

ENERGY EMISSIONS MODELING AND DATA LAB

Regional Mass Balance Flight Tool

Regional mass balance flights have been widely used in providing snapshots of regional emission estimates. Emissions are estimated by making methane concentration measurements upwind and downwind of a region and calculating the total amount of methane entering and leaving the region. The difference in methane entering and leaving the region is assumed to be due to emissions from sources immediately upwind and downwind of the flight path; for regions with a high density of sources, emissions from some sources near the region boundaries will enter or leave the region bounded by the mass balance flight path.

Regional Mass Balance Flight Tool

Objective:

To accurately define sources detected by mass balance flights.

Functionality:

- **Data Analysis:** Using wind trajectories from public sources (HYSPLIT and the high-resolution rapid refresh meteorological data sets) determine sites captured by downwind legs of mass balance flights.
- **Visualization:** Offering clear, intuitive visualizations for sources captured.



Use Cases

Source Footprint Analysis:

- Map source footprints for mass balance flights at specific times and specific locations.

Time varying emissions:

- Sources at different distances upwind of the downwind mass balance flight path, will have different times required for emissions to reach the downwind flight leg. These transport times can extend over multiple hours for large mass balance regions. If emissions vary over time, users can identify the times for each source to have its emissions reach the downwind flight path.

Status

Beta testing:

- We are currently developing a beta-test version of the tool.