MANE-VU Regional Haze Planning
Application & Coordination of Regional Modeling for Setting Reasonable Progress Goals

Round 2 Regional Haze Planning Workshop
December 7, 2017
Denver, CO

Overview

1. Identification of most pertinent haze causing pollutants at regional Class I Areas

2. Identification of contributing states for these pollutants
   - Identification of major induvial emission sources

3. Consult with contributing states
   - Discuss what's needed to achieve Rate of Progress requirements
   - Discuss additional reasonable measures

4. Develop Reasonable Progress Goal emission inventory projection for 2028
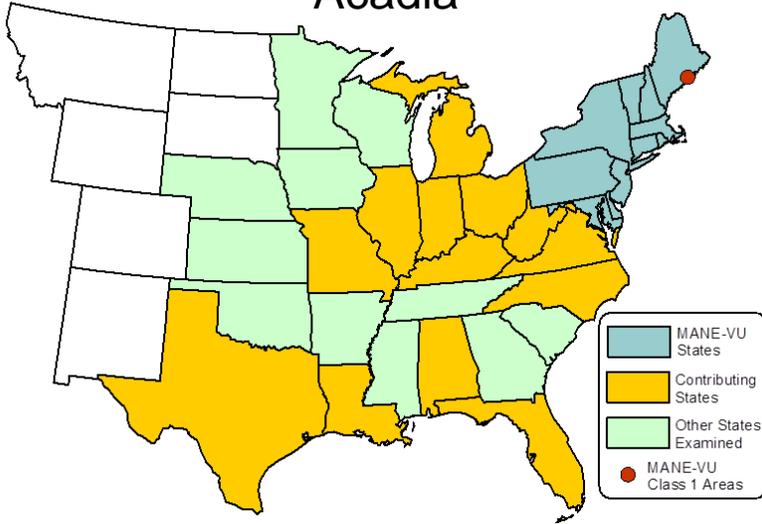
Identification of Contributing States
Revised Weighted Contribution Assessment

▸ Estimated which states contribute more to visibility impairment than others

  ▸ Used CALPUFF on point emission sources (2015 emissions for EGUs, 2011 for industrial)

  ▸ Used modified Q/d for all state emission sources (2015 emissions)

  ▸ Used a 2% (Nitrate + Sulfate) contribution threshold for each Class I Area

▸ Examined trajectories for each regional Class I area on 20% most impaired visibility days as a Quality Assurance check

▸ Updated analyses based on comments received

Identification of Contributing States
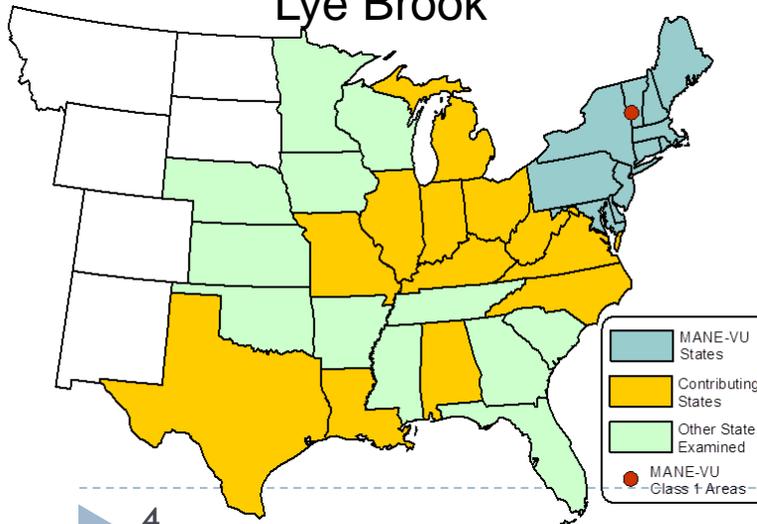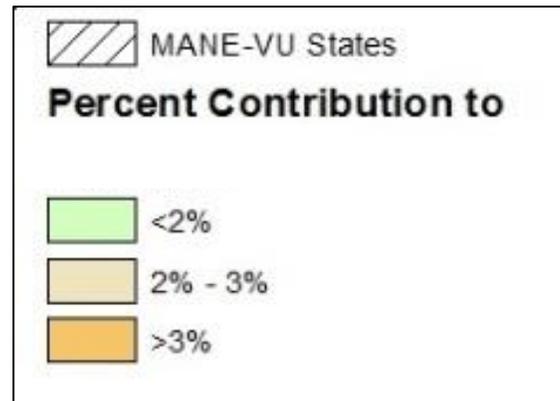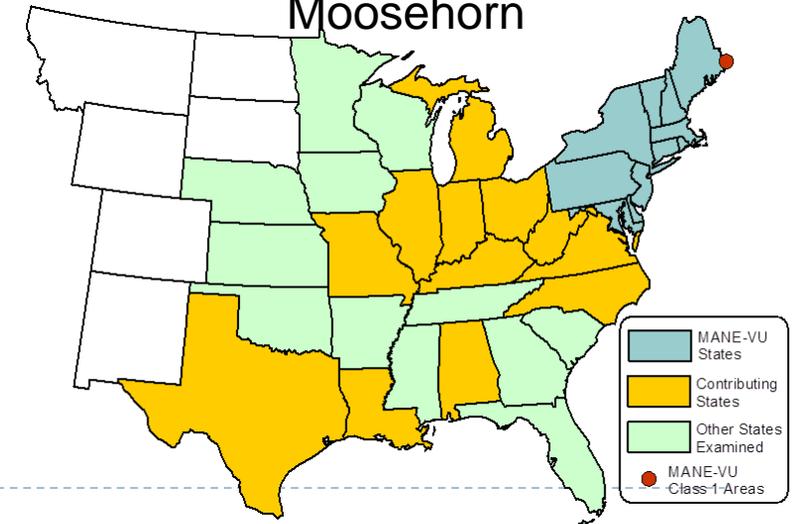# Weighted Contribution Assessment: Impact by Class I Area

Identification of Contributing States
# Weighted Contribution Assessment: Maximum Contribution

Identification of Contributing Emission Sources

- Started with 5 largest emitting EGUs in each state located within modeling domain based on 2011 CAMD emissions
  - Added other large emitting EGUs
  - 2015 actual 95th percentile CAMD emissions
- Industrial sources of size similar to large EGUs based on 2011 typical emissions
  - Smaller industrial sources added where they were close enough to a Class I area to potentially impact it based on Q/d
- Sources with the modeled potential for $3Mm^{-1}$ of visibility impact were selected for states to perform 4-factor analyses for appropriateness of emission remediation

Identification of Contributing Sources (Point Emission Sources Modeled)

EGU's (95th percentile actual daily emissions)

Industrial (typical daily emissions)
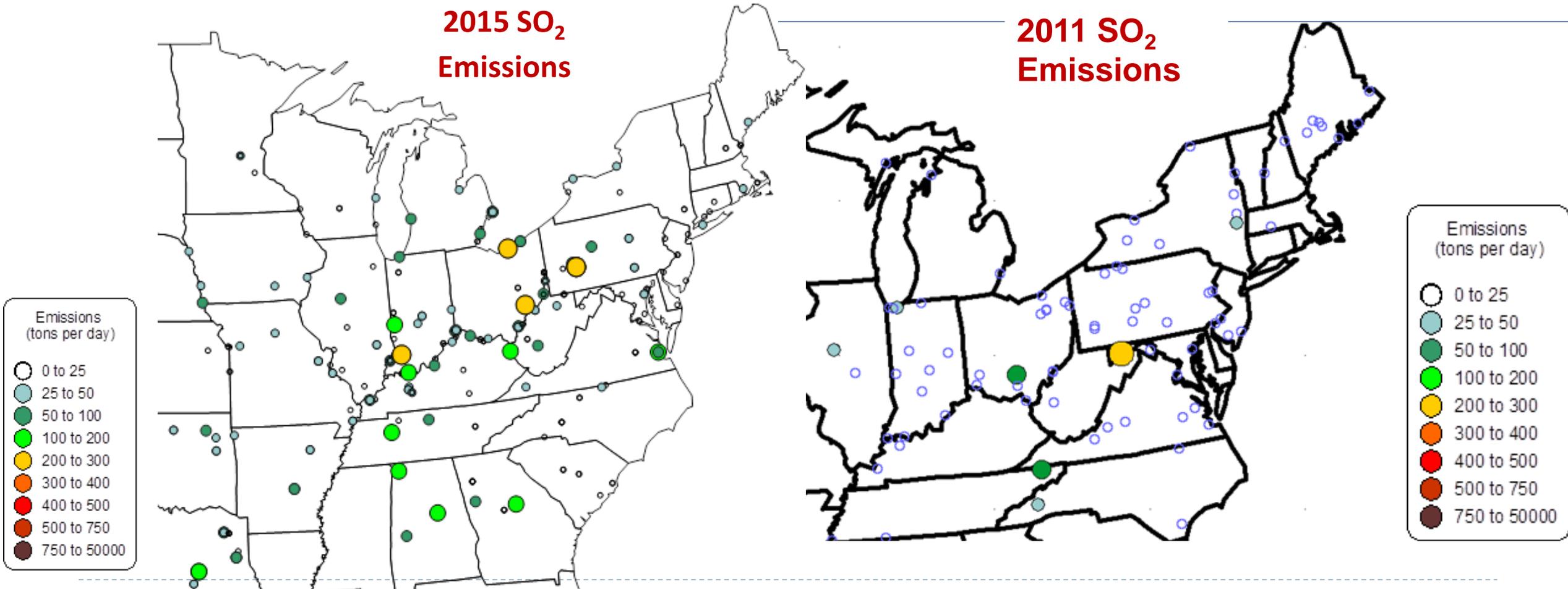
Development of the MANE-VU "Asks"

▶ "Asks" adopted by MANE-VU August 25, 2017

1. "Intra-RPO Ask"
   ▶ Requests reasonable emission measures to be addressed in state SIPs and implemented by 2028
   ▶ Measures more stringent in some cases than those included in the "Inter-RPO Ask"

2. "Inter-RPO Ask"
   ▶ Requests what MANE-VU found to be potentially reasonable emission measures to be addressed in state SIPs and implemented by 2028
   ▶ Understands other regions may plan to submit SIPs later than the MANE-VU states
     ▶ Benefit in allowing states more time to pursue measures included in the "MANE-VU Ask"

3. "EPA and FLM Ask"
   ▶ Requests assistance and help with emission measures outside of the control of MANE-VU states

# Development of Modeling Emission Inventory (Adding the "Ask")

Including Emission Reductions

- Year Round NO_X Controls
- High Impairment Sources
- Low-Sulfur Fuel Oil
- HEDD Units (MANE-VU only)
- EPA. Heavy-duty NO_X Standards

Not Including Emission Reductions

- Permit Updates
- Combined Heat/Power, Distributed Generation
- FLMs. Prescribed Burns

Recognize that some states may offer equivalent alternatives
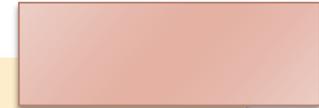
Notes:

- 2028 is a long way to project emission inventories
- Major progress since the 2008 regional haze SIPs were submitted cannot be credited to those SIPs
  - Economic decisions drove emission changes as a result of:
    - Cheaper and more plentiful natural gas
    - MACT/MATS Rules
    - Clean Power Plan
  - Some of these achieved benefits are not locked-in

Accounting for Emissions: Controllable and Uncontrollable

▶ **What we know that we know:**

  ▶ Most know man-made emissions from sources with emissions monitors

  ▶ We have good estimates of other U.S. and Canadian man-made emissions based on modeling and emission factor information

  ▶ We can develop reasonable estimates for many uncontrollable emissions such as current or past wild-fires within our modeling domain

  ▶ Our photochemical models do a pretty reasonable job replicating past episodes

Accounting for Emissions: Controllable and Uncontrollable

- **What we know that we don't know:**
    - Economic and political drivers in future years
    - International emissions, especially in future years
    - Weather patterns in the future:
        - Changes could lead to unanticipated emissions changes and pollution transport patterns
    - Our models may be a little weak in replicating aloft air pollution and there is little data to support efforts to improve performance
- **What we don't know that we don't know:**
    - I don't know, but I'm sure there is something