



OPST- 8 meeting
Busan, South Korea
6-10 November 2023

REPORT

The 8th OceanPredict Science Team meeting took place at the Grab the ocean Hotel in Busan, South Korea. The information in this document summaries the discussions and highlights the actions in order of the agenda.



Korean meeting hosts and members of the OPST on top of the hotel (click on image to enlarge)

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Introduction

The 8th OPST Annual meeting in 2023 was hosted by our colleagues from KIOST and KHOA, South Korea. After more than 4 years of virtual meetings we finally were able to meet again in person.

Our meeting hosts welcomed us in Busan at the Grab the Ocean Hotel to a pleasant and very well organised event. We particularly like to thank Dr Do-Seong Byun, Dr Byoung-Ju Choi, Dr Young Ho Kim and Dr Yang-Ki Cho and all their colleagues for their outstanding support, especially for the organisation of the OP Science Day, but also for our visit to KIOST and for the organisation of the reception and dinner. It was an exceptional experience.

We also like to express our gratitude to Dr Hyi Seung Lee, Vice President of KIOST who opened the meeting and welcomed all OPST members and guest.

Meeting objectives

Presented by Fraser Davidson, ECCO

OceanPredict evolved a lot since the last in-person meeting and started to integrate its strategy and future plans with other international and intergovernmental initiatives, specifically the UN Decade of Ocean Science. It is now vital to continue to understand and define the evolving operational oceanography landscape via the increased digital literacy and communication, the operational oceanography value chain and the increased need for advancing ocean prediction capacity.

This meeting brought together various players in support of OceanPredict (OP) and in moving UN Decade related activities forward including the Decade Collaborative Centre for Ocean Prediction (OP-DCC), the OP task teams, the OPOS-WG and representatives from partner decade programmes and projects. The main objectives of the meeting were to:

- Understand how OP can collaborate most effectively with the UN Decade programmes
- Discuss ways forward for ForeSea, and what other projects (apart from SynObs) it could host
- Discuss the plans for the OP'24 symposium
- Understand current activities and plans of the OP task teams
- Learn about the advances of the OP predictions systems
- Get an insight in the activities of the Korean operational oceanography efforts (Science Day)
- Discuss general progress and future plans

Presentation links: <https://oceanpredict.org/docs/Documents/OPST/Meetings/OPST-8-Nov-2023/Presentations/1.2-OPST-8-objectives.pdf>

UN Decade links and activities

OP-DCC as an asset for ForeSea

Presented by Enrique Alvarez, MOi

Enrique Alvarez provided an overview of the current status of the OP-DCC regarding community building, capacity develop and update of technical activities. He then proposed potential options for collaboration with OP.

It was stated that the OP-DCC has organised its regional teams which are promoting the implementation and use of ocean forecasting systems worldwide. Another action currently undertaken by OP-DCC is the development of a new website which will provide services to the community, specifically a prediction system atlas, a community forum and a resources section. A “news” section is also included. In addition, the ETOOFS guide is being set up as a wiki page.

In parallel, the ocean forecasting co-design team (a group called together by the OP-DCC) is developing a comprehensive document describing the a new architecture for ocean prediction (standards, tools, best practices, etc...). The team is also working on developing the Operational Readiness Level (ORL) to guide and stimulate services development.

Action 1: **OPPO together with the OP-DCC** to work on a website forum for interaction of TTs. OP-DCC is developing a forum on their new website already which could be used for this purpose.

Presentation links: <https://oceanpredict.org/docs/Documents/OPST/Meetings/OPST-8-Nov-2023/Presentations/2.1-OceanPredictionDCC-EnriqueAlvarez.pdf>

ForeSea

Presented by Eric Chassignet, FSU

ForeSea is seen as the extension of OP in that it will improve its communication, specifically with the operational prediction system to highlight their applications and societal benefit. ForeSea will be the connector between OP and the UN Decade efforts, including the OP-DCC. One approach of improved communication anticipates the publication of a common newsletter featuring OP and ForeSea as well as the ForeSea associated projects. It was proposed to also consider involving GEO Blue Planet in the ForeSea outreach effort.

Advertisement of national operational prediction centres via an OP/ForeSea newsletter could be quite attractive and develop an understanding of user requirements. OP will distribute the newsletter as well as work with the OP comms team to collect information from contributors on a regular basis. In future this could maybe extend to pod casts. However, limited resources must be considered when planning for promotional material. It might be possible to draw on the OP partners / national centres for support. Such effort could also include other partner communities such as observation groups, atmospheric groups, etc. to show the whole value chain and clarify the overall importance of such networks and eventually showing the economic impact. However, quantification of economic of social impact would be difficult. The newsletter will also be made available via OP-DCC.

Action 2: **OP communications committee** to discuss and contribute to setting up the Terms of Reference for the ForeSea communication effort. The OPPO should support ForeSea communication, including engaging with OP prediction systems to leverage ForeSea news.

Action 3: **OP groups** must continue to support ForeSea in moving forward.

Presentation link: <https://oceanpredict.org/docs/Documents/OPST/Meetings/OPST-8-Nov-2023/Presentations/2.2-ForeSea-EricChassignet.pdf>

SynObs

Presented by Yosuke Fujii, MRI-JMA

The current activities of the SynObs project were presented. The project has seen strong interest but limited funds for participating partners.

A special issue is planned to be published in 2024. Further details are in the presentation (link below).

Presentation link: <https://oceanpredict.org/docs/Documents/OPST/Meetings/OPST-8-Nov-2023/Presentations/2.3-SynObs-YosukeFujii.pdf>

UN Decade partner programmes

Presented by representatives from partner programmes (Nadia Pinardi, Emma Heslop, Martin Visbeck)

CoastPredict (*Nadia Pinardi, University of Bologna/CMCC*)

Participants to [GlobalCoast](#) have now been identified and pilot sites agreed, although the option to join late is still open. South Korea could still join, but they would need to get in touch with the project organisers.

A focus is coastal resilience which could involve A. “Early warning measures” and B. “Adaptation plans for better preparation”. The pilot sites require an infrastructure but there are different levels of readiness. Communication and interaction with existing activities is anticipated. This could be organised by a new task team.

Further details are in the presentation (link below).

Presentation links: <https://oceanpredict.org/docs/Documents/OPST/Meetings/OPST-8-Nov-2023/Presentations/3.1-CoastPredict-DCCCR-NadiaPinardi.pdf>

Ocean Observing Co-Design (*Emma Heslop, GOOS/IOC/UNESCO*)

The plan for the project is to evolve the observing system with users along the value-chain, looking at areas of high societal impact. Pilot regions with certain users are identified and an exemplar pilot

map is being drawn up. The focus is on a select number of end-users with design capacity, including societal aspects of observations. ForeSea (with OceanPredict) is important in this context working with OP-DCC and could collaborate with Ocean Observing Co-Design to learn about observation infrastructure needs. SynObs can also contribute to this by validating observation impacts. This could lead to a rolling review of requirements of established services with a global focus. GOOS could support the communication with WMO.

Presentation link unavailable

DITTO (*Martin Visbeck, GEOMAR*)

DITTO deliverables are likely to include a user interface providing “what if” scenarios, but at the moment this is still too technical for a *normal* user to work with. A user interface should be simple and intuitive. This is work in progress and will be discussed at the upcoming DITTO summit in the area of digital twins.

It was proposed to identify groups within OP who could contribute to DITTO. SynObs will contribute to DITTO through sensitivity experiments.

Further details are in the presentation (link below).

Presentation link: <https://oceanpredict.org/docs/Documents/OPST/Meetings/OPST-8-Nov-2023/Presentations/3.4-DigitalTwinOcean-MartinVisbeck.pdf>

GEO Blue Planet

Presented by Pierre-Yves Le Traon, MOi

GBP just had a symposium in Seoul (mid-Nov 2023) focusing on user service engagement and is now planning to work more with the UN Decade programmes. OP/ForeSea and GBP plan to work closer together on projects, but this needs some exchanges on details.

Further details are in the presentation (link below).

Presentation link: <https://oceanpredict.org/docs/Documents/OPST/Meetings/OPST-8-Nov-2023/Presentations/3.3-GEO-Blue-Planet-PierreYvesLeTraon.pdf>

Links to “UN Decade links and activities2 session discussions

To learn more about the discussions following the session presentations please visit the links below:

- [OP and ForeSea](#) (16min)
- [ForeSea and OP-DCC](#) (47min)
- [SynObs](#) (18min)
- [CoastPredict and Observing System Co-Design](#) (14min)
- [GEO Blue Planet](#) (6min)
- [DITTO and general discussion](#) (40min)

OP'24 Symposium

Symposium local organisation status

Presented by Marie Drevillon, MOi

It is planned to restrict the symposium to in-person presenters but to allow online attendance (listen only). Rooms allocations are yet to be fixed. The initial programme draft is planned to be available from Feb 2024. It is hoped that the next announcement can be sent in Jan 2024 to inform the community about the symposium date and upcoming registration and abstract submission.

Room fees cannot be covered by a registration fee. Collection of monies from attendees can only be done in the form of payment for food vouchers.

It is still unclear how many splinter sessions are possible and will depend on the number of submitted abstracts. Splinter session allocations will also depend in the room sizes which vary.

Action 4: All OPST members to propose names and email contacts to the OPPO to advertise the OP '24 symposium.

Action 5: All OPST and OPAS members to provide proposals for funding or direct funding for the OP '24 symposium.

Presentation link: <https://oceanpredict.org/docs/Documents/OPST/Meetings/OPST-8-Nov-2023/Presentations/4.1-OP24Symposium-Marie%20Drevillon-StephanieCuven.pdf>

Symposium strategy and programme organisation status

Presented by Eric Chassignet, FSU

It was agreed to invite representatives from the UN Decade to assist the symposium programme committee. It is hoped that we can have booths provided for symposium sponsors and to consider making the event attractive for early career scientists.

Although the symposium will be science heavy, it was suggested to address high-level issues that are of interest to a wide community and possibly non-science focused audiences as well, including

- Highlighting societal benefit
- Climate change impacts/ threats to the environment
- Marine litter, heatwaves, ecosystem

It is important to find good wording for the theme descriptions to attract interest in the event, as well as a diverse programme with plenary talks, splinter sessions, poster sessions, fora, town halls, panel discussions, etc. It is also anticipated to produce a special issue following the symposium.

It was agreed to allow new sessions to be created if the demand is there. This will be determined following the abstract submissions and theme choice the submitters make.

It was agreed for the science programme committee to work on refining the theme descriptions and keywords. A Google document has been set up to collect input from committee members during the OPST-8 meeting.

ForeSea and how it represents OP in the Decade should be at the centre of the symposium programme.

Action 6: All OPST and OPAS members to contribute to the setting up of the OP'24 symposium themes & keywords by adding comments and content to a themes document which has been circulated (on google docs) by end of week (10 Nov 2023)

Presentation link: <https://oceanpredict.org/docs/Documents/OPST/Meetings/OPST-8-Nov-2023/Presentations/4.2-OP24Strategy-Science-Outreach-EricChassignet-AndreasSchiller.pdf>

Links to "OP'24 Symposium" session discussions

To learn more about the discussions following the session presentations please visit the links below:

- [OP symposium organisation](#) (46 min)
- [OP Science committee and UN Decade](#) (21min)

Task Teams

The presentation link in the TT paragraphs show the main achievements, plans and issues of the TTs, so please refer to them for main TT information.

COSS-TT

Presented by Alexander Kurapov, NOAA

The COSS-TT is keen to improve communication with its members and other internal and external groups by setting up a better dialogue with global ocean modellers (large scale systems) on the ocean continuum: large-scale ↔ regional ↔ shelf ↔ nearshore ↔ inland. The COSS-TT systems are now addressing new challenges and working in new areas, including:

- Expanded scope of essential processes (marine heat waves - MHW, surface waves, floods, physical-bio-geochemical interactions)
- New numerical model approaches, coupling (atm ↔ ocean ↔ ice ↔ wave ↔ hydrology)
- Machine learning / Artificial Intelligence
- Coastal climate projections is still TBD with TT and OP: coordinate with CP/FLAME ?
- Synergy with other TT: data assimilation, BGC, CalVal etc.

The COSS-TT will also continue to support CoastPredict and the GlobalCoast pilot project.

The [NOAA online seminar series](#) was promoted as a very good platform to exchange on scientific results. There is interest from estuaries community and increasing numbers of people are interested in near shore processes and storm surge.

Presentation link: <https://oceanpredict.org/docs/Documents/OPST/Meetings/OPST-8-Nov-2023/Presentations/5.1-COSS-TT-AlexanderKurapov.pdf>

CP-TT

Presented by Kristian Mogensen, ECMWF

The CP-TT is planning a joint workshop with the DA-TT in Boulder, Colorado in May 2025. There is drive for more collaboration with the other TTs, e.g. on tropical cyclones (link with the Ocean Observing Co-Design programme), the impact of ocean initial conditions on coupled forecasts (link with SynObs and DA-TT), diurnal cycles in SST and intercomparison (with IV-TT).

It was suggested to consider linking these efforts with WMO, as short to medium range predictions are underrepresented. It will be important to show the effect of coupling on the atmosphere.

It was suggested to consider writing a white paper to describe the current baseline of the CP-TT efforts. Suggestions for discussion at the next CP-TT included methodologies for coupled prediction/ wave coupling and current atmosphere/ocean community relationships. It would be helpful to learn more about how systems deal with coupling and develop guidance or best practice for it.

Jae-Il Kwon (KIOST) and Andy Moore (UCSC) will become new members of the CP-TT.

Presentation link: <https://oceanpredict.org/docs/Documents/OPST/Meetings/OPST-8-Nov-2023/Presentations/5.2-CP-TT-KristianMogensen.pdf>

DA-TT

Presented by Andy Moore, UCSC

The DA-TT is considering developing regular university level online DA training accessible globally, including giving credits for successful completion. How to provide this on a free-for-all basis is still to be explored. The motivation is to enthuse more students and ECOPs to learn about DA as numbers of skilled DA experts are small. This most likely requires a lot of effort but could be of interest at intergovernmental level (e.g. IOC) to be implemented as global capacity building.

Action 7: DA-TT co-chairs to explore the options for setting up DA training at university level and find ways to run lectures (also check possibilities for accreditation of courses)

Presentation link: <https://oceanpredict.org/docs/Documents/OPST/Meetings/OPST-8-Nov-2023/Presentations/5.3-DA-TT-AndyMoore.pdf>

OS-Eval TT

Presented by Elisabeth Remy, MOi

The OS-Eval TT is planning the publication of two special issues with contributions to the 1st special issues from DA-TT, COSS-TT, Fishery observation group, and WMO S2S as well as OS-Eval TT and SynObs members covering a wide range of the activities including global to coastal scales, real-time ocean monitoring / coupled simulations, OSE / OSSE-design / diagnostics and present/future satellite observations, in situ observations (Argo, fishing vessels data...). The manuscript deadline is 25 Feb 2024. The 2nd special issue will include SynObs results with a publication in 2025/26.

The OS-Eval TT is increasingly contacted about the “in situ ocean observing network” to get involved in showcasing their usefulness for the ocean prediction systems (e.g. SMART cable (Ocean Bottom Pressure), fishing vessel observation, low-cost sensors, etc.)

Although the OS-Eval TT is mostly focused on physical variables there are suggestions for coastal observation impact assessments (with COSS-TT contribution) as well as for BGC observations and possibly ecosystem observations.

Other items:

- WMO Rolling Review of Requirements: identified OP/OSEval TT as a point of contact to fill the survey for "ocean prediction" (with different requirements depending on “ocean applications”)
- Evolving landscape with different actors interested in ocean observation "impact" in prediction systems: GOOS, WMO and UN Decade DCC/programs with the concept of “the value chain”.

OP could provide more guidance on impact assessments of observations, as the value of observations and the importance of its impacts needs to be highlighted. It would be useful to look

for maximum impact scenarios through case studies to show the impact. ECMWF has used show cases (atmosphere) to show high impact events (Medicane example).

The OS-Eval TT will contribute to the [8th WMO Workshop on the Impact of Various Observing Systems on Numerical Weather Prediction and Earth System Prediction](#), 27-30 May 2024.

Presentation link: <https://oceanpredict.org/docs/Documents/OPST/Meetings/OPST-8-Nov-2023/Presentations/5.4-OS-Eval-TT-YosukeFujii.pdf>

IV-TT

Presented by Fabrice Hernandez, IRD/MOi

Class-4 activities are impacted by a critical issue with datasets at the US GODAE server. It has become a major roadblock for ongoing collaboration and operational validation. Class 4 activities need to transition from IV-TT to operational centres.

To improve the situation, GODAE server requirements and future characteristics will need to be identified and documented. It will also be important to get support from national prediction centre on implementing class-4 intercomparisons as an operational process. OP should prepare material to support and promote these demands by considering drafting:

- justification of benefit of providing funding for the server
- an OP schematic and its network
- solicitation letter for support from prediction system leads
- collection of the benefits, OP is providing to the community and sponsors, including emphasizing the engagement with the UN Decade

It was proposed that the IV-TT could adopt ensembles as their new approach for intercomparisons. This is already investigated at ECCO. This could also bridge links and collaboration with seasonal groups.

Action 8: OPST co-chairs, IV-TT co-chairs and OP-DCC to discuss and propose solutions for organising the class-4 intercomparison effort on an operational basis

Presentation link: <https://oceanpredict.org/docs/Documents/OPST/Meetings/OPST-8-Nov-2023/Presentations/5.5-IV-TT-FabriceHernandez.pdf>

MEAP-TT

Presented by Liuqian Yu, University of Hong Kong

Discussions are taking place to collaborate around existing projects objectives, develop common platforms and tools, explore the feasibility to forecast higher trophic levels and ecosystems. Regular online seminars are organized.

The MEAP-TT is planning an in-person meeting either in summer 2024 or during the OP '24 symposium. Fabrice Hernandez (IV-TT) suggested to set up intercomparisons for surface color and/or BGC Argo working with the MEAP-TT. At Copernicus, ecosystem model intercomparison are already happening and Stefano would like to share the report of the metrics with the IV-TT.

Presentation link: <https://oceanpredict.org/docs/Documents/OPST/Meetings/OPST-8-Nov-2023/Presentations/5.6-MEAP-TT-LiuqianYu.pdf>

Current frequencies of TT meetings and lectures & seminars

	Member's meetings (internal business)	Seminars/ lecture (educational/ science)	Training
COSS-TT	Biennial	N/A	N/A
CP-TT	Irregularly	Annually	N/A
DA-TT	Biennial	Quarterly (last in Dec 2022)	at OP 19
IV-TT	6-12 monthly	N/A	N/A
MEAP-TT	<i>See seminars</i>	Monthly (includes business meeting)	Once
OS-Eval TT	Quarterly (last in Oct 2022) – replaced by SynObs meetings which are every 1-3 months	N/A	N/A

Links to “Task Teams” session discussions

To learn more about the discussions following the session presentations please visit the links below:

- [DA-TT discussion](#) (7min)
- [OS-Eval TT discussion](#) (10 min)
- [IV-TT discussion](#) (12min)
- [MEAP-TT discussion](#) (41 min)

OPOS-WG and system progress

OPOS-WG progress, plans and best practice

Presented by David Ford, Met Office

It is considered to invite representatives from the observing community to the OPOS-WG on their interaction with the operational systems. The OPOS-WG works with the OP-DCC to provide detailed information on the technical evolution of the systems in an online system atlas. Past reports from the OPOS-WG members could also be exploited for this purpose but they might need some clarification for the atlas developers. The Atlas is considered to become the central location for system information online with input from various sources including OP and ForeSea. This will also support the class-4 intercomparison effort.

The OPOS-WG is planning to organise seminars on their progress and can support promoting the efforts of the systems to a wider community.

Action 9: OPPO with the help of OPOS-WG to prepare and circulate a questionnaire on the Argo use to OPST and the wider community.

Action 10: OPPO with the help of OPOS-WG (or all OPST) to provide feedback on a question about storage of daily forecasting data (length and method of storage)

- **In addition, set up a list of questions for feedback to OPPO on**
 - what data services are being used
 - what best practices are in place
 - how best to store data
 - what plans for digital twins are pursued
 - how systems deal with ensembles, etc.

Action 11: OPOS-WG to invite NZ system reps as new members

Presentation link (progress and plans)

<https://oceanpredict.org/docs/Documents/OPST/Meetings/OPST-8-Nov-2023/Presentations/6.1-OPOSprogress-plans-DavidFord-FraserDavidson.pdf>

Presentation link (best practice)

<https://oceanpredict.org/docs/Documents/OPST/Meetings/OPST-8-Nov-2023/Presentations/6.2-OPOS-BestPractices-DavidFord-FraserDavidson.pdf>

Links to “OPOS-WG and system progress” session discussions

To learn more about the discussions following the session presentations please visit the links below:

- [OPOS progress and plans discussion](#) (11min)
- [Ocean best practice discussion](#) (7min)

OPOS-WG system reports

Presented by system representatives (see below)

Please find the link to the system presentation (where available) in the left column of the table.

System	Presenter/representative	Affiliation, country
Global and Mediterranean Operational Forecasting systems	Emanuela Clementi	CMCC, Italy
TOPAZ	Laurent Bertino	NERSC, Norway
South Africa's Operational Forecast System	Jennifer Veitch	SAETON/ University of Cape Town, South Africa
REMO	Clemente Tanajura	UFBA, Brazil
CONCEPTS	Fraser Davidson	ECCC, Canada
Update from the US global ocean prediction efforts using HYCOM	Eric Chassignet	FSU, USA
FOAM – Met Office systems updates, UK	David Ford	Met Office, UK
The ECMWF operational system, UK/Europe	Kristian Mogensen	ECMWF, UK/Europe
Update of Operational Forecasting Systems in China	Guimei Liu	NMEFC, China
INDian Ocean FOrcecast System (INDOFOS)	Francis Pavanathara	INCOIS, India
Mercator Ocean international, France	Yann Drillet	MOi, France
Operational Real Time Ocean Forecast System at NOAA/NWS/NCEP, USA	Dmitry Dukhovskoy	NOAA, USA
JMA operational ocean prediction system – MOVE/MRI.COM, Japan	Goro Yamanaka	MRI-JMA, Japan
Operational systems update, Australia	Gary Brassington	BoM, Australia

It was agreed that we would still produce annual national reports in addition to transferring some of the report information to the OP-DCC atlas. It was proposed to also consider information about storm surge and wave activities in the report.

Links to “OPOS-WG system reports” session discussions

To learn more about the discussions following the session presentations please visit the links below:

- [CMCC, Norway and South Africa discussion](#) (4min)
- [REMO discussion](#) (3 min)
- [CONCEPTS discussion](#) (3min)
- [HYCOM discussion](#) (12min)
- [ECMWF discussion](#) (10min)
- [FOAM and general discussion](#) (21 min)
- [NMEFC discussion](#) (7min)
- [INCOIS discussion](#) (7min)
- [RTOFS discussion](#) (2min)
- [MRI-JMA discussion](#) (2min)
- [BoM discussion](#) (30min)

Observing systems

We invited representatives from various ocean observing systems relevant to OP to provide an overview of their ongoing efforts and what feedback OP could provide in support. Specifically, we wanted to find out how communication and information exchange can be improved and to explore what are the most important aspects of the observing system, how can OP strengthen it, and what feedback does the observing system need from the forecasting systems.

Argo: Present and future challenge

Presented by Peter Oke, CSIRO

SynObs and OS-Eval TT are very important groups for OP in assessing the ocean observing system and should be high priority. QC used by Argo has much improved and should be used to make sure all data are considered.

It was agreed to set up survey collecting information about the use of Argo data.

Action 12: OPPO with the help of OPOS-WG to prepare and circulate a questionnaire on the Argo use to OPST and the wider community.

Further details are in the presentation (link below).

Presentation link: <https://oceanpredict.org/docs/Documents/OPST/Meetings/OPST-8-Nov-2023/Presentations/7.1-Argo-PeterOke.pdf>

GOOS interaction with OceanPredict

Presented by Joanna Post, IOC/UNESCO

There is strong need for ocean observations, and the value of the observations is often not pushed enough. It will be important in future to work with users to drive the co-design of ocean observations. This will not only better match the demand but could also provide a cost benefit in providing and deploying them.

The interaction between OP and GOOS will need to improve. Mutual engagements of GOOS and OP group members could be beneficial (e.g. through ETOOFS).

Action 13: All OPST members (with the help of the TTs and OPST co-chairs and OPAS members) to develop a mechanism to stronger engage with the observation communities on providing feedback on the utility and impact of observations e.g. SWOT, OneArgo, etc. .

Closer collaboration could be achieved in the form of short statements or recommendations gathered directly from OPST members or via surveys (see action 12) and sent by email or letter. The OPAS group should provide guidance on the best way of communication. Direct interaction of OPST members with observation agencies is also possible, but we need to make sure to provide consistent messages (e.g. via a common document) from OP.

Further details are in the presentation (link below).

Presentation link: <https://oceanpredict.org/docs/Documents/OPST/Meetings/OPST-8-Nov-2023/Presentations/7.2-GOOS-JoannaPost.pdf>

Global Ocean Observing System for Marine Life

Presented by Karen Evans, CSIRO

The vision for the BioEco panel is to develop a truly global ocean observing system that delivers the essential information needed for sustainable development, safety, wellbeing and prosperity.

There is interest to interact with the physical prediction community more on questions of what variables are used in the prediction systems and whether the *right* variables are collected. It was proposed for the BioEco panel to become part of the conversation with [NECTON](#) which OP is already involved with.

Further details are in the presentation (link below).

Presentation link: <https://oceanpredict.org/docs/Documents/OPST/Meetings/OPST-8-Nov-2023/Presentations/7.3-Bio-Eco-KarenEvans.pdf>

Contributions from satellite observations

Presented by Elisabeth Remy, MOi (for Estelle Obligis, EUMETSAT)

Elisabeth kindly presented information about the latest update on satellite observations, provided by Estelle Obligis.

It was highlighted that we need better connections with EUMETSAT, CNES, etc. Maybe it is possible to establish this via outcomes from SynObs.

Further details are in the presentation (link below).

Presentation link: <https://oceanpredict.org/docs/Documents/OPST/Meetings/OPST-8-Nov-2023/Presentations/7.4-SatellitesObservations-EstelleObligis.pdf>

SWOT overview

Presented by Pierre-Yves Le Traon, MOi

SWOT data (L3 products) will be available by 2024.

Further details are in the presentation (link below).

Presentation link: <https://oceanpredict.org/docs/Documents/OPST/Meetings/OPST-8-Nov-2023/Presentations/7.5-SWOT-Dibarboure-PierreYvesLeTraon.pdf>

Links to “Observing systems” session discussions

To learn more about the discussions following the session presentations please visit the links below:

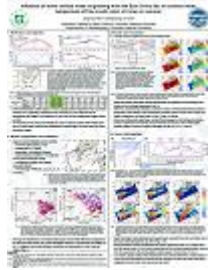
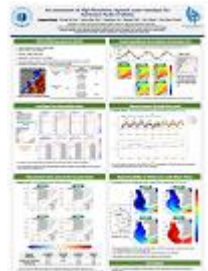
- [Argo discussion](#) (8min)
- [BIOECO-GOOS discussion](#) (13min)
- [Satellite overview discussion](#) (6min)
- [SWOT discussion](#) (10min)


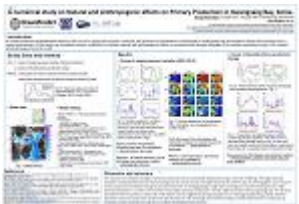
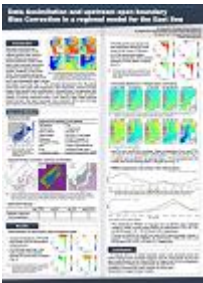

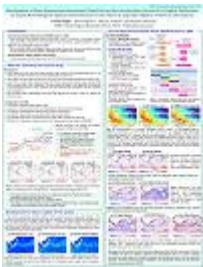
OP Science Day

The OP Science Day provided a platform for all local scientist to present their work and outcomes. The links to the presentation and posters are listed below. Abstracts and recordings are also available.

Oral presentations				
Session 1: Regional and global operational ocean forecasting systems in Korea				
1.1	KHOA's activity on ocean forecasting activities and their applications	Do-Seong Byun (KHOA)	Abstract	Recording (includes the 5 first presentations)
1.2	Development of a marine forecasting system for use in fisheries	Joon-Soo Lee (NIFS)	Abstract	Recording (includes the 5 first presentations)
1.3	Introduction to Korean Operational Oceanographic System (KOOS)	Jae Il Kwon (KIOST)	Abstract	Recording (includes the 5 first presentations)
1.4	Operational Wave Forecasting System in KMA and its Applications	Pilhun Chang (NIMS)	Abstract	Recording (includes the 5 first presentations)
1.5	Introduction to KIOST Ocean Climate Seasonal Prediction Modeling and Outlook Service	Hyoun-Woo Kang (KIOST)	Abstract	Recording (includes the 5 first presentations)
Session 2: User application of ocean forecasting systems				
2.1	Digital Twin for Ocean – Extension of Our Experiences and Experiments	Changwon Ahn (MEGAZONE CLOUD)	Abstract	Recording

2.2	Applicability of AGRIF in the Regional Ocean Circulation Model	Hyeok Jin (Geosystem Research)	Abstract	Recording
2.3	Application of numerical models in UST21: from coastal to open ocean	Joonho Lee (UST21)	Abstract	Recording
2.4	Tracking the pumice rafts from the Fukutoku-Okanoba submarine volcano with Satellites and a Lagrangian Particles trajectory model	Young-Gyu Park (KIOST)	Abstract	Recording
2.5	The achievement of KOOS in national agencies and industries	Nam-Hoon Kim (KIOST)	Abstract	Recording
Session 3: Science in support of ocean prediction				
3.1	Local stratification preconditions the marine heatwaves in the Yellow Sea	Dong Eun Lee (Chungnam National University)	Abstract	Recording
3.2	Containerization of numerical ocean model for computational reproducibility and portability in the cloud computing	Kwangwoog Jung (Seoul Nat. University)	Abstract	Recording
3.3	Evaluation of impact on regional observing system through Observing System Experiment in Northwest Pacific	YoungHo Kim (Pukyong National University)	Abstract	Recording
3.4	Evaluation of ocean reanalysis data for the	Byoung-Ju Choi (Chonnam	Abstract	Recording

	Yellow Sea and East Sea	National University)		
3.5	Impact of satellite-based thickness data assimilation on bias reduction in Arctic Sea ice concentration	Jeong-Gil Lee (Chonnam Nat. University)	Abstract	Recording
3.6	Prediction of sea surface current around the Korean peninsula using artificial neural network	Jeong-Yeob Chae (Inha University)	Abstract	Recording
3.7	Seasonal differences in tropical cyclone-induced sea surface cooling in the western North Pacific	Vineet Kumar Singh (Jeju National University)	Abstract	Recording
No	Poster presentation title	Poster presenter	Abstract	Poster (pdf) for download
1	Influence of warm surface water originating from the East China Sea on surface water temperature off the south coast of Korea in summer	Jong-Kyu Kim and Byoung-Ju Choi (Chonnam Nat. University)	Abstract	
2	An assessment of High-Resolution regional ocean reanalysis for Northwest Pacific K-ORA22	Inseong Chang (Pukyong National University)	Abstract	

3	Conducting and Performance Evaluation of a High-Resolution Regional Ocean Model in Yeosu-Gwangyang Bay using GFDL MOM6	Nayoung Park, Inseong Chang, Young Ho Kim (Pukyong Nat. University)	Abstract	
4	A numerical study on Natural and Anthropogenic effects on Primary Production in Gwangyang Bay, Korea	Seung-Hwa Chae ¹ , Yang-Ki Cho ¹ , Yong-jin Tak ² and Myeong-Taek Kwak ³ (1Seoul National University 2Gangneung-Wonju National University 3Chonnam Nat. University)	Abstract	
5	Influence of warm surface water originating from the East China Sea on surface water temperature off the south coast of Korea in summer	Jae-Sung Choi and Byoung-Ju Choi (Chonnam National University), Kyungman Kwon (KIOST)	Abstract	
6	A multi-year climate prediction system based on CESM2	Yong-Yub Kim (PKNU) et al	Abstract	
7	Development of Four-Dimensional Variational Global Ocean Data Assimilation System for Coupled Predictions in Japan	Yosuke Fujii, MRI-JMA	Abstract	

	Meteorological Agency and Evaluation of the effects of Argo Data Quality Control in the System			
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OPST business

OPAS meeting (feedback)

Presented by Pierre-Yves Le Traon, MOi

The OPAS meeting was held as a hybrid event as some OPAS members were not in Busan. The meeting minutes are available from the [OP website](#).

Presentation link: <https://oceanpredict.org/docs/Documents/OPST/Meetings/OPST-8-Nov-2023/Presentations/8.1-OPASmeeting.pdf>

New OP programme office assistant

Presented by Stéphanie Cuvén, MOi

Stephanie introduced herself as the new OceanPredict Programme Office Assistant Coordinator and provided information about her background in Sedimentology/Paleoclimatology (*see presentation for more information*).

She highlighted her roles (50% covering OceanPredict tasks and 50% working on EU4OceanObs) and identified the tasks she is planning to address in the next year.

Presentation link: <https://oceanpredict.org/docs/Documents/OPST/Meetings/OPST-8-Nov-2023/Presentations/8.3-OPPO-NewCoordinator-StephanieCuvén.pdf>

Programme office activities and OPST-8 meeting actions

Presented by Kirsten Wilmer-Becker, Met Office

An overview of last year's activities and events was provided including details about upcoming tasks. After OPST-8 the focus will be on communication, website updates (SynObs and ForeSea webpages), publications update (online), update of list observations for operational use (online), communication plan for ForeSea (communications committee), OP '24 organisation, advertisement, registration, abstracts, etc., event support (e.g. CP-TT workshop, 2025) and general OP support for OPAS, OPST co-chairs and TTs.

OPST-8 meeting actions were discussed and agreed as they appear in this document.

- Action 14:** OPPO to update the OP website to lift information on seminars and TT meetings to a higher level to make them more prominent
- Action 15:** OPPO to organise a first meeting (and prepare for subsequent meetings) of the OPEC group (OP Executive Committee = OPST and TT co-chairs + OPOS-WG co-chairs + OPPO), including engagement with OPEC members to develop first OPEC meeting agenda
- Action 16:** OPPO to add the names and email addresses of all OPST and OPAS members to the OP website
- Action 17:** OPPO to organise a better solution for the IV-TT mailing list (issues with send emails by co-chairs)
- Action 18:** OPPO to update TT memberships due to several requests from TT co-chairs and potential new joining TT members

Presentation link: <https://oceanpredict.org/docs/Documents/OPST/Meetings/OPST-8-Nov-2023/Presentations/8.4-OPPO-Activities-KirstenWilmer-Becker.pdf>

Presentation link to proposed OPST-8 actions:

<https://oceanpredict.org/docs/Documents/OPST/Meetings/OPST-8-Nov-2023/Presentations/8.5-OPPO-OPST8-Actions-KirstenWilmer-Becker.pdf>

OP future discussion

Presented by Fraser Davidson, ECCC

This presentation provided a brief future vision, strategy review, executive committee introduction, and OPST, OPOS-WG and TT interaction information. The highlights included the arrival of AI/ML and how it could be exploited, the plan to organise a reanalyses intercomparison exercise starting with a white paper, showed the involvement of the OPOS-WG with the OP-DCC and provided some insight of the advancement of ForeSea with the help of the OPPO.

OceanPredict is getting increasingly involved in UN Decade collaborations with other groups which will strengthen links in the value chain. Examples are given below:

- SynObs is strengthen links between observations and prediction systems, in parts through collaboration with the Observing System Co-Design project
- Consideration of ForeSea show cases, highlighting ocean forecasting (research, systems) and how it fits in OO value chain
- Close activities with OP-DCC which provides framework, structure and infrastructure for whole value chain an important function for OP, ForeSea, SynObs....
- GEO Blue Planet and Obs. Sys. Co-design wishes to have discussion on specific tasks for collaboration with OP
- Connecting the value chain identified as a common task across decade partners
- Supporting of ETOOFS in providing plans for accreditation of prediction systems

- OP task teams advance research but also engage in Decade Programs covering the full value chain (CoastPredict)
- OPOS-WG capturing health and progress of forecasting systems, solving issues faced by forecasting systems

Going forward OP has many opportunities and alignments with of groups to enable progress with the OO Value Chain through the UN Decade of Ocean Sciences. OP needs to be efficient with its efforts via internal communication about activities, so that OP can effectively collaborate, leverage engagements and advertisement of activities. The OP-DCC interactions will be very useful.

OP should also consider increasing its long-term efforts in training, and document and publish its work (books, white papers, guides, etc.)

INCOIS is volunteering to host the next OP Summer school in 2026. The IOC has a facility in India that leverages IOC online education tools.

Presentation link: <https://oceanpredict.org/docs/Documents/OPST/Meetings/OPST-8-Nov-2023/Presentations/8.6-OP-FuturePlan-OP-Co-Chairs.pdf>

Next OPST meeting

The next OPST meeting (OPST-9) will be a virtual meeting in June 2024. Day 5 of the OP '24 Symposium will provide room for OPST-10 (one day in-person meeting).

Appendix

Appendix A: Agenda

Day 1 – Monday 6 November

Introduction day – Meeting objectives, UN Decade and other external engagements

Diamond room on the 20th floor

Morning session chair: Marie Drevillon

08:30 – 09:15 Registration and posters set-up for science day

09:15 – 09:30 Welcome by local host, Hyi Seung Lee, Vice President of KIOST

1. OPST-8 objectives and priorities

09:30 – 10:00 Meeting objectives and priorities
(20+10) – Fraser Davidson, ECCC (remote)

10:00 – 10:05 2. OP and links with the UN Decade (5 min) intro by session chair

10:05 – 10:35 OP-DCC and OP: How OP is involved, value chain vision of OP-DCC, what OP support is needed in future
(20+10) – Enrique Alvarez (onsite)

10:35 – 11:00 Break

11:00 – 11:30 ForeSea and OP: Integration of OP/ForeSea/OP-DCC, what are their roles and how do they interact with each other, what are the ForeSea activities, how can OP support ForeSea, where does ForeSea want to be in 2-3 years ..
(20+10) – Eric Chassignet (onsite)

11:30 – 12:00 Discussion about ForeSea role, support by TTs, future path of ForeSea

12:00 – 12:30 SynObs – current status of activities, progress plans, issues, support needed from OP
(20+10) – Yosuke Fujii (onsite)

12:30 – 13:00 Discussion on ForeSea, SynObs, OP-DCC and other involvement options with UN Decade actions, proposals for new projects, engagements with programmes, etc. (30 min)

13:00 – 14:00 Lunch

Afternoon session chair: PN Vinayachandran

14:00 – 14:05 3. OP engagements with partner organisations (5 min) intro by chair

14:05 – 14:30 CoastPredict – overview of activities and existing/expected collaboration with OP
(15+10 min) – Nadia Pinaridi (remote)

14:30 – 14:55 Ocean Observing Co-Design – overview of activities and existing/expected collaboration with OP
(15+10) – Emma Heslop (remote)

14:55 – 15:20 GEO Blue Planet – feedback from GBP symposium (previous week) and vision for OP/GBP collaboration
(15+10) – Pierre-Yves Le Traon (onsite)

15:20 – 16:00 Break

16:00 – 16:25 DITTO (15+10) – overview of activities and existing/expected collaboration with OP
(15+10) – Martin Visbeck (remote)

16:25 – 16:55 **Discussion** about external OP activities (in and outside UN Decade): what partnerships are in place, what new partnerships should OP seek, where should OP move, what partnerships should be improved and how should we reflect our partnerships and engagement at the OP '24 symposium?

16:55 – 17:00 **Daily recap**

17:00 – 17:10 **Group photo**

17:10 **End of day 1**

From 17:30 **Welcome OPST dinner hosted by KIOST**

Day 2 – Tuesday 7 November

Task Team Day

Diamond room on the 20th floor

Morning session chairs: Fraser Davidson

Continued posters set-up for science day

4. OP Symposium 2024

09:00 – 09:30 Organisational status, costs, room
(20 + 10) – PN Vinayachandran, Indian Institute of Science (remote), Marie Drevillon, MOI (onsite)

09:30 – 10:00 Science content, strategy and outreach
(20 + 10) - Eric Chassignet (onsite), Andreas Schiller (remote)

10:00 – 10:30 Discussion about OP symposium 2024

5. Task Teams – science activities and plans by task team co-chairs

10:30 – 11:00 Break

11:00 – 11:30 COSS-TT (20+10) – Alexander Kurapov, NOAA (onsite)

11:30 – 12:00 CP-TT (20+10) – Kristian Mogensen, ECMWF (onsite)

12:00 – 12:30 DA-TT (20+10) – Andy Moore, UCSC (onsite)

12:30 – 13:30 Lunch

Afternoon session chairs: Marie Drevillon

13:30 – 14:00 OS-Eval TT (20+10) – Yosuke Fujii, MRI-JMA/ Elisabeth Remy, MOI (onsite)

14:00 – 14:30 IV-TT (20+10) – Fabrice Hernandez, IRD (onsite)

14:30 – 15:00 MEAP-TT (20+10) – Liuqian Yu, Hong Kong University (remote)

15:00 – 15:30 Discussion or exchange option for TTs to discuss via breakout groups or with fellow TT members

15:30 – 16:00 Break

6. OPOS

16:00 – 16:20 OPOS progress / plans – providing overview of WG work and introducing new national reports
(15 + 5) - David Ford and Fraser Davidson

16:20 – 16:35 Highlight relevance of Ocean best practice
(10 + 5) - David Ford and Fraser Davidson

OPOS system presentations

16:35 – 16:50 CMCC/OSG, Italy – Emanuela Clementi, CMCC (remote)

16:50 – 17:05 NERSC, Norway - Laurent Bertino, NERSC (remote)

17:05 – 17:20 Operational systems South Africa – Jennifer Veitch, SAEON (remote)

17:20 – 17:30 Discussion

17:30 – 17:35 Daily recap

17:35 End of day 2

Day 3 – Wednesday 8 November

OPOS and OP systems

Continued posters set-up for science day

Diamond room on the 20th floor

Morning session chair: PN Vinayachandran

6 contd. OPOS / systems (talks tbc)

09:00 – 09:15	REMO – Luiz Claudio Fonseca or Clemente Tanajura, REMO, Brazil
09:15 – 09:30	CONCEPTS – Greg Smith or Fraser Davidson, ECCO, Canada
09:30 – 09:45	HYCOM – Pat Hogan (NOAA), USA
09:45 – 10:00	FOAM – David Ford, Met Office, UK
10:00 – 10:15	ECCO – Patrick Heimback, University of Texas at Austin, USA

10:15 – 10:30 Discussion

10:30 – 11:30 Break

11:00 – 11:15	ECMWF – Kristian Mogensen, ECMWF (onsite)
11:15 – 11:30	NMEFC – Guimei Liu, NMEFC (onsite)
11:30 – 11:45	INDOFOS – Francis Pavanathara, INCOIS (onsite)

11:45 – 12:00 Discussion

12:00 – 12:15	MOI – Marie Drevillon, MOI (onsite)
12:15 – 12:30	RTOFS – Dmitry Dukhovskoy, NOAA (remote)

12:30 – 13:30 Lunch

Afternoon session chair: Fraser Davidson

13:45 – 14:00	JMA system; MOVE/MRI.COM – Goro Yamanaka, MRI-JMA (remote)
14:00 – 14:15	BLUElink – Gary Brassington, BoM (remote)
14:15 – 15:00	Discussion

7. Discussion about Observing system interaction with OP

15:00 – 15:15	Argo (and ARGO BGC) – Peter Oke, CSIRO (remote)
15:15 – 15:30	GOOS – Joanna Post (IOC/GOOS) (remote)
15:30 – 15:45	Bio/Eco – Karen Evans (CSIRO), co-chair of the GOOS panel for BIO/ECO (remote)

15:45 – 16:00 Discussion / Q&A

16:00 – 16:30 Break

16:30 – 16:45	Satellites observations – Elisabeth Remy, MOi (onsite)
16:45 – 17:00	SWOT – Pierre-Yves Le Traon, MOi (onsite)

17:00 – 17:10 Daily recap

17:10 End of day 3

18:00 – 19:30 OPAS meeting (OPAS, PO and OP co-chairs only)

Day 4 – Thursday 9 November

Science session – Topic or header to be confirmed

Crystal room on the 2nd floor

Morning session chair: Do-Seong Byun

Science day presentations (12 min talk + 3 min Q&A)

Potential attendee: ocean and atmospheric scientists, observation specialists, industry representatives, service providers, governments, and users of ocean data & products

Session 1: Regional and global operational ocean forecasting systems in Korea			
			Session chair: Alex Kurapov
09:00-09:15	1.1	KHOA's activity on ocean forecasting activities and their applications	Do-Seong Byun (KHOA)
09:15-09:30	1.2	Development of a marine forecasting system for use in fisheries	Joon-Soo Lee (NIFS)
09:30-09:45	1.3	Introduction to Korean Operational Oceanographic System (KOOS)	Jae Il Kwon (KIOST)
09:45-10:00	1.4	Operational Wave Forecasting System in KMA and its Applications	Pilhun Chang (NIMS)
10:00-10:15	1.5	Introduction to KIOST Ocean Climate Seasonal Prediction Modeling and Outlook Service	Hyoun-Woo Kang (KIOST)
10:15-10:45		Group photo & Coffee break	

Session 2: User application of ocean forecasting systems			
			Session chair: Francis Pavanathara
10:45-11:00	2.1	Digital Twin for Ocean – Extension of Our Experiences and Experiments	Changwon Ahn (MEGAZONE CLOUD)
11:00-11:15	2.2	Applicability of AGRIF in the Regional Ocean Circulation Model	Hyeok Jin (Geosystem Research)
11:15-11:30	2.3	Application of numerical models in UST21: from coastal to open ocean	Joonho Lee (UST21)
11:30-11:45	2.4	Tracking the pumice rafts from the Fukutoku-Okanoba submarine volcano with Satellites and a Lagrangian Particles trajectory model	Young-Gyu Park (KIOST)
11:45-12:00	2.5	The achievement of KOOS in national agencies and industries	Nam-Hoon Kim (KIOST)
12:00-13:20		Lunch break	
13:20-14:30		Poster presentation	

Session 3: Science in support of ocean prediction			
Session chair: Ann Kristin Sperrevik			
14:30-14:45	3.1	Local stratification preconditions the marine heatwaves in the Yellow Sea	Dong Eun Lee (Chungnam National University)
14:45-15:00	3.2	Containerization of numerical ocean model for computational reproducibility and portability in the cloud computing	Kwangwoog Jung (Seoul Nat. University)
15:00-15:15	3.3	Evaluation of impact on regional observing system through Observing System Experiment in Northwest Pacific	YoungHo Kim (Pukyong National University)
15:15-15:30	3.4	Evaluation of ocean reanalysis data for the Yellow Sea and East Sea	Byoung-Ju Choi (Chonnam National University)
15:30-15:45		Coffee break	
15:45-16:00	3.5	Impact of satellite-based thickness data assimilation on bias reduction in Arctic sea ice concentration	Jeong-Gil Lee (Chonnam Nat. University)
16:00-16:15	3.6	Prediction of sea surface current around the Korean peninsula using artificial neural network	Jeong-Yeob Chae (Inha University)
16:15-16:30	3.7	Seasonal differences in tropical cyclone-induced sea surface cooling in the western North Pacific	Vineet Kumar Singh (Jeju National University)

Poster presentation

Session	Title	Name (affiliation)
1	Influence of warm surface water originating from the East China Sea on surface water temperature off the south coast of Korea in summer	Jong-Kyu Kim and Byoung-Ju Choi (Chonnam Nat. University)
2	An assessment of High-Resolution regional ocean reanalysis for Northwest Pacific K-ORA22	Inseong Chang (Pukyong National University)
3	Conducting and Performance Evaluation of a High-Resolution Regional Ocean Model in Yeosu-Gwangyang Bay using GFDL MOM6	Nayoung Park, Inseong Chang, Young Ho Kim (Pukyong Nat. University)
4	A numerical study on Natural and Anthropogenic effects on Primary Production in Gwangyang Bay, Korea	Seung-Hwa Chae ¹ , Yang-Ki Cho ¹ , Yong-jin Tak ² and Myeong-Taek Kwak ³ (¹ Seoul National University ² Gangneung-Wonju National University ³ Chonnam Nat. University)
5	Data assimilation and upstream open boundary bias correction in a regional model for the East Sea	Jae-Sung Choi and Byoung-Ju Choi (Chonnam National University), Kyungman Kwon (KIOST)
6	A multi-year climate prediction system based on CESM2	Yong-Yub Kim (PKNU) et al
7	Development of Four-Dimensional Variational Global Ocean Data Assimilation System for Coupled Predictions in Japan Meteorological Agency and Evaluation of the effects of Argo Data Quality Control in the System	Yosuke Fujii (JMA-MRI)

17:00 End of day 4

From 18:00/18:30 OPST- 8 Science Day dinner (invite by host)

Day 5 – Friday 10 November

Communications, future plans and meeting conclusion

Crystal room on the 2nd floor

Morning session chair: Marie Drevillon

09:00 – 09:30	OPAS group – feedback from the OPAS meeting this week (20+10) – Pierre-Yves Le Traon, MOi (onsite)
09:30 – 09:40	Introduction of new OP coordinator (10 min) – Stephanie Cuvén, MOi (onsite)
09:40 – 10:00	Programme office activities (15+5 min) – Kirsten Wilmer-Becker, Met Office (onsite)
10:00 – 10:30	Discussion: Internal & external communication and OP visibility
10:30 – 11:00	Break
11:30 – 11:45	Review of OPST-8 meeting actions (if available) (15 min) – Kirsten Wilmer-Becker, Met Office (onsite)
11:45 – 12:30	OP Future Plan – brief future vision statement by co-chairs, strategy review, executive committee introduction, OPST-OPOS interactions, .. (20 + 25) – Fraser Davidson, ECCC (onsite)
12:30 – 13:00	Discussion about this meeting and lessons learnt
13:00	Meeting closes
From 13:00	Lunch
From 13:30	Bus trip – self pay
To ca 18:00	Drop of at hotel

Appendix B: Meeting actions

Summary of general activities in the programme office including actions from last meeting which are ongoing.

OPST-8 actions

- Action 1:** **OPPO together with the OP-DCC** to work on a website forum for interaction of TTs. OP-DCC is developing a forum on their new website already which could be used for this purpose.
- Action 2:** **OP communications committee** to discuss and contribute to setting up the Terms of Reference for the ForeSea communication effort. The OPPO should support ForeSea communication, including engaging with OP prediction systems to leverage ForeSea news.
- Action 3:** **OP groups** must continue to support ForeSea in moving forward.
- Action 4:** **All OPST members** to propose names and email contacts to the OPPO to advertise the OP '24 symposium.
- Action 5:** **All OPST and OPAS members** to provide proposals for funding or direct funding for the OP '24 symposium.
- Action 6:** **All OPST and OPAS members** to contribute to the setting up of the OP'24 symposium themes & keywords by adding comments and content to a themes document which has been circulated (on google docs) by end of week (10 Nov 2023)
- Action 7:** **DA-TT co-chairs** to explore the options for setting up DA training at university level and find ways to run lectures (also check possibilities for accreditation of courses)
- Action 8:** **OPST co-chairs, IV-TT co-chairs and OP-DCC** to discuss and propose solutions for organising the class-4 intercomparison effort on an operational basis
- Action 9:** **OPPO with the help of OPOS-WG** to prepare and circulate a questionnaire on the Argo use to OPST and the wider community.
- Action 10:** **OPPO** with the help of OPOS-WG (or all OPST) to provide feedback on a question about storage of daily forecasting data (length and method of storage)
- **In addition, set up a list of questions for feedback to OPPO on**
 - what data services are being uses
 - what best practices are in place
 - how best to store data
 - what plans for digital twins are pursued
 - how systems deal with ensembles, etc.
- Action 11:** **OPOS-WG** to invite NZ system reps as new members
- Action 12:** **OPPO with the help of OPOS-WG** to prepare and circulate a questionnaire on the Argo use to OPST and the wider community.
- Action 13:** **All OPST members (with the help of the TTs and OPST co-chairs and OPAS members)** to develop a mechanism to stronger engage with the observation communities on providing feedback on the utility and impact of observations e.g. SWOT, OneArgo, etc. .

- Action 14:** OPPO to update the OP website to lift information on seminars and TT meetings to a higher level to make them more prominent
- Action 15:** OPPO to organise a first meeting (and prepare for subsequent meetings) of the OPEC group (OP Executive Committee = OPST and TT co-chairs + OPOS-WG co-chairs + OPPO), including engagement with OPEC members to develop first OPEC meeting agenda
- Action 16:** OPPO to add the names and email addresses of all OPST and OPAS members to the OP website
- Action 17:** OPPO to organise a better solution for the IV-TT mailing list (issues with send emails by co-chairs)
- Action 18:** OPPO to update TT memberships due to several requests from TT co-chairs and potential new joining TT members

Ongoing actions from OPST-6:

- Action:** OPOS-WG co-chairs to decide whether to include the observation community as members of the OPOS-WG.
- Action:** OPST chairs & TT co-chairs to set up working group to explore solutions for a common nature run, considering working with DITTO, and /or exploring what is used in the wider community. Kristian to share ECMWF project details on nature run use.
- Action:** OP communication committee to revise current PO communication plan (publish articles in popular science, info graphics, videos, etc. and OPST community to suggest ideas, and options for resources and funding communication plans.
- Action:** ForeSea and SynObs chairs to develop a plan for ForeSea and SynObs funding by learning from and/or work with other groups (e.g. Ocean Observing Co-Design)
- Action:** OPST and ForeSea chairs to set up an OP'24 organising committee by end of summer
- Action:** IV-TT co-chairs and OPOS-WG co-chairs to set up an across OP working group to explore solutions for class-4 server continuation working with OPOS-WG, ETOOFS and DCC

Appendix C: Attendance

Combined attendance for OPST-8 science team meeting and the Day 4 Science Day

No	First name	Surname	Affiliation	Representation
1	Chang-Won	Ahn	MEGAZONECLOUD	Science Day presenter
2	Santha	Akella	NASA	CP-TT
3	Enrique	Alvarez Fanjul	Mercator Ocean International	OP expert
4	Eric	Bayler	NOAA/NESDIS Center for Satellite Applications and Research (STAR)	OPAS
5	Laurent	Bertino	NERSC	OPOS
6	Gary	Brassington	BoM	OPOS
7	Do-Seong	Byun	Korea Hydrographic and Oceanographic Agency	OPOS and science day presenter
8	Jeong-Yeob	Chae	Department of Ocean Sciences, Inha University, Republic of Korea	Science Day presenter
9	Pilhun	Chang	Forecast Research Department, National Institute of Meteorological Sciences, Korea	Science Day presenter
10	Eric	Chassignet	Florida State University	OP expert
11	Jungwoon	Choi	KIOST	Guest
12	Heung-Bae	Choi	GeoSystem Research Corporation	Guest
13	Byoung-Ju	Choi	Chonnam National University	Local organiser and Science Day presenter
14	Jeyun	Chun	KIOST	Guest
15	Stefano	Ciavatta	MOi	MEAP-TT
16	Emanuela	Clementi	CMCC	Guest
17	Stephanie	Cuven	MOi	OP coordinator
18	Fraser	Davidson	ECCC	OPST co-chair
19	Pierre	De Mey-Frémaux	CNRS/LEGOS	COSS-TT
20	Marie	Drevillon	MOi	OPST co-chair
21	Yann	Drillet	MOi	OPOS
22	Dmitry	Dukhovskoy	NOAA	OPOS
23	Mikhail	Entel	Australian Bureau of Meteorology	OPAS
24	Karen	Evans	CSIRO	Invited speaker
25	Luiz Claudio	Fonseca	Brazilian Navy	OPOS
26	David	Ford	Met Office	OPOS
27	Yosuke	Fujii	JMA/MRI	OSEval-TT
28	Bon-Ho	Gu	KIOST	Guest
29	Kiyong	Heo	KIOST	Guest
30	Fabrice	Hernandez	IRD/LEGOS	IV-TT

31	Emma	Heslop	IOC/UNESCO	Invited speaker
32	Pat	Hogan	NOAA	OPOS
33	Sang-Hun	Jeong	KIOST	Guest
34	Hyeok	Jin	GeoSystem Research Corporation	Science Day presenter
35	Kwangwoog	Jung	Seoul National University	Science Day presenter
36	Hyoun-Woo	Kang	KIOST	Science Day presenter
37	Nam-Hoon	Kim	KIOST	Science Day presenter
38	YoungHo	Kim	Pukyong National University	Science Day presenter
39	Deoksu	Kim	KIOST	Guest
40	Hojin	Kim	KIOST	Guest
41	Yong-Yub	Kim	IBS Center for Climate Physics	Guest
42	Sang-Yeob	Kim	KIOST	Guest
43	Villy	Kourafalou	Univ. of Miami	COSS-TT
44	Alexander	Kurapov	NOAA	COSS-TT
45	Jae-II	Kwon	KIOST	Local organiser and Science Day presenter
46	Yeong-Yeon	Kwon	KIOST	Guest
47	Pierre Yves	Le Traon	MOi	OPAS
48	Dong Eun	Lee	Chungnam National University	Science Day presenter
49	Jae-Ho	Lee	KIOST	Guest
50	Jeong-Gil	Lee	KIOST	Science Day presenter
51	Joonho	Lee	UST21	Science Day presenter
52	Joon-Soo	Lee	National Institute of Fisheries Science	Science day presenter
53	Guimei	Liu	NMEFC	OPOS
54	Matthew	Martin	Met Office	DA-TT
55	Simona	Masina	CMCC	Expert
56	Kristian	Mogensen	ECMWF	CP-TT
57	Andrew	Moore	University of California Santa Cruz	DA-TT
58	Peter	Oke	CSIRO	Invited speaker
59	Young-Min	Park	GeoSystem Research Corporation	Guest
60	Sung-Hwan	Park	KIOST	Guest
61	Young-Gyu	Park	KIOST	Science Day presenter
62	Francis	Pavanathara	INCOIS	OPAS
63	Nadia	Pinardi	UniBo	Invited speaker
64	Joanna	Post	IOC/UNESCO	Invited speaker
65	Elisabeth	Remy	MOi	OSEval-TT
66	Hal	Ritchie	ECCC	OP expert
67	Andreas	Schiller	Unaffiliated	OP expert
68	Vineet Kumar	Singh	Typhoon research Center, Jeju National University	Science Day presenter

69	Gregory	Smith	ECCC	IV-TT
70	Jun-Hyeok	Son	IBS center for climate physics in Pusan National University, Korea	Guest
71	Ann Kristin	Sperrevik	The Norwegian Meteorological Institute	DA-TT
72	Clemente	Tanajura	UFBA & REMO	OPOS
73	Jennifer	Veitch	SAEON	OPOS
74	PN	Vinayachandran	Indian Institute of Science	OPST co-chair
75	Martin	Visbeck	GEOMAR	Invited speaker
76	Liyang	Wan	National Marine Environmental Forecasting Center	Guest
77	Zhaoyi	Wang	National Marine Environmental Forecast Center	Guest
78	Kirsten	Wilmer-Becker	Met Office	OP coordinator
79	Goro	Yamanaka	Meteorological Research Institute	OPOS
80	Liuqian	Yu	Hong Kong University	MEAP-TT