



The Spatial Distribution of Tropospheric Ozone Concentration Associated to Land Use in the São Paulo Metropolitan Area, Brazil

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Atmospheric Pollution presents a great challenge in the environmental and health management of the great urban centres, affecting all who reside in these locations. Presently, one of the most hazardous pollutants in the São Paulo Metropolitan Area (SPMA) is tropospheric ozone (O_3). Its formation and control are influenced by a number of different factors, which involve precursor emission, atmospheric and environmental variables such as incoming shortwave solar radiation, and land use in the surroundings of the monitoring site (which alter atmospheric chemistry locally), creating a complex picture of temporal and spatial distribution of this pollutant in the study area. In addition to its complexity, O_3 does not present a decreasing tendency through the years in the study area and its highest concentrations are measured in places often visited by the population, such as urban parks and squares, yet typical of having lower concentrations of vehicular pollution.

In order to properly assess these issues, a better understanding of the processes related to the control of tropospheric ozone is required. Using data from the State Environmental Agency (CETESB), we intend to study the spatial distribution of tropospheric ozone in the SPMA. Previous works on the subject have shown that land use is an important factor in the control of O_3 concentrations. From this understanding, we intend to look for associations between ozone concentrations and land use throughout the city, and also in specific locations, such as parks and squares, known for high ozone concentrations in the city. In order to assess the impact of land use change in the pollutant's concentration, the atmospheric model WRF/Chem will be used. This will be done by replacing, in the model, a typically urbanized area in the city by that of a park, and checking the impacts on ozone concentrations afterwards. Through sensitivity tests in the model, we also intend to work with other parametrizations that define the impact of urbanization in the concentration and spatial distribution of tropospheric ozone.