

# Exploring atmospheric stagnation during a severe particulate matter air pollution episode over complex terrain in Santiago, Chile

Toro A, Richard

Kvaki?, Marko

Klai?, Zvezdana B.

Kora?in, Darko

Morales S, Raúl G.E.

Leiva G, Manuel A.

© 2018 Elsevier LtdA severe air quality degradation event occurred in the Santiago Metropolitan Area (SMA), Chile, in June 2014. Meteorological and air quality measurements from 11 stations in the area as well as numerical simulations using the Weather and Research Forecasting (WRF) model were used to explain the main reasons for the occurrence of elevated particulate matter (PM) concentrations. The conditions were characterized with formation of a coastal low in central Chile between the southeastern anticyclone and a high-pressure system over Argentina. At a local scale, these conditions generated a depression at the base of the inversion layer, an increase in the vertical thermal stability, lower humidity and low-wind conditions, which were conducive to a decrease in pollutant dispersion and insufficient ventilation of the polluted air. Measurements and simulations using the WRF model revealed a vertical structure of the boundary layer during these stagnant conditions and provided a