

## Algebra map

### Przykład 1 - Wyrażenie Algebra Map

The screenshot shows the PostgreSQL SQL Editor with the following SQL code:

```
CREATE TABLE szymanek.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])'
) AS rast
FROM r;
```

The Results 2 panel shows the following statistics:

Name	Value
Updated Rows	23
Query	CREATE TABLE szymanek.porto_ndvi AS WITH r AS ( SELECT a.rid, ST_Clip(a.rast, b.geom, true) ... FROM rasters.landsat8 AS a, vectors.porto... WHERE b.municipality ilike 'porto' and S... ) SELECT r.rid, ST_MapAlgebra( r.rast, 1, r.rast, 4, '([rast2.val] - [rast1.val]) / ([rast2.val] + [r...

The Value panel shows a message: "Select a cell to view/edit value. Press F7 to hide this panel."

The screenshot shows the PostgreSQL SQL Editor with the following SQL code:

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

The Results 2 panel shows the following statistics:

Name	Value
Updated Rows	0
Query	CREATE INDEX idx_porto_ndvi_rast_gist ON szymanek.porto_ndvi USING gist (ST_ConvexHull(rast))
Finish time	Tue Nov 29 23:45:50 CET 2022

The screenshot shows the PostgreSQL SQL Editor with the following SQL code:

```
ALTER TABLE szymanek.porto_ndvi ADD CONSTRAINT addrastrerconstraints
```

The Results 1 panel shows the following statistics:

Name	Value
Updated Rows	0
Query	ALTER TABLE szymanek.porto_ndvi ADD CONSTRAINT addrastrerconstraints

The Value panel shows a message: "Enter a SQL expression to filter results (use)".

## Przykład 2 – Funkcja zwrotna

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

Statistics 1 x Results 2

Name	Value
Updated Rows	0
Query	create or replace function szymanek.ndvi( value double precision [] [] [], pos integer [], VARIADIC userargs text [] ) RETURNS double precision AS \$\$ BEGIN

Select a cell to view/edit value

```
CREATE TABLE szymanek.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.ge  
  )  
  SELECT  
    r.rid,ST_MapAlgebra(  
      r.rast, ARRAY[1,4],  
      'szymanek.ndvi(double precision[], integer[],text[])::re  
      '32BF'::text  
    ) AS rast  
  FROM r;
```

Statistics 1 x Results 2

Name	Value
Updated Rows	23
Query	CREATE TABLE szymanek.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

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

Statistics 1 x Results 2

Name	Value
Updated Rows	0
Query	CREATE INDEX idx_porto_ndvi2_rast_gist ON szymanek.porto_ndvi2 USING gist (ST_ConvexHull(rast))
Finish time	Tue Nov 29 23:49:12 CET 2022

```
constraints('szymanek'::name, 'porto_ndvi2'::name,'rast':
```

Results 1 x Results 2

Enter a SQL expression to filter results (use | to filter)

Grid	addrasterconstraints	Value
1	[v]	true

## Eksport danych

### Przykład 1 - ST\_AsTiff

The screenshot shows a SQL query editor with the following query:

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

The results pane displays a table with one row and one column, showing the output of the ST\_AsTiff function. The output is a binary representation of a TIFF image, displayed as a grid of values.

Grid	Value
1	00
2	00000:49
3	00001:49
4	00002:2A
5	00003:00
6	00004:08

### Przykład 2 - ST\_AsGDALRaster

The screenshot shows a SQL query editor with the following query:

```
SELECT ST_AsGDALRaster(ST_Union(rast), 'GTiff', ARRAY['CC'])  
FROM szymanek.porto_ndvi;
```

The results pane displays a table with one row and one column, showing the output of the ST\_AsGDALRaster function. The output is a binary representation of a GDAL raster, displayed as a grid of values.

Grid	Value
1	00 0
2	00000:49 4
3	00002:2A 0
4	00004:08 0

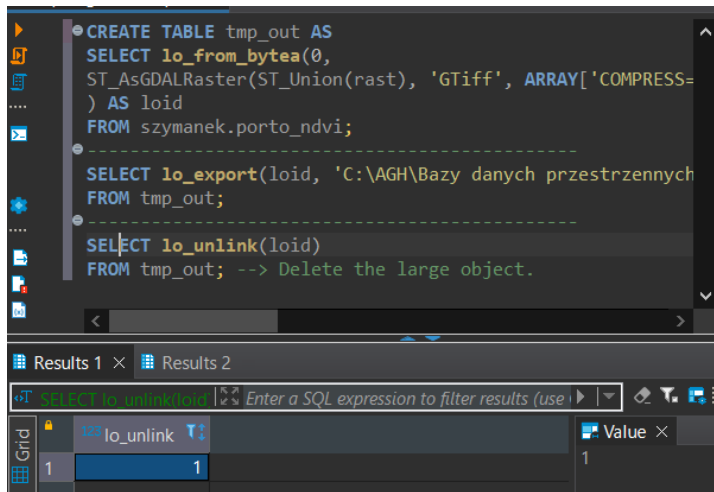
The screenshot shows a SQL query editor with the following query:

```
SELECT ST_GDALDrivers();
```

The results pane displays a table with one row and one column, showing the output of the ST\_GDALDrivers function. The output is a list of supported drivers, displayed as a grid of values.

Grid	Value
1	(0,GTiff,GeoTIFF,t,t,"<CreationOptionList> <Option name=
2	(1,AAIGrid,"Arc/Info ASCII Grid",t,t,"<CreationOptionList>1
3	(2,DTED,"DTED Elevation Raster",t,t,"")
4	(3,PNG,"Portable Network Graphics",t,t,"<CreationOptionLis
5	(4,JPEG,"JPEG JFIF",t,t,"<CreationOptionList>1 <Option nar
6	(5,GIF,"Graphics Interchange Format (.gif)",t,t,"<CreationOp
7	(6,USGSDem,"USGS Optional ASCII DEM (and CDED)",t,t,"<
8	(7,XYZ,"ASCII Gridded XYZ",t,t,"<CreationOptionList> <Op

### 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=']) AS loid
FROM szymaneek.porto_ndvi;
-----
SELECT lo_export(loid, 'C:\AGH\Bazy danych przestrzennych')
FROM tmp_out;
-----
SELECT lo_unlink(loid)
FROM tmp_out; --> Delete the large object.
```

Results 1 × Results 2

SQL Editor: Enter a SQL expression to filter results (use ...)

Grid	lo_unlink	Value
1	1	1