

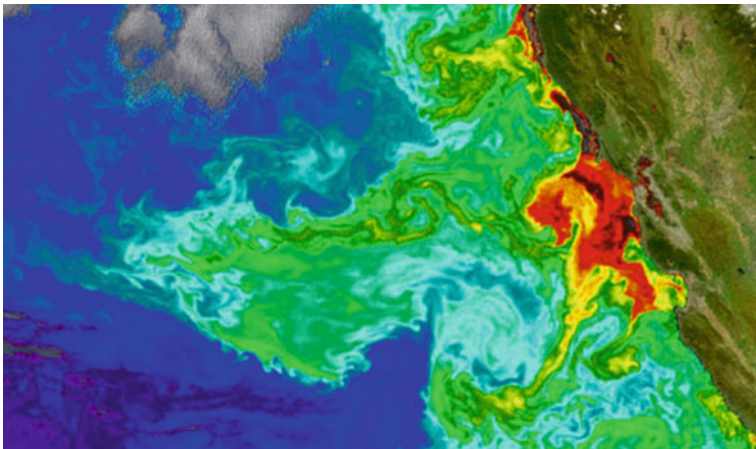
Jochen Kämpf · Piers Chapman

Upwelling Systems of the World

A Scientific Journey to the Most
Productive Marine Ecosystems

 Springer

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Phytoplankton blooms in an upwelling area in the Pacific Ocean off the California coast. *Image source* NASA <http://visibleearth.nasa.gov/view.php?id=4317> [accessed 2/06/2016]

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Preface

To early explorers and fishermen, the ocean seemed to be limitless, teeming with vast quantities of fish and other food organisms. However, as people got to know the ocean better, they realized that not all regions were the same. Large portions of the oceans in fact contained little marine life, while other regions, particularly along certain coasts, were much more productive. The most productive regions were found along the west coast of the main continents, in what are now known as *eastern boundary currents*, and these regions, which account for only about 1 % of the global ocean, produce about 20 % of the global fish catch. The four main eastern boundary systems are those off California/Oregon/Washington in the North Pacific, Peru and Chile in the South Pacific, off northwest Africa and Portugal in the North Atlantic, and off South Africa and Namibia in the South Atlantic. These upwelling systems have long provided large quantities of fish and are also known to support seabirds and mammals such as whales and fur seals.

We now know that a number of other upwelling systems exist throughout the global ocean, some of which are year-round features, whereas others occur on a seasonal basis. Recently, a number of reviews of individual systems have appeared in the scientific literature, some concentrating on physics and chemistry, others on biology, but we do not know of any consolidated text that covers all of them. Because of their importance in global productivity, biogeochemical cycles and food-web dynamics under exposure to global climate change, we believe that such an interdisciplinary book covering all important upwelling systems of the world is needed to describe their similarities and differences. We hope that this book will fill the gap and that you, the reader, will enjoy this scientific journey to the most productive ecosystems of the world.

Writing a book always takes a lot longer than anticipated, and this is particularly true of scientific books. While the World Wide Web makes it relatively easy to find information, it also complicates matters because of the enormous number of research papers that have been written about the different upwelling systems.

Undoubtedly we may have missed papers that some of you regard as being of supreme importance, but we have tried our best to cover all the major advances in the four major eastern boundary currents and give a good overview of the other upwelling regions. We welcome any suggestions you may have to improve this book for future editions.

Adelaide, Australia
College Station, USA
May 2016

Jochen Kämpf
Piers Chapman

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