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## *Context-dependent effects of ocean acidification on soft-sediment biodiversity and ecosystem functioning*

Anthropogenic carbon dioxide emissions are rapidly changing seawater pH and carbonate chemistry. In this presentation we demonstrate that research needs to incorporate spatio-temporal environmental contexts, e.g. the seasonal dynamics in resource availability, to effectively support management decisions for the conservation of marine ecosystems in a high CO2 world. In a first study we reared larvae of the clam Macoma balthica throughout their entire 3-week pelagic stage under ambient (pH 8.1) and acidified (pH 7.8) conditions, and temporal differences in food abundance that may result from differential responses of phytoplankton and clam larvae to changing oceanic conditions. Starvation of larvae during the first week enhanced the reduction in larval growth found under acidified conditions, and also enhanced the percentage of pediveliger larvae with developed shell abnormalities. In a second study we demonstrate that ocean acidification, as mimicked in the laboratory by a realistic pH decrease of 0.3, significantly reduced sediment community oxygen consumption on average by 60% and benthic nitrification rates on average by 94% in both coastal permeable and fine sandy sediments in February (pre-bloom period), but not in April (bloom period). Changes in biogeochemical cycling most likely resulted from changes in the activity of the microbial community during the two-week incubations. As benthic nitrification makes up the gross of ocean nitrification, a slowdown of this nitrogen cycling pathway in both permeable and fine sediments in winter, could therefore have global impacts on coupled nitrification-denitrification and hence eventually on pelagic nutrient availability.

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