

Supplementary Material

Supplementary Table 1. Variance Inflation Factor (VIF) for each variable.

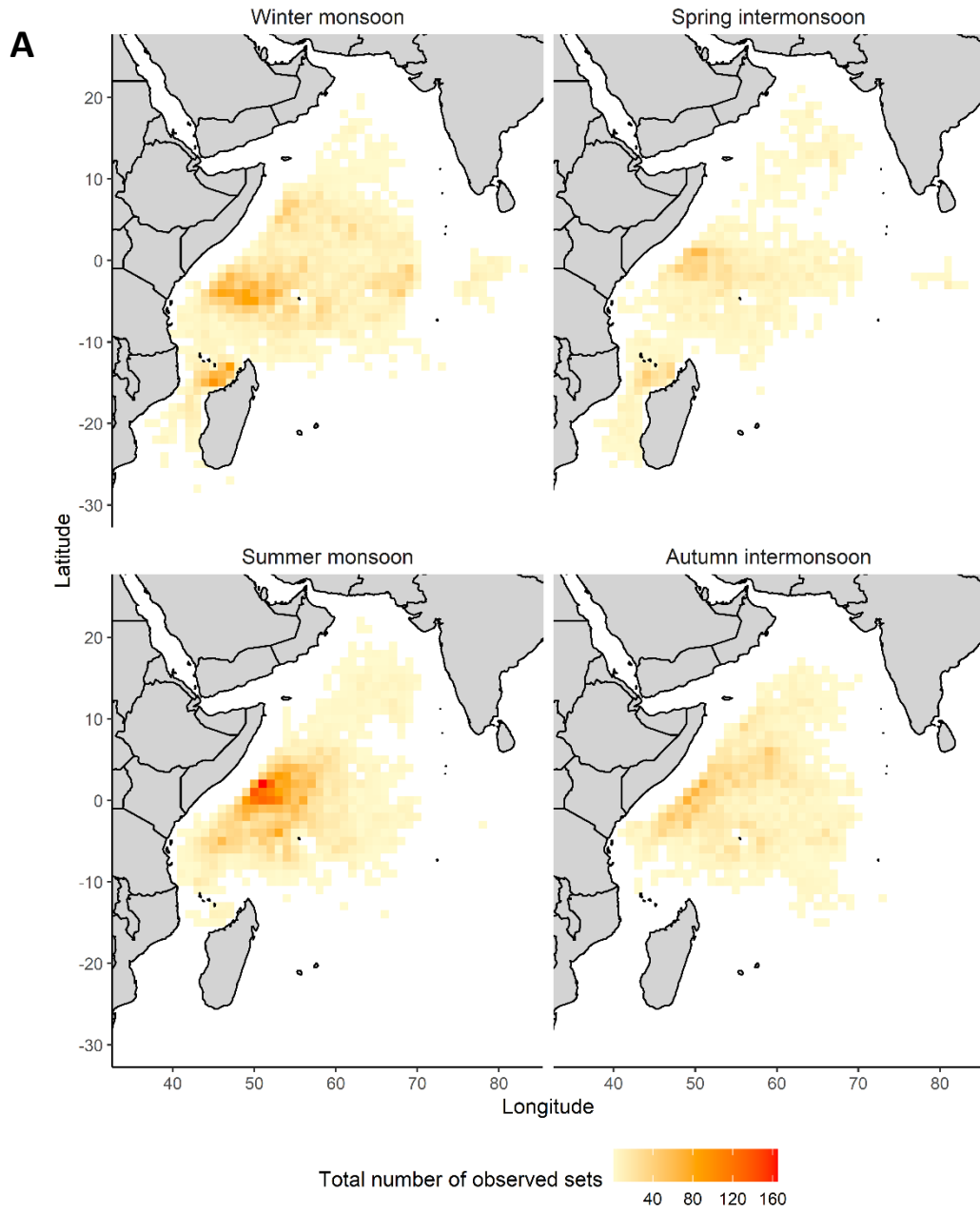
Variable	VIF
Latitude	3.941
Longitude	1.901
Target tuna catch	1.079
Total bycatch	1.076
Year	2.061
Week	1.340
Hours from sunrise	1.042
Chlfronts	1.194
NO ₃	2.282
NPPV	3.014
O ₂	3.074
PO ₄	3.549
Si	2.995
MLD	1.333
Salinity	2.728
SST	3.553
SSH	1.523
SSTfronts	1.042
Ke	1.139
Heading	1.066
Depth	1.530
Distance to seamount	1.048

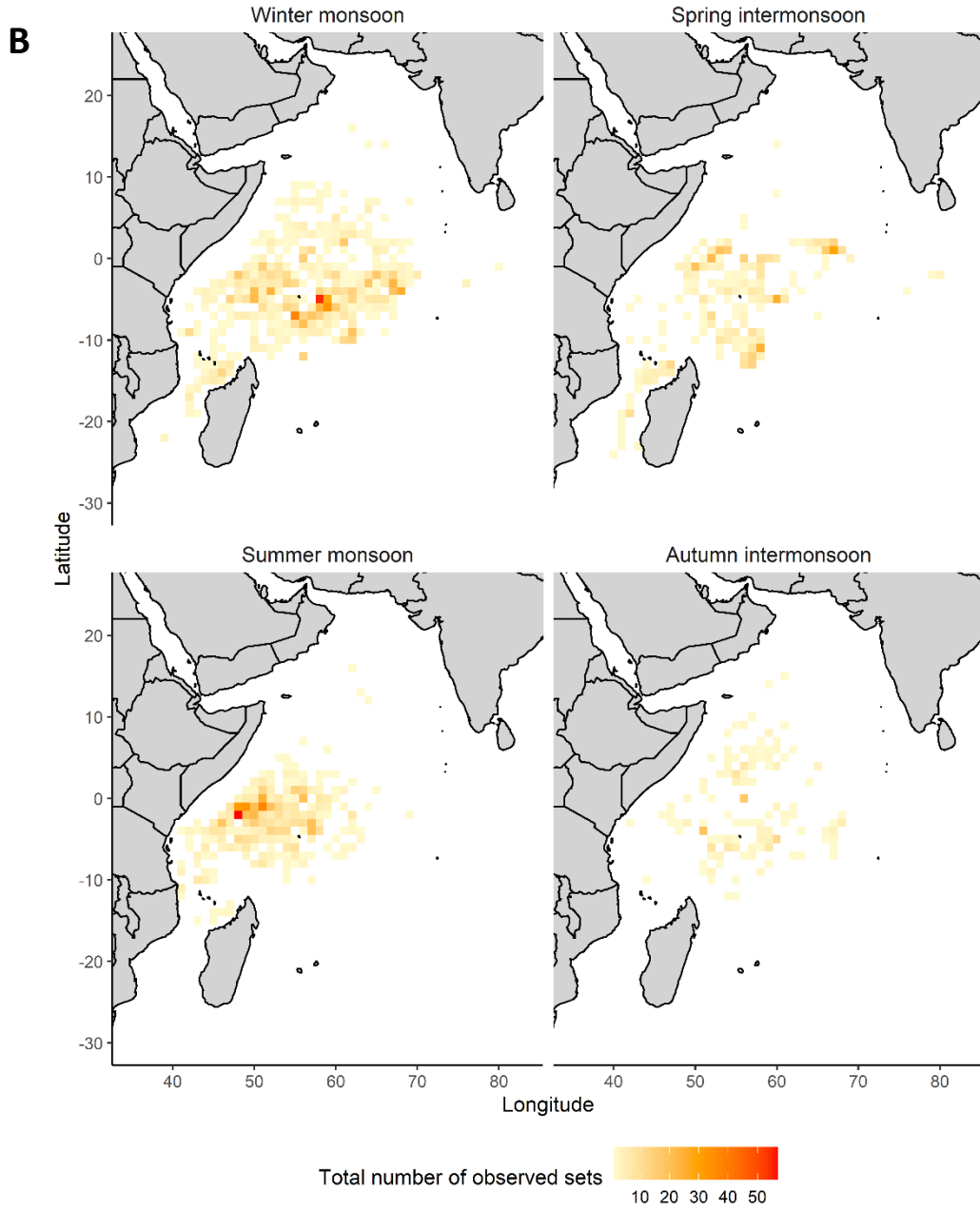
Supplementary Table 2. The piece-wise construction of the best model with each new variable improving the AIC value.

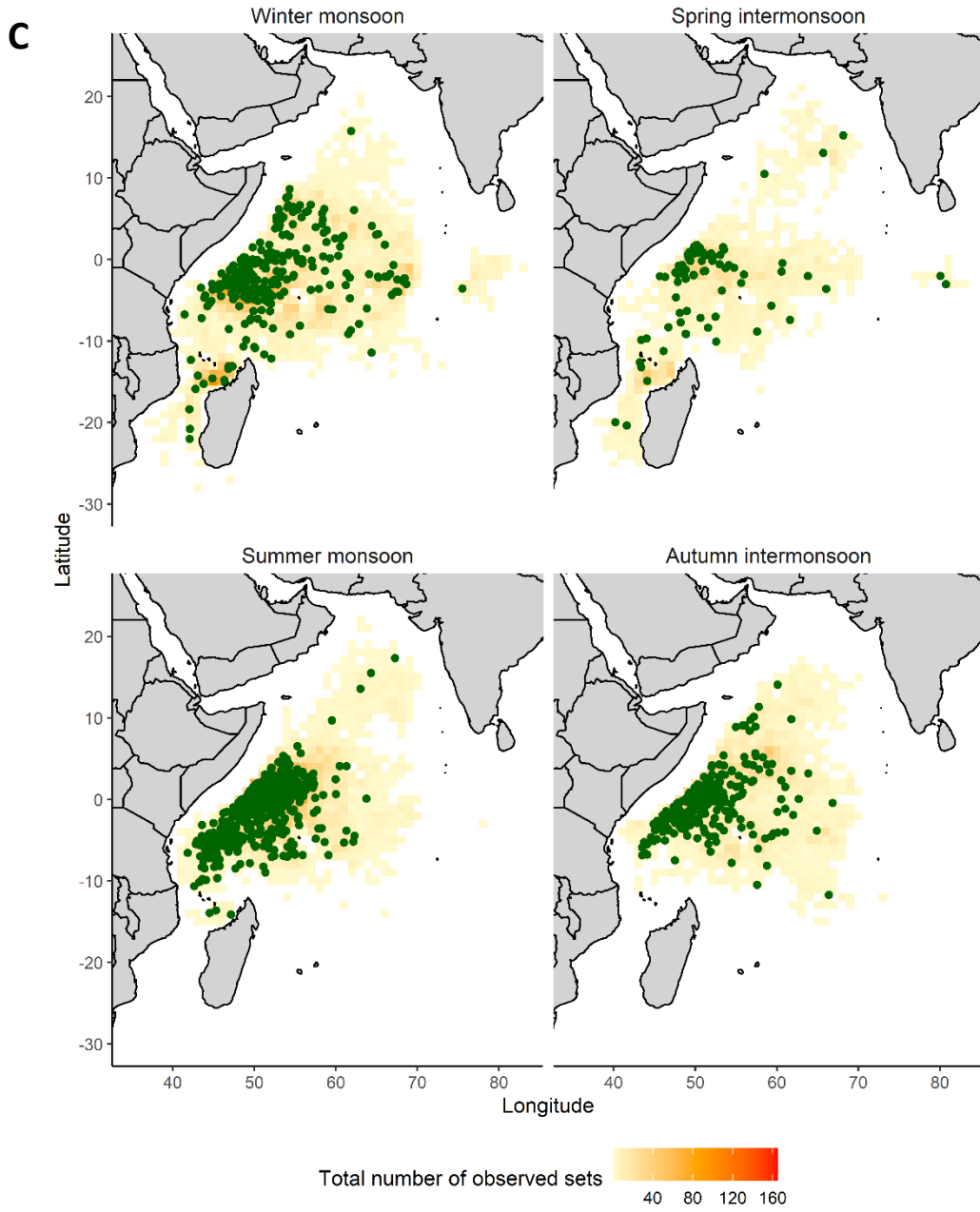
Variables	AIC
Latitude * Longitude	9199.364
Latitude * Longitude + SST	9043.117
Latitude * Longitude + SST + Year	8969.637
Latitude * Longitude + SST + Year + Set type	8933.439
Latitude * Longitude + SST + Year + Set type + Target tuna catch	8907.759
Latitude * Longitude + SST + Year + Set type + Target tuna catch + Week	8895.117
Latitude * Longitude + SST + Year + Set type + Target tuna catch + Week + NO ₃	8891.513

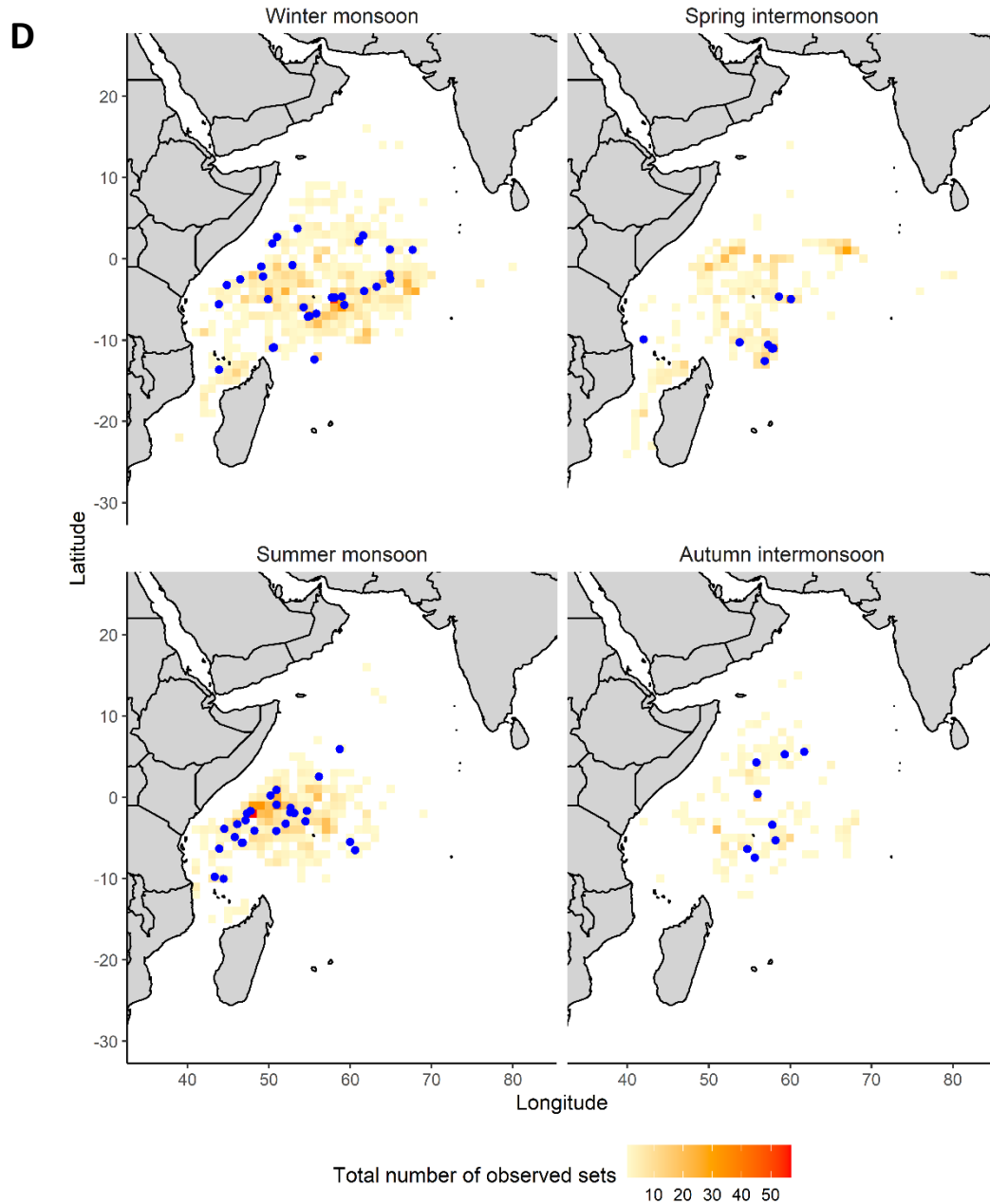
Supplementary Table 3. Individual contribution of each variable (explained deviance) running the univariate binomial GAM model separately.

Variable	Explained deviance
Latitude * Longitude	5.30 %
Year	1.19 %
Week	1.21 %
Set type	0.55 %
Target tuna catch	0.70 %
Sea surface temperature	3.55 %
Nitrate	1.39 %

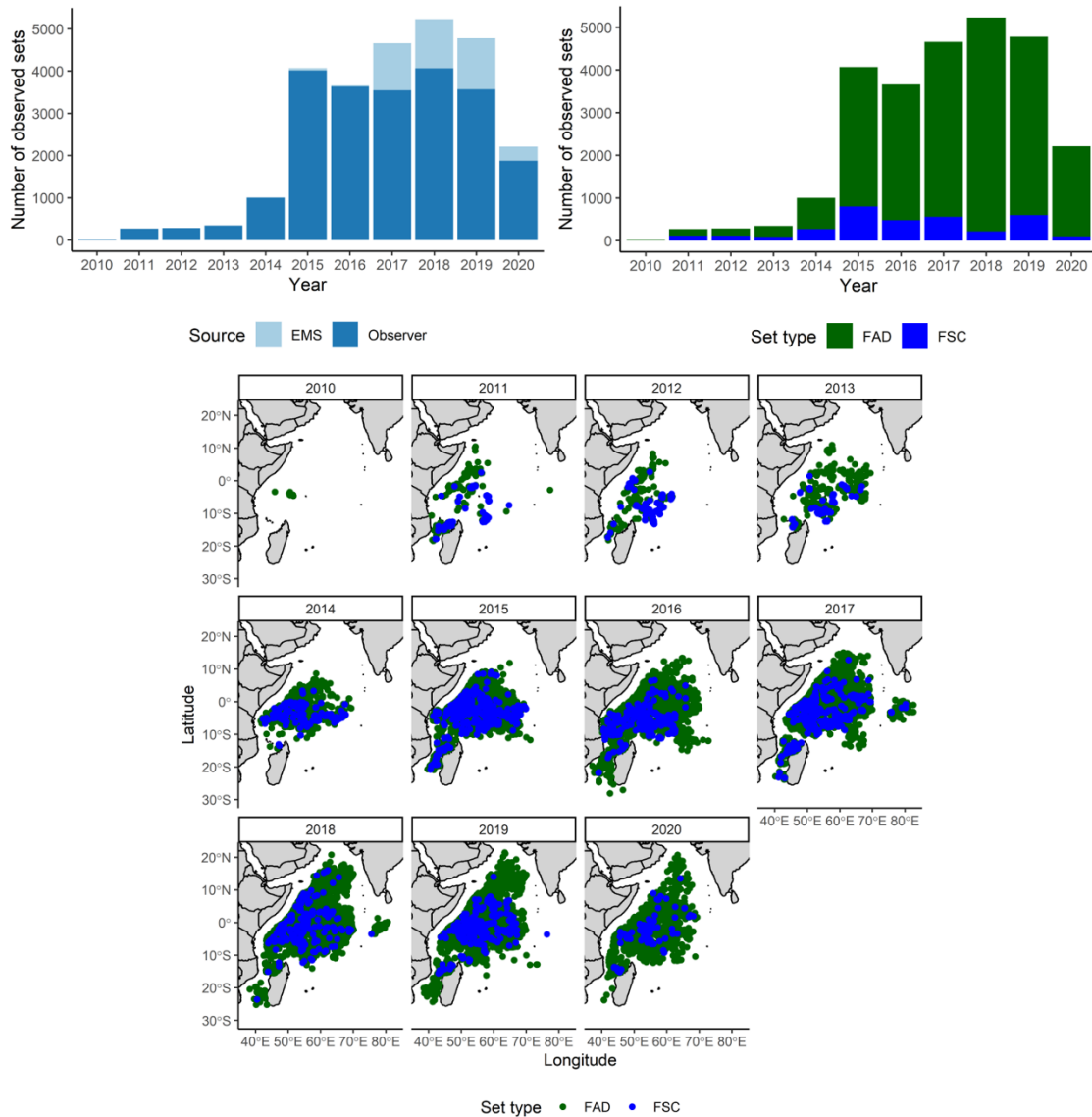




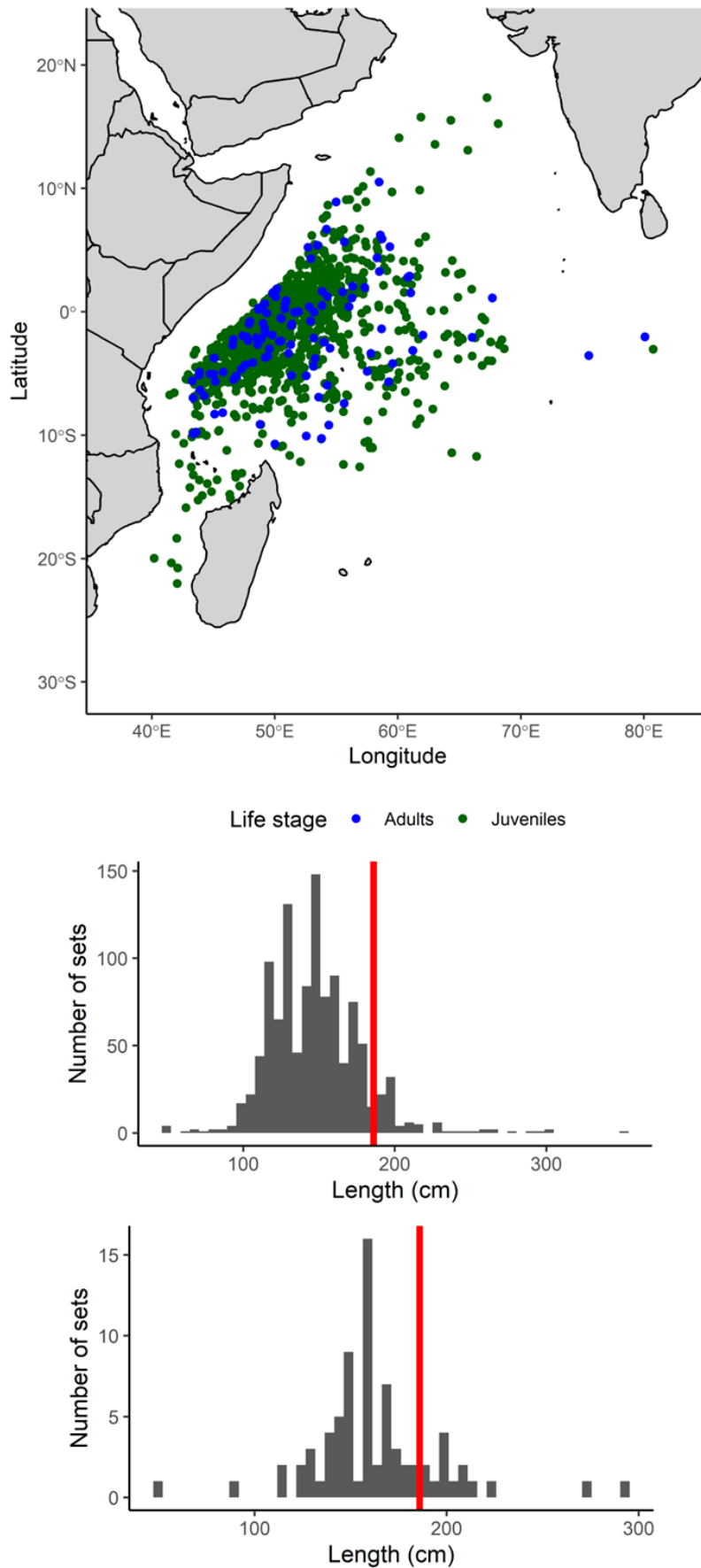




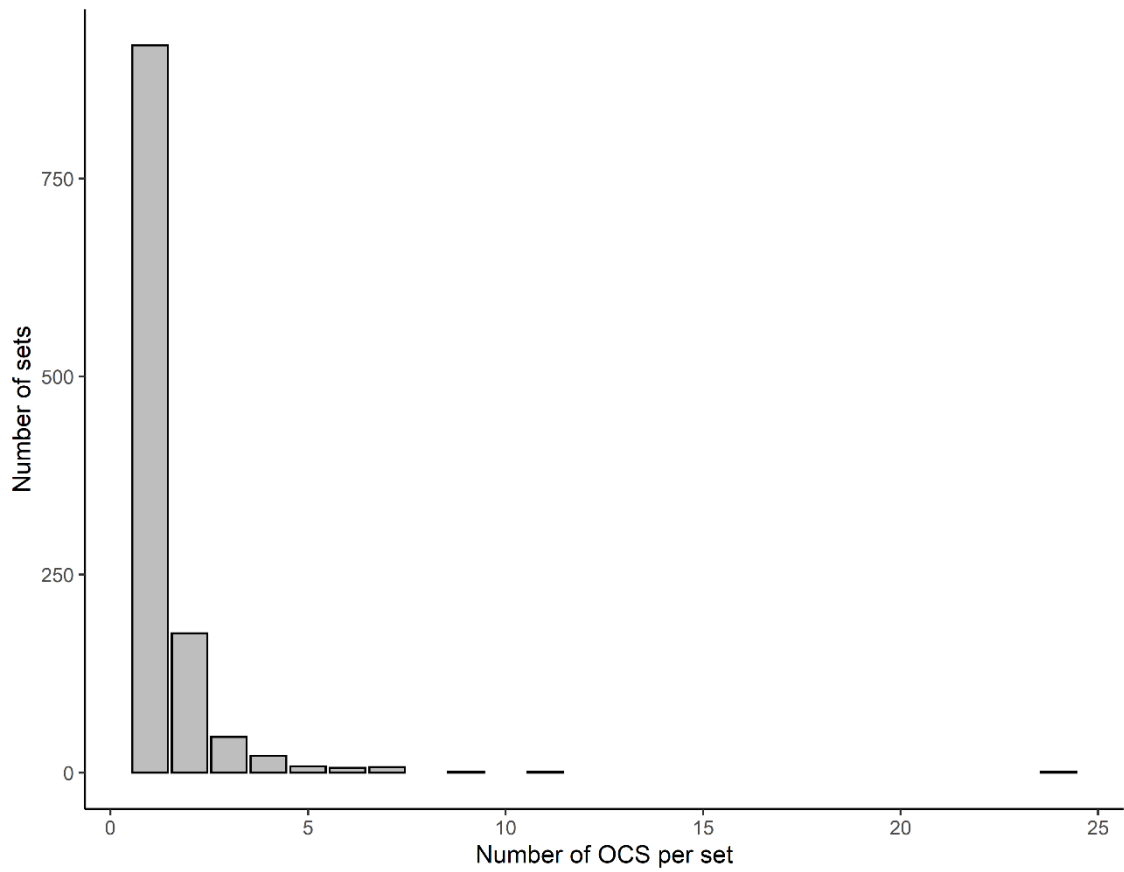
Supplementary Figure 1. Spatial distribution of the cumulative effort (observed sets) in the EU and associated flags purse seine fishery from 2010-2020 and observed presences with oceanic whitetip shark catch by monsoon regimes: winter monsoon (December-March), spring intermonsoon (April and May), summer monsoon (June-September) and autumn intermonsoon (October and November). **(A)** Spatial distribution of observed FAD sets. **(B)** Spatial distribution of observed FSC sets. **(C)** Spatial distribution of observed FAD sets and observed presences with oceanic whitetip shark catch (green dots). **(D)** Spatial distribution of observed FSC sets and observed presences with oceanic whitetip shark catch (blue dots).



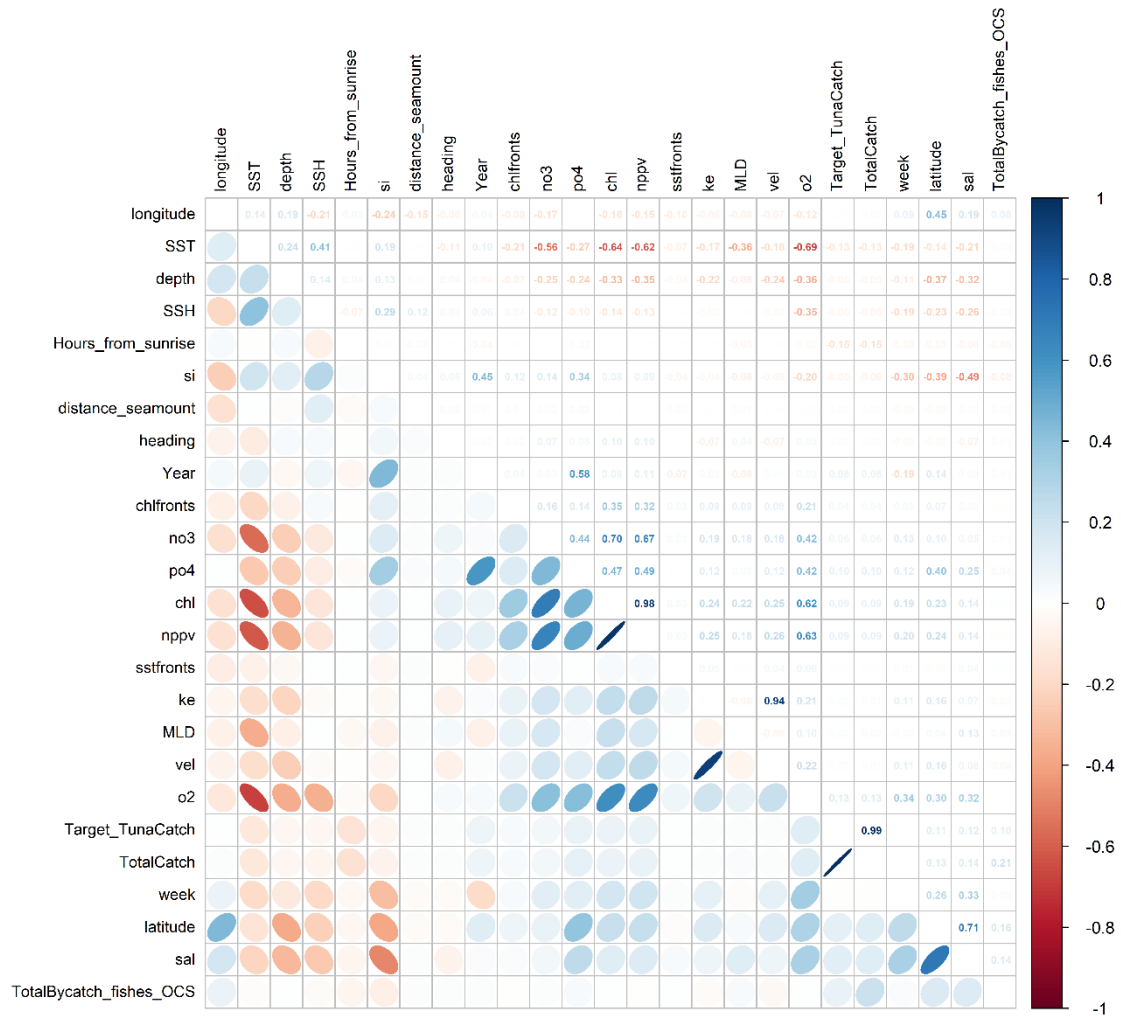
Supplementary Figure 2. Temporal and spatial distribution of the observed sets in the EU and associated flags purse seine fishery from 2010-2020. (A) Total number of observed sets per year by human observers and Electronic Monitoring System (EMS). (B) Total number of observed sets per year by set type (FAD and FSC). (C) Spatial distribution of the observed sets per year and set type (FAD, FSC).



Supplementary Figure 3. Observed life stages and length distributions of oceanic whitetip shark. (A) Spatial distribution of observed oceanic whitetip shark catches by life stages (adults and juveniles). (B) Mean length frequency distribution of oceanic whitetip shark in observed FAD sets. (C) Mean length frequency distribution of oceanic whitetip shark in observed FSC sets. Vertical red line indicates the length at maturity (186 cm) for oceanic whitetip shark.



Supplementary Figure 4. Distribution of the number of oceanic whitetip shark captured per set. Only observed sets with presence of oceanic whitetip shark are included.



Supplementary Figure 5. Pearson's correlation test for all the explanatory variables.

Supplementary Animation 1. Sea Surface Temperature (SST) weekly mean values (2010-2020) in the western Indian Ocean.

Supplementary Animation 2. Nitrate concentration weekly mean values (2010-2020) in the western Indian Ocean.