UCDAVIS
UNIVERSITY OF CALIFORNIA

# CSN 2020 Site Report: Minneapolis - Philips

## AQS ID: 27-053-0963, POC 5 (44.95366, -93.25821) 1-in-3 Day Schedule

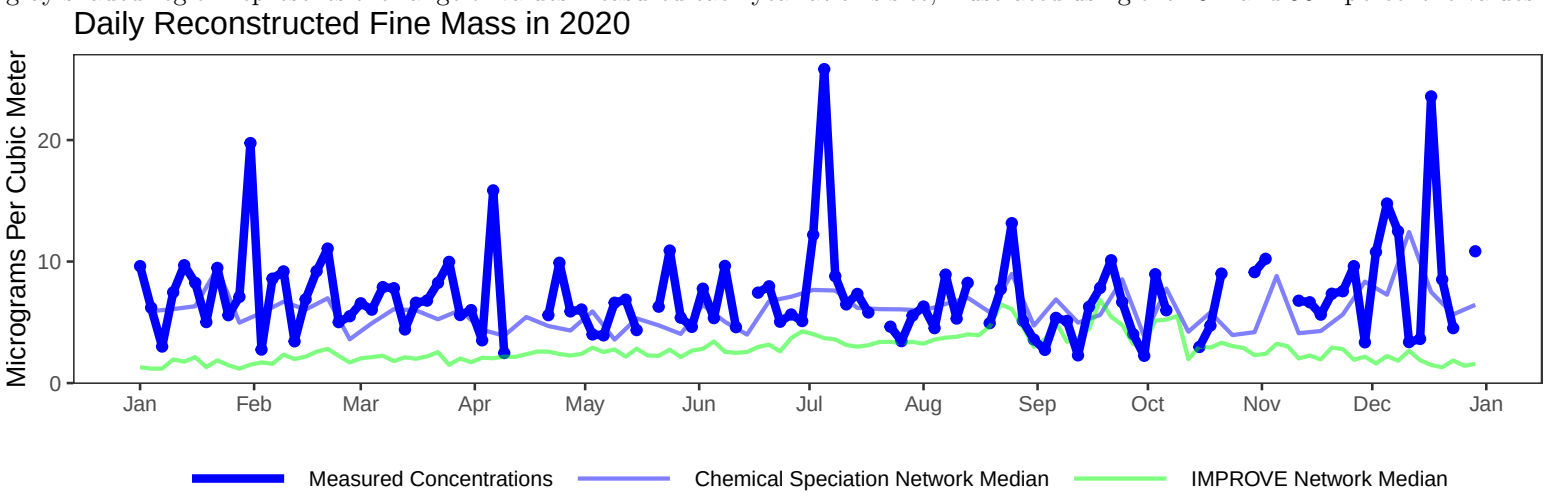
The Chemical Speciation Network (CSN) is a routine air monitoring network designed to complement the $PM_{2.5}$ monitoring network; support the implementation of $PM_{2.5}$ National Ambient Air Quality Standards (NAAQS); assist in developing and tracking emission control strategies; and provide data to aid in health studies. CSN sites are primarily located in urban areas and complement the largely rural Interagency Monitoring of PROtected Visual Environments (IMPROVE) network. The CSN target analytes are trace elements, ions, and carbon.

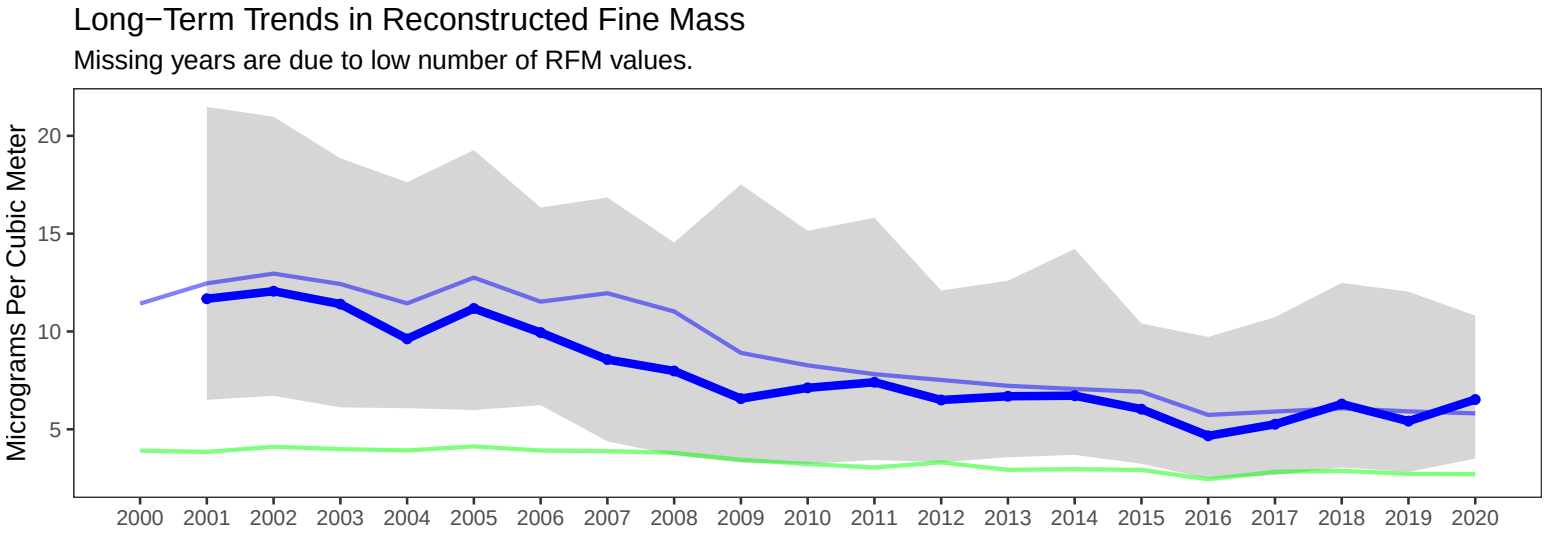
Percent of Samples Successfully Collected and Analyzed Per Year

| 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 98 | 98 | 98 | 97 | 96 | 98 | 97 | 97 | 94 | 95 | 95 | 97 | 99 | 98 | 96 | 99 | 95 | 93 |

Samples Successfully Collected and Analyzed in 2020 by Filter Type. PTFE: 114 (93.4%), Nylon: 114 (93.4%), Quartz: 113 (92.6%)

The plots below show temporal trends for site 27-053-0963 alongside network-wide CSN and IMPROVE average concentrations. The top plot shows the variability of the reconstructed fine mass (RFM) concentrations during 2020; RFM can only be calculated if all three filters collected on a sampling day are valid. The bottom plot illustrates the long-term trends of ambient concentrations; the gray shaded region represents the range of values measured each year at this site, illustrated using the $10^{th}$ and $90^{th}$ percentile values.

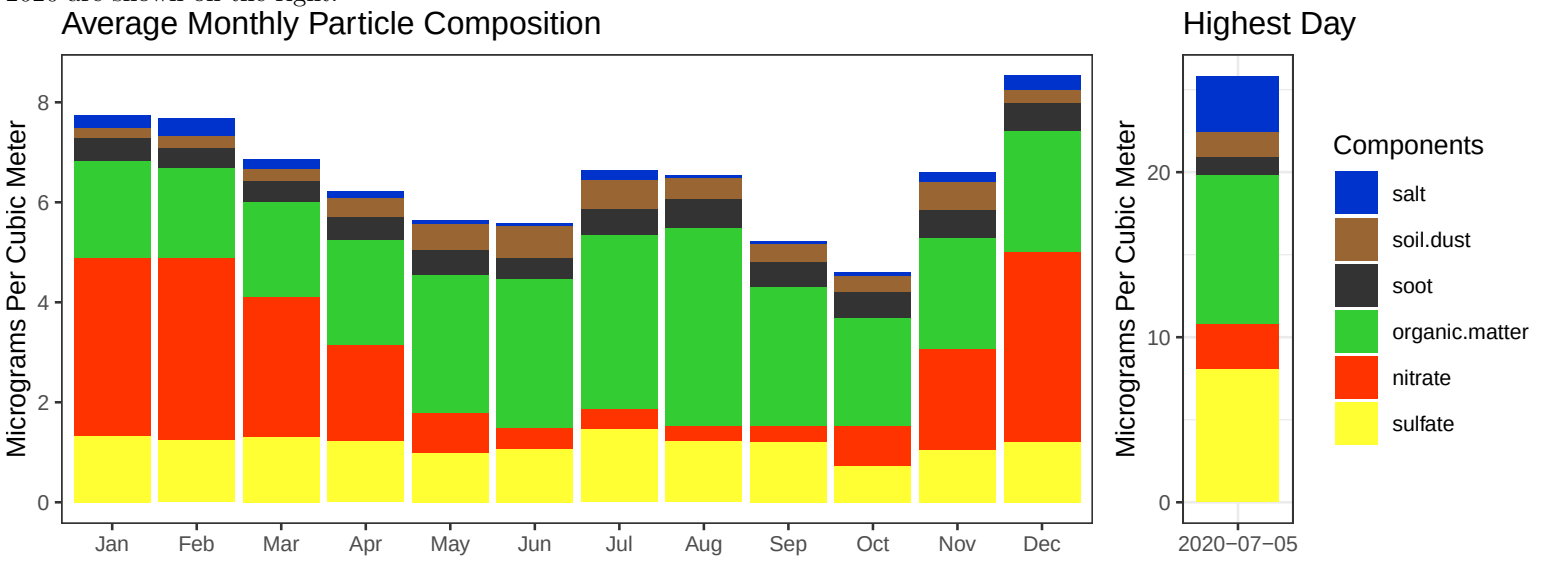


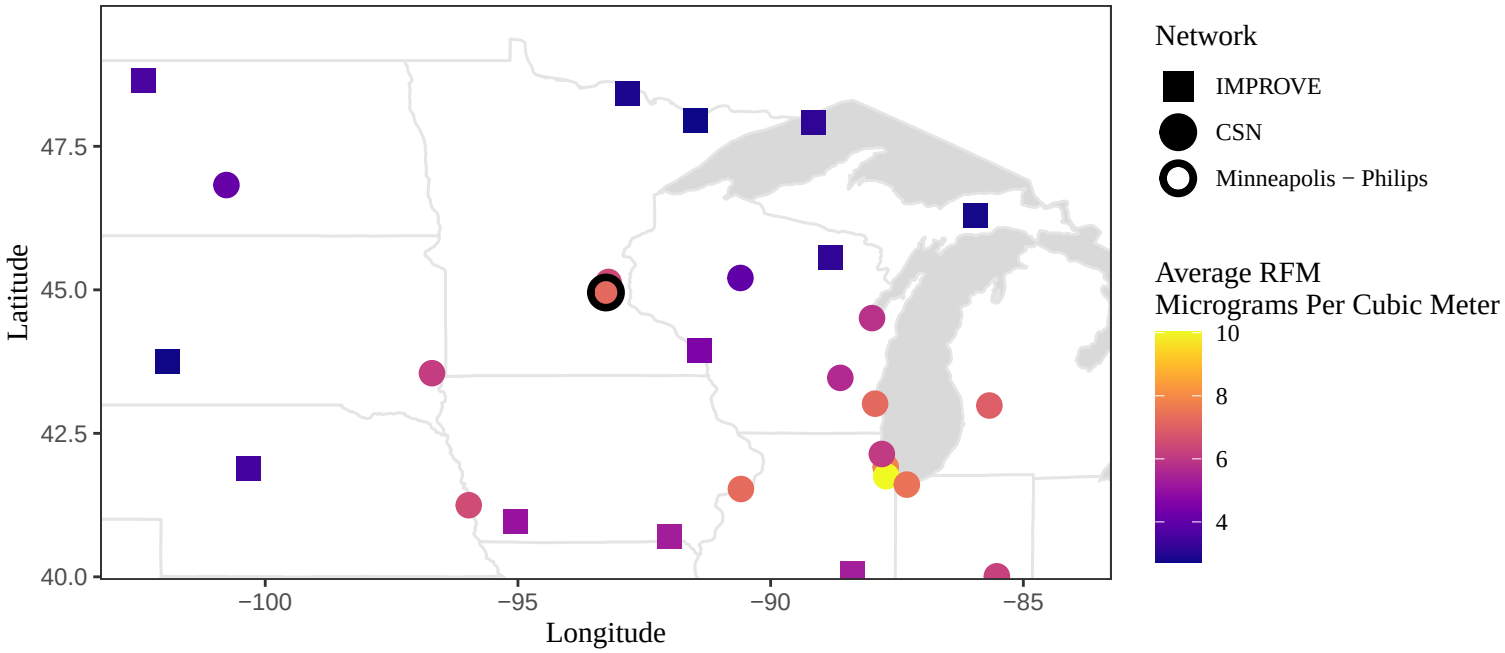




### More Information

To view and download CSN data: https://www.epa.gov/outdoor-air-quality-data
The EPA website with guidance documents and background information: https://www.epa.gov/amtic/chemical-speciation-network-csn
EPA real-time air monitoring data: https://www.airnow.gov/
The Univ. of California, Davis website with information about current research and publications: https://aqrc.ucdavis.edu/csn
The Colorado State Univ. website with data resources, literature, and visibility overviews: http://vista.cira.colostate.edu/improve/

The following plots summarize the chemical composition of particles collected at this site. The monthly averaged compositions calculated from 2016-2020 data are shown on the left while compositions for the day with the highest measured concentrations during 2020 are shown on the right.




| Components | Calculation | Natural Sources | Anthropogenic Sources |
|---|---|---|---|
| Salt | $1.8 \cdot Chloride$ | Ocean spray, dry lakebeds | Chemical manufacturing, lake consumption |
| Soil Dust | $2.2 \cdot Al + 2.49 \cdot Si + 1.63 \cdot Ca + 2.42 \cdot Fe + 1.94 \cdot Ti$ | Soil resuspension, dust storms long-range transport | Construction, agriculture, deforestation, unpaved roads |
| Soot | $Elemental\ Carbon$ | Wildfires | Motor vehicles, wood burning, smoking |
| Organic Matter | $1.4 \cdot Organic\ Carbon$ | Plants, animals, wildfires | Motor vehicles, cooking oils, household cleaners |
| Nitrate | $1.29 \cdot Nitrate$ | Plants, animals | Fertilizer, stock yards, chemical manufacturing |
| Sulfate | $4.125 \cdot Sulfur$ | Volcanism | Coal-fired power plants, chemical manufacturing |

The following map shows the average RFM concentrations for nearby sites in both CSN and the rural IMPROVE Network. The point shapes indicate which network the sites are associated with. The color bar indicates the average annual RFM concentration (micrograms per cubic meter) measured at each site in 2020.