

GUEST EDITORIAL

This issue of the *Proceedings of the Estonian Academy of Sciences, Engineering*, is devoted to hydrodynamical and geological studies of the possible deep harbour sites in Saaremaa Island. The study, initiated by the Ministry of Environment and financed by the Estonian Centre of Environmental Investments, confirms that it is becoming traditional to ask scientists to evaluate complicated problems before making decisions. It is particularly pleasant that the investigation, originally designed as a specific applied study, was not bounded by the prescribed scope. Instead, it has inspired many ideas that are important for wide scientific community. Publishing of the special extended issue of the *Proceedings* shows that this initiative has had a most fertilizing influence on implementation of contemporary research methods in support of management of Estonian coastal areas.

The need for a new deep harbour in Saaremaa became evident when Estonia obtained independence. The harbour, open towards Europe, will radically reduce transport and travel costs to and from Saaremaa, create a new dimension for the island through integrating it into European transport network and will essentially influence the development of industry and tourism in Saaremaa. Benefits from the new harbour would be remarkable for the whole westernmost region of Estonia.

The possible harbour sites lie in the most vulnerable area – in the immediate neighbourhood of Vilsandi National Park and the most important wintering area of rare or globally endangered birds such as Steller's Eider. The road connections will pass very close to the Viidumäe Reservation. A large number of unique or protected nature objects and many rare species of plants can be found in the area influenced by the harbour and its traffic connections. Since the harbour may cause considerable risk to this very sensitive environment, its location, construction process, and operating routine must be subject to specific restrictions.

The environmental risk consists of many components. To mention only a few, dredging the basins and erection of quays inevitably causes redistribution of sediments. Construction of traffic connections may distort the balance of terrestrial ecosystems. Maintenance of the harbour is accompanied by the risk of seawater pollution in the harbour and on the shipping lanes as well as groundwater pollution with wastewater from the harbour complex.

The complexity of the problem in question, covering many disciplines suggested a concerted action of geologists, hydrogeologists, oceanographers, engineers, mathematicians, and meteorologists from many institutions. It was necessary to create an exhaustive picture of the geological situation and hydrodynamical processes that may be important by selecting the best possible location for the harbour. The study indeed included a wide range of areas, starting from the interpretation of historical data (covering more than one century), construction and implementation of contemporary circulation and wave models and culminating in intense geological and hydrodynamical field campaigns.

A number of conclusions and recommendations of the working group coincide with those suggested by common sense. Earlier discussions concerning the possibility of constructing the new harbour, its possible sites and its potential dangerous environmental impacts exposed a number of fears and obsessions. The performed research scattered many of them but also revealed some completely unexpected circumstances. The number of unexpected features of meteorological, geological, and hydrodynamical fields at the harbour sites is amazing and instructive. They recollect that it is always better to look than to guess and it is better to measure and calculate than to assume.

It is pleasant that the papers in this issue do not simply paraphrase the results of the investigations. Instead, the papers concentrate on interesting and unexpected features of hydrodynamical and geological settings at the harbour sites that have wider scientific significance. The papers do not tackle the economical, navigational, and engineering aspects of the construction and maintenance of the harbour that have to be scrutinized by other experts.

Last but not least, this most pleasing co-operation between the Estonian Ministry of Environment and the Estonian Marine Institute, co-ordinator of the working group, has vividly demonstrated that both governmental and scientific institutions may greatly benefit from well-organized joint actions.

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