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STARTING SOON:

Working With Overture Data: A Step-by-Step Guide

Meta Research Scientist **Jennings Anderson** discusses Overture's use of cloud-native parquet format and provides a step-by-step guide to accessing and visualizing the initial Overture data release.

Marc Prioleau

Executive Director of
Overture Maps

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Jennings Anderson, PhD

Research Scientist
at Meta

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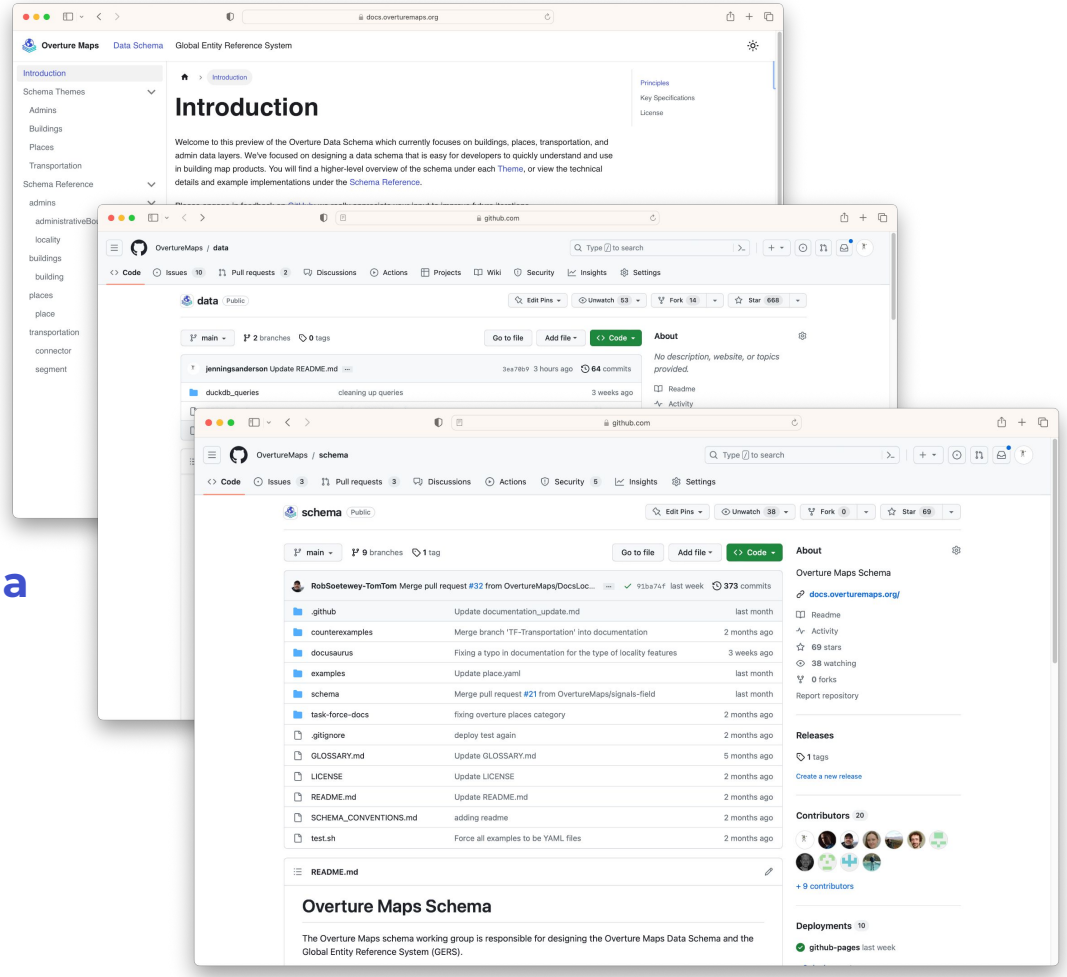
Resources

docs.overturemaps.org

github.com/overturemaps/data

github.com/overturemaps/schema



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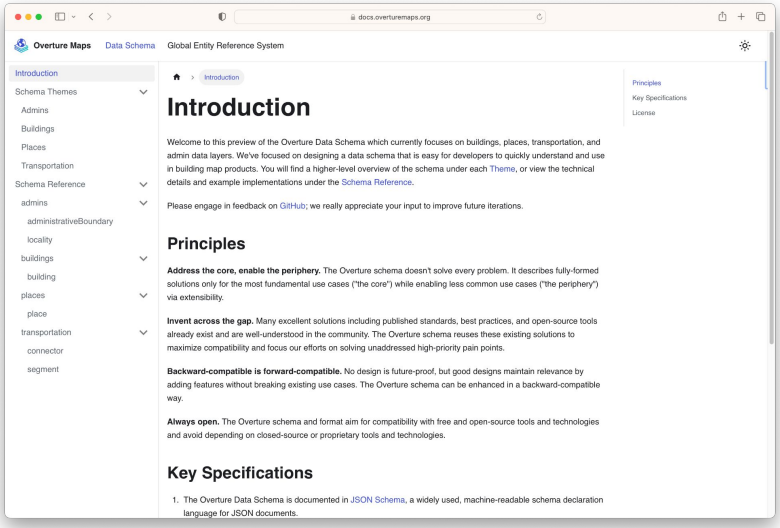
What is in the 2023-07-26-alpha.0 data release?

...and why is there no
“download all the data here”
button?

What is in the 2023-07-26-alpha.0 data release?

4 Themes:

1. Administrative Boundaries (admins)
2. Buildings
3. Places
4. Transportation



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Administrative Boundaries (admins) at-a-glance

99,403 features

2,948 locality

i. adminLevel=2 (265) (Polygon/Multipolygon)

ii. adminLevel=4 (2,683) (Multipolygons)

96,455 administrativeBoundary (LineStrings)

iii. adminLevel=2 (18,825)

iv. adminLevel=4 (77,630)

Buildings at-a-glance

785,524,851 building features

- **27,871,758 have *height* information (at least 10M from USGS Lidar)**
- **562,731,640 from OpenStreetMap**
- **211,937,251 from Microsoft ML Buildings Dataset**
- **10,855,960 from Esri Community Maps**

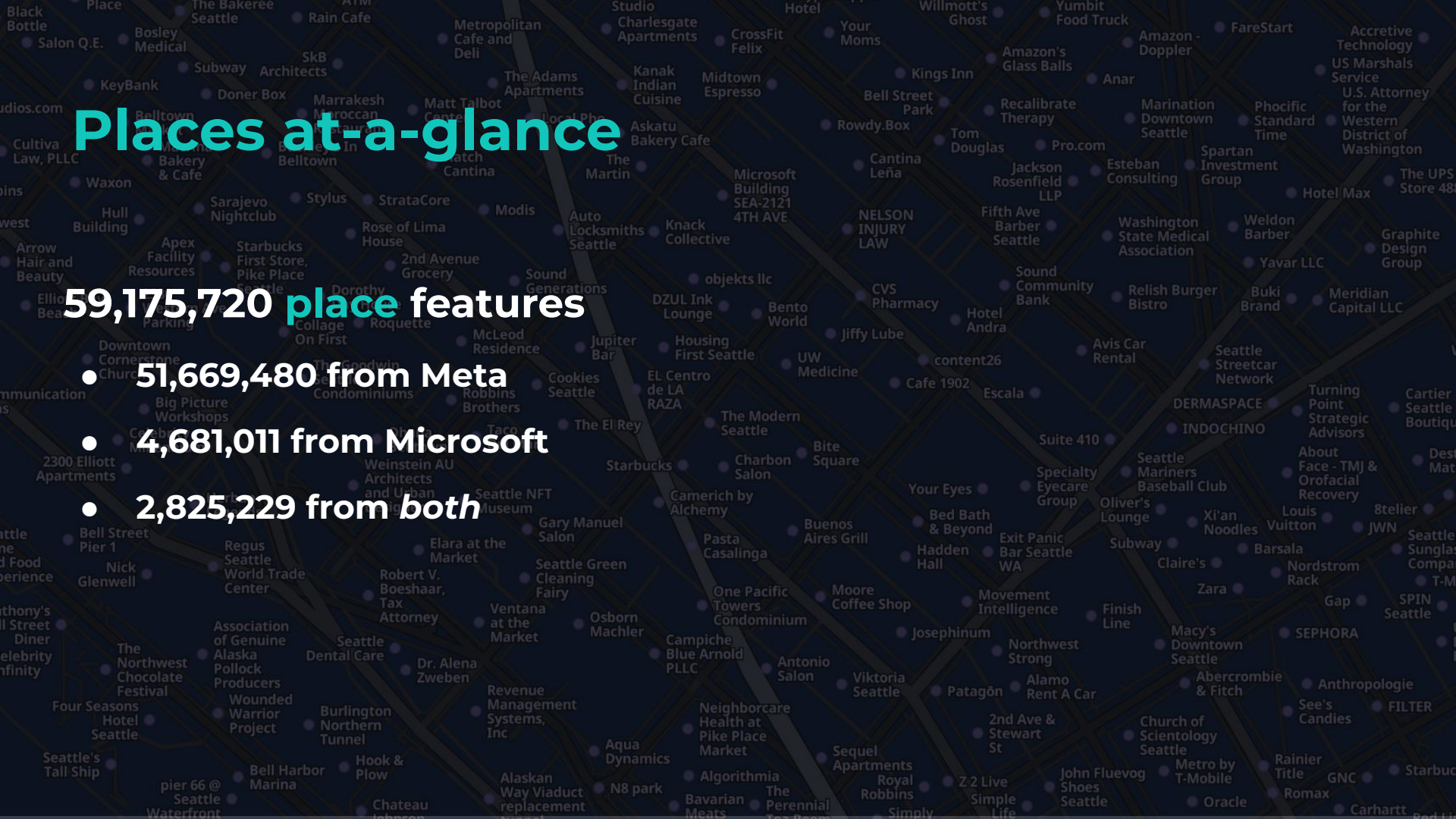
What is the order of conflation?

OpenStreetMap > Esri > Microsoft ML

Places at-a-glance

59,175,720 place features

- **51,669,480 from Meta**
- **4,681,011 from Microsoft**
- **2,825,229 from *both***



Transportation at-a-glance

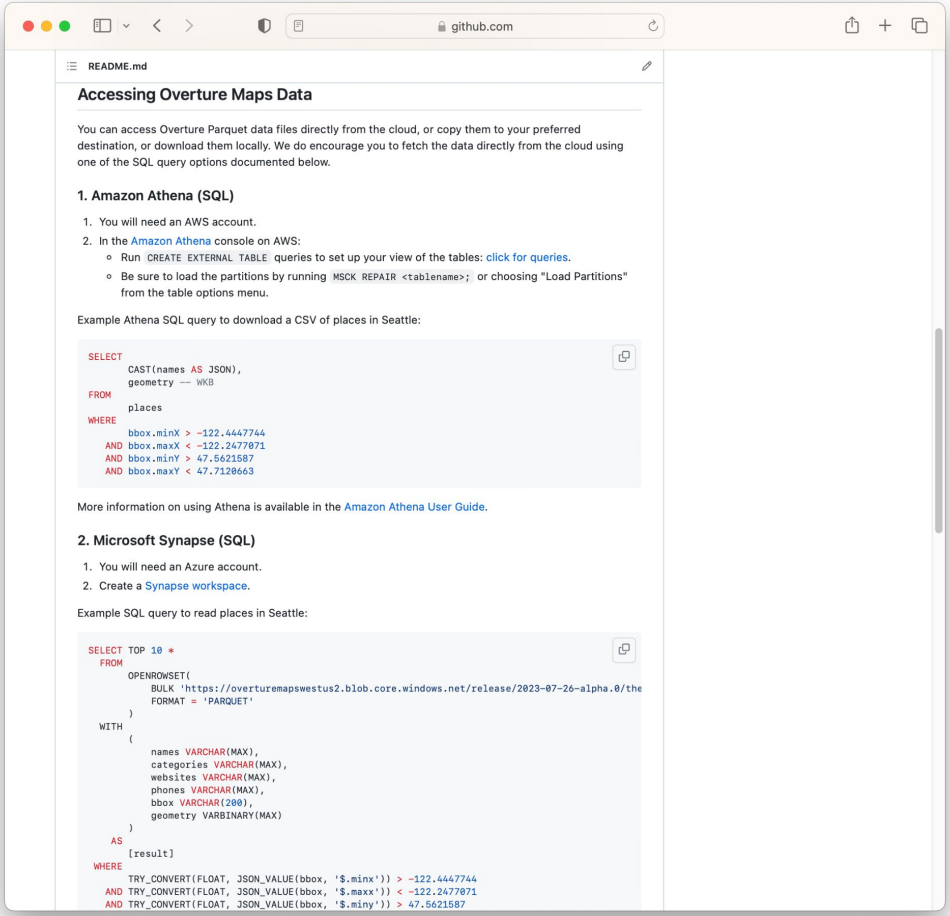
Re-segmented OSM road network:

- **294,327,662 segment features**
- **330,606,087 connector features**

Let’s dig in

Using Amazon **Athena** as an interactive query environment to read Overture data

Athena is just *one* way to access the data. Instructions are available on github.



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github.com/overturemaps/data

Places Queries

```
SELECT COUNT(*) FROM places

SELECT * FROM places LIMIT 10

SELECT ROUND(confidence * 10)/10 AS _conf,
    COUNT(id) as _count
FROM places
GROUP BY ROUND(confidence * 10)
ORDER BY _conf DESC
```

Where is the places coverage?

```
WITH places_with_quadkey AS (
     SELECT bing_tile_quadkey(
               BING_TILE_AT(
                    ST_Y(ST_GeomFromBinary(geometry)),
                    ST_X(ST_GeomFromBinary(geometry)),
                    8
               )
          ) AS q8,
          id
     FROM places
     WHERE confidence > 0.8
)
SELECT BING_TILE_POLYGON(BING_TILE(q8)),
count(id) as num_places
FROM places_with_quadkey
GROUP BY q8
```

Download some data as a CSV with Athena

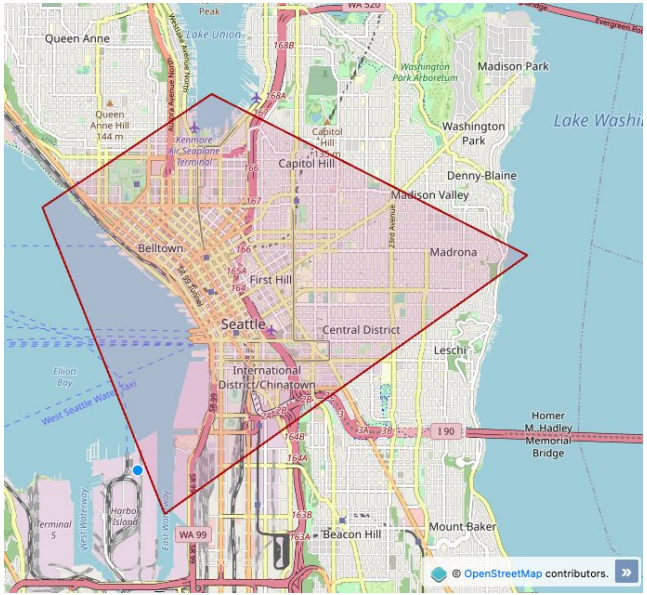
```
SELECT TRY(
        FILTER(
            names [ 'common' ],
            name->name [ 'language' ] = 'local'
        ) [ 1 ] [ 'value' ]
    ) AS name,
    categories.main AS category,
    confidence,
    ST_GeomFromBinary(geometry) as wkt
FROM places
WHERE confidence > 0.8
    AND bbox.minX > -126.7952
    AND bbox.maxX < -118.5453
    AND bbox.minY > 43.5453
    AND bbox.maxY < 50.4344
```

Analyze buildings coverage globally

```
WITH buildings_with_quadkey AS (
  SELECT
    bing_tile_quadkey(
      BING_TILE_AT(
        (bbox.maxY + bbox.minY)/2,
        (bbox.maxX + bbox.minX)/2,
        8
      )
    ) AS q8,
    id,
    CARDINALITY(
      FILTER(sources, x -> x['dataset'] = 'OpenStreetMap')
    )>0 AS osm_building
  FROM buildings
)
SELECT
  BING_TILE_POLYGON(BING_TILE(q8)),
  COUNT(id) as num_buildings,
  COUNT_IF(osm_building) AS osm_building,
  COUNT_IF(osm_building) / CAST(COUNT(id) AS double) AS percent_osm
FROM buildings_with_quadkey
GROUP BY q8
```

Download some buildings in Seattle

```
SELECT class, height,
      ST_GeomFromBinary(geometry) as wkt
FROM buildings
WHERE ST_CONTAINS(
            ST_GeometryFromText(
                  'POLYGON((-122.36719284258956
47.618321237733284,-122.33594394153602
47.632404470851924,-122.2775808079059
47.61236859966664,-122.34462990362489
47.58012171471199,-122.36719284258956
47.618321237733284))'
            ),
            ST_GeomFromBinary(geometry)
      )
```

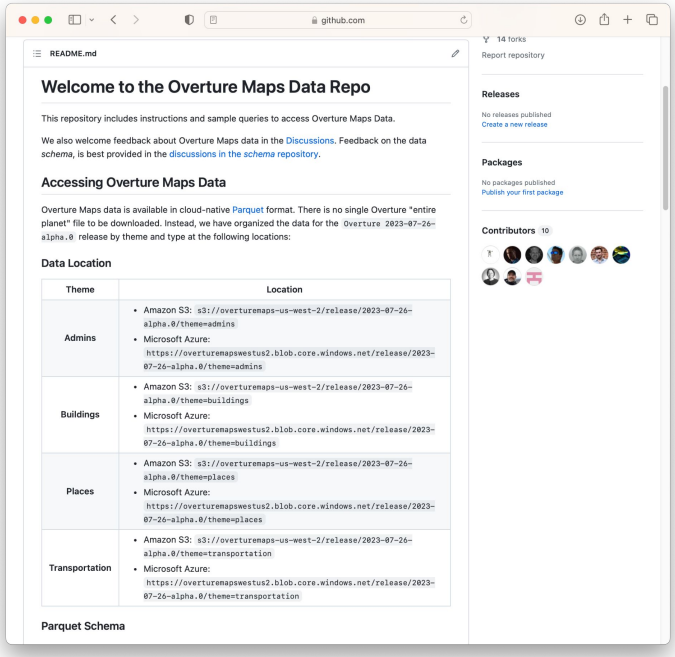


Still no download button?

Athena is just *one* way to access the data.

Today, we transformed, downloaded, analyzed, and grouped the data all without needing to first download and process a massive file.

If you *must* download all of the data, the parquet files are available!



github.com/overturemaps/data

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What’s Next?

Future releases will continue improving in coverage and quality on the the existing themes

The Global Entity Reference System (GERS) will assign stable IDs to features in the 4 themes, allowing matching of external datasets and easy id-based conflation.

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Q & A

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Thank You