

ABSTRACT:

Grear, Jason.S., Ruth Gutjahr-Gobell, and Doranne Borsay Horowitz. Effects of seawater acidification on the life cycle and fitness of opossum shrimp populations. Oral presentation. New England Estuarine Research Society Fall 2010 Meeting. October 28-30, 2010. Provincetown, MA.

Much of the current concern about ecological effects of ocean acidification focuses on molluscs and coccolithophores because of their importance in the global calcium cycle. However, many other marine organisms are likely to be affected by acidification because of their known sensitivity to changes in cellular acid-base balance. Predicting effects of this sensitivity on whole marine populations would be improved by study systems that possess population-level attributes such as age structure and competition. Thus, there is a need to integrate formal methods of experimental population ecology into studies of ocean acidification. To that end, we developed an observational scheme for *Americamysis bahia* which allows estimation of vital rates for specific life stages, but within the context of functioning populations. Initial experiments focused on food limitation and revealed demographic effects not detectable in standard cohort-based methods. We are currently using this system to examine demographic effects of reduced seawater pH, which we manipulate using gaseous carbon dioxide. Future work will include laboratory and field studies of acidification effects on *Neomysis americana*, an important mysid in New England's coastal waters.

KEYWORDS: ecological risk assessment; population model; crustacea; mysid; *Americamysis bahia*; demography; matrix model; inverse demographic estimation; experiment; ocean acidification; survival; fecundity; population growth rate; cohort; dose-response; pH; climate; CO₂