

Preparing the Wave Atlas of the Persian Gulf, the Gulf of Oman and the Caspian Sea

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Abstract

Waves are the most important index of sea state. Therefore, knowledge of wave regime for using in design of marine and coastal structures is of great importance. Since Iran is located adjacent to three important seas, i.e. Caspian Sea, Persian Gulf and Gulf of Oman, determination of wave condition for marine activity is very important. Wave measurements are usually gathered in short period and are in limited locations.

Satellite data represent also wave data in special paths and with low temporal resolution. Therefore, numerical wave modeling is carried out for generation long time wave data in grids covering the whole domain.

Wave modeling in Iranian seas was done before in project "Iranian Seas Wave Modeling (ISWM) in Iranian National Institute for Oceanography (INIO) that contains the wave modeling in 12 years period. This is a short period for achieving the accurate extreme value analysis. Therefore, the current project was carried out in INIO to obtain the more accurate extreme value analysis and wave simulation for 32

years. In addition, in this research, SWAN numerical model was used instead of Mike 21-SW (which was used before in ISWM) for modeling of the wave characteristics. After purchasing the ECMWF wind field and modifying it, wave modeling was done in Iranian seas and the results were calibrated and verified using measured values. Finally, wave atlas was prepared for 32-yearly modeled wave characteristics.

Keywords

Wave modeling, SWAN model, ECMWF wind field, Wind field modification.