



Analysis of the impact of biomass burning in Australia on cloud properties using historical long-term satellite records

Jennifer Small and Jonathan Jiang

Jet Propulsion Laboratory, California Institute of Technology, 4800 Oak Grove Drive, Pasadena, CA 91109

Aerosols are one of the most important but poorly understood factors that influence global climate change, either directly by interaction with radiation or indirectly through interaction with clouds. We investigate changes in cloud properties related to biomass burning events in Australia using multiple satellite data records spanning nearly 30 years. Australia was identified as a region of interest due to 1) the regional nature of aerosols and wide spread biomass burning on the continent, 2) the occurrence of two distinct fire seasons, one in the north and a second in the south which occur during different months and 3) prolonged drought for the last decade.

The analysis uses TOMS and OMI aerosol optical depths to identify periods of intense burning along with MODIS fire counts, cloud properties from ISCCP, and NCEP/NCAR reanalysis data to characterize cloud properties and meteorological conditions. Aerosol-cloud interactions are investigated by analyzing inter-annual, decadal variability, and long-term trend of biomass burning generated aerosols and the corresponding long term trends in cloud properties.