Seminar

GIS and QGIS

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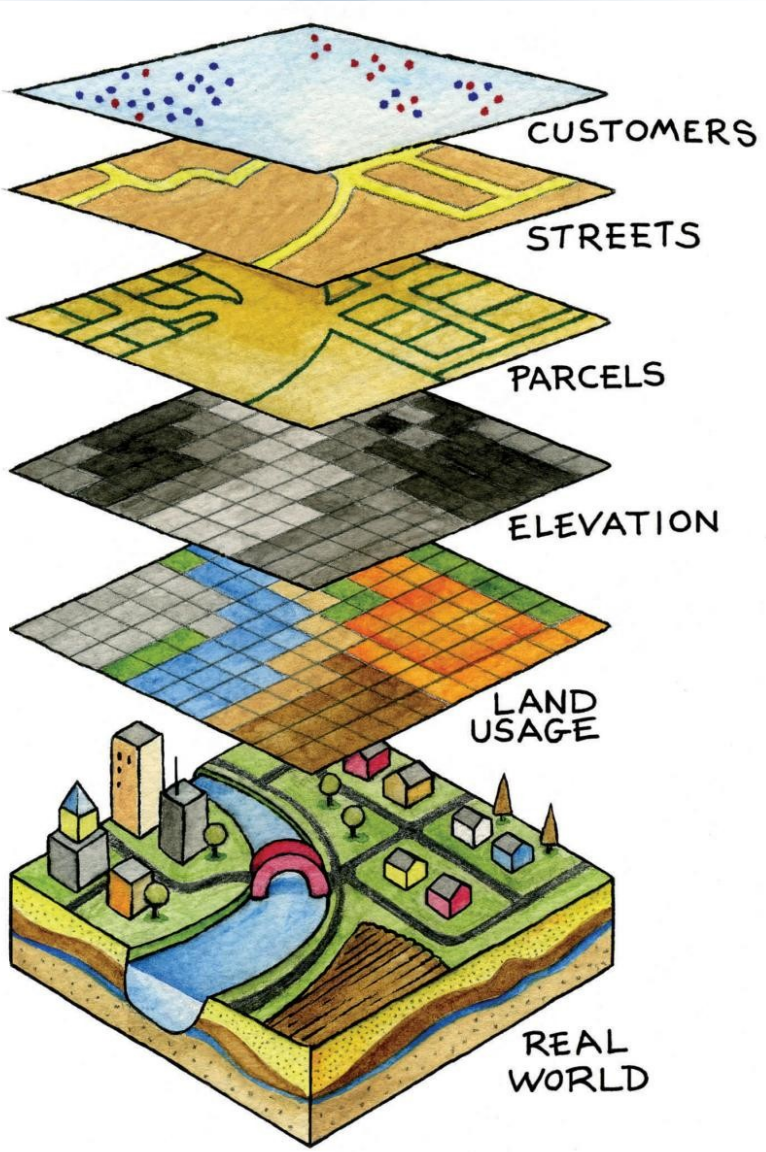
What is GIS?

- “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, GeoTools, Orfeo toolbox

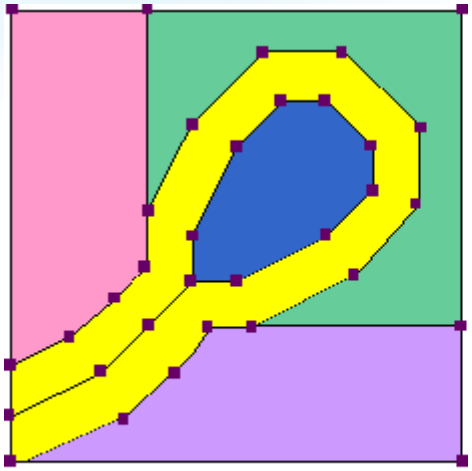
- Spatial DBMS

  PostGIS, SpatiaLite

Data types

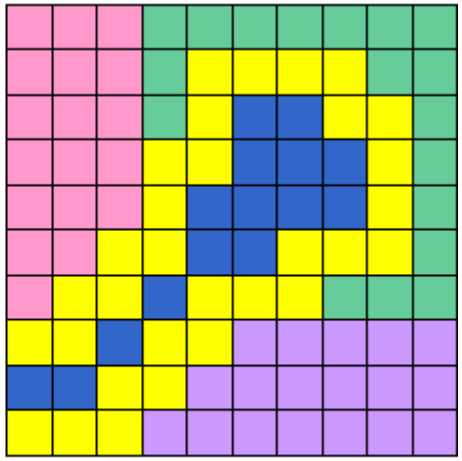
Vector

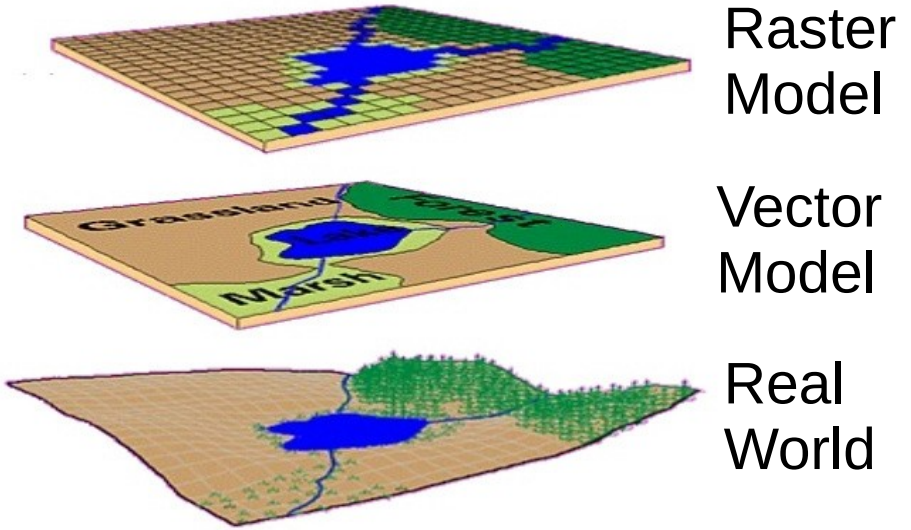
- Points
- Lines
- Polygons



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

Open Source and **multiplatform** software

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

An official **OSGeo** project

OSGeo
Your Open Source Compass

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/2.12/en/docs/pyqgis_developer_cookbook/

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

GDAL

GRASS

PROJ.4

MapServer

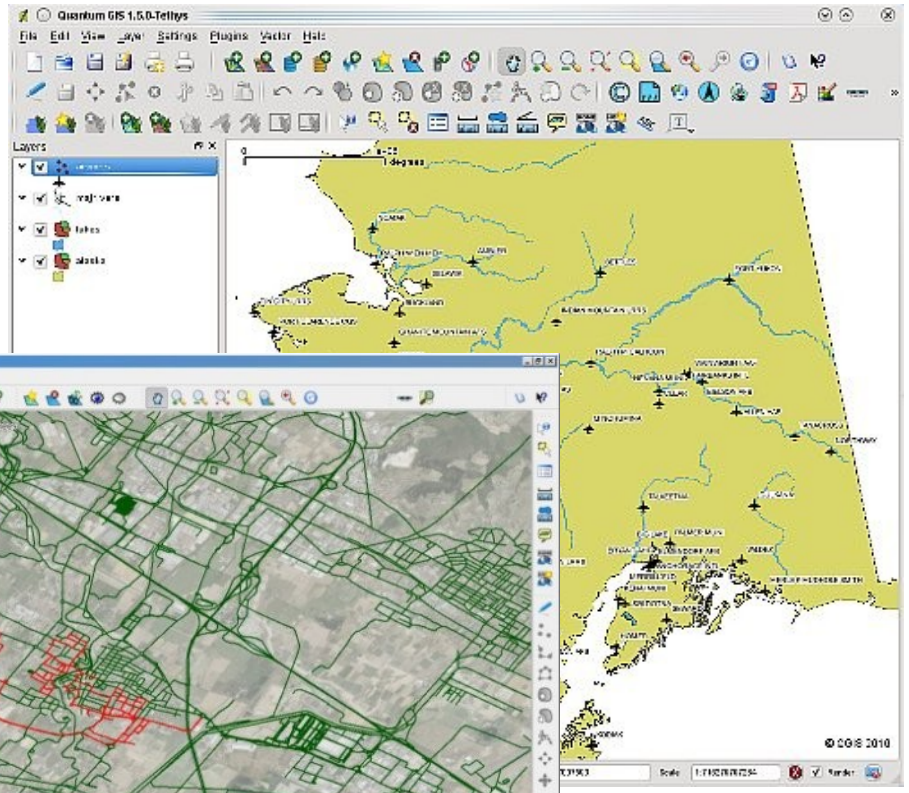
Spatialite

PostGIS
Spatial PostgreSQL

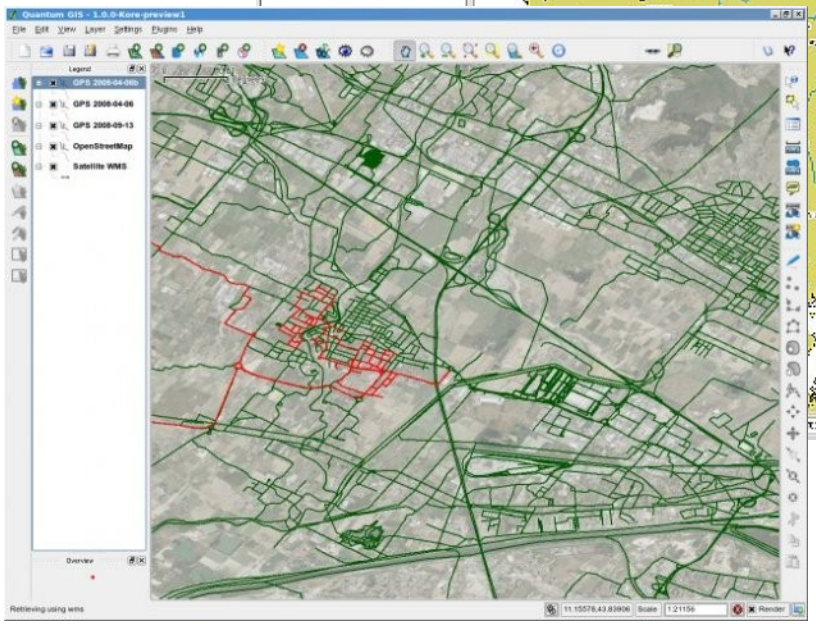
QGIS Datasources

- File based
  - Shapefiles, GeoTIFFs, GML, KML, ...
- Database
  - SQLite/SpatiaLite
  - PostgreSQL/PostGIS
  - MSSQL spatial
  - Oracle spatial
- Web services (OGC)
  - WMS (Maps)
  - WFS (Features)
  - WCS (Catalogs)

Alaska - sample data



OSM data



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/

Questions?