

PHYSICAL OCEANOGRAPHY OF THE ADRIATIC SEA

Past, Present and Future

TABLE OF CONTENTS

Preface

Contributing authors

Chapter 1: Overview

1.1 Introduction

- 1.1.1 Geography
- 1.1.2 Bathymetry
- 1.1.3 Climate

1.2 History of Major Expeditions

- 1.2.1 Early achievements
- 1.2.2 Classical period
- 1.2.3 Research between the two world wars
- 1.2.4 Developments after World War II
- 1.2.5 Last decades of the 20th century

1.3 Classical Hydrography

- 1.3.1 Basin morphology and current field
- 1.3.2 Temperature distribution
- 1.3.3 Salinity distribution
- 1.3.4 Water-mass properties and climatic changes

1.4 Advent of New Observations

- 1.4.1 Measurements from moored instruments
- 1.4.2 Lagrangian observations
- 1.4.3 Acoustic Doppler Current Profiler (ADCP) and Coastal Radar
- 1.4.4 Remote sensing

1.5 Deep-water Formation

Chapter 2: Forcings

2.1 Air-sea Fluxes

2.1.1 Surface winds

Bora

Sirocco

Other winds

2.1.2 Momentum flux

Wind climatologies and products

Satellite winds

2.1.3 Heat flux

2.1.4 Water flux

2.2 River and Coastal Runoff

Chapter 3: Circulation

3.1. Observations of Near-Surface Circulation

3.1.1 Introduction

3.1.2 Indirect Observations

3.1.3 Direct Observations

3.1.4 Lagrangian Methods

3.1.5 Circulation inferred from remote sensing

3.2 Observations of Intermediate and Bottom Circulations

3.3 Dynamical Description

3.3.1 Thermohaline circulation

3.3.2 Wind-driven circulation

3.3.3 Topographic steering

3.4 Numerical Simulations

3.4.1 Modeling of the northern and middle Adriatic

3.4.2 Modeling of the Mediterranean Sea

3.4.3 Modeling of the whole Adriatic Sea

3.5 Concluding Remarks

Chapter 4: Adriatic Deep Water and Interaction with the Eastern Mediterranean Sea

4.1 Evidence of Deep-water Formation

- 4.1.1 Strait of Otranto
- 4.1.2 Southern Adriatic
- 4.1.3 Northern Adriatic

4.2 Modeling of Deep-Water Formation

4.3 Interaction with the Eastern Mediterranean

- 4.3.1 Eastern Mediterranean circulation and water mass characteristics
- 4.3.2 Interaction between the Adriatic and Ionian Seas

Chapter 5: Northern Adriatic Sea

5.1 Introduction

5.2 Forcing Mechanisms

5.3 Observations

- 5.3.1 Distributions of temperature, salinity and pigment
- 5.3.2 Satellite observations of surface temperature and chlorophyll concentration
- 5.3.3 Po River plume and Western Coastal Layer
- 5.3.4 Circulation

5.4 Numerical Simulations

- 5.4.1 Wind-driven circulation
- 5.4.2 Thermohaline circulation and the role of the Po River
- 5.4.3 Climatological forcing and long-term effects
- 5.4.4 High-frequency forcing and episodic events

Chapter 6: Regional Studies

6.1 Gulf of Trieste

- 6.1.1 Historical background
- 6.1.2 Seiches in the Gulf of Trieste
- 6.1.3 Post-war hydrography and water-mass analysis
- 6.1.4 Circulation in the Gulf
- 6.1.5 Heating and cooling of the Gulf of Trieste
- 6.1.6 Rivers into the Gulf
- 6.1.7 Conclusions

6.2 Italian Coastal Waters

- 6.2.1 Introduction
- 6.2.2 Northern WAC segment
- 6.2.3 Middle WAC segment
- 6.2.4 Southern WAC segment

6.3 Croatian Coastal Waters

- 6.3.1 Introduction
- 6.3.2 Wind-driven motions
- 6.3.3 Barotropic free waves
- 6.3.4 Baroclinic free waves
- 6.3.5 Conclusions

6.4 Albanian Shelf Circulation

Chapter 7: Tides, Seiches and Low-frequency Oscillations

- 7.1 Tidal Observations
- 7.2 Theoretical Models of Tides
- 7.3 Numerical Models of Tides
- 7.4 Tidal Residuals
- 7.5 Seiches
- 7.6 Low-frequency Oscillations

Chapter 8: Toward the Future

- 8.1 Summary and Conclusions
 - 8.1.1 General remarks
 - 8.1.2 Specifics
- 8.2 Research Recommendations

References

Index

PREFACE

Because of its central location in the Old World, the Adriatic Sea has long been explored and studied. Modern methods of investigation, however, have accelerated the pace of study during the last decade. These are the ADCP currentmeter, satellite imagery, drifter technology, and, last but not least, the computer with its arsenal of tools for data analysis and model simulations. As a result of this renaissance, the Adriatic Sea and its sub-basins are currently the object of intensified scrutiny by a number of scientific teams, in Europe and beyond. Questions concerning the mesoscale variability that dominates regional motions, the seasonal circulation of the sea, and its long-term climatic role in the broader Mediterranean, have become topics of lively discussions. The time was ripe then when an international workshop dedicated to the physical oceanography of the Adriatic Sea was convened in Trieste on 21-25 September 1998. Its objectives were to assess the current knowledge of the oceanography of the Adriatic Sea, to review the newly acquired observations, to create synergy between model simulations and observations, and to identify directions for future Adriatic oceanography.

This book, however, is not the mere proceedings of the workshop. It was written as a monograph synthesizing the current knowledge of the physical oceanography of the Adriatic Sea, with the hope that it will serve as a reference to anyone interested in the Adriatic. The book also identifies topics in need of additional inquiry and proposes research directions for the next decade.

To provide a more directly useful compilation of the current knowledge of Adriatic physical oceanography, the editors decided to structure this volume around the various basins comprising the Adriatic and their processes. Distinct sections also cover the interactions of the Adriatic with the external environment through its surface, coastline and the rest of the Mediterranean Sea. Therefore, references to in-situ observations, theoretical insights and numerical simulations are not to be found in dedicated chapters but are rather scattered across the text. A rather extensive literature on the Lagoon of Venice was not included because the book considers only those components of the Adriatic Sea that have an influence on the basin or sub-basin circulation. Finally, the editors made a special effort to refer to a maximum of prior publications in order that the bibliography at the end be as exhaustive as possible. A generous index completes the volume to facilitate its use as a reference handbook. It is expected therefore that not only physical oceanographers of the Adriatic Sea but also marine biologists, climatologists, ocean engineers and those more broadly interested in the Mediterranean Sea will find this book readily accessible to them.

We hope that this volume will also stimulate a similar effort to synthesize the knowledge of biochemical processes in the Adriatic. This is especially important because there is ample evidence that occurrences of extreme events in the Adriatic ecosystem such as mucillage, red tides and appearances of tropical species are intimately related to interannual climatic and circulation variations.

Certain conventions have been adopted in writing the text. For example, the Adriatic Sea is divided in three basins according to their main topographic and dynamical features: northern, middle and southern. An effort has also been made to use unambiguous and consistent names for the distinct water masses and currents of the Adriatic. Finally, for geographical features and locations (such as capes, bays, rivers and cities) that go by different names in the different languages spoken in the

surrounding countries, the local name is used. A problem remained, however, with the names of features in the middle of the sea. The bottom trough known to the Slovenes and Croats as Jabuka Pit and to the Italians as Pomo Depression is called here Middle Adriatic Pit (MAP).

This book would not have become reality if it had not been for the foresight of Drs. Steven R. Ramp and Alan Weinstein of the US Office of Naval Research, who first recognized that the time was ripe for an international gathering of Adriatic Sea oceanographers. Once, the idea was launched, financial support was provided by the US Office of Naval Research, the Istituto Nazionale di Oceanografia e di Geofisica Sperimentale and the Abdus Salam International Centre for Theoretical Physics, which also provided the venue for the meeting thanks to Prof. Giuseppe Furlan. The organizers-editors are most grateful for that support. They also thank all participants for their valuable contributions at the meeting, especially those who afterwards contributed significantly to the writing of this text:

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