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RELATING FRONTAL FEATURES AND FISHING ACTIVITY IN THE BOHOL SEA USING MULTI-SENSOR CHLOROPHYLL-A AND VIIRS NIGHT LIGHT DATA

by

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ABSTRACT

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Ocean fronts are high-gradient zones of enhanced water properties that separates areas with different water masses. Previous studies have shown that these ocean features can act as bioaccumulation mechanisms, leading to higher productivity. Furthermore, frontal features have been related to fish distribution and abundance, encouraging the use of frontal data in elucidating potential fishing grounds of commercially important fisheries. However, this approach remains to be largely unexplored in the Philippines. Thus, this study was conducted to investigate the relationship between frontal features and fishing activity in the Bohol Sea area, a major fishing area in the Philippines. Location and frequency of fronts were identified from merged multi-satellite chlorophyll-a (CHL) data while dense fishing areas were mapped using clustered night light data from the Visible Infrared Imaging Radiometer Suite (VIIRS). Collocation of frontal features to dense fishing activities in both space and time was then used to identify robust patterns for potential fishing grounds. In this area, a total of 17 high-frontal areas referred to as areas of interest (AoIs) and 11 dense fishing areas (DFAs) were identified. Generally, these were located in areas around Bohol, near the bays of northern Mindanao, along the Surigao shoreline, and at the edges of Surigao, Tañon, and Dipolog straits. A strong spatial link was observed with 10 out of the 11 DFAs overlapping or proximate to the AOIs. Temporal patterns depicted seasonality and long-term trends in either frontal frequency or fishing activity, albeit there is weak correlation between them. Taking into account the limitations of using CHL fronts and nightlight data as proxy to productivity and fishing activity accordingly, this study pinpoints specific fishing areas or AOIs in the Bohol Sea area that are covered by 4 Fishing Management Ar-

eas (FMAs) of the Philippines. One important implication to the FMAs is that the findings can provide more targeted approaches to managing specific areas covered by each of the FMAs in the study domain.