On validation of regional atmosphere and wave models for the Black Sea region estimates and the sea region of the sea re

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Data and method

In-situ data were obtained on Katsiveli research platform of the Marine Hydrophysical Institute (33 59' E, 44 23' N) near the southern coast of the Crimea for three periods: October 2012 – April 2013, July – October 2012 and September -October 2011.



Mesoscale atmospheric modeling for the Black Sea region: **1.** Global operational analysis of NCEP/NCAR (resolution of 0.5° and 6 hours). 2. MM5 and WRF mesoscale atmospheric models adapted to the Black Sea region at MHI (resolution of 18 km and 1 hour). **3.** MHI operational forecast for the Black Sea region (resolution of 10 km and 1 hour). 4,5,6. Special calculations using WRF model with downscaling in three nested domains centered at the point of measurements (9, 3 and 1 km step of grid).

Wave modeling with WAM-c4 for entire Black Sea area on 10 km uniform grid using wind-input from atmosphere model data of 1-3 types. Only restricted spectral domain (frequencies lower than 0.4 Hz, arrival azimuths of 45-255 deg.) was used in comparing with in situ data.



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Quality of atmospheric and wave modeling at the Black Sea region corresponds to the quality for the Mediterranean Sea [Cavaleri, Bertotti, 2003; Cavaleri, Sclavo, 2006; Ardhuin et al., 2007].

Results

Weather disasters in the Black Sea region

Flooding of 6-7 July 2012 in the Krasnodar Region, Russia caused a loss of more than 170 lives and huge economic damage. Hazardous storm of 11 40 November 2007 near the Crimean coast caused accidents and sinks of many vessels including ones carrying fuel oil and sulfur, more than 20 members of the crews were missing and severe ecological damage was suffered. However, the forecast of rainfall intensity had appeared five days before the flood at free access on the Internet website <u>http://vao.hydrophys.org</u> and the forecast of the wave height appeared on the same website three days before the storm.



