

# Volcanic Ash

## NOAA Volash Research

- Source Detection
  - Location, duration, magnitude
  - Remote sensing issue
  - Interim solution: eruption source parameters
- Transport and Dispersion
  - Grid scale defined by meteorological models
  - Sub-grid scale parameterized
  - Interim solution: ensemble forecasts
- Verification
  - Data assimilation – remote sensing issue
  - Requires a long-term event archive



## Dispersion Simulations Using HYSPLIT

HYSPLIT is set to use the same volcanic ash source term and produce look-alike output graphics as VAFTAD (Heffter and Stunder, 1993). The main differences between [running HYSPLIT for volcanic ash](#) and [running HYSPLIT at the ARL HYSPLIT web page](#) (unregistered or registered) is in the source term (the initial conditions of the substance being modeled) and the output graphics. For volcanic ash, a set of particles of a given size distribution are uniformly distributed in a vertical layer above the volcano. Additional options such as mass emission rate and wet deposition are not available for volcanic ash runs. All HYSPLIT options are available in the Windows-based version that may be downloaded [from the HYSPLIT main page](#).

Brief description of volcanic ash dispersion modeling:

### 1. Eruption input

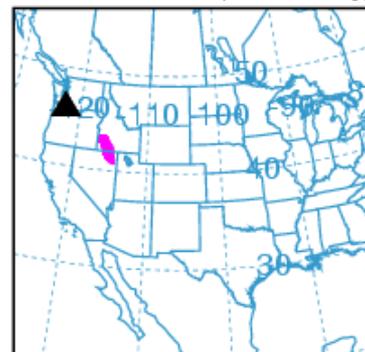
Required inputs are:

- ▶ Volcano latitude and longitude
- ▶ Volcano summit height
- ▶ Eruption date and time
- ▶ Eruption duration
- ▶ Ash column height
- ▶ Ash reduction level (none-small-medium-large)

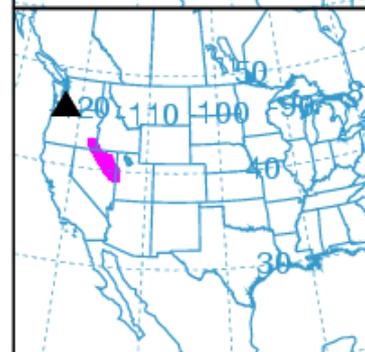
Preset input is a unit source (1 g) since the actual amount is not known in real-time. The ash particle distribution is described below.

### 2. Meteorological data input

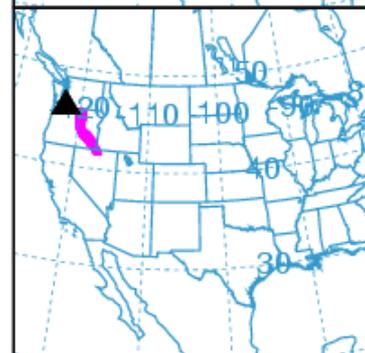
This HYSPLIT output is for a hypothetical volcanic eruption.



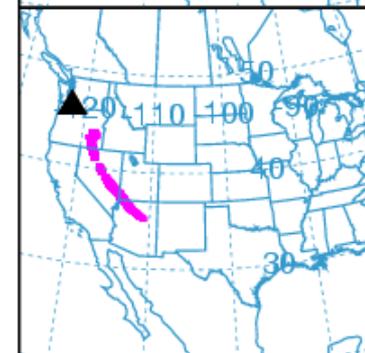
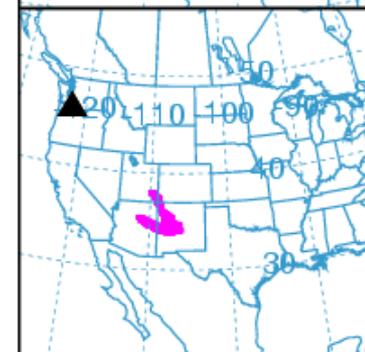
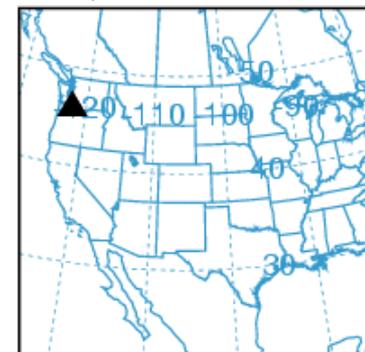
FL550  
FL350



FL350  
FL200



FL200  
SURFACE



**This web page is under construction and changes may be made at any time.**

		<a href="#">Run 1 (traditional)</a>		<a href="#">Run 2</a>		<a href="#">Run 3</a>							
		Deterministic		Deterministic		Meteorological offset ensemble							
		Source: one unit of mass		Source: <a href="#">ESP spreadsheet</a>		Source: one unit of mass							
						Number of members with conc>0		90th percentile		Probability of exceeding			
<a href="#">VAAC</a>	<a href="#">VOLCANO, from Smithsonian</a>	forecast hour	animation	scale	forecast hour	forecast hour	animation	forecast hour	animation	forecast hour	animation	Stamp (ensemble member) plots	Run specifications
anchorage	CLEVELAND	+6 Go	<a href="#">loop</a>	Medium Go	+18 Go	+6 Go	<a href="#">loop</a>	+6 Go	<a href="#">loop</a>	+6 Go	<a href="#">loop</a>	+6 Go	<a href="#">txt</a>
buenosaires	CHAITEN	+6 Go	<a href="#">loop</a>	Medium Go	+18 Go	+6 Go	<a href="#">loop</a>	+6 Go	<a href="#">loop</a>	+6 Go	<a href="#">loop</a>	+6 Go	<a href="#">txt</a>
tokyo	BEZYMIANNY	+6 Go	<a href="#">loop</a>	Medium Go	+18 Go	+6 Go	<a href="#">loop</a>	+6 Go	<a href="#">loop</a>	+6 Go	<a href="#">loop</a>	+6 Go	<a href="#">txt</a>
tokyo	KARYMSKY	+6 Go	<a href="#">loop</a>	Medium Go	+18 Go	+6 Go	<a href="#">loop</a>	+6 Go	<a href="#">loop</a>	+6 Go	<a href="#">loop</a>	+6 Go	<a href="#">txt</a>
tokyo	KLIUCHEVSKOI	+6 Go	<a href="#">loop</a>	Medium Go	+18 Go	+6 Go	<a href="#">loop</a>	+6 Go	<a href="#">loop</a>	+6 Go	<a href="#">loop</a>	+6 Go	<a href="#">txt</a>
tokyo	SHIVELUCH	+6 Go	<a href="#">loop</a>	Medium Go	+18 Go	+6 Go	<a href="#">loop</a>	+6 Go	<a href="#">loop</a>	+6 Go	<a href="#">loop</a>	+6 Go	<a href="#">txt</a>