



Mean ocean dynamical topography and local volume balance in the Bering Sea

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We present the results of the multiyear efforts on the development of 4Dvar data assimilation system in the Bering Sea. The presented result include the estimate of the Mean Ocean Dynamical Topography (MDOT) and volume balance in the Bering Sea as a variational inverse of the hydrographic (temperature, salinity and velocity) and atmospheric climatologies. The derived MDOT can be used as a reference SSH for the satellite altimetry data in the Bering Sea region. Several numerical experiments reveal that the combination of the obtained reference SSH with satellite altimetry anomaly observations results in a realistic reconstruction of the Amukta passes circulation. The optimized transports through the Kamchatka Strait, Near Strait, Amchitka and Amukta passes are -28, 13, 6, and 3.5 Sv respectively. These transports are significantly higher than the conventional climatological estimates but agree well with the recent transports calculations based on direct velocity measurements. Posterior error analysis and satellite sea surface height observations indicate high interannual and seasonal variability of the transports through the Aleutian passes. It was found, that the changes in the Kamchatka strait transport are controlled by variability of the Near strait inflow and by Alaska Stream transport.