Satellite Derived Suspended Sediment Concentrations Along the West Coast of India: Implications for Coastal Oceanography and Monsoonal Dynamics

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Suspended sediment concentrations (SSC) in coastal seas have a direct influence on sediment transport and pollutants to the ocean, and they also have direct bearing on biological activity of the oceans. Processes such as tides, currents and waves, river discharge, and coastal configuration modulate the transport and the distribution of suspended sediments in coastal environments. It has been demonstrated by Klemas *et al*. (1974) and Tassan and Strum (1986) that satellite based remote sensing can be effectively used in the monitoring of transport and estimation of quantum of the suspended particles in the ocean waters.

In the present study, we have estimated the SSCs in case-2 waters of southwest coast of India with the help of satellite images acquired on board Indian Remote Sensing Satellite (IRS – P4) OceanSat-1. The IRS – P4 has a spatial resolution of 360 m, swath width of 1420 km and 8 spectral bands in visible and NIR region, and this makes it highly competitive to map the distribution of SSCs along the Indian coast. The geometric and atmospheric corrections on the satellite data were carried out using ERDAS 9.1 software. We have estimated SSCs for the monsoon and post-monsoon periods with the help of OCEPAR 1.0 software (Ramana et al., 2000). The SSCs were retrieved with the help of algorithm proposed by Tassan (1994) for case-2 waters.

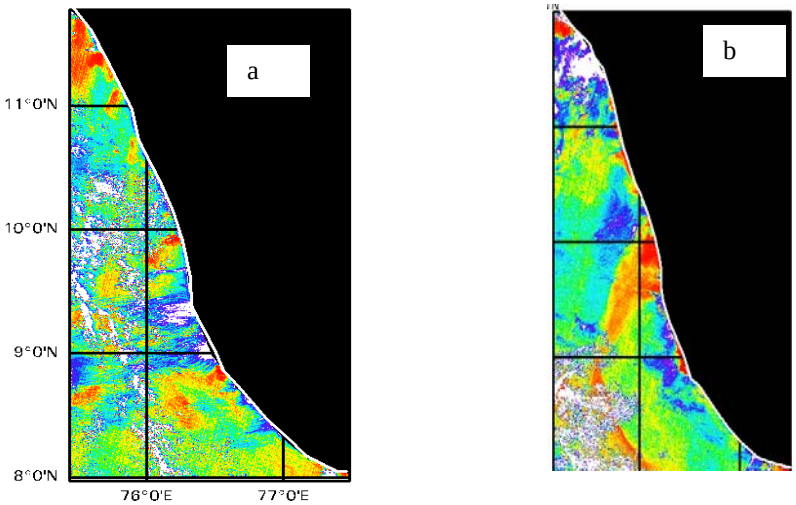

Figure 1: Distribution of suspended sediment concentrations (mg/l) along southwest coast of India during the monsoon period (a) and post-monsoon period (b).

It is recorded that the SSCs varied from 4-42 mg/l during monsoon and 1-35 mg/l during post-monsoon period. It is also observed that the transport of fine sediments along the coast from north to south. The spatial distribution of SSCs suggests that higher amounts of suspended particles are observed along the coast, for about 35 kms in to the sea, particularly along the central part of the study area. The role of longshore currents, on-offshore currents, waves, and monsoon dynamics are discussed in relation to the suspended sediment concentrations and their transport paths in the coastal seas are discussed.

References

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