

The role of science in the management of environmental problems of the Baltic Sea

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The current environmental state of the Baltic Sea is a product of an unfortunate cocktail of multiple primary and secondary stressors (natural and anthropogenic), with additive and unforeseeable effects. It is generally agreed upon that eutrophication (i.e. the secondary effects of nutrient over-enrichment), effects of over-fishing, harmful substances (including their transports), traffic, loss of habitats, and general threats to biodiversity, are some of the main problems. These problems are further enhanced by the ongoing global climate change, presumably dramatically affecting the Baltic Sea within the next 100 years.

Alterations of the structure (species compositions, threatened species, the role of invasive species, habitat changes etc) of the entire system has caused functional changes (often referred to as "regime shifts"), and the major issues as to what we want to save and protect (setting the boundaries), how do we define (and agree upon) the boundaries of acceptable change, how do we define the aims and goals of the Baltic Sea we wish to achieve (e.g. "the Baltic Sea a hundred years from now"), and how do we get there?

Our awareness of the inter-dependence of the components affecting the health of the marine ecosystems of the Baltic Sea has increased, and decision makers in the countries bordering the sea agree that strong measures are needed in order to counteract the negative trends. Hence, irrespective of the strategies and frameworks proposed (the EU Marine Strategy may provide one strong tool, and the HELCOM Action Plan another), we need to combine knowledge and expertise from several disciplines, and tackle the problems from multiple perspectives simultaneously in order to achieve truly integrated management options for sustainable solutions both for the entire Baltic Sea and its specific regional problems.