CDOM- INDICATOR OF EUTROPHICATION IN THE CASE-2 WATER OF MUMBAI MARINE ENVIRONMENT

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Abstract: Coastal water of Mumbai is having a lot of anthropogenic pressure of ever growing population, ports, oil spill, increasing industry especially dye industry and others. Recent construction of sea link and outfall inside the coastal waters influence the bio-optical properties of water. In this context, present study focused with these objectives 1. The assessment of the trophic status and 2.To assess the impact of anthropogenic pressure through remotely sensed bio-optical water properties. Average depth of the study area varies from 8m to 15 m. The study area extends from 18-20N latitude and 71.5-73E Longitude. Satellite imagery from sensor Coastal Zone Color Scanner (CZCS) is used for retrieval of Chlorophyll and Attenuation coefficient for the month of May & October 1979. MODIS is used for retrieval of Chlorophyll, Attenuation coefficient for the month of May & October 2003 and OCM 2 for the month and year May & October 2011   for the retrieval of Euphotic Depth, Total Suspended Matter (TSM), and CDOM Index. SeaDas 6.2 software is used for deriving parameters. Standard methods are used for water quality parameter estimation.

Satellite imagery shows decreasing trend of chlorophyll in Coastal water over the Decades. There is no apparent relationship between chlorophyll and light attenuation Coefficient (Kd) in these waters but Total Suspended Matter (TSM) and euphotic Depth is negatively correlated. The relationship is strong in case I water for pre and post monsoon season, but is weak for case II water especially in post monsoon. This is explained by higher Coloured Dissolved Organic Matter (CDOM) index and TSM in the study area. Fuzzy logic method (Mamdani method) of Eutrophication index (EI) estimation is smoother than Principal Component Analysis (PCA) method. Artificial Neural Network (ANN) method restores non linear relationship among the water quality parameters. Eutrophication index predicted from Principal Component Analysis output as target in Artificial Neural Network has R value of 0.851 whereas Eutrophication index predicted from Fuzzy method output as target in Artificial Neural Network has R value of 0.968. In this context, we conclude our study with the following remarks: Over the decades (1979-2011), TSM and Euphotic depth are negatively correlated. During post monsoon, the Euphotic depth is regulated by TSM in case I water whereas, in case II water it is regulated not only by TSM but also CDOM. So for prediction of eutrophication status of the water body CDOM content of the water body should be taken in to consideration. We know that monsoon causes

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terrestrial drainage of organic matter and sediment material to coastal water. CDOM being colloidal in nature remains suspended and affects the euphotic depth.

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