



# Air Resources Laboratory

## Real-time Environmental Applications and Display System

Providing a Unique Web-based System for Displaying Meteorological Data

The Air Resources Laboratory (ARL) provides meteorological services and related research to NOAA and other Federal agencies in order to predict the consequences of atmospheric releases of potentially harmful materials. The Real-time Environmental Applications and Display System (READY) is a web-based system, developed by ARL, for accessing and displaying meteorological data and running trajectory and dispersion model products on ARL's web server. The system brings together dispersion models, graphical display programs and textual forecast programs generated over many years at ARL into a form that is easy to use by anyone.

READY was originally developed for the personal computer but is now available to anyone with a web browser. Users can access many of the same products available to ARL researchers for analyzing forecast meteorological data. Users can also run ARL's HYbrid Single-Particle Lagrangian Integrated Trajectory (HYSPLIT) model and then use meteorological display programs to analyze the results— all within READY. This makes READY a unique web-based system.

### READY Tools and Products

The image displays five distinct outputs from the READY system:

- HYSPLIT:** A satellite-style map showing a green plume dispersion over a coastal region.
- Trajectory Analysis:** A map showing multiple colored lines representing atmospheric trajectories over a geographic area.
- Wildfire Smoke Forecasts:** A map of the United States with shaded regions indicating smoke forecast areas.
- Volcanic Ash:** A grid of six small maps showing ash dispersion patterns from various volcanic sources.
- Meteorological Tools:** A collection of four meteorological plots: a bar chart of precipitation, a line graph of wind speed, a polar plot of wind direction and speed, and a line graph of temperature.

Since its development in 1997, thousands of users (largely atmospheric scientists) have generated products from READY for their day-to-day needs and research projects. READY also provides a portal for users to become familiar with the HYSPLIT model and in the interpretation of its results.

## What READY Is Used For

There are several applications of READY. Typical user applications range from atmospheric emergencies associated with the release of hazardous pollutants, to routine poor air quality events, to various climatological studies. Having access to tools such as those within READY provides the user with quick access to meteorological forecasts interpolated to the location of interest.

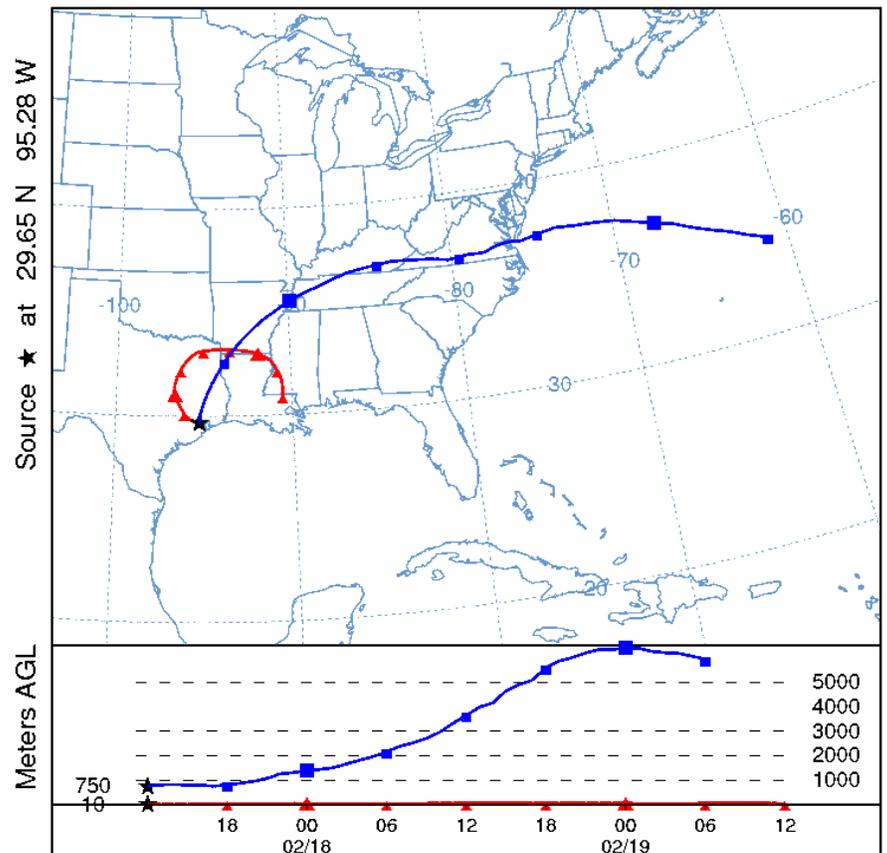
The primary application of READY is running HYSPLIT. Users can produce air parcel trajectories that follow the movement of the wind patterns defined by the meteorological models run operationally by the NOAA National Centers for Environmental Prediction (NCEP). Meteorological data (forecast and archived) are available to HYSPLIT on global and regional scale grids. Users can also model the dispersal of pollutants with HYSPLIT by tracking thousands of particles across the domain, as opposed to one or two particles for trajectories. In this way, pollutant plumes can be produced from such sources as wildfires, chemical or radiological releases, or volcanic eruptions.

Another application of READY is for users to be able to produce meteorological products for any location in the world based on the meteorological data produced by NCEP. These products include meteorograms (time series of meteorological variables), vertical profiles, wind roses, time-series of atmospheric stability, user-selectable two-dimensional maps, and forecast animations of meteorological data over North America and Europe. Although READY meteorological programs were initially designed just to support HYSPLIT, many users now use the meteorological display programs independent of HYSPLIT for a wide range of applications.

READY also provides links to other programs produced by ARL and other NOAA groups that offer additional support to air quality forecasters, meteorologists, emergency managers and National Weather Service Forecast Offices.

Finally, READY can be used as a diagnostic tool to provide air quality managers information on possible pollutant source regions that may have contributed to a bad air quality event.

NOAA HYSPLIT MODEL  
Forward trajectories starting at 1200 UTC 17 Feb 09  
12 UTC 17 Feb NAM Forecast Initialization



Example of two forward trajectories at different heights with source location being Houston, TX

---

### For More Information, Contact:

READY <http://ready.arl.noaa.gov/>  
HYSPLIT Model [www.arl.noaa.gov/HYSPLIT\\_info.php](http://www.arl.noaa.gov/HYSPLIT_info.php)  
ARL Transport & Dispersion R&D [www.arl.noaa.gov/atmosDisp.php](http://www.arl.noaa.gov/atmosDisp.php)

NOAA, Air Resources Laboratory  
1315 East West Highway, R/ARL  
SSMC #3, Rm. 3316  
Silver Spring, MD 20910  
Phone: 301.713.0295 ext. 100

Email: [arl.webmaster@noaa.gov](mailto:arl.webmaster@noaa.gov)