

Operational modelling capacity in European Seas

An assessment and recommendations for improvement

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EuroGOOS Coastal Working Group

February 11, 2022

■ Objectives & Method

■ Contributions

■ Observations

■ Forcings

■ Data assimilation

■ Coastal capacity

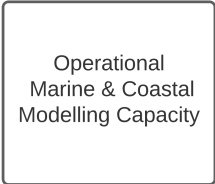
■ Means of improvement

■ Recommendations

■ Perspectives

Objectives & Method

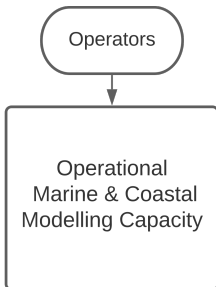
To characterize, at European scale :



Operational
Marine & Coastal
Modelling Capacity

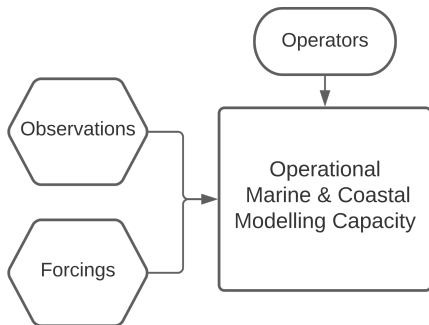
Objectives & Method

To characterize, at European scale :



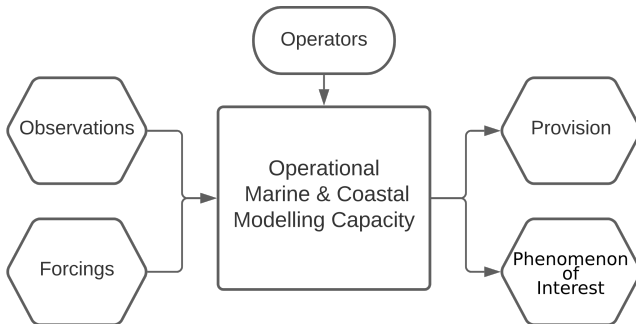
Objectives & Method

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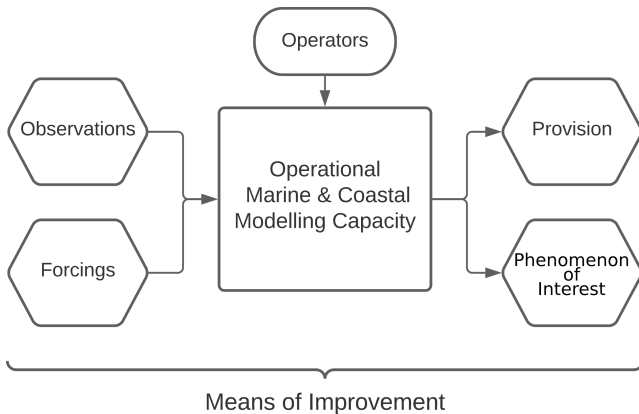
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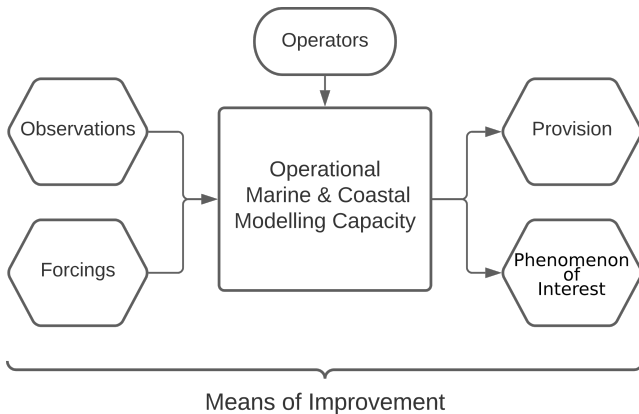
Objectives & Method

To characterize, at European scale :



Objectives & Method

To characterize, at European scale :



Survey (Google Form) → EuroGOOS → ROOSes/CMEMS → Partners

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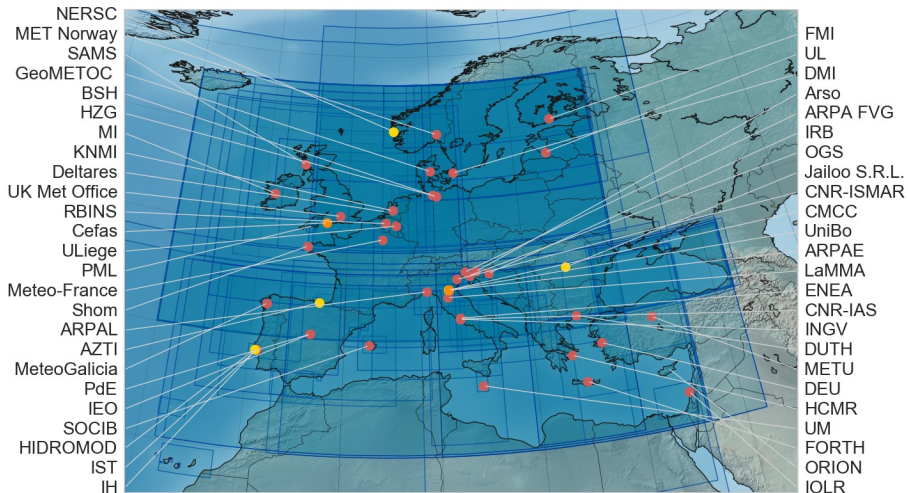
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Contributions

49 organizations – 104 operational model systems



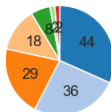
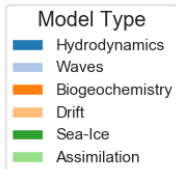
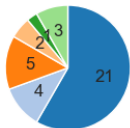
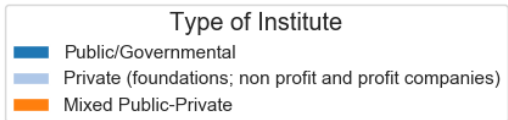
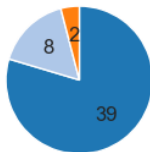
Contributions

49 organizations – 104 operational model systems



Contributions

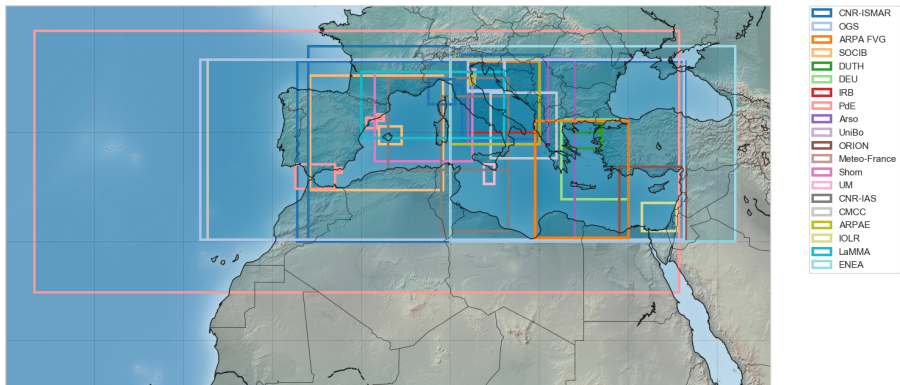
49 organizations – 104 operational model systems



Contributions

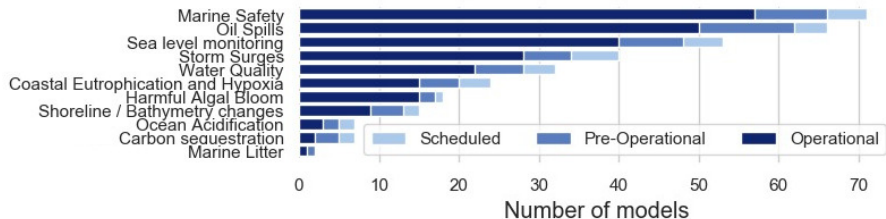
Mediterranean example

21 organizations – 39 operational model systems



Contributions

Which Phenomenon of Interest ?



■ Objectives & Method

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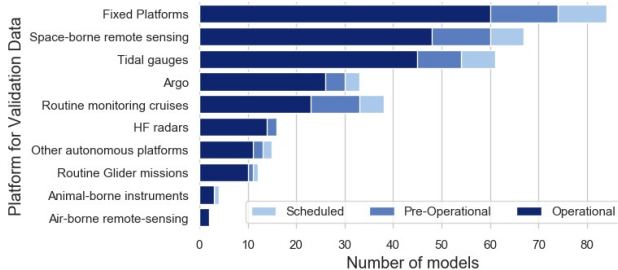
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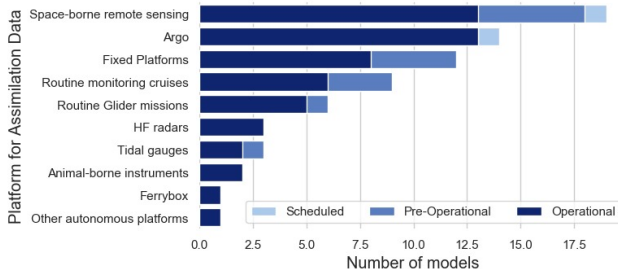
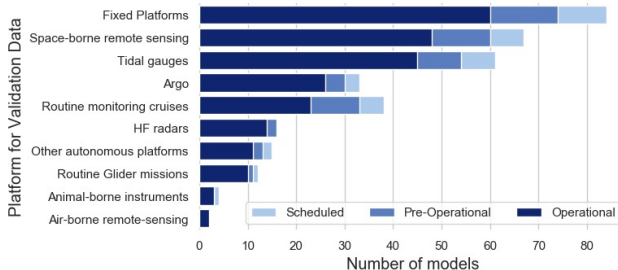
Observations

Which platform, for which purpose?



Observations

Which platform, for which purpose?



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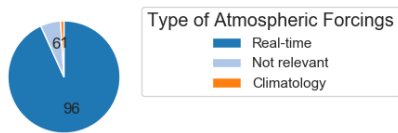
■ Recommendations

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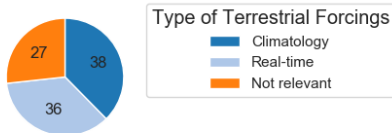
Forcings

What type of forcings?

Atmosphere



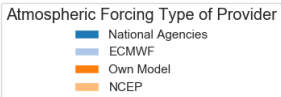
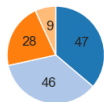
Land



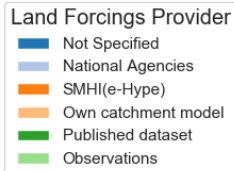
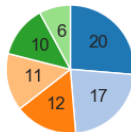
Forcings

What type of providers?

Atmosphere



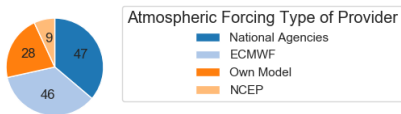
Land



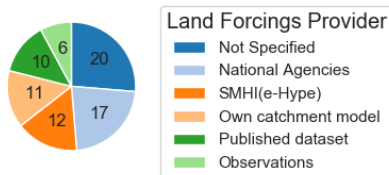
Forcings

What type of providers?

Atmosphere



Land



Lists of national providers

Agency	Country	Website
DMI	Denmark	https://www.dmi.dk/
FMI	Finland	https://en.ilmatienlaitos.fi/
MetCoOp	Finland, Norway, Sweden	https://www.met.no/en/projects/metcoop
RMI	Finland	https://www.meteo.be/en/belgium
Meteo France	France	http://www.meteofrance.com

Agency	Country	Website
DHMZ	Croatia	http://meteo.hr/
HYDRO-SCHAPI	France	http://hydro.saufrance.fr/
FFG Elbe	Germany	https://www.elbe-datenportal.de
WSV	Germany	https://www.gdws.wsv.bund.de/
EPA	Ireland	https://www.epa.ie/

■ Objectives & Method

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■ **Data assimilation**

■ Coastal capacity

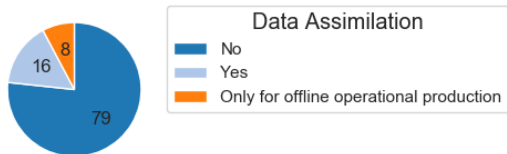
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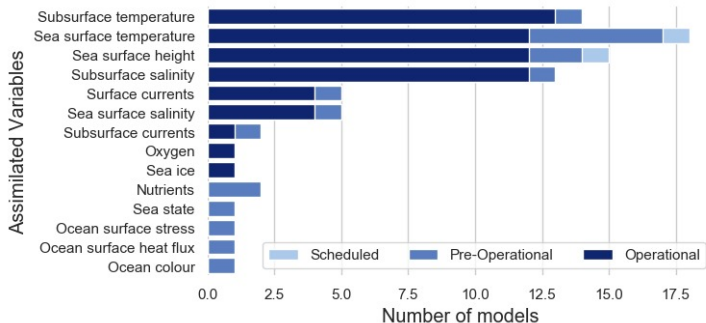
Data assimilation

Do you use data assimilation?



Data assimilation

For what variables?



■ Objectives & Method

■ Contributions

■ Observations

■ Forcings

■ Data assimilation

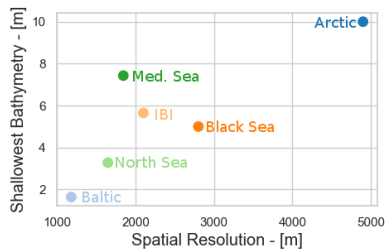
■ **Coastal capacity**

■ Means of improvement

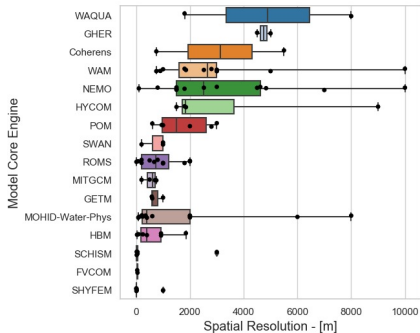
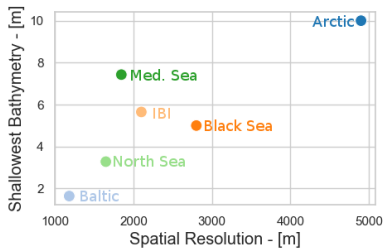
■ Recommendations

■ Perspectives

Coastal capacity



Coastal capacity



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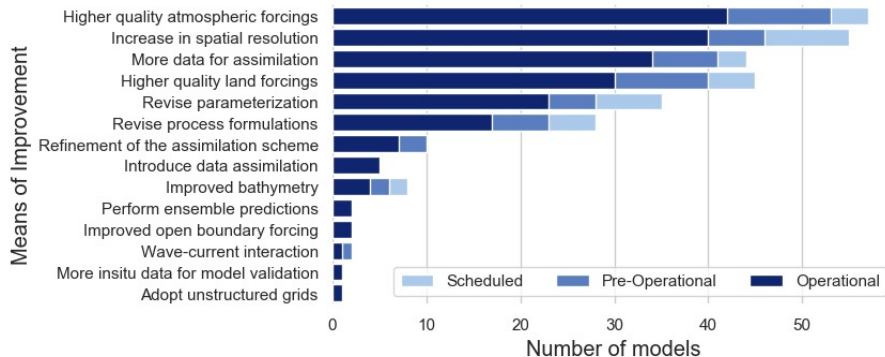
■ **Means of improvement**

■ Recommendations

■ Perspectives

Means of improvement

What are the top three means to enhance your data production?



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■ Means of improvement

■ **Recommendations**

■ Perspectives

Recommendations

Disparity in European Modelling Capacity

In terms of

- Quality of forcings.
- Model engine and processes.
- Assimilation procedures.

Recommendations

Homogenization

Best Practices – Modular codes – Inter-comparison exercises.

Recommendations

Homogenization

Best Practices – Modular codes – Inter-comparison exercises.

Poor capacity in biogeochemical operational modelling

- Lack of real-time land forcing service (incl. nutrient loads).
- Bottlenecks in the provision of near-real time datasets able to constrain biogeochemical phenomena.

Recommendations

Homogenization

Best Practices – Modular codes – Inter-comparison exercises.

Enforce biogeochemical capacity

Real-time land forcing service – Data provision for BGC assimilation.

Recommendations

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Generalize the use of data assimilation

Generalize operational data delivery – Capacity building – Unlock coastal.

Recommendations

Homogenization

Best Practices – Modular codes – Inter-comparison exercises.

Enforce biogeochemical capacity

Real-time land forcing service – Data provision for BGC assimilation.

Generalize the use of data assimilation

Generalize operational data delivery – Capacity building – Unlock coastal.

Further pan-European surveys

Involve private and downstream operators – Dissemination – Continuation

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Perspectives

Dissemination

Model Inventory - Chromium

Model Inventory

Variable: VertCoord

Type: AssimPlatform

Legend: Vertical Coordinate System

- 2D (Red)
- Hybrid (Green)
- Sigma (Purple)
- z (Orange)

InstituteName	InstituteType	ModelName	ModelCore	MinRes	VertCoord	NLevels
AZTI	Private	BASQUE COASTAL GRID	ROMS	670	sigma	32
IST	Public	Guadiana - Operational Model for the Guadiana Estuary	MOHID-Water-Phys, MOHID-Water-Bio	180	2D	1
CNR-ISMAR	Public	Tiresias	SHYFEM	10	z	34

Open Source variable ranking

Fixed Platforms: 15

Agis: 13

Rivers monitoring modes: 10

Legend: 3, 2, 1

Perspectives

Continuation

EuroGOOS Coastal Operational Modeling Capacity Assessment

This survey is done in the Framework of the EuroGOOS Coastal Working Group (www.eurogoos.eu/coastal-wg/) and its main objective is to draw an updated inventory of the actual operational, or pre-operational, coastal modelling capacities in the European Regional Seas, in the Physics, Biogeochemistry or Biology domains. Note that the process-oriented numerical studies are outside the scope of this questionnaire.

It will take you no more than 20 minutes to complete the survey and your response would help to increase the visibility of your operational model and also the whole community to have a complete overview of what are the coastal modelling capacities in Europe, and also to provide recommendations for further improvements.

*Required

1. Email address *

2. Name of Organization/Institute *

3. Type of Organization/Institute

Mark only one oval.

- Private
- Public
- Mixed Public-Private
- Other: _____

4. Model Name

Name of the model implementation

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Thanks to all contributors !!



Operational Modeling Capacity in European Seas—An EuroGOOS Perspective and Recommendations for Improvement

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