



UNIVERSITY OF THE PHILIPPINES

Master of Science in Meteorology

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*Characterizing the Transport and Meteorological Factors in Leading to the 2019
Southeast Asian Transboundary Haze in the Southern Philippines*

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ABSTRACT

The present study investigated the effects of meteorological systems on Indonesian forest fire and the transport of particulate matters leading to the transboundary haze episode in the Philippines, a representative country in Southeast Asia (SEA) affected by this event. The main goal is to investigate the prevailing meteorological pattern and the behavior of the pollutants during the event. Data and other relevant information were obtained from ground-based stations of DENR-EMB, NASA-AERONET, PAGASA, and satellite data from ECMWF-CAMS and HIMAWARI-8. The data gathered were divided into three periods, namely: pre-haze (August 01, 2019), during the haze (September 13-21, 2019), and post-haze (October 01, 2019). Results of the data analysis showed that the particulate matter concentration and aerosol optical thickness during the smoke haze episodes increased, and the particulate carbon, water-soluble ions, and mono sugars likewise increased by a factor ranging from 15% to 288% compared to non-haze periods. Backward and forward air trajectories using the NOAA-HYSPLIT and wind vectors from MERRA-2 were plotted to find the sources of biomass burning to the recurring smoke haze in this region. In conclusion, air trajectory analysis and the results of aerosol sample analysis using ground-based data indicate that the transboundary air pollution from Indonesia influenced the haze event experienced in the Southern Philippines.

KEYWORDS: Transboundary Haze, Emission Burning, Southeast Asia, Indonesia, Philippines, Air Quality