Exploration of Outdoor Air Quality in Minnesota

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A series of interactive slides which let's you explore Minnesota's Air Quality Index from various viewpoints. The exploration demonstrates the impact of various events (COVID shutdowns, July 4th Fireworks, Wildfires) on the outdoor air quality in Minnesota as measured by the air quality index.

Messaging:

ViewPoint: MN Air Quality during COVID-19 Lockdowns

It has been observed that during COVID-19 lockdowns there was an impact on air quality through out the world. It was noticed that the average AQI was lower, indicating good air quality. The visualizations use data reported by various air quality stations in Minnesota and point out important observations, such as COVID lockdowns, air quality during July 4th, and George Floyd riots and protests.

Viewpoint: MN Air Quality During July 4th Holiday

July 4 Fireworks create unhealthy levels of air pollution. During the Fourth of July in the daytime, concentrations of PM2.5 can rise anywhere between 10 micrograms per cubic meter--well below the EPA 24-hour standard of 35. However, near sunset on July 4, the PM2.5 levels spiked up to 35, and continue to rise during the early morning hours to 59, an air quality level that is considered "Unhealthy". According to the EPA, if sustained for 24 hours, this "red zone" air quality will cause increased aggravation of heart or lung disease and premature mortality in persons with cardiopulmonary disease, and the elderly, and will also cause increased respiratory effects in the general population.

Viewpoint: MN Air Quality During Canadian Wildfires

Observing data from Jun 2021 to end of July 2021. July 20th, 2021, Air quality alert was expanded across Minnesota over Canadian wildfire smoke. Heavy smoke from Canadian wildfires prompted the Minnesota Pollution Control Agency to expand an air quality alert originally for northern Minnesota to much of the state.

Viewpoint: MN Air Quality throughout the years

The data presented here allows one to observe the data freely. The data was downloaded from United States Environmental Protection Agency.

Narrative Structure:

The visualization uses an Interactive Slideshow structure and allows the user to hover over the time series data to observe the data values.
Visual Structure: Line graphs, annotation and tooltips are used to help user interact and view the data. A consistent visual structure is used across the scenes, framing the viewpoints and keep the air quality as the main focus throughout the slides.

Scenes:

The scenes start off the observing the air quality during covid and interesting insights and observations are pointed out to the user via annotations, tooltips and text. The scenes take a viewpoint approach by pivoting and looking at the data from various pivot or viewpoints.

Annotations:

The visualizations use minimal and clean style annotation and point out events to call out and any spikes in the data.

Parameters:

The visualizations are updated and changed based on the data station chosen by the user. The station represents various areas from suburbs to wilderness areas of Minnesota.

Triggers:
The change of air quality data station is the trigger to update the line graphs. Another trigger is when the user hovers over the line graphs the tooltips are shown with the air quality index and the data of the observation.