Investigation of Coastal Upwelling processes at the coast of Poland: Use of online coupled models ICON and GETM

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To understand the processes of local phenomena over the Western Baltic Sea such as Coastal Upwelling or Salinity Inversion, we are coupling an atmosphere and ocean model. For the atmospheric part the ICOsahedral Non-hydrostatic modeling framework (ICON) from the German Weather Service is utilized. The General Estuarine Turbulence Model (GETM) has been chosen for the local ocean model. The Earth System Modelling Framework (ESMF) is used for the coupling of ICON and GETM.

One part of the presentation will be an overview about typical issues within the coupling process such as the choice of a suitable interpolation method ESMF is providing. Various aspects due to the different grids are considered, i.e. the resolution of the grids and their different schemes. ICON is based on an unstructured triangular grid while on the other hand GETM uses a structured rectangular latitude longitude grid. Furthermore, each model has been provided with its own land sea masking which leads to problems within the interpolation process.

Secondly, the set of state variables (e.g. temperature) and flux data (e.g. heat flux), which are going to be interpolated from ICON to GETM and vice versa, are presented.

For the investigation of a Coastal Upwelling event at the coast of Poland, each model, ICON and GETM, is used independently and in a coupled mode. This provides the basis for an investigation of the phenomena and to work out the differences of an uncoupled as well as a coupled run.

The presentation contains an overview about the issues within the setup of a modeling based investigation and how we are addressing them within our coupled framework including some first results.