



Areas-of-Interest and the Beauty of Geovisualization

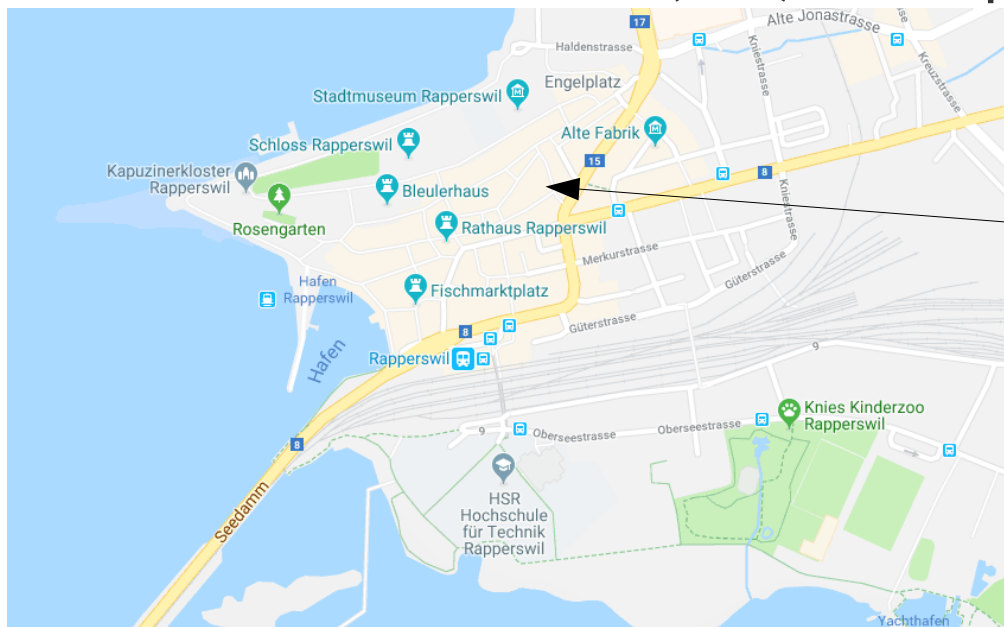
Philipp Koster
Cand. MSc, HSR Rapperswil

About my Thesis

- Big Geospatial Data Analytics and Processing

Using Python and Open Source Tools

- Use case: Areas-of-Interest (AOI) with OpenStreetMap



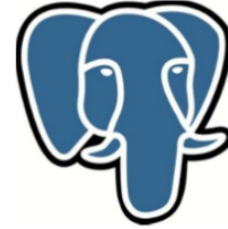
Light orange style for “highly frequented and worth seeing areas”

Rapperswil in Google Maps

About my Thesis

1. Implement AOI with a robust and open source relational database (and explore it's limits)

PostgreSQL



PostGIS



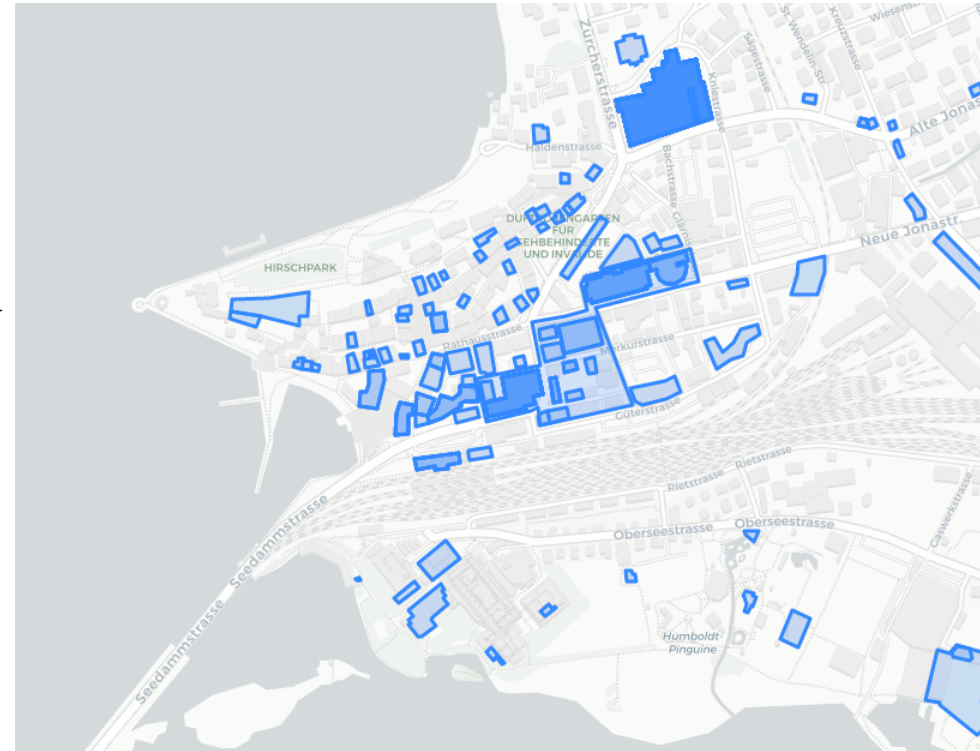
2. Implement AOI with a “Big Data Framework” and Python



AOI with PostgreSQL + PostGIS

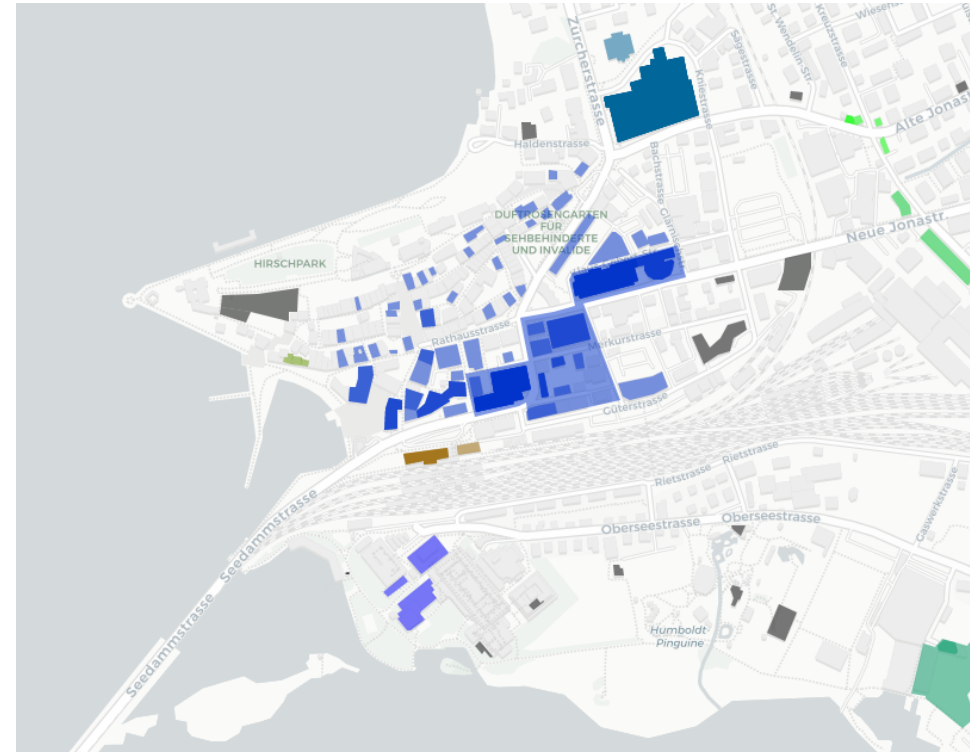
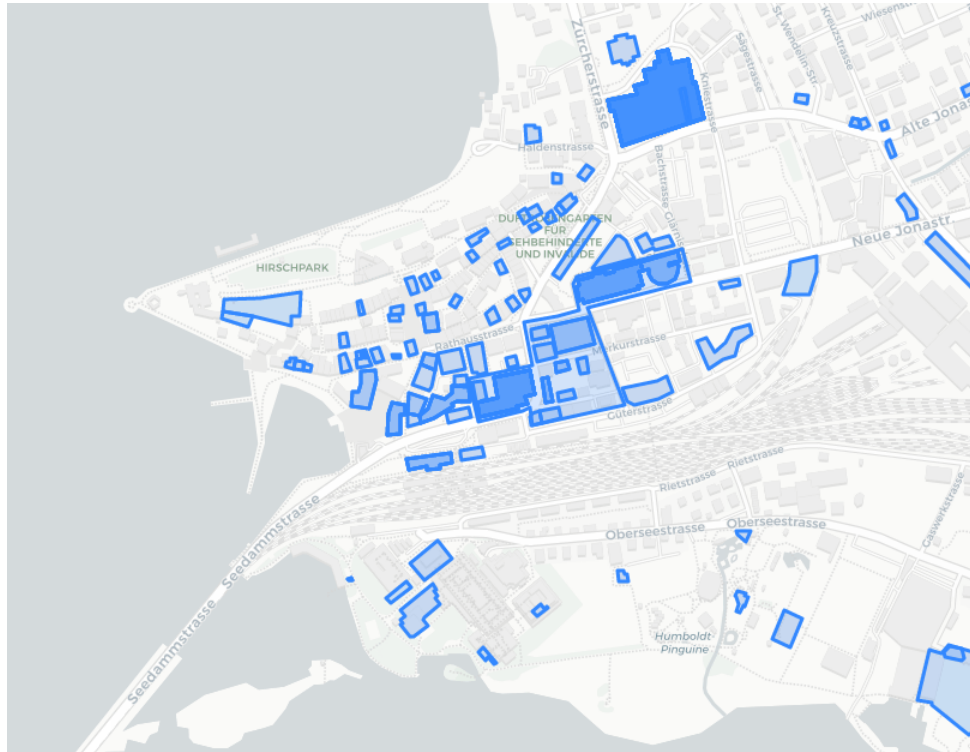
1. Select POI by tags

```
shop_tags = ['mall', 'bakery', 'beverages', 'butcher', 'chocolate', 'coffee',  
'confectionery', 'deli', 'frozen_food', 'greengrocer', 'healthfood',  
'ice_cream', 'pasta', 'pastry', 'seafood', 'spices', 'tea', 'department_store',  
'supermarket', 'bag', 'boutique', 'clothes', 'fashion', 'jewelry', 'leather',  
'shoes', 'tailor', 'watches', 'chemist', 'cosmetics', 'hairstylist',  
'medical_supply', 'electrical', 'hardware', 'electronics', 'sports',  
'swimming_pool', 'collector', 'games', 'music', 'books', 'gift', 'stationery',  
'ticket', 'laundry', 'pet', 'tobacco', 'toys']  
  
amenity_tags = ['pub', 'bar', 'cafe', 'restaurant', 'pharmacy', 'bank', 'fast_food',  
'food_court', 'ice_cream', 'library', 'ferry_terminal', 'clinic', 'doctors', 'hospital',  
'pharmacy', 'veterinary', 'dentist', 'arts_centre', 'cinema',  
'community_centre', 'casino', 'fountain', 'nightclub', 'studio', 'theatre',  
'dojo', 'internet_cafe', 'marketplace', 'post_office', 'townhall']  
  
leisure_tags = ['adult_gaming_centre', 'amusement_arcade', 'beach_resort',  
'fitness_centre', 'garden', 'ice_rink', 'sports_centre', 'water_park']  
  
landuse_tags = ['retail']
```



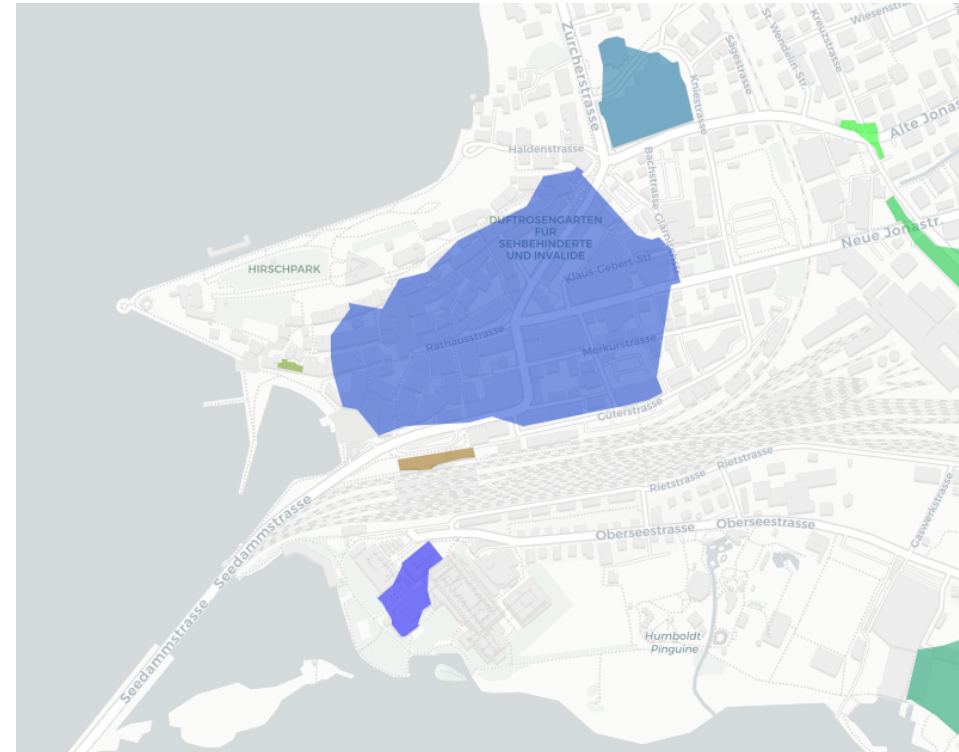
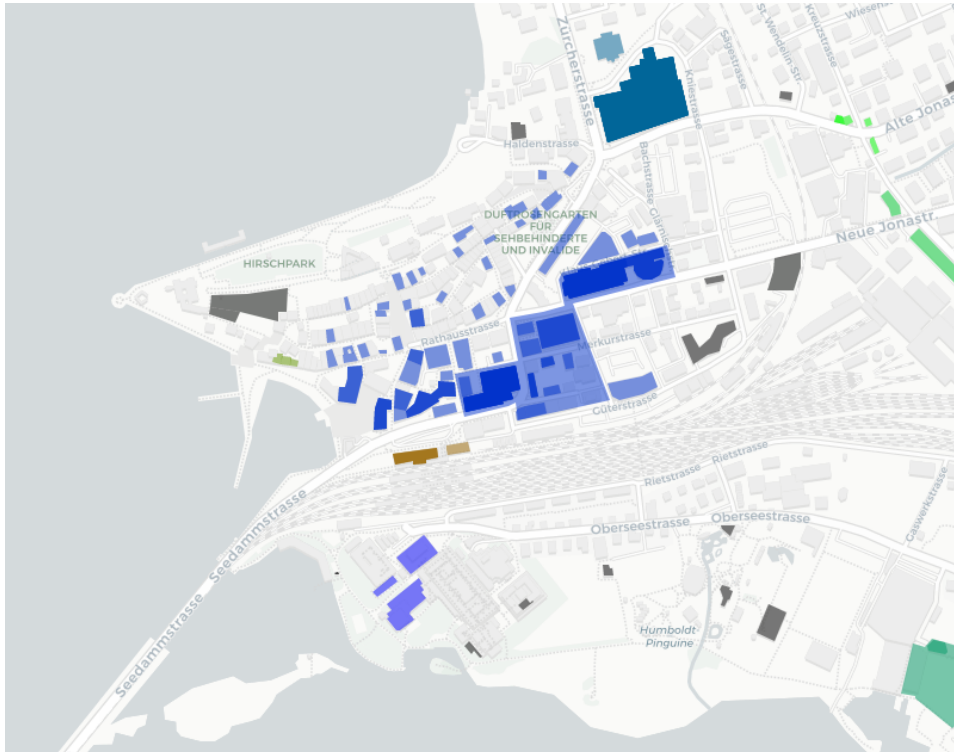
AOI with PostgreSQL + PostGIS (cont'd)

2. Cluster POI with spatial clustering algorithm DBSCAN



AOI with PostgreSQL + PostGIS (cont'd)

3. Concave hull around clusters



AOI with PostgreSQL + PostGIS (cont'd)

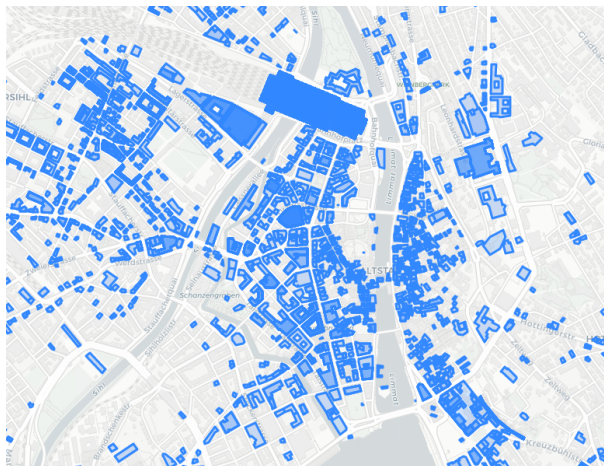
3. Concave hull around clusters



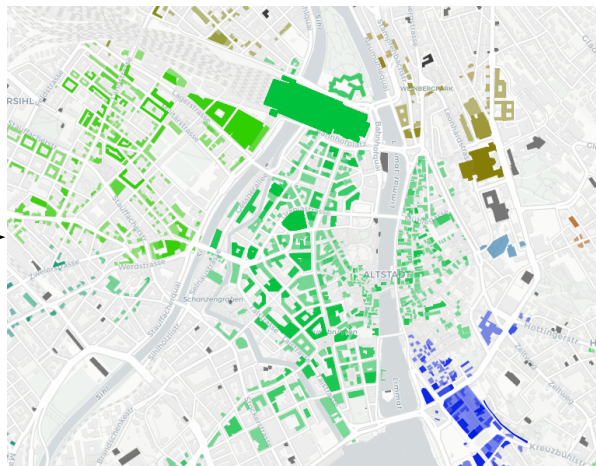
Already not bad. But what about other cities?

AOI of Zürich

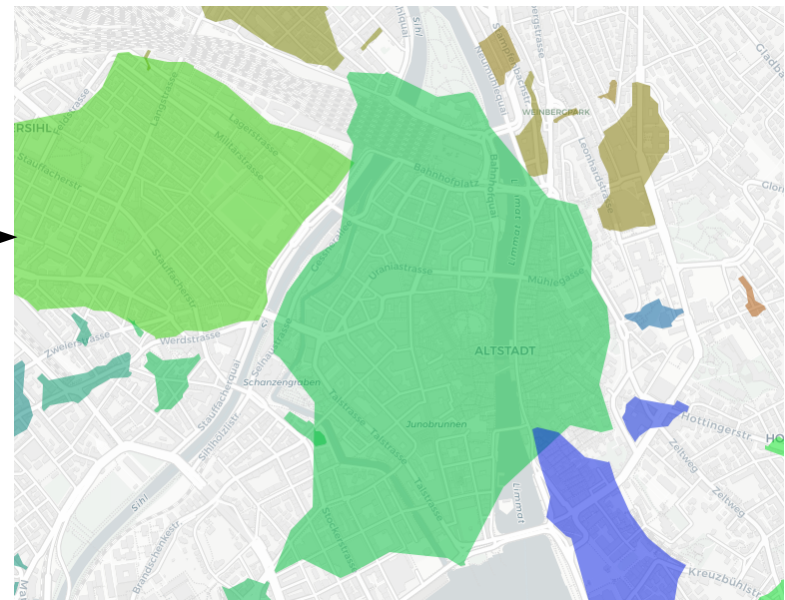
1. POI



2. Cluster



3. AOI



“Network Centrality” algorithm

1. Select street network (with osmnx)



“Network Centrality” algorithm (cont’d)

2. Calculate network centrality (with osmnx)



Next Steps and Final Results

- Finish AOI with PostgreSQL + PostGIS
- Do the same with Apache Spark
- Final results to be expected September 2018

A map of the Dufourpark area in Basel, Switzerland. The map shows various streets and landmarks. Several regions are highlighted in different colors: a small blue area in the upper left, a large blue area in the center, a small green area in the upper right, a small purple area in the lower left, and a larger green area in the lower right. A red area is visible in the top right corner, partially cut off. The text "Thank you" is overlaid in the center, and "Questions? Input? philipp.koster@hsr.ch" is overlaid below it.

Thank you

Questions? Input?
philipp.koster@hsr.ch



CARTOGRAPHIC ADVENTURES IN 3D



Raluca Nicola @nicolaraluk

🏠 Bucharest, Romania



MSc. Cartography, Technical University of Munich



Product Engineer - Esri R&D Center Zurich

--- 3D demos, prototypes for ArcGIS API for JavaScript

Prototype - Manhattan skyscraper explorer

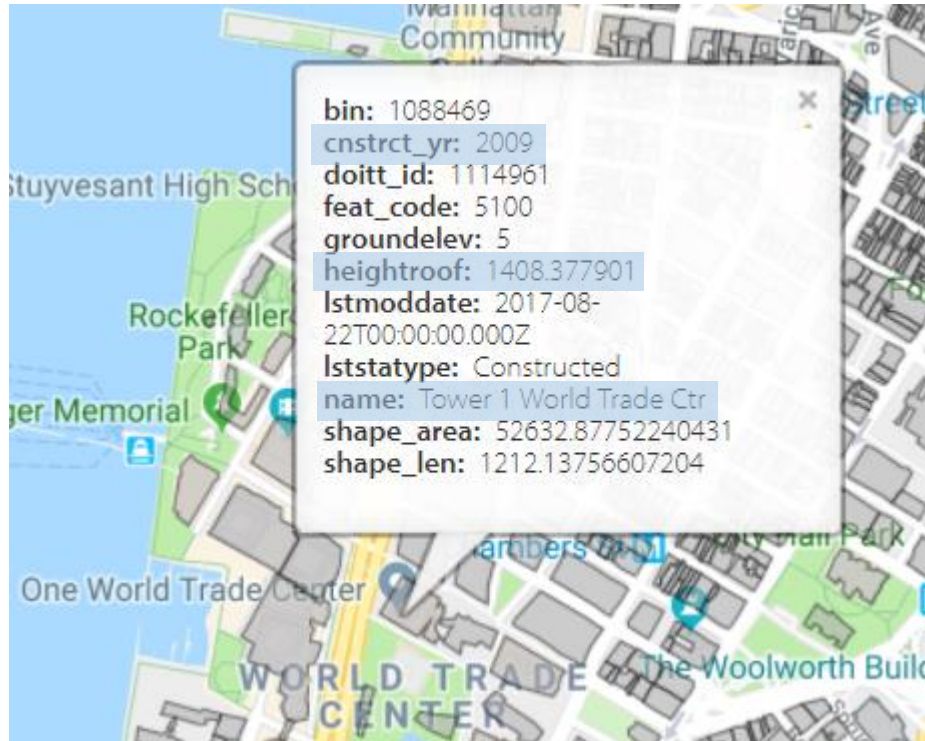
Goals:

- ☞ Learn about famous buildings in Manhattan - where are they, what are they used for, what do they look like?
- ☞ Where are the old/new buildings on the island?
- ☞ Which/where are the tallest skyscrapers?



Learn about famous buildings

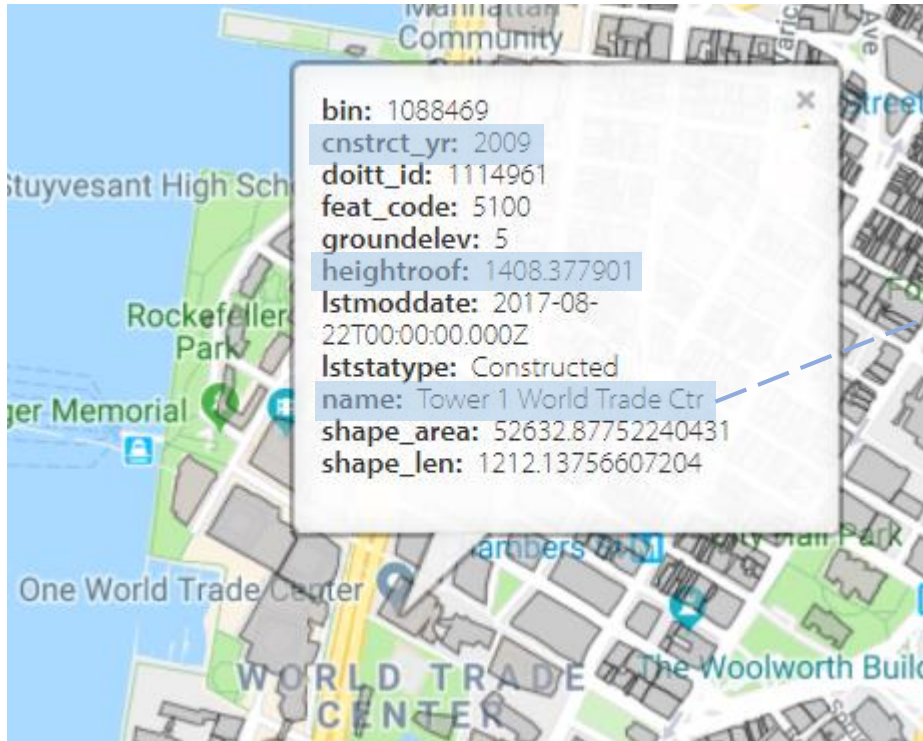
Building data



<https://data.cityofnewyork.us/Housing-Development/Building-Footprints/nqwf-w8eh>

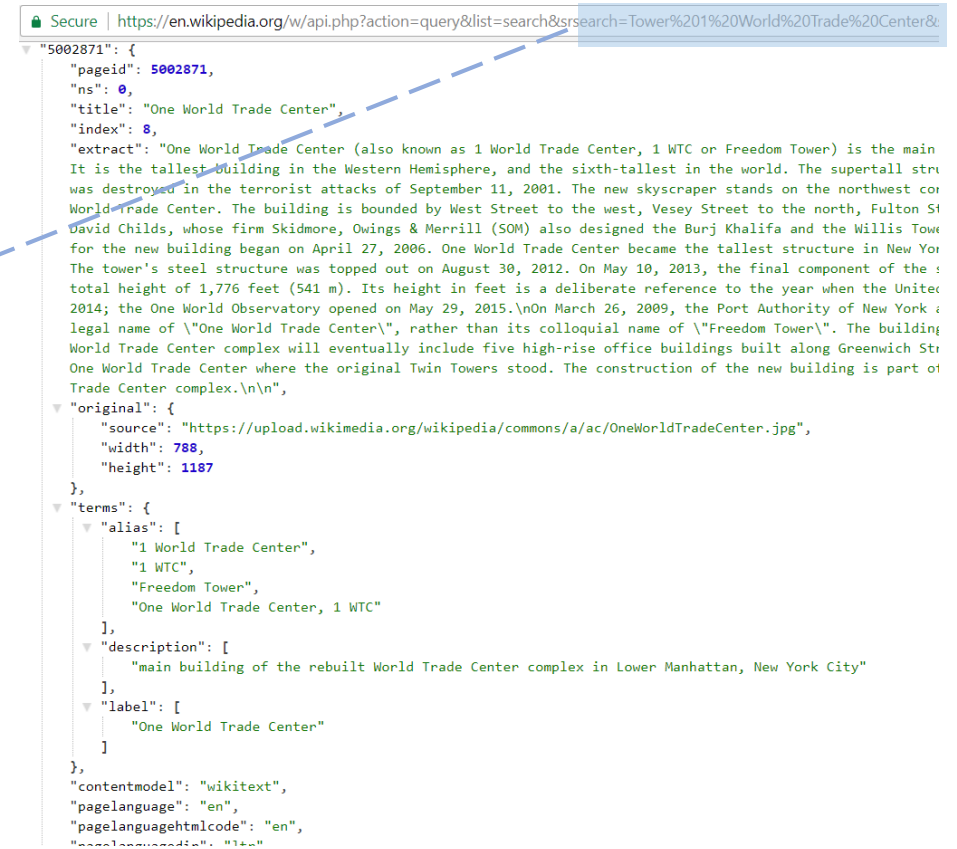
Learn about famous buildings

Building data



<https://data.cityofnewyork.us/Housing-Development/Building-Footprints/nqwf-w8eh>

Famous? Are they on Wikipedia?

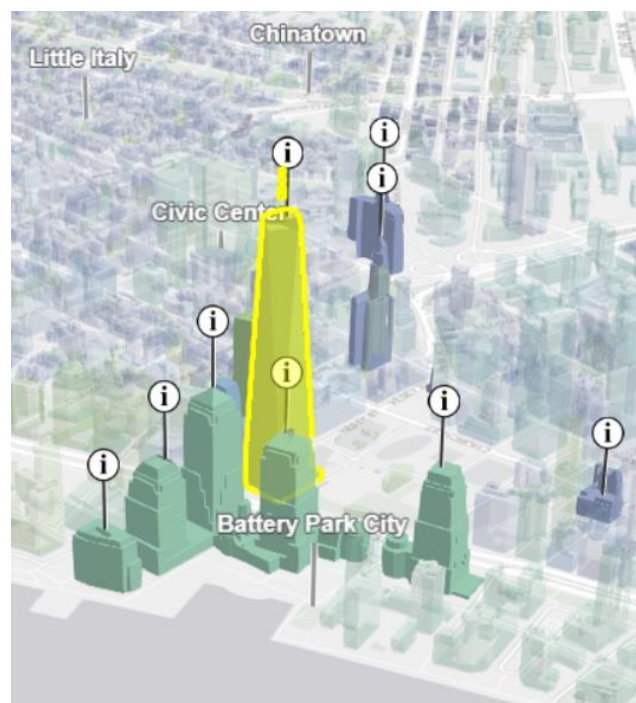


https://www.mediawiki.org/wiki/API:Main_page

Learn about famous buildings



Where are they?



How tall? How old?

Tower 1 World Trade Center

1408 feet 2009

One World Trade Center (also known as 1 World Trade Center, 1 WTC or Freedom Tower) is the main building of the rebuilt World Trade Center complex in Lower Manhattan, New York City. It is the tallest building in the Western Hemisphere, and the sixth-tallest in the world. [Read the entire article on Wikipedia](#)

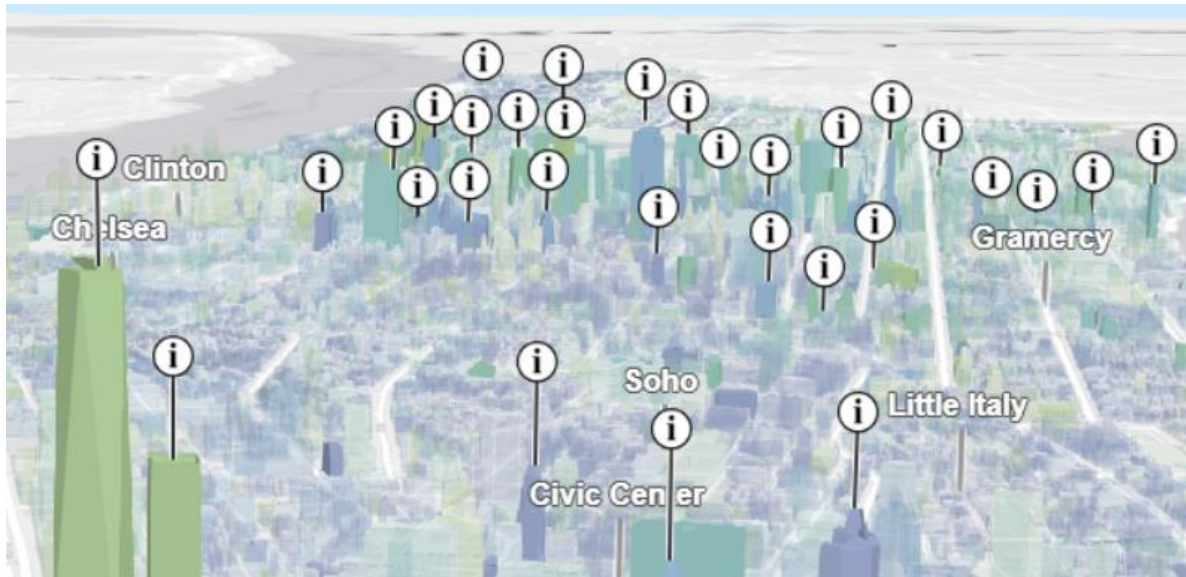
Image: Manhattan Dreamscape courtesy of Flickr

See more images on Flickr

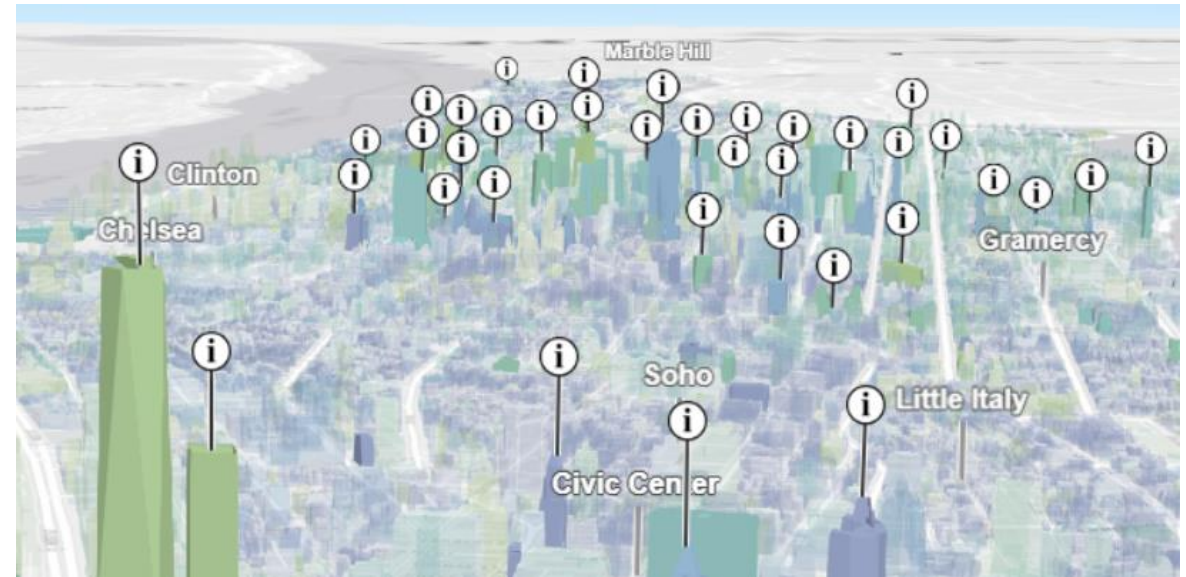
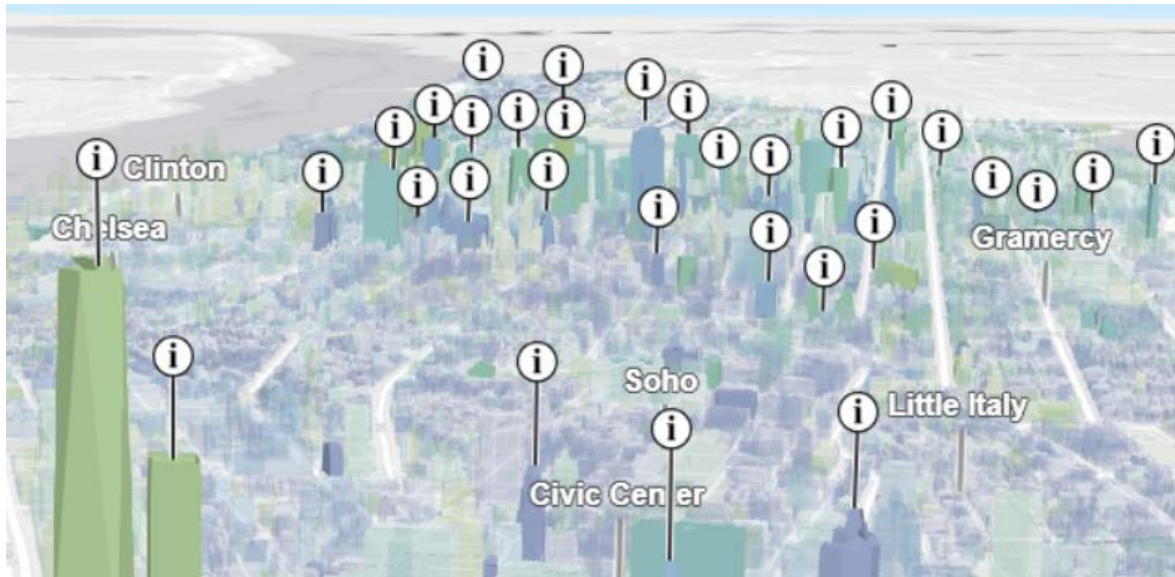
What are they?

How do they look like?

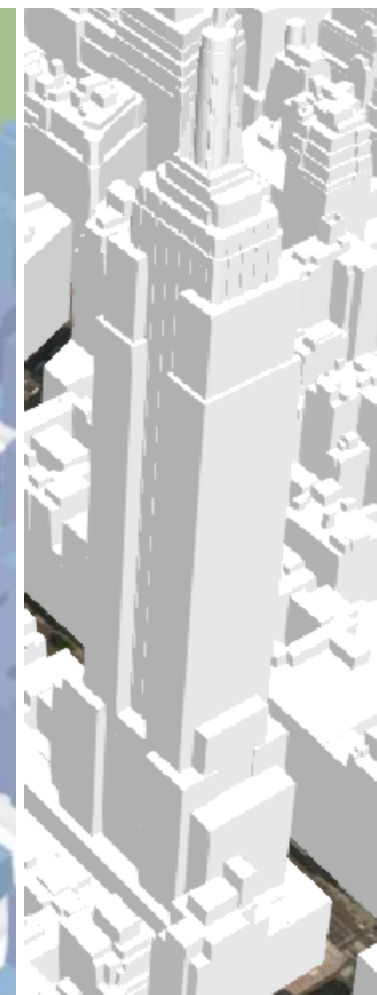
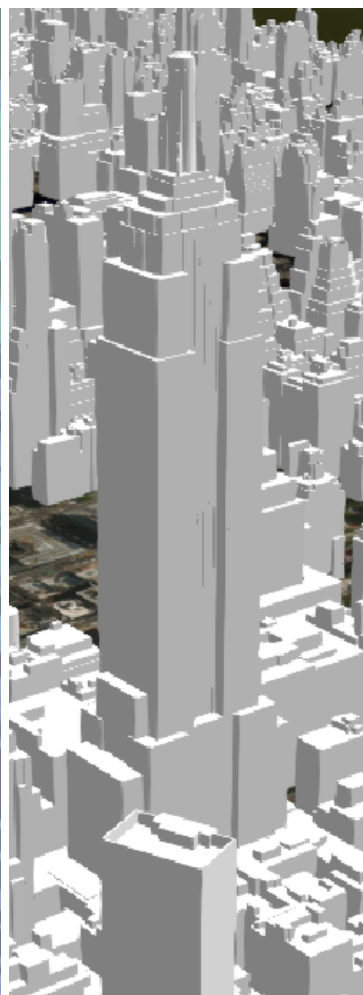
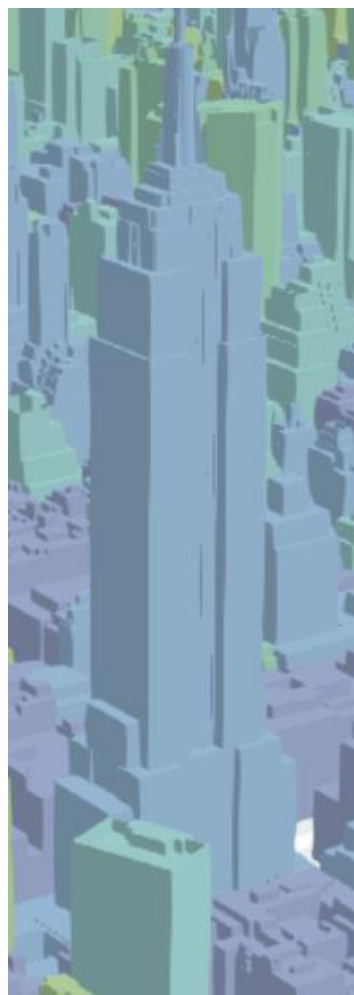
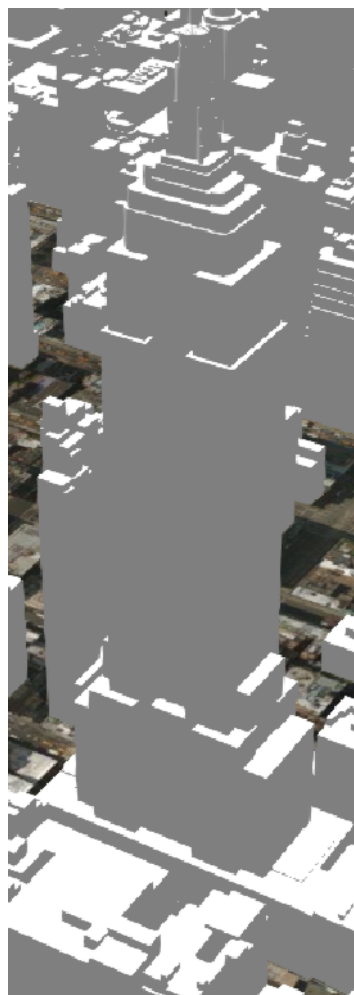
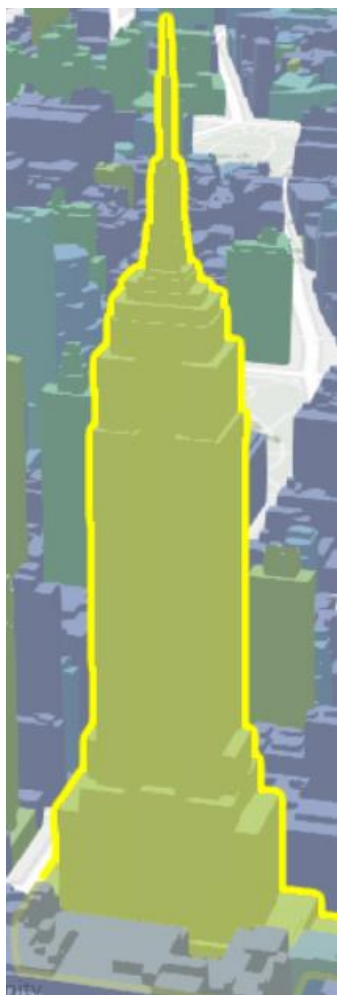
Adventure #1: depth perception



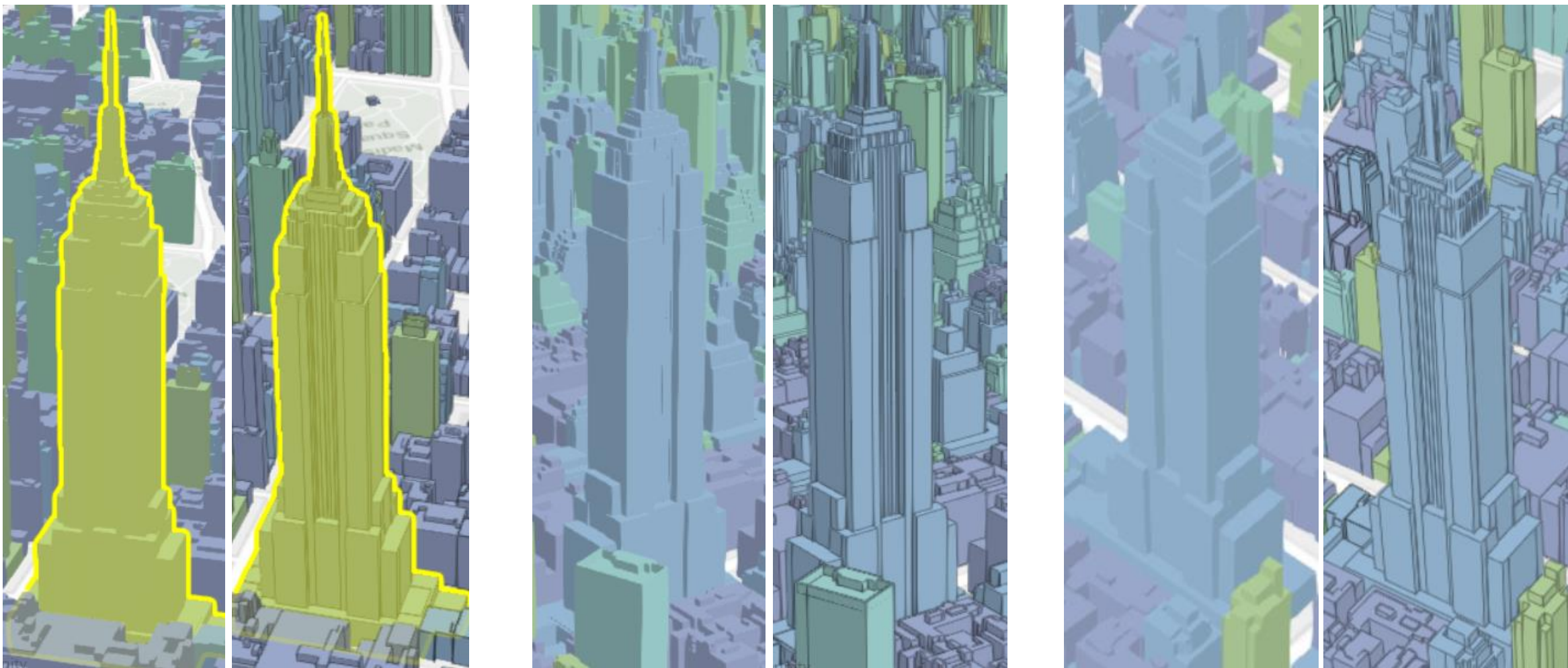
Adventure #1: depth perception



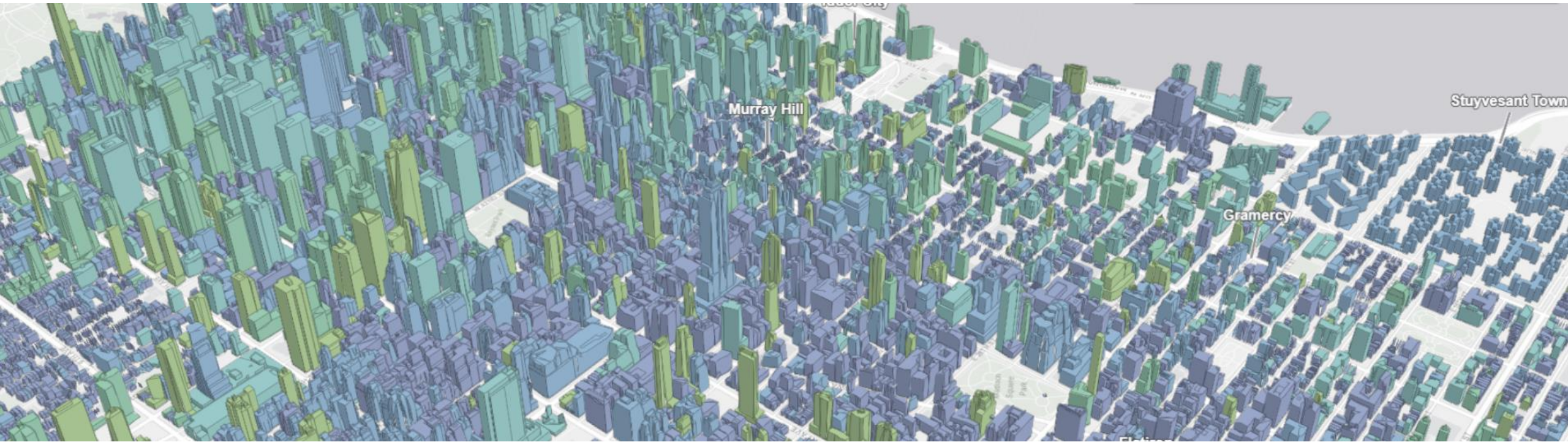
Adventure #2: recognize shape



Adventure #2: recognize shape



Where are the old/new buildings on the island?



1900 - 1924

1925 - 1949

1950 - 1974

1975 - 1999

2000 - 2024

Which/where are the tallest skyscrapers?

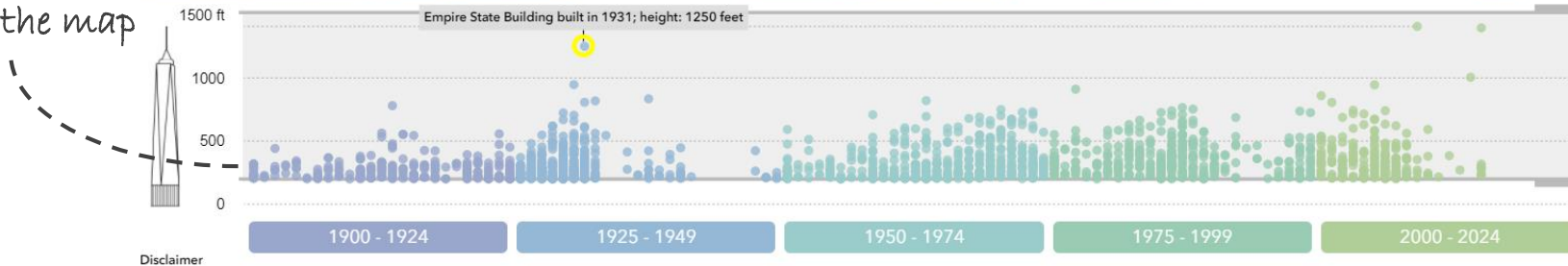


Empire State Building seems to be the tallest...

Adventure #3: compare heights



Add a 2D scatter chart
and connect it to the map

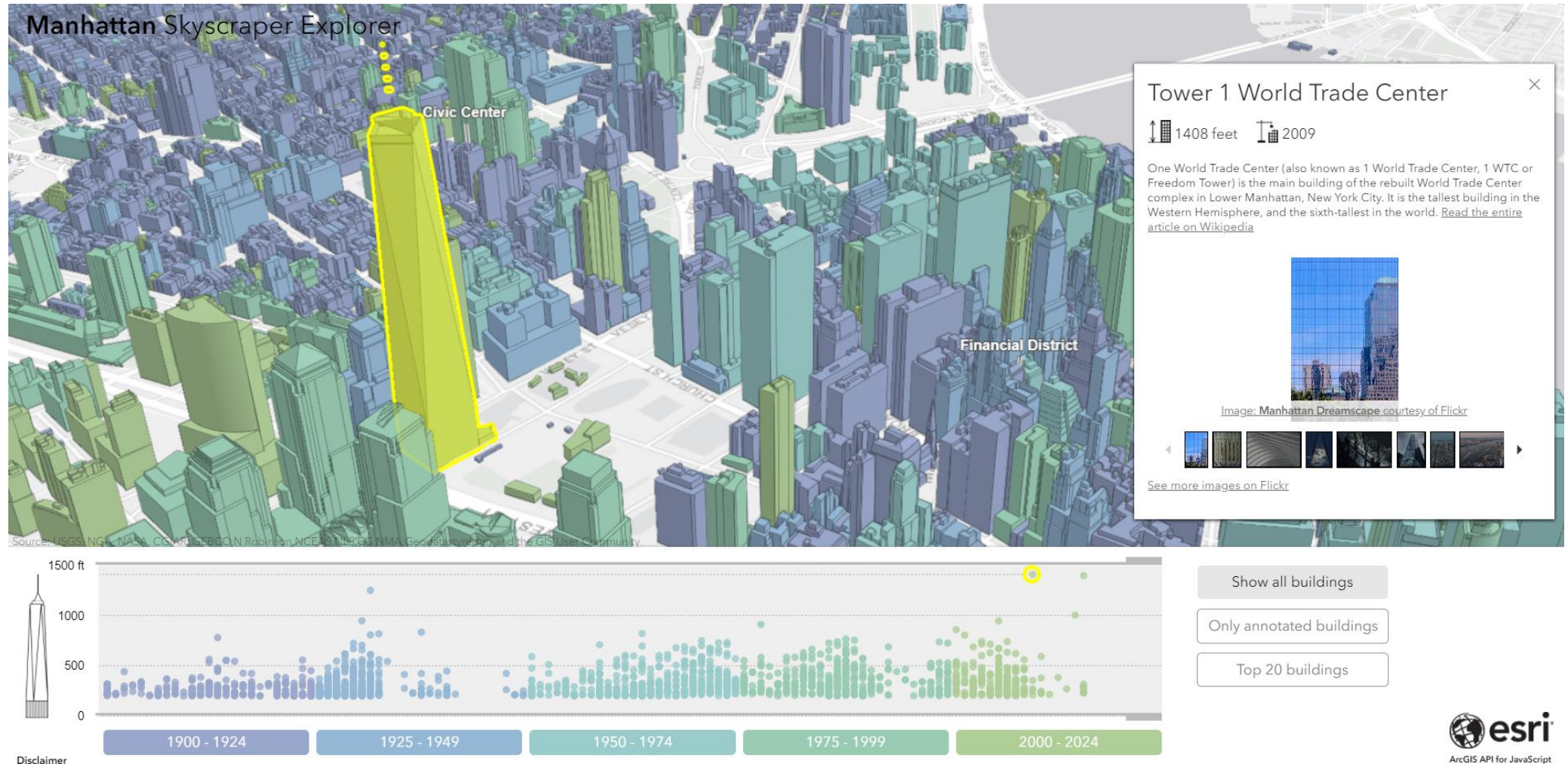


Show all buildings

Only annotated buildings

Top 20 buildings

Show time!



<https://esri.github.io/Manhattan-skyscraper-explorer/>

