

Long-term changes in the trophic position of dolphins in waters of Galicia (Northwest of Spain)

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Recent changes in climate and local hydrography have induced decadal shifts in plankton and fish assemblages in the highly dynamic coastal upwelling system of Galicia (Northwest of Spain). These changes in the composition and structure of the pelagic food web may have affected upper trophic levels. This study aims to understand whether and how top predators have responded to these changes in the food web by investigating long-term changes in the ratio of nitrogen stable isotopes ($\delta^{15}\text{N}$) and in the trophic position (TP) of two species of dolphins inhabiting Galician waters. Skin tissue samples from 121 common dolphins (*Delphinus delphis*) and 62 striped dolphins (*Stenella coeruleoalba*) that stranded along Galician shores between 2004 and 2019 were selected to perform bulk and compound-specific analyses of nitrogen stable isotopes. Results of Generalized Additive Models using bulk $\delta^{15}\text{N}$ as a proxy for TP showed a significant increase in the trophic level of common dolphins over the 18-year period, which was mainly driven by the increasing trophic level of females. In addition, males had higher $\delta^{15}\text{N}$ than females. No significant changes were observed in striped dolphins, in either sex. Future steps include using a subset of samples to perform amino acid compound-specific isotopic analyses in order to compute TP, and to determine whether the trends observed from results using bulk $\delta^{15}\text{N}$ are driven by a change in the diet of dolphins and/or a change in the isotopic baseline of the pelagic food web. Results from this study will provide a better understanding of how top predators react to ecosystem changes, in particular by identifying the main factors driving this response. This will ultimately inform current and future ecosystem management policies in a context of rapid climate change due to natural and anthropogenic forcing.