

## Book Review

THE GULF OF ALASKA: BIOLOGY AND OCEANOGRAPHY. Editor: Phillip R. Mundy. Alaska SeaGrant College Program, University of Alaska–Fairbanks. 2005. ISBN 1-56612-090-X, 214 pp.

The 2005 publication *The Gulf of Alaska: Biology and Oceanography*, edited by Phillip R. Mundy and published by the Alaska SeaGrant College Program at the University of Alaska–Fairbanks, is a compilation of the collective scientific knowledge of the Gulf of Alaska (GOA) marine ecosystem from the GOA Ecosystem Monitoring and Research (GEM) program. This program was funded by the Exxon Valdez oil spill trustee council (EVOS).

The book begins with a comprehensive overview that summarizes the physical forcing mechanisms and their relationships to the biological systems in the GOA, and a summary of the leading hypotheses for long-term ecosystem change, with specific emphasis on hypotheses related to climate change and human impacts. The remaining chapters, written by leading scholars in North Pacific research, describe specific aspects of the GOA ecosystem, including both physical (climate, geology, circulation, chemistry) and biological (benthic, seabirds, fish and shellfish, marine mammals) systems. The final chapters examine human dimensions and modeling. There is an extensive reference list and list of acronyms, and a comprehensive topics index.

The Central Hypothesis, introduced in the “Introduction” (Chapter 1), provides a framework for examining more specific questions related to mechanisms of change and the relative importance of specific abiotic and biotic forcing factors over four habitat types: watershed, inter/subtidal, Alaska Coastal Current, and offshore:

*Natural forces and human activities, working over global to local scales, bring about short-term and long-lasting changes in the biological communities that support birds, fish, shellfish, and mammals. Natural forces and human activities bring about change by altering relationships among defining characteristics of habitats and ecosystems such as heat and salt distribution, isolation, biological energy flow, freshwater flow, biogeochemical cycles, food web structure, fishery impacts, and pollutant levels. (p. 12)*

This Central Hypothesis is adapted for each habitat type at the appropriate temporal (seasonal, annual, decadal) and spatial (local, regional, global) scales, and is considered in the subsequent chapters.

The chapters are well-written and accessible, with a good balance of discussion between bottom-up and top-down forcing, and an emphasis on the importance of scale. Most chapters include useful tables and figures, although the lack of color illustrations or plates is disappointing. Several chapters contain specific case studies and comments on future directions. The inclusion of the economics of the GOA as they relate to ecological issues is especially timely as Alaskans and the nation consider the meaning of the sustainable extraction of the region’s resources.

This work is at minimum an excellent primer and reference for anyone working in the GOA, but it may also serve as a senior undergraduate or graduate-level case study for courses examining the complex intersection between natural and anthropogenic mechanisms for marine ecosystem change. Specific chapters could easily be taught as stand-alone readings in a variety of courses.

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