

Table S1: Cruises details with corresponding names, codes used in the manuscript, start and end dates, distance travelled (km) and bibliometric references (DOI).

Cruise name	Cruise code	Start	End	Total distance	DOI
Nectalis 1	N1	30/07/2011	18/08/2011	3683	10.17600/11100050
Nectalis 2	N2	26/11/2011	14/12/2011	4052	10.17600/11100070
Nectalis 3	N3	21/11/2014	08/12/2014	3824	10.17600/14004900
Nectalis 4	N4	19/10/2015	25/10/2015	1505	10.17600/15004000
Nectalis 5	N5	23/11/2016	06/12/2016	2604	10.17600/16004200

Table S2: Number of hauls composing the final dataset (e.g., 123 hauls) grouped by different factors: moment of the day and vertical layers (epipelagic: 0-200m; and mesopelagic: 200-400m) (columns) and EEZ region (north: north of the latitude 20°S; and south: south of the latitude 20°S) and season (warm: from December to May; and cold: from April to November). Last row and last column show the totals by row and by column (italic numbers).

		Day		Night		Total
		Epipelagic	Mesopelagic	Epipelagic	Mesopelagic	
Cold	North	17	17	20	3	57
	South	1	4	9	1	15
Warm	North	4	8	13	5	30
	South	5	4	14	1	21
<i>Total</i>		<i>24</i>	<i>33</i>	<i>56</i>	<i>10</i>	<i>123</i>

Table S3: Micronekton families collected in the 123 trawl hauls conducted, ordered by group (Crustacea, Fish and Mollusc) and then alphabetically with 'N' the total number of individuals and 'W' the total weight (g).

	N	W		N	W
CRUSTACEA			Lampridae	1	0.7
Benthescymidae	38	18	Melamphaidae	1	0.9
Cystisomatidae	7	9.6	Molidae	9	1.14
Euphausiidae	6642	1115.16	Monacanthidae	7	2
Lanceolidae	1	0.2	Myctophidae	20529	31702.48
Oplophoridae	903	638.53	Nemichthyidae	2	1.5
Oxycephalidae	51	5.46	Nomeidae	24	241.6
Pandalidae	1	0.4	Notosudidae	40	137.9
Penaeidae	151	172.9	Opisthoproctidae	22	132.7
Phronimidae	821	236.17	Ostraciidae	9	4.7
Platyscelidae	207	42.97	Paralepididae	18	60.8
Pronoidae	8	1.4	Phosichthyidae	249	104.15
Scinidae	40	3.7	Priacanthidae	8	10.9
Sergestidae	86	22.85	Radiicephalidae	2	2.7
Thalassocarididae	119	10.8	Scombridae	4	26.2
FISH			Scombrolabracidae	5	160.8
Acanthephyridae	28	110.6	Scopelarchidae	12	46.1
Amarsipidae	2	2.1	Sternoptychidae	3829	2660.72
Anoplogastridae	1	0.6	Stomiidae	288	811.2
Bathylagidae	3	2.9	Syngnathidae	2	1
Bathysauridae	1	5.2	Xiphiidae	1	55.9
Bramidae	34	250.3	MOLLUSC		

Bregmacerotidae	1	1.5	Ancistrocheiridae	7	11.3
Carangidae	302	4316.1	Carinariidae	5	6.7
Chiasmodontidae	3	2.7	Cavoliniidae	13	3.31
Chlopsidae	14	98.3	Ctenopterygidae	2	2.1
Cirrhitidae	7	1	Cliidae	55	4.85
Dalatiidae	11	1375.8	Cranchiidae	393	451.24
Derichthyidae	1	0.5	Enoploteuthidae	349	730.2
Diretmidae	15	13.9	Histioteuthidae	7	69.7
Emmelichthyidae	14	19.3	Hydromylidae	378	9.46
Engraulidae	116	123.2	Lycoteuthidae	1	1.6
Epigonidae	3	2.8	Ommastrephidae	123	4046.5
Evermannellidae	1	0.8	Onychoteuthidae	11	17.3
Fistulariidae	1	0.6	Pholidoteuthidae	9	66.4
Gempylidae	200	247.39	Pterotracheidae	3	5.8
Gonostomatidae	765	1530.2	Pyroteuthidae	1471	626.59
Grammicolepididae	3	4.4	Spirulidae	29	113.8
Howellidae	3	9.9	Thysanoteuthidae	1	6.9

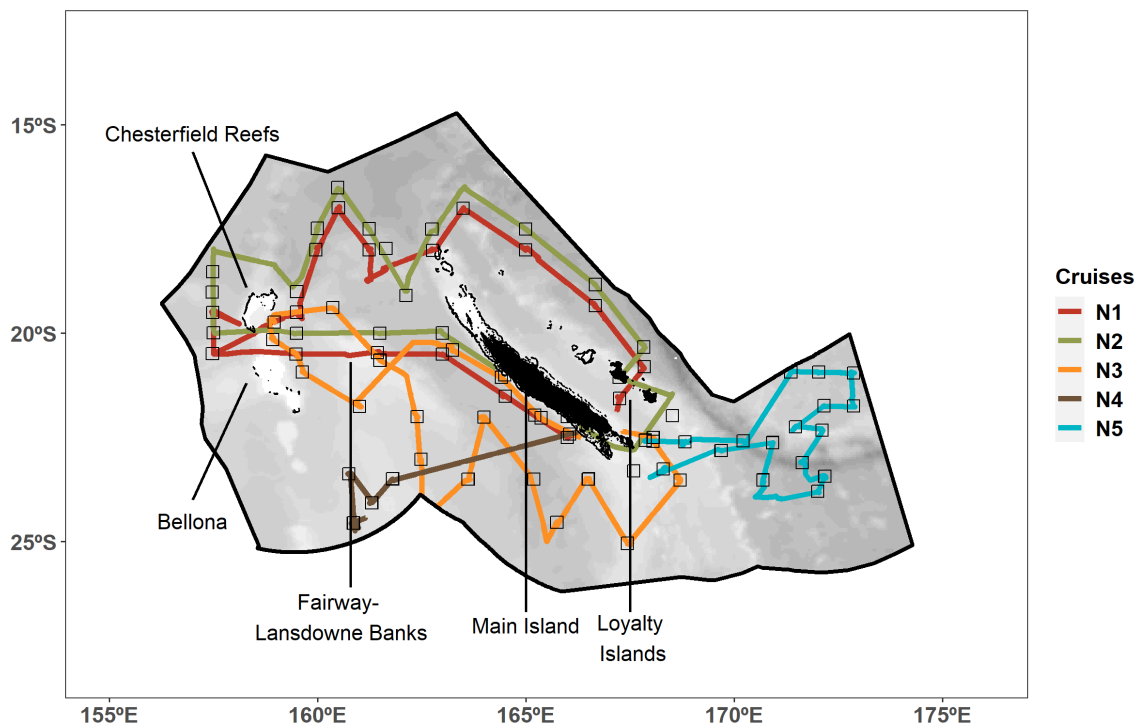


Figure S1: Cruise tracks of the R/V Alis with EK60 echosounder (colored lines) in the New Caledonian Exclusive Economic Zone. Black boxes show sampling stations. The background grey colors represent the seabed depth (where lighter colors are shallower). Note that N1 and N2 tracks partially overlap but N2 track has been shifted by 0.5° to the north for visualization purposes.

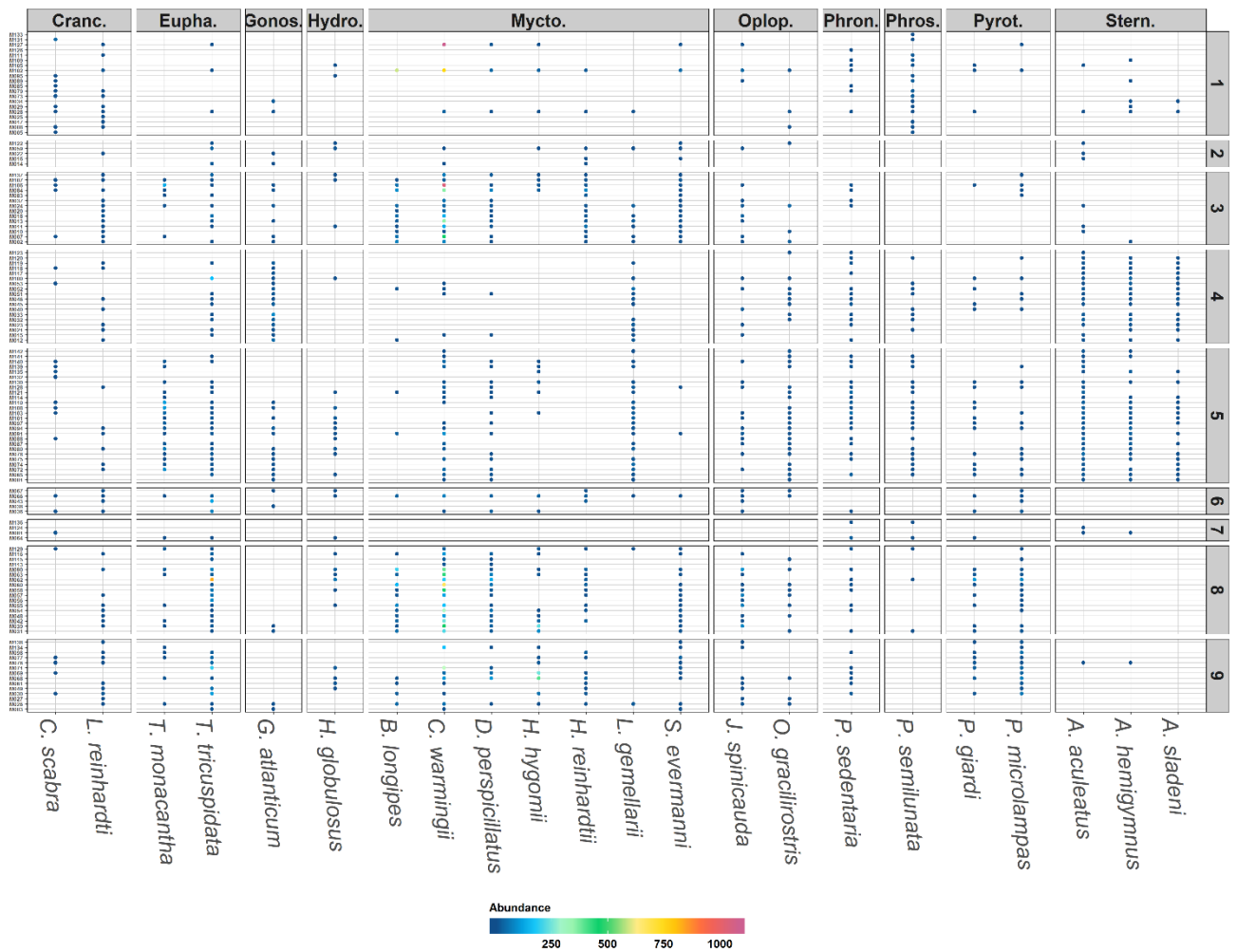


Figure S2: Raw species composition from hauls and their corresponding RCP. Each row corresponds to one haul, grouped by RCP (grey boxes on the right) and each column corresponds to one species, grouped by family (grey boxes on the top): Cranc. (Cranchiidae), Eupha. (Euphausiidae), Gonos. (Gonostomatidae), Hydro. (Hydromylidae), Mycto. (Myctophidae), Oplop. (Oplophoridae), Phron. (Phronimidae), Phros. (Phrosinidae), Pyrot. (Pyroteuthidae), Stern. (Sternoptychidae). Dots color shows the abundance. The complete species names are given in full in Figure 1.

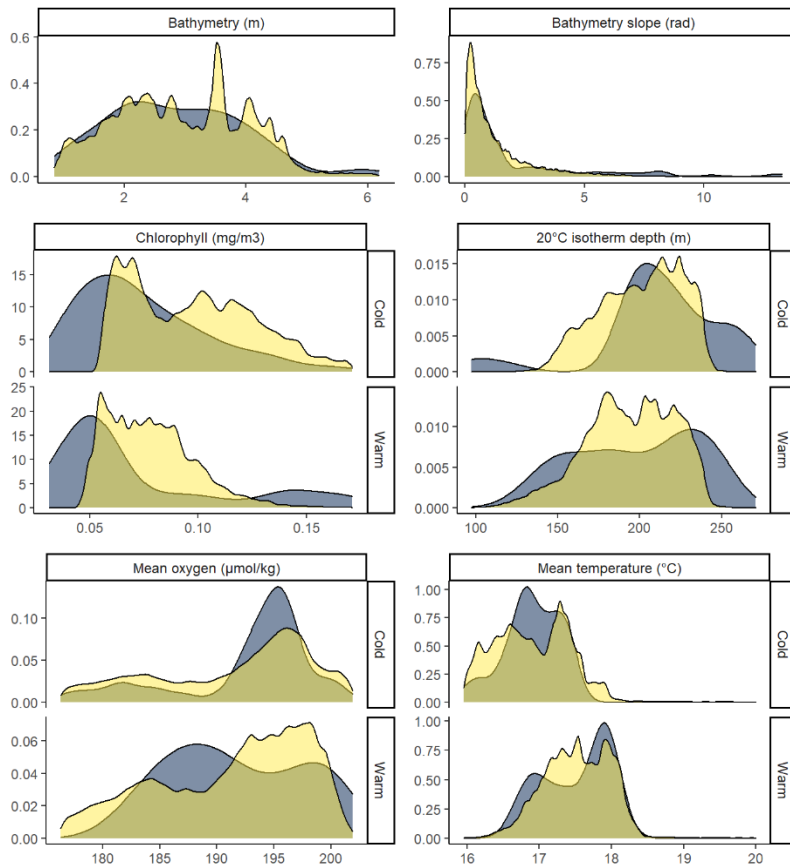


Figure S3: Distribution of values sampled in the final trawl dataset (blue) and used by the statistical model for the predictions (yellow) by variable and by season for seasonal variables (warm season from December to May and cold season from June to November).

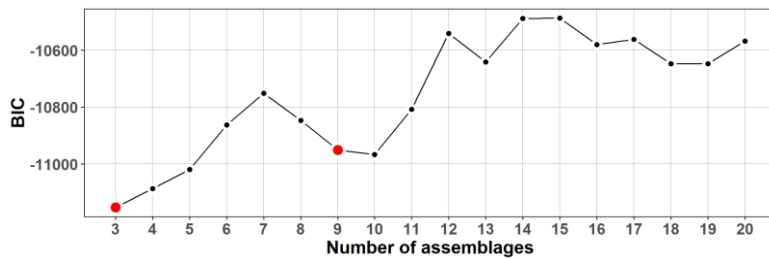


Figure S4: BIC (Bayesian information criteria) as a function of the number of assemblages (also called RCPs). Red points shown the number of assemblages chosen to fit in the study.

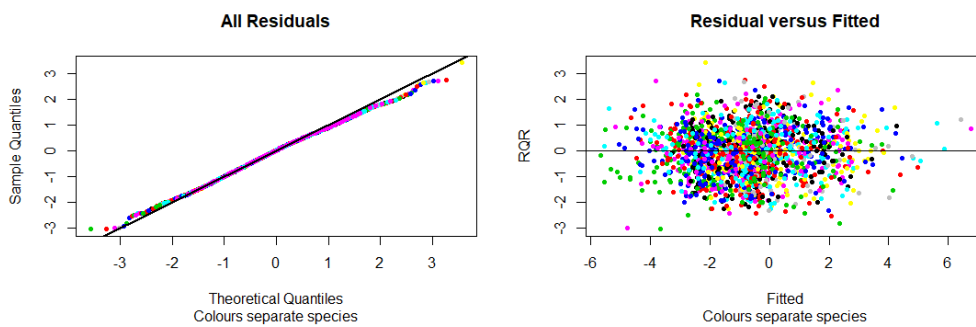


Figure S5: Residuals plots checking: qqline (left) and residuals as a function of fitted values (right).

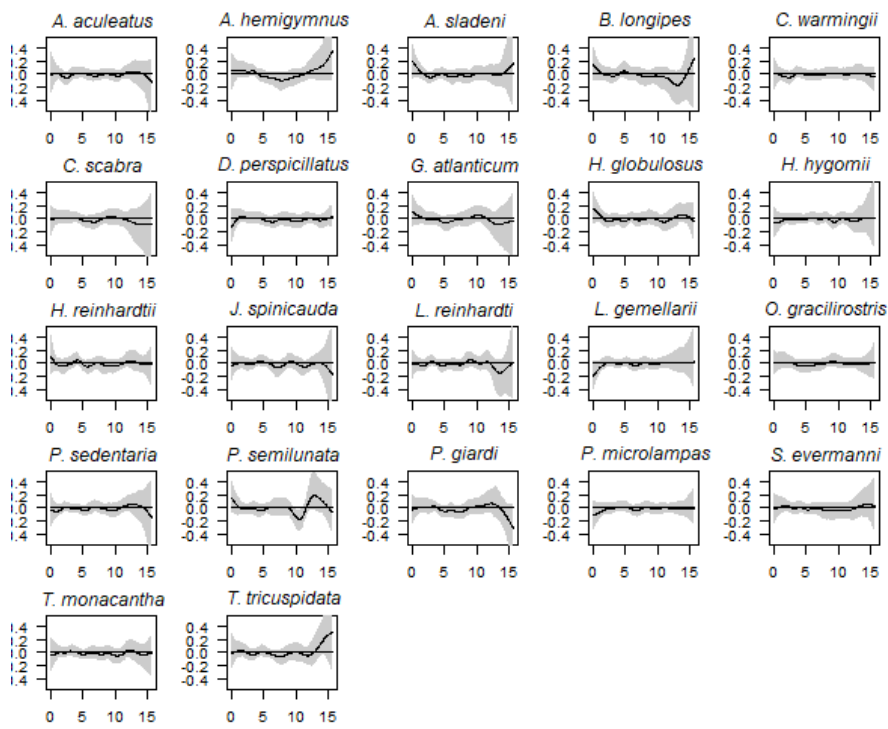


Figure S6: Spatial auto-correlation by species, horizontal axis is the distance in km. The complete species names are given in full in Figure 1.

Horta e Costa, B., Claudet, J., Franco, G., Erzini, K., Caro, A., and Gonçalves, E.J. (2016). A regulation-based classification system for Marine Protected Areas (MPAs). *Marine Policy* 72, 192–198.