



CSN & IMPROVE Protocol Assessments: Outcomes

Recommendations

As the output of the CSN and IMPROVE Protocol Assessments, five recommendations were made and ultimately implemented. Feedback was received and incorporated from EPA management and regional staff, state and local monitoring agencies, and university, research and local communities.

Recommendation #1 - Eliminate the CSN PM_{2.5} mass measurement

- The CSN mass measurement was widely used when the network was established.
- Now, the FRM mass measurement is widely used for model attainment, model evaluation, design values, and other purposes.
- The majority of the CSN sites have an FRM that is also providing a PM_{2.5} mass measurement.*
- Extensive analysis has been conducted demonstrating that the CSN and FRM PM_{2.5} mass measurements compare well. Any differences in the measurement can primarily be explained by the differences in the measurement techniques (e.g., sample volume, sampler design, etc.)
- A QA check can still be conducted by performing a mass balance and comparing to the FRM PM_{2.5} mass measurement.
- Information regarding the comparison of these methods is found in [*FRM versus CSN Mass.pdf*](#)
- The CSN PM_{2.5} mass measurement was eliminated in October 2014 (last sample collected September 29th).

*The few sites that do not have FRMs will continue the CSN PM_{2.5} mass measurement until such time as an FRM is established.

Recommendation #2 - Reduce sample frequency at 3 CSN Sites

- Sample frequency was reduced to 1-in-6 at CSN Supplemental sites that are not NCore or STN in January 2015 (Arnold West, MO, Wylam, AL and Albany, NY).

Recommendation #3 - Reduce carbon blank collection frequency in the CSN

- Carbon backup filter blanks were eliminated in January 2015.
- The number of field blank filters were reduced to the lowest level needed to adequately support organic carbon (OC) artifact correction for the CSN.
- As of February 2015, carbon field blanks are collected at 26 representative 1-in-3 day CSN sites and 23 representative 1-in-6 day CSN sites at a frequency of 1 per month.
- The full report on the recommendations for field blank collection for the CSN can be found in [*Carbon Field Blank Final Report.pdf*](#)
- UPDATE: starting in March of 2017, field blanks for all filter types (including carbon) are now collected at a frequency of 1 per month at all CSN sites.

Recommendation #4 - Reduce ice packs in shipping in the CSN

- The number of icepacks included in sample shipments was reduced in October 2014 from 8 to 6 during the cooler months of the year (October 1 - March 31).

Recommendation #5 - Defund CSN and IMPROVE Protocol sites

- After incorporating scoring, intangibles, and feedback from stakeholders, 38 CSN sites were defunded by January 2015 and 8 IMPROVE Protocol sites were defunded by January 2016.

Sites Funded

Network	AQS Site ID	Site Name	State
IMPROVE Protocol		Egbert (EGBE1)	Canada
CSN	<u>01-073-0023</u>	Birmingham - North Birmingham	AL
CSN	<u>01-073-2003</u>	Wylam	AL
CSN	<u>01-113-0001</u>	Phenix City	AL
CSN	<u>02-090-0010</u>	Fairbanks State Bldg	AK
IMPROVE Protocol	<u>04-003-1005</u>	Douglas (DOUG1)	AZ
CSN	<u>04-013-9997</u>	Phoenix Supersite	AZ
IMPROVE Protocol	<u>04-015-9000</u>	Meadview (MEAD1)	AZ
IMPROVE Protocol	<u>04-019-0005</u>	Organ Pipe (ORPI1)	AZ
CSN	<u>04-019-1028</u>	Children's Park	AZ
IMPROVE Protocol	<u>04-019-9000</u>	Saguaro West (SAWE1)	AZ
CSN	<u>05-119-0007</u>	North Little Rock (NLR) Parr	AR
CSN	<u>06-019-0011</u>	Fresno - Garland	CA
IMPROVE Protocol	<u>06-027-0002</u>	Great Basin/Bishop (OWVL1)	CA
CSN	<u>06-029-0014</u>	Bakersfield - California Ave.	CA
CSN	<u>06-037-1103</u>	Los Angeles - North Main Street	CA
CSN	<u>06-065-8001</u>	Riverside - Rubidoux	CA
CSN	<u>06-067-0006</u>	Sacramento - Del Paso Manor	CA
CSN	<u>06-073-0003</u>	El Cajon	CA
CSN	<u>06-085-0005</u>	San Jose - Jackson Street	CA
CSN	<u>08-001-0006</u>	Commerce City	CO
CSN	<u>08-031-0026</u>	La Casa	CO
CSN	<u>08-123-0008</u>	Platteville	CO

Network	AQS Site ID	Site Name	State
IMPROVE Protocol	<u>09-005-0005</u>	Mohawk Mountain (MOMO1)	CT
CSN	<u>09-009-0027</u>	Criscuolo Park	CT
CSN	<u>10-003-2004</u>	Wilmington - MLK	DE
CSN	<u>11-001-0043</u>	Washington DC - McMillan Reservoir	DC
CSN	<u>12-011-1002</u>	U of F Ag. School Site	FL
CSN	<u>12-057-3002</u>	Sydney (Tampa)	FL
CSN	<u>12-073-0012</u>	Tallahassee Community College	FL
CSN	<u>13-021-0007</u>	Macon	GA
CSN	<u>13-069-0002</u>	Douglas	GA
CSN	<u>13-089-0002</u>	South Dekalb	GA
CSN	<u>13-115-0003</u>	Rome - Elementary School	GA
CSN	<u>13-215-0011</u>	Columbus	GA
CSN	<u>13-245-0091</u>	Augusta	GA
CSN	<u>13-295-0002</u>	Rossville	GA
CSN	<u>15-003-0010</u>	Kapolei	HI
CSN	<u>16-001-0010</u>	St Lukes Meridian	ID
IMPROVE Protocol	<u>17-019-1001</u>	Bondville (BOND1)	IL
CSN	<u>17-031-0057</u>	Chicago - Springfield Pumping Station	IL
CSN	<u>17-031-0076</u>	Chicago - Com Ed	IL
CSN	<u>17-031-4201</u>	Northbrook	IL
CSN	<u>17-043-4002</u>	Naperville	IL
CSN	<u>17-119-0024</u>	Granite City - (Missouri)	IL
CSN	<u>18-019-0006</u>	Jeffersonville/Walnut street	IN
CSN	<u>18-037-2001</u>	Jasper Post Office	IN
CSN	<u>18-065-0003</u>	Shenandoah High School - Mechanicsburg	IN
CSN	<u>18-089-0022</u>	Gary	IN
CSN	<u>18-097-0078</u>	Indianapolis - Washington Park	IN
CSN	<u>18-163-0021</u>	Evansville - Buena Vista Road	IN
IMPROVE Protocol	<u>19-137-0002</u>	Viking Lake (VILA1)	IA
CSN	<u>19-163-0015</u>	Jefferson Elementary (10th and Vine)	IA
IMPROVE Protocol	<u>19-177-0006</u>	Lake Sugema (LASU2)	IA
IMPROVE Protocol	<u>20-017-0001</u>	Tallgrass (TALL1)	KS
CSN	<u>20-173-0010</u>	Wichita Dept. of Environmental Health	KS
IMPROVE Protocol	<u>20-195-0001</u>	Cedar Bluff (CEBL1)	KS

Network	AQS Site ID	Site Name	State
CSN	<u>20-209-0021</u>	JFK Center	KS
CSN	<u>21-111-0067</u>	Louisville - Cannon's Lane	KY
CSN	<u>22-015-0008</u>	Shreveport Airport	LA
CSN	<u>22-033-0009</u>	Capitol	LA
IMPROVE Protocol	<u>23-003-1020</u>	Presque Isle (PRIS1)	ME
IMPROVE Protocol	<u>23-005-9002</u>	Casco Bay (CABA1)	ME
IMPROVE Protocol	<u>23-019-9000</u>	Penobscot (PEN01)	ME
CSN	<u>24-005-3001</u>	Essex	MD
IMPROVE Protocol	<u>24-023-0002</u>	Frostburg Reservoir (FRRE1)	MD
CSN	<u>24-033-0030</u>	HU-Beltsville	MD
IMPROVE Protocol	<u>25-001-0002</u>	Cape Cod Natl Seashore (CAC01)	MA
IMPROVE Protocol	<u>25-007-0001</u>	Martha's Vineyard (MAV11)	MA
CSN	<u>25-013-0008</u>	Westover AFB (Chicopee)	MA
CSN	<u>25-025-0042</u>	Dudley Square - Roxbury (Boston)	MA
CSN	<u>26-081-0020</u>	Grand Rapids	MI
CSN	<u>26-091-0007</u>	Tecumseh	MI
CSN	<u>26-163-0001</u>	Allen Park	MI
CSN	<u>26-163-0015</u>	Southwest High School	MI
CSN	<u>26-163-0033</u>	Dearborn	MI
CSN	<u>27-003-1002</u>	Blaine Anoka County Airport	MN
CSN	<u>27-053-0963</u>	Minneapolis - Phillips	MN
IMPROVE Protocol	<u>27-169-9000</u>	Great River Bluffs (GRR11)	MN
CSN	<u>28-049-0020</u>	Jackson NCore	MS
CSN	<u>29-099-0019</u>	Arnold West	MO
CSN	<u>29-510-0085</u>	St. Louis - Blair Street	MO
IMPROVE Protocol	<u>30-047-9000</u>	Flathead (FLAT1)	MT
CSN	<u>30-049-0004</u>	Sieben Flats	MT
IMPROVE Protocol	<u>30-085-9000</u>	Ft Peck (FOPE1)	MT
IMPROVE Protocol	<u>30-087-0762</u>	Northern Cheyenne (NOCH1)	MT
CSN	<u>30-093-0005</u>	Butte-Greeley School	MT
CSN	<u>31-055-0019</u>	Woolworth Street	NE
IMPROVE Protocol	<u>31-171-9000</u>	Nebraska (NEBR1)	NE
CSN	<u>32-003-0540</u>	Jerome Mack Middle School	NV
CSN	<u>32-031-0016</u>	Reno	NV

Network	AQS Site ID	Site Name	State
IMPROVE Protocol	<u>33-011-5001</u>	Pack Monadnock Summit (PACK1)	NH
IMPROVE Protocol	<u>33-015-0018</u>	Moosehill School (LOND1)	NH
CSN	<u>34-007-0002</u>	Camden	NJ
CSN	<u>34-013-0003</u>	Newark Firehouse (Newark)	NJ
CSN	<u>34-023-0006</u>	New Brunswick	NJ
CSN	<u>34-027-3001</u>	Chester	NJ
CSN	<u>34-039-0004</u>	Elizabeth Lab	NJ
CSN	<u>35-001-0023</u>	Del Norte	NM
CSN	<u>36-001-0005</u>	Albany Co HD	NY
CSN	<u>36-005-0110</u>	Bronx - IS52	NY
CSN	<u>36-029-0005</u>	Buffalo	NY
CSN	<u>36-031-0003</u>	Whiteface	NY
CSN	<u>36-055-1007</u>	Rochester Primary	NY
CSN	<u>36-061-0134</u>	New York - Division Street	NY
CSN	<u>36-081-0124</u>	Queens College	NY
CSN	<u>36-101-0003</u>	Pinnacle State Park	NY
CSN	<u>37-067-0022</u>	Winston-Salem - Hattie Ave	NC
CSN	<u>37-119-0041</u>	Garinger High School	NC
CSN	<u>37-183-0014</u>	East Millbrook Middle School	NC
CSN	<u>38-017-1004</u>	Fargo NW	ND
CSN	<u>39-035-0038</u>	Cleveland - St. Theo	OH
CSN	<u>39-035-0060</u>	G.T. Craig	OH
CSN	<u>39-061-0040</u>	Cincinnati - Taft	OH
CSN	<u>39-081-0017</u>	Steubenville	OH
CSN	<u>39-093-3002</u>	Lorain	OH
CSN	<u>39-113-0032</u>	Downtown Library	OH
IMPROVE Protocol	<u>39-121-8001</u>	Quaker City (QUCI1)	OH
CSN	<u>39-135-1001</u>	National Trail High School	OH
CSN	<u>39-151-0017</u>	Canton Fire Station	OH
CSN	<u>39-153-0023</u>	Akron - 5 Points	OH
IMPROVE Protocol	<u>40-001-9009</u>	Stilwell (STIL1)	OK
CSN	<u>40-109-1037</u>	OCUSA Campus	OK
CSN	<u>40-143-1127</u>	Peoria Site 1127 - North Tulsa Fire Station 24	OK
CSN	<u>41-051-0080</u>	Portland - SE Lafayette	OR

Network	AQS Site ID	Site Name	State
CSN	<u>42-001-0001</u>	NARSTO (Arendtsville)	PA
CSN	<u>42-003-0008</u>	Lawrenceville (Pittsburgh)	PA
CSN	<u>42-003-0064</u>	South Alleghany (Liberty)	PA
CSN	<u>42-021-0011</u>	Johnstown	PA
CSN	<u>42-029-0100</u>	New Garden	PA
CSN	<u>42-071-0007</u>	Lancaster	PA
CSN	<u>42-095-0025</u>	Freemansburg	PA
CSN	<u>42-101-0048</u>	NE Wastewater Treatment Plant	PA
CSN	<u>42-101-0055</u>	Philadelphia - Ritner	PA
CSN	<u>42-125-5001</u>	East of Pittsburgh- Florence	PA
CSN	<u>42-129-0008</u>	Greensburg	PA
CSN	<u>44-007-1010</u>	Francis School (East Providence)	RI
CSN	<u>45-079-0007</u>	Parklane	SC
CSN	<u>46-099-0008</u>	Sioux Falls School of Deaf	SD
CSN	<u>47-093-1020</u>	Knoxville - Spring Hill Elementary School	TN
CSN	<u>47-157-0075</u>	Shelby Farms - Memphis	TN
CSN	<u>48-113-0069</u>	Hinton (Dallas)	TX
CSN	<u>48-141-0044</u>	Chamizal	TX
CSN	<u>48-201-1039</u>	Deer Park	TX
CSN	<u>48-203-0002</u>	Karnack	TX
CSN	<u>49-005-0007</u>	Smithfield (Cache Valley)	UT
CSN	<u>49-011-0004</u>	Bountiful	UT
CSN	<u>49-035-3006</u>	Salt Lake City - Hawthorne	UT
CSN	<u>49-049-4001</u>	Lindon	UT
IMPROVE Protocol	<u>50-007-0007</u>	Proctor Research Center (PMRF1)	VT
CSN	<u>50-007-0012</u>	Zampieri State (Burlington)	VT
CSN	<u>51-087-0014</u>	Henrico Co. (Richmond)	VA
IMPROVE Protocol	<u>53-009-0013</u>	Makah Indian Reservation/Cheeka Peak (MAKA2)	WA
CSN	<u>53-033-0057</u>	Seattle - Duwamish	WA
CSN	<u>53-033-0080</u>	Seattle - Beacon Hill	WA
CSN	<u>53-053-0029</u>	Tacoma	WA
CSN	<u>53-053-0031</u>	Tacoma - Alexander Ave	WA
CSN	<u>53-061-1007</u>	Marysville-7th Ave	WA
CSN	<u>53-077-0009</u>	Yakima - 4th Ave	WA

Network	AQS Site ID	Site Name	State
CSN	<u>54-039-0011</u>	WV - Guthrie Agriculture Center	WV
CSN	<u>54-051-1002</u>	Moundsville Armory	WV
CSN	<u>55-009-0005</u>	Green Bay East High School	WI
CSN	<u>55-027-0001</u>	Horicon Palmatory	WI
CSN	<u>55-079-0026</u>	SER-DNR Headquarters	WI
CSN	<u>55-119-8001</u>	Perkinstown CASTNET	WI
IMPROVE Protocol	<u>56-005-0123</u>	Thunder Basin (THBA1)	WY
CSN	<u>56-021-0100</u>	Cheyenne NCore	WY
CSN	<u>72-021-0006</u>	Jail at Bayamon (began sampling in 2016)	PR

Sites Defunded

Network	AQS Site ID	Site Name	State
CSN	<u>01-089-0014</u>	Huntsville Old Airport	AL
CSN	<u>01-101-1002</u>	MOMS	AL
IMPROVE Protocol	<u>04-021-8001</u>	Queen Valley (QUVA1)	AZ
CSN	<u>10-001-0003</u>	Dover	DE
CSN	<u>12-103-0026</u>	Skyview (Pinellas County)	FL
CSN	<u>13-059-0001</u>	Athens	GA
CSN	<u>18-039-0008</u>	Elkhart Prarie Street	IN
CSN	<u>19-113-0040</u>	Linn County Health	IA
CSN	<u>19-153-0030</u>	Public Health Building	IA
CSN	<u>21-019-0017</u>	Ashland Health Dept	KY
CSN	<u>21-043-0500</u>	Grayson Lake	KY
CSN	<u>21-067-0012</u>	Lexington Health Dept	KY
IMPROVE Protocol	<u>23-005-0002</u>	Bridgton (BRMA1)	ME
IMPROVE Protocol	<u>25-015-4002</u>	Quabbin Reservoir (QURE1)	MA
CSN	<u>26-113-0001</u>	Houghton Lake	MI
CSN	<u>26-115-0006</u>	Sterling Park	MI
CSN	<u>26-147-0005</u>	Port Huron	MI
CSN	<u>27-109-5008</u>	Rochester	MN
IMPROVE Protocol	<u>27-133-9000</u>	Blue Mounds (BLMO1)	MN

Network	AQS Site ID	Site Name	State
IMPROVE Protocol	<u>29-039-0001</u>	El Dorado Springs (ELDO1)	MO
CSN	<u>29-047-0005</u>	Liberty	MO
CSN	<u>29-186-0005</u>	Bonne Terre	MO
IMPROVE Protocol	<u>31-069-9000</u>	Crescent Lake (CRES1)	NE
CSN	<u>37-021-0034</u>	Buncombe County Board of Education	NC
CSN	<u>37-035-0004</u>	Hickory	NC
CSN	<u>37-057-0002</u>	Lexington	NC
CSN	<u>37-159-0021</u>	Rockwell	NC
CSN	<u>39-049-0081</u>	Columbus - Maple Canyon	OH
CSN	<u>39-087-0012</u>	ODOT Garage	OH
CSN	<u>39-095-0026</u>	Toledo Airport	OH
CSN	<u>39-099-0014</u>	Head Start	OH
IMPROVE Protocol	<u>40-045-0890</u>	Ellis (ELLI1)	OK
CSN	<u>42-011-0011</u>	Reading Airport	PA
CSN	<u>42-027-0100</u>	State College	PA
CSN	<u>42-043-0401</u>	Harrisburg	PA
CSN	<u>42-049-0003</u>	Erie	PA
CSN	<u>42-069-2006</u>	Scranton	PA
CSN	<u>42-133-0008</u>	York	PA
CSN	<u>45-045-0015</u>	Greenville ESC	SC
CSN	<u>47-037-0023</u>	Lockeland School	TN
CSN	<u>47-065-4002</u>	UTC	TN
CSN	<u>47-099-0002</u>	Lawrence County	TN
CSN	<u>53-011-0023</u>	VANNEVAN	WA
CSN	<u>54-039-1005</u>	South Charleston Library	WV
CSN	<u>55-133-0027</u>	Waukesha, Cleveland Ave. site	WI
IMPROVE Protocol	<u>56-019-9000</u>	Cloud Peak (CLPE1)	WY