

# Las Vegas Ozone Study (LVOS)

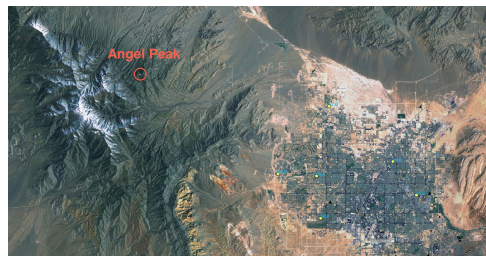
## Stratospheric contribution to surface ozone in the intermountain west during springtime

**Frequent intrusions of air from the stratosphere may prevent western states from meeting stricter standards for surface ozone pollution.**

Prior to 1970 the source of ozone at Earth's surface away from urban areas was believed to be transport from the stratosphere.

The importance of photochemistry in producing ozone in the lower atmosphere was first recognized in the mid-1970s, and by the 1990s the stratospheric input was considered to be unimportant.

Recent work by NOAA researchers has shown that transport from the stratosphere can, in fact, cause episodic increases in surface concentrations leading to exceedances of the National Ambient Air Quality Standard (NAAQS) in the higher elevation U.S. West.



Angel Peak is  $\approx$ 45 km west of Las Vegas



TOPAZ lidar on Angel Peak

Researchers from the NOAA ESRL Chemical Sciences Division conducted the 2013 Las Vegas Ozone Study (LVOS) on Angel Peak, Nevada, at the request of Clark County (Las Vegas) to help identify the sources of high ozone observed there in the springtime.

NOAA ESRL brought the one-of-a-kind TOPAZ mobile scanning ozone lidar, along with surface ozone and carbon monoxide measurements, to Angel Peak in May and June, 2013. The data were interpreted using model results from colleagues at NOAA's Geophysical Fluid Dynamics Laboratory (GFDL) and National Environmental Satellite, Data, and Information Service (NESDIS).

**The researchers showed that transport from the stratosphere directly led to 3 exceedances of the then-current (2008) NAAQS of 75 parts-per-billion (ppb) in Clark County during the 6-week LVOS campaign, and would have caused 14 exceedances of the lowered 70 ppb NAAQS, adopted by the EPA in 2015.**



**Clark County officials are using the 2013 LVOS results to put together a request for a waiver of the 3 exceedances under the EPA's "exceptional events" rule.**

**At the request of Clark County, Nevada, NOAA will conduct a second Las Vegas Ozone Study in late spring/early summer of 2017. The study is being conducted in partnership with the Clark County Department of Air Quality.**