Operational modelling capacity in European Seas

EuroGOOS

Based on a survey to operational modelling community launched by Coastal Working Group of EuroGOOS

Operational modelling survey: Main Objectives

1. Create an **updated Inventory/Catalogue** of the operational models running in the European Seas

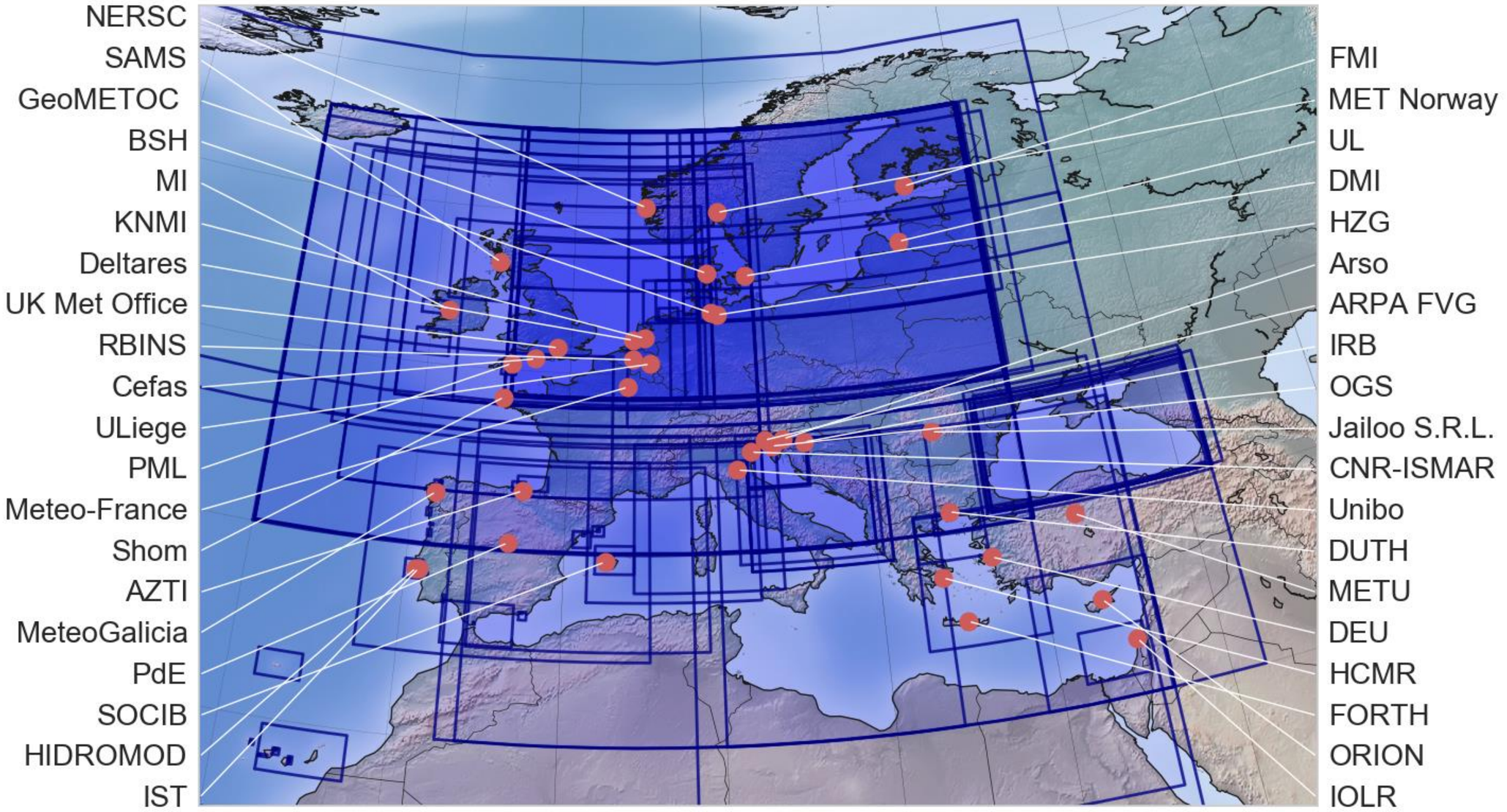
2. Derive associated **strengths** and **identify gaps** of the operational capacities and **propose recommendations and possible actions** for **improvement** the modelling forecast in the European context

Operational modelling survey: Methodology

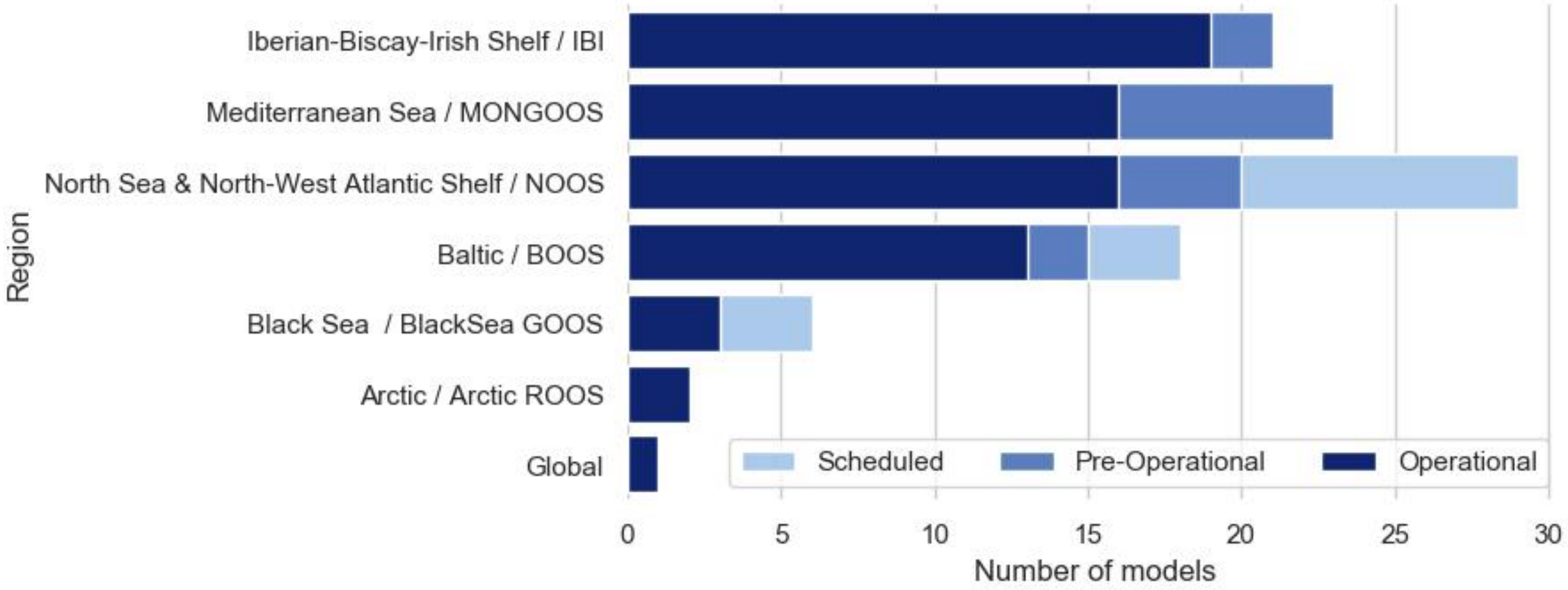
- ~40 questions on different issues:
    - Domain and grid design (resolutions, etc..)
    - Model outputs (EOVs and POIs)
    - Operational setups (length of forecast, etc…)
    - External forcing (atmospheric, land…)
    - Data Assimilation and validation
    - Means to improve accuracy
- Questionnaire sent to **CWG & ROOS members operating operational models and EU projects (around 100 contacts)** – answered by operational responsible

Survey is still open for future updates!

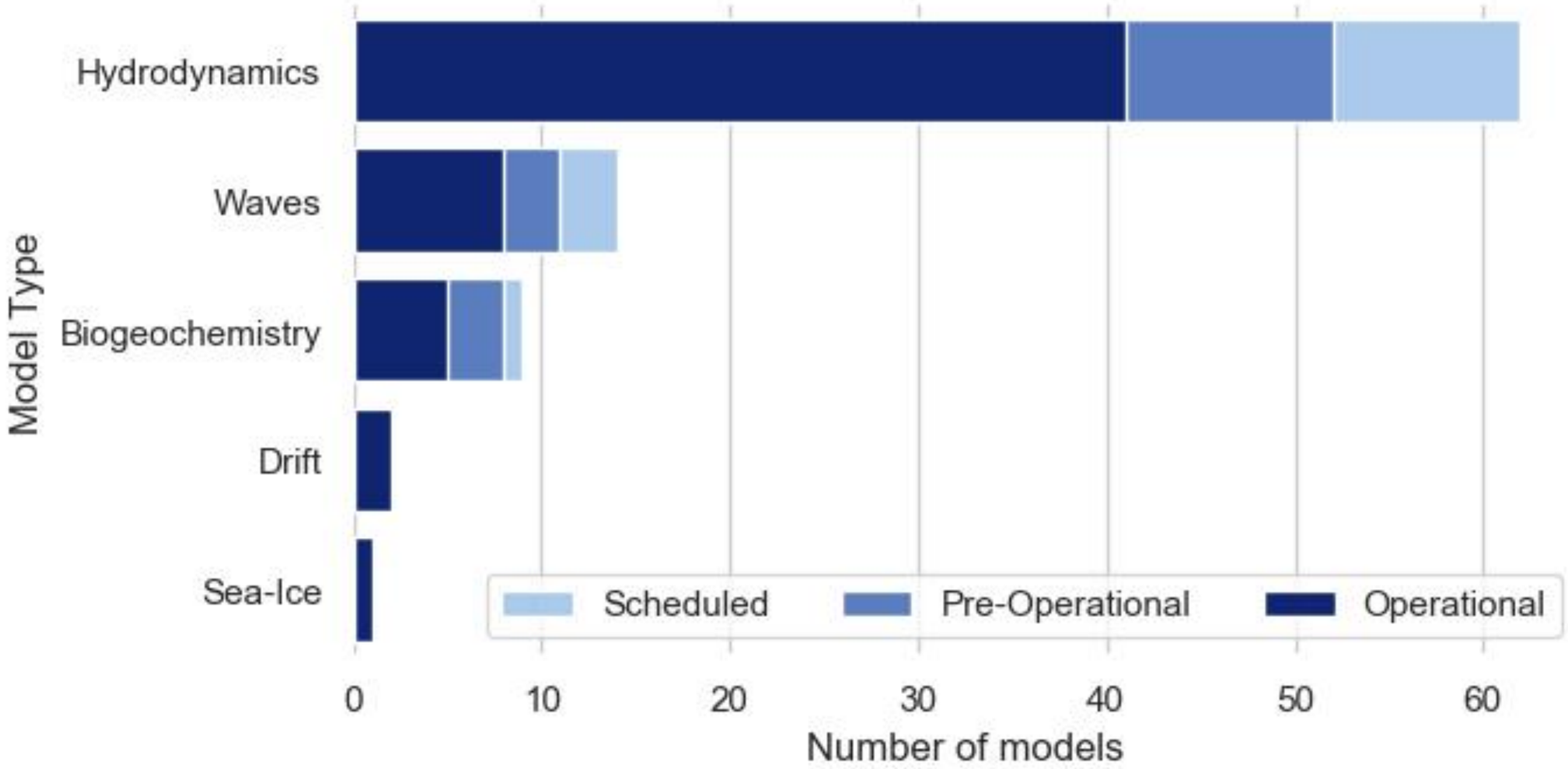
Results: 39 Institutes / 86 model configurations



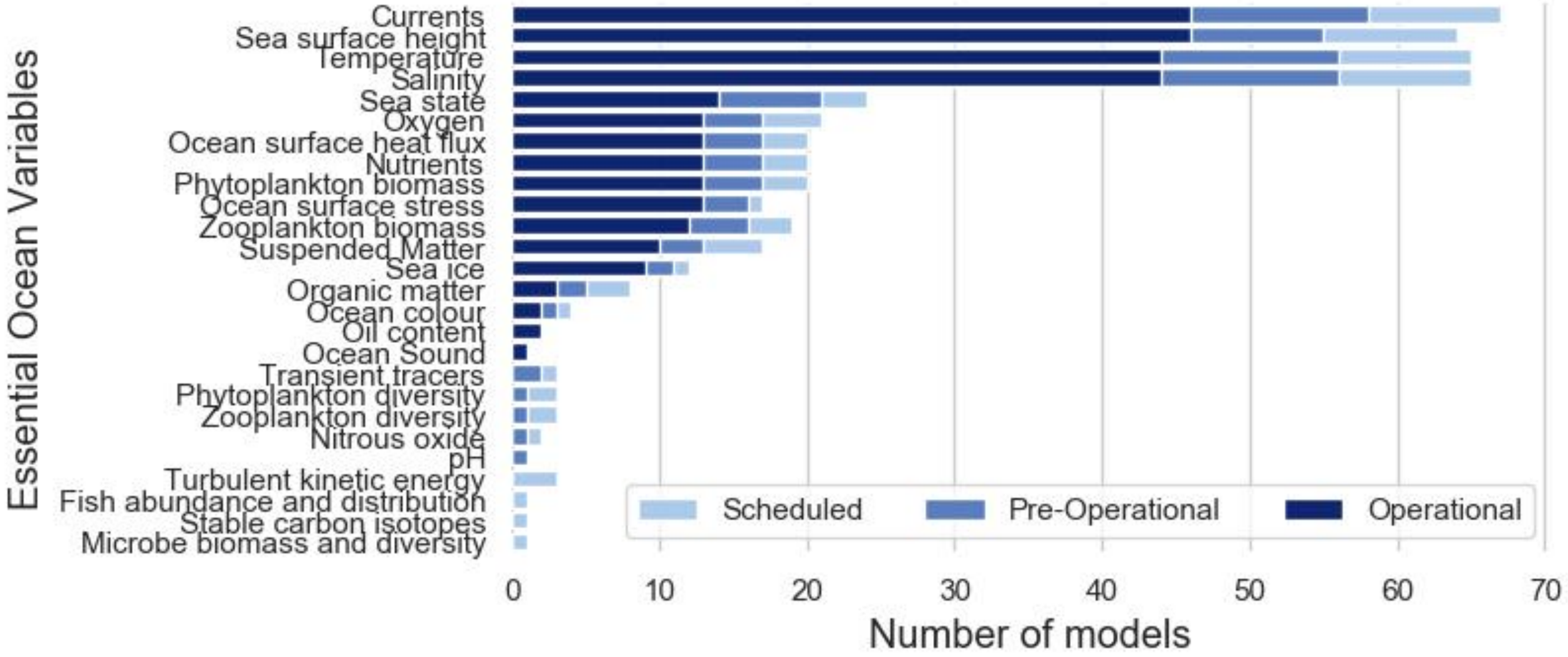
Distribution by ROOSs



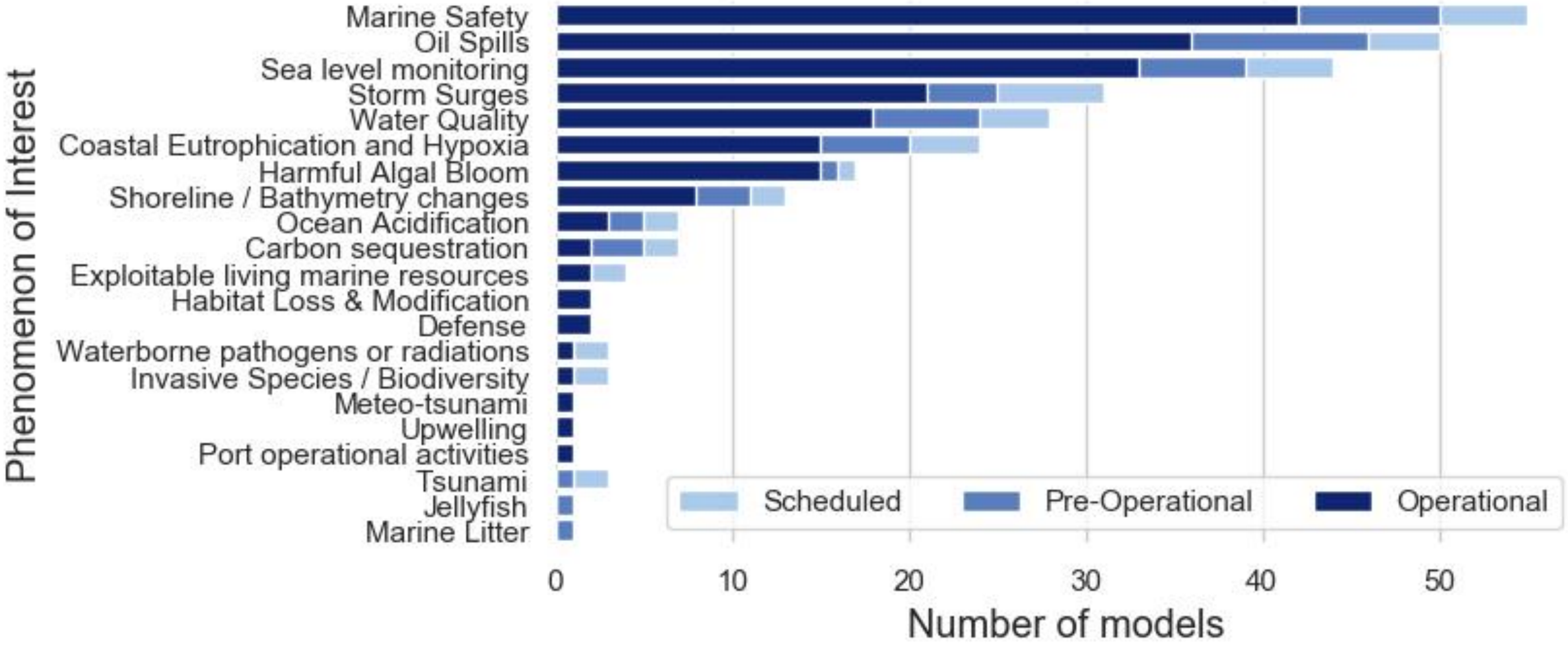
Distribution by Type of model



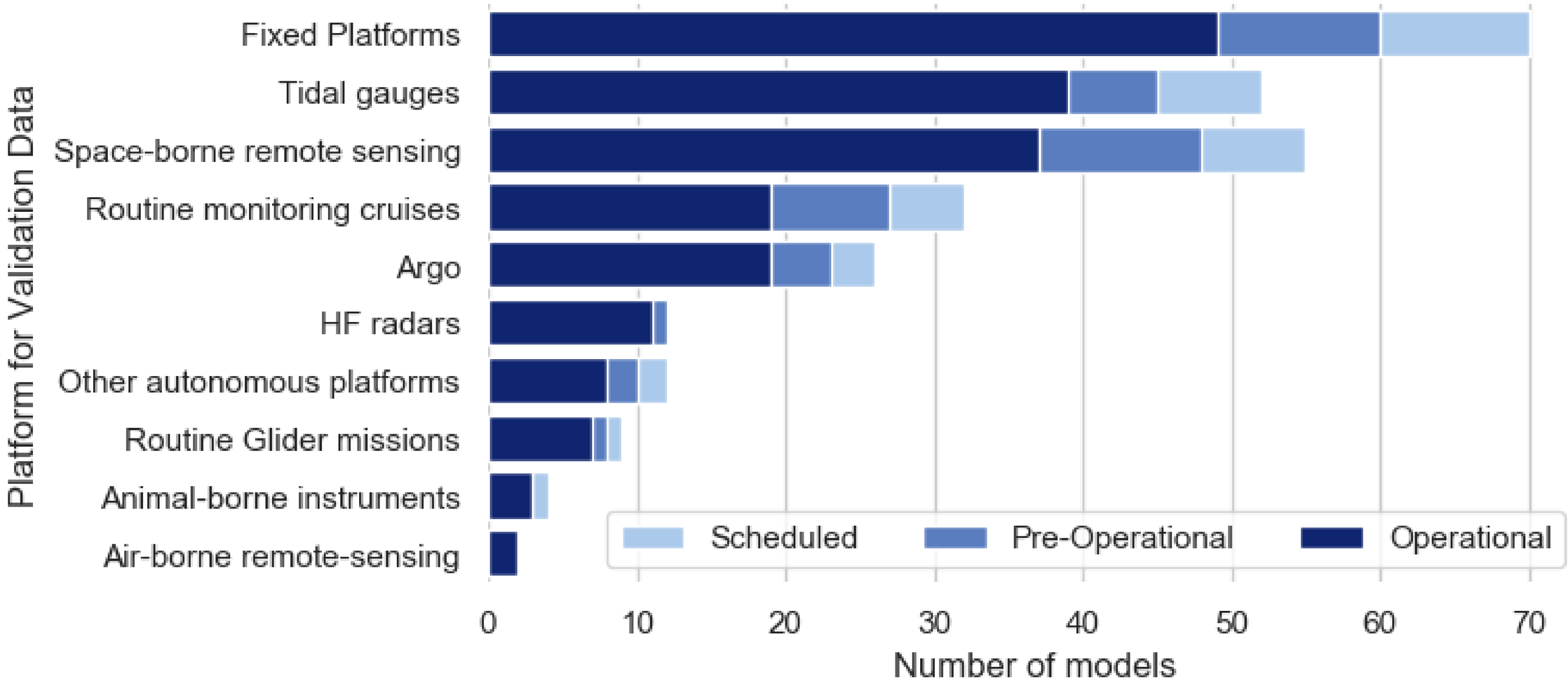
Number of models providing Essential Ocean Variable (EOVs)



Number of models by Phenomena of Interest (POI)

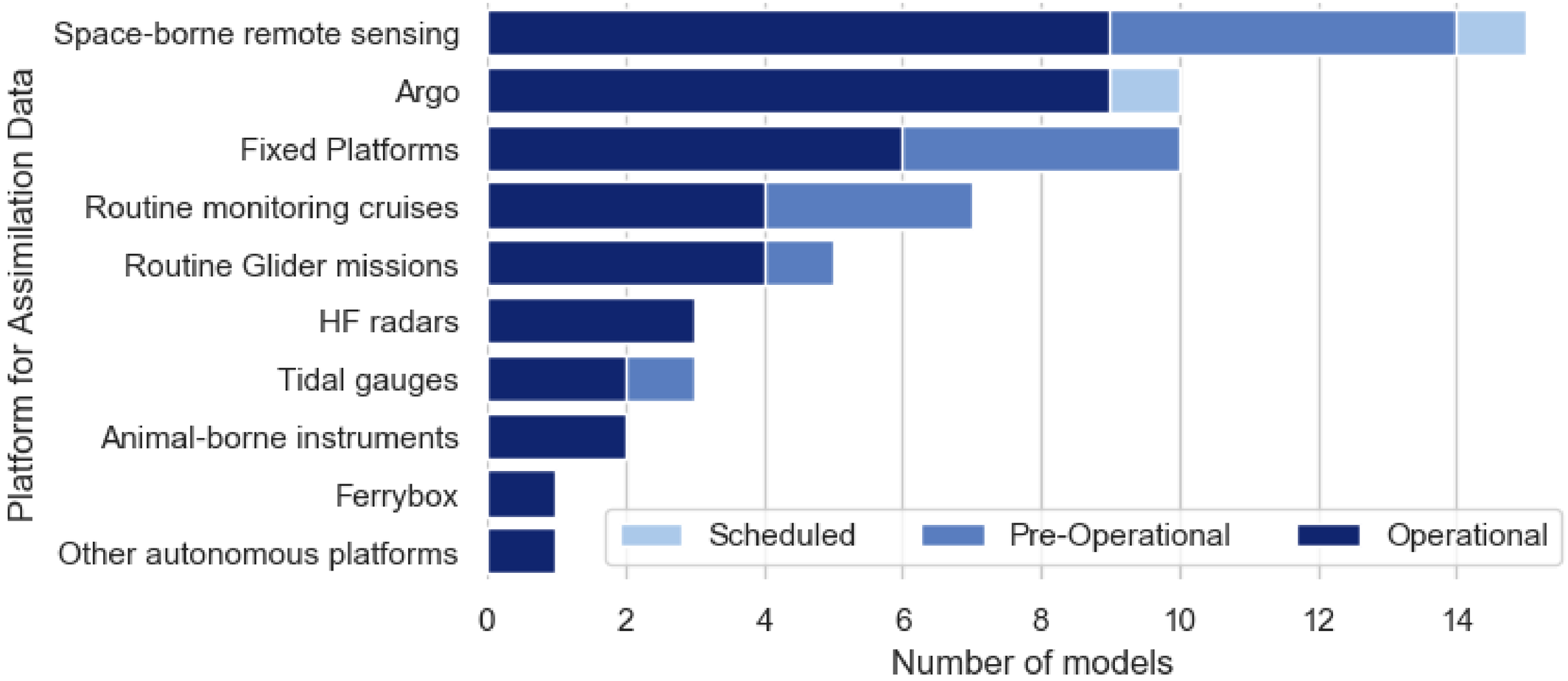


Use of observations: Platforms used for validation

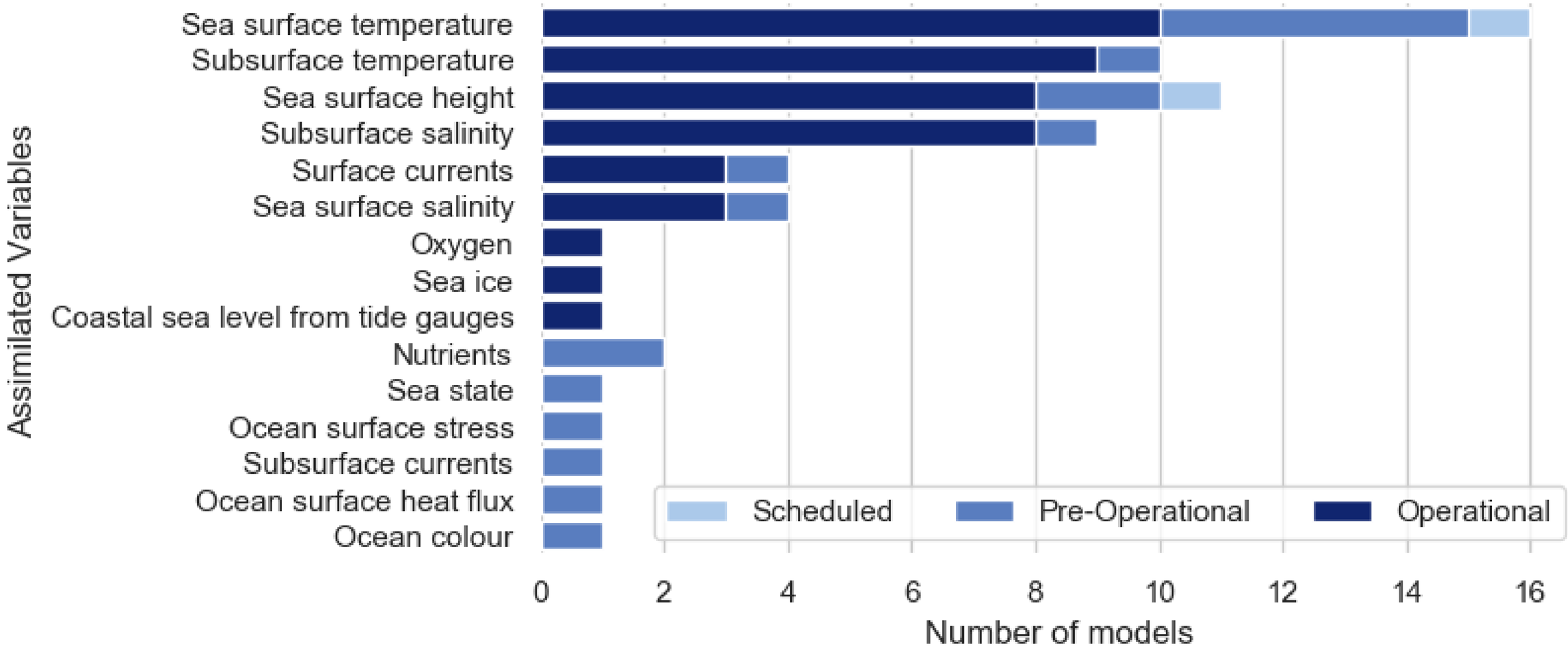


Use of observations: Platforms used for DA

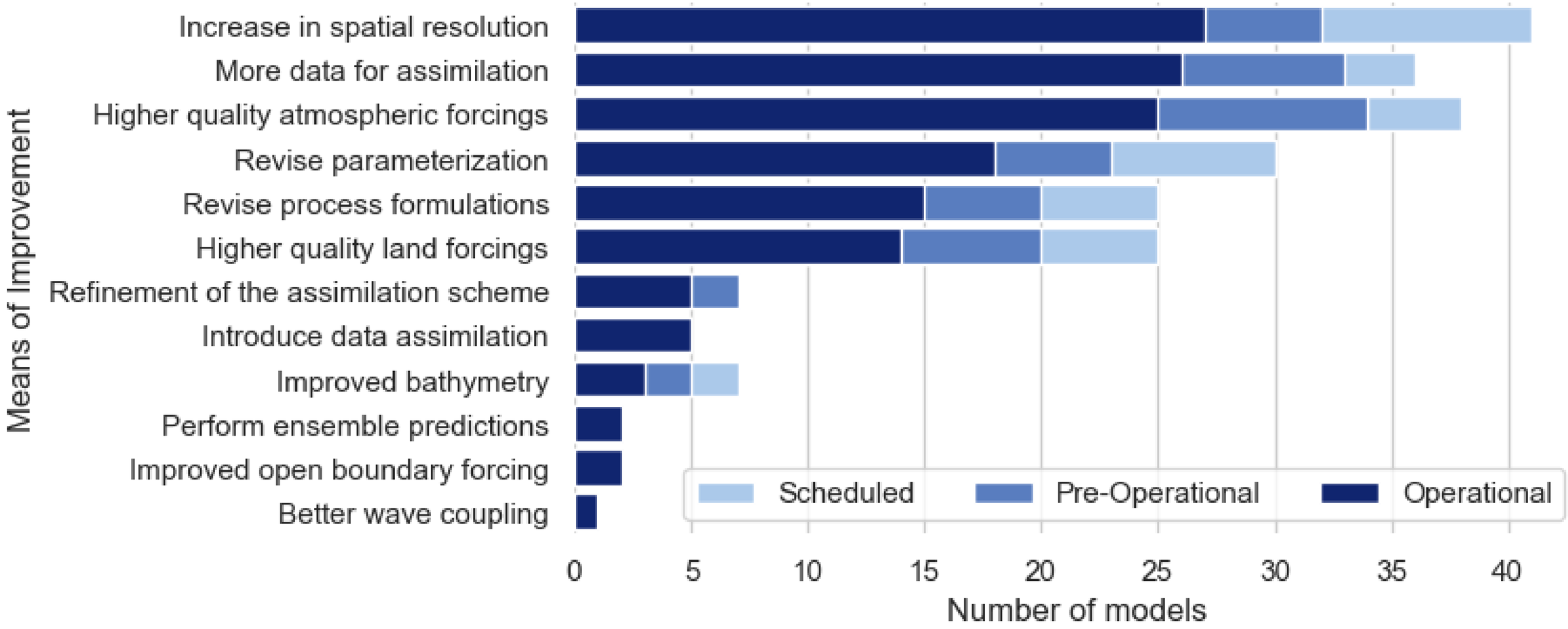
Only 24% of models use some form of data assimilation (9% of them offline)



Use of observations: Assimilated variables



Ways to improve modelling capacity/accuracy



Discussion and proposed recommendations

- **Inhomogeneity across regions** (in codes and in atmospheric and land forcing sources)

✓ More integration: promoting of code-sharing and adoption of best practices
✓ Model intercomparison procedures at regional levels (ROOSs)
✓ More knowledge transfer and capacity building (e.g. for DA)

- **Lack of BGC forecasts** due to the complexity of phenomena and lack of BGC real time measurements, also user's requirements are not well defined (for short-term forecasts).

✓ Promote the operational availability of NRT BGC data (and associated technology)
✓ Better define user requirements in terms of BGC EOVs – links with MSFD
✓ Enforcing collaboration between atmosphere, ocean and land components.
✓ More capacity building

Discussion and proposed recommendations

- **Limited data assimilation**

✓ Need for more timely data in a strict operational time-schedule (shortening delivery time)
✓ NRT observing platforms are essentials
✓ More capacity building and human resources are essential (R&D on advanced DA schemes).

- **Need of better external forcing as a way to improve forecast accuracy**

✓ Improve cooperation between ocean-atmosphere-land-cryosphere domains
✓ More river data necessary (NRT river discharge, nutrient and organic load)
✓ R&D on coupling with land hydrology models
✓ Better finer bathymetry (specially near the coast)

Discussion and proposed recommendations

- **Need of better external forcing as a way to improve accuracy**

✓ Best practices definition in the preparation and use of high resolution atmospheric forcing (specially close to the coast)
✓ More in-situ observations networks for subsurface physical and BGC variables

More results, discussion, conclusions and recommendations in a manuscript submitted to *Frontiers of Ocean Scien*ce at the end of October.

THANK YOU!

ANY QUESTIONS?

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Dynamic uncertainty

Does your model provides dynamic uncertainty associated with at least one output variable ?

77 responses