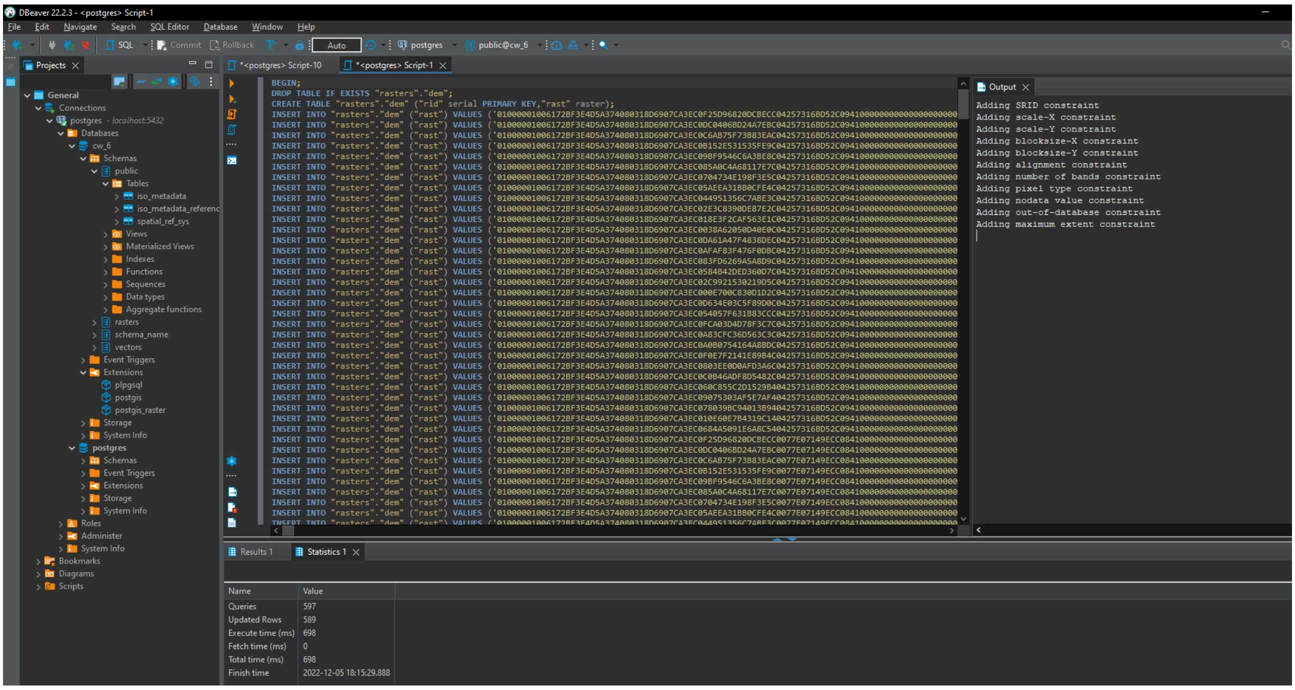
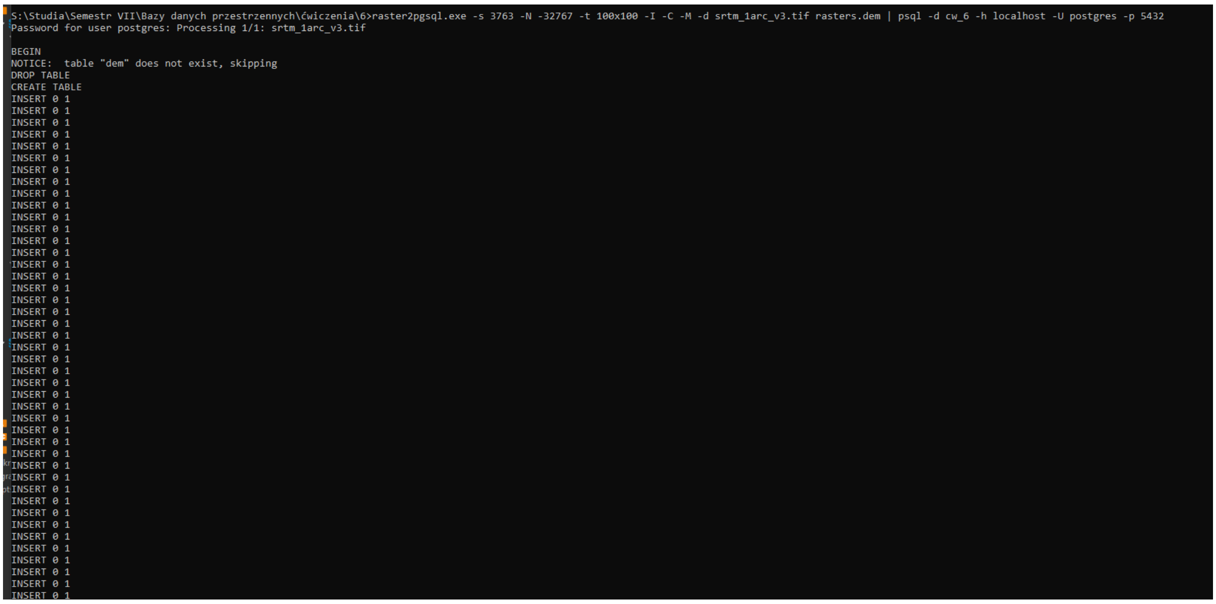
Ładowanie danych rastrowych

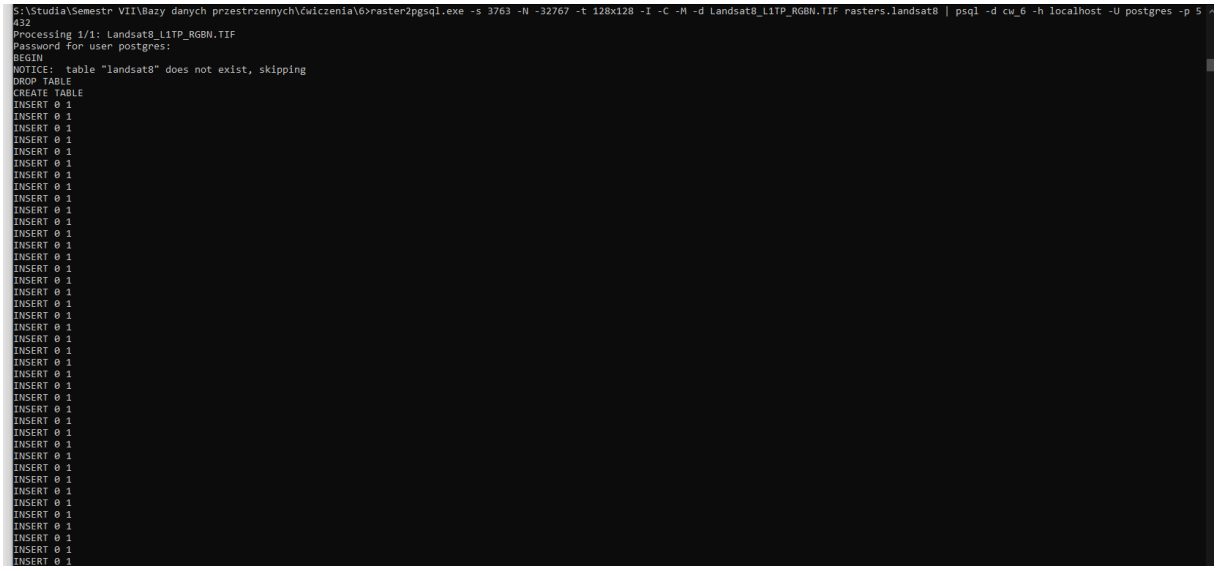
Przykład 1



Przykład 2

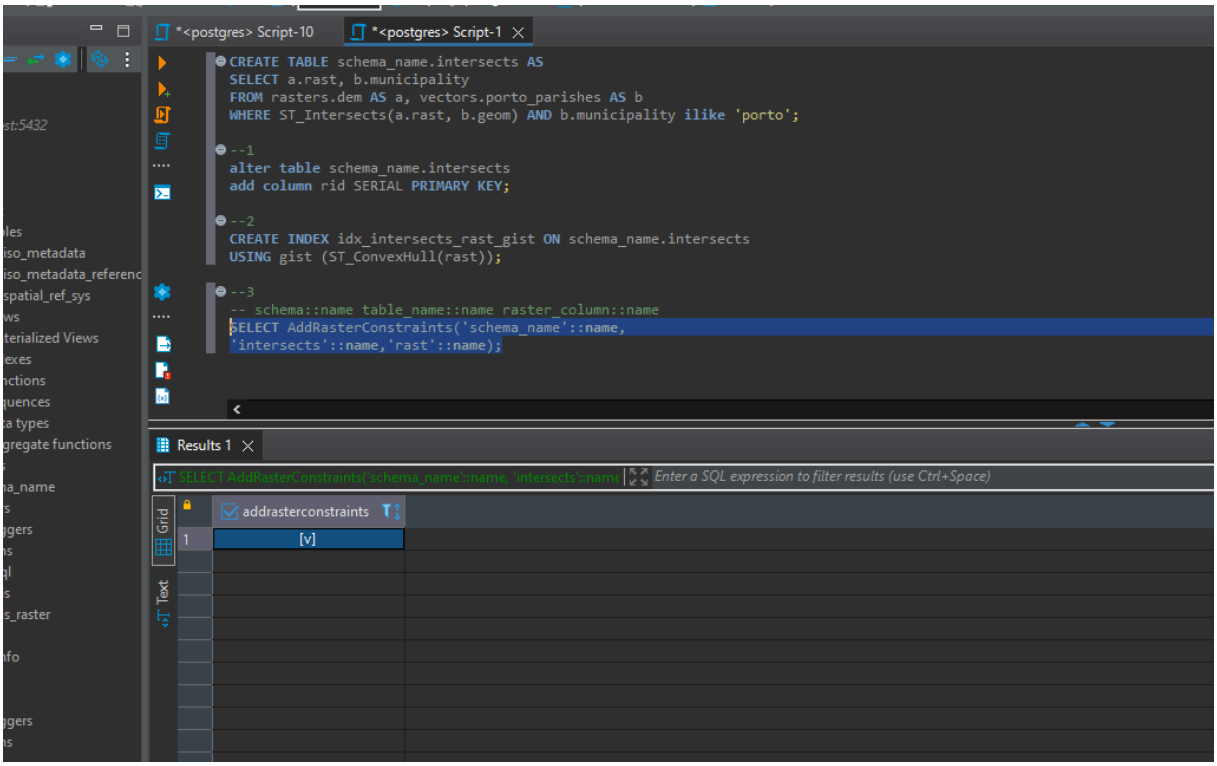


Przykład 3

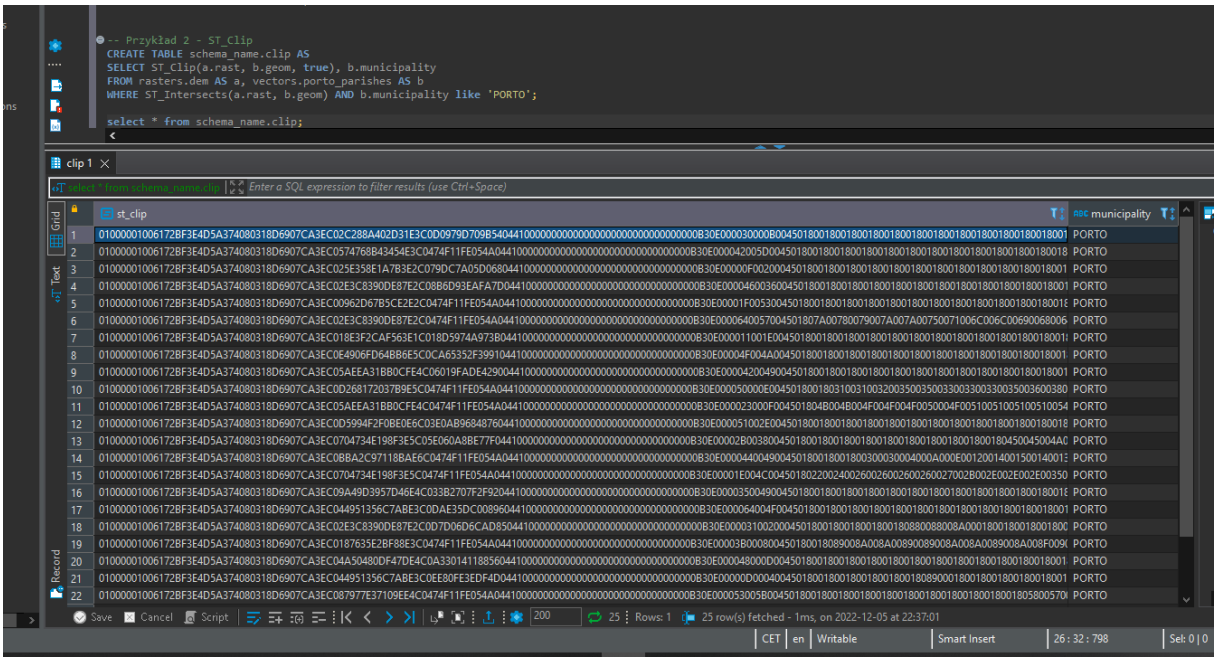


Tworzenie rastrów z istniejących rastrów i interakcja z wektorami

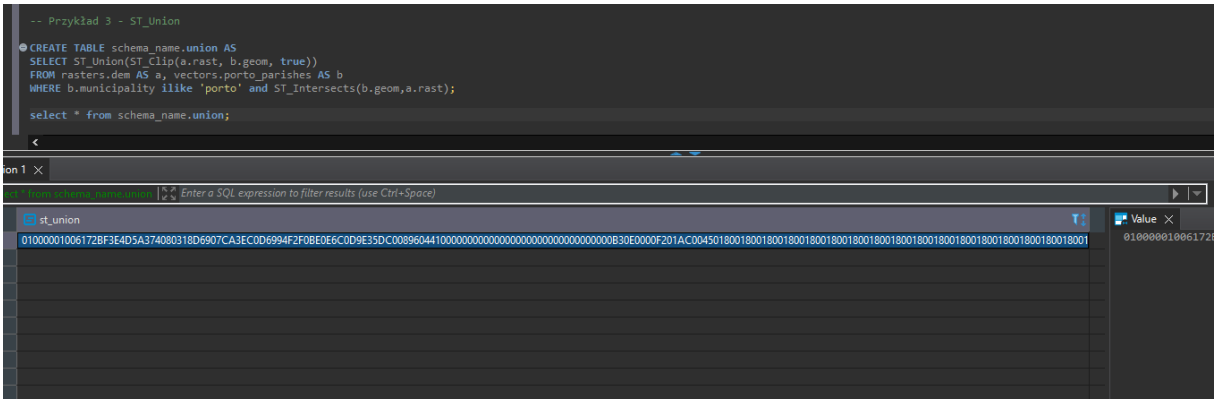
Przykład 1 - ST_Intersects



Przykład 2 - ST_Clip

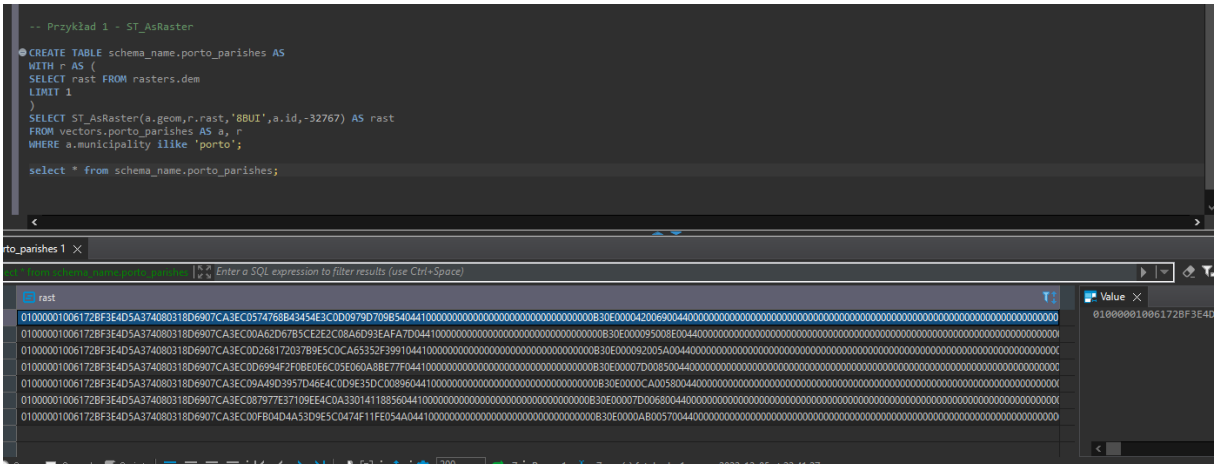


Przykład 3 - ST_Union

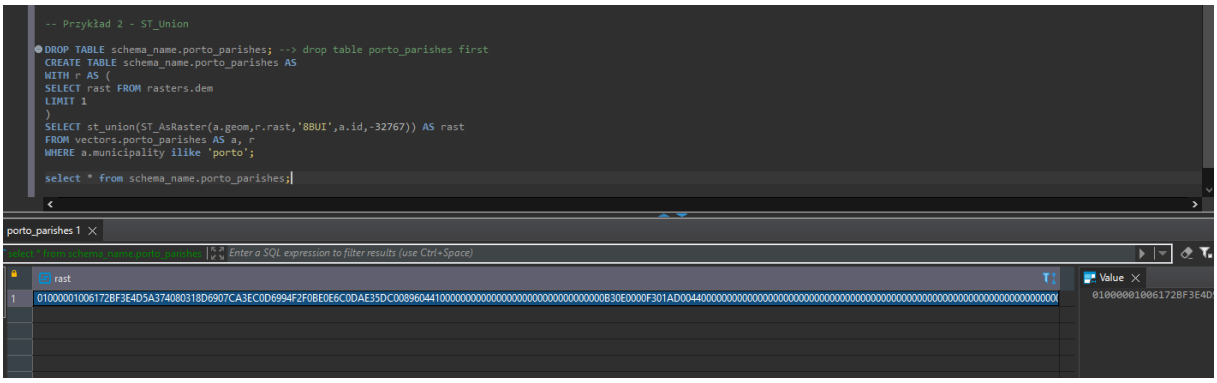


Tworzenie rastrów z wektorów (rastrowanie)

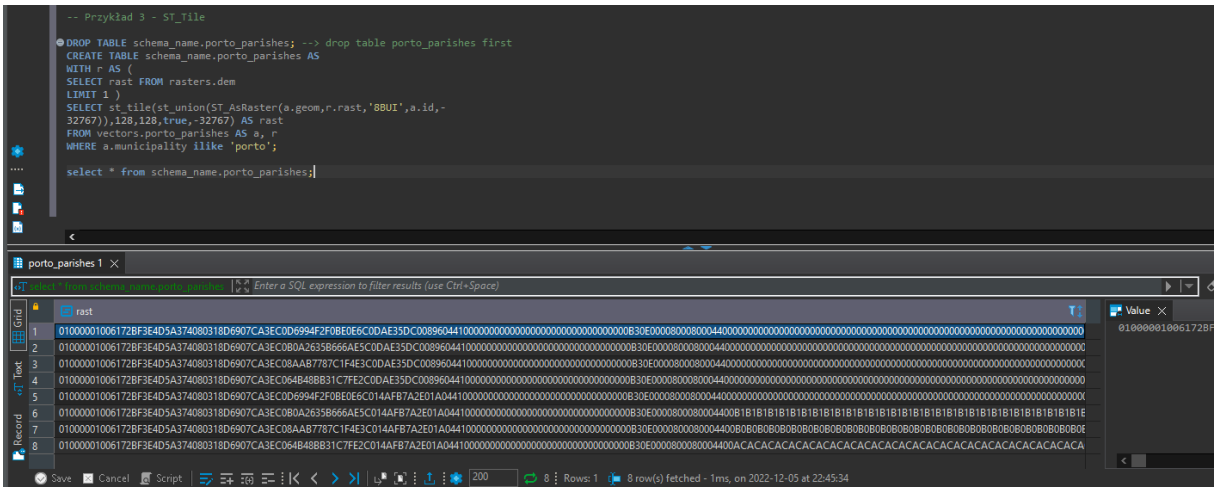
Przykład 1 - ST_AsRaster



Przykład 2 - ST_Union

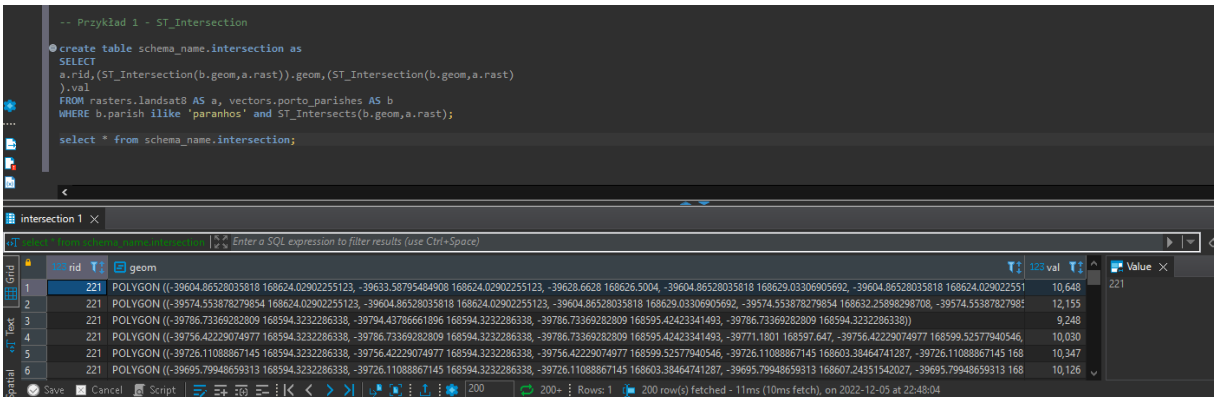


Przykład 3 - ST_Tile

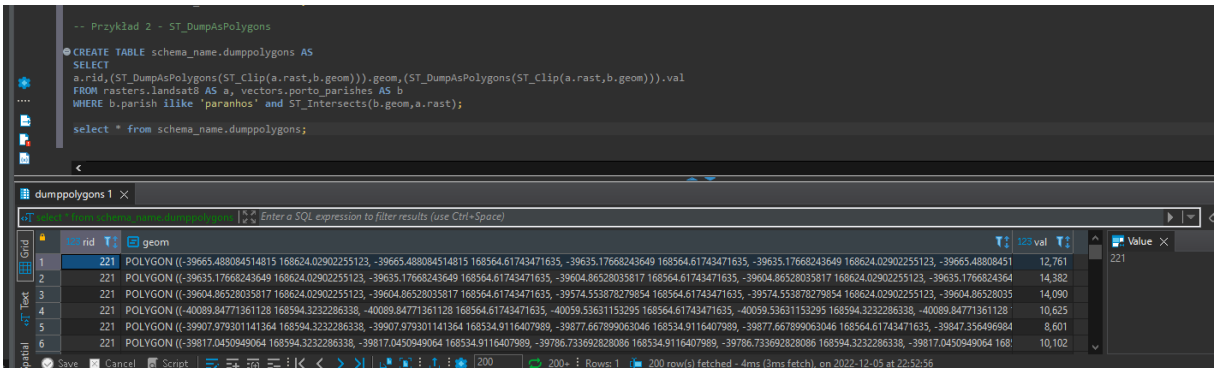


Konwertowanie rastrów na wektory (wektoryzowanie)

Przykład 1 - ST_Intersection

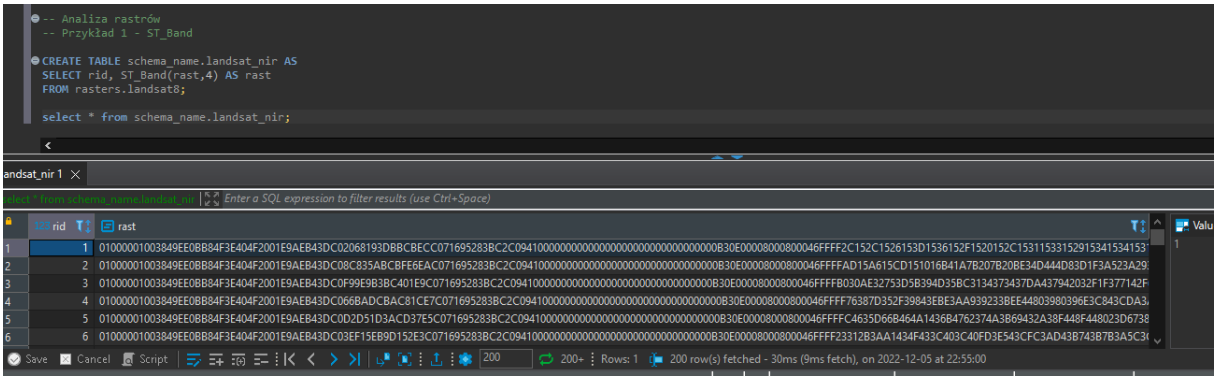


Przykład 2 - ST_DumpAsPolygons

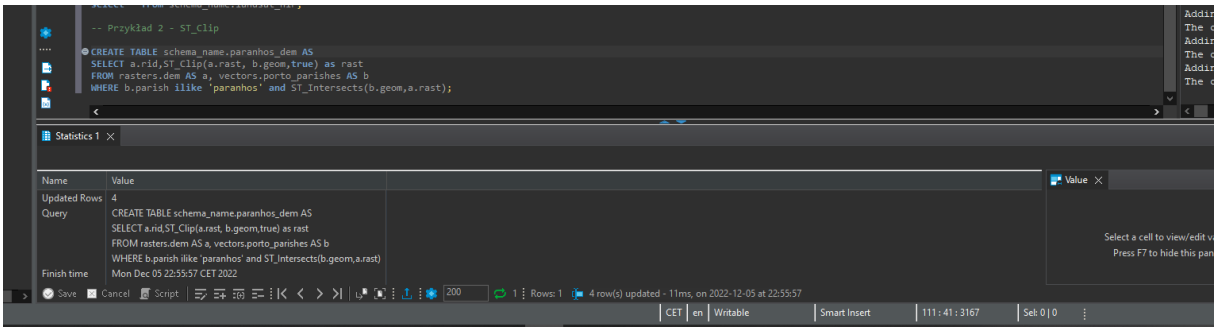


Analiza rastrów

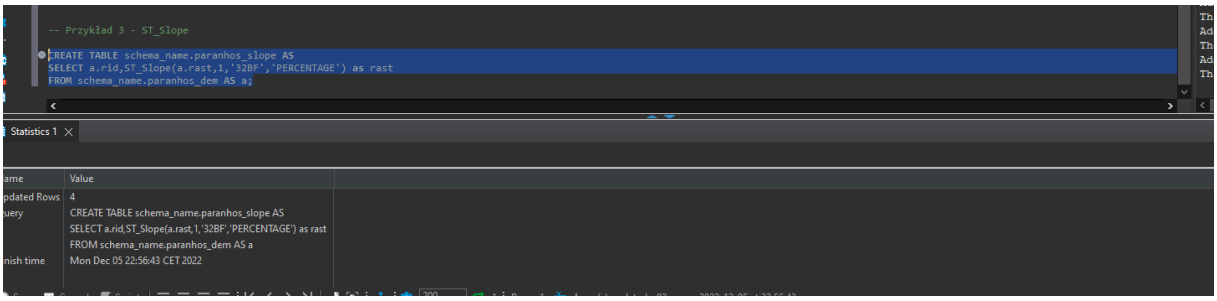
Przykład 1 - ST_Band



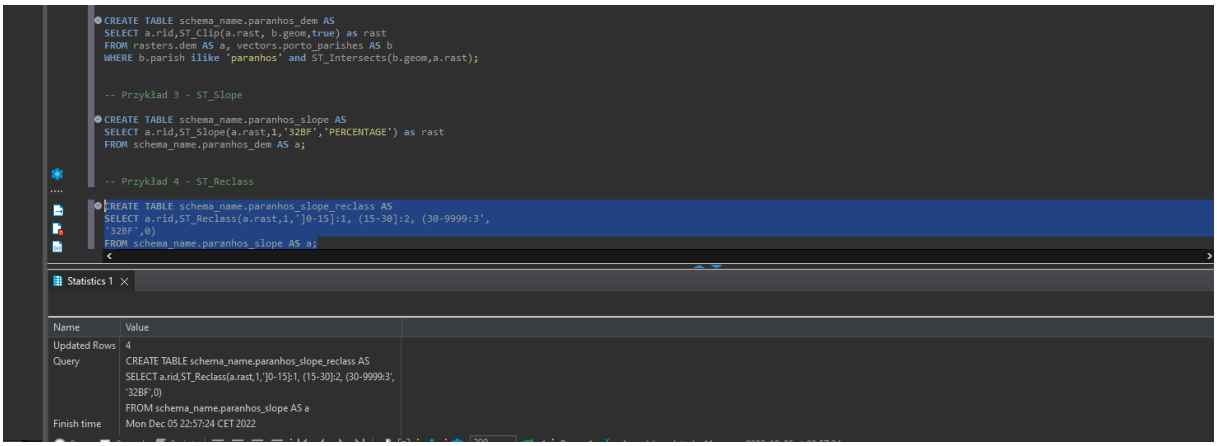
Przykład 2 - ST_Clip



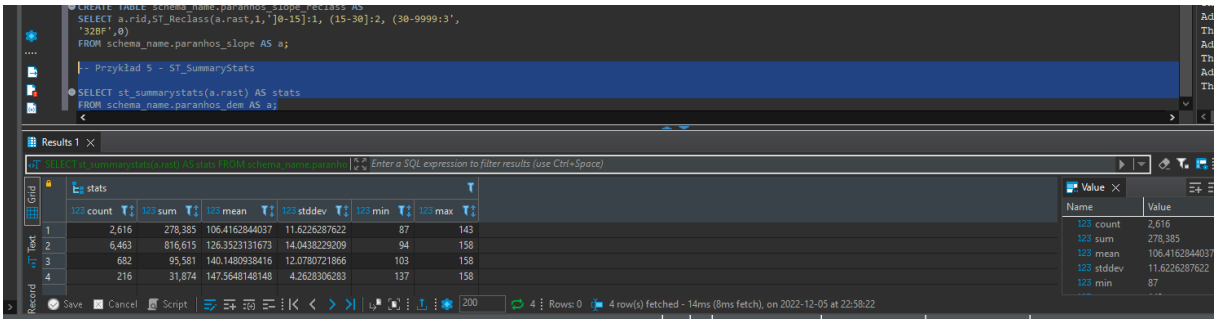
Przykład 3 - ST_Slope



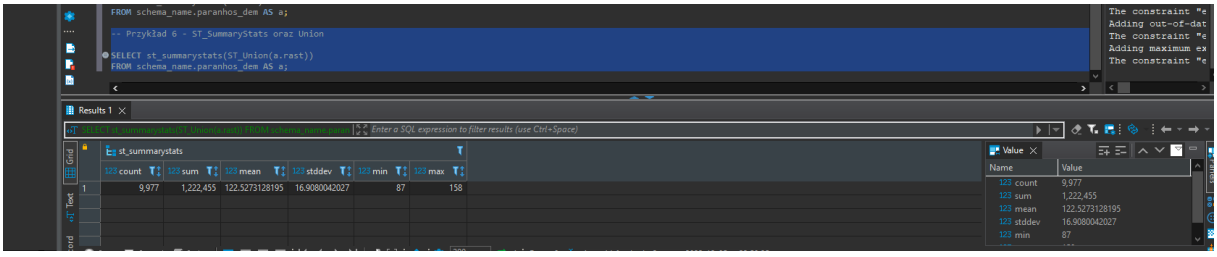
Przykład 4 - ST_Reclass



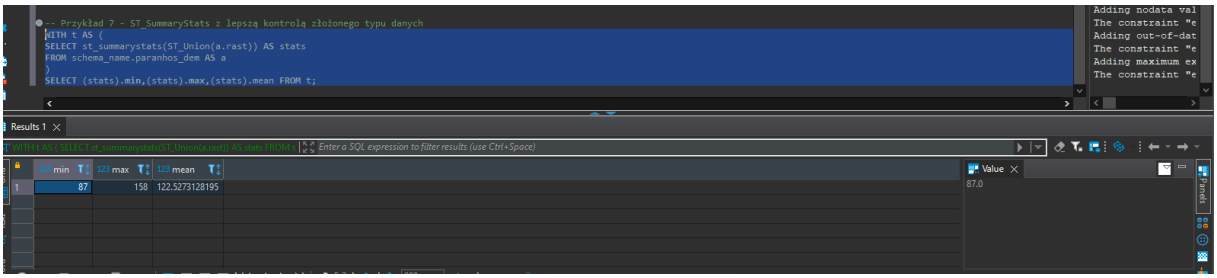
Przykład 5 - ST_SummaryStats



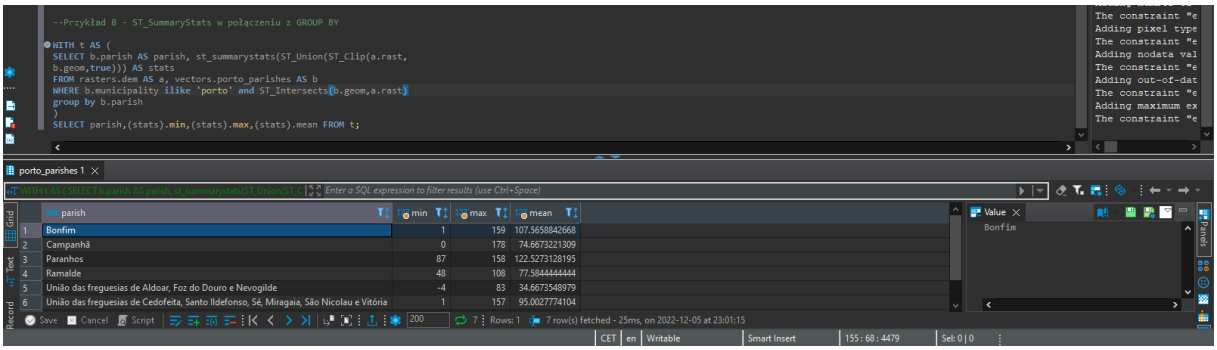
Przykład 6 - ST_SummaryStats oraz Union Przy użyciu UNION



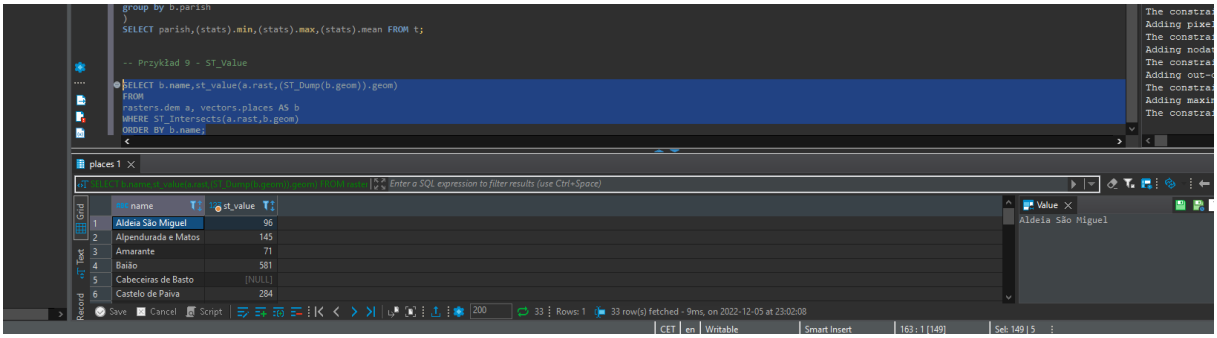
Przykład 7 - ST_SummaryStats z lepszą kontrolą złożonego typu danych



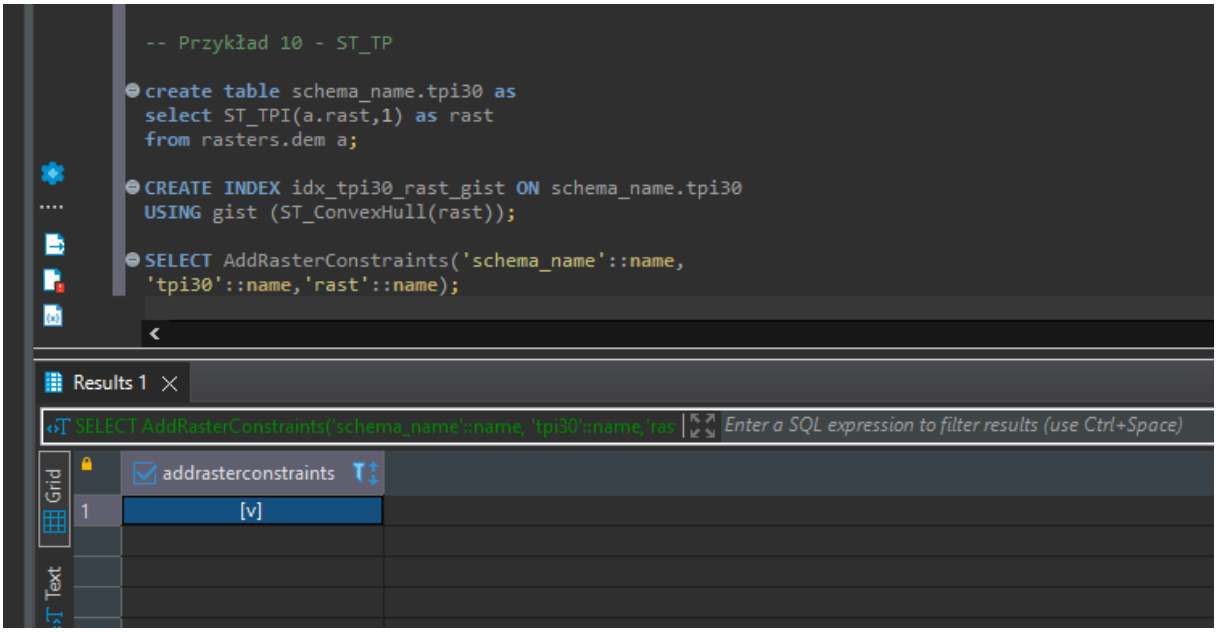
Przykład 8 - ST_SummaryStats w połączeniu z GROUP BY



Przykład 9 - ST_Value

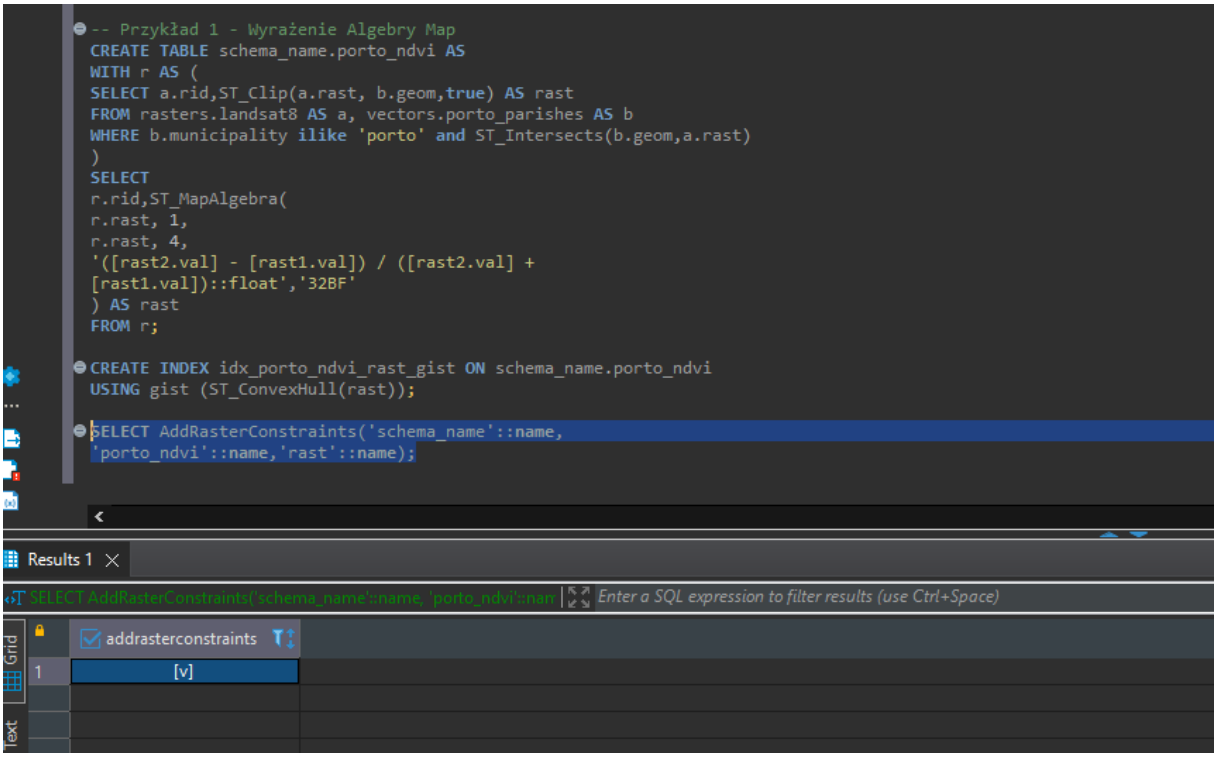


Przykład 10 - ST_TPI

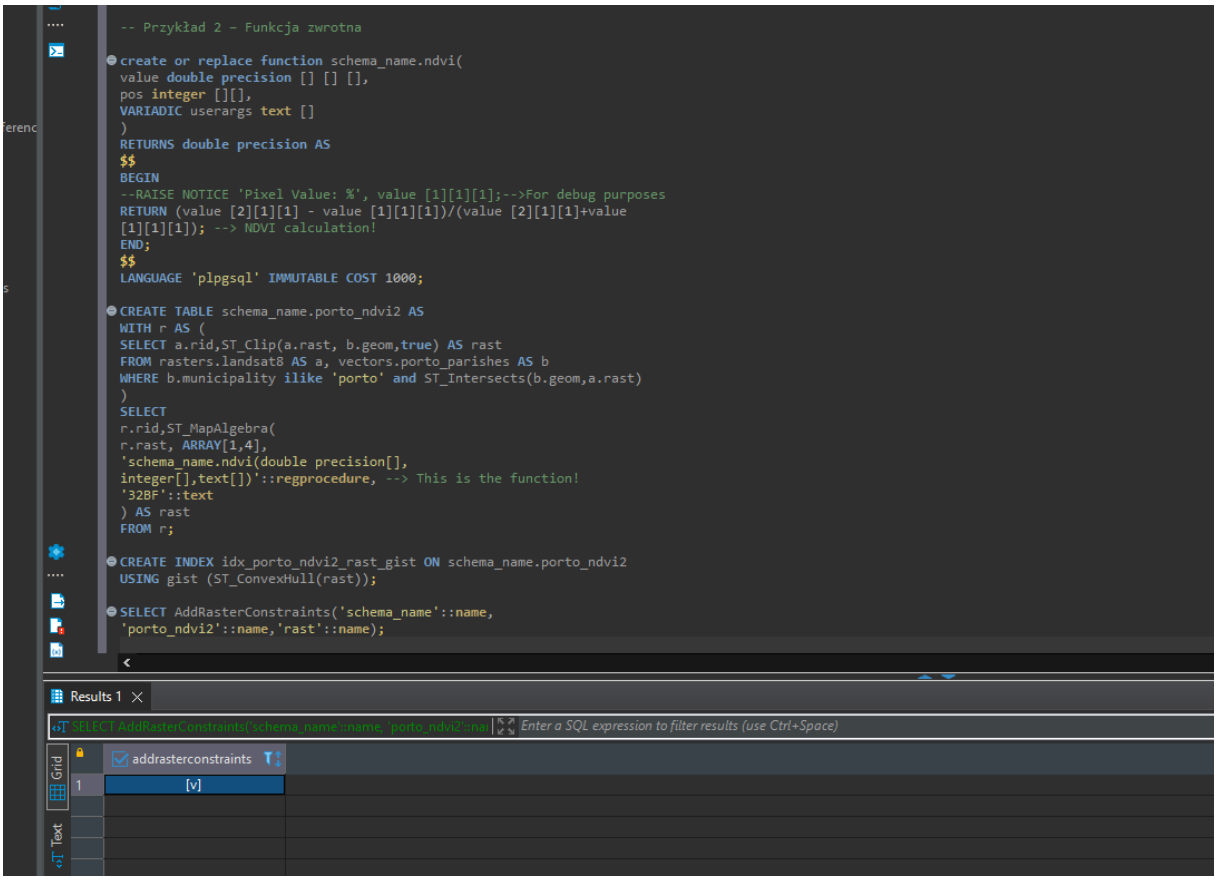


Algebra map

Przykład 1 - Wyrażenie Algebry Map



Przykład 2 – Funkcja zwrotna

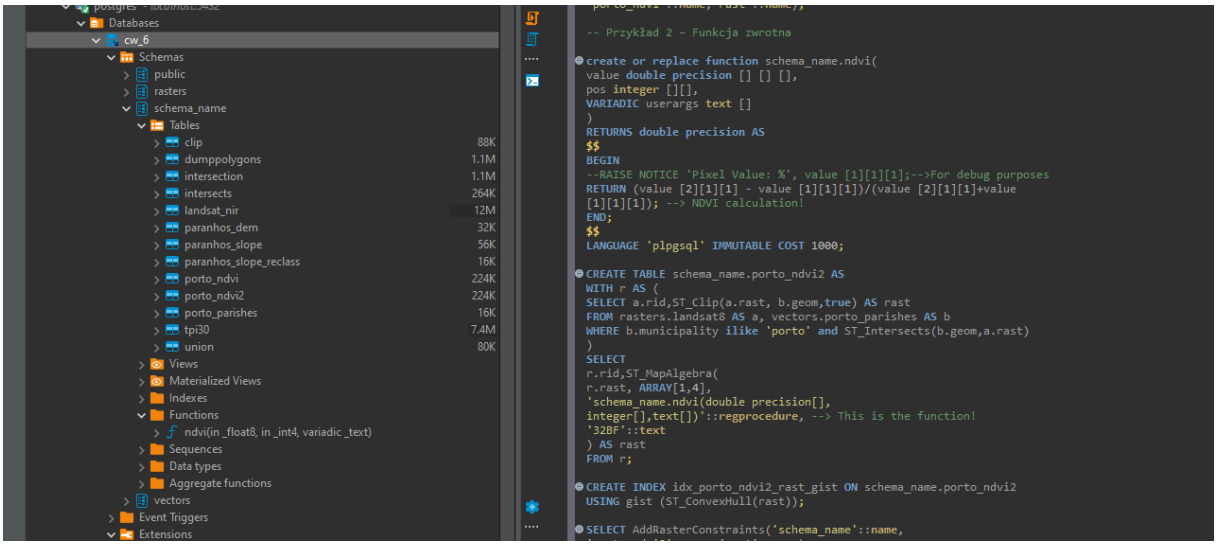


```
-- Przykład 2 – Funkcja zwrotna

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

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

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

Results 1

Enter a SQL expression to filter results (use Ctrl+Space)

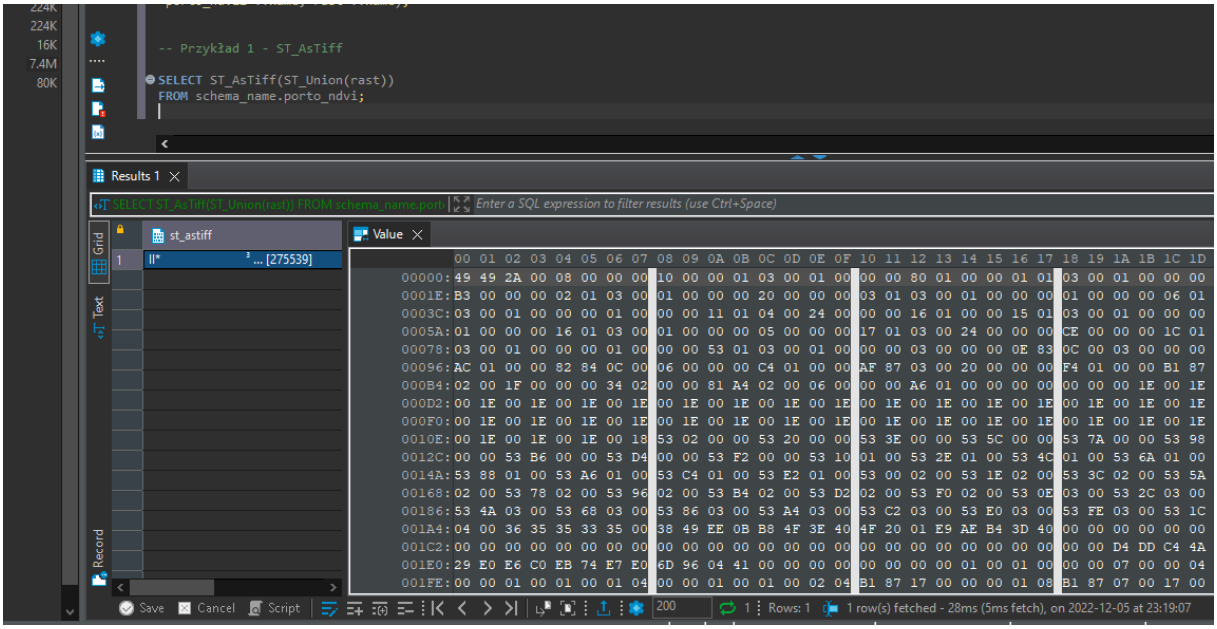
	addrasterconstraints
1	[v]



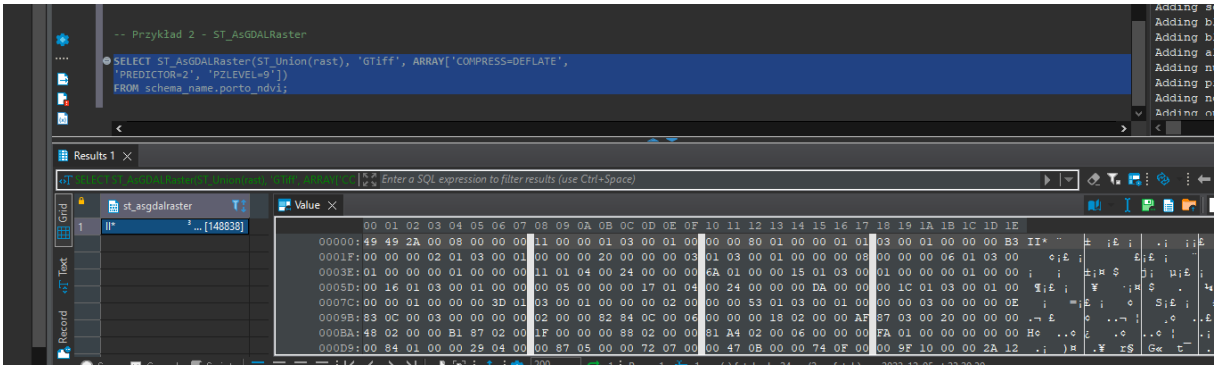

```
-- Przykład 2 – Funkcja zwrotna

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

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

SELECT AddRasterConstraints('schema_name'::name,
```

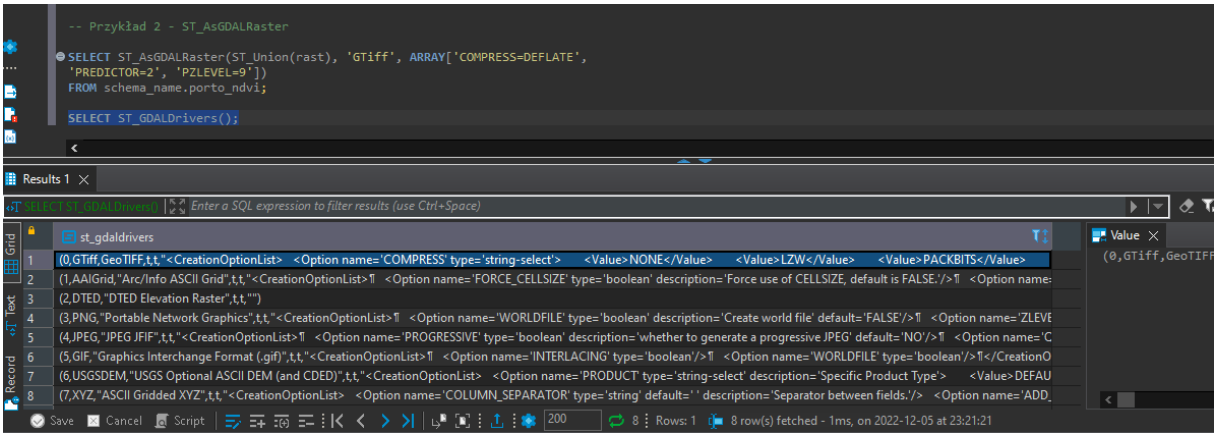
Eksport danych

Przykład 1 - ST_AsTiff

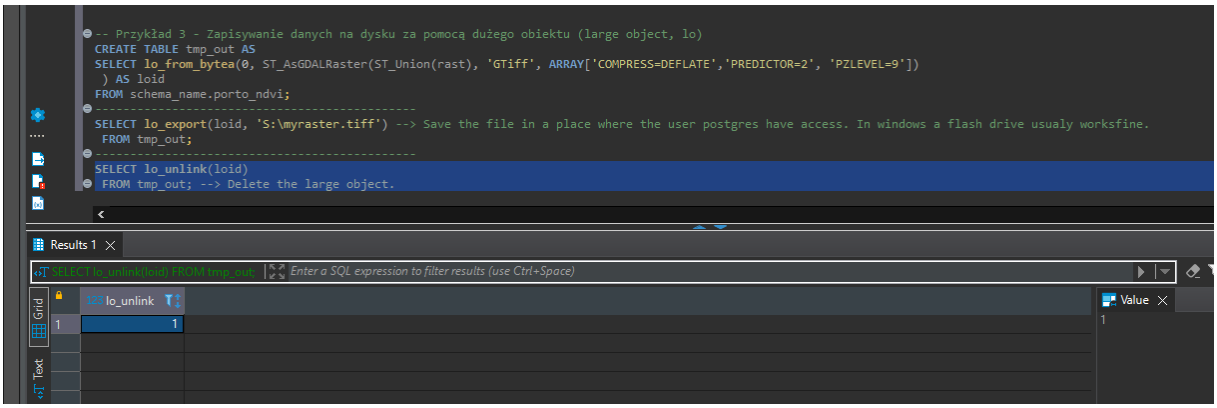


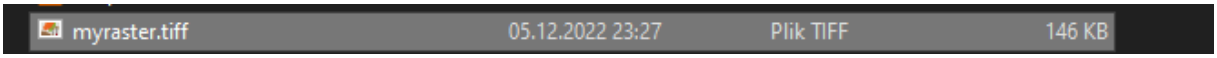
Przykład 2 - ST_AsGDALRaster

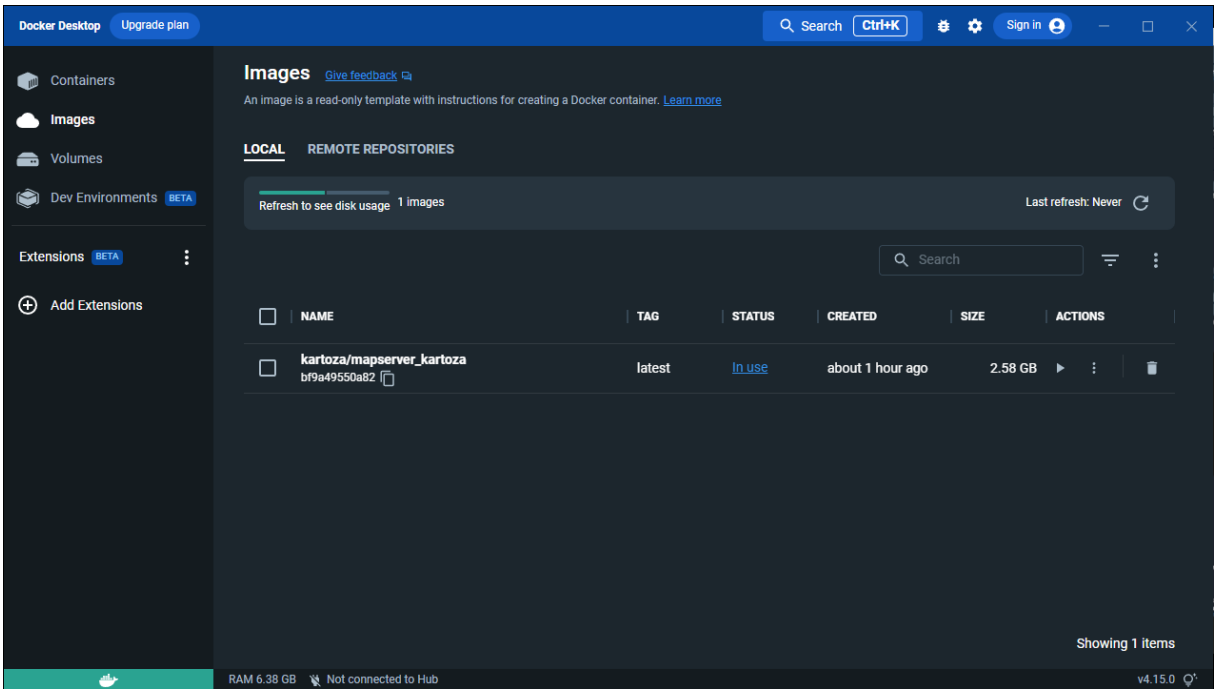




Przykład 3 - Zapisywanie danych na dysku za pomocą dużego obiektu (large object, lo)







```
┌──(wiktor㉿ DESKTOP-LHSFLGB)-[~]
└─$ sudo apt-get update
[sudo] password for wiktor:
Get:1 http://kali.koyanet.lv/kali kali-rolling InRelease [30.6 kB]
Get:2 http://kali.koyanet.lv/kali kali-rolling/main amd64 Packages [18.8 MB]
Get:3 http://kali.koyanet.lv/kali kali-rolling/non-free amd64 Packages [237 kB]
Get:4 http://kali.koyanet.lv/kali kali-rolling/contrib amd64 Packages [114 kB]
Fetched 19.2 MB in 7s (2,858 kB/s)
Reading package lists... Done

┌──(wiktor㉿ DESKTOP-LHSFLGB)-[~]
└─$ sudo apt-get install git-all
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  apache2 apache2-bin apache2-data apache2-utils bzip2 curl cvs cvsps file fontconfig-config fonts-dejavu-core git
  git-cvs git-doc git-email git-gui git-man git-mediawiki git-svn gitk gitweb libalgorithm-c3-perl libapr1 libaprutil1
  libaprutil1-dbd-sqlite3 libaprutil1-ldap libauthen-sasl-perl libb-hooks-endofscope-perl libb-hooks-op-check-perl
  libbz2-1.0 libc-bin libc-l10n libc6 libcbor0.8 libcgi-fast-perl libcgi-pm-perl libclass-c3-perl libclass-c3-xs-perl
  libclass-data-inheritable-perl libclass-inspector-perl libclass-method-modifiers-perl libclass-singleton-perl
  libclass-xsaccessor-perl libclone-perl libcommon-sense-perl libcurl3-gnutls libcurl4 libdata-dump-perl
  libdata-optlist-perl libdatetime-format-builder-perl libdatetime-format-iso8601-perl
  libdatetime-format-strptime-perl libdatetime-locale-perl libdatetime-perl libdatetime-timezone-perl
  libdbd-sqlite3-perl libdbi-perl libdevel-callchecker-perl libdevel-caller-perl libdevel-lexalias-perl
  libdevel-stacktrace-perl libdigest-bubblebabble-perl libdigest-hmac-perl libdynaloader-functions-perl
  libemail-valid-perl libencode-locale-perl liberror-perl libeval-closure-perl libexception-class-perl libexpat1
  libfcgi-bin libfcgi-perl libfcgi0ldbl libfido2-1 libfile-listing-perl libfile-sharedir-perl libfont-afm-perl
  libfontconfig1 libfreetype6 libgdbm-compat4 libgdbm6 libhtml-form-perl libhtml-format-perl libhtml-parser-perl
  libhtml-tagset-perl libhtml-tree-perl libhttp-cookies-perl libhttp-daemon-perl libhttp-date-perl
  libhttp-message-perl libhttp-negotiate-perl libice6 libio-html-perl libio-socket-ssl-perl libjson-perl
  libjson-xs-perl liblocale-gettext-perl liblua5.3-0 liblwp-mediatypes-perl liblwp-protocol-https-perl liblzma5
  libmagic-mgc libmagic1 libmailtools-perl libmediawiki-api-perl libmodule-implementation-perl libmodule-runtime-perl
  libmro-compat-perl libnamespace-autoclean-perl libnamespace-clean-perl libnet-dns-perl libnet-dns-sec-perl
  libnet-domain-tld-perl libnet-http-perl libnet-libidn2-perl libnet-smtp-ssl-perl libnet-ssleay-perl
  libpackage-stash-perl libpackage-stash-xs-perl libpadwalker-perl libparams-classify-perl libparams-util-perl
  libparams-validate-perl libparams-validationcompiler-perl libperl4-corelibs-perl libperl5.36 libpng16-16
  libreadonly-perl libref-util-perl libref-util-xs-perl libregexp-ipv6-perl librole-tiny-perl libserf-1-1 libsm6
  libspecio-perl libsqlite3-0 libssl3 libsub-exporter-perl libsub-exporter-progressive-perl libsub-identify-perl
  libsub-install-perl libsub-name-perl libsub-quote-perl libsvn-perl libsvn1 libtcl8.6 libterm-readkey-perl
  libtext-charwidth-perl libtext-iconv-perl libtimedate-perl libtk8.6 libtry-tiny-perl libtypes-serialiser-perl
  liburi-perl libutempter0 libutf8proc2 libvariable-magic-perl libwww-perl libwww-robotrules-perl libx11-6 libx11-data
```

```
┌──(wiktor㉿ DESKTOP-LHSFLGB)-[~]
└─$ git clone https://github.com/kartoza/docker-mapserver
Cloning into 'docker-mapserver'...
remote: Enumerating objects: 231, done.
remote: Counting objects: 100% (35/35), done.
remote: Compressing objects: 100% (7/7), done.
remote: Total 231 (delta 28), reused 28 (delta 28), pack-reused 196
Receiving objects: 100% (231/231), 39.95 MiB | 4.97 MiB/s, done.
Resolving deltas: 100% (104/104), done.

┌──(wiktor㉿ DESKTOP-LHSFLGB)-[~]
└─$ ls
docker-mapserver

┌──(wiktor㉿ DESKTOP-LHSFLGB)-[~]
└─$ cd docker-mapserver/

┌──(wiktor㉿ DESKTOP-LHSFLGB)-[~/docker-mapserver]
└─$  docker build -t kartoza/mapserver_kartoza .
[+] Building 0.8s (2/3)
 => [internal] load build definition from Dockerfile                                   0.0s
[+] Building 0.9s (2/3)
 => [internal] load build definition from Dockerfile                                   0.0s
[+] Building 845.2s (27/27) FINISHED
 => [internal] load build definition from Dockerfile                                                     0.0s
 => => transferring dockerfile: 3.43kB                                                                   0.0s
 => [internal] load .dockerignore                                                                        0.0s
 => => transferring context: 2B                                                                          0.0s
 => [internal] load metadata for docker.io/library/ubuntu:focal                                          2.5s
 => [internal] load build context                                                                        0.0s
 => => transferring context: 3.97kB                                                                      0.0s
 => [ 1/22] FROM docker.io/library/ubuntu:focal@sha256:450e066588f42ebe1551f3b1a535034b6aa46cd936fe7f2c6b0d72997ec61dbd   11.2s
 => => resolve docker.io/library/ubuntu:focal@sha256:450e066588f42ebe1551f3b1a535034b6aa46cd936fe7f2c6b0d72997ec61dbd   0.0s
 => => sha256:450e066588f42ebe1551f3b1a535034b6aa46cd936fe7f2c6b0d72997ec61dbd 1.42kB / 1.42kB           0.0s
 => => sha256:b25ef49a40b7797937d0d23eca3b0a41701af6757afca23d504d50826f0b37ce 529B / 529B               0.0s
 => => sha256:680e5dfb52c74a1fbc99c2922c8e25b5736e6cd1a3d9430890d52a4f8f44087a 1.46kB / 1.46kB           0.0s
 => => sha256:eaead16dc43bb8811d4ff450935d607f9ba4baffda4fc110cc402fa43f601d83 28.58MB / 28.58MB         10.7s
 => => extracting sha256:eaead16dc43bb8811d4ff450935d607f9ba4baffda4fc110cc402fa43f601d83                0.3s
 => [ 2/22] RUN apt-get -qq update --fix-missing && apt-get -qq --yes upgrade                            50.2s
 => [ 3/22] RUN DEBIAN_FRONTEND=noninteractive apt-get install -y software-properties-common g++ make cmake wget git  bzip2 apache2 curl apache2  229.4s
 => [ 4/22] RUN apt-get install -y --fix-missing --no-install-recommends     libxml2-dev     libxslt1-dev     libfribidi-dev     libcairo2-dev   164.0s
 => [ 5/22] RUN apt-get install -y libgdal-dev                                                           87.0s
 => [ 6/22] RUN  apt-get install -y php7.4-fpm libapache2-mod-php7.4 php7.4-common php7.4-cli  php7.4 php7.4  php7.4-opcache  php7.4-gd php7.4-cu  28.6s
 => [ 7/22] ADD resources /tmp/resources                                                                 0.1s
 => [ 8/22] ADD setup.sh /setup.sh                                                                       0.1s
 => [ 9/22] RUN chmod 0755 /setup.sh                                                                     0.4s
 => [10/22] RUN /setup.sh                                                                                256.4s
 => [11/22] RUN cp  /tmp/resources/000-default.conf /etc/apache2/sites-available/                        0.4s
```

```
┌──(wiktor㉿DESKTOP-LHSFLGB)-[~/docker-mapserver]
└─$ sudo docker run -d -p 8182:80 --name mapserver2 kartoza/mapserver_kartoza
[sudo] password for wiktor:
a3c49e81ea498d23924ace593a8e390c3fe1cd93a9466ae38d101c0583670ef9

┌──(wiktor㉿DESKTOP-LHSFLGB)-[~/docker-mapserver]
└─$ sudo docker exec -it mapserver2 /bin/bash
root@a3c49e81ea49:/# mkdir /map && touch /map/dem.map && chown -R root /map && chmod -R 777 /map
root@a3c49e81ea49:/# ls -a
.  ..  .dockerenv  bin  boot  dev  etc  home  lib  lib32  lib64  libx32  map  media  mnt  opt  proc  root  run  sbin  setup.sh  srv  sys  tmp  usr  var
root@a3c49e81ea49:/# ls -la
total 80
drwxr-xr-x   1 root root 4096 Dec  6 13:13 .
drwxr-xr-x   1 root root 4096 Dec  6 13:13 ..
-rwxr-xr-x   1 root root    0 Dec  6 13:08 .dockerenv
lrwxrwxrwx   1 root root    7 Oct 19 16:47 bin -> usr/bin
drwxr-xr-x   2 root root 4096 Apr 15  2020 boot
drwxr-xr-x   5 root root  340 Dec  6 13:08 dev
drwxr-xr-x   1 root root 4096 Dec  6 13:08 etc
drwxr-xr-x   2 root root 4096 Apr 15  2020 home
lrwxrwxrwx   1 root root    7 Oct 19 16:47 lib -> usr/lib
lrwxrwxrwx   1 root root    9 Oct 19 16:47 lib32 -> usr/lib32
lrwxrwxrwx   1 root root    9 Oct 19 16:47 lib64 -> usr/lib64
lrwxrwxrwx   1 root root   10 Oct 19 16:47 libx32 -> usr/libx32
drwxrwxrwx   2 root root 4096 Dec  6 13:13 map
drwxr-xr-x   2 root root 4096 Oct 19 16:47 media
drwxr-xr-x   2 root root 4096 Oct 19 16:47 mnt
drwxr-xr-x   2 root root 4096 Oct 19 16:47 opt
dr-xr-xr-x 308 root root    0 Dec  6 13:08 proc
drwx------   1 root root 4096 Dec  6 11:56 root
drwxr-xr-x   1 root root 4096 Dec  6 11:52 run
lrwxrwxrwx   1 root root    8 Oct 19 16:47 sbin -> usr/sbin
-rwxr-xr-x   1 root root 2407 Dec  6 10:43 setup.sh
drwxr-xr-x   2 root root 4096 Oct 19 16:47 srv
dr-xr-xr-x  11 root root    0 Dec  6 13:08 sys
drwxrwxrwt   1 root root 4096 Dec  6 13:08 tmp
drwxr-xr-x   1 root root 4096 Dec  6 11:47 usr
drwxr-xr-x   1 root root 4096 Dec  6 11:47 var
root@a3c49e81ea49:/# apt-get map
E: Invalid operation map
root@a3c49e81ea49:/# apt-get update
Get:1 http://archive.ubuntu.com/ubuntu focal InRelease [265 kB]
Get:2 http://security.ubuntu.com/ubuntu focal-security InRelease [114 kB]
Get:3 http://archive.ubuntu.com/ubuntu focal-updates InRelease [114 kB]
Get:4 http://archive.ubuntu.com/ubuntu focal-backports InRelease [108 kB]
Get:5 http://archive.ubuntu.com/ubuntu focal/universe amd64 Packages [11.3 MB]
Get:6 http://security.ubuntu.com/ubuntu focal-security/main amd64 Packages [2350 kB]
Get:7 http://security.ubuntu.com/ubuntu focal-security/universe amd64 Packages [972 kB]
```

```
root@a3c49e81ea49:/map# psql postgresql://postgres:[redacted]@host.docker.internal/cw_6
psql (12.12 (Ubuntu 12.12-0ubuntu0.20.04.1), server 14.5)
WARNING: psql major version 12, server major version 14.
         Some psql features might not work.
Type "help" for help.

cw_6=# \dn
    List of schemas
    Name     |  Owner
-------------+----------
 public      | postgres
 rasters     | postgres
 schema_name | postgres
 vectors     | postgres
(4 rows)

cw_6=#
```