ZR Zoological Research

Supplementary Materials

Anthropogenic activity, hydrological regime, and light level jointly influence temporal patterns in biosonar activity of the Yangtze finless porpoise at the junction of the Yangtze River and Poyang Lake, China

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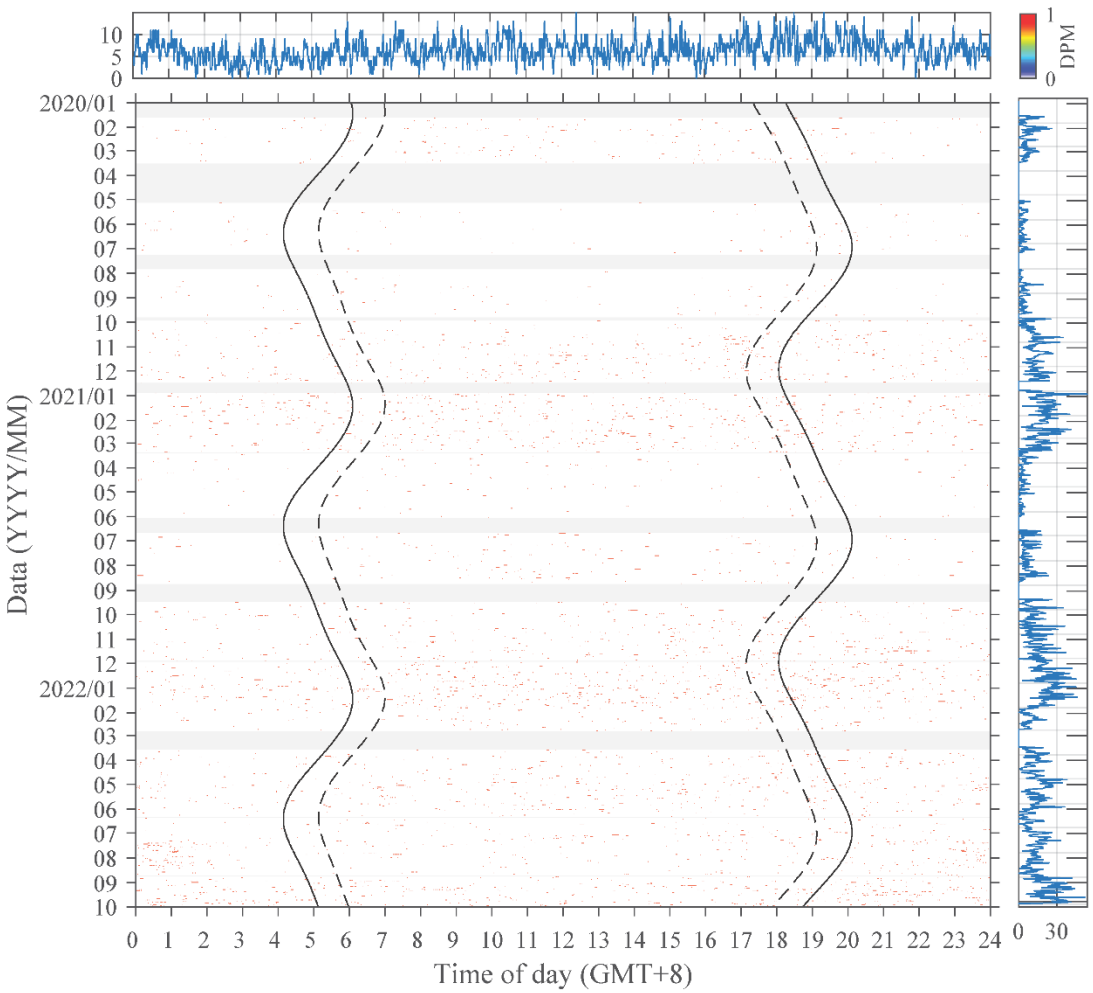
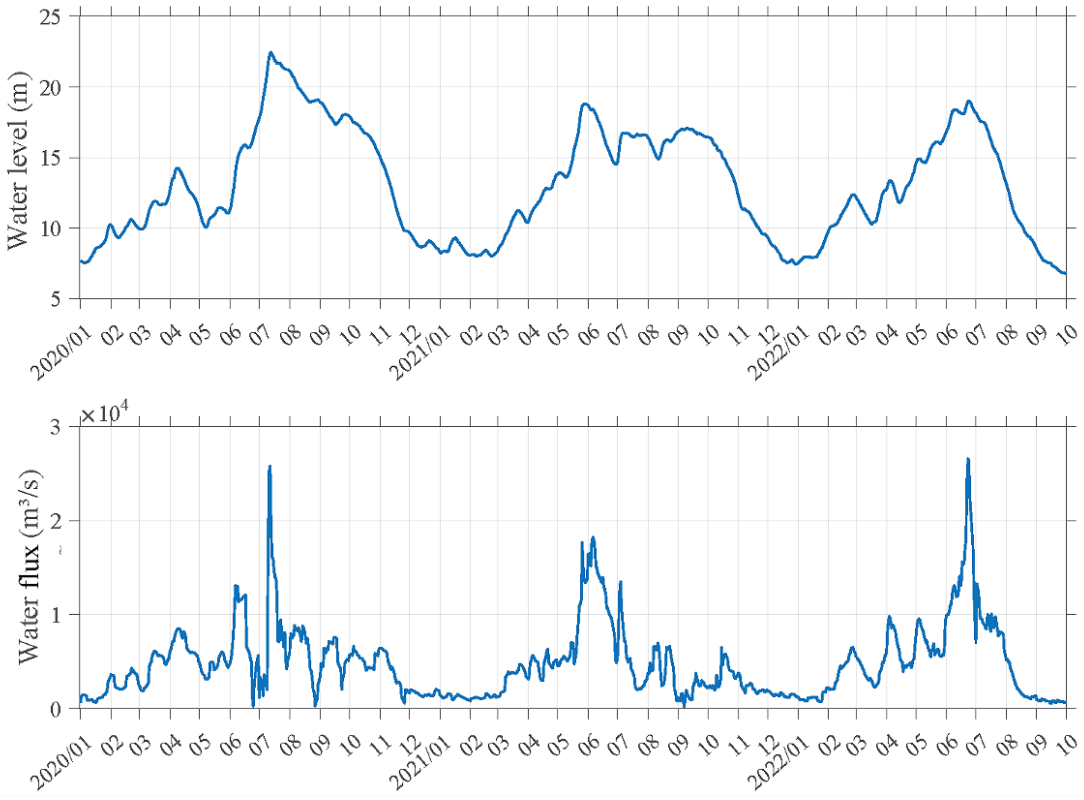
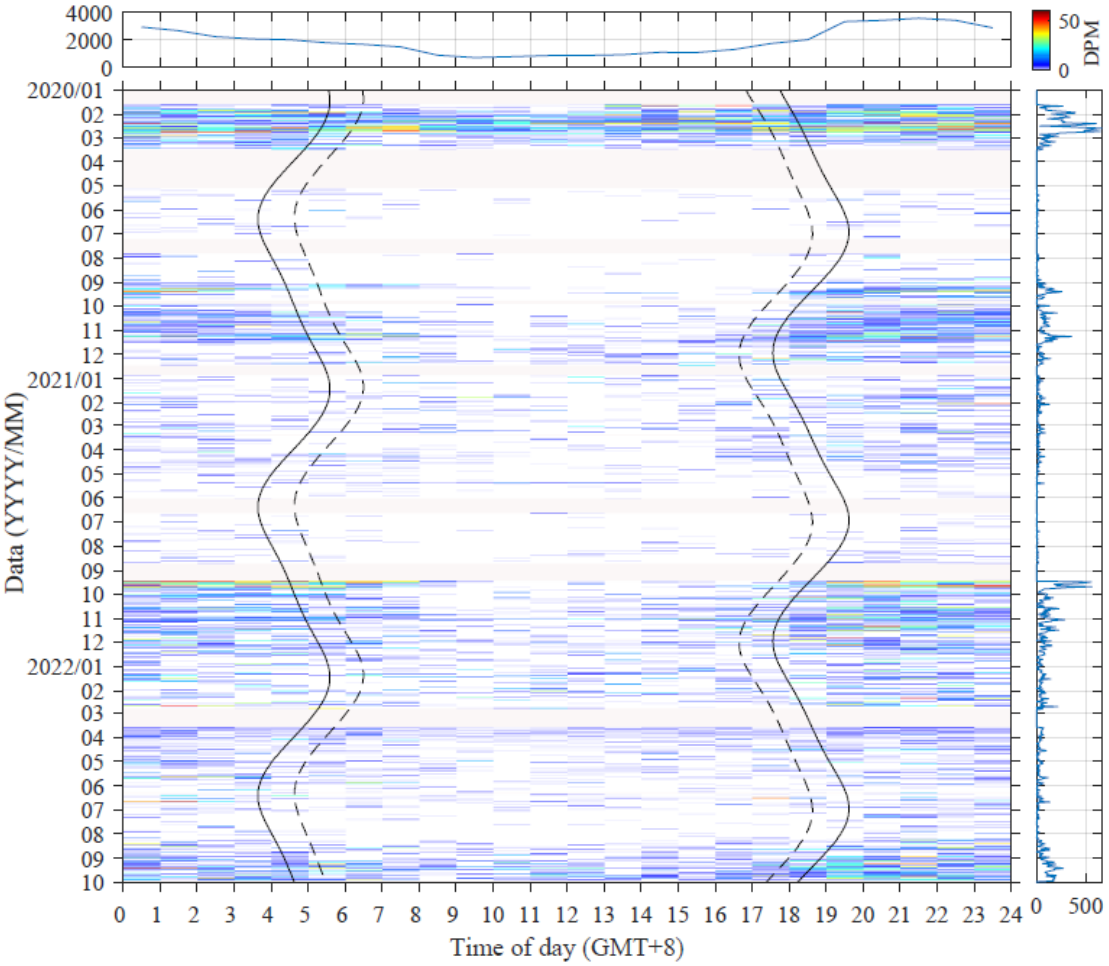


Supplementary Figure S1 Boat sonar detection-positive rate per minute (DPRM) as a function of time of day (X-axis) and date (Y-axis)

Results are given for each minute. Light gray horizontal boxes indicate periods without 24 h full-time recording or periods of no recordings not included in this study. Solid black lines indicate start of dawn and end of dusk. Dashed broken lines indicate end of dawn and start of dusk. Line plots on top denote diel pattern of boat sonar DPRM over the whole analyzed period. Line plot on right side denotes summed boat sonar detection-positive minutes daily.

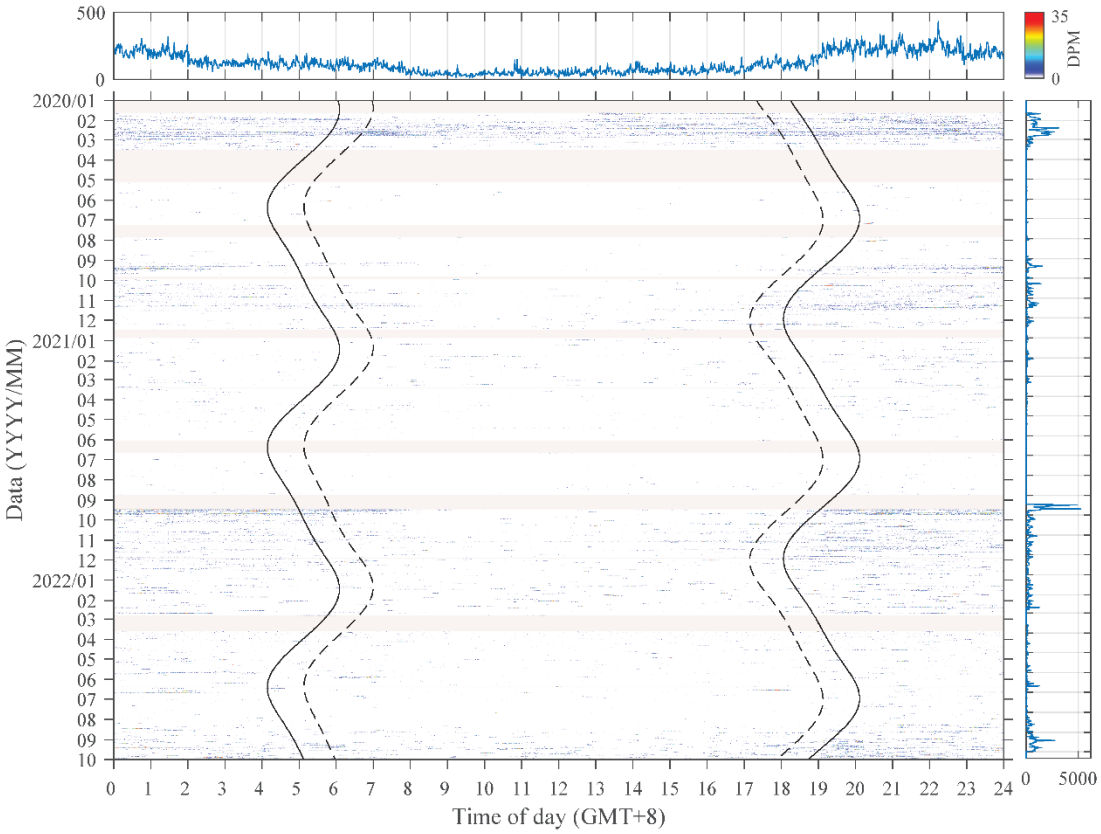


Supplementary Figure S2 Water level and water flux at acoustic monitoring site



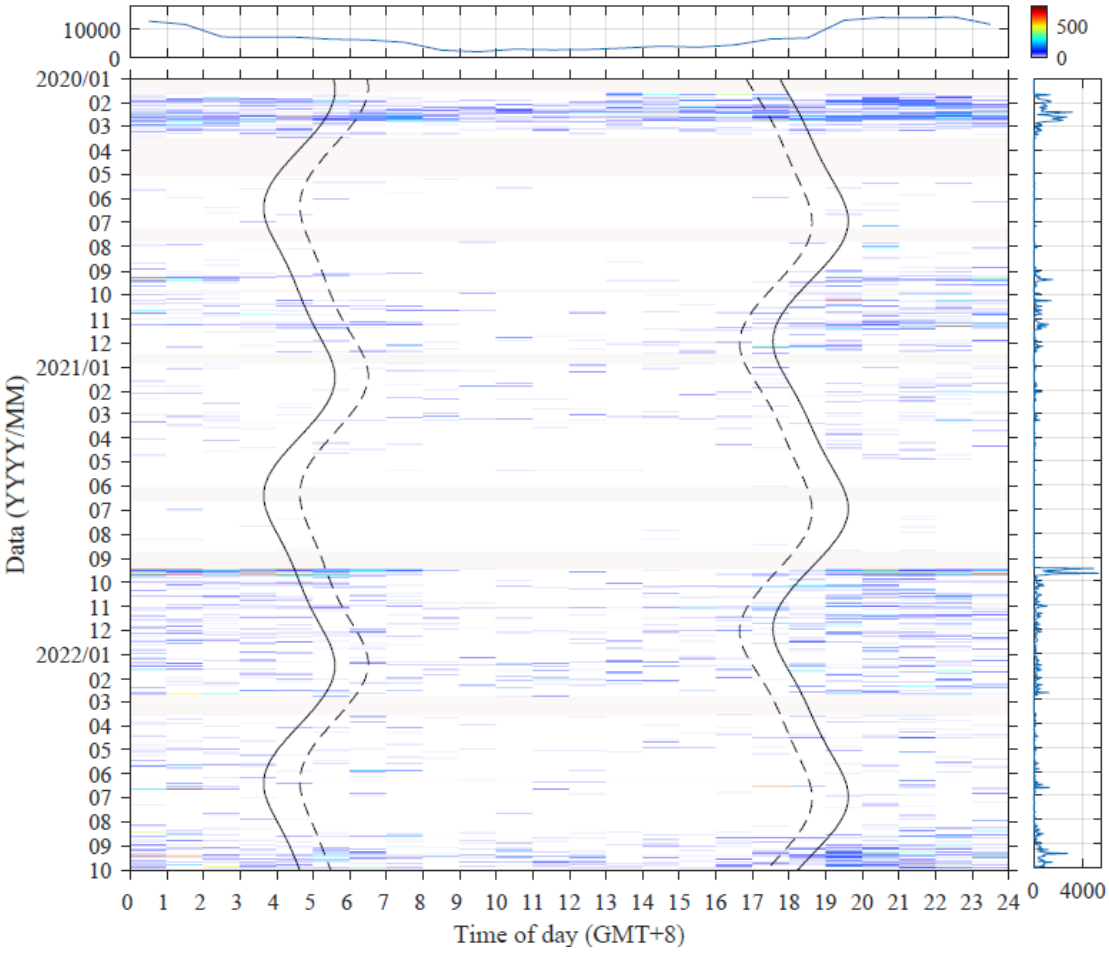
Supplementary Figure S3 Porpoise click detection-positive minutes in each hour as a function of time of day (X-axis) and date (Y-axis)

Results are given for each hour. Light gray horizontal boxes indicate periods without 24 h full-time recording or periods of no recordings not included in this study. Solid black lines indicate start of dawn and end of dusk. Dashed broken lines indicate end of dawn and start of dusk. Line plots on top of a and b denote diel pattern of porpoise click detection-positive minutes each hour over the whole analyzed period. Line plot on right side denotes summed porpoise click detection-positive minutes daily.



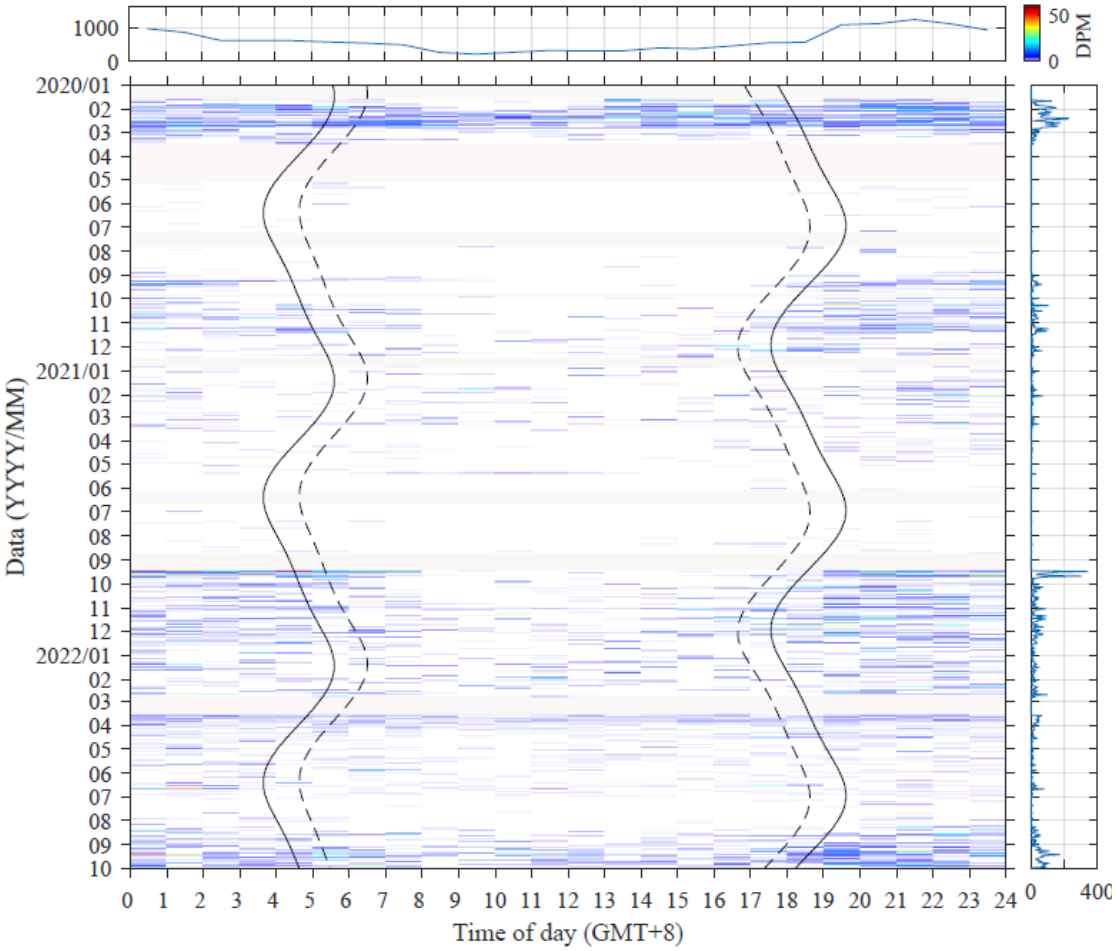
Supplementary Figure S4 Number of porpoise click trains detected in each minute as a function of time of day (X-axis) and date (Y-axis)

Light gray horizontal boxes indicate periods without 24 h full-time recording or periods of no recordings not included in this study. Solid black lines indicate start of dawn and end of dusk. Dashed broken lines indicate end of dawn and start of dusk. Line plots on top denote diel pattern of number of porpoise click trains detected each minute over the whole analyzed period. Line plot on right side denotes summed number of porpoise click trains detected daily.



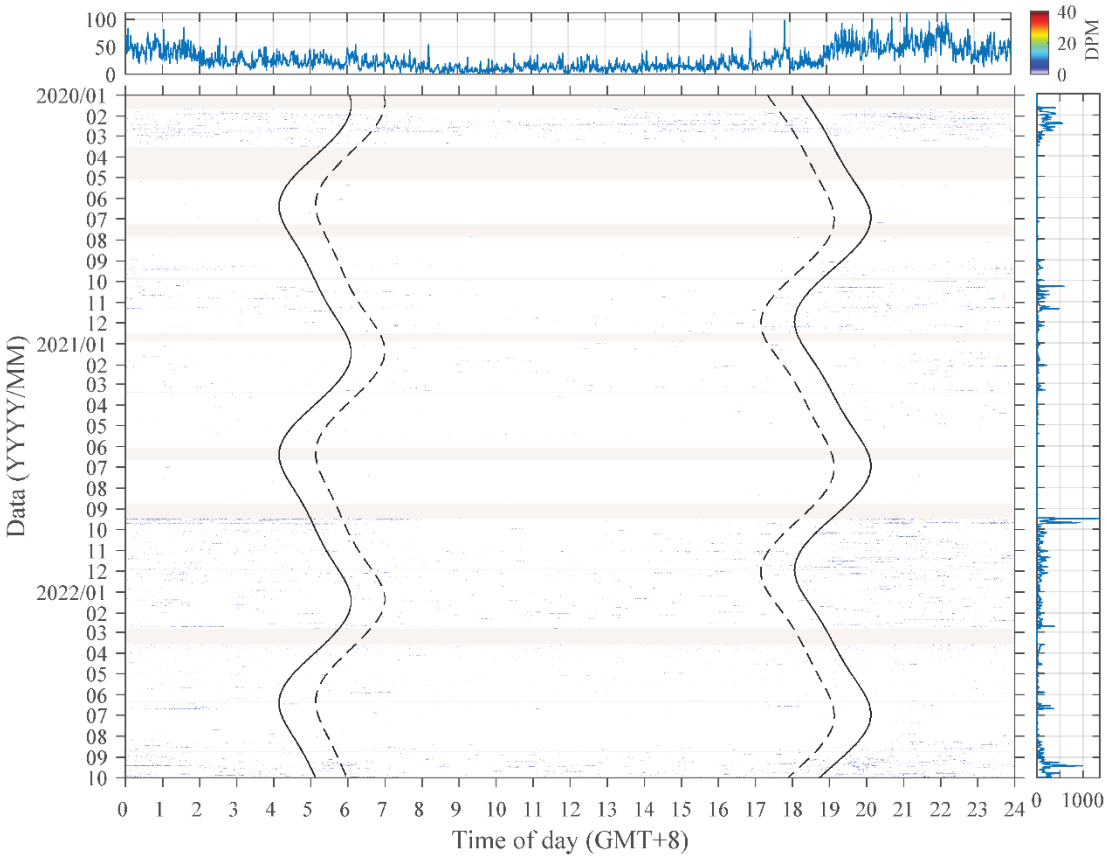
Supplementary Figure S5 Number of porpoise click trains each hour as a function of time of day (X-axis) and date (Y-axis)

Light gray horizontal boxes indicate periods without 24 h full-time recording or periods of no recordings not included in this study. Solid black lines indicate start of dawn and end of dusk. Dashed broken lines indicate end of dawn and start of dusk. Line plots on top denote diel pattern of number of porpoise click trains each hour over the whole analyzed period. Line plot on right side denotes summed number of porpoise click trains detected daily.



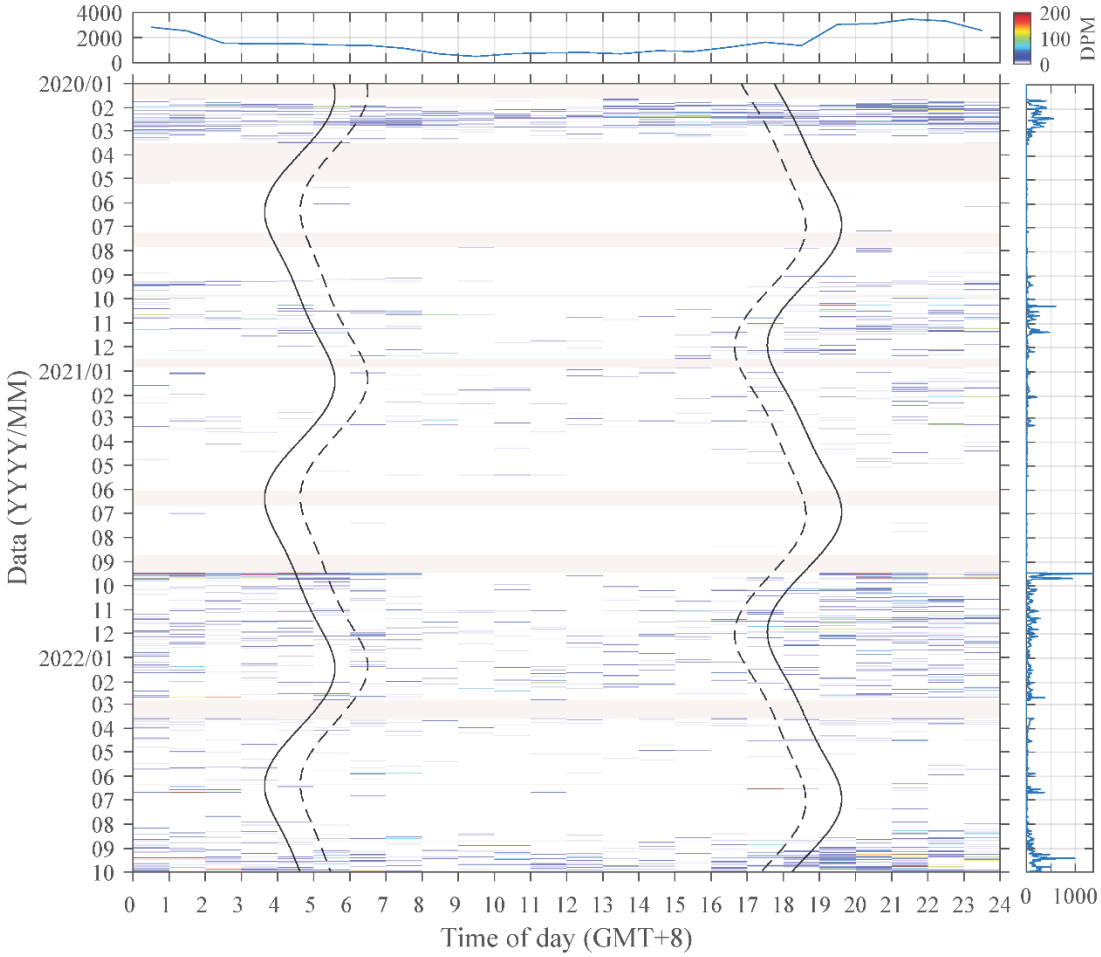
Supplementary Figure S6 Porpoise buzz detection-positive minutes each hour as a function of time of day (X-axis) and date (Y-axis)

Results are given for each minute. Light gray horizontal boxes indicate periods without 24 h full-time recording or periods of no recordings not included in this study. Solid black lines indicate start of dawn and end of dusk. Dashed broken lines indicate end of dawn and start of dusk. Line plots on top denote diel pattern of porpoise buzz detection-positive minutes each hour over the whole analyzed period. Line plot on right side denotes summed porpoise buzz detection-positive minutes daily.



Supplementary Figure S7 Number of porpoise buzzes detected each minute as a function of time of day (X-axis) and date (Y-axis)

Light gray horizontal boxes indicate periods without 24 h full-time recording or periods of no recordings not included in this study. Solid black lines indicate start of dawn and end of dusk. Dashed broken lines indicate end of dawn and start of dusk. Line plots on top denote diel pattern of number of porpoise buzzes detected each minute over the whole analyzed period. Line plot on right side denotes summed number of porpoise buzzes detected daily.



Supplementary Figure S8 Number of porpoise buzzes detected each hour as a function of time of day (X-axis) and date (Y-axis)

Light gray horizontal boxes indicate periods without 24 h full-time recording or periods of no recordings not included in this study. Solid black lines indicate start of dawn and end of dusk. Dashed broken lines indicate end of dawn and start of dusk. Line plots on top denote diel pattern of number of porpoise buzzes detected each hour over the whole analyzed period. Line plot on right side denotes summed number of porpoise buzzes detected daily.

Supplementary Table S1. Eight-way ANOVA of the effects of eight parameters (pandemic * boat traffic * water level * water flux * diel * month * season * year) on the number of porpoise click trains per minute.

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	94091.20	185	508.60	332.84	0.00
Intercept	87.20	1	87.20	57.07	0.00
Pandemic	36.15	1	36.15	23.66	0.00
Boat traffic	119.67	1	119.67	78.32	0.00
Water level	13.77	4	3.44	2.25	0.06
Water flux	41.67	1	41.67	27.27	0.00
Diel	63.54	2	31.77	20.79	0.00
Month	833.95	11	75.81	49.62	0.00
Season	1419.10	3	473.03	309.57	0.00
Year	629.82	2	314.91	206.09	0.00
Pandemic * boat traffic	73.05	1	73.05	47.80	0.00
Boat traffic * diel	35.03	2	17.51	11.46	0.00
Boat traffic * month	137.33	11	12.49	8.17	0.00
Water level * diel	595.73	8	74.47	48.73	0.00
Water level * month	217.19	15	14.48	9.48	0.00
Diel * month	9053.83	22	411.54	269.32	0.00
Diel * season	1930.09	6	321.68	210.52	0.00
Diel * year	28.38	4	7.09	4.64	0.00
Month * season	1312.58	1	1312.58	858.99	0.00
Month * year	4487.67	13	345.21	225.91	0.00
Season * year	9844.15	6	1640.69	1073.71	0.00
Water level * diel * month	6988.40	40	174.71	114.34	0.00
Water level * diel * year	86.90	23	3.78	2.47	0.00
Diel * month * season	896.13	2	448.06	293.23	0.00
Error	1834845.50	1200774	1.53		
Total	1954501.00	1200960			
Corrected Total	1928936.70	1200959			

Supplementary Table S2. Eight-way ANOVA of the effects of eight parameters (pandemic * boat traffic * water level * water flux * diel * month * season * year) on the porpoise buzz detection positive rate per minutes.

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	460.04	185	2.49	211.88	0.00
Intercept	0.65	1	0.65	55.27	0.00
Pandemic	0.28	1	0.28	24.23	0.00
Boat traffic	0.64	1	0.64	54.78	0.00
Water level	0.15	4	0.04	3.13	0.01
Water flux	0.19	1	0.19	15.79	0.00
Diel	0.24	2	0.12	10.19	0.00
Month	3.39	11	0.31	26.24	0.00
Season	5.68	3	1.89	161.22	0.00
Year	2.90	2	1.45	123.56	0.00
Pandemic * boat traffic	0.35	1	0.35	29.62	0.00
Boat traffic* diel	0.19	2	0.09	7.92	0.00
Boat traffic * month	0.74	11	0.07	5.75	0.00
Water level * diel	1.13	8	0.14	12.00	0.00
Water level * month	1.32	15	0.09	7.52	0.00
Diel * month	27.40	22	1.25	106.11	0.00
Diel * season	4.04	6	0.67	57.36	0.00
Diel * year	0.34	4	0.08	7.19	0.00
Month * season	5.48	1	5.48	466.63	0.00
Month * year	27.81	13	2.14	182.24	0.00
Season * year	37.31	6	6.22	529.77	0.00
Water level * diel * month	19.31	40	0.48	41.12	0.00
Water level * diel * year	0.45	23	0.02	1.66	0.02
Diel * month * season	2.62	2	1.31	111.70	0.00
Error	14093.19	1200774	0.01		
Total	14734.00	1200960			
Corrected Total	14553.24	1200959			

Supplementary Table S3. Eight-way ANOVA of the effects of eight parameters (pandemic * boat traffic * water level * water flux * diel * month * season * year) on the number of porpoise buzzes per minute.

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	3986.51	158	25.23	121.89	0.00
Intercept	4.46	1	4.46	21.56	0.00
Pandemic	1.92	1	1.92	9.25	0.00
Boat traffic	3.53	1	3.53	17.04	0.00
Water level	0.87	4	0.22	1.05	0.38
Water flux	0.44	1	0.44	2.12	0.15
Diel	2.54	2	1.27	6.14	0.00
Month	38.93	11	3.54	17.10	0.00
Season	59.79	3	19.93	96.28	0.00
Year	78.03	2	39.01	188.47	0.00
Pandemic * boat traffic	1.67	1	1.67	8.07	0.01
Boat traffic * diel	1.98	2	0.99	4.79	0.01
Boat traffic * month	9.80	11	0.89	4.30	0.00
Water level * diel	25.37	8	3.17	15.32	0.00
Water level * month	27.47	16	1.72	8.29	0.00
Diel * month	413.22	22	18.78	90.74	0.00
Diel * season	45.04	6	7.51	36.26	0.00
Month * season	89.29	1	89.29	431.32	0.00
Month * year	320.54	14	22.90	110.60	0.00
Season * year	404.42	6	67.40	325.61	0.00
Water level * diel * month	320.98	40	8.02	38.76	0.00
Diel * month * season	25.88	2	12.94	62.50	0.00
Error	248572.51	1200801	0.21		
Total	253862.00	1200960			
Corrected Total	252559.01	1200959			