Climate change or natural cycle? Not sure, but it gets 2 hot and 2 cold 4 sure

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Introduction

Perceiver experience → increased awareness

- Perceived personal experience of global warming increases personal awareness of the risk of climate changing.

  (Akerlof, Maibach, Fitzgerald, Cedeno, & Neuman, 2013).

- Perceived experience and motivated reasoning of extreme weather are going to increase belief certainty of extreme weather

  (Myers, Maibach, Roser-Renouf, Akerlof, & Leiserowitz, 2013).

- Climate message increases public perception of climate science consensus and the spatial variation is that conservative part of US have higher responsiveness

  (Zhang et al., 2018).

Hypothesis

- The extremes of weather observed in recent years increases people's awareness and expressions about weather on twitter.

- Due to the variation in climate between different geographical regions as well as political polarization at the state level, people's perception and expression of weather extremes may exhibit geographic variation.

Data & Methods

- Twitter data from March 2014 – Feb 2015
  - One year time span
  - 7 million tweets
  - Separated in seasons
  - Twitter Streaming API: geo-located tweets in the US

keywords

- 215 weather-related keywords
- E.g. arid, cloudy, coldfront, cumulus, etc.

Definition

- Containing at least one keyword ➔ weather tweet
- Monthly, tweet at least on weather tweet ➔ weather user

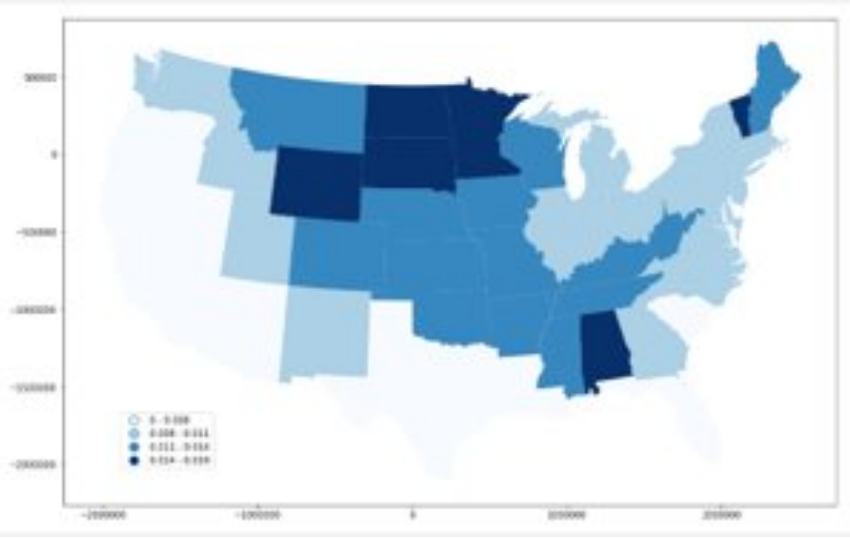
- Variables to visualize
  - Weather tweet ratio
  - Weather user ratio

Weather Tweet Ratio = weather tweets/All tweets

Lower	Upper	Count
	x[i] <= 0.008	234
0.008 <	x[i] <= 0.011	168
0.011 <	x[i] <= 0.014	113
0.014 <	x[i] <= 0.019	50
0.019 <	x[i] <= 0.027	23

Mar(5)

Apr(4)



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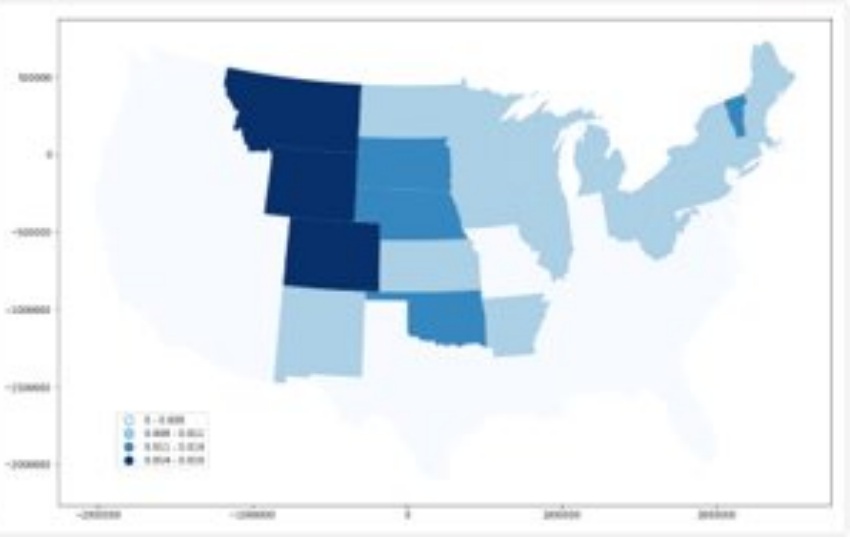

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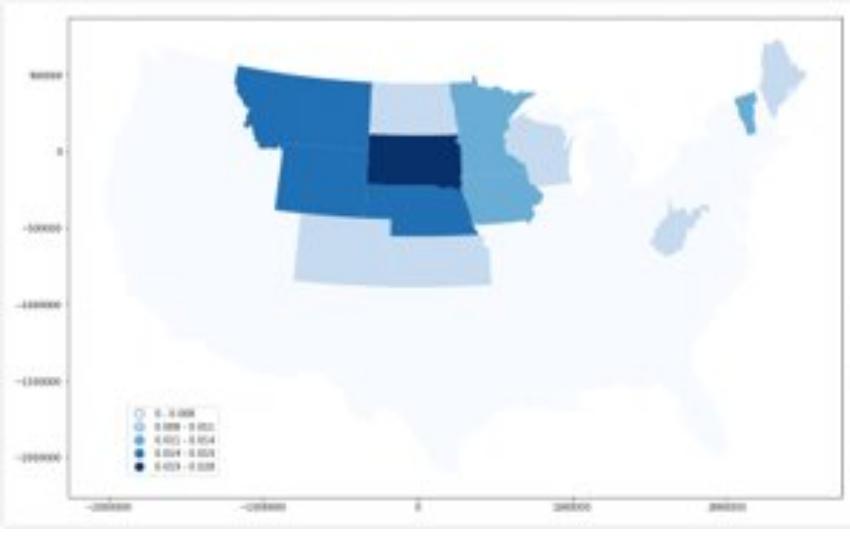

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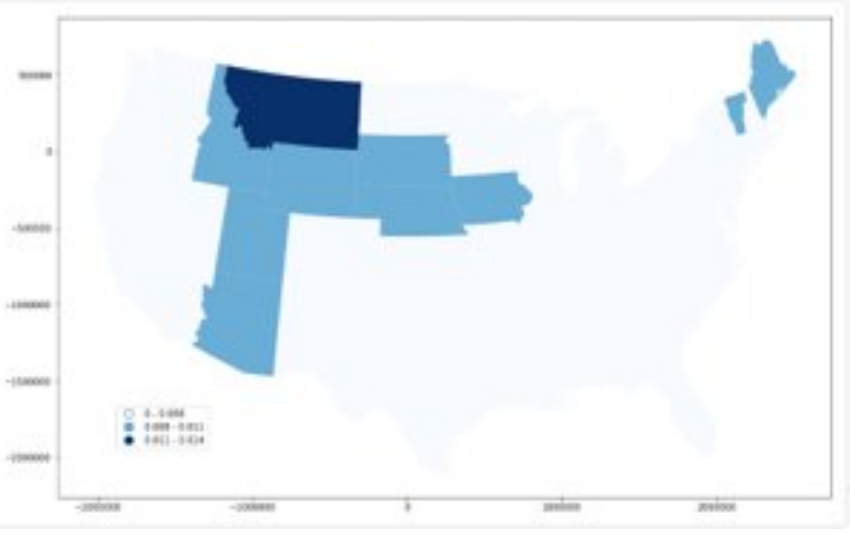

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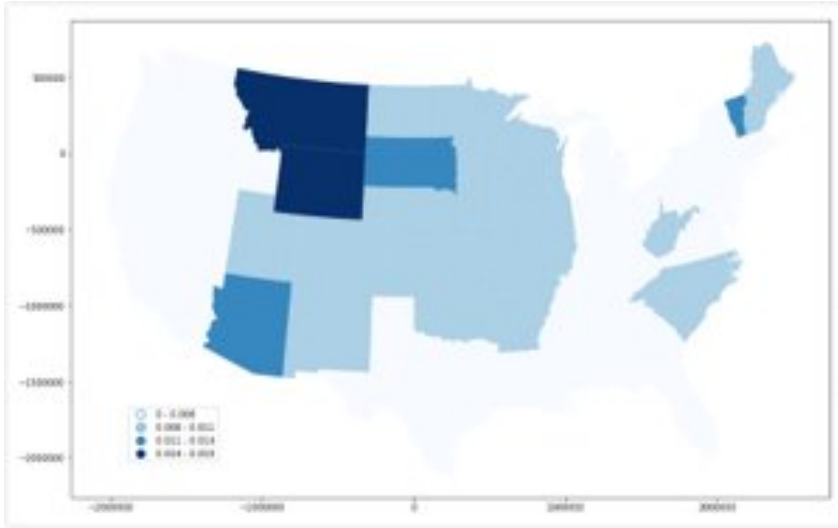

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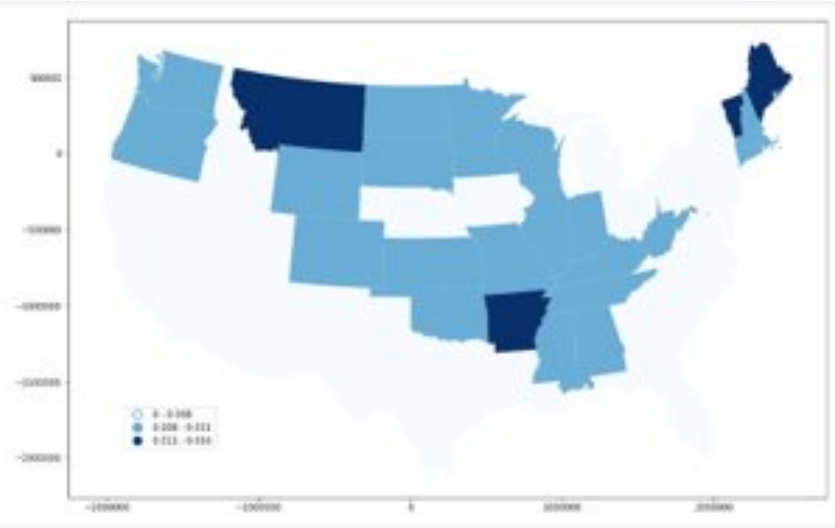

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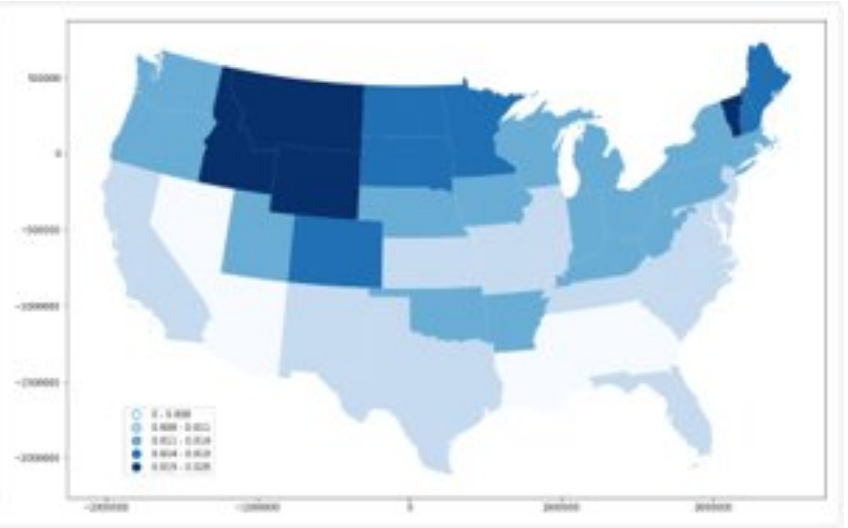

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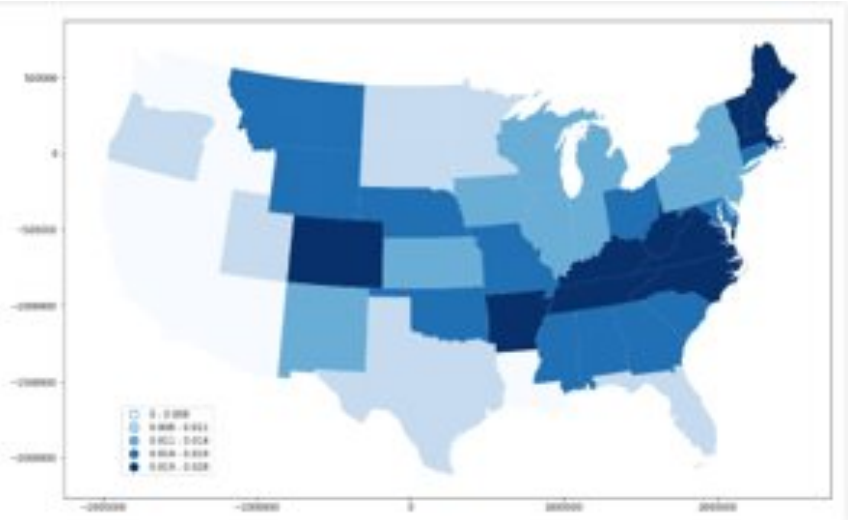

Weather User Ratio = Weather Users / All Users

Lower	Upper	Count
	x[i] <= 0.064	93
0.064 <	x[i] <= 0.121	133
0.121 <	x[i] <= 0.156	203
0.156 <	x[i] <= 0.201	115
0.201 <	x[i] <= 0.275	44

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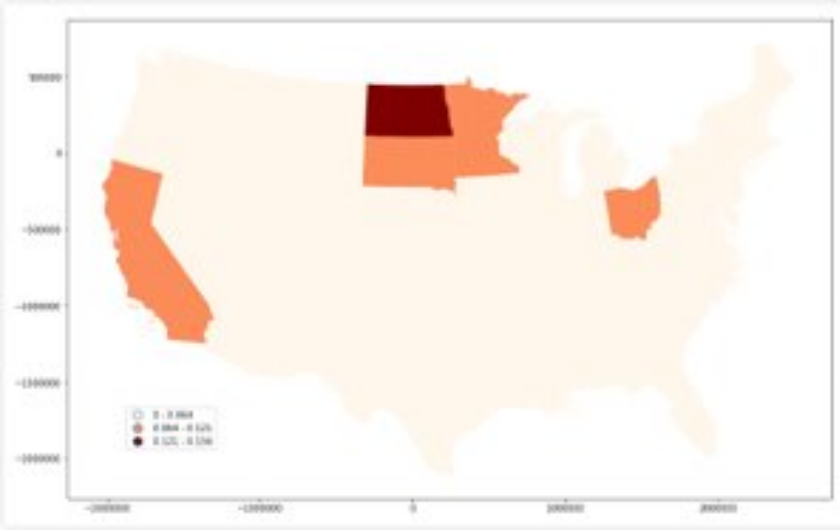

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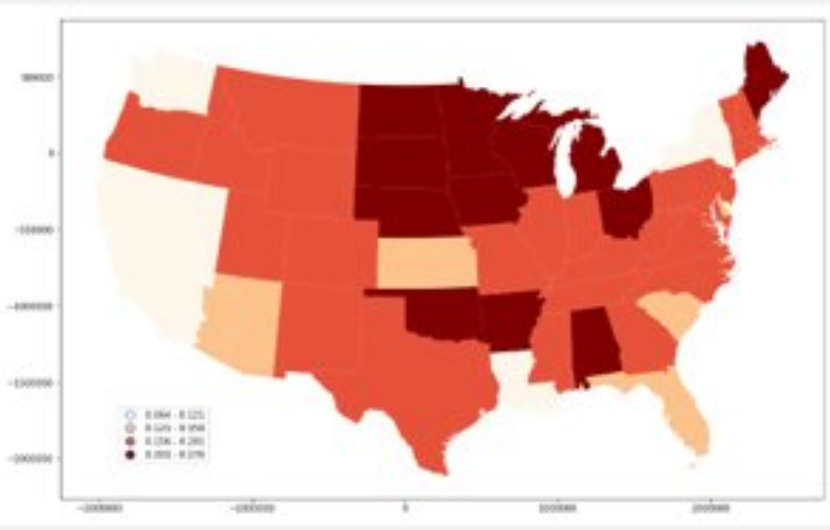

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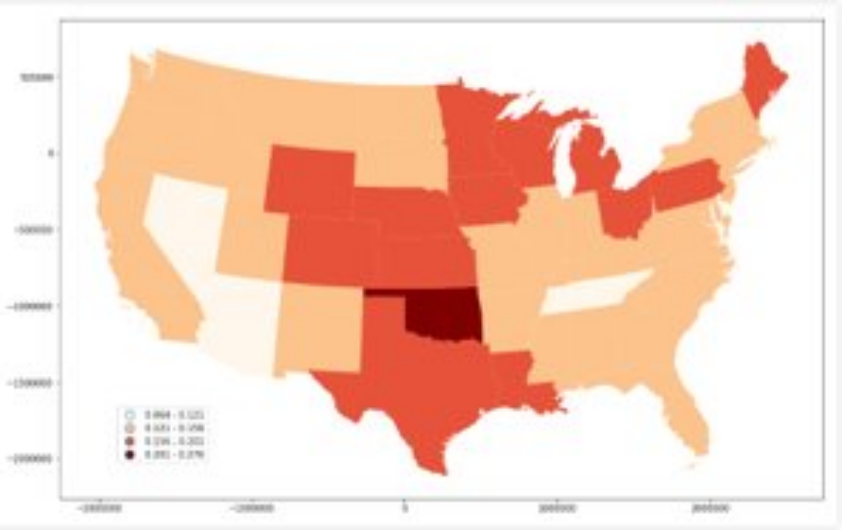

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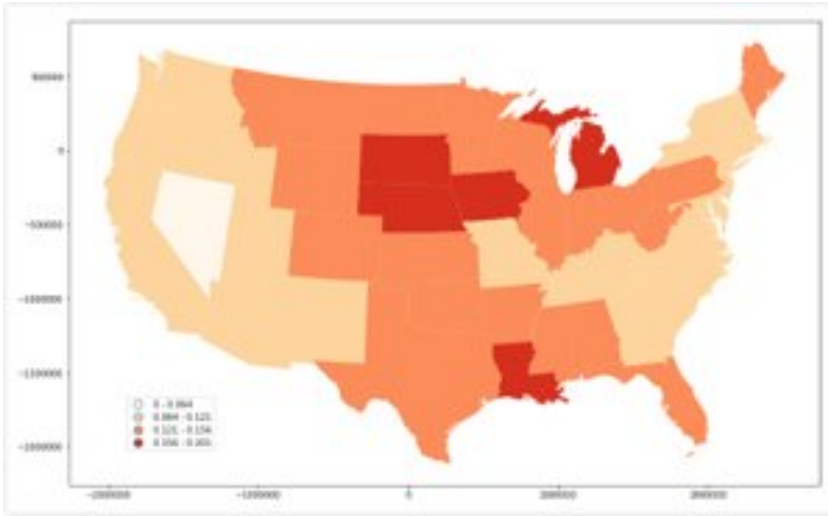

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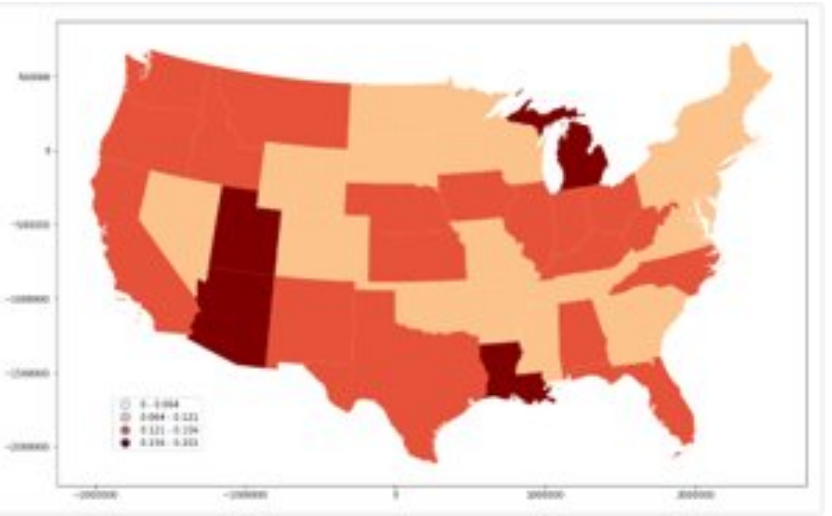

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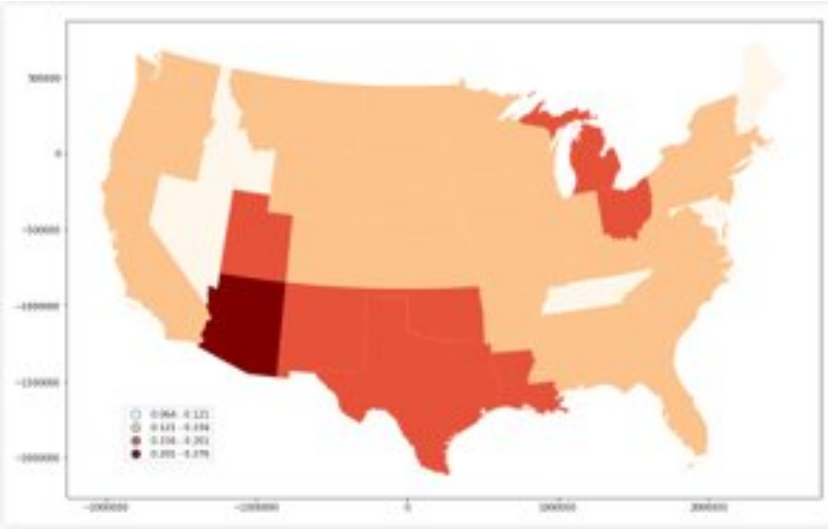

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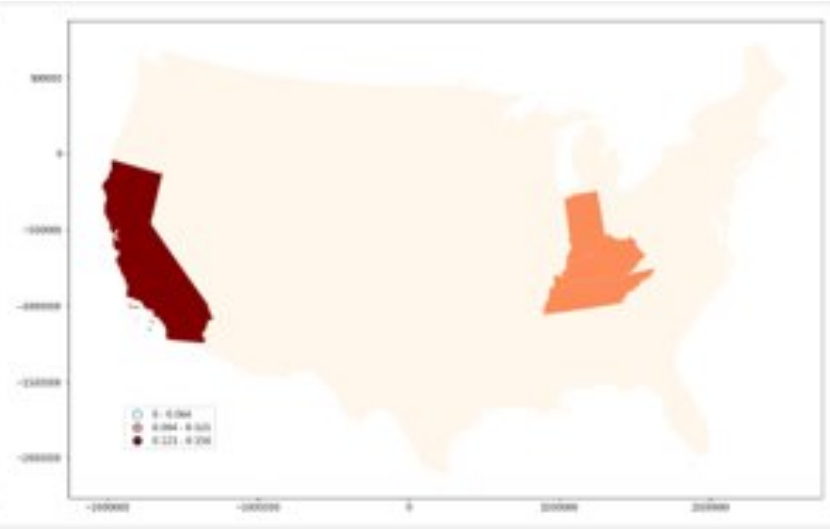

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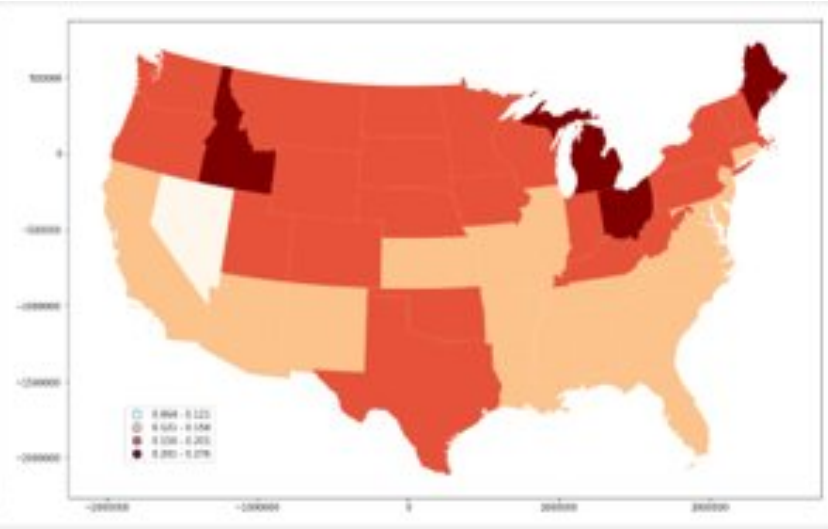

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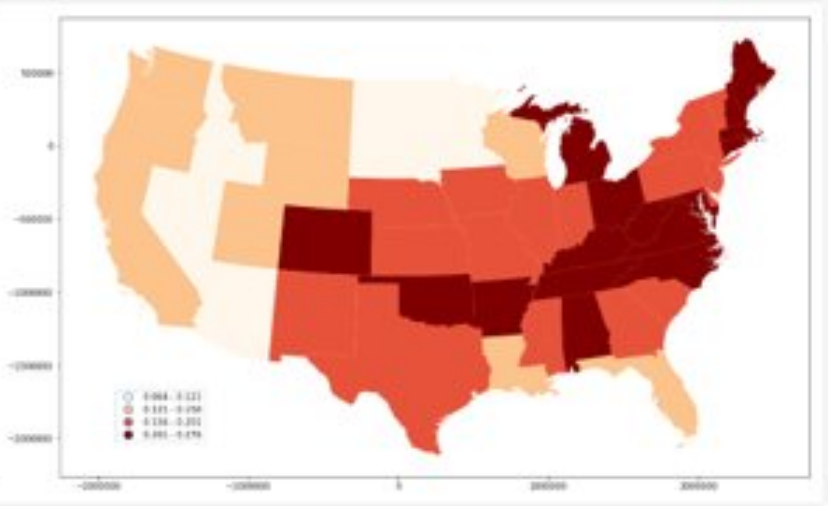
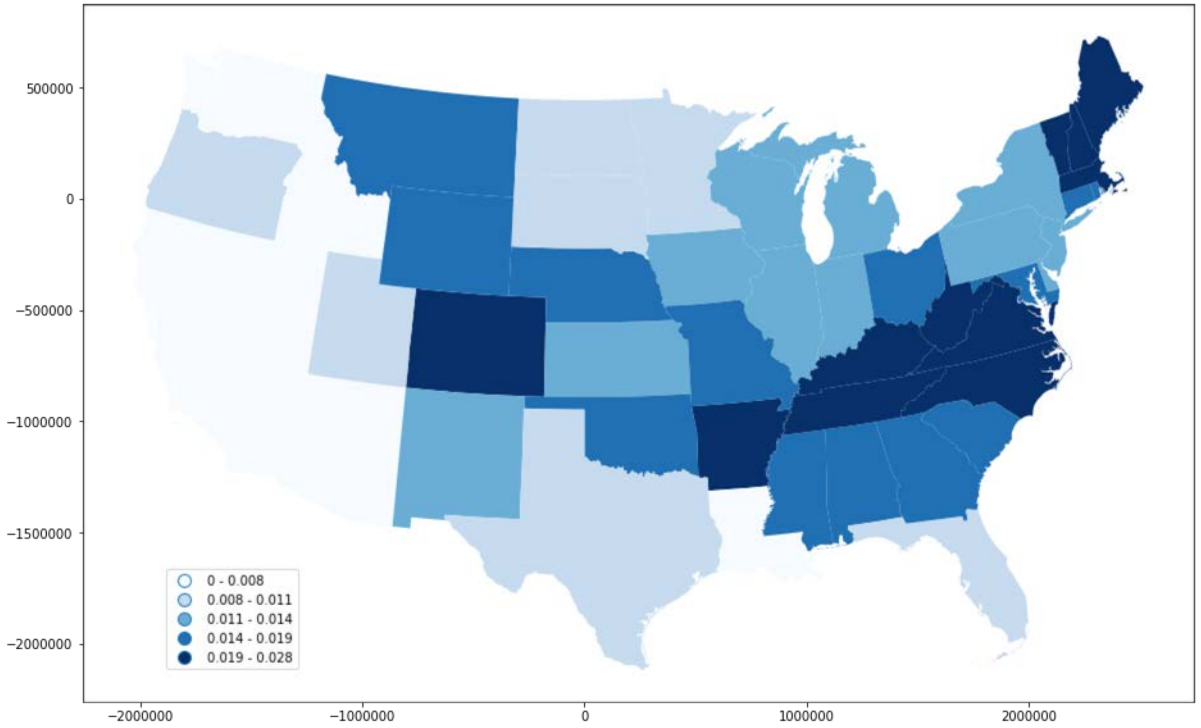
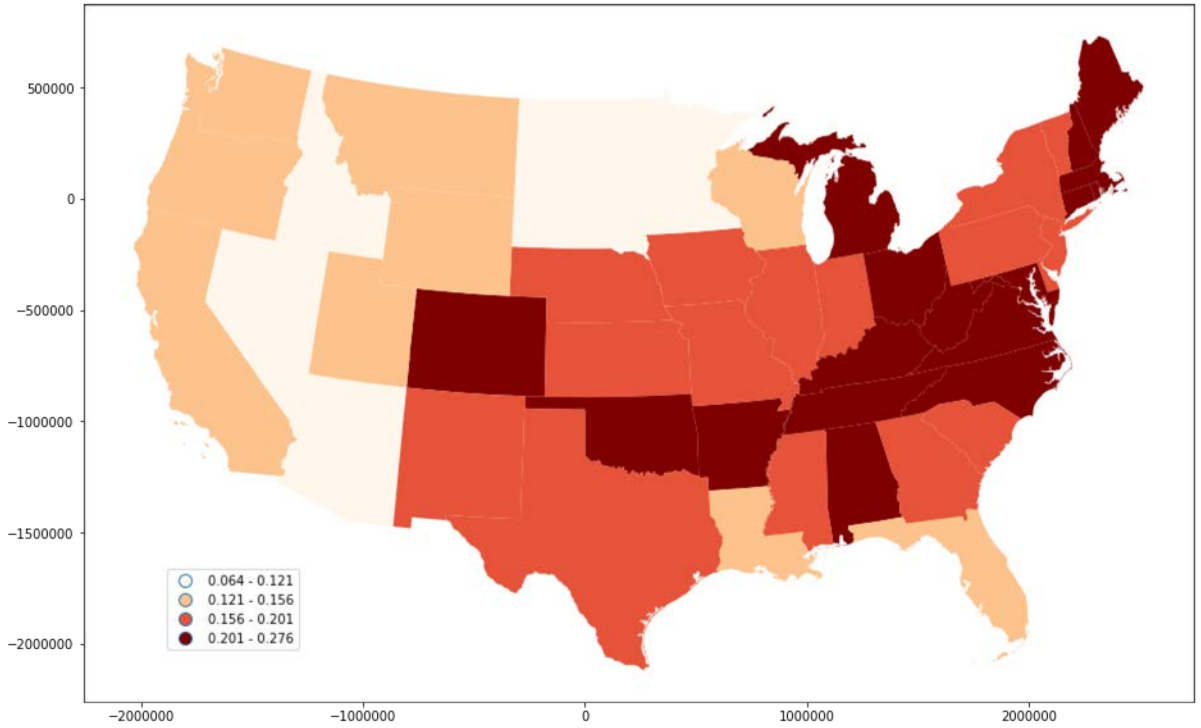


Comparison of Feb 2015

Weather Tweet Ratio

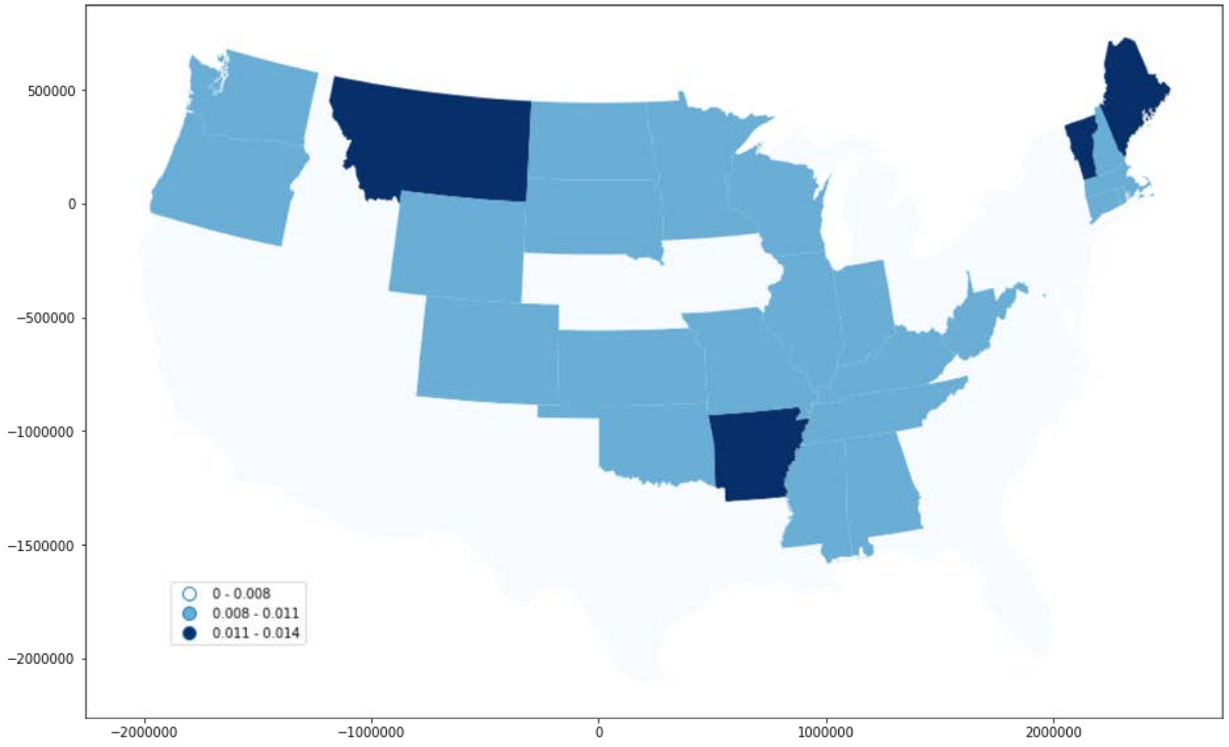


Weather User Ratio

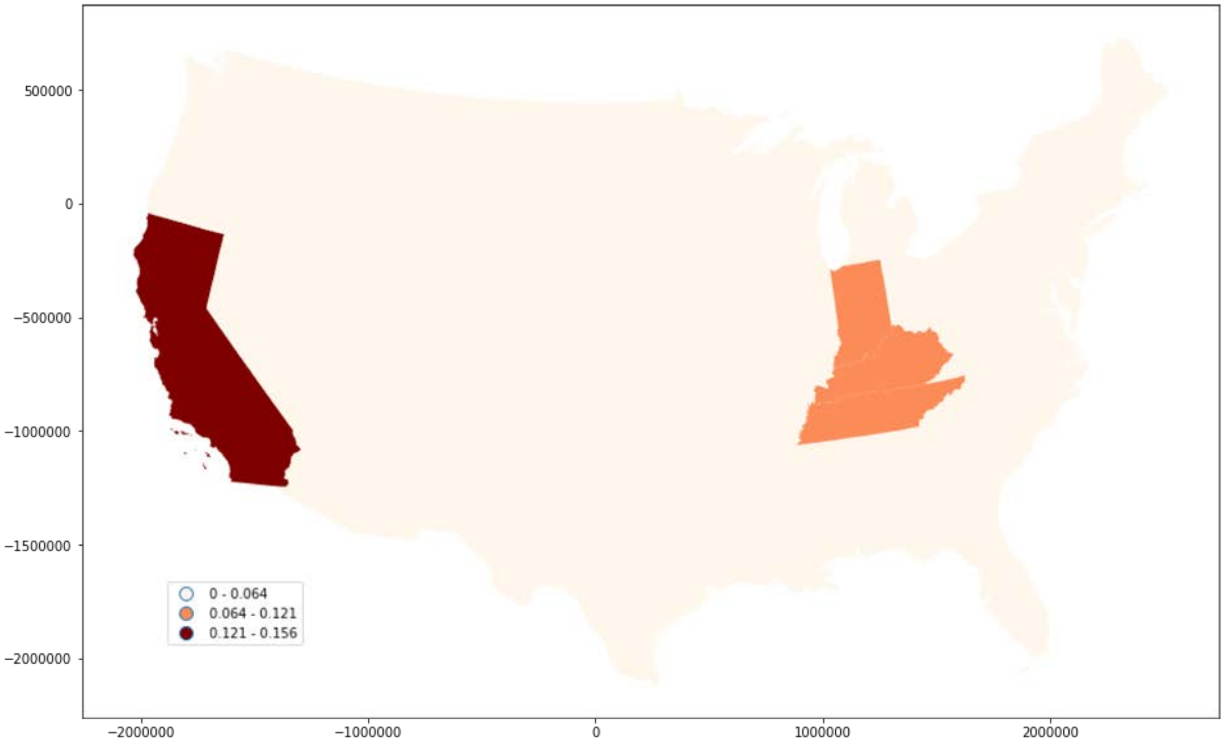


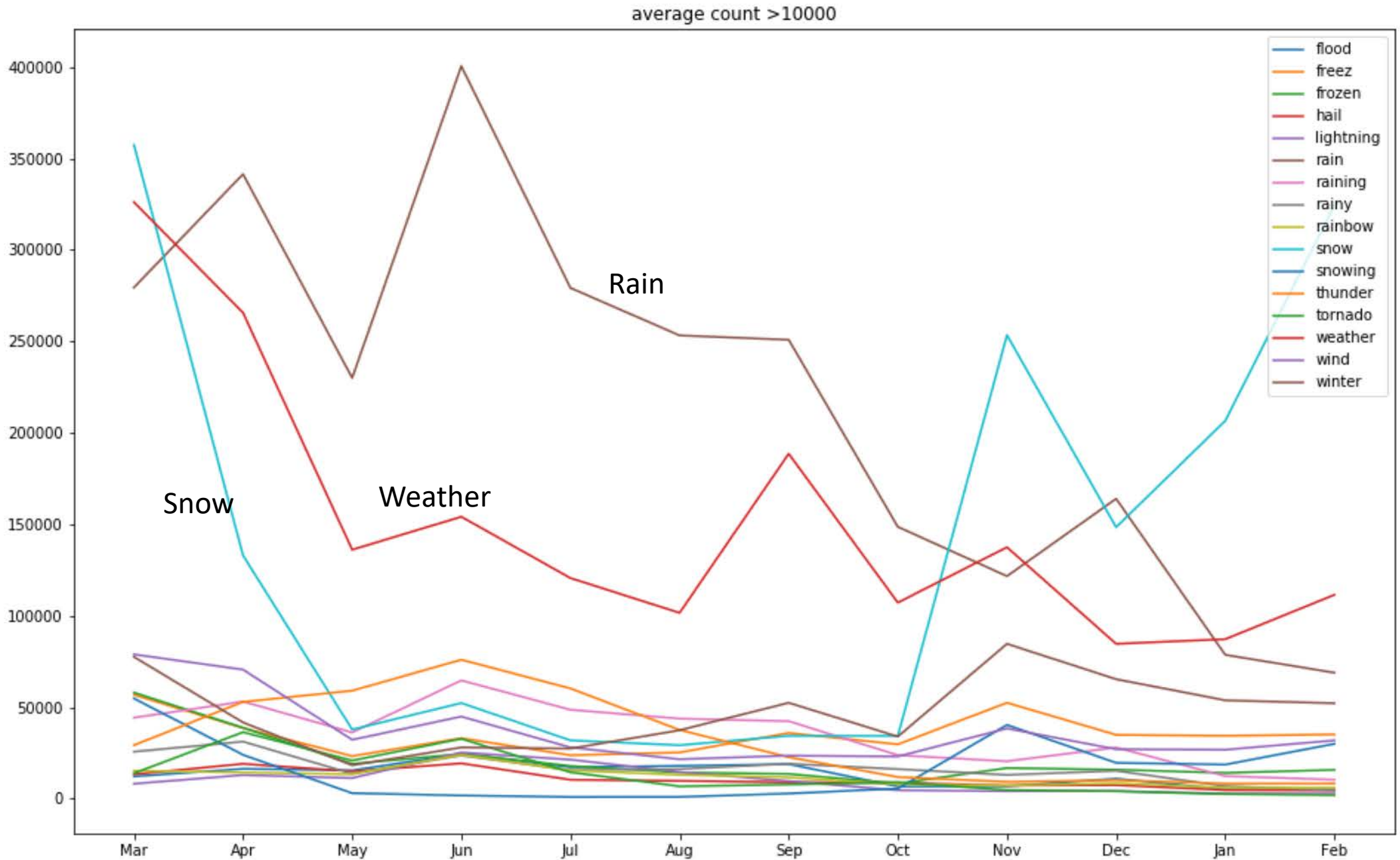
Comparison of Oct 2014

Weather Tweet Ratio



Weather User Ratio

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400000
350000
300000
250000
200000
150000
100000
50000
0
Mar
Apr
May
Jun
Jul
Aug
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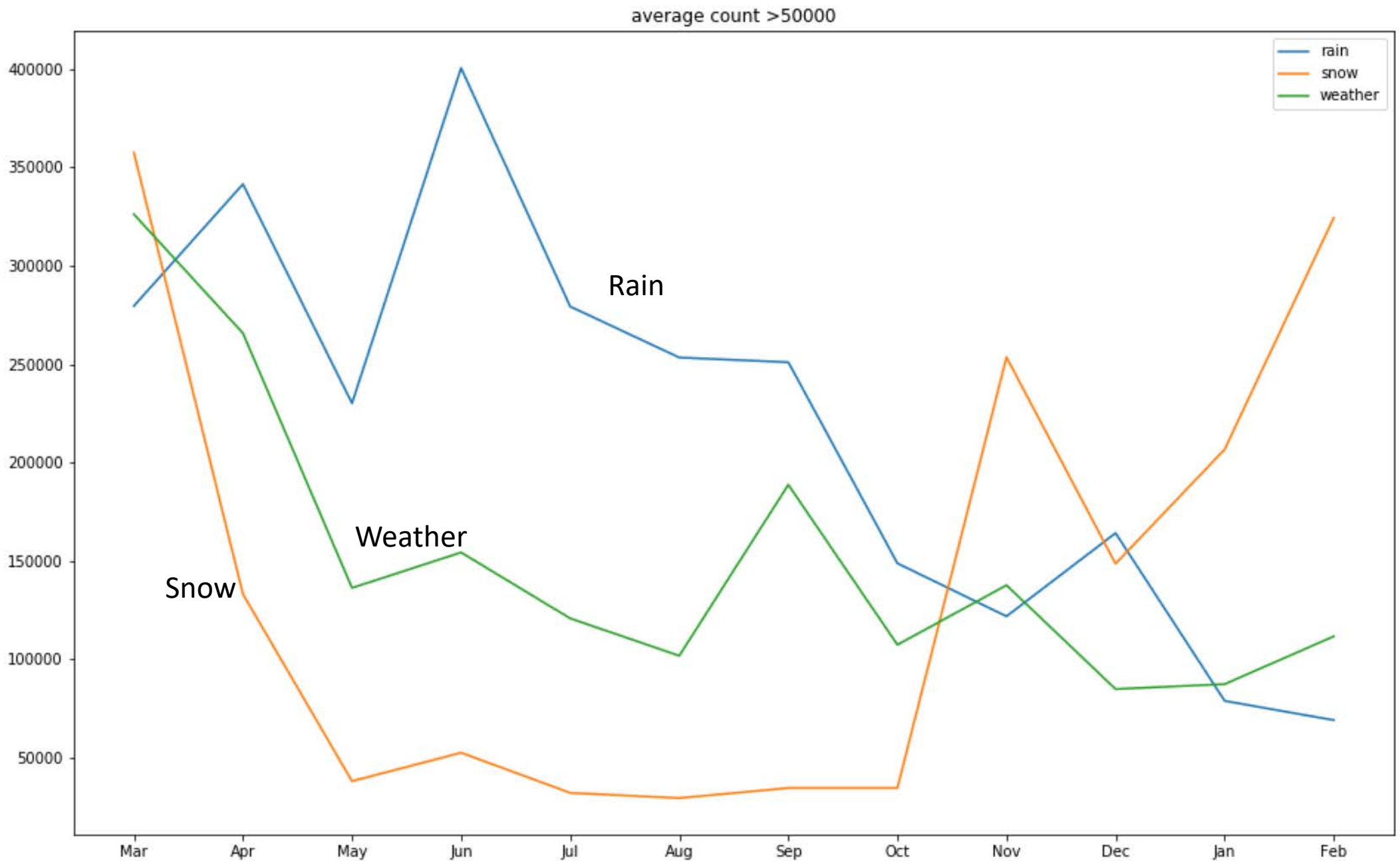
Oct
Nov
Dec
Jan
Feb
flood
freez
frozen
hail
lightning
rain
raining
rainy
rainbow
snow
snowing
thunder
tornado
weather
wind
winter
Rain
Snow
Weather


average count >50000
rain
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250000
200000
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100000
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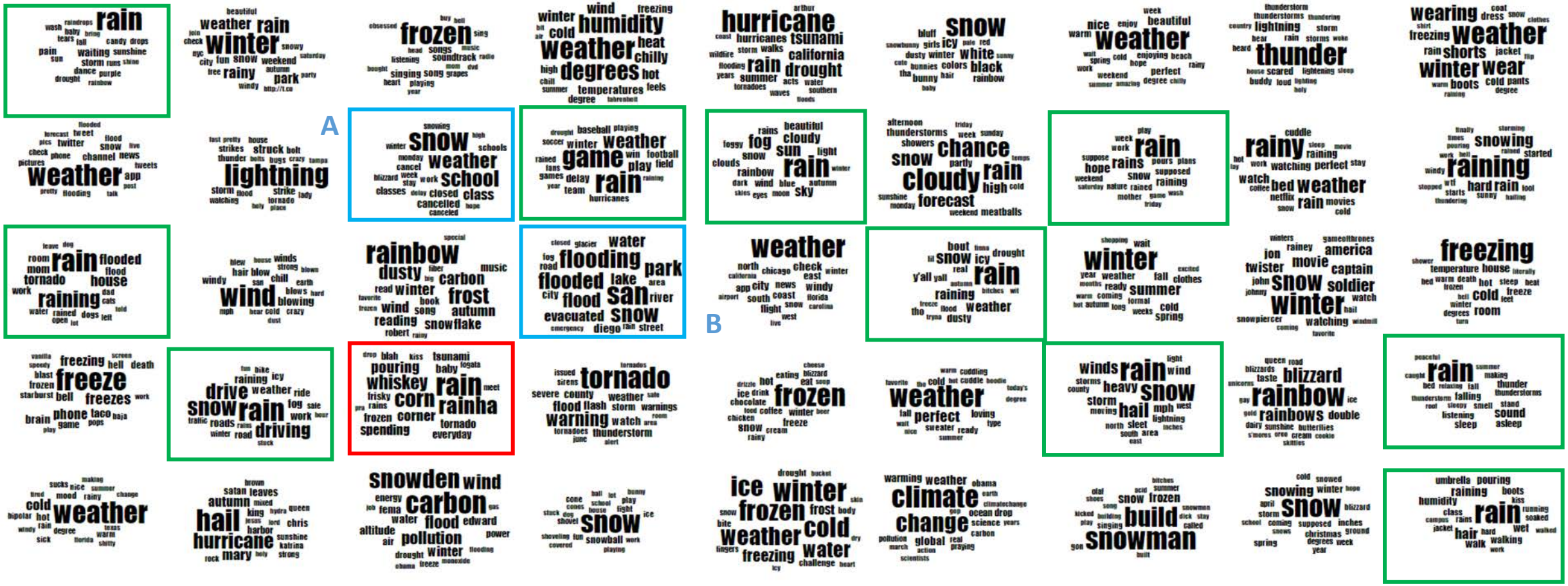
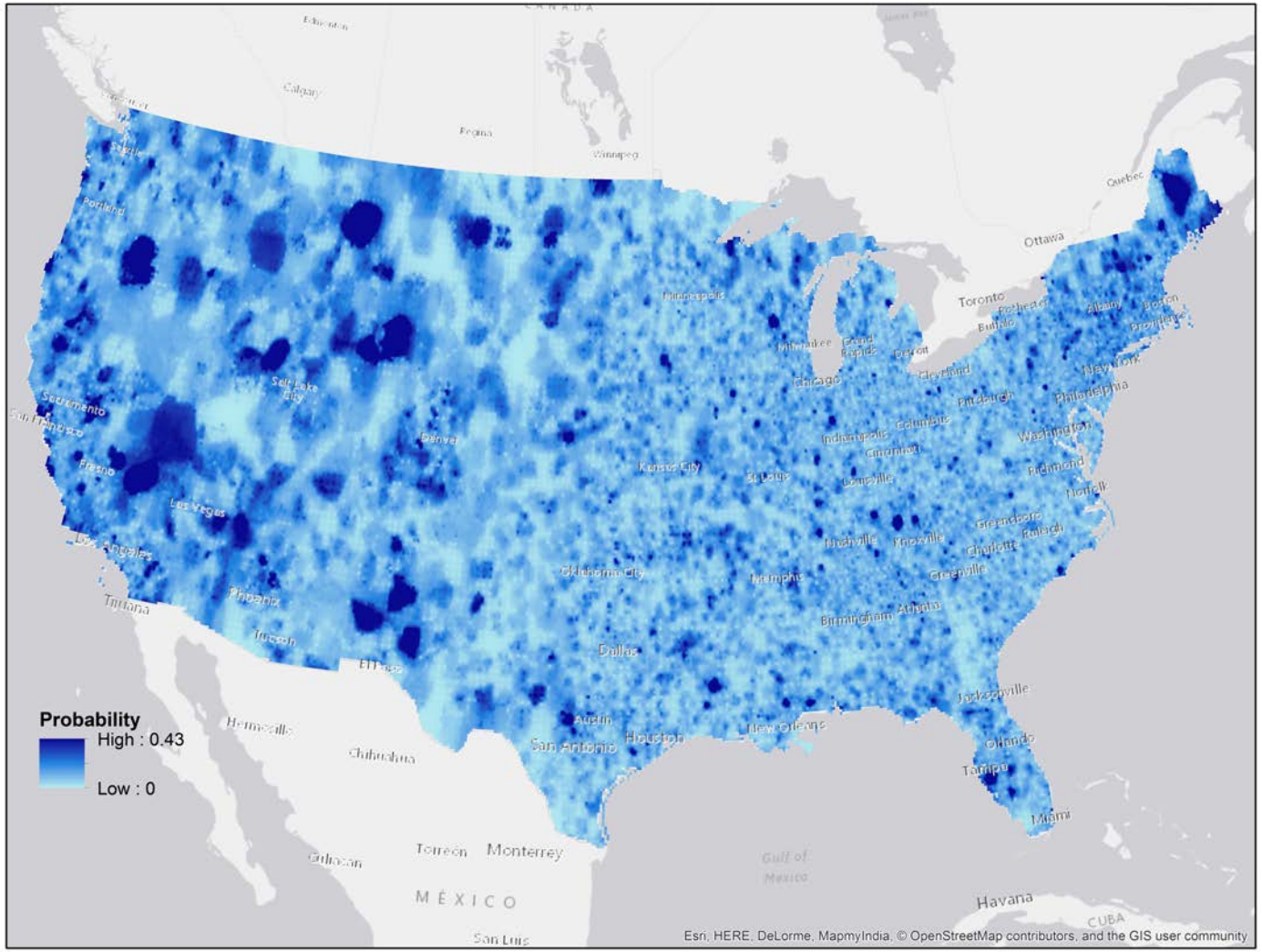
Topic modelling

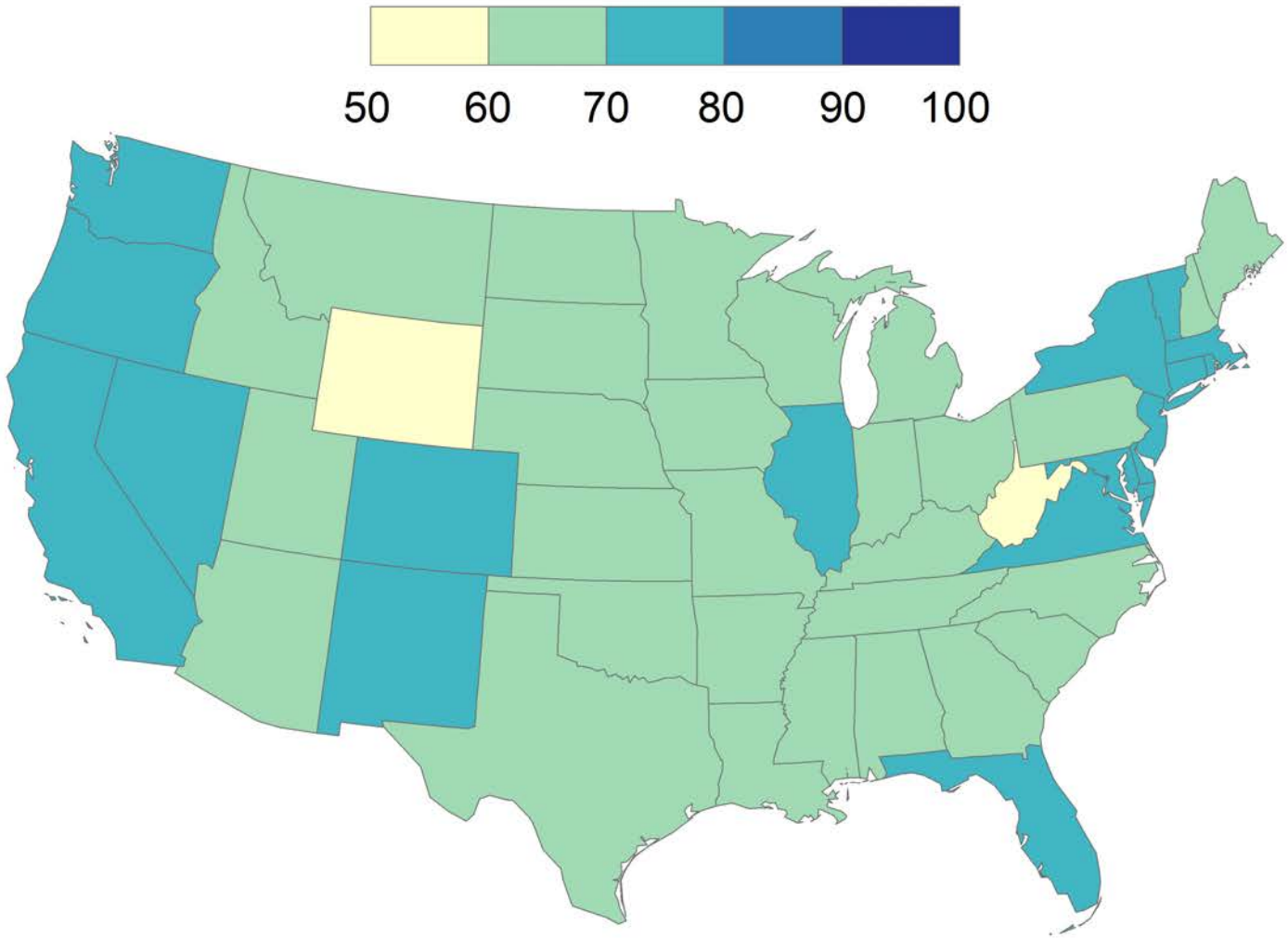
45 Topics of 7 million Tweets



Ratio of Climate Change & Global Warming Tweets

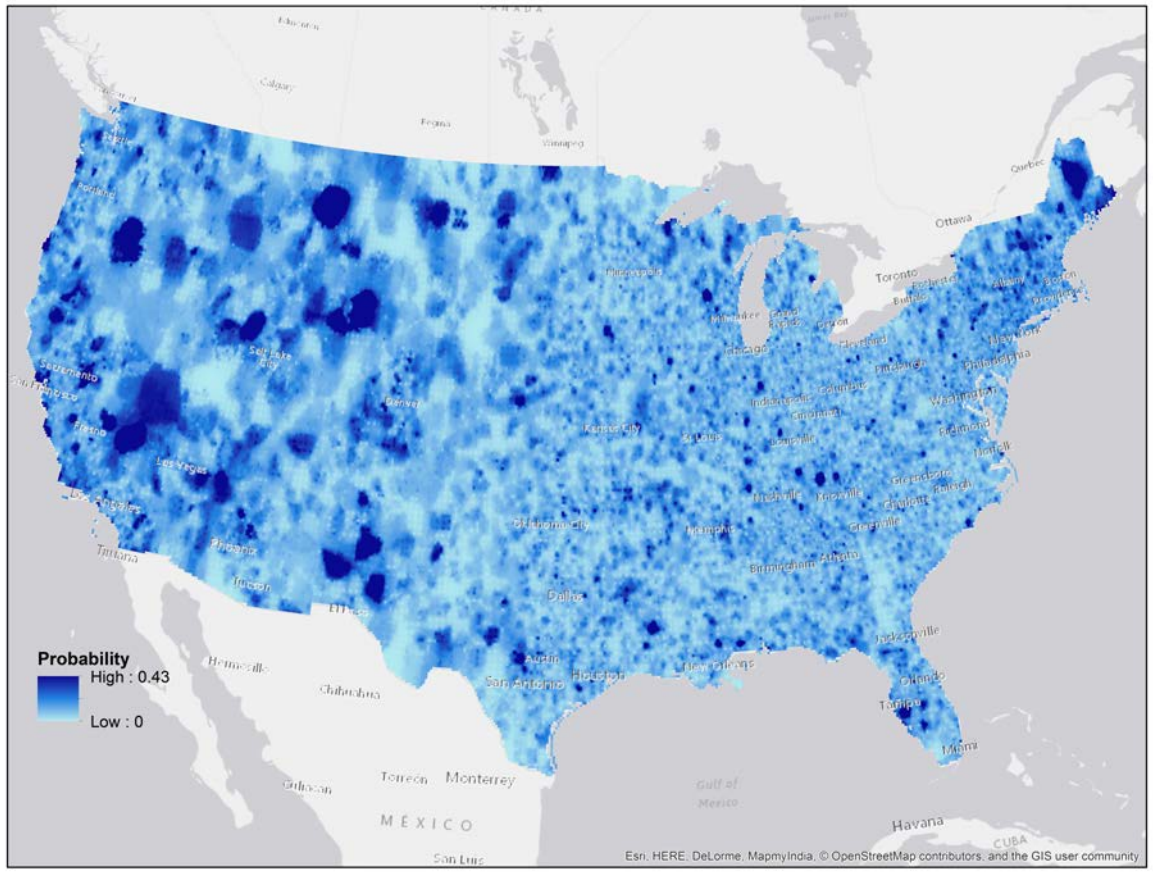


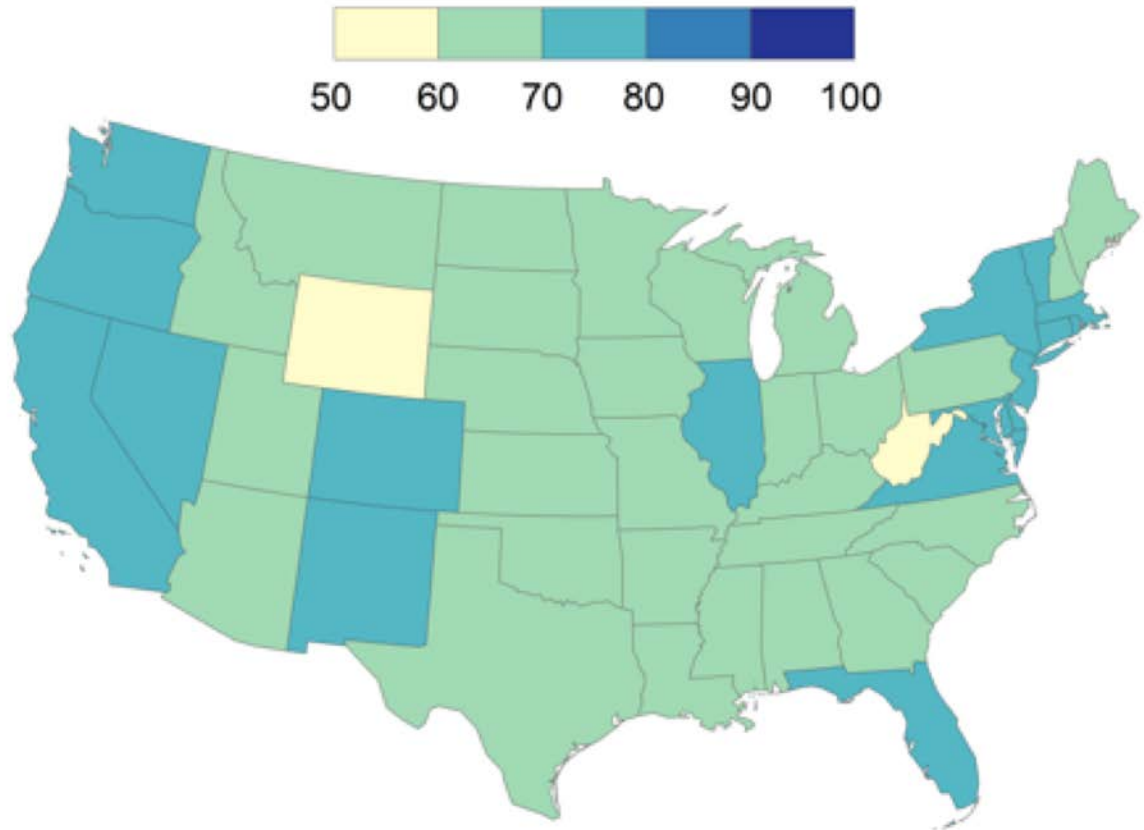
Estimated percentage who think that global warming is happening



http://climatecommunication.yale.edu/

Tweet vs. Survey





Questions & Comments?

Key finds

- Temporal & spatial variation
- Low around summer, high around winter
  - Apply more years of tweets
- Higher ratio in less populated area
  - Appropriate resolution

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