# 2024 PM2.5 Year in Review (Updates on Designations and Exceptional Events Too)

Bureau of Air Quality 5/08/2025





## Agenda

- DEP's PM2.5 Designation Process
- DEP's PM2.5 Exceptional Event Process
- 2024 PM2.5 Year in Review
  - A review of the meteorology
  - PM2.5 Concentration Data
- Next Steps



# DEP's PM2.5 Designation Process



## **DEP's PM2.5 Designation Process**

- On February 7, 2024, EPA signed the final rule for a new PM2.5 NAAQS, revising the primary annual standard to 9.0  $\mu$ g/m³ and retaining the primary 24-hour standard to 35  $\mu$ g/m³.
- EPA finalized 2023 PM2.5 design values in August 2024. DEP used these 2023 PM2.5 design values for its designation purposes.
- In its plan, DEP used five factors (air quality data, emissions data, meteorology data, geography/topography data and jurisdictional boundary data) to define its proposed PM2.5 nonattainment areas.
- The result: DEP proposed four areas in the Commonwealth for nonattainment area designation.
- DEP went out for public comment on its recommended PM2.5 designation from December 21, 2024 until January 28, 2025.



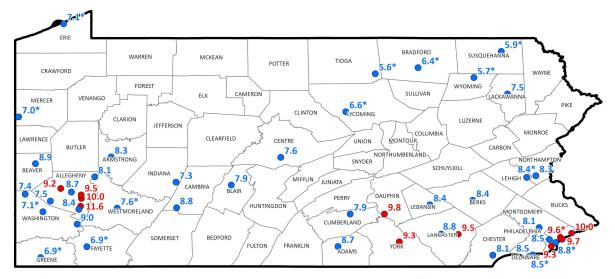
## **DEP's PM2.5 Designation Process**

#### Facts about the public comment period:

- DEP extended the public comment period due to a request that was submitted.
- In total, DEP received 24 public comments.
- Public comments were submitted from Pennsylvania citizens in addition to different environmental organizations, including from Allegheny County Clean Air Now, Breathe Project, Carnegie Mellon University's CREATE Lab, Clean Air Council, Environmental Health Project, Environmental Integrity Project, Group Against Smog and Pollution, PennEnvironment Research and Policy Center, PennFuture, and Protect PT.
- Final comment and response document will be published to DEP website once approved for publication.



# DEP's PM2.5 Designation Process – Final 2023 Annual DV

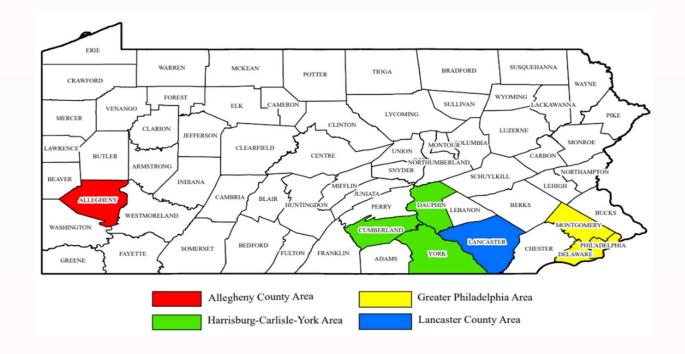


Appearing in Red – 2023 annual PM2.5 design value above 9.0  $\mu g/m^3$  (2024 PM2.5 Standard)

Appearing in Blue – 2023 annual PM2.5 design value at or below 9.0 µg/m³ (2024 PM2.5 Standard)



# DEP's PM2.5 Designation Process – Final Proposal





# DEP's PM2.5 Exceptional Event Process

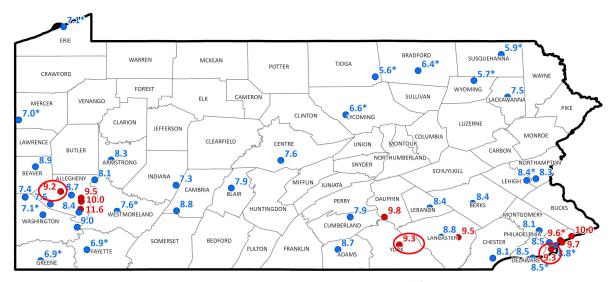


### **DEP's PM2.5 Exceptional Event Process**

- Coinciding with the 2024 PM2.5 NAAQS designation process, DEP embarked on a PM2.5 exceptional event analysis.
- The events focused on <u>two</u> different time periods in June 2023: June 6 June 8 and June 28 July 1. Both events were centered on wildfires in eastern Canada (Quebec province).
- DEP focused the analysis on three sites: Avalon (ACHD), York (DEP), Ritner (PAMS).
- Result: the analysis demonstrated that if the PM2.5 data from the two events were excluded for
  determination of the compliance with the 2025 PM2.5 NAAQS, the three sites would no longer be
  exceeding the 2025 PM2.5 NAAQS based on the 2023 PM2.5 design value period, thereby meeting
  the "regulatory significance" requirement of completing an exceptional event analysis.
- The exceptional event analysis went out for public comment from February 15, 2025 to March 17, 2025. DEP received no public comments.



# DEP's PM2.5 Designation Process – Final 2023 Annual DV



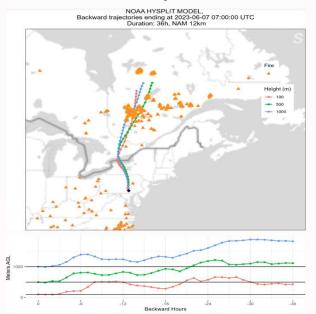
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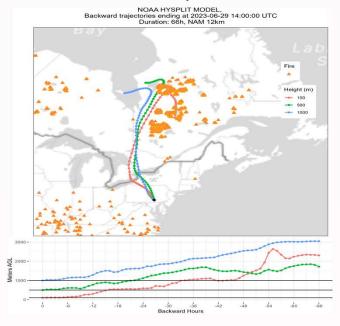


# DEP's PM2.5 Exceptional Event Process – Back Trajectories

June 7, 2023

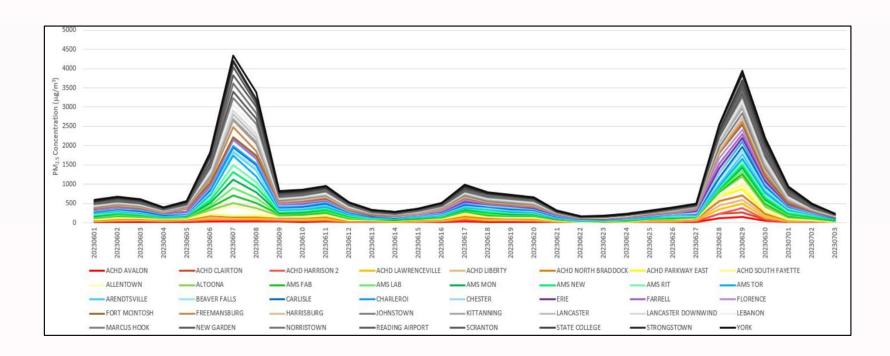


June 29, 2023





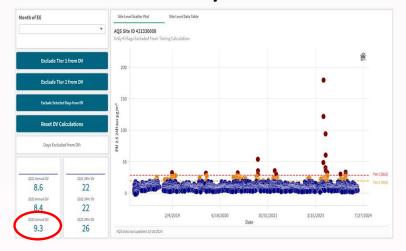
## DEP's PM2.5 Exceptional Event Process – PM2.5 Concentrations





# DEP's PM2.5 Exceptional Event Process – PM2.5 Concentrations

#### York - No Days Excluded



#### York - Seven Days Excluded



Graphics from EPA Website: <a href="https://www.epa.gov/air-quality-analysis/pm25-tiering-tool-exceptional-events-analysis">https://www.epa.gov/air-quality-analysis/pm25-tiering-tool-exceptional-events-analysis</a>



## 2024 PM2.5 Year in Review



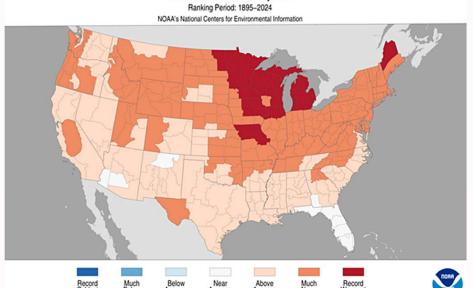
Created: Wed Mar 6 2024

Source: nClimGrid - Monthly

## **Meteorology – Winter 2024**

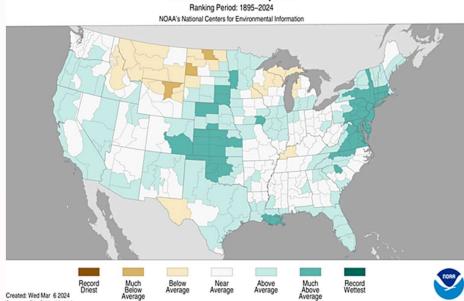
#### **Temperature**

#### **Divisional Maximum Temperature Ranks** December 2023-February 2024



#### **Precipitation**

#### **Divisional Precipitation Ranks** December 2023-February 2024



Source: nClimGrid - Monthly



Created: Thu Jun 6 2024

Source: nClimGrid - Monthly

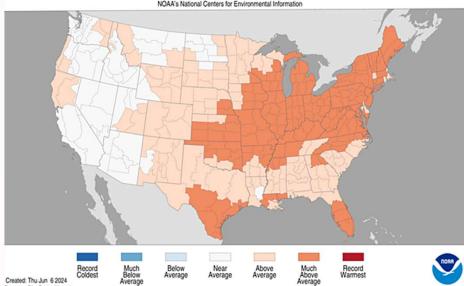
# **Meteorology – Spring 2024**

Source: nClimGrid - Monthly

#### **Temperature**

#### Divisional Maximum Temperature Ranks March-May 2024 Ranking Period: 1895-2024

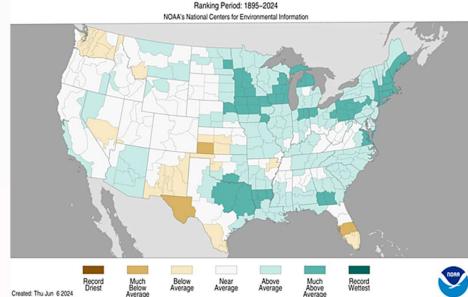
NOAA's National Centers for Environmental Information



#### **Precipitation**

### Divisional Precipitation Ranks March-May 2024

Ranking Period: 1895-2024



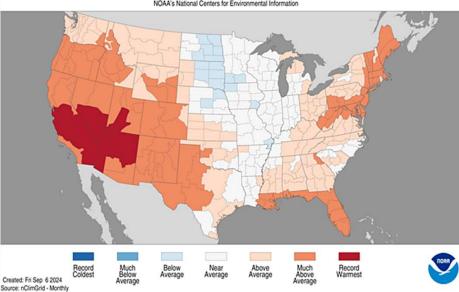


# Meteorology – Summer 2024

#### **Temperature**

#### Divisional Maximum Temperature Ranks June-August 2024 Ranking Period: 1895-2024

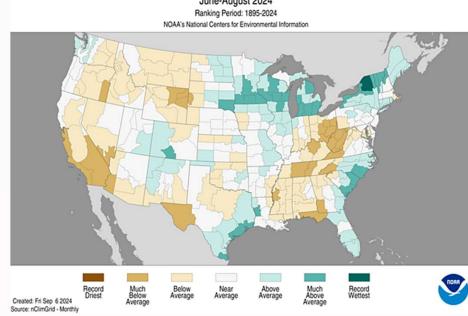
NOAA's National Centers for Environmental Information



#### **Precipitation**

#### **Divisional Precipitation Ranks**

June-August 2024



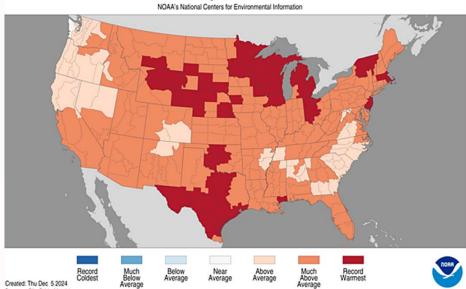


Source: nClimGrid - Monthly

## Meteorology – Fall 2024

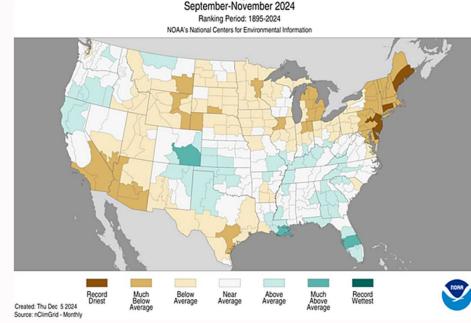
#### **Temperature**

#### Divisional Maximum Temperature Ranks September-November 2024 Ranking Period: 1895-2024



#### **Precipitation**







## **2024 PM2.5 Monitoring Summary**

- PM2.5 monitoring season Year-round
- Overview of the 2024 design value (DV) for the 24-hour and annual PM2.5 national ambient air quality standard (NAAQS) continuous monitors:
  - 2024 24-hour DV calculation 98<sup>th</sup> percentile value from 2022, 2023, and 2024 averaged over a 3-year period.
  - <u>2024 annual DV calculation</u> Annual average calculated from quarterly (January March, and so on) averages. Annual average for 2022, 2023, and 2024 averaged over a 3-year period.



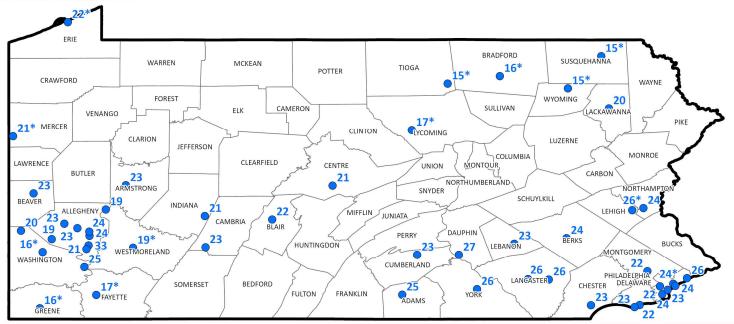
# Number of 24-hour PM2.5 Exceedances

Number of PM2.5 exceedance days and total number of exceedances per year within Pennsylvania's PM2.5 monitoring network (~46 total monitors):

- 2022: 9 days | 12 total exceedances
- 2023: 20 days | 204 total exceedances
- 2024: 8 days | 10 total exceedances



## 2023 24-hour PM2.5 Design Values

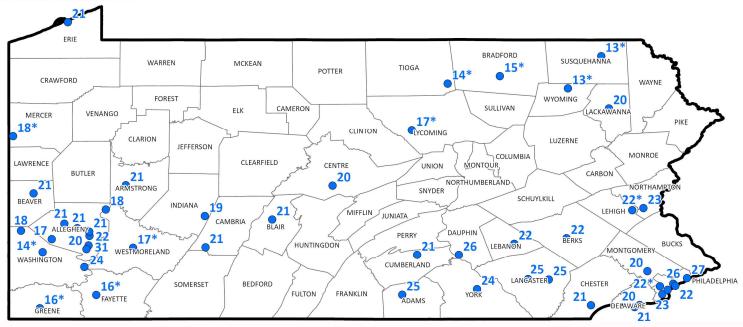


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## 2024 24-hour PM2.5 Design Values

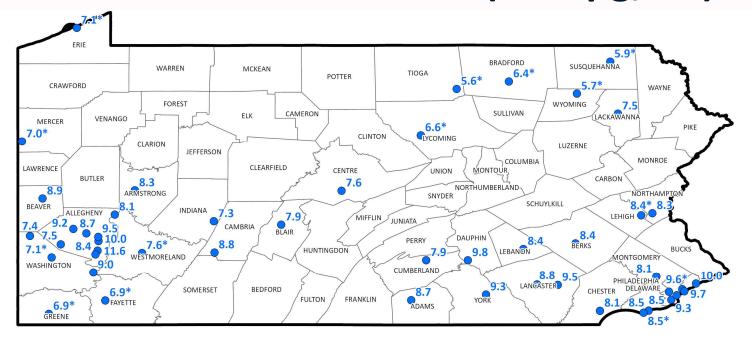


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# 2023 Annual PM2.5 Design Values – 2012 NAAQS (12.0 µg/m³)

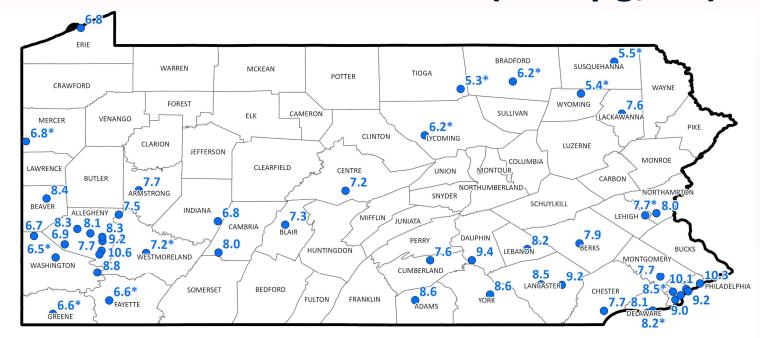


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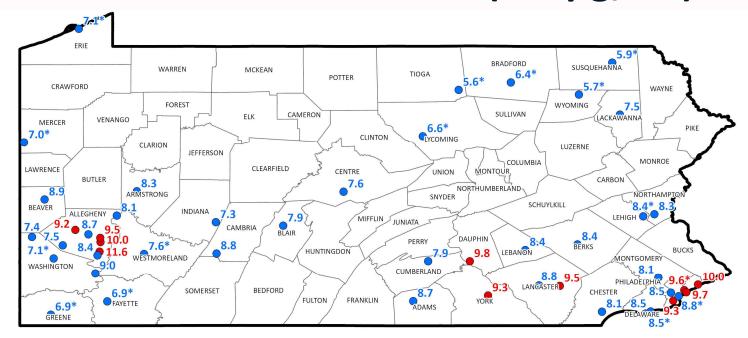


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# 2023 Annual PM2.5 Design Values – 2024 NAAQS (9.0 μg/m³)

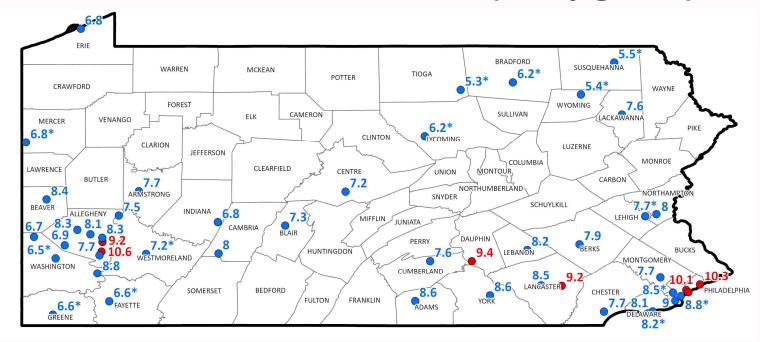


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# 2024 Annual PM2.5 Design Values – 2024 NAAQS (9.0 μg/m³)



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# **Next Steps**





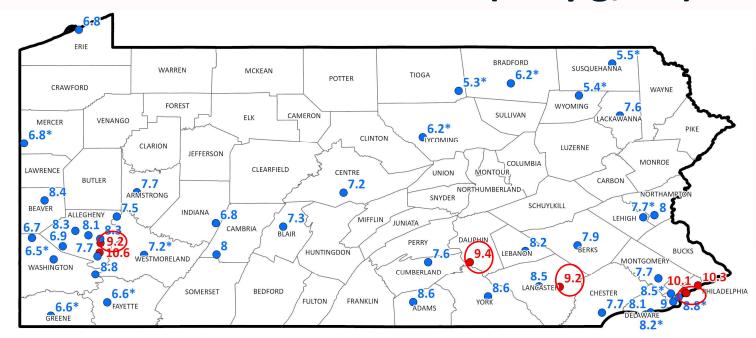
Image Source: https://www.istockphoto.com

## **Next Steps**

- DEP early certified its 2024 PM2.5 data for consideration for the PM2.5 designation process.
- We await decisions at the federal level about our PM2.5 recommended designations and our PM2.5 exceptional event analysis.
- If current PM2.5 annual NAAQS stays at 9.0 µg/m³, we will reevaluate the need for additional exceptional event analyses (that may now be "regulatory significant") with respect to the June 2023 wildfire event.



# 2024 Annual PM2.5 Design Values – 2024 NAAQS (9.0 μg/m³)



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### **Get In Touch**

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The Department of Environmental Protection's mission is to protect Pennsylvania's air, land and water resources and to provide for the health and safety of its residents and visitors, consistent with the rights and duties established under the Environmental Rights Amendment (Article 1, Section 27 of the Pennsylvania Constitution).