Encyclopedia of Seas

This Encyclopedia of Seas series is designed to accumulate and systematize our knowledge about the unique natural water areas – the Aral, Caspian, Black, Arctic, Far-Eastern, and Baltic seas; their wealth; the events that took place on its waters and shores; and the remarkable people whose lives were and are closely intertwined with the seas. The Encyclopedia series contains thousands of terms and concepts related to the seas. It describes geographical features: rivers, lakes, straits, and bays; provides information about towns, seaports, transport communications, basic aquatic biological species, nature reserves, national and international programs for the study of the sea, research institutes, historical monuments, activities of prominent explorers and travelers, researchers, and scientists. Each Encyclopedia includes a chronology of major historical events connected with these seas for several centuries.

More information about this series at http://www.springer.com/series/14357

Igor S. Zonn • Andrey G. Kostianoy • Aleksandr V. Semenov • Aleksandar Joksimović • Mirko Đurović

The Adriatic Sea Encyclopedia

With 300 Figures





Igor S. Zonn
Engineering Research Production
Center for Water Management
Land Reclamation and
Ecology "Soyuzvodproject"
Moscow, Russia

S.Yu. Witte Moscow University Moscow, Russia

Aleksandr V. Semenov S.Yu. Witte Moscow University Moscow, Russia

Mirko Đurović Institute of Marine Biology University of Montenegro Kotor, Montenegro Andrey G. Kostianoy P.P. Shirshov Institute of Oceanology Moscow, Russia

S.Yu. Witte Moscow University Moscow, Russia

Aleksandar Joksimović Institute of Marine Biology University of Montenegro Kotor, Montenegro

ISBN 978-3-030-50031-3 ISBN 978-3-030-50032-0 (eBook) ISBN 978-3-030-50033-7 (print and electronic bundle) https://doi.org/10.1007/978-3-030-50032-0

© The Editor(s) (if applicable) and The Author(s), under exclusive license to Springer Nature Switzerland AG 2021

This work is subject to copyright. All rights are reserved by the Publisher, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, reuse of illustrations, recitation, broadcasting, reproduction on microfilms or in any other physical way, and transmission or information storage and retrieval, electronic adaptation, computer software, or by similar or dissimilar methodology now known or hereafter developed.

The use of general descriptive names, registered names, trademarks, service marks, etc. in this publication does not imply, even in the absence of a specific statement, that such names are exempt from the relevant protective laws and regulations and therefore free for general use.

The publisher, the authors, and the editors are safe to assume that the advice and information in this book are believed to be true and accurate at the date of publication. Neither the publisher nor the authors or the editors give a warranty, expressed or implied, with respect to the material contained herein or for any errors or omissions that may have been made. The publisher remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

This Springer imprint is published by the registered company Springer Nature Switzerland AG.

The registered company address is: Gewerbestrasse 11, 6330 Cham, Switzerland

The Adriatic Sea Encyclopedia

The book is dedicated to the Adriatic Sea, which is part of the Mediterranean. The encyclopedia contains about 700 entries on the hydrographic and geographic objects, hydrological features of the sea, biological resources, as well as administrative-territorial units of the Adriatic countries. The most significant natural objects like islands, peninsulas, bays, rivers, and mountains and their geographical peculiarities are briefly described. The economy, culture and history, cities, ports, international agreements, research institutions, and activities of outstanding scientists, researchers, and travelers are also presented in the publication. The chronology of the main historical events that have become significant landmarks in the history of discovery and exploration of the Adriatic Sea from the 625 BC to the present day is given.

Igor S. Zonn

- (1) Engineering Research Production Center for Water Management, Land Reclamation and Ecology "Soyuzvodproject", Moscow, Russia
- (2) S.Yu. Witte Moscow University, Moscow, Russia

Andrey G. Kostianoy

- (1) P.P. Shirshov Institute of Oceanology, Russian Academy of Sciences
- (2) S.Yu. Witte Moscow University

Moscow, Russia

Aleksandr V. Semenov S.Yu. Witte Moscow University Moscow, Russia

Dr. Aleksandar Joksimović Institute of Marine Biology, Kotor, Montenegro

Dr. Mirko Đurović Institute of Marine Biology, Kotor, Montenegro

> Igor S. Zonn Andrey G. Kostianoy Aleksandr V. Semenov Aleksandar Joksimović Mirko Đurović

Preface

The Adriatic Sea Encyclopedia is the first book in a series of books dedicated to the Mediterranean seas. It continues the series of encyclopedias describing the seas of Russia entitled Encyclopedia of the Russian Seas, which was begun in 2004 with The Caspian Sea Encyclopedia¹ published in Russian edition by the publishing house International Relations (Moscow, Russia). Since 2010, all the books in this series began to be published in English by Springer Publishing House (Germany)². In 2016, Springer Reference established a new book series entitled Encyclopedia of Seas where encyclopedias of the seas are now published (http://www.springer.com/series/14357).

For centuries, the Adriatic Sea has been a sea of blessed living. Being a large bay of the Mediterranean Sea, it has been the cradle of European civilization, seamanship, maritime culture, and commerce since ancient times. Until 1991, due to its location between the eastern coast of the Apennine Peninsula and the western coast of the Balkan Peninsula, it washed the shores of three European states – Italy, Yugoslavia, and Albania – and then six – Italy, Slovenia, Croatia, Bosnia and Herzegovina, Montenegro, and Albania with a common population of over 75 million people. Fleet played a great role in the historical development of these nations. It was an important factor that significantly influenced their prosperity. The people of the Adriatic were not only excellent sailors but also skillful and brave warriors.

¹Earlier the publishing house "International Relations" (Moscow) published the following books: Zonn I.S. "The Caspian Encyclopedia" (2004); Grinevetskiy S.R., Zonn I.S., Zhiltsov S.S. "The Black Sea Encyclopedia" (2006); Zonn I.S., Glanz M.G. "The Aral Sea Encyclopedia" (2008); Zonn I.S., Kostianoy A.G. "The Japan Sea. Encyclopedia" (2009); Zonn I.S., Kostianoy A.G. "The Barents Sea Encyclopedia" (2011); Zonn I.S., Kostianoy A.G., Kumantsov M.I. "The Bering Sea Encyclopedia" (2012); Zonn I.S., Kostianoy A.G., Kumantsov M.I. "The Chukchi Sea Encyclopedia" (2013); Zonn I.S., Kostianoy A.G. "The Kara Sea Encyclopedia" (2013); Zonn I.S., Kostianoy A.G. "The Laptev Sea Encyclopedia" (2014); Zonn I.S., Kostianoy A.G., Semenov A.V. "The White Sea Encyclopedia" (2014); Zonn I.S., Kostianoy A.G., Semenov A.V. "The East-Siberian Sea Encyclopedia" (2014).

²Zonn I.S., Glantz M., Kostianoy A.G., Kosarev A.N. "The Aral Sea Encyclopedia" (2009); Zonn I.S., Kostianoy A.G., Kosarev A.N., Glantz M. "The Caspian Sea Encyclopedia" (2010); Grinevetskiy S.R., Zonn I.S., Zhiltsov S.S., Kostianoy A.G., Kosarev A.N. "The Black Sea Encyclopedia" (2015); Zonn I.S., Kostianoy A.G., Semenov A.V. The Eastern Arctic Seas Encyclopedia (2016); Zonn I.S., Kostianoy A.G., Semenov A.V. The Western Arctic Seas Encyclopedia (2017).

viii Preface

The creation of *The Adriatic Sea Encyclopedia* is due to the growing popularity of the coast of this magnificent and clean sea, with numerous picturesque islands, gulfs, and bays, its magnificent beaches, the extraordinary beauty of the mountains, historical monuments, entertainment, sports, tourist, and cultural centers. If you once visit the Adriatic coast, you will fall in love with it. And this love remains forever.

The Adriatic Sea is marked by many landmarks of historical events of different eras. There are traces and testimonies of different civilizations and cultures: antiquity, medieval, and Renaissance. In the prehistoric times of the Neolite, our European ancestors came here. Here the ancient Greeks traded, the Romans waged wars with the Illyrians and built their villas, the Byzantines created the first Christian basilicas, the Venetians fought with varying success with the Slavic kings in the early Middle Ages, and they all united against the Ottomans in the years of the Turkish expansion in the Balkans. Here the pirates of the Adriatic hid themselves, and whole dynasties and schools of sailors, painters, and jewelers grew up. After the Venetians and Serbian kings, the Austrians built their fortresses here, and during the period of resistance to Napoleon, the Russian flag waved over the cities of the Montenegrin bays.

Despite its beauty and "kindness," the Adriatic Sea sometimes shows its temper, and then a catastrophe occurs, as it was in November 1966 in Venice, when, as a result of the upsurge, the water level in the city rose 2 m higher than usual. The call "Save Venice!" was heard all over the world, which came to its aid.

The popularity of the Adriatic Sea and its coast is growing every year, as evidenced by the intensive development of land and sea tourism; the creation of tourist infrastructure, super-modern yachts, boats, catamarans, ferries, and sightseeing ships; and the introduction of the most modern forms of recreation – diving, rafting, windsurfing, and underwater fishing. A lot of tourists are attracted by the "Pearl of the Adriatic" – Venice (Italy), the palace of the Roman emperor Diocletian in Split (Croatia), a well-preserved Roman amphitheater of the first century AD in Pula (Croatia), the smallest city in the world (total population – 30) Hum (Croatia), listed in the Guinness Book of Records, the fortress City of Dubrovnik (Croatia), the island-hotel Sveti-Stefan (Montenegro), and many others.

The encyclopedia contains about 700 concepts and terms covering the description of the Adriatic Sea and its coasts. It gives a characteristic of geographical objects: rivers, lakes, straits, and gulfs. It contains information about cities, seaports, transport communications, basic aquatic biological species, sanctuaries, national and international programs for the sea studies, scientific institutes, historical monuments, and activities of outstanding travelers and navigators, researchers, and scientists. The encyclopedia includes a chronology of the main historical events related to the Adriatic Sea, starting from 625 BC.

Preface ix

This encyclopedia in a relatively small, generally available edition is intended to satisfy the need of many readers to understand the history and geography of the Adriatic. Anticipating possible comments on the text, we want to draw the reader's attention to the fact that this encyclopedia is the author's approach, primarily to the selection of natural-historical facts that, in our opinion, give an idea of the past and present of the Adriatic Sea and its adjacent territories. Therefore, we are responsible for any inaccuracies and interpretations that may occur. The difficulty of selecting and writing entries was, on the one hand, the abundance of historical and tourist information and, on the other, that this information is presented in various languages.

Naturally, the information presented on the encyclopedia pages is not exhaustive. For us, this is an invitation to scientists and specialists to devote themselves to the study of the Adriatic Sea Basin, the systematization of accumulated knowledge in various areas of sea life and international cooperation.

Many people, directly or indirectly were involved in the work on the encyclopedia of the Adriatic Sea. Some of them are listed in the references. The use of these materials unwittingly made them our coauthors.

We would like to express our gratitude specially to Elena V. Kostianaia (Scientific-Coordination Oceanological Center of the Russian Academy of Sciences at the P.P. Shirshov Institute of Oceanology of the Russian Academy of Sciences, Moscow) for a considerable time, which she generously spent on searching and selecting materials and illustrations related to various entries of the encyclopedia, as well as to Dr. Sergey M. Shapovalov, Head of the Scientific-Coordination Oceanological Center, for supporting our work in creating such encyclopedias.

An invaluable assistance in preparing the encyclopedia for publication was provided by Larisa A. Abakumova, whose benevolence and interest allowed us to complete this work.

We express our deep gratitude to the leadership of the S.Yu.Witte Moscow University, charitable foundation "CREATION XXI Century," and to late Nikolai G. Malyshev, the Chairman of its Board of Trustees, for financial support of translation and preparation of the manuscript.

Moscow, Kotor 1 October 2020 Prof. Igor S. Zonn Prof. Andrey G. Kostianoy Prof. Aleksandr V. Semenov Dr. Aleksandar Joksimović Dr. Mirko Đurović x Preface

ITALY

Capital – Rome Area – 301,340 km² Population – 60.4 million people (2018) Natural resources – various ores, marble, granite, tuff. Unified on March 17, 1861. A member of the United Nations since

SLOVENIA

Capital – Ljubljana Area – 20,273 km² Population – 2,1 million people (2019) Natural resources – lead and zinc, uranium, and mercury ores. Declared on June 25, 1991 A member of the United Nations since 1992.

BOSNIA AND HERZEGOVINA

Capital – Sarajevo Area – 51,129 km² Population – 3,3 million people (2019) Natural resources – coal, iron ore, mineral salt. Declared on April 6, 1992 A member of the United Nations since 1992.



Map of the Adriatic Sea Created by Norman Einstein, May 20, 2005 https://en.wikipedia.org/wiki/Adriatic_Sea#/media/File:Adriatic Sea map.png

CROATIA

Capital – Zagreb Area 56,594 km² Population – 4,1 million people (2019) Natural resources – oil, gas, coal, bauxite Declared on June 25 1991. A member of the

United Nations since 1992.

MONTENEGRO

Capital – Podgorica Area - 13,812 km² Population – 631 thousand people (2020) Natural resources – bauxite, iron ore, coal. Declared on June 3, 2006. A member of the United Nations since 2006.

ALBANIA

Capital – Tirana
Area – 28,748 km²
Population – 2,9
million people (2017)
Natural resources –
oil, gas, lignite,
various ores
Declared on
November 28, 1912
A member of the
United Nations since
1955.

Basic Abbreviations and Acronyms Used in the Adriatic Sea Encyclopedia

AD Anno Domini ASL Absolute sea level

AS UkrSSR Academy of Sciences of the Ukrainian SSR

AS USSR Academy of Sciences of the USSR

BC Before Christ
Bln Billion
Cent. Century
Cm Centimeter

COE Council of Europe EC European Commission

Et al. And others
EU European Union

FAO Food and Agricultural Organization (United Nations)

Glf. Gulf

Hg. Mercury column

IAEA International Atomic Energy Agency ICZM Integrated Coastal Zone Management

Is. Island
Isl (s) Islands
Kg Kilogram km
Km Kilometer
Lat. Latitude
Long. Longitude

Max Maximum, maximal

Mln Million Mm Millimeter

MSP Marine spatial planning

NM Nautical mile

NATO North Atlantic Treaty Organization

Navy Naval Forces

OSCE Organization for Security and Cooperation in Europe

Pen. Peninsula

PR Petroleum refinery R/V Research vessel

RAS Russian Academy of Sciences

SL Sea level

SFRY Socialist Federal Republic of Yugoslavia

T Ton

UN United Nations

UNESCO United Nations Educational, Scientific and Cultural

Organization

USSR The Union of Soviet Socialist Republics

WTO World Trade Organization

Yrs. Years