

## **Modeling of Summertime Surface O<sub>3</sub> in the Salt Lake Valley: Model Performance and Sensitivity Analyses**

The Salt Lake Valley in Utah often experiences exceedances of the National Ambient Air Quality Standard (NAAQS) for ozone during the summer, with ozone having a mix of different sources, both local and non-local. These sources can also be derived from both anthropogenic and natural sources, including stratospheric transport, wildfires, biogenic emissions as well as US and international anthropogenic sources. A typical summertime O<sub>3</sub> air pollution episode that occurred in the Salt Lake Valley in 2017 was simulated using the Comprehensive Air Quality Model with extensions (CAMxv7.1). Three 12/4/1.33 km nested grid domains and cb6r5 chemical mechanism were considered for this analysis. A comparison of measured and modeled O<sub>3</sub> showed that while the model overall captures well the temporal variation in maximum daily 8-hr average O<sub>3</sub> (MDA8), measured MDA8 was overall underestimated by about 10-20% on ozone exceedance days across the entire 1.33 km domain. This underprediction in O<sub>3</sub> is accompanied by an underestimation of oxygenated and biogenic VOCs, particularly formaldehyde and isoprene. Model sensitivity to different versions of the Biogenic Emissions Inventory System (beis) and Biogenic Emissions Landcover Database (BELD) was also evaluated, with results showing better model performance at urban locations with beis3.6/beld4.1 compared to beis3.7/beld5. Model sensitivity to halogens emissions is currently being investigated. Findings have important policy implications for emissions control development.