

# Supplementary information

## Temporal patterns in acoustic presence and foraging activity of oceanic dolphins at seamounts in the Azores

Irma Cascao<sup>1\*</sup>, Marc O. Lammers<sup>2,3</sup>, Rui Prieto<sup>1</sup>, Ricardo S. Santos<sup>1</sup>, Mónica A. Silva<sup>1,4</sup>

<sup>1</sup> Marine and Environmental Sciences Centre (MARE), Institute of Marine Research (IMAR) and Okeanos R&D Centre, University of the Azores, Rua Frederico Machado 4, 9901-862 Horta, Portugal

<sup>2</sup> Hawaiian Islands Humpback Whale National Marine Sanctuary, National Oceanic and Atmospheric Administration (NOAA), Kihei, HI 96753, USA

<sup>3</sup> Oceanwide Science Institute (OSI), PO Box 61692, Honolulu, HI 96744, USA

<sup>4</sup> Biology Department, Woods Hole Oceanographic Institution, Woods Hole, MA 02543, USA

\* Corresponding author (email: [irma.cascao@gmail.com](mailto:irma.cascao@gmail.com))

25 **Supplementary tables**

26

27 **Supplementary Table S1. Analysis of deviance (ANOVA) table for the best fitted GLM model**

28 **of dolphin positive hours (DPH) and of foraging positive hours (FPH).** Significant term ( $p < 0.05$ )

29 is shown in bold. S. period - sampling period, *df* - degrees of freedom, *Dev.* - deviance, *Res. df* -

30 residual *df*, *Res dev.* - residual deviance.

	<b>DPH</b>					<b>FPH</b>				
	<i>df</i>	<i>Dev.</i>	<i>Res. df</i>	<i>Res. dev.</i>	<i>p-value</i>	<i>df</i>	<i>Dev.</i>	<i>Res. df</i>	<i>Res. dev.</i>	<i>p-value</i>
NULL			688	208.10				682	35.80	
Seamount	1	0.001	687	208.10	0.976	1	2.129	681	33.67	0.145
S. period	13	60.509	674	147.59	<b>&lt; 0.001</b>	13	5.020	668	28.65	0.975

31

32 **Supplementary Table S2. Pairwise comparisons using Wilcoxon rank-sum test of dolphin positive hours (DPH) between pairs of sampling**  
 33 **periods at Condor seamount.** Significant terms ( $p < 0.05$ ) are shown in bold.

	Jan2011	Feb2011	Mar2008	Apr2008	Apr2010	May2008	May2010	Jun2010	Jul2010	Aug2010	Sep2010	Oct2010	Nov2010
Feb2011	1.000	-	-	-	-	-	-	-	-	-	-	-	-
Mar2008	1.000	1.000	-	-	-	-	-	-	-	-	-	-	-
Apr2008	<b>0.001</b>	<b>&lt;0.001</b>	<b>&lt;0.001</b>	-	-	-	-	-	-	-	-	-	-
Apr2010	1.000	1.000	1.000	<b>&lt;0.001</b>	-	-	-	-	-	-	-	-	-
May2008	<b>&lt;0.001</b>	<b>&lt;0.001</b>	<b>&lt;0.001</b>	1.000	<b>&lt;0.001</b>	-	-	-	-	-	-	-	-
May2010	1.000	<b>0.028</b>	<b>0.022</b>	0.474	1.000	<b>&lt;0.001</b>	-	-	-	-	-	-	-
Jun2010	<b>&lt;0.001</b>	<b>&lt;0.001</b>	<b>&lt;0.001</b>	1.000	<b>&lt;0.001</b>	<b>0.043</b>	0.749	-	-	-	-	-	-
Jul2010	<b>0.034</b>	<b>&lt;0.001</b>	<b>&lt;0.001</b>	1.000	<b>0.008</b>	<b>&lt;0.001</b>	1.000	1.000	-	-	-	-	-
Aug2010	<b>0.017</b>	<b>&lt;0.001</b>	<b>&lt;0.001</b>	1.000	<b>0.003</b>	<b>0.002</b>	1.000	1.000	1.000	-	-	-	-
Sep2010	1.000	<b>0.021</b>	<b>0.008</b>	1.000	0.159	<b>0.002</b>	1.000	1.000	1.000	1.000	-	-	-
Oct2010	<b>&lt;0.001</b>	<b>&lt;0.001</b>	<b>&lt;0.001</b>	1.000	<b>&lt;0.001</b>	1.000	<b>0.007</b>	1.000	0.102	0.400	0.052	-	-
Nov2010	1.000	<b>0.014</b>	<b>0.006</b>	0.539	0.248	<b>&lt;0.001</b>	1.000	0.575	1.000	1.000	1.000	<b>0.002</b>	-
Dec2010	1.000	0.050	<b>0.015</b>	0.100	0.840	<b>&lt;0.001</b>	1.000	0.129	1.000	1.000	1.000	<b>&lt;0.001</b>	1.000

35 **Supplementary Table S3. Pairwise comparisons using Wilcoxon rank-sum test of dolphin positive hours (DPH) between pairs of sampling**  
 36 **periods at Gigante seamount.** Significant terms ( $p < 0.05$ ) are shown in bold.

	Jan2011	Feb2011	Mar2008	Apr2008	May2008	Jul2010	Aug2010	Sep2010	Oct2010	Nov2010
Feb2011	1.000	-	-	-	-	-	-	-	-	-
Mar2008	<b>0.036</b>	0.129	-	-	-	-	-	-	-	-
Apr2008	<b>0.024</b>	0.096	1.000	-	-	-	-	-	-	-
May2008	<b>&lt;0.001</b>	<b>0.001</b>	1.000	1.000	-	-	-	-	-	-
Jul2010	1.000	1.000	0.592	1.000	<b>0.003</b>	-	-	-	-	-
Aug2010	<b>0.022</b>	0.058	1.000	1.000	0.287	1.000	-	-	-	-
Sep2010	<b>0.012</b>	0.102	1.000	1.000	1.000	1.000	1.000	-	-	-
Oct2010	<b>0.001</b>	<b>0.009</b>	1.000	1.000	1.000	0.111	1.000	1.000	-	-
Nov2010	1.000	1.000	0.094	0.415	<b>&lt;0.001</b>	1.000	0.381	0.082	<b>0.015</b>	-
Dec2010	1.000	1.000	<b>0.020</b>	<b>0.048</b>	<b>&lt;0.001</b>	1.000	<b>0.003</b>	<b>0.004</b>	<b>0.002</b>	1.000

37

38 **Supplementary Table S4. ANOVA table for the best fitted GAMM model of diel patterns in**  
 39 **dolphin detections and acoustic signals.** Significant terms ( $p < 0.05$ ) are shown in bold. H after SS –  
 40 hours after sunset.

<b>Models</b>	<b>Smooth terms</b>	<i>edf</i>	<i>F</i>	<i>p-value</i>
Dolphin detections	s(H after SS) <sub>Jan-Mar</sub>	1.000	35.70	< <b>0.001</b>
(n = 16,421)	s(H after SS) <sub>Apr-Dec</sub>	7.114	69.91	< <b>0.001</b>
Foraging signals	s(H after SS)	3.646	16.92	< <b>0.001</b>
(n = 7,966)				
Echolocation clicks	s(H after SS)	6.226	24.44	< <b>0.001</b>
(n = 7,966)				
Social signals	s(H after SS)	6.527	14.10	< <b>0.001</b>
(n = 7,966)				

41