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GABRIELE Di BONA, MANUEL BERLINO, GIANLUCA SARÀ, MARIA CRISTINA MANGANO

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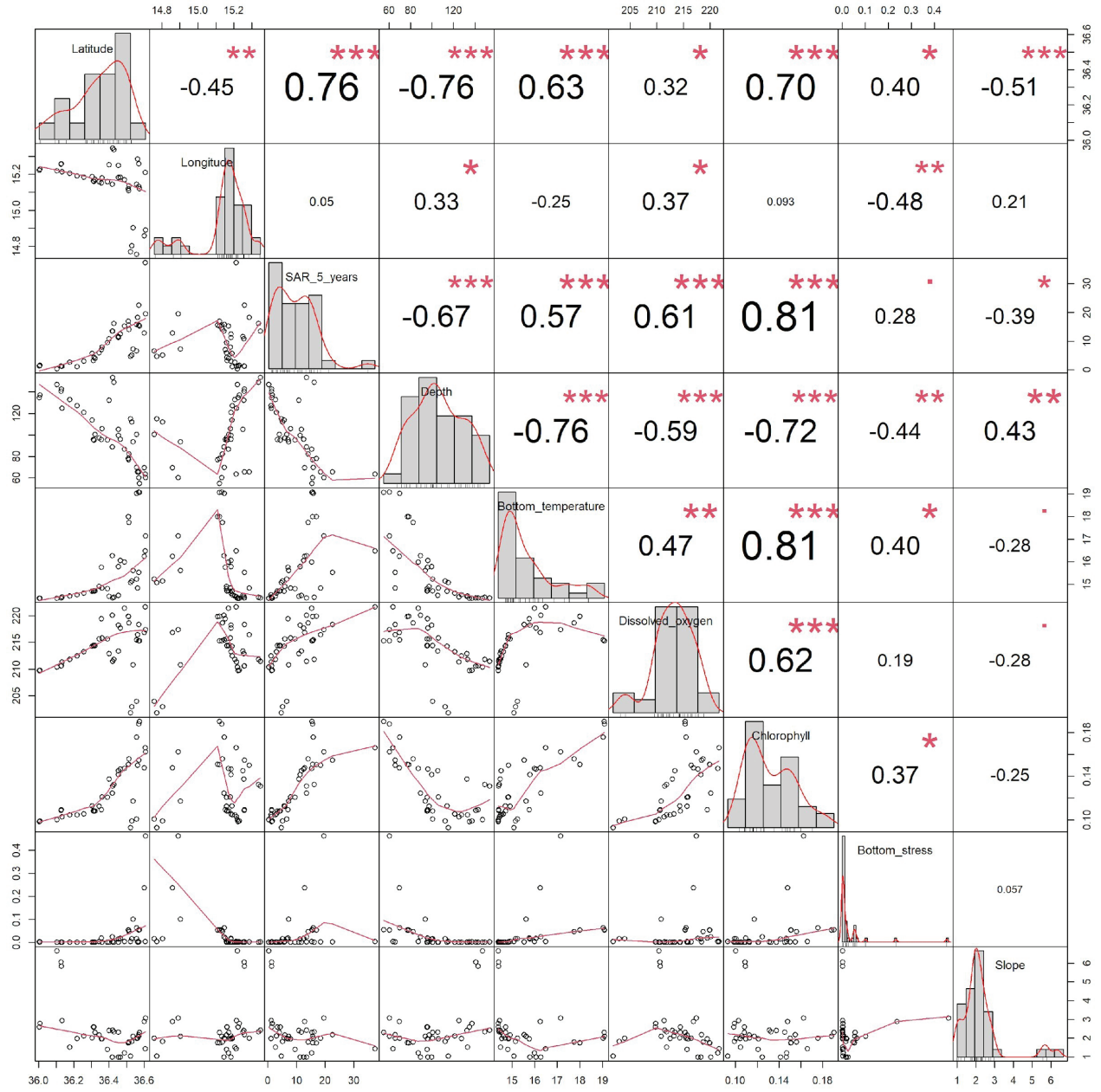

Fig. S1: Correlation charts of the variables considered in the study (values are expressed as Pearson's correlation coefficient while the symbols represent the significance level of the p-value: ‘ for p<0.1, * for p<0.05, ** for p<0.01, *** for p<0.001)

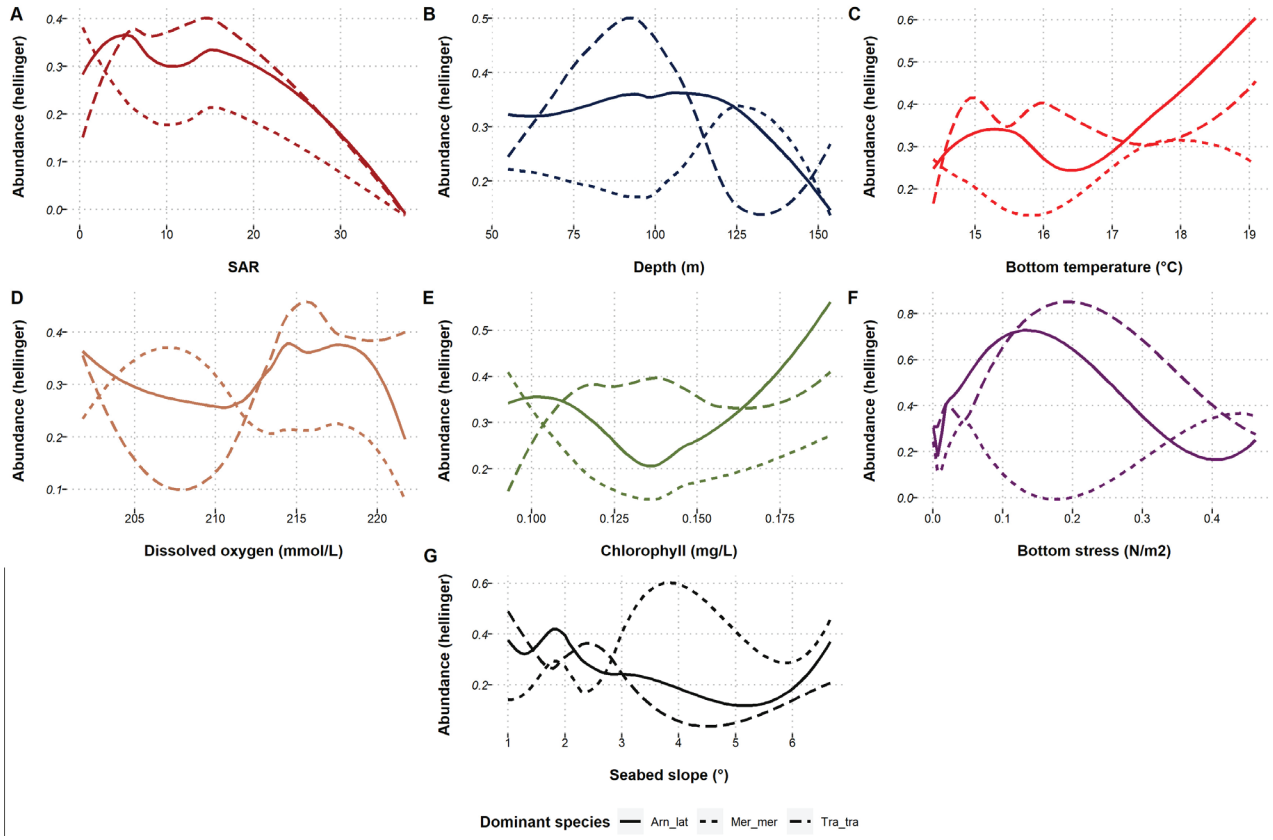

Fig. S2: Distribution of the most dominant demersal species densities (total number of individual/km^2 after Hellinger transformation) along the selected variables (as can be seen in the scatter plots with linear trends). Arn_lat = *Arnoglossus laterna*; Mer_mer = *Merluccius merluccius*; Tra_tra = *Trachurus trachurus*.

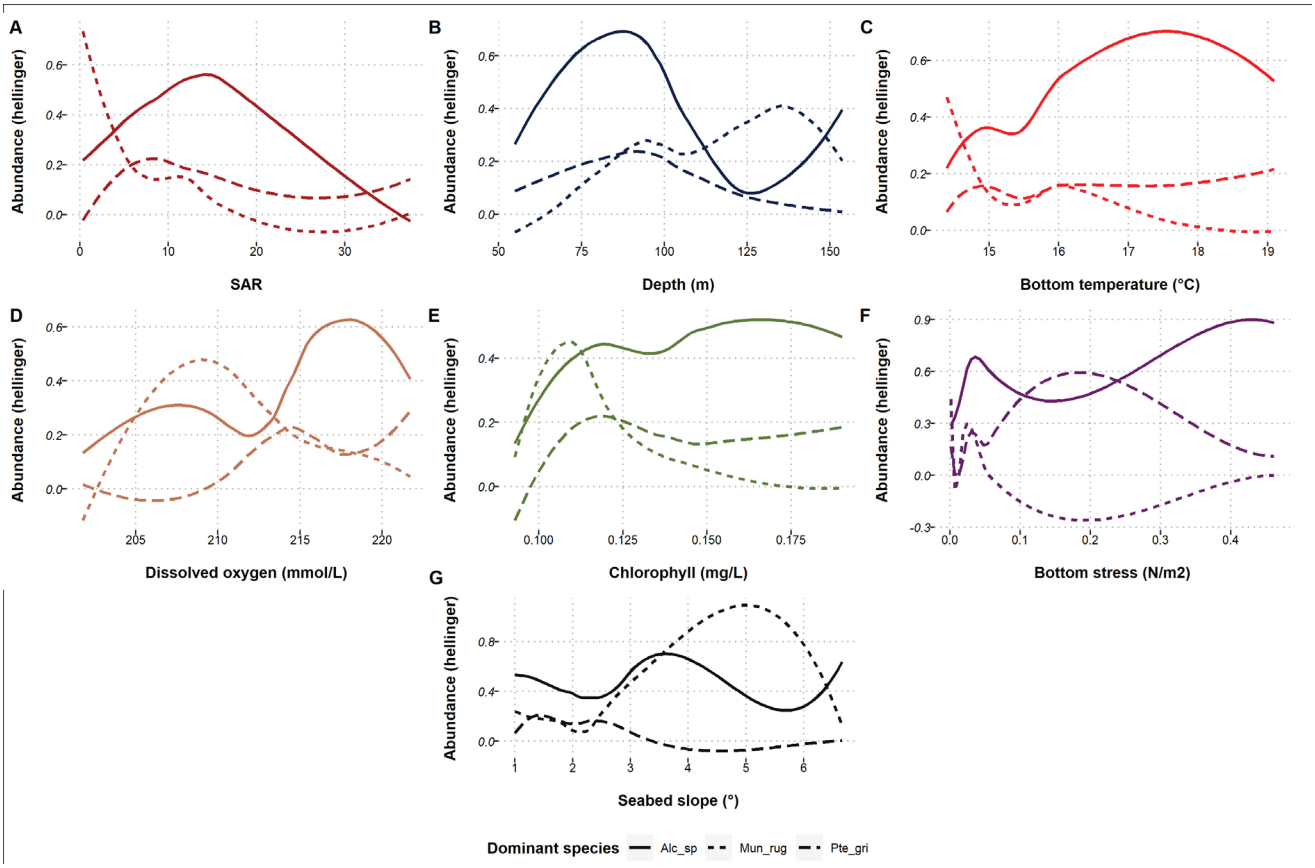

Fig. S3: Distribution of the most dominant benthic species densities (total number of individual/km^2 after Hellinger transformation) along the selected variables (as can be seen in the scatter plots with linear trends). Alc_sp = *Alcyonium sp.*; Mun_rug = *Munida rugosa*; Pte_gri = *Pteroides griseum*.

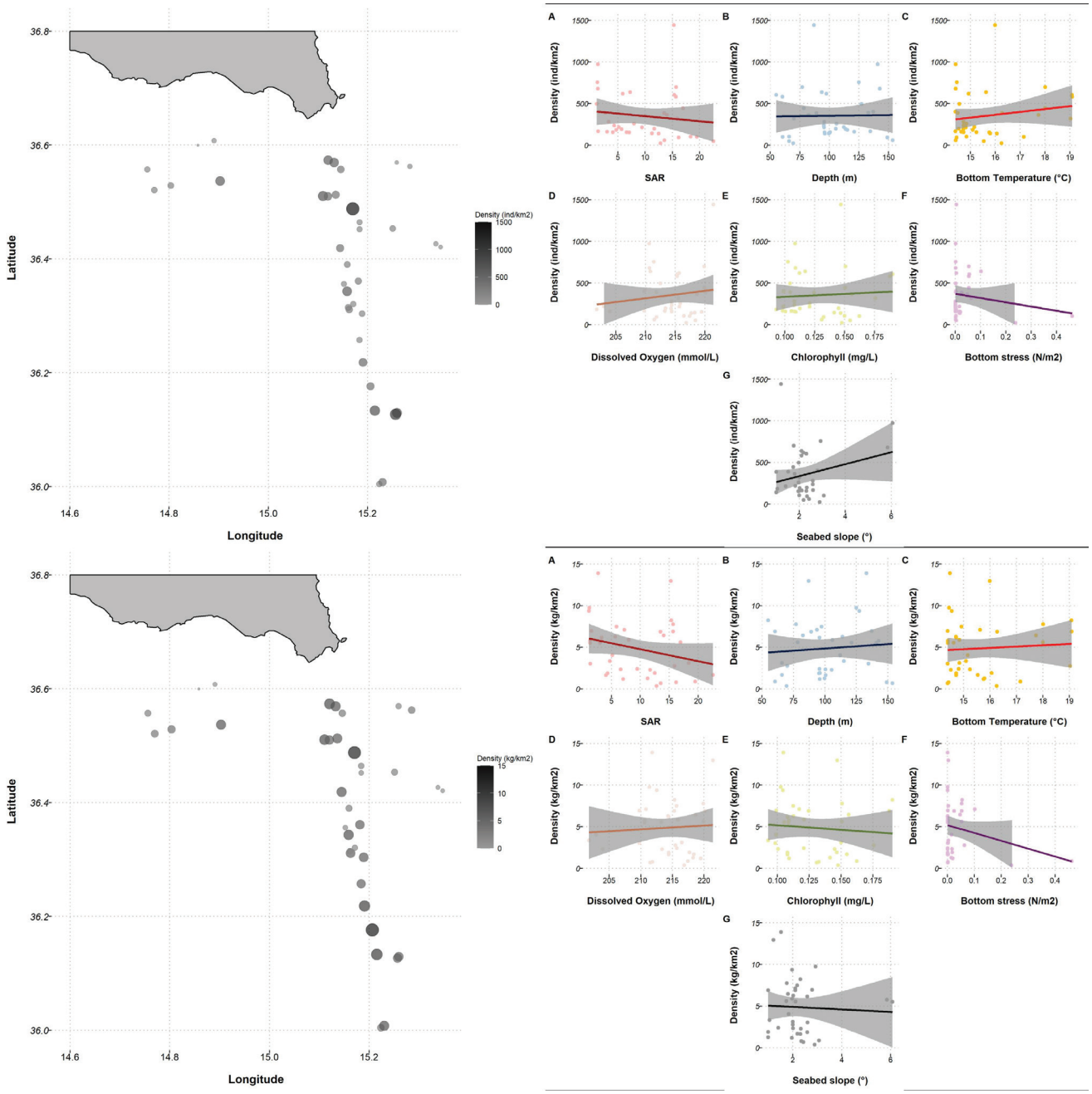

Fig. S4: Distribution of demersal densities (total number of individual/km^2) along the study area (as can be seen in the bubble plot where bigger points represent higher density values) and along the selected variables (as can be seen in the scatter plots with linear trends). For each haul, densities were obtained by dividing total individuals/biomasses by the corresponding swept area.

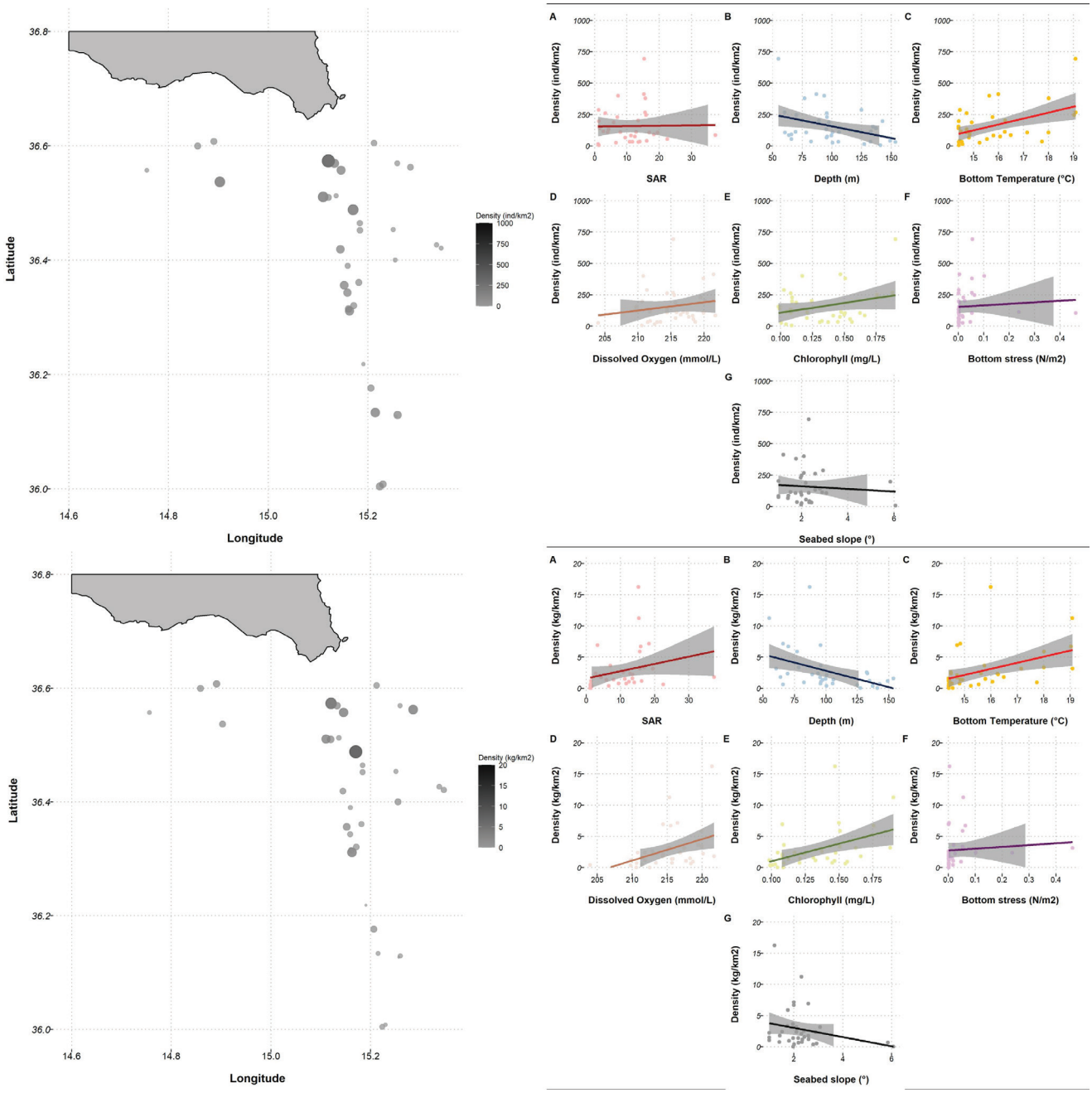

Fig. S5: Distribution of benthic densities (total number of individual and biomasses/km^2) along the study area (as can be seen in the bubble plots where bigger points represent higher density values) and along the selected variables (as can be seen in the scatter plots with linear trends). For each haul, densities were obtained by dividing total individuals/biomasses by the corresponding swept area.

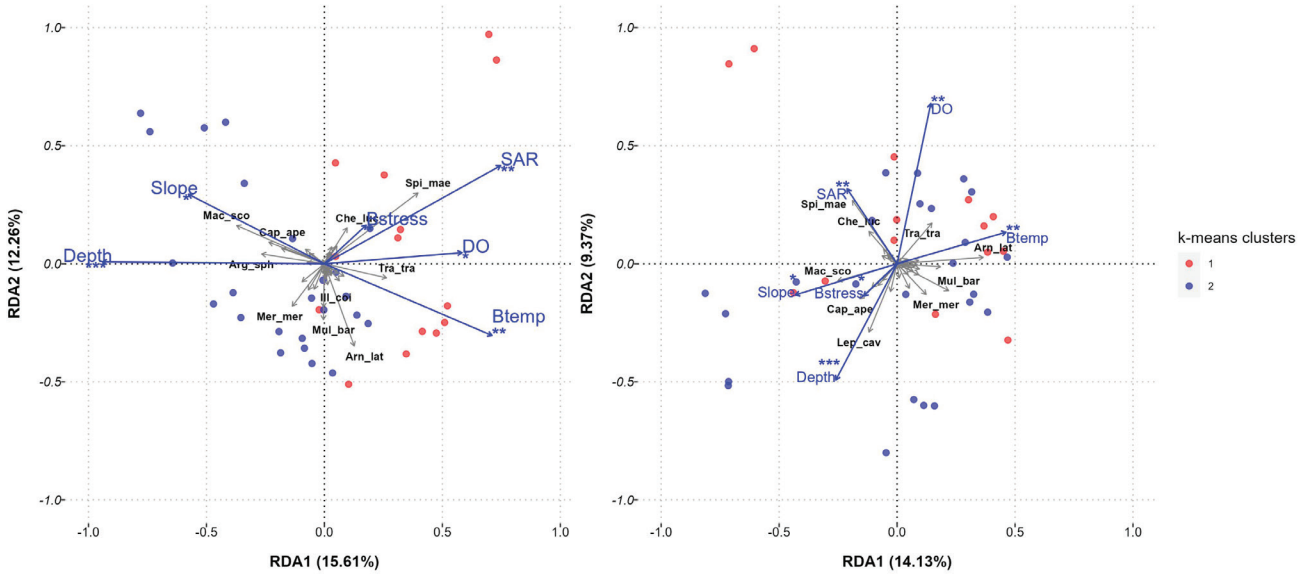

Fig. S6: Ordination of the all demersal species along the two main axes of Redundancy Analysis (RDA) triplot for all the sampled hauls. On the left the RDA triplot of the model accounting stewpwise selected variables while on the right is displayed the partial RDA accounting spatial coordinates (Latitude and Longitude) as conditioning factor. Colors of the points represent the clusters obtained from a k-means classification according to the variables associated to the hauls (SM1-S1). Stars represent the significance level of the p-value for each term: * for p<0.05, ** for p<0.01, *** for p<0.001.

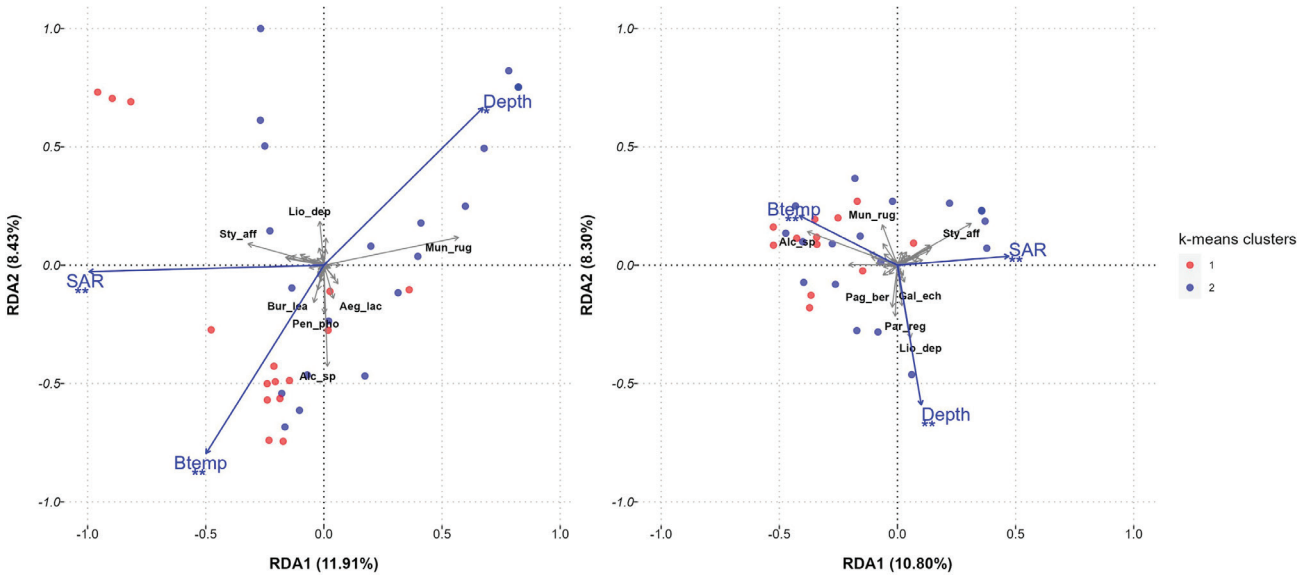

Fig. S7: Ordination of the all benthic species along the two main axes of Redundancy Analysis (RDA) triplot for all the sampled hauls. On the left the RDA triplot of the model accounting stewpwise selected variables while on the right is displayed the partial RDA accounting spatial coordinates (Latitude and Longitude) as conditioning factor. Colors of the points represent the clusters obtained from a k-means classification according to the variables associated to the hauls (SM1-S1). Stars represent the significance level of the p-value for each term: * for p<0.05, ** for p<0.01, *** for p<0.001.

Table S1. Variables associated with the sampled hauls and summary of the two clusters obtained from the k-mean classification.

SAR: Average annual swept area ratio from 2016 to 2020, Depth: bathymetry value, Btemp: modelled average temperature at the seabottom, DO: modelled average dissolved oxygen at the seabottom, Chl: modelled average chlorophyll concentration at the seabottom, Stress: shear bottom stress due to the currents, Slope: seabed slope, k-mean clusters: k-mean classification results using variables associated to the hauls.

Haul ID	SAR	Depth (m)	Btemp (°C)	DO (mmol/L)	Chl (mg/L)	Stress (N/m²)	Slope (°)	k-mean cluster
HCP1_1	15.35	54.91	19.08	215.34	0.190	0.0554	2.31	2
HCP1_2	15.67	76.97	18.01	219.88	0.151	0.0535	1.76	2
HCP1_3	16.94	78.34	18.00	219.91	0.151	0.0534	1.74	2
HCP1_4	15.66	60.29	19.09	215.31	0.188	0.0537	2.10	2
HCP1_5	13.49	89.09	16.27	220.12	0.125	0.0250	1.00	2
HCP1_6	5.89	97.41	14.92	215.66	0.112	0.0041	2.18	1
HCP1_7	1.37	134.7	14.40	209.76	0.098	0.0024	2.60	1
HCP1_8	1.58	137.21	14.40	209.78	0.099	0.0024	2.79	1
HCP1_9	0.36	146.91	14.39	210.37	0.100	0.0015	6.66	1
HCP1_10	1.22	124.97	14.45	211.37	0.103	0.0015	2.94	1
HCP1_11	2.72	133	14.49	211.82	0.105	0.0016	1.52	1
HCP1_12	1.12	127.3	14.55	212.51	0.104	0.0014	1.98	1
HCP1_13	3.02	121.09	14.62	213.24	0.106	0.0013	2.12	1
HCP1_14	5.66	113.92	14.71	214.29	0.113	0.0010	2.025	1
HCP1_15	7.98	105.98	14.84	215.83	0.121	0.0013	1.98	1
HCP1_18	14.02	82.47	17.74	218.67	0.156	0.0471	1.80	2
HCP1_21	7.25	93.62	15.63	210.80	0.117	0.1016	2.10	1
HCP1_22	4.72	115.13	15.09	201.78	0.093	0.0035	1.06	1
HCP1_23	5.17	112.20	15.16	202.93	0.099	0.0161	1.83	1
HCP1_24	6.60	100.52	15.24	203.99	0.101	0.0172	2.01	1
HCP1_M1	37.37	63.78	16.49	221.70	0.166	0.0041	1.43	2
HCP1_M2	22.53	65.84	15.54	218.39	0.155	0.0032	2.19	2
HCP1_M3	18.36	65.84	14.84	216.48	0.150	0.0027	2.00	2
HCP2_1	9.46	95.59	14.81	215.69	0.121	0.0010	1.41	1
HCP2_2	15.26	87.02	15.99	221.42	0.147	0.0042	1.22	2
HCP2_3	15.89	70.01	19.03	215.49	0.176	0.0636	2.00	2
HCP2_4	11.68	105.36	14.52	213.38	0.145	0.0011	2.33	1
HCP2_7	10.83	132.46	14.48	212.90	0.137	0.0009	2.41	1
HCP2_8	3.31	95.75	14.72	214.42	0.108	0.0010	2.59	1
HCP2_9	4.34	95.25	14.72	214.42	0.108	0.0010	2.60	1
HCP2_10	7.06	95.87	15.77	219.46	0.109	0.0110	1.96	1
HCP2_11	4.05	100.59	14.72	214.42	0.108	0.0010	2.31	1
HCP3_1	12.81	69.49	16.25	216.85	0.148	0.2378	2.89	2
HCP3_2	19.49	60.35	17.15	217.44	0.162	0.4617	3.07	2
HCP3_3	16.17	149.05	14.44	211.84	0.132	0.0020	2.35	1
HCP3_4	13.53	153.62	14.40	211.46	0.131	0.0022	2.43	1
HCP3_5	1.31	142.65	14.40	210.63	0.109	0.0018	5.85	1
HCP3_6	1.32	140.82	14.40	210.60	0.109	0.0018	6.07	1
HCP3_7	12.49	96.01	16.06	217.70	0.147	0.0179	1.00	2
HCP3_8	11.25	99.67	15.79	218.28	0.141	0.0150	1.00	2
Cluster 1	5.51	118.84	14.73	211.73	0.111	0.0072	2.64	
Cluster 2	17.10	74.67	17.02	218.20	0.157	0.0732	1.83	

Table S2. List of species collected and identified during the fishing surveys in the study area.

Species
Demersal
Fish *Argentina sphyraena* (Linnaeus, 1758) *Arnoglossus laterna* (Walbaum, 1792) *Blennius ocellaris* (Linnaeus, 1758) *Boops boops* (Linnaeus, 1758) *Capros aper* (Linnaeus, 1758) *Centracanthus cirrus* (Rafinesque, 1810) *Cepola macrophthalma* (Linnaeus, 1758) *Chelidonichthys lucerna* (Linnaeus, 1758) *Conger conger* (Linnaeus, 1758) *Cubiceps gracilis* (Lowe, 1843) *Deltentosteus quadrimaculatus* (Valenciennes, 1837) *Diplodus annularis* (Linnaeus, 1758) *Echelus myrus* (Linnaeus, 1758) *Engraulis encrasicolus* (Linnaeus, 1758) *Gobius niger* (Linnaeus, 1758) *Hippocampus guttulatus* (Cuvier, 1829) *Lepidopus caudatus* (Euphrasen, 1788) *Lepidotrigla cavillone* (Lacepède, 1801) *Lophius piscatorius* (Linnaeus, 1758) *Macroramphosus scolopax* (Linnaeus, 1758) *Merluccius merluccius* (Linnaeus, 1758) *Mullus barbatus* (Linnaeus, 1758) *Muraena helena* (Linnaeus, 1758) *Ophidion barbatum* (Linnaeus, 1758) *Pagellus erythrinus* (Linnaeus, 1758) *Pagrus pagrus* (Linnaeus, 1758) *Peristedion cataphractum* (Linnaeus, 1758) *Phycis phycis* (Linnaeus, 1766) *Sciaena umbra* (Linnaeus, 1758) *Scorpaena notata* (Rafinesque, 1810) *Scorpaena scrofa* (Linnaeus, 1758*)* *Serranus cabrilla* (Linnaeus, 1758) *Serranus hepatus* (Linnaeus, 1758) *Spicara maena* (Linnaeus, 1758) *Spicara smaris* (Linnaeus, 1758) *Synodus saurus* (Linnaeus, 1758) *Tetronarce nobiliana* (Bonaparte, 1835) *Torpedo marmorata* (Risso, 1810) *Torpedo torpedo* (Linnaeus, 1758) *Trachurus trachurus* (Linnaeus, 1758) *Trigla lyra* (Linnaeus, 1758) *Umbrina cirrosa* (Linnaeus, 1758) *Uranoscopus scaber* (Linnaeus, 1758) *Zeus faber* (Linnaeus, 1758)
Mollusca *Illex coindetii* (Vérany, 1839) *Loligo vulgaris* (Lamarck, 1798) *Octopus vulgaris* (Cuvier, 1797) *Sepia officinalis* (Linnaeus, 1758) *Sepiola rondeletii* (Leach, 1817)
Crustacea *Parapenaeus longirostris* (Lucas, 1846) *Squilla mantis* (Linnaeus, 1758)

Continued

Table S2 continued

Benthic
Crustacea *Aegaeon lacazei* (Gourret, 1887) *Calappa granulata* (Linnaeus, 1758) *Dardanus arrosor* (Herbst, 1796) *Dardanus calidus* (Risso, 1827) *Ethusa mascarone* (Herbst, 1785) *Goneplax rhomboides* (Linnaeus, 1758) *Lepas sp.* (Linnaeus, 1758) *Liocarcinus depurator* (Linnaeus, 1758) *Medorippe lanata* (Linnaeus, 1767) *Munida rugosa* (Fabricius, 1775) *Nephrops norvegicus* (Linnaeus, 1758) *Pagurus alatus* (Fabricius, 1775) *Pagurus bernhardus* (Linnaeus, 1758) *Pagurus excavatus* (Herbst, 1791) *Spinolambrus macrochelos* (Herbst, 1790)
Mollusca *Aequipecten opercularis* (Linnaeus, 1758) *Aplysia sp.* (Linnaeus, 1767) *Bolinus brandaris* (Linnaeus, 1758) *Bursatella leachii* (Blainville, 1817) *Calliostoma sp* (Swainson, 1840) *Galeodea echinophora* (Linnaeus, 1758) *Galeodea rugosa* (Linnaeus, 1771) *Philinopsis depicta* (Renier, 1807) *Pteria hirundo* (Linnaeus, 1758) *Tonna galea* (Linnaeus, 1758) *Turritellinella tricarinata* (Brocchi, 1814) *Venus verrucosa* (Linnaeus, 1758) *Euopisthobranchia*
Echinodermata *Antedon mediterranea* (Lamarck, 1816) *Astropecten aranciacus* (Linnaeus, 1758) *Astropecten bispinosus* (Otto, 1823) *Astropecten irregularis* (Pennant, 1777) *Astrospartus mediterraneus* (Risso, 1826) *Ceramaster granularis* (Retzius, 1783) *Diadema setosum* (Leske, 1778) *Echinus melo* (Lamarck, 1816) *Echinaster sepositus* (Retzius, 1783) *Leptometra phalangium* (Müller, 1841) *Marthasterias glacialis* (Linnaeus, 1758) *Parastichopus regalis* (Cuvier, 1817) *Peltaster placenta* (Müller & Troschel, 1842) *Pisaster brevispinus* (Stimpson, 1857) *Psammechinus microtuberculatus* (Blainville, 1825) *Spatangus purpureus* (Müller, 1776) *Sphaerechinus granularis* (Lamarck, 1816) *Stylocidaris affinis* (Philippi, 1845)
Other *Alcyonium sp.* (Linnaeus, 1758) *Calliactis parasitica* (Couch, 1842) *Pennatula phosphorea* (Linnaeus, 1758) *Phallusia mammillata* (Cuvier, 1815) *Pteroeides griseum* (Bohadsch, 1761) *Porifera*

Table S3. PERMANOVA table with results of the analysis on community abundance composition between the three sampling year and months. DF: degree of freedom, SumSq: sum of squares, R2: coefficient of determination, F = F-statistic value.

Factor	DF	SumSq	R2	F	p-value
Year	1	192475	0.04021	1.6158	0.219
Month	1	186703	0.03901	1.5674	0.244
Residual	37	4407403	0.92078		

Table S4. ANOVA table representing significant test of results obtained from PERMIDISP analysis on community abundance composition between the sampling years and months. DF: degree of freedom, SumSq: sum of squares, MeanSq = mean squares, F = F-statistic value.

Grouping	Factor	DF	SumSq	MeanSq	F-value	p - value
Year	Groups	2	21603	10802	0.1207	0.8866
	Residuals	37	3310923	89484		
Month	Groups	1	10324	10324	0.1169	0.7343
	Residuals	38	3356828	88338		

Table S5. Variation partitioning between environmental (Env), anthropogenic (Ant) and spatial variables (Spat) accounted in RDA models for demersal and benthic domains. Combinations (Env+Ant, Env+Spat, Ant+Spat, All) constitute the proportion of variation explained by the coo occurence of both the variables in the model while Tot and Res represent the total variation explained by the model and by the residuals, respectively. See Table 5 for the environmental variables considered in each RDA model.

Variation explained by	Demersal		Benthic	
	Taxonomic	Functional	Taxonomic	Functional
Env	17%	17%	7%	
Ant	3%	7%	2%	
Spat	4%	3%	6%	12%
Env+Ant				
Env+Spat	2%		1%	13%
Ant+Spat	6%	3%	6%	2%
All	2%		1%	
Tot	34%	30%	23%	27%
Res	66%	70%	77%	73%