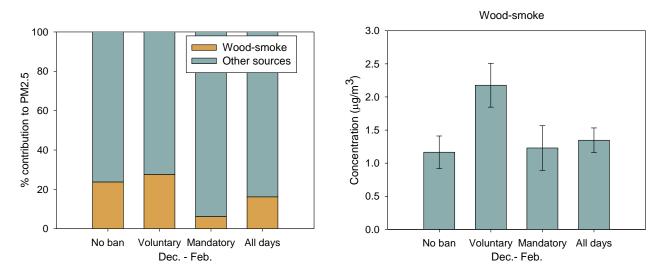# Positive Matrix Factorization

Results of the Positive Matrix Factorization (PMF) analysis show that wood-smoke contribution to $PM_{2.5}$ averaged about 16.2% of total $PM_{2.5}$ during the winter at the Hawthorne School monitor which is a centrally-located site in Salt Lake City. This contribution varied between days when there were no restrictions on burning and mandatory no-burn days, ranging from 6.2% to 23.8%. The lowest contribution occurred on days when there was a mandatory ban on wood-burning and the highest contribution occurred on days when wood-burning was allowed. However, while the percent wood-smoke contribution to $PM_{2.5}$ was lowest on mandatory no-burn days, wood-smoke levels on these days, that is the amount of micrograms per cubic meter ($\mu g/m^3$), were comparable to those measured on days with no burning restriction, accounting for ~1.2 $\mu g/m^3$.

The contribution of wood-smoke to $PM_{2.5}$ also varied spatially across all three valleys in Utah, with peak contributions being generally recorded at North Provo. Wood-smoke contribution to $PM_{2.5}$ varied from 21.2% and 2.53 $\mu g/m^3$ at North Provo to 11.1% and 2.01 $\mu g/m^3$ at Smithfield, on average during winter. Moreover, in agreement with the observations at Hawthorne, while lower percent contributions of wood-smoke to $PM_{2.5}$ were observed on mandatory no-burn days compared to days with no burning restriction, wood-smoke levels were higher on mandatory ban days relative to days without burning restrictions, ranging from ~2 to 2.73 $\mu g/m^3$. These high concentrations could be related to increased atmospheric stability and possibly wood-burning activity on no-burn days. The two charts on the following page show the comparisons among the North Provo, Brigham City and Smithfield monitors.