

# Operational modelling capacity in European Seas

## An assessment and recommendations for improvement

A. Capet, V. Fernandez, J. She, T. Dabrowski, G. Umgiesser, J. Staneva, L. Meszaros, F. Campuzano, L. Ursella, G. Nolan, G. El Serafy

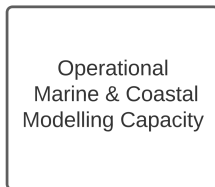
EuroGOOS Coastal Working Group

May 4, 2021

# Operational modelling capacity in European Seas

Perspectives and Recommendations from the EuroGOOS-Coastal Working Group

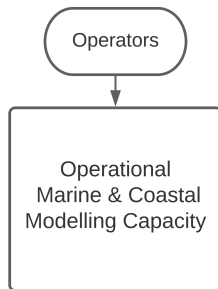
To characterize, at European scale :



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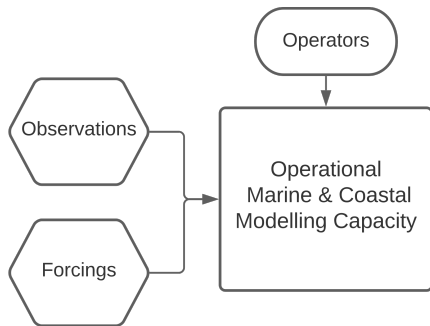
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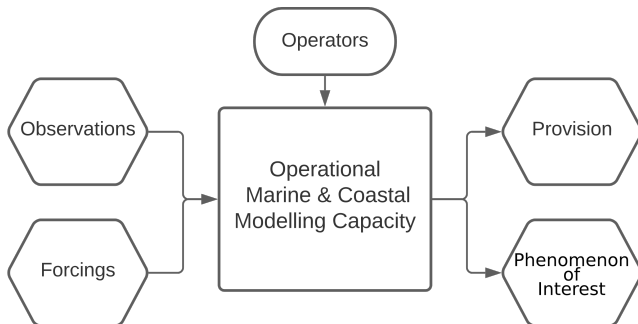
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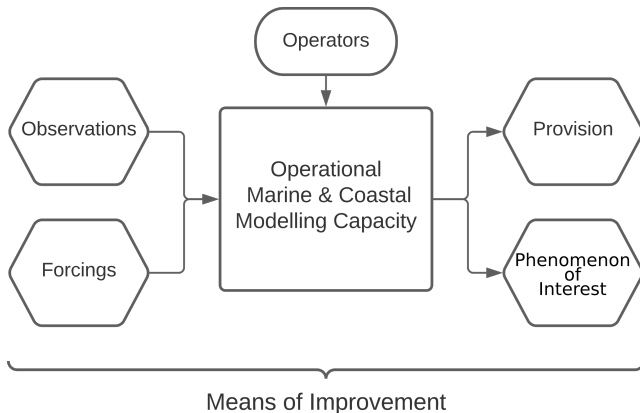
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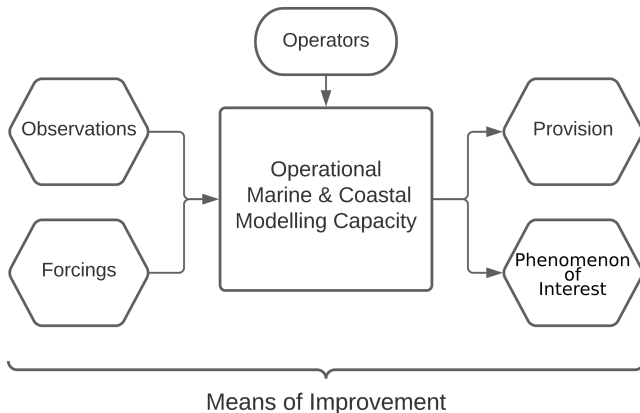
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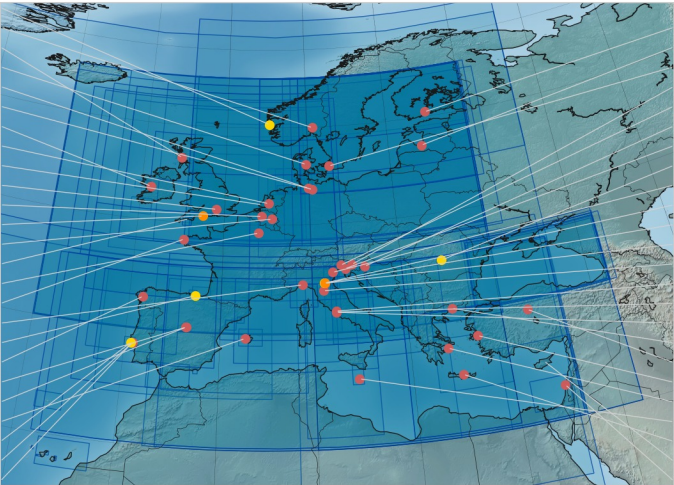


Survey (Google Form) → EuroGOOS → ROOSes & CMEMS → Partners

# Contributions

49 organizations – 104 operational model systems

- NERSC
- MET Norway
- SAMS
- GeoMETOC
- BSH
- HZG
- MI
- KNMI
- Deltares
- UK Met Office
- RBINS
- Cefas
- ULiege
- PML
- Meteo-France
- Shom
- ARPAL
- AZTI
- MeteoGalicia
- PdE
- IEO
- SOCIB
- HIDROMOD
- IST
- IH

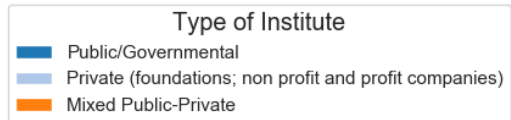
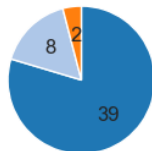


- FMI
- UL
- DMI
- Arso
- ARPA FVG
- IRB
- OGS
- Jailoo S.R.L.
- CNR-ISMAR
- CMCC
- UniBo
- ARPAE
- LaMMA
- ENEA
- CNR-IAS
- INGV
- DUTH
- METU
- DEU
- HCMR
- UM
- FORTH
- ORION
- IOLR



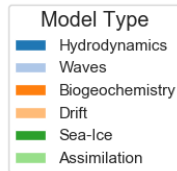
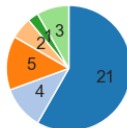
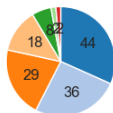
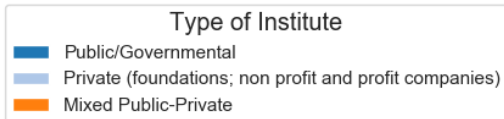
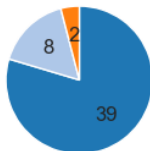
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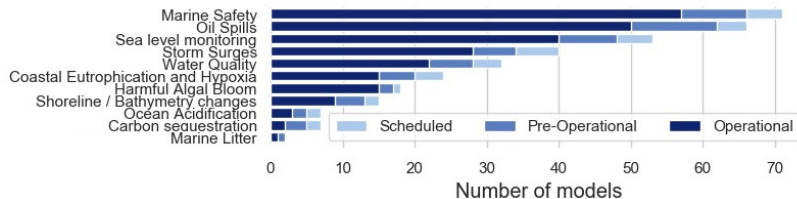
# Contributions

49 organizations – 104 operational model systems



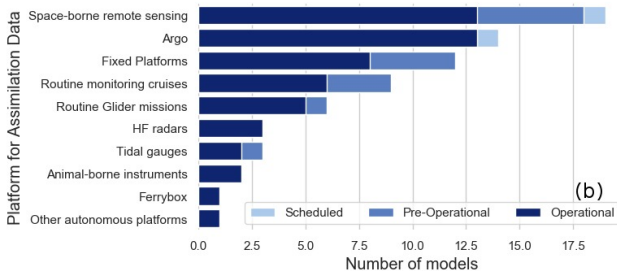
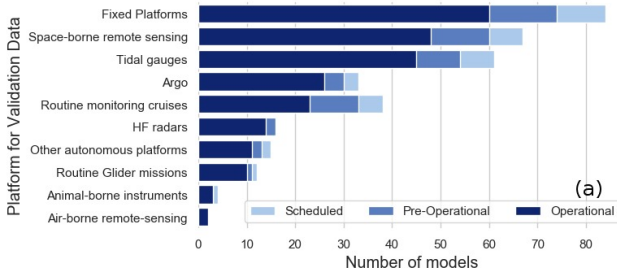
# Data provision

Which Phenomenon of Interest ?



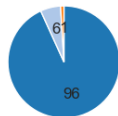
# Observations

Which platform, for which purpose?



# Forcings

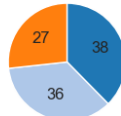
## Atmosphere



Type of Atmospheric Forcings

- Real-time
- Not relevant
- Climatology

## Land

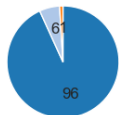


Type of Terrestrial Forcings

- Climatology
- Real-time
- Not relevant

# Forcings

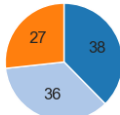
## Atmosphere



Type of Atmospheric Forcings



## Land



Type of Terrestrial Forcings

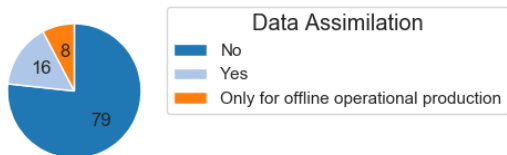


## Lists of national providers

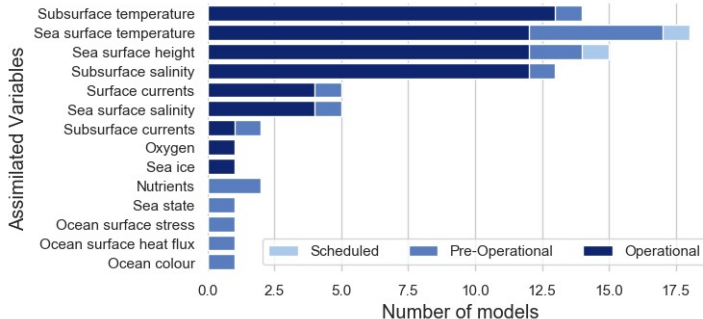
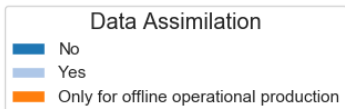
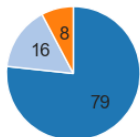
Agency	Country	Website
DMI	Denmark	<a href="https://www.dmi.dk/">https://www.dmi.dk/</a>
FMI	Finland	<a href="https://en.ilmatienlaitos.fi/">https://en.ilmatienlaitos.fi/</a>
MetCoOp	Finland, Norway, Sweden	<a href="https://www.met.no/en/projects/metcoop">https://www.met.no/en/projects/metcoop</a>
RMI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

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

# Data assimilation

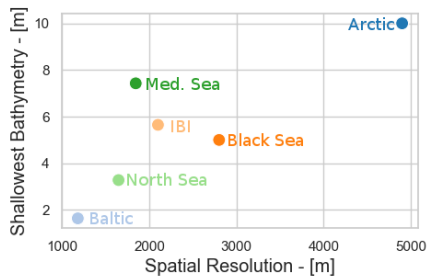


# Data assimilation

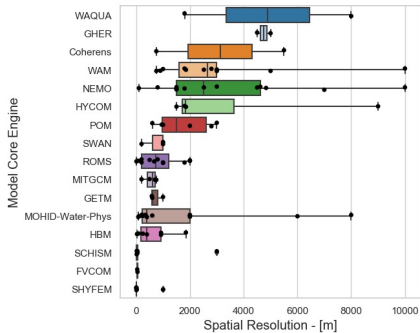
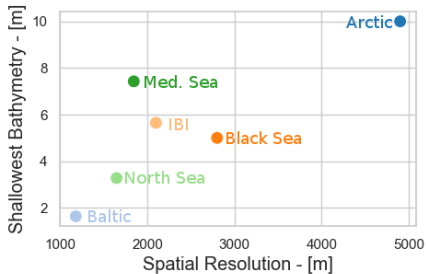




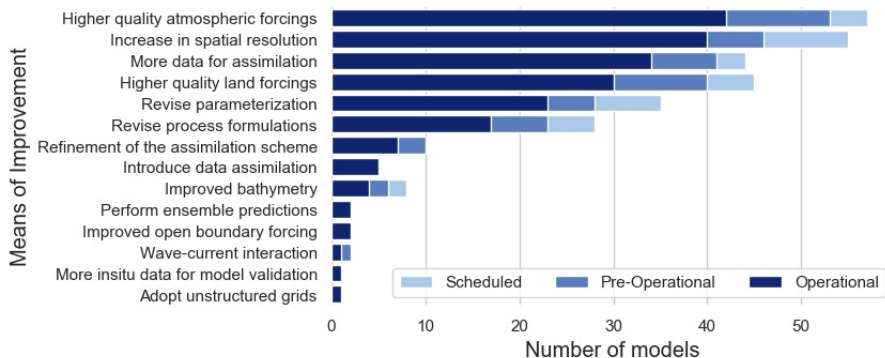
# Coastal



# Coastal



# Means of improvements



# Recommendations

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## Dissimilarity in European Modelling Capacity

In terms of

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

# Recommendations

## Homogenization

Best Practices – Modulable models – Inter-comparison exercises.

# Recommendations

## Homogenization

Best Practices – Modulable models – 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 – Modulable models – Inter-comparison exercises.

## Enforce biogeochemical capacity

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



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Generalize operational data delivery – Capacity building – Unlock coastal.

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## Finer model resolution

Process refinement.

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## Finer model resolution

Process refinement.

## Further pan-European surveys

Follow-up – Involve private and downstream operators – Dissemination.

# Thanks to all contributors !!



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

Arthur Capet<sup>1</sup>, Vicente Fernández<sup>2\*</sup>, Jun She<sup>3</sup>, Tomasz Dabrowski<sup>4</sup>, Georg Umgiesser<sup>5</sup>, Joanna Staneva<sup>6</sup>, Lőrinc Mészáros<sup>7</sup>, Francisco Campuzano<sup>8</sup>, Laura Ursella<sup>9</sup>, Glenn Nolan<sup>2</sup> and Ghada El Serafy<sup>7</sup>

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