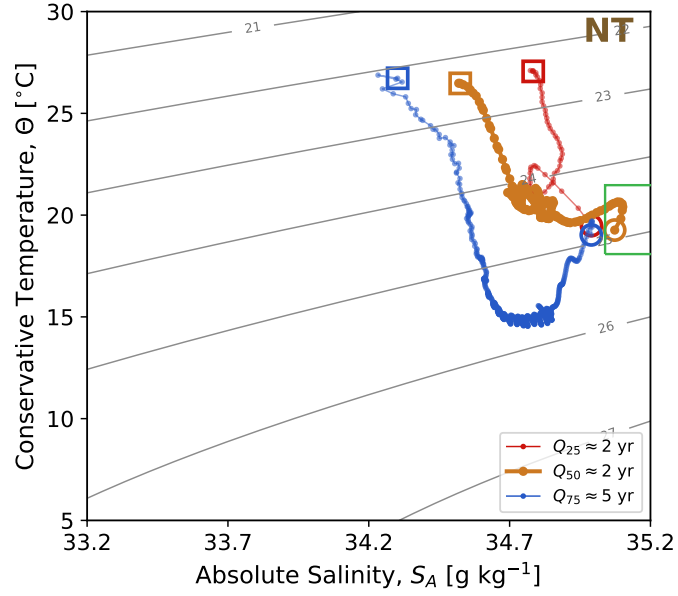


Supplementary Information for:
Non-tropical Sources of Equatorial Pacific Ocean Heat
Content

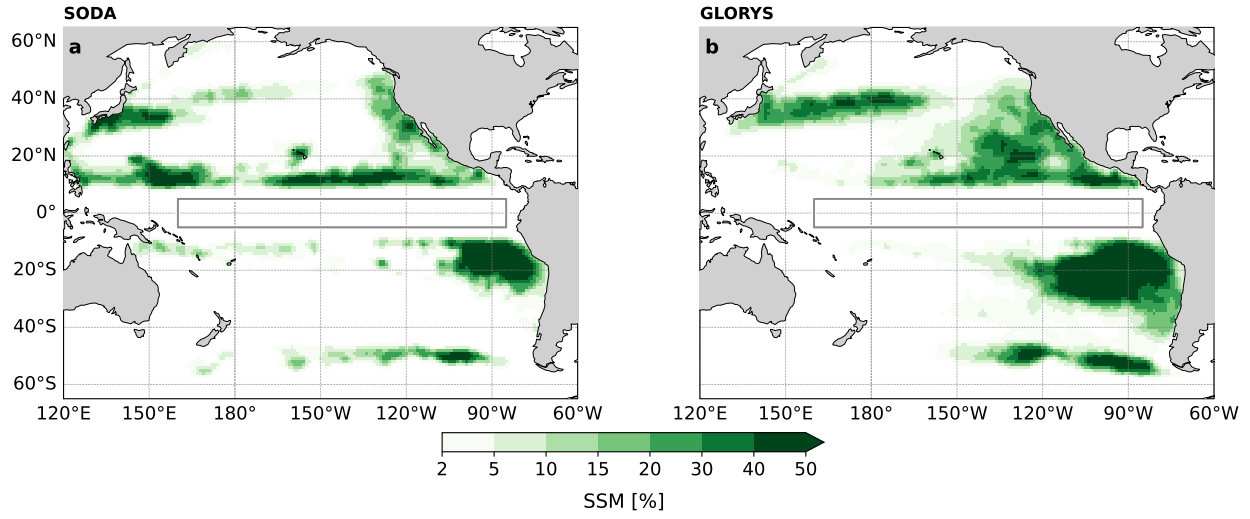


Supplementary Figure S1: Conservative Temperature–Absolute Salinity (Θ – S_A) diagrams for the northern subtropical band (10–19°N; NT), showing the lower-bound (Q_{25}), median (Q_{50}), and upper-bound (Q_{75}) transit times. Square markers denote subduction at the source region mixed-layer base; circle markers denote obduction at the equatorial thermocline. The green line indicates the equatorial seeding reference. Data taken from SODA3 for 1997–2018. This illustrates that NT reflects the shallow tropical overturning cell rather than a genuine non-tropical source, and is therefore excluded from the source-region analysis in the main text.

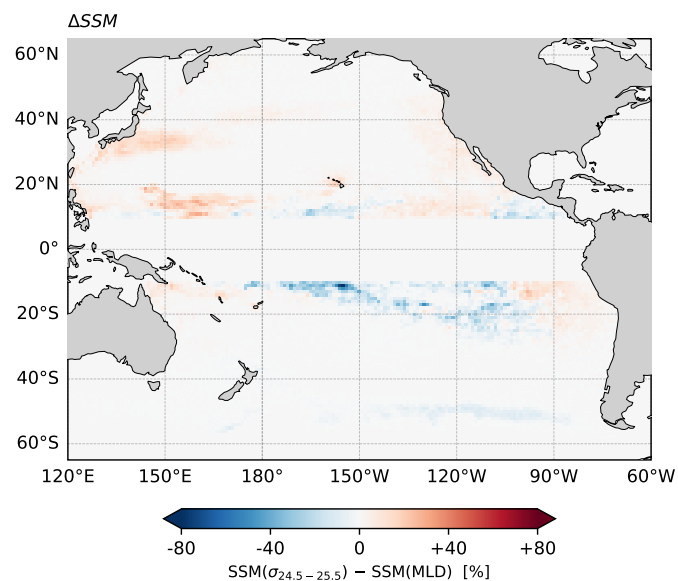
Supplementary Table S1: Sensitivity of the thermally conservative fraction to the choice of Conservative Temperature threshold $|\Delta\Theta|$. Values are the percentage of total valid particles classified as conservative at each threshold.

Region	< 0.5°C	< 1.0°C	< 1.5°C	< 2.0°C	< 3.0°C
NXW	3.0%	6.0%	9.0%	12.0%	17.0%
NXE	5.0%	9.0%	13.0%	17.0%	25.0%
ST	7.0%	14.0%	21.0%	26.0%	36.0%
SXT	0.0%	0.0%	0.0%	0.0%	0.0%

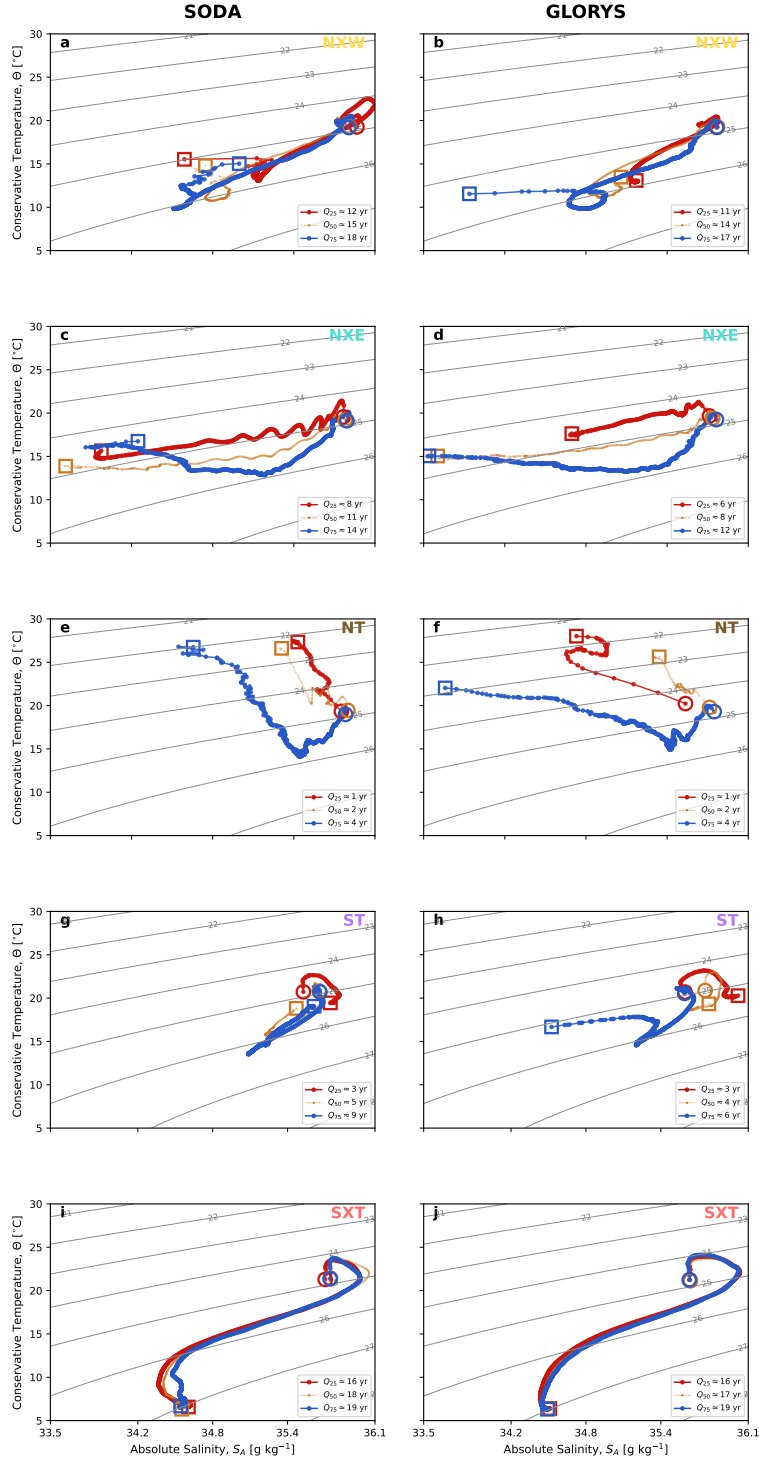
Equatorial thermocline 1 STD = 1.077°C. Chosen threshold (bold) ≤ 1 STD.



Supplementary Figure S2: Source Subduction Map (SSM) computed from SODA3 (a; reproduced from Fig. 2a of the main text) and from the GLORYS12 reanalysis (b), over their common period (1993–2018). The two reanalyses yield qualitatively similar source-region patterns, indicating that the SSM is not strongly sensitive to the choice of reference ocean reanalysis.



Supplementary Figure S3: Comparison of the Source Subduction Map obtained when particles are seeded within the equatorial thermocline layer versus seeded at the base of the mixed-layer, following prior studies. The two seeding approaches yield a nearly identical source-region attribution.



Supplementary Figure S4: Conservative Temperature–Absolute Salinity (Θ – S_A) diagrams computed from the SODA3-based trajectories (left column) shown in the main text (Figure 4) compared with GLORYS12 reanalysis (right column), over their common period (1993–2018).