EMISSIONS INVENTORY UPDATE

Briefing for OTC Committees and
Stakeholder Meeting
September 13, 2012
Washington, DC
Julie McDill & Susan Wierman

Preparing a regional modeling inventory

Select **years**

Gather information from states, EPA, other regions, & Canada

Adjust & adapt information

Run **emissions models** for base year (MOVES, NONROAD, CMU Ammonia, ERTAC)

**Project** the inventory to future years

- Apply growth/control factors for non-EGU point and area
- Run emissions models for on-road, non-road, and EGU
- Adjust base inventory to create "what if" scenarios

QA/QC

Convert files to ORL format and **run SMOKE** to create gridded hourly inventory
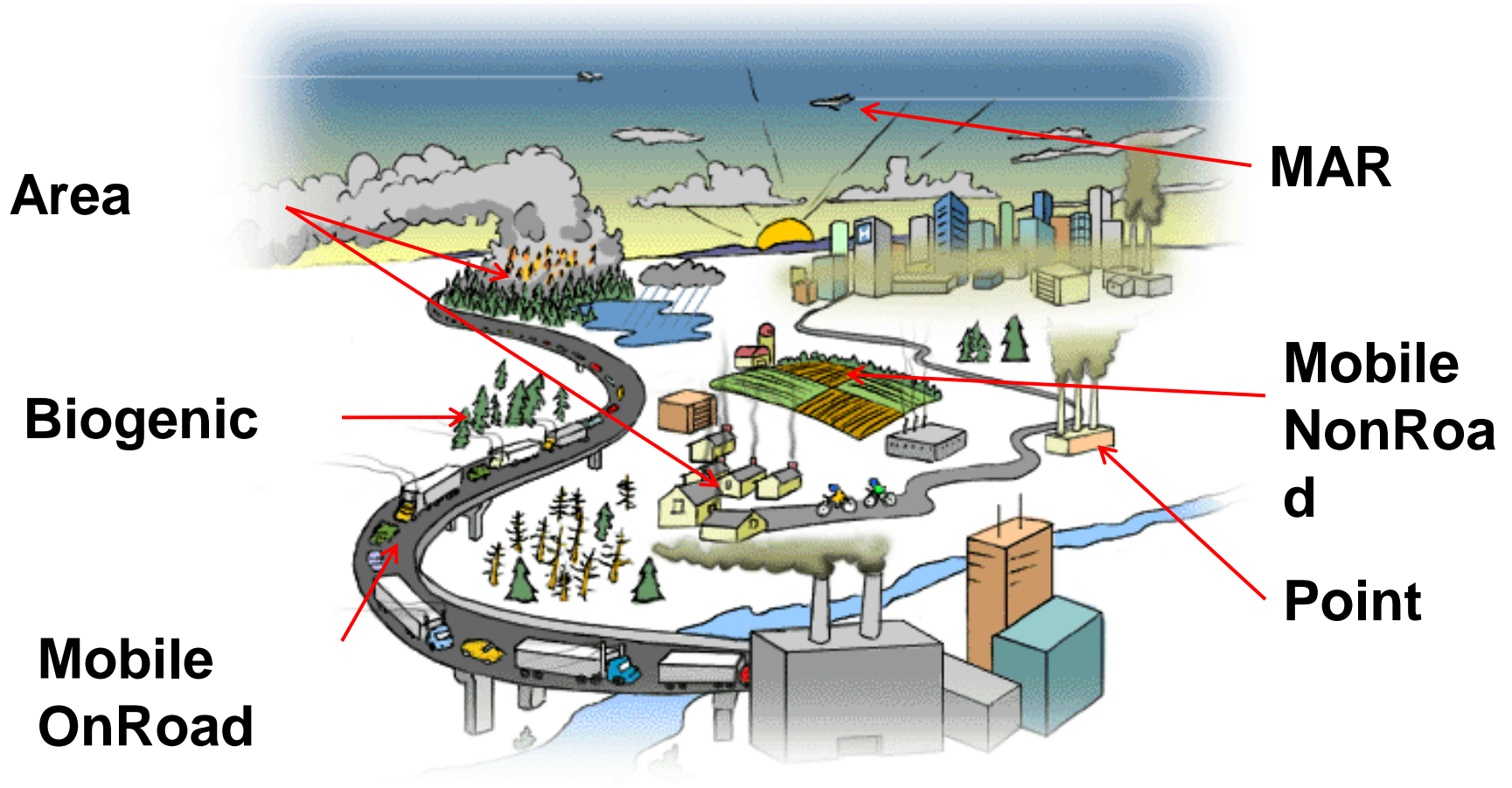
EXAMPLE – EMISSIONS INPUTS

a=egts3d_l.1996157.1.us36.cmaq2k.ncf

June 5,1996 13:00:00
Min= 0.000 at (1,1), Max= 111.843 at (119,59)

PAVE
by
MCNC
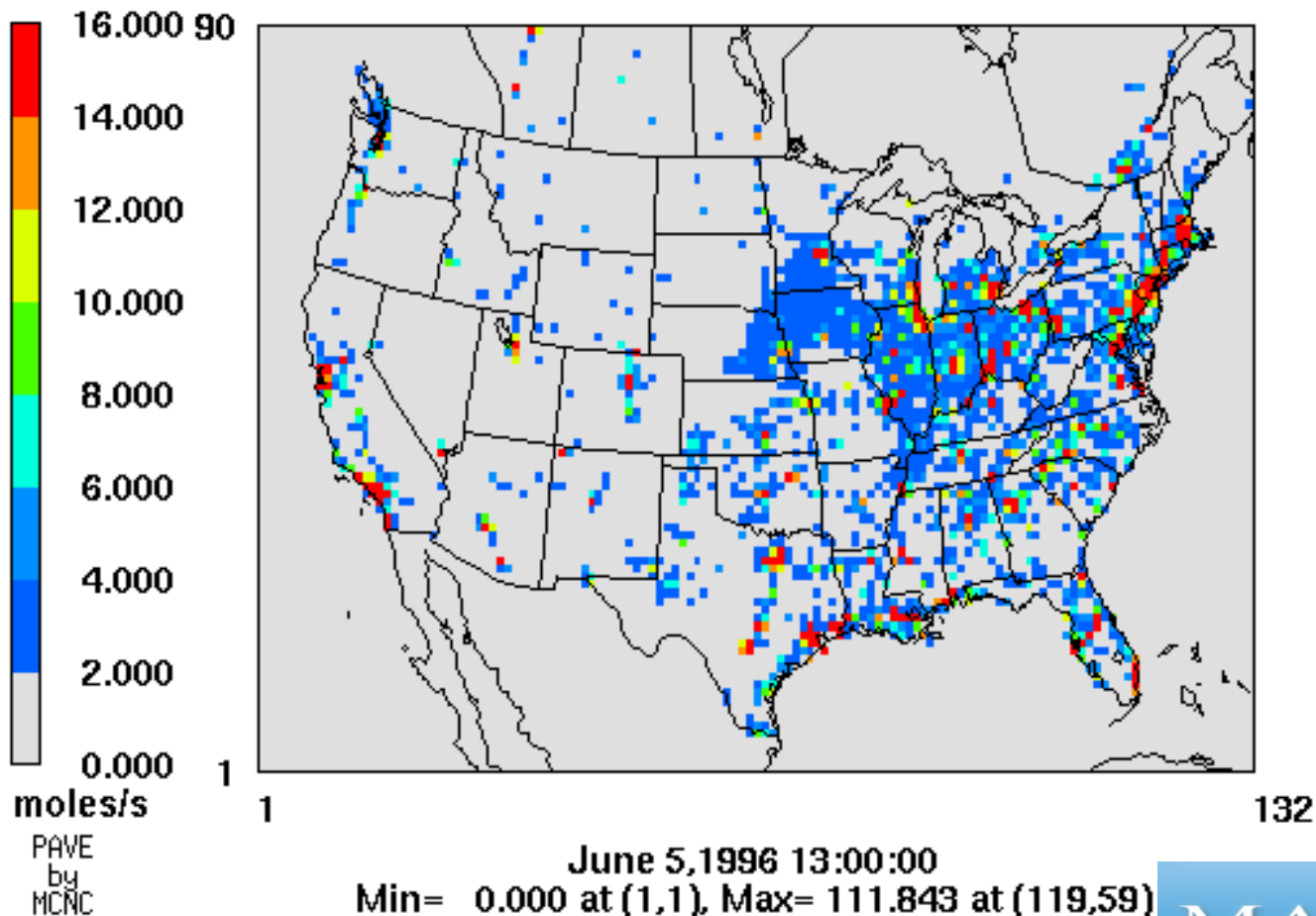
EMISSION SOURCE TYPES

ESTIMATION OF 2020 EGU EMISSIONS FOR VERSION 3

ERTAC EGU model will be used to estimate 2020 emissions from Electric Generating Units (EGU)
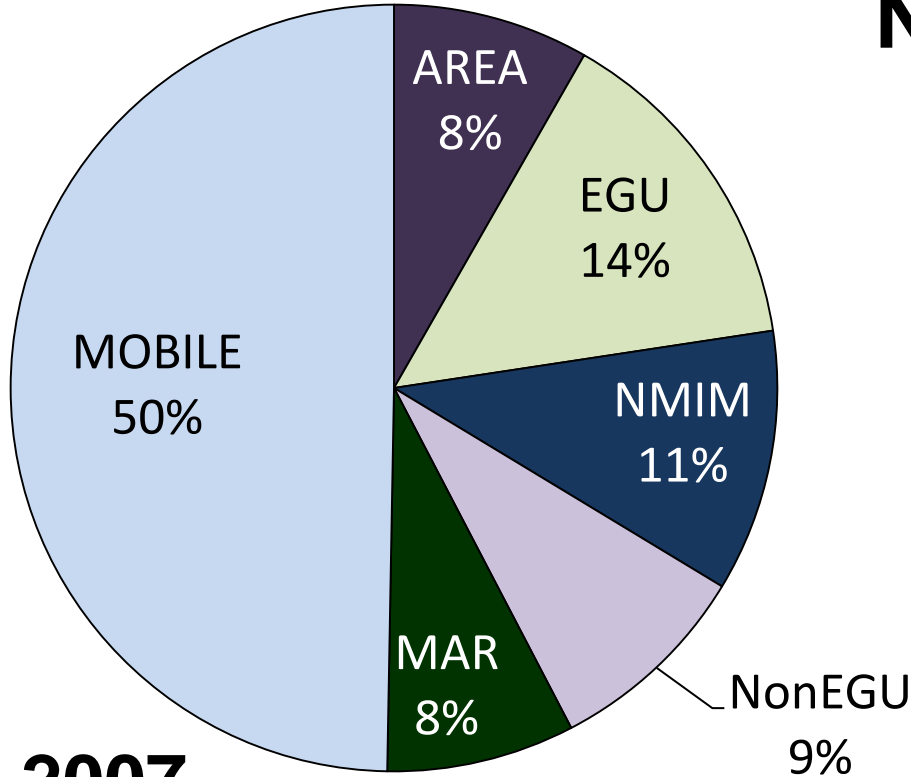
However results from the model are not yet available

For MARAMA V3:

- NOX & SO2 - CSAPR caps were applied

- PM2.5 – No growth or control

- VOC - Increased 24% based on an IPM model run performed for the CSAPR rule development
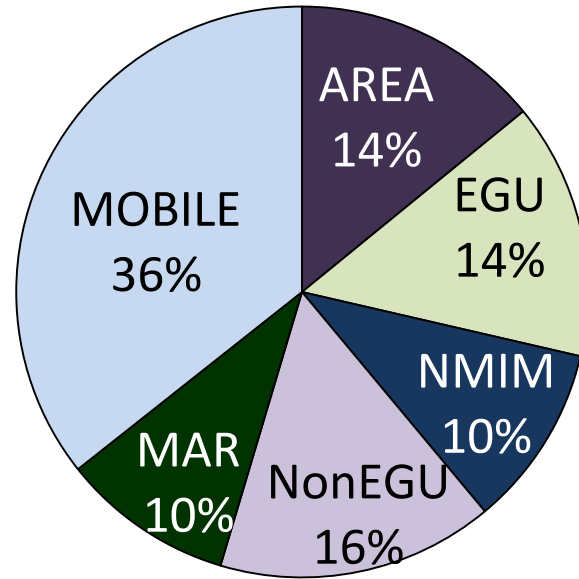
MANEVU and Virginia MARAMA Version 3 NOx

2007
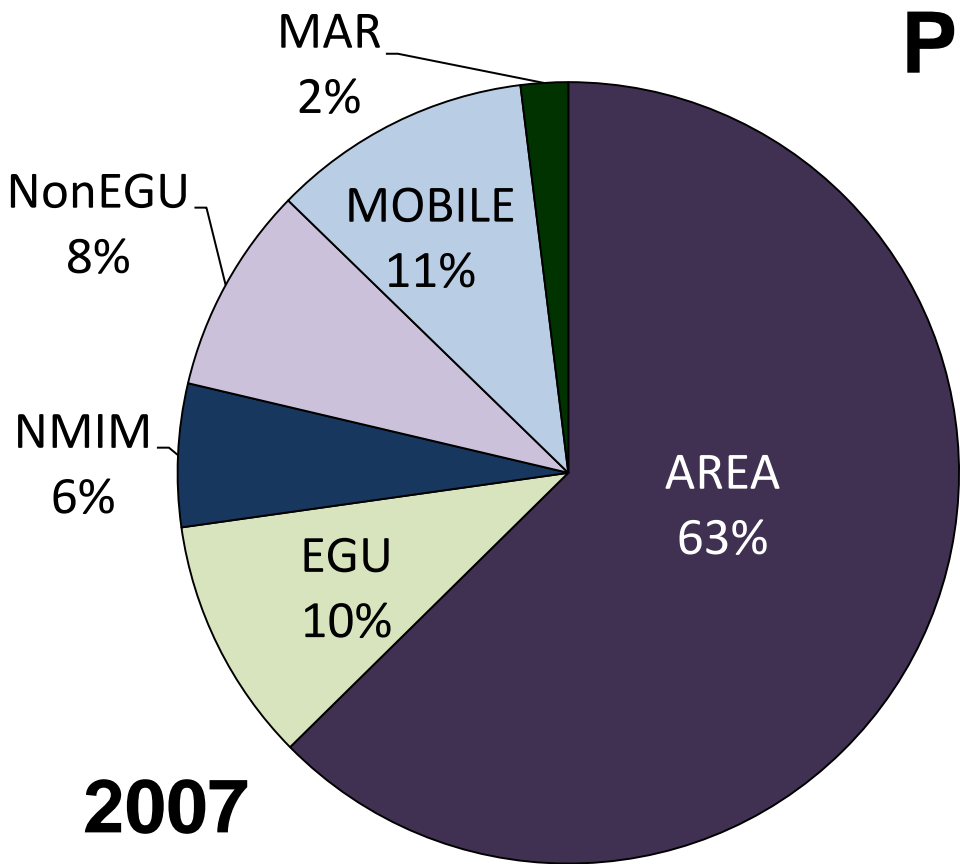Total: 2,764,323 TPY

EGU 2020 Estimated by applying CSAPR Caps

2020
Total: 1,513,153 TPY

Overall NOx reduction from 2007 to 2020 Expected to be 45%
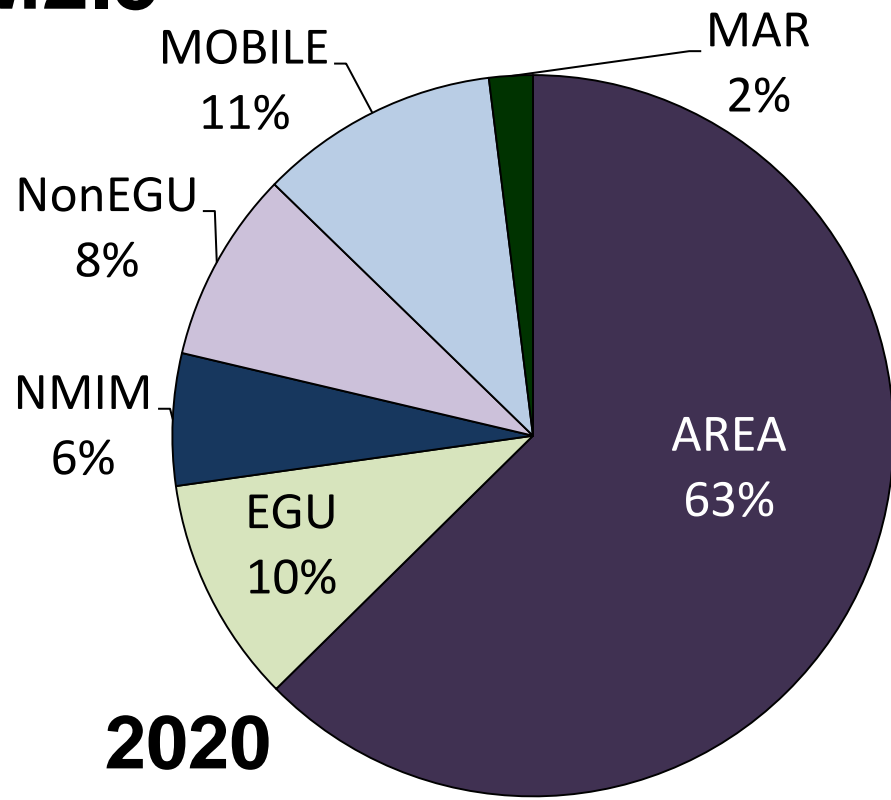
MANEVU and Virginia
MARAMA Version 3
PM2.5

2007

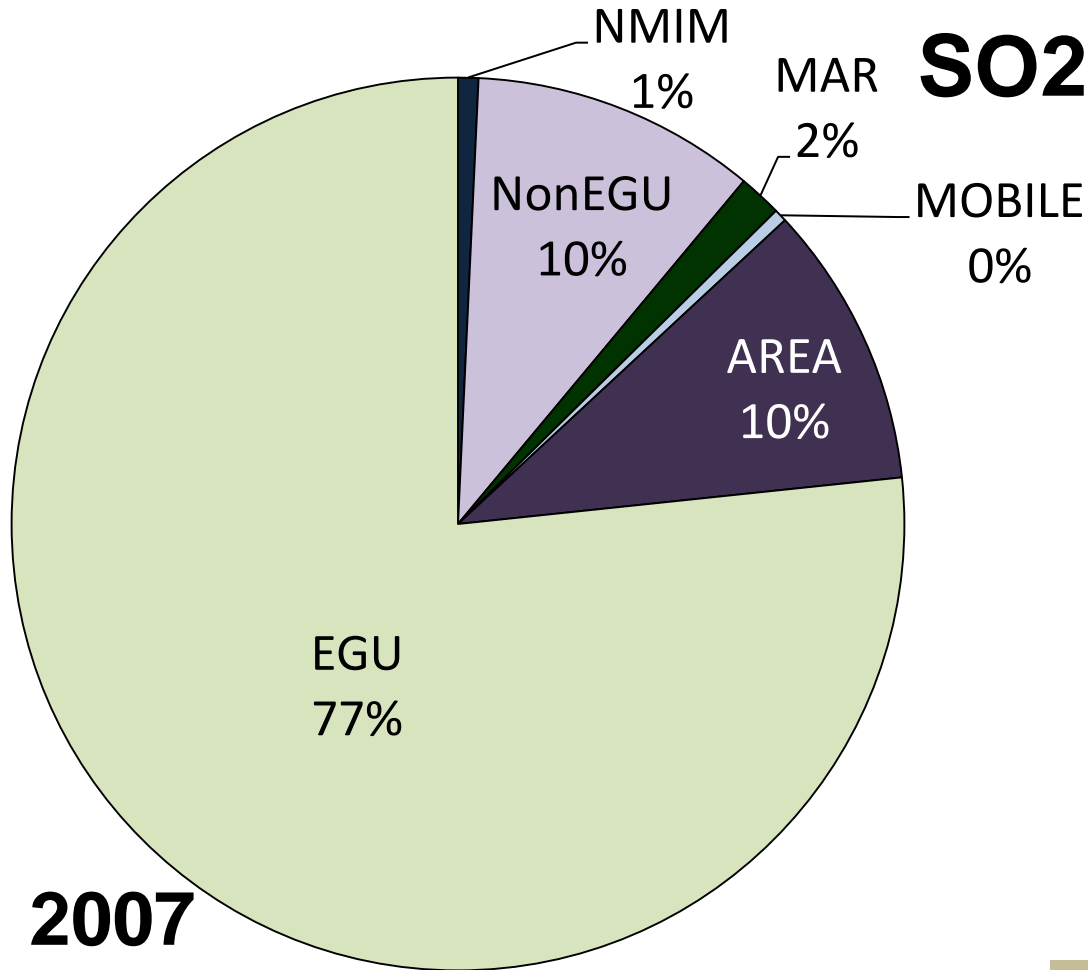Total: 484,517

EGU 2020 PM2.5
emissions unchanged
from 2007

Total: 452,026

Overall PM2.5 reduction from
2007 to 2020
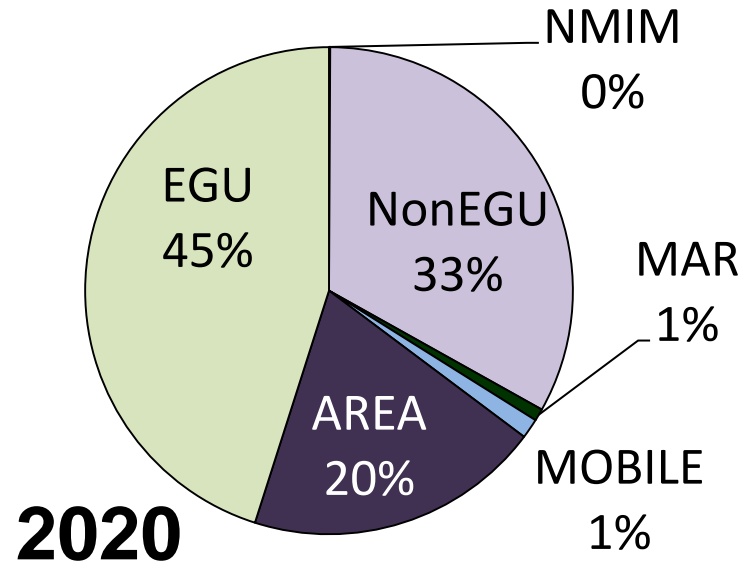Expected to be 7%

MANEVU and Virginia
MARAMA Version 3
SO2

2007

Total: 2,240,172 TPY

EGU 2020 Estimated by applying CSAPR Caps

2020

Total: 666,110 TPY

Overall SO2 reduction from 2007 to 2020 Expected to be 70%

MANEVU and Virginia MARAMA Version 3 VOC
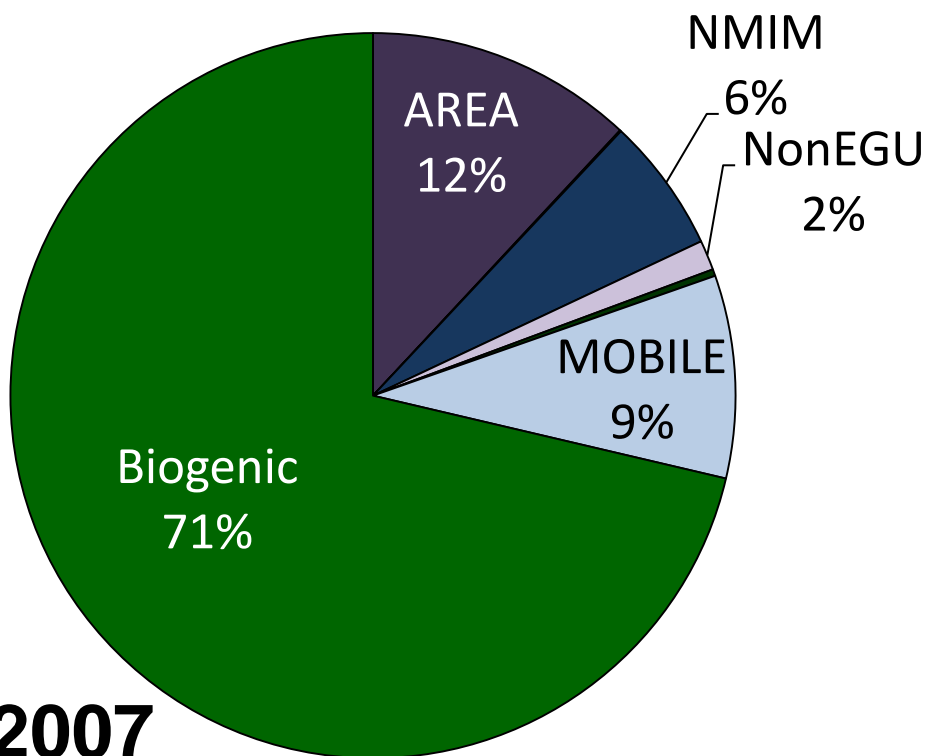
2007
Total: 7,779,329 TPY
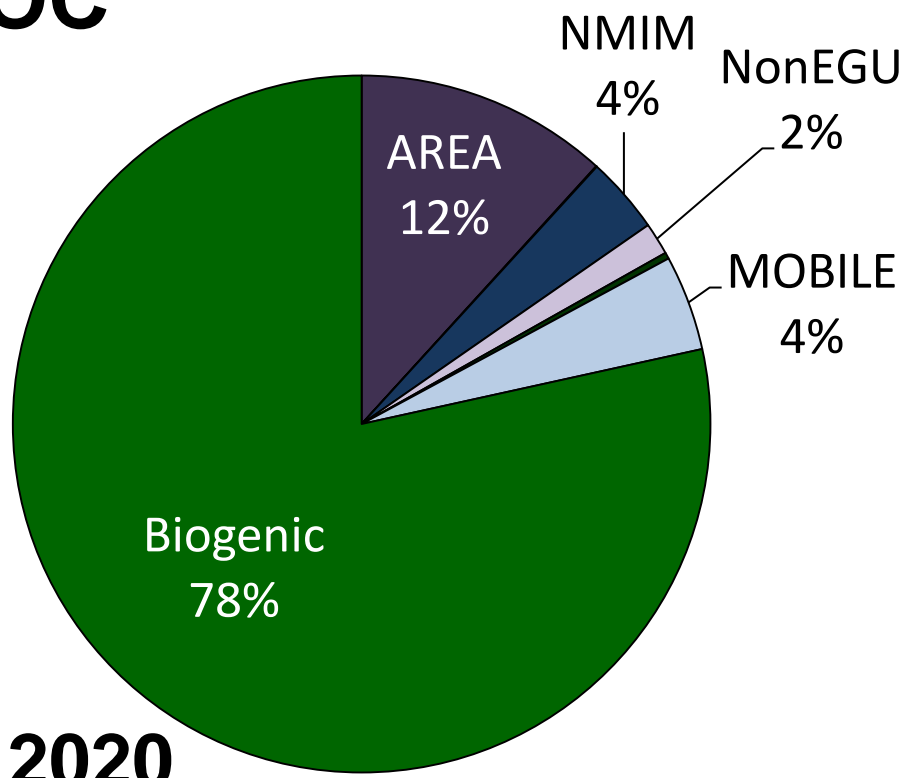
2020
Total: 7,073,176 TPY

Overall VOC reduction from 2007 to 2020 Expected to be 9%

9

2007 NOx Regional Mobile Emissions
Area Normalized

Legend

— Interstate

Counties

NOx/County Area (Tons/[yr*sq mi])

0 - 10.00

10.01 - 30.00

30.01 - 70.00

70.01 - 130.0

>130.1

10

2020 NOx Regional Mobile Emissions
Area Normalized

Legend

—— Interstate

Counties

NOx/County Area (Tons/[yr*sq mi])

- 0 - 10.00
- 10.01 - 30.00
- 30.01 - 70.00
- 70.01 - 130.0
- > 130.1
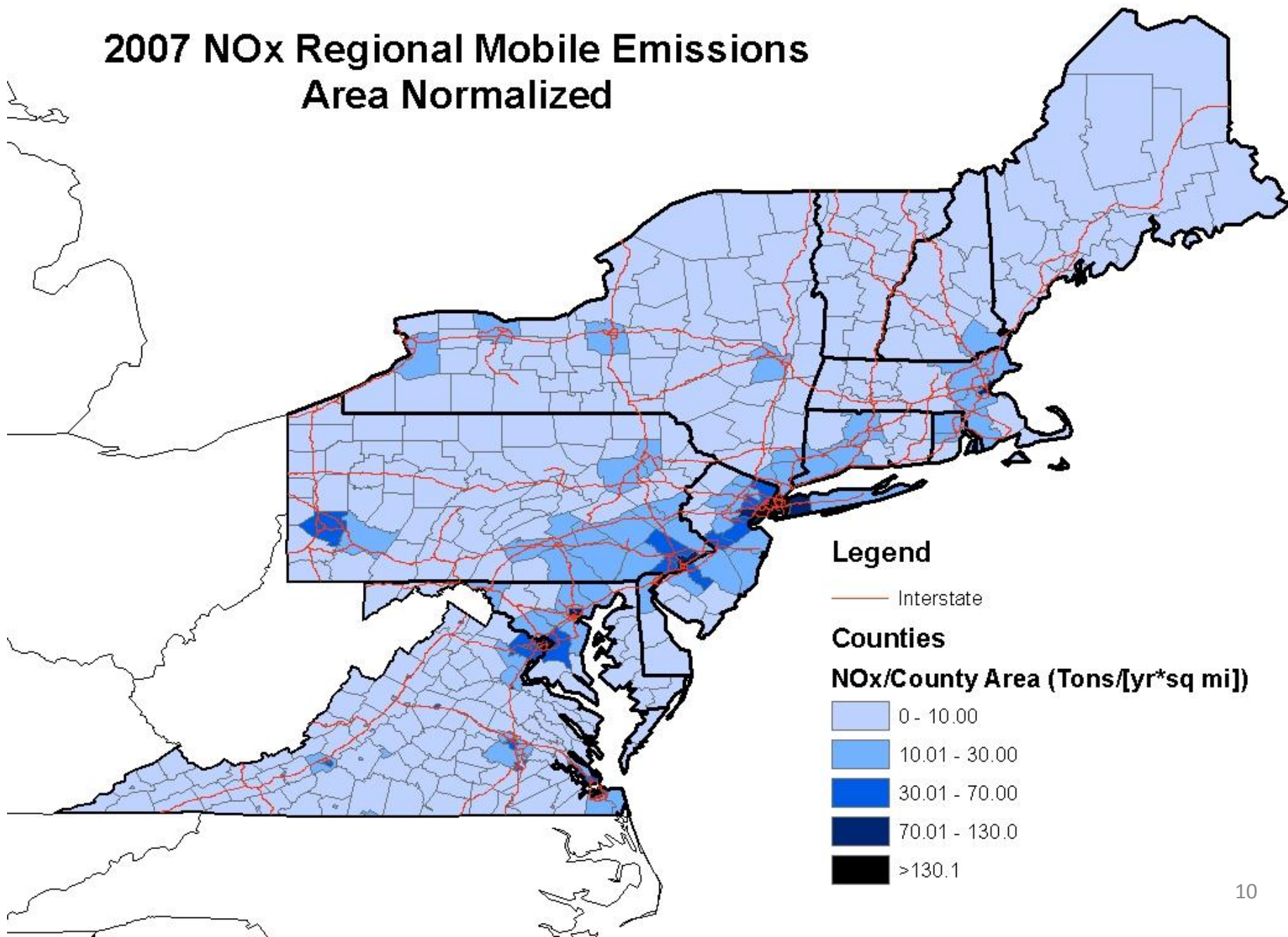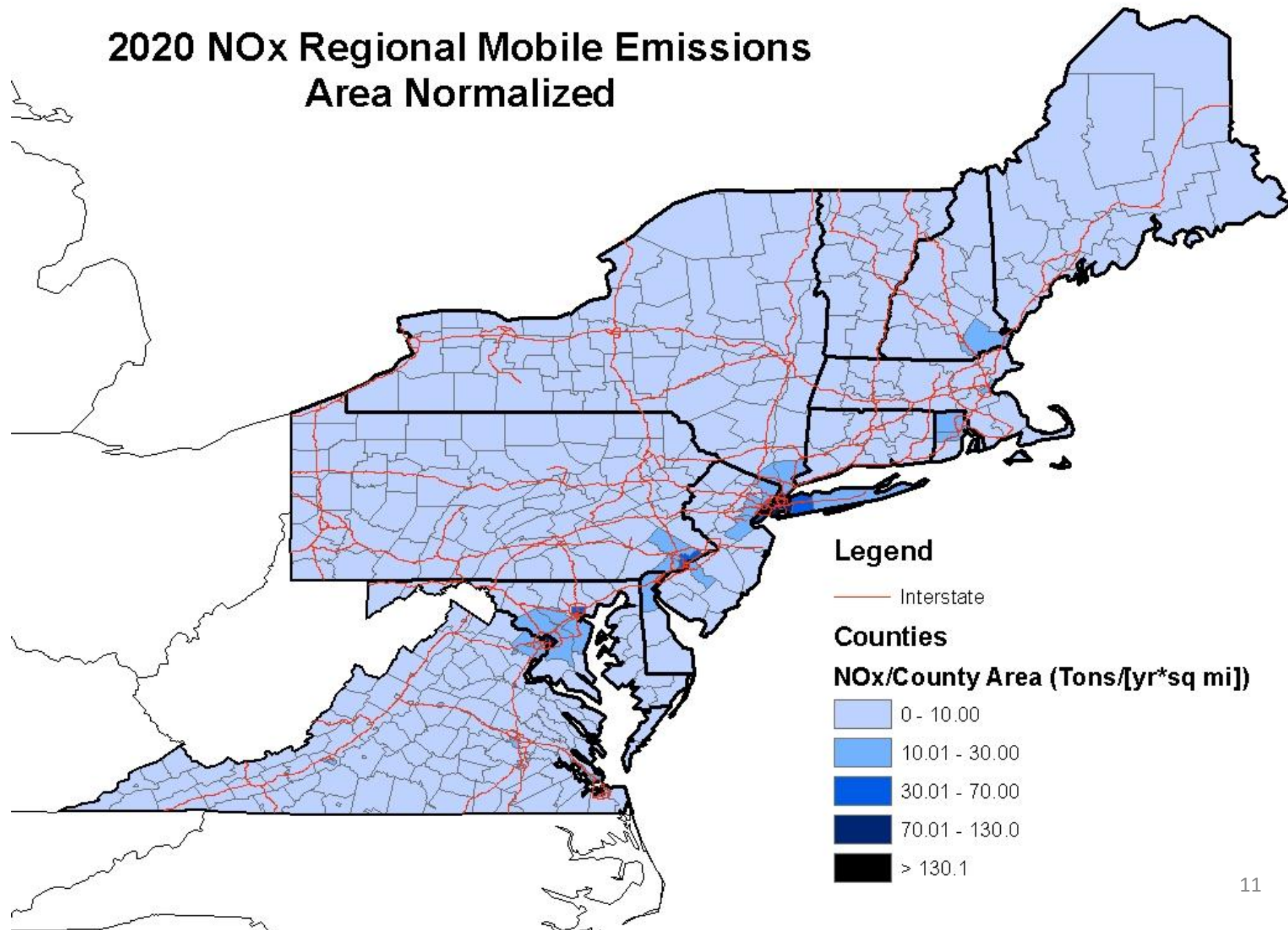
ERTAC EGU Growth

- **ERTAC = Eastern Regional Technical Advisory Committee**
- **Collaboration:**
  - NE, Mid-Atlantic, SE, and Lake Michigan area states
  - Partnership: Industry and Multi-jurisdictional organizations
- **Goal: Methodology to Create EGU FY Emission Inventories**
  - Conservative predictions of activity
  - Transparent
  - Relies on base year activity data
  - Realistic temporal profile that matches meteorology
  - Flexible

What You Can Expect….

- **Growth estimates for**
  - CAMD reporting units
  - Coal, oil, natural gas
- **Regional boundaries delineate NYC**
  - Flexibility in growth rates
  - No unit retired w/o state input
- **Future year hourly temporal profiles for**
  - NOx, SO2, activity data
  - New units that didn't operate in the base year

Progress So Far ….

- **Development:**
  - Methodology created, documentation crafted
  - System is running on Linux and Windows platforms (GA, VA, MARAMA, IN, NJ, OTC)
  - Key to this work: Doris McLeod, Jin-Sheng Lin (VA), Wendy Jacobs (CT), Danny Wong (NJ)
- **Estimating Growth in Generation:**
  - Growth rates and regions defined
  - Plan to update with the 2012 Annual Energy Outlook
- **Input File Development:**
  - State review of 2007 unit file and known future controls
  - Further state input required – Draft results

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How does the algorithm work? Inputs

- **Starting Point: BY CAMD activity data**
  - Gross load hourly data, unit fuel, unit type, location
  - Units categorized by type, fuel, region

- **States provide known new units, controls, retirements, fuel switches, etc**

- **Energy Information Agency annual energy growth factors**

- **NERC peak growth factors**

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How does the algorithm work? Processing

- **Project growth by region: peak and nonpeak**

- **Adjust growth to account for unit retirements, new units, fuel switches**

- **Allocate growth on an hourly basis to units by region and type**

- **Check system integrity: Does enough generation exist to satisfy future needs?**

- **Check policy: Will units meet program caps?**

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ERTAC EGU TIMELINE

- **September - October, 2012**
  - Initial multi-state test runs
  - Review output, revise and rerun
  - Present results to states for comment
- **November, 2012**
  - Present to full ERTAC Committee
  - Present model and results to USEPA
- **Future tasks**
  - Develop AEO 2012 growth factors
  - Develop new base year 2011

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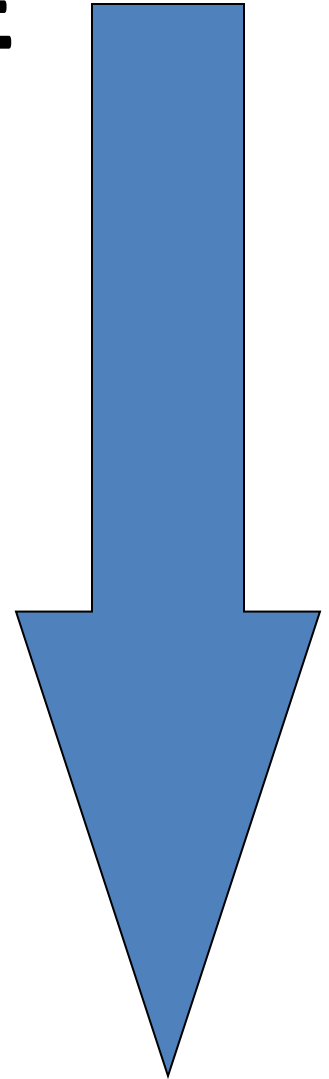
Modeling Summary – Upgrades from Level 2 to 3A

- ## OTR: Version 3 of 2007 and 2020 Inventory
  - Numerous small changes to every sector
  - Large changes to Nonroad and Onroad sector
    - VA and NY Nonroad model rerun
    - SMOKE-MOVES rerun using a revised temperature file
  - 2020 EGU: State level proxy based on CSAPR
  - Decrease in NO_X for every state from 1-5%
  - Decrease in VOC for every state except PA & DC

- ## Outside OTR
  - SESARM 2007 inventory including fire file
  - LADCO 2007 Point sources converted
  - CENRAP – NEI2008 Version 2
  - 2020 Proxy reductions based on actual reductions experienced in the OTR

- ## Boundary Conditions
  - Improved from static to modeled time variant

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KEY POINTS

- Thanks to state inventory staff partners!
- Continuing inventory analysis
  - Regional summaries & state details
- ERTAC EGU emissions projection underway
  - Need state review of preliminary results
  - Developing plans to brief USEPA

FINDING THE INVENTORIES

MARAMA inventories, documentation, and supporting information are posted on the "Technical Center" tab on our website at:

www.MARAMA.org

Contact for questions and further information at:

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