A Non-linear Quality Control Procedure for Representativeness errors in Ocean Historical Datasets



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Objectives

In-situ ocean observations are fundamental in our understanding of the ocean state, from short to climate time scales. In order to estimate the **low frequency variability** of the ocean essential variables, temperature and salinity, a robust quality control procedure is essential. Uncertainties in the oceanographic in-situ data are complex because the historical data collections do not properly sample the ocean variability in order to extract the long term temporal average of the state variables.

Historical collections of measurements are affected by different kind of uncertainties:

Systematic Errors

Gross Errors: Human Errors, transmission error, malfunctioning of the instruments, wrong formatting and archiving of data/metadata, etc.

Natural Errors

- Casual Errors : Instrument limited precision or possible bias of sensors
- **Representativeness Errors:** Inability of the sampling scheme to resolve the multiple oceanic scales.

We should remove as much as possible these uncertainties before doing any analysis!! Here we propose a new method called: NONLINEAR QUALITY CONTROL PROCEDURE



Historical Dataset



Implementation area North West Pacific



Regime Oriented Division



Regular Division

Profiling floats 2003-2018 from World Ocean Database-18 using all the Quality Flags of WOD18: WODf and WODp



Conclusions

- NQC removes the high frequency signals connected to representativeness errors more efficiently.
- Dynamical subregions make the NQC procedure converge, rejecting
- a relatively low number oprofiles as compared to regular subdivisions.

References

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