

Interactive comment on “The subtle effects of sea water acidification on the amphipod *Gammarus locusta*” by C. Hauton et al.

Anonymous Referee #1

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This paper describes the sub lethal physiological responses induced by elevated CO₂ in what was considered to be an organism with a high tolerance to pH change. In a number of previous studies, small changes in pH have appeared to induce no noticeable response in a range of marine invertebrates. However, the molecular techniques used in the study by Hauton et al have been sensitive enough to identify the metabolic cost of maintaining acid-base balance in the face of changing environmental conditions. This important study highlights the necessity of considering small yet prolonged physiological changes when predicting the likely impact of long-term acidification on individuals, populations and communities.

This paper clearly presents new data relevant to the scope of this special issue. Its conclusions are both interesting and sound.

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Interactive Discussion

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In the abstract the authors state that subtle effects may be overlooked in studies of whole organism response. I disagree with this statement as it stands but, I think, this is primarily due to an issue of language rather than a disagreement of ideas. I think the authors have used the term whole organism response; to describe studies that have looked at gross end points that integrate across a wide range of interacting physiological responses (e.g. mortality, growth). However, I would argue that the phrase whole organism response should be maintained for studies that look at a number of individual physiological and ecological responses and attempt to demonstrate the net effects through understanding the interactions between them. If the authors wish to keep the phrase whole organism response I would like to see some further explanation of what precisely they mean by it.

When describing the microcosm performance (page 930 and fig.1) are the authors able to provide carbonate data in addition to pH?

It is a small point but on page 936 line 11 the authors talk of exposure to acidic; sea water. Given that the lowest pH used in the study was still above 7 this is technically inaccurate.

Throughout the manuscript the authors use a variety of ways to spell seawater (seawater, sea water, sea-water). I don't mind which they use as long as they are consistent.

Page 924 line 7: There appears to be some words missing here that should list the apparatus used to measure temperature and salinity.

Interactive comment on Biogeosciences Discuss., 6, 919, 2009.

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