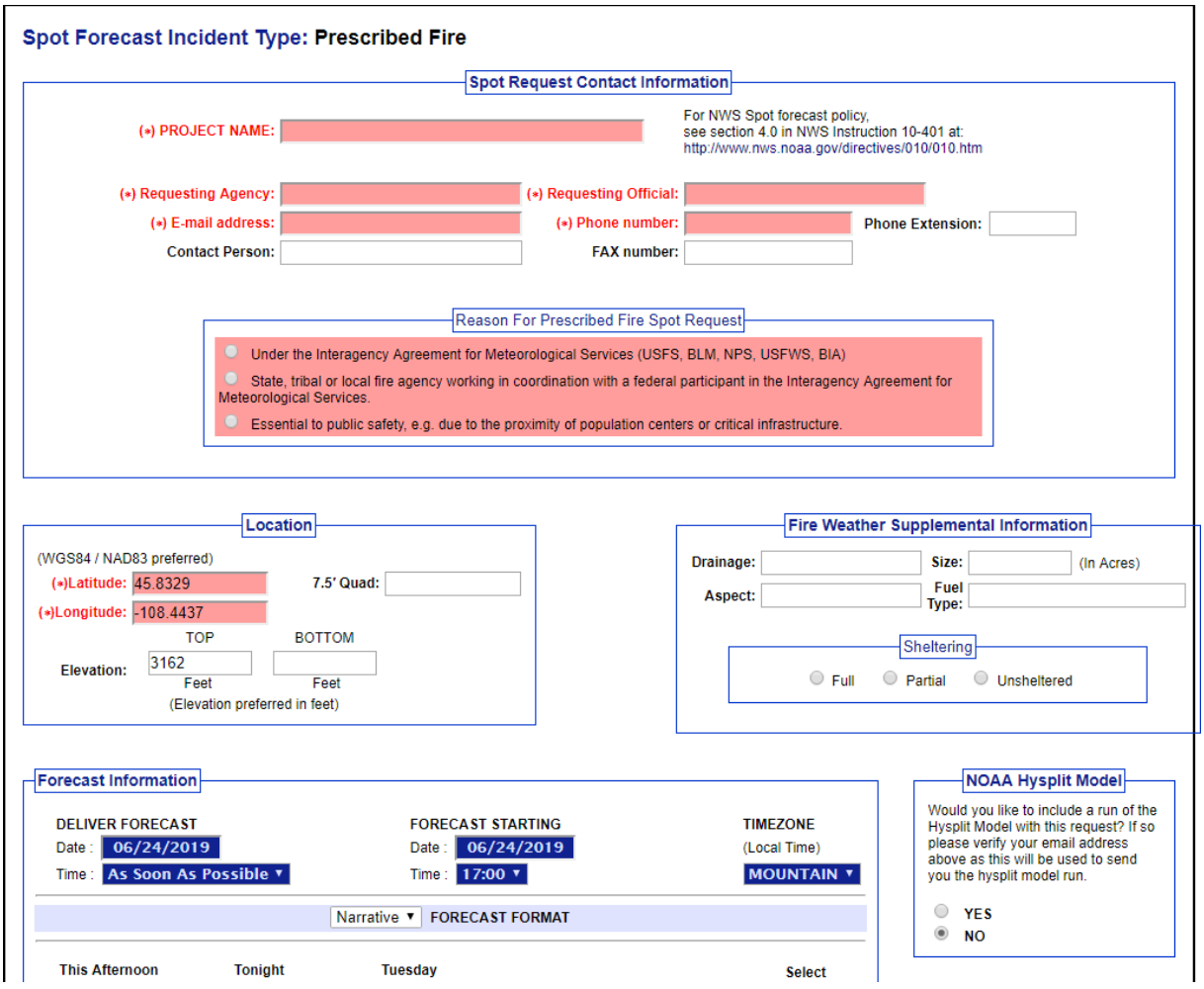
HYSPLIT Trajectory Model Products in Spot Weather Forecasts

Introduction: The National Weather Service (NWS) providing optional HYSPLIT trajectories as part of a Spot Weather Forecast request. This paper presents a brief overview of the HYSPLIT trajectory information.

How to Request HYSPLIT Modeling: On the request form on the weather.gov/spot website, there is a NOAA Hysplit Model section where customers can select the "yes" option to receive the HYSPLIT Trajectory Output. An email must also be included in the request form (in the email address box on the form) if HYSPLIT output is desired.

All requests submitted from the weather.gov/spot webpage are monitored using a computer script running at the National Weather Service Office in Billings, MT. If HYSPLIT=Yes and an email address has been included in the request, then the computer script will submit a HYSPLIT model request via email to NOAA ARL. At times, this computer system goes down for system maintenance, so the HYSPLIT model request is not sent. If you do not see your output in 30 minutes, please call the responsible forecast office for the Spot Request and ask them to submit the HYSPLIT model request manually through the NOAA ARL website.



What information is provided? The HYSPLIT trajectory model provides simulated smoke plume trajectory information by tracking a parcel of air that is carried by the mean 3-D wind field of the meteorological model (turbulence is not included). The air parcel is released from three different atmospheric heights above ground level (AGL) – 500 m (1640 ft), 1500 m (5000 ft), and 3000 m (10,000 ft) – representing estimated plume heights from which the transport will commence. The HYSPLIT trajectory starting time is the forecast start time in the Spot Weather Forecast. Trajectory model results typically extend out 36 to 42 hours from the start time. Each point along the trajectory is another hour out in time. Thus, the trajectory is similar to a time-lapse photograph of where a parcel of air could travel over the 36 to 42 hour duration, given the AGL release height. If a different time was requested or the plume rises to a different height than displayed, then the trajectory would likely yield different results. The model results are e-mailed in three formats:

1. A table showing the hour by hour raw data results, embedded into the e-mail.
2. An attached file showing graphical results in .gif format (symbols at 6-hour intervals along the trajectory).
3. An attached file with the results in .kml format for uploading into Google Earth.

For the .gif and .kml files, the trajectories are color coded by AGL trajectory release height – red = 500 m (1640 ft), blue = 1500 m (5000 ft), and green = 3000 m (10,000 ft).

Remember, HYSPLIT trajectory model output is designed to supplement the Spot Weather Forecast; with the modeling results showing downwind air parcel locations which approximate the smoke plume centerline. If additional information on smoke transport or dispersion is necessary such as potential movement of the smoke plume towards the ground and areas of concern, consider HYSPLIT Dispersion or 3-D particle model at the NOAA Air Resources Laboratory (ARL) web page http://ready.arl.noaa.gov/HYSPLIT.php.

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