Ice – ocean model of the Baltic Sea

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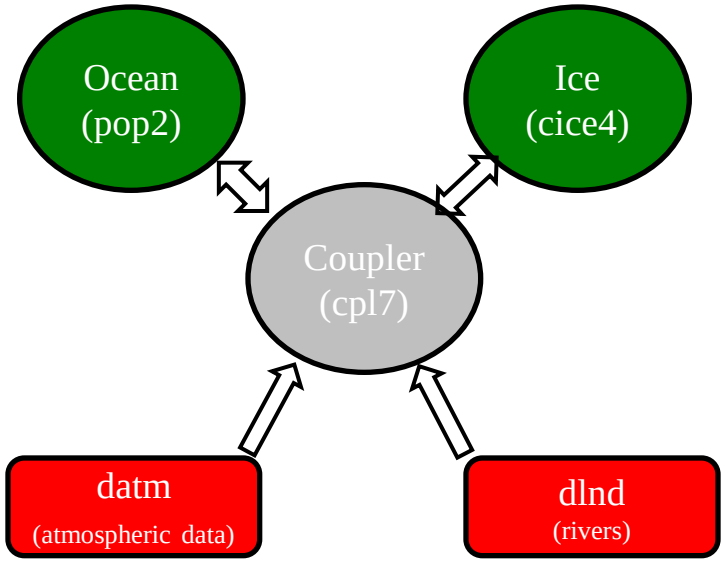
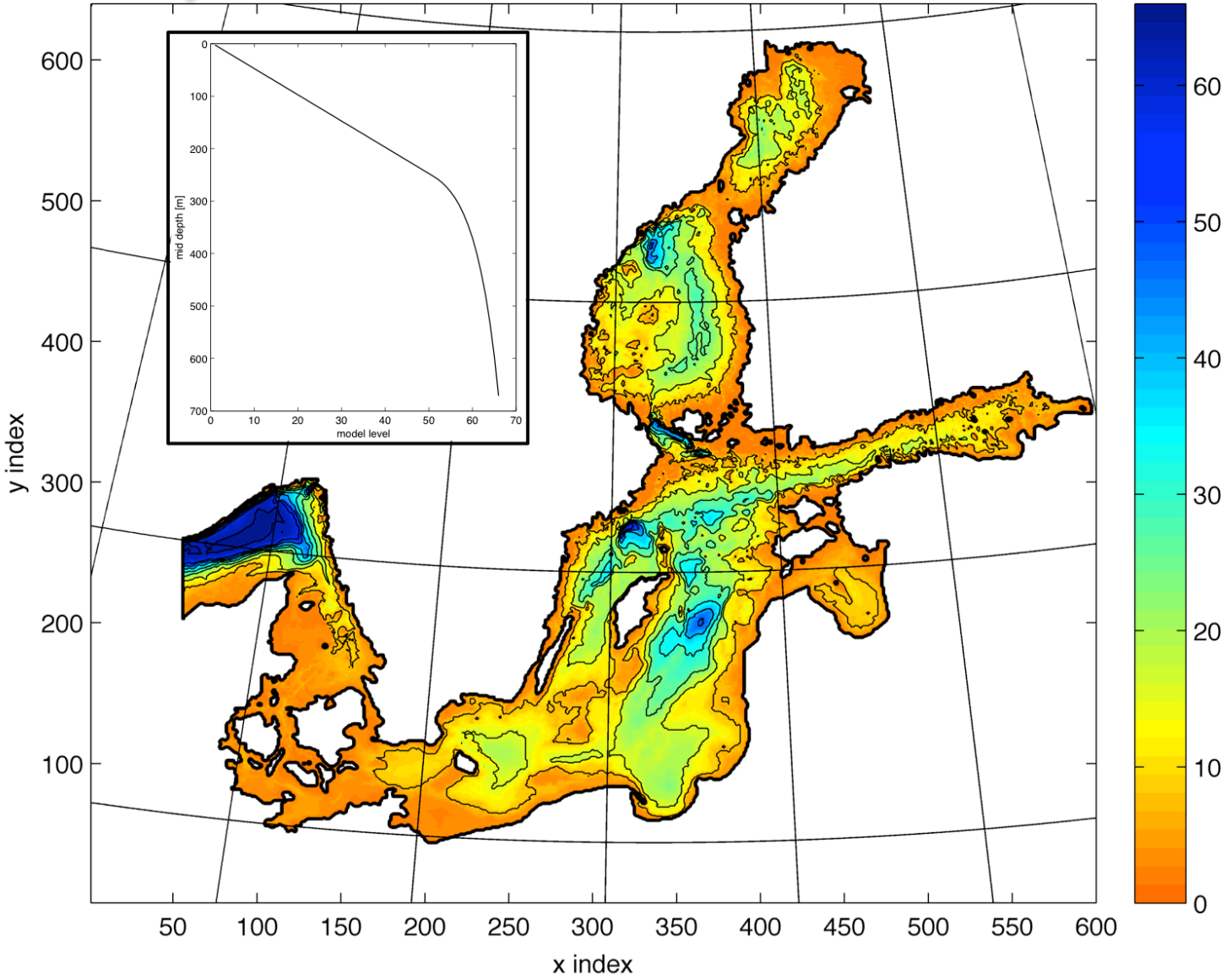
Block diagram of the Baltic Sea model configuration



- Is based on CESM – **C**ommunity **E**arth **S**ystem **M**odel (developed by NCAR and UCAR)
- Was adopted for the Baltic Sea (2 or 3 versions) and for the Arctic
- Our Baltic adaptation consist of two active components (ice and ocean) and two data models [atmosphere and land (only catchment area)]
- Ice model – **C**ommunity **I**ce **C**od**E** - has identical horizontal resolution and 5 categories
- The models are coupled through flux coupler (cpl7) which is based on MCT tools

Component	Model/Code	Configuration
Atmosphere	datm	Currently data from our WRF model operational simulation
Land Hydrology	dlnd (runoff)	Balt-Hype (SMHI)
Ocean	**POP**	2.3 km & 66
Sea Ice	**CICE**	2.3 km, 5
Coupler	**CPL**	10 minutes coupling timestep

Model domain and bathymetry (66 vertical levels)



Baltic Sea with 66 vertical levels
(color scale in levels)

Nemo model implementation in progress

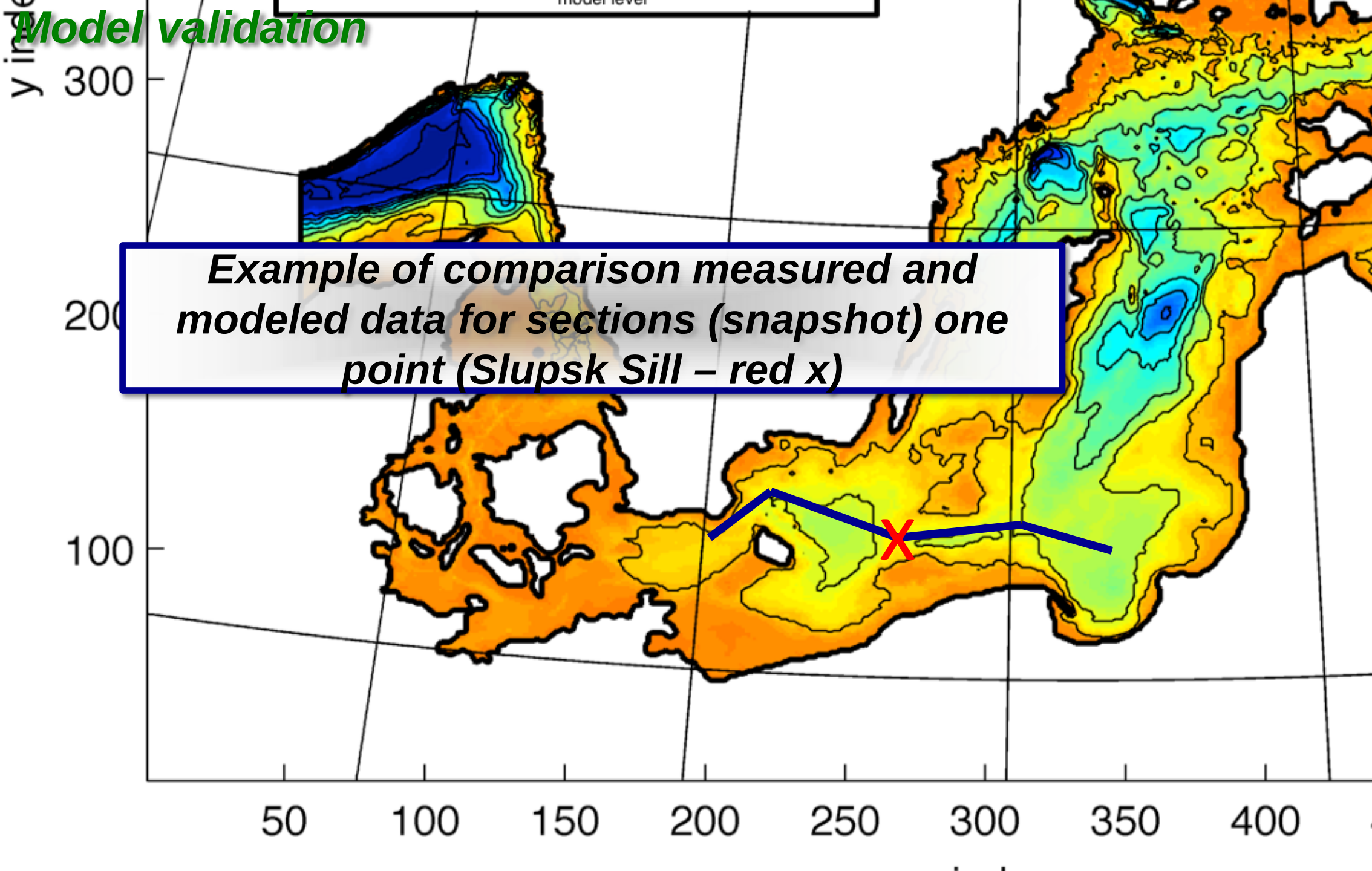
- Data identical to B-CESM
- Works fine, but still we have two main problems:
    - We have added sea level assimilation in the barotropic equation but it has influence on temperature im that area
    - Problems with vertcal structure (mainly located in turbulence)

Vision

- Multi Model Enasmble directed by BSH can be good starting point
- Comparison across different scales? For example internal waves
- Finding key locations/procesess and compare them

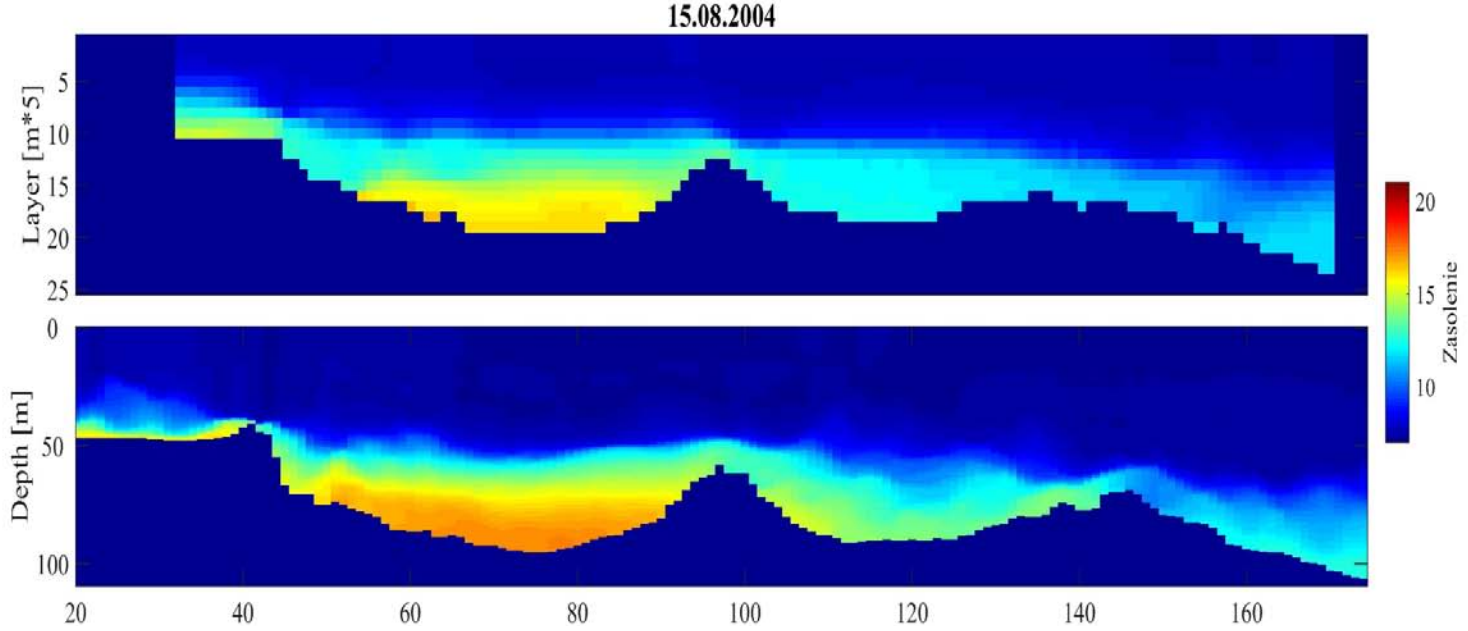
- Sharing data (mostly experimental from our cruises (RV Oceania) – see examples
- We run WRF operational simulation with 10 km horisontal resolution – we are able to share data (currently we have since 2014, but we are able run long time simulation)

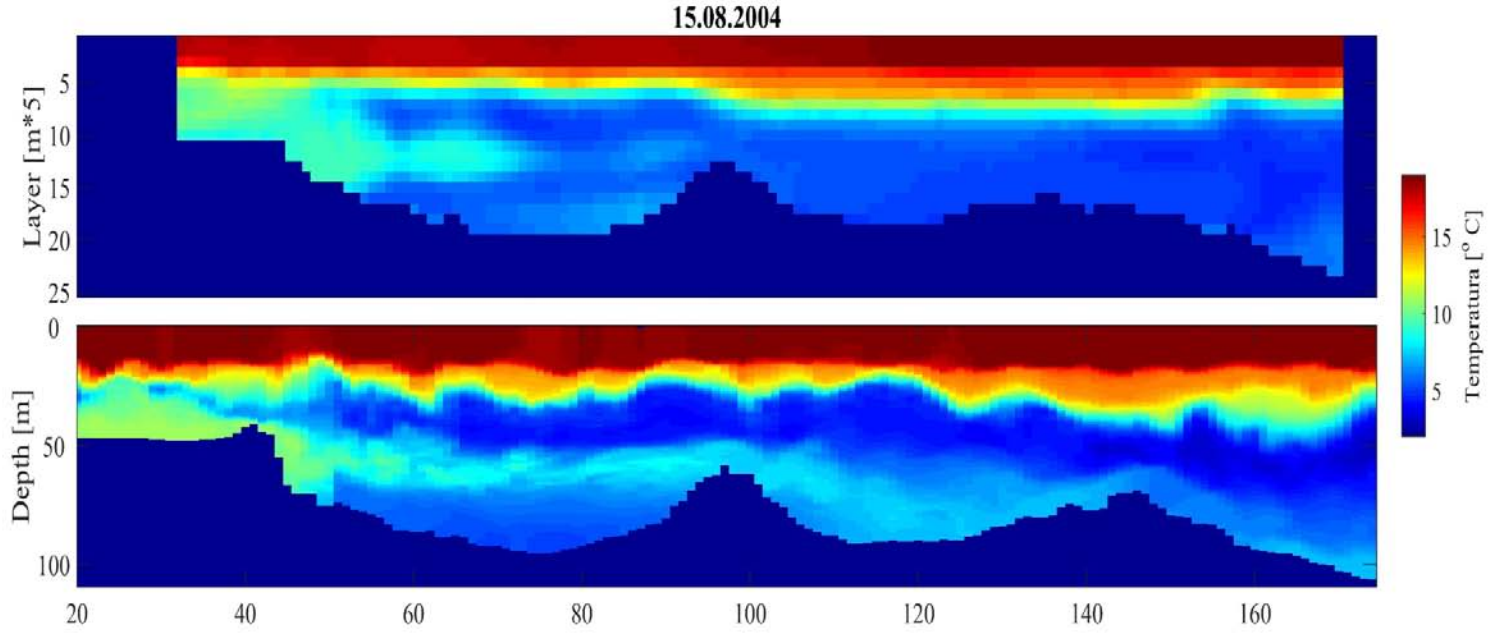
Model validation

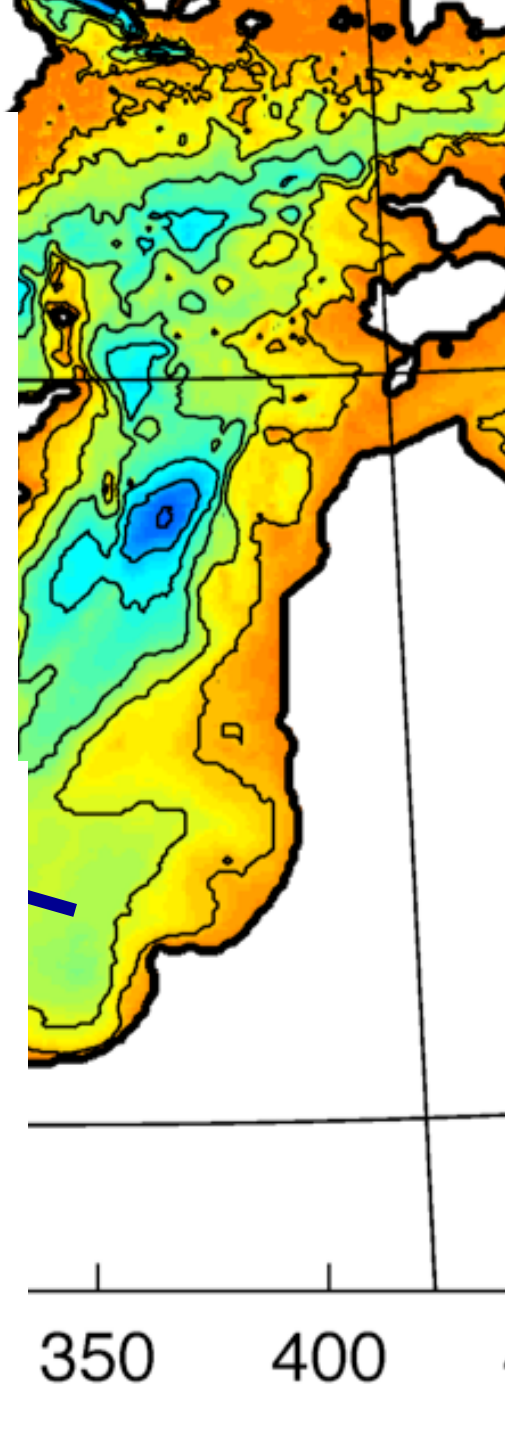


Example of comparison measured and modeled data for sections (snapshot) one point (Slupsk Sill – red x)

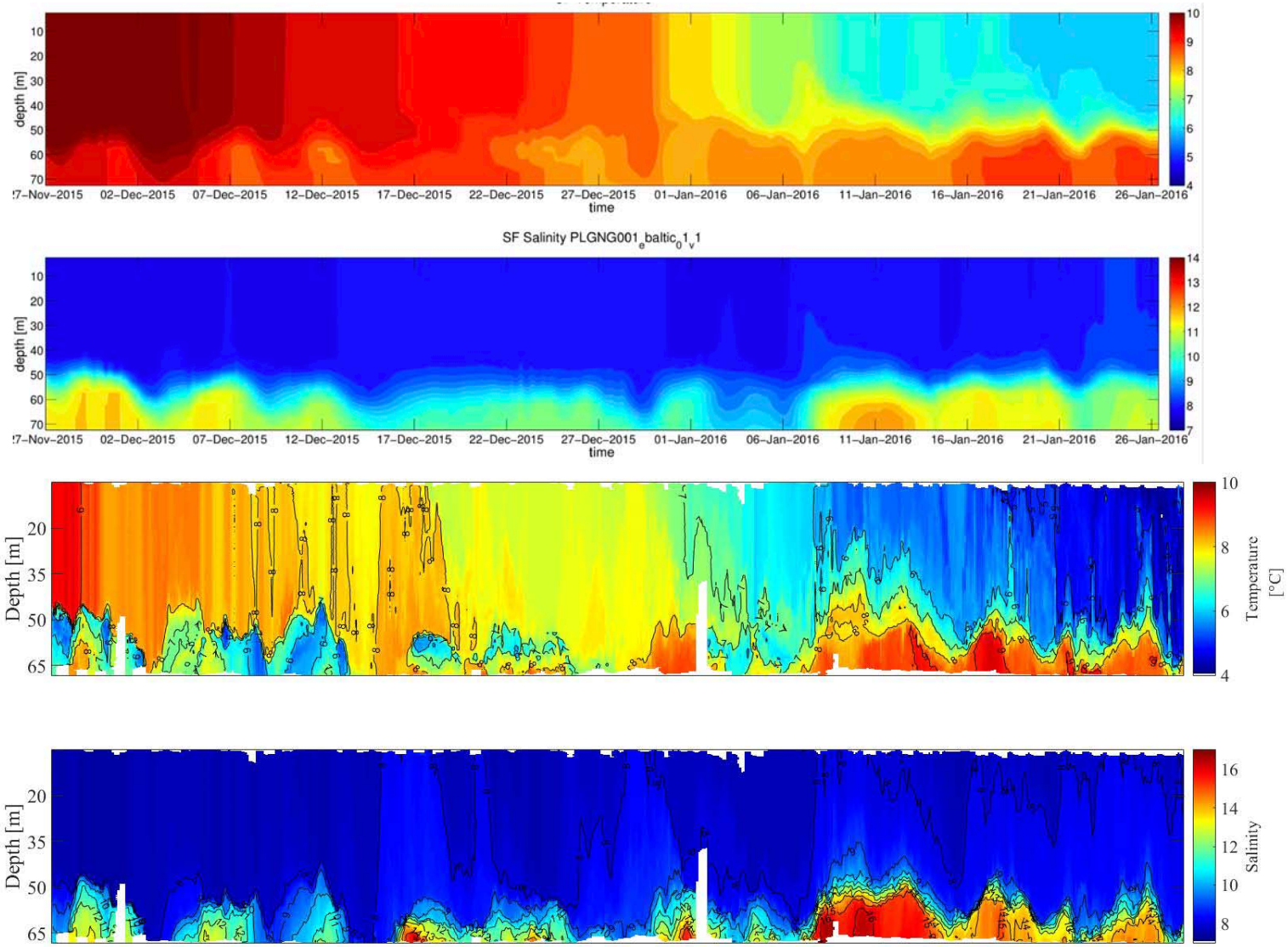
Model validation







The Shirshov Institute of oceanology – mooring data. The Słupsk Sill.About two months here, but estimated time of total is 2 years of recording



Thank you