

Improving Regional Air Quality Modelling Using Surface and Satellite Observations



Author Mariel Friberg

Science Question: How can we use aerosol data from satellites and ground monitors to improve regional air quality (AQ) model predictions of airborne fine particles ($\text{PM}_{2.5}$)?

Finding: Our approach integrates ground-based AQ monitor and satellite measurements of particle amounts and chemical types (from MISR) with physically-based model simulations to identify local urban hotspots and regional dispersion patterns of $\text{PM}_{2.5}$. Satellite aerosol-attribute products provide regional context, and decrease error and uncertainty in surface AQ characterization.

Impact: This improved approach produces better spatial, temporal, and categorical $\text{PM}_{2.5}$ exposure maps over wider areas.

Why It Matters: Poor AQ due to concentrations of airborne particles create acute as well as chronic health hazards to exposed populations and ecosystems. With more accurate modeling, we can support epidemiological studies and inform policymakers that shape public health and environmental policy.

