Sprawozdanie z przedmiotu Bazy Danych Przestrzennych – ćwiczenia z PostGIS raster

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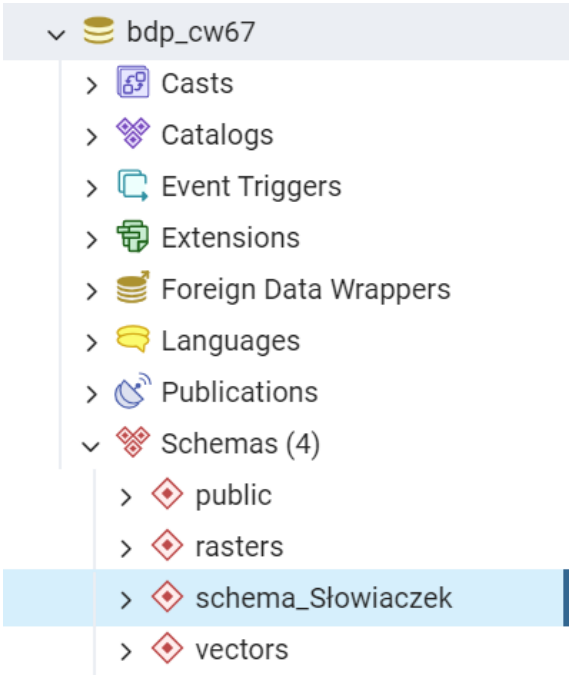
Nowa baza danych

```
bdp_cw67=# psql bdp_cw67 < "C:\Users\Lenovo\Desktop\Studia\7 semestr\Bazy Danych przestrzennych\Lab6\PostGIS raster - da
ne\postgis_raster.backup"
bdp_cw67-#
```

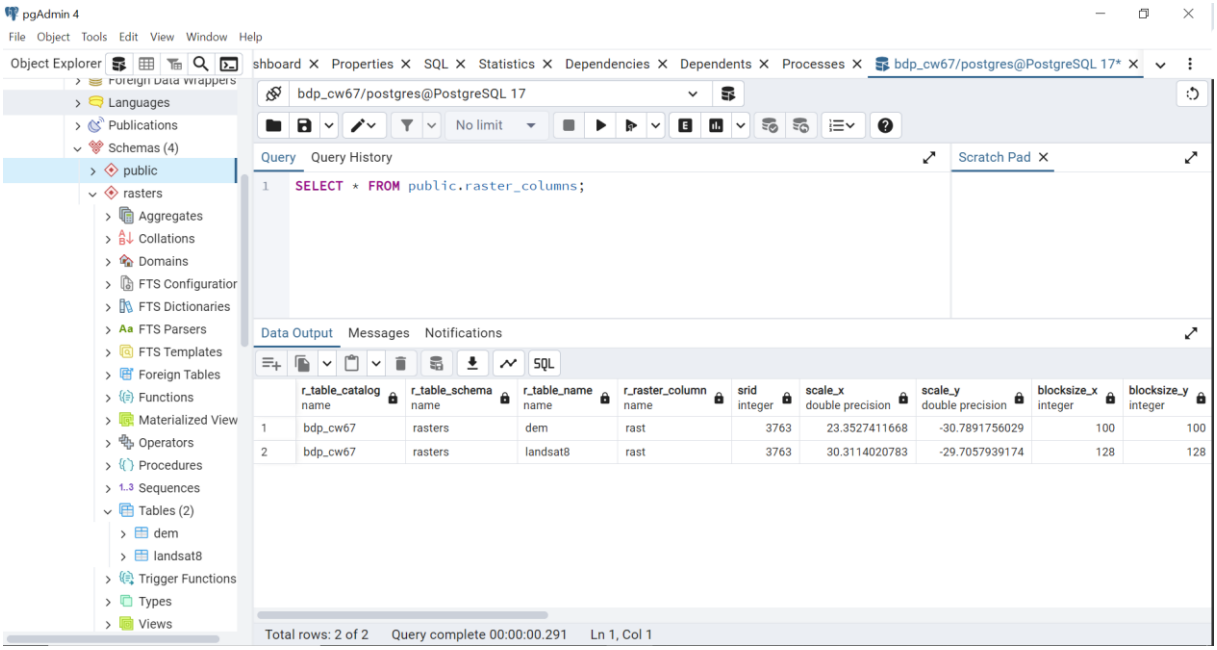
Struktura bazy danych



Ładowanie danych rastrowych

```
C:\Program Files\PostgreSQL\17\bin>.\raster2pgsql.exe -s 3763 -N -32767 -t 100x100 -I -C -M -d "C:\Users\Lenovo\Desktop\
Studia\7 semestr\Bazy Danych przestrzennych\Lab6\PostGIS raster - dane\srtm_1arc_v3.tif" rasters.dem | psql -d bdp_cw67
-U postgres
Processing 1/1: C:\Users\Lenovo\Desktop\Studia\7 semestr\Bazy Danych przestrzennych\Lab6\PostGIS raster - dane\srtm_1arc
_v3.tif
Hasło użytkownika postgres:
BEGIN
UWAGA:  tabela "dem" nie istnieje, pominiÄtto
DROP TABLE
CREATE TABLE
INSERT 0 1
INSERT 0 1
INSERT 0 1
INSERT 0 1
INSERT 0 1
INSERT 0 1
INSERT 0 1
INSERT 0 1
INSERT 0 1
INSERT 0 1
```

```
C:\Program Files\PostgreSQL\17\bin>.\raster2pgsql.exe -s 3763 -N -32767 -t 128x128 -I -C -M -d "C:\Users\Lenovo\Desktop\
Studia\7 semestr\Bazy Danych przestrzennych\Lab6\PostGIS raster - dane\Landsat8_L1TP_RGBN.TIF" rasters.landsat8 | psql -
d bdp_cw67 -h localhost -U postgres -p 5432
Processing 1/1: C:\Users\Lenovo\Desktop\Studia\7 semestr\Bazy Danych przestrzennych\Lab6\PostGIS raster - dane\Landsat8_
L1TP_RGBN.TIF
Hasło użytkownika postgres:
BEGIN
UWAGA:  tabela "landsat8" nie istnieje, pominiÄtto
DROP TABLE
CREATE TABLE
INSERT 0 1
INSERT 0 1
INSERT 0 1
INSERT 0 1
INSERT 0 1
INSERT 0 1
INSERT 0 1
INSERT 0 1
INSERT 0 1
INSERT 0 1
INSERT 0 1
```



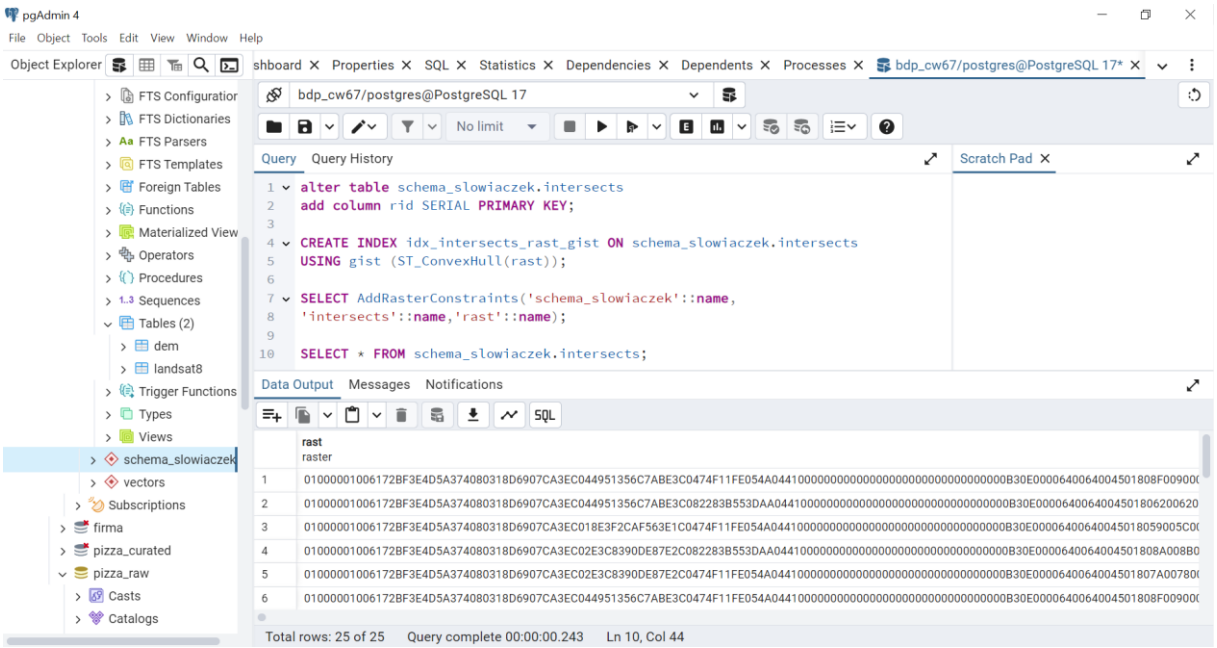
Tworzenie rastrów z istniejących rastrów i interakcja z wektorami

St_intersects

```sql
CREATE TABLE schema_slowiaczek.intersects AS
SELECT a.rast, b.municipality
FROM rasters.dem AS a, vectors.porto_parishes AS b
WHERE ST_Intersects(a.rast, b.geom) AND b.municipality ilike 'porto';
```

Data Output | Messages | Notifications

```
SELECT 25

Query returned successfully in 105 msec.
```



St_Clip

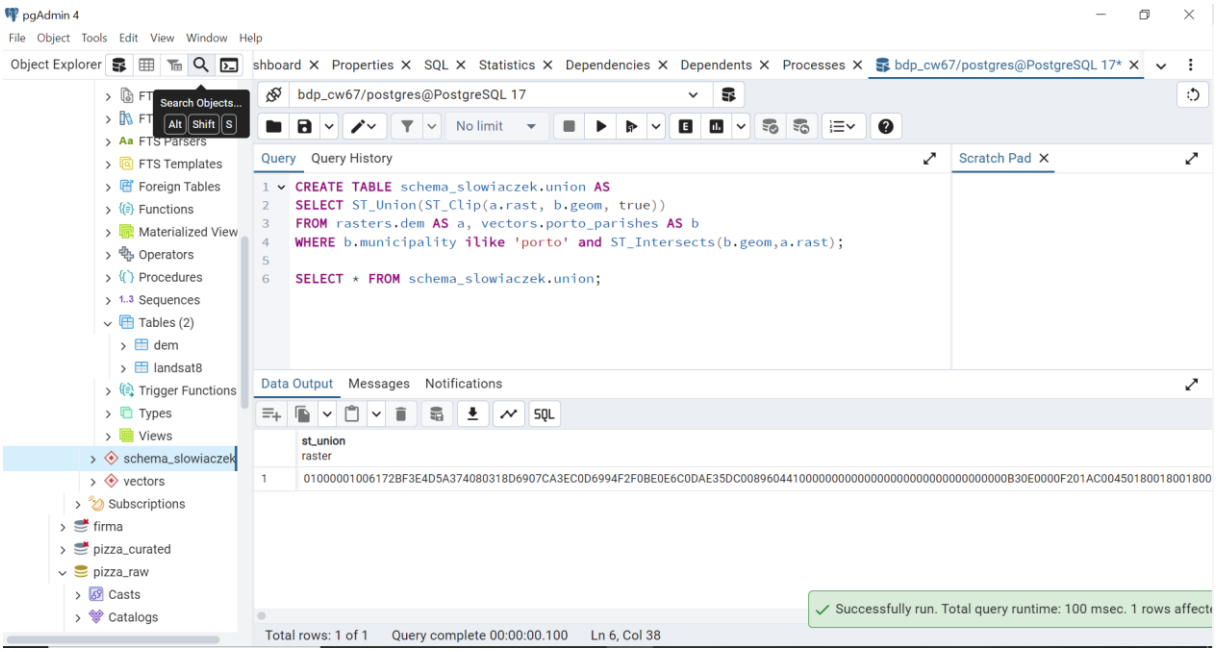
Query | Query History

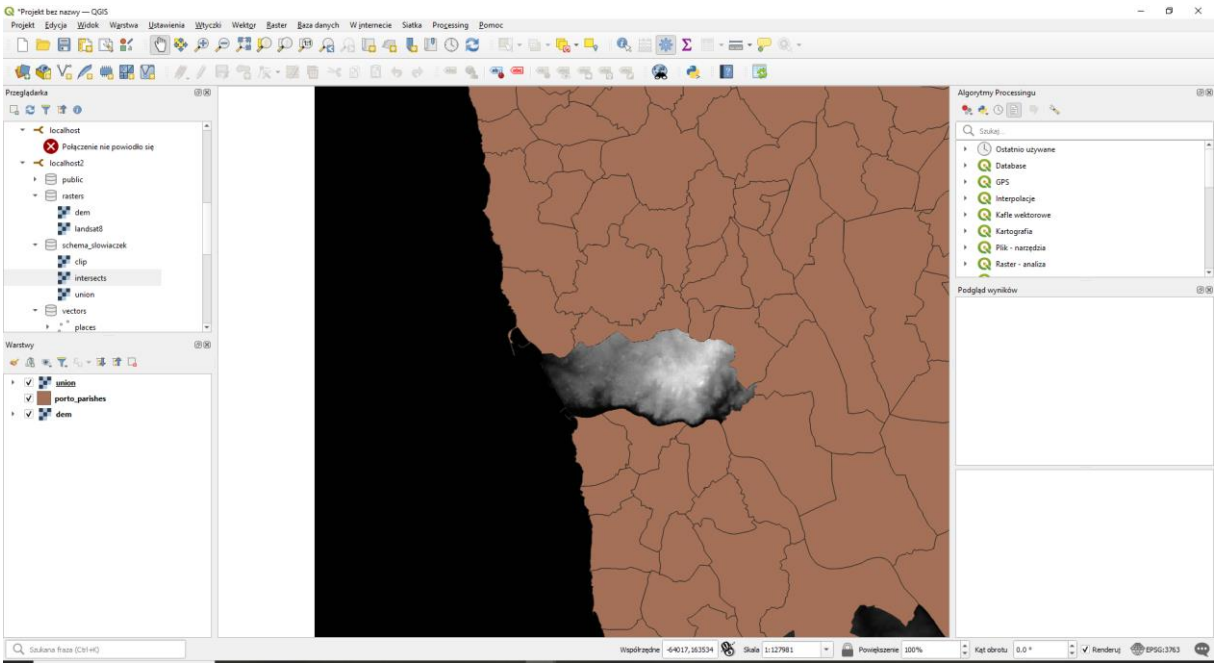
```
1  CREATE TABLE schema_slowiaczek.clip AS
2  SELECT ST_Clip(a.rast, b.geom, true), b.municipality
3  FROM rasters.dem AS a, vectors.porto_parishes AS b
4  WHERE ST_Intersects(a.rast, b.geom) AND b.municipality like 'PORTO';
```

Data Output | Messages | Notifications

```
SELECT 25

Query returned successfully in 86 msec.
```

St_Union





Tworzenie rastrów z wektorów (rastrowanie)

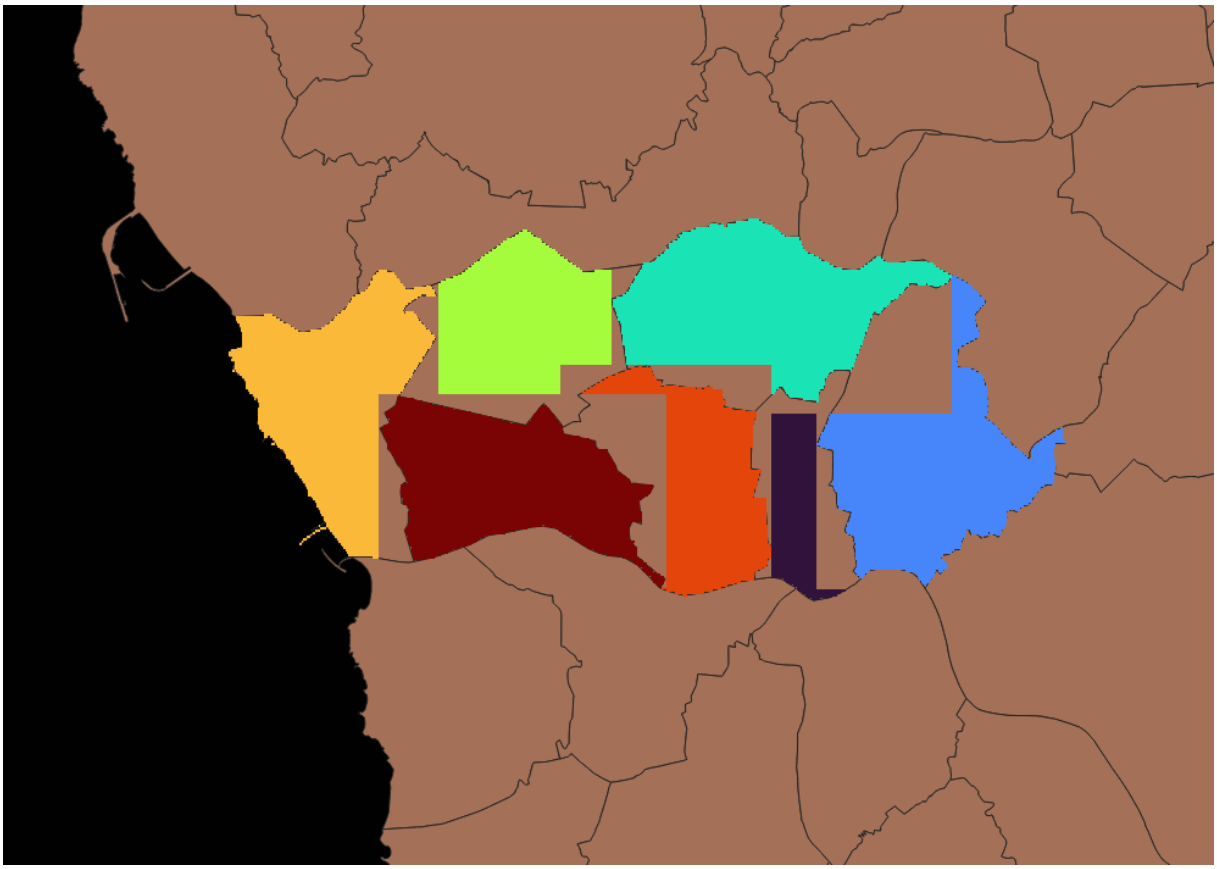
St_AsRaster

```
1  WITH r AS (
2  SELECT rast FROM rasters.dem
3  LIMIT 1
4  )
5  SELECT ST_AsRaster(a.geom,r.rast,'8BUI',a.id,-32767) AS rast
6  FROM vectors.porto_parishes AS a, r
7  WHERE a.municipality ilike 'porto';
8
```

Data Output | Messages | Notifications

SQL

	rast raster
1	01000001006172BF3E4D5A374080318D6907CA3EC0574768B43454E3C0D0979D709B5404410000000000000000000000000000000000B30E0000420069004400000000000(
2	01000001006172BF3E4D5A374080318D6907CA3EC00A62D67B5CE2E2C08A6D93EAFA7D0441000000000000000000000000000000000B30E000095008E004400000000000(
3	01000001006172BF3E4D5A374080318D6907CA3EC0D268172037B9E5C0CA65352F399104410000000000000000000000000000000000B30E000092005A004400000000000(
4	01000001006172BF3E4D5A374080318D6907CA3EC0D6994F2F0BE0E6C05E060A8BE77F0441000000000000000000000000000000000B30E00007D008500440000000000(
5	01000001006172BF3E4D5A374080318D6907CA3EC09A49D3957D46E4C0D9E35DC00896044100000000000000000000000000000000B30E0000CA005800440000000000(
6	01000001006172BF3E4D5A374080318D6907CA3EC087977E37109EE4C0A33014118856044100000000000000000000000000000000B30E00007D006800440000000000(

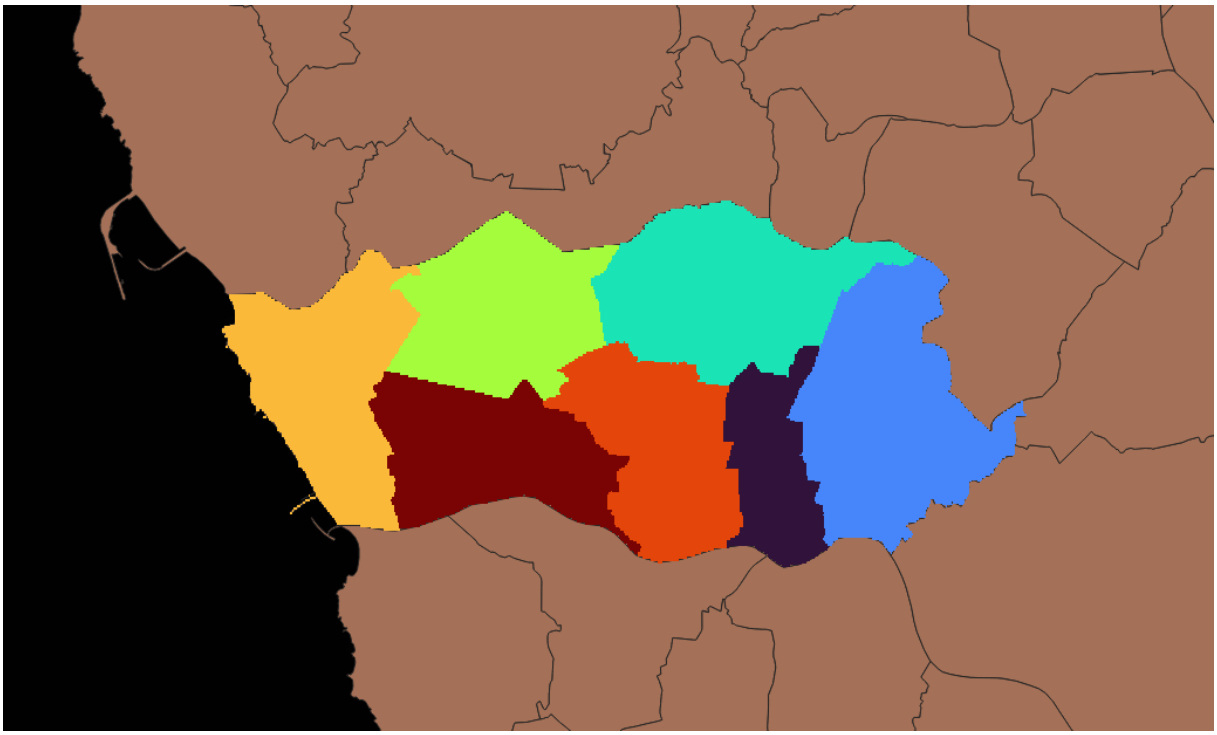


ST_Union

```
1  DROP TABLE schema_slowiaczek.porto_parishes;--> drop table porto_parishes first
2
3  CREATE TABLE schema_slowiaczek.porto_parishes AS
4  WITH r AS (
5  SELECT rast FROM rasters.dem
6  LIMIT 1
7  )
8  SELECT st_union(ST_AsRaster(a.geom,r.rast,'8BUI',a.id,-32767)) AS rast
9  FROM vectors.porto_parishes AS a, r
10 WHERE a.municipality ilike 'porto';
11
```

Data Output | Messages | Notifications

```
SELECT 1

Query returned successfully in 128 msec.
```



ST_Tile

```
1  DROP TABLE schema_slowiaczek.porto_parishes; --> drop table porto_parishes first
2
3  CREATE TABLE schema_slowiaczek.porto_parishes AS
4  WITH r AS (
5  SELECT rast FROM rasters.dem
6  LIMIT 1 )
7  SELECT st_tile(st_union(ST_AsRaster(a.geom,r.rast,'8BUI',a.id,
8  32767)),128,128,true,-32767) AS rast
9  FROM vectors.porto_parishes AS a, r
10 WHERE a.municipality ilike 'porto';
```

Data Output | Messages | Notifications

```
SELECT 8

Query returned successfully in 142 msec.
```

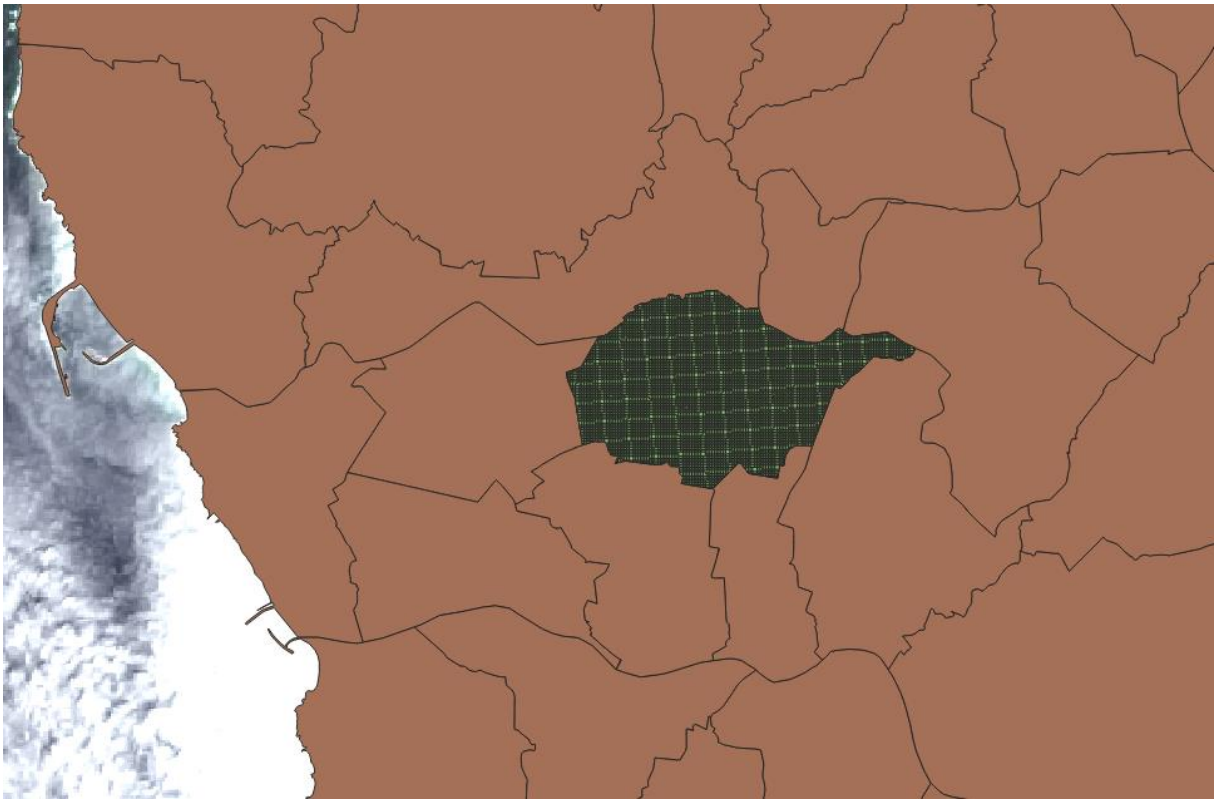
Konwertowanie rastrów na wektory (wektoryzowanie)

ST_Intersection

```
create table schema_slowiaczek.intersection as
SELECT
a.rid,(ST_Intersection(b.geom,a.rast)).geom,(ST_Intersection(b.geom,a.rast)
 ).val
FROM rasters.landsat8 AS a, vectors.porto_parishes AS b
WHERE b.parish ilike 'paranhos' and ST_Intersects(b.geom,a.rast);
```

Data Output | Messages | Notifications

```
SELECT 6629

Query returned successfully in 7 secs 91 msec.
```

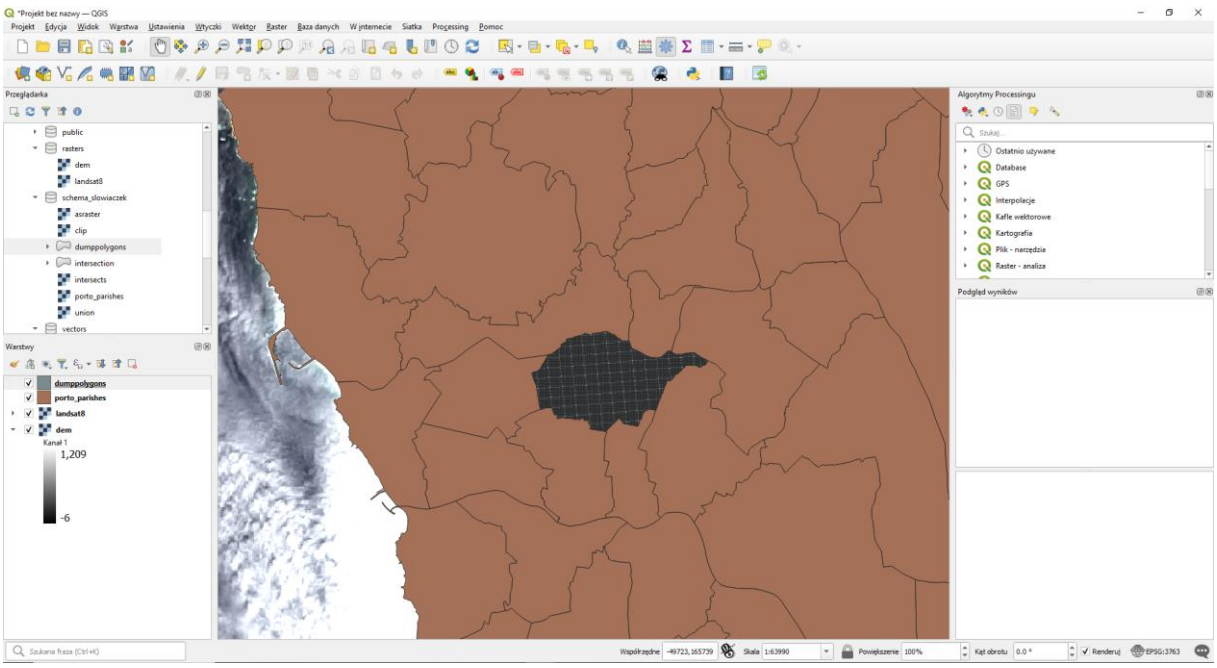


ST_DumpAsPolygons

```
1  CREATE TABLE schema_slowiaczek.dumppolygons AS
2  SELECT
3  a.rid,(ST_DumpAsPolygons(ST_Clip(a.rast,b.geom))).geom,(ST_DumpAsPolygons(ST_Clip
4  FROM rasters.landsat8 AS a, vectors.porto_parishes AS b
5  WHERE b.parish ilike 'paranhos' and ST_Intersects(b.geom,a.rast);
```

Data Output | Messages | Notifications

```
SELECT 6422

Query returned successfully in 146 msec.
```



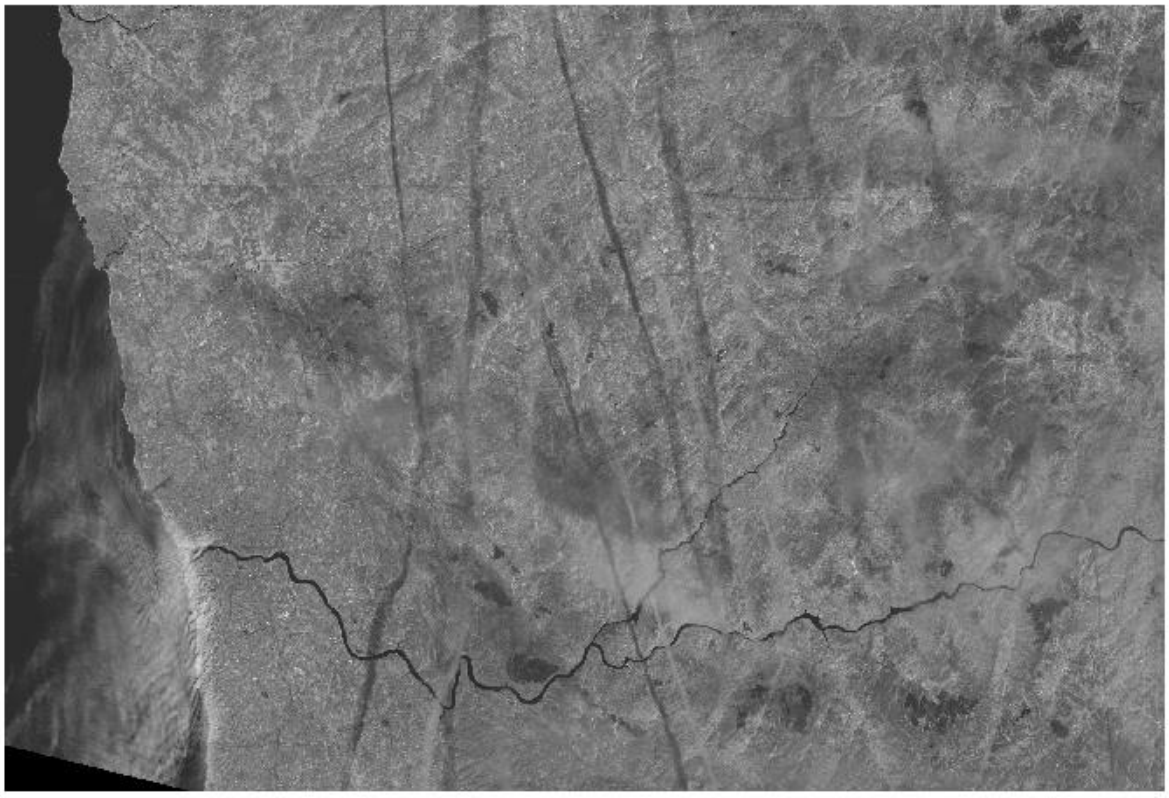
Analiza rastrów

ST_Band

```sql
CREATE TABLE schema_slowiaczek.landsat_nir AS
SELECT rid, ST_Band(rast,4) AS rast
FROM rasters.landsat8;
```

Data Output | Messages | Notifications

```
SELECT 384

Query returned successfully in 902 msec.
```



ST_Clip

```
CREATE TABLE schema_slowiaczek.paranhos_dem AS
SELECT a.rid,ST_Clip(a.rast, b.geom,true) as rast
FROM rasters.dem AS a, vectors.porto_parishes AS b
WHERE b.parish ilike 'paranhos' and ST_Intersects(b.geom,a.rast);
```

Data Output | Messages | Notifications

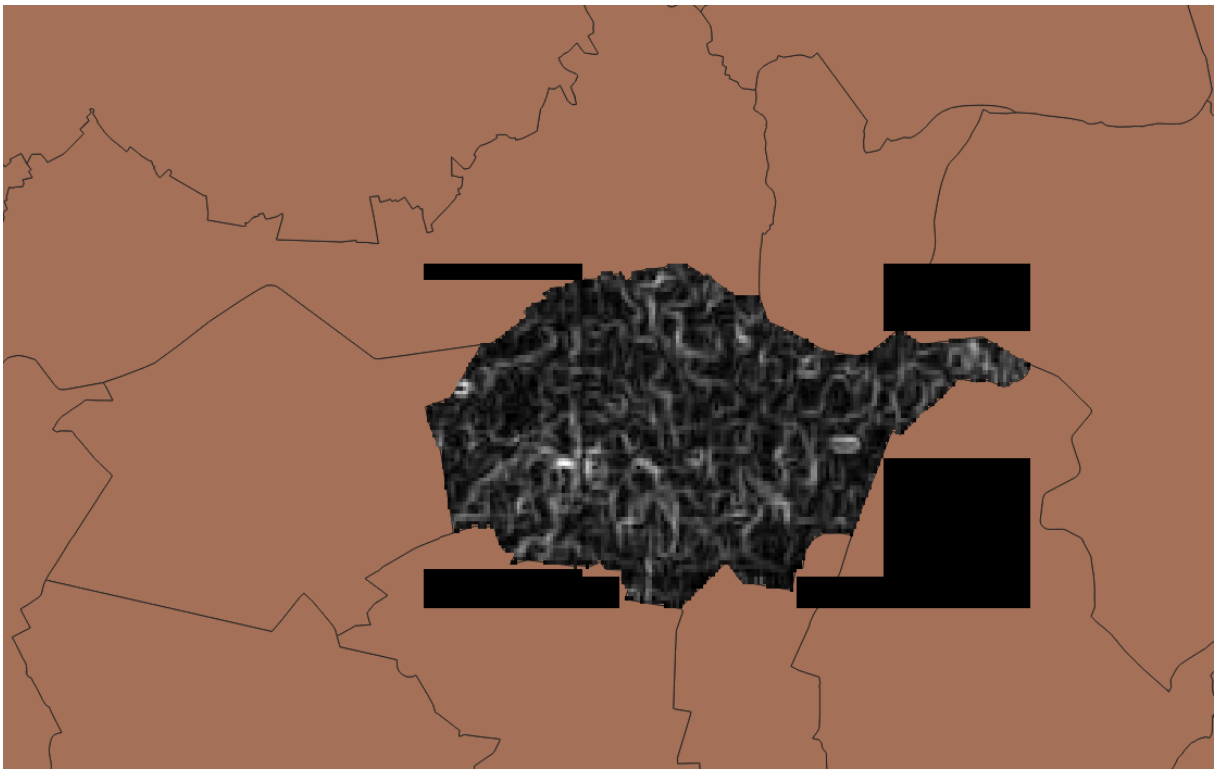
```
SELECT 4

Query returned successfully in 174 msec.
```

ST_Slope

```
CREATE TABLE schema_slowiaczek.paranhos_slope AS
SELECT a.rid,ST_Slope(a.rast,1,'32BF','PERCENTAGE') as rast
FROM schema_slowiaczek.paranhos_dem AS a;
```

Data Output | Messages | Notifications

```
SELECT 4

Query returned successfully in 437 msec.
```

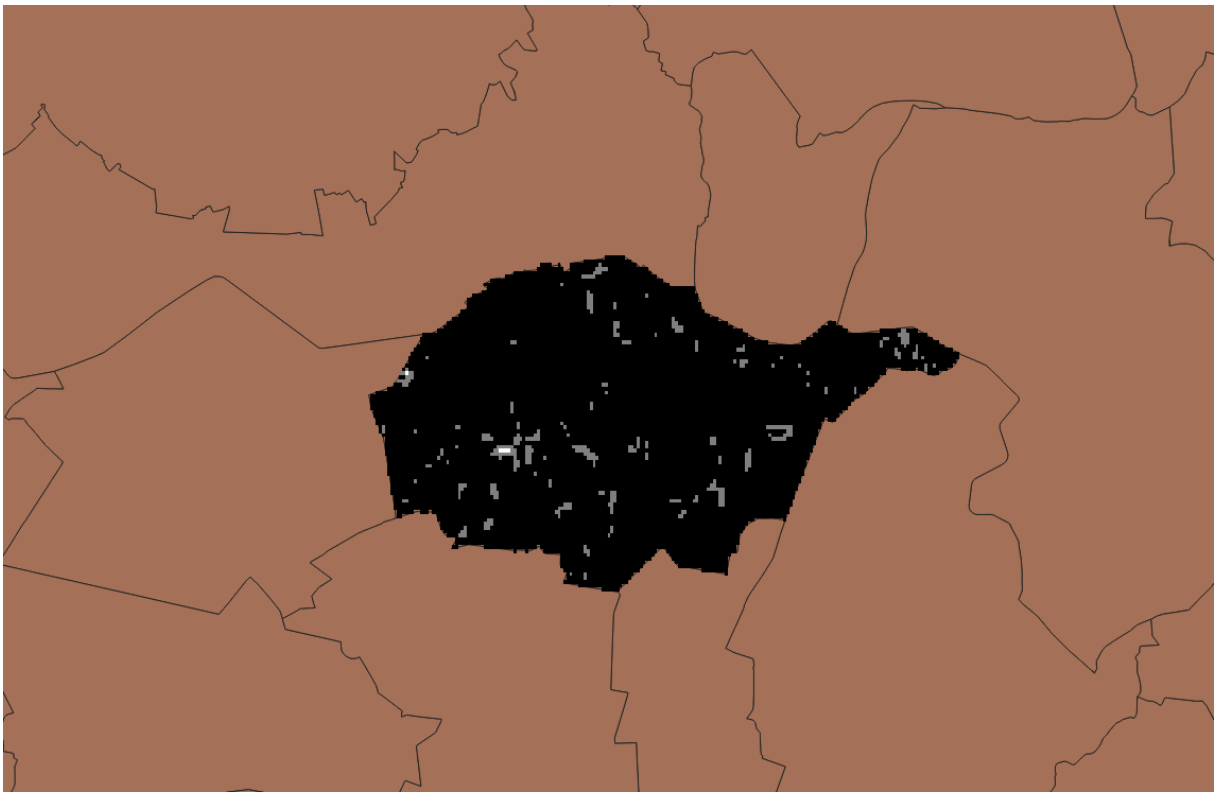


ST_Reclass

```
1  CREATE TABLE schema_slowiaczek.paranhos_slope_reclass AS
2  SELECT a.rid,ST_Reclass(a.rast,1,']0-15]:1, (15-30]:2, (30-9999:3', '32BF',0)
3  FROM schema_slowiaczek.paranhos_slope AS a;
```

Data Output | Messages | Notifications

```
SELECT 4

Query returned successfully in 131 msec.
```



ST_SummaryStats

```
1 SELECT st_summarystats(a.rast) AS stats
2 FROM schema_slowiaczek.paranhos_dem AS a;
```

Data Output | Messages | Notifications

SQL

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

ST_SummaryStats oraz Union

```
SELECT st_summarystats(ST_Union(a.rast))
FROM schema_slowiaczek.paranhos_dem AS a;
```

Data Output | Messages | Notifications

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

ST_SummaryStats z lepszą kontrolą złożonego typu danych

```
WITH t AS (
SELECT st_summarystats(ST_Union(a.rast)) AS stats
FROM schema_slowiaczek.paranhos_dem AS a
)
SELECT (stats).min,(stats).max,(stats).mean FROM t;
```

Data Output | Messages | Notifications

	min double precision	max double precision	mean double precision
1	87	158	122.52731281948482

ST_SummaryStats w połączeniu z GROUP BY

```sql
WITH t AS (
SELECT b.parish AS parish, st_summarystats(ST_Union(ST_Clip(a.rast,
b.geom,true))) AS stats
FROM rasters.dem AS a, vectors.porto_parishes AS b
WHERE b.municipality ilike 'porto' and ST_Intersects(b.geom,a.rast)
group by b.parish
)
SELECT parish,(stats).min,(stats).max,(stats).mean FROM t;
```

Data Output | Messages | Notifications

	parish character varying (254)	min double precision	max double precision	mean double precision
1	Bonfim	1	159	107.5658842667906
2	Campanhã	0	178	74.66732213085449
3	Paranhos	87	158	122.52731281948482
4	Ramalde	48	108	77.58444444444444
5	União das freguesias de Aldoar, Foz do Douro e Nevogilde	-4	83	34.66735489791237
6	União das freguesias de Cedofeita, Santo Ildefonso, Sé, Miragaia, São Nicolau e Vitó…	1	157	95.00277741039545
7	União das freguesias de Lordelo do Ouro e Massarelos	-1	117	49.50051440329218

ST_Value

```sql
SELECT b.name,st_value(a.rast,(ST_Dump(b.geom)).geom)
FROM rasters.dem a, vectors.places AS b
WHERE ST_Intersects(a.rast,b.geom)
ORDER BY b.name;
```

Data Output | Messages | Notifications

	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

Topographic Position Index (TPI)

```
1 create table schema_slowiaczek.tpi30 as
2 select ST_TPI(a.rast,1) as rast
3 from rasters.dem a;
```

Data Output | Messages | Notifications

```
SELECT 589

Query returned successfully in 1 min 29 secs.
```

```
1 CREATE INDEX idx_tpi30_rast_gist ON schema_slowiaczek.tpi30
2 USING gist (ST_ConvexHull(rast));
```

Data Output | Messages | Notifications

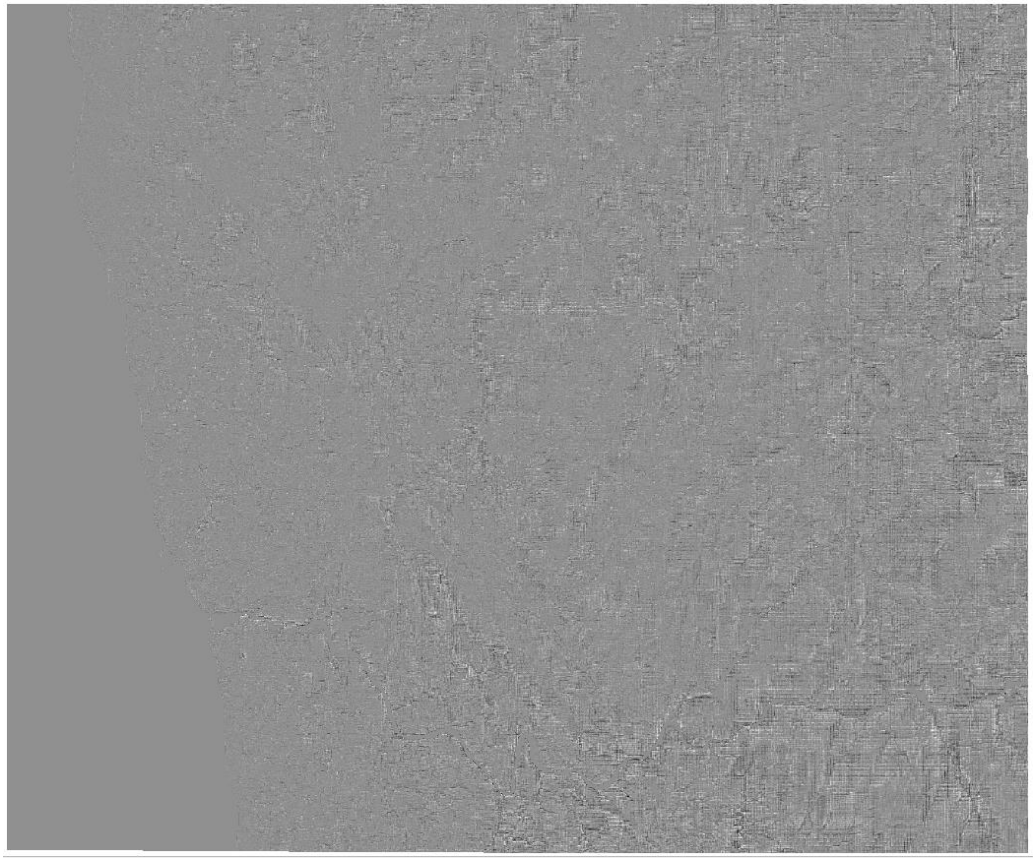
```
CREATE INDEX

Query returned successfully in 140 msec.
```

```
1 SELECT AddRasterConstraints('schema_slowiaczek'::name,
2 'tpi30'::name,'rast'::name);
```

Data Output | Messages | Notifications

SQL

	addrasterconstraints boolean
1	true



Problem do samodzielnego rozwiązania

```
1  -- ograniczony obszar
2  CREATE TABLE schema_slowiaczek.tpi30_porto AS
3  SELECT ST_TPI(a.rast, 1) AS rast
4  FROM rasters.dem AS a, vectors.porto_parishes AS b
5  WHERE ST_Intersects(a.rast, b.geom) AND b.municipality ILIKE 'porto';
```

Data Output | Messages | Notifications

```
SELECT 25

Query returned successfully in 1 secs 666 msec.
```

Widać, że to zapytanie wykonało się po 1,666 sekundy, natomiast do dla całego rastra minutę 29 sekund. Jest to spora różnica.

```sql
CREATE INDEX idx_tpi30_porto_rast_gist ON schema_slowiaczek.tpi30_porto
USING gist (ST_ConvexHull(rast));

SELECT AddRasterConstraints('schema_slowiaczek'::name,
                            'tpi30_porto'::name,
                            'rast'::name);

ALTER TABLE schema_slowiaczek.tpi30_porto
ADD COLUMN rid SERIAL PRIMARY KEY;
```

Data Output | Messages | Notifications

```
ALTER TABLE

Query returned successfully in 66 msec.
```

Dodatkowe porównanie czasów przetwarzania przy pomocy EXPLAIN ANALYZE:

Query | Query History

```sql
EXPLAIN ANALYZE
SELECT ST_TPI(a.rast, 1) AS rast
FROM rasters.dem AS a;
```

Data Output | Messages | Notifications

	QUERY PLAN text
1	Seq Scan on dem a (cost=0.00..162.14 rows=589 width=32) (actual time=69.584..32953.404 rows=589 loops…
2	Planning Time: 0.078 ms
3	Execution Time: 32953.841 ms

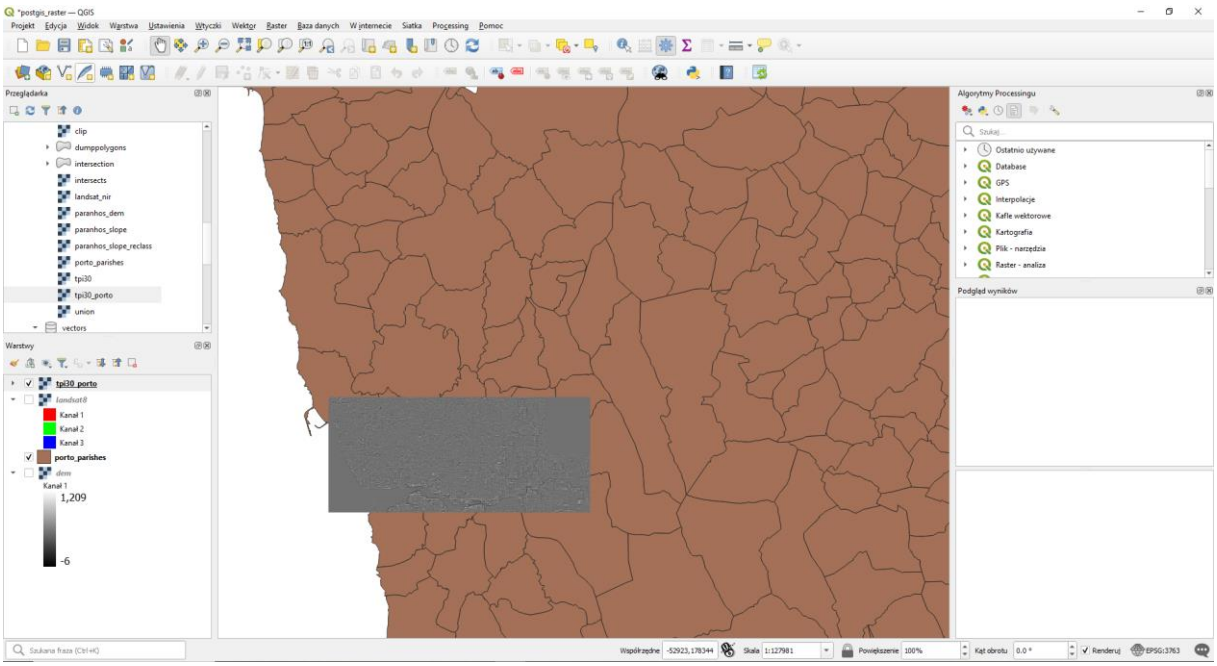
Query | Query History | Scratc

```
1  EXPLAIN ANALYZE
2  SELECT ST_TPI(a.rast, 1) AS rast
3  FROM rasters.dem AS a, vectors.porto_parishes AS b
4  WHERE ST_Intersects(a.rast, b.geom) AND b.municipality ILIKE 'porto';
```

Data Output | Messages | Notifications

	QUERY PLAN text
1	Nested Loop (cost=0.14..205.98 rows=1 width=32) (actual time=55.593..2324.349 rows=25 loops=1)
2	-> Seq Scan on porto_parishes b (cost=0.00..147.04 rows=7 width=8358) (actual time=0.476..0.831 rows=7 loops=1)
3	Filter: ((municipality)::text ~~* 'porto'::text)
4	Rows Removed by Filter: 236
5	-> Index Scan using dem_st_convexhull_idx on dem a (cost=0.14..8.37 rows=1 width=88) (actual time=0.126..0.548 rows=4 loop...
6	Index Cond: ((rast)::geometry && b.geom)
7	Filter: _st_intersects(b.geom, rast, NULL::integer)
8	Rows Removed by Filter: 0
9	Planning Time: 0.256 ms
10	Execution Time: 2324.404 ms

Oraz wynik w Qgis na tle porto_parishes:



Algebra map

Wyrażenie Algebry Map

Query | Query History

```
CREATE TABLE schema_slowiaczek.porto_ndvi AS
WITH r AS (
SELECT a.rid,ST_Clip(a.rast, b.geom,true) AS rast
FROM rasters.landsat8 AS a, vectors.porto_parishes AS b
WHERE b.municipality ilike 'porto' and ST_Intersects(b.geom,a.rast)
)
SELECT
    r.rid,ST_MapAlgebra(
        r.rast, 1,
        r.rast, 4,
        '([rast2.val] - [rast1.val]) / ([rast2.val] + [rast1.val])::float','32BF'
    ) AS rast
FROM r;
```

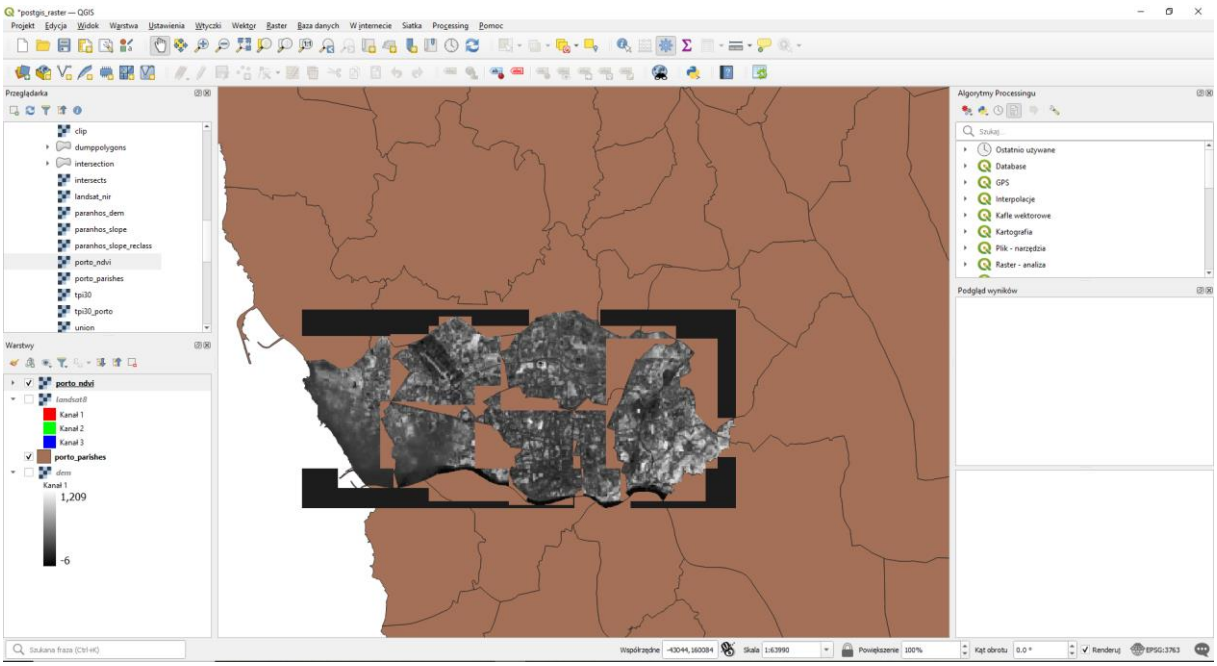
Data Output | Messages | Notifications

```
SELECT 23

Query returned successfully in 259 msec.
```

```
CREATE INDEX idx_porto_ndvi_rast_gist ON schema_slowiaczek.porto_ndvi
USING gist (ST_ConvexHull(rast));

SELECT AddRasterConstraints('schema_slowiaczek'::name,
'porto_ndvi'::name,'rast'::name);
```

Data Output | Messages | Notifications

	addrasterconstraints boolean
1	true



Funkcja zwrotna

Query | Query History

```
create or replace function schema_slowiaczek.ndvi(
    value double precision [] [] [],
    pos integer [][],
    VARIADIC userargs text []
)
RETURNS double precision AS
$$
BEGIN --RAISE NOTICE 'Pixel Value: %', value [1][1][1];-->For debug purposes
    RETURN (value [2][1][1] - value [1][1][1])/(value [2][1][1]+value [1][1][1]);
END;
$$
LANGUAGE 'plpgsql' IMMUTABLE COST 1000;

CREATE TABLE schema_slowiaczek.porto_ndvi2 AS
WITH r AS (
```

Data Output | Messages | Notifications

```
CREATE FUNCTION

Query returned successfully in 85 msec.
```

```
CREATE TABLE schema_slowiaczek.porto_ndvi2 AS
WITH r AS (
    SELECT a.rid,ST_Clip(a.rast, b.geom,true) AS rast
    FROM rasters.landsat8 AS a, vectors.porto_parishes AS b
    WHERE b.municipality ilike 'porto' and ST_Intersects(b.geom,a.rast)
)
SELECT
    r.rid,ST_MapAlgebra(
        r.rast, ARRAY[1,4],
        'schema_slowiaczek.ndvi(double precision[], integer[],text[])'::regproce
        '32BF'::text
    ) AS rast
FROM r;
```

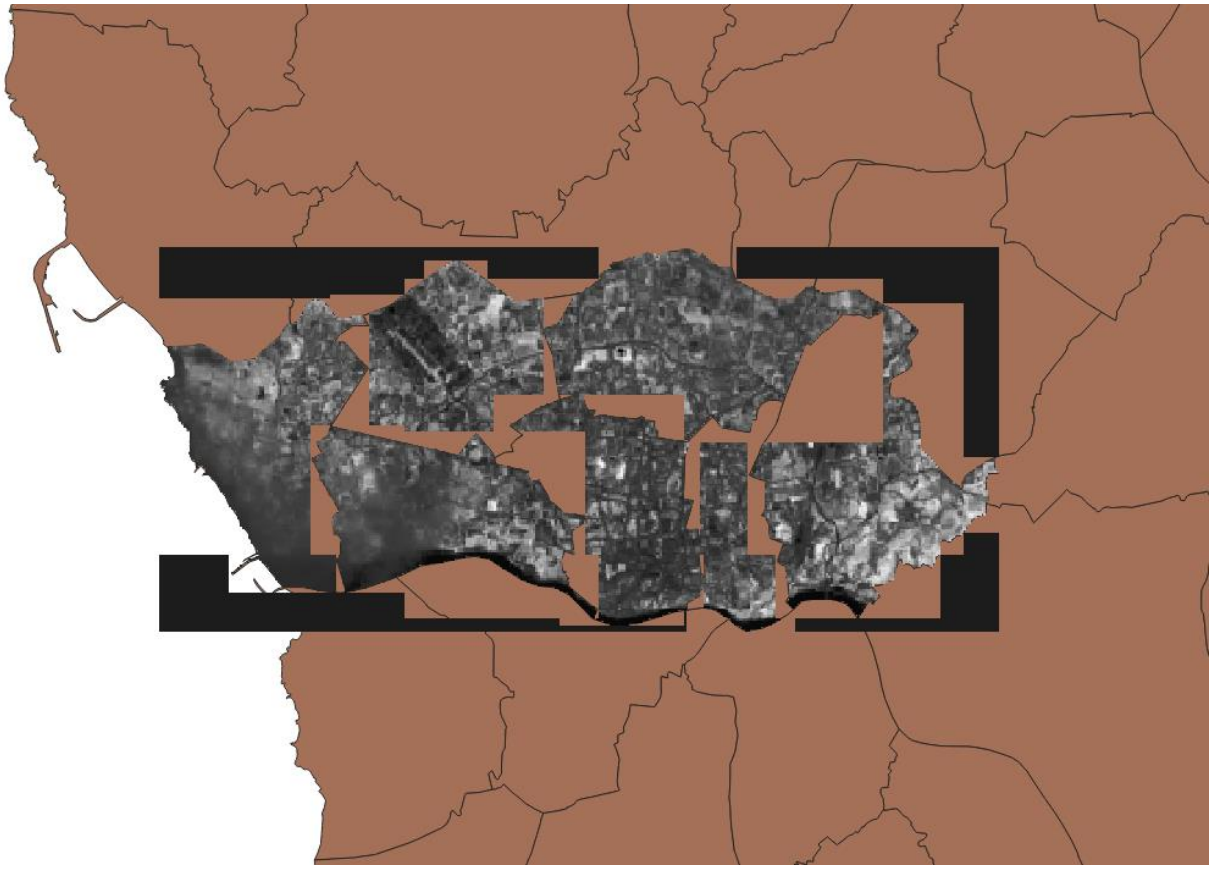
Data Output | Messages | Notifications

```
SELECT 23

Query returned successfully in 154 msec.
```

```
28 CREATE INDEX idx_porto_ndvi2_rast_gist ON schema_slowiaczek.porto_ndvi2
29 USING gist (ST_ConvexHull(rast));
30
31 SELECT AddRasterConstraints('schema_slowiaczek'::name,
32 'porto_ndvi2'::name,'rast'::name);
```

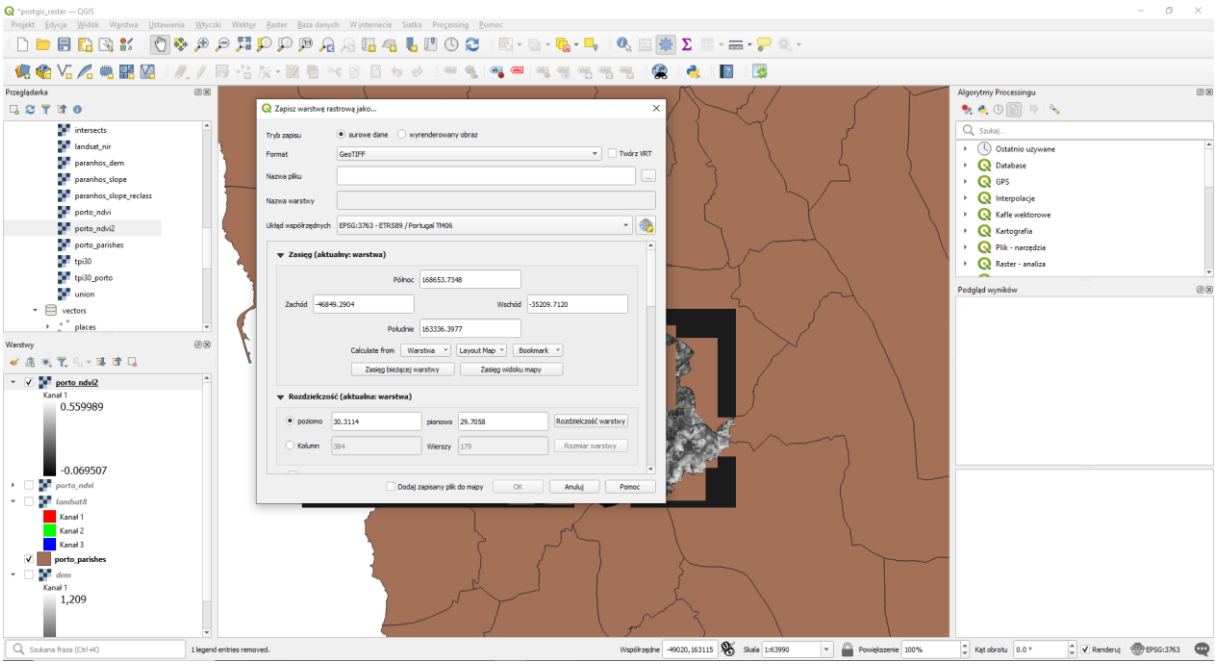
Data Output | Messages | Notifications

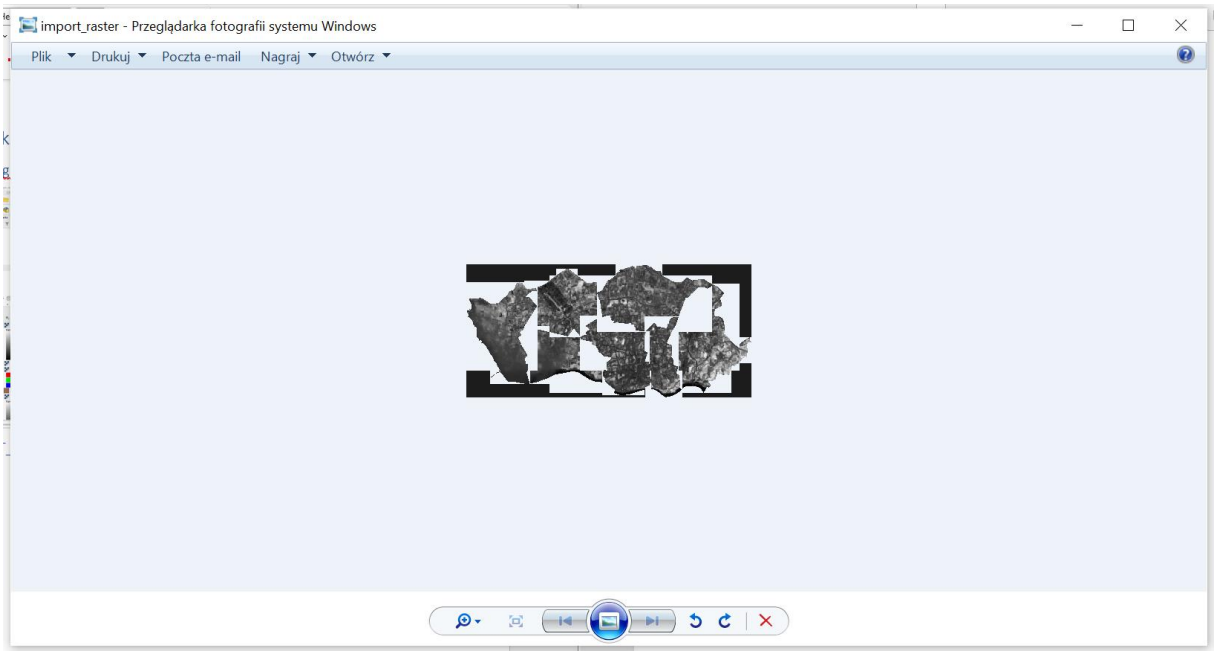
	addrasterconstraints boolean
1	true



Eksport danych

Qgis





ST_AsTiff

Query | Query History

```
1 SELECT ST_AsTiff(ST_Union(rast))
2 FROM schema_slowiaczek.porto_ndvi;
```

Data Output | Messages | Notifications

	st_astiff bytea
1	[binary data]

ST_AsGDALRaster

Query | Query History

```
1 SELECT ST_AsGDALRaster(ST_Union(rast), 'GTiff',  ARRAY['COMPRESS=DEFLATE',
2 'PREDICTOR=2', 'PZLEVEL=9'])
3 FROM schema_slowiaczek.porto_ndvi;
```

Data Output | Messages | Notifications

	st_asgdalraster bytea
1	[binary data]

```
5 SELECT ST_GDALDrivers();
```

Data Output | Messages | Notifications

	st_gdaldrivers record
1	0,GTiff,GeoTIFF,t,t,<CreationOptionList> <Option name='COMPRESS' type='string-select'> <Value>NONE</Value> <Value>LZW</Value> <Value>PACKBITS</V
2	1,AAIGrid,Arc/Info ASCII Grid,t,t,<CreationOptionList>
3	2,DTED,DTED Elevation Raster,t,t,
4	3,PNG,Portable Network Graphics,t,t,<CreationOptionList>
5	4,JPEG,JPEG JFIF,t,t,<CreationOptionList>
6	5,GIF,Graphics Interchange Format (.gif),t,t,<CreationOptionList>
7	6,USGSDEM,USGS Optional ASCII DEM (and CDED),t,t,<CreationOptionList> <Option name='PRODUCT' type='string-select' description='Specific Product Type'> <Val
8	7,XYZ,ASCII Gridded XYZ,t,t,<CreationOptionList> <Option name='COLUMN_SEPARATOR' type='string' default=' ' description='Separator between fields.'/> <Option nam

Zapisywanie danych na dysku za pomocą dużego obiektu

Query | Query History

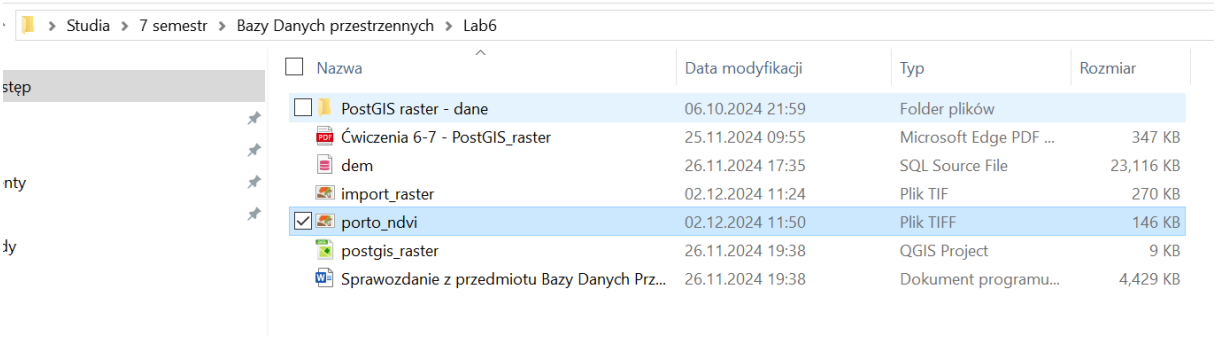
```
1  CREATE TABLE tmp_out AS
2  SELECT lo_from_bytea(0,
3  ST_AsGDALRaster(ST_Union(rast), 'GTiff',  ARRAY['COMPRESS=DEFLATE',
4  'PREDICTOR=2', 'PZLEVEL=9'])
5  ) AS loid
6  FROM schema_slowiaczek.porto_ndvi; ----------------------------------------------
7  SELECT lo_export(loid, 'C:\Users\Lenovo\Desktop\Studia\7 semestr\Bazy Danych przestrzennych\Lab6\
8  -- where the user postgres have access. In windows a flash drive usualy works fine.
9  FROM tmp_out; ----------------------------------------------
10 SELECT lo_unlink(loid)
11 FROM tmp_out; --> Delete the large object.
```

Data Output | Messages | Notifications

```
SELECT 1

Query returned successfully in 88 msec.
```

Użycie Gdal

```
C:\Program Files\QGIS 3.24.1>gdal_translate -co COMPRESS=DEFLATE -co PREDICTOR=2 -co ZLEVEL=9 PG:"host=localhost port=54
32 dbname=bdp_cw67 user=postgres password=[redacted] schema=schema_slowiaczek table=porto_ndvi mode=2" "C:\Users\Lenovo\Deskto
p\Studia\7 semestr\Bazy Danych przestrzennych\Lab6\porto_ndvi.tiff"
Input file size is 384, 179
0...10...20...30...40...50...60...70...80...90...100 - done.

C:\Program Files\QGIS 3.24.1>
```



MapServer

0. Instalacja dockera
1. Clone git repo

```
C:\Users\Lenovo\Desktop\Studia\7 semestr\Bazy Danych przestrzennych\Lab6>git clone https://github.com/kartoza/docker-map
server
Cloning into 'docker-mapserver'...
remote: Enumerating objects: 231, done.
remote: Counting objects: 100% (35/35), done.
remote: Compressing objects: 100% (7/7), done.
remote: Total 231 (delta 28), reused 28 (delta 28), pack-reused 196 (from 1)Receiving objects:  72% (167/231), 39.92 MiB
Receiving objects:  84% (195/231), 39.92 MiB | 666.00 KiB/s
Receiving objects: 100% (231/231), 39.95 MiB | 707.00 KiB/s, done.
Resolving deltas: 100% (104/104), done.

C:\Users\Lenovo\Desktop\Studia\7 semestr\Bazy Danych przestrzennych\Lab6>
```

2. cd do docker-mapserver i zbuduj obraz dockerowy (to trochę zajmie)

```
C:\Users\Lenovo\Desktop\Studia\7 semestr\Bazy Danych przestrzennych\Lab6\docker-mapserver>docker build -t kartoza/mapser
ver_kartoza .
[+] Building 912.3s (28/28) FINISHED                                                                  docker:desktop-linux
 => [internal] load build definition from Dockerfile                                                                  0.0s
 => => transferring dockerfile: 3.51kB                                                                                0.0s
 => WARN: MaintainerDeprecated: Maintainer instruction is deprecated in favor of using label (line 4)                 0.0s
 => [internal] load metadata for docker.io/library/ubuntu:focal                                                       1.1s
 => [auth] library/ubuntu:pull token for registry-1.docker.io                                                         0.0s
 => [internal] load .dockerignore                                                                                     0.0s
 => => transferring context: 2B                                                                                       0.0s
 => [internal] load build context                                                                                     0.0s
 => => transferring context: 2.57kB                                                                                   0.0s
 => [ 1/22] FROM docker.io/library/ubuntu:focal@sha256:8e5c4f0285ecbb4ead070431d29b576a530d3166df73ec44affc1cd275     0.0s
 => => resolve docker.io/library/ubuntu:focal@sha256:8e5c4f0285ecbb4ead070431d29b576a530d3166df73ec44affc1cd27555     0.0s
 => CACHED [ 2/22] RUN apt-get -qq update --fix-missing && apt-get -qq --yes upgrade                                  0.0s
 => CACHED [ 3/22] RUN DEBIAN_FRONTEND=noninteractive apt-get install -y software-properties-common g++ make cmak     0.0s
 => CACHED [ 4/22] RUN apt-get install -y --fix-missing --no-install-recommends     libxml2-dev     libxslt1-dev      0.0s
 => CACHED [ 5/22] RUN apt-get install -y libgdal-dev                                                                 0.0s
 => CACHED [ 6/22] RUN  apt-get install -y php7.4-fpm libapache2-mod-php7.4 php7.4-common php7.4-cli  php7.4 php7     0.0s
 => CACHED [ 7/22] ADD resources /tmp/resources                                                                       0.0s
 => [ 8/22] ADD setup.sh /setup.sh                                                                                    0.0s
 => [ 9/22] RUN chmod 0755 /setup.sh                                                                                  0.3s
 => [10/22] RUN /setup.sh                                                                                           780.3s
 => [11/22] RUN cp  /tmp/resources/000-default.conf /etc/apache2/sites-available/                                     0.5s
 => [12/22] RUN wget http://mirrors.kernel.org/ubuntu/pool/multiverse/liba/libapache-mod-fastcgi/libapache2-mod-f     3.8s
 => [13/22] RUN cp /tmp/resources/php7-fpm.conf /etc/apache2/conf-available/                                          0.5s
```

3. stwórz kontener (port 8182 to port pod którym będzie można połączyć się z kontenerem z poziomu komputera) to z -v to jest wolumen z przykładowymi danymi od kartozy czyli katalog map z pobranego repo (opis na githubie, można sobie potestować)

```
C:\Users\Lenovo\Desktop\Studia\7 semestr\Bazy Danych przestrzennych\Lab6\docker-mapserver>docker run -d -p 8182:80 --nam
e mapserver2 -v "C:/Users/Lenovo/Desktop/Studia/7 semestr/Bazy Danych przestrzennych/Lab6/docker-mapserver/map:/map" kar
toza/mapserver_kartoza
441a94a014685b77d45837383c391b04e54dd53a565ad6c824db93394d760243
```

4. wejdź do kontenera

```
C:\Users\Lenovo\Desktop\Studia\7 semestr\Bazy Danych przestrzennych\Lab6\docker-mapserver>docker exec -it mapserver2 /bi
n/bash
root@441a94a01468:/#
```

5. sprawdź połączenie z bazą danych - tutaj zmień odpowiednio hosta, usera i hasło w jdbc stringu

```
root@441a94a01468:/# apt-get install -y postgresql-client
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following package was automatically installed and is no longer required:
  libjpeg62
Use 'apt autoremove' to remove it.
The following additional packages will be installed:
  postgresql-client-12 postgresql-client-common
```

```
root@441a94a01468:/# psql postgresql://postgres:postgres@host.docker.internal/bdp_cw67
psql: error: KATASTROFALNY:  autoryzacja has□em nie powiod□a si□ dla u□ytkownika "postgres"
root@441a94a01468:/# psql postgresql://postgres:root@host.docker.internal/bdp_cw67
psql (12.20 (Ubuntu 12.20-0ubuntu0.20.04.1), server 17.0)
WARNING: psql major version 12, server major version 17.
         Some psql features might not work.
Type "help" for help.

bdp_cw67=#
```

6. zainstaluj edytor

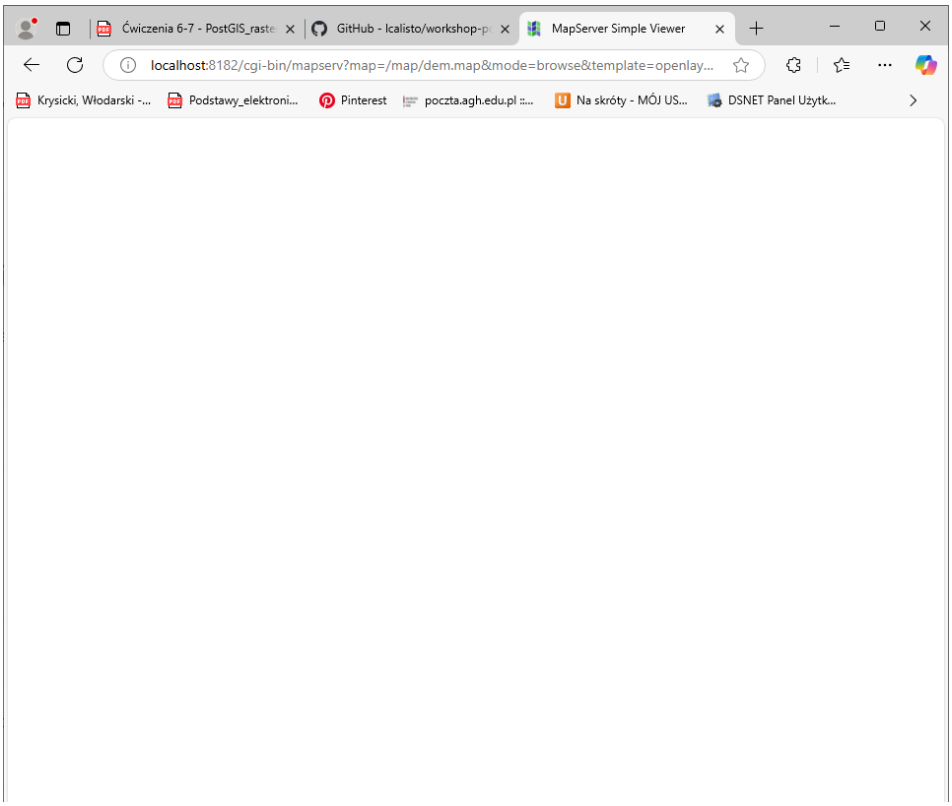
```
root@441a94a01468:/# apt-get install vim
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following package was automatically installed and is no longer required:
  libjpeg62
Use 'apt autoremove' to remove it.
The following additional packages will be installed:
  alsa-topology-conf alsa-ucm-conf libasound2 libasound2-data libcanberra0 libgpm2 libogg0 libtdb1 libvorbis0a
  libvorbisfile3 sound-theme-freedesktop vim-common vim-runtime xxd
```

7. Stwórz mapfile

```
MAP
 NAME 'map'
 SIZE 800 650
 STATUS ON
 EXTENT -58968 145487 30916 206234
 UNITS METERS

 WEB
  METADATA
   'wms_title' 'Terrain wms'
   'wms_srs' 'EPSG:3763 EPSG:4326 EPSG:3857'
   'wms_enable_request' '*'
   'wms_onlineresource'
'http://54.37.13.53/mapservices/srtm'
  END
 END

 PROJECTION
  'init=epsg:3763'
 END

 LAYER
  NAME srtm
  TYPE raster
  STATUS OFF
  DATA "PG:host='host.docker.internal' port=5432 dbname='bdp_cw67' user='postgres' password='root' schema='rasters' table='dem' mode='2'"
  PROCESSING "NODATA=-32767"
  OFFSITE 0 0 0
  METADATA
   'wms_title' 'srtm'
  END
 END
END
~
```

8. Gotowe!

Niestety, wszystko zrobiłam jak w tutorialu, połączenie z bazą danych jest, ale na stronie nic nie wyskakuje…


Ćwiczenia 6-7 - PostGIS_raste
GitHub - lcalisto/workshop-p
MapServer Simple Viewer
localhost:8182/cgi-bin/mapserv?map=/map/dem.map&mode=browse&template=openlay...
Krysicki, Włodarski -...
Podstawy_elektroni...
Pinterest
poczta.agh.edu.pl :...
Na skróty - MÓJ US...
DSNET Panel Użytk...