

Determinants of wintering waterbird changes in a Mediterranean coastal lagoon affected by eutrophication



"Southern Mediterranean lagoons are among the more vulnerable systems regarding human activities (e.g. agriculture, tourism, urbanization) leading to eutrophication. We analyse the relationship of waterbirds with locally measured or modelled environmental variables (nutrient load, fish production, jellyfish blooms) related with this process, in the Mar Menor lagoon (Murcia, SE Spain), and discuss the potential value of birds as indicators of the trophic status of the wetland. We use GLMs to relate the biomass of the five most abundant and representative waterbird species to these variables, accounting for the potential influence of external factors affecting their population at higher biogeographical scales. A significant effect of such factors was only found for Great Cormorant, which biased the positive response of the piscivore guild to nutrient load (NLD). Red-breasted Merganser appeared relatively insensitive to nutrient enrichment, although declined in the long term. The remaining species responded positively, NLD being a significant predictor of their biomass when a 2-year lag was allowed, although this variable alone had a low explanatory power except for the Coot. When homogeneous temporal phases were defined, grebes could be identified as early warners of eutrophication, and Coot as late-stage ones. The increase of piscivores along a period of declining fish catches could reflect a shift in fish community composition or structure that favours their feeding preferences. The interactive role of jellyfish, buffering temporally the loading of nutrients, may also be related to these changes."

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