

1. Nowa baza danych

CREATE DATABASE cw6;

CREATE EXTENSION postgis;

CREATE EXTENSION postgis_raster;

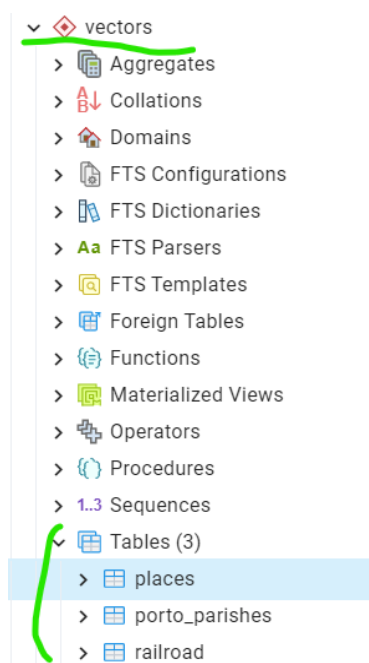
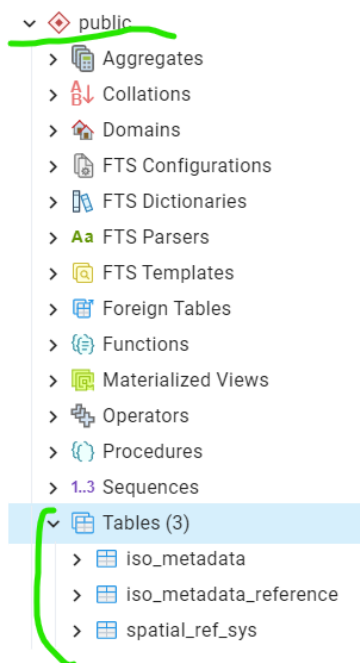
```
C:\Program Files\PostgreSQL\14\bin>pg_restore -h localhost -p 5432 -U postgres -d cw6 C:\hurtownie_backups\postgis_raster.backup
pg_restore: warning: restoring tables WITH OIDS is not supported anymore
pg_restore: warning: restoring tables WITH OIDS is not supported anymore
Password:
pg_restore: while PROCESSING TOC:
pg_restore: from TOC entry 4; 2615 2200 SCHEMA public postgres
pg_restore: error: could not execute query: ERROR: schema "public" already exists
Command was: CREATE SCHEMA public;

pg_restore: warning: errors ignored on restore: 1

C:\Program Files\PostgreSQL\14\bin>
```

2. Struktura bazy danych

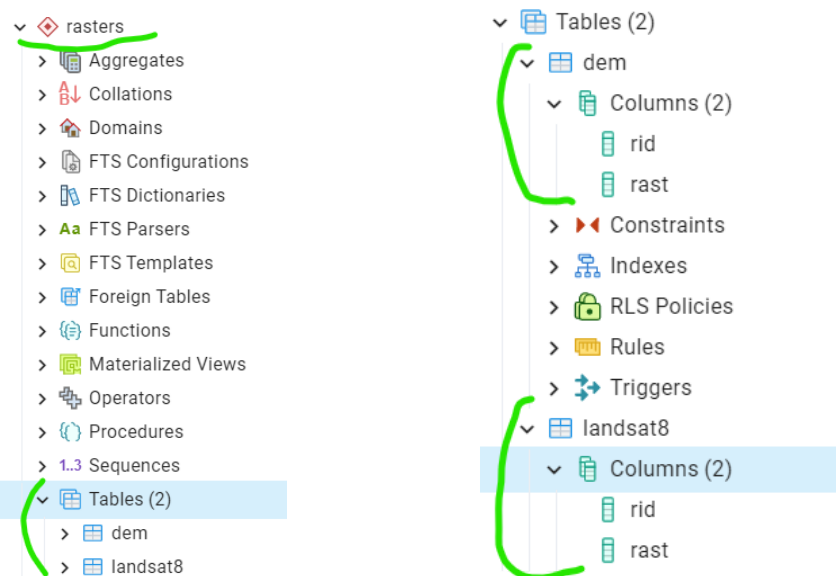
ALTER SCHEMA schema_name RENAME TO pelc;



3. Ładowanie danych rastrowych & Ładowanie wysokości

```
C:\Program Files\PostgreSQL\14\bin>raster2pgsql -s 3763 -N -32767 -I -C -M -t 100x100 C:\hurtownie_backups\srtm_1arc_v3.tif rasters.dem | psql -h localhost -p 5432 -d cw6 -U postgres
Processing 1/1: C:\hurtownie_backups\srtm_1arc_v3.tif
Password for user postgres:
BEGIN
CREATE TABLE
INSERT 0 1
INSERT 0 1
INSERT 0 1

C:\Program Files\PostgreSQL\14\bin>raster2pgsql -s 3763 -N -32767 -I -C -M -t 128x128 C:\hurtownie_backups\Landsat8_L1TP_RGBN.tif rasters.landsat8 | psql -h localhost -p 5432 -d cw6 -U postgres
Processing 1/1: C:\hurtownie_backups\Landsat8_L1TP_RGBN.tif
Password for user postgres:
BEGIN
CREATE TABLE
INSERT 0 1
INSERT 0 1
INSERT 0 1
```



4. Tworzenie rastrow z istniejących rastrow i interakcja z wektorami

- ST_Intersects



- ST_Clip
- Tables (2)
 - clip
 - Columns (2)
 - st_clip
 - municipality

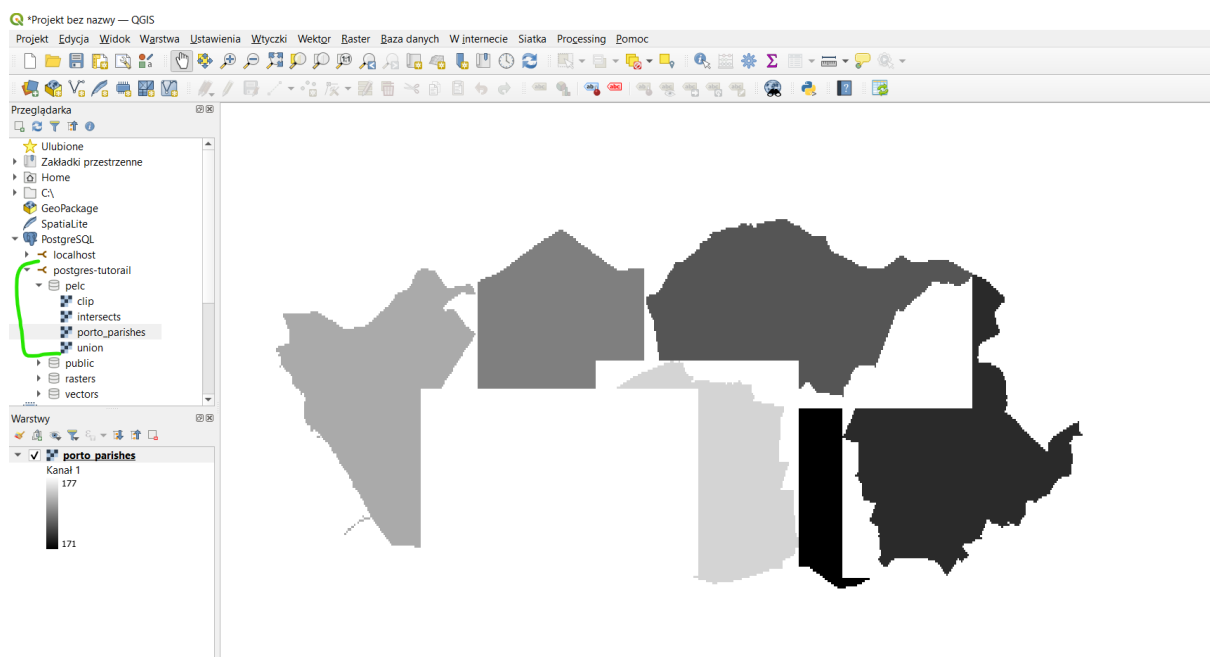
- ST_Union

- Tables (3)
 - clip
 - intersects
 - union
 - Columns (1)
 - st_union

5. Tworzenie rastrow z wektorów (rastrowanie)

- ST_AsRaster

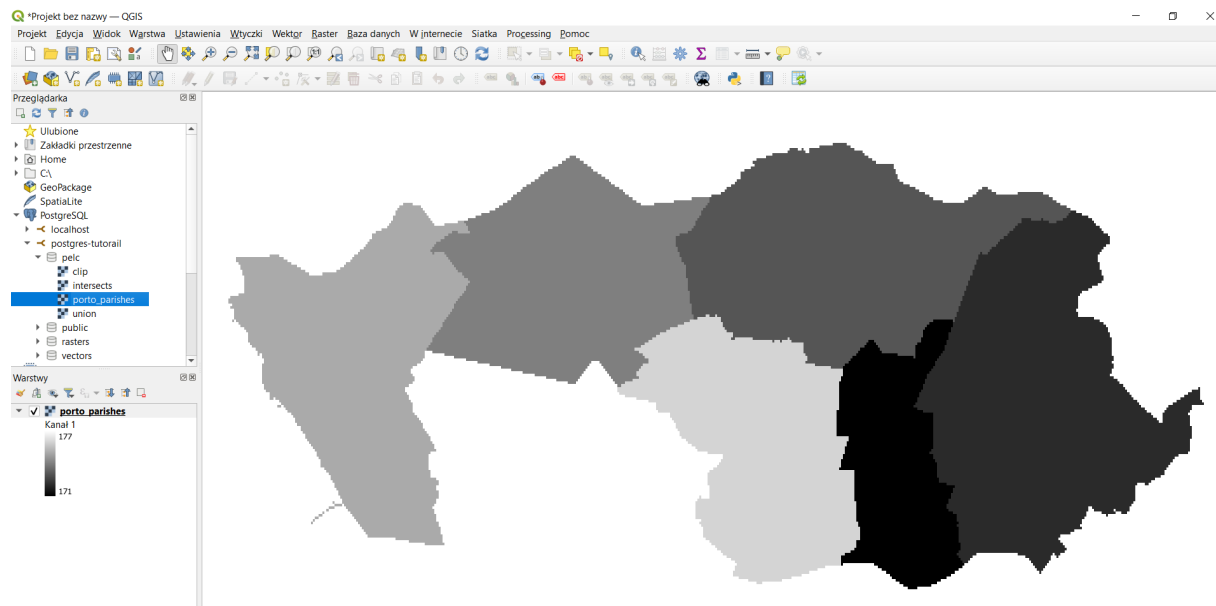
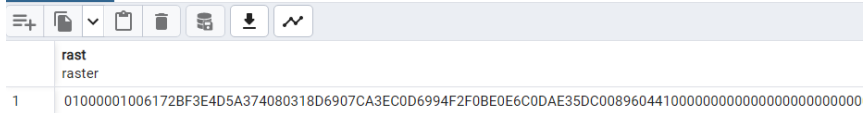
- Tables (4)
 - clip
 - intersects
 - porto_parishes
 - Columns (1)
 - rast



- ST_Union

```
1 SELECT * FROM pelc.porto_parishes
2 LIMIT 100
3
```

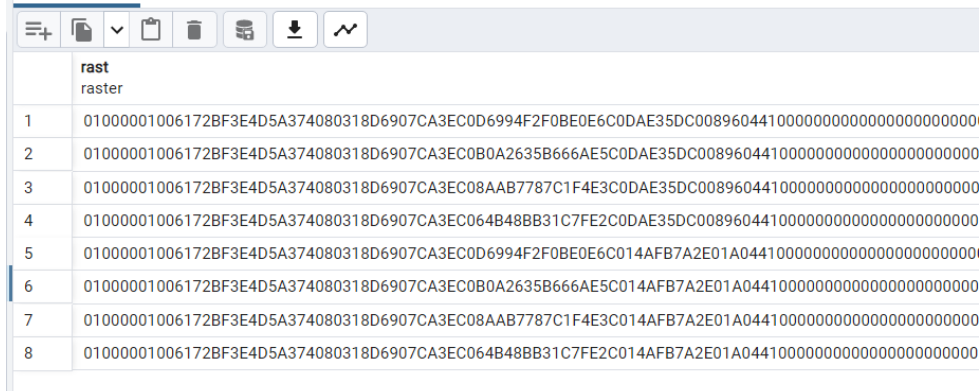
Data Output Messages Notifications

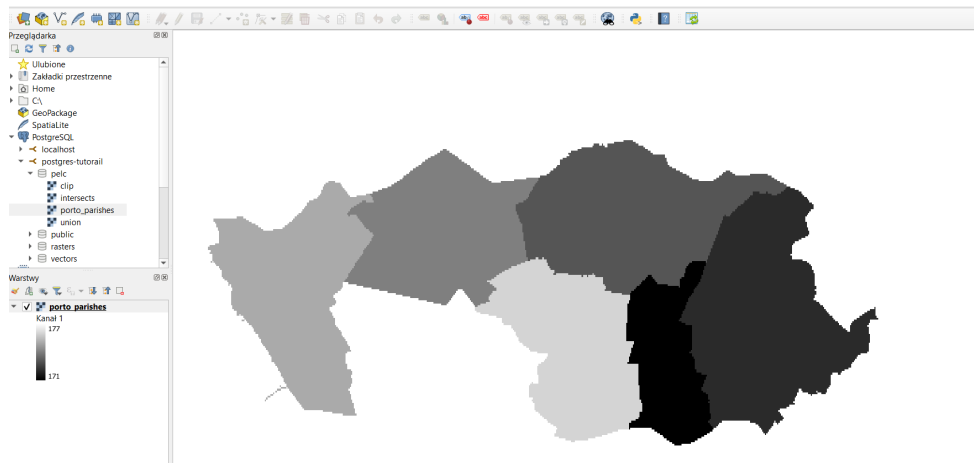


- ST_Tile

```
1 SELECT * FROM pelc.porto_parishes
2 LIMIT 100
3
```

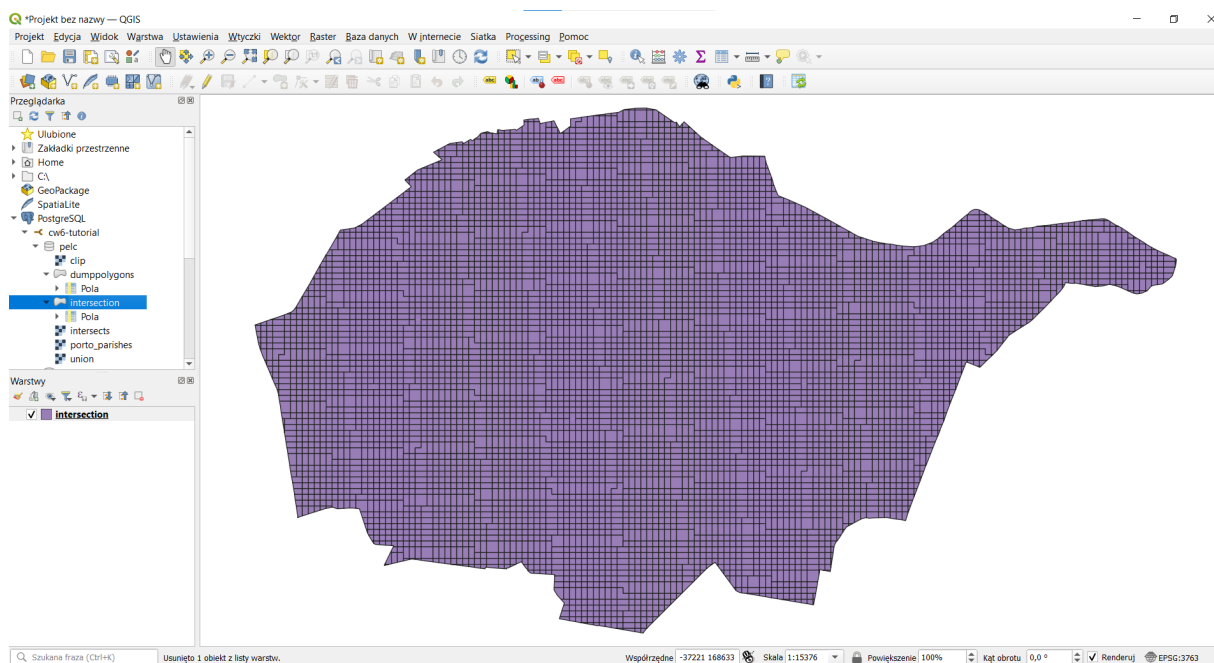
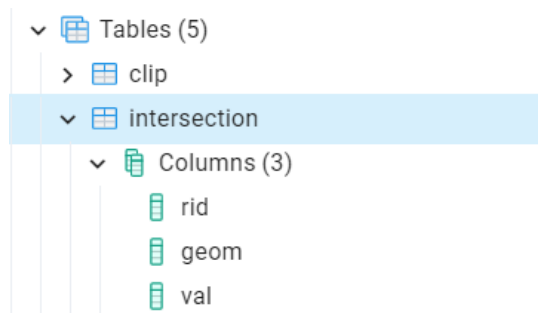
Data Output Messages Notifications



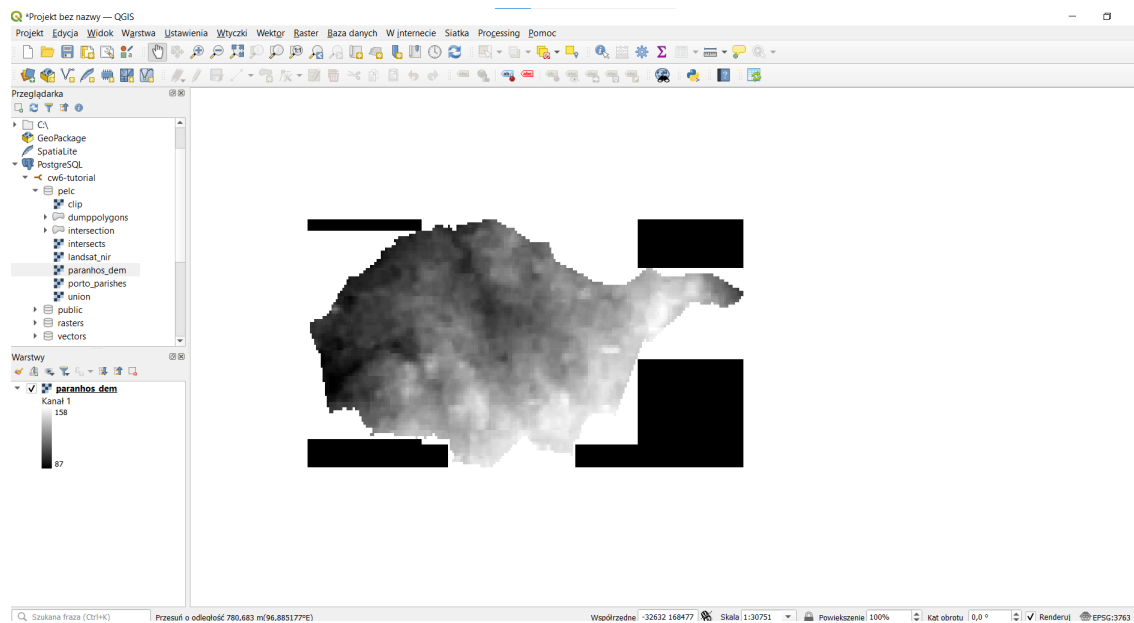


6. Konwertowanie rastrów na wektory (wektoryzowanie)

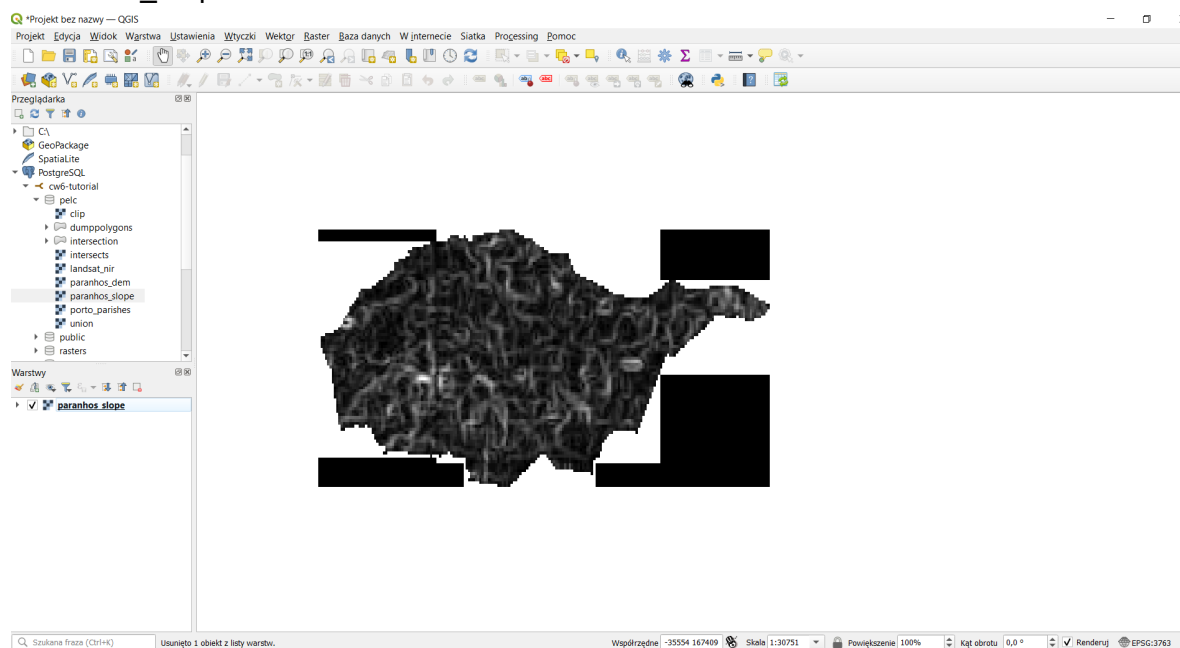
- ST_Intersection



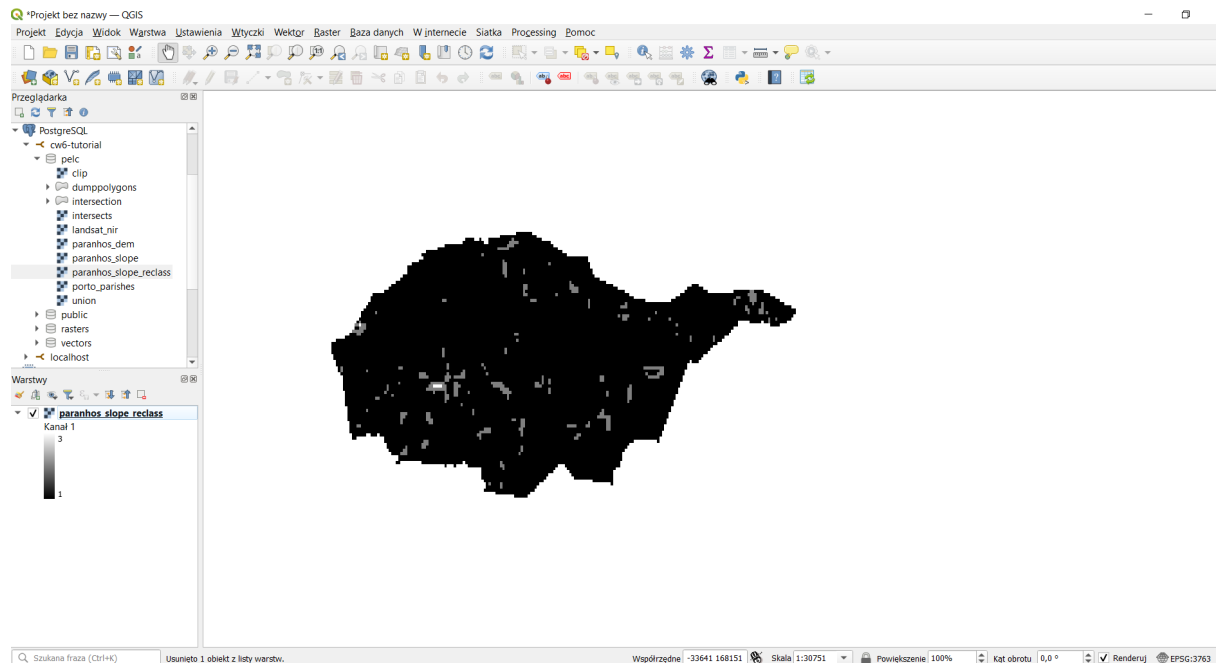
- ST_DumpAsPolygons



- ST_Slope



- ST_Reclass



- ST_SummaryStats

```
1 SELECT st_summarystats(a.rast) AS stats
2 FROM pelc.paranhos_dem AS a;
3
4
```

Data Output Messages Notifications

	stats	
	summarystats	
1	(2616,278385,106.41628440366972,11.622628762211638,87,14...	
2	(6463,816615,126.35231316725978,14.0438229209133,94,158)	
3	(682,95581,140.14809384164224,12.078072186605759,103,158)	
4	(216,31874,147.5648148148148,4.262830628315728,137,158)	

- ST_SummaryStats i ST_Union

```
1 SELECT st_summarystats(ST_Union(a.rast))
2 FROM pelc.paranhos_dem AS a;
3
4
```

Data Output Messages Notifications

	st_summarystats	
	summarystats	
1	(9977,1222455,122.52731281948482,16.908004202736272,87,15...	

- ST_SummaryStats z lepszą kontrolą złożonego typu danych

```

1 WITH t AS (
2 SELECT st_summarystats(ST_Union(a.rast)) AS stats
3 FROM pelc.paranhos_dem AS a
4 )
5 SELECT (stats).min,(stats).max,(stats).mean FROM t;
6
7

```

Data Output Messages Notifications			
<div> <div>+</div> <div>📄</div> <div>▼</div> <div>📋</div> <div>🗑️</div> <div>📦</div> <div>⬇️</div> <div>📈</div> </div>			
	min double precision 🔒	max double precision 🔒	mean double precision 🔒
1	87	158	122.52731281948482

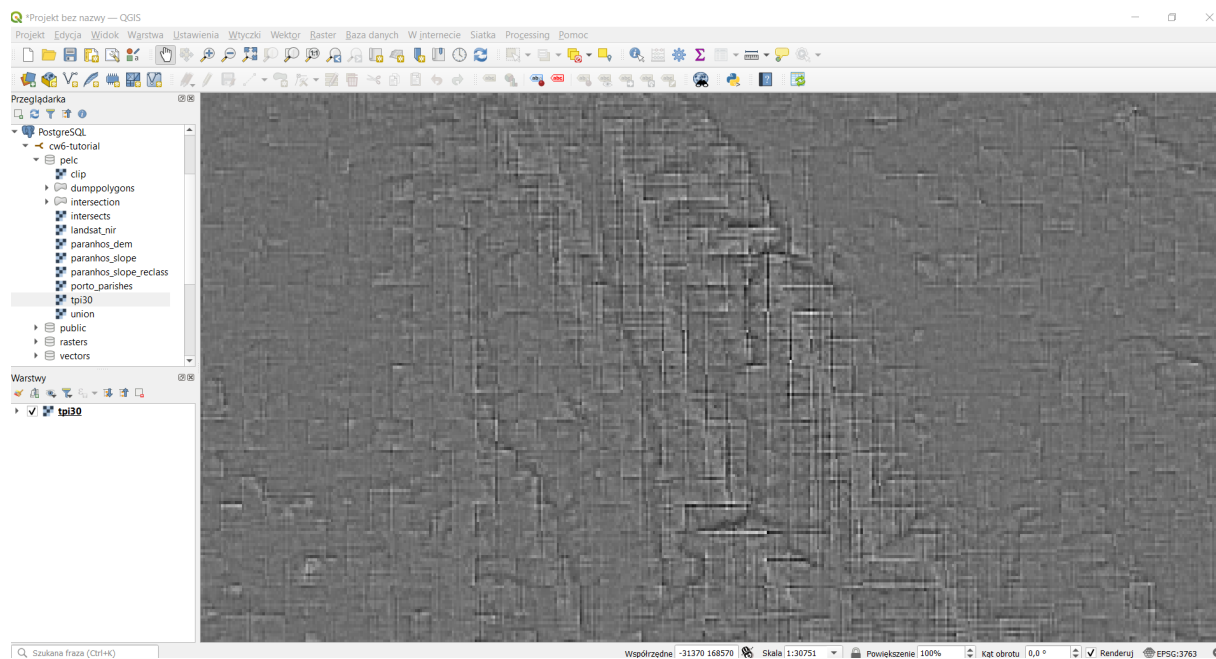
- ST_SummaryStats i Groupby Statystyka dla każdego poziomu parish

Data Output Messages Notifications				
<div> <div>+</div> <div>📄</div> <div>▼</div> <div>📋</div> <div>🗑️</div> <div>📦</div> <div>⬇️</div> <div>📈</div> </div>				
	parish character varying (254) 🔒	min double precision 🔒	max double precision 🔒	mean double precision 🔒
1	Bonfim		1	107.5658842667906
2	Campanhã		0	74.66732213085449
3	Paranhos		87	122.52731281948482
4	Ramalde		48	77.58444444444444
5	União das freguesias de Aldoar, Foz do Douro e Nevogilde		-4	34.66735489791237
6	União das freguesias de Cedofeita, Santo Ildefonso, Sé, Miragaia, São Nicolau e Vitó...		1	95.00277741039545
7	União das freguesias de Lordelo do Ouro e Massarelos		-1	49.50051440329218

- ST_Value

	name character varying (48) 🔒	st_value double precision 🔒
1	Aldeia São Miguel	96
2	Alpendurada e Matos	145
3	Amarante	71
4	Baião	581
5	Cabeceiras de Basto	[null]
6	Castelo de Paiva	284
7	Celorico de Basto	227
8	Cinfães	405
9	Espinho	14
10	Fafe	338
11	Fajozes	53

8. Topographic Position Index (TPI)



9. Problem do samodzielnego rozwiązania

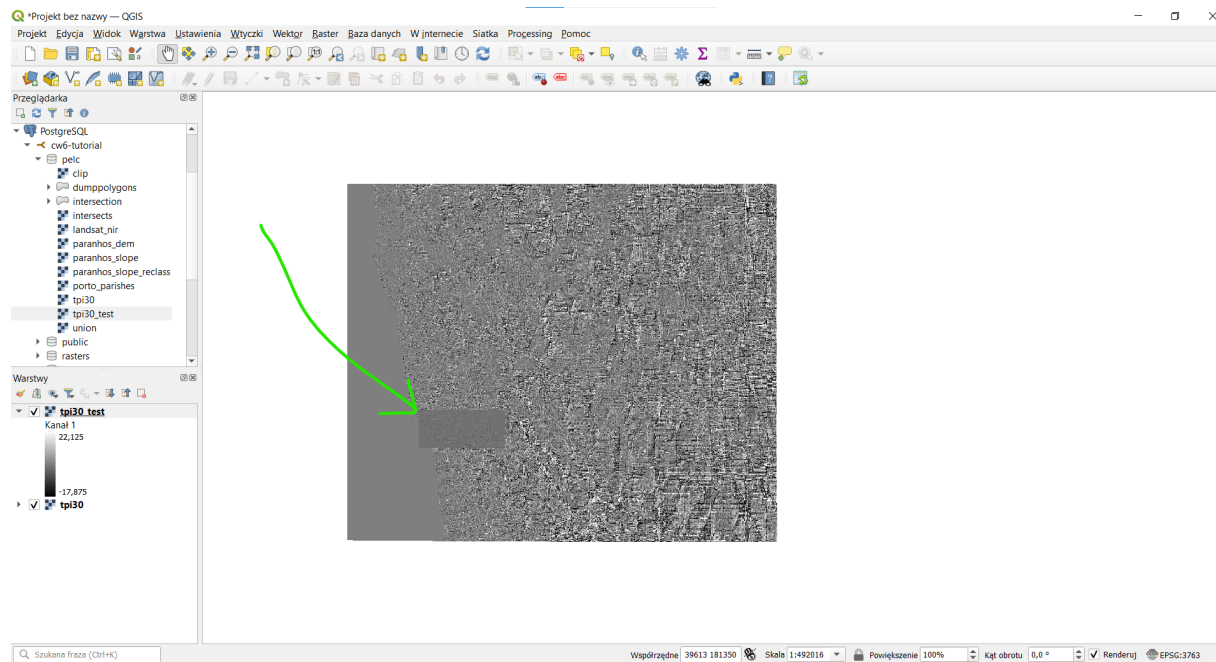
- Kwerenda

```
create table pelc.tpi30_test as
select ST_TPI(a.rast,1) as rast
from rasters.dem AS a, vectors.porto_parishes AS b
WHERE ST_Intersects(a.rast, b.geom) AND b.municipality ilike 'porto';;
```

```
CREATE INDEX idx_tpi30_rast_gist_test ON pelc.tpi30_test  
USING gist (ST_ConvexHull(rast));
```

```
SELECT AddRasterConstraints('pelc'::name,  
'tpi30_test'::name,'rast'::name);
```

- QGIS



- Porównanie czasu wykonania

Pełny obszar: **38 sec 386 msec**

```
SELECT 589
```

Query returned successfully in 38 secs 386 msec.

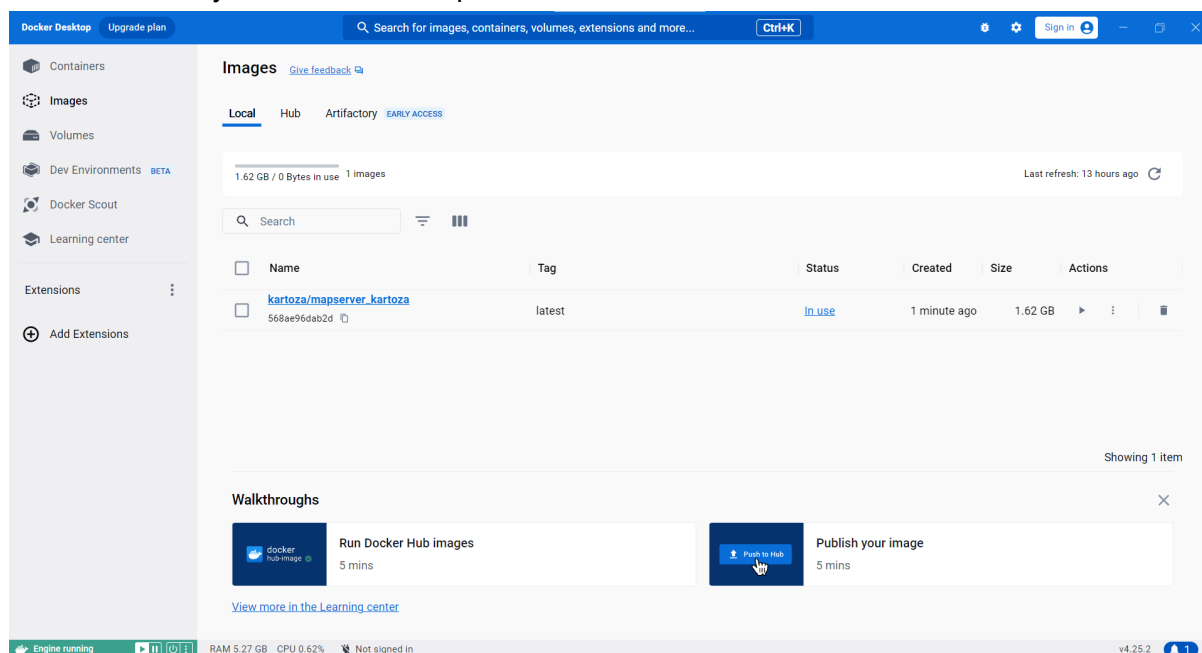
Ograniczony obszar: **1 sec 363 msec**

```
SELECT 25
```

Query returned successfully in 1 secs 363 msec.

10. Docker

Serwer widoczny w Docker Desktop:



po połączeniu się z serwerem z terminala WSL-owego, prompt wygląda w następujący sposób:

```
root@5275d5a920a3:/# psql postgres://postgres:test123@192.168.160.1/cw6
psql (16.1 (Ubuntu 16.1-1.pgdg20.04+1), server 14.7)
Type "help" for help.

cw6=#
```

W wykonaniu części II tutorialu nastąpi wyświetlenie mapfile na stronie.