

Climate-Related Long-Term Faunal Changes in a California Rocky Intertidal Community

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Abstract

The effects of gradual climate change (*ie*, multi-decadal) on biological communities are not well understood for most natural systems, owing principally to the lack of quantitative observations in early studies. Although coastal communities respond rapidly to environmental perturbations, the protracted effects of climate change should be evident as concomitant shifts by species with similar environmental requirements. During periods of warming, species' ranges should migrate poleward. We resurveyed invertebrate species on an intertidal transect in central California, first established and surveyed in 1931, to assess shifts in community structure. Changes in the invertebrate fauna along the transect between 1931-1933 and 1993-1994 indicate that species' ranges shifted northward, consistent with predictions of change associated with climate warming. Of 45 invertebrate species, abundances of eight of nine southern species increased, and five of eight northern species decreased. No trend was evident for cosmopolitan species. Annual mean shoreline ocean temperatures at the site increased by 0.75°C during the past 60 years, and mean summer maximum temperatures from 1983-1993 were 2.2°C warmer than during 1921-1931.