



European Digital Twin Ocean

DestinE Data Bridge supporting the Digital Twin of the Ocean

Jérôme GASPERI, Mercator Ocean international

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Co-authors: A. Arnaud, Q. Gaudel, M. Tonani, V. Persson (MOi), J. Calewaert, J. Vera, C. Delaney (SSBE)



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OCEANeye

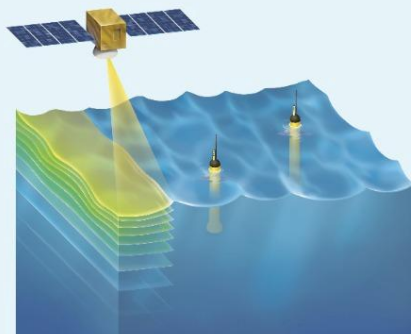
The power of ocean knowledge

European Ocean Observation System

Satellite observation



In-situ observation



European Digital Ocean System

EDITO



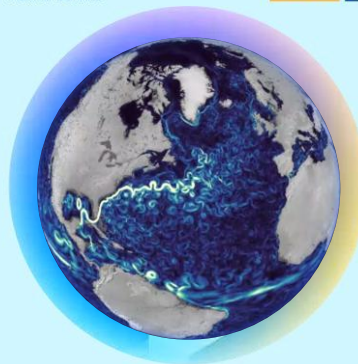
European Digital Twin Ocean



Copernicus Marine Service



EMODnet



EUROPEAN OPERATIONAL ASSETS

INTERNATIONAL COLLABORATIONS



Ocean Data Sharing



The European Ocean Pact Priorities



Protecting and restoring ocean health



Boosting the competitiveness of the EU sustainable blue economy



Supporting coastal and island communities, and outermost regions



Advancing ocean research, knowledge, skills and innovation



Enhancing maritime security and defence



Strengthening EU ocean diplomacy and international ocean governance



PROGRAMME OF THE EUROPEAN UNION



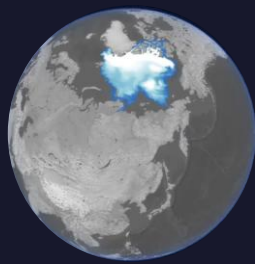
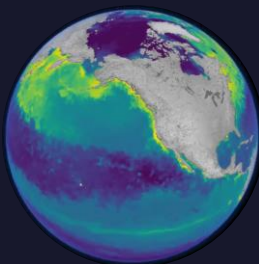
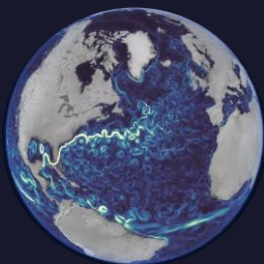
Copernicus Marine Service



MERCATOR OCEAN INTERNATIONAL

EMODnet: *in situ* marine data service

EMODnet serves users in policy, research, industry, and society, the EU Digital Twin Ocean and global ocean data initiatives



BLUE OCEAN
physical



GREEN OCEAN
biogeochemical



WHITE OCEAN
Sea Ice



Copernicus
Marine Service



PROGRAMME OF THE
EUROPEAN UNION



Copernicus
Marine Service



MERCATOR
OCEAN
INTERNATIONAL

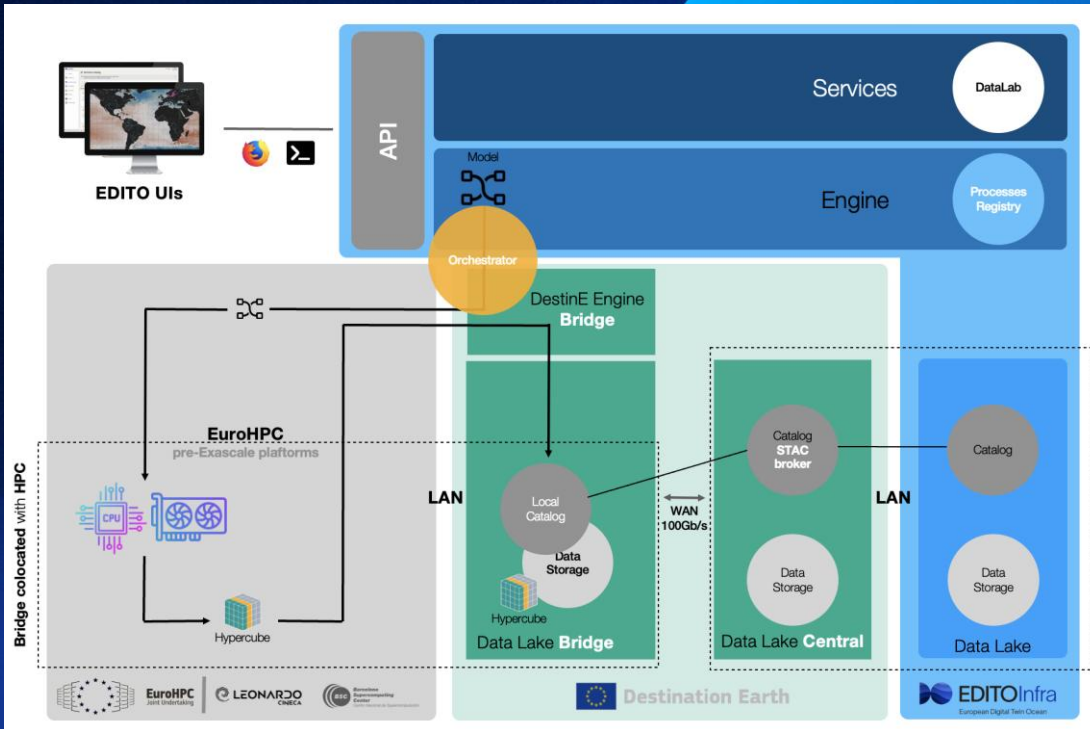
Tailored information – on demand

Add my data and models

What if scenario



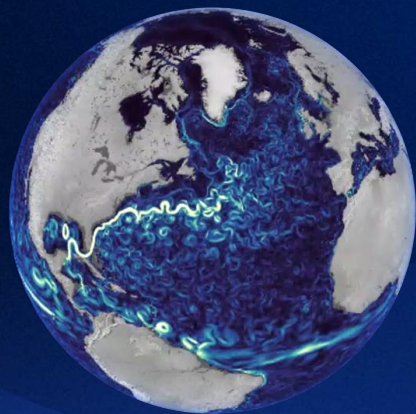
Infrastructure for AI processing on EDITO



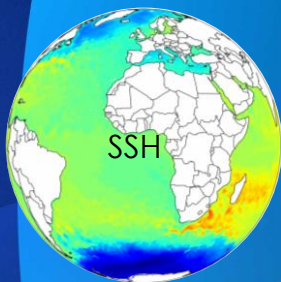
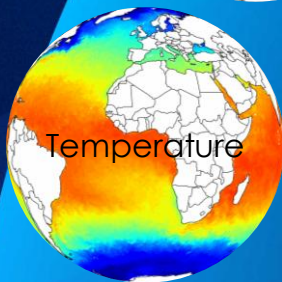
Providing a computing infrastructure supporting **AI large model training** is a **challenge**

DTO is working with DestinE and EuroHPC to get access to resources for training, that do not require real-time availability

Lighter resources needed in real-time for AI model inferences or What-If scenarios are directly proposed on the EDITO platform



Trained by: GLORYS12
Initialised by: GLO12
Forecast lead time: 10-day



10-day forecast produced daily



Visualise the latest forecast



Browse and download



Execute on demand

viewer

catalogue

datalab



GLONET



On EDITO



GLONET 1.1
GLONET 2.0



Compute key ocean variables in seconds, enabling rapid, global-scale forecast

More stable

- Atmospheric forcing
- 40 days (vs. 10 days)

Optimized training

- GLORYS12/IBI36 + ERA5
- 8xH100 VM ~ 4 week each
- **On Destination Earth**

10-days inferences

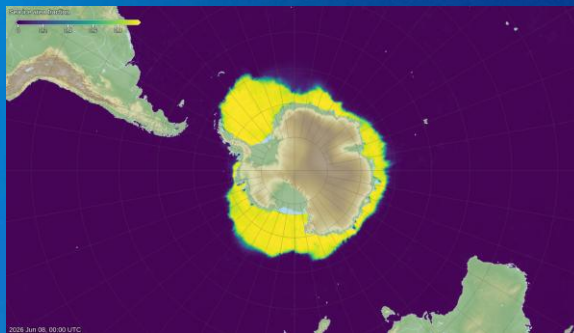
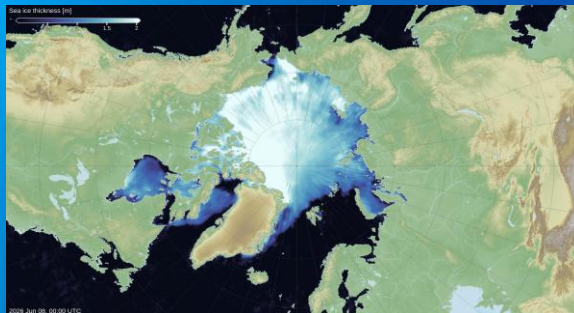
- GLO12/IBI + IFS
- GPU 48G VRAM ~ 10 sec
- **On EDITO**

Size

- 80m/79m parameters
- 910 MB checkpoints

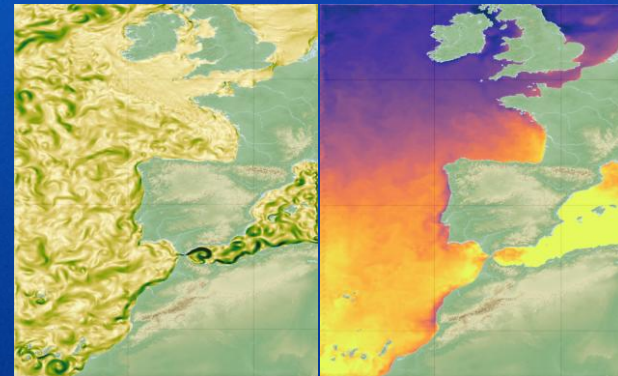
Ice

Fraction, velocity, thickness



IBI

Temperature, currents, salinity, surface height



Resolution: 1/36°

Output grid resolution: 1/4°
Effective resolution: 1/12°

EDITO2 – DestinE Collaboration

MOI objectives

- Validate deployment of EDITO backend on DestinE Infra
- Have Dedicated GPUs instances to train MOI AI models

Current status

- DestinE provided MOI ressources (300 vCPUs / 38 TB Storage / 8 H100 GPUs), accounts and a dedicated OpenStack Project environment.
- Very helpful and responsive DestinE / EUMETSAT user support
- As a result, the two objectives are fulfilled : a fully functional backend EDITO instance is hosted at DEDL-EUMETSAT and eight dedicated GPU Instances are used to train MOI models.

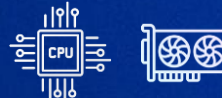
EDITO2 – DestinE

Objective 1



EDITO backend

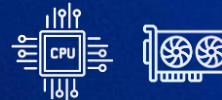
Region waw3-1



Computing
resources

EDITO backend on
Destine

*Region DEDL-
EUMETSAT*



Computing
resources

EDITO2 – DestinE

Example : Ocean Lens

Input
 $1/4^\circ$

Output
 $1/36^\circ$



EDITO

On demand **downscaling**
triggered on EDITO
OceanLens Application

Inference computed on
EUMETSAT **DestinE** infra



 Destination Earth

Regional downscaling processing time
< 1 minute

EDITO2 – DestinE

Next steps

Consolidated the EDITO backend to support multi-infrastructure. This will enable user to use resources from DEDL-EUMETSAT through EDITO interface

Continue training and inferences of MOI models using DEDL-EUMETSAT GPUs infrastructures

Future steps

Achieve the link with EuroHPC centers, via the bridges, to run HR ocean models

Improve the access to GPUs resources

Enable Ocean / Atmosphere models coupling

Building the Digital Twin Ocean, Together.

By 2030, EDITO envisions a fully **operational DTO**, enabling on demand production of products based on AI and serving as a global benchmark for digital ocean solutions

A more advanced integration with DestinE would be key to reach this objective



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