NAAQS Updates and Monitoring Implications

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National Ambient Air Quality Standards

Pollutant	Primary Standards: Level	Primary Standards: Averaging Time	Secondary Standards: Level	Secondary Standards: Averaging Time	Upcoming Actions
Carbon Monoxide	9 ppm (10 mg/m^3)	8-hour (1)	None		NPR: 10/2010 NFR: 5/2011
	35 ppm (40 mg/m^3)	1-hour (1)			
Lead	0.15 µg/m^3 (2)	Rolling 3-Month Average	Same as Primary		Monitoring NPR: 12/2009 NFR: mid 2010
	1.5 µg/m^3	Quarterly Average	Same as Primary		
Nitrogen Dioxide	0.053 ppm (100 µg/m^3)	Annual (Arithmetic Mean)	Same as Primary		NFR: 1/2010
Particulate Matter (PM_{10})	150 µg/m^3	24-hour (3)	Same as Primary		NPR: 1/2011 NFR: 10/2011 Both dates subject to change
Particulate Matter ($PM_{2.5}$)	15.0 µg/m^3	Annual (4) (Arithmetic Mean)	Same as Primary		
	35 µg/m^3	24-hour (5)	Same as Primary		
Ozone	0.075 ppm (2008 std)	8-hour (6)	Same as Primary		Reconsideration NPR: 12/2009 NFR: 8/2010
	0.08 ppm (1997 std)	8-hour (7)	Same as Primary		
	0.12 ppm	1-hour (8)	Same as Primary		
Sulfur Dioxide	0.03 ppm	Annual (Arithmetic Mean)	0.5 ppm (1300 µg/m^3)	3-hour (1)	NPR: 11/2009 NFR: 6/2010
	0.14 ppm	24-hour (1)			

NPR – Notice of Proposed Rulemaking NFR – Notice of Final Rulemaking

(1) Not to be exceeded more than once per year.
(2) Final rule signed October 15, 2008.
(3) Not to be exceeded more than once per year on average over 3 years.
(4) To attain this standard, the 3-year average of the weighted annual mean PM2.5 concentrations from single or multiple community-oriented monitors must not exceed 15.0 µg/m3.
(5) To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 35 µg/m3 (effective December 17, 2006).
(6) To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.075 ppm. (effective May 27, 2008)
(7) (a) To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.08 ppm.
(b) The 1997 standard—and the implementation rules for that standard—will remain in place for implementation purposes as EPA undertakes rulemaking to address the transition from the 1997 ozone standard to the 2008 ozone standard.
(8) (a) The standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is ≤ 1.
(b) As of June 15, 2005 EPA has revoked the 1-hour ozone standard in all areas except the fourteen 8-hour ozone nonattainment Early Action Compact (EAC) Areas. For one of the 14 EAC areas (Denver, CO), the 1-hour standard was revoked on November 20, 2008. For the other 13 EAC areas, the 1-hour standard was revoked on April 15, 2009.

Ozone

AQI Value	Actions to Protect Your Health From Ozone
Good (0–50)	None
Moderate (51–100*)	Unusually sensitive people should consider reducing prolonged or heavy outdoor exertion.
Unhealthy for Sensitive Groups (101–150)	The following groups should reduce prolonged or heavy outdoor exertion: • People with lung disease, such as asthma • Children and older adults • People who are active outdoors
Unhealthy (151–200)	The following groups should avoid prolonged or heavy outdoor exertion: • People with lung disease, such as asthma • Children and older adults • People who are active outdoors Everyone else should limit prolonged outdoor exertion.
Very Unhealthy (201–300)	The following groups should avoid all outdoor exertion: • People with lung disease, such as asthma • Children and older adults • People who are active outdoors Everyone else should limit outdoor exertion.

* An AQI of 100 for ozone corresponds to an ozone level of 0.075 parts per million (averaged over 8 hours).

Reconsideration of Ozone NAAQS

- In May 2008, states, environmental groups and industry groups filed petitions with the D.C. Circuit Court of Appeals for review of the 2008 ozone standards.
  - In March 2009, the court granted EPA's request to stay the litigation so the new administration could review the standards and determine whether they should be reconsidered.
- On September 16, 2009, the U.S. Environmental Protection Agency (EPA) announced it would reconsider the 2008 NAAQS for ground-level ozone, the primary component of smog.
  - The ozone standards set in 2008 were not as protective as recommended by EPA's panel of science advisors, the Clean Air Scientific Advisory Committee (CASAC).

Reconsideration of Ozone NAAQS

- The reconsideration affects both the primary ozone standard, designed to protect public health, and the secondary standard, designed to protect the environment.
- The agency will propose to stay the 2008 standards for the purpose of attainment (meeting standards) and nonattainment (not meeting standards) area designations. The stay will allow states and EPA to prepare for an accelerated ozone designation process for the reconsidered standards.

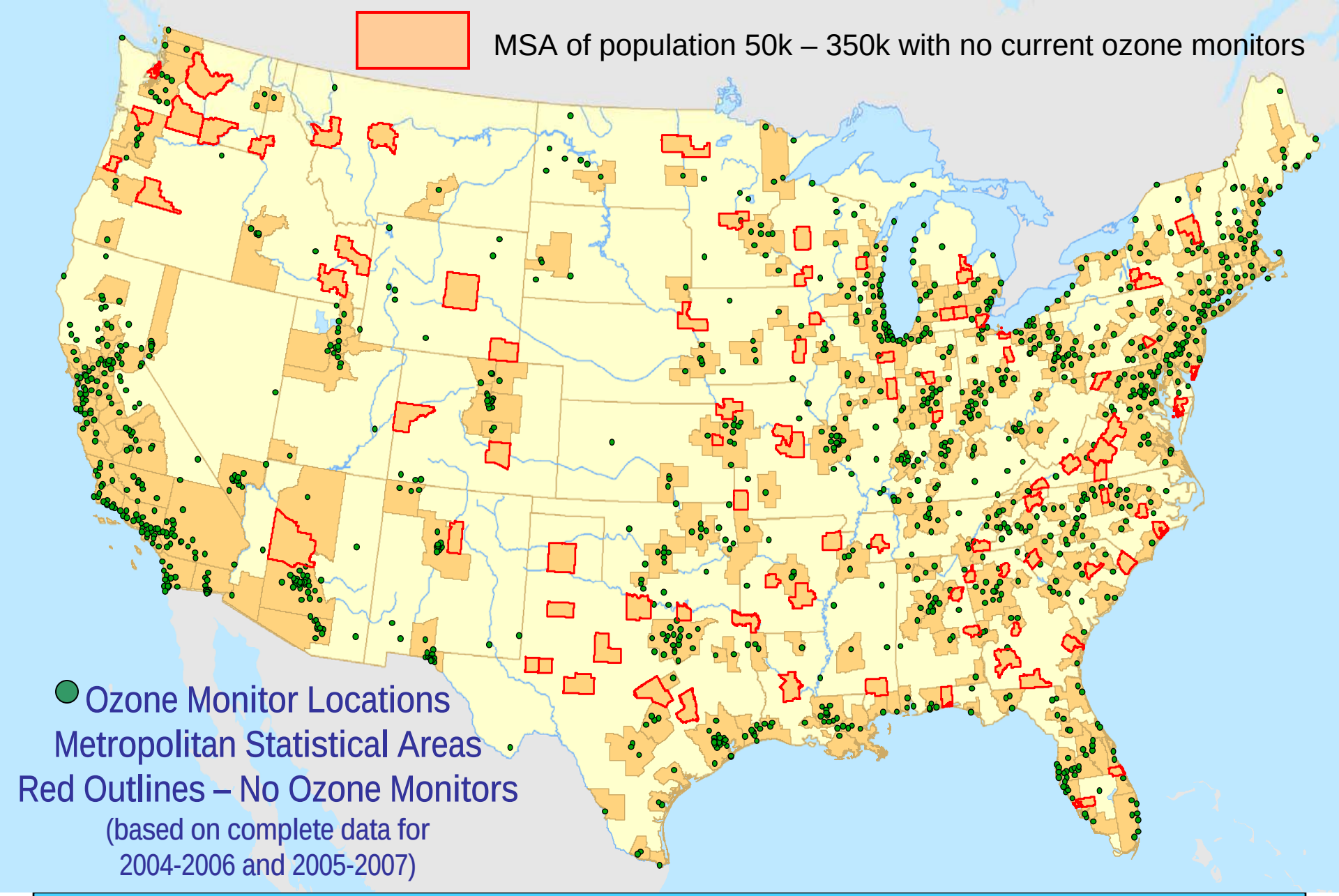
Expected Schedule

Proposed Reconsidered NAAQS.....December 2009
Final Reconsidered NAAQS.....August 2010
Final Designations.....August 2011
State Implementation Plans (SIPs) due.....December 2013

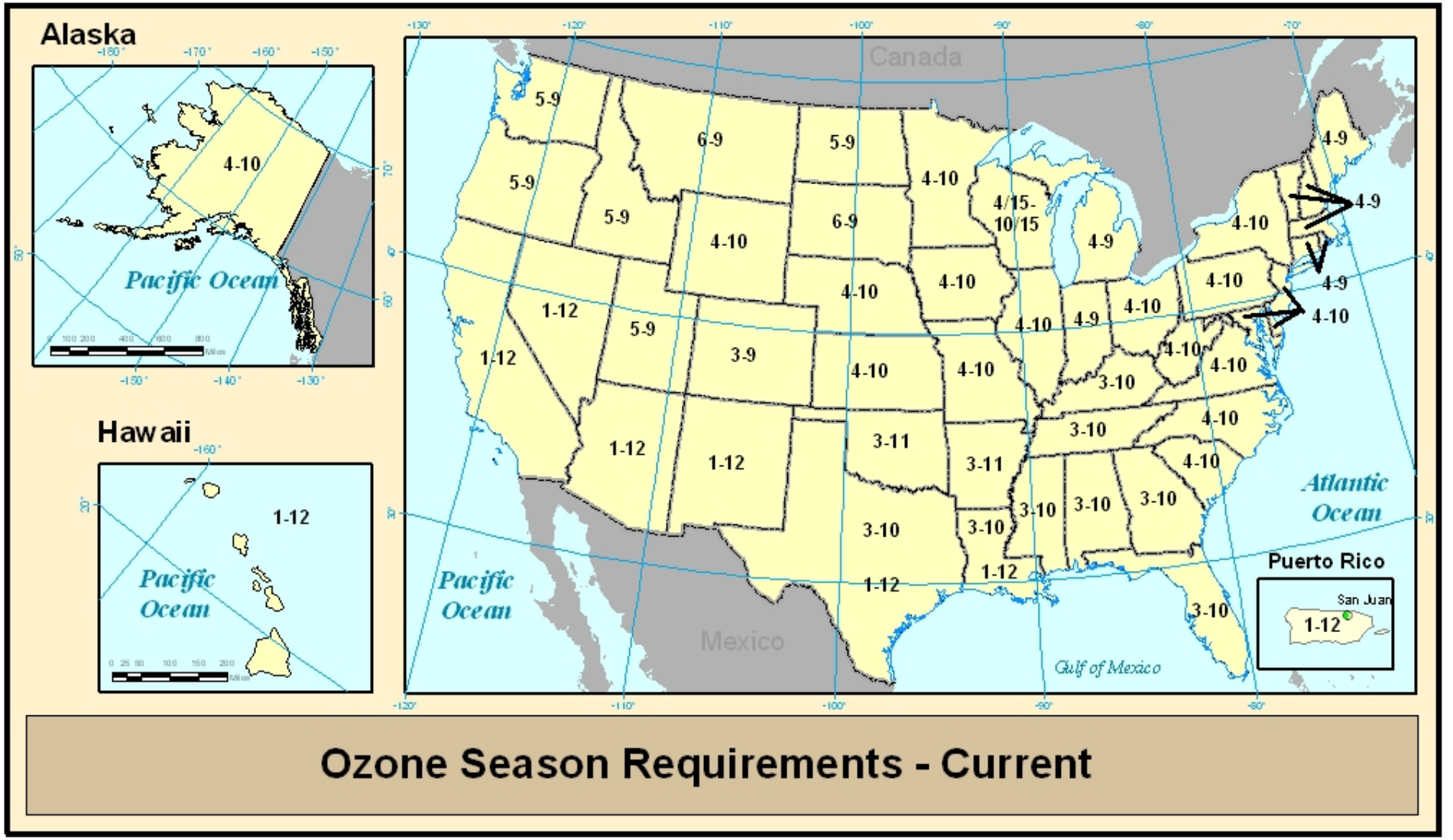
- The next review of the ozone NAAQS will continue as planned

Updating the Ozone Monitoring Network

- Intent noted in 2008 NAAQS final rule; monitoring proposal published July 16, 2009, final rule expected in 2010
- 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

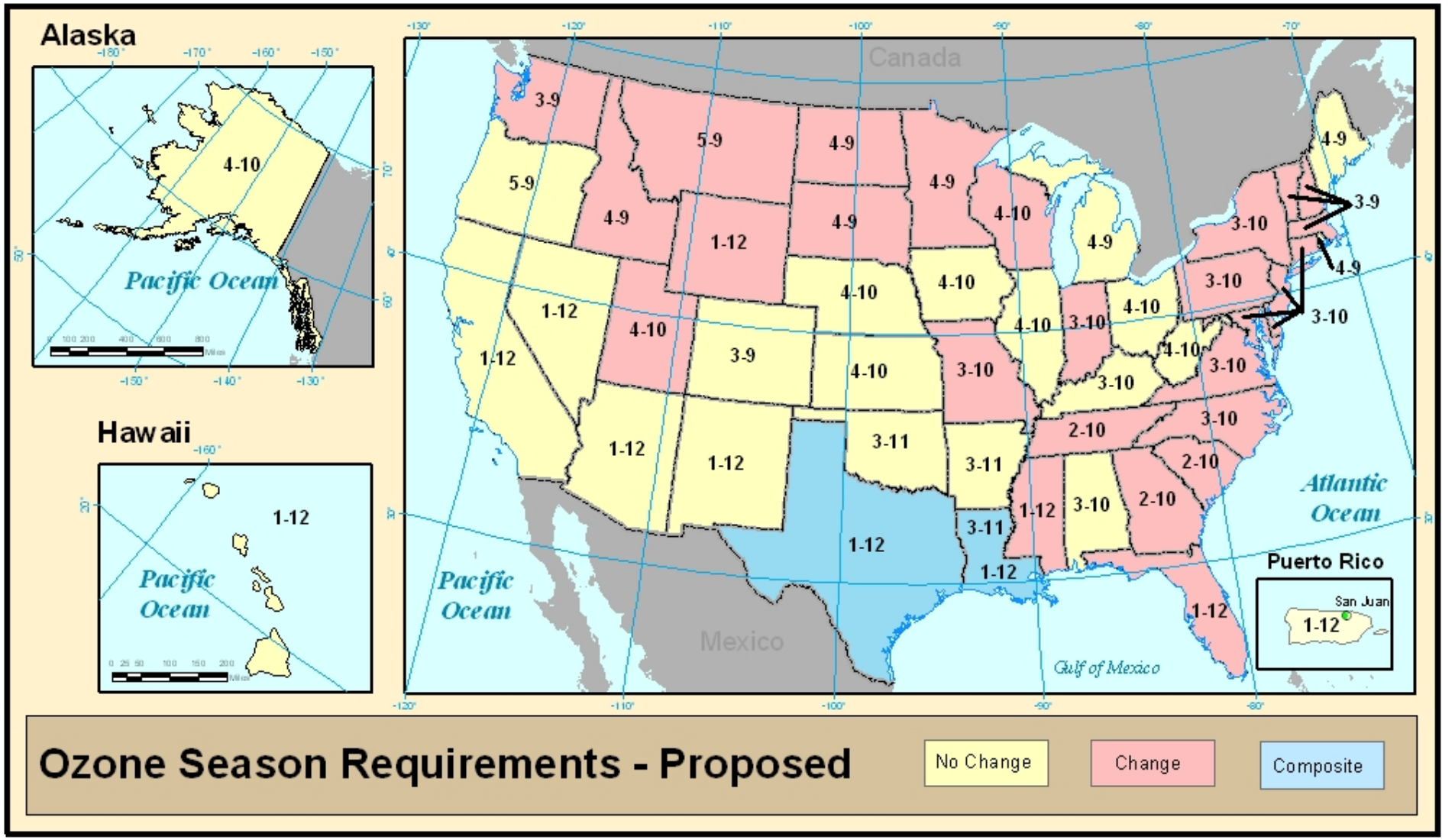

MSA of population 50k – 350k with no current ozone monitors
Ozone Monitor Locations
Metropolitan Statistical Areas
Red Outlines – No Ozone Monitors
(based on complete data for
2004-2006 and 2005-2007)

Revising the Ozone Monitoring Seasons



NACAA national association of clean air agencies

Revising the Ozone Monitoring Seasons



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

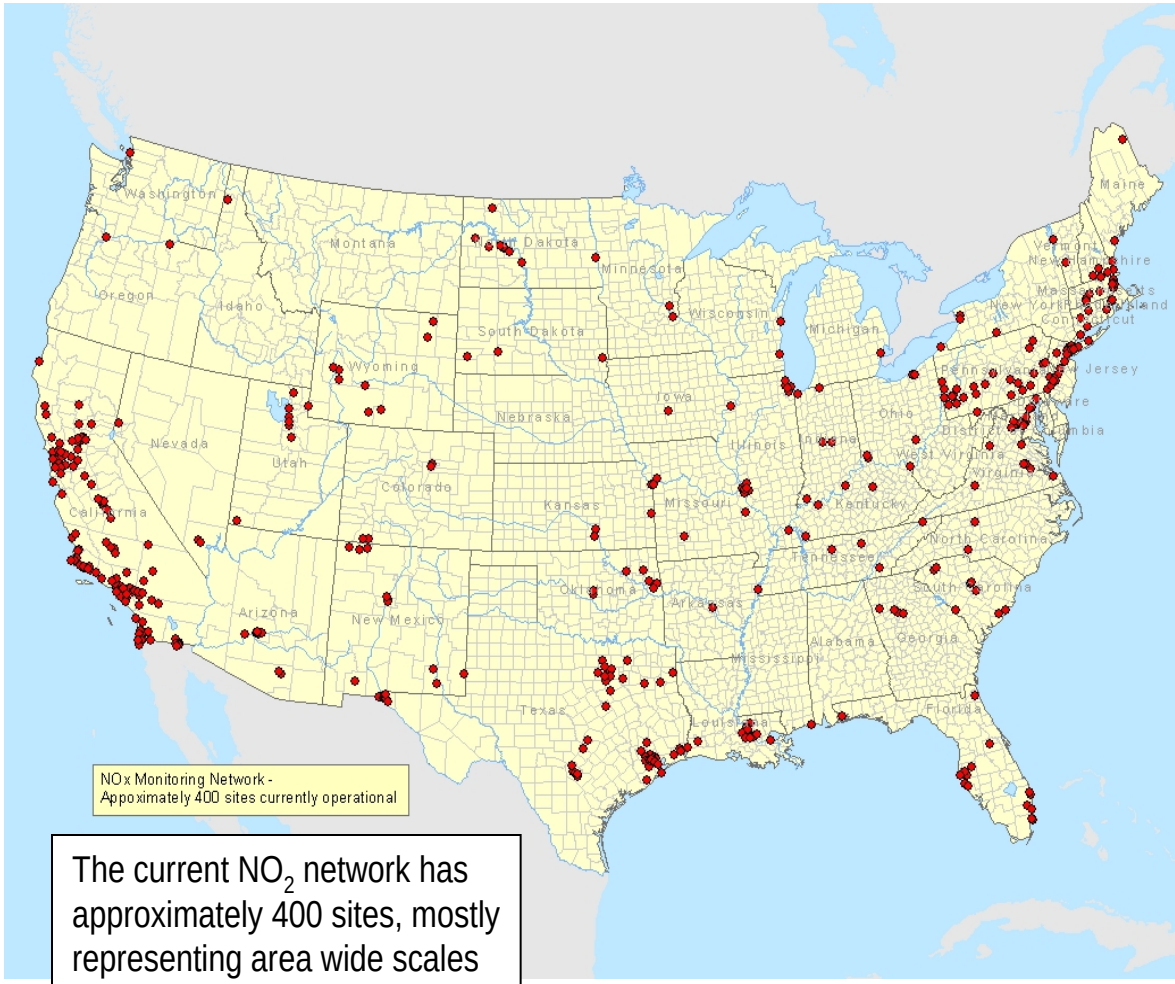
- EPA will review comments, update analyses using 2006 – 2008 ambient data, brief management, and draft a final rule during the upcoming months
- Current thinking is that the proposed monitoring requirements fully support all possible options under NAAQS reconsideration
- We will consider the timing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

Look for a final ozone monitoring rule sometime between April and August of 2010

Nitrogen Dioxide

Current NO_2 Monitoring Network

- The current network was implemented to support an annual standard
- The existing sites are satisfying multiple objectives including:
  - NAAQS compliance
  - assessment of ozone formation and transport
  - health study support
  - Prevention of Significant Deterioration (PSD)



The current NO_2 network has approximately 400 sites, mostly representing area wide scales (neighborhood or larger scales)

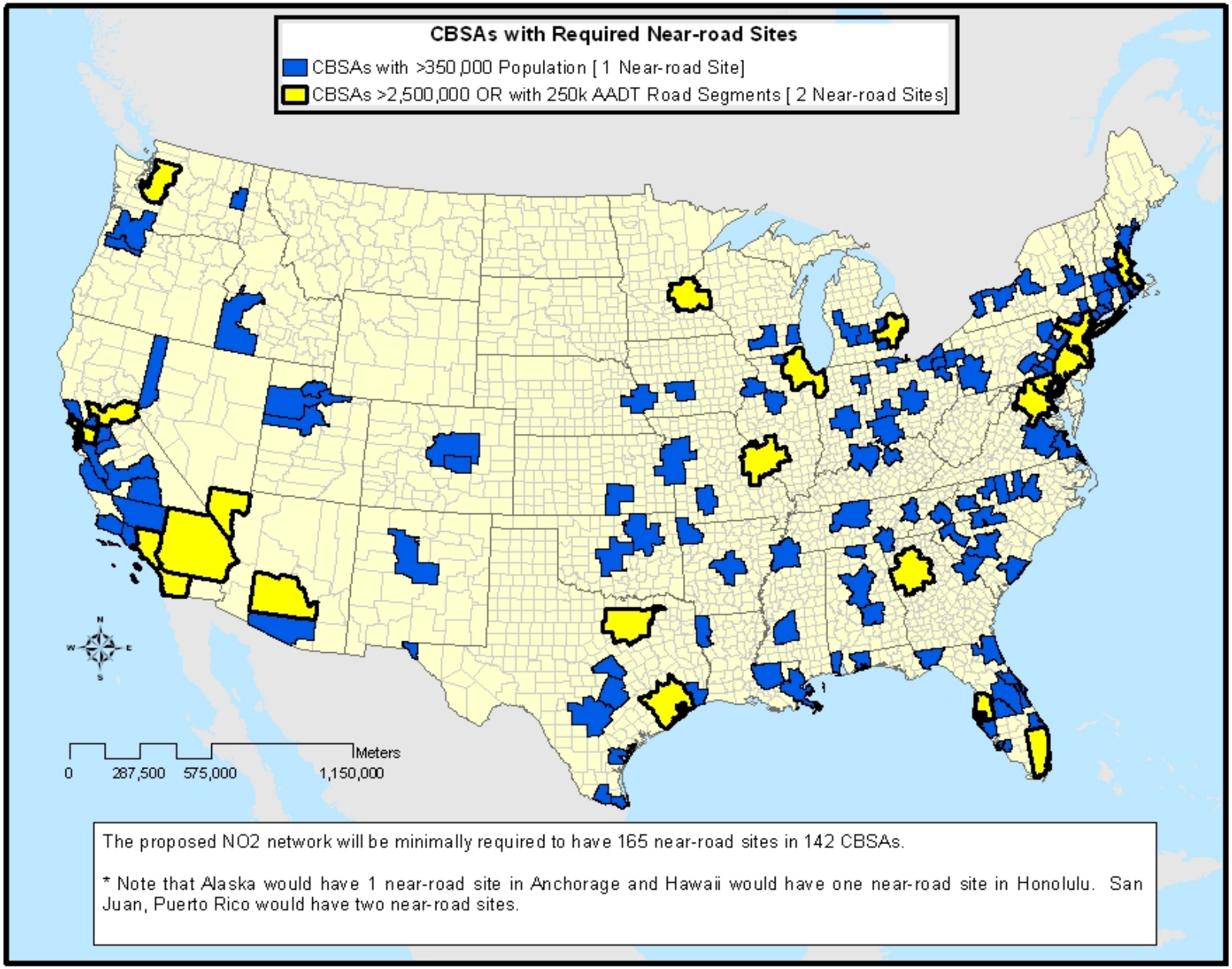
Summary of the NO_2 NAAQS and Monitoring Proposal

- **Proposed approach**
  - Retain the current annual standard and to increase public health protection against respiratory effects linked to short-term NO_2 exposure by setting a **new 1-hour standard** reflecting the **maximum allowable NO_2 concentration anywhere in an area**
    - Level: Proposed **80 to 100 ppb** and solicited comment from **65 to 150 ppb**
    - Form: proposed **99th percentile** and solicited comment on **98th percentile**
  - In order to have monitors in locations where peak NO_2 concentrations are likely to occur, we also proposed to require a **2-tiered NO_2 monitoring network** that would include…
    - **Near road monitors:** Monitors placed within 50 meters of major roadways, **and**
    - **Area-wide monitors:** Monitors placed away from major roadways to measure NO_2 concentrations that occur more broadly across the community

Summary of the NO_2 NAAQS and Monitoring Proposal

- **Alternative approach**
  - We solicited comment on setting the 1-hour standard such that it would reflect the allowable **area-wide NO_2 concentrations**
  - Under this alternative, we solicited comment on standard levels from **50 to 75 ppb**
  - In order to have monitors that measure area-wide NO_2 concentrations, we solicited comment on requirements for monitor placement, including a requirement that monitors be located at some **minimum distance from major roadways**

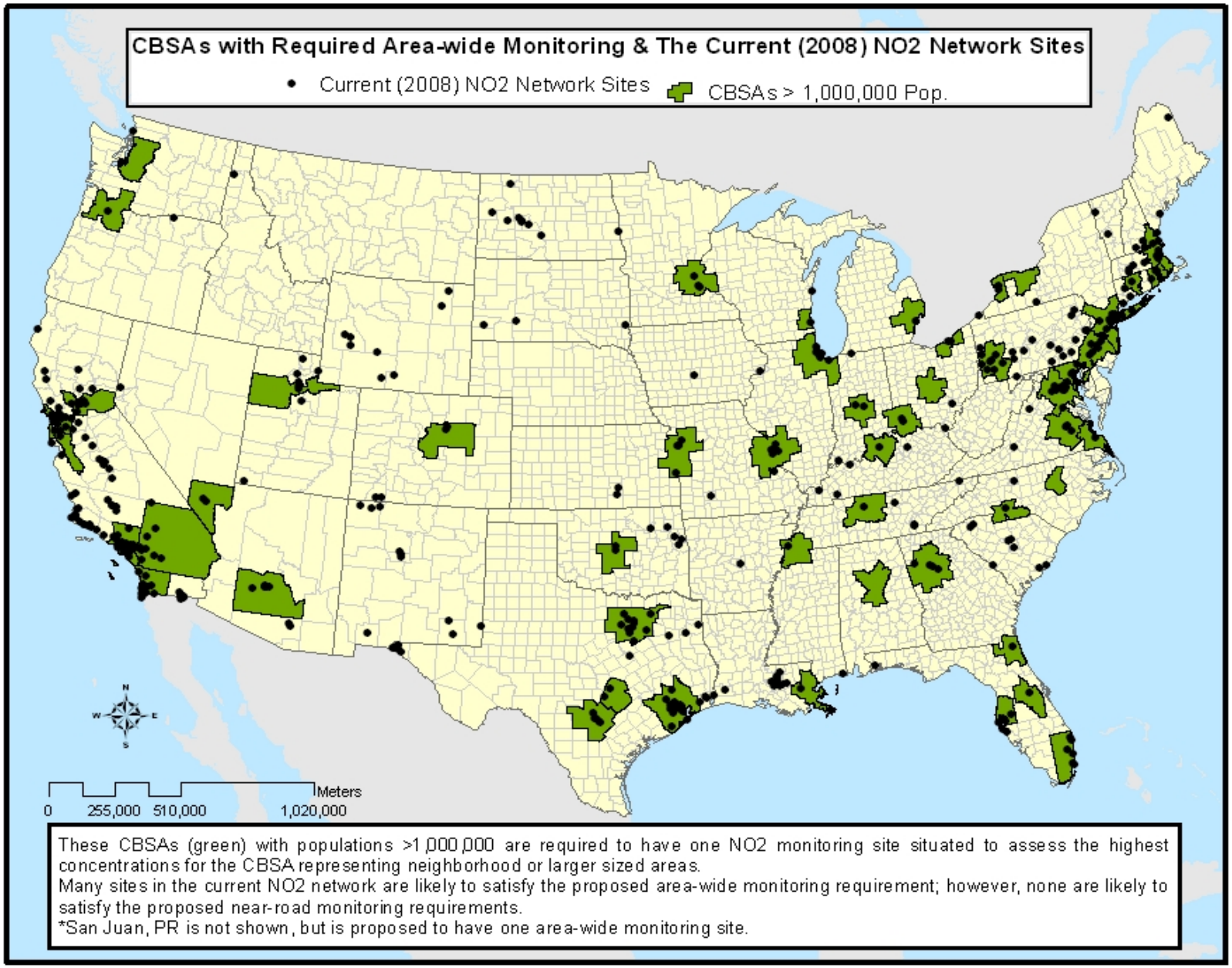
Proposed approach – Tier 1 – Near road sites



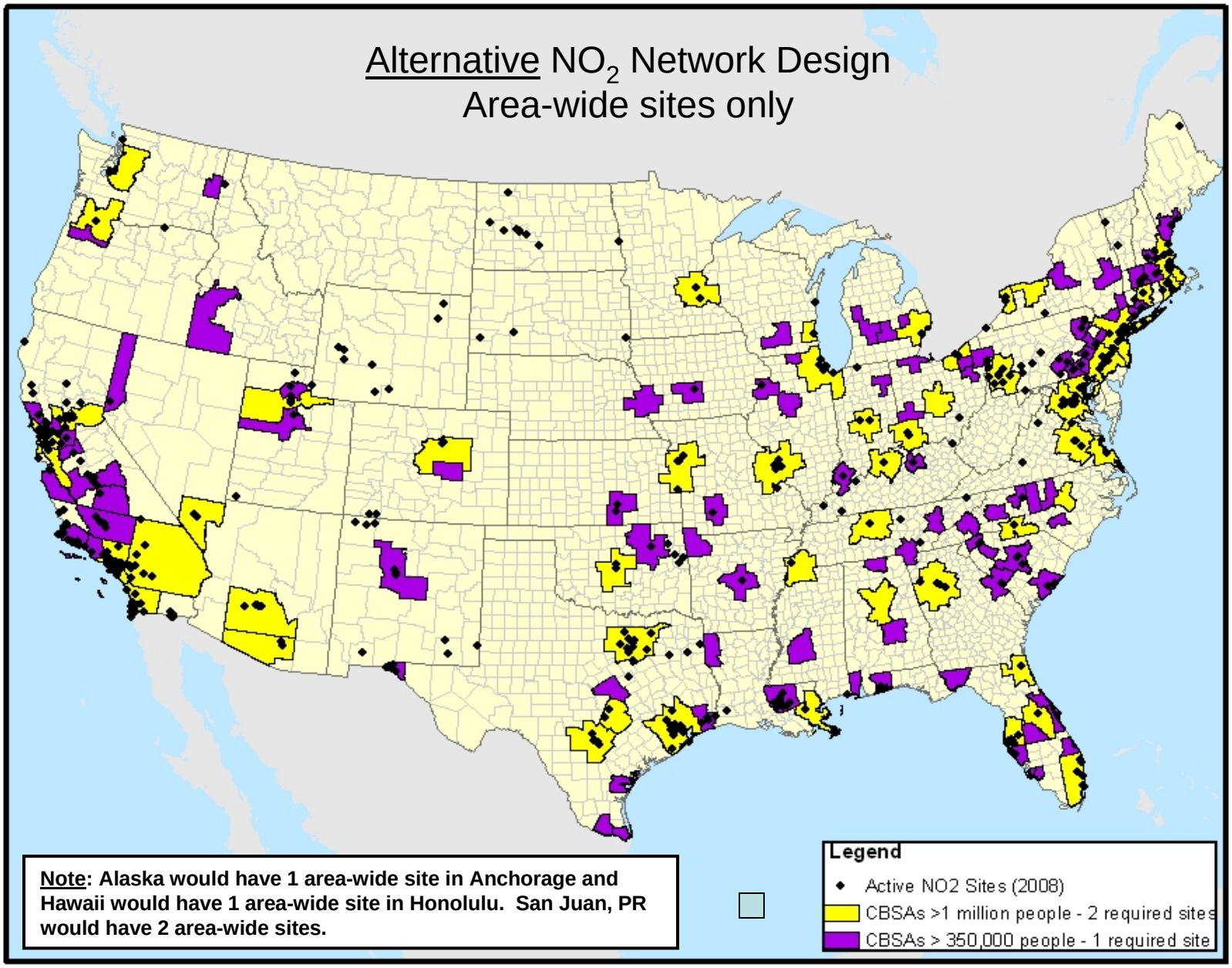
The proposed NO2 network will be minimally required to have 165 near-road sites in 142 CBSAs.

* Note that Alaska would have 1 near-road site in Anchorage and Hawaii would have one near-road site in Honolulu. San Juan, Puerto Rico would have two near-road sites.

Proposed approach – Tier 2 – area wide sites

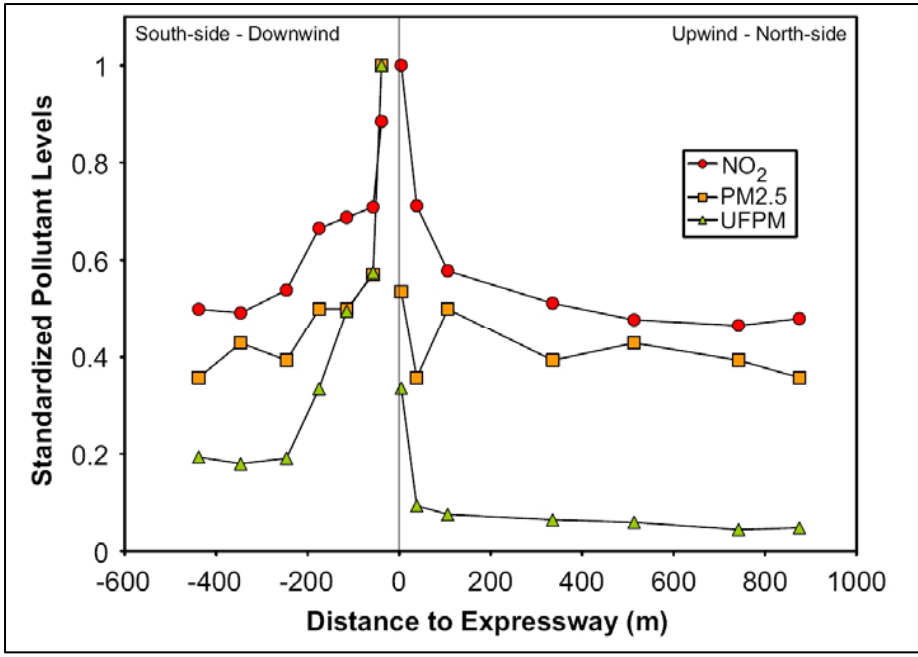


Alternative approach – area wide (only) sites



Near-road NO_2 Site Selection

- Rank all road segments within a CBSA by Annual Average Daily Traffic (AADT) and then identifying a location or locations adjacent to those highest road segments where maximum hourly NO_2 concentrations are expected to be highest
- Additional factors to consider: proximity to interchanges, fleet mix (diesel vs. light-duty), rapidly accelerating traffic, grade-climbing traffic, local terrain and meteorological effects
- Monitor probes must be no greater than 50 meters away, horizontally, from the outside nearest edge of the traffic lanes of the target road segment
- Located within 2 to 7 meters above the ground; may be placed on the interior side of any noise barriers (not ideal, however)



Beckerman et.al., 2008

Overview of Public Comments on NO_2

- **Current Standard**
  - CASAC, environmental/public health groups, and most states agree with the proposed conclusion that **the current standard alone is not requisite to protect public health with an adequate margin of safety**
  - Some industry groups commented that **revision of the current standard is not justified** at this time based largely on uncertainties in the scientific evidence

- **Approach** to setting a new 1-hour standard and establishing a 2-tiered monitoring network
  - CASAC, environmental/public health groups, and most states **support the establishment of a new 1-hour standard and the need to obtain better information on NO_2 concentrations around roads**
    - Groups disagree regarding the most appropriate approach
  - Industry does not support the establishment of a new 1-hour standard or the proposed monitoring network based largely on uncertainties in the scientific evidence

- **Standard level and form**
  - CASAC and some States **support our proposed ranges of levels** and recommend a **98th percentile form** under the proposed approach
  - Environmental/public health groups **recommend a lower level with a more stringent form** (e.g., 99th percentile or no exceedance)
  - Industry groups **recommend a higher level** and generally recommend a **98th percentile form**

CASAC Comments on NO_2 Approach

- CASAC **strongly supports the establishment of a new 1-hour standard** and the need to obtain **better information on NO_2 concentrations around roads**
- CASAC consensus was that we **need to monitor near roads**, but CASAC members were **split regarding the most appropriate approach**
- The **majority of CASAC members favor the proposed approach** noting that this approach would be more effective than the alternative at limiting roadway-associated exposures
- A **minority of CASAC members favor the alternative approach,** combined with the establishment of a **research-oriented near-road network** noting…
  - That epidemiologic studies did not use near-roadway exposure data
  - The limited information available at this time to inform the design of a national roadside monitoring network

Other Public Comments on NO_2

- Most environmental and public health organizations strongly support the proposed NAAQS and near-road monitoring

- Mixed response from State, Local, and tribal air monitoring groups and agencies.
  - Mostly support near-road monitoring, but are divided on:
    - 1) Specifics on monitor requirement triggers and siting, and
    - 2) Whether EPA should run a research network (non-regulatory) or an actual regulatory network

Anticipated NO_2 Implementation Schedule

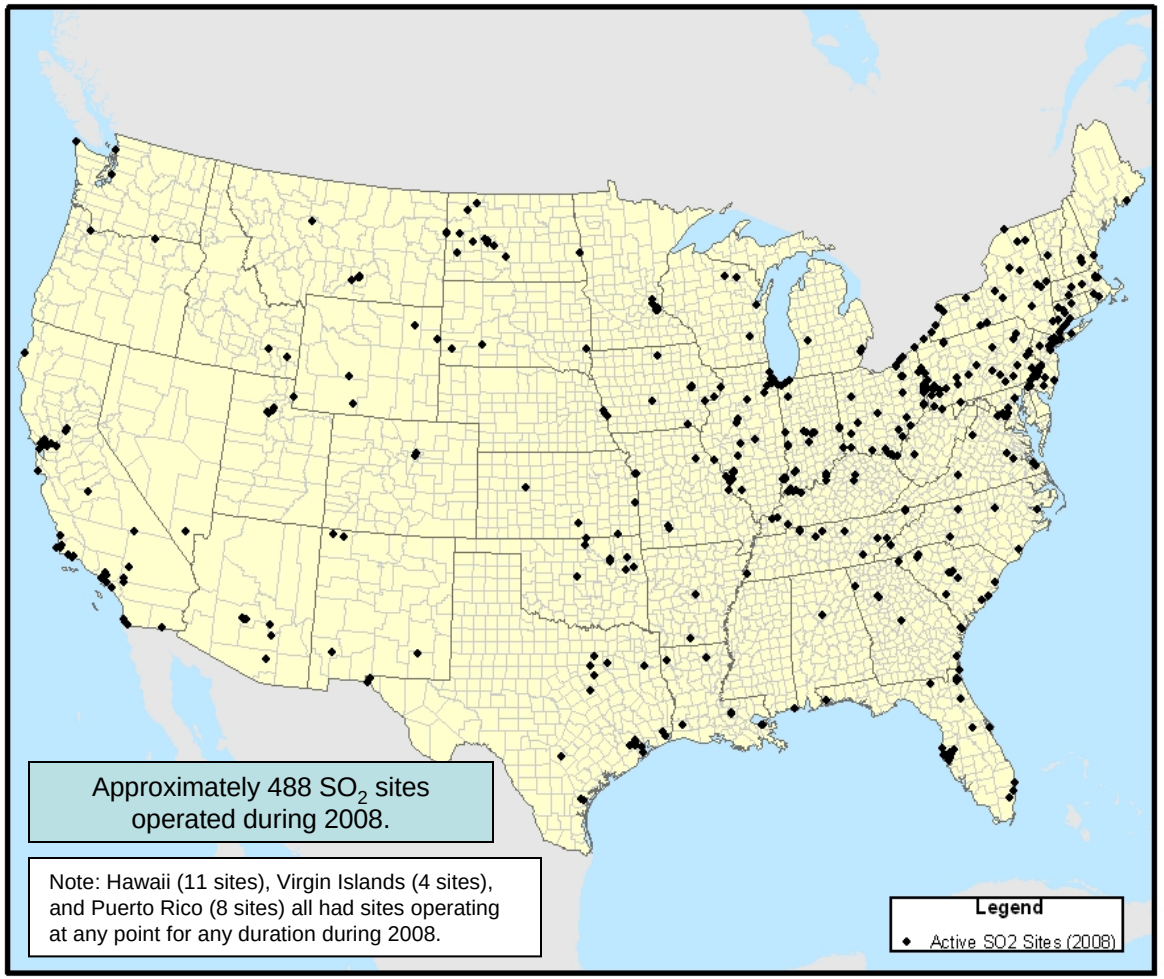
Under a judicial consent decree, EPA must complete this review of the primary NO_2 standard by January 22, 2010.

Milestone	Dates for Proposed Approach	Dates for Alternative Approach
State Designation Recommendations to EPA	**January 2011:** Based on existing network data because near-road monitors not in place	**January 2011 utilizing existing network**
Designations	**January 2012:** EPA designates all/most areas as "unclassifiable" because near road monitors not in place	**January 2012 utilizing existing network**
New NO_2 Monitoring Network	**January 1, 2013**: Monitoring sites operational	**January 1, 2013**: New area-wide monitoring sites operational but not utilized for current round of designations
Nonattainment Re-Designations	**January 2018** based on 2013 – 2016 ambient data	Not Applicable
Attainment Date	**January 2023:** 5 years after date of re-designations	**January 2017**

Sulfur Dioxide

Current SO_2 Network

- According to AQS, approximately 35% of the sites are source oriented and/or high concentration sites
- Approximately 43% have a monitor objective of population exposure
- These sites satisfy multiple objectives including:
  - NAAQS compliance
  - Trends and Transport
  - Health study support
  - Prevention of Significant Deterioration (PSD)



CASAC SO_2 Recommendations on Current Review

- The current standards are not adequate to protect public health
- CASAC supported a new 1-hour standard within range from 50 ppb to an upper limit of 150 ppb
  - 1-hour averaging time can protect against peak 5-minute exposures
  - "An upper limit of 150 ppb posited in [the REA] could be justified under some interpretations of weight of evidence, uncertainties, and policy choices regarding margin of safety"
  - Noted importance of weighing uncertainties in considering an adequate margin of safety (e.g., severe asthmatics likely at greater risk)
- With regard to current standards (if new 1-hour standard is set):
  - If new standard set no higher than 150 ppb, agrees annual standard not justified

SO_2 NAAQS – Monitoring Outlook

- Current SO_2 network is not primarily configured to monitor locations of expected maximum short-term concentrations
- Only ~1/3 of the ~488 SO_2 monitors operating in 2008 were source oriented or high concentration sites
- If the administrator chooses to move towards a NAAQS with a short-term averaging period, the resulting monitoring network design will likely:
  - Refocus network resources to address short-term, peak concentrations
  - Account for both population and emissions
- Notice of Proposed Rulemaking (NPR) is to be signed November 16th, 2009
- Public Hearing is tentatively scheduled for January 4th, 2010 in Atlanta, GA (Location TBD)
- Notice of Final Rulemaking (NFR) is to be signed June 2nd, 2010

Lead (Pb)

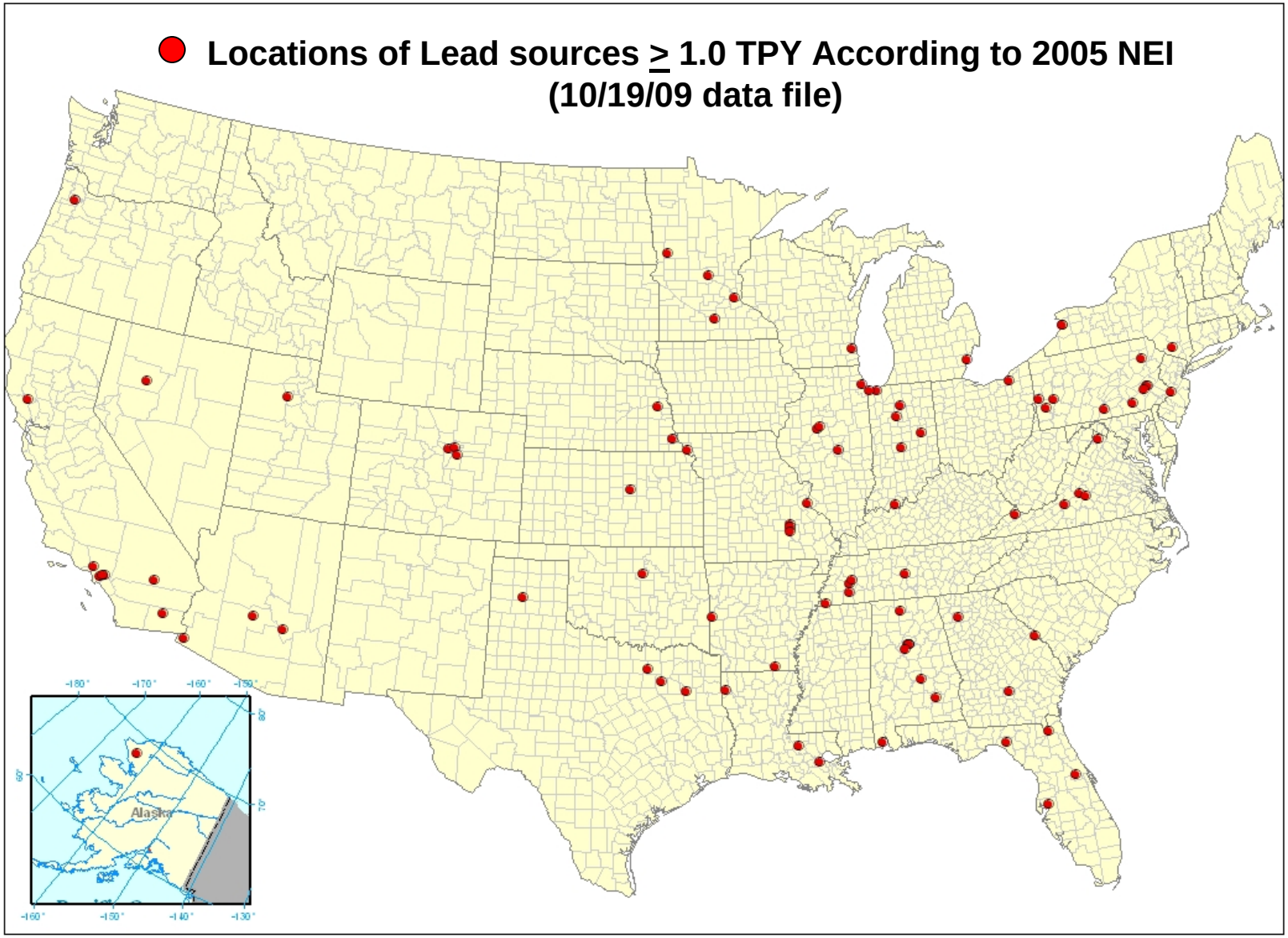
Overview of Pb NAAQS Revision

- On October 15, 2008, EPA strengthened the national ambient air quality standards (NAAQS) for lead (Pb) to increase protection of public health and the environment.
  - Since 1978, ambient air lead standards have been set at 1.5 $\mu g/m^3$ (micrograms per cubic meter of air).
  - **EPA has strengthening the lead standards to a level of 0.15 $\mu g/m^3$.**
  - The level is based on the concentration of lead in total suspended particles (TSP)
- For more information go to http://www.epa.gov/air/lead/

Updating the Lead (Pb) Monitoring Network

- Currently required through the 2008 NAAQS revision:
  - Monitoring in areas near sources with lead emissions greater than or equal to 1 ton per year (tpy).
    - Waiver process by the EPA Regional Administrator if the monitoring agency can demonstrate that the lead source will not contribute to an ambient concentration greater than 50% of the NAAQS
  - The operation of a (non-source) lead monitor in every urban area with a population of 500,000 or more.
- Source-oriented monitors required to be listed in annual monitoring network plans by July 1, 2009 and operational by January 1, 2010
- Non-source-oriented monitors required to be listed in annual monitoring network plans by July 1, 2010 and operational by January 1, 2011

Locations of Lead sources ≥ 1.0 TPY According to 2005 NEI (10/19/09 data file)

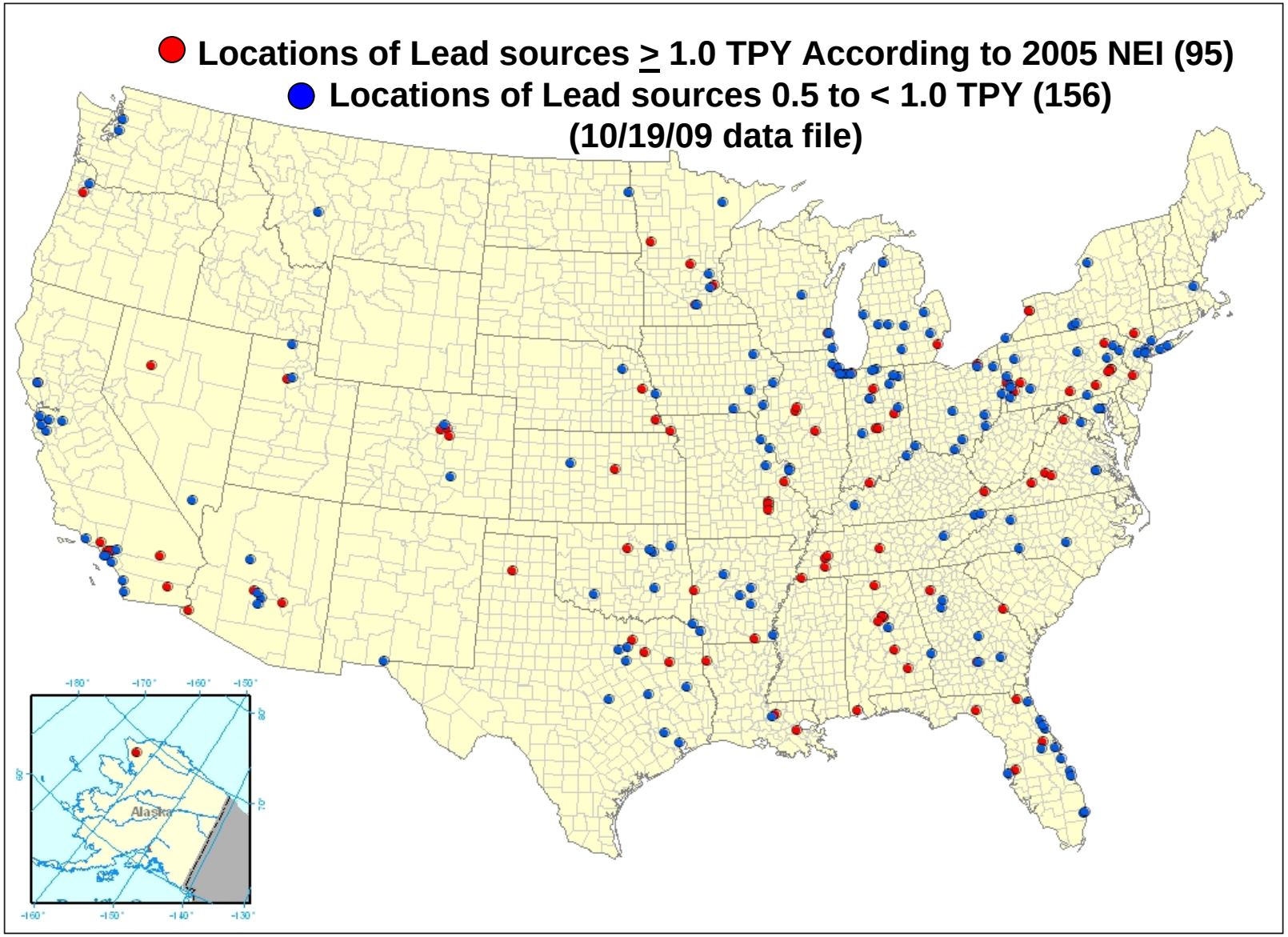


Update - EPA To Reconsider Portions of Lead Monitoring Requirements

- In January 2009, EPA received a petition to reconsider the lead monitoring requirements from the Missouri Coalition for the Environment Foundation, Natural Resources Defense Council, the Coalition to End Childhood Lead Poisoning, and Physicians for Social Responsibility
- On July 22, 2009, EPA granted the petition for reconsideration to:
  - Reconsider the emissions threshold (currently 1 tpy) for source-oriented monitoring requirements and determine whether it should be lowered, as requested by Petitioners.
  - Reconsider related issues as appropriate, including the requirements for non-source oriented monitoring.
- EPA is not reconsidering the lead standards; implementation of those standards, including existing source monitoring requirements, will move ahead on schedule.

Status of Pb Monitoring Reconsideration Effort

- Proposed monitoring rule – signature expected in December 2009 and final rule in spring/summer 2010
- Potential outcomes:
  - Decreased emissions threshold for source monitors in the range 0.5 to 1.0 tpy
  - Re-proposal of non-source requirements to more efficiently implement new monitors through leveraging of existing NCore network
- Potential affect on Pb monitoring networks:
  - Non-source monitors still due January 1, 2011, but network design approach may change
  - Additional source-oriented monitors potentially due a year after final monitoring rule which would be around spring/summer 2011
    - Waiver provisions still applicable to monitoring around smaller sources


Locations of Lead sources ≥ 1.0 TPY According to 2005 NEI (95)
Locations of Lead sources 0.5 to < 1.0 TPY (156)
(10/19/09 data file)
Alaska