

Supplementary Information (SI) for

**Forecasting size-at-maturity shifts under global warming: A case study on European hake, a widely distributed species**

*Reviews in Fish Biology and Fisheries*

David José Nachón\*, E. Ramírez-Romero, A. Paz, M. Cousido-Rocha, F. Izquierdo, M<sup>a</sup>. G. Pennino, & S. Cerviño

**\*Corresponding author:** Instituto Español de Oceanografía (IEO-CSIC), Centro Oceanográfico de Vigo, Subida a Radio Faro, 50–52, 36390 Vigo, Pontevedra, Spain.

[davidjose.nachon@gmail.com](mailto:davidjose.nachon@gmail.com)

**This pdf file includes:**

- **Online Resource 8** Table summarizing model comparisons for generalised additive models (GAMs) predicting European hake size-at-maturity with temperature (SST and SBT, °C; tested as raw values and with 1- and 2-year lags), sex (males, combined, females), area (Atlantic Ocean and Mediterranean Sea), ecogeographic/thermal zone (North European Atlantic Ocean, South European Atlantic Ocean and Mediterranean Sea) and a smooth tensor product between longitude and latitude [te(lon, lat)] as predictors. The symbol s denotes the spline applied to the predictor. The best model, selected based on low AIC values and a high deviance explained, is shown

**Online Resource 8** Model comparisons for generalised additive models (GAMs) predicting European hake size-at-maturity with temperature (SST and SBT, °C; tested as raw values and with 1- and 2-year lags), sex (males, combined, females), area (Atlantic Ocean and Mediterranean Sea), ecogeographic/thermal zone (North European Atlantic Ocean, South European Atlantic Ocean and Mediterranean Sea) and a smooth tensor product between longitude and latitude [te(lon, lat)] as predictors. The symbol s denotes the spline applied to the predictor. The best model, selected based on low AIC values and a high deviance explained, is shown

| Model                                                                     | Deviance explained | AIC      |
|---------------------------------------------------------------------------|--------------------|----------|
| Size-at-maturity ~ te (lat, long)                                         | 0.464              | 1773.806 |
| Size-at-maturity ~ te (lat, long) + Sex                                   | 0.798              | 1513.558 |
| Size-at-maturity ~ te (lat, long) + Sex + s(SBT <sub>y-2</sub> , k = 4)   | 0.811              | 1487.308 |
| Size-at-maturity ~ te (lat, long) + Sex + SBT <sub>y-2</sub> <sup>a</sup> | 0.811              | 1487.308 |

<sup>a</sup> Following a series of forward steps, the final model retained a linear effect for SST (since the spline term did not improve model fit or reveal significant deviations from linearity).