

Predicting GPP with Salinity and SWC/pH/Tair

It looks like the effect of salinity on GPP might interact with soil water content (SWC), pH, or air temperature. To test the strength of these possible interactions, I constructed several general linear models and compared them using Akaike's Information Criterion.

Results of AIC comparison of GLMs:

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Table 1:

	<i>Dependent variable:</i>						
	GPP						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Sal	−0.429*** (0.033)	−0.317*** (0.072)	−4.647*** (1.134)	−0.436*** (0.032)	−1.738 (1.753)	−0.420*** (0.033)	−1.220*** (0.253)
SWC		−22.914*** (3.231)	−76.300*** (14.299)				
Sal:SWC			9.820*** (2.567)				
pH				−3.567*** (0.694)	−4.740*** (1.724)		
Sal:pH					0.171 (0.230)		
Tair						−0.137*** (0.036)	−0.358*** (0.078)
Sal:Tair							0.033*** (0.010)
Constant	10.162*** (0.249)	19.996*** (1.383)	43.404*** (6.263)	37.425*** (5.312)	46.354*** (13.139)	13.354*** (0.862)	18.686*** (1.877)
Observations	306	185	185	306	306	306	306
Log Likelihood	−620.074	−345.893	−338.701	−607.292	−607.012	−612.731	−607.674
Akaike Inf. Crit.	1,244.148	697.786	685.402	1,220.584	1,222.025	1,231.461	1,223.348

Note:

*p<0.1; **p<0.05; ***p<0.01

There appears to be an interaction between salinity and soil water content. Both have a large negative impact on GPP.

Other variables to improve GPP predictions based on Salinity*SWC?

Can we lower AIC further by adding anything onto this interaction? Or by replacing soil water content with Depth?

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Table 2:

	<i>Dependent variable:</i>				
	GPP				
	(1)	(2)	(3)	(4)	(5)
Sal	−0.317*** (0.072)	−4.647*** (1.134)	−4.675*** (1.137)	−4.060** (1.633)	−0.818* (0.473)
SWC	−22.914*** (3.231)	−76.300*** (14.299)	−75.096*** (14.460)	−76.933*** (14.384)	
pH			−0.575 (0.947)		
Sal:SWC		9.820*** (2.567)	9.863*** (2.572)	10.180*** (2.671)	
Sal:pH				−0.099 (0.197)	
Depth					−6.134*** (2.026)
Sal:Depth					0.215 (0.259)
Constant	19.996*** (1.383)	43.404*** (6.263)	47.288*** (8.958)	43.698*** (6.303)	21.329*** (3.697)
Observations	185	185	185	185	306
Log Likelihood	−345.893	−338.701	−338.512	−338.573	−603.669
Akaike Inf. Crit.	697.786	685.402	687.023	687.145	1,215.337

Note:

*p<0.1; **p<0.05; ***p<0.01

No.