NAAQS UPDATES

Presented at
MARAMA 2010 Monitoring Committee Training Workshop

Kevin Cavender

Ambient Air Monitoring Group

EPA/OAQPS

The List

- NO_2
- SO_2
- Ozone
- Lead
- CO
- PM

Projected Schedules for Ongoing NAAQS Reviews

as of November 19, 2009

Stage of Review	Major Milestone[1]	NO_2 Primary	SO_2 Primary	Ozone Reconsideration	CO	PM (accelerated schedule)	NO_2/SO_2 Secondary	Ozone (new review after reconsideration)
Integrated Review Plan	Call for Information	Dec 2005	May 2006		Sept 2007	Jun 2007	Dec 2005	Aug 2008
	Workshop on science/policy issues	Feb 2007	Feb 2007		Jan 28-29, 2008	Jul 2007	July 2007	Oct 29-30, 2008
	Draft Integrated Review Plan	Apr 2007	Apr 2007		Mar 2008	Oct 2007	Sept 2007	Sept 2009
	CASAC/public review of Draft Plan	May 11, 2007	May 11, 2007		Apr 8, 2008	Nov 30, 2007	Oct 30, 2007	*Nov 13, 2009*
	Final Integrated Review Plan	Aug 2007	Sept 2007		Aug 2008	Mar 2008	Dec 2007	Dec 2009
Integrated Science Assessment (ISA)	1st draft ISA	Aug 2007	Sept 2007		Mar 14, 2009	Dec 19, 2008	Dec 2007	Nov 2010
	CASAC/public review of 1st draft ISA	Oct 24-25, 2007	Dec 5-6, 2007		May 12-13, 2009	Apr 1-2, 2009	Apr 2-3 2008	**Feb 2011**
	2nd draft ISA	Mar 4, 2008	late May 2008		late Sept 2009	late Jul 2009	early Aug 2008	Jun 2011
	CASAC/public review of 2nd draft ISA	May 1-2, 2008	Jul 30-31, 2008		Nov 16-17, 2009	**Oct 5-7, 2009**	Oct 1-2, 2008	**Sep 2011**
	Final ISA	Jul 11, 2008	Sept 12, 2008		Jan 29, 2010	**mid Dec 2009**	Dec 12, 2008	Dec 2011
Risk/ Exposure Assessment (REA)	Draft REA scope/methods plan	Sept 2007	Oct 2007		mid Apr 2009	Late Feb 2009	Feb 2008	Jan 2011
	CASAC/public review of REA plan	Oct 2007	Dec 2007		May 12-13, 2009	Apr 1-2, 2009	Apr 2-3 2008	**Feb 2011**
	1st draft REA	Mar 2008	Jun 2008		Oct 29, 2009	early Sep 2009	Aug 2008	Jul 2011
	CASAC/public review of 1st draft REA	May 1-2, 2008	Jul 30-31, 2008		Nov 16-17, 2009	Oct 5-7, 2009[2]	Oct 1-2, 2008	**Sep 2011**
	2nd draft REA	early Aug 2008	Mar 20, 2009		Feb 2010	Dec 2009	June 2009	Mar 2012
	CASAC/public review of 2nd draft REA	Sept 9-10, 2008 Oct 22, 2008	Apr 16-17, 2009		**Mar 2010**	**Mar 2010**	Jul 22-23, 2009	**May 2012**
	Final REA	Nov 21, 2008	July 2009		May 28, 2010	April 2010	Sept 2009	Sept 2012
Policy Assessment (PA)/ Rulemaking	1st draft PA				Feb 2010	Feb 2010	late Feb 2010	Aug 2011
	CASAC/public review of 1st draft PA				**Mar 2010**	**Mar 2010**	**early Apr 2010**	**Sep 2011**
	2nd draft PA					late Apr 2010	late July 2010	Apr 2012
	CASAC/public review of 2nd draft PA					***late May 2010***	***early Sept 2010***	***May 2012***
	Final PA				May 2010	July 2010	late Nov 2010	Oct 2012
	CASAC/AAMM meeting on monitoring issues				**Jul - Sept 2010**	*Feb 11, 2009*[3] **Jan/Feb 2010**[4]		*Feb 10, 2009*[3]
	Proposed rulemaking	Jun 26, 2009	Nov 16, 2009	Dec 21, 2009[5]	Oct 28, 2010	late Nov 2010	Jul 12, 2011	May 2013
	Final rulemaking	Jan 22, 2010	Jun 2, 2010	Aug 31, 2010	May 13, 2011	late Jul 2011	Mar 20, 2012	Feb 2014

[1] NOTES: Underlined dates indicate court-ordered or settlement agreement deadlines. Future CASAC meeting dates in **bold**; dates in italics are planned as teleconferences.

[2] CASAC meeting included discussion of preliminary draft PA

[3] CASAC Ambient Air Monitoring Methods (AAMM) Subcommittee. Feb 10-11, 2009 meeting related to coarse particle ($PM_{10-2.5}$) speciation and ozone monitoring network design

[4] CASAC AAMM Subcommittee meeting related to urban visibility, Jan/Feb 2010

[5] CASAC Ozone Panel meeting on the Dec 2009 proposed rule requested for late Jan 2010

NO_2 Update

NO_2 Round-up

- On January 22, 2010 EPA strengthened the primary national ambient air quality standard (NAAQS) for nitrogen dioxide (NO_2) to increase protection of public health by:
  - adding a *1-hour* NO_2 standard at 100 parts per billion (ppb); and
  - retaining the *annual* average NO_2 standard at a level of 53 ppb

- To determine compliance with the revised NO_2 standard, EPA also is making changes to the NO_2 air quality monitoring network requirements.
  - Monitoring is needed to measure:
    - Peak, short-term concentrations – primarily near major roads in urban areas
    - Highest concentrations of NO_2 that occur over wider community areas, and
    - Concentrations impacting vulnerable and susceptible individuals

- We did make changes to monitoring requirements relative to the proposal…

Monitoring: Proposed vs. Final Requirements

- Near-road Requirement Thresholds:
  - We proposed at least one NR monitor in any CBSA with 350,000 or more people
  - Considering public comments, particularly from states, the Administrator finalized a threshold of 500,000.
  - This reduces the total number of NR sites from ~167 in 143 CBSAs to ~126 in 102 CBSAs (a reduction of 41 monitors)
  - This was appropriate, as this modification still required a geographically and spatially diverse network, with respect to populations and locations across the country.
  - This was also supported by part of the air quality analysis presented in the REA
- Near-road Site Selection
  - Rank by AADT and consider fleet mix, roadway design, congestion patterns, terrain, and meteorology in determining locations of expected maximum NO_2 concentrations

Monitoring: Proposed vs. Final Requirements (cont)

- No Downwind Siting Requirements
  - EPA received comments both for and against this requirement
  - Downwind requirement would likely be too restrictive
  - EPA believes downwind should be a goal, not a requirement, and can encourage this through guidance (discussed later)

- Removal of Meteorological Monitoring Requirements:
  - EPA received no real support for requiring meteorological monitoring
  - Issues with collection frequency to make data useful (i.e. 1Hz versus 1-hr) in the NR environment
  - EPA strongly encourages meteorological measurements even though it is not required

Monitoring: Proposed vs. Final Requirements (cont)

- Regional Administrator Authority
  - The Administrator chose to clearly state in the preamble to the final rule that the RAs shall site 40 monitors nationwide, focused on susceptible and vulnerable populations
  - EPA will need to work with states on where such populations or communities might exist and subsequently determine how best to site these 40 monitors
  - There is no pre-conceived notion of where the will go; i.e. no simple distribution by state or region
  - These sites DO NOT have to be near-road monitors, but are not prohibited as such
- The RAs may also require additional monitors if minimum required monitors are not sufficient, particularly where a location without a monitor has NO_2 concentrations approaching or exceeding the NAAQS

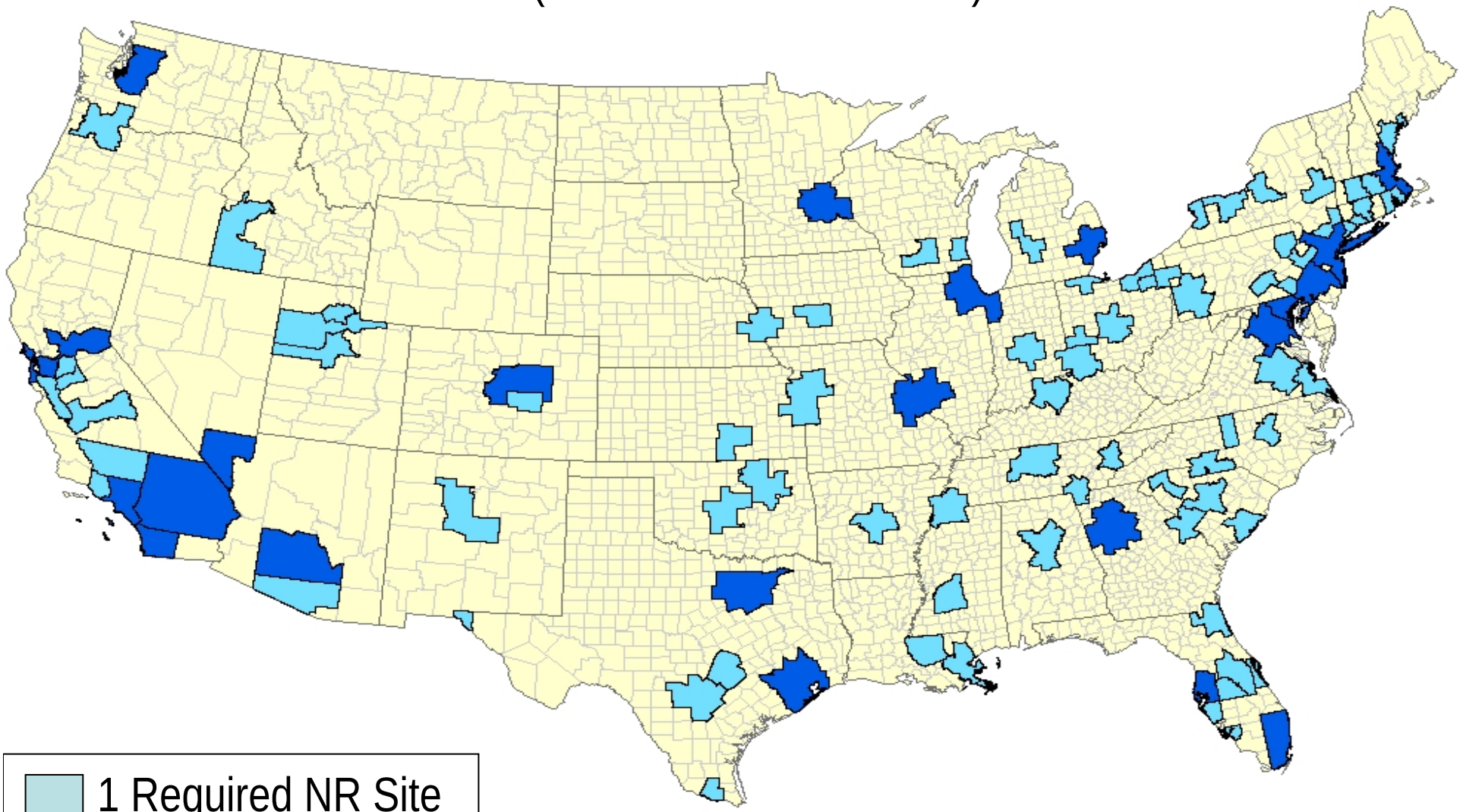
Minimally Required Monitors - Final

- Near-road Monitors (126 in 102 CBSAs):
  - One NR monitor in any CBSA with 500,000 or more people (102)
  - A second NR monitor in any CBSA with 2,500,000 or more people OR any CBSA with one or more road segments with 250,000 AADT (24)
- Area-wide (53 in 53 CBSAs)
  - One monitor in any CBSA with 1,000,000 or more people (53)
  - These are sited at highest/max concentrations occurring at the neighborhood or larger spatial scale in a CBSA

❖ RA “40” – Focused on susceptible and vulnerable populations

➢ In all, 219 total monitors “required” through this rule

CBSAs with Required Near-road NO_2 Sites
(126 Sites in 102 CBSAs)



1 Required NR Site
2 Required NR Sites

Note: San Juan has 2 required NR sites
Honolulu has 1 required NR site

Implementation

- Proposed and finalized that the required NO_2 monitoring network will be operational by January 1, 2013
- CHANGED the date by which monitoring network plans are due from July 2011 to JULY 2012
- The RA "40" are to be implemented by January 1, 2013
- EPA has scheduled time with the CASAC AAMM subcommittee for near-road consultation (~3rd quarter of 2010)
- EPA has committed to work with stakeholders in creating near-road siting guidance
- EPA believes that this process will benefit from a pilot where a handful of states move to install their required NR monitors early – Looking for volunteers who are willing to do this

SO2 Update

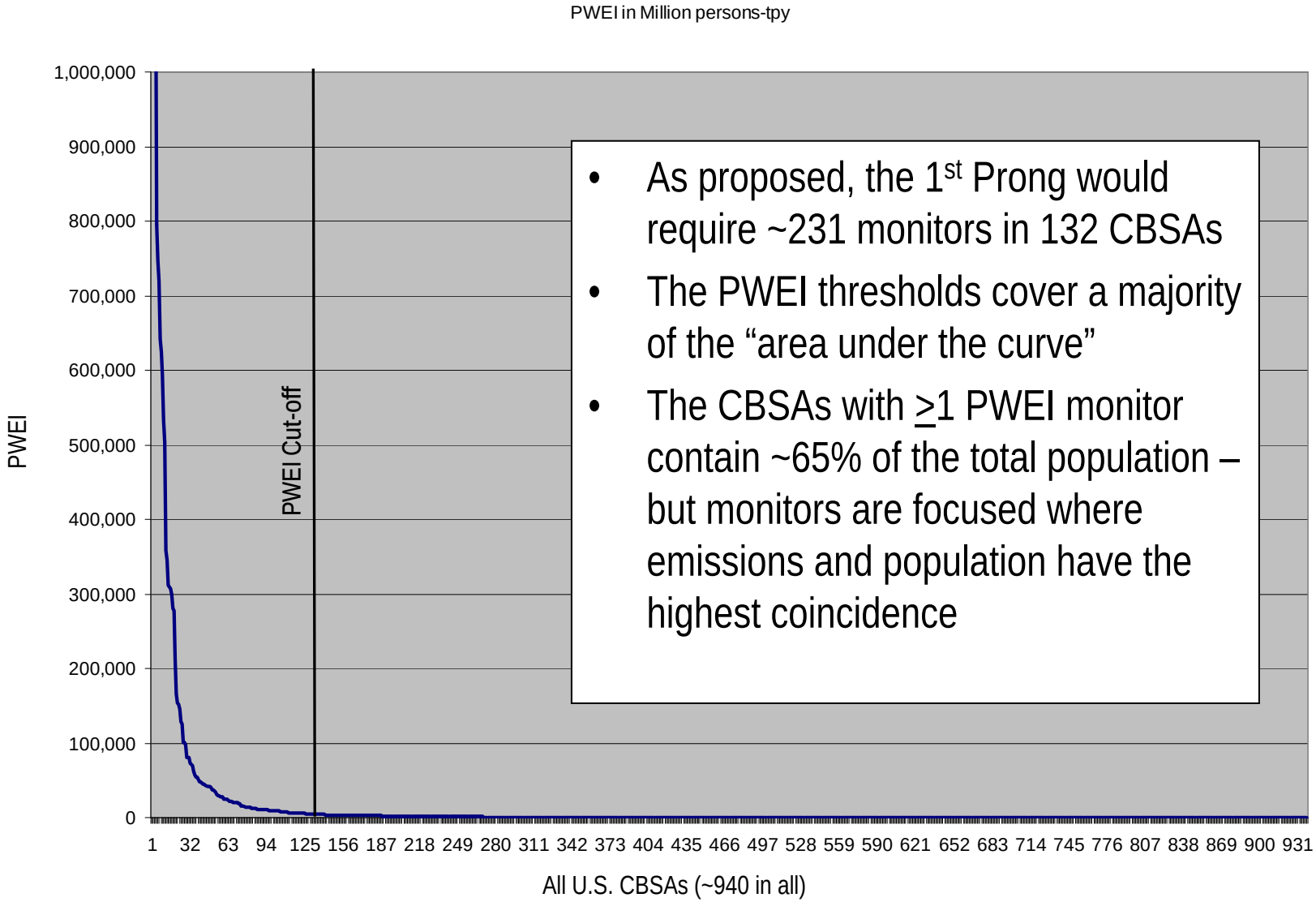
Proposed NAAQS

- EPA is proposing to replace the current annual and 24-hour SO_2 primary standards with a new 1-hour SO_2 standard set at a level between 50-100 ppb
  - A 1-hour standard would better protect public health by reducing people's exposure to high short-term (five-minute to 24-hour) concentrations of SO_2
  - EPA is proposing to revoke both the annual and 24-hour SO_2 standards because current evidence indicates that they would not offer any protection beyond that achieved by a 1-hour standard within the proposed range of 50-100 ppb
  - EPA is proposing two different options for the form of the standard, which is used to determine whether the ambient concentration measured at each monitor meets the standard: the 3-year average of either the 99th percentile concentration or the 4th highest daily maximum concentration in a year
- EPA is taking comment on alternative levels for the 1-hour standard up to 150 ppb. However, at this level, the Agency would retain the existing 24-hour primary standard and revoke only the annual standard

Proposed Monitoring Requirements

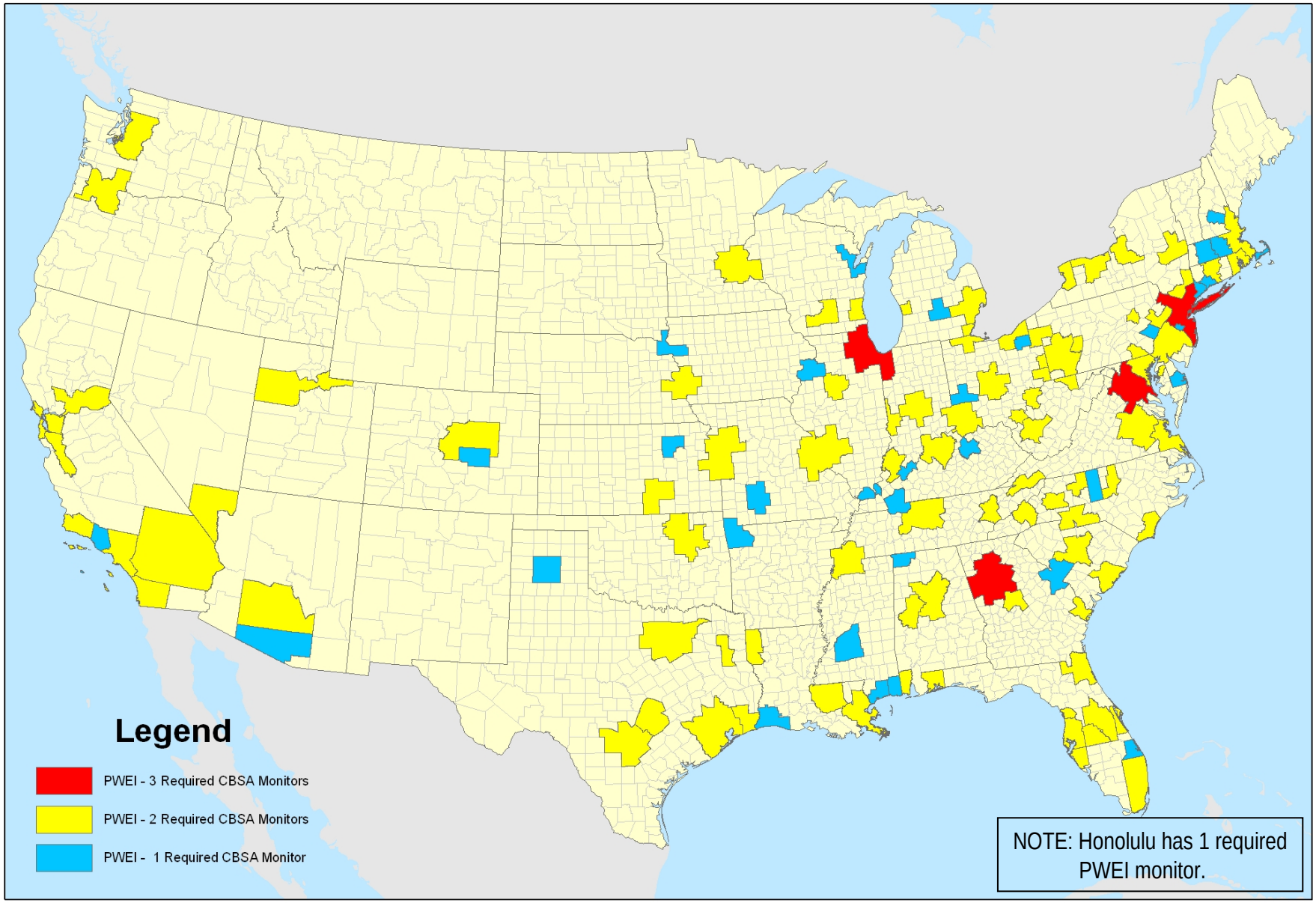
- SO_2 emissions are dominated by stationary sources (~95% of total per 2002 NEI)
- The monitoring network is intended to support the revised NAAQS which intends to reduce exposures to short-term, peak concentrations
- Two Prong Network Design:
  - ➢ Prong 1: Population Weighted Emissions Index (PWEI)
  - – Intended to take monitors to areas where there is a higher coincidence of population and emissions
  - – Calculated by multiplying CBSA population by the total SO2 emissions (tons per year) in that CBSA, then dividing the product by 1 million, providing values with the metric “million persons-tons per year”
  - – Monitors are required in a CBSA based on the PWEI values:
    - 3 if the PWEI is >1,000,000
    - 2 if the PWEI is 10,000 to 999,999
    - 1 if the PWEI is 5,000 to 9,999

1st Prong (PWEI) - Visualized



- As proposed, the 1st Prong would require ~231 monitors in 132 CBSAs
- The PWEI thresholds cover a majority of the "area under the curve"
- The CBSAs with ≥1 PWEI monitor contain ~65% of the total population – but monitors are focused where emissions and population have the highest coincidence

Proposed SO2 Network Design - Prong 1 (PWEI Triggered)



2nd Prong – State Level Emissions

- The 2nd prong of the proposed network design is meant to ensure that monitoring can occur inside or outside of CBSAs wherever peak, short-term ground level concentrations may occur
- The number of monitors required is on a per state basis, where 1 monitor is required for every 1% of anthropogenic SO_2 each state contributes to the total national inventory
- Each state has at least one monitor under Prong 2
- In all, the 2nd Prong will require a total of 117 monitors, which includes all 5 U.S. territories (U.S. V.I. , Puerto Rico, Guam, American Samoa, and the Northern Mariana Islands)

Implementation

- We proposed that sites that will fulfill minimum monitoring requirements are to be included in the annual monitoring network plan due July 1, 2012
- We also proposed that the minimally required network will be operational by January 1, 2013
- We proposed that the Regional Administrators may require additional monitors above those minimally required in situations where exposures to concentrations approaching or exceeding the NAAQS may be occurring

Known Issues – Public Comments

- Funding
  - It is clear through public comments already received that this may be the #1 issue to some commenters, and will likely be a common theme from states
- Use of the NEI
  - Indications are that states are not satisfied with the NEI data
- Waivers
  - Requests on stakeholder calls and in public comments are requesting increased flexibility for states, particularly via the ability to waive out of minimum requirements
- Re-evaluation of PWEI and/or its breakpoints
  - Several states have suggested alternative PWEI breakpoints and some have offered wholly alternative ways to require monitors in CBSAs

Ozone Update

Updating the Ozone Monitoring Network

- Intent noted in 2008 NAAQS final rule; monitoring proposal published July 16, 2009, final rule expected in 2010 (by August 31, 2010 with NAAQS)
- Key provisions:
  - Additional monitors in smaller urban areas where not already operating
  - New non-urban monitors (3 per state) to characterize sensitive ecosystems and/or to provide coverage in less populated areas where elevated levels are occurring or likely
  - Lengthened ozone monitoring seasons, where necessary, to ensure network operation when ambient levels approach NAAQS
- Proposed new monitors be deployed by January 1, 2012
- Proposed ozone monitoring season changes effective on the first day of ozone monitoring in 2011

Ozone Monitoring Proposal – Comment Summary

- Comments Received from 22 State/local Agencies, 1 Tribal Agency, 1 Federal Agency, and 9 from Citizens
- Changes to Urban Requirements
  - Majority of comments indicated it would be better to take into account design considerations (i.e. geographic size, population density, topography, source types, land use, etc) rather than just population
- Changes to Non-Urban Requirements
  - support for additional monitors, more clarification needed, monitors should be deployed based on analysis of ozone emissions and met data
  - Requiring same number of monitors per State does not best serve objective to characterize the distribution and transport of ozone; RA should have discretion to waive siting requirements

Ozone Monitoring Proposal – Comment Summary

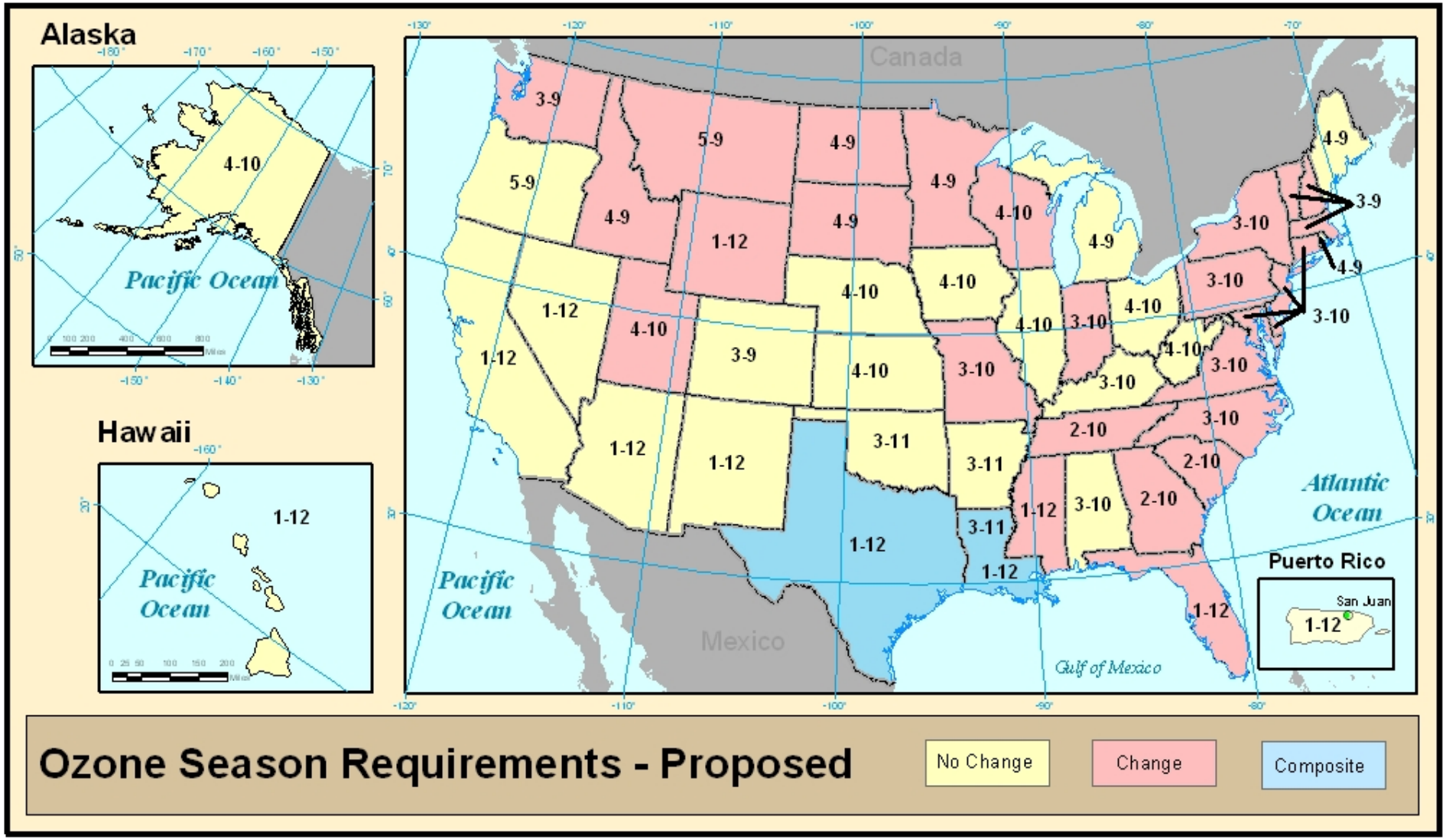
- Length of Ozone Monitoring Season
  - Many feel the criteria is inconsistent
  - Will cause big changes for multi-state areas (when one city changes and the other does not) – clear guidance needed
  - Regulatory implications need to be considered – CAIR defines ozone season as beginning May 1
- Other Comments
  - Support for 2 year monitor deployment cycle
  - New federal funding needed for additional monitoring; State budget cuts cannot accommodate network expansions (for all pollutants); Section 103 authority should be used for non-urban monitoring
  - CASTNET sites should be upgraded to meet QA requirements
  - Majority agree that NCORE sites should operate year round

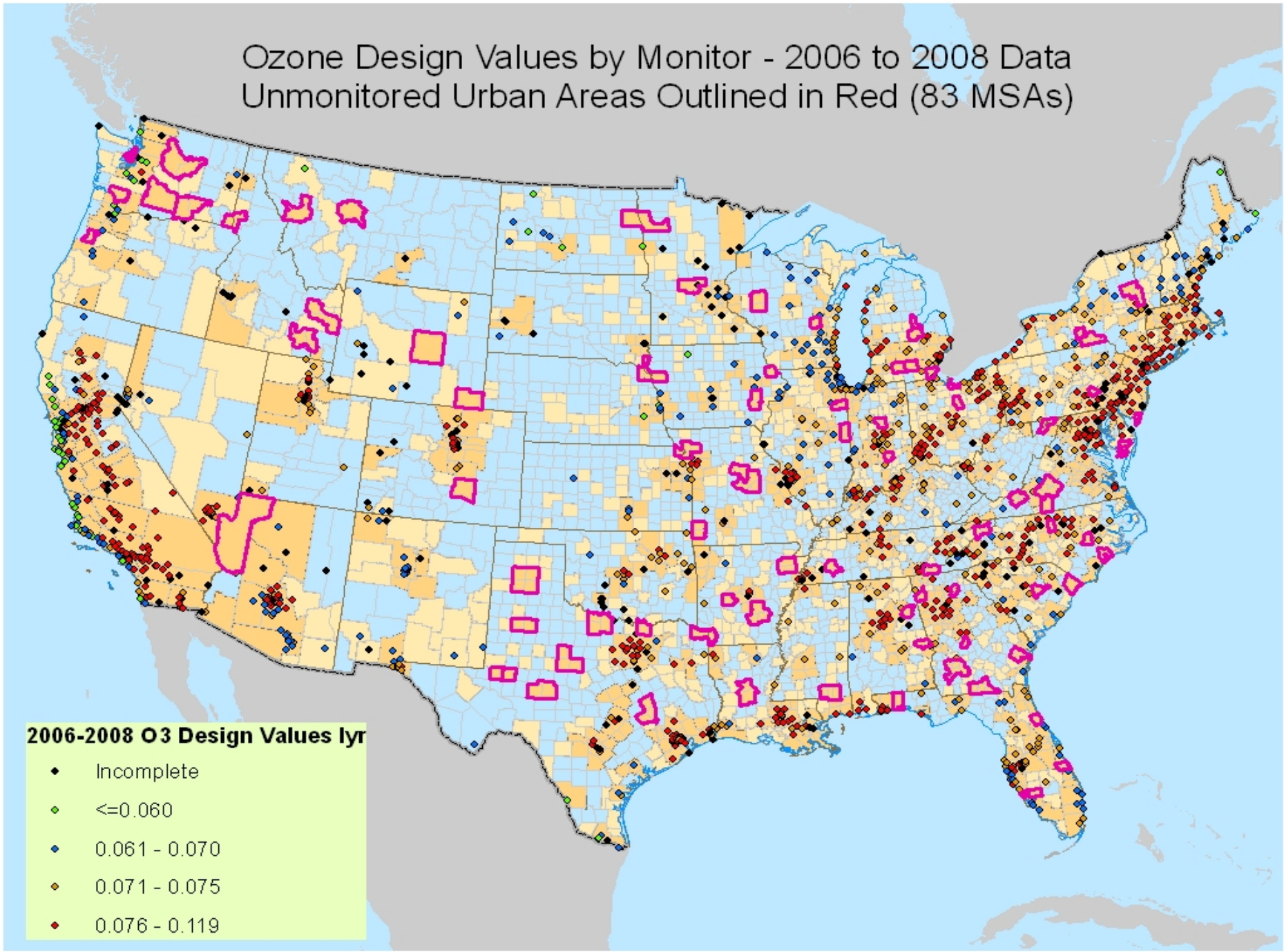
Ozone Monitoring Revisions
Next Steps

- EPA will review comments, update analyses using 2006 – 2008 ambient data, brief management, and draft a final rule during the upcoming months
- Current thinking is that the proposed monitoring requirements fully support all possible options under NAAQS reconsideration
- EPA will consider coordinating the final rules for the NAAQS and monitoring provisions

Look for a final ozone monitoring rule by August 31, 2010

Revising the Ozone Monitoring Seasons




Ozone Design Values by Monitor - 2006 to 2008 Data
Unmonitored Urban Areas Outlined in Red (83 MSAs)
2006-2008 O3 Design Values lyr
Incomplete
<=0.060
0.061 - 0.070
0.071 - 0.075
0.076 - 0.119

Lead Update

1.0 tpy Source-Oriented Monitors

- Final rule identified 135 facilities identified in 2002 NEI as >= 1.0 tpy.
- 100 sources required monitoring following review of emissions and waivers (based on survey of Regional offices)
  - Approximately 26% reduction from “potential”
- Vast majority of sites are believed to have met January 1, 2010 deadline for sampling

Summary of Proposed Revisions

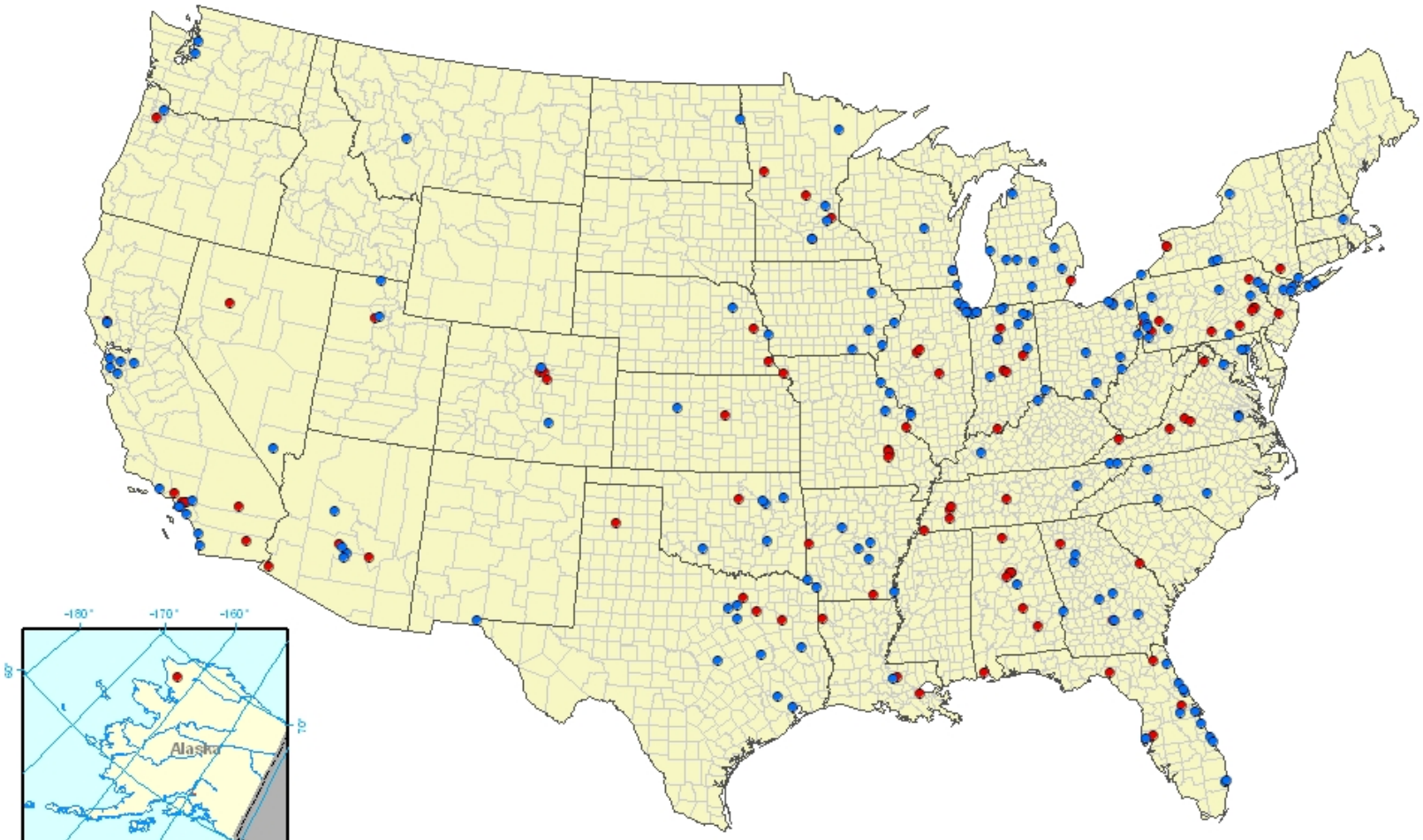
- Source-oriented monitoring
  - Proposed to lower emission threshold from 1.0 tpy to 0.50 tpy
  - Requested comment on thresholds greater than 0.50 tpy
- Non-source-oriented monitoring
  - Proposed to require Pb monitoring at all NCore stations [~80 monitors]
    - Many NCore sites will have low-volume PM_{10} samplers to meet $PM_{10-2.5}$ requirement
  - Requested comment on "urban-only" requirement for NCore (defined as populations greater than 500,000) [~50 monitors]
  - Proposed to revoke existing requirement for non-source monitoring in each CBSA of 500,000 or more population
  - Proposed to revoke existing requirement for NCore Pb monitoring – each NCore site in most populated MSA/CSA per EPA Region

Impacts of Proposed Requirements on Network Size

	Existing Requirements	Proposed Requirements
Source-Oriented	100	272 (+172)
Non-Source-Oriented	101	80+ (-21)
Total	201	352 (+151)
One-time cost Incremental O&M	$2.4M $1.7M	$4.5M $2.8M

Locations of lead sources of 1.0 TPY or greater

Locations of lead sources between 0.5 and 1.0 TPY



Data Source: 2005 National Emissions Inventory (updated as of 10/19/09)

Timeline

- January 1, 2010 – Source-oriented monitors for 1.0 tpy and greater operational
- February 16, 2010 – Close of comment period
- Fall 2010 – Final revisions published
- January 1, 2011 – Pb at NCore starts up (proposed)
- ~Fall 2011 – Remaining source-oriented monitors operational (proposed)
  - Annual monitoring network plans due 6 months earlier

Methods Update

- New “generic FEM” for Pb-TSP being developed
  - IML has submitted an application to ORD for ICP-MS using the Appendix G extraction method
  - RTI submitted an application for ICP-MS using heated ultrasonic (HCl/HNO3)
  - RTI is working on an ICP-AES application
  - Region 9 is working on an ICP-MS application with hot block and HNO3
- Not aware of any Pb-PM10 FEM that are in the works at this point
- OAQPS is working on a National Contract for Pb analysis
  - Pb-TSP using existing FEM for ICPMS
  - Pb-PM_{10} based on XRF FRM

CO Update

Carbon Monoxide NAAQS

- Court ordered rulemaking:
  - Proposal due October 28, 2010
  - Final rule due May 13, 2011
- Integrated Science Assessment is final and was posted 1/29/10
  - http://cfpub.epa.gov/ncea/cfm/recordisplay.cfm?deid=218686
- The CASAC meeting on the 2nd draft Risk/Exposure Assessment and draft Policy Assessment is scheduled for March 22-23, with location in RTP (specific site not yet confirmed).
- Policy Assessment draft goes to CASAC on March 1st, and therefore will be public

Carbon Monoxide Monitoring Issues

- CASAC noted that network, as it is currently, is not as useful as it needs to be to estimate exposures
- We have no current monitoring requirements
- The near-road network required for NO_2 may be a suitable and logical location for CO monitors – unsure about if or how urban canyons might be included at this point
- CASAC and NACAA, among others did encourage multi-pollutant near-road monitoring, regardless of their particular support to the NO_2 proposal
- CASAC also has noted that trace-level CO methods should be considered for future monitoring as opposed to standard CO boxes

PM Update

PM NAAQS

- Rule making is underway
  - PM NAAQS Integrated Review Plan finalized
    - http://www.epa.gov/ttnnaaqs/standards/pm/data/2008_03_final_integrated_review_plan.pdf
  - Plans for impact assessments recently released
    - Scope and Methods Plan for Urban Visibility Impact Assessment
      - http://www.epa.gov/ttnnaaqs/standards/pm/data/20090227PMNAAQSWelfare.pdf
    - Scope and Methods Plan for Health Risk and Exposure Assessment
      - http://www.epa.gov/ttnnaaqs/standards/pm/data/20090227PMNAAQSREA.pdf
- Proposed rule planned for November 2010
- Monitoring issues –
  - $PM_{10-2.5}$
  - Urban visibility