



**6th Annual meeting of the
OceanPredict Science Team (OPST)**

**2022, June
Semi-annual
OPST-6 Report**

15-17 June 2022

MS Teams meeting

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1. Overview and meeting objectives

Presented by PN Vinayachandran

- (1) **UN Decade engagements** → Review of activities in Decade and where OceanPredict contributes or can contribute.
 - a. Understand purpose and intersects of the various activities in ObsCode, Coast Predict, DCC and ForeSea
 - b. Review OP objectives in Decade for ForeSea and current projects
 - c. Common OP vision on ForeSea and Decade
 - i. Immediate goal: Better awareness of OP activities and systems
 - ii. Ultimate goals: Strong operational oceanography international ecosystem with continuous advancing science
 - d. ForeSea project creation approach

- (2) **New OP Operational Systems Working Group (OPOS-WG):**
 - a. OPOS-WG and Task Team relationships (including ToR)
 - b. OPOS-WG and Decade activities
 - c. OPOS-WG and system reporting

- (3) Learn about and support **Task Team activities and plans**
 - a. Relationship to Decade
 - b. Relationship, exchanges with other TT's and Working groups

2. World Ocean Initiative – Invited talk

Presented by Tatiana Der Avedissian (from the Economist)

Following the World Ocean Summit in 2012, The Economist Group, set up the World Ocean Initiative which concentrates on three cross-cutting levers of change — blue finance, governance and innovation — learning more about the opportunities for blue economy in a sustainable ocean. The World Ocean Initiative is bringing together global ocean stakeholders to grow and nurture a vibrant community across many areas.

The Economist Group combines the power of evidence-based insights and analysis, creative innovation and storytelling, and unmatched global influence by turning ideas into action and deliver unmatched business value and world-changing impact.

Of specific interest is the value of ocean observation data for the blue economy. Economist Impact's World Ocean Initiative proposes a unique and vital research programme that will assess the value of ocean observation data streams to the Blue Economy, and explore how governments, NGOs and industry can more effectively unleash the potential of ocean observation data through greater data accessibility and usability, talent development and public-private sector cooperation.

It was agreed that it will be of interest for Tatiana Der Avedissian to return for a longer seminar to be held in the autumn of 2022.

OPST-6 Action 1: KWB and FD to work with Tatiana to organise a seminar on the World Ocean Initiative by autumn 2022 (lead: Fraser and Kirsten)

More details about the [World Ocean Initiative presentation](#) is available from the OP website.

3. UN Decade engagements

OceanPredict is now engaged with various aspects of the UN Decade, as initiator for UN Decade programme ForeSea and project SynObs, as contributor to the UN Decade Collaborative Centre and as partner for various UN Decade programmes. The presentations under this chapter reflect the current level of activities and plans of the Decade initiatives in collaboration with OceanPredict.

3.1 OceanPrediction DCC

Presented by Enrique Alvarez

The OceanPrediction Decade Collaborative Centre will provide a means of internal and external collaboration of the UN Decade programmes, projects and activities endorsed by the UN Decade. It will give the ocean prediction community a voice to support the Decade implementation and is centered on

- creating a global forum (coastal to deep sea, nowcast to climate, Bio to physics, public to private, users to scientists) and other tools,
- developing the ocean prediction capacity and ocean literacy, and to
- promoting the OOFs as a key tool for Blue Economy and ocean policy.

This effort will be underpinned by tools, standards and best-practices for a science-to-service framework, providing a platform for interoperability and integration towards the creation of a digital twins.

The DCC is now in the process of being set up and has reached out to the many Decade partners to develop the best possible plans for its initiation and continued operation. At the June 2022 UN Lisbon Conference the DCC will be officially launched.

In summary, the DCC will be

- Building an active community of users, scientists and policy makers (additional focus on developing countries)
- Taking advantage of the decade framework and arrival of DTO concept to promote delivering as one worldwide
- Developing and promoting substantial benefits:
 - A connected community
 - New and better OOFs
 - A technically linked worldwide ocean forecasting framework

It will be a significant challenge which can only be achieved via collaboration with Decade programmes and other relevant actors.

Further discussions related to building an atlas for ocean prediction in collaboration with OceanPredict.

OPST-6 Action 2: OPST co-chairs and PO to work with DCC to learn how it will work, engaging all partners in setting up a partnership interaction map, including relations with external groups like e.g. GEO Blue Planet (DCC) and support the development of an online map of systems (as a contribution to the DCC atlas) ([lead: OPST co-chairs, PO](#))

More details about the DCC plans can be found in the [“OceanPrediction DCC”](#) presentation.

3.2 Ocean Observing System Co-Design (ObsCoDe)

Presented by David Legler

The new UN Decade programme has been set up to realize the benefits of Ocean Knowledge through Ocean Observing System Co-Design. The aim is to transform the way the ocean observing system is implemented building stronger links with ocean users and stakeholders. This will allow to provide actionable information addressing needs for safety, sustainability, and economic prosperity.

To achieve this aim Ocean observing Co-Design will transform the observing system assessment and design process by

- Developing a more user-focused co-design process
- Involve existing efforts and new technologies as well as modelling forecasting and service communities
- Build the backbone (process, infrastructure and tools) to inform return on investment and societal benefit

The programme will set up focused projects or Exemplars which will be targeting specific societal needs or impacts, to develop and demonstrate the co-design process. The first set of Exemplars include Tropical Cyclones, Marine Heatwaves, Boundary Currents, Carbon, Storm Surge and Marine Life 2030.

An Ocean Observing System Co-Design Workshop was organised in June 2022 to advance the planning for the initial priority exemplars. To find out more about the workshop please visit: [Global Ocean Observing System - Ocean Decade Co-Design Workshop \(goosocean.org\)](https://goosocean.org).

Next steps will include:

- Continued engagement with current exemplars in preparing ocean observing co-design “proposals”
- Help conceptualizing and/or coordinating proposed design studies (e.g. OSSEs, OSEs) for exemplars
- Ideas/priorities for additional exemplars, particularly those that move us towards an integrated ocean observing system.

The presentation on the “[ObsCoDe](#)” by David Legler can be viewed on the OceanPredict website.

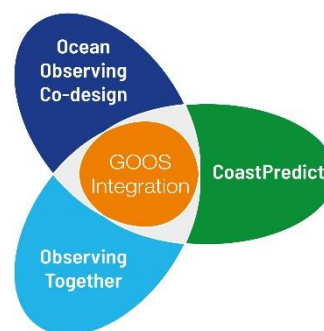
3.3 CoastPredict

Presented by Villy Kourafalou

CoastPredict is a partner programme of Ocean Observing Co-Design and Observing Together, all sitting under the auspices of GOOS.

The CoastPredict objectives are

1. A **predicted** global coastal ocean
2. The upgrade to a **fit-for-purpose** oceanographic information **infrastructure**



3. Co-design and implementation of an **integrated coastal ocean observing and forecasting system** adhering to **best practices and standards**, designed as a global framework and implemented locally

The CoastPredict programme is structured around six focus areas which will lead the science. The focus areas will have core & affiliated projects, of which have already been endorsed by the UN Decade (examples include core projects: “PredictionOnTime” and “FLAME” and affiliated projects: “Integrating Coastal Hazards Early Warning Systems in the Tropical Americas and Caribbean”). Each focus area is advised by expert members and at least one ECOP representative together with the Core Project leaders (~10-15 people).

The Decade Collaborative Centre for Coastal Resilience in a Changing Climate is closely affiliated with CoastPredict. The Coastal Resilience DCC is hosted at the University of Bologna and will work closely with the UN Decade DCU.

More details can be found in the “[CoastPredict presentation](#)” available on the OceanPredict website.

3.4 ForeSea

Presented by Eric Chassignet

ForeSea is the UN Decade endorsed programme for the development of the “Ocean prediction capacity of the future” with the vision for a “Strong international coordination and community building of the ocean prediction”.

The latest updates include

1. Creation of an advisory committee: Next meeting will take place later this summer to go over the recommendations of the OceanPredict task teams on how best to promote and act on ForeSea’s objectives.
2. On-going discussion on establishing a ForeSea project office (ideally two persons – Eurasia/Africa and America/Pacific)
3. Working toward the goal of establishing a portal (collaboration with OP DCC) that would a) summarize the international status and availability of ocean assimilation and prediction (blue and green - global, regional, and coastal) with regular updates of capacity, i.e. communications – conversation with the new OP operational systems working group b) provide a description of available resources (observations and models) and how to access them c) have tutorials on basic setups of models and data assimilation as well as their limitations d) linkages and collaborations with other Decade programmes (linkages with CoastPredict, ObsCoDe, DITTO, MarineLife2020, etc.) e) be in place by the OceanPredict/ForeSea ’24 conference

ForeSea is hosting two UN Decade endorsed projects:

1. Synergistic Observing Network for Ocean Prediction (SynObs) by MRI Japan - SynObs is being proposed as a common comprehensive Decade Project to the three Decade Programmes, ForeSea, CoastPredict, and Observing System Co-Design. SynObs will seek to extract maximum benefit from combining various observation platform measurements, typically satellite and in situ observation data, or combinations of coastal and open ocean platforms for ocean/coastal predictions.
2. Integrating Coastal Hazard Warning Systems for the Tropical Americas and Caribbean (TAC) by UNESCO IOC IOCARIBE - Co-Design, CoProduction and Co-Delivery of Integrated Multiple

Coastal Hazard Early Warning System and Services for the Tropical Americas and Caribbean. The project will prioritize the integration of existing and new coastal hazards early warning systems and services considering four components: Monitoring and Warning, Risk Knowledge, Warning Dissemination and Communication, and Response Capabilities, supported by capacity development.

More details about "[ForeSea](#)" can be viewed on the OceanPredict website.

3.5 SynObs

Presented by Yosuke Fujii

The Synergistic Observing Network for Ocean Prediction project or SynObs was officially endorsed by the UN Decade in June 2022.

The objective of SynObs is to seek the way to extract maximum benefits from the optimal combination of various observation platforms, typically between satellite and in situ observation data, or between coastal and open ocean platforms, in ocean and coastal predictions. SynObs target areas include the open-ocean regions, such as the global ocean, tropical ocean, mid-latitude, and polar areas, and coastal and biogeochemical observing systems.

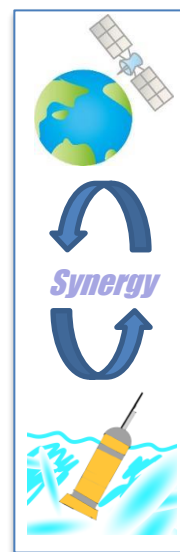
While endorsed under ForeSea, the SynObs project is a common comprehensive project for three UN Decade programmes, ForeSea, CoastPredict, and Ocean Observing System Co-Design, to collaborate for designing and constructing the observing systems which are effective for ocean and coastal predictions. OceanPredict task teams will also be involved to generate transformative collaboration between the three UN Decade Programmes.

The official SynObs kick-off is planned during the [OS-Eval TT/CP-TT workshop](#) in Tsukuba, near Tokyo from 15-18 Nov 2022. The workshop will see presentations on the OS-Eval showcase, DA development, and earth system predictions, and discussion on the SynObs activity plan.

SynObs current activities are [covering four areas](#):

1. Collaboration for evaluation and design
2. Supports for DA scheme development
3. Providing information from ocean prediction systems in real time
4. OS-Eval showcase and reporting

Please check details about [OS-Eval showcase](#), plan of [OSE/OSSE for SynObs](#), rough [Plan of Collaborative OSE in SynObs](#), and [Preparation of the Nature Runs](#) (Collaboration with DITTO).



For more information please check the "[SynObs](#)" presentation on the OceanPredict website.

4. Operational Systems Working Group

Presented by David Ford

The new Operational Systems Working Group was set up in early 2022 and is now in the process of defining its terms of reference and system report formats. It will be contributing to the UN Decade Ocean Best Practices workshop in Oct 2022 to develop plans for best practice system reports. It is open to propose a UN Decade project dedicated to Ocean Best Practices, works closely with other UN Decade programmes and OP Task Teams.

The purpose of the new WG will be to collaborate with members to define common challenges in operational oceanography and drive solutions. Its vision is to improve ocean forecasts for those who need them, and the mission will be to advance ocean prediction systems by sharing expertise, engaging external partners, and better understanding user needs.

The discussion on the OPOS-WG continued after the presentation. It was suggested to:

- Consider discussing how best to define/describe what constitutes an operational system. The DCC readiness level could be taken into account as a possible process for this.
- Include representatives from observing system groups (e.g. Argo or satellite groups) in the OPOS-WG to make sure communication about erroneous measurements is communicated directly with the operational systems and vice versa, feed back impact of observations to observing systems.

OPST-6 Action 3: OPOS-WG co-chairs to discuss and decide with OPOS-WG on whether to include the observation community as members of the OPOS-WG. ([lead: OPOS-WG co-chairs](#))

It was also highlighted that it will be important to provide more space for the full representation of the OP operational systems in face-to-face meetings as in previous years. It was suggested to consider also setting up seminars to present the system with more time provided.

The [OP Operational Systems Working Group presentation](#) can be viewed on the OceanPredict website.

4.1 Systems presentations

Brief description of the latest operational system updates.

Australia – BLUELink	PN Vinayachandran (for Gary Brassington)	(BoM)	OPST member
Brazil – REMO	Clemente Tanajura	UFBA/REMO	OPST member
Canada – CONCEPTS	Gregory Smith	ECCC	OPST member
China – NMEFC	Dakui Wang (for Guimei Liu)	NMEFC	OPST member

<u>France – MOI</u>	Yann Drillet	MOI	OPST member
<u>India – INDOFOS</u>	Arya Paul	INCOIS	OPST member
<u>Italy – CMCC and OGS</u>	Giovanni Coppini	CMCC	OPST member
<u>Japan – MRI/JMA</u>	Goro Yamanaka	MRI-JMA	OPST member
Norway – TOPAZ	Laurent Bertino	NERSC	OPST member
Republic of Korea – KOOFS and KOOS	PN Vinayachandran (for Do-Seong Byun)	KHOA	OPST member
<u>South Africa - SAEON</u>	Jennifer Veitch	SAEON	Invited speaker
<u>UK/Europe – ECMWF</u>	Kristian Mogensen	ECMWF	OPST member
<u>UK – FOAM</u>	David Ford	Met Office	OPST member
USA – NOAA/NCEP	Eric Bayler (for Avichal Mehra)	NOAA	OPAS member

5. OceanPredict Task Teams – latest progress and UN Decade involvement

OP tasks teams presented on the status and plans of current activities, plans for contributions to UN Decade programmes and what support and help they might need from OceanPredict and/or ForeSea.

For OceanPredict it will be helpful to consider improving its outreach and promotion of itself and its task team better, so it can become a useful resource for the community. It might help to unify the effort of e.g. webinars and to involve UN Decade programmes and other partners.

5.1 OS-Eval TT

Presented by Elisabeth Remy

The OS-Eval TT continues its regular team meetings which can be explored at <https://oceanpredict.org/science/task-team-activities/observing-system-evaluation/#section-meetings>. A major activity for the TT is the discussion about the SynObs project which has been recently endorsed by the UN Decade (*please see further details in chapter 3.5*). A specific topic that was highlighted by Peter Oke (Argo steering team) was the agreement for common OSEs to assess the [impact of the Argo sensor salinity drift on ocean analysis/reanalysis](#). Furthermore, the TT is now regularly updating information about the [use of observations in OP operational systems](#), which is updated every 4 months. Other activities described in the OS-Eval TT presentation related [to goals and expected outcomes for the TT activities, TT outreach plans](#), planned TT events (specifically the [OS-Eval TT/CP-TT workshop and SynObs Kick-Off](#) and general challenges for the TT, including discussion on a suitable nature run.

The TT will need help with seeking financial support for SynObs and OS-Eval TT goals. It will also be useful for the TT to establish a secure framework with the help of the OceanPredict community that can provide feedback and other information to observational agencies, including requirements for observations.

It was suggested to put together a working group including OceanPredict partners (DCC and DITTO) to discuss how to move the nature run question forward. It was stated that there is unlikely be one nature run for all. It needs to be explored in detail, also taking into account regional requirements, and nature runs which already exist. There is clear demand from space agencies to run OSSEs.

OPST-6 Action 4: OPST chairs & TT co-chairs to put together a working group to discuss and explore solutions for a common nature run, also considering working with DITTO, and /or exploring what is used in the wider community. (*lead: OPST chairs & TT chairs*) – see also action 5.

5.2 IV-TT

Presented by Fabrice Hernandez

The IV-TT is focusing on developing tools and validation metrics to verify and intercompare OP systems to ensure their usefulness for users, which includes development of new metrics in an innovative way, devoted first to research activities. For the class-4 intercomparison there are now critical issues with datasets on the US GODAE server as it is no longer secured and new solutions

should be explored. A new drift intercomparison is being done (initiated by MOI and supported by Australia). Fabrice highlighted the need to publish more work on intercomparison to bring it back to the community. Events are planned now to be done virtually where an in-person meeting is not possible. Exchange with the Joint Working Group for Verification Research (atmospheric community) is being further explored. The TT is seeking new members to support the class-4 intercomparison further.

With regard to collaboration with the UN Decade activities, some possible contributions were identified. See [slide](#) for more information.

Fabrice highlighted that the TT work needs better technical support (data servers) and that Class-4 activities need to adjust to an evolving observation network. He is happy to see the plans for the Decade Collaborative Centre (OP-DCC) which will provide the opportunity to support the operationalisation of Class 4 activities. He also welcomes the forming of the OPOS working group and is suggesting close collaboration with the IV-TT as it provides a direct link to the OP operational systems. In this context ForeSea should play a connecting role.

- US GODAE data server issue is an ongoing problem
- Right time now to elevate the intercomparison and validation activities further and make it a Decade issue to solidify it long-term resolve (could be a new project under DCC, ETOOFS or ForeSea)
- ForeSea can indeed support this plan but would like to explore the possibility of keeping it at NOAA as it has funding there

Also see US GODAE server discussion in 11. OP housekeeping

5.3 MEAP-TT

Presented by Marjy Friedrichs

Marjy Friedrichs is the new MEAP-TT co-chair taking over from Katja Fennel. She introduced herself as a coastal biogeochemical modeller, working at the Virginia Institute of Marine Science, where they have developed a forecasting system particularly focusing on hypoxia, acidification and HAB in the Chesapeake Bay.

She presented the MEAP-TT missions and highlighted the latest TT activities, including the H2020 SEAMLESS project and support for the ETOOFS guide on operational oceanography and forecasting systems. The TT has agreed to run more frequent virtual meetings and has updated its membership with Marjy as new co-chair and three new members from Canada, Greece and South Africa. The next in-person meeting of the MEAP-TT is planned in summer 2023 in Spain.

It was emphasised that the MEAP-TT has strong interest to work closely with the UN Decade, providing the link between the BGC/biological components (among others) and UN Decade programmes/projects ForeSea/SynObs, CoastPredict, Marine Life 2030, DITTO, GOOS Co-design and others. Details of what contributions have been considered are described in the [MEAP-TT presentation](#).

Generally, the MEAP-TT would like to have more exchange with TT co-chairs and the OPST on possible funding opportunities for activities and better solutions for effective and sustained

communication of MEAP-TT outputs (e.g. interactive maps to disseminate info on BGC modelling and observing systems, platforms to link to datasets etc).

5.4 COSS-TT

Presented by Pierre De Mey-Frémaux

Pierre provided an overview of the COSS-TT activities since the last OPST meeting. These included running an online TT meeting in April 2022 and providing contributions to the ETOOFS guide, including a list of (pre-)operational coastal forecasting systems. The TT is also discussing their ToR and are running a survey to collect input from COSS-TT members. The TT is also interested to launch science webinar series on COSS-TT related topics. The COSS-TT also agreed to invite a new COSS-TT co-chair, Alexander Kurapov from NOAA to support Villy and Pierre.

Pierre then summarised their [activities in support of the UN Decade and its programmes](#), including CoastPredict (see 3.3), ForeSea involvement, support for SynObs and PredictOnTime, and ObsCoDe.

As other TT, the COSS-TT is also interested to exchange more with the OPST co-chair and the other TT co-chairs on the vision and plans for future activities and overarching objectives of OP, including plans for coordination of finding resources for OP and UN Decade projects. There was also a push to encourage better collaboration of ForeSea and OP with all TTs to explore their role and opportunities within the UN Decade landscape. This should include to exactly define the different bodies within the decade and to publicise their aims and objectives.

OPST-6 Action 5: OP, ForeSea and CoastPredict chairs to work together to develop description of the OP, ForeSea and CoastPredict roles (e.g. to allow better definition of associated project like PredictOnTime) to better define OP and UN Decade programmes for wider understanding, including group strategies ([lead: OP, CoastPredict and ForeSea chairs](#))

5.5 DA-TT

Presented by Matt Martin

Matt provided an overview of the latest DA-TT activities, which included the continuation of the [DA-TT technical seminar series](#), planning activity on coupled initialisation organised by WMO/CLIVAR groups: WGNE, DAOS and OMDP, push for coupled DA development, EGU session, participation in the Mercator Ocean International DA expert team and contributing to the EuroSea/OceanPredict workshop. An in-person DA-TT workshop is planned for spring 2023, when it is anticipated to renew the TT leadership.

The TT provided a suggestions of how to OP can engage with the UN Decade through projects, including advances in coupled DA (with CP-TT), more wide-spread adoption of community DA infrastructure such as JEDI, routine assessment of observation impacts and improved observing system design (within SynObs, OSEVal-TT and IV-TT), advances in DA methodologies and use of new data such as SWOT, advances in coastal DA and linkages between global and coastal systems (with COSS-TT), exploration of ML in DA and other aspects of model analysis and aligning the DA-TT and OP with WWRP implementation plan.

It was suggested that the DA-TT could take a wider view of developing platforms for ocean DA, and to provide recommendations of how to move forward. Sea-ice DA is already considered, as is using machine learning.

5.6 CP-TT

Presented by Santha Akella

In the past 6 months the CP-TT has renewed its plans and leadership. It would like to get organised by focusing on a few projects of common interest, for example tropical cyclones. The TT is also planning to get more engagement from the community by starting a quarterly lecture series. The CP-TT will support the joint workshop with the OS-Eval TT in Nov 2022, which will also see the SynObs kick-off. Membership is currently under review.

ECMWF is planning a project that could contribute to delivering a nature run that could contribute to SynObs. Kristian will keep the OPST informed about progress.

OPST-6 Action 6: Kristian to share ECMWF project details which could deliver a nature run to OPST chairs and TT co-chairs, including Eric C. ([Kristian Mogensen](#))

5.7 Upcoming TT meetings

Task Team	Meeting type	Dates	Location
CP-TT	In-person/virtual meeting	15-18 Nov 2022	Tsukuba, Japan
OS-Eval TT	In-person/virtual meeting	15-18 Nov 2022	Tsukuba, Japan
COSS-TT	In-person/virtual meeting	2-4 May 2023	Montreal, Canada
DA-TT	In-person/virtual meeting	9-11 May 2023	Rome, Italy
MEAP-TT	In-person/virtual meeting	Summer 2023	Spain
IV-TT	TBC	TBC	TBC

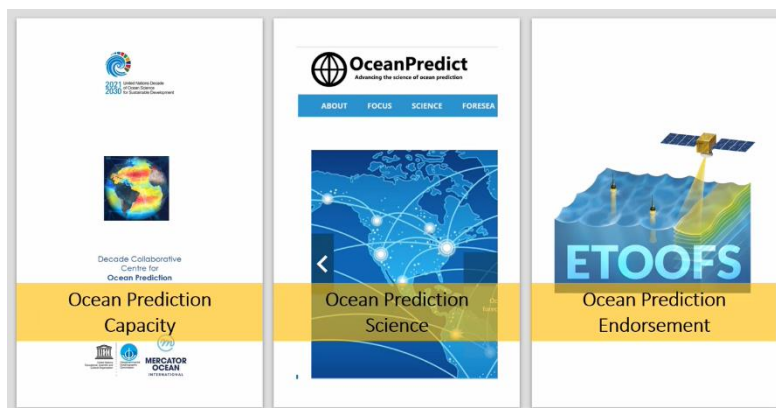
All **presentation corresponding to the TT contribution** to OP and the results from the survey can be viewed/downloaded from the OP website:

1. [COSS-TT presentation](#) by Pierre De Mey-Frémaux and Villy Kourafalou
2. [IV-TT presentation](#) by Fabrice Hernandez and Greg Smith
3. [MEAP-TT presentation](#) by Stefano Ciavatta and Marjy Friedrichs
4. [DA-TT presentation](#) by Matt Martin and Andy Moore
5. [OS-Eval TT presentation](#) by Yosuke Fujii and Elisabeth Remy
6. [CP-TT presentation](#) by Santha Akella, Kristian Mogensen and Chris Harris

6. ETOOFS update

Presented by Pierre Bahurel

Pierre provided an overview of the ETOOFS missions and current activities. The Expert Team of Operational Ocean Forecasting Systems (ETOOFS) now sits under GOOS, hosted by IOC, and is an important partner of OceanPredict. For this year, ETOOFS will promote ocean forecasting in the IOC community and foster capacity building (through [ETOOFS workshops](#)), focus on the release of the Guide to Operational Forecasting Systems, as well as liaise stronger with OceanPredict and integrate ETOOFS in the UN Decade. He introduced the plan of working close together, including collaboration with the OP-DCC (see 3.1). He envisages ETOOFS to work on ocean prediction endorsement, recognising and accrediting ocean prediction processes and systems. Overall, the objective is to leverage the ETOOFS activity through community-wide efforts by taking advantage of the *existing* OceanPredict community and the *emerging* UN Decade ocean prediction community.



It is hoped that the OP-DCC will take over the coordination of all the activities planned within the OP, ETOOFS and DCC collaboration.

7. Argo discussion

Discussion raised by Peter Oke

In view of the [7th Argo Science Workshop](#) being organised in Brussels from 11-13 Octo 2022, it was highlighted that contributions from OceanPredict would be highly valued. OP members were invited to submit an abstract to the workshop. In addition, Peter Oke stated that Argo is changing in that it now includes BGC and deep ocean measurements on a regular basis making Argo more costly and therefore requiring stronger advocacy. He also suggested inviting OP to contribute to Argo observation experiments to improve the array design. Demonstrating the impact of Argo on ocean monitoring and prediction is very important.

Argo Steering Teams sessions would most likely be open to OP members.

8. OP communication and online presence

Presented by PN Vinayachandran

The OP strategy and the ForeSea programme have identified interaction and collaboration with an increasing number of new partners requiring increased communication, which will also require increased resources. The OP communication plan draft was introduced, highlighting ideas for specific targeted communication like an OP brochure, collection of material for all OP members to use at

conferences to promote OP and possibly animations or videos for online use to increase OP visibility. In addition, OP will have to better show its linkages with the UN Decades and where it fits in with other partner groups. This is in discussion but has not yet reached the stage of putting it into action. As one of the first steps for OP to embed itself and its programmes (ForeSea) and project (SynObs) into the UN Decade landscape is to develop an effective relationship with the DCC.

Other suggestions for improving communication were to develop a repository for OP resources, educational toolkits, fora (e.g. for early career scientists), and better interaction with OP communities (TTs).

OPST-6 Action 7: OP communication committee to revise current PO communication plan to include ideas for better OP communication, e.g. publication of articles in popular science, infographics, video, etc. (expensive, but high impact with general public and high-level engagement) (lead: OP comms team, PO, tbc)

In the past 6 months the communication effort included the publication of two newsletters in Dec 2021 and May 2022, online implementation of a publications list. Regular updates of use of observations at operational centres and communication of upcoming events.

In the subsequent discussions various communication aspects were highlighted:

- Info graphics or videos can raise awareness at senior management level / CEO for increased impact but would be costly to produce
- Pooling together ETOOFS, DCC and OP communication resources will provide better information coverage and coordinated messaging by reducing the overall comms effort
- Consideration to produce information / communication for targeted audiences, for example to highlight the skill and maturity of the Class-4 intercomparison effort (maybe vis demo or show case presented on the website)

OPST-6 Action 8: OPST community to provide ideas around videos, info graphics and its realisation: ideas, resources and funding. (OPST members)

OPST-6 Agreement 1: OP communication committee to utilise link with DCC to develop better communication ideas and support

The presentation on the "[OP communication](#)" by PN Vinayachandran can be viewed on the OceanPredict website.

9. Decade interactions

Chaired by Fraser Davidson

With continued maturity of the UN Decade programmes it becomes more important to make sure all partners (ETOOFS, DCC, OP, and UN Decade programmes) define their roles on the Decade landscape, ideally by constructing a partnership or landscape map. This will include clarification of programme and project strategies including their alignment. This relates to the planning of activities, the overall outcomes and the connection with each other. Goals should be documented, be made available to partners, aligned and subsequently published.

How to find funding for UN Decade related activities is still unclear, so reaching out to funders is a requirement. A clear case for funding needs must be made to attract attention and willingness of sponsors to support the effort. ObsCoDe is meeting in June/July 2022 with a donor group, so advice on the preparation and outcomes would be helpful.

OPST-6 Action 9: ForeSea and SynObs chairs to develop a plan for ForeSea and SynObs funding by learning from and/or work with other groups (e.g. ObsCoDe) (lead: ForeSea and SynObs co-chairs)

While it is expected that OP could continue its current funding setup, ForeSea needs to make a case for its support. It was proposed to consider adding socioeconomic and social science aspects into ForeSea activities and projects to look at the impact on end-use (or impact-based forecasting or impact of the various observing systems on end-use), which would improve possibilities for raising funds. Outreach could also include publications in popular journals and developing links with scientific/popular writers.

10. OP'24 Symposium planning

Presented by Eric Chassignet

Five years after OP '19 (Halifax, Canada) it is now planned to organise a next OP/ForeSea '24 symposium. Goals of the OP '19 included to build a common picture of the future of Operational Oceanography, motivate integrated international community projects and enhance end-user awareness and engagement. The symposium ran for 4 days with an additional day for a 1-day internal OPST meeting. We also set up a training course for ocean DA and marked the moment when we renamed GODAE OceanView to OceanPredict.

Despite Covid delays it is anticipated to organise the next symposium in 2024. The primary focus of the event should still be the science behind the predictions, but with a strong focus on decade goals. The location of the symposium is still undetermined but it would be useful to find a host that can cover some of the location costs. The symposium format will still need to be agreed, and so we need a science programme committee and local organising committee to be set up soon.

It will be important to identify the scope of the symposium and to decide whether to involve closely with the UN Decade programmes, DCC, etc. In addition to the science components, we should also consider the integration of the future components to operational oceanography and links with the Decade. The link with the Decade is very important, and with two DCCs starting up in Europe an European location might be best suited. We also have to be flexible when developing the symposium strategy considering that we are just starting up with the Decade. We also should think about developing a plan for coordinated publications dedicated to science questions, e.g. through a special issue or another form of coordinated publications.

OPST-6 Action 10: OPST and ForeSea chairs to set up an OP'24 organising committee by end of summer 2022 (input requested from all)

11. OP housekeeping

Chaired by Fraser Davidson

Various topics had been collected for a general discussion about OP activities.

- **Status of USGODAE server** - potential options of additional/ alternate servers for OceanPredict?

US GODAE server is a knowledge & file transfer tool for intercomparison and validation. It is used for storing & sharing of class-4 files (observed values and collocated analysed and predicted values at various lead times daily increments), to which a number of OP operational centres contribute. However, there have been connection problems (historically and recently) and the contact point is unresponsive. Also, the server does not accept uploads from some centres and there is strong concern that the class-4 effort could be shut down due to lack of resources. Therefore, an alternative solution is sought. MOI is currently analysing the technical feasibility to host a mirroring server (which might become the main server in future). Aspects addressed with this issue are the long-term server usage, operationalization of the intercomparisons, and the needed resources at the prediction centres (people and funds) to make class-4 part of the operational process.

The class-4 effort has become mature, a [white paper](#) detailing it has been published but the recognition and implantation (similar to weather forecasting intercomparisons at WMO) has not happened yet. There needs to be a clear path of transforming this activity from a research effort to an operational prediction system process recognised and supported at UN Decade level, properly noted in the same way as the WMO intercomparison for weather forecasting is noted as an important activity that is contributing to an international effort. Getting OPOS-WG, ETOOFS and DCC involved will be beneficial and should include the definition of the scope of what the server/portal should be able to do and how it can serve the community.

OPST-6 Action 11:	Fabrice to send 2019 white paper on class-4 server continuation to OPST (Fabrice)
OPST-6 Action 12:	IV-TT co-chairs, OPOS-WG co-chairs and Eric Chassignet to set up a meeting with the US GODAE server team (including Emily Smith) to discuss current US GODAE server issues and find solutions for continuation, scope and funding. (lead: Eric Chassignet and US OP reps, IV-TT co-chairs, OPOS-WG chairs)
OPST-6 Action 13:	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 (lead: IV-TT co-chairs)
OPST-6 Agreement 2:	OP, DCC and ETOOFS chairs to consider moving up a level and create a mechanism within the UN Decade for long-term server support and maintenance (show relevance, adopt under WMO/IOC, and get DCC and ETOOFS engagement) (lead: OP, DCC and ETOOFS co-chairs)

- **Changes in OPST Co-chair positions**

In the next weeks, Eric Chassignet will be stepping down as co-chair of the OPST and will instead focus on ForeSea and the planning of OP '24.

The new OPST co-chair will be Marie Drevillon from MOI who will be working with Fraser and Vinay following OPST-6.

- **Programme office evolution**

- Programme Office to reduce hours from Aug 2022
- Plan to work with MOI to build a second OP programme office branch in Toulouse
- Set up and implementation not before Jan 2023
- Funding from OP sponsors will be shared and can hopefully be increased
- Needs discussion with OPAS and OPST co-chairs to establish the best possible setup
 - o What tasks are most important during the second half of this year
 - o How to best share the tasks once the second office is set up
 - o Funding requirements

This needs to be discussed and agreed at OPAS level before it will be actioned. The funding for the programme office is still too low and it needs more effort to try to increase financial support, but we need to explore different models of how to achieve

- **Next OPST- face to face meeting**

The next OPST meeting (OPST-7) is planned as a hybrid event and should be organised for Jan 2023. The OPST-8 meeting in Korea should have a hybrid option. Coordination with TT meetings to make sure there are no meeting clashes.

OPST-6 Action 14: KWB to organise the dates for next OPST-7 meeting to be held in early 2023 as a virtual event and to find dates for the OPST-8 planned as an in-person event in Busan, Republic of Korea ([KWB](#))

Appendices

Appendix A: Attendance list (collated from all meeting days)

Co-chairs (3):	Eric Chassignet, FSU, USA	(EC)
	Fraser Davidson, DFO, Canada	(FD)
	PN Vinayachandran	(PNV)
OPST members (27):	Santha Akella, NASA, USA	(SA)
	Enrique Alvarez Fanjul, Moi, France	(EAF)
	Stefano Ciavatta, PML, UK	(SC)
	Giovanni Coppini, CMCC, Italy	(CC)
	Pierre De Mey-Frémaux, CNRS/LEGOS, France	(PDM)
	Marie Drevillon, MOi, France	(MD)
	Yann Drillet, Mercator Ocean international, France	(YD)
	David Ford, Met Office, UK	(DF)
	Marjy Friedrichs, Virginia Institute of Marine Science, USA	(MF)
	Yosuke Fujii, MRI/JMA, Japan	(YF)
	Chris Harris, Met Office, UK	(CH)
	Fabrice Hernandez, Mercator Ocean, France	(FH)
	Pat Hogan, NRL, USA	(PHO)
	Villy Kourafalou, University of Miami, USA	(VK)
	Alex Kurapov, NOAA, USA	(AK)
	Matt Martin, Met Office, UK	(MM)
	Simona Masina, CMCC, Italy	(SM)
	Kristian Mogensen, ECMWF, UK	(KM)
	Andrew Moore, UCSC, USA	(AM)
	Arya Paul, INCOIS, India	(AP)
	Elisabeth Remy, Mercator Ocean, France	(ER)
	Hal Ritchie, ECCC, Canada	(HR)
	Andreas Schiller, unaffiliated, Australia	(AS)
	Gregory Smith, ECCC, Canada	(GS)
	Clemente Tanajura, UFBA, Brazil	(CT)
	Kirsten Wilmer-Becker, Met Office, UK	(KWB)
	Goro Yamanaka, MRI-JMA, Japan	(GY)
OPAS members (8):	Pierre Bahurel, MOi, France	(PB)
	Eric Bayler, NOAA/NESDIS, USA	(EB)
	Paul DiGiacomo, NOAA/NESDIS, USA	(PDG)
	Mikhail Entel, BoM, Australia	(ME)
	Isabelle Gaboury, DFO, Canada	(IG)
	Pierre-Yves Le Traon, MOi, France	(PYLT)
	Hendrik Tolman, NOAA/NCEP, USA	(HT)
	Xueming Zhu, NMEFC, China (for Hui Wang)	(XZ)
Guests (7):	Tatiana Der Avedissian, The Economist, UK	(TDA)
	David Legler, NOAA, USA	(DL)
	Jean-Michel Lellouche, MOi, France	(JML)

Peter Oke, CSIRO, Australia
Ann Kristin Sperrevik, Met.No, Norway
Liyang Wan, NMEFC, China
Yang (?). NMEFC, China

(PO)
(AKS)
(LW)
(Y?)

Total participation – 45 attendees over 3 days

Appendix B: Meeting agenda

Meeting dates & times

The meeting will take place on **three days: 15, 16 and 17 of June 2022**, in 2-hour slots each day, using MS Teams, starting at the same time every day.

Times are as:

<i>West Coast US (PDT):</i>	<i>5:00 am</i>
<i>Washington DC (EST):</i>	<i>8:00 am</i>
<i>Montreal/Ottawa (EDT, Canada):</i>	<i>8:00 am</i>
<i>Brazil (BRT):</i>	<i>9:00 am</i>
<i>St John's (NDT, Canada):</i>	<i>9:30 am</i>
<i>UK (BST, Europe):</i>	<i>13:00 pm</i>
<i>Europe (CEST, continent):</i>	<i>14:00 pm</i>
<i>India (IST):</i>	<i>17:30 pm</i>
<i>China (Beijing):</i>	<i>20:00 pm</i>
<i>South Korea</i>	<i>21:00 pm</i>
<i>Japan (Tokyo):</i>	<i>21:00 pm</i>
<i>Australia (Sydney, Hobart, ..)</i>	<i>22:00 pm</i>

Day 1 – Wednesday, 15 June 2022 (MS Teams) – 120 min

Participants can join up to 10 min before the meeting. Chat is open to everyone, and the meeting will be recorded.

Time	Description	Meeting chair and presenters	Shared material, comments
Day 1 is chaired by Fraser and Vinay			
5 min	Welcome	PN Vinayachandran	
80 min	Update on Decade Activities (several 10 min presentations)		
Notes	<ul style="list-style-type: none"> - Presentations should be submitted ahead of time to permit OPST members to review them before the meeting, so that they can jump into the discussions right away - Overall objective is to understand the interaction and overall group objective of all UN Decade programmes and centers working together - Opportunity for Decade Programs to get feedback 		
20 min	Update from the Decade Collaborative Centre (DCC)	Enrique Alvarez	Presentation
10 min	Digital Ocean/Ocean Prediction and Blue Economy (exact title TBD) www.ocean.economist.com	Tatiana Der Avedissian	Presentation
10 min	Digital Twin of the Ocean (DITTO)	Martin Visbeck	Presentation
10 min	Observing System Co-Design (ObsCoDe)	David Legler	Presentation
10 min	CoastPredict	Villy Kourafalou	Presentation
10 min	ForeSea	Eric Chassignet	Presentation
10 min	SynObs	Yosuke Fujii or Elisabeth Remy	Presentation
30 min	OP operational systems working group and Ocean Best Practices		
30 min	OPOS-WG <ul style="list-style-type: none"> • Terms of reference • Systems reports format and utility for Task Teams • Ocean Best Practices • System updates • OPOS-WG potential impact on Decade and collaborations <ul style="list-style-type: none"> ○ ETOOFS, Decade Programs 	Fraser Davidson and David Ford	ToR information Presentation(s)
5 min	Adjourn / recap	Co-Chairs	

Day 2 – Thursday, 16 June 2022 (MS Teams) – 120 min

Participants can join up to 5 min before the meeting. Chat is open to everyone, and the meeting will be recorded.

Time	Description	Meeting chair and presenters	Shared material, comments
Day 2 is chaired by Eric Chassignet			
<p>Presentations from the Task teams (20 min each). Please provide the following information</p> <p>(1) Overall status and plans of TT activity (2) UN Decade TT contributions</p> <ul style="list-style-type: none"> • What does your TT contribute to ForeSea and Decade Objectives (see list below)? <p>NB: review information your TT provided at OPST-5 (link below), and update on https://oceanpredict.org/docs/Documents/OPST/Meetings/OPST-5-Dec-2021/Presentations/Task-Team-slides-Dec2021-update3.pdf</p> <ul style="list-style-type: none"> • What help do you need from OPST and ForeSea in pursuing decade activities? • Are there any OPST group projects you see that should be undertaken in the Decade? • How is the Task Team promoting what it's doing? Where should OPST and ForeSea push to amplify this promotion (e.g. through the communication committee, the DCC (when up and running), the OPOS-WG, etc.?) • What contributions would you like OP to make supporting the Digital Ocean approach? <p><u>ForeSea objectives</u> are:</p> <ul style="list-style-type: none"> • Coordinate ocean prediction world-wide in a sustainable manner towards maximum societal benefits • Maximize the benefits of ocean observations for ocean predictions and societal impact • Support development and maturation of the full-length operational oceanography value chain, from observations to end users, by using best practices and coordinating the integration of existing and new partners (international science initiatives and intergovernmental organizations) • Advance the science behind ocean prediction and its connection to the other components of the earth system, including the atmosphere, land, cryosphere, continental hydrology, etc. • Make ocean prediction science more impactful and relevant by collaborating with socioeconomic experts and stakeholders to quantify the impact and utility of ocean prediction for science and society, especially in coastal areas (in collaboration with CoastPredict) 			
	Task Team reports	TT co-chairs	
20 min	OS-Eval TT	Elisabeth Remy and Yosuke Fujii	Presentation
20 min	IV-TT	Fabrice Hernandez and Greg Smith	Presentation
20 min	MEAP-TT	Stefano Ciavatta and Marjy Friedrichs	Presentation

20 min	COSS-TT	Pierre De-Mey-Frémaux and Villy Kourafalou	Presentation
20 min	DA-TT	Matt Martin and Andy Moore	Presentation
20 min	CP-TT	Santha Akella, Chris Harris and Kristian Mogensen	Presentation
	Adjourn	Co-Chairs	

Day 3 – Friday, 17 June 2022 (MS Teams) – 120 min

Participants can join up to 5 min before the meeting. Chat is open to everyone, and the meeting will be recorded.

Time	Description	Meeting chair and presenters	Shared material, comments
Day 3 is chaired by Fraser Davidson and PN Vinayachandran			
10 min	ETOOFS <ul style="list-style-type: none"> • Info on connections between ETOOFS, OPOS-WG, OceanPredict, Decade... • Status of the Operational Oceanography Forecast Systems Guide 	Pierre Bahurel	Presentation
10 min	Communications and Online Presence <ul style="list-style-type: none"> • working group report • Online systems Inventory • Options to improve/ augment 	PN Vinayachandran	Presentation
30 min	Discussion on Decade plans <ul style="list-style-type: none"> • Decade interactions: ETOOFS, DCC, Best Practices, • Brainstorm on funding ideas, in kind support requests • Recap from Day 1 and 2: Decisions, Actions needed • OPOS-WG potential impact on Decade and collaborations • 	PN Vinayachandran	
10 min	OP '24 – next OP symposium <ul style="list-style-type: none"> • Themes • Relation to Decade • Build program team for OP24 • Where? (Europe, Asia, Australia?) 	Eric Chassignet	Presentation
20 min	Housekeeping <ul style="list-style-type: none"> • Status of USGODAE server - potential options of additional/ alternate servers for OceanPredict? • Changes in OPST Co-chair positions • Programme office evolution • Next OPST- face to face meeting 	Fraser Davidson and OP officer	Presentation
25 min	OPEN Round Table discussion: To all OPST members: Please contribute discussion items, announcements ahead of time	PN Vinayachandran	

	<ul style="list-style-type: none"> • Global nature run for observing system design and OSSEs • Observing system representations in OP? • Ocean Prediction Application Guidance Task Team? <ul style="list-style-type: none"> • Ensemble forecasting • Global uses • Coastal uses • E-Navigation products with standards: what do they miss from the overall ability of prediction systems? • How best to connect/fill/ contribute to Digital Ocean • Exemplar by Exemplar approach • What are large questions from end user groups/exemplars, and how to harness ForeSea / OceanPredict • Provides forum to contributing and connecting us to various Decade programs 		
10 min	OPST Actions	Fraser Davidson / Kirsten Wilmer-Becker	
5 min	Close of meeting	PN Vinayachandran	

Appendix C: List of presentations

Day 1 – 15 June 2022

OPST interaction with external partners and the UN Decade partner programmes, and OPST new working group on OP operational prediction systems

Title	Presenter	Affiliation	Role
<u>“OceanPrediction DCC” A Decade Collaborative Centre to build the ocean prediction we need</u>	Enrique Alvarez	Mercator Ocean International	DCC and ETOOFS representative
<u>An Introduction to World Ocean Initiative</u>	Tatiana Der Avedissian	<u>Home – World Ocean initiative (economist.com)</u>	Invited speaker
<u>Realizing the Benefits of Ocean Knowledge through Ocean Observing Co-Design</u>	David Legler	NOAA	Invited speaker
<u>CoastPredict: Observing and Predicting the Global Coastal Ocean</u>	Villy Kourafalou	Univ. of Miami/RSMAS	OPST member and COSS-TT co-chair
<u>ForeSea – The Ocean Prediction Capacity of the Future</u>	Eric Chassignet	Florida State University	OPST co-chair
<u>SynObs Updates</u>	Yosuke Fujii	MRI-JMA	OPST member and OS-Eval TT co- chair
<u>Operational Systems Working Group (OPOS- WG)</u>	David Ford	Met Office	OPST member and OPOS-WG co- chair

Day 2 – 16 June 2022

OceanPredict Task Teams reports

Title	Presenter	Affiliation	Role
Task Team presentations – latest activities and support for ForeSea and SynObs	Various (Task Team co-chairs) – see below	Various	OPST members
<u>OS-Eval TT</u>	Elisabeth Remy	Mercator Ocean International	OS-Eval TT co-chair
<u>IV-TT</u>	Fabrice Hernandez	IRD	IV-TT co-chair
<u>MEAP-TT</u>	Marjy Friedrichs	Virginia Institute of Marine Science	MEAP-TT co-chair
<u>COSS-TT</u>	Pierre De Mey-Frémaux	CNRS/LEGOS	COSS-TT co-chair
<u>DA-TT</u>	Matt Martin	Met Office	DA-TT co-chair
<u>CP-TT</u>	Santha Akella	NASA	CP-TT co-chair

Day 3 – 17 June 2022

OPST business meeting

Title	Presenter	Affiliation	Role
ETOOFS update	Pierre Bahurel	Mercator Ocean International	ETOOFS director and OPAS member
<u>OP communication and online presence</u>	PN Vinayachandran	Indian Institute of Science	OPST co-chair
OP '24 – next OP symposium	Eric Chassignet	FSU/COAPS	OPST co-chair

OP housekeeping	Fraser Davidson and Kirsten Wilmer-Becker	DFO/ECCC and Met Office	OPST co-hairs and OP programme officer
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Appendix D: Actions

- OPST-6 Action 1:** KWB and FD to work with Tatiana to organise a seminar on the World Ocean Initiative by autumn 2022.
- OPST-6 Action 2:** OPST co-chairs and PO to work with DCC to learn how it will work, engaging all partners in setting up a partnership interaction map, including relations with external groups like e.g. GEO Blue Planet (DCC) and support the development of an online map of systems (as a contribution to the DCC atlas) (lead: OPST co-chairs, PO)
- OPST-6 Action 3:** OPOS-WG co-chairs to discuss and decide with OPOS-WG on whether to include the observation community as members of the OPOS-WG. (lead: OPOS-WG co-chairs)
- OPST-6 Action 4:** OPST chairs & TT co-chairs to put together a working group to discuss and explore solutions for a common nature run, also considering working with DITTO, and /or exploring what is used in the wider community. (lead: OPST chairs & TT chairs) – see also action 5.
- OPST-6 Action 5:** OP, ForeSea and CoastPredict chairs to work together to develop description of the OP, ForeSea and CoastPredict roles (e.g. to allow better definition of associated project like PredictOnTime) to better define OP and UN Decade programmes for wider understanding, including group strategies (lead: OP, CoastPredict and ForeSea chairs)
- OPST-6 Action 6:** Kristian to share ECMWF project details which could deliver a nature run to OPST chairs and TT co-chairs including Eric C. (Kristian Mogensen)
- OPST-6 Action 7:** OP communication committee to revise current PO communication plan to include ideas for better OP communication, e.g. ways to publish articles in popular science, info graphics, video, etc. (expensive, but high impact with general public and high-level engagement) (lead: OP comms team, PO, tbc)
- OPST-6 Action 8:** OPST community to provide ideas around videos, info graphics and its realisation: ideas, resources and funding. (OPST members)
- OPST-6 Agreement 1:** OP communication committee to utilise link with DCC to develop better communication ideas and support
- OPST-6 Action 9:** ForeSea and SynObs chairs to develop a plan for ForeSea and SynObs funding by learning from and/or work with other groups (e.g. ObsCoDe) (lead: ForeSea and SynObs co-chairs)
- OPST-6 Action 10:** OPST and ForeSea chairs to set up an OP'24 organising committee by end of summer (input requested from all)
- OPST-6 Action 11:** Fabrice to send 2019 white paper on class-4 server continuation to OPST (Fabrice)

- OPST-6 Action 12:** IV-TT co-chairs, OPOS-WG co-chairs and Eric Chassignet to set up a meeting with US GODAE server team (including Emily Smith) to discuss current US GODAE server issues and find solutions for continuation, scope and funding. (lead: [Eric Chassignet and US OP reps](#), [IV-TT co-chairs](#), [OPOS-WG chairs](#))
- OPST-6 Action 13:** 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 (lead: [IV-TT co-chairs](#))
- OPST-6 Agreement 2:** OP, DCC and ETOOFS chairs to consider moving up a level and create a mechanism within the UN Decade for long-term server support and maintenance (show relevance, adopt under WMO/IOC, and get DCC and ETOOFS engagement) (lead: [OP](#), [DCC](#) and [ETOOFS co-chairs](#))
- OPST-6 Action 14:** KWB to organise the dates for next OPST-7 meeting to be held in early 2023 as a virtual event and to find dates for the OPST-8 planned as an in-person event in Busan, Republic of Korea ([KWB](#))