Changes in Physical and Biological Fields during Fall Upwelling along Primorye Coast in the Japan Sea

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CHANGES IN PHYSICAL AND BIOLOGICAL FIELDS DURING FALL UPWELLING ALONG PRIMORYE COAST IN THE JAPAN SEALobanov V., V.Zvalinsky, S.Ladychenko, A.Salyuk, P.Tishchenko and S.Zakharkov V.I.Il'ichev Pacific Oceanological Institute, Far Eastern Branch, Russian Academy of Sciences, Vladivostok, 690041, Russia (lobanov@poi.dvo.ru)September-October period in the northwestern Japan Sea is characterized by transition in monsoon winds and associated coastal upwellings and beginning of sea surface cooling and convection. These processes intensify booth vertical and horizontal circulation and cross shelf water exchange and cause fast changes in physical and biological fields in coastal zone of Primorye region, Russia. Satellite data from various sensors were collected during fall period of 2000. At the same period ship hydrographic, chemical and biological observations were implemented in the area. Evolution of coastal and shelf fronts associated with Primorye (Liman) Current, shelf and slope waters were traced using NOAA AVHRR and SeaWiFS images. On the background of SST cooling during fall period a drastic change in circulation pattern, formation of mesoscale eddies and upwelling event were revealed. These events enhanced horizontal water transport toward and off the coast and ventilation of shelf area by open sea water. In situ observations confirmed prominent changes in hydrographic field, nutrients and primary production (PP). It was found however that increase in PP was not observed in the cold upwelled water tongues, while it was found in the areas where subsurface horizontal advection induced by mesoscale eddies had happened. This could be explained by decreasing of stratification and deepening of upper mixed layer in the upwelling tongues that decreased PP. In opposite, subsurface intrusion of cold, saline and nutrient rich open sea waters onto the shelf increased stratification and uplifted pycnocline that creates favorable conditions for plankton. Thus horizontal advection associated with eddy dynamics is most effective mechanism of fall plankton bloom in the coastal area of Primorye.