Preface

Sylvia A. Earle

Eventually man . . . found his way back to the sea . . . And yet he has returned to his mother sea only on her own terms. He cannot control or change the ocean as, in his brief tenancy on earth, he has subdued and plundered the continents.

—Rachel Carson, "The Sea Around Us," 1951

The 20th century proved to be a time of unprecedented scientific discovery, with more new insights gained about ourselves, the nature of the Earth and the universe beyond than during all preceding human history. Fifty years ago many scoffed at the notions that continents move around, that oceans come and go and that life can exist in the deepest sea. In the 1950s most people believed the ocean was so vast and so resilient that there wasn't much humans could to do alter its nature. Half a century later, two great truths have emerged based on new knowledge about the sea. First, the ocean is the cornerstone of Earth's life support system and therefore is vital to human survival and well-being. We have come to understand that the sea generates most of the oxygen in the atmosphere, absorbs huge quantities of carbon dioxide, governs our climate and weather, regulates temperature, drives planetary chemistry, harbors most of the water and contains the greatest abundance and diversity of life on Earth. As the sea changes, so do the circumstances that shape the way our world works.

The second great truth that emerged in the latter half of the 20th century was that humans *do* have the capacity to alter basic global processes. In fact, changes are occurring as a consequence of what we are putting into the ocean and atmosphere and onto the land, as well as what we are removing from the mantle of living systems on land and in the sea that are vital to maintaining the planet as a place hospitable for humankind. We learned the hard way that the ocean is not infinite in its capacity to accommodate what we put in or take out. Already, destruction of coastal and deepsea habitats, the annual removal of millions of tons of ocean wildlife and the addition of millions of tons of noxious wastes have set in motion processes that are not likely to be in our best interests. In the 20th century, we learned more about the ocean than during all preceding human history, but during the same time, we lost more.

Those who participated in the *Defying Ocean's End* Conference in Los Cabos, Mexico, in May/June 2003 came with this knowledge as a starting point, and with a com-

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School of jacks near Cocos Island in the eastern tropical Pacific.
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mitment to identify actions that realistically could be taken to reverse the worrisome global trends. The year before, in June 2002, Conservation International convened a small group of scientists and conservation experts also in Cabo San Lucas, Mexico, to consider what could be done not just to slow the decline of ocean health, but to succeed in turning the trends in a positive direction. The major outcome of that planning session was the vision of assembling the best international experts available, after a year devoted to developing background data about specific issues and actions that could "defy ocean's end" on a global scale. Thus the *DOE* Conference began to take form.

That a meeting of minds prepared to develop an action plan could actually help drive positive, international initiatives was inspired by the successful outcomes of the *Defying Nature's End* Conference held in 2000 at the California Institute of Technology. At that event, a select group of scientists, economists, leaders in business and other disciplines focused attention on actions needed to stem the loss of global biodiversity. That conference gave rise to strategies aimed at protecting biodiversity, with an emphasis on "hotspots"—areas of high diversity and high threat—as well as intact wilderness areas. Innovative programs were recommended to preserve the economic, societal and security advantages of maintaining global biodiversity, while underlining the problems that arise when biodiversity is diminished or lost.

Optimism prevailed because of the realization, as reported in the journal *Science* in May 2001, that ". . . greatly increasing the areas where biodiversity is protected is a clear and achievable goal, one potentially attainable by using funds raised in the private sector and leveraged through governments." Critical needs were identified: synthesis and distribution of available knowledge, investment in targeted research, development of research and management centers in countries where biodiversity actions are focused, and demonstrating the links among biodiversity, ecosystems, their services and people—all of these leading to benefits for humankind through increased and enduring protection for hotspots and wilderness areas worldwide.

An improbably colorful nudibranch in the Philippines.

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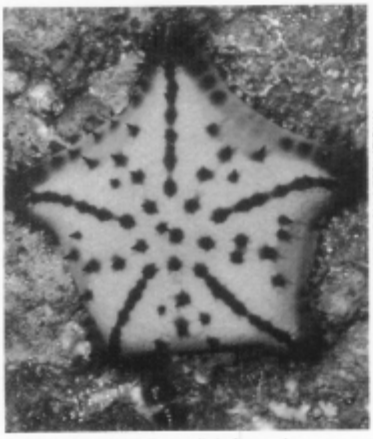
Goldenstriped cardinalfish and a sea anemone in the waters off Japan.

Some consideration was given to coastal and ocean matters at the *Defying Nature's End* Conference, but both the recommendations and subsequent implementation focused largely on terrestrial issues. By 2002 it was time to take a hard look at the blue part of the planet—largely neglected by conservation organizations, national governments and international policymakers, despite alarming trends that closely parallel declines of natural systems and species on land, and with similar devastating consequences to the interests of humankind.

The challenge was and still is daunting. Many seemingly intractable ocean problems were identified in 1998, the International Year of the Ocean, at various national and international conferences. Over and over the need for accelerated research and exploration were expressed, recognizing that less than five percent of the ocean has been seen, let alone explored. Repeatedly, the consequences were discussed of overfishing and the use of gear and techniques that extract an enormous toll in terms of habitat destruction and many millions of tons of non-targeted marine life destroyed incidental to fishing operations. Problems relating to the downstream consequences of upstream pollution, as well as the deliberate dumping of wastes into the sea, were the subject of numerous meetings and reports. Most puzzling and damaging of all was the widespread indifference to ocean issues, a complacency borne of the lack of awareness among decision-makers and the public at large that the ocean is in trouble, and a profound lack of understanding that there is a direct connection between the declining state of the ocean and human affairs.

In response to these grave concerns, two ocean commissions were established in the United States in 2001: the Pew Oceans Commission supported privately by the Pew Foundation, and the National Ocean Commission appointed by the President and Congress to review national policies and recommend actions. Both of these Commissions, however, focused largely on U.S. national issues and actions.



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A "chocolate chip" starfish from the Galápagos.

Defying Ocean's End took a broader view, deliberately looking for solutions that could be implemented globally over broad areas involving a wide range of participants the public and private sectors of local communities, states, nations and international institutions. Several reports issued just before the Conference highlighted the urgency of the deliberations. Two Canadian scientists, Drs. Boris Worm and Ransom Meyers, published the results of their ten-year study of global fisheries data with the conclusion that 90% of the big fish—tuna, swordfish, marlin, sharks, grouper, snapper and others—have been extracted from the ocean in the past fifty years. New data on bycatch revealed the destruction of more than 300,000 marine mammals, tens of thousands of birds and turtles and more than 20 million tons of animals killed and discarded in industrial fishing operations every year. Another report cited a dramatic increase in the number of "dead zones" in coastal waters, created by unnaturally high levels of nitrates and phosphates flowing down rivers from fields, lawns and farms—an increase from 50 such areas a decade ago to more than 150 now. Many other recent studies have documented dramatic declines in coral reefs, seagrass meadows, kelp stands, mangrove forests and other vital systems known to have thrived half a century ago. Special concern was raised at *DOE* about the swift destruction of seamount habitats and their associated ocean wildlife by bottom-trawl fishing, coincident with news that seamounts may be likened to the Galápagos Islands on a grand scale, with each rocky, underwater "island" hosting high biodiversity and high levels of species found nowhere else on Earth.

There was also good news. The high, hidden costs of industrial fishing have not gone unnoticed and a fundamental change in thinking about commercial fishing is underway, starting with a recognition that fish and other marine life are not commodities, they are wild animals. Fishing involves hunting and capturing, not cultivating and harvesting. Some policy and regulatory revisions for commercial fishing are beginning with a growing focus on "sustainable use" of living marine populations within nations' Exclusive Economic Zones and in the 60% of the ocean called high seas that lacks coherent governance. Commitment to research, education and new technologies to improve access to the ocean depths are gradually improving in some countries, including Australia, China, Japan, France and the United States.

The mood of participants at the *Defying Ocean's End* Conference was electric. It was driven in some measure by a sense of urgency, but also by a conviction that it is not too late to do something about protecting ocean health and restoring some of the damage. Ten percent of the big fish are still out there in the ocean; they're not all gone yet. Half of the coral reefs are still in good shape. Despite pollution issues, much of the ocean is still healthy and resilient. A strong sense of hope prevailed that actions could be taken in time to avoid further loss of marine species and irreplaceable ocean ecosystems, and resources could be raised and mechanisms identified to achieve the desired, successful outcomes.

Whether we act on what we know or allow the present opportunities for concerted action to slip away, the next decade may prove to be the most significant for ocean conservation—and for the future of humankind—in the next thousand years.

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Giant octopus with anemone off British Columbia, Canada.
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