

UCT-SANCOR SEMINAR BY DR BJÖRN BACKEBERG

TUESDAY, 8 NOVEMBER 2022 AT 12H00

PHYSICAL VENUE: UCT OCEANOGRAPHY SEMINAR ROOM

ONLINE VIEWERS PLEASE RSVP [HERE](#) BY 7 NOVEMBER TO RECEIVE THE LINK.

ABOUT THE SPEAKER



Björn Backeberg is a physical oceanographer and project manager with experience in research and development focusing on numerical modelling, data assimilation and the development of decision support tools for stakeholders and end-users. Björn has a PhD in numerical ocean modelling from the University of Cape Town, where he also worked as a Research Officer before moving to the Council for Scientific and Industrial Research (CSIR) as Principal Researcher. Later he served as Director of the Nansen-Tutu Centre, a South African - Norwegian joint venture in marine environmental research and training. He currently works at the Environmental Hydrodynamics and Forecasting Department of Deltares where he focuses on the development and implementation of new innovative capabilities in Deltares' simulation software and data analysis tools.

Towards a workflow solution for Delft3D Flexible Mesh that can be easily deployed across distributed cloud and high-performance computing infrastructures

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The [C-SCALE project](#) is leveraging cross-disciplinary open-source technologies available through the [European Open Science Cloud \(EOSC\) Portal](#) to implement an open compute and data federation. The federation will provide homogenous access to advanced computing and data services supporting [Copernicus](#) big data analytics. For more information about the federation and its components please see the recently published technical note: [An open compute and data federation as an alternative to monolithic infrastructures for big Earth data analytics](#).

To facilitate community co-design of the federation, its functional specifications are derived from community use cases. These determine user requirements for the federation members to implement. C-SCALE will deliver a range of services supporting [Copernicus](#) big data analytics to the EOSC Portal. The use cases are contributing to this service portfolio by developing so-called workflow solutions. These give users templates and reusable components to build their own applications, including the ability to connect high resolution earth observation monitoring

capabilities to modelling and forecasting applications. These workflow solutions will be easy to deploy on the heterogenous cloud, high-performance and high-throughput computing infrastructures part of the C-SCALE federation.

At the [EGI Conference](#), we demonstrated the hydrodynamic and water quality modelling workflow solution we are developing for DELFT3D FLEXIBLE MESH. This was done for an example model in the Aegean Sea developed for the [HiSea project](#).

[EGI Check-in](#) is used for homogenous access to distributed computing infrastructures and [docker](#) takes care of interoperability.

Building on previous developments, docker containers have been created that contain python scripts for downloading, preprocessing and postprocessing data. These make use of the [Copernicus Marine Services' MOTU Client](#), the [Climate Data Store's API](#) and the python scripts developed for [COASTSERV](#). The model is run using the DELFT3D FLEXIBLE MESH docker container, and the results can easily be visualized using [dfm_tools](#) provided in a [JupyterHub](#) environment connected to the computing resources.

Future plans include, (1) wrapping the workflow components in a workflow engine such as [snakemake](#) or [cylc](#), (2) expanding the workflow to be able to run the model on a high-performance computer using the DELFT3D FLEXIBLE MESH [Singularity](#) container, and (3) migrating pre and post-processing functionality from COASTSERV to [HYDROLIB](#).

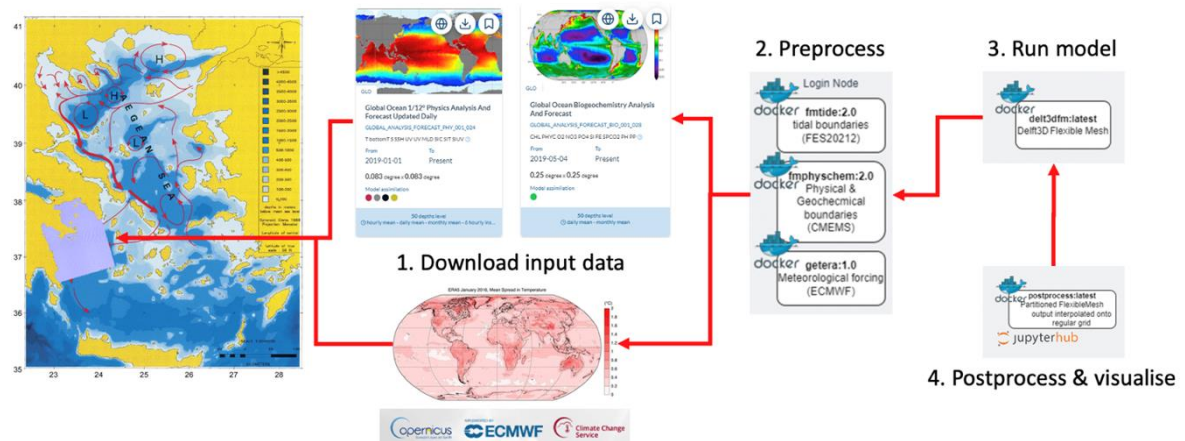


Figure: Schematic of the workflow components demonstrated for an example model in the Aegean Sea.