Climatic wave spectra of extreme wind waves

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Modern approach to wind wave climate investigation is based on numerical simulation (spectral hydrodynamic models are used) with subsequent statistical generalization. Climatic wave spectra are spectra with certain probability, including extreme situation (with n-years return periods). Main parameters of any two-dimensional spectra are at least wave heights H, periods T, direction, peakdness and angular parameters. Even in the simplest case of frequency spectra of prescribed form distribution of a couple of (H,T) parameters is needed. This means, that joint distribution of these parameters define set of extreme spectra of any return periods.
The main steps of extreme waves climatic wave spectra include:
• Hindcasting of wave spectra by spectral hydrodynamic model.
• Classification of spectra for different classes (as rule 5 classes, namely: wind waves, swell, wind waves & young swell, matured swell & wind waves, complicated wind fields).
• Estimation of parameters for each class of spectra.
• Calculation of parameters of different classes of spectra for extreme situation.
This approach is partly realized in the new generation of wind and wave handbooks published by Russian Maritime Register of Shipping.
The details of approach and results for different seas will be presented.