



**pennsylvania**  
DEPARTMENT OF ENVIRONMENTAL PROTECTION



Bureau of Air Quality

# 2023 Ozone Year in Review

**Small Business Compliance Advisory Committee**

**January 17, 2023**

**Harrisburg, PA**

Josh Shapiro, Governor

Jessica Shirley, Interim Acting Secretary

# Agenda

## Review of 2023 Weather and Ozone Concentrations

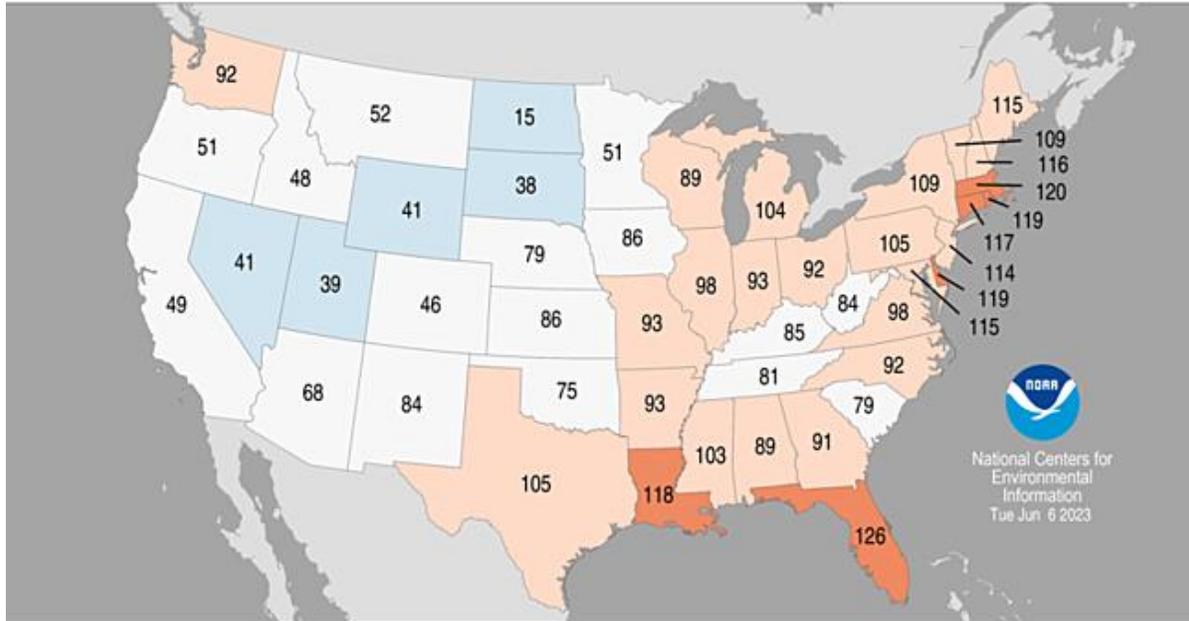
- Weather features include analysis of temperature and precipitation
- Ozone Concentration Data
  - Number of ozone exceedances
  - Current projected design values
- Ozone Episode Data
  - Dominated by smoke influenced events
  - Focus on June 1-2, June 29-30

# Review of 2023 Weather and Ozone Concentrations

# Meteorology – Spring 2023

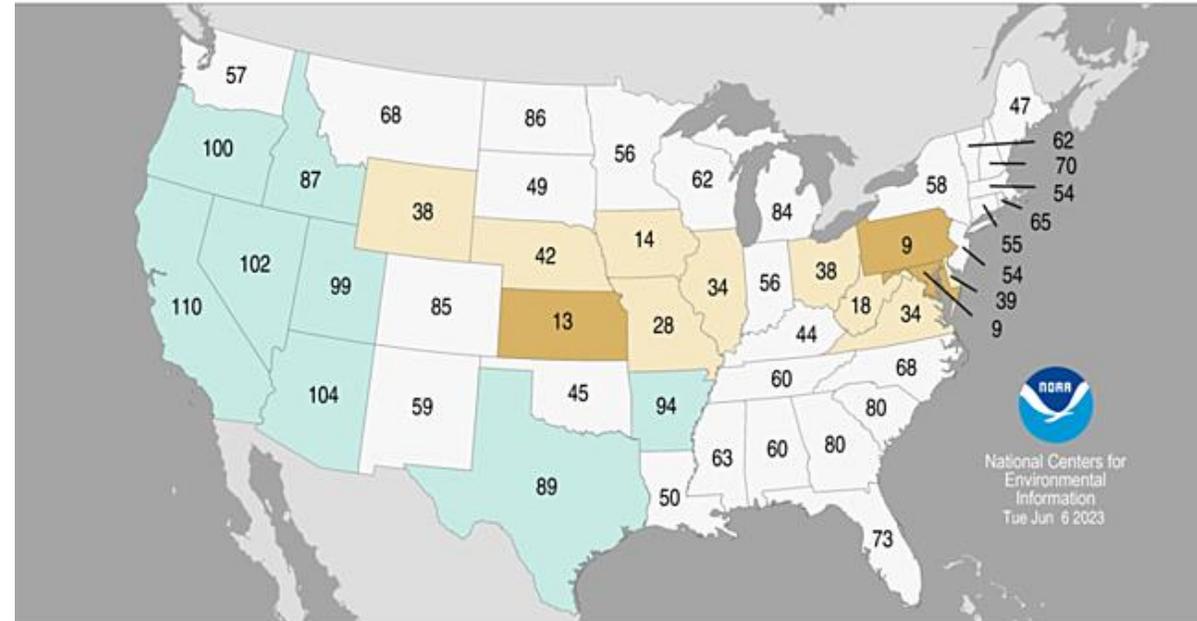
## Temperature

Statewide Average Temperature Ranks  
March – May 2023  
Period: 1895–2023



## Precipitation

Statewide Precipitation Ranks  
March – May 2023  
Period: 1895–2023





# Meteorology – Fall 2023

Pictures will be added when they become available. As of December 4, November data is not yet available.

# 2023 Ozone Monitoring Summary

- Ozone monitoring season – March 1 to October 31
- Overview of the projected 2023 design values (DV)\* for the 8-hour ozone national ambient air quality standard (NAAQS)
- 2023 DV calculation – 4<sup>th</sup> high from 2021, 2022, and 2023 averaged over a 3-year period

\* 2023 ozone data has not been fully QA/QC'd.

# Number of 8-hour Ozone Exceedances

- Number of 8-hour ozone exceedance days of 2015 ozone NAAQS (0.070 parts per million or 70 parts per billion) and total number of ozone exceedances per year within Pennsylvania.

(Includes 46 monitors from PA DEP (40), ACHD (3), and Philadelphia AMS(3))

- 2023: 18 days | 114 total exceedances\*
- 2022: 5 days | 26 total exceedances
- 2021: 15 days | 46 total exceedances

\* 2023 ozone data has not been fully QA/QC'd.

# 2023 8-hour Ozone NAAQS Attainment Status

- In 2022, one sampler in the Commonwealth monitored nonattainment of the 2015 8-hour ozone NAAQS.
- In 2023\*, one sampler in the Commonwealth is projected to be monitoring nonattainment of the 2015 8-hour ozone NAAQS.

\* 2023 ozone data has not been fully QA/QC'd.





# 2023 Ozone Episode Data

- 2023 had the greatest number of ozone exceedances since 2016 (169 exceedances).
- 2023 saw a greater frequency of days impacted from smoke from associated wildfires in eastern Canada, western Canada and New Jersey.
- Two date periods are of interest for elevated ozone
  - June 1 – June 2
  - June 29 – June 30
- Preliminary analysis includes review of Aerosol Optical Depth imagery, surface satellite imagery and regional ozone concentrations.

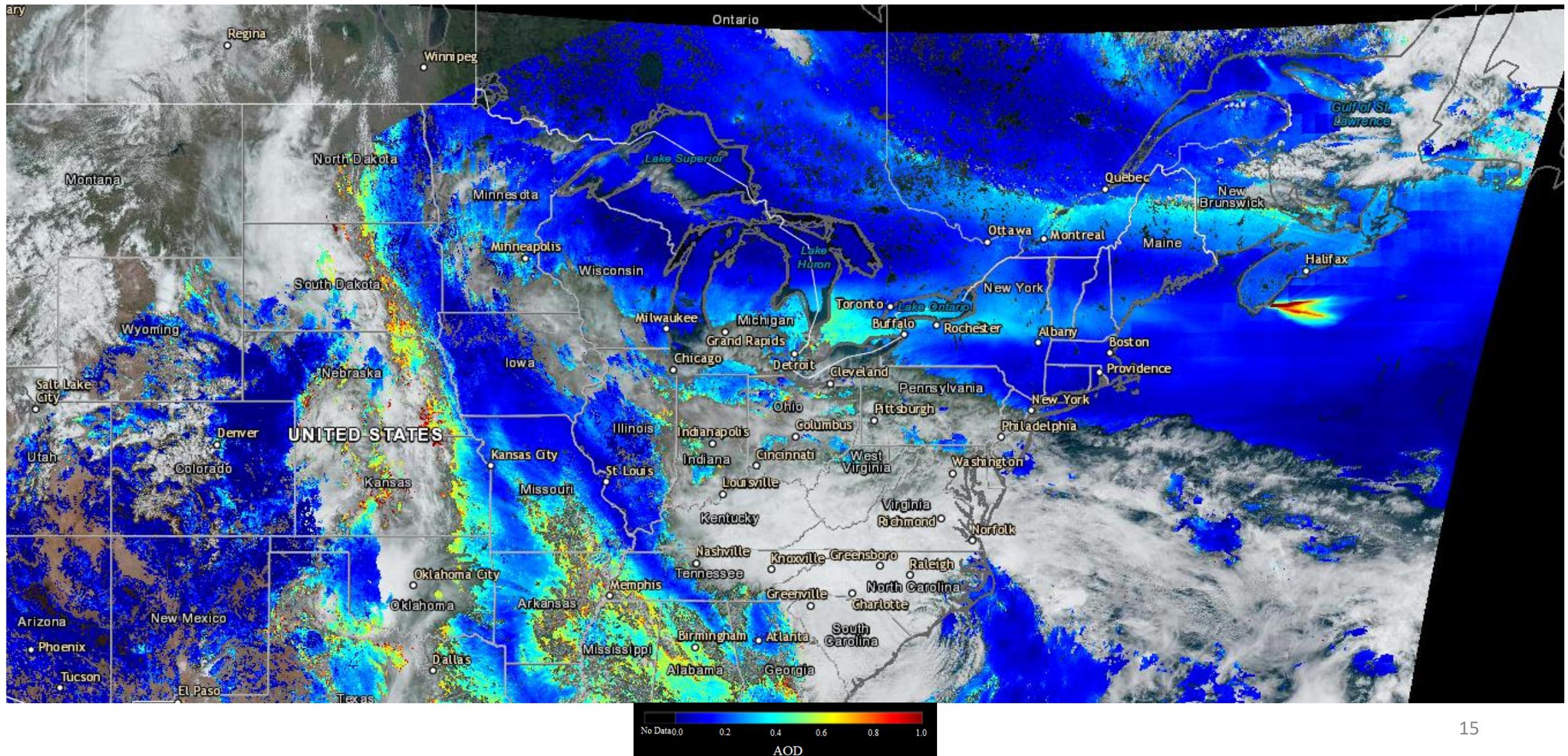
# Meteorology – Fall 2023

Once data is available, add in NOx emissions data reported to EPA Clean Air Markets Division for summer 2023.

# Evolution of an Ozone Episode

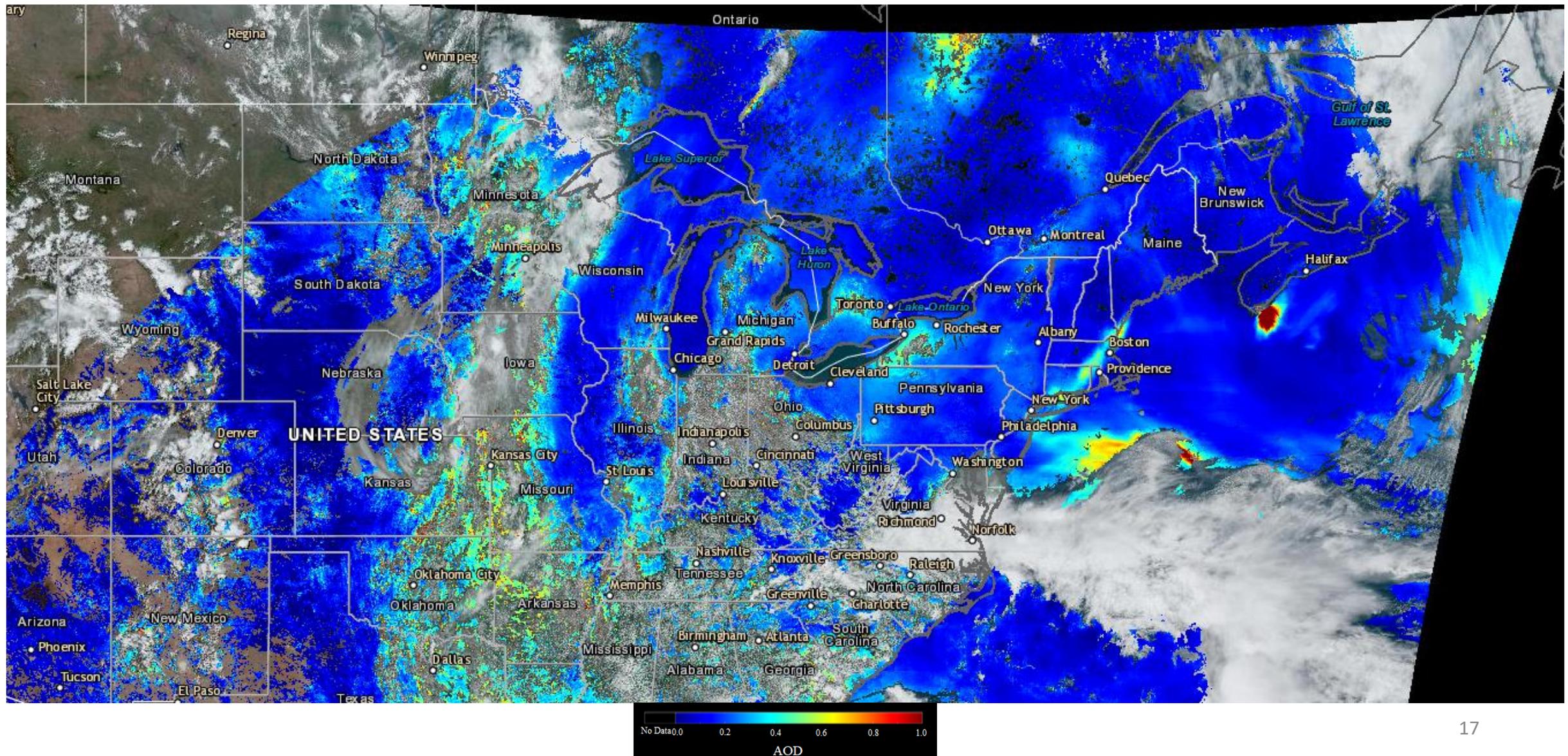
## June 1-June 2, 2023

# Aerosol Optical Depth – May 28, 2023

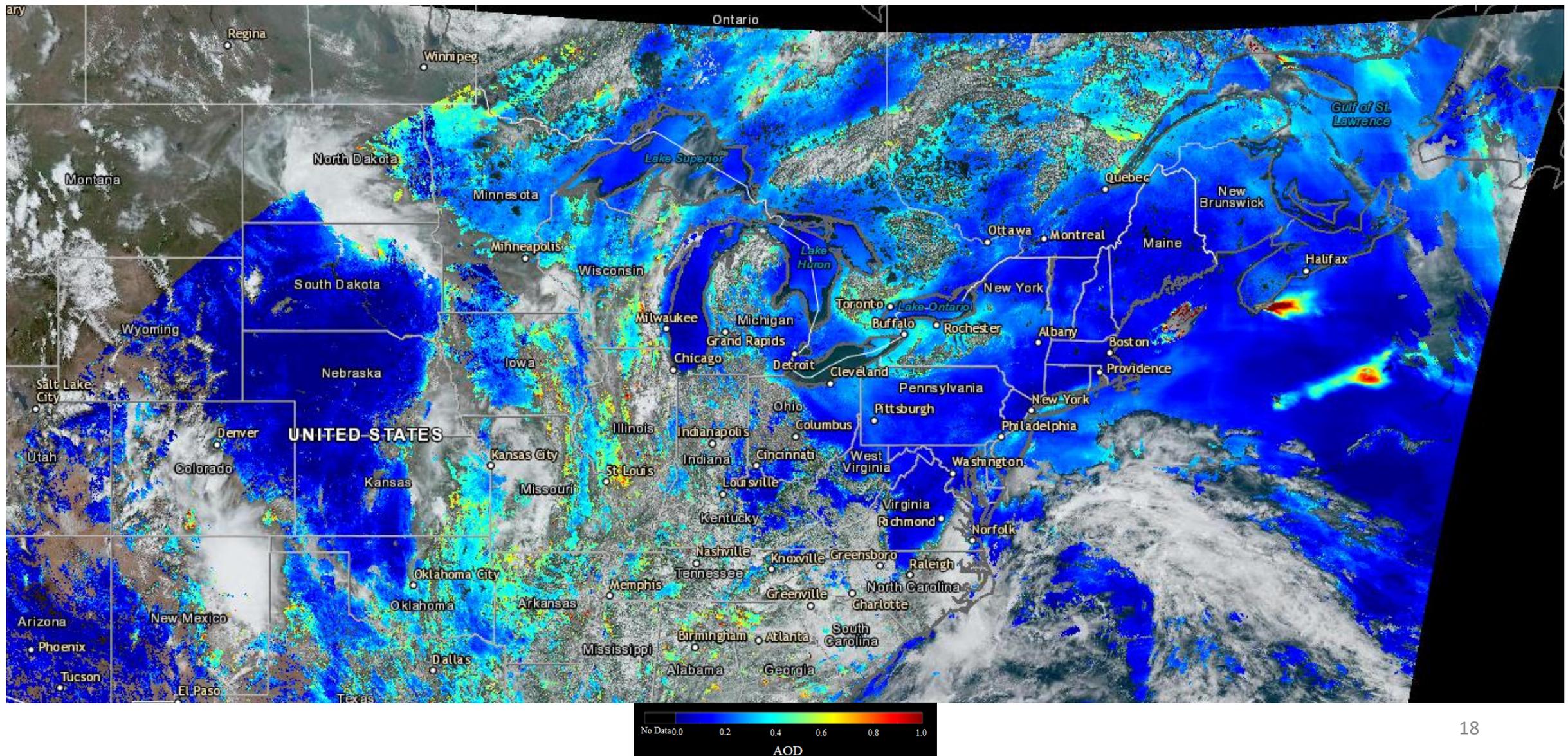




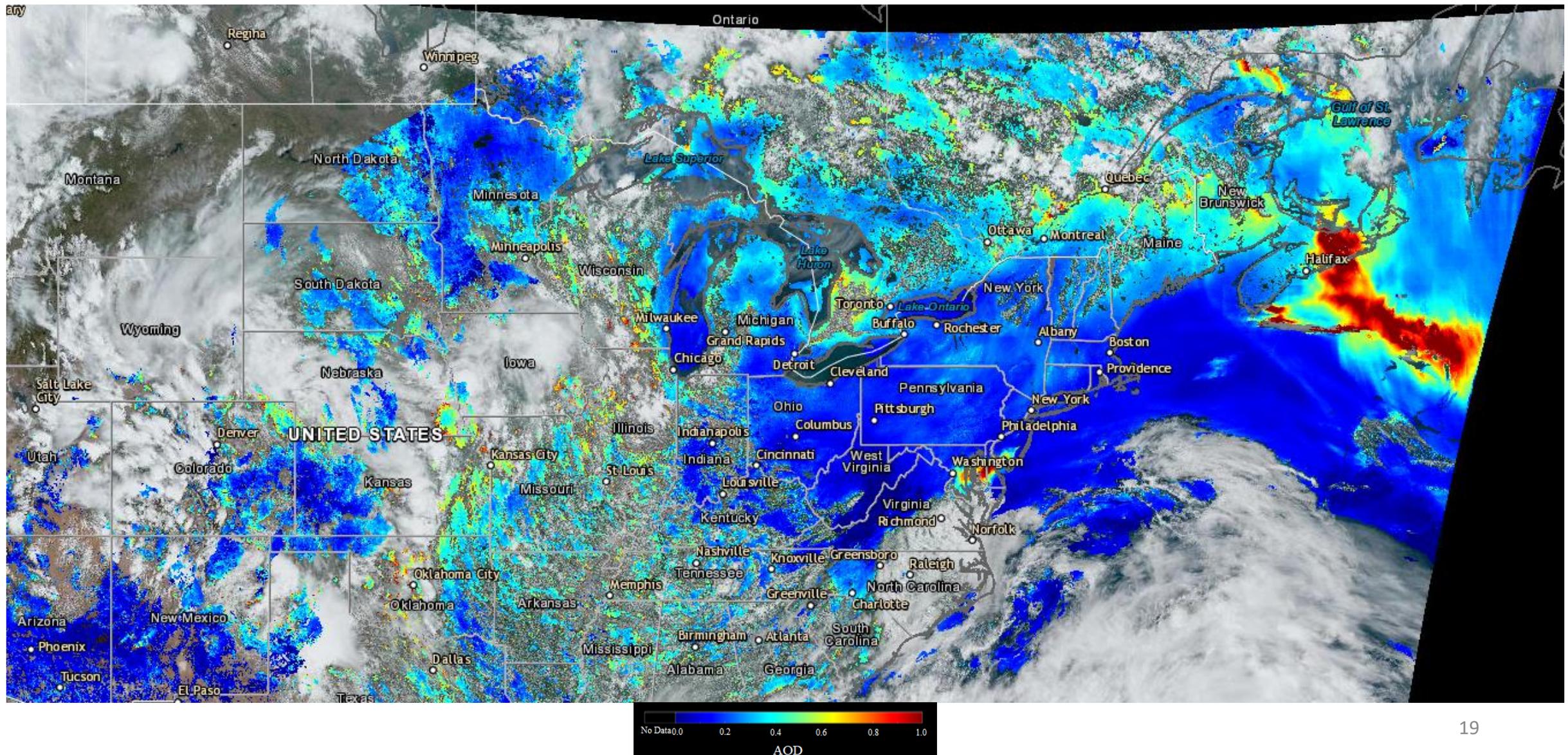
# Aerosol Optical Depth – May 30, 2023



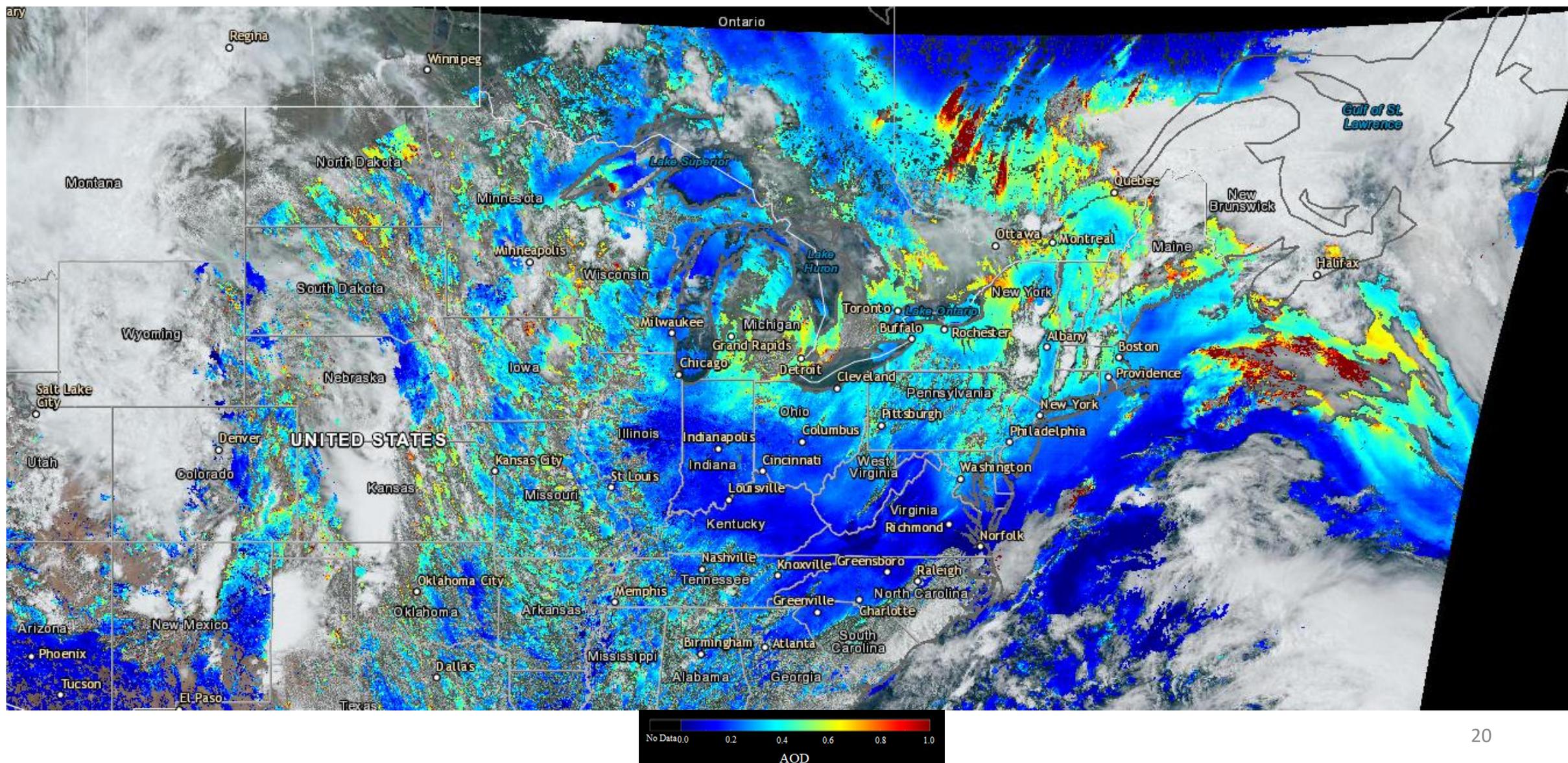
# Aerosol Optical Depth – May 31, 2023



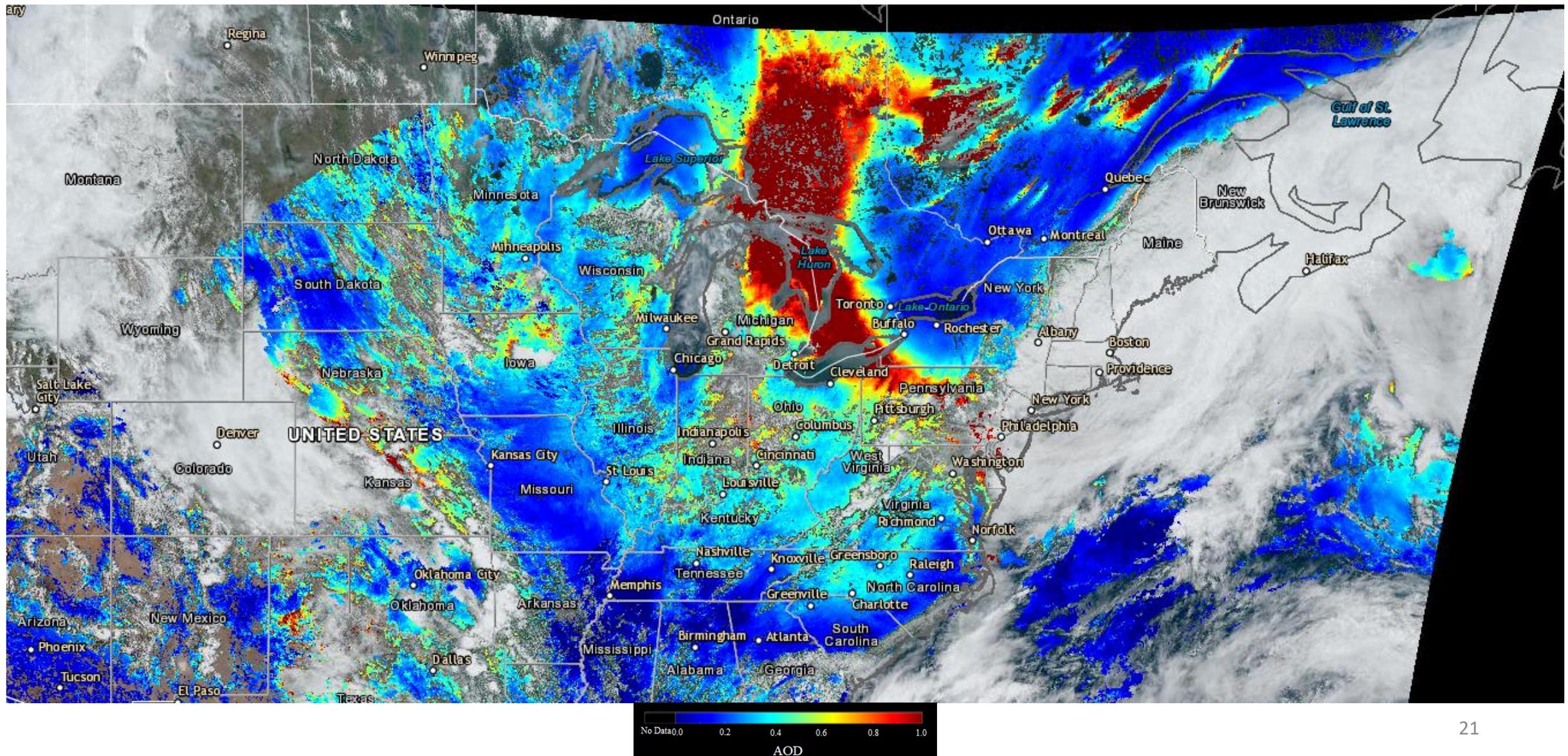
# Aerosol Optical Depth – June 1, 2023



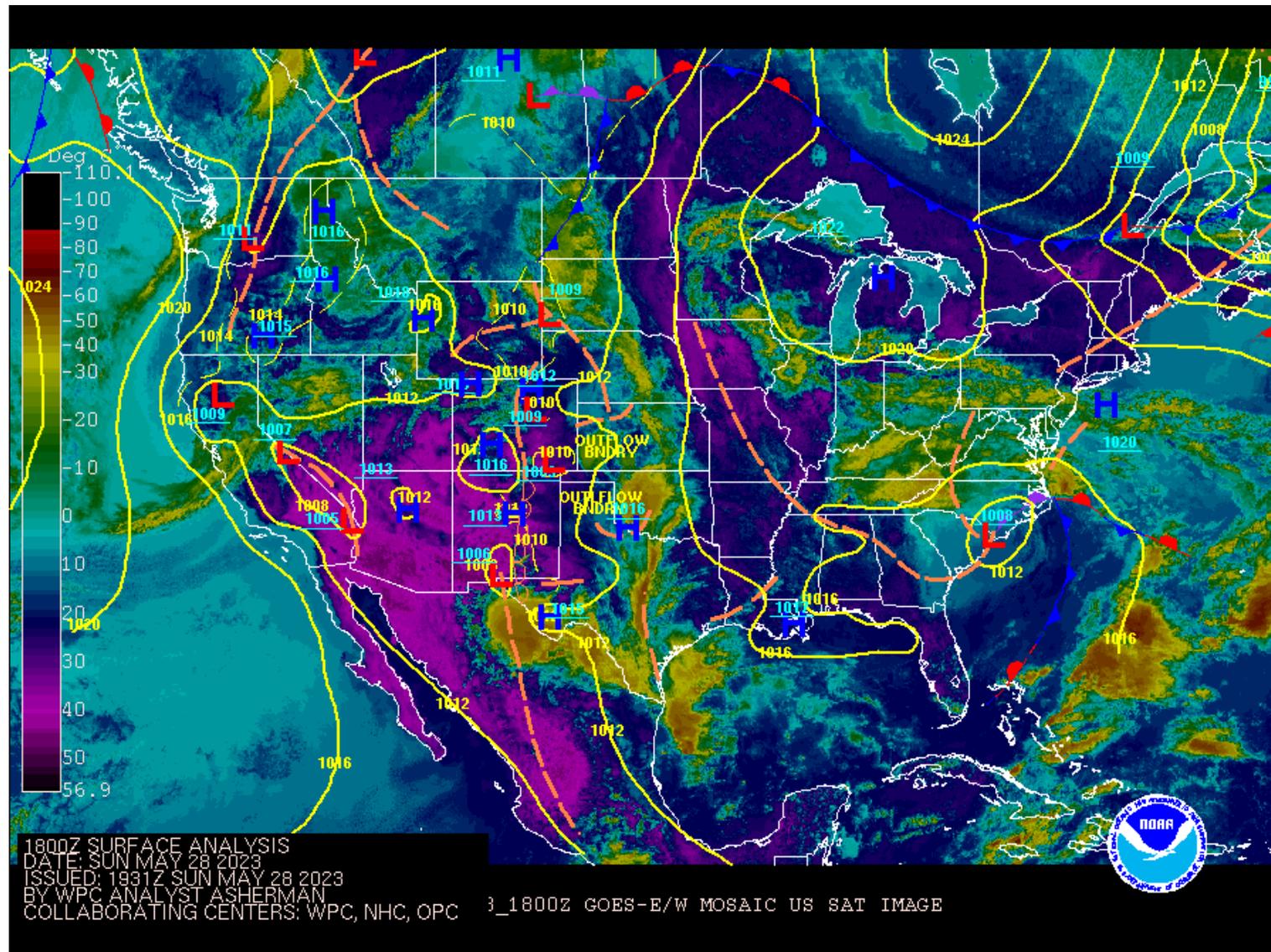
# Aerosol Optical Depth – June 2, 2023



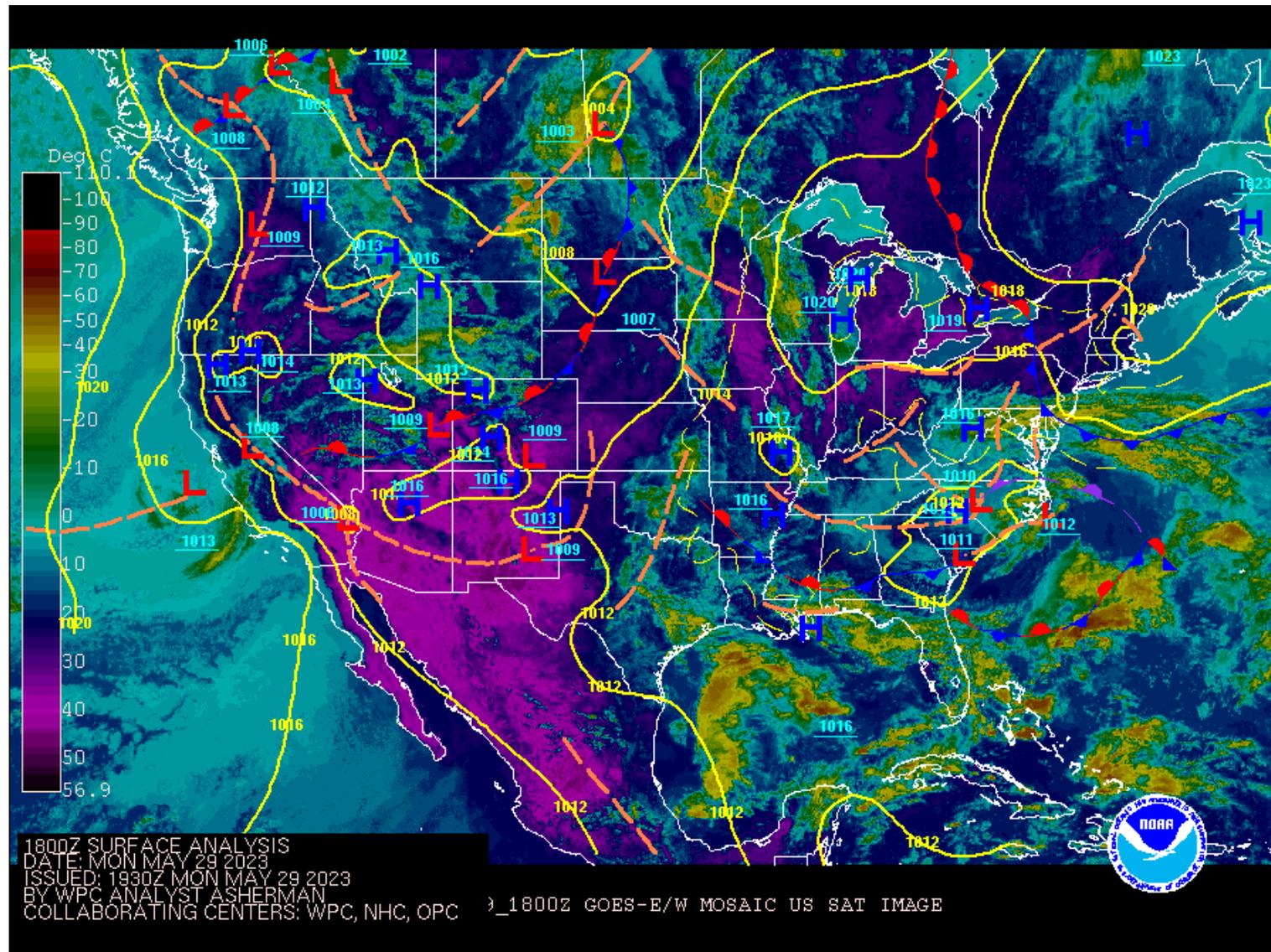
# Aerosol Optical Depth – June 3, 2023



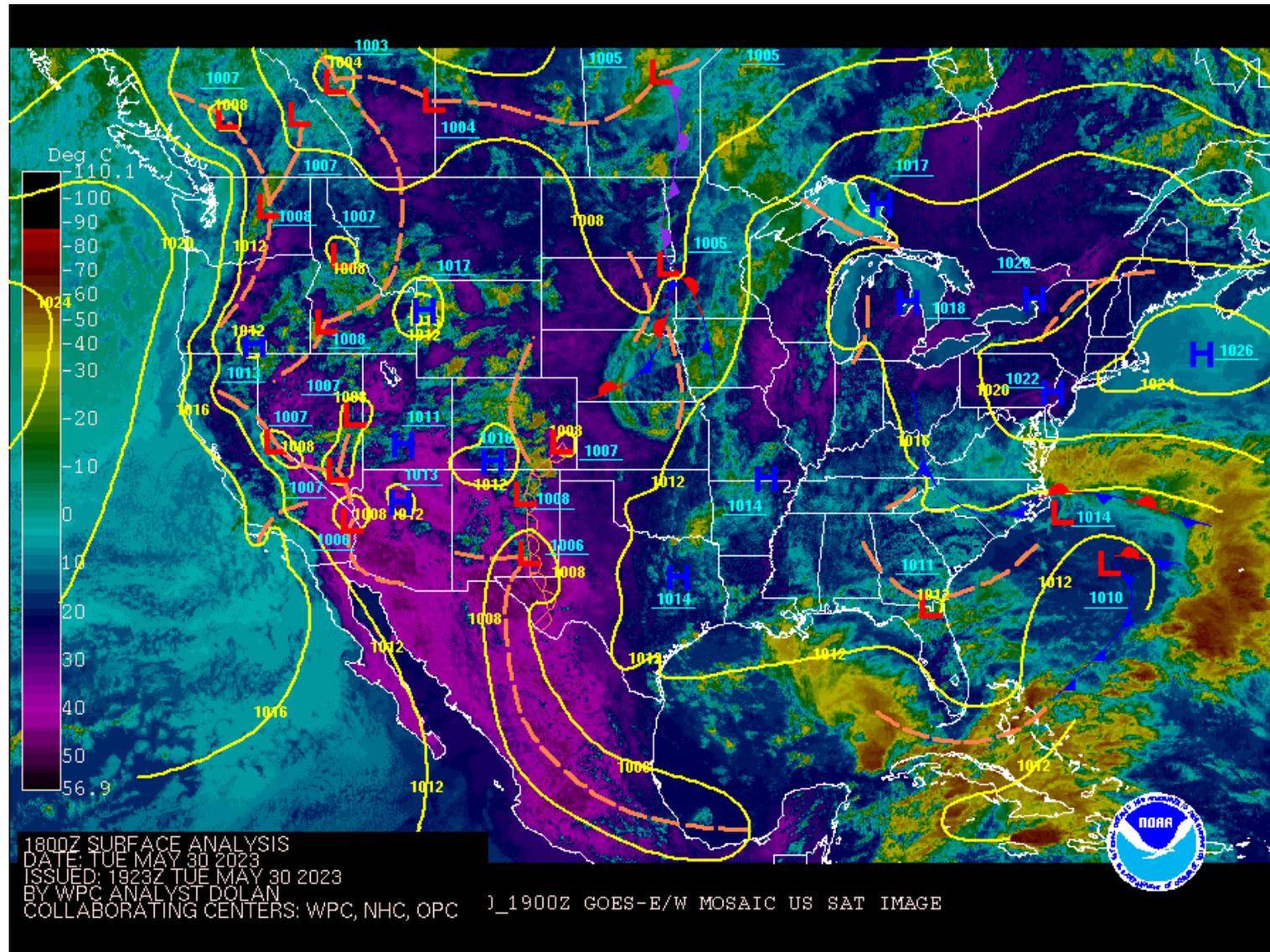
# Surface Map – May 28, 2023



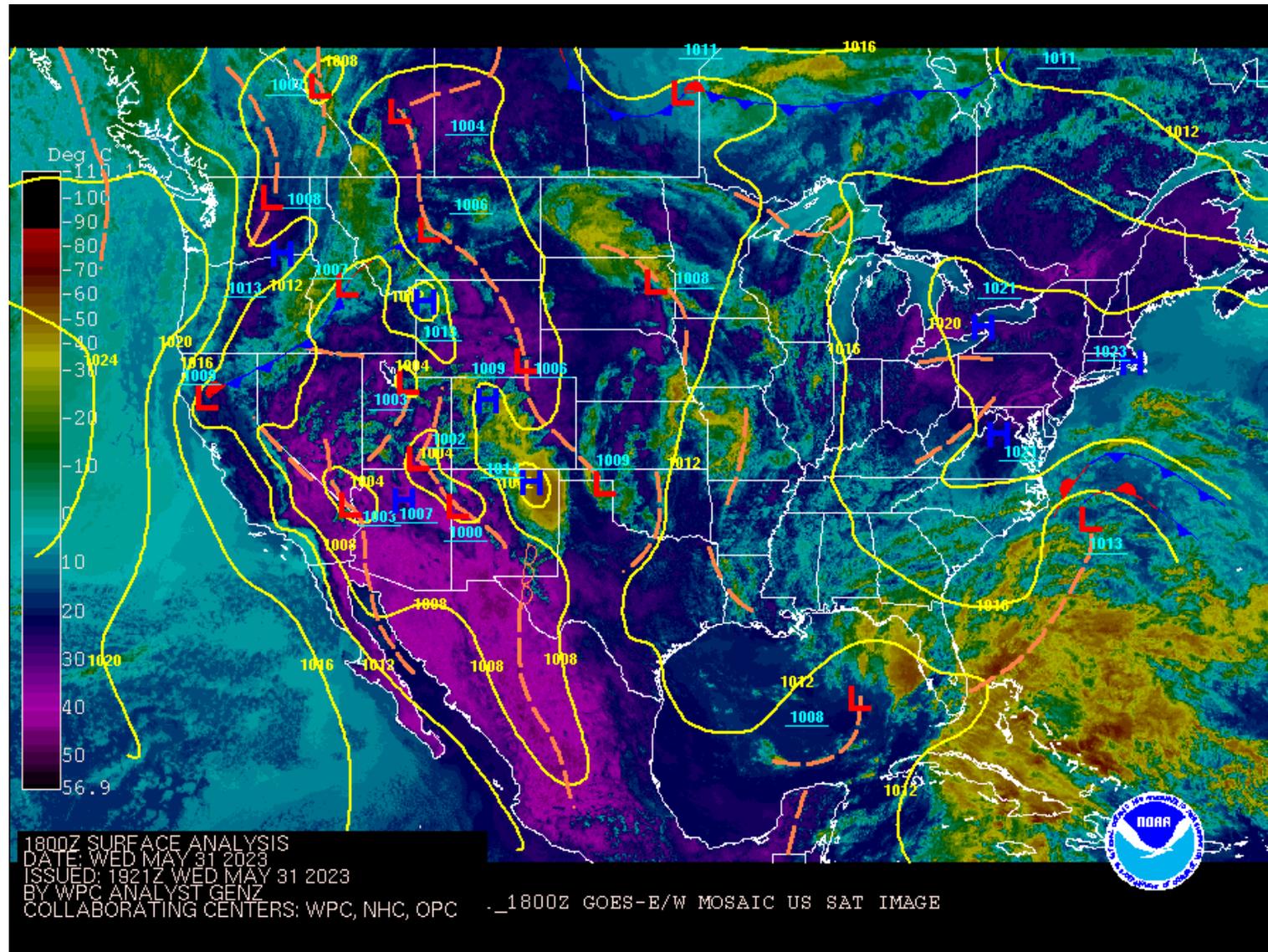
# Surface Map – May 29, 2023



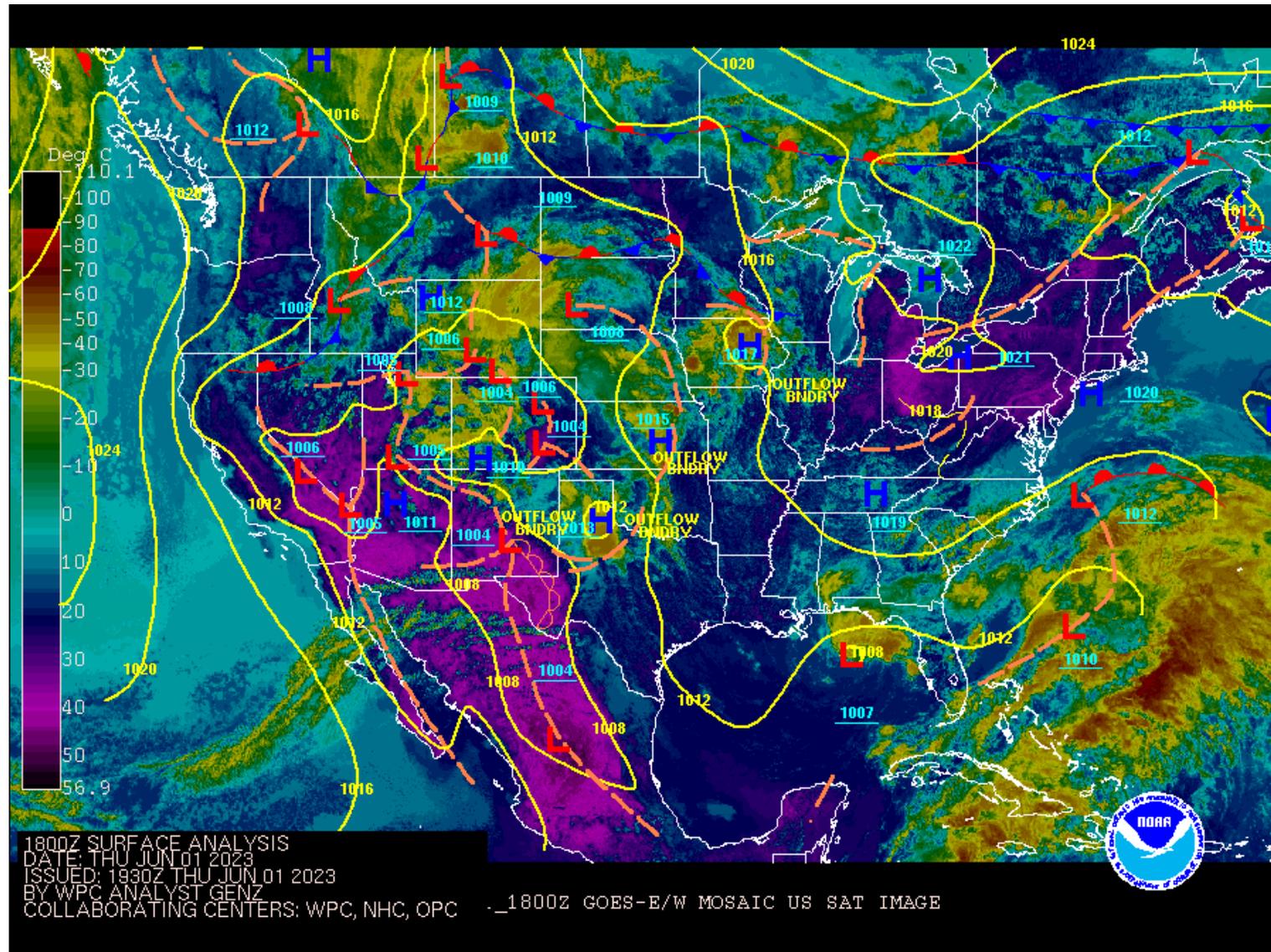
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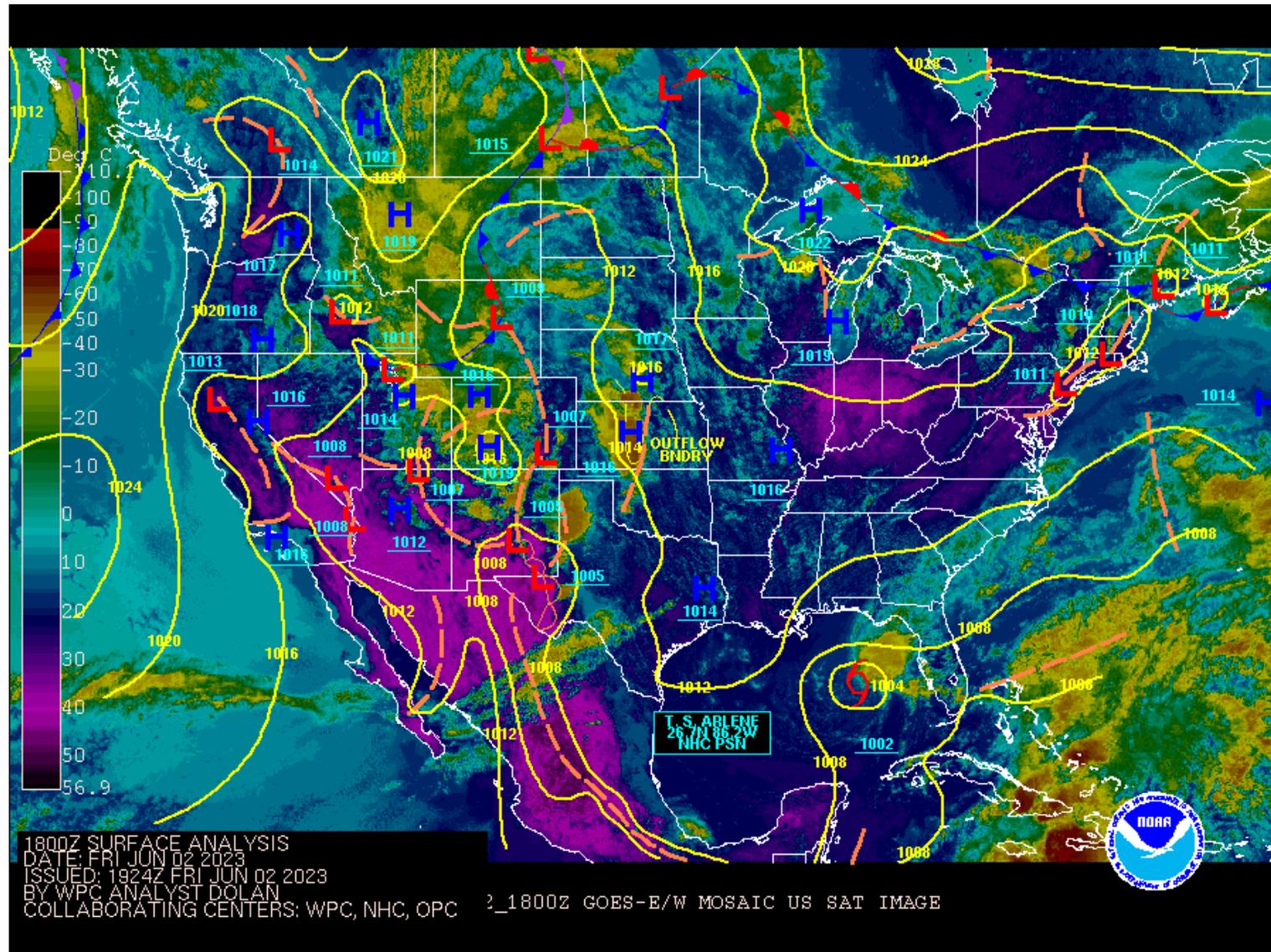
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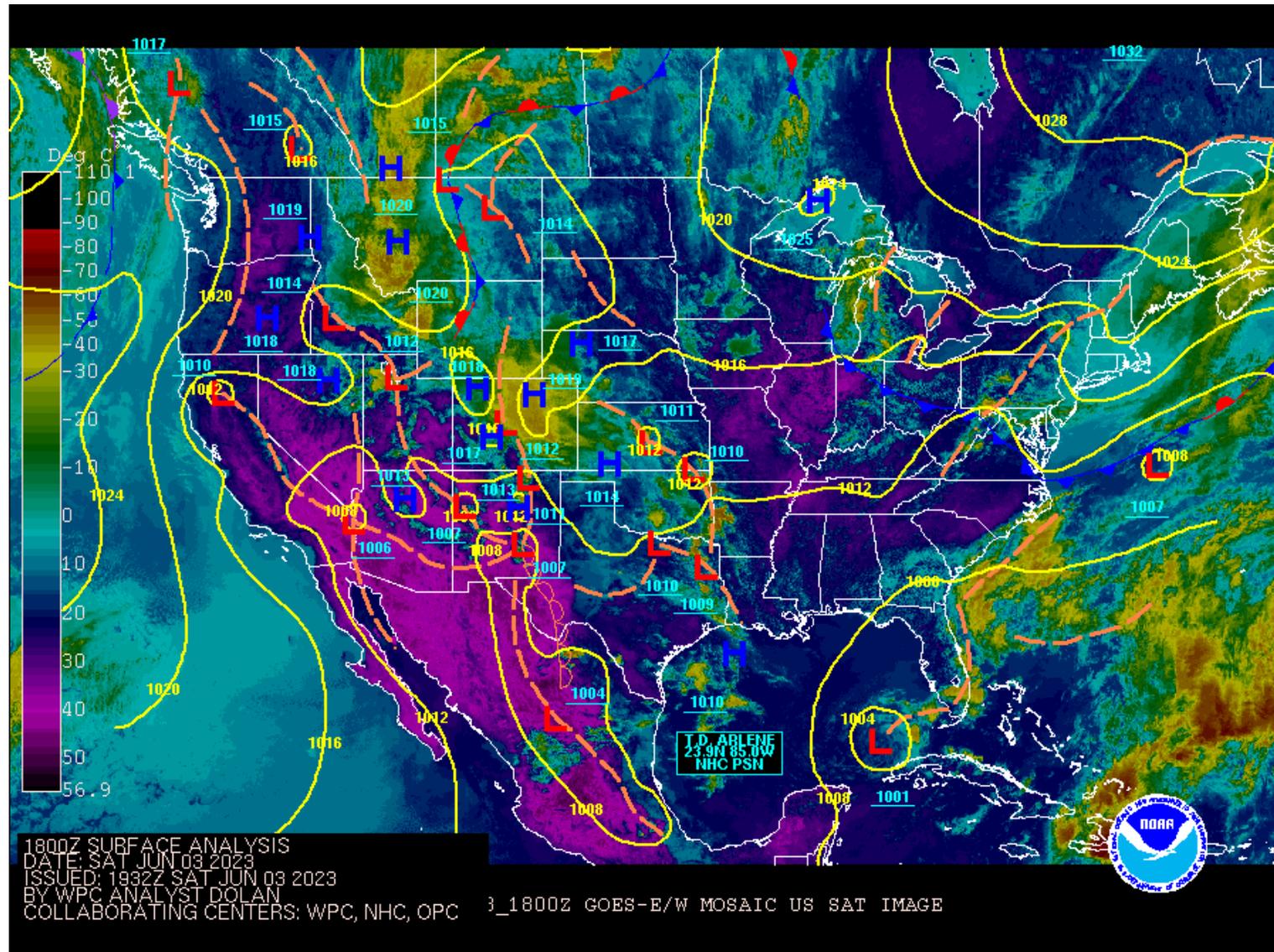
# Surface Map – June 1, 2023



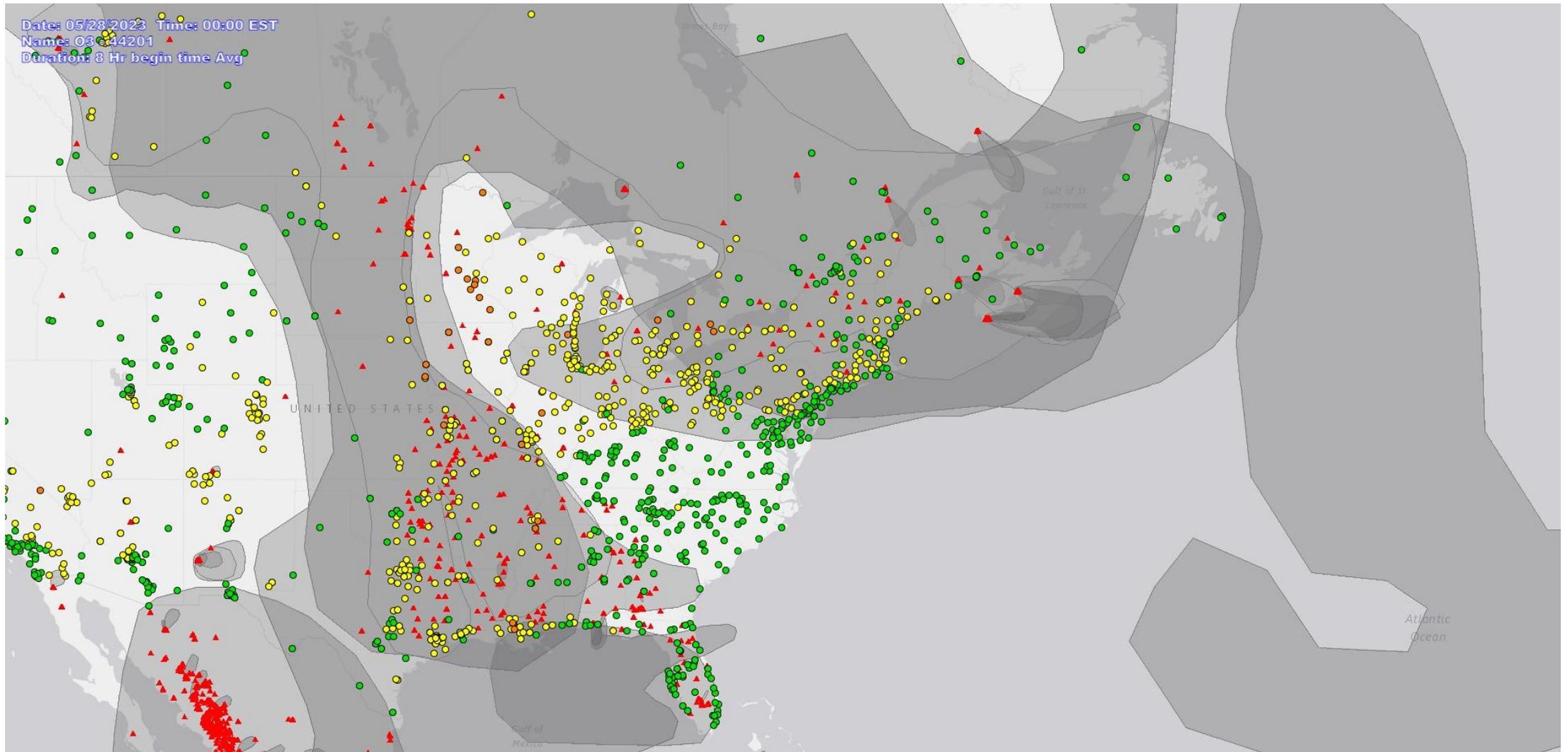
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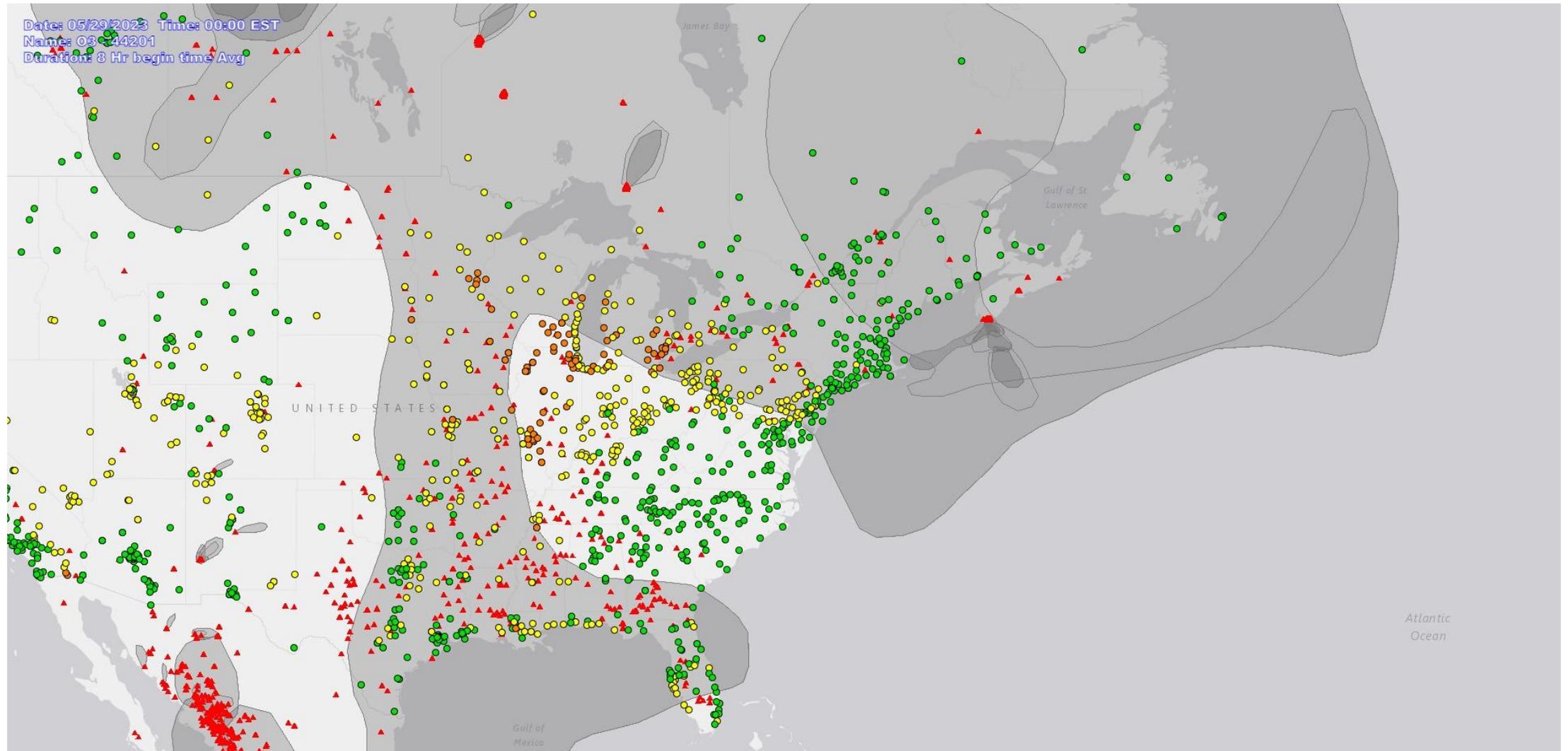
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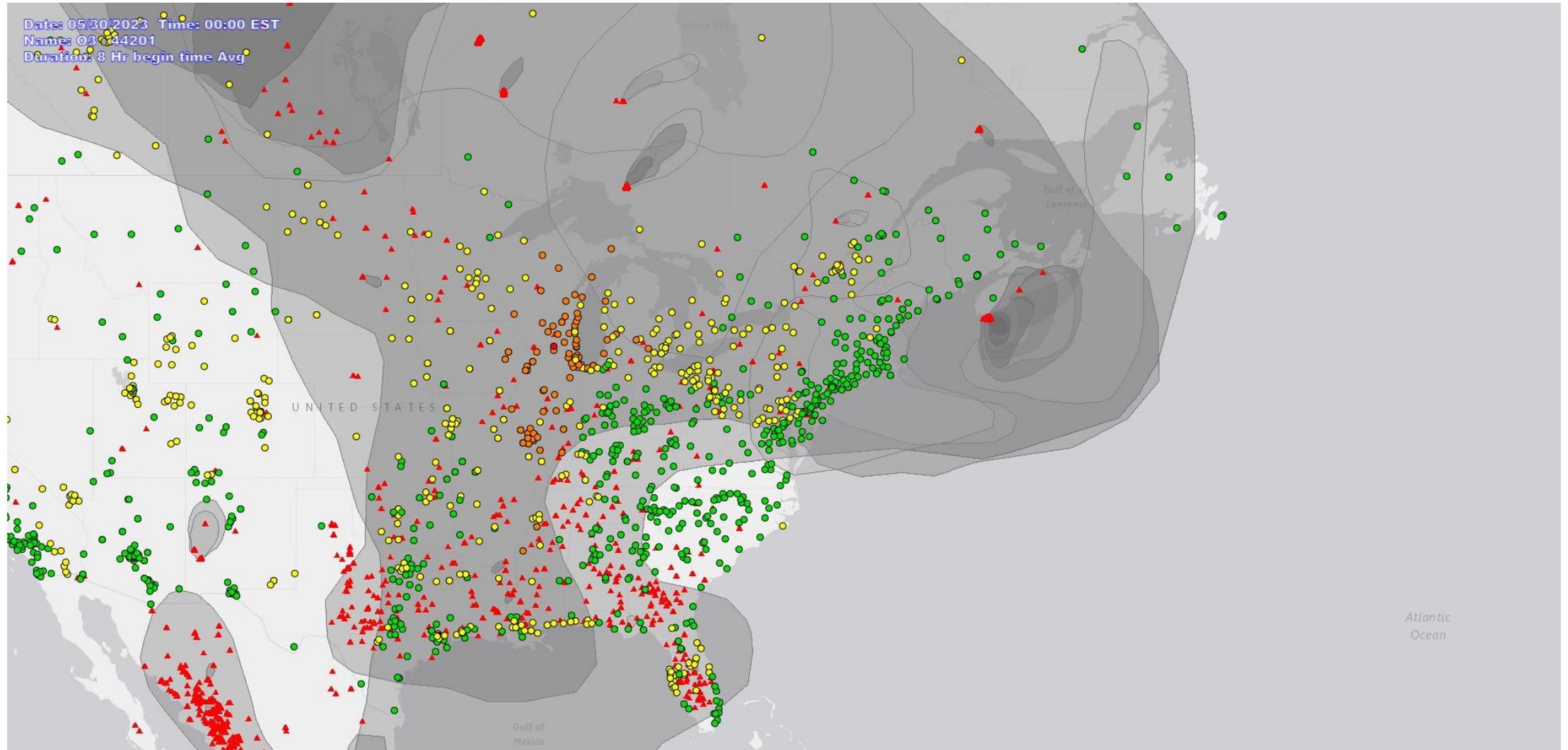
# Ozone Concentrations – May 28, 2023



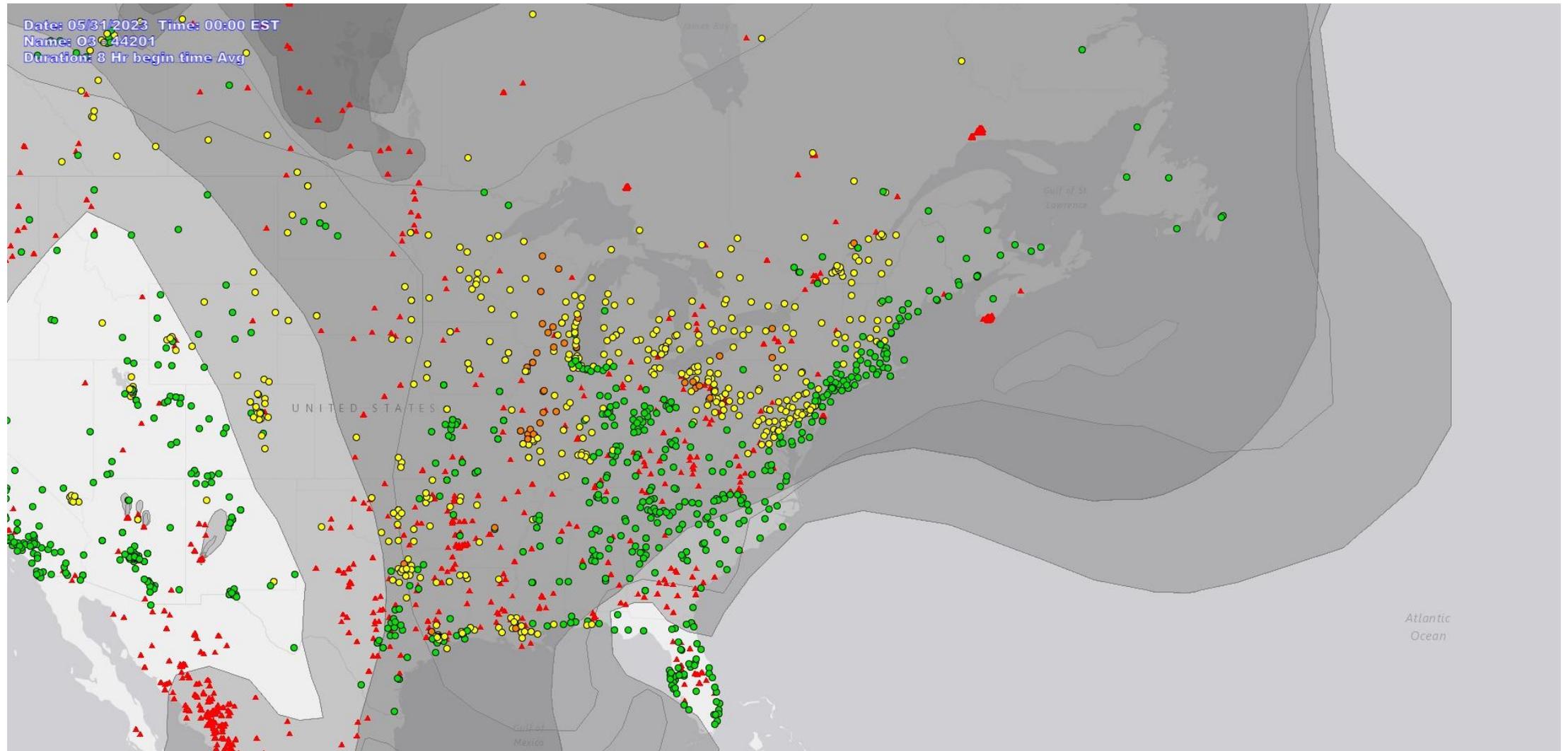
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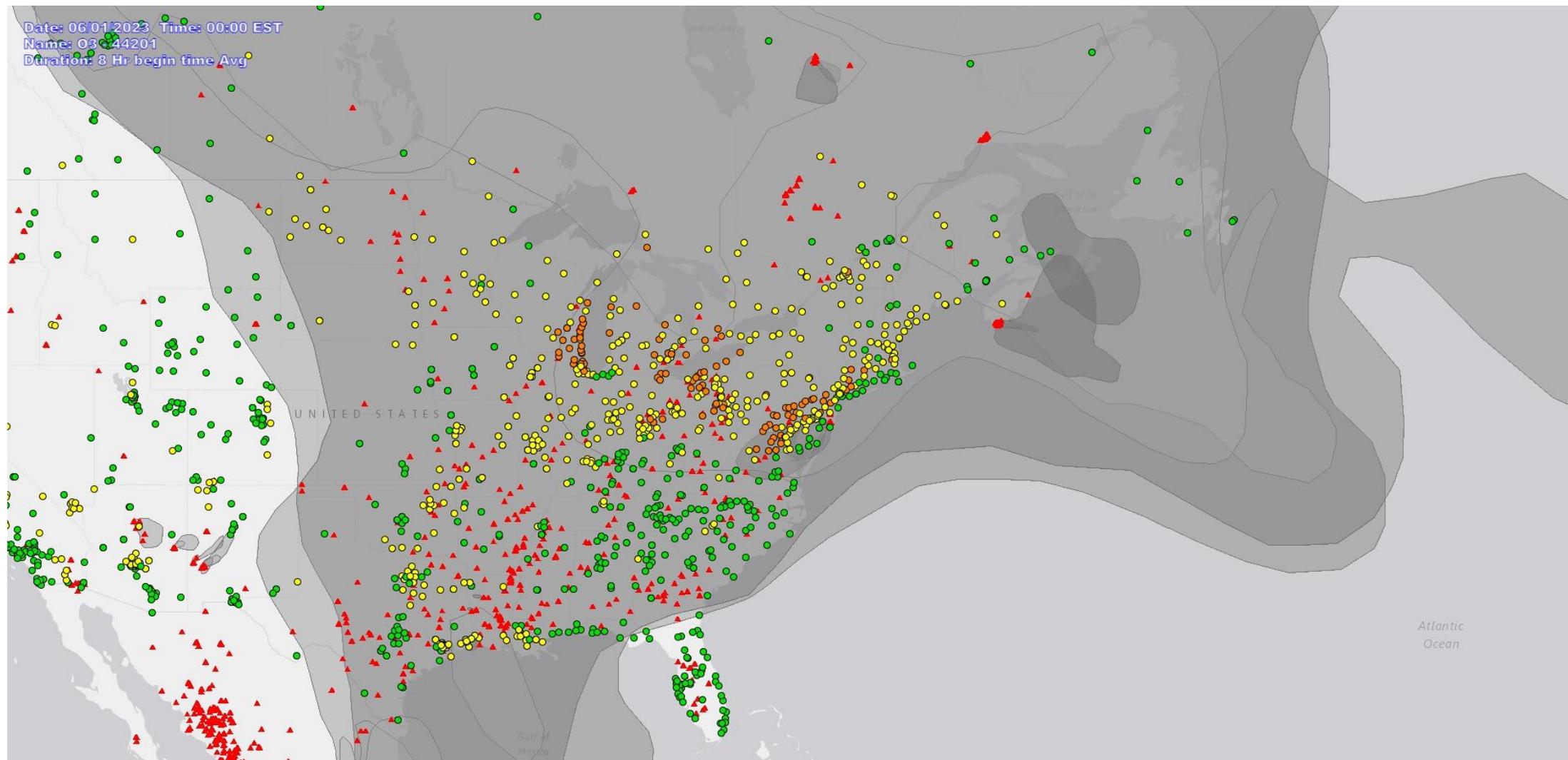
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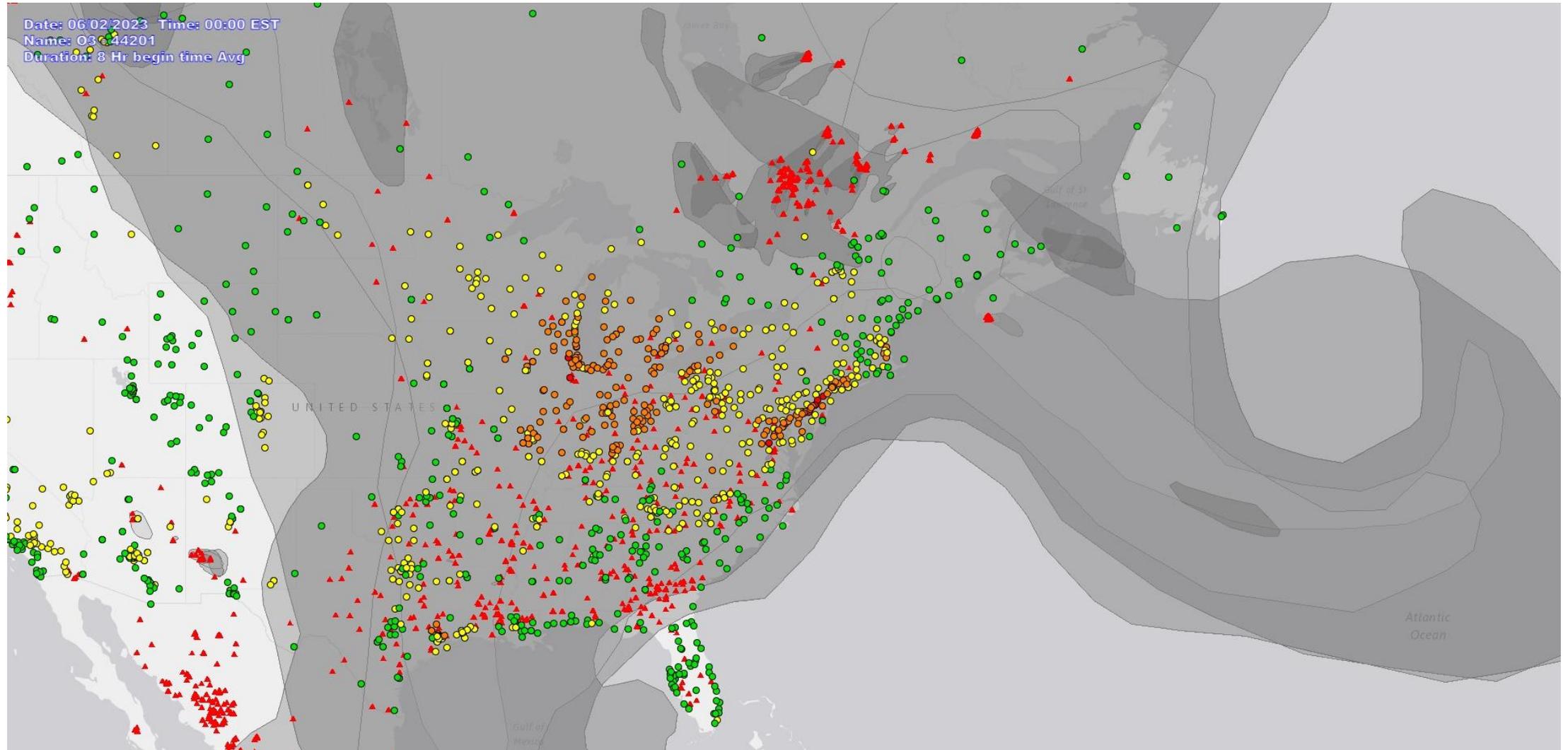
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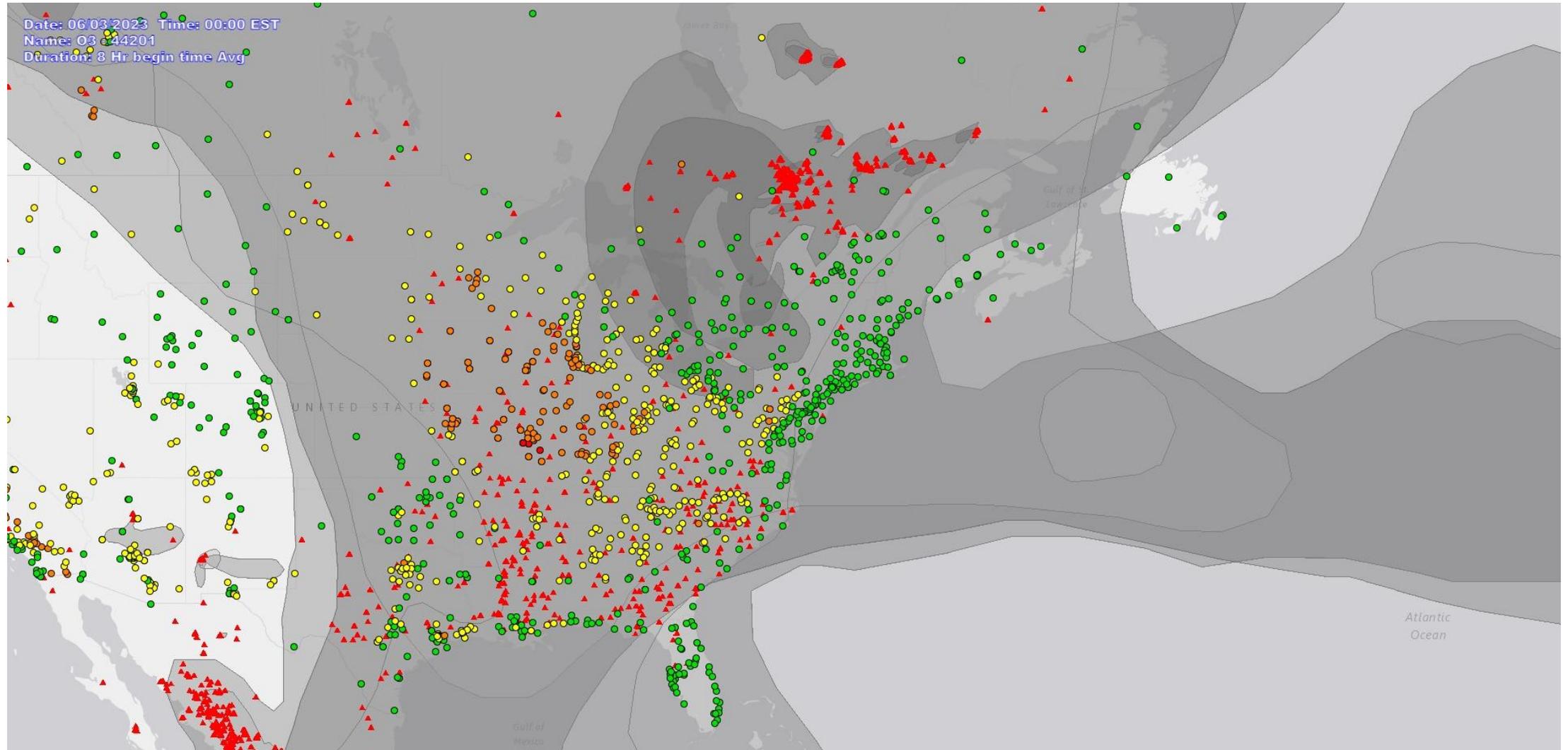
# Ozone Concentrations – June 1, 2023



# Ozone Concentrations – June 2, 2023



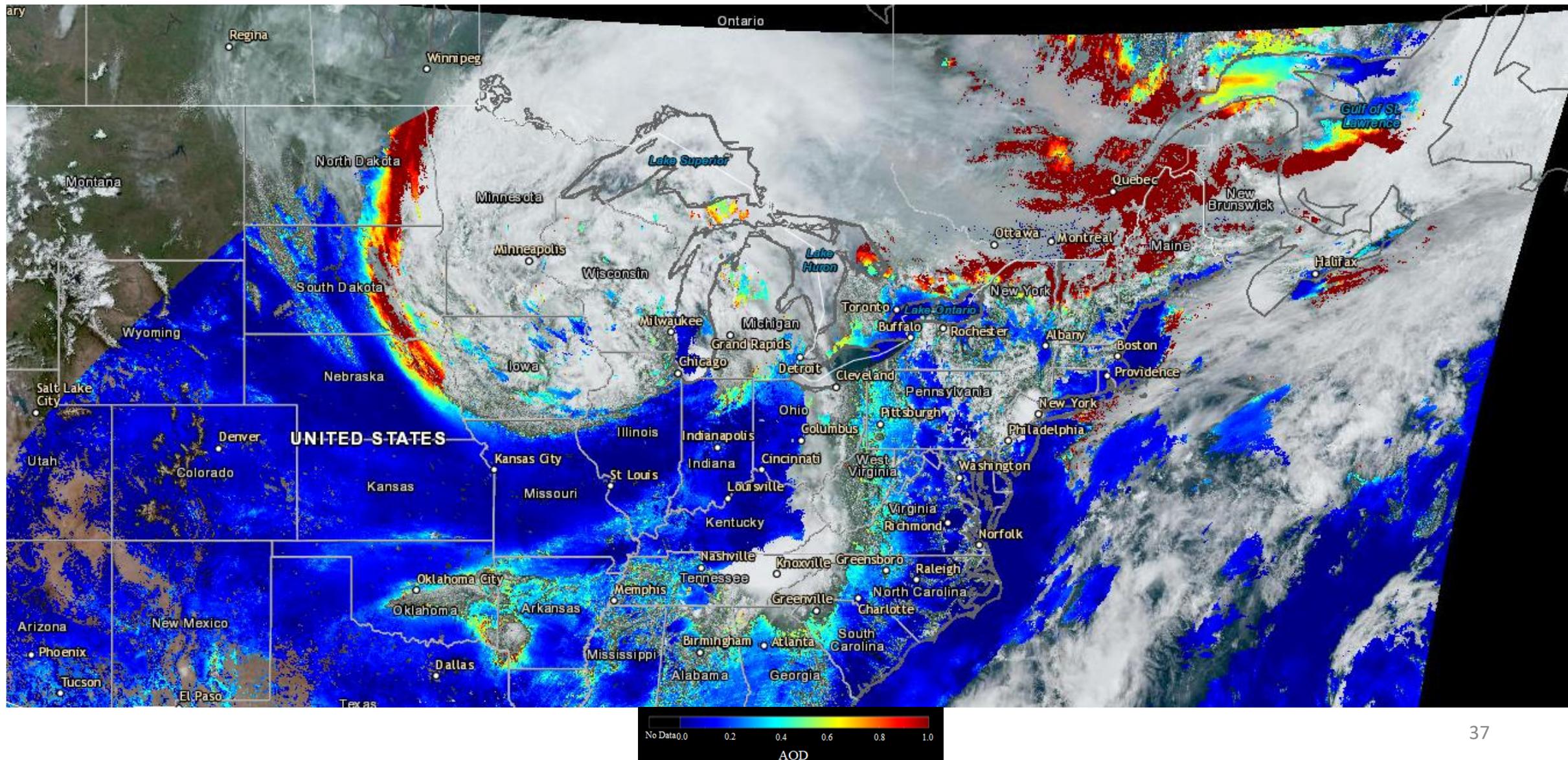
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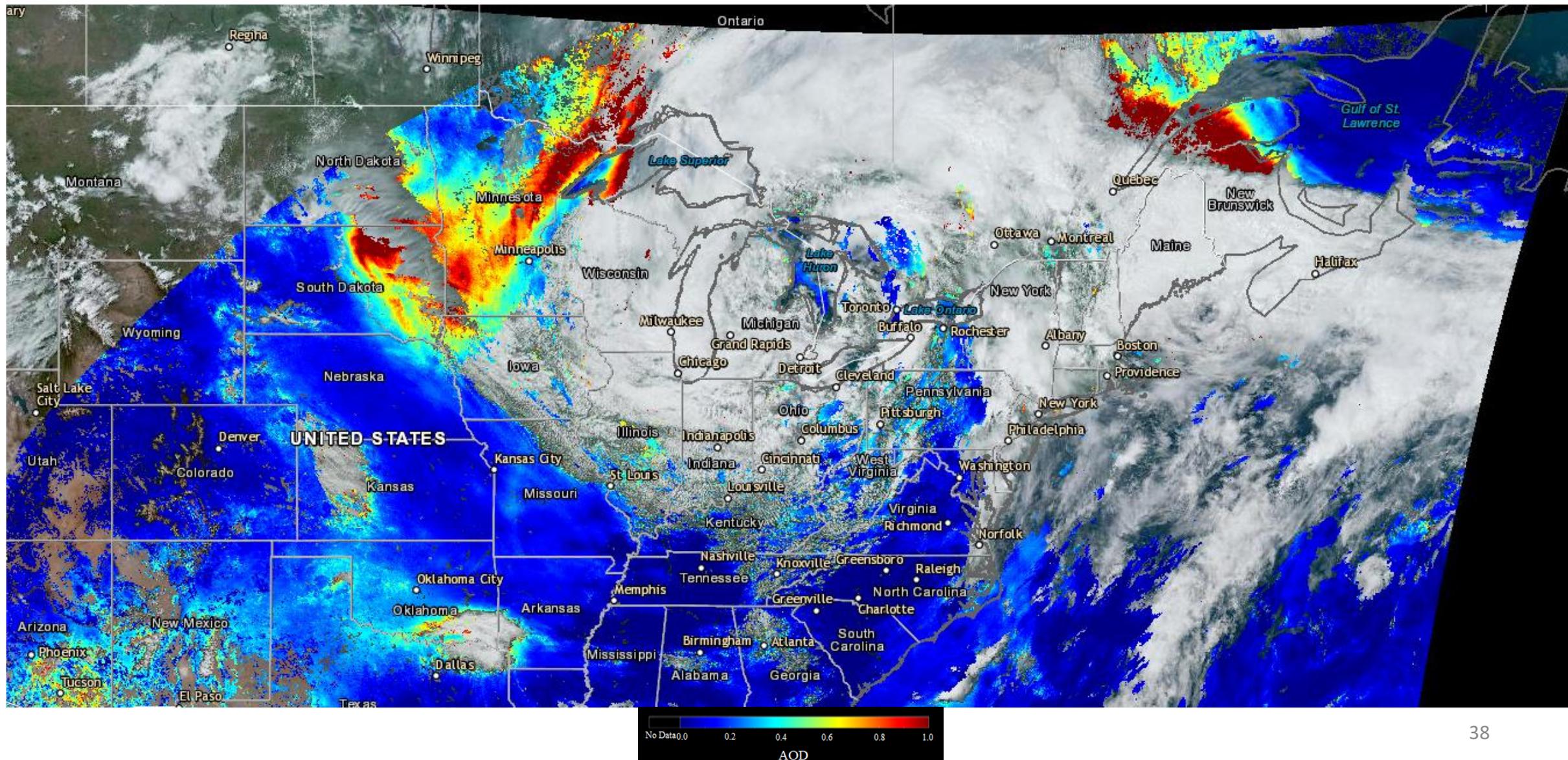
# Evolution of an Ozone Episode

## June 29-June 30, 2023

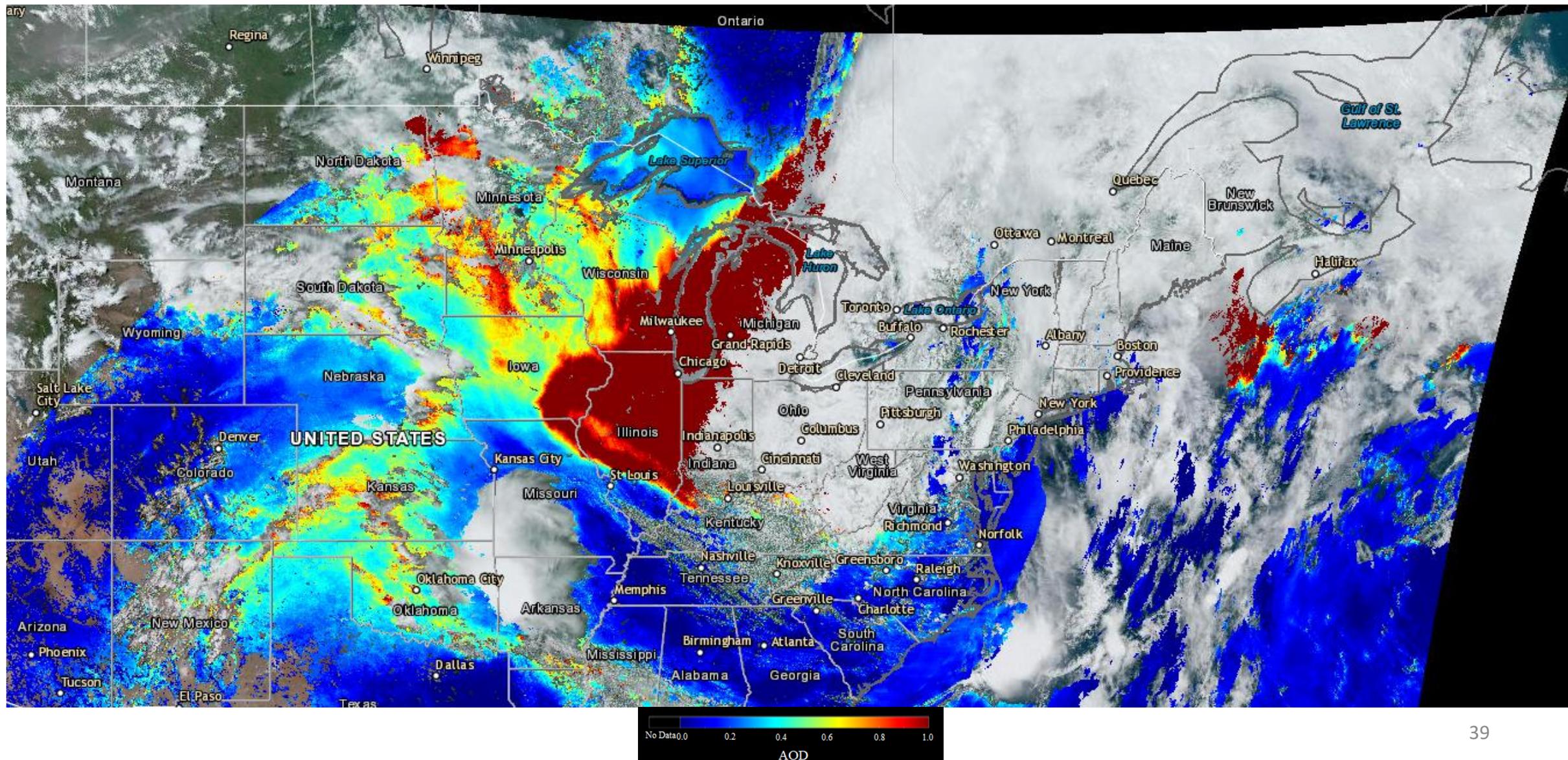
# Aerosol Optical Depth – June 25, 2023



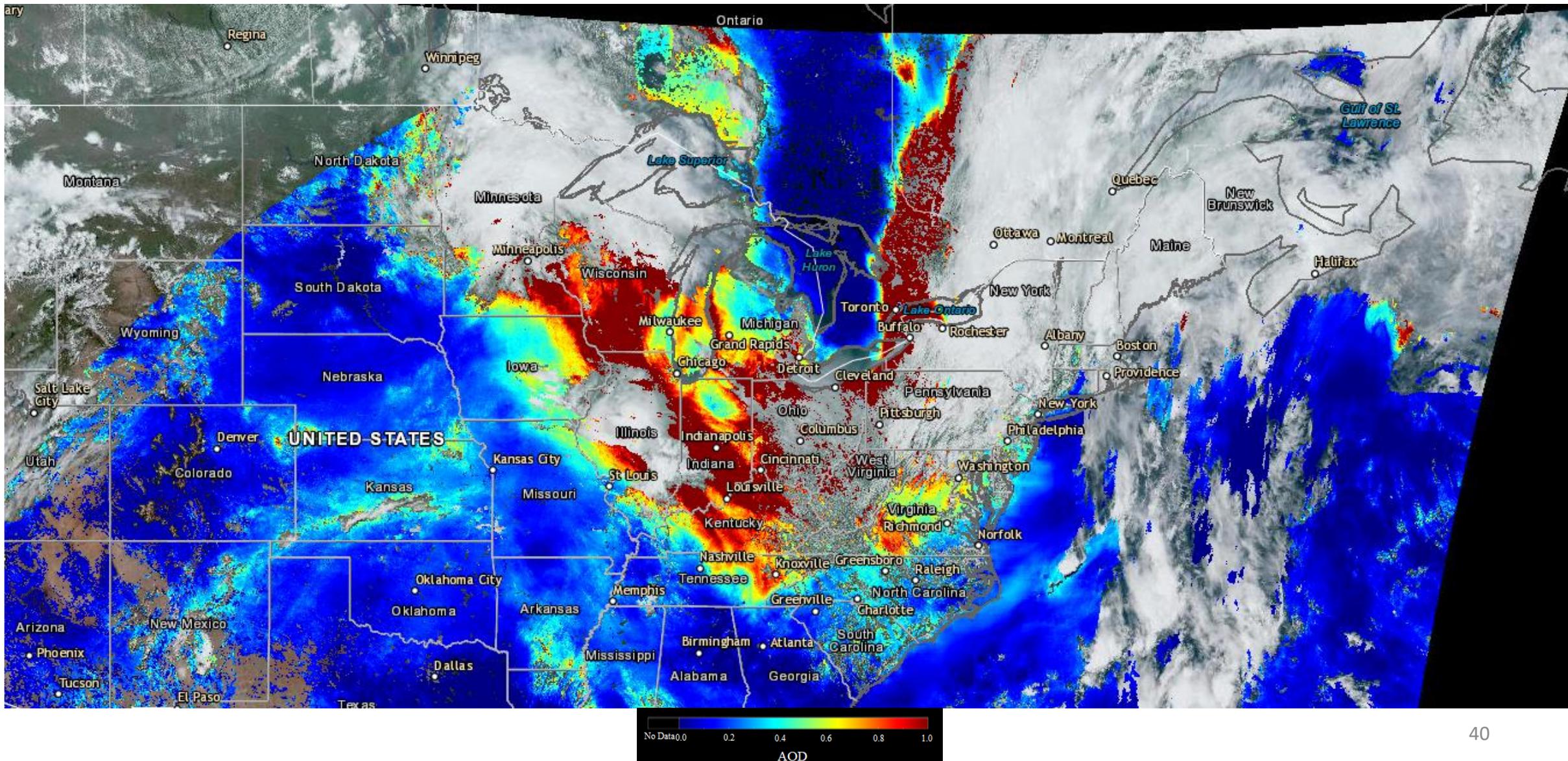
# Aerosol Optical Depth – June 26, 2023



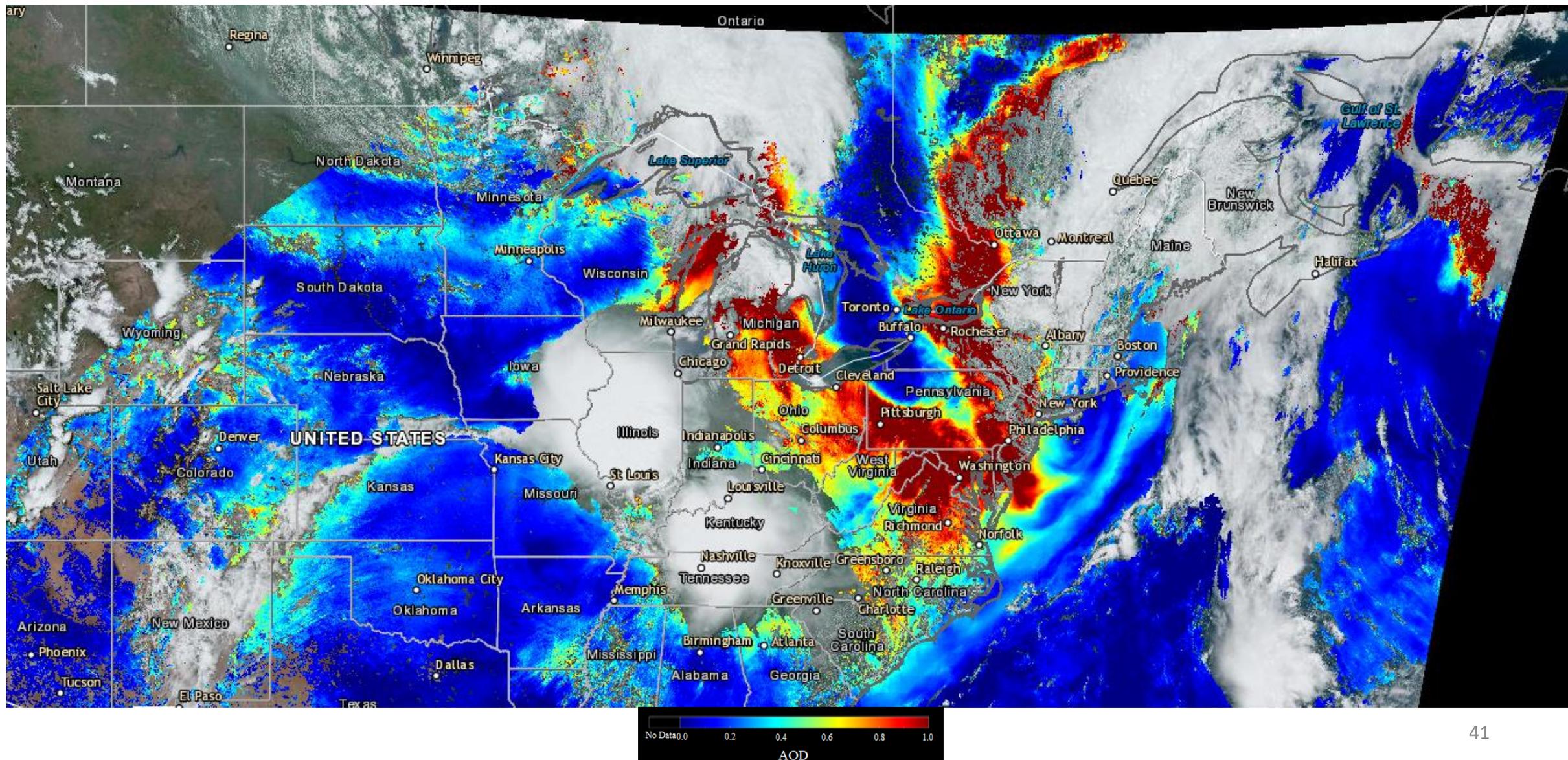
# Aerosol Optical Depth – June 27, 2023



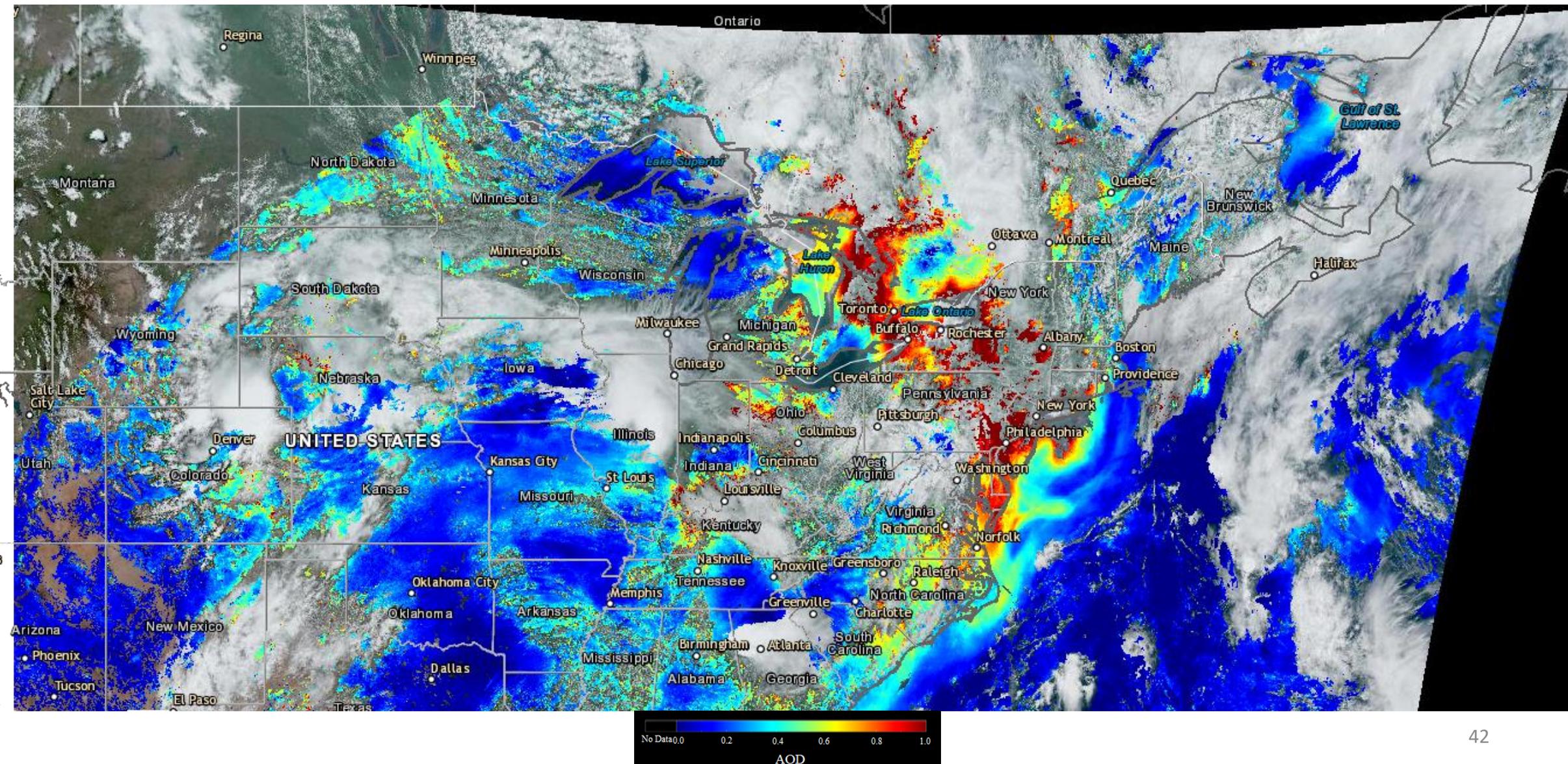
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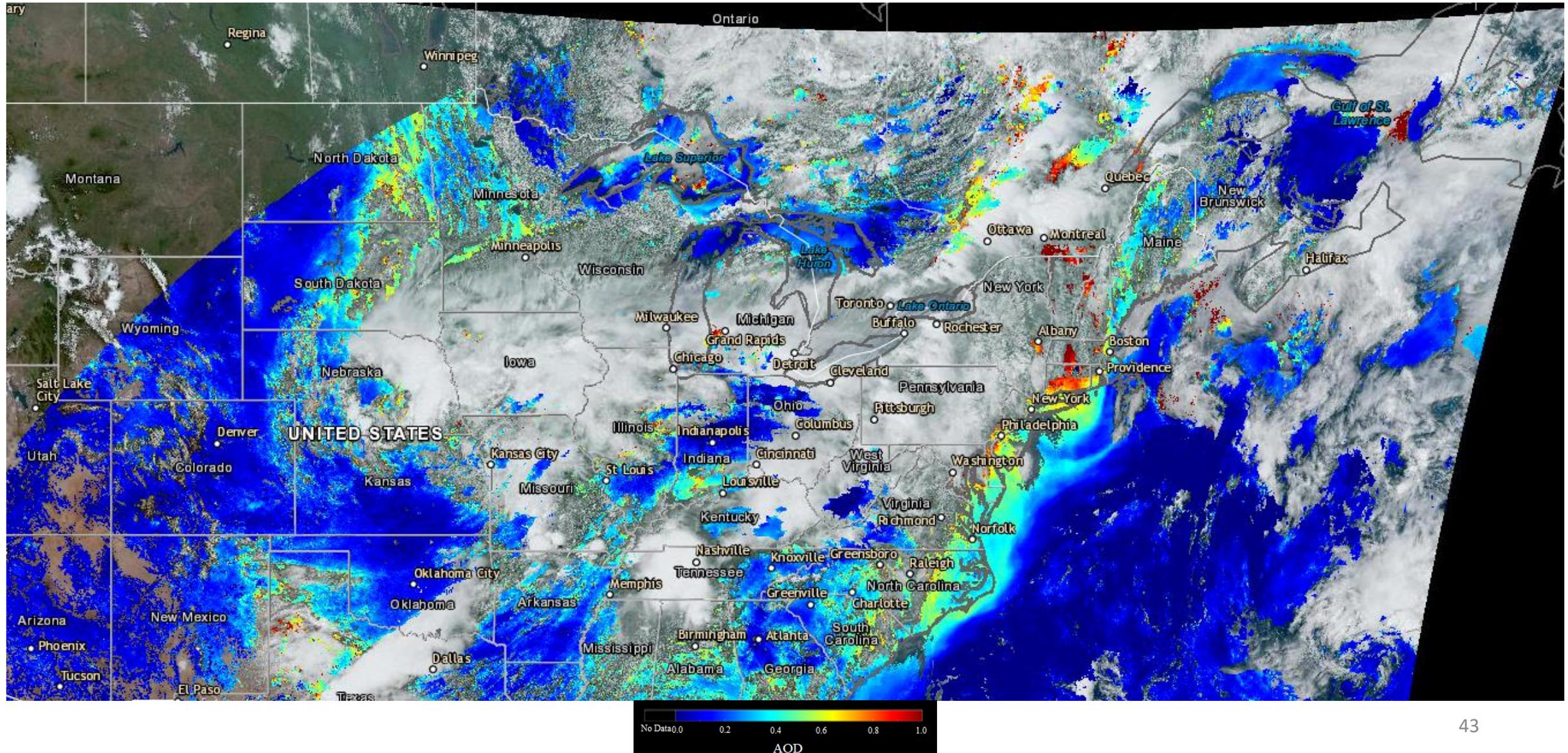
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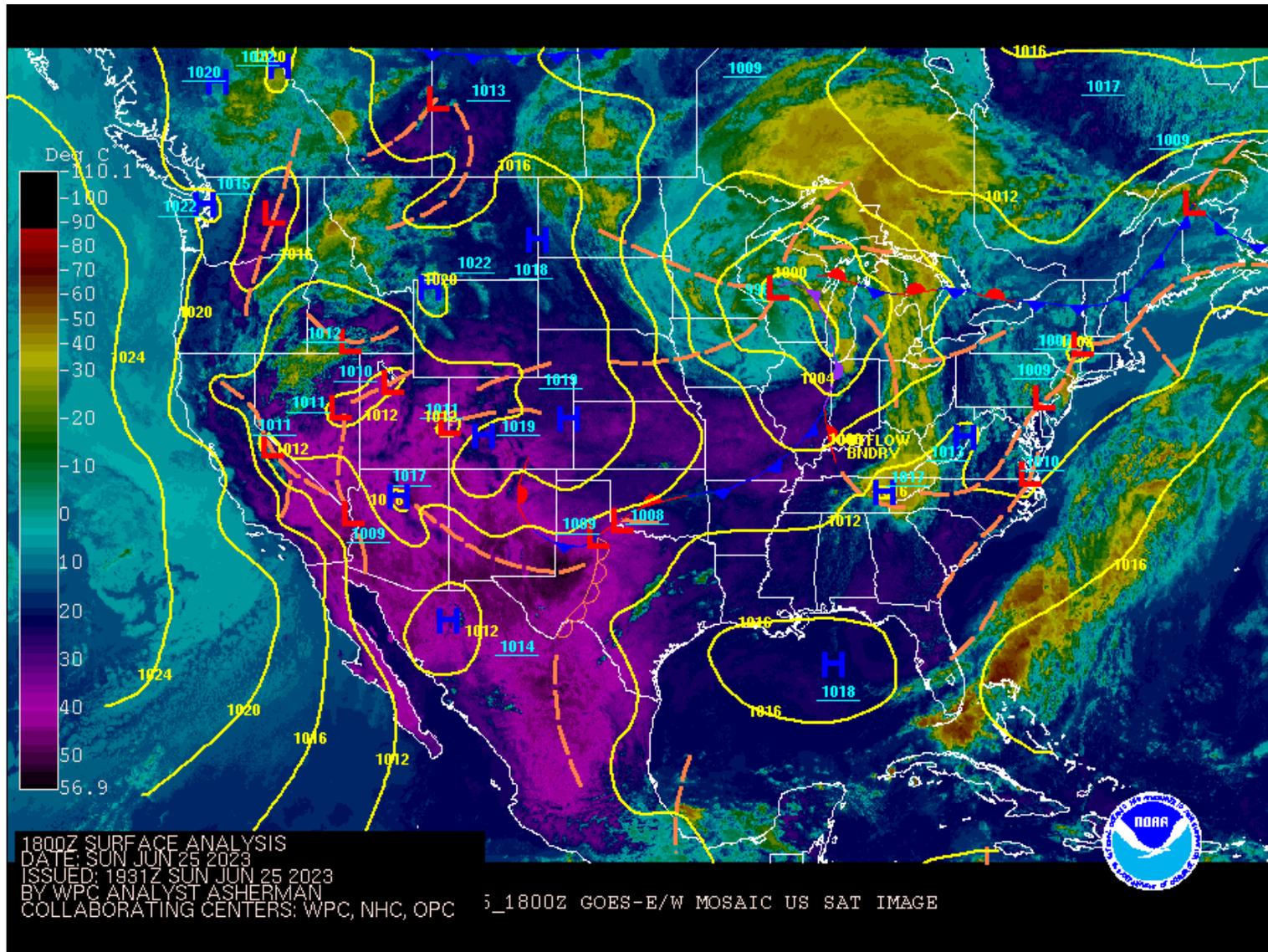
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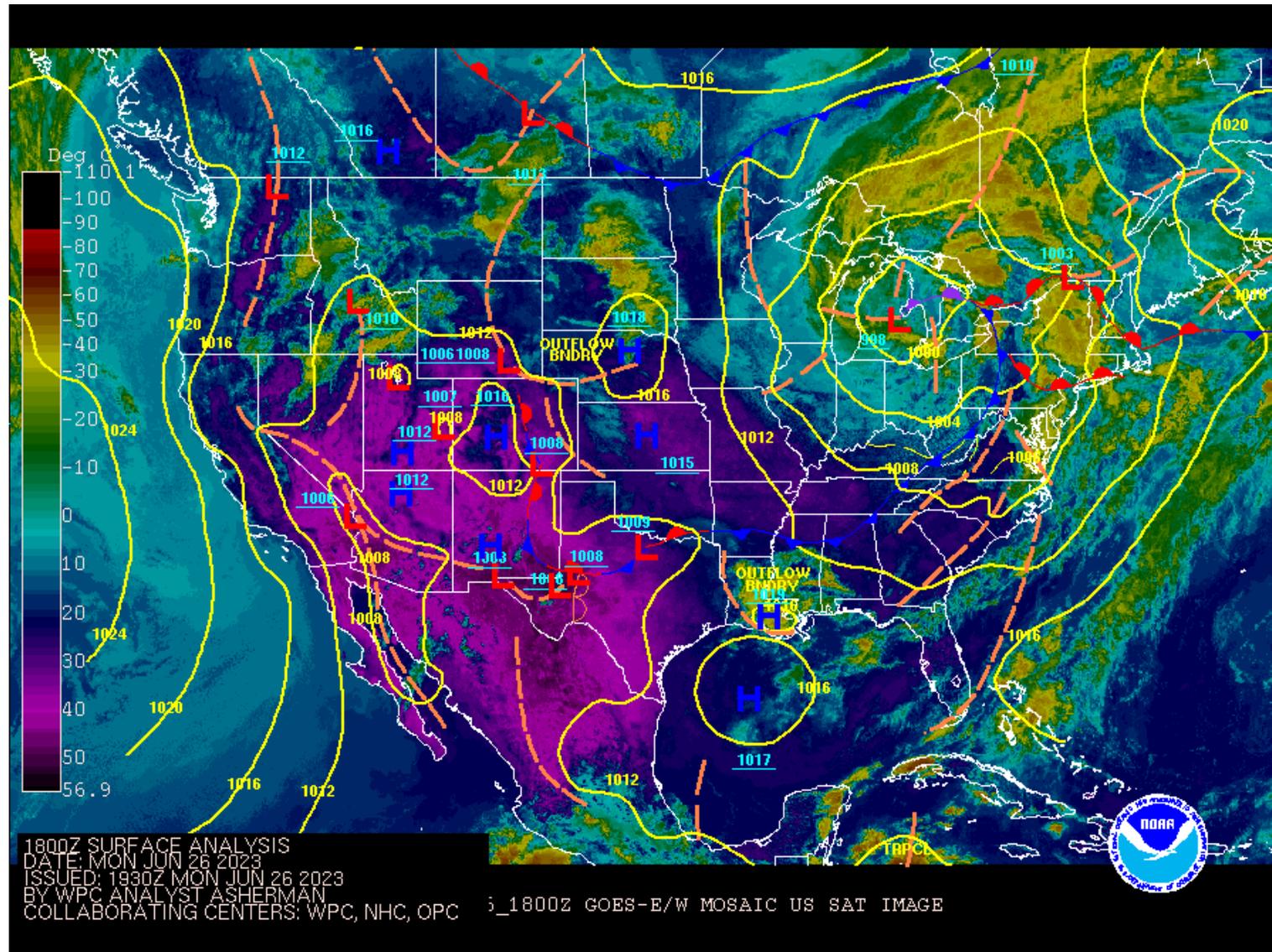
# Aerosol Optical Depth – July 1, 2023



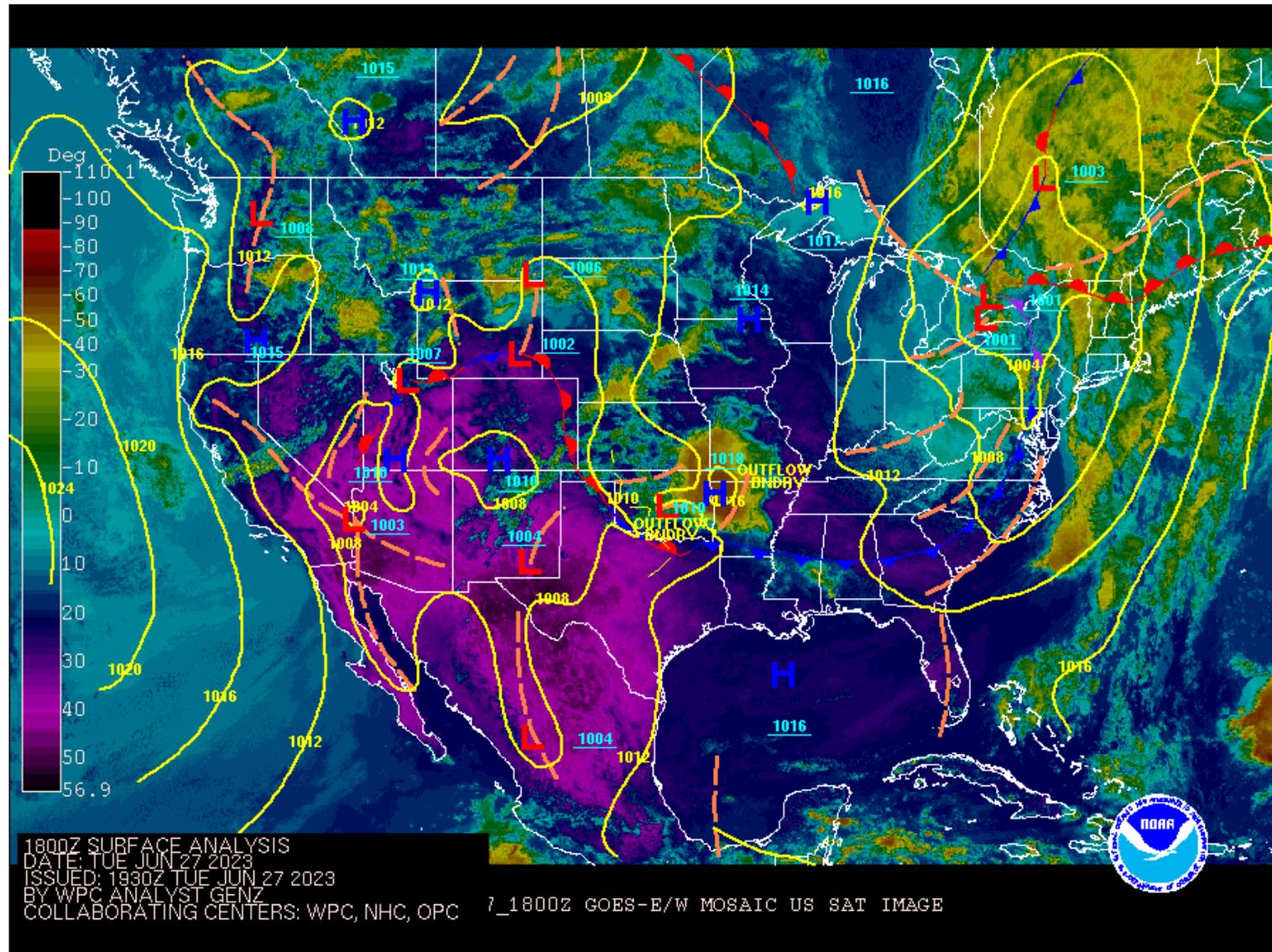
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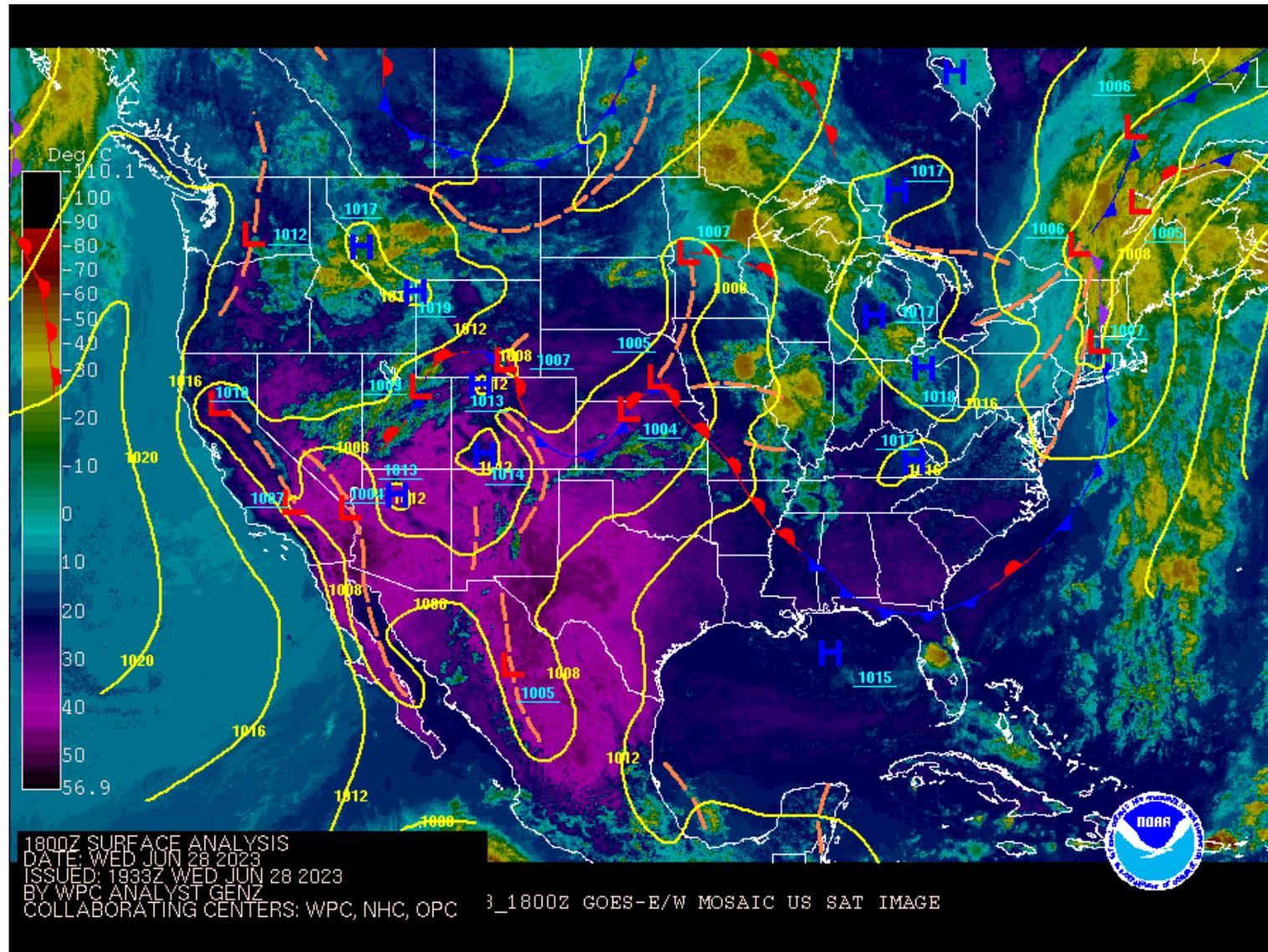
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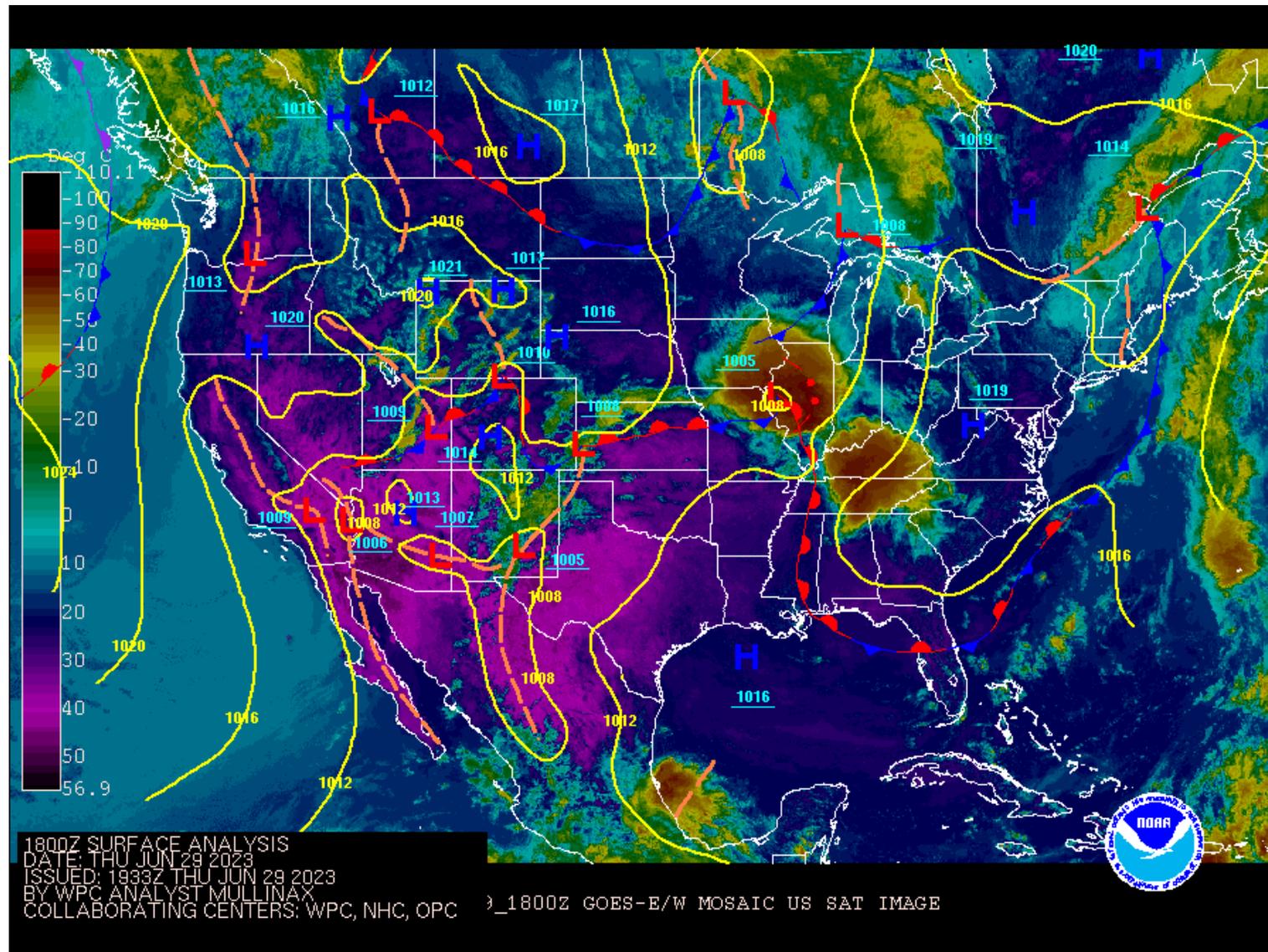
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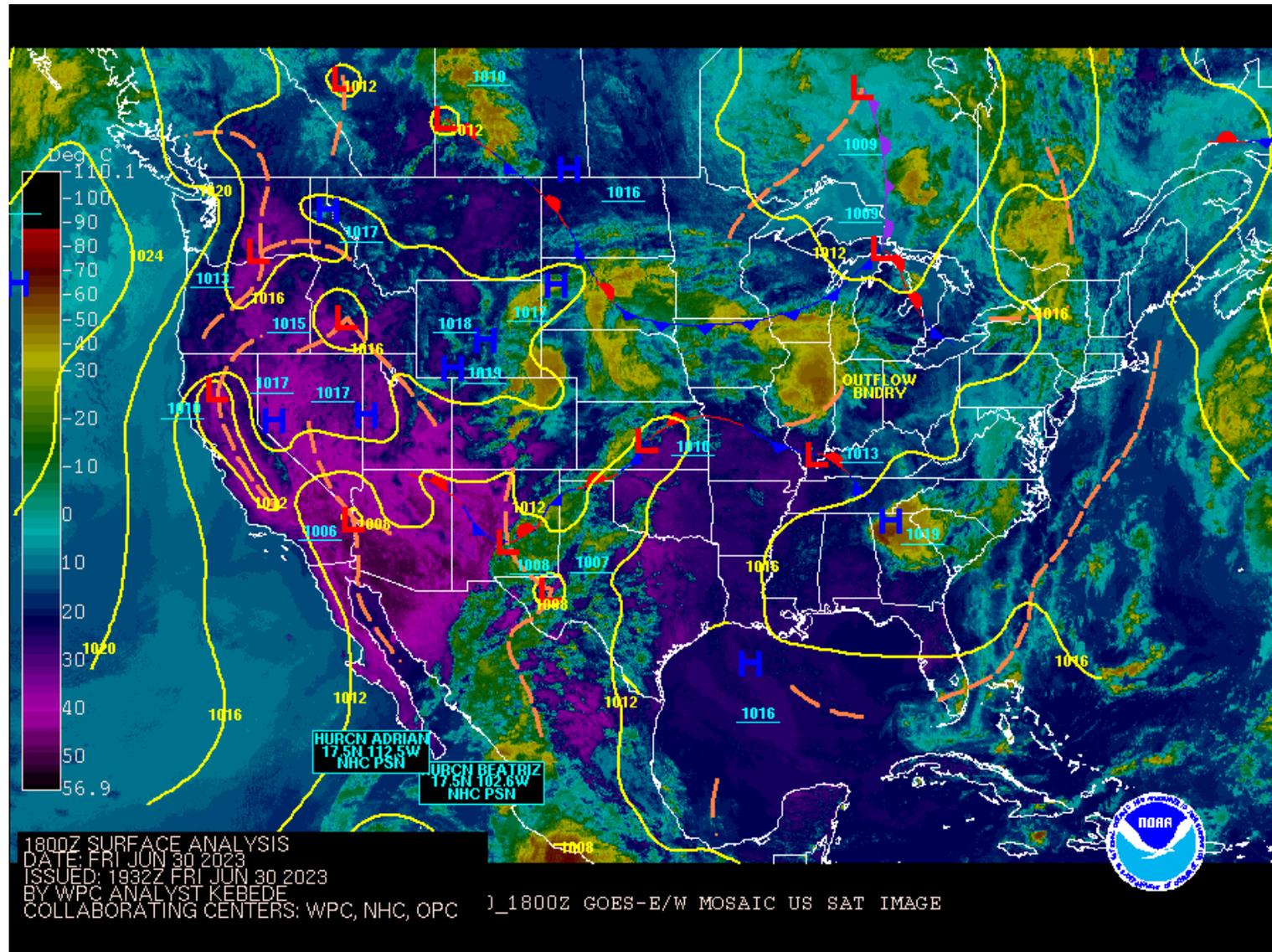
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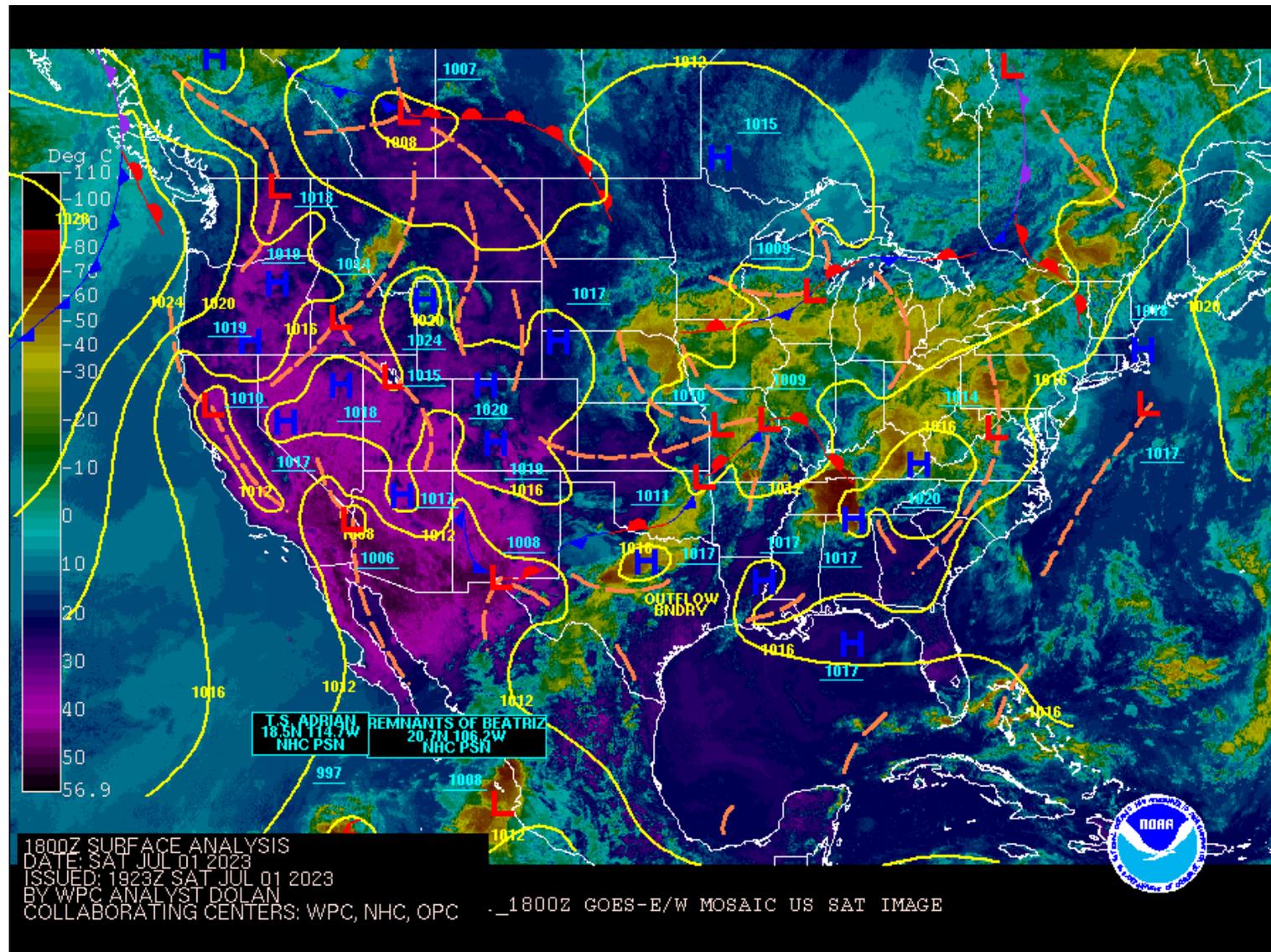
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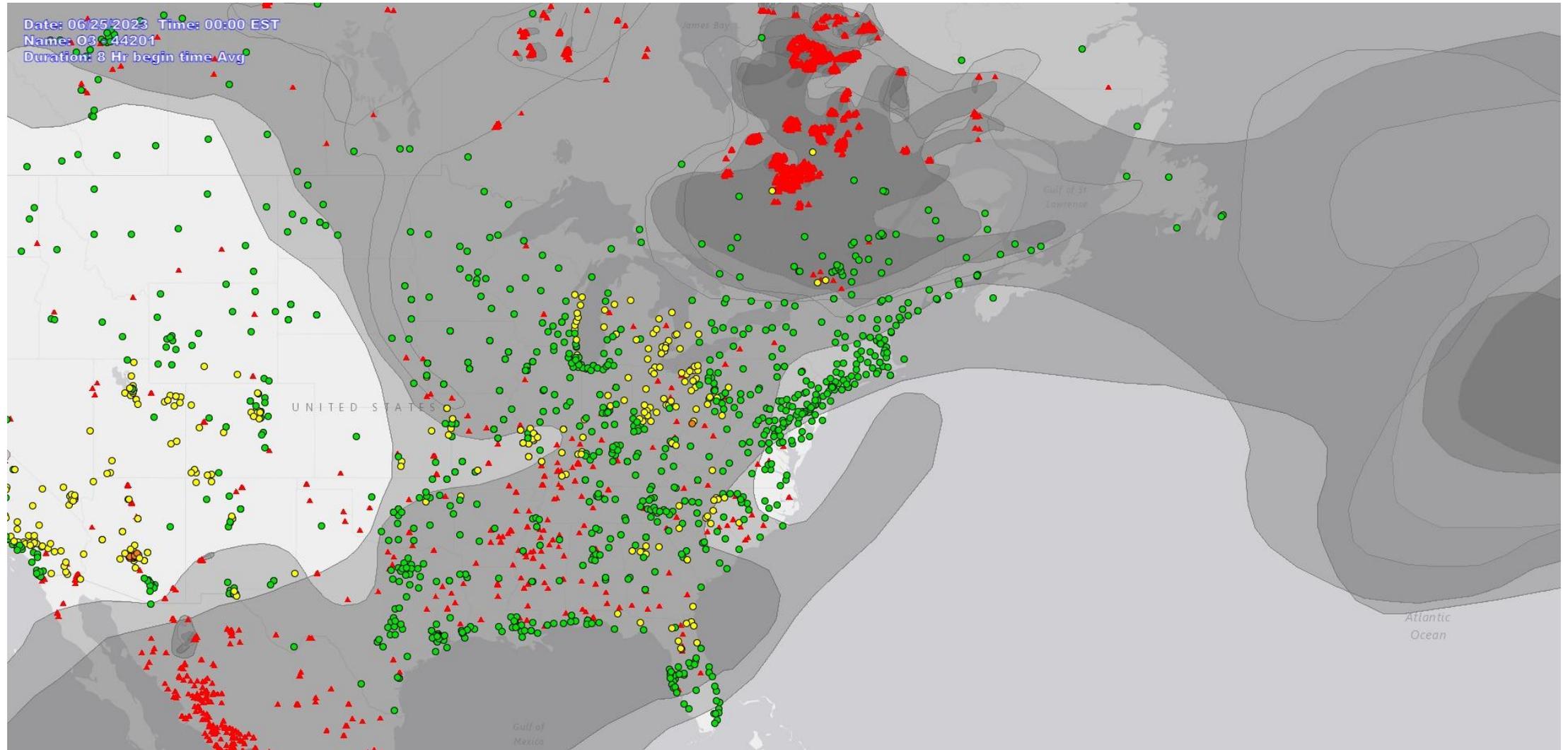
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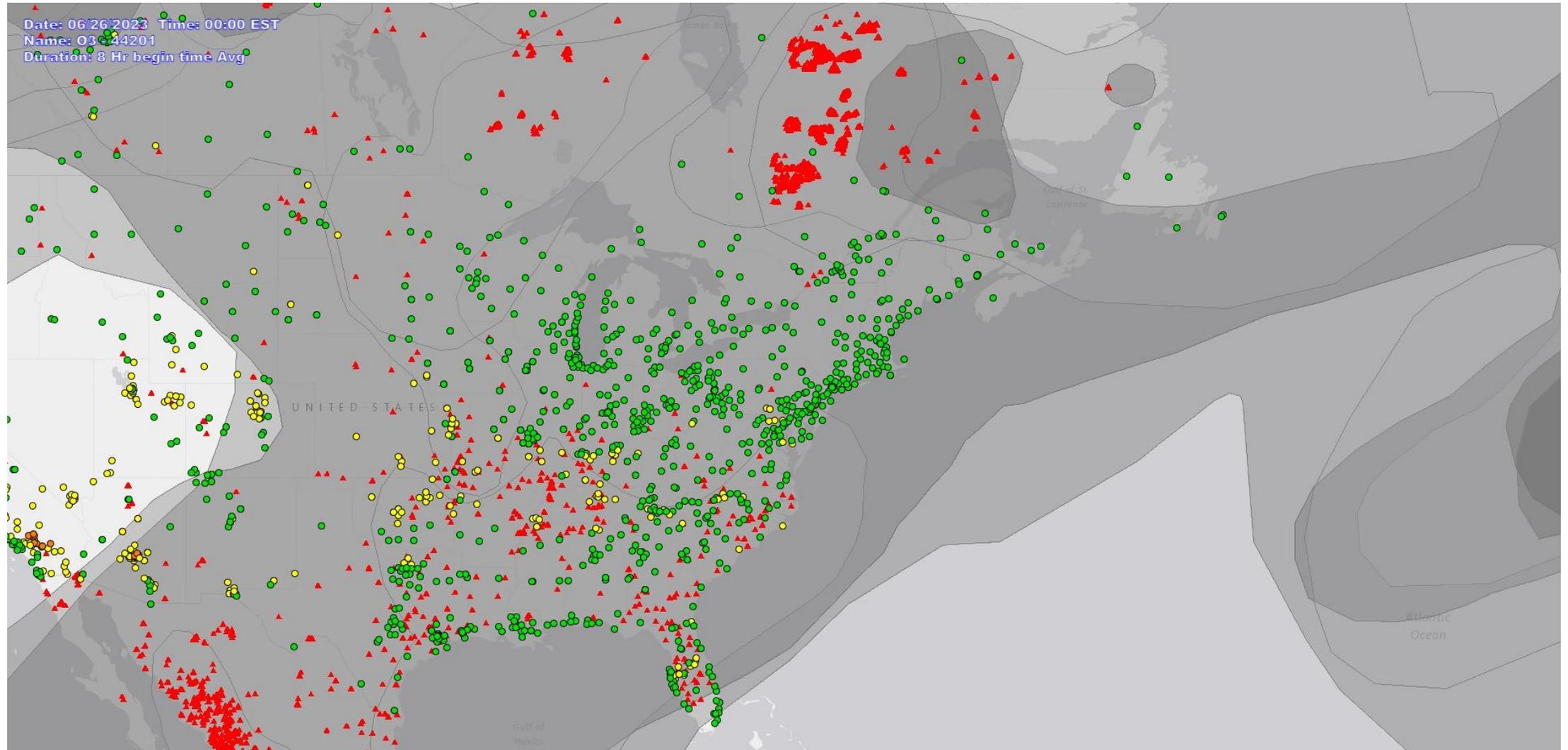
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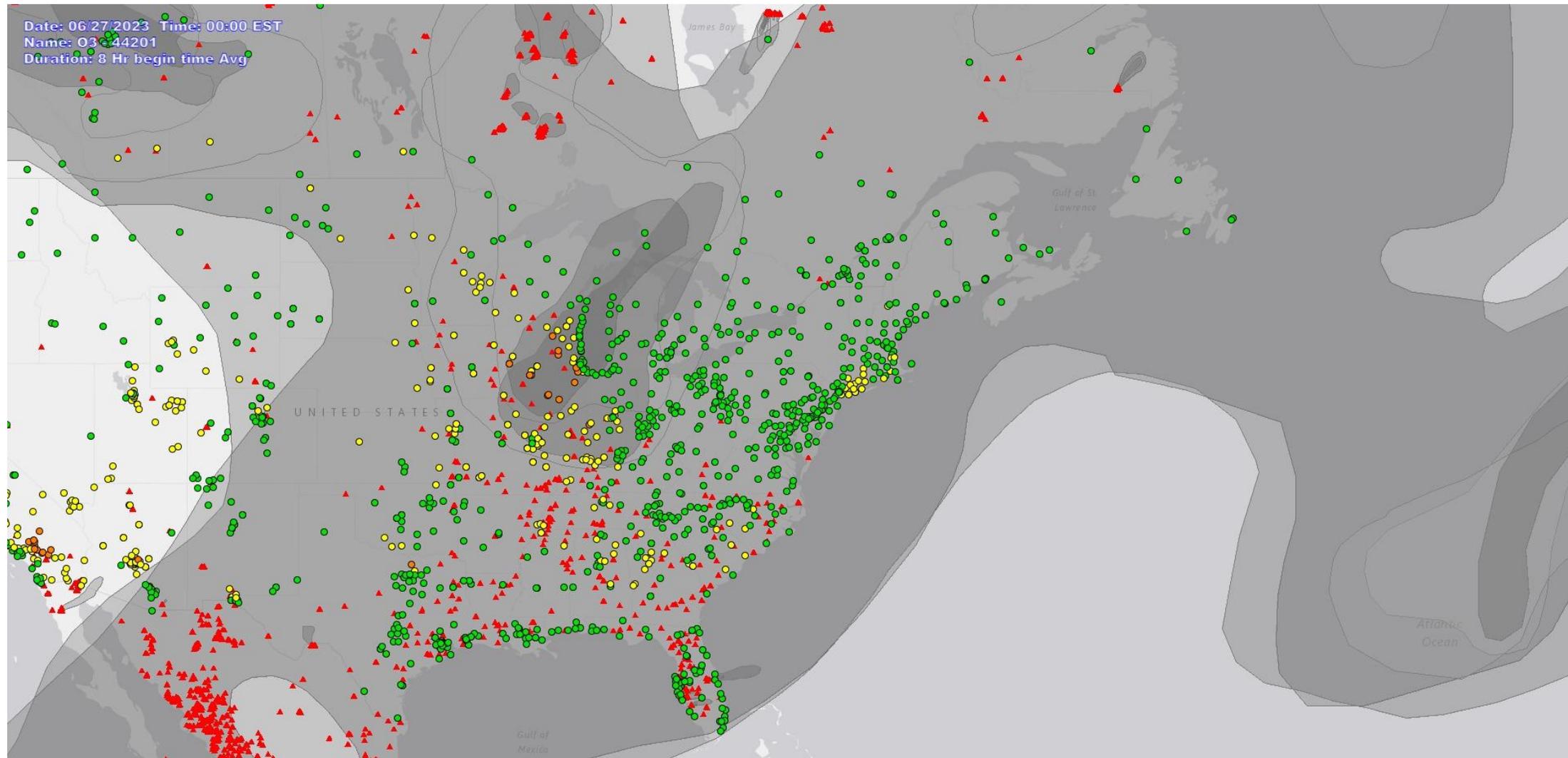
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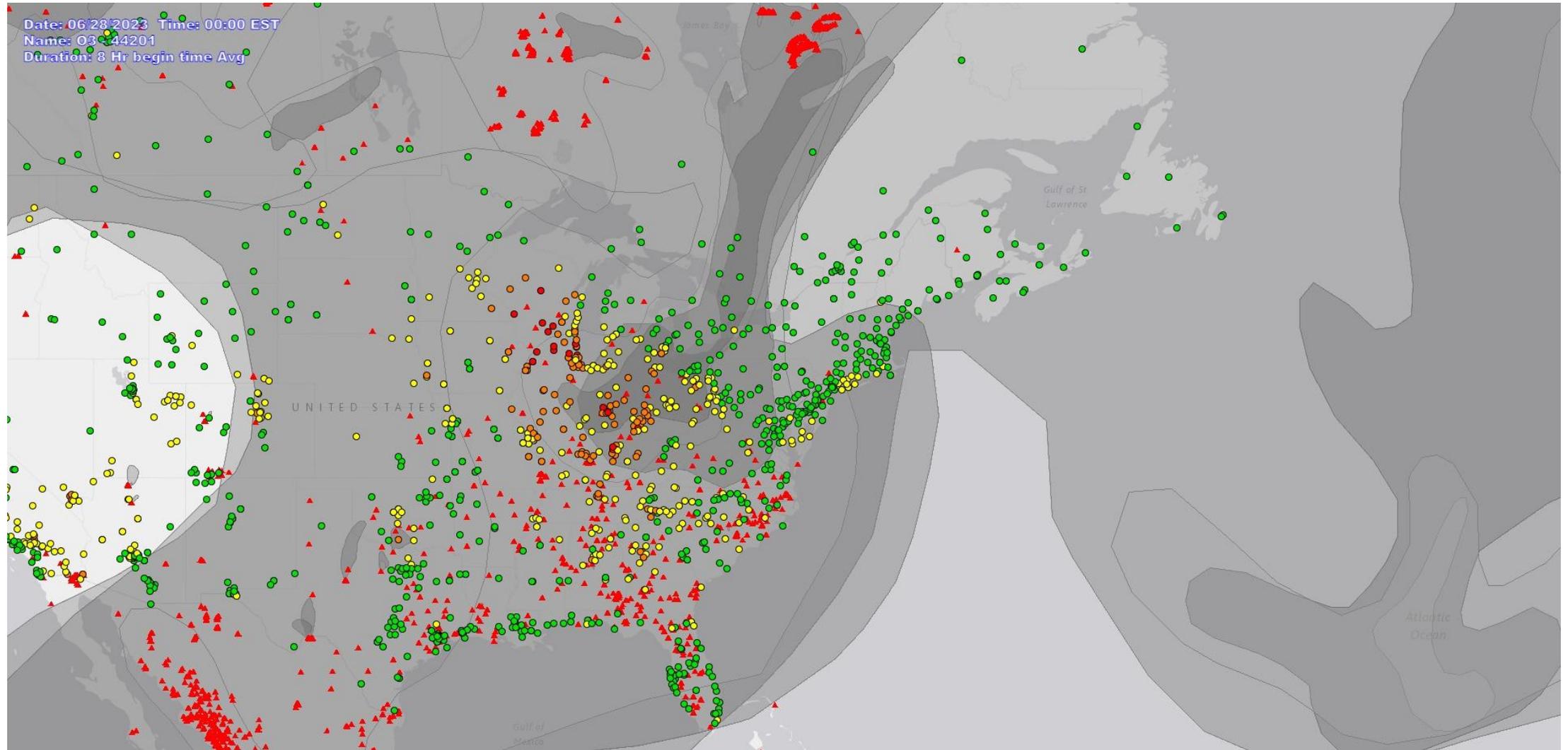
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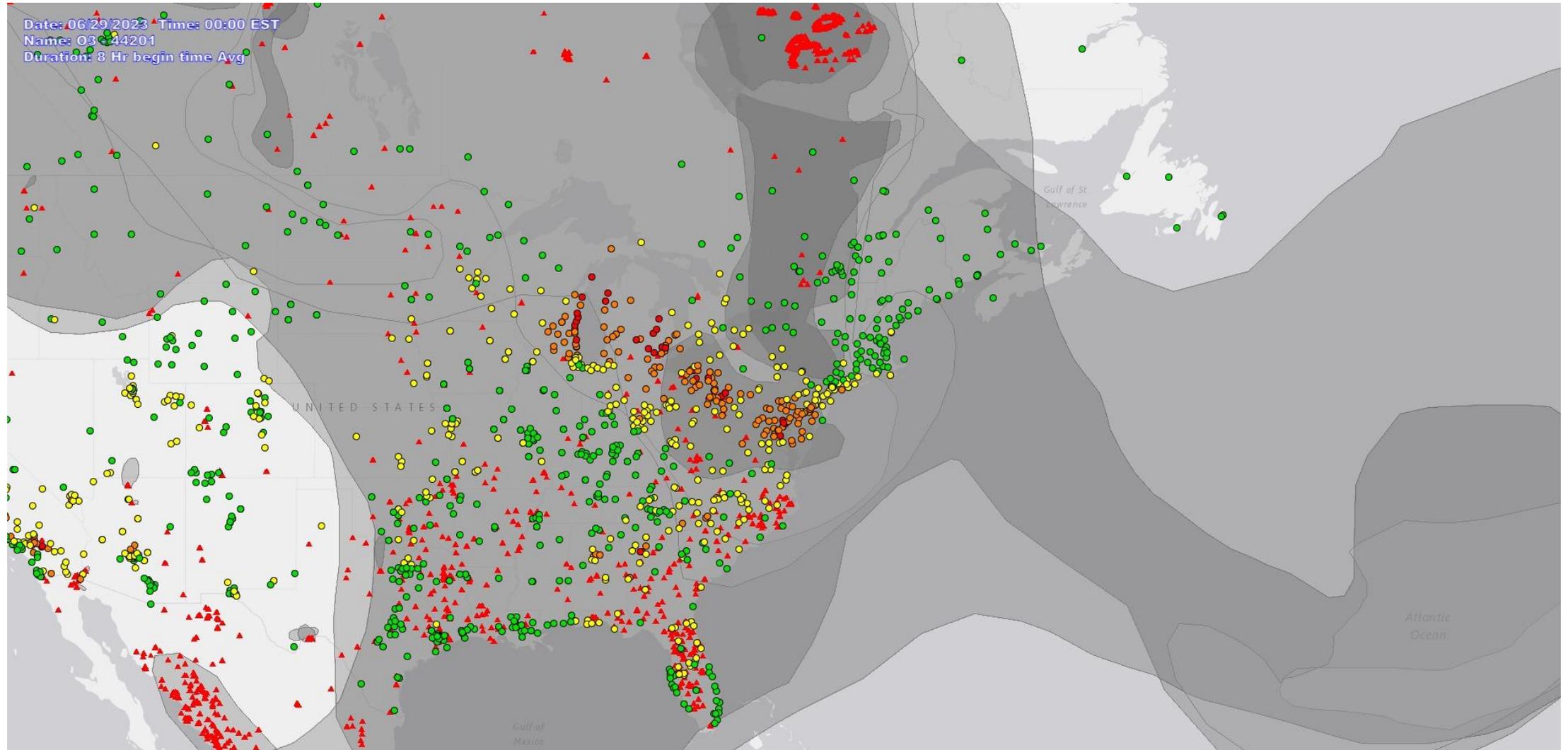
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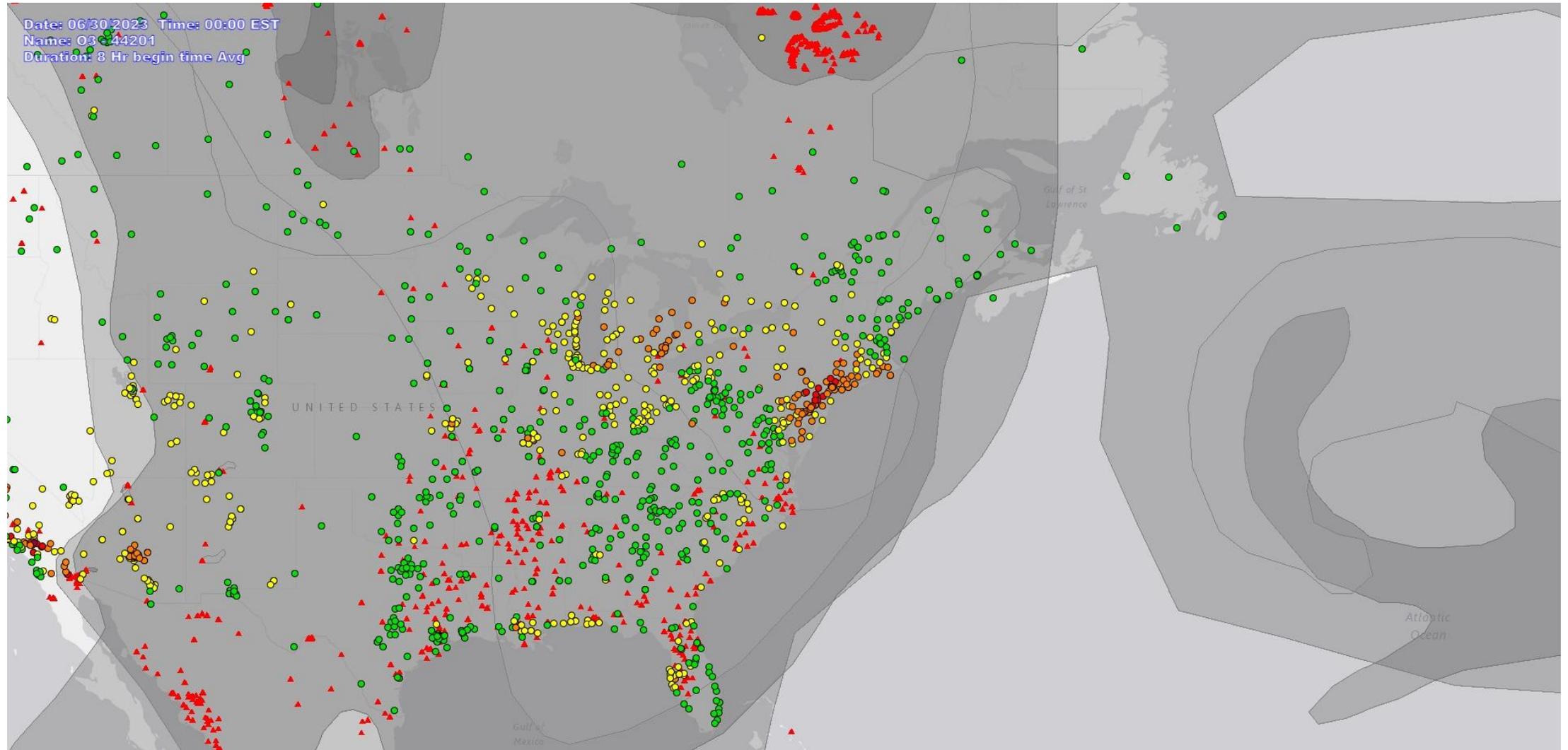
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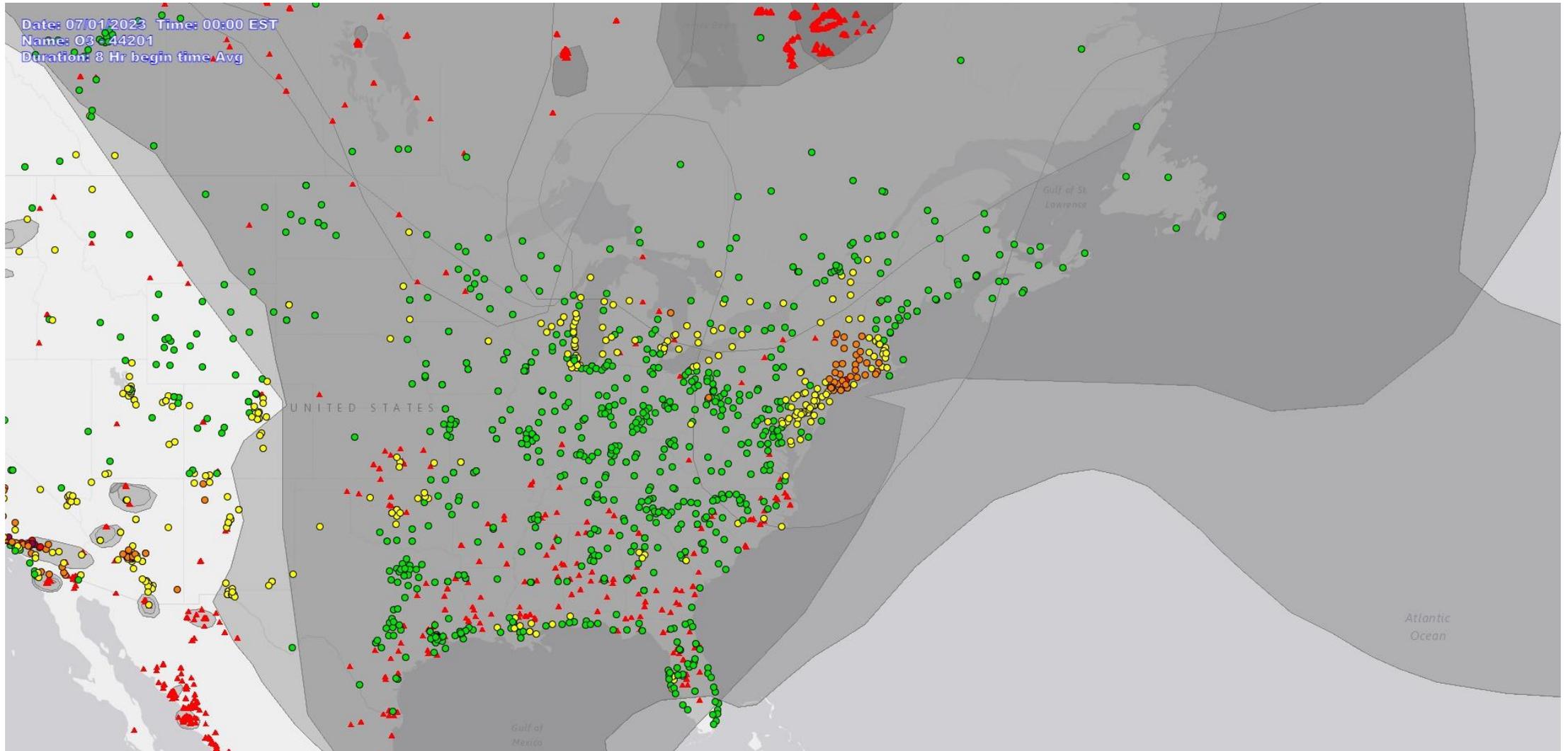
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# Ozone Concentrations – June 30, 2023



# Ozone Concentrations – July 1, 2023





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