

LEVERAGING DIGITAL TWIN OPPORTUNITIES FOR KEY SEA-ICE IMPACT SECTORS IN THE NORDIC AND BALTIC CONTEXT

NOrdic CryOSphere Digital Twin – NOCOS DT

Project duration: 2022–2024

Explore and pilot the digital twin technology opportunities and showcase how output from key initiatives like the Destination Earth (DestinE) Climate Adaptation Digital Twin (Climate DT) could be leveraged for key sea-ice impact sectors in the Nordic and Baltic context.

In the longer term, deliver a major Arctic and Baltic contribution to the climate change information system developed by Climate DT, with cryosphere-related use cases at the interface between science and policy, in line with the overarching Destination Earth approach.

Marine Spatial Planning

(led by SMHI)

Traditionally, Marine Spatial Planning (MSP) databases and platforms include only static information on the seabed, marine infrastructures, habitats and other environmental parameters. Climate change causes quickly changing environmental conditions that should be taken into account in MSP since they have large direct influence on cumulative ecosystem impacts (e.g. Wåhlström *et al*, 2022) as well as on new potential activities and pressures that become possible, e.g. when sea-ice conditions change. In order to provide information on ocean and sea changes for decision making, new high-resolution ocean and sea-ice model projections will be made available in formats that can be integrated into MSP platforms.

Goal

Pilot how the climate models' data can be utilized in the MSP platforms.

Potential users

- Marine spatial planners and managers
- Policy and decision makers

Models and data

- Focus will be on the data from climate projections with Nemo-SCOBI.
- There are existing CMIP5 projections for the Gulf of Bothnia from the SmartSea project, and new CMIP5 and CMIP6 projections are presently being produced for the North Sea and the Baltic Sea.

Developments

An open-source processing toolbox will be developed for the extraction of relevant data from climate model projections, and from the Climate DT.



Key innovations

The innovation lies in the fact that climate data are very relevant to MSP, but yet not considered enough and facilitating access to the data via the unprecedented capabilities of DestinE is a breakthrough into managing our seas better.

Capabilities provided to DestinE

Daily and monthly averaged ice concentration, ice volume, salinity, temperature, sea level, and current vectors

Foreseen DestinE capabilities

The contribution of the processing toolbox to Climate DT, hence DestinE, will give access to relevant climate model data to MSP to provide the opportunity to increase ecosystem resilience e.g. through climate refugia, long-term fisheries planning, marine protected areas etc., to maximise impact and support EU policy making and implementation.

Funding



Partners



Contact

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