

Title: Evidence of global warming effects on zooplankton populations and communities, including larvae of benthic invertebrates and fish (Q)

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To a large extent our current assessments of the ecosystem effects of climate change have been most effectively demonstrated by reference to the observed spatial and temporal changes in abundance, distribution, and phenology of plankton communities and key species. Some ecosystem regime shifts and links with fisheries harvests, recruitment etc. have been demonstrated over a range of scales, from the basin scale in the Atlantic and Pacific oceans down to different responses noted for different regions of the North Sea. But more remain to be discovered and described.

Different organisms have evolved different life cycle strategies and adaptive capacities to exist and co-exist in the habitats and niches they occupy. Any population's success or failure depends essentially on the changing relationships between organisms and their habitats, and on the relative efficiencies of life cycle trajectories and functional abilities within communities. Study of phenology, the timing of life cycles and developmental processes in relation to environments over time and across latitudinal gradients, allows insight into the real expression of species adaptive capacities and ranges and into the factors determining resultant productivity across the food web.

The marine environment is changing, sometimes abruptly, due to habitat changes, climatic factors, anthropogenic pressures, or introduced species. All species adapt to their surroundings, which may involve underlying genetic traits and capacities as well as expression of phenotypic plasticity in relation to environmental trends and pressures, or are replaced by others. The study of functional relationships in relation to environmental gradients allows insight into the capacity and efficiency of organisms in their adaptations to change. Understanding the effects of such changes across the continuum of marine habitats demands a coming together of observations, ideas, and research efforts.

This theme session is designed to bring together zooplankton specialists studying 1) the variability in spatial distribution, productivity, and timing of life cycles, 2) the population dynamics in varied species and environments, 3) the rates and functional relationships of species, and 4) the modelling of these processes. The session should produce a better understanding of the strengths and gaps in current formulations, theories, and data. The session aims to span the marine food web, to find synergies, and to build towards better ecosystem understanding and management.

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