

Physical processes related to bio-optical properties on the New York Bight inner  
continental shelf

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Abstract

The present study is part of the ONR sponsored Hyperspectral Coupled Ocean Dynamics Experiment (HyCODE) on the New Jersey continental shelf. The central goal of the project is to develop ocean color algorithms for remote sensing of the coastal ocean. One of the primary objectives of the HyCODE experiment is to determine how physical processes affect the temporal and spatial variability in inherent optical properties (IOPs). We acquired an extensive set of physical and bio-optical data from an offshore mooring and bottom tripod (24 m water depth), and inshore optical and CTD profiling nodes (15 m water depth) during spring and summer 2000. We have found that temporal variability in physical processes is governed by advection with strong influence by the semi-diurnal and diurnal tidal cycles, spatial scales are influenced by relatively small-scale (typically <20 km) convergence and divergence zones; and the location of these convergence and divergence zones is determined by the tidal cycle. Surprisingly, inshore bio-optical properties are governed by upwelling/downwelling and the presence of the southward coastal jet, whereas offshore bio-optical properties are influenced by estuarine flows.