

Supplemental methods

Animal handling methods, biollogger specifications, and calculation of arrival and departure dates are described in Robinson, et al.¹ Satellite tracking data were filtered and processed using the R package *crawl*^{2,3} to eliminate inaccurate location points and interpolate between locations. The resulting latitude and longitude estimates were used to calculate great circle distance (in kilometers) from the Año Nuevo breeding beach (37.1083°N, 122.3366°W) for each time-latitude-longitude point in the R package *distsm* (NOTE: I don't think this is right. According to the workflow file, this was done in MATLAB with the *distance()* function.) Across all seals, foraging trip timing (mean \pm SD day-of-year) was as follows: departure 157 ± 9 , turnaround 287 ± 40 , and arrival 15 ± 8 (Figure 1C). Therefore, outbound trip durations were 130 ± 41 days, and inbound trip durations were 93 ± 41 days. Turnaround dates were calculated using Gaussian kernels with standard deviation 6 hours using custom functions in R. Code and data for a subset of animals are available on GitHub (link available upon review of manuscript) (NOTE: The GitHub repo will be archived on Zenodo, so cite that instead when ready.) Drift rate dates were calculated using...⁴ Dates are presented as day-of-year relative to parturition date, with negative numbers indicating dates before pupping. All analyses were carried out in R v4.0.2. The linear mixed effects model was run in the package *lme4*⁵ after scaling and centering the continuous variables and including individual as a random effect.

1. Robinson, P.W., Costa, D.P., Crocker, D.E., Gallo-Reynoso, J.P., Champagne, C.D., Fowler, M.A., Goetsch, C., Goetz, K.T., Hassrick, J.L., Hückstädt, L.A., et al. (2012). Foraging Behavior and Success of a Mesopelagic Predator in the Northeast Pacific Ocean: Insights from a Data-Rich Species, the Northern Elephant Seal. *PLoS ONE* 7, e36728.
2. Johnson, D.S., London, J.M., Lea, M.-A., and Durban, J.W. (2008). Continuous-time correlated random walk model for animal telemetry data. *Ecology* 89, 1208–1215.
3. Johnson, D., Josh M. London (NOAA), and Kenady (2016). *Crawl: V2.0*.
4. Robinson, P.W., Simmons, S.E., Crocker, D.E., and Costa, D.P. (2010). Measurements of foraging success in a highly pelagic marine predator, the northern elephant seal. *Journal of Animal Ecology* 79, 1146–1156.
5. Bates, D., Mächler, M., Bolker, B., and Walker, S. (2015). Fitting Linear Mixed-Effects Models Using *lme4*. *Journal of Statistical Software* 67.

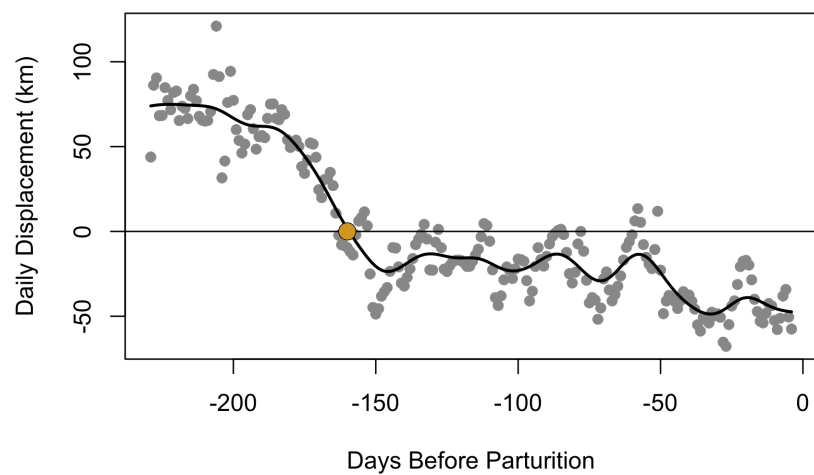
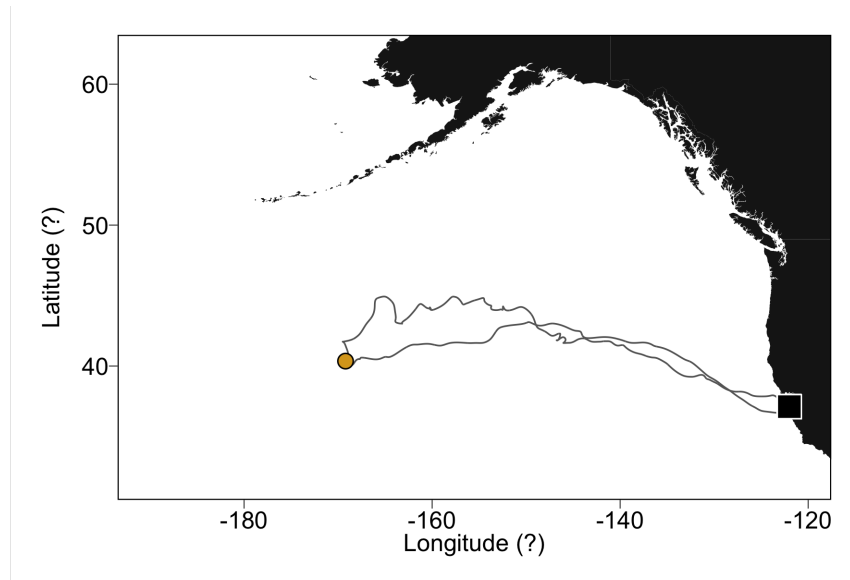


Figure S1: Tracking data (top), distance traveled from the breeding beach (middle), and daily displacement from the breeding beach (bottom) for a representative seal (#2007048). Gold points indicate turnaround locations in all panels