

THEME SECTION

Emergent properties of complex marine systems: a macroecological perspective

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Foreword

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A macroecological view of the ecosystem offers the possibility to integrate information at large spatial and temporal scales over a variety of complex ecological systems. Marine macroecology can be regarded as a new research agenda aiming to develop new models which can explain the emergent structures and dynamics of complex ecological systems in terms of basic physical and biological principles (Brown 1999). Macroecology theory as a way to describe the emergent properties in terrestrial systems has received relatively little attention in marine ecology. This Theme Section is a collection of articles that will discuss the importance of macroecological and complexity theory, in a very broad context, to untangling patterns that underlie the relationships between species abundance and other biotic and abiotic factors linking organismal biology, population dynamics, community ecology, food web structure, biodiversity, and behavioral ecology, to ecosystem structure and function. This macroecological view of different processes underlying the dynamics of marine ecosystems extends the general

theory of macroecology and allometric scaling, developed mainly for terrestrial systems (Brown 1995, West et al. 1997), to a marine context as recently proposed by Li (2002). Ultimately we need to understand by first principles, from organism organization to ecosystem organization (Reynolds 2001), the basic common ecological rules that generate the variability and patterns that we observe across scales.

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