Identifying Pollutant Sources in the El Paso Region

Cordova, S.A[1]; Fitzgerald, R[2]; Cohen, M[3], Lu, D[4]

[1,2]University of Texas at El Paso, [3]NOAA Air Resources Laboratory; [4]Jackson State University

This study aims to identify pollutant sources in the El Paso region for 2024 using backward trajectories and dispersion simulations conducted with the Hybrid Single-Particle Lagrangian Integrated Trajectory (HYSPLIT) model, developed by NOAA's Air Resources Laboratory. The source-receptor analysis focuses on high $PM_{2.5}$ events (concentrations >35μg/m³), utilizing data collected by the Texas Commission on Environmental Quality (TCEQ).

Uncertainty in the analysis is addressed through several approaches: (a) evaluation of the meteorological datasets used to drive the HYSPLIT model by comparing them against in situ meteorological observations from the region, and (b) sensitivity analyses to assess the impact of varying model parameters, including meteorological inputs and starting heights, on simulation outcomes.

For the event on February 28, 2024, a maximum daily $PM_{2.5}$ concentration of 111.9μg/m³ was recorded. Source attribution for this event was analyzed using a computationally efficient particulate matter source apportionment algorithm, Particulate Source Apportionment Technology (PSAT). HYSPLIT trajectory and dispersion simulations were also carried out to analyze this event, using meteorological data from the NOAA High-Resolution Rapid Refresh (HRRR-NECP) Near Surface Smoke Product model and other NOAA weather models.

This work is critical for identifying emission sources and informing the development of targeted air quality control strategies to mitigate pollution impacts in the region.