

Preface

Estonia generally enjoys the mildness of the local climate, more or less regular changes of seasons, each of which has certain pleasant features, and a reasonable combination of sunshine, rain, snow and temperature variations. Since Estonia is situated at the prolongation of the North Atlantic storm track (the presence of which stays behind our mild climate), it directly feels the increase of storminess. Also, the trigger of disasters in this region is most commonly born in the atmosphere. The consequences may become evident in a variety of ways. A storm can root out trees, a long period of rain can destroy crops, a tornado can raise roofs, excessive snow may break the power supply, etc.

Another important geographical issue is the Baltic Sea, washing about 3800 km of the Estonian coastline. While direct atmospheric threats are relatively well understood and their adverse effects mostly lie within reasonable limits, the reaction of sea surface and associated changes in the coastal processes to the changes of atmospheric forcing are still a great challenge. The consequences of natural disasters are much more serious when water is brought into motion. Estonia learned this simple truth, which is a part of everyday life in areas frequently affected by floods or tropical cyclones, from the exceptional coastal flooding and extreme wave conditions created by windstorm Gudrun in January 2005. The consequences of this storm draw attention to the importance of scientific knowledge on processes that take place in the coastal region and to the necessity of joint studies of interaction between different aspects of meteorology, oceanography and coastal processes.

This necessity has been recognized and reflected at the recent highlights of the Baltic Sea scientific community. The Baltic Sea Science Congress (BSSC) was held as a joint event of physical oceanographers, marine chemists, biologists and geologists in Rostock on 19–23 March 2007. Its about 200 papers provided a comprehensive picture of the recent highlights and perspectives of marine studies in this region. Among suggestions, formulated at this meeting, were more tight communication between scientists, specializing in different areas of marine sciences and promotion interdisciplinary studies.

The same ideas were expressed from a slightly different viewpoint at the Fifth Study Conference on BALTEX (Kuressaare, 4–8 June 2007). BALTEX (the Baltic Sea Experiment) is one of the oldest continental-scale experiments of GEWEX (Global Energy and Water Cycle Experiment). BALTEX was launched in 1992 with the aim to collect meteorological, oceanographical and hydrological data from

the whole Baltic Sea catchment area and to model its water and energy cycles. By now, these efforts have led to the construction of several high-resolution circulation models and to two coupled regional climate models that look at the atmosphere and the sea of this region together. These models enable one to calculate temporal and spatial patterns of meteorological and oceanographic parameters that to a large extent follow the observed patterns. The models enable one also to calculate future projections of these parameters and on the basis of them to construct future climate scenarios. At the moment the differences between the outputs of different models are large. That is why joint analysis of atmospheric and oceanographic processes and their driving factors, and a wider look to the pool of processes in general, has become more important than ever.

Scientific papers, addressing the listed topics, have always been welcome in all series of the Proceedings of the Estonian Academy of Sciences. Special issues have been published in the Engineering and Biology & Ecology series since 2001. The increasing potential of the studies into meteorology, oceanography and coastal engineering in Estonia has led to the idea to regularly publish special issues, concentrating on the listed topics and in particular on interdisciplinary studies, covering two or more of listed aspects. This issue is designed as the first one in this series which in the future will appear not less than once a year.

We particularly encourage submitting to this series papers, reflecting multi-disciplinary studies on (but not limited to) physical oceanography, limnology, coastal processes and meteorology and containing data or conclusions directly relevant to Estonia. Papers concentrating on climate analysis and climate change, land and sea interactions in the coastal zone, water management, air quality etc. are welcome as well. The selection, however, will be made exclusively on basis of the quality of the papers. All contributions undergo rigorous international peer-reviewing process according to the rules of the Engineering series.

We are happy with the large interest to this pilot issue. Its scope reflects the wide basis of relevant studies in Estonia, covering aspects from the mathematical theory of climate variations down to sophisticated experiments in breaking waves. Due to the limitations for the size of regular issues, only a fraction of submissions has been selected for this issue. We hope that many papers that were submitted here will appear soon in other series of the Proceedings or in the next special issue. Special thanks are due to the regular staff of the Proceedings of the Estonian Academy of Sciences for taking care of the correspondence with the prospective authors and reviewers and for carrying out the publication process at a very short term. Last but not least, the efforts of numerous anonymous reviewers are gratefully acknowledged.

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