



# Air Resources Laboratory

## HYSPLIT Modeling System

### Simulating the Transport & Dispersion of Harmful Atmospheric Materials

The accidental or intentional release of chemical, biological, or nuclear agents or the eruption of volcanic ash can have significant health, safety, national security, economic, and ecological implications. ARL's transport and dispersion modeling system, called HYSPLIT, is a valuable and highly-used tool that helps explain how, where, and when potentially harmful materials are atmospherically transported and deposited. Having this understanding is essential for responding appropriately to prevent disaster and protect the health and welfare of the public and emergency response personnel.

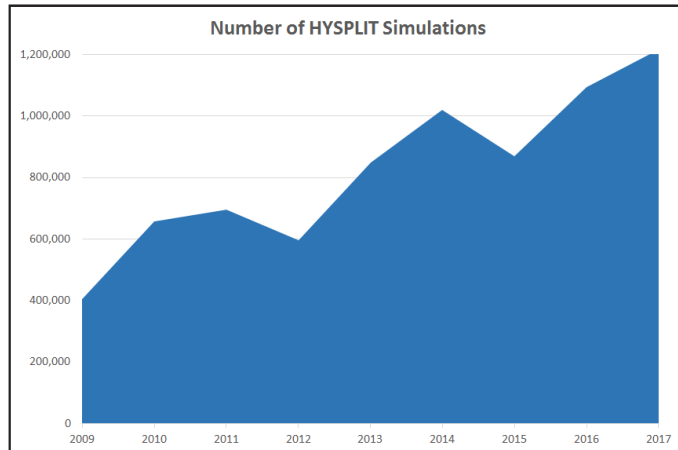
HYSPLIT has been continuously developed for over thirty years, and today it is one of the most extensively used atmospheric models in the scientific community. Some examples of its application include tracking and forecasting the release of radioactive material (e.g., Fukushima Daiichi nuclear disaster); chemical pollutants (e.g., mercury, sulfur dioxide, chlorine); and volcanic ash (e.g., Eyjafjallajökull volcano eruption). It has also been used to track and predict the movement of wildfire smoke and windblown dust.

NOAA uses HYSPLIT for both research and operational emergency response events. At the local and regional level, field forecasters regularly respond to requests for dispersion forecasts from state and local emergency managers. At the national level, the model is often applied to needs from the aviation industry and air quality managers. And, at the international level, NOAA coordinates with the World Meteorological Organization on information about expected transport and dispersion of radiation and possible source regions of clandestine nuclear and/or radiological releases.

HYSPLIT is also heavily used by academia, private companies, and other U.S. and international government agencies. Users may download the model to their computer, or they may run the model in a variety of web-based venues. In 2017, a new record was set with over 1.2 million HYSPLIT simulations performed using ARL's web server.



Examples of HYSPLIT simulations. Photo: NOAA



HYSPLIT simulations have seen a steady increase since usage tabulations began in 2009.

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HYSPLIT Model  
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