

**Enhancing the utility of known-biomass production models: a case study of the Bay of Biscay  
and Iberian Coast ecoregion**

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SUPPLEMENTARY MATERIAL

Table S1. – Model estimates (*a* and *b*) derived from single-species KBPM fits.

Stock	Parameters	Estimate	Std. error	<i>t</i> -value	Pr(>  <i>t</i>  )
Northern hake	<i>a</i>	1.195e+00	8.965e-02	13.334	< 2e-16
	<i>b</i>	-3.039e-06	3.751e-07	-8.103	4.8e-10
Southern hake	<i>a</i>	1.249e+00	9.913e-02	12.601	1.45e-14
	<i>b</i>	-1.974e-05	2.846e-06	-6.935	4.63e-08
Northern anglerfish	<i>a</i>	1.201e+00	1.548e-01	7.758	6.14e-09
	<i>b</i>	-1.346e-05	3.224e-06	-4.175	0.000204
Southern anglerfish	<i>a</i>	1.020e+00	1.302e-01	7.835	1.58e-09
	<i>b</i>	-6.960e-05	1.331e-05	-5.229	6.07e-06
Northern megrim	<i>a</i>	4.082e-01	5.823e-02	7.011	3.7e-08
	<i>b</i>	-1.343e-06	8.211e-07	-1.636	0.111
Southern megrim	<i>a</i>	3.495e-01	6.961e-02	5.021	1.73e-05
	<i>b</i>	-2.260e-05	3.796e-05	-0.595	0.556

Table S2. – Model estimates (*a* and *b*) derived from the retrospective analysis by removing three years at a time (2020-2017-2014-2011-2008-2005) from northern hake.

Time period	Parameters	Estimate	Std. error	<i>t</i> -value	Pr(>  <i>t</i>  )
1978-2017	<i>a</i>	1.230e+00	8.726e-02	14.099	< 2e-16
	<i>b</i>	-3.057e-06	3.604e-07	-8.483	2.68e-10
1978-2014	<i>a</i>	1.247e+00	8.847e-02	14.092	5.41e-16
	<i>b</i>	-3.087e-06	4.238e-07	-7.285	1.64e-08
1978-2011	<i>a</i>	1.228e+00	9.786e-02	12.547	6.72e-14
	<i>b</i>	-2.766e-06	6.499e-07	-4.255	0.00017
1978-2008	<i>a</i>	1.935e+00	1.132e-01	17.100	< 2e-16
	<i>b</i>	-1.535e-05	1.684e-06	-9.115	5.18e-10
1978-2005	<i>a</i>	1.913e+00	1.206e-01	15.863	6.91e-15
	<i>b</i>	-1.518e-05	1.761e-06	-8.621	4.23e-09

Table S3. – Model estimates ( $a$  and  $b$ ) derived from multispecies KBPM fit, aggregating stocks in southern and northern ICES areas, and also the global one (both areas).

Stock	Parameters	Estimate	Std. error	$t$ -value	Pr(>  $t$  )
South	$a$	1.262e+00	7.915e-02	15.944	3.43e-16
	$b$	-2.099e-05	2.748e-06	-7.639	1.61e-08
North	$a$	9.304e-01	4.957e-02	18.770	< 2e-16
	$b$	-1.354e-06	1.509e-07	-8.979	2.95e-10
Global	$a$	9.336e-01	4.996e-02	18.686	< 2e-16
	$b$	-1.152e-06	1.531e-07	-7.525	2.7e-08

Table S4. – Model estimates ( $a$  and  $b$ ) derived from the original fit without an environmental covariable, and from the environmental fits (multiplicative and additive) with the observed SP values.

Stock	Parameters	Estimate	Std. error	$t$ -value	Pr(>  $t$  )
Additive: Equation (3)	$a$	1.250e+00	9.421e-02	13.268	3.10e-16
	$b$	-3.322e-06	4.075e-07	-8.152	4.93e-10
	$c$	3.015e+04	1.868e+04	1.614	0.114
Multiplicative: Equation (4)	$a$	1.248e+00	8.599e-02	14.509	< 2e-16
	$b$	-3.392e-06	3.631e-07	-9.341	1.33e-11
	$c$	6.358e-01	2.546e-01	2.498	0.0167