



**Figure S1.** Example of ECG signals from A) Turtle 2 on Sept. 18, 2013 and B) Turtle 6 on Sept. 12, 2015. R waves are denoted by a red plus sign above the wave and the black bars above the ECG signals indicate when the turtle was at the surface. ECG signals were very difficult to read in 2013 (A) during surface periods, but legible during dives (~10:42 – 10:44). However, R waves were quite legible in 2015 (B), even during surface periods.

**Table S1. Oxygen (O<sub>2</sub>) stores,  $\dot{V}_{O_2}$  and calculated aerobic dive limits (cADLs) for eight turtles using different equations.**

Turtle	Mass	O <sub>2</sub> Stores	Water Temp.	$\dot{V}_{O_2}$ 100% Active Kinoshita	cADL 100% Active Kinoshita	$\dot{V}_{O_2}$ 0% Active Kinoshita	cADL 0% Active Kinoshita	$\dot{V}_{O_2}$ Hochscheid	cADL Hochscheid
	Kg	mL O <sub>2</sub>	°C	mL O <sub>2</sub> min <sup>-1</sup>	Mins	mL O <sub>2</sub> min <sup>-1</sup>	Mins	mL O <sub>2</sub> min <sup>-1</sup>	Mins
T1	88	1953.6	22.8	35.94	54.4	16.98	115.1	12.691	153.9
T2	61	1354.2	22.6	26.21	51.7	12.38	109.4	10.783	125.6
T3	79	1742.7	23.4	34.02	51.5	16.07	109.1	13.482	129.3
T4	66	1454.1	22.5	27.81	52.7	13.14	111.5	10.873	133.7
T5	41	910.2	19.9	16.11	56.5	7.61	119.6	5.954	152.9
T6	57	1265.4	20.5	21.93	57.7	10.36	122.2	7.398	171.0
T7	38	843.6	19.9	15.12	55.8	7.14	118.1	5.797	145.5
T8	38	843.6	19.8	15.04	56.1	7.10	118.8	5.700	148.0

Two calculations are based on the  $\dot{V}_{O_2}$  equation from Kinoshita et al.:  $\dot{V}_{O_2} = 0.1098 \exp(0.0581T_w + 0.0075A)$ , where  $T_w$  is the water temperature in Celsius, A is the percentage of time turtle was active and units are expressed as ml O<sub>2</sub> min<sup>-1</sup> kg<sup>-0.83</sup>. The first  $\dot{V}_{O_2}$  and cADL are assuming the turtle are active 100% of the time and the second set assumes the turtles are active 0% of the time (Kinoshita et al., 2018). The second equation is from Hochscheid et al.:  $\ln \dot{V}_{O_2} = -2.87 + 0.168 T_w + 0.353 \ln M_b$ , where  $M_b$  is turtle mass (Hochscheid et al., 2004). The Kinoshita equation is based on data collected from North Pacific loggerhead turtles and the Hochscheid equation is based on data collected from Mediterranean loggerhead turtles (Hochscheid et al., 2004; Kinoshita et al., 2018).