elena.fontanesi2@gmail.com

Bottlenose dolphin (*Tursiops truncatus*) habitat partitioning in relation to age-classes in the Western Ligurian Sea

Fontanesi E.[1], Ascheri D.[1], Salvioli F.[1], Bertulli C.G.[1], McGinty N.[2]

1 Delfini del Ponente APS, Italy; **2** Department of Oceanography, Dalhousie University, Canada

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INTRODUCTION AND AIM

The Western Ligurian Sea has recently shown an increase in the occurrence of bottlenose dolphins (Ascheri *et al*. 2022) and an understanding of their habitat use in the area is lacking. This work aims at:

- assessing the existence of age class partitioning among bottlenose dolphin groups using species distribution models.

METHODS

- Systematic surveys (n=237) between April 2018-December 2021;
- Photo-ID data used to categorise groups as adults and sub-adults only (A), groups including calves (C) and groups with newborns (N);
- Ensemble modelling approach (BIOMOD; Thuiller *et al*. 2009) to describe and predict each groups' distribution;
- 7 environmental predictors included in the final models: SST, chlorophyll-a concentration, bathymetry, aspect, distance to 200 m, bottom type, slope.

RESULTS

	ROC					TSS				
	ANN	GAM	GBM	GLM	MAXENT	ANN	GAM	GBM	GLM	MAXENT
N groups	0.68	0.82	1.00	0.84	0.85	0.35	0.54	0.99	0.56	0.59
C groups	0.66	0.74	0.99	0.74	0.78	0.31	0.38	0.95	0.38	0.43
A groups	0.66	0.77	0.99	0.76	0.83	0.34	0.43	0.94	0.43	0.54

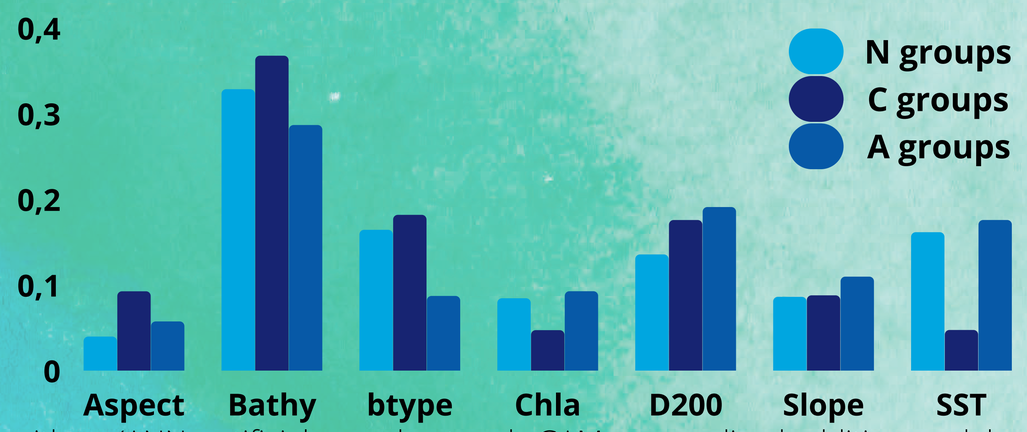
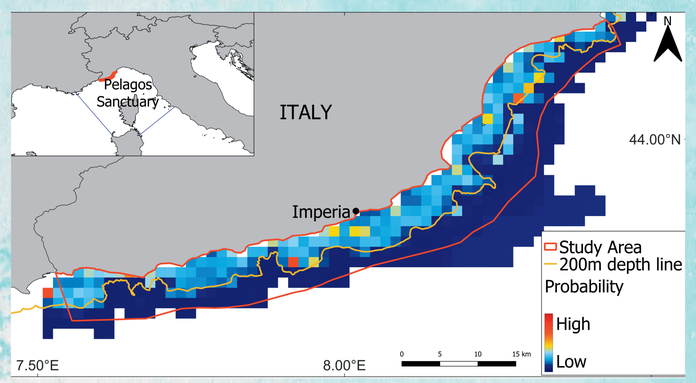


Table 1. The receiver operating characteristic (ROC) and the true skill statistics (TSS) for the five model algorithms (ANN- artificial neural network, GAM - generalised additive model, GBM - generalised boosted model, GLM -generalised linear model, MAXENT- Maximum Entropy). **Fig 1.** Histogram showing the relative importance of predictors among the groups.

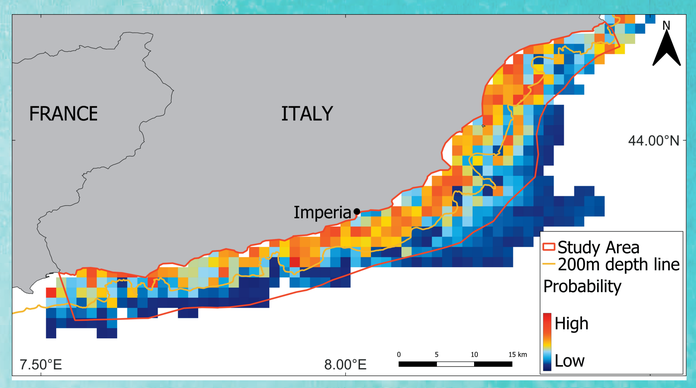
N GROUPS



n=35 sightings; mean group size = 18.80, sd=8.83

- few cells with high probability predicted;
- general pattern of higher distribution in a restricted area between the coast and the shelf break.

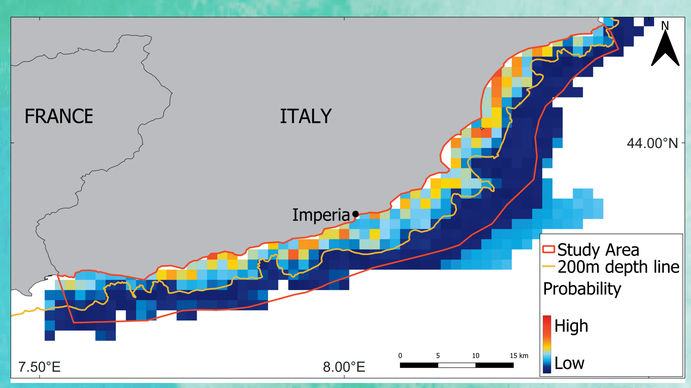
C GROUPS



n=62 sightings; mean group size = 14.76, sd=9.46

- high probability cells evenly distributed on the whole continental platform;
- high probability forecasted also close to the shelf break.

A GROUPS



n=49 sightings; mean group size = 3.16, sd=1.99

- groups size significantly different from both N and C groups;
- high probability cells located close to shore;
- probability decreasing moving offshore.

CONCLUSIONS

- The use of BIOMOD allows the identification of differences in the distribution of age-class groups;
- partitioning of habitat use within the bottlenose dolphin population exists despite the narrow continental shelf platform;
- spatial partioning might reflect the different needs and existing local pressures affecting bottlenose dolphin age classes;
- this information is valuable for a better management and conservation of *T. truncatus* in the area.

References: -Thuiller W., Lafourcade B., Engler R., and Araújo M.B. 2009. "BIOMOD – a Platform for Ensemble Forecasting of Species Distributions." Ecography 32 (3): 369–73.

-Ascheri D., Fontanesi E., Ballardini M., Nani B., and Alessi J. 2022. "Occurrence, Site Fidelity and Abundance of Bottlenose Dolphins (*Tursiops truncatus*) in the Western Ligurian Sea." J. Cetacean Res. Manage

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