

Trends Across Relocated IMPROVE Sites

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Environmental Protection Agency
IMPROVE Steering Committee Meeting
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Regional Haze Rule Background

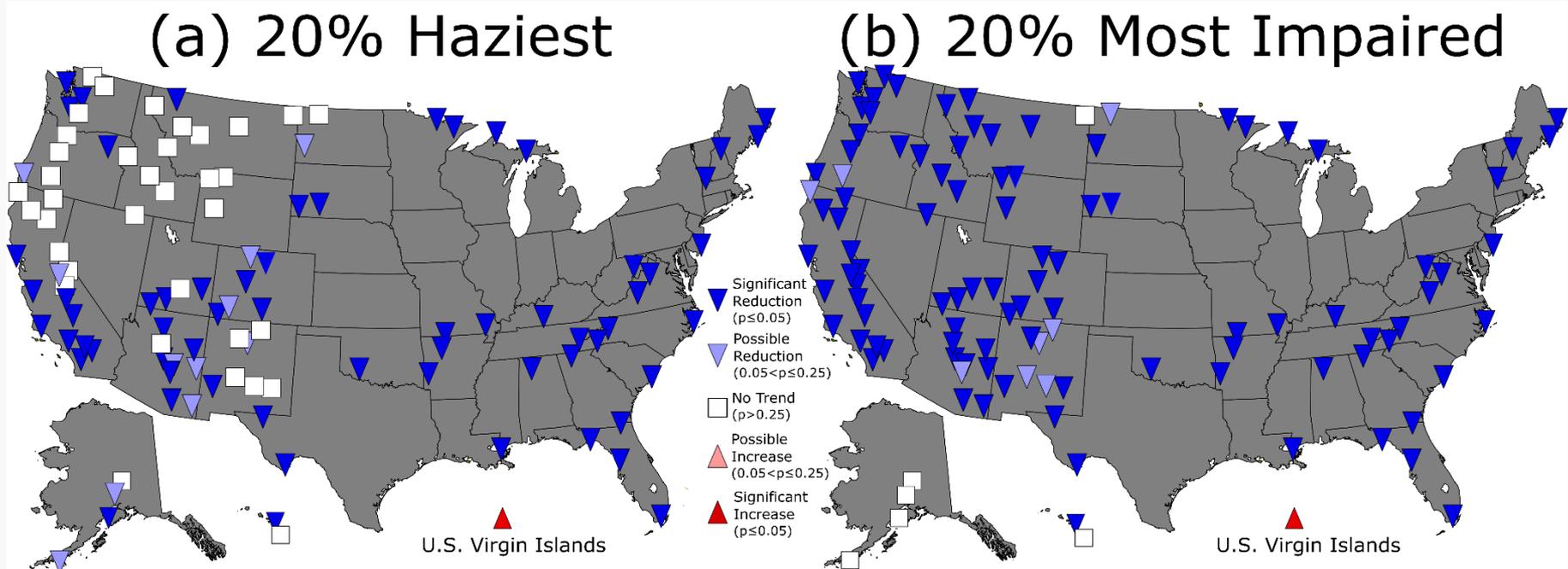


- The Regional Haze Rule was promulgated in 1999 based on Clean Air Act sections 169A and 169B.
 - CAA declared the national goal of preventing future and remedying existing impairment of visibility in mandatory Class I Federal areas, which impairment results from man-made air pollution.
 - Visibility impairment means “any humanly perceptible change in visibility (light extinction, visual range, contrast, coloration) from that which would have existed under *natural conditions*”.
- Based on experiences during the first implementation period, EPA started working towards revisions to the rule and development of guidance for the second implementation period:
 - Final rule revisions on January 10, 2017
 - Final technical guidance on December 20, 2018
 - Final “policy” guidance on August 20, 2019
 - Technical support document for 2028 regional haze modeling on September 19, 2019
 - Memo on ambient data usage and completeness on June 3, 2020

Regional Haze Rule Background



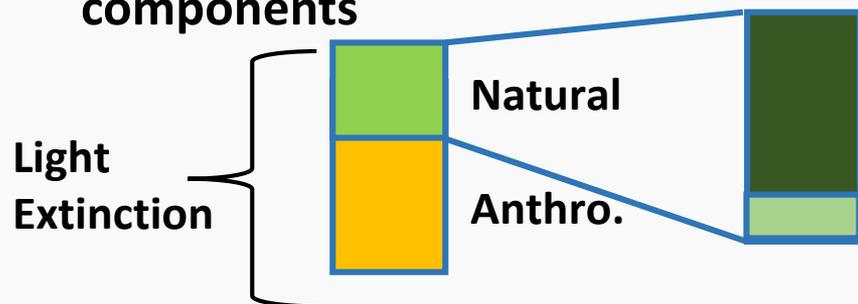
- In the 2017 final rule revisions and 2018 final technical guidance, we recommended a new metric for tracking visibility in the second planning period:
 - Rather than tracking the **20% haziest days**, we recommended that States track the **20% most impaired days** and continue to track the 20% clearest days based on extinction.
 - Among the many impacts to visibility tracking, this change altered the considerations and importance of IMPROVE site relocations.



Recommended Tracking Metric



- 1) Split each day of IMPROVE data into natural and anthropogenic extinction components

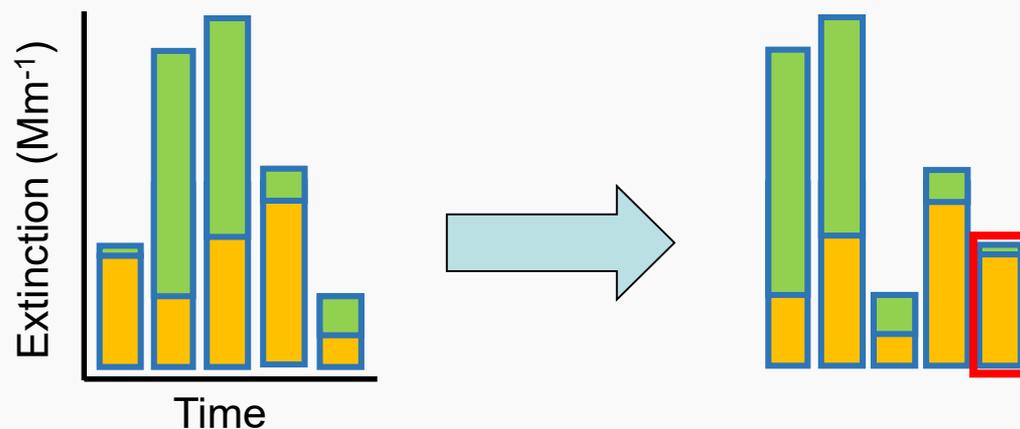


Episodic = site-specific daily dust and carbon > site's lowest annual 95th percentile values between 2000-2014

Routine = all sea-salt; daily fraction of avg. NC2 dust, carbon, sulfate, and nitrate in proportion to the non-episodic portion of measured values.

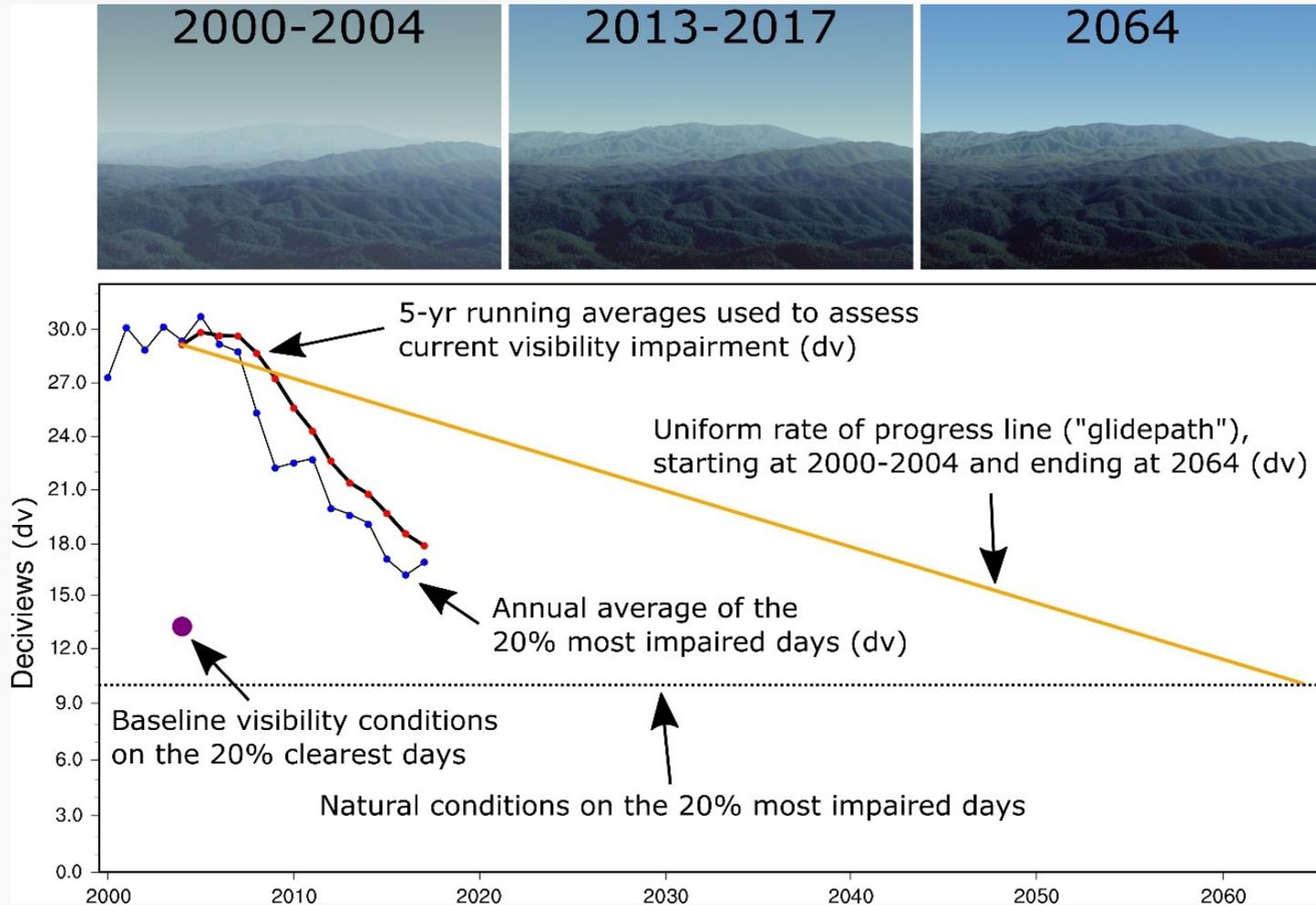
- 2) Sort the set of days each year by the anthropogenic impairment

- Recommended Approach = $dv_{Total} - dv_{Nat}$; proportional to $\frac{\text{anthropogenic extinction}}{\text{natural extinction}}$



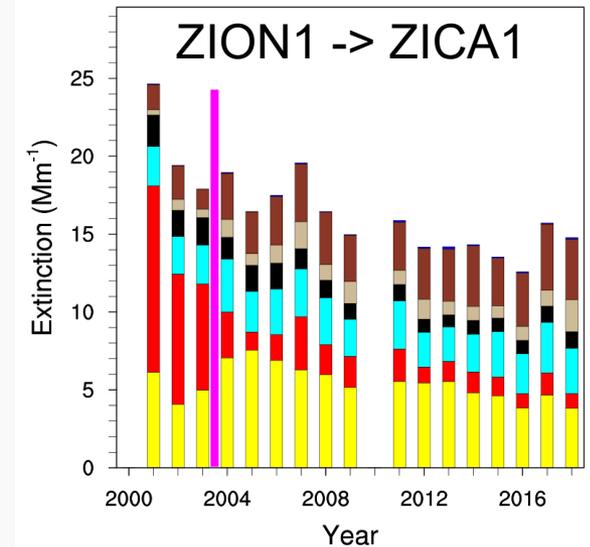
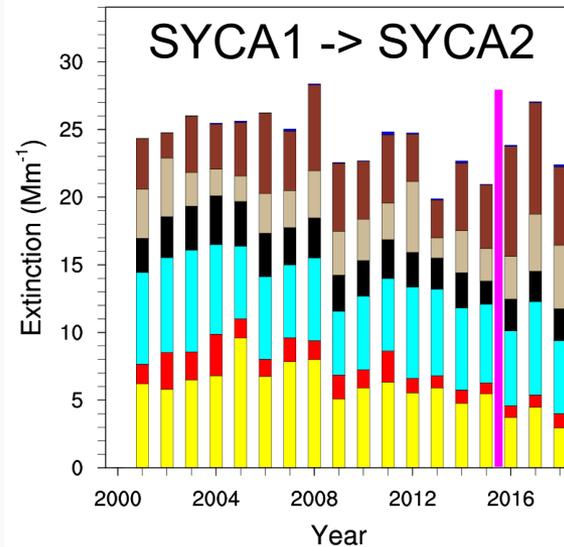
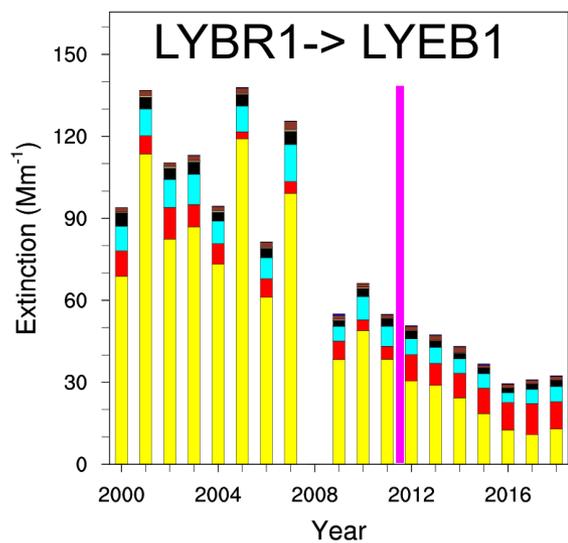
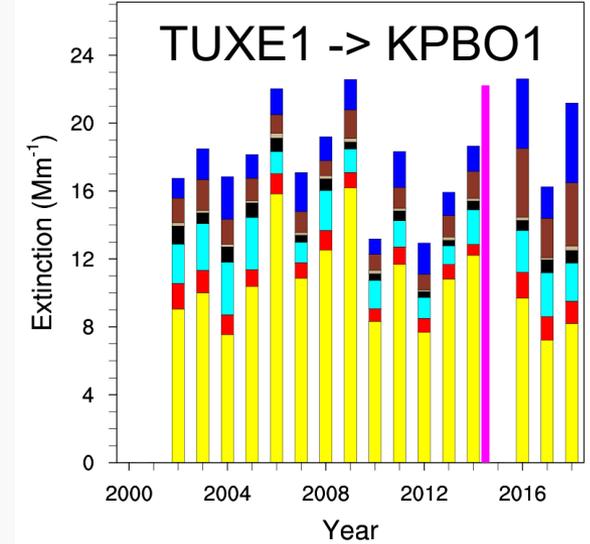
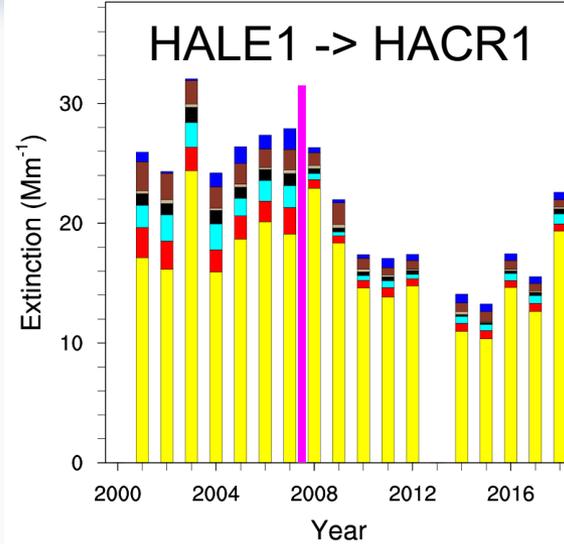
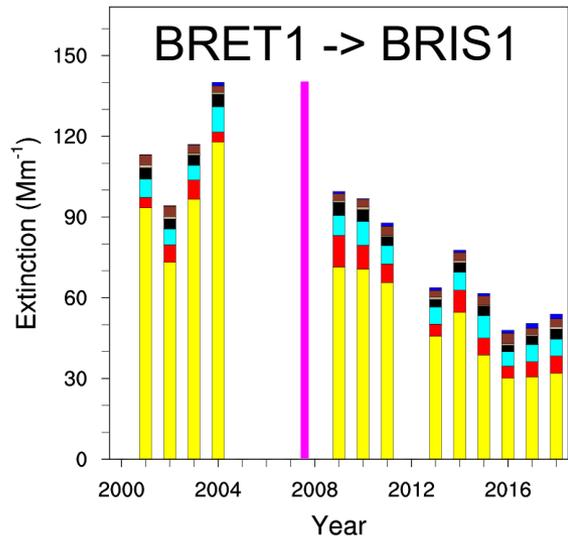
- 3) Select the 20% most impaired days

Uniform Rate of Progress (Glidepath)



In the Regional Haze Rule, current and projected visibility values are compared to their point on the glidepath to help set regional progress goals

EPA Default Combined Sites



EPA Default Combined Sites



BRET1 -> BRIS1

- Breton National Wildlife Refuge, LA
- U.S. Fish and Wildlife Service
- Elevation: 11m -> -7m
- Distance: 123 km
- Notes: No overlap, BRET1 destroyed by hurricane

HALE1 -> HACR1

- Haleakalā National Park, HI
- National Park Service
- Elevation: 1153m -> 2158m
- Distance: 7 km
- Notes: 4+ years of overlap, HI previously combined on 20% haziest

TUXE1 -> KPBO1

- Tuxedni National Wildlife Refuge, AK
- U.S. Fish and Wildlife Service
- Elevation: 15m -> 5m
- Distance: 54 km
- Notes: No overlap, AK asserts that sites shouldn't be combined

LYBR1-> LYEB1

- Lye Brook Wilderness, NH
- U.S. Forest Service
- Elevation: 1015m -> 882m
- Distance: 28 km
- Notes: 8+ months of overlap, Scott Copeland currently combines

SYCA1 -> SYCA2

- Sycamore Canyon Wilderness, AZ
- U.S. Forest Service
- Elevation: 2046m -> 2,046m
- Distance: 3 km
- Notes: No overlap; Scott Copeland currently combines; AZ has concerns with Boy Scout camp

ZION1 -> ZICA1

- Zion National Park, UT
- National Park Service
- Elevation: 1545m -> 1213m
- Distance: 30 km
- Notes: 1+ years of overlap; Only site combination during 2000-2004 baseline period

Combining Sites for the NAAQS



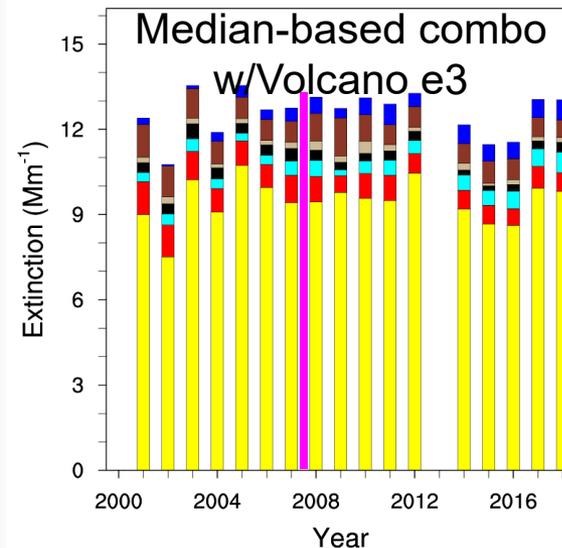
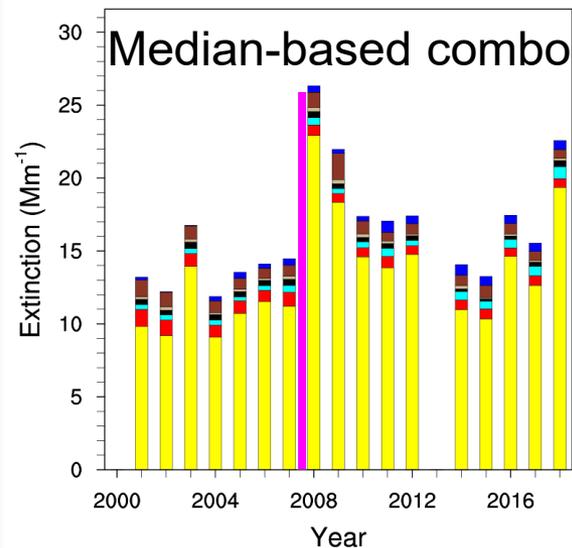
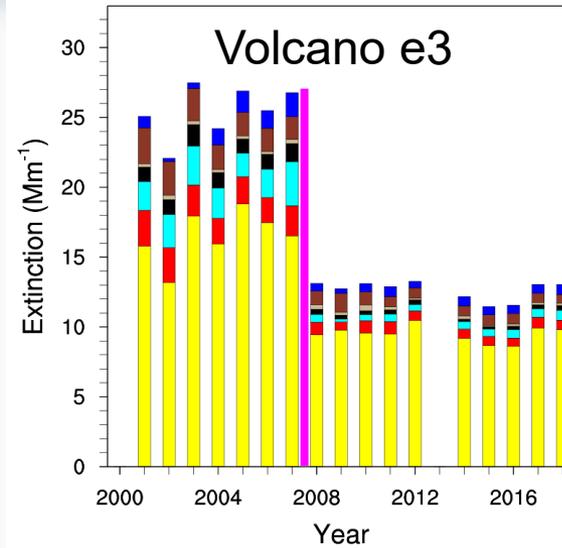
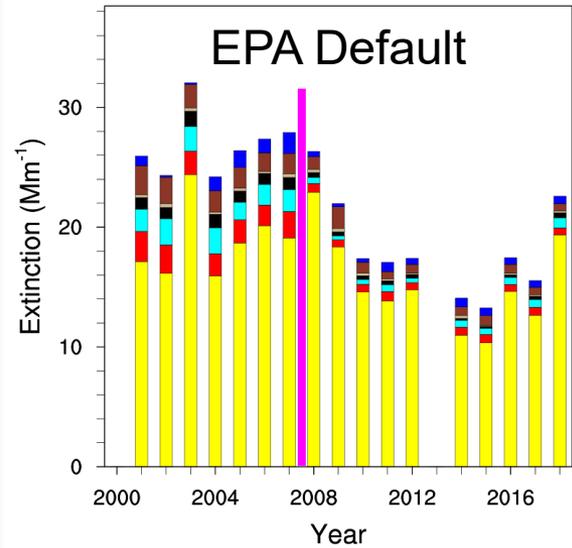
2015 Ozone NAAQS, Appendix U to Part 50:

“In certain circumstances, including but not limited to site closures or relocations, data from two nearby sites may be combined into a single site data record for the purpose of calculating a valid design value. The appropriate Regional Administrator may approve such combinations after taking into consideration factors such as distance between sites, spatial and temporal patterns in air quality, local emissions and meteorology, jurisdictional boundaries, and terrain features.”

Evaluation of Cowtown Road Replacement Sites; Final Report:

- “EPA also described the spatial scale of representativeness in terms of the physical dimensions of an air parcel throughout which actual pollutant concentrations are reasonably similar. This homogeneity refers to the PM concentrations, as well as the land use and land surface characteristics.”
- “The site selection process resulted in two potential evaluation sites, the Hidden Valley (HV) site located approximately 7 kilometers km (4.4 miles) west of the community of Stanfield on Pinal County property, and the White and Parker (W&P) site located approximately 6.5 km (4 miles) southeast of the City of Maricopa on City owned property...Ambient monitoring was conducted between June 13, 2014 and June 14, 2015.”

Combining HALE and HACR



Median-based site combination

1. Match overlap days for complete years (if available)
2. Calculate median (or average, middle 20%, etc.) extinction value for each component
3. Adjust original site's daily extinction for each component by the original/new ratio
4. Recalculate the 20% most impaired days and associated baseline, current, and natural conditions



- **Goal: facilitate discussion with the IMPROVE Steering Committee members about potential procedures for combining IMPROVE sites for Regional Haze Rule purposes**
- Siting IMPROVE monitors is different than that of NAAQS monitors
- Past (and potentially future) site combinations may not have overlapping data
- Site combinations for Regional Haze Rule purposes do not have the same regulatory significance as they do for NAAQS pollutants
- IMPROVE site combinations could potentially involve many stakeholders, including academic researchers, state/local air agencies, NPS/USFS/USFWS, EPA, and the IMPROVE Steering Committee
- Long-term trends are vital for Regional Haze Program