{rokbox title=|Locations of landing ports :: Image: Authors| thumb=|images/stories/ieo/imagenespublicaciones/centro-oceanografico-baleares-ieo-csic-spatial-structuring-mediterranean-fisheries-landings-seasonal-fluctuations-wozniacka-et-al-2024-thumb.jpg|}images/stories/ieo/imagenespublicaciones/centro-oceanografico-baleares-ieo-csic-spatial-structuring-mediterranean-fisheries-landings-seasonal-fluctuations-wozniacka-et-al-2024.jpg{/rokbox}

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Spatial structuring of Mediterranean fisheries landings in relation to their seasonal and long-term fluctuations

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Abstract: The Western Mediterranean fisheries significantly contribute to the regional blue economy, despite evidence of ongoing, widespread overexploitation of stocks. Understanding the spatial distribution and population dynamics of species is crucial for comprehending fisheries dynamics combining local and regional scales, although the underlying processes are often neglected. In this study, we aimed to (i) evaluate the seasonal and long-term spatio-temporal fluctuations of crustacean, cephalopod, and fish populations in the Western Mediterranean, (ii) determine whether these fluctuations are driven by the spatial structure of the fisheries or synchronic species fluctuations, and (iii) compare groupings according to the individual species and life history-based groups. We used dynamic factor analysis to detect underlying patterns in a Landing Per Unit Effort (LPUE) time series (2009–2020) for 23 commercially important species and 33 ports in the Western Mediterranean. To verify the spatial structure of ports and species groupings we investigated the seasonal and long-term spatio-temporal fluctuations and common LPUE trends that exhibit non-homogeneous and species-specific trends, highlighting the importance of life history, environmental and demographic preferences. Long-term trends revealed spatial segregation with a north-south gradient, demonstrating complex population structures of Western Mediterranean resources. Seasonal patterns exhibited a varying spatial aggregation based on species-port combinations. These findings can inform the Common Fishery Policy on gaps challenging their regionalisation objectives in the Mediterranean Sea. We highlight the need for a nuanced and flexible approach and a better understanding of sub-regional processes for effective management and conservation – a current challenge for global fisheries. Our LPUE approach provides insight into population dynamics and changes in regional fisheries, relevant beyond the Mediterranean Sea.

Keywords: Dynamic factor analysis, Spatio-temporal trends, Synchrony, Seasonality, Benthopelagic communities, Commercial fisheries