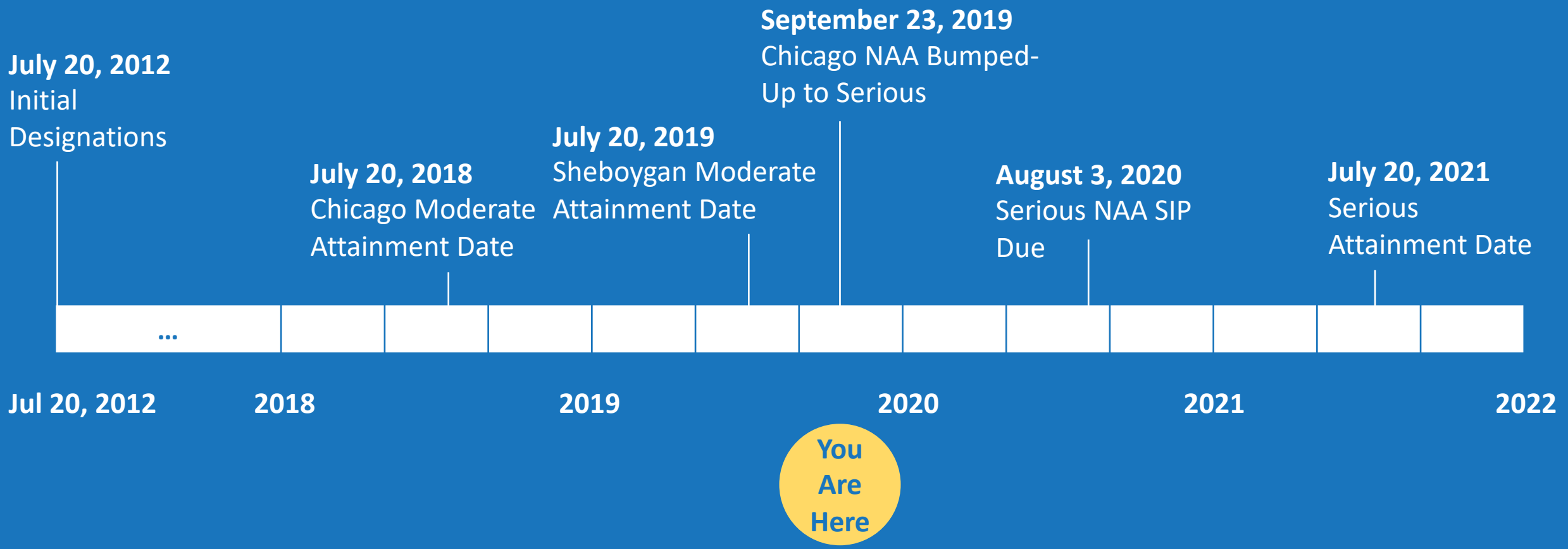
LADCO | LAKE MICHIGAN AIR DIRECTORS CONSORTIUM

LADCO Fall 2019 Project Team Meeting

September 24, 2019
Rosemont, IL

Ozone Planning

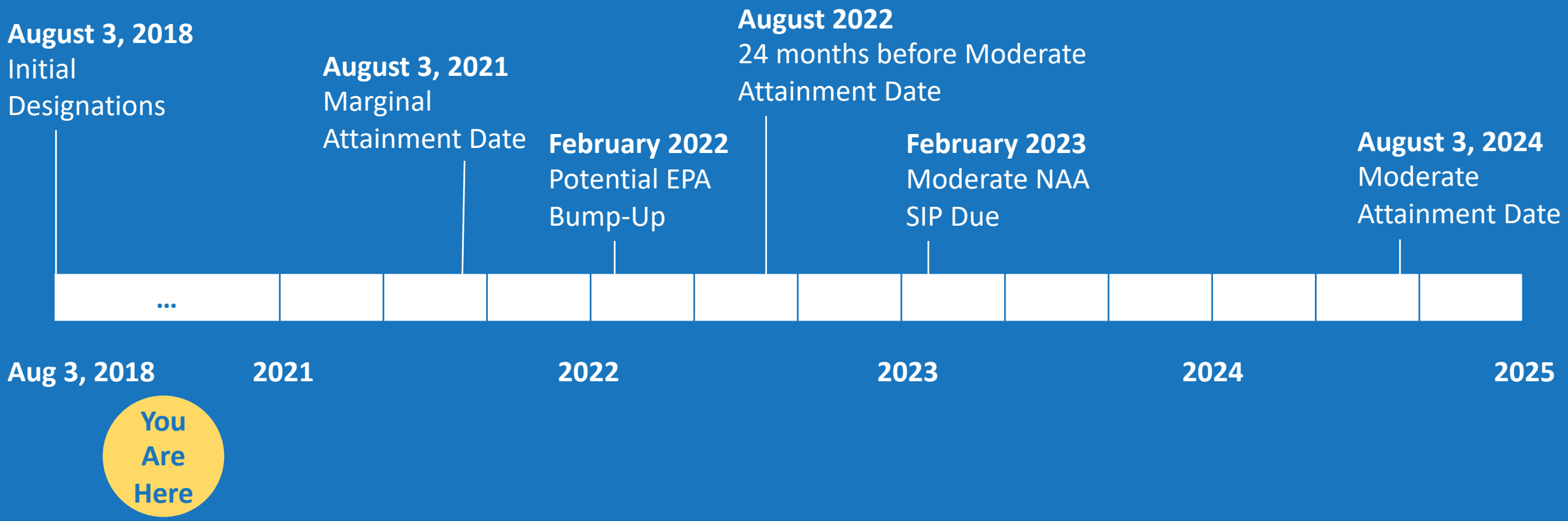
2008 O_3 NAAQS Planning Schedule



2008 O3 NAAQS Work Plan

- Attainment Status
  - Chicago and Sheboygan measuring attainment, based on draft/current 2019 DVs
- SIP
  - Serious NAA SIP due August 3, 2020
  - LADCO targeting TSD to states (WI, IL, IN) in March/April 2020

2015 O_3 NAAQS Planning Schedule



2015 O3 NAAQS Work Plan

- Attainment Status
  - A number of sites throughout the LADCO region are not attaining the NAAQS
  - Even with 2019 being a historically low ozone year, some sites will likely bump-up in February 2022
- SIP
  - Moderate NAA SIP due February 2023
  - LADCO targeting TSD to states in September/October 2022
- Guidance from states on the next steps

O3 Attainment Technical Support Ideas

- Ozone Precursor Emissions Control Review Contract
  - Objective: evaluate candidate emissions controls for reducing NOx and VOC emissions in the LADCO region.
  - Outcomes: database of potential emissions reduction options, in costs/ton and reduction potential, for all anthropogenic sources of NOx and reactivity-weighted VOC in the 2016v1 U.S. emission inventory
  - Timing: 9-12 months from RFP release (available Q3/4 2020)

O3 Attainment Technical Support Ideas

- Regional Modeling
  - Source apportionment tagging inventory sectors
  - HDDM modeling to develop ozone isopleths for NAAs
  - Sensitivity modeling
    - Heavy duty diesel base case revision: add in impacts of HDDV defeat devices, off-cycle emissions, and intermodal facilities
    - Gasoline vs diesel on-road mobile contributions
    - Commercial and consumer solvent VOC contributions
    - Municipal methane leaks/fugitives contributions
    - Airport and intermodal facility contributions

O3 Control Strategies: Regional Planning

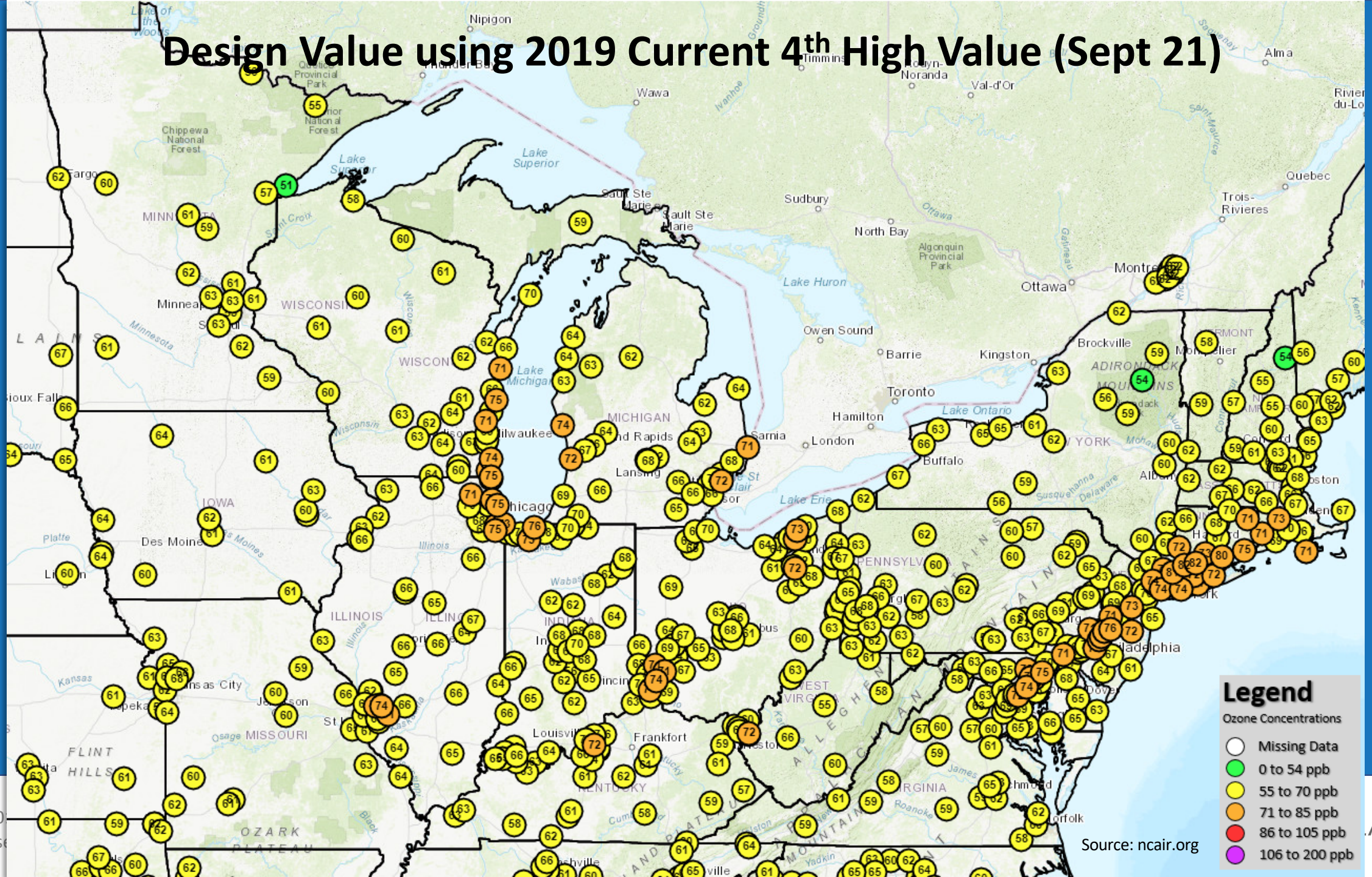
- Local vs regional ozone control strategies: a few hypotheses
  - Lake Michigan monitors will attain through regional/multi-state emissions control strategies
  - Detroit will attain through NAA emissions control strategies; as the NAA is also influenced by Canadian sources, there is a potential 179b case
  - Cleveland, Cincinnati, St. Louis, and Louisville will attain through NAA emissions control strategies

O3 Planning: Issues to Address

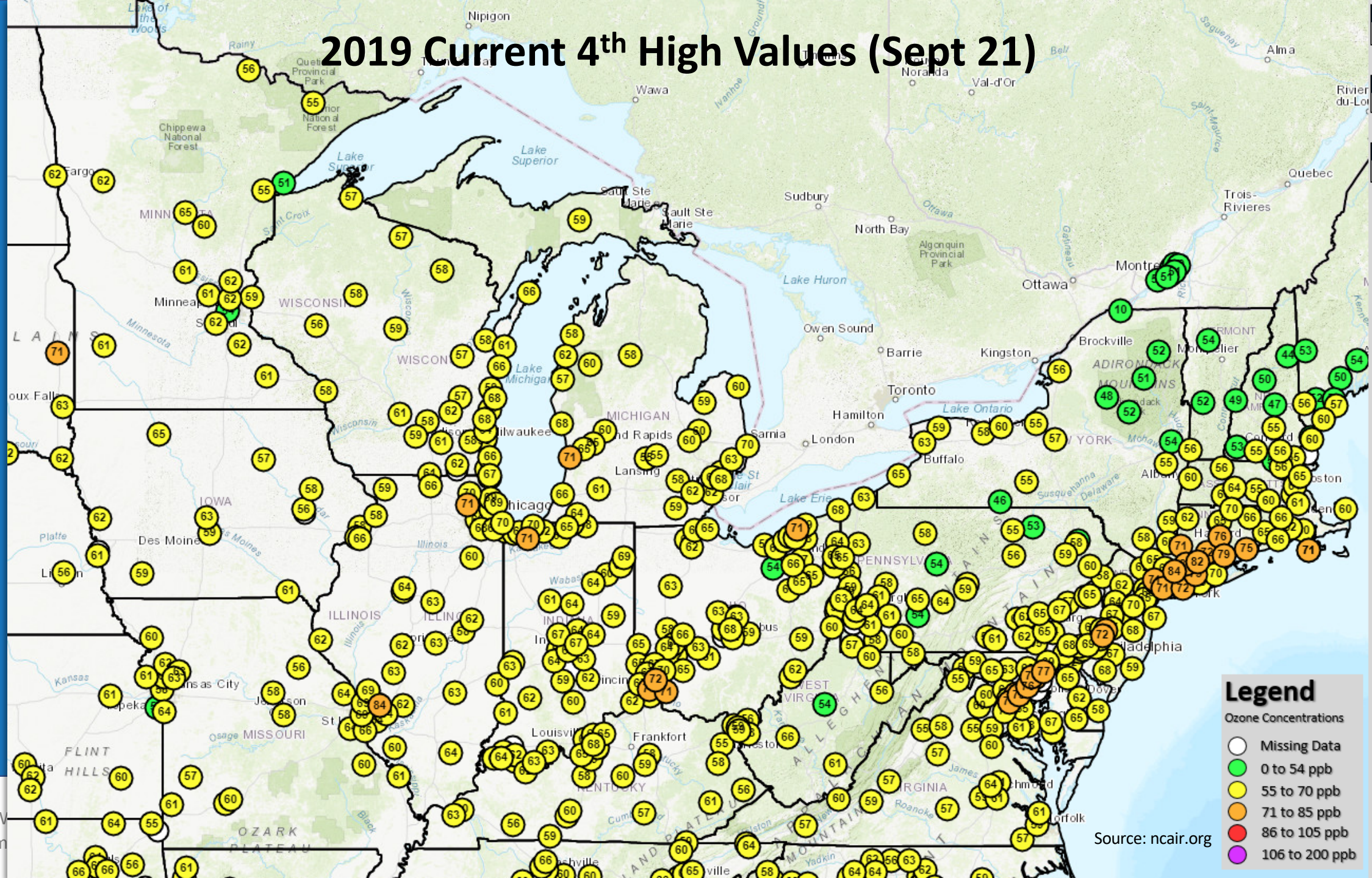
- What is the current position of your air program with regard to ozone and mitigation strategies?
- What should LADCO's priorities be over the next 2-3 years?

Ozone Trends Summary

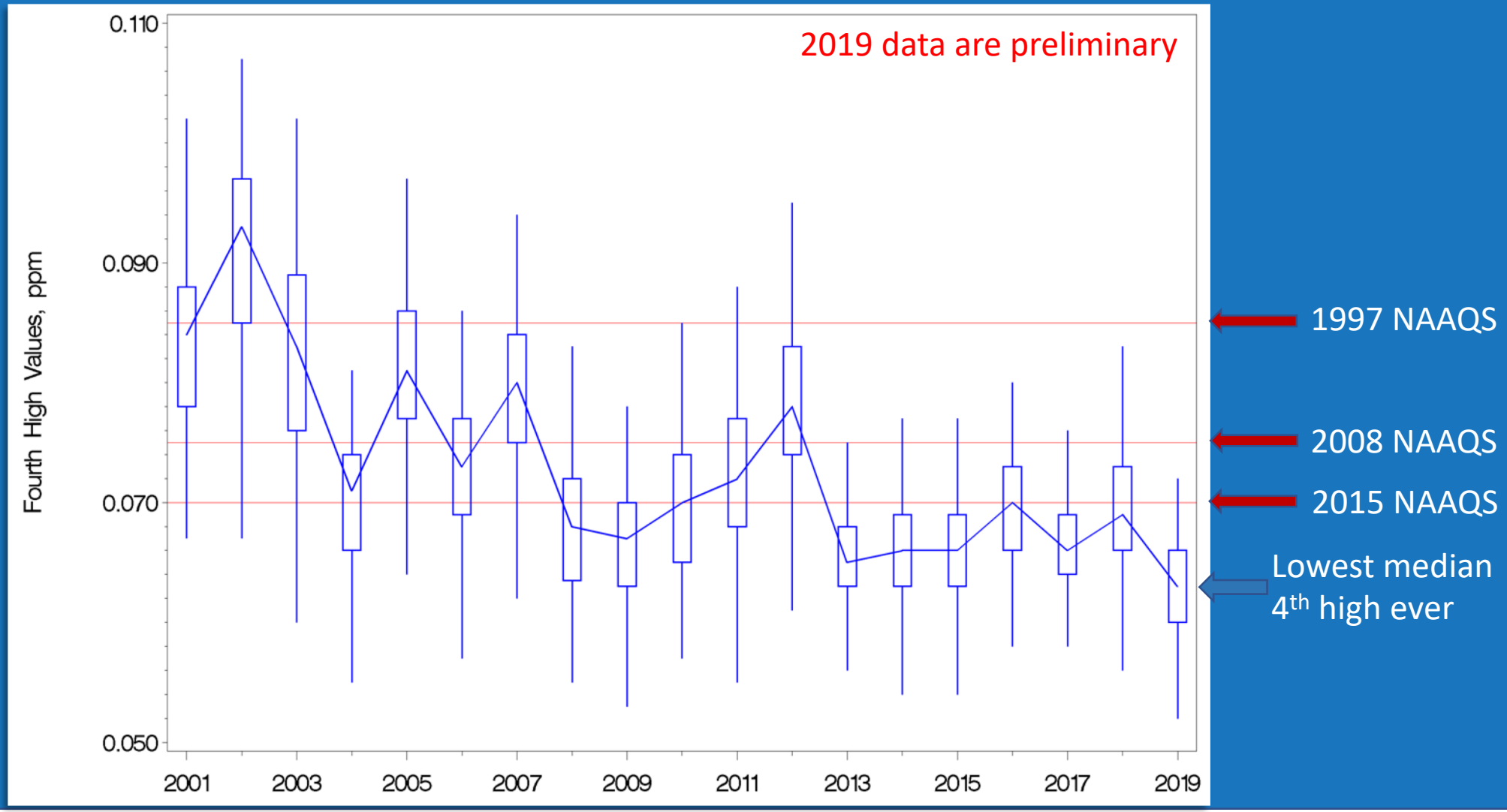
Design Value using 2019 Current 4th High Value (Sept 21)



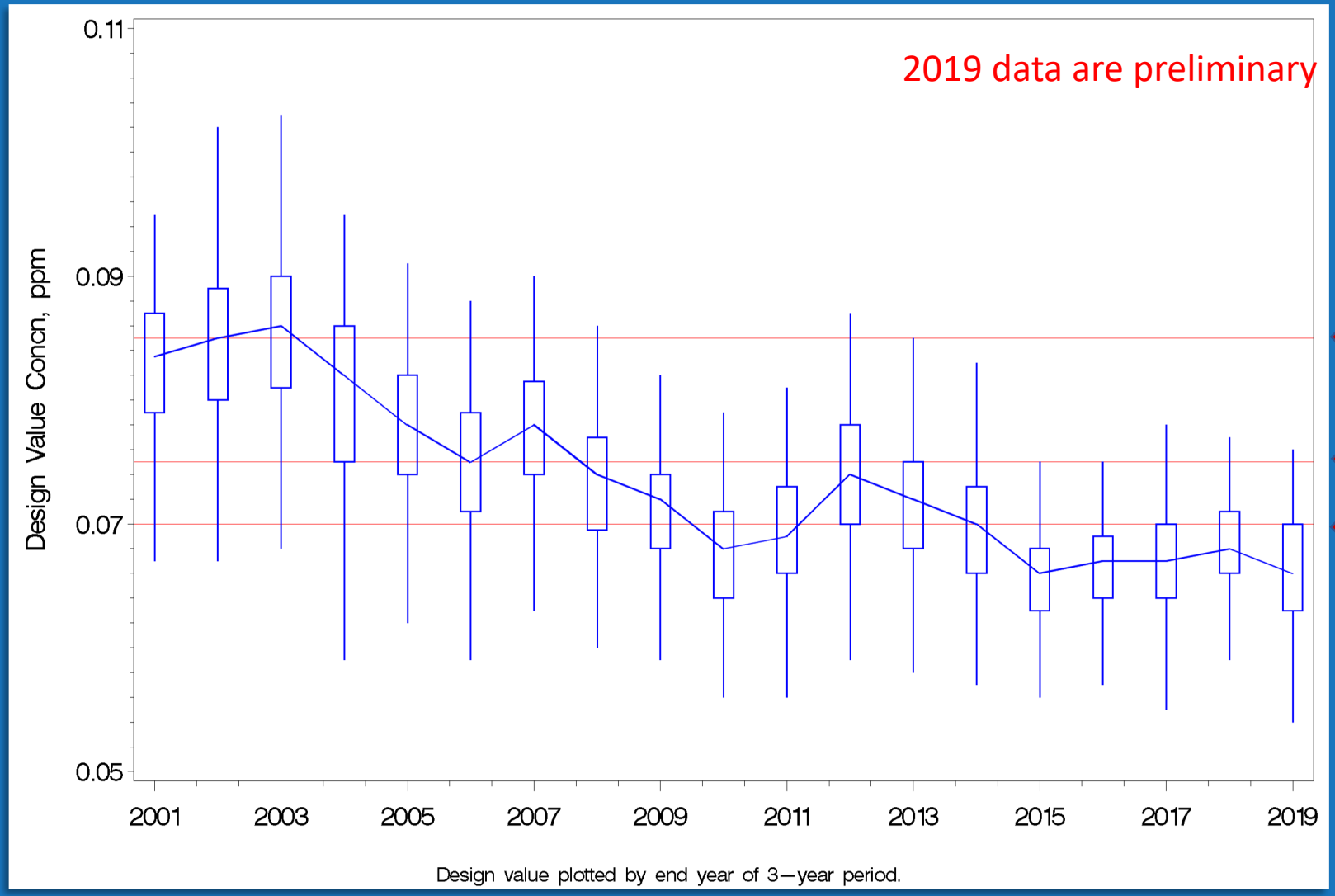
2019 Current 4th High Values (Sept 21)



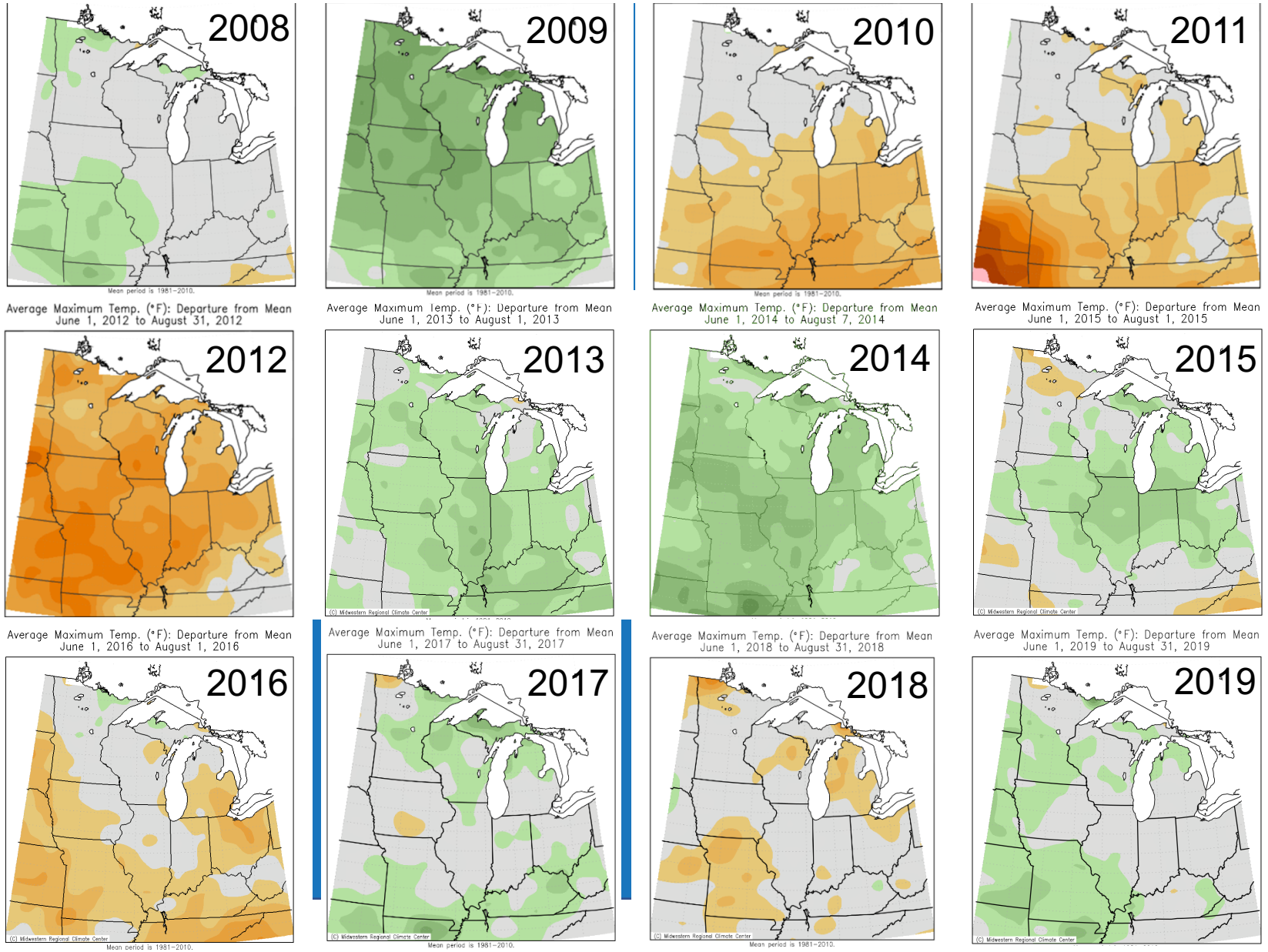
Ozone: Region-wide Fourth High Trends



Ozone: Region-wide Design Value Trends



Average Maximum Temperature Departure from Mean, Jun-Aug

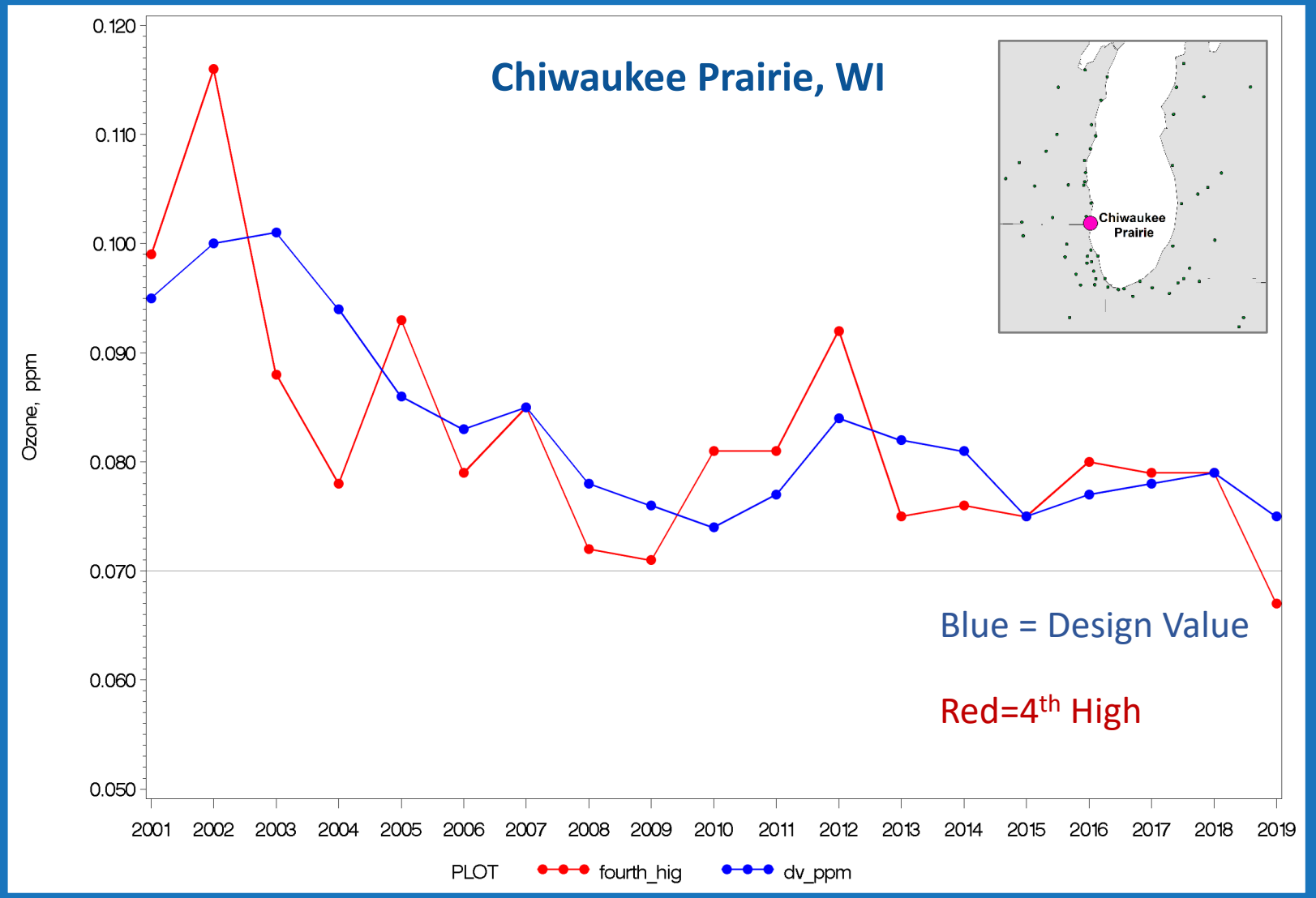


Despite near-average temperatures across region in 2019, most sites experienced record low 4th high ozone.

Source: Midwest Regional Climate Center

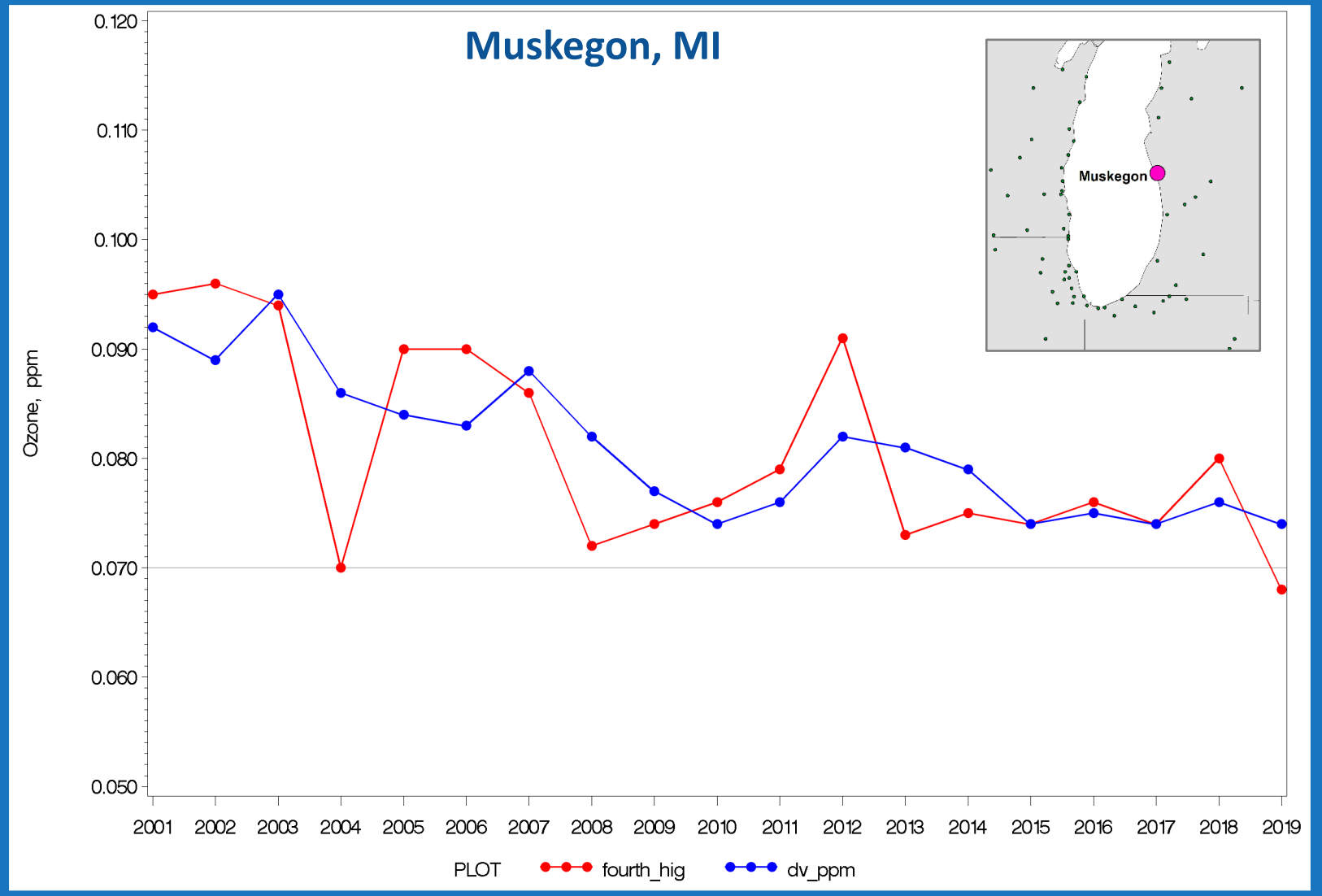
LADCO

Ozone: Trends at Key Monitors

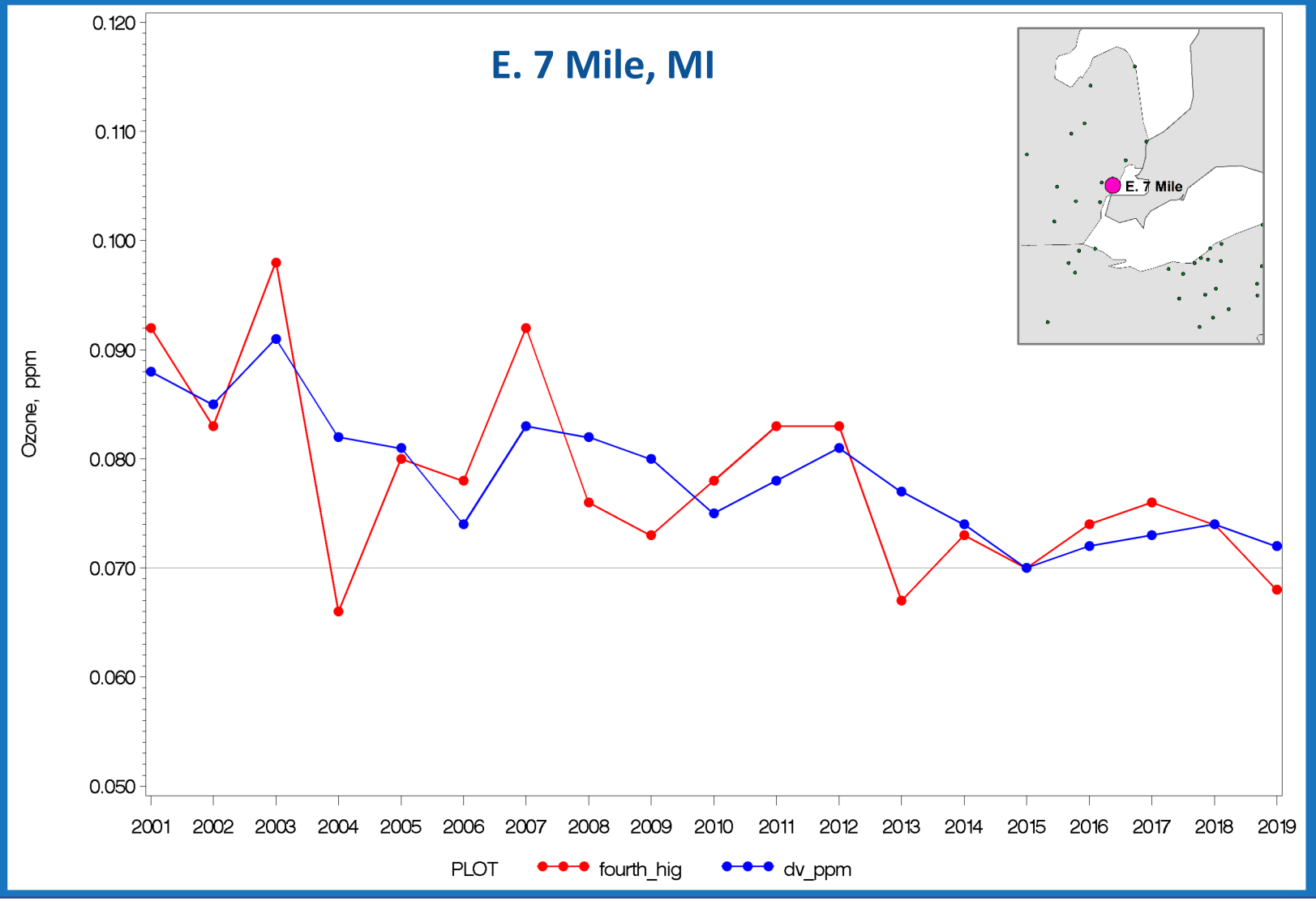


Most sites across R5 had lowest 4th highs ever

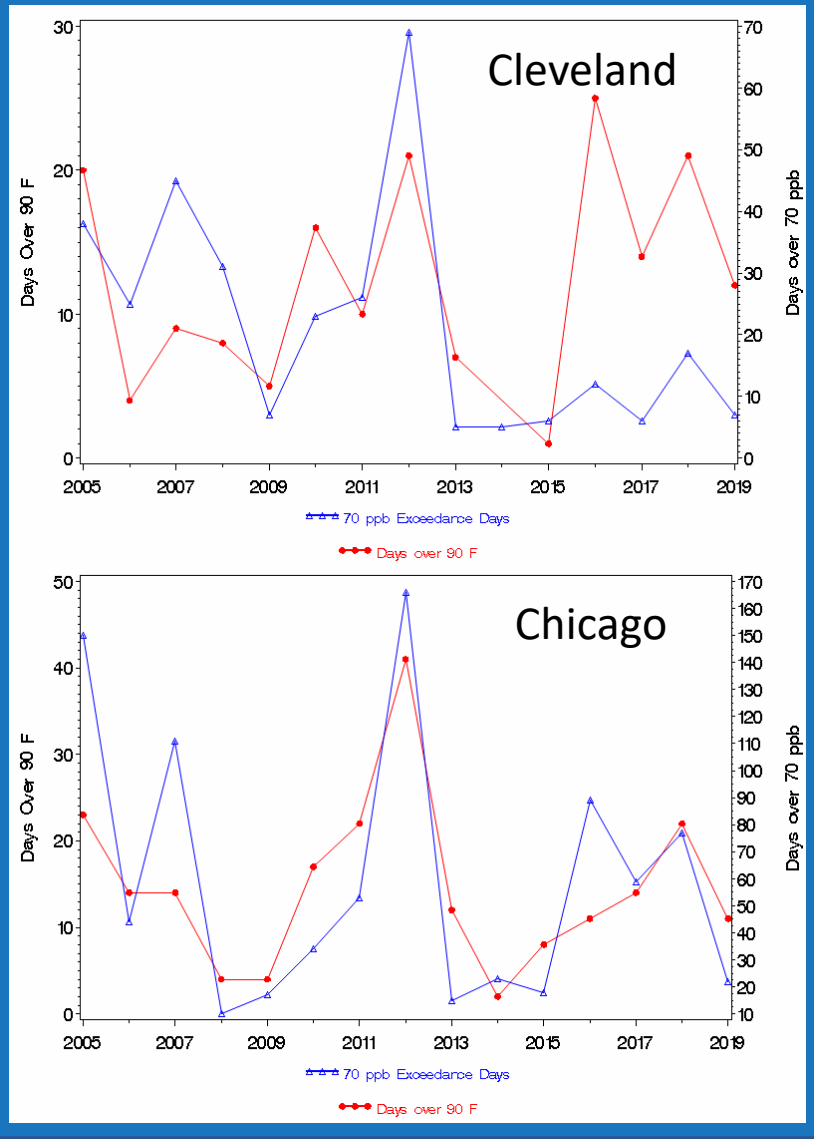
Ozone: Trends at Key Monitors

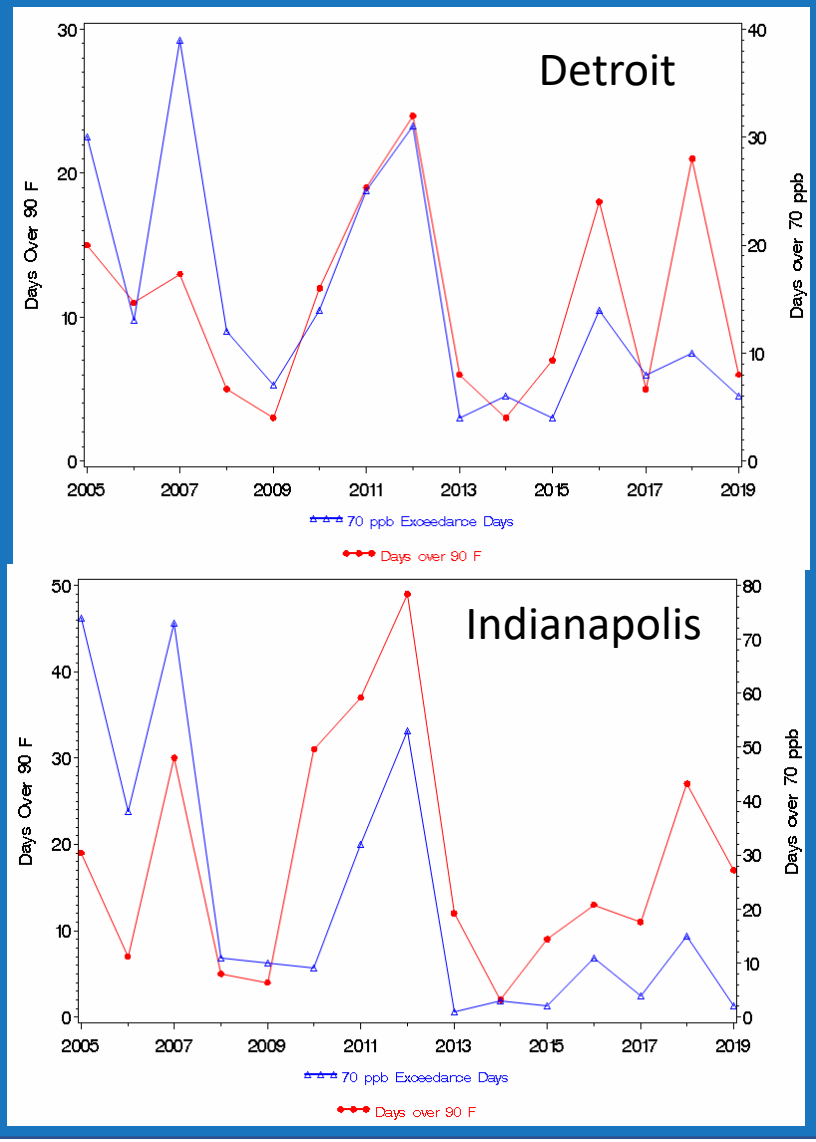


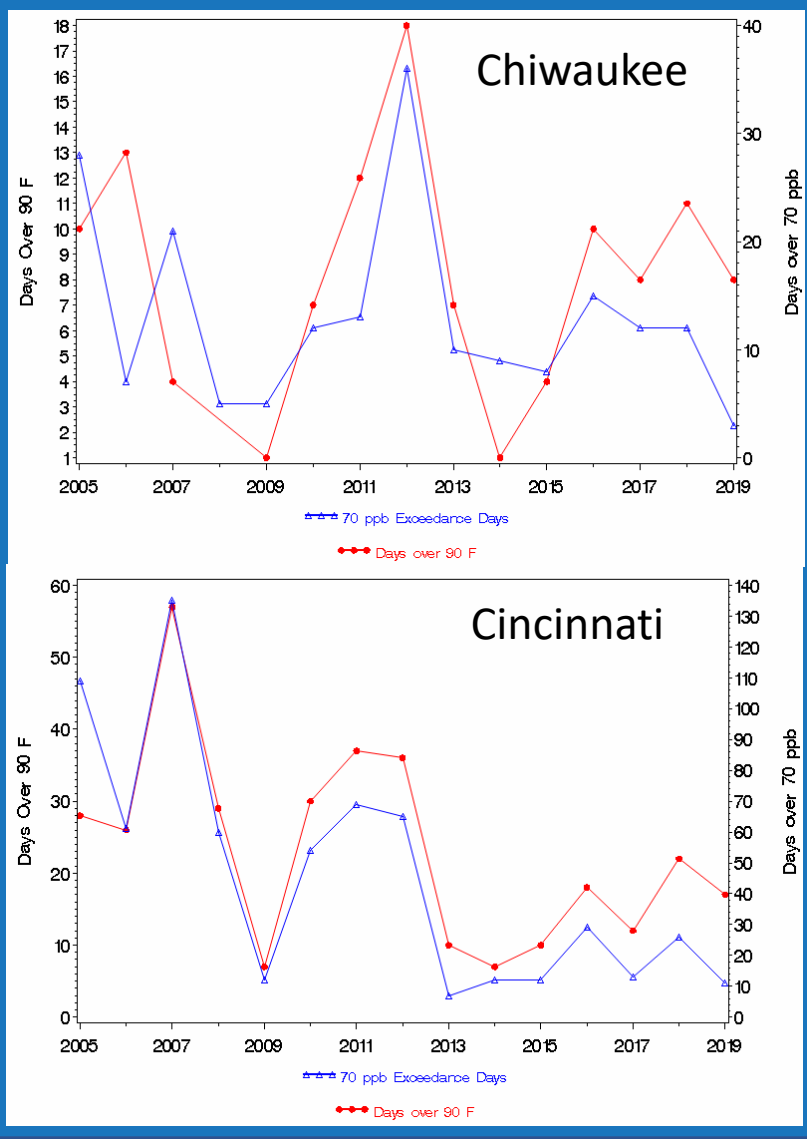
Ozone: Trends at Key Monitors



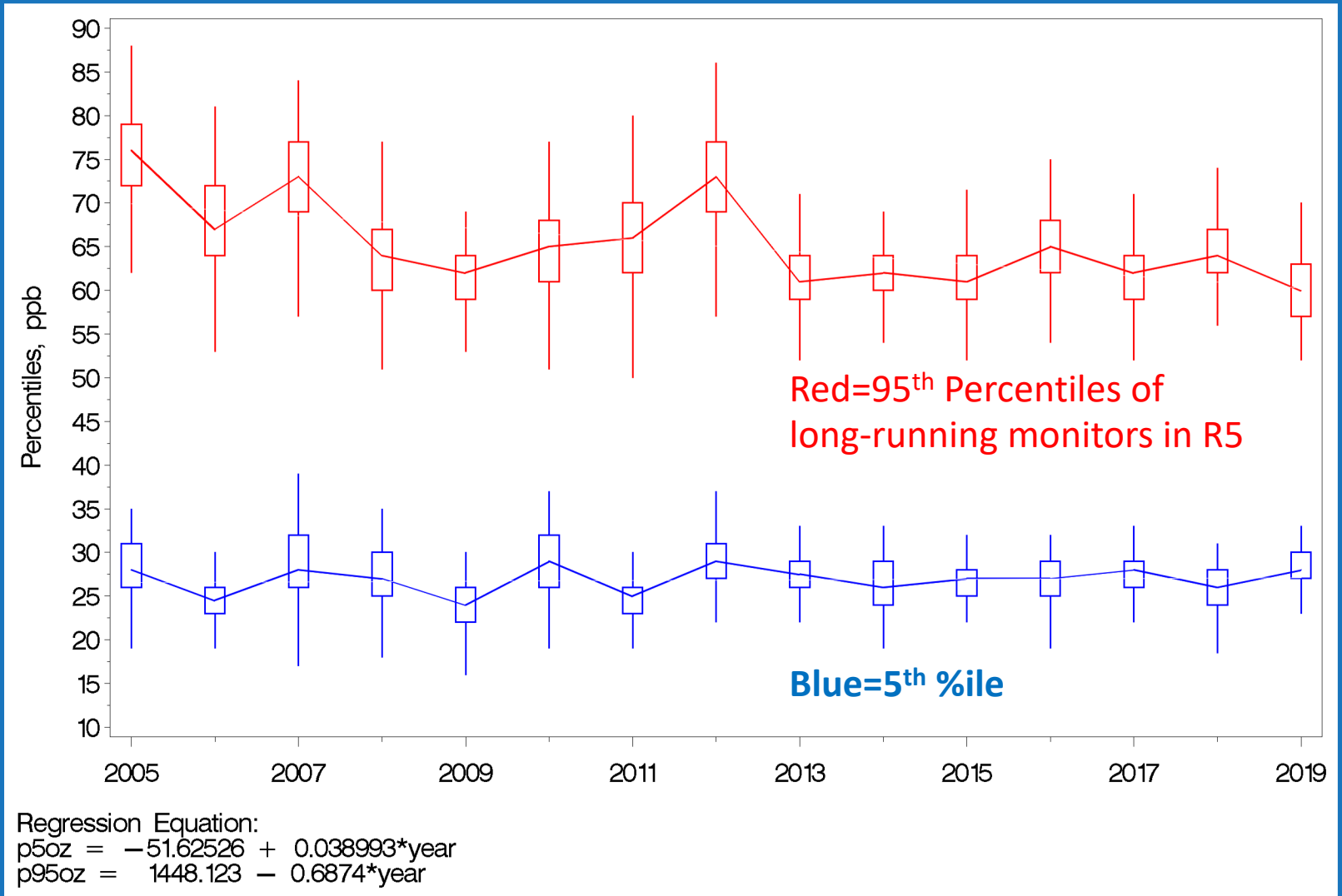
Exceedance Days (Blue) and 90-degree Days (Red)





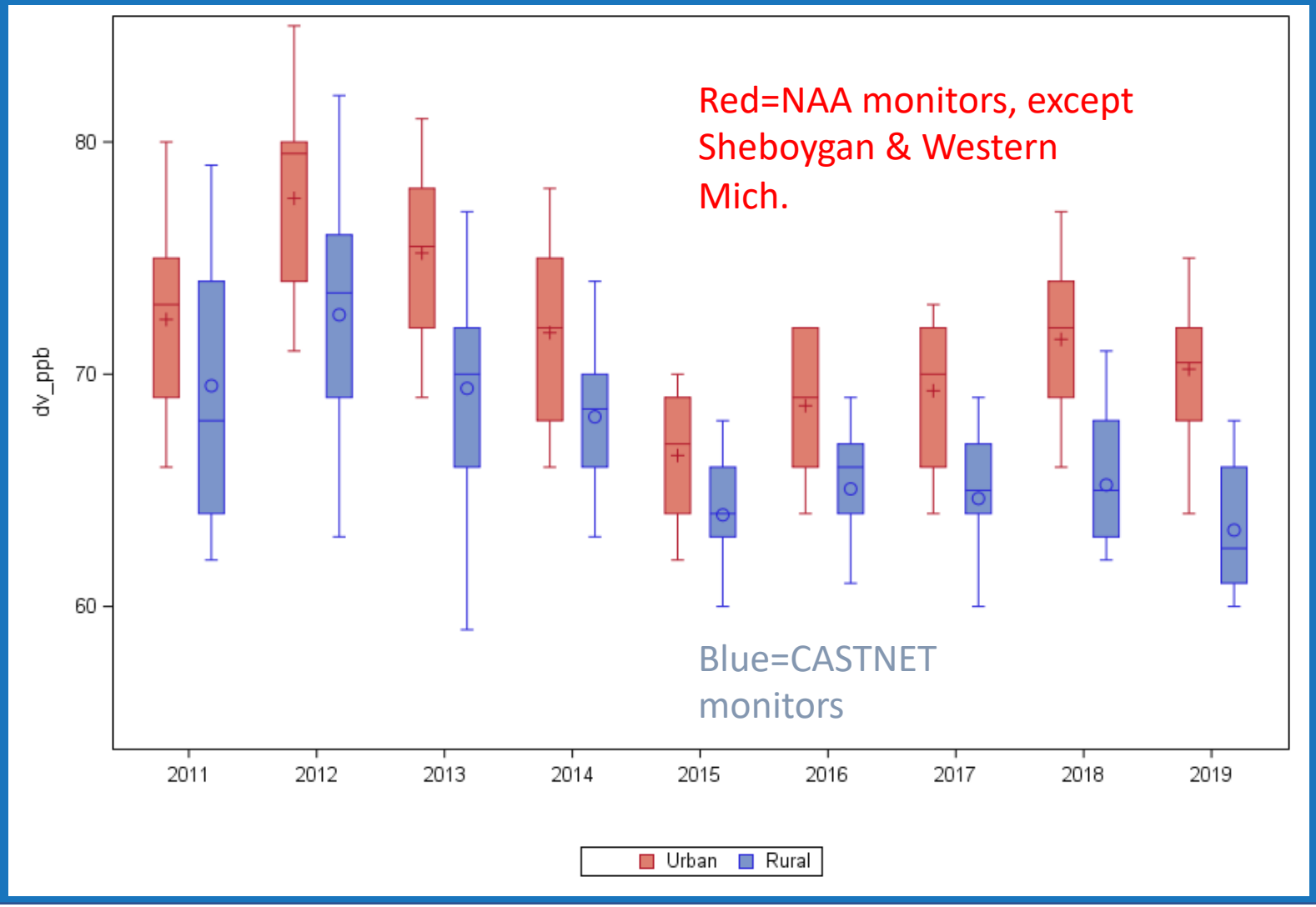


5th and 95th Percentile Trends, LADCO States



Minuscule trend in lowest concentration days, in contrast to declining concentrations on highest days

Urban and Rural DV Trends

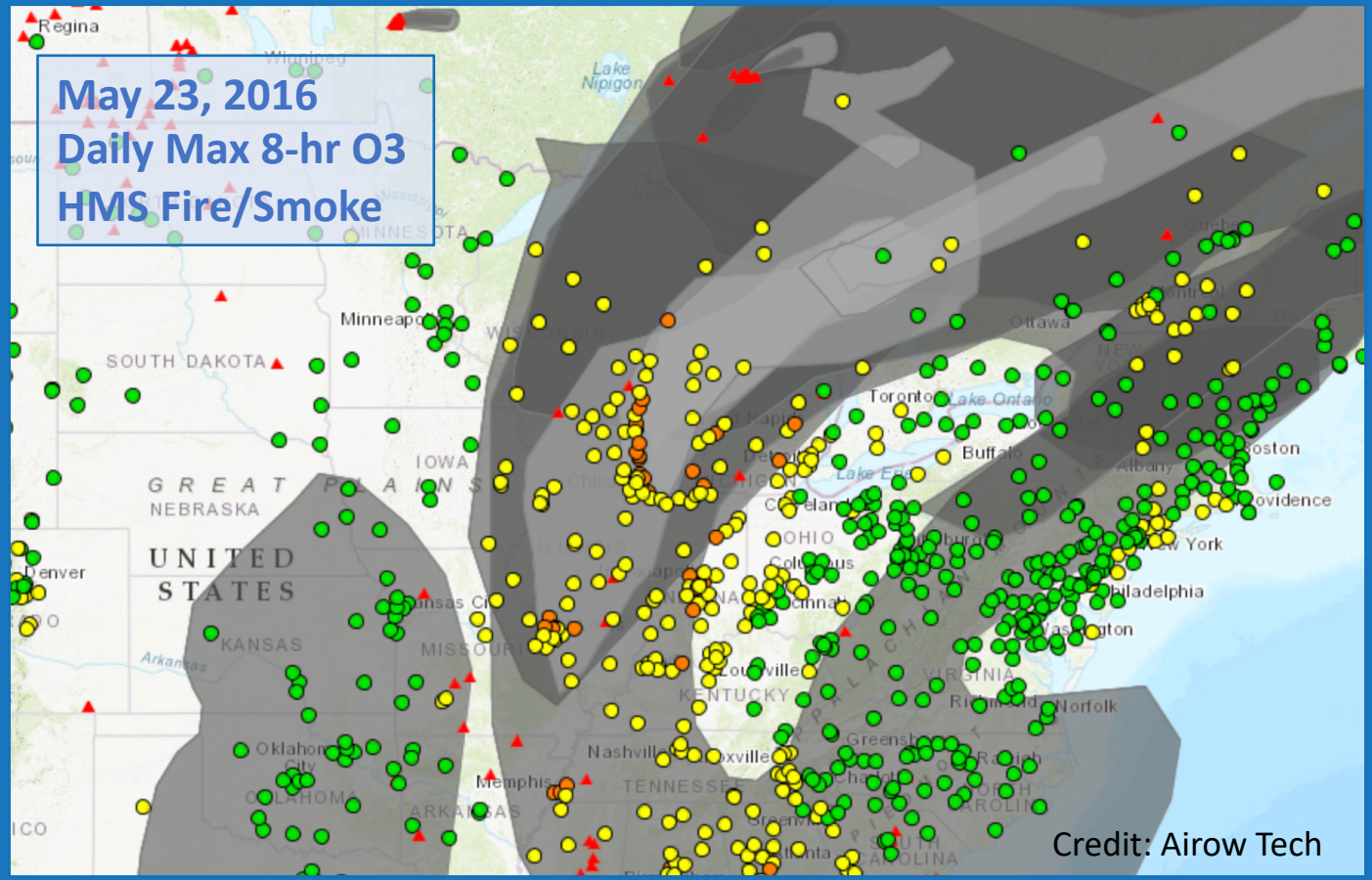


Ozone at rural monitors decreasing more than urban monitors

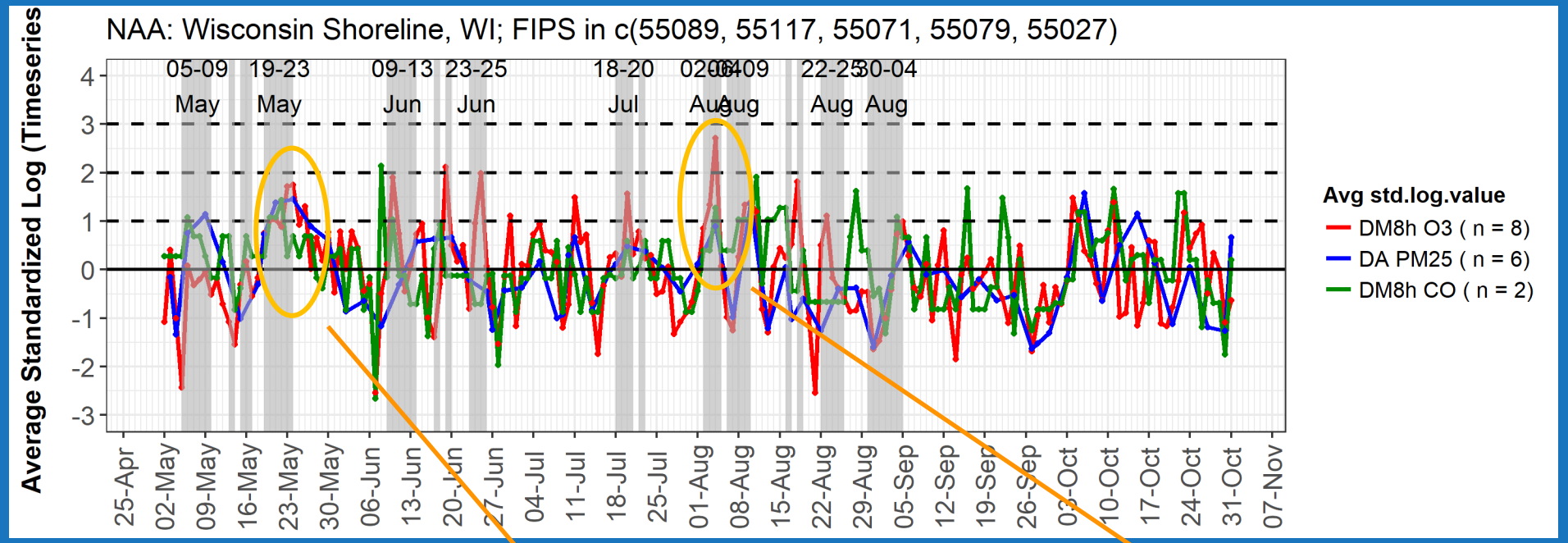
Exceptional Events

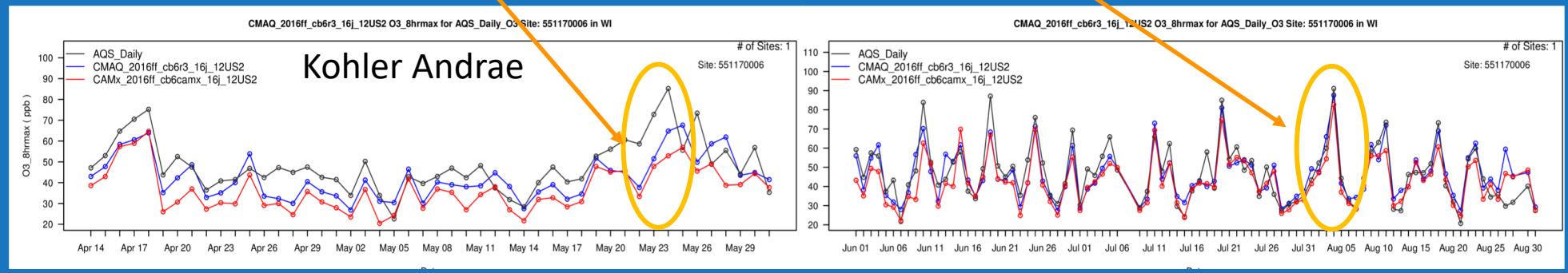
Exceptional Events

- LADCO EE Workgroup: monthly triage analysis reviews daily surface observations and smoke columns from previous month
- Implications on designations, attainment, and future year attainment testing



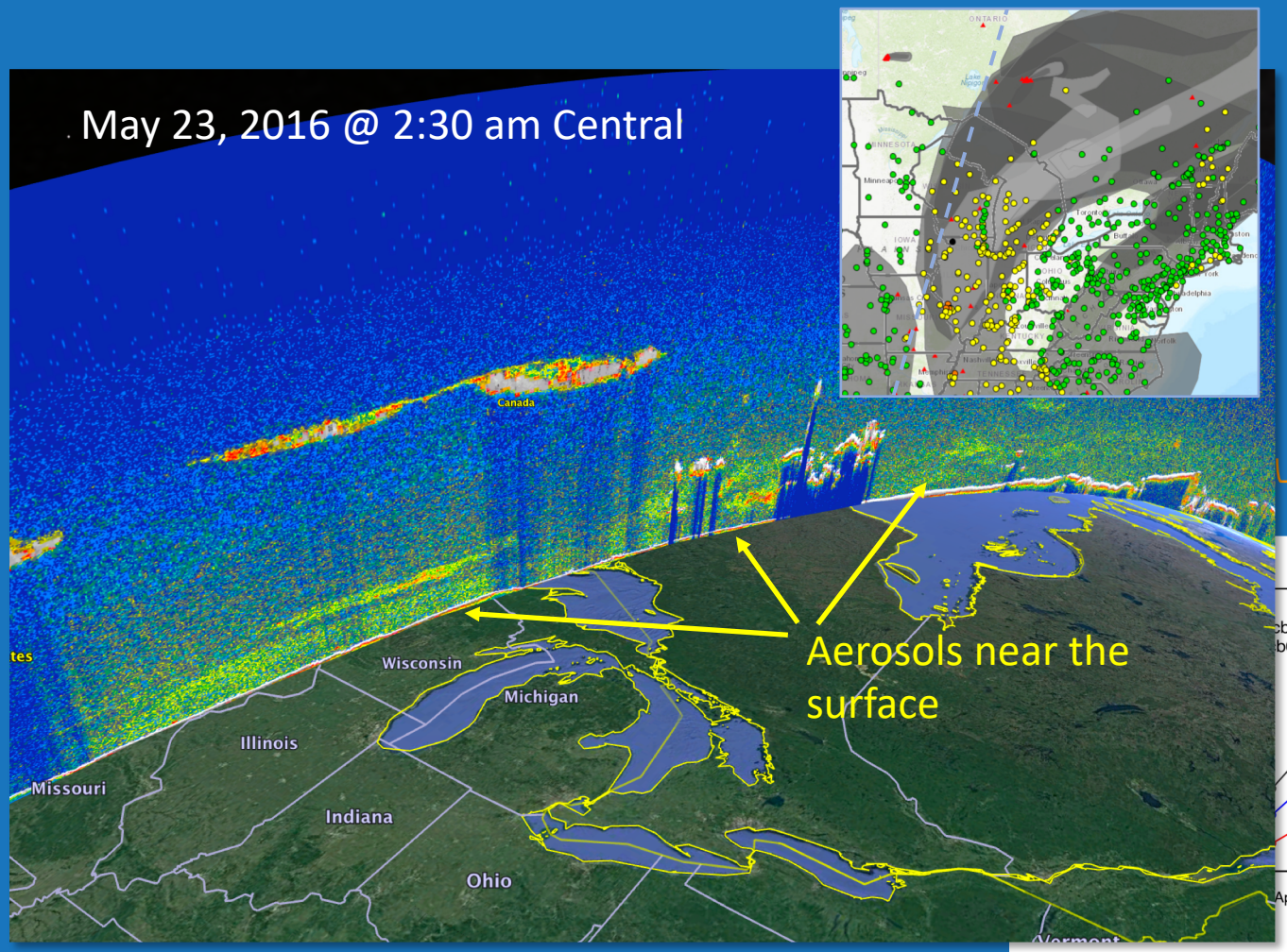
Sheboygan, WI NAA 2016 EE Screening



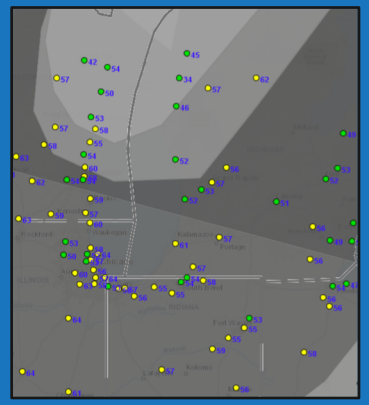


- LADCO screening metric seeks coincident 5-year anomalies in surface O_3, $PM_{2.5}$ and CO + smoke in the column
- > 1σ in all pollutants + smoke is a flag for smoke enhancement at the surface

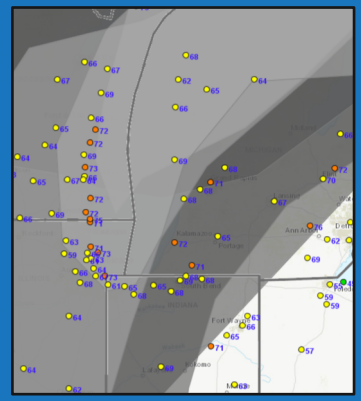
Ft. McMurray Fire (~May 20-24)



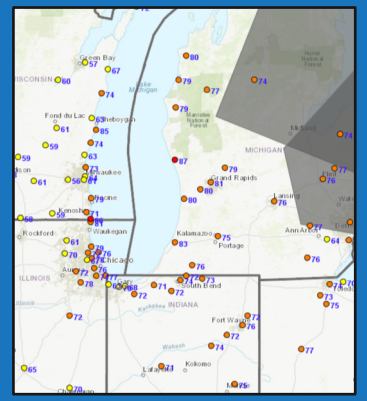
May 22

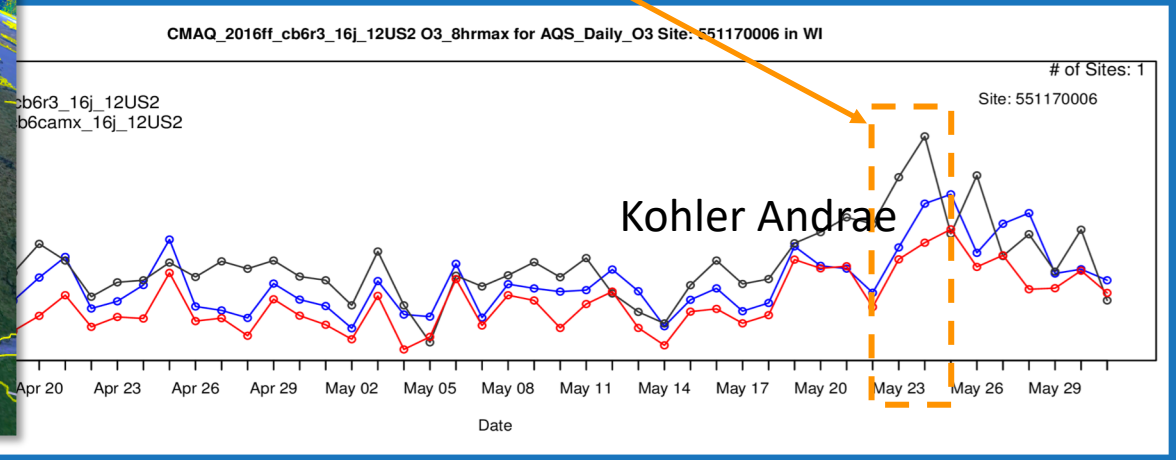


May 23



May 24





Exceptional Events Planning Applications

- Regulatory Significant
  - Designations
  - Re-classifications/bump-ups
  - Determination of attainment
  - Attainment date extensions
  - Attainment demonstration (SIP)
- Other Regulatory Programs
  - PSD
  - Base and future year DVs for O_3 and $PM_{2.5}$ attainment demonstrations
  - Good Neighbor SIPs
  - Transportation conformity PM ”hot spot” analysis

Not mutually exclusive processes, but only the regulatory significant applications can impact official design values

Exceptional Events: Issues to Address

- Challenging to identify regulatory significance
- Do we need to approach EE applications regionally?
  - What does a regional approach to EE planning look like?
- Are there areas where EPA could provide better support/data/guidance?
- What is LADCO's role in EE applications?

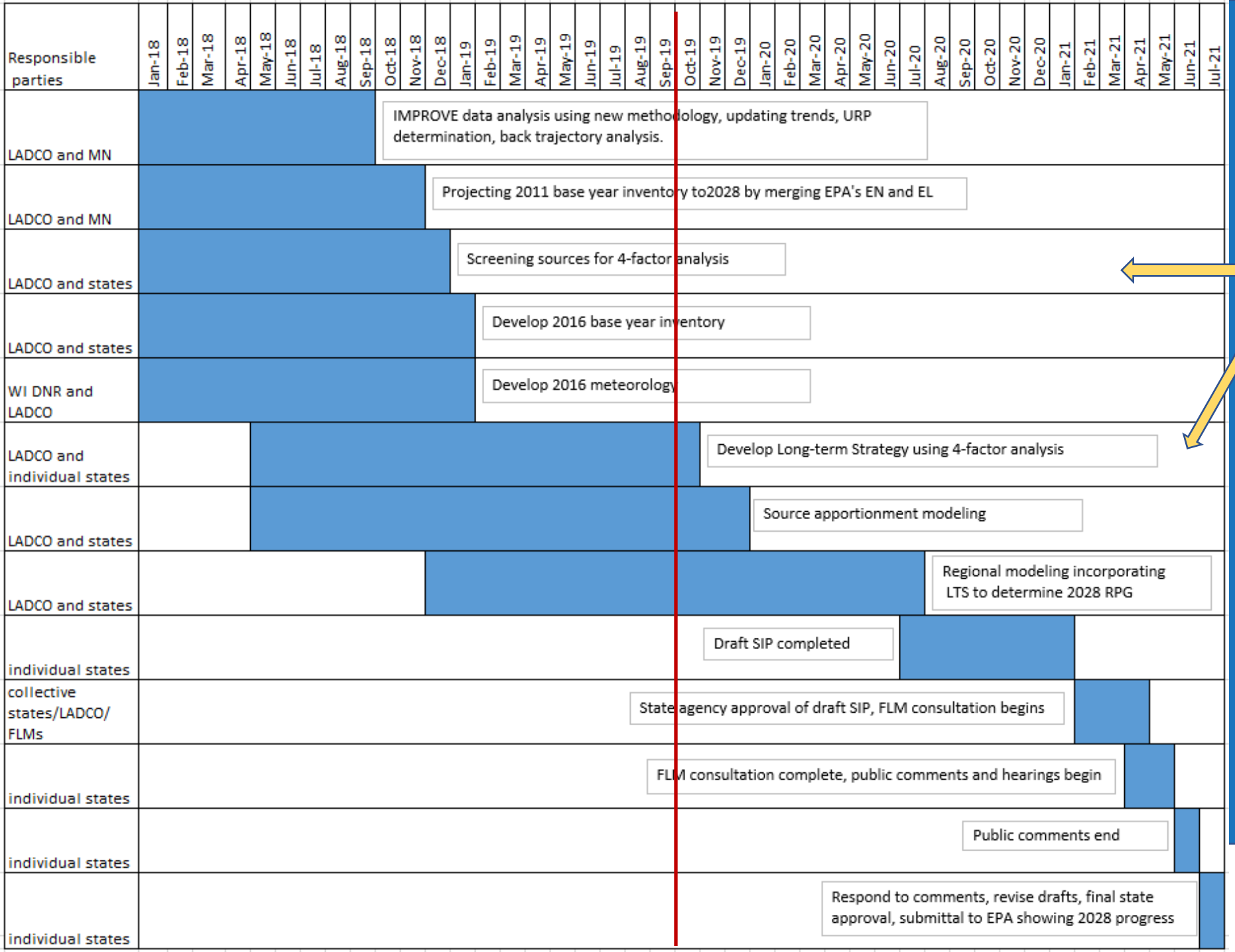
Regional Haze Planning

LADCO RH Planning Milestones

- Regional Haze committee was reconvened in January 2018
- Members from LADCO states, FLMs, R5, EPA-HQ
- Meet monthly via teleconference
- Goal: develop documentation, analyses, modeling, and inventories to assist states in meeting the July 2021 RH SIP submittal target
- Tasks described on timeline (next slide); 2 years remaining to SIP submittal
- Progress has been slow but steady so far; questions remain about how to move forward
- New guidance from EPA released Aug. 20

Accomplishments to Date

- Data screening, dialogue with IMPROVE about methodology.
- Examined source sector emissions to select groups (NAICS categories) for 4-factor analysis.
- Agreed to split 4-factor analysis tasks up, giving at least one category to each state
- Projected 2028 emissions and Q/d for sources impacting the all Class 1 areas were calculated and put in a web app (Q/d Web App)
  - Many iterations of the emissions and Q/d have been evaluated; finalized in August.
- Work on 2016 meteorology and 2016 emissions is almost complete.
- Source apportionment model runs expected early 2020.



Mostly on target to meet milestones for modeling, inventory, meteorology goals.

Problem areas: 4-factor analysis, LTS

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Four-factor group	NAICS	NAICS Name	No. of facilities	Facility total Q/d	No. of units
1	221112	Fossil Fuel Electric Power Generation	81	2690	210
2	212210	Iron Ore Mining	9	374	58
3	322121	Paper (except Newsprint) Mills	16	182	36
3	311221	Wet Corn Milling	5	45	13
3	311313	Beet Sugar Manufacturing	3	14	6
3	322110	Pulp Mills	2	9	4
3	322130	Paperboard Mills	3	7	3
4	327310	Cement Manufacturing	10	104	28
4	327410	Lime Manufacturing	8	45	13
5	331110	Iron and Steel Mills and Ferroalloy Manufacturing	9	77	33
6	486210	Pipeline Transportation of Natural Gas	16	77	40
6	221210	Natural Gas Distribution	2	4	2
7	324199	All Other Petroleum and Coal Products Manufacturing	6	47	12
7	324110	Petroleum Refineries	5	9	6
			Total facilities: 175		Total Units: 464

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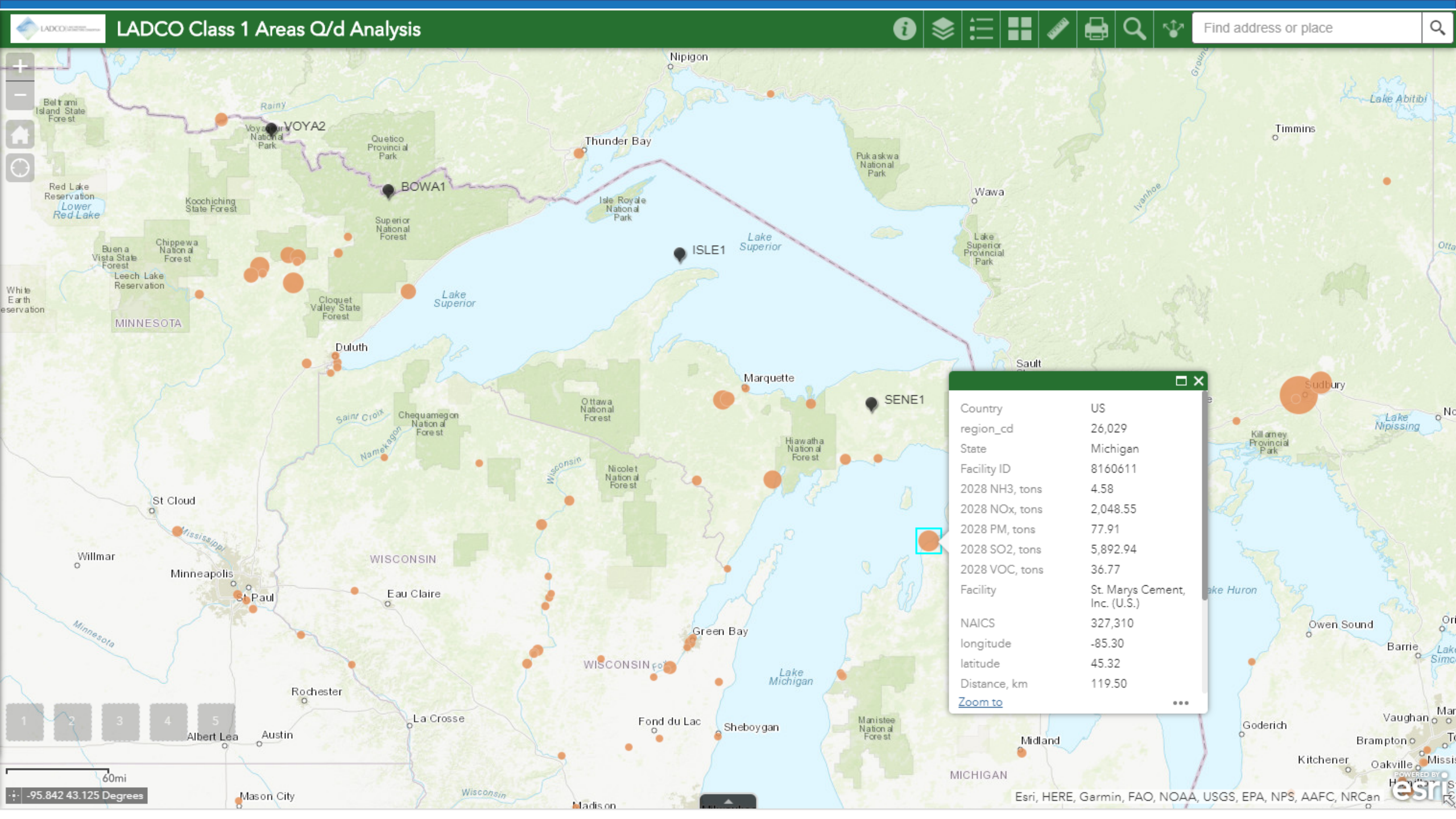
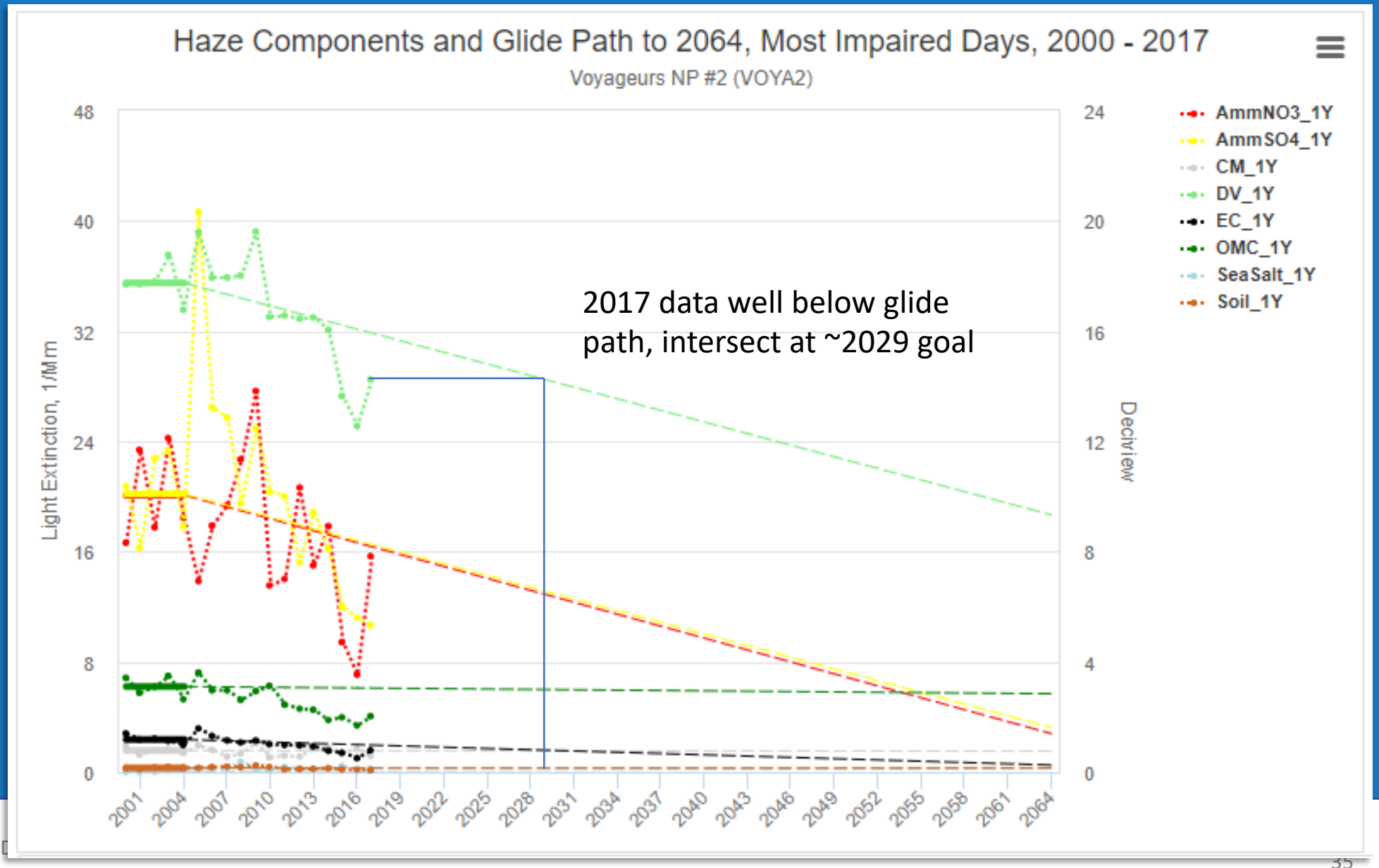

LADCO Class 1 Areas Q/d Analysis
Find address or place
VOYA2
BOWA1
ISLE1
SENE1
Nipigon
Thunder Bay
Wawa
Timmins
Sault
Sudbury
Marquette
Duluth
St Cloud
Minneapolis
St Paul
Willmar
Eau Claire
Green Bay
Rochester
La Crosse
Albert Lea
Austin
Mason City
Fond du Lac
Sheboygan
Midland
Goderich
Owen Sound
Barrie
Brampton
Vaughan
Kitchener
Oakville
Lake Superior
Lake Michigan
Lake Huron
Lake Nipissing
Lake Abitibi
MINNESOTA
WISCONSIN
MICHIGAN
Voyageurs National Park
Quetico Provincial Park
Pukaskwa National Park
Isle Royale National Park
Superior National Forest
Chippewa National Forest
Cloquet Valley State Forest
Ottawa National Forest
Chequamegon National Forest
Nicolet National Forest
Hiawatha National Forest
Manistee National Forest
Lake Superior Provincial Park
Killarney Provincial Park
Koochiching State Forest
Buena Vista State Forest
Leech Lake Reservation
Red Lake Reservation
White Earth Reservation
Beltrami Island State Forest
Country US
region_cd 26,029
State Michigan
Facility ID 8160611
2028 NH3, tons 4.58
2028 NOx, tons 2,048.55
2028 PM, tons 77.91
2028 SO2, tons 5,892.94
2028 VOC, tons 36.77
Facility St. Marys Cement, Inc. (U.S.)
NAICS 327,310
longitude -85.30
latitude 45.32
Distance, km 119.50
Zoom to
60mi
-95.842 43.125 Degrees
Esri, HERE, Garmin, FAO, NOAA, USGS, EPA, NPS, AAFC, NRCan

Regional Haze: Glide Paths



Regional Haze Planning: Issues to Address

- Some states do not want to do 4-factor analysis
  - Don’t think it applies to them
  - Process is too burdensome
  - Not important for non-Class 1 states
- Not a clear understanding of how to develop a long-term strategy from the 4-factor analyses
  - New guidance covers this process in detail
- Questions about whether EGUs and sources that were subject to BART in the last RH review are exempt from consideration now
  - New guidance says all sources are on the table