

## Dynamic energy budget theory and ecology; learning from *Daphnia*

Prof. Roger NISBET

Ecology, Evolution & Marine Biology, University of California Santa Barbara, Santa Barbara, CA  
93106-9610, USA

E-mail: [nisbet@lifesci.ucsb.edu](mailto:nisbet@lifesci.ucsb.edu)

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Major themes in ecology include population persistence and regulation, the origins and maintenance of biodiversity, and regulation of the flows of energy and elemental matter. There is currently a formidable body of sophisticated (non-DEB) theory addressing each of these themes. DEB theory offers a perspective on ecology whose starting point is energy utilization by, and homeostasis within, *individual* organisms. It is natural to ask what it adds to existing ecological theory. I shall show that simplifications of DEB models lead to the widely used “size structured” models that have produced important recent conceptual advances in population and community ecology. Furthermore, DEB theory is the natural framework for modelling ecological stoichiometry and constitutes a distinctive “metabolic theory of ecology”. I shall illustrate these themes drawing on recent studies of zooplankton.