Spatial and Temporal Distribution of Cherry Blossom-viewing Date in the US based on Twitter Data

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1 Introduction

As an important phenological indicator, the blossom-viewing date is an intuitive reflection of the environmental changes. However, most phenological site observation data of blossom show a pattern of incompleteness. As a result, the big data from Twitter become a complementary source to solve this problem.

Figure.1

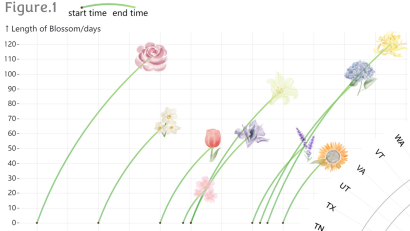


Figure.1 shows the average starting date and ending date of ten most popular ornamental flowers' blossom phase. From Figure.1, cherry blossom shows
The shortest phase.

Goal: Explore trend of climate change based on cherry blossom-viewing date
Research object: Cherry blossom
Data source: Twitter (main)
Geographical research scope: the United States
Technical approach: Python, Plotly, and D3

Figure.2

2 Data

Figure.2 is a word cloud of the contents of tweets after data cleaning. Keywords like "spring", "park" and "photo" indicate that most tweets are describing the blossom-viewing, thus verifying the rationality of using Twitter data to determine the cherry blossom- viewing phase.

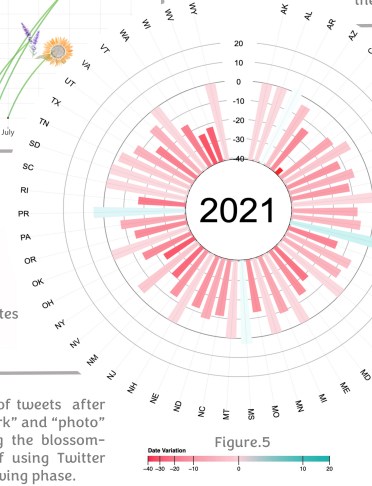


Figure.5

3 Spatial distribution

Figure.3 is a map demonstrating the starting viewing date in each state. From the map, date slips from south to north in general, and the date in the west is slightly higher due to the elevational difference.

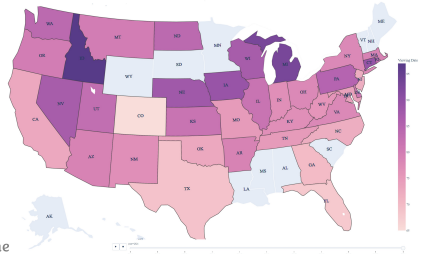


Figure.3

4 Temporal distribution

Figure.4 is a lollipop plot with the starting and ending viewing date among all states each year. From the figure, the viewing date gradually become earlier from 2011 to 2021 . A calendar of the number of tweets is provided as a supplement.

5 Change over time in different states

Figure.5 is a circular bar chart with change of the earliest viewing date from 2011 to 2021 in different states. From the figure, 43 (82%) states get earlier viewing dates and only 3 (6%) states get later ones.

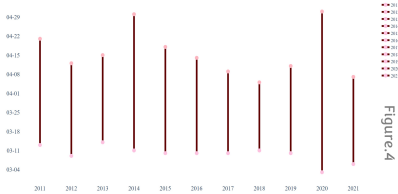
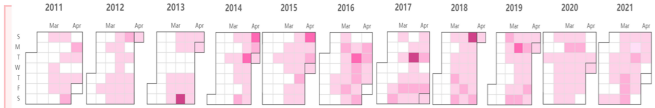


Figure.4

6 Discussion

Strength: innovative & original visualization; effective interactions

Weakness: Data from Twitter is coarse. Refinement by official data may help



7 Conclusion

To conclude, extracting cherry blossom-viewing date from Twitter is reliable. Spatially, the viewing date clearly correlates to latitude and slightly correlates to altitude. Temporally, the viewing date becomes earlier from 2011 to 2021, which provides evidence for the global warming.