

**Electronic Supplemental Material: Abundance and distribution of Blue Swimmer Crab
in response to environmental variation across two contrasting estuaries.**

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Running Title: Blue Swimmer Crab responses to temperature and conductivity

Figure S1. Kernel distribution estimates for each month in Wallis Lake by sex. Solid vertical lines show median values for each sex (black = females, grey = male) while the dashed lines show the interquartile range.

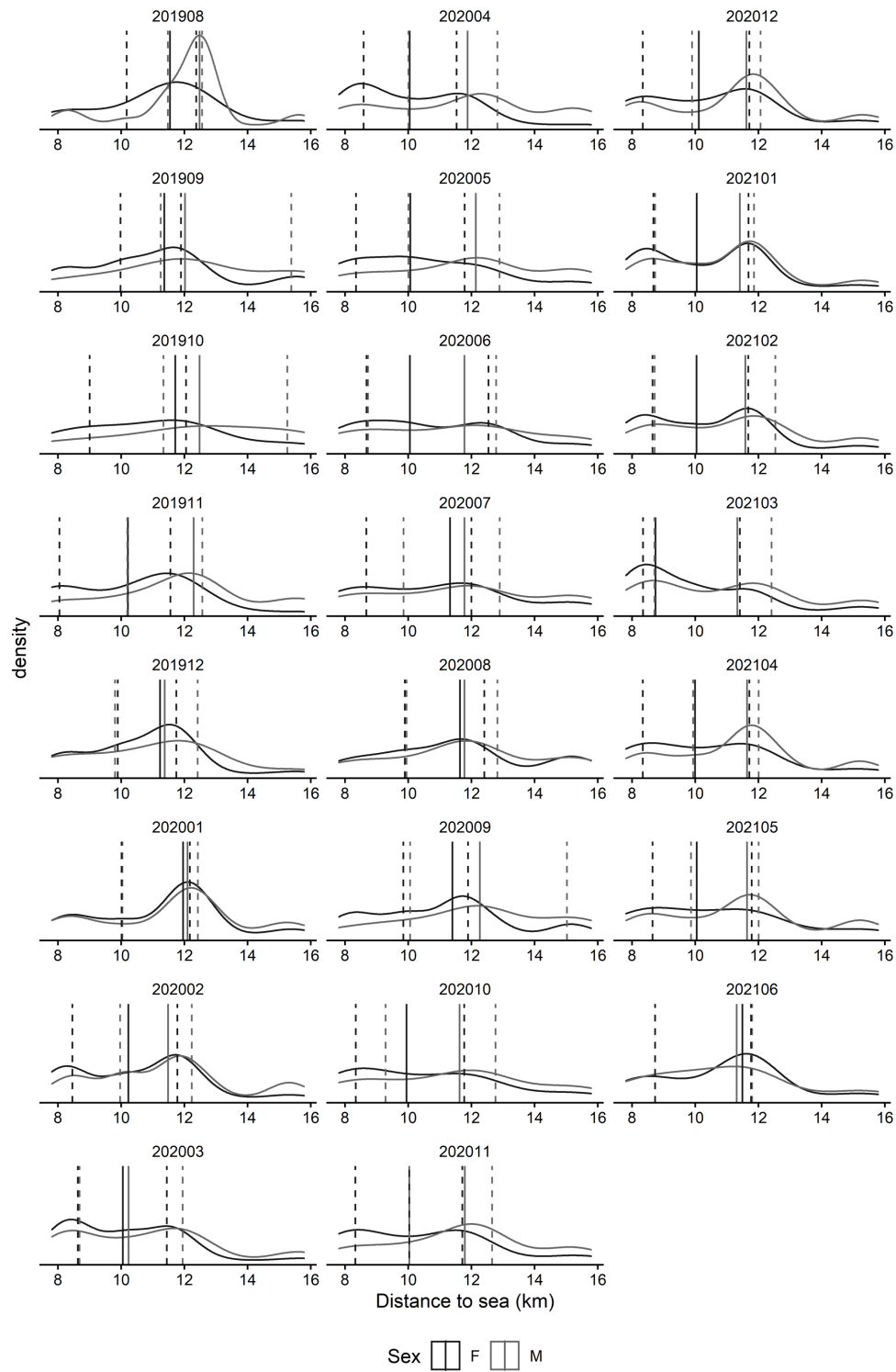


Figure S2. Kernel density estimates for each month in Port Stephens by sex. Solid vertical lines show median values for each sex (black = females, grey = male) while the dashed lines show the interquartile range.

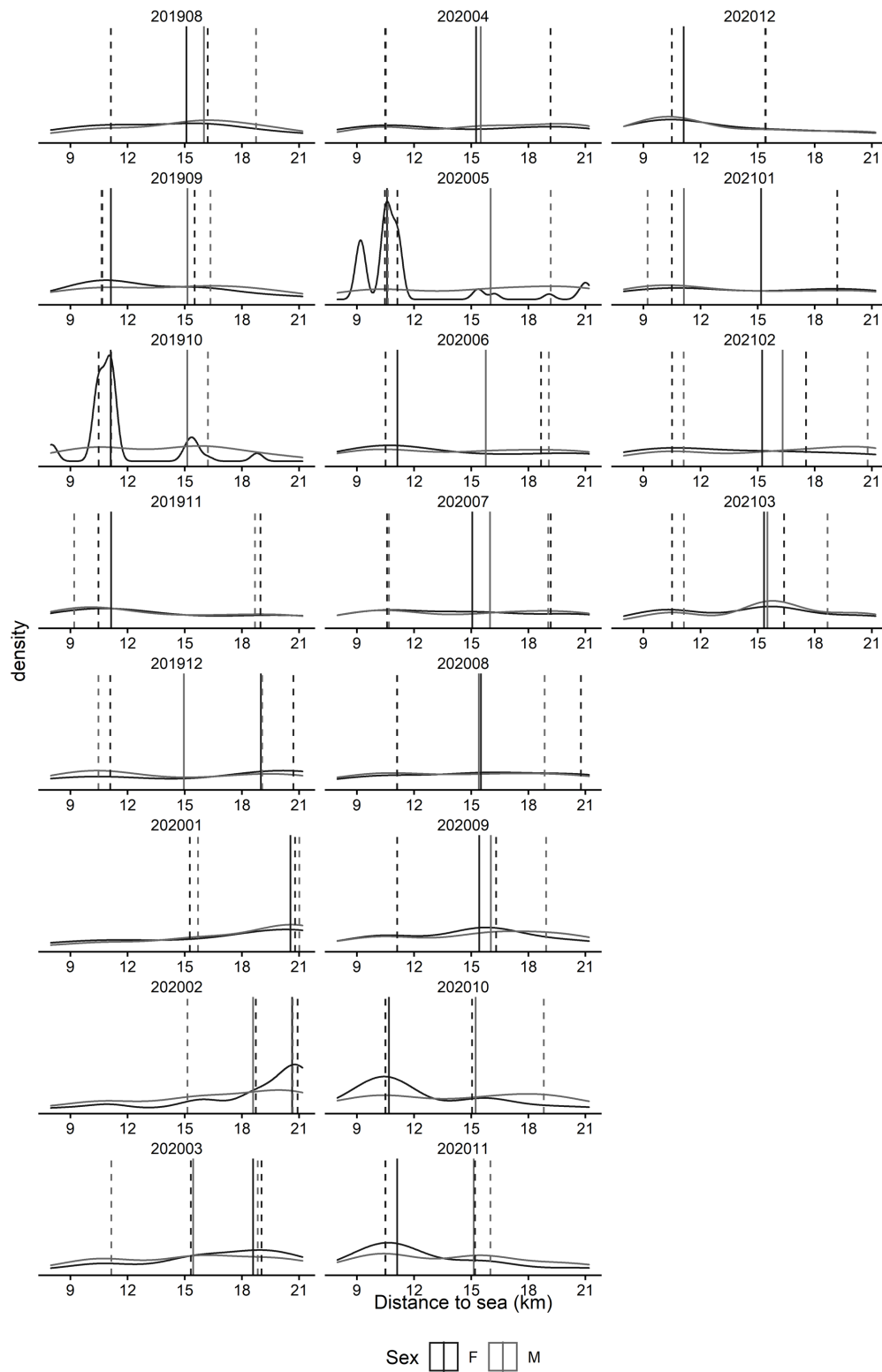


Table S1 Model selection table for Wallis Lake abundance model constructed with backwards stepwise selection. Linear and quadratic forms of temperature (Temp) and conductivity (Cond) were included to test for non-linearity. Models are presented in the order tested. “(1|Site)” and “(1|Date)” represent random intercept effects for site and date respectively. Δ AIC shows the difference in AIC values from the best (lowest AIC model). If two models were equivalent ($< 2 \Delta$ AIC; shown in bold) we retained the simpler model in the selection process.

Name	Model	Comment	AIC	Δ AIC
M1	Abund ~ Temp + Temp² + Cond + Cond² + Flow + (1 Site) + (1 Date)	Full Model	10573.5	1.2
M2	Abund ~ Temp + Cond + Cond ² + Flow + (1 Site) + (1 Date)	M1 + Drop non-linear temperature	10588.5	16.2
M3	Abund ~ Temp + Temp ² + Cond + Flow + (1 Site) + (1 Date)	M1 + Drop non-linear conductivity	10591.4	19.1
M4	Abund ~ Cond + Cond ² + Flow + (1 Site) + (1 Date)	M1 + Drop temperature	10632.7	60.4
M5	Abund ~ Temp + Temp ² + Flow + (1 Site) + (1 Date)	M1 + Drop conductivity	10602.6	30.3
M6	Abund ~ Temp + Temp² + Cond + Cond² + (1 Site) + (1 Date)	M1 + Drop flow	10572.3	0
M7	Abund ~ Temp + Cond + Cond ² + (1 Site) + (1 Date)	M6 + Drop non-linear temperature	10586.9	14.6
M8	Abund ~ Temp + Temp ² + Cond + (1 Site) + (1 Date)	M6 + Drop non-linear conductivity	10589.4	17.1
M9	Abund ~ Cond + Cond ² + (1 Site) + (1 Date)	M6 + Drop temperature	10633.4	61.1
M10	Abund ~ Temp + Temp ² + (1 Site) + (1 Date)	M6 + Drop conductivity	10618.8	46.5

Table S2 Model selection table for Port Stephens abundance model constructed with backwards stepwise selection. Linear and quadratic forms of temperature (Temp) and conductivity (Cond) were included to test for non-linearity. Models are presented in the order tested. “(1|Site)” and “(1|Date)” represent random intercept effects for site and date respectively. Δ AIC shows the difference in AIC values from the best (lowest AIC model). If two models were equivalent ($< 2 \Delta$ AIC; shown in bold) we retained the simpler model in the selection process.

Name	Model	Comment	AIC	Δ AIC
M1	Abund ~ Temp + Temp² + Cond + Cond² + Flow + (1 Site) + (1 Date)	Full Model	7811.2	0.1
M2	Abund ~ Temp + Cond + Cond ² + Flow + (1 Site) + (1 Date)	M1 + Drop non-linear temperature	7818.2	7.1
M3	Abund ~ Temp + Temp² + Cond + Flow + (1 Site) + (1 Date)	M1 + Drop non-linear conductivity	7811.1	0
M4	Abund ~ Cond + Cond ² + Flow + (1 Site) + (1 Date)	M1 + Drop temperature	7817.8	6.7
M5	Abund ~ Temp + Temp ² + Flow + (1 Site) + (1 Date)	M1 + Drop conductivity	7828.1	17
M6	Abund ~ Temp + Temp ² + Cond + Cond ² + (1 Site) + (1 Date)	M1 + Drop flow	7813.7	2.6
M7	Abund ~ Temp + Cond + Flow + (1 Site) + (1 Date)	M3 + Drop non-linear temperature	7817.4	6.3
M8	Abund ~ Cond + Flow + (1 Site) + (1 Date)	M3 + Drop temperature	7816.2	5.1
M9	Abund ~ Temp + Temp ² + Flow + (1 Site) + (1 Date)	M3 + Drop conductivity	7828.1	17
M10	Abund ~ Temp + Temp² + Cond + (1 Site) + (1 Date)	M3 + Drop flow	7811.8	0.7
M11	Abund ~ Temp + Cond + (1 Site) + (1 Date)	M10 + Drop non-linear temperature	7816.9	5.8

M12	Abund ~ Cond + (1 Site) + (1 Date)	M10 + Drop temperature	7815.7	4.6
M13	Abund ~ Temp + Temp ² + (1 Site) + (1 Date)	M10 + Drop conductivity	7829.1	18

Table S3 Model selection table for Wallis Lake median distance to sea model (Distance) constructed with backwards stepwise selection where the least significant (highest P-value) term was removed each step. “:” represents an interaction term. Δ AIC shows the difference in AIC values from the best (lowest AIC model). Δ AIC shows the difference in AIC values from the best (lowest AIC model). If two models were equivalent ($< 2 \Delta$ AIC; shown in bold) we retained the simpler model in the selection process.

Name	Model	Comment	AIC	Δ AIC
M1	Distance ~ Temp + Cond + Flow + Sex + Flow:Sex	Full Model	717.22	2.49
M2	Distance ~ Temp + Flow + Sex + Flow:Sex	Dop conductivity	718.28	3.55
M3	Distance ~ Cond + Flow + Sex + Flow:Sex	Drop temperature	724.22	9.49
M4	Distance ~ Temp + Cond + Sex + Flow:Sex	Drop flow	717.22	2.49
M5	Distance ~ Temp + Cond + Flow + Sex	Drop flow:sex	716.4	1.67
M6	Distance ~ Cond + Flow + Sex	M5 + drop temperature	723.19	8.46
M7	Distance ~ Temp + Cond + Sex	M5 + drop flow	714.73	0
M8	Distance ~ Temp + Flow + Sex	M5 + drop conductivity	717.37	2.64
M9	Distance ~ Cond + Sex	M7 + drop temperature	723.83	9.1
M10	Distance ~ Temp + Sex	M7 + drop conductivity	723.95	9.22

Table S4 Model selection table for Wallis Lake interquartile spread (Spread) model constructed with backwards stepwise selection where the least significant (highest P-value) term was removed each step. “:” represents an interaction term. Δ AIC shows the difference in AIC values from the best (lowest AIC model). If two models were equivalent ($< 2 \Delta$ AIC; shown in bold) we retained the simpler model in the selection process.

Name	Model	Comment	AIC	Δ AIC
M1	Spread ~ Temp + Cond + Flow + Sex + Flow:Sex	Full Model	745.42	4.89
M2	Spread ~ Cond + Flow + Sex + Flow:Sex	Drop temperature	743.82	3.29
M3	Spread ~ Temp + Cond + Sex + Flow:Sex	Drop flow	745.42	4.89
M4	Spread ~ Temp + Cond + Flow + Sex	Drop flow:sex	745.02	4.49
M5	Spread ~ Temp + Flow + Sex + Flow:Sex	Drop conductivity	744.04	3.51
M6	Spread ~ Cond + Sex + Flow:Sex	M2 + drop flow	743.81	3.28
M7	Spread ~ Cond + Flow + Sex	M2 + drop flow:sex	743.40	2.87
M8	Spread ~ Flow + Sex + Flow:Sex	M2 + drop conductivity	742.39	1.86
M9	Spread ~ Flow + Sex	M8 + drop sex:flow	741.96	1.43
M10	Spread ~ + Sex + Flow:Sex	M8 + drop flow	742.38	1.85
M11	Spread ~ Sex	M9 + drop flow (Simplest possible model)	740.53	0

Table S5 Model selection table for Port Stephens median distance the sea model (Distance) constructed with backwards stepwise selection where the least significant (highest P-value) term was removed each step. “:” represents an interaction term. Δ AIC shows the difference in AIC values from the best (lowest AIC model). Δ AIC shows the difference in AIC values from the best (lowest AIC model). If two models were equivalent ($< 2 \Delta$ AIC; shown in bold) we retained the simpler model in the selection process.

Name	Model	Comment	AIC	Δ AIC
M1	Distance ~ Temp + Cond + Flow + Sex + Flow:Sex	Full Model	754.4	2.1
M2	Distance ~ Temp + Flow + Sex + Flow:Sex	Dop conductivity	752.8	0.5
M3	Distance ~ Cond + Flow + Sex + Flow:Sex	Drop temperature	753.1	0.8
M4	Distance ~ Temp + Cond + Sex + Flow:Sex	Drop flow	754.4	2.1
M5	Distance ~ Temp + Cond + Flow + Sex	Drop flow:sex	754.6	2.3
M6	Distance ~ Flow + Sex + Flow:Sex	M2 + drop temperature	752.3	0
M7	Distance ~ Temp + Sex + Flow:Sex	M2 + drop flow	754.8	2.5
M8	Distance ~ Temp + Flow + Sex	M2 + drop flow:sex	753.0	0.7
M9	Distance ~ Flow + Sex	M6 + drop flow:sex	752.5	
10	Distance ~ Flow:Sex + Sex	M6 + drop flow	754.3	2
M11	Distance ~ Sex	M10 + drop temp (Simplest possible model)	753.9	1.6

Table S6 Model selection table for Port Stephens interquartile spread (Spread) model constructed with backwards stepwise selection where the least significant (highest P-value) term was removed each step. “:” represents an interaction term. Δ AIC shows the difference in AIC values from the best (lowest AIC model). If two models were equivalent ($< 2 \Delta$ AIC; shown in bold) we retained the simpler model in the selection process.

Name	Model	Comment	AIC	Δ AIC
M1	Spread ~ Temp + Cond + Flow + Sex + Flow:Sex	Full Model	738.8	3.9
M2	Spread ~ Cond + Flow + Sex + Flow:Sex	Drop temperature	737.9	3
M3	Spread ~ Temp + Cond + Sex + Flow:Sex	Drop flow	738.8	3.9
M4	Spread ~ Temp + Cond + Flow + Sex + Flow:Sex	Drop flow:sex	738.2	3.3
M5	Spread ~ Temp + Flow + Sex + Flow:Sex	Drop conductivity	754.6	19.7
M6	Spread ~ Cond + Sex + Flow:Sex	M2 + flow	737.9	3
M7	Spread ~ Cond + Flow + Sex	M2 + drop flow:sex	737.2	2.3
M8	Spread ~ Flow + Sex + Flow:Sex	M2 + drop conductivity	737.3	2.4
M9	Spread ~ Cond + Sex	M7 + drop flow	735.2	0.3
M10	Spread ~ Sex + Flow	M7 + drop conductivity	736.6	1.7
M11	Spread ~ Sex	M9 + drop conductivity (Simplest possible model)	734.9	0