



## **Synoptical situations and meteorological conditions associated to floods in the mouth of rivers in the European part of Russia**

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The synoptical situations associated to the various type of floods in the mouth of rivers in European part of Russia are described. The storm surges, water flows and ice-jams are considered for Baltic, Barents sea, White sea, Azov sea, Black sea and Caspian sea regions. It is shown that the specific types of flood may be associated to various synoptical situations. Therefore it is unlikely to introduce the classification of synoptical regimes resulting in specific type of floods. However for each zone under consideration and for each specific flood type it is possible to determine the potential predictors of inundation: i.e. meteorological parameters which are characteristics of all cases of specific flood. There are:

- for storm surges – long term wind forcing resulting in seiches in the sea, strong wind speed (the threshold varies in dependence on region), the wind direction orthogonal to the flow of river and strong baric gradient;
- for water flows – the abundant precipitation, usually associate with the intensive frontal zone, the sudden change of air temperature resulting in snow melting in spring time;
- for ice-jams – the strong temperature gradient extended in north-south direction resulting in negative temperature in the river mouth and positive temperature in the other basin.

The probability of occurrence of predictors mentioned above was estimated for modern climate and global warming conditions using the outputs of ECHAM5/MPI-OM model. It is shown that the occurrence of intensive frontal zone and rainfall in the South of Russia will increase (decrease) in summer (winter) under warmer climate conditions which may contribute to the increase of water flows in this region. Maximum of floods occurs during the warm period, we can conclude that global warming increases the risk of floods in Black Sea coast.