

Preface

This volume is the fourth in a series on Large Marine Ecosystems (LMEs) based on symposia held during the annual meetings of the American Association for the Advancement of Science (1984, 1987, 1988, 1990). In the volumes, emphasis is placed on LMEs as a unifying concept for conducting research, monitoring, and managing of regional units of ocean space around the globe. Much marine science is specialized into disciplines dealing with the biology, physics, and chemistry of the oceans. Specialists generally publish separately on the use and management of ocean resources. It is not often that the results of multidisciplinary scientific and management studies are brought together in a single volume, as they are here.

The LME approach is an effort to bring multidisciplinary marine studies to bear on global problems of resource sustainability by examining the causes of variability in productivity of those regions around the margins of the world oceans from which 95 percent of the annual yields of useable fisheries biomass is harvested. Emphasis is placed on the identification of the principal, secondary, and tertiary driving forces controlling the large-scale variability of biomass yields among LMEs. The LMEs adjacent to the continents are being stressed by overexploitation, pollution, and natural environmental perturbations. This volume focuses on the food chains and biomass yields of the U.S. Exclusive Economic Zone and adjacent waters, providing case studies of LMEs and offering new insights on the trophodynamics and management strategies for increasing the long-term sustainability of the living marine resources under the jurisdiction of the United States.

The volume represents the collective efforts of oceanographers, fishery biologists, ecologists, modellers, and managers to improve our understanding of LMEs and to ensure their continued productivity. By way of comparison, the volume includes a contribution from Dr. Vladimir Borisov of the Soviet Union, who underscores the need for improvement in the management of human-induced interventions

changing the structure of an LME through excessive fishing mortality. He bases his arguments on the significant reduction of annual biomass yields from 2.8 million metric tons (mmt) in 1977 to 356,000 mt in 1987, during just one decade in waters of the Barents Sea ecosystem.

The theoretical contributions are aimed at linking food chain studies and sustainable yield models. It is clear that more effort is needed to make the appropriate linkages. However, the studies presented represent a basis for addressing more holistic research, monitoring, and management of LMEs around the globe.

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