

Title:

Stratospheric Intrusions in relation to Surface Ozone over Northern California during CABOTS

By:

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Abstract:

Stratospheric Intrusions are identified from the ozonesonde measurements over Bodega Bay, CA during the California Baseline Ozone Transport Study (CABOTS). Utilizing MERRA-2 potential vorticity, GFS 250 hPa winds, and NOAA/HYSPLIT model, three intrusion events are confirmed to influence both the coastal North Bay Area and the greater Sacramento Area at similar times and depths. An analysis of average MERRA-2 potential vorticity, upper air ozone and humidity for the 15 km vertical column above both regions are shown as comparable. The coastal ozonesonde data gives insight to variations in ozone elevated above Sacramento due to the intrusion. An analysis of daily change in ozone observed at the coast shows the downward progression of ozone intrusion to influence the surface ozone. Correlations of the maximum daily 8-hr average surface ozone at Bodega Bay and 14 inland monitoring sites across the Sacramento Valley and into the Sierra Foothills were performed. Weak negative correlations between the inland elevated surface sites and coastal surface data lead to the investigation of elevated ozonesonde measurement correlation analysis. The Placerville observations indicate a moderately strong correlation with the elevated coastal ozonesonde observations. Daily changes in ozone at both locations indicate 4 days of interest where both sites exhibit the same change in observed concentrations ( $\pm 1.0$  ppb). HYSPLIT back-trajectories for each hour during the dates of interest were analyzed. Patterns emerged such that the trajectories from both locations either passed through the same air mass simultaneously or with a short time delay.