

Supplemental tables and figures for:

**Diving Behavior of Common Bottlenose Dolphins Around the Main Hawaiian Islands:
Individual Variation and Responses to Diel and Lunar Cycles**

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TABLE S1 Summary of time series (TS) message by portion of the water column for satellite-tagged bottlenose dolphins with time series data (n=11). Tags are organized by island where the animal was tagged, then by tag ID, with the grand mean values based on data from all individuals shown in the top row.

Tag ID	Depth in TS Data (m) Mean (SD)/Median/Max	% Messages 0-50m	% Messages 51-100m	% Messages 101m-200m	% Messages 201-300m	% Messages 301-400m	% Messages 401-500m	% Messages 501m+
Overall	42.2 (21.3)/37.9/70.7	81.0	7.7	4.9	2.5	1.6	1.0	1.3
TtTag005	44.8 (88.8)/3.0/447.0	79.9	5.5	5.0	6.5	2.9	0.3	0.0
TtTag008	23.4 (67.6)/3.0/457.0	90.6	2.5	2.9	1.9	1.2	0.9	0.0
TtTag009	12.8 (32.1)/2.0/314.5	93.1	3.5	3.0	0.4	0.1	0.0	0.0
TtTag019	25.5 (56.0)/4.0/478.0	85.6	5.2	7.4	1.1	0.2	0.4	0.0
TtTag020	56.5 (129.0)/5.0/776.0	74.6	12.1	4.2	4.2	1.5	1.0	2.5
TtTag022	28.3 (39.7)/5.0/182.0	73.4	21.1	5.6	0.0	0.0	0.0	0.0
TtTag041	69.1 (153.8)/6.0/866.0	81.3	2.5	4.1	1.9	2.8	2.8	4.6
TtTag042	70.6 (152.4)/6.0/763.0	80.1	2.2	5.9	1.4	2.8	2.2	5.3
TtTag043	70.7 (137.7)/6.0/718.0	78.5	3.2	3.6	3.3	6.1	3.6	1.8
TtTag006	37.9 (54.8)/11.5/214.0	70.5	17.7	6.9	4.9	0.0	0.0	0.0
TtTag021	25.0 (46.6)/2.0/277.0	83.2	9.8	5.6	1.4	0.0	0.0	0.0

TABLE S2 Summary of bathymetric depth error ranges within the 95% error ellipse for dives from 11 satellite-tagged bottlenose dolphins, based on confidence rating of the bathymetry estimate.

Confidence rating	Mean of bathymetric depth error range (sd)/Max
Extremely high	155.7 (172.7)/983.3
High	327.4 (248.3)/1474.6
Moderate	503.5 (284.3)/1522.6
Poor	909.6 (626.7)/3114.9

TABLE S3 Segmented linear regression results for 11 satellite-tagged bottlenose dolphins from the Hawaiian Islands, with dive duration (min) as a response variable, and dive depth (m) as the independent variable. The break point represents the depth at which the relationship between dive depth and duration shifts from slope 1 to slope 2. Tags are organized by island where the animal was tagged, then by tag ID.

Tag ID	Slope 1	Slope 2	Depth break point (m)	R²
TtTag005	0.010 ± 0.001	-0.003 ± 0.004	359.5 ± 92.7	0.375
TtTag008	0.023 ± 0.003	-0.016 ± 0.010	287.5 ± 63.7	0.605
TtTag009	0.342 ± 0.209	-0.323 ± 0.209	54.8 ± 1.6	0.446
TtTag019	0.013 ± 0.001	-0.006 ± 0.005	427.7 ± 47.8	0.817
TtTag020	0.016 ± 0.001	-0.009 ± 0.003	367.5 ± 57.8	0.877
TtTag022	-0.086 ± 0.116	0.100 ± 0.116	61.9 ± 7.5	0.226
TtTag039	0.072 ± 0.019	-0.058 ± 0.019	75.5 ± 4.8	0.609
TtTag041	0.018 ± 0.001	-0.009 ± 0.002	291.8 ± 32.2	0.862
TtTag042	0.022 ± 0.005	-0.011 ± 0.005	143.5 ± 32.1	0.840
TtTag044	-0.033 ± 0.040	0.046 ± 0.040	71.5 ± 12.2	0.334
TtTag021	0.017 ± 0.002	-0.009 ± 0.003	175.5 ± 24.4	0.392

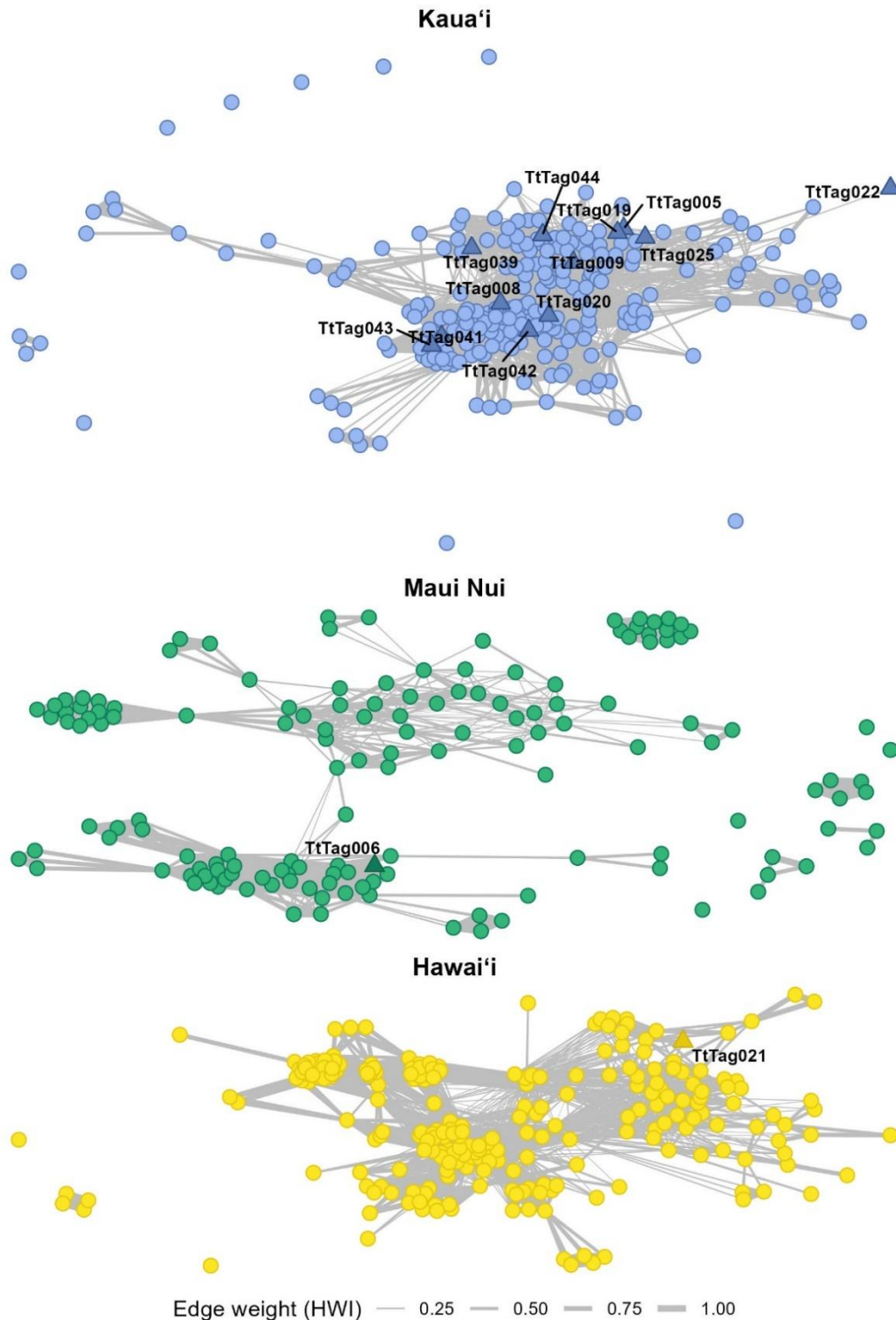


FIGURE S1 Social network of all common bottlenose dolphins from Kaua'i, Maui Nui, and Hawai'i Island identified between 2000-2024 with highest distinctiveness of 2 or greater, and photo quality of 2 or greater, with darkened triangle-shaped nodes indicating individuals with tags that were included in the study, and linewidth indicating the half-weight index of each relationship. See Baird et al. (2009) for details on distinctiveness and photo quality scores.

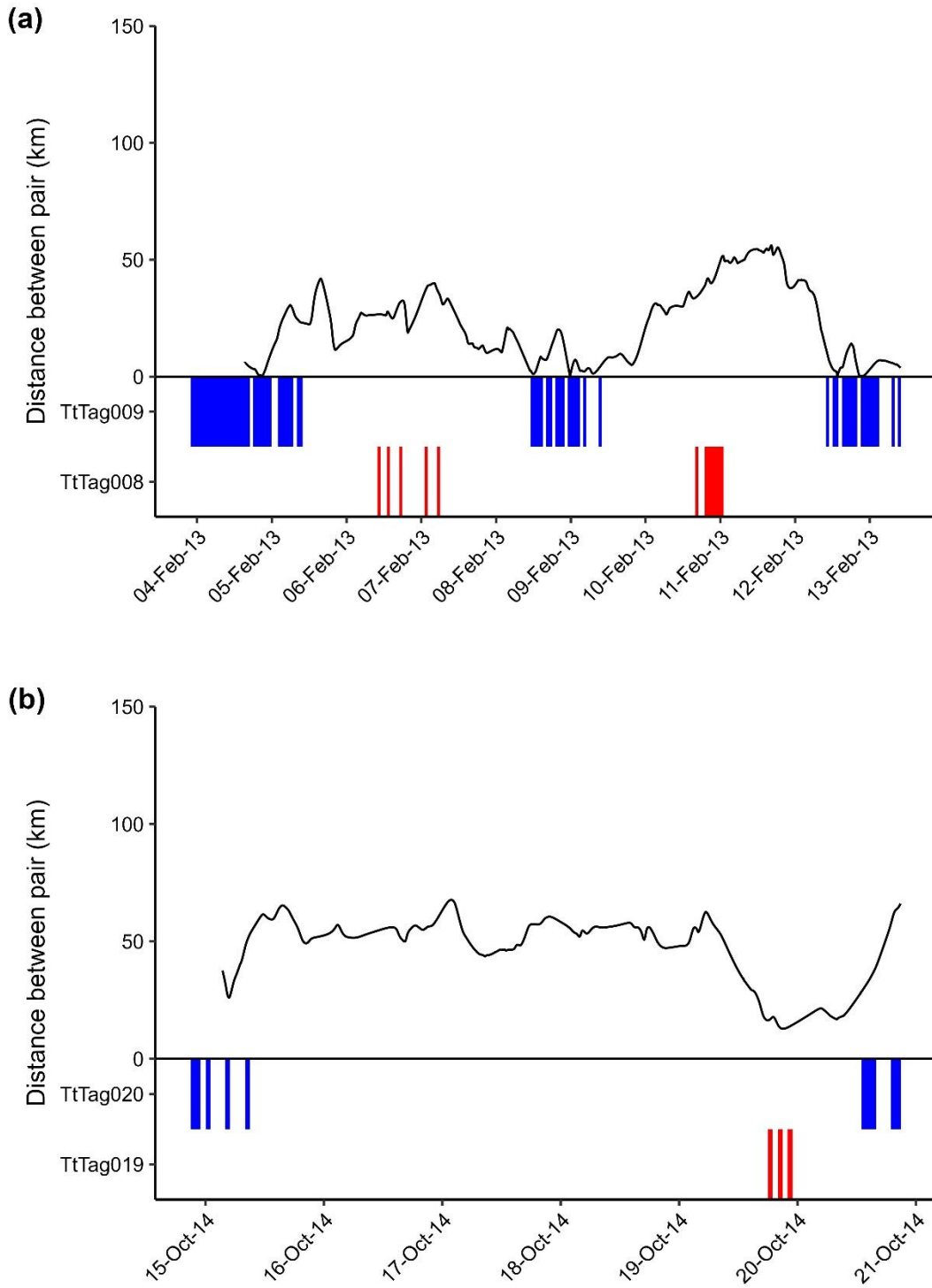


FIGURE S2 Distance between pairs of tagged individuals with behavior log data that had overlapping deployments. Colored bars show the availability of behavior data for each tag. Dates are in HST.

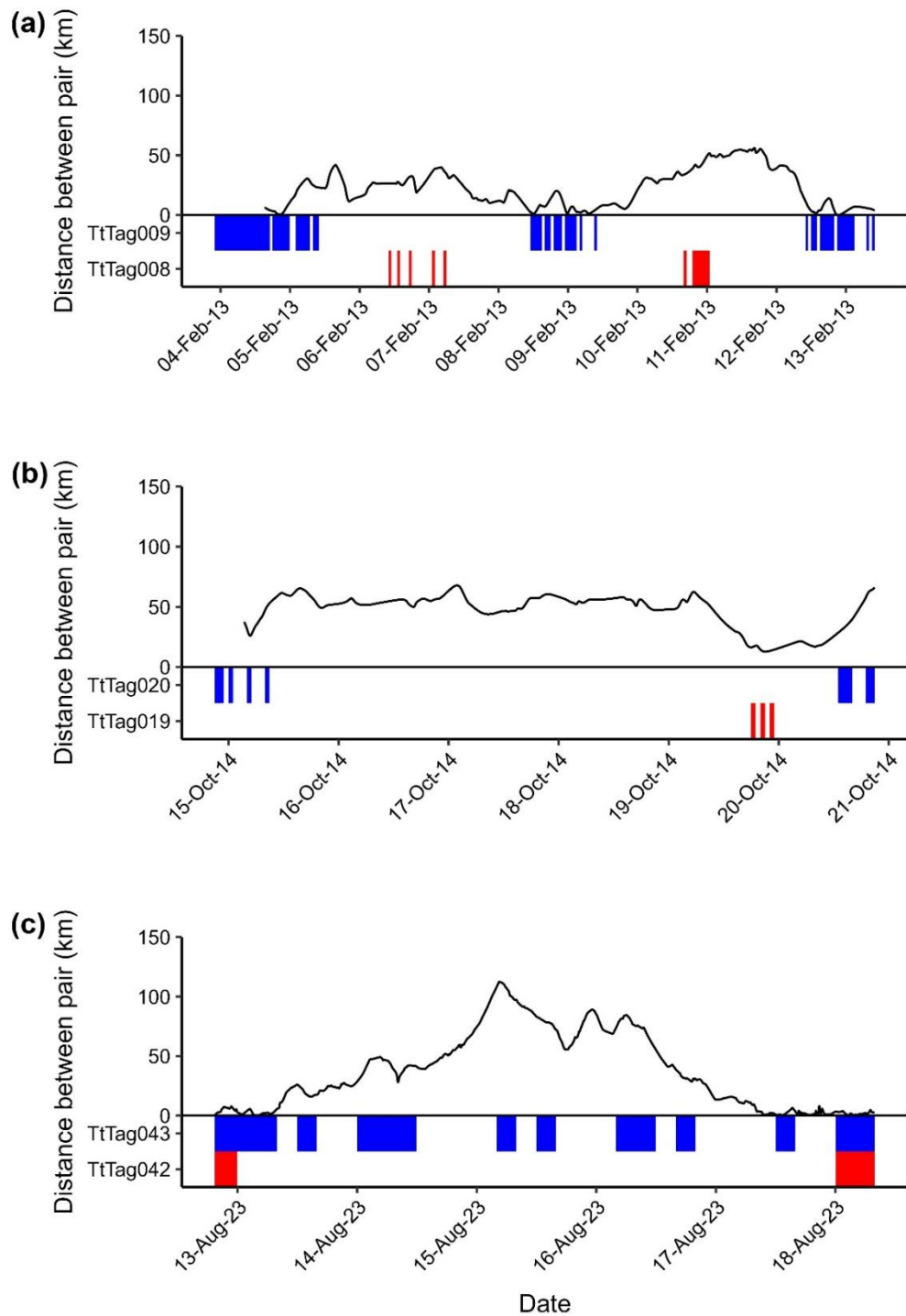
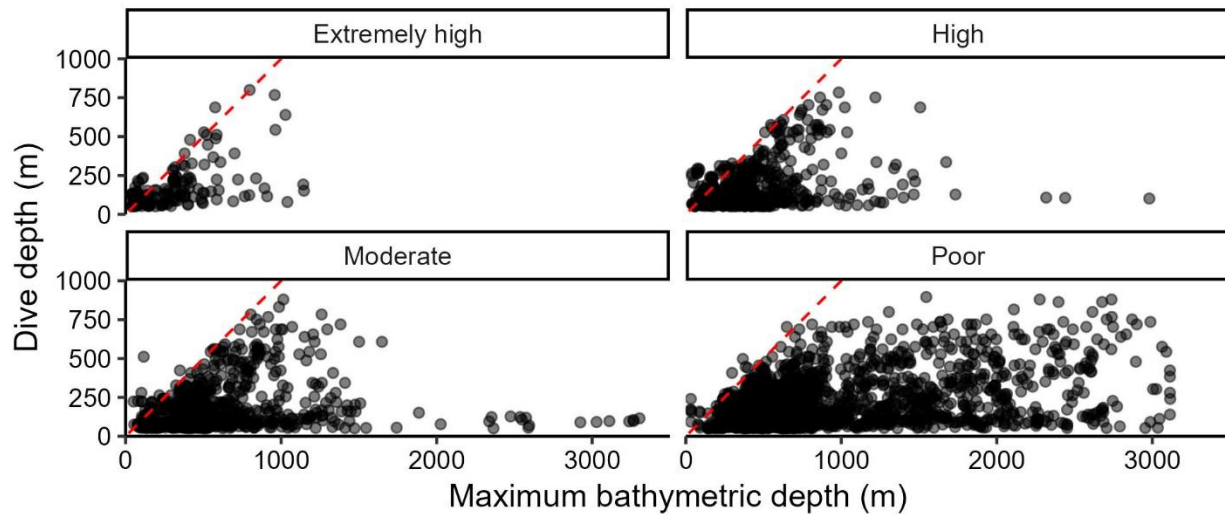


FIGURE S3 Distance between pairs of tagged individuals with time series data that had overlapping deployments. Colored bars show the availability of time series data for each tag. Dates are in HST.

(a)



(b)

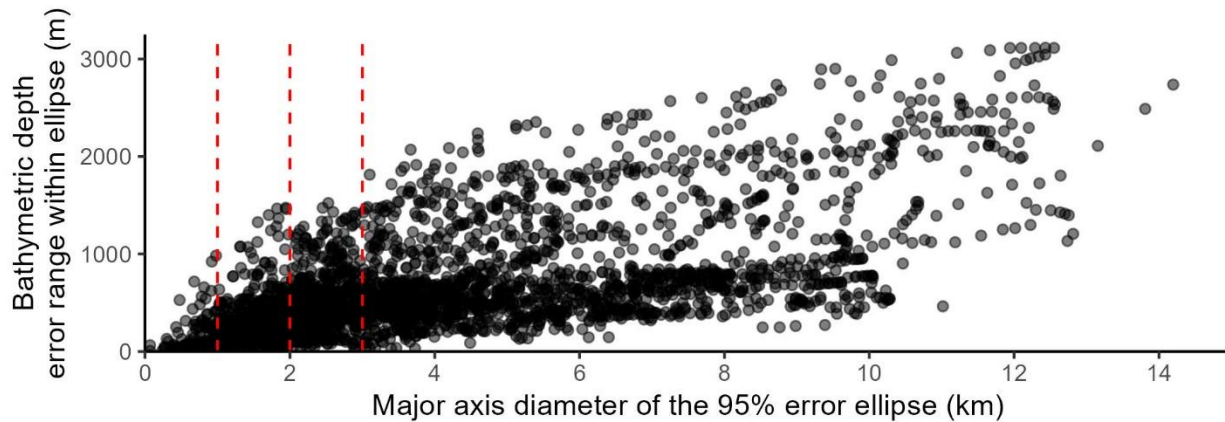


FIGURE S4 Scatterplots of dive depth in relation to maximum bathymetric depth with the 95% error ellipse for all dives conducted by 11 satellite-tagged bottlenose dolphins with behavior log data, grouped by level of confidence in the bathymetry estimate (a). A 1:1 trendline (dashed red line) is included as a reference on each plot. Bottom panel (b) shows the bathymetric depth error ranges (defined as the maximum minus the minimum bathymetric depth within the 95% error ellipse for the dive) for the same dives, relative to the major axis diameter of the 95% error ellipse. Vertical red dashed lines indicate the cutoff points for dives with extremely high confidence (≤ 1 km major axis diameter), high confidence (> 1 km and ≤ 2 km major axis diameter), moderate confidence (> 2 km and ≤ 3 km major axis diameter), and poor confidence (> 3 km major axis diameter) in the bathymetry estimate.

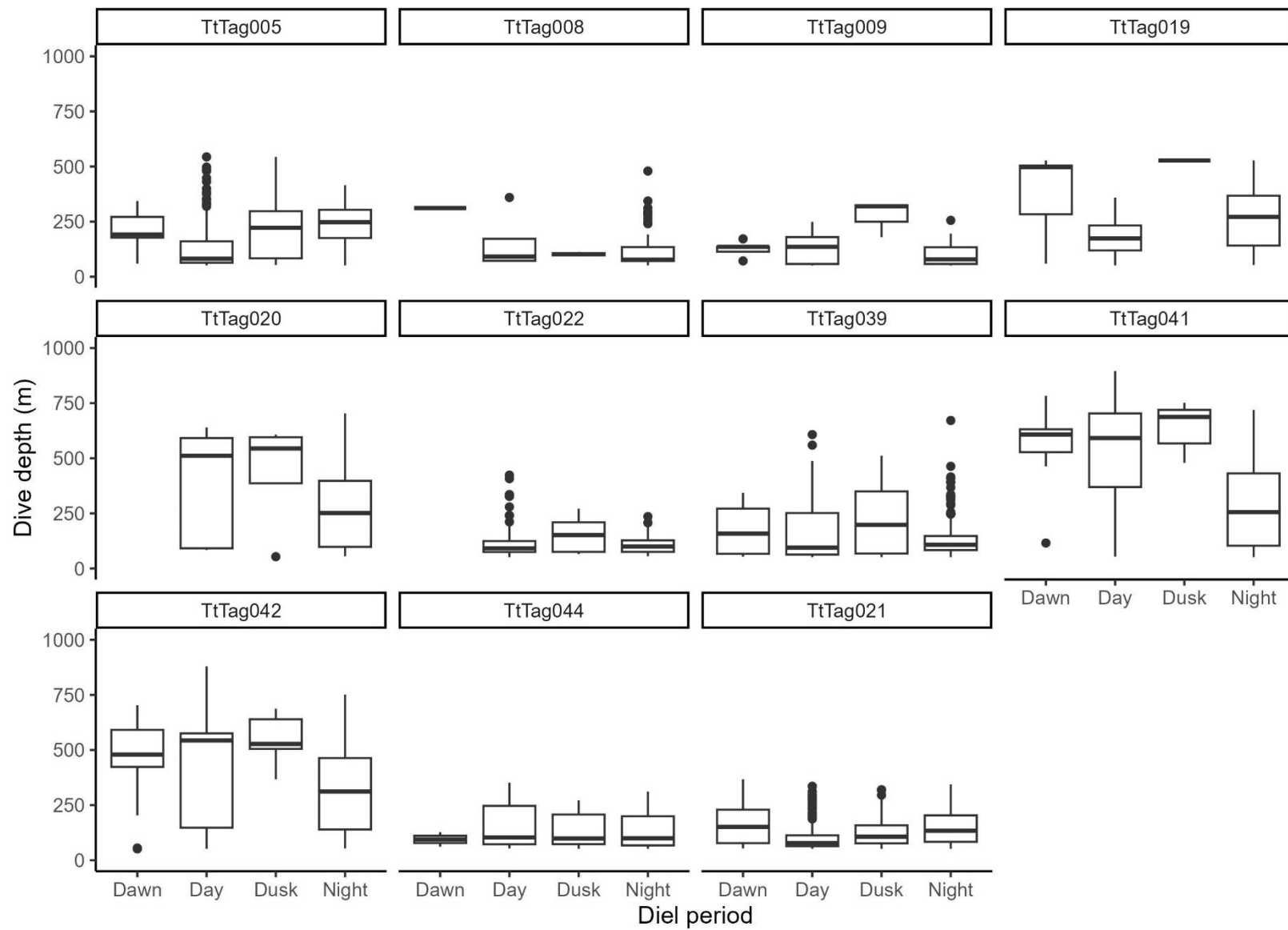


FIGURE S5 Boxplots of dive depths by diel period and Tag ID for 11 satellite-tagged bottlenose dolphins with behavior log data.

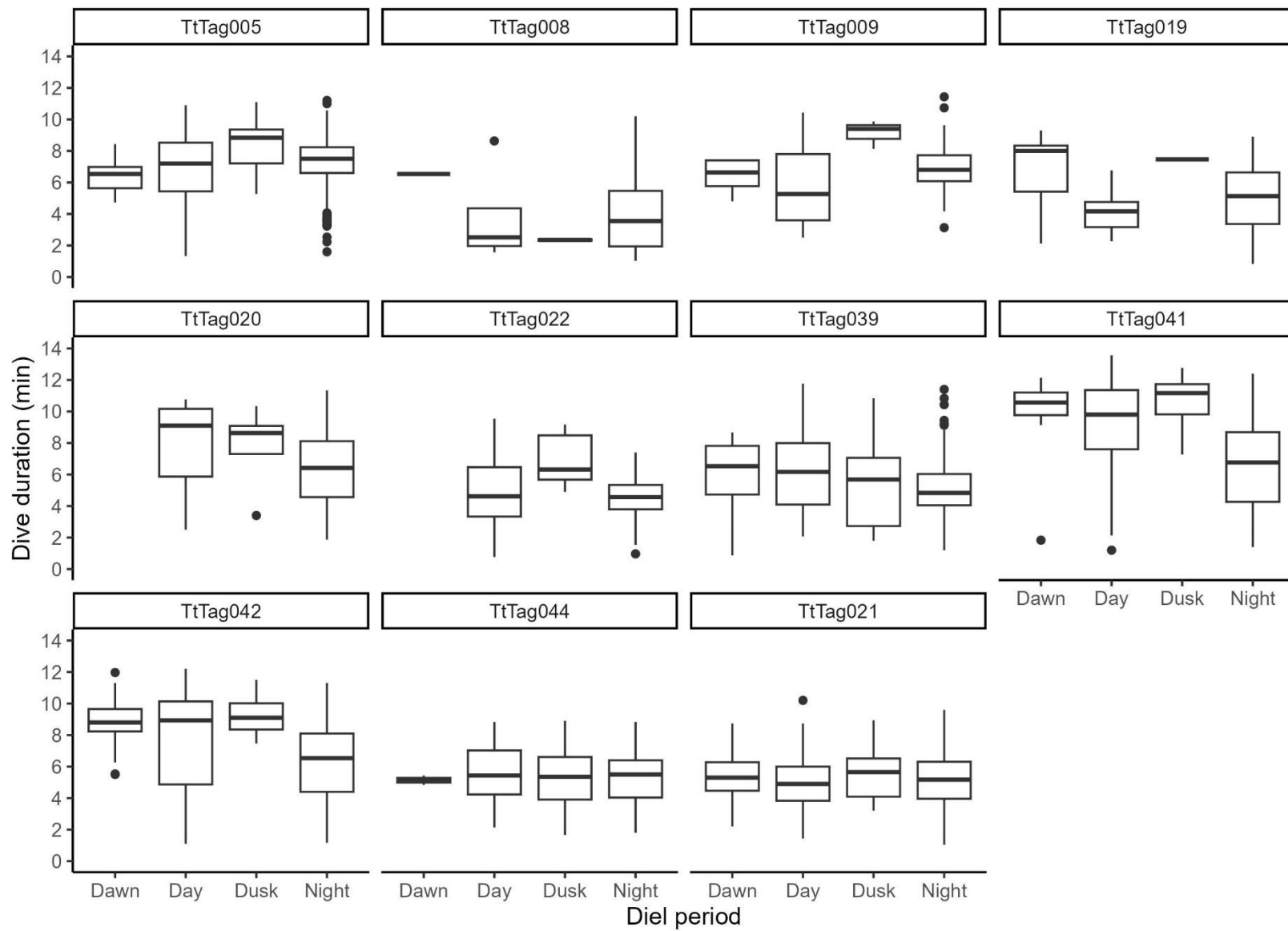


FIGURE S6 Boxplots of dive durations by diel period and Tag ID for 11 satellite-tagged bottlenose dolphins with behavior log data.

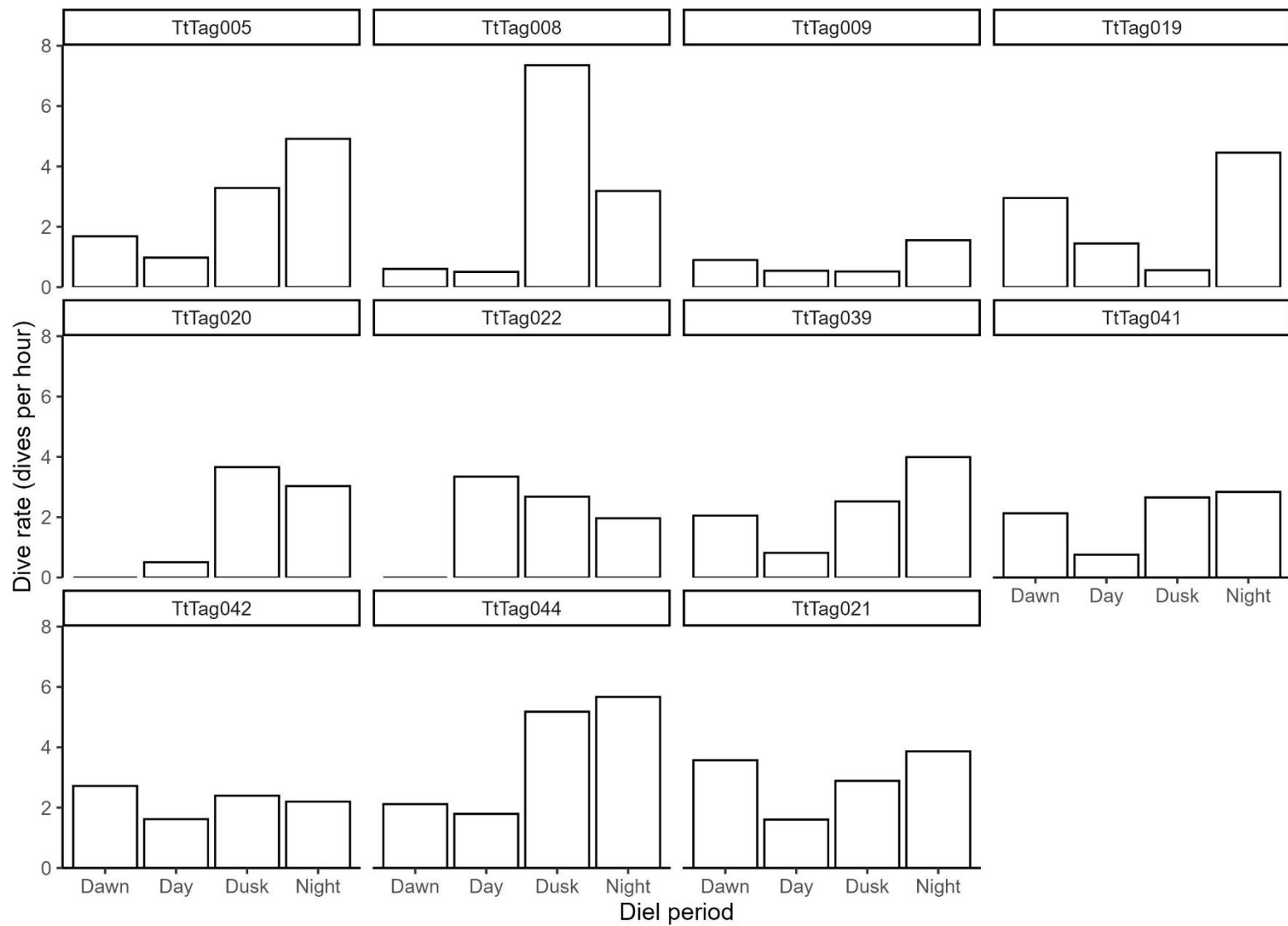


FIGURE S7 Barplots of overall dive rates by diel period and Tag ID for 11 satellite-tagged bottlenose dolphins with behavior log data.

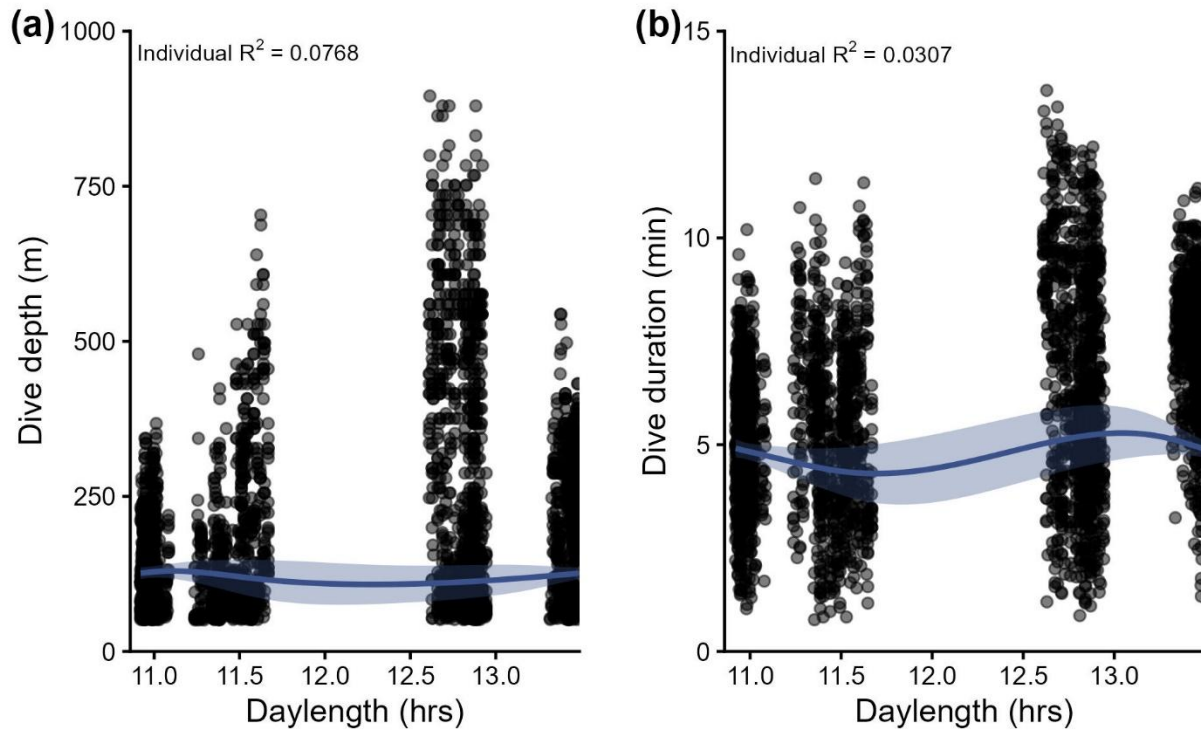


FIGURE S8 Generalized Additive Mixed-Effect Model (GAMM) predictive plots for the models of (a) dive depth (m) and (b) dive duration (min) for 11 satellite-tagged bottlenose dolphins with behavior log data, based on daylength (hrs). The mean predicted functional response curve is conditional upon the mean value for all other covariates, and is represented by the blue line, with the associated 95% confidence interval represented by the shaded blue ribbon. Observed individual datapoints are represented by black circles.

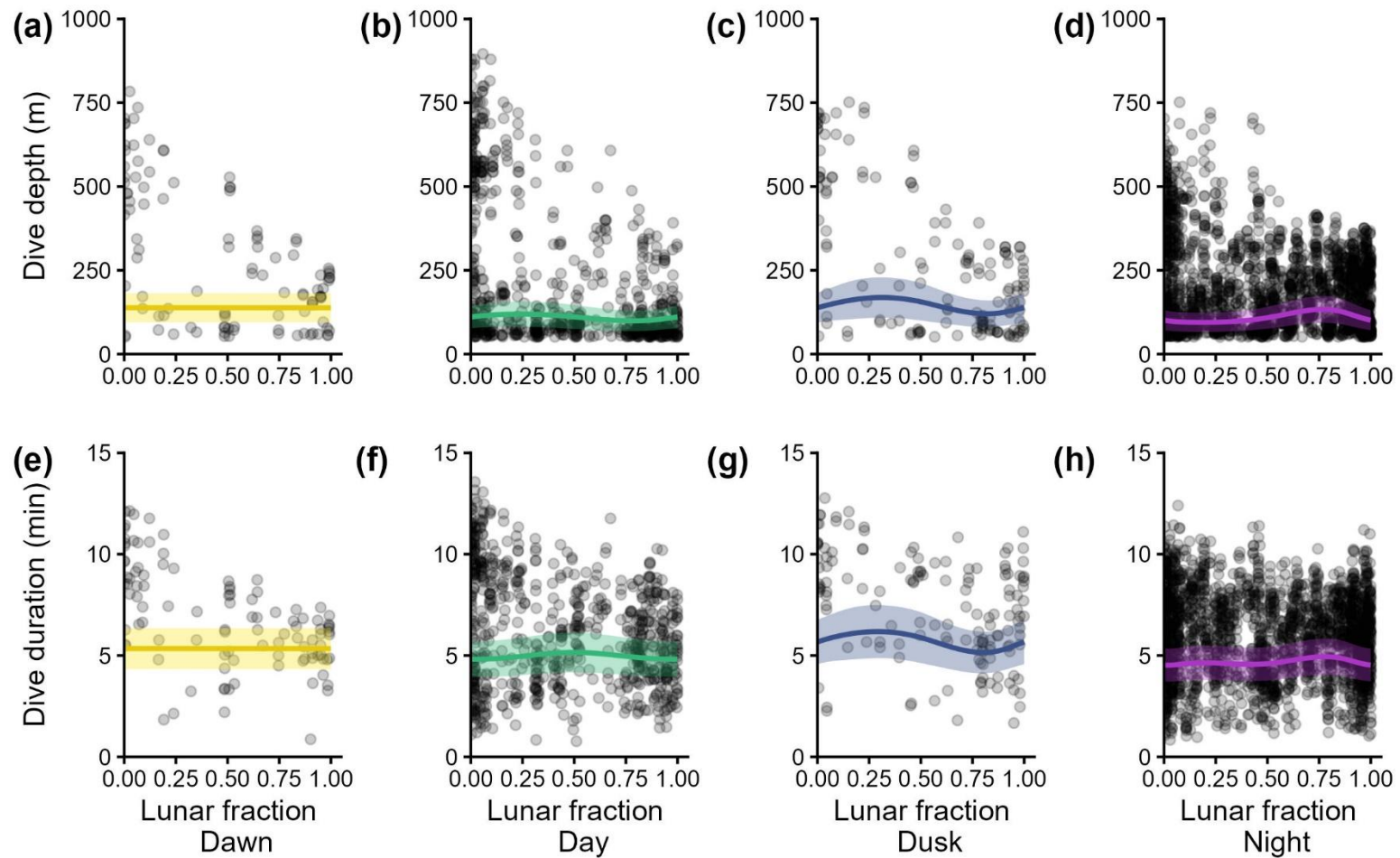
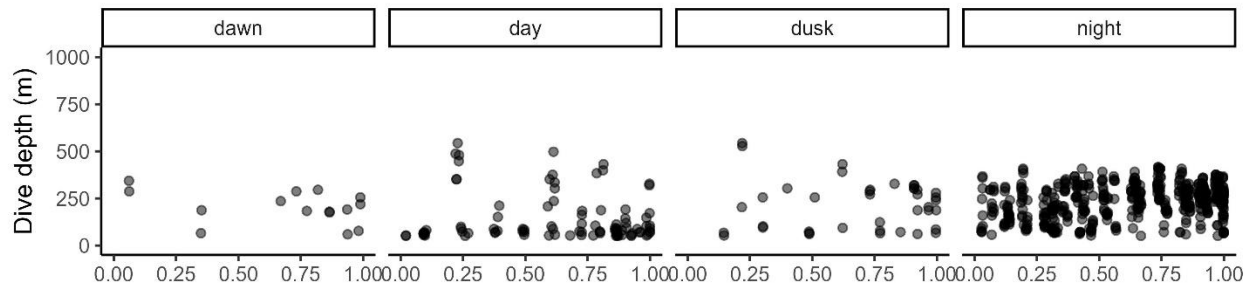
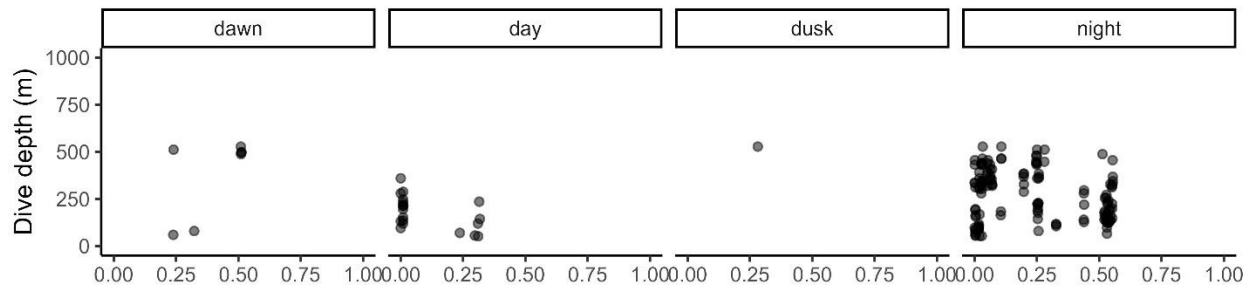


FIGURE S9 Generalized Additive Mixed-Effect Model (GAMM) predictive plots for the models of dive depth (m) and dive duration (min) for 11 satellite-tagged bottlenose dolphins with behavior log data, based on the interaction between lunar fraction and diel period. The mean predicted functional response curve is conditional upon the mean value for all other covariates, and is represented by the colored lines (dawn = yellow, day = green, dusk = blue, night = purple), with the associated 95% confidence interval represented by the shaded ribbons. Observed individual datapoints for each diel period are represented by black circles. The interaction between lunar fraction and diel period has an individual R^2 of 0.037 for the dive depth GAMM, and an individual R^2 of 0.012 for the dive duration GAMM.

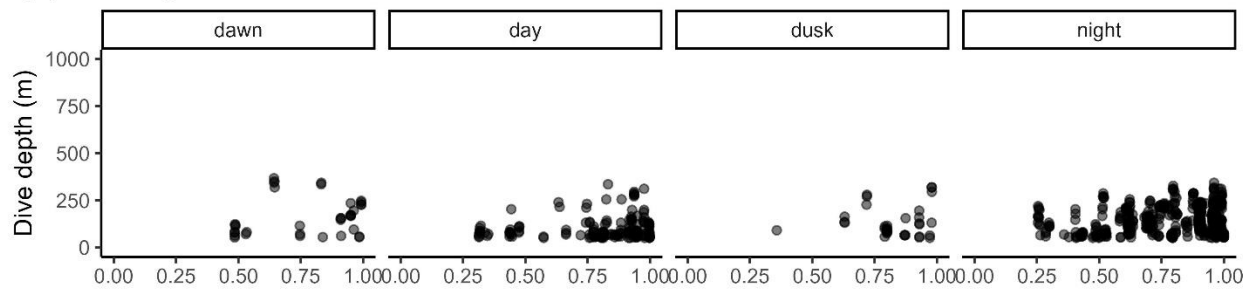
(a) TtTag005



(b) TtTag019



(c) TtTag021



(d) TtTag039

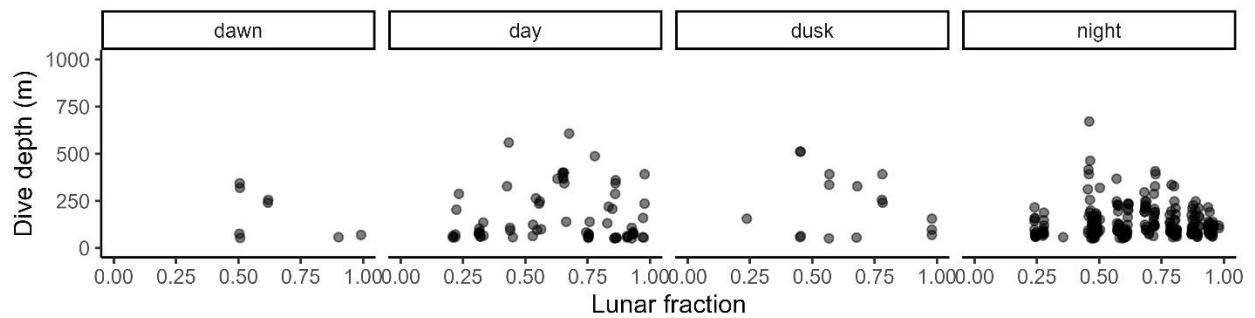
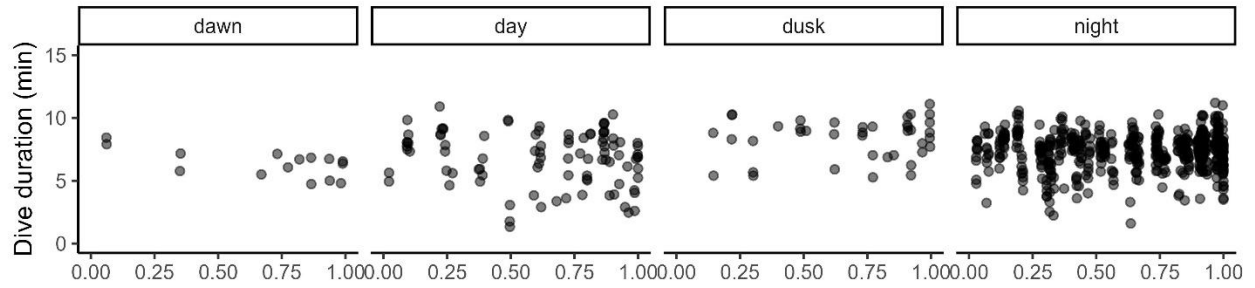
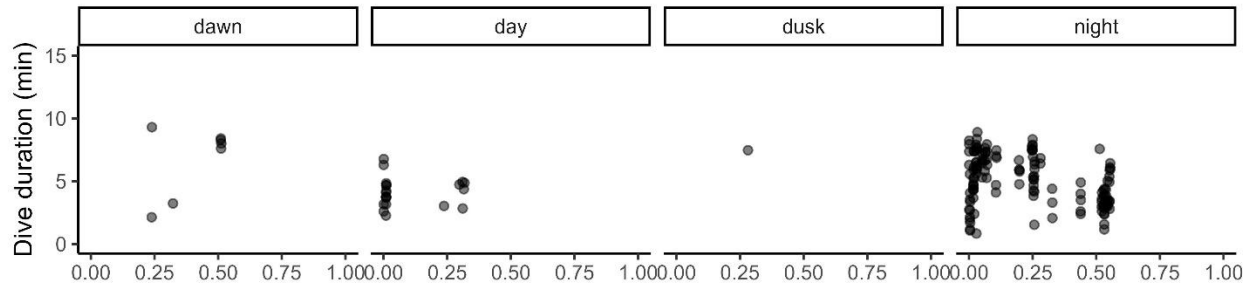


Figure S10 Scatterplots showing dive depths (for dives > 30 sec and > 50 m) versus lunar fraction for four selected tagged individuals with behavior log data.

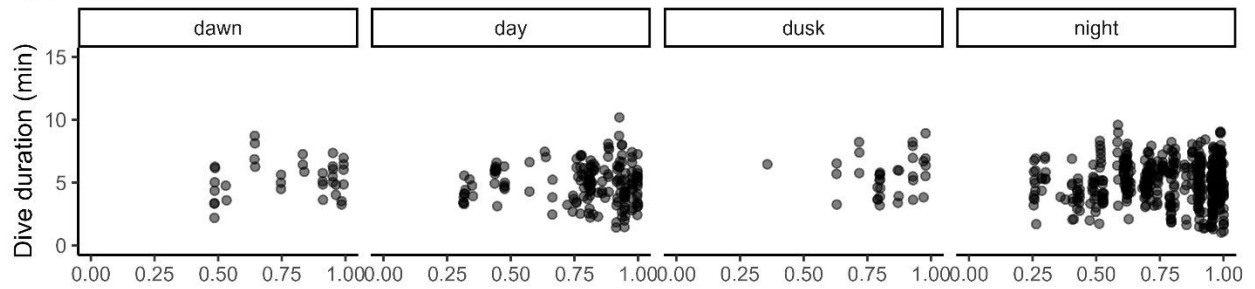
(a) TtTag005



(b) TtTag019



(c) TtTag021



(d) TtTag039

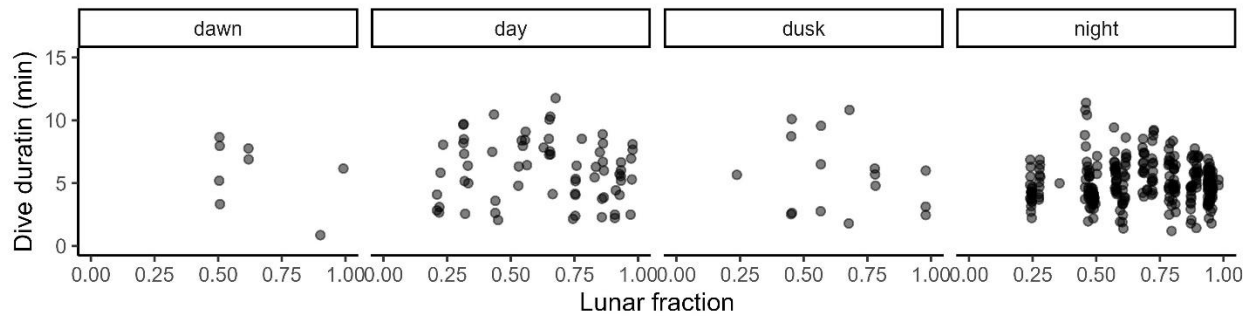


Figure S11 Scatterplots showing dive durations (for dives > 30 sec and > 50 m) versus lunar fraction for four selected tagged individuals with behavior log data.

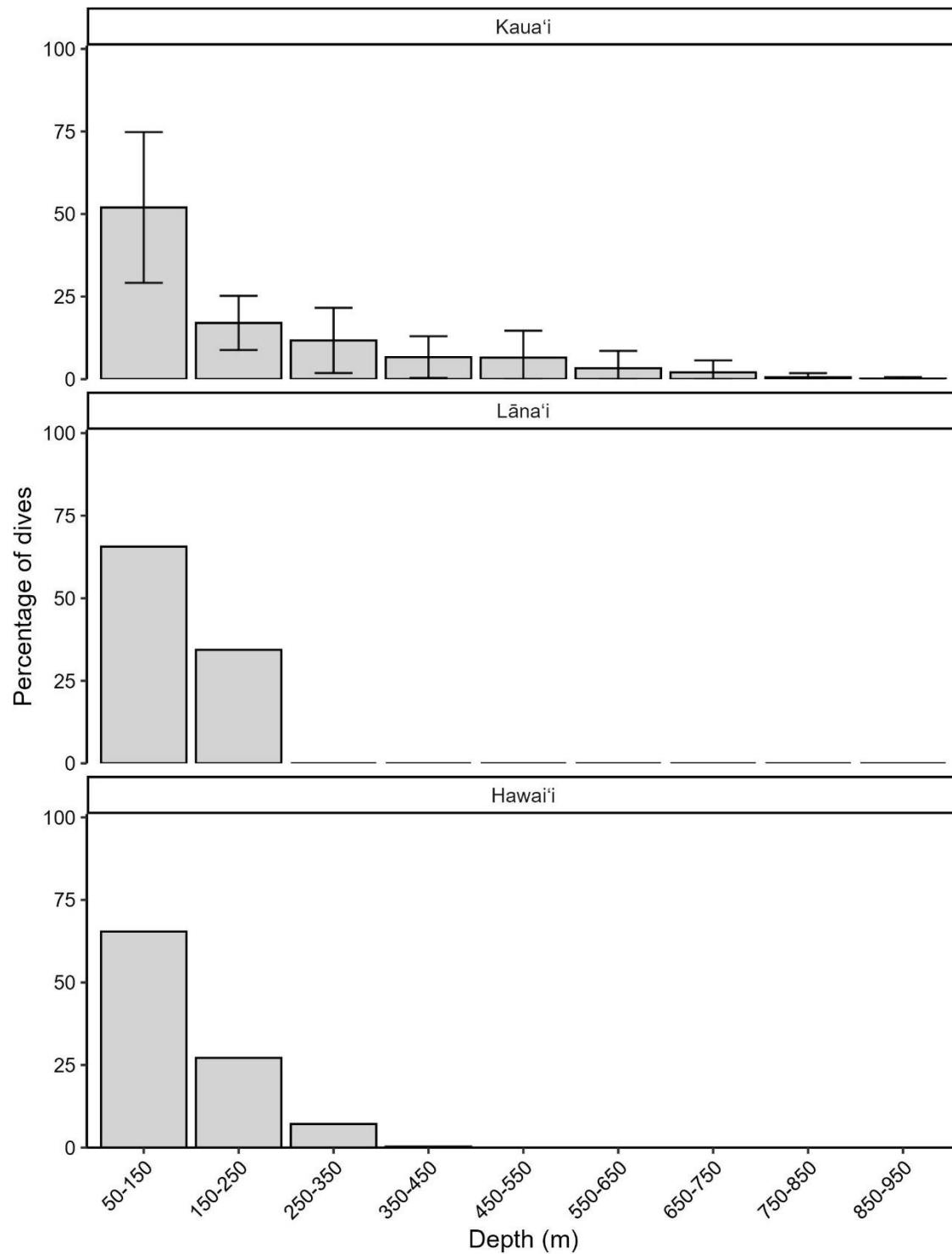


FIGURE S12 Frequency histograms of dive depths (for dives > 30 sec and > 50 m) by population for 12 satellite-tagged bottlenose dolphins with behavior log data, including TtTag006, with error bars showing the standard deviation for Kaua'i animals. Although behavioral log duration for TtTag006 is < 1.0 day it is included in this plot as it represents the sole tag deployment from Lāna'i.

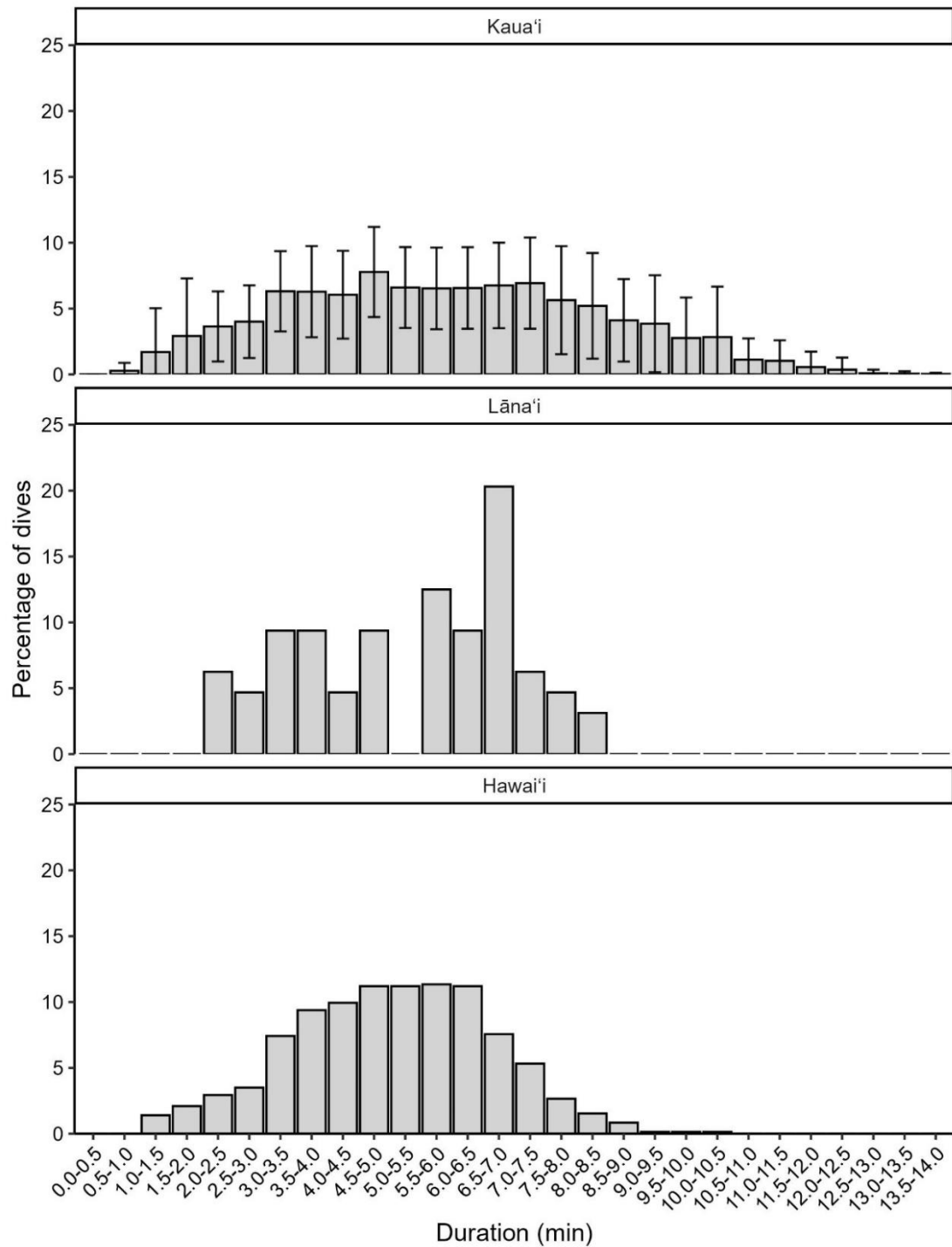


FIGURE S13 Frequency histograms of dive durations (for dives > 30 sec and > 50 m) by population for 12 satellite-tagged bottlenose dolphins with behavior log data, including TtTag006, with error bars showing the standard deviation for Kaua'i animals. Although behavioral log duration for TtTag006 is < 1.0 day it is included in this plot as it represents the sole tag deployment from Lāna'i.

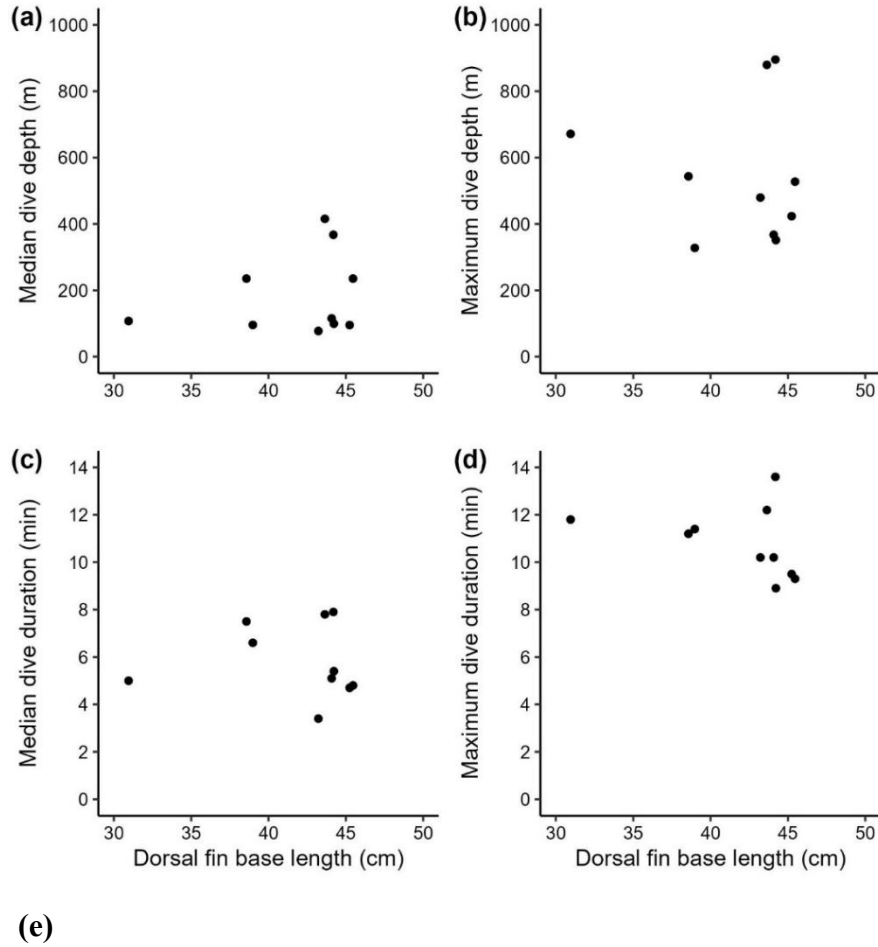


FIGURE S14 Scatterplots of the relationship between measured dorsal fin base length and various dive metrics for 10 bottlenose dolphins with satellite-linked tags with behavior log data and photos of the tag attachment that were suitable for measurement (a-d), and (e) photograph of a tag attached (TtTag021) with lines showing the placement of the dorsal fin base length (yellow) and the tag length (red) from which this measure was derived.