

Table S1. Estimated sampling depths based on the relationship between the wire length and known sampling depths of the rectangular midwater trawl (RMT 8) in the Benguela Upwelling Systems using a ratio of  $1.77 \pm 0.26$ . The minimum and maximum sampling depths and water volumes are also provided based on the standard deviation of the mean ratio.

Station number	Sampling depth (m)	Minimum sampling depth (m)	Maximum sampling depth (m)	Mean volume (m <sup>3</sup> )	Minimum volume (m <sup>3</sup> )	Maximum volume (m <sup>3</sup> )
6_1	566	493	664	28439	28091	28975
6_3	566	493	664	39764	39516	40149
6_4	566	493	664	32487	32182	32957
5_3	566	493	664	45470	45253	45807
5_1	566	493	664	41246	41006	41617
4_2	566	493	664	48217	48013	48535
3_5	453	395	531	38291	38126	38547
3_3	566	493	664	38053	37793	38455
1_5	566	493	664	43747	43521	44097
1_3	566	493	664	30877	30556	31371
10_3	566	493	664	24457	24051	25078
10_4	566	493	664	34798	34514	35237
9_3	566	493	664	29275	28937	29796
9_2	566	493	664	38752	38497	39147
8_4	566	493	664	33795	33503	34247
8_5	566	493	664	45470	45253	45807
7_4	566	493	664	41090	40849	41462
7_1	566	493	664	43199	42971	43554

Table S2. Hauls using the rectangular midwater trawl (RMT 8) with known wire lengths and depths in the Benguela Upwelling Systems. The ratio was used to estimate the sampling depths of RMT hauls in the Canary Current region, where a depth meter was not available.

Wire length (m)	Sampling depth (m)	Ratio
752	550	1.37
210	124	1.69
226	115	1.97
751	390	1.93
741	400	1.85
601	330	1.82
751	400	1.88
597	450	1.33
270	130	2.08
	Mean ratio	1.77
	Standard deviation	0.26

Table S3. Abundance of mesopelagic fish species caught using a rectangular midwater trawl in the Mauritanian-Senegalese subregion of the Canary Current. Species marked with \* have a frequency of occurrence of  $\geq 2$  and were included in all multivariate statistics. Total abundance refers to the total number of individuals at all stations, according to by the volume filtered in the net. All species of the genus *Cyclothone* were pooled for total abundance, since most were damaged and could not be identified to species level but the species identified are listed.

Family	Species	Total abundance (ind. 10 m <sup>-2</sup> )
Alepocephalidae	<i>Xenodermichthys copei</i>	0.14
Bathylagidae	Unidentified spp.	0.13
	<i>Bathylagoides</i>	
	<i>argyrogastrer</i> *	0.59
	<i>Bathylagus euryops</i> *	0.52
	<i>Bathylagus</i> sp.	0.23
	<i>Dolicholagus longirostris</i> *	0.76
Caristiidae	<i>Platyberyx opalescens</i>	0.16
Diretmidae	<i>Diretmus argenteus</i>	0.15
Epigonidae	<i>Epigonus constanciae</i> *	0.23
	<i>Epigonus telescopus</i>	0.14
Gonostomatidae	<i>Bonapartia pedaliota</i>	0.12
	<i>Cyclothone</i> spp.*	156.46
	<i>Cyclothone acclinidens</i>	-
	<i>Cyclothone alba</i>	-
	<i>Cyclothone livida</i>	-
	<i>Cyclothone</i> cf. <i>microdon</i>	-
	<i>Cyclothone pallida</i>	-
	<i>Cyclothone parapallida</i>	-
	<i>Gonostoma atlanticum</i> *	0.50
	<i>Gonostoma denudatum</i>	0.14
	<i>Gonostoma elongatum</i> *	0.34
	<i>Gonostomatidae</i>	6.96
Howellidae	<i>Howella atlantica</i>	0.15
Macrouridae	<i>Coelorinchus</i> sp.*	0.36
	<i>Hymenocephalus gracilis</i>	0.20
	<i>Trachonurus villosus</i>	0.17
Melamphaidae	<i>Poromitra megalops</i> *	0.58
	<i>Scopeloberyx opisthopterus</i>	0.17
	<i>Scopelogadus beanii</i> *	0.97
	<i>Scopelogadus mizolepis</i> *	1.02
Melanocetidae	<i>Melanocetus johnsonii</i> *	0.54
Melanonidae	<i>Melanonus zugmayeri</i> *	0.65
Myctophidae	<i>Benthoosema fibulatum</i>	0.58
	<i>Benthoosema glaciale</i> *	16.47
	<i>Benthoosema suborbitale</i> *	0.88
	<i>Diaphus brachycephalus</i>	0.35
	<i>Diaphus dumerilii</i> *	3.95

Family	Species	Total abundance (ind. 10 m <sup>-2</sup> )
	<i>Diaphus holti</i> *	0.99
	<i>Diaphus rafinesquii</i> *	1.73
	<i>Diaphus</i> sp.*	0.28
	<i>Diaphus vanhoeffeni</i> *	14.43
	<i>Diogenichthys atlanticus</i>	0.20
	<i>Hygophum macrochir</i> *	11.77
	<i>Hygophum taaningi</i> *	4.48
	<i>Lampadena speculigera</i>	0.14
	<i>Lampanyctus alatus</i> *	2.12
	<i>Lampanyctus crocodilus</i> *	1.16
	<i>Lampanyctus festivus</i> *	0.71
	<i>Lampanyctus Isaacsi</i> *	0.35
	<i>Lampanyctus</i> sp.	0.23
	<i>Lepidophanes guentheri</i> *	0.32
	<i>Lobianchia dofleini</i> *	1.97
	<i>Lobianchia gemellarii</i> *	0.23
	Myctophid unidentified*	3.61
	<i>Myctophum affine</i> *	10.24
	<i>Myctophum nitidulum</i> *	0.86
	<i>Myctophum punctatum</i>	0.15
	<i>Myctophum</i> sp.	0.12
	<i>Notolychnus valdiviae</i> *	0.54
	<i>Notoscopelus resplendens</i> *	0.81
	<i>Symbolophorus</i> sp.*	0.28
	<i>Symbolophorus veranyi</i> *	0.70
Nemichthyidae	Unidentified	0.14
	<i>Nemichthys scolopaceus</i> *	1.10
Oneirodidae	<i>Oneirodes</i> sp.	0.23
Opisthoproctidae	<i>Dolichopteryx rostrata</i> *	1.40
	<i>Opisthoproctus soleatus</i> *	0.63
	<i>Winteria telescopa</i>	0.13
Paralepididae	<i>Sudis hyalina</i>	0.14
Peristediidae	<i>Peristedion catapractum</i>	0.12
Phosichthyidae	<i>Ichthyococcus ovatus</i> *	0.41
	<i>Pollichthys maui</i> *	0.83
	<i>Vinciguerria nimbaria</i> *	10.19
	<i>Vinciguerria poweriae</i> *	0.52
Scopelarchidae	<i>Scopelarchus analis</i> *	1.16
Searsidae	<i>Ceratias uranoscopus</i>	0.18
	<i>Searsia koefoedi</i>	0.18
Serrivomeridae	<i>Serrivomer beani</i> *	0.57
	<i>Serrivomer brevidentatus</i>	0.12
Sternoptychidae	<i>Argyropelecus gigas</i> *	1.67
	<i>Argyropelecus</i> <i>hemigymnus</i> *	4.06
	<i>Argyropelecus olfersi</i>	0.19
	<i>Argyropelecus sladeni</i> *	10.35

Family	Species	Total abundance (ind. 10 m <sup>-2</sup> )
	<i>Argyropelecus</i> sp.	0.12
	cf Sternoptychidae	0.12
	<i>Maurolicus muelleri</i>	0.17
	<i>Polyipnus laternatus</i> *	0.82
	<i>Polyipnus polli</i> *	25.12
	<i>Polyipnus</i> sp.*	0.61
	Sternoptychidae	
	unidentified*	0.37
	<i>Sternoptyx diaphana</i> *	5.22
	<i>Sternoptyx</i> sp.	0.16
Stomiidae	<i>Bathophilus nigerrimus</i>	0.13
	<i>Borostomias menomena</i>	0.17
	<i>Chauliodus schmidtii</i> *	6.21
	<i>Chauliodus</i> sp.*	1.65
	<i>Flagellostomias boureei</i>	0.16
	<i>Malacosteus niger</i> *	0.27
	<i>Melanostomias</i> sp.	0.23
	<i>Odontostomias micropogon</i>	0.17
	<i>Stomias boa</i> *	4.94
Stomiiformes (order)	Stomiiformes unidentified	0.98
Stylophoridae	<i>Stylophorus chordatus</i>	0.44
Unidentified	Unidentified species	1.74

Table S4. The minimum and maximum abundances of mesopelagic fishes in each cluster in the Canary Current based on the minimum and maximum sampling depth and filtered volume. The mean abundance has been corrected by the number of stations in each cluster.

Cluster	Species	Minimum total abundance (ind. 10 m <sup>-2</sup> )	Minimum mean abundance (ind. 10 m <sup>-2</sup> )	Maximum total abundance (ind. 10 m <sup>-2</sup> )	Maximum mean abundance (ind. 10 m <sup>-2</sup> )	
A	<i>Cyclothone</i> spp.	17.8	8.90	23.30	11.65	
	<i>Lobianchia dofleini</i>	1.2	0.60	1.60	0.80	
	<i>Argyropelecus hemigymnus</i>	1.2	0.60	1.60	0.80	
	Unidentified myctophid	0.9	0.45	1.20	0.60	
	Other (21 spp.)	7.4	3.72	9.85	4.93	
	B	<i>Benthoosema glaciale</i>	13.4	4.47	17.70	5.90
		<i>Cyclothone</i> spp.	10.7	3.57	14.10	4.70
<i>Hygophum machrochir</i>		2.0	0.67	2.70	0.90	
<i>Vinciguerria nimbaria</i>		1.9	0.63	2.50	0.83	
<i>Diaphus vanhoeffeni</i>		1.5	0.50	2.00	0.67	
<i>Stomias boa</i>		1.4	0.47	1.90	0.63	
<i>Myctophum affine</i>		1.3	0.43	1.70	0.57	
Other (27 spp.)		10.0	3.32	13.38	4.46	
C		<i>Cyclothone</i> spp.	109.2	9.10	143.50	11.96
		<i>Polyipnus polli</i>	21.1	1.76	27.80	2.32
		<i>Diaphus vanhoeffeni</i>	11.1	0.93	14.70	1.23
	<i>Hygophum machrochir</i>	8.3	0.69	11.00	0.92	
	<i>Myctophum affine</i>	7.7	0.64	10.20	0.85	
	<i>Argyropelecus sladeni</i>	7.5	0.63	9.90	0.83	
	<i>Vinciguerria nimbaria</i>	7.0	0.58	9.20	0.77	
	Other (45 spp.)	40.4	3.36	52.82	4.40	

Table S5. The single and cumulative contribution to the dissimilarity between clusters of mesopelagic fish assemblages in the Mauritanian-Senegalese subregion of the Canary Current, as indicated by the SIMPER analysis. Those species contributing < 4% are pooled in the category ‘Others’.

Cluster comparison	Species	Single contribution (%)	Cumulative contribution (%)
A vs. B	<i>Bentosema glaciale</i>	10.8	10.8
	<i>Cyclothone</i>	6.9	17.7
	<i>Diaphus vanhoeffeni</i>	4.8	22.5
	<i>Myctophum affine</i>	4.4	26.9
	<i>Hygophum macrochir</i>	4.4	31.3
	<i>Lobianchia dofleini</i>	4.0	35.3
	Others (37 species)	64.7	100.0
A vs. C	<i>Polyipnus polli</i>	7.3	7.3
	<i>Diaphus vanhoeffeni</i>	6.1	13.4
	<i>Lobianchia dofleini</i>	5.5	18.9
	<i>Myctophum affine</i>	4.7	23.6
	<i>Hygophum macrochir</i>	4.5	28.1
	<i>Argyropelecus hemigymnus</i>	4.3	32.4
	Others (49 species)	67.6	100.0
B vs. C	<i>Bentosema glaciale</i>	14.0	14.0
	<i>Cyclothone</i>	6.4	20.4
	<i>Polyipnus polli</i>	5.1	25.5
	<i>Hygophum macrochir</i>	4.3	29.8
	<i>Vinciguerrria nimbaria</i>	4.0	33.8
	Others (52 species)	66.2	100.0

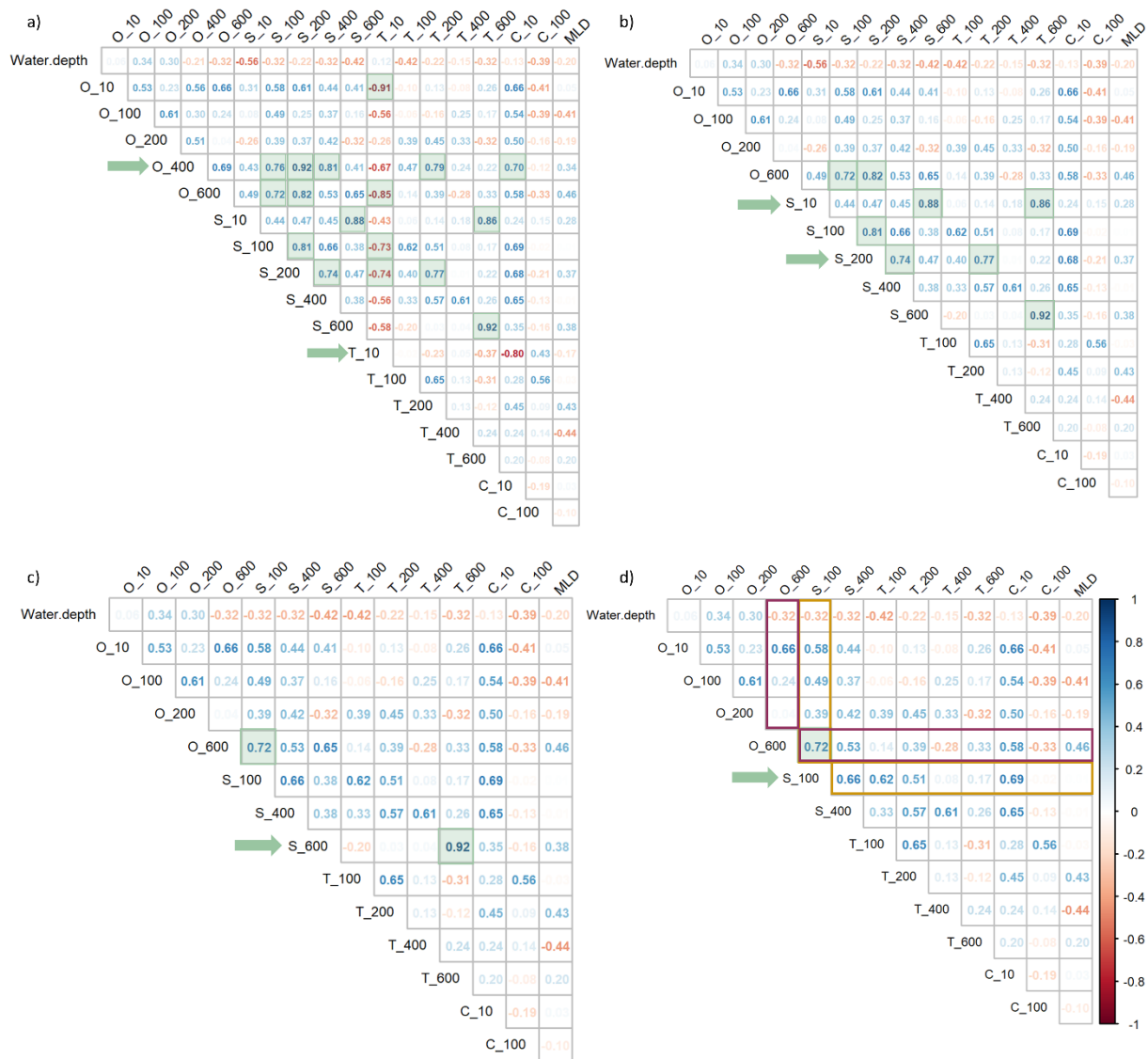


Fig. S1. Environmental variable selection for Redundancy Analysis and forward selection model. Variables with a correlation of  $\geq 0.7$  are removed due to collinearity based on their relevance (Dormann et al. 2013). Final model shown in panel D where salinity at 100 m (S<sub>100</sub>) was removed, as it had a higher correlation to other variables than oxygen at 600 m (O<sub>600</sub>).

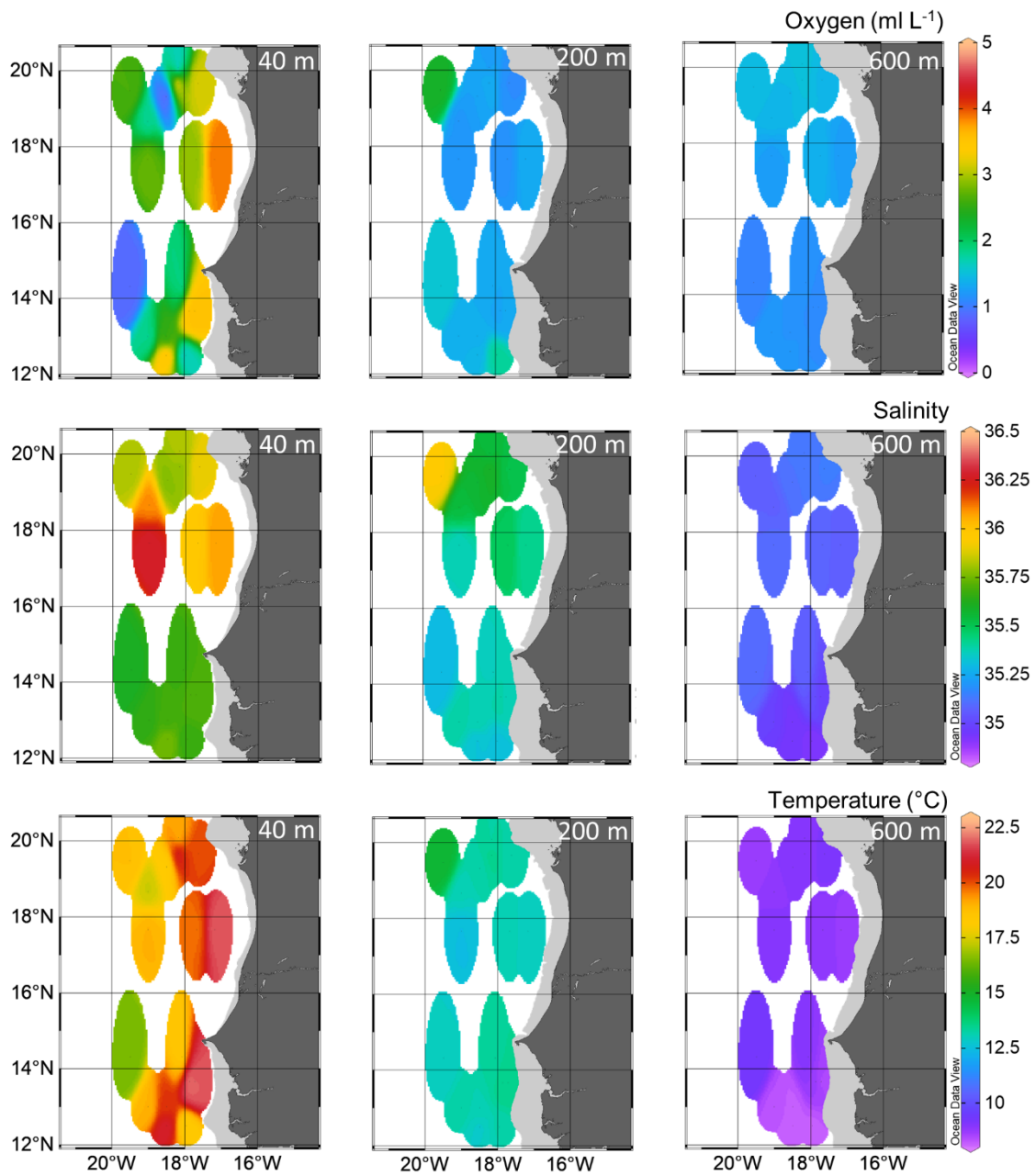


Fig. S2. Oxygen, temperature, and salinity at 40, 200, and 600 m in the Canary Current. Data from CTD casts at each station and plots created in Ocean Data View using the weighted average gridding.