

Since its discovery Antarctica has held a deep fascination for biologists. Extreme environmental conditions, seasonality and isolation have lead to some of the most striking examples of natural selection and adaptation on Earth. Paradoxically, some of these adaptations may pose constraints on the ability of the Antarctic biota to respond to climate change. Parts of Antarctica are showing some of the largest changes in temperature and other environmental conditions in the world. In this volume leading polar scientists present a synthesis of the latest research on the biological systems in Antarctica, covering organisms from microbes to vertebrate higher predators. This book comes at a time when new technologies and approaches allow the implications of climate change and other direct human impacts on Antarctica to be viewed at a range of scales; across entire regions, whole ecosystems and down to the level of species and variation within their genomes. Chapters address both Antarctic terrestrial and marine ecosystems, and the scientific and management challenges of the future are explored.

Alex D. Rogers is a marine biologist working on the ecology and conservation of marine ecosystem. Most of his research has focused on Antarctic and deep-sea habitats, including seamounts, hydrothermal vents and cold-water corals. He uses molecular tools to help investigate the diversity and evolution of species and connectivity of populations of marine organisms. He has also worked extensively on human impacts on the oceans and the development of policies for improved management of the oceans.

Nadine M. Johnston is a marine ecologist. Her research is focused on the interaction of Scotia Sea species and their links to the circumpolar ocean (from a food web perspective) to understand the importance of spatial and temporal variability in the operation of this ecosystem.

Eugene J. Murphy has spent over 25 years working on polar marine ecosystems, as a marine ecologist and ecological modeller. His major interests are in the structure and function of oceanic ecosystems, and how biological and physical interactions at different scales affect the dynamics of marine populations, the overall structure of marine ecosystems and their response to change.

Andrew Clarke has spent over 40 years working in polar regions, principally as a marine ecologist. His major interests are the relationship between temperature and the physiology and ecology of organisms, and how changes in climate over geological time have influenced the distribution and diversity of organisms.

Cover image: Weddell Seal (*Leptonychotes weddellii*) on Lagoon Island in Ryder Bay, Antarctica.
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