

Table S1. Results of the generalized linear models testing effects of dispersal units and current velocities on dispersal speeds. In this scenario, current velocities of 0.1, 0.2, 0.3, 0.4 and 0.5 m s<sup>-1</sup> were imposed with the constant wind (3.0 m s<sup>-1</sup>) come from the same direction.

Models	Estimate	Std. error	t- value	p-value
<i>Salicornia europaea</i>				
Intercept	6.512	0.093	70.379	< 0.001 ***
Dispersal units	0.111	0.020	5.674	< 0.001 ***
Velocities	-9.901	0.184	-53.877	< 0.001 ***
<i>Scirpus maritimus</i>				
Intercept	6.185	0.088	70.272	< 0.001 ***
Dispersal units	0.041	0.019	2.128	0.054
Velocities	-8.877	0.175	-50.589	< 0.001 ***
<i>Spartina anglica</i>				
Intercept	6.145	0.081	75.504	< 0.001 ***
Dispersal units	0.023	0.018	1.251	0.212
Velocities	-8.545	0.163	-52.551	< 0.001 ***
<i>Elymus athericus</i>				
Intercept	6.050	0.078	77.707	< 0.001 ***
Dispersal units	0.013	0.017	0.778	0.437
Velocities	-8.411	0.155	-54.100	< 0.001 ***

Significance level: \*\*\* 0.001, \*\*0.01, \*0.05

Table S2. Results of the generalized linear models testing effects of dispersal units and current velocities on dispersal speeds. In this scenario, current velocities of 0.1, 0.2, 0.3, 0.4 and 0.5 m s<sup>-1</sup> were imposed with the constant wind (3.0 m s<sup>-1</sup>) come from the opposite direction.

<b>Models</b>	<b>Estimate</b>	<b>Std. error</b>	<b>t- value</b>	<b>p-value</b>
<i>Salicornia europaea</i>				
Intercept	9.437	0.229	41.293	<0.001 ***
Dispersal units	-0.084	0.043	-1.944	0.053
Velocities	-14.838	0.453	-32.741	<0.001 ***
<i>Scirpus maritimus</i>				
Intercept	10.570	0.295	35.783	<0.001 ***
Dispersal units	0.001	0.054	0.027	0.979
Velocities	-17.339	0.584	-29.699	<0.001 ***
<i>Spartina anglica</i>				
Intercept	10.959	0.312	35.166	<0.001 ***
Dispersal units	0.018	0.056	0.319	0.75
Velocities	-18.078	0.616	-29.368	<0.001 ***
<i>Elymus athericus</i>				
Intercept	11.607	0.337	34.437	<0.001 ***
Dispersal units	0.023	0.060	0.387	0.699
Velocities	-19.360	0.666	-29.089	<0.001 ***

Significance level: \*\*\* 0.001, \*\*0.01, \*0.05

Table S3. Results of the generalized linear models testing effects of dispersal units and wave heights on dispersal speeds under different wave conditions. In this scenario, waves of four magnitudes (**i**: wave height ( $h$ ) = 4 cm, frequency ( $f$ ) = 0.45 Hz; **ii**:  $h$  = 6 cm,  $f$  = 0.50 Hz; **iii**:  $h$  = 8 cm,  $f$  = 0.56 Hz; **iv**:  $h$  = 10 cm,  $f$  = 0.67 Hz) were imposed without wind, and a slow current of  $0.1 \text{ m s}^{-1}$  was applied to facilitate movement in one direction.

Models	Estimate	Std. error	t- value	p-value
<i>Salicornia europaea</i>				
Intercept	17.039	0.210	81.059	< 0.001 ***
Dispersal units	0.212	0.047	4.503	< 0.001 ***
Wave magnitudes	-0.169	0.024	-7.180	< 0.001 ***
<i>Scirpus maritimus</i>				
Intercept	18.304	0.258	70.922	<0.001 ***
Dispersal units	0.112	0.057	1.969	0.044 *
Wave magnitudes	-0.343	0.029	-12.003	<0.001 ***
<i>Spartina anglica</i>				
Intercept	19.847	0.240	82.658	< 0.001 ***
Dispersal units	-0.221	0.052	-4.217	< 0.001 ***
Wave magnitudes	-0.447	0.026	-16.978	< 0.001 ***
<i>Elymus athericus</i>				
Intercept	18.260	0.299	61.046	< 0.001 ***
Dispersal units	-0.126	0.066	-1.900	0.058
Wave magnitudes	-0.271	0.033	-8.191	< 0.001 ***

Significance level: \*\*\* 0.001, \*\*0.01, \*0.05

Table S4. Results of the generalized linear models testing effects of dispersal units and wave heights on dispersal speeds. In this scenario, waves of four magnitudes (**i**: wave height ( $h$ ) = 4 cm, frequency ( $f$ ) = 0.45 Hz; **ii**:  $h$  = 6 cm,  $f$  = 0.50 Hz; **iii**:  $h$  = 8 cm,  $f$  = 0.56 Hz; **iv**:  $h$  = 10 cm,  $f$  = 0.67 Hz) were imposed with the constant wind (3.0 m s<sup>-1</sup>) come from the same direction, and a slow current of 0.1 m/s was applied to facilitate movement in one direction.

<b>Models</b>	<b>Estimate</b>	<b>Std. error</b>	<b>t- value</b>	<b>p-value</b>
<i>Salicornia europaea</i>				
Intercept	7.270	0.169	43.126	< 0.001 ***
Dispersal units	1.433	0.040	35.891	< 0.001 ***
Wave magnitudes	-0.089	0.019	-4.596	< 0.001 ***
<i>Scirpus maritimus</i>				
Intercept	7.210	0.217	33.193	<0.001 ***
Dispersal units	0.671	0.050	13.317	<0.001 ***
Wave magnitudes	0.013	0.025	0.521	0.603
<i>Spartina anglica</i>				
Intercept	8.268	0.179	46.117	< 0.001 ***
Dispersal units	0.448	0.041	10.996	< 0.001 ***
Wave magnitudes	-0.069	0.020	-3.388	< 0.001 ***
<i>Elymus athericus</i>				
Intercept	8.681	0.116	74.998	< 0.001 ***
Dispersal units	0.165	0.026	6.378	< 0.001 ***
Wave magnitudes	-0.103	0.013	-7.912	< 0.001 ***

Significance level: \*\*\* 0.001, \*\*0.01, \*0.05

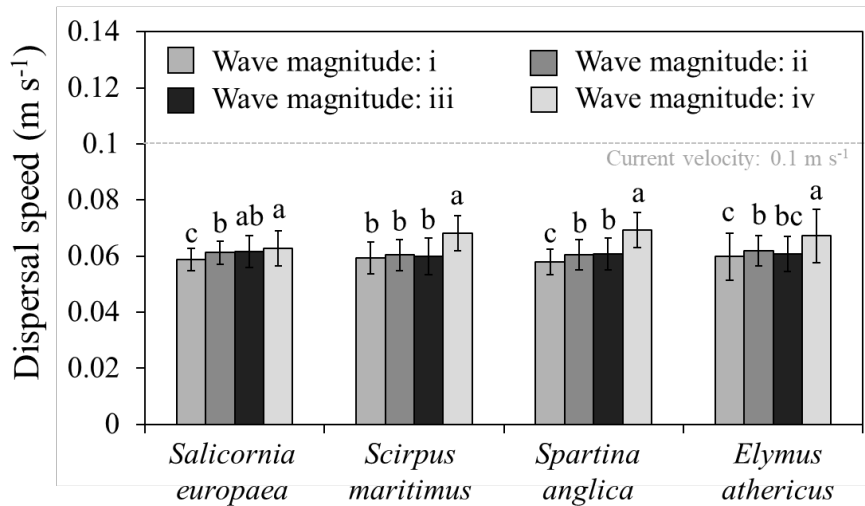


Fig. S1. Dispersal speeds (mean  $\pm$  SD) of four species under different wave magnitudes. In this scenario, waves of four magnitudes (i: wave height (h) = 4 cm, frequency (f) = 0.45 Hz; ii: h = 6 cm, f = 0.50 Hz; iii: h = 8 cm, f = 0.56 Hz; iv: h = 10 cm, f = 0.67 Hz) were imposed without wind, and a slow current of 0.1 m s<sup>-1</sup> was applied to facilitate movement in one direction. Different lowercase letters denote significant differences in dispersal speed among different wave magnitudes. The gray dotted line shows the water current speed, which serves as a reference to reflect the deceleration effect of waves on the dispersal speed of dispersal units.