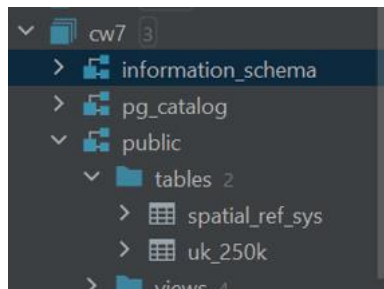


```
--1
create database cw7;
create extension postgis;
create extension postgis_raster;
```

```
--2
-- Przy próbie realizacji zadania na całym zbiorze pojawiały się błędy ->
-- wybrano 5 plików
raster2pgsql.exe -s 3763 -N -32767 -t 100x100 -I -C -M -d
C:/Users/oliwi/Downloads/ras250_gb/ras250_gb/data/*.tif uk_250k | psql -d
cw7 -h localhost -U postgres -p 5432
```



```
create index idx_rast_gist on uk_250k
using gist(ST_ConvexHull(rast));

select AddRasterConstraints('public'::name,
'uk_250k'::name, 'rast'::name);
```

--3

```
create table uk_250k_union as
select st_union(rast)
from uk_250k;

alter table uk_250k_union
add column rid serial primary key;

create index idx_rast_gist_union on uk_250k_union
using gist (ST_ConvexHull(rast));

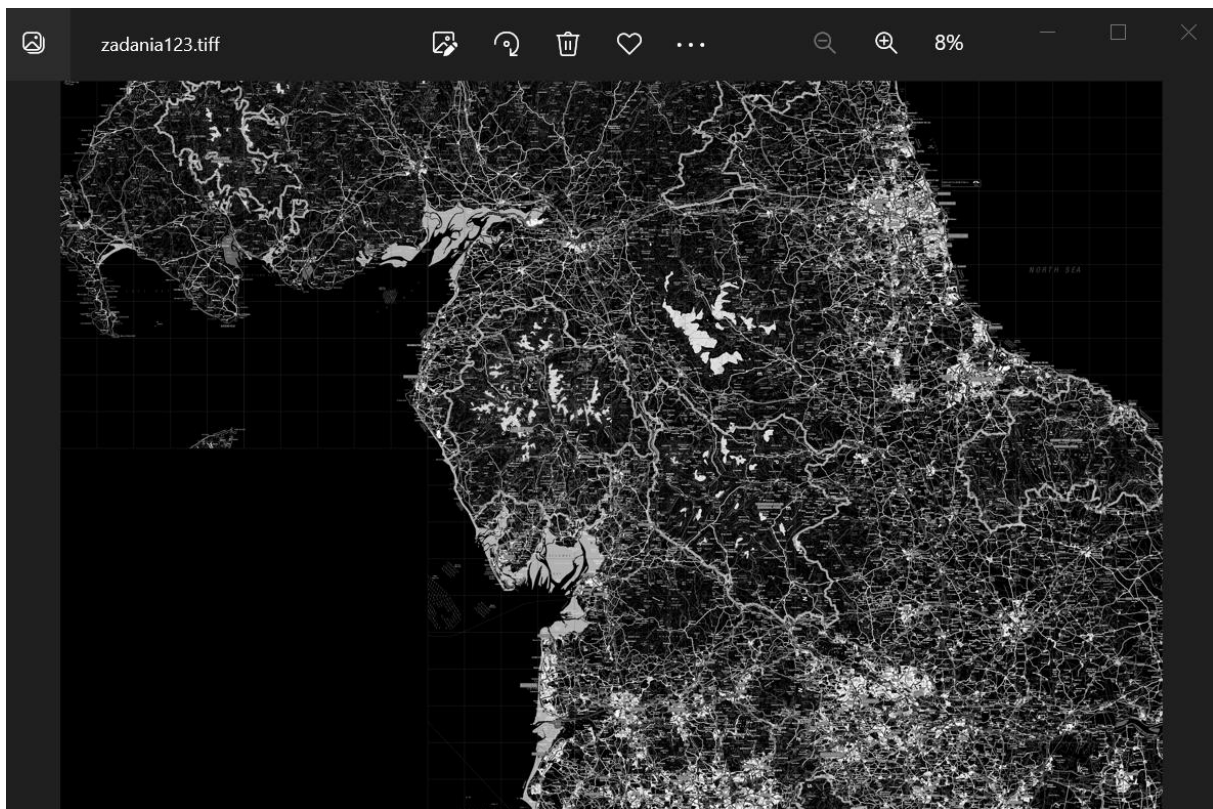
select AddRasterConstraints('public'::name,
'uk_250k_union'::name, 'rast'::name);

select ST_AsGDALRaster(rast, 'GTiff', array['COMPRESS=DEFLATE',
'PREDICTOR=2', 'PZLEVEL=9'])
from uk_250k_union;

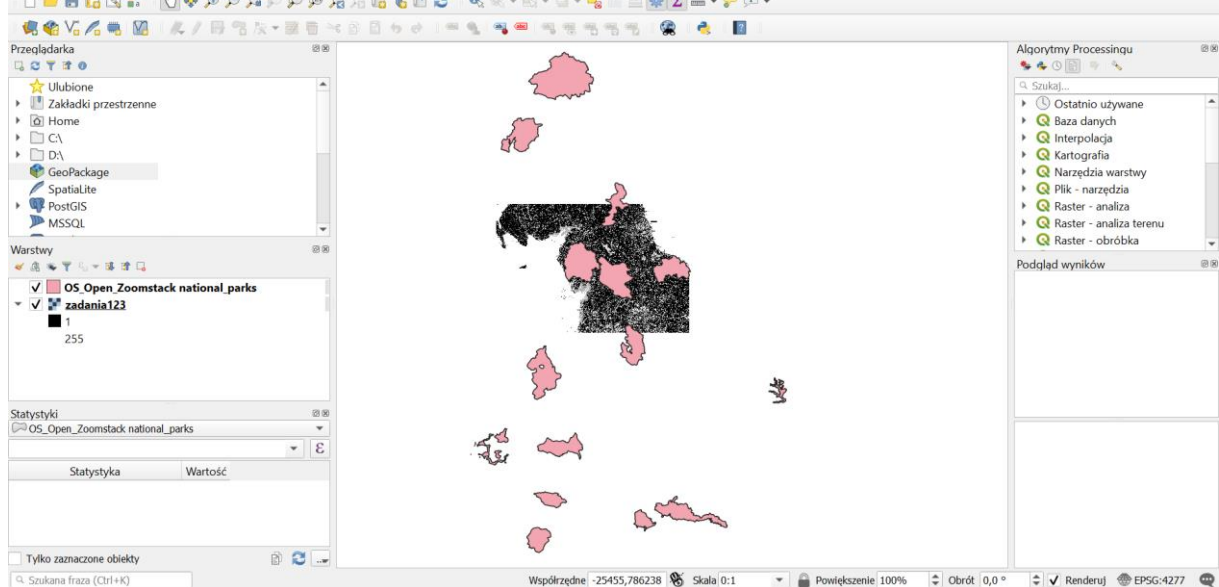
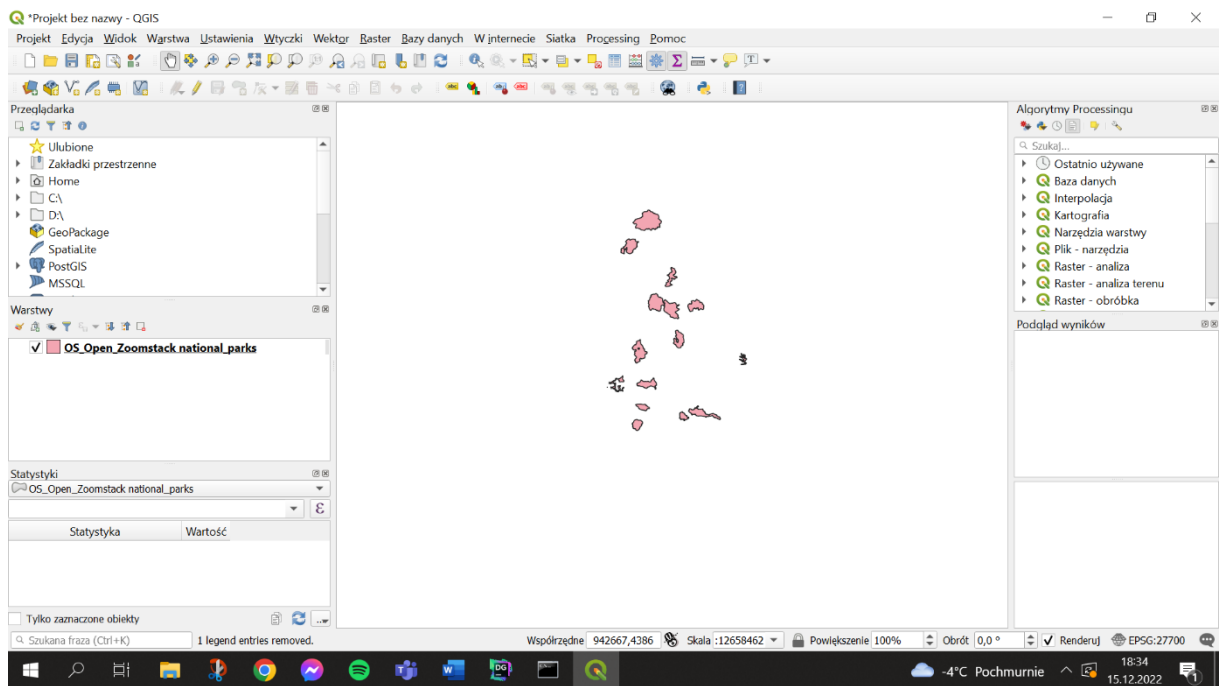
create table tmp AS
select lo_from_bytea(0, ST_AsGDALRaster(ST_Union(rast), 'GTiff',
array['COMPRESS=DEFLATE', 'PREDICTOR=2', 'PZLEVEL=9']))
as loid
from uk_250k_union;

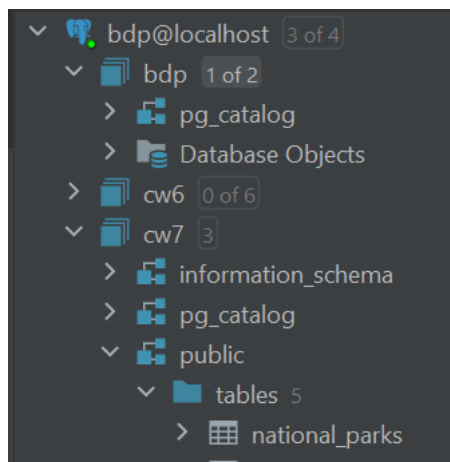
select lo_export(lo_id, 'D:zadania123.tiff')
from tmp;

select lo_unlink(lo_id)
```



-- 5





-- 6

```
select updategeometrysrid('national_parks', 'geom', 4277);
select updaterrastersrid('uk_250k_union', 'rast', 4277);

create table uk_lake_disctrict as
select ST_Union(ST_Clip(a.rast, b.geom, true))
from uk_250k_union as a, national_parks as b
where b.id = 1 and ST_Intersects(b.geom,a.rast);
```

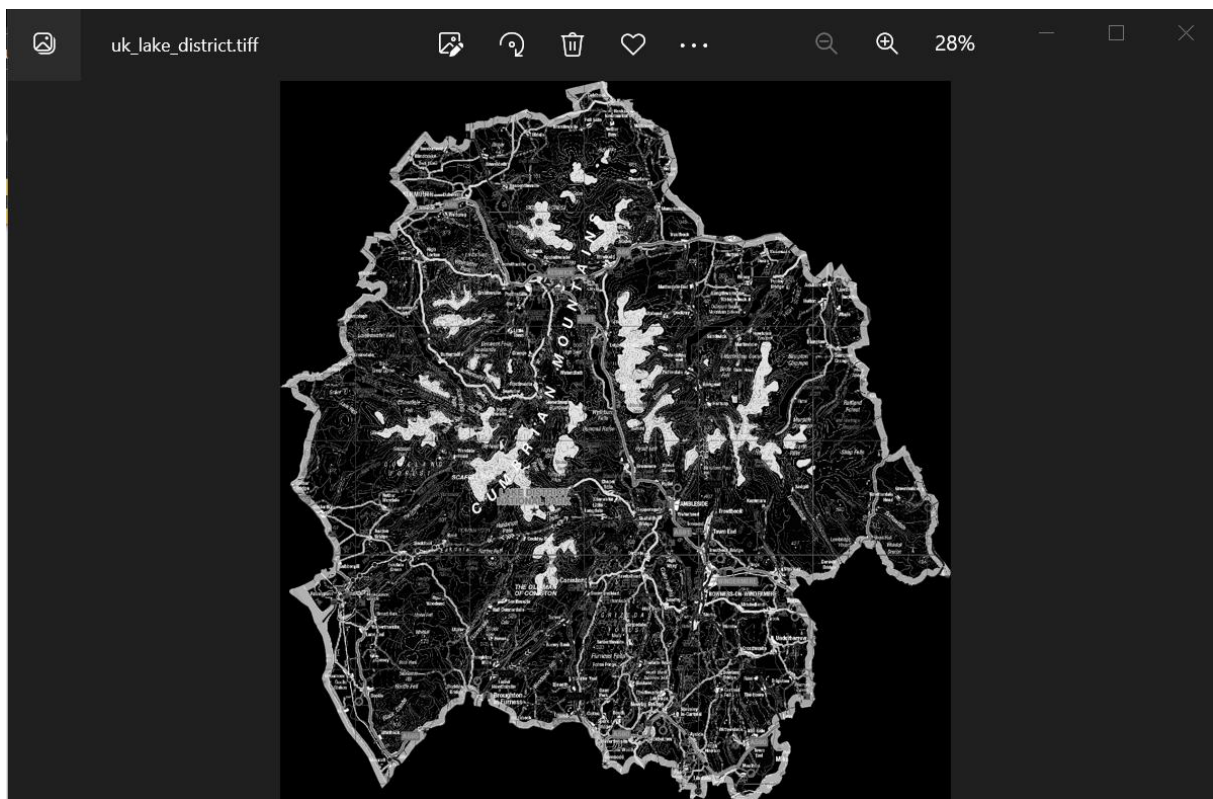


-- 7

```
create table tmp2 as
select lo_from_bytea(0, ST_AsGDALRaster(ST_Union(st_union), 'GTiff',
ARRAY['COMPRESS=DEFLATE', 'PREDICTOR=2', 'PZLEVEL=9'])
) as loid
from uk_lake_disctrict;

select lo_export(loid, 'D:uk_lake_district.tiff')
from tmp2;

select lo_unlink(loid)
from tmp2;
```



-- 8

esa copernicus Copernicus Open Access Hub


Insert search criteria...

London/Derry/Derry


Display 1 to 25 of 30835 products. 0 products selected

Order By: Ingestion Date ↓


Request Done: (footprint: "Intersects(POLYGON((-5.376235592687543 52.65510604148088,-1.365253597338946 52.65510604148088,-1.365253597338946 52.65510604148088,-5.376235592687543 52.65510604148088)))")

S2A MSI S2A_MSIL2A_20221215T112501_N0509_R037_T30UUE_2... 

Download URL: [https://scihub.copernicus.eu/dhus/odata/v1/Products\('S2A_MSIL2A_20221215T112501_N0509_R037_T30UUE_2...'\)/\\$value](https://scihub.copernicus.eu/dhus/odata/v1/Products('S2A_MSIL2A_20221215T112501_N0509_R037_T30UUE_2...')/$value)
Mission: Sentinel-2 Instrument: MSI Sensing Date: 2022-12-15

S2A MSI S2A_MSIL2A_20221215T112501_N0509_R037_T30UWD_... 

Download URL: [https://scihub.copernicus.eu/dhus/odata/v1/Products\('S2A_MSIL2A_20221215T112501_N0509_R037_T30UWD_...'\)/\\$value](https://scihub.copernicus.eu/dhus/odata/v1/Products('S2A_MSIL2A_20221215T112501_N0509_R037_T30UWD_...')/$value)
Mission: Sentinel-2 Instrument: MSI Sensing Date: 2022-12-15

S2A MSI S2A_MSIL2A_20221215T112501_N0509_R037_T30UXE_2... 

Download URL: [https://scihub.copernicus.eu/dhus/odata/v1/Products\('S2A_MSIL2A_20221215T112501_N0509_R037_T30UXE_2...'\)/\\$value](https://scihub.copernicus.eu/dhus/odata/v1/Products('S2A_MSIL2A_20221215T112501_N0509_R037_T30UXE_2...')/$value)
Mission: Sentinel-2 Instrument: MSI Sensing Date: 2022-12-15

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United Kingdom

Newcastle upon Tyne, Sunderland, Durham, Carlisle, Belfast, Lisburn, Ripon, York, Hull, Wakefield, Lincoln, Nottingham, Derby, Lichfield, Leicester, Peterborough, Stoke-on-Trent, Manchester, Sheffield, Leeds, Preston, Lancaster, Liverpool, Bangor, St Asaph, Chester, Limerick.

-- 9

```
raster2pgsql.exe -s 4277 -N -32767 -t 100x100 -I -C -M -d
C:/Users/oliwi/Downloads/satellite.jp2 sentinel | psql -d cw7 -h localhost -
U postgres -p 5432
```

-- 10

```
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 as
    with r as(
        select * from sentinel
    )
select
    r.rid, st_mapalgebra(
        r.rast, array [1, 4],
        'NDVI(double precision[], integer[], text[])::regprocedure,
        '32BF'::text
    ) as rast
from r;

select * from uk_ld_sentinel;

select updaterrastersrid('sentinel', 'rast', 4277);
select st_srid(rast) from sentinel;

create table uk_ld_sentinel as
select a.rid, st_clip(a.rast, b.geom, true) as rast
from ndvi as a, national_parks as b
where b.id=1 and st_intersects(b.geom, a.rast);

```

```

-- 11
create table tmp3 as
select lo_from_bytea(0, ST_AsGDALRaster(ST_Union(rast), 'GTiff',
ARRAY['COMPRESS=DEFLATE', 'PREDICTOR=2', 'PZLEVEL=9'])
) as loid
from uk_ld_sentinel;

select lo_export(loid, 'D:zad11.tiff')
from tmp3;

select lo_unlink(loid)
from tmp3;

```