Tworzenie rastrów z istniejących rastrów i interakcja z wektorami

1

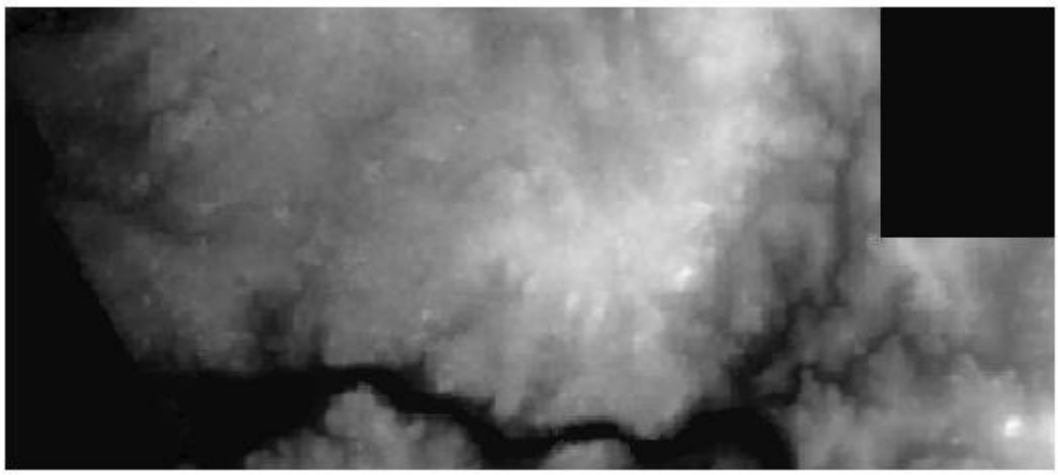
```
CREATE TABLE kurcaba.intersects AS
SELECT a.rast, b.municipality
FROM rasters.dem AS a, vectors.porto_parishes AS b
WHERE ST_Intersects(a.rast, b.geom) AND b.municipality ilike 'porto';

select * from kurcaba.intersects;
```

intersects 1

select * from kurcaba.intersects | Enter a SQL expression to filter results (use Ctrl+Space)

	rast	municipality	rid
1	01000001006172BF3E4D5A374080318D6907CA3EC044951356C7ABE3C0474F11FE054A0441000000000000000000000000000000B30E000064006400450180	PORTO	1
2	01000001006172BF3E4D5A374080318D6907CA3EC044951356C7ABE3C082283B553DAA0441000000000000000000000000000000B30E000064006400450180	PORTO	2
3	01000001006172BF3E4D5A374080318D6907CA3EC018E3F2CAF563E1C0474F11FE054A0441000000000000000000000000000000B30E000064006400450180	PORTO	3
4	01000001006172BF3E4D5A374080318D6907CA3EC02E3C8390DE87E2C082283B553DAA0441000000000000000000000000000000B30E000064006400450180	PORTO	4
5	01000001006172BF3E4D5A374080318D6907CA3EC02E3C8390DE87E2C0474F11FE054A0441000000000000000000000000000000B30E000064006400450180	PORTO	5
6	01000001006172BF3E4D5A374080318D6907CA3EC044951356C7ABE3C0474F11FE054A0441000000000000000000000000000000B30E000064006400450180	PORTO	6
7	01000001006172BF3E4D5A374080318D6907CA3EC044951356C7ABE3C082283B553DAA0441000000000000000000000000000000B30E000064006400450180	PORTO	7
8	01000001006172BF3E4D5A374080318D6907CA3EC05AEEA31BB0CFE4C082283B553DAA0441000000000000000000000000000000B30E000064006400450180	PORTO	8
9	01000001006172BF3E4D5A374080318D6907CA3EC05AEEA31BB0CFE4C0474F11FE054A0441000000000000000000000000000000B30E000064006400450180	PORTO	9
10	01000001006172BF3E4D5A374080318D6907CA3EC0704734E198F3E5C0474F11FE054A0441000000000000000000000000000000B30E000064006400450180	PORTO	10
11	01000001006172BF3E4D5A374080318D6907CA3EC0704734E198F3E5C082283B553DAA0441000000000000000000000000000000B30E000064006400450180	PORTO	11
12	01000001006172BF3E4D5A374080318D6907CA3EC0704734E198F3E5C0474F11FE054A0441000000000000000000000000000000B30E000064006400450180	PORTO	12
13	01000001006172BF3E4D5A374080318D6907CA3EC0704734E198F3E5C082283B553DAA0441000000000000000000000000000000B30E000064006400450180	PORTO	13
14	01000001006172BF3E4D5A374080318D6907CA3EC085A0C4A68117E7C0474F11FE054A0441000000000000000000000000000000B30E000064006400450180	PORTO	14
15	01000001006172BF3E4D5A374080318D6907CA3EC085A0C4A68117E7C082283B553DAA0441000000000000000000000000000000B30E000064006400450180	PORTO	15
16	01000001006172BF3E4D5A374080318D6907CA3EC05AEEA31BB0CFE4C082283B553DAA0441000000000000000000000000000000B30E000064006400450180	PORTO	16

```
alter table kurcaba.intersects
add column rid SERIAL PRIMARY KEY;

CREATE INDEX idx_intersects_rast_gist ON kurcaba.intersects
USING gist (ST_ConvexHull(rast));

-- schema::name table_name::name raster_column::name
SELECT AddRasterConstraints('kurcaba'::name,
'intersects'::name,'rast'::name);
```



2

```
CREATE TABLE kurcaba.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';

select * from kurcaba.clip;

CREATE TABLE kurcaba.union AS
```

clip 1

select * from kurcaba.clip — Enter a SQL expression to filter results (use Ctrl+Space)

	st_clip	munici
1	0100000100617 2BF3E4D5A374080318D6907CA3EC0574768B43454E3C0474F11FE054A0441000000000000000000000000000000B30E000042005D00450180018001800180018001800180018001800180	PORTO
2	0100000100617 2BF3E4D5A374080318D6907CA3EC02C288A402D31E3C0D0979D709B5404410000000000000000000000000000000B30E000030000B00450180018001800180018001800180018001800180018	PORTO
3	0100000100617 2BF3E4D5A374080318D6907CA3EC018E3F2CAF563E1C018D5974A973B0441000000000000000000000000000000B30E000011001E00450180018001800180018001800180018001800180180	PORTO
4	0100000100617 2BF3E4D5A374080318D6907CA3EC02E3C8390DE87E2C08B6D93EAFA7D0441000000000000000000000000000000B30E000046003600450180018001800180018001800180018001800180018	PORTO
5	0100000100617 2BF3E4D5A374080318D6907CA3EC02E3C8390DE87E2C0474F11FE054A0441000000000000000000000000000000B30E000064005700450180 7A00780079007A007A00750071006C006C0	PORTO
6	0100000100617 2BF3E4D5A374080318D6907CA3EC00962D67B5CE2E2C0474F11FE054A0441000000000000000000000000000000B30E00001F005300450180018001800180018001800180018001800180	PORTO
7	0100000100617 2BF3E4D5A374080318D6907CA3EC025E358E1A7B3E2C079DC7A05D0680441000000000000000000000000000000B30E00000F002000450180018001800180018001800180018001800180018	PORTO
8	0100000100617 2BF3E4D5A374080318D6907CA3EC05AEEA31BB0CFE4C06019FADE4290044100000000000000000000000000000B30E000042004900450180018001800180018001800180018001800180180	PORTO
9	0100000100617 2BF3E4D5A374080318D6907CA3EC05AEEA31BB0CFE4C0474F11FE054A0441000000000000000000000000000000B30E000023000F004501804B004B004F004F004F0050004F0051005100	PORTO
10	0100000100617 2BF3E4D5A374080318D6907CA3EC0D268172037B9E5C0474F11FE054A0441000000000000000000000000000000B30E0000500000E00450180018031003100320035003500330033003300	PORTO
11	0100000100617 2BF3E4D5A374080318D6907CA3EC0E4906FD64BB6E5C0CA65352F39910441000000000000000000000000000000B30E00004F004A00450180018001800180018001800180018001800180	PORTO
12	0100000100617 2BF3E4D5A374080318D6907CA3EC0704734E198F3E5C0474F11FE054A0441000000000000000000000000000000B30E00001E004C00450180220024002600260026002600270028002E00	PORTO

Save | Cancel | Script | 200 | 25 | Rows: 1 | 25 row(s) fetched - 3ms, on 2022-11-29 at 23:44:57

3.

```
select * from kurcaba.union;
```

union 1

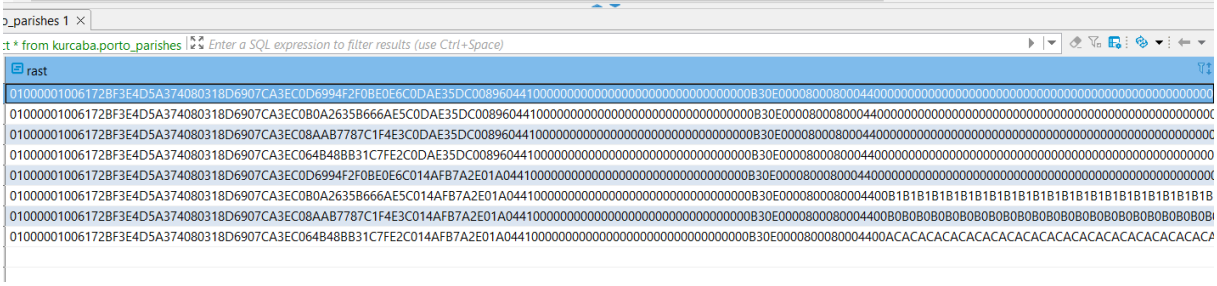
select * from kurcaba.union — Enter a SQL expression to filter results (use Ctrl+Space)

	st_union
1	0100000100617 2BF3E4D5A374080318D6907CA3EC0D6994F2F0BE0E6C0DAE35DC0089604410000000000000000000000000000000B30E0000F201AC00450180018001800180018001800180018001800180018

Tworzenie rastrów z wektorów (rastrowanie)

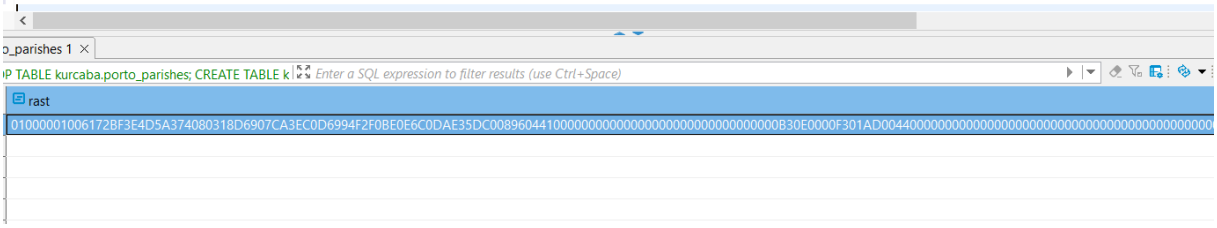
1.

```
CREATE TABLE kurcaba.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';

select * from kurcaba.porto_parishes
```

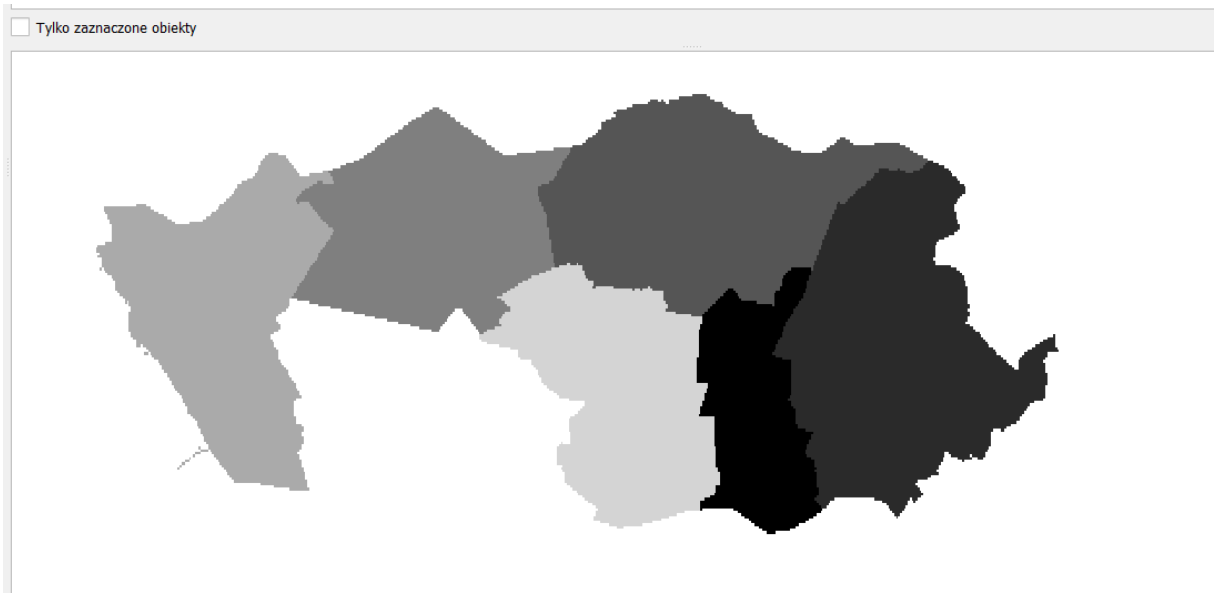


2.

```
DROP TABLE kurcaba.porto_parishes; --> drop table porto_parishes first
 CREATE TABLE kurcaba.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';

 select * from kurcaba.porto_parishes;
```



3




```
DROP TABLE kurcaba.porto_parishes; --> drop table porto_parishes first
CREATE TABLE kurcaba.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';

select * from kurcaba.porto_parishes;
```

to_parishes 1

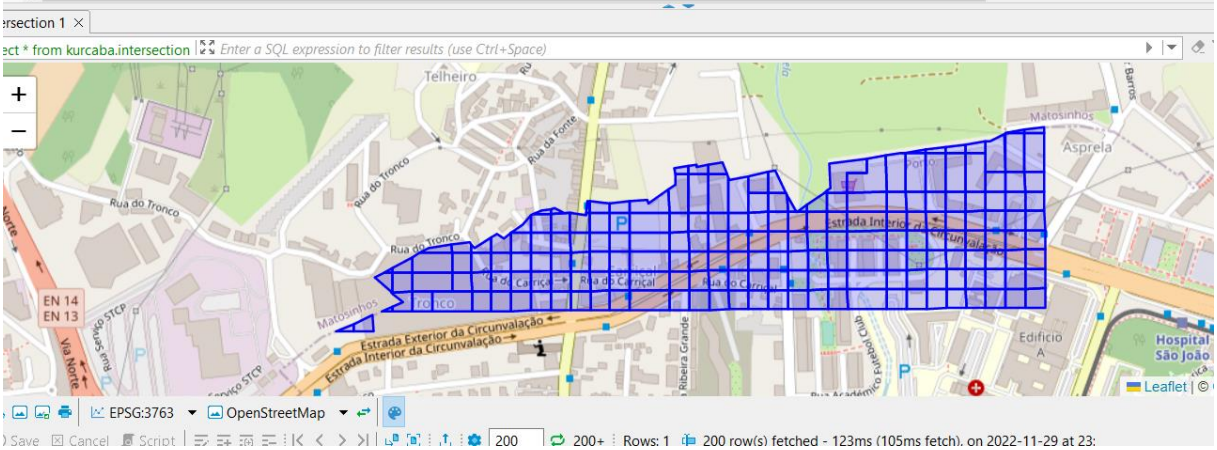
ct * from kurcaba.porto_parishes | Enter a SQL expression to filter results (use Ctrl+Space)

rast
0100000100617 2BF3E4D5A374080318D6907CA3EC0D6994F2F0BE0E6C0DAE35DC00896044100000000000000000000000000000000B30E00008000800044000000000000000000000000000000000000000000000000000000000000
0100000100617 2BF3E4D5A374080318D6907CA3EC0B0A2635B666AE5C0DAE35DC00896044100000000000000000000000000000000B30E00008000800044000000000000000000000000000000000000000000000000000000000000
0100000100617 2BF3E4D5A374080318D6907CA3EC08AAB7787C1F4E3C0DAE35DC00896044100000000000000000000000000000000B30E00008000800044000000000000000000000000000000000000000000000000000000000000
0100000100617 2BF3E4D5A374080318D6907CA3EC064B48BB31C7FE2C0DAE35DC00896044100000000000000000000000000000000B30E00008000800044000000000000000000000000000000000000000000000000000000000000
0100000100617 2BF3E4D5A374080318D6907CA3EC0D6994F2F0BE0E6C014AFB7A2E01A0441000000000000000000000000000000B30E00008000800044000000000000000000000000000000000000000000000000000000000000
0100000100617 2BF3E4D5A374080318D6907CA3EC0B0A2635B666AE5C014AFB7A2E01A0441000000000000000000000000000000B30E00008000800044 00B1B1B1B1B1B1B1B1B1B1B1B1B1B1B1B1B1B1B1B1B1B1B1B1B1
0100000100617 2BF3E4D5A374080318D6907CA3EC08AAB7787C1F4E3C014AFB7A2E01A0441000000000000000000000000000000B30E00008000800044 00B0B0B0B0B0B0B0B0B0B0B0B0B0B0B0B0B0B0B0B0B0B0B0B0B0B0
0100000100617 2BF3E4D5A374080318D6907CA3EC064B48BB31C7FE2C014AFB7A2E01A0441000000000000000000000000000000B30E00008000800044 00ACACACACACACACACACACACACACACACACACACACACACACACACACAC

Konwertowanie rastrów na wektory (wektoryzowanie)

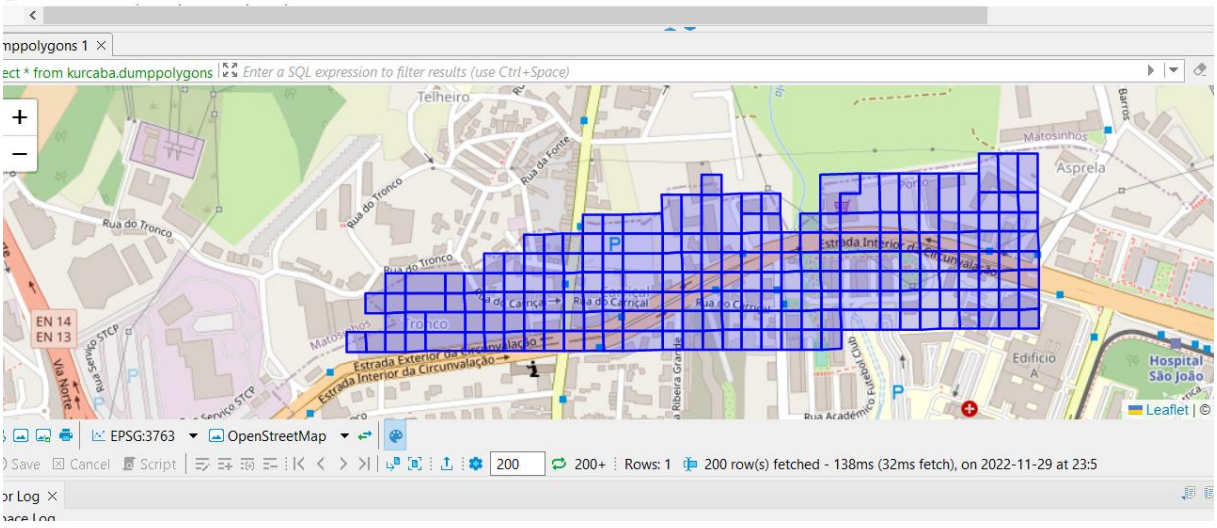
1.

```
create table kurcaba.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);

select * from kurcaba.intersection;
```



2.

```
CREATE TABLE kurcaba.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);

select * from kurcaba.dumppolygons
```



Analiza rastrów

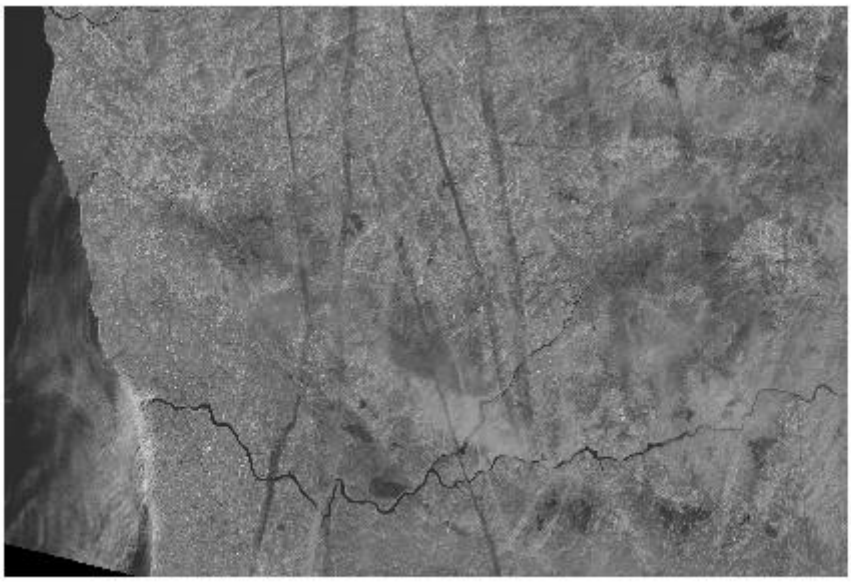
1.

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

select * from kurcaba.landsat_nir
```

landsat_nir 1

select * from kurcaba.landsat_nir | Enter a SQL expression to filter results (use Ctrl+Space)

	rid	rast
1	1	01000001003849EE0BB84F3E404F2001E9AEB43DC02068193DBBCBECC071695283BC2C0941000000000000000000000000000000000B30E00008000800046FFFF2C152C1526
2	2	01000001003849EE0BB84F3E404F2001E9AEB43DC08C835ABCBFE6EAC071695283BC2C0941000000000000000000000000000000000B30E00008000800046FFFFAD15A615CI
3	3	01000001003849EE0BB84F3E404F2001E9AEB43DC0F99E9B3BC401E9C071695283BC2C0941000000000000000000000000000000000B30E00008000800046FFFFB030AE3275
4	4	01000001003849EE0BB84F3E404F2001E9AEB43DC066BADCBAC81CE7C071695283BC2C0941000000000000000000000000000000000B30E00008000800046FFFF76387D352F
5	5	01000001003849EE0BB84F3E404F2001E9AEB43DC0D2D51D3ACD37E5C071695283BC2C0941000000000000000000000000000000000B30E00008000800046FFFFC4635D66B
6	6	01000001003849EE0BB84F3E404F2001E9AEB43DC03EF15EB9D152E3C071695283BC2C0941000000000000000000000000000000000B30E00008000800046FFFF23312B3AA1
7	7	01000001003849EE0BB84F3E404F2001E9AEB43DC0AB0CA038D66DE1C071695283BC2C0941000000000000000000000000000000000B30E00008000800046FFFFA33C033C8
8	8	01000001003849EE0BB84F3E404F2001E9AEB43DC02F50C26FB511DFC071695283BC2C0941000000000000000000000000000000000B30E00008000800046FFFFCE36FB33E73
9	9	01000001003849EE0BB84F3E404F2001E9AEB43DC00887446EBE47DBC071695283BC2C0941000000000000000000000000000000000B30E00008000800046FFFFAD38953B40
10	10	01000001003849EE0BB84F3E404F2001E9AEB43DC0E0BDC66CC77DD7C071695283BC2C0941000000000000000000000000000000000B30E00008000800046FFFF7B4BA94D2
11	11	01000001003849EE0BB84F3E404F2001E9AEB43DC0BAF4486BD0B3D3C071695283BC2C0941000000000000000000000000000000000B30E00008000800046FFFFD355765783
12	12	01000001003849EE0BB84F3E404F2001E9AEB43DC0285796D3B2D3CFC071695283BC2C0941000000000000000000000000000000000B30E00008000800046FFFF753816404F5
13	13	01000001003849EE0BB84F3E404F2001E9AEB43DC0D8C49AD0C43FC8C071695283BC2C0941000000000000000000000000000000000B30E00008000800046FFFF7D38BF38C2
14	14	01000001003849EE0BB84F3E404F2001E9AEB43DC088329FCDD6ABC0C071695283BC2C0941000000000000000000000000000000000B30E00008000800046FFFFE037E037A6



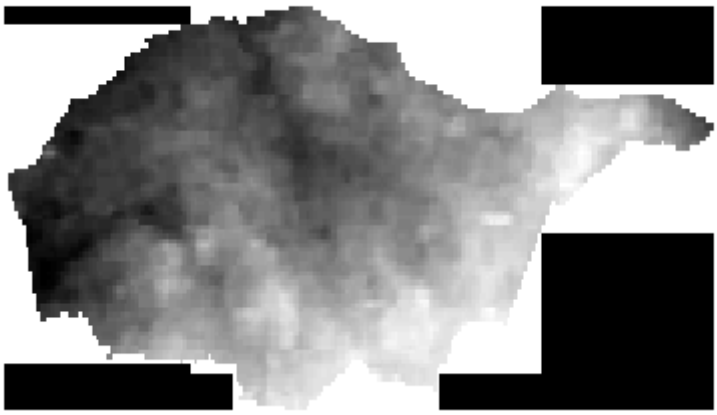
2.

```
CREATE TABLE kurcaba.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);

select * from kurcaba.paranhos_dem
```

nhos_dem 1 ×

t * from kurcaba.paranhos_dem | Enter a SQL expression to filter results (use Ctrl+Space)

rid	rast
380	01000001006172BF3E4D5A374080318D6907CA3EC09A49D3957D46E4C033B2707F2F92044100000000000000000000000000000000B30E
382	01000001006172BF3E4D5A374080318D6907CA3EC02E3C8390DE87E2C0D7D06D6CAD85044100000000000000000000000000000000B3(
412	01000001006172BF3E4D5A374080318D6907CA3EC0187635E2BF88E3C0474F11FE054A04410000000000000000000000000000B30EC
381	01000001006172BF3E4D5A374080318D6907CA3EC044951356C7ABE3C0DAE35DC00896044100000000000000000000000000000B30



3.

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

select * from kurcaba.paranhos_slope
```

paranhos_slope 1 ×

select * from kurcaba.paranhos_slope | Enter a SQL expression to filter results (use Ctrl+Space)

	rid	rast
1	380	01000001006172BF3E4D5A374080318D6907CA3EC09A49D3957D46E4C033B2707F2F92044100000000000000000000000000000000B30E000035004900
2	382	01000001006172BF3E4D5A374080318D6907CA3EC02E3C8390DE87E2C0D7D06D6CAD85044100000000000000000000000000000000B30E000031002000
3	412	01000001006172BF3E4D5A374080318D6907CA3EC0187635E2BF88E3C0474F11FE054A04410000000000000000000000000000B30E00003B0008004A00
4	381	01000001006172BF3E4D5A374080318D6907CA3EC044951356C7ABE3C0DAE35DC00896044100000000000000000000000000000B30E000064004F004A00

4.

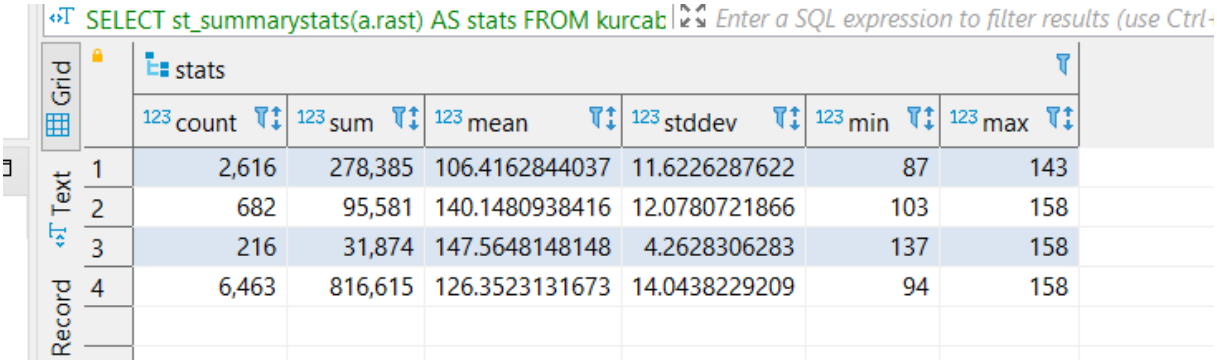
```
CREATE TABLE kurcaba.paranhos_slope_reclass AS
SELECT a.rid,ST_Reclass(a.rast,1,']0-15]:1, (15-30]:2, (30-9999:3',
'32BF',0)
FROM kurcaba.paranhos_slope AS a;

select * from kurcaba.paranhos_slope_reclass
```

aranhos_slope_reclass 1 ×

elect * from kurcaba.paranhos_slope_reclass | Enter a SQL expression to filter results (use Ctrl+Space)

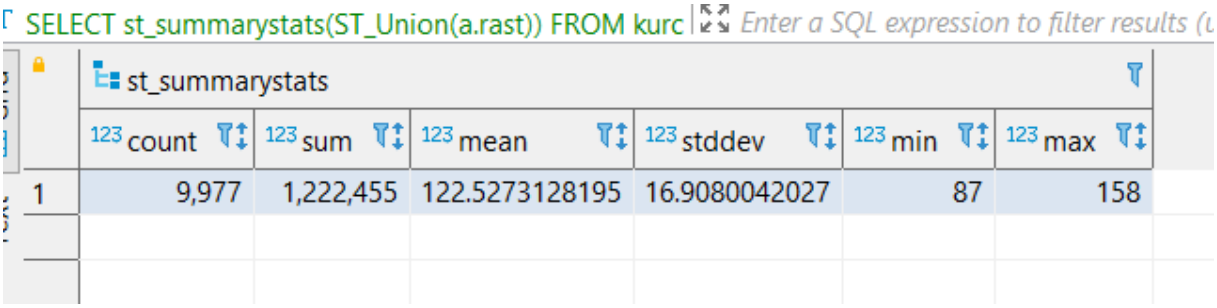
	rid	st_reclass
1	380	01000001006172BF3E4D5A374080318D6907CA3EC09A49D3957D46E4C033B2707F2F920441000000000000000000000000000000000B30E0000350049004A00000000000000
2	382	01000001006172BF3E4D5A374080318D6907CA3EC02E3C8390DE87E2C0D7D06D6CAD850441000000000000000000000000000000000B30E0000310020004A00000000000000
3	412	01000001006172BF3E4D5A374080318D6907CA3EC0187635E2BF88E3C0474F11FE054A044100000000000000000000000000000000B30E00003B0008004A00000000000000
4	381	01000001006172BF3E4D5A374080318D6907CA3EC044951356C7ABE3C0DAE35DC00896044100000000000000000000000000000000B30E000064004F004A00000000000000

5.



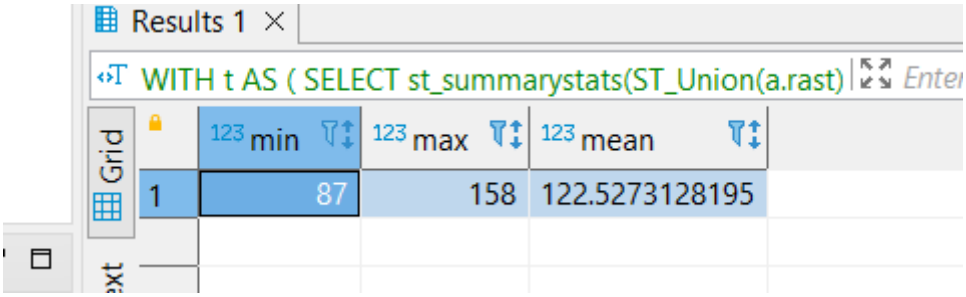
	count	sum	mean	stddev	min	max
1	2,616	278,385	106.4162844037	11.6226287622	87	143
2	682	95,581	140.1480938416	12.0780721866	103	158
3	216	31,874	147.5648148148	4.2628306283	137	158
4	6,463	816,615	126.3523131673	14.0438229209	94	158

6



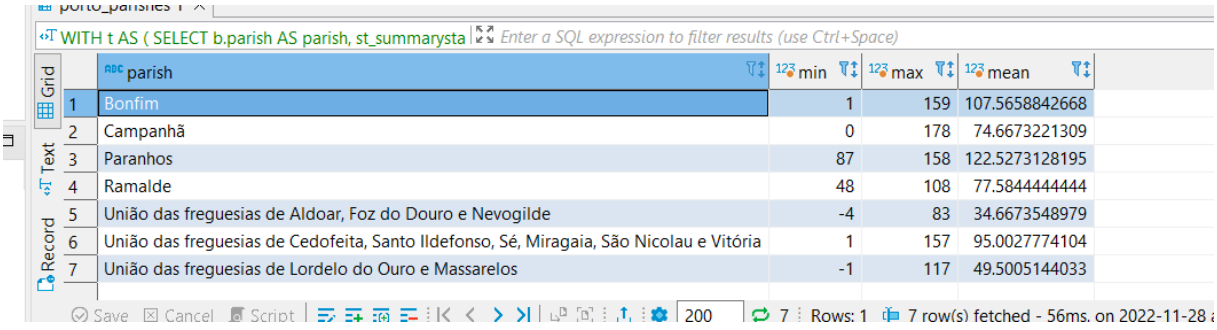
	count	sum	mean	stddev	min	max
1	9,977	1,222,455	122.5273128195	16.9080042027	87	158

7



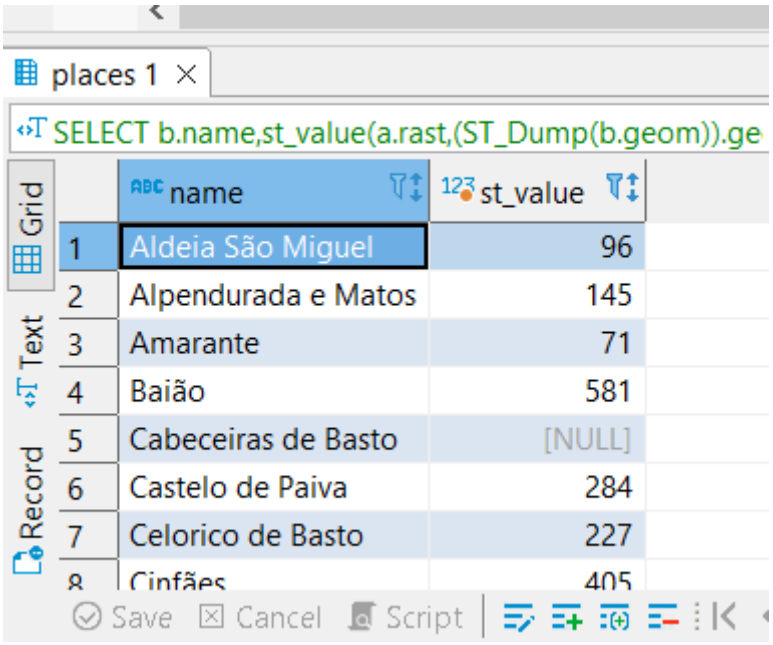
	min	max	mean
1	87	158	122.5273128195

8



	parish	min	max	mean
1	Bonfim	1	159	107.5658842668
2	Campanhã	0	178	74.6673221309
3	Paranhos	87	158	122.5273128195
4	Ramalde	48	108	77.5844444444
5	União das freguesias de Aldoar, Foz do Douro e Nevogilde	-4	83	34.6673548979
6	União das freguesias de Cedofeita, Santo Ildefonso, Sé, Miragaia, São Nicolau e Vitória	1	157	95.0027774104
7	União das freguesias de Lordelo do Ouro e Massarelos	-1	117	49.5005144033

9



10.

Algebra map

1.

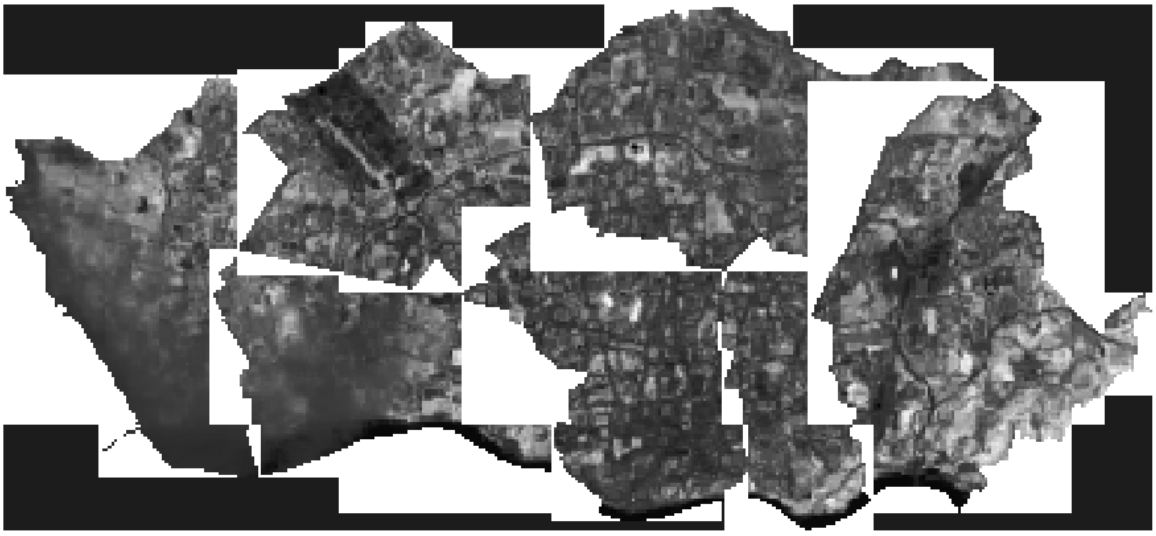
```
--1
CREATE TABLE kurcaba.porto_ndvi AS
WITH r AS (
SELECT a.rid,ST_Clip(a.rast, b.geom,true) AS rast
FROM rasters.landsat8 AS a, vectors.porto_parishes AS b
WHERE b.municipality ilike 'porto' and ST_Intersects(b.geom,a.rast)
)
SELECT
r.rid,ST_MapAlgebra(
r.rast, 1,
r.rast, 4,
'([rast2.val] - [rast1.val])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

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

SELECT AddRasterConstraints('kurcaba'::name,
'porto_ndvi'::name,'rast'::name);

select * from kurcaba.porto_ndvi;
--2
```

porto_ndvi 1

select * from kurcaba.porto_ndvi | Enter a SQL expression to filter results (use Ctrl+Space)

Grid | Text

	Row #0
123 rid	245
rast	01000001003849EE0BB84F3E404F2001E9AEB43DC0086F60B09B56E3C01F1195122C32044100000000000000000000000000000000B30E000001000A006A00FF7F4700FF7F4700FF7F4700FF7F4700FF7F4700FF7F4



2.

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

CREATE INDEX idx_porto_ndvi2_rast_gist ON kurcaba.porto_ndvi2
USING gist (ST_ConvexHull(rast));

SELECT AddRasterConstraints('kurcaba'::name,
'porto_ndvi2'::name,'rast'::name);

select * from kurcaba.porto_ndvi2;
```

porto_ndvi2 1

select * from kurcaba.porto_ndvi2 | Enter a SQL expression to filter results (use Ctrl+Space)

	Row #0
rid	245
rast	01000001003849EE0BB84F3E404F2001E9AEB43DC0086F60B09B56E3C01F1195122C320441000000000000000000000000000000B30E000001000A006A00FF7F4700FF7F4700FF7F4700FF7F4700FF

Save Cancel Script 200 23 Rows: 1 Row 1/23

Error Log

Workspace Log

EKSPORT DANYCH

```sql
--1
SELECT ST_AsTiff(ST_Union(rast))
FROM kurcaba.porto_ndvi;

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

SELECT ST_GDALDrivers();

--3

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 kurcaba.porto_ndvi;
----------------------------------------------
SELECT lo_export(loid, 'D:\myraster.tiff') --> Save the file in a place where the user postgres have acc
 FROM tmp_out;
----------------------------------------------
SELECT lo_unlink(loid)
 FROM tmp_out; --> Delete the large object.


 --4
-- gdal_translate -co COMPRESS=DEFLATE -co PREDICTOR=2 -co ZLEVEL=9
--PG:"host=localhost port=5432 dbname=postgis_raster user=postgres
--password=postgis schema=schema_name table=porto_ndvi mode=2"
--porto_ndvi.tiff
```