

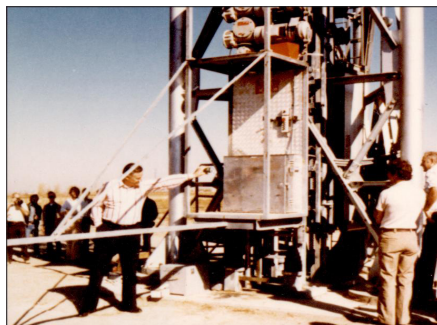
Boulder Atmospheric Observatory



The Boulder Atmospheric Observatory (BAO) is research facility in Erie, Colorado maintained by the NOAA/ESRL Physical Sciences Division, which is used for studying the planetary boundary layer and for testing and calibrating atmospheric sensors. Ongoing measurements include solar radiation and greenhouse gases.

The centerpiece of the facility is a 300-m tower instrumented at multiple levels with slow-response temperature, relative humidity and wind sensors, a profiling instrument carriage, a variety of remote sensing systems, and a real-time processing and display capability that greatly reduces analysis time for scientists.

The BAO has been the host of several large national and international experiments and numerous smaller ones.



Inauguration of the tower in 1977



New instruments are often tested at the site.



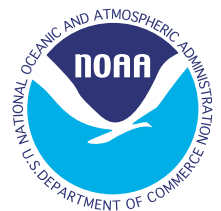
A view from atop the tower.

For more information, contact:

NOAA Earth System Research Laboratory
Dan Wolfe

Email: Daniel.Wolfe@noaa.gov • Phone: (303) 497-6204

www.esrl.noaa.gov/psd/technology/bao/



Continual Measurements

NOAA ESRL Physical Sciences Division

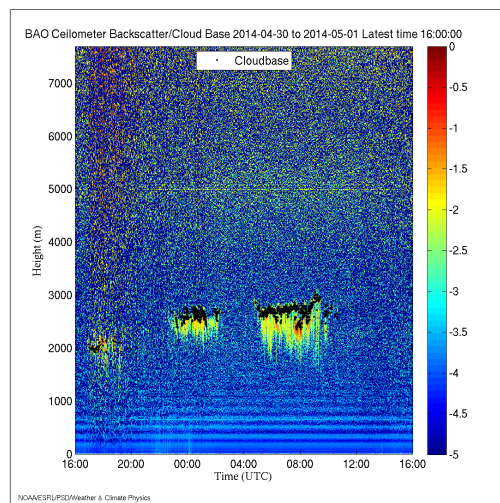
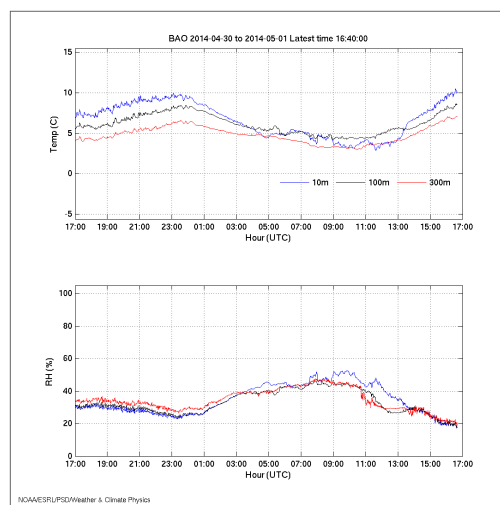
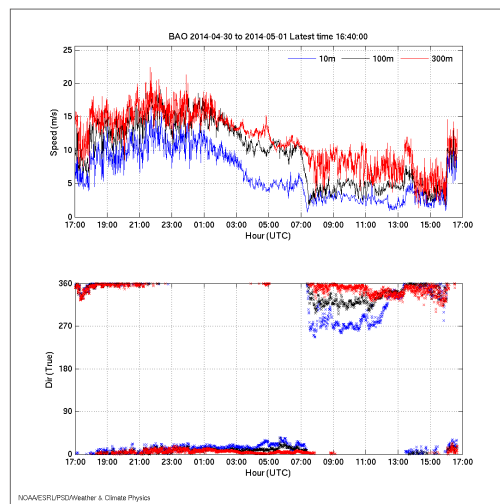
- **Tower Meteorological Measurements** - Continuous monitoring of conditions in the Atmospheric Boundary Layer (ABL) with measurements of surface precipitation.

NOAA ESRL Global Monitoring Division

- **Tall Tower Network** - Regionally representative measurements of carbon dioxide with measurements taken at 22, 100, 300m.
- **Ozone Monitoring** - Continuous measurements of ozone at the surface and 300m.
- **Solar Radiation Measurements** - Long-term radiation measurements of incoming and outgoing short-wave solar radiation (300m), incoming and outgoing long-wave solar radiation (300m), direct and diffuse short-wave solar radiation, all sky camera, Sunphotometer AERONET (Aerosol RObotic NETwork).

Recent Tower Experiments

- **Nitrogen, Aerosol Composition, and Halogens on a Tall Tower (NACHTT) 2011** – a month-long study of the chemistry of the wintertime atmosphere. Researchers examined why and how a compound usually associated with the atmosphere near oceans — nitryl chloride — also forms during the winter nighttime in land-locked regions such as the foothills of the Rocky Mountains. Could have important implications for both climate and air quality.
- **Lower Atmospheric Thermodynamics & Turbulence Experiment (LATTE) February 2014** – A multiinstitutional and multi-sensor research experiment conducted at the base of the Colorado Rocky Mountains to compare and validate data from several radars measuring wind and weather, and also to learn how well atmospheric turbulence can be measured by Doppler lidars.
- **Front Range Air Pollution and Photochemistry Experiment (FRAPPÉ) Summer 2014** – a four-week experiment to find out why the Colorado Northern Front Range is still experiencing air quality problems and regularly exceeding ozone standards in the summertime, despite efforts to limit emissions.



Above are samples of data collected at the Boulder Atmospheric Observatory Tower. Wind speed and direction (top), temperature and relative humidity (middle), cloud base height and visibility (bottom).