

Open Source GI Solutions for the Management of Geological Data and Mining Cadastre

Pekka Sarkola, Gispo Oy

Niina Ahtonen, Geological Survey of Finland

GIMCS

Geological Information and Mining Cadastre System



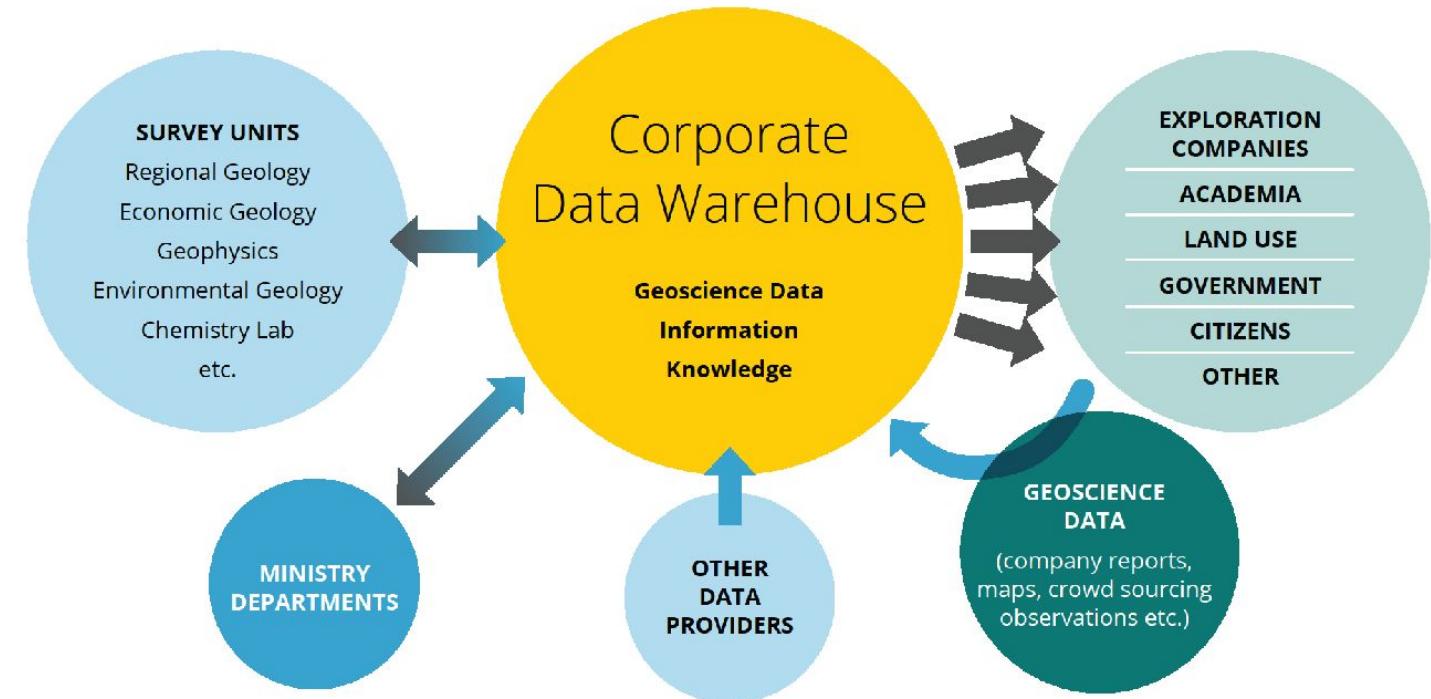
GISPO tukes



GIMCS - GEOLOGICAL INFORMATION AND MINING CADASTRE SYSTEM

- The Geological Information and Mining Cadastre System (GIMCS) is one kind of implementation of the national geodata centre concept to support decision making and promote the possibilities to invest in the country
- Capacity building is an essential part of the project

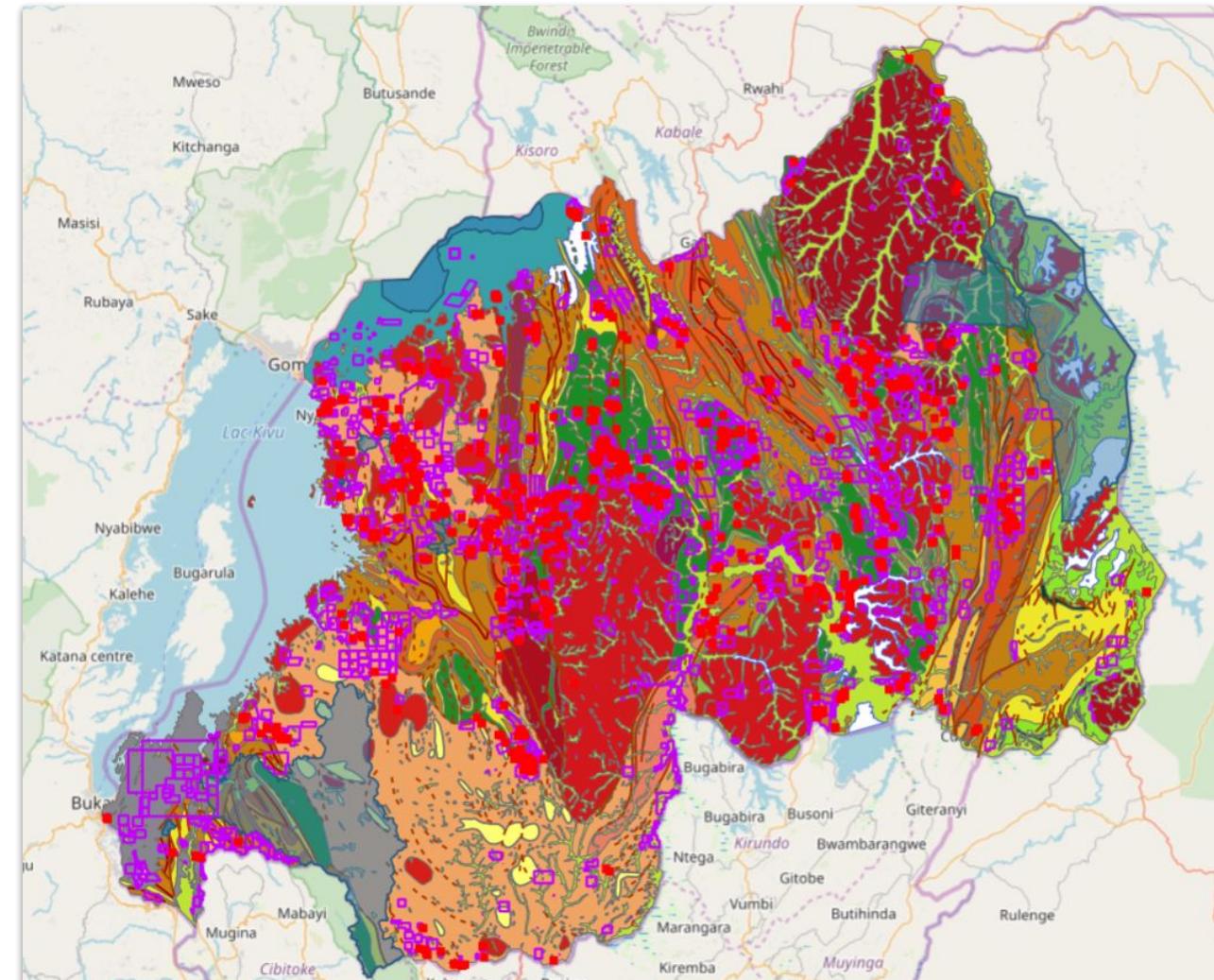
The concept of a National Geoscience Information Centre



GIMCS - GEOLOGICAL INFORMATION AND MINING CADASTRE SYSTEM

Geological Information Management

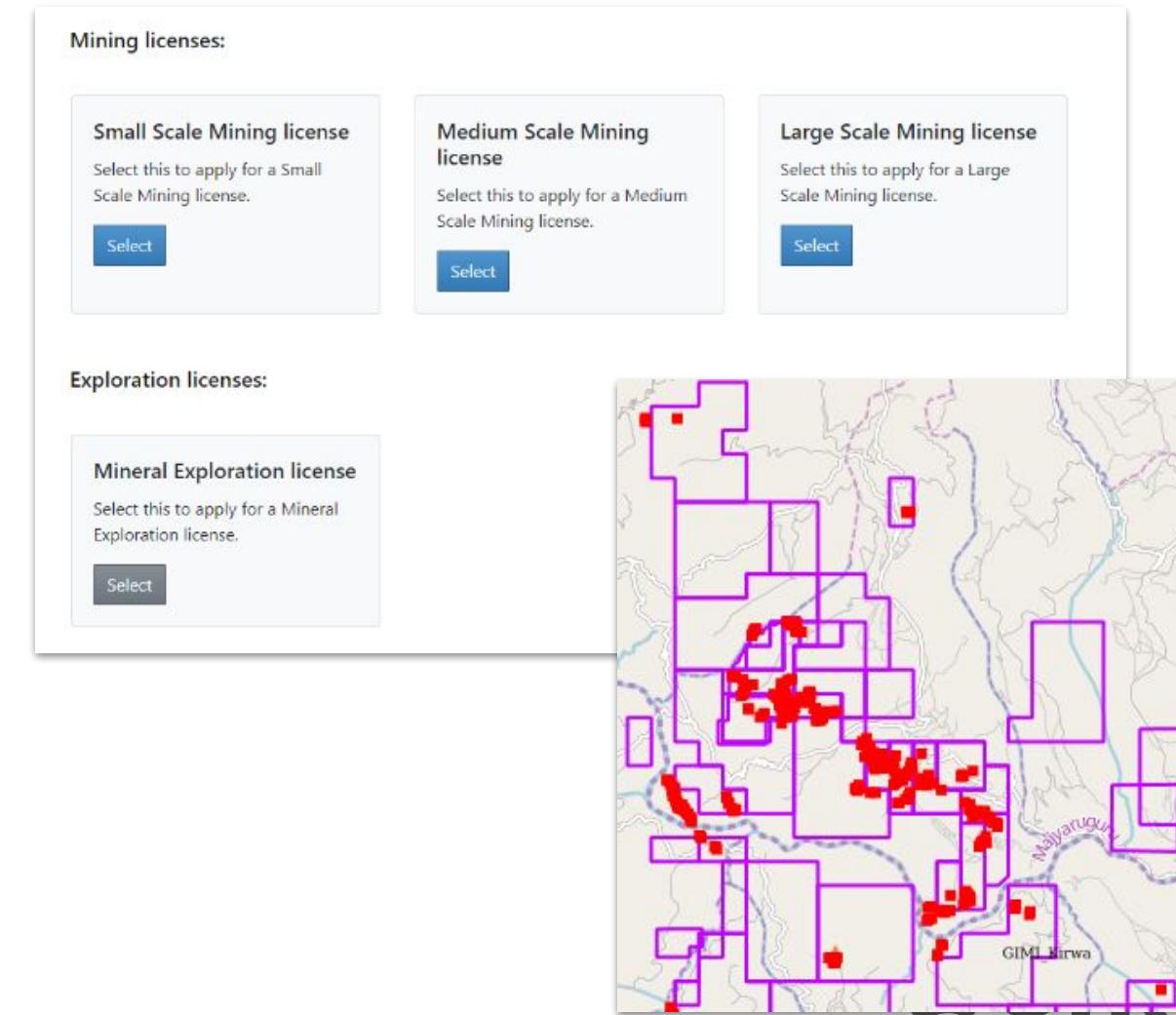
- Web site
- Web Map for the distribution of geological, geophysical and exploration data
- Web Shop
- Metadata Application
- The design of the scanning process for the digitization of old data
- Geodatabase (PostGIS), File share
- Desktop GIS (QGIS)
- Server GIS (GeoServer)
- Training



GIMCS - GEOLOGICAL INFORMATION AND MINING CADASTRE SYSTEM

Mining Cadastre

- Identity Management Module
- External Web Application for Applicants
- API (backend system)
- Internal Web Application for RMB employees
- Geodatabase
- Database
- Training



Use of FOSS4G software in GIMCS

FOSS4G = Free and Open Source Software for Geospatial



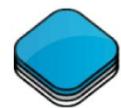
GeoServer



QGIS

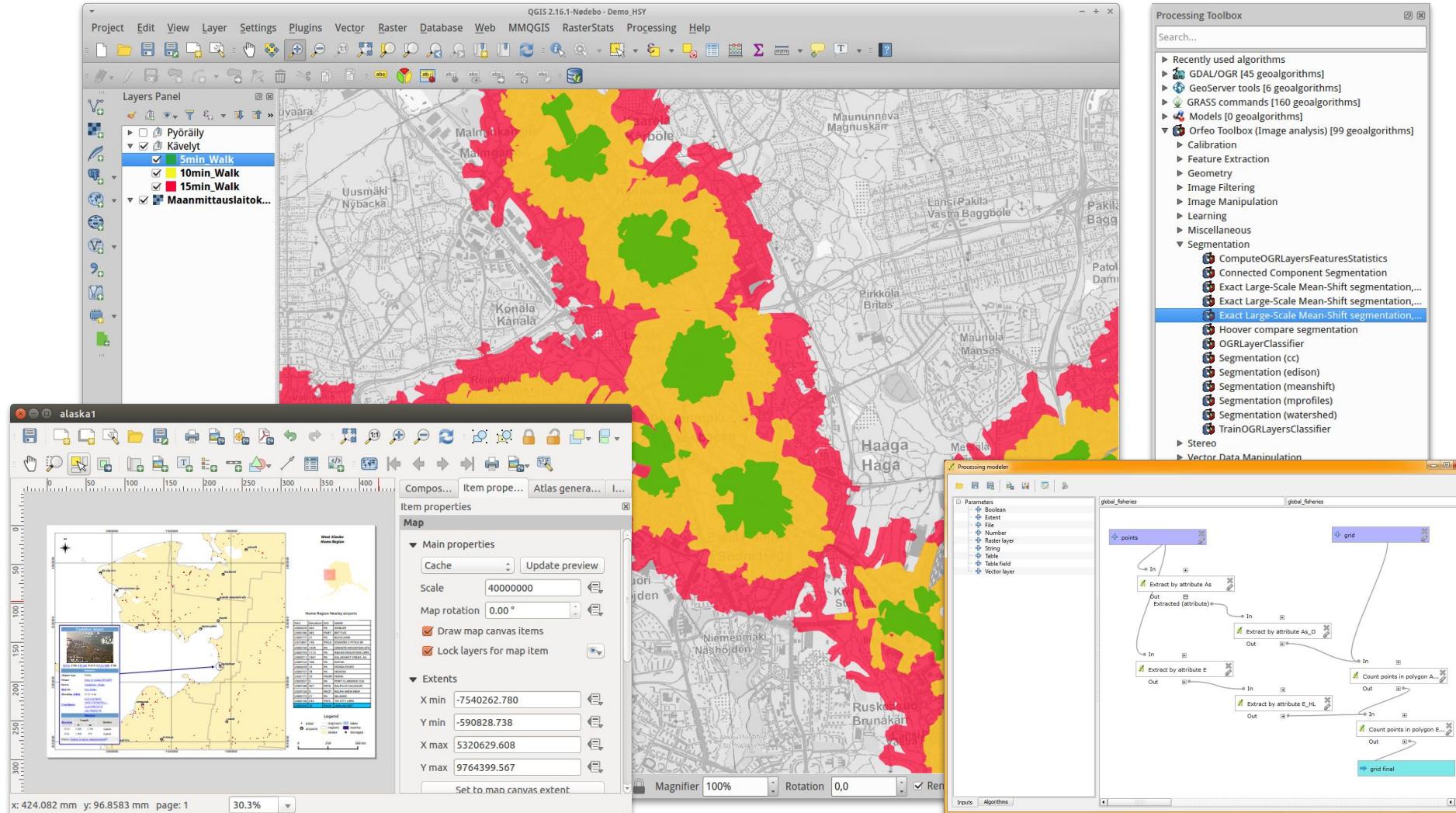


Open Source GIS Stack

Desktop	GIS Server	Database	Front End and Libraries
    	 GeoServer  MapServer open source web mapping  GeoWebCache  MapProxy	    Spatialite	 OpenLayers   GDAL  GeoTools  ORFEOToolBox  CENTRE NATIONAL D'ÉTUDES SPATIALES

FOSS4G: Free Open Source Software for Geospatial

QGIS - Desktop GIS application





QGIS in GIMCS

- Tool for GIS experts
- Data import, export
- Geological information analysis
- Creating maps, reports
- Data management



Geoserver - GIS application server

GeoServer

Welcome

Welcome

This GeoServer belongs to [The ancient geographies INC.](#)

19 Layers Add layers
9 Stores Add stores
7 Workspaces Create workspaces

The master password for this server has not been changed from the default. It is **highly** recommended that you change it now. [Change it](#)

The administrator password for this server has not been changed from the default. It is **highly** recommended that you change it now. [Change it](#)

Service Capabilities

WCS
2.0.1
1.0.0
1.1.0
1.1.1
1.1
WFS
1.0.0
1.1.0
2.0.0
WMS
1.1.1

WMS version: 1.1.1 Tiling: Single tile Antialias: Full Format: PNG 24bit Styles: Default

Width/Height: 750 300

Filter: CQL

Apply Reset

Map of the United States showing state boundaries and names.

Scale = 1 : 35M
Click on the map to get feature info

About & Status
Server Status
GeoServer Logs
Contact Information
About GeoServer

Data
Layer Preview
Workspaces
Stores
Layers
Layer Groups
Styles

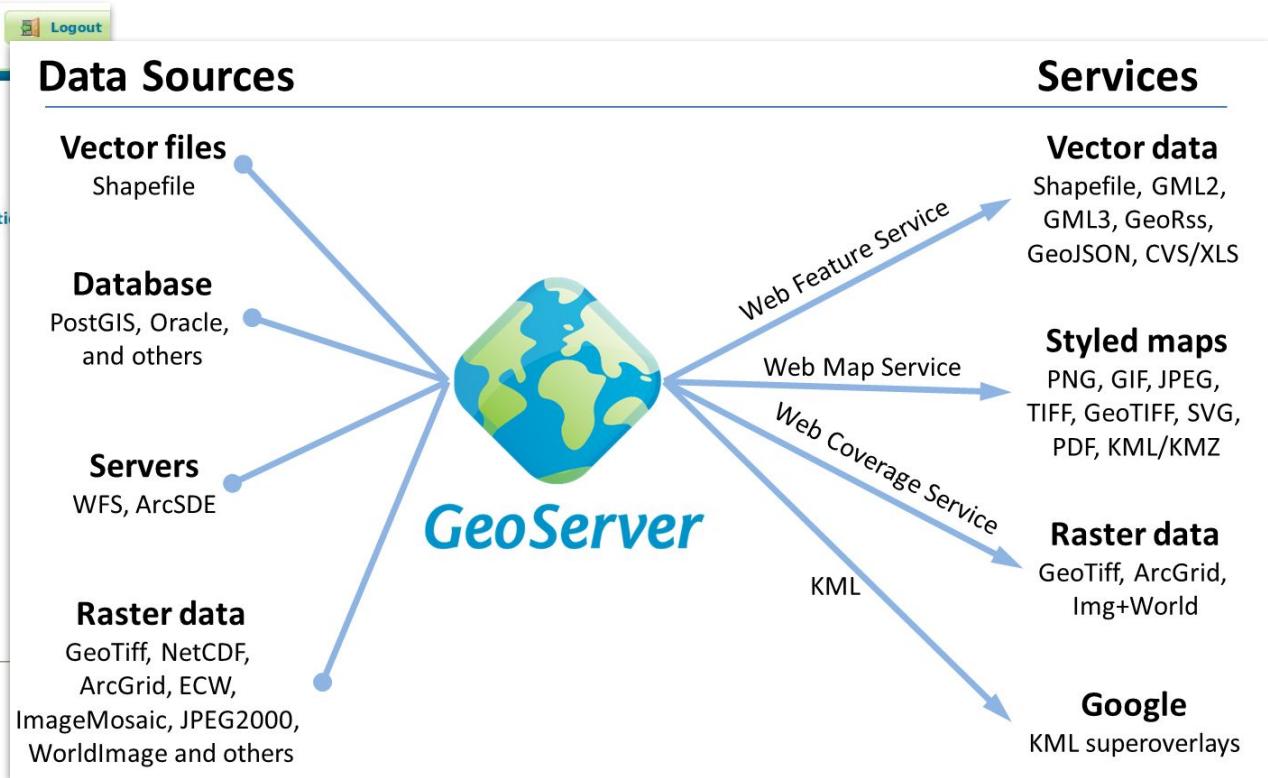
Services
WFS
WMS
WCS

Settings
Global
JAI
Coverage Access

Tile Caching
Tile Layers
Caching Defaults
Gridsets
Disk Quota

Security
Settings
Authentication
Passwords
Users, Groups, Roles
Data
Services

Demos





GeoServer

Geoserver in GIMCS

- Creating and managing WMS, WFS, WMTS services
- Data visualisation
- Data sharing



OpenLayers

- Interactive maps on the web
- High-performance, feature packed Javascript library

OpenLayers

Docs Examples API Code

Draw and Modify Features

+

-

Parc national de Kahuzi-Biega

Ntungamo

Kabale

Musanze

Goma

Lake Kivu

Iburengerazuba

Rwanda

Amajyepongo

Bukavu

Huye

Cibitoke

Ngozi

Muyinga

Muyinga

Bukoba

Mw

Mayaruguru

Jurasirasuba

Kagera

Burigi Forrest Reserve

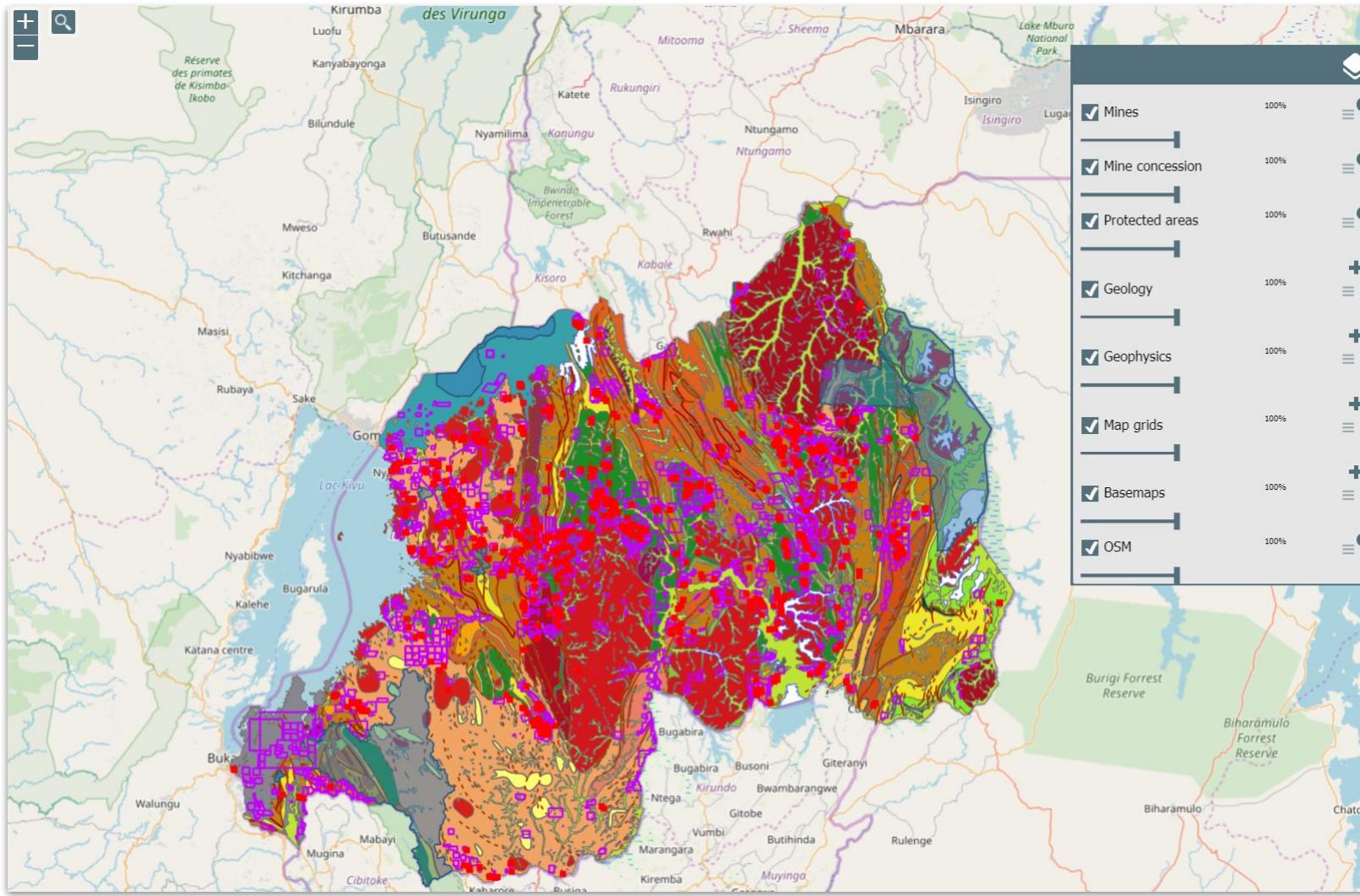
Biharamulo Forrest Reserve

© OpenStreetMap contributors.

Geometry type Circle ▾

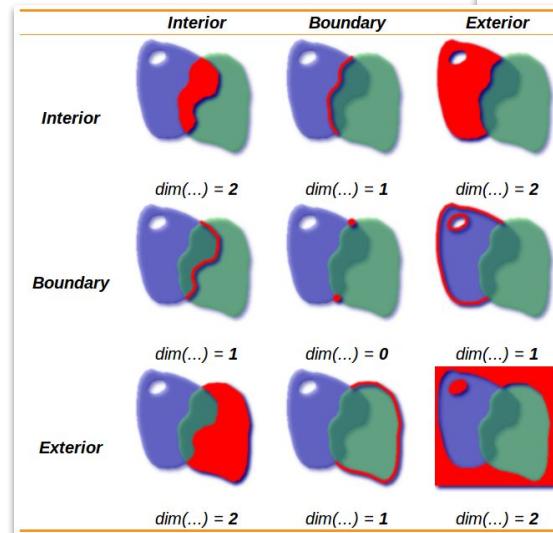
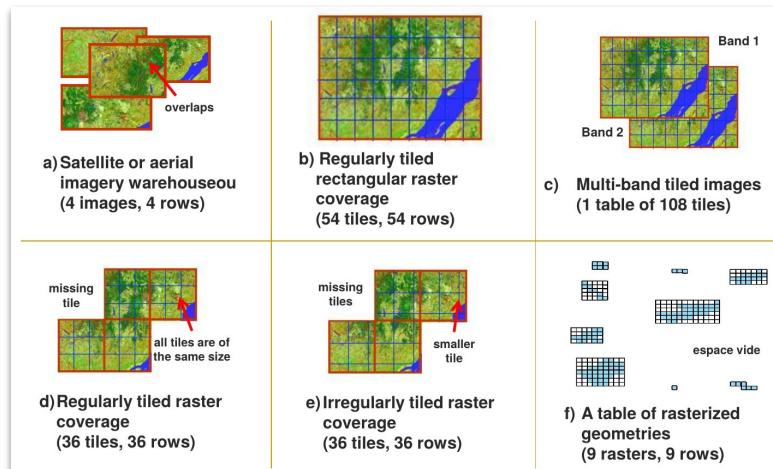


OpenLayers in GIMCS



PostGIS

- Extension to PostgreSQL database
- Manage and shares geospatial data
- Support vector and raster data
- Over 200 spatial functions



ST_Intersects
8.9. Spatial Relationships and Measurements

Name

`ST_Intersects` — Returns TRUE if the Geometries/Geography "spatially intersect in 2D" - (share any portion of space) and FALSE if they don't (they are Disjoint). For geography -- tolerance is 0.00001 meters (so any points that close are considered to intersect)

Synopsis

```
boolean ST_Intersects( geometry geomA , geometry geomB );
boolean ST_Intersects( geography geogA , geography geogB );
```

Description

If a geometry or geography shares any portion of space then they intersect. For geography -- tolerance is 0.00001 meters (so any points that are close are considered to intersect)

Overlaps, Touches, Within all imply spatial intersection. If any of the aforementioned returns true, then the geometries also spatially intersect. Disjoint implies false for spatial intersection.

! Do not call with a GEOMETRYCOLLECTION as an argument for geometry version. The geography version supports GEOMETRYCOLLECTION since its a thin wrapper around distance implementation.

The GEOS module (for geometry), geography is native
.5 support for geography was introduced.

- This function call will automatically include a bounding box comparison that will make use of any indexes that are available on the geometries.
- For geography, this function has a distance tolerance of about 0.00001 meters and uses the sphere rather than spheroid calculation.
- NOTE: this is the "allowable" version that returns a boolean, not an integer.

PostGIS IN GIMCS

- Data storing, management and sharing
- Vector and raster data
- Store of metadata information

Training of FOSS4G softwares in GIMCS



Murakoze

Kiitos

Thank you

?¿?¿?

F@\$#!