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Environmental drivers of zooplankton community structure at Loch Ewe, Scotland.

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The EU Marine Strategy Framework Directive (MSFD) requires all member states to ensure that their respective marine habitats achieve Good Environmental Status (GES) by 2020. Little is known about the plankton community on the west coast of Scotland, making it difficult to ascertain the status of the marine environment in this region or how it is likely to respond to future environmental change. UK monitoring for the MSFD on the west coast of Scotland is represented by a coastal sampling station at Loch Ewe, which has been sampled weekly for phytoplankton, zooplankton and oceanographic variables since 2002. The present study examines this time-series dataset in the context of the MSFD and investigates how changes in zooplankton community structure relate to environmental drivers. We show a number of changes observed in the mesozooplankton community including a decline in the biomass of decapod larvae, *Calanus helgolandicus*, *Calanus finmarchicus*, and *Acartia* spp., and increased variability in *Pseudocalanus* spp. biomass since 2008. These results are discussed in relation to physical and biological variables such as temperature, salinity, nutrient and chlorophyll-a concentrations, and the phytoplankton community. The ubiquity of patterns observed at this west coast monitoring site is examined by comparison to an analogous site on the east coast of Scotland. Our results will help provide an assessment of which environmental drivers exert the largest pressures on zooplankton community structure and the subsequent implications in terms of ecosystem health in the context of climate change, food provision services, and GES.

Keywords: MSFD, time-series, mesozooplankton, environmental drivers

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