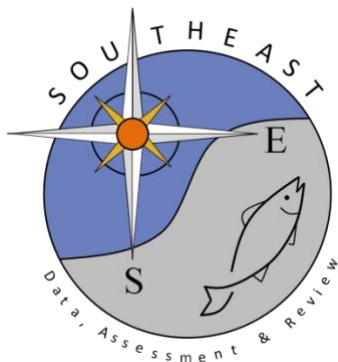# Gulf of Mexico Brown, Pink, and White Shrimp Weight-Length Regression using SEAMAP Data

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Gulf of Mexico Brown, Pink, and White Shrimp Weight-Length Regression using SEAMAP Data

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SEAMAP Data

Shrimp length and weights are collected on the Southeast Area Monitoring and Assessment Program (SEAMAP) summer and fall trawl surveys and are housed at SEFSC (Table 1). These data were summarized and used to update weight-length conversion parameters for use in the SEDAR87 Gulf of Mexico Brown, Pink, and White Shrimp Research Track Assessment.

Table 1, Annual number of samples for brown, pink, and white shrimp collected by the SEAMAP survey for both length and weight data.

Year	Brown	Pink	White
2002	619	56	250
2003	645	76	150
2004	600	52	157
2005	2,369	134	421
2006	5,986	273	570
2007	4,212	293	620
2008	17,893	1,868	1,081
2009	31,130	2,392	3,566
2010	20,020	3,364	4,142
2011	15,618	1,783	2,205
2012	16,046	2,031	2,346
2013	11,323	1,405	1,003
2014	12,492	3,183	1,247
2015	18,456	2,236	2,827
2016	12,074	2,075	779
2017	13,996	1,873	2,448
2018	10,597	2,754	899
2019	4,878	1,219	619
2020	85	352	42
2021	4,246	705	881
2022	3,361	916	829

Comparison of Weight-Length Parameters

Stock assessments on Gulf of Mexico Brown, Pink, and White shrimp included weight-length conversion parameters that were estimated in the early 1980s, where original sources were never located. Given that these are annual species in a warming ocean, the potential for changes in the relationship between weight and length over 30 years is high. These conversion parameters were estimated here using SEAMAP data collected 2002-2022. Old values pulled from historical assessment documentation are given in Table 2 and plotted in Figure 1, compared with the newly estimated parameters. These parameters are given in units converting weights in kilograms and lengths in mm TL.

Table 2, Weight-length conversion parameters given in the form W = α * L ^ β, where W is weight in kg and L is length in mm TL for brown, pink, and white shrimp. The suffix _old indicates the parameters used in the previous assessments, while _est are the parameters estimated using data presented here.

Species	α_old	β_old	α_est	β_est
Brown	5.036e-09	2.999	8.987e-09	2.949
Pink	1.410e-09	3.290	1.043e-08	2.948
White	1.360e-09	3.247	2.320e-08	2.779

Overall, the newly estimated regression predicts that all species of shrimp are heavier for any given length (Figure 1) when compared with the regressions used in the past. These regressions fit the raw SEAMAP data better than the parameters that have been used in the past. It is recommended that the newly estimated parameters provided in Table 2 be used to convert brown, pink, and white shrimp lengths to weights (or vice versa) in the SEDAR87 Research Track Assessment.
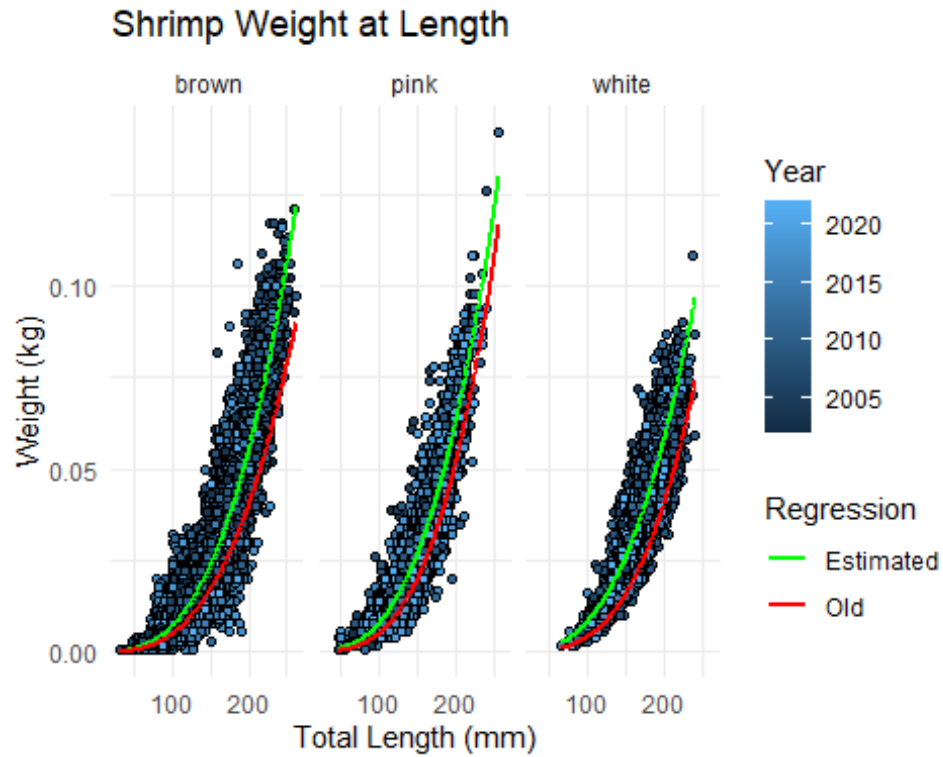
Figure 1, Raw SEAMAP weight and length data for brown, pink, and white shrimp plotted with the old regression alongside the regression estimated here. Point colors are shaded by year from the darkest blue in 2002 to the lightest blue in 2022.