



gvSIG project: Open Source SDI client

www.gvsig.gva.es



Introductions:

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Generalitat Valenciana (GV) is the government of the Valencian Community (Castellón, Valencia, Alicante)

Spain is currently heavy de-centralized (17+2 communities)

Conselleria de Infraestructuras y Transporte (CIT) or Dept of Infrastructures and Transport, is the maximum authority in the Generalitat Valenciana for Public Works, Transport, Architecture, Ports and Coasts, Energy, and Telecommunications.

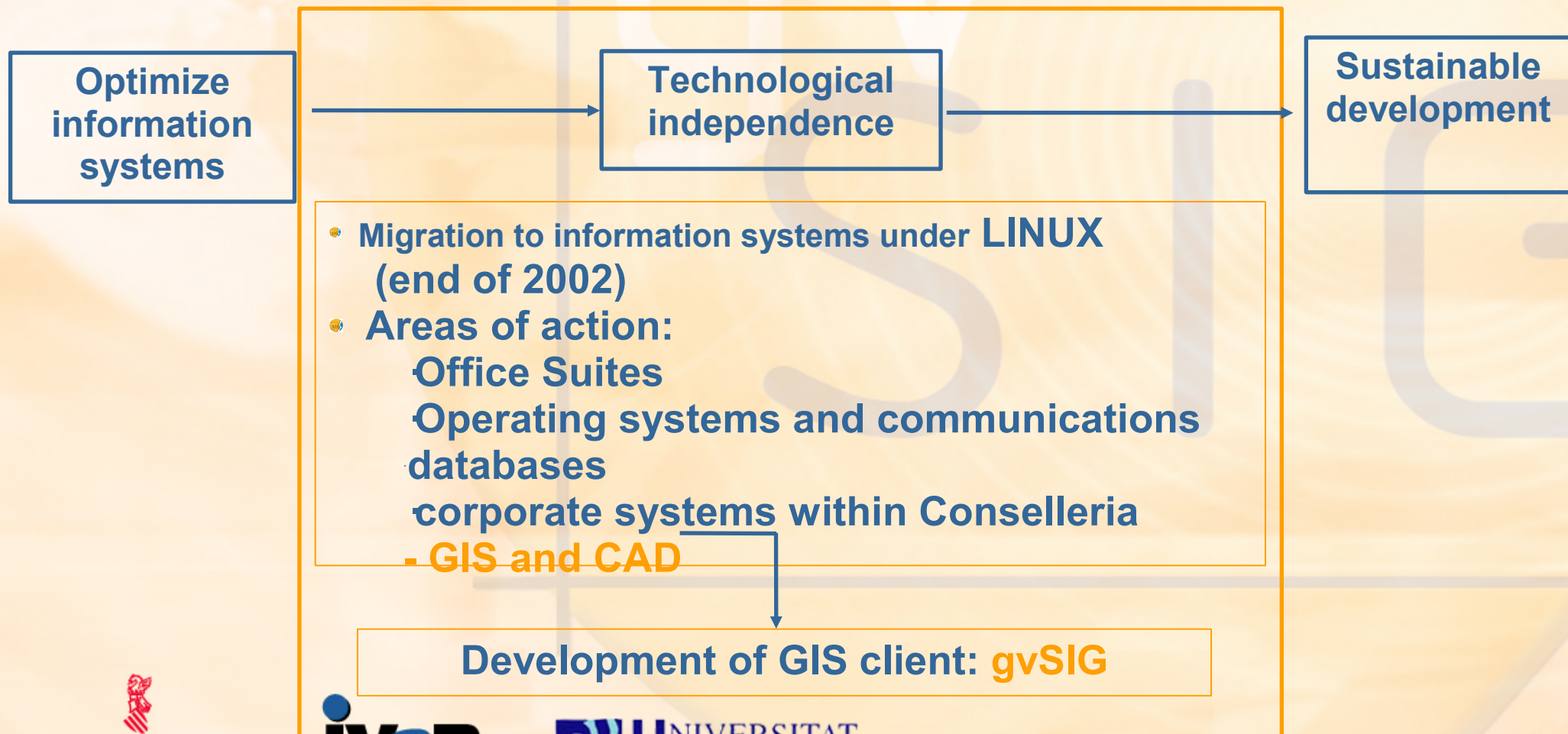
Approximately 1000 PC users of various types

Origin of gvSIG



gvPontis: migration of IT to free software solutions

Conselleria de Infraestructuras y Transporte



GIS-CAD: migration procedure

Needs analysis of GIS-CAD users, by questionnaire and interviews

- Visualization
- Query
- Edición
- Spatial analysis
- Topology
- Map preparation
- Printing

Analysis of the GIS-CAD software on the market

- ArcView
- ArcGIS
- Jump
- Grass
- AutoCAD
- MicroStation
- IntelliCAD

Initial requirements analysis.

Origin of gvSIG



GIS-CAD. Procedure.

Public Tender: Exp. 2003/01/0090

“Desarrollo de aplicaciones SIG (Sistema de Información Geográfica) para la C.O.P.U.T. Utilizando software libre.”

Public Tender: Exp. 2004/01/228

“Servicios informáticos de incorporación de funcionalidades de geoprosesamientos, topología y CAD en el producto gvSIG”

Origin of gvSIG



Tender required working prototypes in C++ and Java, and for Windows and Linux !

Initial actors (circa 2004)

- **Administration: Conselleria de Infraestructures i Transport. Generalitat Valenciana**
- **University: Universidad Jaume I de Castellón**
- **SME contractor: IVER Tecnologías de la Información**

Origin of gvSIG



Main characteristics

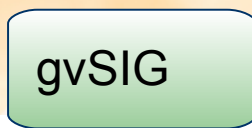
- **Development language: Java (Multiplatform).**
- **Free license (GNU/GPL).**
- **Modular, scalable, powerful.**
- **Int'l standards-based (OGC, ISO, W3C).**
- **Simple interface**
- **International (Español, Valenciano, Euskera, Gallego, English, French, Italiano, Portugués, German, Czech, soon Mandarin)**

Born as a GIS client

- Initially designed to meet GIS needs of the Conselleria
 - Then the team learned of INSPIRE:
 - Optimal access to geodata, maintained in situ
 - Facilitate discovery of geodata
 - Connectivity and interoperability
- > and they were believers
- gvSIG grew to become a thick SDI client, offering best of both worlds



User applications



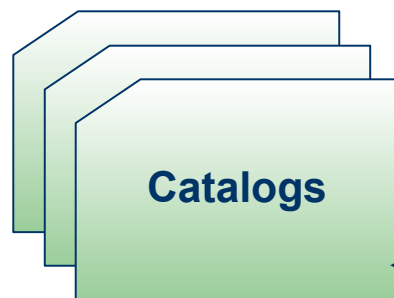
Clients

Access to transformed data, pictures, maps, reports, multi-media content

Metadata search and retrieval for data and services

Service chaining: search, display, access, e-commerce,

Middleware



Catalogs

Geo-processing and catalog Services

Metadata update

Direct data access

Content Repositories

Other data

e.g., administrative, statistical, env. reporting

Coverages

Features

Servers

Distributed Geographic reference data



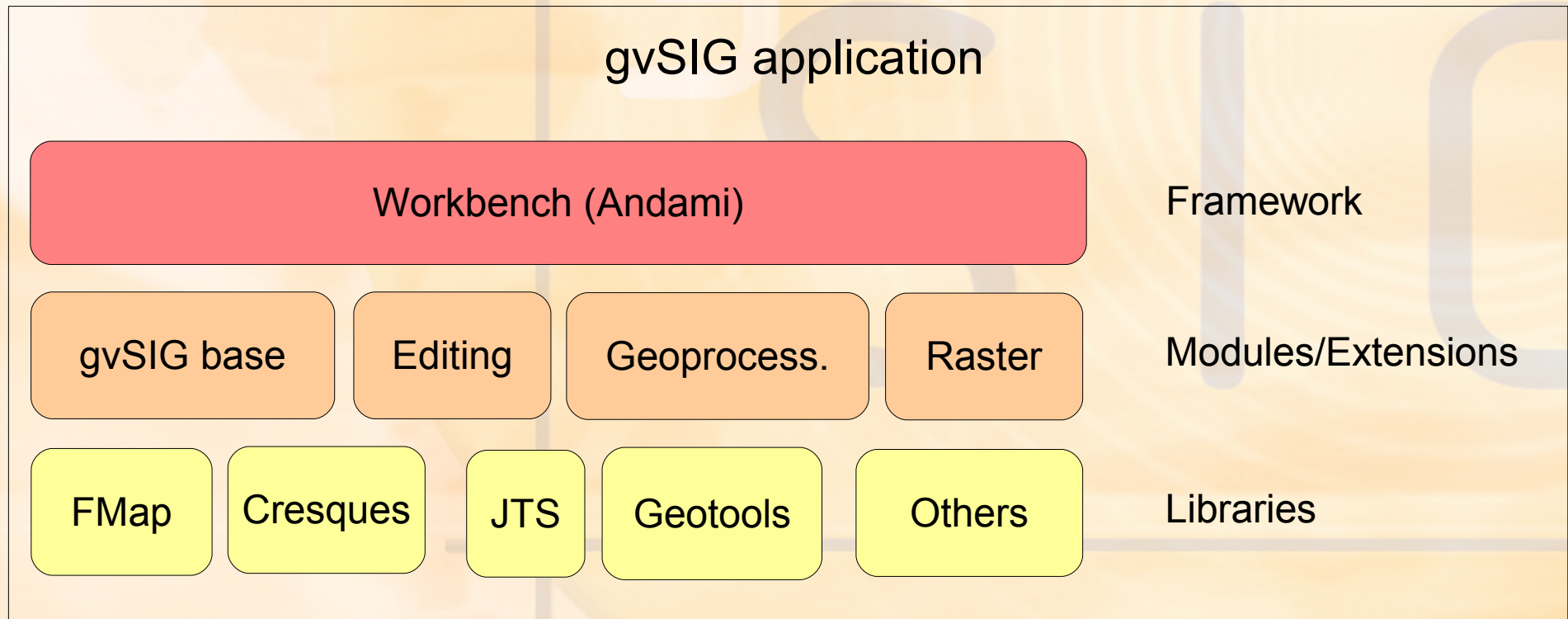
gvSIG Background

- Developed with companies (IVER) and universities (UJI)
- GPL License
- Java. Multiplatform (Windows, Linux, Mac -at 1.0-)
- Multilingual, easy internationalization
- Version 1.0 RC2 available now at www.gvsig.gva.es and in distributions like [GeoNetwork](#) Open Source DVD



gvSIG Background: Architecture

- Modular, efficient and easily extensible



gvSIG Background: Functionality

- Visualización, query, map composition

The screenshot displays the gvSIG software interface with the following components:

- Gestor de proyectos:** A panel on the left showing document types (Vistas, Tablas, Mapas) and existing documents (Vista 1, Vista 2).
- Vista : Vista 1:** A central map window displaying a satellite image with overlaid vector data (roads, boundaries).
- Identificar Resultados:** A panel on the right showing a table of search results for a selected feature.
- Vista : Vista 2:** A map window showing a topographic map with contour lines and colored overlays.
- Tabla: Termmun.shp:** A data table window showing attributes for a shapefile.
- Mapa :** A map composition window titled "Topográfico + Ortofoto" showing a side-by-side comparison of the topographic map and the satellite image.

Campo	Valor
AREA	2.74506321...
PERIMETER	27167.80181
TERMMUNC...	46204
NOMBRE	PUIG
ESTADO	ESPAÑA
TERMMUN_	11128.0
TERMMUNID	11128.0
COD_PROV	46

AREA	PERIMETER	TERMMUNCOD	NOMBRE	ESTADO
23.252.100,0...	19.066,281		AÇORES	PORTUGAL
173.795.238,...	53.045,46		AÇORES	PORTUGAL
76.645.897,2...	33.895,549		AÇORES	PORTUGAL
463.931.463,...	89.145,72		AÇORES	PORTUGAL
269.829.545,...	120.890,467		AÇORES	PORTUGAL
201.401.540,...	62.157,754		AÇORES	PORTUGAL
523.643.840,...	115.000,87		AÇORES	PORTUGAL



gvSIG Background: Functionality

■ Data input/output

- Reading:

- SHP
- DGN
- DXF
- DWG
- ECW
- MrSID
- JPEG2000
- JPG
- PNG
- GIF
- TIFF

- PostGIS
- MySQL

- Writing:

- SHP
- DXF
- ECW
- GeoTIFF
- Jpeg2000
- MrSID
- PostGIS

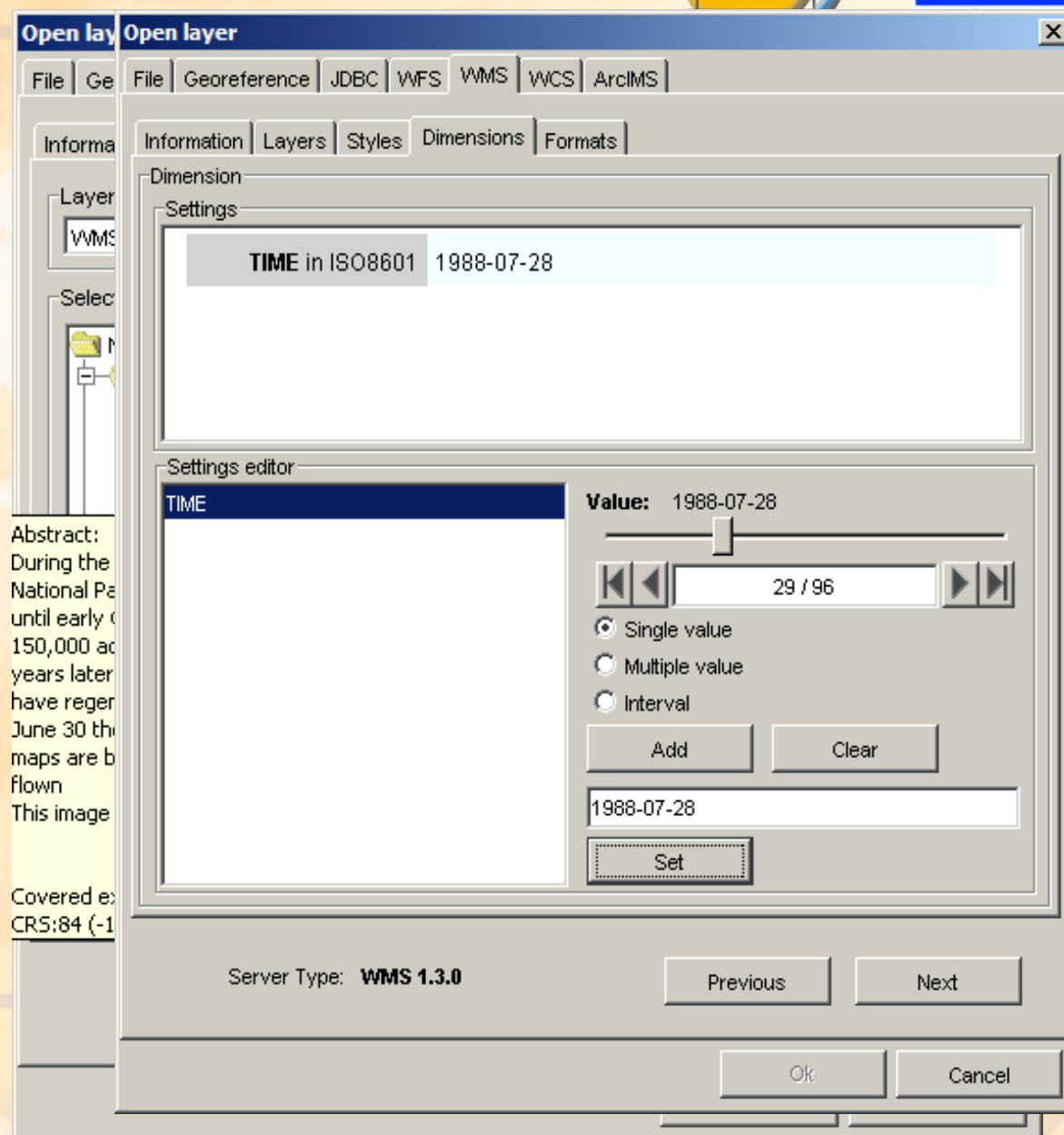


gvSIG as SDI Client

- Rich support of OGC remote services:
 - WMS (1.1.0 - 1.3.0)
 - WFS (1.0.0) + GML import/export (2.1.2) at 1.0
 - WCS (1.0.0)
 - Catalog search tool (OGC CSW 2.0, IDEC)
 - Gazetteer search tool (WFS 1.0.0, WFS-G 0.9, ADL)
- Supports ArcIMS Map and Feature services, too

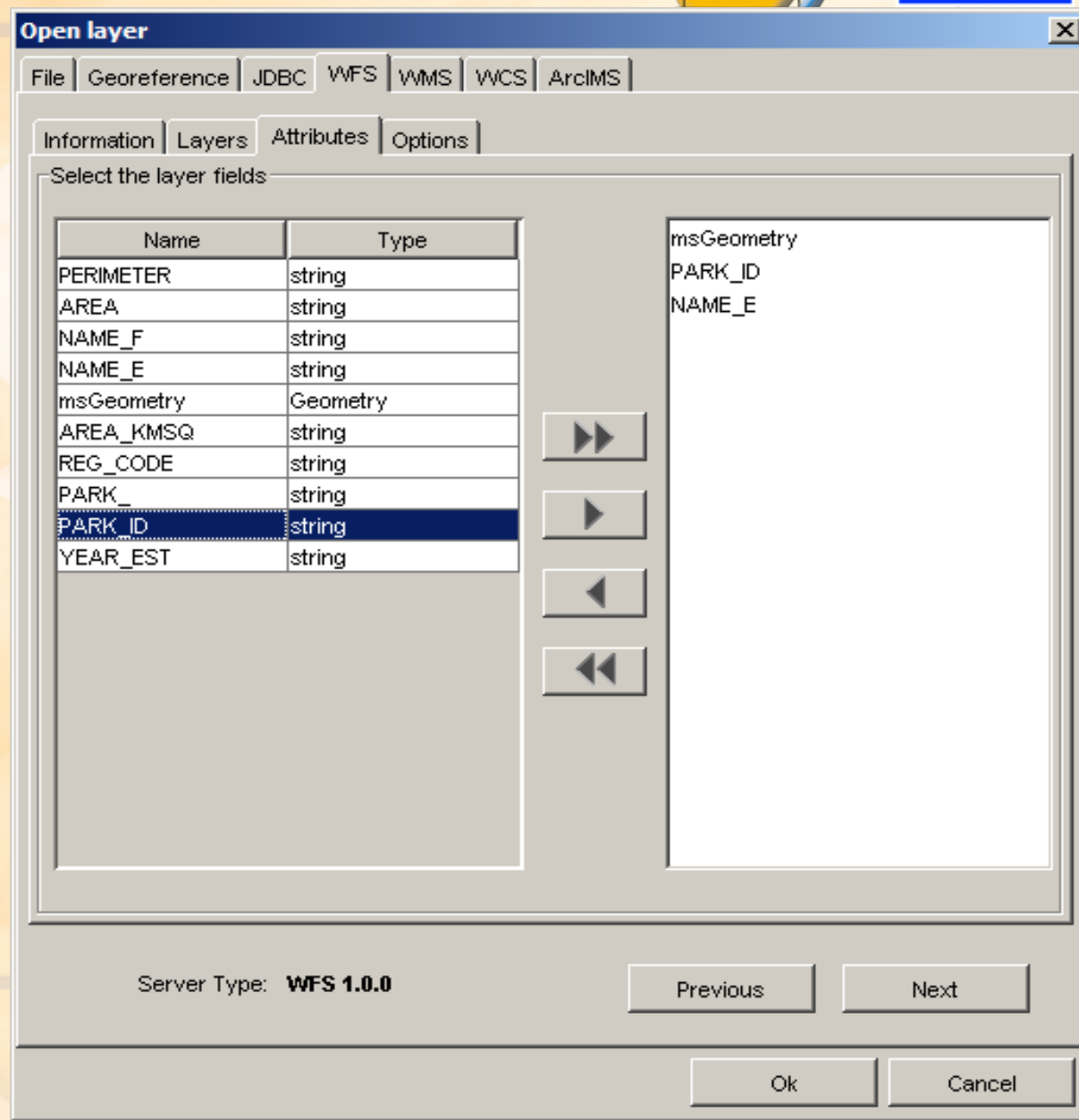


Example: GUI for WMS access



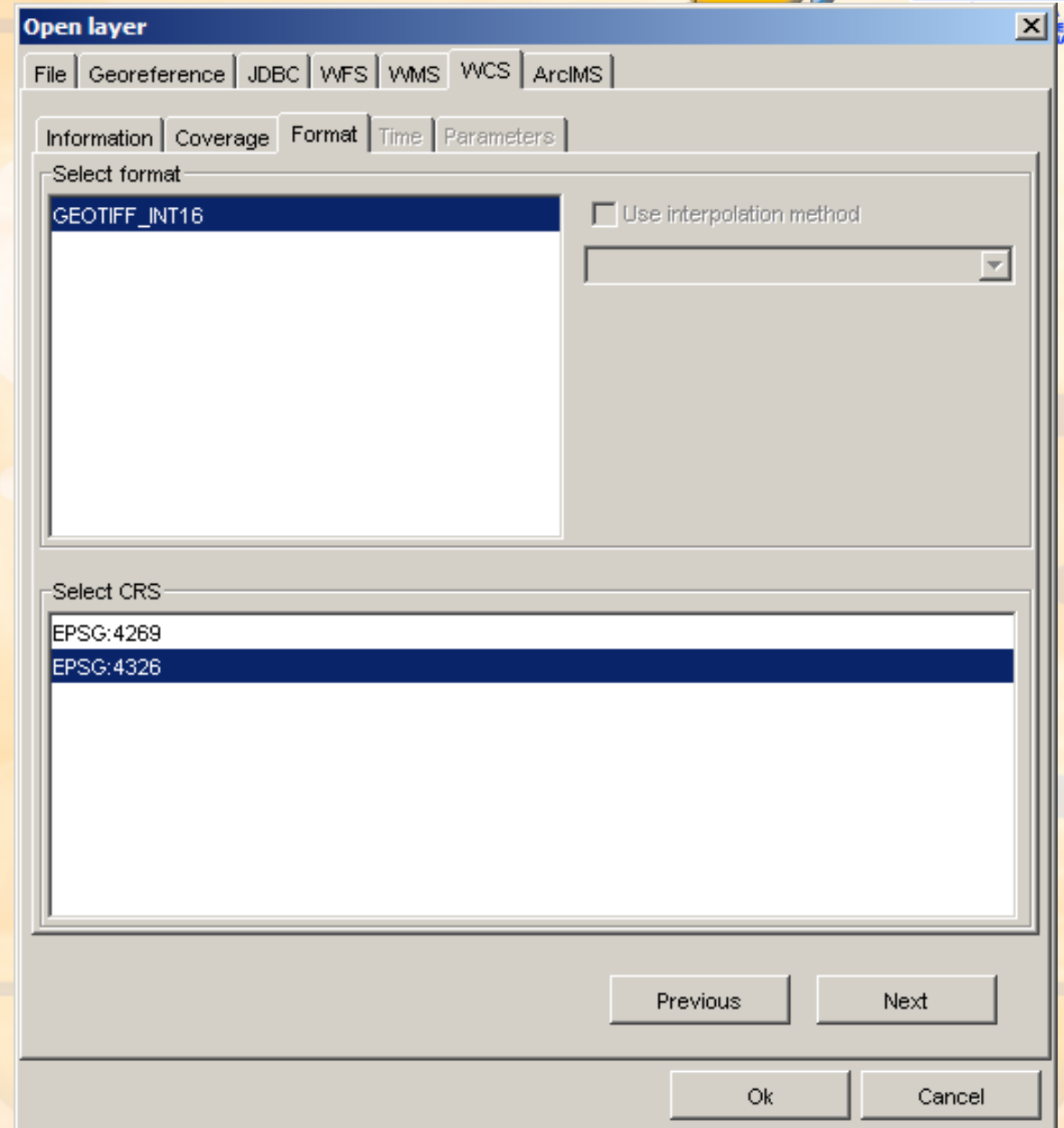


Example: GUI for WFS access



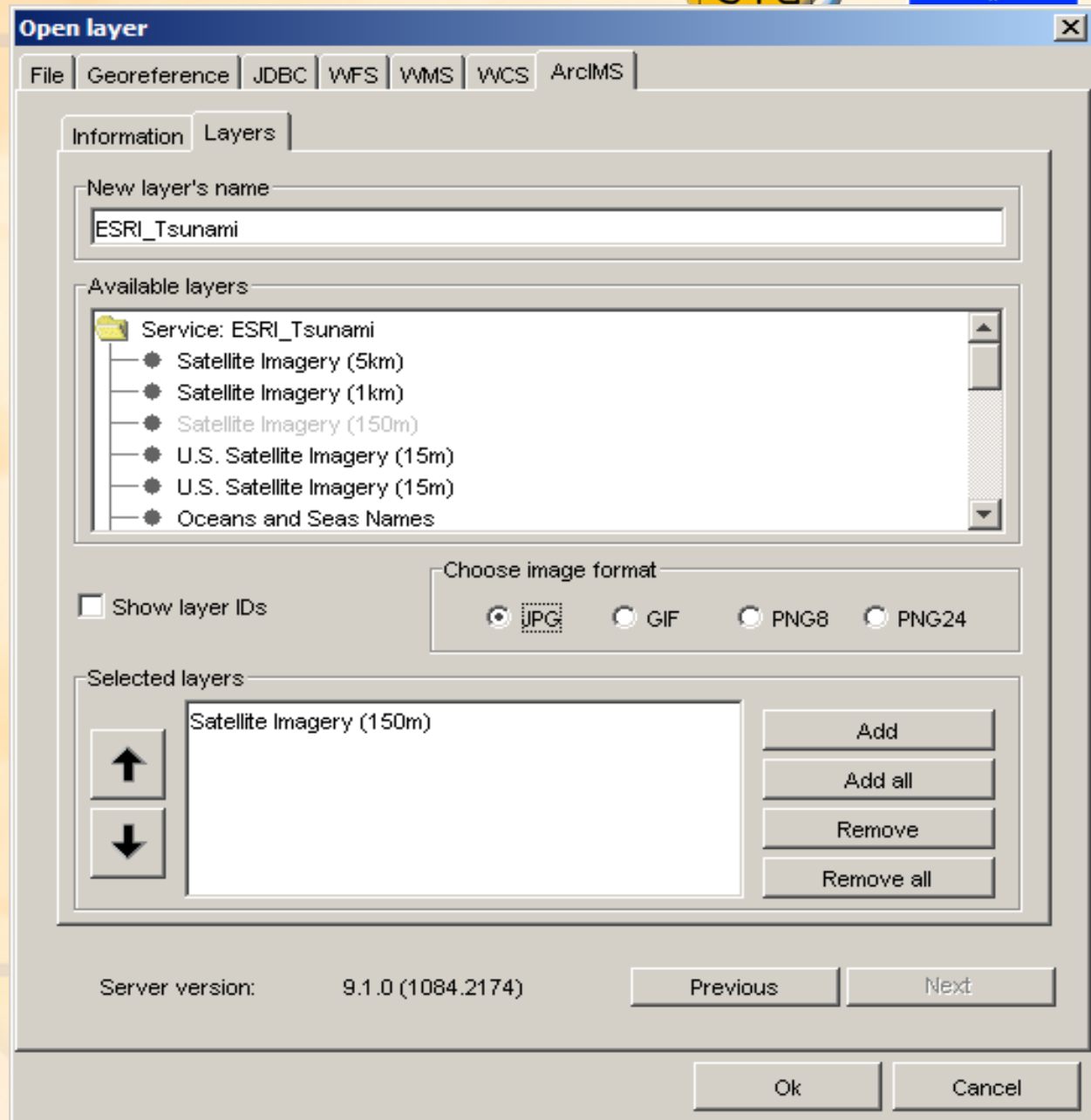


Example: GUI for WCS access



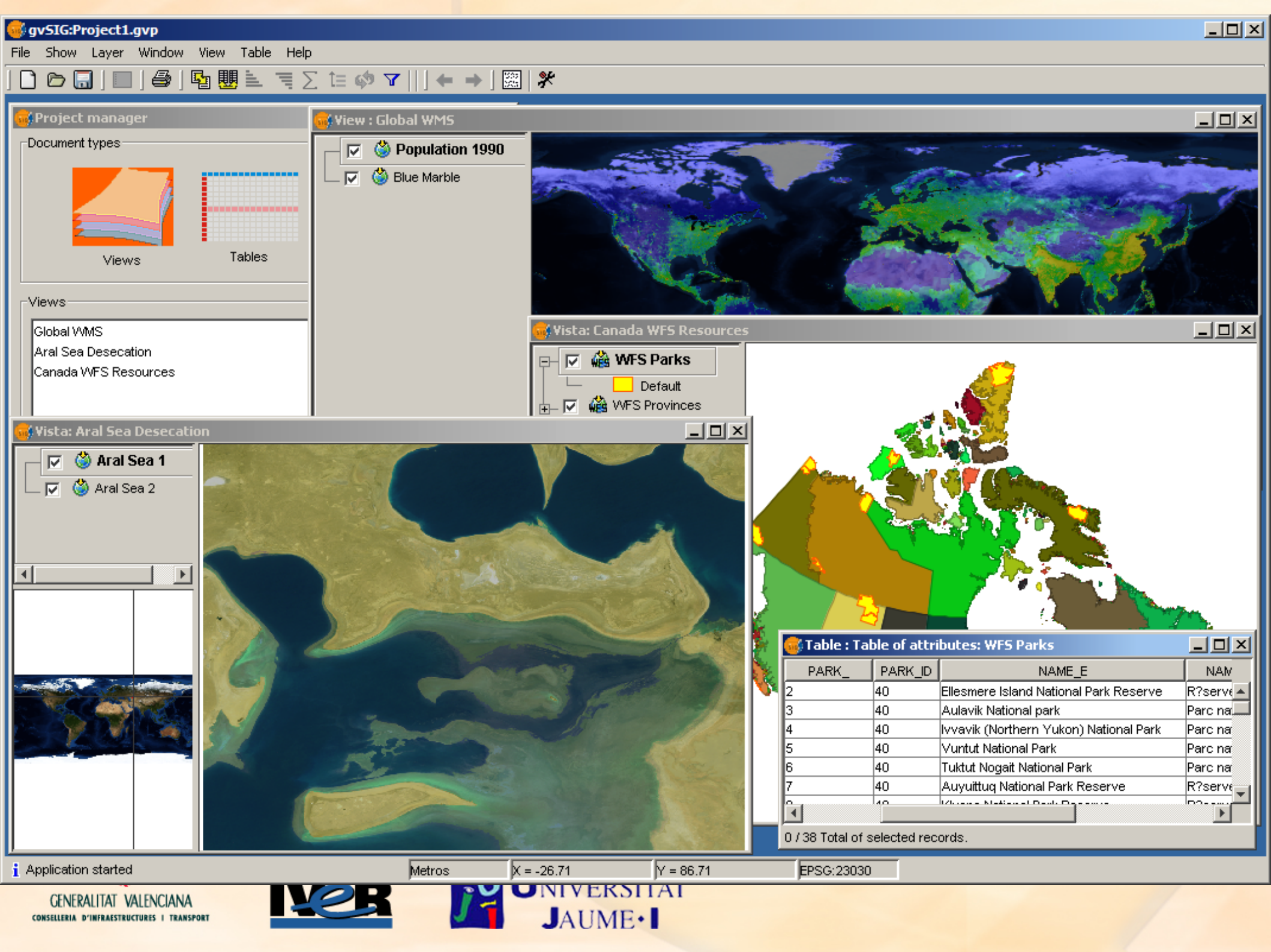


Example: ArcIMS access





Examples: Integration of remote WMS, WFS,
WCS services from different servers/catalogs
and local sources



Project manager

Document types

Views Tables

Views

- Global WMS
- Aral Sea Desecation
- Canada WFS Resources

View : Global WMS

- Population 1990
- Blue Marble

Vista: Canada WFS Resources

- WFS Parks
 - Default
- WFS Provinces

Vista: Aral Sea Desecation

- Aral Sea 1
- Aral Sea 2

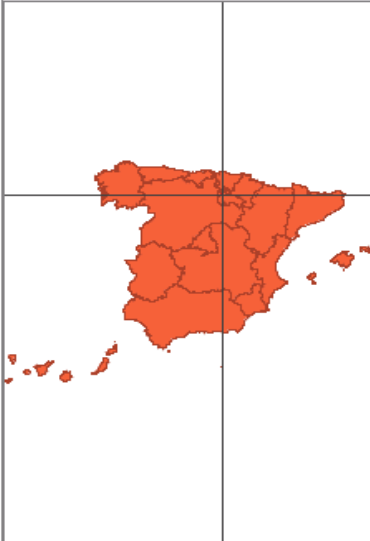
Table : Table of attributes: WFS Parks

PARK_	PARK_ID	NAME_E	NAM
2	40	Ellesmere Island National Park Reserve	R?serve
3	40	Aulavik National park	Parc na
4	40	Ivvavik (Northern Yukon) National Park	Parc na
5	40	Yuntut National Park	Parc na
6	40	Tuktut Nogait National Park	Parc na
7	40	Auyuittuq National Park Reserve	R?serve
8	40	Quttinipuk National Park Reserve	R?serve

0 / 38 Total of selected records.



- Catastro
 - Catastro
- IDE:La Rioja
 - Ortofoto_2004
- IDENA - IDE de Navarra
 - Ortofoto Color 1/1.000
 - Red de carreteras
 - Zonificacion Navarra 200
- IDEE-Base
 - Todas las capas



Example: Gazetteer Search

gvSIG:Proyecto1.gvp
File Show Window View vista capa Help

View : Untitled - 3

Finding by Gazetteer [http://middleware.alexandria.ucsb.edu:8080/gaz/adlgaz/dispat...]

Name
 Restrict search area

Agreement
 Exact sentence
 Any word
 Every word

Type

- hydrographic features
 - aquifers
 - bays
 - channels
 - deltas
 - drainage basins
 - estuaries

Coordinates
 Upper
 ULX: ULY:
 Lower
 BRX: BRY:

contain

Aspect setup
 Go to the place
 Remove old searches
 Draw result

Results per page

Intelligent search
 All word forms

Search Cancel Last Close





Example: Catalog Search

Geodata search [193.43.36.137:2100]

Title
water Africa Restrict search area

Search results

Last Results: 1 of 317 Next

[Inland water bodies in Africa](#)

Abstract: Shapefile of inland water bodies in Africa. This dataset originates from the Digital Chart of the World 1:1000000, 1998. The waterbodies for Africa have been characterized (as lake, lagoon, reservoir etc.) and named

Available Resources

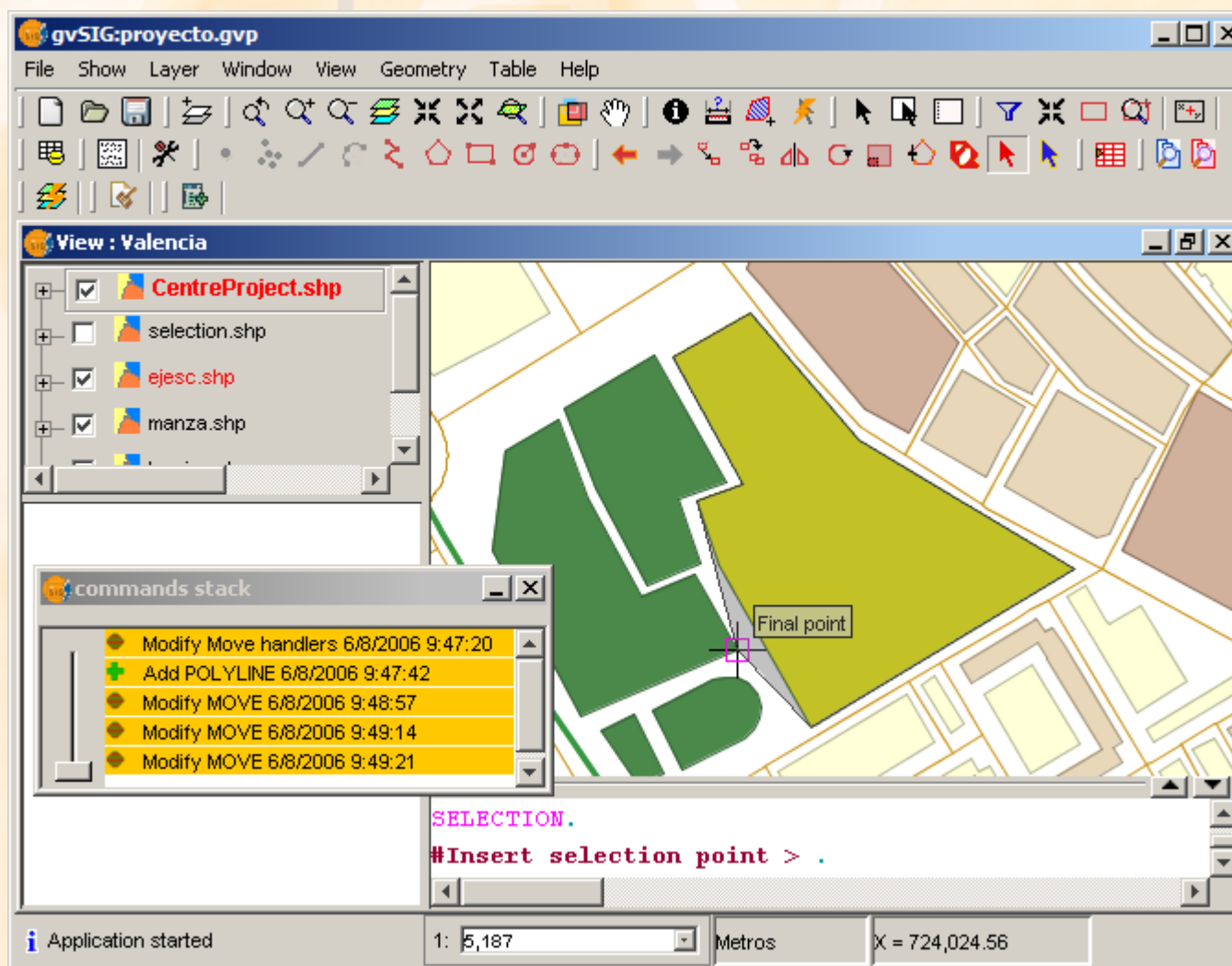
Type	Link	Show
WWW:LINK-1.0-http--link	http://www.fao.org/ag/AGL/aglw/aq...	Web Site
WWW:LINK-1.0-http--link	http://www.fao.org/geonetwork	Web Site
WWW:DOWNLOAD-1.0-http--downl...	http://www.fao.org:80/geonetwork/...	Download
OGC:WMS-1.1.1-http-get-map	http://193.43.36.137/ows/281	Map

Close

Description Add Layer Close



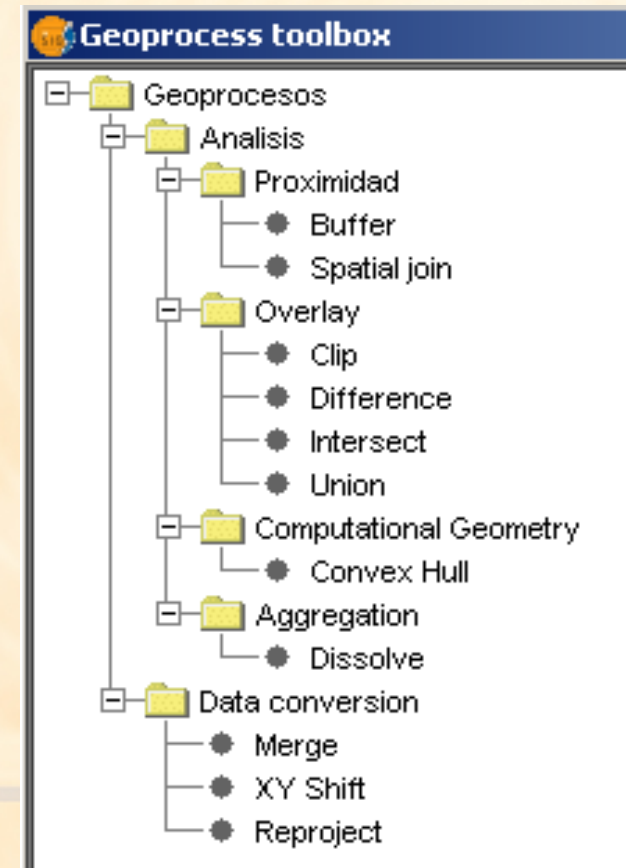
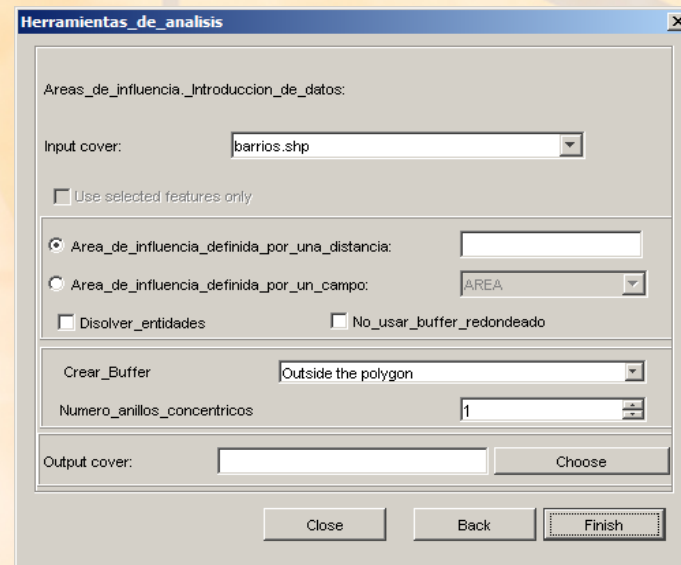
gvSIG 1.0: Editing





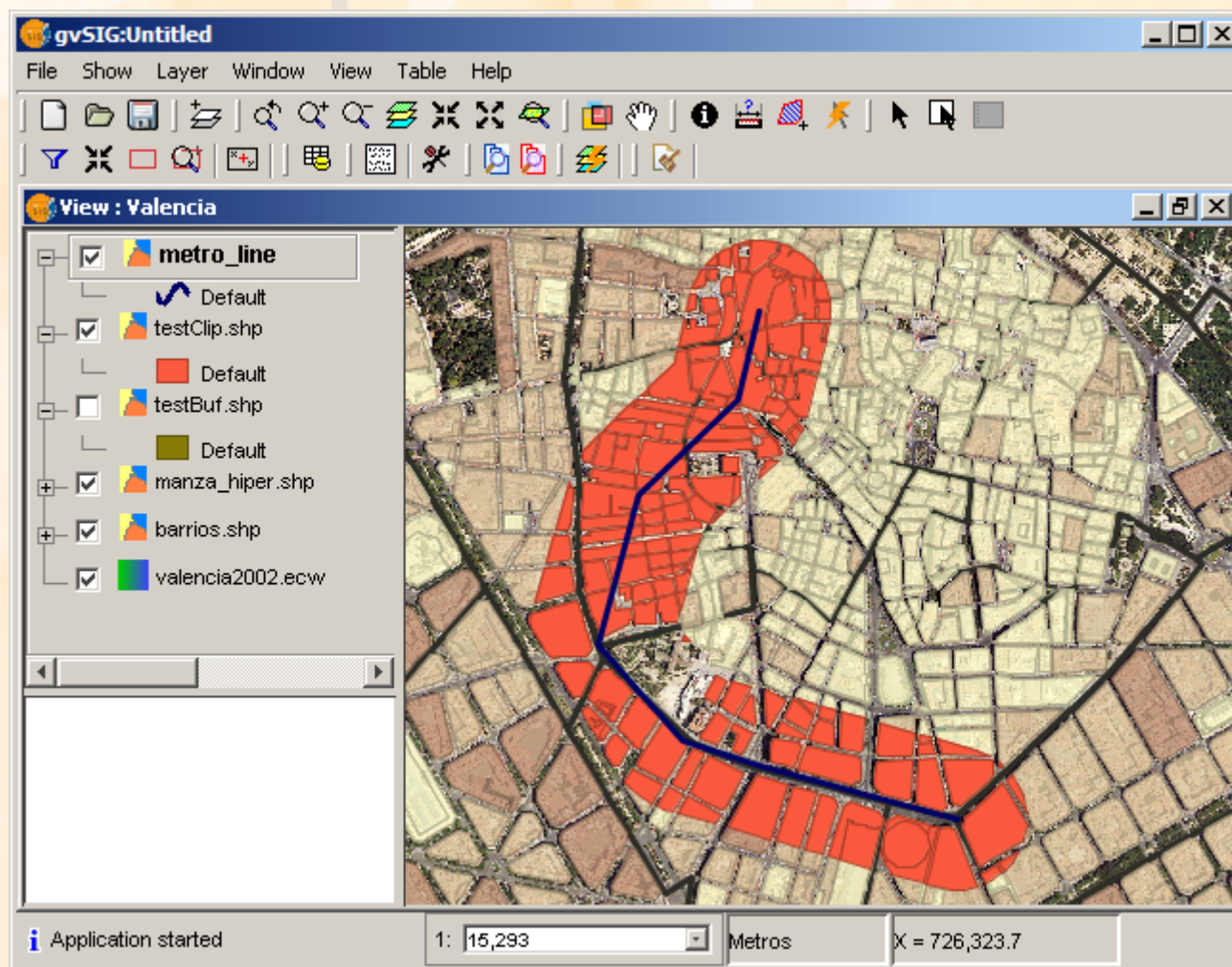
gvSIG 1.0

- Geoprocessing
 - Extensible framework
 - Vector processing operators

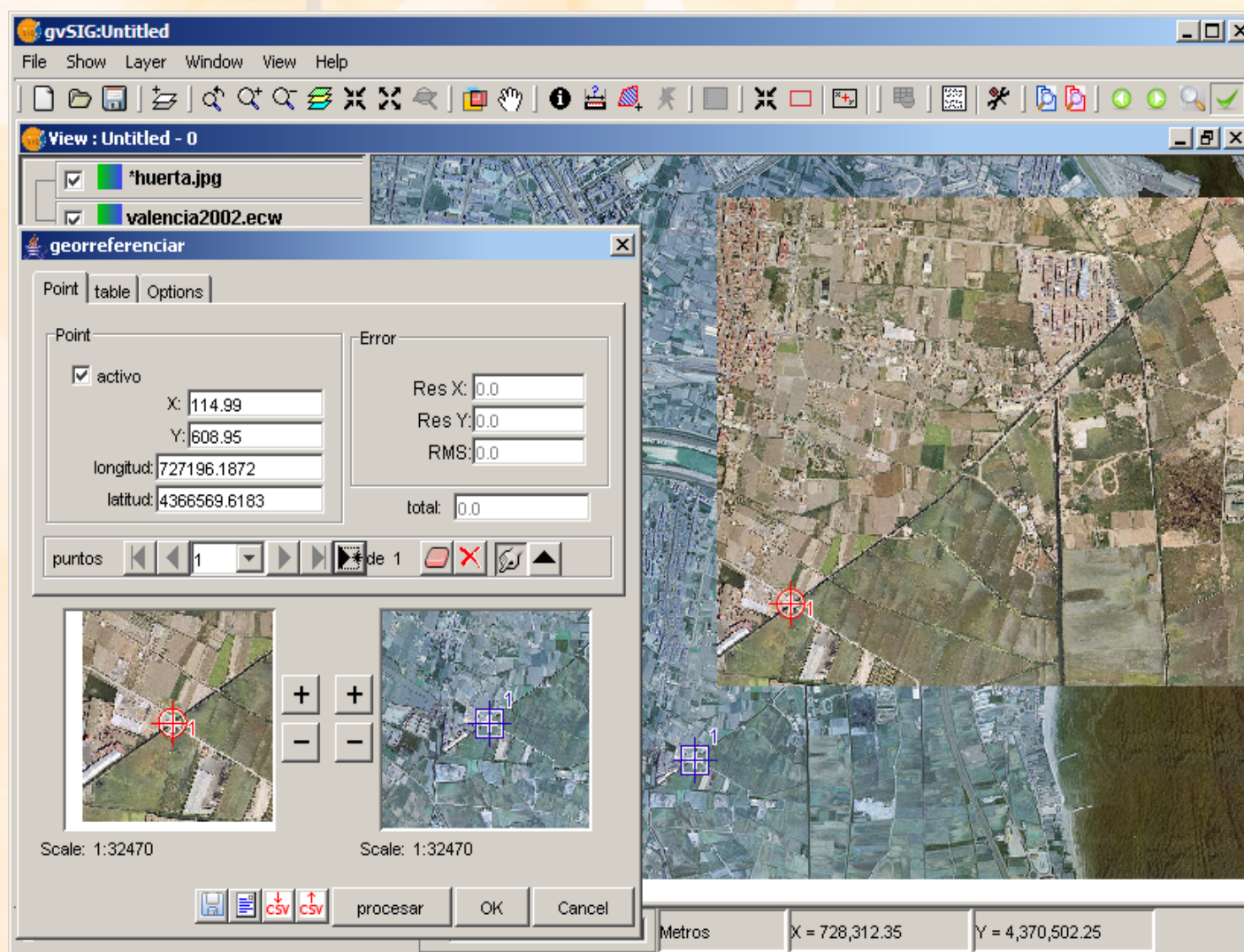




gvSIG 1.0: Geoprocessing



gvSIG 1.0: Image georeferencing



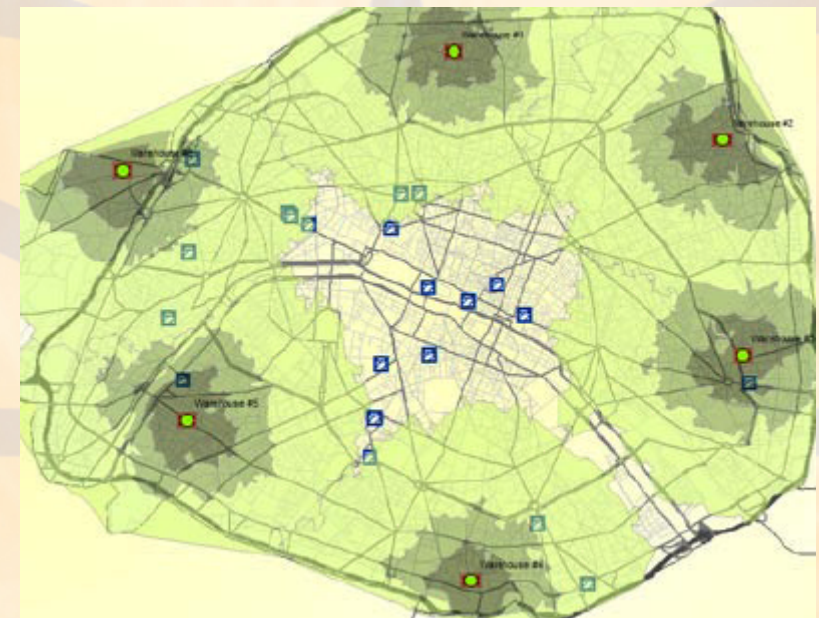


After 1.0: Development roadmap

- Most basic functions covered with 1.0
- gvSIG becoming platform for specialized users:
 - Core enhancements: symbology, labeling
 - Network and topology analysis
 - Raster analysis
 - 3D and temporal GIS
 - **SDI authoring: OGC service publishing**

After 1.0: Network analysis

- Network generation and topology tools
- Optimal path calculation
- Service areas
- Optimal spanning tree
- Upstream and downstream event analysis



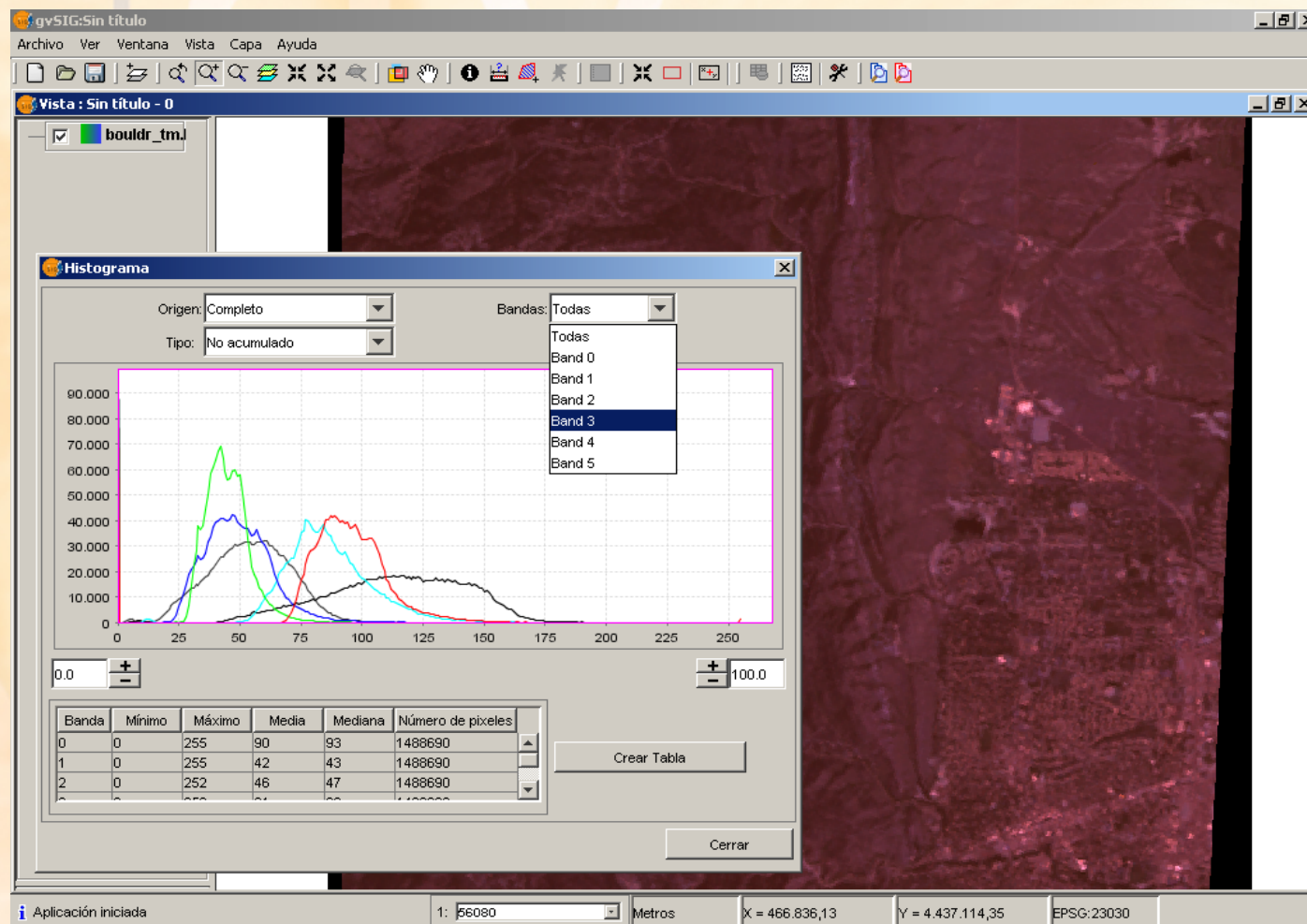


After 1.0: Raster analysis

- More I/O formats and options (e.g. by band)
- Accurate raster reprojection
- Histogram view and correction
- Mosaicing and fusion tools
- Filters
- Classification and vectorization
- Spatial analysis geoprocesses
- Surface interpolation and analysis

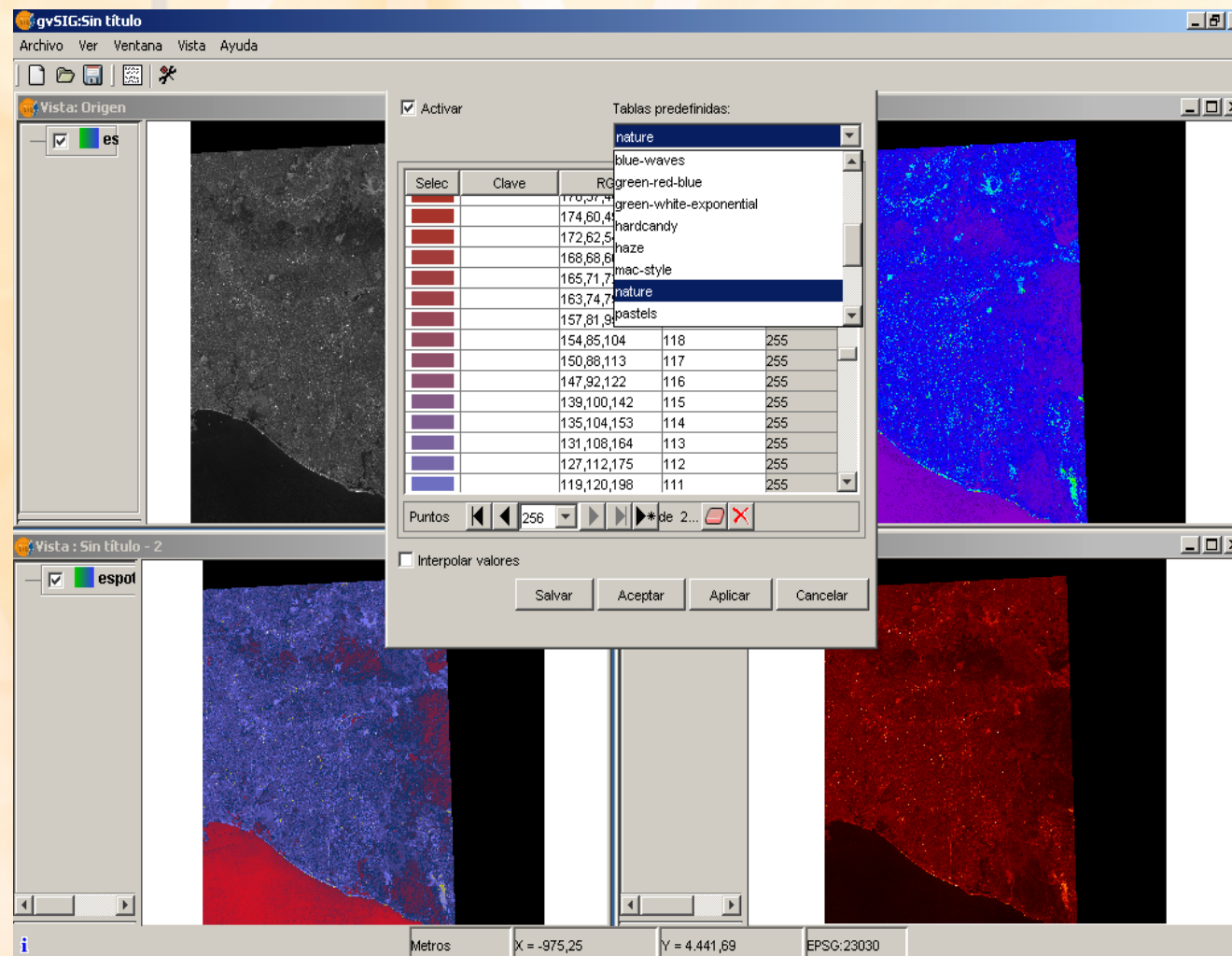
After 1.0: Raster analysis

Histogram View



After 1.0: Raster analysis

Look-up
Tables





After 1.0: Raster analysis

mtdjerte.asc

Parámetros Salida Raster Ayuda

Capas Raster

MDT mtdjerte.asc

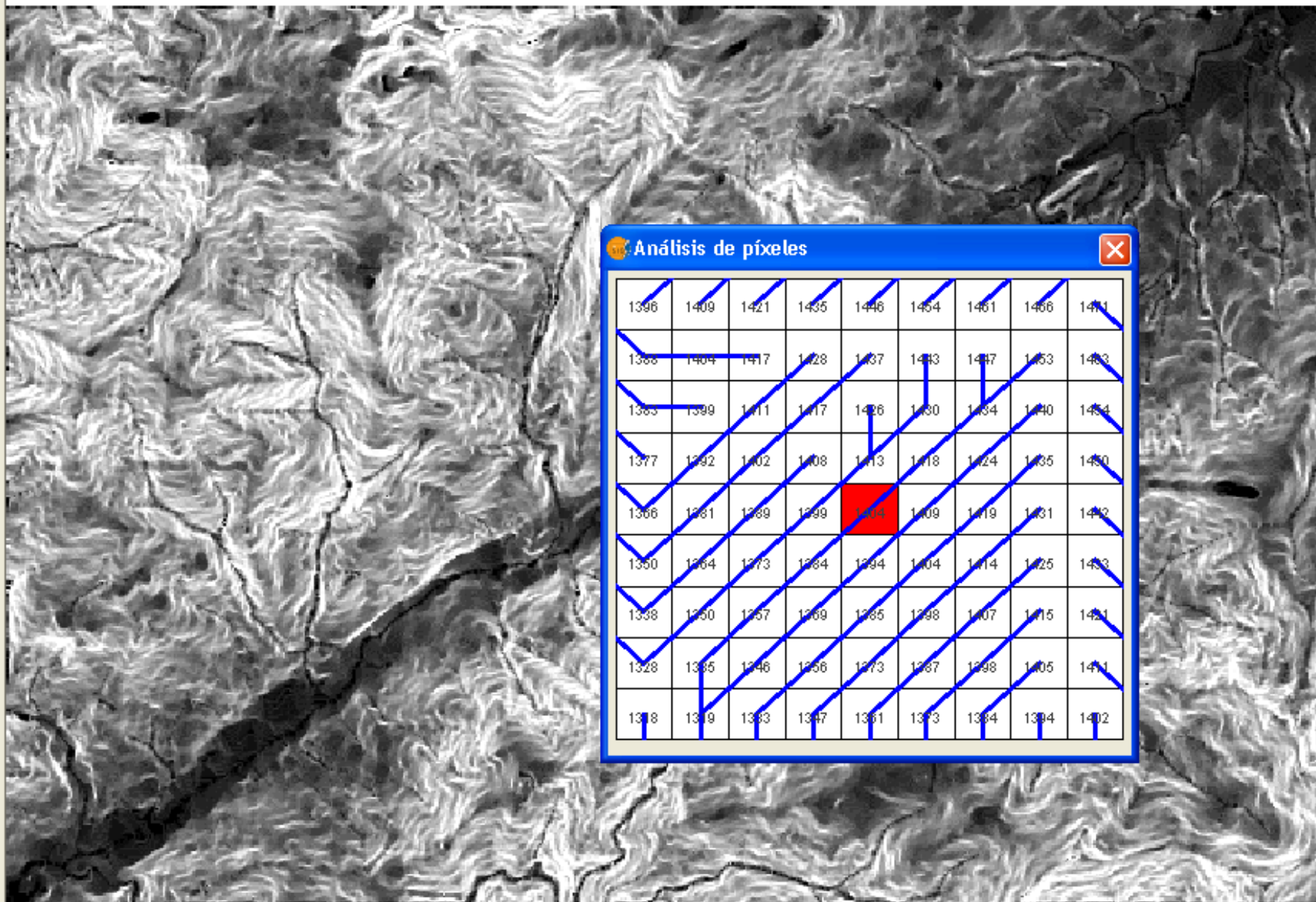
Opciones

Método Máxima Pendiente (Travis et al. 1975)

Aceptar Cancelar

After 1.0: Raster analysis

- Pendiente
- mdtjerte.asc



Análisis de píxeles

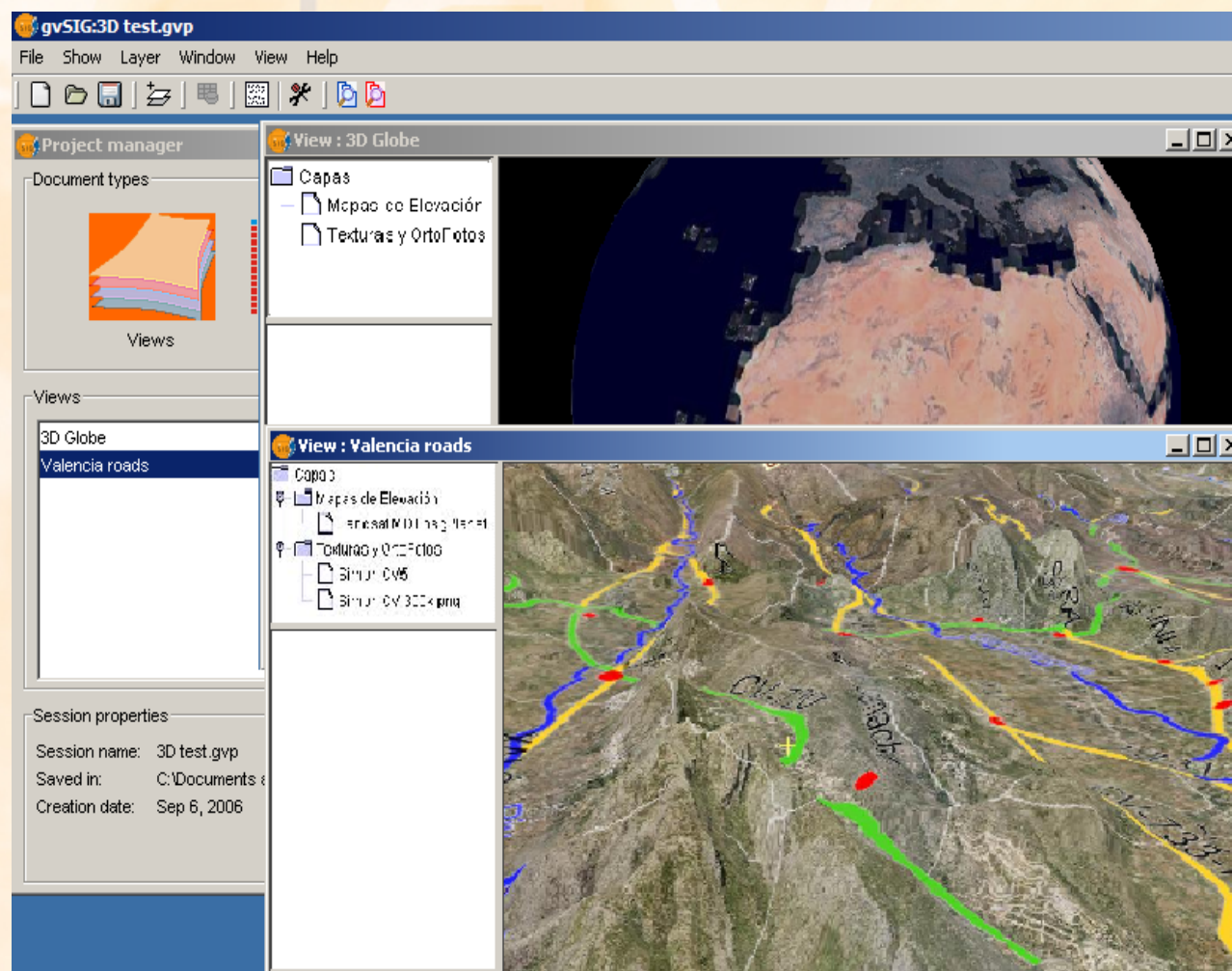
1396	1409	1421	1435	1446	1454	1461	1466	1471	
1388	1404	1417	1428	1437	1443	1447	1453	1458	
1385	1399	1411	1417	1426	1430	1434	1440	1454	
1377	1392	1402	1408	1413	1418	1424	1435	1450	
1366	1381	1389	1399	1404	1409	1419	1431	1452	
1350	1364	1373	1384	1394	1404	1414	1425	1453	
1338	1350	1357	1369	1385	1398	1407	1415	1421	
1328	1335	1346	1356	1373	1387	1398	1405	1411	
1318	1319	1333	1347	1361	1373	1384	1394	1402	



After 1.0: 3D and Temporal GIS

- 3D visualization of large datasets (raster, TIN, vector and 3D objects), in global and Cartesian views
- GIS functionality on 3D view: symbology, analysis
- View and layer animation
- Temporal data
 - Time series
 - Multidimensional data (NetCDF)
 - Dimension parameter in OGC services
- 3D and temporal geoprocesses

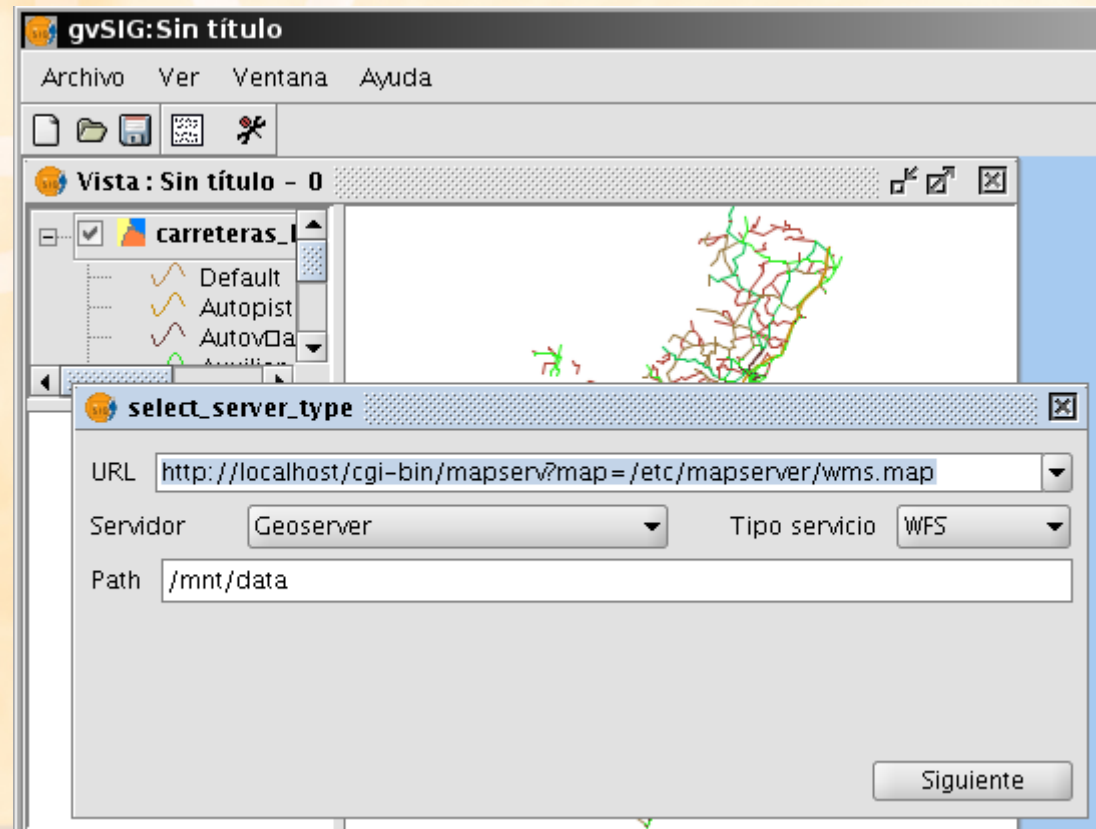
After 1.0: 3D and Temporal GIS





After 1.0: SDI authoring

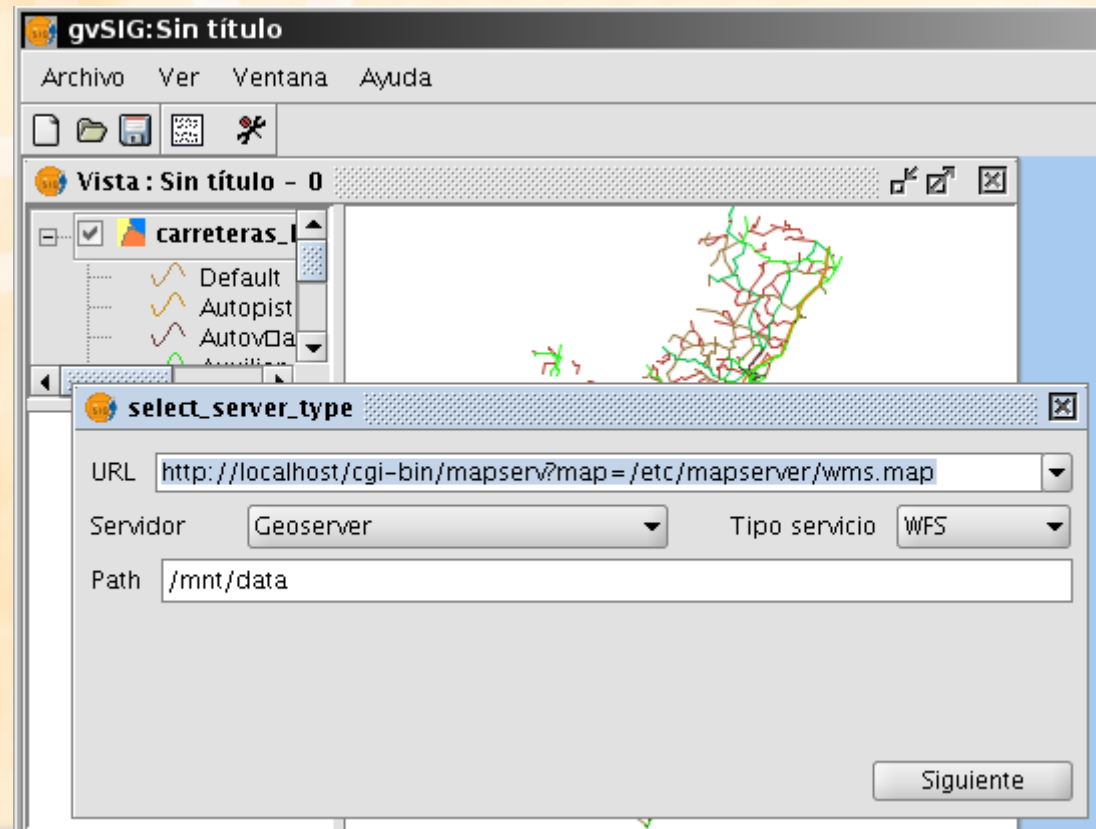
- Export of gvSIG Views to WMS services
- Export gvSIG layers to WFS, WCS
- Support for multiple FOSS Servers
- Integrated metadata discovery and editing tools





After 1.0: SDI authoring

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gvSIG Community

- **Main users:**
 - **Government agencies:** Instituto Geográfico Nacional, Ministerio de Fomento, Instituto de Estadística de Valencia
 - **Companies:** Hidroven (Water company of Venezuela)
 - **International agencies:** UN, FAO, UNSDI
 - **Regional Governments:** Valencia, Castilla-La Mancha, Extremadura, País Vasco
 - **Cities:** Valencia, Teruel, Ronda, Getafe...
 - **Universities:** Politécnica de Madrid, Patagonia, Castilla la Mancha, Jaime I de Castellón...





The gvSIG Community

Diverse: companies, public admin, universities, individuals

International: France, Portugal, Switzerland, Czech Rep., Venezuela, Cuba, Brasil, China, ...

Three community fora recently created:

434 subscribers on users list

266 subscribers on developer list

104 subscribers on international list

Two user meetings (2005, 2006)



New community actions:

E-Learning materials

External quality control

Software and installation documentation

Internationalization (Chinese under way)

¿gvSIG Foundation?



LIVE DEMOS



Future actions:

Closer involvement in OGC

Interoperability Experiment, to stress-test WFS
(collaboration with JRC?)

Collaboration with FAO (GeoNetwork) and the
rest of the UN family

Attention to IDABC <http://europa.eu.int/idabc/>

Participation in OsGeo initiative



Reflections

Thick client-based SDI is more interesting for advanced users of GI, than a geoportal

Technological Independence (European, national, regional)

- Invest in people, not licenses

Huge potential “multiplier-effect”

- Creates a community of collaborators

Freely accessible reference implementation
-not a black box solution



Proposal

JRC: download and test gvSIG!

Promote gvSIG as an open reference implementation of ESDI thick client

Possible JRC collaboration in future versions

Possible versions supporting JRC's project needs (flooding, Natura2000, etc.)

Framework contract(s) with key actors of gvSIG project



Thanks for your attention



www.gvsig.gva.es

www.gvsig.com