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Antarctic Free Ocean CO2 Enrichment Experiment: Meiobenthic community responses to ocean acidification under the ice

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The Southern Ocean absorbs 40% of the global ocean uptake of CO2. Because cold water is able to absorb more CO2 than warmer water, polar waters are acidifying twice the rate of tropical waters and are therefore particularly vulnerable to ocean acidification. To date, ocean acidification research on polar flora and fauna has been mainly focused on laboratory and mesocosm approaches. The successful Antarctic Free Ocean Carbon Enrichment experiment (AntFOCE) was able to obtain a -0.4 pH offset (projected 2100 global ocean pH decrease using 'business as usual' CO2 emissions scenario) in flow-through chambers positioned on the seafloor underneath the sea ice at Casey Station, East Antarctica, for a period of 8 weeks. As part of a holistic, integrated ecosystem response study, the meiofauna communities were sampled and analyzed using multivariate statistics. Meiofauna community composition, structure and diversity responses (and preliminary nematode community responses) to this experimentally induced acidification are discussed individually and in relation to a suite of environmental variables.