

Spatial ecology of sub-adult green turtles in coastal waters of the Turks and Caicos Islands: Implications for conservation management - Supplementary materials

Doherty, P.D.¹, Broderick, A.C.¹, Godley, B.J.¹, Hart, K.A.², Phillips, Q.³, Sanghera, A.⁴, Stringell, T.B.¹, Walker, J.T.⁵, & Richardson, P.B.^{3*}

¹ Centre for Ecology and Conservation, University of Exeter, Penryn Campus, Cornwall, TR10 9FE, UK.

² Deep Blue Charters, Grand Turk, Turks and Caicos Islands.

³ Department of Environment and Coastal Resources (DECR), Providenciales, Turks and Caicos Islands.

⁴ Marine Conservation Society (MCS), Ross on Wye, Herefordshire, HR9 5NB, UK.

⁵ New Brunswick, Canada.

*Corresponding author (email: peter.richardson@mcsuk.org).

Table S1. Potential scale-reduction factor (PSRF); the ratio between the variance and the within chain variability for two Monte Carlo Markov Chain (MCMC) simulations as a test for convergence within chains.

Potential scale reduction factors (PSRF)		
	Point estimate	CI
Sigma (1,1)	1.06	1.23
Sigma (2,1)	1.03	1.12
Sigma (1,2)	1.03	1.12
Sigma (2,2)	1.01	1.01
Multivariate PSRF		1.06

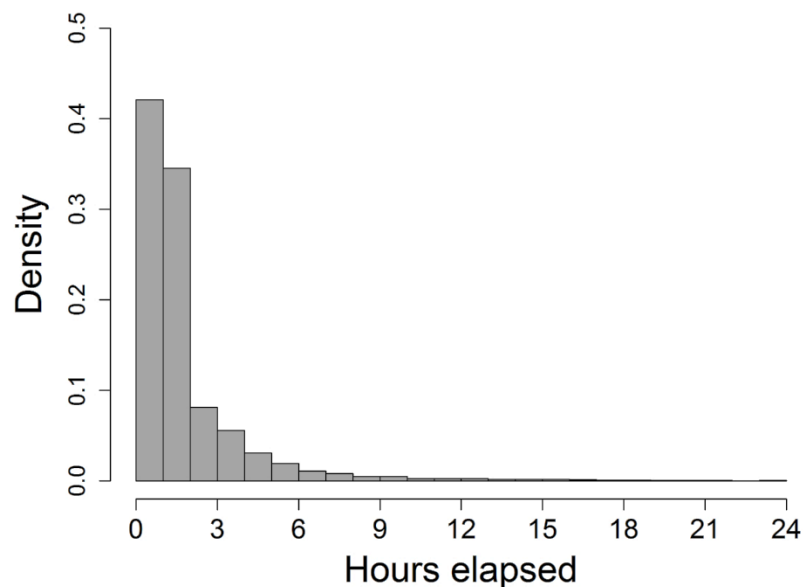


Figure S1. Histogram of temporal gaps between Argos derived locations of satellite tracked sub-adult green turtles ($n = 16$), used as basis for parameters set in state-space model (6-hrs; SSM).

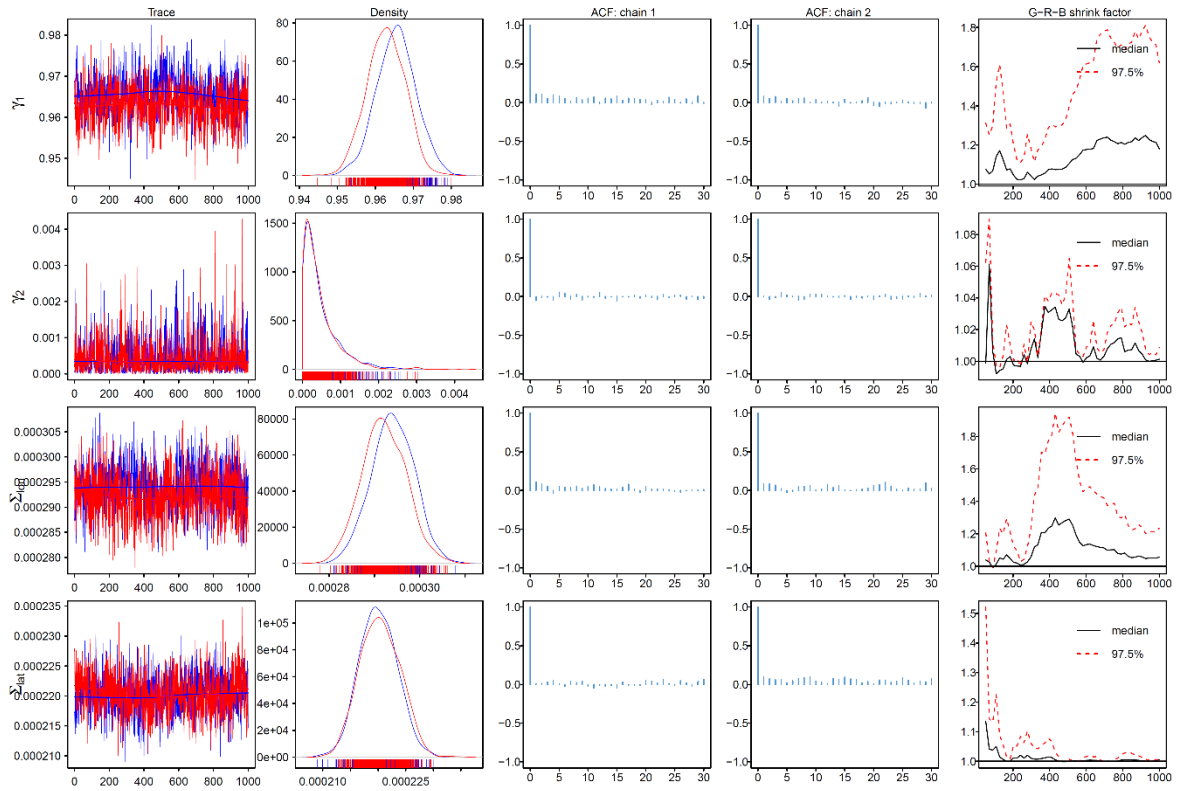


Figure S2. Diagnostic trace plots for hierarchical behavioural switching State Space Model (hSSM) showing posterior distribution of two Markov chains run simultaneously.

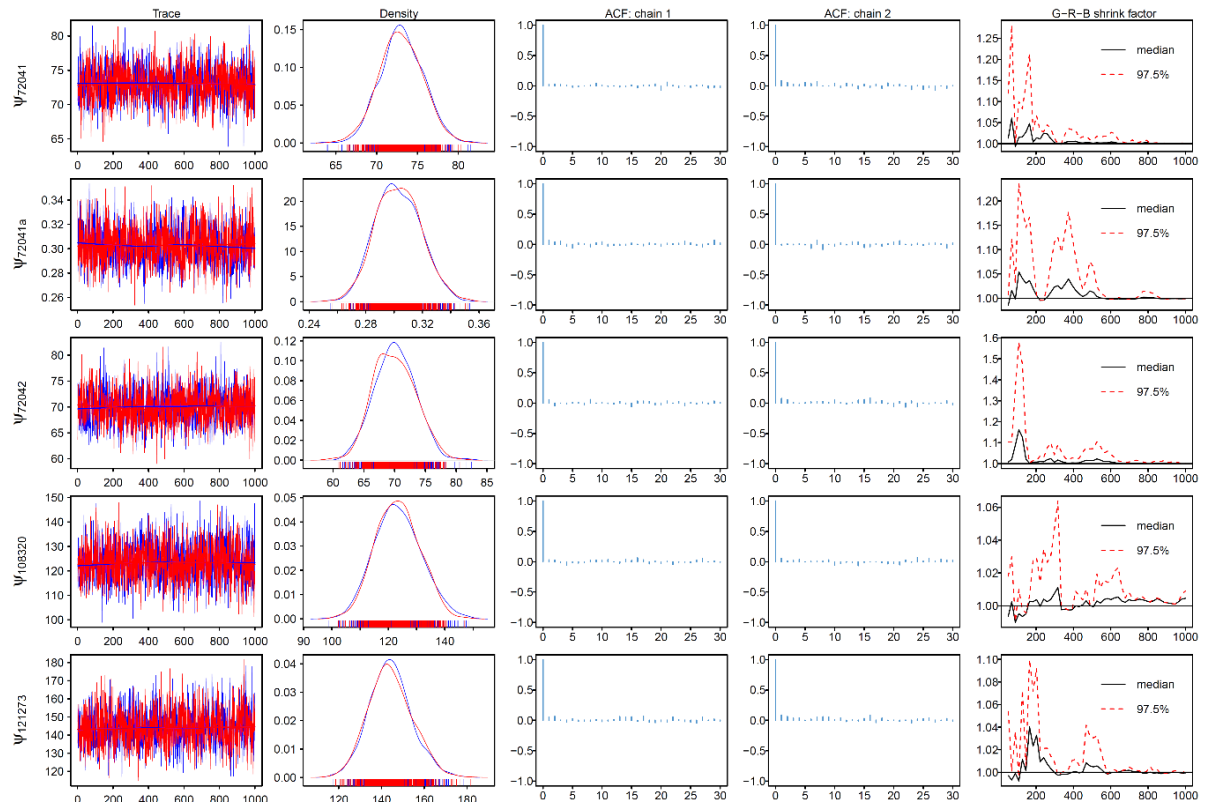


Figure S2 cont.

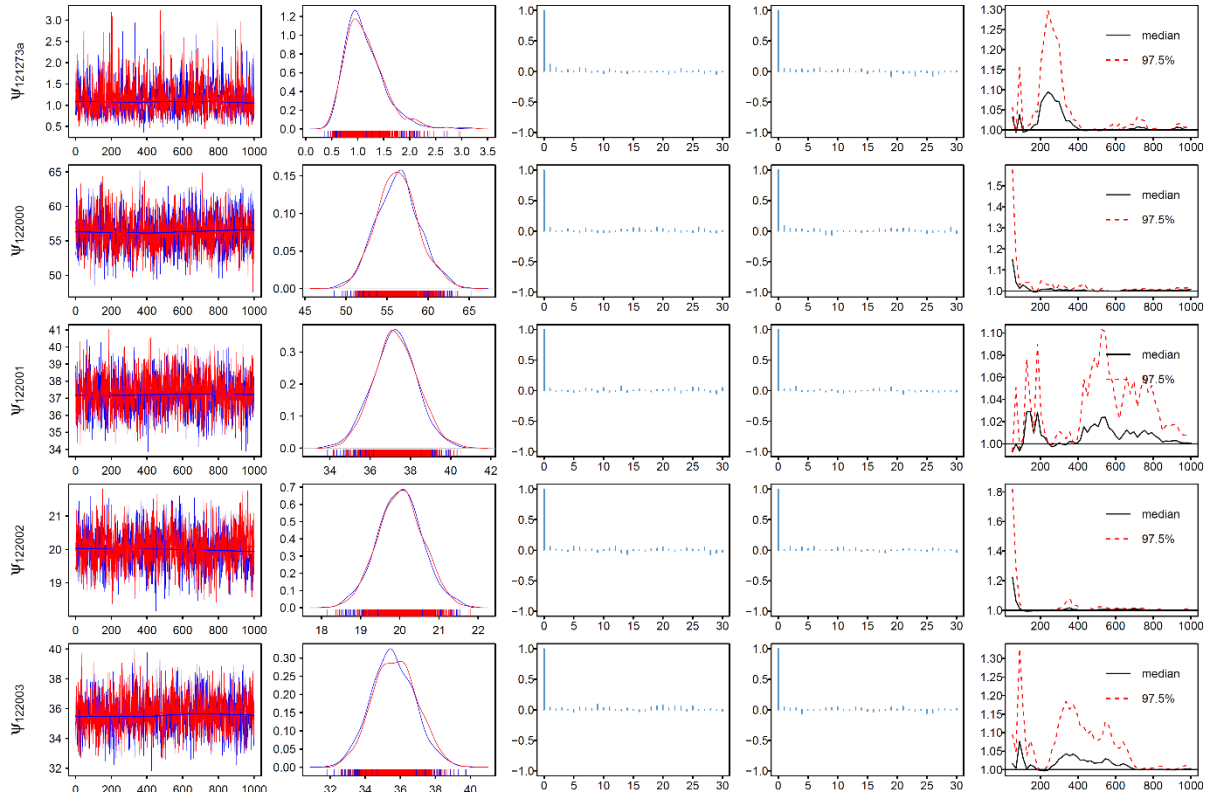


Figure S2 cont.

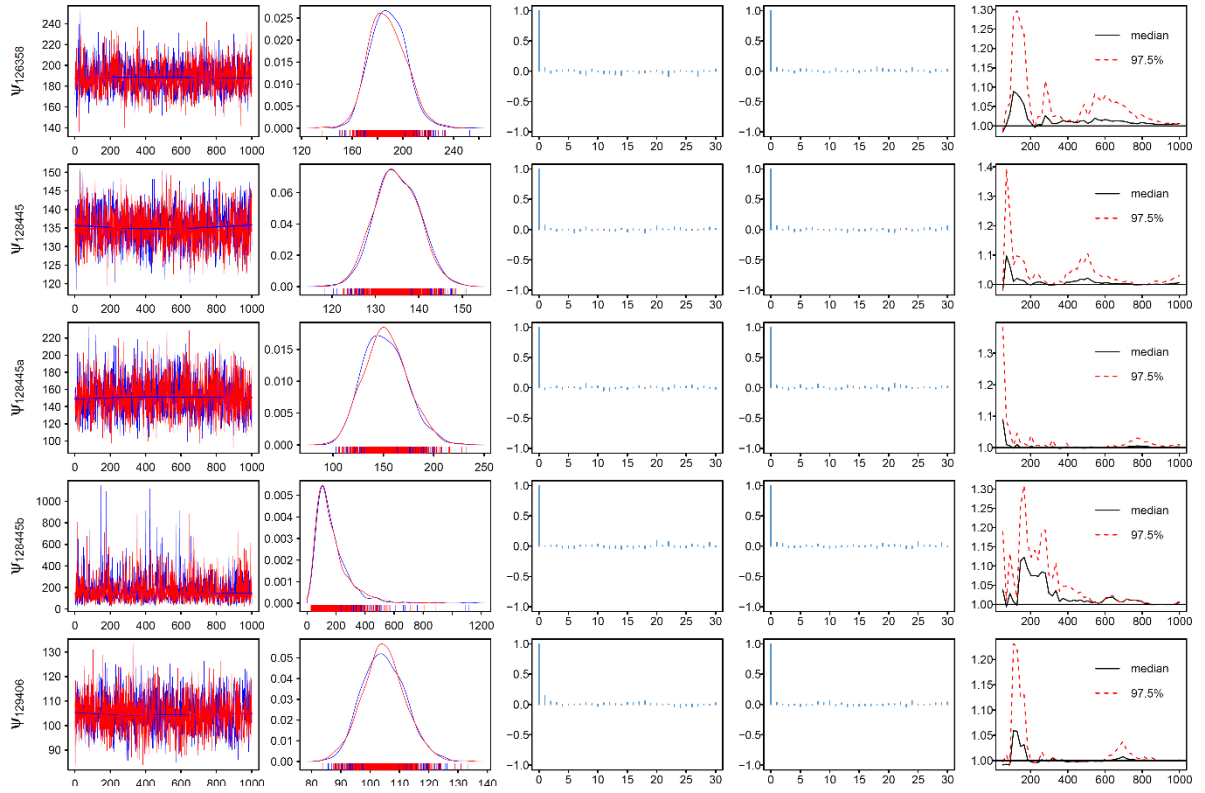


Figure S2 cont.

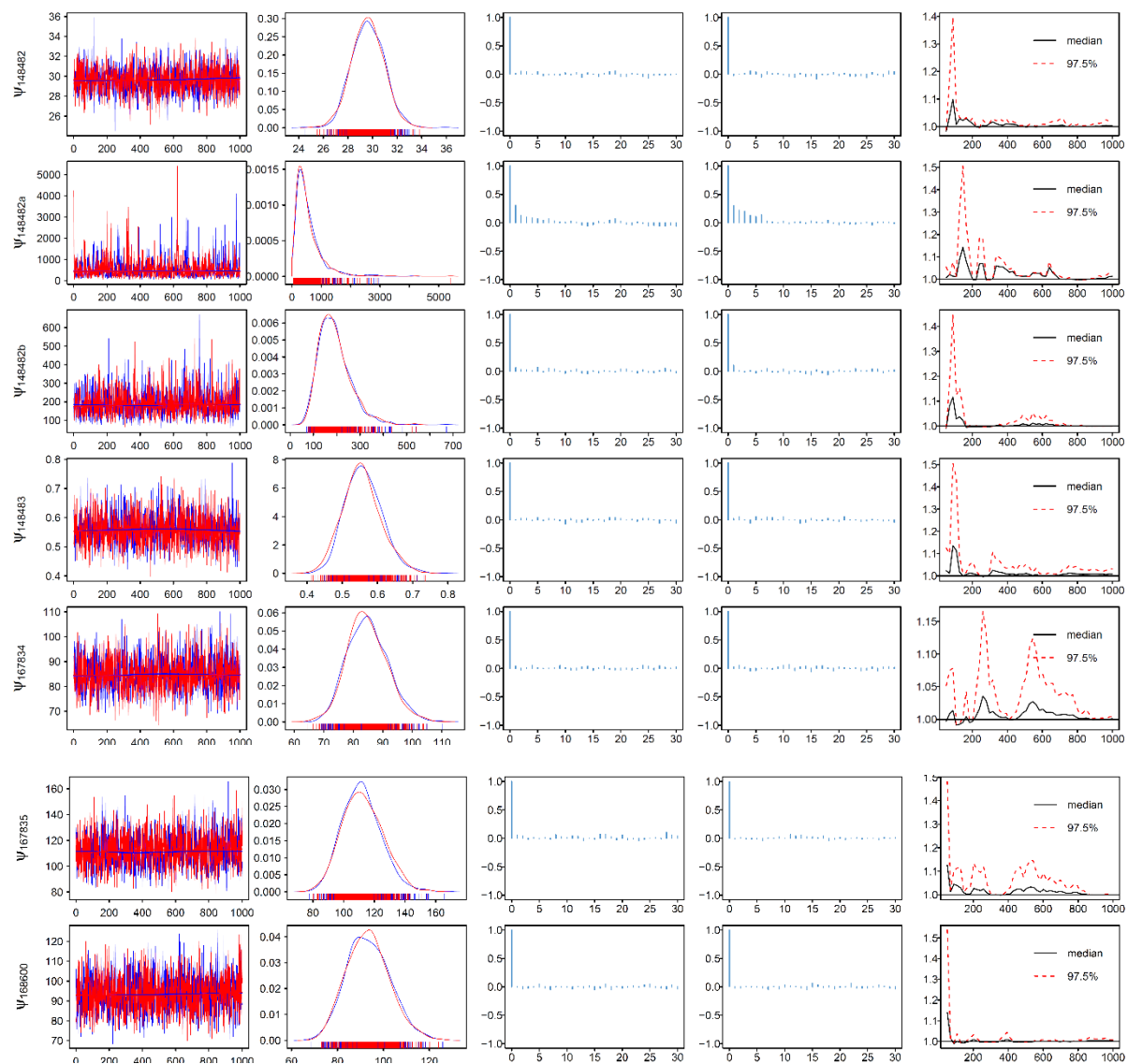


Figure S2 cont.

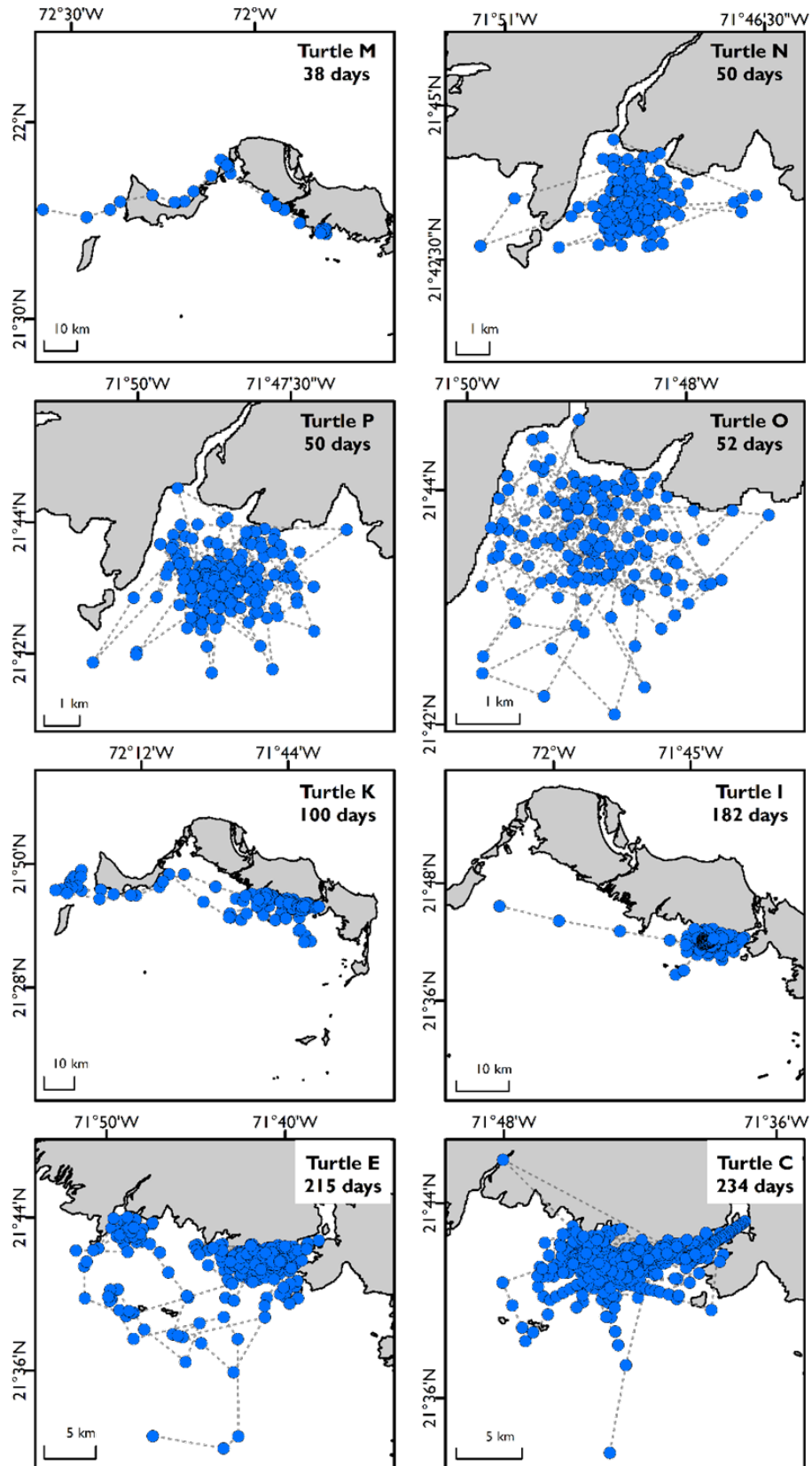


Figure S3. Individual movements for satellite tracked sub-adult green turtles (n = 16). Each circle represents locations interpolated at 6-hr time steps using a hierarchical behavioural switching State Space Model (hSSM). Broken grey line is representative of tracked movement. Plots are ordered by tag attachment durations. Note figure parts are to differing scales.

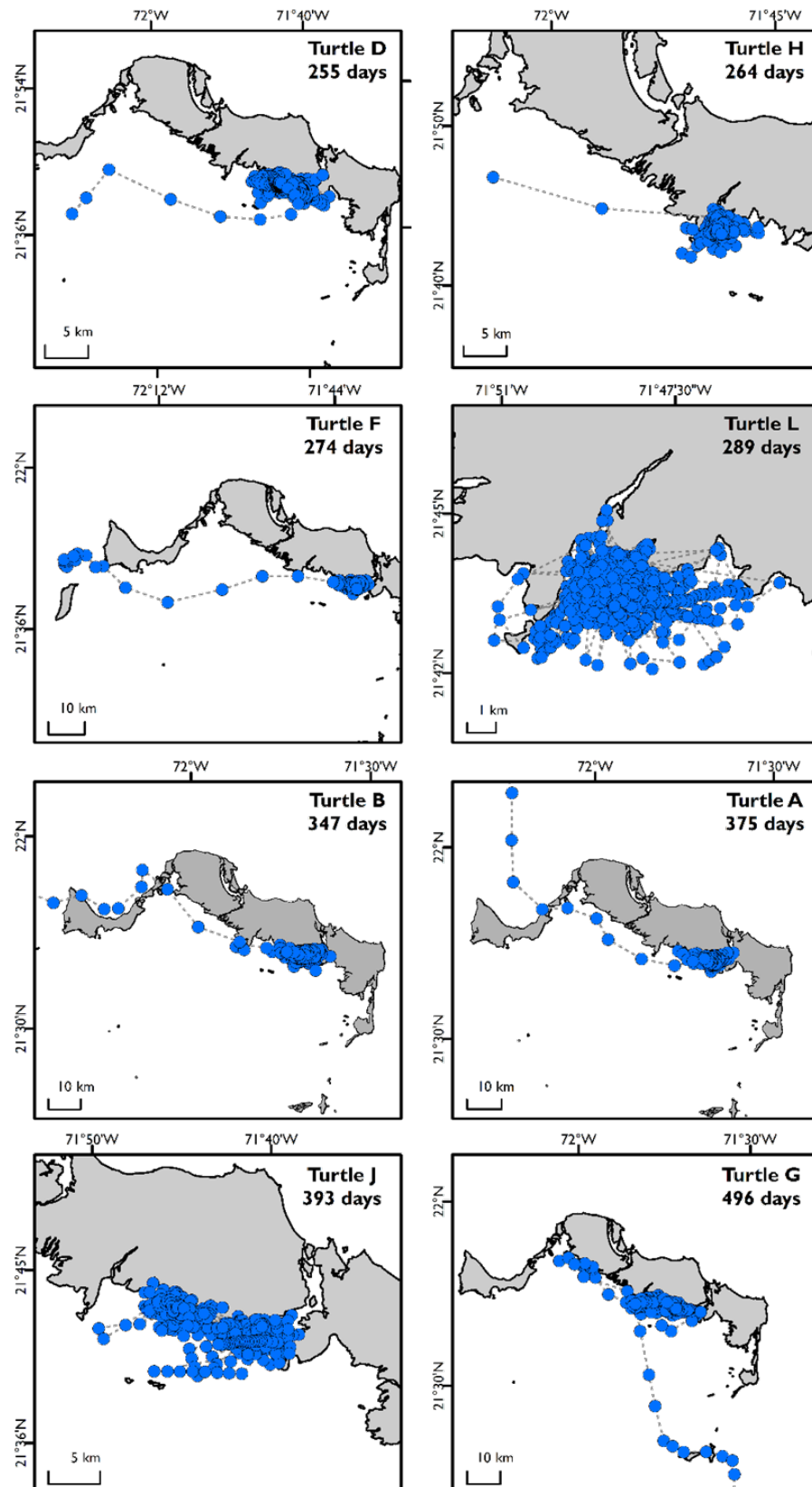


Figure S3 cont.

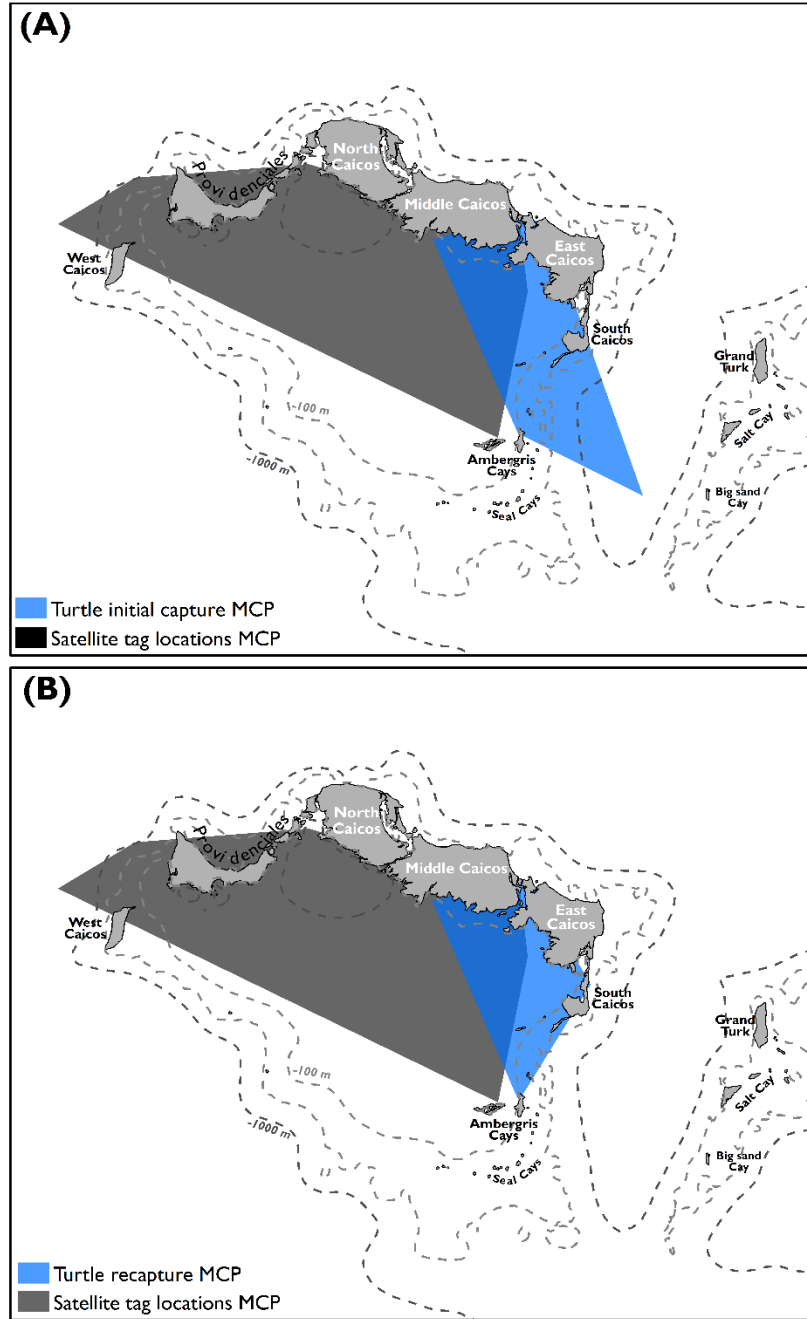


Figure S4. Comparing tagging technologies. Minimum Convex Polygons (MCPs) of (A) deployment area, and (B) recapture area of flipper tagged green turtles in coastal waters of the Turks and Caicos Islands (blue shaded polygon). Black shaded polygon in both parts denotes MCP of locations of satellite tracked sub-adult turtles interpolated at 6-hr time steps using a hierarchical behavioural switching State Space Model (hSSM). Labelled broken grey lines denote depth contours.

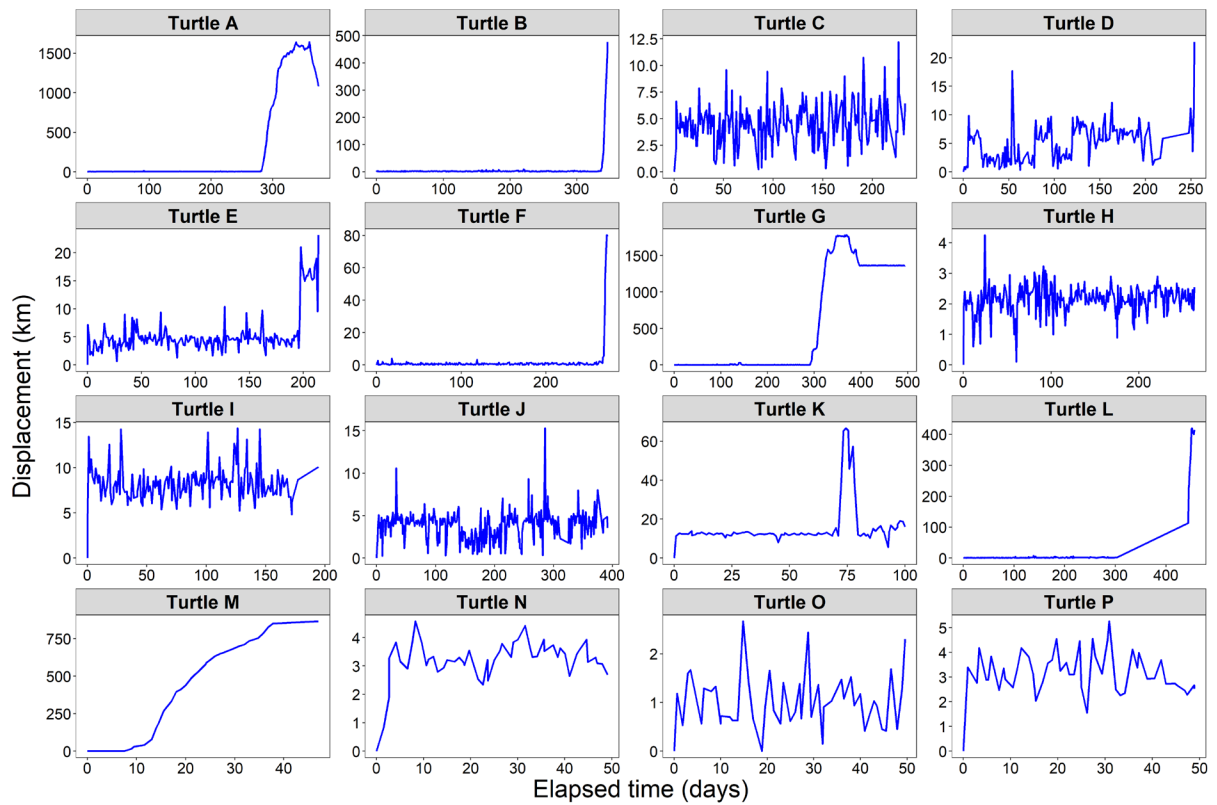


Figure S5. Sub-adult green turtle ($n = 16$) displacement from satellite tag attachment location in the coastal waters of the Turks and Caicos Islands for each track's time at liberty.