UNDERSTANDING THE EFFECTS OF CHANGING ENVIRONMENTAL CONDITIONS AND CLIMATE EVENTS ON PLANKTON COMMUNITIES USING AUTOMATED IMAGE SENSORS

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In marine ecosystems, plankton comprise the base of trophic webs and serve as an integral part of chemical cycles such as carbon sequestration. Due to their foundational role in these systems, plankton are highly useful for monitoring and anticipating abiotic effects on marine communities. In the Belgian Part of the North Sea (BPNS), where the shallow waters are already subject to various anthropogenic influences, changes such as marine heatwaves have also started to affect plankton dynamics. In recent years, warmer summers in the BPNS have led to phenology changes such as unprecedented blooms of *Bellerochea* spp., while groups such as copepods see dramatic dips in abundance. The current study expands on such findings using a long-term time series from the Belgian contribution to LifeWatch. Plankton samples are collected monthly (nine coastal stations) and seasonally (with an additional eight offshore stations) on board the RV Simon Stevin, with zooplankton data from 2012 onwards and phytoplankton data from 2017 onwards. Zooscan and FlowCam imaging sensors were used to study changes in zooplankton and phytoplankton communities, respectively, in relation to climate-driven events. The aim of this investigation was to highlight community dynamics and taxon interactions related to climate, particularly testing whether there were any downstream impacts of HABs or shifts in the gelatinous zooplankton community. This investigation provides preliminary insight into the health of the broader BPNS ecosystem in the face of climate change. Future research will further elucidate the effects of marine heatwaves on plankton using continuous imaging data as well as laboratory tests of genetic heat stress responses.