

15 . New capabilities

Enhancing research value and utility for operational prediction centres through targeted collective multi-disciplinary projects on new capabilities for operational oceanography in cooperation with other relevant international research programmes, including adopting machine learning/AI

SHORT TERM

- Identify communities of intermediates users that are well organised and mature with which we can communicate, and do one challenge for each community, maybe each of our centers is in contact with a different community and could make the link
- Engage with stakeholders, co-design of applications :
 - Connecting groups that are prototyping a concept, a forum to share ideas and build temporary collaborations
 - online forum + workshops, delayed time « hackathons »
 - Improve communication of task teams
 - Leverage OP-DCC regional teams, surveys and communication means
- A task team on applications of ocean prediction and ocean prediction literacy
 - Joint user meetings in between OP services
 - OceanPredict can also « endorse » existing use cases and link them with research done by the members -> communication
 - Digital twin context : build together a solid OP multidisciplinary exemplar for MPA management on the DTO, crossing ideas from the members -> for OP29

POST DECADE

- Sustain this work after 2030 is important
- assessing the benefit of coordination versus fragmentation
- Explanability of AI for ocean prediction

From the survey

A/ SHORT-TERM ACTIONS - Feed the 5-year Implementation Plan (2026-2031) – focusing on practical, achievable priorities that can be delivered with available resources.

1) Crosscutting Task Team activities – Specify

- Promote coordinated multidisciplinary pilot projects linking modelling, data assimilation, verification, visualization, and user communities.
- Strengthen collaboration between the AI Task Team, OPOS-WG, and operational centres to evaluate operational readiness of emerging capabilities.
- identify, in the science team and/or in each ocean predict TT, the research community with whom to collaborate (Meteo, climate, AI ...) and invite them to dedicated TT meeting

2) Leveraging UN Ocean Decade activities – Specify

- Align capability development with relevant UN Ocean Decade programmes, especially those related to Digital Twins, ecosystem prediction, and ocean services.

From the survey

3) **Key priorities (e.g. AI/ML transition, S2S)** – Specify

- Promote responsible and transparent adoption of AI/ML-enhanced forecasting, data assimilation, and observation impact tools, ensuring interpretability and robustness.
- dissemination of AI-based utilities and AI-based observation estimate that can be used by all users and operational units to foster common collaboration and developments

4) **Partnerships required (e.g. WMO, IOC-UNESCO, Ocean Decade initiatives, etc.)** – Specify

- Engage global modelling centres, AI research groups, and observing system agencies to support co-development.

B/ LONG-TERM ACTIONS - Inform the new OceanPredict Strategy for 2031-2040 – by identifying high-impact opportunities and longer-term actions.

1) **Crosscutting Task Team activities** – Specify

- Maintain sustained expert networks linking AI specialists, modellers, data assimilation experts, and operational centres.
- AI based (or other) observation array design/optimization including in the optimization the cost of maintenance/CO2 footprint and the societal benefit.