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32 **2015-2019 period in the Mediterranean Sea. \* The video is included as a separate**  
33 **file.**

34 **Supplementary Tables**

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37 **Table S1: Affected taxa (\*) per ecoregion**

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Phylum	Taxa	Ecoregion						
		Adriatic Sea	Aegean Sea	Alboran Sea	Ionian Sea	Levantine Sea	N. W. Mediterranean	S. W. Mediterranean
<b>Bryozoa</b>	<i>Adeonella calveti</i>						*	
	<i>Amathia verticillata</i>							*
	<i>Calpensia nobilis</i>					*		
	<i>Myriapora truncata</i>						*	
	<i>Pentapora fascialis</i>						*	
	<i>Reteporella grimaldii</i>						*	
	<i>Reteporella spp.</i>						*	*
	<i>Schizobrachiella sanguinea</i>							
<b>Cnidaria</b>	<i>Astroides calycularis</i>						*	
	<i>Balanophyllia europaea</i>						*	*
	<i>Caryophyllia inornata</i>							*
	<i>Cladocora caespitosa</i>		*				*	*
	<i>Corallium rubrum</i>						*	
	<i>Eunicella cavolini</i>	*	*	*			*	*
	<i>Eunicella singularis</i>			*			*	*
	<i>Eunicella verrucosa</i>							*
	<i>Leptogorgia sarmentosa</i>							*
	<i>Leptopsammia pruvoti</i>							*
	<i>Madracis pharensis</i>					*		
	<i>Oculina patagonica</i>							*
	<i>Paramuricea clavata</i>	*		*	*		*	*
	<i>Parazoanthus axinellae</i>						*	
<b>Echinodermata</b>	<i>Arbacia lixula</i>					*		
	<i>Holothuria poli</i>							*
	<i>Paracentrotus lividus</i>					*	*	
	<i>Sphaerechinus granularis</i>					*		

<b>Mollusca</b>	<i>Arca noae</i>		*		
	<i>Brachidontes pharaonis</i>		*		
	<i>Dendropoma cristatum</i>			*	
	<i>Fulvia fragilis</i>			*	*
	<i>Pinctada imbricata radiata</i>		*		*
	<i>Spondylus gaederopus</i>			*	
<b>Ochrophyta</b>	<i>Ericaria crinita</i>		*		
<b>Porifera</b>	<i>Agelas oroides</i>	*			
	<i>Aplysina aerophoba</i>	*			
	<i>Cacospongia mollior</i>				*
	<i>Chondrosia reniformis</i>	*	*		
	<i>Crambe crambe</i>		*	*	
	<i>Hippospongia comunis</i>				*
	<i>Ircinia spp.</i>		*	*	*
	<i>Ircinia variabilis</i>			*	*
	<i>Sarcotragus foetidus</i>	*			
	<i>Spongia lamella</i>				*
	<i>Spongia officinalis</i>			*	*
<b>Rhodophyta</b>	<i>Lithophyllum stictaeforme</i>	*		*	
	<i>Mesohphyllum alternans</i>			*	
	<i>Peyssonellia spp.</i>	*			
<b>Tracheophyta</b>	<i>Posidonia oceanica</i>	*		*	*

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\* Apart from the data shown in the table (species/genus level). unspecific observations of mass mortality were also detected in the Aegean Sea for encrusting calcareous algae and gorgonians.

45 **Table S2. Mass Mortality Events Dataset description. Main information provided for each**  
 46 **mass mortality event record.**

Field	Values
ID record	A unique identifier
Year and season of the survey	Year, Spring, Summer, Fall, Winter
Ecoregion, country, name of the monitored area and name of the surveyed site	Ecoregion (following Spalding et al., (2007))
Geographic position	Latitude and longitude in decimal degrees, datum WGS84
Depth range	Depth in meters of the record. Minimum and maximum depth
Survey periodicity	Record comes from a single survey or from periodical yearly monitoring
Broad and specific habitat of the record	The following broad and specific habitats were assigned: Hard substrates, Mobile substrates, Seagrasses. Within Hard substrates the following specific habitats were considered Upper sublittoral, Lower sublittoral (precoraligenous and coraligenous) and marine caves.
Phyla and taxa of the record	Name of the phyla and taxa affected
Percentage of affected colonies/individuals/surface	Values from 0 to 100%;
Severity class of impact	Severity classes are based on the percentage of affected organisms: no mortality (<10%), low ( $\geq 10\%$ , <30%), moderate ( $\geq 30\%$ , < 60%), and severe ( $\geq 60\%$ );



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**Table S3. Details on monitored areas; Ecoregion. name. coordinates centre of the area. years in which they were monitored and years in which mass mortality was found.**

<b>Ecoregion</b>	<b>Area</b>	<b>Longitude</b>	<b>Latitude</b>	<b>Monitored Years</b>	<b>Years with mortality</b>
Adriatic Sea	Island Bisevo Gatula Peninsula	42.9536	15.9972	2019	2019
Adriatic Sea	Island Bisevo Totac Islet	42.9825	16.0244	2019	2019
Adriatic Sea	Island Krk Cape Sokol	44.9703	14.8212	2018	2018
Adriatic Sea	Island Prvic Cape Silo	44.8845	14.8386	2018	2018
Adriatic Sea	Island Prvic Strazica	44.93476	14.7705	2018	2018
Adriatic Sea	Islet Vodnjak	43.1686	16.3072	2019	2019
Adriatic Sea	Kornati Mali Obrucan	43.8364	15.2201	2019	2019
Adriatic Sea	Rava	44.0405	15.0650	2016;2019	
Adriatic Sea	Rivanjski Kanal	44.1519	15.0246	2015;2017	
Adriatic Sea	Tremiti island	42.1233	15.4998	2018;2019	2018;2019
Aegean Sea	Antiparos island	36.9550	25.0780	2016	
Aegean Sea	Chalkidiki	40.3412	23.9144	2016	2016
Aegean Sea	Chania (Crete)	35.5500	24.0600	2016;2019	2016
Aegean Sea	Chios	38.2400	25.8700	2016	2016
Aegean Sea	Dodekanese islands	36.9728	27.0362	2016;2019	2016;2019
Aegean Sea	Fathiye bay	36.6398	29.0191	2019	2019
Aegean Sea	Heraklion (Crete)	35.4160	24.9880	2017	2017
Aegean Sea	Kavala gulf	40.8600	24.3400	2016	
Aegean Sea	Keros Island	36.8800	25.6800	2016	2016
Aegean Sea	North Evoikos	38.5200	23.3900	2016	2016
Aegean Sea	South Pelion	39.0864	23.1125	2016	2016
Alboran Sea	Benyounech	35.9134	-5.4189	2015;2017; 2018;2019	2017;2018; 2019
Alboran Sea	Cap Falcon	35.7826	-0.7908	2018	

Alboran Sea	Chafarinas islands	35.1819	-2.4294	2015	2015
Alboran Sea	Ghazaouet	35.1114	-1.8662	2018	
Alboran Sea	Habibas islands	35.7246	-1.1277	2018	2018
Alboran Sea	Paloma island	35.7703	-0.9027	2018	2018
Alboran Sea	Rachgoun island	35.3243	-1.4850	2018	
Alboran Sea	Stidia1	35.8162	-0.0817	2018	
Ionian Sea	Catania	37.6014	15.1861	2018;2019	2018;2019
Levantine Sea	Achziv	33.0638	35.1038	2015;2016	2016
Levantine Sea	Cap Greco (Agia Napa)	34.9863	34.0077	2015;2016; 2017;2018; 2019	2016;2017; 2019
Levantine Sea	Akko	32.9207	35.0659	2015;2016	2016
Levantine Sea	Alamanou	34.7210	33.2321	20187	2017
Levantine Sea	Bat-Yam	32.0310	34.7398	2015;2016	2016
Levantine Sea	Dhekelia	34.9848	33.7547	2017	2017
Levantine Sea	Habonim 1	32.6459	34.9220	2015;2016	2016
Levantine Sea	Habonim 2	32.6302	34.9197	2015;2016	2016
Levantine Sea	Larnaka	34.9188	33.6559	2015;2016; 2017;2018; 2019	2019
Levantine Sea	Latchi	35.0515	32.3382	2018	2018
Levantine Sea	Makronisos	34.9805	33.9559	2017	2017
Levantine Sea	Michmoret	32.4022	34.8651	2015;2016	2016
Levantine Sea	Palmachim	31.9302	34.6981	2015;2016	2016
Levantine Sea	Paphos	34.7549	32.4652	2015;2016; 2017;2018	2019
Levantine Sea	Paralimni	35.04531	34.01995	2017;2018; 2019	2017;2018; 2019
Levantine Sea	Potamos tou Liopetri	34.9627	33.8914	2015;2016; 2017;2018; 2019	2017
Levantine Sea	Protaras	35.0112	34.0592	2016;2018	2016;2018
Levantine Sea	Rosh Hanikra	33.0904	35.105	2015;2016	2016
Levantine Sea	Sdot-Yam	32.4942	34.8879	2015;2016	2016

Levantine Sea	Xylophagou-platform	34.9643	33.8360	2017	2017
N.W. Mediterranean	Baie de Marseille	43.2819	5.3061	2019	2019
N.W. Mediterranean	Bergeggi island	44.2349	8.4459	2018	2018
N.W. Mediterranean	Bonifacio East	41.4864	9.2797	2015;2016; 2017;2018	2015;2016; 2017
N.W. Mediterranean	Bonifacio South	41.4469	9.0767	2015;2017	2015
N.W. Mediterranean	Bonifacio West	41.3697	9.2117	2017	2017
N.W. Mediterranean	Cabrera island	39.1551	2.9367	2015;2016;20 17;2018;2019	2015;2016;20 17;2018
N.W. Mediterranean	Calanques	43.2064	5.4983	2015;2016; 2017;2018; 2019	2015;2016; 2017;2018; 2019
N.W. Mediterranean	Cap de Creus (North)	42.3211	3.2382	2015;2016; 2017;2018; 2019	2015;2017; 2018;2019
N.W. Mediterranean	Cap de Creus (South)	42.3039	3.2358	2016;2017; 2018;2019	2017;2018; 2019
N.W. Mediterranean	Cinque Terre	44.1334	9.6356	2017	2017
N.W. Mediterranean	Columbretes islands	39.8964	0.6867	2015;2016;20 17;2018;2019	2015;2016; 2018
N.W. Mediterranean	El Montgrí. Les Illes Medes I El Baix Ter	42.0761	3.1875	2015;2016; 2017;2018; 2019	2016;2017; 2018;2019
N.W. Mediterranean	Elba island	42.7779	10.2932	2019	2019
N.W. Mediterranean	Formiche di Grosseto	42.5660	10.8933	2019	2019
N.W. Mediterranean	Genoa	44.3906	8.9895	2018	2018
N.W. Mediterranean	Giglio island	42.3549	10.9001	2017	2017
N.W. Mediterranean	Ischia (Naples)	40.7006	13.9543	2015;2016; 2017;2018; 2019	2015;2017; 2018;2019
N.W. Mediterranean	La pointe du Mistral	37.5260	8.9606	2019	2019
N.W. Mediterranean	La Spezia	44.0417	9.9839	2016	2016
N.W. Mediterranean	Mallorca island	39.6005	2.9583	2015;2016; 2017;2018 ;2019	2015;2016; 2017;2018; 2019
N.W. Mediterranean	Montecristo island	42.3288	10.3084	2017	2017
N.W. Mediterranean	Mortoriotto	41.0753	9.6049	2017;2018	2017;2018
N.W. Mediterranean	MPA Capo Caccia Isola Piana	40.5988	8.1831	2019	2019
N.W. Mediterranean	MPA Tavolara Punta Coda Cavallo	40.8777	9.6768	2018	2018



N.W. Mediterranean	Olbia	40.9353	9.6736	2015;2016; 2017;2018; 2019	2015;2016; 2017;2018; 2019
N.W. Mediterranean	Palamós	41.8658	3.1735	2015;2016; 2017;2018; 2019	
N.W. Mediterranean	Pianosa	42.5829	10.0798	2017;2019	2017;2019
N.W. Mediterranean	Port-Cros	43.0099	6.3790	2015;2016; 2018	2015;2016; 2018
N.W. Mediterranean	Portofino Promontory	44.3055	9.1968	2018	2018
N.W. Mediterranean	Santa Croce Bank (Gulf of Naples)	40.6800	14.4322	2015;2016; 2017;2018; 2019	2016;2017; 2018;2019
N.W. Mediterranean	Scandola MPA	42.3542	8.5675	2015;2016; 2017;2018	2016;2017; 2018
N.W. Mediterranean	Secca di Costacuti	41.3635	12.6210	2018	2018
N.W. Mediterranean	Secca tra Molara e Tavolara	40.8798	9.7061	2017	2017
N.W. Mediterranean	Tor Paterno	41.6045	12.3421	2015;2016; 2018;2019	2019
N.W. Mediterranean	Var (Nice)	43.6415	7.1904	2018	2018
N.W. Mediterranean	Villefranche (Nice)	43.6700	7.3000	2018;2019	2018;2019
S.W. Mediterranean	Banc des Kabyles	36.8616	5.6350	2018	
S.W. Mediterranean	Banc des Romains	36.6294	2.4539	2018	
S.W. Mediterranean	Banc Matifou	36.8493	3.2272	2018	
S.W. Mediterranean	Beb El Karma	37.0475	11.0747	2017	
S.W. Mediterranean	Bizerta lagoon	37.1937	9.9263	2015;2017	2015;2017
S.W. Mediterranean	Bizerte	37.3310	9.8652	2015	2015
S.W. Mediterranean	Bordelaise	36.8164	3.3002	2018	
S.W. Mediterranean	Bourj Essalhi	37.0601	11.0635	2015	2015
S.W. Mediterranean	Boussadoune	36.8445	5.7518	2018	
S.W. Mediterranean	Cabo Roig	37.9109	-0.7182	2016	2016
S.W. Mediterranean	Cap Acrata	36.8056	2.8802	2018	
S.W. Mediterranean	Cap Grosso	37.1382	10.8031	2015;2016	2015;2017
S.W. Mediterranean	Cap Serrat	37.2421	9.2177	2015	2015
S.W. Mediterranean	Cap Tabarka	37.1461	8.8719	2016	2016

S.W. Mediterranean	Chanel of Ajim	33.7225	10.7355	2015	2015
S.W. Mediterranean	Dhouiher	33.5554	10.8153	2015	2015
S.W. Mediterranean	Eceuils de Ait Rhouna	36.9337	4.3406	2018	
S.W. Mediterranean	Eceuils de Tizirt	36.9091	4.1185	2018	
S.W. Mediterranean	El Argoub	37.0542	10.9612	2017	2017
S.W. Mediterranean	El Bibanes lagoon	33.3117	11.1730	2019	2019
S.W. Mediterranean	El Mansourah	36.8403	11.1219	2015	2015
S.W. Mediterranean	Formentera island	38.7578	1.4351	2015;2016; 2017;2018; 2019	2015;2016; 2017;2018; 2019
S.W. Mediterranean	Gallina	37.5528	8.9494	2016	2016
S.W. Mediterranean	Gallo	37.5588	8.9537	2016	2016
S.W. Mediterranean	Grand Cavalo	36.7888	5.6065	2018	
S.W. Mediterranean	Ile Aguelli	36.8012	3.3577	2018	
S.W. Mediterranean	Île srigina	36.9381	6.8904	2018	
S.W. Mediterranean	Illots Ponent (Ibiza)	38.9219	1.1806	2016	2016
S.W. Mediterranean	Kobet Hwé	36.8829	10.3429	2015	2015
S.W. Mediterranean	Korbous	36.8178	10.5666	2018	2018
S.W. Mediterranean	La Cathédrale	37.1271	10.7894	2016	2016
S.W. Mediterranean	La gabi	36.8325	4.9860	2018	
S.W. Mediterranean	La Marsa Cube	36.8953	10.3288	2018	2018
S.W. Mediterranean	Les Chiens	37.5440	8.9421	2016	2016
S.W. Mediterranean	Les Grottes	37.0716	11.0219	2019	2019
S.W. Mediterranean	Messina strait	38.2565	15.6755	2018	2018
S.W. Mediterranean	MPA Capo Carbonara	39.0910	9.5327	2018	2018
S.W. Mediterranean	Mteris	37.0753	11.0295	2015	2015
S.W. Mediterranean	Musoire sud Port d'Alger	36.7740	3.0728	2018	
S.W. Mediterranean	Nhayssa	37.0402	11.0727	2017	2017

S.W. Mediterranean	Petit Cavallo	36.8076	5.6394	2018	
S.W. Mediterranean	Pointe de Pescade	36.8226	3.0085	2018	
S.W. Mediterranean	Pointe Sidi Yahia	37.0293	6.5721	2018	
S.W. Mediterranean	Ras Drak	37.0454	11.0728	2015;2017; 2019	2015;2017; 2019
S.W. Mediterranean	Ras Lahmar	37.0326	10.8985	2017	2017
S.W. Mediterranean	Ras M'sid	36.9166	4.0043	2018	
S.W. Mediterranean	Rocher Merou	37.1069	8.8100	2019	2019
S.W. Mediterranean	Rochet Tafelkout	36.7742	5.5724	2018	
S.W. Mediterranean	Tabarca island	38.1666	-0.4721	2015;2017; 2018;2019	2015;2017; 2018;2019
S.W. Mediterranean	Ustica	38.7044	13.1755	2017	
Tunisian plateau / Gulf of Sidra	Sharki Island	34.7836	11.3486	2019	2019
Tunisian plateau / Gulf of Sidra	Sidi El Djillali	36.5609	1.6833	2018	
Tunisian plateau / Gulf of Sidra	Sidi Merouan	36.5593	1.3496	2018	
Tunisian plateau / Gulf of Sidra	Trois Pianes	36.8237	5.6916	2018	
Tunisian plateau / Gulf of Sidra	Zarat	34.7300	10.7890	2015	2015
Tunisian plateau / Gulf of Sidra	Zarzis	33.4693	11.1139	2019	2019

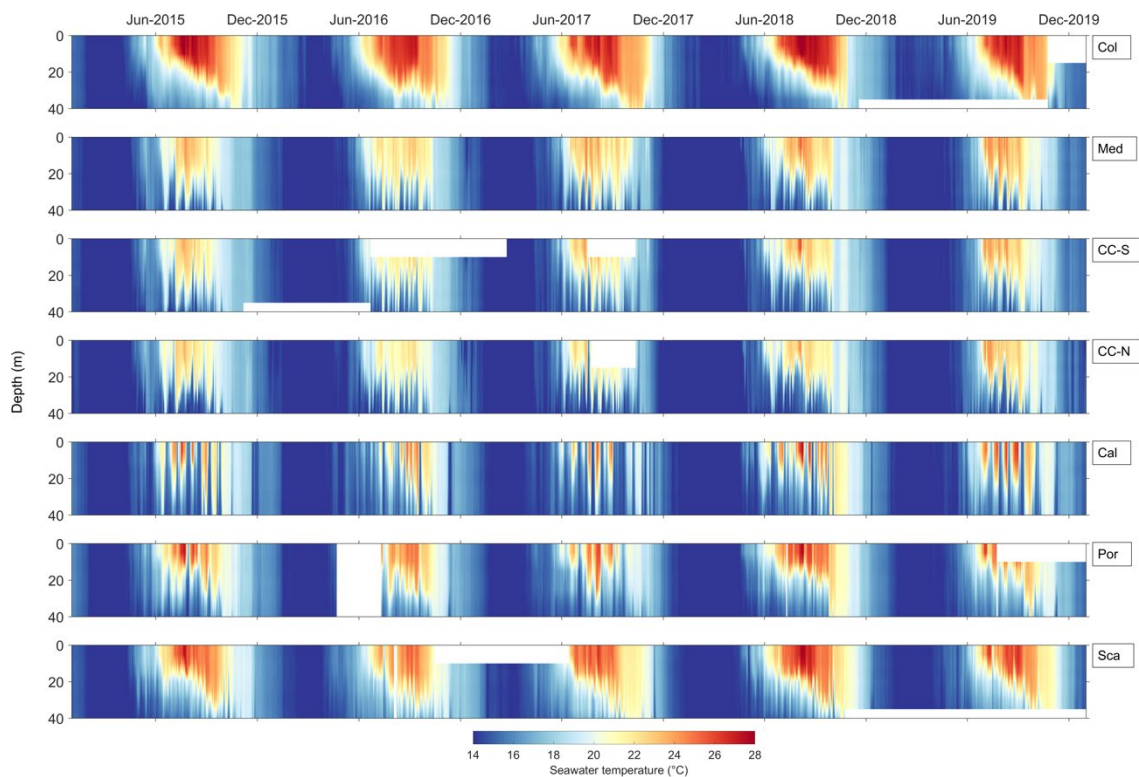
54 **Table S4. Summary of binomial GLMs outputs**  
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Model	Fixed effects	Estimate	Std. Error	z value	Pr (> z )	AIC
<b>Mortality incidence ~ MHW days (SST)</b>	Intercept	-1.72	0.32	-5.3	< 0.001	108.81
	MHW days	0.037	0.006	5.98	< <b>0.001</b> ***	
<b>Mortality incidence ~ MHW days (in-situ)</b>	Intercept	0.38	0.18	2.08	0.038	121.25
	MHW days	0.05	0.02	2.56	<b>0.01</b> *	

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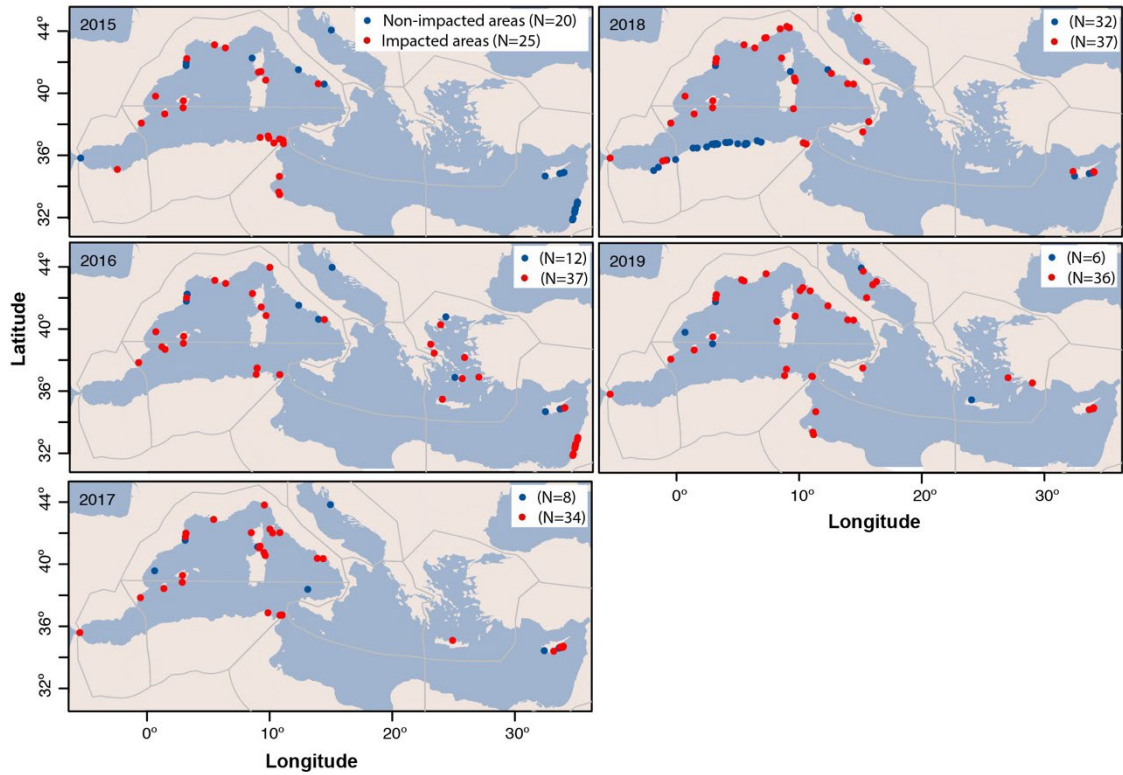
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## Supplementary Figures



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**Figure S1. Hovmoller diagram showing the coastal seawater daily temperature measured *in situ* from the surface to 40 m depth during years 2015-2019 in 7 monitoring areas of the North-Western Mediterranean Sea. From top to bottom, the Columbretes islands Natural Park (Col), El Montgrí, Les Illes Medes i El Baix Ter Natural Park (Med), Southern area of the Cap de Creus Natural Park (CC-S), Northern area of the Cap de Creus Natural Park (CC-N), Calanques National Park (Cal), Port-Cros National Park (Por) and Scandola Natural Reserve (Sca). The white patches indicate the lack of available data for the corresponding depth layers. The date ticks placed on the 1<sup>st</sup> of June and 1<sup>st</sup> December for each year delimit the warm period (JJASON) considered for MHW analysis.**



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**Figure S2. Spatio-temporal trends in the number of impacted and non-impacted monitored areas across the Mediterranean Sea over the 2015-2019 period.**

