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An Overview of Late Quaternary Studies and Status of Mineral Magnetism from the Konkan Coast: Constrains on Degradation of the West Coast of India

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Abstract

We present here an overview of textural, sedimentological, magnetic, and remote sensing studies from different sectors of the west coast along with new mineral magnetic results. The emerging coastal erosion and growing incidences of extreme events with an increase in cyclones in the Arabian Sea are affecting these beaches at higher rates of dynamics. The sand characteristics, textures, sorting and clast composition have been studied to correlate them with energy conditions and interpret the transportation dynamics. Heavy mineral analyses delineated provenances and detrital pathways, the morphological and volumetric vicissitudes of beaches helped characterize western coast beaches into stable, eroding or depositing regimes aided by time elapsed satellite images. The multi-parametric studies unravel the relationship of hydrodynamics over a range of geomorphic features. The predominant controls of longshore and rip currents in altering the land-sea interfaces at less than decadal scales were observed.

New mineral magnetic results from the Vengurla Beach of the Sindhudurg district are evaluated in above context and to establish semiquantitative relations amongst depositional and erosional patterns that can be further linked to the effects of degree and intensity of local monsoon. The beaches record systematic changes in the concentration of magnetite, haematite, maghaemite, and goethite as a result of a combination of the above beach processes. The studies from Vengurla beach successfully demonstrate mineral magnetism as a suitable quantitative approach to depict the quasi-decadal effects of long shore currents that are further governed by the shoreline changes resultant of increasing competitiveness between coastal erosion and depositional conditions in recent years. The status of studies over the west coast depicted an alarming increase in the rates of erosion at several beaches demanding quantitative monitoring using the integrative approach of mineral magnetism and satellite data.

Keywords: West Coast, Magnetic Susceptibility, Curie Temperature, Provenance, Sindhudurg.

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