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.

Samples Successfully Collected and Analyzed in 2017 by Filter Type. PTFE: 57 (93.4%), Nylon: 57 (93.4%), Quartz: 58 (95.1%)

The plots below show temporal trends for site 17-031-0057 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 10$^{th}$ and 90$^{th}$ percentile values.

To view and download CSN data: [www3.epa.gov/airquality/airdata/](http://www3.epa.gov/airquality/airdata/)
The EPA website with guidance documents and background information: [https://www.epa.gov/amtic/chemical-speciation-network-csn](https://www.epa.gov/amtic/chemical-speciation-network-csn)
EPA real-time air monitoring data: [https://www.epa.gov/outdoor-air-quality-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](https://aqrc.ucdavis.edu/csn)
The Colorado State Univ. website with data resources, literature, and visibility overviews: [http://vista.cira.colostate.edu/improve/](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.

### Average Monthly Particle Composition

The chart shows the average monthly particle composition from January to December. Each bar represents a month, with different colors indicating the composition of various components such as Salt, Soil Dust, Soot, Organic Matter, Nitrate, and Sulfate. The variation in the heights of the bars indicates the micrograms per cubic meter for each component.

### Highest Day

This chart presents the composition for the day with the highest measured concentrations in 2017. It includes the same components as the average monthly composition chart.

### Components Calculation Natural Sources Anthropogenic Sources

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

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.

### Network

- **Chicago – Springfield Pumping Station**
- **CSN**
- **IMPROVE**

### Average RFM Micrograms Per Cubic Meter

The map uses a color gradient to represent the concentration levels, with darker shades indicating higher concentrations.