

Supplementary Materials

Table S1. Estimated true measurements of dimensions (DW, DL, and CW), including the lower and upper 95% confidence intervals (CIs), of each individual *M. alfredi* measured using drones. ♂, ♀, and U denote sexually mature males, sexually mature female, and unsexed individual, respectively. * denotes a large individual that was confirmed to be female based on observations from somersault feeding, but recorded here as unsexed because we were not able to observe mating scars in dorsal view by the drone. C and M represent normal “chevron” and melanistic color patterns of the manta rays. WYG = Wayag lagoon, HOL = Hol Gam bay, ARB = Arborek reefs, FAM = Fam islands, YFK = Yefnabi Kecil reef. N repeats = the number of measurement repeats for each individual. Est. = Estimated true measurement, Lower = lower 95% CI, Upper = upper 95% CI.

ID	Sex	Color morph	Site	N repeats	Disc Width (DW)			Disc Length (DL)			Cranial Width (CW)		
					Est.	Lower	Upper	Est.	Lower	Upper	Est.	Lower	Upper
1	U	C	WYG	6	219.4	217.7	221.2	93.6	92.3	95.0	56.6	55.7	57.5
2	U	C	HOL	9	226.8	225.4	228.3	99.4	98.3	100.5	57.1	56.3	57.8
3	U	M	ARB	4	327.9	325.8	330.0	155.3	153.7	156.9	84.6	83.6	85.7
4	♀	C	ARB	4	341.6	339.5	343.7	163.3	161.7	164.9	90.4	89.3	91.5
5	♂	M	ARB	5	300.2	298.3	302.1	129.2	127.7	130.7	76.4	75.4	77.4
6	U	M	ARB	5	350.1	348.2	352.0	156.9	155.4	158.4	92.7	91.7	93.6
7	♀	C	ARB	6	354.1	352.3	355.8	164.4	163.0	165.7	94.7	93.8	95.6
8	U	M	ARB	3	334.7	332.3	337.1	156.6	154.7	158.4	87.8	86.5	89.0
9	U	M	ARB	5	340.6	338.8	342.5	154.8	153.3	156.3	92.4	91.4	93.4
10	♂	C	ARB	5	289.2	287.3	291.1	129.9	128.4	131.4	76.2	75.2	77.2
11	♂	C	ARB	6	301.0	299.3	302.7	139.0	137.7	140.3	78.1	77.2	79.0
12	♂	C	ARB	7	284.7	283.1	286.3	123.1	121.9	124.3	73.2	72.4	74.0
13	U	C	ARB	5	342.3	340.4	344.2	162.5	161.0	163.9	92.4	91.4	93.4
14	U	M	ARB	2	303.0	300.0	306.0	139.7	137.5	142.0	77.0	75.5	78.5
15	U	M	ARB	4	344.0	341.9	346.1	159.3	157.7	160.9	92.2	91.1	93.3
16	♀	C	ARB	9	355.2	353.7	356.6	170.6	169.5	171.7	94.9	94.1	95.6
17	U	M	ARB	5	266.3	264.4	268.2	120.6	119.2	122.1	68.4	67.4	69.4
18	U	C	ARB	4	292.3	290.1	294.4	132.4	130.7	134.0	71.5	70.4	72.6
19	♂	C	ARB	4	298.7	296.6	300.8	132.3	130.7	134.0	76.1	75.0	77.2
20	U	M	ARB	5	299.9	298.0	301.8	132.0	130.5	133.4	77.1	76.2	78.1
21	U	C	ARB	5	329.8	327.9	331.7	143.4	142.0	144.9	83.1	82.1	84.0
22	♂	C	ARB	4	292.9	290.8	295.0	130.5	128.9	132.1	78.1	77.0	79.2
23	♂	C	ARB	5	291.1	289.2	293.0	128.8	127.4	130.3	73.7	72.8	74.7
24	♂	C	ARB	3	300.2	297.8	302.6	134.3	132.4	136.1	75.4	74.2	76.7
25	♂	C	ARB	3	316.3	313.9	318.7	140.3	138.5	142.2	76.6	75.3	77.8
26	♀	C	ARB	5	363.3	361.5	365.2	171.8	170.3	173.2	93.4	92.4	94.3
27	U	M	ARB	5	348.8	347.0	350.7	163.6	162.1	165.0	89.1	88.1	90.0
28	U	C	ARB	7	208.4	206.9	210.0	90.2	88.9	91.4	51.6	50.8	52.4
29	♂	C	ARB	7	283.8	282.2	285.4	128.1	126.8	129.3	74.6	73.7	75.4
30	♀	C	ARB	9	355.1	353.7	356.5	169.4	168.4	170.5	94.4	93.7	95.1

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ID	Sex	Color morph	Site	N repeats	Disc Width (DW)			Disc Length (DL)			Cranial Width (CW)		
					Est.	Lower	Upper	Est.	Lower	Upper	Est.	Lower	Upper
31	♂	M	ARB	5	276.8	274.9	278.7	125.5	124.1	127.0	72.8	71.8	73.8
32	U	C	ARB	7	352.0	350.4	353.6	165.9	164.6	167.1	92.3	91.4	93.1
33	♂	C	ARB	7	290.0	288.4	291.6	126.6	125.4	127.8	76.2	75.4	77.1
34	♂	C	ARB	5	285.3	283.4	287.2	128.9	127.5	130.4	73.2	72.2	74.2
35	U	C	ARB	5	313.9	312.0	315.8	141.2	139.7	142.6	83.0	82.0	83.9
36	♀	C	ARB	5	362.9	361.0	364.7	172.0	170.5	173.4	96.9	95.9	97.8
37	♂	C	ARB	5	281.6	279.7	283.5	135.2	133.7	136.7	79.0	78.0	79.9
38	U	M	ARB	10	307.5	306.2	308.8	140.3	139.3	141.4	80.7	80.0	81.4
39	U	M	HOL	5	254.3	252.4	256.2	108.2	106.7	109.6	61.7	60.7	62.6
40	♂	M	ARB	5	278.0	276.1	279.9	126.3	124.8	127.7	72.1	71.1	73.1
41	U	C	ARB	4	268.0	265.9	270.1	125.0	123.4	126.6	71.8	70.8	72.9
42	♀	C	ARB	5	323.5	321.6	325.4	147.3	145.9	148.8	82.9	81.9	83.9
43	U	C	ARB	5	318.5	316.6	320.4	140.8	139.3	142.3	81.8	80.9	82.8
44	♂	C	ARB	5	288.1	286.2	289.9	131.3	129.8	132.7	72.6	71.6	73.6
45	♂	C	ARB	4	284.0	281.8	286.1	123.3	121.7	124.9	72.6	71.5	73.6
46	U	C	FAM	7	266.8	265.2	268.4	115.2	114.0	116.4	66.9	66.1	67.7
47	♂	C	ARB	5	283.4	281.6	285.3	129.8	128.4	131.3	75.4	74.4	76.3
48	U	C	ARB	3	212.4	209.9	214.8	88.0	86.1	89.9	49.4	48.2	50.7
49	♂	M	ARB	5	282.9	281.0	284.8	123.3	121.9	124.8	70.2	69.2	71.1
50	♂	M	ARB	5	297.6	295.7	299.5	137.1	135.7	138.6	75.0	74.1	76.0
51	U	C	FAM	10	360.9	359.6	362.2	167.2	166.2	168.3	96.5	95.8	97.2
52	♂	M	ARB	5	283.1	281.2	285.0	132.2	130.7	133.6	73.0	72.0	74.0
53	♂	C	FAM	5	290.3	288.4	292.1	127.6	126.1	129.0	76.1	75.1	77.0
54	U	M	ARB	7	339.2	337.6	340.8	163.5	162.3	164.7	86.6	85.8	87.4
55	♂	C	ARB	5	274.8	272.9	276.7	129.1	127.6	130.6	71.2	70.2	72.1
56	♂	C	ARB	6	281.5	279.8	283.2	128.0	126.7	129.4	74.5	73.6	75.3
57	U	C	WYG	4	218.1	216.0	220.3	103.3	101.7	105.0	59.2	58.1	60.3
58	U	M	YFK	5	243.2	241.3	245.1	107.3	105.8	108.7	61.3	60.3	62.2
59	U	M	YFK	5	206.8	204.9	208.6	94.2	92.7	95.6	54.2	53.2	55.1
60	U	M	YFK	10	225.0	223.6	226.3	99.6	98.5	100.6	54.1	53.4	54.8

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ID	Sex	Color morph	Site	N repeats	Disc Width (DW)			Disc Length (DL)			Cranial Width (CW)		
					Est.	Lower	Upper	Est.	Lower	Upper	Est.	Lower	Upper
61	U	C	YFK	10	218.9	217.6	220.3	94.8	93.8	95.8	52.4	51.7	53.1
62	U	C	YFK	10	227.7	226.4	229.0	102.0	100.9	103.0	57.9	57.2	58.6
63	U	C	YFK	9	230.2	228.8	231.6	100.7	99.6	101.8	58.9	58.2	59.6
64	U	M	YFK	10	220.5	219.2	221.9	95.8	94.7	96.8	57.5	56.8	58.2
65	U	C	YFK	6	269.5	267.8	271.2	117.7	116.4	119.1	70.1	69.2	71.0
66	U	C	YFK	8	225.1	223.6	226.6	96.4	95.2	97.6	59.0	58.2	59.8
67	U	C	FAM	7	231.2	229.6	232.8	101.8	100.6	103.1	59.8	58.9	60.6
68	U	M	YFK	4	242.5	240.4	244.6	107.3	105.7	109.0	61.1	60.0	62.2
69	U	C	FAM	10	227.5	226.2	228.9	97.9	96.9	98.9	57.9	57.2	58.6
70	U	C	FAM	6	225.0	223.3	226.7	99.6	98.2	100.9	59.7	58.9	60.6
71	U	M	FAM	3	242.9	240.5	245.4	109.4	107.5	111.2	61.0	59.8	62.3
72	U	C	YFK	5	231.2	229.3	233.1	94.9	93.4	96.3	58.4	57.4	59.4
73	♂	C	YFK	8	304.9	303.4	306.4	139.4	138.2	140.6	80.7	79.9	81.5
74	♂	C	FAM	8	293.7	292.3	295.2	135.9	134.7	137.1	76.0	75.3	76.8
75	♀	C	FAM	9	371.8	370.4	373.2	178.6	177.5	179.7	100.4	99.7	101.2
76	♂	C	ARB	8	298.1	296.6	299.5	135.8	134.7	137.0	77.9	77.1	78.7
77	♂	C	ARB	7	293.2	291.7	294.8	137.8	136.5	139.0	78.6	77.7	79.4
78	♂	C	FAM	8	291.3	289.8	292.8	131.6	130.4	132.8	75.9	75.2	76.7
79	♂	C	FAM	8	286.1	284.6	287.6	132.3	131.2	133.5	75.9	75.1	76.6
80	U	M	YFK	8	208.7	207.2	210.2	95.2	94.1	96.4	54.2	53.5	55.0
81	U	M	YFK	7	243.4	241.8	244.9	108.9	107.7	110.1	59.4	58.5	60.2
82	U	M	HOL	5	247.6	245.7	249.5	105.1	103.6	106.5	66.5	65.5	67.4
83	U	C	HOL	6	253.2	251.4	254.9	114.0	112.6	115.3	66.6	65.7	67.5
84	U	C	HOL	5	248.9	247.0	250.8	112.3	110.9	113.8	66.7	65.7	67.7
85	U	C	HOL	4	319.1	317.0	321.2	144.6	143.0	146.2	84.6	83.6	85.7
86	U*	M	ARB	3	375.6	373.2	378.0	171.9	170.1	173.8	97.5	96.3	98.8