



Determining ocean correlation scales using Argo float data

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The scales over which ocean properties vary play an important part in the assimilation of ocean data. In this study Argo data has been used to develop a method of estimating the correlation scales of salinity on a potential temperature surface. The correlation scales of both salinity, and salinity anomalies relative to a reference field from WOA05 have been examined. For the development of the method, three test regions in the Pacific Ocean were chosen and scales are estimated on the 6° theta surface.

For pairs of data in a region, the difference in salinity is found. To determine scales in the mean field all pairs of data from one year are used. To determine scales in the anomaly field 7 years of Argo data is used but pairs are only included when the observations fall within a 10-day window. The salinity differences are then divided into 50 km bins according to the distance between the data points. The median difference in salinity is then calculated for each bin. A curve is fitted to the data varying exponentially from the near field to a far field limit based on a function devised by Bohme and Send [Bohme, L. and U. Send, 2005 Deep Sea Research II, 52, 651-664]. By varying the scale parameter in the equation and finding the best fit to the data (the lowest rms error) a best estimate for the correlation scale is found.

This method will be used to estimate correlation scales across the global ocean so that the regional variation of these scales may be examined.