

Marine geological data as a basis for sustainable growth, an example from the Gulf of Bothnia, Finland

Study area

Finland has one of the longest coastlines in Europe. In fact, there is an old saying that Finland is an island as about 80 % of Finnish foreign trade takes place by sea. In addition to the marine traffic, the interests to use marine resources (e.g. aquaculture, constructions) have been increasing during the past decades. The Gulf of Bothnia is located in the northern part of the Baltic Sea. Besides an important shipping route, the Gulf of Bothnia is an essential resource in terms of fish farming and wind power, for example, and it is also possible to make use of the geological resources of the gulf. It is a shallow marine area with brackish water that freezes yearly. It is also an area of rapid isostatic land uplift with a maximum uplift rate of about 0.9 cm/year.

SmartSea supports blued growth

If unmanaged, increasing human interests combined with the projected impacts of the climate change pose a possible threat to the sustainable use of marine resources, especially in sensitive marine areas like the Gulf of Bothnia. The Academy of Finland funded SmartSea project (2015 – 2020) aims to combat with these issues with a key idea that sustainable growth can only be attained by planning the use of sea areas wisely. An essential part of the work is identifying practical and administrative obstacles to 'blue growth'. In order to fulfill these tasks there is an urgent need for confident marine data including seafloor geological information.



Figure. The Gulf of Bothnia, between Finland and Sweden, forms the northernmost part of the Baltic Sea. The area freezes yearly and the icebreakers are needed to keep the shipping routes open. Figure of the Ice breaker Otso by Arctia.



Figure. The SmartSea project will assess how the Gulf of Bothnia will change in the next decades and strives to find out how the natural resources of the Gulf of Bothnia can be used sustainably.

Marine geology - current activities

Full-coverage marine geological data is not yet available from the Bothnian Sea. Therefore geological field surveys and studies (including seabed monitoring) have been implemented in carefully selected areas, representing different seafloor conditions. The collected data will be used to produce marine geological data that is useful for both scientists and marine managers of this sensitive sea area.

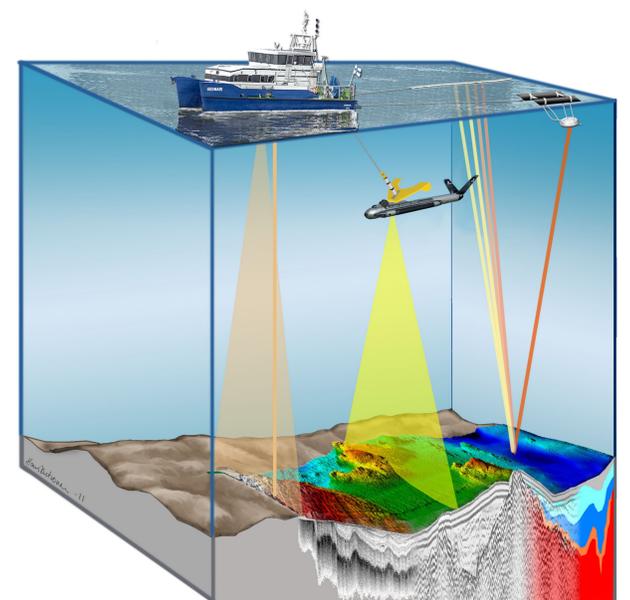


Figure. Marine geological field studies included detailed seismo-acoustic surveys by research vessel Geomari

VELMU programme

The Finnish Inventory Programme for the Underwater Marine Environment, VELMU, has collected spatial data on both abiotic (geological, physical and chemical) and biotic characteristics of the marine environment for 12 years. The map portal (<http://paikkatieto.ymparisto.fi/velmu>) with all available VELMU data released in 2016 is an important source for marine data.

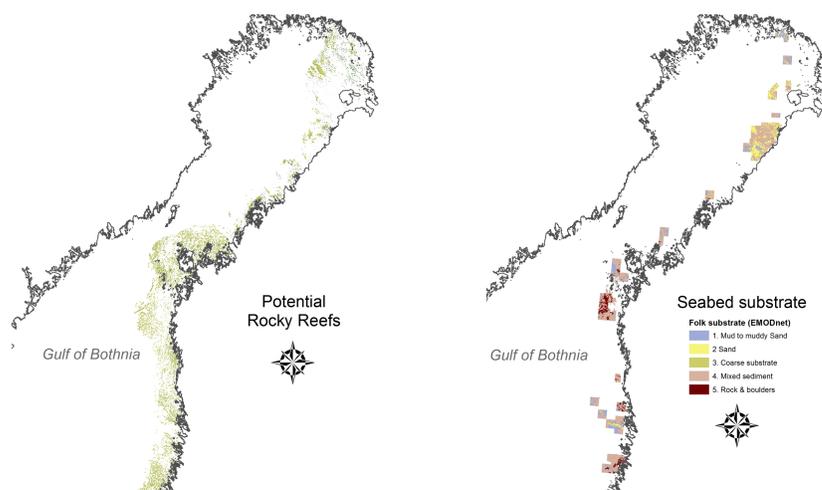


Figure. The VELMU portal includes multitude of datasets that inform about seafloor environment. Geological information contains data on seabed substrate and rocky reefs among others.

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