



Introduction to QGIS Data Processing

Directorate of the Cultural Heritage
Registration and IT Section

Basic introduction to using GIS software

- Features
- Installation
- Launching & Sample Session
- Loading Steps
- Managing Data Source
- Working with vector data
- Working with raster data

Features

- View data

You can view and overlay vector and raster data in different formats and projections without conversion to an internal or common format. Supported formats include: • Spatially-enabled tables and views using PostGIS, SpatiaLite and MS SQL Spatial, Oracle Spatial, vector formats supported by the installed OGR library, including ESRI shapefiles, MapInfo, SDTS, GML and many more. See section Working with Vector Data. • Raster and imagery formats supported by the installed GDAL (Geospatial Data Abstraction Library) library, such as GeoTIFF, ERDAS IMG, ArcInfo ASCII GRID, JPEG, PNG and many more. See section Working with Raster Data. • GRASS raster and vector data from GRASS databases (location/mapset). See section GRASS GIS Integration. • Online spatial data served as OGC We

- Explore data and compose maps

You can compose maps and interactively explore spatial data with a friendly GUI. The many helpful tools available in the GUI include: • QGIS browser • On-the-fly reprojection • DB Manager • Map composer • Overview panel • Spatial bookmarks • Annotation tools • Identify/select features • Edit/view/search attributes • Data-defined feature labelling

- Create, edit, manage and export data

Digitizing tools for OGR-supported formats and GRASS vector layers • Ability to create and edit shapefiles and GRASS vector layers • Georeferencer plugin to geocode images • GPS tools to import and export GPX format, and convert other GPS formats to GPX or down/upload directly to a GPS unit (On Linux, usb: has been added to list of GPS devices.) • Support for visualizing and editing OpenStreetMap data • Ability to create spatial database tables from shapefiles with DB Manager plugin • Improved handling of spatial database tables • Tools for managing vector attribute tables • Option to save screenshots as georeferenced images • DXF-Export tool with enhanced capabilities to export styles and plugins to perform CAD-like functions

- Analyze data

You can perform spatial data analysis on spatial databases and other OGR- supported formats. QGIS currently offers vector analysis, sampling, geoprocessing, geometry and database management tools. You can also use the integrated GRASS tools, which include the complete GRASS functionality of more than 400 modules. (See section GRASS GIS Integration.) Or, you can work with the Processing Plugin, which provides a powerful geospatial analysis framework to call native and third-party algorithms from QGIS, such as GDAL, SAGA, GRASS and more. (See section Introduction.)

- Publish maps on the Internet

- QGIS can be used as a WMS, WMTS, WMS-C or WFS and WFS-T client, and as a WMS, WCS or WFS server. (See section Working with OGC Data.) Additionally, you can publish your data on the Internet using a webserver with UMN MapServer or GeoServer installed.

Installation

- Installation of QGIS
- Download the binary or source from
 - <https://qgis.org/en/site/forusers/download.html>
 - Follow the steps and hooray you are here

Launching QGIS & Sample Session

- Launch QGIS
 - typing qgis at a command prompt, assuming that QGIS is added to your PATH or you're in its installation folder
 - Command line option
 - `qgis --help` Returns: QGIS - 2.16.1-Nødebo 'Nødebo' (8545b3b) QGIS is a user friendly Open Source Geographic Information System. Usage: /usr/bin/qgis.bin [OPTION] [FILE] OPTION: [--snapshot filename] emit snapshot of loaded datasets to given file [--width width] width of snapshot to emit [--height height] height of snapshot to emit [--lang language] use language for interface text [--project projectfile] load the given QGIS project [--extent xmin,ymin,xmax,ymax] set initial map extent [--nologo] hide splash screen [--noversioncheck] don't check for new version of QGIS at startup [--noplugins] don't restore plugins on startup [--nocustomization] don't apply GUI customization [--customizationfile] use the given ini file as GUI customization [--optionspath path] use the given QSettings path [--configpath path] use the given path for all user configuration [--authdbdirectory path] use the given directory for authentication database [--code path] run the given python file on load [--defaultui] start by resetting user ui settings to default [--dxf-export filename.dxf] emit dxf output of loaded datasets to given file [--dxf-extent xmin,ymin,xmax,ymax] set extent to export to dxf [--dxf-symbology-mode none|symbol|feature] symbology mode for dxf output [--dxf-scale-denom scale] scale for dxf output [--dxf-encoding encoding] encoding to use for dxf output [--dxf-preset visibility-preset] layer visibility preset to use for dxf output [--help] this text [--] treat all following arguments as FILES
- Load raster and vector layer
 - the landcover raster layer i.e., `qgis_sample_data/raster/landcover.img`
 - and the lakes vector layer i.e., `qgis_sample_data/gml/lakes.gml`.

Loading Steps

1. Start QGIS as seen in Starting and Stopping QGIS
2. Click on the Add Raster Layer icon.
3. Browse to the folder `qgis_sample_data/raster/`, select the ERDAS IMG file `landcover.img` and click [Open].
4. If the file is not listed, check if the Files of type combo box at the bottom of the dialog is set on the right type, in this case Erdas Imagine Images (*.img *.IMG).
5. Now click on the Add Vector Layer icon.
6. File should be selected as Source Type in the new Add vector layer dialog. Now click [Browse] to select the vector layer.
7. Browse to the folder `qgis_sample_data/gml/`, select Geography Markup Language [GML] [OGR] (*.gml *.GML) from the Filter combo box, then select the GML file `lakes.gml` and click [Open]. In the Add vector layer dialog, click [OK]. The Coordinate Reference System Selector dialog opens with NAD27 / Alaska Albers selected, click [OK].
8. Zoom in a bit to your favourite area with some lakes.
9. Double click the lakes layer in the map legend to open the Properties dialog.
10. Click on the Style tab and select a blue as fill color.
11. Click on the Labels tab and select Show labels for this layer in the drop-down menu to enable labeling. Then from the Label with list, choose the NAMES field as the field containing labels.
12. To improve readability of labels, you can add a white buffer around them by clicking Buffer in the list on the left, checking Draw text buffer and choosing 3 as buffer size.
13. Click [Apply]. Check if the result looks good, and finally click [OK].

Managing Data Source

The DB Manager Plug-in provides several features:

- connect to databases and display its structure and contents;
- preview tables of databases;
- add layers to map canvas, either by double-click or drag-and-drop;
- add layers to a database from the QGIS Browser or from another database;
 - create and add output of SQL queries to the map canvas;
- create virtual layers

Working with Vector Data

- The Style Manager -You can open it with the Settings → Style Manager or from the Style tab in the vector layer's Properties
- Add, Edit, Remove Symbol
 - Selecting a group returns in the right panel, if applicable, the list of symbols of the group (including its subgroups). These symbols are organized in four different tabs:
 - Marker for point symbols
 - Line for linear symbols
 - Fill for surface symbols • and Color Ramp

Working with raster data

- Raster Properties Dialog -To view and set the properties for a raster layer, double click on the layer name in the map legend, or right click on the layer name and choose Properties from the context menu
- There are several tabs in the dialog:
 - General
 - Style
 - Transparency
 - Pyramids
 - Histogram
 - Metadata
 - Legend