



## **Modeling study of biomass burning plumes and their impact on urban air quality; a case study of Santiago de Chile**

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Wildfires are a significant direct source of atmospheric pollutants; on a global scale biomass burning is believed to be the largest source of primary fine particles in the atmosphere and the second largest source of trace gases after anthropogenic emission sources. During the summer of 2014, an intense forest and dry pasture wildfire occurred nearby the city of Santiago de Chile. The biomass-burning plume was transported towards the metropolitan area of Santiago and exacerbated the air quality in this region. In this study, we investigated this wildfire event using a forward plume-rise and a chemistry (WRF/Chem) simulation. These data sets provided an opportunity to validate a regional air-quality simulation over Santiago, and a unique case to assess the performance of biomass burning plume modeling in complex topography and validated against an established air quality network. The results from both meteorological and air quality models provide insights about the transport of biomass-burning plumes from the wildfire region towards the metropolitan region of Santiago de Chile. We studied a seven-day period between January 01-07, 2014, and the impact of biomass burning plume emissions estimated by Fire Inventory from NCAR version 1 (FINNv1) on the air quality of Santiago de Chile.