The following supplements accompany the article

Potential effects of sea-level rise on plant productivity: species-specific responses in northeast Pacific tidal marshes

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Supplement 1.

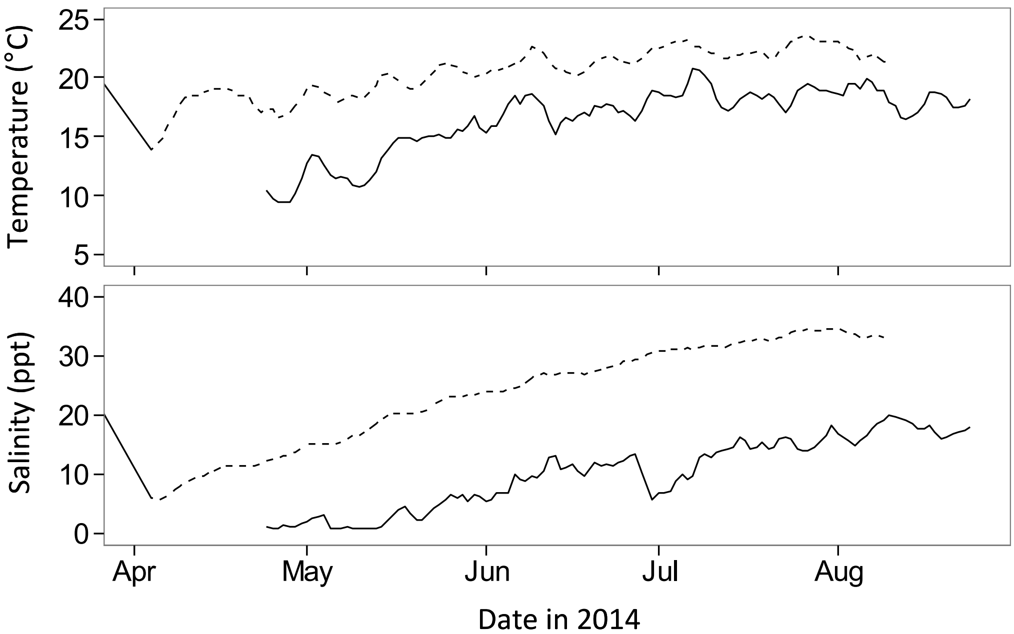

Figure S1. Mean daily water column temperature (°C) and salinity (ppt) during the growing season at Petaluma marsh, CA (dashed lines) and at Millport Slough, Siletz, OR (solid lines). Data consist of values when the loggers were immersed.

Supplement 2.

Table S1. Summary of polynomial fits to inundation effects on total, shoot, and root biomass; root-to-shoot ratios; and total shoot counts. In these analyses, missing roots or shoots at the end of the experiment were treated as missing values.

Species and site	Response variable	Polynomial equation	Adjusted R^2	F	df	p
Salicornia pacifica , Petaluma	Total dry mass (g)	$= 0.0039\ I^2 - 0.4747\ I + 14.56$	0.61	25.8	2, 30	<0.0001
	Shoot dry mass (g)	$= 0.0034\ I^2 - 0.4066\ I + 12.19$	0.60	24.6	2, 30	<0.0001
	Root dry mass (g)	$= 0.0005\ I^2 - 0.0679\ I + 2.37$	0.61	31.0	2, 37	<0.0001
	Root-to-shoot ratio	$= 0.0002\ I^2 - 0.0006\ I - 1.56$	0.18	4.6	2, 30	0.018
	Total shoot count	NA	NA	NA	NA	NA
Bolboschoenus maritimus , Petaluma	Total dry mass (g)	$= -0.0020\ I^2 + 0.1130\ I + 4.16$	0.33	9.9	2, 34	0.0004
	Shoot dry mass (g)	$= -0.0009\ I^2 + 0.0571\ I + 1.00$	0.35	10.9	2, 35	0.0002
	Root dry mass (g)	$= -0.0012\ I^2 + 0.0586\ I + 3.16$	0.31	9.7	2, 36	0.0004
	Root-to-shoot ratio	$= 0.0006\ I^2 - 0.0363\ I + 1.26$	0.31	9.0	2, 34	0.0008
	Total shoot count	$= -0.0015\ I^2 + 0.1045\ I + 2.12$	0.15	4.2	2, 35	0.023
Spartina foliosa , Petaluma	Total dry mass (g)	$= -0.0081\ I^2 + 0.6136\ I + 0.98$	0.60	29.5	2, 36	<0.0001
	Shoot dry mass (g)	$= -0.0044\ I^2 + 0.3295\ I + 0.43$	0.60	29.1	2, 36	<0.0001
	Root dry mass (g)	$= -0.0035\ I^2 + 0.2764\ I + 0.61$	0.52	23.2	2, 39	<0.0001
	Root-to-shoot ratio	$= 0.0006\ I^2 - 0.0389\ I + 0.51$	0.15	4.3	2, 36	0.021
	Total shoot count	$= -0.0041\ I^2 + 0.3164\ I + 2.27$	0.35	10.8	2, 35	0.0002
Juncus balticus , Siletz	Total dry mass (g)	$= 0.0060\ I^2 - 0.6120\ I + 16.8$	0.49	15.0	2, 27	<0.0001
	Shoot dry mass (g)	$= 0.0008\ I^2 - 0.1251\ I + 5.01$	0.38	9.7	2, 27	0.0007
	Root dry mass (g)	$= 0.0052\ I^2 - 0.4869\ I + 11.75$	0.55	16.8	2, 27	<0.0001
	Root-to-shoot ratio	$= 0.0008\ I^2 - 0.0541\ I + 0.96$	0.15	3.49	2, 27	0.045
	Total shoot count	$= 0.0028\ I^2 - 0.5967\ I + 32.08$	0.30	7.3	2, 27	0.003
Carex lyngbyei , Siletz	Total dry mass (g)	$= -0.0069\ I^2 + 0.2094\ I + 12.04$	0.31	7.5	2, 27	0.0026
	Shoot dry mass (g)	$= -0.0029\ I^2 + 0.1225\ I + 4.11$	0.26	6.1	2, 27	0.006
	Root dry mass (g)	$= -0.0039\ I^2 + 0.0870\ I + 7.93$	0.30	7.2	2, 27	0.003
	Root-to-shoot ratio	$= -0.0002\ I^2 - 0.0060\ I + 0.55$	0.33	8.2	2, 27	0.002
	Total shoot count	$= -0.0021\ I^2 + 0.0296\ I + 9.41$	0.27	6.3	2, 27	0.006

Table S2. Summary of polynomial fits to inundation effects on total, shoot, and root biomass; and total shoot counts. In these analyses, missing roots or shoots at the end of the experiment were assigned zero biomass or zero total shoot counts. Only results that differ from table S1 are shown. Overall, all analyses were qualitatively and quantitatively similar, regardless of how missing roots or shoots were treated statistically.

Species and site	Response variable	Polynomial equation	Adjusted R^2	F	df	p
Salicornia pacifica , Petaluma	Total dry mass (g)	$= 0.0036\ I^2 - 0.4629\ I + 14.49$	0.66	40.5	2, 38	<0.0001
	Shoot dry mass (g)	$= 0.0031\ I^2 - 0.3950\ I + 12.13$	0.65	38.4	2, 38	<0.0001
	Root dry mass (g)	$= 0.0005\ I^2 - 0.0679\ I + 2.37$	0.61	32.6	2, 38	<0.0001
Bolboschoenus maritimus , Petaluma	Total dry mass (g)	$= -0.0022\ I^2 + 0.1210\ I + 4.13$	0.49	20.1	2, 38	<0.0001
	Shoot dry mass (g)	$= -0.0009\ I^2 + 0.0553\ I + 1.01$	0.44	17.1	2, 39	<0.0001
	Root dry mass (g)	$= -0.0012\ I^2 + 0.0636\ I + 3.13$	0.40	14.6	2, 38	<0.0001
	Total shoot count	$= -0.0017\ I^2 + 0.1172\ I + 2.07$	0.28	8.9	2, 39	0.0007
Spartina foliosa , Petaluma	Total dry mass (g)	$= -0.0078\ I^2 + 0.5958\ I + 1.12$	0.60	31.5	2, 39	<0.0001
	Shoot dry mass (g)	$= -0.0043\ I^2 + 0.3194\ I + 0.51$	0.60	31.8	2, 39	<0.0001
	Total shoot count	$= -0.0043\ I^2 + 0.3219\ I + 2.27$	0.38	13.4	2, 38	<0.0001

Supplement 3.

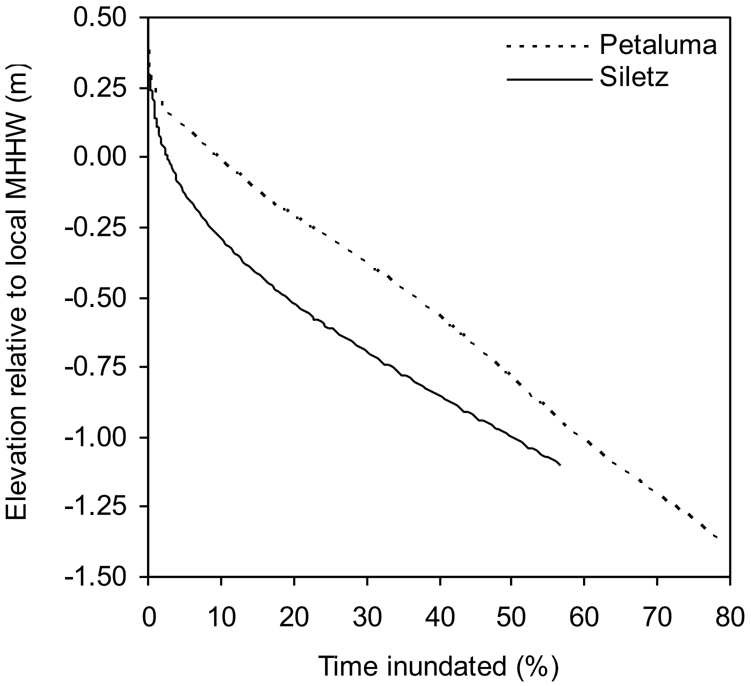

Figure S2. Relationships between local mean higher high water (MHHW) and time inundated during the 2014 growing season at Petaluma marsh in California and Siletz estuary in Oregon.

Supplement 4.

Table S3. Flowering incidence by inundation treatment at Petaluma. Inundation of the three modules at each of the seven experimental treatment levels was averaged (n = 6 mesocosms per treatment). Inundation significantly affected flowering incidence in *S. pacifica* (Fisher's exact test, p < 0.0001) and *S. foliosa* (p = 0.01). *B. maritimus* was not tested because it flowered too infrequently (only 0 or 1 times per inundation level).

Mean inundation (%)	Flowering incidence (%)		
	S. pacifica	*B. maritimus*	*S. foliosa*
0.2	100	0	0
8.4	83	17	50
23.5	50	17	67
38.8	0	0	83
52.3	0	0	50
64.6	0	0	0
77.9	NA	0	0

Table S4. Flowering incidence by inundation treatment at Siletz. Inundation of both modules at each of the five experimental treatment levels were averaged (n = 6 mesocosms per treatment). Inundation significantly affected flowering incidence in *J. balticus* (Fisher's exact test, p = 0.02). *C. lyngbyei* was not tested because it flowered too infrequently.

Mean inundation (%)	Flowering incidence (%)	
	J. balticus	*C. lyngbyei*
0.4	67	17
4.3	83	17
14.8	67	17
33.6	17	0
54.6	0	0

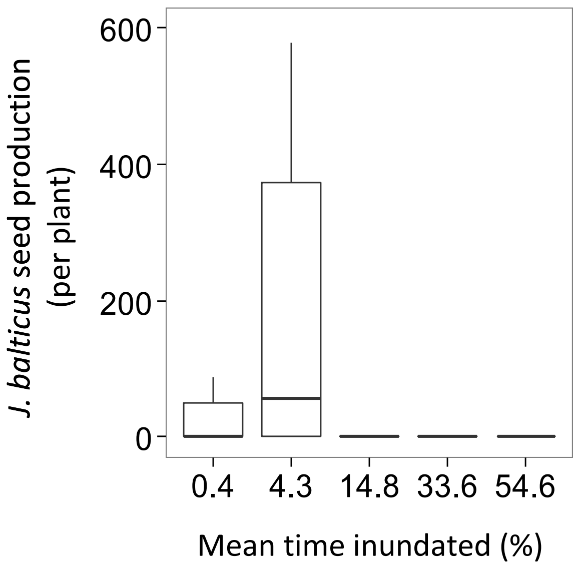

Figure S3. Variation in *Juncus balticus* seed production across different inundation levels at Siletz (solid line = median; top of box = upper 75% quartile). Flooding duration was averaged for the two modules deployed at each of five elevation levels. Seeds were only produced in the two least flooded treatments; production was highly variable within and between inundation treatments (Kruskall-Wallis test, $\chi^2 = 15.6$, df = 4, p = 0.004).

Supplement 5.

Table S5. Summary of quantile regression fits (using natural splines) for the five species in the study. Each regression was fit at the 90% quantile with four internal knots (df = 5).

Species and site	Model coefficient	Coefficient value	S.E.	p
Salicornia pacifica , Petaluma	Y-Intercept	99.81	12.10	<0.0001
	Natural spline coeff 1	-4.37	11.51	0.705
	Natural spline coeff 2	13.79	16.13	0.395
	Natural spline coeff 3	-99.35	39.08	0.012
	Natural spline coeff 4	-98.41	32.43	0.003
	Natural spline coeff 5	-100.39	47.94	0.038
Bolboschoenus maritimus , Petaluma	Y-Intercept	-0.18	0.48	0.712
	Natural spline coeff 1	-2.06	2.93	0.483
	Natural spline coeff 2	76.68	22.40	0.0009
	Natural spline coeff 3	0.02	23.64	1.000
	Natural spline coeff 4	2.00	9.62	0.836
	Natural spline coeff 5	0.54	24.63	0.983
Spartina foliosa , Petaluma	Y-Intercept	0.00	0.05	0.996
	Natural spline coeff 1	0.00	0.25	0.993
	Natural spline coeff 2	0.05	1.05	0.959
	Natural spline coeff 3	-1.35	17.28	0.938
	Natural spline coeff 4	44.46	11.77	0.0003
	Natural spline coeff 5	78.88	32.35	0.016
Juncus balticus , Siletz	Y-Intercept	35.00	37.39	0.351
	Natural spline coeff 1	17.10	35.92	0.635
	Natural spline coeff 2	49.96	44.02	0.259
	Natural spline coeff 3	-62.96	63.72	0.325
	Natural spline coeff 4	22.43	84.44	0.791
	Natural spline coeff 5	-66.30	71.88	0.358
Carex lyngbyei , Siletz	Y-Intercept	0.00	5.39	1.000
	Natural spline coeff 1	-0.39	5.16	0.939
	Natural spline coeff 2	19.03	10.34	0.068
	Natural spline coeff 3	143.16	40.81	0.0006
	Natural spline coeff 4	114.69	58.44	0.052
	Natural spline coeff 5	89.91	121.76	0.462