1.Ładowanie rastra do bazy

E:\postgresql\bin\raster2pgsql.exe -s 3763 -N -32767 -t 100x100 -I -C -M -d "E:\DeadByDaylight\Datagrip\DataGrip 2025.2.4\projects\CW6-7\srtm_1arc_v3.tif" rasters.dem | "E:\postgresql\bin\psql.exe" -d RASTER -h localhost -U postgres -p 5432

2.Ładowanie danych Landsat do bazy

E:\postgresql\bin\raster2pgsql.exe -s 3763 -N -32767 -t 128x128 -I -C -M -d "E:\DeadByDaylight\Datagrip\DataGrip 2025.2.4\projects\CW6-7\Landsat8_L1TP_RGBN.TIF" rasters.landsat8 | "E:\postgresql\bin\psql.exe" -d RASTER -h localhost -U postgres -p 5432

3.ST_Intersect

```
CREATE TABLE ciura.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';

alter table ciura.intersects
add column rid SERIAL PRIMARY KEY;

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

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

2.ST_DUmpAsPolygon

```
CREATE TABLE ciura.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.landsat8 AS a, vectors.porto_parishes AS b
WHERE b.parish ilike 'paranhos' and ST_Intersects(b.geom,a.rast);
```

3.ST_Band

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

4.ST_Clip

```
CREATE TABLE ciura.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);
```

5.ST_Slope

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

6.ST_Reclass

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

7.ST_SummarryStats

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

8.ST_Union

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

9.ST_Summarystats z lepszą kontrolą

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

10.ST_Summarystats 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;
```

11.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;
```

12.ST_TPI

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

CREATE INDEX idx_tpi30_rast_gist ON ciura.tpi30
USING gist (ST_ConvexHull(rast));

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

ALGEBRA MAP

1.CREATE TABLE

```
CREATE TABLE ciura.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 ciura.porto_ndvi
USING gist (ST_ConvexHull(rast));

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

2.Funkcja zwrotna

```
create or replace function ciura.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;

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

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

SELECT AddRasterConstraints('ciura'::name,
'porto_ndvi2'::name,'rast'::name);
```

3.ST_AsTiff

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

4.ST_AsGDALRaster

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

SELECT ST_GDALDrivers();
```

5.GDAL

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

6.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=localhost port=5432 dbname='postgis_raster'

user='sasig' password='postgis' schema='rasters' table='dem' mode='2'"

PROCESSING "SCALE=AUTO"

PROCESSING "NODATA=-32767"

OFFSITE 0 0 0

METADATA

'wms_title' 'srtm'

END

END

END