

Geografski informacioni sistemi

Projekat 1:OpenStreetMap & PostGIS

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Niš 2023

Izvoz OpenStreetMap podataka preko HOT export tool-a

- Kako bi demonstrirali i isprobali rad ovog alata morali smo kreirati nalog na web aplikaciji OpenStreetMap-a.
- Nakon kreiranja naloga na osm mozemo pristupiti alatu HOT export korišćenjem istog.
- Za demonstraciju rada odlučili smo se da izaberemo region Niša i okoline.

Pokretanje Alata

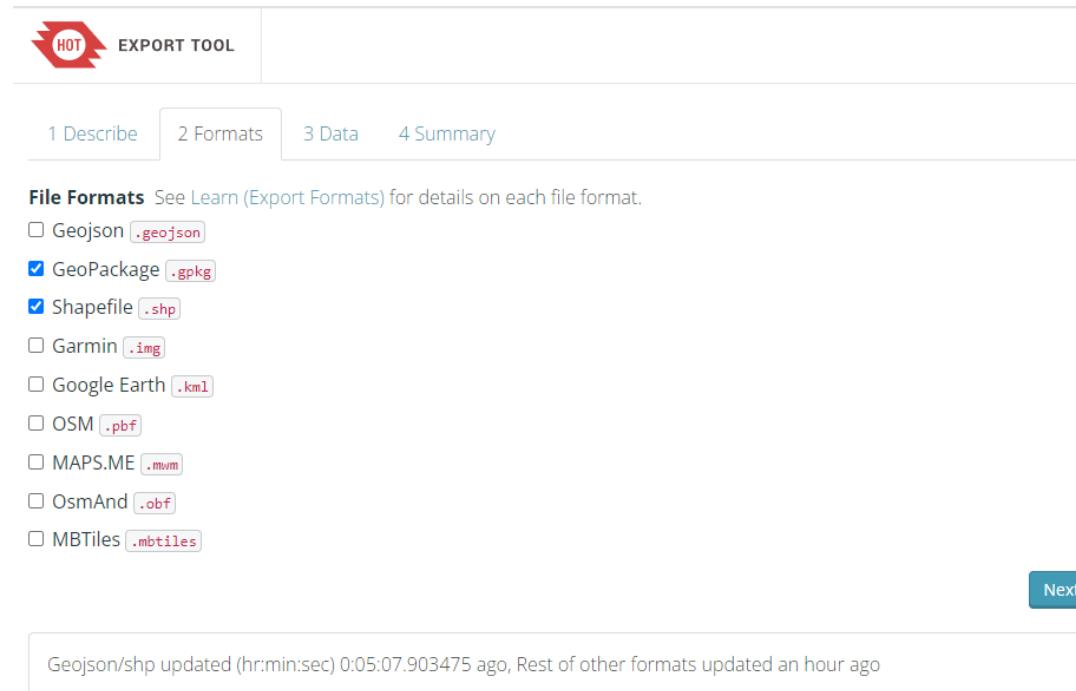
The screenshot shows a web browser window with the title "HOT Export Tool". The address bar displays "export.hotosm.org/en/v3/". The page content is as follows:

- EXPORT TOOL** (Logo)
- Create**, **Exports**, **Configs**, **About**, **Learn**, **Support**, **English** (dropdown), **Log Out**
- ## Download OpenStreetMap Data
- The Export Tool is an open service that creates customized extracts of up-to-date OSM data in various file formats.
- Download and use the data simply by crediting the OpenStreetMap contributors.
- [Start Exporting](#)
- [Get Started](#)

Nakon pokretanja selektujemo region na mapi koji nam je od interesa i dajemo neke osnovne podatke poput imena, kratkog opisa i projekta za koji su namenjeni podaci

The screenshot displays the HUI export tool interface. On the left, there is a sidebar with tabs: 1 Describe (selected), 2 Formats, 3 Data, and 4 Summary. Below these tabs are input fields for Name (containing 'Nis'), Description (empty), and Project (empty). A 'Next' button is located at the bottom of this sidebar. On the right, there is a map of Serbia with a large blue polygon drawn over it, representing the Area Of Interest (AOI). The map also shows various geographical features like rivers, roads, and mountains. A legend at the bottom of the map area indicates 'Area Of Interest (AOI)' with options for 'Custom Polygon' and 'Draw'. The top of the page shows a browser header with the URL 'export.hotosm.org/en/v3/exports/new/describe' and a tab bar with several other open tabs related to electronics and programming.

Zatim vršimo izbor formata fajlova koje zelimo izvesti



The screenshot shows the HOT Export Tool interface. At the top left is the HOT logo. Below it is a navigation bar with tabs: 1 Describe (selected), 2 Formats, 3 Data, and 4 Summary. The main content area is titled "File Formats" with a sub-instruction: "See Learn (Export Formats) for details on each file format." A list of file formats is provided with checkboxes:

- Geojson (.geojson)
- GeoPackage (.gpkg)
- Shapefile (.shp)
- Garmin (.img)
- Google Earth (.kml)
- OSM (.pbf)
- MAPS.ME (.mwm)
- OsmAnd (.obf)
- MBTiles (.mbtiles)

A "Next" button is located at the bottom right of the main content area. At the very bottom, there is a message: "Geojson/shp updated (hr:min:sec) 0:05:07.903475 ago, Rest of other formats updated an hour ago".

Po izboru formata vršimo izbor layera koje zelimo koristiti i izvesti

HOT EXPORT TOOL

1 Describe 2 Formats 3 Data 4 Summary

Tag Tree Configs YAML

Search for a feature type... Clear

> Buildings
> Administrative Boundaries
> Commercial
> Communication
> Education
> Emergency
> Financial
> Government
> Healthcare
> Humanitarian
> Land Use
> Localities
> Natural
> Power
> Public
> Sport
> Transportation
> Water
> Language

Education
Geometry types: point, polygon
Keys:

- name
- amenity
- isced:level
- capacity

Where: amenity IN ('kindergarten', 'school', 'college', 'university', 'language_school') OR office='educational_institution'

Next

Kada smo odabrali sve željene podatke započinjemo pripremu fajlova za izvoz i preuzimanje

The screenshot shows the HOT Export Tool interface. At the top left is the logo 'HOT EXPORT TOOL'. Below it is a navigation bar with four tabs: '1 Describe', '2 Formats', '3 Data', and '4 Summary'. The '4 Summary' tab is currently selected and highlighted in orange. On the left side, there are several input fields: 'Name: Nis', 'Description:', 'Project:', and 'Export Formats:' which lists 'GeoPackage (.gpkg)' and 'Shapefile (.shp)'. To the right of these fields are several checkboxes with descriptions: 'Buffer AOI - expand an uploaded boundary by 0.02 degrees' (unchecked), 'Publish this Export' (checked), 'Unfiltered files - all OSM data for PBF, MWM, OBF, IMG formats. Use only for small areas.' (unchecked), and 'Bundle for POSM' (unchecked). At the bottom right of the summary section is a large red button labeled 'Create Export'. At the very bottom of the page, in a separate box, is the message 'Geojson/shp updated (hr:min:sec) 0:05:07.903475 ago, Rest of other formats updated an hour ago'.

HOT EXPORT TOOL

1 Describe 2 Formats 3 Data 4 Summary

Name: Nis

Description:

Project:

Export Formats:

- GeoPackage [.gpkg](#)
- Shapefile [.shp](#)

Buffer AOI - expand an uploaded boundary by 0.02 degrees

Publish this Export

Unfiltered files - all OSM data for PBF, MWM, OBF, IMG formats. Use only for small areas.

Bundle for POSM

Create Export

Geojson/shp updated (hr:min:sec) 0:05:07.903475 ago, Rest of other formats updated an hour ago

Nakon pripreme i izvoza fajlova iste možemo preuzeti

The screenshot shows the HOT Export Tool interface. On the left, a project named "Nis" is displayed with the following details:

- Description: [redacted]
- Id: 06700262-f041-4565-aade-03a5c8c011a2
- Project: [redacted]
- Area: 3209 sq km
- Created at: Friday, January 13th 2023, 9:02 pm
- Created by: JovanJox
- Published: Yes
- Export formats: GeoPackage (.gpkg) and Shapefile (.shp)
- OSM Analytics: [View this area](#)

At the bottom of this section are buttons for "Features", "Re-Run" (highlighted in green), "Clone", and "Delete".

On the right, a log entry for the export of "Nis" is shown:

Friday, January 13th 2023, 9:02 pm	
Status:	COMPLETED
ID:	f9d96d73-27d4-4a41-8e57-81c2a9bc138d
Finished:	Friday, January 13th 2023, 9:05 pm
Duration:	a few seconds
GeoPackage (.gpkg)	Nis_gpkg.zip (16.9 MB)
Shapefile (.shp)	Nis_shp.zip (29.3 MB)

A "Create" button is located at the top right of the log section.

- Pored HOT export-a za dalji rad ćemo koristiti podatke izvezene pomocu GeoFabrik-a
- Za razliku od HOT export-a GeoFabrik ne zahteva nikako kreiranje naloga, ali nedaje mogućnost preciznog izbora regiona.
- Preko geo fabrika preuzecemo fajlove za ceo region srbije.

Po ulasku na stranicu GeoFabrik-a biramo region Evrope

Geofabrik Download Server New Tab Not secure | download.geofabrik.de

Osciloskop Driver Elektronika topbuz Open Advanced Sys... (3) How to fix PL23... DIY capacitive soil... M&G Electronic | IC... Programming nRF5... Arduino on the nRF... Babin Zub - Početak GitHub - AprilBroth... Attiny Programmer... auto makao

OpenStreetMap Data Extracts

The OpenStreetMap data files provided on this server do **not** contain the user names, user IDs and changeset IDs of the OSM objects because these fields are assumed to contain personal information about the OpenStreetMap contributors and are therefore subject to data protection regulations in the European Union.
[Extracts with full metadata](#) are available to OpenStreetMap contributors only.

Welcome to Geofabrik's free download server. This server has data extracts from the [OpenStreetMap project](#) which are normally updated every day. Select your continent and then your country of interest from the list below. (If you have been directed to this page from elsewhere and are not familiar with OpenStreetMap, we highly recommend that you read up on OSM before you use the data.) This open data download service is offered free of charge by Geofabrik GmbH.

Willkommen auf dem Geofabrik-Downloadserver. Hier gibt es Daten-Auszüge aus dem [OpenStreetMap-Projekt](#), die normalerweise täglich aktualisiert werden. Wählen Sie aus dem Verzeichnis unten den Kontinent und ggf. das Land, für die Sie Daten benötigen. (Wenn Sie von anderswo auf dieser Seite gelandet sind und von OpenStreetMap nichts wissen, dann ist es empfehlenswert, sich mit dem Projekt vertraut zu machen, bevor Sie mit den Daten arbeiten.) Diese Downloads werden von der Geofabrik GmbH kostenlos angeboten.

Click on the region name to see the overview page for that region, or select one of the file extension links for quick access.

Sub Region	Quick Links
	.osm.pbf .shp.zip .osm.bz2
Africa	[.osm.pbf] (5.6 GB) X [.osm.bz2]
Antarctica	[.osm.pbf] (31.1 MB) [.shp.zip] [.osm.bz2]
Asia	[.osm.pbf] (11.4 GB) X [.osm.bz2]
Australia and Oceania	[.osm.pbf] (1.0 GB) X [.osm.bz2]
Central America	[.osm.pbf] (587 MB) X [.osm.bz2]
Europe	[.osm.pbf] (26.2 GB) X [.osm.bz2]
North America	[.osm.pbf] (12.0 GB) X [.osm.bz2]
South America	[.osm.pbf] (2.9 GB) X [.osm.bz2]

[Technical details](#) about this download service.

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Nicht das Richtige dabei? Die Geofabrik ist ein auf OpenStreetMap spezialisiertes Beratungs- und Softwareentwicklungsunternehmen in Karlsruhe. Gern helfen wir Ihnen bei der Datenaufbereitung, Datenkonvertierung, Serverinstallation und ähnlichen Aufgaben. [Besuchen Sie unsere Webseite](#) und sprechen Sie mit uns, wenn wir Ihnen helfen können.

Nakon odabira Evrope iz liste regionalnih preuzimamo Shapefile .shp za Srbiju

Geofabrik Download Server New Tab Not secure | download.geofabrik.de/europe.html

_Oscloskop Driver _Elektronika _topbuz _Open Advanced Sys... _YouTube (3) How to fix PL23... _DIY capacitive soil... _M&G Electronic | IC... _Programming nRF5... _Arduino on the nRF... _Babin Zub - Početak _GitHub - AprilBroth... _Attiny Programmer... _auto _mak

Faroe Islands	[.osm.pbf] (5.2 MB)	[.shp.zip]	[.osm.bz2]
Finland	[.osm.pbf] (533 MB)	[.shp.zip]	[.osm.bz2]
France	[.osm.pbf] (4.0 GB)	X	[.osm.bz2]
Georgia	[.osm.pbf] (67 MB)	[.shp.zip]	[.osm.bz2]
Germany	[.osm.pbf] (3.8 GB)	X	[.osm.bz2]
Great Britain	[.osm.pbf] (1.5 GB)	X	[.osm.bz2]
Greece	[.osm.pbf] (272 MB)	[.shp.zip]	[.osm.bz2]
guernsey-jersey	[.osm.pbf] (4.1 MB)	[.shp.zip]	[.osm.bz2]
Hungary	[.osm.pbf] (216 MB)	[.shp.zip]	[.osm.bz2]
Iceland	[.osm.pbf] (52 MB)	[.shp.zip]	[.osm.bz2]
Ireland and Northern Ireland	[.osm.pbf] (248 MB)	[.shp.zip]	[.osm.bz2]
Isle of Man	[.osm.pbf] (4.2 MB)	[.shp.zip]	[.osm.bz2]
Italy	[.osm.pbf] (1.7 GB)	X	[.osm.bz2]
Kosovo	[.osm.pbf] (22.7 MB)	[.shp.zip]	[.osm.bz2]
Latvia	[.osm.pbf] (100 MB)	[.shp.zip]	[.osm.bz2]
Liechtenstein	[.osm.pbf] (2.6 MB)	[.shp.zip]	[.osm.bz2]
Lithuania	[.osm.pbf] (167 MB)	[.shp.zip]	[.osm.bz2]
Luxembourg	[.osm.pbf] (37.2 MB)	[.shp.zip]	[.osm.bz2]
Macedonia	[.osm.pbf] (22.2 MB)	[.shp.zip]	[.osm.bz2]
Malta	[.osm.pbf] (5.5 MB)	[.shp.zip]	[.osm.bz2]
Moldova	[.osm.pbf] (62 MB)	[.shp.zip]	[.osm.bz2]
Monaco	[.osm.pbf] (477 KB)	[.shp.zip]	[.osm.bz2]
Montenegro	[.osm.pbf] (27.4 MB)	[.shp.zip]	[.osm.bz2]
Netherlands	[.osm.pbf] (1.1 GB)	X	[.osm.bz2]
Norway	[.osm.pbf] (1.1 GB)	[.shp.zip]	[.osm.bz2]
Poland	[.osm.pbf] (1.5 GB)	X	[.osm.bz2]
Portugal	[.osm.pbf] (276 MB)	[.shp.zip]	[.osm.bz2]
Romania	[.osm.pbf] (241 MB)	[.shp.zip]	[.osm.bz2]
Russian Federation	[.osm.pbf] (3.2 GB)	X	[.osm.bz2]
Serbia	[.osm.pbf] (136 MB)	[.shp.zip]	[.osm.bz2]
Slovakia	[.osm.pbf] (245 MB)	[.shp.zip]	[.osm.bz2]
Slovenia	[.osm.pbf] (266 MB)	[.shp.zip]	[.osm.bz2]
Spain	[.osm.pbf] (1.0 GB)	X	[.osm.bz2]
Sweden	[.osm.pbf] (619 MB)	[.shp.zip]	[.osm.bz2]
Switzerland	[.osm.pbf] (399 MB)	[.shp.zip]	[.osm.bz2]
Turkey	[.osm.pbf] (424 MB)	[.shp.zip]	[.osm.bz2]
Ukraine (with Crimea)	[.osm.pbf] (690 MB)	[.shp.zip]	[.osm.bz2]

Special Sub Regions
These regions are "special" because they are outside of the usual administrative hierarchies and may duplicate data already contained in the other sub regions.

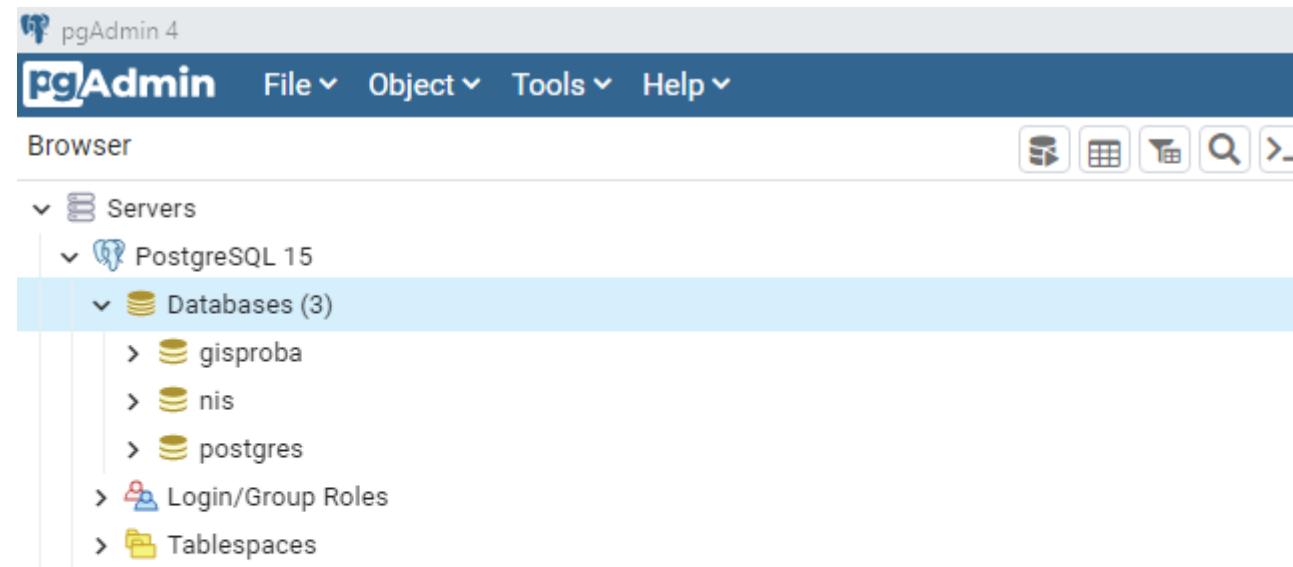


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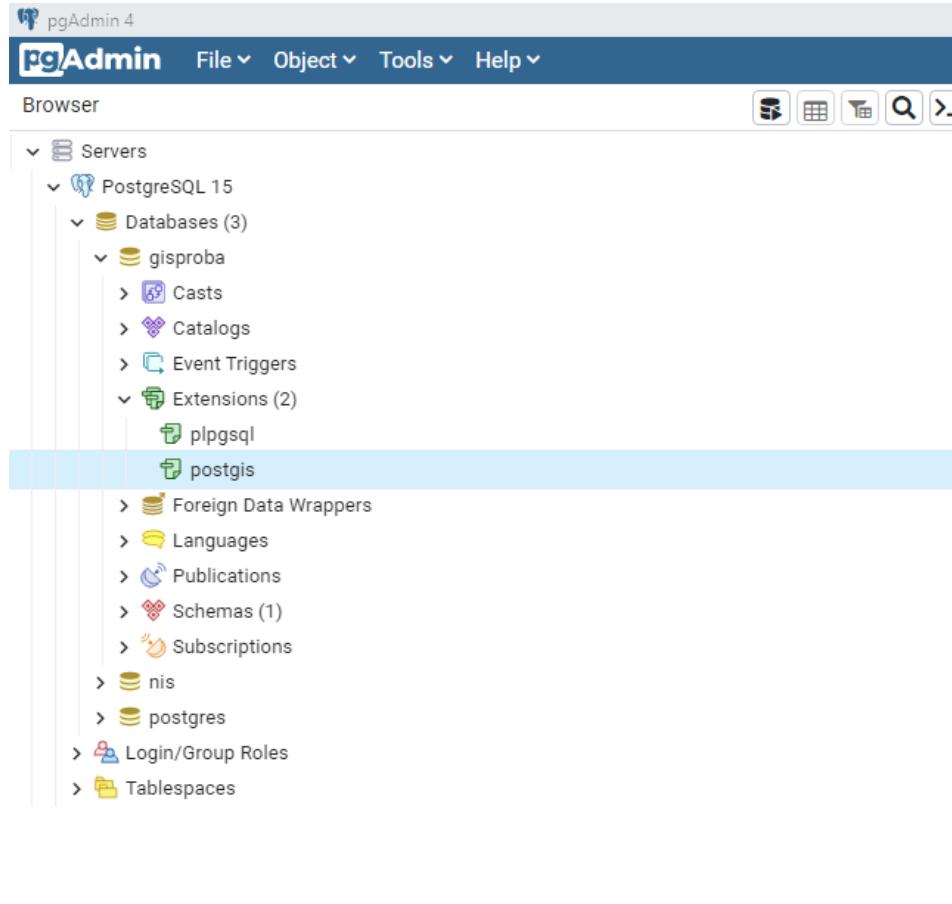
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- Nakon preuzimanja fajlova za region od interesa vršimo instalaciju DBMS-a PostgreSQL i kreiramo bazu podataka gisproba.

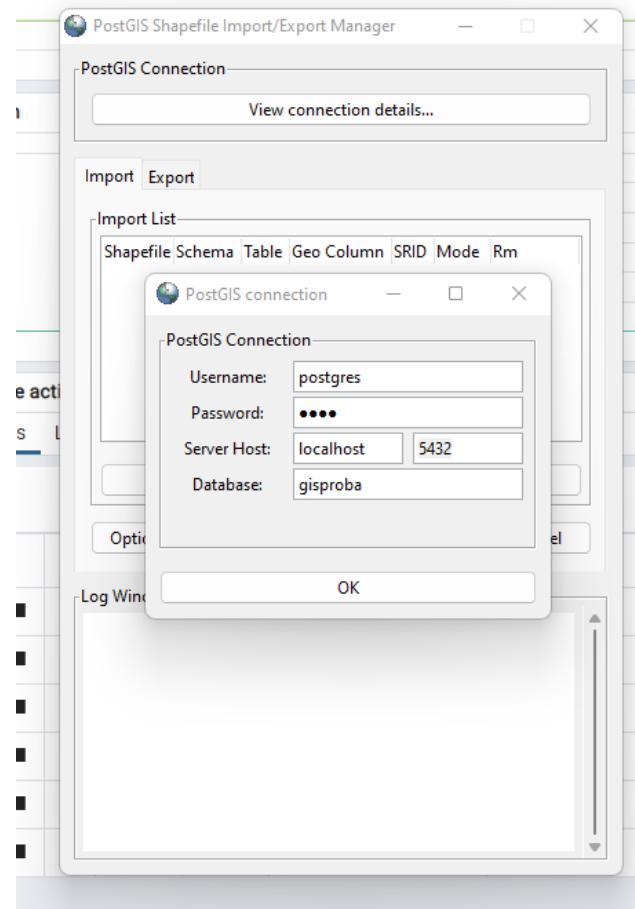
Za kreiranje baze koristili smo alat pgAdmin 4



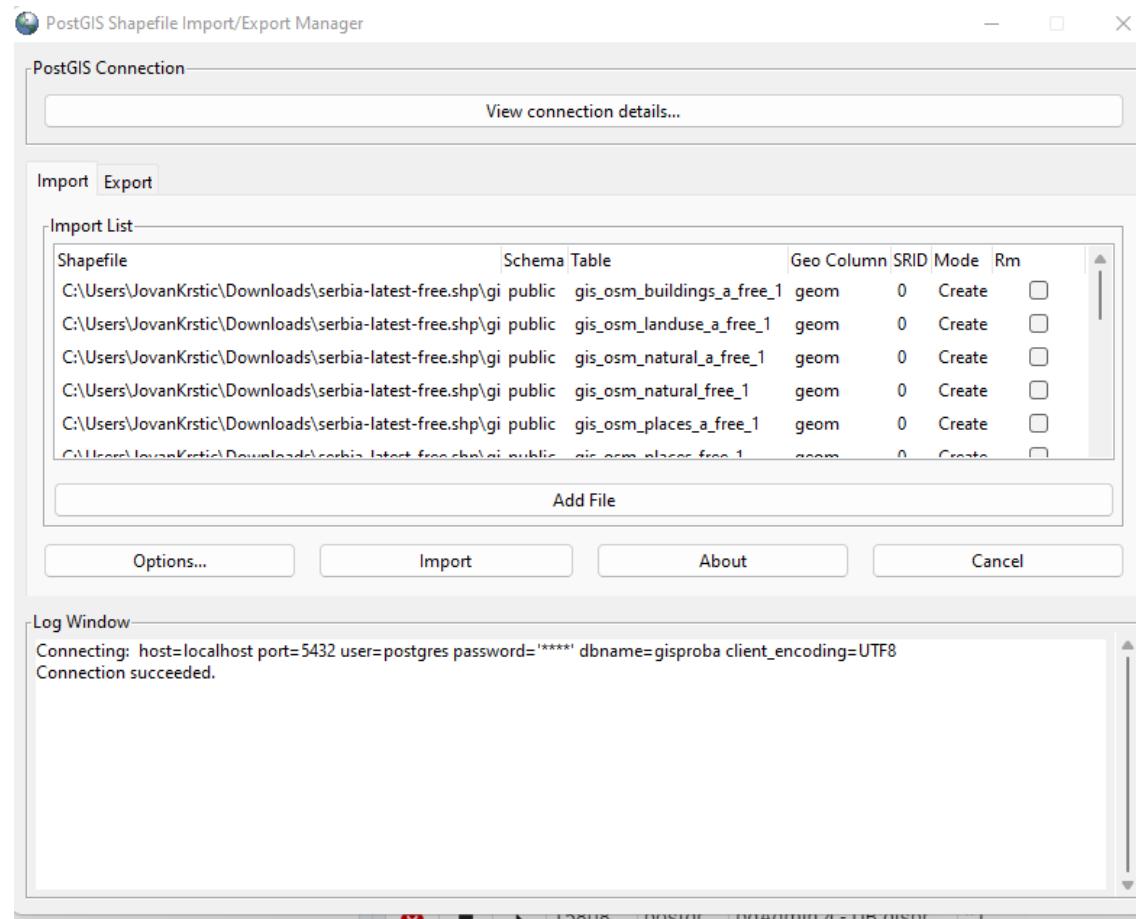
Nakon krijanja baze dodajemo extenziju za PostGIS



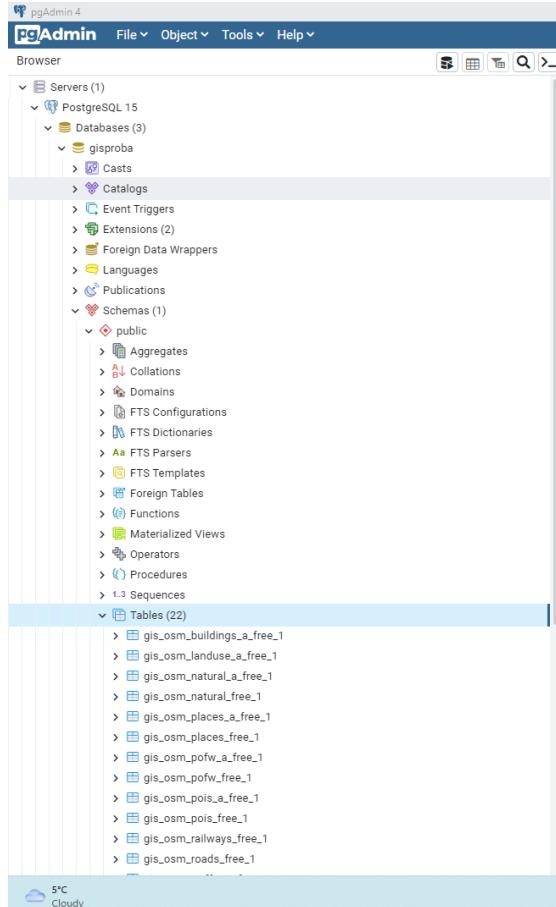
Nakon dodavanja extenzije pokrecemo PostGIS Import Menager i vršimo konekciju sa kreiranom bazom kako bi izvršili učitavanje fajlova



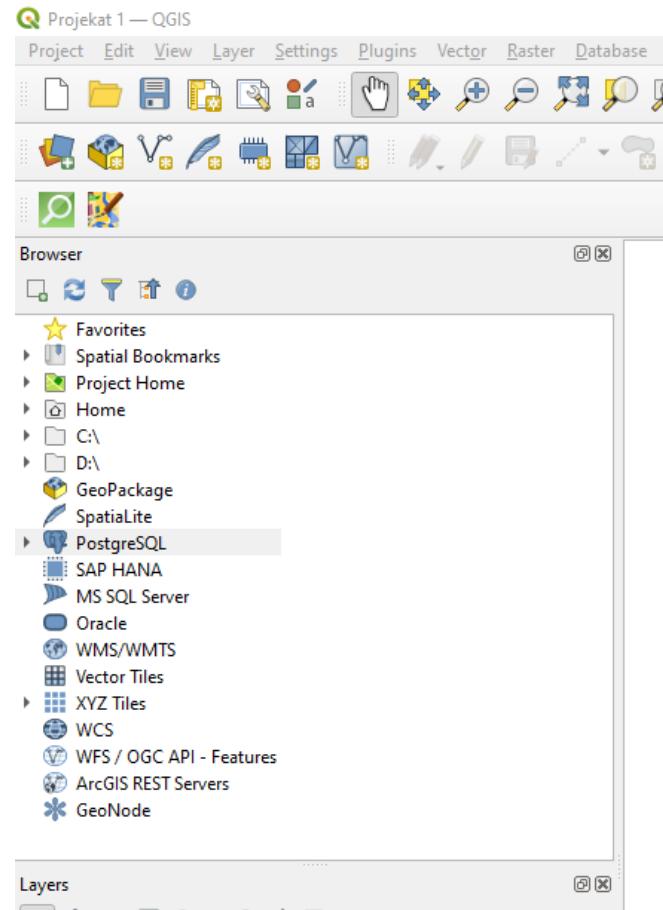
Kada smo uspešno konektovani promalazimo preuzete shp fajlove i vršimo njihovo učitavanje u bazu



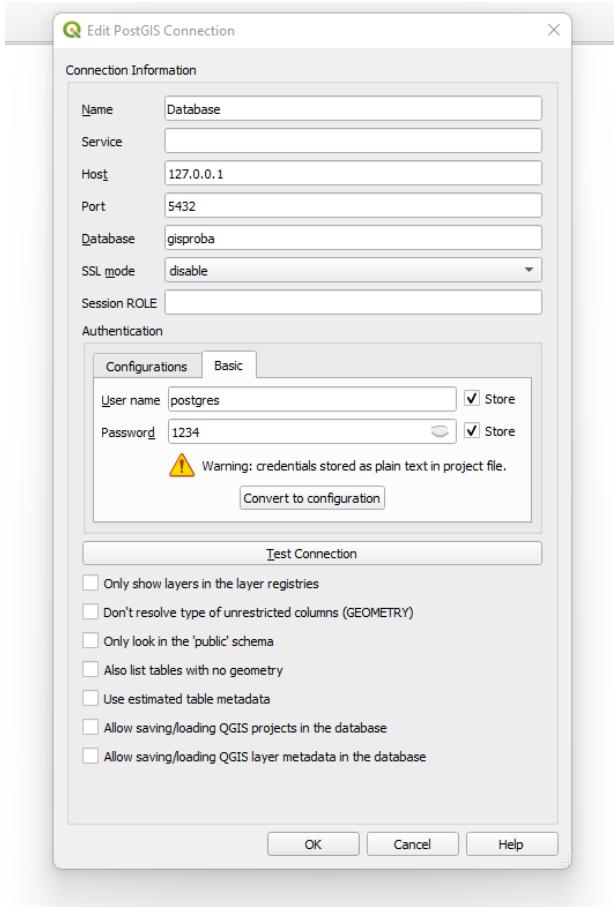
Kada su podaci ispravno učitani u bazi
dobijamo tabele sa istim podacima



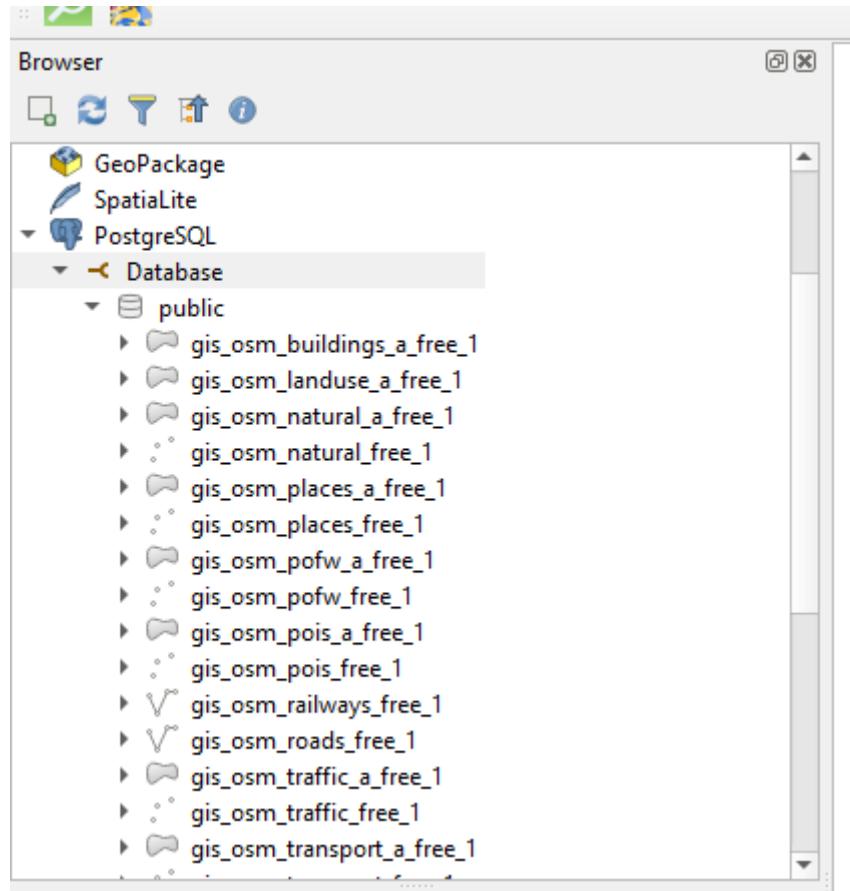
Kako bi ove podatke iz baze mogli analizirati i vizuelno pregledati moramo izvršiti konekciju PostgreSQL baze sa programom QGIS



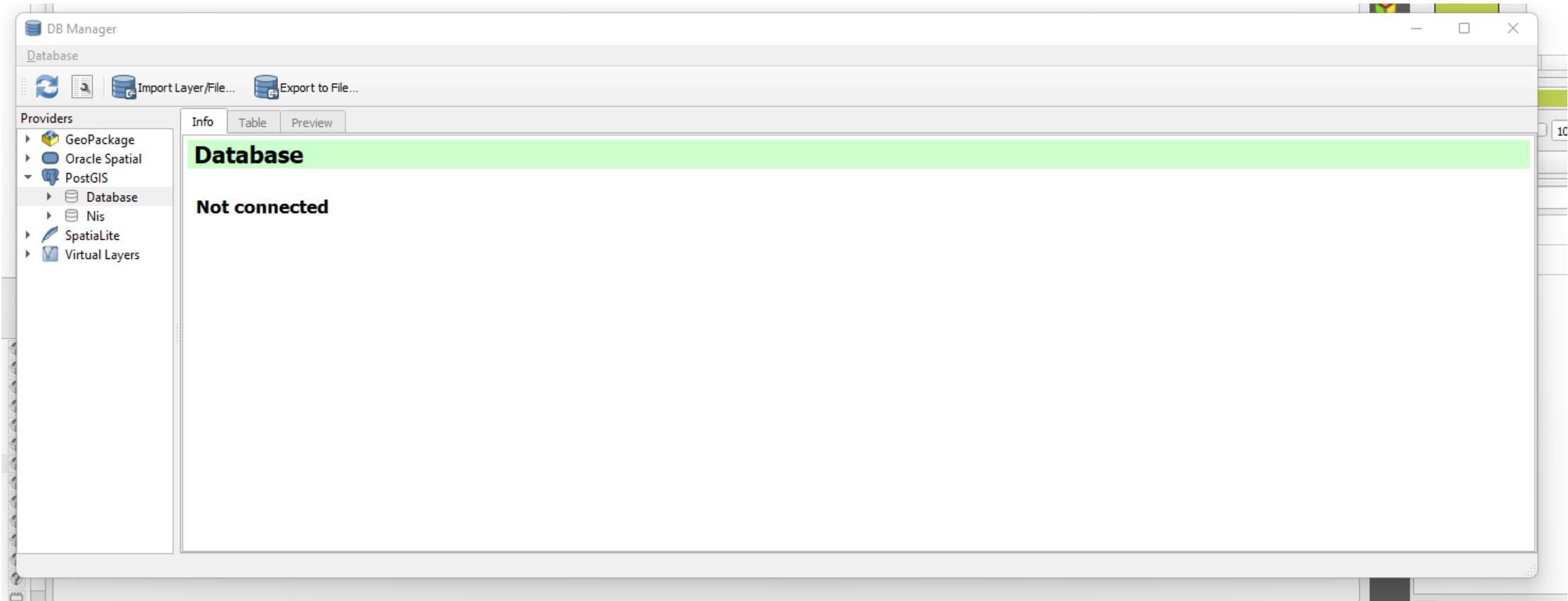
Na ovom slajdu je prikazano kreiranje konekcije sa bazom



Nakon uspesne konekcije u programu mozemo videti podatke kao layere koje importujemo radi vizuelnog prikaza

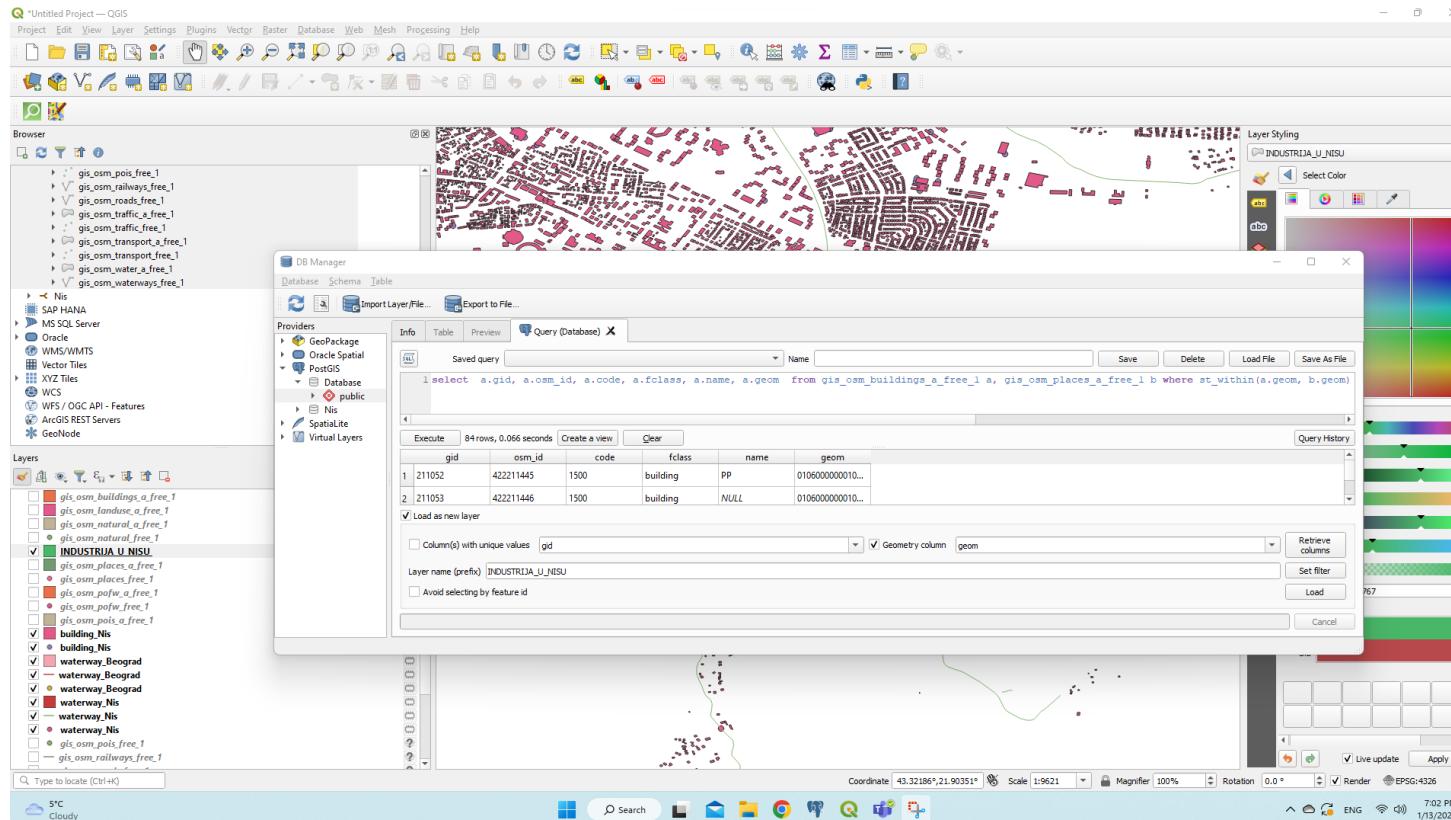


U slajdovima koji slede biće prikazane SQL upite
koje smo izvršavali pomoću DB Menagera u QGIS-u
i prikazivali

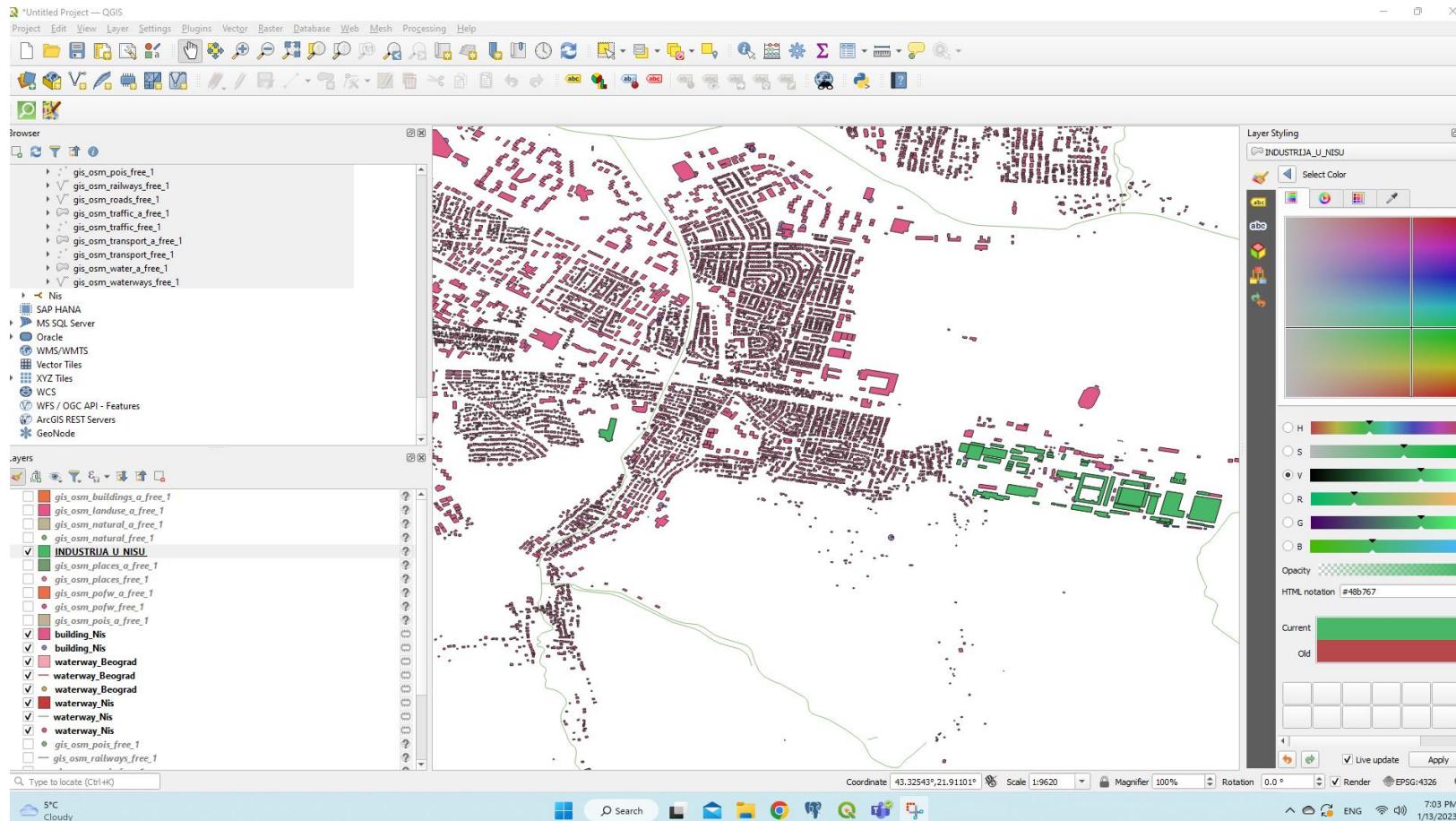


SQL upit za prikaz svih industriskih objekata u Nišu

```
select a.gid, a.osm_id, a.code, a.fclass, a.name, a.geom from gis_osm_buildings_a_free_1 a,  
gis_osm_places_a_free_1 b where st_within(a.geom, b.geom) and a.type='industrial' and b.name='Niš'
```

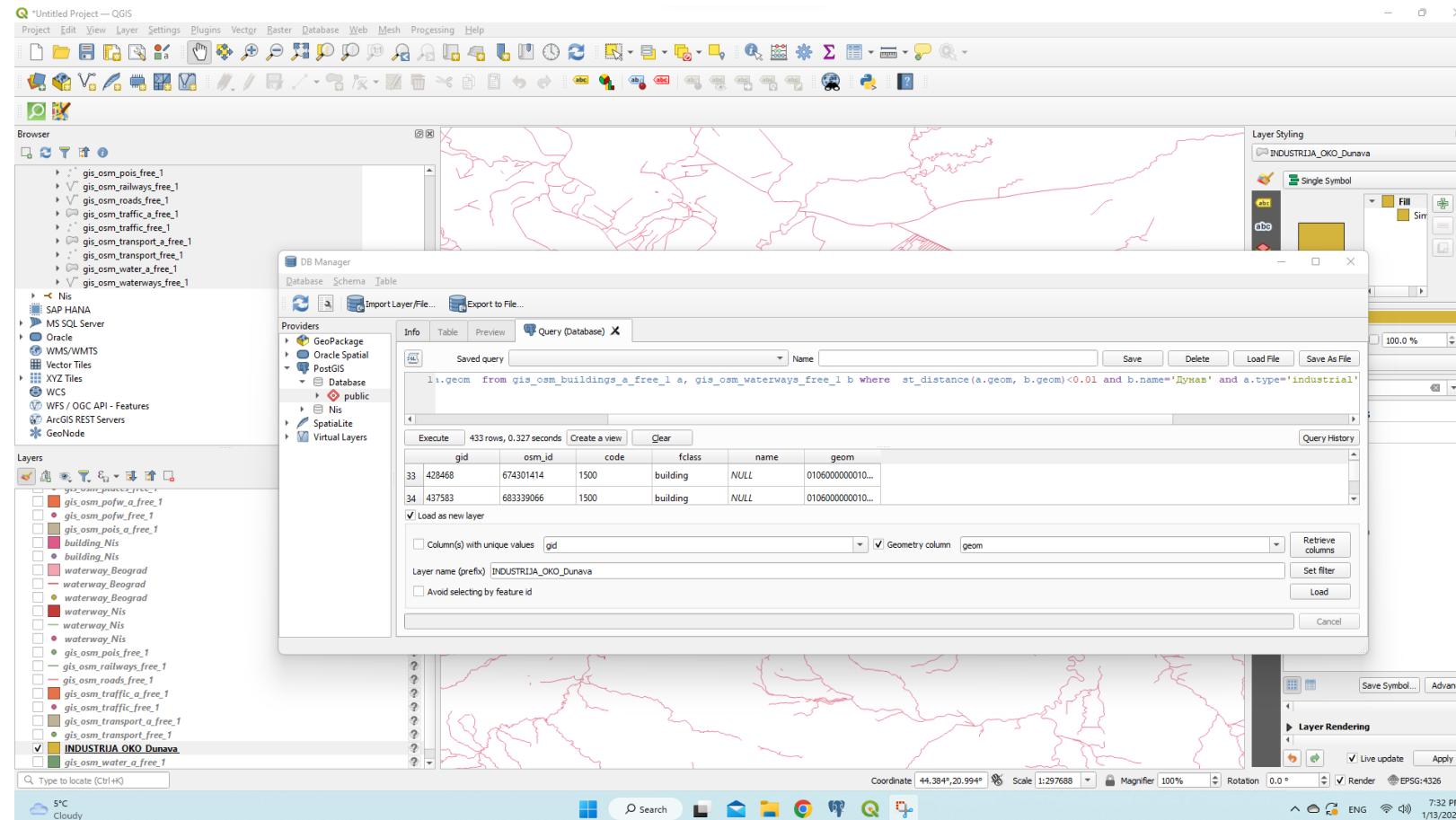


Zelenom bojom je prikazan rezultet prethodnog sql upita.

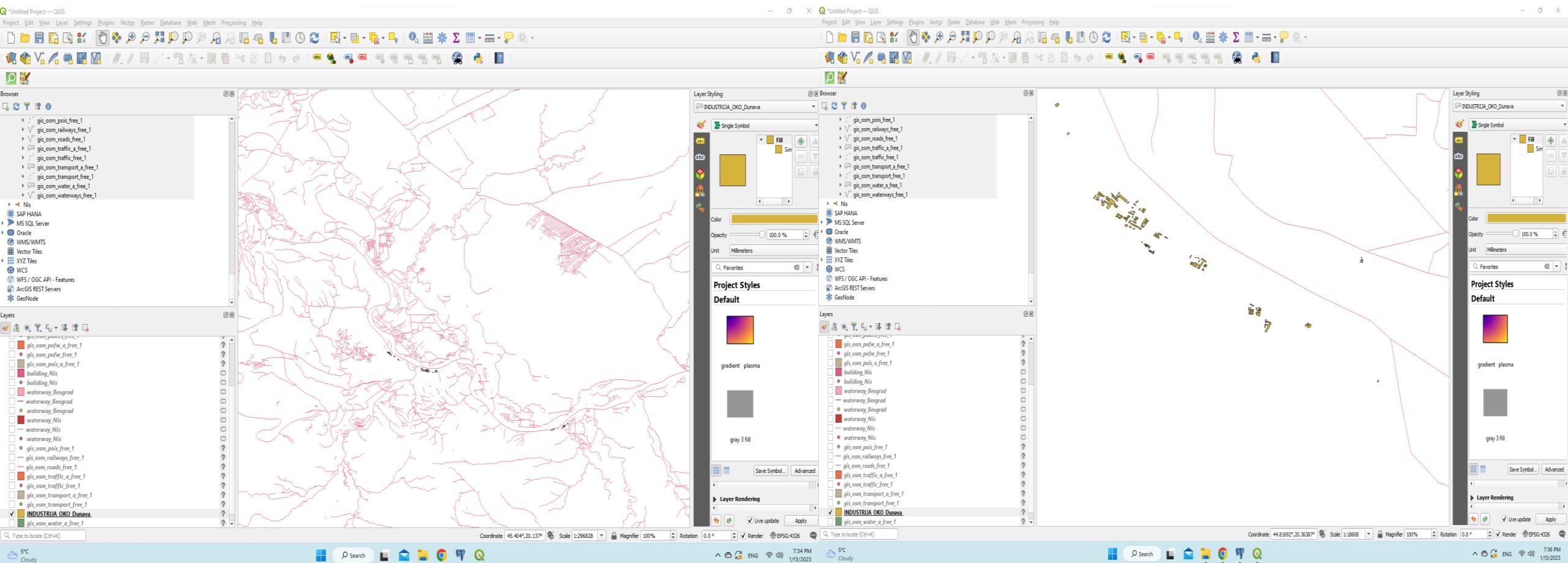


SQL upit za prikaz svih industriskih objekata u blizini reke Dunav

```
select a.gid, a.osm_id, a.code, a.fclass, a.name, a.geom from gis_osm_buildings_a_free_1 a,  
gis_osm_waterways_free_1 b where st_distance(a.geom, b.geom)<0.01 and b.name='Дунав' and a.type='industrial'
```

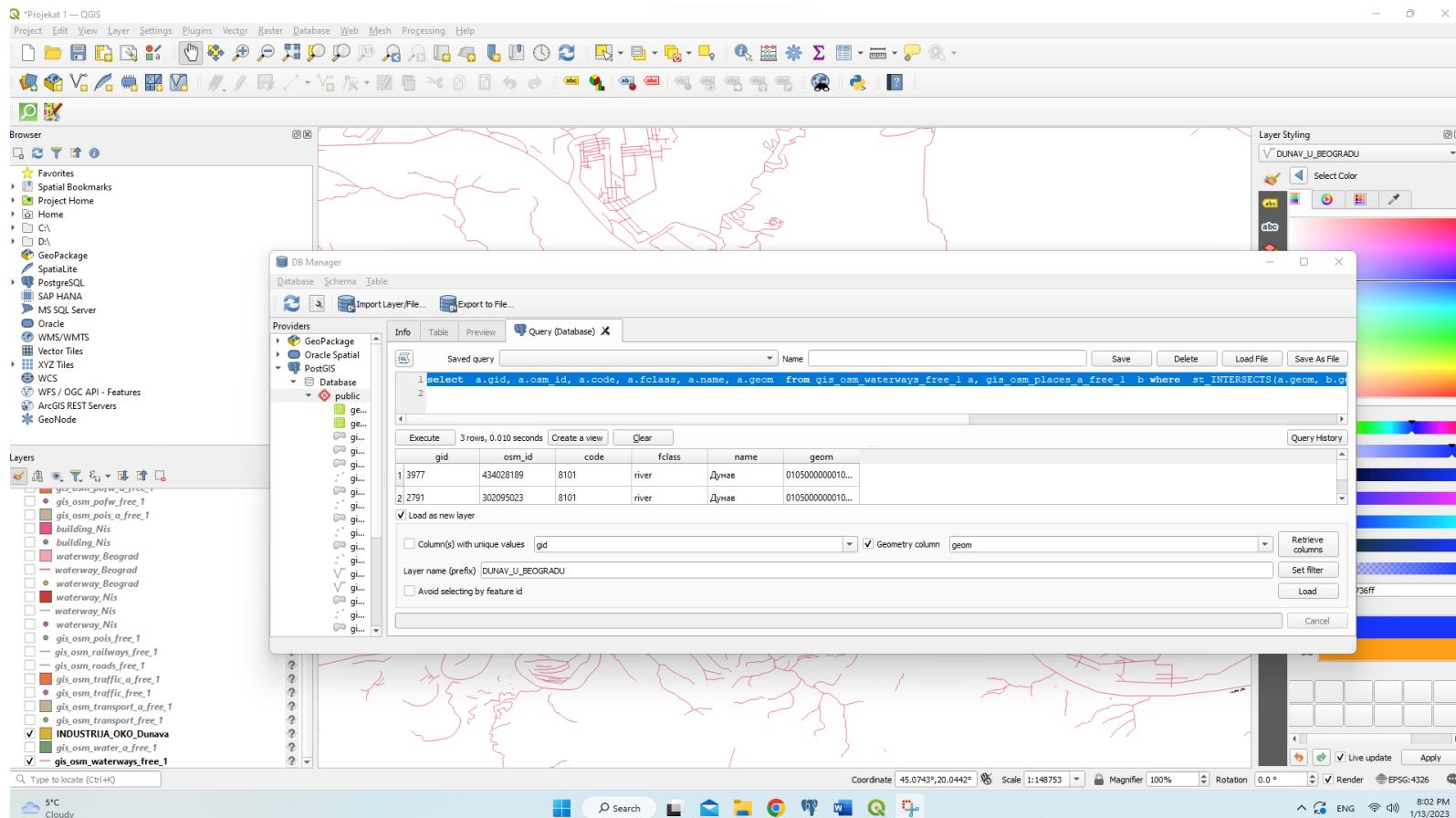


Zutom bojom su prikazani industriski objekti u blizini reke dunav

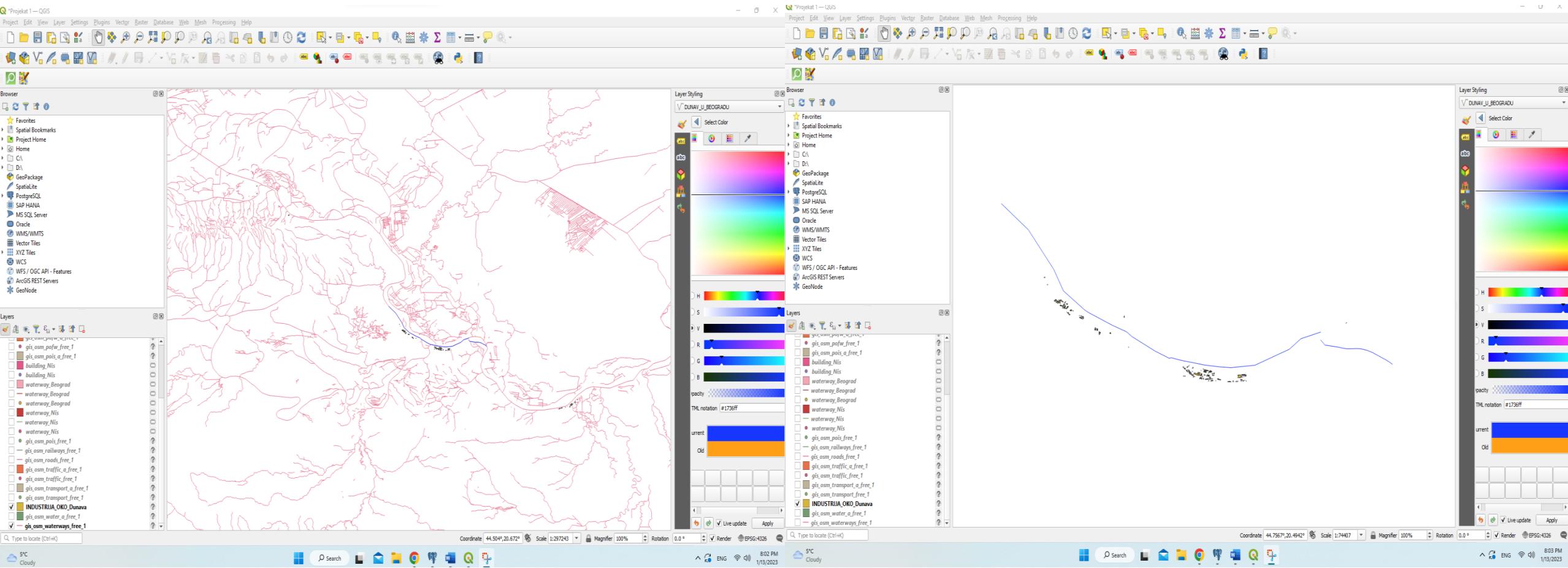


SQL upit koji prikazuje samo deo toka reke Dunav koji prolazi kroz Beograd

```
select a.gid, a.osm_id, a.code, a.fclass, a.name, a.geom from gis_osm_waterways_free_1 a, gis_osm_places_a_free_1 b  
where st_INTERSECTS(a.geom, b.geom) and a.name='Дунав' and b.name='Београд'
```

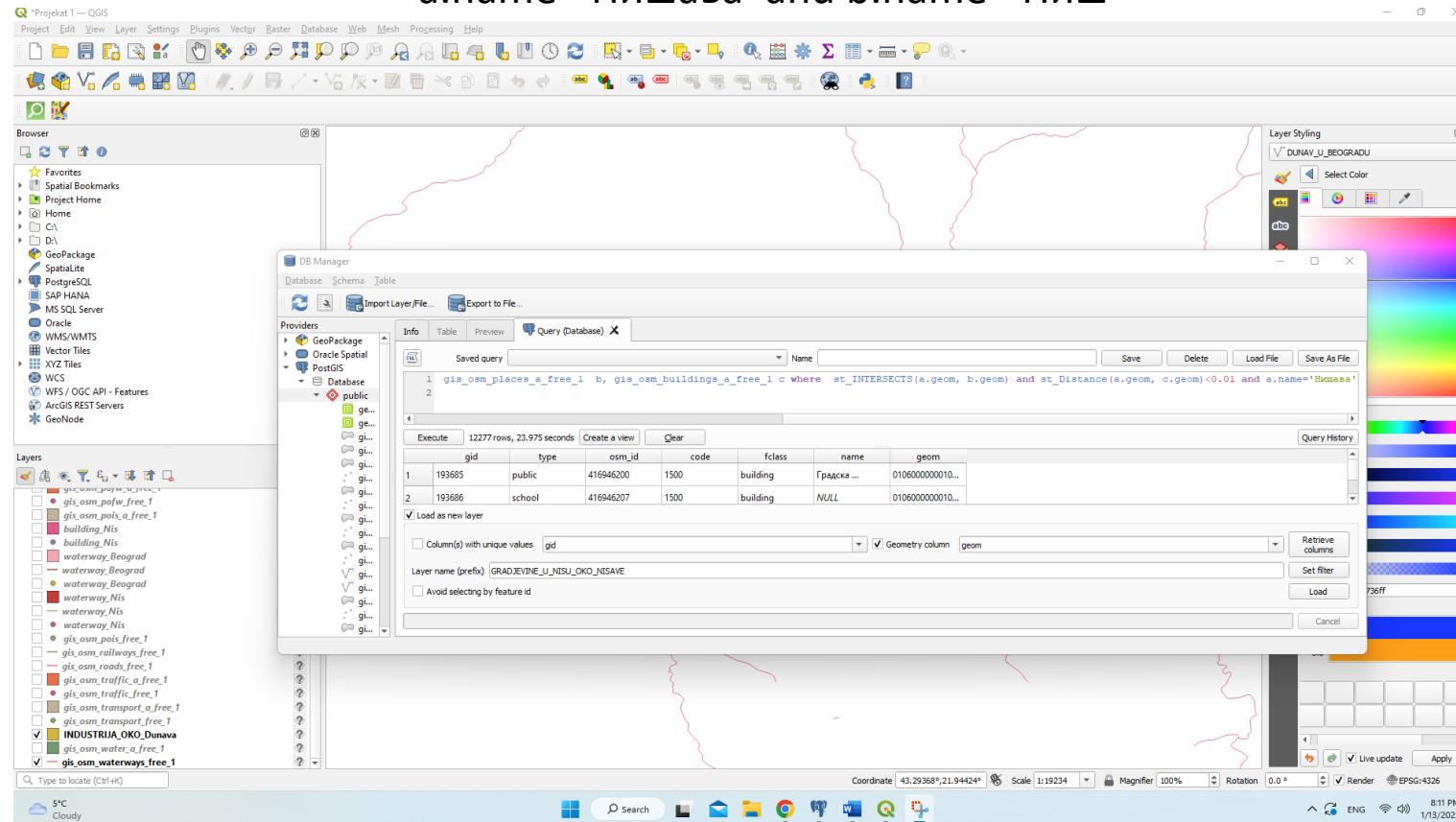


Plavom bojom je prikazan deo toka reke Dunav koji prolazi kroz Beograd

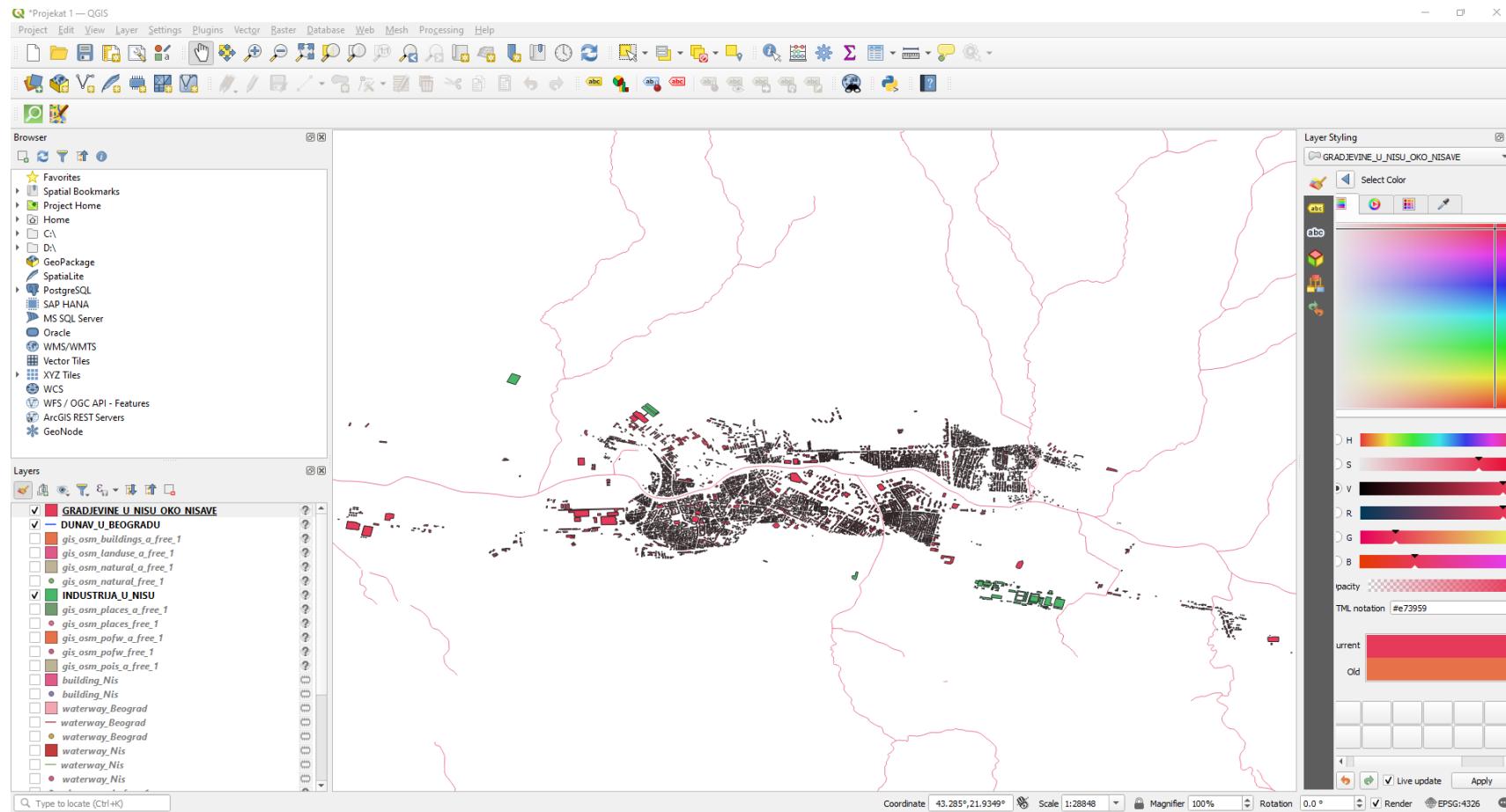


SQL upit koji prikazuje objekte u blizini toka reke Nišave samo na području grada Niša

```
select c.gid, c.type, c.osm_id, c.code, c.fclass, c.name, c.geom from gis_osm_waterways_free_1 a, gis_osm_places_a_free_1 b, gis_osm_buildings_a_free_1 c where st_INTERSECTS(a.geom, b.geom) and st_Distance(a.geom, c.geom)<0.01 and a.name='Nišava' and b.name='Niš'
```

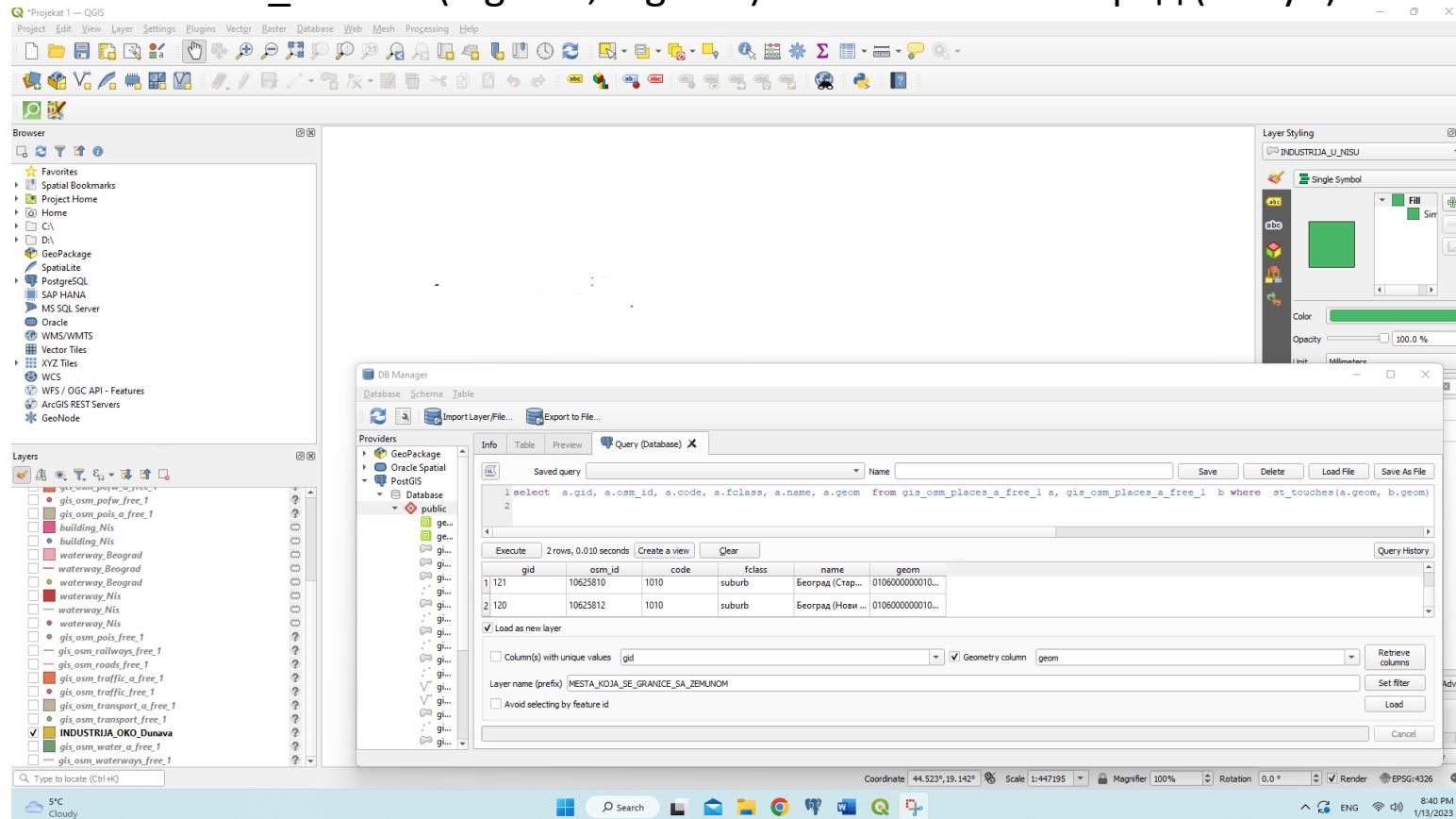


Roze bojom mozemo videti objekte u blizini reke Nišave samo na delu njenog toka koji protiče kroz grad Niš



SQL upit koji prikazuje mesta koja se granice sa opštinom Zemun

```
select a.gid, a.osm_id, a.code, a.fclass, a.name, a.geom from gis_osm_places_a_free_1 a, gis_osm_places_a_free_1 b  
where st_touches(a.geom, b.geom) and b.name='Београд (Земун)'
```



Maslinasto zelenom bojaom su prikazana mesta koja se graniče sa opštinom Zemun

