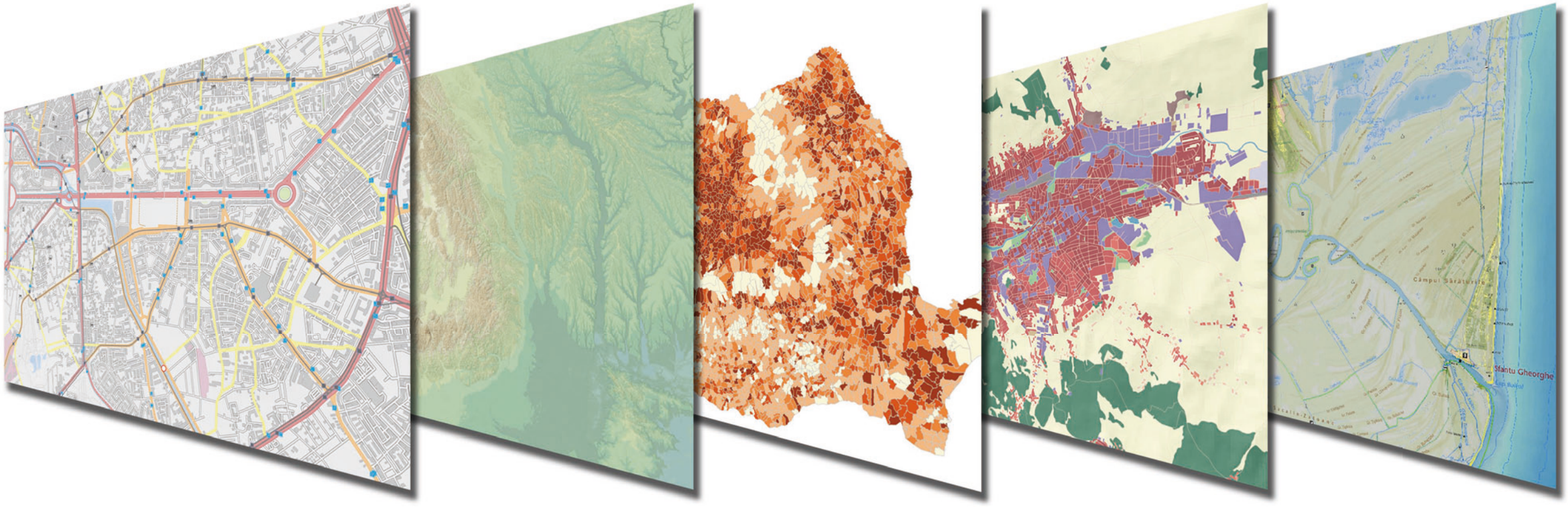



# GEOIDEA.RO
# Technical Results and Research Outlook

## GEodata Openness Initiative for Development and Economic Advancement in Romania

Nadia H. Panchaud and Dr. Ionuț Iosifescu Enescu
Institute of Cartography and Geoinformation, ETH Zürich, Switzerland

# About us

www.karto.ethz.ch



# Motivation

- Preview and user-friendly download of geodata are needed to efficiently promote the use and reuse of geodata

# Motivation

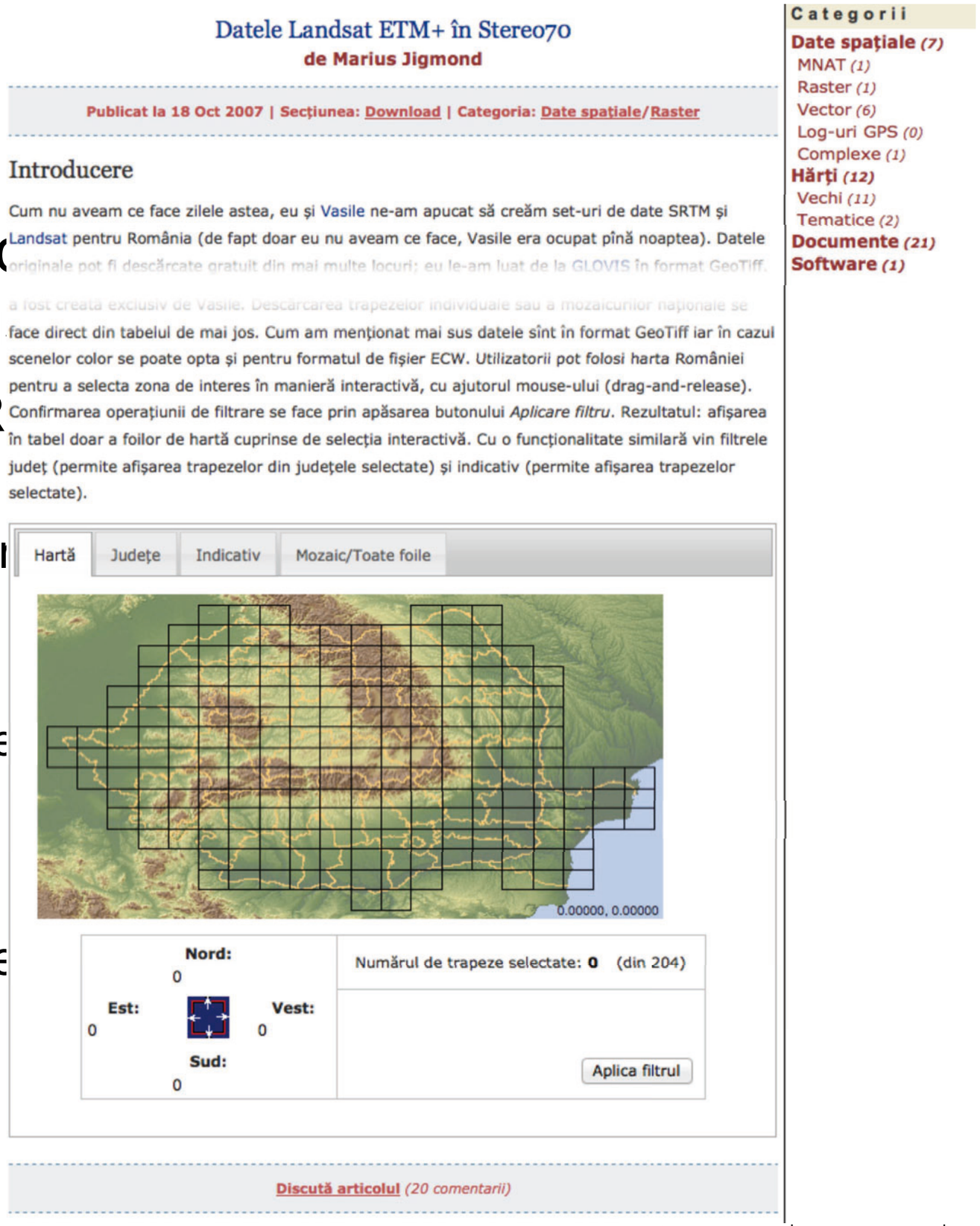
- Preview and user-friendly download of geodata are needed to efficiently promote the use and reuse of geodata
- Situation before GEOIDEA.RO:
  - Complicated access to geodata
  - No single access point for Romanian geodata
  - Various locations (websites)
  - Offered in bulk
  - No preview, nor search possibilities

# Motivation

- Preview and user-friendly download of geodata are needed to efficiently promote the use and reuse of geodata
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  - Mainly listing, blog style
  - Partners for the GEOIDEA.RO project

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  - Mainly listing, blog style
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- The GEOIDEA.RO geoportal
- Available datasets and services
- Architecture
- Use and re-use

# Technical Results

# What is a Geoportal?

- Website operating as an entry point to geographic content* and with the following functionalities**:
  - **discovering** spatial datasets
  - **portraying** data on the map interface
  - **retrieving** data for further analysis
  - **providing access** to spatial data via standardized service interface (e.g. WMS, WFS)

* Tait 2005
** Resch and Zimmer 2013

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ccias 2013
Technical University of Civil Engineering Bucharest
Groundwater Engineering Research Center

IKG Institute of Cartography and Geoinformation
ETH Eidgenössische Technische Hochschule Zürich Swiss Federal Institute of Technology Zurich

To profit from fixes and updates please clear your browser cache regularly (every 1-2 weeks).

## Welcome on the Geoportal of the GEOIDEA.RO project!

This page gives you access to the prototype of the geoportal. The goal of the geoportal is to enable the publication and retrieval of geodata pertaining to Romania.

## The GEOIDEA.RO Project

The project GEodata Openness Initiative for Development and Economic Advancement in ROmania aims to improve the scientific basis for open geodata model adoption in Romania. The main objective is to implement a geoportal allowing the access to geodata in an usable format and under an open license.

To do so, it is planned to develop innovative technologies and tools for geodata publishing and retrieval as well as a common methodology for open data publishing. Further, the project will explore the possibilities to lower the costs of open geodata publication.

For more information, please go on the project website here.

## Disclaimer

Any liability arising from the use of this service is hereby explicitly disclaimed. This geoportal is for demonstration purposes only and the copyright of the original datasets must be respected.

For research purposes only, we are recording basic statistical information about the users visiting this page (e.g. date of visit, user location, but **no** IP addresses).

## GEOIDEA.RO Login

☐ **I have read and hereby explicitly accept the Disclaimer.**

Log in

## Browser Limitations

Please use a modern browser, such as Firefox, Chrome or Safari.

Tablets and smartphones are not supported yet.

*Internet Explorer is not supported.*

## Questions, Feedback

## News

*Last update: July 13, 2015*

2015

**New Server**
The geoportal just moved to a brand new server!

**Metadata**
Metadata are being added incrementally to the geodata of the geoportal.

**Download - new functionality**
After hearing the request several times, we finally set up the possibility to download the whole extent of the datasets, not just a specified frame. Mind the download time that can be longer.

**Major bug fixes**
After an extending period of testing from our team, we fixed many bugs in the geoportal. Additionally, we added legend information for most of the data layers.

2014

**Major import of new datasets**
The GEOIDEA.RO team is happy to announce that many new datasets are now available. This includes data from data.gov.ro that have been georeferenced as well as a hydrogeological map and data about protected areas.

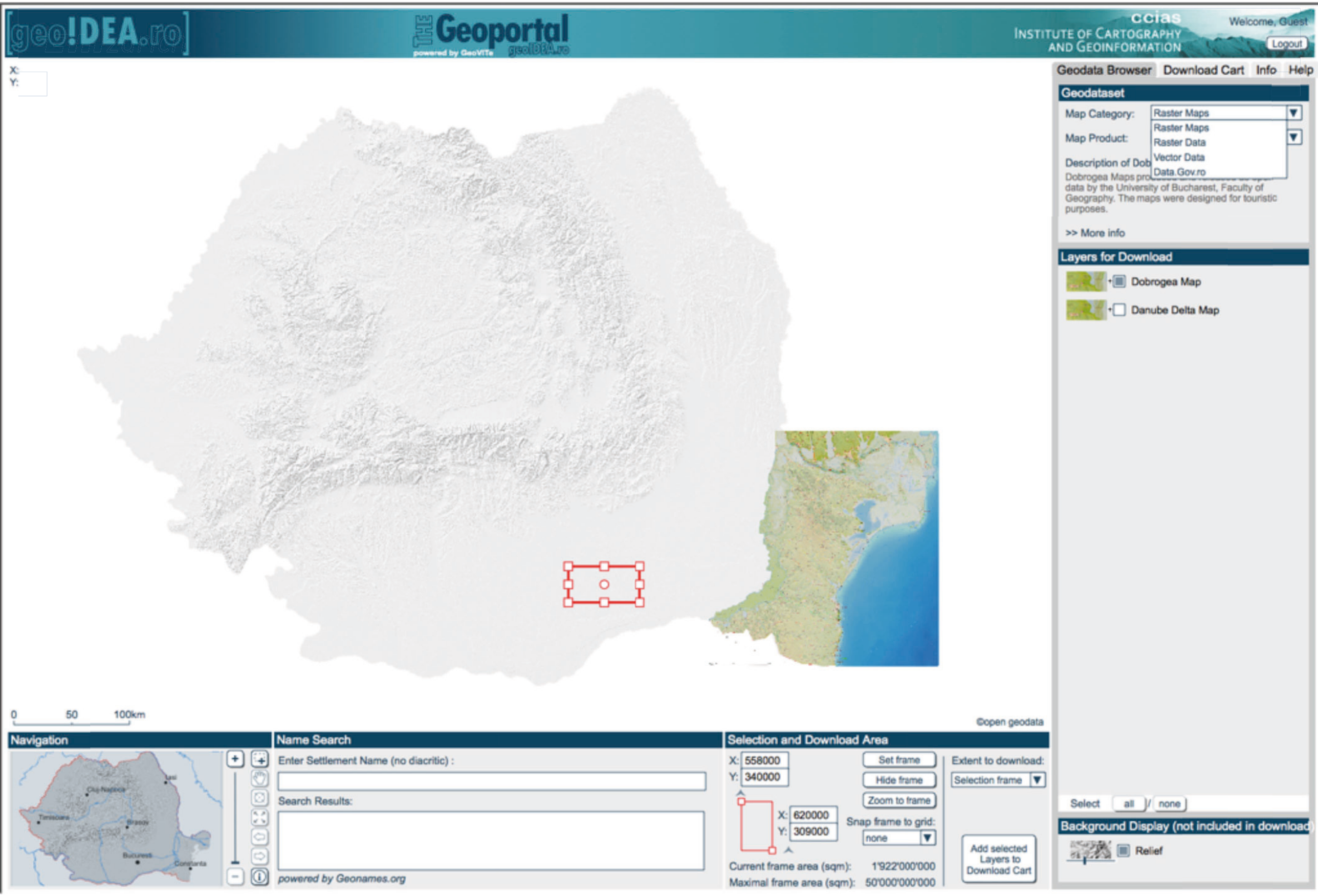
**Legend update**
Many datasets now have a more detailed legend, so you can have a better idea of the data.

**OpenStreetMap Update**
The third update of the OSM data are online.

**CLC Urban Atlas**
The vector dataset Urban Atlas extracted for urban areas from the Corine Land Cover is now available.

**Gov.data.ro**
Two addiotnal datasets from the romanian open data portal are now also available on the geoprotal: health infrastructure and personnel, and demography datasets.

**Hydrogeological Data (Sample)**
The CCIAS has offered a sample dataset of hydrogeological data for the neighborhoods of Ferentari and Rahova in Bucharest, that can now be


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Y:
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Info
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Geodataset
Map Category:
Raster Maps
Raster Maps
Raster Data
Vector Data
Data.Gov.ro
Map Product:
Description of Dob
Dobrogea Maps pro
data by the University of Bucharest, Faculty of Geography. The maps were designed for touristic purposes.
>> More info
Layers for Download
Dobrogea Map
Danube Delta Map
0
50
100km
©open geodata
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Timisoara
Brasov
Bucuresti
Constanta
Name Search
Enter Settlement Name (no diacritic) :
Search Results:
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Selection and Download Area
X: 558000
Y: 340000
X: 620000
Y: 309000
Set frame
Hide frame
Zoom to frame
Snap frame to grid:
none
Extent to download:
Selection frame
Current frame area (sqm): 1'922'000'000
Maximal frame area (sqm): 50'000'000'000
Add selected Layers to Download Cart
Select all / none
Background Display (not included in download)
Relief

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Y:

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**Geodataset**

Map Category: Raster Maps
Raster Maps
Raster Data
Vector Data
Data.Gov.ro

Map Product:

Description of Dob
Dobrogea Maps pro
data by the Univers y of Bucharest, Faculty of Geography. The maps were designed for touristic purposes.

>> More info

**Layers for Download**

Dobrogea Map

Danube Delta Map

0 50 100km

©open geodata

**Navigation**

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Timisoara
Brasov
Bucuresti
Constanta

**Name Search**

Enter Settlement Name (no diacritic) :

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**Selection and Download Area**

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Y: 340000

X: 620000
Y: 309000

Set frame
Hide frame
Zoom to frame

Snap frame to grid: none

Extent to download: Selection frame

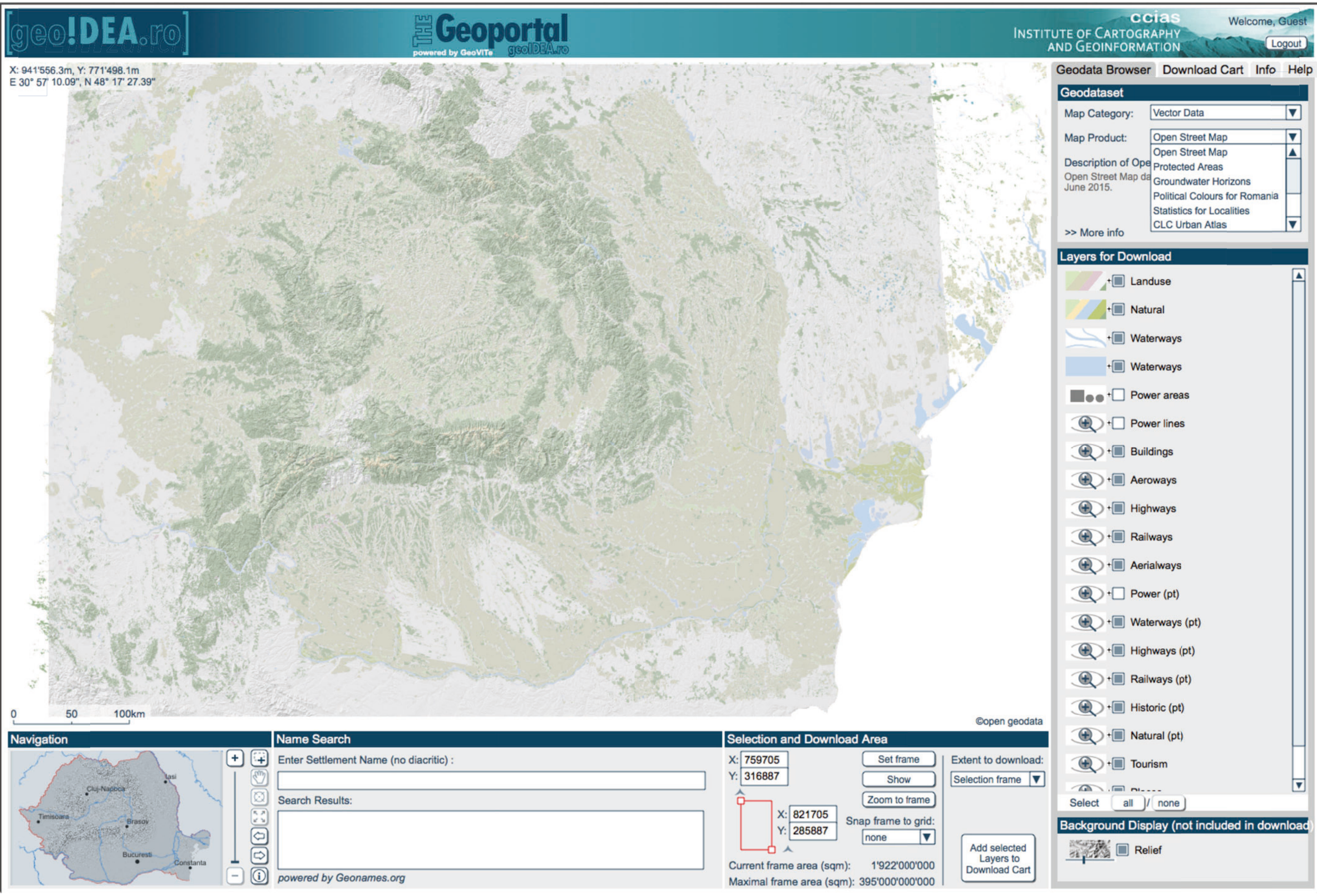
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Maximal frame area (sqm): 50'000'000'000

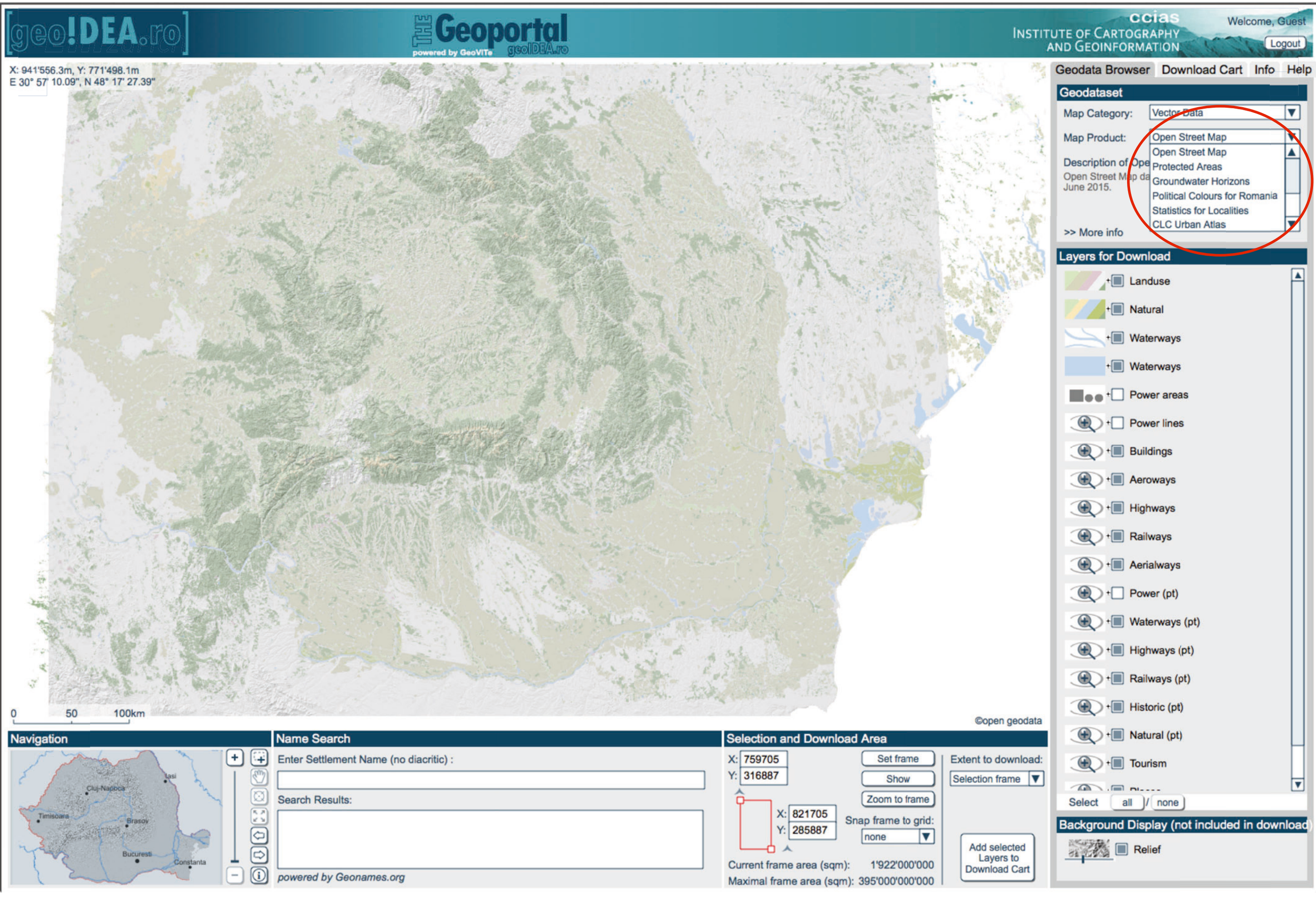
Add selected Layers to Download Cart

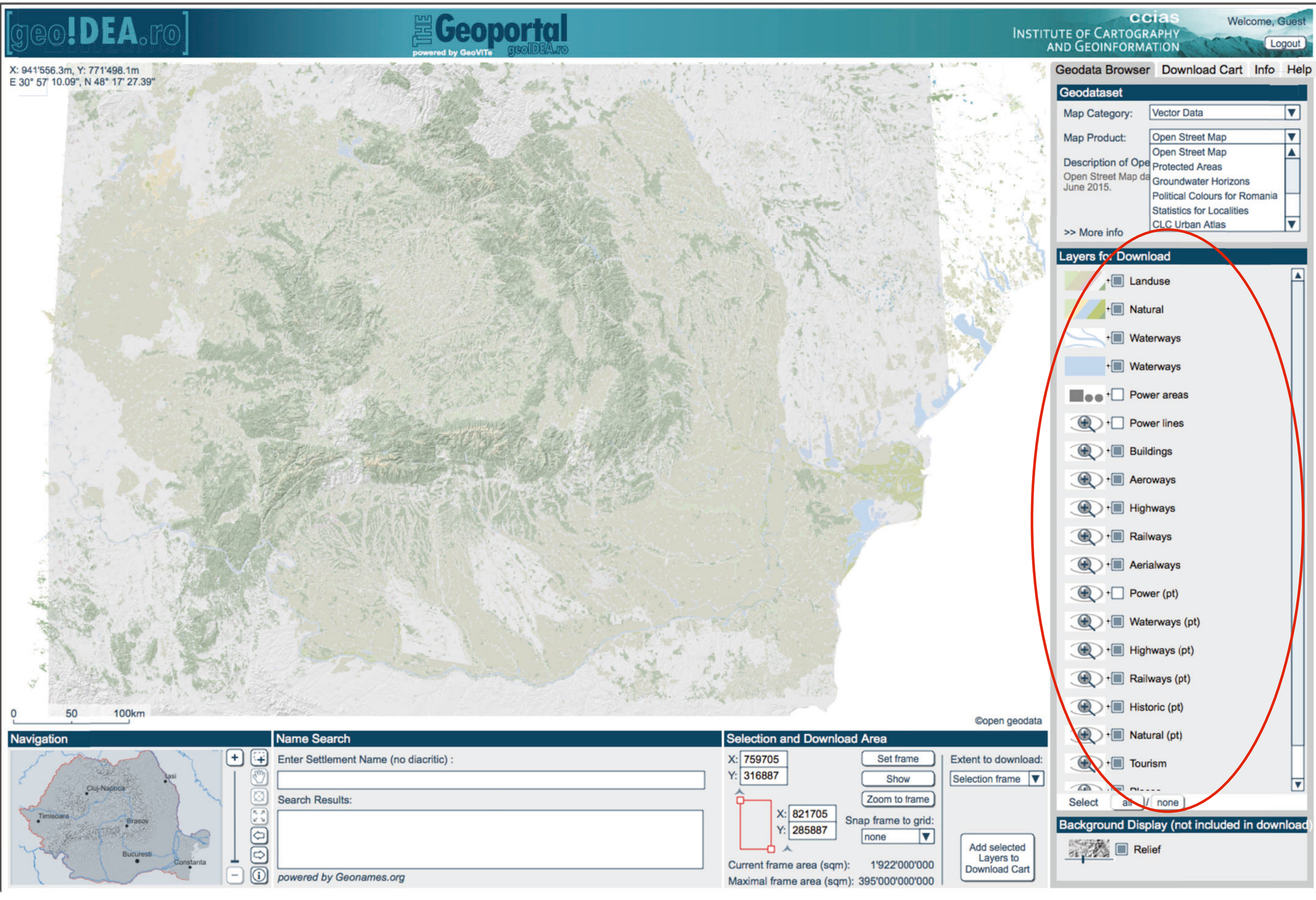
Select all / none

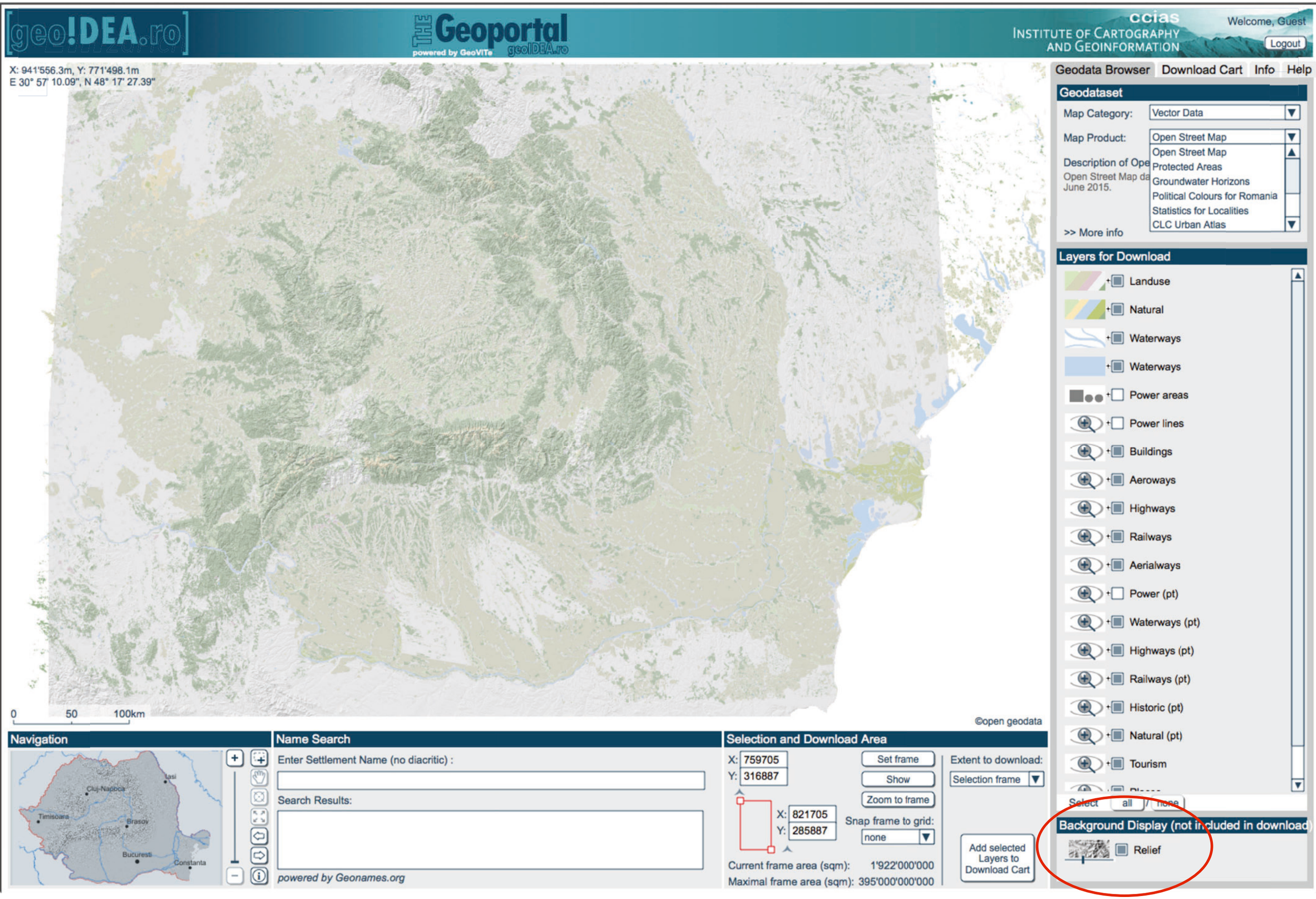
**Background Display (not included in download)**

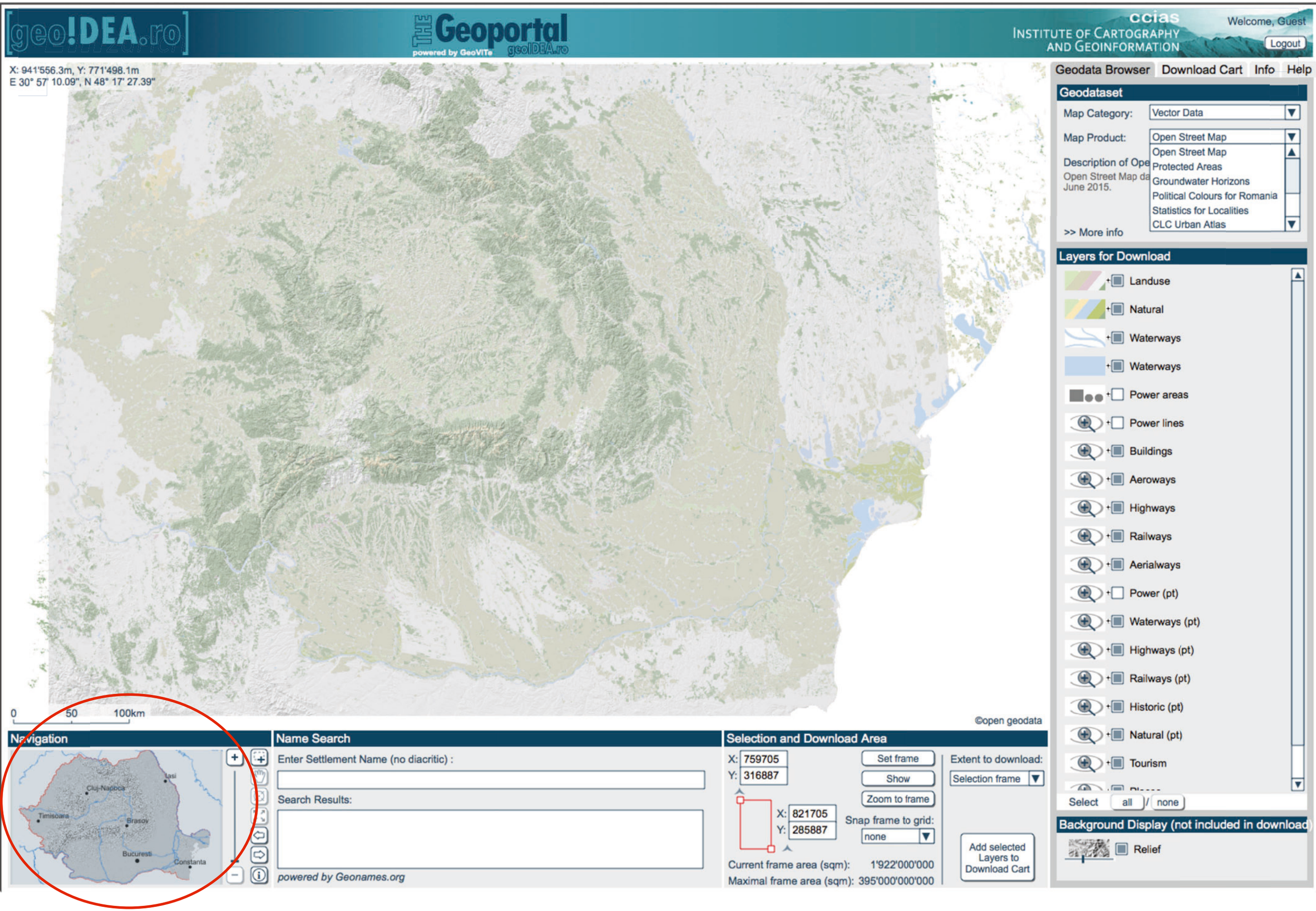
Relief

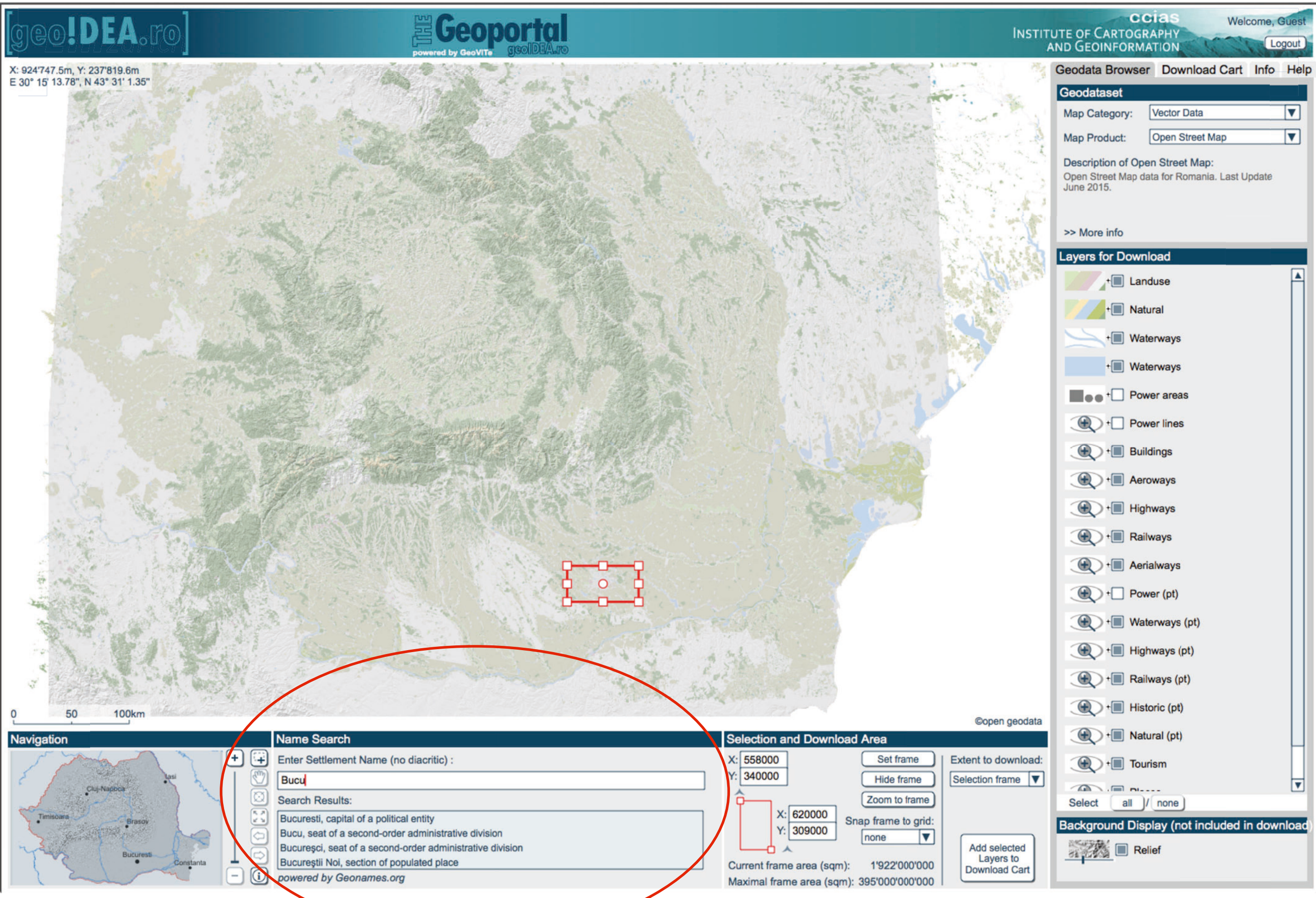

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X: 941'556.3m, Y: 771'498.1m
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Geodata Browser
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Geodataset
Map Category:
Vector Data
Map Product:
Open Street Map
Open Street Map
Protected Areas
Groundwater Horizons
Political Colours for Romania
Statistics for Localities
CLC Urban Atlas
Description of Ope
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Aerialways
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Waterways (pt)
Highways (pt)
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Y: 316887
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Show
Zoom to frame
X: 821705
Y: 285887
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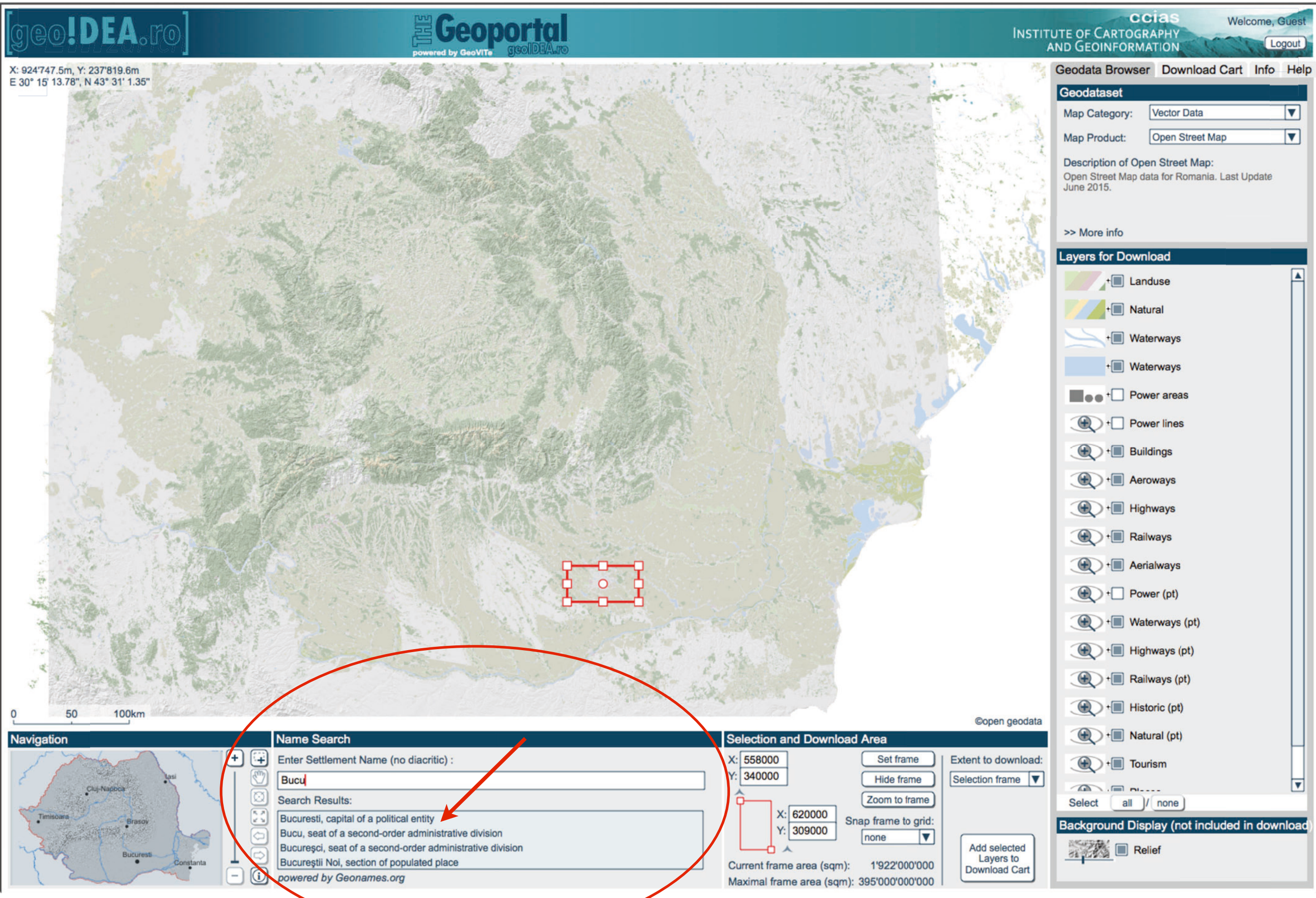

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Geodataset
Map Category: Vector Data
Map Product: Open Street Map
Description of Open Street Map:
Open Street Map data for Romania. Last Update June 2015.
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Name Search
Enter Settlement Name (no diacritic) :
Bucu
Search Results:
Bucuresti, capital of a political entity
Bucu, seat of a second-order administrative division
Bucureşci, seat of a second-order administrative division
Bucureştii Noi, section of populated place
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Selection and Download Area
X: 558000
Y: 340000
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X: 588'731.0m, Y: 326'190.8m
E 26° 6' 51.99", N 44° 25' 49.13"

Geodata Browser | Download Cart | Info | Help

**Geodataset**

Map Category: Vector Data

Map Product: Open Street Map

Description of Open Street Map:
Open Street Map data for Romania. Last Update June 2015.

>> More info

**Layers for Download**

- Landuse
- Natural
- Waterways
- Waterways
- Power areas
- Power lines
- Buildings
- Aeroways
- Highways
- Railways
- Aerialways
- Power (pt)
- Waterways (pt)
- Highways (pt)
- Railways (pt)
- Historic (pt)
- Natural (pt)
- Tourism

Select all / none

**Background Display (not included in download)**

- Relief

0 400 800m

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**Navigation**




**Name Search**

Enter Settlement Name (no diacritic) :

Bucu

Search Results:

- Bucuresti, capital of a political entity
- Bucu, seat of a second-order administrative division
- Bucureşci, seat of a second-order administrative division
- Bucureştii Noi, section of populated place

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**Selection and Download Area**

X: 586664
Y: 326809

Set frame
Hide
Zoom to frame

X: 590820
Y: 324150

Snap frame to grid: none

Extent to download: Selection frame

Add selected Layers to Download Cart

Current frame area (sqm): 11'050'804
Maximal frame area (sqm): 395'000'000'000

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X: 588'710.6m, Y: 325'771.4m
E 26° 6' 50.80", N 44° 25' 35.55"

Geodata Browser | Download Cart | Info | Help

**Queryable Layer**

Highways

**Information Window**

Attributes of the pointed feature of the layer **<Highways>:**

| Name | Value |
|---|---|
| gid | 504252 |
| id | 231121052 |
| highway | primary |
| name | Bulevardul Unirii |
| maxspeed | 50 |
| oneway | yes |
| lanes | 3 |
| surface | asphalt |
| access | |

0 400 800m

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**Navigation**

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Timisoara
Brasov
Bucuresti
Constanta

**Name Search**

Enter Settlement Name (no diacritic) :

Bucu

Search Results:

- Bucuresti, capital of a political entity
- Bucu, seat of a second-order administrative division
- Bucureşci, seat of a second-order administrative division
- Bucureştii Noi, section of populated place

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**Selection and Download Area**

X: 586664
Y: 326809

Set frame
Hide
Zoom to frame

X: 590820
Y: 324150

Snap frame to grid: none

Extent to download: Selection frame

Add selected Layers to Download Cart

Current frame area (sqm): 11'050'804
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X: 588'710.6m, Y: 325'771.4m
E 26° 6' 50.80", N 44° 25' 35.55"

Geodata Browser | Download Cart | Info | Help

**Queryable Layer**

Highways

**Information Window**

Attributes of the pointed feature of the layer **<Highways>:**

| Name | Value |
|---|---|
| gid | 504252 |
| id | 231121052 |
| highway | primary |
| name | Bulevardul Unirii |
| maxspeed | 50 |
| oneway | yes |
| lanes | 3 |
| surface | asphalt |
| access | |

0 400 800m

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**Navigation**

Iasi
Cluj-Napoca
Timisoara
Brasov
Bucuresti
Constanta

**Name Search**

Enter Settlement Name (no diacritic) :

Bucu

Search Results:

- Bucuresti, capital of a political entity
- Bucu, seat of a second-order administrative division
- Bucureşci, seat of a second-order administrative division
- Bucureştii Noi, section of populated place

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**Selection and Download Area**

X: 586664
Y: 326809

Set frame
Hide
Zoom to frame

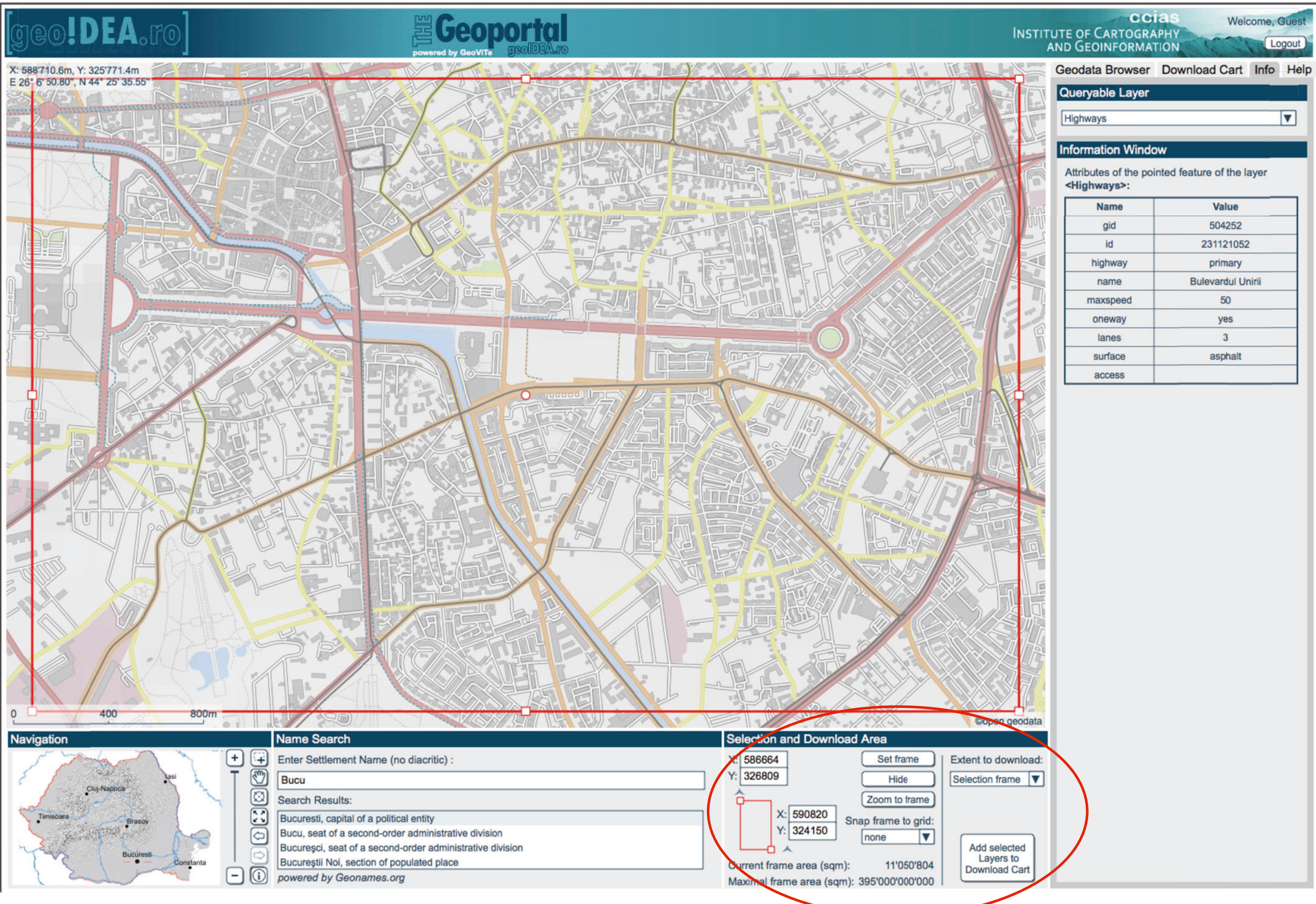
X: 590820
Y: 324150

Snap frame to grid: none

Extent to download: Selection frame

Add selected Layers to Download Cart

Current frame area (sqm): 11'050'804
Maximal frame area (sqm): 395'000'000'000


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Welcome, Guest
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X: 588'710.6m, Y: 325'771.4m
E 26° 6' 50.80", N 44° 25' 35.55"
Geodata Browser
Download Cart
Info
Help
Queryable Layer
Highways
Information Window
Attributes of the pointed feature of the layer <Highways>:
Name
Value
gid
504252
id
231121052
highway
primary
name
Bulevardul Unirii
maxspeed
50
oneway
yes
lanes
3
surface
asphalt
access
0
400
800m
©Open geodata
Navigation
Iasi
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powered by Geonames.org
Selection and Download Area
X: 586664
Y: 326809
Set frame
Hide
Zoom to frame
X: 590820
Y: 324150
Snap frame to grid:
none
Extent to download:
Selection frame
Add selected Layers to Download Cart
Current frame area (sqm): 11'050'804
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Welcome, Guest

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X: 588'731.0m, Y: 326'190.8m
E 26° 6' 51.99", N 44° 25' 49.13"

Geodata Browser | Download Cart | Info | Help

**Geodataset**

Map Category: Vector Data

Map Product: Open Street Map

Description of Open Street Map:
Open Street Map data for Romania. Last Update June 2015.

>> More info

**Layers for Download**

- Landuse
- Natural
- Waterways
- Waterways
- Power areas
- Power lines
- Buildings
- Aeroways
- Highways
- Railways
- Aerialways
- Power (pt)
- Waterways (pt)
- Highways (pt)
- Railways (pt)
- Historic (pt)
- Natural (pt)
- Tourism

Select all / none

**Background Display (not included in download)**

- Relief

0 400 800m

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**Navigation**




**Name Search**

Enter Settlement Name (no diacritic) :

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**Selection and Download Area**

X: 586664
Y: 326809

Set frame
Hide
Zoom to frame

X: 590820
Y: 324150

Snap frame to grid: none

Extent to download: Selection frame (Selection frame / Dataset extent)

Current frame area (sqm): 11'050'804
Maximal frame area (sqm): 395'000'000'000

Add selected Layers to Download Cart

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X: 588'731.0m, Y: 326'190.8m
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- Railways
- Aerialways
- Power (pt)
- Waterways (pt)
- Highways (pt)
- Railways (pt)
- Historic (pt)
- Natural (pt)
- Tourism

Select all / none

**Background Display (not included in download)**

- Relief

0 400 800m

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**Navigation**




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**Selection and Download Area**

X: 586664
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Set frame
Hide
Zoom to frame

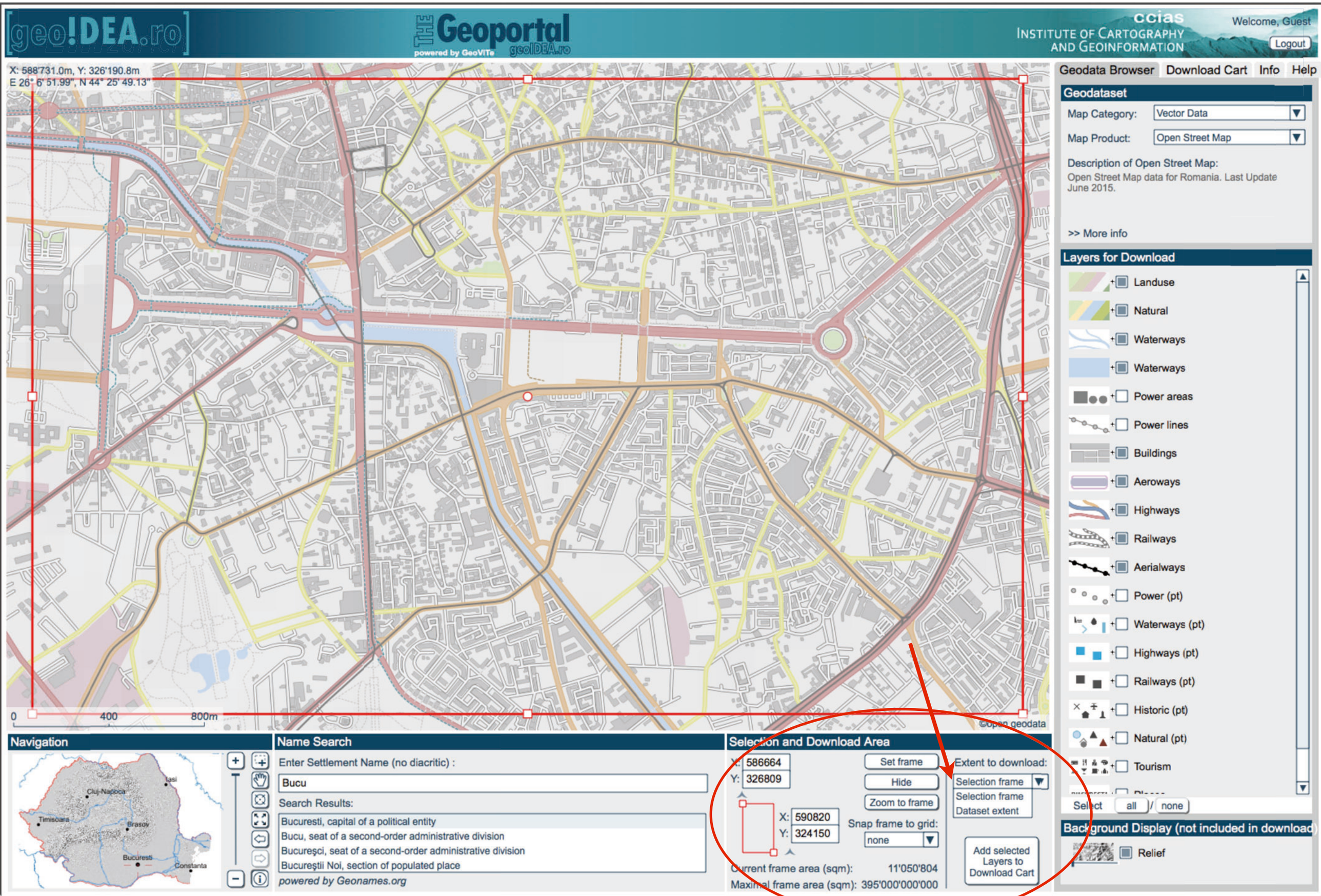
X: 590820
Y: 324150

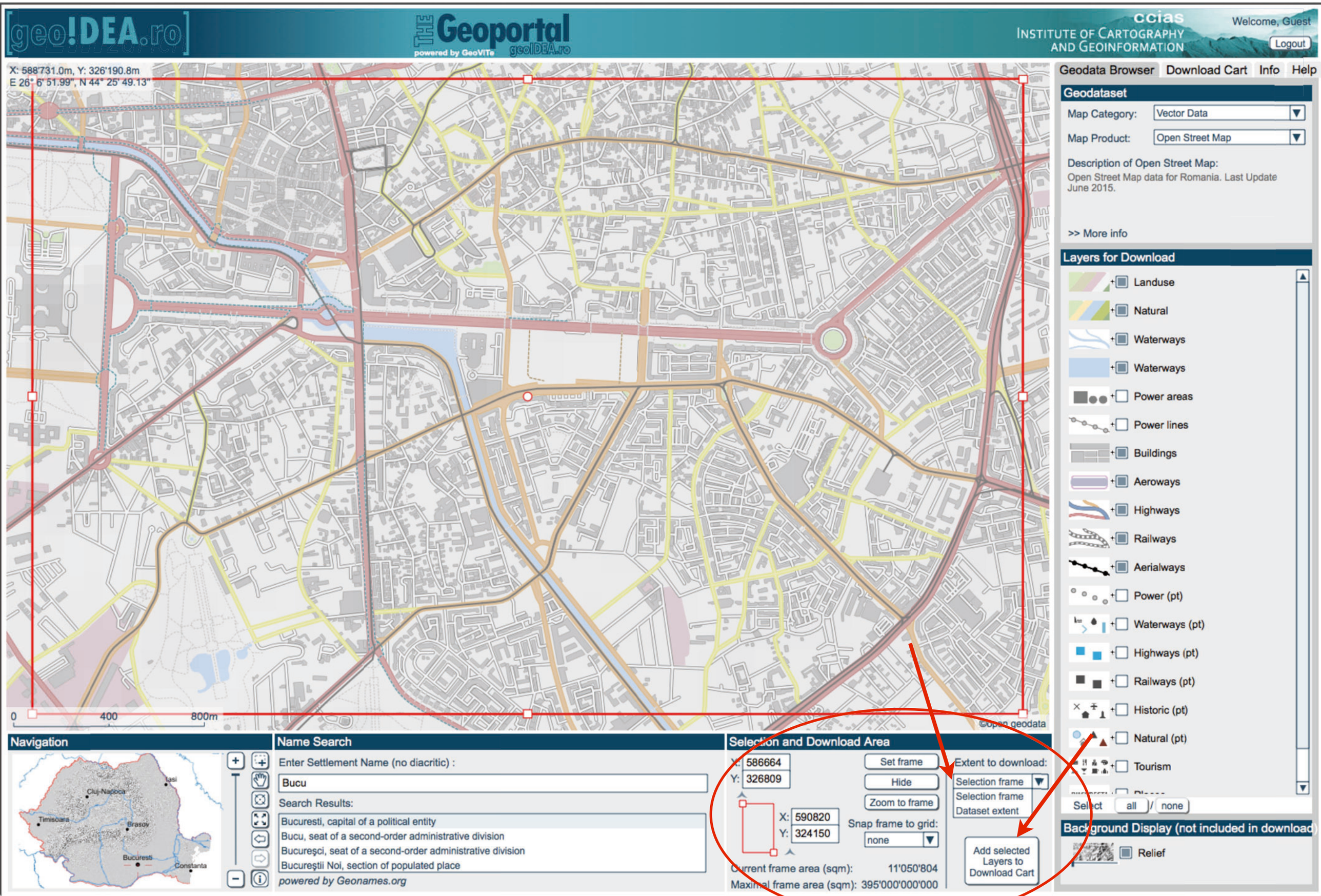
Snap frame to grid: none

Extent to download: Selection frame (Selection frame / Dataset extent)

Add selected Layers to Download Cart

Current frame area (sqm): 11'050'804
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Selection frame
Dataset extent
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Extent to download:
Selection frame
Selection frame
Dataset extent
Add selected Layers to Download Cart
Current frame area (sqm): 11'050'804
Maximal frame area (sqm): 395'000'000'000

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X: 590'616.9m, Y: 326'272.7m — Geodata Browser | Download Cart | Info | Help

import Cart | export Cart

Your Download Cart lists all the selected products / product-layers. Click the "Generate File" button to clip and download a layer. Depending on the data extent and the data density or resolution, files can take up to several minutes to generate. Generated files will be stored till midnight on the GeoViTe server. To download a generated file click on the download link in the Status/Download column.

| Thumbnail | Source Product | Extent (Stereo 1970) | Download Format / Projection | Action | Status / Download |
|---|---|---|---|---|---|
| | Landuse (ro_osm_landuse_pl) | hor.: 586664, 590820 vert.: 324150, 326809 | Format: ESRI .shp Projection: Stereo 1970 | Generate File | |
| | Natural (ro_osm_natural_pl) | hor.: 586664, 590820 vert.: 324150, 326809 | Format: ESRI .shp Projection: Stereo 1970 | Generate File | |
| | Waterways (ro_osm_waterway_ln) | hor.: 586664, 590820 vert.: 324150, 326809 | Format: ESRI .shp Projection: Stereo 1970 | Generate File | |
| | Waterways (ro_osm_waterway_pl) | hor.: 586664, 590820 vert.: 324150, 326809 | Format: ESRI .shp Projection: Stereo 1970 | Generate File | |
| | Buildings (ro_osm_building_pl) | hor.: 586664, 590820 vert.: 324150, 326809 | Format: ESRI .shp Projection: Stereo 1970 | Generate File | |
| | Aeroways (ro_osm_aeroway_ln) | hor.: 586664, 590820 vert.: 324150, 326809 | Format: ESRI .shp Projection: Stereo 1970 | Generate File | |
| | Highways (ro_osm_highway_ln) | hor.: 586664, 590820 vert.: 324150, 326809 | Format: ESRI .shp Projection: Stereo 1970 | Generate File | |
| | Railways (ro_osm_railway_ln) | hor.: 586664, 590820 vert.: 324150, 326809 | Format: ESRI .shp Projection: Stereo 1970 | Generate File | |
| | Aerialways (ro_osm_aerialway_ln) | hor.: 586664, 590820 vert.: 324150, 326809 | Format: ESRI .shp Projection: Stereo 1970 | Generate File | |

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X: 590'616.9m, Y: 326'272.7m — Geodata Browser | Download Cart | Info | Help

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|---|---|---|---|---|---|
| | Landuse (ro_osm_landuse_pl) | hor.: 586664, 590820 vert.: 324150, 326809 | Format: ESRI .shp Projection: Stereo 1970 | Generate File | |
| | Natural (ro_osm_natural_pl) | hor.: 586664, 590820 vert.: 324150, 326809 | Format: ESRI .shp Projection: Stereo 1970 | Generate File | |
| | Waterways (ro_osm_waterway_ln) | hor.: 586664, 590820 vert.: 324150, 326809 | Format: ESRI .shp Projection: Stereo 1970 | Generate File | |
| | Waterways (ro_osm_waterway_pl) | hor.: 586664, 590820 vert.: 324150, 326809 | Format: ESRI .shp Projection: Stereo 1970 | Generate File | |
| | Buildings (ro_osm_building_pl) | hor.: 586664, 590820 vert.: 324150, 326809 | Format: ESRI .shp Projection: Stereo 1970 | Generate File | |
| | Aeroways (ro_osm_aeroway_ln) | hor.: 586664, 590820 vert.: 324150, 326809 | Format: ESRI .shp Projection: Stereo 1970 | Generate File | |
| | Highways (ro_osm_highway_ln) | hor.: 586664, 590820 vert.: 324150, 326809 | Format: ESRI .shp Projection: Stereo 1970 | Generate File | |
| | Railways (ro_osm_railway_ln) | hor.: 586664, 590820 vert.: 324150, 326809 | Format: ESRI .shp Projection: Stereo 1970 | Generate File | |
| | Aerialways (ro_osm_aerialway_ln) | hor.: 586664, 590820 vert.: 324150, 326809 | Format: ESRI .shp Projection: Stereo 1970 | Generate File | |

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X: 590'616.9m, Y: 326'272.7m

Geodata Browser | Download Cart | Info | Help

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| Thumbnail | Source Product | Extent (Stereo 1970) | Download Format / Projection | Action | Status / Download |
|---|---|---|---|---|---|
| | Landuse (ro_osm_landuse_pl) | hor.: 586664, 590820 vert.: 324150, 326809 | Format: ESRI .shp Projection: Stereo 1970 | Generate File | |
| | Natural (ro_osm_natural_pl) | hor.: 586664, 590820 vert.: 324150, 326809 | Format: ESRI .shp Projection: Stereo 1970 | Generate File | |
| | Waterways (ro_osm_waterway_ln) | hor.: 586664, 590820 vert.: 324150, 326809 | Format: ESRI .shp Projection: Stereo 1970 | Generate File | |
| | Waterways (ro_osm_waterway_pl) | hor.: 586664, 590820 vert.: 324150, 326809 | Format: ESRI .shp Projection: Stereo 1970 | Generate File | |
| | Buildings (ro_osm_building_pl) | hor.: 586664, 590820 vert.: 324150, 326809 | Format: ESRI .shp Projection: Stereo 1970 | Generate File | |
| | Aeroways (ro_osm_aeroway_ln) | hor.: 586664, 590820 vert.: 324150, 326809 | Format: ESRI .shp Projection: Stereo 1970 | Generate File | |
| | Highways (ro_osm_highway_ln) | hor.: 586664, 590820 vert.: 324150, 326809 | Format: ESRI .shp Projection: Stereo 1970 | Generate File | Extracting Data... Please wait |
| | Railways (ro_osm_railway_ln) | hor.: 586664, 590820 vert.: 324150, 326809 | Format: ESRI .shp Projection: Stereo 1970 | Generate File | |
| | Aerialways (ro_osm_aerialway_ln) | hor.: 586664, 590820 vert.: 324150, 326809 | Format: ESRI .shp Projection: Stereo 1970 | Generate File | |

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X: 590'616.9m, Y: 326'272.7m

Geodata Browser | Download Cart | Info | Help

import Cart | export Cart

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|---|---|---|---|---|---|
| | Landuse (ro_osm_landuse_pl) | hor.: 586664, 590820 vert.: 324150, 326809 | Format: ESRI .shp Projection: Stereo 1970 | Generate File | |
| | Natural (ro_osm_natural_pl) | hor.: 586664, 590820 vert.: 324150, 326809 | Format: ESRI .shp Projection: Stereo 1970 | Generate File | |
| | Waterways (ro_osm_waterway_ln) | hor.: 586664, 590820 vert.: 324150, 326809 | Format: ESRI .shp Projection: Stereo 1970 | Generate File | |
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| | Buildings (ro_osm_building_pl) | hor.: 586664, 590820 vert.: 324150, 326809 | Format: ESRI .shp Projection: Stereo 1970 | Generate File | |
| | Aeroways (ro_osm_aeroway_ln) | hor.: 586664, 590820 vert.: 324150, 326809 | Format: ESRI .shp Projection: Stereo 1970 | Generate File | |
| | Highways (ro_osm_highway_ln) | hor.: 586664, 590820 vert.: 324150, 326809 | Format: ESRI .shp Projection: Stereo 1970 | Generate File | Click here to download result |
| | Railways (ro_osm_railway_ln) | hor.: 586664, 590820 vert.: 324150, 326809 | Format: ESRI .shp Projection: Stereo 1970 | Generate File | |
| | Aerialways (ro_osm_aerialway_ln) | hor.: 586664, 590820 vert.: 324150, 326809 | Format: ESRI .shp Projection: Stereo 1970 | Generate File | |

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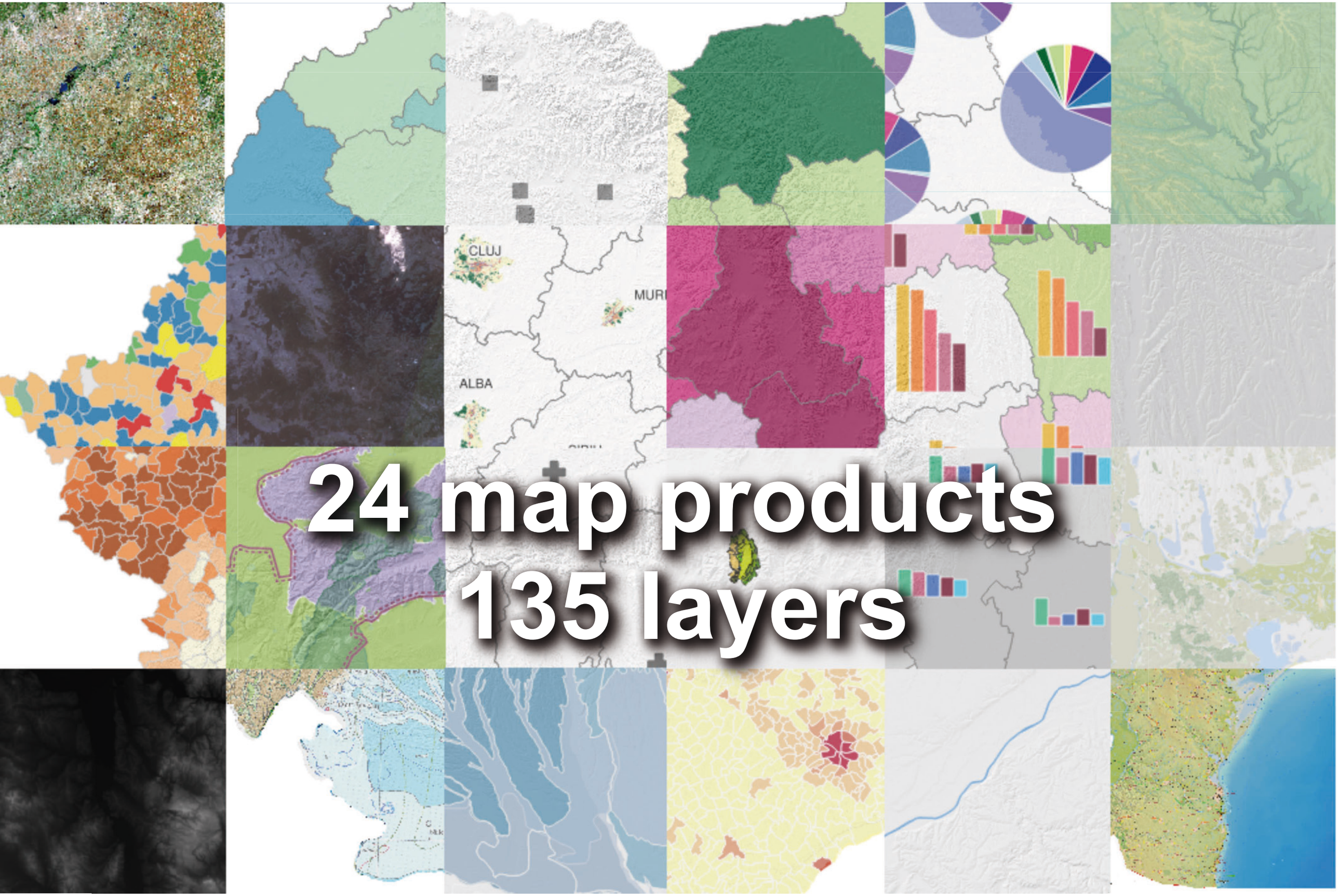
X: 958'365.0m, Y: 204'202.1m

Geodata Browser | Download Cart | Info | Help

import Cart | export Cart

Your Download Cart lists all the selected products / product-layers. Click the "Generate File" button to clip and download a layer. Depending on the data extent and the data density or resolution, files can take up to several minutes to generate. Generated files will be stored till midnight on the GeoViTe server. To download a generated file click on the download link in the Status/Download column.

| Thumbnail | Source Product | Extent (Stereo 1970) | Download Format / Projection | Action | Status / Download |
|---|---|---|---|---|---|
| | Landuse (ro_osm_landuse_pl) | Whole Dataset | Format: ESRI .shp<br>Projection: N/A | Generate File | Click here to download |
| | Natural (ro_osm_natural_pl) | Whole Dataset | Format: ESRI .shp<br>Projection: N/A | Generate File | Click here to download |
| | Waterways (ro_osm_waterway_ln) | Whole Dataset | Format: ESRI .shp<br>Projection: N/A | Generate File | Click here to download |
| | Waterways (ro_osm_waterway_pl) | Whole Dataset | Format: ESRI .shp<br>Projection: N/A | Generate File | Click here to download |
| | Buildings (ro_osm_building_pl) | Whole Dataset | Format: ESRI .shp<br>Projection: N/A | Generate File | Click here to download |
| | Aeroways (ro_osm_aeroway_ln) | Whole Dataset | Format: ESRI .shp<br>Projection: N/A | Generate File | Click here to download |
| | Highways (ro_osm_highway_ln) | Whole Dataset | Format: ESRI .shp<br>Projection: N/A | Generate File | Click here to download |
| | Railways (ro_osm_railway_ln) | Whole Dataset | Format: ESRI .shp<br>Projection: N/A | Generate File | Click here to download |
| | Aerialways (ro_osm_aerialway_ln) | Whole Dataset | Format: ESRI .shp<br>Projection: N/A | Generate File | Click here to download |




# 24 map products
# 135 layers

# Available geodata

http://geoidea.ethz.ch/helpinfo/geoidea_availability.html

Enter a keyword to sea

Last update: June 23, 2015

| Map Category | Map Product | Layers | Format |
|---|---|---|---|
| Raster Maps | Dobrogea Maps | Dobrogea Map | geoTIFF |
| | | Danube Delta Map | geoTIFF |
| | Hydrogeological Map | Map Sheet Budapest | geoTIFF |
| | | Map Sheet Bucharest | geoTIFF |
| Raster Data | Landsat | Landsat TM | geoTIFF |
| | | Landsat ETM | geoTIFF |
| | Elevation Model | Digital Elevation Model | geoTIFF |
| | Relief | Colored Relief | geoTIFF |
| | | Relief | geoTIFF |
| | | Relief (cut at the border) | geoTIFF |
| Vector Data | Open Street Map | Landuse | shp, dxf |
| | | Natural | shp, dxf |
| | | Waterways | shp, dxf |
| | | Waterways | shp, dxf |
| | | Buildings | shp, dxf |
| | | Aeroways | shp, dxf |
| | | Highways | shp, dxf |
| | | Railways | shp, dxf |
| | | Aerialways | shp, dxf |
| | | Waterways (pt) | shp, dxf |
| | | Highways (pt) | shp, dxf |
| | | Railways (pt) | shp, dxf |
| | | Historic (pt) | shp, dxf |
| | | Natural (pt) | shp, dxf |
| | | Tourism | shp, dxf |

# GEOIDEA.RO - Web Map Services

The Geoportal | About us | FAQ | Available Layers | Metadata | **Web Map Services**

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GEodata Openness Initiative for Development and Economic Advancement in ROmania

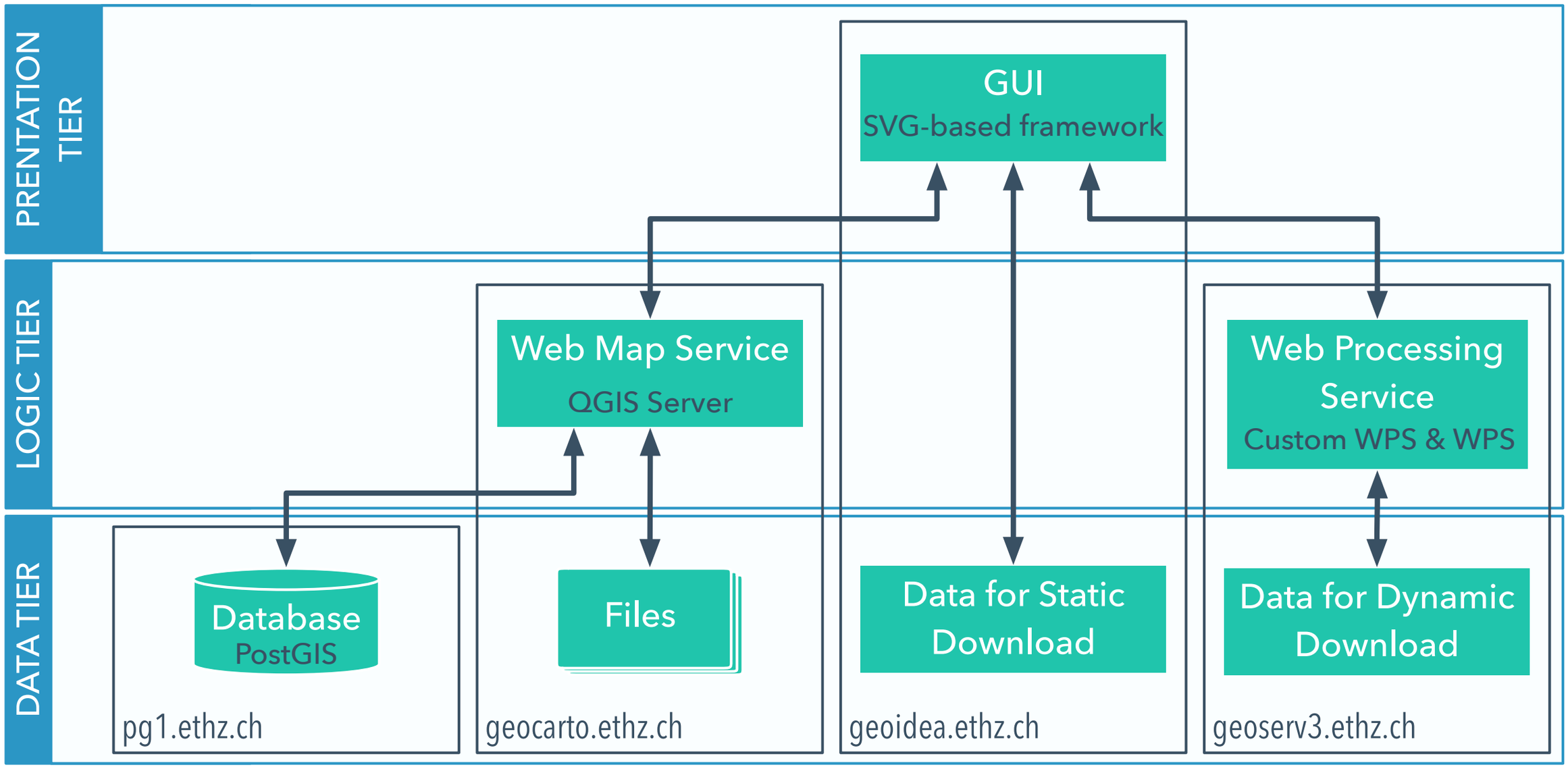
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## Web Map Services List

This page lists all the available WMS within the GEOIDEA.RO project. Below you will find the GetCapabilities links to the different WMS that are also available in the Geoportal.

| Map Product | GetCapabilities |
|---|---|
| **Dobrogea Maps** | http://geocarto.ethz.ch/cgi-bin/dob_raster_maps/qgis_mapserv.fcgi?SERVICE=WMS&VERSION=1.1.1&REQUEST=GetCapabilities |
| **Hydrogeological Map** | http://geocarto.ethz.ch/cgi-bin/ro_bgr_hydrogeo/qgis_mapserv.fcgi?SERVICE=WMS&VERSION=1.1.1&REQUEST=GetCapabilities |
| **Landsat** | http://geocarto.ethz.ch/cgi-bin/ro_raster_data/qgis_mapserv.fcgi?SERVICE=WMS&VERSION=1.1.1&REQUEST=GetCapabilities |
| **Elevation Model** | http://geocarto.ethz.ch/cgi-bin/ro_raster_data/qgis_mapserv.fcgi?SERVICE=WMS&VERSION=1.1.1&REQUEST=GetCapabilities |
| **Relief** | http://geocarto.ethz.ch/cgi-bin/ro_raster_data/qgis_mapserv.fcgi?SERVICE=WMS&VERSION=1.1.1&REQUEST=GetCapabilities |
| **Open Street Map** | |
| **Protected Areas** | http://geocarto.ethz.ch/cgi-bin/ro_natura/qgis_mapserv.fcgi?SERVICE=WMS&VERSION=1.1.1&REQUEST=GetCapabilities |
| **Groundwater Horizons** | http://geocarto.ethz.ch/cgi-bin/ro_eea_groundwater/qgis_mapserv.fcgi?SERVICE=WMS&VERSION=1.1.1&REQUEST=GetCapabilities |
| **Political Colours for Romania** | http://geocarto.ethz.ch/cgi-bin/ro_politicalcolours/qgis_mapserv.fcgi?SERVICE=WMS&VERSION=1.1.1&REQUEST=GetCapabilities |
| **Statistics for Localities** | http://geocarto.ethz.ch/cgi-bin/ro_despresate/qgis_mapserv.fcgi?SERVICE=WMS&VERSION=1.1.1&REQUEST=GetCapabilities |
| **CLC Urban Atlas** | http://geocarto.ethz.ch/cgi-bin/ro_clc_urban/qgis_mapserv.fcgi?SERVICE=WMS&VERSION=1.1.1&REQUEST=GetCapabilities |
| **Dobrogea Region** | http://geocarto.ethz.ch/cgi-bin/dob_vector/qgis_mapserv.fcgi?SERVICE=WMS&VERSION=1.1.1&REQUEST=GetCapabilities |
| **Bucegi Natural Park** | http://geocarto.ethz.ch/cgi-bin/bnp_bucegi/qgis_mapserv.fcgi?SERVICE=WMS&VERSION=1.1.1&REQUEST=GetCapabilities |
| **Hydrogeology (Sample)** | http://geocarto.ethz.ch/cgi-bin/fer-rah_hydrogeo/qgis_mapserv.fcgi?SERVICE=WMS&VERSION=1.1.1&REQUEST=GetCapabilities |
| **Danube Fairway** | http://geocarto.ethz.ch/cgi-bin/dan_afdj_fairway/qgis_mapserv.fcgi?SERVICE=WMS&VERSION=1.1.1&REQUEST=GetCapabilities |
| **Livestock** | http://geocarto.ethz.ch/cgi-bin/gov_animals/qgis_mapserv.fcgi?SERVICE=WMS&VERSION=1.1.1&REQUEST=GetCapabilities |
| **Sanitary Expenses** | http://geocarto.ethz.ch/cgi-bin/gov_sanitary_expenses/qgis_mapserv.fcgi?SERVICE=WMS&VERSION=1.1.1&REQUEST=GetCapabilities |
| **Health Personnel** | http://geocarto.ethz.ch/cgi-bin/gov_health_personnel/qgis_mapserv.fcgi?SERVICE=WMS&VERSION=1.1.1&REQUEST=GetCapabilities |
| **Health Infrastructure** | http://geocarto.ethz.ch/cgi-bin/gov_health_resources/qgis_mapserv.fcgi?SERVICE=WMS&VERSION=1.1.1&REQUEST=GetCapabilities |
| **Demography Information** | http://geocarto.ethz.ch/cgi-bin/gov_demography/qgis_mapserv.fcgi?SERVICE=WMS&VERSION=1.1.1&REQUEST=GetCapabilities |
| **Prisons** | http://geocarto.ethz.ch/cgi-bin/gov_prisons/qgis_mapserv.fcgi?SERVICE=WMS&VERSION=1.1.1&REQUEST=GetCapabilities |
| **Sanitary Network** | |

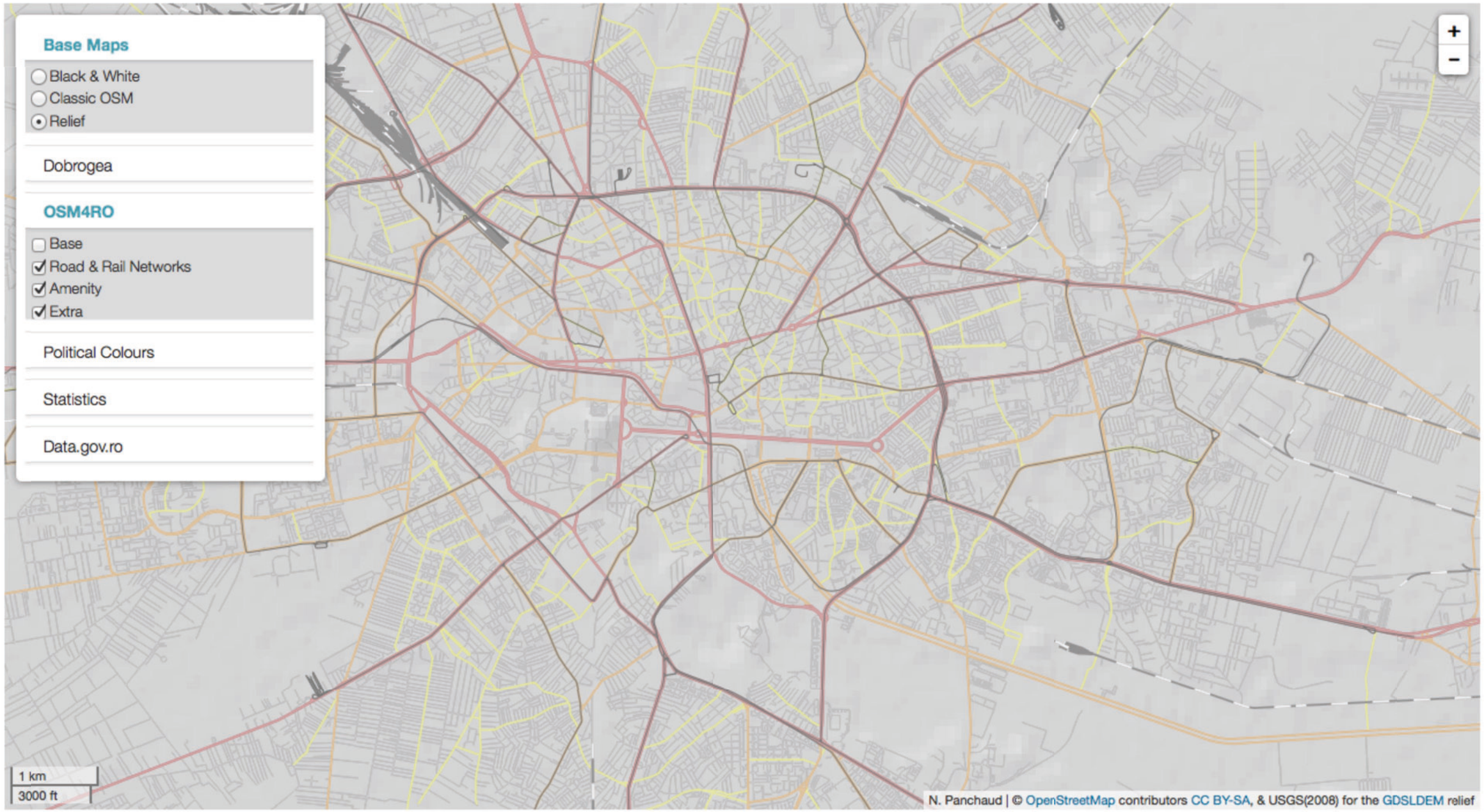
# Architecture



# GEOIDEA.RO - The GEOPORTAL Lite

The Geoportal Viewer  About  FAQ & Contact

http://djana.github.io




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- Cartographic conflicts on geoportals
- Geodata management
- Spatial Data Infrastructures
- Open source geospatial technologies

# Research Outlook

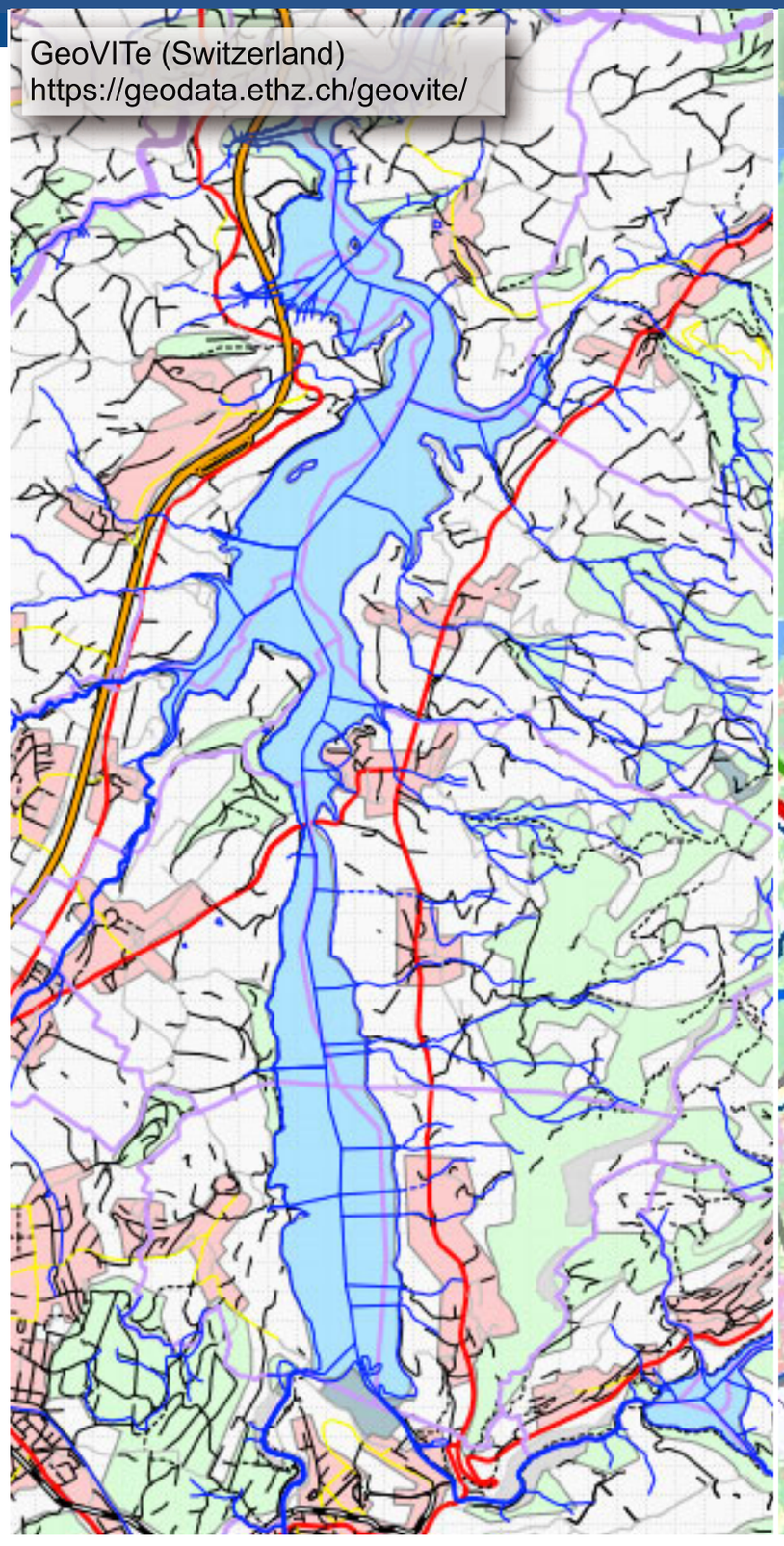
# Cartographic Conflicts on Geoportals

- Cartographic quality of geodata representation is low on geoportals
- Geoportal allowing map-mashup might lead to even worse representations

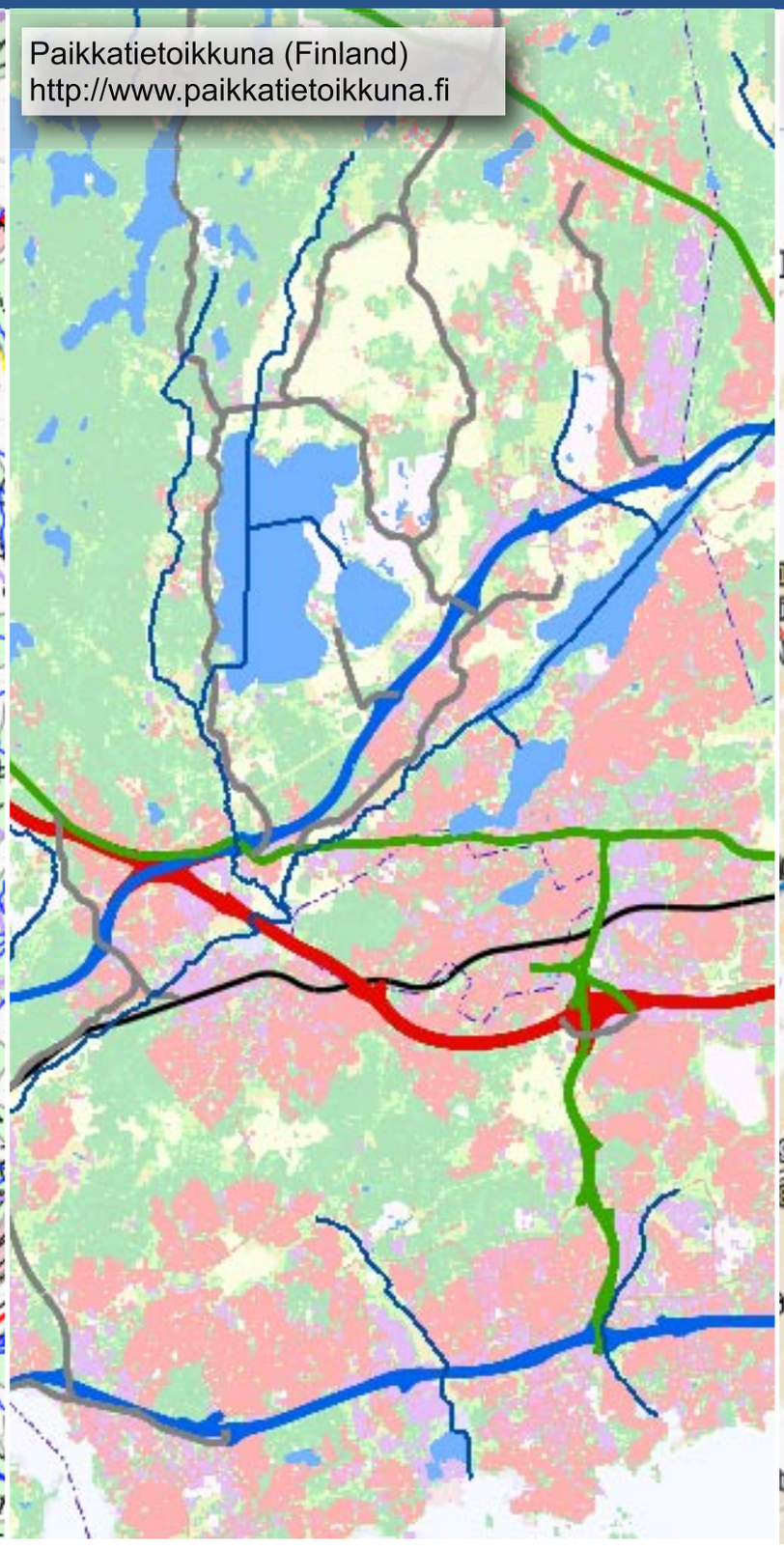
# Cartographic Conflicts on Geoportals

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- Geoportal allowing map-mashup might lead to even worse representations
  - Drawing order of the layer -> overlaps and occlusion

GeoVITe (Switzerland)
https://geodata.ethz.ch/geovite/



Paikkatietoikkuna (Finland)
http://www.paikkatietoikkuna.fi



Bhuvan (India)
http://bhuvan.nrsc.gov.in/map/bhuvannew/bhuvan2d.php



# Cartographic Conflicts on Geoportals

- Cartographic quality of geodata representation is low on geoportals
- Geoportal allowing map-mashup might lead to even worse representations
  - Drawing order of the layer -> overlaps and occlusion
  - Visual clutter and information overload


Géoportail France (IGN)
http://www.geoportail.gouv.fr
Pays
France métr...
Echelle 1 : 4.367.624
0
100 km

Paikkatietoikkuna (Finland)
http://www.paikkatietoikkuna.fi

GeoAdmin (Switzerland)
https://map.geo.admin.ch

National Geoportal (Luxembourg)
https://www.geoportail.lu

Geoportal.lt (Lithuania)
https://www.geoportal.lt

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- Cartographic quality of geodata representation is low on geoportals
- Geoportal allowing map-mashup might lead to even worse representations
  - Drawing order of the layer -> overlaps and occlusion
  - Visual clutter and information overload
  - Lack of visual hierarchy

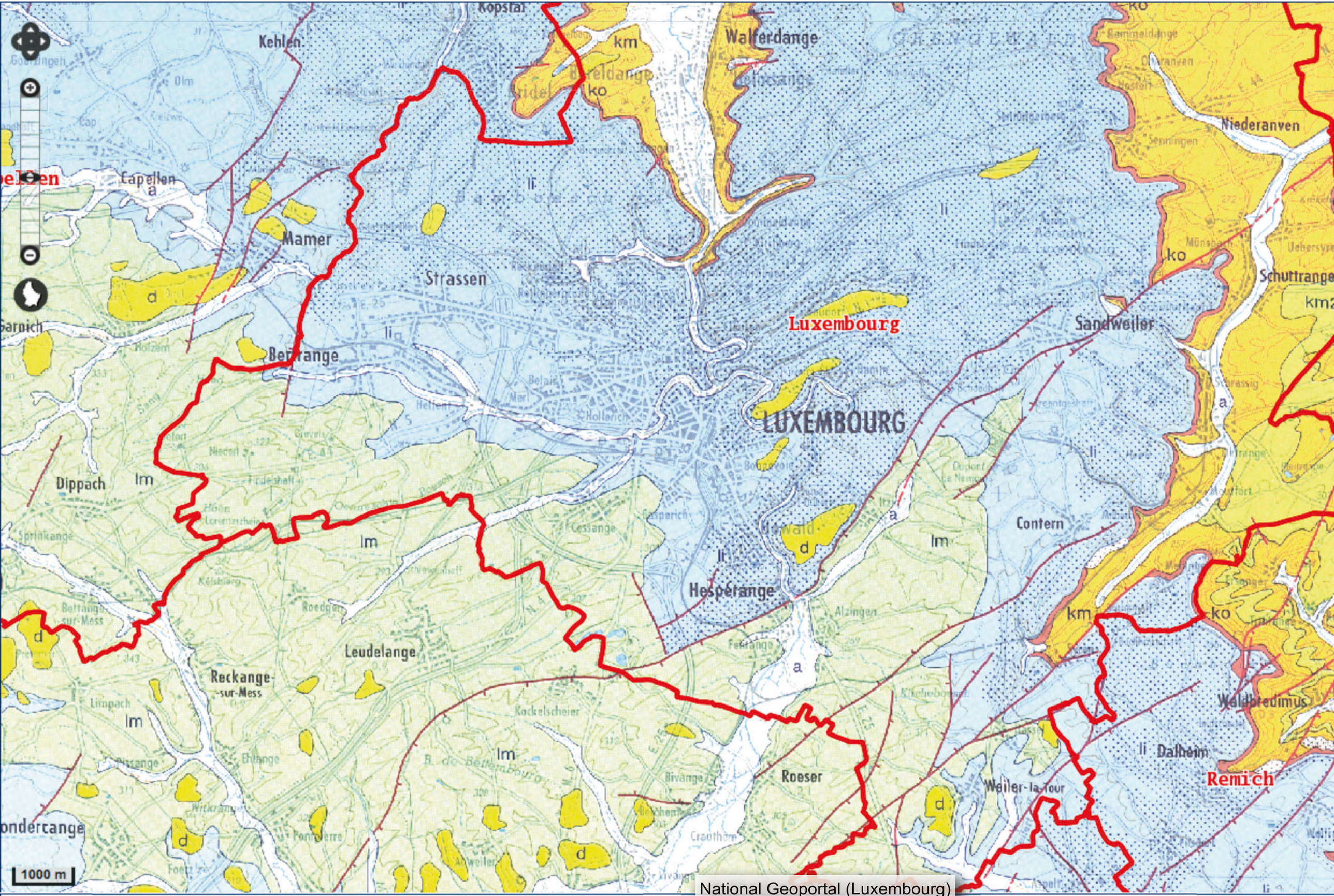
National Geoportal (Luxembourg)
https://www.geoportail.lu

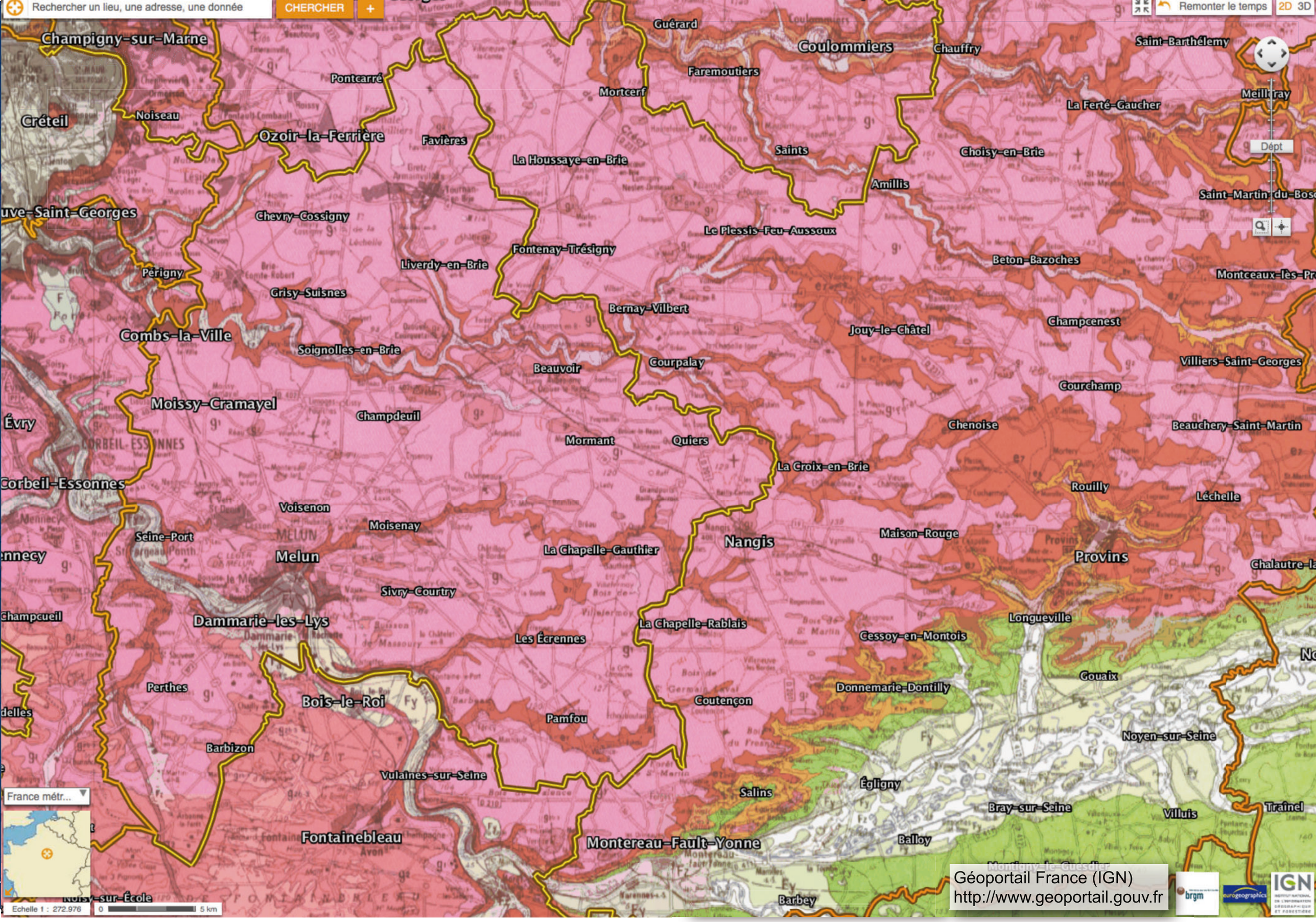
Paikkatietoikkuna (Finland)
http://www.paikkatietoikkuna.fi

Géoportail France (IGN)
http://www.geoportail.gouv.fr

# Cartographic Conflicts on Geoportals

- Cartographic quality of geodata representation is low on geoportals
- Geoportal allowing map-mashup might lead to even worse representations
  - Drawing order of the layer -> overlaps and occlusion
  - Visual clutter and information overload
  - Lack of visual hierarchy
  - Topographic or raster maps as background


Kehlen
Kopstal
Walferdange
Niederanven
Capellen
Mamer
Strassen
Luxembourg
LUXEMBOURG
Sandweiler
Schuttrange
Bertrange
Dippach
Hespérange
Contern
Leudelange
Reckange-sur-Mess
Roeser
Dalheim
Remich
Niederanven
1000 m
1 : 60'000
LUREF Luxembourg 1930 /
77120 E, 77390 N - Elevation:
National Geoportal (Luxembourg)
https://www.geoportail.lu


Rechercher un lieu, une adresse, une donnée
CHERCHER
Remonter le temps
2D 3D
Champigny-sur-Marne
Guérard
Coulommiers
Chauffry
Saint-Barthélemy
Pontcarré
Faremoutiers
Mortcerf
La Ferté-Gaucher
Créteil
Noiseau
Ozoir-la-Ferrière
Favières
Saints
Choisy-en-Brie
La Houssaye-en-Brie
Amillis
Chevry-Cossigny
Le Plessis-Feu-Aussoux
Fontenay-Trésigny
Liverdy-en-Brie
Beton-Bazoches
Périgny
Grisy-Suisnes
Bernay-Vilbert
Jouy-le-Châtel
Champcenest
Combs-la-Ville
Soignolles-en-Brie
Beauvoir
Courpalay
Villiers-Saint-Georges
Courchamp
Moissy-Cramayel
Champdeuil
Chenoise
Évry
Mormant
Quiers
La Croix-en-Brie
Corbeil-Essonnes
Rouilly
Léchelle
Voisenon
Moisenay
Maison-Rouge
Seine-Port
Melun
La Chapelle-Gauthier
Nangis
Provins
Sivry-Courtry
Longueville
Dammarie-les-Lys
La Chapelle-Rablais
Cessoy-en-Montois
Les Écrennes
Gouaix
Perthes
Donnemarie-Dontilly
Bois-le-Roi
Coutençon
Pamfou
Noyen-sur-Seine
Barbizon
Vulaines-sur-Seine
Égligny
Salins
Bray-sur-Seine
Villuis
Fontainebleau
Montereau-Fault-Yonne
Balloy
Barbey
Dépt
France métr...
Echelle 1 : 272.976
0
5 km
Géoportail France (IGN)
http://www.geoportail.gouv.fr

# Cartographic Conflicts on Geoportals

- The map become **illegible**

- Bring confusion to the users
- Prevent the optimal use of geoportals functionality
- The users cannot interpret the map

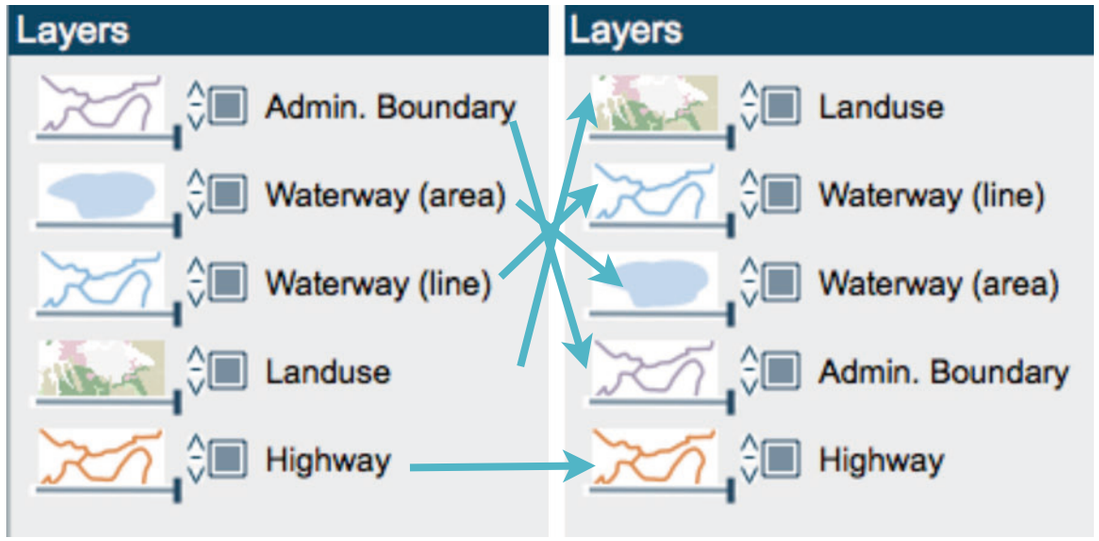
- What is needed:
  - Support for cartographic functionalities within geoportals
  - Cartographically improvement of user map mashups

# Cartographic Conflicts on Geoportals

- Development of smart cartographic functionality
  - Integrated to the user workflow on the geoportal
  - Powered by semantic annotation
- Automatic re-ordering of layers
- Optimization of visual hierarchy

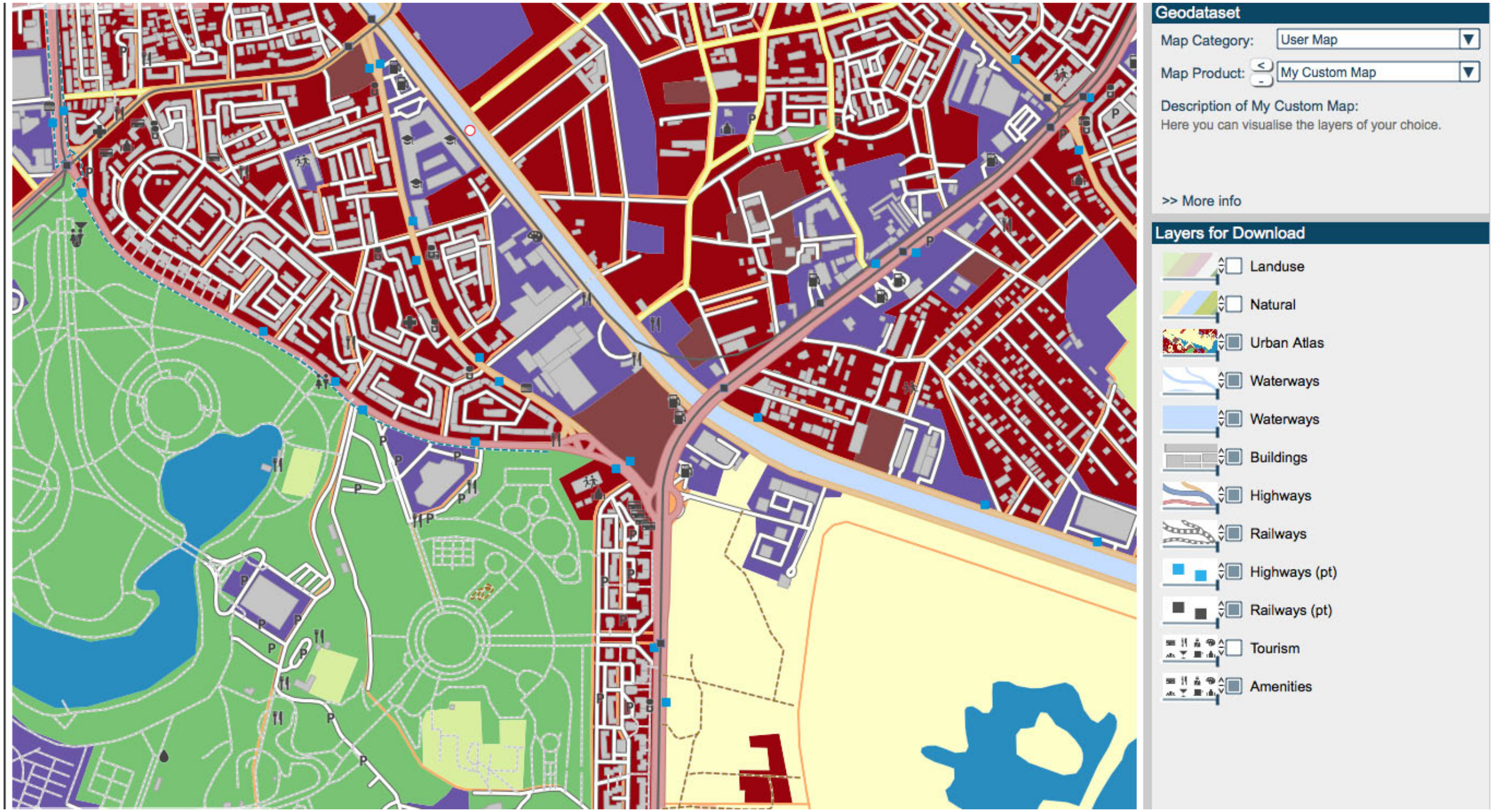
# Cartographic Conflicts on Geoportals

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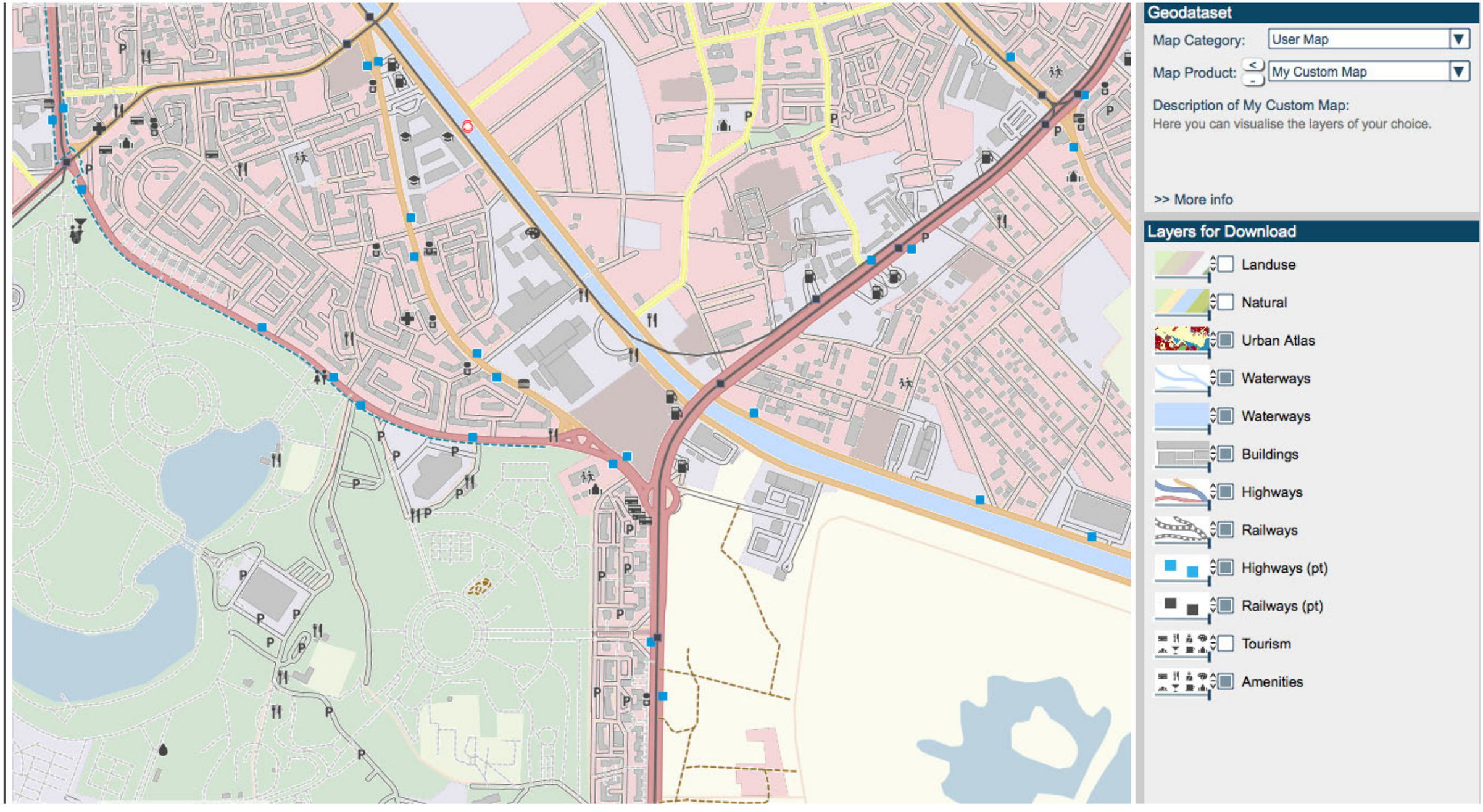



- Automatic re-ordering of layers
- Optimization of visual hierarchy

# Cartographic Conflicts on Geoportals



# Cartographic Conflicts on Geoportals



# More Information

*to be published*

## Providing smart functionality to reduce cartographic conflicts on geoportals with a symbology-based approach

*Nadia H. Panchaud, Ionuț Iosifescu Enescu and Lorenz Hurni*
*ETH Zurich, Institute of Cartography and Geoinformation, Switzerland*

**Abstract**

Access to spatial data has never been so easy for so many people thanks to the growth of geoportal products and the data openness movement. However, the access to cartographic knowledge to the laypersons that use these data is lagging behind. Moreover, we postulate that functionality on geoportals, which allows users to create custom maps by combining layers with their original symbolization from diverse data sources, can lead to unsatisfactory cartographic visualization, which reduces the legibility of the map and the usefulness of such functionality. This article focuses on the creation of a framework for smart cartographic functionalities to improve the quality of cartographic representation on geoportal and to support the democratization of cartographic knowledge. We start by assessing the state of cartographic conflicts on national generic geoportals. Afterwards, we describe an approach to enhanced cartographic geoportals that focus on symbology changes, and based on a client-side and white box strategy. We do not aim at modelling the complex decision making process of a professional cartographer; but rather at providing useful functions that use appropriate assumptions and constraints based on cartographic principles and heuristics, with support of semantic information. We bring added value to geoportals, while suggesting an interoperable approach.

*recently published*

*The* Cartographic Journal *Vol. 52 No. 2 pp. 125–136 International Cartographic Conference, Rio 2015 - Special Issue May 2015*
© *The* British Cartographic Society 2015

REFEREED PAPER

## Towards Better WMS Maps Through the Use of the Styled Layer Descriptor and Cartographic Conflict Resolution for Linear Features

*Ionuț Iosifescu Enescu, Nadia H. Panchaud, Magnus Heitzler, Cristina M. Iosifescu Enescu and Lorenz Hurni*

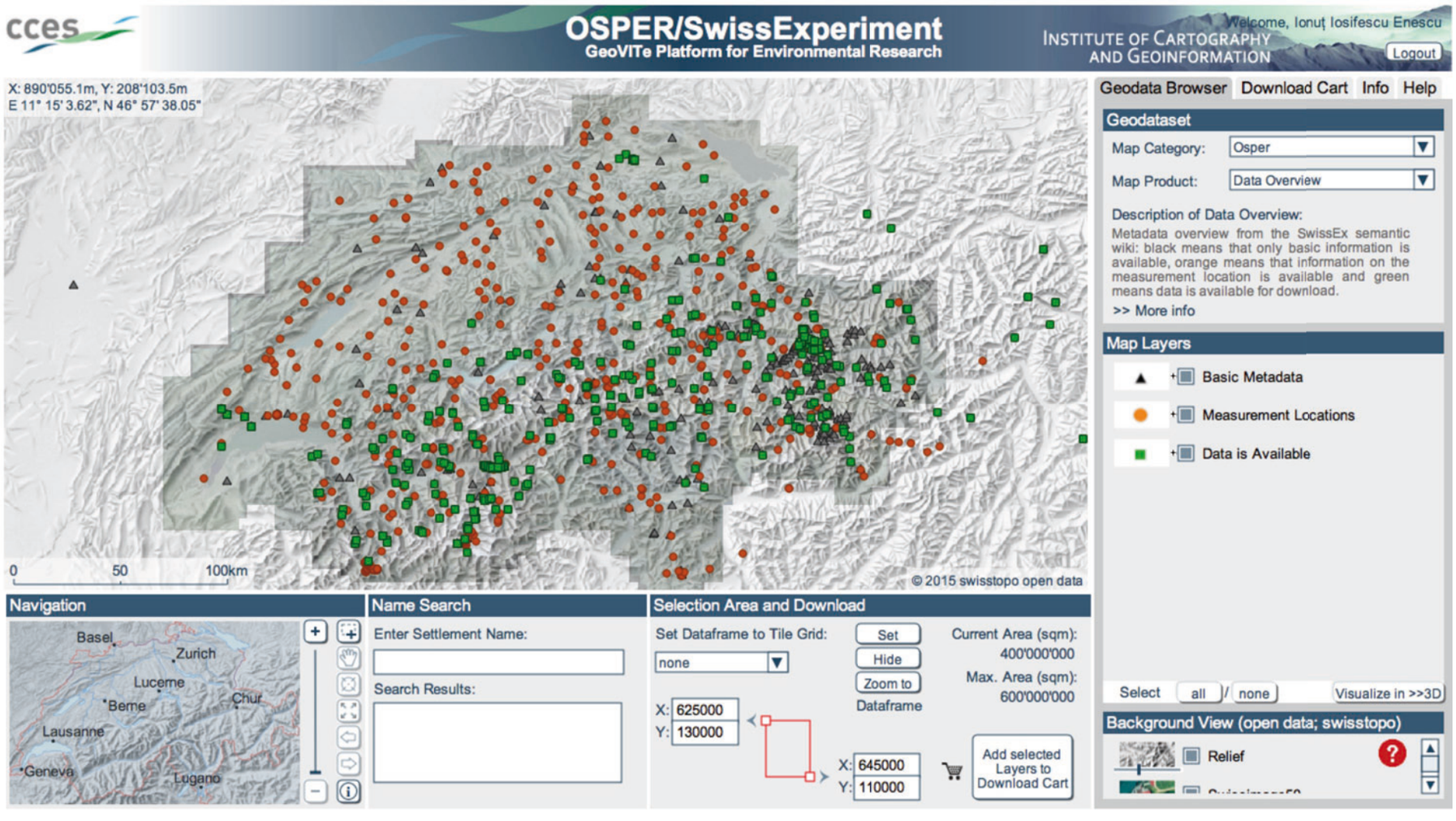
ETH Zurich, Institute of Cartography and Geoinformation, Switzerland
Email: iosifescu@ethz.ch

*The Open Geospatial Consortium (OGC) Web Map Service (WMS) and Styled Layer Descriptor (SLD) standards define a way of dynamically producing maps from vector data. However, this dynamic process often results in maps that are not easily readable when the underlying data are automatically represented at smaller scales than the original data were intended for. Fortunately, the SLD rules can be decoded, the symbolization rules translated into geometrical features, and cartographic conflicts detected and partially solved. The conflicting features can be identified based on the use of few basic geospatial analysis functions. After a solution that minimizes these conflicts emerges, new SLD rules are generated that attempt to visually solve the cartographic conflicts. The new SLD rules can then be applied on-demand by a cartographic proxy server that rewrites the incoming GetMap requests to use the new SLD rules. The process for improving the WMS cartographic output has several stages, grouped into preparatory steps (basic automatic generalization methods, rough scale-dependent SLD symbolization) and real-time processing steps (detection of cartographic conflicts, conflicts solution and generation of new SLD rules). The entire process of detecting and solving cartographic conflicts in the maps produced by WMS through the use of overriding SLD rules is described in detail. Furthermore, it is conceivable to transform the conflicting features into spatial objects containing methods for discovering appropriate SLD values that minimize conflicts. Such approaches can bring the performance of automatic detection and correction of cartographic conflicts above the threshold required for interactive visualization, thus, making the process of dynamically solving cartographic conflicts in WMS servers a viable solution.*

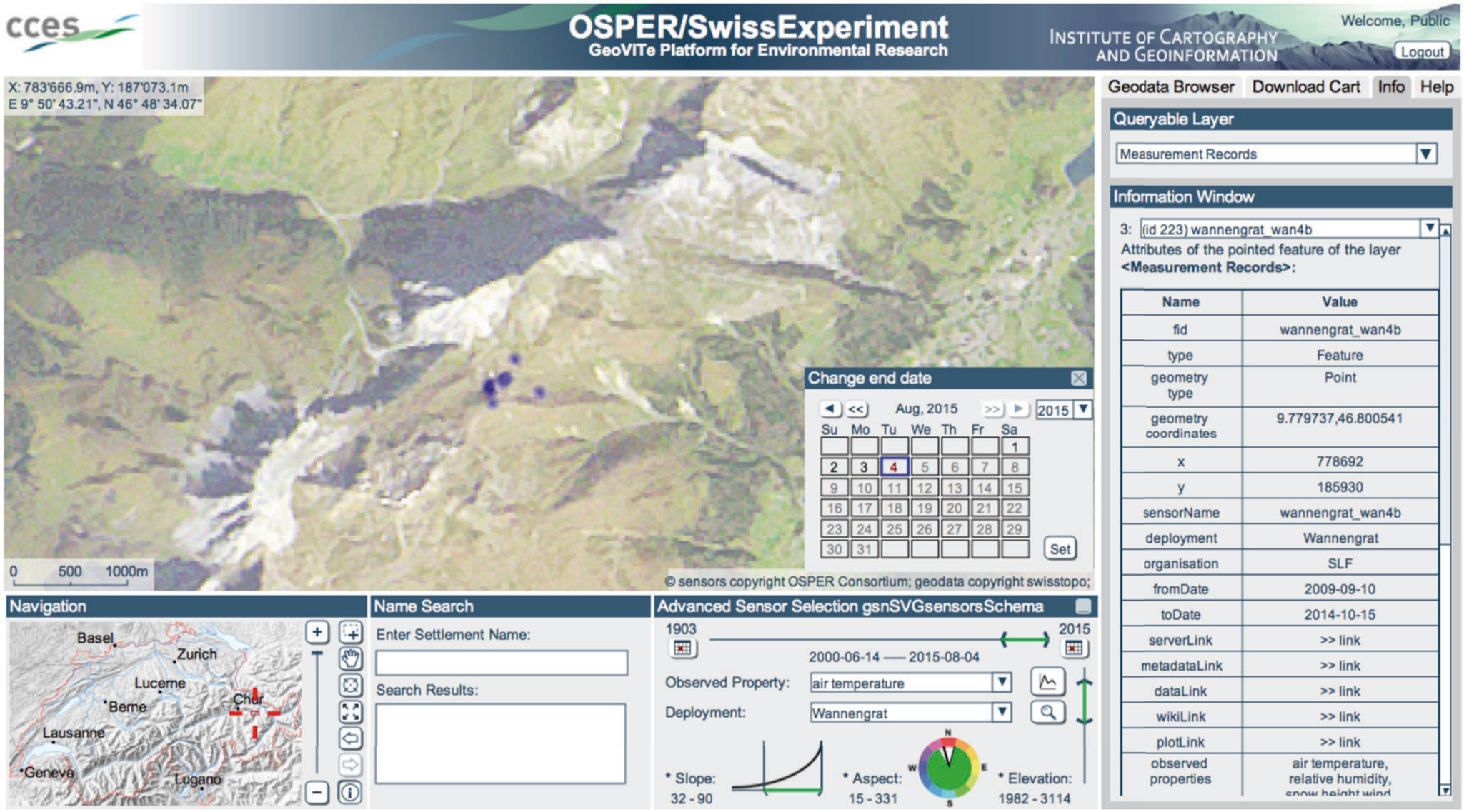
Keywords: WMS, extended SLD/SE, automatic generalization, cartographic conflicts, object-orientation

# Geodata Management

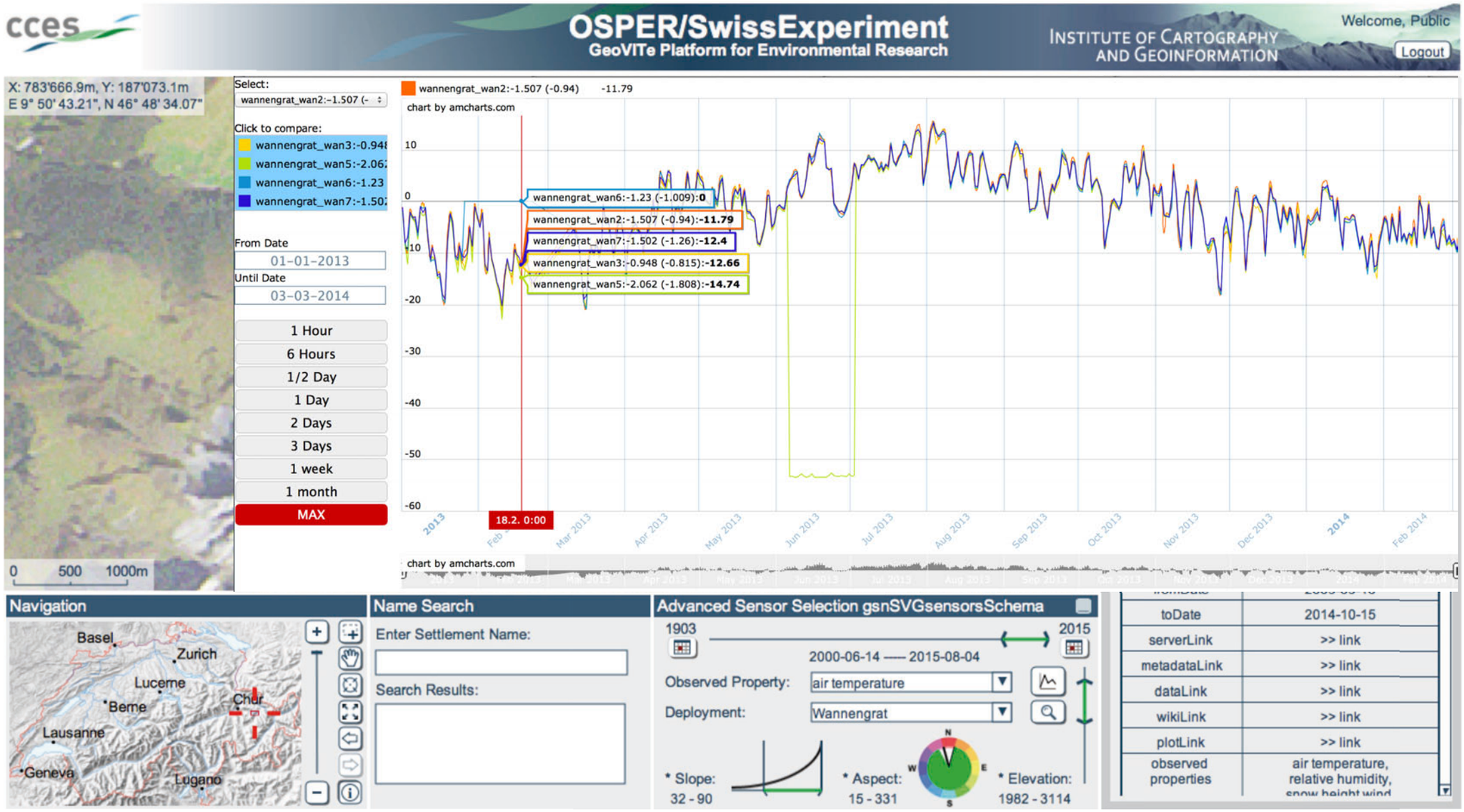
- Main goal of GEOIDEA.RO and GeoVITe: to efficiently promote the use and reuse of geodata at large
- But what is geodata exactly? Anything georeferenced!



# Geodata Management

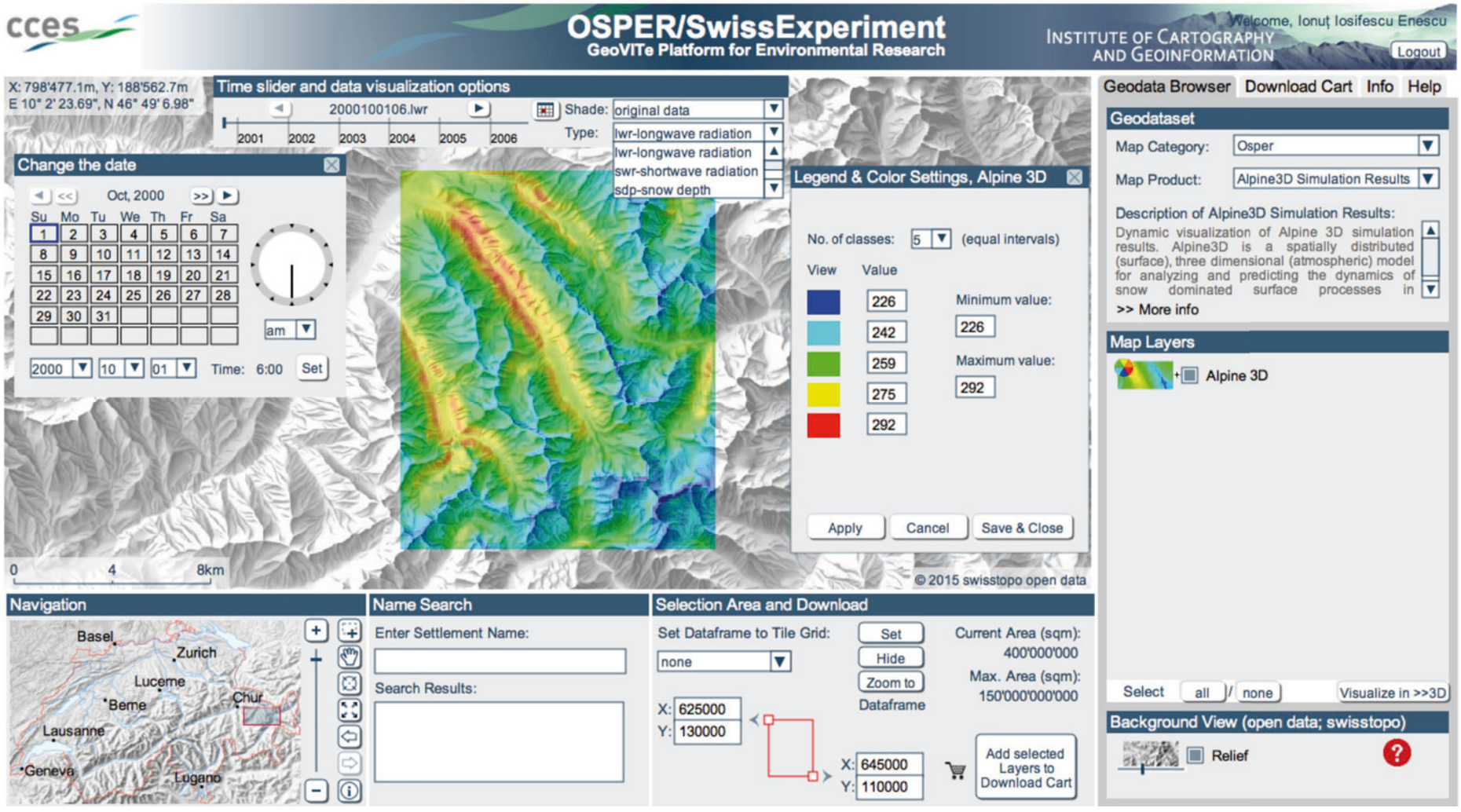


# Geodata Management

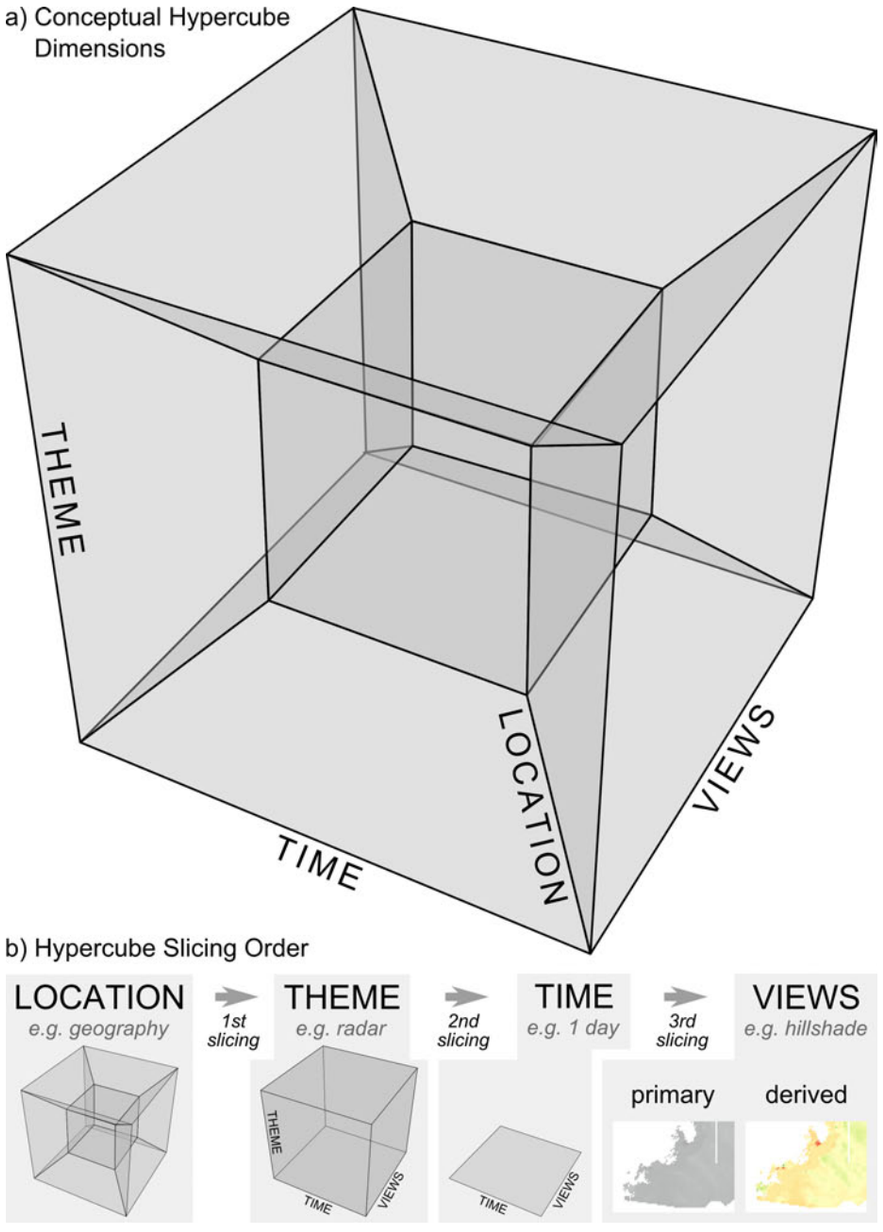


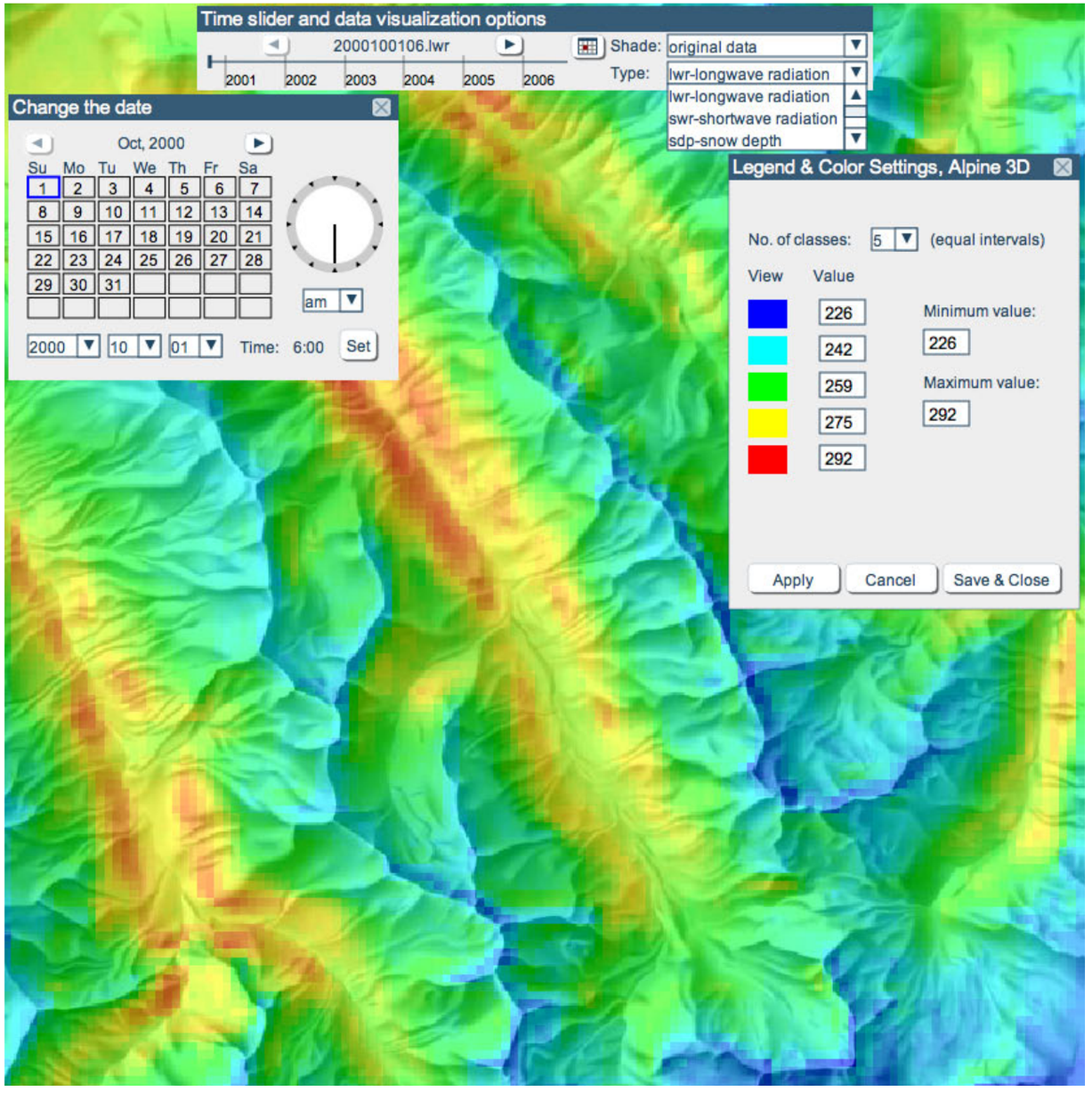
# Geodata Management

- This requires multi-dimensional data management and visualization



# The Hypercube Concept



# The Hypercube Concept

*recently published*

*The* Cartographic Journal *Vol. 52 No. 2 pp. 137–148 International Cartographic Conference, Rio 2015 - Special Issue May 2015*
© *The* British Cartographic Society 2015

REFEREED PAPER

## Hypercube-Based Visualization Architecture for Web-Based Environmental Geospatial Information Systems

*Ionuț Iosifescu Enescu, Vassilios Vescoukis, Cristina M. Iosifescu Enescu, Fabian Müller, Nadia H. Panchaud and Lorenz Hurni*

ETH Zurich, Institute of Cartography and Geoinformation, Switzerland
Email: iosifescu@ethz.ch

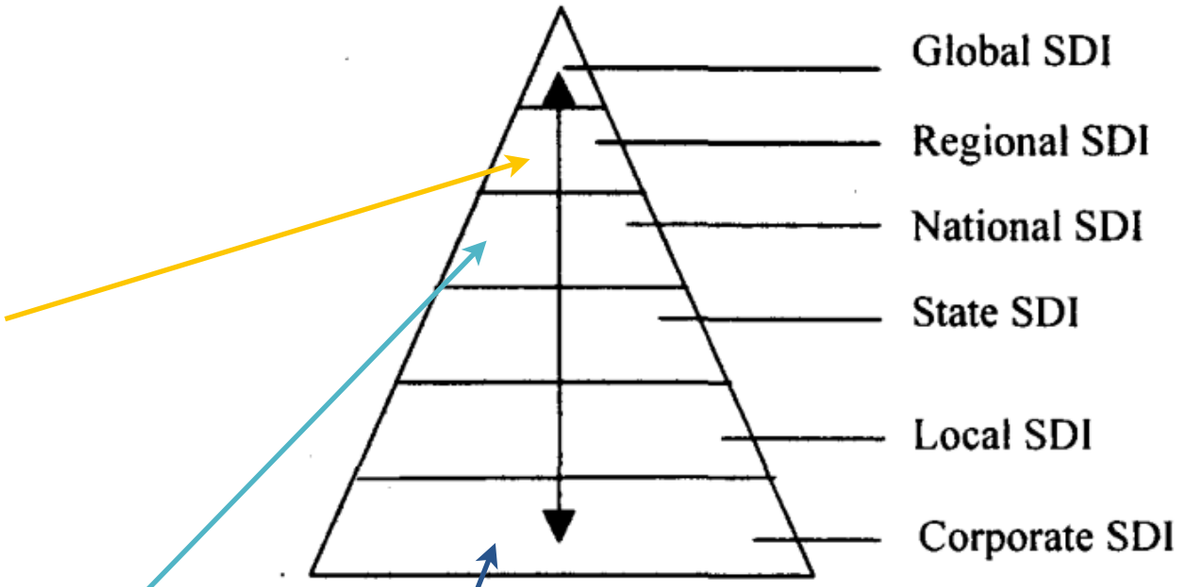
*The geospatial field significantly influences the development of the environmental domain, including a wide range of geospatial and cartographic information systems, such as Geographic Information Systems (GIS), Multimedia Atlas Information Systems (MAIS) and more recently web-based GIS (Web-GIS). In this context, we introduce web-based environmental geospatial information systems (Web-EGIS) as a special case of Web-GIS, aiming to integrate the functionalities of geospatial information systems with the enormous quantity of specialized, distributed and highly heterogeneous environmental geo-referenced data and services. We define three main characteristics of the Web-EGIS. The first is a generic hypercube-based data organization and visualization. The next characteristic is a standard-based, three-tier service-oriented architecture. The third and last characteristic is the traceability of the architectural and design decisions, for which we introduce the new concept of an 'Environmental Application Context', arguing that not only the functional but also the non-functional requirements (NFRs) have an important role in defining the architecture, software components and data services of such systems. In a nutshell, a Web-EGIS is characterized by a coherent user experience through the hypercube-based visualization concept, technically supported by a service-oriented architecture that is structured according to an extensive analysis of NFRs. On this basis, we introduce the Geodata visualization and interactive training environment (GeoVITe) Platform for Interdisciplinary Environmental Research as a reference implementation of a Web-EGIS with its basic design requirements, integrative hypercube-based visualization for heterogeneous data sources, extended web cartography functionalities, and its* de facto *system architecture. The concept of the hypercube-based visualization is better transferred to the system architecture by understanding the 'Environmental Application Context' of this particular Web-EGIS, which also makes it easier to maintain and enhance. The resulting system is a support platform for research activities in the environmental domain.*

Keywords: web-EGIS, hypercube-based data exploration, environmental application context, design decisions, non-functional requirements

# Spatial Data Infrastructures (SDI)

- But how about the geospatial needs of academia?




geo!DEA.ro
GEodata Openness Initiative for Development and Economic Advancement in ROmania

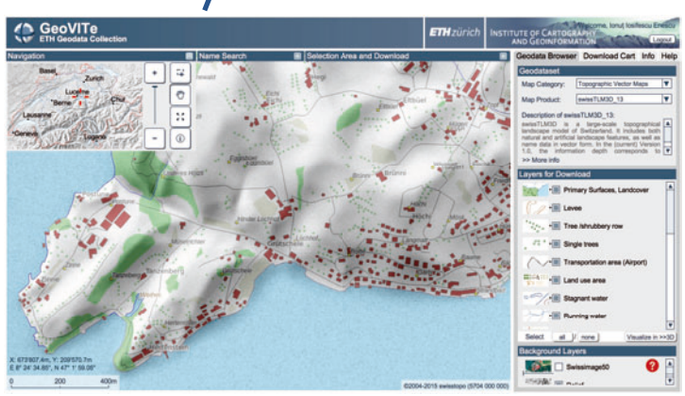
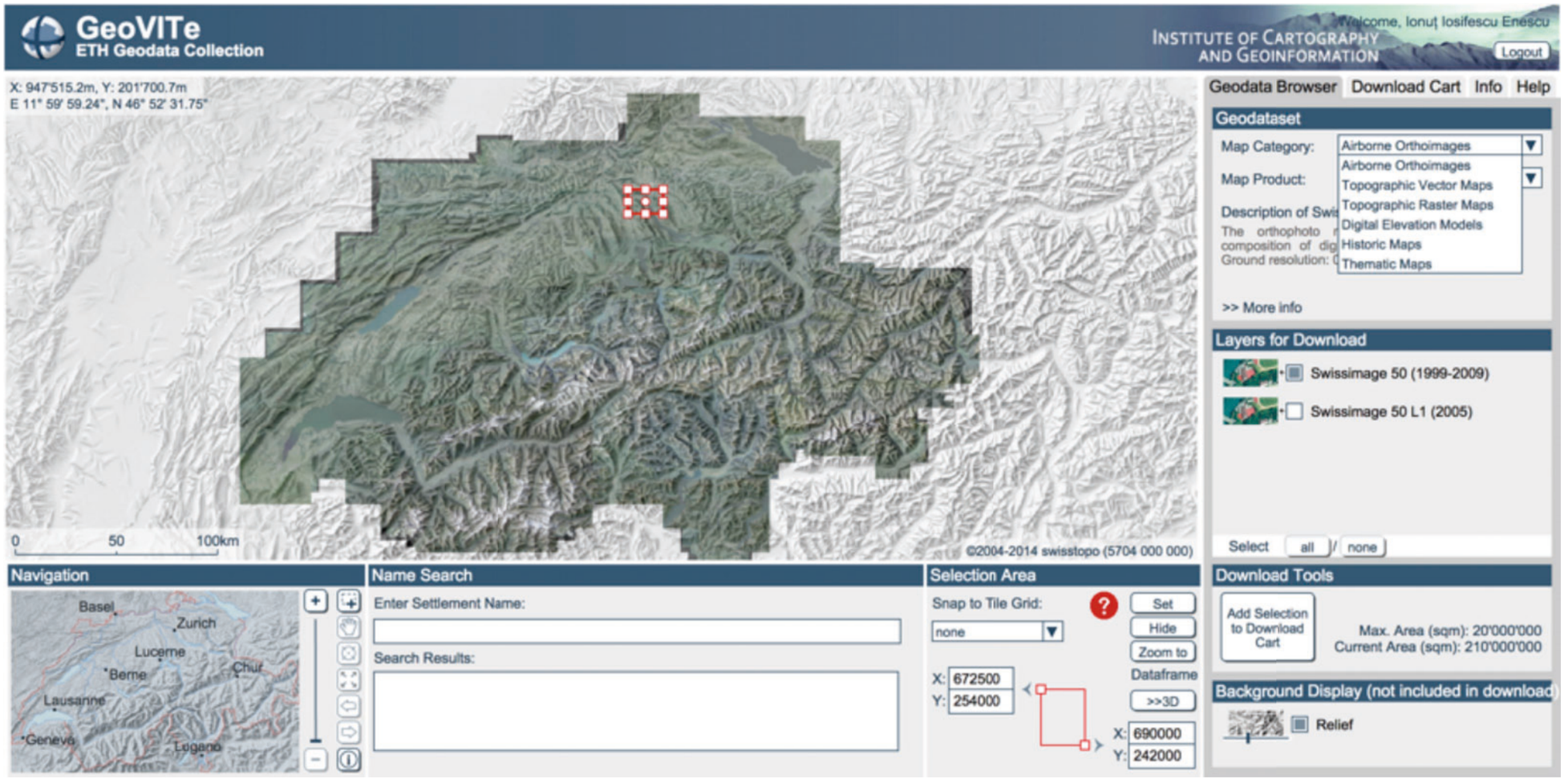



Image source: Rajabifard et al. 2000
http://dspace.uah.es/dspace/bitstream/handle/10017/6818/%28HS%29Spatial%20data.pdf?sequence=1

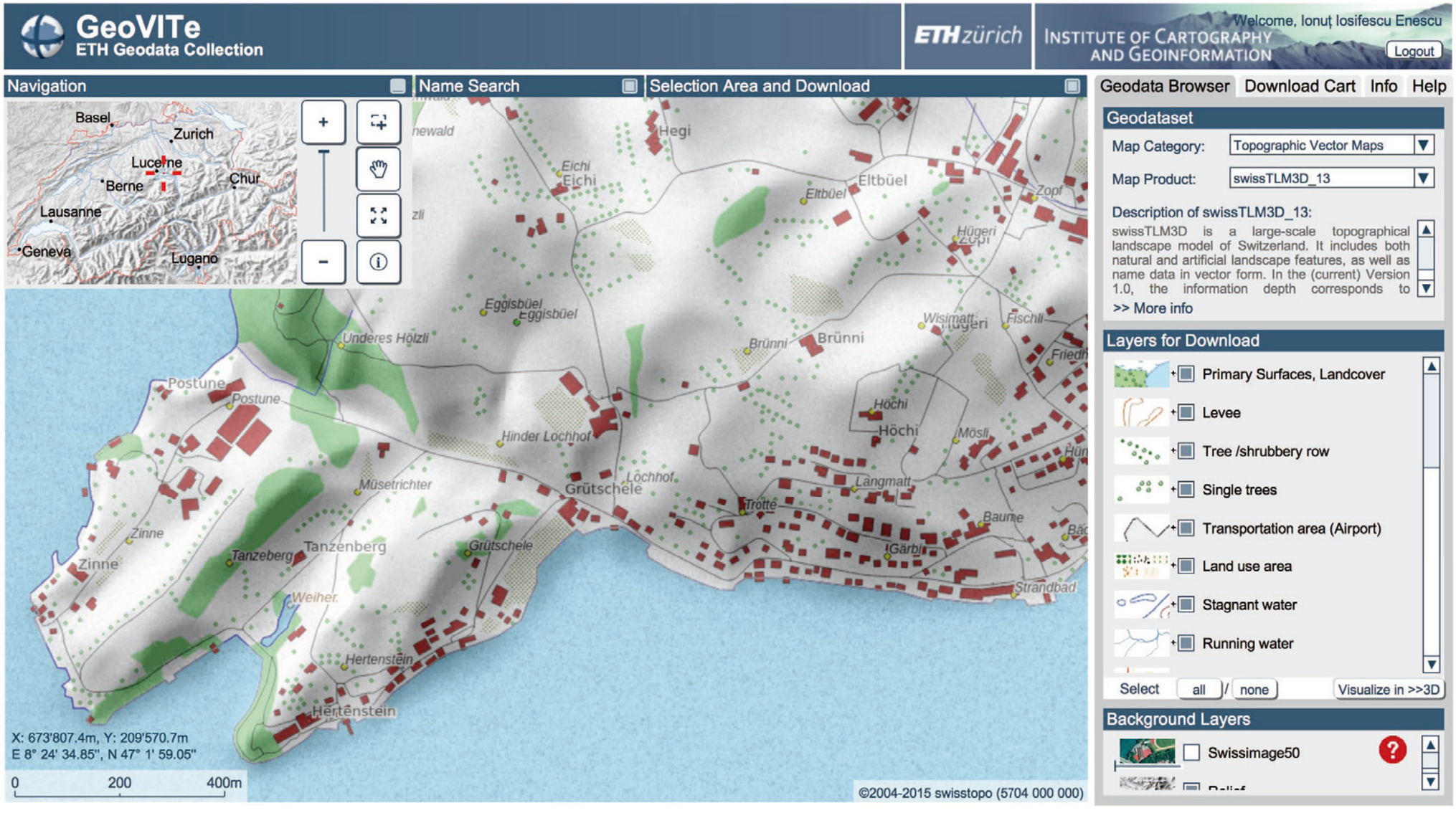
# Towards an Academic SDI in Switzerland

- The GEOIDEA.RO portal is powered by GeoVITe technology
- ETH-wide Spatial Data Infrastructure operational from 2010



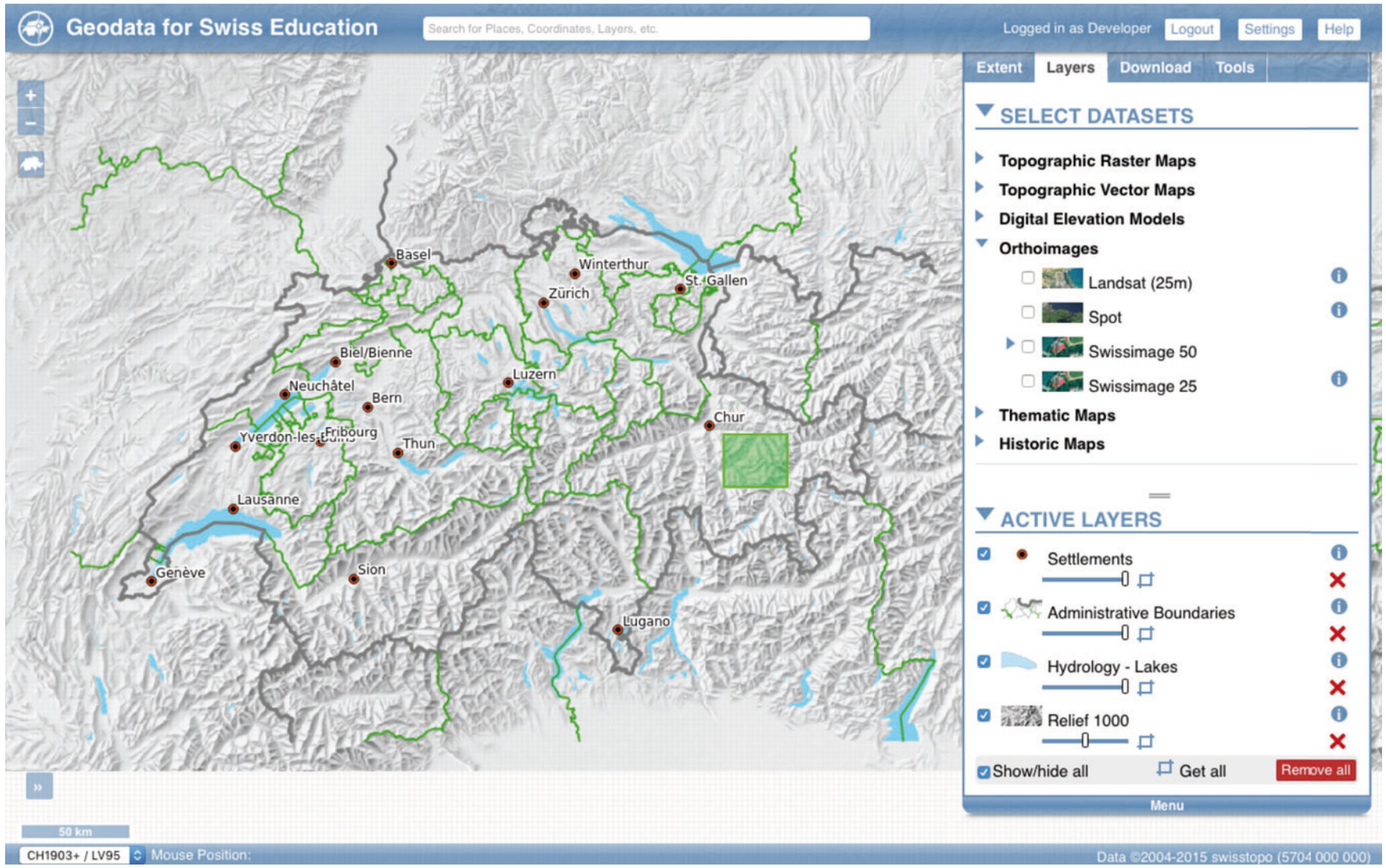
# Towards an Academic SDI in Switzerland

- Usability studies to find out optimal design for GeoVITe
- Usability results hard to implement in the “standard” design



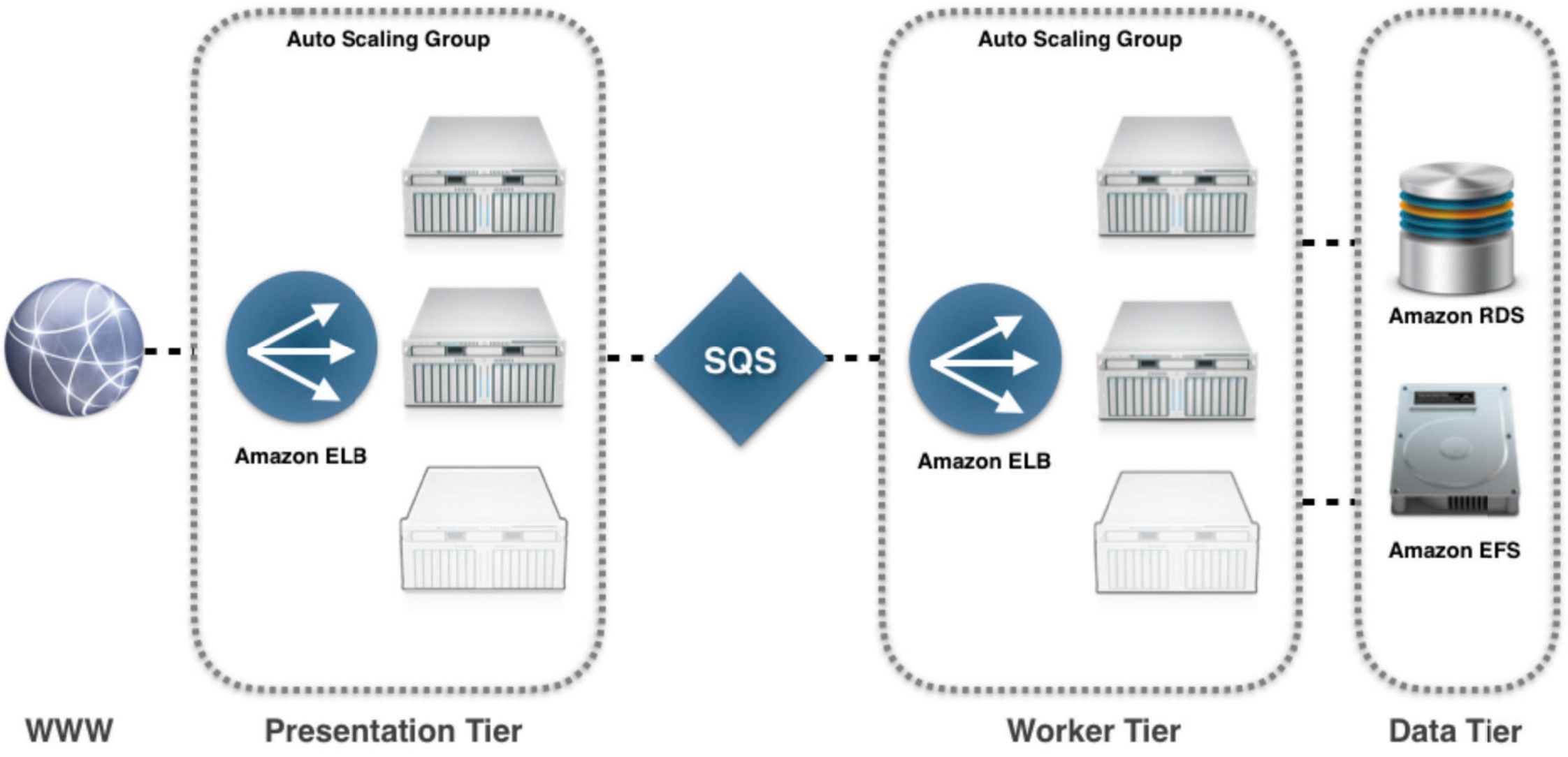
# Towards an Academic SDI in Switzerland

- Coming in 2016: Geodata4SwissEDU
  - Upscaling of GeoVITe to national level in Switzerland, funded by swissuniversities.ch

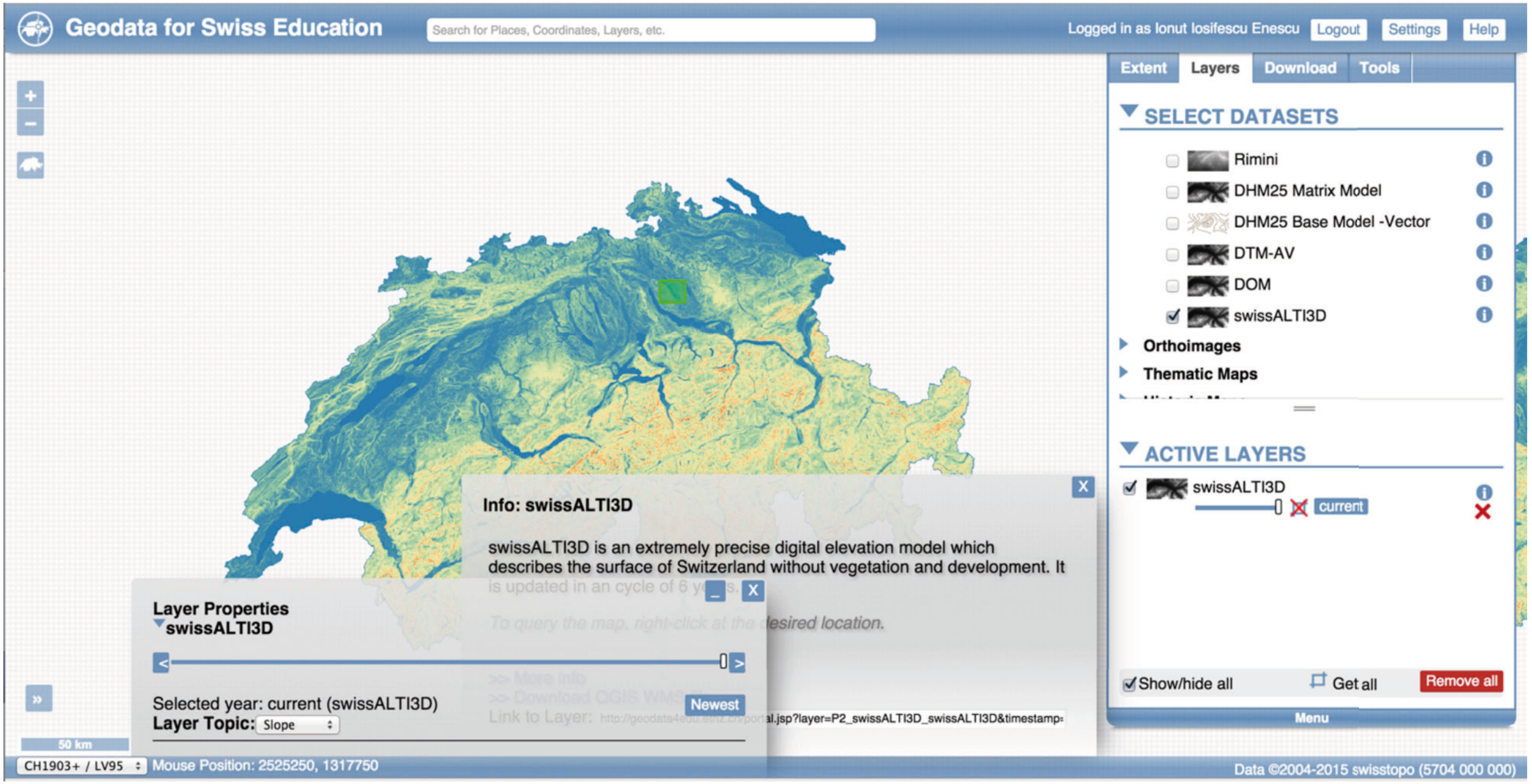


# Towards an Academic SDI in Switzerland

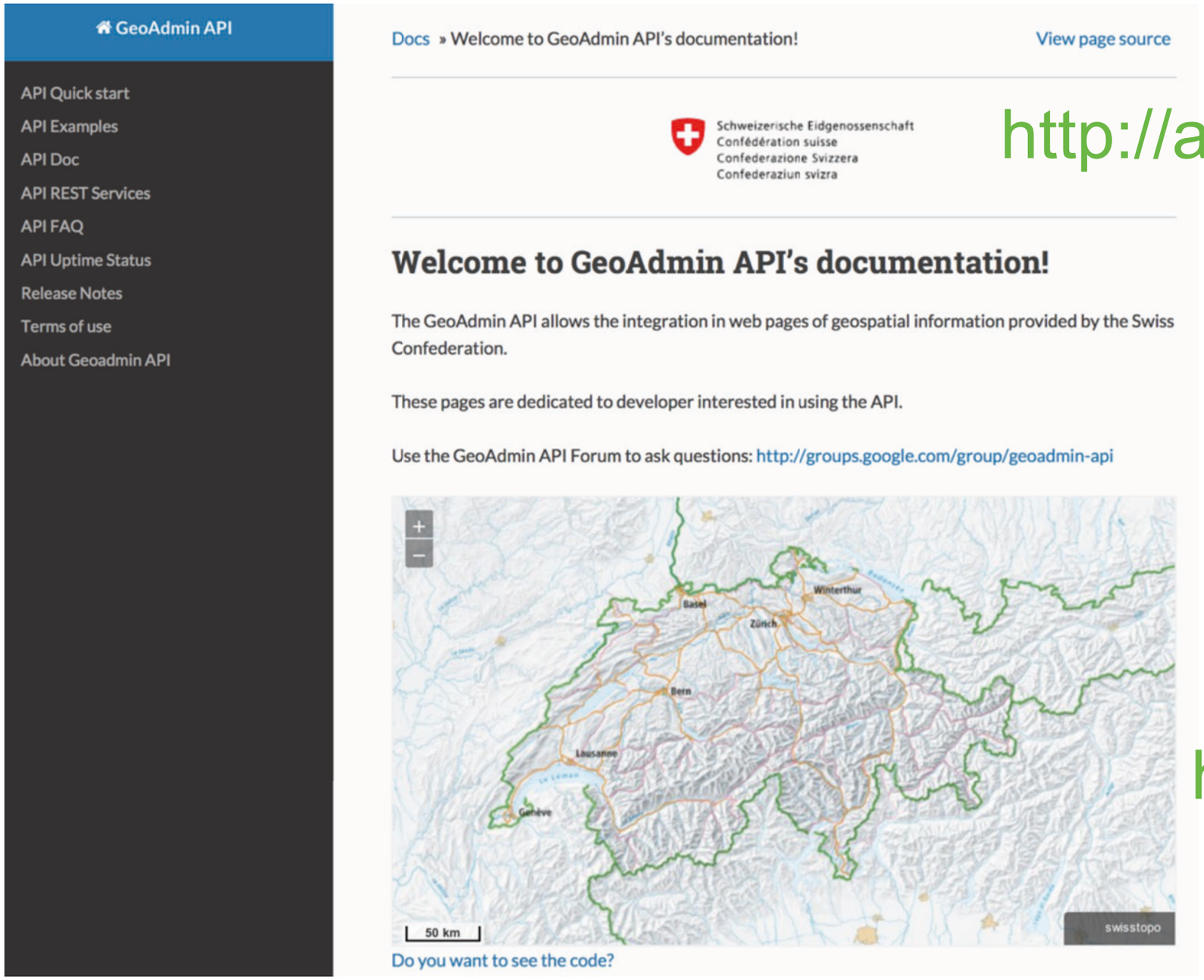
- Scalable infrastructure required (ideal solution)



# New Portal for mid-2016



# More Information




http://api3.geo.admin.ch/

http://openlayers.org/

OpenLayers 3

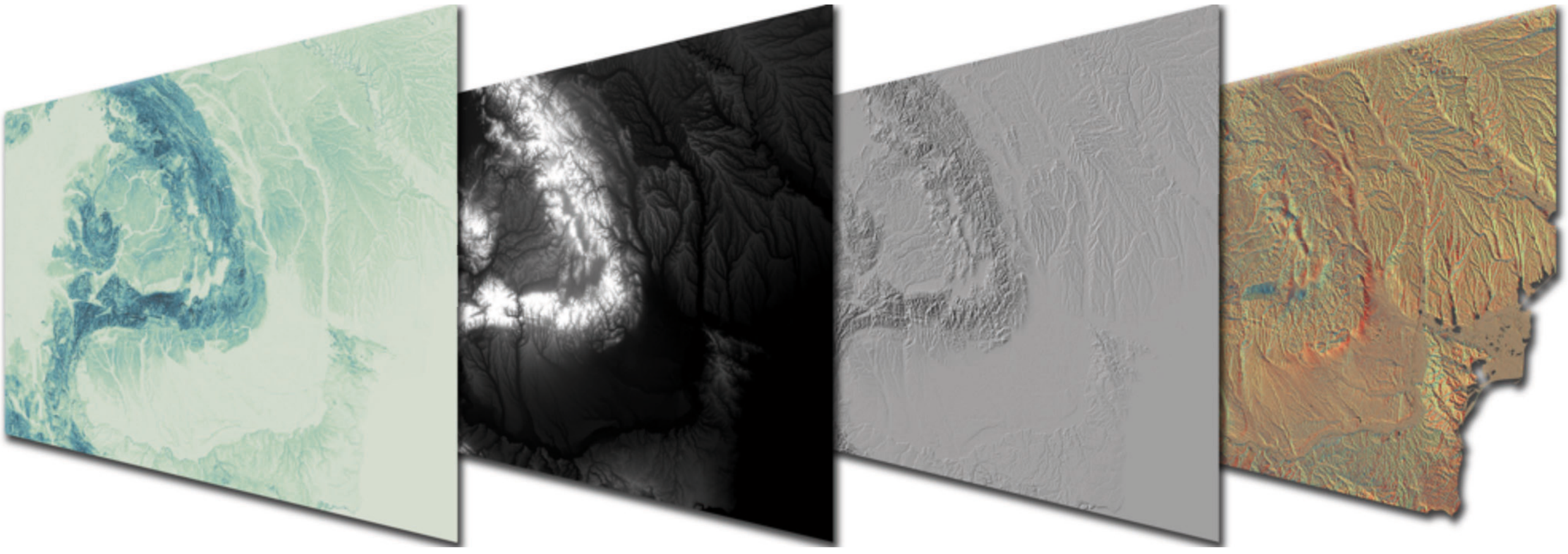
# Surprises!

- Basic derived views for DEMs available in the GEOIDEA.RO portal (slope and aspect)

- How the next generation of the GEOIDEA.RO geoportal could look like (!alpha only!)

# Surprises!

- Basic derived views for DEMs available in the GEOIDEA.RO portal (slope and aspect)

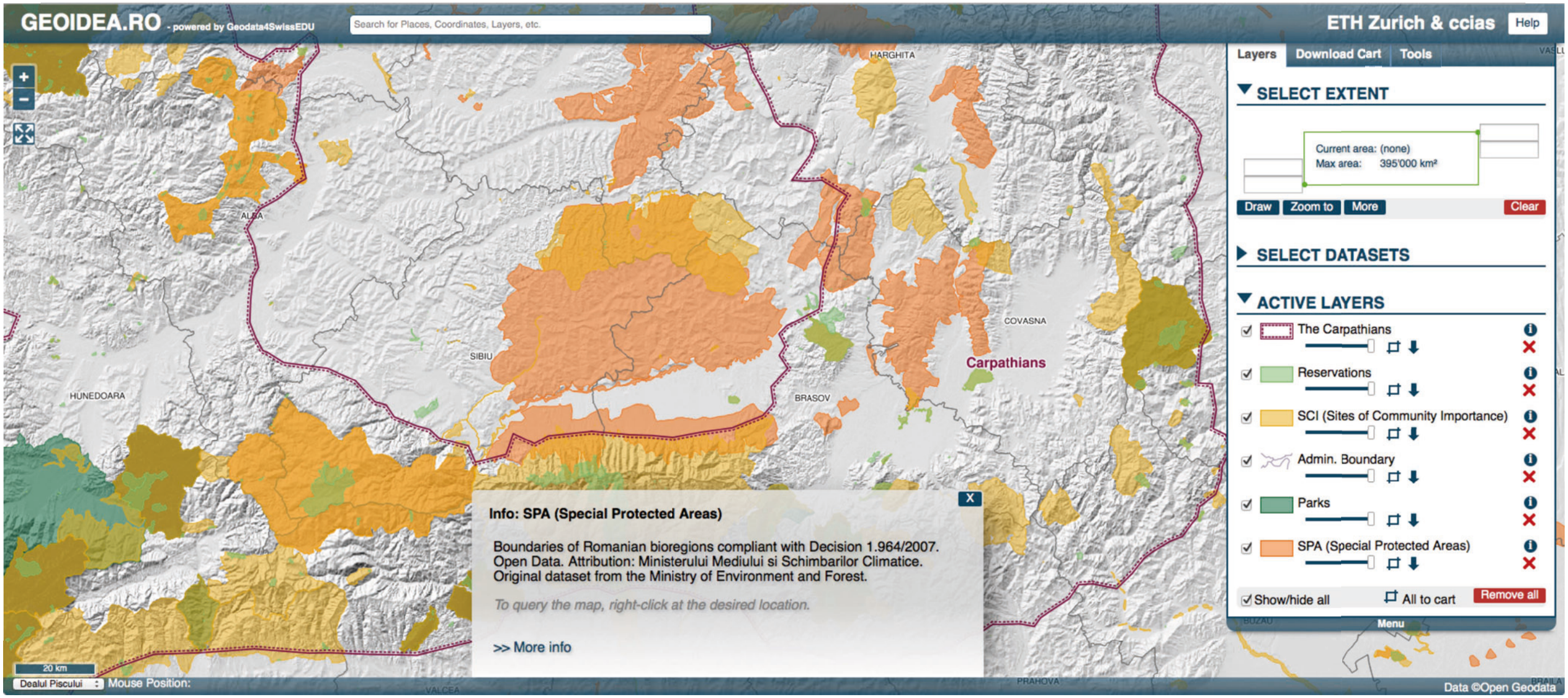


# Surprises!

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# Surprises!

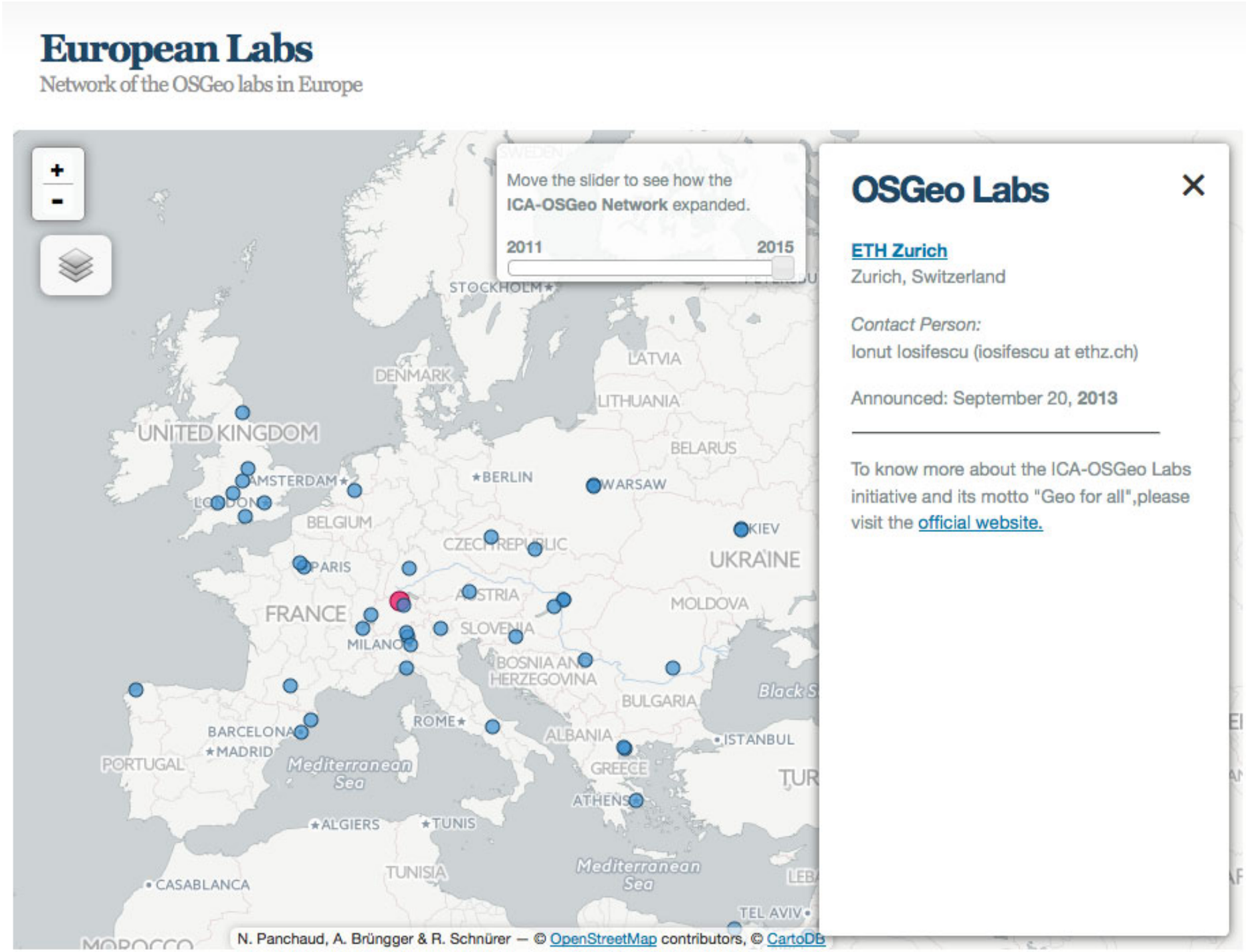

GEOIDEA.RO - powered by Geodata4SwissEDU
Search for Places, Coordinates, Layers, etc.
ETH Zurich & ccias
Help
Layers
Download Cart
Tools
SELECT EXTENT
Current area: (none)
Max area: 395'000 km²
Draw
Zoom to
More
Clear
SELECT DATASETS
ACTIVE LAYERS
The Carpathians
Reservations
SCI (Sites of Community Importance)
Admin. Boundary
Parks
SPA (Special Protected Areas)
Show/hide all
All to cart
Remove all
Menu
Info: SPA (Special Protected Areas)
Boundaries of Romanian bioregions compliant with Decision 1.964/2007.
Open Data. Attribution: Ministerului Mediului si Schimbarilor Climatice.
Original dataset from the Ministry of Environment and Forest.
To query the map, right-click at the desired location.
>> More info
HARGHITA
COVASNA
Carpathians
SIBIU
BRASOV
HUNEDOARA
ALBA
20 km
Dealul Piscului
Mouse Position:
Data ©Open Geodata

# Conclusions

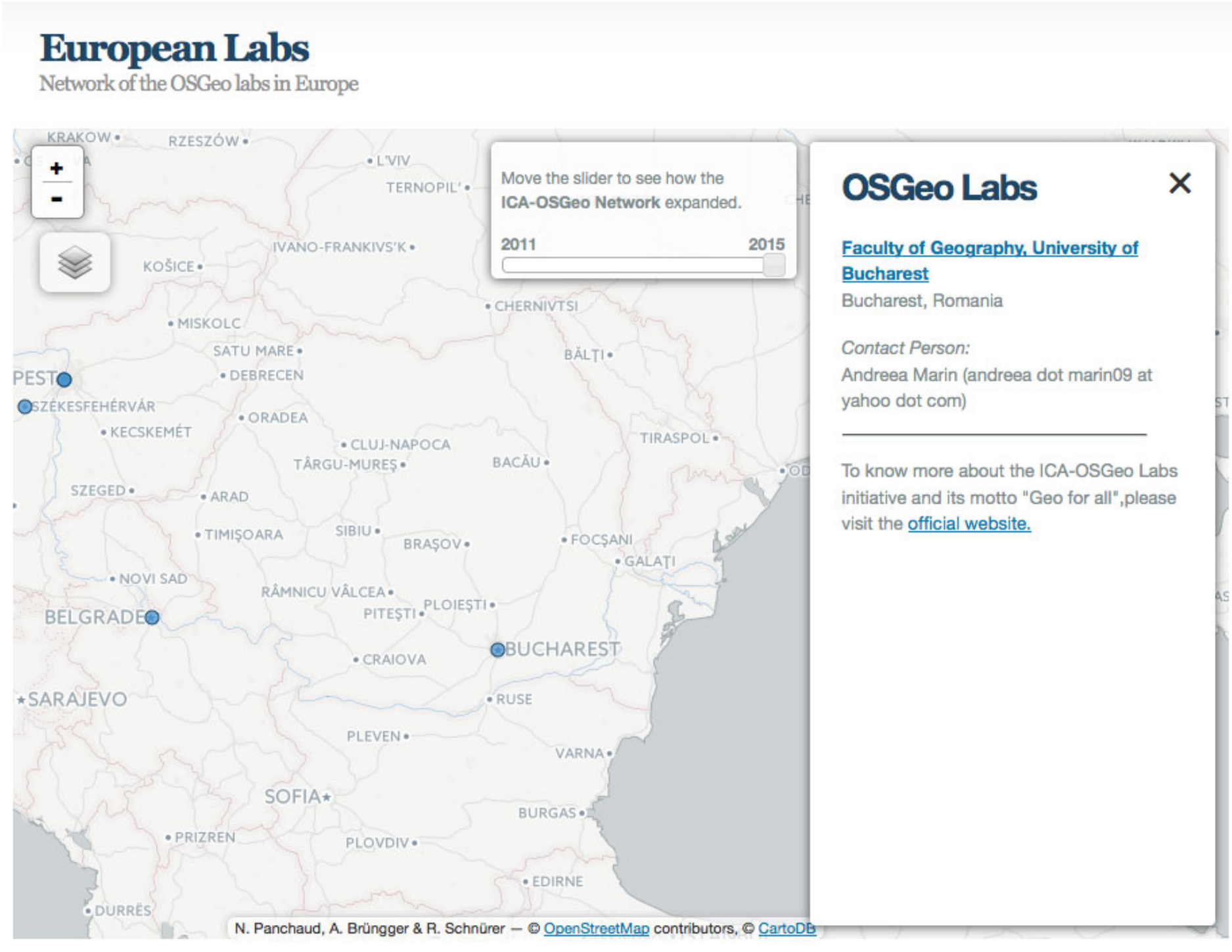
- With GEOIDEA.RO, Romania has a state-of-the art geoportal
- Everyone can use and reuse the data and services
- The process is documented: more data can be added as soon as they become available
- Pace of change is increasing in the geospatial field – more research is coming
- Open source is the foundation for sustainable geoportals and services



# Open Source Geospatial Technologies



# Open Source Geospatial Technologies



ETH zürich

# Questions?

