

Supplementary Materials: Supplementary Figures

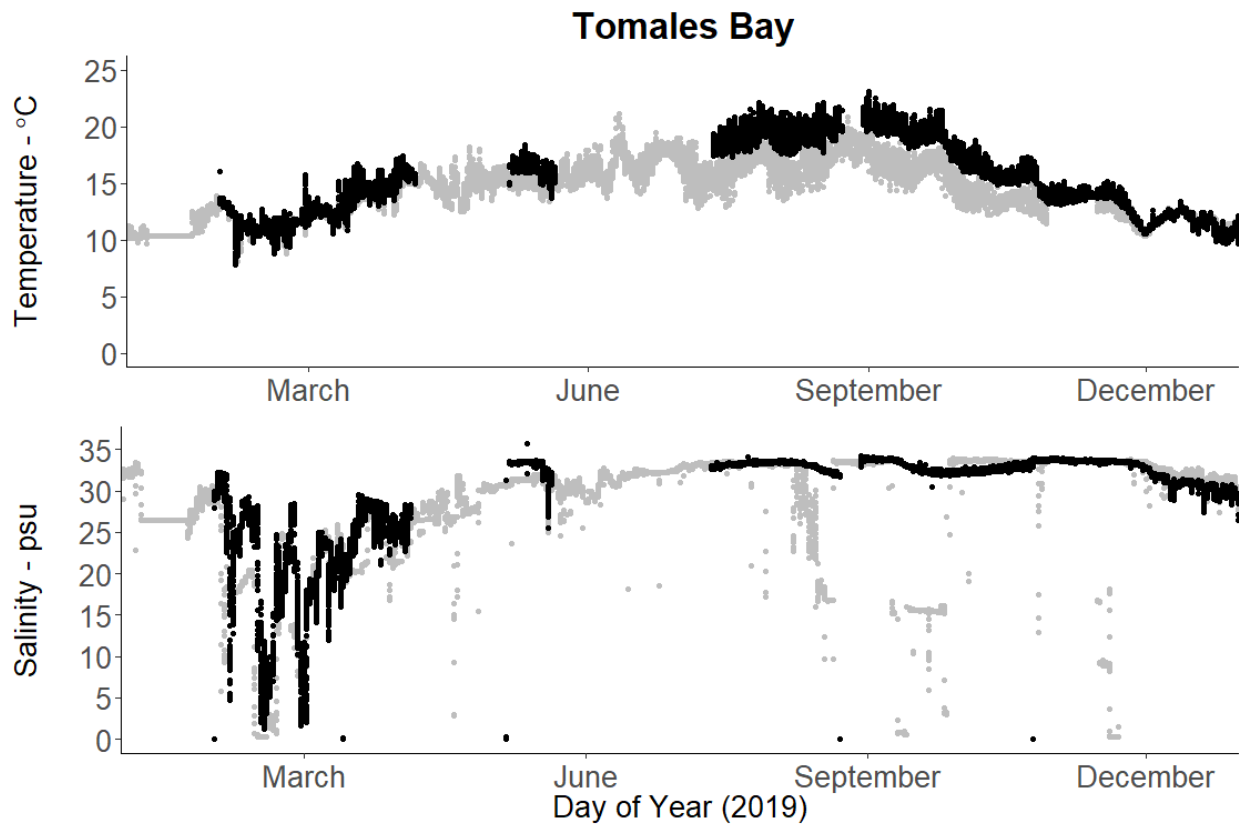


Fig. S1. Records of sea surface temperature and salinity from Hog Island (gray, 38.18785°N, 122.927681°W, proxy for White Gulch) and Sacramento Landing, Tomales Bay, CA (black, 38.149695°N, 122.905856°W, proxy for Marshall Beach) in 2019. Hog Island data represents hourly intervals and was obtained from publicly available Tomales Bay Buoy data from the Bodega Ocean Observing Node (BOON, <https://boon.ucdavis.edu/data-access/products/tbbuoy>). Sacramento Landing measurements were taken at 15 minute intervals using an In-Situ Aqua TROLL 500.

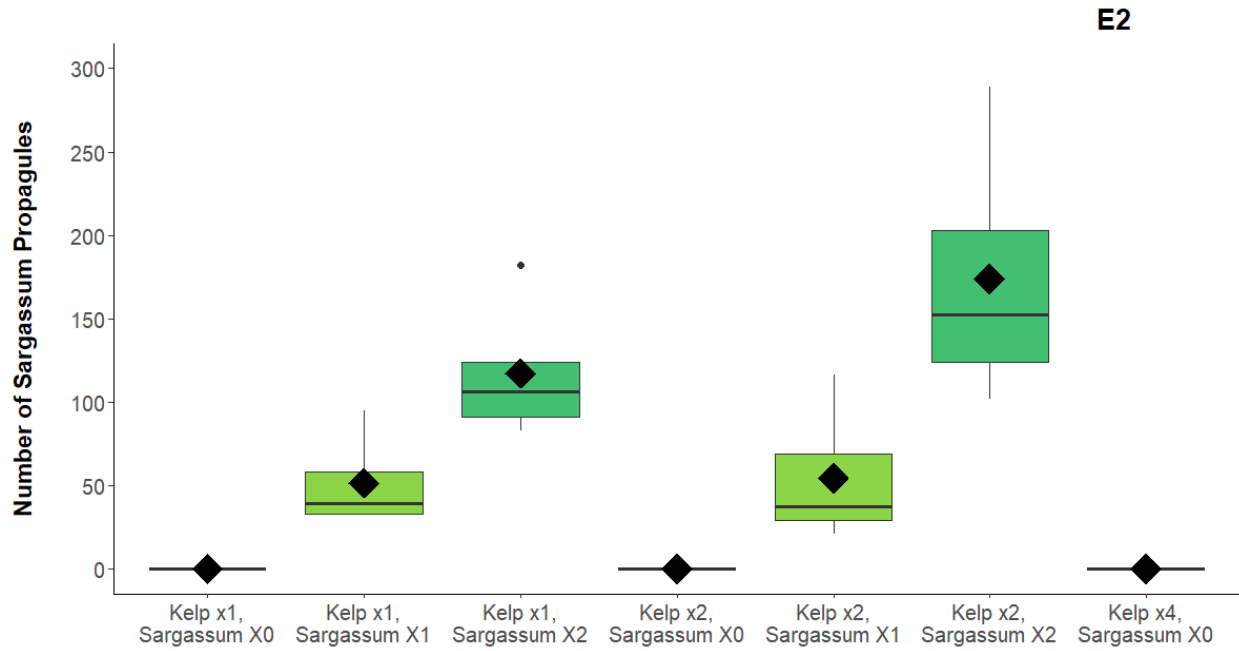


Fig. S2. Number of Sargassum propagules present in each dish after 2 weeks of growth under different initial densities of giant kelp and wireweed inoculation in Expt 2. The box plots summarize the mean (diamond) and median (box midline) for each treatment, the first and third quartiles (upper and lower box limits), outliers within 1.5 times the inter-quartile range (vertical lines), and outliers beyond that range (dots).

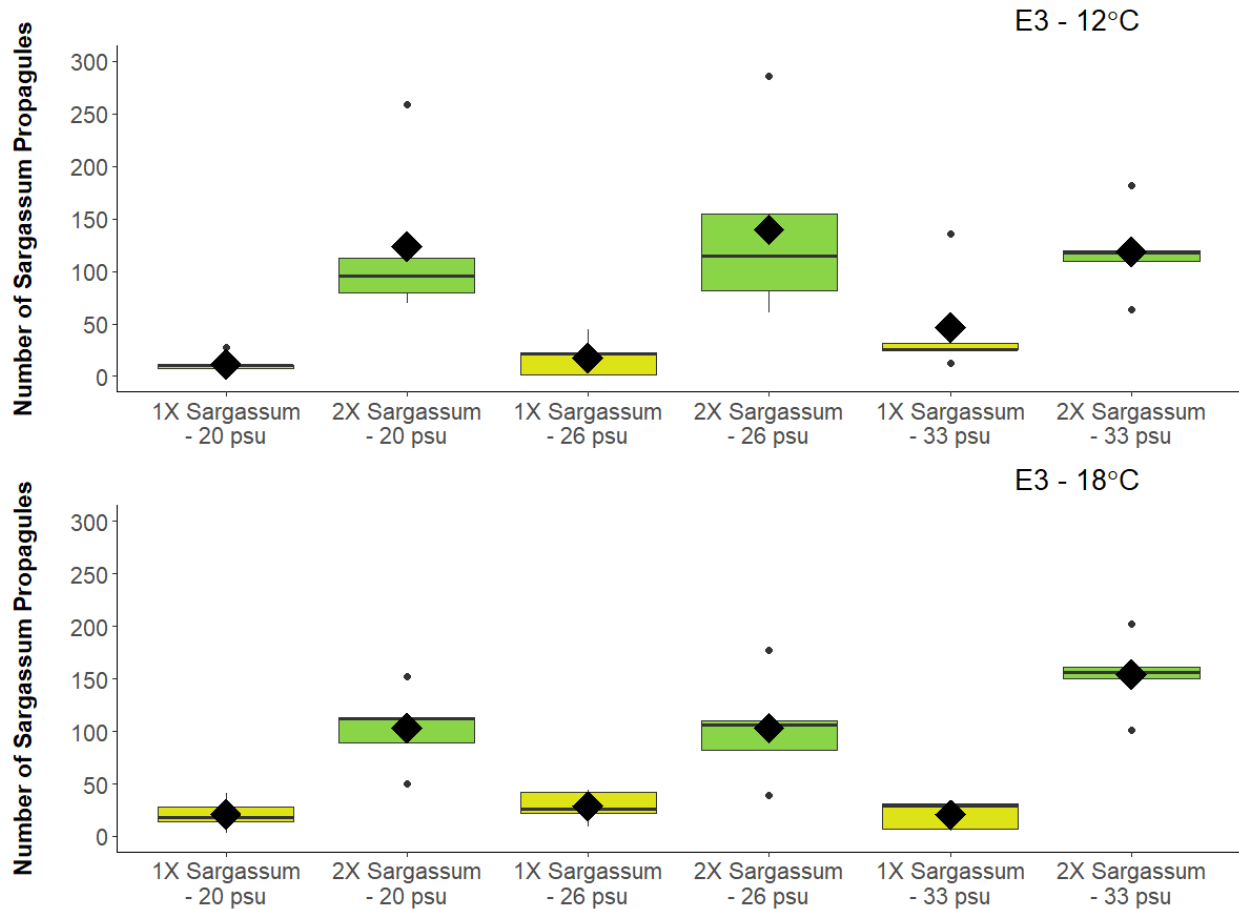


Fig. S3. Number of Sargassum propagules present in each dish after 2 weeks of growth in Expt 3, investigating the interacting effects of *S. muticum* presence, temperature, and salinity. The box plots summarize the mean (diamond) and median (box midline) for each treatment, the first and third quartiles (upper and lower box limits), outliers within 1.5 times the inter-quartile range (vertical lines), and outliers beyond that range (dots).

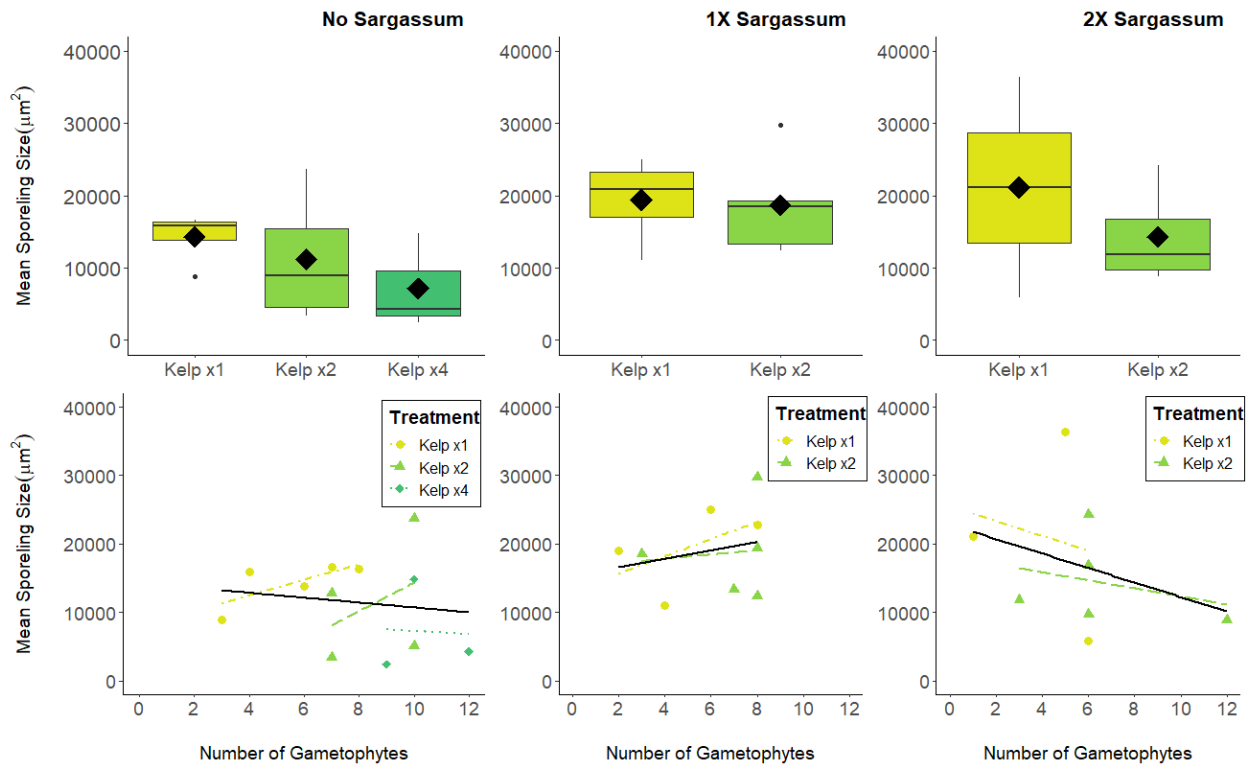


Fig. S4. Sizes of embryonic sporophytes from tests of density dependent effects (E2). Each treatment had a total of five replicates, and the number of sporophytes measured in each treatment can be found in Table S8. Top panels show the average size of sporelings (embryonic sporophytes) after 4 weeks of growth with box plots that summarize the mean (diamond) and median (box midline) for each treatment, the first and third quartiles (upper and lower box limits), outliers within 1.5 times the inter-quartile range (vertical lines), and outliers beyond that range (dots). The bottom panels show the relationship between mean number of gametophytes and mean sporeling size. Colors, shapes, and line types represent different kelp densities within each Sargassum density (yellow, circle, dot-dash line = 1X Kelp; green, triangle, dashed line = 2X Kelp; teal, diamond, dotted line = 4X Kelp), and the solid black line represents the overall trend across kelp densities. The number of dots in the bottom panels represent the number of replicates in which embryonic sporophytes were observed. Heterogeneous slopes and different ranges of values for each treatment indicate that the different treatments are confounded with differences in the covariate.

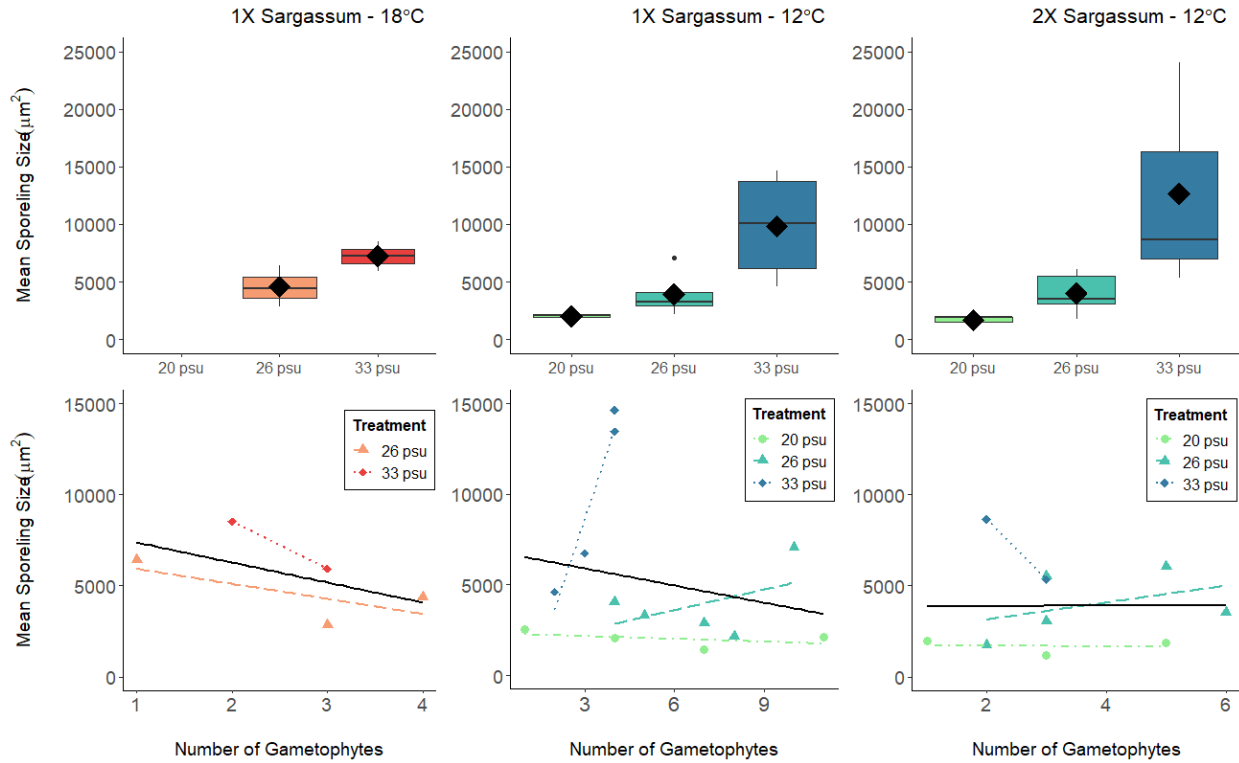


Fig. S5. Sizes of sporelings from tests of the interacting effects of *S. muticum* presence, temperature, and salinity (E3). Each treatment had a total of five replicates, and the number of sporophytes measured in each treatment can be found in Table S8. Top panels show the average size of sporeling (embryonic sporophytes) after 4 weeks of growth with box plots that summarize the mean (diamond) and median (box midline) for each treatment, the first and third quartiles (upper and lower box limits), outliers within 1.5 times the inter-quartile range (vertical lines), and outliers beyond that range (dots). The bottom panels show the relationship between mean number of gametophytes and mean sporeling size. Colors represent different temperature treatments (red theme = 18°C, blue theme = 12°C), and point shape and line type represent different salinities within each temperature treatment (circle, dot-dash line = 20 psu, triangle, dashed line = 26 psu, diamond, dotted line = 33psu). The solid black line represents the overall trend across salinity treatments. The number of dots in the bottom panels represent the number of replicates in which embryonic sporophytes were observed. No data is shown for the 18°C-20 psu-1X *Sargassum* treatment due to a lack of embryonic sporophytes within that treatment. Heterogeneous slopes and different ranges of values for each treatment indicate that the different treatments are confounded with differences in the covariate.

Supplementary Materials: Statistical Tables

Expt 1

Table S1. Count and size responses to temperature and salinity stress for subset White Gulch data (Generalized Linear Model with 2-Way Interaction, Distribution = Negative Binomial, Link=Log, Size Distribution = Gamma, ‘ref’ = reference)

Lifestage	Variable Type	Variable	Fixed Effects	Estimate	SE	z	p		
<i>Females</i>	Count	Intercept		-1.204	0.5805	-2.074	0.038		
		Temperature	18 ° C	<i>ref</i>	<i>ref</i>	<i>Ref</i>	<i>ref</i>		
			12 ° C	4.47	0.5869	7.616	2.62E-14		
		Salinity	20 psu	<i>ref</i>	<i>ref</i>	<i>Ref</i>	<i>Ref</i>		
			26 psu	1.466	0.6462	2.269	0.233		
			33 psu	1.484	0.6271	2.943	0.00324		
		Interactions	Temp (12°C): Salinity (26 psu)	-1.455	0.6576	-2.212	0.0269		
			Temp (12°C): Salinity (33 psu)	-2.949	0.641	-3.887	0.000101		
		<i>Males</i>	Count	Intercept		-20.73	10035.05	-0.002	0.998
				Temperature	18 ° C	<i>ref</i>	<i>ref</i>	<i>ref</i>	<i>ref</i>
12 ° C	19.12				10035.05	0.002	0.998		
Salinity	20 psu			<i>ref</i>	<i>ref</i>	<i>ref</i>	<i>ref</i>		
	26 psu			19.81	10035.05	0.002	0.998		
	33 psu			21.83	10035.05	0.002	0.998		
Interactions	Temp (12°C): Salinity (26 psu)			-15.83	10035.05	-0.002	0.999		
	Temp (12°C): Salinity (33 psu)			-17.22	10035.05	-0.002	0.999		
<i>Eggs</i>	Count			Intercept		-1.6094	0.7254	-2.219	0.0265
				Temperature	18 ° C	<i>ref</i>	<i>ref</i>	<i>ref</i>	<i>ref</i>

		12 ° C	3.7612	0.7509	5.009	5.48E-07
		20 psu	<i>ref</i>	<i>ref</i>	<i>ref</i>	<i>Ref</i>
	Salinity	26 psu	1.3863	0.823	1.684	0.0921
		33 psu	1.7047	0.802	2.126	0.0335
		Temp (12°C): Salinity (26 psu)	-1.2659	0.8669	-1.46	0.1442
	Interactions	Temp (12°C): Salinity (33 psu)	-2.1888	0.852	-2.569	0.0102
		Intercept	-2.303	1.005	-2.291	0.02196
		18 ° C	<i>ref</i>	<i>ref</i>	<i>ref</i>	<i>ref</i>
	Temperature	12 ° C	5.464	1.012	5.398	6.73E-08
		20 psu	<i>ref</i>	<i>ref</i>	<i>ref</i>	<i>ref</i>
	Salinity	26 psu	2.996	1.034	2.896	0.00378
		33 psu	1.946	1.078	1.804	0.07117
		Temp (12°C): Salinity (26 psu)	-3.013	1.048	-2.874	0.00405
	Interactions	Temp (12°C): Salinity (33 psu)	-2.805	1.094	-2.563	0.01038
		Intercept	-1.204	0.5805	-2.074	0.038
		18 ° C	<i>ref</i>	<i>ref</i>	<i>Ref</i>	<i>ref</i>
	Temperature	12 ° C	4.47	0.5869	7.616	2.62E-14
		20 psu	<i>ref</i>	<i>ref</i>	<i>Ref</i>	<i>Ref</i>
	Salinity	26 psu	1.466	0.6462	2.269	0.233
		33 psu	1.484	0.6271	2.943	0.00324
		Temp (12°C): Salinity (26 psu)	-1.455	0.6576	-2.212	0.0269

Temp
(12°C): -2.949 0.641 -3.887 **0.000101**
Salinity
(33 psu)

Table S2. Count and size responses to source location and salinity stress for subset low temperature data (Generalized Linear Model with 2-Way Interaction, Count Distribution = Negative Binomial, Link=Log, Size Distribution = Gamma, ‘ref’ = reference)

Lifestage	Variable Type	Variable	Fixed Effects	Estimate	SE	z	p		
<i>Females</i>	Count	Intercept		3.0106	0.1308	23.025	2E-16		
		Source Location	Marshall Beach	<i>ref</i>	<i>ref</i>	<i>Ref</i>	<i>ref</i>		
			White Gulch	0.2551	0.1819	1.403	0.1607		
		Salinity	20 psu	<i>ref</i>	<i>ref</i>	<i>Ref</i>	<i>Ref</i>		
			26 psu	0.2513	0.1819	1.381	0.1672		
			33 psu	-0.7593	0.1995	-3.806	0.000141		
		Interactions	Salinity (26 psu): Location (WG)	-0.2399	0.255	-0.941	0.3468		
			Salinity (33 psu): Location (WG)	0.111	0.2743	0.405	0.6858		
		<i>Males</i>	Count	Intercept		-20.18	7606.7	-0.003	0.998
				Source Location	Marshall Beach	<i>ref</i>	<i>ref</i>	<i>ref</i>	<i>ref</i>
White Gulch	18.57				7606.7	0.002	0.998		
Salinity	20 psu			<i>ref</i>	<i>ref</i>	<i>ref</i>	<i>ref</i>		
	26 psu			20.44	7606.7	0.003	0.998		
	33 psu			22.27	7606.7	0.003	0.998		
Interactions	Salinity (26 psu): Location (WG)			-16.46	7606.7	-0.002	0.998		
	Salinity (33 psu): Location (WG)			-17.66	7606.7	-0.002	0.998		

<i>Eggs</i>	Count	Intercept		2.04122	0.19283	10.586	2.00E-16		
		Source Location	Marshall Beach	<i>ref</i>	<i>ref</i>	<i>ref</i>	<i>ref</i>		
			White Gulch	0.11054	0.2702	0.409	0.682		
		Salinity	20 psu	<i>ref</i>	<i>ref</i>	<i>ref</i>	<i>Ref</i>		
			26 psu	0.13353	0.26971	0.495	0.621		
			33 psu	-0.51516	0.2883	-1.787	0.074		
		Interactions	Salinity (26 psu): Location (WG)	-0.01317	0.37825	-0.035	0.972		
			Salinity (33 psu): Location (WG)	0.03111	0.4025	0.077	0.938		
		<i>Sporelings</i>	Count	Intercept		3.165476	0.150524	21.03	2.00E-16
				Source Location	Marshall Beach	<i>ref</i>	<i>ref</i>	<i>ref</i>	<i>ref</i>
White Gulch	-0.00228				0.212915	-0.02	0.984158		
Salinity	20 psu			<i>ref</i>	<i>ref</i>	<i>ref</i>	<i>ref</i>		
	26 psu			0.184426	0.211197	0.873	0.382532		
	33 psu			0.758529	0.22384	-3.389	0.000702		
Interactions	Salinity (26 psu): Location (WG)			0.201522	0.300047	-0.672	0.501815		
	Salinity (33 psu): Location (WG)			0.100135	0.318148	-0.315	0.752955		
<i>Sporelings</i>	Size			Intercept		3.0106	0.1308	23.025	2E-16
				Source Location	Marshall Beach	<i>ref</i>	<i>ref</i>	<i>Ref</i>	<i>ref</i>
		White Gulch	0.2551		0.1819	1.403	0.1607		
		Salinity	20 psu	<i>ref</i>	<i>ref</i>	<i>Ref</i>	<i>Ref</i>		
			26 psu	0.2513	0.1819	1.381	0.1672		
			33 psu	-0.7593	0.1995	-3.806	0.000141		

Interactions	Salinity (26 psu): Location (WG)	-0.2399	0.255	-0.941	0.3468
	Salinity (33 psu): Location (WG)	0.111	0.2743	0.405	0.6858

Table S3. Pairwise comparisons of life stage count and juvenile size responses to salinity, grouped by population and temperature. (ND = No Data)

Stage	Variable Type	Location, Temp	Salinity Comparison	Estimate	SE	df	<i>t</i>	p	
<i>Females</i>	Count	White Gulch, 12°C	20 psu v. 26 psu	-0.011	0.122	53	-0.093	0.995	
			20 psu v. 33 psu	0.648	0.136	53	4.776	<0.001	
			26 psu v. 33 psu	0.660	0.136	53	4.865	<0.001	
		White Gulch, 18°C	20 psu v. 26 psu	-1.466	0.646	53	-2.269	0.069	
			20 psu v. 33 psu	-1.846	0.627	53	-2.943	0.013	
			26 psu v. 33 psu	-0.380	0.370	53	-1.026	0.564	
	Marshall Beach, 12°C	20 psu v. 26 psu	-0.251	0.182	53	-1.381	0.358		
		20 psu v. 33 psu	0.759	0.199	53	3.806	0.001		
		26 psu v. 33 psu	1.011	0.197	53	5.137	<0.001		
	<i>Males</i>	Count	White Gulch, 12°C	20 psu v. 26 psu	-3.980	0.732	53	-5.434	<0.001
				20 psu v. 33 psu	-4.605	0.729	53	-6.314	<0.001
				26 psu v. 33 psu	-0.625	0.203	53	-3.077	0.009
White Gulch, 18°C			20 psu v. 26 psu	-19.814	1000.000	53	-0.002	1.000	
			20 psu v. 33 psu	-21.829	1000.000	53	-0.002	1.000	
			26 psu v. 33 psu	-2.015	0.557	53	-3.617	0.002	
Marshall Beach, 12°C		20 psu v. 26 psu	-20.438	7606.696	53	-0.003	1.000		
		20 psu v. 33 psu	-22.268	7606.696	53	-0.003	1.000		
		26 psu v. 33 psu	-1.829	0.351	53	-5.207	<0.001		
<i>Eggs</i>		Count	White Gulch, 12°C	20 psu v. 26 psu	-0.120	0.272	53	-0.442	0.898
				20 psu v. 33 psu	0.484	0.288	53	1.682	0.221

		26 psu v. 33 psu	0.604	0.285	53	2.118	0.096		
	White Gulch, 18°C	20 psu v. 26 psu	-1.386	0.823	53	-1.684	0.221		
		20 psu v. 33 psu	-1.705	0.802	53	-2.126	0.094		
		26 psu v. 33 psu	-0.318	0.518	53	-0.615	0.813		
		Marshall Beach, 12°C	20 psu v. 26 psu	-0.134	0.270	53	-0.495	0.874	
	20 psu v. 33 psu		0.515	0.288	53	1.787	0.184		
	26 psu v. 33 psu		0.649	0.285	53	2.272	0.069		
<i>Sporelings</i>	Count	White Gulch, 12°C	20 psu v. 26 psu	0.017	0.169	53	0.101	0.994	
			20 psu v. 33 psu	0.859	0.185	53	4.629	<0.001	
			26 psu v. 33 psu	0.842	0.186	53	4.532	<0.001	
		White Gulch, 18°C	20 psu v. 26 psu	-2.996	1.034	53	-2.896	0.015	
			20 psu v. 33 psu	-1.946	1.078	53	-1.804	0.178	
			26 psu v. 33 psu	1.050	0.462	53	2.275	0.068	
	Marshall Beach, 12°C	20 psu v. 26 psu	-0.184	0.211	53	-0.873	0.659		
		20 psu v. 33 psu	0.759	0.224	53	3.389	0.004		
		26 psu v. 33 psu	0.943	0.222	53	4.243	0.000		
	<i>Sporelings</i>	Sizes	White Gulch, 12°C	20 psu v. 26 psu	-0.434	0.056	584	-7.720	<0.001
				20 psu v. 33 psu	-0.699	0.070	584	9.919	<0.001
				26 psu v. 33 psu	-0.264	0.072	584	-3.664	<0.001
White Gulch, 18°C			20 psu v. 26 psu	ND	ND	ND	ND	ND	
			20 psu v. 33 psu	ND	ND	ND	ND	ND	
			26 psu v. 33 psu	-20.386	6.192	584	-3.292	0.003	

Marshall Beach, 12°C	20 psu v. 26 psu	-0.311	0.057	1189	-5.453	<0.001
	20 psu v. 33 psu	-0.679	0.080	1189	-8.516	<0.001
	26 psu v. 33 psu	-0.368	0.079	1189	-4.658	<0.001

Expt 1–Expt 3 SIZE DATA**Table S4.** Linear regression data for the slopes of size vs. the number of gametophytes associated with each treatment. (ND = No Data)

Stage	Model Subset	Predictor	df	R ²	F	p	
<i>Expt 1</i>	White Gulch, 12°C	All Salinities	567	-0.002	0.014	0.905	
		20 psu	234	0.005	2.141	0.145	
		26 psu	231	0.039	10.420	0.001	
		33 psu	98	0.045	5.663	0.019	
	White Gulch, 18°C	All Salinities	26	-0.035	0.087	0.770	
		20 psu	ND	ND	ND	ND	
		26 psu	18	-0.052	0.062	0.806	
		33 psu	5	0.486	6.679	0.049	
	Marshall Beach, 12°C	All Salinities	631	0.005	4.390	0.037	
		20 psu	235	0.004	1.834	0.177	
		26 psu	283	0.016	5.631	0.018	
		33 psu	109	<0.001	1.026	0.313	
<i>Expt 2</i>	0X Sargassum	All Macrocyctis Densities	47	0.03475	2.728	0.1053	
		1X Macrocyctis	14	-0.03142	0.5431	0.4733	
		2X Macrocyctis	20	0.2204	6.938	0.01591	
		4X Macrocyctis	9	-0.01288	0.8728	0.3746	
	1X Sargassum	All Macrocyctis Densities	44	-0.02214	0.02509	0.8749	
		1X Macrocyctis	23	-0.006827	0.8373	0.3697	
		2X Macrocyctis	19	-0.04768	0.08989	0.7676	
	2X Sargassum	All Macrocyctis Densities	20	0.03844	1.84	0.1901	
		1X Macrocyctis	1	-0.9283	0.03721	0.8787	
		2X Macrocyctis	17	0.01418	1.259	0.2775	
	<i>Expt 3</i>	18°C, 1X Sargassum	All Salinities	7	0.044	1.372	0.280
			20 psu	ND	ND	ND	ND
26 psu			4	-0.032	0.844	0.410	
12°C, 1X Sargassum		33 psu	1	-0.713	0.168	0.753	
		All Salinities	51	-0.003	0.821	0.369	
		20 psu	9	-0.107	0.038	0.850	

	26 psu	31	0.173	7.712	0.009
	33 psu	7	0.274	4.013	0.085
	All Salinities	20	-0.012	0.745	0.398
12°C, 2X	20 psu	2	-0.500	<0.001	0.983
Sargassum	26 psu	16	-0.043	0.306	0.588
	33 psu	ND	ND	ND	ND

Expt 2

Table S5. Count and size responses to different *Sargassum* and *Macrocystis* densities (Generalized Linear Model with 2-Way Interaction, Distribution = Poisson, Link=Log, Size Distribution = Gamma, ‘*ref*’ = reference)

Lifestage	Variable Type	Variable	Fixed Effects	Estimate	SE	z	p
<i>Females</i>	Count	Intercept		1.723	0.189	9.116	< 0.01
		Initial	1x	<i>Ref</i>	<i>Ref</i>	<i>Ref</i>	<i>Ref</i>
		Macrocystis	2x	0.305	0.249	1.226	0.220
		Density	4x	0.580	0.236	2.456	0.014
		Initial	0x	<i>Ref</i>	<i>Ref</i>	<i>Ref</i>	<i>Ref</i>
		Sargassum	1x	-0.074	0.272	-0.272	0.786
		Density	2x	-0.499	0.307	-1.623	0.105
		Interactions	Macrocystis (2x):Sargassum (1x)	-0.037	0.360	-0.103	0.918
		Interactions	Macrocystis (2x):Sargassum (2x)	0.358	0.389	0.921	0.357
		<i>Males</i>	Count	Intercept		1.435	0.218
Initial	1x			<i>ref</i>	<i>Ref</i>	<i>Ref</i>	<i>ref</i>
Macrocystis	2x			0.669	0.268	2.493	0.013
Density	4x			1.033	0.254	4.065	< 0.01
Initial	0x			<i>ref</i>	<i>ref</i>	<i>Ref</i>	<i>Ref</i>
Sargassum	1x			1.16E-16	0.309	0.00	1.000
Density	2x			-0.211	0.326	-0.648	0.517
Interactions	Macrocystis (2x):Sargassum (1x)			-0.418	0.396	-1.055	0.291
Interactions	Macrocystis (2x):Sargassum (2x)			-0.101	0.405	-0.249	0.803
<i>Eggs</i>	Count			Intercept		1.030	0.267
		Initial	1x	<i>ref</i>	<i>Ref</i>	<i>Ref</i>	<i>ref</i>
		Macrocystis	2x	0.194	0.361	0.538	0.591
		Density	4x	0.539	0.336	1.603	0.109
			0x	<i>ref</i>	<i>Ref</i>	<i>Ref</i>	<i>Ref</i>

		Initial Sargassum Density	1x	-19.332	2556.960	-0.008	0.994	
			2x	-19.946	0.756	-2.574	0.010	
		Interactions	Macrocystis (2x):Sargassum (1x)	17.885	2556.960	0.007	0.994	
			Macrocystis (2x):Sargassum (2x)	1.059	0.879	1.204	0.229	
		Intercept		1.163	0.250	4.653	< 0.01	
<i>Sporelings</i>	Count	Initial Macrocystis Density	1x	<i>ref</i>	<i>Ref</i>	<i>Ref</i>	<i>Ref</i>	
			2x	0.406	0.323	1.256	0.209	
			4x	-0.375	0.392	-0.957	0.339	
		Initial Sargassum Density	0x	<i>ref</i>	<i>Ref</i>	<i>Ref</i>	<i>Ref</i>	
			1x	0.446	0.320	1.394	0.163	
			2x	-1.163	0.512	-2.270	0.023	
		Interactions	Macrocystis (2x):Sargassum (1x)	-0.580	0.438	-1.324	0.186	
			Macrocystis (2x):Sargassum (2x)	0.981	0.595	1.648	0.099	
			Intercept		1.19E-04	6.21E-05	1.912	0.059
		<i>Sporelings</i>	Size	Initial Macrocystis Density	1x	<i>ref</i>	<i>Ref</i>	<i>Ref</i>
	2x			-1.28E-04	6.71E-05	-1.906	0.059	
	4x			1.92E-04	2.59E-04	0.742	0.460	
Initial Sargassum Density	0x			<i>ref</i>	<i>Ref</i>	<i>Ref</i>	<i>Ref</i>	
	1x			-6.49E-05	6.59E-05	-0.985	0.327	
	2x			-8.01E-05	7.45E-05	-1.074	0.285	
Gametophyte #				-7.59E-06	8.99E-06	-0.844	0.401	
Interactions	Macrocystis (2x):Sargassum (1x)			1.44E-04	9.09E-05	1.580	0.117	
	Macrocystis (2x):Sargassum (2x)			1.13E-04	8.72E-05	1.296	0.198	

Expt 3

Table S6. Count and size responses to temperature and salinity stress in the subset 1X *Sargassum* treatment (Generalized Linear Model with 2-Way Interaction, Distribution = Negative Binomial, Link=Log, Size Distribution = Gamma, ‘*ref*’ = reference)

Lifestage	Variable Type	Variable	Fixed Effects	Estimate	SE	<i>t</i>	<i>p</i>	
<i>Females</i>	Count	Intercept		-1.609	1.005	-1.601	0.109	
		Temperature	18 ° C	<i>ref</i>	<i>ref</i>	<i>Ref</i>	<i>ref</i>	
			12 ° C	3.219	1.030	3.125	0.002	
		Salinity	20 psu	<i>ref</i>	<i>ref</i>	<i>Ref</i>	<i>Ref</i>	
			26 psu	2.079	1.070	1.942	0.052	
			33 psu	2.079	1.070	1.942	0.052	
				Temp (12°C): Salinity (26 psu)	-1.772	1.112	-1.594	0.111
				Interactions				
				Temp (12°C): Salinity (33 psu)	-2.590	1.128	-2.295	0.022
		<i>Males</i>	Count	Intercept		-21.040	1.66E+04	-0.001
Temperature	18 ° C			<i>ref</i>	<i>ref</i>	<i>ref</i>	<i>ref</i>	
	12 ° C			-6.591	4.11E+05	0.000	1.000	
Salinity	20 psu			<i>ref</i>	<i>ref</i>	<i>ref</i>	<i>ref</i>	
	26 psu			19.430	1.66E+04	0.001	0.999	
	33 psu			21.510	1.66E+04	0.001	0.999	
				Temp (12°C): Salinity (26 psu)	7.285	4.11E+05	0.000	1.000
				Interactions				
		Temp (12°C): Salinity (33 psu)	7.077	4.11E+05	0.000	1.000		
<i>Eggs</i>	Count	Intercept		-0.916	0.789	-1.162	0.245	

	Temperature	18 ° C	<i>ref</i>	<i>ref</i>	<i>ref</i>	<i>ref</i>	
		12 ° C	1.609	0.919	1.752	0.080	
	Salinity	20 psu	<i>ref</i>	<i>ref</i>	<i>ref</i>	<i>Ref</i>	
		26 psu	0.693	0.997	0.695	0.487	
		33 psu	1.504	0.925	1.626	0.104	
	Interactions	Temp (12°C): Salinity (26 psu)	-1.204	1.227	-0.981	0.327	
		Temp (12°C): Salinity (33 psu)	-2.197	1.183	-1.857	0.063	
	<i>Sporelings</i>	Intercept	-21.000	1.62E+04	-0.001	0.999	
		Temperature	18 ° C	<i>ref</i>	<i>ref</i>	<i>ref</i>	<i>ref</i>
			12 ° C	22.090	1.62E+04	0.001	0.999
Salinity		20 psu	<i>ref</i>	<i>ref</i>	<i>ref</i>	<i>ref</i>	
		26 psu	21.180	1.62E+04	0.001	0.999	
		33 psu	20.480	1.62E+04	0.001	0.999	
Count		Temp (12°C): Salinity (26 psu)	-20.390	1.62E+04	-0.001	0.999	
		Interactions	Temp (12°C): Salinity (33 psu)	-21.000	1.62E+04	-0.001	0.999
<i>Sporelings</i>		Intercept	10.113	1.92E+00	5.270	<0.001	
		Temperature	18 ° C	<i>ref</i>	<i>ref</i>	<i>ref</i>	<i>ref</i>
	12 ° C		-2.537	1.88E+00	-1.350	0.183	
	Size	20 psu	<i>ref</i>	<i>ref</i>	<i>ref</i>	<i>ref</i>	
		26 psu	-1.362	2.03E+00	-0.669	0.506	
		33 psu	-0.339	8.28E-01	-0.409	0.684	
Gametophyte #	-0.937	6.76E-01	-1.387	0.171			

Interactions	Temp (12°C): Salinity (26 psu)				
		1.3015	2.0235	0.643	0.5229

Table S7. Count and size responses to *Sargassum* density and salinity stress in the low temperature treatment (Generalized Linear Model with 2-Way Interaction, Distribution = Negative Binomial, Link=Log, Size Distribution = Gamma, ‘ref’ = reference)

Lifestage	Variable Type	Variable	Fixed Effects	Estimate	SE	<i>t</i>	p		
<i>Females</i>	Count	Intercept		1.609	0.202	7.963	0.000		
		Sargassum Density	1X	<i>ref</i>	<i>ref</i>	<i>Ref</i>	<i>ref</i>		
			2X	-0.654	0.344	-1.899	0.058		
		Salinity	20 psu	<i>ref</i>	<i>ref</i>	<i>Ref</i>	<i>Ref</i>		
			26 psu	0.307	0.267	1.153	0.249		
			33 psu	-0.511	0.329	-1.552	0.121		
		Interactions	Salinity (26 psu): Sargassum Density (2X)	0.072	0.450	0.160	0.873		
			Salinity (33 psu): Sargassum Density (2X)	0.143	0.546	0.262	0.793		
		<i>Males</i>	Count	Intercept		-21.271	1.86E+04	-0.001	0.999
				Sargassum Density	1X	<i>ref</i>	<i>ref</i>	<i>ref</i>	<i>ref</i>
2X	-6.067				4.08E+05	0.000	1.000		
Salinity	20 psu			<i>ref</i>	<i>ref</i>	<i>ref</i>	<i>ref</i>		
	26 psu			20.355	1.86E+04	0.001	0.999		
	33 psu			22.226	1.86E+04	0.001	0.999		
Interactions	Salinity (26 psu): Sargassum Density (2X)			6.473	4.08E+05	0.000	1.000		
	Salinity (33 psu): Sargassum Density (2X)			6.210	4.08E+05	0.000	1.000		
<i>Eggs</i>	Count			Intercept		0.693	0.459	1.511	0.131
				1X	<i>ref</i>	<i>ref</i>	<i>ref</i>	<i>ref</i>	

		Sargassum Density	2X	-0.223	0.668	-0.334	0.738
			20 psu	<i>ref</i>	<i>ref</i>	<i>ref</i>	<i>Ref</i>
		Salinity	26 psu	-0.511	0.698	-0.731	0.465
			33 psu	-0.693	0.722	-0.960	0.337
		Interactions	Salinity (26 psu): Sargassum Density (2X)	-1.569	1.354	-1.158	0.247
			Salinity (33 psu): Sargassum Density (2X)	-0.288	1.096	-0.263	0.793
		Intercept		1.099	0.258	4.255	0.000
		Sargassum Density	1X	<i>ref</i>	<i>ref</i>	<i>ref</i>	<i>ref</i>
			2X	-1.099	0.516	-2.127	0.033
		Salinity	20 psu	<i>ref</i>	<i>ref</i>	<i>ref</i>	<i>ref</i>
			26 psu	0.789	0.311	2.532	0.011
			33 psu	-0.511	0.422	-1.212	0.226
<i>Sporelings</i>	Count		Salinity (26 psu): Sargassum Density (2X)	0.493	0.594	0.829	0.407
		Interactions	Salinity (33 psu): Sargassum Density (2X)	0.277	0.792	0.363	0.717
	Size	Intercept		7.575	4.10E-01	18.490	<2e-16
		Sargassum Density	1X	<i>ref</i>	<i>ref</i>	<i>ref</i>	<i>ref</i>
		2X	-0.130	7.61E-01	-0.171	0.865	
Salinity		20 psu	<i>ref</i>	<i>ref</i>	<i>ref</i>	<i>ref</i>	
		26 psu	-0.060	5.34E-01	-0.112	0.911	
		33 psu	-0.339	8.72E-01	-0.389	0.699	
		Gametophyte #		-0.005	5.09E-02	-0.103	0.918

Interactions	Salinity (26 psu): Sargassum Density (2X)	0.655048	0.924492	0.709	0.4811
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Table S8. Number of embryonic sporophytes measured per treatment. Italic text represents factors not manipulated for a given experiment.

Experiment	Population	<i>Macrocystis</i> Density	<i>Sargassum</i> Density	Temperature	Salinity	Number of Female Gametophytes Counted	Number of Male Gametophytes Counted	Number of Eggs Counted	Number Embryonic Sporophytes Counted and Measured
1	MB	<i>1X</i>	<i>0X</i>	18°C	20	0	0	0	0
	MB	<i>1X</i>	<i>0X</i>	18°C	26	1	0	0	0
	MB	<i>1X</i>	<i>0X</i>	18°C	33	0	0	0	0
	MB	<i>1X</i>	<i>0X</i>	12°C	20	203	0	77	237
	MB	<i>1X</i>	<i>0X</i>	12°C	26	261	13	88	285
	MB	<i>1X</i>	<i>0X</i>	12°C	33	95	81	46	111
	WG	<i>1X</i>	<i>0X</i>	18°C	20	3	0	2	1
	WG	<i>1X</i>	<i>0X</i>	18°C	26	13	4	8	20
	WG	<i>1X</i>	<i>0X</i>	18°C	33	19	30	11	7
	WG	<i>1X</i>	<i>0X</i>	12°C	20	262	2	86	236
	WG	<i>1X</i>	<i>0X</i>	12°C	26	265	107	97	232
	WG	<i>1X</i>	<i>0X</i>	12°C	33	137	200	53	100
2	<i>WG</i>	1X	0X	<i>12°C</i>	33	28	21	14	16
	<i>WG</i>	1X	1X	<i>12°C</i>	33	26	21	0	25
	<i>WG</i>	1X	2X	<i>12°C</i>	33	17	17	2	5
	<i>WG</i>	2X	0X	<i>12°C</i>	33	38	41	17	24
	<i>WG</i>	2X	1X	<i>12°C</i>	33	34	27	4	21
	<i>WG</i>	2X	2X	<i>12°C</i>	33	33	30	7	20
	<i>WG</i>	4X	0X	<i>12°C</i>	33	50	59	24	11
3	<i>WG</i>	<i>1X</i>	1X	18°C	20	1	0	2	0
	<i>WG</i>	<i>1X</i>	1X	18°C	26	8	1	4	6
	<i>WG</i>	<i>1X</i>	1X	18°C	33	8	8	9	3
	<i>WG</i>	<i>1X</i>	1X	12°C	20	25	0	10	15

<i>WG</i>	<i>IX</i>	1X	12°C	26	34	2	6	33
<i>WG</i>	<i>IX</i>	1X	12°C	33	15	13	5	9
<i>WG</i>	<i>IX</i>	2X	18°C	20	0	0	0	0
<i>WG</i>	<i>IX</i>	2X	18°C	26	1	0	1	1
<i>WG</i>	<i>IX</i>	2X	18°C	33	3	3	3	0
<i>WG</i>	<i>IX</i>	2X	12°C	20	13	0	8	5
<i>WG</i>	<i>IX</i>	2X	12°C	26	19	3	1	18
<i>WG</i>	<i>IX</i>	2X	12°C	33	9	15	3	4
