OAQPS Ambient Monitoring Update

MARAMA Monitoring Committee Workshop - December 2016

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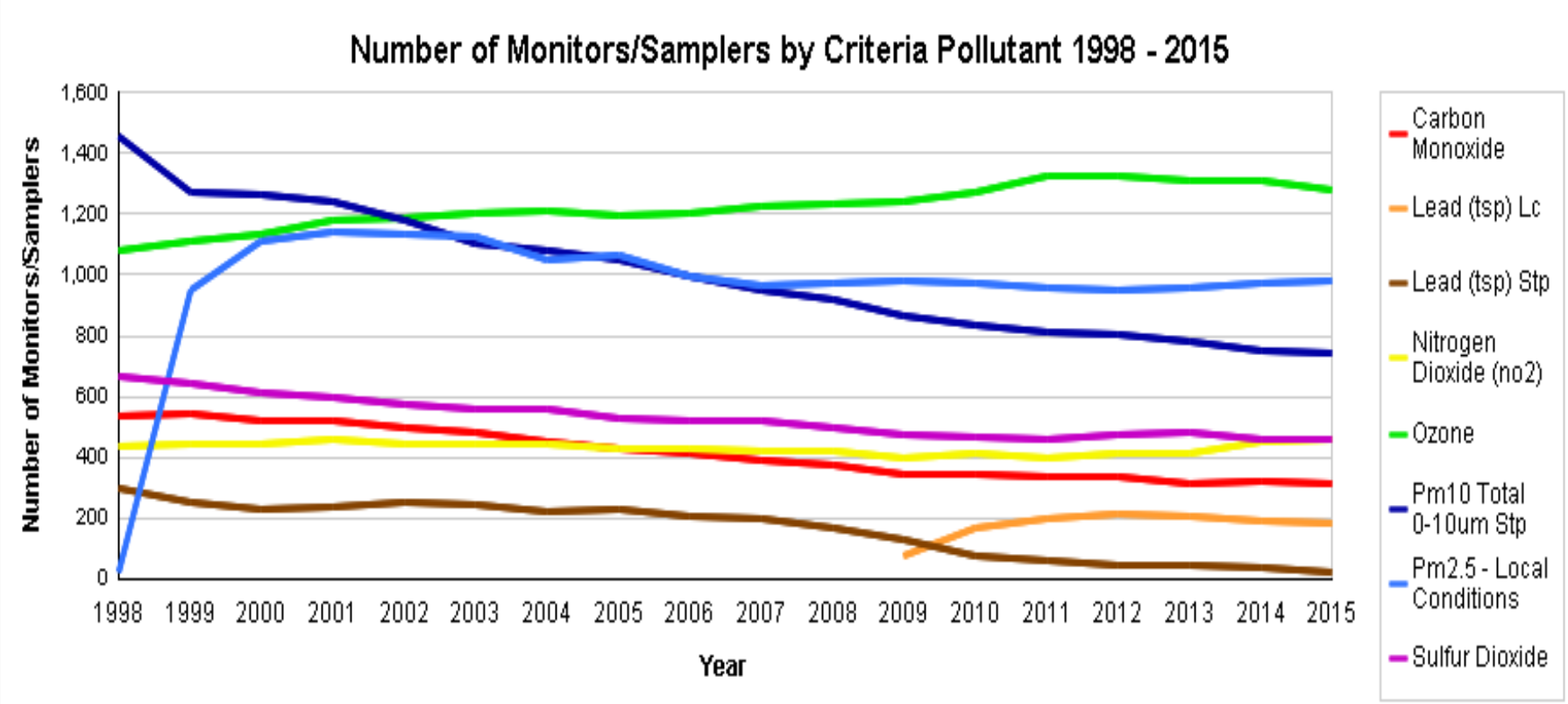
Office of Air Quality Planning and Standards

The Robust Monitoring Network Remains Important



Our Priorities

- Finding efficiencies
- Keeping the networks relevant
- Improving QA programs
- Supporting responses to localized air quality problems

Ambient Monitoring Rule (1 of 2)

- Published March 28, 2016
  - https://www.gpo.gov/fdsys/pkg/FR-2016-03-28/pdf/2016-06226.pdf
- Better aligned definitions with AQS
- Additional flexibility for manual PM2.5/CSN sampling frequency
- Reduced data certification requirements
- Reduced data reporting requirements
- Eliminated Lead (Pb) at urban NCore stations
- Restructured QA appendices for clarity
- Eliminated national QA requirements for $PM_{10-2.5}$
- Additional flexibility for QA on PSD projects; moved requirements back into Appendix B

Ambient Monitoring Rule (2 of 2)

- Required Annual Monitoring Network Plan comments to be collected at the state level and sent with ANP to EPA
- Clarified period of increased PM2.5 sampling when triggered by DV's
- Required reporting of flow rate verifications to AQS
- Expanded Annual Performance (PE) audit levels and required some points to occur at lower concentrations
- Reporting of QMPs and QAPPs approval dates to AQS
- Completing the Ambient Air Protocol Gas Survey and participating in the program at the request of EPA every 5 years

Chemical Speciation Network (CSN) Update

- 2014 CSN Assessment Results:
  - CSN $PM_{2.5}$ mass measurement eliminated
  - 38 CSN Sites defunded
  - Sample frequency reduced at 3 CSN Sites
  - Carbon blank collection frequency reduced
  - Icepacks in shipment reduced during cooler months
- 2015 IMPROVE Protocol Assessment Results:
  - 8 IMPROVE Protocol Sites defunded

CSN & IMPROVE Protocol Assessment Website

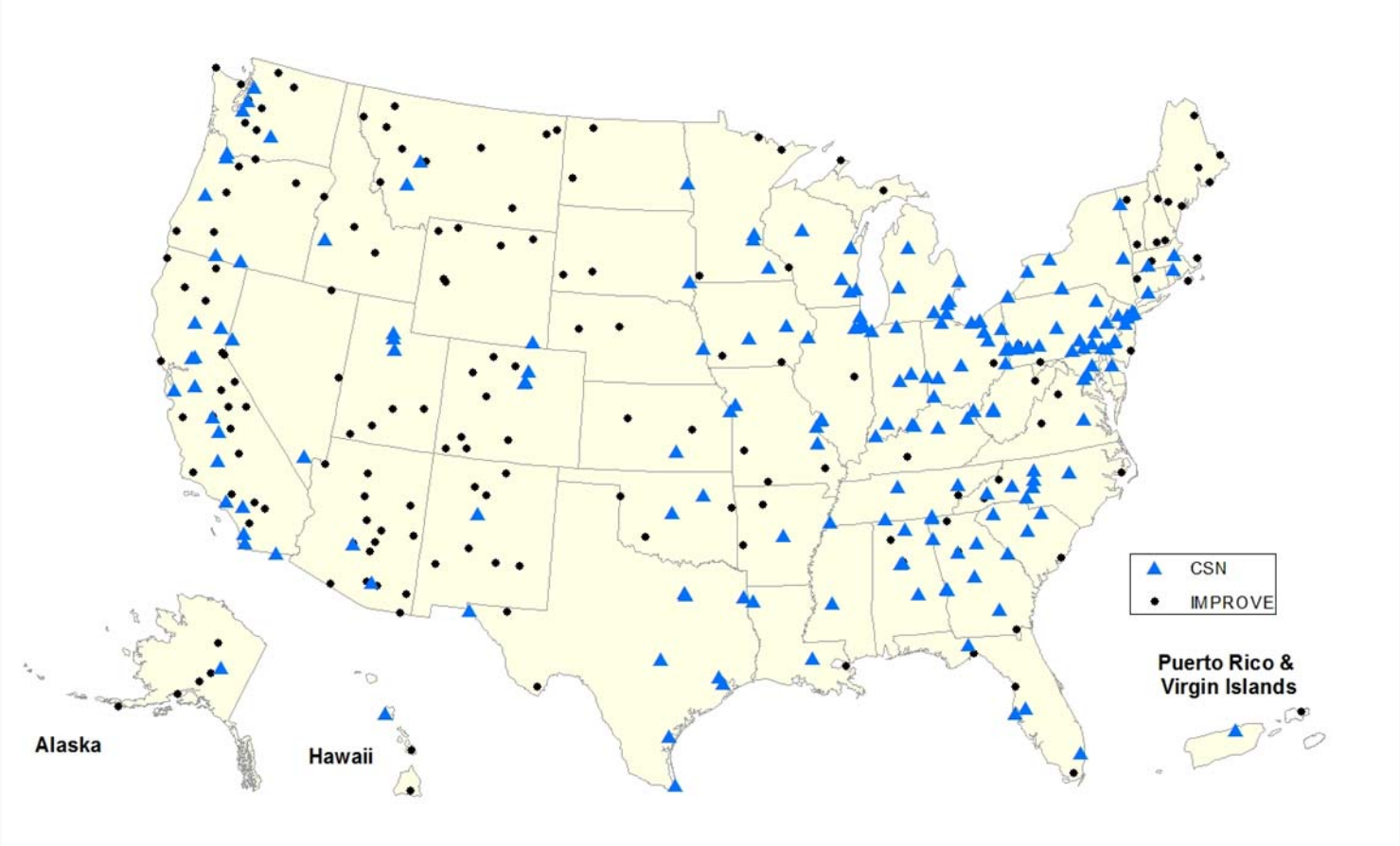
https://www.airqa.org/csna

CSN Contract Transition

- RTI served as the national contract laboratory from 1999 – 2015
- In September 2015, the contract was split into 2 pieces and awarded to:
  - Amec Foster Wheeler – shipping, handling and gravimetric mass contract
  - UC Davis – laboratory analysis contract
- STI has updated the Data Analysis and Reporting Tool (DART) to accommodate CSN data for validation purposes
  - Data reported through March 2016 as the catch-up period following transition continues

Source: http://suzannewoodsfisher.com/blog/2008/06/the-worlds-most-confusing-traffic-sign/

Current Speciation Networks



CSN/PM Reinvestment

- Resources available from the assessment are being used to fund:
  - FT-IR research for carbon aerosol analysis
  - Purchase of MetOne SuperSASS for all 1-in-3 CSN sites with SASS (to allow for sequential sampling)
  - Purchase of additional VSCC's to replace remaining WINS
  - Development/improvement of DART for CSN
  - Investigation of Transmissometer measurements on Teflon filters and best options for reporting of data
- OAQPS is considering a meeting with the CASAC AMMS in 2017 to discuss technical issues

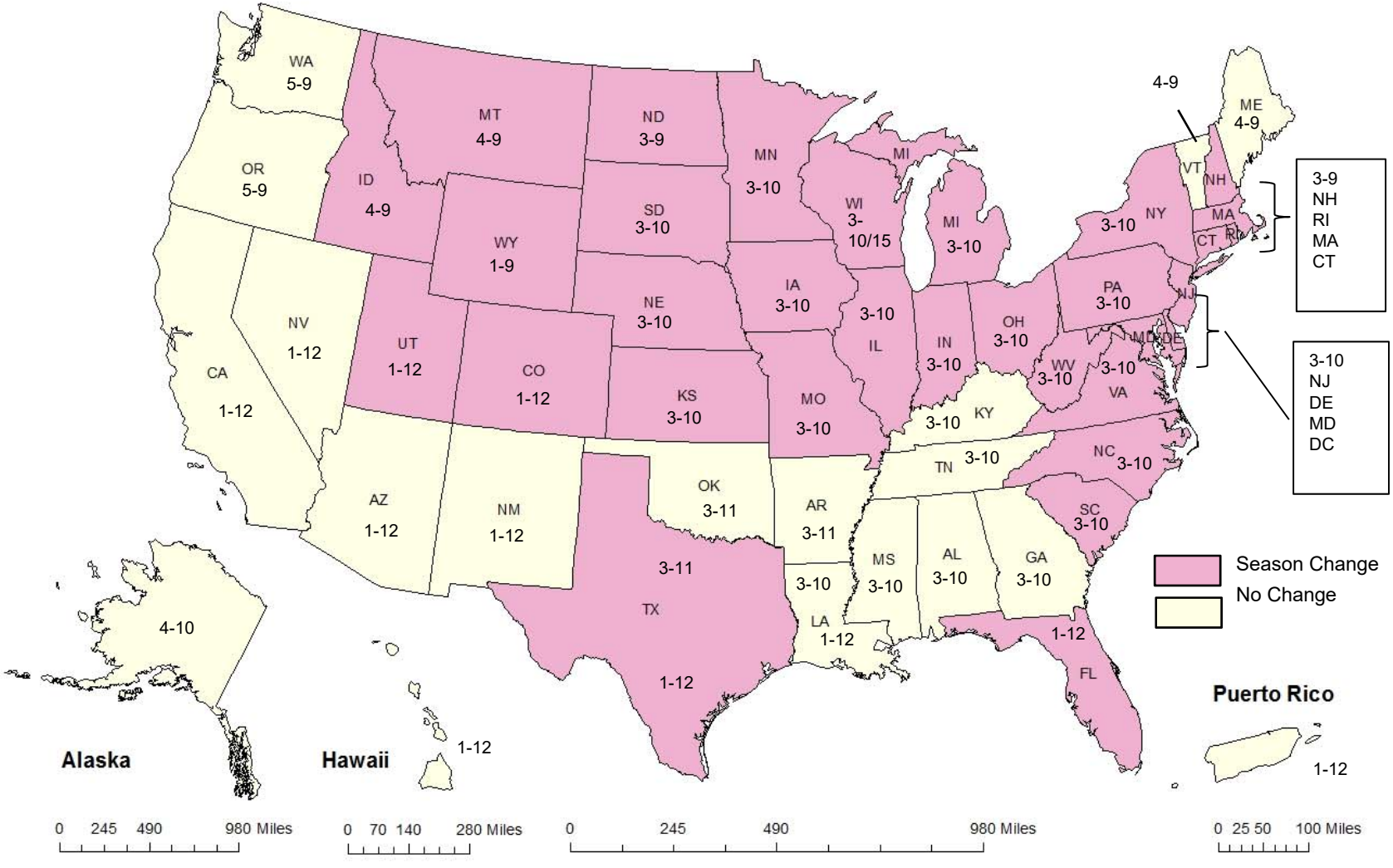
Ozone NAAQS Final Rule and Monitoring Changes

- Final rule signed October 1, 2015
- NAAQS final rule addresses monitoring and data handling including:
  - Updates to the Photochemical Assessment Monitoring Stations (PAMS)
  - Extension of the ozone monitoring season in 32 states and D.C.
  - New Federal Reference Method (FRM) for ambient measurements of ozone while retaining existing FRM and Federal Equivalent Methods (FEMS)
    - Existing FEMs can continue to be used for monitoring
  - Revisions to the Part 53 FEM performance testing requirements to be more in line with technological advancements and current ozone monitor performance
  - New data handling requirements in Appendix U

Ozone Monitoring Seasons

- Final rule extends the ozone monitoring season for 32 states and the District of Columbia
  - Year-round ozone seasons for all NCore multi-pollutant sites
- All waivers were revoked when the rule became effective December 28, 2015
  - States with existing waivers should pursue new waivers through the Regional Administrator (RA) as appropriate
  - RAs can still approve changes to states' ozone monitoring seasons without rulemaking
    - Reg 9 has developed an SOP that is being shared
- New season requirements and year-round monitoring at NCore will become effective January 1, 2017

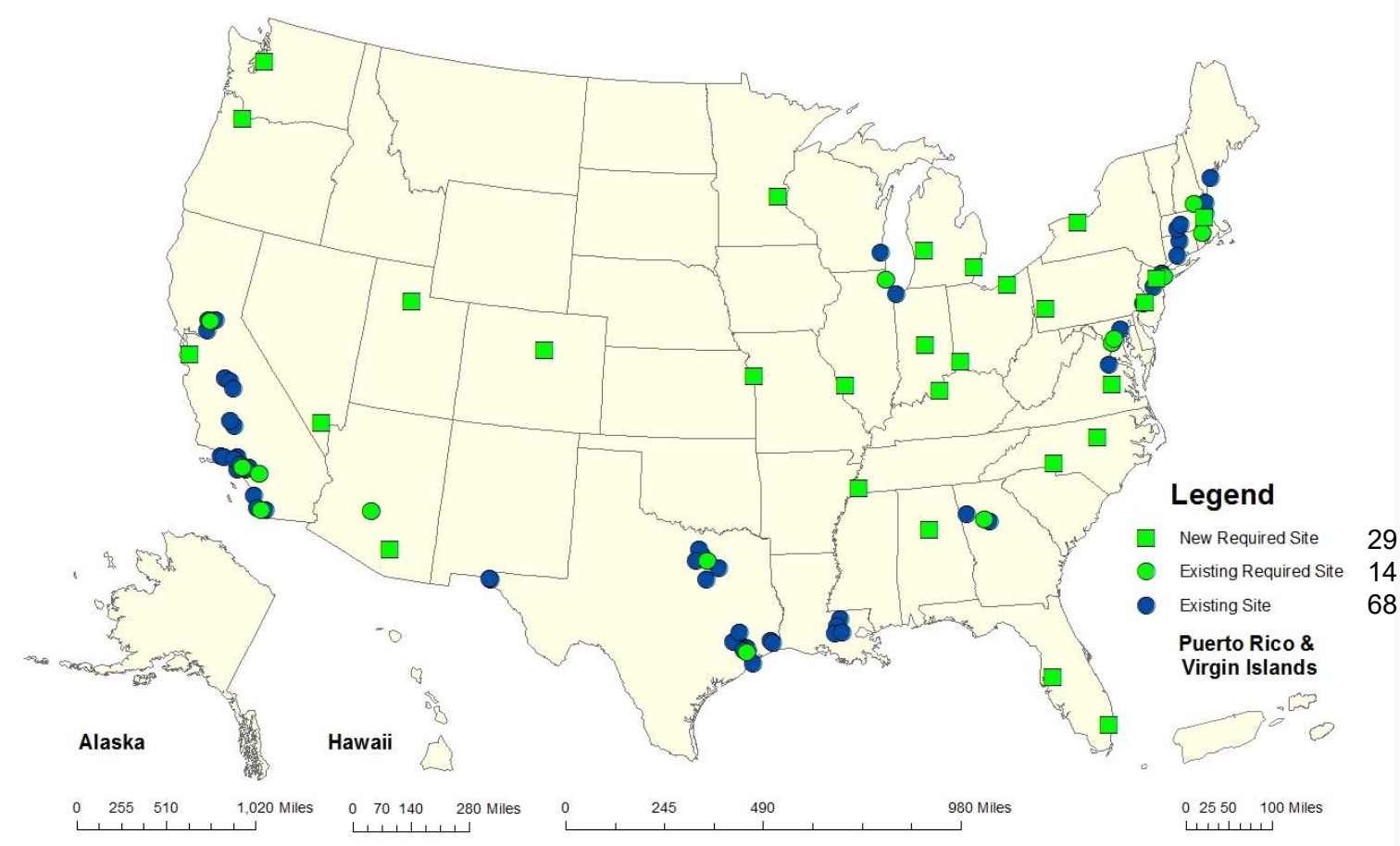
Ozone Seasons: Finalized Requirements



PAMS Network Update

- PAMS Requirements revised in October 2015
- PAMS measurements to be taken @ NCore sites in CBSAs with 1,000,000 or more people
  - Revised PAMS measurements include:
    - Hourly VOC measurements
    - Carbonyl measurements
    - True NO2 measurement
    - Ozone and NOy
    - Hourly mixing height measurement and other meteorology parameters
- States with moderate or above 8-hour ozone non-attainment areas required to develop a Enhanced Monitoring Plan (EMP) for ozone and its precursors

Updated PAMS Map



PAMS Timeline and Milestones

- PAMS plan due July 1, 2018 as part of Annual Network Plan
  - Consider moving this up to July 1, 2017 if waivers are needed
  - Also consider status of legacy PAMS and discuss priorities with RO's; there are options for divestment here
- PAMS monitoring at NCore sites will need to start by June 1, 2019
  - ***We have successfully identified states to be early implementors and start getting equipment installed in 2017 and 2018***
- EMPs submitted within two years of designations or by October 1, 2019, whichever is later

EPA Commitments on PAMS

- PAMS Funding reallocation
  - Start in 2017, and spread over multiple years
- National Procurements for autoGCs, true NO2, and ceilometers
- Guidance documents
  - Technical Assistance Document
  - Generic QAPP
  - SOPs for autoGCs, true NO2, and ceilometer
  - EMP Guidance
- National QA Program
- Training, Training, and more Training!
  - Data Validation/Reporting
  - AutoGC operation
  - Mixing height/Ceilometer

QA Challenges

- Staffing transitions – loss of organizational history and FTE's
- Ambient signal is diminishing – challenging procedures and metrics
- Guidance documents must evolve
- Stakeholder involvement is increasing
- Gap filling – improving QA on NATTS and addressing PAMS
- Becoming efficient, e.g., using the LEAN process

Using the LEAN process to re-invent the PM2.5 PEP, NPAP, Pb-PEP QA Programs

The new programs will be:

- **More Efficient** – automation, real-time data review, conditional checks
- **Cheaper** – less contract support at OAQPS
- **Timely** – automated data upload to AQS
- **More Consistent** – increased standardization
- **Sustainable** – Software developed and maintained in-house
- **Modern** – programs are Tablet computer optimized

NPAP has been completed and is being used now.
$PM_{2.5}$ and Pb will be implemented in 2017

Source: http://www.thebookpatch.com/BookStore/lean-transformation/58d2c280-68d3-4b84-b8db-c5ae39260de3

The TSA Workgroup

Has worked together to develop guidance to conduct consistent TSAs

- Input from all regions in developing a TSA Guidance Document for conducting TSAs
- Consistent approach
- Definition and emphasis on audit independence
- Modified and portable TSA Questionnaire
- Use of AQS to help prepare for audits

Plans to develop tools to help digest data more efficiently using R and other software

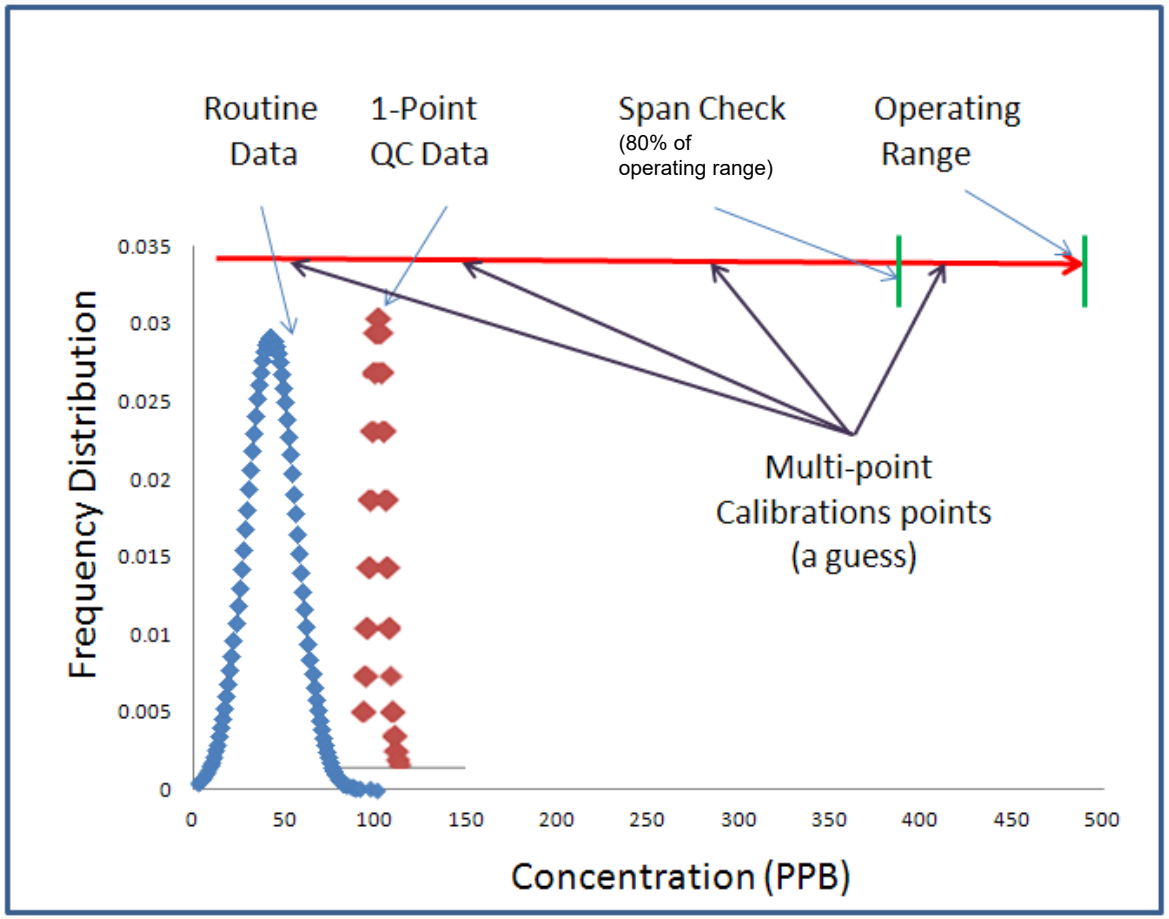
In the future, will provide technical training for auditors on monitoring equipment to build expertise

New Guidance Documents On AMTIC

- Quality Assurance Guidance Document 2.12
- Guidance on Statistics for Use of 1-Point QC Checks at Lower Concentrations
- Technical Note Related to PSD Monitoring Quality Assurance Activities
- Technical Guidance on the Use of Electronic Logbooks for Ambient Air Monitoring
- Technical Guidance on Annual PE Audit Levels Using Method Detection Limits
- Clarification on Use of PM2.5 Field and Laboratory Requirements for Low Volume PM10 Monitoring to Support PM10 NAAQS
- Determining the Primary Quality Assurance Organizations for Industrial Monitors in Support of the SO2 Data Requirements Rule

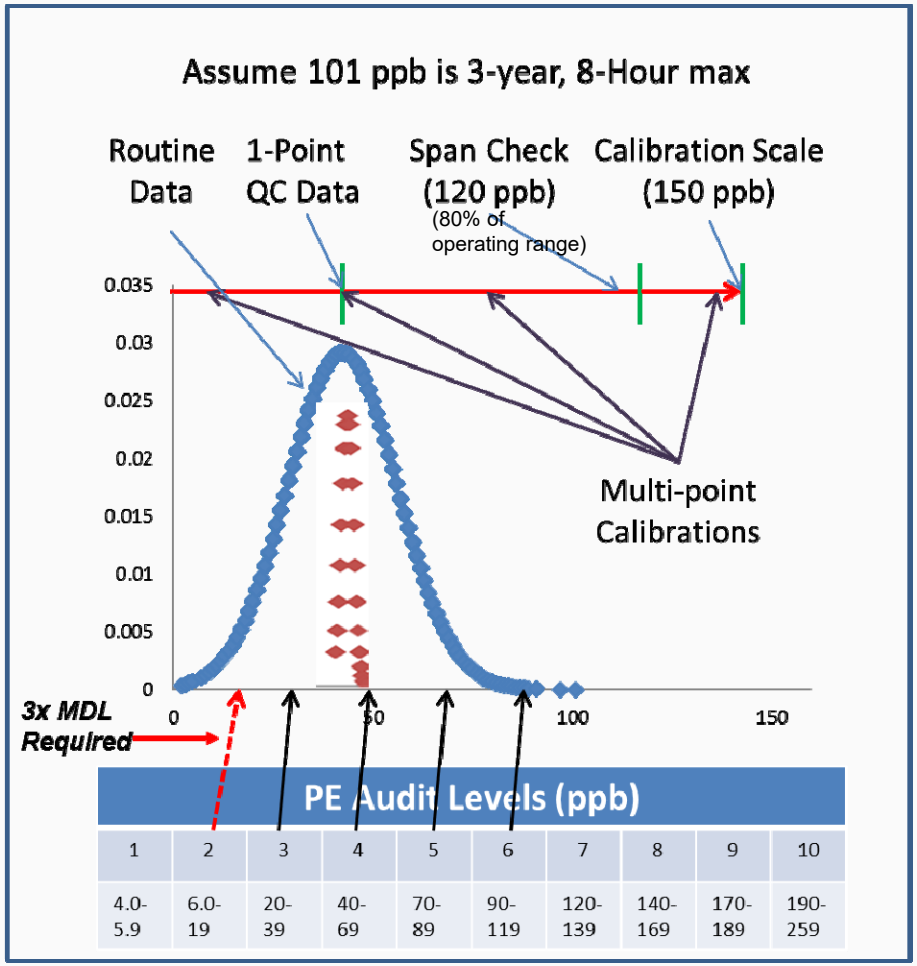
Changing the Paradigm – Adjusting to Improved Air Quality

Historical Model



Changing the Paradigm – Adjusting to Improved Air Quality

Current Model



PE Audit Levels (ppb)									
1	2	3	4	5	6	7	8	9	10
4.0-5.9	6.0-19	20-39	40-69	70-89	90-119	120-139	140-169	170-189	190-259

Improving Quality Assurance Programs

MegaPE CSN Program oversight transitioned from ORIA/NAREL to OAQPS

- First set of PE's anticipated early 2017

Gravimetric Inter-Laboratory Comparison Study (PM2.5 Round Robin)

- First set anticipated early 2017
- Biannual evaluation

CSN field QAPP revisions

- Update of SOPs and QA activities

IMPROVE Field QA Training

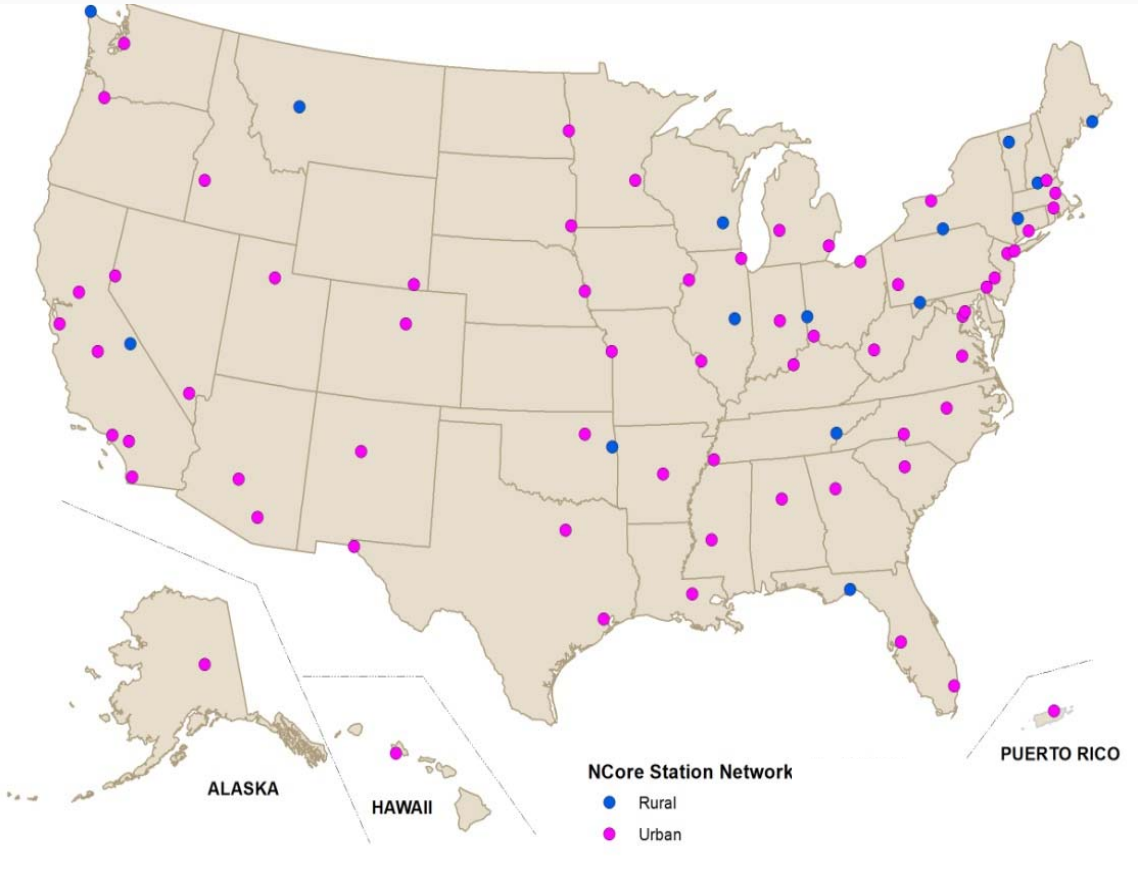
- Transitioned to National Park Service

Protocol Gas Verification Program

- Required survey and cylinder participation

Quick Check-ins

The National Core (NCore) Monitoring Network



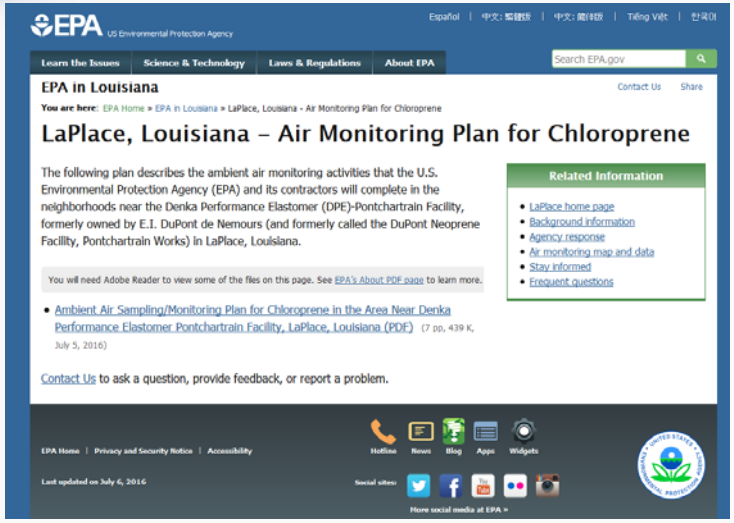
- NCore is a mature network
  - 78 stations
  - 63 urban and suburban
  - 15 rural
  - WV, PR, FL (2 sites) added in 2014
  - One site move planned in 2016 for ND.
- NOy measurements
  - Expect lots of collocation between NCore and PAMS
  - New information on calibration of NOy method in presentation this afternoon by Russell Long
  - Value of data when collocated with "true" NO2 in Wednesday afternoon PAMS session presentation by Tim Hanley
- Lead (Pb) measurements
  - Requirement for Lead at NCore revoked in recent final rule. Work with your Region, where applicable, if seeking a request to shut down lead sampling at NCore.
- Keep an eye on the age and condition of your original trace level instruments

Near-road NO_2 Network Status

- Currently, the EPA estimates that there are 68 operational near-road monitoring sites
- Phase 1 sites: 48 of 52 sites operational
  - Missing CBSAs: Chicago, Orlando, Salt Lake City, Virginia Beach
- Phase 2 sites: 17 of 23 sites operational
  - Missing CBSAs: Boston, Chicago, Miami, New York, San Diego, San Juan
- Phase 3 sites: Boise, Des Moines, and Fresno are operational
  - Bakersfield scheduled
- Final rule addressing changes in Phase 3 requirements under internal review

OAQPS Role in Monitoring

- Funding support
- Assistance with method evaluations and monitoring plans
- Contractual support
- Data analysis and validation



Current and Longer term Monitoring Concerns (Lew's List)

- Monitoring agency staff transition and training
- Undiscovered QA issues
- Aging equipment/lack of investment
- Methodological challenges with a cleaner atmosphere
- Integrating sensor data into routine operations

Questions?