

CSN 2017 Site Report: Northbrook

AQS ID: 17-031-4201, POC 5 (42.139996, -87.799227) 1-in-3 Day Schedule

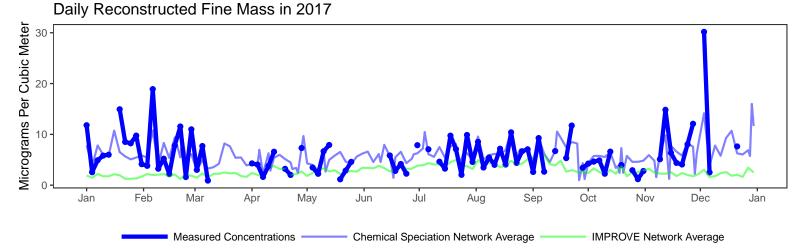
The Chemical Speciation Network (CSN) is a routine air monitoring network designed to complement the $PM_{2.5}$ monitoring network; support the implementation of $PM_{2.5}$ National Ambient Air Quality Standards (NAAQS); assist in developing and tracking emission control strategies; and provide data 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

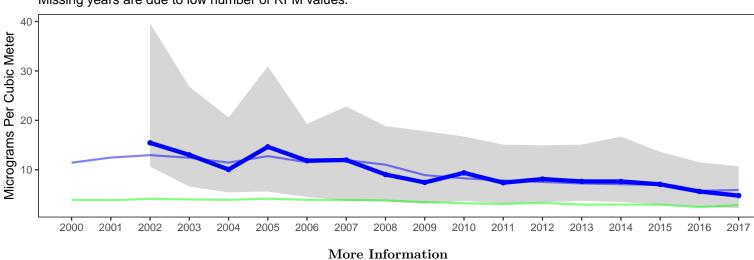
2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
69	97	99	97	89	93	90	96	96	91	93	84	90	95	91	85

Samples Successfully Collected and Analyzed in 2017 by Filter Type. PTFE: 107 (87.7%), Nylon: 107 (87.7%), Quartz: 98 (80.3%)

The plots below show temporal trends for site 17-031-4201 alongside network-wide CSN and IMPROVE average concentrations. The top plot shows the variability of the reconstructed fine mass (RFM) concentrations during 2017; 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 10th and 90th percentile values.



Long-Term Trends in Reconstructed Fine Mass



Missing years are due to low number of RFM values.

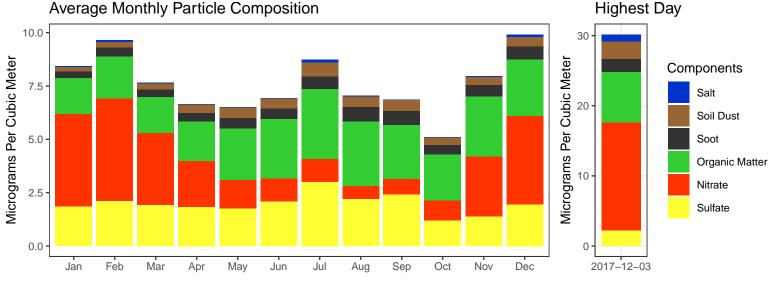
To view and download CSN data: www3.epa.gov/airquality/airdata/

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.epa.gov/outdoor-air-quality-data

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 2013-2017 data are shown on the left while compositions for the day with the highest measured concentrations during 2017 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	$2.2 \cdot Al + 2.49 \cdot Si + 1.63 \cdot Ca$	Soil resuspension, dust storms	Construction, agriculture, deforestation,
	$+2.42 \cdot Fe + 1.94 \cdot Ti$	long-range transport	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 2017.

