ESTIMATION OF CHLOROPHYLL-A CONCENTRATION IN LAGUNA DE BAY USING SENTINEL-3 SATELLITE DATA

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ABSTRACT

Sentinel-3 is a satellite launched by the European Space Agency (ESA) in 2016 with the mission to provide data for land and ocean monitoring purposes. One of the most important features of Sentinel-3 is its OLCI products that is capable of provided the best way of monitoring coastal waters. Laguna de Bay is the largest freshwater lake in the Philippines with a surface area of 911-949 km² and is situated east of Metro Manila. For the past years, Laguna Lake is under tremendous stress due to the industrialization around it. One of the major problems it is currently facing is the excessive amounts of nutrients present in the water, which is denoted by the chlorophyll-a concentrations. Chlorophyll-a is a type of chlorophyll present in algae and is commonly used for water quality measurement. Sentinel 3 OLCI images of Laguna Lake were utilized together with established chlorophyll-a estimation algorithms from other researches and in-situ data to assess the capability of the satellite for inland waters and to produce a map showing the chlorophyll-a concentration in Laguna Lake. A regression model was created with an R^2 of 0.780, an adjusted R^2 of 0.759 and an AIC of -18.4514. The final model shows that Sentinel 3 OLCI images can be utilized for inland water applications.

KEYWORDS: Sentinel-3, OLCI, Chlorophyll-a (Chl-a), Water Quality, Regression Model