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FEDERATING SPACE, AIR, AND GROUND AIR QUALITY DATA TO IMPROVE OUTCOMES IN  
CITIES AROUND THE WORLD**Abstract**

Air pollution is one of the world's leading factors for early deaths. Every five seconds, someone around the world dies from the adverse health effects of air pollution. 92

The technical aspect is to use high-resolution, remote-sensing satellite imaged of atmospheric chemicals and particulate matter to forecast air quality. By combining satellite data with ground-sensor data from city networks, we create a hyper-local forecasting dataset that can be combined with wildfire, smoke, and urban heat data. We utilize government maintained ground-based PM2.5 and meteorological sensor data. We also use real-time remote-sensing satellite imagery of wildfire and smoke data from the NASA MERRA-2 and MODIS collections. Because satellite data is available to all cities, this creates a data layer for cities across the world to build from.

Workshops have helped cities like London, Mexico City, and Durban use these models for forecasting, and to create the basis for digital twins across these and other cities. Such digital twins provide a framework for comparative forecasts, effective government policies, and saving lives. This project is funded through NASA's Advanced Information Systems Technology Program.