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ANNOUNCEMENT OF THE MASTER'S EXAMINATION

of

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in defense of his Master's thesis

SPATIAL AND TEMPORAL ASSESSMENT OF THE INFLUENCE OF RUNOFF ON PHILIPPINE COASTAL PRODUCTIVITY USING GRIDDED DATASETS

for the degree of M.S in Environmental Science

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Via Zoom*

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Attachment: Abstract

Spatial and Temporal Assessment of the Influence of Runoff on Philippine Coastal Productivity using Gridded Datasets

Publicly available datasets from ETH Zürich and the National Aeronautics and Space Administration were used in examining the relationship between long-term spatiotemporal patterns in runoff rates and chlorophyll-a within the coastal areas of the Philippines. Linear correlation analysis of the overlap between remotely sensed chlorophyll-a data and runoff from the Global Runoff Reconstruction (GRUN) dataset revealed a distribution of negative coefficients within the internal seas of the archipelago and positive coefficients in open coasts and embayments. Riverine-influenced sites with positive correlation coefficients ($r = 0.33\text{-}0.62$, $p<0.00001$) were principally associated with the delivery of nutrients by terrestrial runoff. Seasonal changes in total suspended solids (TSS) adjacent to a river discharge site were also seen to be an influencing factor, demonstrating how high sediment load can dampen productivity because of limited light penetration in marine waters. Runoff showed variable impact across several upwelling regions accounted for by the different dynamics of oceanographic processes in each site. Time series analysis revealed areas with statistically significant long-term trends for each parameter. The observed trends were discussed within the context of changes in land use and the global climate as runoff correlates with the Multivariate ENSO (El Niño Southern Oscillation) Index (MEI) ($r = -0.703$, $p<0.0001$). The correlations and temporal patterns described in this study can aid present and future coastal management efforts, particularly in areas identified with statistically significant relationships.