AOGS 2005

Sub-tidal variation in water level in the Mandovi and Zuari estuaries on the west coast of India during March-April 2003

S.R. SHETYE[1], D. SUNDAR[1], S. JAYAKUMAR[1], P. MEHRA[1] and S.G. PRABHU DESAI[1]
[1]*National Institute of Oceanography, Dona Paula, Goa 403 004, India*

Mandovi and Zuari are two shallow (approximately 5 m deep) estuaries on the west coast of India with converging channels whose widths are less than a kilometer along three-fourths of their approximately 50 km lengths. The estuaries receive influx of freshwater which is large during the summer monsoon (June-September) and negligible during rest of the year. Water level was monitored in the two estuaries at 15 locations for a month during March-April 2003. Detided water level during this time showed presence of oscillations with periods of a few days to longer than a week. The oscillations were coherent throughout the two estuaries. Currents measured along the coastline in the vicinity of the mouths of the two estuaries showed that the sub-tidal oscillations in the estuarine channels resulted from geostrophic adjustment in the alongshore coastal current: water level dropped (rose) when the current was southward (northward). The alongshore current was highly correlated, with a lag of 15 hours, with the alongshore winds that were filtered to remove the diurnal cycle due to sea-breeze. This indicates that local wind forcing was the dominant driving for the current.

Remote forcing is known to dominate over local forcing in driving of the current along the west coast of India during November-January when the current is northward and flows against local winds. The high correlation seen during March-April 2003 between the estuarine water level, alongshore wind and alongshore current shows that there are times when local wind driving dominates over remote driving of the current along this coast.