



Web application
AirVizR package



Creating Tools in R for Analysis and Visualization of Spatio-Temporal Air Quality Data

Gillian McGinnis, Juliane Fry
Fry Lab, Reed College Chemistry Department - Environmental Chemistry



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FOR
CLEAN
AIR



Background

As public interest in citizen science and localized pollution data grows, more tools need to be developed to allow for greater accessibility in data exploration and understanding.

Current tools are often limited to individual snapshots or single monitors, do not allow for ease of comparisons for multiple data sources, or require substantial programming knowledge.

Goal

Create reusable and publicly accessible tools for the visual analysis of air quality data sets, with implemented quality control and options to observe changes over both space and time.

Approach

Language: R

Environment: RStudio

Process:

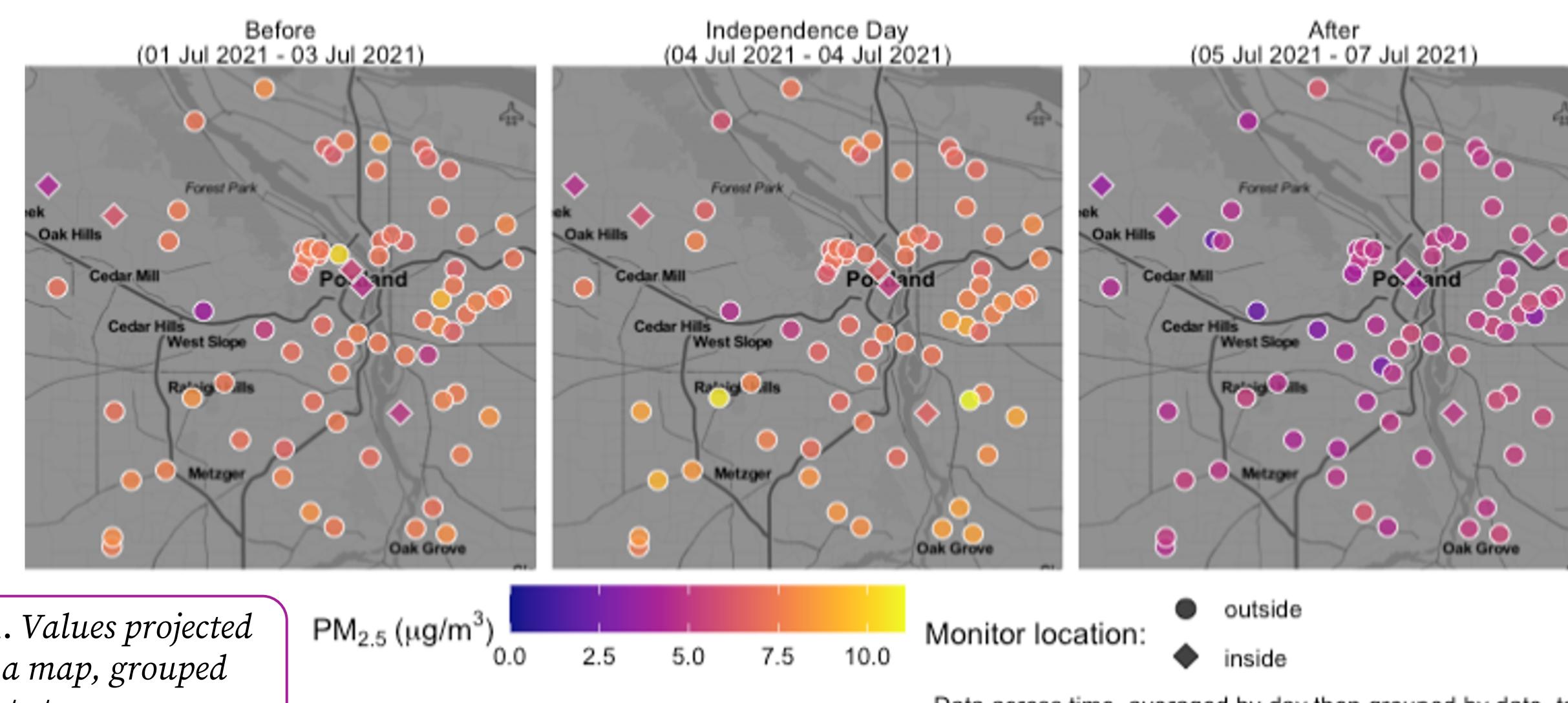
- Raw data **introduced** (PurpleAir, FRM, ObservAir®, &c.)
- Values **corrected** (PurpleAir PM_{2.5} data only)
- Data **averaged** (and temporal “tags” applied)
- Sets **combined** (allowing for cross-comparisons)
- Data frame **visualized** (custom, or one of six integrated)

Visualization function options: six total

Projection over map	Grouped	<i>by temporal unit/tag</i>
	Interactive	<i>requires continuous location data</i>
Temporal heatmap	En masse	<i>works best for larger sets</i>
	Single monitor	<i>hourly</i>
Time series	With extrema	<i>optional min and max labels</i>
	Variation	<i>from OpenAir package</i>

Map of Particulate Matter (PM)

Data from 01 Jul 2021 to 07 Jul 2021.
Variable plotted: pm25_epa_2021, with a reported range of 2.06 to 11.04 units.



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Results

Extensive collaboration conducted with NCA to expand air quality awareness, monitor network, and citizen science

Resulting package:

AirVizR

github.com/gmcginnis/AirVizR

Web dashboard:

AirVizViewR

shiny.reed.edu/s/users/gmcginnis/AirVizViewR/

Source code

github.com/gmcginnis/AirVizViewR

Future Work

Improve documentation as a *resource* for scientific literacy

Use tools to *compare* BC and PM_{2.5} data

Refine AirVizR package for *CRAN submission* and publication

Incorporate more AirVizR functions into the web dashboard to *maximize interactivity and accessibility*

