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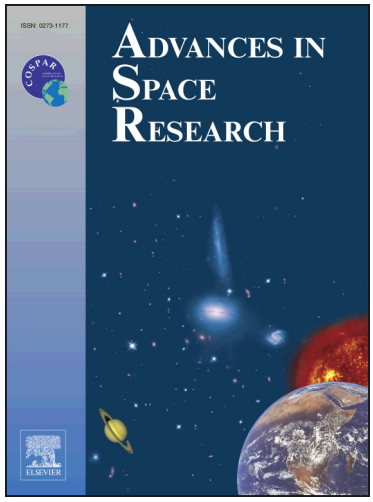

Space based observation of chlorophyll, sea surface temperature, nitrate and sea surface height anomaly over the Bay of Bengal and Arabian Sea

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Space based observation of chlorophyll, sea surface temperature, nitrate and sea surface height anomaly over the Bay of Bengal and Arabian Sea

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Abstract

Monthly chlorophyll and sea surface temperature (SST) images have been generated using MODIS-Aqua datasets during 2014 and 2015 for the Bay of Bengal and Arabian Sea water. The *in situ* data based nitrate algorithm has been applied to generate nitrate images, using the satellite derived chlorophyll and SST images. To link ocean productivity with the sea surface features and sea level anomaly, the Indo-French altimeter mission SARAL-Altika derived sea surface height (SSH) anomaly datasets have been processed and maps generated. The monthly averaged chlorophyll concentration ranges set 0.001-3.0 mg m^{-3}, SST ranged 24-32 $^{\circ}$C, nitrate ranged 0.01-6.0 μM and overall SSH anomaly ranged -52 to +40cm. Nitrate was observed to be high (3-5 μM) during December-January, possibly due to convective eddies and winter cooling and also due to atmospheric aerosols and dusts inducing ocean productivity. The nitrate concentration observed to be linked more to the chlorophyll than the SST, as nitrate inherently enhancing the ocean chlorophyll and productivity, acting as proxy. The SSH anomaly has shown irregular features and depicting few eddies, upwelling and ocean circulation features. The low SSHa has mostly been linked to high chlorophyll concentration. The low SST ~24-26 $^{\circ}$C is observed to be related to high chlorophyll concentration (1.5-3.0 mg m^{-3}) over the study area. The lag phase and enhancement in chlorophyll mean during September has been observed due to decrease in SST mean during August. The SSHa has shown seasonal trend over the study area during monsoon period with observation of negative anomaly. The Arabian Sea has depicted with more negative SSH anomaly monthly mean values as compared to Bay of Bengal. The impact and inter-relationship of SSHa has indicated better relationship with chlorophyll, than with nitrate and SST as observed from multiple regression analysis. The ANOVA results between the two year's

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