**Table S1.** Variance Inflation Factor (VIF) results for the variables used in modelling *P. blennoides* habitat. VIF values > 3 are highlighted in bold. (2) indicates the VIF after removing one of the variables with values >3. Since all remaining variables have values <3, they were retained for modelling.

| Variable | Description | VIF | VIF (2) |
|---|---|---|---|
| Depth | Mean depth of the haul (m) | 2.648 | 2.480 |
| Slope | Mean slope of the haul (º) | 1.931 | 1.884 |
| Organic matter | Organic matter sediment (%) | 1.645 | 1.240 |
| Mud | Mud sediment (%) | **12.013** | ----- |
| Fine sand | Fine sand sediment (%) | **20.808** | 1.796 |
| Coarse sand | Coarse sand sediment (%) | **27.130** | 1.881 |
| Temperature | Temperature at the bottom (ºC) | 1.895 | 1.894 |
| Salinity | Salinity at the bottom | 1.251 | 1.251 |

**Table S2.** Correlation coefficients of the explanatory variables after applying VIF (see Table S1). No absolute correlation value was >0.7 and all variables were retained.

| | Depth | Slope | Organic matter | Mud | Coarse sand | Temperature | Salinity |
|---|---|---|---|---|---|---|---|
| Depth | | -0.61 | -0.14 | -0.16 | 0.21 | 0.63 | 0.03 |
| Slope | | | 0.26 | 0.14 | 0.11 | -0.39 | -0.15 |
| Organic matter | | | | 0.34 | -0.05 | -0.16 | -0.16 |
| Mud | | | | | -0.65 | 0.00 | 0.18 |
| Coarse sand | | | | | | 0.03 | -0.30 |
| Temperature | | | | | | | 0.41 |
| Salinity | | | | | | | |

**Table S3.** P-values of the spatial autocorrelation analysis conducted using Moran's I to test the dependence among hauls of the same survey. All values were >0.05*.

| Year | Presence-Absence | Abundance | Biomass |
|---|---|---|---|
| 1998 | 0.99 | 0.99 | 0.99 |
| 1999 | 0.46 | 0.48 | 0.25 |
| 2000 | 0.82 | 0.89 | 0.72 |
| 2001 | 0.82 | 0.97 | 0.87 |
| 2002 | 0.64 | 0.73 | 0.86 |
| 2003 | 0.98 | 0.46 | 0.70 |
| 2004 | 0.70 | 0.35 | 0.48 |
| 2005 | 0.86 | 0.86 | 0.87 |
| 2006 | 0.52 | 0.74 | 0.77 |
| 2007 | 0.52 | 0.91 | 0.96 |
| 2008 | 0.84 | 0.82 | 0.99 |
| 2009 | 0.81 | 0.92 | 0.80 |
| 2010 | 0.75 | 0.97 | 0.84 |
| 2011 | 0.89 | 0.92 | 0.96 |
| 2012 | 0.58 | 0.77 | 0.96 |
| 2013 | 0.88 | 0.81 | 0.98 |
| 2014 | 0.90 | 0.80 | 0.72 |
| 2015 | 0.84 | 0.97 | 0.71 |
| 2016 | 0.95 | 0.62 | 0.46 |
| 2017 | 0.87 | 0.66 | 0.63 |
| 2018 | 0.69 | 0.68 | 0.79 |
| 2019 | 0.81 | 0.44 | 0.44 |

* A value greater than 0.05 indicates that the observed data pattern can be considered randomly distributed, indicating no statistically significant spatial autocorrelation. Therefore, spatial correlation does not need to be considered in the model selection for the spatial scale analysed in this study.

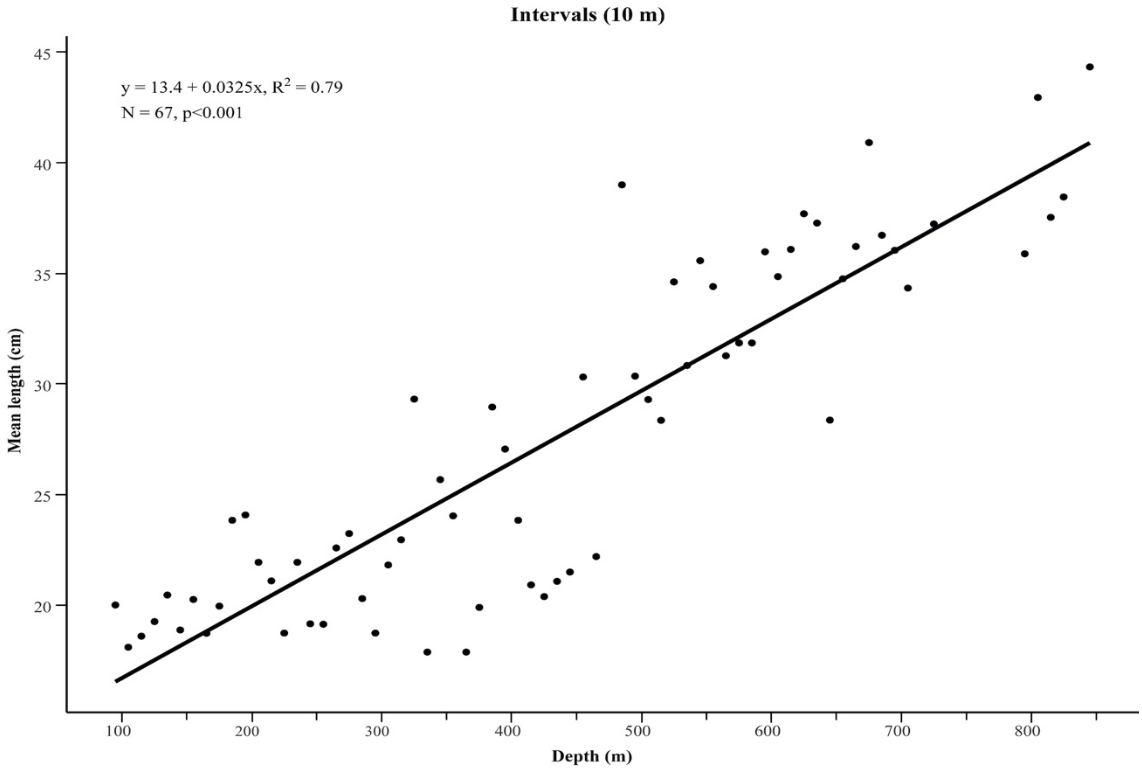


**Fig S1.** Relationship between mean length of *Phycis blennoides* specimens and depth of capture. Linear regression equation describing depth-size trend obtained in this study is shown.

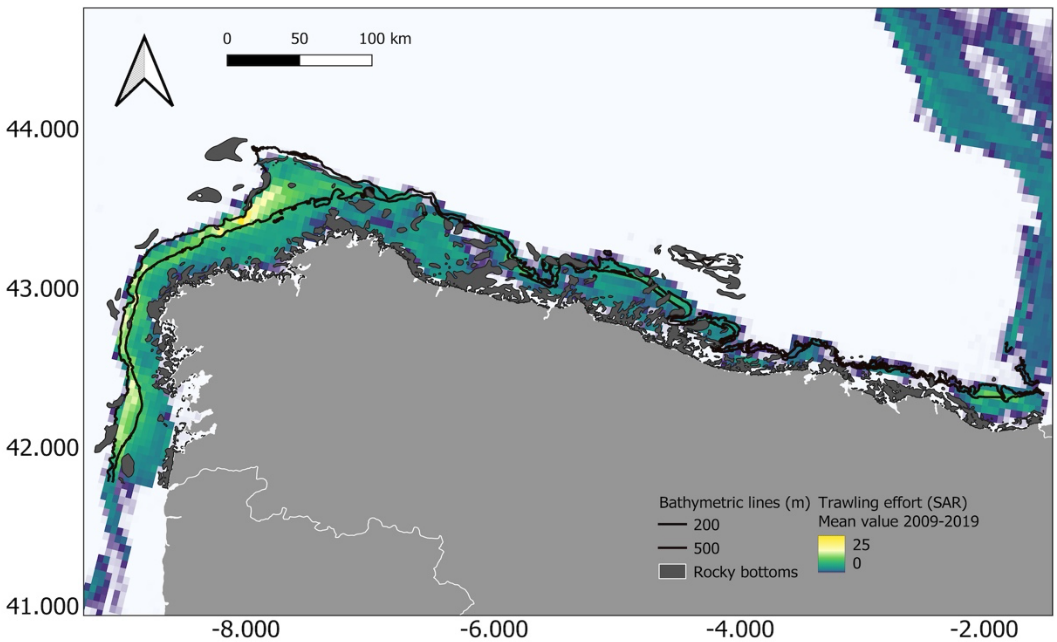


**Fig S2.** Trawling fishing effort data (2009-2019) used in the mean body size model.

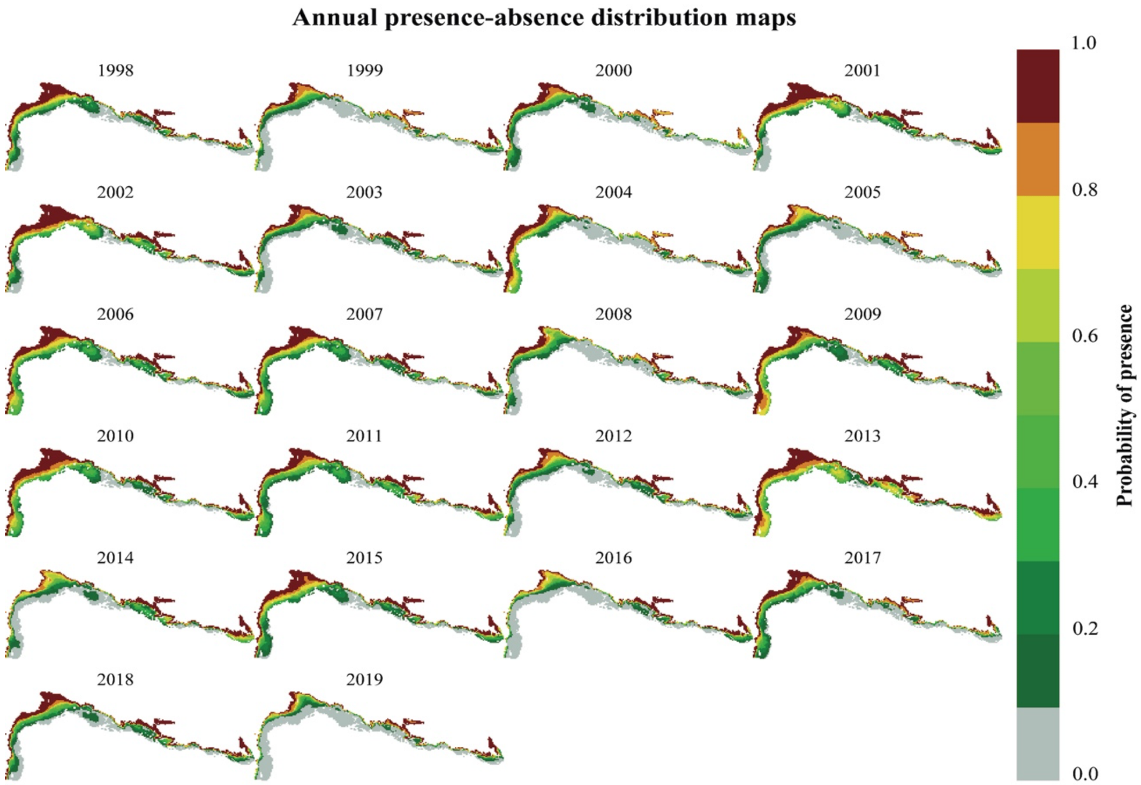


**Fig S3.** Distribution maps of the probability of presence of *Phycis blennoides* ($Pr_p$) during the study period (1998-2019).

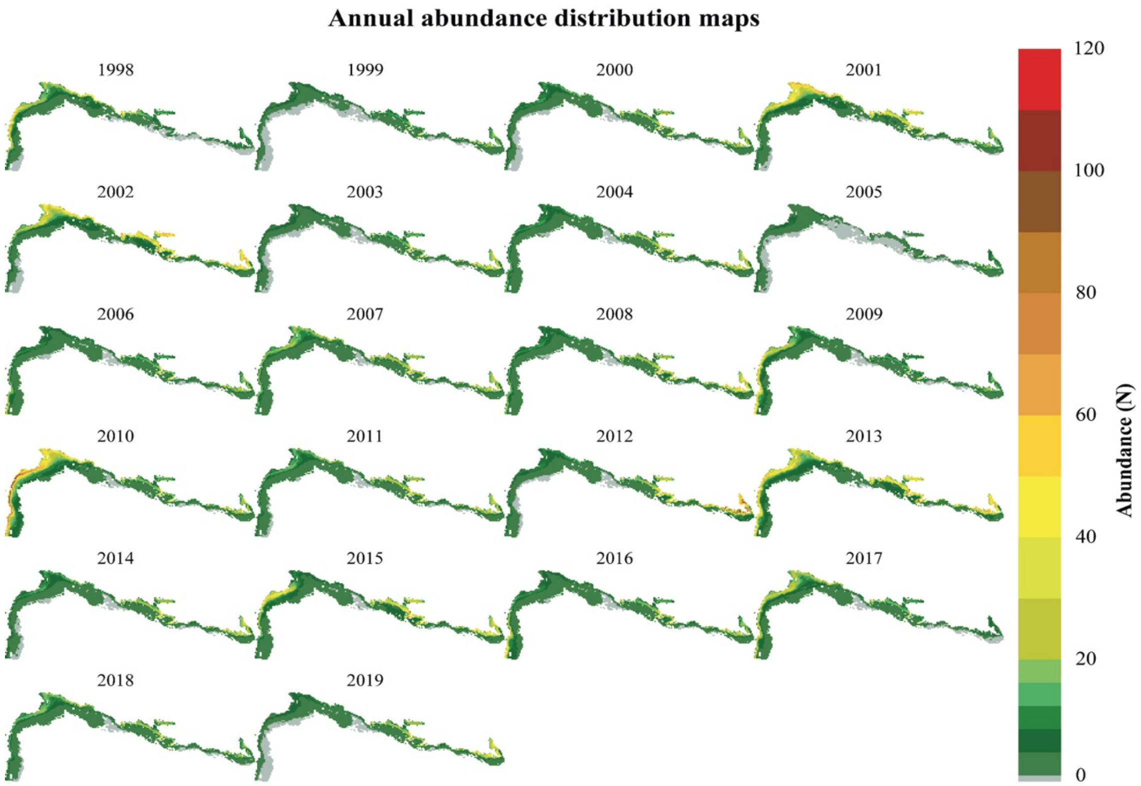


**Fig. S4.** Distribution maps of the abundance of *Phycis blennoides* in presence areas ($Pr_a$) during the study period (1998-2019).

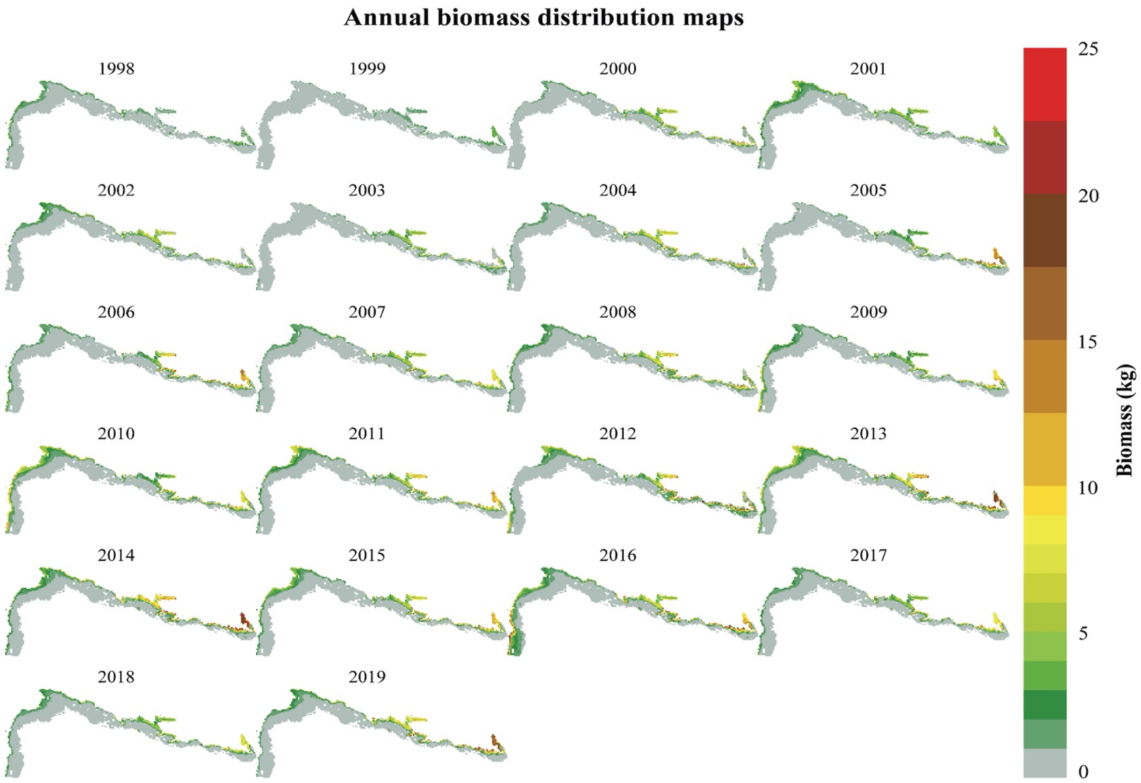


**Fig. S5.** Distribution maps of the biomass of *Phycis blennoides* in presence areas ($Pr_b$) during the study period (1998-2019).

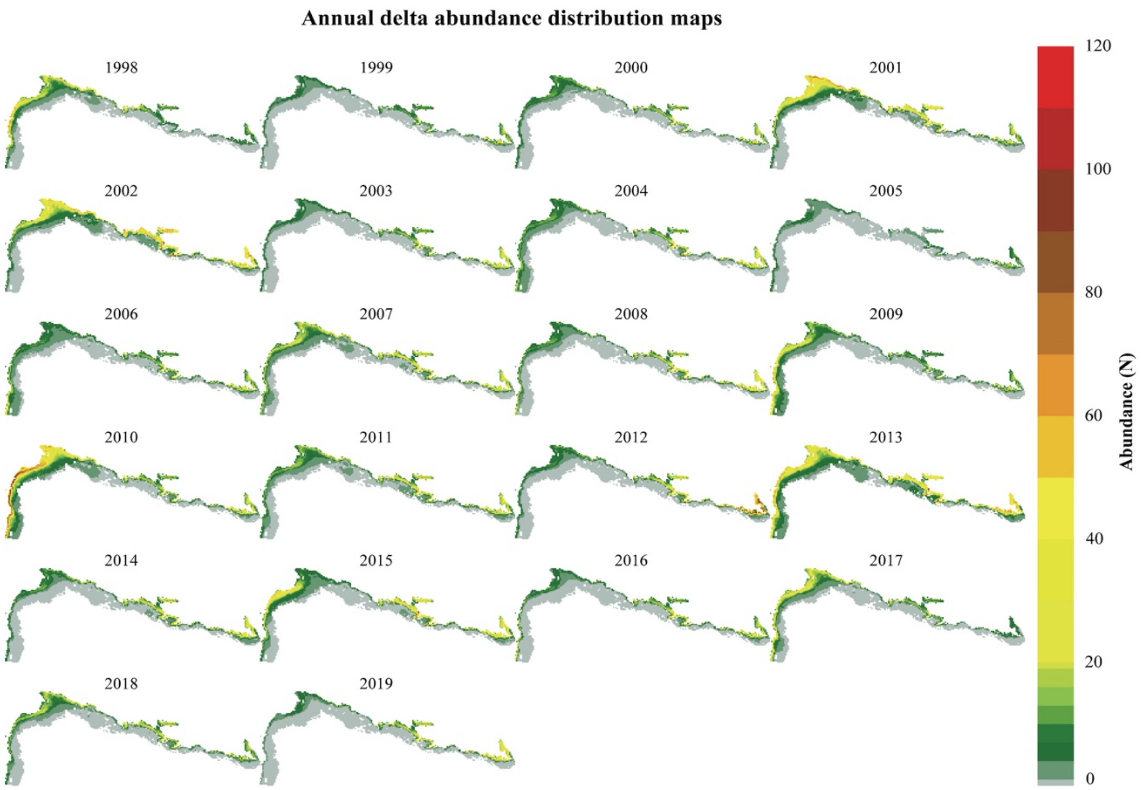


**Fig. S6.** Distribution maps of the abundance of *Phycis blennoides* in the delta model ($Pr_p$ x $Pr_a$) during the study period (1998-2019).

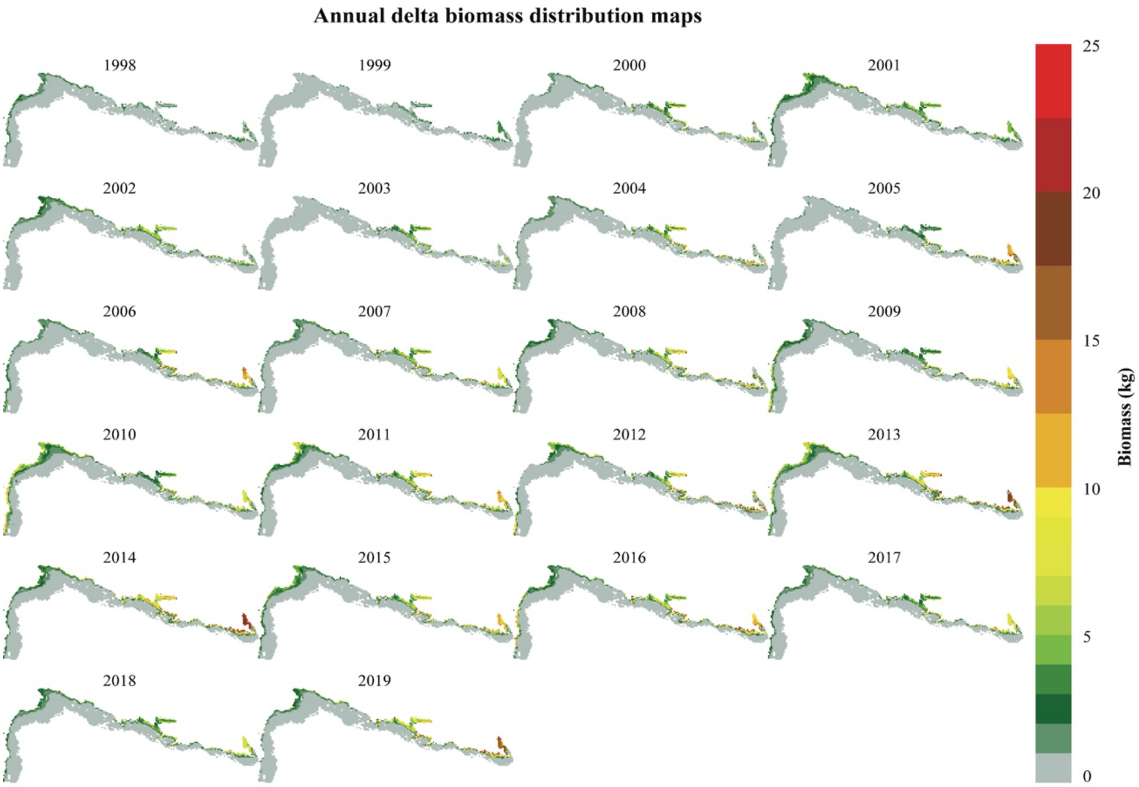


**Fig. S7.** Distribution maps of the biomass of *Phycis blennoides* in the delta model ($Pr_p$ x $Pr_b$) during the study period (1998-2019).

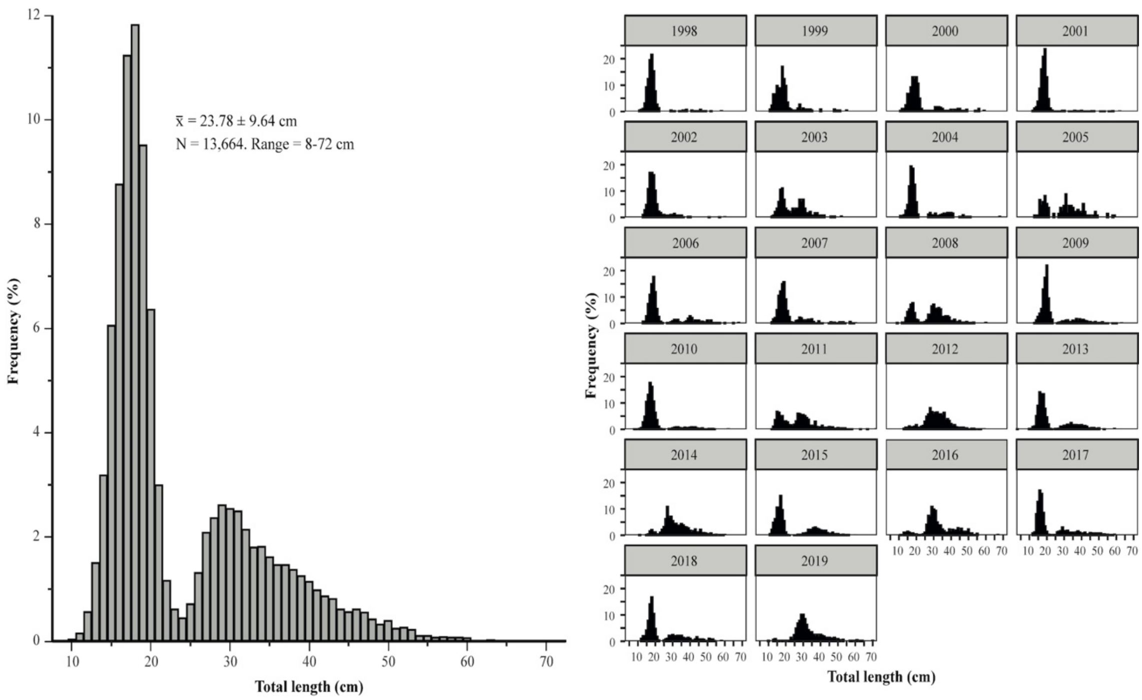


**Fig. S8.** Length frequency distribution of *Phycis blennoides*: Overall (1998-2019) (left); Annual (right).

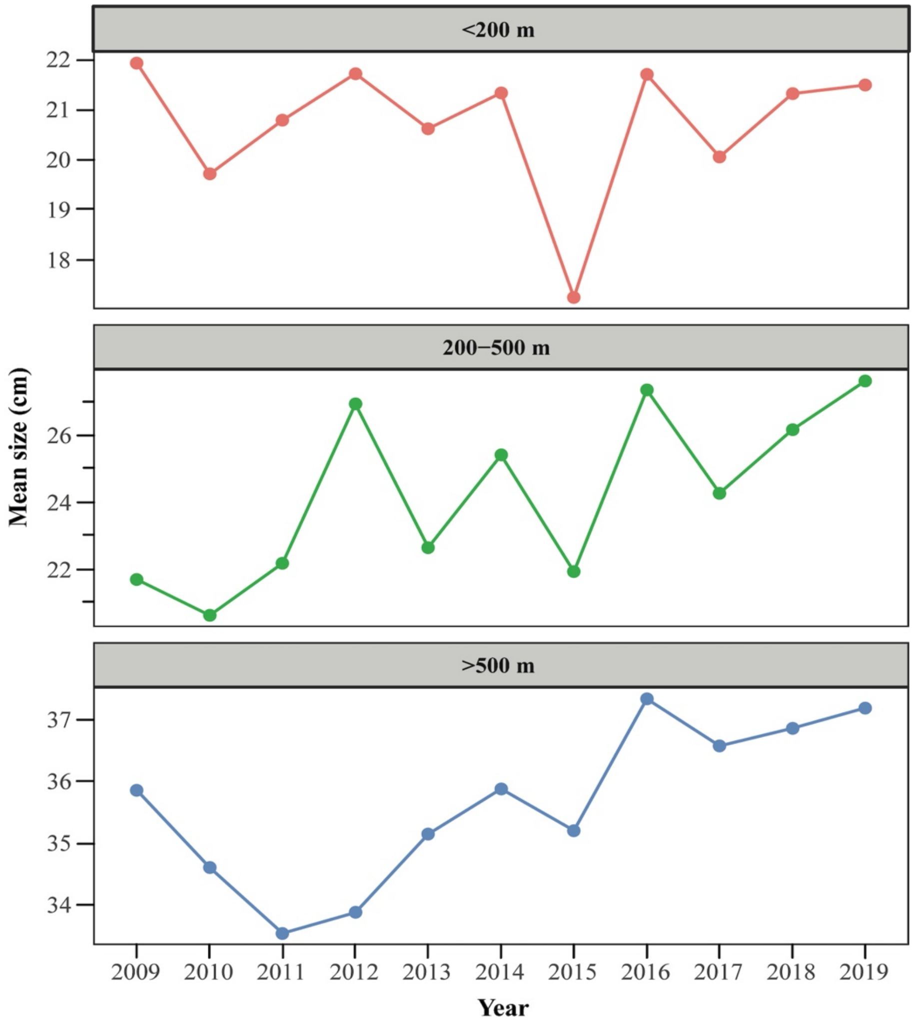


**Fig. S9.** Yearly evolution of the mean size of *Phycis blennoides* by depth strata.