Ichthyoplankton time series track changing fish communities along the west coast of North America.

Ichthyoplankton time series from the Gulf of Alaska (GoA) and along the California Current (CC) (Vancouver Island, Oregon, central, southern, and Baja California) were analyzed for patterns of coherence and fish community response to local and large-scale ocean forcing. Previous studies off southern California reported decadal-scale declines in suites of mesopelagic taxa, correlated with midwater oxygen concentrations, and the decline of several dominant CC endemics, e.g. northern anchovy, Pacific hake, and rockfishes, associated with changes in temperature, upwelling, and transport of the CC. Updated analyses indicate that warming conditions have favored the increased dominance of a tropical-subtropical mesopelagic assemblage better adapted to low-oxygen conditions, first off Baja California and more recently off southern and central California, leading to changed relationships with midwater oxygen.

Examining coherence between fish communities off California, Oregon, Vancouver Is., and Alaska, the dominant taxa within the CC generally exhibit coherent responses, although there is also a tendency for taxa to show opposite trends at the extremes of their range. However, the trend for the dominant fishes in the GoA appears to be out of phase with that in the CC. Temperature was the variable most consistently correlated with these patterns, consistent with the expectation that taxa are affected oppositely at the northern and southern extremes of their ranges. Ichthyoplankton time series provide valuable indicators of change in regional fish communities. These time series can be used to model and understand fish community change in relation to changing ocean conditions as the basis for ecosystem-based management.