The Influence of Laguna Lake on Local Climate in Metro Manila

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Abstract

Metro Manila is highly vulnerable to climate-related hazards, including extreme rainfall and temperature events. Due to the thermal difference between the lake and the surrounding land, lakes can influence local weather and climate. Shallow lakes such as Laguna Lake are highly responsive to atmospheric conditions. Its influence can further extend to other meteorological variables, like humidity and water vapor. Hence, studying the role of Laguna Lake in the local climate is increasingly important. This study aims to evaluate the influence of Laguna Lake on temperature and precipitation. Specifically, it will characterize the lake effect on daytime and nighttime temperatures. The study will also analyze the intensity and distribution of convective rainfall in connection with the lake's presence during easterlies.

The study will use the Weather Research and Forecasting (WRF) model. To quantify Laguna Lake's influence on local climate, two experimental sets will be conducted. The first experiment will include the lake, and the second will exclude the lake and replace it with natural vegetation. To see if the lake's presence drives localized precipitation, only easterly driven convective rainfall will be analyzed.

The results of this study will provide a deeper understanding of how lakes influence local climate, especially the temperature and precipitation. The findings can also serve as a basis for government agencies in developing preparedness plans to address the lake's climate-related effects.

Keywords- lakes, temperature, convective rainfall, local climate