

## Creek Length Assessment:

Caution criteria were developing using a simple linear regression relationship between total estuarine length of the creek (km) and geometric mean total nitrogen concentrations using the robustreg procedure in SAS

The ROBUSTREG Procedure

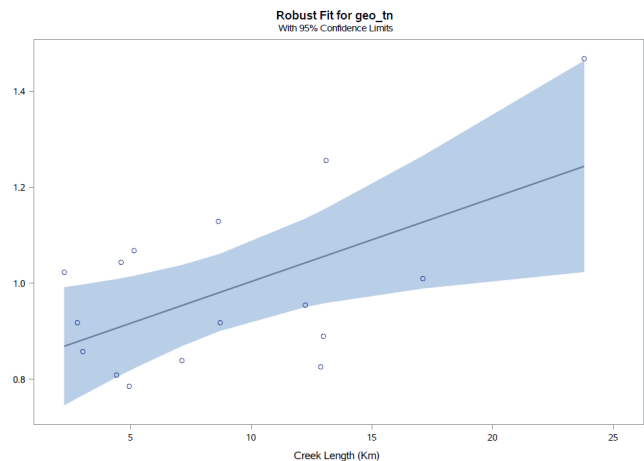
Model Information		
Data Set	WORKADJUST	
Dependent Variable	geo_tn	Geometric Average Total Nitrogen (mg/l)
Number of Independent Variables	1	
Number of Observations	16	
Method	M Estimation	

Number of Observations Read	16
Number of Observations Used	16

Parameter Information	
Parameter	Effect
Intercept	Intercept
total_km	total_km

Summary Statistics						
Variable	Q1	Median	Q3	Mean	Standard Deviation	MAD
total_km	4.5078	7.8764	12.9242	8.9790	5.9860	6.8303
geo_tn	0.8479	0.9360	1.0560	0.9870	0.1814	0.1524

Parameter Estimates							
Parameter	DF	Estimate	Standard Error	95% Confidence Limits		Chi-Square	Pr > ChiSq
Intercept	1	0.8293	0.0756	0.6811	0.9775	120.26	<.0001
total_km	1	0.0174	0.0071	0.0036	0.0313	6.07	0.0138
Scale	1	0.1963					



This was described in the reports and in Wessel et al. as a somewhat weak relationship but used because it could be applied to all creeks in the population to define a protective standard for smaller creeks. The assessment is supported by an assessment of the TN creek length relationship based on the statewide repository database using only those creeks in the lowest “Monitor” category using log creek length (meters). Using only the Monitor category allowed us to focus on an expectation for creeks with lower TN concentrations, presumably representing more natural creeks.

Dependent Variable: geo\_tn Grand Geometric Mean TN (mg/l)

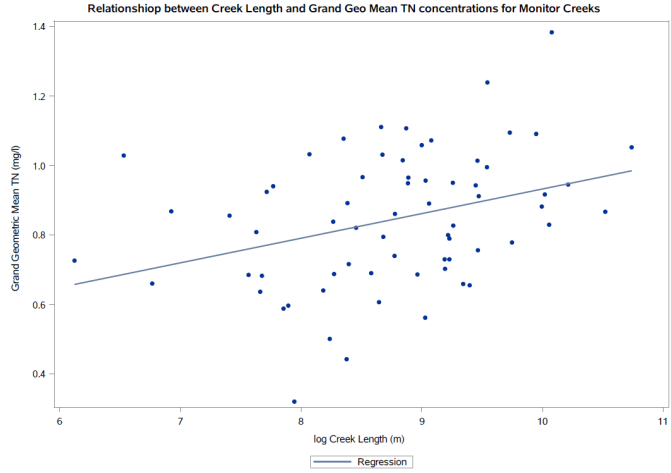
Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	1	0.29046259	0.29046259	8.75	0.0043
Error	65	2.15835393	0.03320545		
Corrected Total	66	2.44881652			

R-Square	Coeff Var	Root MSE	geo_tn Mean
0.118613	21.58090	0.182224	0.844375

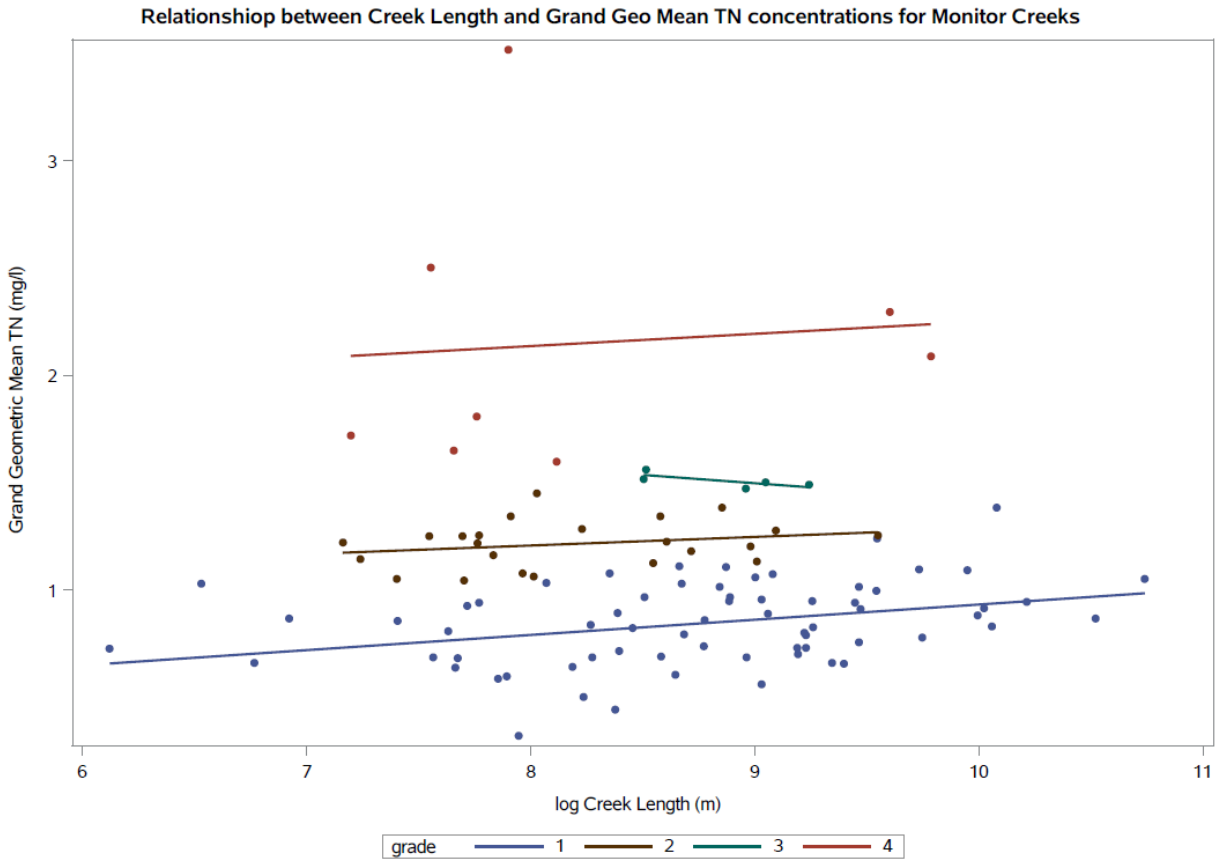
Source	DF	Type I SS	Mean Square	F Value	Pr > F
Total	1	0.29046259	0.29046259	8.75	0.0043

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Total	1	0.29046259	0.29046259	8.75	0.0043

Parameter	Estimate	Standard Error	t Value	Pr >  t
Intercept	0.2236877464	0.21103863	1.06	0.2931
Total	0.0708833394	0.02396645	2.96	0.0043



The relationship does not hold using all categories because point source discharges and other anthropogenic effects interfere with this expectation.



Finally creek length (Total\_m) was an important factor influencing variation in TN and TP concentrations using the RandomForest Routine in R as described by the variable importance plots below.

