

Changes in the macrobenthic infaunal community of the Southern California continental margin over five decades in relation to oceanographic factors

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ABSTRACT

Climate change has altered the physiochemical conditions of the coastal ocean but effects on infaunal communities have not been well assessed. Here, we used multivariate ordination to examine temporal patterns in benthic community composition from 4 southern California continental shelf monitoring programs that range in duration from 30 to 50 yr. Temporal changes were compared to variations in temperature, oxygen, and acidification using single-taxon random forest models. Species richness increased over time, coupled with a decline in overall abundance. Continental shelf macrobenthic communities from the 2010s comprised a broader array of feeding guilds and life history strategies than in the 1970s. Changing water temperature was associated with northward shifts in geographic distribution and increases in species abundance, while acidification was associated with southward shifts and declines in abundance of other species. Acidification was also associated with changes in depth distribution of benthic fauna, with shelled molluscs declining in abundance at depths most associated with increasing exposure to acidification. This broad-scale community-level analysis establishes causal hypotheses that set the stage for more targeted studies investigating shifts in abundance or distribution for taxa that appear to be responding to climate change-related disturbances.

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