

OSEval Task Team

Co-chairs: Yosuke Fujii (JMA/MRI), Elisabeth Rémy (MOi)



- **TT activities since last OPST meeting in June 2022**
- Online meetings mostly focus on SynObs UN Decade project (“Synergistic Observing Network for Ocean Prediction”): Presentations and recordings on the OceanPredict website:

<https://oceanpredict.org/science/task-team-activities/observing-system-evaluation/#section-meetings>

- Table on the **use of observations in OceanPredict Systems**

(Updated every three months):

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

- Set up of a list of Nature Runs:

[ListNatureRun.xlsx - Google Sheets](#)

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			



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

OSE 1. Real time data used at they are in an **operational set-up**

OSE 2. Same as OSE 1 but **real time** Argo floats included in the **gray list** are discarded.

OSE 3. Same as OSE 2 but with the **delayed-mode** Argo GDAC data

OSE 4. Same as OSE 1 but the **real time** Argo data are assimilated **without using the QC flags**.

Design and results shared in a google doc: JMA, ECMWF, NERSC are participating.

Preliminary conclusions from the OSEs: **The QC activity by the Argo GDAC** (real-time and delayed mode QCs and the gray list) mitigates the spurious increasing trend of the global salinity mass and, thus, **contributes to reliable ocean reanalysis**.

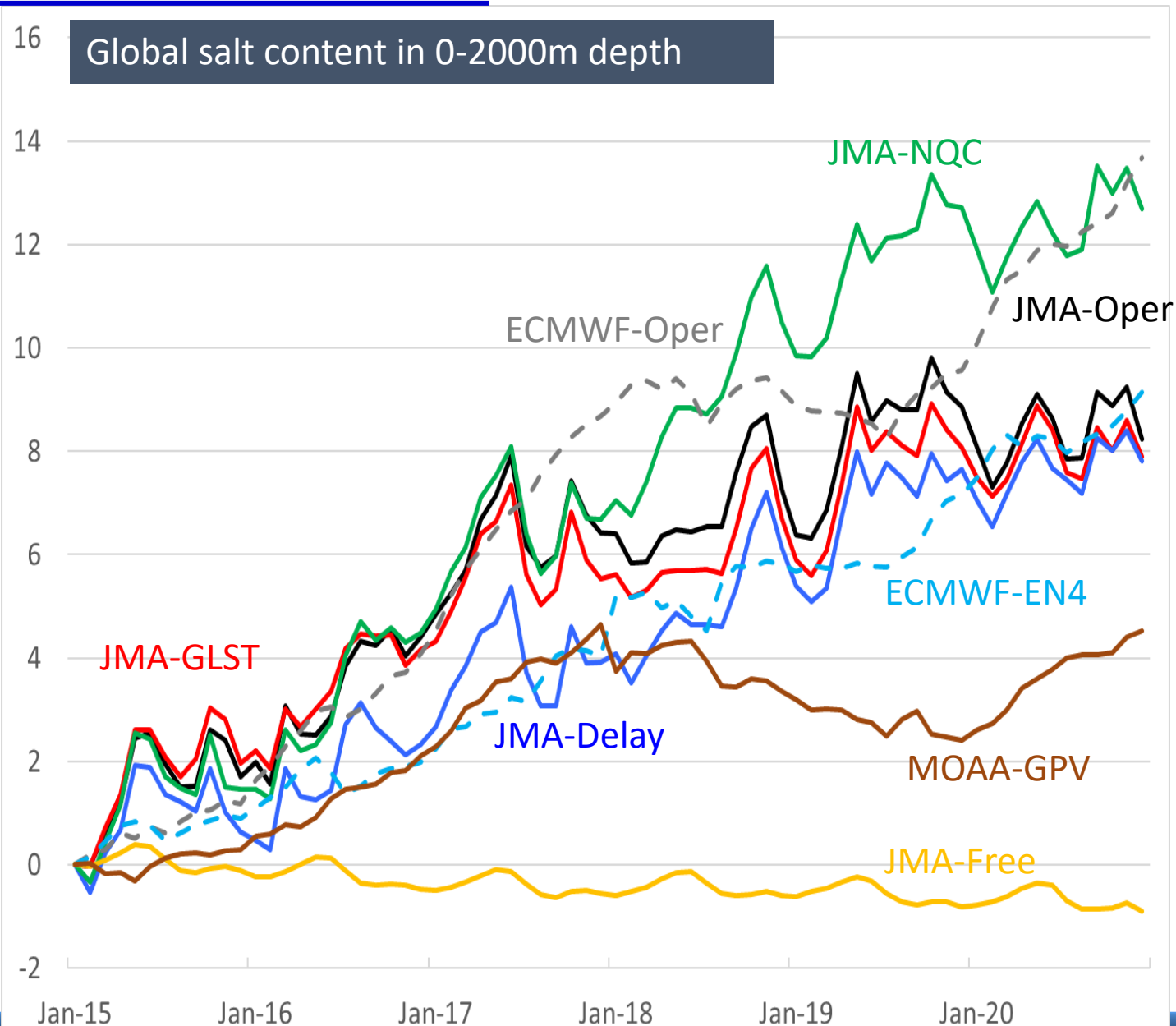
Message from Argo: **Use of latest delayed mode Argo data sets on the GDAC as soon as available instead of real time Argo observations** to benefit for improved QC to identify “faulty” floats.

Strong connection with the Argo ST:

- OSEs for salinity were discussed with Peter Oke (Argo ST member, OSEval TT co-chair in the past)
- Presentations at the Argo Science Team meeting (Brussels, 2022) from different TT co-chairs : organisation of a session dedicated to modeling and assimilation.
- *Funds may not be sufficient to extend the network as planned for « OneArgo »*



★ Global Salt content time series.



- Global salinity content is almost conserved in JMA-Free
- But it has increasing trend in other 4 OSEs in JMA and 2 OSEs in ECMWF.
- Objective analyses also has the trend.
- Results are consistent between JMA and ECMWF
- Real Time QC by the Argo GDAC effectively mitigate the trend in JMA.
- The gray list and delayed mode QC and using EN4 in ECMWF also contribute to reduce the trend.
- We can infer that the trend is mainly induced by ASD.
- The difference between JMA-GLST and JMA-Delay becomes small in 2020 because the ratio that the delayed mode data are available is decreasing.
- **The QC activity by the Argo GDAC contributes to reliable ocean reanalysis.**



SynObs Kick-Off and OS-Eval/CP-TT workshop, 15-18 November 2022, Tsukuba, Japan Hybrid event



Workshop themes

1. Co-design and evaluation of ocean observing systems: their needs and achievements
2. Data assimilation development for better use of observation data
3. Ocean modeling and initialization in earth system predictions
4. Discussion on the future activities of OS-Eval TT, CP-TT, and SynObs:
 - Setup of SynObs activities
 - CP-TT contribution to UN Decade of Ocean Science (ForeSea and SynObs)
 - Enhancing communication across ocean and coupled predictions and observational communities for more effective use of the ocean observation data

➤ **All (almost) presentations and the workshop summarizing report are available online:**
<https://oceanpredict.org/archived-events/synobs-kick-off-and-es-eval-cp-tt-workshop/#section-presentations>

Invited/external talks:

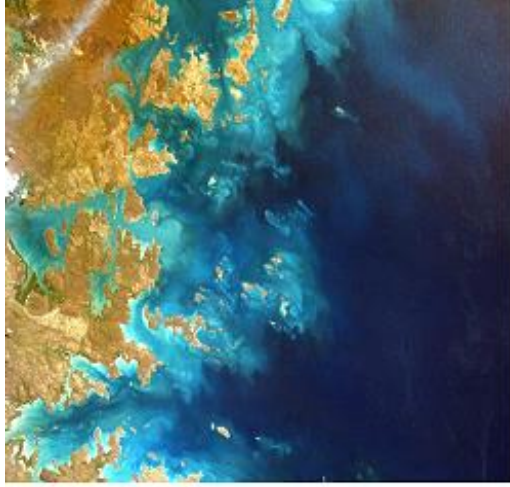
- ◆ Potential NASA **GEOS Nature Runs** for Next Generation Colocated Air-Sea Measurement Satellite: Dimitris Menemenlis (NASA-JPL, US)
- ◆ The **WMO Rolling Review of Requirements process: Ocean perspective**: Marilaure Gregoire (Liège University, Belgium)
- ◆ Ongoing efforts at **NOAA** to develop a global ocean **Observing System Simulation Experiment capability**: Lidia Cucurull (NOAA, US)
- ◆ Coastal ocean data assimilation with **fishing vessels**: Naoki Hirose RIAM, Kyushu University, JP
- ◆ **Argo** salinity: Annie Wang from ARGO ST
- ◆ **Gliders**: Victor Turpin from OceanGliders
- ◆ **ObsCode UN decade program** presentation by David Legler NOAA US: Strengthening ocean observation and modelling integration through co-design of a fit-for-purpose ocean observing system

} observations

Comments on organizing the workshop in the hybrid style (by Yosuke Fujii):

- ◆ We have **many remote participants** from broad areas (an advantage of web meeting)
 - ◆ Although only a **few international guests** attended the meeting in person, but they **are very supportive**.
 - ◆ **Difficulty due to the difference of time zones** (Especially in Japan)
 - ◆ **Hosting midnight sessions is not appropriate**. I should have asked others to host midnight sessions.
 - ◆ It is **difficult to have in-depth discussions** in a hybrid meeting.
- **The hybrid style is not always the best solution!**





Joint EuroSea/Ocean predict workshop
Ocean Prediction and Observing System Design
29 June – 1 July 2022, Met Office, UK

- Session 1: OSEs & OSSEs in support of observing system design
- Session 2: Extreme marine events – observing, modelling, forecasting and user accessibility
- Session 3: Coastal Ocean: Modelling, observing system design and product utility
- Session 4: EuroSea & OceanPredict – support for the UN Ocean Decade

Recommendations from the round table discussion:

- need for better communication and closer collaboration of the observation and prediction communities,
- importance to involving intermediate and end-users in questions of ocean observations,
- consideration of a fully integrated ocean observing system (including all regions and observation types),
- plan to create a fully ocean information value-chain (from user needs, to observations, data assembly and distribution, ocean prediction and services to user and societal benefits)
- value of defining and describing all processes involved in operational oceanography through ocean best practice methodology.

<https://oceanpredict.org/archived-events/eurosea-oceanpredict-workshop-june-2022/#section-home>

- **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
 - Advance on common OSE to evaluate the impact of the Argo salinity drift

- **TT outreach plans**

Presentations of OSEval studies at different conferences.

- Plan to continue to invite people from the observing networks to the meetings
- Some TT members participate to the ObsCoDe exemplar meetings.
- WMO workshop on the impact of Various Observing Systems on NWP and Earth System Prediction, planned in May 2024: Yosuke Fujii member of the SOC: discussion ongoing on the science question to be raised.



- **TT events planned**

Continue web meetings (which are generally common with the SynObs web meetings)

- **Challenges:**

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

SMART cable that measures Ocean Bottom Pressure,

gliders,

fishing vessel observation (example in Tasmania), ...

- 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 *and soon ecosystem observations?*



- **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.
- **How do we answer to WMO/IOC request on ocean observation needs as OceanPredict and not only at the OSEval TT level?**
- **Server or data storage to share the data and information among OceanPredict community (such as US GODAE sever ...)**
 - Nature Run and OSE/OSSE common results



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

SynObs project: Yosuke Fujii presentation

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

- **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, ...
- But currently considering the possibility to manage the SynObs web pages by ourselves ...
- Support to secure a **server (or web storage)** for sharing SynObs flagship OSE data (about 300TB at maximum) and OS-Eval showcase (~100GB)

- **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, ...), web sites, Journal Special Issue ...

