

BOOK REVIEWS

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HARRISON, PAUL J., AND TIMOTHY R. PARSONS [EDS.]. 2000. **Fisheries oceanography: An integrative approach to fisheries ecology and management**. Blackwell Science. xii + 347 p. £30. ISBN 0-632-05566-9.

My favorite book for teaching biological oceanography is Parsons, Takahashi, and Hargrave (1984). Their last chapter discussed the state of fisheries oceanography two decades ago, and I looked forward to reading this new book devoted to this subject, with an eye toward its suitability for teaching.

The subtitle of the book, "An integrative approach to fisheries ecology and management," is perplexing. Fisheries ecology and fisheries management are dissimilar endeavors with distinctly different goals. Ecology is a science, and the goal of science is to understand how nature works. Fisheries management, on the other hand, is the application of the principles of control to exploit renewable resources; its goal is to maximize the economic and social benefits derived from nature. Science and management measure success very differently—in science it is the ability to predict nature, whereas in management it is the ability to extract benefits from the resource sustainably. Management decisions are made by governments; scientific information is one component of the decision-making process, but nonscientific considerations are frequently more important to decision makers. Thus, an integrative approach to fisheries ecology and fisheries management is inherently difficult to design, and even more difficult to implement. I was very interested in what this book had to say about this dubious marriage.

The book includes seven invited review papers, each followed by a commentary written by other leaders in the field. Typical is the chapter by Gary Sharp subtitled "Refashioning a responsible fisheries science," which offers a visionary discussion of future management in view of the failure to keep stocks at sustainable levels by regulating fishing effort. In Sharp's future world, regulation of market flow-through rates would effectively control fishing effort. The new fisheries science would support fleet optimization planning on global ocean scales.

Another strong contribution is by Michael Laurs and Jeffrey Polovina, who discuss how remote-sensing tools developed and deployed over the past three decades have changed fisheries oceanography. The synoptic data provided by satellite imagery has revolutionized this field, which is the study of how the ocean environment affects fish recruitment, distribution, and migration. "Operational" fisheries oceanography is the synthesis of knowledge of oceanography, meteorology, and fish behavior into an "environmental service" for commercial and recreational fisheries; its goal is to minimize fishers' search time. Proof of the maturity of this field is that private fishery advisory services now successfully market satellite-derived charts of ocean temperature, current, and color features.

A theme running through all the chapters of the book is the recognition that the oceanographic climate of a marine ecosystem regime changes naturally on decadal scales and longer periods and

that fish populations fluctuate accordingly. The assumption of a steady state ocean made by Parsons, Takahashi, and Hargrave (1984) when describing biological oceanographic processes has been dramatically shown to be false. Beamish, McFarland, and King present a summary of climate indices for the Pacific and Atlantic Oceans over the past several decades and document abrupt regime shifts where the change is completed within months to a year. The coherence across ocean basins of fish population responses to oceanographic regime shifts is remarkable and not yet fully understood. The pioneering book on climate and fisheries by Cushing (1982) does not seem so speculative today. Beamish, McFarland, and King suggest that students should be trained in fisheries and ocean sciences, as well as climatology, to pursue research in this new field of study they call "fisheries climatology."

Another notable contribution is the chapter on genetics of marine fishes by Stew Grant and Robin Waples, who discuss how past states of ocean climate marked the genetic variability of fish populations. Ken Mann goes on to point out that unexploited fish stocks must have evolved to survive the complete range of ocean environmental conditions; whether fish populations with age-structures severely skewed by exploitation can tolerate natural stresses is an open question.

In the final commentary of the book, John Dower, William Leggett, and Kenneth Frank discuss research issues for the future. Prominent among these is the need to understand the mechanisms by which fish populations respond to climate change. The influence of the ocean environment on recruitment, distribution, and growth of fish stocks must be incorporated into stock assessments. New management strategies that preserve fish populations, such as the establishment of marine protected areas, should be encouraged.

This book is extraordinary in its clear, comprehensive presentation of new and exciting developments in the field of fisheries oceanography. For undergraduate teaching purposes it should have included information on basic global patterns in atmospheric pressure, ocean currents, and fish production, as well as the details of fish growth, reproduction, and migration behavior. Further, I would have ordered the chapters differently, putting Dan Ware's chapter on the theory of world fish production at the front, not the back. As it is, this book would be appropriate for a graduate course. In any case, it is a wonderful follow-up to the text of Parsons, Takahashi, and Hargrave (1984), and I am happy to recommend it.

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