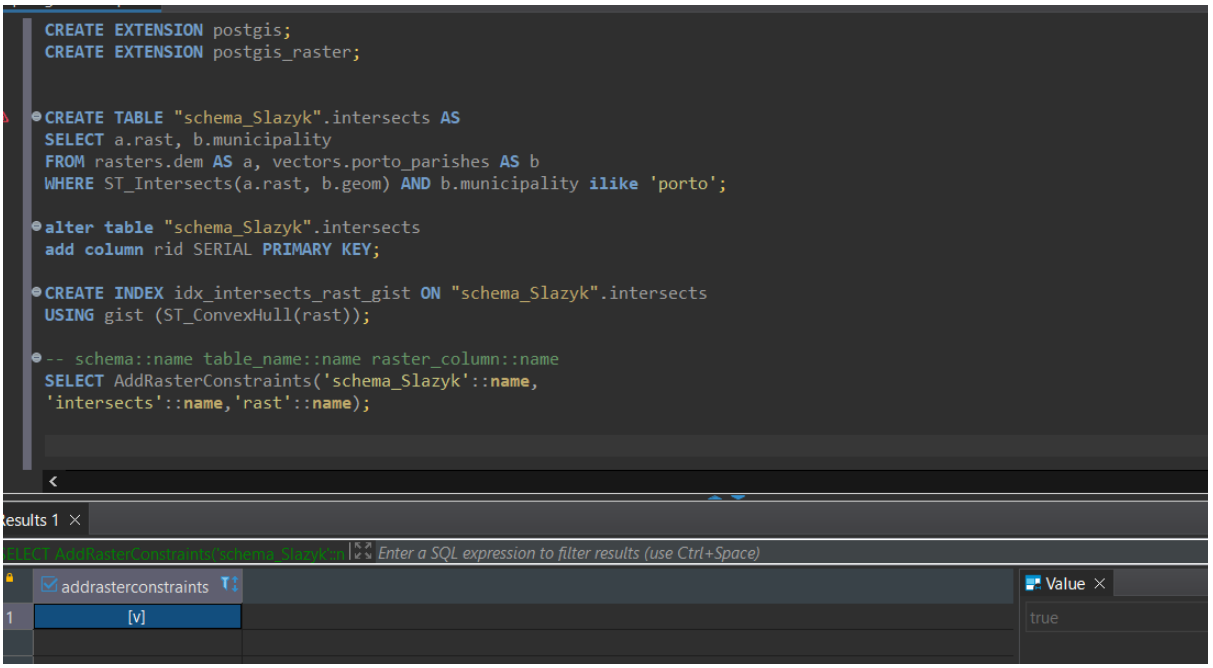
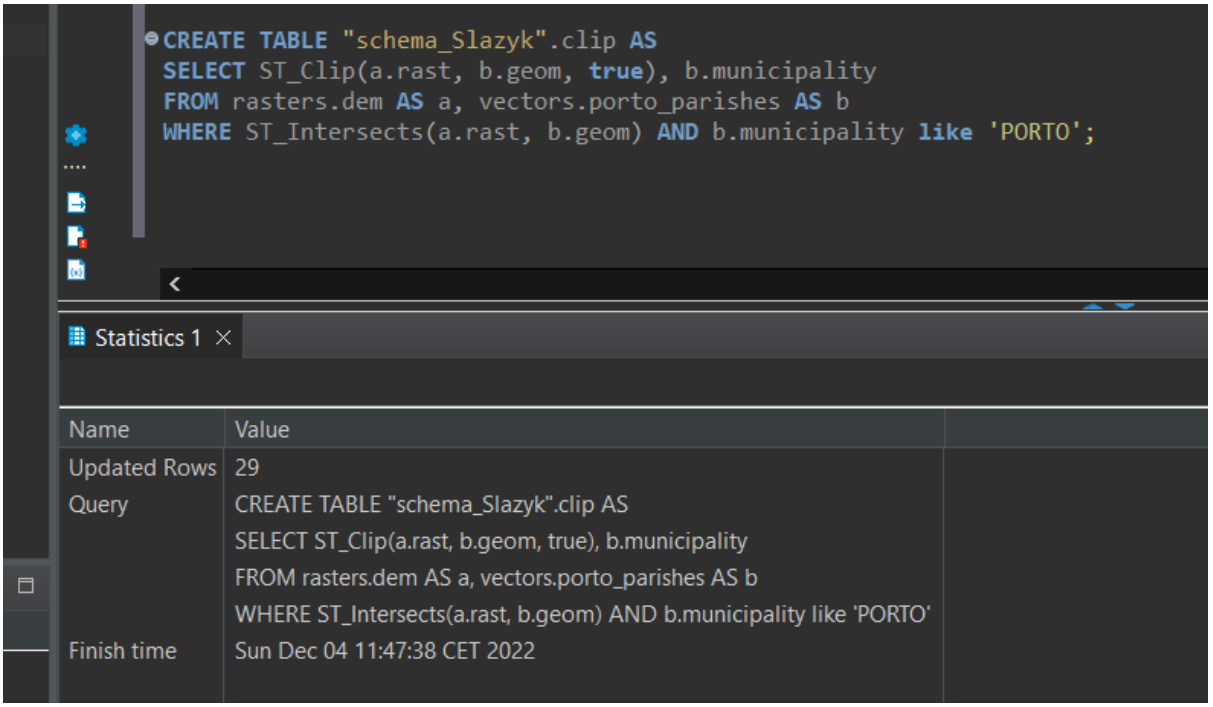
Tworzenie rastrów z istniejących rastrów i interakcja z wektorami

Przykład 1 - ST_Intersects



Przykład 2 - ST_Clip



Przykład 3 - ST_Union

```
CREATE TABLE "schema_Slazyk".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

Name	Value
Updated Rows	1
Query	CREATE TABLE "schema_Slazyk".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	Sun Dec 04 11:50:07 CET 2022

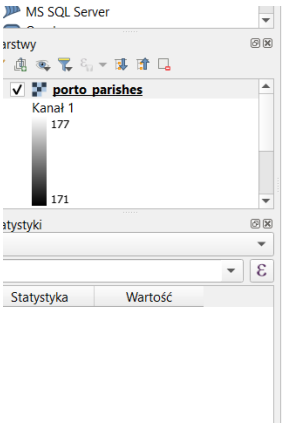
Tworzenie rastrów z wektorów (rastrowanie)

Przykład 1 - ST_AsRaster

```
CREATE TABLE "schema_Slazyk".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';
```

Statistics 1

Name	Value
Updated Rows	7
Query	CREATE TABLE "schema_Slazyk".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'
Finish time	Sun Dec 04 13:25:36 CET 2022

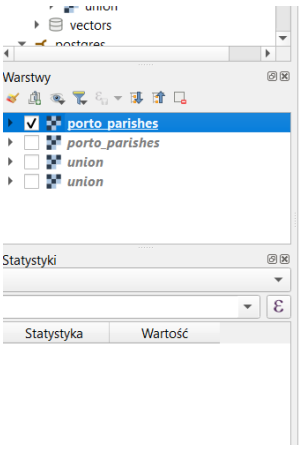


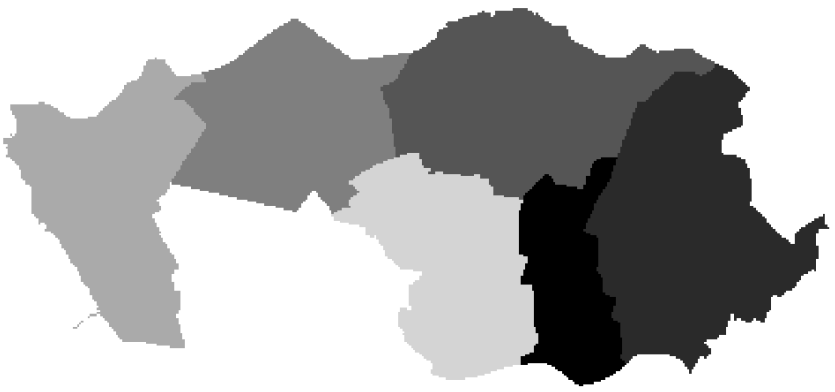
Przykład 2 - ST_Union

```
DROP TABLE "schema_Slazyk".porto_parishes;
CREATE TABLE "schema_Slazyk".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';
```

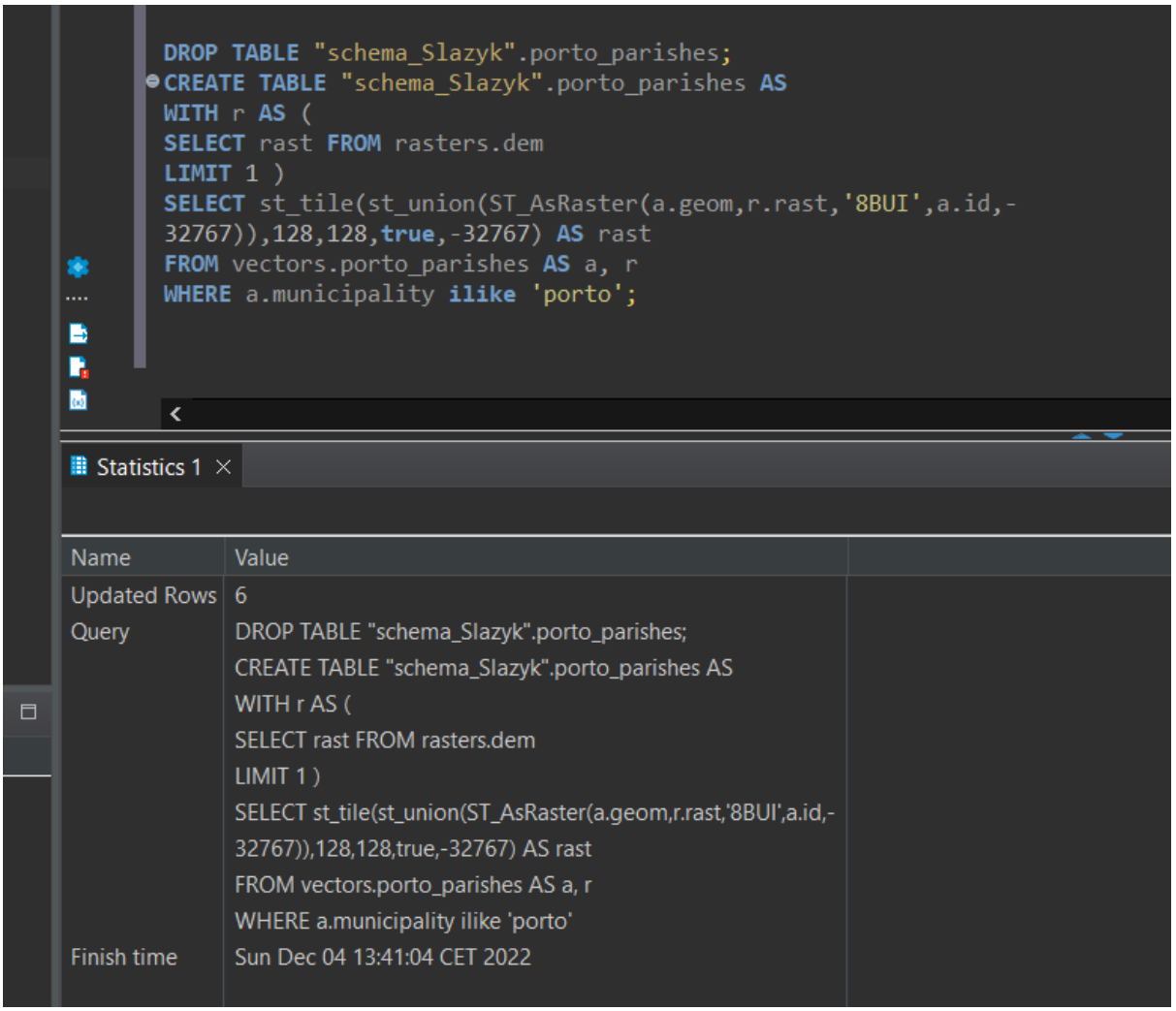
Statistics 1

Name	Value
Updated Rows	1
Query	DROP TABLE "schema_Slazyk".porto_parishes; CREATE TABLE "schema_Slazyk".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'
Finish time	Sun Dec 04 13:37:31 CET 2022





Przykład 3 - ST_Tile



```
DROP TABLE "schema_Slazyk".porto_parishes;
CREATE TABLE "schema_Slazyk".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
Updated Rows	6
Query	DROP TABLE "schema_Slazyk".porto_parishes; CREATE TABLE "schema_Slazyk".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'
Finish time	Sun Dec 04 13:41:04 CET 2022

Konwertowanie rastrów na wektory (wektoryzowanie)

Przykład 1 - ST_Intersection

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

Statistics 1

Name	Value
Updated Rows	6649
Query	create table "schema_Slazyk".intersection as SELECT a.rid,(ST_Intersection(b.geom,a.rast)).geom,(ST_Intersection(b.geom,a.rast)).val FROM rasters.dem AS a, vectors.porto_parishes AS b WHERE b.parish ilike 'paranhos' and ST_Intersects(b.geom,a.rast)
Finish time	Sun Dec 04 14:00:17 CET 2022

Przykład 2 - ST_DumpAsPolygons

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

Statistics 1

Name	Value
Updated Rows	6649
Query	create table "schema_Slazyk".intersection as SELECT a.rid,(ST_Intersection(b.geom,a.rast)).geom,(ST_Intersection(b.geom,a.rast)).val FROM rasters.dem AS a, vectors.porto_parishes AS b WHERE b.parish ilike 'paranhos' and ST_Intersects(b.geom,a.rast)
Finish time	Sun Dec 04 14:00:17 CET 2022

Analiza rastrów

Przykład 1 - ST_Band

```
CREATE TABLE "schema_Slazyk".landsat_nir AS
SELECT rid, ST_Band(rast,4) AS rast
FROM rasters.dem;
```

Statistics 1

Name	Value
Updated Rows	630
Query	CREATE TABLE "schema_Slazyk".landsat_nir AS SELECT rid, ST_Band(rast,4) AS rast FROM rasters.dem
Finish time	Sun Dec 04 14:08:19 CET 2022

Przykład 2 - ST_Clip

```
CREATE TABLE "schema_Slazyk".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);
```

Statistics 1

Name	Value
Updated Rows	6
Query	CREATE TABLE "schema_Slazyk".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)
Finish time	Sun Dec 04 14:09:49 CET 2022

Przykład 3 - ST_Slope

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

Statistics 1

Name	Value
Updated Rows	6
Query	CREATE TABLE "schema_Slazyk".paranhos_slope AS SELECT a.rid,ST_Slope(a.rast,1,'32BF','PERCENTAGE') as rast FROM "schema_Slazyk".paranhos_dem AS a
Finish time	Sun Dec 04 14:11:37 CET 2022

Przykład 4 - ST_Reclass

```
CREATE TABLE "schema_Slazyk".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_Slazyk".paranhos_slope AS a;
```

Statistics 1

Name	Value
Updated Rows	6
Query	CREATE TABLE "schema_Slazyk".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_Slazyk".paranhos_slope AS a
Finish time	Sun Dec 04 14:12:27 CET 2022

Przykład 5 - ST_SummaryStats

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

Results 1

SELECT st_summarystats(a.rast) AS stats FROM "s | Enter a SQL expression to filter results (use Ctrl+S

Grid | Text

	stats					
	count	sum	mean	stddev	min	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	337	3,427,187	10,169.6943620178	1,584.0295979304	6,834	16,529
4	34	355,473	10,455.0882352941	701.3987440086	9,278	12,098
5	4,267	45,261,151	10,607.2535739395	1,283.6466423885	7,074	18,620
6	2,395	26,501,357	11,065.2847599165	1,321.4788511304	7,997	19,919

Przykład 6 - ST_SummaryStats oraz Union

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

Results 1

SELECT st_summarystats(ST_Union(a.rast)) FROM | Enter a SQL expression to filter results (use Ctrl+Spac

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

Przykład 7 - ST_SummaryStats z lepszą kontrolą złożonego typu danych

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

Results 1

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

Przykład 8 - ST_SummaryStats w połączeniu z GROUP BY

```
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

	parish	min	max	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 9 - ST_Value

```
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;
```

places 1

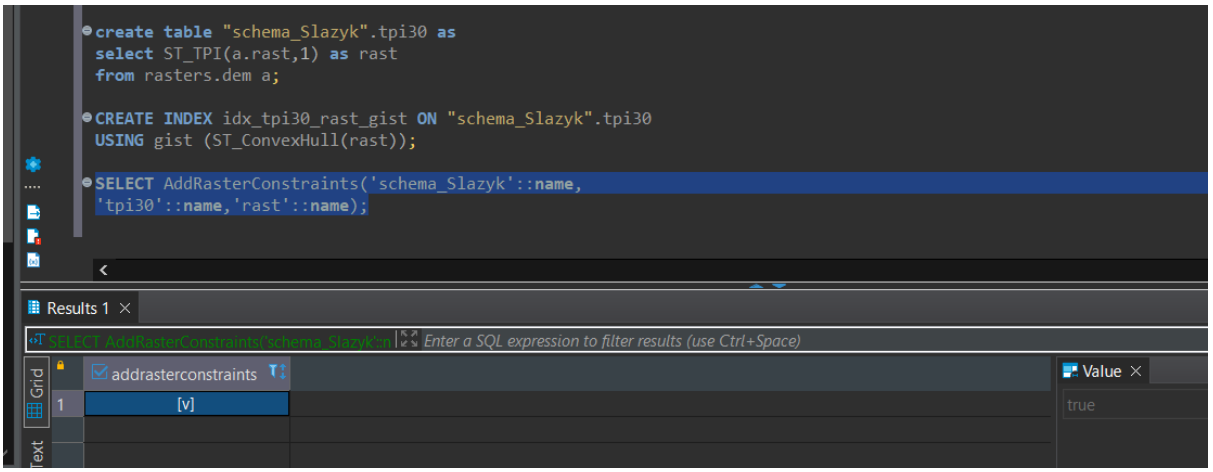
SELECT b.name,st_value(a.rast,(ST_Dump(b.geor | Enter a SQL expression to filte

Grid | Text | Record

	name	st_value
1	Aldeia São Miguel	8,922
2	Alpendurada e Matos	9,533
3	Amarante	8,238
4	Baião	7,273
5	Cabeceiras de Basto	8,411
6	Castelo de Paiva	8,761
7	Celorico de Basto	9,419
8	Cinfães	8,699
9	Espinho	16,708
10	Fafe	10,838
11	Fajozes	9,512
12	Felgueiras	10,846
13	Gondomar	9,764

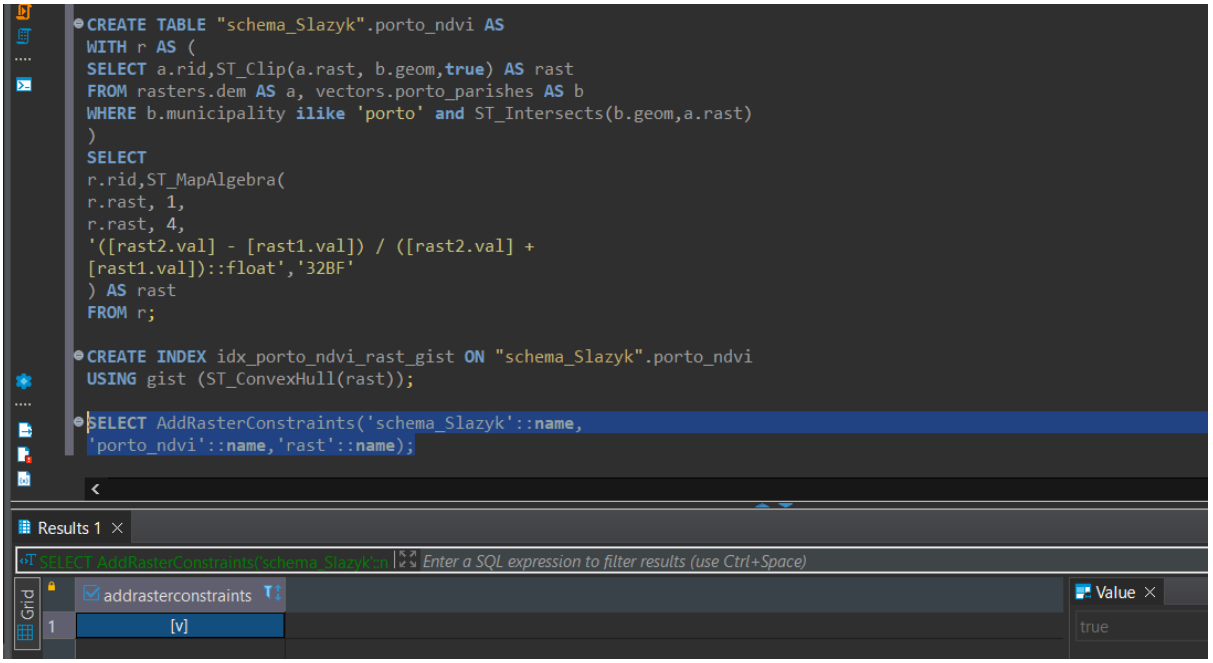
Topographic Position Index (TPI)

Przykład 10 - ST_TPI



Algebra map

Przykład 1 - Wyrażenie Algebry Map



Przykład 2 – Funkcja zwrotna

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

Statistics 1

Name	Value
Updated Rows	0
Query	create or replace function "schema_Slazyk".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

Eksport danych

Przykład 1 - ST_AsTiff

```
SELECT ST_AsTiff(ST_Union(rast))
FROM "schema_Slazyk".porto_ndvi;
```

Results 1

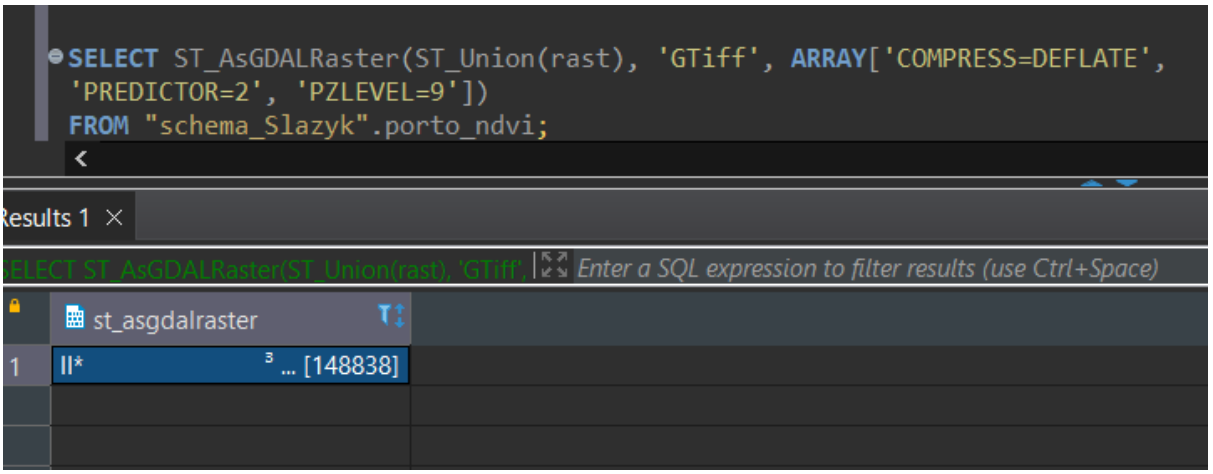
SELECT ST_AsTiff(ST_Union(rast)) FROM "schema

	st_astiff
1	II* ... [275539]

Grid

Text

Przykład 2 - ST_AsGDALRaster



Przykład 3 - Zapisywanie danych na dysku za pomocą dużego obiektu (large object, lo)

```
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_Slazyk".porto_ndvi;

 SELECT lo_export(loid, 'D:\Studia\SEM7\BDP\myraster.tiff') FROM tmp_out;
```

Results 1

SELECT lo_export(loid, 'D:\Studia\SEM7\myraste | Enter a SQL expression to filter results (use Ctrl+Space)

	lo_export
1	1