

# MANE-VU Technical Support Committee Update

**OTC/MANE-VU Fall Meeting: November 15, 2017**

**Washington, DC**

# Overview

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1. Action Plan & Schedule Updates
2. Monitoring Data
3. Selections of States
4. MANE-VU Ask
5. Winter EGU NO<sub>x</sub> Analysis
6. HEDD Visibility Analysis
7. Modeling Plan

# Regional Haze SIP 2<sup>nd</sup> Planning Period - Schedule

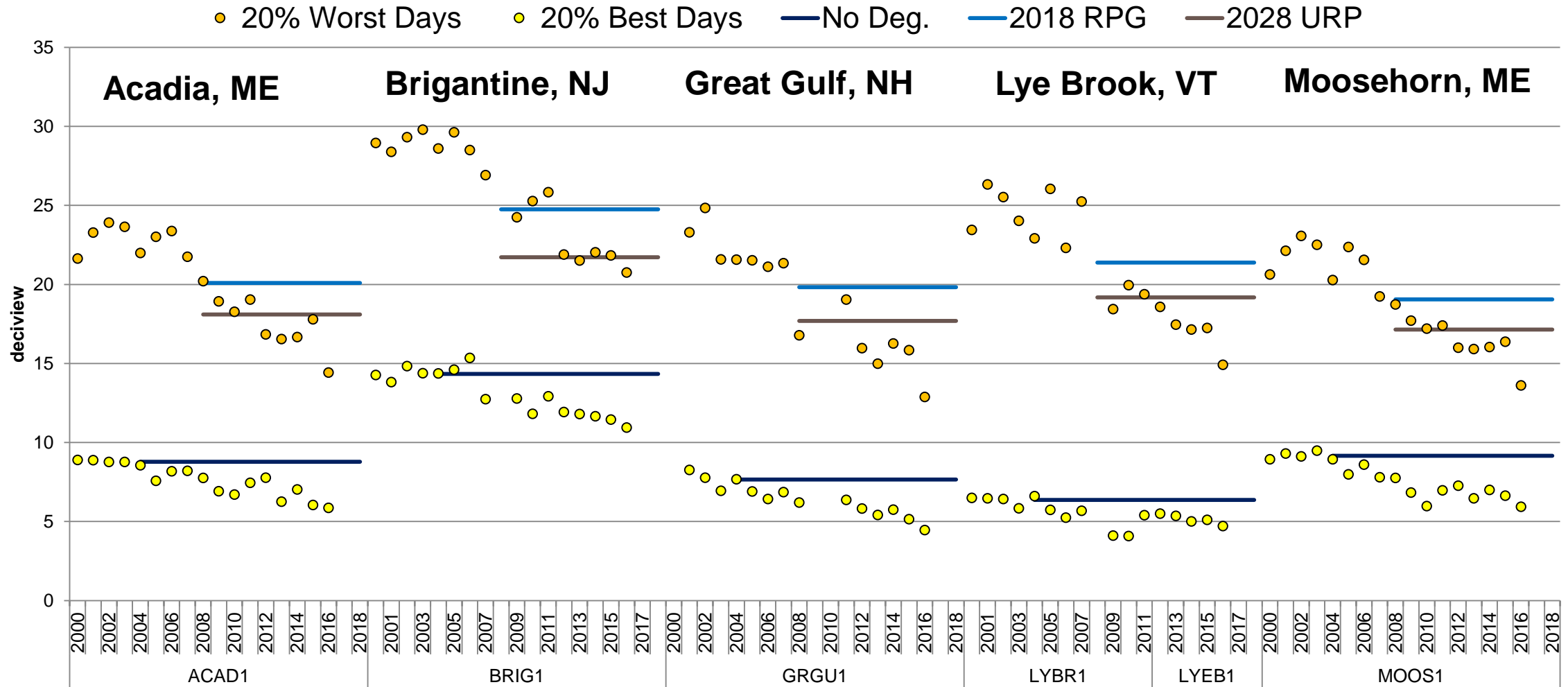
<b>IMPROVE Data Analysis</b>	<ul style="list-style-type: none"> <li>• Decisions on Methods</li> <li>• Calculations, QA, and TSD</li> </ul>	<p>Complete</p> <p>Complete (in Back Traj. Report)</p>
<b>Inventory Development &amp; Analysis</b>	<ul style="list-style-type: none"> <li>• 2011/2028 Alpha 2 &amp; TSD</li> <li>• Emissions Trends Analysis</li> </ul>	<p>Complete</p> <p>Spring 2018</p>
<b>Modeling</b>	<ul style="list-style-type: none"> <li>• 2011 Base Case Modeling</li> <li>• 2028 Base Case Modeling</li> <li>• 2028 Control Case Modeling</li> <li>• Document Modeling Platform and Results</li> </ul>	<p>Complete</p> <p>Complete</p> <p>Winter 2018</p> <p>Complete (Except Control Case)</p>
<b>Four-Factor Analysis/Contribution Assessment</b>	<ul style="list-style-type: none"> <li>• Qc/d</li> <li>• CALPUFF Assessment</li> <li>• Back Trajectory &amp; IMPROVE Data Analysis</li> <li>• 4-Factor Data Collection</li> <li>• HEDD Analysis</li> <li>• Winter EGU NOX Control</li> <li>• Synthesize Assessments</li> </ul>	<p>Complete</p> <p>Complete</p> <p>Complete</p> <p>Complete</p> <p>Fall 2017</p> <p>Fall 2017</p> <p>Complete</p>
<b>Updating RPGs</b>	<ul style="list-style-type: none"> <li>• Draft RPGs and Document</li> </ul>	<p>Winter 2018</p>
<b>Consultation</b>	<ul style="list-style-type: none"> <li>• Establish Consultation Process</li> <li>• Intra-RPO Consultation</li> <li>• Inter-RPO Consultation</li> </ul>	<p>Complete</p> <p>Complete (Except Documentation)</p> <p>Fall 2017</p>
<b>SIP Submission</b>	<ul style="list-style-type: none"> <li>• SIP Submission</li> <li>• Rule Adoption</li> </ul>	<p>Summer 2018</p> <p>2018</p>

# Why Target July 2018 SIP Submittal?

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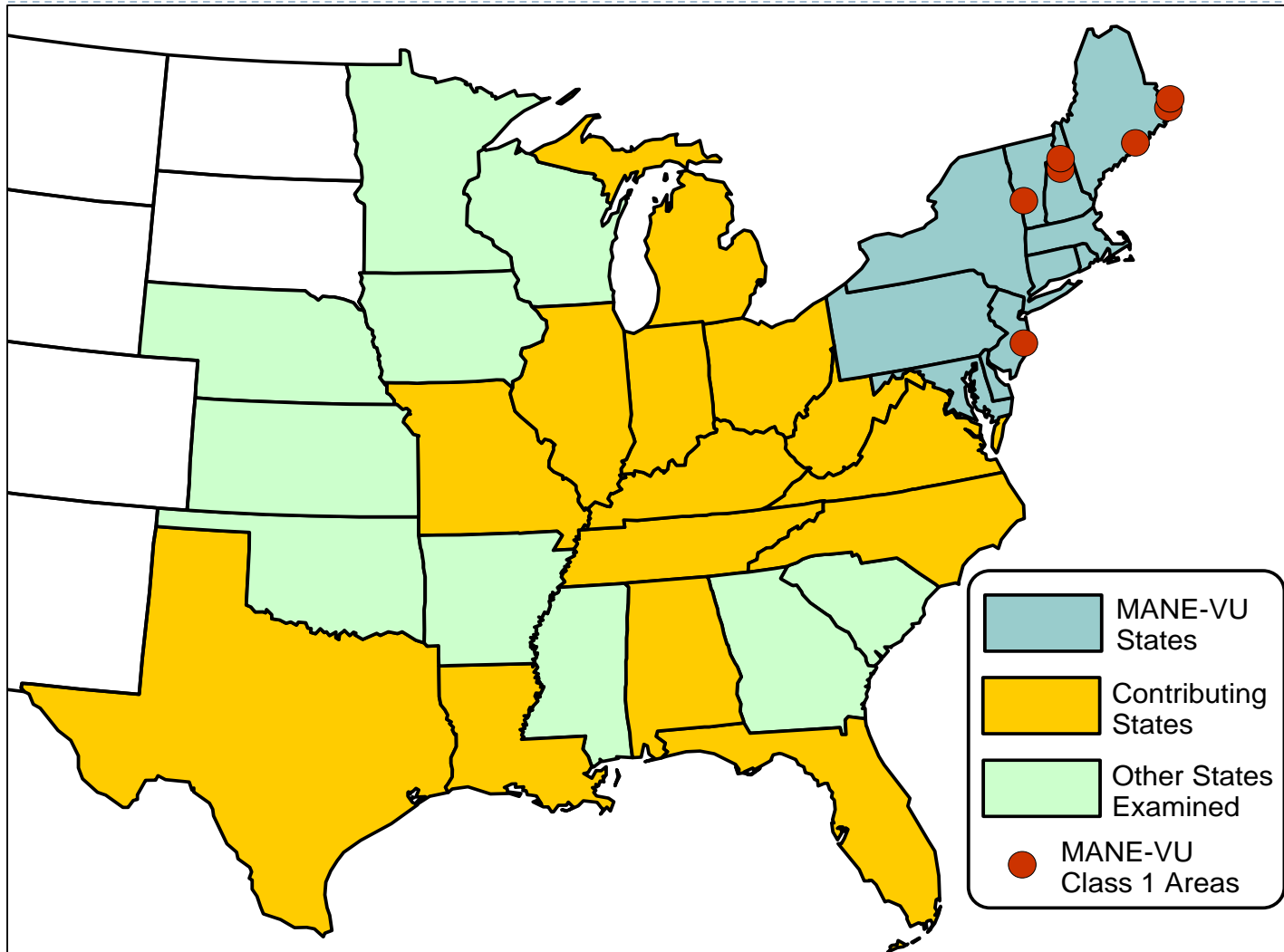
- ▶ In 2016 EPA finalized updated Regional Haze regulations
  - ▶ SIP deadline was extended to 2021
- ▶ Why not wait?
  - ▶ OTC developed a 2011-based SIP quality modeling platform for states in nonattainment of the 2008 ozone NAAQS
  - ▶ MANE-VU Air Directors agreed that 2011 should also be used for regional haze modeling rather than develop an entirely new modeling platform
    - ▶ EPA has all but said 2011 based work would not be acceptable for SIPs targeting a 2021 submittal date, but would be acceptable for 2018 submittals
    - ▶ State resources and Federal funding issues needed to be considered
      - 50-70% of the work completed was done using Federal money rolled over from first planning period
      - EPA will not be providing additional funding for work
      - States contribute to MANE-VU, but not at a level to redo all of the completed work
  - ▶ EPA's not yet finalized draft guidance called for far more extensive analyses than we think is necessary

# Visibility is Improving and the Class I Areas can meet RPGs



Progress at Monitored Class I States in MANE-VU using 20% Worst Day IMPROVE Algorithm

# MANE-VU Is Consulting with the Contributing States



Estimated which states contribute more to visibility impairment than others

Contributing States:

1. Contributed  $\geq 2\%$  to any Class I Area
2. Contributed  $\geq 1\%$  weight by mass averaged using the four techniques

Updated based on comments from upwind states and environmental groups

- Analyses now based on 2015 data or 2011 data adjusted to 2015
- Excluded states that didn't contribute much mass
- Used state-wide Q/d so mobile and area sources are considered
- Didn't consider Texas CALPUFF results due to locations outside of the domain (but did include Texas Q/d data)

# MANE-VU Consultation Plan

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## ▶ State consultation

### ✓ Phase 1: Intra-RPO consultation

- ▶ MANE-VU states, tribes, EPA, and FLMs
- ▶ Ask signed on August 25, 2017

### ▶ Phase 2: Inter-RPO consultation

- ▶ Began October 20, 2017
- ▶ Between MANE-VU and contributing states, as identified using weighted contribution analysis
- ▶ By webinar, following intra-RPO consultation
- ▶ Facilitates consultation between contributing states and affected Class I states

## ▶ FLM consultation

- ▶ Invited to intra- and inter-RPO consultations, and special FLM webinars

# MANE-VU “Ask”

Signed August 25, 2017

## MANE-VU States:

- Ensure effective use of installed controls on EGUs ( $\geq 25$  MW) year-round
- 4-factor analysis for most important sources ( $> 3\text{Mm}^{-1}$  extinction)
- Complete 2007 low sulfur fuel oil rule
- Update permits and/or rules to reflect already achieved rates for  $\text{SO}_2$ ,  $\text{NO}_x$ , and  $\text{PM}_{2.5}$
- Strive to meet particular  $\text{NO}_x$  emissions standards or perform 4-factor analysis on HEDD units
- Increase energy efficiency and implement CHP or other DG

## Upwind States:

- Ensure effective use of installed controls on EGUs ( $\geq 25$  MW) year-round
- 4-factor analysis for most important sources ( $> 3\text{Mm}^{-1}$  extinction)
- Complete 2007 low sulfur fuel oil rule
- Update permits and/or rules to reflect already achieved rates for  $\text{SO}_2$ ,  $\text{NO}_x$ , and  $\text{PM}_{2.5}$
- Increase energy efficiency and implement CHP or other DG

## FLMs/EPA:

- FLMs consult with MANE-VU Class I States when scheduling prescribed burns
- EPA develop measures that will further reduce emissions from heavy-duty onroad vehicles
- EPA ensure that Class I Area state “Asks” are addressed in “contributing” state SIPs prior to approval

▶ Including the Ask in photochemical modeling underway

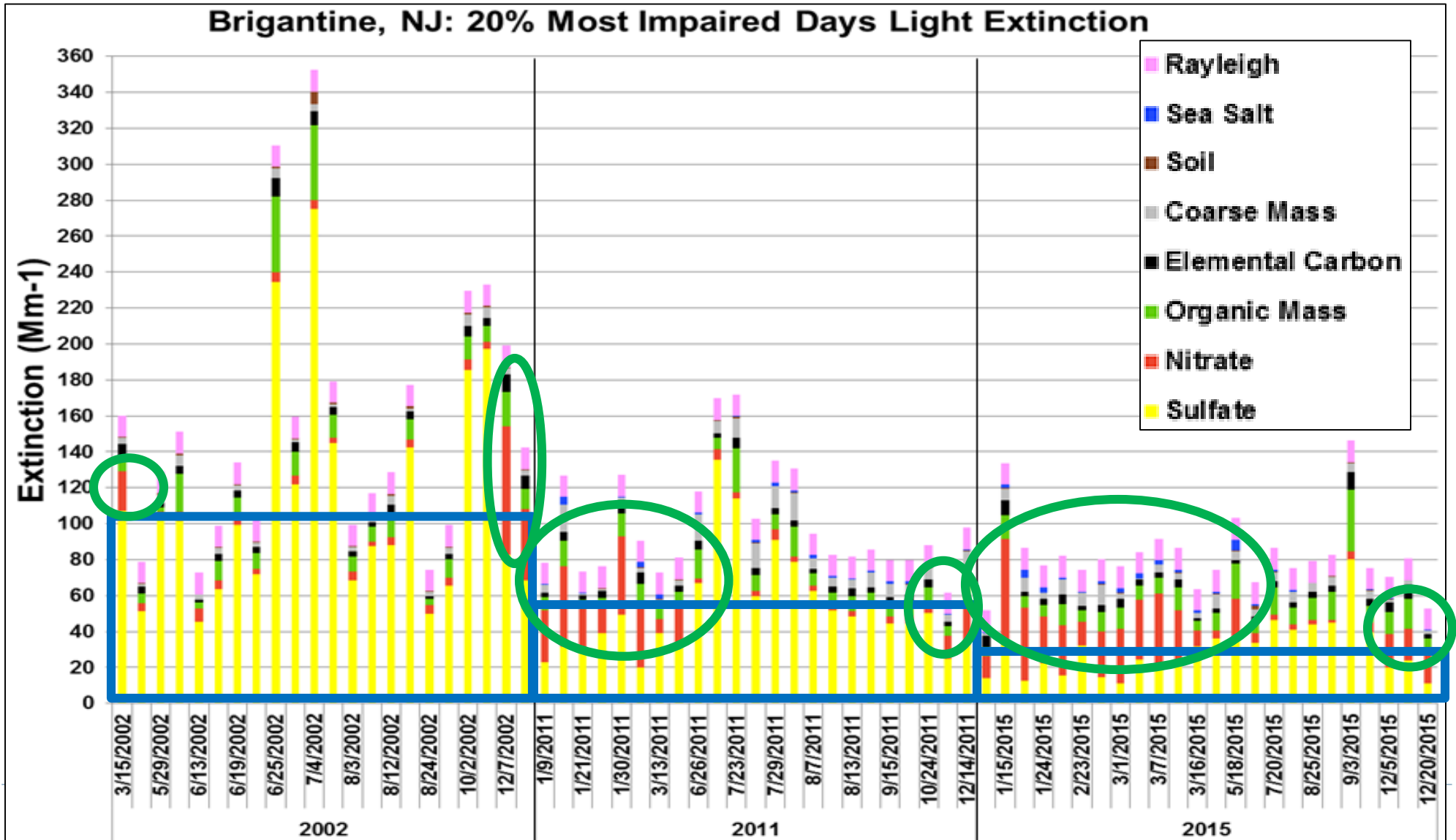


# Why Look at Winter NO<sub>x</sub> & EGUs?

Winter days are often more impaired by Nitrate, especially at Brigantine

Percent of summer sulfate on most impaired days decreases

Percent of Nitrate on most impaired days increases

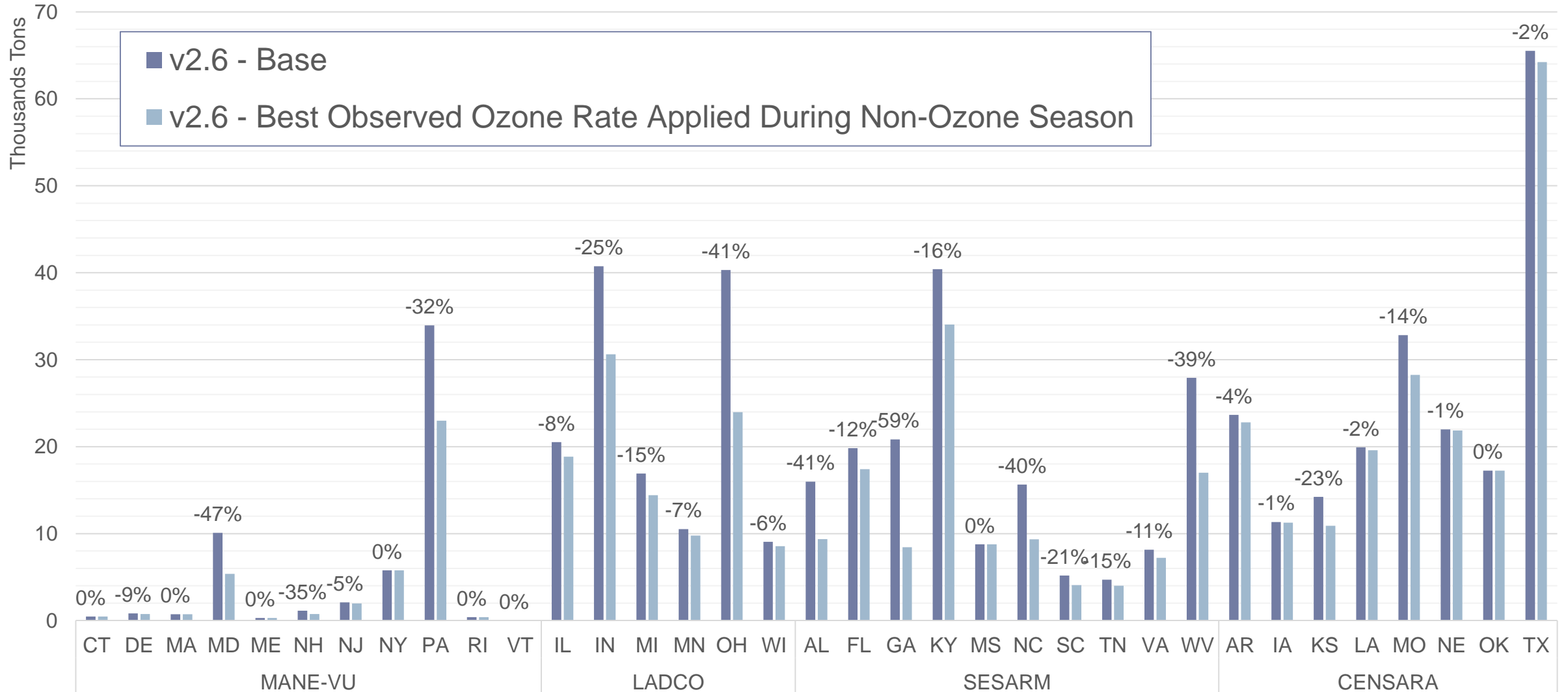


# Why Look at Winter NO<sub>x</sub> & EGUs? (continued)

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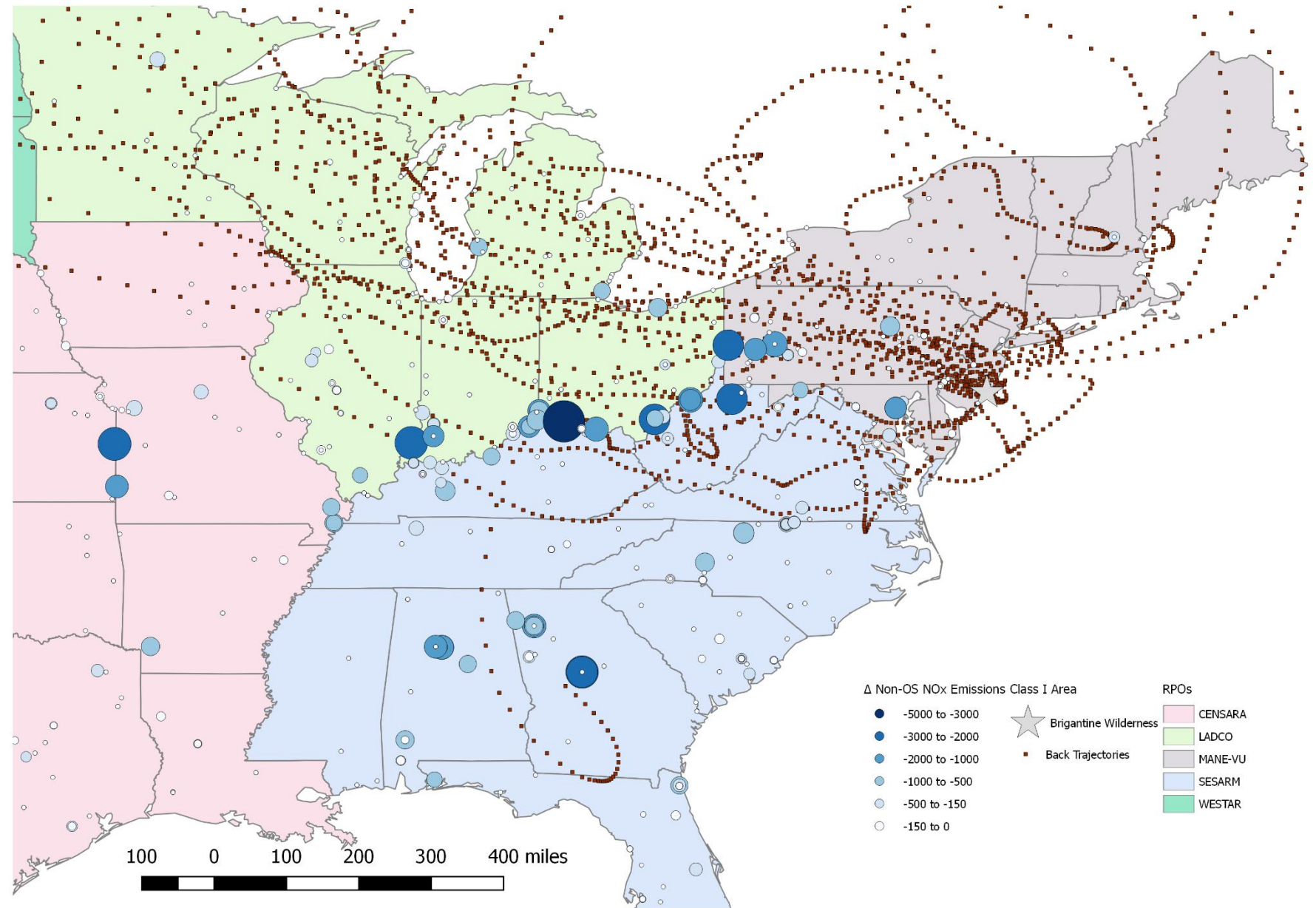
- ▶ 2011 and 2018 inventories show EGUs are the second highest emitter of NO<sub>x</sub>
- ▶ EPA haze modeling points to point sources as having a high impact
- ▶ Best observed rates (BORs) for NO<sub>x</sub> have been shown in CAMD data from 2002-2015
  
- ▶ Didn't focus on mobile sources which do have a large overall contribution for the following reasons:
  - ▶ States have more regulatory authority over effective NO<sub>x</sub> controls from EGUs
  - ▶ Mobile sources emit close to ground level, which leads to less mixing, secondary particle formations, and transport
  - ▶ Running existing controls on EGUs has been found to be possibly the most cost effective way to control NO<sub>x</sub> emissions.
    - ▶ EPA found the following costs to restart idled NO<sub>x</sub> controls
      - SCR - \$1,400 per ton
      - SNCR - \$3,400 per ton
  
- ▶ For all of these reasons focusing on running controls on EGUs to reduce the impact of nitrates on visibility impairment during the colder months a reasonable approach that should be considered.

# Running Controls Reduces Non-Ozone Season NO<sub>x</sub> Emissions



# Air Masses flow from areas with High Potential for Winter NO<sub>x</sub> Reduction in MANE-VU & LADCO

- Δ Non-Ozone Season NO<sub>x</sub> Emissions (tons) at EGUs
- Back Trajectories from Brigantine
  - Winter Days in 2011 & 2015
  - More impairment from Nitrates



# Winter NO<sub>x</sub> & EGUs: Stakeholder Comment & Finalization

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- ▶ Received comment from MOG
  - ▶ Mostly focused on concerns with the MANE-VU haze planning approach beyond this paper
    - ▶ Submitting in 2018, we're already below 2028 URP, need to consider mobile sources, international emissions
  - ▶ Specific concerns with the analysis:
    - ▶ Reduced NO<sub>x</sub> emissions have not led to similar improvements in Nitrates
    - ▶ SCRs degrade over time so achieving BORs is unrealistic
    - ▶ Didn't consider the need to conduct maintenance on units
    - ▶ Some units use SCRs for Mercury control so one can't assume they can achieve BORs
    - ▶ Coal units don't act as base loaded and the new operating patterns aren't conducive to achieving BORs
  - ▶ Workgroup updated document in response to comments addressing concerns specific to the analysis
    - ▶ Many concerns had already been addressed in the data, just not specified in the narrative

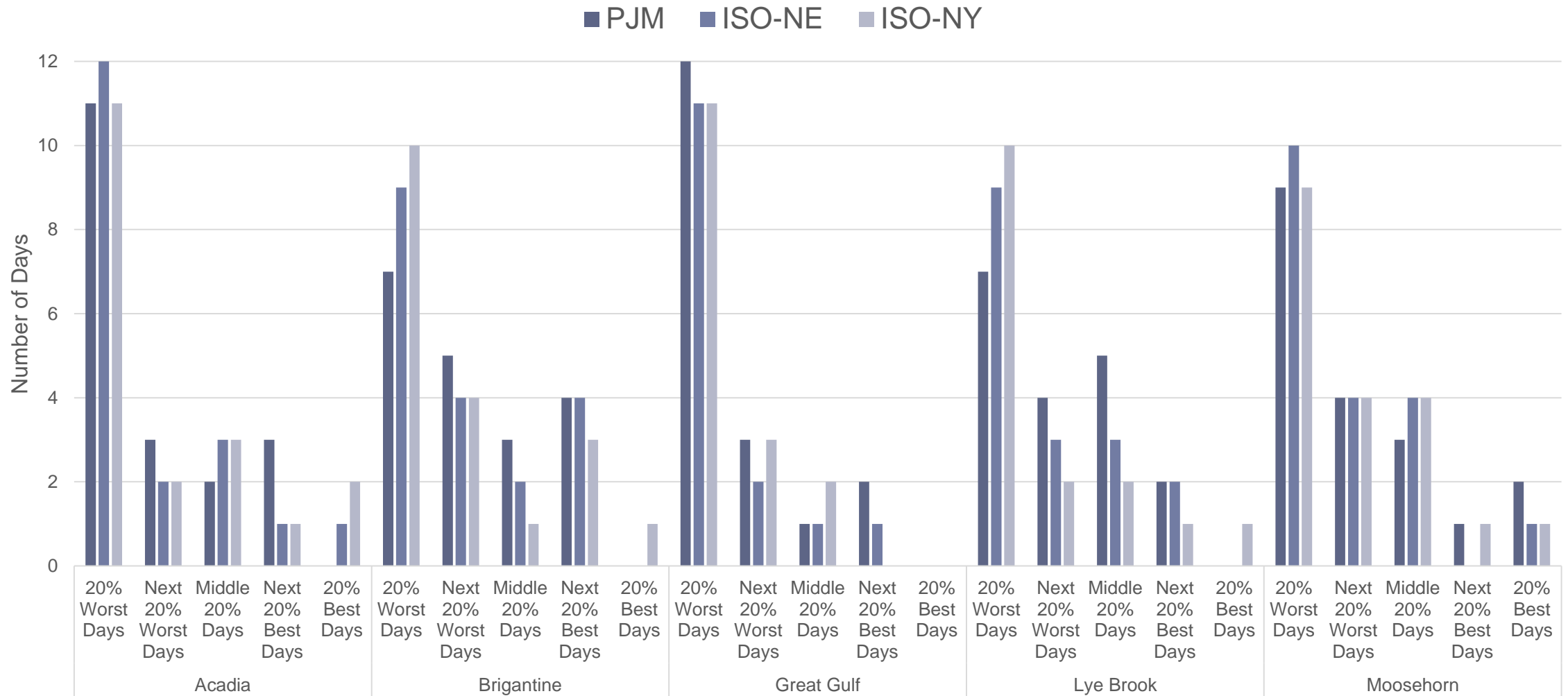
Final Document to be posted on MANE-VU Website

## HEDD and Visibility Analysis

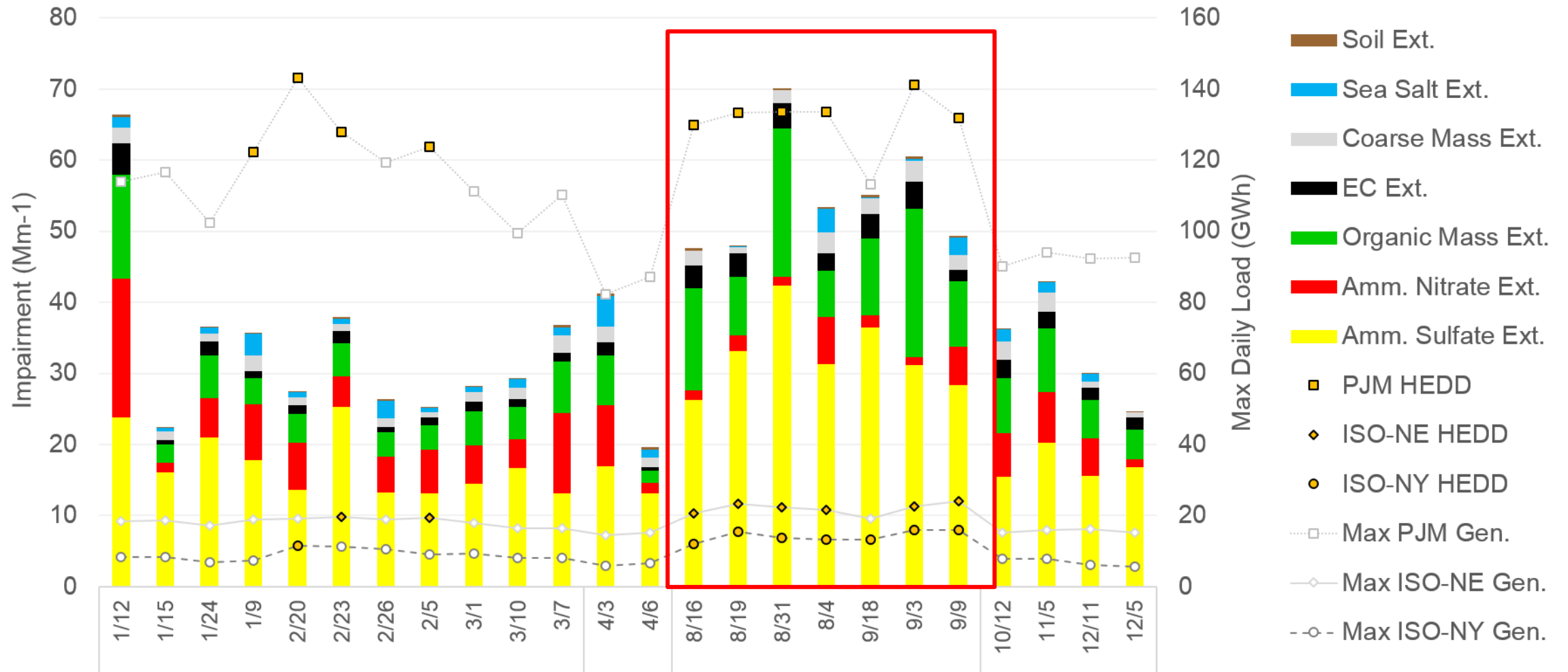
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- ▶ Goal is to determine what relationship exists between HEDDs and visibility impairment
- ▶ Looked at 2015 maximum daily load data from ISO NE, ISO NY, and PJM
- ▶ Used the 85<sup>th</sup> percentile in terms of generation as the definition of HEDD
- ▶ Compared HEDDs to visibility impairment and back trajectories
- ▶ No notable difference between 85 percentile of load and 85 percentile of load on days monitored by IMPROVE
  
- ▶ Draft ready for public comment: feedback due to [jjakuta@otcair.org](mailto:jjakuta@otcair.org) by 12/15/2017

# More HEDDs During Days with Worst Visibility

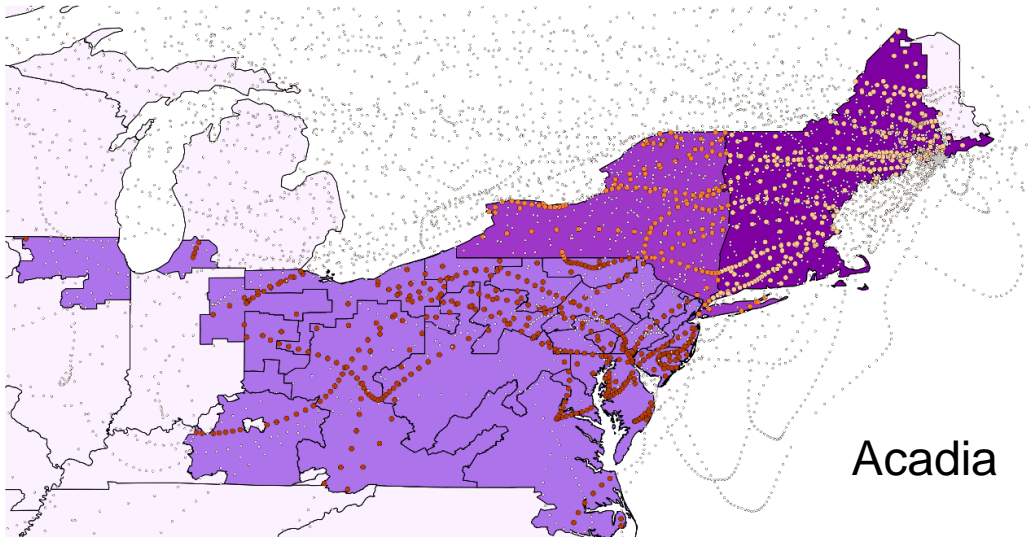


# HEDDs Occur During Summer Days with Poor Visibility (Acadia example)

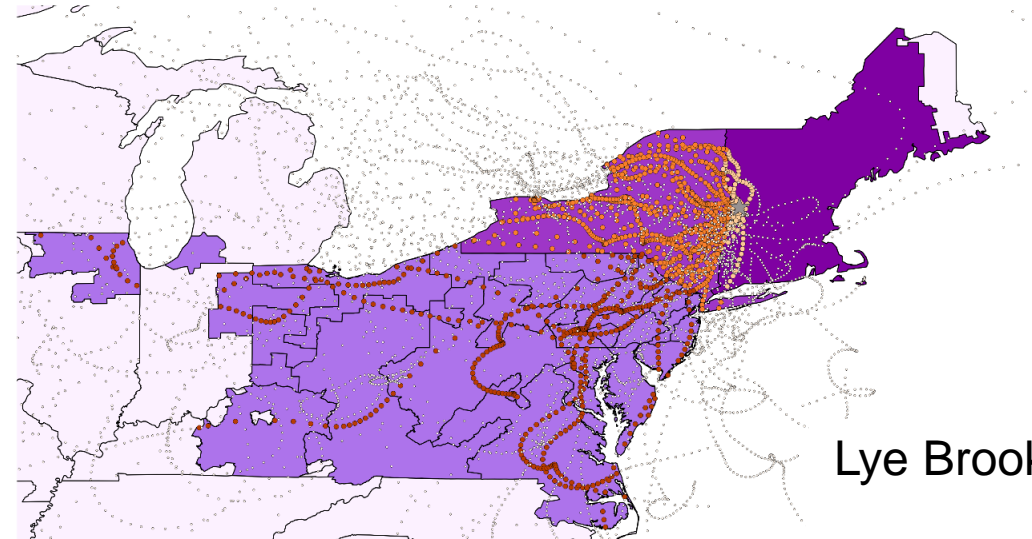




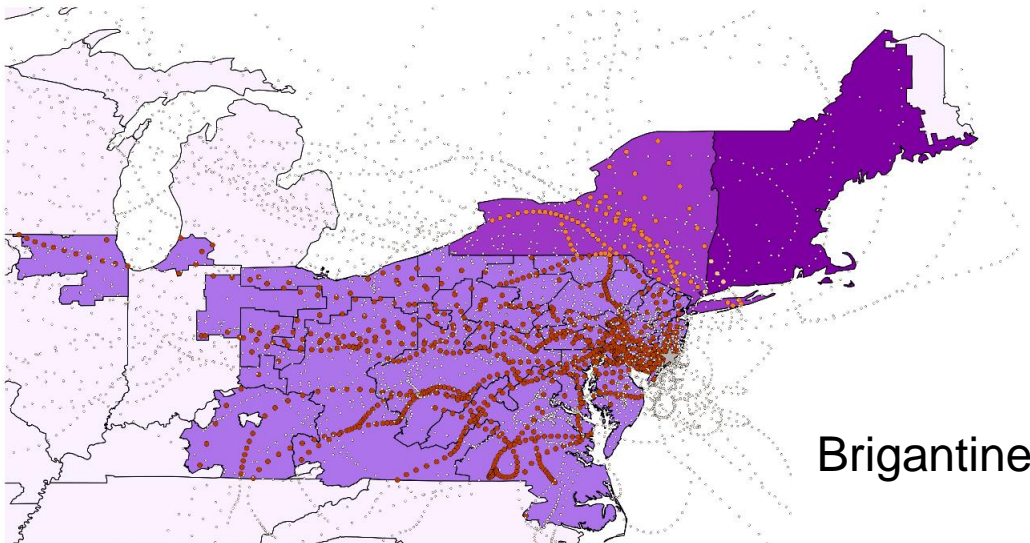
# Air Masses Come from ISOs Experiencing HEDDs



Acadia



Lye Brook



Brigantine

## Back Trajectories ISOs

- ISO NE
- ISO NY
- PJM
- ISO NE
- ISO NY
- PJM

72-hour back trajectories at 3 AM & PM and 9 AM & PM from during 20% Most Impaired Days that were HEDDs in one analyzed ISO at 500m

# HEDD and Visibility Summary

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## ▶ Relationship

- ▶ Relationships between HEDDs and worst visibility impairment
  - ▶ Appears to be a relationship during summer months
  - ▶ Does not appear to be a relationship during winter months
- ▶ HEDDs are rare to occur on days with good visibility
- ▶ Even if every HEDD doesn't lead to visibility impairment, some clearly do and those emissions need to be controlled in order to eliminate man-made visibility in MANE-VU Class I Areas

## In Summary

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- ▶ Nearing completion of 2<sup>nd</sup> Planning Period Regional Haze SIP work
- ▶ Selection of States report is final on [otcair.org/mane-vu](http://otcair.org/mane-vu) [Publications: Reports & Technical Materials]
- ▶ The “ask” is final for the 2<sup>nd</sup> Planning Period
- ▶ Inter-RPO consultation has begun
- ▶ Running NO<sub>x</sub> controls on EGUs during the winter is a cost effective, reasonable approach to improving visibility
- ▶ Analysis shows a correlation between HEDDs and visibility degradation during the summer
- ▶ Inventory development for modeling is beginning