# Who Cares About 2011?

## The Policy, Science, and Timing of the National Emissions Inventory

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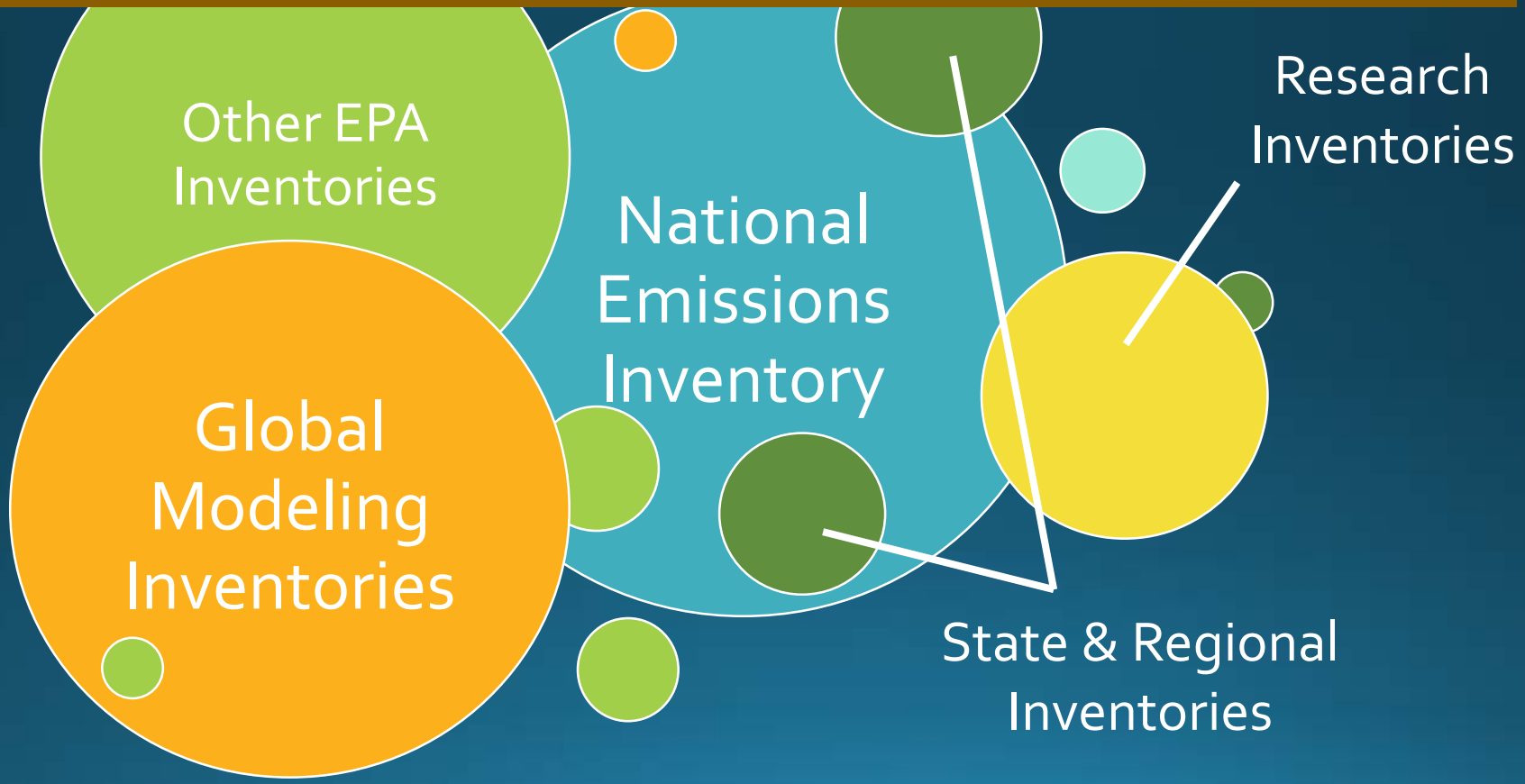
# Inventory Origins


- Clean Air Act (CAA)
- National Ambient Air Quality Standards
- Air toxics
- For regulation and decision making
- As an input for modeling
- To inform the public

- For research sake
- Desire to understand the environment
- As an input for modeling
- To inform the public

# Different Origins Lead to Many Inventories

## This Complexity Can Cause Confusion



# At the Intersection of Policy and Science

- The National Emissions Inventory (NEI) tries to meet many policy and science needs both inside and outside of the EPA
- Meeting these multiple needs gives rise to one particular inventory that will be different from inventories meeting other needs
- Including new science may mean diverging from previous policy-accepted method

**Two Key Points to Explore:**

- The time needed to create inventories can cause challenges for meeting both policy and science needs
- The different results among inventories can cause confusion

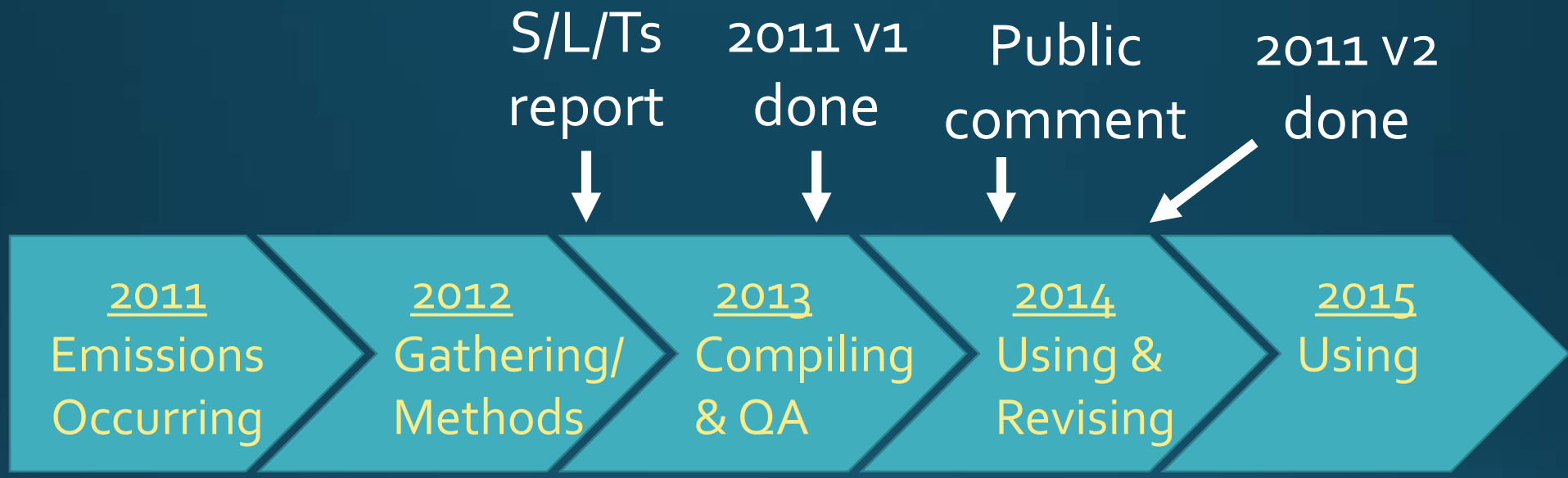
# NEI Process

- The NEI is on a 3-yr cycle (e.g. 2008, 2011, 2014)
  - Stationary point and nonpoint (county), mobile, fires, biogenic soil and vegetation
- States, locals, and tribes (S/L/Ts) are required to submit CO, $SO_2$, $NO_X$, VOC, $PM_{10}$, $PM_{2.5}$, $NH_3$, and Lead.
  - Origin is the National Ambient Air Quality Standards (NAAQS) parts of the Clean Air Act
  - Hazardous Air Pollutants (HAPs) and GHGs can also be voluntarily submitted
  - Data required to be submitted one year after end of inventory year
- EPA develops emissions methods and fills inventory gaps when needed
  - In collaboration with S/L/T air agencies, regional groups, other EPA programs, other federal agencies, and other researchers

# Four Five Key NEI Goals

- Complete
- Represents the year of the inventory
- Uses best available information
- Transparent - includes the emissions origin
  (who provided, factor, activity, method)
- What About Timing? The 2011 NEI as an example…

# 2011 NEI Timeline



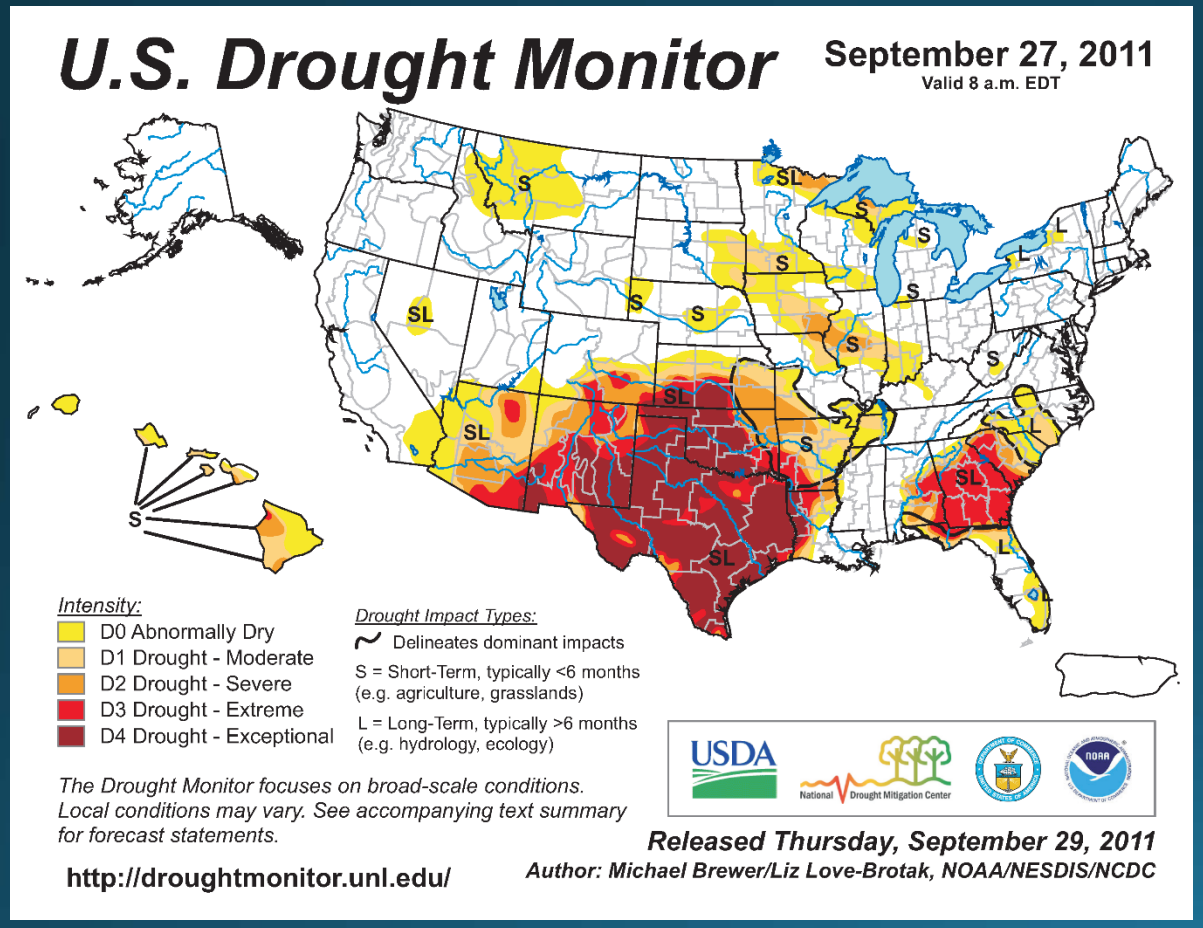

High spring fire season
Oil & gas production up
Economy improving

Then

Now

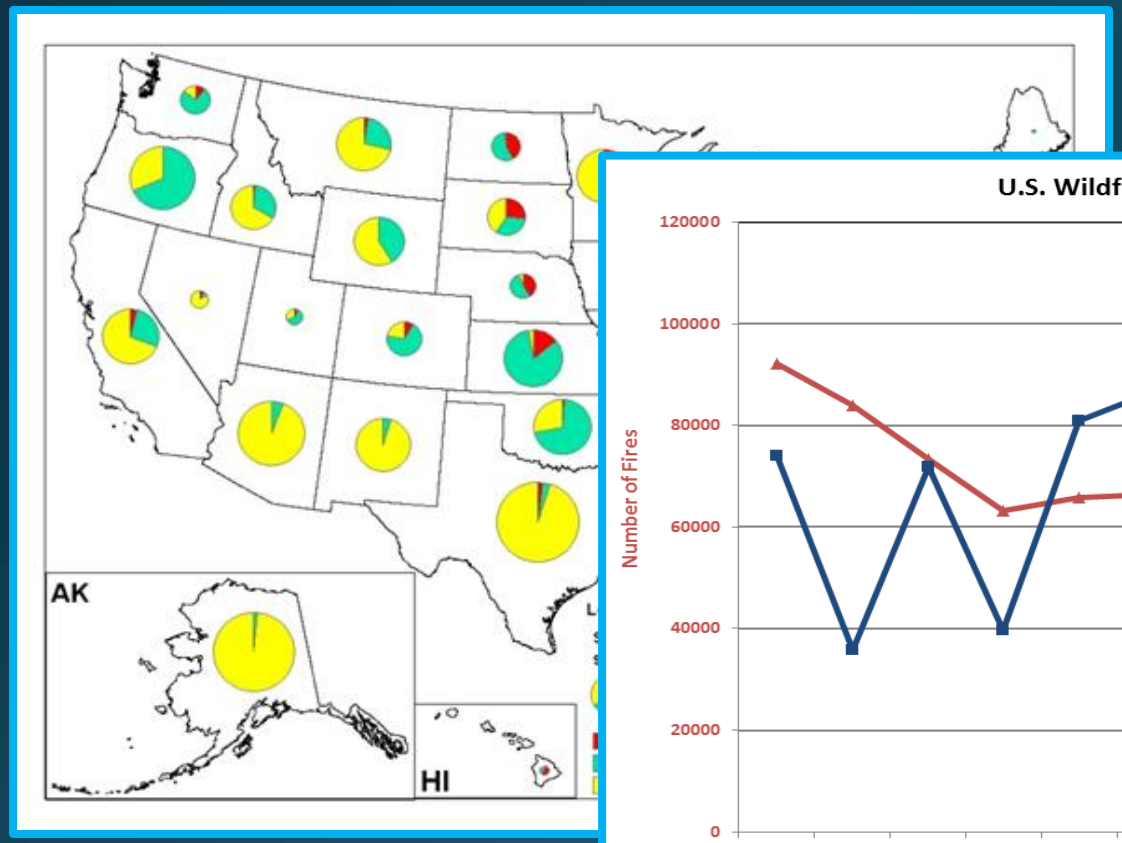
Worsening drought
Oil prices falling
Economy keeps growing

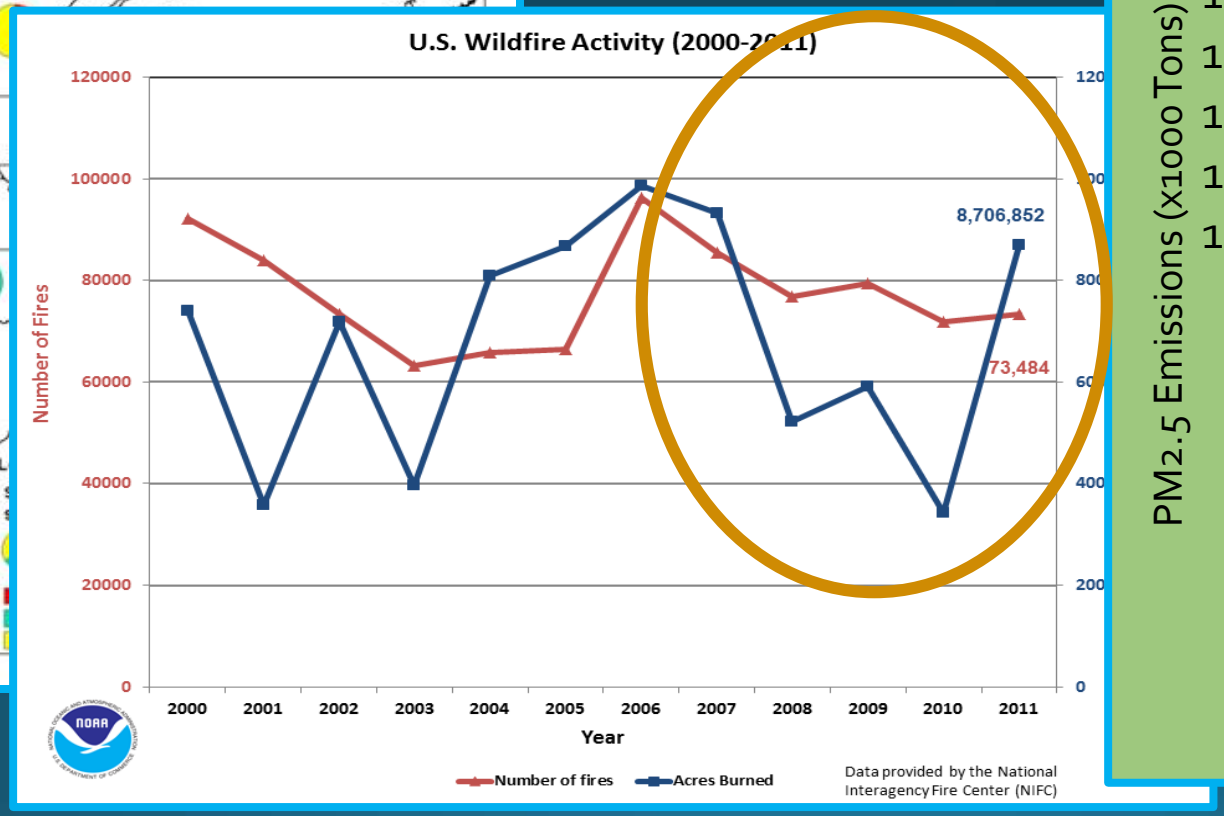
# Wildfires – 2011 Real World

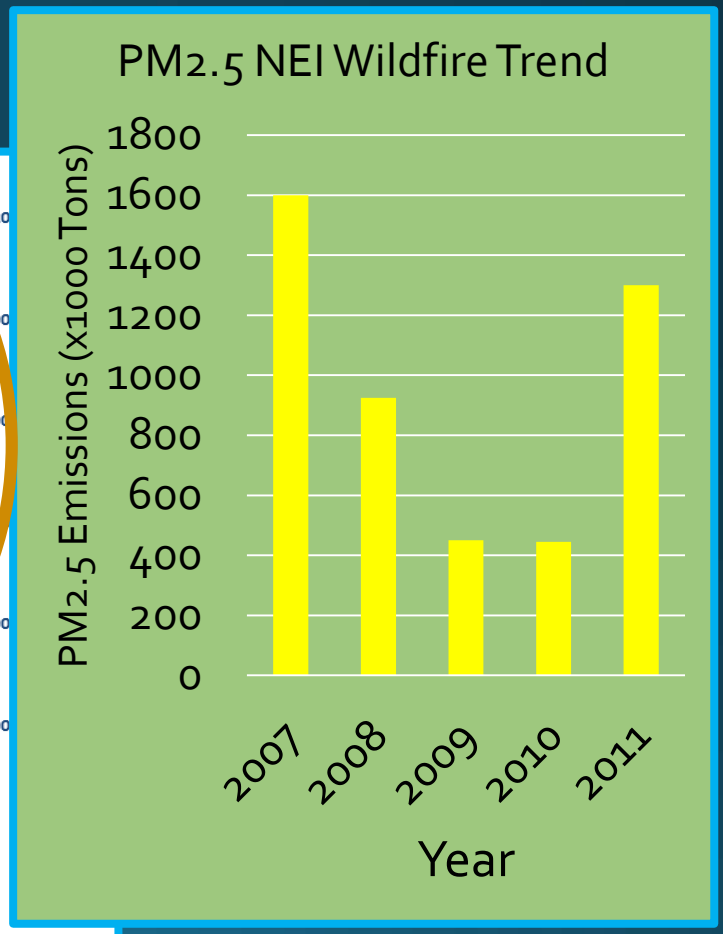



- Wet 2010 & dry early 2011 led to high spring wildfire season in TX, AZ, and NM
- TX Jan-Apr 2011 burned 2.2 million acres
- AZ *Wallow Fire* in May-June largest ever in state
- NM *Las Conchas* fire in June-July largest ever in state

# Wildfires – 2011 NEI

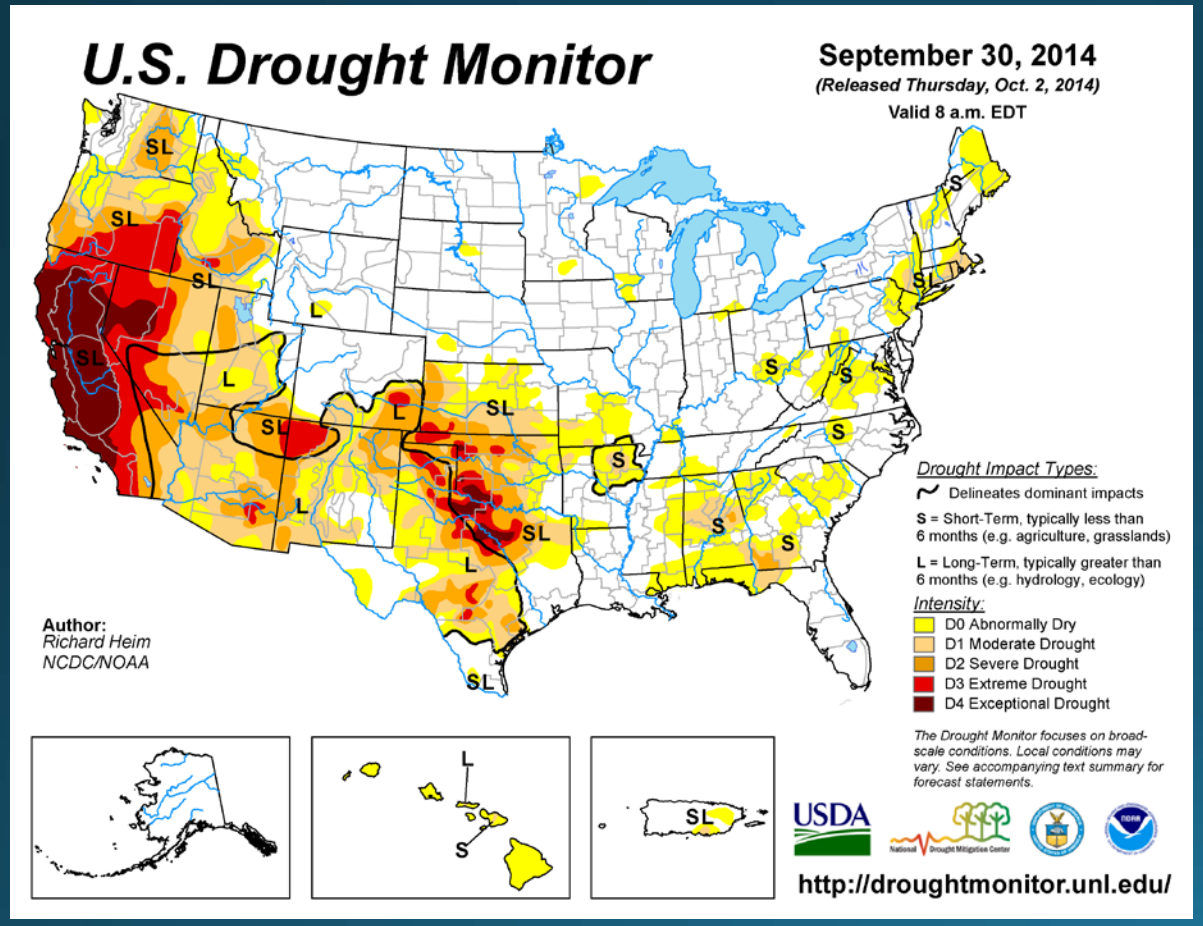



Graphic: NOAA, : https://www.ncdc.noaa.gov/sotc/fire/2011/13

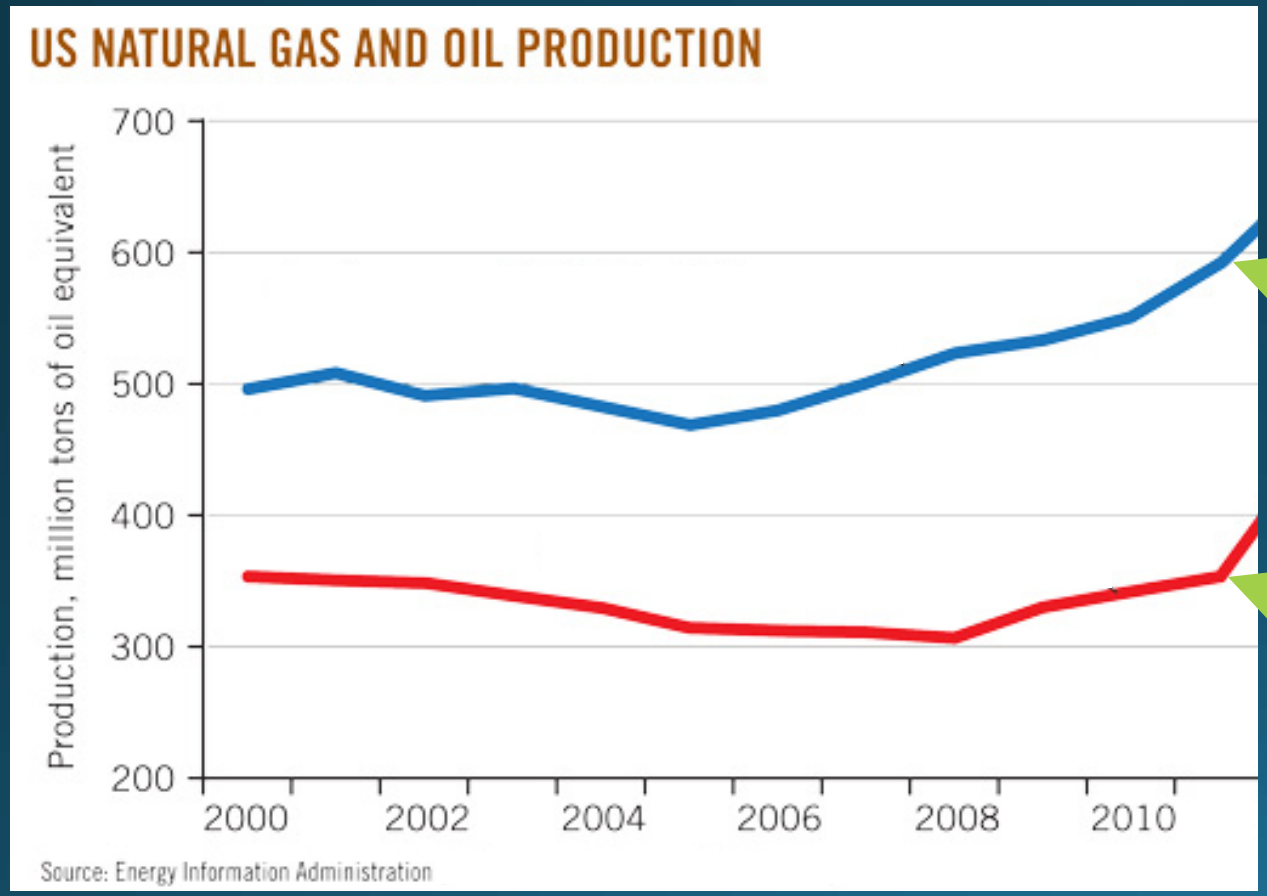
# Wildfires – 2014 Real World




| Year | Fires | Acres |
|---|---|---|
| 2014 | 63,312 | 3,595,613 |
| 2013 | 47,579 | 4,319,546 |
| 2012 | 67,774 | 9,326,238 |
| 2011 | 74,126 | 8,711,367 |

Source: NIFC, http://www.nifc.gov/fireInfo/fireInfo_stats_totalFires.html

# Oil and Gas – 2011



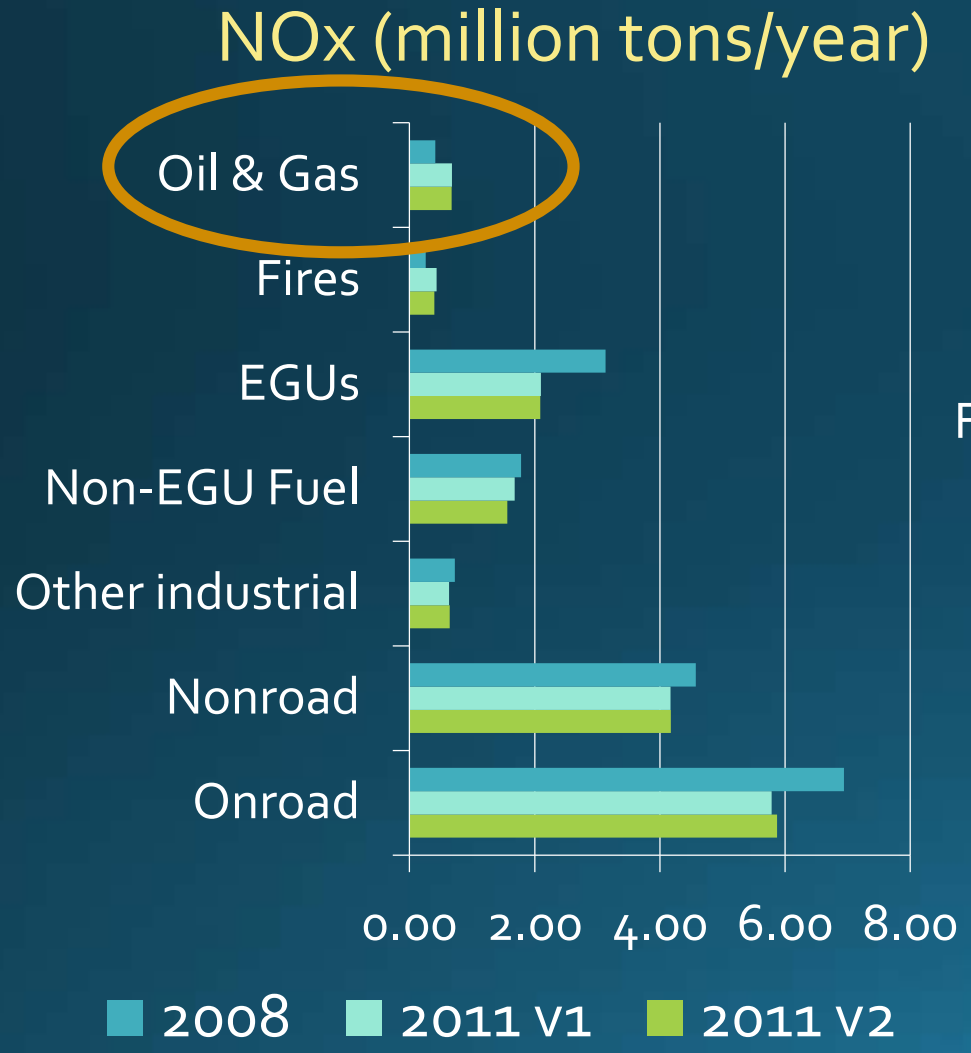

2008 to 2011

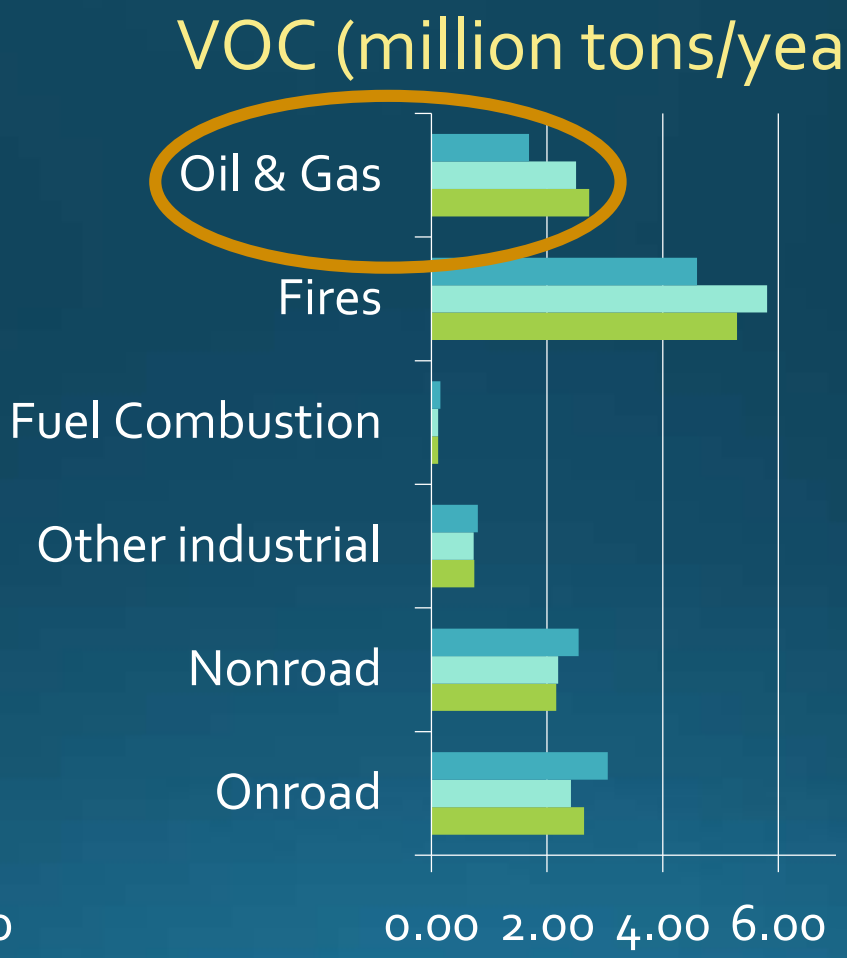
Gas Production: up 14%

Oil Production: up 15%

Graphic: Aguilera and Radetzki, Oil and Gas Journal, December 2013.

# Oil and Gas – NEI 2008 to 2011



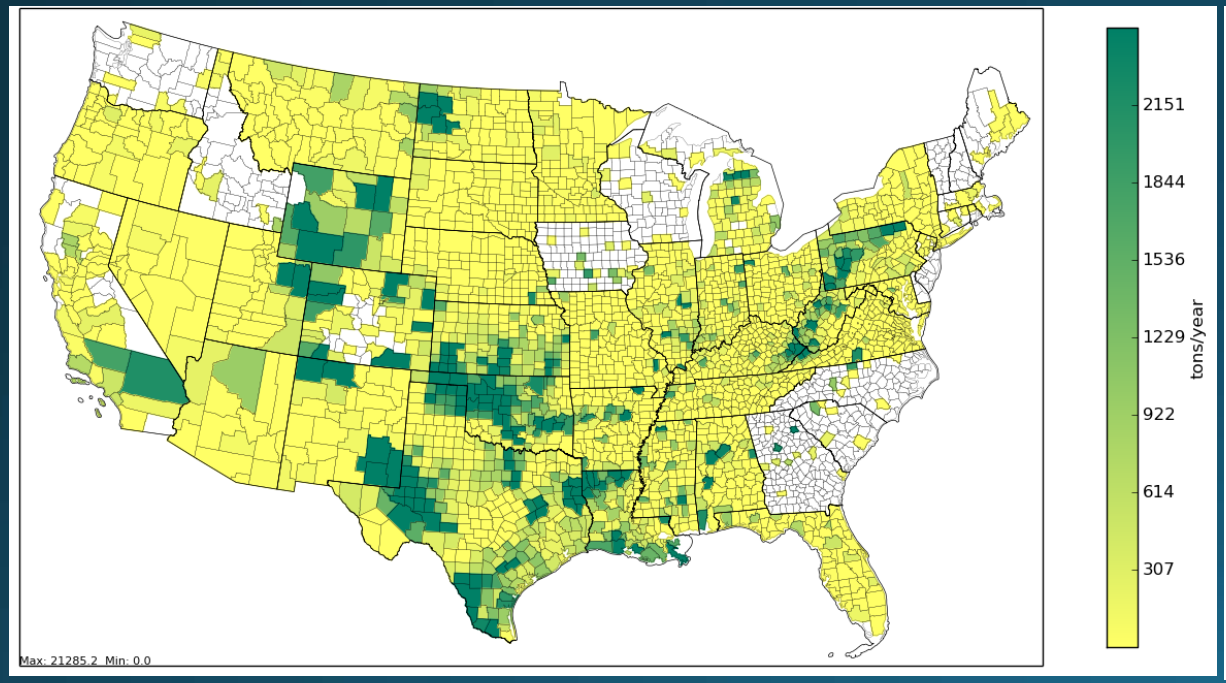




Oil and Gas:

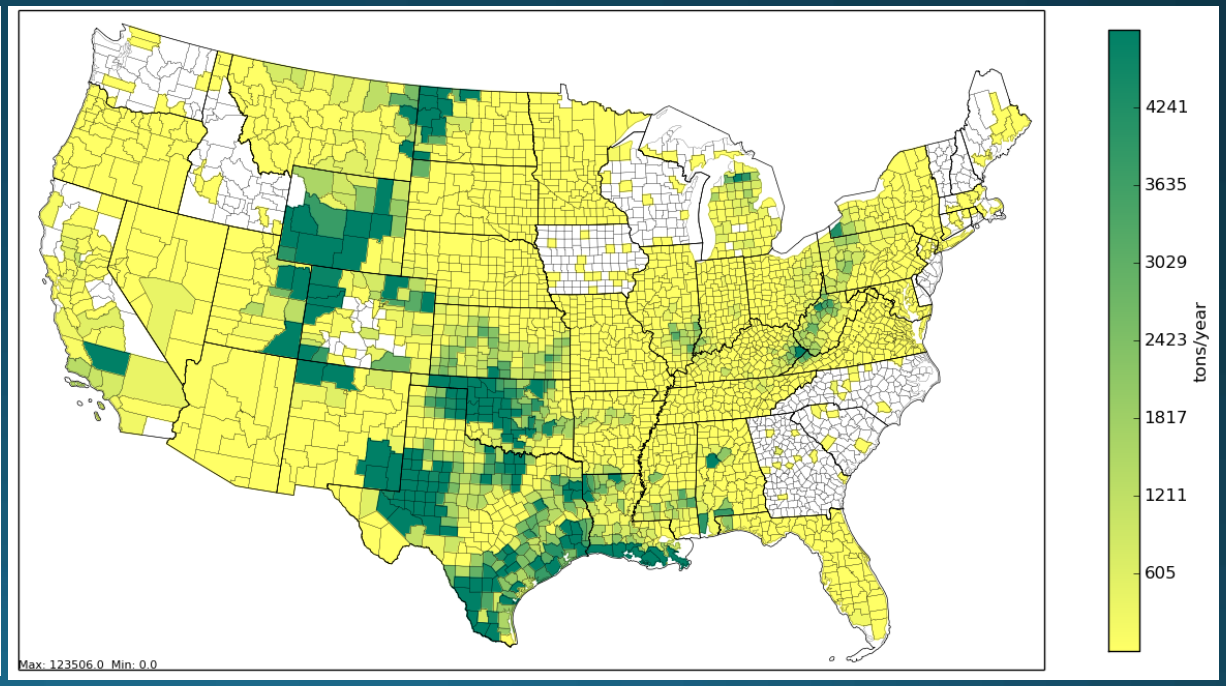
- NOx increased 64%
- VOC increased 62%
- Partly due to improved characterization of emissions in the 2011 NEI

# Oil and Gas – NEI 2011 v2 by county

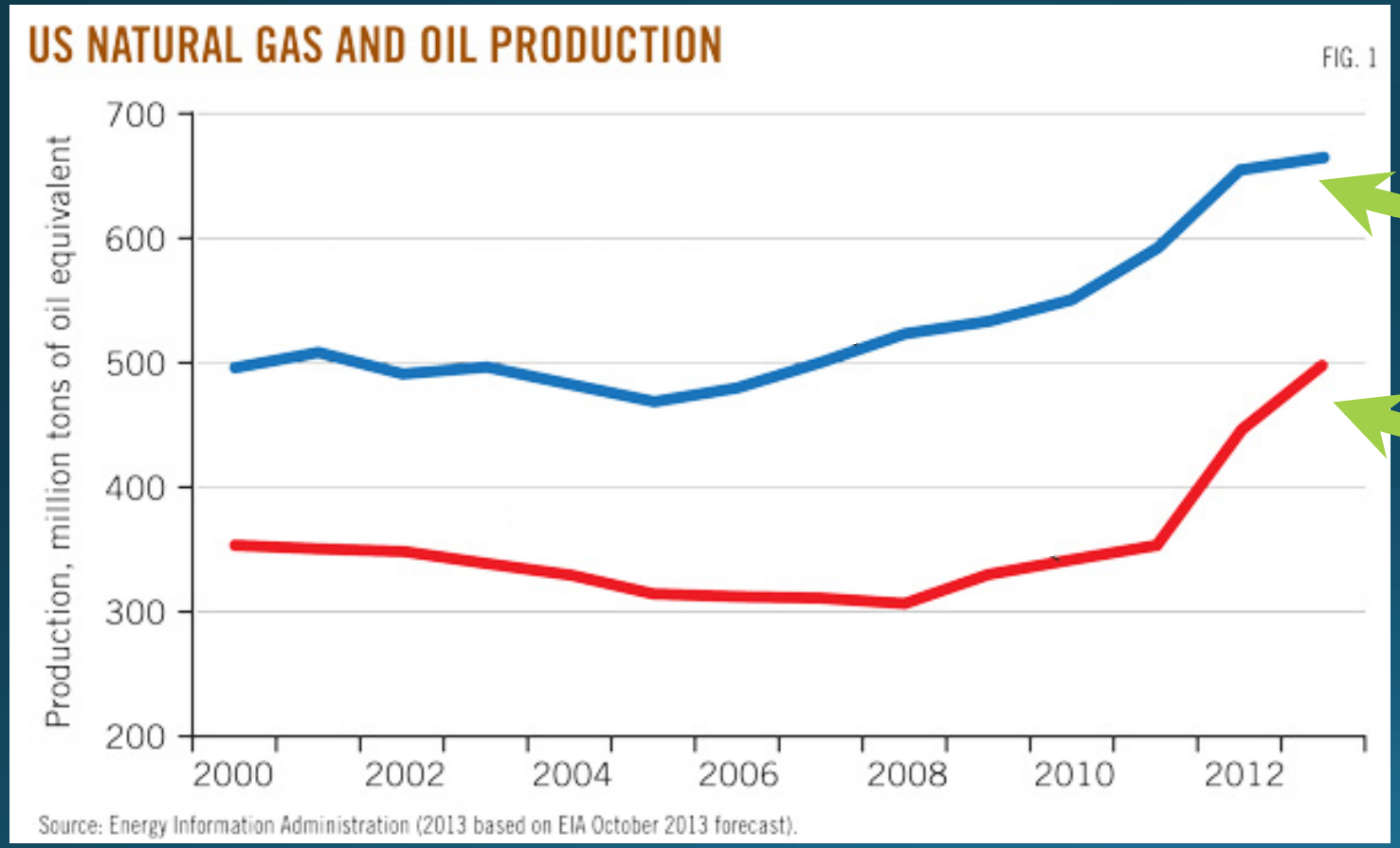
## NOx (tons/year)




## VOC (tons/year)



# Oil & Gas – 2013 Real World




2011 to 2013

Gas Production:
Up 12%

Oil Production:
Up 42%

Graphic: Aguilera and Radetzki, Oil and Gas Journal, December 2013.

# Why Care About 2011?

- For policy purposes, the NAAQS process needs (and the CAA requires) a reference point
  - Nonattainment designations
  - Subsequent state implementation plan development (including air quality modeling)
  - Track progress in reducing emissions over time
  - Allow the time needed for the regulatory process to work with participation from many groups
- For science purposes, research takes time and researchers cannot constantly adjust to a new inventory year

# Why Care About Current and Consistent Inventories?

- To inform the public, old inventories have many flaws
  - Do not reflect reductions from new regulation
  - Do not reflect reductions or increases from production changes
  - Do not reflect new underlying information (e.g., emissions tests)
  - Public expects up to minute information
- Inconsistent inventories confuse and can undermine trust
  - Don't the regulators *know* the amount of emissions?
  - Aren't all emissions *always measured?*
- Point source inventories are well suited for more current public information

# E-Enterprise and Air Emissions

- E-Enterprise for the Environment is jointly governed by states and the EPA to collaboratively modernize EPA business processes
  - To improve **environmental results**
  - To enhance services **to the regulated community** and **the public** by making government more efficient and effective
- A "Combined Air Emissions" project has arisen from two similar proposals in the spring of 2014, made by Arizona and the EPA
- In summer 2014, the E-Enterprise Leadership Council (senior level state and EPA members) selected five project for scoping and return-on-investment (ROI) analyses
- Implementation depends on the results of the ROI and would include continued state-EPA collaboration

# Air Emissions - Project Goals

- Reduce industry burden
- Improve timeliness and transparency of data
- Create consistent information across air emissions programs
- Improve data quality
- Make data more accessible and useable

# E-Enterprise Air Emissions Focuses on Point Sources

- Focuses on four major air reporting programs (different policies & science)

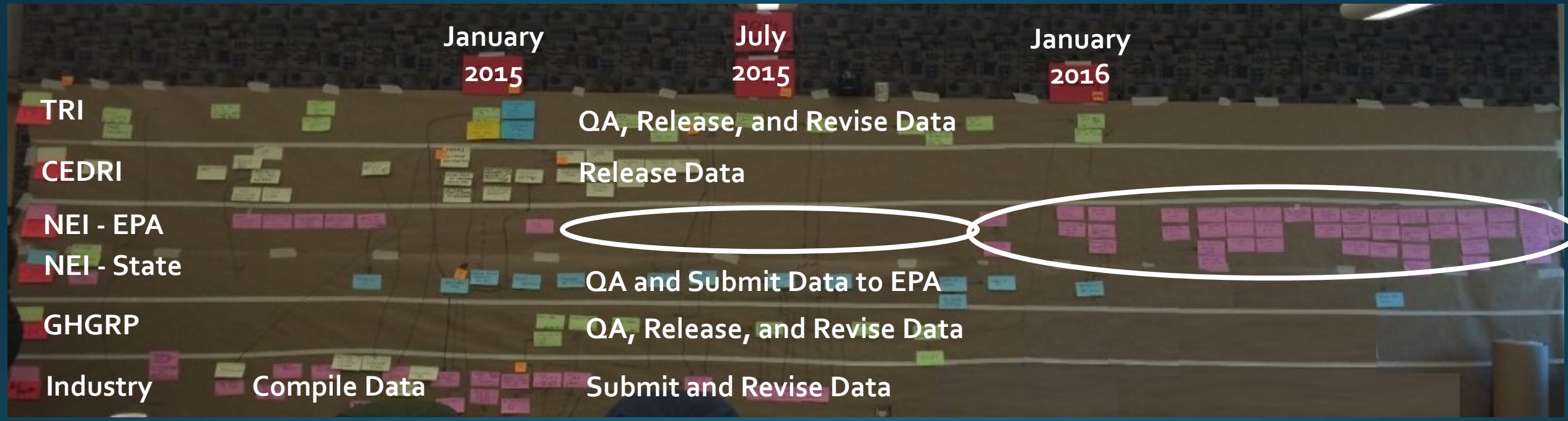
| Toxics Release Inventory | Greenhouse Gas Reporting Program | Compliance and Emissions Data Reporting Interface | National Emissions Inventory |
|---|---|---|---|
| • Air Toxics<br>• Emissions to all media<br>• Many industries<br>• "Best" methods<br>• Direct facility<br>• Mature program | • Greenhouse Gases<br>• Specific industries<br>• Prescriptive methods<br>• Direct facility<br>• Young program | • Largely air toxics focused<br>• CAA Part 60 and 63 compliance – many industries<br>• Stack test data<br>• Direct facility<br>• New approach | • Criteria pollutants and air toxics<br>• Facilities report to S/L/T air agencies who report to the EPA<br>• "Best" methods<br>• Evolving program |

# Air Emissions - Approach

- Team with members from state and local agencies, ECOS, EPA from all four reporting programs, and others at the EPA
- Starting fall 2014, developed a team charter, problem statement, and defined the scope of the project
- Developed detailed information on the "As Is" or baseline case
  - Key variables are program costs, reporting facility burden, and time to access collected data
- Developed detailed "value stream maps" (VSMs) for the four programs + the state NEI
  - A flow chart that shows connections of value-added steps and timing
- Held a 3-day in person "lean" facilitated event (February 10-12), which identified a "To Be" solution
  - "Lean" is based on manufacturing concepts of identifying and eliminating inefficiencies
- Involved industry stakeholders through Fall 2014 meeting and lean event in February 2015
- Currently clarifying the "To Be" State and building ROI analysis

# Air Emissions – "As Is" Value Stream Maps

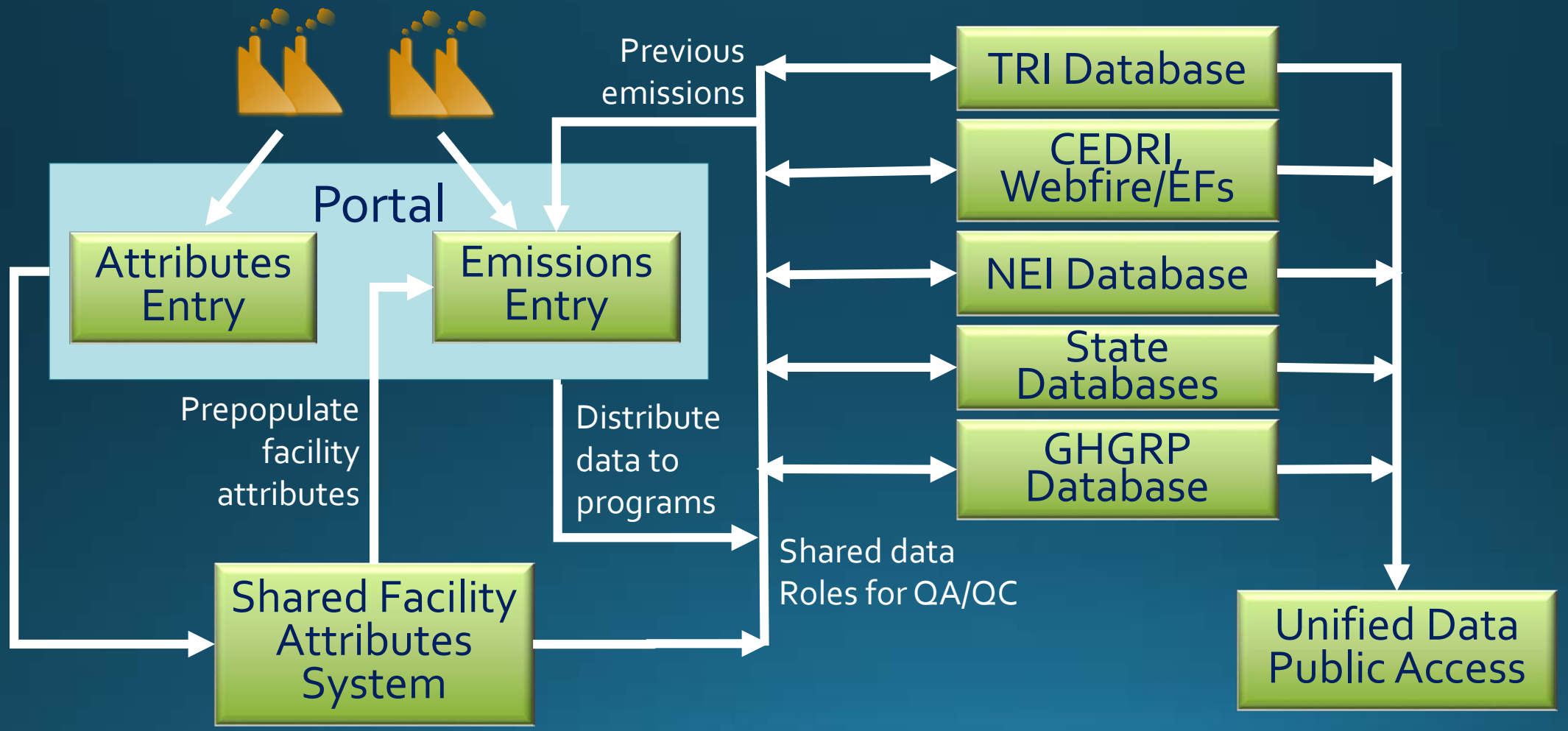
- Example of 2014 inventory year



# Key Inefficiencies to be Eliminated

- Duplicative and inconsistent facility info / facility matching
- Duplicative data entry and revisions by facilities of data elements that are included in several separate emissions programs
- Wait time caused by current state/EPA NEI process
- Some duplicative post-submission QA by EPA and states
- Inconsistent emissions data across programs and associated work (e.g. reconciliation)
- NEI augmentation steps

# Air Emissions – "To Be" Result



# "To Be" Shared Facility Attributes

- Would include all details of facility needed for EPA and S/L/T air emissions systems *such as name, address, latitude / longitude, units, processes, contacts, and controls*
- Facility information collected once and shared among EPA programs and state/locals
- Could include S/L/T QA and/or a sign-off role where appropriate

**Key potential benefits**

- One cross-program definition / understanding of "facility" generally and each facility specifically
- Common IDs would eliminate cross-program data matching for facilities and sub-facilities

**Key open issues**

- How to leverage existing systems (i.e., Facility Registry Services (FRS) and state systems)?
- What is centrally maintained and what relies on appropriate state systems?
- How to handle the regulatory and statutory definitions of facility?

# "To Be" Single Data Entry Portal

- Facilities would report attributes and emissions through a single portal
  - Seek to unify the submission experience (i.e., interface) for industry
  - Accommodate multiple reporting deadlines as needed
- Allows coordinated communication to industry of changes to data submission forms
- Shares pre-population (smart submission) across programs
- Shares pre-submittal data validation

**Key potential benefits**

- Simpler for industry
- Makes NEI timeline much shorter
- Eliminates many inconsistencies in emissions data

# "To Be" Distributed and Connected Program Databases

- Back-end emissions databases for programs (including states) remain separate
- *A single database solution was considered too unwieldy with the many different underlying programs, regulations, and purposes for the data*
- Post-submission QA roles would be defined across all programs (including states)
- Previously identified roles for CEDRI relating to other programs fits nicely into this model

**Key potential benefits**

- Allows for improving interconnectivity
- Facilitates compliance test data for CEDRI to be used for emission factors and emissions
- Eliminates duplicative QA and different programs asking the same questions to facilities; makes data better faster

# The Future

- E-Enterprise will set the stage for new ways of doing inventories

- EPA, S/L/T agencies, the public, and industry share the common interest in accessing timely and accurate facility emissions data
  - How can we leverage this interest to improve the future?

# "Real-Time" Emissions Inventory

- For EPA's risk modeling needs, the latest emissions information is crucial
  - This has been collected historically by Information Collection Requests because other sources of information (including TRI and NEI) were not sufficient
  - These are costly and time consuming, in part because of the issues that E-Enterprise seeks to fix
- For the public, current and accurate information is expected
- A "Real-Time" inventory could be updated on an ongoing bases using
  - Shared Facility Attributes, including the latest control information,
  - The most recent and applicable source tests (CEDRI),
  - Updated emission factors (Webfire), and
  - Current activity information (e.g., GHGRP)

# A Vision for the Future

- More timely and accurate inventories better meet policy needs, research needs, and needs of the public
- With vastly improved, efficient inventory processes, all stakeholders focus most inventory work to improve underlying data
  - Emissions/field testing
  - New measurement and estimation methods
  - Better QA and error prevention
- High quality underlying data and new efficient processes create consistent inventories across multiple programs
- Better emissions information allows regulators, industry, environmental groups, and other stakeholders to more quickly achieve consensus on the data, moving the focus to lowering emissions