DC2: Probabilistic short-term forecasting of global ocean dynamics

Task description

Probabilistic short-term (a few tens of days) forecasting of upper ocean dynamics (scalar and vector fields) from gridded satellite-derived data (2D+T and sparsely sampled fields) and ARGO float data (sets of vertical profiles).

Training datasets

- **Satellite data:** Nadir altimetry and SWOT measurements for SSH, SST, SSS
- **ARGO data:** MLD, with added T, S, U, V for different depths in the 3D case.
- **Ocean simulation data:** e.g. eORCA36.
- **Atmospheric forecasts:** up to 10 days.

Evaluation metrics / data

Standardized outputs for all solutions: global scale at daily 0.25° resolution for the following variables

- **Case I:** SST, SSH, SSS, U, V, MLD
- **Case II:** T, H, S, U, V, MLD from surface to bottom

Usual metrics for probabilistic forecasting: CRPS, spread-skill ratio, for surface variables, and then in 3D.

Data: data from 2023 to 2024 will be available as inputs during inference

- gridded atmospheric forecasts up to 10 days lead time
- sparse (L3) satellite data for sea surface variables
- ARGO float data

L3 satellite-derived and ARGO data will also be used to evaluate the considered performance metrics.

Baseline solutions

Operational product (CMEMS GLO Forecast) and deterministic ML baselines for the emulation of ocean dynamics (XiHe, GLONET) using the initial conditions delivered by the operational system (CMEMS GLO Forecast).

References

- Price et al. (2023)
- Wang et al. (2024)
- Lam et al. (2023)
- Pauthenet et al. (2022)
- Chattopadhyay et al. (2024)
- El Aouni et al. (2024)