

Supplementary material for: Warmer temperature decreases the maximum length of six species of marine fishes, crustacean and squid in New Zealand

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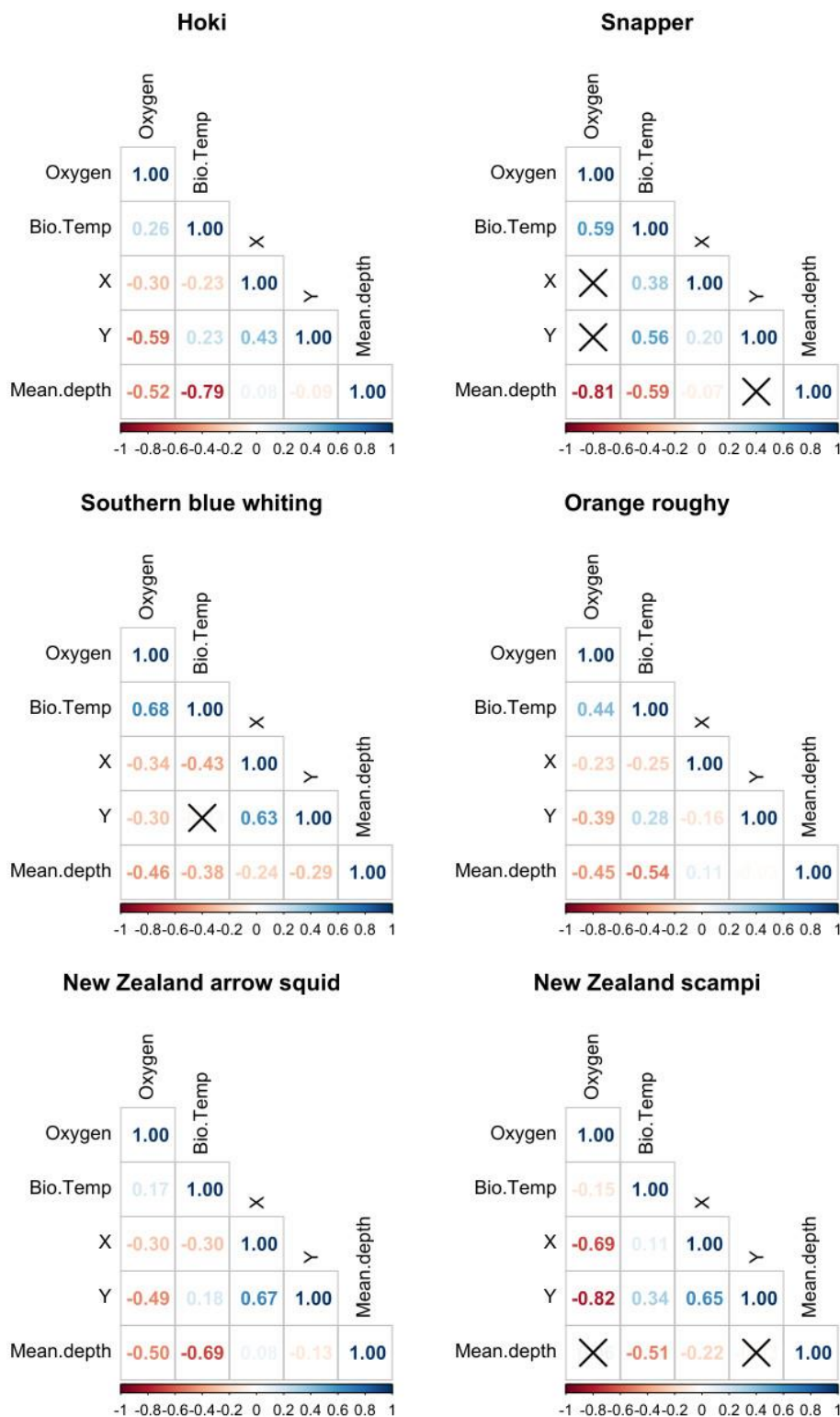
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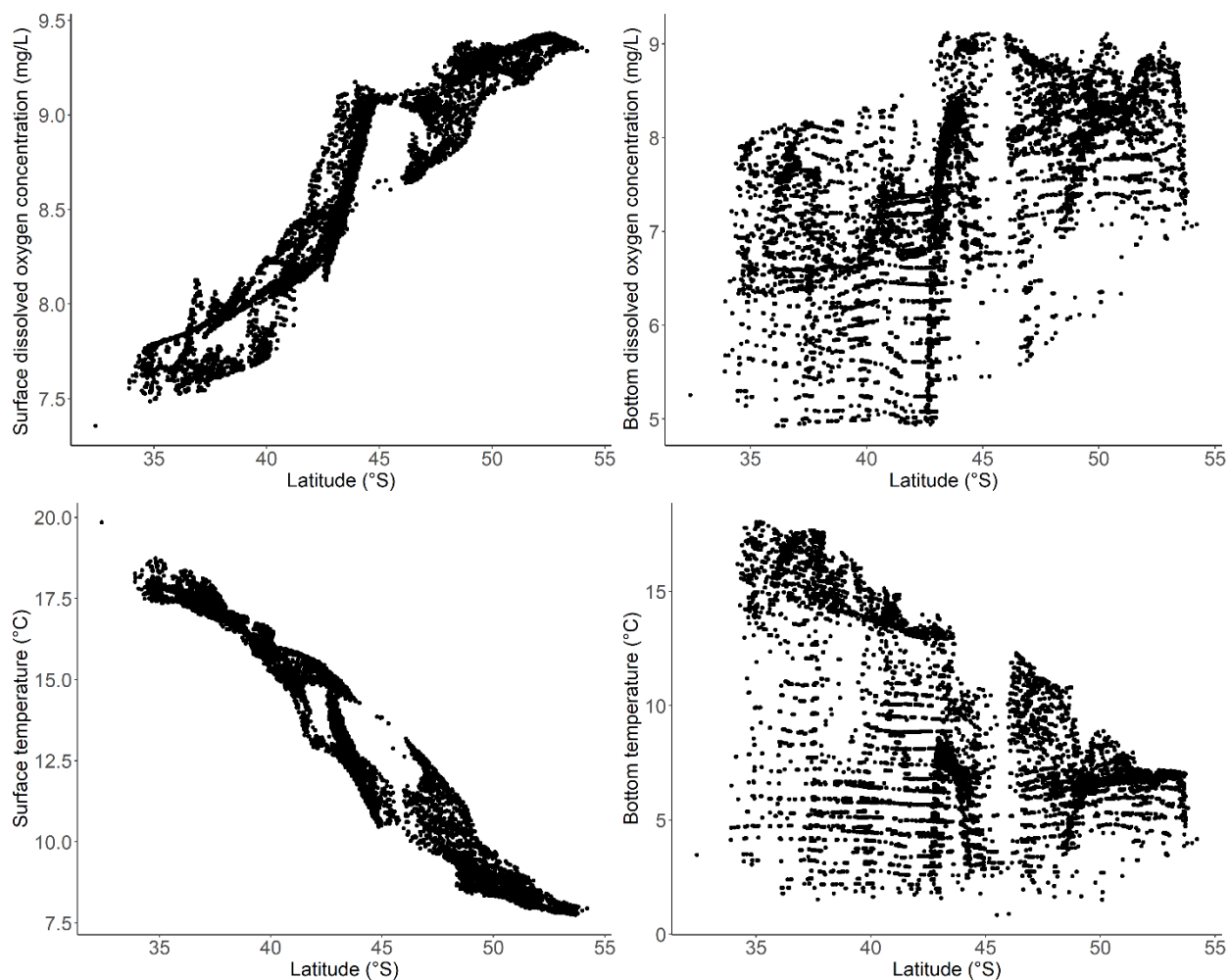
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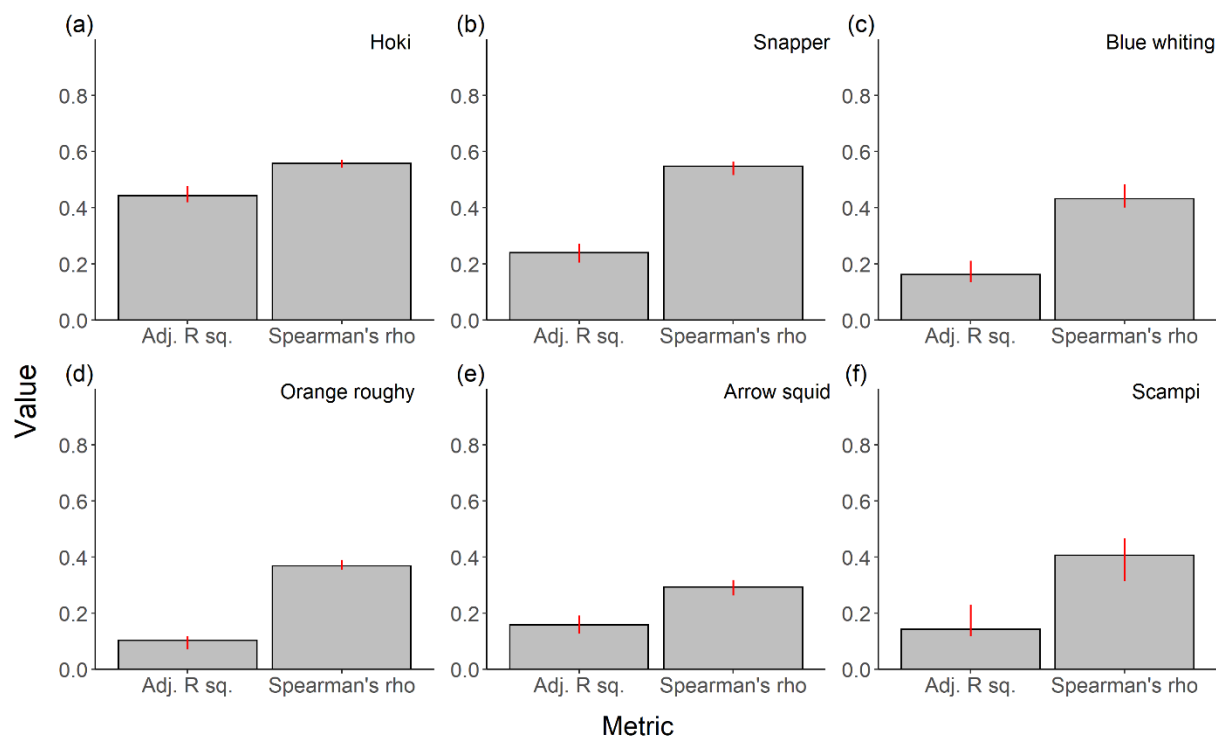
Supplementary Fig 1 Pearson's correlation coefficients (Pearson's r) between dissolved oxygen concentration (mg/L), temperature ($^{\circ}$ C), northings (X), eastings (Y), and mean depth of trawl sampling (m) for each study species. Temperature and dissolved oxygen concentrations data were obtained from Bio-Oracle (Assis et al. 2018). This figure was created using R Studio (Team R Development Core 2021)

Supplementary Table 1 The observed minimum, mean and maximum temperatures (°C) for hoki, snapper, blue whiting, orange roughy, arrow squid and scampi in our study. The reported temperature ranges (°C), include the preferred minimum, mean and maximum temperatures for species according to FishBase (for fishes) (Froese & Pauly 2021; www.fishbase.org) and SeaLifeBase (for invertebrates) (Palomares & Pauly 2021; www.sealifebase.org)

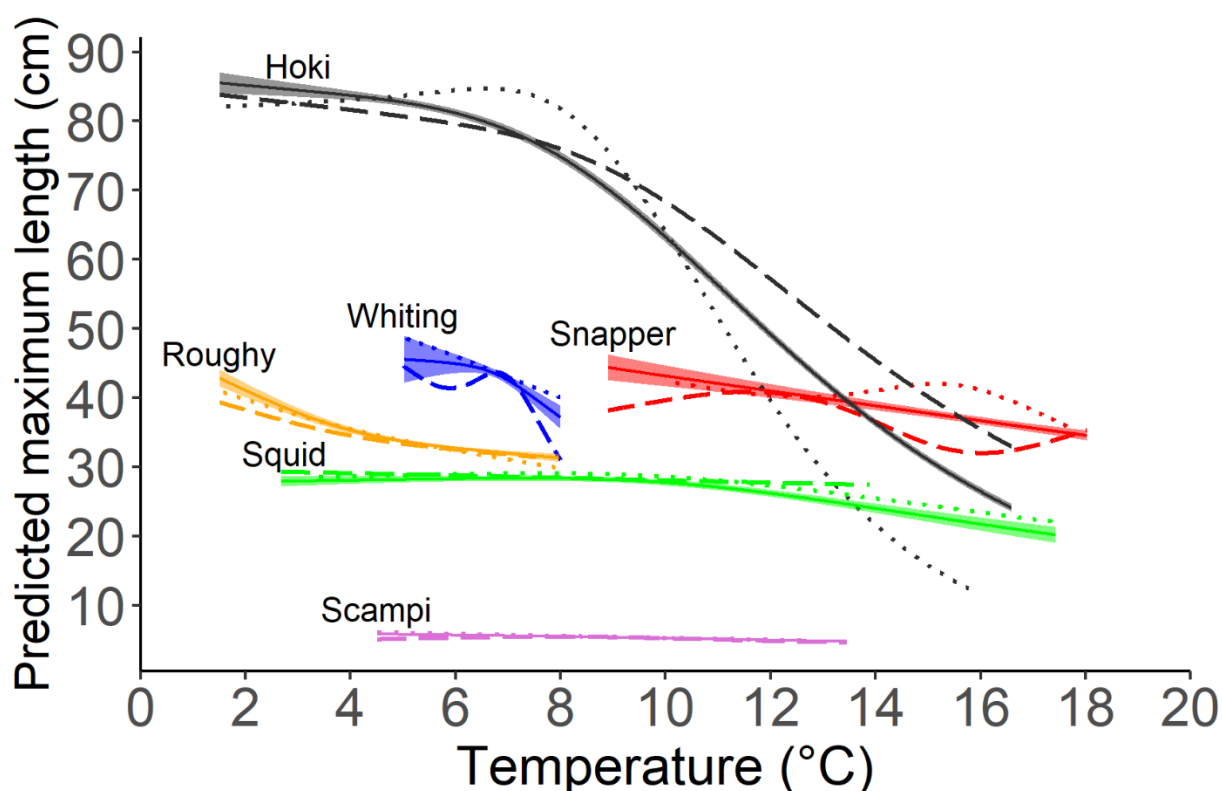
Species	Observed temperature (°C)			Reported temperature (°C)		
	Minimum	Mean	Maximum	Minimum	Mean	Maximum
Hoki	1.5	6.9	16.5	5.8	8	12.5
Snapper	8.9	15.5	18	14	17.4	25.2
Blue whiting	5	6.7	7.9	3.4	5.8	9.1
Orange roughy	1.5	4.6	7.9	3.5	6.6	8.4
Arrow squid	2.6	8	17.4	8	11.8	14.5
Scampi	4.5	8.8	13.4	8.6	10.9	13.4



Supplementary Fig 2 Surface dissolved oxygen concentration (mg/L), bottom dissolved oxygen concentration (mg/L), sea surface temperature (°C) and bottom temperature (°C), as a function of latitude across the study area. The temperature and dissolved oxygen data used to produce this figure were obtained from Bio-Oracle at surface and maximum depth layers (Assis et al. 2018). This figure was created using R Studio (Team R Development Core 2021)



Supplementary Fig 3 Results from the evaluation of final generalised additive models (GAMs), including the adjusted R^2 value, the Spearman's rho value, and their 95% confidence intervals, for (a) hoki, (b) snapper, (c) blue whiting, (d) orange roughy, (e) arrow squid and (f) scampi. This figure was created using R Studio (Team R Development Core 2021)



Supplementary Fig 4 The predicted maximum body lengths (cm) as a function of temperature (°C) for hoki, snapper, blue whiting, orange roughy, arrow squid and scampi across the entire study period (solid line and confidence interval band) as well as predicted maximum body lengths for each species within the “past” fishing period (dashed line) and “recent” fishing period (dotted line). This figure was created using R Studio (Team R Development Core 2021)

References

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