

Investigation of the main surface currents in Eastern South Pacific using Topex/Poseidon altimetry data

Alexander Sirota, Sergey Lebedev
AtlantNIRO

sirota@atlant.baltnet.ru

Monthly sea level anomalies maps, based on TOPEX/Poseidon (T/P) altimetry data from 1992 to 2003 were used to investigate the spatial and temporal variability of the main surface currents in the Eastern South Pacific. The South Pacific Current and Peruvian Current were constructed on the basis of the superposition of the sea level anomalies distribution over the climatic dynamic topography calculated from mean temperature and salinity data of WOA-1998 Atlas relative to 1000 dbar using the geostrophic equation. To reveal the variability of the South Pacific Current the zonal component of geostrophic current was used. Analysis of spatial-temporal distribution of the current intensity has revealed the zone of the stream location and its variability. Analysis of time series of the zonal velocity has shown that the two years cycle predominates in the temporal variability of the current. To reveal the variability of the Peruvian Current the meridional component of geostrophic current was analyzed. It was revealed that the stream of PC shifts from the west to the east during every year. Amplitude of these displacements is about 300 miles. This is accompanied by a pronounced 12 months cycles peak in the temporal variability of the intensity of the current. This study has demonstrated efficiency of the analysis of the satellite altimetry data in the investigation of the structure and spatial and temporal variability of the main surface currents in the Eastern South Pacific. In view of the fact of the lack of regular oceanographic observations in the Eastern South Pacific the proposed approach may give a high advantage and improve our knowledge about seasonal and interannual variability of the currents in this region.