

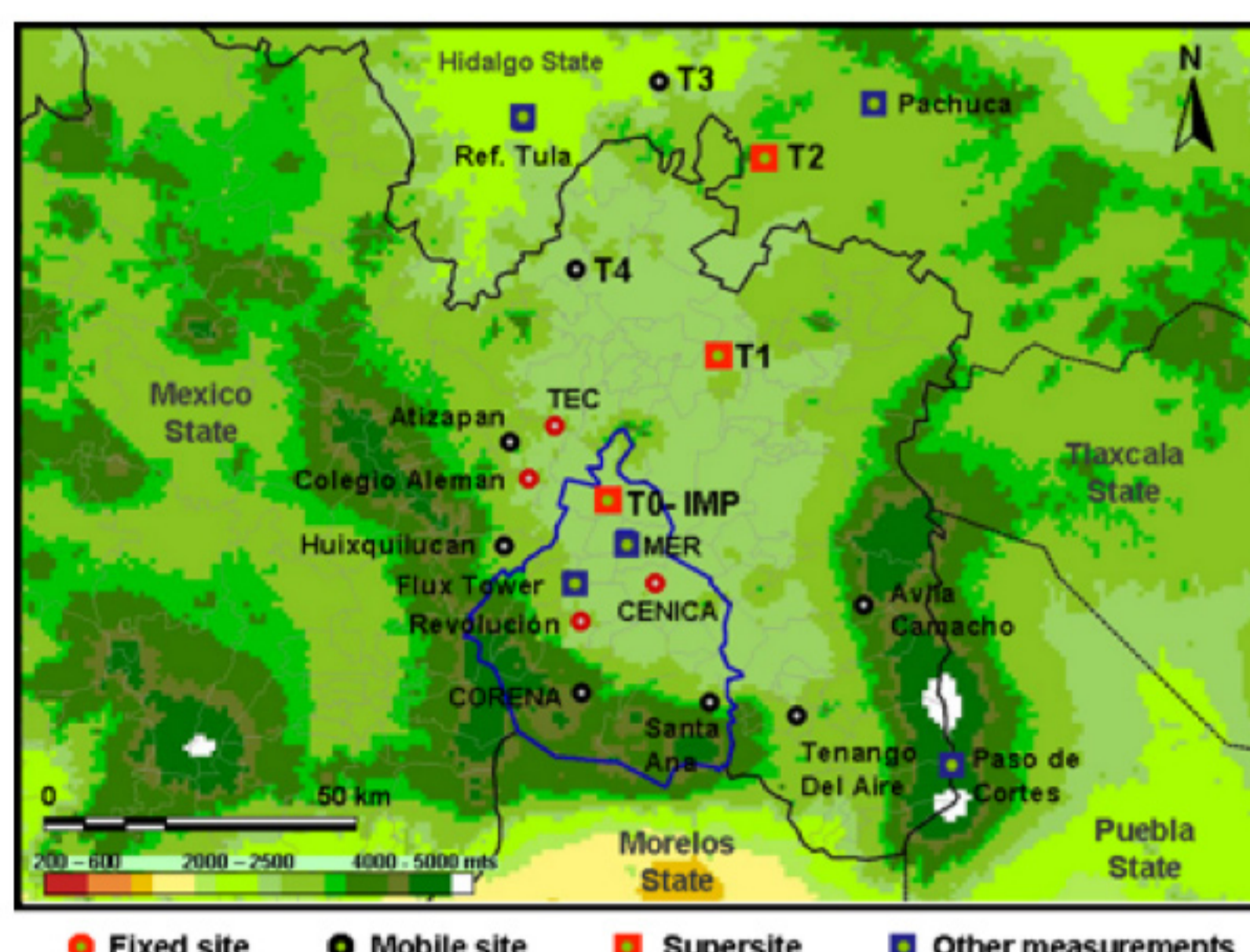


OTHER GROUND-BASED MEASUREMENT SITES

Mobile Units and Fixed Stations at Boundary Sites: Criteria Pollutants

In order to acquire greater knowledge on the regional impact of pollutants emitted by the Mexico City Metropolitan Area, the MILAGRO Campaign will conduct a study on the environmental conditions at the city's boundary sites. This information will help to better understand the transport mechanisms of pollutants between the region and its surrounding areas. Consequently, a network of monitoring stations has been developed to measure criteria pollutants (CO, O₃, NO_x, SO₂ and PM₁₀) and meteorological parameters.

The monitoring network consists of eight mobile units. During the month of March, the mobile units will be deployed to MCMA boundary sites. Once there, they will continuously monitor the air quality of the area.



Locations of Mobile Units

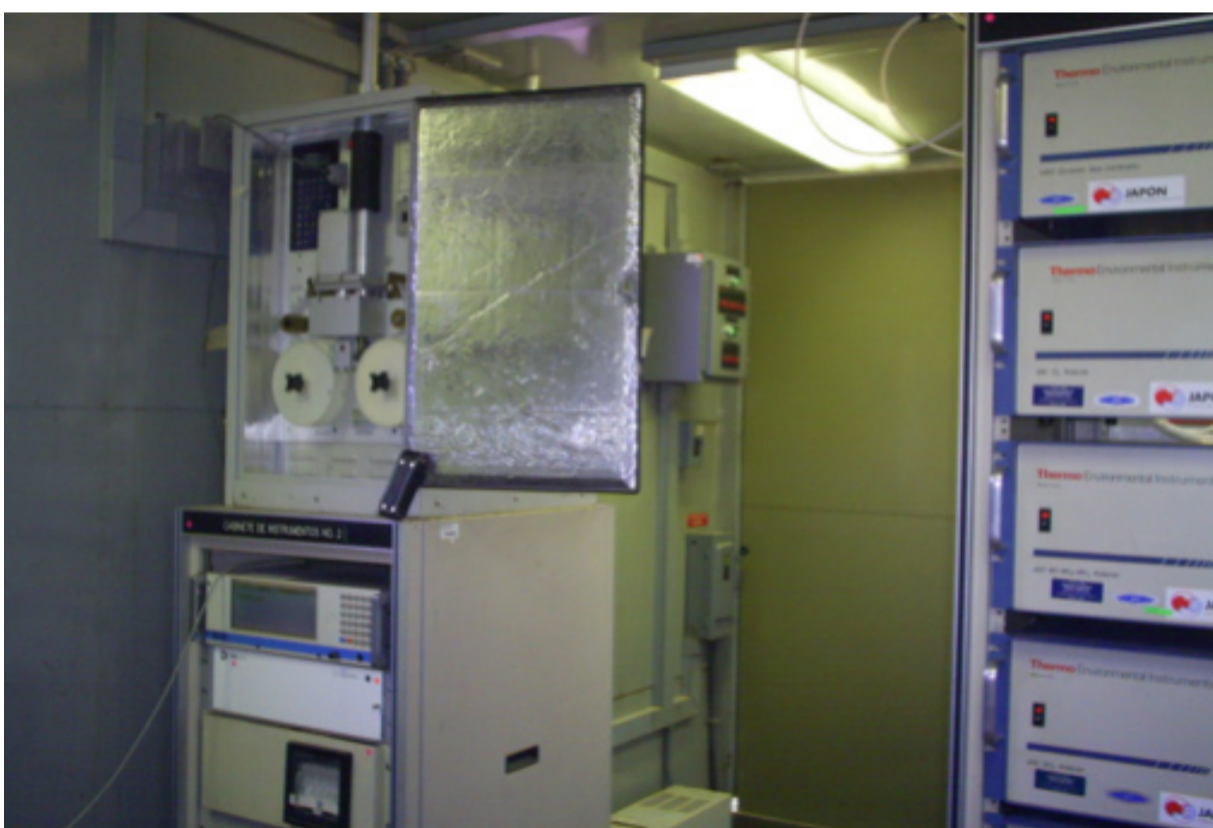
- Atizapán Airport
- Huizquilucan
- Technological University of Tecámac
- La Bisnaga Ranch
- CORENA
- Santa Ana
- Tenango del Aire
- Avila Camacho

Fixed Stations

- ITESM Lago Guadalupe
- Colegio Alemán

This study is being conducted in collaboration with the following institutions:

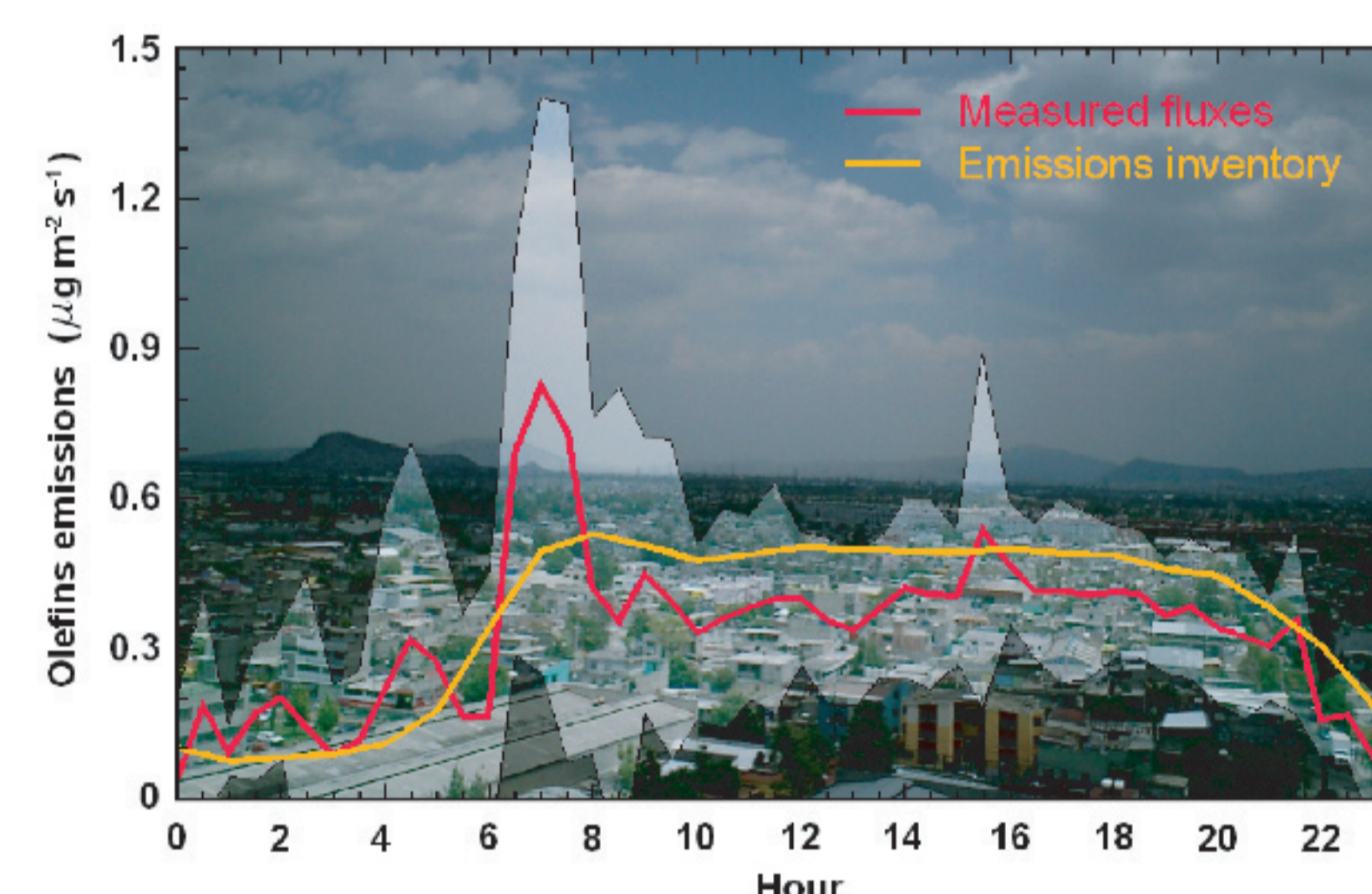
- Government of the Federal District
- Government of the State of Guanajuato
- Government of the State of Hidalgo
- Government of the State of Mexico
- Government of the State of Nuevo Leon
- Government of the State of Queretaro
- National Institute of Ecology
- Center for Atmospheric Sciences, UNAM



FLUX TOWER

The flux tower measures the overall pollutant emissions from vehicles, industries, shops, restaurants, houses, etc. In other words, it measures pollutant emissions from a large district-sized area without differentiating between emission sources. The tower is equipped with sensitive instruments that measure the wind's velocity 10 times per second, the temperature and other meteorological parameters. These instruments also measure the concentration of pollutants of some species of hydrocarbons and carbon dioxide, among others. The emissions are calculated through fluctuations in vertical wind velocity and pollutant concentrations measured at 30 minute intervals. This technique is known as turbulent covariance.

The measurements conducted by the flux tower help to evaluate the emissions inventories used by air quality models. Environmental policies are designed based on these models. For example, the emissions of olefinic hydrocarbons are measured using the flux tower. These types of hydrocarbons are highly reactive in the atmosphere and contribute to the formation of ozone. The figure on the right illustrates a comparison of emissions of olefinic hydrocarbons measured by flux tower in Iztapalapa during April 2003, with the emissions reported in the emissions inventory for that same district. The figure shows the similarity between the measurements taken by flux tower and those of the emissions inventory. The clear shadow represents the variation of emissions measured with the flux tower.



MEGAMex Project

The Paso de Cortés is located in the Izta-Popo national park. This atmospheric monitoring site has been actively measuring different properties of aerosols and of certain pollutant gases since November 2005. In addition, it also measures solar radiation and different micrometeorological parameters like the turbulence caused by the surface and the heat exchange between the atmosphere and the Earth's surface. These measurements help evaluate the effects of Mexico City's atmospheric pollution in cloud formation and adjoining ecosystems.



Microlight Aircraft

The microlight aircraft funded by IMK-IFU, Garmisch-Partenkirchen, Germany with logistical support and cooperation with UNAM, will be based in Puebla International Airport PBC and typically enters the Mexico City basin along the motorway Puebla Mexico. It normally leaves the area in the south at Cuautla for return to Puebla east of Popocatepetl. It will measure aerosols, ozone and radiation on both sides of the volcanoes.



Measurement Site in the City of Tula, Hidalgo

The City of Tula is located in the Valley of Mezquital, 83 miles northeast of Mexico City, at an altitude of 2100 m above sea level.

The region is characterized by having a semiarid climate and highly eroded terrain, caused by the intense exploitation of the land which is mined in open pits for the production of cement and other construction materials.

In addition, Tula is located within the Tula-Vito-Apazco industrial strip where industries such as the Miguel Hidalgo refinery and the Francisco Pérez Ríos Thermoelectric power plant are located.

Rapid urban and industrial growth in this region have led to the deterioration of the air quality, particularly in reference to the concentration of suspended particles and, more recently, to the concentration of sulfur dioxide (SO₂). This last one is emitted mostly by power and energy industries (refinery, petrochemistry and thermoelectric).

