TIDAL ASYMMETRY IN A PARTIALLY MIXED ESTUARY - WEST COAST SRI LANKA

E.M.S. Wijeratne and W.S. Wickremaratne
Oceanography Division, National Aquatic Resources Agency,
Colombo 15, Sri Lanka

The tidal wave in the Negombo lagoon, a partially mixed estuary on the west coast of Sri Lanka, displays distinctive forms of asymmetry. Tidal asymmetry can be described in terms of current velocity asymmetry (horizontal tide) and in terms of changing tide level with time (vertical tide).

Ebb and flood currents monitored at the mouth of the estuary showed that under most conditions maximum ebb currents were three times greater than maximum flood currents. Both peak-ebb and peak-flood currents are shifted towards high water compared with the 90 degree phase difference of a perfect standing wave. Typically, maximum flood currents occur one hour before high water and peak-ebb currents about 3.5 hours after high water. Asymmetry in the vertical tide is characterized by a rising tide that is 0.5-1.0 hours longer than the corresponding falling tide. Both forms of tidal asymmetry are most pronounced at spring tide, whereas tidal asymmetry is reduced at neap tide.