

# **THE INFLUENCE OF THE EL NIÑO SOUTHERN OSCILLATION ON SHEAR LINE OCCURRENCE IN THE PHILIPPINES DURING THE WINTER MONSOON SEASON**

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## **ABSTRACT**

During the boreal winter months, the convergence of the cold, dry air of the Northeast Monsoon (Amihan) and the warm, moist Pacific air (easterlies) can lead to the formation of shear lines. These shear lines are characterized by abrupt changes in wind speed and direction, leading to enhanced low-level convergence and vertical motion, which can trigger significant convective activity and heavy rainfall events. These shear line events have been linked to extreme rainfall that caused flooding, landslides leading to socioeconomic impacts in the Philippines. However, shear lines remain relatively understudied, leading to critical gaps in understanding their mechanisms and impacts. This study aims to analyze the characteristics of shear lines in the Philippines—such as their frequency and duration—with a focus on their interaction with the El Niño–Southern Oscillation (ENSO) during the winter monsoon season. The research will utilize data from the European Centre for Medium-Range Weather Forecasts Reanalysis (ERA5) and PAGASA Station Data and high-resolution gridded rainfall data (ClimGridPH) from 1990 to 2024. ENSO phases will be identified using the Southern Oscillation Index (SOI) and Oceanic Niño Index (ONI). A combination of regression, correlation, and composite analyses will be employed to examine the relationship between ENSO variability and shear line occurrence. The results of this study are expected to enhance our understanding of how ENSO influences shear line occurrence. Such insights could contribute to the development of improved forecasting models and more effective disaster preparedness strategies.