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# Impact of megacities on the regional air quality: A South American case study

Claas Teichmann and Daniela Jacob
Max Planck Institute for Meteorology, Hamburg, Germany (claas.teichmann@zmaw.de)

The two major sources of air pollutants in South America are anthropogenic emissions and biomass burning emissions. Anthropogenic megacity emissions play a special role with respect to air pollution: a relatively large amount of pollutants is released in a small area potentially leading to non-linear chemical processes, which may further aggravate air pollution. Megacities in South America - themselves being highly populated - are mainly located in coastal areas which have a relatively high population density. Wildland fires on the other hand are located in the inner continent, predominantly south of the Amazon basin, in a region with relatively low population density.

In order to compare the impact of these two emission sources in South America on a climatological timescale, the regional climate model REMO is used, which calculates meteorological processes together with chemical processes. The extent of transported pollution and the number of people potentially affected by the two emission sources is investigated as a case study for the year 2000 for different trace gases (e.g., carbon monoxide and ozone). The production of secondary pollutants such as ozone is of special interest as its concentration may be reduced close to the highly concentrated emissions of megacities leading to a comparatively small impact of ozone on population in this area.