Detection of submarine delta along Madras coast, India, using IRS imagery

Remote sensing has proved its credibility beyond doubt in natural resources survey and environmental monitoring owing to its synopticity, multispectral photographic capability and repetitive coverage. While its synopticity gives unbiased information on the regional panorama of the earth surface, its multispectral possibility aids precise interpretation of various objects, as different terrestrial objects exhibit various spectral responses in different bands of the electromagnetic spectrum. Amongst various terrestrial objects, water has a characteristic spectral response of its own, i.e. it permits the blue/red part of EMR (electromagnetic radiation, 0.4–0.8 μm) to penetrate inside. On the contrary, it totally absorbs the infrared part of EMR (0.8–1.5 μm). As such blue/red part of EMR penetrates the water bodies, the impurities and suspended sediments are seen very clearly in various shades of grey as and when the water bodies are shallow. Many workers, therefore, have used blue/red band of the satellite data in such water-quality studies. Hardy has observed that the infrared light in the spectral regions of 0.6–1.4 μm has the potential to map the turbidity in the ocean water, whereas Kritakos et al. have used the rationed data of visible and near infrared bands (0.4–1.1 μm) and obtained better results for water quality monitoring. Keeping such facts in mind, the blue/red band (band 2) of the IRA 1A satellite data was used to configure the bathymetry along Madras coast in Bay of Bengal (Figure 1a).

In the present study, the IRS 1A band 2 data (0.52–0.59 μm) of March 1991 was used and subjected to edge enhancement studies for the coastal zone of Madras (Figure 1a). Such edge enhancement normally sharpens the edges of two contrasting objects or sharpens the edges of objects of contrasting relief. In such edge enhanced data, few straight to serrated lines resembling contours were observed in the offshore region of Bay of Bengal in the area east of Pulicat lake (Figure 1a, b). These serrated concentric lines were correlated with the bathymetric charts supplied by Survey of India (Figure 1c). This indicated that the serrated lines of the core almost coincided with the 5 fathom contour (equivalent to 9 m depth) and the serrated lines of the outer rim were found to coincide with the 10 fathom line (equivalent to 18 m depth). This suggested that the serrated lines observed in the edge enhanced IRS data (Figure 1a) are nothing but the different relief variations of the continental shelf. Configuration of such serrated lines observed in edge enhanced data as well as the value and shape of the bathymetric contours have thus led to the conjecture of an arcuate positive subaqueous landmass with NE–SW orientation (Figure 1b, c).

Ramasamy has observed a huge palaeochannel in the area north of Madras (Figure 2a, b) and Ramasamy has observed a major lobate delta again north of Madras and demonstrated that both the palaeochannel and the continental delta belong to the Cauvery river which has once flown in the area. He has further aligned the axis of such continental delta and termed the delta as 'proto Cauvery delta' in NE–SW direction. The axis of such proto-Cauvery delta also coincides with the axis of the positive arcuate subaqueous landmass observed in the edge enhanced data (Figure 1b) and the bathymetric data (Figure 1c).

The occurrence of the lobate proto-Cauvery delta north of Madras (Figure 2a, b) and the positive arcuate subaqueous landmass observed in edge enhanced data and bathymetric charts in the north eastern extension of such

Figure 1.

1. Pulicat lake
2. Bay of Bengal

Figure 1.
proto Cauvery delta confirms that this delta might have extended up to 20–30 km inside the continental shelf in the area each of Pulicat lake.

Thus the present study reveals the possibility of utilizing blue/red band of the IRS data in ocean bathymetric mapping. In addition, the present study clearly demonstrates the existence of a huge submarine delta east of Pulicat lake, confirming the flow of the mighty Cauvery river in this region in the recent past.


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A new overlay in virological work for animal viruses

Virus assay by plaque method is a basic need in virus laboratories. The virus assay system by plaque method needs pure chemicals. The overlay ingredients/chemicals should not be toxic either to the host system or inhibitory to the virus. Various overlay materials such as agar, agarose, carboxymethyl cellulose, methocil and paraffin oil are