Supplementary Material

1   SUPPLEMENTARY TABLES AND FIGURES

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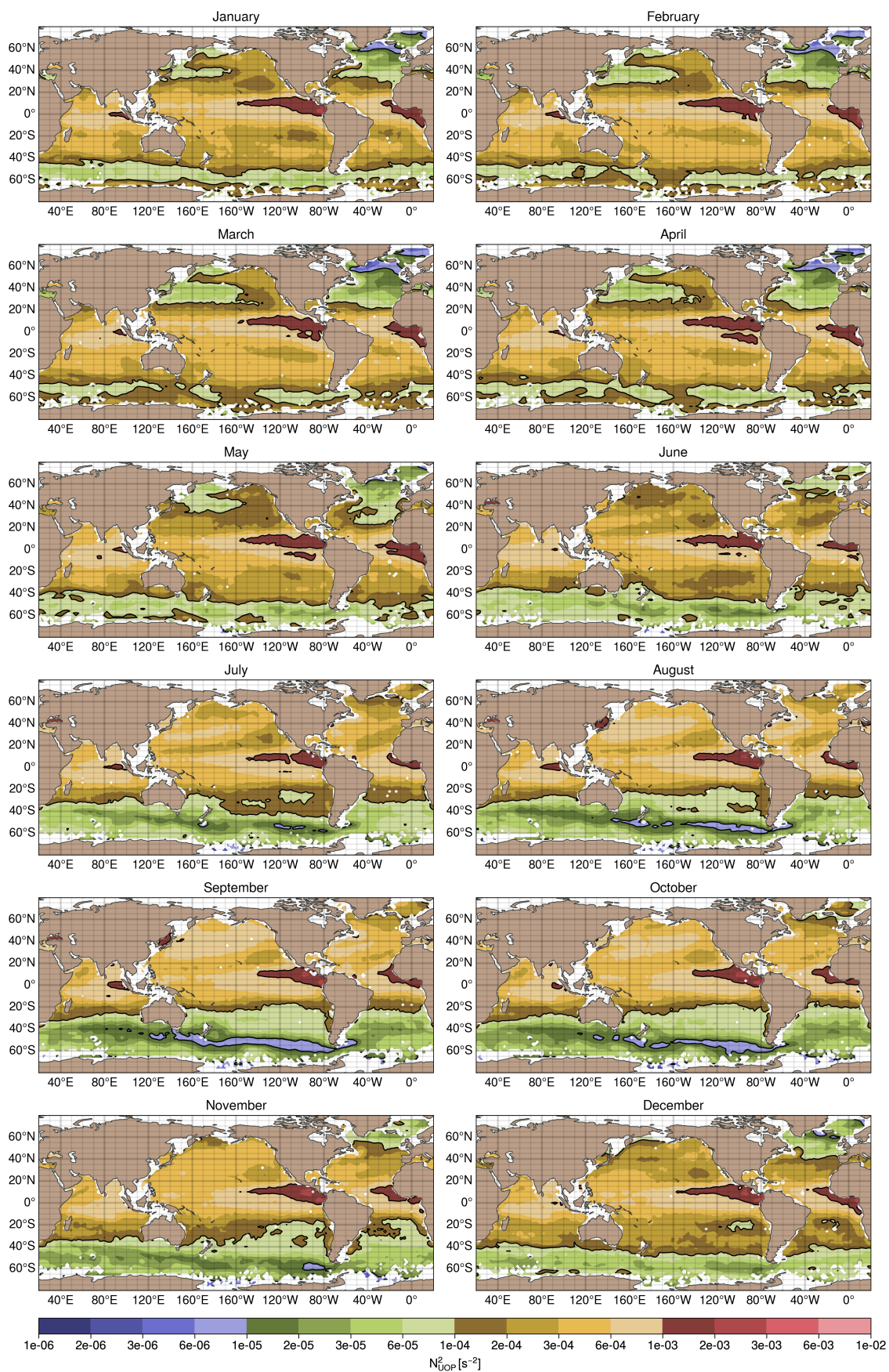
1.1   Figures

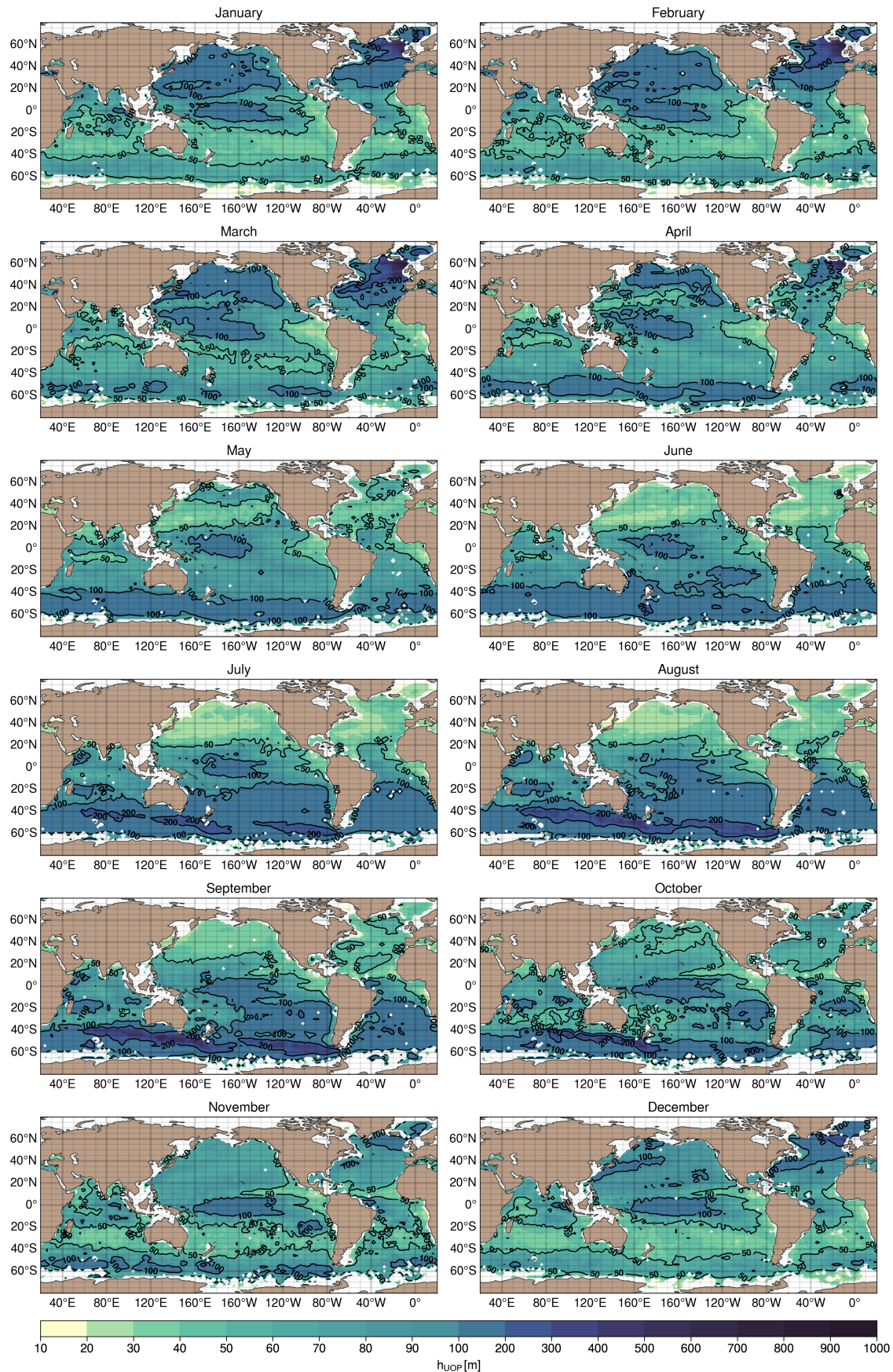**Figure S1.** Monthly climatology of UOP intensity

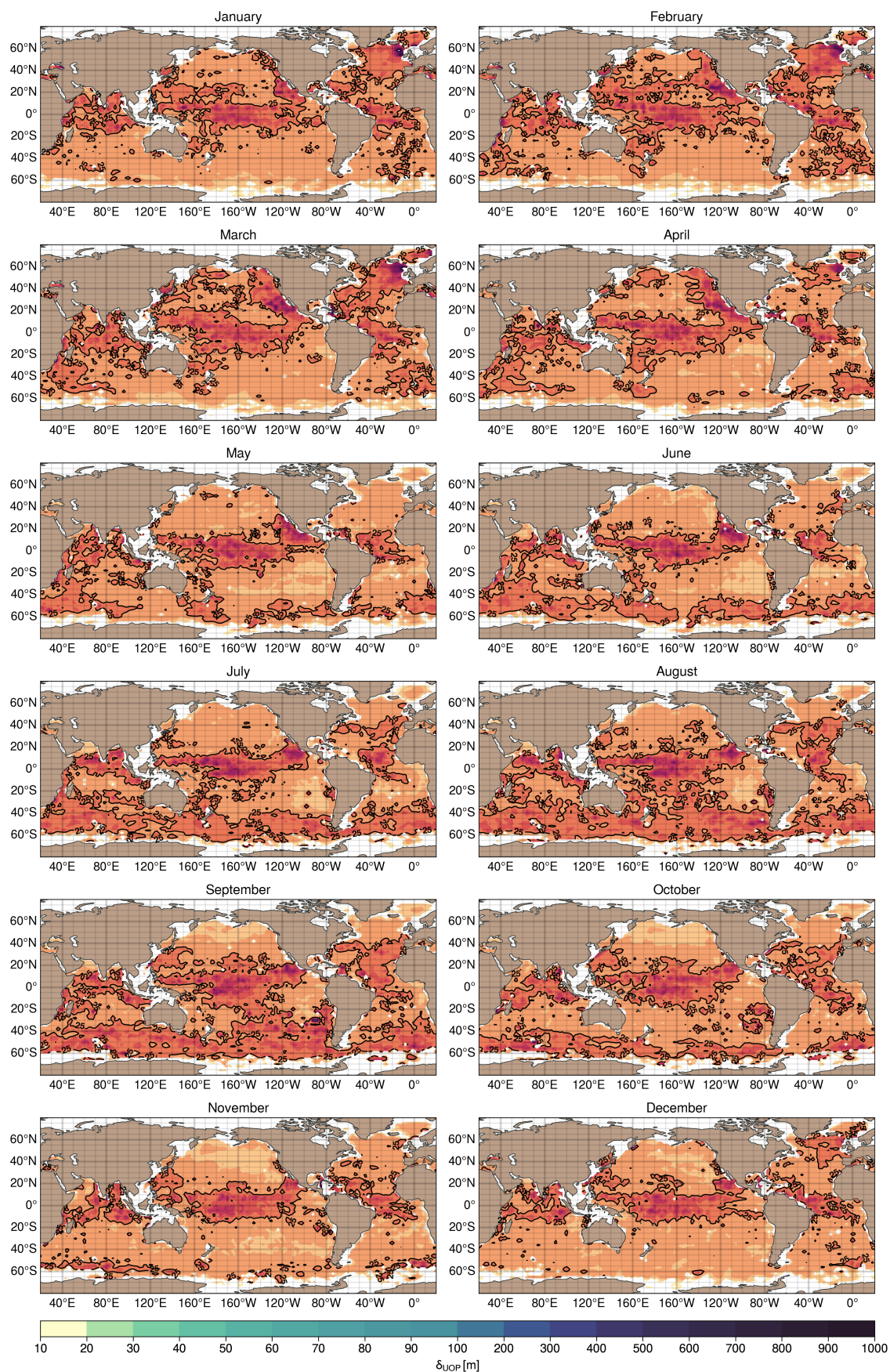**Figure S2.** Monthly climatology of UOP depth

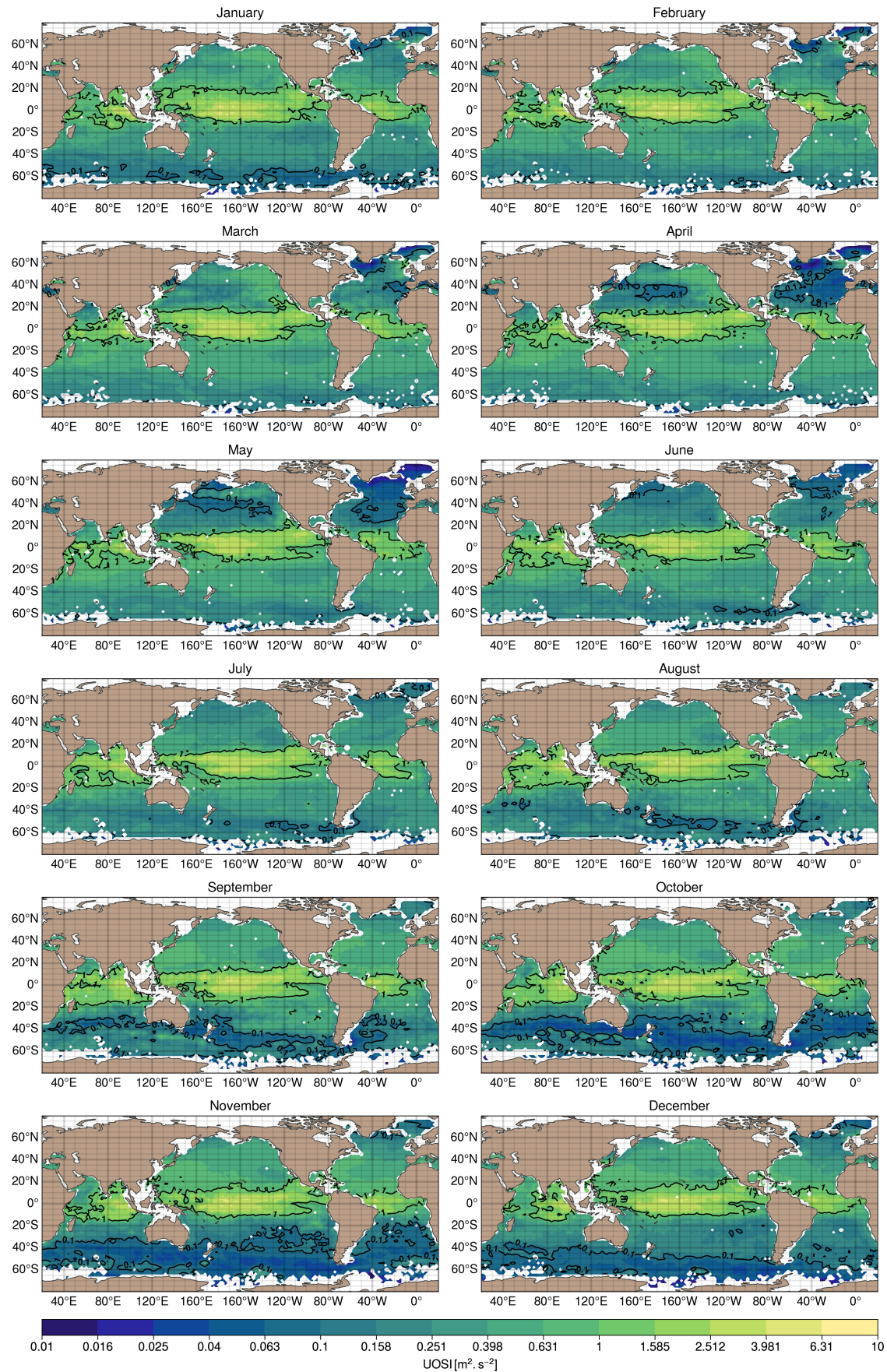**Figure S3.** Monthly climatology of UOP depth

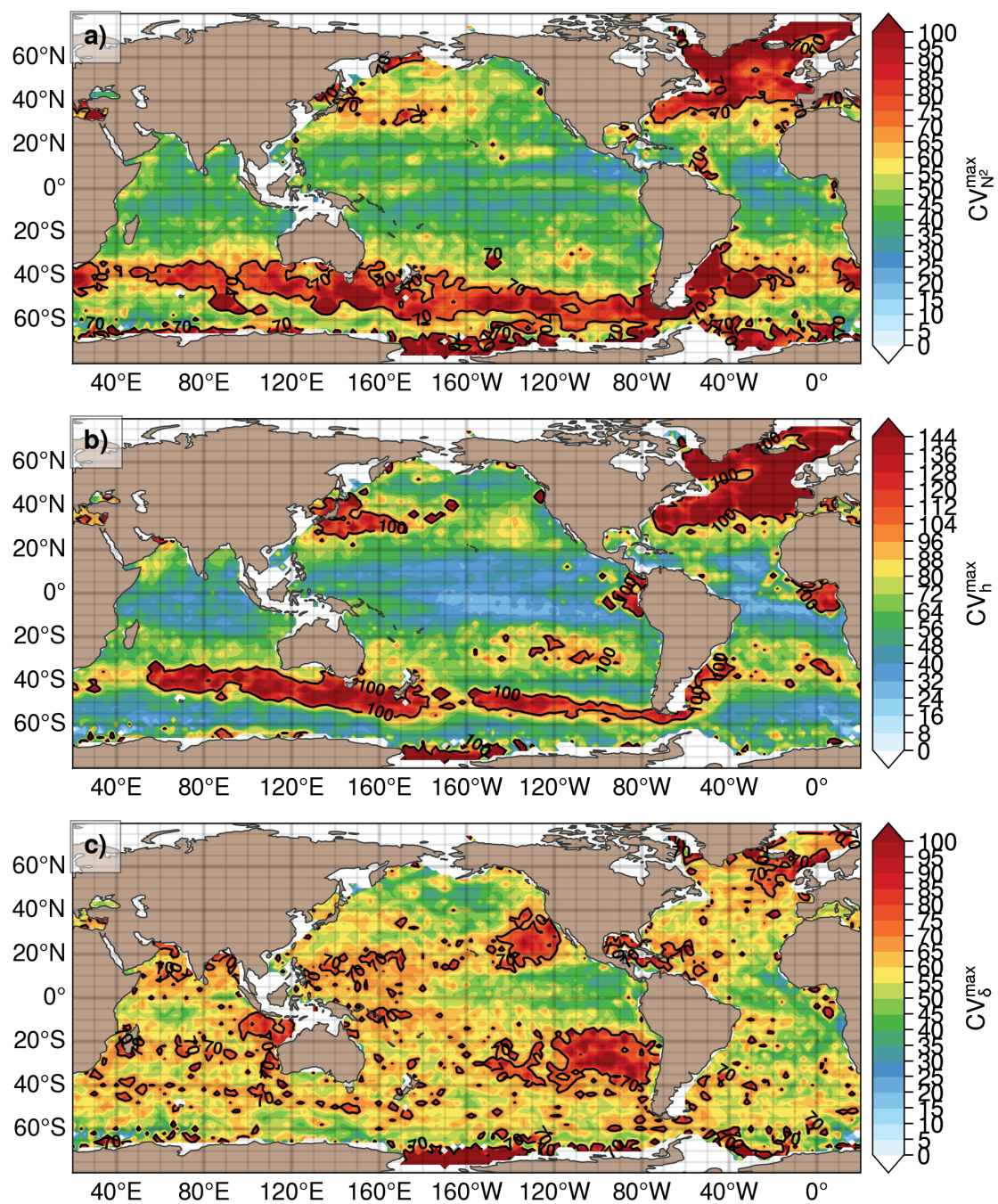**Figure S4.** Monthly climatology of UOSI

Figure S5. Maximum monthly coefficient of variation for a) intensity, b) depth and c) thickness.
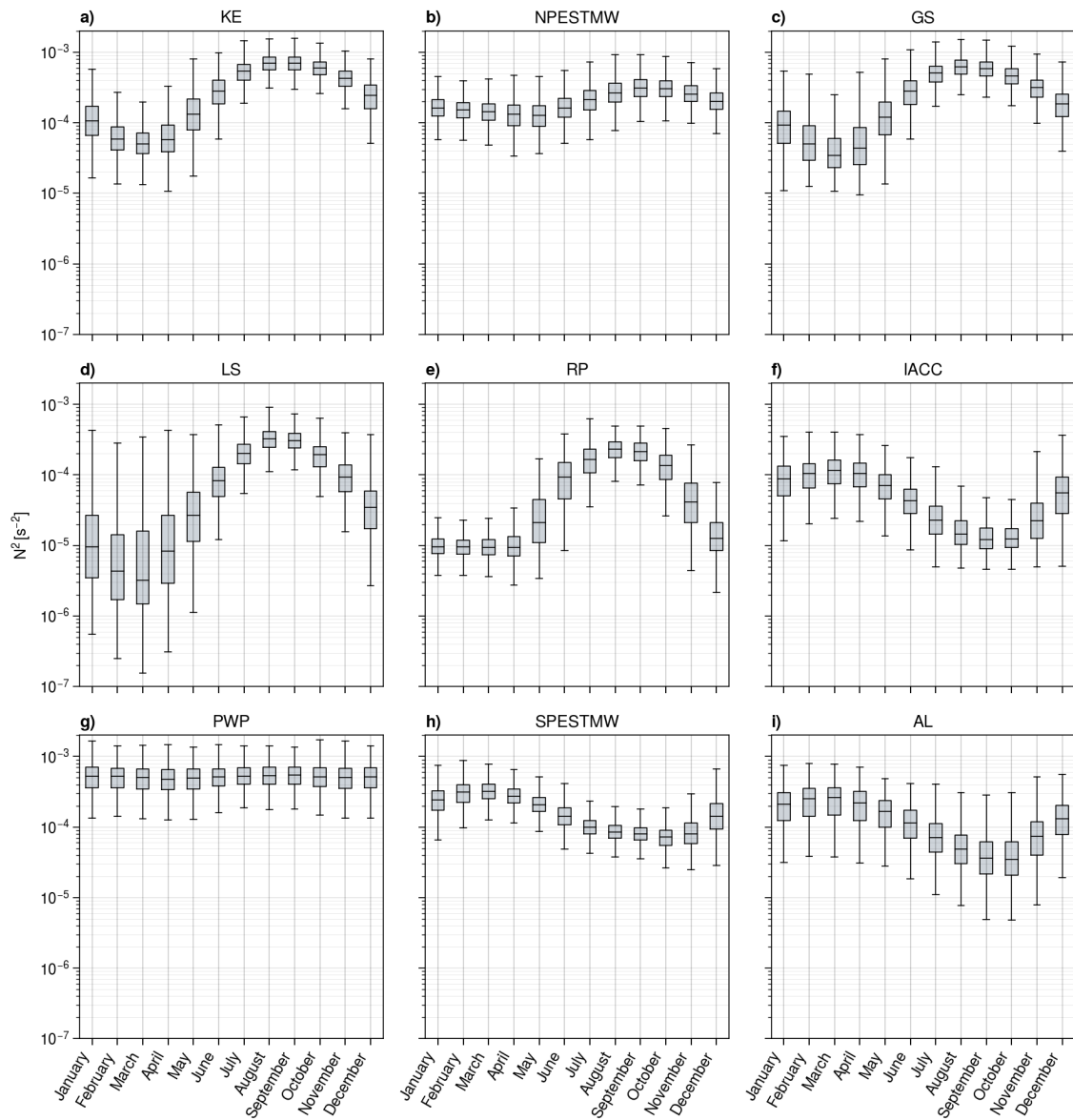
Figure S6. Seasonal cycle of UOP intensity distributions (boxplots) for the different region of analysis.
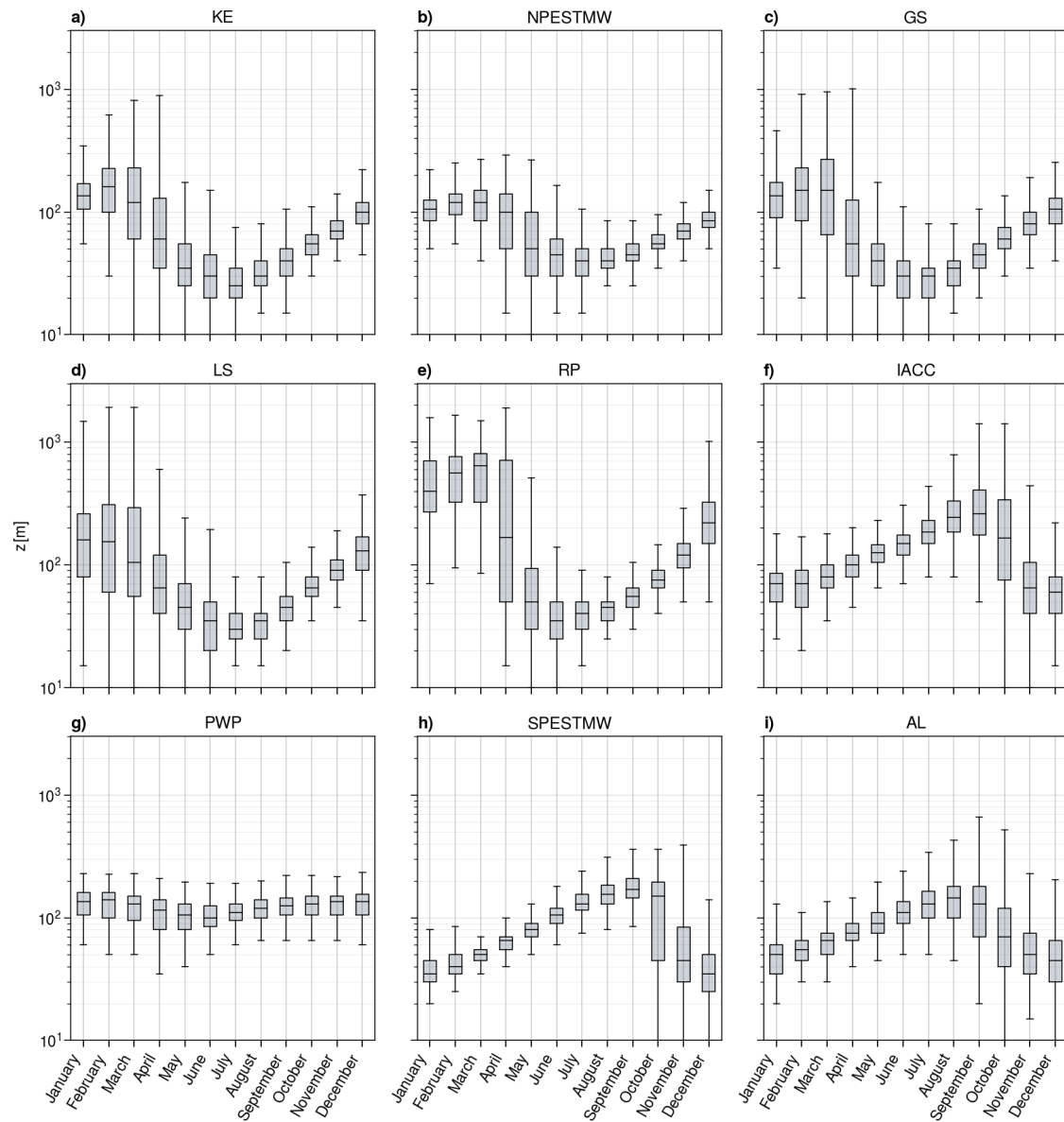
Figure S7. Seasonal cycle of UOP depth distributions (boxplots) for the different region of analysis.
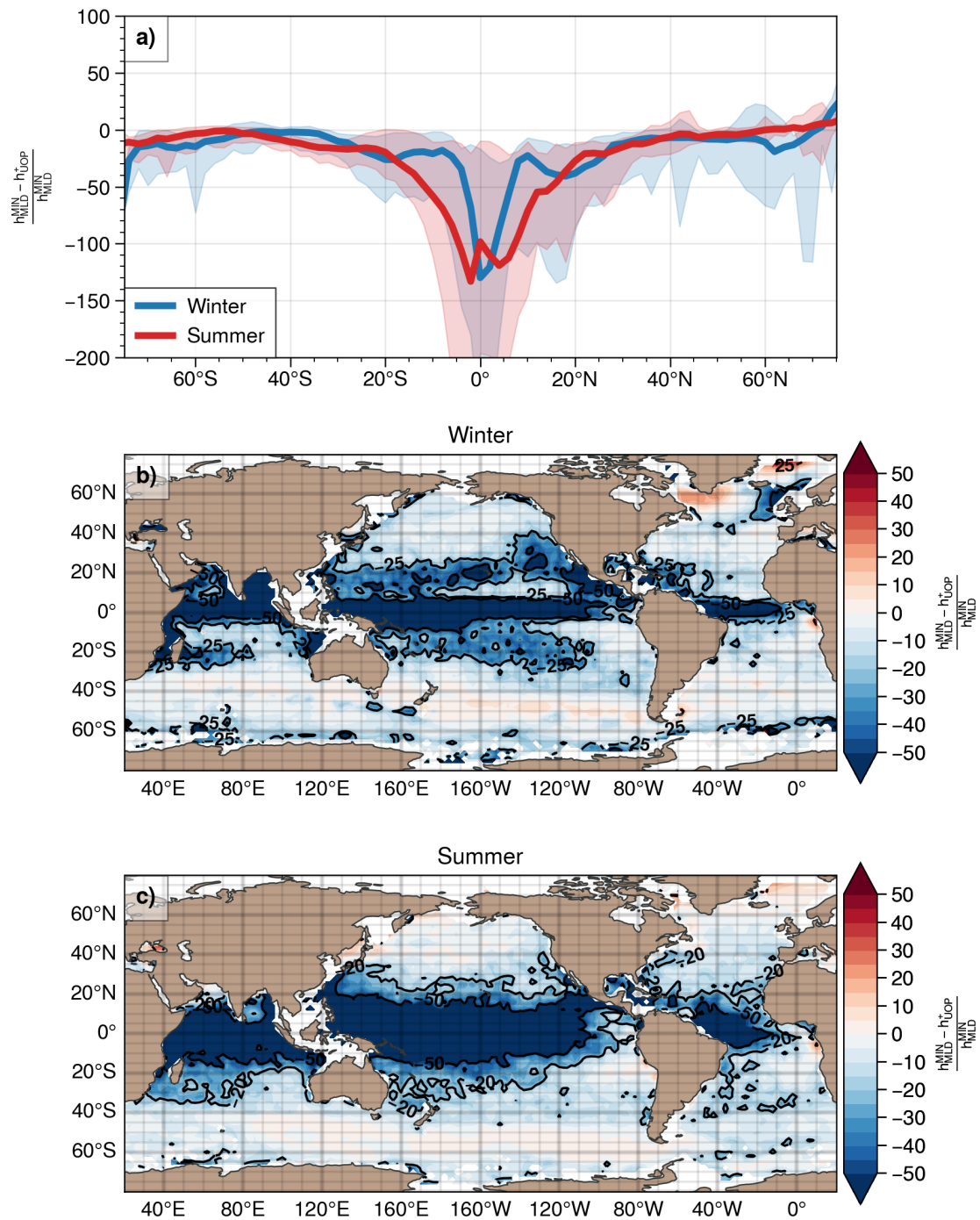
Figure S8. Median of the difference between the minimum of mixed layer depth estimates (h_{MLD}^{MIN}) and the upper boundary of the UOP (h_{UOP}^{+}) relative to the median of the minimum of mixed layer depth, expressed in percentage. a) Meridional distribution of the median difference for the winter season (blue curves) and for the summer season (red curves). The shaded areas represent the amplitude of the distributions based on the 5 and 95 percentiles. b), c) Climatological maps of winter and summer median differences.