



Regional accuracy of global ARGO-based monthly mixed layer property estimates: depth, temperature and salinity.

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The ARGO global array of profiling floats has been sampling the upper 2 kilometers of the global ocean for several years now. The interest of these global measurements for climate monitoring and research is certain, but their accuracy in depicting the climate-relevant spatial and temporal variability of mixed layer heat/salt contents remains unclear.

In this study, we make use of a DRAKKAR $1/4^\circ$ global ocean/sea-ice 50-year simulation to assess the sampling error of the existing ARGO array at global scale within $30^\circ \times 30^\circ$ monthly bins in terms of mixed layer depth (MLD), temperature (MLT), salinity (MLS), heat and salt contents. Statistical regional estimates of these time-varying sampling errors are obtained by comparing full model fields with ARGO-like model-derived T/S profiles.

The sampling errors derived from this eddy-admitting solution depend on the number and distribution of drifters in each bin. Monthly MLD/MLT/MLS sampling error maps reveal non-zero annually-averaged values reaching $\pm 10\text{m}/2^\circ\text{C}/0.4$ over certain regions, with maximum values reaching $\pm 100\text{m}/5^\circ\text{C}/1.0$ at certain periods of the year.