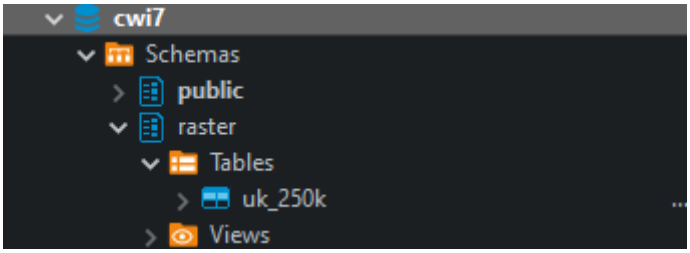
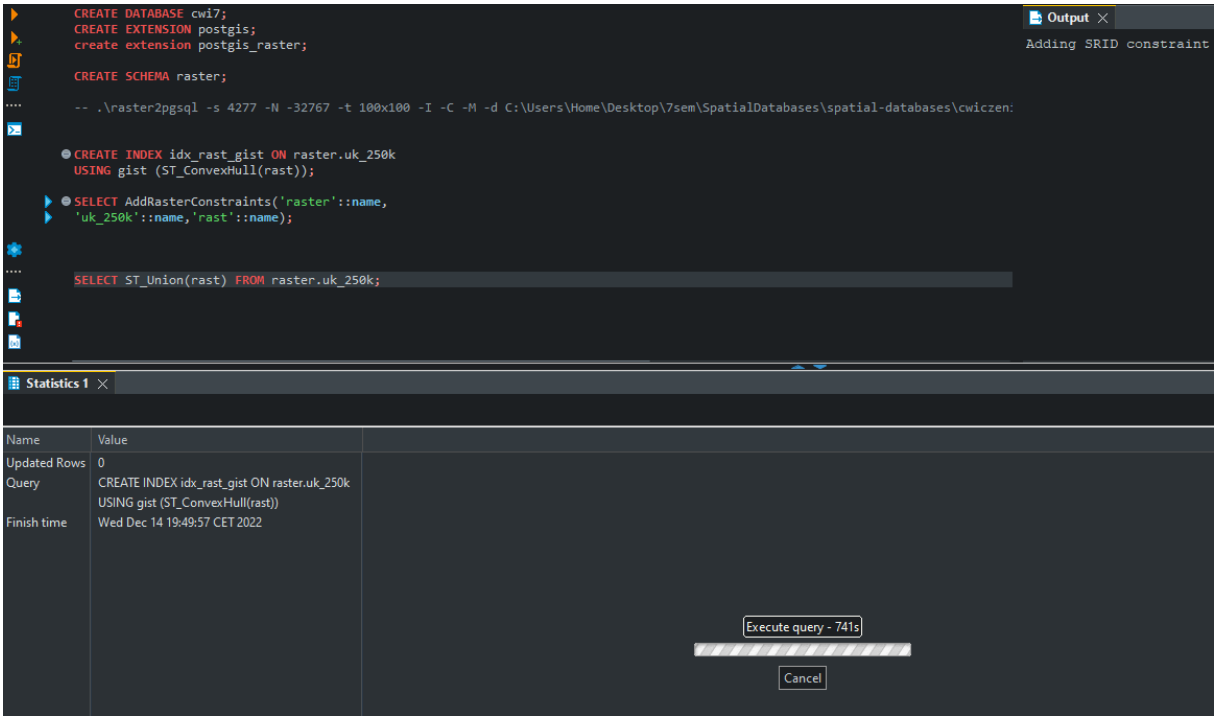
Ćwiczenia 7

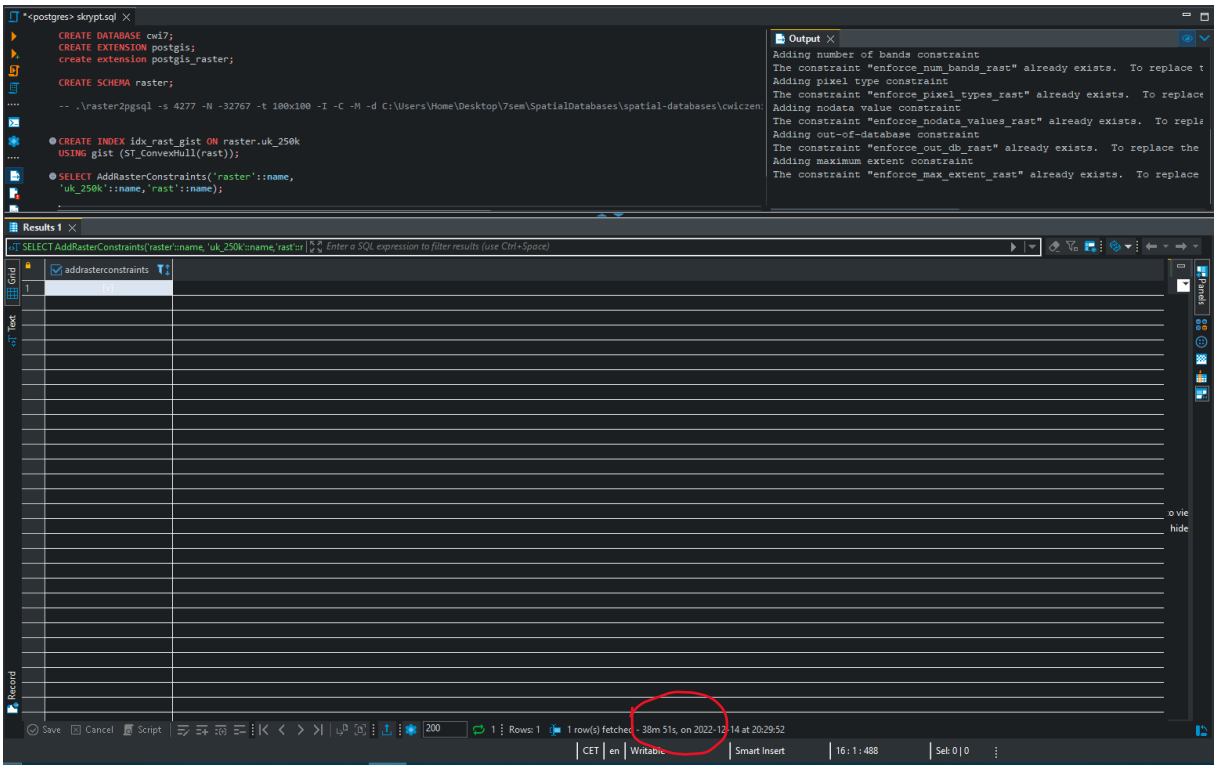
Zad. 1

.\raster2pgsql -s 4277 -N -32767 -t 100x100 -I -C -M -d C:\Users\Home\Desktop\7sem\SpatialDatabases\spatial-databases\cwiczenia7\ras250_gb\data*.tif uk_250k | psql -d cwi7 -h localhost -U postgres -p 5433



Zad. 2 i 3



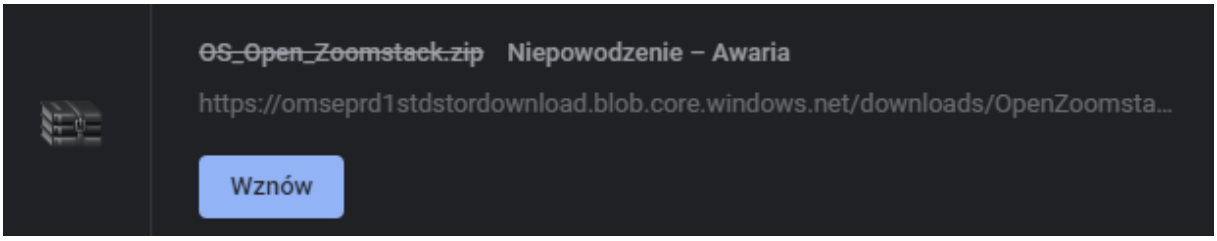


Zapytanie trwało prawie 39 minut.

```
DROP TABLE IF EXISTS tmp_out ;

CREATE TABLE tmp_out AS
SELECT lo_from_bytea(0,
       ST_AsGDALRaster(ST_Union(rast), 'GTiff')
        ) AS loid
FROM raster.uk_250k;

SELECT lo_export(loid, 'C:\bazy_przestrzenne\zadanie3.tif')
FROM tmp_out;

SELECT lo_unlink(loid)
  FROM tmp_out;
```

Kwerenda również działała bardzo długo. Niestety nie udało mi się zapisać do pliku.

Zad. 4,5,6,7

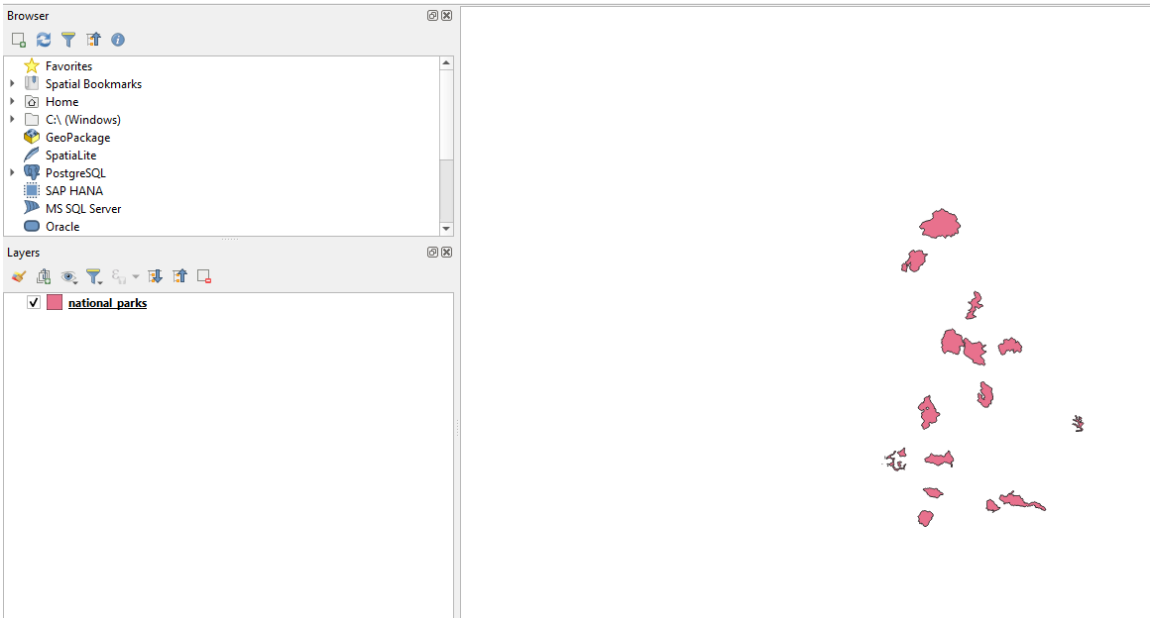


Plik pobierał się około godziny i pojawił się problem dotyczący awarii pliku…

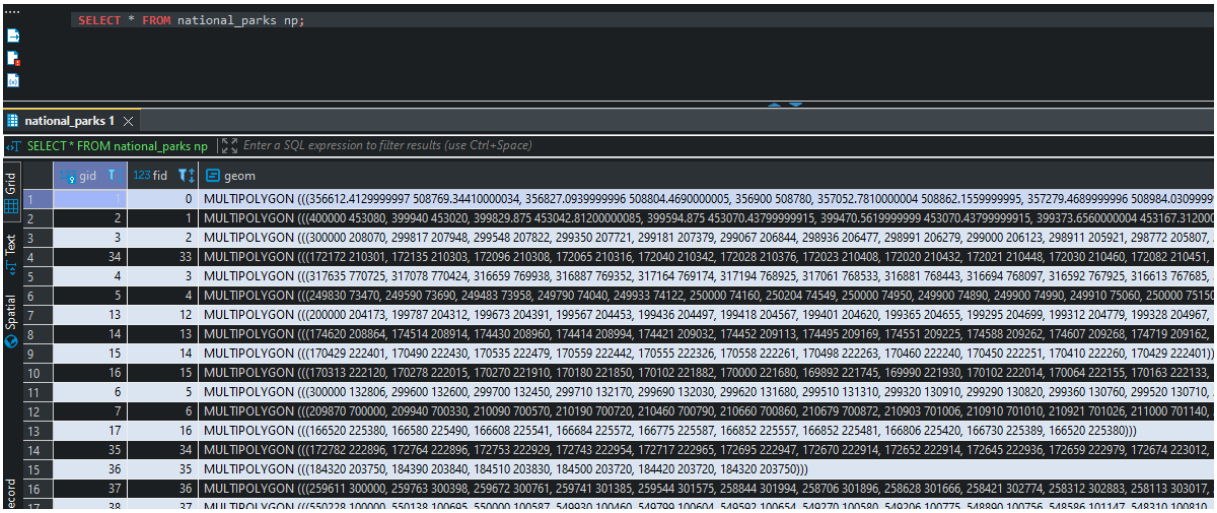
Po powtórnym pobraniu:

```
ogr2ogr.exe C:\bazy_przestrzenne\ C:\bazy_przestrzenne\OS_Open_Zoomstack.gpkg
```

Po wczytaniu do qgis:




```
shp2pgsql -s 27700 C:\bazy_przestrzenne\national_parks.shp national_parks | psql -U postgres -h localhost -p 5433 -d cwi7
```



	gid	fid	geom
1	1	0	MULTIPOLYGON (((356612.4129999997 508769.3441000034, 356827.0939999996 508804.4690000005, 356900 508780, 357052.7810000004 508862.1559999995, 357279.4689999996 508984.0309999
2	2	1	MULTIPOLYGON (((400000 453080, 399940 453020, 399829.875 453042.81200000085, 399594.875 453070.43799999915, 399470.5619999999 453070.43799999915, 399373.6560000004 453167.312000
3	3	2	MULTIPOLYGON (((300000 208070, 299817 207948, 299548 207822, 299350 207721, 299181 207379, 299067 206844, 298936 206477, 298991 206279, 299000 206123, 298911 205921, 298772 205807,
4	34	33	MULTIPOLYGON (((172172 210301, 172135 210303, 172096 210308, 172065 210316, 172040 210342, 172028 210376, 172023 210408, 172020 210432, 172021 210448, 172030 210460, 172082 210451,
5	4	3	MULTIPOLYGON (((317635 770725, 317078 770424, 316659 769938, 316887 769352, 317164 769174, 317194 768925, 317061 768533, 316881 768443, 316694 768097, 316592 767925, 316613 767685,
6	5	4	MULTIPOLYGON (((249830 73470, 249590 73690, 249483 73958, 249790 74040, 249933 74122, 250000 74160, 250204 74549, 250000 74950, 249900 74890, 249900 74990, 249910 75060, 250000 75150
7	13	12	MULTIPOLYGON (((200000 204173, 199787 204312, 199673 204391, 199567 204453, 199436 204497, 199418 204567, 199401 204620, 199365 204655, 199295 204699, 199312 204779, 199328 204967,
8	14	13	MULTIPOLYGON (((174620 208864, 174514 208914, 174430 208960, 174414 208994, 174421 209032, 174452 209113, 174495 209169, 174551 209225, 174588 209262, 174607 209268, 174719 209162,
9	15	14	MULTIPOLYGON (((170429 222401, 170490 222430, 170535 222479, 170559 222442, 170555 222326, 170558 222261, 170498 222263, 170460 222240, 170450 222251, 170410 222260, 170429 222401))
10	16	15	MULTIPOLYGON (((170313 222120, 170278 222015, 170270 221910, 170180 221850, 170102 221882, 170000 221680, 169892 221745, 169990 221930, 170102 222014, 170064 222155, 170163 222133,
11	6	5	MULTIPOLYGON (((300000 132806, 299600 132600, 299700 132450, 299710 132170, 299690 132030, 299620 131680, 299510 131310, 299320 130910, 299290 130820, 299360 130760, 299520 130710,
12	7	6	MULTIPOLYGON (((209870 700000, 209940 700330, 210090 700570, 210190 700720, 210460 700790, 210660 700860, 210679 700872, 210903 701006, 210910 701010, 210921 701026, 211000 701140,
13	17	16	MULTIPOLYGON (((166520 225380, 166580 225490, 166608 225541, 166684 225572, 166775 225587, 166852 225557, 166852 225481, 166806 225420, 166730 225389, 166520 225380)))
14	35	34	MULTIPOLYGON (((172782 222896, 172764 222896, 172753 222929, 172743 222954, 172717 222965, 172695 222947, 172670 222914, 172652 222914, 172645 222936, 172659 222979, 172674 223012,
15	36	35	MULTIPOLYGON (((184320 203750, 184390 203840, 184510 203830, 184500 203720, 184420 203720, 184320 203750)))
16	37	36	MULTIPOLYGON (((259611 300000, 259763 300398, 259672 300761, 259741 301385, 259544 301575, 258844 301994, 258706 301896, 258628 301666, 258421 302774, 258312 302883, 258113 303017,

Fid dla lake_district znalazłam na podstawie:

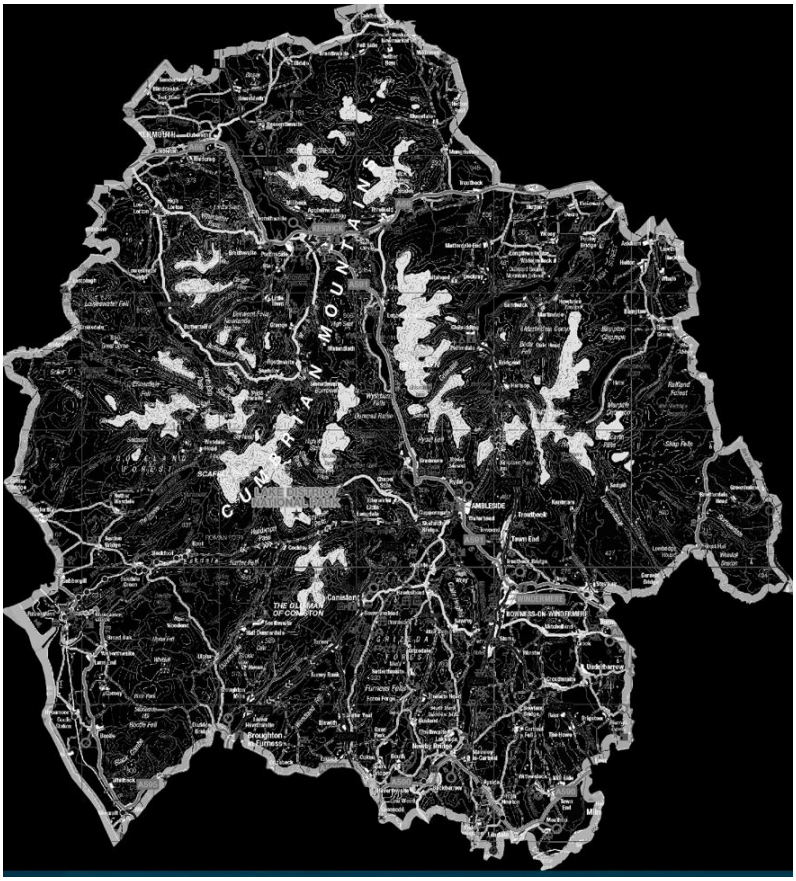
```sql
SELECT * FROM national_parks np;

SELECT UpdateGeometrySRID('national_parks','geom',4277);

CREATE TABLE uk_lake_district AS
SELECT a.rid,ST_Clip(a.rast, b.geom,true) as rast
FROM raster.uk_250k AS a, national_parks AS b
where b.gid = 1 and ST_Intersects(b.geom,a.rast);
```

```sql
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 uk_lake_district;

SELECT lo_export(loid, 'C:\bazy_przestrzenne\zadanie7.tif')
FROM tmp_out;

SELECT lo_unlink(loid)
FROM tmp_out; --> Delete the large object.
```

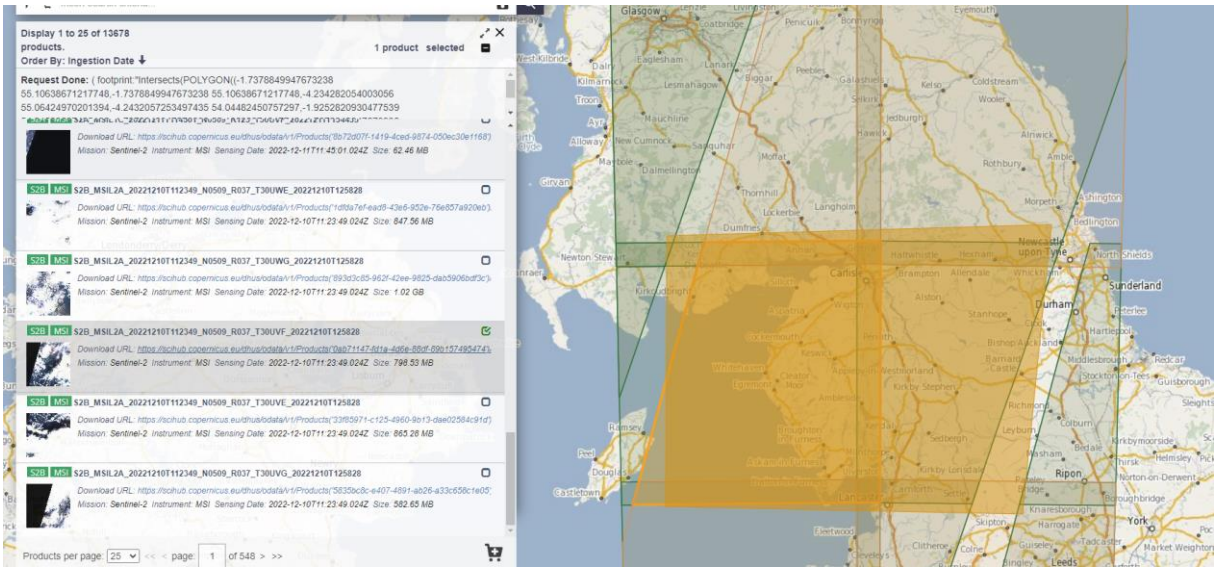
Results 1

SELECT lo_unlink(loid) FROM tmp_out; Enter a SQL expression to filter results (use Ctrl+Space)

	lo_unlink
1	1



Zad. 8,9,10,11



raster2pgsql.exe -s 4277 -N -32767 -t 100x100 -I -C -M -d C:\bazy_przestrzenne\sentinel.jp2 raster.sentinel | psql -d cwi7 -h localhost -U postgres -p 5433

```
SELECT * FROM raster.sentinel;
```

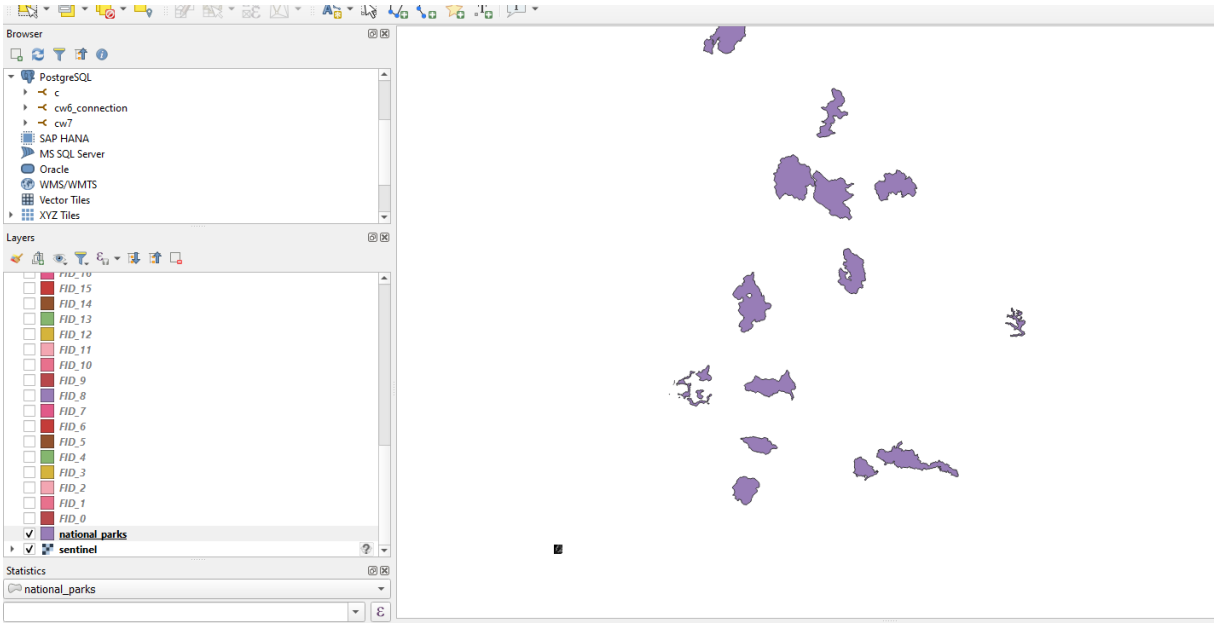
sentinel 1

SELECT * FROM raster.sentinel | Enter a SQL expression to filter results (use Ctrl+Space)

	rid	rast
1	1	0100000100000000000000024400000000000024C000000000E09B1A4100000000D4557410000000000000000000000000000000B5100000640064004600000
2	2	0100000100000000000000024400000000000024C00000000080AB1A4100000000D4557410000000000000000000000000000000B5100000640064004600000
3	3	0100000100000000000000024400000000000024C00000000020BB1A4100000000D4557410000000000000000000000000000000B5100000640064004600000
4	4	0100000100000000000000024400000000000024C00000000C0CA1A4100000000D4557410000000000000000000000000000000B5100000640064004600005
5	5	0100000100000000000000024400000000000024C00000000060DA1A4100000000D4557410000000000000000000000000000000B5100000640064004600000
6	6	0100000100000000000000024400000000000024C00000000000EA1A4100000000D4557410000000000000000000000000000000B5100000640064004600000
7	7	0100000100000000000000024400000000000024C000000000A0F91A4100000000D4557410000000000000000000000000000000B5100000640064004600002
8	8	0100000100000000000000024400000000000024C0000000040091B4100000000D4557410000000000000000000000000000000B5100000640064004600000
9	9	0100000100000000000000024400000000000024C000000000E0181B4100000000D4557410000000000000000000000000000000B5100000640064004600000
10	10	0100000100000000000000024400000000000024C00000000080281B4100000000D4557410000000000000000000000000000000B5100000640064004600002
11	11	0100000100000000000000024400000000000024C00000000020381B4100000000D4557410000000000000000000000000000000B5100000640064004600004
12	12	0100000100000000000000024400000000000024C000000000C0471B4100000000D4557410000000000000000000000000000000B5100000640064004600001

```sql
SELECT * FROM raster.sentinel;


CREATE INDEX idx_rast_sentinel_gist ON raster.sentinel
USING gist (ST_ConvexHull(rast));

SELECT AddRasterConstraints('raster'::name,
'sentinel'::name,'rast'::name);


CREATE OR REPLACE FUNCTION NDVI(
value double precision [] [] [],
pos integer [][],
VARIADIC userargs text []
)
RETURNS double precision AS
$$
BEGIN

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 NDVI_2 AS
WITH r AS (
SELECT * FROM raster.sentinel
)
SELECT
r.rid,ST_MapAlgebra(
r.rast, ARRAY[1,4],
'NDVI(double precision[],
integer[],text[])'::regprocedure, --> This is the function!
'32BF'::text
) AS rast
FROM r;

SELECT * FROM NDVI_2;
```

```sql
SELECT * FROM NDVI_2;


CREATE TABLE uk_lake_district_sentinel AS
SELECT a.rid, ST_Clip(a.rast,b.geom,true) AS rast
FROM NDVI_2 AS a, national_parks AS b
WHERE b.gid=1 AND ST_Intersects(b.geom,a.rast);

SELECT * FROM uk_lake_district_sentinel;

DROP TABLE tmp_out2;

CREATE TABLE tmp_out2 AS
SELECT lo_from_bytea(0,
ST_AsGDALRaster(ST_Union(rast), 'GTiff', ARRAY['COMPRESS=DEFLATE',
'PREDICTOR=2', 'PZLEVEL=9'])
) AS loid
FROM uk_lake_district_sentinel;

SELECT lo_export(loid, 'C:\bazy_przestrzenne\zadanie11.tiff')
FROM tmp_out2;

SELECT lo_unlink(loid)
FROM tmp_out2; --> Delete the large object.
```



Po przycięciu brak wyników mimo, że mam te same układy współrzędnych. W lewym dolnym rogu – warstwa sentinel.