

# Geographic Data Science

Point Patterns

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The *point* of points

# Points like polygons

Points *can* represent “fixed” entities

In this case, points are qualitatively similar to polygons/lines

The goal here is, taking location fixed, to model other aspects of the data

# Points like polygons

Examples:

- Cities (in most cases)
- Buildings
- Polygons represented as their centroid
- ...

# When points are not polygons

Point data are not only a different geometry than polygons or lines...

... Points can also represent a fundamentally different way to approach spatial analysis

Points unlike polygons

A few examples...

Crime Types

Dates

Address

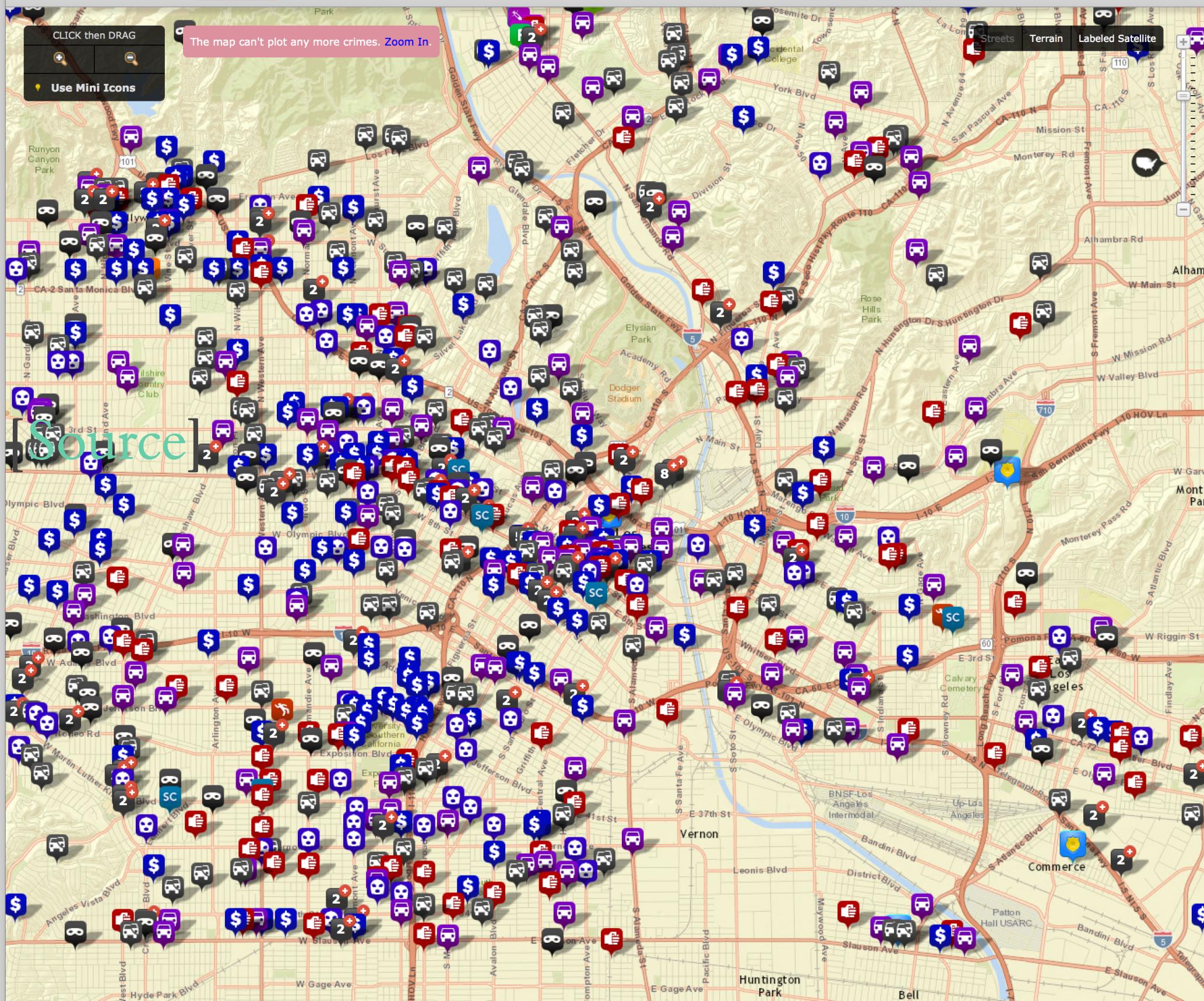
Agencies

+800 crimes

between 11/11/2015 - 11/17/2015



Terrain Labeled Satellite

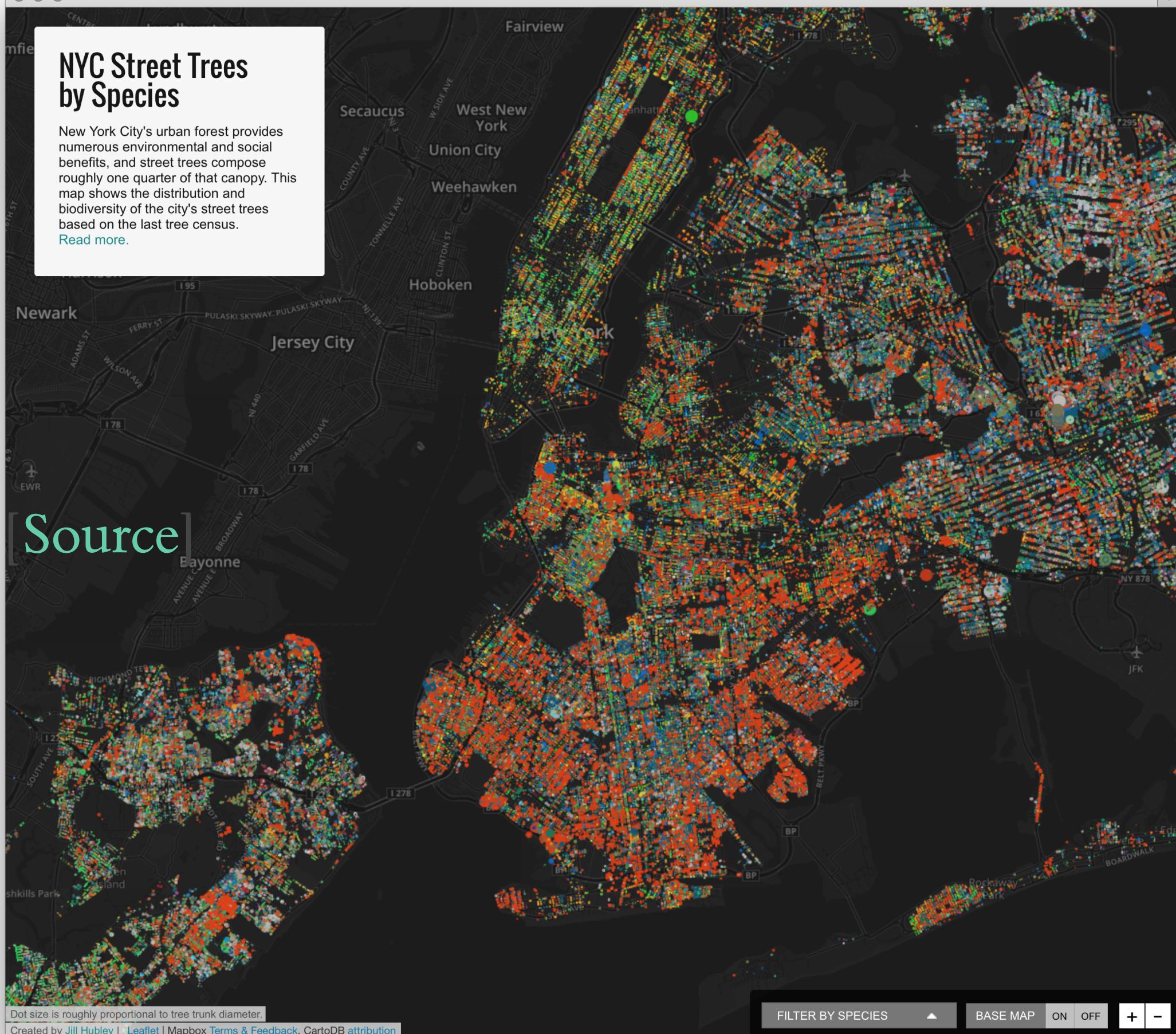


# NYC Street Trees by Species

New York City's urban forest provides numerous environmental and social benefits, and street trees compose roughly one quarter of that canopy. This map shows the distribution and biodiversity of the city's street trees based on the last tree census.

[Read more.](#)

[Source]



Dot size is roughly proportional to tree trunk diameter.

Created by Jill Hubley | [Leaflet](#) | Mapbox [Terms & Feedback](#), CartoDB attribution

# UFO Sightings (1933-)



Map created by  [lcpearso](#)

# Geo-tagged tweets



# Point patterns

# Point patterns

Distribution of points over a portion of space

Assumption is a point can happen anywhere on that space, but only happens in specific locations

- Unmarked: locations only
- Marked: values attached to each point

# Point Pattern Analysis

Describe, characterize, and explain point patterns,  
focusing on their generating process

- Visual exploration
- *Clustering* properties and clusters
- Statistical modeling of the underlying processes



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