WESTAR
Western States Air Resources Council

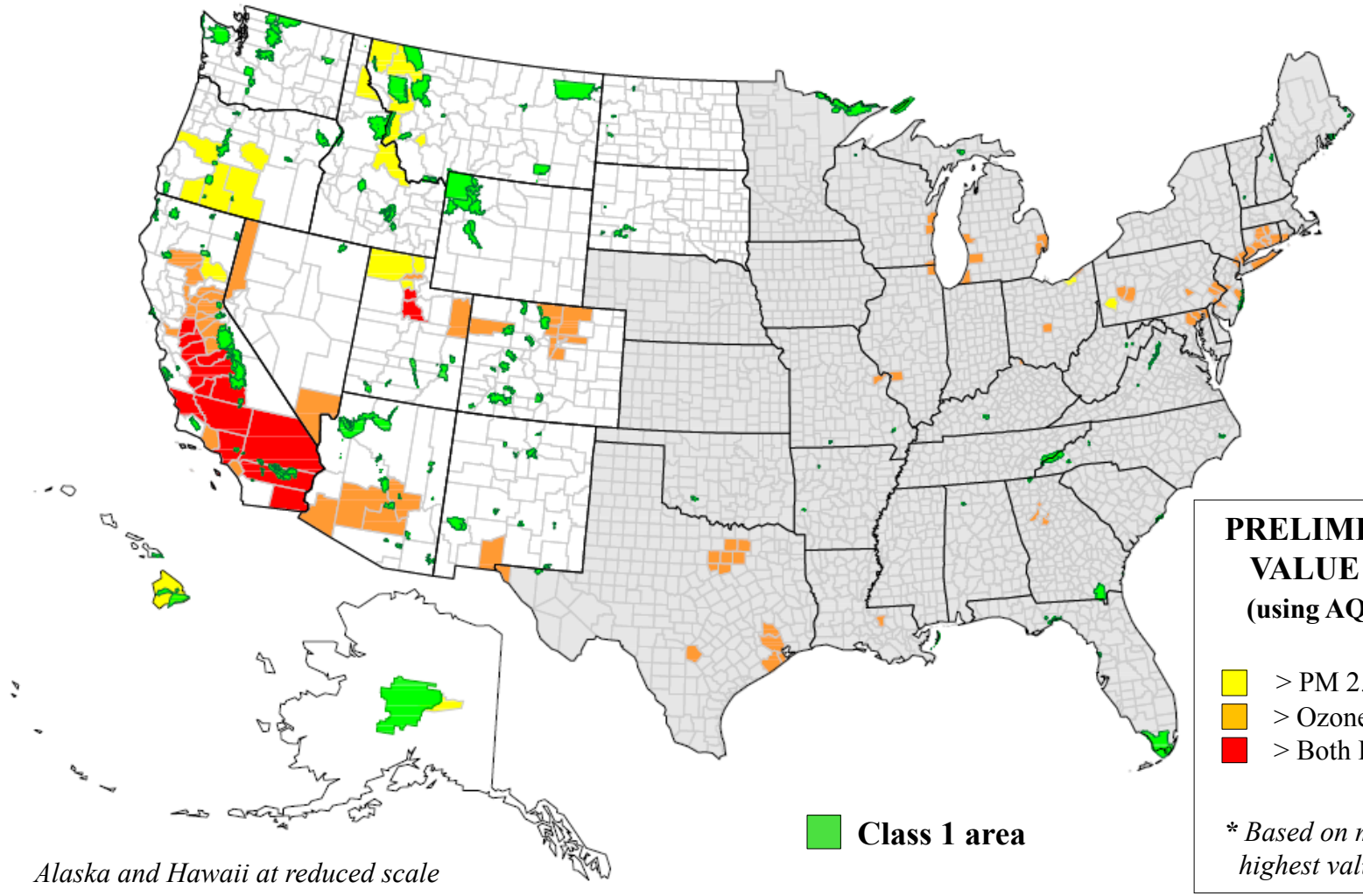
WRAP
Western Regional Air Partnership

WESTAR - WRAP Regional Analysis and Planning

Tom Moore

WESTAR - WRAP

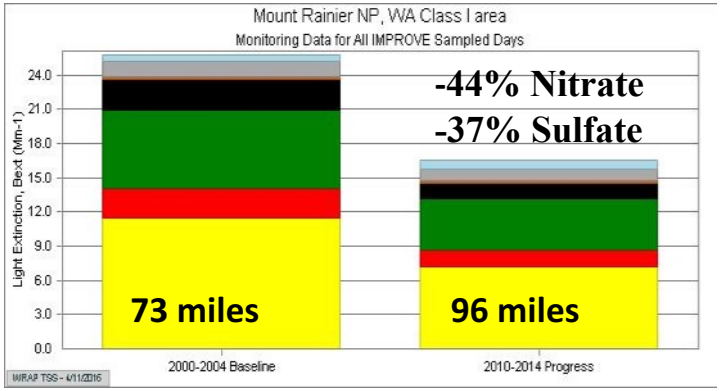
Western Class 1 area Environment



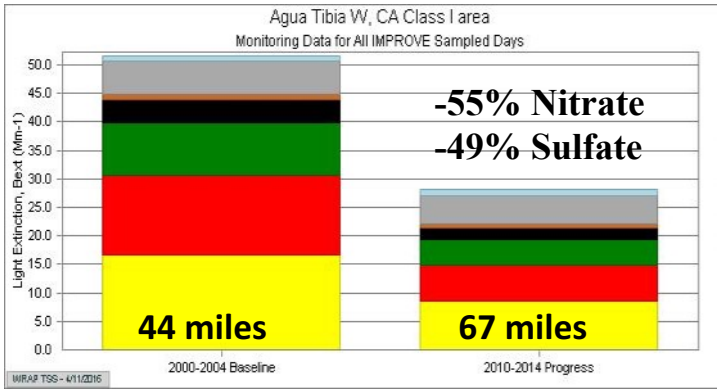
Western region characterized by complex terrain, several climactic zones, oceanic and international source transport, dispersed population centers, large land mass, mix of nonattainment areas, unique geologic sources

Benefits of NOx and SOx reductions

Mt. Rainier, near Seattle

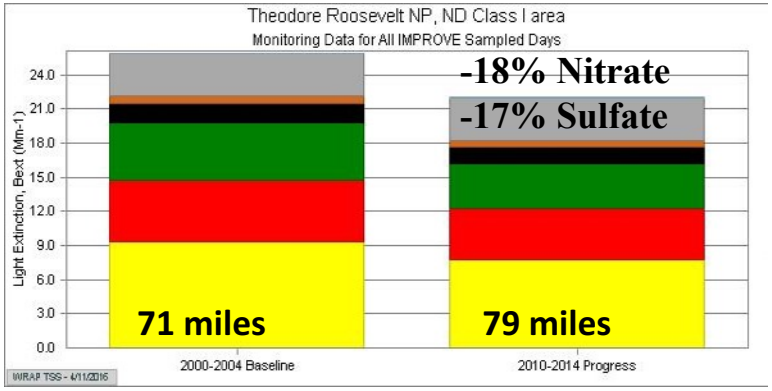


Agua Tibia, near the Los Angeles Basin

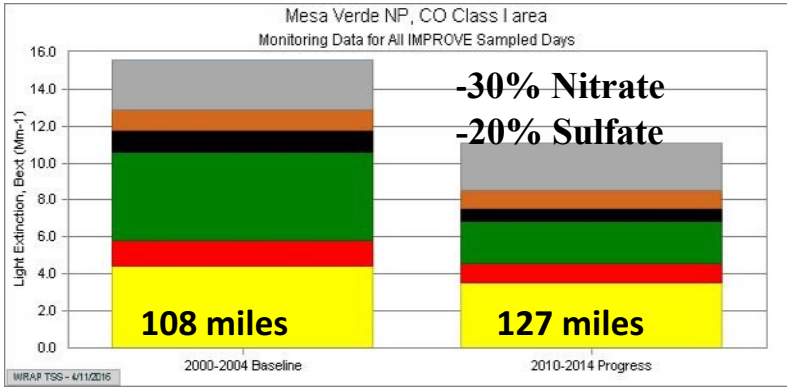


- **After a decade of annual anthropogenic NOx and SOx reductions in <u>nearby</u> urban areas, particle Light Extinction and Visual Range improve more than 20% on "average" days at Class 1 areas.**

Theodore Roosevelt NP, western North Dakota

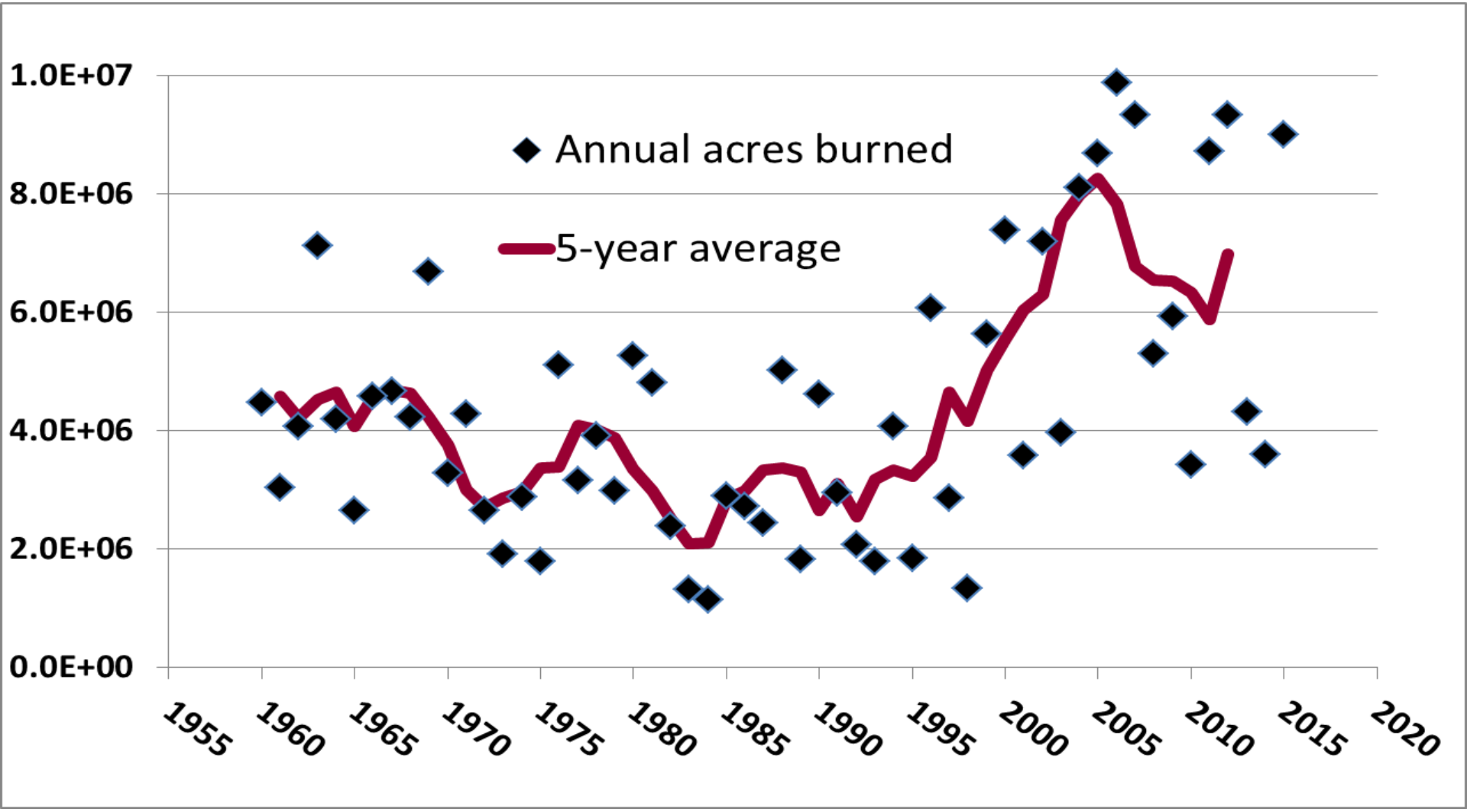


Mesa Verde, near "Four Corners"



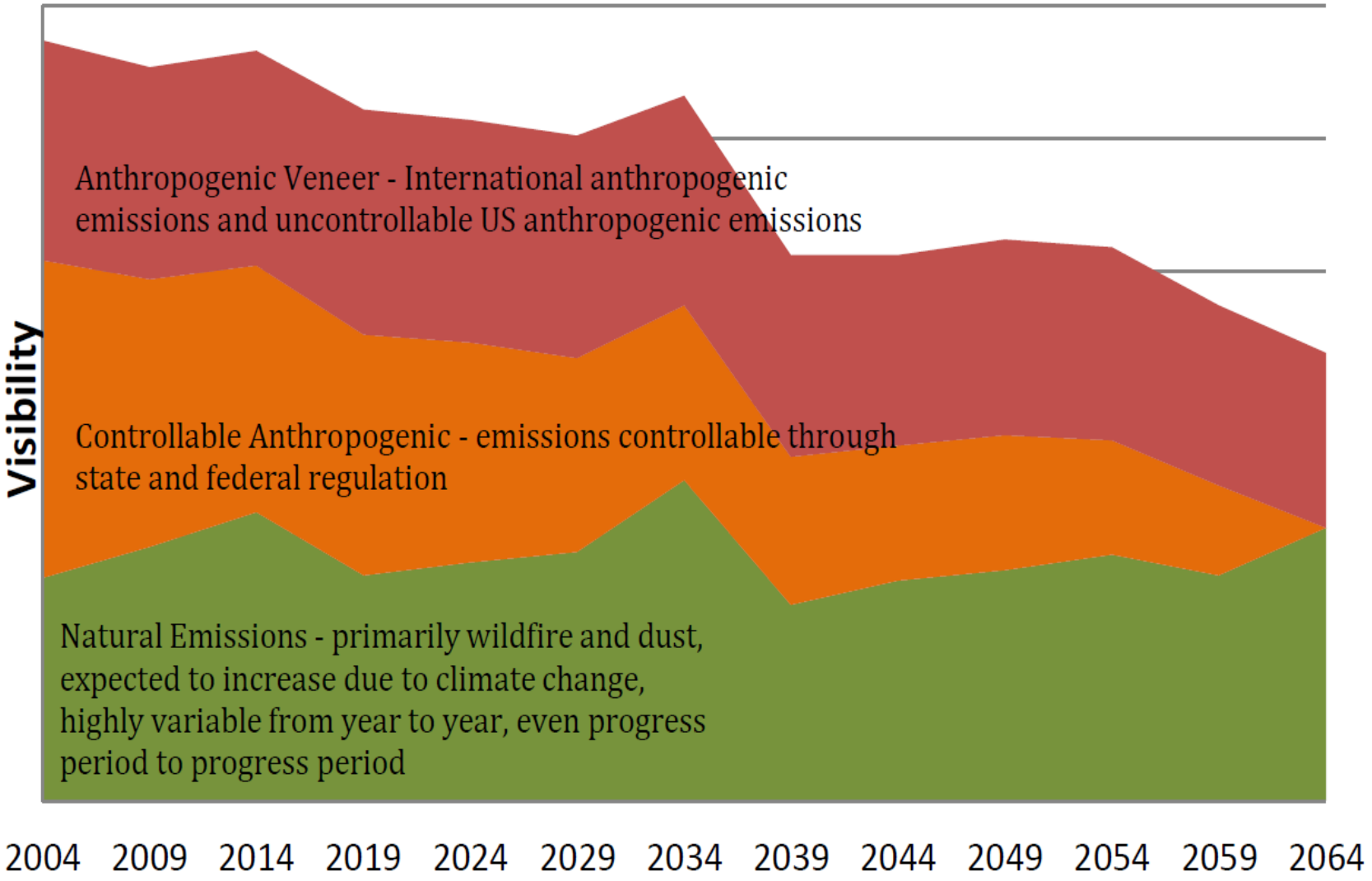
- **On "average" days at Class 1 Areas not near urban areas, there is still measurable benefit from ongoing BART reductions of NOx and SOx at large facilities relatively nearby.**
- **Farther from urban areas and large anthropogenic sources, the smaller "controllable" anthropogenic emissions are overwhelmed by uncontrollable natural sources and international transport.**

Area Burned for U.S. Wildfires (NIFC)



The last decade has seen a significant increase in the area burned. Approximately 70% of these fires are in the Western U.S.

Conceptual Progress in Reducing Visibility Impairment



Typical Sources affecting Visibility

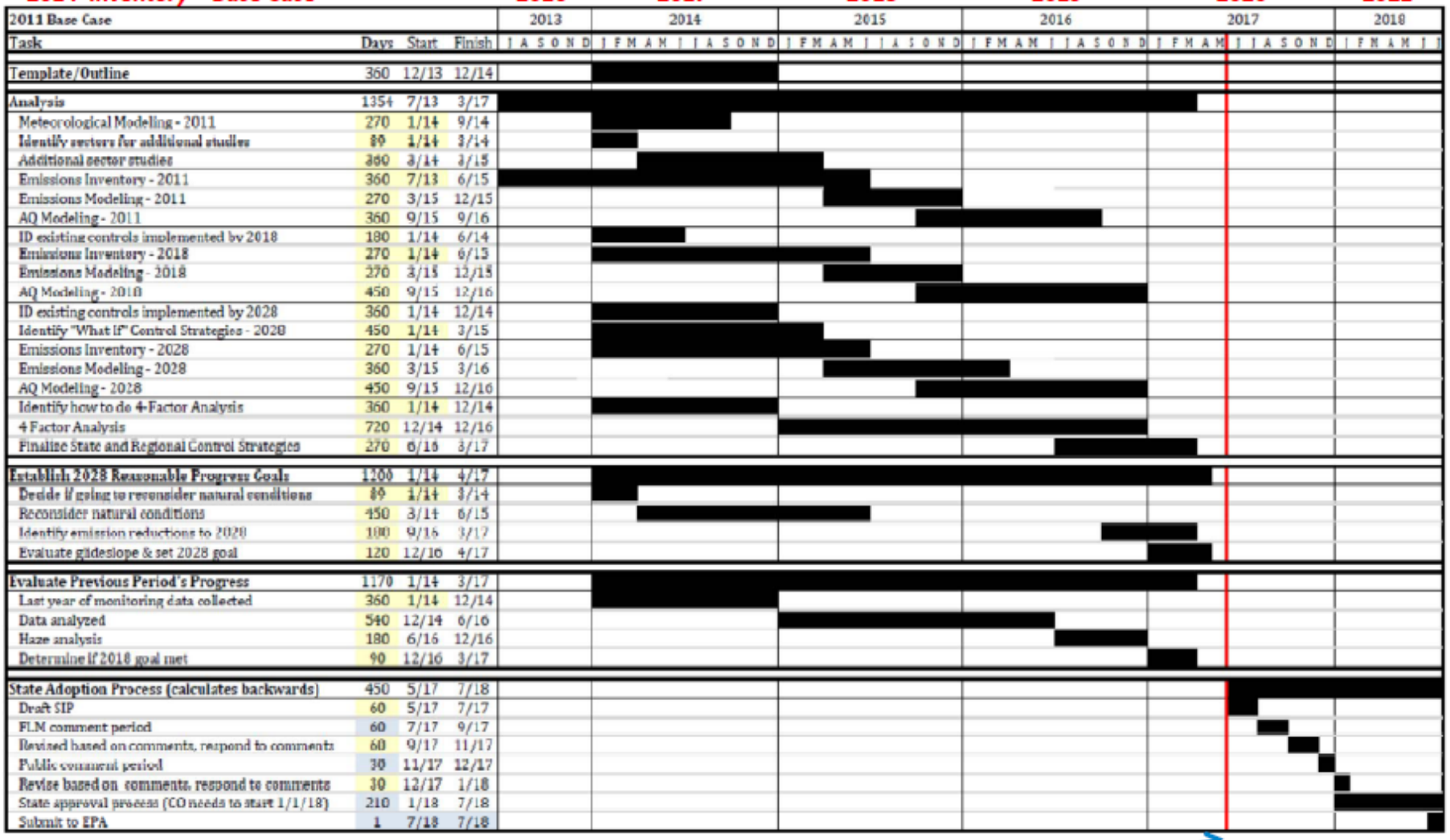
	Source	Controllability	Trend	Variability
Anthropogenic	US Anthropogenic	Some emissions are controllable	Downward as sources are controlled	Relatively stable
		Some emissions will remain after all reasonable controls implemented	Could rise because of population increases	Relatively stable
	International Anthropogenic	Not controllable by state or federal regulations	Likely increasing due to increased development worldwide and rising population	Relatively stable
Natural	Fire, Dust, Sea Salt	Natural, not controllable	Increases due to climate change	Highly variable
	Volcanic	Natural, not controllable	Unpredictable	Highly variable
	Other Natural Sources	Not controllable	Potentially affected by climate change, e.g., changes in temperature	Relatively stable

Table Note: Shaded areas represent emissions that states cannot control.

Preliminary Draft WESTAR-WRAP Work Plan for Regional Haze SIP Revision for 2028 Reasonable Progress Goals

2014 Inventory – Base Case

All dates for individual tasks would be updated, shifted three years ahead



2011 Base Case				2013	2014	2015	2016	2017	2018
Task	Days	Start	Finish	J A S O N D	J F M A M J J A S O N D	J F M A M J J A S O N D	J F M A M J J A S O N D	J F M A M	J J A S O N D J F M A M J J
Template/Outline	360	12/13	12/14						
Analysis	1354	7/13	3/17						
Meteorological Modeling - 2011	270	1/14	9/14						
Identify sectors for additional studies	80	1/14	3/14						
Additional sector studies	360	3/14	3/15						
Emissions Inventory - 2011	360	7/13	6/15						
Emissions Modeling - 2011	270	3/15	12/15						
AQ Modeling - 2011	360	9/15	9/16						
ID existing controls implemented by 2018	180	1/14	6/14						
Emissions Inventory - 2018	270	1/14	9/15						
Emissions Modeling - 2018	270	3/15	12/15						
AQ Modeling - 2018	450	9/15	12/16						
ID existing controls implemented by 2028	360	1/14	12/14						
Identify "What If" Control Strategies - 2028	450	1/14	3/15						
Emissions Inventory - 2028	270	1/14	6/15						
Emissions Modeling - 2028	360	3/15	3/16						
AQ Modeling - 2028	450	9/15	12/16						
Identify how to do 4-Factor Analysis	360	1/14	12/14						
4 Factor Analysis	720	12/14	12/16						
Finalize State and Regional Control Strategies	270	6/16	3/17						
Establish 2028 Reasonable Progress Goals	1200	1/14	4/17						
Decide if going to reconsider natural conditions	80	1/14	3/14						
Reconsider natural conditions	450	3/14	6/15						
Identify emission reductions to 2028	180	9/16	3/17						
Evaluate glidepslope & set 2028 goal	120	12/16	4/17						
Evaluate Previous Period's Progress	1170	1/14	3/17						
Last year of monitoring data collected	360	1/14	12/14						
Data analyzed	540	12/14	6/16						
Haze analysis	180	6/16	12/16						
Determine if 2018 goal met	90	12/16	3/17						
State Adoption Process (calculates backwards)	450	5/17	7/18						
Draft SIP	60	5/17	7/17						
FLM comment period	60	7/17	9/17						
Revised based on comments, respond to comments	60	9/17	11/17						
Public comment period	30	11/17	12/17						
Revise based on comments, respond to comments	30	12/17	1/18						
State approval process (CO needs to start 1/1/18)	210	1/18	7/18						
Submit to EPA	1	7/18	7/18						

Regulatory required time periods

Flexible dates

WESTAR must finish regional work by Spring 2020 if SIPS due Summer of 2021

Regional analysis timelines for regional haze planning support

- Regional Haze
  - Final Rule late 2016
  - Final guidance 2017 ??
  - Regional analyses starting in late 2017, continuing 2018-19
    - 2014 base year
    - 2028 rules on the books
    - Associated air quality modeling
  - 2018 and 2019 analyses
    - Evaluation of reasonable progress controls
    - Associated air quality modeling
  - Plans due July 2021

Regional Analysis steps (#1)

WESTAR-WRAP Regional Haze monitoring and emissions analysis to support planning (118 visibility-protected Class I areas)

- **Assess revised Regional Haze Program Requirements**
- **IMPROVE Monitoring Data Analysis for revised metric**
- **Regional Emissions Analysis – work covers list below**
  a. **Emissions Inventories**
  b. **Emission Inventory Method Changes**
  c. **Sector Methods**
  d. **Additional (critical) Emission Inventory Studies**
  e. **Emission Inventory Projections**

  - **Includes separate work for Alaska and Hawaii as those states direct**

Need funding in hand in 2017 to start work

Work to be completed mid-2018

Regional Analysis steps (#2)

Contiguous WESTAR-WRAP region (112 Class I areas)

- **Regional Modeling – solves transport contributions at each area by source**

a. **Meteorological and Emissions Modeling**

b. **Visibility Modeling - Reasonable Progress Goals for each Class I area**

c. **Source Apportionment and Sensitivity Analyses**

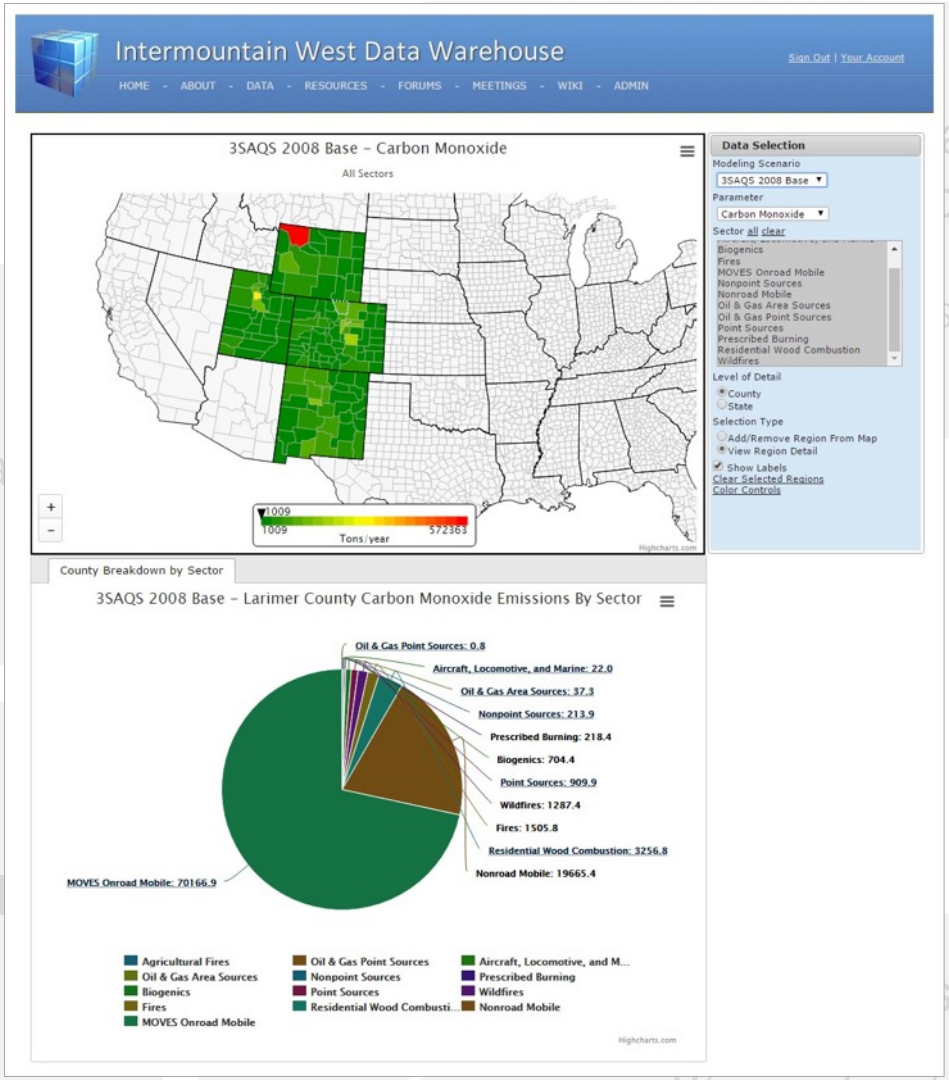
Need funding available starting in Fall 2017 to start work

Modeling continues for 2 years

Final modeling done late 2019

NPS Air Quality Conditions & Trends Tools (nps.gov)

Partners: NPS



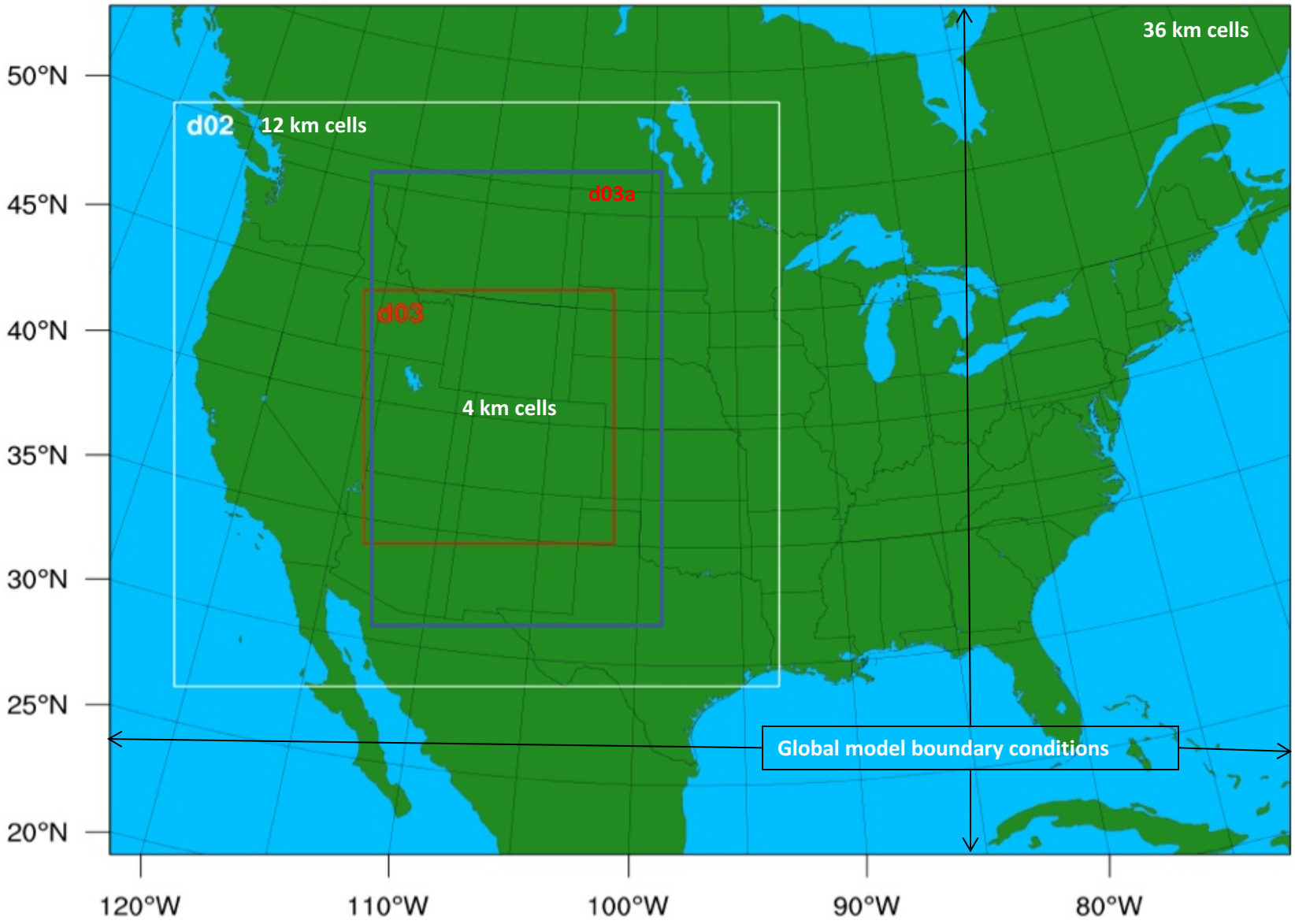
http://views.cira.colostate.edu/iwdw

Intermountain West Data Warehouse (IWDW)

Partners: NPS, BLM, USFS, EPA, CO, WY, UT, NM

Partners: AL, FL, GA, KY, MS, NC, SC, TN

IWDW-WAQS nested 36/12/4 km WRF/CAMx and CMAQ domains



Regional Analysis steps (#3)

Assessing Emission Reduction Strategies and Reasonable Progress Goals (118 visibility-protected Class I areas) • **Four-Factor Analysis** • **Potential Visibility Effects of 4-factor controls** • **Setting each Class I area's Reasonable Progress Goal following EPA guidance** • **other planning support as needed**	**Need funding available starting by early Summer 2018 to start work** **Analyses completed late 2019**

Regional Haze analyses for SIPs: What role(s) is/are NW-Airquest interested in? - If any?

- Which jurisdictions to be directly supported by these analyses?
- Could/would modeling or other analyses be done at NW-Airquest using input data from outside the current data sources?
- How does supporting the regional analysis for Regional Haze planning affect the other activities of NW-Airquest?
- Could IWDW-WAQS and NW-Airquest sufficiently align to work together?
  - Homogeneous technical data inputs and assumptions
  - Seamless results output to IWDW
  - Effects of different platforms-computer systems-compilers, et cetera
  - Resources and timing of work products
  - Other?

Thanks.

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