Air Resources Laboratory

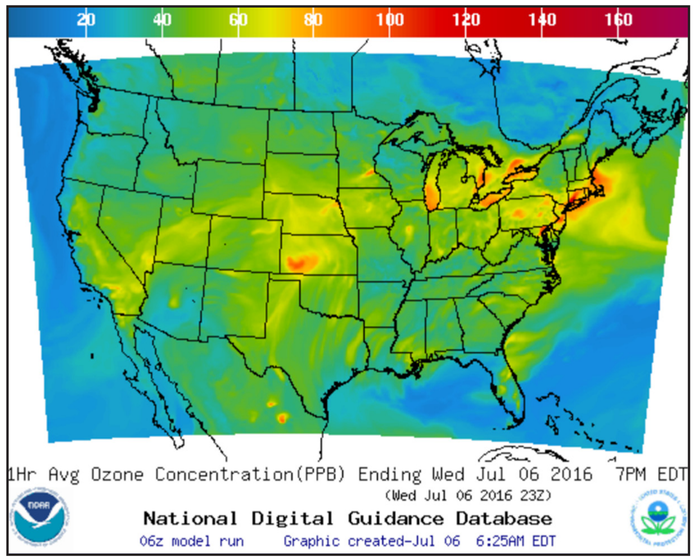
Atmospheric Chemistry and Deposition Research

World-class measurements and models for decision-makers, forecasters, and the research community

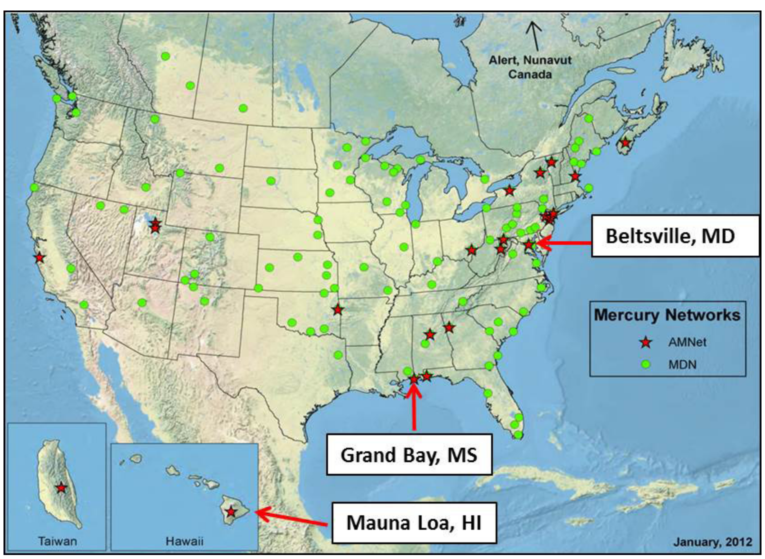
Most pollutants are emitted into the boundary layer and typically reside there for a significant fraction – if not all – of their lifetime. Since the boundary layer is where we breathe and where pollutants are deposited to ecosystems, understanding the physics and chemistry of pollutants in the boundary layer is essential to understanding public health and ecological risks. Pollutants in the boundary layer and elsewhere in the atmosphere can also affect the weather itself. While much progress has been made in reducing releases of harmful air pollutants, many locations in the U.S. continue to experience problems associated with poor air quality and many ecosystems are degraded due to atmospheric deposition.

ARL evaluates and improves computer models used by NOAA's National Weather Service to forecast the occurrence of ground-level ozone and fine particulate matter. These forecasts improve the ability of communities and individuals to respond to anticipated episodes of poor air quality by reducing pollutant emissions (e.g., limiting driving) and by taking personal protective measures (e.g., limiting outdoor exercise).

ARL also conducts research on the exchange of pollutants between the air and the Earth's surface. This improves scientific understanding of atmospheric chemistry and guides policies concerning air quality management and ecosystem health. ARL researchers focus on pollutants, such as mercury, reactive nitrogen, and sulfur compounds, which can have significant impact on the environment and—in the case of mercury—human health.



An example map of ground-level O_3 concentrations predicted for the continental U.S. The NWS generates such maps twice daily using an ARL-developed modeling system.



In coordination with the National Atmospheric Deposition Program, ARL operates three, long-term intensive ambient air mercury monitoring stations.

ARL's activities include: a) developing and applying a specialized modeling system that tracks mercury emissions and links these emissions to atmospheric transport, transformation, and deposition; b) conducting long-term, intensive ambient air monitoring of mercury; c) conducting short-term, process-level field studies for mercury and reactive nitrogen compounds; and d) supporting long-term, research-grade monitoring of pollutants in precipitation.

For More Information, Contact:

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