OPST- 6:
Task team presentations

TT presentations to provide the following information

Status and plans of TT activities

- TT activities, goals and expected outcomes (since last OPST meeting)
- TT outreach plans (if applicable)
- TT events planned
- TT membership update
- Etc.

UN Decade TT contributions

- TT contributions to ForeSea/Decade objectives (new or updated info – see link)
- TT suggestions for OPST group projects undertaken in the Decade
- What contributions would you like OceanPredict to make supporting the Digital Ocean approach?

Coordination support from OP/ForeSea

- What help does your TT need from OPST and ForeSea to pursue decade activities?
- What are the TT needs for promoting its activities? Where should OPST and ForeSea push to amplify this promotion?

Order of presentation

OS-Eval TT

IV-TT

MEAP-TT

COSS-TT

DA-TT

CP-TT

OSEval Task Team

Yosuke Fujii (JMA/MRI), Elisabeth Rémy (MOi)

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- **TT activities since last OPST meeting**

➢ Regular online meetings continued, approx. each 2 months (2 meetings in 2022, next this June)

Presentations and recordings on the OceanPredict website: https://oceanpredict.org/science/task-team-activities/observing-system-evaluation/#section-meetings

➢ Discussions on the SynObs project for the UN Decade ("Synergistic Observing Network for Ocean Prediction")

Yosuke presentation

➢ Agreement on common OSEs to assess the impact of Argo sensor salinity drift on ocean analysis/reanalysis:

- To evaluate the possible impacts of Argo fast salinity drift on the operational systems,
- To define a strategy to mitigate the effect of the salinity drift:
  - Use of the Argo gray list, use of the delayed mode data « as soon as possible » compared to the real time data set, …
  - Examine the effects of added QC in ocean prediction systems.

Those experiments were discussed with Peter Oke (Argo ST member)

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Participating systems:

JMA 1x1/2˚ Global System, MOVE G3A 3DVAR (Y. Fujii)

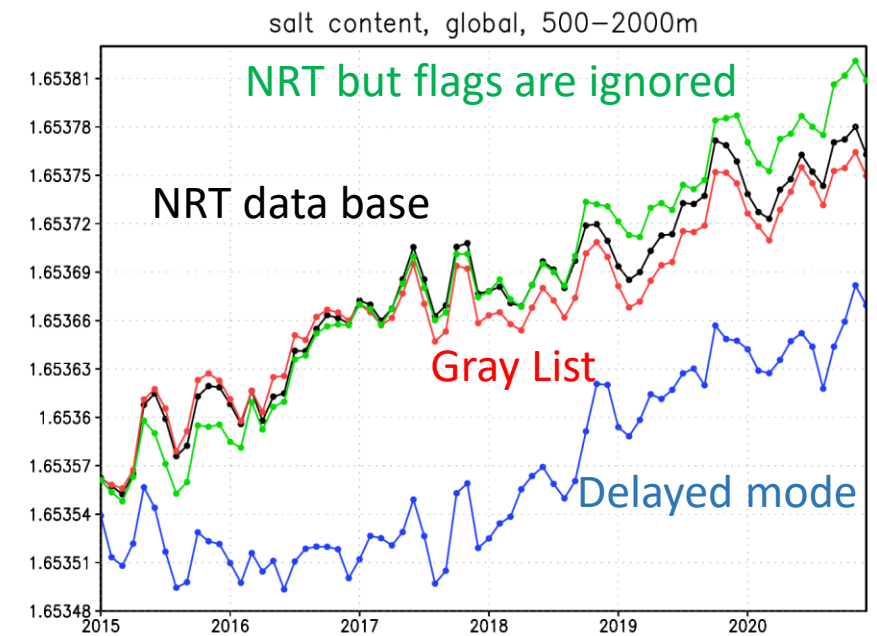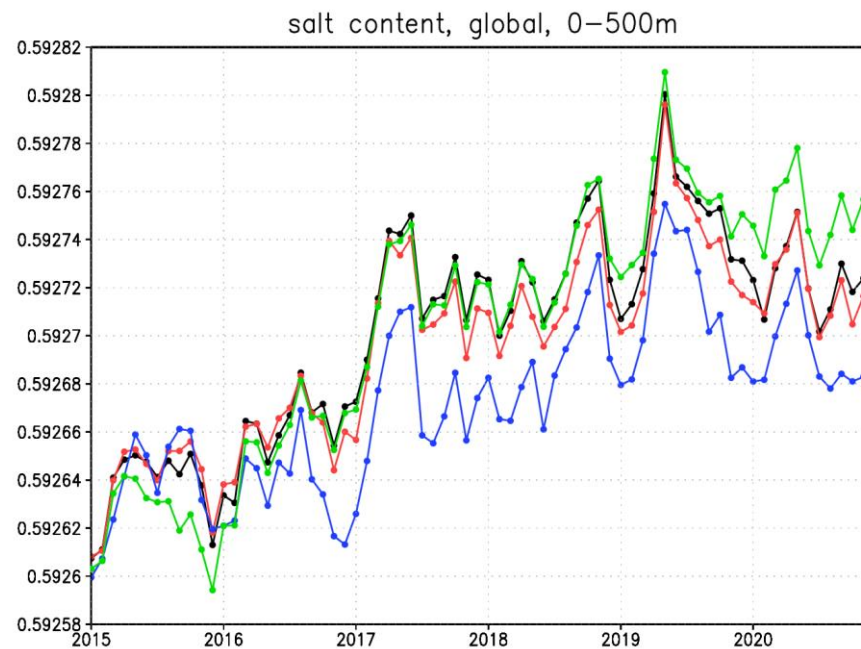CSIRO 1/10˚ Global System, Global Blue Maps (P. Oke)

ECMWF 1/4˚ Global System, OCEAN5 (H. Zuo)

NERSC 1˚ Global System, NorCPM (Y. Wang)

IAP/CAS 1˚ Global objective analysis system (L. Cheng)

Global salinity contents depending on the assimilated Argo data set in 10^{19} psu/m³

(OSE with MOVE-G3A from JMA, Yosuke Fujii)

salt content, global, 0−500m

salt content, global, 500−2000m

NRT but flags are ignored

NRT data base

Gray List

Delayed mode

![OceanPredict logo - Advancing the science of ocean prediction]

- Table on the **use of observations in OceanPredict Systems** (Updated every three months):

  https://oceanpredict.org/observations-use/#section-argo-profiling-floats

- Discussion on **Nature Runs to share**, that are "easily" available:

  Set up of an excel file to list them.

  (do we include NR made available by the research community?)

Observations table(s) (operational centre usage)

Levels	Description
Level 0	Not used at all
Level 1	Used for validation (The system is constructed independently from the data)
Level 2	Not assimilated but used for input data (The system depends on the data), or assimilation scheme is currently being developed
Level 3	Assimilated on the research basis
Level 4	Assimilated indirectly in operation (as the ingredient of objective analysis or forcing data)
Level 5	Assimilated directly in operation (The data are assimilated without combining with other data)

| **Argo (profiling floats)** | Moorings | Ship | Other In-situ | Altimeter | SST | Ice | Other Remotely Sensed | References |

Platform: Profiling floats (Argo floats)

Latest update: 27 January 2022
Level descriptions as in graphic above.

Center/ Institute	System Name	Trajectory	Temp.	Salinity	Oxygen	Chlorophyl	Notes
BoM (CSIRO)	OceanMAPS	Level 1	Level 5	Level 5			
CHM-REMO	RODAS		Level 5	Level 5			
ECCC	GIOPS (global 1/4°)	Level 1	Level 5	Level 5			
	RIOPS (Pac-Arctic-NAtl 1/12°)	Level 1	Level 5	Level 5			

https://oceanpredict.org/observations-use/#section-argo-profiling-floats

OSEval TT – Status and plans of TT activities

- **Goals and expected outcomes of the TT activities**

➢ Share experience between the OSEval TT members and enhanced discussion on ocean observation impact assessment in real time analysis and forecasts: results, methods, best practices...

➢ Enhance the communication between OceanPredict and observational communities and international organization linked to ocean observing network management

Report on the impact of present observation: advocate for their continuity and help designing the future expansion

- **TT outreach plans**

Presentations of OSEval studies at different conferences.

➢ Participation of TT members to the Ocean Observing Co-Design Workshop last week

➢ Participation to the EuroSea/Ocean Predict meeting (end of June 2022)

➢ Presentation of OSEval/OceanPredict results at the next Argo Science Team meeting (Brussels, October 2022)

➢ Plan to continue to invite people from the observing networks to the meeting

OSEval TT – Status and plans of TT activities

- **TT events planned**

  Joint OS-Eval TT/ CP-TT Symposium:

  15 – 18 Nov 2022, Hybrid workshop, Tsukuba (near Tokyo), Japan

     Announcement soon on the OP website

- **Challenges:**

  ➢ More and more requests from the "in situ ocean observing network" management to express the ocean observation need for the ocean operational systems:

     priorities should also be discussed, as for Argo core versus BGC versus deep.

  ➢ Participation of operational system representatives to science definition team for future satellite mission: salinity, surface velocity, …

  ➢ Today, the OSEval TT mostly focus on physical variables but there are expectation for coastal observation impact assessment (COSS-TT contribution) and also for BGC observations:

     different TTs are involved, organisation at the level of OceanPredict/ within ForeSea?

- **TT contributions to ForeSea/Decade objectives**

  SynObs project: Yosuke Fujii presentation

- **TT suggestions for OPST group projects undertaken in the Decade**

- **What contributions would you like OceanPredict to make supporting the Digital Ocean approach?**

  Provide Nature Run for observation simulations for OSSEs, observation simulator (SWOT, Surface currents, …)

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- **What help does your TT need from OPST and ForeSea to pursue decade activities?**

  ➢ We are very well supported by the OP Project Office to manage the TT communications, meetings, webpages, ...

  ➢ Need of a support for seeking financial resources for SynObs/OSEval common activities.

- **What are the TT needs for promoting its activities? Where should OPST and ForeSea push to amplify this promotion?**

  ➢ To establish a secure framework through which OceanPredict community makes feedbacks to observational agencies, including needs in observation.

    ! In situ and space observation "institutions" have very different organisation

  ➢ Find a sustainable and efficient way to communicate on observation impact and need with GOOS/space agencies.

IV-TT – UN Decade TT contributions

- **TT contributions to ForeSea/Decade objectives (new or updated info)**

  - **Class 4 intercomparison = Best effort, but unique and heritage of GODAE (framework, expertise, team involved worldwide, international recognition of this approach)**

  - **IV-TT provides science based innovation on ways to verify and characterise quality of products for operational oceanography stakeholders**

  - **Identified contributions**

    - **Project 1: Class4 on dedicated mirror maintained by MOi**

    - **Project 2: Uncertainty estimation and drift**

    - **Project 3: User-relevant and process-based metrics**

    - **Project 4: Regional/Coastal verification with adapted observing system, including ensemble approaches**

- **TT suggestions for OPST group projects undertaken in the Decade**

  - **TBD**

- **What contributions would you like OceanPredict to make supporting the Digital Ocean approach?**

  - **TBD**

IV-TT : Coordination support from OP/ForeSea

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- **What help does your TT need from OPST and ForeSea to pursue decade activities?**

  - **The existing Class 4 activity may not "survive" in the future**: need dedicated dataserver for being shared by wider actors (regional systems..), and ease future upgrades of metrics computation

  - **Class 4 activity needs total change of framework**: committed resources in OOFC, technical framework (eg, continuous regular monitoring), and technical support (eg, data servers)

  - The IV-TT expertise and future plans need to focus activity into innovative validation/verification approaches that can be aligned to ForeSea developments

- **What are the TT needs for promoting its activities? Where should OPST and ForeSea push to amplify this promotion?**

  - **OPPORTUNITY**: DCC, ForeSea, ETOOFS can be the framework to support the "operationalisation" of Class 4 activities

  - OP-ST "shareholders" are (kindly) asked to take into account the IV-TT Class 4 issue: most of the solution can only be raised from the operational centres

MEAP-TT
Stefano Ciavatta and Marjy Friedrichs

MEAP – Status and plans of TT activities

- **MEAP-TT mission:** To advance the science and tools for integration of biogeochemical and ecosystem models into operational systems (including hindcasts/reanalyses, climate projections, short-term forecasts, scenarios)

  - Applications: Carbon cycle research, marine productivity/ecosystems/fisheries

- **MEAP-TT activities:**

  - ➤ **H2020 SEAMLESS**

    - Advancing CMEMS capability in predicting ecosystem indicators through ensemble DA of multiplatform obs

  - ➤ **ETOOFS guide on operational oceanography and forecasting systems**

    - Promotes the development of new forecasting systems
    - Promotes best practices and standards and provides key points of contact

- **TT events planned:**

  - More frequent (bimonthly calls) going forward; in person meeting ASLO Summer 2023

- **TT membership update:**

  - Marjy Friedrichs replaced Katja Fennel as co-chair (spring 2022)

  - Three members have left (DFO-CA; HCMR-GR; U Cape Town – SA)

  - Plan to expand the biological modelling expertise and add early career researchers

TT contributions to ForeSea/Decade objectives

MOi to become a "Decade Collaborative Center for Ocean Prediction": support for ocean prediction collaborations ➔ strengthen the links between BGC/biological components (among the others) of the UN Decade programmes/projects Foresea/SynObs, CoastPredict, Marine Life 2030, GOOS Co-design, …

➢ **ForeSea (OceanPredict)**

- Stefano is on ForeSea steering committee, ensuring coordination with MEAP-TT and SynObs

- Working on dissemination/communication of:

  a) Up-to-date summary of international status/availability of green ocean assimilation and prediction (global, regional, and coastal)

  b) Description and links to available resources (observations and models)

  c) Tutorials on basic setups of models and DA as well as their limitations (e.g. SEAMLESS prototype), including best practices for:
  - o Linking coastal and large-scale biogeochemistry
  - o Linking biological models (e.g. fish, benthic community) to BGC models

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TT contributions to ForeSea/Decade objectives

➢ **SynObs (Yosuke Fujii, co-chair)**

• SynObs is part of 3 UN Decade Programmes – ForeSea, CoastPredict, Ocean Observing Co-Design; goal is to generate transformative collaboration among the three Programmes

• Marjy is on the SynObs steering committee ensuring coordination with MEAP-TT

• MEAP-TT can bring the importance of BGC observations to the more physically based SynObs group; can share synergies between BGC and physics; co-located BGC/physics observations will be critical

  • OSSE analysis with BGC observing networks (e.g. biogeochemical-ARGO floats, gliders)

  • Assessment and best practices for multi-platform (sat/floats/gliders) and multi-type (PHY/BGC) DA

  • MEAP-TT member will attend the SynObs kick-off meeting in Tsukuba, Japan

TT contributions to ForeSea/Decade objectives

➢ **Marine Life 2030 / GOOS Co-design Programme: Biodiversity exemplar (Frank Muller-Karger, co-chair)**

- Mission: building global knowledge of marine life for local action

- Expand MEAP membership/expertise/collaboration in biological modelling & prediction

- Provide roadmap to higher trophic level prediction, supporting fishery stakeholders

- Analyse feasibility of "biological OSSEs", expanding beyond BGC, e.g. with acoustic sensors, imaging

- Promote and integrate LTL/HTL prediction and scenarios for marine management and MPA

➢ **CoastPredict**

- Promote the BGC and biological components of the programme (is there any?)

➢ **TT suggestions for OPST group projects undertaken in the Decade**

- Not clear what group projects are feasible

➢ **What contributions would you like OceanPredict to make supporting the Digital Ocean approach?**

- Promote the vision of fully integrated ecosystem modelling for a seamless linkage of its components in the ocean digital twin (e.g. pelagic BGC, nekton and benthic biological communities)

MEAP-TT: Coordination support from OP/ForeSea

➢ **What help does your TT need from OPST and ForeSea to pursue decade activities?**

- Provide links to sponsors/funding opportunities

- Engage with TT-chairs on concrete examples and plans for actions

➢ **What are the TT needs for promoting its activities? Where should OPST and ForeSea push to amplify this promotion?**

- Provide 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)

Coastal Ocean and Shelf Seas Task Team (COSS-TT)
Villy Kourafalou (U. Miami), Pierre De Mey-Frémaux (LEGOS), Alexander Kurapov (NOAA)
Currently 33 members

COSS-TT – Status and plans of TT activities

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- **TT activities since OPST-5, goals and expected outcomes**

  - After 2 TT meetings cancelled in 2020 and 2021, an online TT meeting was successfully held on 12-13 April 2022. Scientific presentations (21), discussion on major science challenges, on Decade actions, on ToR evolutions.

  - As first reported at OPST-5, TT pursues a significant involvement in UNDOS. (next slide)

  - As first reported at OPST-5, TT members wrote coastal sections of ET-OOFS *"Guide on Operational Ocean Monitoring and Forecasting Systems"*, including list of (pre-)operational coastal forecasting systems. As of June 2022, the Guide is in the last stages of publication by UNESCO.

- **TT outreach plans**

  - Indirect plans via participation in UNDOS actions.

- **TT events planned**

  - We are thinking about the conditions that would allow us to organize a face-to-face meeting (target: spring 2023).

  - Upcoming survey with TT members on evolving the TT's ToR in the Decade years.

  - Consider launching a COSS-TT science webinar series. As an option, publicize and/or sponsor the NOAA Coastal Ocean Modeling Seminar series run by AK (https://coastaloceanmodels.noaa.gov/seminar). The challenge is to accommodate all the time zones!

- **TT membership update**

  - New co-chair: Alexander Kurapov, NOAA.

  - We are in the process of removing inactive members + invite new members following pending ToR update.

COSS-TT – UN Decade TT contributions

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- **TT contributions to ForeSea/Decade objectives since OPST-5**

  - Involvements of TT co-chairs: **ForeSea** (Pierre in ST) and **CoastPredict** (Villy and Pierre in founding group; Villy co-chair; Pierre FA1 co-lead; TT members in SC); Villy also in Advisory Group for OceanPredict.US and in the co-Advisory Board for ForeSea and GOOS Programs (inc. CP).

  - Two Decade projects, **PredictOnTime** and **SynObs**, have been endorsed by the IOC as UN Decade actions. Pierre co-leads PredictOnTime with Giovanni Coppini and Guimei Liu, and participates in the SynObs steering team. Villy participated in SynObs development as a member of the OS-Eval TT.

  - **PredictOnTime** is a Core Project under CoastPredict and will deliver new predictive capacities, services and products for the global coastal ocean based on innovative integrated observing systems and forecasting systems implemented and tested at selected Pilot areas. <u>Highlights:</u> a relocatable, easy to be deployed, cost effective observing and forecasting system of systems, as well as best practices. <u>Focus:</u> a) observing and predicting natural extreme events in the global coastal ocean on due time and with the appropriate accuracy so that impacts on natural and human resources and assets will be minimized; b) develop and consolidate the citizen science observing capacities and support innovative and sustainable applications for coastal solutions/services.

  - Pierre and Villy also participated in the Ocean Decade Co-Design Workshop organized by GOOS (7-9 June) as a contribution to the **ObsCoDe** Decade program (storm surge exemplar, closely linked to PredictOnTime).

COSS-TT – Coordination support from OP/ForeSea

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- **What help does your TT need from OPST and ForeSea to pursue decade activities?**

  - Vision and leadership on fruitful overarching objectives.

  - Guidance through the "maze" of endeavors at different levels. Need OPST/ForeSea to lead in keeping TTs informed of developments/opportunities and in providing framework to best tap into TT resources & strengths.

  - Coordination to get "core" Decade projects funded (especially since "core" activities are not region-specific).

  - Contribute to the dissemination of the results from relevant TT activities (below).

- **What are the TT needs for promoting its activities? Where should OPST and ForeSea push to amplify this promotion?**

  - OPST and ForeSea should work with the TTs to better define OceanPredict's original positioning in the Decade landscape, and give sufficient exposure and recognition to that positioning. (So as to stay useful, visible, supported and recognized under the "sparkling fountains" of the Decade.)

Data Assimilation Task Team

Andy Moore and Matt Martin

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- **TT activities, goals and expected outcomes (since last OPST meeting)**

  - Exchanging information between the DA-TT members, OSEVal-TT and the wider ocean DA community through a virtual technical seminar series:

    - Recent talks by A. Weaver (14 March) and J.-M. Lellouche (13 June).

    - Set up an ocean DA community mailing list to involve the wider ocean DA community.

  - Involved in planning activity on coupled initialisation organised by WMO/CLIVAR groups: WGNE, DAOS and OMDP.

  - Links to WMO WWRP IP – push for coupled DA development in support of new research initiatives.

  - Supported EGU session: Data assimilation techniques and applications in coastal and open seas with an associated special issue in the journal Ocean Science.

  - Participating in a European activity as part of the Mercator Ocean International DA expert team to discuss possibilities for agreeing a common DA software infrastructure by some European operational ocean forecasting groups (chaired by Mike Bell and Pierre de Mey).

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- **TT outreach activities:**

  - Contributing to organisation of the joint EuroSea/OceanPredict workshop at the Met Office (29 June – 1st July 2022).

  - Coordination of experiments of initialization of coupled models (w/various WMO WGs)

- **TT events planned**

  - Further DA-TT technical seminars planned:

    - A. Storto (11th July); TBC (Sep); S. Frolov (7th Nov).

  - Tentative plans for DA-TT workshop in late Spring 2023. Likely to be hosted in Rome (A. Storto).

- **TT membership update**

  - No changes to membership.

  - Seeking new co-chairs with the aim of handing over by the next DA-TT workshop.

DA-TT – UN Decade TT contributions

- **TT contributions to ForeSea/Decade objectives (new or updated info)**

  - *(A. Moore on SynObs steering committee; M. Martin on ForeSea steering committee.)*

  - A. Storto involved in UN-Decade Regional Programme SciNMeet "The Mediterranean Sea We Need for the Future We Want": http://www.ismar.cnr.it/progetti/scinmeet.

  - Sperrevik is an "early career" ECOP focal point for CoastPredict and Foresea.

  - De Mey is co-lead of CoastPredict focus areas, and member of SynObs steering committee.

- **TT suggestions for OPST group projects undertaken in the Decade**

  - 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

  - align DA-TT and OP with WWRP implementation plan

- **What contributions would you like OceanPredict to make supporting the Digital Ocean approach?**

  - Better define the role of DA in the Digital Ocean approach.

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- **What help does your TT need from OPST and ForeSea to pursue decade activities?**

  - ?

- **What are the TT needs for promoting its activities? Where should OPST and ForeSea push to amplify this promotion?**

  - Continue existing support from the OP programme office (Kirsten) in hosting meetings/workshops, organising membership and mailing lists, …

Coupled Prediction TT
Chris Harris
Kristian Mogensen
Santha Akella

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- **TT activities, goals and expected outcomes (since last OPST meeting)**

  - **Started an effort to revamp and revive**

  - **Coordination using a few projects of common interest e.g.:**

    - **Tropical cyclones from an ocean perspective; Atmospheric *driving* fields from a coupled perspective**

  - **Quarterly lecture series**

  - **Goals: Get a few of the common projects started**

- **TT outreach plans (if applicable): N/A**

- **TT events planned**

  - **Co-organize workshop with OS-Eval-TT in Tsukuba, Japan (Nov, 2022)**

- **TT membership update**

  - **Some left and new additions expected**

- **TT contributions to ForeSea/Decade objectives (new or updated info)**

  - **Active participation in SynObs and OS-Eval**

- **TT suggestions for OPST group projects undertaken in the Decade**

  - **A common approach for sharing data and code**

- **What contributions would you like OceanPredict to make supporting the Digital Ocean approach?**

  - **(as above) A common approach for sharing data and code**

- **What help does your TT need from OPST and ForeSea to pursue decade activities?**

  We have just started revival, once that process settles down, we will be able to say something concretely.

- **What are the TT needs for promoting its activities? Where should OPST and ForeSea push to amplify this promotion?**

  None right now (see above).