

Integrated Using of Satellite Altimetry in Monitoring Problem of the Caspian Sea

S. A. Lebedev (1, 2), A.G. Kostianoy (3)

(1) Geophysical Center, Russian Academy of Science, Russia, (2) State Oceanographic Institute, Russia, (3) P.P. Shirshov Institute of Oceanology, Russian Academy of Science, Russia (lebedev@wdcb.ru /Phone:+7-495-930-5639)

The oscillations of the Caspian Sea level represent a result of mutually related hydrometeorological processes, which proceed not only in the sea catchment area but also far beyond it. The regime of the Caspian Sea level is mostly controlled by the proportions of the cyclonic and anticyclonic activity in the basin of the sea (mainly, in the Volga River region) and the related precipitation regime. The change in the tendency of the mean sea level variations that occurred in the middle 1970s, when the long-term level fall was replaced by its rapid and significant rise, represents an important indicator of the changes in the natural regime of the Caspian Sea. Therefore, sea level monitoring and long-term forecast of the sea level changes represent an extremely important task. The aim of this presentation is to expound the experience of application of satellite altimetry methods to the investigation of seasonal and interannual variability of the sea level, wind speed and wave height in different parts of the Caspian Sea and Kara-Bogaz-Gol Bay, and the Volga River level. The work is based on the 1992-2005 TOPEX/Poseidon and Jason-1 data sets. The process of the filling of the Caspian Sea and Kara-Bogaz-Gol Bay and its acquisition of the new climatic regime is well traced in the satellite altimetry data with high spatial (5-6 km) and temporal (5-10 days) resolutions. The high efficiency of this method for the purposes of sea level monitoring (seasonal and long-term variabilities) and for the studies of the water dynamics of enclosed seas and lakes, in particular, of the Caspian Sea is proved by the results of recent investigations. This work was supported by Project “Elaboration of technologies for multi-level regionally adapted ecological and geodynamical monitoring of the Russian seas” of the Russian Ministry of Education and Science, by NATO Science for Peace Program Project “Multi-disciplinary Analysis of the Caspian Sea Ecosystem” and by the Russian Foundation for Basic Research Grant 06-05-64871.