

# Ordinary Least Squares Single Regression Abundance Models

**Discussion** OLS regression models using all lifestages from all surveys with a 1- and 2-yr lag to predict all survey's total CPUEs were constructed to find all explanatory relationships. All significant relationships are displayed in the following tables. The CRMS Creek Trawl is the most consistently responsive of the surveys when used in regression modeling. Fifteen significant relationships exist between total CPUEs from the Creek Trawl survey and several 1- and 2-yr.lagged lifestage variables (Table 3). The CRMS Harbor Trawl had one significant explanatory relationship with subadults from the same survey lagged 1-yr (Table 4). The Trammel Net survey had one significant explanatory relationship with mature females from the Harbor Trawl lagged 1-yr (Table 4), which is the highest correlation ( $r^2=0.36$ ) of all the single regression models.

Although there were several significant regression models constructed using fisheries independent survey life stage abundance CPUEs, no relationships correlate strong enough to be effective models. Using OLS single regression modeling, the six SCDNR fisheries independent surveys used to monitor blue crab populations in the Charleston Harbor watershed are ineffective are ineffective predictors of their own abundance CPUEs.

The next step in this chapter is to put all relevant variables for the Creek Trawl into an exploratory dredge to find combinations of variables to populate multiple regression models. These models will be constructed using the suggestions of the dredge.

**Table 3:** OLS regression of total Creek Trawl CPUE by all lifestages from all surveys.

Dependent Variable	Explanatory Variable	Summary Statistics			
		p-value	r <sup>2</sup>	F-statistic	Degrees of Freedom
Total CPUE	Subadult (1-yr. lag)	0.007774	0.1809	7.949	36
Total CPUE	Adult (1-yr. lag)	0.031200	0.1225	5.028	36
Total CPUE	Immature Female (1-yr. lag)	0.050070	0.1025	4.111	36
Total CPUE	Immature Male (1-yr. lag)	0.048540	0.1038	4.169	36
Total CPUE	Mature Male (1-yr. lag)	0.002197	0.2321	10.880	36
Total CPUE	Sublegal (1-yr. lag)	0.025290	0.1314	5.448	36
Total CPUE	Legal (1-yr. lag)	0.031200	0.1225	5.028	36
Total CPUE	Total CPUE (1-yr lag)	0.019060	0.1434	6.027	36
Total CPUE	Subadult (2-yr. lag)	0.001926	0.2432	11.250	35
Total CPUE	Immature Female (2-yr. lag)	0.010380	0.1733	7.337	35
Total CPUE	Immature Male (2-yr. lag)	0.004023	0.2131	9.481	35
Total CPUE	Mature Female (2-yr lag)	0.019000	0.1473	6.048	35
Total CPUE	Mature Male (2-yr. lag)	0.030760	0.1265	5.067	35
Total CPUE	Sublegal (1-yr. lag)	0.004317	0.2102	9.316	35
Total CPUE	Total CPUE (2-yr lag)	0.004898	0.2050	9.024	35

**Table 4:** OLS regression of all non-Creek Trawl survey total CPUEs by all lifestages from all surveys.

Dependent Variable	Explanatory Variable	Summary Statistics			
		p-value	r2	F-statistic	Degrees of Freedom
<b>Harbor Trawl</b>					
Total CPUE	Harbor Trawl Subadult (1-yr. lag)	0.02906	0.12890	5.181	35
<b>Trammel Net</b>					
Total CPUE	Harbor Trawl Mature Female (1-yr lag)	0.04651	0.36137	5.028	11