

Abstract: **Dispersion Simulations using HYSPLIT for Sagebrush Tracer Experiment**

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The Sagebrush experiment, led by the Field Research Division of the Air Resources Laboratory (ARLFRD) of NOAA was conducted at the Idaho National Laboratory (INL) during October 2013. The experiment has tracer releases on five different days, all occurring in the afternoon in stability of neutral with higher wind speeds and unstable conditions with low higher wind speeds. Sampling network for tracer concentration was implemented within a 3-km range from the release location and samples were taken in 10-minute averages. NOAA's dispersion model, HYSPLIT, was originally designed for offline approach by using a conversion program to extract parameters from archived meteorological files for the dispersion calculation. The HYSPLIT has inline coupled with WRF that the dispersion is calculated simultaneously with the meteorological prediction resulting in a more consistent depiction of the state of the atmosphere and dispersion simulation. We applied the offline and inline version of HYSPLIT, driven by WRF meteorology using different PBL schemes, to simulation the tracer releases and evaluated the results with concentration measurements during the Sagebrush experiment. The dispersion runs driven by WRF data based on the MYJ PBL scheme showed the best statistical performance for release #3 while the WRF data based on the YSU PBL scheme produced a better HYSPLIT results for release #5. For the inline and offline comparison, the statistical score of inline simulations was better than the offline runs in three out of four releases.