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Winter Presence and Distribution of Cetacean Species in the NWMS

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Introduction

Cetaceans presence and distribution in the North-Western Mediterranean Sea (NWMS) is widely studied, with research effort focusing on the summer season. Currently, **knowledge on winter presence** is **scarce** and **scattered**.

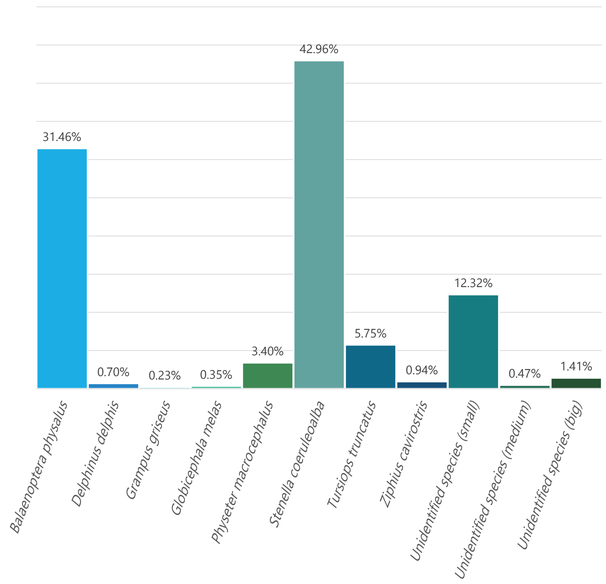
This work provides new information about **winter presence** and **habitat preferences** of cetaceans in NWMS and identifies **intra-basin differences** in species occurrence.

Materials and methods

- Data collected **from 2008 to 2020** during **winter**
- **Line transect surveys** along **fixed routes**
- **Study area**: NWMS
- **Subareas** defined: CW, SW, EAST, SSE
- In total: 281 surveys and 852 sightings
- **Environmental variables** sampled: depth, CHL, SST, EKE
- **Presence analysis** carried out computing **average ERs**
- **Habitat preference** analysis at different spatial scales using **GAMs** and **violin plots**

Results

- All **8** regular **species sighted** in the NWMS
- **Most** sighted species: **striped dolphin** and **fin whale**

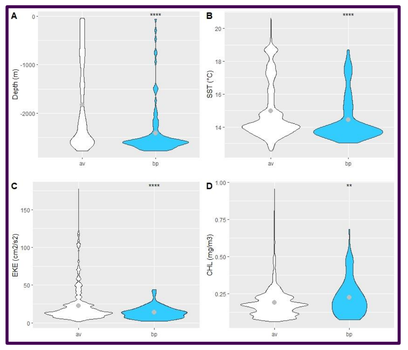


ERs of the species in the **NWMS** and in the **4 subareas**

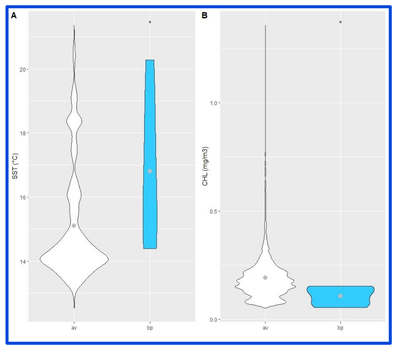
Sp.	NWMS	CW	EAST	SSE	SW
Bp	0.45	0.93	0.042	0.50	0.55
Dd	0.011	0.00	0.023	0.00	0.010
Gg	0.0046	0.018	0.00	0.00	0.00
Gm	0.0047	0.012	0.00	0.00	0.00
Pm	0.049	0.14	0.00	0.016	0.055
Sc	0.62	0.96	0.40	0.56	0.65
Tt	0.12	0.038	0.23	0.096	0.023
Zc	0.011	0.010	0.00	0.017	0.026

Results for Fin Whales (scan the map to discover more)

Central-Western (**CW**)

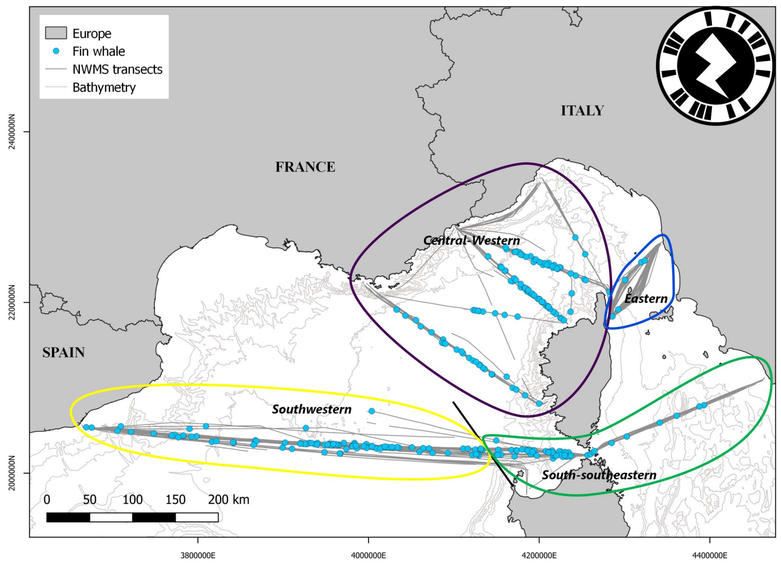


Eastern (**EAST**)

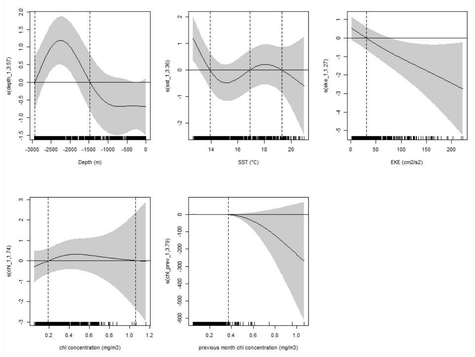


CW: preference for deeper (A), colder (B) waters with lower EKE (C) and higher CHL (D).

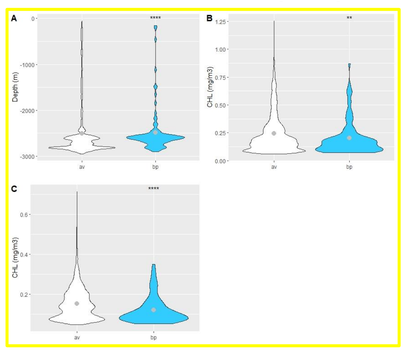
EAST: preference for warmer waters (A) with lower CHL (B).



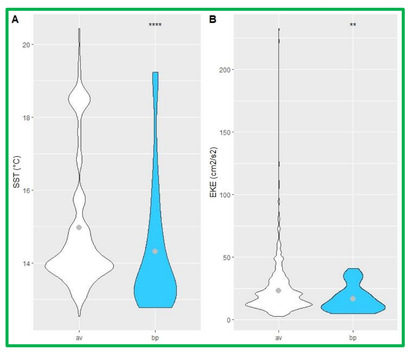
Best GAM for **NWMS** included: depth, SST, EKE, CHL and CHL of the previous month.



Southwestern (**SW**)



South-southeastern (**SSE**)



SW: preference for shallower waters (A) with low CHL during the sighting (B) and the previous month (C).

SSE: preference for colder waters (A) with lower EKE (B).

Discussion

NWMS is a **key area** for cetaceans **year-round**, even if the ERs revealed the existence of **significant differences** in their **occurrence** throughout the study area.

The **variation** of **winter habitat preferences** according to the **spatial scale** and to the **geographic subarea** might be useful in addressing **seasonal-specific conservation measures**.