

Supporting Information for ”Subtropical Mode Waters and Permanent Pycnocline properties in the World Ocean”

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The following figures are to support the main article.

Figure 1 complements Section 1 on data and methodology by showing the spatial density of observations used to map the mode-water and permanent-pycnocline OAC-P diagnostics present in the article.

Figure 2 complements Section 2 on results by showing the top and bottom thicknesses of the permanent pycnocline. The vertical asymmetry of the pycnocline is shown as the top thickness fraction of the total thickness.

Figure 3 complements Section 2 on results by showing the conservative and absolute salinity at the depth of the permanent pycnocline and mode water.

Figure 1. (A) Number of profiles per $1^\circ \times 1^\circ$ cell of the collection of 1 226 177 profiles in the Argo dataset used in this study (January 2000-December 2015). (B) Number of profiles per $1^\circ \times 1^\circ$ cell of the collection of 459 553 profiles with permanent pycnocline property estimates. White cells contains less than 5 profiles.

Figure 2. 2000-2015 Argo climatology of the permanent pycnocline upper and lower layer thicknesses (in meters). For plots A and B, contours are every 25m, labelled every 50m. Plot C shows the fraction (in %) of the total pycnocline thickness due to the upper layer only (contours every 5%, labelled every 10%). To allow for an easier comparison of patterns, the color scale has been normalized for each basin separately (the mean μ and standard deviation σ are given in the respective insets). Red (blue) areas thus correspond to higher (lower) values than the basin mean and the color saturation is reached at 3σ .

Figure 3. 2000-2015 Argo climatology of subtropical mode water and permanent pycnocline conservative temperature (contours every 1°C) and absolute salinity (contours every 0.1 g/kg). To allow for an easier comparison of patterns, the color scale has been normalized for each basin separately (the mean μ and standard deviation σ are given in the respective insets). Red (blue) areas thus correspond to higher (lower) values than the basin mean and the color saturation is reached at 3σ .