



OceanPredict OS-Eval Task Team
The 14th web meeting

(Jan 25th, 2022, 13:00 UTC)

★ Agenda

00:00-00:02: Introduction

00:02-00:47: Discussion on the activity of **SynObs**

00:47-00:55: Discussion on the on-site OS-Eval Workshop in November.

00:55-01:00: Communications, Wrap-up

Synergistic Observing network for Ocean Prediction (SynObs)

(From July 2022 to June 2026)

◆ Objective

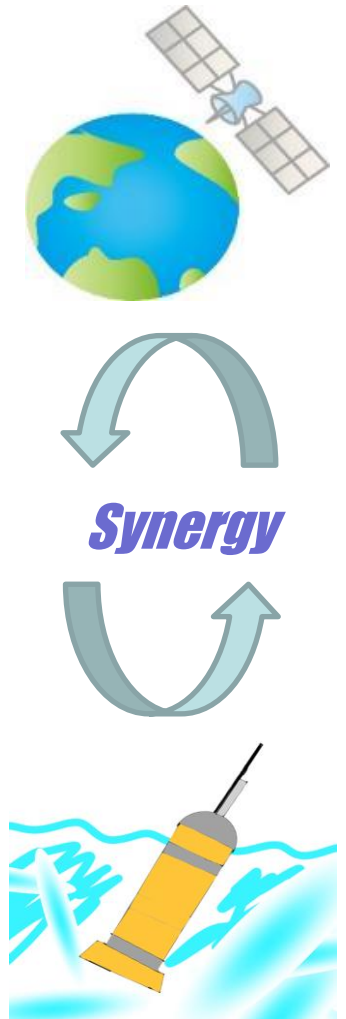
SynObs will seek the way to extract maximum benefits from the combination among various observation platforms, typically between satellite and in situ observation data, or between coastal and open ocean platforms, in ocean/coastal predictions.

◆ Strategy

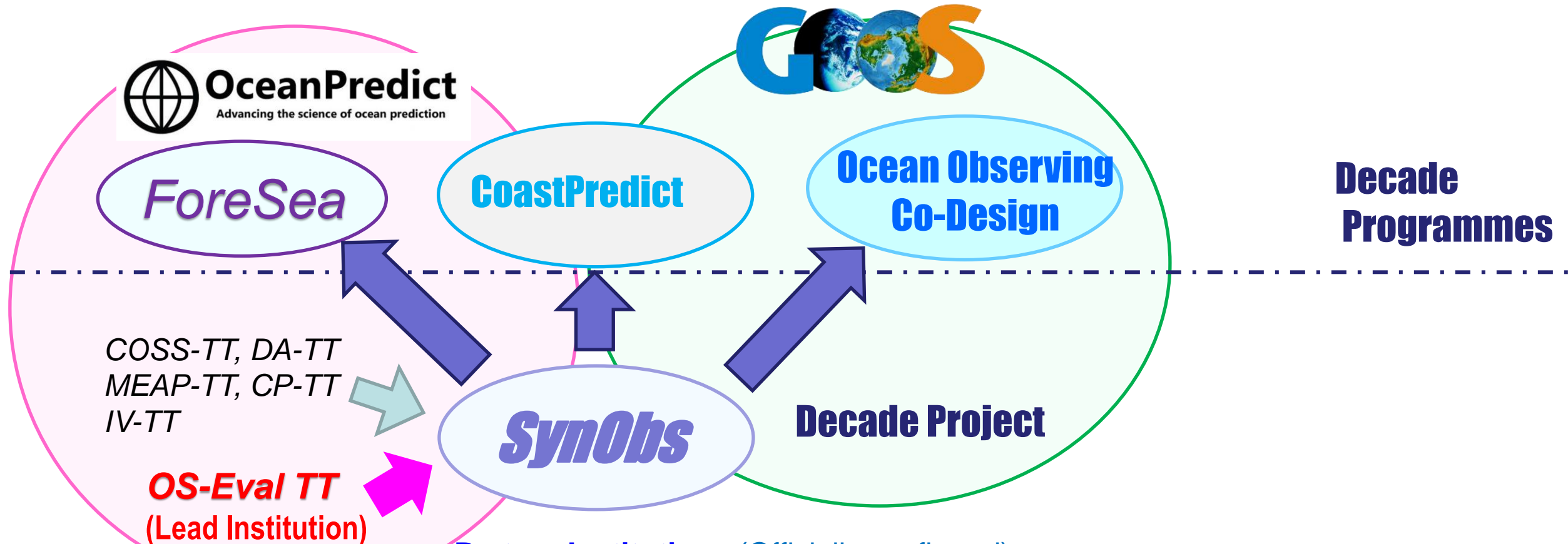
SynObs aims to identify the optimal combination of different ocean observation platforms through observing system design/evaluation, and to develop assimilation methods with which we can draw synergistic effects from the combination.

◆ Scope

Targets of **SynObs** include open-ocean (global, tropical, mid-latitude, polar areas), coastal, and biogeochemical (BGC) observing systems



SynObs: A common comprehensive project



Partner Institutions (Officially confirmed):

JMA/MRI (contact point, Japan), Mercator Ocean International (France)
 Met Office (UK), NOAA Quantative Observing System Assessment Program (USA)
 ECMWF, CNR ISMAT (Italy), NERSC (Norway), Ocean Data Network (Denmark)
 CNRS (France), UFBA (Brazil)

ForeSea: high-level objectives

- ❖ **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)

- ◆ Ocean Observing Co-Design will develop a more user-focused co-design process to evolve a truly integrated, and responsible ocean observing System
- ◆ Exemplar: a use area around which scientists pilot and refine tools and processes for ocean observing Co-Design. It must engage end-users as part of the co-design development process.
- ◆ Current candidates of exemplars
 - Carbon, Marine heatwaves, Storm Surge/Coastal Inundation, Maine Life, Hurricanes and trop storms, **Boundary Currents**, Climate Assessment (e.g., AMOC)
- ◆ Co-Design Workshop
 - June 7, 8, 9, and Day 4 TBS
 - Use lessons learnt and previous experiences to define exemplars and agree on a set of priority exemplars around which to focus projects.
- ◆ Maybe SynObs can take charge of one of priority exemplars or set its own exemplars.
- ✓ But how we take a balance with the wide targets of SynObs and the own exemplars?

★ Expected Activities in SynObs



1. OS-Eval showcase and reporting

- Collect OS-Eval examples and introduce them (Showcase)
- Generate a report on observation requirements and design

2. Collaboration for evaluation and design

- Provide Nature runs
- Multi-System OSE and OSSE
- Establish on a best practice method or a model case

3. Providing information from ocean prediction systems in real time

- Regular reporting on information of QC, innovations, increments, etc.
- Explore the methods to evaluate observing system status in real-time operation

4. Supporting DA scheme development

- Support DA-TT seminar series
- Summarize required development for extracting synergy from the targeted combinations
- Observation campaigns for the development



★ 1. OS-Eval Showcase and reporting

OS-Eval Showcase

- Collect OS-Eval examples for all targeted observations and introduce them to the broad communities (particularly to observational communities) to show the potential of OS-Eval.
- General any studies which evaluate the ocean observing systems will be included.
- A possible plan: We will set up the showcase activity at the **Tsukuba Symposium this November**, and organize a **special issue of some academic Journal in 2023**.
- We may also make the web page on the showcase.

OS-Eval Report

- Issue a report on the observation requirements and design based on various OS-Eval studies as the concluding achievement of SynObs. (**The activity will start at 2024?**)
- The report is generated for the sustaining and developing ocean observing networks. So it will be hopefully distribute to broad observational communities.
- Maybe we need to adjust the schedule and targets considering the timeline and exemplars of Ocean Observing Co-Design.

★ 2. Collaboration for evaluation and design

Nature Runs

- It is difficult to produce original Nature Runs in SynObs.
- Instead, we can make a list of ocean simulation data which are available to use as the Nature Run. (Is it reasonable for the current circumstance of SynObs?)

Multi-System OSSE or OSE or other delayed-mode evaluation

- Full implementation of OSSEs needs considerable efforts (**not feasible?**)
- OSE may be easier. Collaborative OSEs with a loose protocol may be feasible.
- But **I think an multisystem OSE (or other OS-Eval) is necessary as a flagship activity.** (need funds to implement this?)
- **Set a Co-Design Exemplar as the OSE target? (Maybe SynObs can take charge of an exemplar.)**
- We can make **a environment in which a new light collaborative OSE (like oo-going Argo ASD OSEs) can be easily suggested and people can communicate on the results.**

Best Practice

- Seek a best-practice way through the collaborative activity above and generate a report.

★ 3. Providing information from ocean prediction systems in real time

Regular reporting (web page?) on information of QC, innovations, increments, etc.

- Extension from the table of observation use
- Set up the discussion on the design (what we can report?) as early as possible?
- Design (2022-2023?), Construction (2023-2024?)
- Maybe collaboration with IV-TT is possible.

Explore the methods to evaluate observing system status in real-time operation

- Explore and develop the methods (e.g., DFS, FSOI, Array modes and multi-system ensemble) (2022-2024)
- Establish a regular reporting framework (2025-2026)

If some regular reporting related to OS-Eval is established, it will be a good legacy of SynObs!!

- Are there any available funds for this?

★ 4. Supporting DA scheme development

- ◆ Support the DA-TT seminar series
- ◆ Summarize required development for assimilating new-type observation data or exploiting existing data more effectively (May not be difficult. But effective?)
 - Set up the discussion at the Tsukuba Symposium(?)
 - Ideally, we should involve relating observational communities.
- ◆ Observation campaign (Advanced target if feasible)
 - Identify desirable observation campaigns for the DA scheme development and discuss on the implementation of the campaign with the observational community.
 - As an example, we have already proposed collocate observation of atmospheric hyper spectral sounder and Argo floats. Some pilot experiment may be feasible for this.
 - This may generate a invaluable opportunity to enhance the communication with observational community!!
 - Maybe we can combine the campaign with the collaborative OS-Eval project



Symposium toward Synergistic Observation Networks for Ocean and Earth System Predictions (SynObs Kick-off Meeting)

15-18 Nov, 2022, Tsukuba Japan

- ◆ Jointly organized by the OS-Eval TT and CP-TT
- ◆ It will be held by Hybrid or Online. (It will not be postponed this time.)
- ◆ Organized by the original organizing committee and the SynObs steering team.
- ◆ Set up the showcase activities and other discussion related to SynObs.
- ◆ Expect the presentation demonstrating the potential of ocean OS-Eval activities.
- ◆ We also expect the presentation coupled data assimilation, and predictions and the impacts of ocean observation data in the coupled predictions.
- ◆ **The deadline of the abstract submission will be early August.**

★ ➤ Communications

◆ Table on the use of observations in OceanPredict System?

◆ OSE collaboration on the Argo fast salinity drift (on going):

https://docs.google.com/document/d/11a7Srmw8AcWNP_XyPq1Rgd3PtX0vklYdChWHvMik9T8/edit

If you can join, please contact to Yosuke Fujii by E-mail.

◆ The Tsukuba Symposium organizing Committee & SynObs Steering Team Meeting

At early or mid April?

◆ Next Meeting

➤ In late May or June?

➤ We may have invited talks on SOOS and/or the observing system evaluation activity in ECCO group

➤ SynObs will be adopted by the UN Decade and will officially start!

A large, powerful ocean wave is shown crashing, with a massive wall of white foam and spray rising from the base of the wave. The water is a deep blue-green color. The word "Backup" is overlaid in the center of the image.

Backup

Combination of observations targeted in SynObs



1. **Satellite altimeters, satellite ocean current observations (SKIM) and Argo floats**
 - For WBC, eddies ⇒ OST-ST, SWOT community, Argo ST
2. **Argo floats, Tropical Moorings, and satellite altimeters in the tropical regions.**
 - For equatorial waves, ENSO, extreme climates ⇒ TPOS, Argo ST
3. **Satellite SSS, Moorings, Argo floats, and sea surface atmospheric parameters**
 - For Fresh water budget(?) ⇒ ESA, NASA(?)
4. **Satellite SST, Moorings, Argo floats, and sea surface atmospheric parameters**
 - For coupled data assimilation ⇒ CP-TT, WWRP/WCRP-S2S
5. **Satellite ocean colour observations and in-situ (Argo) observations**
 - For BGC applications ⇒ MEAP-TT
6. **Observations of sea ice concentrations and sea ice thickness**
 - For the polar regions ⇒ Arctic Observation Community (Greg Smith?), Sat Agencies?
7. **Coastal ocean radars and sensors, gliders, drones, satellite remote sensing, and Argo floats**
 - COSS-TT, CoastPredict

I hope the targets combinations can be changed considering the interests of participants and requests from other communities

