

Supplement 2

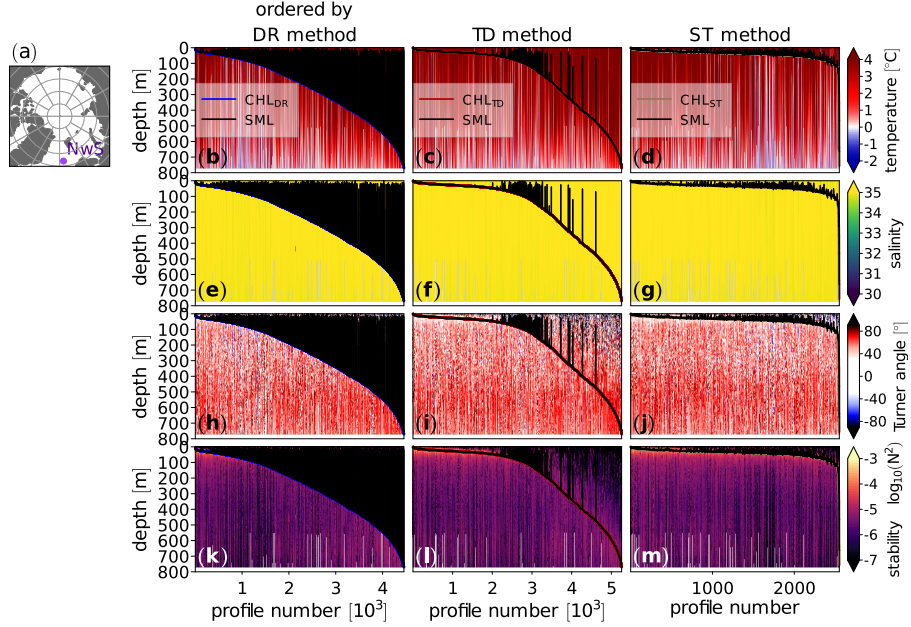


Figure S2. Same as Fig. 4 for 3° radius region around $72^\circ \text{ N } 5^\circ \text{ E}$ in the Norwegian Sea (NwS).

In Figure S2, we compare the methods for determining the CHL base depth in a region in which no CHL is expected. In this case, it is expected that either the CHL and the SML depth match (indicating “no CHL”) or else that the profile is not included in the figure because the criteria for detecting the CHL base were not fulfilled. For the first few profiles in Figures S2a, e, and c, CHL_{DR} matches the SML depth, indicating a correct “no CHL” classification. After this, CHL_{DR} sometimes coincides with the SML depth, and sometimes it does not. In cases in which the classification switches between the detection of a CHL and “no CHL”, an almost vertical line occurs. The length of these vertical lines corresponds to the depth of the (erroneously identified) CHL. Each of the vertical lines indicates at least one incident in which a CHL was erroneously identified. While the DR method erroneously identifies a CHL numerous times, the number of cases in which the TD method erroneously identifies a very shallow CHL (Figures S2c, f, and i) is more limited, and the number of cases with an erroneously detected CHL decreases as the SML depth increases, indicating that false detections of a CHL base below the SML base become less likely with increasing SML depth. For the ST method (Figure S2d), the number of profiles shown is smaller and also the CHL base and the SML base often coincide, implying correct “no CHL” classifications. There are however, still a relatively large number of cases in which the a shallow CHL is erroneously detected as evidenced by short vertical

black lines above the CHL_{ST} . These are cases in which the SML is shallow as well. On the whole, shown more clearly in Section 3.2, for the Atlantic the TD method appears to do best at identifying cases in which no evidence of a CHL is found in the temperature and salinity data. This indicates that an additional condition regarding water temperature may help to avoid misclassifications in the DR method. Imposing an additional condition on water temperature would, however, imply that some of the sensitivity to salinity in the DR method is lost.