

Figure S1. Location of the thermocline in temperature profiles with the proposed method and the VRI method, the MLD determined by the threshold of 0.2°C (B04T) and the criteria (D_{σ} and D_{T-02}) that limit the barrier layer according to de Boyer Montégut et al. (2007). (a) 52.95°S and 90.05°W on 01/23/2003. (b) 60.00°S and 116.86°W on 08/12/2015. (c) 25.13°S and 93.47°W on 01/12/2013. (d) 55.42°S and 162.63°W on 08/12/2020. (e) 1.90°S and 126.07°W on 08/25/2013. (f) 63.23°N and 54.20°W on 02/08/2010. (g) 20.02°N and 41.14°W on 12/15/2015. (h) 56.07°N and 174.91°W on 02/20/2014. (i) 49.00°N and 174.69°W on 12/13/2017. (j) 61.84°N and 54.27°W on 02/01/2016.

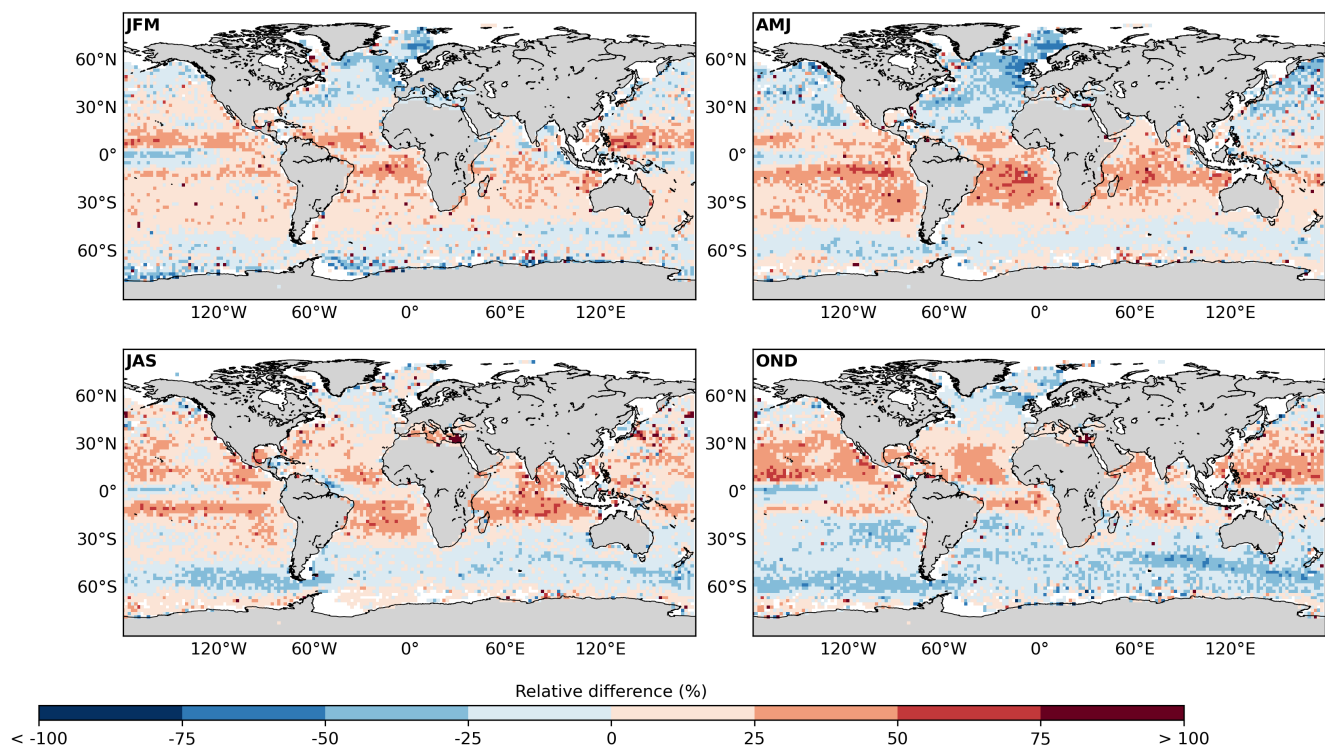


Figure S2. Seasonal relative difference of the MLD results between the proposed methodology and HT09. Averages are shown for the months January-March (JFM), April-June (AMJ), July-September (JAS) and October-December (OND).

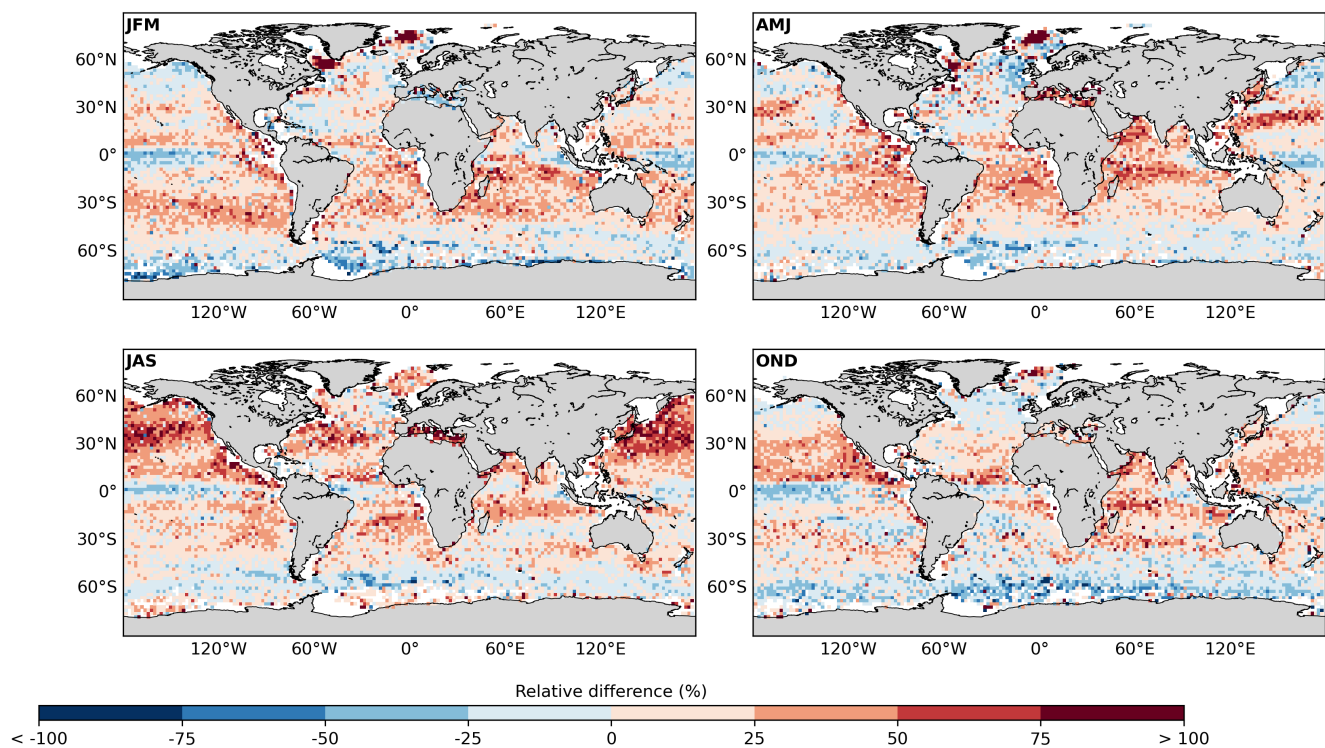


Figure S3. Seasonal relative difference of the MLD results between the proposed methodology and B04D. Averages are shown for the months January-March (JFM), April-June (AMJ), July-September (JAS) and October-December (OND).

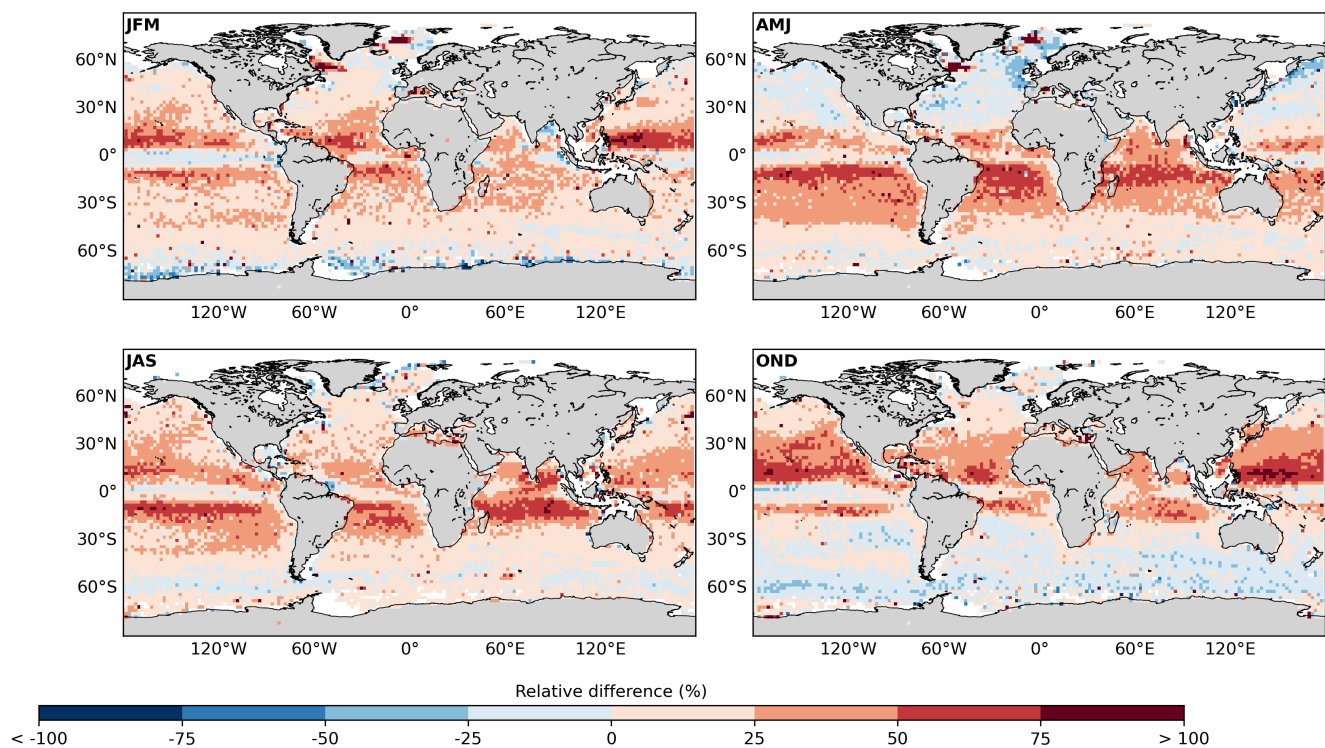


Figure S4. Seasonal relative difference of MLD results between the proposed methodology and B04T. Averages are shown for the months January-March (JFM), April-June (AMJ), July-September (JAS) and October-December (OND).

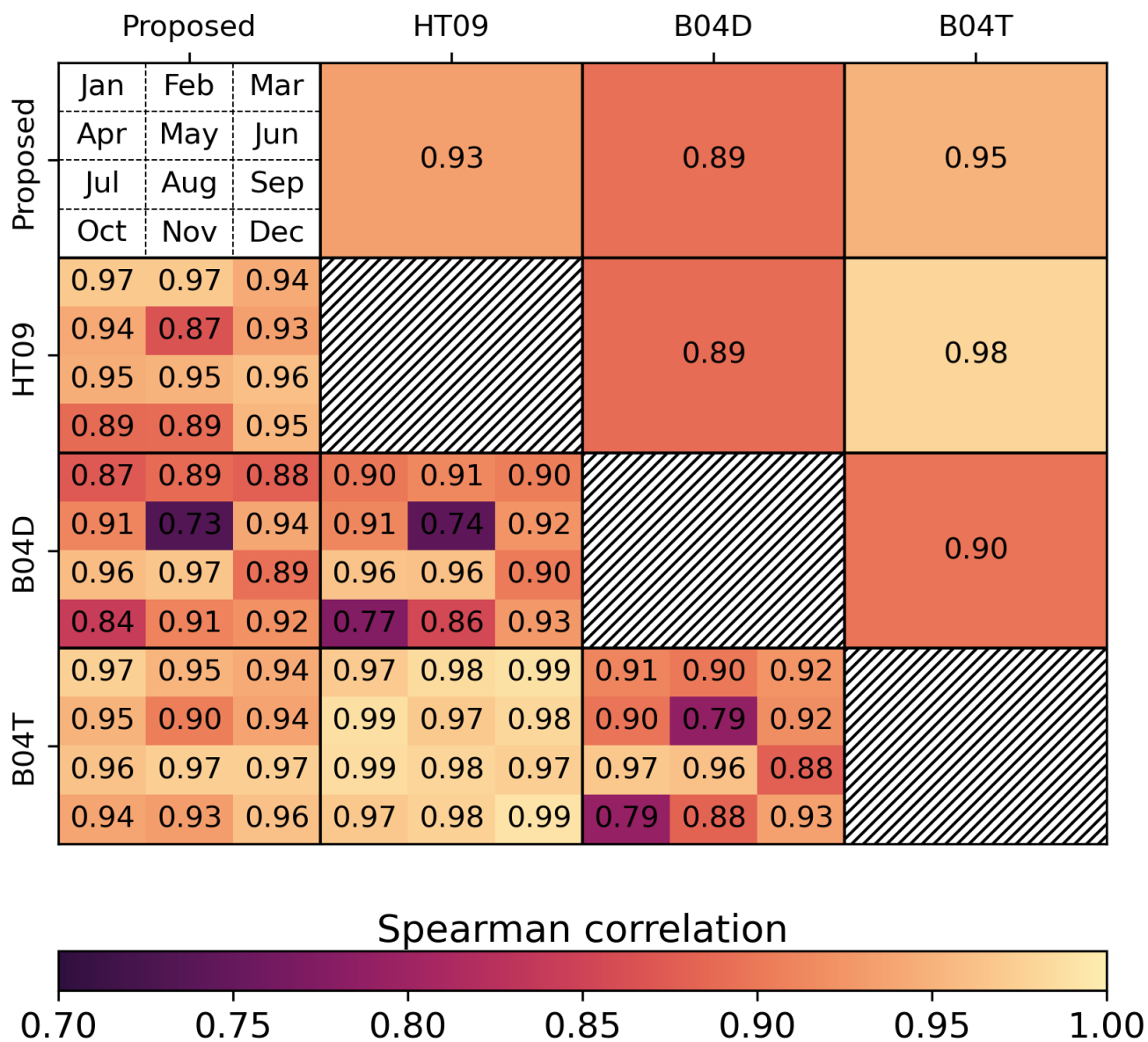


Figure S5. Correlation matrix between the results of the calculation of the MLD of the proposed method, HT09, B04D and B04T. The lower left corner shows the average monthly correlation between methods distributed as shown in the upper left corner. The upper right corner shows the global averages of the correlation between methods.