Assessing Mixed Layer Depth Variability And Sub-Polar Frontal Dynamics In The NE Atlantic

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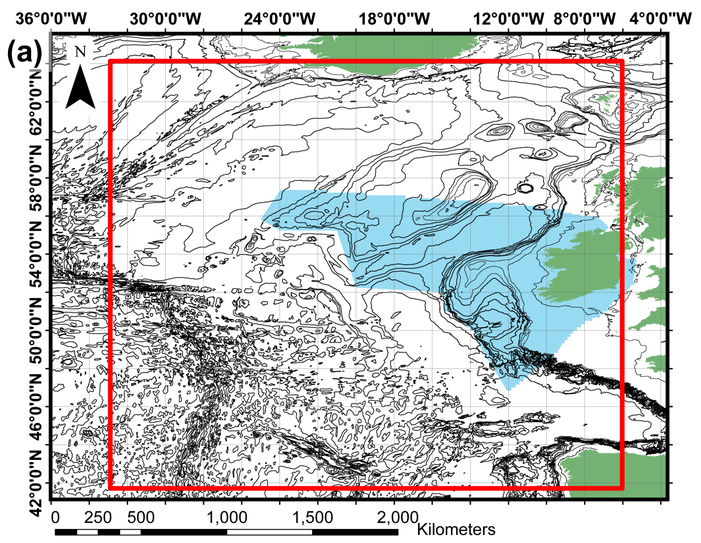
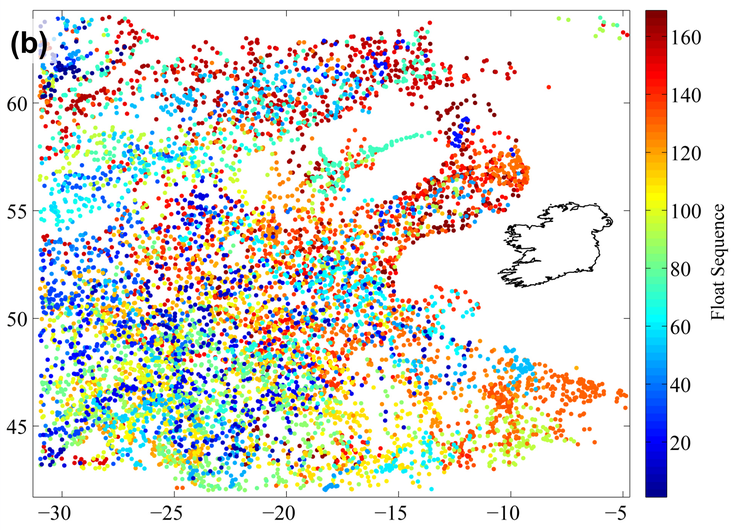
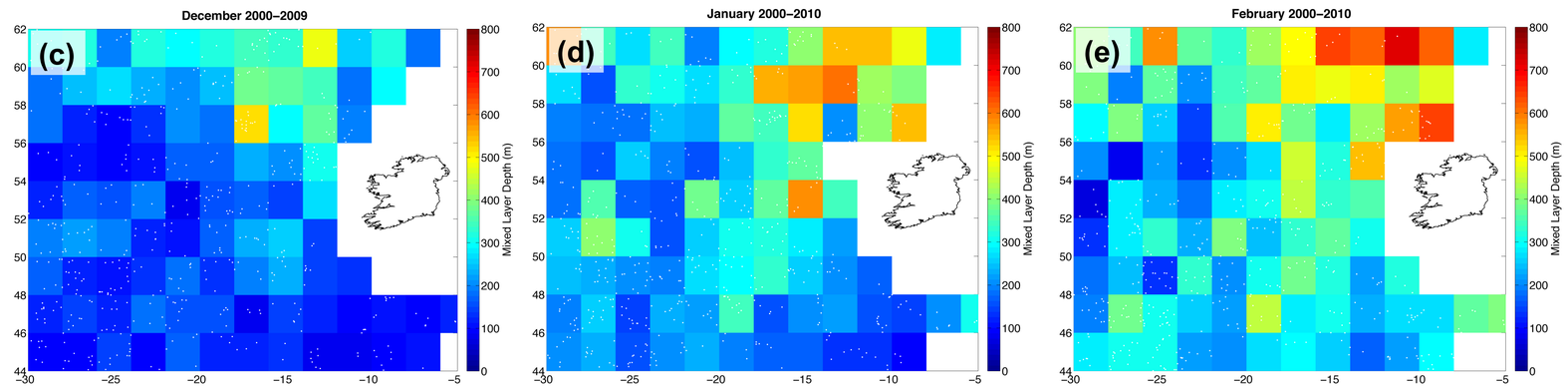
Introduction. This poster represents a preliminary look at Argo float data in the eastern North Atlantic (42-64N; 31-5W) between the years 2000 to 2010.The data was will be used to investigate the spatial and temporal variability in mixed layer depth as well as the spatial variability in the frontal structures present between the NE Atlantic water masses. A total of 169 floats that sampled in the area are used. The data used is Argo delayed mode data.

(a) The topography of the NE Atlantic is shown. The coverage of the Argo data used is bordered with a red box. The Irish EEZ is highlighted in blue. (b) A continuous sequence code was assigned to all 169 Argo floats that appeared in the box. The positions of each profile used is shown and colour coded by sequence code.



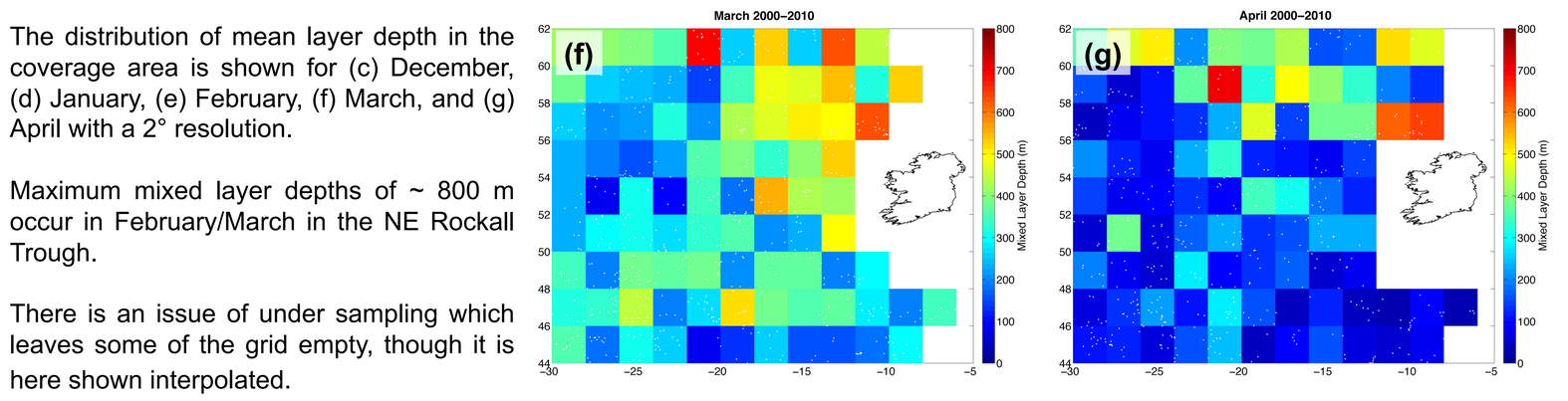


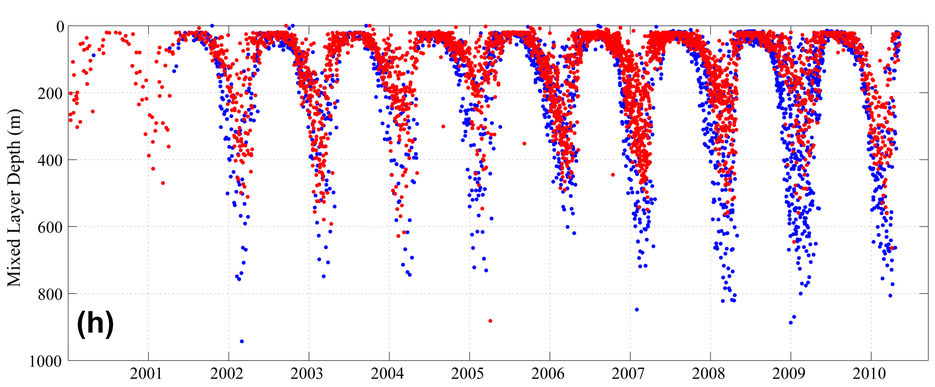


The distribution of mean layer depth in the coverage area is shown for (c) December, (d) January, (e) February, (f) March, and (g) April with a 2° resolution.

Maximum mixed layer depths of ~ 800 m occur in February/March in the NE Rockall Trough.

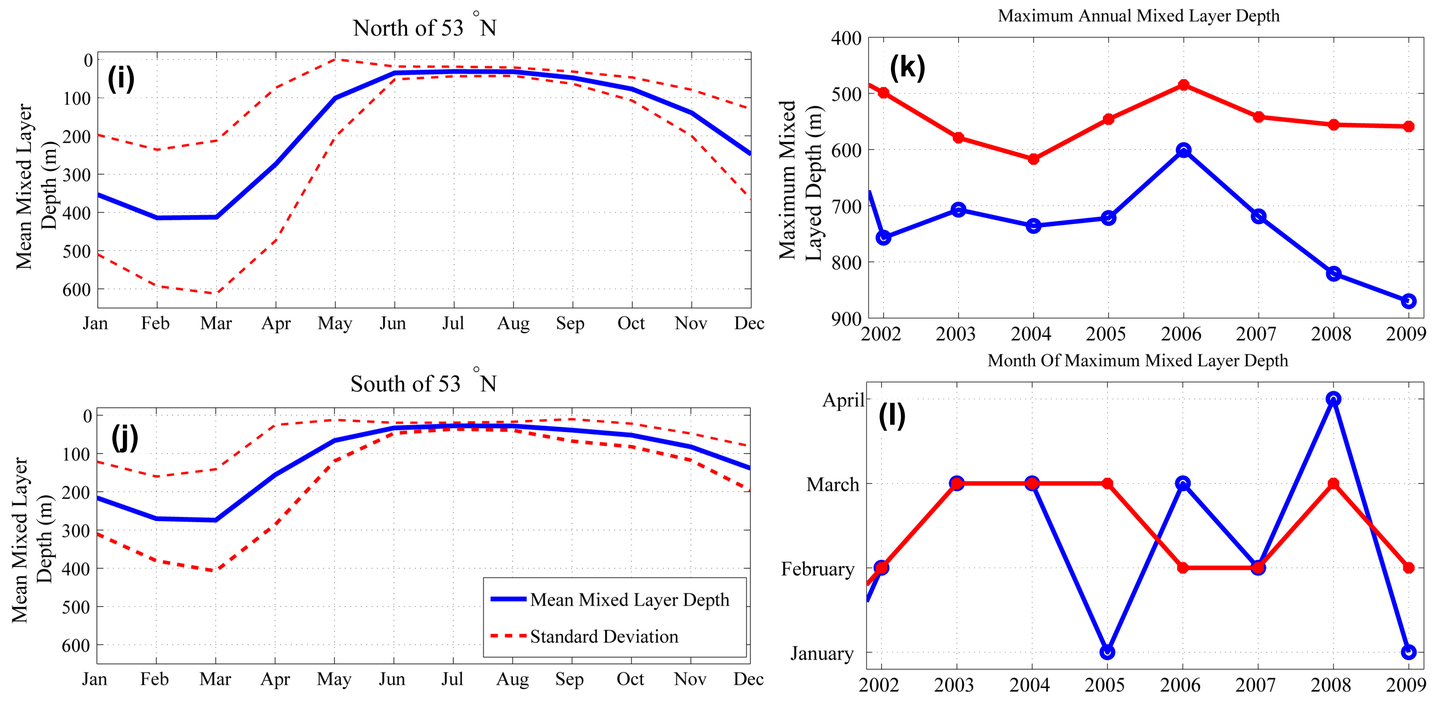
There is an issue of under sampling which leaves some of the grid empty, though it is here shown interpolated.

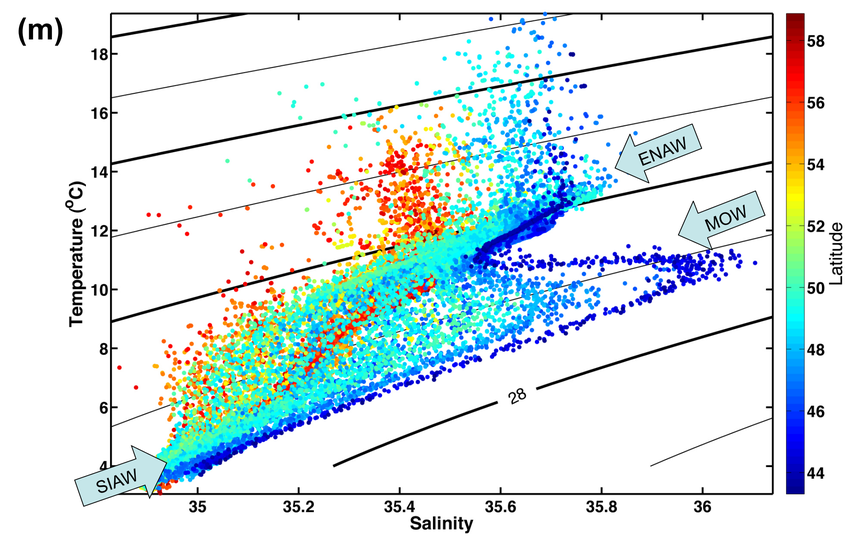




(h) The mixed layer depth over time, north and south of 53 N. (i) The mixed layer depth is deeper in the north than the south. (j) The winter months variability is also greatest in the north.

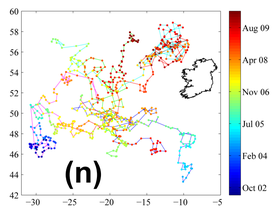
(k) The annual maximum depth of the mixed layer was observed to vary typically between 700 and 800 m in the north and 500 and 600 in the south. The maximum mixed layer depth increased to nearly 900 m in 2009. Climate forcing will be further investigated as a factor in mixed layer depth variability.

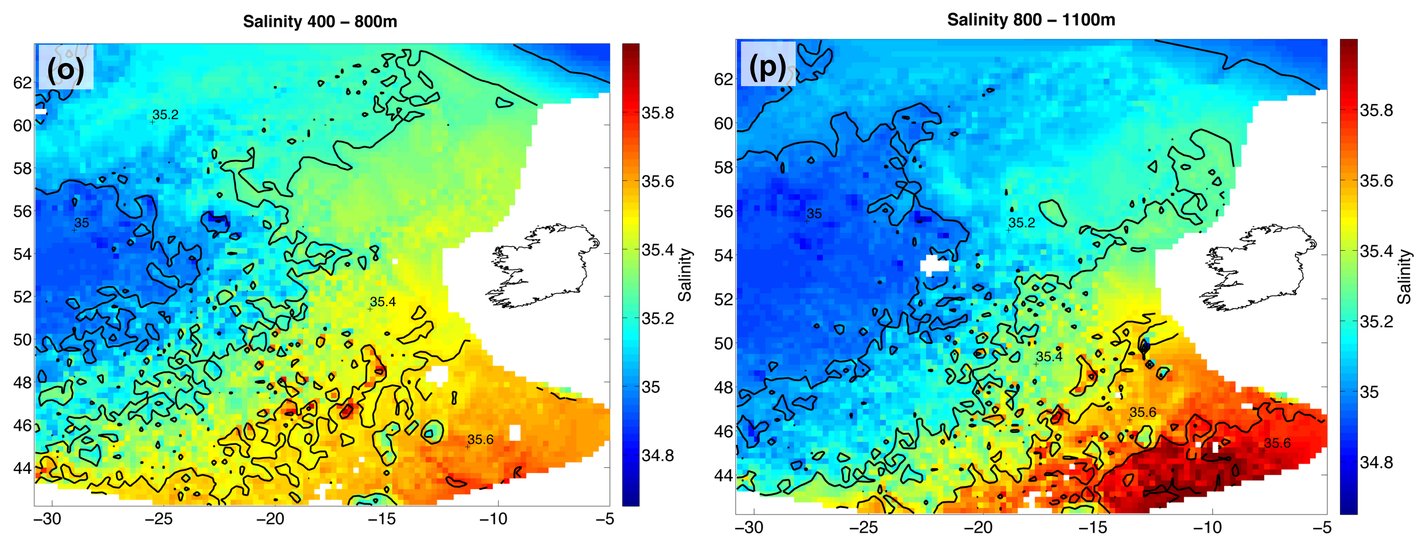




The five floats with the most profiles in the coverage area were used to plot (m) temperature and salinity, colour-coded by latitude.

The interaction between Subarctic Intermediate Water (SAIW), penetrating at σ=27.3 from the west, and Eastern North Atlantic Water (ENAW) and the Mediterranean Outflow Water (MOW) sourced from southern latitudes. The MOW is absent at northern latitudes beyond 54 N. (n) The position of each float of the five floats is shown over time.





The salinity in the coverage area is shown (o) between 400 and 800 m depth and (p) between 800 and 1100 m depth. The MOW is most visible between 800 and 1100 but does not extend north of 53 N.

The frontal conditions between the SAIW and the MOW will be examined following Ulgren and White .

Ullgren and White. Water mass interaction at intermediate depths in the southern Rockall Trough, northeastern North Atlantic. Deep-Sea Res Pt I (2010) vol. 57 (2) pp. 248-257