

Lake-Atmosphere Interaction at Lake-Mainit, Philippines

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ABSTRACT

Lake-atmosphere interaction deals with the exchanges of heat, energy, and momentum between the lake and the atmosphere. Most studies about lake-atmosphere interaction are on temperate lakes due to higher thermal gradient compared to the tropics. However, lake water surface temperature (LWST) in tropical Lake Victoria has been revealed to have an important role on local and regional climate. In the Philippines, lakes are smaller in scale compared to lakes with existing studies. The domain of this study will be Lake Mainit, found in the northeastern part of Mindanao island, the deepest and 4th largest lake in the Philippines. This study aims to investigate the lake-atmosphere interactions over Lake Mainit using observations, and using the coupled lake-atmosphere model, simulations with varying LWST profiles, as well as different wind regimes, will be made to determine the impact to precipitation. Determining the diurnal cycles of precipitation will be first based on direct observations with automatic rain gauges of DOST-ASTI along the basin of the lake. For the coupled model, WRF and either POM or DELFT3D will be used for the 3D representation of the atmosphere and the lake, respectively. Atmospheric data will be from ERA5, while lake profiles will be adapted from previous studies.

Keywords: Lake Mainit, tropical lake, lake-atmosphere interaction