



## The precursors of a storm

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### Abstract

A systematic study of storm surges on the South-Western and South-Eastern coasts of Sakhalin Island was carried out. It is established that the coming storm precedes the arrival to the observation point of the longer swell waves whose periods are reduced for the coming storm and they is about 7 s. Field experiments have also shown that early arrival of swell does not depend on the wind direction at the point of observation. The observed effect is explained using a model that takes into account the dispersion properties of swell. The results of numerical simulations show that the group velocity of the swell propagation is an important parameter that can be used for forecasting of storm. And if the velocity of waves propagation and the time difference of their arrival are known, then it is possible to determine at what distance was the storm at the time of the long-wavelength swell arrival. In addition, it is possible to estimate the minimum time of the storm arrival by the time of the first arrival of the long-wave swell and the wave velocity for the characteristic wave period at the beginning of the storm 7–10 s.

### Keywords

swell, wave dispersion properties, group velocity

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