

## BOOK REVIEW

Bakun, A.- 1996. *Patterns in the Ocean. Ocean processes and marine population dynamics*. California Sea Grant College System/NOAA/Centro de Investigaciones Biologicas del Noroeste, La Paz, Mexico. 323 pp., ISBN 1-888691-01-8.

During the last decades, the complex physical-biological interactions taking place in marine environments have received a preferential attention by biological oceanographers. The control exerted by the physical forcing on the structural and functional properties of marine ecosystems has been recognized, and the importance of the coupling between the broad time and space scales of physical variability and spatial heterogeneity with similar scales of biological phenomena universally accepted.

This book by Andrew Bakun is an example of the such growing attention, and a valuable attempt to identify the physical and ecological basis for the variability observed in the populations of exploited marine organisms. In 14 chapters plus an appendix the author, according the foreword, has updated the contents of a series of lectures on recruitment fishery oceanography given a decade earlier. One of the strengths of this book, apart from the fact that it provides a huge amount of examples of the complex interactions between physical structures and biological processes, is the clear, understandable descriptions of the hydrographic singularities relevant to the control of fish populations, and the basic physical mechanisms responsible for their formation. The control exerted by physical phenomena on the processes affecting the viability of early life-stages of exploited organisms (i.e., feeding, dispersion, predation, etc., essential for the success on the recruitment) and which is one of the focusing points of the book, has been discussed in the light of the central idea: the existence of a nested pattern of

interacting oceanic events. Water motion and circulation from the smaller scales (i.e., turbulence), to global phenomena (i.e., ENSO events), and their effects (extreme oscillations in fish stocks, species alternance, etc.), have been analyzed using examples from a variety of marine areas. In the final chapters, the possible consequences of global climatic changes on fisheries are discussed.

Being a physical oceanographer working in marine biology and population dynamics, the author is aware of the communication problems derived from the use of specific jargon, and so specific terminology has therefore been avoided when possible. This characteristic, and intuitive rather than mathematical approaches to the physical mechanisms (only four pages, in an appendix, are devoted to a brief development of the Navier-Stokes equation, geostrophic currents and Ekman transport, and vorticity balance) make the book accessible to those readers not familiar with advanced mathematical analysis, or simply not specialized in fisheries or physical oceanography.

A colloquial style, the use of common analogies and some doses of humour facilitate the comprehension of the intricate pattern of relations between physical oceanography and marine fisheries, and make the book easily readable. Although the book may be of moderate interest for specialists looking for rigorous mathematical treatment, it will be a useful piece of information for marine scientists dealing with different fields. Minor inconveniences are the appearance of disorder, some reiterative approaches, and certain bias and curious omissions in the bibliographic quotation.

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