

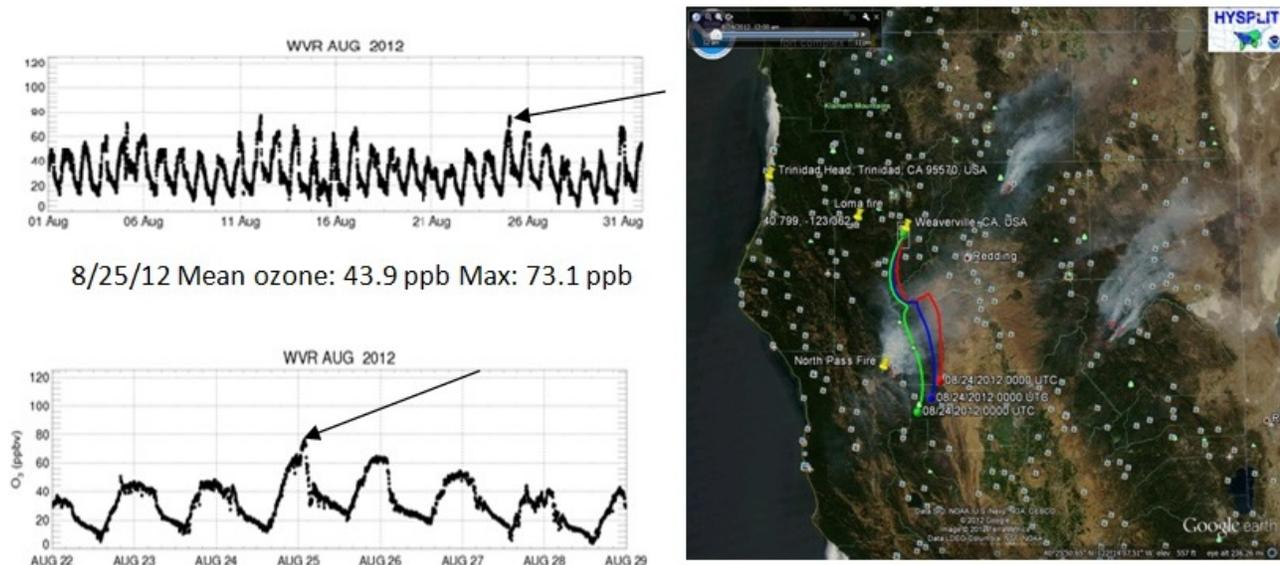
## Increased Surface Ozone with Relation to Wildfires in the Western United States (U.S.)

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Increased surface ozone levels have been shown to have significant effects on both vegetation and human health, which led to 1970 U.S. Clean Air Act policy enactment for the reduction of surface level ozone. Surface ozone has been measured and monitored globally in an attempt to study the natural variability and trends of this important pollutant; which is often produced by industry and car exhaust in big cities, then transported downwind. The common means of ozone production is through reactions of CO, NO<sub>x</sub>, and Volatile Organic Compounds with the OH radical in the presence of sunlight. However, ozone is also produced through natural processes (lightning, stratospheric intrusions, organic carbons released from trees, etc.). Each of these ozone precursor pollutants can also be produced through the process of biomass burning. This study analyzes the high surface ozone episodes observed in California and Colorado as they relate to the 2012 wildfire events. Through investigation and correlation of ozone data, temperature and wind patterns, atmospheric trajectories, and wildfire locations, the individual dates of high ozone levels, which exceeded the environmental protection agency state regulations, can be identified and explained. This information was thoroughly scrutinized to determine if the high ozone episodes were observed as a direct result of the fires, or due to other anthropogenic or natural causes. In that fire frequency and intensity is increasing across the Western United States, it is imperative that we understand the impacts of fires on atmosphere composition and in turn, the impacts on human and biological health.



**Figure 1.** Increased surface level ozone was detected in Weaverville, California, on August 25, 2012. The associated back trajectory provided by Hysplit trajectory model, Moderate-resolution Imaging Spectroradiometer, and Google earth presents a visual representation of the air mass coming into the Weaverville area passing through the plume of smoke released by the North Pass Fire. This suggests that ozone formation was assisted by ozone precursor species released from the burning biomass.