Geo-mapping

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Assistant Professor
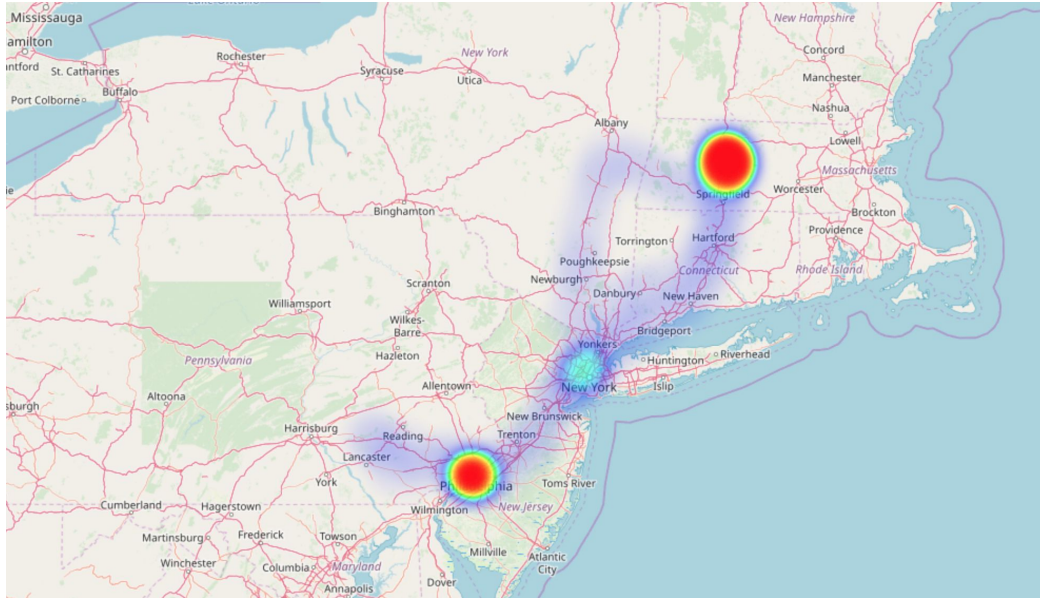Department of Communication, UMass-Amherst
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We are all being tracked

If you have a Google account (not your UMass-affiliated one), sign in Google Timeline (https://www.google.com/maps/timeline?pb), see every place Google logged your coordinates.

https://www.maketecheasier.com/visualize-google-location-history/

If you don't want to be tracked by Google

Turn it off.

Google Account

Search Google Account

🔵 Home	
🔵 Personal info	
🔵 **Data & personalization**	
🔒 Security	
👥 People & sharing	
💳 Payments & subscriptions	
❓ Help	
💬 Send feedback	

Activity controls

You can choose to save your activity for better personalization across Google. Turn on or pause these settings at any time.
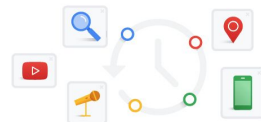
🕘 Web & App Activity	✔ On	›
📍 Location History	✔ On	›
🎤 Voice & Audio Activity	✔ On	›
🖥 Device Information	✔ On	›
🔍 YouTube Search History	⏸ Paused	›
▶ YouTube Watch History	✔ On	›

https://myaccount.google.com/data-and-personalization?pli=1

Leveraging geo data for understanding movement of people

http://qianxi.baidu.com/
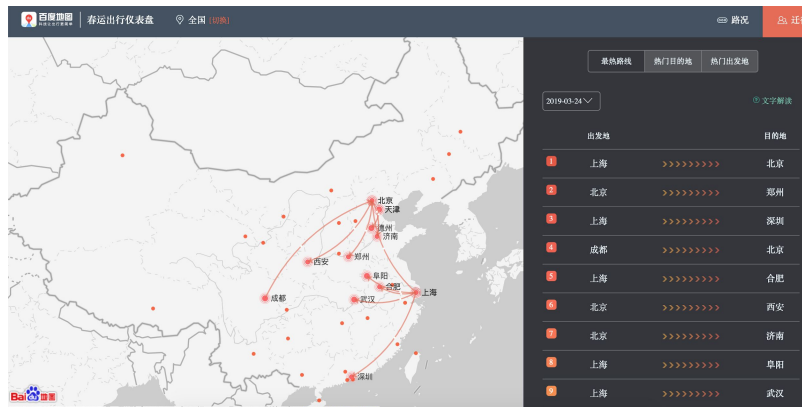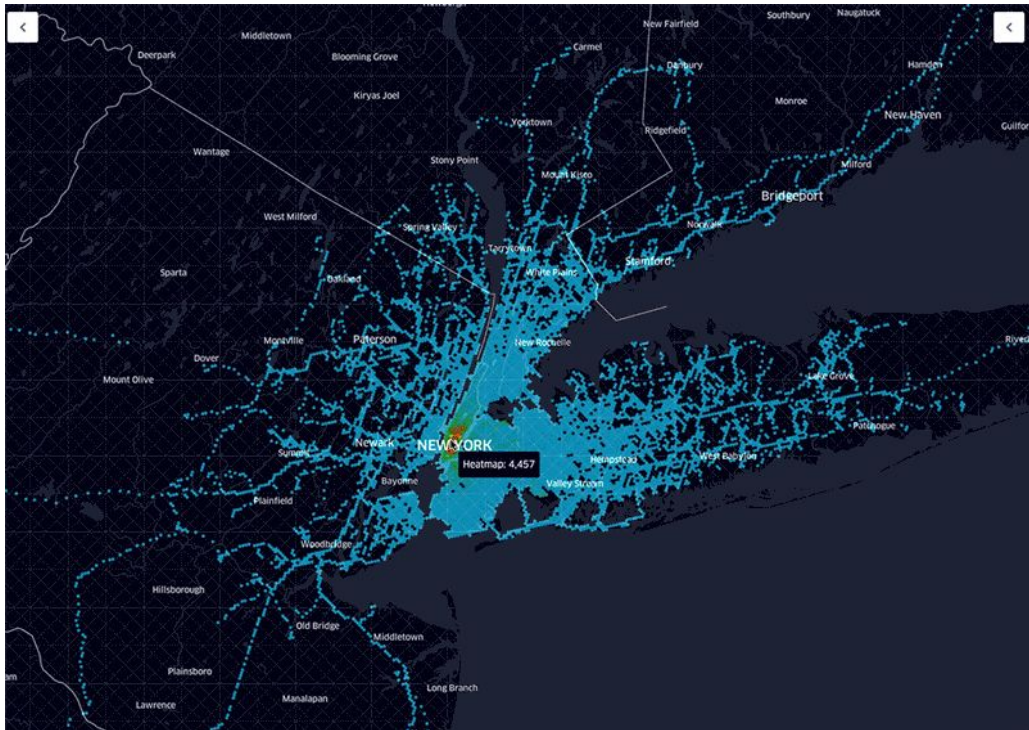
Geo data on Twitter

Some easy visualization tools — these apps do not last forever

https://onemilliontweetmap.com

https://www.omnisci.com/demos/tweetmap/
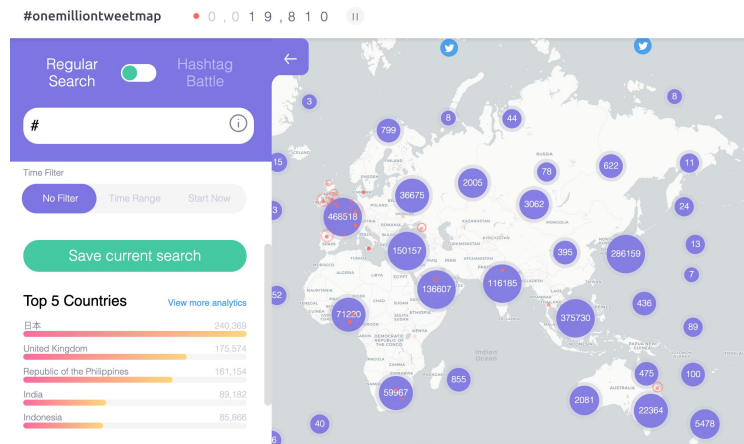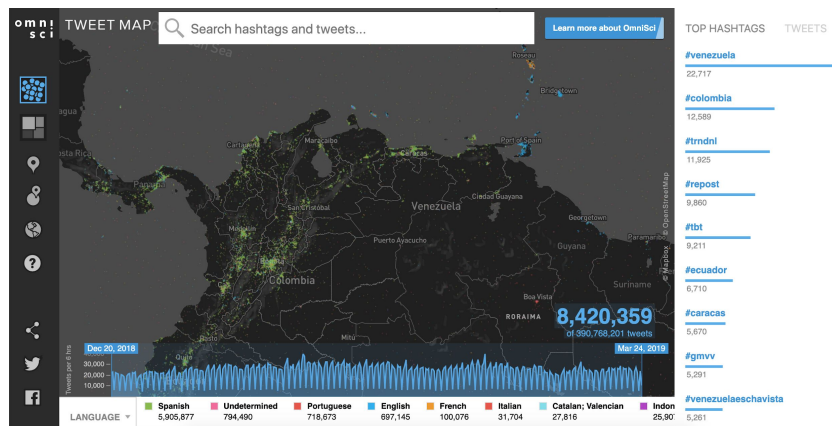
Units in geographic data

An unique identifier of a place

- Country
- State or province
- County, FIPS (Federal Information Processing Standards)
- City or metropolitan area
- Zip code

The most precise unit is:

Coordinates (latitude, longitude)
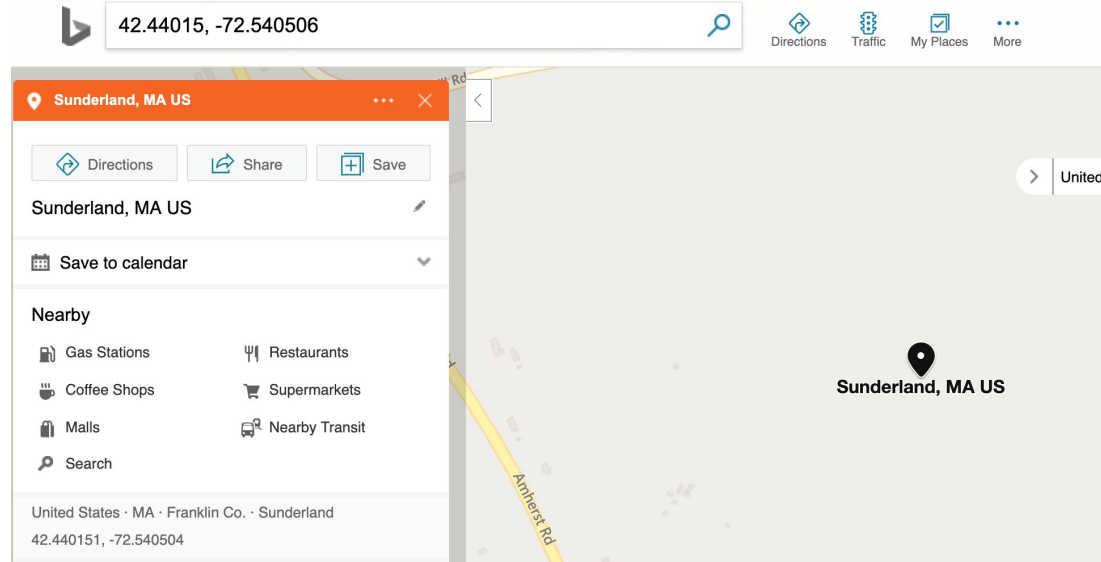
Two types of *public* Twitter geo data

Assistant Prof. of Computational Communication Research. studies online public opinion and internet communities. CuriosityBits.org, bike trek, air travel

Amherst, MA; Philadelphia, PA

curiositybits.com

Joined December 2008

location on user bio

Big Gunner Mick @Barnet_Gooner · 3h
Look who's in the shadow as always

2   65   83

Geo-tagged tweets

What can the geo data tell us?

There are very few geo-tagged tweets. But they reveal the precise location of a user at the moment of tweeting, but not necessarily where a user lives.

Twitter API returns geo-tagged tweets come with exact coordinates
For the location info on user bio, we will need to convert whatever they enter to coordinates

Br██████████

@BradHarmon13

Postal worker

⊙ Paducah ky

⬚ Joined February 2018

Paducah
Kentucky
37.075092, -88.648139

Use Google Map API to convert addresses to coordinates

Rate-limited, up to 5,000 locations every month

Brad Harmon

@BradHarmon13

Postal worker

Paducah ky

Joined February 2018

Paducah

Kentucky

37.075092, -88.648139

The scarcity of geo-tagged tweets

A convenient sample of *17,439* tweets sent to @realDonaldTrump created on 3/24/2019 at 5:30pm

Only 493 are geo-tagged (<3%)

Why so few geo-tagged tweets?

Location data on user bio are *messy*

location
Thermal, Ca
United States
Long Island, NY
United States / South Pacific
Michigan, USA
HOME:Maine
Florida, USA
Summerlin South, NV
Georgia, USA
United States
RightHERE
Asheville, NC
TEXAS
Houston
Nashville, TN

location
Chatteris, England
Pennsylvania, USA
Washington, DC
chesapeake, ohio
United States
Cave Spring, VA
Paris
Litter box
North Pole, AK
SC
Extreme NE Georgia Mountains
United States
otto, new york
Free @GenFlynn

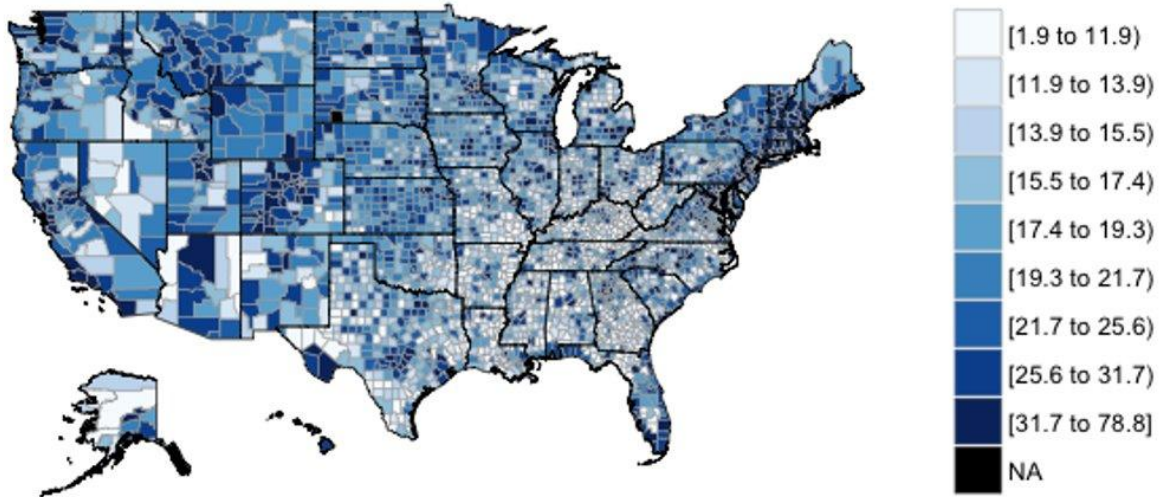| |
| --- |
| Dumbfuckistan aka Cali |
| Detroit, MI |
| United States |
| Washington DC |
| The South :) |
| Philadelphia, PA |
| United States |
| This is for you Dad |
| California, USA |
| United States |
| Paducah ky |
| The cornfield in Peaksville, Oh |
| Malvern, PA |
| United States |

Types of maps

Choropleth

Areas are shaded or patterned in proportion to the numerical values

Areas: countries, states, counties, cities, zip codes, etc.
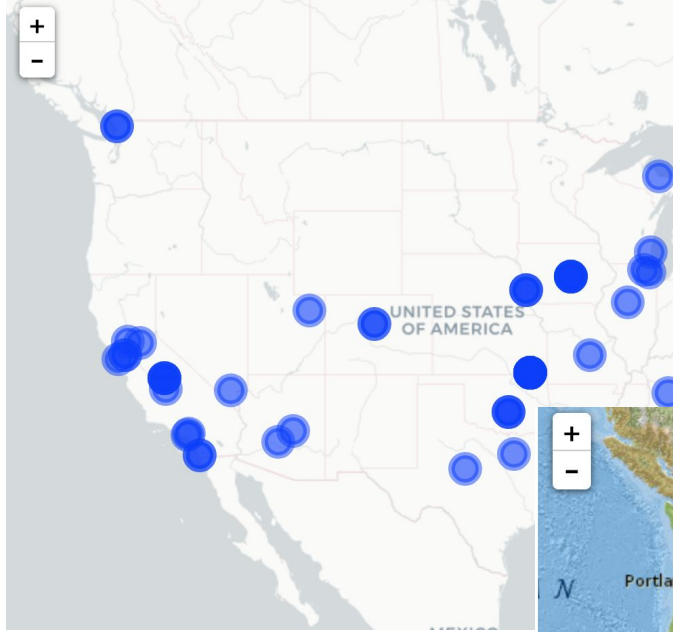
% of Population with Bachelor Degree or Higher by County

[1.9 to 11.9)
[11.9 to 13.9)
[13.9 to 15.5)
[15.5 to 17.4)
[17.4 to 19.3)
[19.3 to 21.7)
[21.7 to 25.6)
[25.6 to 31.7)
[31.7 to 78.8]
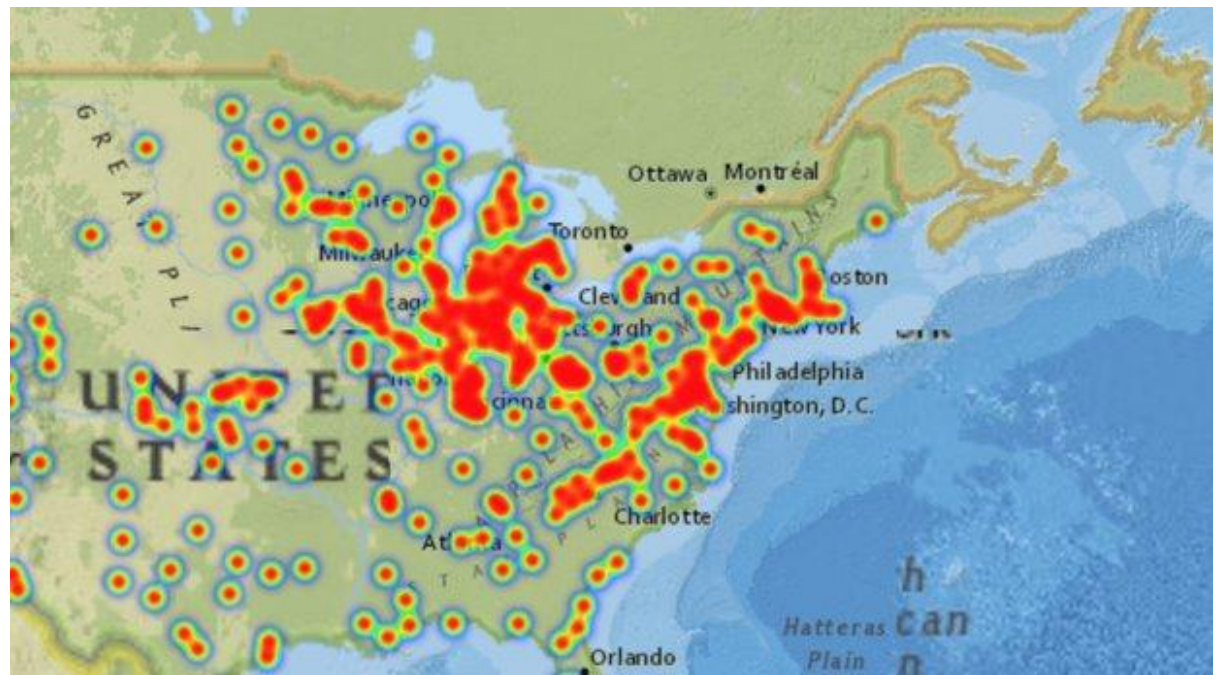NA

Types of maps

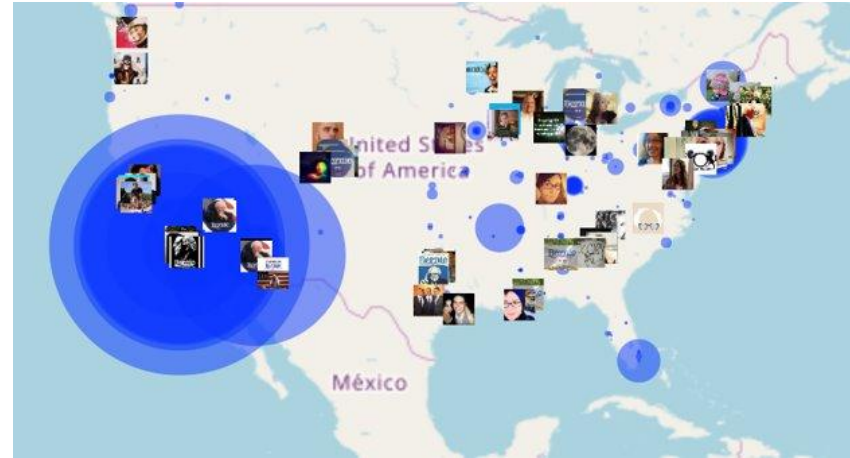## Markers map
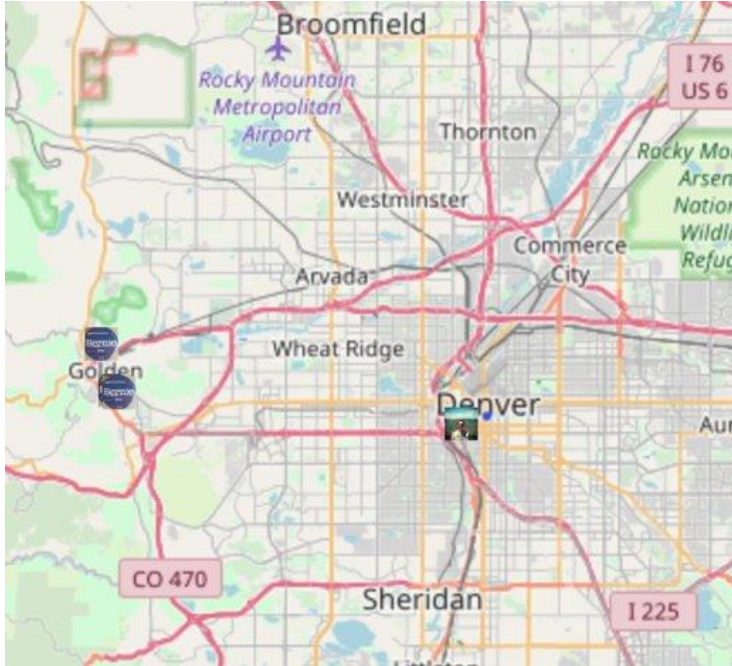
Putting markers on a map

Markers: pin, circle, dot, etc
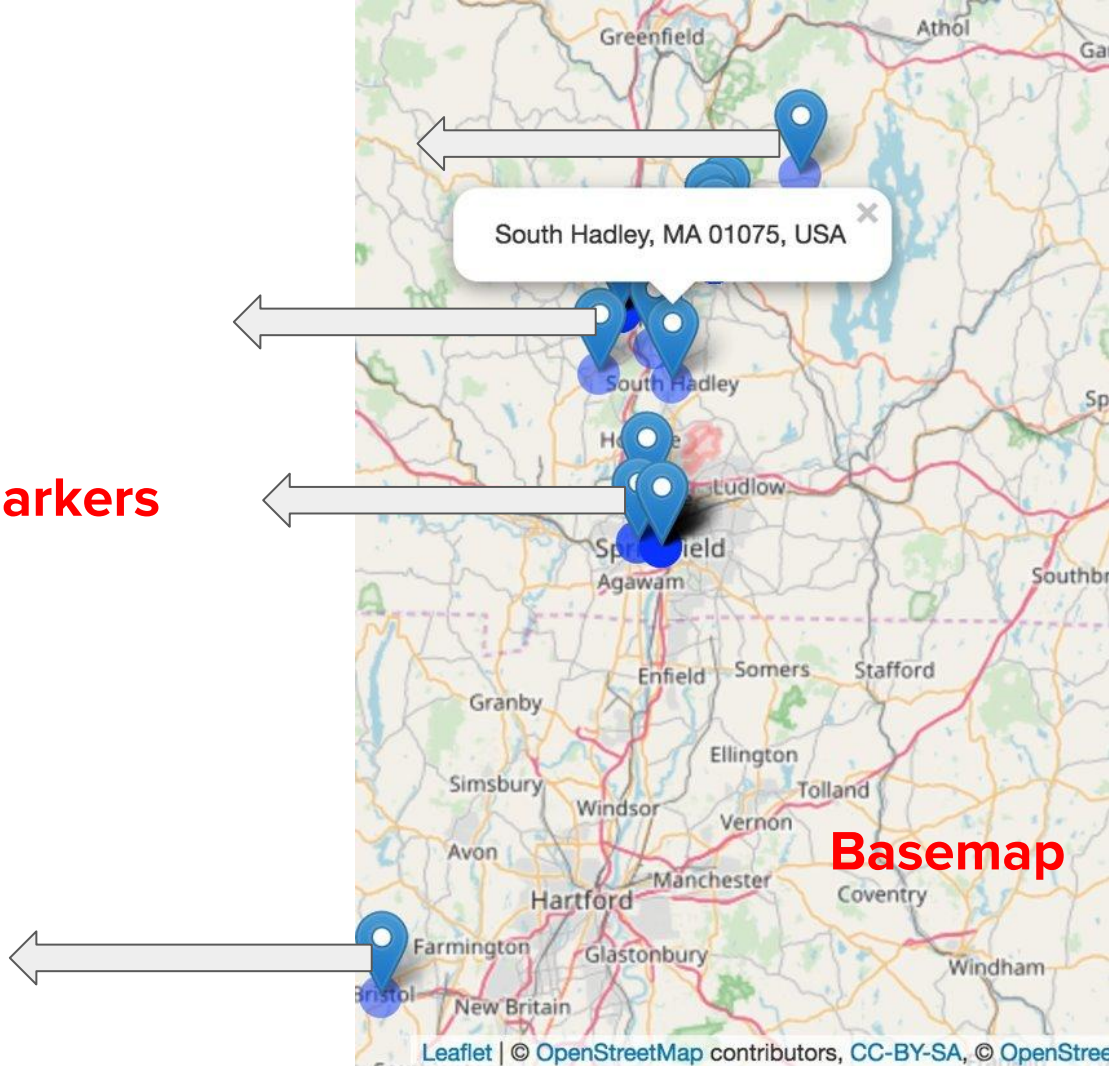
Types of maps

Heatmap

Terminology

Pop-up

Terminology

Basemap and markers

Markers

South Hadley, MA 01075, USA

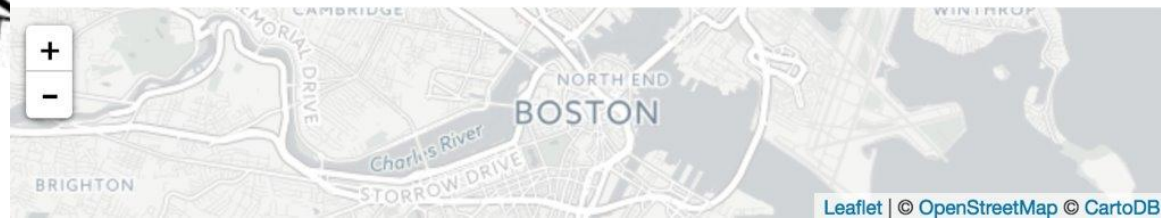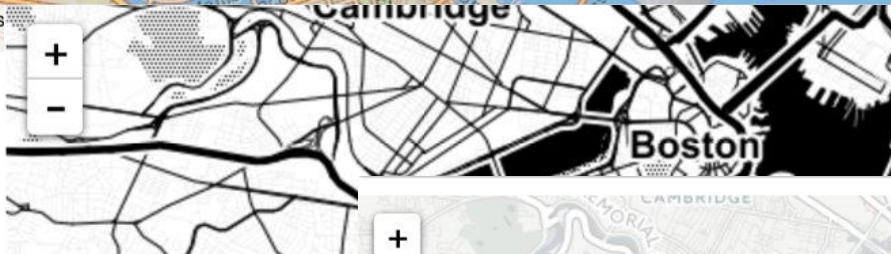**Basemap**

Leaflet | © OpenStreetMap contributors, CC-BY-SA, © OpenStree

Terminology

Different types of
basemap available in R

Terminology

Different types of
markers available in R