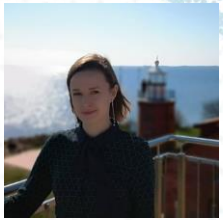
Copernicus Marine Service

EU Coastal Use Cases Workshop

September 16, 2024

Development of the Operational hydrodynamic model for the Curonian Lagoon and coastal area of the southeastern Baltic Sea



Jovita Mėžinė

Klaipėda University, Lithuania

Klaipeda University
Marine Research Institute

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OPER-LIT

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- **The project aims to improve understanding of the shallow lagoon and coastal waters of Lithuania.**

Promote an operational modeling service for stakeholders and enhance the visibility of CMEMS.

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KLAIPEDA UNIVERSITY. MARINE RESEARCH INSTITUTE

THE CORE OF THE NUMERICAL MODELING TEAM

Dr. Jovita Mėžinė

OPER-LIT project lead, modeller, data analyst, developer

Dr. Rasa Idzelytė

Modeller, data analyst, developer

Dr. Georg Umgiesser

Modelling group lead, modeller, developer

Dr. Petras Zemlys

Modeller, data analyst, developer

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- # Copernicus Marine Products and Coastal model

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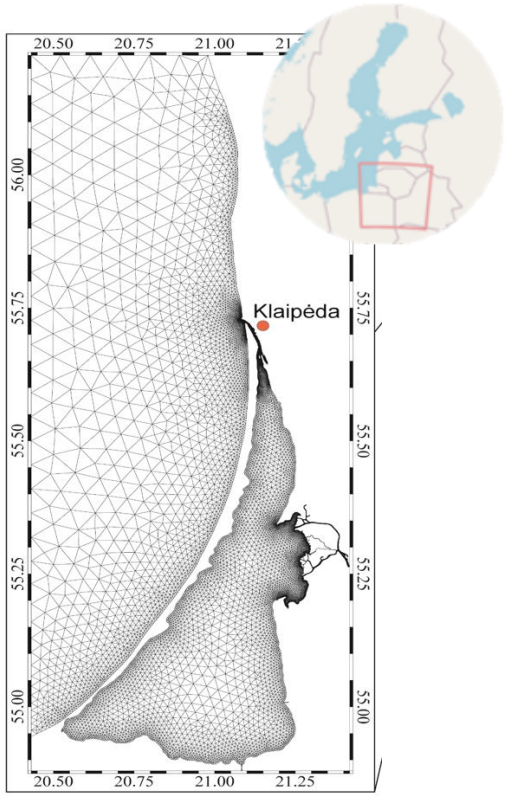
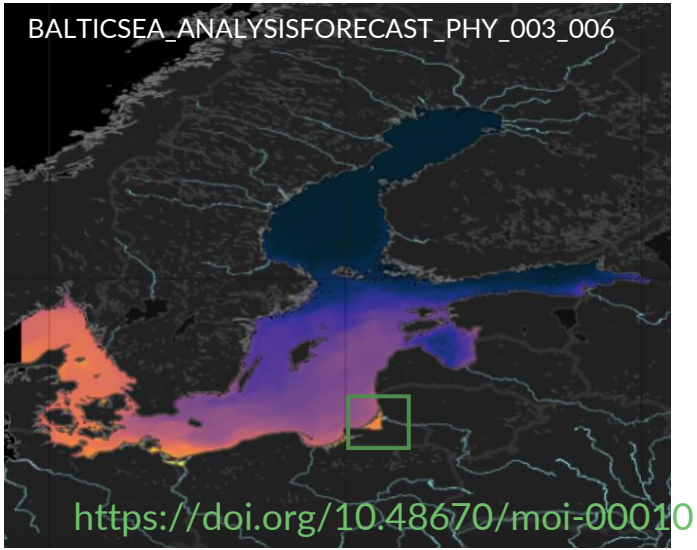
COASTAL MODEL

- MODEL
  - SHYFEM – Shallow water HYdrodynamic Finite Element Model (https://github.com/SHYFEM-model/shyfem)
- GEOGRAPHICAL COVERAGE:
  - 20.431° E, 54.87986° N,
  - 21.41875° E, 56.22538° N
- HORIZONTAL GRID:
  - triangular elements with varying resolution from 20-5000 m
- VERTICAL GRID IS IN ZETA LAYERS:
  - 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 13, 15, 18, 25, 35, 50 and 68 m.



FORCING DATA

- SEA BOUNDARIES:
  - Copernicus Marine Product - Baltic Sea Physics Analysis and Forecast
- METEOROLOGICAL DATA:
  - ECMWF
- RIVER DATA:
  - Lithuanian Hydrometeorological Service



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- **Seamless Coastal Marine Service**

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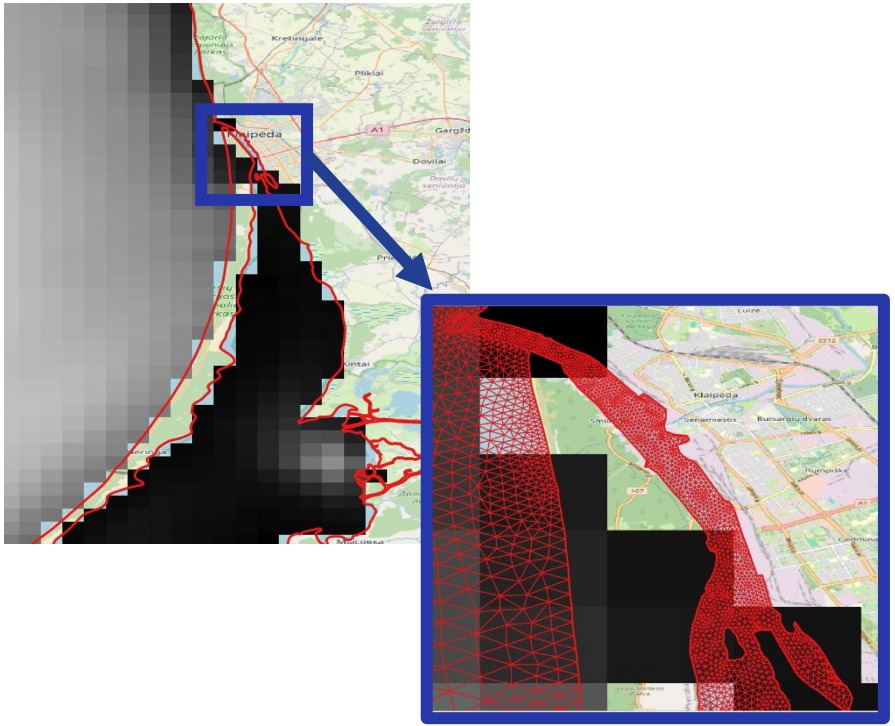
DOWNSCALING (INCREASING RESOLUTION)

- Very precise coastline
- Much higher resolution, particularly in shallow and narrow areas
- Modelled parameters:
  - Water temperature
  - Salinity
  - Water level
  - Waves
  - Currents



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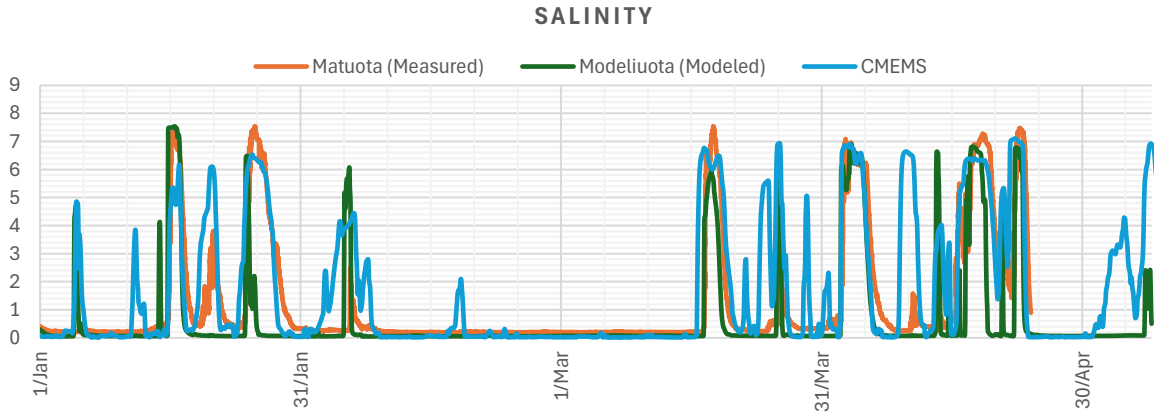
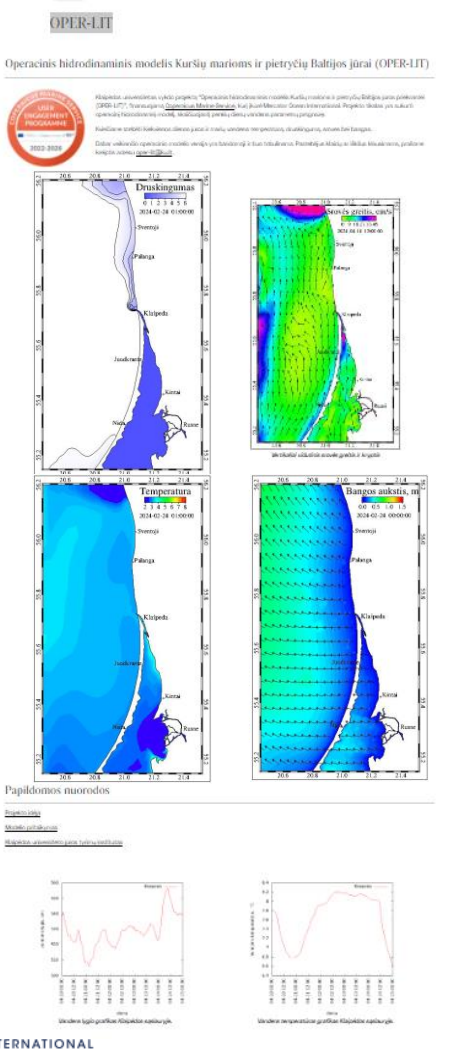
OPEN DATA

- Website was launched on March 2024 https://jti.ku.lt/lt/projektai-8/oper-lit
- Model was validated.
- 5 day forecast are open and updates twice a day.





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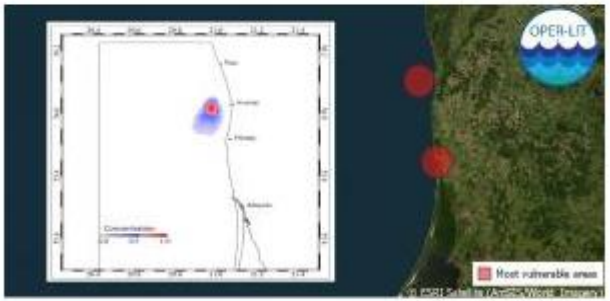
STAKEHOLDER INVOLVEMENT

- Environmental Protection Agency
- Lithuanian Hydrometeorological Service
- Klaipėda State Seaport Authority

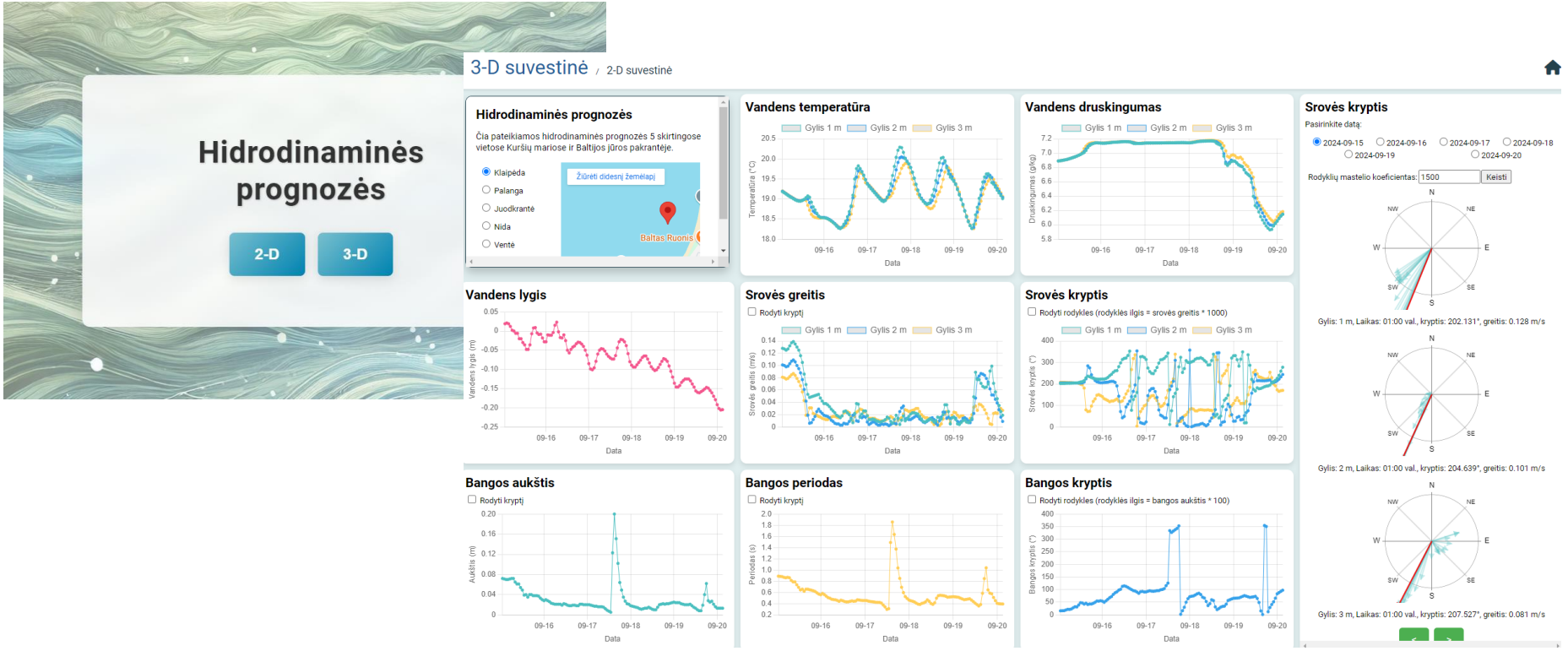
Use Cases

An Operational model for monitoring shallow waters in the Curonian Lagoon and the Southeast Baltic Sea coasts



Enhancing Pollution Response in the Southeast Baltic Sea with High-Resolution Hydrodynamic Modelling

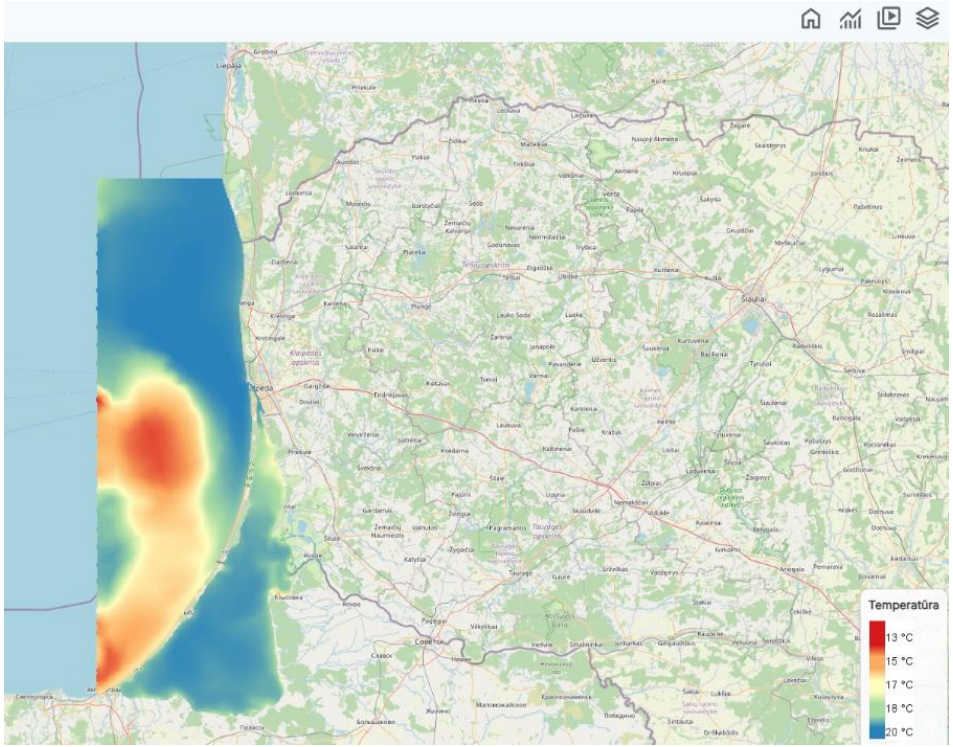
WHAT WE OFFER FOR STAKEHOLDERS



WHAT WE OFFER FOR STAKEHOLDERS. II

Coming soon:

- Online maps for main parameters
- Possibility to check any point data
- To see 5-day forecast graphs



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Thank you!

We thank for our stakeholders:

Environmental Protection Agency, Lithuanian Hydrometeorological Service, Klaipėda State Seaport Authority

This work has been carried out as part of the Copernicus Marine Service 'Development of the Operational hydrodynamic model for the Curonian Lagoon and coastal area of the southeastern Baltic Sea (Lithuania)' project. Copernicus Marine Service is implemented by Mercator Ocean in the framework of a delegation agreement with the European Union

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