Supplementary material

Supplementary materials presenting maps of temperatures in the area of interest (Figure S1), correlograms of non-selected environmental-only models (Figure S2) and absolute models fitting errors from early period (Figure S3) are available at the *ICES Journal of Marine Science* online version of the paper. In addition, the supplementary material includes three regression parameters tables (Tables S1 to S3), for saithe, hake and their overlap, respectively, allowing the comparison between non-selected environmental-only models and selected spatial ones.

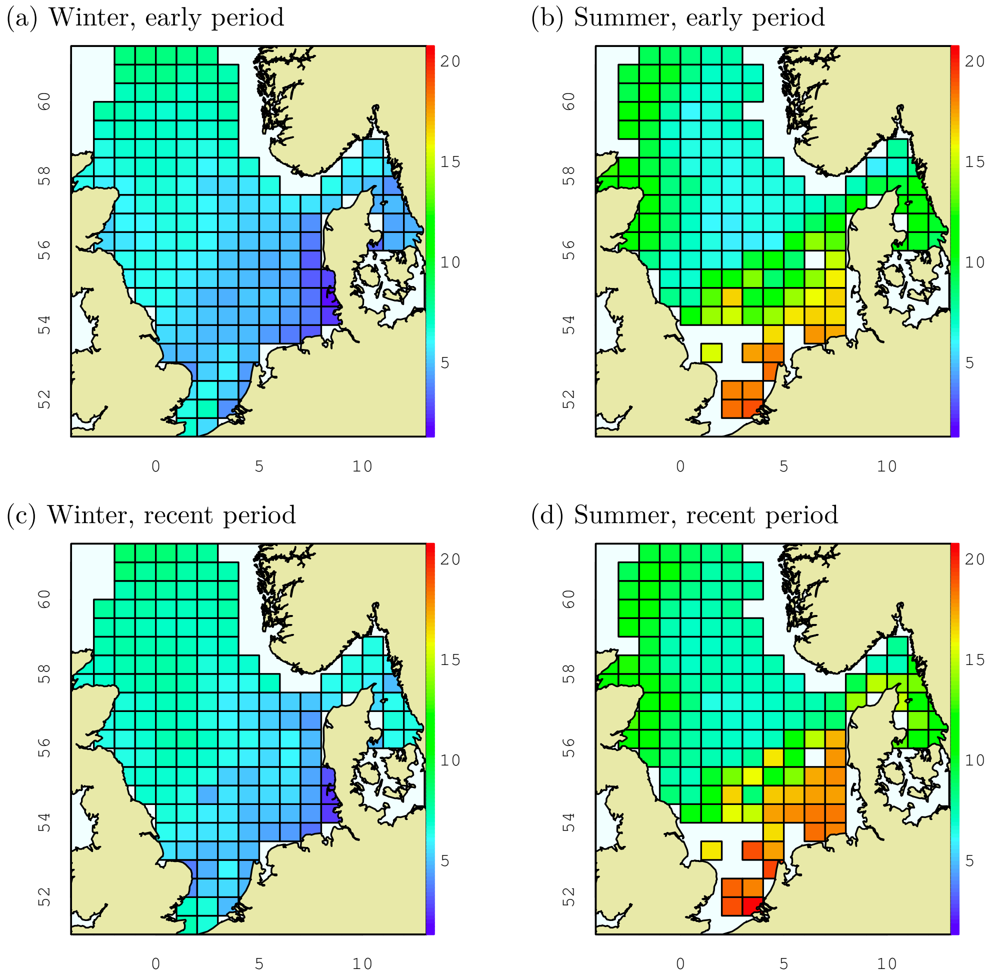

Figure S1: Temperature observation maps (in degree Celsius) for the early period (1991-1996), in (a) winter and in (b) summer and for the recent period (2007-2012) in (c) winter and in (d) summer.

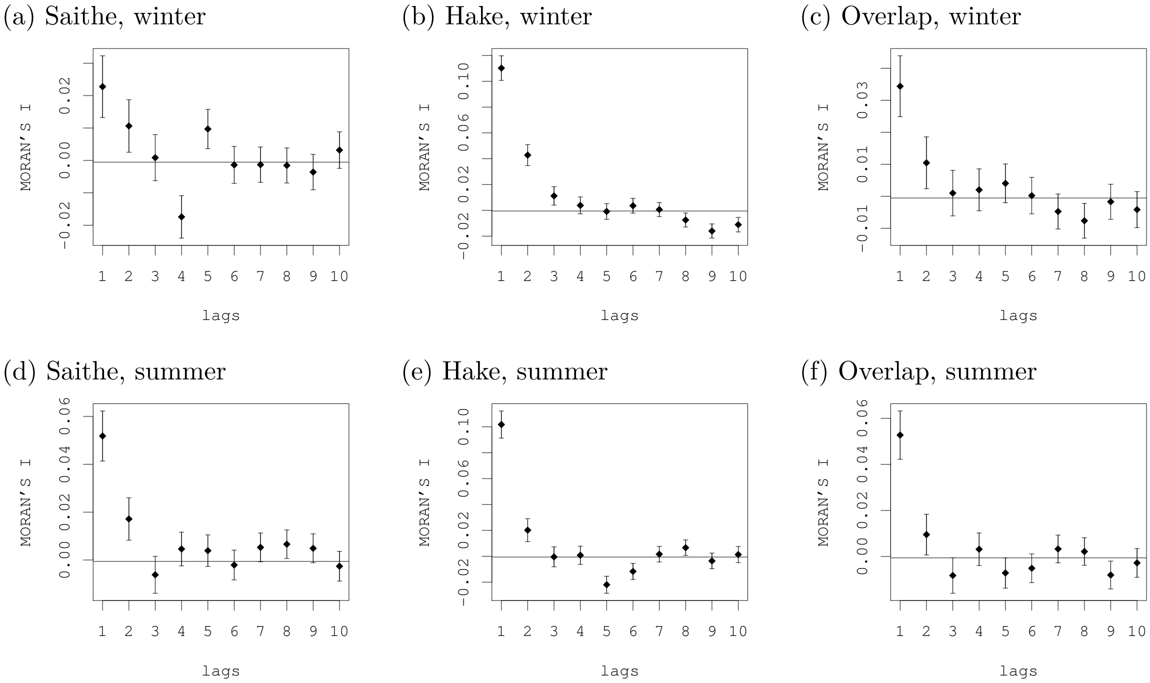

Figure S2: Correlograms of detrended residuals of environmental-only models for saithe (first column), hake (second column) and their overlap (third column) at winter (first line) and summer (second line). Moran's I coefficients depending on different spatial lags, spaced by 75 ± 10 kilometres.

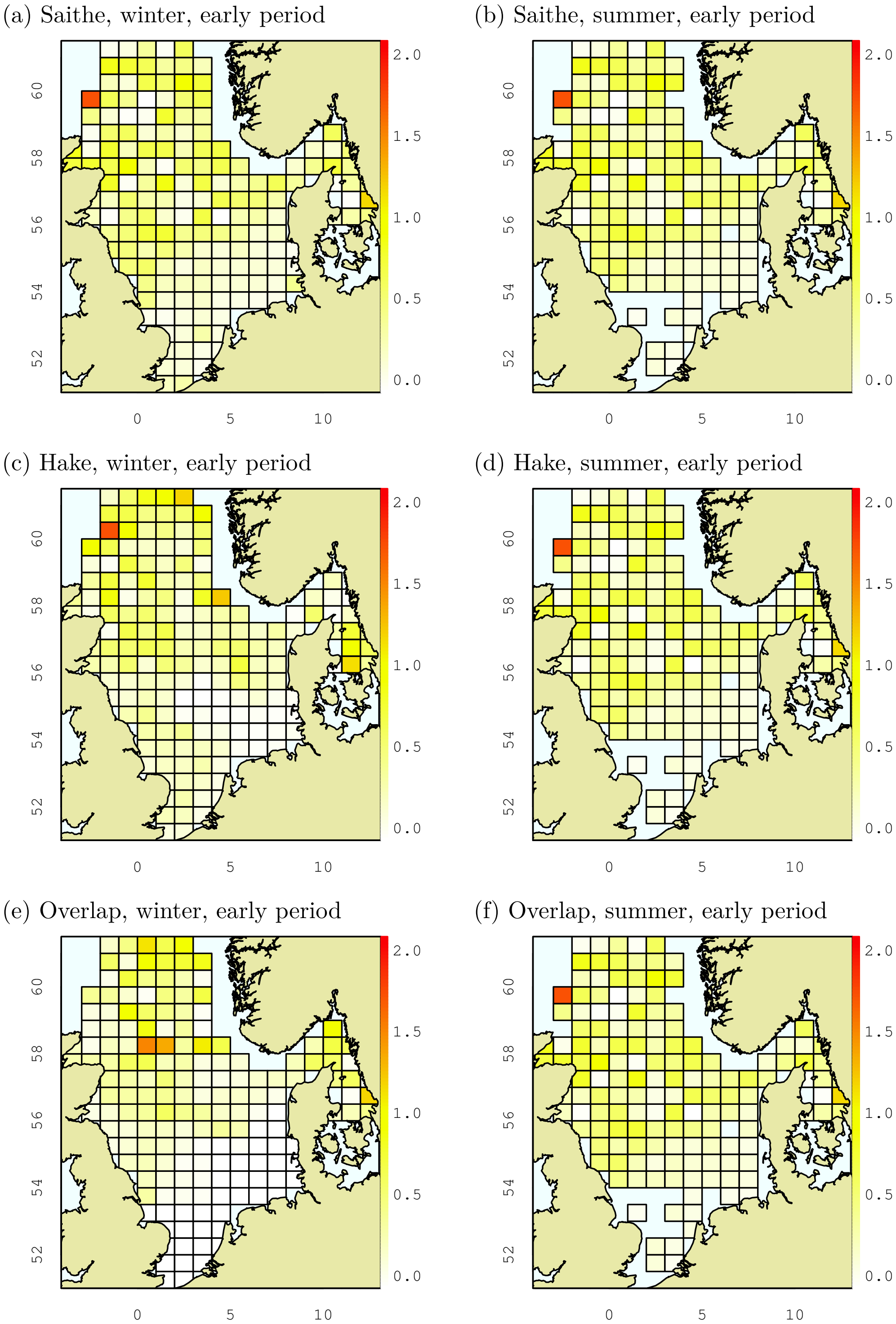

Figure S3: Maps of spatial models absolute fitting error, error between observations and predictions, calculated for the early period (1991-1996) for saithe (a) in winter and (b) in summer; for hake (c) in winter and (d) in summer; for overlap (e) in winter and (f) in summer.

Table S1: Environmental-only and spatial saithe distribution models parameters β per variables (Table 1) and for each season. All coefficients are significant with $p < 0.001$, except for those marked with a letter as exposant. ^{a}: $p < 0.01$.

	Winter		Summer	
	ENV	ENV+SP	ENV	ENV+SP
H.Tot	7.92×10^{-1}	7.89×10^{-1}	9.57×10^{-1}	9.22×10^{-1}
C.Adu	1.05	1.05	1.02	1.09
C.Juv			1.58	1.61
NP.Tot	1.18	1.18		
BW.Tot				
HG.Adu				
HG.Juv	-8.29×10^{-1}	-8.46×10^{-1}	-1.02	-9.04×10^{-1}
CSpp				
FSpp			-1.13	-9.77×10^{-1}
Gpp	3.96^a	4.23	5.71	6.60
Ppp				
Lpp				3.72×10^{1a}
Temp				
Temp2				
Temp3				
Depth	2.84×10^{-2}	2.83×10^{-2}	6.27×10^{-2}	4.77×10^{-2}
Depth2			-1.09×10^{-4}	
Depth3	-6.98×10^{-8}	-6.52×10^{-8}		-1.66×10^{-7}

Table S2: Environmental-only and spatial hake distribution models parameters β per variables (Table 1) and for each season. All coefficients are significant with $p < 0.001$, except for those marked with a letter as exposant. ^{a}: $p < 0.01$; ^{b}: $p < 0.05$.

	Winter		Summer	
	ENV	ENV+SP	ENV	ENV+SP
S.Tot	6.10×10^{-1}	7.86×10^{-1}	1.02	1.09
C.Adu			5.01×10^{-1}	4.40×10^{-1a}
C.Juv				
NP.Tot	9.89×10^{-1}	7.82×10^{-1a}		
BW.Tot	7.85×10^{-1}	7.76×10^{-1}	6.47×10^{-1a}	
HG.Adu	1.31	1.25		
HG.Juv				
CSpp				$-1.97\,^a$
FSpp	-2.92	-2.75	-1.13	-8.60×10^{-1}
Gpp				5.17
Ppp	-3.28	-4.62	-2.71	-2.43
Lpp				
Temp	5.07^b		1.13	1.06
Temp2	$-1.01\,^a$	-1.56×10^{-1}		
Temp3	6.41×10^{-2a}	1.79×10^{-2}	-2.79×10^{-3}	-2.57×10^{-3}
Depth	4.04×10^{-2}	4.37×10^{-2}	6.76×10^{-3}	7.87×10^{-3}
Depth2	-2.07×10^{-4}	-2.09×10^{-4}		
Depth3	2.73×10^{-7}	2.59×10^{-7}		

Table S3: Environmental-only and spatial overlap models parameters β per variables (Table 1) and for each season. All coefficients are significant with $p < 0.001$, except for those marked with a letter as exposant. ^{a}: $p < 0.01$.

	Winter		Summer	
	ENV	ENV+SP	ENV	ENV+SP
C.Adu	7.24×10^{-1}	7.73×10^{-1}	1.02	9.80×10^{-1}
C.Juv			8.81×10^{-1a}	9.37×10^{-1a}
NP.Tot	1.17^a	1.41	9.37×10^{-1a}	9.51×10^{-1a}
BW.Tot			7.64×10^{-1}	7.12×10^{-1}
HG.Adu	1.33	1.28		
HG.Juv	-7.94×10^{-1}	-1.11	-8.23×10^{-1}	-9.16×10^{-1}
FSpp	-1.54	-1.02	-1.34	-1.09
Gpp				
Ppp				
Lpp				
Temp	1.07×10^{1a}		1.63	1.65
Temp2	$-1.91\ ^a$		-7.04×10^{-2}	-7.19×10^{-2}
Temp3	1.08×10^{-1}			
Depth	5.53×10^{-2}	2.75×10^{-2}	6.78×10^{-2}	6.03×10^{-2}
Depth2	-2.00×10^{-4}	-3.88×10^{-5}	-2.53×10^{-4}	-2.12×10^{-4}
Depth3	2.31×10^{-7a}		2.91×10^{-7}	2.32×10^{-7a}