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Extreme storms could limit the expansion of the invasive species *Caulerpa cylindracea* on rocky shores

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Table S1. Summary of the t-test results of *Caulerpa cylindracea* cover comparing the control and each treatment of the storm extremeness gradient for the two periods of the year (cold and warm) when the disturbances were applied, and the corresponding samplings that showed a significant or close to significant gradients (see Fig. 1 & 2).

	Cold							***Warm***		
	Samplings T1-T5				**Samplings T6**			**Samplings T1-T5**		
	df	**MS**	**T**	**P**	**MS**	**T**	**P**	**MS**	**T**	**P**
Control vs 1	6	1.60	-1.04	0.34	30.25	-0.32	0.76	23.05	-1.82	0.12
Control vs 2	6	1.20	-0.59	0.57	28.00	-0.18	0.87	20.45	-1.15	0.30
Control vs 3	6	0.85	-0.10	0.93	25.33	0.03	0.98	16.05	-0.14	0.89
Control vs 6	6	0.45	0.83	0.44	10.00	1.20	0.27	4.44	2.47	**< 0.05**

Table S2. Summary of the t-test results of *Ellisolandia elongata* and canopy-forming species cover, and bare rock comparing the control and each treatment of the storm extremeness gradient for the warm period of the year, when the disturbances were applied and there was a significant gradient in the cover of *Caulerpa cylindracea* as disturbances become more extreme (see Fig. 1).

	Ellisolandia elongata				**Canopy-forming species**			**Bare rock**		
	df	**MS**	**T**	**P**	**MS**	**T**	**P**	**MS**	**T**	**P**
Control vs 1	6	24.7	0.60	0.57	91.0	-0.31	0.77	19.7	0.12	0.91
Control vs 2	6	30.9	-0.34	0.75	93.1	-0.48	0.65	15.8	0.60	0.57
Control vs 3	6	32.7	-0.63	0.55	92.2	-0.40	0.70	13.4	1.00	0.36
Control vs 6	6	11.4	3.50	**0.01**	68.2	2.18	0.07	36.6	-2.09	0.08

Table S3. Summary of the Akaike information criterion (AICc) of the regression models. Lower values (in bold) determine the most parsimonious model.

	Storm extremeness gradient			**Cover of *Caulerpa cylindracea* vs cover of all sessile species**
	Cold period		**Warm period**	
	Samplings 1-5	**Sampling 6**	**Samplings 1-5**	
Yi=β0+β1Xi	**46.84**	**109.5**	**95.85**	**288.8**
Yi=β0+β1Xi+β2Xi2	50.12	113.6	99.40	290.9

Table S4. List of all the species found in the samplings (in bold if they have been considered as canopy forming species in the analyses).

Actinaria unidentified
***Amphiroa beauvoisii* J.V.Lamouroux, 1816**
***Vertebrata fruticulosa* (Wulfen) Kuntze, 1891**
Caulerpa cylindracea Sonder, *1845*
Chaetomorpha sp.
***Chondria* sp.**
Cladophora spp.
Codium fragile (Suringar) Hariot, 1889
Colpomenia sinuosa (Mertens ex Roth) Derbès & Solier, 1851
***Ellisolandia elongata* (J.Ellis & Solander) K.R.Hind & G.W.Saunders, 2013**
Crustose coralline algae complex
Cystoseira "sensu lato"
Dasycladus vermicularis (Scopoli) Krasser, 1898
Derbesia spp.
***Dictyota* spp.**
***Ulva* spp. (Enteromorpha section)**
Gastroclonium clavatum (Roth) Ardissone, 1883
Gelidium spp.
Gymnogongrus griffithsiae (Turner) C.Martius, 1833
Halopteris scoparia (Linnaeus) Sauvageau, 1904
***Hypnea musciformis* (Wulfen) J.V.Lamouroux, 1813**
***Jania* spp.**
Liagora spp.
Mytilaster minimus (Poli, 1795)
Padina pavonica (Linnaeus) Thivy, 1960
Laurencia complex
Petalonia fascia (O.F.Müller) Kuntze, 1898
Rivularia spp.
Serpulidae unidentified
Turf
***Ulva* spp. (Ulva section)**
Vermetidae unidentified
Spyridia filamentosa (Wulfen) Harvey, 1833

Fig. S1: Map of the location of the study area.

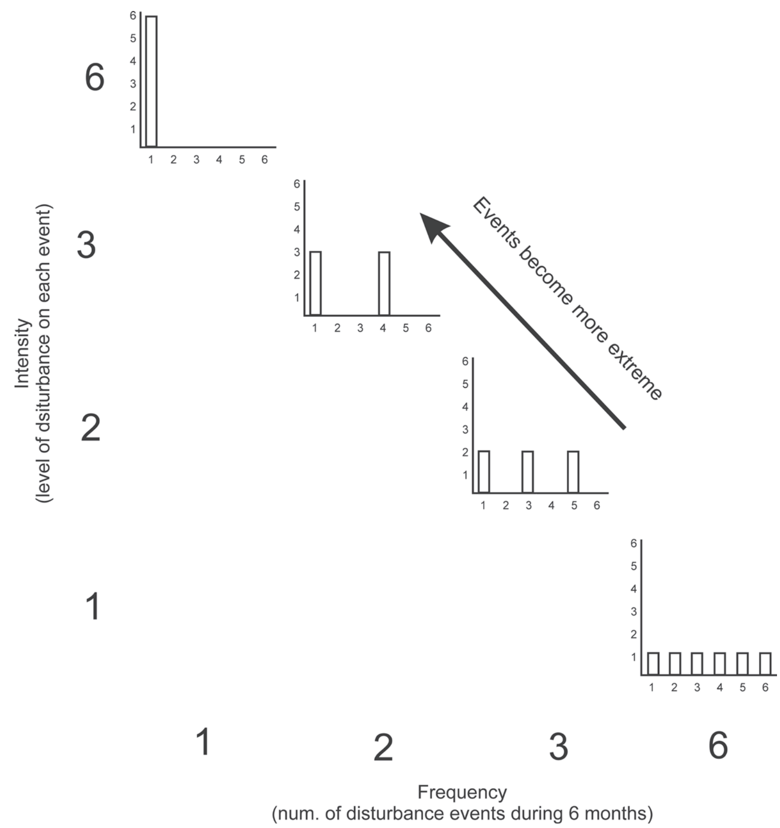

Fig. S2: Scheme of the disturbance gradient aiming to simulate storms ranging from several small storms to a single extreme one. The frequency and intensity were inversely manipulated to keep the amount of disturbance applied during the experiment similar among treatments so they can be compared (*sensu* Sanz-Lazaro 2016; from Sanz-Lazaro *et al*. 2022).

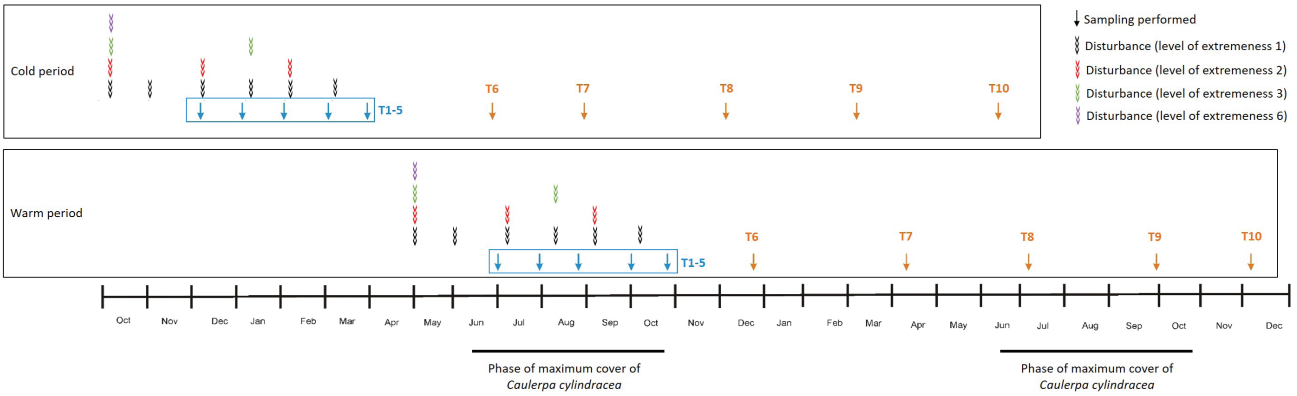

Fig. S3: Scheme of the samplings performed in the two groups of plots that were disturbed simulating the effects of the storms in the cold and the warm period. Samplings are indicated by blue and orange arrows that were used to assess the short and long-term effects, respectively. Black, red, green and purple special arrows indicate when disturbances simulating storms were applied.

References

Sanz-Lázaro, C., 2016. Climate extremes can drive biological assemblages to early successional stages compared to several mild disturbances. *Scientific Reports*, 6 (1), 1-9.

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