

EU Coastal Use Cases Workshop

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SYROCO The SYstem of ROmanian Coastal monitoring



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seamod.ro NIMRD



Copernicus
Marine Service



- **Consortium**



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PROGRAMME OF
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implemented by

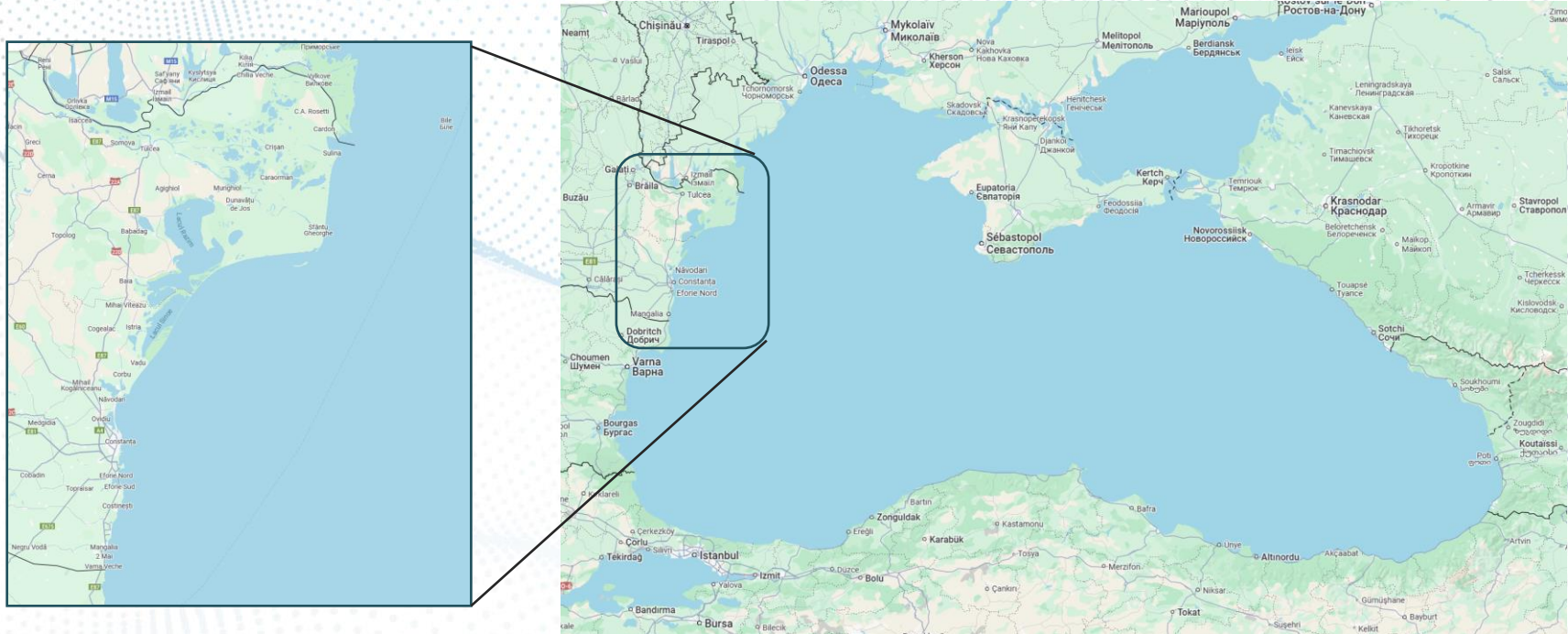




Copernicus
Marine Service



- Project in a nutshell: an integrated coastal observatory



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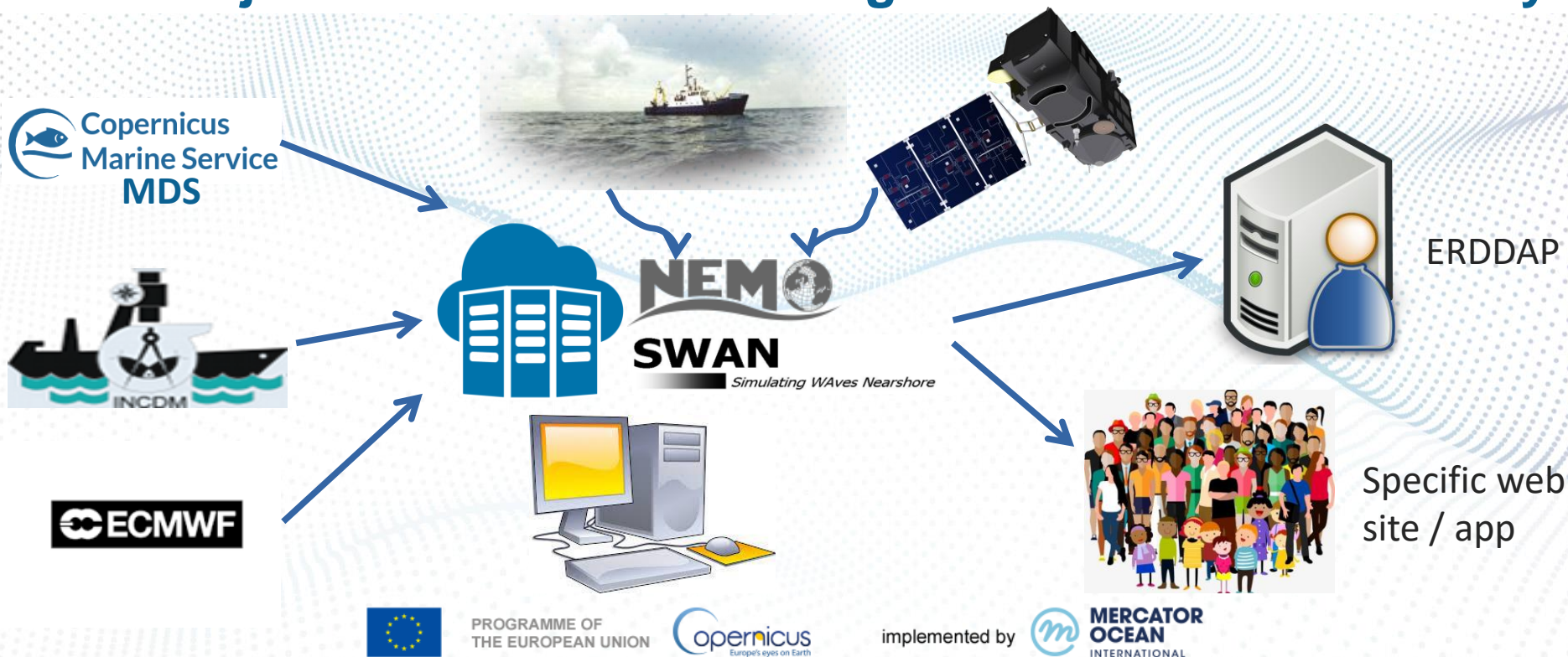
implemented by



• Project in a nutshell: an integrated coastal observatory

- 2 pre-existing coastal / regional systems in Romania :
 - iSWIM by Action Modulers, NIMRD (MOHiD) Financed a.o. by *CMEMS User Uptake*
not based on a mainstream platform such as e.g. NEMO
 - seamod.ro with ULiege, NIMRD (NEMO 3.6-BAMHBI) Financed by *H2020 ForCoast*
not accessible to end users (e.g. only 1 Thredds server feeding raw data)
- Ambitious goal : build 1 single integrated system
 - **coastal obs (CTD, ADCP, gauges...) + model based on NEMO 4.2-AGRIF**
 - include coastal validation, **and DA**
 - cover **PHY – WAV – BGC**
 - include **downstream apps** e.g. systematic and on-demand lagrangian tracker (multiple variants)
- Keep existing users (mostly from iSWIM) & gain new ones
 - water quality, pollution, tourism activities
 - Maritime safety (environmental hazards, weather forecasting and search and rescue)

- Project in a nutshell: an integrated coastal observatory



• Copernicus Marine Products and Coastal model

NEMO 4.2-AGRIF-BAMHBI *seamlessly* nested in Copernicus Marine BLK

- BLKSEA_ANALYSISFORECAST_PHY_007_001 *I.C.*
 - BLKSEA_ANALYSISFORECAST_WAV_007_003 *appl.*
 - BLKSEA_ANALYSISFORECAST_BGC_007_010 *appl.*
 - INSITU_BLK_PHYBGCWAV_DISCRETE_MYNRT_013_034 *D.A.*
 - SST_BS_SST_L3S_NRT_OBSERVATIONS_010_013_b (night UHR images) *D.A.*

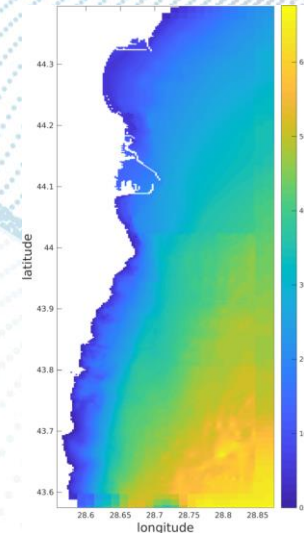
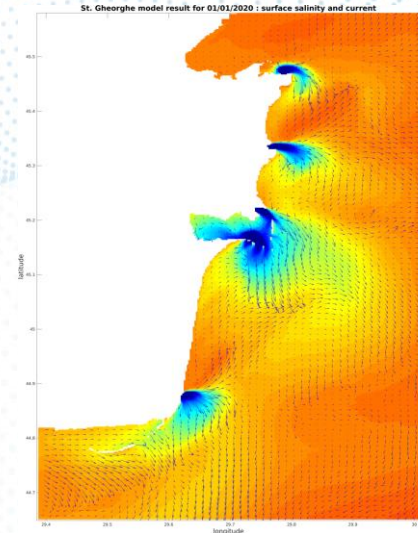
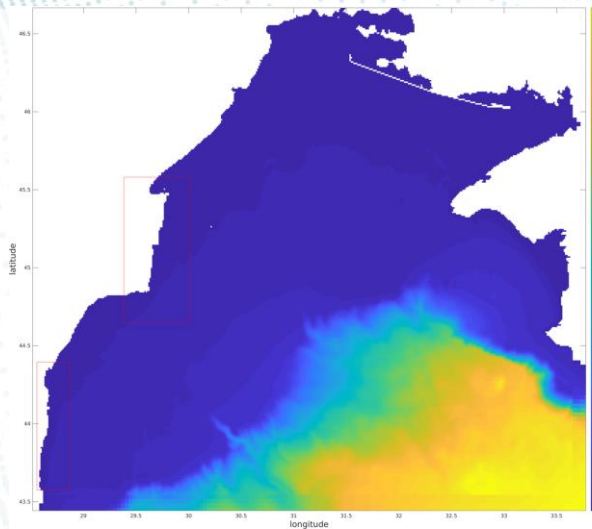
 - SEALEVEL_EUR_PHY_L3_NRT_OBSERVATIONS_008_059 *valid., D.A.*
 - OCEANCOLOUR_BLK_BGC_HR_L3_NRT_009_206 *valid., D.A.*
- + *non-Copernicus, coastal observations (NIMRD)*

• Copernicus Marine Products and Coastal model

NEMO 4.2-AGRIF-BAMHBI *seamlessly* nested in Copernicus Marine BLK

- 2.5km → 800 meter → 160 meter
- 59 levels

- 5-day fc.



• Seamless Coastal Marine Service

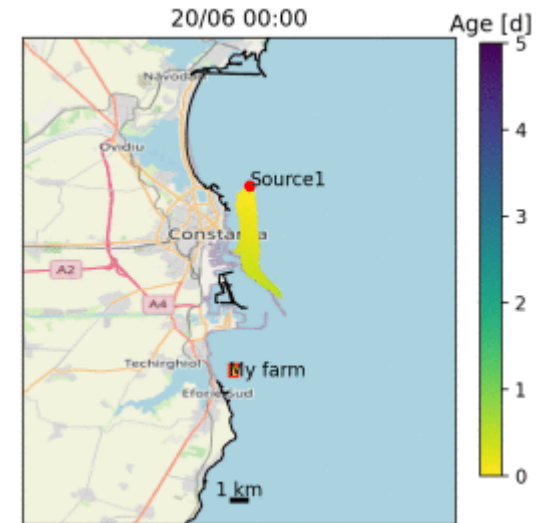
- Use cases based on the Ocean Parcels software for Lagrangian tracker
- Particles flow in and out of nested and parent grids (incl. Copernicus BLK grid)
- 1st Use Case: potential waste-water pollution events from the Constanta treatment plant overflow
- 2^d Use Case: plastic litter from (a) rivers (b) coastal population

- Next Use Case: MAPN (Romanian military) and the issue of floating mines
- Next Use Case: Salvamar (Baywatch) -- 2024 is a particularly bad year
- Next Use Case: tourism (water bulletin)
- Next Use Case: Romanian Water authority, Constanta City Hall
- Next Use Case: Maritime Transport (security and routing of ships)

• Seamless Coastal Marine Service

Use Case 1 – E.Coli and aquaculture

- Ocean Parcels 3.0
- Nested 3D currents, and Stokes drift ; diffusion
- Particle age
- systematic daily simulations
- on-demand simulations



• Seamless Coastal Marine Service

Use Case 2 – macro-plastic litter

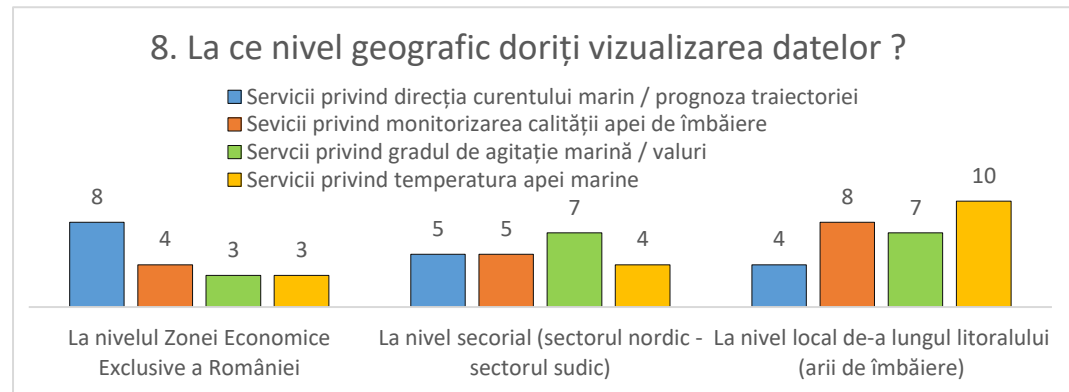
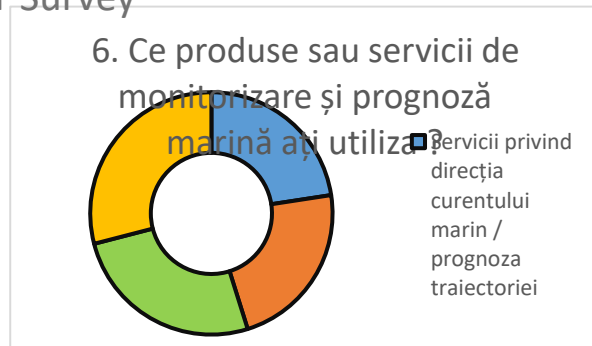
- Ocean Parcels 3.0 or Parcels.jl
- Nested currents, Stokes drift, wind ; diffusion
- Biofouling (sinking)
- Punctual and diffuse sources (rivers, cities and beaches)

- seasonal & long-term simulations

- **Seamless Coastal Marine Service**
 - Mines & military user
 - from the start of the war to April 2024, 98 mines were detected
 - alert channel for fishermen
 - collaboration initiated with Maritime Hydrographic Directorate
 - difficulty to characterize floating mine behavior
 - Salvamar
 - adapt Parcels to simulate person-in-the-water
 - PIW better studied in the literature than mines, also more complicated
- some Use Cases with many users (but maybe not so critical)
- others with very few users (but maybe very important consequences)

• Seamless Coastal Marine Service

- intermediate users website with ERDDAP server
- end user website incl. on-demand lagrangian simulation
- presentations or posters at Emsea (Batumi), Spa/RAC (Morocco), Doors & BS-Bridge meetings
- inclusion in the OceanPredict / GlobalCoast network
- User Survey





thank you

