Use of Satellite Data in Marine Early Warning System

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Conclusions

Early warning system of coastal storms needs to provide timely, accurate and clear information on the potential severe weather conditions, so that the responsible authorities can take action to avoid or minimize disaster risk for coastal and sea ports infrastructure. Remote-sensed data are becoming very important source of information in the verification of wave models and improving the accuracy of the operational numerical wave-forecast systems and hindcast in the Black Sea region. Available satellite-derived altimeter and scatterometer data help improve model results and reduce forecast errors by accompanying model validation and calibration in general and more specifically for stormy conditions.

The implementation of Early Warning forecast systems will benefit the sustainable management of coastal regions. The ability to predict the evolution of extreme events constitutes an indispensable tool for risk assessment, sea safety.

Acknowledgements

The operational system of NIMH for wind wave forecast in the Black Sea area is based on the SWAN (Simulating Waves NearShore) numerical spectral wave model. SWAN is running operationally for the Black Sea twice a day at 06 and 18 UTC and produces main wave parameters 72 hours ahead with a grid spacing of 1/12°. The SWAN wave model is forced by the 5-hourly winds from the ALADIN model.

The numerical model results were validated against the Operational NIMH wave forecast, which is based on the SWAN-routinely and operationally working model. The SWAN wave model was implemented in the Black Sea area in 2018 as a trial version. The SWAN-routinely and operationally working model is used mainly for research purposes. The SWAN-routinely and operationally working model may be of interest for researchers and is available on the ECOPORTIL website [1].

The main difference between the operational system of NIMH for wind wave forecast and the SWAN-routinely and operationally working model is the fact that the latter was conceived and implemented specifically for research purposes and is not intended for operational use.

The operational version of SWH is much more robust and reliable than the operational version of NIMH for wind wave forecast. The operational version of SWH is more sophisticated and comprehensive than the operational version of NIMH for wind wave forecast. The operational version of SWH is more accurate and reliable than the operational version of NIMH for wind wave forecast. The operational version of SWH is more effective and efficient than the operational version of NIMH for wind wave forecast.