

JOURNAL OF COASTAL RESEARCH

An International Forum for the Littoral Sciences

EDITOR-IN-CHIEF

Charles W. Finkl, Jr.
Coastal Education and Research
Foundation, Inc. (CERF)
P.O. Box 8068
Charlottesville, VA 22906, USA

CONSULTING EDITOR

Rhodes W. Fairbridge
Department of Geosciences
Schermmerhorn Box 13
Columbia University
New York, NY 10027, USA

BOOK REVIEW EDITOR

R.W.G. Carter
Environmental Science
University of Ulster, Coleraine
County Londonderry
Northern Ireland BT52 1SA, UK

EDITORIAL BOARD

Eric C.F. Bird
Department of Geography
University of Melbourne
Parkville, Victoria 3052, Australia

Charles Birkeland
Marine Laboratory
U.O.G. Station
Mangilao, Guam 96913, USA

James M. Broadus
Marine Policy and Ocean
Management Center
Woods Hole Oceanographic Institution
Woods Hole, MA 02543, USA

Per Bruun
International Marine Science
and Engineering
34 Baynard Cove Road
Hilton Head, SC 29928, USA

Donald R. Coates
Department of Geological Sciences
State University of New York
Binghamton, NY 13901, USA

Anthony J. Davy
School of Biological Sciences
University of East Anglia
Norwich, England NR4 7TJ, UK

Clinton J. Dawes
Department of Biology
University of South Florida
Tampa, FL 33620, USA

Elliot W. Dawson
New Zealand Oceanographic Institute
P.O. Box 12-346
Wellington North, New Zealand

Richard V. Dingle
Department of Geology
University of Cape Town
Rondebosch 7700, South Africa

Robert Dolan
Department of Environmental Science
University of Virginia
Charlottesville, VA 22903, USA

Keith R. Dyer
Institute of Oceanographic Sciences
Merseyside, England TA1 2DW, UK

David W. Fischer
Grad. Ctr. Public Policy
California State University
Long Beach, CA 90840, USA

Shoji Fujii
Department of Geology
Toyama University
Toyama City 930, Japan

Edgardo D. Gomez
Marine Sciences Center
University of the Philippines
Quezon City 3004, Philippines

Douglas R. Grant
Geological Survey of Canada
601 Booth Street
Ottawa K1A 0E8, Canada

André Guilcher
University of Brest
B.P. 860 F 29279
Brest, France

Terry R. Healy
Earth Sciences Department
University of Waikato
Hamilton, New Zealand

Joel W. Hedgpeth
Environmental and Editorial Analysis
5660 Montecito Avenue
Santa Rosa, CA 95404, USA

Richard G. Hildreth
Ocean and Coastal Law Center
University of Oregon
Eugene, OR 97403, USA

David Hopley
Department of Geography
James Cook University
Townsville, Queensland
Australia

Paul Kaplin
Faculty of Geography
Moscow State University
Moscow 117234, USSR

Vic Klemas
College of Marine Studies
Center for Remote Sensing
University of Delaware
Newark, DE 19716, USA

Pierre Lasserre
Marine Station Roscof
Université Pierre et Marie Curie
Paris VI, France

Miguel A. Losada
Universidad de Santander
Santander, Spain

C. Peter McRoy
Institute of Marine Science
University of Alaska
Fairbanks, AK 99701, USA

Roland P. Paskoff
10, Square Saint-Florentin
78150 Le Chesnay, France

Edward J. Petuch
Department of Geology
Florida Atlantic University
Boca Raton, FL 33431, USA

Orrin H. Pilkey, Jr.
Department of Geology
Duke University
Durham, NC 27708, USA

Paolo A. Pirazzoli
C.N.R.S. "INTERGEO"
191 rue St-Jacques
75005 Paris, France

Ren Mei-e
Department of Geography
Nanjing University
Nanjing, China

Donna C. Rona
Rona Coastal Consulting
P.O. Box 490102
Key Biscayne, FL 33149, USA

Keith Ronald
Department of Zoology
University of Guelph
Guelph, Ontario, Canada

Reynold J. Ruppé
Department of Anthropology
Arizona State University
Tempe, AZ 85287, USA

Bernard Salvat
EPHE/Museum
55 rue Buffon
75005 Paris, France

Carlos Schubert
I.V.I.C.
Apartado 1827
Caracas 1010A, Venezuela

Maurice L. Schwartz
Department of Geology
Western Washington University
Bellingham, WA 98225, USA

Andrew D. Short
Department of Geography
University of Sydney
Sydney NSW, 2006 Australia

Aprilani Soegiarto
National Institute of Oceanology
P.O. Box 580/Dak.
Jakarta, Indonesia

Bernard A. Thomassin
Station Marine D'Endoume
rue de la Batterie des Lions
F 13007 Marseille, France

Michael J. Tooley
Department of Geography
University of Durham
Durham, England DH1 3LE, UK

José F. Araya Vergara
Department of Geography
University of Chile
Santiago, Chile

Herman Th. Verstappen
International Institute for Aerial
Survey and Earth Sciences (ITC)
7500 AA Enschede, The Netherlands

Ian Watson
Department of Geology
Florida Atlantic University
Boca Raton, FL 33431, USA

Edward Wedler
Terra-Control Technologies
Jalan Brickfields
50470 Kuala Lumpur
Malaysia

Niels West
Department of Marine Affairs
University of Rhode Island
Kingston, RI 02881, USA

EDITORIAL ASSISTANT

Pamela A. Matlack
Coastal Education and Research Foundation

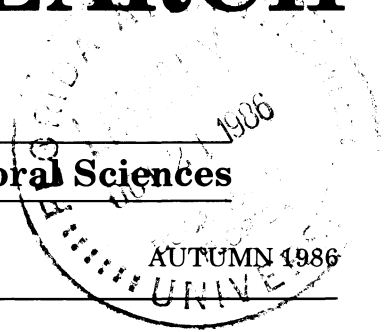




JOURNAL OF COASTAL RESEARCH

An International Forum for the Littoral Sciences

VOL. 2, NO. 4 (pages 391 – 514)



CONTENTS

- The Pliocene Reefs of Miami: Their Geomorphological Significance in the Evolution of the Atlantic Coastal Ridge, Southeastern Florida, U.S.A. **Edward J. Petuch** 391
- Field Study and Prediction of Longshore Currents, Argentine Coast
. **Néstor W. Lanfredi and Mariana B. Framiñan** 409
- Change of Particle Composition from Fluvial into an Estuarine Environment:
Rappahannock River, Virginia. **J.W. Pierce and Maynard M. Nichols** 419
- Coastal Submergence and Marsh Fringe Erosion **Jonathon D. Phillips** 427
- Integrated Multi-Disciplinary Information for Coastal Management, Florida
David W. Fischer, Gregory W. Stone, James P. Morgan, and Donald E. Henningsen 437
- The Arctic Shelf in the Late Pleistocene and Certain Problems of Paleoglaciology
. **Yu. I. Vozovik** 449
- New Jersey's Longshore Current Pattern. **Gail M. Ashley, Susan D. Halsey,
and Christopher B. Buteux** 453
- The Severe Erosion of Cape Shoalwater, Washington **Thomas Terich
and Terrance Levenseller** 465
- Coral Cay Instability and Species-Turnover of Plants at Swain Reefs, Southern
Great Barrier Reef, Australia. **Peter G. Flood and Harold Heatwole** 479

Departments

- | | | | |
|---------------------------------|-----|---------------------------|-----|
| News and Announcements. | 497 | New Citations. | 503 |
| Book Reviews. | 499 | Coastal Calendar. | 507 |
-

COPY PERMISSION

Authorization to photocopy items for internal or personal use, or the internal or personal use of specific clients, is granted by the Coastal Education and Research Foundation (CERF). This authorization is extended to libraries and other users registered with the Copyright Clearance Center (CCC) Transactional Reporting Service, provided that the base fee of \$US 1.00 per copy of the article plus \$US 0.10 per page is paid directly to the Copyright Clearance Center, 27 Congress Street, Salem, MA 01970. For those organizations that have been granted a License with the Copyright Clearance Center, a separate system of payments has been arranged. Please contact the Copyright Clearance Center to determine whether the License fee arrangement covers your organization.

ISSN 0749-0208/1986 \$1.00 + 0.10



Journal of Coastal Research

Volume 2, No. 4, 1986. ISSN: 0749-0208

Published by The Coastal Education and Research Foundation, Inc.
P.O. Box 8068
Charlottesville, Virginia 22906, USA

Volume 2, 1986 (4 issues)

Subscription price for Volume 2: \$US 50.00 postpaid, \$US55.00 outside North America
\$US60.00 for Institutions, \$US65.00 outside North America
Single copy price: \$US 15.00

Subscription orders and notification about change of address
should be sent to the Editorial Office of the journal.

Copyright © 1986 The Coastal Education and Research Foundation, Inc.

THE JOURNAL OF COASTAL RESEARCH is indexed or abstracted in:

Aquatic Sciences and Fisheries Abstracts
Current Awareness in Biological Sciences
Current Contents/Agriculture, Biology &
Environmental Sciences
Ecology Abstracts
GeoAbstracts
GeoScience Contents
Institute of Scientific Information (USSR)
Marine Science Contents Tables
Oceanic Abstracts
Oceanographic Literature Review
Physics Abstracts
Pollution Abstracts

Printed in the United States of America

Journal of Coastal Research

Supporting Organizations

- International Union for Quaternary Research (**INQUA**)
Commission on Quaternary Shorelines
The Holocene Commission
The Neotectonics Commission
- International Geological Correlation Program (**IGCP**)
(supported by the International Union of Geological
Sciences and UNESCO)
Project No. 200 — Sea Level Correlations and Applications
- The International Geographical Union (**IGU**)
Commission on the Coastal Environment
- International Institute for Aerial Survey and Earth
Sciences (**ITC**) [Enschede, The Netherlands]
- International Association for Biological Oceanography (**IABO**)
- International Association of Meiobenthologists
- International Post-Graduate Training Courses on Fundamental
and Applied Quaternary Geology (**IFAQ**) [Brussels, Belgium]
- The Coastal Society (**TCS**) [Bethesda, Maryland, USA]

Aims and Scope of the Journal

Journal of Coastal Research, an International Forum for the Littoral Sciences, is dedicated to all aspects of coastal research. These include geology, biology, geomorphology (physical geography), climate, littoral oceanography, hydrography, coastal hydraulics, environmental (resource) management, engineering, and remote sensing. Although each field functions effectively within its own purview, the cross-disciplinary nature of coastal studies requires familiarity with other fields as well. Hence, the scope of topics is necessarily broad in order to address the complexity of coastal biophysical and socio-economic interactions. Because of the wide range of interrelated topics, the journal invites original contributions and manuscripts dealing with theory, methodology, techniques, and field or applied topic studies on interdisciplinary coastal issues.

The journal encourages the dissemination of knowledge and understanding of the coastal zone by promoting cooperation and communication between specialists in different disciplines. Natural scientists, for example, are encouraged to collaborate with professionals in other fields to prepare contributions relating to the coastal zone that foster increased appreciation of coastal environments and processes. By means of this journal, with its scholarly and professional papers, systematic review articles, book and symposia reviews, communications and news, and special topical issues, an international forum for the development of integrated coastal research is provided.

Subscription Information

Editorial Office: Dr. Charles W. Finkl, Jr., Editor-in-Chief, Post Office Box 8068, Charlottesville, Virginia 22906, USA, Telex: 4944447

Published Quarterly in January, March, June, and September. *Annual Subscription Rate (1986):* \$US50.00 (Personal) and \$US60 (Institutional). Subscribers outside of North America please add \$US5 for surface postage or \$US25 for airmail postage and handling to Europe and South America, \$US28 to Australia, Africa, and the Far East.

REPOSITORY LIBRARIES

As part of our international intention to provide access to the *Journal of Coastal Research (JCR)* in as many widely scattered regions as practical, a number of national libraries have been selected as repositories for JCR. It is hoped that our efforts to supply these select libraries with gratis copies of each journal issue will help establish and broaden our international forum for coastal researchers. In this way we may encourage collaboration on a global scale and specialists near major research centers as well as those in more remote regions may become more quickly aware of other progress in coastal studies.

ARGENTINA

Biblioteca Nacional
Buenos Aires

AUSTRALIA

National Library of Australia
Canberra, A.C.T. 2600

BELGIUM

IFAQ
Freie Universite
B-1005 Brussels

BRAZIL

Biblioteca Nacional
Rio de Janeiro, R.J.

CANADA

National Library
Ottawa, Ontario K1A 0N4

ENGLAND

Library
British Geological Survey
London SW7 2DE

FEDERAL REPUBLIC OF GERMANY

Max-Planck-Gesellschaft zur
Förderung der Wissenschaften e.v.
8000 Munich

FRANCE

International Council of Scientific Unions
75016 Paris

Intergovernmental Oceanographic
Commission (IOC)
C/o UNESCO
75 700 Paris

Centre National de la Recherche
Scientifique (C.N.R.S.)
Centre d'Etude d'Océanographie et
de Biologie Marine
29 211 Roscoff

INDIA

National Institute of Oceanography
Dona Paula, Goa 403 004

Geological Survey of India
Calcutta 700 013

ITALY

Consiglio Nazionale delle Ricerche (C.N.R.)
Rome

ITALY

Fisheries Information, Data & Statistics
Service
Food & Agricultural Organization (FAO)
00100 Rome

JAPAN

Ryukyus University
Nishihara, Okinawa

MALAYSIA

National Library of Malaysia
Kuala Lumpur 01-33

MEXICO

Biblioteca Nacional de México
Cuidad Universitaria
Mexico 20, D.F.

THE NETHERLANDS

Nederlands Instituut voor Onderzoek
der Zee 't Horntje
Texel

NORWAY

Fiskeridirektoratets Havforskningsinst.
Biblioteket
N-5011 Bergen

PEOPLE'S REPUBLIC OF CHINA

Chinese Academy of Sciences Library
Beijing

REPUBLIC OF SOUTH AFRICA

Associated Scientific and Technical
Societies of South Africa
Johannesburg

SENEGAL

Bibliothèque
Université de Dakar
Fann, Dakar

SWITZERLAND

Regional Seas Programme Activity Centre
United Nations Environmental Programme
1211 Geneva 10

USSR

Moscow State University
117234 Moscow B234

USA

National Academy of Sciences
Washington, D.C. 20418

Library of Congress
Washington, D.C. 20540