

Variability of phytoplankton primary productivity during three *El Niño* events in the Mindanao Dome, Western Pacific Ocean

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The Mindanao Dome is a cyclonic circulation located on the east of the southern Philippine Island of Mindanao in the western Pacific Ocean. It assists upwelling and thereby enhancing the primary productivity in the area. Variations in primary productivity may influence the overall ocean productivity of a given area. *El Niño* events generate widespread climate and ecosystem changes in the Pacific Ocean and in regions beyond. The relationship between oceanic phytoplankton and climate variability to assess the ecosystems has gained an increasing attention recently. Therefore this study was aimed to evaluate the variability of chlorophyll-a, which is a proxy of primary productivity and also some related physical parameters including sea surface temperature (SST), sea surface height (SSH) of the area to examine the influence of 1997-1998, 2009-2010 and 2015-2016 *El Niño* events. This assessment was mainly based on the data derived from remote-sensed satellite data from Sea-viewing Wide Field-of-View Sensor (SeaWiFS) and Moderate Resolution Imaging Spectroradiometer (MODIS) for chlorophyll-a. Data from NOAA Extended Reconstructed Sea Surface Temperature dataset and NCEP Global Ocean Data Assimilation System was used for SST and SSH data respectively. During our study, the estimated chlorophyll-a concentration (mg/m^3) anomalies were +10.02 %, +3.35 %, +17.44%, SST ($^{\circ}\text{C}$) anomalies were -1.65%, -0.71%, -0.47%, and SSH (m) anomalies were -29.10%, -11.17%, -45.02% respectively for the 1997-1998, 2009-2010 and 2015-2016 *El Niño* events. A similar trend was found throughout the three events with some variances in the Mindanao Dome area. Among the three events, the highest observed chlorophyll-a concentration ($0.12 \text{ mg}/\text{m}^3$) was found during the 1997-1998 *El Niño* event for the Mindanao Dome. These biophysical variabilities during the *El Niño* events will help to improve our understanding of the changes in the marine ecosystem, thus the effect to the productivity of the area.

Keywords: Chlorophyll-a, *El Niño*, Primary productivity, Pacific ocean, Satellite data