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…

CRIMEMAPPING.com
Building Safer Communities

Enter an address: SEARCH

RECEIVE CRIME ALERTS

Try: 131 N. Isabel Street, Glendale, CA

Crime Types | Dates | Address | Agencies

Version 5.5.5b

+800 crimes between 11/11/2015 - 11/17/2015

CLICK then DRAG

Use Mini Icons

The map can't plot any more crimes. Zoom In.

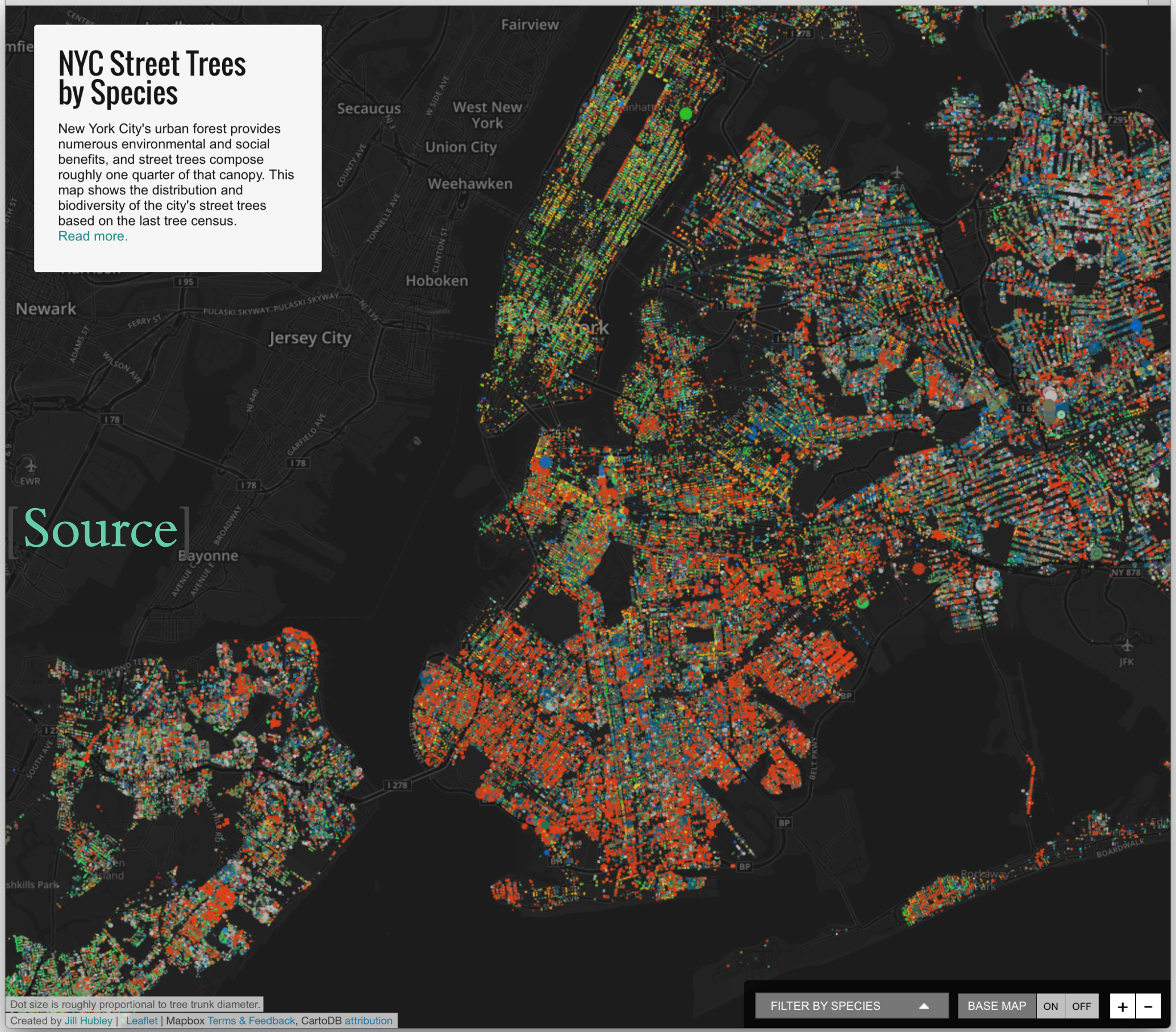
Streets | Terrain | Labeled Satellite

[Source]

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]



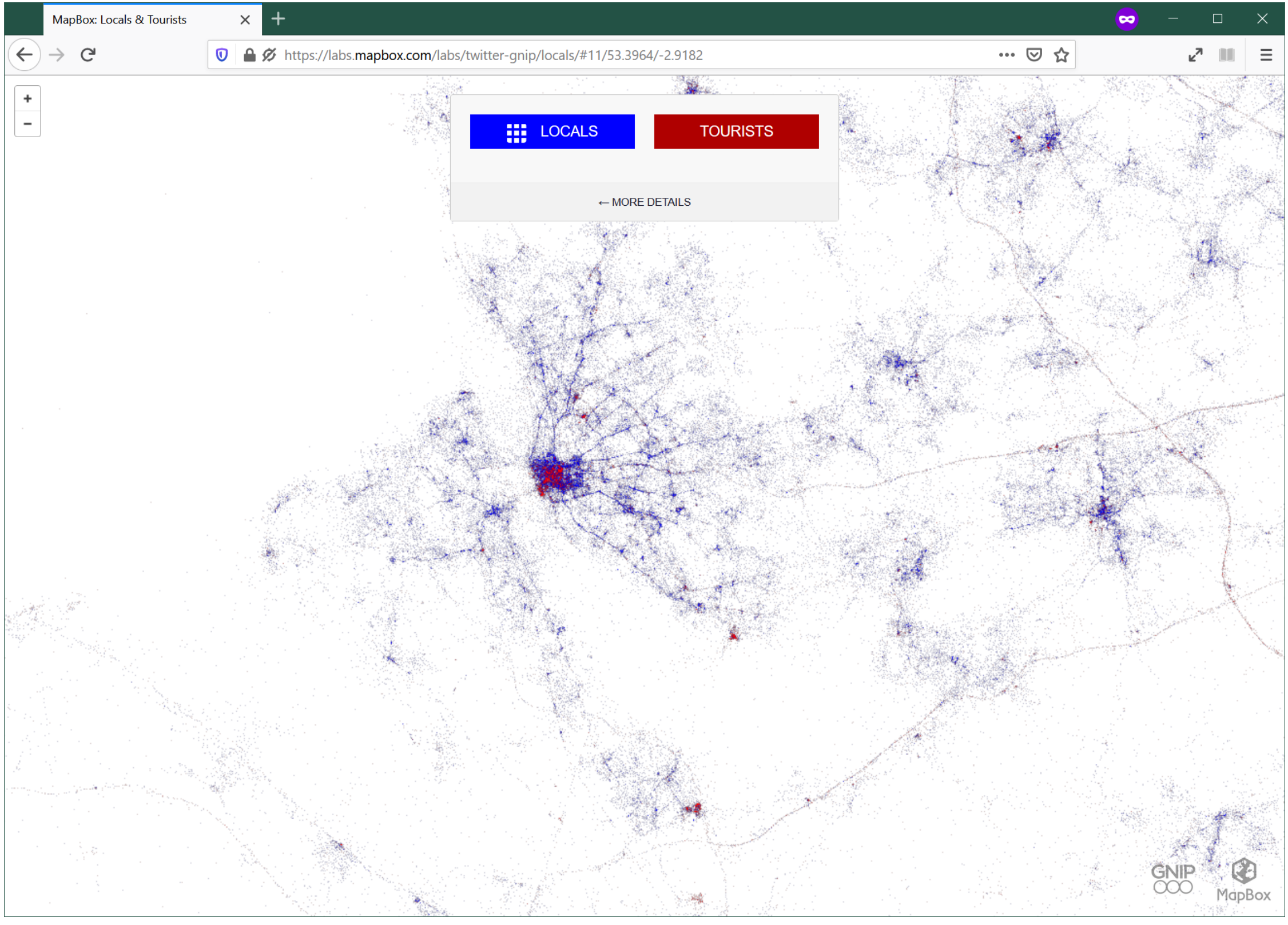
Dot size is roughly proportional to tree trunk diameter.

Created by Jill Hubley | Leaflet | Mapbox Terms & Feedback, CartoDB attribution

FILTER BY SPECIES

BASE MAP ON OFF

+ −


MapBox: Locals & Tourists
https://labs.mapbox.com/labs/twitter-gnip/locals/#11/53.3964/-2.9182
LOCALS
TOURISTS
← MORE DETAILS
GNIP
MapBox

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