The Puffin Application

Welcome to the Puffin application.

Running Puffin

Once you fill out the information for the eruption parameters, go to the run tab. Hit 'run puffin', 'run puff', then 'create animations'.

If you are using a previous puffin run: Hit 'run puff', then 'create animations'.

Images will be outputted to the output tab.

Some Expected Output Files

******_ash.cdf** Outputted by puff. These are the plots of where the ash particles are in the atmosphere.

******_ash.jpg** Outputted when you make images. These are images of the particles plotted on a map

FIELD.txt Outputted by puffin. This is the points for a plume.

weather.txt Outputted by puffin. Only created when you input a radiosonde similar to the type from the wyoming website. It is the given radiosonde translated into a version that puffin can use.

conc.jpg Outputted when you make images. This is the plume image.

Ashxp-Rainbow**.gif** Outputted when you make images. This is the ashxp gif.

Ashxp-Isopach**.gif** Outputted when you make images. This is the ashxp gif.

puffin.kmz This

FAQ

I can't find my radiosonde file.

In order to use your radiosonde file, you have to first upload it to Vhub. Use the filexfer popup box. You just need to click on the upload button and find your radiosonde. When you then browse for the radiosonde file, it will be there.

When I run puffin, I get unreasonable results.

Depending on the input parameters, certain plumes can collapse. Try varying the vent radius or the axial velocity.

I can't find my files.

If you did not use a runname, there should be a folder with numbers representing the date of the run in your home folder. If you used a runname, they should be in a folder labled with that runname.

Puffin Input Options

Previous Imput File Using a previous .inp file, you can load many of the relevant pieces of information into the gui.

Volcano Name Volcano name.

Volcano Coordinates Volcano's latitude and longitude, in digital degrees.

Eruption Date When the eruption starts. Format YYYY MM DD HH:MM

Volcano Temperature Vent temperature of the volcanic plume, in K.

Plume Shape This information is passed to 'puff', q.v.

Eruption Type This input determines the total grain size distribution.

Vent Radius Radius of the vent, in m.

Axial Velocity Initial speed of pyroclasts and gas from the vent.

Radiosonde File

File Location The location of a weather balloon (radiosonde) file. The weather balloon file should be a text file. Lines that do not have information should have a # sign at the front. Data lines should be separated by whitespace, and should not have missing entries.

Radiosonde Data Type What kind of information is in the important columns.

Column Numbers Which are the important data columns. You have to specify four columns, one for each of the four data types you specified in the "Radiosonde Data Type" entry. Note that the first column is numbered 1.

More Puffin Input

Generate Radiosonde from NWP If you have no relevant weather balloon file, one can be generated using numerical weather prediction databases. This requires the temperature database to be specified in the

databases tab.

Water Fraction Weight fraction of water in the erupting mixture.

Particle Dencity Density of most pyroclasts, in kg/cu m.

Particle Shape Particle shape factor from Wilson and Huang (1979).

Random Grain Mean Adds a small variation to the grain set by "Eruption Type".

Grain Size Mean/Standard Diviation These would only be used to override the total grain size distribution set by "Eruption Type".

Display Plume Outputs the necessary information to create a visualization of the volcanic plume. When the images are created, this will be made into a graph.

Puff Input Options

Ash Output Outputs intermediate ash files. Required for creating animations.

Run Hours How many real-time hours will be simulated.

Number of Particles The number of particles that will be simulated.

Grid Output

Grid Latitude/Latitude/Height Range The range over which particles will be simulated.

Previous Puff run Reads in a previous puff.gui file to use previously ran puffin run. Note that the following entries will normally be either generated by a puffin run, or read from a puff.gui.

Puffin Output Here are a series of options normally generated by puffin.

Databases Input Options

Model The name of the atmospheric model you are using (reanalysis, gfs, etc.).

Directory The directory where your atmosphere's netcdf file is located.

Mask The filenames of the data files. The naming protocol uses YYYY as the year, MM as the month, DD as the day, and HH as the hour.

VarUname The variable within the netcdf file that represents the name of the variable used. This can be found by running `ncdump -h` on the file.

Databases To input

UWND The u component of wind (in miles/hour). Required for running puff.

VWND The v component of wind (in miles/hour). Required for running puff.

Temperature The air temperature (in Celsius). Only required for generating a weather balloon file for puffin. Not required if "Generate radiosonde from NWP" is not selected.

Irods Name This is only needed for remote runs. The Irods username is used to convert the directory paths of an irods mount into the directory paths on the cluster. Note that you have to use public

Image Output Options

Images to Output Selects which images will be created. NOTE: Ashgmt requires files that currently aren't on vhub. It will not work.

Choose Background File The background file used for ashgmt and ashxp.

Latitude/Longitude Range Determines the range of how the image will be created.

Particles to plot Lets you limit which kinds of particles will be plotted.

Ashgmt Map Type If you are using ashgmt, what kind of map will be made.

Image Magick Options

Delay The speed at which the animated image will move.

Size The size the image will be while it is being made.

Resize The size the final outputted image will be.

Run Tab Options

Output Folder The folder where the output will be stored.

Run Name Creates a named folder, in which the outputs will be placed.

Run Location Either specify local or u2-grid. Note that puffin will always run locally, no matter which is selected.