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Attention : Anna Pirani & Dr Aida
Alvera-Azcarate

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Final Report - COST STSM Request - Ref. : COST-ONLINE_STSM-ES1402-29212

Dear Mrs Pirani, Dear Mrs Alvera-Azcarate,

I would like to synthesize in this final report my Short Term Scientific Mission which occurred in Bergen (IMR, Norway) between August 12th and August 21th 2015.

The first days were dedicated to first contacts with the key people at IMR, with a focus on data frequency, geographical distribution and access policy from data originators. Some first DIVA analyses were presented by Helge Sagen as test cases, opening discussions on the DIVA settings we should use in order to create our new climatologies on the Barents Sea.

The data we have been using during this STSM originates from the World Ocean Database 2013 (WOD13) and from Russian data provided by PINRO institute in Murmansk. These last ones can only be accessed via an IMR server (restricted access). In the next future, it could become possible to use data from 2 other Russian data centers.

From there, ODV format files were produced by IMR so they can be directly used in DIVA. We discovered small bugs in the ODV files, fixed in less than 1 day. In accordance with the IMR oceanographers, we decided to work between 1965 and 2014 on 4 seasons : 1101, 0204, 0507, 0810 (1101 is November-January, etc). A bug was found in DIVA concerning winter season crossing New Year, and quickly fixed.

From a GEBCO topography, we extracted contours at 23 standard depths from surface to 500 m depth. Finite-elements meshes were created and data removed when outside the mesh (only covering our region of interest). We defined our year periods as follows : 11 years when possible, otherwise minimum 6. We had to create a script to adapt DIVA to this particular need. For example : 1965-1970 (because no data before 1965), 1989-1999, 2009-2014 (because no data after 2014). We then optimized 2 statistical parameters (correlation length and signal to noise ratio) for the variable «Temperature» on these 50 year periods, 4 seasons, and 23 levels. After some tests, we decided to filter vertically these parameters, in order not to create discontinuity between levels. The signal to noise ratio was capped at 10, to avoid being too confident in data accuracy.

Using these parameters, we started generating reference fields (= first guess analyses). This is the last step before generating our final climatologies. However, Vidar Lien suggested to use the advection option in DIVA to improve these climatologies. He

accepted to generate himself these advection fields from an ocean model.

This work will be continued at IMR and ULg (Belgium) in parallel. We are currently trying to find a technical solution to use IMR servers directly from ULg, probably a matter of days. Once these climatologies are ready, we will try to detect any possible change in the oceanic circulation, as well as in the Norwegian sea where IMR can also help us by its expertise in data collecting.

In any case, we will meet again between 9 and 14th of October 2015, in the frame of the DIVA workshop 2015 in Calvi (France). A nice occasion to improve again our climatologies, benefiting from potential peer reviews from other participants.

Hoping this final report will receive all your attention, I remain at your disposal for any extra information.

Looking forward to hearing from you soon,
Yours sincerely,

Sylvain Watelet