OCEANPREDICT SCIENCE TEAM MEETING - 11

OPST-11, Sept. 23, 2025



AGENDA

1- Welcome (5') - Marie Drevillon and Greg Smith

- Welcome and announcements
- Review of Agenda
- Brief mention of OPAS meeting following OPST-11

2 – TT and WG Updates (8x10') – TT/WG Co-chairs

- Short presentations from TTs and WGs (10 min inc. Q&A)
 - Provide overview of current activities, planned events and issues

3 – Implementating the OceanPredict Strategy (20') - Marie Drevillon and Greg Smith

- Discuss approach toward development of Implementation and Workplan
- Specific elements, e.g.:
 - BAMS paper
 - Call for international mobilisation
 - ForeSea and UN Decade links
- OceanPredict DCC collaborations Enrique Alvarez
- Realization of 5-year plan (content, timeline, contributors, ..)

4 - Events (10')

- ✓ OPST-12 and AITT workshop co-organisation *Greg Smith, Kirsten Wilmer-Becker*
- ✓ CP/DA-TT workshop postponed from last year Kirsten Wilmer-Becker, Greg Smith
- ✓ SynObs Workshop, Aug 2026 *Kirsten Wilmer-Becker*
- ✓ OP Summer School, INCOIS Jan/Feb 2027 Francis Pavanathara and Kirsten Wilmer-Becker

TT/WG UPDATES

- DA-TT
- IV-TT
- OseVal-TT
- COSS-TT
- MEAP-TT
- OPOS-WG
- CP-TT
- AI-TT

OCEANPREDICT STRATEGY 2021-2030



- Strategic plan describes history, status and need for OceanPredict
- Provides vision for Future Ocean Prediction Capacity
- Describes Mission to Enhance Ocean Prediction Systems
- Outlines 17 Strategic Objectives, e.g.:
 - Advance ocean prediction science and operational capacity to benefit marine science and economies.
 - Strengthen engagement with the international ocean science community for effective collaboration.
 - Co-design and develop ocean observing systems that deliver value and meet user needs.
 - Increase societal impact through routine assessments and outreach initiatives to promote ocean prediction science
- Need for plan to describe implementation of strategy

OCEANPREDICT IMPLEMENTATION PLAN

Key pillars:

- Connections to UN Decade (Foresea)
 - OceanPrediction DCC
 - UN Decade programmes and projects
 - Links via Task Teams
 - Consolidation of UN Decade and legacy
- Linkages to other international groups
 - Including those via task teams
 - WMO and IOC
 - Various linkages described in Terms of Reference
- Task Team and Working Group Activities
 - E.g. Organization of meetings
- Communication and outreach
 - OP'29 as a key consolidation piece for UN Decade?

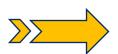
Action: Develop 5-year plan for OceanPredict based on the outcome of the OP '24 symposium (see BAMS paper) and taking into consideration the current UN Decade activities its future legacy in conjunction with UN Decade organization like the OP-DCC.

Deadline: Aim to finalize implementation plan at OPST-12

OP'24 ARTICLE IN BAMS

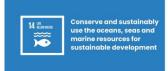
- Should be available from BAMS website by the end of Sept.
- Co-signed by organising committee, session chairs and rapporteurs
- 80 co-authors in 48 institutions

- 1. Introduction: a symposium to identify the **challenges** faced by the ocean prediction science community
- 2. Ocean prediction, past, present and future
- 3. Fostering exchanges between coastal ocean forecasters
- 4. **Polar ocean prediction**: a focus on rapid changes in the Arctic
- 5. Key trends and challenges for **global and regional ocean prediction**
- 6. New developments in Ocean Prediction : close-up on **Machine Learning**
- 7. Ocean Prediction systems and services
- 8. User applications and societal benefit



Details: Call for international mobilization to advance ocean prediction by engaging ocean science stakeholders





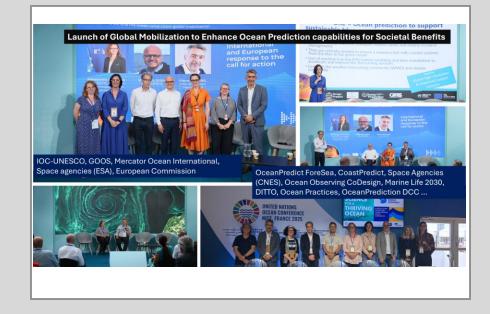
Building on the outcomes of OceanPredict 2024, the Call for action highlights the urgent need to enhance ocean observing, modeling, data integration, and the development of innovative, reliable, and **Ocean prediction decision-making tools**, including reanalysis and forecasting systems:

- · based on reliable observation networks,
- · based on improved models and data assimilation for fit-for-purpose services,
- that fully leverage of artificial intelligence and the acceleration in digital twin development,

This international cooperation and mobilization brings together all the ocean prediction stakeholders: OceanPredict, UN Ocean Decade Actions — including ForeSea, CoastPredict, Ocean Observing CoDesign, Marine Life 2030, DITTO, Ocean Practices, and the OceanPrediction DCC — along with key partners like IOC-UNESCO, GOOS, Mercator Ocean International, space agencies, the European Commission, and others.











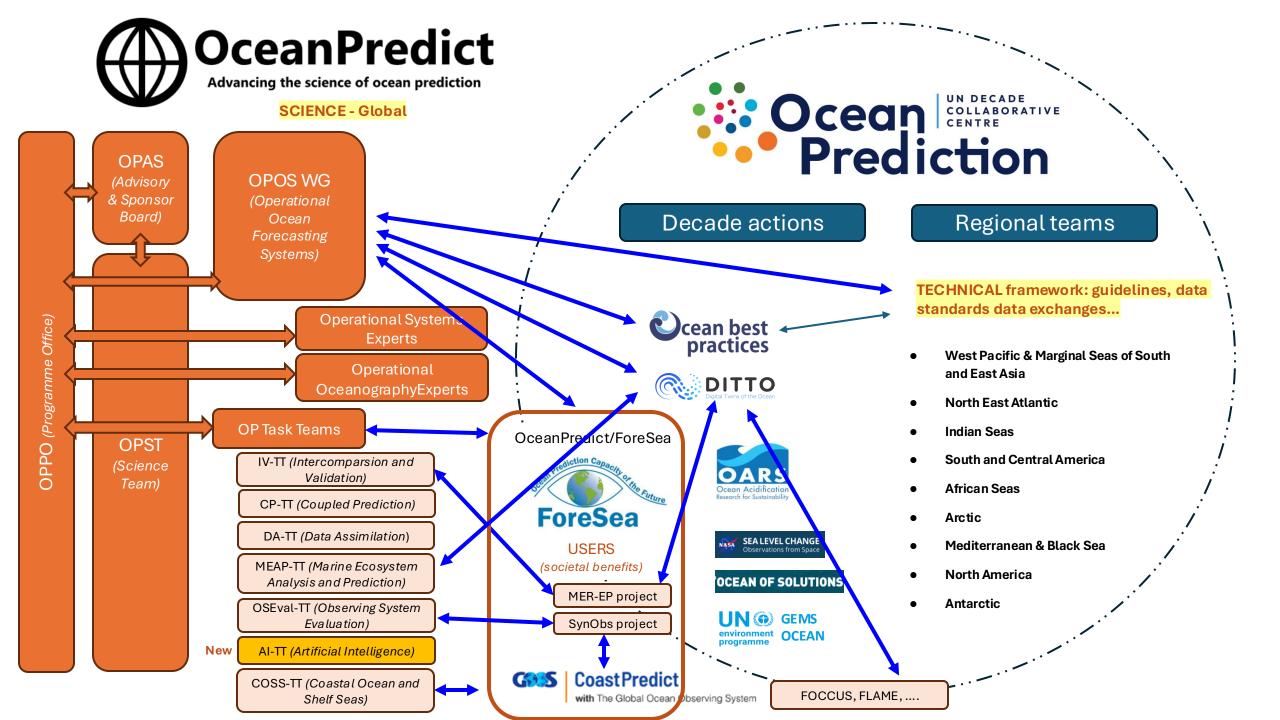












OceanPredict/FORESEA and OceanPrediction DCC connection

Next steps

Index

Connecting OPERA Project to FORESEA

- Architecture development
- Capacity development activities
- Technology Transfer Team

Connection with Call for action

Creation of a network of Certified centers

- Status of Atlas
- Call to develop a tool to compute ORL

Technical developments

- Special issue (Vol. 2)
- Definition of data standards for Ocean Forecasting

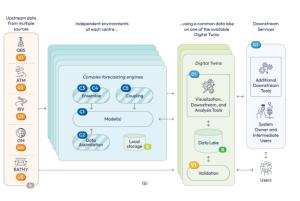
Connection with the Regional Teams

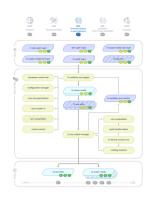
- Structure
- Incoming meetings

OPERA: Building robust Ocean forecasting services

- The OPERA project will allow us to transform a design on paper into a real product
- An open call ready to be launched in the following weeks
- Can be exploited jointly with Oceanpredict/FORESEA









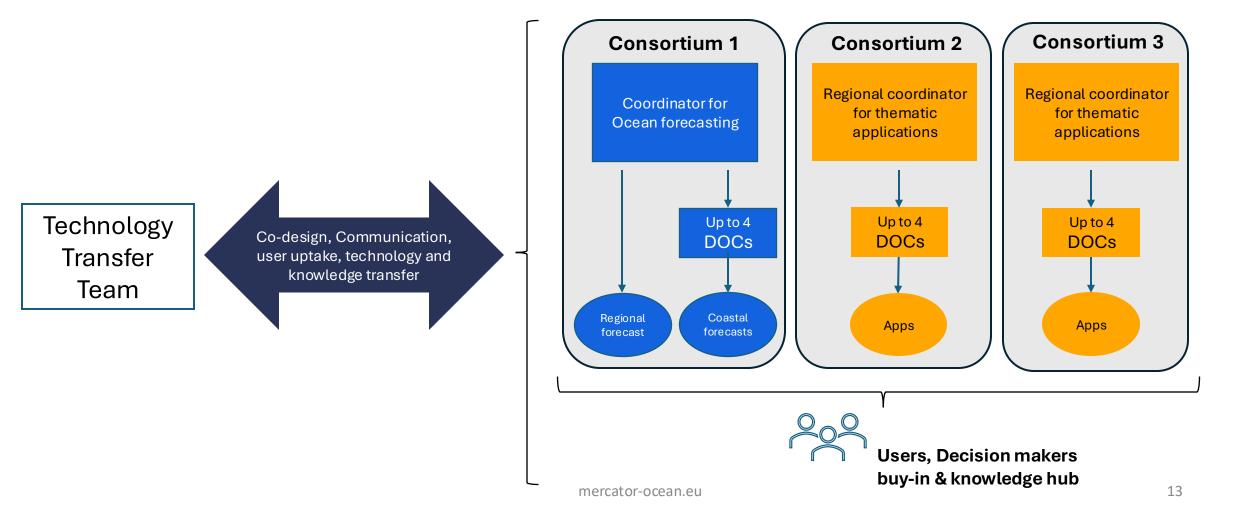
OPERA: Capacity building & knowledge sharing

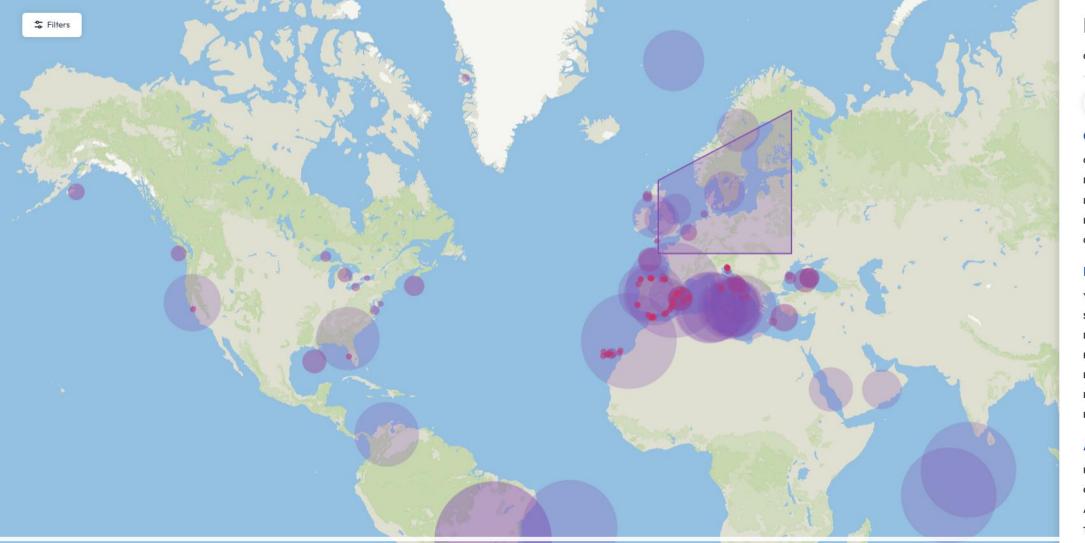
- The virtuous loop for ocean forecasting as a guideline for capacity development during the OPERA project
- A call to design the tools already launched
- Massive Open Online Courses on Ocean understand and learn to use the virtuous loop components for applications and forecasting services
- Oceanpredict/FORESEA community to be part of the initiative



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OPERA's Technology Transfer Team





OceanPrediction DCC's Atlas



DKSS - DMI storm su

Ocean Basins & Regions of interest Global



Contact information ~

Organization(s) in charge of the system: Danmarks N

DOI: https://doi.org/10.3389/fmars.2021.657720

Link to system webpage or reference paper: https://e

Link to output data repository (Opendap or similar):

Contact e-mail: tar@dmi.dk

Main description ~

Year of start of operations: 2001

System presently active: Yes

Describe the main applications of the system: Coast

Boundary conditions to other OOFS: No

Employing ensemble techniques: No

Data policy: All generated data is freely available

Employing dynamic coupling: Yes

Atmospheric forcing ~

Forced or obtaining boundary conditions from atmo

Organization provider: DINI-HARMONIE + ECMWF

Atmospheric model: HARMONIE-AROME

Temporal resolution: 1 hours

Type of model: Circulation

Numerical model: Other circulation or sea level mode

EOV the model provides quantitative estimate: Curr

Global domain: No

New: Digital Ocean Centers Network

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Building together a network of reliable services thanks to the ORL

- A global network of Digital Ocean Centers committed to the continuous improvement of their ocean forecasting capabilities through the adoption of Best Practices.
- Based on the Operational Readiness Level (ORL) framework. Participating centers will
 use a new tool to evaluate the ORL status of their systems

How to participate?

- By being on the Atlas a system is already participating; these are these called "Engaged Digital Ocean Centers"
- By computing the ORL (and updating every two years), an institution or company became a "Certified Digital Ocean Center." Call to build the tools already launched

What is the **benefit**?

- Oceanprediction DCC will provide an assessment service to improve on the ORL ladder, giving advice that could help in the design of development plans
- We will be able to monitor the evolution of our community (in cooperation with OceanPredict) over the years to improve the average values of the ORL

Building robust Ocean forecasting services: data standards

New work is being launched! : recommendations on data
Standards for Ocean
Forecasting



What are data standards?



Data standards are documented agreements on the representation, format, definition, structuring, tagging, transmission, manipulation, use, and management of data..

Why?

- Capacity development
- Facilitate user uptake and model intercomparison
- Integrate with Ocean Observations in a Decade Digital Ecosystem
- Promote the interoperability towards Digital Twins
- ..

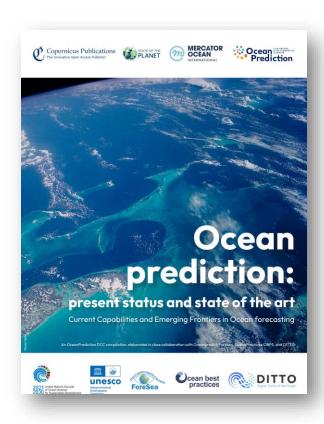
Who?

MOi, GOOS, IODE, DCOs on Data sharing and observations, Foresea, DITTO, FOCCUS

How?

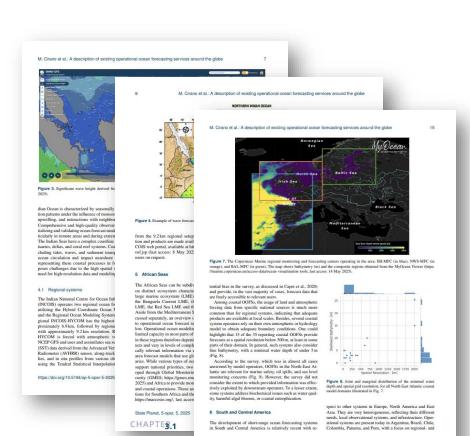
Building on what is existing: a survey recently launched

OceanPrediction DCC special issue Vol. 2



A special issue (27 papers – 290 pages) describing the status of ocean forecasting from 68 authors from all continents

A second volume, focused on Gaps and Ways forward is on the making



CHAPTE 3.1

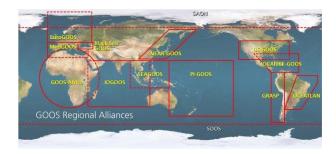
Reagonal Teams: A global and transversal community

Oceanprediction DCC **Regional Teams**: Promoting the implementation and use of ocean forecasting systems worldwide

UNEP regional seas



GOOS regional alliances



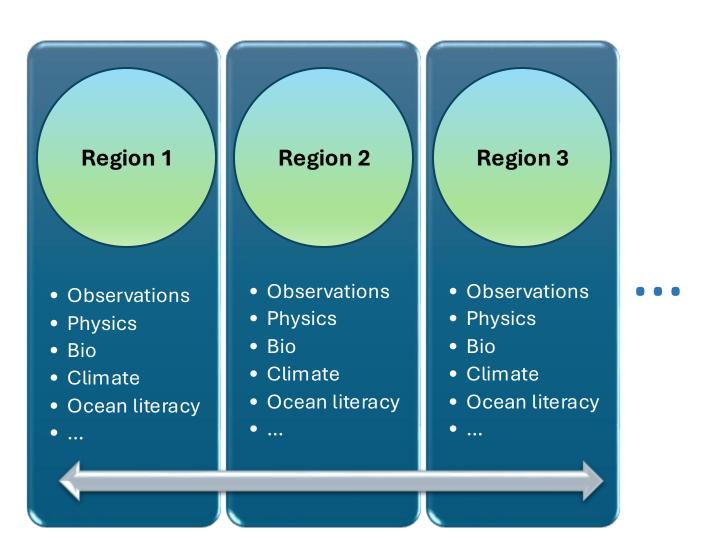
- Region 1: West Pacific and MSEA
- Region 2: Indian seas
- Region 3: African seas
- Region 4: Mediterranean and Black Sea
- Region 5: North-East Atlantic
- Region 6: South and central America
- Region 7: North America
- Region 8: Arctic
- Region 9: Antarctic

"Boots on the ground" work:

- Support decade actions related to ocean forecasting
- Identify gaps and ways forward
- Capacity building
- Advocate for the implementation of Best Practices, Standards, and Tools
- ...

Reagonal Teams: A global and transversal community

- (almost) All the steering teams are in position
- Time to create a cross-regional network of specialists!
- Let's start with a series of meetings per category!
- Open to participation of Oceanpredict/FORESEA



TTs and WG updates

Upcoming events

- OPAS Meeting Virtual _ Sep 23, 2025
- AGU2025, in New Orleans, USA, 15-19 December
 - · CoastPredict's session "OS021 Satellite and In Situ Observations in Support of the Prediction of Coastal Hazard Impacts for Enhancing the Resilience of Coastal Communities"
- Ocean Science Meeting 2026 in Glasgow, Scotland, 22-27 February 2026



- · Session (co-led by OceanPredict): Advances in Ocean Data Assimilation and Prediction Science. Topic area: Digital Ocean.
- Session (co-led by MER-EP): Marine Environment Reanalysis and Four-dimensional Data Driven Models: Progress and applications. Topic area: Climate and Ocean Change.
- Session Synobs: Co-designing the synergistic ocean observing Network for ocean and climate monitoring and predictions. Topic area: Ocean Technology and Observatories.
- Session MEAP/NECCTON: Advancing Marine Ecosystem Modeling for a Predictable and Sustainable Ocean. Topic Area: Ocean Biology and Biogeochemistry
- Session Marine Heatwave drivers: Marine Heatwave drivers and compound events in a changing climate. Topic Area: Climate and Ocean Science
- Al-TT workshop, Montreal, Canada, April 13 &14, 2026
- OPST-12 in Montreal, Canada, April 15-17, 2026
- SynObs international Workshop 2026 in Mustu, Japan, 24-28 May 2026
- CP/DA TT joint Meeting, in Boulder, Colorado, USA, postponed in 2026, Date tbc
- COSS-TT Meeting, end 2026, Date and site tbc
- OceanPredict Summer School, Hyderabad/INCOIS, India, early 2027 tbc



OPST-12 MONTREAL

- 15-17 April 2026
- In-person 3-day meeting of the science team, local organization by Greg and Fraser
- Important topics for discussion:
 - Approve 5-year plan
 - Intercomparison activities
 - Digital twin developments
- Opportunity to discuss AI forecasting with joint AI-TT 2day meeting (13-14 April)





To be held in downtown Montréal in the "Chaufferie" at the Université de Québec à Montréal.



ANY OTHER BUSINESS?

Extras

Upcoming events - specifics

OPST-12

- In-person meeting
- 15-17 April 2026 (Wed-Fri)
- Montréal
- Following the AI-TT workshop

AI-TT

- In-person meeting, hybrid considered
- 13 & 14 April 2026 (Mon & Tue)
- Montréal
- Preceding the OPST-12 meeting
- Consideration to continue event (from 15 Apri) with an AI hackathon in parallel to the OPST-12 meeting (tbc)

SynObs workshop

- In-person meeting with hybrid options
- Partnering with Ocean Observing Co-Design and GOOS
- 24-29 Aug 2026
- Mutsu, Japan
- More information available on the OP website under Events

COSS-TT meting

- In-person event
- Autumn 2026
- Location to be confirmed (Brazil in discussion)

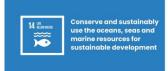
Joint CP/DA-TT workshop

- Realising the postponed workshop (May 2025)
- In-person event, hybrid considered
- Autumn 2026
- Location to be confirmed (College Park or ECMWF are in discussion)



Details: Call for international mobilization to advance ocean prediction by engaging ocean science stakeholders





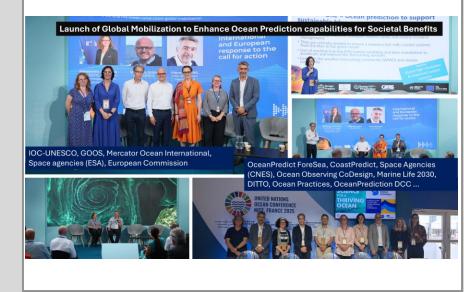
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OceanPredict State of Play (20')

- Collaborations and developments:
 - ✓ Recent meeting with ForeSea Marie Drevillon and Greg Smith
 - ✓ Joint Newsletter OceanPredict/ForeSea Stephanie Cuven and Kirsten Wilmer-Becker
 - Activities with OceanPrediction DCC (Atlas, survey, special issues, DDE) *Kirsten Wilmer-Becker and Stephanie Cuven*
- ☐ Co-chair meeting OceanPredict and ForeSea: planned to be regular every 3 months

<u>ForeSea - The Ocean Prediction Capacity of the Future - Ocean Decade - Current projects:</u>



- Marine Environment Reanalyses Evaluation Project (MER-EP)
- 2. Making Oceanography Data Available to All
- 3. Sistema de Alerta, Predicción y Observación
- 4. Sistema de Información Oceanográfica CHONOS (CHONOS)
- 5. TAC Ocean Observing and Forecasting System
- 6. Subseasonal to Seasonal North Pacific Prediction
- 7. Synergistic Observing Network for Ocean Prediction

Action: Plan to organise meeting with ForeSea project leads to identify synergies and opportunities for better collaboration

Action: Update OP Terms of Reference to better describe the linkages and inteactions between OP and ForeSea linkages, as well as the OceanPrediction DCC.

☐ Joint newsletter
OceanPredict/ForeSea – every 6
months



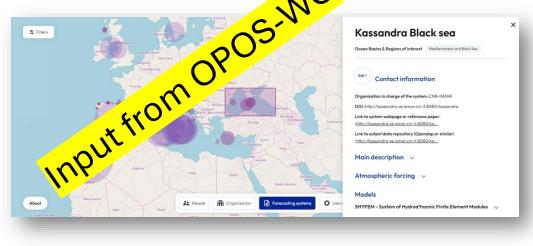
Action: Use the project meeting outcome as material for the next OP newsletter to promote ForeSea activitiets

OceanPredict State of Play (20')

Current activitities of the OP-DCC that OceanPredict is supporting



■ Explore the world of ocean prediction by regions, including information on its members, system and services



☐ Ongoing Survey on the Data standards

Input from OPOS-WG

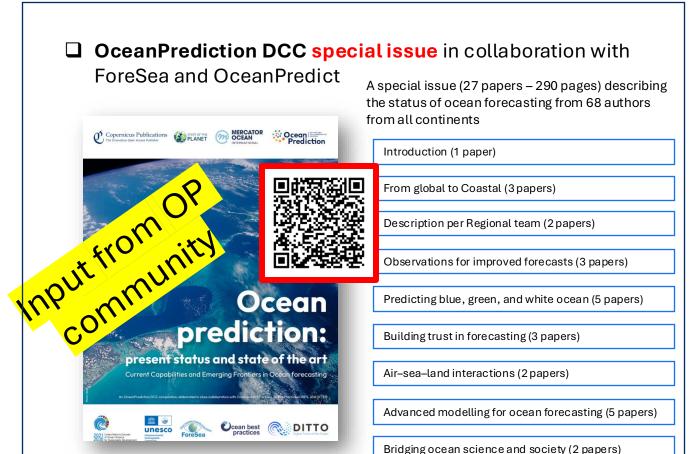
Collaborations and developments:

Next one (in preparation) on

Gaps and Challenges in

ocean forecasting

- Recent meeting with ForeSea Marie Drevillon and Greg Smith
- ✓ Communication: Newsletter OceanPredict/ForeSea Stephanie Cuven and Kirsten Wilmer-Becker
- ✓ Activities with OceanPrediction DCC (Atlas, survey, special issues, DDE) Kirsten Wilmer-Becker and Stephanie Cuven



https://sp.copernicus.org/art

icles/sp-5-opsr.pdf

■ Advance the DDE

ADVANCING THE DECADE'S DIGITAL ECOSYSTEM (DDE)

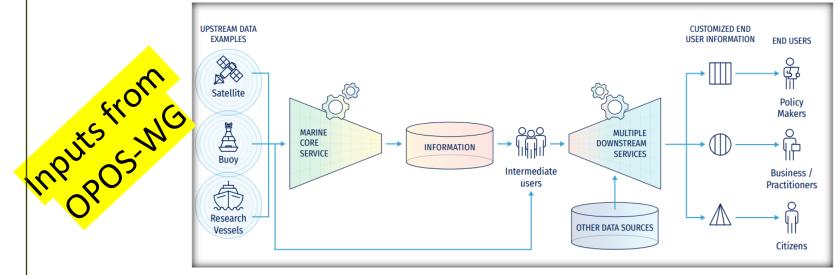




More infos



From observations to end user services: the ocean value chain



Challenges in the development of digital ocean ecosystem globally:

- Significant regional variation in digital ocean observing systems
- Interoperability issues
- lack of globally endorsed "tools, data standards and best practices"

TTs and WG updates (15')



OP Task Teams

IV-π (Intercomparsion and Validation)

CP-TT (Coupled Prediction)

DA-TT (Data Assimilation)

MEAP-TT (Marine Ecosystem Analysis and Prediction)

OSEval-TT (Observing System Evaluation)

AI-TT (Artificial Intelligence)

COSS-TT (Coastal Ocean and Shelf Seas)

IV-TT:

• migration of the Class4 intercomparison to an external server host-ed by Environment and Climate Change Canada.

Joint CP/DA-TT meeting in Colorado (US) postponed

Regular MEAP-TT seminars (monthly)

Co-chairs transition

in progress

• New – 1st meeting in June 2025

Al workshop in Montréal alongside the OPST-12 meeting

• Meeting, June 2025 (France) – report available soon

ForeSea activities



Decade links

NECCTON:

- Release of model code in the NECCTON repository
- Progress on zooplankton diel vertical migration and bio-optical modeling via FABM, shared across European forecasting centers
- Delivery of major modeling outputs and tools: Climate change indicators / Marine pollutant modeling / Pelagic biogeochemistry modules / Visualization and dissemination tools
- NECCTON UNOC3 session





SynObs:

- it enriched the scientific dialogue around sustained and integrated ocean observations
- SynObsworkshop in Japan (August 2026)

OceanPrediction DCC special issue in collaboration with OP/ForeSea





A special issue (27 papers – 290 pages) describing the **status of ocean forecasting** from 68 authors from all continents

Upcoming events - specifics

OP Summer school

Proposed schedule and set up

- 18-29 January, 2027
- INCOIS, Hyderabad
- Max. number of participants (physical): 74 (including local/international) capacity in E-Classroom
- Provision for online attendance : Yes (E-classtoom can allow online attendance)
- Infrastructure for hands-on-sessions: Class-rooms with desktops can be provided. Access to HPC can be provided, if required

Other logistics

- Visa: INCOIS will provide all necessary support to secure Indian visa for foreign attendees
- Local site-seeing: INCOIS will facilitate based on the interest of the participants
- Travel support : only limited to Indian participants/faculty members
- Local transport : Airport/Hotel pickup/drop-off can be arranged by INCOIS

OceanPredict contributions

- Invite applications & short list attendees
- Allow at least 25% attendees from India

Dravide trevel evener to leternetional feaulty members

Boarding/Lodgi

Action:

- Single acc rooms
- Faculty hc
- Breakfast/
- Meeting D

- Need to form the summer school organising committee asap and call a first meeting
- Eric C has already indicated his support
- More OPST and/or OPAS members need to support the effort
- OP partners to collect funds to support the summer school

with faculty

OceanPredict Terms of Reference

https://oceanpredict.org/docs/Documents/General%20documents/OceanPredict_2023-ToR-final.pdf

4. Partnerships

During the past years, with the establishment of the UN Decade for Ocean Science for Sustainable Development, OceanPredict has developed an increasing number of collaborations and partnerships. Although this does not yet affect its governance as such, it may impact how OceanPredict will be coordinated in future. The motivation for adding this section to the governance document is based on possible future changes to the governance, but for now, should be seen as a summary of progress within OceanPredict relationships.

- OceanPredict will contribute to the UNESCO's Intergovernmental Oceanographic Commission (UNESCO-IOC) by partnering with various groups and organisations so that the Ocean Decade can deliver on its mission to 'catalyse transformative and tangible ocean science solutions for sustainable development, reconnecting people to our ocean.'
- The UN Decade of Ocean Science is a catalyst for increased collaborations, partnerships, cooperation and activities, and is initiating OceanPredict contributions to the creation of a comprehensive ocean information value-chain for societal benefit. OceanPredict will interact with several programmes (e.g. ForeSea, CoastPredict, ObsCoDe) and projects (e.g. SynObs) of the UN Decade, in particular, with/through the UN Decade Collaborative Centre for Ocean Prediction or DCC-OP. In particular, OceanPredict activities will be developed in very close interaction with the ForeSea programme and the SynObs project.
- OceanPredict's role will be to support the ocean prediction component of the value-chain, developing the connections, linkages and interactions needed to establish long-term robustness and, working with partners, delivering the whole value-chain to society.

OceanPredict activities include building an overall framework for operational oceanography through the Decade Collaborative Centre for Ocean Prediction (DCC-OP) and advancing the science of prediction systems. Furthermore, OP activities help strengthen collaboration and knowledge flow between prediction and observing system groups, and between operational prediction centres themselves.

To be updaped:
Provide further clarification on the link with ForeSea and OceanPrediction DCC



Plan to be finalized for the OPST-12

For info



Decade actions

- DITTO: Co-chair / Joanna Staneva (Hereon, Germany) Vice-chair / Fei Chai (SIO, China) Vice-chair; Swadhin Behera (JAMSTEC, Japan) Cochair / Marina Tonani (MOi, France)
- ForeSea: Eric Chassignet
 (COAPS, USA) Co-chair / PN
 Vinayachandran Co-chair /
 Marie Drévillon (MOi, France)
 Co-chair / Fraser Davidson
 Co-chair
- GEMS Ocean: Joana Akrofi
 (UNEP)

- OARS: Kirsten Itensee
 (UNESCO) Chair / Samantha
 Siedleckin / Richard
- OceanPractices: Rebecca
 Zitoun (GEOMAR, Germany)
 Co-lead / Aileen Tan Shau
 Hway (CEMACS, Malaysia) Co-lead / Georges Petihakis (HCM, Grece) Co-chair / Jay Pearlman (FourBridges, USA)
- Ocean of Solutions: Wilfried
 Sanchez (Ifremer, France) Colead / Bruno Blanke (CNRS,
 France Colead / Celine
 Degremont (Ifremer, France)
 Project manager
- NASA-SLCT: Ben Hamlington
 (NASA, USA) / Nadya
 Vinogradova Shiffer (NASA,
 USA) Programme manager /
 Angelica Rodriguez (NASA,
 USA)

Regional teams

- West Pacific & Marginal Seas of South and East Asia: Swadhin Behera (JAMSTEC, Japan) Leader
- North East Atlantic: Ghada El Serafy (Deltares, Netherlands) – Leader / Loreta Cornicchia (Deltares, Netherlands) – Cochair
- Indian Seas: Sudheer Joseph (INCOIS, India) – Leader / Srinivas Kumars (IOC)
- South and Central America: Boris

 Dewitte (CEAZA, Chile) Co-Leader /

 Clemente Augusto Souza Tanajura (UFBA,
 Federal University of Bahia Salvador,

 Brazil) Co-Leader
- African Seas: Koudio Affian (UFHB, Côte d'Ivoire) Leader / Karim Hilmi (INRH National Institute of Fisheries Research, Morocco) Co-Chair / Jennifer Veitch (University of Cape Town / SAEON, South Africa) Co-Chair / Siva Reddy (Abdullah University of Science and Technology, Saudi Arabia) Co-Chair

- **Arctic:** Heather Regan (NERSC, Norway) Leader
- Mediterranean & Black Sea:
 Emmanuela Clementi (CMCC, Italy) –
 Leader
- North America: Fraser Davidson
 (ECCC, Canada) Co-Leader / Patrick
 Hogan (NOAA, USA) Co-Leader
- Antarctic: Stuart Corney (University of Tasmania, Australia) Leader

