

README file for the dataset associated with the research article titled: Could the Exception Become the Rule? “Uncontrollable” Air Pollution Events in the U.S. due to Wildland Fires.

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Research article abstract: Exceptional events occur when air pollution in a specific location exceeds the National Ambient Air Quality Standards (NAAQS) due to an event that cannot be reasonably attributed to human activities, such as wildland fire. Ground-level ozone (O₃) and particulate matter (PM) are EPA criteria pollutants regulated under the NAAQS. Smoke from wildland fires can increase PM and O₃ concentrations downwind of fire and impact air quality, visibility, and health. Our analysis shows that the frequency of exceptional event reporting for particulate matter with aerodynamic diameters smaller than 2.5 μ m or 10 μ m (PM_{2.5} and PM₁₀) had increased since 2007 when the air quality standards became more stringent. We also show that wildland fires and windblown dust drive many exceptional events in several EPA regions. We note the importance of growth in the number of exceptional event days due to wildfire smoke in the future due to climate change and point to possible changes to the NAAQS and implementations.

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Data sources and structure:

Source: Data compiled by Liji David. The daily (24-hour) files of O₃ mixing ratios, PM_{2.5} and PM₁₀ along with the 8-hour file for O₃ archived by the U.S. Environmental Protection Agency (EPA) Air Quality System (AQS)¹.

Spatial coverage: Continental U.S.

Temporal coverage: 2000-2017

Data description: The dataset gives the days when O₃ and PM exceeded the standards and were also flagged for an exceptional event in the AQS database. We have connected those day(s) with

an exact event (e.g., a specific wildland fire, high wind period, stratospheric O₃ intrusion, agricultural or prescribed burn). We have also gathered information on the number of Exceptional Event Demonstrations (EED) along with the total number of days (for each EED) submitted by each state (on a county-by-county basis), and the days that were concurred and denied by EPA. We have also included supporting documents for the exceptional day(s).

Format of data files: There are two data files and a codebook in the CSV format along with a README file. The two data files are described as follows:

1. The file 'O3_PM_count_EPA_regions_2000-2017.csv' gives details on the number of days O₃ and PM concentrations were influenced by an exceptional event in the ten EPA regions. The files give the number of EED along with the total number of days submitted to EPA, and the days that were concurred and denied by EPA in the ten EPA regions. It also gives the total days that were associated with an exceptional event (high wind, Saharan dust, wildland fire, agricultural fires, prescribed burns, stratospheric intrusion, fireworks emissions, and volcanic emissions) in the ten EPA regions.
2. The file 'O3_PM_state_EE_2000-2017.csv' gives the days when O₃, PM_{2.5}, and PM₁₀ exceeded the standards and were flagged for an exceptional event in the AQS database. The exceptional days are classified as high wind, Saharan dust, wildland fire, agricultural fires, prescribed burns, stratospheric intrusion, fireworks emissions, and volcanic emissions. It gives detail on the number of EEDs. The details are given on a county-by-county basis.

Recommended use: Please read the associated publication to understand our analysis method.

Reference:

- (1) US Environmental Protection Agency. Air Quality System Data Mart (daily and 8-hour average data) available via <https://www.epa.gov/airdata>. Accessed July 6, 2017.