



PROJECT 4: Disaster Estimation

Zach (ZMO) Morris

Greg (Chuck) Dye

Julian Oquendo

Jose Cacho



“ While natural disasters capture headlines and national attention short-term, the work of recovery and building is long-term”

— Sylvia Mathews Burwell

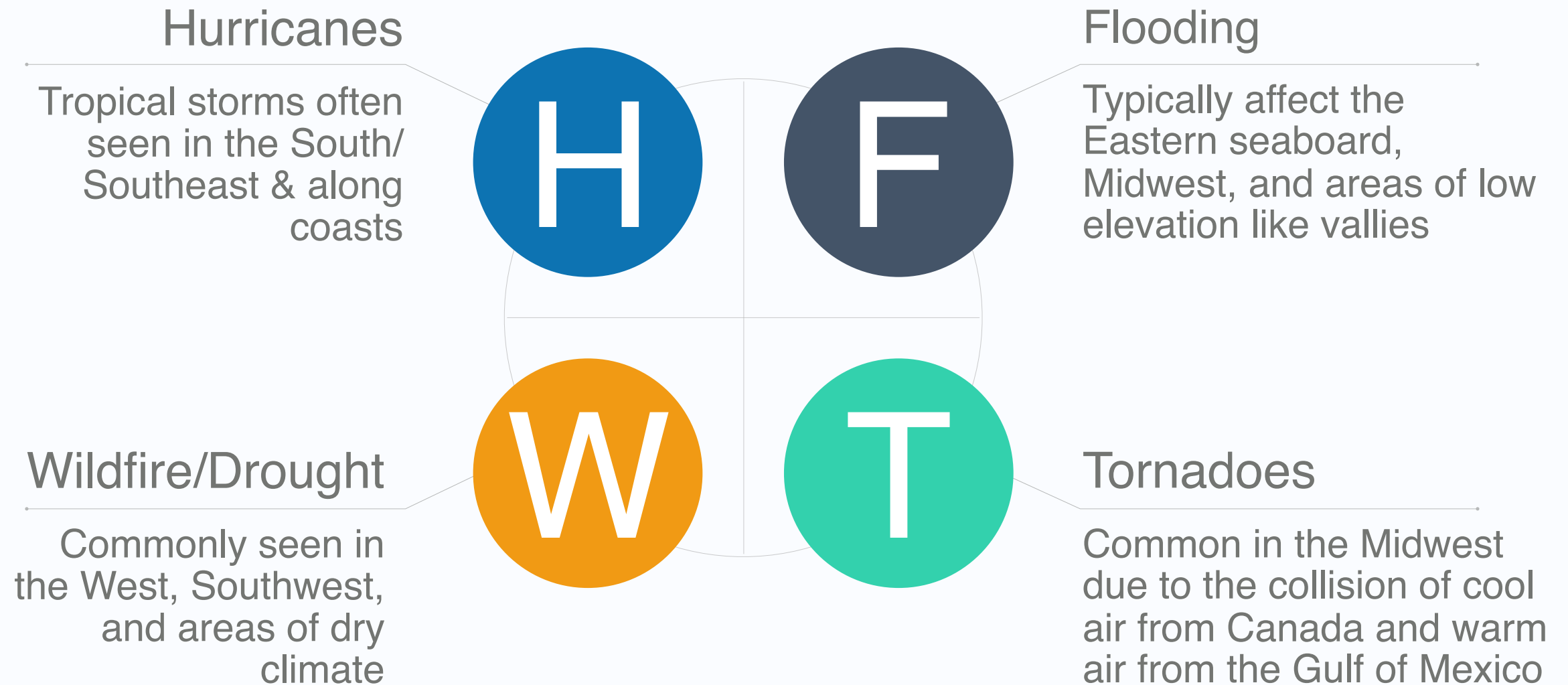
Problem Statement

- During a disaster, it's important to be able to forecast potential damage costs in an effort to strategically and effectively place disaster relief efforts as well as plan for financial recovery efforts. Our goal was to develop a system that allows us to predict disaster estimates based upon zip codes

Executive Summary

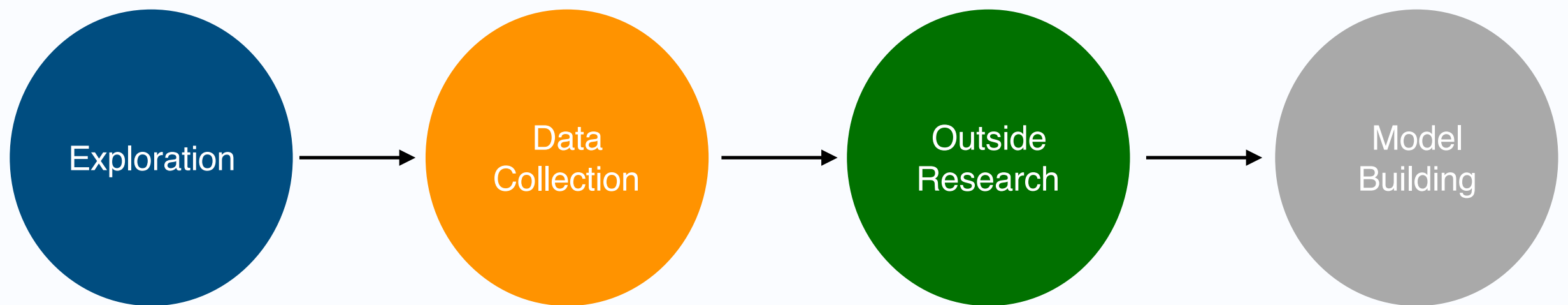
- We developed a simple GUI to input zip codes likely to be affected and based on the predicted magnitude of event, provide current, relative property values
- We also developed a map system that inputs a zip code predicted to be the epicenter of a disaster and provides a radial display to visualize potential damage-estimates

Common Natural Disasters



Additional Disasters: Heat Waves, Drought, Earthquakes, Thunderstorms, Winter Weather, Volcanoes

Our Process



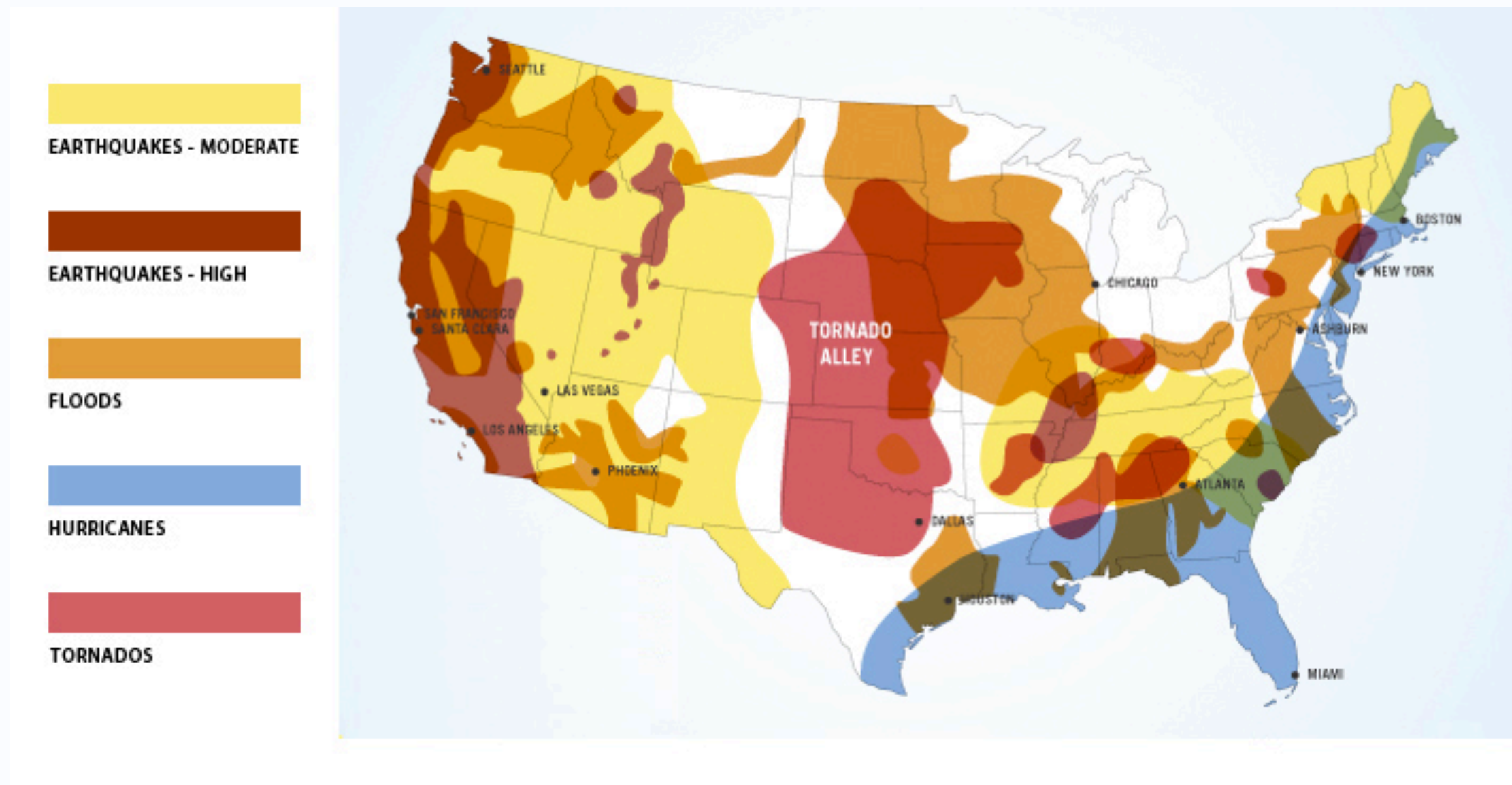
Natural Disaster Snapshot

Impact on the US

\$307 Billion - how much natural disasters cost the US economy in 2017

14 events in 2018 that cost more than \$1 Billion each

16 events in 2017 that cost more than \$1 Billion each



Summary Analytics

1980-2019

Summary	Hurricanes	Flooding	Wildfire/ Drought	Tornadoes	Snow/ Freeze
Events	42	30	42	106	26
Frequency	17.1%	12.2%	17.1%	43.1%	10.6%
Percent of Losses	54.9%	7.4%	19.3%	13.8%	4.7%
Deaths	6, 487	546	3,337	1, 630	1,210
Loss/Event (in billions)	\$22.1	\$4.3	\$14.5	\$2.2	\$6.3
Adjusted Loss (in billions)	\$927.5	\$124.7	\$326.5	\$232.6	\$79.1

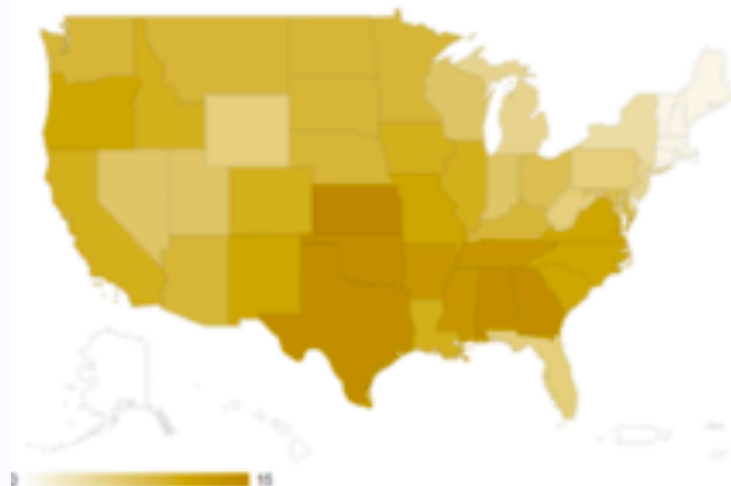
Source: NOAA; Wildfire/Drought statistics combined; Freeze/Snow statistics combined

Visual of Disaster Estimates

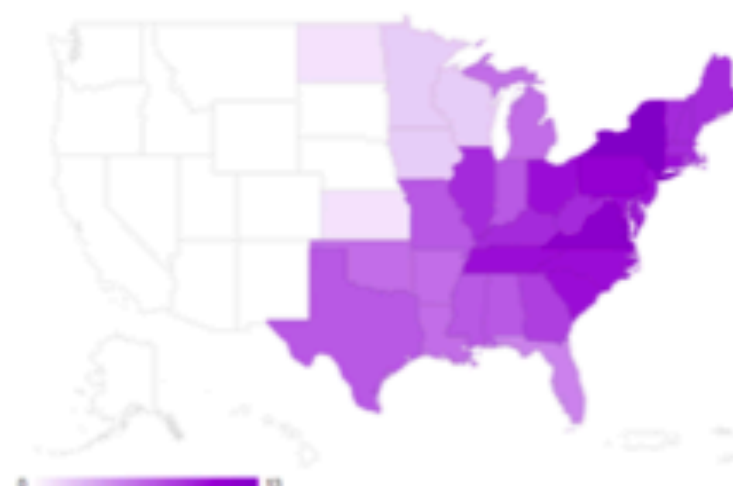
Impact on the US

U.S. Billion-Dollar Weather and Climate Disasters: 1980 – 2016*

Droughts and Heat Waves



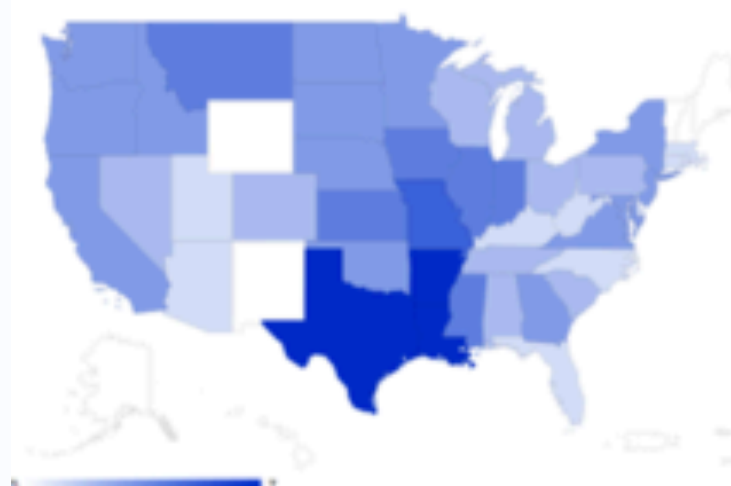
Winter Storms



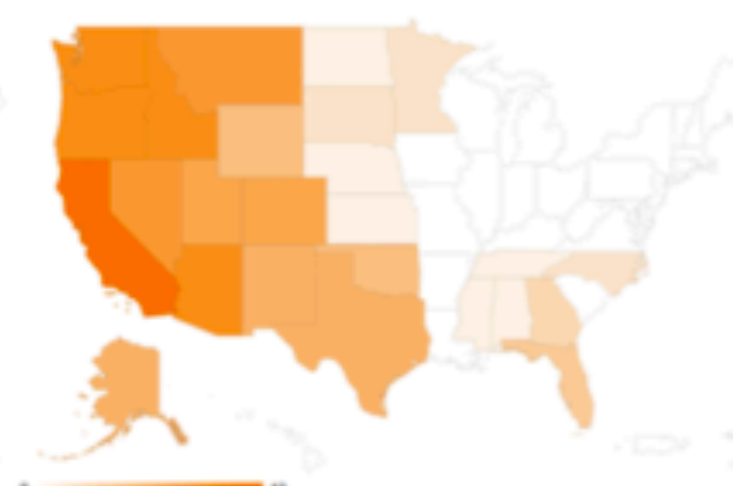
Tropical Cyclones



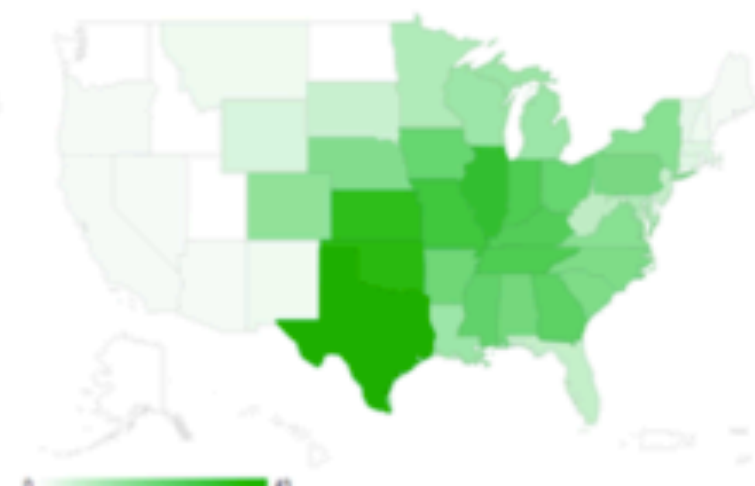
Flooding



Wildfires



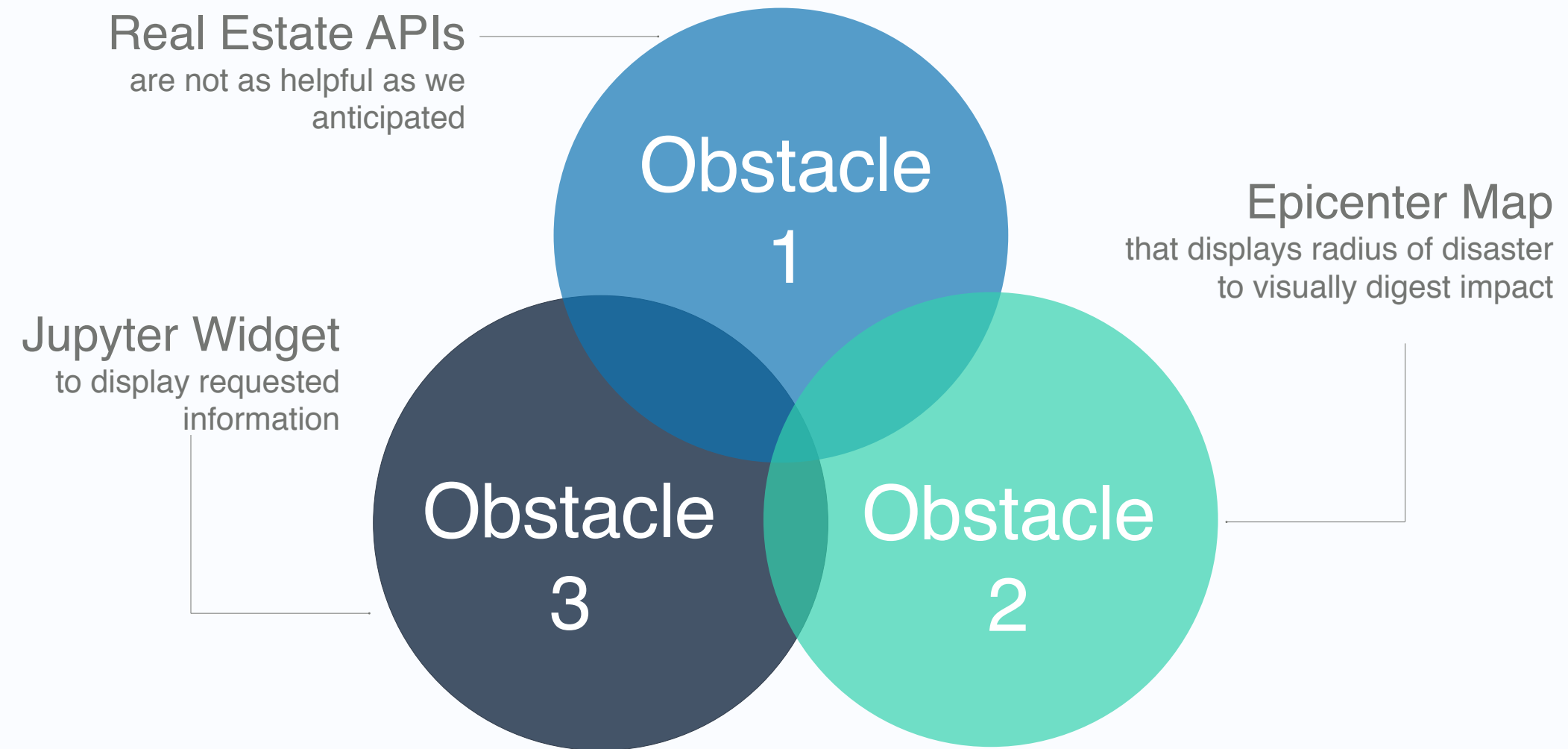
Severe Local Storms



*203 weather and climate disasters reached or exceeded \$1 billion during this period (CPI-adjusted)

Please note that the map reflects a summation of billion-dollar events for each state affected (i.e., it does not mean that each state shown suffered at least \$1 billion in losses for each event).

Obstacles / Future Developments



Obstacles / Future Developments

Jupyter Widget
to display requested
information

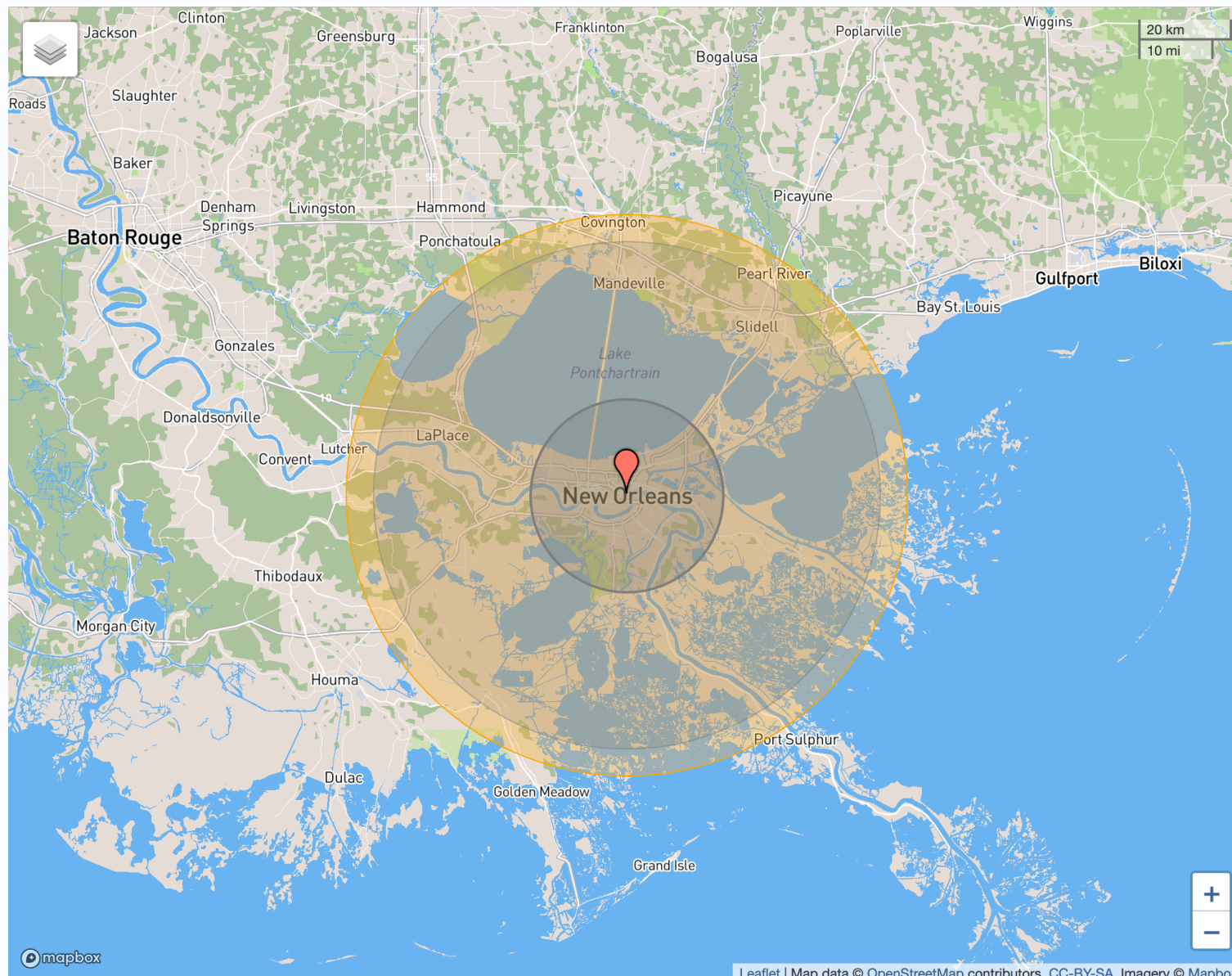
tk #8

Disaster TypeHurricane

ZipCode20002

ShowQuit

Epicenter Map
that displays radius of disaster
to visually digest impact



DISASTER MAP

1. **Drag** the marker to wherever you'd like to target.

Or you can select a preset...

Or type in the name of a city: New Orleans Go

2. **Enter a radius** (in miles): 125

Hurricane Katrina

3. **Click** the "Simulate" button below.

Simulate

Clear all effects

Center ground zero Probe location

Note that you can drag the target marker after you have simulated the disaster.

Other options: ☒ Auto-zoom ☐ Don't log usage data

Sources

- <https://www.thebalance.com/cost-of-natural-disasters-3306214>
- <https://www.popsci.com/natural-hazard-risk#page-2>
- <http://alertsystemsgroup.com/earthquake-early-warning/informative-maps/>