Pollution Transport: Maine's Success Story and Challenges

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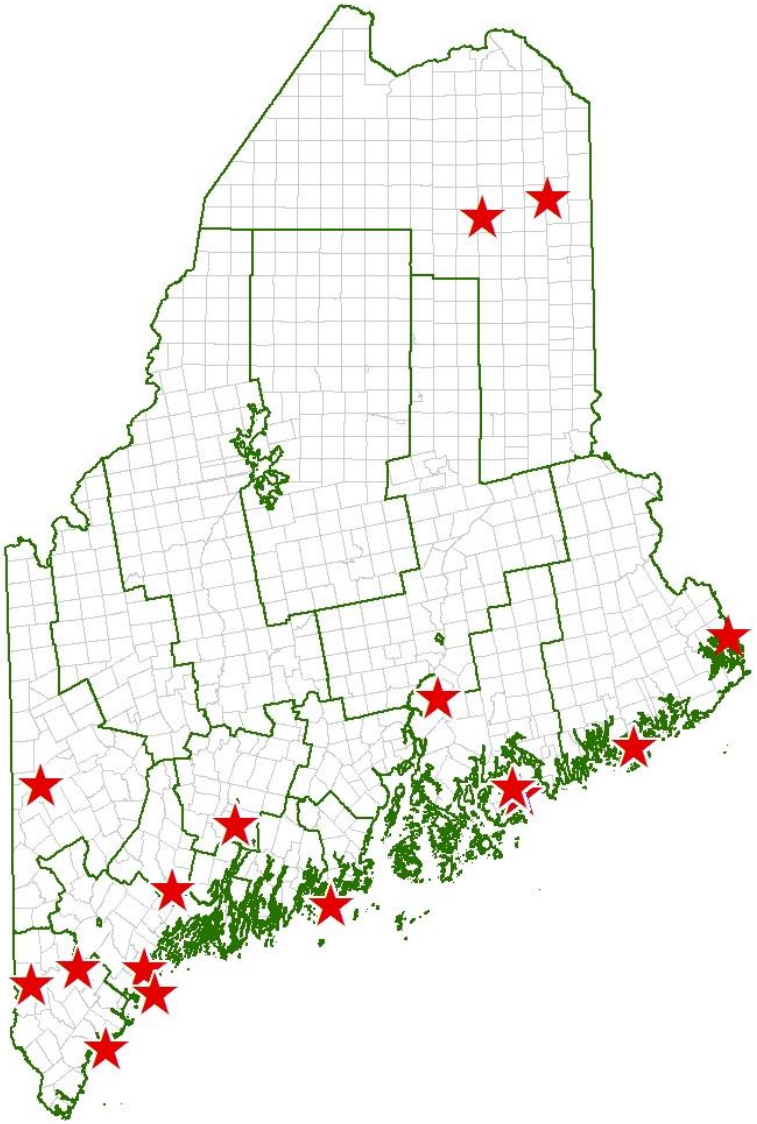
AAPCA 2018 Spring Meeting

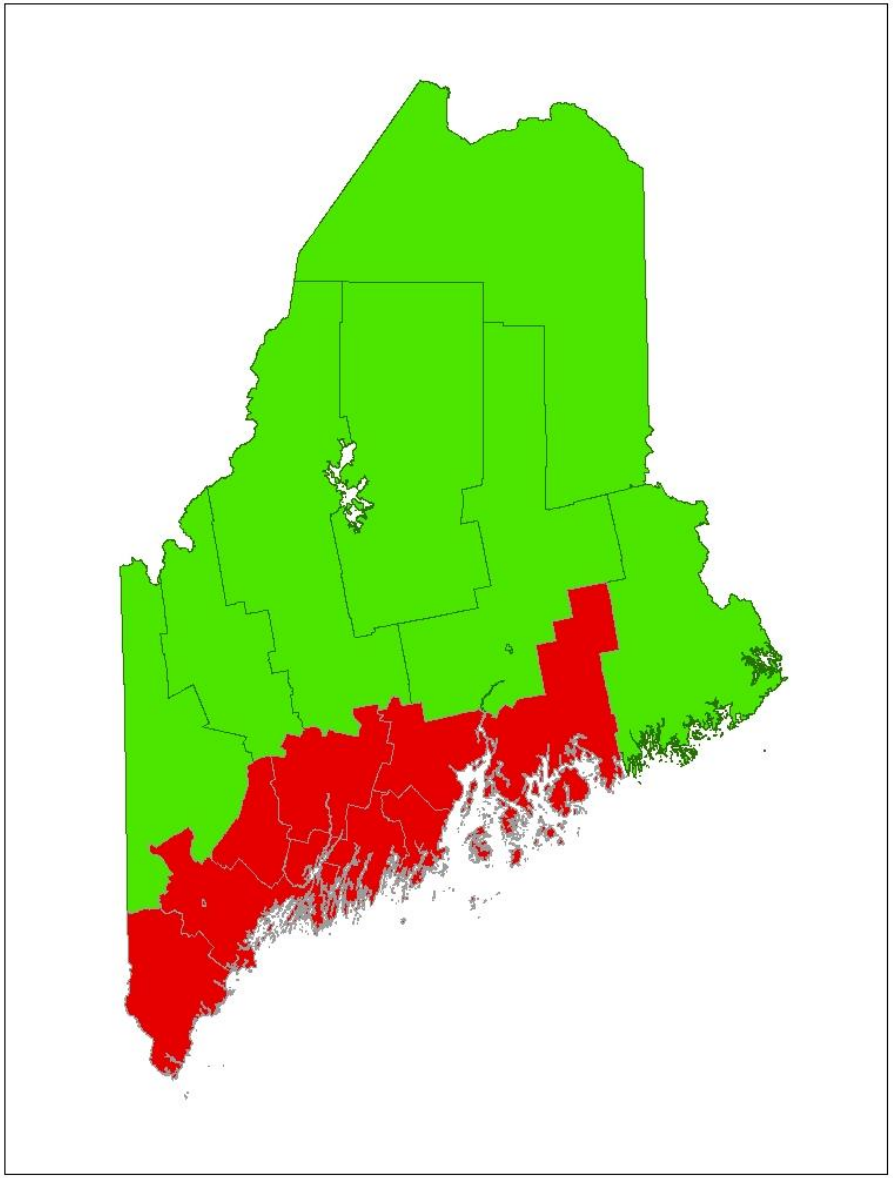
Outline

1. Maine's Ozone Success
2. Maine's Visibility Success
3. Maine Deposition Success
4. Ozone Challenges Remain
5. Opportunities to Consider



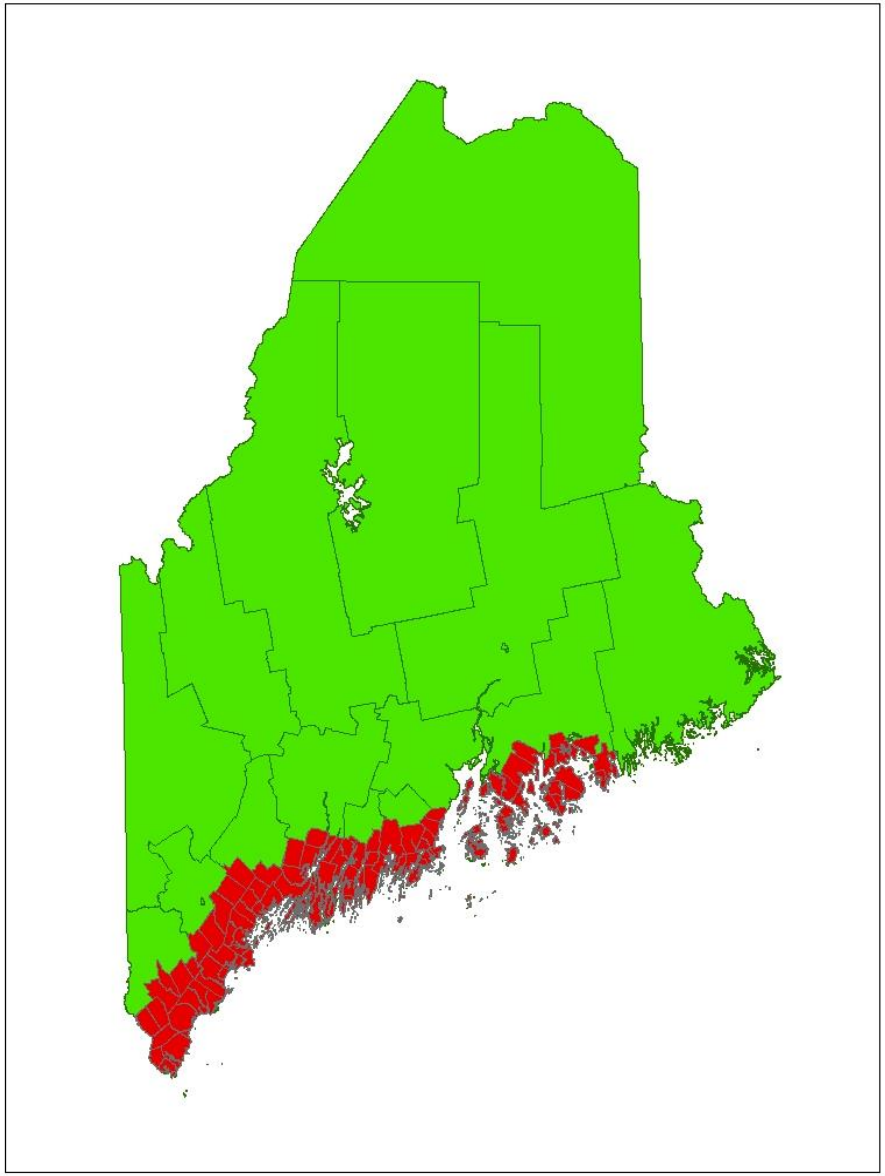
Maine's Ozone Network

Maine's 1979 -1990s
1-hour Ozone Designations:
Nonattainment &
Maintenance Areas



Maine's 1997 8-hour Ozone Designations

2003: Designated Nonattainment
2004: Monitored Attainment
2006: Designated To Attainment

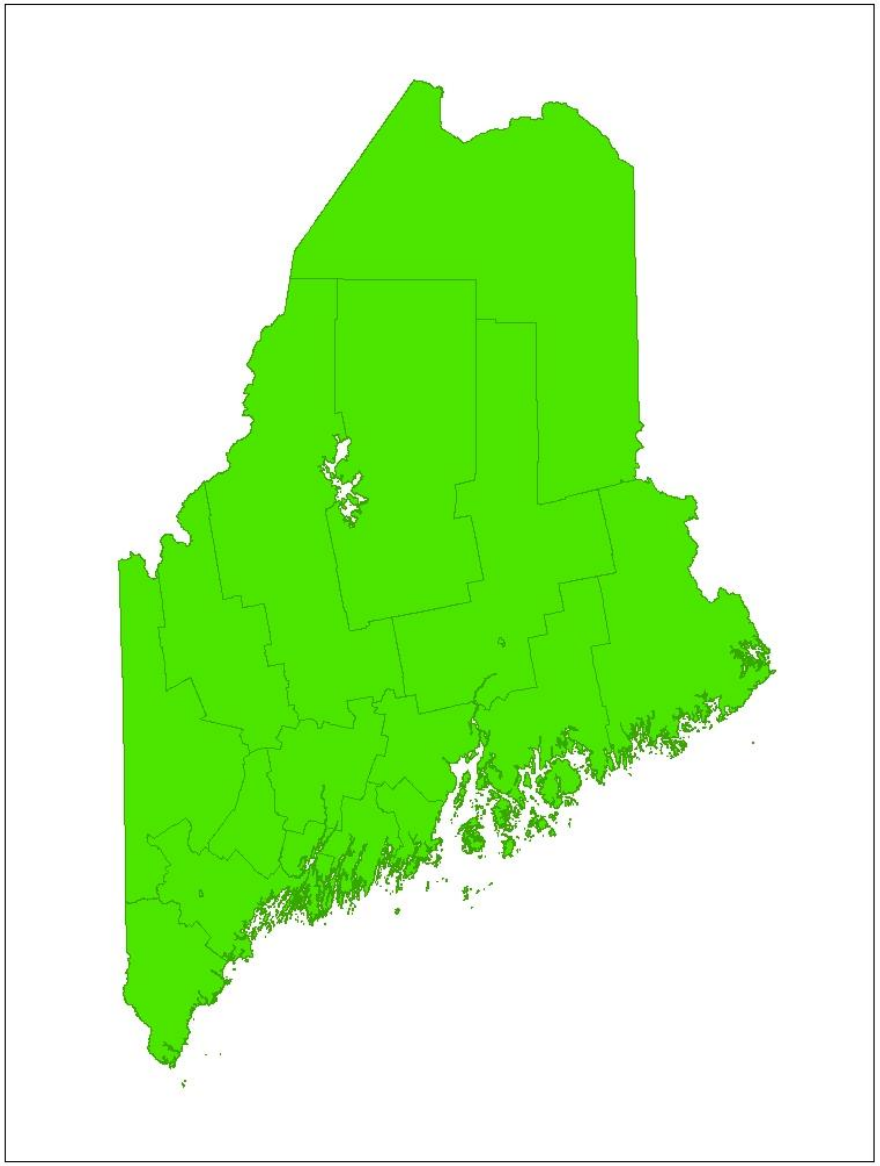


2008 8-Hour Ozone Standard Designation:

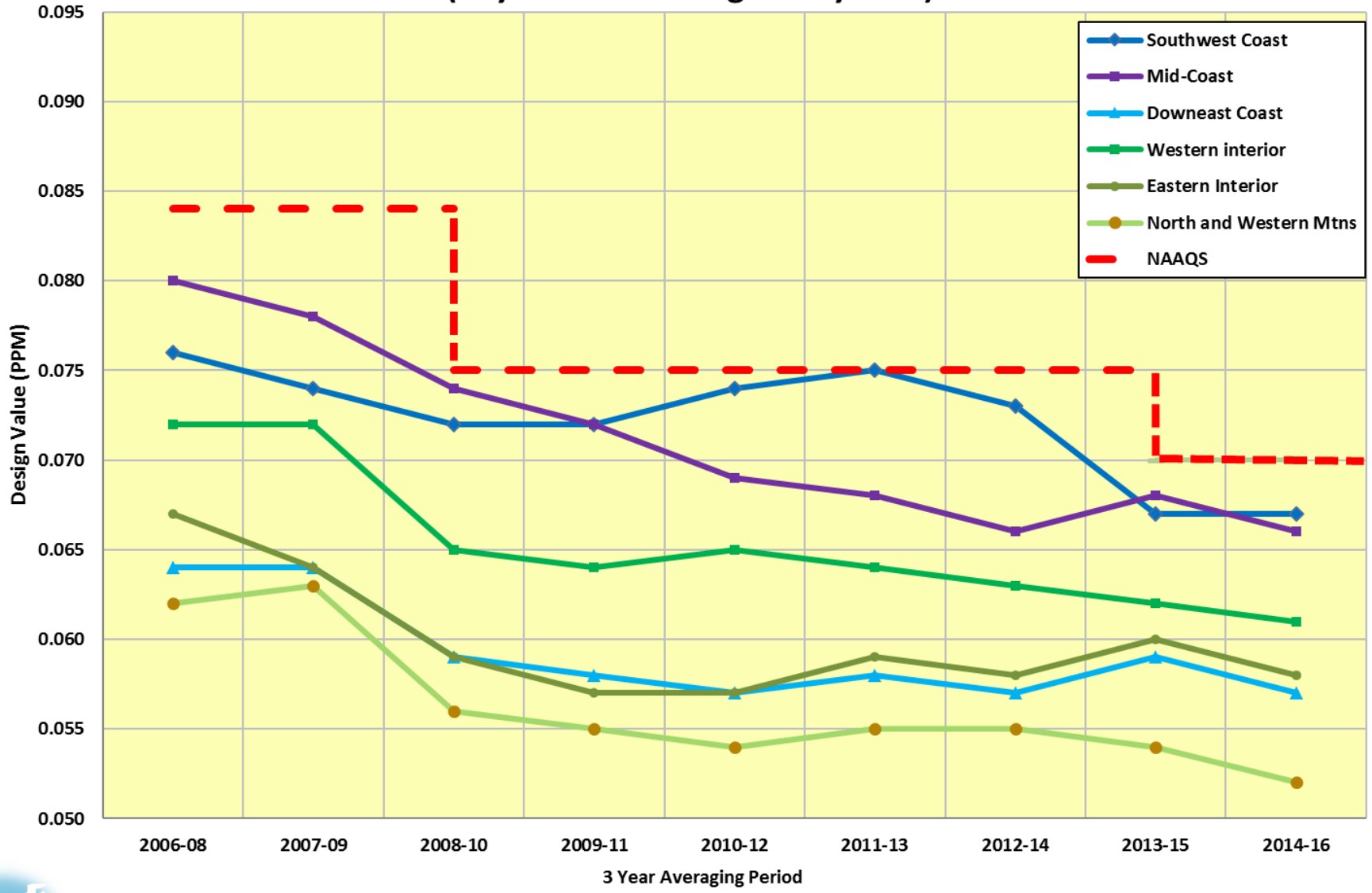
Attainment

2015 8-Hour Ozone Standard Designation:

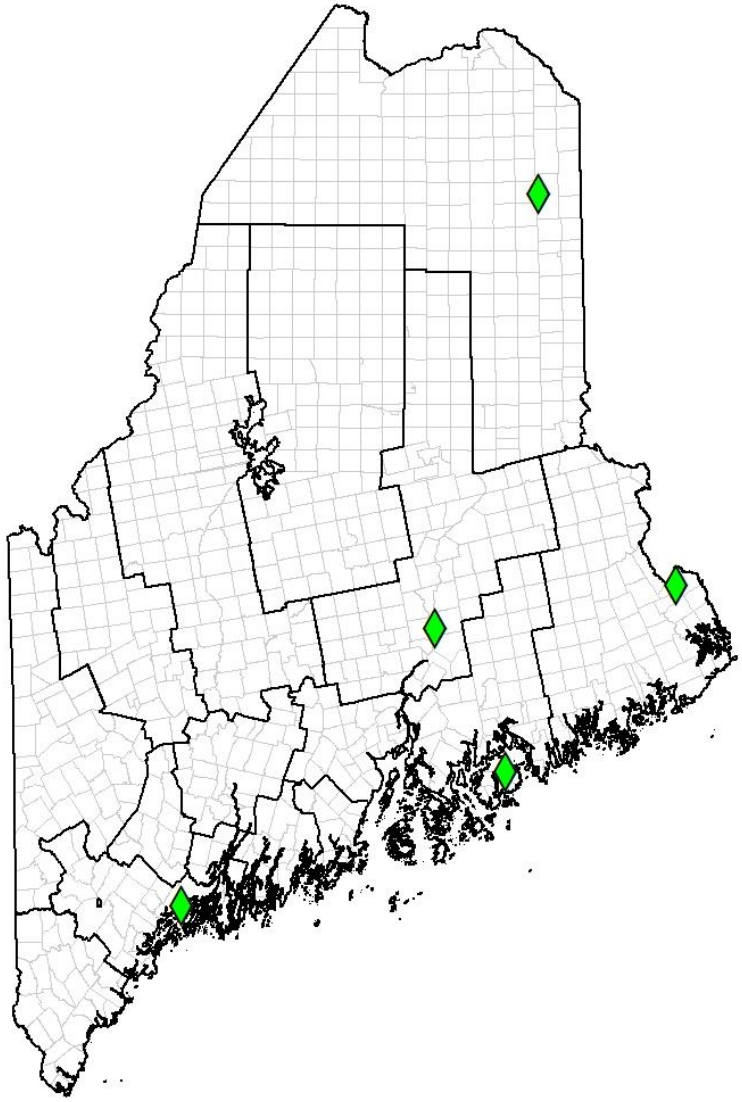
Attainment/unclassifiable statewide based on 2016 Design Value



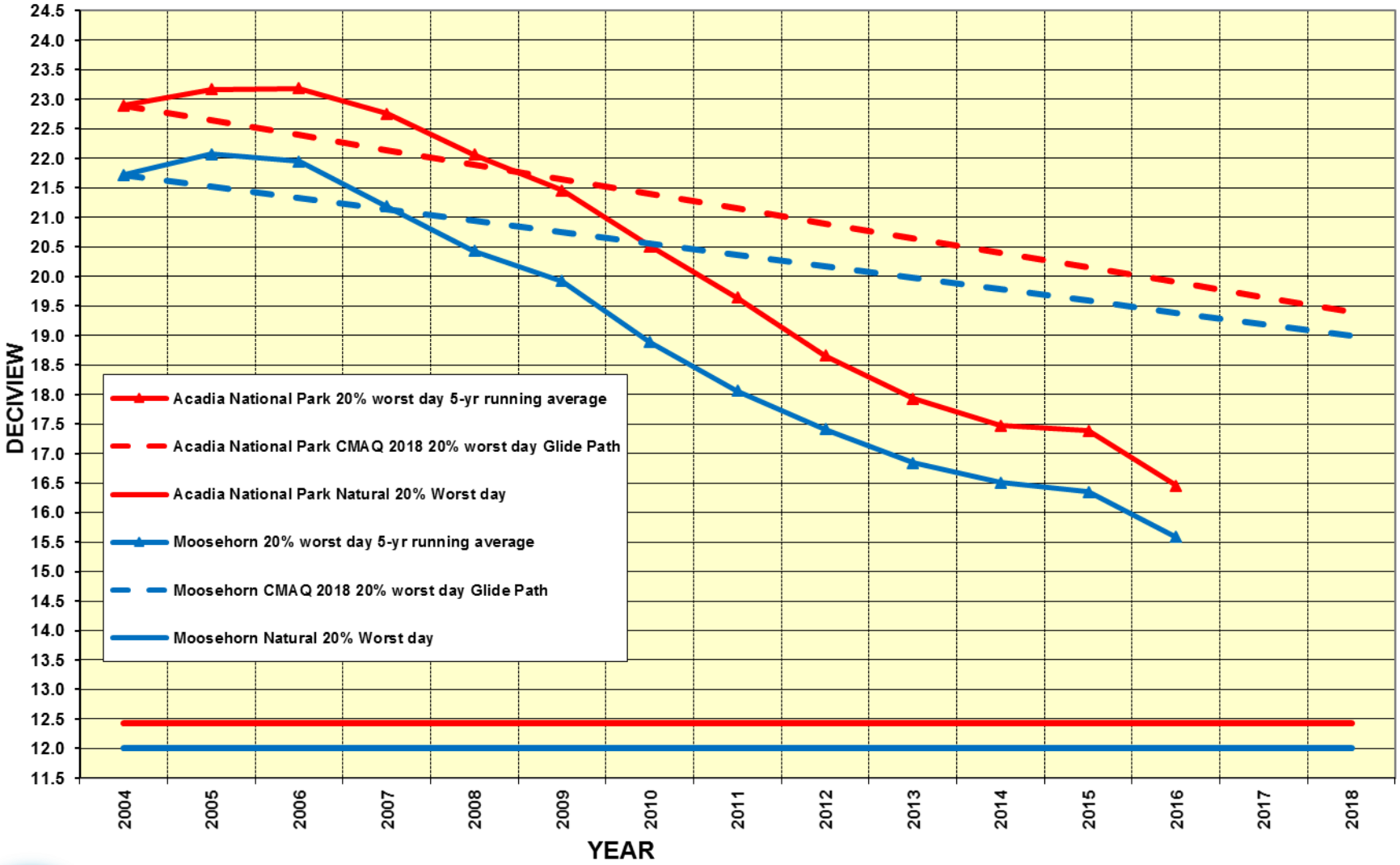
8 HOUR OZONE DESIGN VALUE* TRENDS IN MAINE
(*3yr Ave of 4th High Daily Max)



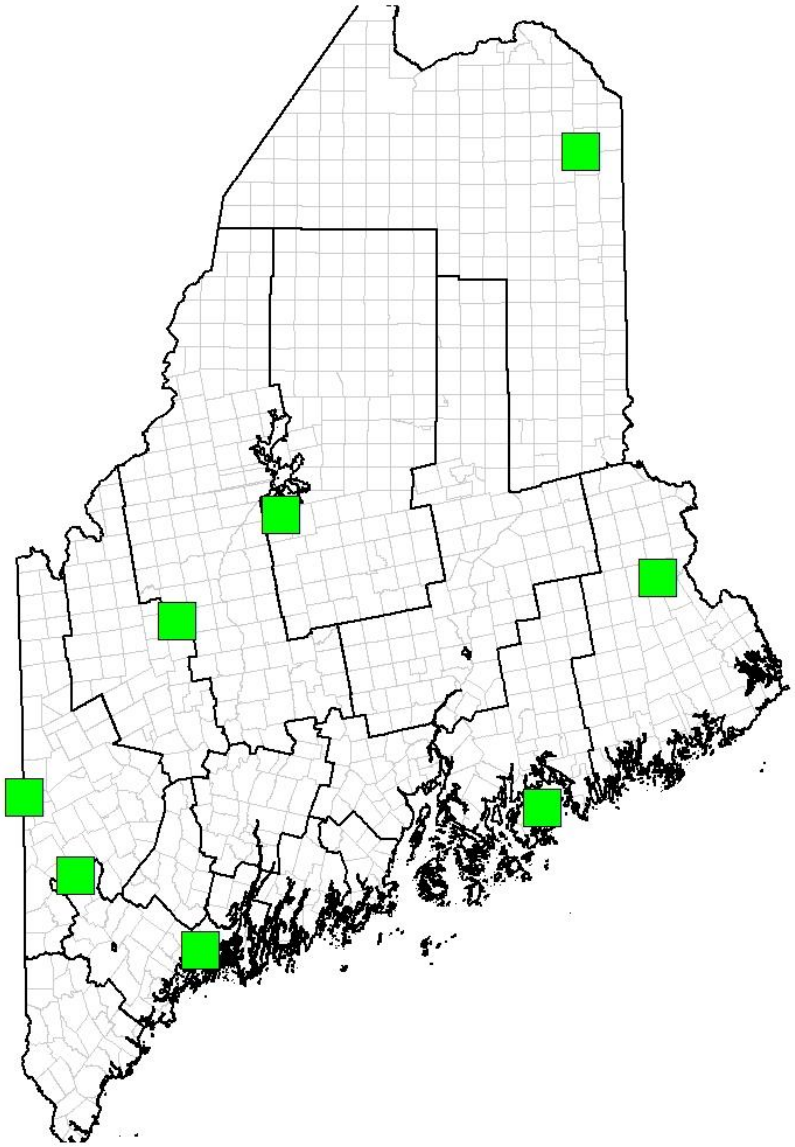
Maine's IMPROVE Monitor Network



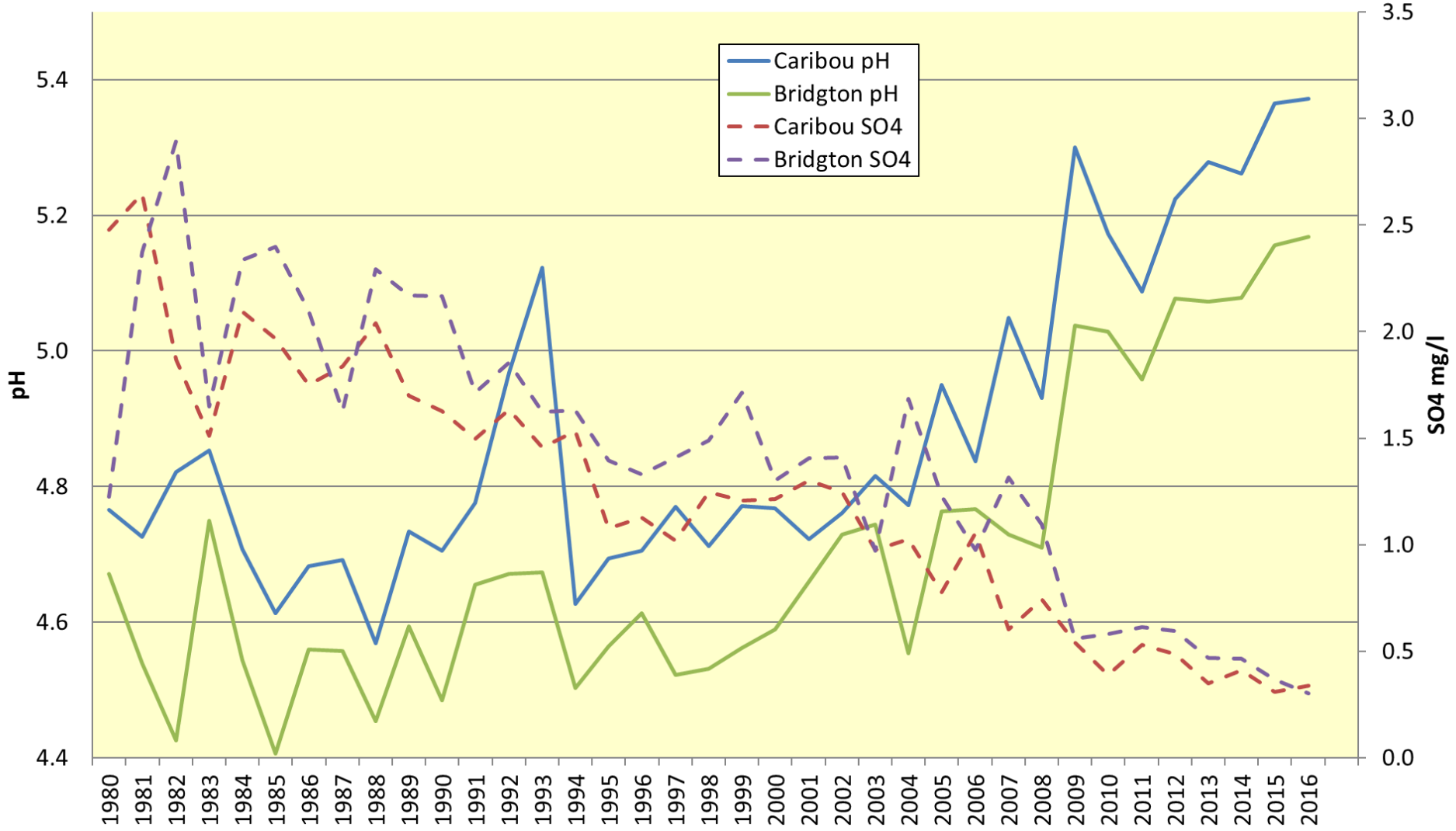
MAINE CLASS I AREA REGIONAL HAZE DATA ANALYSES



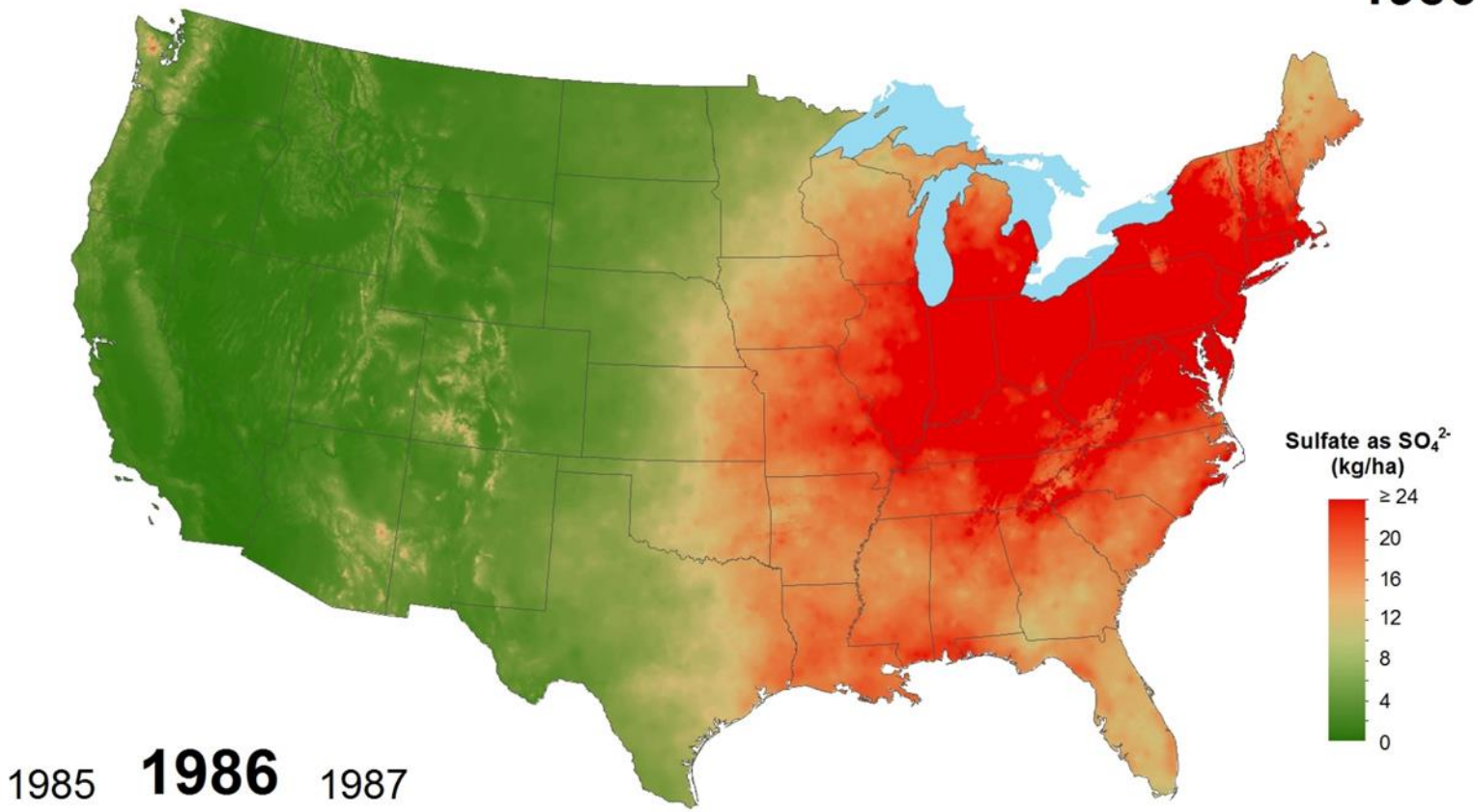
Maine's Atmospheric Deposition Network



Average annual pH/SO4 Trends in Northern and Southern Maine

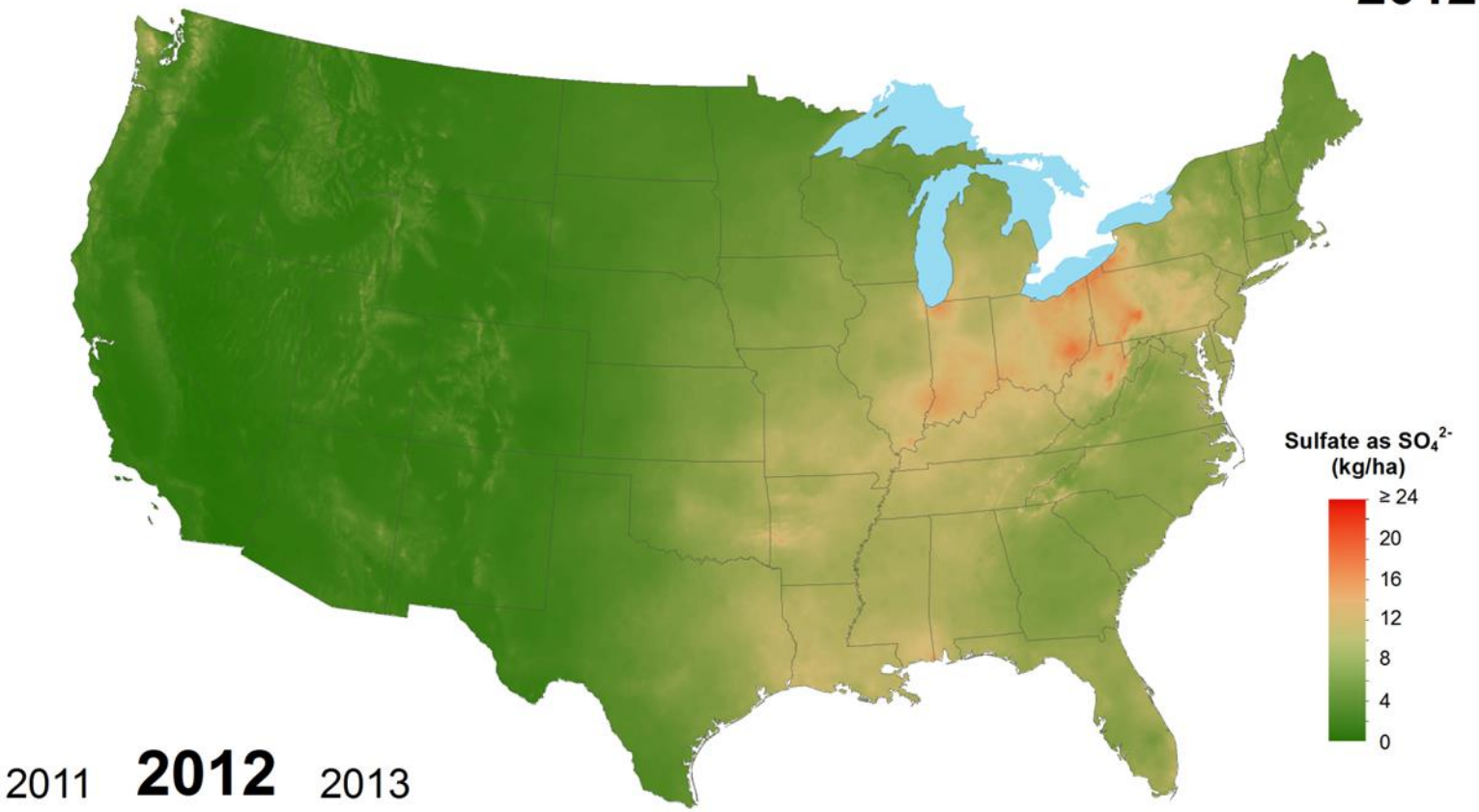


Sulfate ion wet deposition
1986



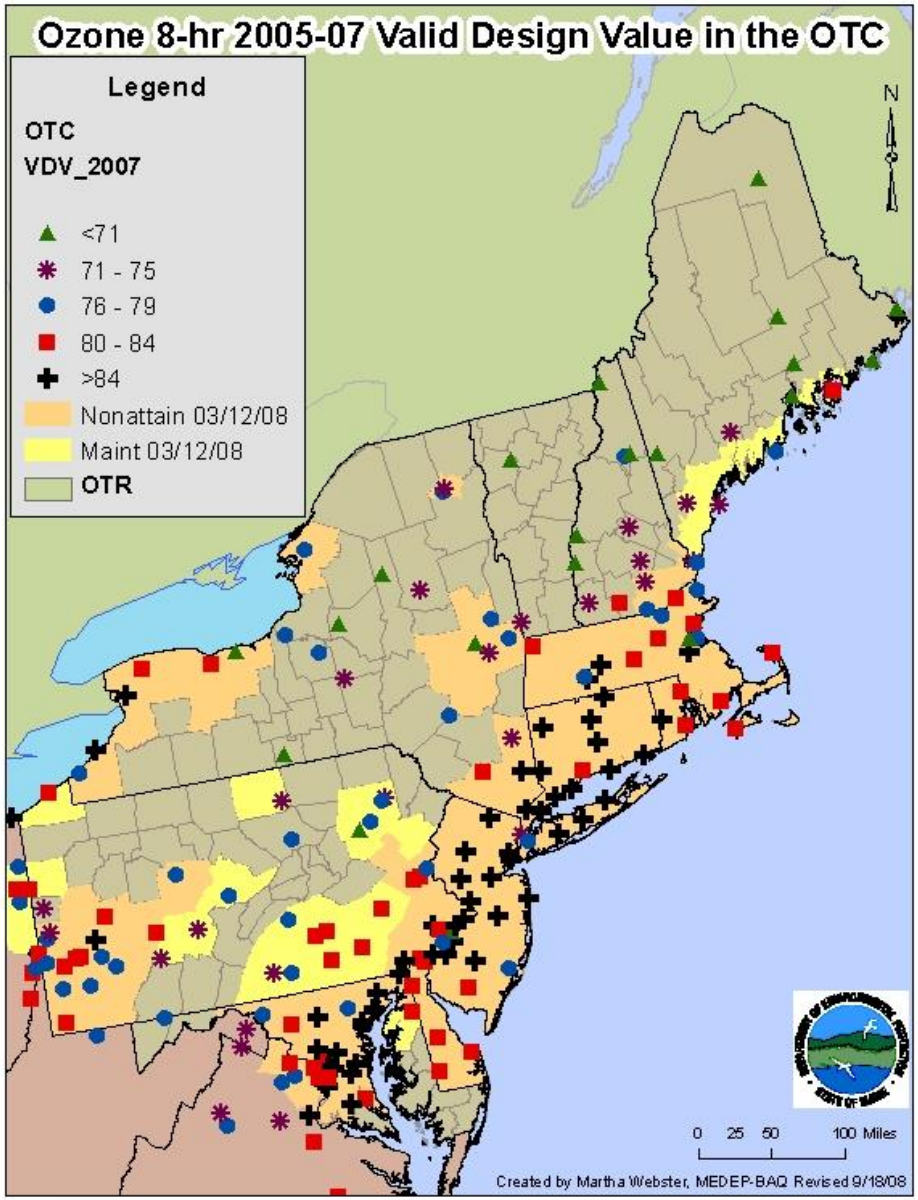
National Atmospheric Deposition Program/National Trends Network
http://nadp.isws.illinois.edu

Sulfate ion wet deposition
2012

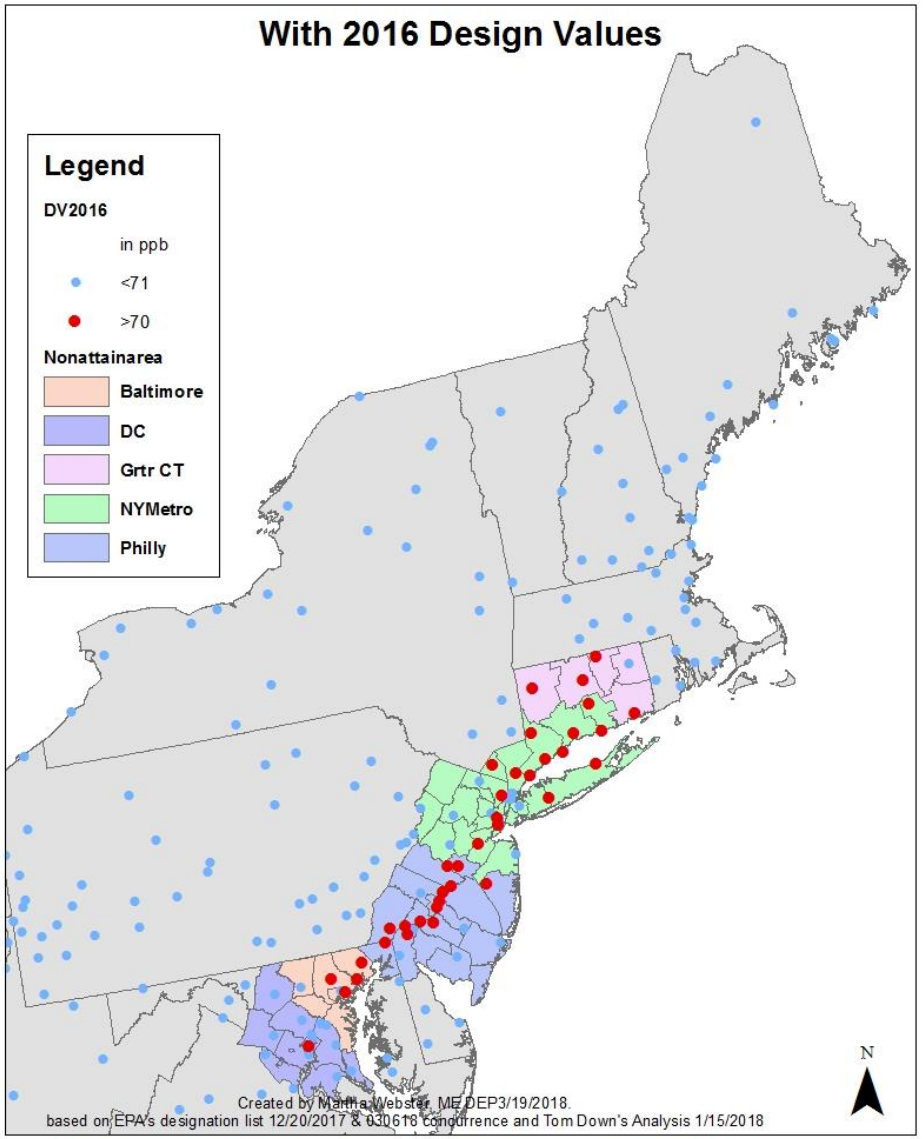


National Atmospheric Deposition Program/National Trends Network
http://nadp.isws.illinois.edu

Challenges Remain

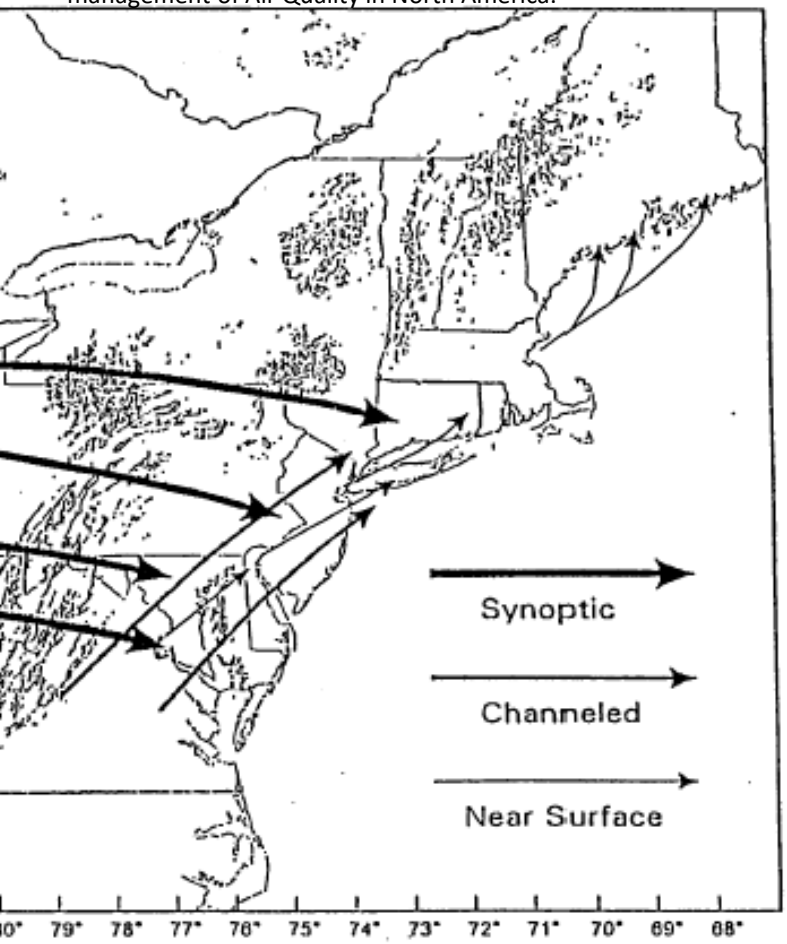


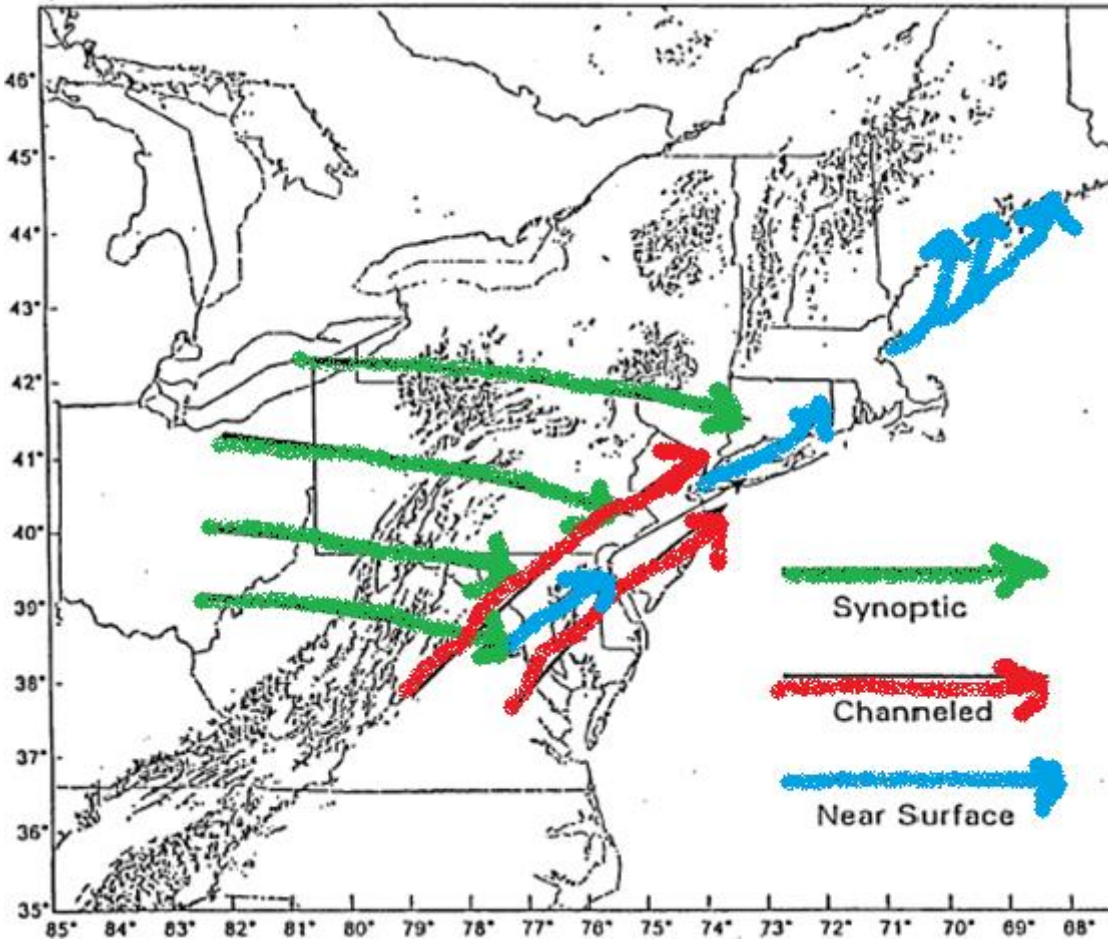
EPA Proposed 2015 Ozone NAAQS nonattainment areas

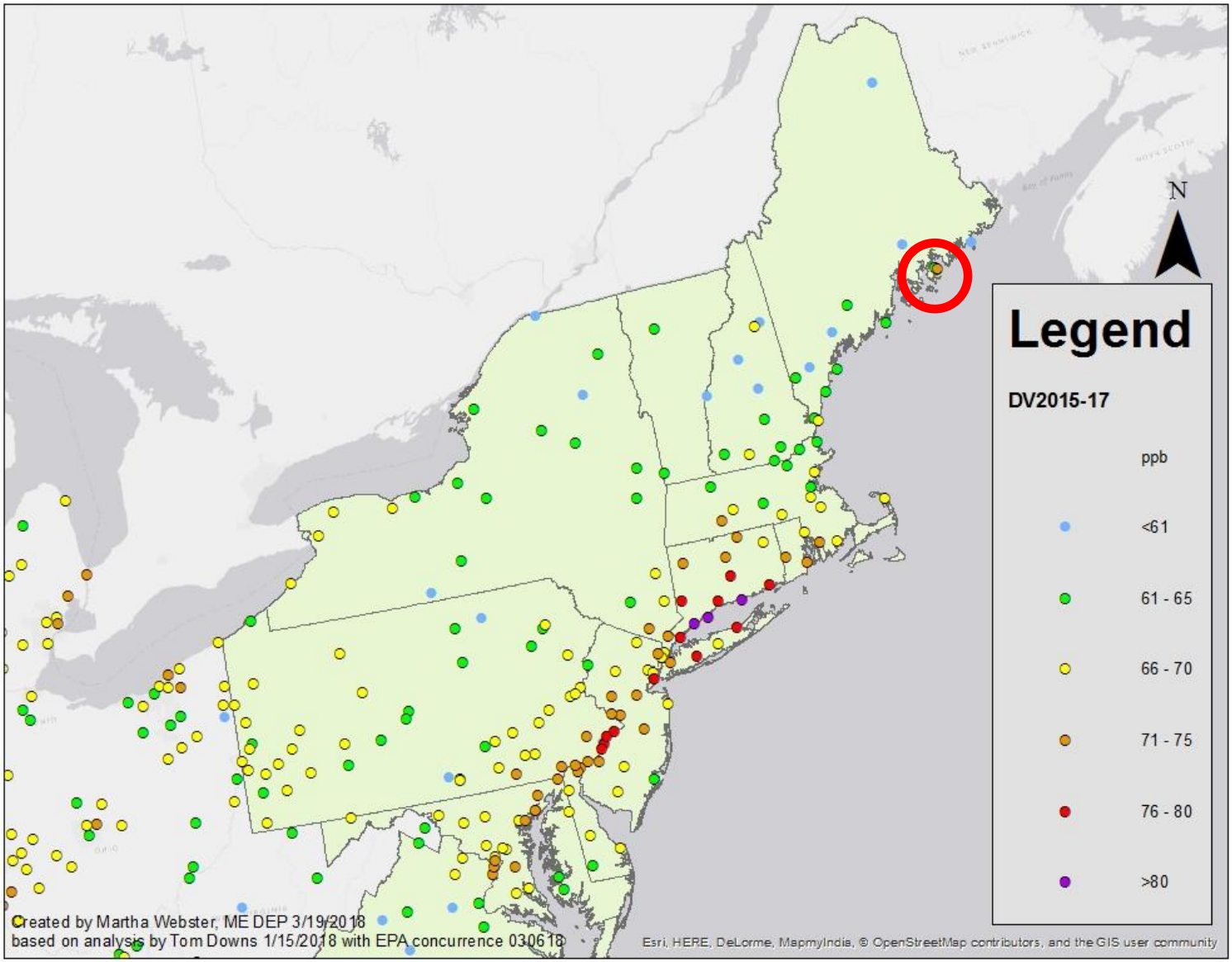


Transport Regimes Observed During NARSTO-Northeast

NARSTO, formerly North American Research Strategies for Tropospheric Ozone, is a partnership of Canada, the US, and Mexico focused on improving management of Air Quality in North America.






N
Legend
DV2015-17
ppb
<61
61 - 65
66 - 70
71 - 75
76 - 80
>80
Created by Martha Webster, ME DEP 3/19/2018
based on analysis by Tom Downs 1/15/2018 with EPA concurrence 030618
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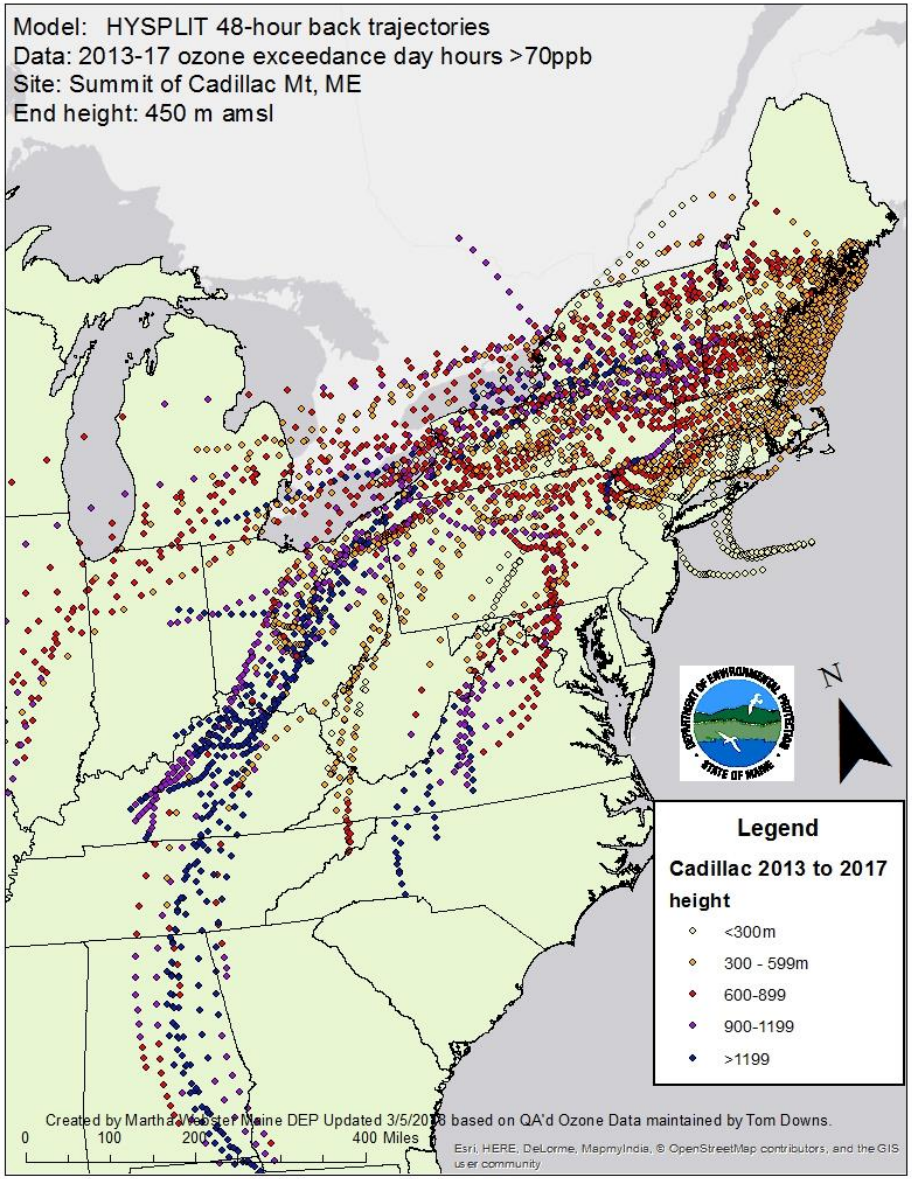
Model: HYSPLIT 48-hour back trajectories
Data: 2013-17 ozone exceedance day hours >70ppb
Site: Summit of Cadillac Mt, ME
End height: 450 m amsl
Legend
Cadillac 2013 to 2017
height
<300m
300 - 599m
600-899
900-1199
>1199
N
Created by Martha Webster Maine DEP Updated 3/5/2018 based on QA'd Ozone Data maintained by Tom Downs.
0 100 200 400 Miles
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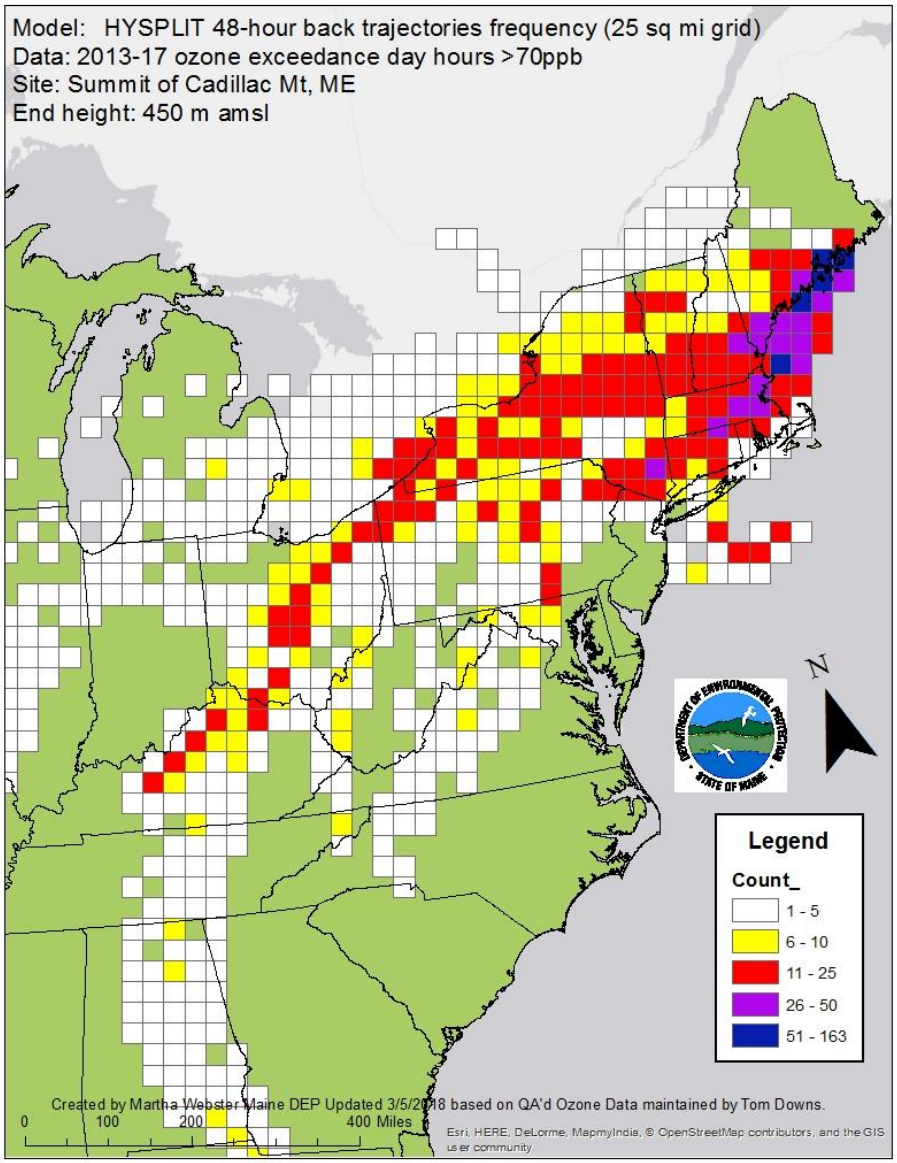
Model: HYSPLIT 48-hour back trajectories frequency (25 sq mi grid)
Data: 2013-17 ozone exceedance day hours >70ppb
Site: Summit of Cadillac Mt, ME
End height: 450 m amsl
Legend
Count_
1 - 5
6 - 10
11 - 25
26 - 50
51 - 163
N
Created by Martha Webster Maine DEP Updated 3/5/2018 based on QA'd Ozone Data maintained by Tom Downs.
0 100 200 400 Miles
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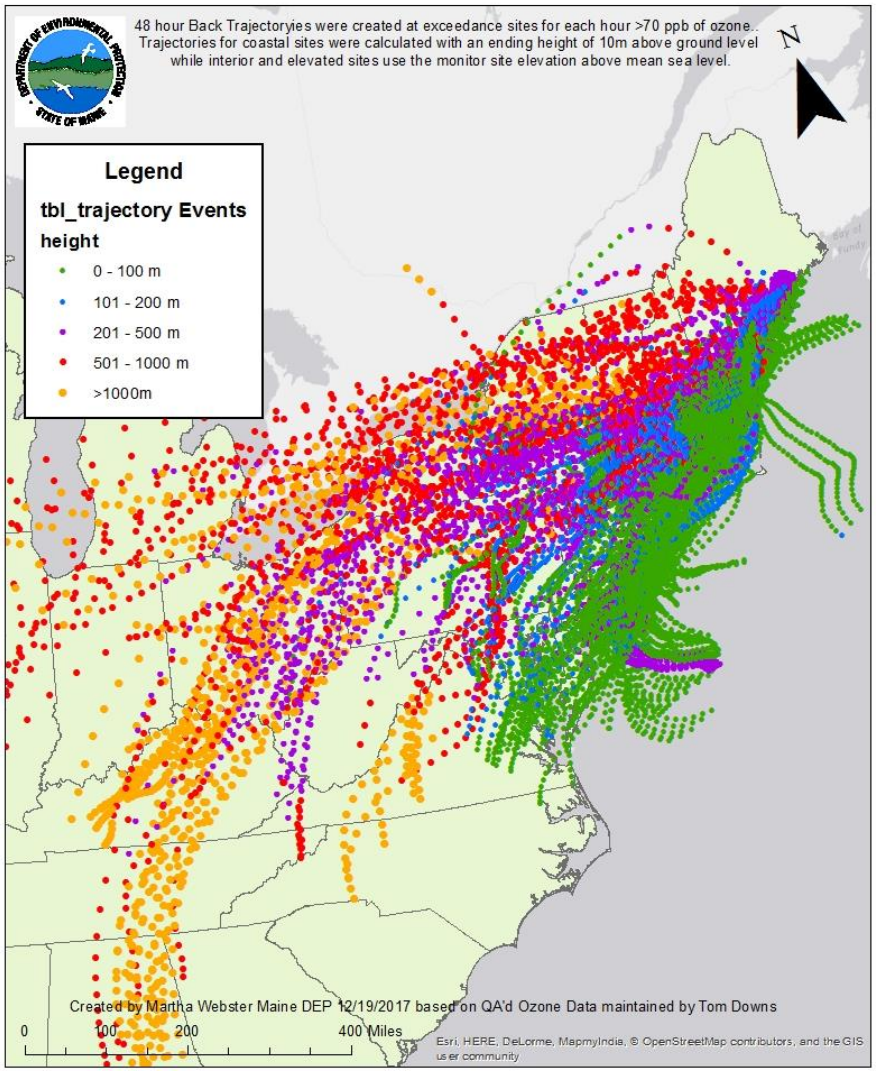
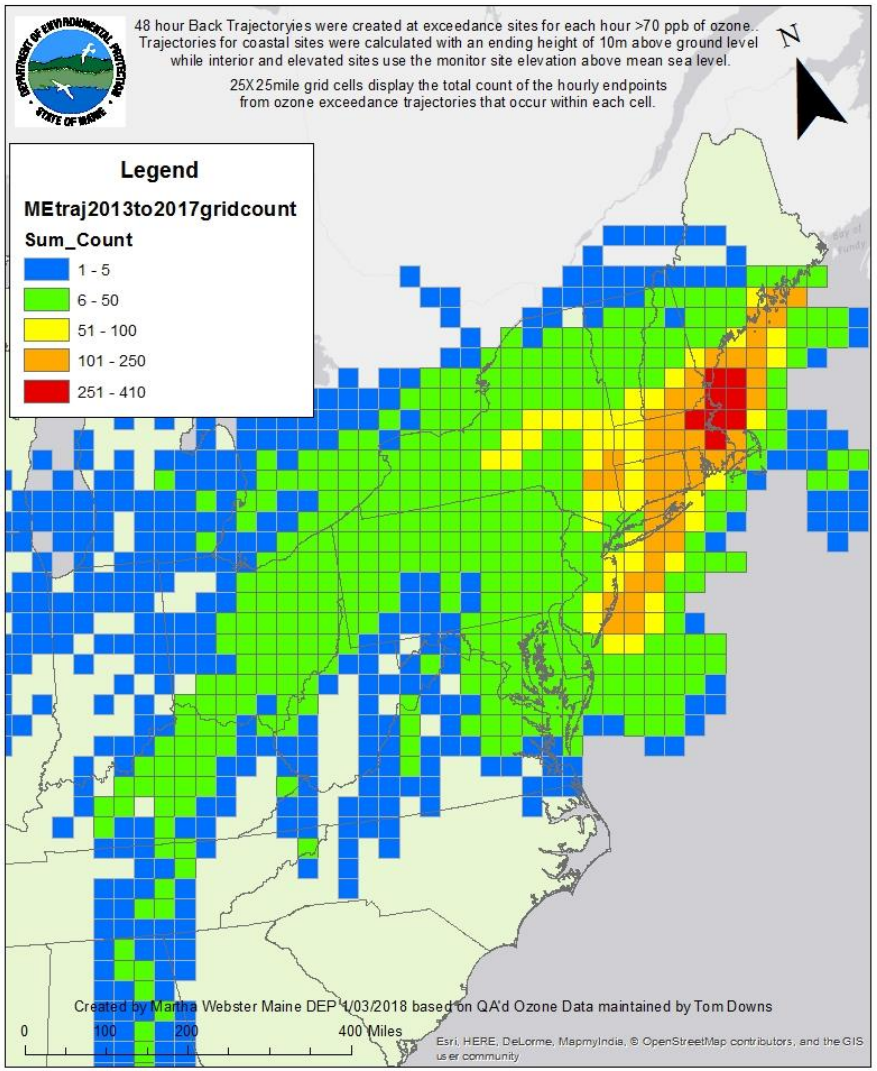
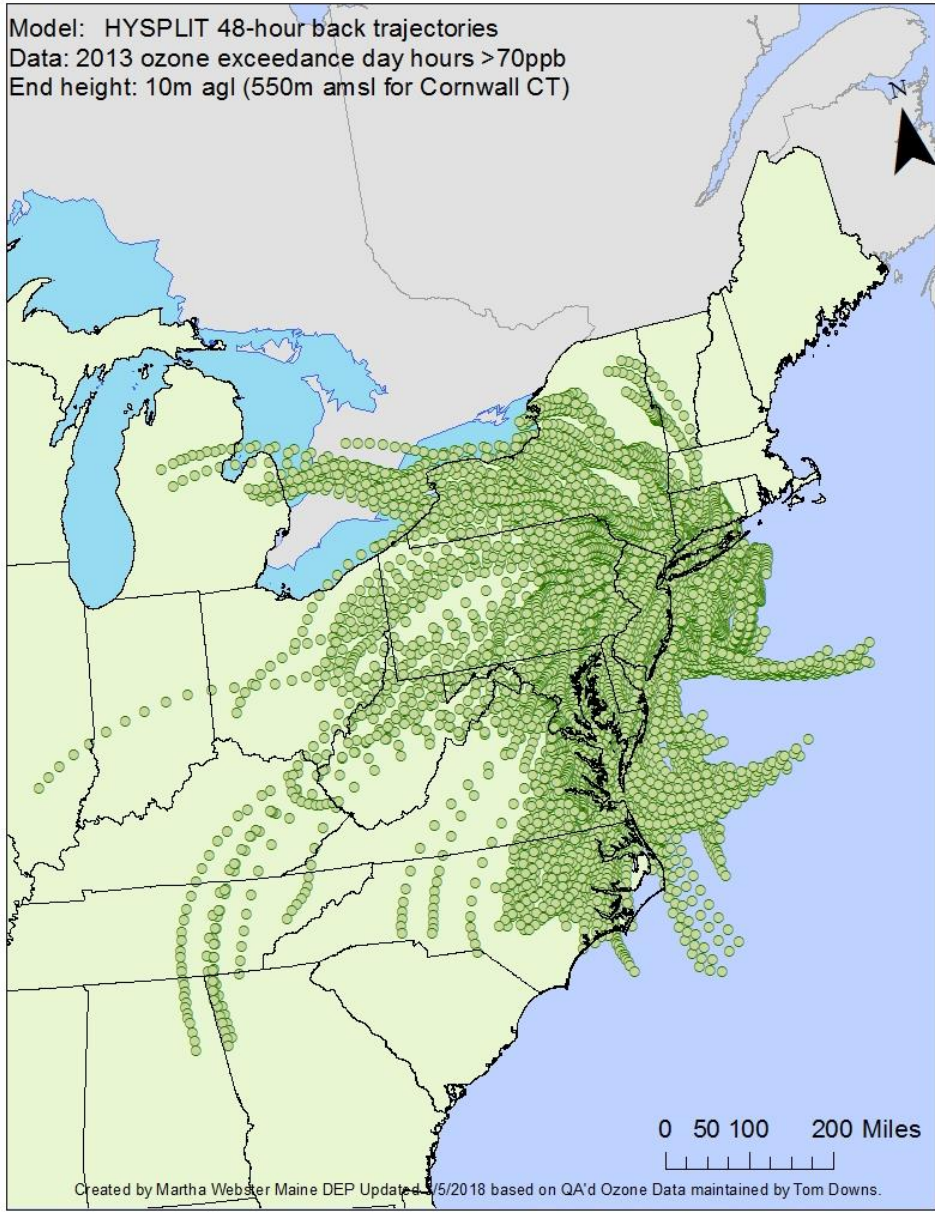
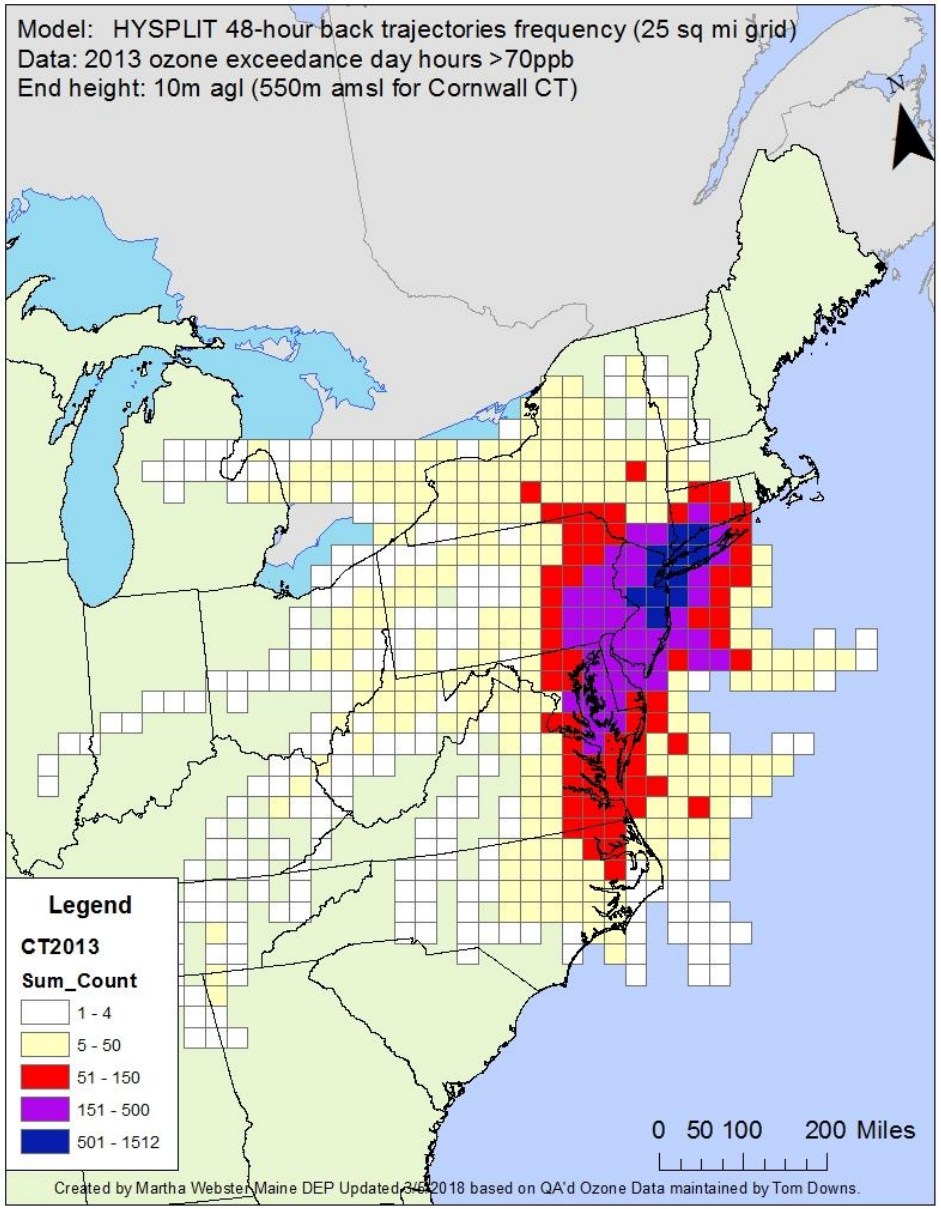
Maine Ozone Exceedances For 2013 - 2017 Ozone Seasons

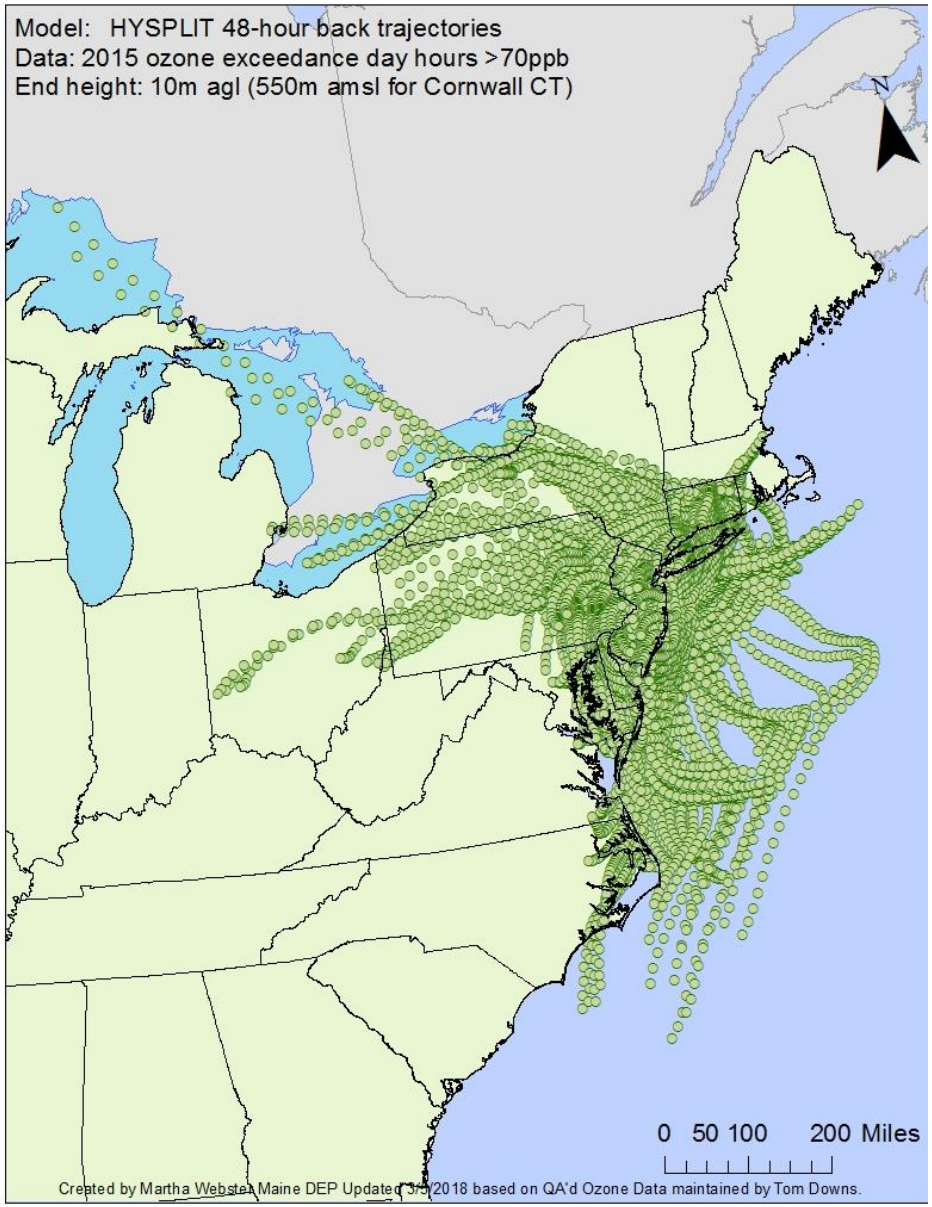


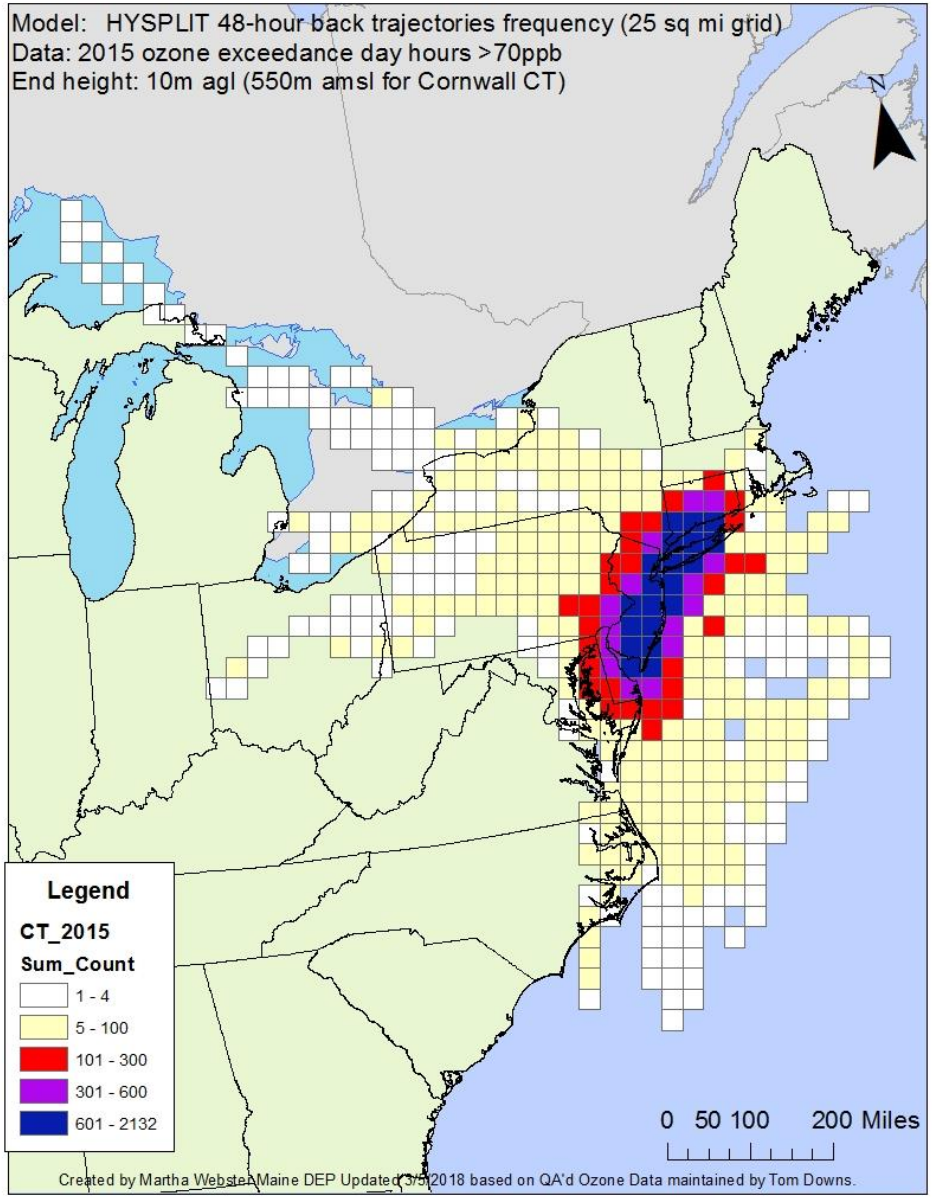
Maine Ozone Exceedances 2013 - 2017




Model: HYSPLIT 48-hour back trajectories
Data: 2013 ozone exceedance day hours >70ppb
End height: 10m agl (550m amsl for Cornwall CT)
N
0 50 100 200 Miles
Created by Martha Webster Maine DEP Updated 3/5/2018 based on QA'd Ozone Data maintained by Tom Downs.


Model: HYSPLIT 48-hour back trajectories frequency (25 sq mi grid)
Data: 2013 ozone exceedance day hours >70ppb
End height: 10m agl (550m amsl for Cornwall CT)
N
Legend
CT2013
Sum_Count
1 - 4
5 - 50
51 - 150
151 - 500
501 - 1512
0 50 100 200 Miles
Created by Martha Webster Maine DEP Updated 3/5/2018 based on QA'd Ozone Data maintained by Tom Downs.


Model: HYSPLIT 48-hour back trajectories
Data: 2015 ozone exceedance day hours >70ppb
End height: 10m agl (550m amsl for Cornwall CT)
N
0 50 100 200 Miles
Created by Martha Webster Maine DEP Updated 3/5/2018 based on QA'd Ozone Data maintained by Tom Downs.


Model: HYSPLIT 48-hour back trajectories frequency (25 sq mi grid)
Data: 2015 ozone exceedance day hours >70ppb
End height: 10m agl (550m amsl for Cornwall CT)
N
Legend
CT_2015
Sum_Count
1 - 4
5 - 100
101 - 300
301 - 600
601 - 2132
0 50 100 200 Miles
Created by Martha Webster Maine DEP Updated 3/5/2018 based on QA'd Ozone Data maintained by Tom Downs.

Opportunities

- Ozone Transport Commission Ideas
- New Jersey Ideas to Consider
- Maryland Ideas to Consider
- New York Ideas to Consider
- Connecticut Petitions to Consider
- Kentucky's Solutions to Adopt

Mobile Source Ideas

- New Car Replacement Program
- CA Car Program
- Aftermarket Catalytic Converter Program

Current Situation

- EPA and CARB AMCC requirements increasingly divergent
  - EPA still 70% HC & CO, 30% NOx at 25k miles
    - No requirement to conform to higher emission tiers
    - No requirement for MIL (check engine light) compatibility
  - CARB typically 90% efficient at 50k miles
    - Required to meet gm/mi limit correlated to OE standard
    - Different limits for each tier (LEV, ULEV, SULEV, etc.)
    - Complies with MIL requirements
  - Result in radically different performance levels

Industry Proposition

- Major aftermarket manufacturers, working with Auto Care & MECA, proposed replacement of EPA converter regulations
- Goals
  - Provide other states with California levels of performance & warranty w/o administrative burden of CARB
  - Provide consistent requirements across all states and all OE emission types
  - Standardized product technology EPA vs. CARB

Key Objectives

- Standardized emission requirements
- Provides California equivalent parts for Federal Emission vehicles
- Increase warranty to 5 years/50,000 miles (from 25,000 miles).
- Provides for periodic in-field compliance testing of approved aftermarket converters to ensure compliance and quality.

Critical Components

- Field surveillance program for parts being sold (3rd party)
  - Assures manufacturer production matches certification

Support?

- OTC has been promoting change
- Could be significant ozone benefits
- Resulting Reductions could make Good Neighbor SIPs easier
- Maine implementing CA aftermarket catalyst program
- Thanks for Listening

Contact:

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www.maine.gov/dep