Baltic Sea marine system: An introduction

Anders Omstedt

University of Gothenburg, Sweden
anders.omstedt@gvc.gu.se

Abstract

The development within science today is to integrate knowledge from many different disciplines addressing both environmental and climate change issues (e.g. BALTEX phase II). As a part of this strategy Earth System Models (ESM) is now developing. This implies that much of the coming model results need to be understood from system point of view. However, system understanding all relies on good process understanding. We may expect that the process understanding will develop through deep knowledge with our special disciplines such as for example air-sea interaction within meteorology, mixing processes within oceanography, acidification within chemistry and ecosystems within biology. However, system understanding of how the processes interact and influence the sea is strongly needed and cannot just be the results of having a number of scientists from different disciplines coming together. It will also require a deeper understanding of the whole system and that scientists try to improve their interdisciplinary talents. The objective of the present lectures and exercises is therefore to give an overview of the Baltic Sea as a marine system by illustrating different important processes that need to be involved in such an understanding.

The Baltic Sea marine system aspects that will be discussed during the lectures are:
Conservation principals and governing equations
Physical aspects
Simplifications
Water masses and water pools
Strait flows
Intrusions and selected withdrawal
Turbulence
Water and salt balances
Heat balance
Nutrient balance
Primary production
Acid–base (pH) balance
Climate change