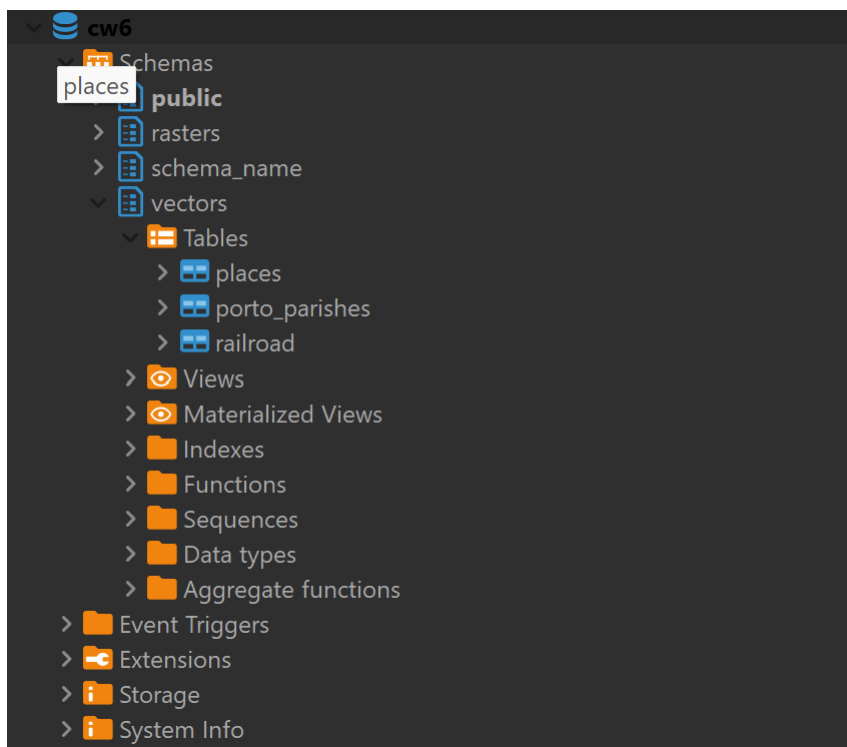
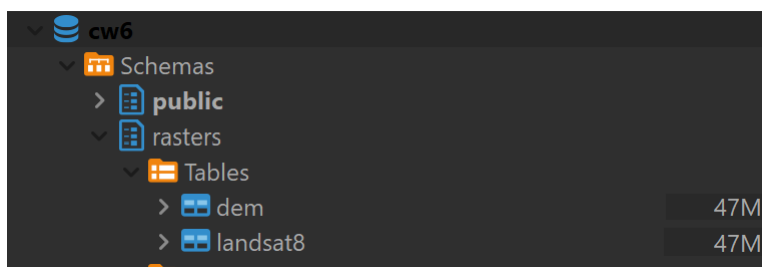


Baza danych

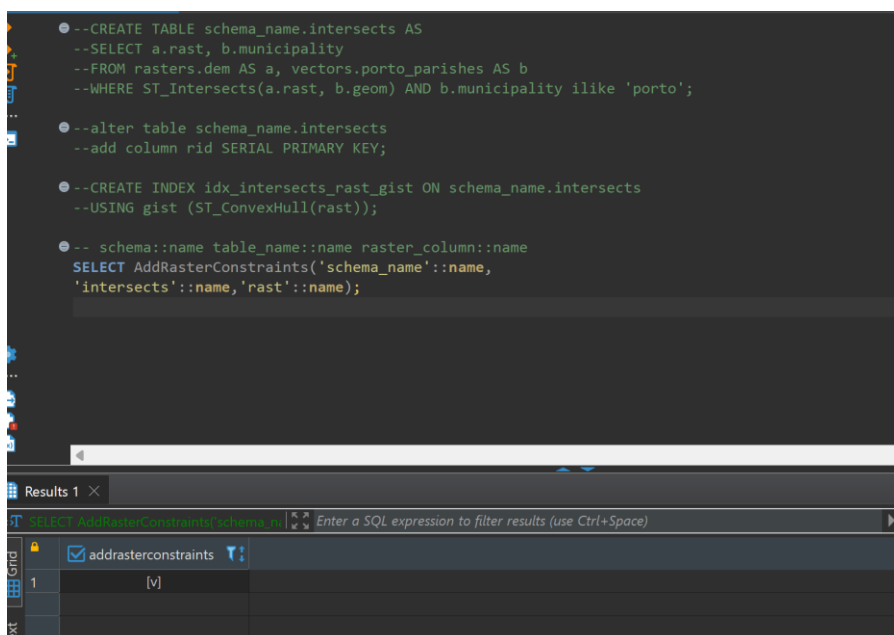


Wczytanie rastrów

```
PS C:\Users\THINK\Desktop> C:/Program Files/PostgreSQL/14/bin/raster2pgsql.exe -s 3763 -N -32767 -t 100x100 -I -C -M -d Landsat8_L1TP_RGBN.tif rasters.dem | C:/Program Files/PostgreSQL/14/bin/psql -d cw6 -h localhost -U postgres -p 5432
```



Przykład 1



Przykład 2

The screenshot shows a QGIS console window with a dark theme. The top panel displays a SQL query:

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

Below the query, the text "...." indicates the query is running. The bottom panel, titled "Statistics 1", shows the execution results:

Name	Value
Updated Rows	29
Query	CREATE TABLE schema_name.clip AS SELECT ST_Clip(a.rast, b.geom, true), b.municipality FROM rasters.dem AS a, vectors.porto_parishes AS b WHERE ST_Intersects(a.rast, b.geom) AND b.municipality like 'PORTO'
Finish time	Fri Dec 02 21:23:55 CET 2022

Przykład 3

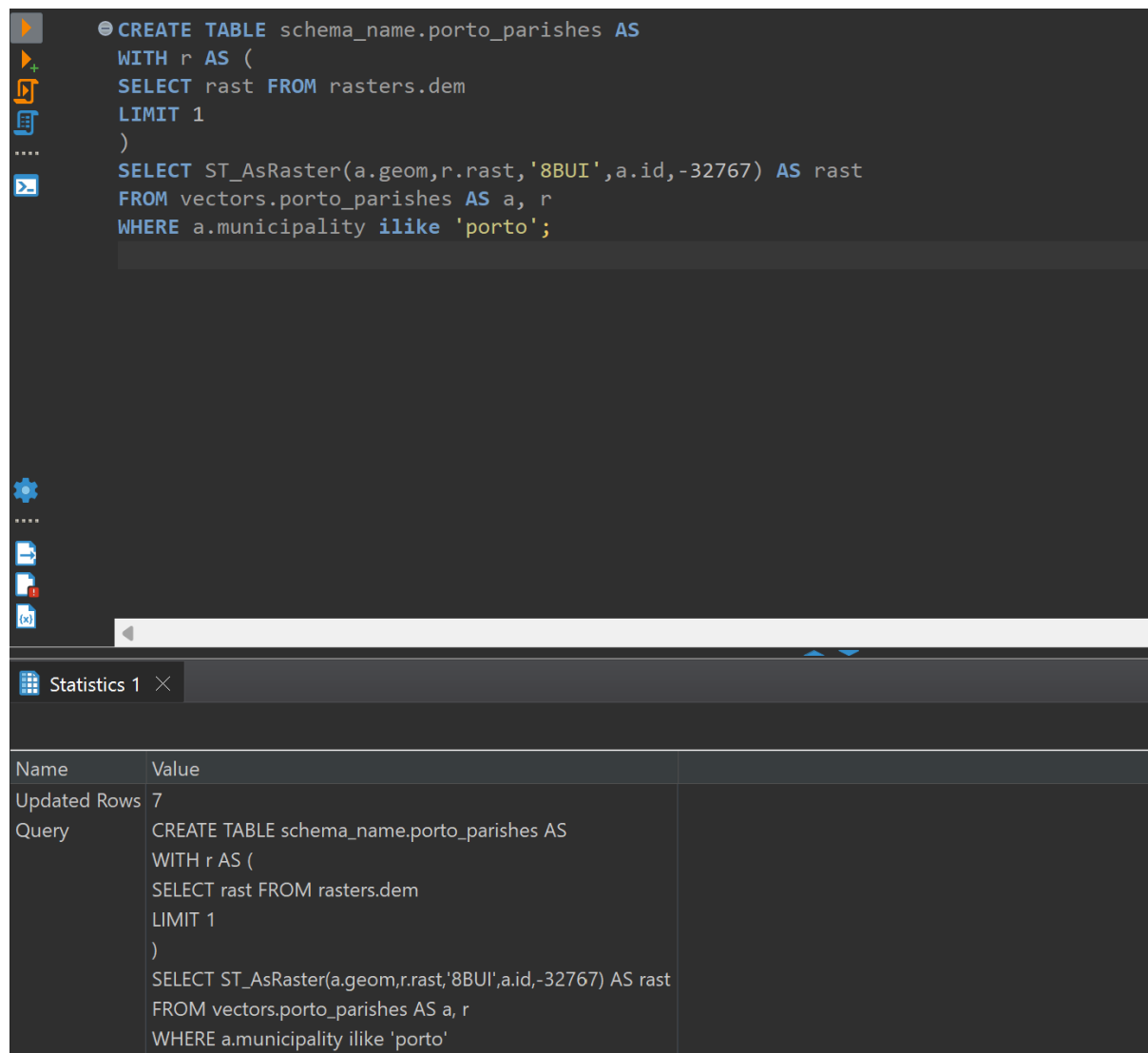
```
● CREATE TABLE schema_name.union AS
SELECT ST_Union(ST_Clip(a.rast, b.geom, true))
FROM rasters.dem AS a, vectors.porto_parishes AS b
WHERE b.municipality ilike 'porto' and ST_Intersects(b.geom,a.rast);
....
>
```

Statistics 1 X

Name	Value
Updated Rows	1
Query	CREATE TABLE schema_name.union AS SELECT ST_Union(ST_Clip(a.rast, b.geom, true)) FROM rasters.dem AS a, vectors.porto_parishes AS b WHERE b.municipality ilike 'porto' and ST_Intersects(b.geom,a.rast)
Finish time	Fri Dec 02 21:24:53 CET 2022

Tworzenie rastrów z wektorów

Przykład 1



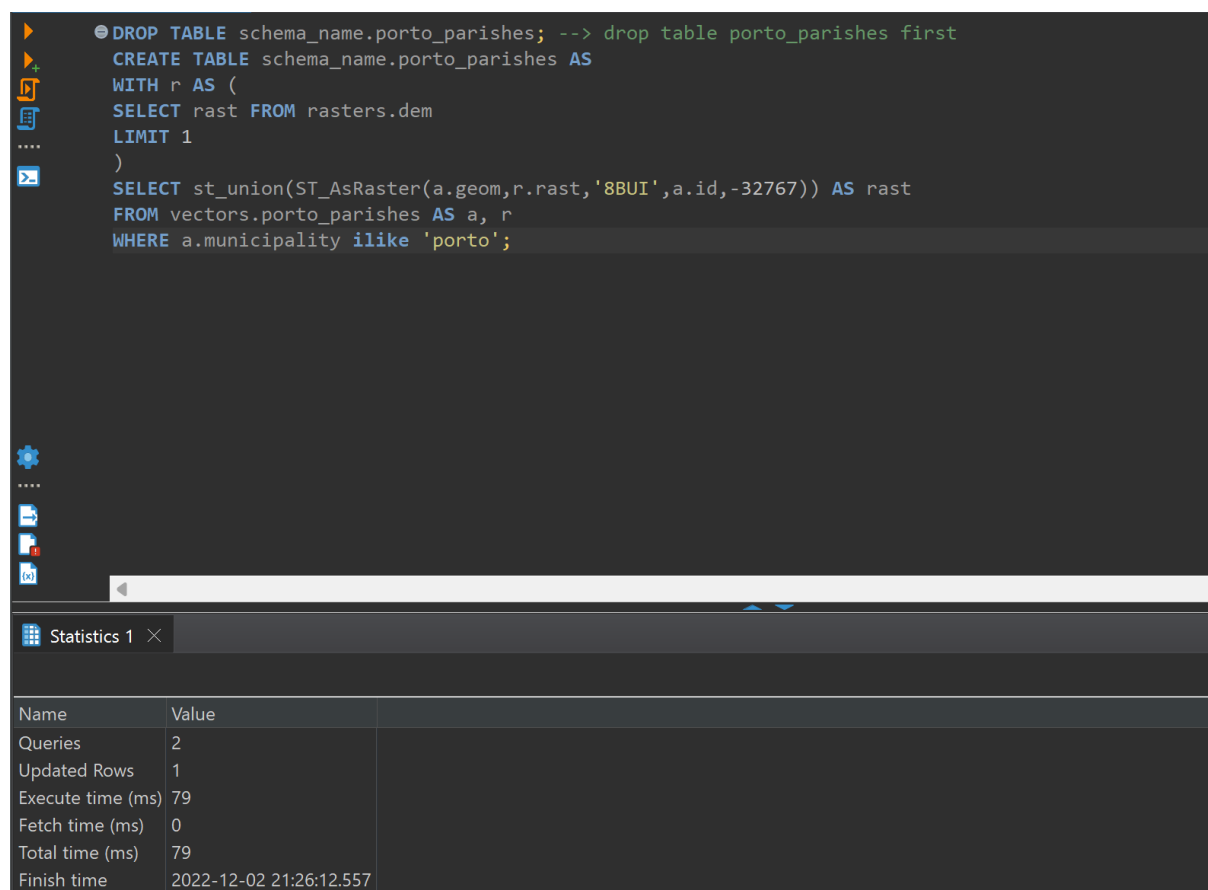
The screenshot shows a SQL editor interface with a query that creates a table named `schema_name.porto_parishes` and populates it with raster data. The query uses a Common Table Expression (CTE) to select a single raster from `rasters.dem` and then uses `ST_AsRaster` to convert the vector data from `vectors.porto_parishes` into a raster format, storing it in the `porto_parishes` table.

```
CREATE TABLE schema_name.porto_parishes AS
WITH r AS (
SELECT rast FROM rasters.dem
LIMIT 1
)
SELECT ST_AsRaster(a.geom,r.rast,'8BUI',a.id,-32767) AS rast
FROM vectors.porto_parishes AS a, r
WHERE a.municipality ilike 'porto';
```

Below the query editor, a "Statistics 1" panel is visible, showing the following information:

Name	Value
Updated Rows	7
Query	CREATE TABLE schema_name.porto_parishes AS WITH r AS (SELECT rast FROM rasters.dem LIMIT 1) SELECT ST_AsRaster(a.geom,r.rast,'8BUI',a.id,-32767) AS rast FROM vectors.porto_parishes AS a, r WHERE a.municipality ilike 'porto'

Przykład 2

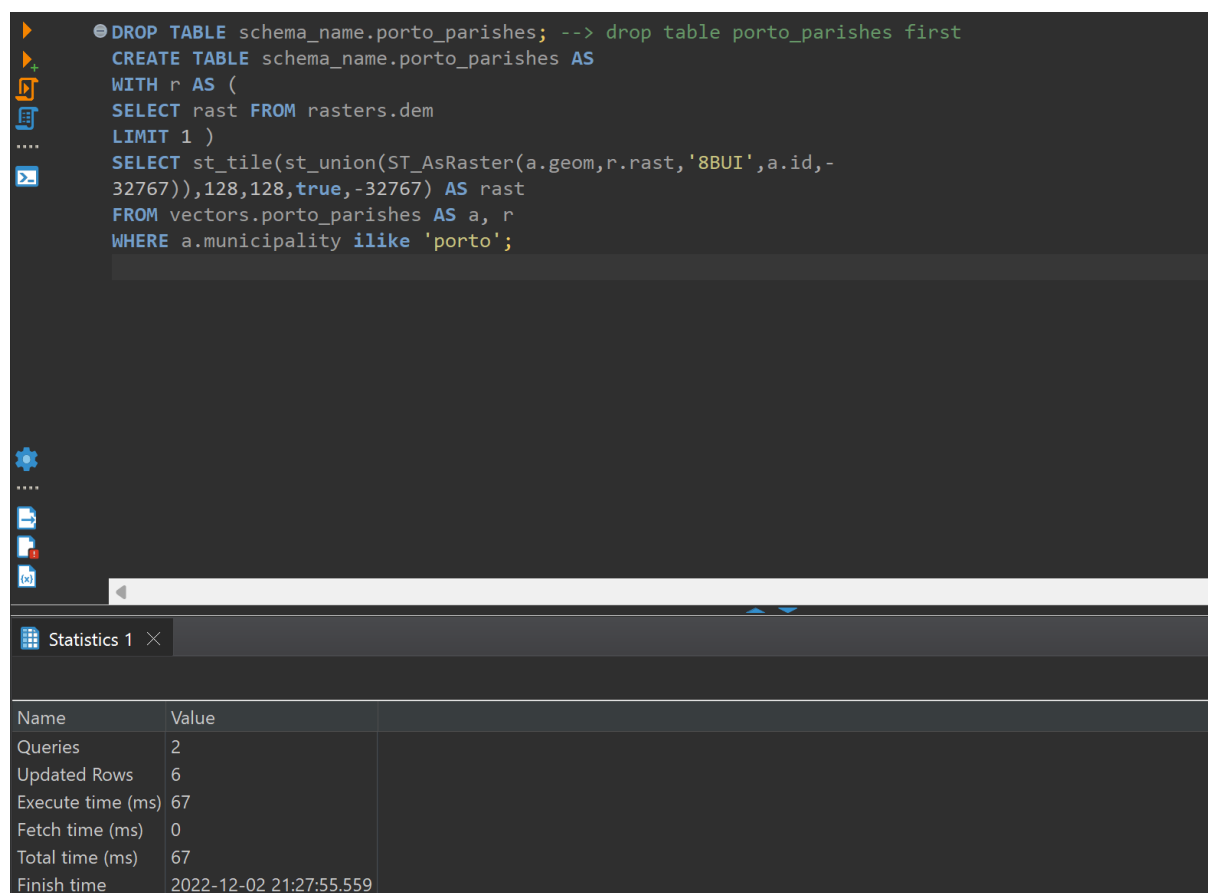


```
● DROP TABLE schema_name.porto_parishes; --> drop table porto_parishes first
CREATE TABLE schema_name.porto_parishes AS
WITH r AS (
SELECT rast FROM rasters.dem
LIMIT 1
)
SELECT st_union(ST_AsRaster(a.geom,r.rast,'8BUI',a.id,-32767)) AS rast
FROM vectors.porto_parishes AS a, r
WHERE a.municipality ilike 'porto';
```

Statistics 1

Name	Value
Queries	2
Updated Rows	1
Execute time (ms)	79
Fetch time (ms)	0
Total time (ms)	79
Finish time	2022-12-02 21:26:12.557

Przykład 3



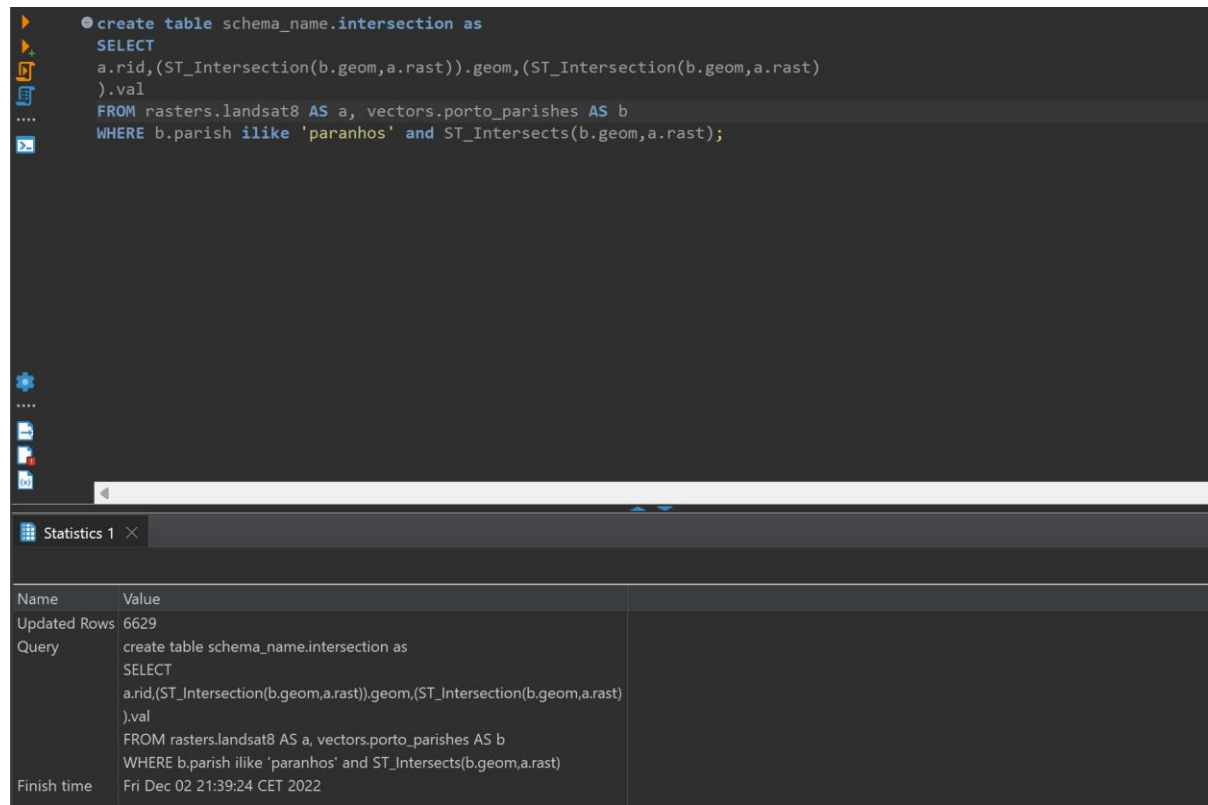
```
● DROP TABLE schema_name.porto_parishes; --> drop table porto_parishes first
CREATE TABLE schema_name.porto_parishes AS
WITH r AS (
SELECT rast FROM rasters.dem
LIMIT 1 )
SELECT st_tile(st_union(ST_AsRaster(a.geom,r.rast,'8BUI',a.id,-
32767)),128,128,true,-32767) AS rast
FROM vectors.porto_parishes AS a, r
WHERE a.municipality ilike 'porto';
```

Statistics 1

Name	Value
Queries	2
Updated Rows	6
Execute time (ms)	67
Fetch time (ms)	0
Total time (ms)	67
Finish time	2022-12-02 21:27:55.559

Konwertowanie rastrow na wektory

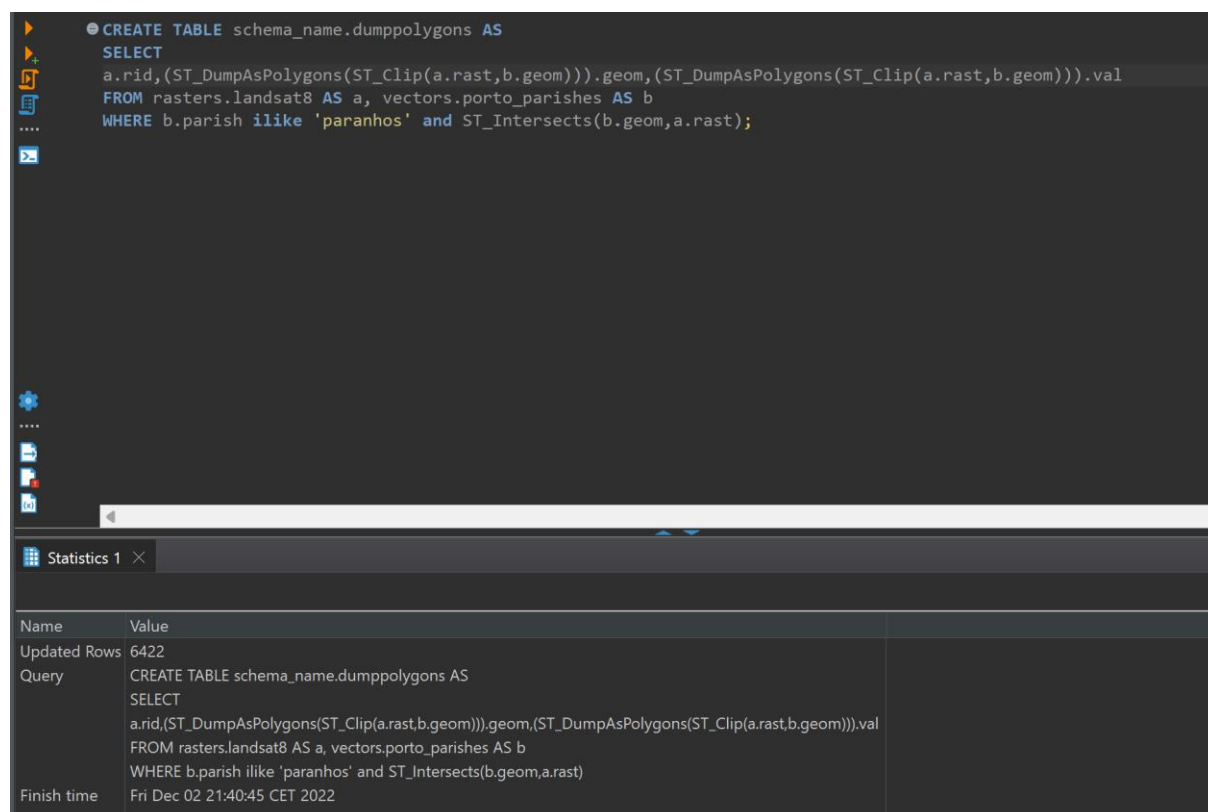
Przyklad 1



```
create table schema_name.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);
```

Name	Value
Updated Rows	6629
Query	create table schema_name.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)
Finish time	Fri Dec 02 21:39:24 CET 2022

Przyklad 2



```
CREATE TABLE schema_name.dumppolygons AS
SELECT
a.rid,(ST_DumpAsPolygons(ST_Clip(a.rast,b.geom))).geom,(ST_DumpAsPolygons(ST_Clip(a.rast,b.geom))).val
FROM rasters.landsat8 AS a, vectors.porto_parishes AS b
WHERE b.parish ilike 'paranhos' and ST_Intersects(b.geom,a.rast);
```

Name	Value
Updated Rows	6422
Query	CREATE TABLE schema_name.dumppolygons AS SELECT a.rid,(ST_DumpAsPolygons(ST_Clip(a.rast,b.geom))).geom,(ST_DumpAsPolygons(ST_Clip(a.rast,b.geom))).val FROM rasters.landsat8 AS a, vectors.porto_parishes AS b WHERE b.parish ilike 'paranhos' and ST_Intersects(b.geom,a.rast)
Finish time	Fri Dec 02 21:40:45 CET 2022

Analiza rastrów

Przykłady 1 - 5

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

--CREATE TABLE schema_name.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);

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

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

SELECT st_summarystats(a.rast) AS stats
FROM schema_name.paranhos_dem AS a;
```

Results 1

Enter a SQL expression to filter results (use Ctrl+Space)

	stats						
	123 count	123 sum	123 mean	123 stddev	123 min	123 max	
1	201	2,125,431	10,574.2835820896	1,300.4928741062	8,259	16,320	
2	727	7,509,266	10,329.1141678129	1,343.3366982639	7,228	14,861	
3	2,395	26,501,357	11,065.2847599165	1,321.4788511304	7,997	19,919	
4	337	3,427,187	10,169.6943620178	1,584.0295979304	6,834	16,529	
5	4,267	45,261,151	10,607.2535739395	1,283.6466423885	7,074	18,620	
6	34	355,473	10,455.0882352941	701.3987440086	9,278	12,098	

Przykład 6

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

Results 1

Enter a SQL expression to filter results (use Ctrl+Space)

	st_summarystats						
	123 count	123 sum	123 mean	123 stddev	123 min	123 max	
1	7,961	85,179,865	10,699.6438889587	1,339.4848543728	6,834	19,919	

Przykład 7

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

Results 1

	123 min	123 max	123 mean
1	6,834	19,919	10,699.6438889587

Przykład 8

```
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;
```

porto_parishes 1

	ABC parish	123 min	123 max	123 mean
1	Bonfim	6,369	21,361	10,416.2133100843
2	Campanhã	6,319	24,149	9,777.0685989257
3	Paranhos	6,834	19,919	10,699.6438889587
4	Ramalde	6,826	31,920	10,744.4076019777
5	União das freguesias de Aldoar, Foz do Douro e Nevogilde	7,347	22,829	13,971.5903077366
6	União das freguesias de Cedofeita, Santo Ildefonso, Sé, Miragaia, São Nicolau e Vitória	6,486	21,438	10,833.142004971
7	União das freguesias de Lordelo do Ouro e Massarelos	6,477	22,358	12,187.9001612903

Przykład 10

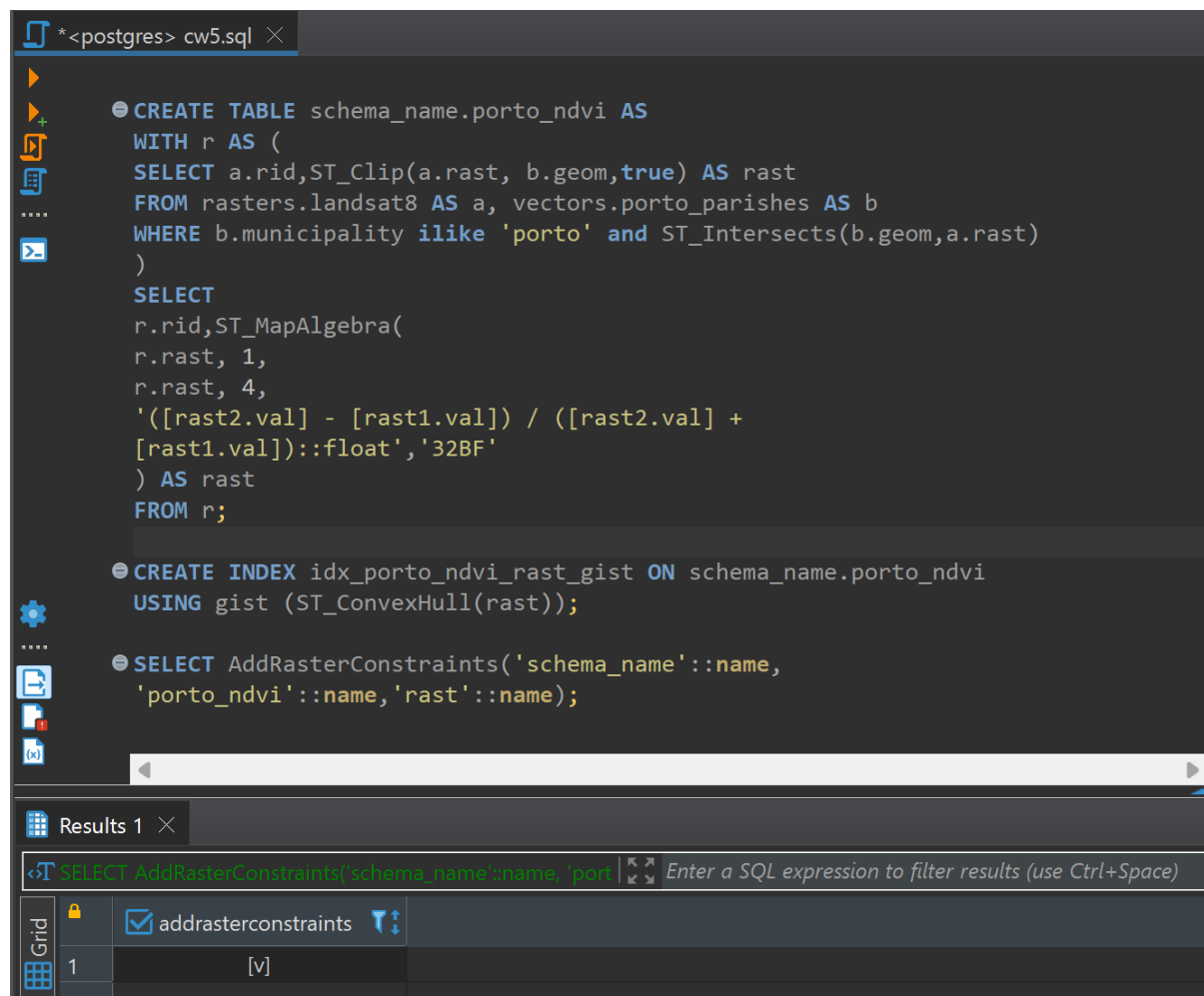
```
SELECT AddRasterConstraints('schema_name'::name,  
  'tpi30'::name,'rast'::name);
```

Results 1

	addrasterconstraints
1	[v]

Algebra map

Przykład 1



The screenshot shows a PostgreSQL SQL editor with a query window titled '*<postgres> cw5.sql'. The query contains three statements:

```
CREATE TABLE schema_name.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;

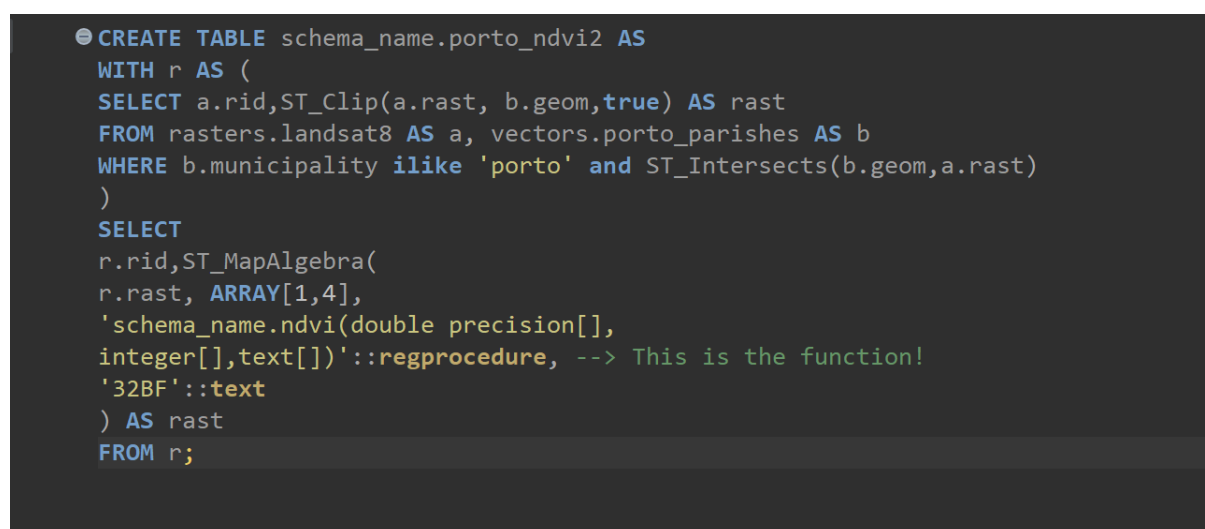
CREATE INDEX idx_porto_ndvi_rast_gist ON schema_name.porto_ndvi
USING gist (ST_ConvexHull(rast));

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

Below the query window, the 'Results 1' tab is active, showing a table with one row and one column:

Grid	addrasterconstraints
1	[v]

Przykład 2



The screenshot shows a PostgreSQL SQL editor with a query window titled '*<postgres> cw5.sql'. The query contains two statements:

```
CREATE TABLE schema_name.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_name.ndvi(double precision[],
integer[],text[])::regprocedure, --> This is the function!
'32BF'::text
  ) AS rast
FROM r;
```


Eksport danych

The screenshot shows the QGIS SQL console with the following query:

```
SELECT ST_AsTiff(ST_Union(rast))
FROM schema_name.porto_ndvi;
```

Below the query, the results are displayed in a table:

Grid	1	st_astiff	11*	3 ... [275539]
1	11*	3 ... [275539]		

The screenshot shows the QGIS SQL console with the following query:

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

Below the query, the results are displayed in a table:

Grid	1	st_asgdalraster	11*	3 ... [148838]
1	11*	3 ... [148838]		

The screenshot shows the QGIS SQL console with the following queries:

```
CREATE TABLE tmp_out AS
SELECT lo_from_bytea(0,
ST_AsGDALRaster(ST_Union(rast), 'GTiff', ARRAY['COMPRESS=DEFLATE',
'PREDICTOR=2', 'PZLEVEL=9'])
) AS loid
FROM schema_name.porto_ndvi;

SELECT lo_export(lo_id, 'G:\myraster.tiff') --> Save the file in a place
where the user postgres have access. In windows a flash drive usually works
fine.
FROM tmp_out;

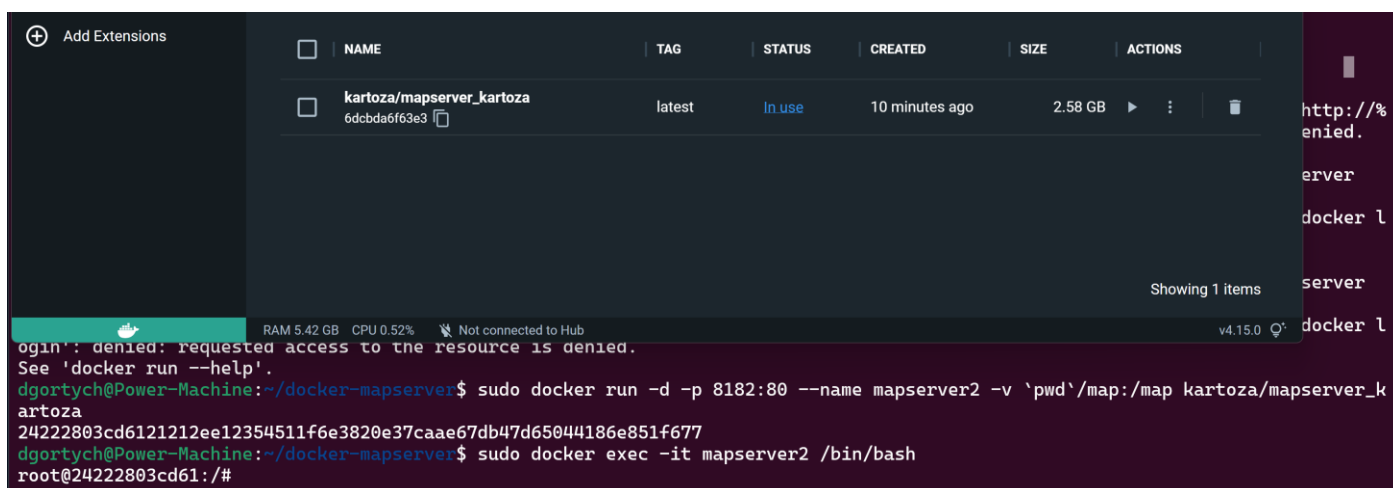
SELECT lo_unlink(lo_id)
FROM tmp_out;
```

Below the queries, the results are displayed in a table:

Grid	1	lo_unlink	1	1
1	1	1		

MapServer i Docker

Stworzenie kontenera



The screenshot shows the Docker Desktop interface. On the left, there's a sidebar with 'Add Extensions'. The main area displays a table of containers:

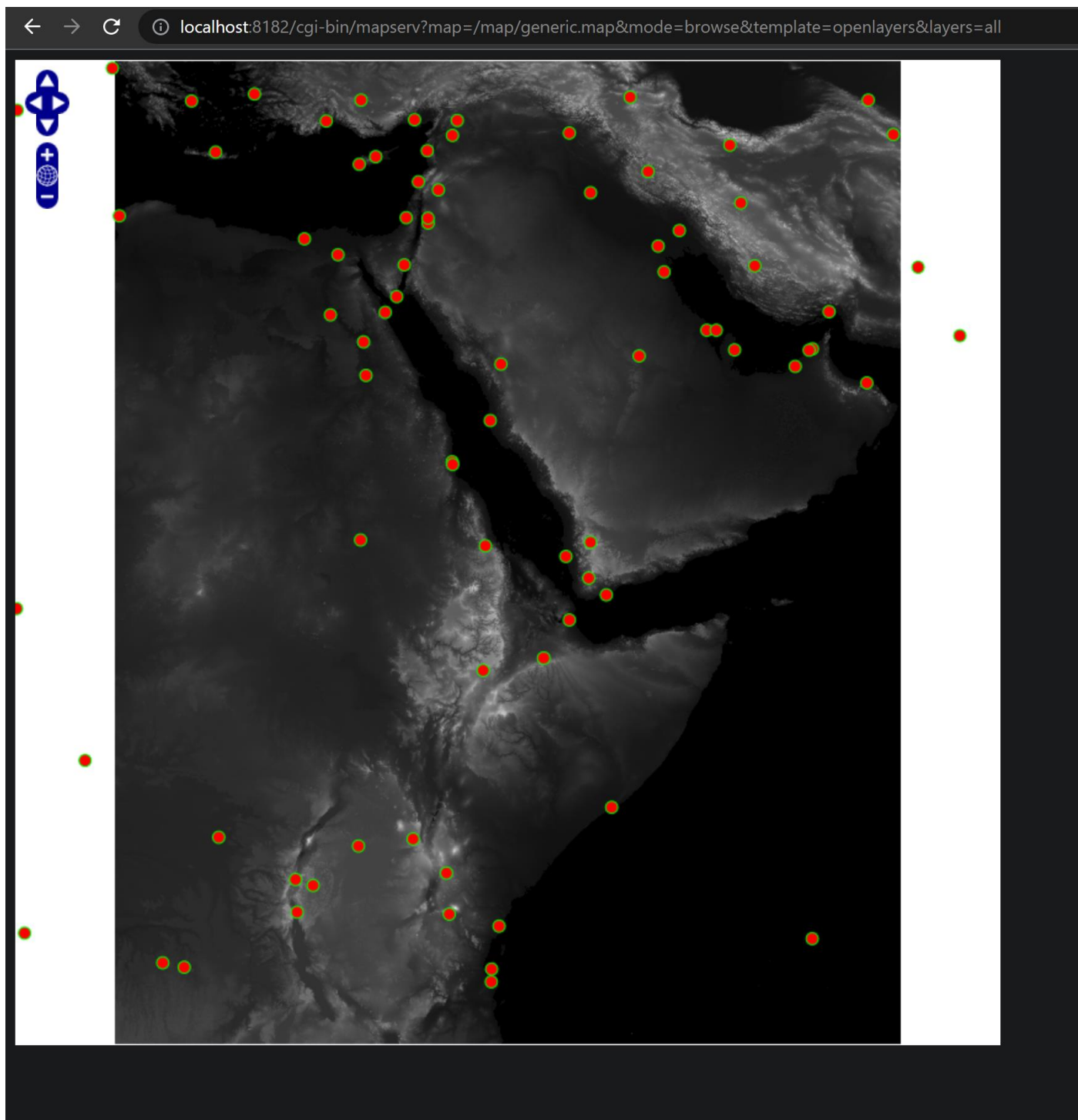
NAME	TAG	STATUS	CREATED	SIZE	ACTIONS
kartoza/mapserver_kartoza 6dcbda6f63e3	latest	In use	10 minutes ago	2.58 GB	[Play] [More] [Stop]

Below the table, it says 'Showing 1 items'. At the bottom, there's a terminal window with the following text:

```
ogin': denied: requested access to the resource is denied.  
See 'docker run --help'.  
dgortych@Power-Machine:~/docker-mapserver$ sudo docker run -d -p 8182:80 --name mapserver2 -v `pwd`/map:/map kartoza/mapserver_kartoza  
24222803cd6121212ee12354511f6e3820e37caae67db47d65044186e851f677  
dgortych@Power-Machine:~/docker-mapserver$ sudo docker exec -it mapserver2 /bin/bash  
root@24222803cd61:/#
```

Przetestowanie połączenie z lokalnym komputerem

```
root@24222803cd61:/map# telnet 172.17.0.1 5432  
Trying 172.17.0.1...  
Connected to 172.17.0.1.  
Escape character is '^['.
```



Błąd wyświetlenia własnego mapServera

