

Supplement

Table S1. Length conversion relationships for brown and white shrimp based on animals collected from the North Inlet estuary during the spring, summer, and fall of 2021. Individual shrimp were measured for total (TL; tip of the rostrum to tip of the telson), cephalothorax (RCL; tip of rostrum to posterior of carapace), and carapace (CL; anterior and posterior margins of carapace) lengths (in mm) according to Ditty (2011).

Conversion	Shrimp Species	N	Size range (TL) included	Length-Length equation	R ²
CL – TL	Brown (<i>Penaeus aztecus</i>)	993	25 - 97	TL = 4.815+4.28*CL	0.86
	White (<i>Penaeus setiferus</i>)	1215	27 – 120	TL = 9.2657+4.318*CL	0.83
RCL - TL	Brown (<i>Penaeus aztecus</i>)	987	25 - 97	TL = 2.862 + 2.617 * RCL	0.94
	White (<i>Penaeus setiferus</i>)	957	27 – 120	TL = 4.271 + 2.43 * RCL	0.95

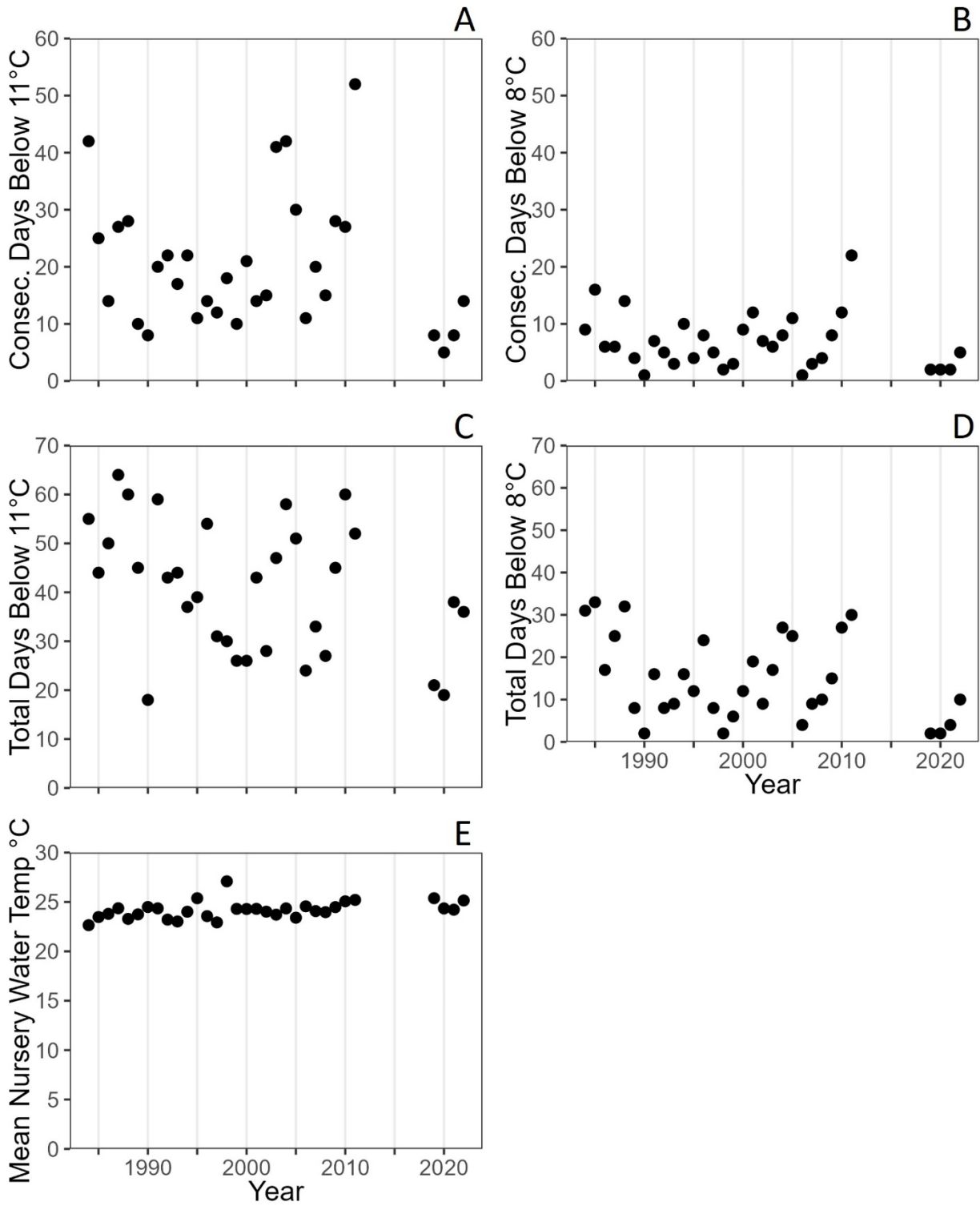


Fig. S1. Surface water temperature variables measured at Oyster Landing in Noeth Inlet Estuary plotted by year. (A) Consecutive days below 11°C, (B) consecutive days below 8°C, (C) total days

below 11°C, (D) total days below 8°C, and (E) mean water temperature during the nursery period of brown shrimp.

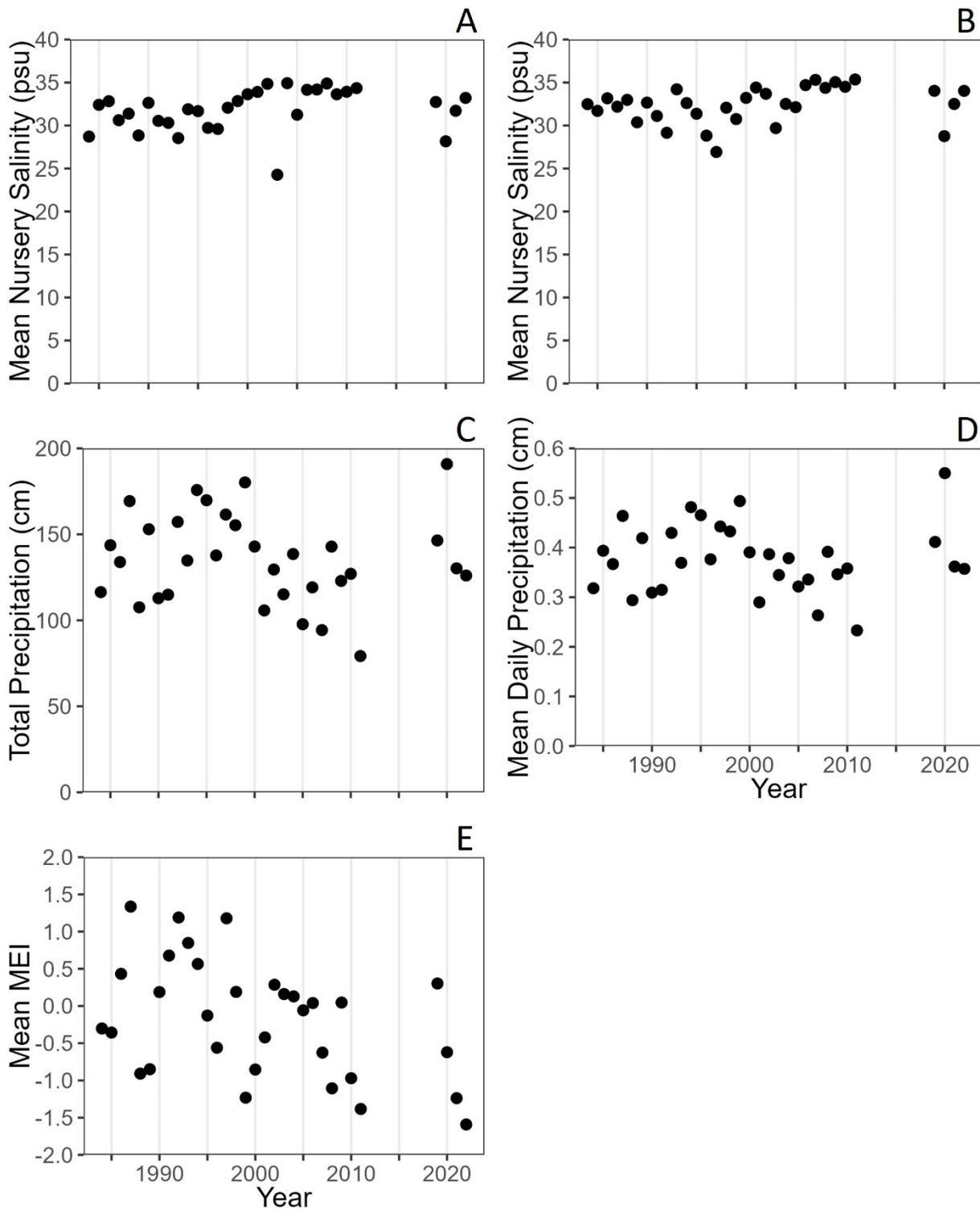


Fig. S2. All other environmental variables (excluding water temperature) with a significant relationship with one or more phenology metric plotted by year. Mean salinity during the nursery period of (A) brown shrimp and (B) white shrimp, (C) total annual precipitation, (D) mean daily precipitation, and (E) mean multivariate El Niño Southern Oscillation Index (MEI).