

Project: **1060**

Project title: **Visualization of high-resolution ocean simulations**

Principal investigator: **Klaus Getzlaff**

Report period: **2018-01-01 to 2018-12-31**

Project overview

The goal of this project is to visualize different aspects and parameters from the output of existing high-resolution ocean simulations. This could be, for example, a combined view of the temporal evolution of the surface velocities, the sea-level elevation and sea-ice formation. To realize such complex and state-of-the-art visualizations it is necessary to use the DKRZ's visualization nodes with the Paraview software. The output of the project will be used to highlight scientific results either within the research community but also to a wider audience outside of the specific research field, such as in outreach or on project websites.

Work fulfilled within the project

During this project a focus was set on establishing the knowledge to generate state-of-the-art visualizations from model simulations. This project addressed aspects of different scientific projects performed by the group "Theory and Modelling" in the department of "Ocean Circulation and Climate Dynamics" at GEOMAR.

The visualization of model output from the new high-resolution configurations took the major share of activities during this project period, such as the VIKING20X configuration (Getzlaff et al. In prep) embedded in the BMBF project RACE-II as well as the INALT Family configurations (Schwarzkopf et al. In prep). The specific visualizations as described in the project application focused on the one hand on the general circulation in the wider Atlantic sector. On the other hand a focus was set on eddy dynamics and specific processes in the subpolar North Atlantic, the Labrador Sea especially and the Agulhas region. Within this project the visualization platform was not used as online diagnostic tool but as a useful way to illustrate processes in state-of-the-art presentations for the scientific community but also for a wider audience. In the following is a list of visualizations that have been produced during the project period.

BMBF request on RACE activities:

K. Getzlaff, T. Schulzki (2018): Sea Surface Temperature (5-daily average) with shading from Sea Surface Height overlayed with Sea Ice coverage from the high-resolution VIKING20X simulation for the period 2000 to 2009. http://dx.doi.org/10.3289/RACE_VIKING20X_SST

K. Getzlaff (2018): Speed at 100m depth (5-daily average) with shading from scaled Sea Surface Height overlayed with Sea Ice coverage from the high-resolution VIKING20X simulation for the period 2000 to 2009. <https://cloud.geomar.de/s/T6NSQkoTEq5J4pd>

K. Getzlaff (2018): Surface Speed (daily average) with shading from Sea Surface Height overlayed with Sea Ice coverage from the high-resolution VIKING20X simulation for the period 2000 to 2009. <https://cloud.geomar.de/s/TydQ6mXLsgXcC8z>

Public lecture:

A. Reintges (2018): Golfstrom Kollaps – steht uns wirklich eine Eiszeit bevor; Spätschicht trifft Wissenschaft, Studio Filmtheater am Dreiecksplatz, Kiel. <https://cloud.geomar.de/s/q985fotiobmz46T>

Internal use:

K. Getzlaff (2018): Salinity on σ_3 surface (daily average) illustrating Denmark Strait overflow and Labrador sea deep water formation from the high-resolution VIKING20X simulation for 2007. <https://cloud.geomar.de/s/RC7jHGXMcj9DqYt>

K. Getzlaff (2018): Spreading of Denmark Strait overflow water in the subpolar North Atlantic overlayed with mixed-layer depth and sea ice coverage with additional temperature sections included in the east Atlantic derived from the high-resolution VIKING20X simulation for the period 2000 to 2009. <https://cloud.geomar.de/s/PcqrkGfnao2bLEF>

T. Schulzki and K. Getzlaff (2018): Sea Surface Temperature (5-daily average) with shading from Sea Surface Height overlayed with Sea Ice coverage with additional overlay of cumulated cloud cover and wind velocities as vectors from a coupled climate model. <https://cloud.geomar.de/s/pTiyNkcpfnLsoar>

K. Getzlaff, T. Schulzki (2018): Sea Surface Temperature (5-daily average) with shading from Sea Surface Height overlayed with Sea Ice coverage from the high-resolution INALT20 simulation for the period 2000 to 2009. <https://cloud.geomar.de/s/Xnrqmrk8W5TsaCk>