



**REGIONAL
OCEANOGRAPHY:
AN INTRODUCTION**

MATTHIAS TOMCZAK

*Professor of Oceanography,
School of Earth Studies,
The Flinders University of
South Australia*

J. STUART GODFREY

*Senior Principal Research
Scientist, CSIRO,
Division of Oceanography,
Australia*

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*School of Earth Sciences
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and

J. STUART GODFREY

CSIRO Division of Oceanography, Tasmania, Australia

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Preface to the first (1994) edition:

This book developed from lectures for undergraduate students of marine sciences in Sydney. Following a good tradition, the curriculum at the university began with an interdisciplinary introduction into all sciences of the oceans. A similar curriculum operates at the Flinders University of South Australia, where the introductory course on regional oceanography brings together students of marine geology, biology, chemistry, geography, and physical oceanography. The choice of textbook for such a course usually follows the rule of the lowest common denominator. This eliminates most textbooks commonly used in physical oceanography because they require some understanding of mathematics and theoretical physics which not all students bring to the course.

When looking around for alternatives we were dissatisfied with the available material. Non-mathematical texts were either written for high school or college use and considered too elementary for a university curriculum, or they were outdated, leaving too large a gap between what students were taught and what they find in research publications. We decided that it was time to produce a set of lectures which would take into account modern findings and modern ideas and present them on a level suitable for an introductory undergraduate course.

This book is the result of our efforts. Originally the material presented to our students was covered in 21 one hour lectures. When we decided to develop it into a book the material grew in response to comments and suggestions from colleagues who were asked by Pergamon Press to comment on our proposal. In writing this book we have been surprised to learn how much of the ocean's behaviour as a component of climate - the particular reasons why it absorbs heat in one region, or restores it to the atmosphere in another - can be understood by combining an understanding of simple physical principles with knowledge of the ocean's geographical features. We therefore expanded on some aspects of the ocean's role in climate in this book; however, we have tried to give a simple account of that role, which should prove useful in more advanced studies, aimed towards actual prediction of possible climate changes. The division into chapters has been retained, but in its present form it is unrealistic to cover them all in 21 hours.

Most horizontal property distributions are shown in the Peters projection which combines fidelity of area with a rectangular coordinate grid (Peters, 1989). Although the problem which projection is appropriate for a given task is not a trivial one, oceanographers usually do not even realize that there is a problem. A basic requirement for a regional description of the world ocean is fidelity of area. The Mercator projection, which will remain the ideal charting tool at sea, grossly overemphasizes the temperate and subpolar regions, at the expense of the tropics and subtropics to which most of the world ocean belongs. Most commonly used projections with fidelity of area are based on curved coordinates and therefore require a latitude/longitude grid across the map for the location of features. The Peters projection keeps the map surface free for the information of interest while doing justice to the relative roles of all climatic regions. Distortions of distance are severe only in the polar regions. To rectify this, pole-centred stereographic projections are used in the discussion of the Arctic and Antarctic oceans.

Although the list of references is long, it is obvious that an introductory text is not the place for a bibliography on regional oceanographic studies. Readers have to be aware of the eclectic character of our reference list. The fact that a certain paper is not quoted does

Preface to the pdf edition:

When the printed edition got out of print in late 2000 I started receiving email enquiries about the availability of the book from various parts of the world. By that time ownership of the publishing company and the copyright to the book had changed hands several times, and the new publisher was not interested in another print run.

Six years is a long time in the information technology area, and significant changes occurred between 1994, when *Regional Oceanography: an Introduction* was first published, and 2000, when it went out of print. It is now possible to publish books at near professional print quality on the web, using full colour illustrations and drawings. As anyone who teaches in a university will know, this not only opened up new avenues to support teaching in the classroom with appealing support material, it also raised the expectations of students. Black and white line drawings were more or less the standard for textbooks before 1994 – today a textbook that does not support its material with colour illustrations is regarded as outdated by students. Moving the book to the web made this transition relatively straightforward.

Publishing on the web has the additional advantage that it can bring the responsibilities of author and publisher under one umbrella. The 1994 edition of *Regional Oceanography: an Introduction* suffered severely from communication problems between the authors and the publisher, to the extent that many equations were simply unintelligible and several figures incomplete.

These experiences and the new opportunities offered by the web led to the decision to proceed with a web edition of *Regional Oceanography: an Introduction*. Having the book on the web (or on a CD) presents one clear disadvantage: As a user of the text I cannot study sitting on a park bench in summer or next to a fireplace in winter. I have always been and continue to be a determined supporter of the printed book, which I can take on the bus or train and read on the way to work. There are, however, several advantages to web publication which, in my view, outweigh the single disadvantage:

Firstly, the book is no longer a static product. It can be updated at any time. Critique and suggestions from users can be accommodated immediately; users do not have to wait for years before errors are corrected.

Secondly, the book becomes available to students at a very reasonable price. The pdf version is not the end of the printed book, it is in fact designed to be printed and bound into a book. But it allows the user a choice of value for money because it can be printed in low quality at low cost or in near professional quality at higher cost. Even the high cost option will be less expensive than the purchase of a comparable book in a bookshop.

Thirdly, modern lecture theatres have facilities to project web pages on a large screen for class use. Illustrations from a web based book can be used in the classroom directly from the web or from a CD. The pdf format allows the display of material at a range of magnifications, so illustrations can be called up in class at any level of detail, as long as the resolution of the pdf file is adequate.

The pdf version of *Regional Oceanography: an Introduction* has a resolution of 600 bpi. As a result, the text and figures can be magnified on the screen without loss of quality,

Regional Oceanography: An Introduction

Matthias Tomczak and J. Stuart Godfrey

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