



# **IMPROVE Protocol Assessment**

11/4/15



# Overview

- The 2014 CSN Assessment resulted in the following:
  - 38 sites defunded
  - 4 sites funded externally
  - Elimination of CSN  $PM_{2.5}$  mass measurement
  - Reduction in carbon blank frequency
  - Reduction in sample frequency at 3 sites
  - Reduction in number of icepacks in shipment during cooler months
- 38 IMPROVE Protocol sites were not considered in the 2014 CSN Assessment. These sites:
  - Chose to operate as IMPROVE sites when the CSN was established
  - Are considered CSN supplemental sites
  - Use IMPROVE samplers & IMPROVE's laboratory analysis contract
  - Were assessed in 2015 using nearly identical criteria as the 2014 CSN Assessment



# Objectives Based Approach

The same approach was taken as the CSN assessment:

- Evaluated which sites met the primary CSN objectives\*
  - Points assigned for: NCore, design values, health effects research city, daily FRM, continuous monitors, and collocation (i.e. NATTS, PAMS, CSN, IMPROVE)
- Created a decision matrix for lower scoring sites\*\*
  - Points assigned for: design value ranges, population, county emissions, proximity of speciation sites, species trends and species correlation

\*Additional Information on slide 9

\*\*Additional Information on slides 10 & 11

*More information about the 2014 CSN Assessment can be found here:*

<https://www.sdas.battelle.org/CSNAssessment>

# 9 IMPROVE Protocol Sites Scheduled for Defunding\*

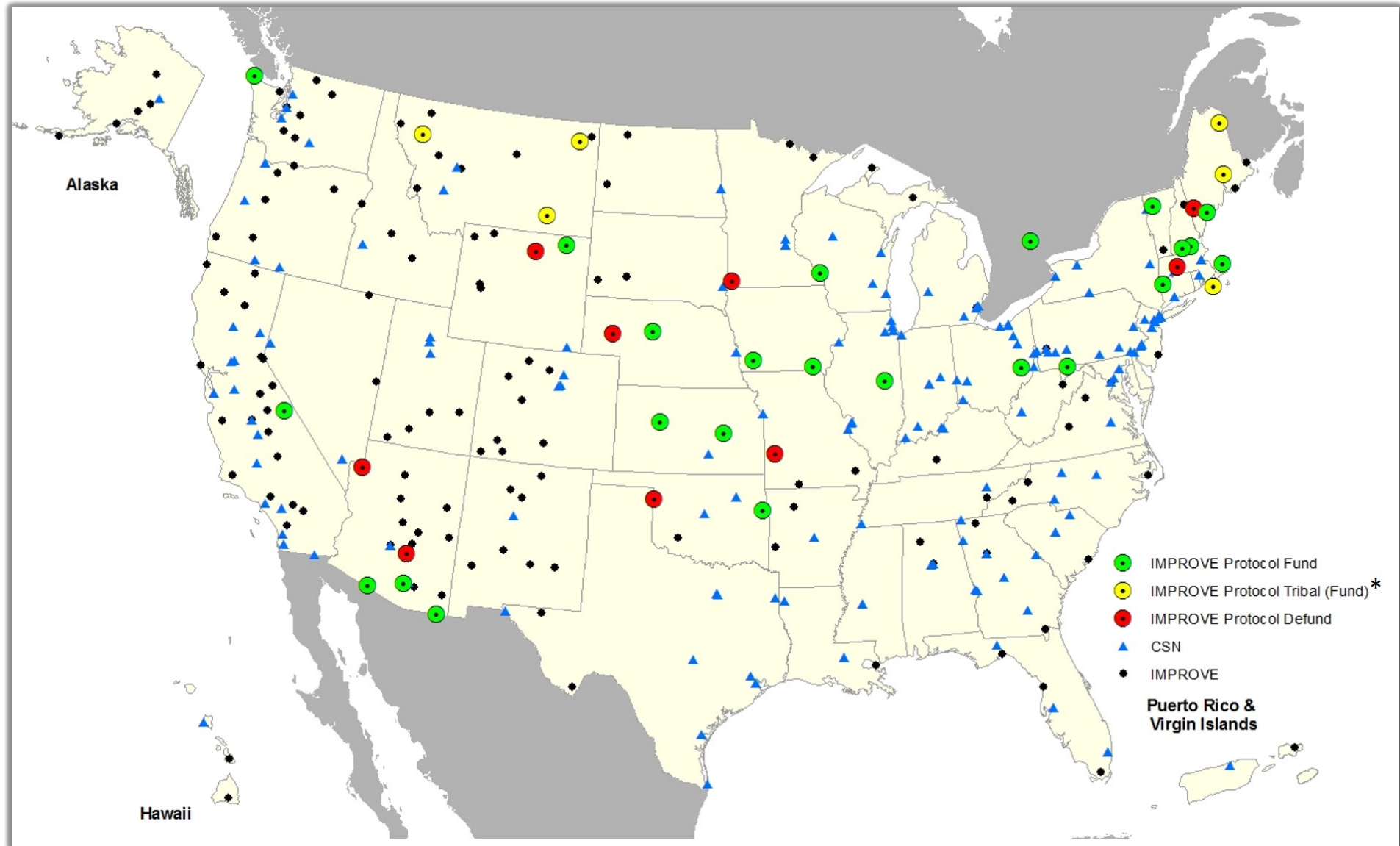


Site Name	Site Code	State	AQS ID
Blue Mounds	BLMO1	MN	271339000
Bridgton	BRMA1	ME	230050002
Cloud Peak**	CLPE1	WY	560199000
Crescent Lake	CRES1	NE	310699000
El Dorado Springs	ELDO1	MO	290390001
Ellis**	ELLI1	OK	400450890
Meadview	MEAD1	AZ	040159000
Quabbin Reservoir	QURE1	MA	250154002
Queen Valley	QUVA1	AZ	040218001

\*Defunded sites will no longer receive laboratory analysis funding, however their speciation monitors could continue to operate if other funding sources are provided (to date, no sites have indicated intentions of continued monitoring). Sites scheduled for defunding will sample through the end of the calendar year (12/31/15).

\*\*Cloud Peak, WY & Ellis, OK have already stopped sampling

# Speciation Network Sites



\*Six (6) IMPROVE Protocol Sites are Tribal and were included in the assessment for informational purposes only (they were NOT recommended for defunding). These sites are funded separately using Tribal funds. The results of the assessment were shared with the Tribes and they all indicated plans to continue monitoring.

38 IMPROVE Protocol Sites

Scored >3 pts for meeting primary objectives?

yes

no

9 rural NCore sites

29 sites

Scored >1 point in decision matrix?

yes

no

8 sites

21 sites

Tribal site?

yes

no

1 site

7 sites

Intangible reason to fund?

yes

no

3 sites

18 sites

Tribal site?

yes

no

1 site

2 sites

Tribal site?

yes

no

4 sites

14 sites

Stakeholder(s) feedback changed recommendation to defund?

yes

no

5 sites

9 sites

Will continue to receive funding

Will continue to receive (Tribal) funding

Initially recommended for defunding & feedback requested from stakeholders

Scheduled for defunding (will sample through end of 2015)

# Flow Chart for IMPROVE Protocol Assessment



# IMPROVE Protocol Assessment

- Using the same process as the 2014 CSN Assessment and incorporating feedback from stakeholders, 9 sites are scheduled for defunding (sampling will run through the end of calendar year 2015)
- Funds saved from defunded IMPROVE Protocol sites will remain in the IMPROVE program during this funding period.
- The Douglas, AZ site was recommended for funding based on scoring in the decision matrix. ADEQ requested & OAQPS approved moving the site to Nogales, AZ for the following reasons:
  - Douglas is no longer in non-attainment
  - Nogales is in nonattainment and has the highest concentrations of PM<sub>2.5</sub> & PM<sub>10</sub> in AZ
  - Easier/less expensive to operate site in Nogales vs. Douglas
- Owen's Valley, CA was recently established (2013) and was not included in the assessment
- Cloud Peak, WY & Ellis, OK have already stopped sampling.





## Appendices

- Slide 9 – Objectives Based Approach
- Slide 10 – Decision Matrix – Positive Scoring
- Slide 11 – Decision Matrix – Negative Scoring
- Slide 12 – Tribal Sites
- Slides 13-15 – Feedback on Sites Recommended for Defunding
- Slide 16 – Feedback on Tribal Sites





# Objectives Based Approach

The same approach was taken as the CSN assessment, where sites were evaluated by determining which meet the primary objective(s) and points were assigned as follows:

Category	Pts	Category	Pts
NCore	5	Sites with daily FRMs	3
Annual DV sites > 12 µg/m <sup>3</sup>	5	Sites with continuous monitors	2
24-hr DV sites > 35 µg/m <sup>3</sup>	5	Collocation w/ IMPROVE*	1
STN sites	4	Collocation w/ NATTS*	1
Currently used in health effects research	3	Collocation w/ PAMS*	1
County DV (annual &/or 24-hr) exceeds, but site is below the standard	3	*Although collocation does not meet a “primary objective”, it does meet an assessment goal of leveraging with existing networks	

*29 sites scored 3 points or less & were evaluated further in decision matrix*

# Decision Matrix - Positive Scoring



Parameter	Range	Points
Annual DV	10-10.9 $\mu\text{g}/\text{m}^3$	+1
	11-11.4 $\mu\text{g}/\text{m}^3$	+2
	$\geq 11.5 \mu\text{g}/\text{m}^3$	+3
24-hr DV	30-31 $\mu\text{g}/\text{m}^3$	+1
	32-33 $\mu\text{g}/\text{m}^3$	+2
	$\geq 34 \mu\text{g}/\text{m}^3$	+3
Population	$\geq 1\text{M}$	+1
County Emission Rank (PM <sub>2.5</sub> , SO <sub>4</sub> , NO <sub>3</sub> , OC, EC, NH <sub>3</sub> , VOCs & SO <sub>2</sub> using 2011 NEI emissions)	Top 1.1-5%	+1 / pollutant
	Top 1%	+2 / pollutant
Nearest Speciation Site	>200km	+1
Statistically significant increase in trend concentration (2010-2012) for pollutants w/ >75% records above MDL & overall average precision <10% (PM <sub>2.5</sub> , SO <sub>4</sub> , NO <sub>3</sub> , OC, EC, NH <sub>4</sub> <sup>+</sup> , Fe, S, K Ca, Na <sup>+</sup> , Si, Cu, Br & Zn)	1 pollutant	+1
	2 pollutants	+2
	3 pollutants	+3
	4 pollutants	+4



# Decision Matrix - Negative Scoring

Parameter	Range	Points
Nearest CSN Site	<50 km	-1
Nearest 5 Speciation Sites	<150 km	-1
Correlation with major species at the nearest 5 speciation sites	R>0.75 for ALL major species at a site	-5 (regardless of how many sites)
	R>0.75 for PM <sub>2.5</sub>	-1 / site
	R>0.75 for SO <sub>4</sub>	-0.25 / site
	R>0.75 for NO <sub>3</sub>	-0.25 / site
	R>0.75 for OC	-0.25 / site
	R>0.75 for EC	-0.25 / site

*21 sites scored ≤1 point in the decision matrix  
 2 sites had intangible reasons for funding & 5 sites are Tribal  
**Bottom line – 14 sites recommended for defunding***

# Tribal Sites – *included in assessment for informational purposes only*



- 6 IMPROVE Protocol sites are Tribal sites
  - Martha's Vineyard, MA
    - Assessment supported continued operation
  - Northern Cheyenne, MT
    - Assessment supported continued operation
  - Flathead, MT
  - Ft. Peck, MT
  - Penobscot, ME
  - Presque Isle, ME

*These sites were NOT recommended for defunding. The findings were shared with the Tribes and they all indicated plans to continue monitoring. These sites are funded separately with Tribal funds.*



# Feedback on Sites Recommended for Defunding

Site Name	State	Comments	Fund?
Bridgton	ME	R1 - NADP/MDN site, visibility/ecosystem research State – similar measurements as Presque Isle (Tribal), but likely different influences	No
Casco Bay	ME	R1 - NADP/MDN site, visibility/ecosystem research State – similar measurements as Penobscot (Tribal), but likely different influences	Yes
Cape Cod National Seashore	MA	R1 - NADP/MDN site, visibility/ecosystem research NPS – uses data to calculate conditions at 42 parks, visibility, ozone, met, wet dep, Hg dep, eco effects & current special study (dragonflies, Hg & citizen scientists in parks)	Yes



# Feedback on Sites Recommended for Defunding

Site Name	State	Comments	Fund?
Lake Sugema	IA	State – would like to keep for background and transport information (not being used in SIP). NOAA – concerned about defunding 4 MN/IA sites.	Yes
Viking Lake	IA	State – would like to keep for background and transport information (not being used in SIP) NOAA – concerned about defunding 4 MN/IA sites.	Yes
Great River Bluffs	MN	State – request to maintain for spatial coverage and use as an upwind site NOAA – concerned about defunding 4 MN/IA sites.	Yes



# Feedback on Sites Recommended for Defunding

Site Name	State	Comments	Fund?
Meadview	AZ	Supportive of defunding	No
Queen Valley	AZ	Supportive of defunding	No
Quabbin Reservoir	MA	Supportive of defunding	No
Blue Mounds	MN	Supportive of defunding	No
El Dorado Springs	MO	Supportive of defunding	No
Crescent Lake	NE	Supportive of defunding	No
Ellis	OK	Supportive of defunding	No
Cloud Peak	WY	Supportive of defunding ASAP	No





## Feedback on Tribal\* Sites

Site Name	State	Feedback
Martha's Vineyard	MA	Wampanoag Tribe – submit grant for nitrogen loading study R1 – visibility/ecosystem research
Penobscot	ME	Penobscot Tribe – site is vital
Presque Isle	ME	MicMac Tribe – using data in source apportionment studies to deal with arsenic issues R1 – NADP & visibility/ecosystem research
Northern Cheyenne	MT	Plan to continue monitoring & revisit during next grant cycle
Flathead	MT	Plan to continue monitoring & revisit during next grant cycle
Ft. Peck	MT	Plan to continue monitoring & revisit during next grant cycle

\*All Tribal sites will continue monitoring and receiving (Tribal) funding