OPST-11, Online
12UTC, Sep. 23rd, 2025

OS-Eval TT & SynObs Update

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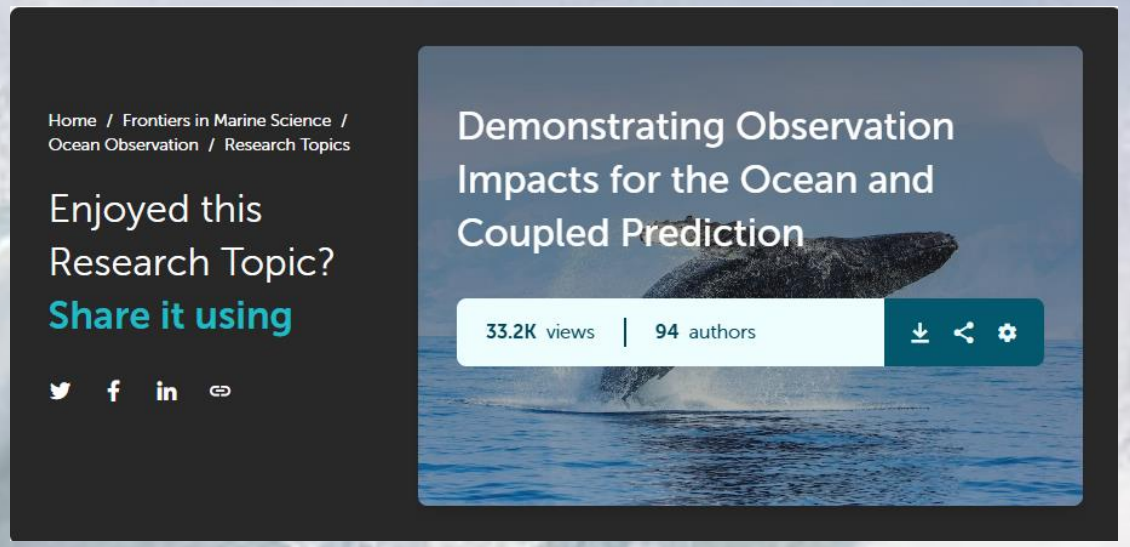
☆ Frontiers in Marine Science Special Collection (Completed)

- Special Collection Web Page
  https://www.frontiersin.org/research-topics/58025
- 18 articles, 94 authors, 33.2K views
- Editorial Paper (Oke, et al.)
  https://www.frontiersin.org/journals/marine-science/articles/10.3389/fmars.2025.1588067/full
- The first introductive paper on SynObs flagship OSE. (Fujii et al.)
  https://www.frontiersin.org/journals/marine-science/articles/10.3389/fmars.2024.1476131/full
- Other valuable papers OS-Eval Studies.
- eBook has been generated.
  https://www.frontiersin.org/research-topics/58025/pdf



SynObs flagship OSEs

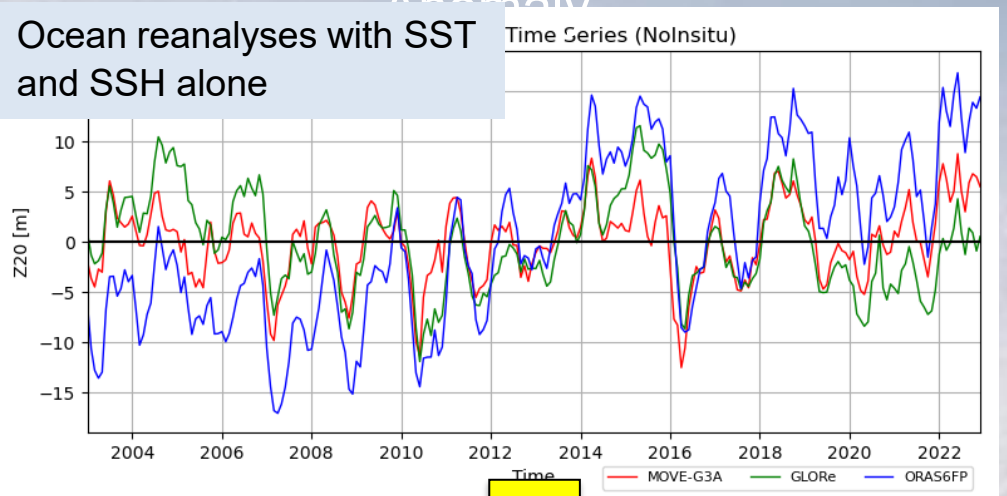
- Implemented in the **UN Ocean Decade Project SynObs**
- Internationally coordinated **OSEs using multiple ocean reanalysis and prediction systems** with a common setting
  - **Observing System Experiment (OSE):** Reanalysis/prediction experiment to examine the sensitivity to observation data
- **To make robust evaluation** which does not depend on a particular system
- Results are stored as netCDF files in **a public database** and volunteer groups analyze observation impacts.

https://www.jamstec.go.jp/jcope/distributions/SynObsDB/

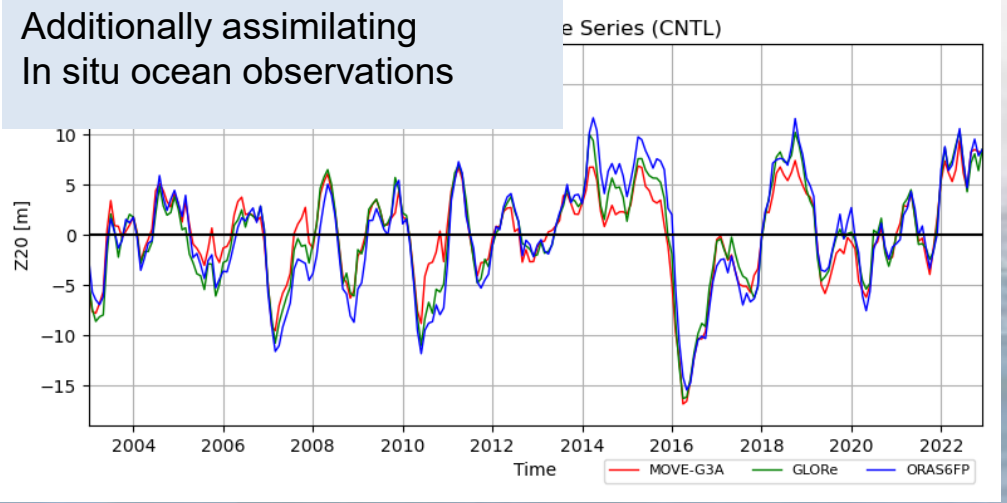
- Observation impact can be demonstrated by reduction of **multi-system Ensemble Spread (MSES)**, which represents **uncertainty** of analyses.
- For example, assimilating ocean observations effectively reduces MSES, i.e., the uncertainty of **Eq-Pac Warm Water Volume (WWV)** analysis (right figure).
  - **Eq-Pac WWV:** Depth of 20˚C isotherm (Z20) averaged over 5˚S-5˚N, 120˚E-80˚W.

Timeseries of Eq-Pac WWV Anomaly

Ocean reanalyses with SST and SSH alone



Additionally assimilating In situ ocean observations



Systems: MOVE-G3A (JMA), GLORe (NOAA-CPC), ORAS6FP (ECMWF)

★ Data Submitted to flagship OSEs

➢ Data Collection for OP Analysis

System	Center	OSEs	Period
FOAM	UKMO	CTL, NoAlt, NoArgo, HalfArgo, Free	2020-2022
GIOPS	ECCC	All OSEs	2020-2022
JCOPE-FGO	JAMSTEC	CNTL, NoAlt, NoArgo	2020-2020
MOVE-G3F	JMA/MRI	All OSEs except Oper	2020-2022
MOVE-NPR	JMA/MRI	CTL, NoAlt, NoArgo	2020-2020
OPEM_MOM5	Pukyon U.	CTL, NoAlt, NoArgo, HalfArgo, Free	2020-2020
ORA6FP	ECMWF	CTL, NoALt, NoArgo, NoInsitu, NoMoor, NoSST, Free	2020-2022

➢ Data Collection for S2S Analysis

System	Center	OSEs	Period
GLORe	NOAA-CPC	CNTL, NoInsitu, Free	2003-2022
MOVE-G3A	JMA/MRI	All OSEs except Oper	2003-2022
ORA6FP	ECMWF	CNTL, NoAlt, NoInsitu, NoSST	2003-2022

- **SynObs is now seeking volunteer groups who analyze the flagship OSE results in the database.**
- Possibility to add No-US-Argo OSE

SynObs & Ocean Observing Codesign Joint International Workshop, 2026

- Period: 24 (Mon) – 29 (Sat), Aug., 2026.
- Location: Mutsu, Japan (Shimokita Culture Hall) https://shimobun.com/ (Japanese)
- Format: In Person and Online (Hybrid), English
- Expected number of in-person participants: 50 people
- Jointly organized with 30th Data Assimilation Summer School on in Japan (DASS, 26 (Wed) -30 (Sun))
  (DASS plans to accept up to 10 international students and several international guests)
- OPPO created the workshop webpage. The first SOC will be held early October.
  https://oceanpredict.org/events/synobs-ocean-observing-co-design-joint-international-workshop

Tentative Schedule

Date	Science Events	Social Events
24 (Mon)	Open Session (AM. PM)	Workshop Dinner
25 (Tue)	Open Session (AM, PM)	
26 (Wen)	Open Session (AM, PM)	
27 (Tur)	Open Session (AM)	Excursion and Barbecue (with DASS)
28 (Fri)	Inner Meeting (AM, closed)	Special Lecture for DASS
29 (Sat)		Town Hall Meeting

Other Activities

- The table of the observation data in ocean prediction systems is currently in the process of updating.
  https://oceanpredict.org/observations-use/#section-argo-profiling-floats

- Ocean Science Meeting 2026
  SynObs organizes a session jointly with Ocean Observing Co-design

- Presentation in the GSOP session in the Pan-CLIVAR Meeting

- Ready to contribute to the NASA ODYSEA mission

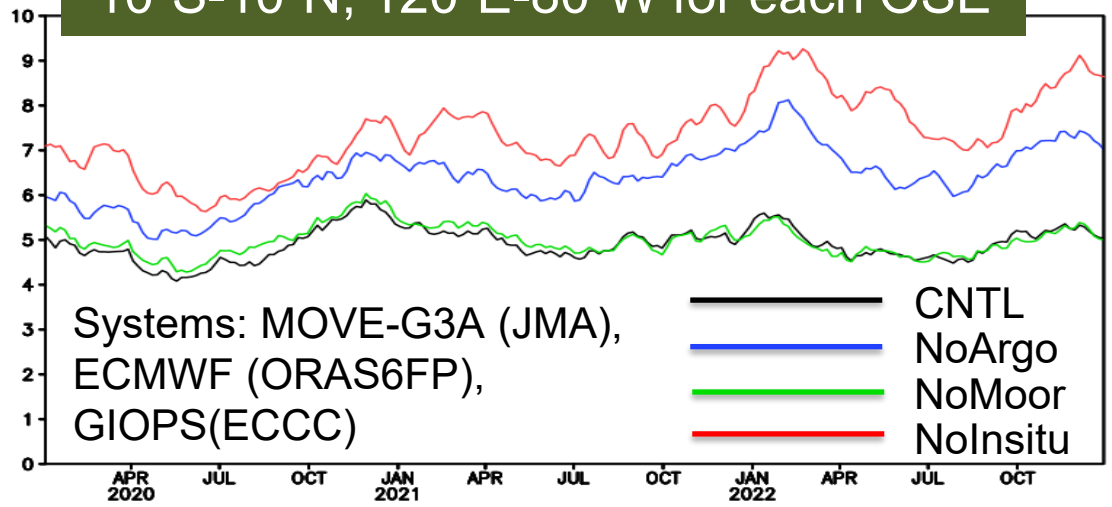
- Since SynObs will end at June 2026, we need to submit follow-on project (SynObs2) to the next UN Ocean Decade action call.

Z20 MSES Reduction by In-situ Observations

- Moorings and ships have substantial impact if Argo is absent (NoInsitu - NoArgo).
- Impact of moorings complementary to others is notable in the east. Eq. Pac. (NoMoor – CNTL)
- Argo data have large impact complementary to others in broad area (NoArgo – CNTL)

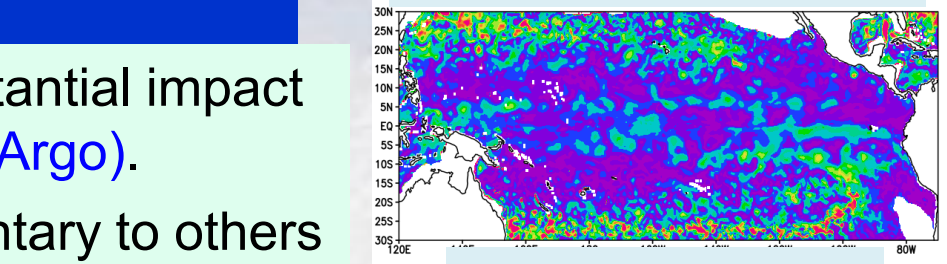
Impacts on predictions will also be investigated!

Time Series of Z20 MSES averaged in 10˚S-10˚N, 120˚E-80˚W for each OSE

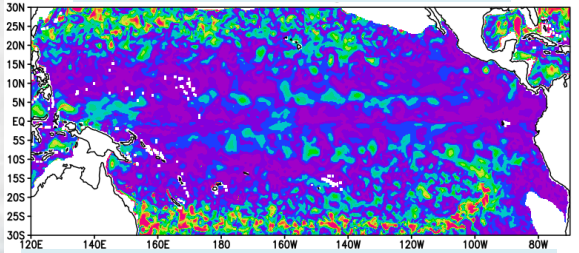


MSES of Z20 (2020-

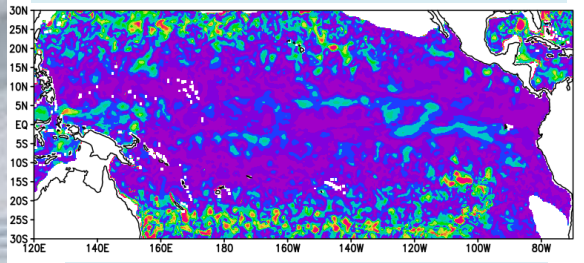
NoInsitu (without all In situ)



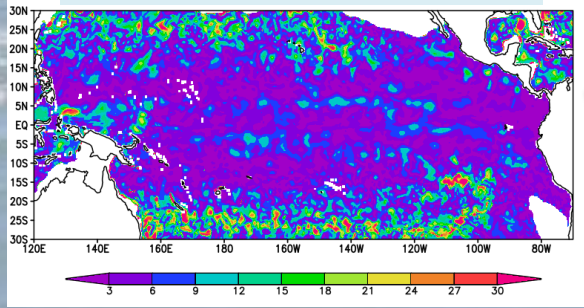
NoArgo (without Argo)



NoMoor (without moorings)

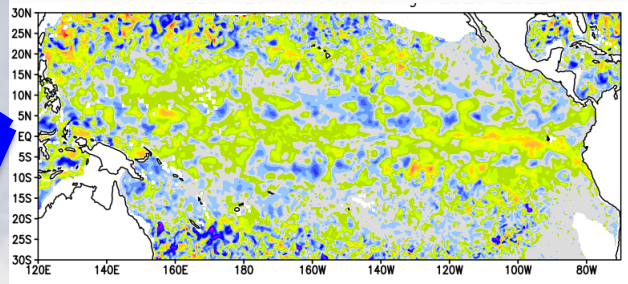


CNTL (regular reanalyses)

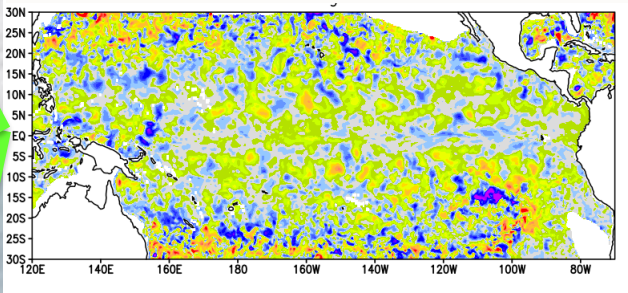


Difference of MSES

NoInsitu – NoArgo (Impact of moorings and ships if Argo is absent.)



NoArgo – CNTL (Impact of Argo complementary to others)



NoMoor – CNTL (Impact of moorings complementary to others)