GeoExperts
Technische Sessie

LOCALYSE

Google Maps Platform

LOCALYSE

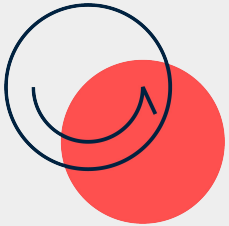
PUT YOUR LOCATION DATA TO WORK

Specialization
Location-Based Services
Google Cloud

Location data to enrich your...

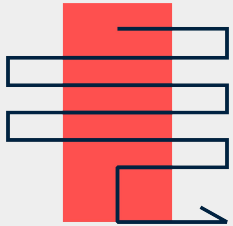
CUSTOMER EXPERIENCE

- Higher conversion rates
- Higher customer engagement
- Frictionless user experience



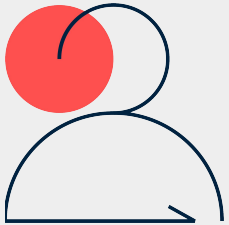
COMPANY PROCESSES

- Automate manual and repetitive tasks
- Raise productivity and efficiency
- Save operational costs
- Motivate your teams



CUSTOMER JOURNEY

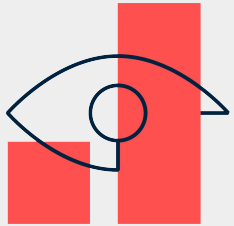
- A better understanding of your target audience
- Better visibility on location-based search activities
- Location-based interactions with your audience
- Increase of sales



BUSINESS INSIGHTS

We'll help you enrich your business strategy via:

- Untapped location data sources
- Real-time actionable insights
- Predictive analytics



OUR OFFERING.

LICENSE MANAGEMENT

- Google Maps
- Google Cloud
- Google Workspace
- Chrome Enterprise
- Tom Tom

SERVICES

- Location strategy
- Inspiration & discovery workshops
- Training
- Onboarding
- Integration & optimisations
- Customer success & support

GEO & LOCATION RELATED PROJECTS

- Data enrichment & visualisation
- Data analytics
- Address verification & validation
- Workforce & planning optimisation
- Geo marketing

SOLUTIONS

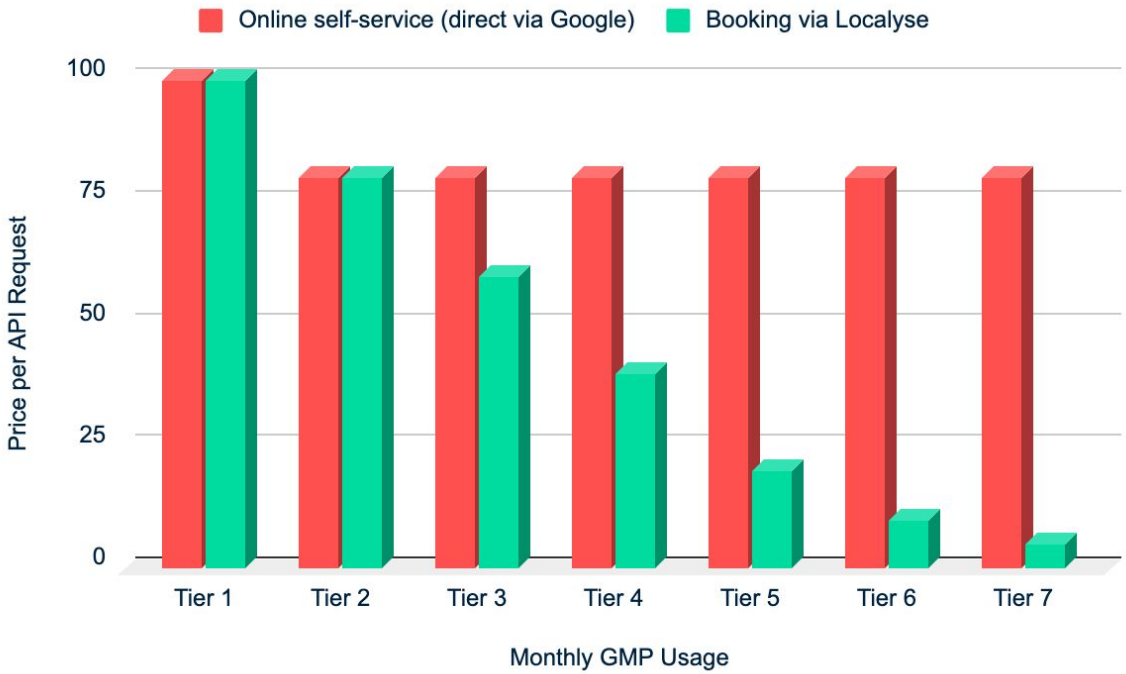
- Location Management
- Indoor Wayfinding
- ODIQ - Speed dashboard
- AnyMap
- Improve Maps
- Traffic counts

WHY LOCALYSE ?

Customer Succes Program

	Essentials	Starter	Premium	Enterprise
License management & cost optimisation	●	●	●	●
Volume discount (7 tiers)	●	●	●	●
Assistance in your local language	●	●	●	●
Offline billing + budget notifications	●	●	●	●
Budget monitoring		●	●	●
Consolidation		●	●	●
Functional support via e-mail/tel/portal		●	●	●
API key security		●	●	●
Dedicated Customer Success Manager			●	●
SLA			●	●
Case escalation + refund request assistance			●	●
Quarterly service review			●	●
New features (tips & tricks)				●
Dedicated customer engineer				●
Yearly Audits				●
Detailed report consumption (insights) - per project,....				●
Console management				●

GOOGLE MAPS PARTNER DISCOUNTS



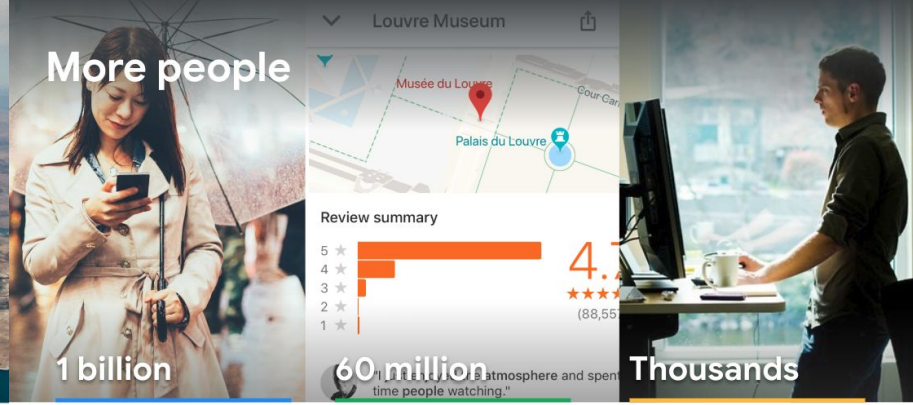
WHY GOOGLE MAPS ?

Global coverage

99%
of the world's countries and territories

40 million
miles of roads

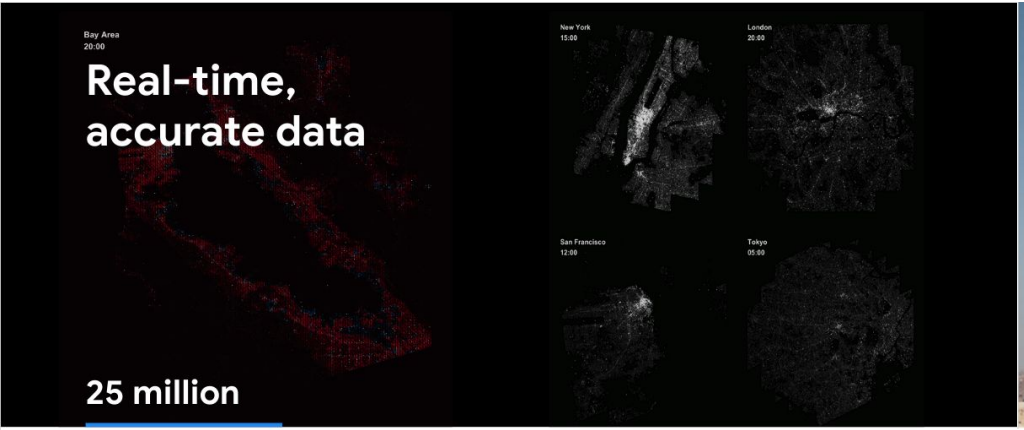
150 million
places



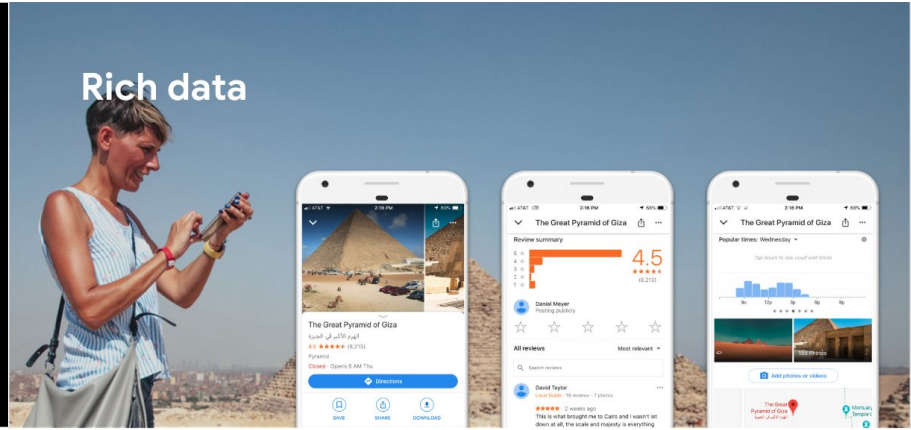
1 billion
Active users

60 million
Google local guides

Thousands
of Google engineers and map operators



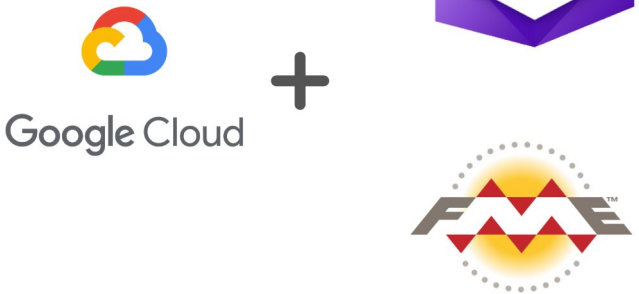
daily updates



USE CASES

Welke Google techniek is voor GIS'ers interessant?

- Google Cloud infrastructuur gebruiken voor hosting
  - ArcGIS Server & Google Cloud
  - FME server & Google Cloud



Feature	FME Server	FME Cloud
Operating System	Windows or Linux	Linux. Since everything is accessed through an API or web interface, the only consideration when it comes to the OS is format support.
File System Access	Yes.	No. You cannot access the instance directly that FME Server is running on. All interaction is via the web interface and API.
Distributed Deployment	Yes.	No. FME Cloud deploys FME Server as a single host. However, we have optimized and tuned the

Google services voor GIS-specialisten

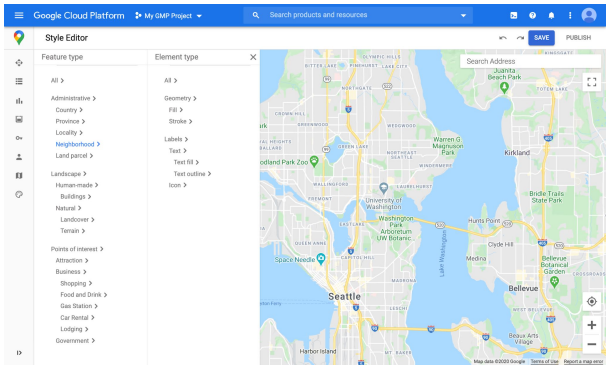
- Google Maps platform (viewer)
- Google Maps API’s
- Google Earth Engine
- BigQuery (spatial) datawarehouse
- Geo Viz

Google Maps platform

- Voorkeurs kaart voor consument / eind-gebruikers
  - Gebruik de herkenbare kaart

- Custom vector basemaps & Data-Driven Styling
  - Learn more @ Localyse Insights

- Google My Maps

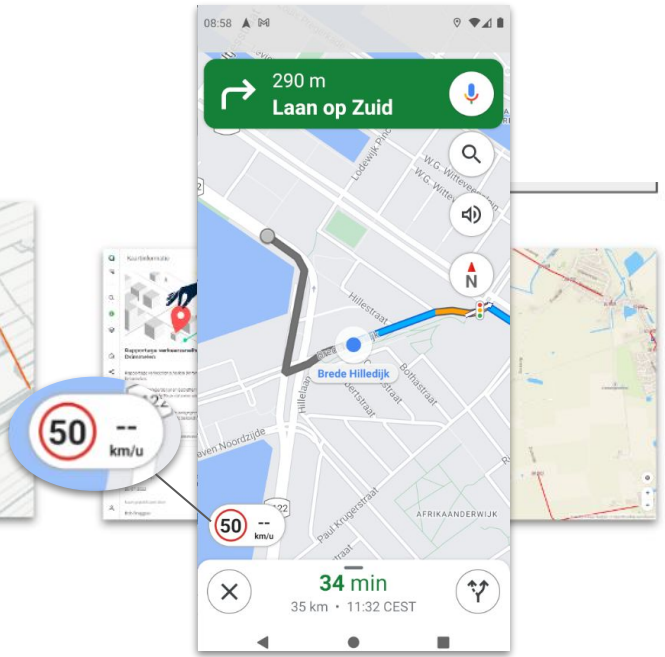


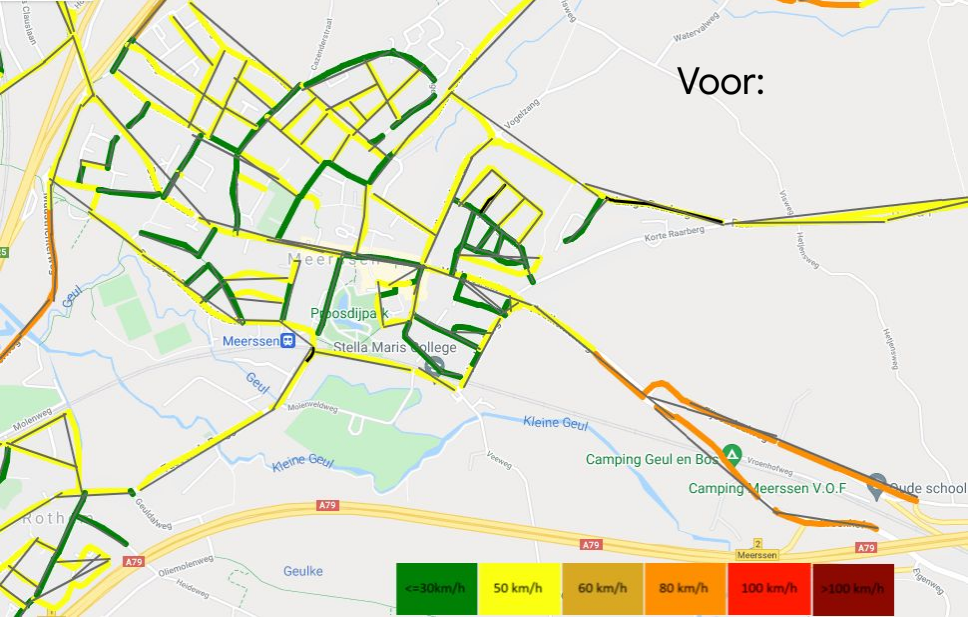
Google Maps API's in GIS software gebruiken

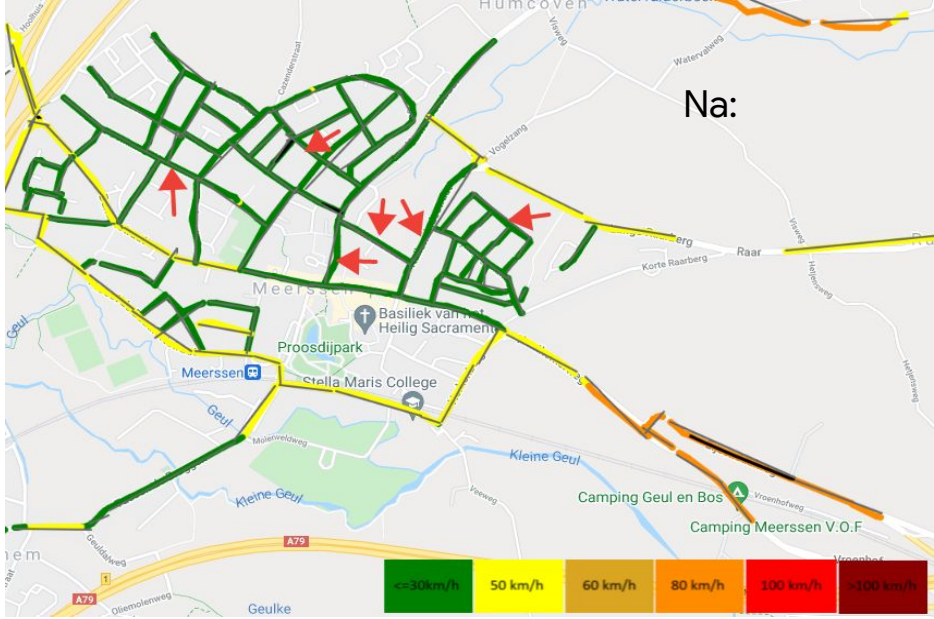
- Welke API’s?
  - Address Validator API
  - Google Places API
  - Geocoding API
  - Directions API advanced
  - Distance Matrix API
  - Road Speed Limits API
- ANY Map
- ODIQ (Directions Advanced)

Use case: Localyse Improve Maps

- Verkeerde routering (ingang ipv parkeerplaats)
- Ongewenst sluipverkeer







Voorbeeld: wijziging 13

Max. snelheden Meerssen

Aanpassen van snelheidsgebieden naar 30, 50 en 60 km per uur zones waar dit onjuist in Google Maps weergegeven wordt.

PoC Maasland

>32% verschil in data kwaliteit (max. km/u) tussen

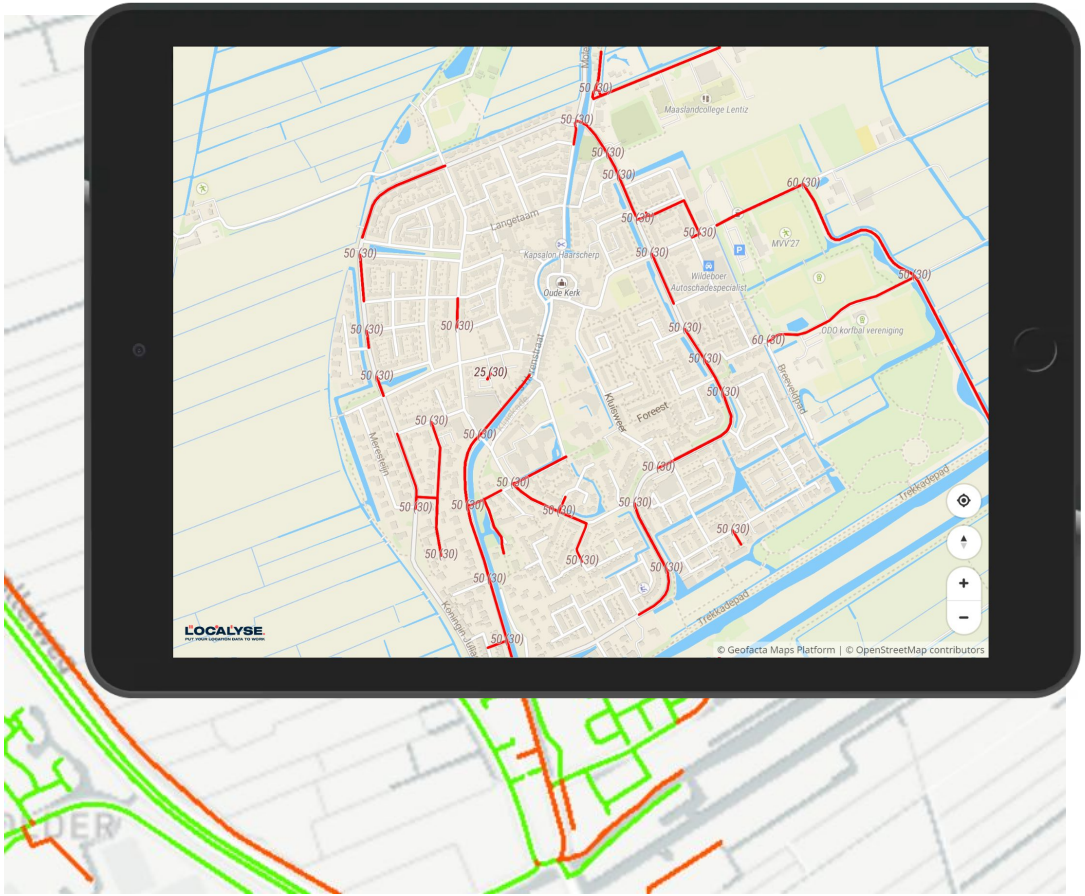
NWB en **Google Maps**

Groen = match in max. km/u

Rood = verschil in max. km/u

Output = lijst met discrepanties

Vervolg = uploaden naar Google

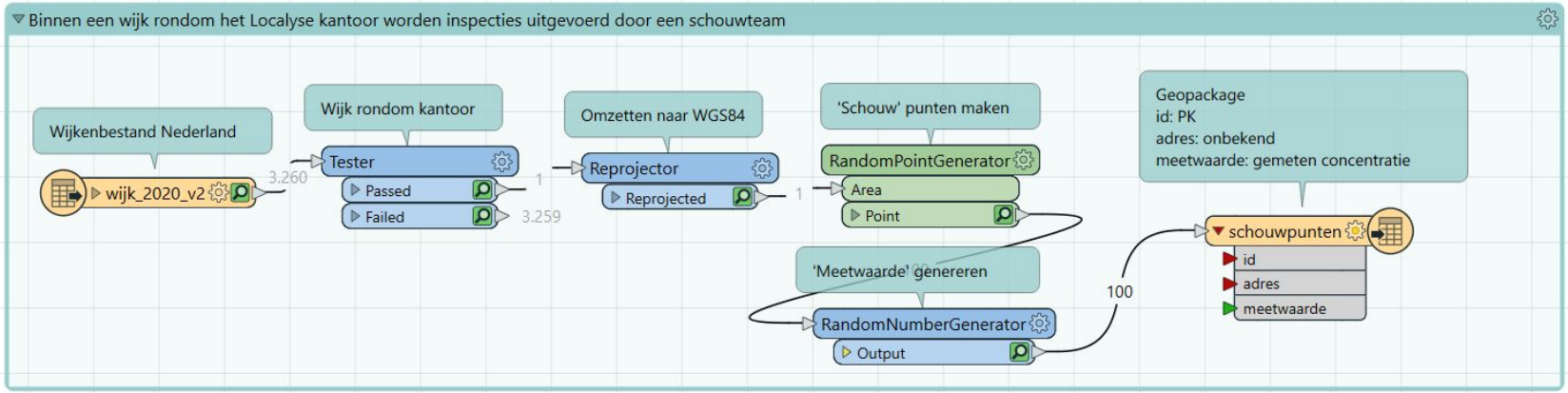


Use case schouw groen buitenruimte

+ Ophalen staat van groen in buitenruimte
+ Data inlezen / verwerken
+ Verrijken schouwdata
+ Publiceren op de kaart

Google API’s & FME Workbench

“Schouw” data genereren



Metadata incompleet

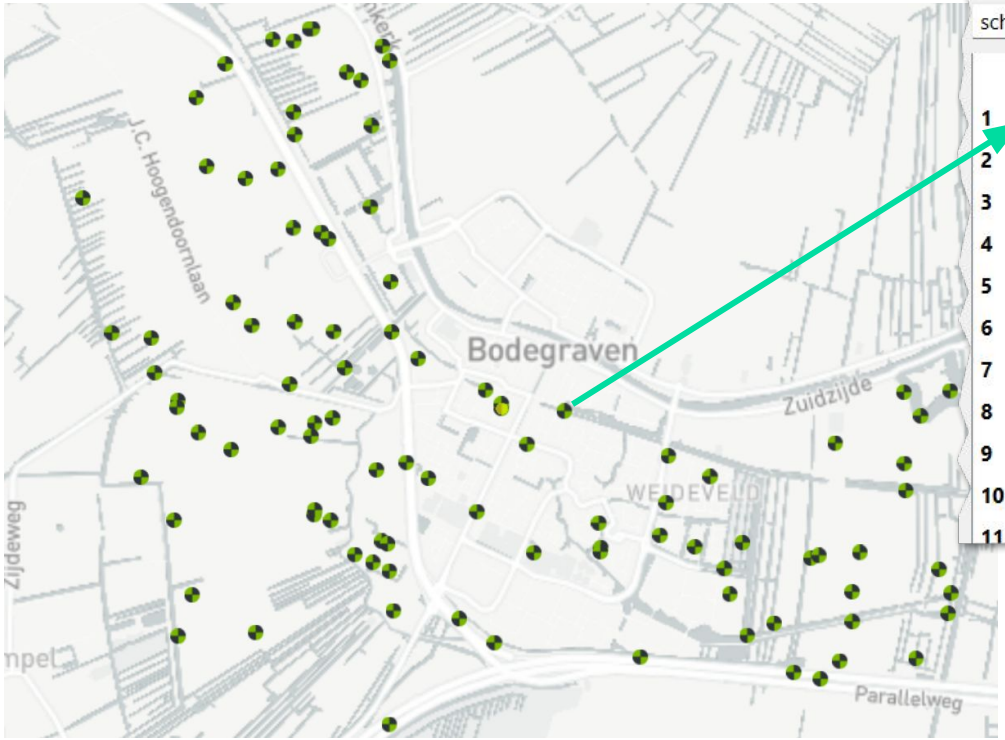
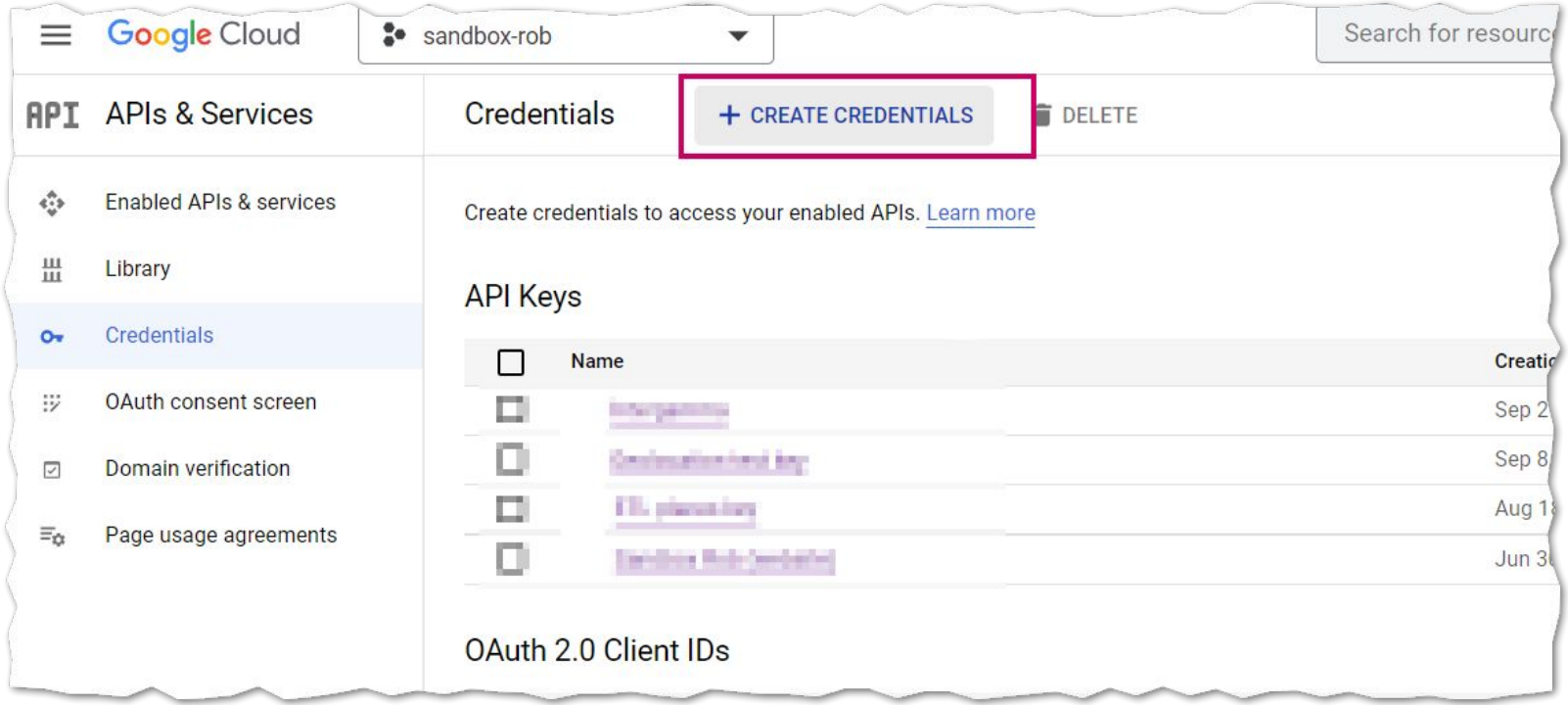


Table View

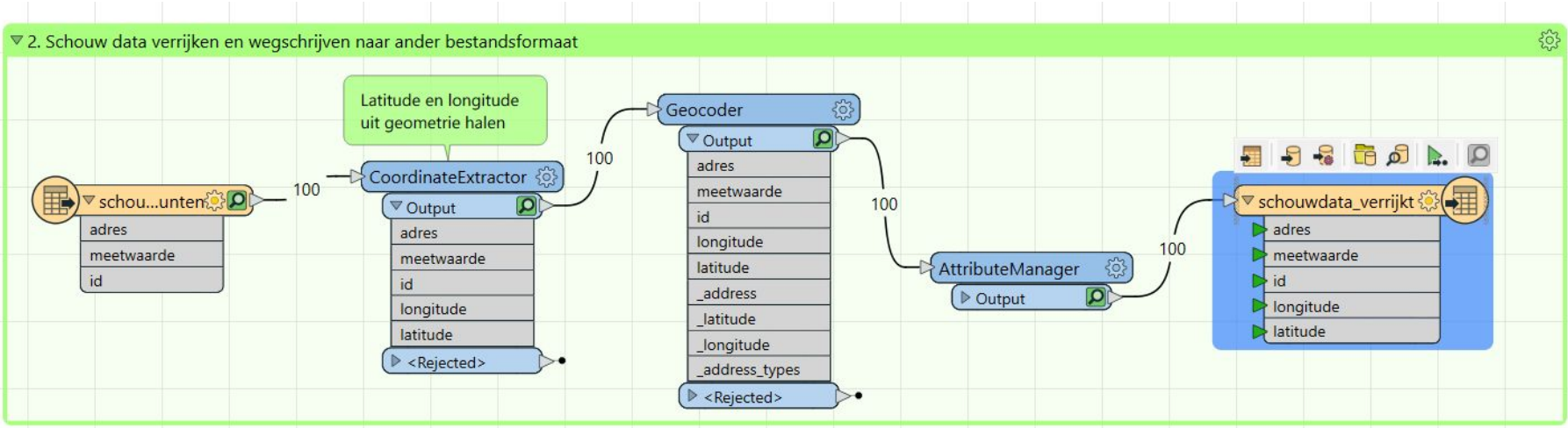
schouwpunten [OGCGEOPACKAGE] - schouwpunten

	adres	meetwaarde	id
1	<null>	98	1
2	<null>	69	2
3	<null>	22	3
4	<null>	2	4
5	<null>	49	5
6	<null>	44	6
7	<null>	78	7
8	<null>	0	8
9	<null>	42	9
10	<null>	97	10
11	<null>	42	11

Maak API key aan in Google Cloud



Data verrijken met Google API



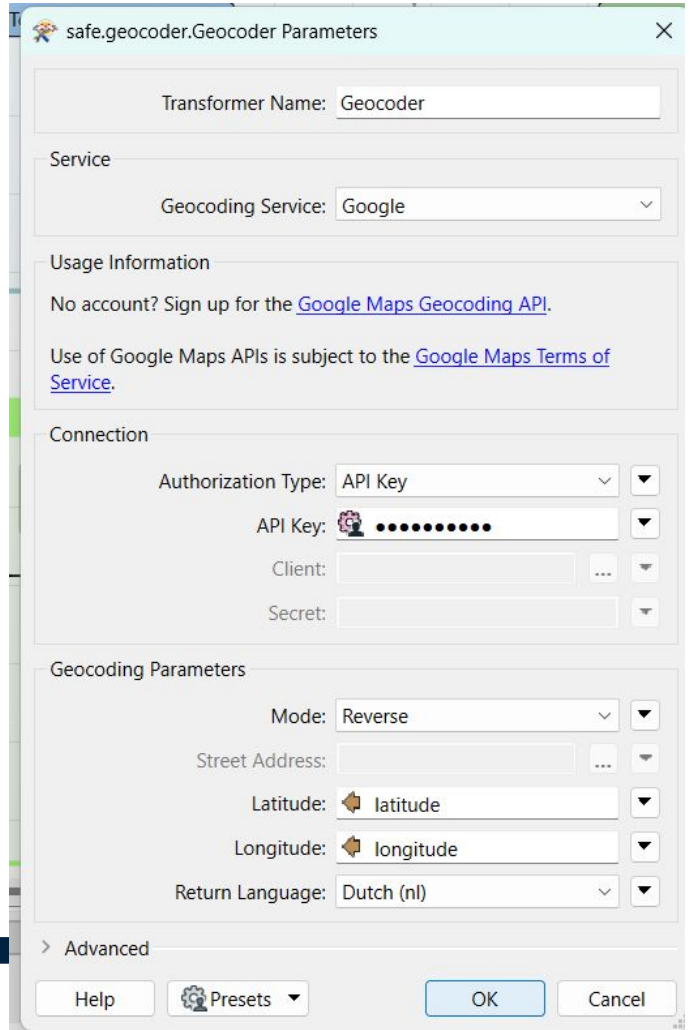
Data verrijken met Google API

Table View

schouwdata_verrijkt [CSV2] - CSV

	adres	meetwaarde	id	longitude	latitude
1	Ekster 10, 2411 MT Bodegraven, Nederland	98	1	4.75508841041...	52.0743793914...
2	J.C. Hoogendoornlaan 4A, 2411 NB Bodegraven, Nederland	69	2	4.72407281610...	52.0858674210...
3	3PHJ+R9 Bodegraven, Nederland	22	3	4.73096432320...	52.0795800005...
4	3PFP+9M Bodegraven, Nederland	2	4	4.73667287325...	52.0734349965...
5	Oud Bodegraafseweg 105c, 2411 HZ Bodegraven, Nederl...	49	5	4.73438065720...	52.0727389847...
6	3PXF+89 Bodegraven, Nederland	44	6	4.72340393658...	52.0983104589...
7	3PHH+P5 Bodegraven, Nederland	78	7	4.72789531930...	52.0793696555...
8	Vlietkade 43, 2411 BZ Bodegraven, Nederland	0	8	4.73751434906...	52.0843430809...
9	3PFJ+W9 Bodegraven, Nederland	42	9	4.73093274076...	52.0748179216...
10	Akkermunt 152, 2411 DR Bodegraven, Nederland	97	10	4.76099107536...	52.0778791393...
11	3PWC+J9 Bodegraven, Nederland	42	11	4.72092150511...	52.0965533430...
12	Ambachtshof 57, 2411 GG Bodegraven, Nederland	56	12	4.74545827008...	52.0813136408...
13	Oud Bodegraafseweg 107, 2411 HZ Bodegraven, Nederla...	30	13	4.73730742098...	52.0718757402...
14	3PMM+P2 Bodegraven, Nederland	97	14	4.73259602503...	52.0843628381...
15	Monnikskap 11, 2412 AC Bodegraven, Nederland	81	15	4.76727958085...	52.0733617093...

in any column



Demo MyMaps

Business data eenvoudig presenteren via Google Kaarten

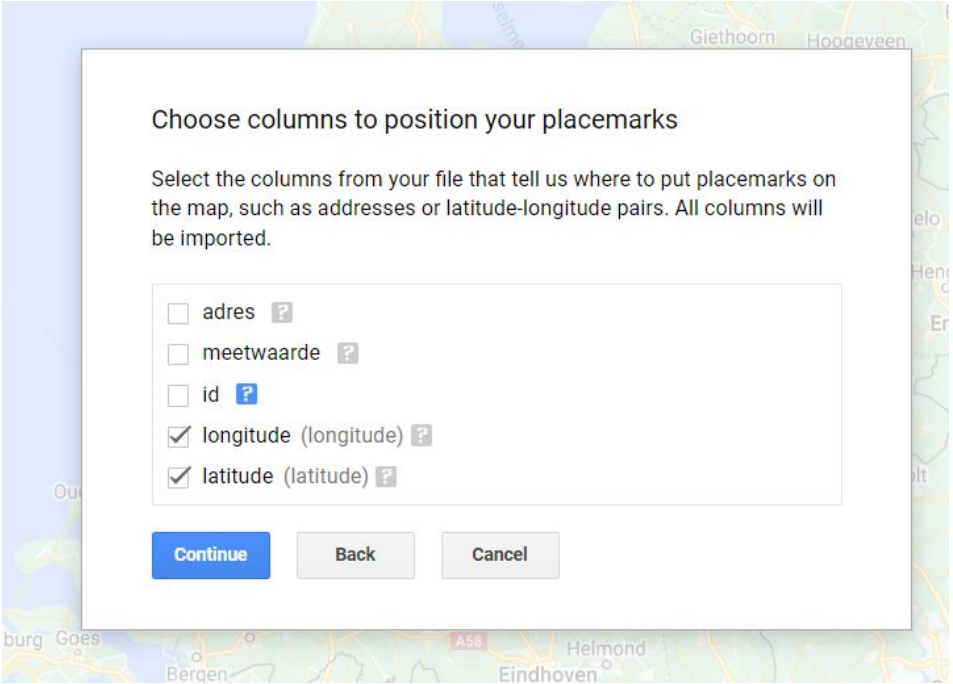
https://mymaps.google.com/

Demo URL:

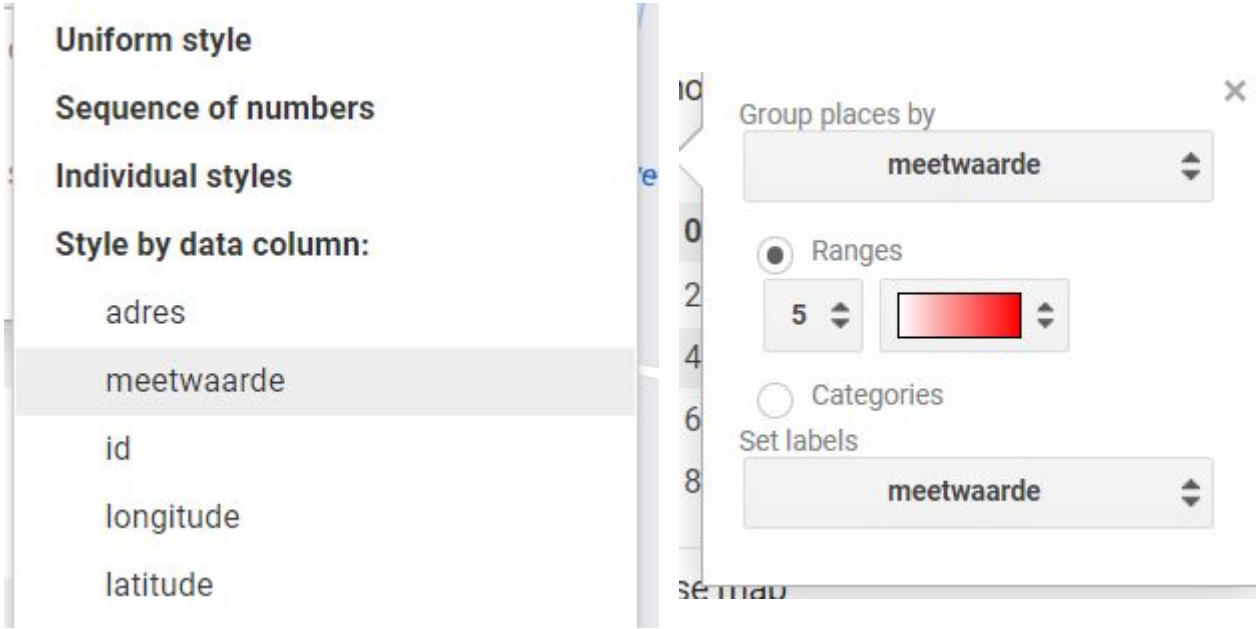
https://www.google.com/maps/d/edit?mid=1j8ZfW5EBpvmKOsuOJkCac98tcGHiPvI&usp=sharing

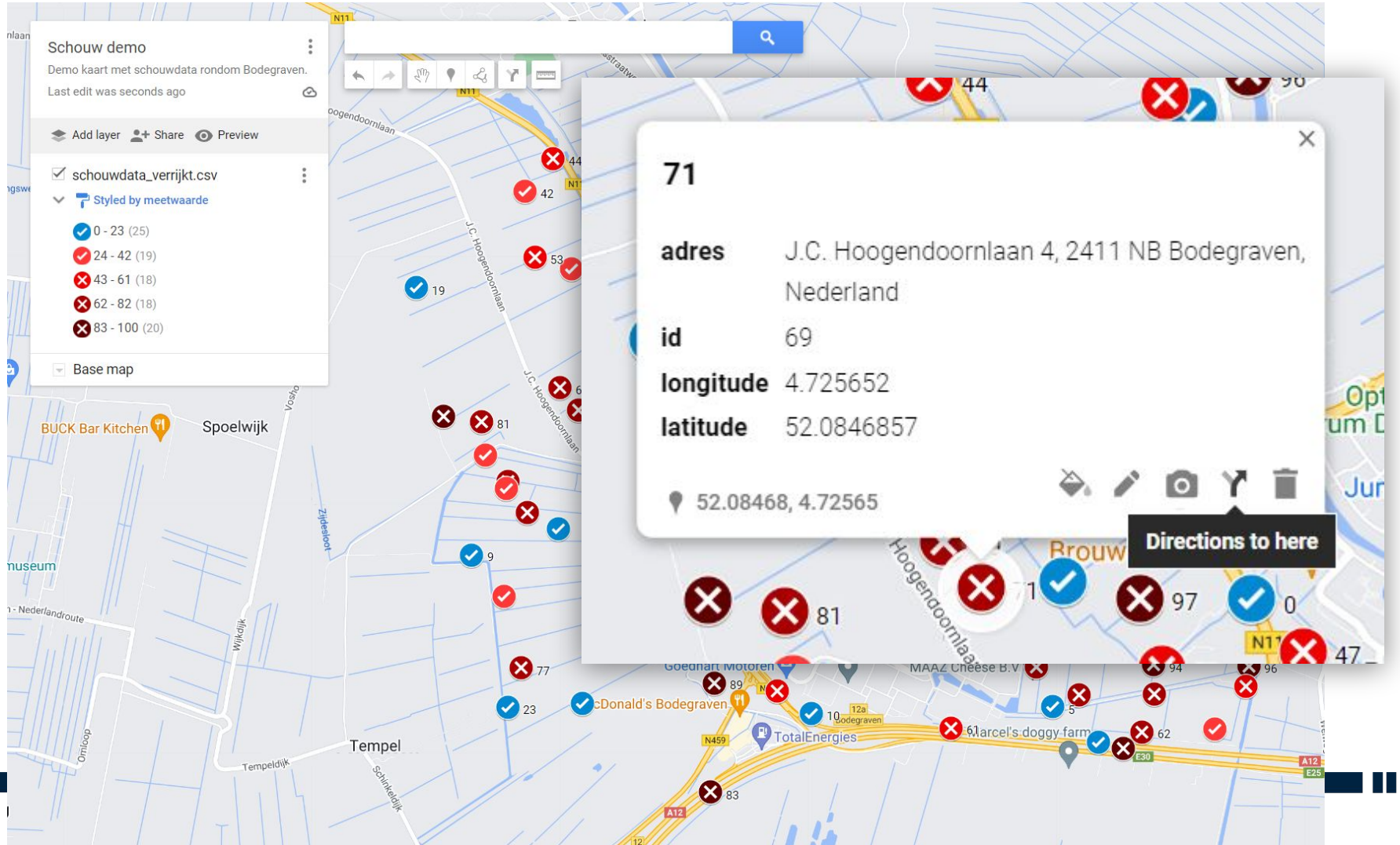
Importeer eenvoudig datasets

- WGS84
- Limiet aantal features
- Gratis gebruik
- Integratie met Google Maps
- Routeplanning naar POI’s



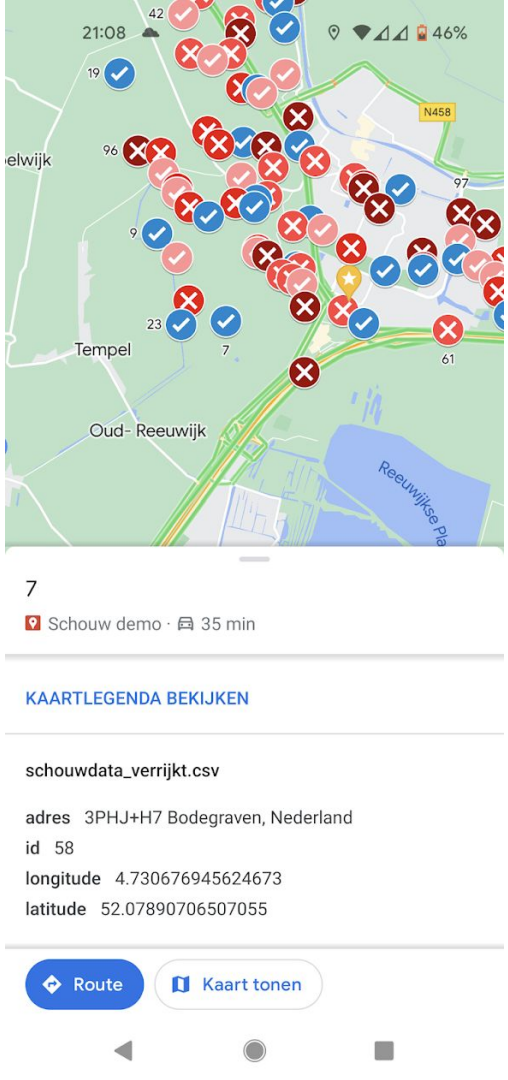
Style de kaart via data attributen




Schouw demo
Demo kaart met schouwdata rondom Bodegraven.
Last edit was seconds ago
Add layer
Share
Preview
schouwdata_verrijkt.csv
Styled by meetwaarde
0 - 23 (25)
24 - 42 (19)
43 - 61 (18)
62 - 82 (18)
83 - 100 (20)
Base map
71
adres
J.C. Hoogendoornlaan 4, 2411 NB Bodegraven, Nederland
id
69
longitude
4.725652
latitude
52.0846857
52.08468, 4.72565
Directions to here
BUCK Bar Kitchen
Spoelwijk
Tempel
TotalEnergies
McDonald's Bodegraven
Marcel's doggy farm
MAAZ Cheese B.V
J.C. Hoogendoornlaan
Hoogendoornlaan
Tempeldijk
Wijkdijk
Zijdelaat
Schinkeldijk
Omloop
N11
N459
A12
E30
E25

Vragen

Google Maps Platform

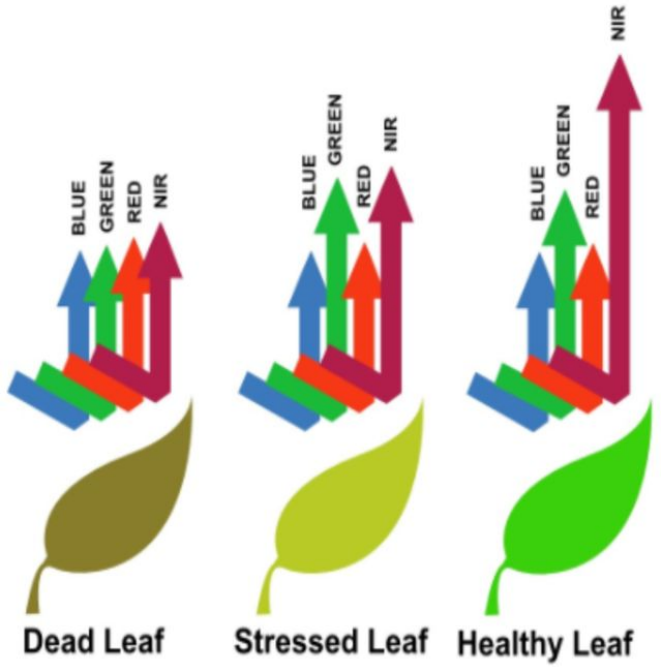


BigQuery & Google Earth Engine

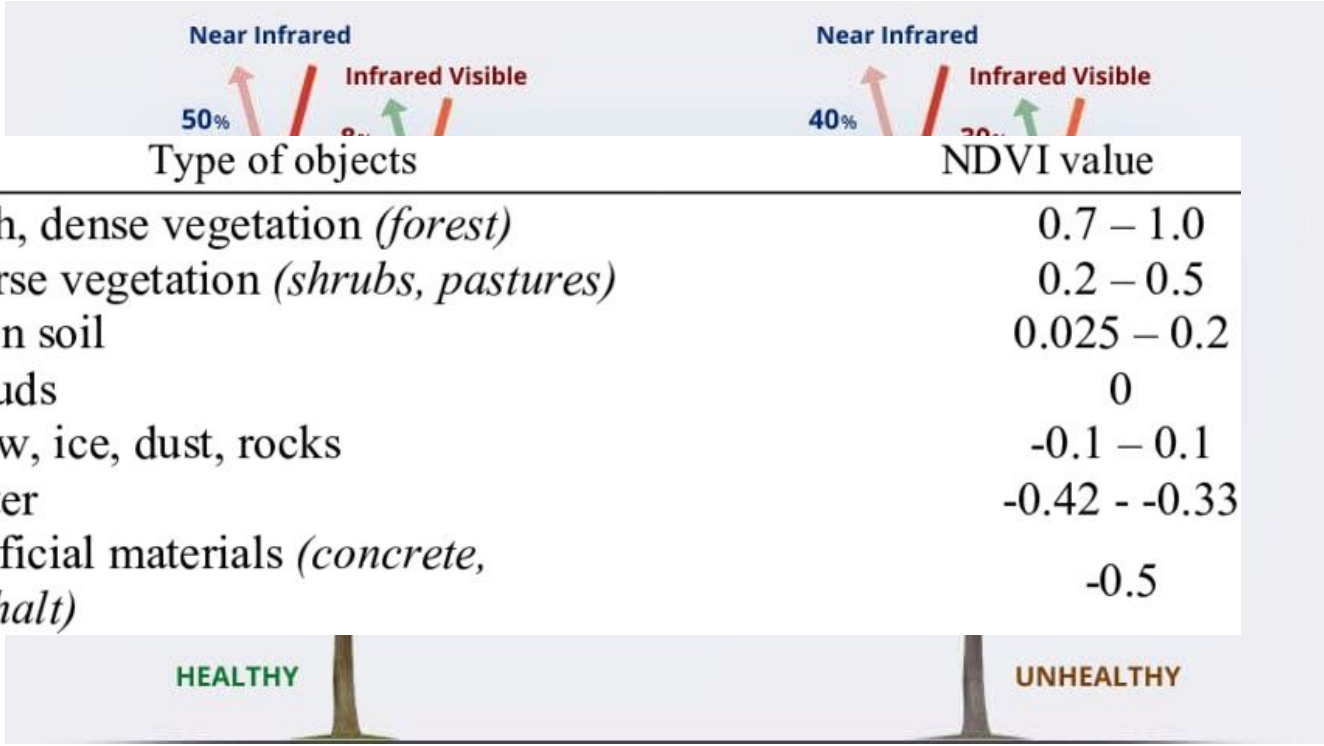
Use case: bepalen gezondheid groen buitenruimte

Gebruik schouwdata punten

Geautomatiseerde berekening aan de hand van satellietfoto’s



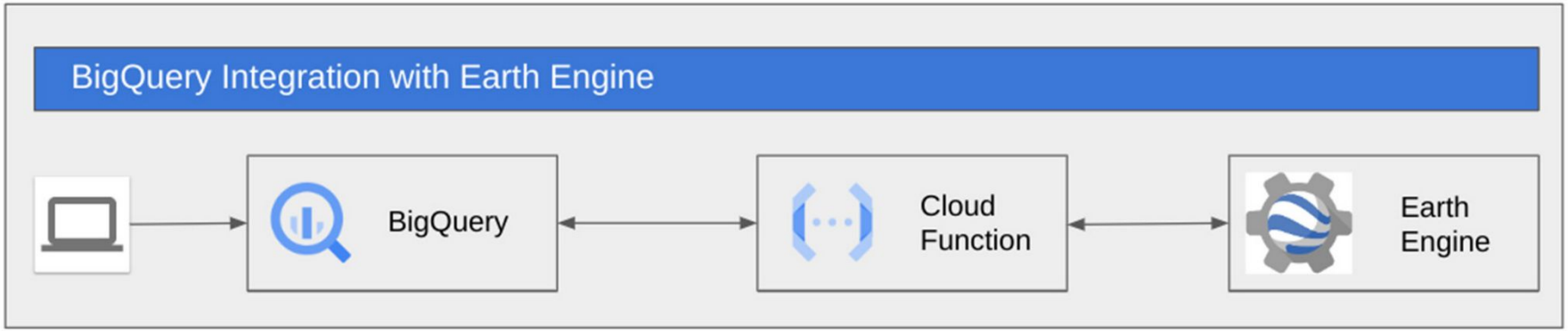
Een hoge vegetatie index voor gezond groen



Type of objects	NDVI value
High, dense vegetation *(forest)*	0.7 – 1.0
Sparse vegetation *(shrubs, pastures)*	0.2 – 0.5
Open soil	0.025 – 0.2
Clouds	0
Snow, ice, dust, rocks	-0.1 – 0.1
Water	-0.42 - -0.33
Artificial materials *(concrete, asphalt)*	-0.5

Proces

- Vanuit SQL wereldwijd luchtfoto's analyseren
- PostGIS syntax voor ruimtelijke database bewerkingen



Google Earth Engine

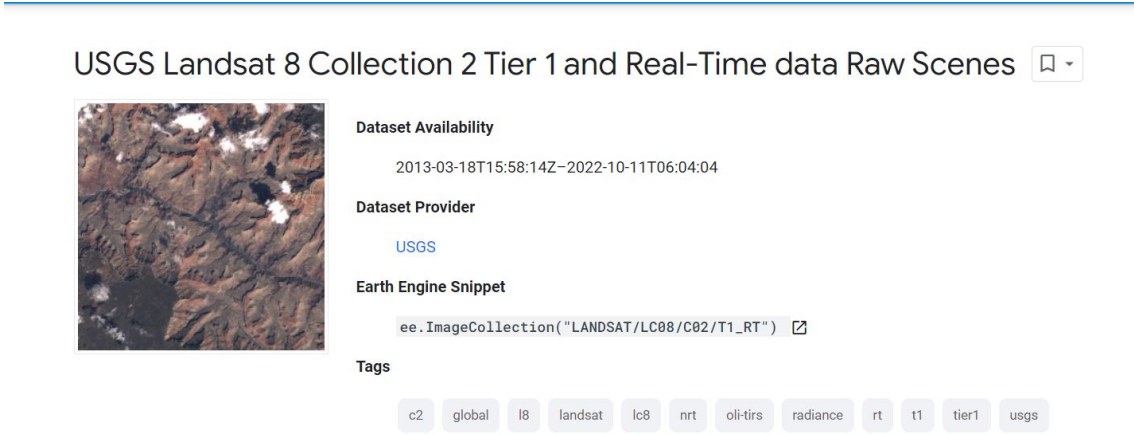
- Platform voor analyseren van grote hoeveelheden satellietdata
- 70 PB raster data beschikbaar (historisch en actueel)
- Mogelijkheid tot maken van apps

- Veel gebruikt voor remote sensing toepassingen:
  - Detectie droogte / klimaateffecten
  - Gewas/vegetatie gezondheid monitoren
  - Change detection: satellietfoto's van verschillende tij
  - Feature detection & extraction:
    - **De link naar vector / feature-based GIS**

Google Earth Engine

Voorbeeld luchtfoto Landsat

https://developers.google.com/earth-engine/datasets/catalog/LANDSAT_LC08_C02_T1_RT?hl=en



Bands van luchtfoto

NDVI = NIR - RED/ NIR + RED

Bands

Name	Pixel Size	Wavelength	Description
B1	30 meters	0.43 - 0.45 µm	Coastal aerosol
B2	30 meters	0.45 - 0.51 µm	Blue
B3	30 meters	0.53 - 0.59 µm	Green
B4	30 meters	0.64 - 0.67 µm	Red
B5	30 meters	0.85 - 0.88 µm	Near infrared

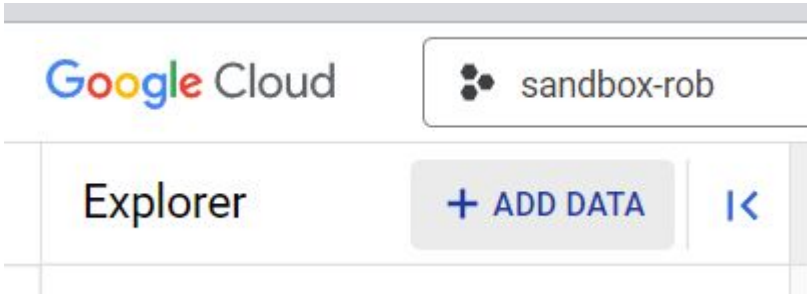
BigQuery

Hosted data warehouse van Google

- Geschikt voor grote hoeveelheden data (vector)
- Pay-per-use
- GIS-data ondersteuning op basis van standaard SQL
- Koppelingen op basis van diverse integraties mogelijk
- Analyse database
- Eenvoudig te gebruiken in analysetools:
  - Data Studio Power BI, Tableau, Looker

Area of interest uploaden naar BigQuery

Selecteer project, dataset & CSV



Create table

Source

Create table from
Upload

Select file *

File format
CSV

Destination

Project *
sandbox-rob-352208

Dataset *

Dataset is required

Table *

Unicode letters, marks, numbers, connectors, dashes or spaces allowed.

Table type
Native table

Schema

Auto detect

Schema will be automatically generated.

Partition and cluster settings

Partitioning
No partitioning

Clustering order

Clustering order determines the sort order of the data. Clustering can be used on both partitioned and non-partiti

CREATE TABLE CANCEL

Bevraag de AOI table

RUN SAVE SHARE SCHEDULE MORE

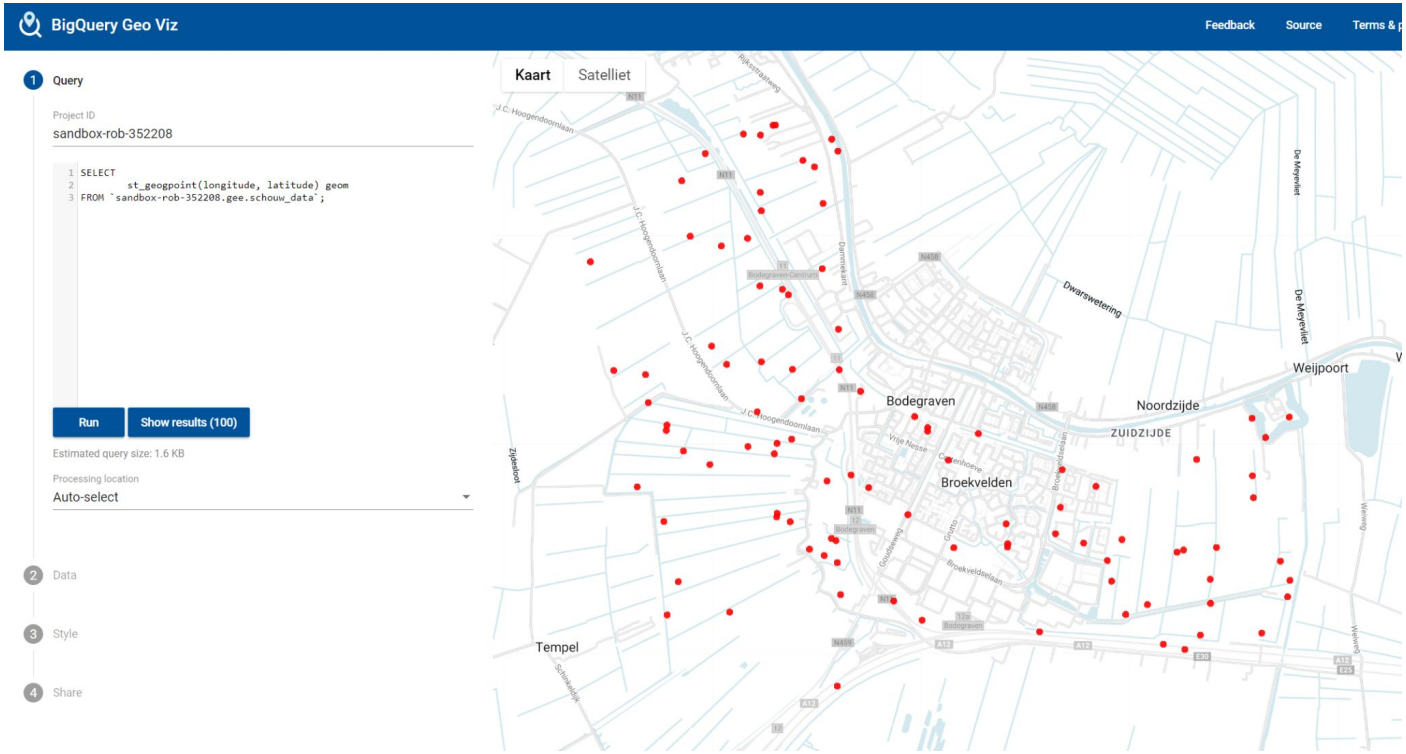
```
1  SELECT * FROM `sandbox-rob-352208.gee.schouw_data` LIMIT 1000
```

Query results

JOB INFORMATION | RESULTS | JSON | EXECUTION DETAILS

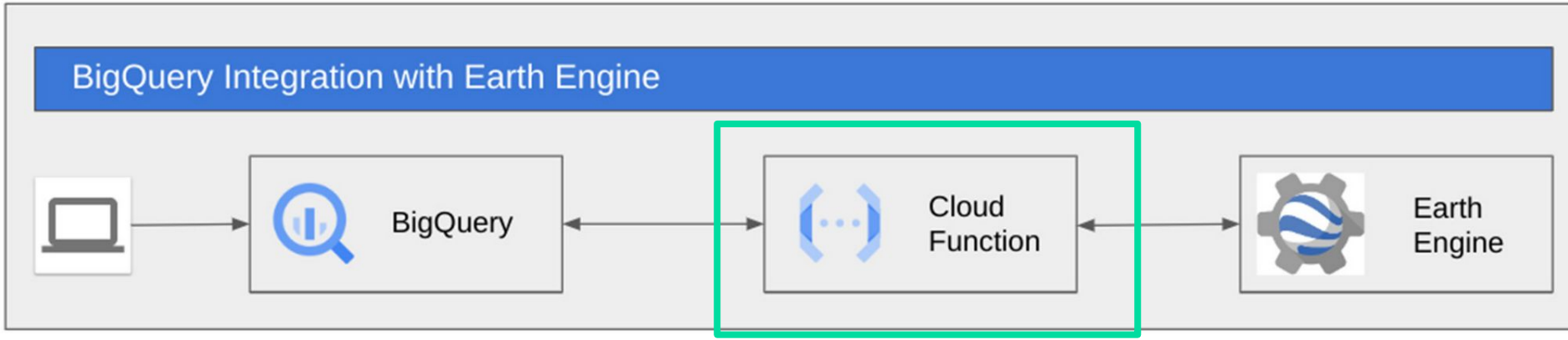
Row	adres	meetwaarde	id	longitude	latitude
1	Vlietkade 43, 2411 BZ Bodegra...	0	8	4.73751434...	52.0843430...
2	3PFP+9M Bodegraven, Nederla...	2	4	4.73667287...	52.0734349...
3	Penningkruid 48, 2412 AN Bod...	5	21	4.76028463...	52.0737383...
4	3Q99+C3 Bodegraven, Nederla...	5	34	4.76767816...	52.0685221...
5	3PQJ+RJ Bodegraven, Nederla...	6	29	4.73152753...	52.0895359...
6	Rijksweg, N11 2, 2411 WZ Bod...	6	100	4.73876338...	52.0775369...
7	3P9G+F9 Bodegraven, Nederla...	7	42	4.72596831...	52.0686742...
8	Watersnip 34, 2411 MD Bodegr...	7	49	4.74957553...	52.0728347...
9	3PHJ+H7 Bodegraven, Nederla...	7	58	4.73067694...	52.0789070...
10	Zuidzijde 132, 2411 RX Bodegr...	8	27	4.78490785...	52.0812727...

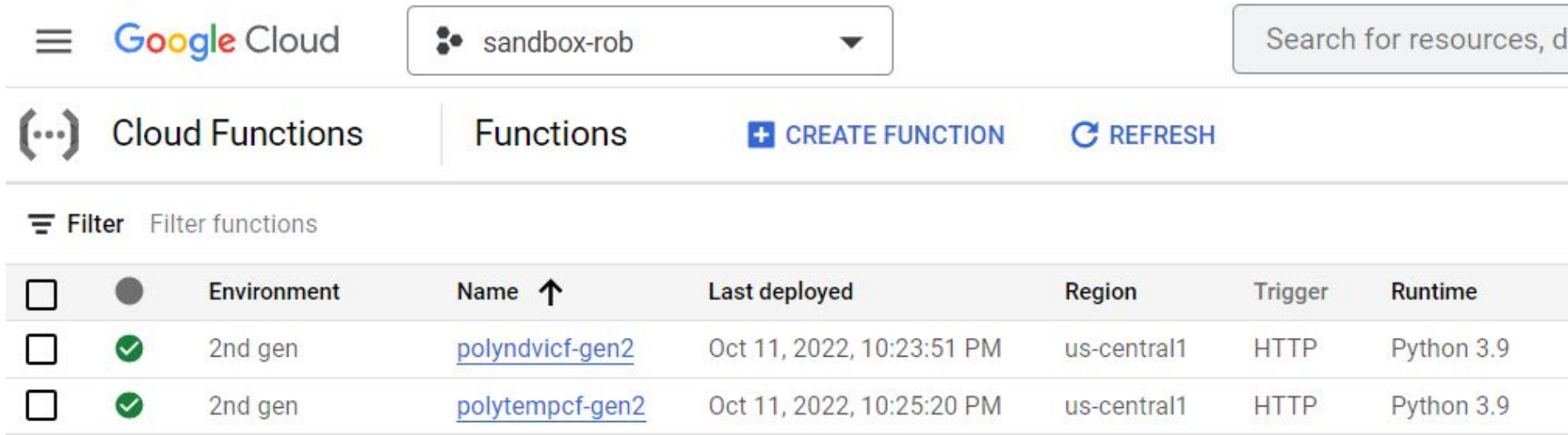
Schouw data bekijken in Geo Viz



Buffers maken als Area of interest voor GEE

Het analyse werk automatiseren in Google Cloud

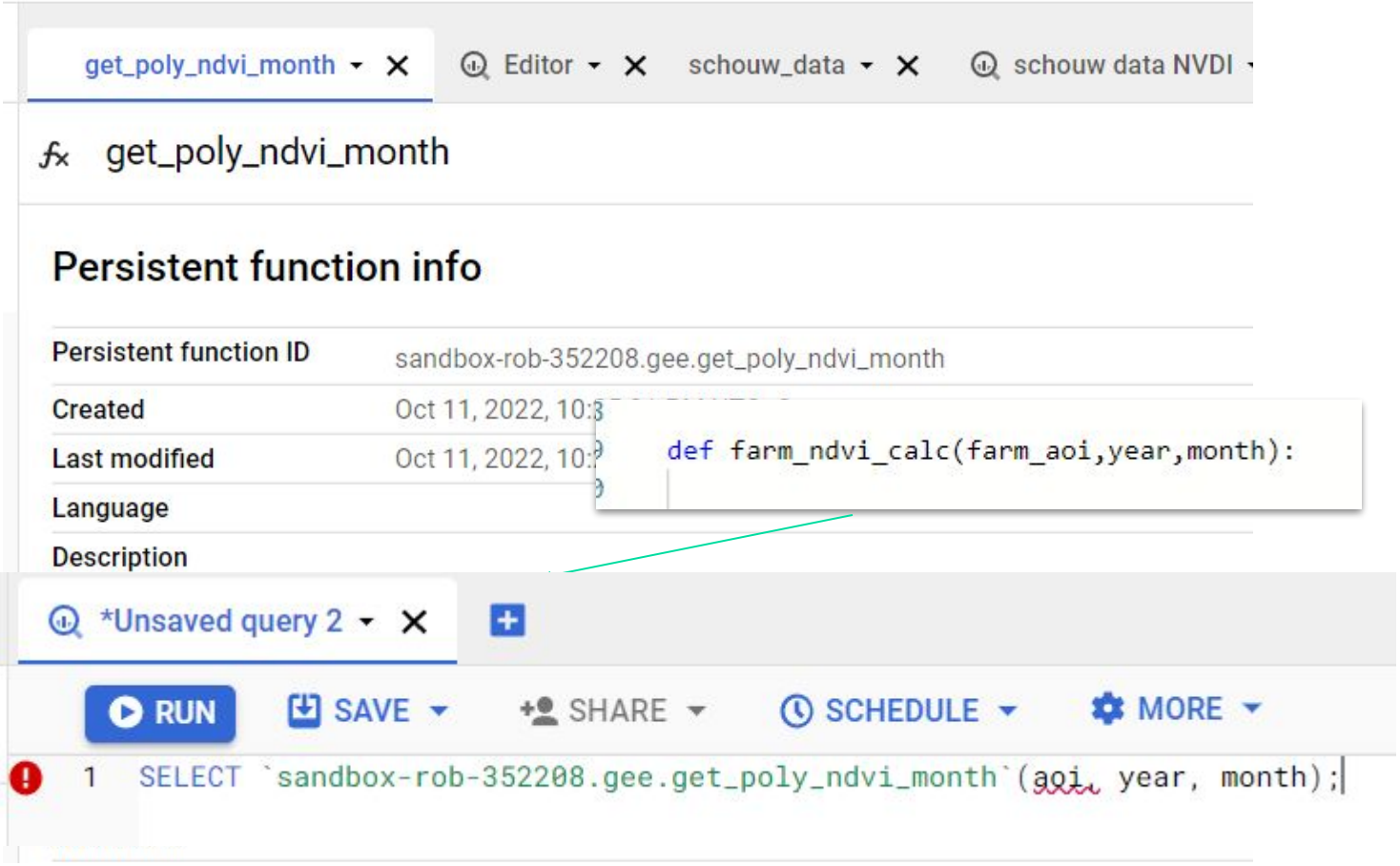



Google Cloud
sandbox-rob
Search for resources, d
Cloud Functions
Functions
CREATE FUNCTION
REFRESH
Filter
Filter functions
Environment
Name
Last deployed
Region
Trigger
Runtime
2nd gen
polyndvicf-gen2
Oct 11, 2022, 10:23:51 PM
us-central1
HTTP
Python 3.9
2nd gen
polytempcf-gen2
Oct 11, 2022, 10:25:20 PM
us-central1
HTTP
Python 3.9

Landsat satellietdata

Filter op tijd > gebruik bands B5 en B4 voor berekening NDVI > uitknippen AOI

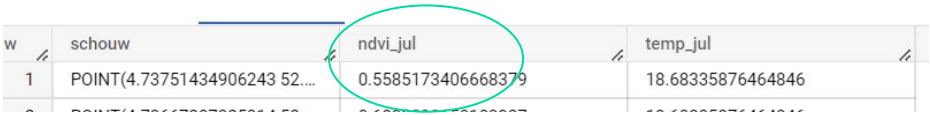
```
39  def farm_ndvi_calc(farm_aoi,year,month):
40
41    first,last = calendar.monthrange(year, month)
42    first_date = datetime(year, month, 1)
43    startDate = first_date.strftime("%Y-%m-%d")
44    last_date = datetime(year, month, last)
45    endDate = last_date.strftime("%Y-%m-%d")
46    landsat8 = ee.ImageCollection("LANDSAT/LC08/C02/T1")
47    filtered = landsat8.filter(ee.Filter.date(startDate, endDate))
48    composite = ee.Algorithms.Landsat.simpleComposite(filtered)
49    ndviImage = composite.normalizedDifference(['B5', 'B4']).rename('NDVI')
50    ndviValue = ndviImage.reduceRegion(**{
51      'geometry': farm_aoi,
```


get_poly_ndvi_month
Editor
schouw_data
schouw data NVDI
get_poly_ndvi_month
Persistent function info
Persistent function ID
sandbox-rob-352208.gee.get_poly_ndvi_month
Created
Oct 11, 2022, 10:3
Last modified
Oct 11, 2022, 10:
Language
Description
def farm_ndvi_calc(farm_aoi,year,month):
*Unsaved query 2
RUN
SAVE
SHARE
SCHEDULE
MORE
1 SELECT `sandbox-rob-352208.gee.get_poly_ndvi_month`(aoi, year, month);

NVDI opvragen verschillende tijdvakken

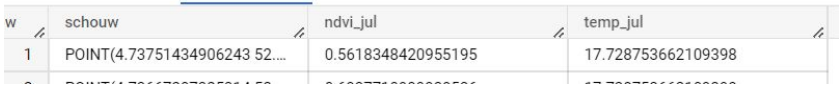
2022 vs 2021: iets warmer in 2022, en wat meer droogte

```
select
st_geogpoint(longitude, latitude) as schouw,
gee.get_poly_ndvi_month(st_astext(st_buffer(st_g
eogpoint(longitude, latitude), 200)),2022,7) AS
ndvi_jul,
gee.get_poly_temp_month(st_astext(st_buffer(st_g
eogpoint(longitude, latitude), 200)),2022,7) AS
temp_jul
FROM `gee.schouw_data`
```



w	schouw	ndvi_jul	temp_jul
1	POINT(4.73751434906243 52....	0.5585173406668379	18.68335876464846

```
select
st_geogpoint(longitude, latitude) as schouw,
gee.get_poly_ndvi_month(st_astext(st_buffer(st_g
eogpoint(longitude, latitude), 200)),2021,7) AS
ndvi_jul,
gee.get_poly_temp_month(st_astext(st_buffer(st_g
eogpoint(longitude, latitude), 200)),2021,7) AS
temp_jul
FROM `gee.schouw_data`
```



w	schouw	ndvi_jul	temp_jul
1	POINT(4.73751434906243 52....	0.5618348420955195	17.728753662109398

Register a new service account for `rob@localyse.eu`

Email *

Please enter the service account email address. It should look like `foo-project@appspot.gserviceaccount.com` or `foo-name@project-name.iam.gserviceaccount.com`.

REGISTER SERVICE ACCOUNT

Current service accounts for `rob@localyse.eu`

9252774779-compute@developer.gserviceaccount.com

To activate the Earth Engine API for your application: you may now perform the following steps:

1. Visit Google Earth Engine API page on Google Cloud Platform
2. Ensure that the Cloud Project associated with your service account is selected in the drop-down at the top of the page.
3. Click "Enable" if the Earth Engine API is not yet enabled for your Cloud Project.
4. Upgrade your application to the latest version of the Earth Engine client library if necessary.

Resultaat

Schouwpunten zijn voorzien van gemiddelde temperatuur en NDVI

Conclusie: het groen is gezond!

Er is geen sprake van overmatige droogte

7755551039",
8164062523",
: \"Point\", \"co

Stedelijk gebied

Weilanden


{
"ndvi_jul": "0.7656187755551039",
"temp_jul": "17.058618164062523",
"schouw": "{ \"type\": \"Point\", \"coordinates\": [4.71936680523245, 52.080762870487
}

Vervolgstappen

- Scheduled queries
- Geautomatiseerde rapportages naar opdrachtgever
- Verbinden met andere BigQuery data bronnen (sensor data, onderleggers)

Vragen

Rob Braggaar

Customer Cloud Engineer (NL)

Working on Thursdays and Fridays.

+31 (0)172 25 55 00 | +31 (0)6 - 11535284

rob@localyse.eu

localyse.eu

LOCALYSE

JELLE DRAIJER

Location Data Consultant

+31 (0) 6 415 254 96

jelle.draijer@localyse.eu

localyse.eu

Credits Python script:
Ankur Wahi

Let's start together to put your location data to work.

LOCALYSE