



Oceans 2020: Science, Trends, and the Challenge of Sustainability

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This is an interesting and useful compendium written by well established oceanographers. It will be of value to marine researchers and administrators. The editors deserve our thanks for a coherent attempt to review the relevance of ocean science to human concerns. The title, however, promises more—a 20/20 vision for the future. Yet, as the editors say “the best we can do is look back on developments that have shaped marine science during the most recent decades.” In this spirit I went back to the previous “vision” commissioned by the Intergovernmental Oceanographic Commission in 1982—“Ocean Science for the year 2000”.

The chapter titles for the past and present volumes tell the story. The earlier text, apart from a chapter on “application and implementation”, viewed the future on strictly disciplinary lines with chapters on physical, chemical, biological and geological oceanography. The new review is four times longer and except for a short, 40 page, section on “ocean studies” focuses on issues in the coastal zone, climate change, fisheries, offshore industry, shipping and defense.

These differing patterns can be seen as encapsulating the changes in our profession of oceanography over the last two decades. For the science itself, the pious hopes in 1982 for multidisciplinary programs has been largely fulfilled. We see this in the international programs like JGOFS and GLOBEC, and in the “global” computer simulations coupling physical, chemical

and biological processes. As might be expected, the need for ocean forecasting of climatic change was noted as an issue in 1982. The role of the oceans in climate is now well accepted in the public domain through the successes in El Niño prediction.

For fisheries, the earlier volume said “there is a serious lack of dialogue between fisheries and the other ocean sciences. Yet commercially exploited species function within the general ecosystem and cannot be understood in isolation from it”. Now “the various fish species that are targeted by fisheries are parts of ecosystems... This requirement was not widely acknowledged until recently”. The section on fisheries in the two volumes has gone from one to twenty-six pages; the public concern, thanks to Daniel Pauly and others, has increased correspondingly; yet, apparently, science still has to connect with management in the “search for sustainability”.

This challenge of sustainability in the book’s title comes predominantly from the chapters on fisheries and the coastal domain. The latter chapter calls for “clear definitions of sustainable use”. The chapter on offshore industry, dealing mainly with the seabed, conveys a different sense. There is “a considerable potential for using natural products”...“considerable commercial interest in industrial uses of thermophilic bacteria”...“gas hydrates may be a potential alternative energy source”...“this subject (carbon sequestration in the ocean) is ripe with exciting research prospects”. It is nice to know there are still plenty of frontier problems in the ocean.

One other topic that gets greatly extended treatment in the present volume is “capacity building” in developing countries. Future expansion in population and industry will be along the coasts of these countries rather than in the developed world. But the consequences for sustainability of the human as well as the marine systems will affect all of us. “International organizations ...need to develop a new role... to persuade donor agencies to spend their money in ways more consistent with (these) regional needs”. I hope this prediction is achieved.

The diverse themes in this book capture the various research topics that are interesting oceanographers at this time. As the editors say in the introduction, the forecast of scientific trends in the 1982 report was “remarkably accurate”. This would suggest that oceanography is becoming a mature science and if so, I would expect the scientific prognoses in the present volume to hold up well in the forecast for 20/40. But the editors also point out that external forces, such as the ending of the Cold War, significantly changed our research environment in ways beyond our control. To the extent that this volume focuses on social issues, its forward look is much more subject to the vagaries of the “terrestrial” world. It will be interesting to find out what replaces “sustainability” as the catchword in 2020. 