

Geographical Databases: PostGIS Raster

Introduction

PostGIS supports raster data since version 2.0

References

PostgreSQL: <http://www.postgresql.org/docs/9.2/interactive/index.html>

PostGIS: <http://postgis.org/documentation/manual-2.0/>

QuantumGIS: <http://www.qgis.org/>

PostGIS Raster: <http://trac.osgeo.org/postgis/wiki/WKTRasterTutorial01>

Connection parameters

We'll be using PostGIS 2.0.1 on Postgres 9.2.1.

Host: 164.15.78.59

Database name: infoh415_2 — infoh415_20

Download scripts at <http://cs.ulb.ac.be/public/teaching/infoh415/tp>

Visualizing Raster data

QGIS can display raster data from several formats. First load the “bel_regn” shapefile from last session to use as a reference. Then, press the Add Raster Layer button and open the BEL_alt.vrt file. The result probably doesn't look very interesting but try clicking at different points on the raster with the Identify Features tool, checking out the altitude at different locations in Belgium and around.

To help visualizing the results, right-click on the Layer and click “Properties”. Choose Custom values with `min=0` and `max=800`. See the results. Try out different settings in the Properties dialog box until the visualization works for you. Try to find the spots with negative altitudes.

Now get the altitude dataset from worldclim.org at http://biogeo.ucdavis.edu/data/climate/worldclim/1_4/grid/cur/alt_10m_bil.zip. Load it into QGIS and observe the differences.

Use the Raster / Raster Calculator dialog to generate the difference between those two layers. Study the result with the visualization tools.

Raster importing in PostGIS

You can start with the database from the previous session or create a new one with the `generate.sql` script. Use the `raster2pgsql` command to import both rasters into PostGIS.

Spatial queries

Write down and execute the following queries:

1. Compute the difference between the two altitude datasets.
2. Export the result and visualize it in QGIS.
3. Compute the maximum altitude in Belgium.
4. Get the altitudes of all cities in Belgium.
5. Compute the maximum and minimum altitudes for each province.
6. Create a new raster table restraining the alt_16 raster to Belgium. (Hint: use ST_Intersection.)
7. Compute the altitude along each river.