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Zooplankton seasonality across a latitudinal gradient in the Northeast Atlantic Shelves Province

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Abstract

Zooplankton seasonality and its environmental drivers were studied at four coastal sites within the Northeast Atlantic Shelves Province (Bilbao35 (B35) and Urdaibai35 (U35) in the Bay of Biscay, Plymouth L4 (L4) in the English Channel and Stonehaven (SH) in the North Sea) using time series spanning 1999-2013. Seasonal community patterns were extracted at the level of broad zooplankton groups and copepod and cladoceran genera using redundancy analysis. Temperature was generally the environmental factor that explained most of the taxa seasonal variations at the four sites. However, between-site differences related to latitude and trophic status (i.e. from oligotrophic to mesotrophic) were observed in the seasonality of zooplankton community, mainly in the pattern of taxa that peaked in spring-summer as opposed to late autumn-winter zooplankton, which were linked primarily to differences in the seasonal pattern of phytoplankton. The percentage of taxa variations explained by environmental factors increased with latitude and trophic status likely related to the increase in the co-variation of temperature and chlorophyll *a*, as well as in the increase in regularity of the seasonal patterns of both temperature and chlorophyll *a* from south to north, and of chlorophyll *a* with trophic status. Cladocerans and cirripede larvae at B35 and U35, echinoderm larvae at L4 and decapod larvae at SH made the highest contribution to shape the main mode of seasonal pattern of zooplankton community,

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