Basisregistraties en OpenStreetMap mixen voor map5topo kaarten

Just van den Broecke - justobjects.nl

map5.nl - map5topo.nl

https://mapstodon.space/@justb4
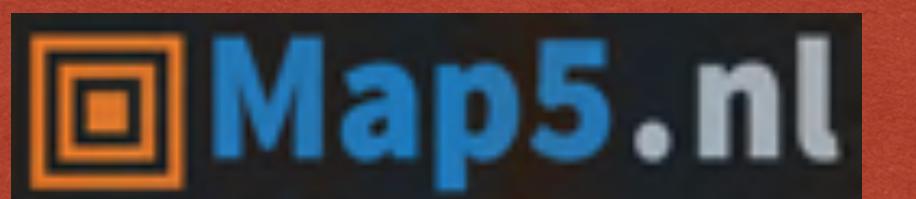
Sept 26, 2024 - FOSS4G-BE-NL - https://foss4g.be/nl/ - Baarle
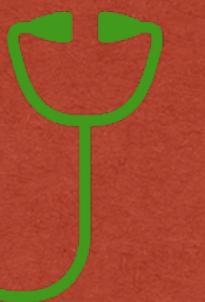
JustObjects

Free Source Geospatial Professional @ justobjects.nl

Just**Objects**
Just van den Broecke

(Former) Board

OSGeo·NL

Oosterbeek

Cloud Services

Map5.nl

GeoQoS

geotoko.nl

FOSS Projects

pygeoapi

GeoHealthCheck

nlextract

About Me

Making a living from Open Source since 1997
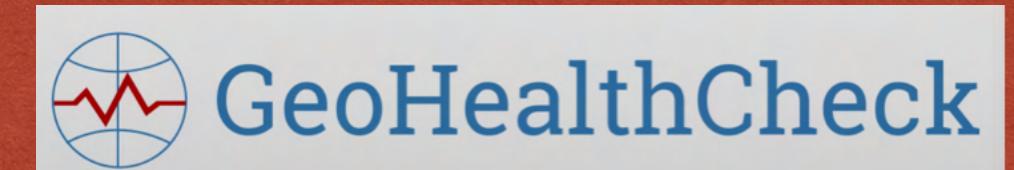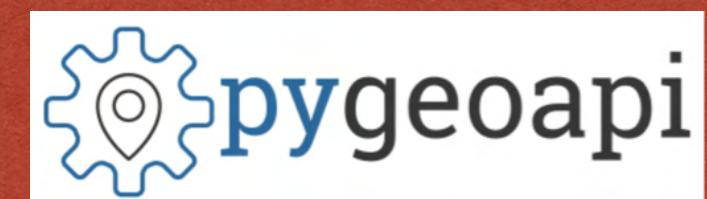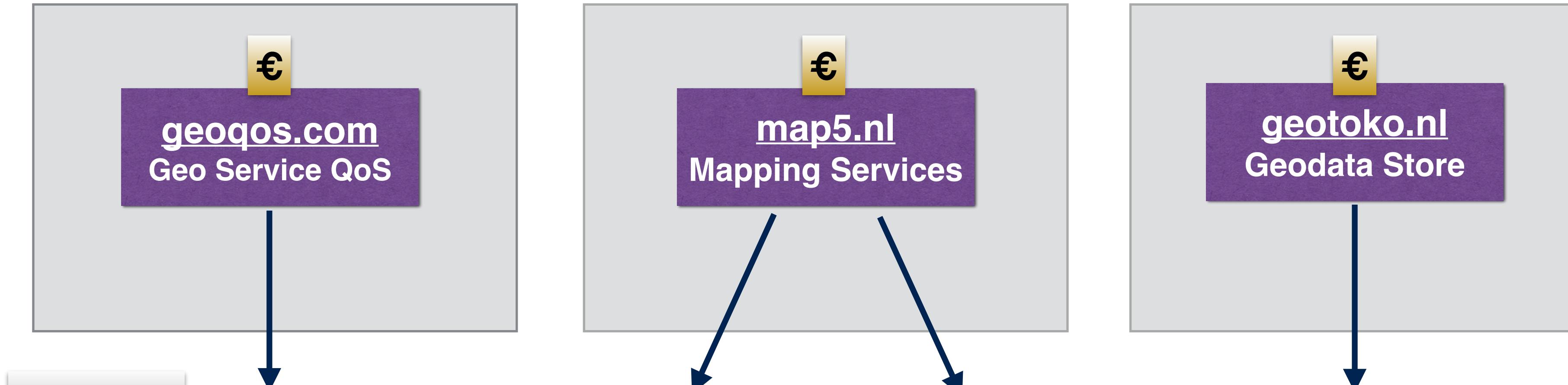
About Me

Now: Providing Cloud Services with Open Source/Data

€ **geoqos.com**
Geo Service QoS

€ **map5.nl**
Mapping Services

€ **geotoko.nl**
Geodata Store

Used by All

GeoHealthCheck

Heron
Mapping Client

Map5topo
NL Topomap

NLExtract
ETL NL Data

pygeoapi
OGC REST APIs

OpenStreetMap
@justb

Stetl
Geo-ETL

Legend

Uses →
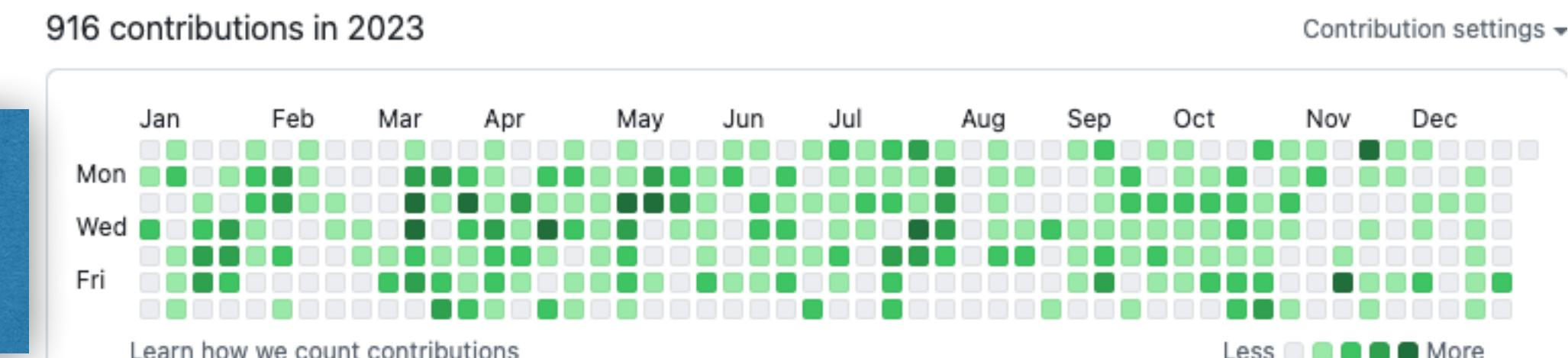
Cloud Service 'Webshops'

Open Source Project

Contributor

Dormant

OpenTraces Project
formerly GeoTracing/
GeoSkating

**More on
github.com/justb4**

916 contributions in 2023

Contribution settings ▾

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Mon												
Wed												
Fri												

Learn how we count contributions

Less ▢▢▢▢▢ More

Docker Build `no status` patreon `donate` license `MIT` docker pulls `23M`

docker-jmeter

Image on Docker Hub
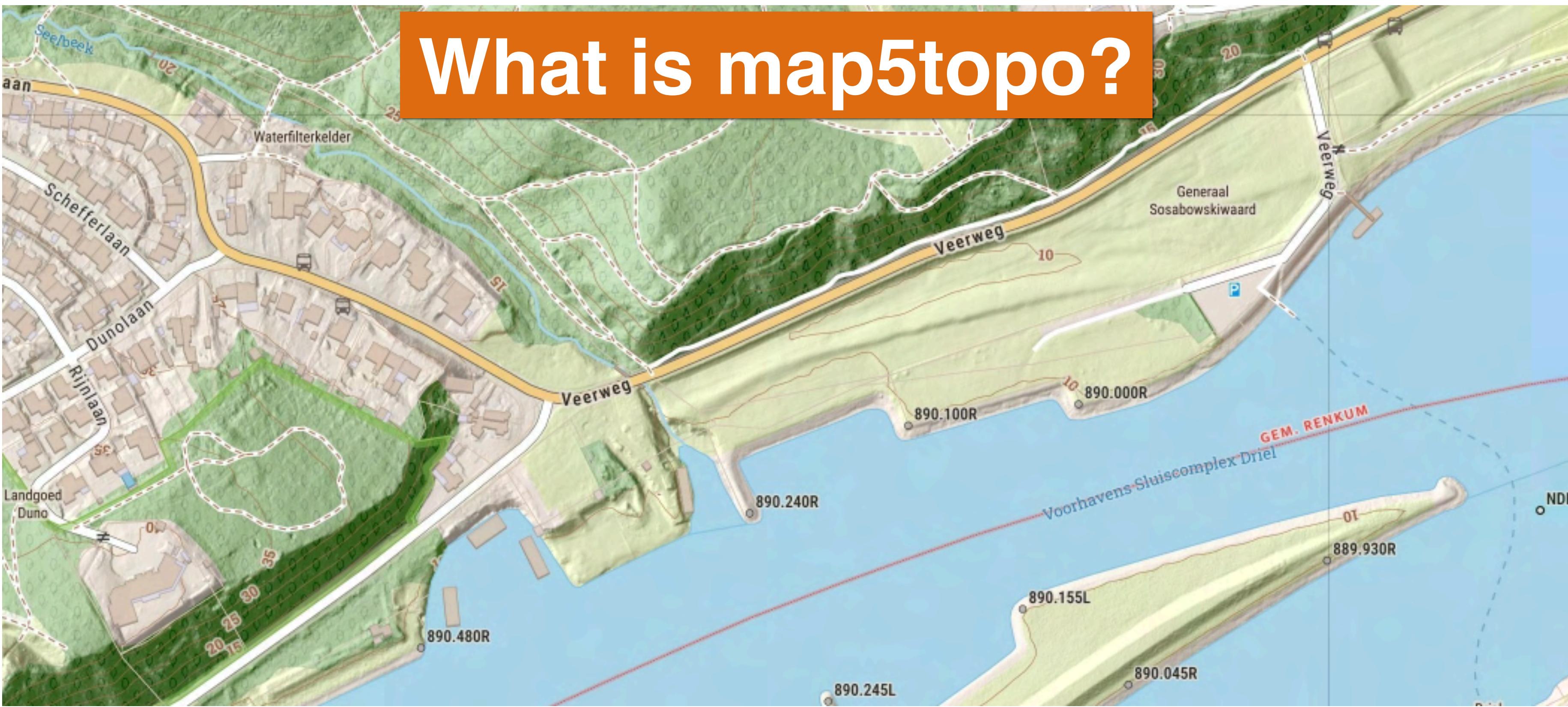
Docker image for Apache JMeter. This Docker image can be run as the `jmeter` command. Find Images of this repo on Docker Hub. Starting version 5.4 Docker builds/pushes are executed via GitHub Workflows.

Donate

With **over 10 Million Pulls from DockerHub**, this Docker Image is increasingly popular. To support its active maintainance consider making a donation, for example via PayPal:

What is map5topo?
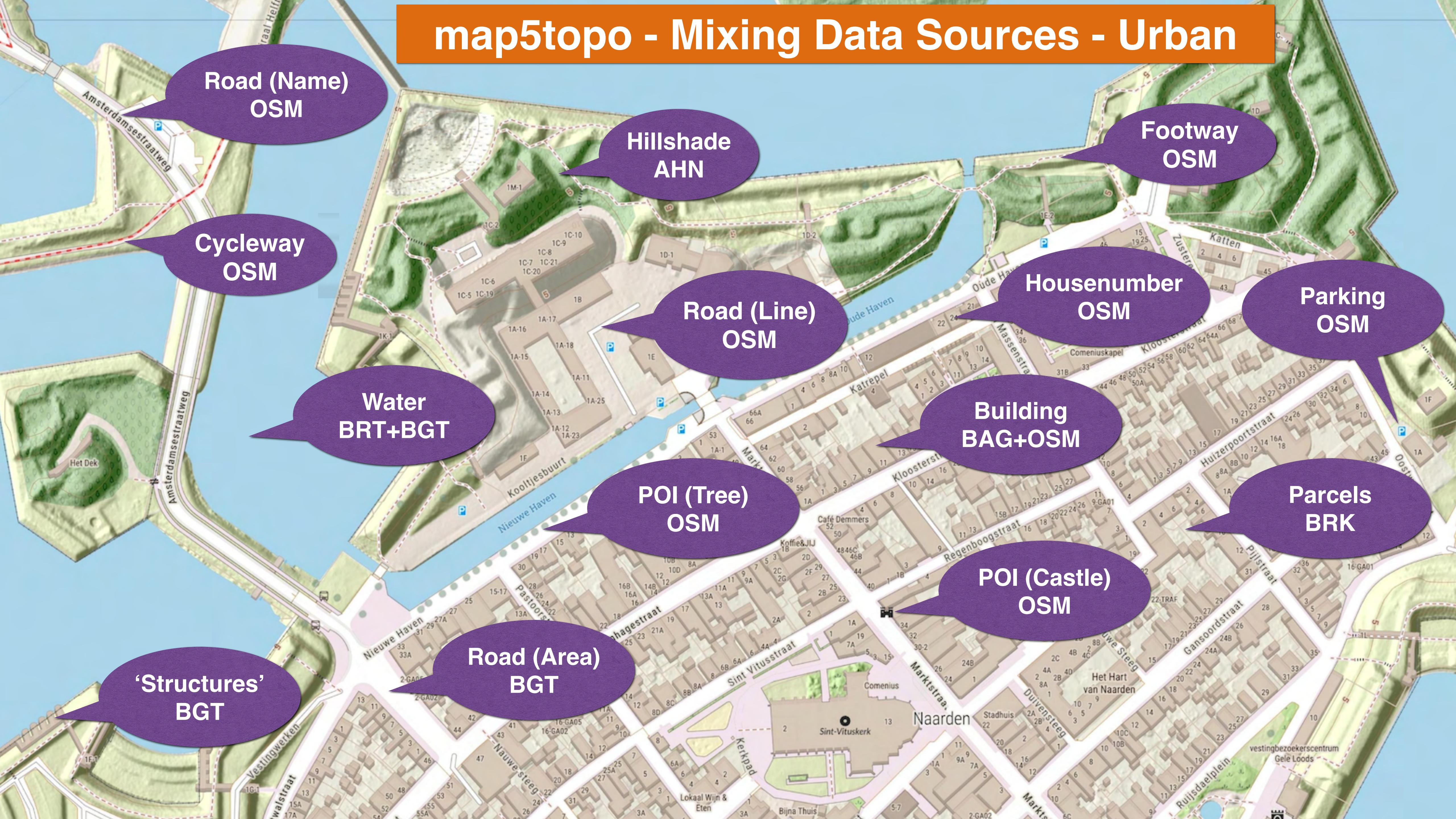
map5topo is a new (2023) topographic digital map covering The Netherlands plus parts of bordering countries. The map5topo project started in April 2022 and is ongoing since.
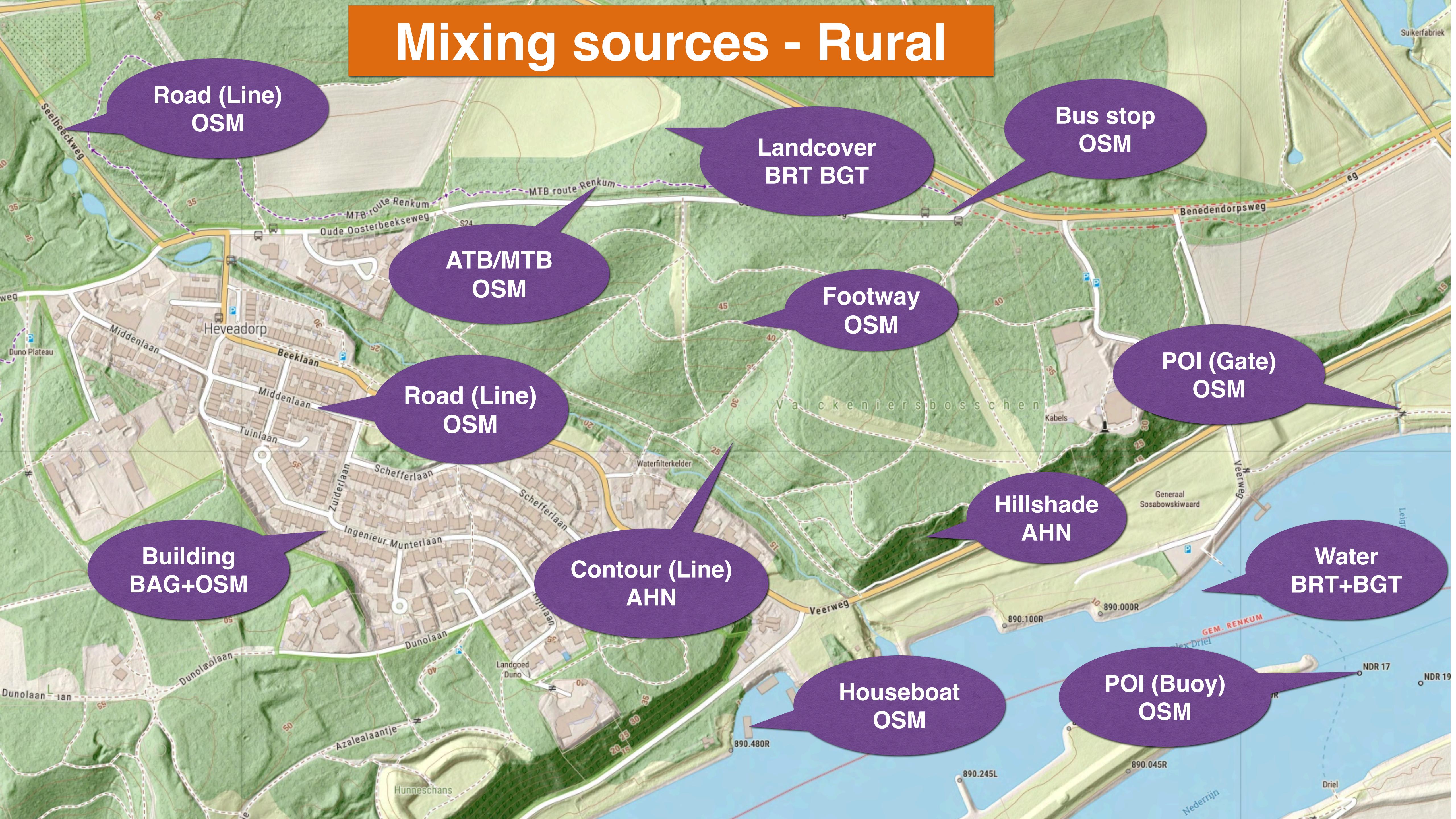
Source data originates from Open Datasets like the Dutch "Key Registries" ("Basisregistraties": BAG, BRT, BGT, BRK, AHN, ...) and from OpenStreetMap.

map5topo is provided by map5.nl via OGC tiled web services like WMTS, but also "XYZ" (Google/OSM tiles, a.k.a. Web Mercator) tiles. Currently only raster (image) tiles.

From: **map5topo.nl**
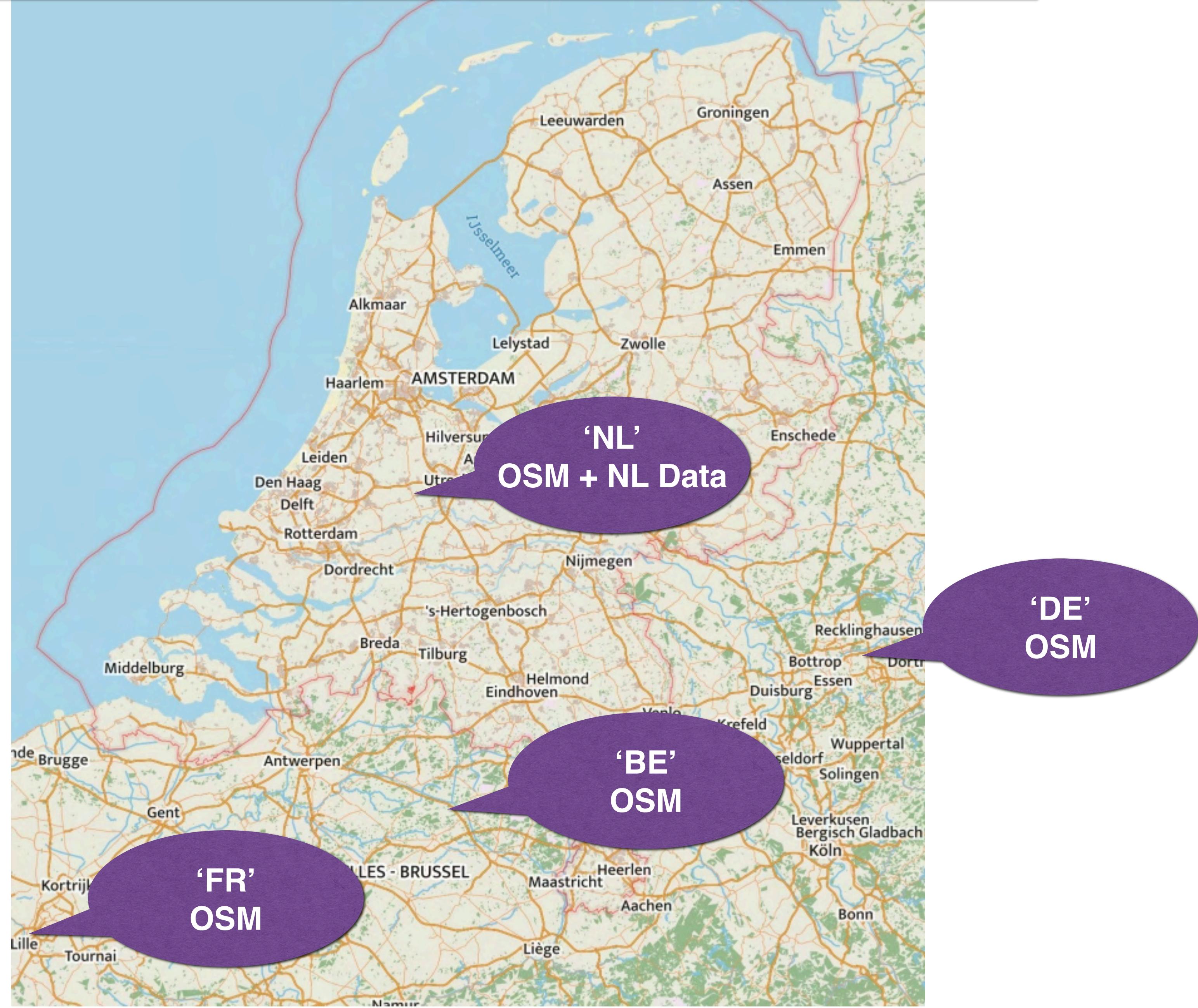
map5topo - Mixing Data Sources - Urban

- Road (Name) OSM
- Hillshade AHN
- Footway OSM
- Cycleway OSM
- Housenumber OSM
- Parking OSM
- Road (Line) OSM
- Water BRT+BGT
- Building BAG+OSM
- POI (Tree) OSM
- Parcels BRK
- POI (Castle) OSM
- 'Structures' BGT
- Road (Area) BGT

The Richness of Dutch Open Geospatial Datasets

- BAG - Buildings and Addresses
- BRK - Kadastral Parcels
- BRT - Topography - 1:10000 up - TOP10NL, TOP50NL,…
- BGT - Very Detailed Topography
- AHN - Lidar height data - DEM - 5m + **50cm resolutions** for hillshading and contour lines
- and much more:
    NWB (national road network), CBS, NS, …

All Open Licenses: CC-0, PD, CC-BY-4.0

Available from: **pdok.nl**

The Richness of Dutch Open Geospatial Datasets

Data - OpenStreetMap - (in The Netherlands)

- Very complete Transport infrastructure and -classification (roads, trails, railways, etc) - AND Import 2007
- Addresses
- BAG Import - Full in 2014 - Now incremental
- Contains Buildings not in BAG (e.g. mobile homes, houseboats)
- Landuse/Landcover: "3DShapes" (TOPVector) import 2010
- Active mapping community, monthly virtual meet

What?
Qué?
Què?

The Challenge!

How to mix all these disparate datasets:
Dutch Open Data + OpenStreetMap?

The Challenges!
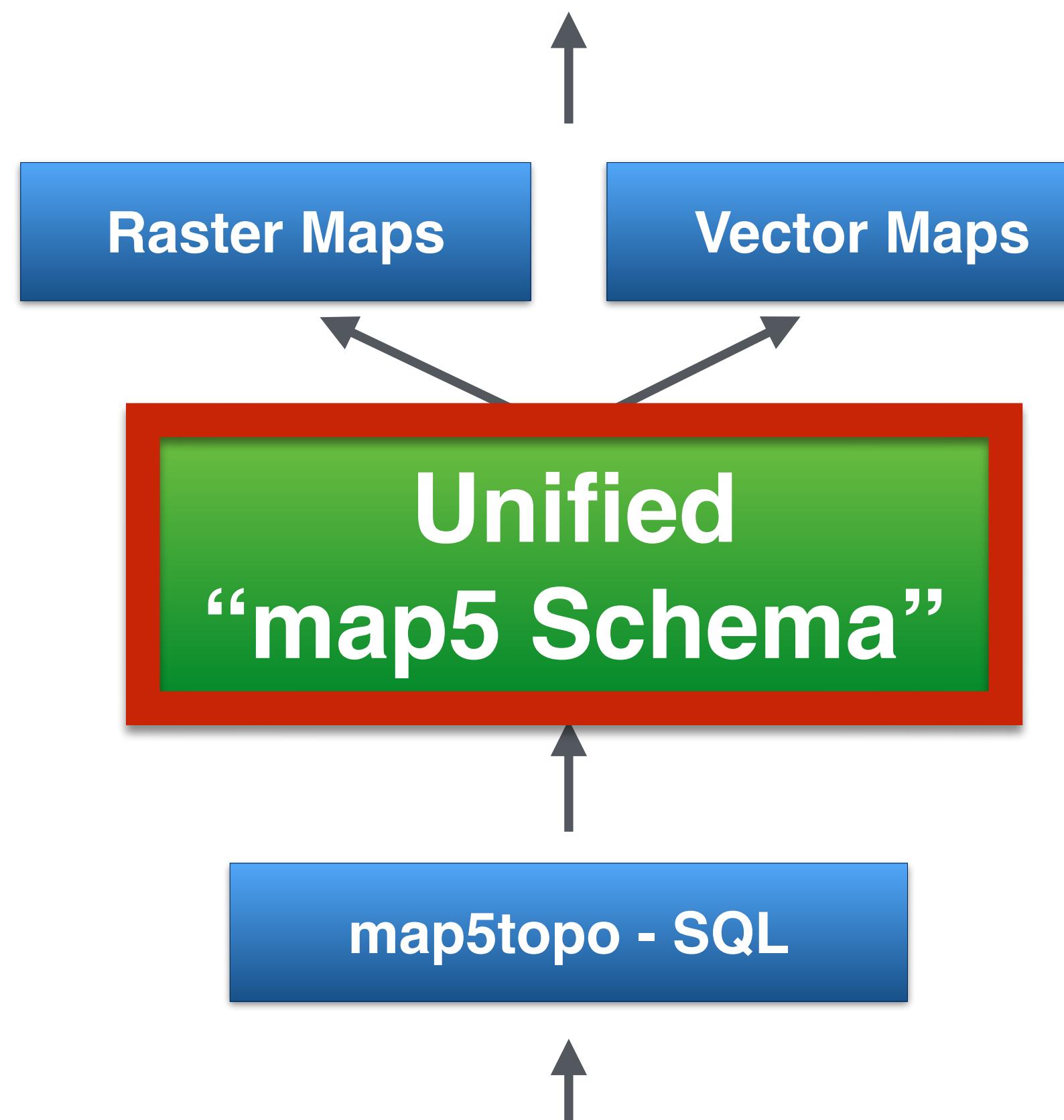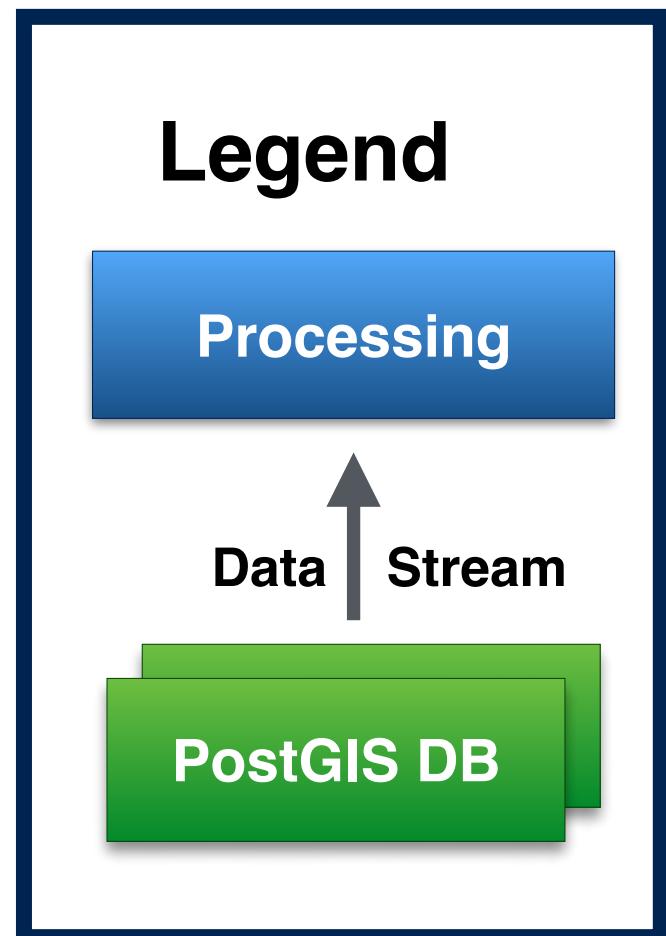
Datasets have:

1. Different classifications (tags, attributes)
2. Different scales/resolutions/generalizations
3. Overlapping geometries
4. Multiple occurrences, duplications

Bonus: Abroad data is OSM-only

A long way from everything: The search for a Grand Unified Theory

By Colin Jeffrey
June 20, 2016

VIEW 10 IMAGES

Can the macroscopic realm of gravity ever be merged with the strange microscopic kingdom of quantum particles to create a Grand Unified Theory of Everything?
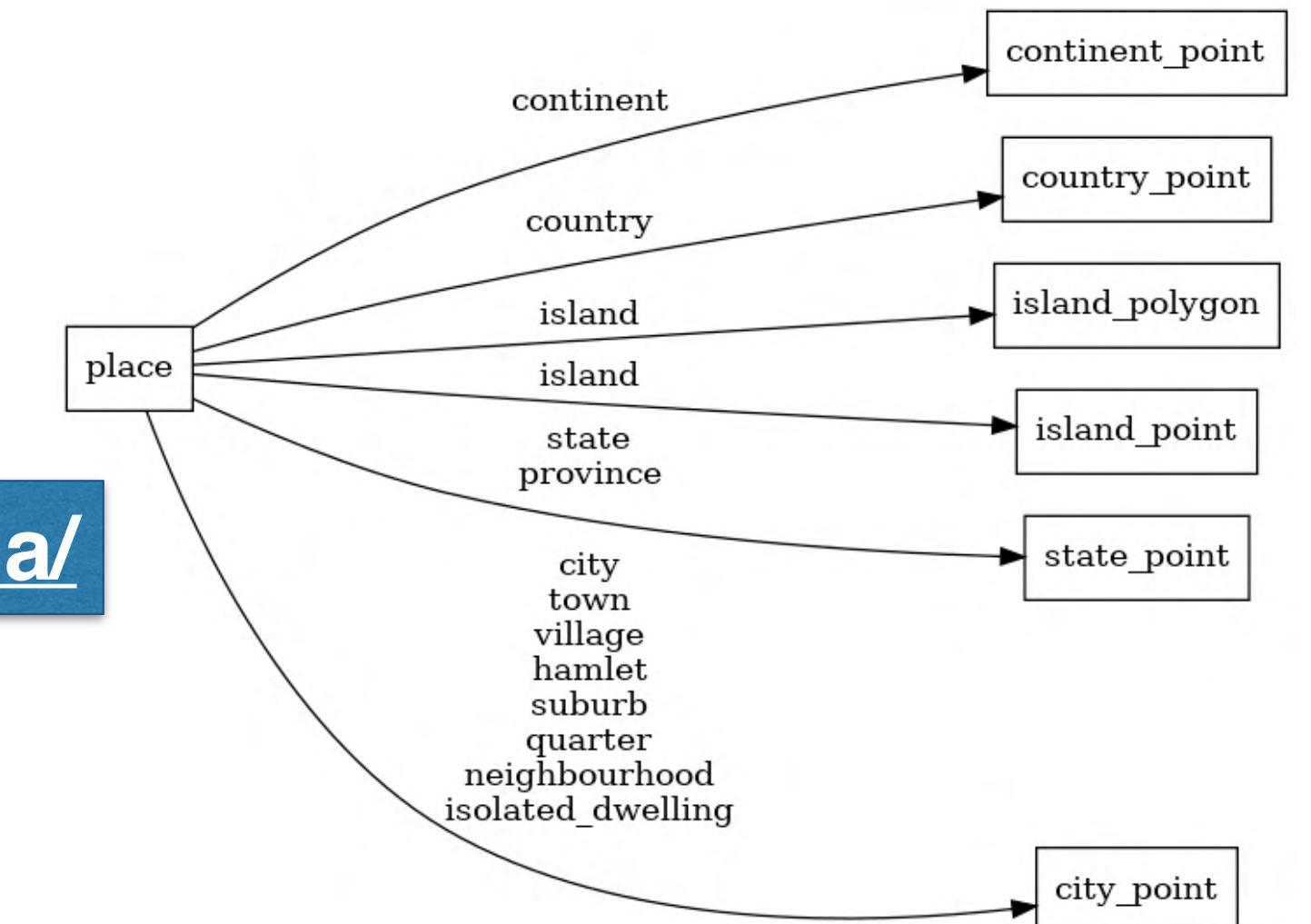
www.sciencephoto.com/media/1058475/view/mad-professor

https://newatlas.com/einstein-quantum-field-theory-relativity-gravity/42389/

Unified Data Schema for Maps - State of the Art

openmaptiles.org/schema/

Data Schema and Tooling DIY - Data from OSM and Natural Earth
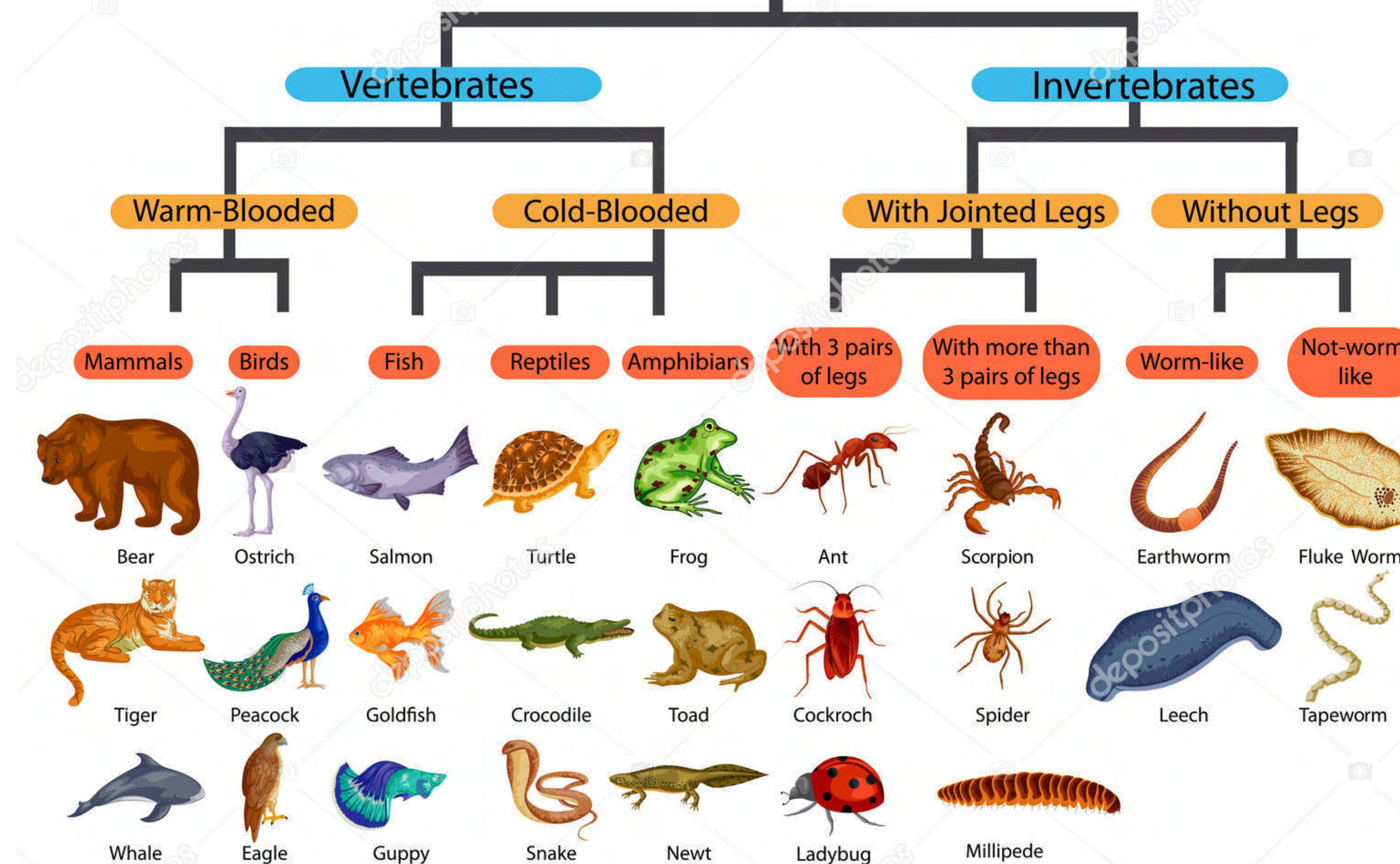
overturemaps.org/

Data Schema and Open QA-ed data (Parquet!) from OpenStreetMap and other sources (MS Buildings, Meta POIs, …)

Structured Data Schema

Open map data can lack the structure needed to easily build map products.

Overture will define and drive adoption of a common, well-structured, and documented data schema to create an easy-to-use ecosystem of map data.
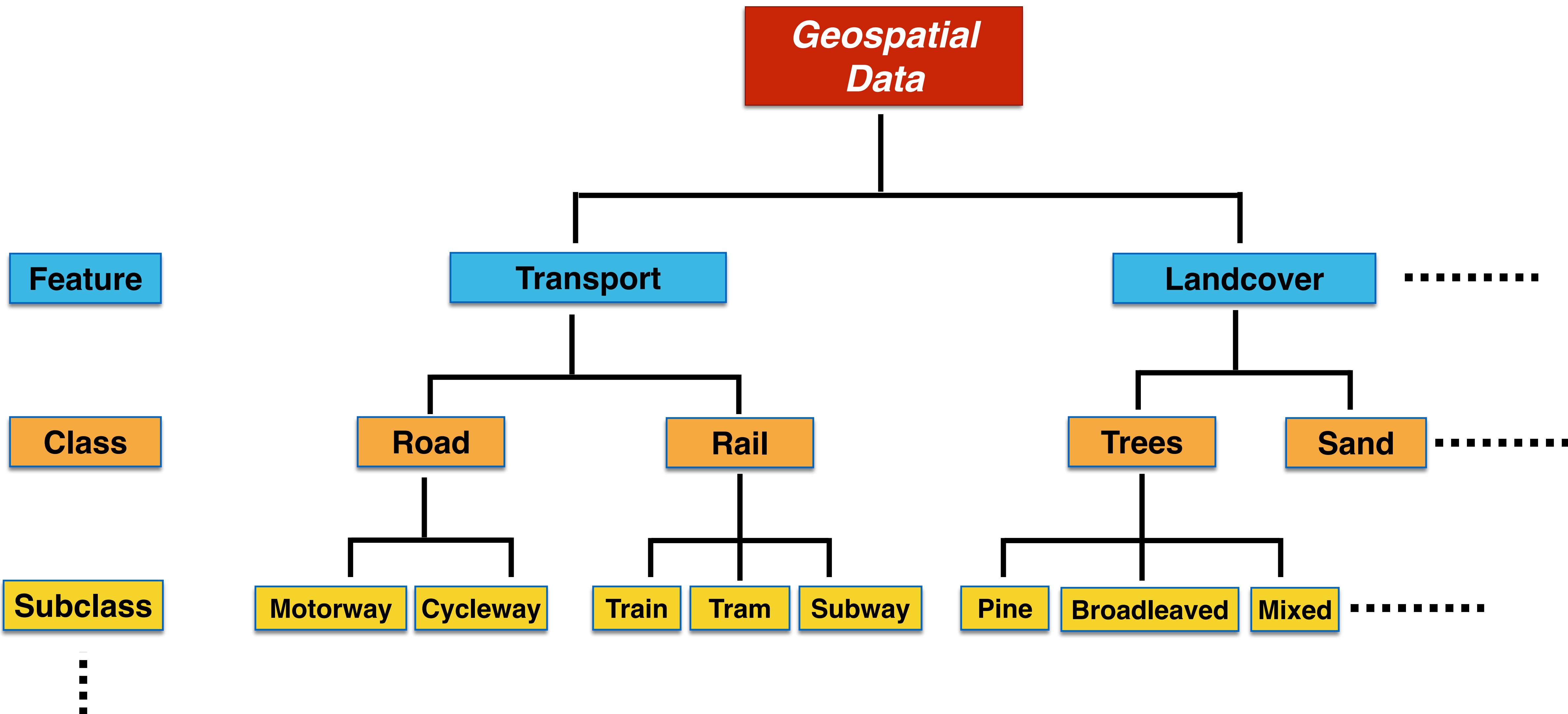
Hierarchical Classification in Species Taxonomy

Classification of Animals

DOMAIN	Eukarya
KINGDOM	Animalia
PHYLUM	Chordata
CLASS	Mammalia
ORDER	Carnivora
FAMILY	Canidae
GENUS	*Canis*
SPECIES	*Canis lupus*

EXAMPLE

Animal kingdom hierarchy

WOLF

https://www.earthreminder.com/space-posters-and-quotes-images/

Hierarchical Classification applied to Geo

Common Data Structure for Features (Tables)

Feature	Landcover	Transport
Geometry	Polygon	Linestring
Zoomrange	min=10 max=12	min=6 max=13
Classification	lod1=trees lod2=pine	lod1=road lod2=motorway
Source	schema=TOP10NL table=Terrein id=105548384	schema=OSM table=planet_osm_line id=1299133834 (osm-id)
Abroad?	No	Yes
Properties	area=3648 z-index=0	oneway=yes surface=asphalt name=Amerikalei ref=A112

Common Data Structure for Features - Realization in PostGIS

Feature Tables

```
  sql
    bag
    bgt
    brk
    brt
    dem-contours
    map5
      tables
        area-label.sql
        border.sql
        contour-line.sql
        grid.sql
        housenumber.sql
        landcover.sql
        landuse.sql
        metadata.sql
        parcel.sql
        place.sql
        poi.sql
        road-area.sql
        structure.sql
        water.sql
        waterway.sql
      functions.sql
    schema.sql
    nwb
    osm
```

Common Table Structure

Classification

Properties

Zoom range

Source

Abroad?

```sql
-- Common Table Structure in pseudo sql
TABLE map5.<table_name> (
    -- Hierarchical object classification
    lod1 TEXT,   -- level-of-detail 1 "type"
    lod2 TEXT,   -- level-of-detail 2 "subtype"
    lod3 TEXT,   -- level-of-detail 3 "subsubtype"

    -- z_order of the object relative to others
    z_index INTEGER {-N..M}

    -- The min and max zoomlevel (Dutch RD 1..13)
    -- when to show the object.
    rdz_min INTEGER {1..13},
    rdz_max INTEGER {1..13},

    -- Where the object originates from
    src_schema TEXT, -- source schema
    src_table TEXT,  -- source table
    src_idref TEXT,  -- unique id in source table

    -- Is this object outside of The Netherlands?
    abroad BOOLEAN FALSE,

    -- Geometry of the object in Dutch Projection
    geom GEOMETRY(POINT|LINESTRING|POLYGON, 28992)
);
```

Example Tables

```sql
CREATE TABLE map5.landcover (
    lod1 TEXT,
    lod2 TEXT,
    lod3 TEXT,
    area BIGINT DEFAULT 0,
    z_index INTEGER DEFAULT 0,
    rdz_min INTEGER DEFAULT -1,
    rdz_max INTEGER DEFAULT 13,
    src_schema TEXT,
    src_table TEXT,
    src_idref TEXT,
    abroad BOOLEAN DEFAULT FALSE,
    geom GEOMETRY(POLYGON, 28992)
);

CREATE TABLE map5.water (
    lod1 TEXT,
    lod2 TEXT,
    intermittent INTEGER DEFAULT 0,
    area BIGINT DEFAULT 0,
    z_index INTEGER DEFAULT 0,
    rdz_min INTEGER DEFAULT -1,
    rdz_max INTEGER DEFAULT 13,
    src_schema TEXT,
    src_table TEXT,
    src_idref TEXT,
    abroad BOOLEAN DEFAULT FALSE,
    geom GEOMETRY(MULTIPOLYGON, 28992)
);

CREATE TABLE map5.poi (
    lod1 TEXT,
    lod2 TEXT,
    lod3 TEXT,
    text1 TEXT DEFAULT '',
    rank INTEGER DEFAULT 0,
    rdz_min INTEGER DEFAULT -1, -- minzoom in RD
    rdz_max INTEGER DEFAULT 13, -- maxzoom in RD
    src_schema TEXT,
    src_table TEXT,
    src_idref TEXT,
    abroad BOOLEAN DEFAULT FALSE,
    geom GEOMETRY(POINT, 28992)
```

map5topo - Unified PostGIS Schema

Example: Landcover

```sql
CREATE TABLE map5.landcover (
    lod1 TEXT,
    lod2 TEXT,
    lod3 TEXT,
    area BIGINT DEFAULT 0,
    z_index INTEGER DEFAULT 0,
    rdz_min INTEGER DEFAULT -1,
    rdz_max INTEGER DEFAULT 13,
    src_schema TEXT,
    src_table TEXT,
    src_idref TEXT,
    abroad BOOLEAN DEFAULT FALSE,
    geom GEOMETRY(POLYGON, 28992)
);
```

Classification

Zoom range

Source

Classification

```
-- lod1           lod2           lod2 (Dutch)
-- ----------------------------------------
-- agriculture    arable         bouw/akkerland
--                orchard        boomgaard
--                pastoral       grasland agrarisch
-- trees          deciduous      loofbos
--                mixed          gemengd bos
--                pine           naaldbos
-- greenery       grass          grasland
--                scrub          allerlei soorten groen (greenery), behal
-- heath          heath          heide
-- wetland        reed           rietland - kwelder - slik
--                tidalflat      wad, wadden
-- sand           sand           duin - stuifzand
-- bare           yard           erf
--                bare           kaal, alles wat niet-erf of niet-urban i
--                urban          bebouwd gebied, staden etc.

-- lod 3 can add 'swamp'  for any of the above.

-- DATASET PER RD ZOOM
-- BGT        13
-- TOP10NL    10-12
-- TOP50      6-9
-- OSM        0-5 and 6-13 Abroad
```

ETL with SQL

```sql
BEGIN;
INSERT INTO map5.landcover
    SELECT
        CASE
            WHEN s.typelandgebruik IN ('akkerland', 'boomgaard', 'boomkwekerij', 'fruitkwekerij')
                THEN 'agriculture'
            WHEN s.typelandgebruik IN ('bos: gemengd bos', 'bos: loofbos', 'bos: naaldbos', 'populieren')
                THEN 'trees'
            WHEN s.typelandgebruik IN ('grasland', 'dodenakker')
                THEN 'greenery'
            WHEN s.typelandgebruik = 'heide'
                THEN 'heath'
            WHEN s.typelandgebruik = 'bos: griend'
                THEN 'wetland'
            WHEN s.typelandgebruik IN ('duin', 'zand')
                THEN 'sand'
            WHEN s.typelandgebruik IN ('aanlegsteiger', 'basaltblokken, steenglooiing', 'bebouwd gebied', 'braakliggend', 's
                THEN 'bare'
            ELSE
                'bare'
        END  AS lod1,
        CASE
            WHEN s.typelandgebruik IN ('akkerland', 'boomkwekerij', 'fruitkwekerij')
                THEN 'arable'
            WHEN s.typelandgebruik  = 'boomgaard'
                THEN 'orchard'
            WHEN s.typelandgebruik IN ('bos: loofbos', 'populieren')
                THEN 'deciduous'
            WHEN s.typelandgebruik IN ('bos: gemengd bos')
                THEN 'mixed'
            WHEN s.typelandgebruik = 'bos: naaldbos'
                THEN 'pine'
            WHEN s.typelandgebruik = 'grasland'
                THEN 'grass'
            WHEN s.typelandgebruik = 'dodenakker'
                THEN 'scrub'
            WHEN s.typelandgebruik  = 'heide'
                THEN 'heath'
            WHEN s.typelandgebruik = 'bos: griend'
                THEN 'reed'
            WHEN s.typelandgebruik IN ('duin', 'zand')
                THEN 'sand'
            WHEN s.typelandgebruik = 'bebouwd gebied'
                THEN 'urban'
            ELSE
                'bare'
        END  AS lod2,

        s.typelandgebruik AS lod3,
        ST_Area(s.geometrie_vlak)    AS area,
        0    AS z_index,
        -- Show between these RD zoomlevels
        6                            AS rdz_min,
        9                            AS rdz_max,
        'top50nl'                    AS src_schema,
        'terrein_vlak'  AS src_table,
        s."lokaalid"                 AS src_idref,
        FALSE                AS abroad,
        (ST_Dump(ST_ForcePolygonCW(ST_CollectionExtract(s.geometrie_vlak, 3)))).geom::geometry(POLYGON, 28992) AS geom
    FROM
        top50nl."terrein_vlak" AS s;
COMMIT;
```

**Example:
Data
at zoom RD 12
(Webmerc 17)**

```
1  SELECT * FROM map5.metadata where abroad is false and rdzoom = 12
```

Data Output   Messages   Notifications

	table_name text	rdzoom integer	wmzoom integer	src_schema text	src_table text	abroad boolean	records integer	created text
1	map5.area_label	12	17	top10nl	geografischgebied	false	15865	2023-Jul-16-22:38:14
2	map5.area_label	12	17	osmnl	planet_osm_polygon	false	74761	2023-Jul-16-22:38:14
3	map5.area_label	12	17	osmnl	planet_osm_point	false	90254	2023-Jul-16-22:38:14
4	map5.border	12	17	osmnl	planet_osm_polygon	false	357	2023-Jul-16-22:38:29
5	map5.contour_line	12	17	dem	contours	false	112187	2023-Jul-16-22:38:41
6	map5.landuse	12	17	osmnl	planet_osm_polygon	false	7408	2023-Jul-16-23:06:55
7	map5.parcel	12	17	brk	kadastralegrens	false	7871858	2023-Jul-16-23:11:26
8	map5.place	12	17	osmnl	planet_osm_point	false	9602	2023-Jul-16-23:12:02
9	map5.poi	12	17	osmnl	planet_osm_polygon	false	8347	2023-Jul-16-23:15:45
10	map5.poi	12	17	osmnl	planet_osm_point	false	585496	2023-Jul-16-23:15:45
11	map5.poi	12	17	nwb	hectoborden	false	159143	2023-Jul-16-23:15:45
12	map5.poi	12	17	top10nl	hoogte_punt	false	78901	2023-Jul-16-23:15:45
13	map5.road_area	12	17	osmnl	planet_osm_polygon	false	8542	2023-Jul-16-23:22:39
14	map5.structure	12	17	bgt_lean	kunstwerkdeel_vlak	false	182473	2023-Jul-16-23:34:44
15	map5.structure	12	17	osmnl	planet_osm_polygon	false	38548	2023-Jul-16-23:34:44
16	map5.structure	12	17	bag	pand	false	10874597	2023-Jul-16-23:34:44
17	map5.structure	12	17	bgt_lean	overigbouwwerk_multivlak	false	1066015	2023-Jul-16-23:34:44
18	map5.structure	12	17	bgt_lean	gebouwinstallatie_vlak	false	1328327	2023-Jul-16-23:34:44
19	map5.water	12	17	osmnl	sea_polygons	false	4	2023-Jul-16-23:41:51
20	map5.water	12	17	top10nl	waterdeel_vlak	false	295180	2023-Jul-16-23:41:51
21	map5.waterway	12	17	top10nl	waterdeel_lijn	false	2867200	2023-Jul-16-23:44:07
22	map5.landcover	12	17	top10nl	terrein_vlak	false	2194227	2023-Jul-18-13:58:38
23	map5.landcover	12	17	osmnl	planet_osm_polygon	false	1694	2023-Jul-18-13:58:38

Status & Conclusions

First version map5 schema ready
Monthly new data and map5topo raster maps
Vector tiling with Martin and MapLibre GL JS in progress

Refinements now
Open Source project: who wants to join?

Thanks!
Questions?

Newsletters: https://map5.nl/contact.html
Documentation: https://map5topo.nl
Viewers: https://app.map5.nl/map5topo/
Social: https://mapstodon.space/@map5nl
Subscriptions: https://map5.nl - *OSM Mappers: reduced pricing*