Abstract Details

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Title: Physical Processes in Large Lakes and Inland Seas

Abstract:

Inland Seas and Large Lake Systems are subjected to many of the sa forcing as coastal oceans and serve as model basins for understandin complex coastal ocean dynamics. They are also somewhat simpler to than the coastal oceans since they are enclosed and large enough to the Coriolis forcing. In large lake systems such as the North Americar Lakes the absence of salinity and tidal forcing simplifies the dynamics further. The coastal zone dynamics is complex and highly variable, wh interrelated biological, chemical, geological and physical processes ar occurring simultaneously and is strongly influenced by the climatic conditions. An understanding of the coastal physical processes is esse develop science based integrated management of coastal oceans. Wit broad objective in mind systematic monitoring and modeling studies North American Great Lakes have been carried out for well over three decades. Coastal zone studies of Great Lakes included long time serie current measurements from a network of self recording current mete satellite tracked drifters, synoptic hydrographic surveys, tracer disper experiments and meteorology. These studies have provided long time climatological data base and systematic analysis of this data base has revealed an array of complexities and variability in water movements from predominant shore parallel currents to near-inertial oscillations, episodes of current stagnation, current reversals, and thermal fronts spring thermal bar and summer upwelling. However, certain flow regi appear to be highly correlated with prevailing meteorological conditio repeat themselves with some regularity at any given coastal station. coastal flow regimes include coastal boundary layer, coastal upwelling coastally trapped waves and scale dependent turbulent exchange. Th complex coastal physical processes are parameterized and incorporat coastal transport and dispersion models. Case studies of the applicati the climatological data base and coastal models will be presented to r waste disposal operations from land based sources such as municipal and industrial discharges including waste heat from thermonuclear pc plants.

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