



Propagation of the Sea of Azov plume in the Black Sea and its relation with atmospheric forcing

Ivan Zavialov and Alexander Osadchiev
Shirshov Institute of Oceanology, Russia (i.zav@ocean.ru)

This work is devoted to research of the influence of wind forcing on propagation of the Sea of Azov water plume in the Black Sea. The Sea of Azov water is characterized by relatively low salinity and high concentrations of suspended matter, terrigenous nutrients, and anthropogenic pollutants. Thus, the Sea of Azov inflow has significant impacts on physical, chemical, and biological processes in the Black Sea. The increased concentration of the suspended matter in the Sea of Azov plume allows to determine accurately its borders based on remote sensing data. For this purpose, data of the satellite color scanner MERIS/EnviSat with 300-meter spatial resolution were used. Atmospheric forcing on the Sea of Azov plume was investigated with the data of 6-hour reanalysis of winds (MERRA and NCAR/NCEP) with spatial resolution at 1/2 degrees in latitude and 2/3 degrees in longitude. Based on satellite images and wind reanalysis data for 2002-2012 period, it was established that the Azov Sea water inflow is favored by strong N and NE winds, which prevail in the region. It is evident in the processed satellite data that the Sea of Azov plume mainly extends along the east coast of the Crimean peninsula. In some cases under sufficiently strong winds, the Azov waters spread to the southern coast of the Crimea, and sometimes even to its south-west extremity. Factors influencing the propagation of the Azov Sea plume include intensity of water exchange between the Azov and the Black seas, the Rim Current, mesoscale eddies and other dynamic processes. However, the study demonstrated that the influence of wind forcing is dominant. Empirical regressions are derived expressing the dependence of the Azov plume area and its orientation on the magnitude and directions of the wind stress. Satellite-derived statistics of the Azov plume in the Black Sea characteristics are obtained.