

Fig. S1. Map showing the original horizontal positions (red crosses), with the locations produced by the DCRWS model within the *bsam* state-space model package (blue circles) and our estimated locations using the methods described (black crosses).

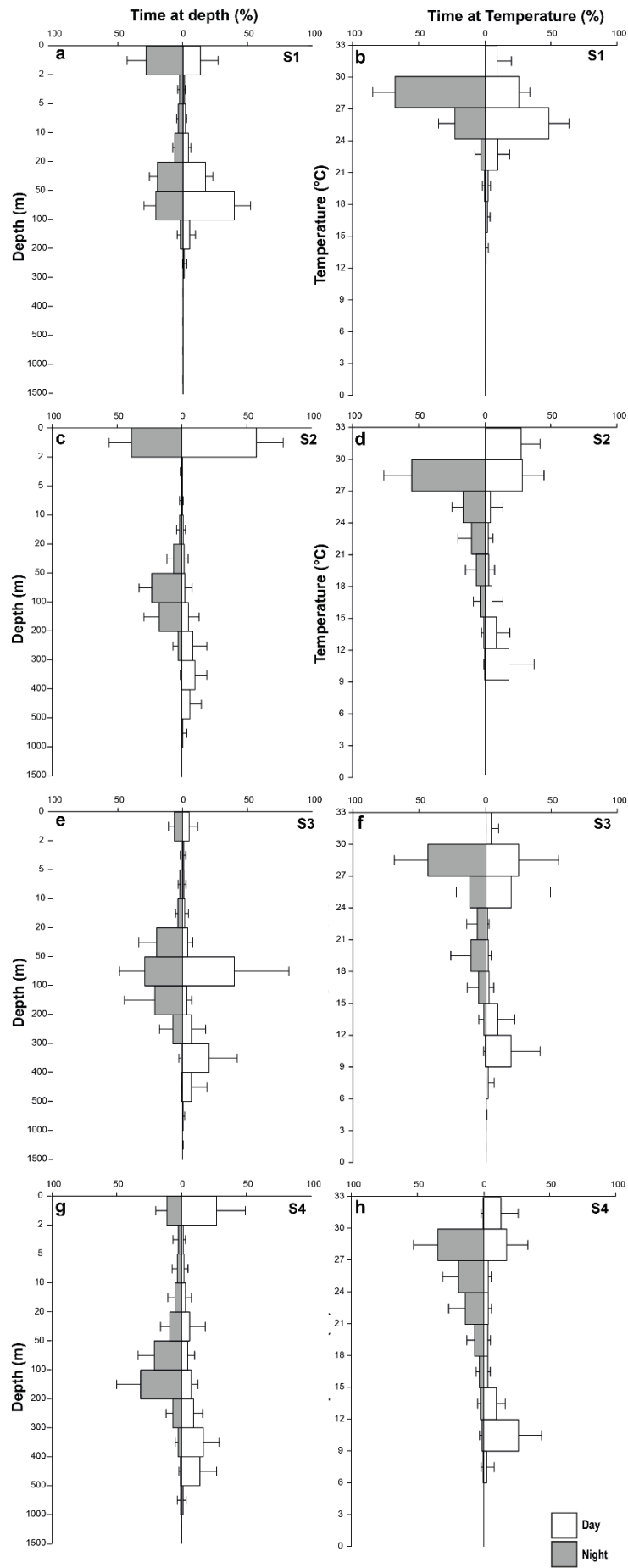


Fig. S2. (a) Time-at-depth plots for Section 1 (S1; Christmas Island); (b) Time-at-temperature plot for Section 1 (S1; Christmas Island); (c) Time-at-depth plots for Section 2 (S2; Migration from Christmas Island to the continental shelf of Australia); (d) Time-at-temperature plot for Section 2 (S2; Migration from Christmas Island to the continental shelf of Australia); (e) Time-at-depth plots for Section 3 (S3; Migration between the continental shelf of Australia and south-west West Papua); (f) Time-at-temperature plot for Section 3 (S3; Migration between the continental shelf of Australia and south-west West Papua); (g) Time-at-depth plots for Section 4 (S4; Return migration between the western side of West Papua and eastern Timor-Leste); (h) Time-at-temperature plot for Section 4 (S4; Return migration between the western side of West Papua and eastern Timor-Leste). White bars represent daytime, and grey represents night periods. Error bars show the standard deviation for depth and temperature on the respected plots.