

Dal Sistema Informativo Territoriale all'Infrastruttura di Dati Territoriali: soluzioni di implementazione con software Free/Open Source

Seminario

Interoperabilità nelle
Infrastrutture di Dati
Territoriali

Roma 26-27 Febbraio 2004

Pasquale Di Donato

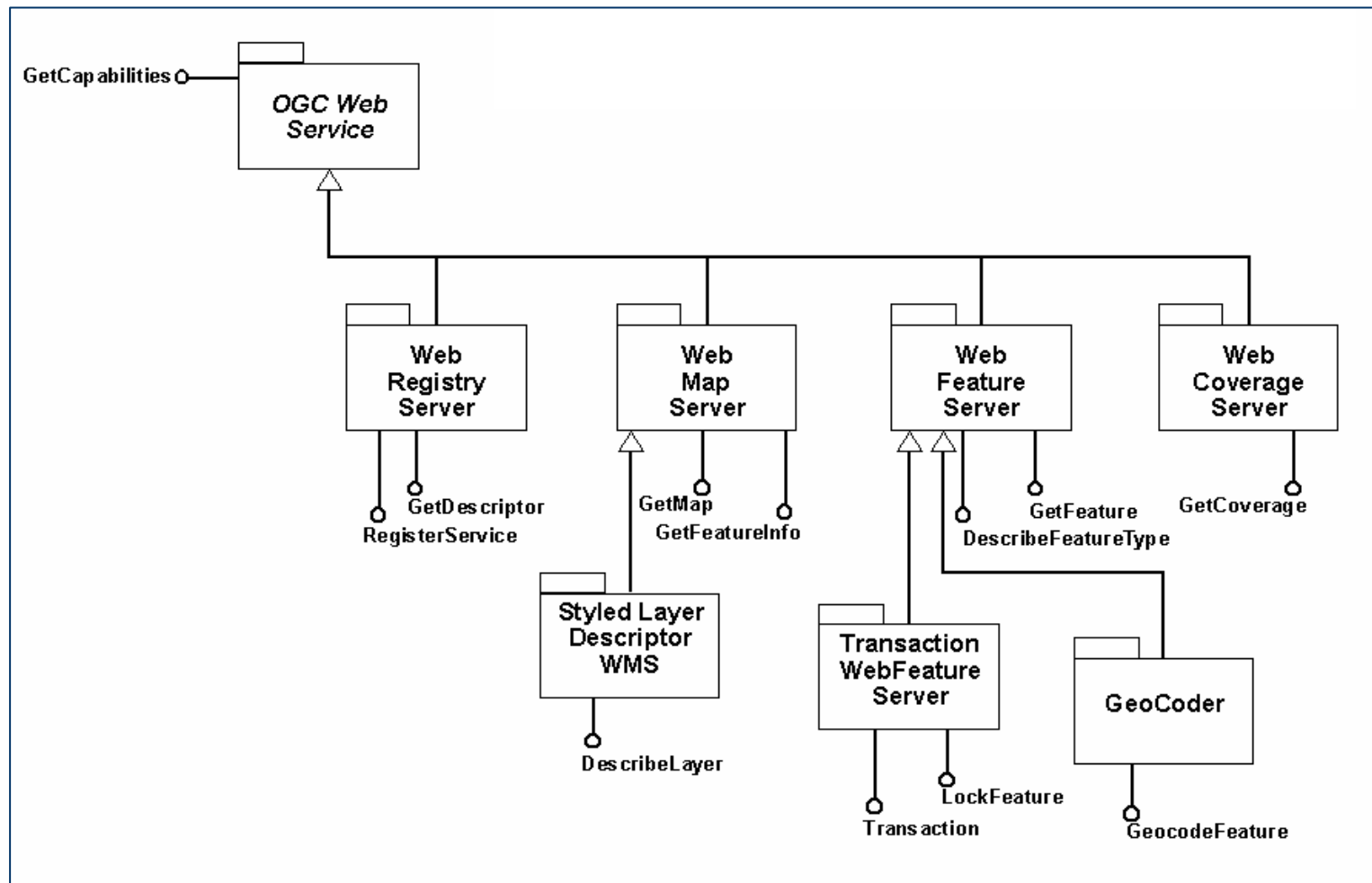
LABSITA



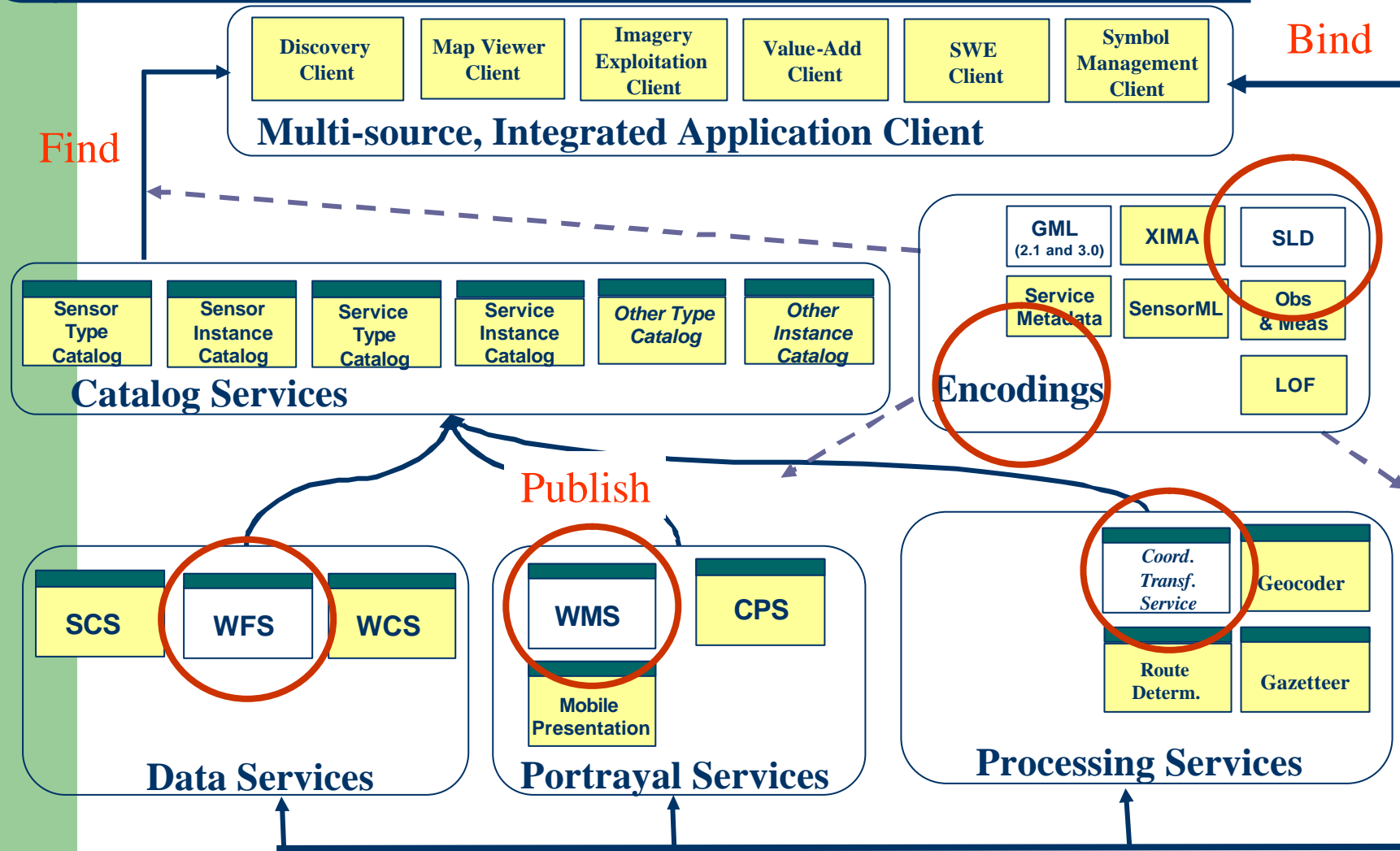
Laboratorio di Sistemi Informativi Territoriali ed Ambientali

<http://labsita.arc.uniroma1.it>

Alcuni GeoWebServices di OGC rilevanti per la IDT



GeoWebServices per tipologia



Software presentato

Software Free/OpenSource che permette di implementare:

- **Portrayal Services:**

- WMS

- **Data Services:**

- WFS

Free/OS per WMS

- **MapServer: University of Minnesota**
- **deegree: University of Bonn e lat/lon**
- **MapLab e Chameleon: DM Solutions**

MapServer

- MapServer è un progetto OS sviluppato dall'Università del Minnesota;
- Fornisce un ambiente di sviluppo per l'implementazione di applicazioni Internet “spatially enabled”;
- È costruito su una serie di sistemi Free/OS come Shapelib, FreeType, Proj4, libTiff, Perl, ...;
- Supporta linguaggi di scripting come PHP, Python, Perl;
- Integra dati provenienti da Oracle, Sybase, MySql, Post-GIS,.....;
- Gira su piattaforme Linux e Windows (NT/98/95)

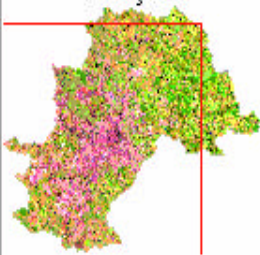
MapServer: le funzionalità

MapServer (a partire dalla versione 3.5) permette di implementare:

- **WMS (lato server)**
- **WMS (lato client)**
- **WFS (lato server)**
- **WFS (lato client)**

Subsídios para Elaboração e Implantação da Agenda 21 do Município de Campinas - SP GISWeb

Posição



(1) Use o Zoom para ver uma área em particular

Zoom:

(2) Selecione os itens que deseja para montar o mapa

Imagem Satélite

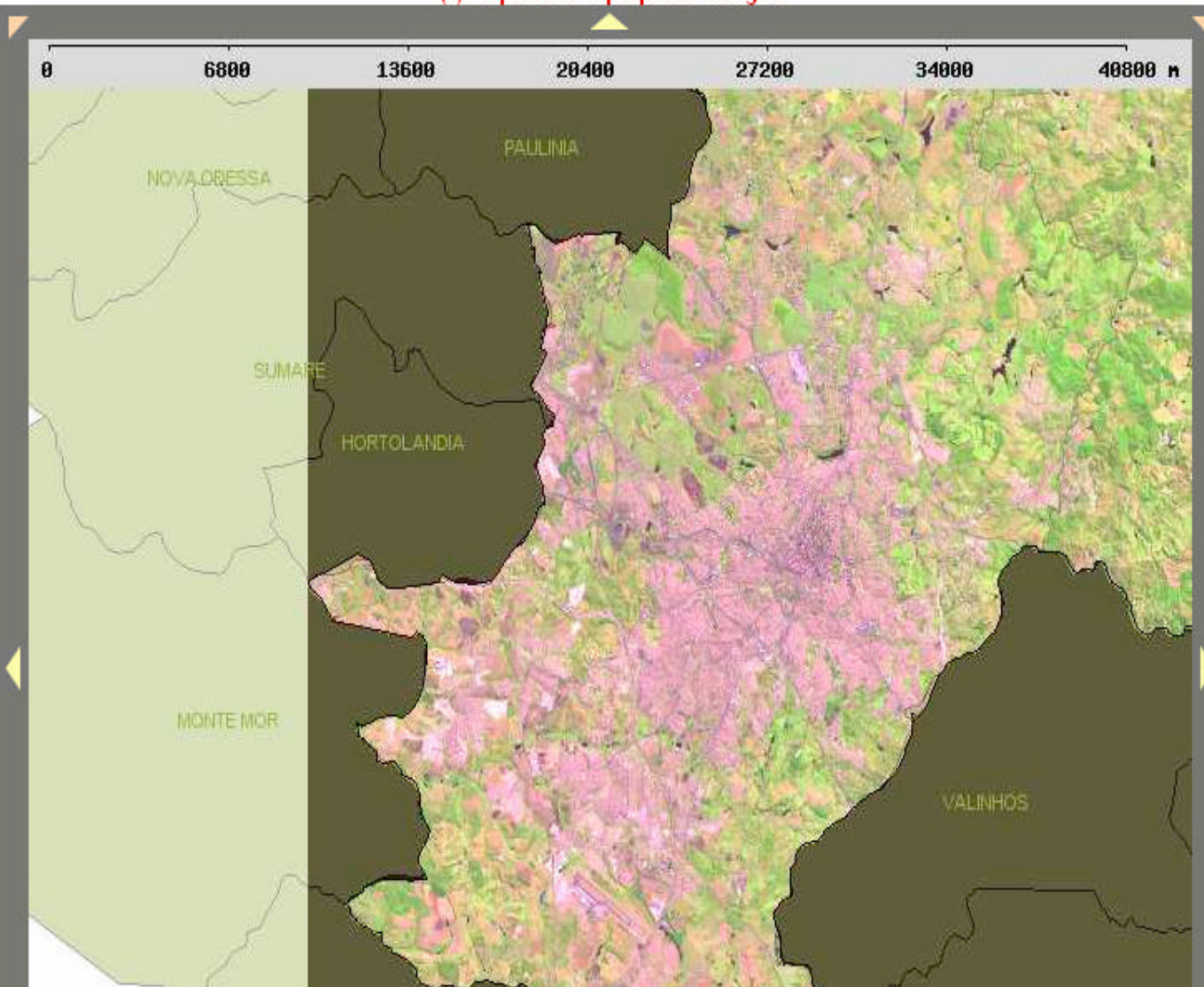
- Sem imagem
- LANDSAT
- SPOT V
- EROS

Referências Geográficas


rótulo?

- Região Metropolitana
- Adm Regionais
- Rodovias

(3) Clique no mapa para navegar



Legenda

-  Região Metro

UTM:
x:281203.000000
y:7463690.520000

lat/long:
-22.920232
-47.133304

[\[Reinicializar mapa\]](#)

[\[Versão Impressão\]](#)

[\[Fechar GISWeb\]](#)



Airphoto search

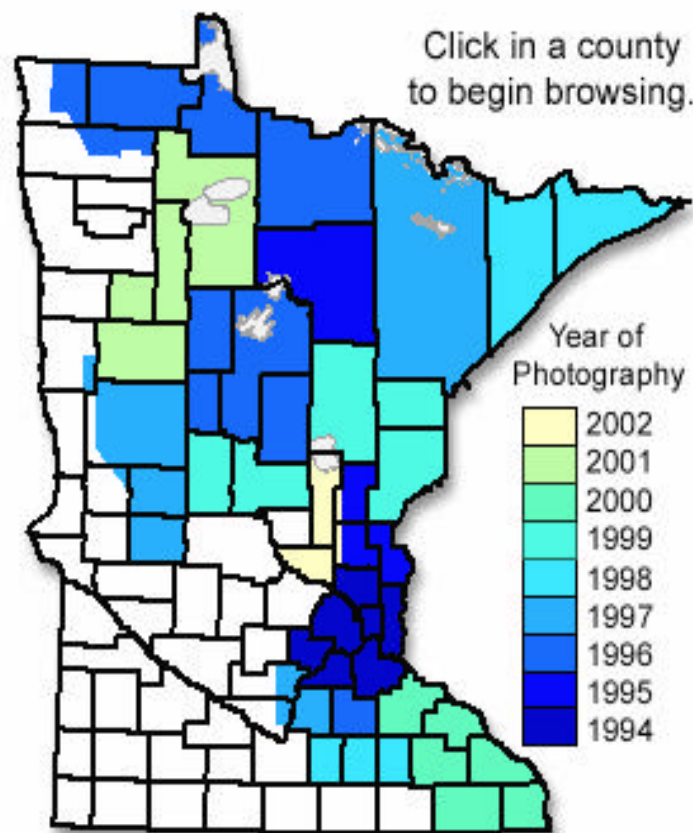
Search for airphotos

Search Using:

- **Place names**
Enter the name of a city, park, lake, etc.
- **Public Land Survey (PLS)**
Enter a PLS identifier of the form t999r99s99.
- **Coordinate Pairs**
Enter a coordinate pair such as you might obtain from a GPS receiver. Use either latitude and longitude or UTM coordinates.

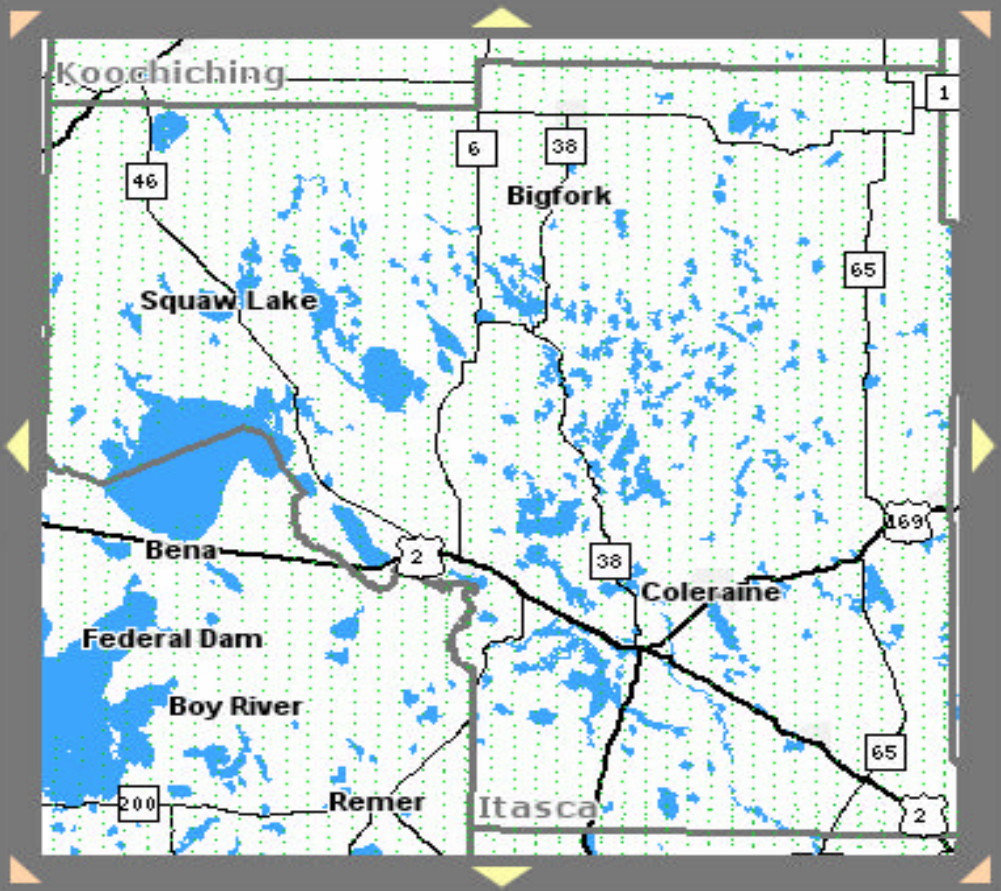
See the [help page](#) for details on methods for finding places.



OR Browse for airphotos with online maps




Airphoto browse

Find a place:



To retrieve a photo:
The green dots  are the center of the photos. Click on the "info" icon  to the left of the map, then click on a green dot to retrieve a particular photo.




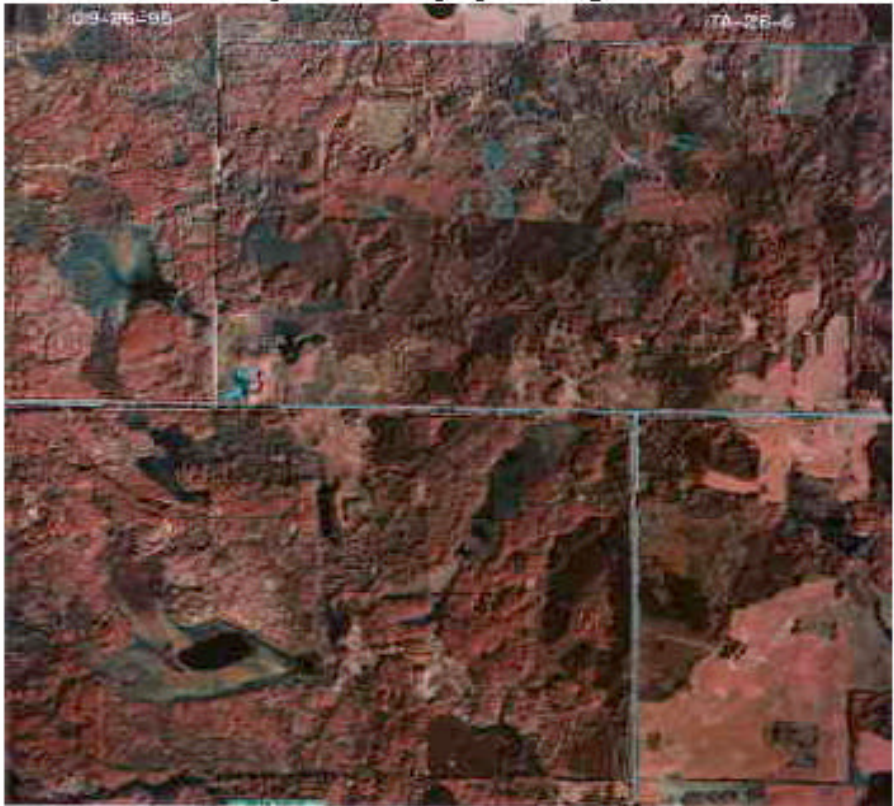




Photo ID: ita-26-006 (low resolution view)
 Click on the photo to display it at higher resolution

0 2 4 mi 0 3 6 km



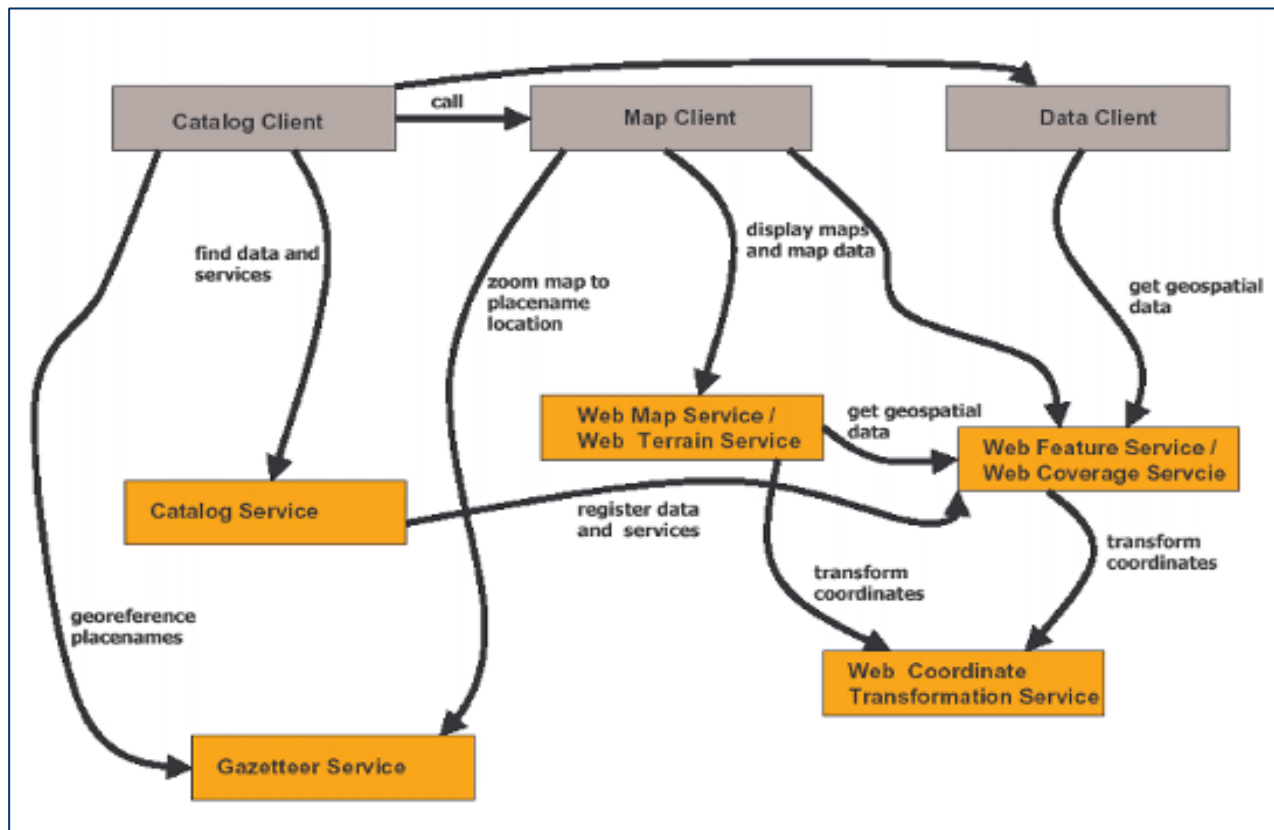
To retrieve a photo:
 The green dots ● are the center of the photos. Click on the "info" icon ⓘ to the left of the map, then click on a green dot to retrieve a particular photo.



deegree

- **degree è un progetto Free Software sviluppato dall'Università di Bonn e da lat/lon;**
- **Fornisce i “building blocks” per la realizzazione di IDT implementando gli standard OGC e ISO/TC211;**
- **Ha interfacce che possono accedere in lettura e scrittura a diverse data source come Oracle Spatial, PostGres/PostGIS, MySQL, SHP, GeoTiff, JPEG, GIF, etc.;**
- **Fornisce dati vettoriali nel formato GML 2.1.1 e SHP**

I servizi implementabili



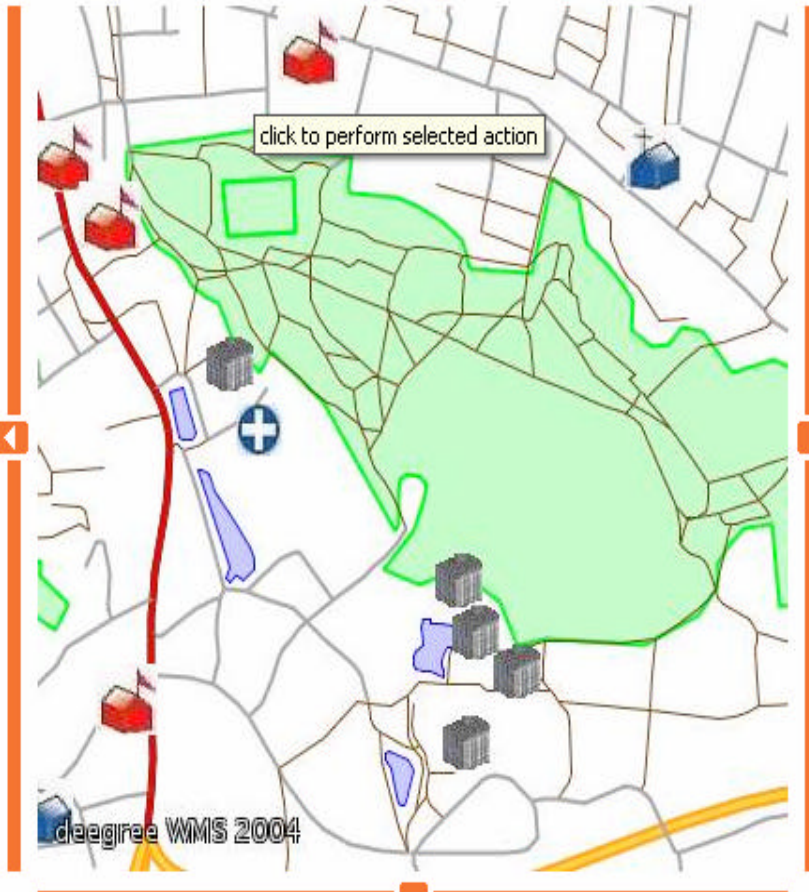
In giallo i servizi implementabili lato server.

Lato client sono disponibili dei moduli che permettono di implementare un client WMS.

Projects:











[Cite](#)
[Osnabrück](#)
[GNS Layers](#)

⊙ ZOOMIN ⊖ ZOOMOUT ○ RECENTER ○ INFO ○ REFRESH ○ RESET




click to perform selected action

deegree WMS 2004


-  osnabrueck:sights
-  = 1
-  = 2
-  = 3
-  = 4
-  = 5
-  = 11
-  osnabrueck:gewaesserlinien
-  osnabrueck:gewaessepoly
-  osnabrueck:gruenpolyl



Available Layers:


osnabrueck:strassen 

Selected Layers:

- osnabrueck:sights
- osnabrueck:strassen
- osnabrueck:gewaesserlinien
- osnabrueck:gewaessepoly
- osnabrueck:gruenpolyl





MapLab

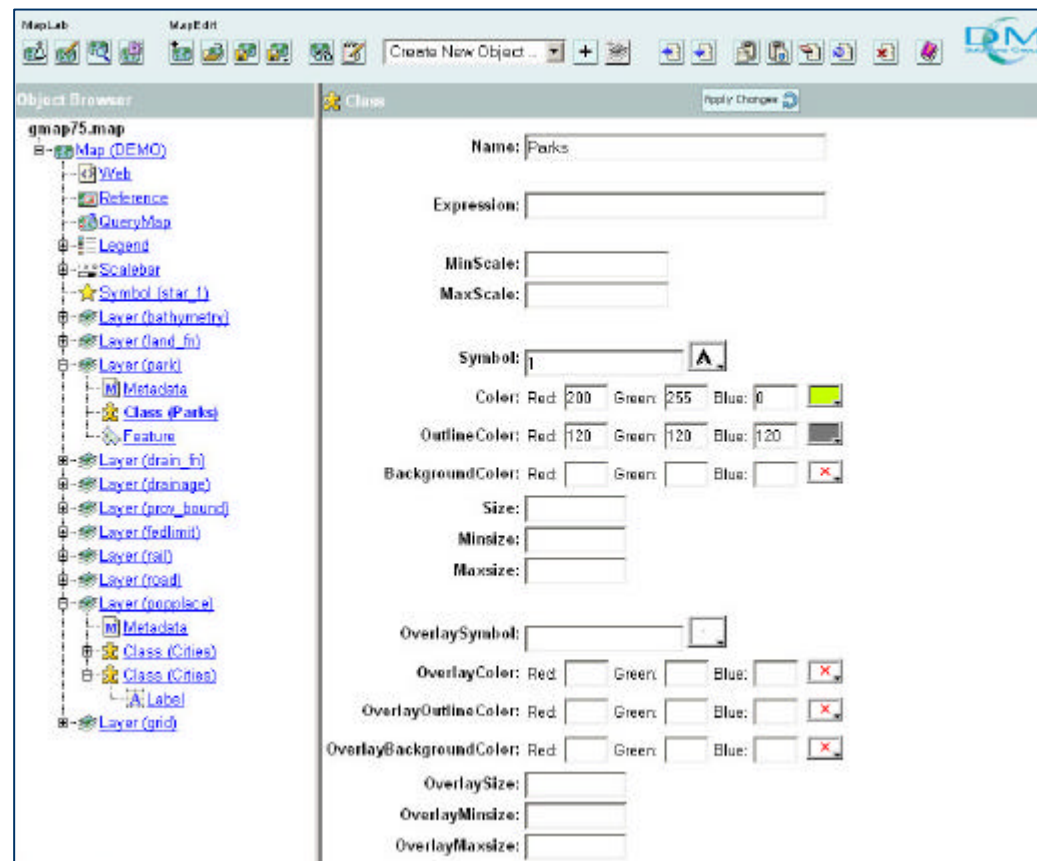
- **MapLab è un progetto OpenSource sviluppato e gestito da DM Solutions, azienda canadese;**
- **Può essere considerato come un front-end grafico a MapServer...**

MapLab

- **MapLab è una suite di strumenti web-based che semplificano il processo di sviluppo di applicazioni di webmapping basate su MapServer;**
- **Ha tre componenti:**
 - **MapEdit;**
 - **MapBrowser;**
 - **GMapFactory.**

MapLab: MapEdit

MapEdit facilita le attività di creazione e gestione di mapfile (i mapfile gestiscono il modo di visualizzazione dei dati) di MapServer:



MapLab: MapBrowser

MapBrowser è un tool per la scoperta/navigazione dei dati:

The screenshot displays the MapLab MapBrowser interface. At the top, there is a toolbar with various icons for map navigation and data management. The main window is titled "ec_mud.map" and features a legend on the left side with a list of layers, each with a checked checkbox. Below the legend is a "Data Stores" section with a tree view of data sources. The central map area shows a detailed view of Ottawa, Canada, with various colored overlays representing different data layers. To the right of the map is a small inset map of Canada and a "ROSA is Enabled" notification. At the bottom, there is a "Current Map View" panel with input fields for "Extent" (Min X, Max X, Min Y, Max Y) and an "Apply" button.

MapLab MapBrowser

ec_mud.map

Legend

Active Layer

- 75M_NatIPark
- 2M_Prov_Outlines
- 2M_Road_Arc
- 2M_Drainage_Fill
- 2M_Drainage
- ProvBoundNTDB
- NTDB_Roads
- NTDB_Lim_Roads
- NTDB_Railway

Data Stores

- GMap WMS Demo Server
- National Atlas of Canada Base Layers
- National Atlas of Canada Base Layers
- WMS CTIS
- CubeSERV
- CCFM National Forest Information Sys
- WMS Ecostratification
- GSC-CGKN WMS Layers
- CCRS Spatial Data Warehouse
- CCRS layers
 - CEOWARE2
 - ATLASBASEMAPS
 - BOUNDARIES

Current Map View

Extent:

Min X:	1470952.8	Max X:	1529192.8
Min Y:	-188374.56	Max Y:	-144742.56

Apply

ROSA is Enabled. Click to [Disable](#)

MapLab: GMapFactory

GMapFactory è un tool per la creazione di applicazioni personalizzate:

The screenshot displays the GMapFactory web application interface. The main window is titled "GMap Demo Atlas" and shows a map of Canada with various geographical features and place names. The interface includes several control panels:

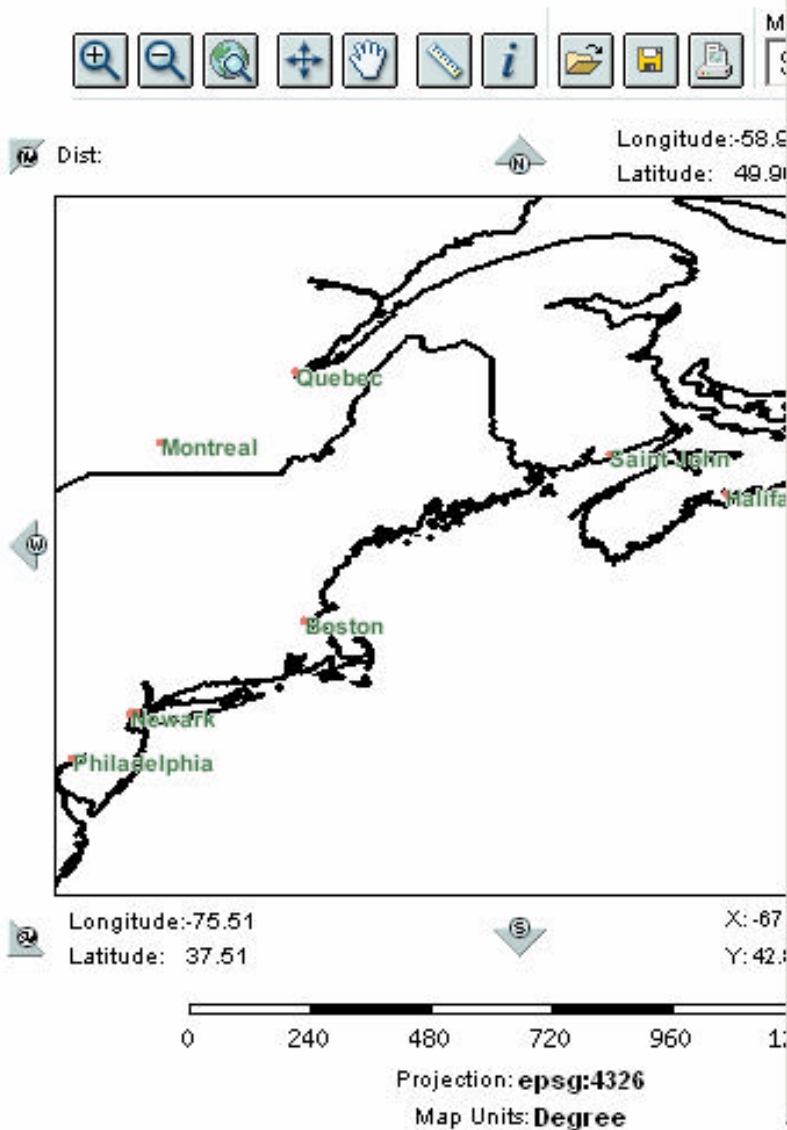
- Layout Elements:** Default Layout, Apply
- gmap URL:** https://msapps/MapLab/maplab-2.0rc1/projects/gmf_apps/gmap/gmap.plhtml
- Map Title:** Text: GMap Demo Atlas, Size: Medium, Colour: Blue, Position: Middle Column, Order: [Icons]
- Legend:** Use Groups: [], Position: Right Column, Order: [Icons]
- Scale Bar:** Position: Middle Column, Order: [Icons]
- Key Map:** Position: Right Column, Order: [Icons]
- Mapping Tools:** ROCSA Java-Applet Tools, Standard HTML Tools, Zoom Factor, Zoom In, Zoom Out, Zoom to Full Extents, Recentie, Query, Zoom Factor visible?
- Columns:** 1, Position: Left Column

The map shows various layers such as grid, popplace, road, rail, fedlimit, prov_bound, drainage, drain_fn, park, land_fn, and bathymetry. A scale bar indicates 0, 330, 660, 990, 1320, 1650 km. A small inset map of Canada is visible in the bottom right corner. The text "this application was built using GMapFactory" is displayed at the bottom right of the map area.

Chameleon

- **Chameleon è un altro prodotto OS sviluppato da DM Solutions, che permette di implementare soluzioni di webmapping in maniera molto intuitiva.**
- **Anch'esso basato su MapServer, permette di sviluppare soluzioni OGC compliant.**

Gulf of Maine: OGC WMS Demo Built with OpenLayers 1.0.0



Layer Selection - Mozilla Firefox

Layer Selection | Browse Data | Manage Servers | Info

In the list the list of available datastores below, server names prefaced with [c] are "Connected" and "Disconnected" respectively. To modify a server's properties select it from the list.

Available Servers:

- [c] - Flood Risk Zones
- [c] - NASA: Imagery
- [c] - FGDC: Imagery
- [c] - CubeWerx: Shade Relief
- [c] - Digital Earth: Imagery
- [c] - World: Forests
- [c] - Snow Fall
- [c] - Annual Precipitation

Connect | Disconnect | Refresh | Test | Remove

Please supply the properties below then click "Add Server" to add a new server to the list, or click "Update" to change an existing server's properties. *The only required field is URL.

Server Properties:

Name:

URL*:

Comments:

Add | Update

GeoServer

- **GeoServer è un progetto Free Software sviluppato in Java (J2EE) che implementa la specifica OGC Web Feature Server;**
- **Permette di implementare un WFS “full transactional”;**
- **Aspira a diventare l’Apache di OGC.**

GeoServer

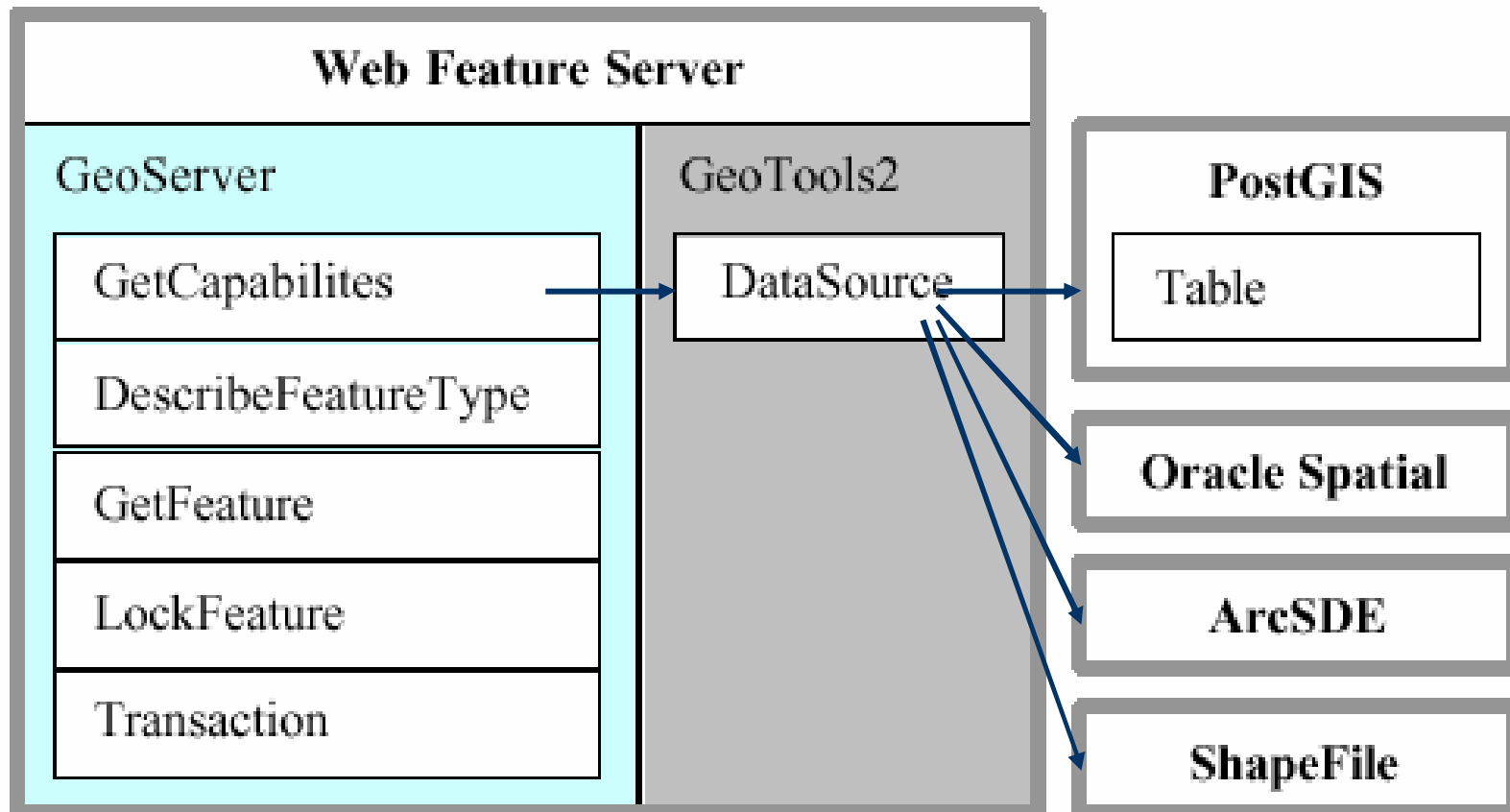


Figure 1 - GeoServer Layer Diagram



Edit

New


Draw 

Erase 

Add 

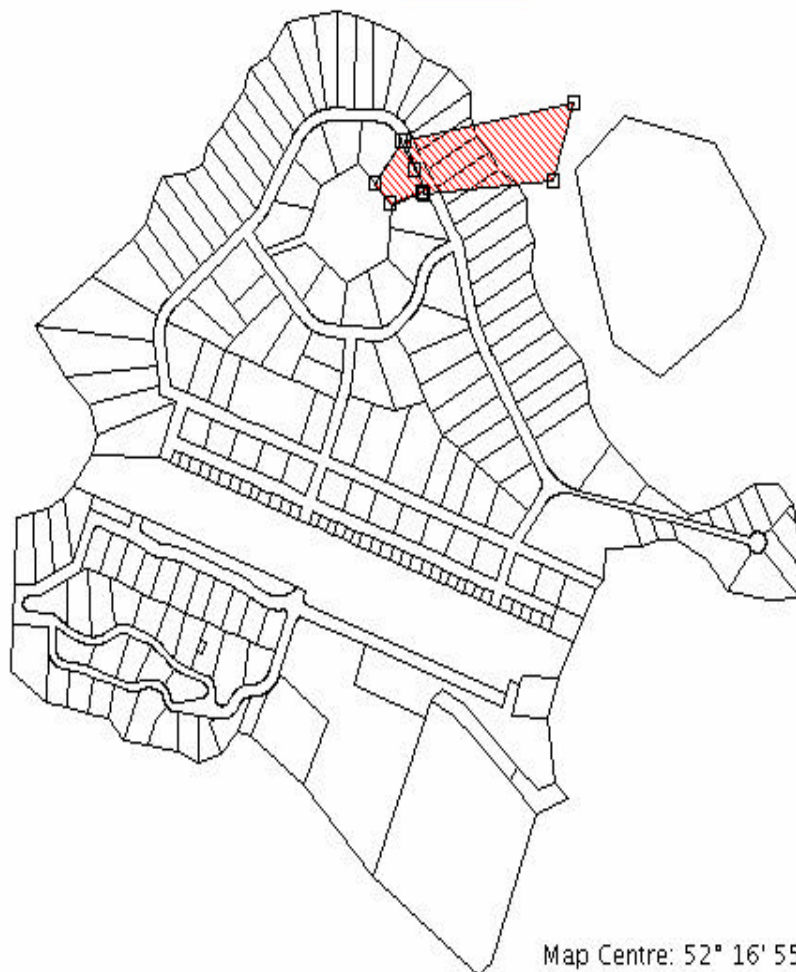
Delete 

Move 

Snap 

Table 

Save 



Map Centre: 52° 16' 55" N, 112° 24' 42" W

Draw Polygon Tool

Point 1:	112° 24' 32.8" W 52° 17' 48.0" N
Point 2:	112° 23' 42.3" W 52° 17' 50.4" N 959.7 meters 85.6 °
Point 3:	112° 23' 50.4" W 52° 17' 39.0" N 384.4 meters 203.7 °
Point 4:	112° 24' 28.7" W 52° 17' 39.5" N 725.7 meters 271.3 °
Point 5:	112° 24' 28.7" W 52° 17' 39.5" N 0.0 meters 0.0 °

Clear Points

Finished


This document shows the positions of the points of a polygon that you have clicked on the map using the polygon add tool, and reports the distances and bearings between the points. When you have completed adding the points, press the Finished button to continue.

To clear the points and start over, press the Draw tool in the toolbar, or press the Clear Points button on this page.

Scale: 1:14,890

go

Map Tool:

Draw 

Draw Polygon

IMF: Integrazione di componenti

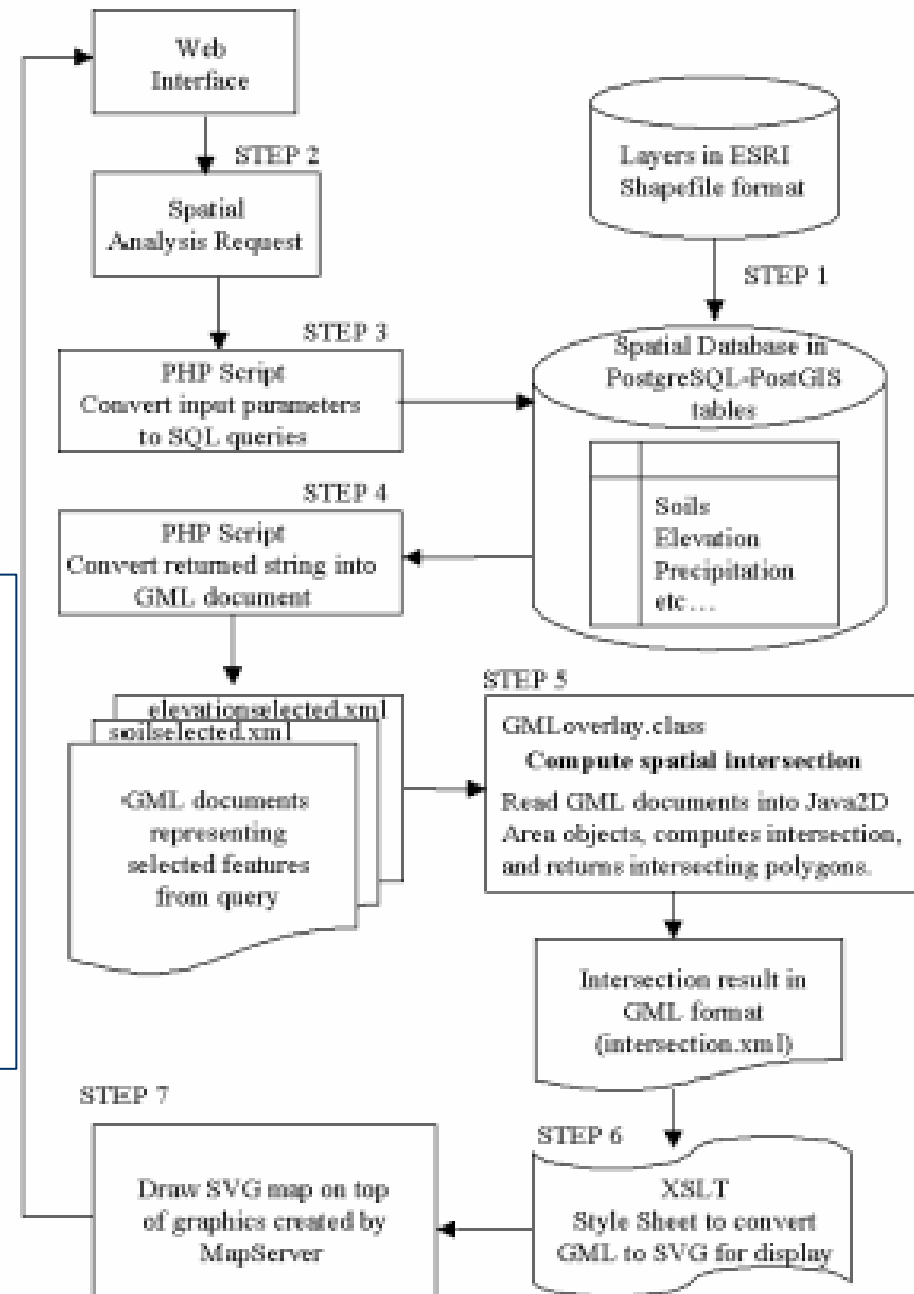
- L'esempio è realizzato con IMF, un framework che permette di sviluppare applicazioni altamente custom-izzabili;
- Utilizza una combinazione di OGC-compliant WMS e WFS;
- La mappa visualizzata è il risultato di richieste WMS fatte a MapServer;
- Le routine di editing usano richieste WFS fatte a GeoServer;
- Entrambe le applicazioni accedono ad una DB PostGIS.

Geoprocessing

Città di Guanajuato

Da:
Building web-based Spatial Information
Solutions around Open Specifications
and Open Source Software

Geoffry Anderson e
Rafael Moreno-Sanchez



(1) Select desired features.

Soil:

Temperature Low:

Temperature High:

Elevation Low:

Elevation High:

(2) Submit Query.

(3) Refresh the map to show the selected features and visually inspect for spatial overlay of all three layers. *(Make sure the selected feature layers are visible.) Repeat steps 1-3 until overlap is visually detected.*

Active Query

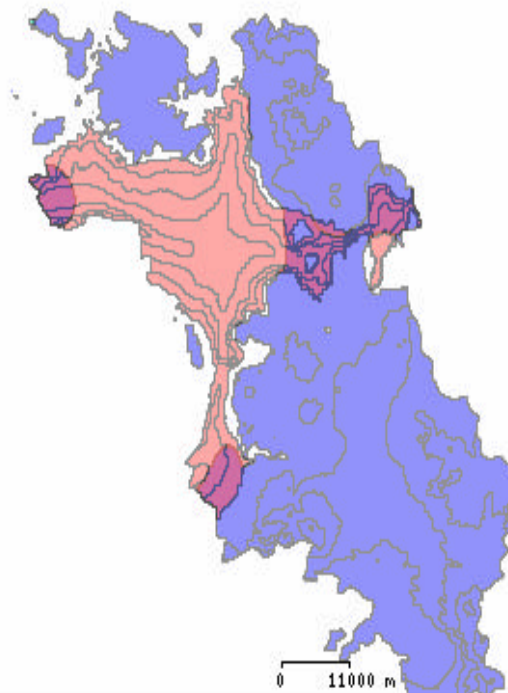
SOIL TYPE : Be

TEMP RANGE : 14 - 18

ELEV RANGE : 1740 - 1800

(4) Create GML documents for the selected features of each layer.

Guanajuato: Open GML Geoprocessor Demo



Visible Layers

- Roads
- Cities
- Selected Soils
- Selected Elev
- Selected Temp
- Soils
- Elevation
- Temperature

Legend

- Overlay Result
- Soils Be
- Elev 1740 - 1800
- Temp 14 - 18

[SVGeoAnalyst](#)
[SVGeoAnalyst_2](#)

Querying soils for soil type Zo.

Writing XML ...

soil.xml created successfully.

Querying temp for range: 18 to 20

Writing XML ...

temp.xml created successfully.

Querying elev for range: 1800 to 1840

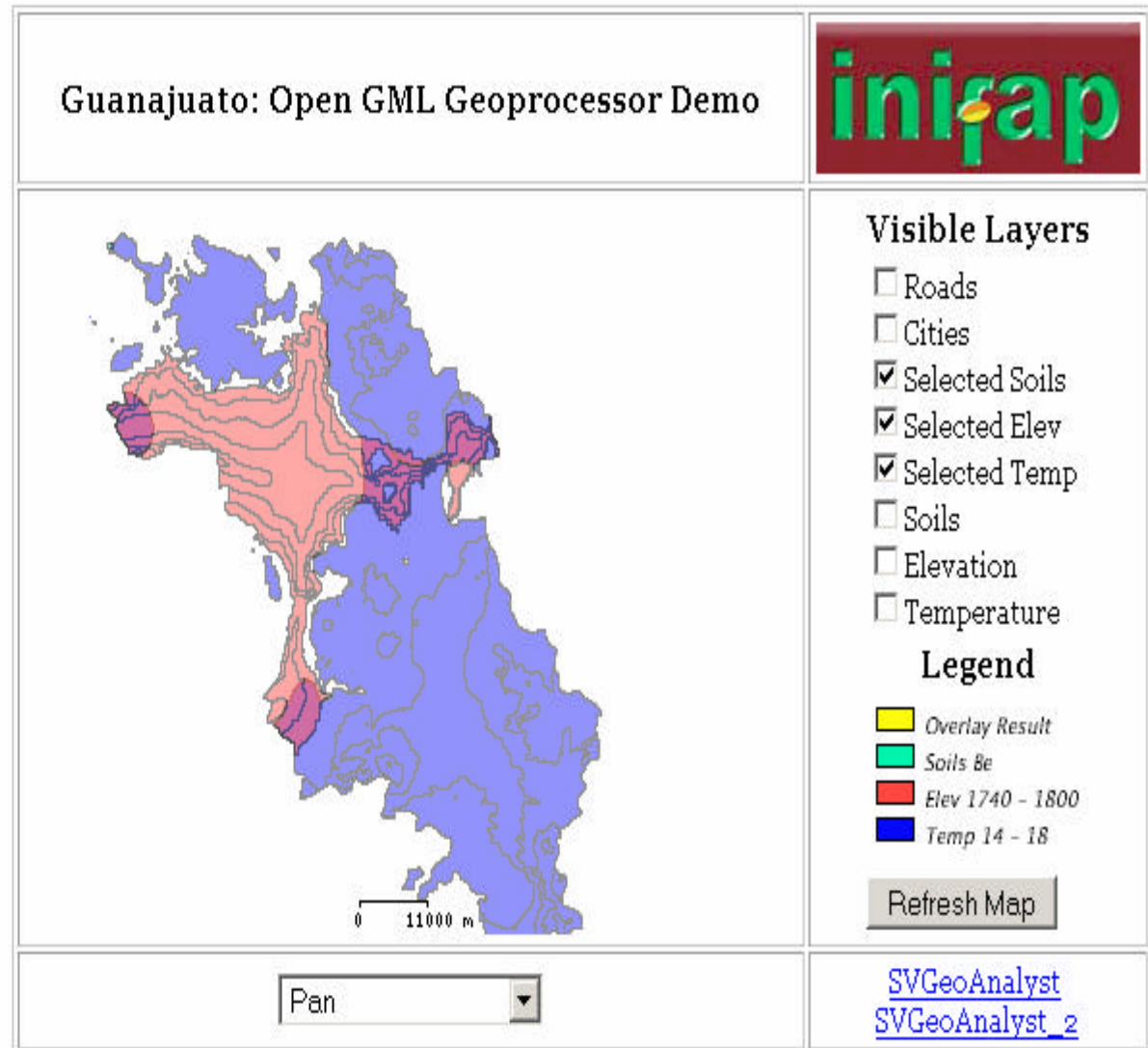
Writing XML ...

elev.xml created successfully.

(5) Calculate the spatial intersection of these layers.

[Calculate Intersection - SVG](#)

[Calculate Intersection - PostGIS](#)



I Link

- MapServer: <http://mapserver.gis.unm.edu>
- deegree: <http://deegree.sourceforge.net/>
- MapLab: <http://www.dmsolutions.ca/techserv/maplab.html>
- Chameleon:
<http://www.dmsolutions.ca/techserv/chameleon.html>
- GeoServer: <http://geoserver.sourceforge.net/html/index.php>
- Geotools: <http://www.geotools.org>
- IMF: http://www.moximedia.com/imf_ogc.html
- Guanajuato: <http://206.168.217.254/guanajuato>
- PostGIS: <http://postgis.refrations.net/>
- Java2d: <http://java.sun.com/products/java-media/2D/>
- JTS: <http://www.vividsolutions.com/jts/jtshome.htm>

I Link

Free GIS: <http://freegis.org>

Open Source GIS: <http://opensourcegis.org>

RemoteSensing: <http://remotesensing.org>