DMI's Baltic Sea Coastal operational forecasting system

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Operational forecasting is challenged with bridging the gap between the large scales of the driving weather systems and the local, human scales of the model applications. The limit of what can be represented by local model has been continuously shifted to higher and higher spatial resolution, with the aim to better resolve the local dynamic and to make it possible to describe processes that could only be parameterised in older versions, with the ultimate goal to improve the quality of the forecast. Current hardware trends demand a str
onger focus on the development of efficient, highly parallelised software and require a refactoring of the code with a solid focus on portable performance. The gained performance can be used for running high resolution model with a larger coverage. Together with the development of efficient two-way nesting routines, this has made it possible to approach the near-coastal zone with model applications that can run in a time effective way. Denmarks Meteorological Institute uses the HBM(1) ocean circulation model for applications that covers
the entire Baltic Sea and North Sea with an integrated model set-up that spans the range of horizontal resolution from 1nm for the entire Baltic Sea to approx. 200m resolution in local fjords (Limfjord). For the next model generation, the high resolution set-ups are going to be extended and new high resolution domains in coastal zones are either implemented or tested for operational use. For the first time it will be possible to cover large stretches of the Baltic coastal zone with sufficiently high resolution to model the local hydrodynamic adequately.

(1) HBM stands for HIROMB-BOOS-Model, whereas HIROMB stands for "High Resolution Model for the Baltic Sea" and BOOS stands for "Baltic Operational Oceanography System".