

Gerald Schernewski
Ulrich Schiewer
Editors

Baltic Coastal Ecosystems

Structure, Function
and Coastal Zone Management

I



Springer

CEEDES

Central and Eastern European Development Studies

Editorial Board:

Professor Dr. Bernhard Müller
Institute of Ecological
and Regional Development
and Chair of Regional Planning
Technical University of Dresden
Weberplatz 1
01217 Dresden
Germany

Professor Dr. Wilfried Erbguth
Baltic Sea Institute for Marine
and Environmental Law
University of Rostock
Richard-Wagner-Str. 31
18119 Rostock
Germany

Volume Editors:

PD Dr. habil. Gerald Schernewski
Baltic Sea Research Institute
Seestraße 15
18119 Rostock-Warnemünde
Germany

Professor Dr. Ulrich Schiewer
Institute for Aquatic Ecology
University of Rostock
Freiligrathstr. 7/8
18051 Rostock
Germany

ISBN 3-540-42937-9 Springer-Verlag Berlin Heidelberg New York

Library of Congress Cataloging-in-Publication Data Applied For

Baltic coastal ecosystems: structure, function and coastal zone management; with 29 tables / Gerald Schernewski; Ulrich Schiewer (ed.). - Berlin; Heidelberg; New York; Barcelona; Hong Kong; London; Milan; Paris; Tokyo: Springer 2002
(Central and Eastern European development studies)

ISBN 3-540-42937-9

This work is subject to copyright. All rights are reserved, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, reuse of illustrations, recitations, broadcasting, reproduction on microfilm or in any other way, and storage in data banks. Duplication of this publication or parts thereof is permitted only under the provisions of the German Copyright Law of September 9, 1965, in its current version, and permission for use must always be obtained from Springer-Verlag. Violations are liable for prosecution under the German Copyright Law.

Springer-Verlag is a member of BertelsmannSpringer Science+Business Media GmbH

<http://www.springer.de>

© Springer-Verlag Berlin Heidelberg 2002
Printed in Germany

The use of general descriptive names, registered names, trademarks, 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.

Cover Design: Erich Kirchner, Heidelberg
Typesetting: Camera-ready by the editors

SPIN: 10858316 30/3130 - 5 4 3 2 1 0 - Printed on acid free paper

Contents

Status, Problems and Integrated Management of Baltic Coastal Ecosystems <i>Gerald Schernewski and Ulrich Schiewer</i>	1
Southern Baltic Coastal Waters: Status and Problems	17
Recent Changes in Northern German Lagoons with Special Reference to Eutrophication <i>Ulrich Schiewer</i>	19
Macrophytes in Coastal Lagoons of the Southern Baltic – Recent Knowledge and Developments <i>Hendrik Schubert and Jochen Christian Krause</i>	31
Microbial Metabolism in Sediments of Coastal Inlets of the Southern Baltic Sea – Response to Gradients of Eutrophication <i>Lutz-Arend Meyer-Reil</i>	43
The Ecological Importance of Mussels, Their Effect on Water Quality and Their Possible Use for Coastal Zone Management <i>Christiane Fenske</i>	53
Effects of Eutrophication on Fish Stocks in Baltic Lagoons <i>Helmut M. Winkler</i>	65
Compilation of Nutrient Loads for the Szczecin Lagoon (Southern Baltic) <i>Magdalena Wielgat</i>	75
Harmful Algal Blooms in Coastal Waters of the South-Eastern Baltic Sea <i>Norbert Wasmund</i>	93
Coastal Waters in Eastern Baltic Countries	117
Anthropogenic Pressure and Environmental Effects on the Gulf of Gdansk: Recent Management Efforts <i>Eugeniusz Andrulowicz and Zbigniew Witek</i>	119
Important Features of Coastline Dynamics in Poland: “Nodal Points” and “Gates” <i>Kazimierz Furmanczyk and Stanislaw Musielak</i>	141

Environmental Problems of the South-Eastern Baltic Coast and the Curonian Lagoon <i>Irina Olenina and Sergej Olenin</i>	149
Problems in Fisheries and Management of Fish Resources in the Gulf of Riga <i>Evald Ojaveer</i>	157
Environmental Problems and Challenges for Coastal Zone Management in the Neva Estuary (Eastern Gulf of Finland) <i>Vadim E. Panov et al.</i>	171
Coastal Zone Management: Needs and Deficits	185
Scientific Research: The German Point of View <i>Hans Eggers and Andreas Irmisch</i>	187
Integrated Coastal Zone Management (ICZM) in the Context of Spatial Planning <i>Andreas Kannen</i>	193
Important User Needs in the Coastal Zone of Mecklenburg-Vorpommern and Legal Obligations in the German Baltic Territorial Sea <i>Hans Obenaus and Jörg Köhn</i>	205
Tourism and Environmental Quality of the German Baltic Coast: Conflict or Chance? <i>Gerald Schernewski and Horst Sterr</i>	215
The EC Water Framework Directive for Coastal Zones: Legal Aspects <i>Guy Beaucamp</i>	231
Environmental Policy-Making in the Northwest of Russia: Ecological Problems and Management of the Eastern Gulf of Finland Coastal Zone <i>Olga S. Skarlato</i>	241
Harmful Non-Native Species in the Baltic Sea – An Ignored Problem <i>Erkki Leppäkoski</i>	253

Coastal Zone Management: Tools and Strategies	277
Remote Sensing Applications in Coastal Zone Management <i>Herbert Siegel et al.</i>	279
3D Ecosystem Models as Decision Support Tools in the Gulf of Finland – the Kotka Archipelago as an Example <i>Mikko Kiirikki et al.</i>	293
The “Geo-Information System Coast Mecklenburg-Vorpommern” <i>Lars Tiepolt</i>	311
Developing Efficient Information Provision Tools for ICM Practitioners in the Baltic <i>Irene Lucius</i>	321
Indicators of the Development of Sustainable Tourism in the Baltic Sea Region <i>Wolfgang Günther</i>	331
Conflict Management and Consensus-Building for Integrated Coastal Zone Management – Does Stakeholder Involvement Fit to the Baltic Sea Region? <i>Jörg Köhn</i>	341
Linking Partners in Joint Coastal Management Research: Strategies toward Sustainability <i>Bernhard Glaeser</i>	353
Practical Experiences with Coastal Management	363
Integrated Coastal Zone Management: Case Study Rügen-Hiddensee <i>Thomas Höpner</i>	365
Integrated Management of Coastal Defence in Schleswig-Holstein: Experience and Challenges <i>Jacobus Hofstede and Matthias Hamann</i>	377
Subject Index	389
List of Contributing Authors	393

Status, Problems and Integrated Management of Baltic Coastal Ecosystems

Gerald Schernewski¹ and Ulrich Schiewer²

¹ Baltic Sea Research Institute (IOW), Rostock-Warnemünde, Germany

² Institute of Aquatic Ecology, University of Rostock, Rostock, Germany

Abstract

The Baltic coastal region is under intensive anthropogenic pressure and is expected to become a major centre for economic growth and prosperity in Europe during this century. Trade, municipalities, industry, traffic, energy generation, shipping, agriculture and fisheries, tourism, nature protection and raw material exploitation all cause a complicated patchwork of interacting and overlapping uses. In rural areas, nature conservation, tourism and coastal protection are most important. Information about terrestrial regions can be regarded as sufficient, but the state of and problems in coastal waters need to receive increased attention. Two major ecological problems are the intrusion of alien species, which arrive in the ballast water of ships, and the ongoing eutrophication. In the future, the pressure on the Baltic coastal zones will increase, and strategies for a joint sustainable development as well as Integrated Coastal Zone Management (ICZM) are urgently needed. On the basis of results obtained as part of the workshop 'Baltic Coastal Ecosystems – Structure, Function and Coastal Zone Management', that took place in Rostock, Germany, in November 2000, the state of ICZM in Germany and the Baltic region is discussed, and shortcomings are outlined.