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Oceanography in the Next Decade: Building New Partnerships

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history, such as the German U-boats in the Battle of the Atlantic and the U.S. Navy's campaigns in the Pacific against Japan in World War II, the Falklands conflict of 1982, and the Persian Gulf "tanker war" of 1982–1988. Each paper and its commentary is complete within itself but also is related to the overall theme. The serious reader will be delighted to find each paper carefully documented with extensive footnotes.

Taken as a whole, Volume 65 of the U.S. Naval War College International Law Studies presents a thorough examination, from a number of varied perspectives, of targeting enemy merchant shipping. It is this comprehensive quality of the book, along with its excellent summary, extensive bibliography, and detailed index, that makes the volume especially valuable to students of contemporary warfare as well as to naval historians and admiralty lawyers. Professor Grunawalt is especially well qualified to serve as editor. He is currently the director of the Oceans Law and Policy Department in the Center for Naval Warfare Studies at the Naval War College. He has the invaluable perspective of a Navy lawyer who, during his active duty days, served as the senior advisor to both the joint theater commander in the Pacific and the Chief of Naval Operations. His preface is an especially articulate and useful summary of the issues covered in this volume.

Clearly, this book will be appealing to more than just a circle of lawyers and historians; these professionals, however, will certainly find this excellent volume

an indispensable component of their libraries.

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It is paramount for a military leader to appreciate and understand the field on which he fights. The naval commander is unique in that he conducts operations in four dimensions: underwater, on the surface of the water, on the land adjacent to the water, and in the air above water and land. Oceanography is the science of analyzing the undersea and its dynamic relationship to the air and land. This short volume of 170 pages is an assessment of U.S. oceanography over the last twenty years and a projection of emerging priorities.

This book provides a sketch of the organization of ocean science: budgets, priorities, the roles of various institutions, scientific direction within the subfields of oceanography, and the relevance of ocean science to civilian and military national priorities. It also contains informative comparative charts and graphs delineating trends in manpower, funding, and direction of oceanography over the last decade.

The volume offers an excellent description of the architecture of federally funded oceanography. Since

World War II, the Office of Naval Research (ONR) and the National Science Foundation (NSF) have been at the forefront of ocean studies. Until 1970, ONR was the dominant source of ocean science funding and was largely responsible for the early development and maintenance of oceanography. ONR has always taken a long-term view toward the U.S. commitment to oceanography, and it is still the lead agency in supporting several areas of basic science, such as ocean acoustics.

Currently, ONR and NSF share responsibility for funding the majority of oceanographic research, primarily by awarding grants to such university and private laboratories as the Scripps Institution of Oceanography and the University of California (both university affiliated) and the Woods Hole Oceanographic Institution (private). In this regard, the National Research Council has characterized the partnership between the federal granting agencies and their private and university patron laboratories as productive and mutually beneficial.

This work is a good primer on the direction of U.S. ocean science and its contribution and relevance to U.S. economic, environmental, and national security planning. It describes significant research areas of oceanography, such as geology and geophysics, biology, chemistry, and coastal sciences, and their impact on national economic, environmental, and defense priorities. Much oceanographic research is related directly or indirectly to national security. With the end of the Cold War and the introduction of the white paper

"... From the Sea," the focus of U.S. Navy ocean science is expected to shift toward the coastline or littoral regions of the world. The war in the Persian Gulf emphasized the need for near-shore data and research, and ONR has already begun to direct more resources toward shallow-water science.

A concise and highly accessible review of the U.S. effort in oceanography, the book details the relevance of ocean science to a broad range of national priorities and offers an excellent depiction of the Navy's programs and contributions within the context of ocean science generally.

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Watts, Anthony J., ed. *Jane's Underwater Warfare Systems, 1993-1994*. United Kingdom: Jane's Information Group, 1993. 348pp. \$245

The original annual naval review, *Jane's Fighting Ships*, first issued in 1897, has been so expanded over the past decade that there are now some twenty different Jane's annuals covering a broad variety of subjects, most of them military. This growth reflects both the rapid development in technology and the Jane's Information Group's effort to chronicle this technological expansion. Thus, *Jane's Underwater Warfare Systems*, fifth edition, is devoted to the latest status of antisubmarine warfare, underwater weapons, mine warfare, and associated underwater warfare systems—subjects little considered in 1897.