

Seminar

QGIS: A Free and Open Source Geographic Information System

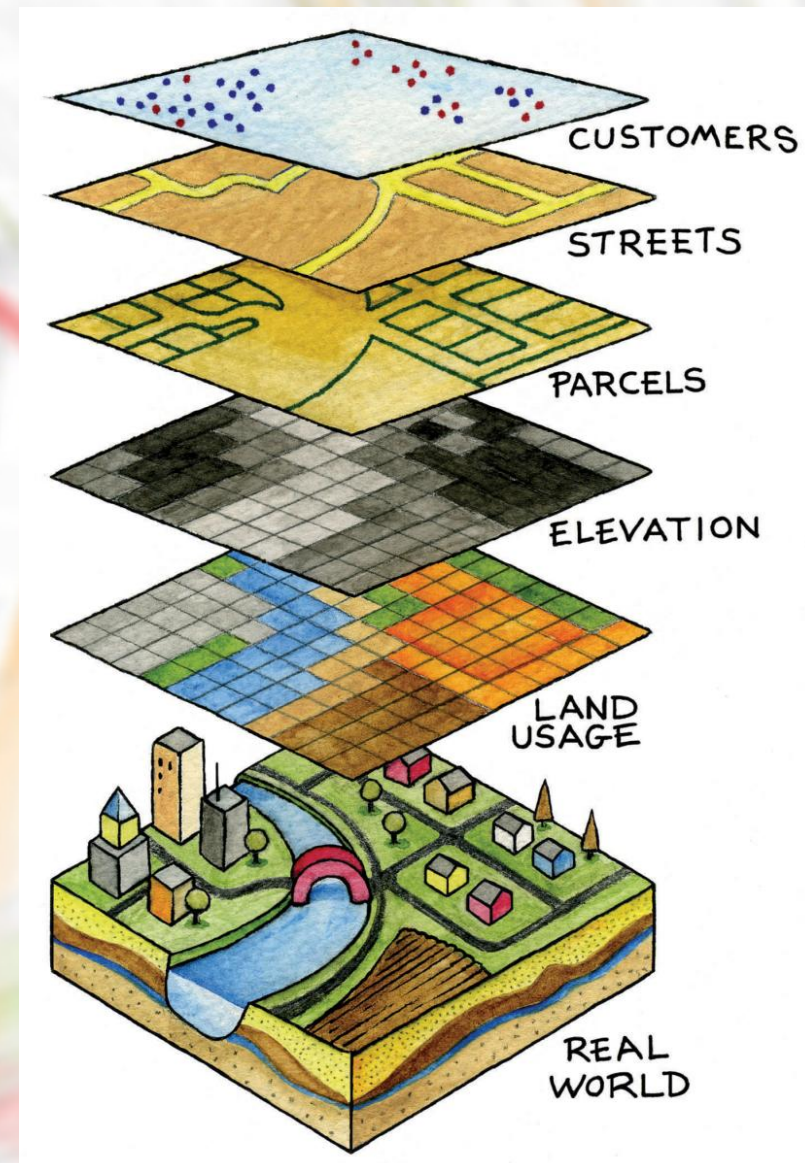
Giuseppe Sucameli

g.sucameli@gmail.com

Free software and open-source enthusiast,
QGIS core developer

What is GIS?

- “Set of tools for collecting, storing, retrieving at will, transforming and displaying spatial data from the real world for a particular set of purposes” (Burrough, 1986)
- “A computer based system that provides four sets of capabilities to handle geo-referenced data: data input, data management (data storage and retrieval), manipulation and analysis, data output.” (Arnoff, 1989)
- “Database systems in which most of the data are spatially indexed, and upon which a set of procedures are operated in order to answer queries about spatial entities in the database”



Advantages of GIS

- Improve Organizational Integration

GIS integrates hardware, software, and data for capturing, managing, analyzing, and displaying all forms of geographically referenced information.

- Better decision making

A GIS helps you answer questions and solve problems by looking at your data in a way that is quickly understood and easily shared.

- Visual analysis

GIS allows us to view, understand, question, interpret, and visualize data in many ways that reveal relationships, patterns, and trends in the form of maps, globes, reports, and charts

- Integration with EIS

GIS technology can be integrated into any enterprise information system framework.

- More employment opportunity

Components of GIS

- Hardware

It consists of the computer system on which the GIS software will run.

- Software

GIS software provides the functions and tools needed to store, analyze, and display geographic information.

- People

GIS users range from technical specialists who design and maintain the system to those who use it to help them perform their everyday work.

- Data

Geographic data and related tabular data can be collected in-house or purchased from a commercial data provider.

- Method

GIS operates according to a well-designed plan and business rules, which are the models and operating practices unique to each organization.

GFOSS

- Desktop GIS

QGIS, GRASS GIS, gvSIG, OpenJUMP, uDig, SAGA GIS

- Web map servers

GeoServer, Mapnik, MapServer

- Framework and libraries

Web: OpenLayers, Leafletjs

Non-Web: GDAL/OGR, GeoTools, Orfeo toolbox

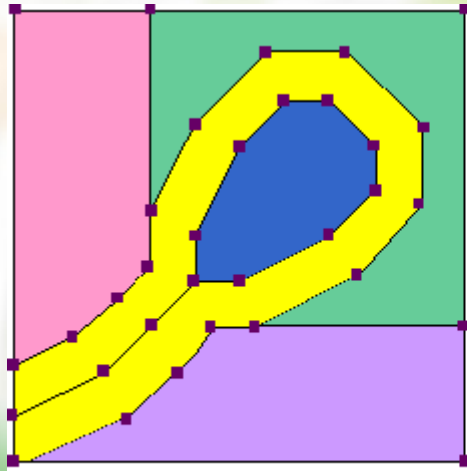
- Spatial DBMS

PostGIS, SpatiaLite

Data types

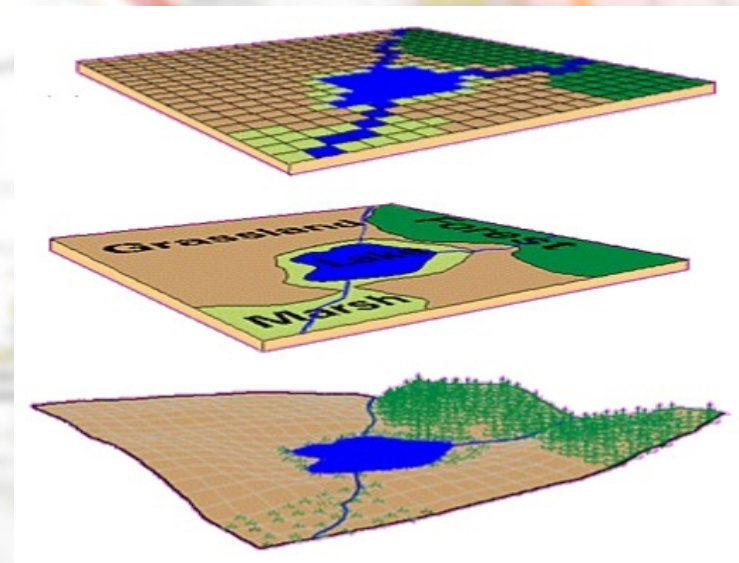
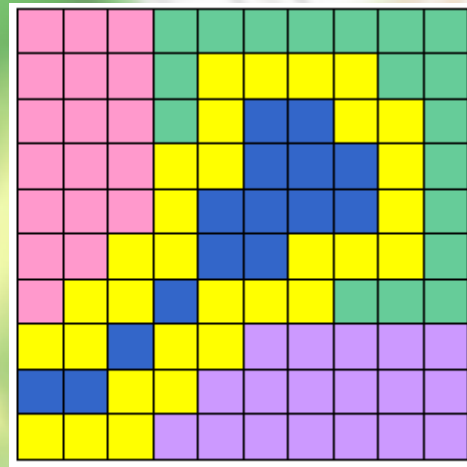
Vector

Points
Lines
Polygons



Raster

Cell
Pixel
Elements



Raster
Model

Vector
Model

Real
World

QGIS

qgis.org



A **GIS desktop** application

Create, edit, visualise, analyse and publish geospatial information



A **GIS server** application

Make your maps available through web



Open Source and **multiplatform** software

Windows, Mac, Linux, BSD (Android coming soon)



An official **OSGeo** project



QGIS Technologies



It's developed using **QT/C++ framework**

<http://www.qt.org>



It can be easily extended through **Python plugins**

http://docs.qgis.org/2.14/en/docs/pyqgis_developer_cookbook/



It uses the best of **GFOSS libraries**:

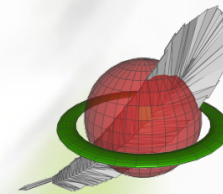


GRASS

PROJ.4



Orfeo Toolbox

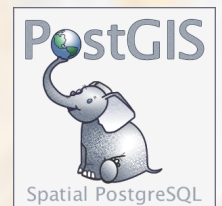


Spatialite



SAGA GIS

MAPSERVER



QGIS Datasources

- File based

Shapefiles, GeoTIFFs, GML, KML, ...

Alaska - sample data

- Database

SQLite/Spatialite

PostgreSQL/PostGIS

MSSQL spatial

Oracle spatial

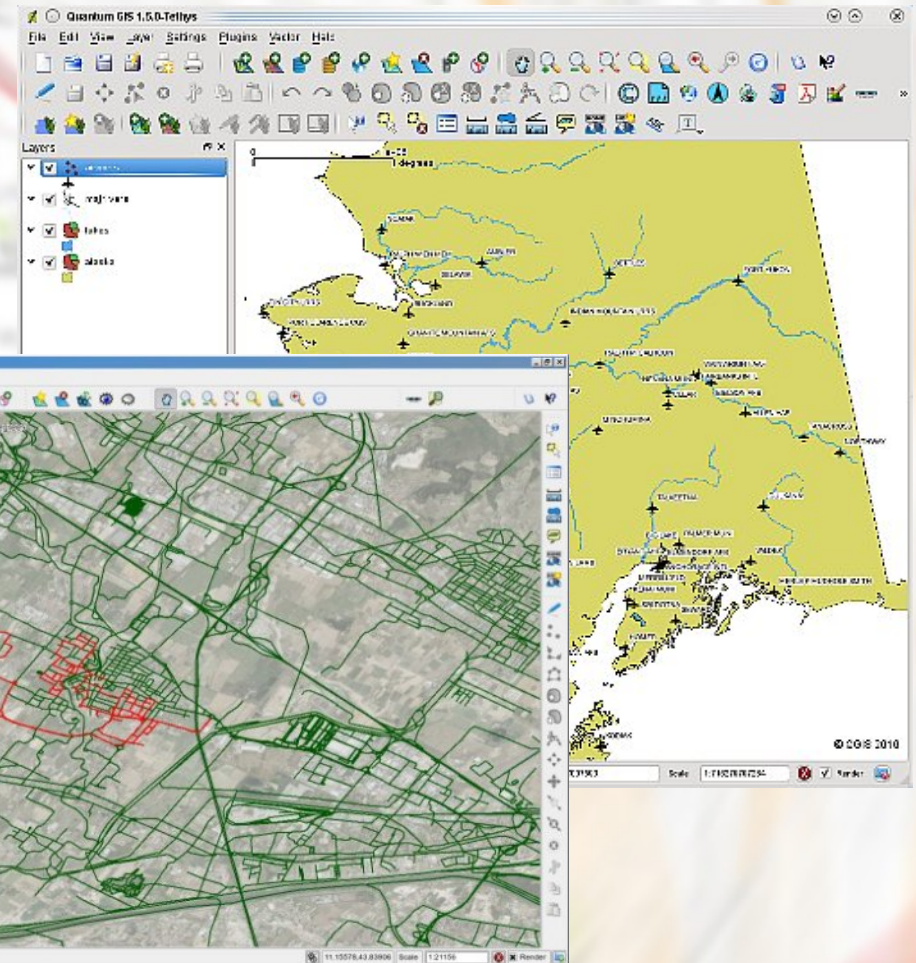
- Web services (OGC)

WMS (Maps)

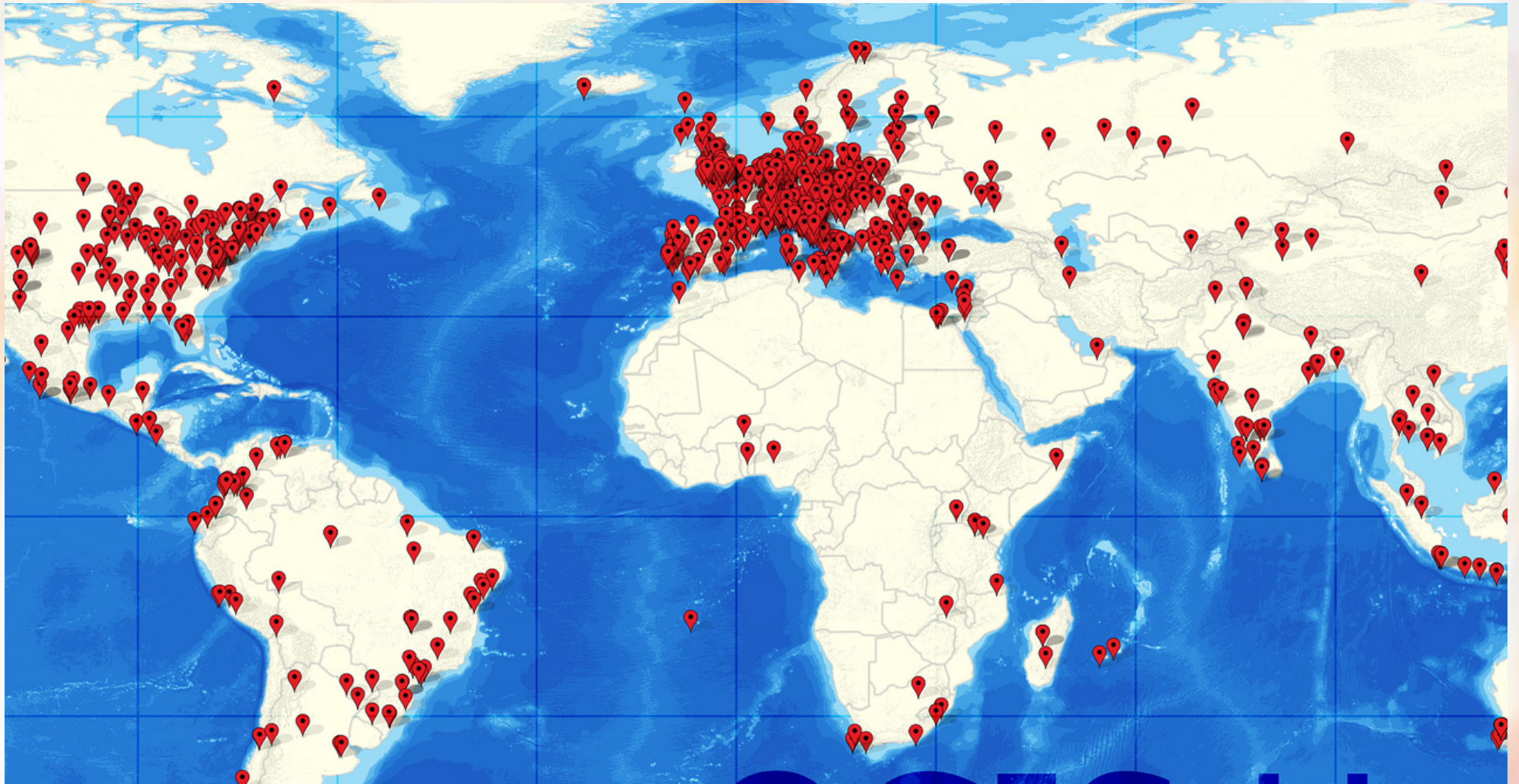
WFS (Features)

WCS (Catalogs)

OSM data



QGIS users in the World!



QGIS Live session



QGIS Resources



Main site: <http://www.qgis.org/>



Code repository: <http://github.com/qgis>



Plugin site: <http://plugins.qgis.org/>



Tracker site: <http://hub.qgis.org/>



Documentation site: <http://doc.qgis.org/>

Useful links to get free/open GIS data

<http://www.naturalearthdata.com/downloads/>

<https://open.wien.gv.at/site/datenkatalog/>

<http://earthquake.usgs.gov>

<https://www.gaia-gis.it/spatialite-2.3.1/resources.html>

<https://www1.nyc.gov/site/planning/data-maps/open-data.page>

<https://freegisdata.rtwilson.com/>

Questions?



“May the FOSS be with you!”

Licensed under the terms of Creative Commons CC-BY-NC