

Ozone Lidar Observations for Air Quality Studies

TOLNet
Tropospheric Ozone LIDAR Network

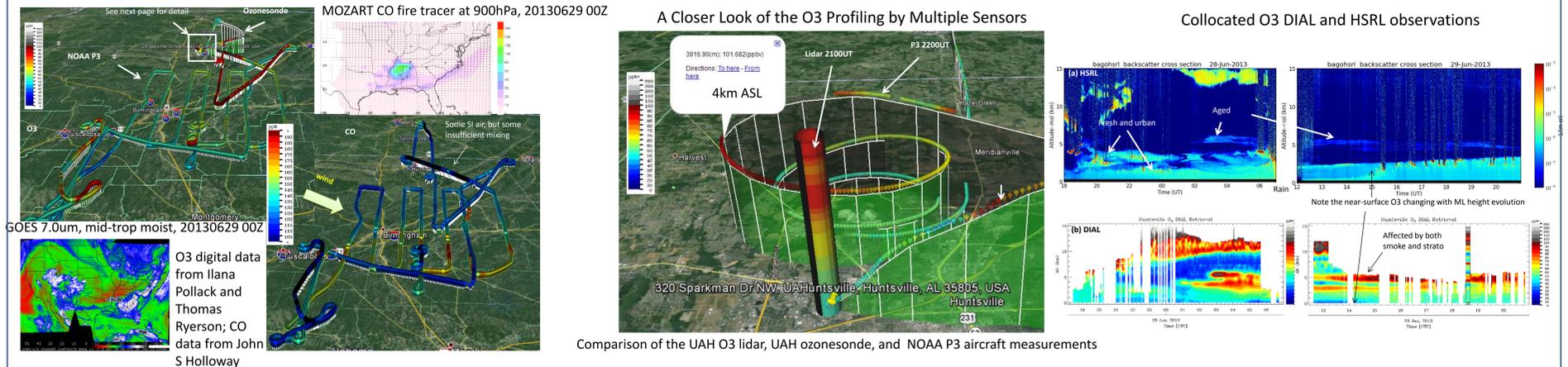


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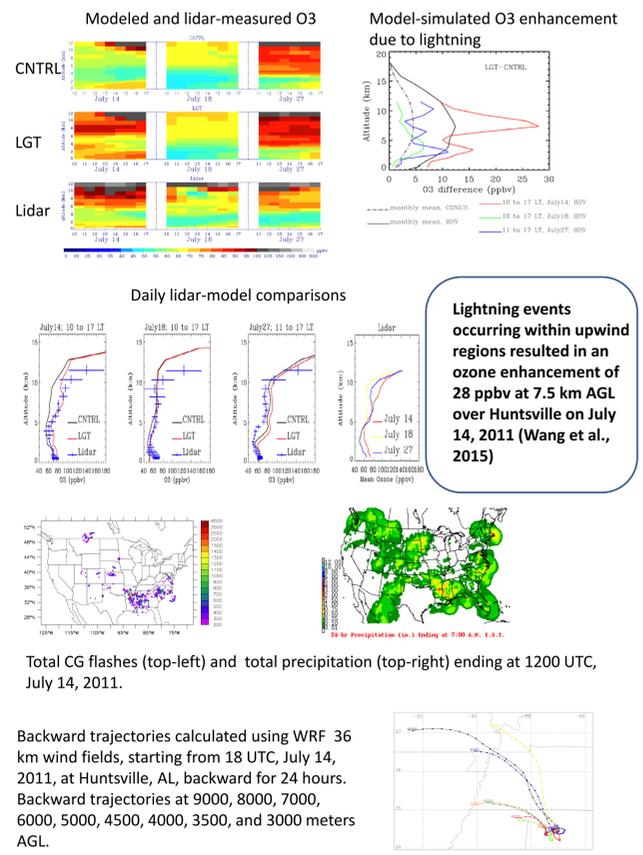
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Tropospheric ozone lidars are well suited to measuring the high spatio-temporal variability of this important trace gas. Furthermore, lidar measurements in conjunction with balloon soundings, aircraft, and satellite observations provide substantial information about a variety of atmospheric chemical and physical processes. Examples of processes elucidated by ozone-lidar measurements are presented, and modeling studies using WRF-Chem, RAQMS, and DALES/LES models illustrate our current understanding and shortcomings of these processes.

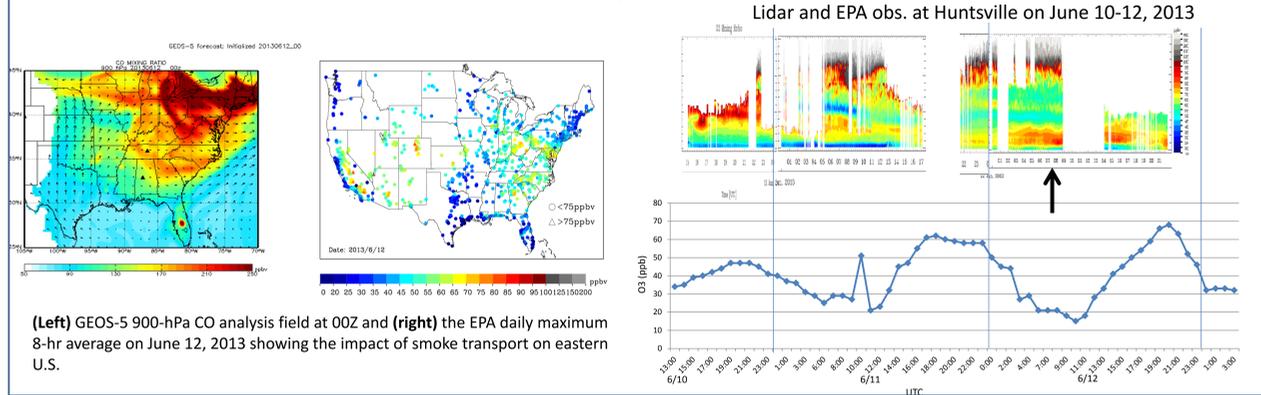
A Complicated Case from June 29, 2013– Affected by both stratospheric source and smoke transport



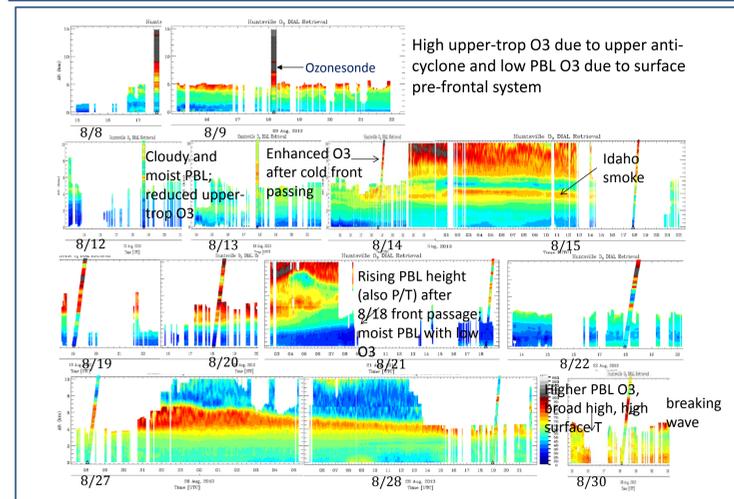
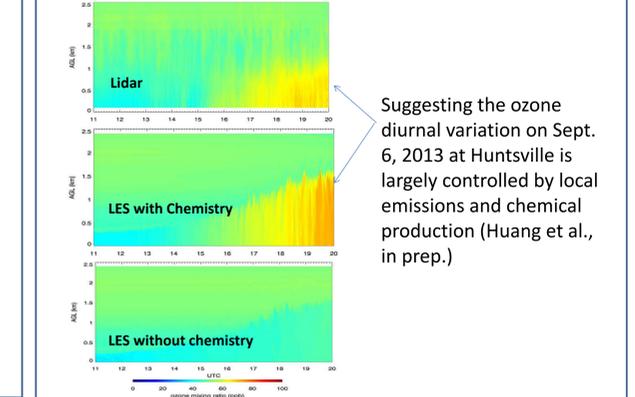
Lightning-induced tropospheric ozone enhancements (Wang et al., 2015)



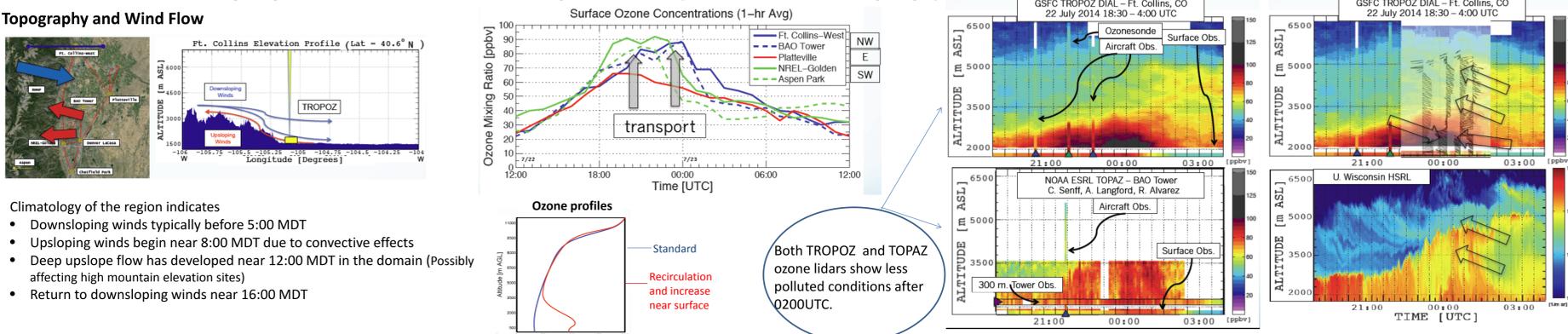
Influence of the Smoke Transport on the Surface, June 12, 2013



PBL/FT O3 diurnal variations



synoptic-scale recirculation of pollutants (Sullivan et al., in prep.)



Both TROPOZ ozone lidar and HSRL aerosol lidar indicate polluted air mass aloft.

HRDL wind lidar data helps to determine ozone transport.

Lower level flow convergence associated with a 20-30 ppb increase in ozone.

Aloft winds indicate southeasterly flow, while less polluted at surface.

TOLNet: <http://www-air.larc.nasa.gov/missions/TOLNet/index.html>

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