Supplementary information

Equation of the global model for fitting the GAMM.

Humpback dolphin encounter rate model

$$\begin{aligned} GlobalModel \leftarrow \text{gam}(&\text{encounters} \sim s(\text{dist}, k = 5, \text{by} = \text{detection}) + \\ &s(\text{depth}, k = 5, \text{by} = \text{detection}) \\ &+ s(\text{timeenc}, k = 5, \text{by} = \text{detection}) + s(\text{boats}, k = 5, \text{by} = \text{detection}) \\ &+ te(\text{swell}, \text{sea state}, k = 3, \text{by} = \text{detection}) + \text{detection} + s(\text{lineID}, \text{bs} = \text{"}re\text{"}) + \\ &\text{offset}(\log(\text{lineseg})), \text{family} = \text{tw}(), \text{method} = \text{"}REML\text{"}, \text{data} = \text{dolphin}) \end{aligned}$$

Finless porpoise encounter rate model

$$\begin{aligned} GlobalModel \leftarrow \text{gam}(&\text{encounters} \sim s(\text{dist}, k = 4, \text{by} = \text{detection}) + \\ &s(\text{depth}, k = 4, \text{by} = \text{detection}) \\ &+ s(\text{timeenc}, k = 4, \text{by} = \text{detection}) + s(\text{boats}, k = 4, \text{by} = \text{detection}) \\ &+ te(\text{swell}, \text{sea state}, k = 4, \text{by} = \text{detection}) + \text{detection} + s(\text{lineID}, \text{bs} = \text{"}re\text{"}) + \\ &\text{offset}(\log(\text{lineseg})), \text{family} = \text{tw}(), \text{method} = \text{"}REML\text{"}, \text{data} = \text{porpoise}) \end{aligned}$$

Table 1. Final GAMM Model

Species	Predictors	Dev.explained	Residual df	AIC
Humpback dolphin	*s*(boats, k = 5) + *s*(distance, k = 5) + *te*(swell + sea state, k = 3)	14.60%	27	362
Finless porpoise	*s*(depth, k = 5) + *s*(distance, k = 5) + *te*(swell + sea state, k = 5)	17.4%	23	546

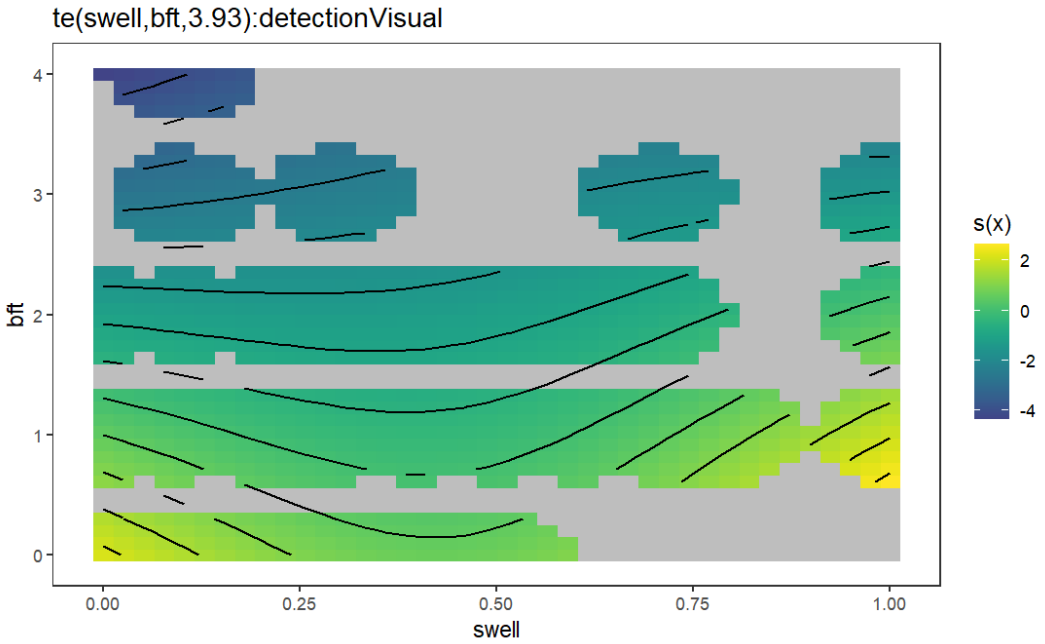

Figure 1. S1.Tensor product interaction of effect of sea swell and sea state on visual detections of humpback dolphins

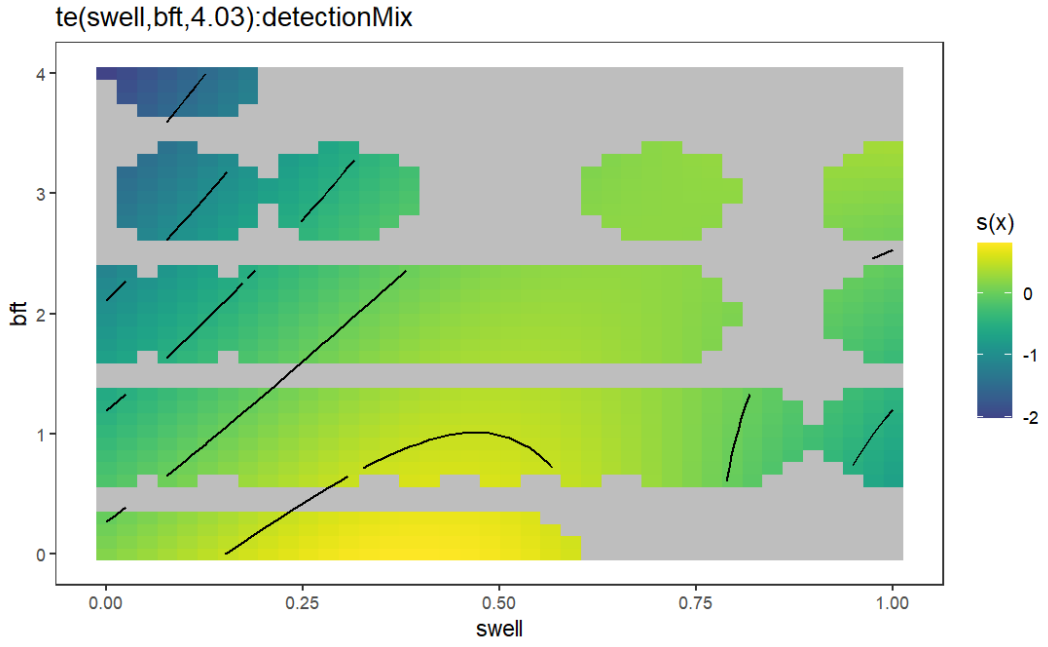

Figure 2. S2.Tensor product interaction of effect of sea swell and sea state on mixed detection of humpback dolphins

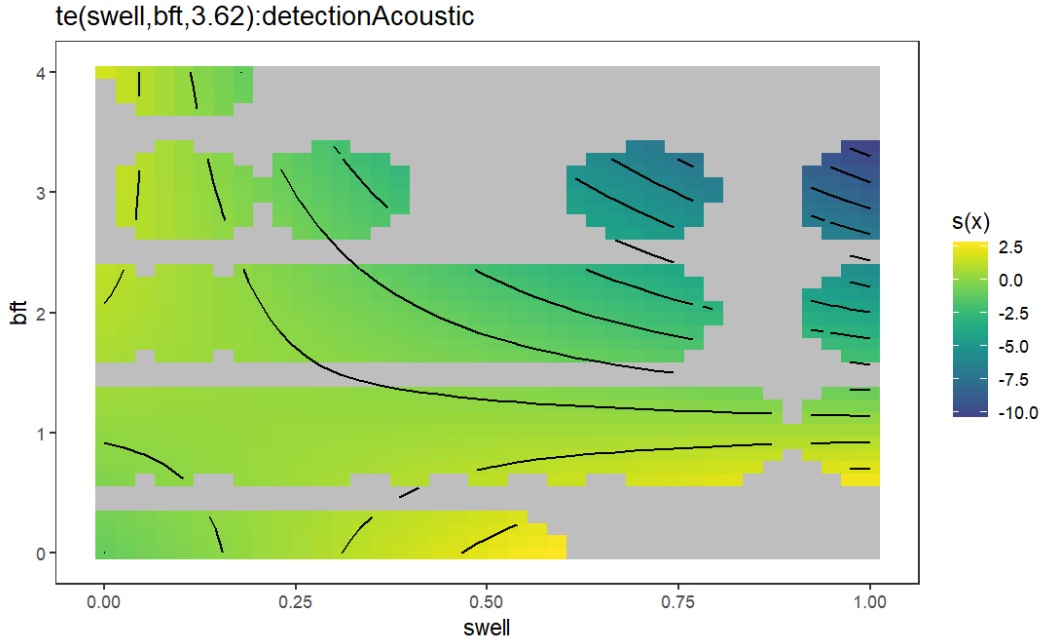

Figure 3. S3.Tensor product interaction of effect of sea swell and sea state on acoustic detections of humpback dolphins

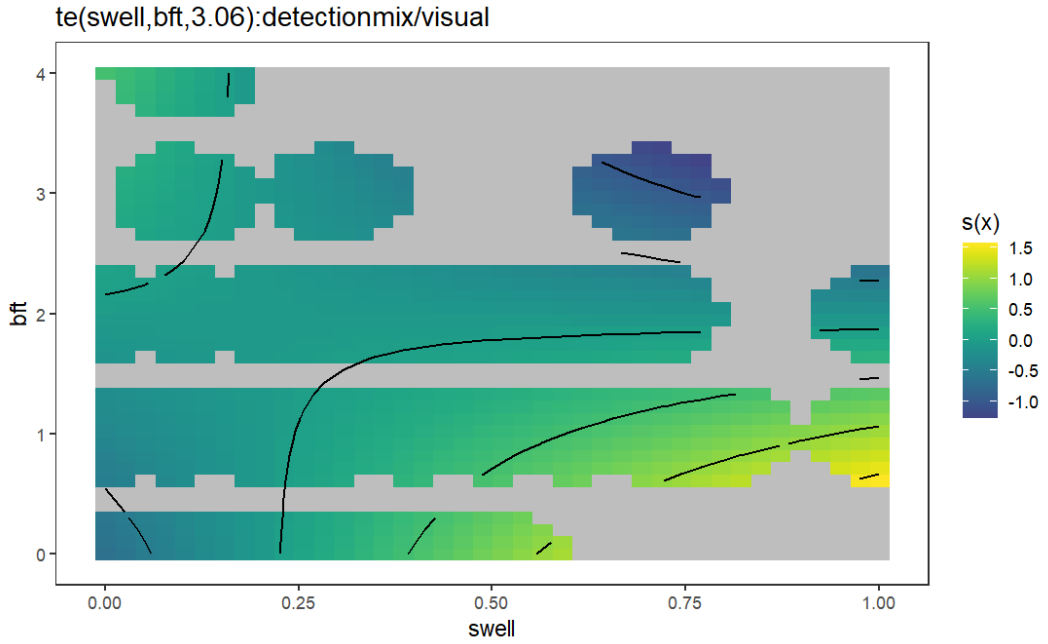

Figure 4. S4.Tensor product interaction of effect of sea swell and sea state on mix/visual detections of finless porpoises

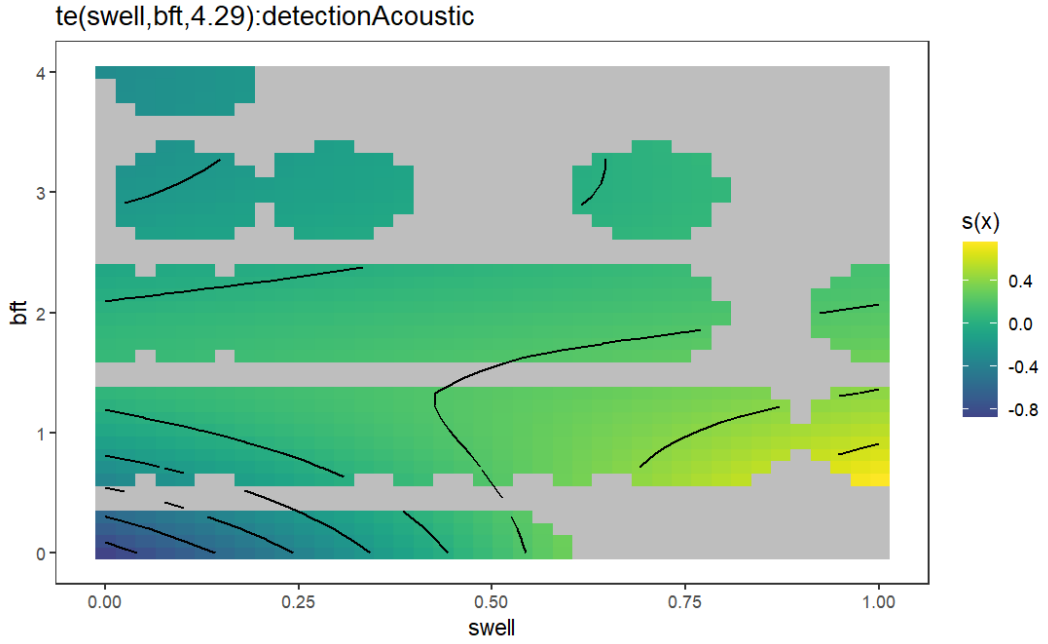

Figure 5. S5.Tensor product interaction of effect of sea swell and sea state on acoustic detections of finless porpoises

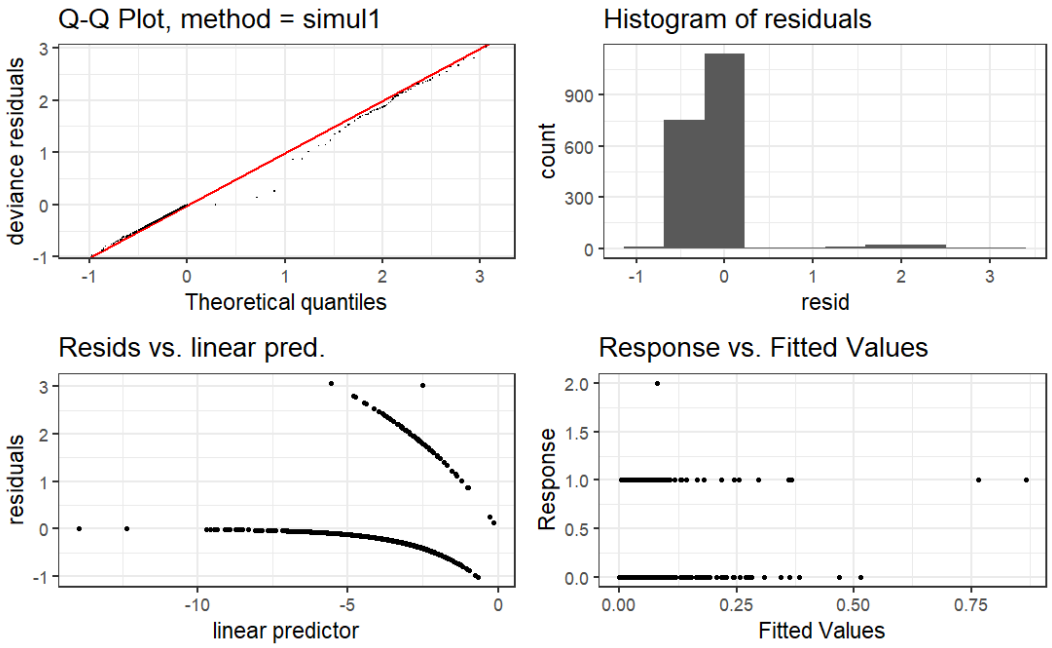

Figure 6. S6.Diagnostic plots of the final GAMM model for humpback dolphin encounter rates

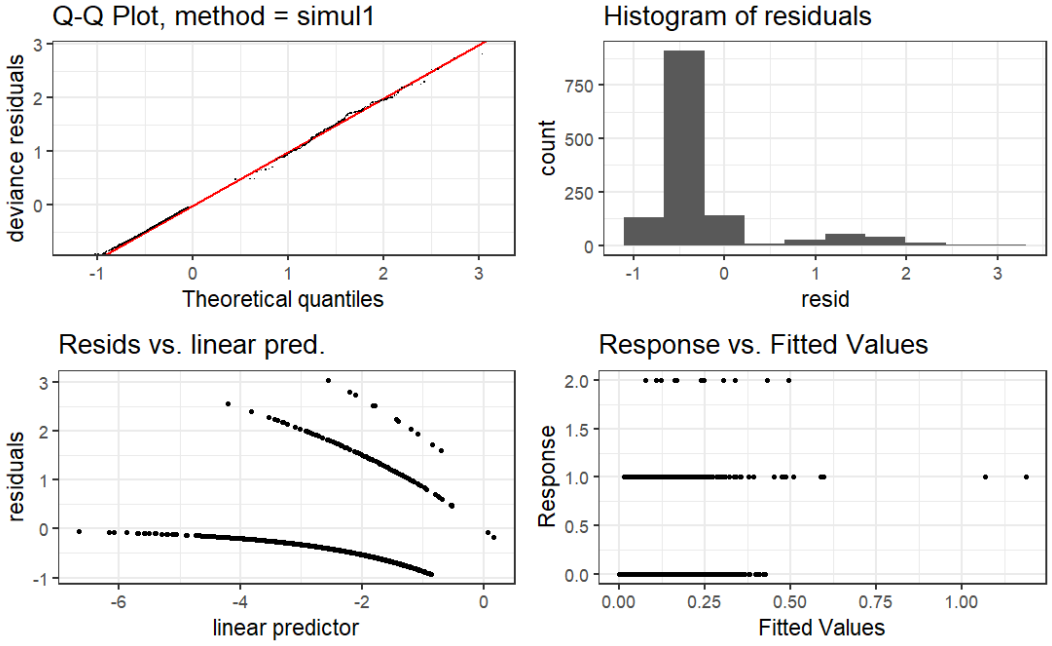

Figure 7. S7.Diagnostic plots of the final GAMM model for finless porpoise encounter rates