

# 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.

## Landfast ice

(led by DMI)

Greenlandic people travel on landfast sea ice and use it for hunting and fishing. This means that changes in landfast ice conditions will (and already do) affect their way of life. Landfast sea ice is also common in the Baltic in the winter, where it is used for winter roads and recreational activities such as skiing and ice fishing. Additionally, knowledge of landfast sea ice dynamics is important for the design of offshore installations such as wind farms.

Simulation of landfast sea ice requires resolving physical processes close to the coasts. Hence, the high resolution of ClimateDT simulations will be beneficial.

### Goal

Create an analysis tool that diagnoses the time period for landfast ice in present and future climate. Integrate the tool into Climate DT post-processing.

### Potential users

- People travelling on sea ice
- Decision-makers who want to plan when it is feasible to travel on ice
- Decision-makers who want to install offshore constructions in ice covered areas

### Models and data

- DMI's ocean–sea-ice model for the Arctic
- Other sea ice model data (e.g. Copernicus)
- Climate DT model output (once available)
- Ice charts (for validation)



## Developments

- Python software tool to detect and analyse areas with landfast ice from sea ice models
- Application of the tool to Climate DT simulations to derive landfast ice areas
- Dissemination of the results in a scientific journal and as a demonstrator for validation and uptake

## Contribution to DestinE

Provide user-relevant information about landfast ice existence in the future climate.

## Benefit of DestinE

The spatial resolution in current climate models often does not allow resolving coastal processes, which are important for landfast sea ice. The high resolution of Climate DT will improve this.

## Funding



## Contact

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## Partners

