THE EFFECTS OF PHYSICAL OCEANOGRAPHIC STRUCTURE AND PROCESSES ON BIOLOGICAL PATCHINESS IN THE COASTAL OCEAN

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Abstract

Thin layers are aggregations of plankton that span large horizontal areas and are vertically thin. These layers are important because of their influence on population dynamics, trophic interactions, biological structure, and cycling of elements in the sea. During a 24 hr overnight study off the leeward coast of Oahu, Hawaii, to assess the effects of physical oceanographic processes and structure on thin layers through a mooring array and continuous water column profiling. Thin layers were present in 22% of the shipboard profiles (32 of 148). Sixty percent of the thin layers (23 of 39) were observed when the water column was stratified due to diurnal daily heating (1800 to 2150). When the water column was stratified, the thin layers occurred on a similar isopycnal. Water column stability is important in the formation of thin layers. These findings agree with historical observations of thin layer structures in the coastal waters of the mainland United States and Europe.