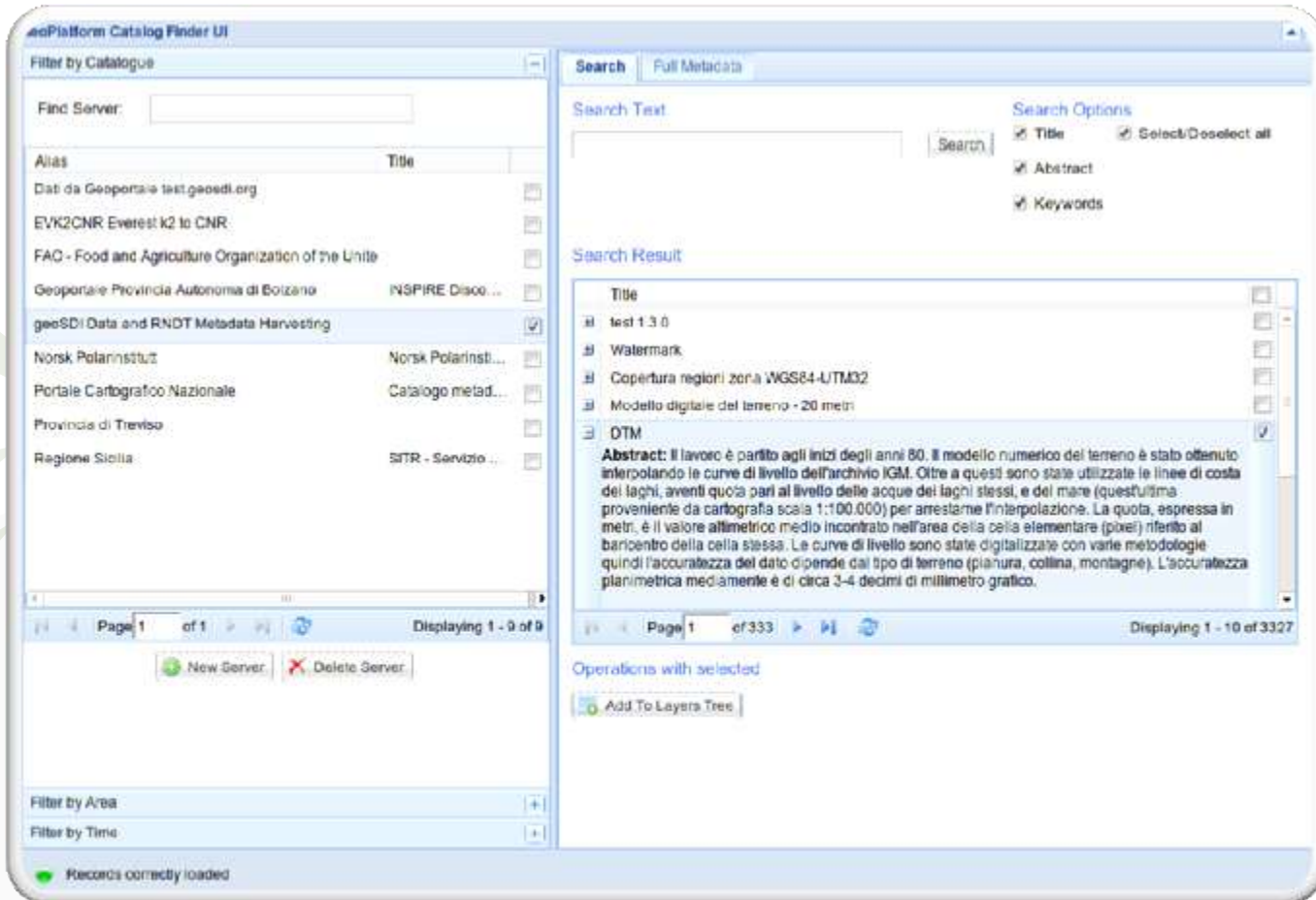
Interactive Features Admin & User

- **Web WFS-T Editor**



GeoPlatform Features

CSW Metadata search: *What*

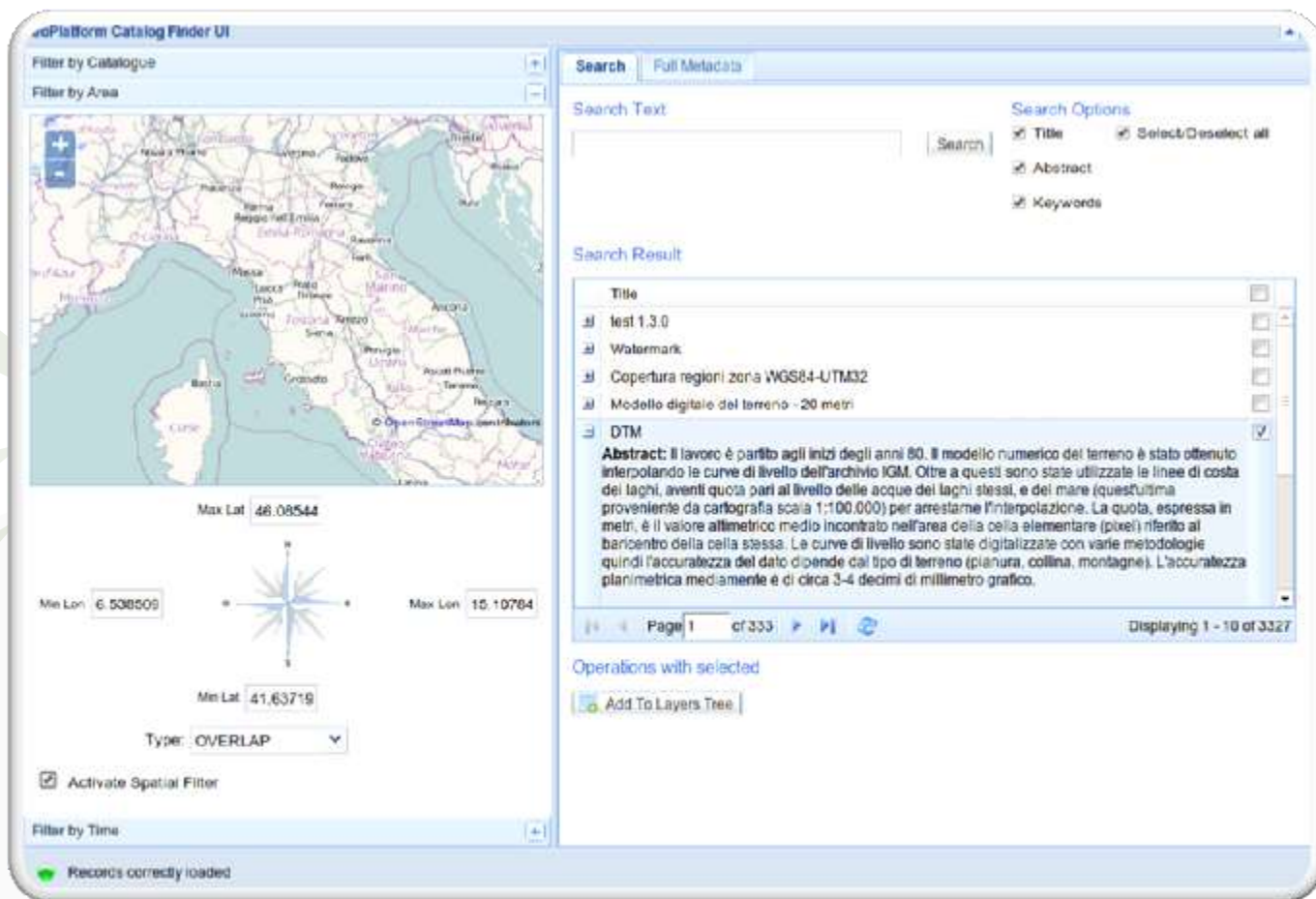


The screenshot displays the GeoPlatform Catalog Finder UI. The interface is divided into several sections:

- Filter by Catalogue:** A table listing various catalogues with checkboxes for selection. The selected catalogue is "geeSDI Data and RNDT Metadata Harvesting".
- Search:** A search bar with a "Search" button and "Full Metadata" selected. Search options include Title, Abstract, and Keywords, all of which are checked.
- Search Result:** A list of search results. The selected result is "DTM", which has an abstract describing a digital terrain model (DTM) derived from IGM level curves and interpolated from a 1:100,000 scale map.
- Operations with selected:** A button labeled "Add To Layers Tree".
- Page Information:** The search results are displayed on Page 1 of 333, showing 1 of 3327 records.
- Footer:** A status bar indicating "Records correctly loaded".

GeoPlatform Features

CSW Metadata search: *Where*



The screenshot displays the GeoPlatform Catalog Finder UI. On the left, a map shows the search area with coordinates: Max Lat: 46.08544, Min Lat: 41.63719, Min Lon: 6.538509, and Max Lon: 15.10764. The search filter is set to 'OVERLAP' and 'Activate Spatial Filter' is checked. The search results on the right show a list of metadata entries:

- test 1,3.0
- Watermark
- Copertura regioni zona WGS84-UTM32
- Modello digitale del terreno - 20 metri
- DTM** (selected)

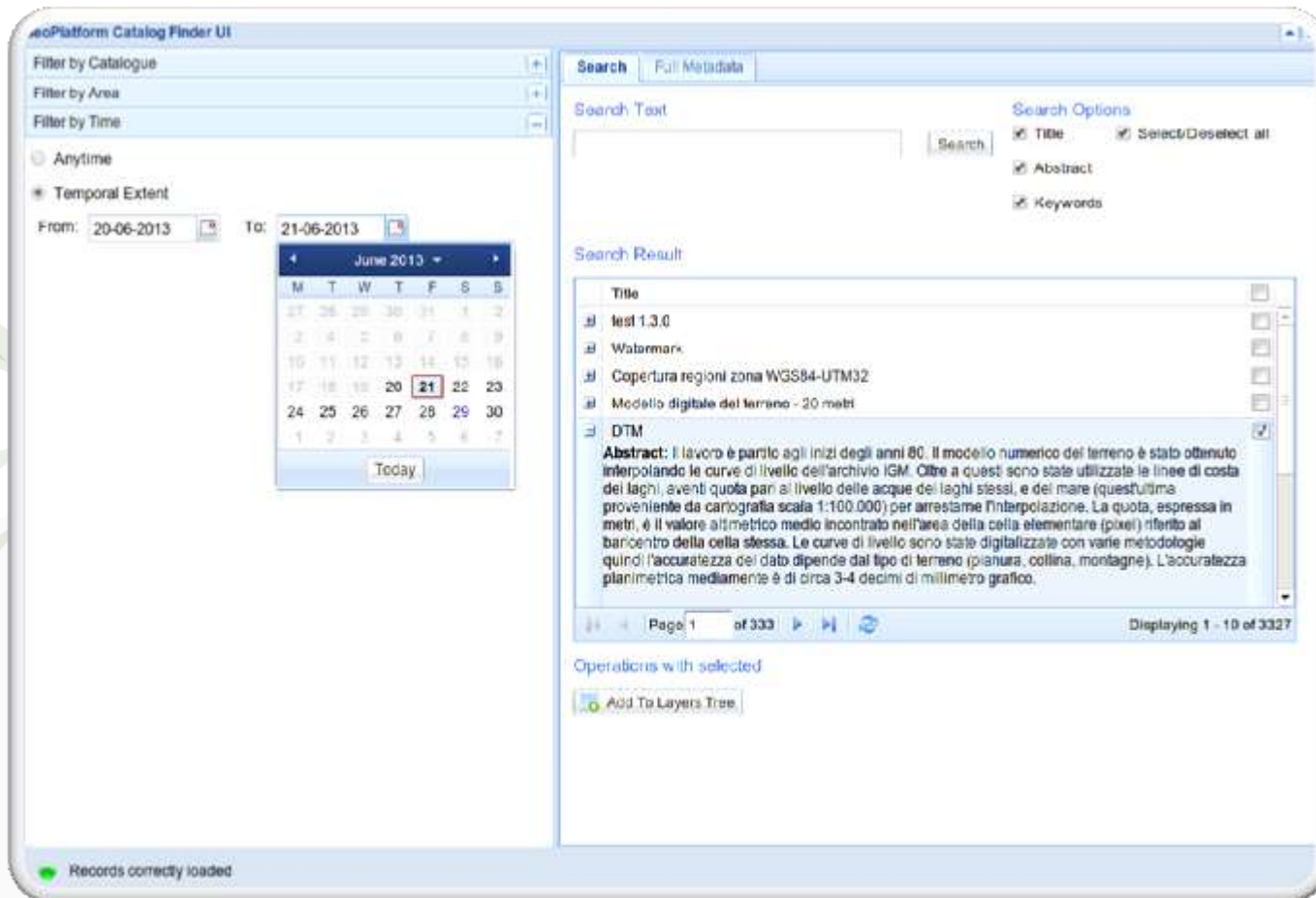
The selected entry 'DTM' has the following abstract:

Abstract: Il lavoro è partito agli inizi degli anni 80. Il modello numerico del terreno è stato ottenuto interpolando le curve di livello dell'archivio IGM. Oltre a questi sono state utilizzate le linee di costa dei laghi, aventi quota pari al livello delle acque dei laghi stessi, e del mare (quest'ultima proveniente da cartografia scala 1:100.000) per arrestare l'interpolazione. La quota, espressa in metri, è il valore altimetrico medio incontrato nell'area della cella elementare (pixel) riferito al baricentro della cella stessa. Le curve di livello sono state digitalizzate con varie metodologie quindi l'accuratezza del dato dipende dal tipo di terreno (planura, collina, montagne). L'accuratezza planimetrica mediamente è di circa 3-4 decimi di millimetro grafico.

Page 1 of 333. Displaying 1 - 10 of 3327.

GeoPlatform Features

CSW Metadata search: *When*



The screenshot displays the 'GeoPlatform Catalog Finder UI' interface. On the left, there are filter options: 'Filter by Catalogue', 'Filter by Area', and 'Filter by Time'. Under 'Filter by Time', 'Anytime' is selected, and 'Temporal Extent' is expanded to show a date range from '20-06-2013' to '21-06-2013'. A calendar for June 2013 is visible, with the 21st highlighted. The main search area has tabs for 'Search' and 'Full Metadata'. The 'Search Text' field is empty, and the 'Search' button is present. 'Search Options' include checkboxes for 'Title', 'Abstract', and 'Keywords', all of which are checked. Below the search options, the 'Search Result' section shows a list of metadata items:

- list 1.3.0
- Watermark
- Copertura regioni zona WGS84-UTM32
- Modello digitale del terreno - 20 metri
- DTM (selected)

The selected 'DTM' item has an abstract: **Abstract:** Il lavoro è partito agli inizi degli anni 80. Il modello numerico del terreno è stato ottenuto interpolando le curve di livello dell'archivio IGM. Oltre a questi sono state utilizzate le linee di costa dei laghi, aventi quota pari al livello delle acque dei laghi stessi, e del mare (quest'ultima proveniente da cartografia scala 1:100.000) per arrestarne l'interpolazione. La quota, espressa in metri, è il valore altimetrico medio incontrato nell'area della cella elementare (pixel) riferito al baricentro della cella stessa. Le curve di livello sono state digitalizzate con varie metodologie quindi l'accuratezza del dato dipende dal tipo di terreno (pianura, collina, montagne). L'accuratezza planimetrica mediamente è di circa 3-4 decimi di millimetro grafico.

At the bottom of the search results, there is a pagination control showing 'Page 1 of 333' and 'Displaying 1 - 10 of 3327'. Below this, there is a section for 'Operations with selected' containing an 'Add To Layers Tree' button. At the very bottom of the interface, a status bar indicates 'Records correctly loaded'.

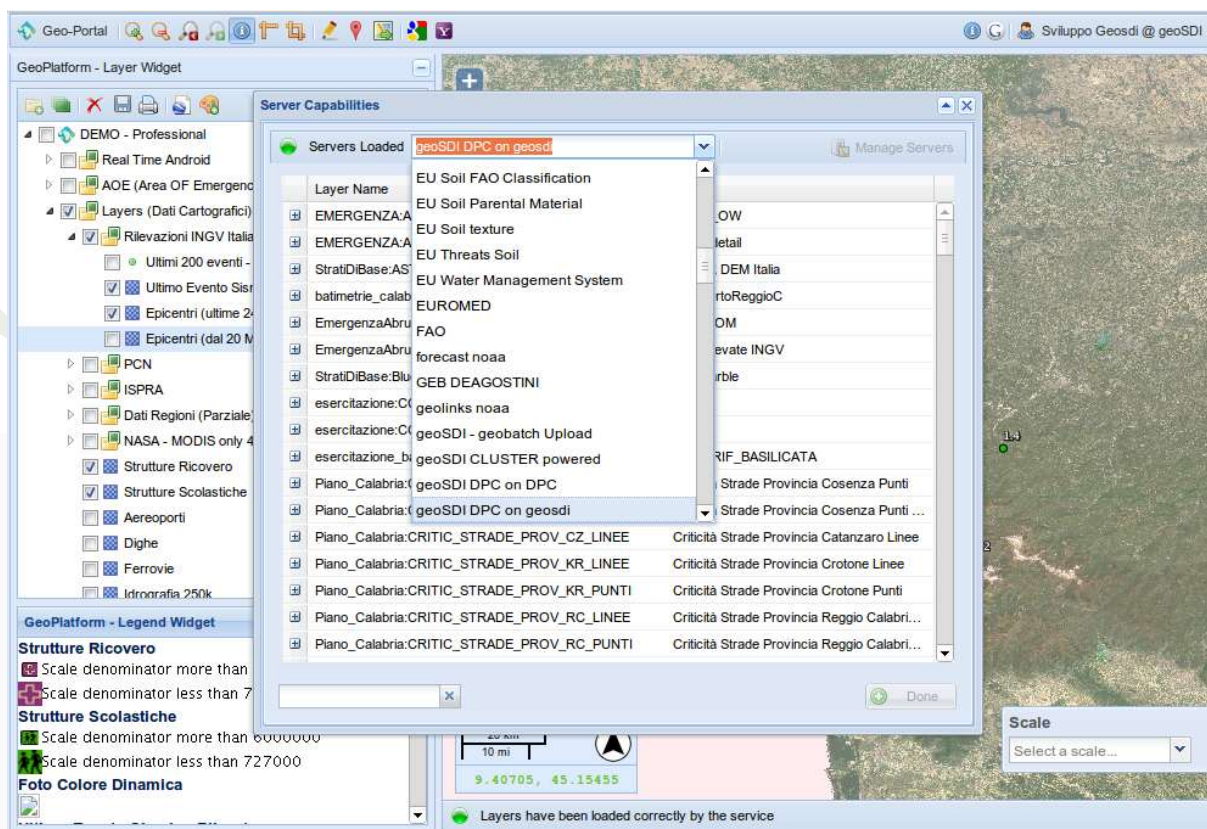


People, DaaS and SaaS joint into web Community

From a Best Practice to the Community

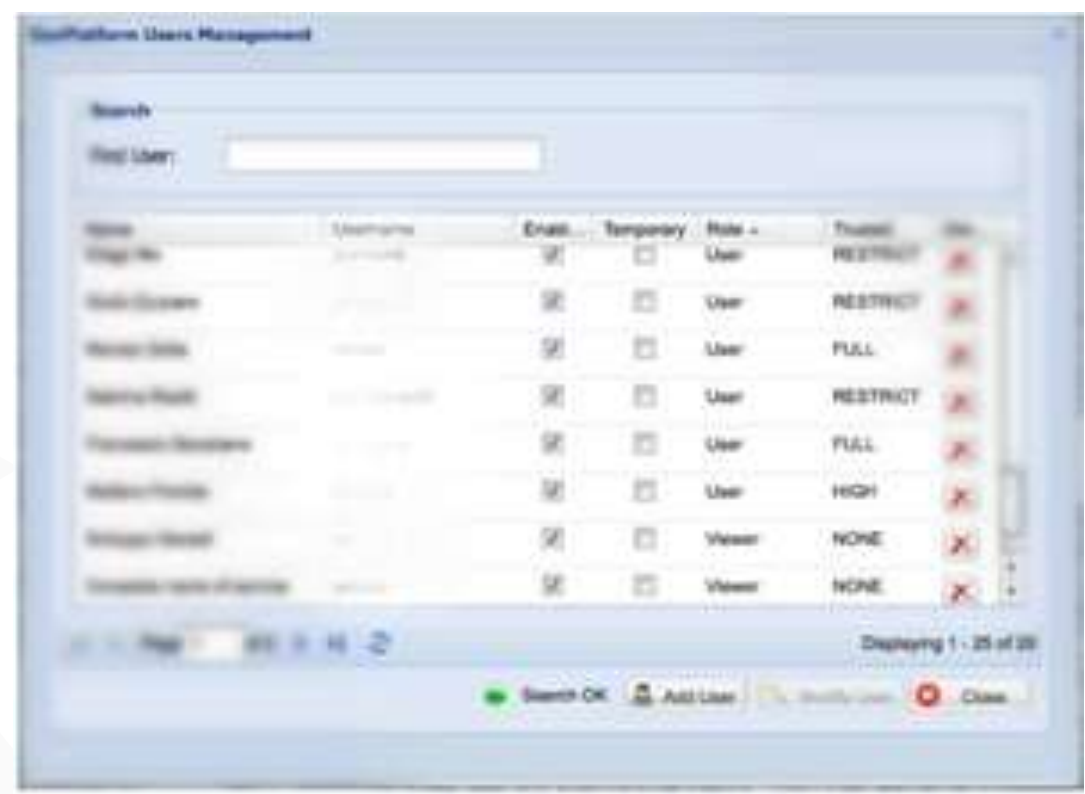
INSPIRE Community

Multi Server Manager



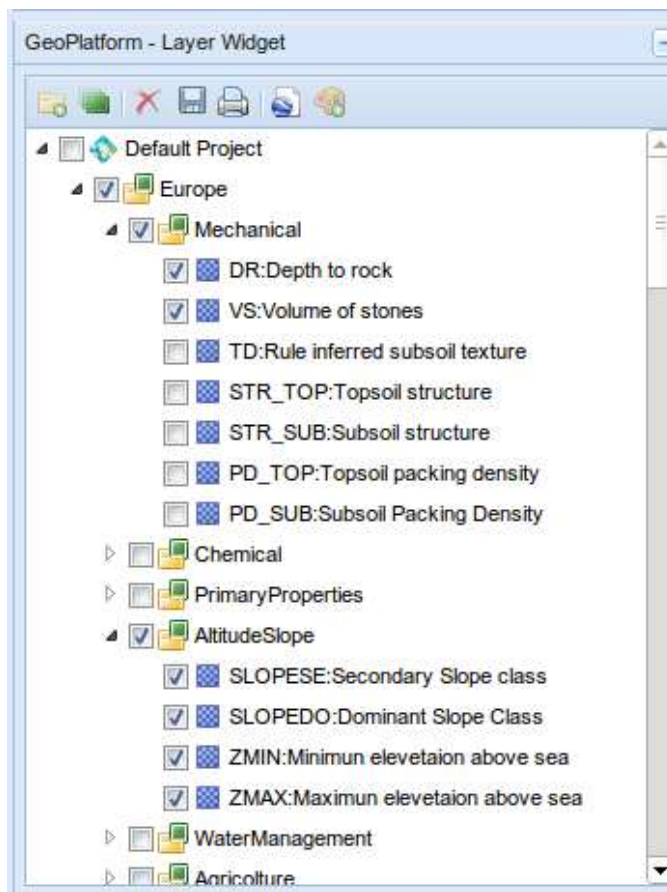
INSPIRE Community

Multilevel User Manager



INSPIRE Community

Harvesting Features



Authors

- Dimitri Dello Buono, Francesco Izzi, Lorenzo Amato, Giuseppe La Scaleia, Donato Maio (CNR - Institute of Environmental Analysis)
- Pablo Recalde (WFP-World Food Program)
- Pierluigi Soddu (Dept. Of Civil Protection - PPRD South Executive Director)
- Luciano Cavarra (Prime Minister's Office - Civil Protection Dept.)
- Fausto Guzzetti, Ivan Marchesini (CNR – Research Institute for Hydrogeological Prevention)
- Adele Manzella (CNR – Institute of Geosciences and Earth Resources)
- Mario Bruno (Campania Region)
- Salvatore Mazzeo (Calabria Region)
- Renzo Carlucci (GEOmedia)

Let's have a Look....

... on a live demo

<http://test.geosdi.org>



SIGN UP Blog

Geo-Platform - Layer Widget

Geo-Platform Tree

- Layers (WMS Data)
- Rilevazioni INGV Italia (Real Time 5 min)
- Ultimo Evento Sismico Rilevati
- Epicentri (ultimo 24h)
- Rilevazioni
- COL Filter
- Apply/Modify Filter
- Remove Filter

Zoom to layer extent

Export

COL Filter

Apply/Modify Filter

Remove Filter

Create your Dynamic Maps!

Sign Up for Free!

geoSDI Online WebGIS

A geoSDI geoPortal for Test.

This is an Online WebGIS Application based on Geo-Platform Framework by geoSDI, published for testing purpose only.

This Testing Application includes most of the existing Geo-Platform widgets. You can start with the demo demo account to enjoy the basic features and work with a sample map project.

ITALY DATA Example

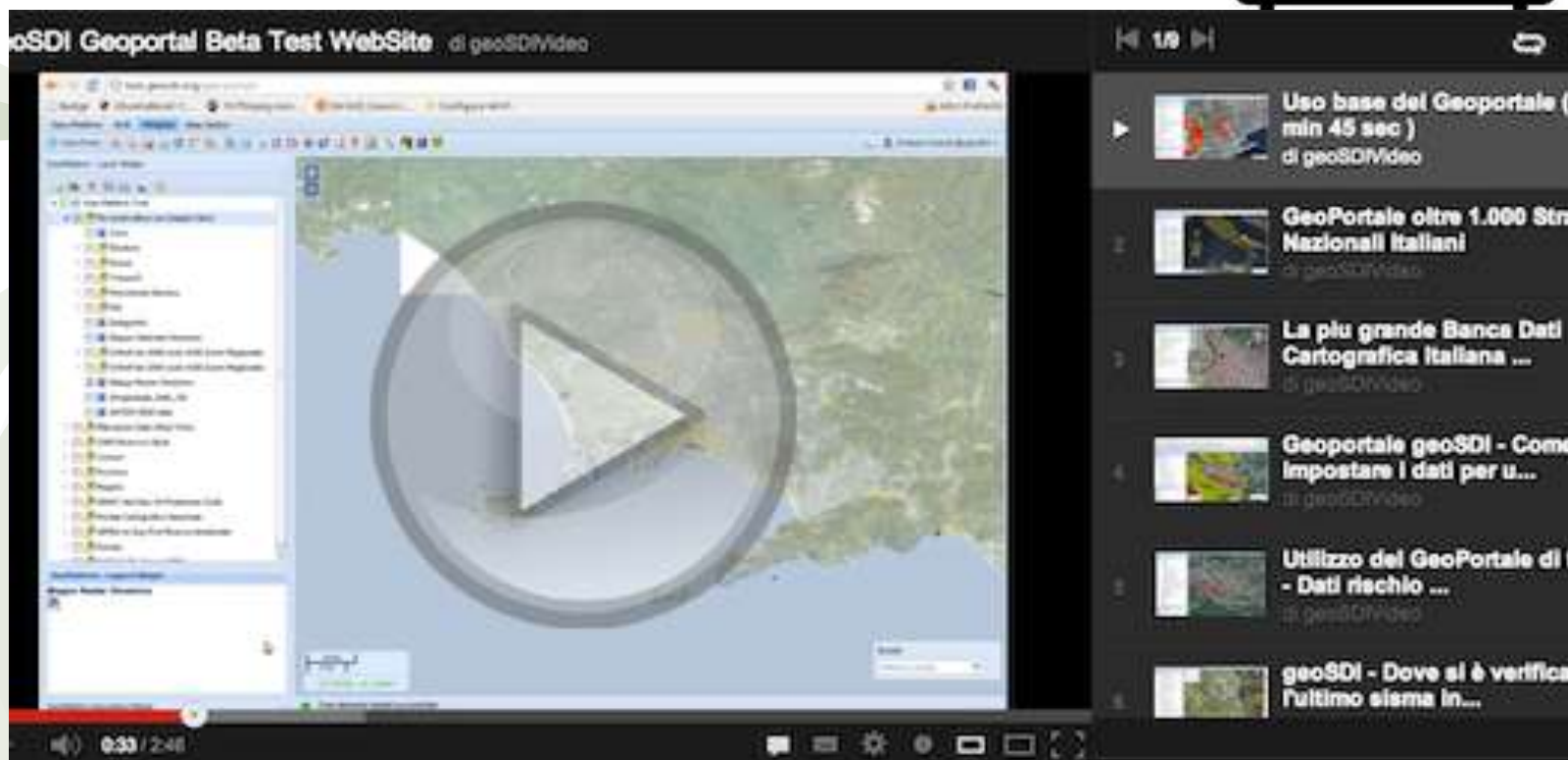
Let's have a Look....

... on youtube channel



geoSDI Video on YouTube.

Demos and Tutorials



Open Dialog ...



Q & A

You have

Questions

We have

Answers

Thank You



geoSDI Team

Web

www.geosdi.org

Mail

sviluppo@geosdi.org

Address

IMAA CNR, C.da S.Loja, Tito Scalo (PZ) Italy



Aprendix C: i2Sim slides

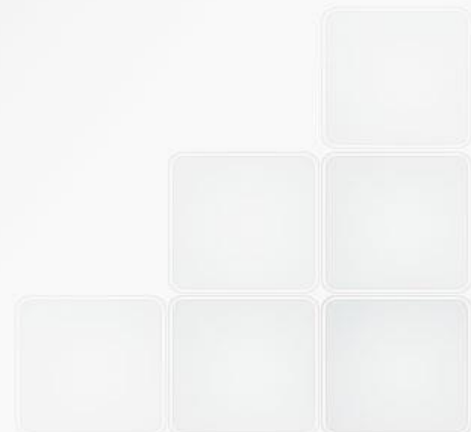
The logo for ENEA, featuring the word "ENEA" in a bold, white, sans-serif font. The letters are set against a dark blue background with a glowing, sun-like effect behind the 'E' and 'N'.

AGENZIA NAZIONALE
PER LE NUOVE TECNOLOGIE, L'ENERGIA
E LO SVILUPPO ECONOMICO SOSTENIBILE

CIPRNet Training Session

I2Sim in the loop

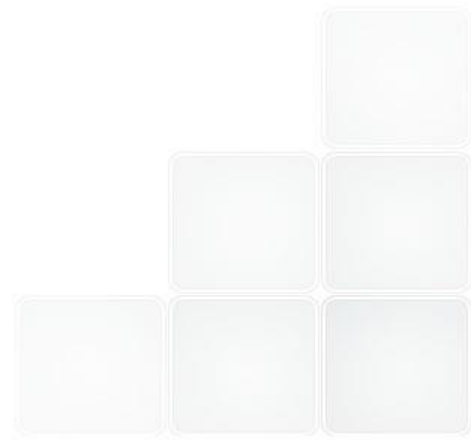
Rome, Italy
November 13rd 2015



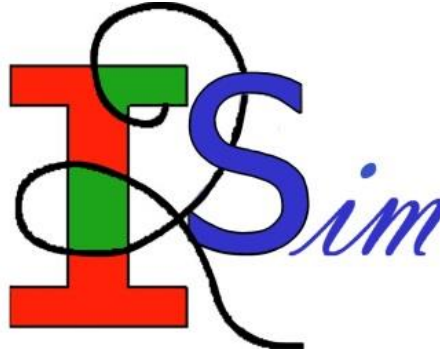
Outline



- I2Sim example usage
- I2Sim main components
- An application of I2Sim within the EU FP7 CIPRNet project



I2Sim: general concepts



- **I2Sim** (Interdependencies Infrastructure Simulator) [1-2] is an Agent based simulator developed with Matlab/Simulink (Python+Java version under testing)
- It models functional dependences among infrastructures based on resource requirements and distribution.
- Developed by the University of British Columbia (UBC), Canada

[1] H. Rahman, M. Armstrong, D. Mao and J. Marti, "I2Sim: A matrix-partition based framework for critical infrastructure interdependencies simulation," in Electric Power Conference (EPEC), Vancouver, 2008.

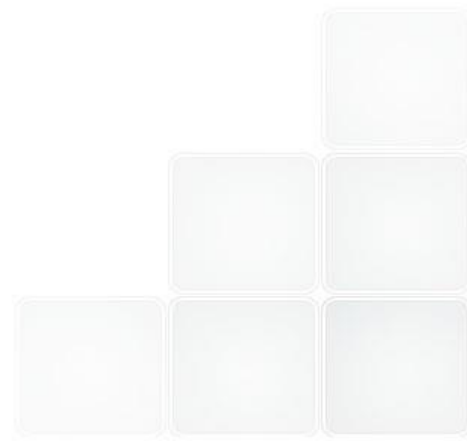
[2] J. Marti, C. Ventura, J. Hollman, K. Srivastava and H. Juarez. **I2Sim modeling and simulation framework for scenario development, training and real-time decision support of multiple interdependent critical infrastructures during large emergencies**, NATO RTO Modeling and Simulation Group Conference, 2008.

- Simulate the Emergent Behaviour of a System of interconnected infrastructures

It is difficult to predict the behaviour that arise from the interconnection of different systems rather than of individual sub-systems

- In Emergency times it is useful to understand the impact of decisions.

Particularly when it comes to resource distribution



Core components of I2Sim

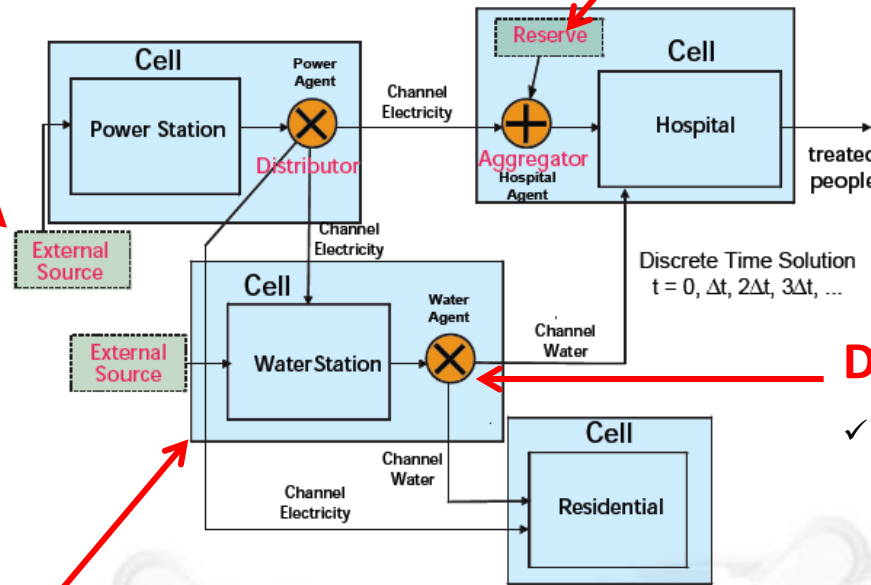
Tokens

- ✓ Critical Resources in the system that are required for functioning of the system (e.g. electrical power, water)
- ✓ Can be continuous or discrete.

Storage Cell

- ✓ A buffer cell that can store and release tokens at a specified rate (e.g. a battery)

I2Sim model



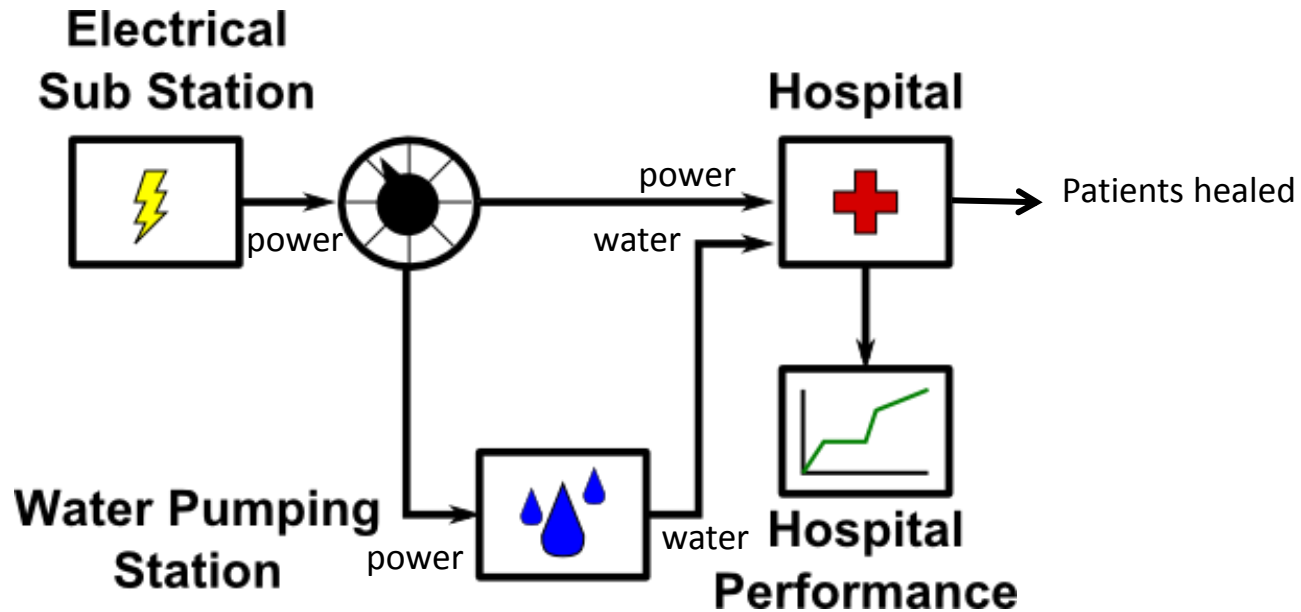
Distributor

- ✓ A control point which determines how the output of a Production cell is split amongst its consumers at a specified rate

Production Cell

- ✓ Represents the Physical service facilities of the system
- ✓ Myriad input token types transmuted to a single output token type
- ✓ I/O relationships defined by "Human Readable Tables" (HRTs) which relate a given level of output to the minimum inputs required to produce it
- ✓ Multiple HRTs available depending on "Physical Mode" of system

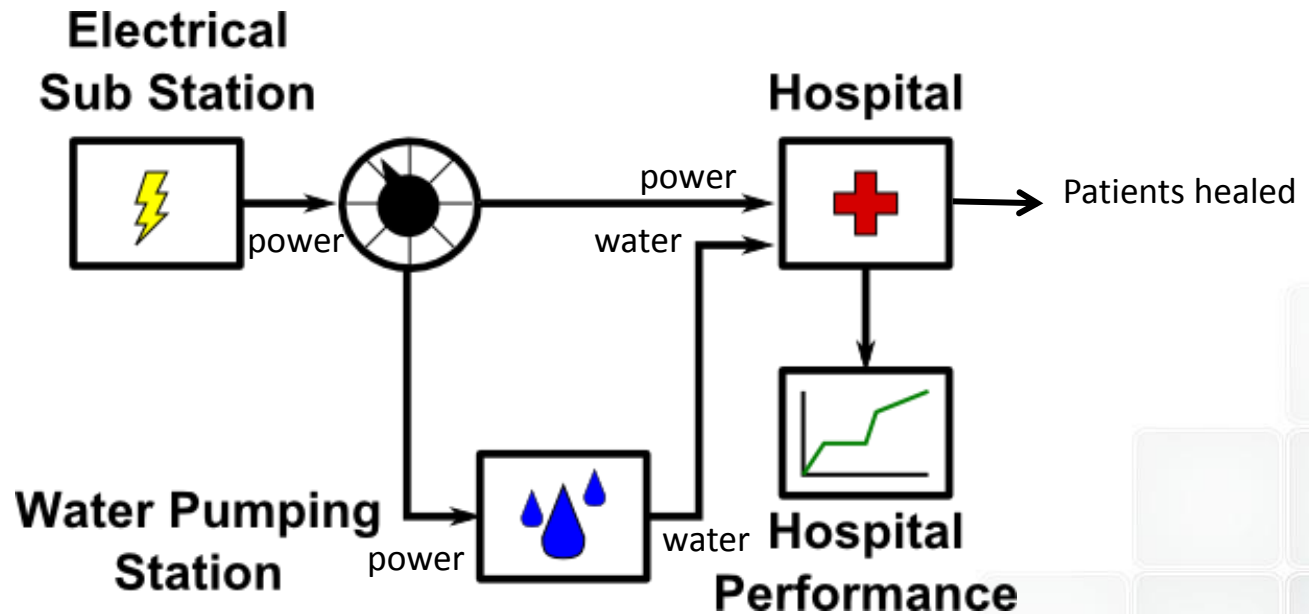
Example Usage



Goal to maintain the hospital performance using available resources during a disaster

Earthquake Scenario (1)

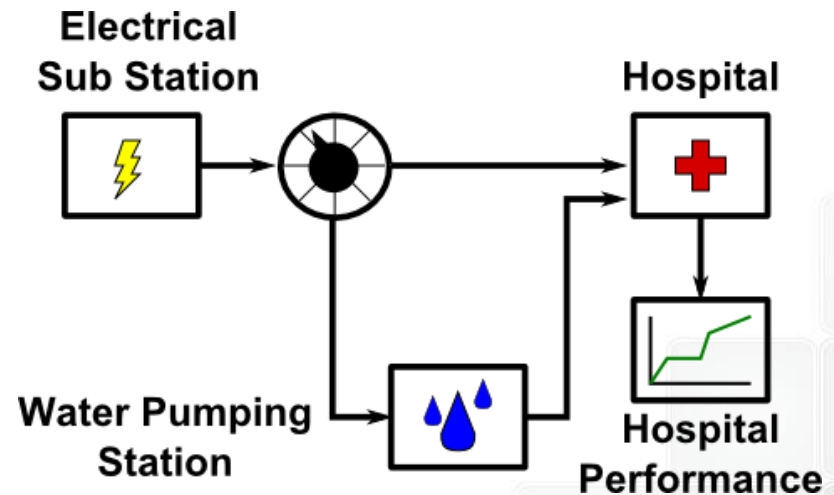
Time	Description
T - 1	Pre-Disaster
E -1	Earthquake happens reducing electricity available
T - 2	Decision process on how to allocate electricity
E -2	Result of electricity allocation takes effect



Earthquake Scenario (2)

Time	Description
T - 1	Pre-Disaster
E -1	Earthquake happens reducing electricity available
T - 2	Decision process on how to allocate electricity
E -2	Result of electricity allocation takes effect

All systems fully functional

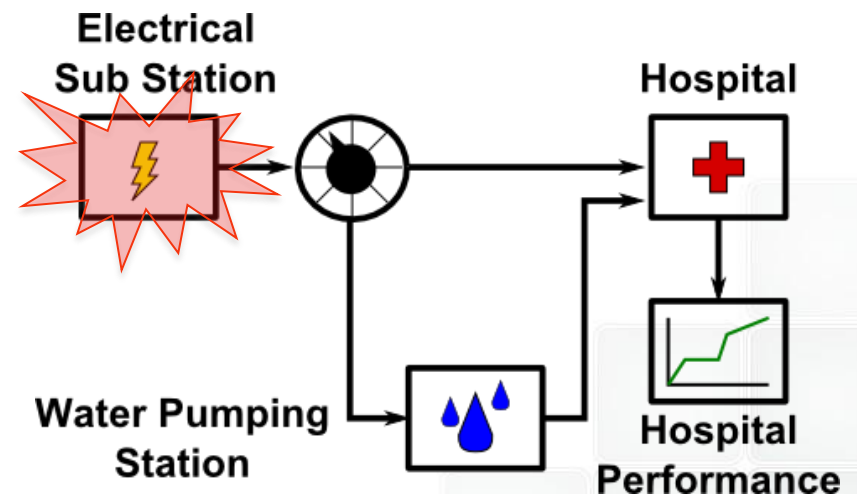


Earthquake Scenario (3)

Time	Description
T - 1	Pre-Disaster
E -1	Earthquake happens reducing electricity available
T - 2	Decision process on how to allocate electricity
E -2	Result of electricity allocation takes effect

Power System is severely damaged

Water Station and Hospital are still fully operational



Earthquake Scenario (4)

Time	Description
T - 1	Pre-Disaster
E -1	Earthquake happens reducing electricity available
T - 2	Decision process on how to allocate electricity
E -2	Result of electricity allocation takes effect

Electric Utility:

“We suffered lots of damage”

“We can only provide limited power”

Water Station

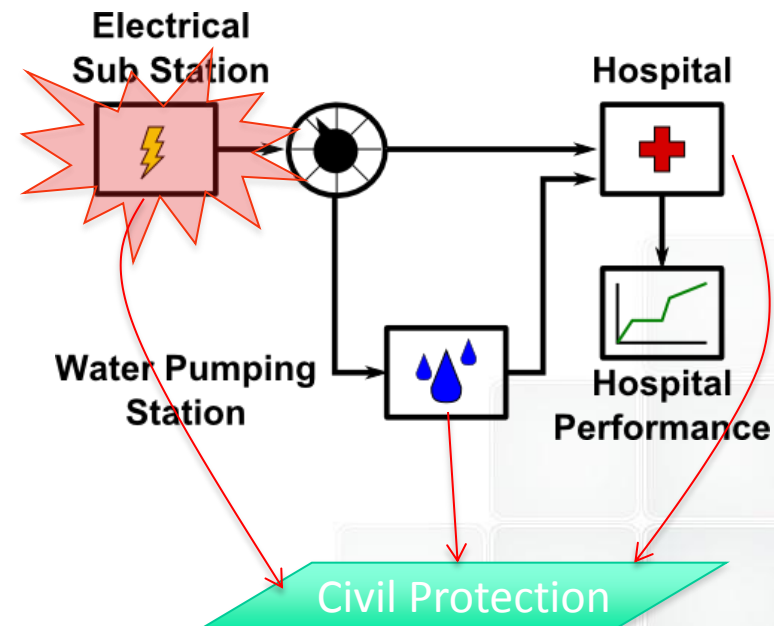
“No structural damage”

“We cannot operate due to lack of power”

Hospital

“No structural damage”

“We cannot operate due to lack of power”



Earthquake Scenario (5)

Time	Description
T - 1	Pre-Disaster
E -1	Earthquake happens reducing electricity available
T - 2	Decision process on how to allocate electricity
E -2	Result of electricity allocation takes effect

Group of experts (Civil protection and Electric Utility) decide on the electricity allocation policy

(e.g. prioritize the hospital vs. the water station?)

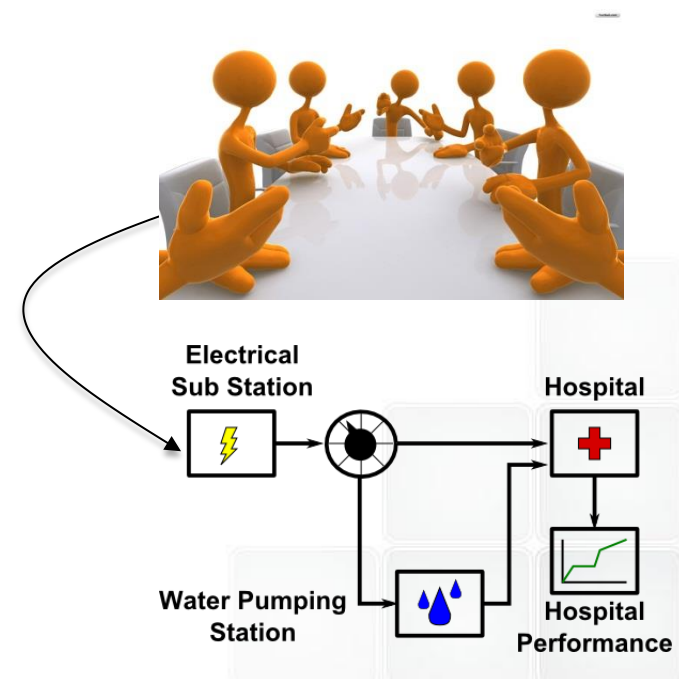
Decision making process:

Time Consuming

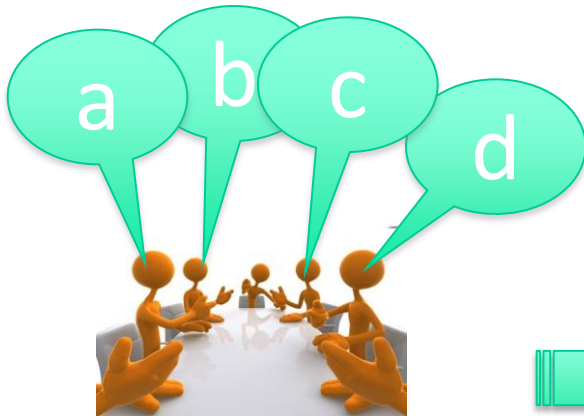
- ✓ Sequential Evaluation of allocation from Civil protection and Utility

No way to rank suggested decisions

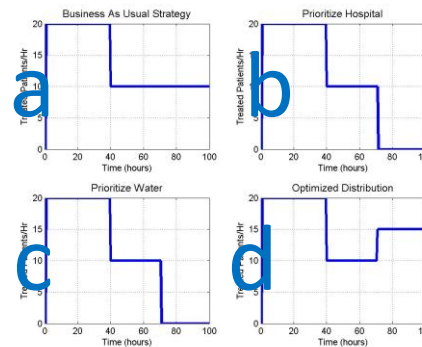
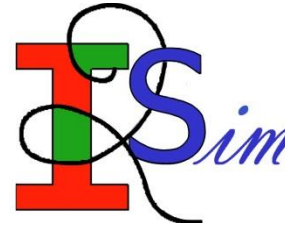
- ✓ Based purely on experience



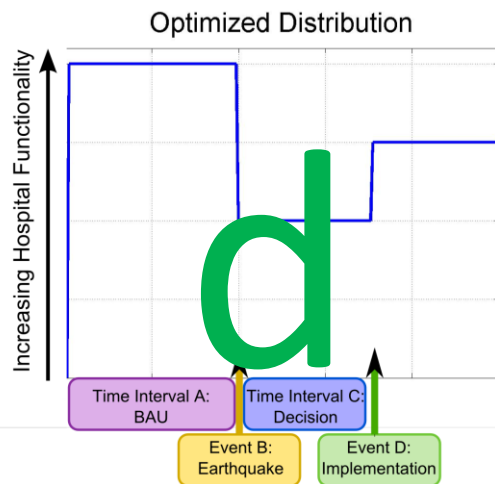
Decision Evaluation using Simulation



Analyse each
candidate policy



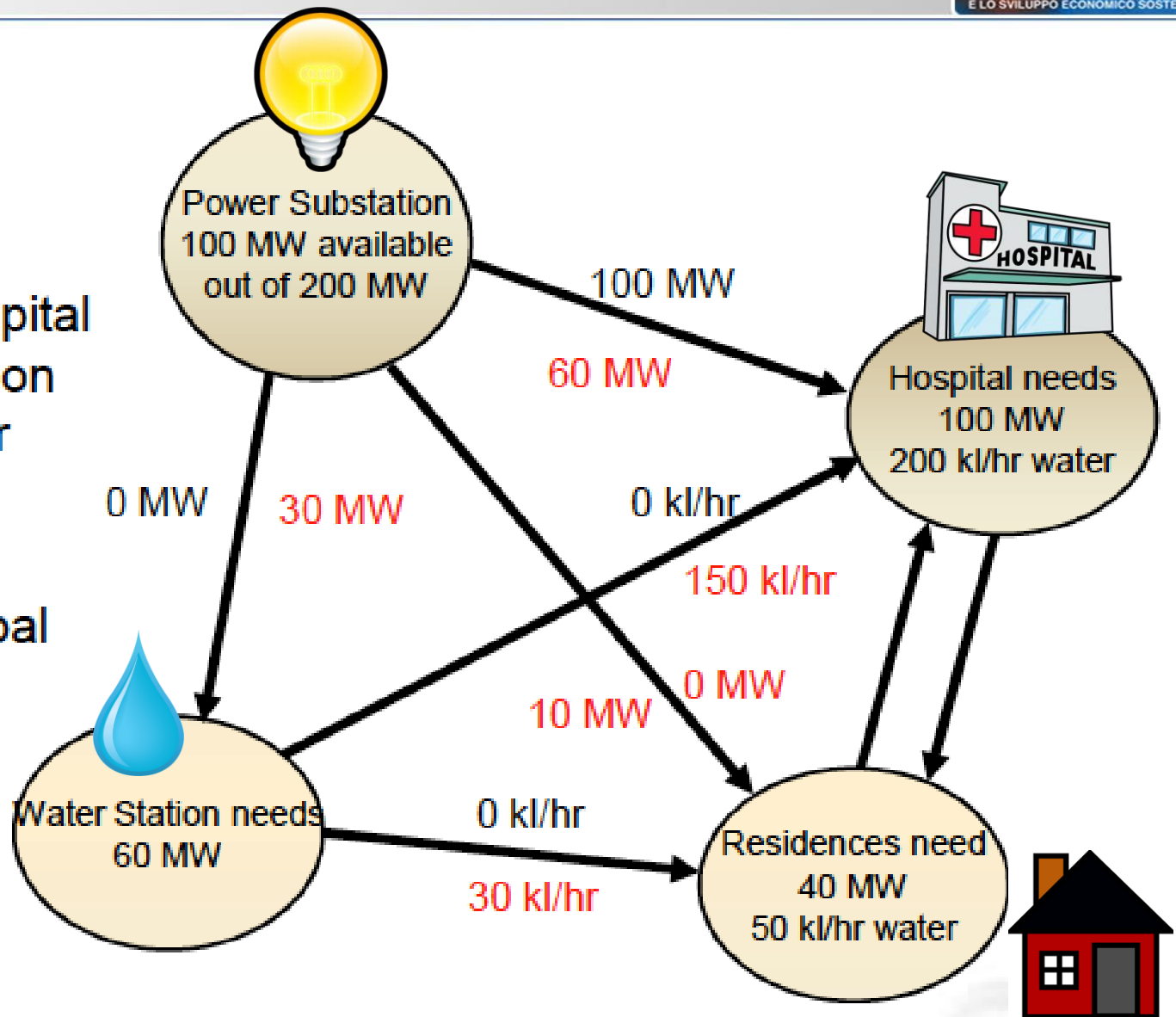
Policy ranking
using I2Sim
decision support
simulator



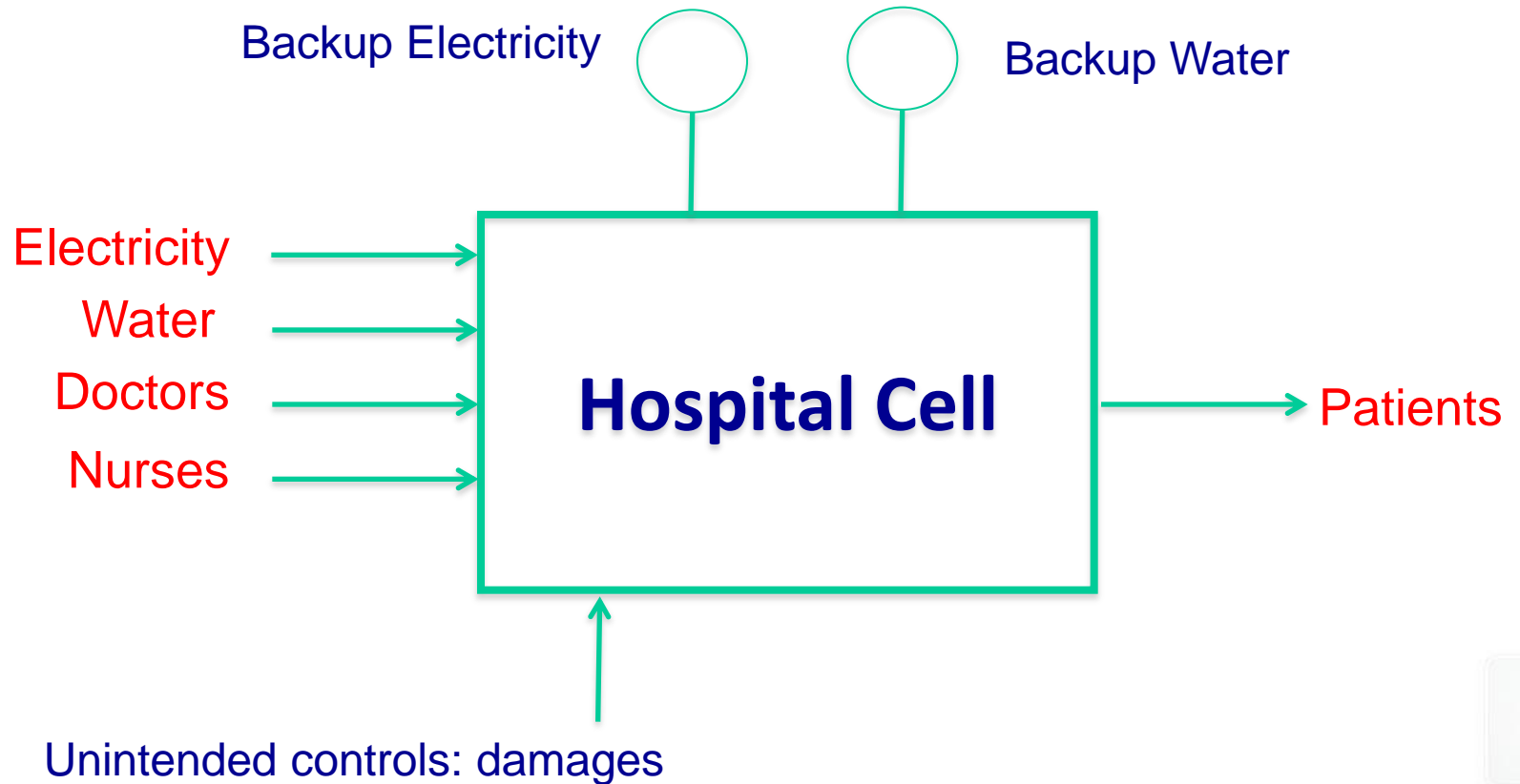
Policy with the best
predicted outcome is
implemented, i.e. best
hospital operation

Possible electricity allocation policies

- **Black bad** decision because hospital cannot function without water
- **Red good** decision to optimize global objective



Production cell



RELATIONS AMONG THE INPUT AND OUTPUT RESOURCES BASED ON
NON LINEAR FUNCTIONS

Human Readable Table (HRT)

- Each **production cell** is associated a table called **Human Readable Table (HRT)** defined by an expert of the system.
- The HRT relates the output token of a production cell to the its input tokens.

Output token Input tokens Functioning level

$y(t)$	$x_1(t)$	$x_2(t)$	$x_3(t)$	$x_4(t)$	$m_1(t)$
Patients per hours	Electricity (KW)	Water (KL/h)	Doctors	Nurses	Physical integrity
20	100	1,000	4	8	100%
15	50	500	3	6	80%
10	30	300	2	4	50%
7	20	200	2	3	20%
0	0	0	0	0	0%

Nominal value →

A possible HRT for a Hospital

Human Readable Table (HRT)

- Each **production cell** is associated a table called **Human Readable Table (HRT)** defined by an expert of the system.
- The HRT relates the output token of a production cell to the its input tokens.

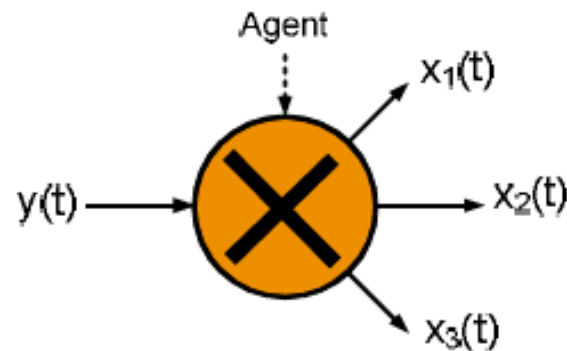
Output token Input tokens Functioning level

$y(t)$	$x_1(t)$	$x_2(t)$	$x_3(t)$	$x_4(t)$	$m_1(t)$
Patients per hours	Electricity (KW)	Water (KL/h)	Doctors	Nurses	Physical integrity
20	100	1,000	4	8	100%
15	50	500	3	6	80%
10	30	300	2	4	50%
7	20	200	2	3	20%
0	0	0	0	0	0%

Lower bound considered →

A possible HRT for a Hospital

- The **distributor** component can be controlled by an intelligent agent to maximize a global objective (e.g. hospital or water station)



Ratio decided by Agent

Input	Output		
$y(t)$	$x_1(t)$	$x_2(t)$	$x_3(t)$
A	1/3	1/3	1/3
A	2/3	1/6	1/6
A	1/2	1/2	0
...
A	1	0	0

A possible distribution policy for a power station

Appendix D: Consequence Analysis slides

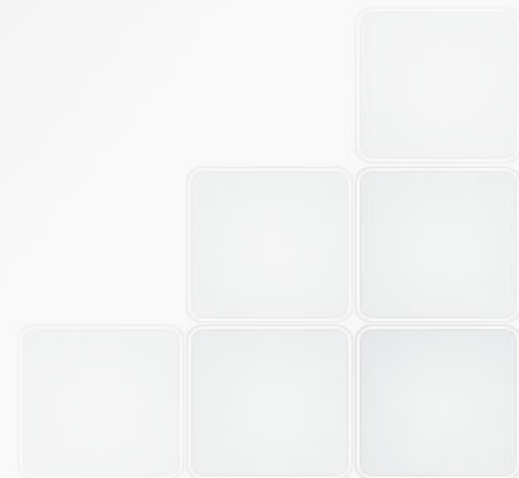


CIPRNet Master Class 2

Rome, 12 November 2015

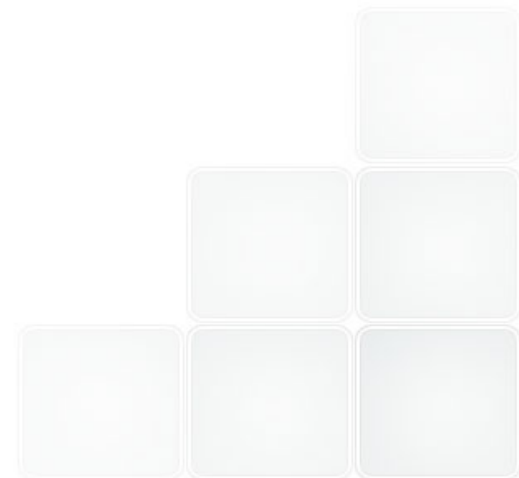
V. Rosato, L. Lavallo, A. Tofani, M. Pollino, A. Di Pietro

Consequence Analysis and applications for supporting operator's decisions



- SAWI indexes
 - ✓ Improved definition
 - ✓ Data sources
 - ✓ Case Study
 - ✓ Conclusions

- CA SW interface



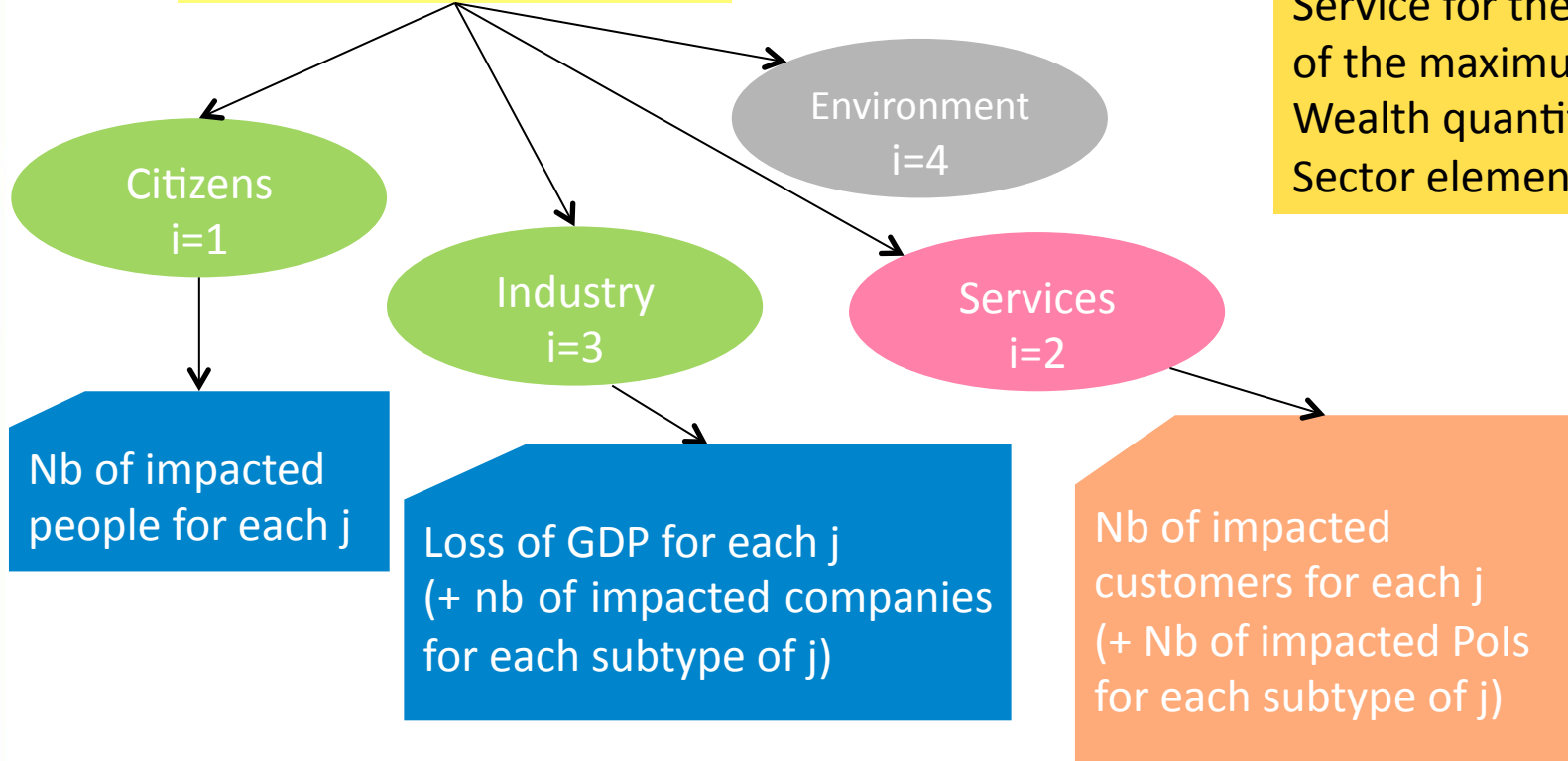
(basic!) SAWI indices

$$C_j^i = M_{ij} \left[1 - \sum_{k=1}^{S_k} r_k \int_0^T Q_k(t) dt \right]$$

↑ Infrastructures

M is the metric for Wealth measure for the specific Sector element t_{ij}

r_k is the relevance of the k-th Service for the achievement of the maximum level of the Wealth quantity M in a given Sector element t_{ij}



SAWI indices key features

- $C_{j \uparrow i} = 0$ if $Q_k(t) = 1$ (no Consequence if no loss of services)
- $C_{j \uparrow i} = M_{ij} \cdot T$ if $Q_k(t) = 0$ for each k (all citizens fully affected if all the Infrastructures are out of service + the longer the disruption the higher the number)
- we accept $\sum_{k=1}^n S_{jk} \cdot r_{jk} \leq 1$ as some components may be moderately dependent on some services (for example, children)
- we impose $\sum_{k=1}^n S_{jk} \cdot r_{jk} = 1$ whenever $\sum_{k=1}^n S_{jk} \cdot r_{jk} > 1$ (for example, schools get closed as soon as just water is not available)
- Normalization will give a better clue of the severity of the event

SAWI indexes (new) definition

$$C^i = \frac{\sum_{j=1}^{L_j} \left(M_{ij} \sum_{k=1}^{S_k} r_k^j \left(T - \int_0^T Q_k(t) dt \right) \right)}{T \sum_{j=1}^{L_j} \left(M_{ij} \sum_{k=1}^{S_k} r_k^j \right)}$$



In principle, considering the **relevance** of a service **not time-dependent** may lead to **macroscopic errors** in the consequence evaluation. For example, consequence on most shops are very limited if a power blackout occurs during the night.

Also, r_k is **(heavily) dependent on the duration** of the loss of service (for example, the consequence on the food in the refrigerator is very limited if power interruption duration is less than one hour and quite severe if it is more than 4 hours).

Data sources & output properties

Statistical data

EU-wide
Availability &
scalability

Consolidated
methodology

Time
independent

Large samples

VS

Measurement campaign

Time
dependent

Small samples

Bigger effort

Different
methodologies

Citizens criterion

Territorio	Centro												
Tipo dato	spesa media mensile familiare												
Misura	valori medi												
Numero di componenti	totale												
Condizione professionale	totale												
Anno	2013												
Tipologia familiare	persona sola con 35-64 anni	persona sola con meno di 35 anni	persona sola con 65 anni o più	coppia senza figli con p.r. con 35-64 anni	coppia senza figli con p.r. con meno di 35 anni	coppia senza figli con p.r. con 65 anni o più	coppia con 1 figlio	coppia con 2 figli	coppia con 3 e più figli	monogenitore	altro	totale	
	Gruppo di spesa												
totale	2041,88	1954,77	1690,06	2529,44	2770,55	2330,76	2765,47	3183,61	3182,28	2531,7	2742,69	2436,12	
alimentari e bevande	347,67	333,88	344,13	484,97	361,34	515,86	544,16	608,27	668,5	492,78	598,91	477,25	
non alimentari	1694,21	1620,9	1345,93	2044,46	2409,2	1814,9	2221,31	2575,35	2513,78	2038,92	2143,79	1958,87	
tabacchi	22,27	17,98	7,78	23,89	..	10,45	23,06	27,8	21,07	20,74	27,72	19,72	
abbigliamento e calzature	89,32	93,45	36,3	115,87	175,64	86,37	136,67	184,43	184,36	122,66	114,26	110,22	
abitazione (principale e secondaria)	695,01	595,77	699,79	812,68	633,41	788,1	800,77	803,81	746,1	804,03	787,83	757,76	
affitto	110,6	103,38	42,74	79,18	..	16,55	76,33	61,17	..	52,74	128,3	70,9	
fitto figurativo	490,74	420,77	563,31	586,86	425,1	659,05	605,74	629,91	526,39	562,7	536,11	572,35	
acqua e condominio	52,28	46,6	58,38	51,82	51,72	59,14	51,62	55,43	66,31	53,03	48,96	54,42	
manutenzione ordinaria	11,49	..	5,77	..	..	12,66	14,05	17,25	..	15,36	24,36	12,81
manutenzione straordinaria	24,57	..	25,62	..	..	29,88	44,84	30,47	..	..	..	40,15
combustibili ed energia	92,65	87,72	103,93	125,69	122,68	149,6	151,21	163,94	166,69	140,25	168,25	132,85	
energia elettrica	35,44	30,55	33,55	47,2	47,18	47,47	53,29	62,62	75,71	48,45	59,19	47,32	
gas	45,03	43,78	57,43	63,53	71,86	81,27	79,27	82,28	87,88	71,29	88,72	69,09	
riscaldamento centralizzato	6,15	..	6,4	..	..	9,52	5,79	7,44	..	8,15	6,74	6,83
mobili, elettrod. e servizi per la casa	78,24	87,26	119,37	81,36	95,75	93,66	109,75	146,05	149,71	89,04	122,38	107,45	

Citizens criterion

Territorio	Centro											
Tipo dato	spesa media mensile familiare											
Misura	valori medi											
Numero di componenti	totale											
Condizione professionale	totale											
Anno	2013											
Tipologia familiare	persona sola con 35-64 anni	persona sola con meno di 35 anni	persona sola con 65 anni o più	coppia senza figli con p.r. con 35-64 anni	coppia senza figli con p.r. con meno di 35 anni	coppia senza figli con p.r. con 65 anni o più	coppia con 1 figlio	coppia con 2 figli	coppia con 3 e più figli	monogenitore	altro	totale
Gruppo di spesa												
totale	2041,88	1954,77	1690,06	2529,44	2770,55	2330,76	2765,47	3183,61	3182,28	2531,7	2742,69	2436,12
alimentari e bevande	347,67	333,88	344,13	484,97	361,34	515,86	544,16	608,27	668,5	492,78	598,91	477,25
non alimentari	1694,21	1620,9	1345,93	2044,46	2409,2	1814,9	2221,31	2575,35	2513,78	2038,92	2143,79	1958,87
tabacchi	22,27	17,98	7,78	23,89	...	10,45	23,06	27,8	21,07	20,74	27,72	19,72
abbigliamento e calzature	89,32	93,45	36,3	115,87	175,64	86,37	136,67	184,43	184,36	122,66	114,26	110,22
abitazione (principale e secondaria)	695,01	595,77	699,79	812,68	633,41	788,1	800,77	803,81	746,1	804,03	787,83	757,76
affitto	110,6	103,38	42,74	79,18	...	16,55	76,33	61,17	...	52,74	128,3	70,9
fitto figurativo	490,74	420,77	563,31	586,86	425,1	659,05	605,74	629,91	526,39	562,7	536,11	572,35
acqua e condominio	52,28	46,6	58,38	51,82	51,72	59,14	51,62	55,43	66,31	53,03	48,96	54,42
manutenzione ordinaria	11,49	...	5,77	...	...	12,66	14,05	17,25	...	15,36	24,36	12,81
manutenzione straordinaria	24,57	...	25,62	...	...	29,88	44,84	30,47	...	...	...	40,15
combustibili ed energia	92,65	87,72	103,93	125,69	122,88	149,6	151,21	163,94	166,69	140,25	168,25	132,85
energia elettrica	35,44	30,55	33,55	47,2	47,18	47,47	53,29	62,62	75,71	48,45	59,19	47,32
gas	45,03	43,78	57,43	...	71,86	81,27	79,27	82,28	87,88	71,29	88,72	69,09
riscaldamento centralizzato	6,15	...	6,4	...	...	9,52	5,79	7,44	...	8,15	6,74	6,83
mobili, elettrod. e servizi per la casa	78,24	87,26	119,37	...	95,75	93,66	109,75	146,05	149,71	89,04	122,38	107,45

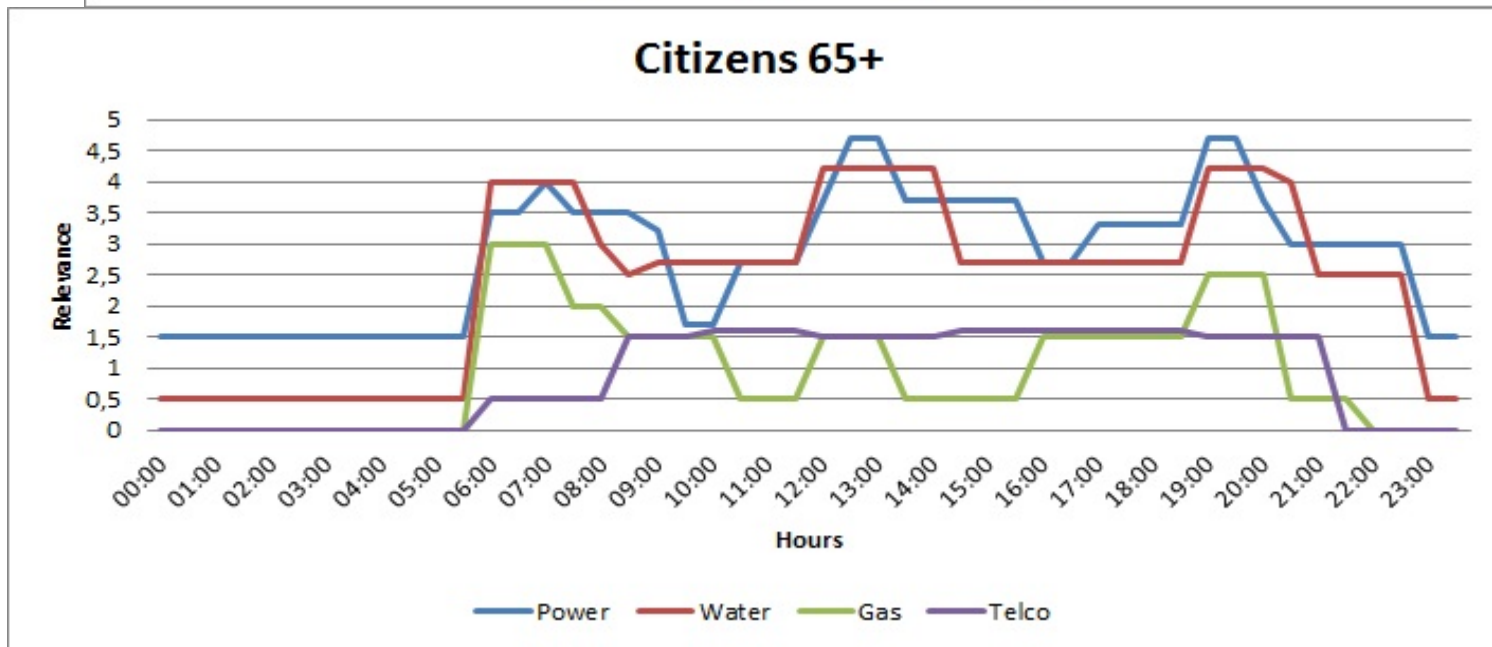
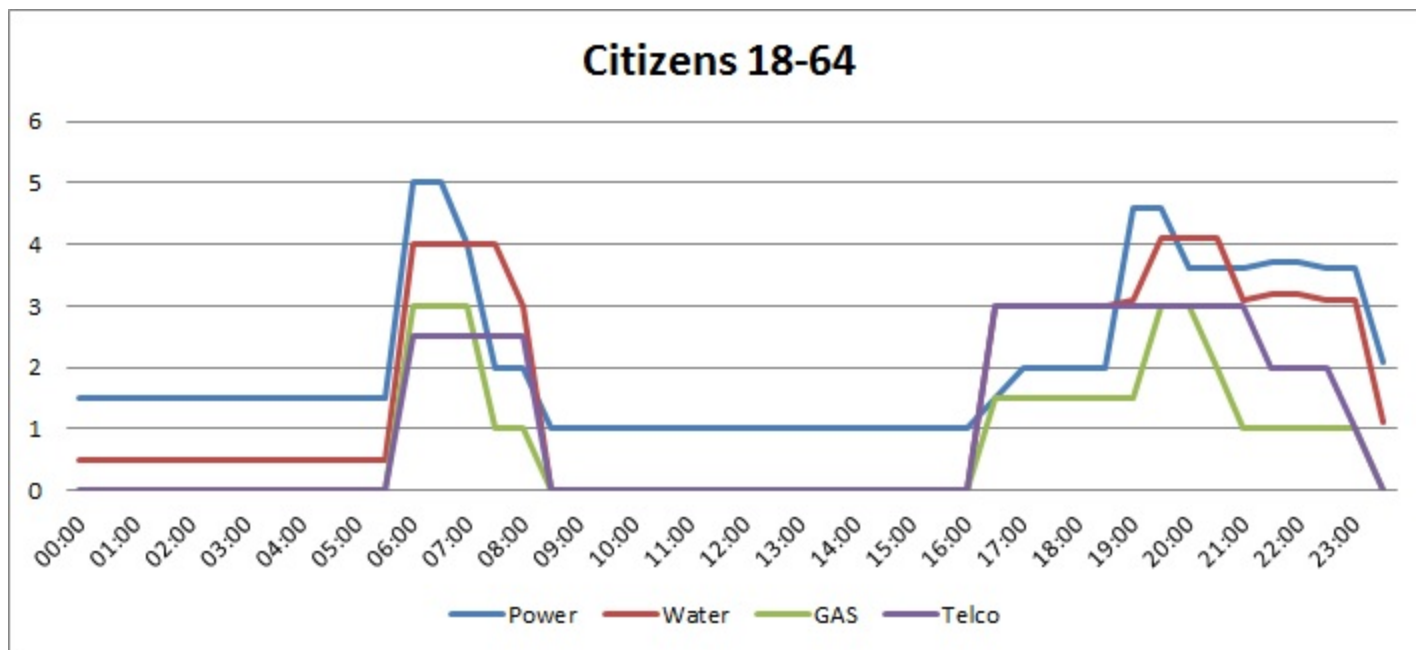


Pop. 65+ = R1 (t11) = 1
 Pop. (0-5) = R1 (t12) = 0.32
 Pop. (18-64) = R1 (t14) = 0.87

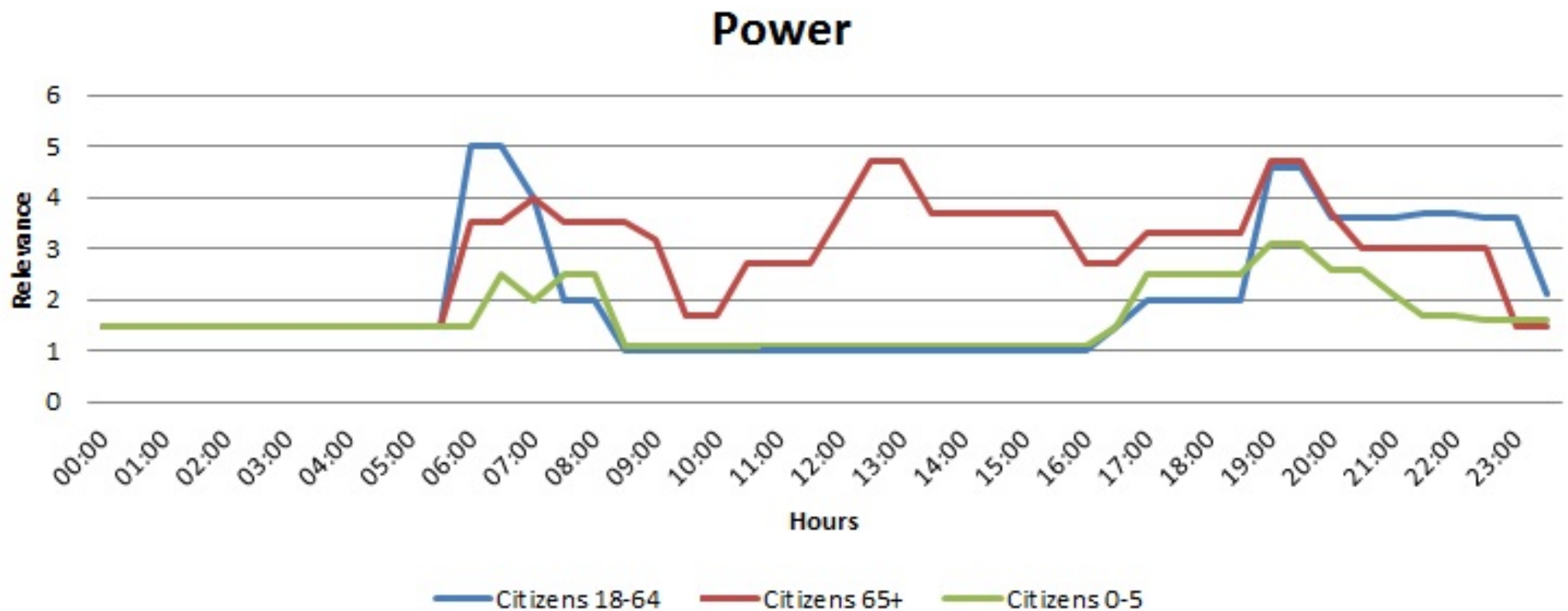
Look up in the raw micro-data files collected by the National Institute of Statistics



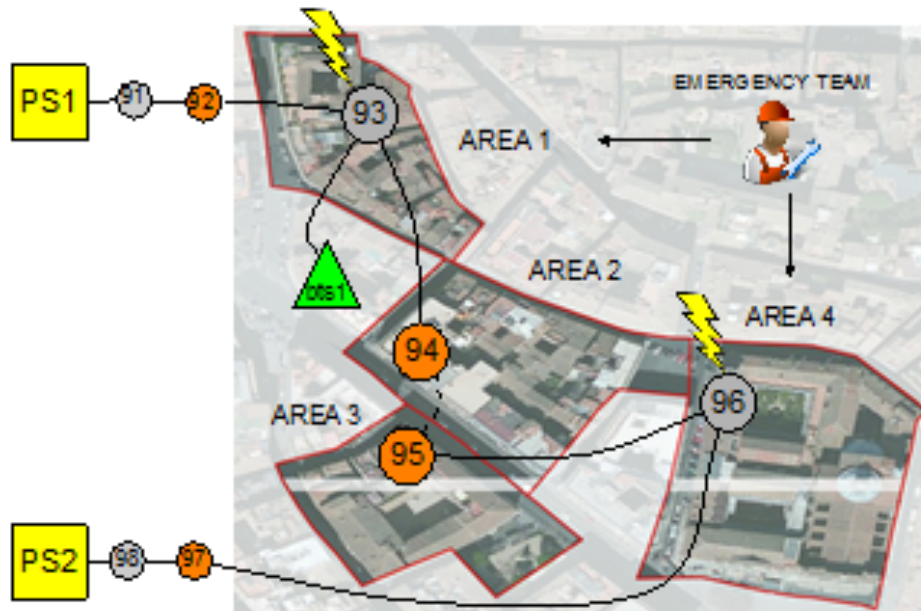
Citizens criterion



Citizens criterion



Census vulnerability: dW/dt



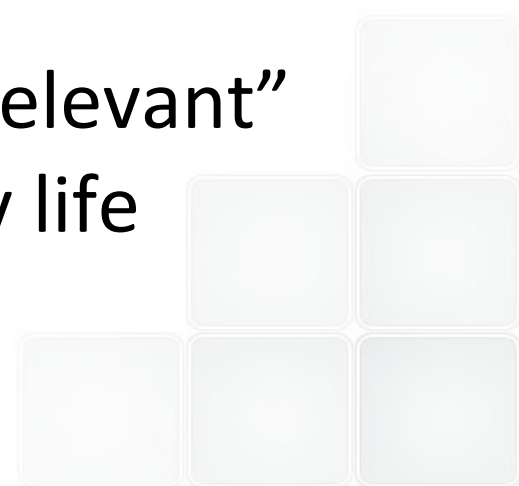
Keep the information M about people nb!

	Pop. 18-64	Pop. 65+	Pop. 0-5	dW/dt
r1	0.87	1	0.32	
Area 1	71	16	2	0.293
Area 2	119	20	4	0.29
Area 3	25	3	1	0.288
Area 4	7	0	0	0.29

Final remarks: please note that...



- The evaluation of the SAW indexes for the 4 Criteria may require the use of different approaches (and data sources)
- For each Criterion, multiple data sources may be used, either alternatively or jointly, to elicit the SAW indexes leading to different results with different properties
- meaning of “relevance”: we consider “relevant” any disruption (or perturbation) of daily life



CA SW interface

