# Air Quality Challenges in Region 9: The Importance of Accurate, Reliable Data

**Primary Quality Assurance Organization Training**
**Pomona, CA**
**24 January 2017**

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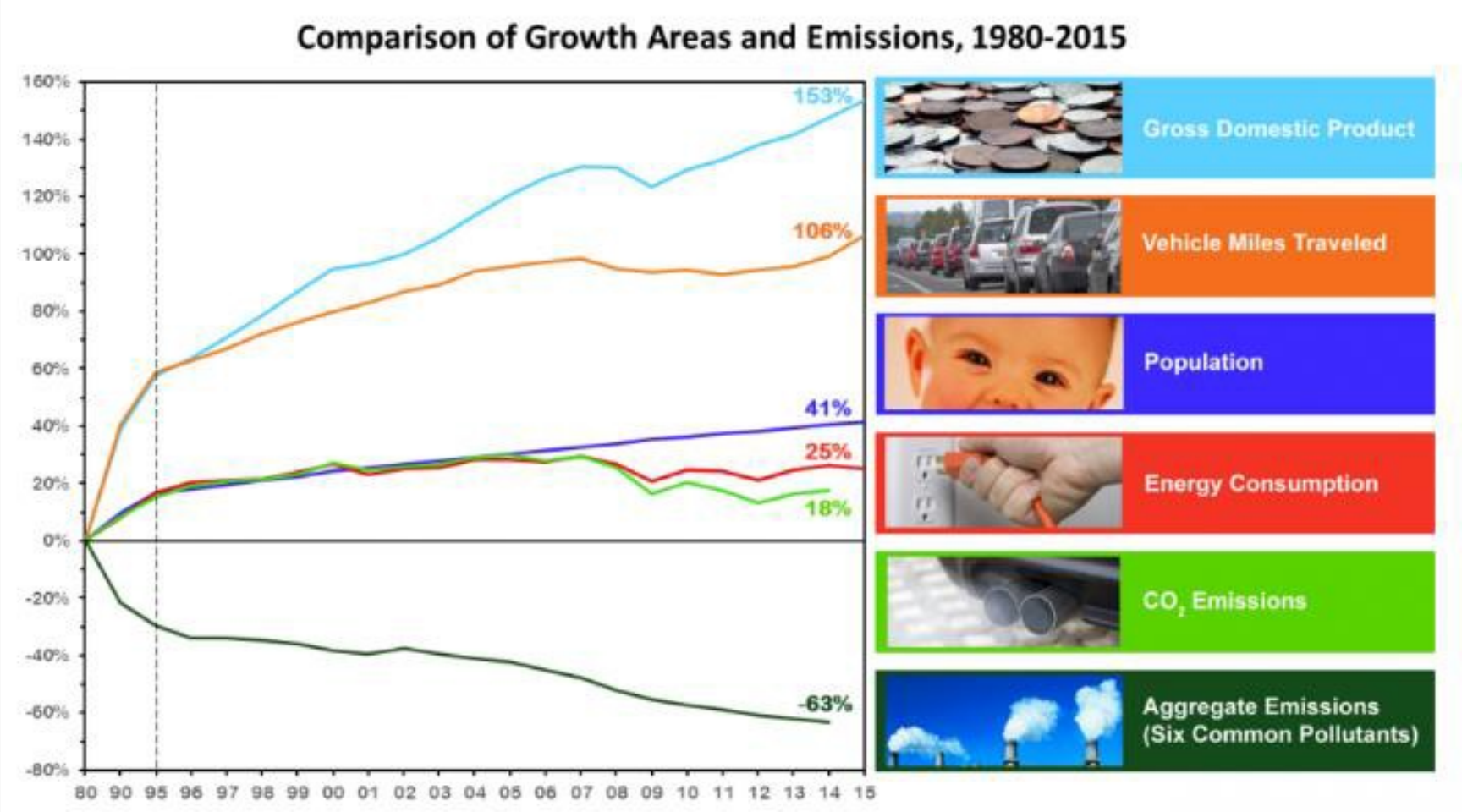
**USEPA Region 9 Air Division**

# Overview

- Historical Air Quality Trends
- Current Nonattainment Areas and Health Risk Exposure
- Importance of Accurate, Reliable Data
  - New Nonattainment Designations
  - Clean Data Determinations
  - Targeting Control Strategies
  - Emergencies
  - Litigation
- Conclusions

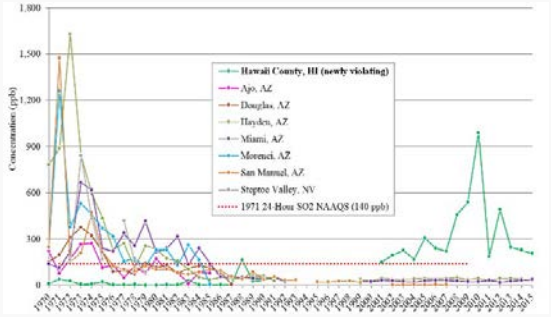
# Historical Air Quality Trends

# National Historical Air Quality Trends

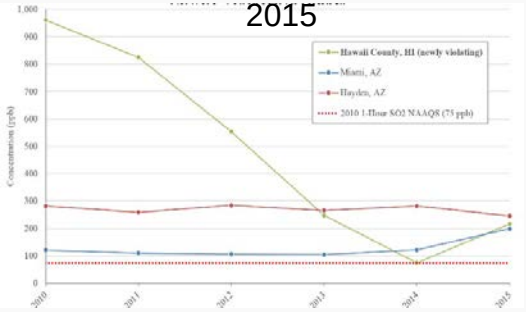


# Region 9:Trends 1970-2015

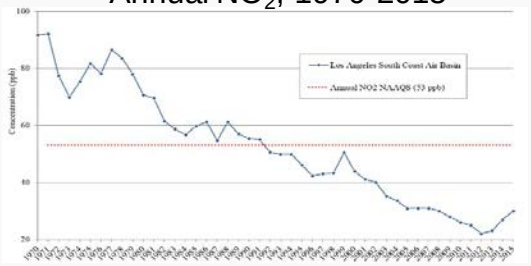
*Old NAAQS*: 24-Hour $SO_2$, 1970-2015



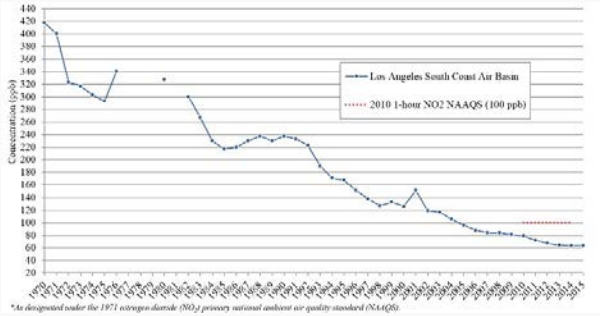

**Current NAAQS**: 1-Hour $SO_2$, 2010-2015



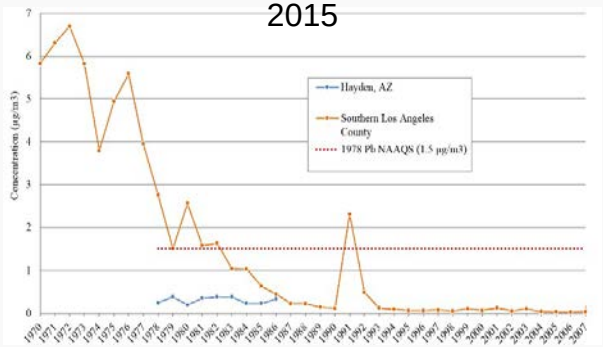

Annual $NO_2$, 1970-2015



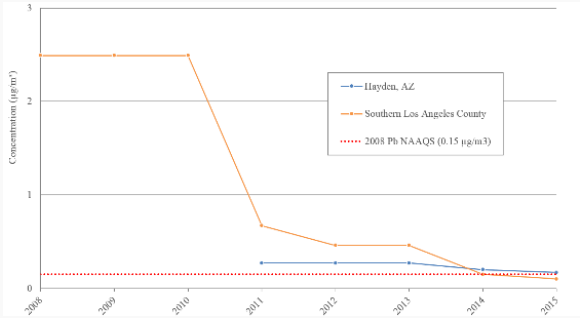

1-Hour $NO_2$, 1970-2015



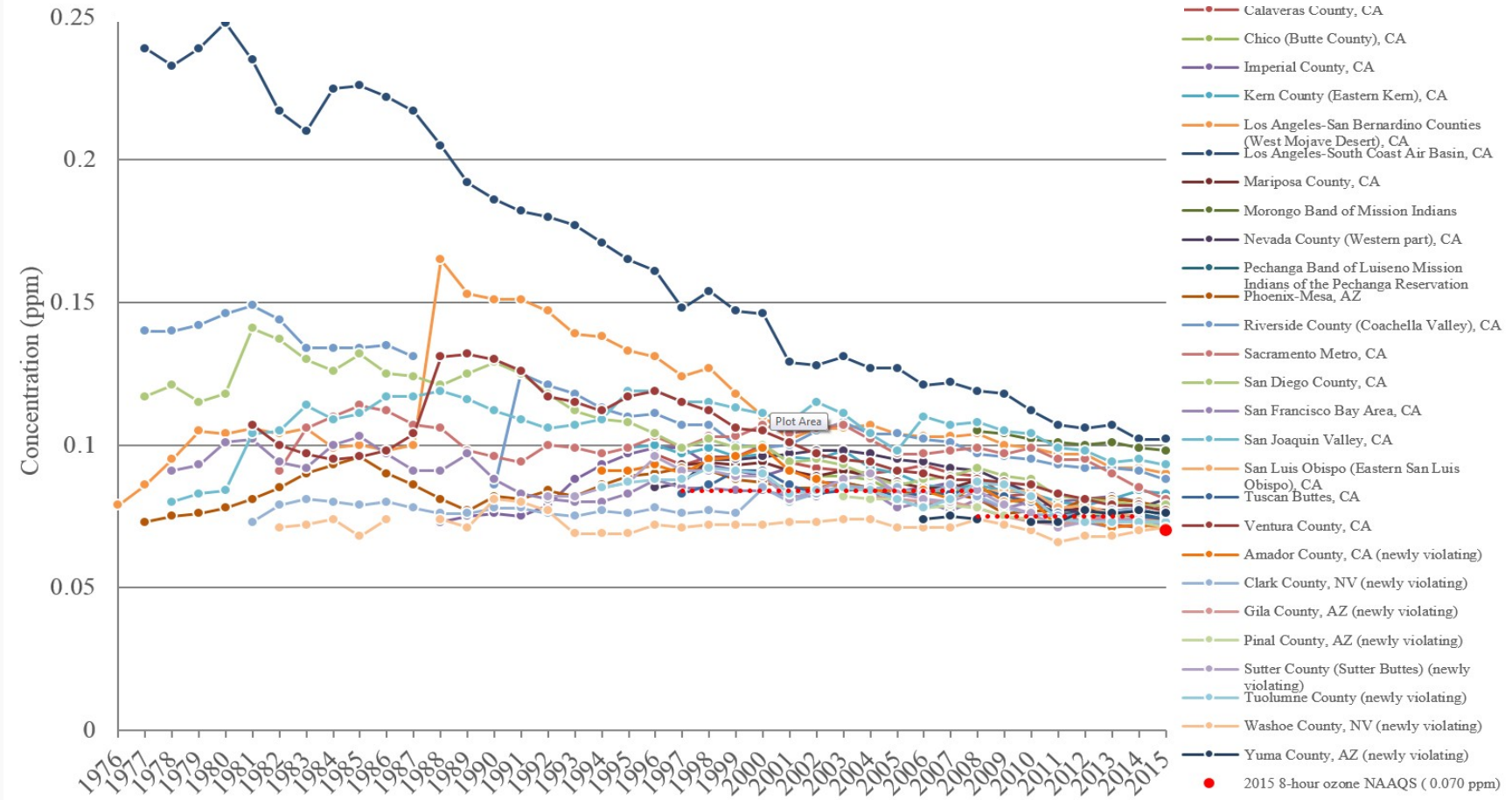

*Old NAAQS*: 1978 Quarterly Pb,1970-2015




**Current NAAQS**: 2008 3-Month Rolling Pb, 2008-2015

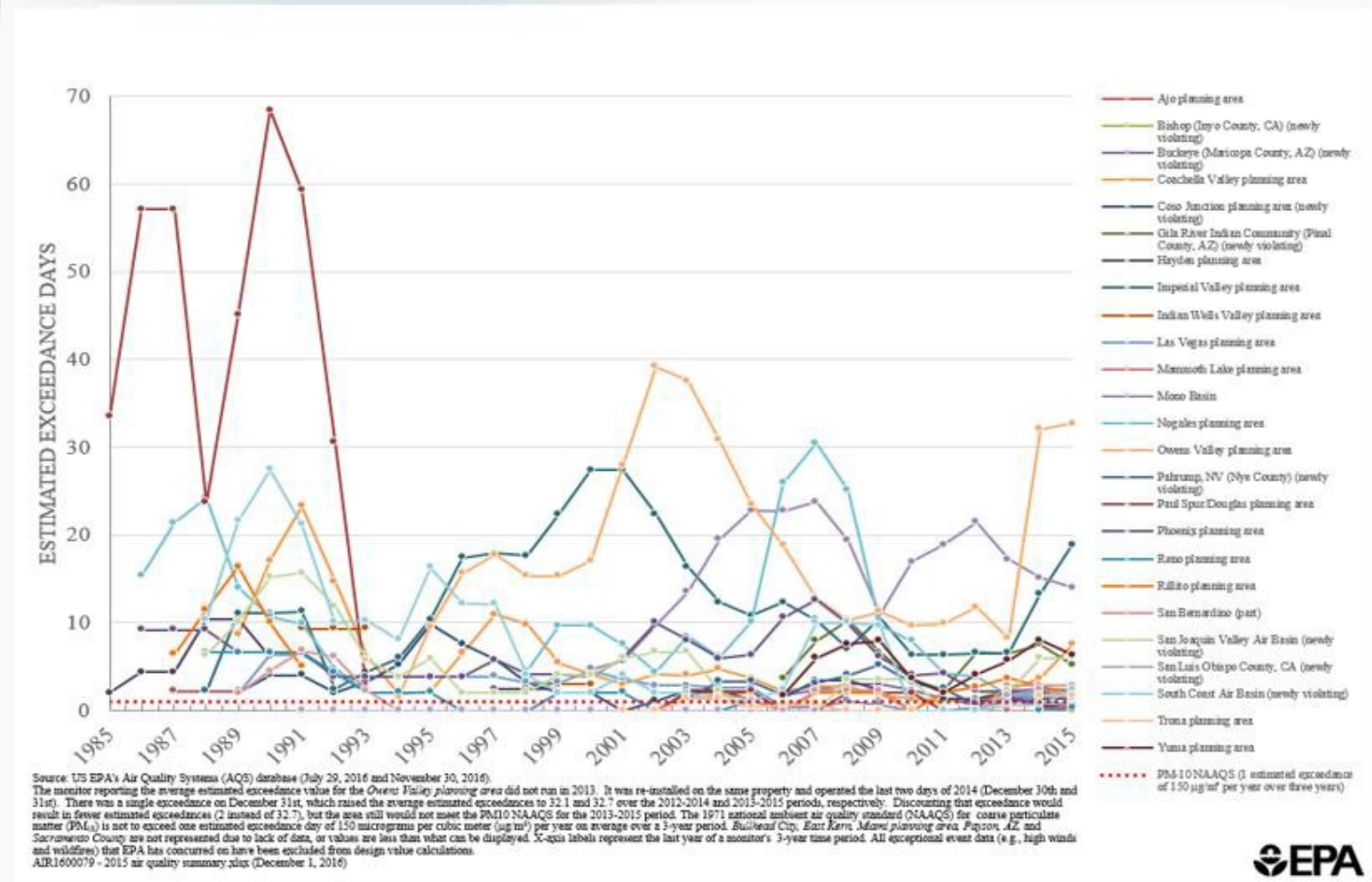


# Region 9: 8-Hour OZONE Trends 1976-2015 Existing and Historic Nonattainment Areas



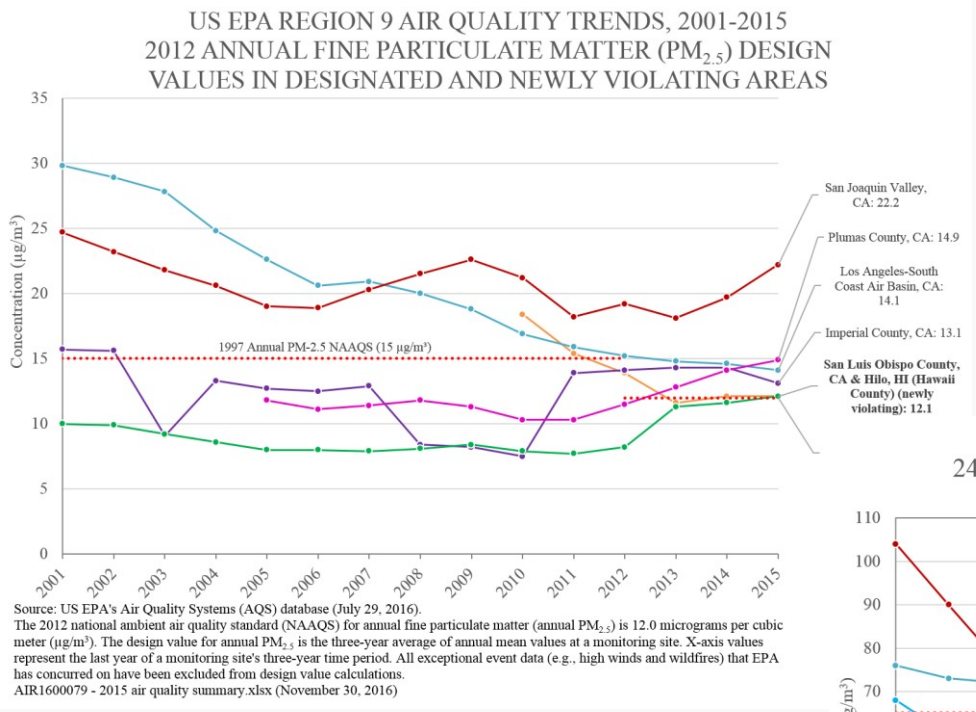

Source: US EPA's Air Quality Systems (AQS) database (July 29, 2016 and December 1, 2016).
The 2015 national ambient air quality standard (NAAQS) for 8-hour ozone is 0.070 parts per million (ppm). The design value is a calculation of each year's 4th-highest day's recorded values, averaged over a 3-year period at an air quality monitor. X-axis labels represent the last year of a monitor's 3 year time period. All exceptional event data (e.g., high winds and wildfires) that EPA has concurred on have been excluded from design value calculations.
AIR1600079 - 2015 air quality summary.xlsx (December 2, 2016)

# Region 9: PM10 Trends 1985-2015
# Designated and Violating Areas*

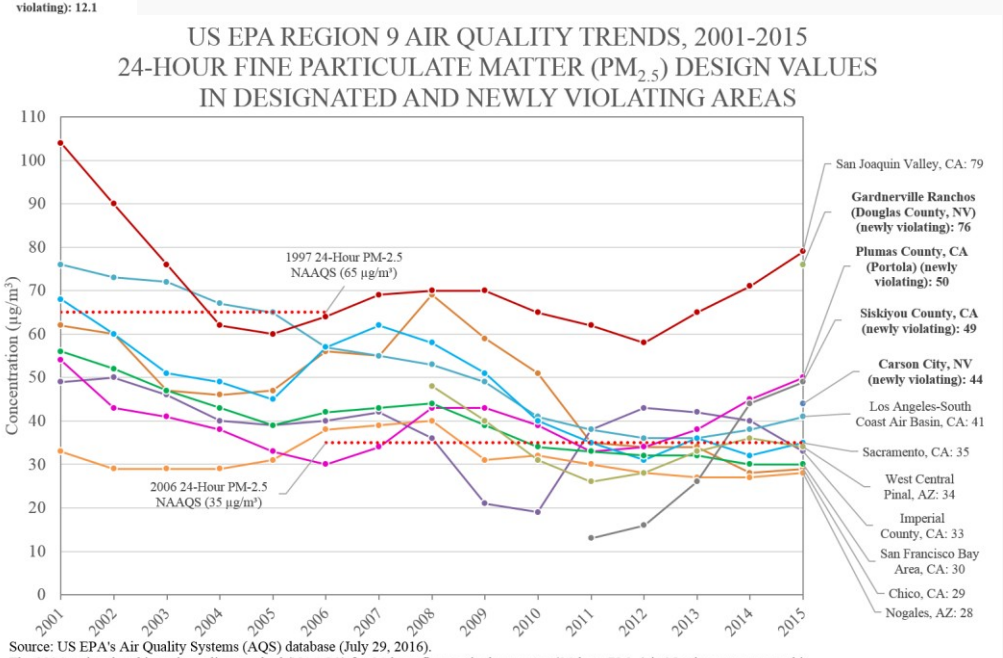



*$PM_{10}$ chart does not include West Pinal, AZ

# Region 9: PM2.5 Trends Designated and Violating Areas



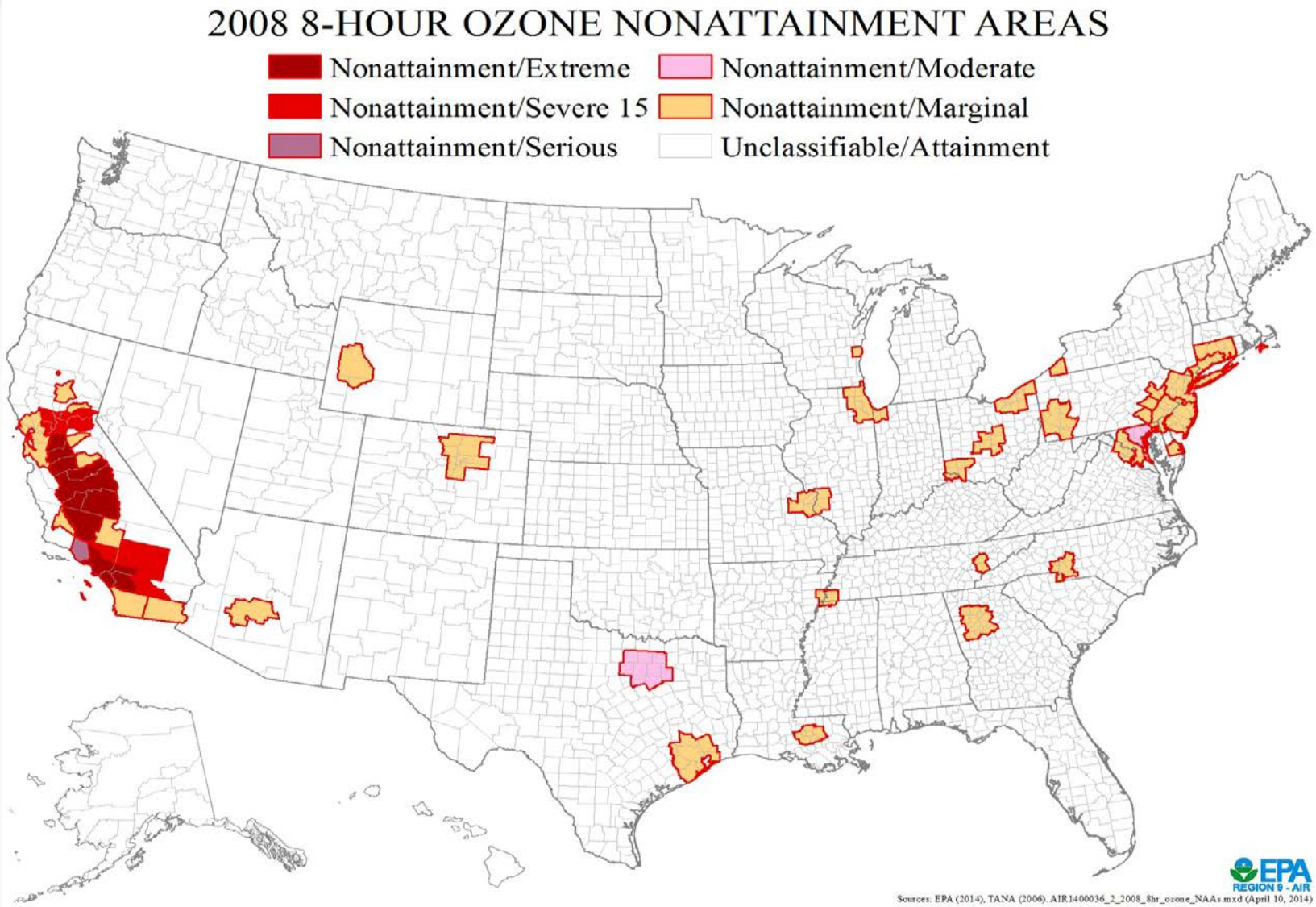

Source: US EPA's Air Quality Systems (AQS) database (July 29, 2016).
The 2012 national ambient air quality standard (NAAQS) for annual fine particulate matter (annual $PM_{2.5}$) is 12.0 micrograms per cubic meter (µg/m³). The design value for annual $PM_{2.5}$ is the three-year average of annual mean values at a monitoring site. X-axis values represent the last year of a monitoring site's three-year time period. All exceptional event data (e.g., high winds and wildfires) that EPA has concurred on have been excluded from design value calculations.
AIR1600079 - 2015 air quality summary.xlsx (November 30, 2016)



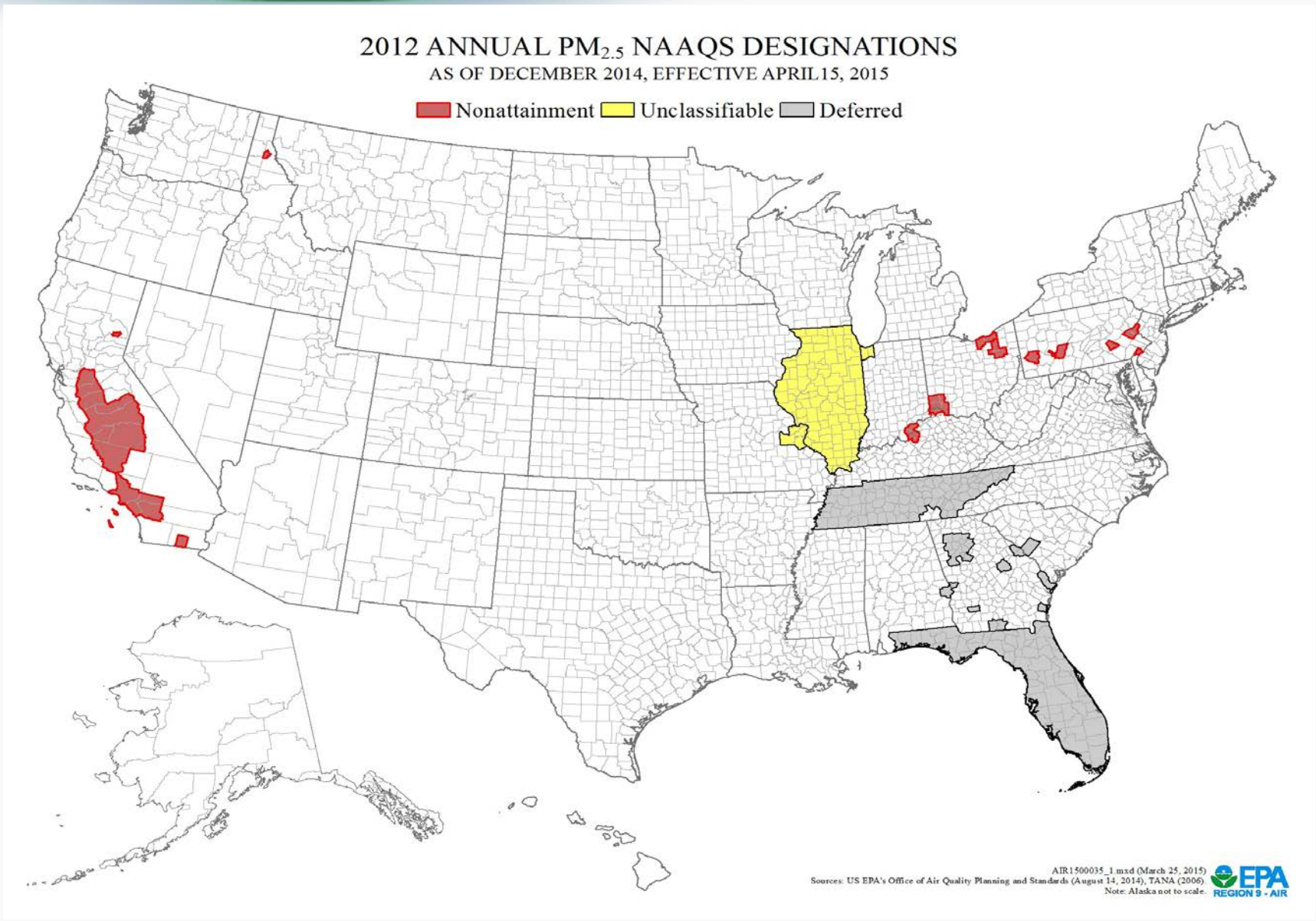

Source: US EPA's Air Quality Systems (AQS) database (July 29, 2016).
The 2006 national ambient air quality standard (NAAQS) for 24-hour fine particulate matter (24-hour $PM_{2.5}$) is 35 micrograms per cubic meter (µg/m³). The design value for 24-hour $PM_{2.5}$ is the three-year average of third-highest daily values. X-axis values represent the last year of a monitoring site's three year time period. All exceptional event data (e.g., high winds and wildfires) that EPA has concurred on have been excluded from design value calculations.
AIR1600079 - 2015 air quality summary.xlsx (November 30, 2016)

# Current Nonattainment Areas and Health Risk Exposure

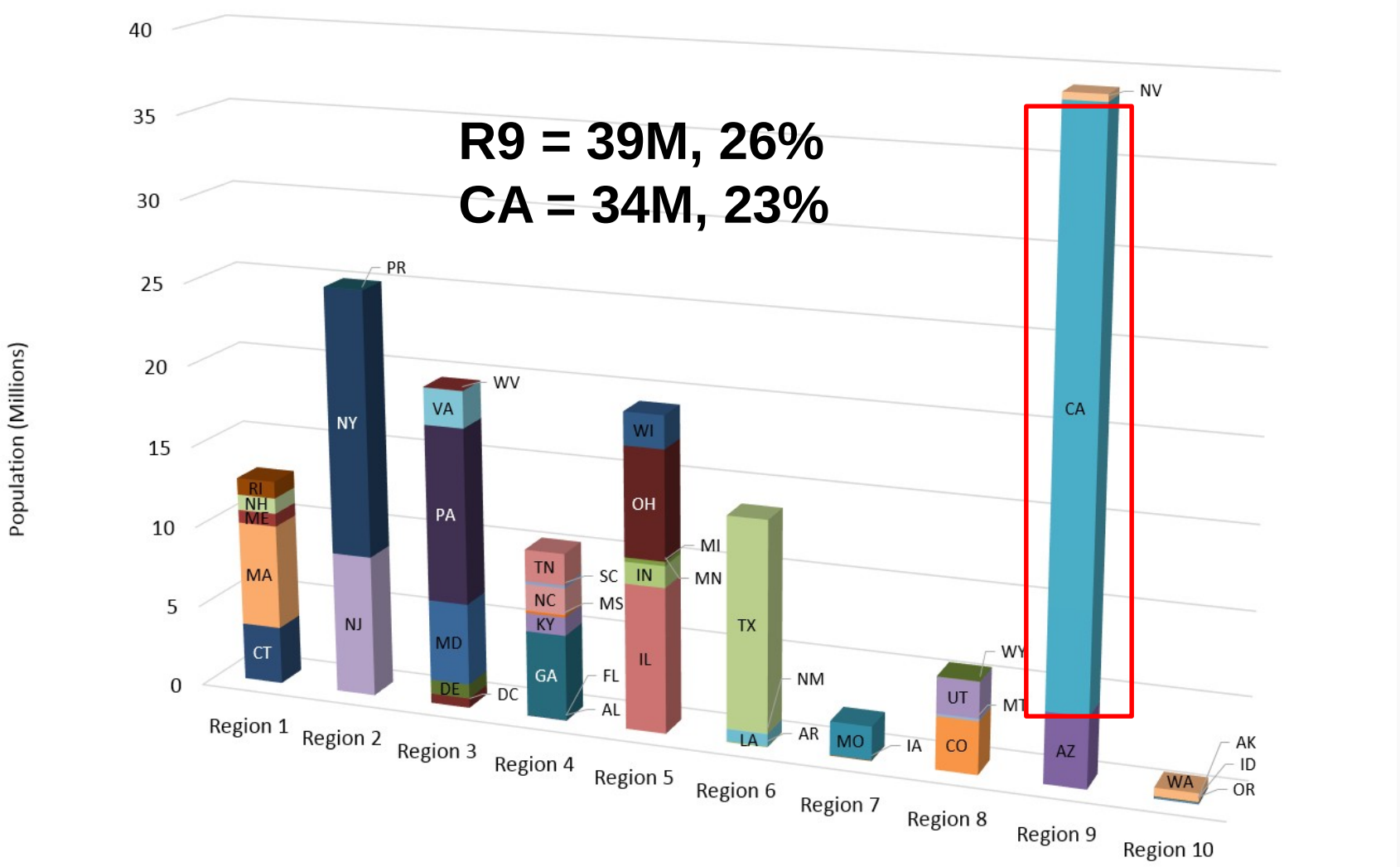
# 2008 8-Hour OZONE Current Nonattainment Areas



# 2012 PM2.5 Current Nonattainment Areas



# Population in Nonattainment Areas




Sources: American Community Survey 2006-2010 File Geodatabase for Block Groups, U.S. EPA Office of Environmental Information (OEI) - Office of Information Analysis and Access (OIAA) (2011), U.S. Environmental Protection Agency, Office of Air and Radiation, Office of Air Quality Planning and Standards (OAQPS) (2015). Columns consist of summaries of populations of 2010 U.S. Census block groups which have centroids inside nonattainment area boundaries. Populations inside revoked 1-hour ozone nonattainment areas and populations inside nonattainment areas of former air quality standards are included.

AIR1500047 (May 1, 2015)

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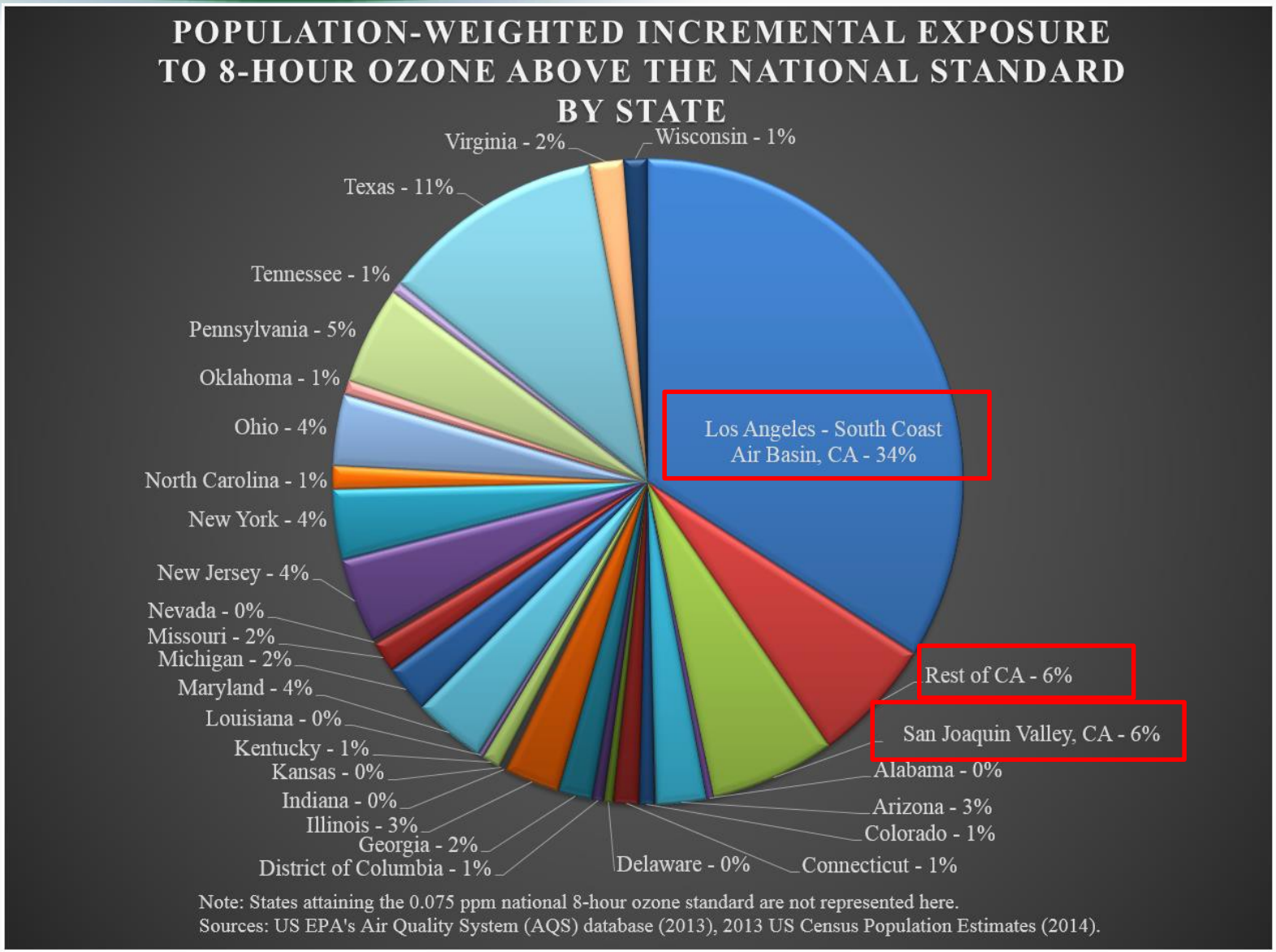
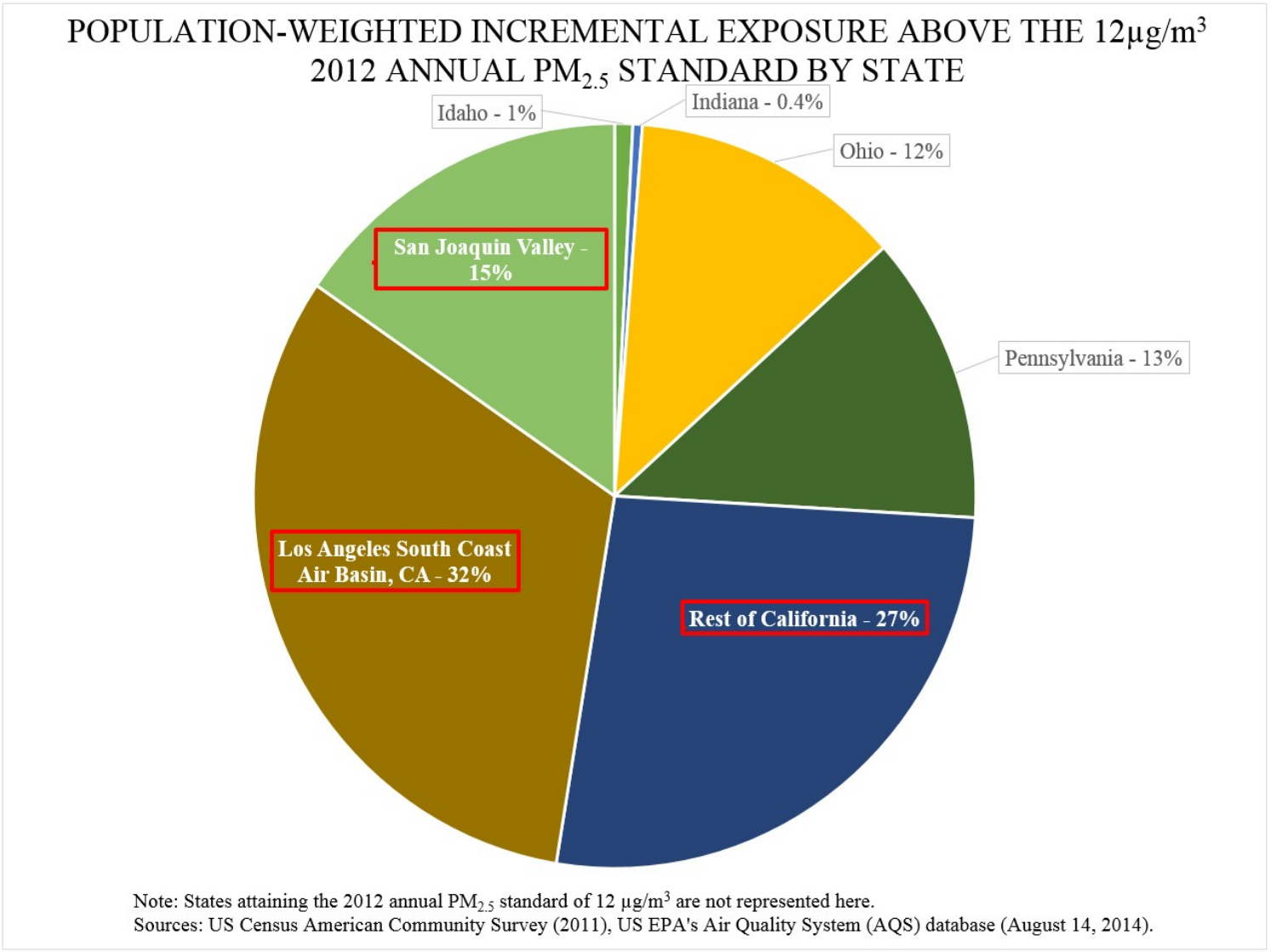
# Population-Weighted Exposure – Ozone



# Population-Weighted Exposure – PM2.5



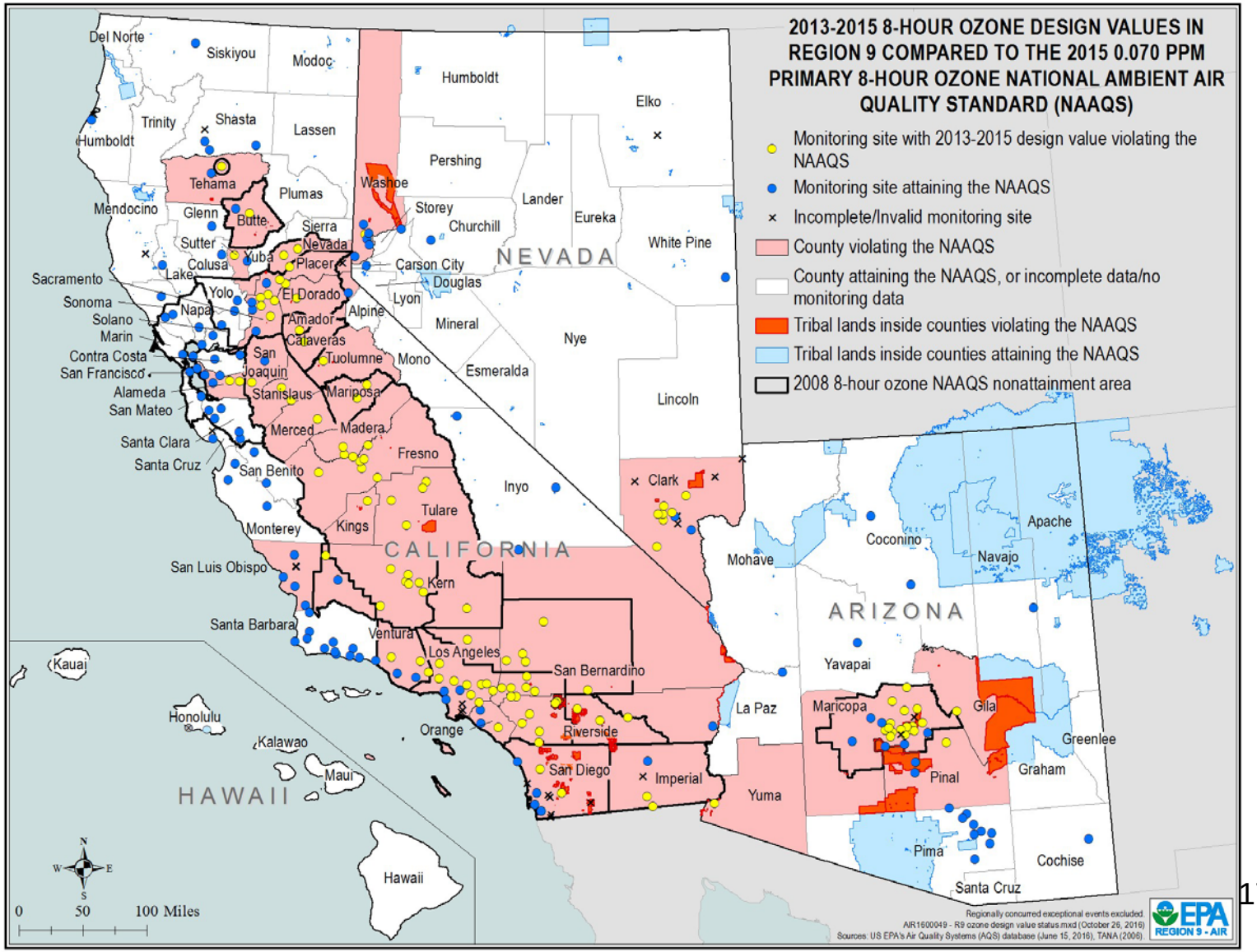

Note: States attaining the 2012 annual $PM_{2.5}$ standard of 12 µg/m³ are not represented here.
Sources: US Census American Community Survey (2011), US EPA's Air Quality System (AQS) database (August 14, 2014).

# Importance of Accurate, Reliable Data

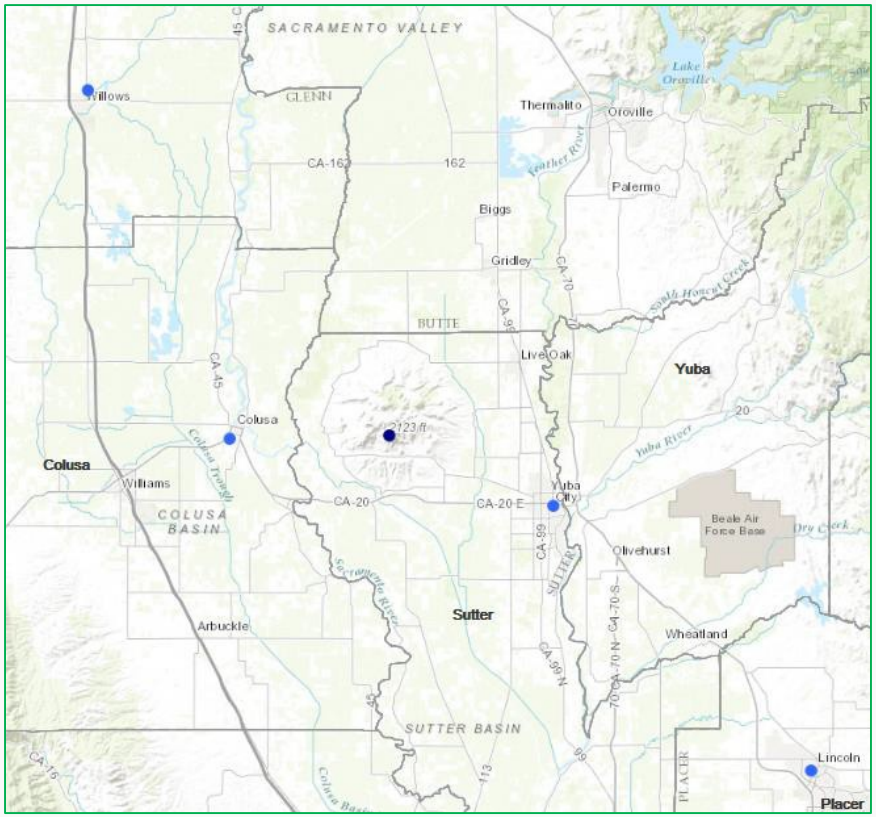
# Importance of Accurate, Reliable Data: Attainment Designations

- Used as the basis for air quality planning
- Designations typically start with monitoring data
  - An area with a violating monitor is designated nonattainment, and includes nearby areas that cause or contribute to the violation.
- EPA considers five factors when determining the size of a nonattainment area:
  1. Air Quality
  2. Emissions
  3. Geography/Topography
  4. Meteorology
  5. Jurisdiction

# 2013-2015 OZONE Design Values in Region 9



# Example: Sutter Buttes, California




## Air Quality

- Navy blue dot in the middle of the map indicates violating monitor. All other dots indicate attaining monitors.

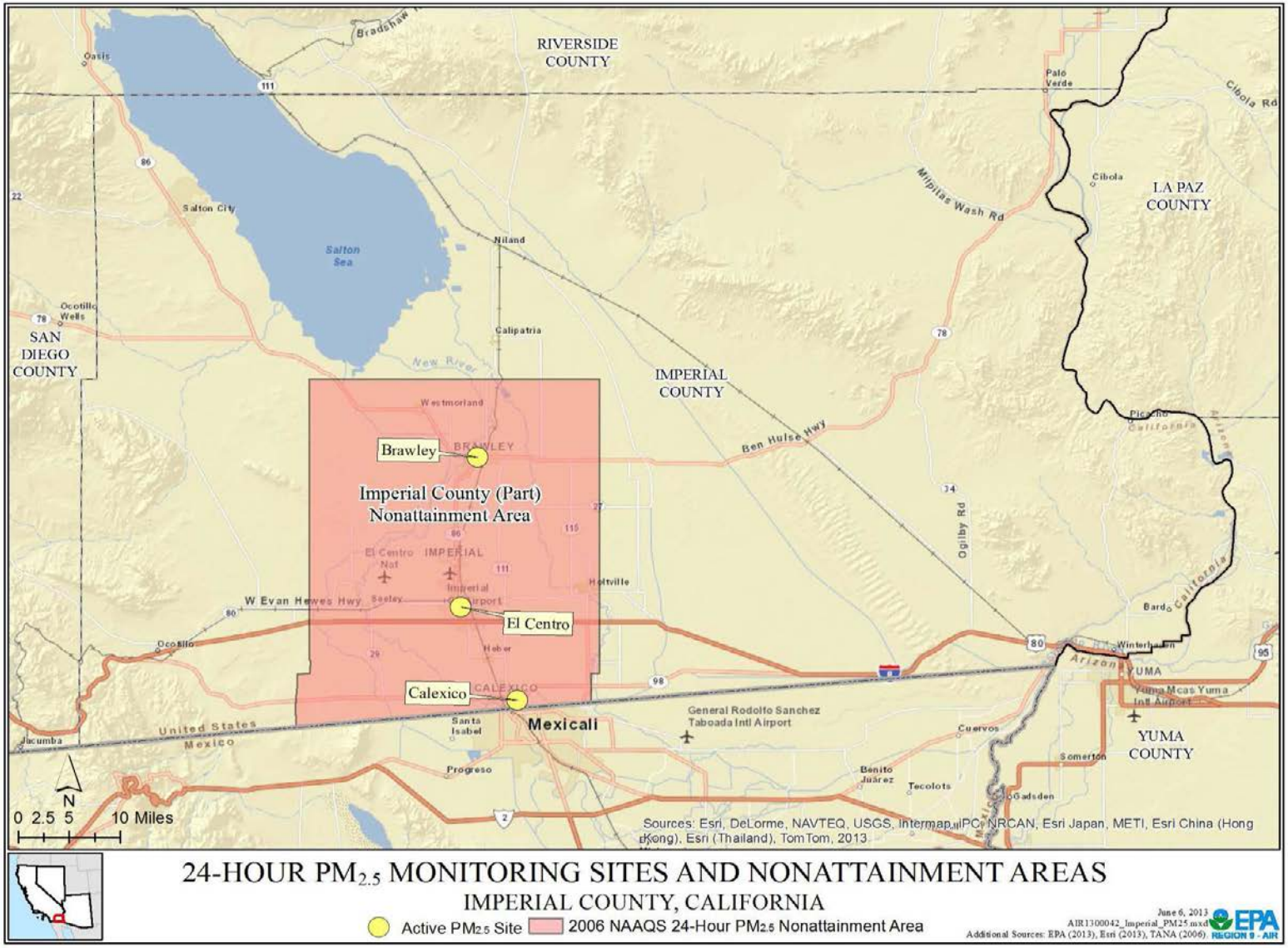
## Other Factors

- Mountain top area
- No sources
- Elevated area contained within Sutter County (does not cross jurisdictions)

# Importance of Accurate, Reliable Data:
## Clean Data Determination

- A specific regulatory action that determines that a nonattainment area is “clean” (i.e. data are below the NAAQS).
- Relies on most recent 3-year design value
  - Must be a valid design value
  - Completeness and QA/QC requirements must be met
- Also relies on preliminary data from most recent year
  - Data must continue to be below the NAAQS
- Reduces regulatory requirements for the area
  - Suspends some planning requirements
  - Could have influence on local control strategies

# Imperial County Clean Data Determination for 2006 PM2.5 Standard



# Importance of Accurate, Reliable Data:
## Targeting Control Strategies

- **PM2.5 Portola Wood Smoke**
- **PM10 Owens Lake Dust**
- **Ozone South Coast Vehicle Emissions**

# PM2.5: Portola Woodsmoke

Figure 12. Diurnal Patterns in $PM_{2.5}$ Concentrations at Portola (2010-2012)

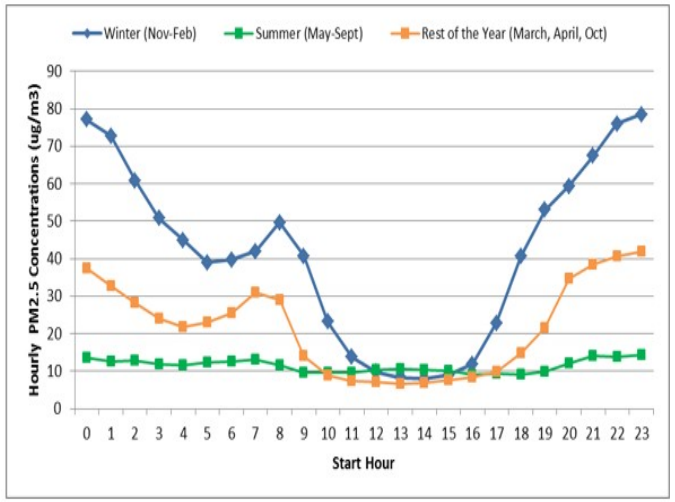
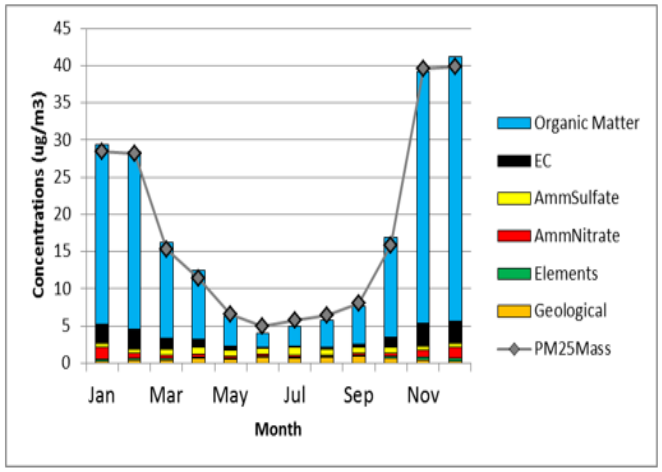


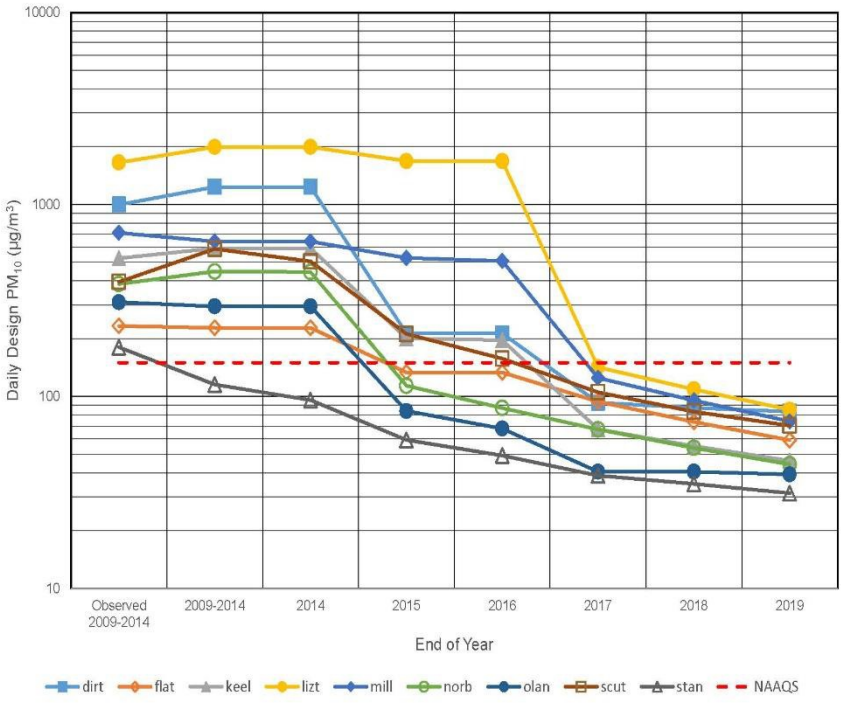

Figure 8. Portola 2013-2014 Monthly Average $PM_{2.5}$ Composition

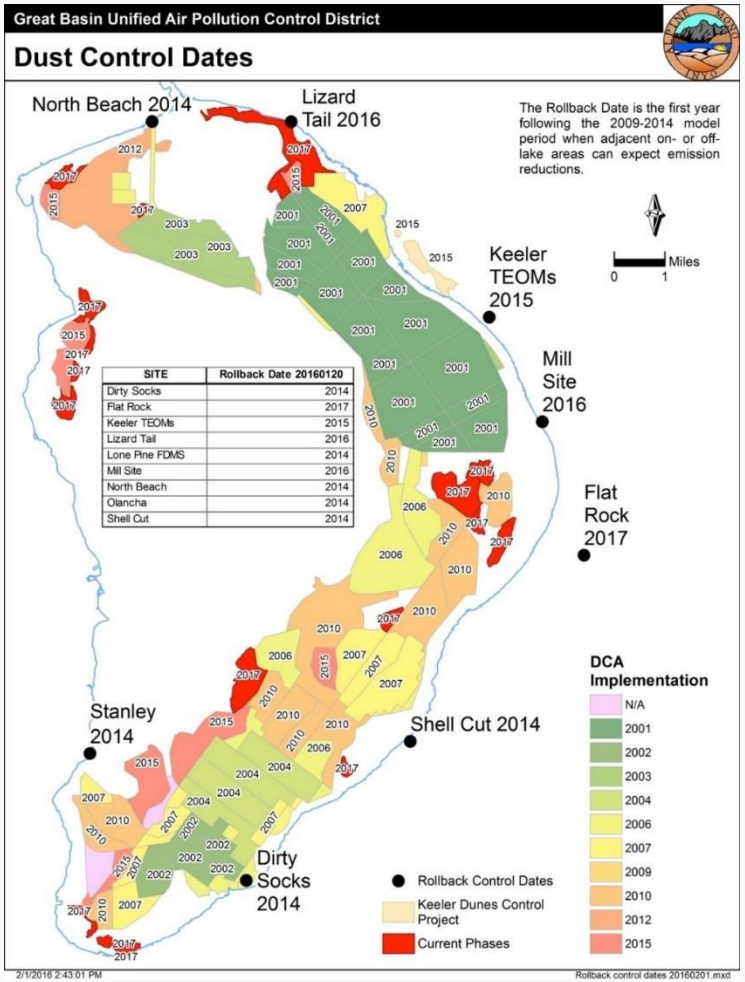



- Classified nonattainment for PM2.5 annual NAAQS in Dec 2015
- NSAQMD received a $2.48M Targeted Air Shed grant from EPA
- 105 stoves changed out in first year of program (April-Dec 2016)
- Passed a comprehensive city ordinance regulating stove use

**33% reduction in number of days exceeding 24-hr PM2.5 standard for Nov-Dec 2016 compared to Nov-Dec 2015**

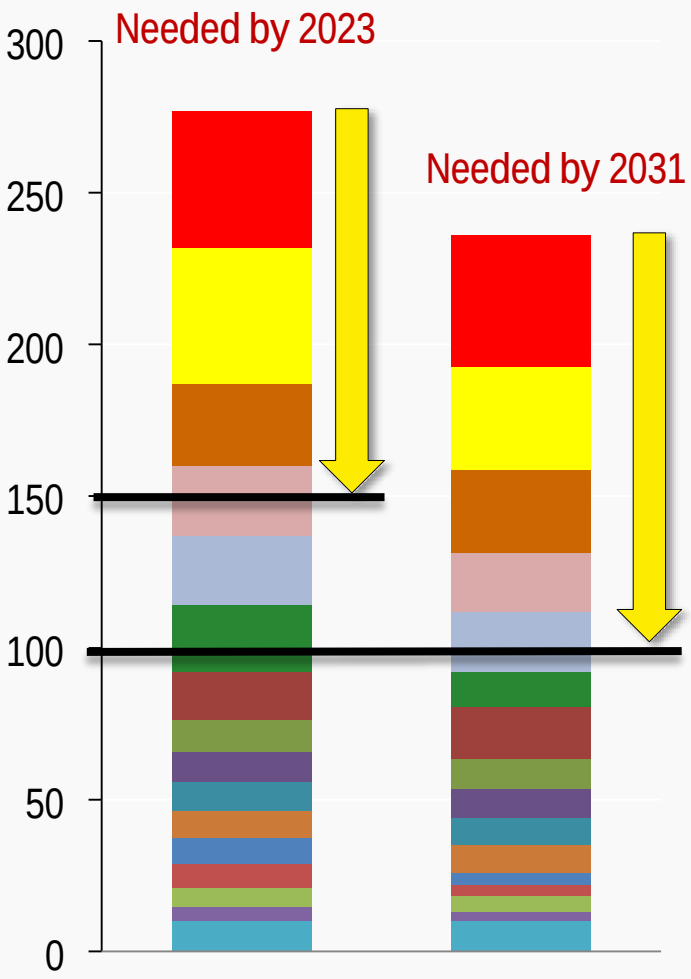
# GBUAPCD Owens Lake Control Strategy



# South Coast & Ozone NAAQS

- Heavy-Duty Diesel Trucks
- Off-Road Mobile Equipment
- RECLAIM
- Ocean Going Vessels
- Locomotives
- Cars/Light-Duty Trucks/SUVs
- Aircraft
- Commercial Harbor Craft
- Manufacturing and Industrial
- Residential Fuel Combustion
- Service and Commercial
- Buses
- Medium-Duty Trucks
- Recreational Boats
- Heavy-Duty Gas Trucks
- Other




Source: SCAQMD (2016)

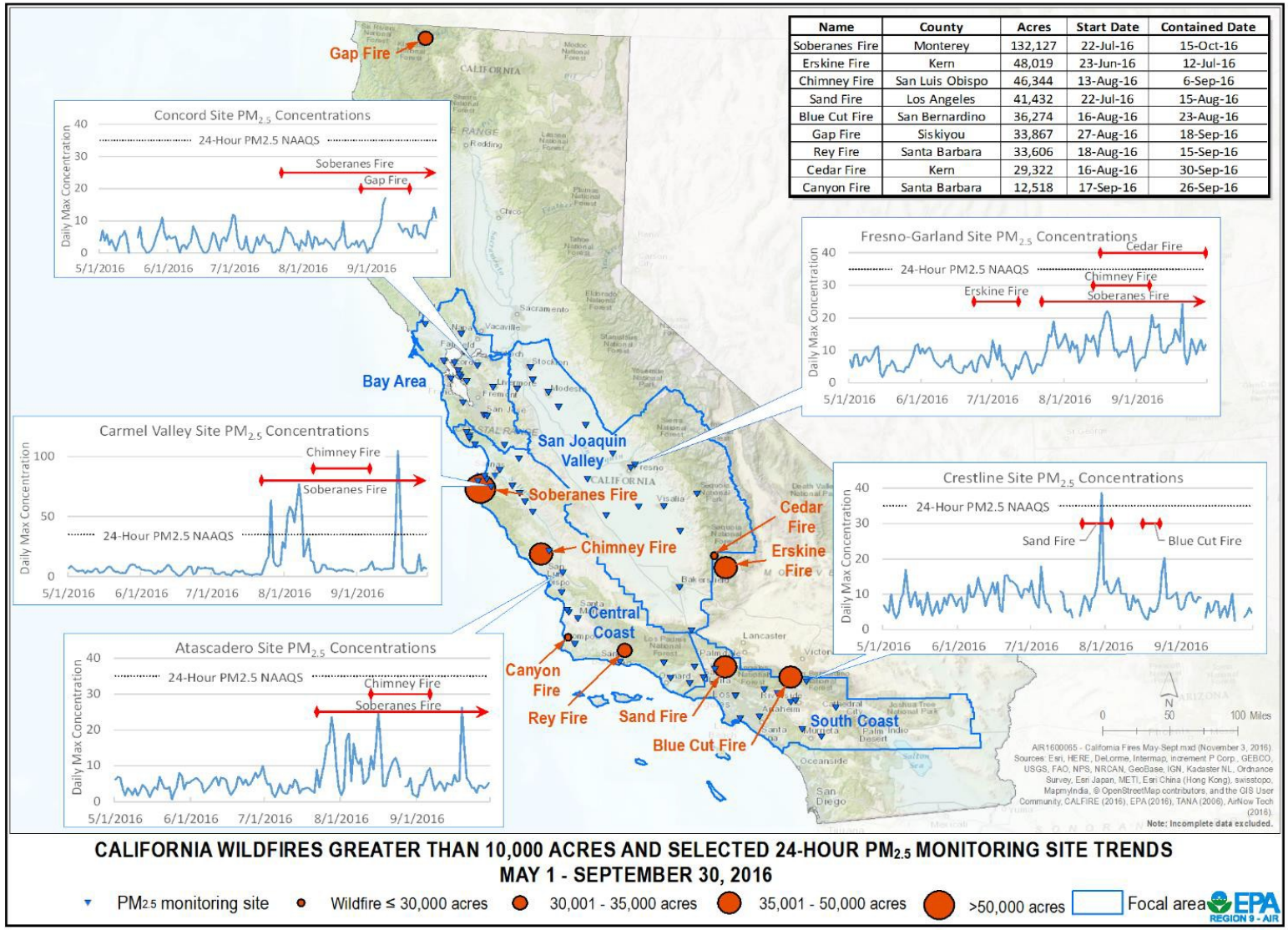
# Importance of Accurate, Reliable Data:
## Wildfire Response

# 2016 CA Wildfire Season

- During the 2016 fire season, 6,883 fires were documented and 563,411 total acres burned in California (as of Oct 29, 2016).
- Nine fires burned over 10,000 acres, including: Soberanes (132,127 acres), Erksine (48,019 acres), Chimney (46,344 acres), and Sand (41,432 acres).
- Based on preliminary 2016 data, several R9 air districts showed elevated $PM_{2.5}$ concentrations during the May – Sept timeframe.
- The 2016 CA fire season is average in total acreage and below average in number of fires when compared to the last 15 years.

Chimney Fire. Photo Credit: CalFire

# 2016 CA Wildfire Season




| Name | County | Acres | Start Date | Contained Date |
|---|---|---|---|---|
| Soberanes Fire | Monterey | 132,127 | 22-Jul-16 | 15-Oct-16 |
| Erskine Fire | Kern | 48,019 | 23-Jun-16 | 12-Jul-16 |
| Chimney Fire | San Luis Obispo | 46,344 | 13-Aug-16 | 6-Sep-16 |
| Sand Fire | Los Angeles | 41,432 | 22-Jul-16 | 15-Aug-16 |
| Blue Cut Fire | San Bernardino | 36,274 | 16-Aug-16 | 23-Aug-16 |
| Gap Fire | Siskiyou | 33,867 | 27-Aug-16 | 18-Sep-16 |
| Rey Fire | Santa Barbara | 33,606 | 18-Aug-16 | 15-Sep-16 |
| Cedar Fire | Kern | 29,322 | 16-Aug-16 | 30-Sep-16 |
| Canyon Fire | Santa Barbara | 12,518 | 17-Sep-16 | 26-Sep-16 |

**CALIFORNIA WILDFIRES GREATER THAN 10,000 ACRES AND SELECTED 24-HOUR $PM_{2.5}$ MONITORING SITE TRENDS**
**MAY 1 - SEPTEMBER 30, 2016**

$PM_{2.5}$ monitoring site · Wildfire ≤ 30,000 acres · 30,001 - 35,000 acres · 35,001 - 50,000 acres · >50,000 acres · Focal area

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# Importance of Accurate, Reliable Data: Litigation

- EPA regularly faces both legal and technical challenges to the use of data for regulatory purposes

- Comments on regulatory actions or annual monitoring network plans, for example:
  - Approval of QAPPs
  - Questioning QA/QC measures
  - Maximum concentration locations/Network design

# CONCLUSIONS

- Reliable, accurate data are foundation of the air quality management program
- California monitoring network is unparalleled
- Fundamental to key policy decisions to clean air

# THANK YOU

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