BioOne COMPLETE

COVER PHOTOGRAPH AND FRONT MATTER: LYTTELTON HARBOUR, CHRISTCHURCH, NEW ZEALAND

Source: Journal of Coastal Research, 30(3)

Published By: Coastal Education and Research Foundation

URL: https://doi.org/10.2112/1551-5036-30.3.ii

BioOne Complete (complete.BioOne.org) is a full-text database of 200 subscribed and open-access titles in the biological, ecological, and environmental sciences published by nonprofit societies, associations, museums, institutions, and presses.

Your use of this PDF, the BioOne Complete website, and all posted and associated content indicates your acceptance of BioOne's Terms of Use, available at www.bioone.org/terms-of-use.

Usage of BioOne Complete content is strictly limited to personal, educational, and non - commercial use. Commercial inquiries or rights and permissions requests should be directed to the individual publisher as copyright holder.

BioOne sees sustainable scholarly publishing as an inherently collaborative enterprise connecting authors, nonprofit publishers, academic institutions, research libraries, and research funders in the common goal of maximizing access to critical research.

Downloaded From: https://complete.bioone.org/journals/Journal-of-Coastal-Research on 29 Mar 2024
Terms of Use: https://complete.bioone.org/terms-of-use

www.JCRonline.org

COVER PHOTOGRAPH

www.cerf-jcr.org



Lyttelton Harbour, Christchurch, New Zealand. Mechanics Bay on the north side of the entrance to Lyttelton Harbour at Christchurch, New Zealand. The photograph shows a plume of dredgate following the trailer suction dredge 'Pelican.' The split hopper is closing as 'Pelican' moves off from the designated dump location having released 965 m^3 of silt size sediment. Concerns of the behavior and possible further transport of the dredgate once deposited on the bottom were addressed by the Port and are discussed in this issue of the JCR (McLaren and Teear, 2014). The 'Pelican' is one of two trailer suction dredges used for the maintenance dredging of the Lyttelton Harbour navigation channel. (Photograph taken in 2010 by Gary Teear, OCEL Consultant to the Port of Lyttelton at Christchurch, and caption by Patrick McLaren, SedTrend Analysis Limited, Brentwood Bay, British Columbia, Canada.)

McLaren, P. and Teear, G., 2014. A Sediment Trend Analysis (STA®) in support of dredged material management in Lyttelton Harbour, Christchurch, New Zealand. *Journal of Coastal Research*, 30(3), 438–447.

Downloaded From: https://complete.bioone.org/journals/Journal-of-Coastal-Research on 29 Mar 2024
Terms of Use: https://complete.bioone.org/terms-of-use

JOURNAL OF COASTAL RESEARCH

An International Forum for the Littoral Sciences

CHEF-HERAUSGEBER | **EDITOR-IN-CHIEF** | **RÉDACTEUR-EN-CHIEF**

Charles W. Finkl

Coastal Education and Research Foundation, Inc. *[CERF]*

Editorial Offices:

25 Jake Ridge Trail
Fletcher, NC
28732, U.S.A.

5130 NW 54th Street
Coconut Creek, FL
33073, U.S.A.

(Editorial Office, Coconut Creek)
CERF/JCR Website: http://www.CERF-JCR.org
e-mail: cfinkl@cerf-jcr.com

BOOK REVIEW EDITOR
J. Andrew G. Cooper
School of Environmental Sciences
University of Ulster
Coleraine, N. Ireland
jag.cooper@ulster.ac.uk

PUBLISHING MANAGER
Christopher Makowski
Coastal Education and Research Foundation, Inc. *[CERF]*
5130 NW 54th Street
Coconut Creek, FL 33073, U.S.A.
cmakowski@cerf-jcr.com

EDITORIAL ASSISTANT
Barbara Russell
Coastal Education and Research Foundation, Inc. *[CERF]*
5130 NW 54th Street
Coconut Creek, FL 33073, U.S.A.
barbara@cerf-jcr.com

WEB DESIGN & DEVELOPMENT
Jon Finkl
Media Mine
111 W Washington, Suite 1100
Chicago, IL 60602, U.S.A.
jon@mediamine.net

MITHERAUSGEBER | **ASSOCIATE EDITORS** | **COMITÉ DE REDACTION**

Edward J. Anthony
Coastal Geomorphology
Dunkerque, France

Cecile Baeteman
Holocene Coastal Dynamics
Brussels, Belgium

Kenneth Banks
Coral Reef Geomorphology
Plantation, Florida

Patrick Barnard
Coastal Geomorphology
Santa Cruz, California

Lindino Benedet
Oceanography, Modeling
Florianopolis, SC, Brazil

David M. Bush
Coastal Geology & Hazards
Carrollton, Georgia

Ilya V. Buynevich
Coastal Geology
Philadelphia, Pennsylvania

Javier A. Carrió
Sediment Processes
Valencia, Spain

Mark Crowell
Coastal Zone Management
McLean, Virginia

Robert Dean
Coastal Engineering & Processes
Gainesville, Florida

Omar Defeo
Sandy Beach Ecology
Montevideo, Uruguay

J. Javier Diez
Coastal Geomorphology
Madrid, Spain

Joseph F. Donoghue
Coastal Morphology & Hazards
Tallahassee, Florida

Oscar Manuel Ferreira
Storm Impacts
Faro, Portugal

Duncan M. FitzGerald
Sediment Transport
Boston, Massachusetts

Chip Fletcher
Coastal Geology
Honolulu, Hawaii

Kazimierz K. Furmańczyk
Marine Cartography
Szczecin, Poland

Gary B. Griggs
Coastal Engineering & Hazards
Santa Cruz, California

Pramod Hanamgond
Coastal Geomorphology
Belgaum, India

Hans Hanson
Coastal Protection
Lund, Sweden

Simon Haslett
Paleoceanography
Wales, United Kingdom

Michael Hilton
Dune Geomorphology & Ecology
Dunedin, New Zealand

Carl H. Hobbs, III
Coastal Geology, Sand Mining
Gloucester Point, Virginia

James R. Houston
Sea-Level Change
Vicksburg, Mississippi

Wenrui Huang
Coastal Hydrodynamics
Tallahassee, Florida

Michael G. Hughes
Coastal Morphodynamics
Canberra, ACT, Australia

Federico I. Isla
Sea-Level Change
Mar Del Plata, Argentina

Nancy L. Jackson
Coastal Geomorphology
Newark, New Jersey

Markes E. Johnson
Paleoshores, Coastal Sand Dunes
Williamstown, Massachusetts

Timothy R. Keen
Waves & Circulation
Stennis Space Center, Mississippi

Dieter H. Kelletat
Coastal Geomorphology
Essen/Cologne, Germany

Joseph T. Kelley
Sea-Level Change
Orono, Maine

Syed Khalil
Coastal Geology & Geophysics
Baton Rouge, Louisiana

Jack Kindinger
Oceanography
St. Petersburg, Florida

Vic Klemas
Remote Sensing
Newark, Delaware

Nobuhisa Kobayashi
Coastal Engineering
Newark, Delaware

Vladimir N. Kosmynin
Coral Reefs, Coastal Ecology
Tallahassee, Florida

Joseph L. Kowalski
Estuarine Plant Ecology
Edinburg, Texas

Michael J. Lace
Coastal Landforms & Processes
West Branch, Iowa

Stephen P. Leatherman
Barrier Islands, Beach Erosion
Miami, Florida

Charles Lemckert
Environmental Fluid Dynamics
Queensland, Australia

Ioannis Liritzis
Geophysical Proxy Data
Rhodes, Greece

Jeffrey H. List
Shoreline Change Processes
Woods Hole, Massachusetts

Michel M. de Mahiques
Sediment Processes
São Paulo, Brazil

Ashish J. Mehta
Coastal Engineering
Gainesville, Florida

Nobuo Mimura
Environmental Engineering
Ibaraki, Japan

Robert Nicholls
Global Climate Change
Southampton, United Kingdom

Karl F. Nordstrom
Coastal Geomorphology
New Brunswick, New Jersey

Julian Orford
Gravel Beaches, Storm Events
Belfast, Northern Ireland, UK

Phil D. Osborne
Sediment Dynamics
Shoreline, Washington

Hugh Parker
Airborne Lidar Bathymetry
Adelaide, SA, Australia

Charitha B. Pattiaratchi
Physical Oceanography
Crawley, WA, Australia

Michael Phillips
Coastal Geomorphology
Swansea, Wales, UK

Orrin H. Pilkey, Jr.
Coastal Geology
Durham, North Carolina

Paolo A. Pirazzoli
Sea-Level Changes
Paris, France

Nobert P. Psuty
Coastal Geomorphology
New Brunswick, New Jersey

Ulrich Radtke
Coastal Geomorphology
Duisburg-Essen, Germany

Elijah W. Ramsey, III
Coastal Image Processing
Lafayette, Louisiana

Kirt Rusenko
Sea Turtles, Dune Restoration
Boca Raton, Florida

Anja Scheffers
Coastal Evolution
Lismore, NSW, Australia

Andrew D. Short
Coastal Geomorphology
Sydney, NSW, Australia

Pravi Shrestha
Coastal Engineering
Irvine, California

Carlos Pereira da Silva
Coastal Zone Management
Lisbon, Portugal

Alejandro J. Souza
Coastal & Sediment Processes
Liverpool, United Kingdom

Tom Spencer
Biogeomorphology
Cambridge, United Kingdom

Marcel Stive
Coastal Hydrodynamics
Delft, The Netherlands

Vallam Sundar
Coastal Engineering
Chennai, India

Adam D. Switzer
Coastal Hazards, Sea-Level Change
NTU, Singapore

E. Robert Thieler
Marine Geology
Woods Hole, Massachusetts

Arthur C. Trembanis
Coastal Morphodynamics
Newark, Delaware

Frank Van Der Meulen
Coastal Zone Management
Delft, The Netherlands

Ping Wang
Beach Morphodynamics
Tampa, Florida

Allan Williams
Coastal Geology
Swansea, Wales, UK

Harry F. Williams
Paleotempestology
Denton, Texas

Colin D. Woodroffe
Coastal Geomorphology
Wollongong, Australia

Robert S. Young
Coastal Processes
Cullowhee, North Carolina

Guoliang Yu
Sediment Transport
Shangai, China

THE *JOURNAL OF COASTAL RESEARCH* (JCR) (ISSN 0749–0208) IS PUBLISHED BIMONTHLY FOR $115.00 FOR INDIVIDUAL US CERF MEMBERS, $125.00 FOR INDIVIDUAL INTERNATIONAL CERF MEMBERS, $519.00 FOR US INSTITUTIONS, AND $541.00 FOR INTERNATIONAL INSTITUTIONS BY THE COASTAL EDUCATION AND RESEARCH FOUNDATION, INC. (CERF), 5130 NW 54TH STREET, COCONUT CREEK, FL 33073–3713. PERIODICALS POSTAGE PAID AT FORT LAUDERDALE, FL AND ADDITIONAL MAILING OFFICES. **POSTMASTER:** SEND ADDRESS CHANGES TO *JOURNAL OF COASTAL RESEARCH*, ALLEN PRESS ASSOCIATION MANAGEMENT, P.O. BOX 1897, LAWRENCE, KS 66044–3018.

© 2014 The Coastal Education & Research Foundation *[CERF]*.

♾ This paper meets the requirements of ANSI/NISO Z39.48-1992 (Permanence of Paper).

Downloaded From: https://complete.bioone.org/journals/Journal-of-Coastal-Research on 29 Mar 2024
Terms of Use: https://complete.bioone.org/terms-of-use

THE COASTAL EDUCATION AND RESEARCH FOUNDATION

5130 NW 54th Street
Coconut Creek, FL 33073, U.S.A.

Officers of the Foundation
Founded in 1983 by: Charles W. Finkl, Sr.,
Charles W. Finkl, Jnr., Rhodes W. Fairbridge,
and Maurice L. Schwartz

President &
Executive Director:
Charles W. Finkl

Senior Vice President &
Assistant Director:
Christopher Makowski

Vice President:
Syed Khalil

Secretary:
Heather M. Vollmer

Executive Assistant:
Barbara Russell

Board of Directors (Trustees)

J. Andrew G. Cooper
Robert Dean
Charles W. Finkl
Gary B. Griggs
James R. Houston
Robert Huff
Joseph T. Kelley
Victor Klemas
Charles Lemckert
Chris Makowski
Michael Phillips
Orrin H. Pilkey, Jr.
Norbert P. Psuty
Elijah W. Ramsey, III
Andrew D. Short
Carlos Pereira da Silva
Daniel J. Stanley
Marcel Stive
Allan Williams

Lifetime Members

Yong-Sik Cho
Nicholas K. Coch
Hany Elwany
Björn Kjerfve
Charles Lemckert
Ya Ping Wang

Patron Members

Luis Antonio Buenfil-Lopez
Carl H. Hobbs, III
Norbert P. Psuty
Giovanni Randazzo
Yung Tseng
Robert S. Young

The Coastal Education and Research Foundation *[CERF]* is a nonprofit society dedicated to the advancement of the coastal sciences. The Foundation is devoted to the multi-disciplinary study of the complex problems of the coastal zone. The purpose of CERF is to help translate and interpret coastal issues for the public and to assist professional research and public information programs. The Foundation specifically supports and encourages field and laboratory studies on a local, national, and international basis. Through the medium of scientific publications, television, and radio CERF brings accurate information to the public and coastal specialists on all aspects of coastal issues in an effort to maintain or improve the quality of shoreline resources.

Because CERF is concerned with broad environmental issues, our efforts concentrate on significant problems such as maintenance of good quality (potable) water with adequate supply, and hazards associated with potential beach erosion, flooding, and susceptibility of developed shorelines to storm surge and wave attack. By focusing attention on these potential man-made and natural hazards, it is hoped that our research efforts will help others improve the quality of life in diverse coastal areas. CERF thus aims to stimulate awareness of coastal (marine and freshwater shorelines) land and water problems; initiate and foster research and innovation to promote long-term coastal productivity; establish an educational forum for the debate of contentious coastal issues; and develop new principles and approaches for enlightened coastal management, and encourage their adoption and use.



☐ CERF MEMBERSHIP ☐

Members are individuals that support the aims of the foundation through personal and group efforts or by donations. Memberships are available in different categories with privileges.

Subscription information is available online at www.cerf-jcr.org. Subscriptions office: Allen Press, Inc., P.O. Box 1897, Lawrence, KS 66044, U.S.A. CERF@allenpress.com

Editor-in-Chief

Charles W. Finkl Ph.D., CSci, CMarSci, FIMarEST, CPGS, CPSSc, PWS

Dr. Charles W. Finkl is President and Executive Director of the Coastal Education & Research Foundation *[CERF]*, publisher of the JCR. Charlie, a founding editor of the *Journal of Coastal Research*, has served as Editor-in-Chief for the past 30 years. He is a Research Professor in the Department of Geosciences at Florida Atlantic University in Boca Raton, Florida. He received his Bachelor and Master of Science degrees from Oregon State University and the Ph.D. from the University of Western Australia. He is a member of more than 20 professional societies and has published more than 200 professional papers, books, and reports. He is a Chartered Marine Scientist (CMarSci) [Institute of Marine Engineering, Science and Technology], Certified Professional Geological Scientist (CPGS) [American Institute of Professional Geologists (AIPG),], Certified Professional Soil Scientist (CPSSc) [American Registry of Certified Professionals in Agronomy, Crops, and Soils], and a Professional Wetland Scientist (PWS) [Society of Wetland Scientists]. Charlie has field experience in parts of the USA, Caribbean area, Brazil, Honduras, Russia, South Africa, Western Europe, Australasia, and South Pacific islands. He is also the Series Editor of the Encyclopedia of Earth Sciences Series that is published by Springer (Germany). There are more than twenty-eight volumes in the Series and about twenty-five are available online. Charlie also serves on the Editorial Board of the *International Journal of Environmental Studies* (Routledge) and is an occasional peer reviewer for many other professional journals.

Charlie has interests and expertise in the general areas of surficial geology, coastal and marine geomorphology (including coastal classification), coastal/marine biophysical environments, exploration geochemistry, soils and weathering (regolith geology), coastal zone management and engineering applications or impacts on natural systems (including erosion control and shore protection), coastal hydrology including submarine freshwater and mineralized seeps, subaerial and marine structural geology, natural hazard mitigation in coastal zones, marine environments and coastal wetland protection and restoration, and remote sensing (*e.g.* land cover classification in coastal wetlands, advection-diffusion turbidity plumes in coastal waters, delineation of bottom types and sand resources), effluent disposal and pollution of wetlands and estuaries, water resources mapping and conservation, time series studies of wetland hydroperiod and soil moisture.

CERF International Meetings

International Coastal Symposium (ICS)

The International Coastal Symposium (ICS) was originally set up by Per Bruun (deceased) and Charlie Finkl as the official meeting of the Coastal Education & Research Foundation (CERF), with the first meeting being held in Hilton Head, South Carolina, in 1993. After the repeated success of these meetings, CERF moved the ICS to the international scene holding these conferences in conjunction with local sponsors in Australia, Brazil, Iceland, New Zealand, Northern Ireland, Poland, and Portugal. The ICS brings together delegates from all over the world to collaborate and discuss the most current coastal research studies and projects. During the ICS 2014, which was held in Durban, South Africa, a grand celebration took place to mark the 30th Anniversary of CERF and the JCR. Our next ICS meeting is scheduled for the spring of 2016 in Sydney, New South Wales, Australia. For more information, please visit www.cerf-jcr.org.

JOURNAL OF COASTAL RESEARCH

An International Forum for the Littoral Sciences

Supporting Scientific Information

- AZTI - Tecnalia [Pasaia, Spain; www.azti.es/]
- Coastal and Hydraulics Laboratory (CHL), US Army Corps of Engineers [Vicksburg, Mississippi, U.S.A.; http://chl.erdc.usace.army.mil/]
- Coastal and Marine Geology Program (CMGP), U.S. Geologic Survey (USGS) [Reston, Virginia, U.S.A.; http://marine.usgs.gov/]
- Coastal Research Laboratory (CRL), University of South Florida [Tampa, Florida, U.S.A.; http://crl.usf.edu/]
- Commission on Coastal System (CCS), International Geographical Union (IGU) [http://www.igu-ccs.org/]
- Consorzio Nazionale Interuniversitario per le Scienze del Mare (Co.N.I.S.Ma.) [Rome, Italy; www.conisma.it/]
- Deltares Institute [Delft, The Netherlands; http://www.deltares.nl/en/coast-sea]
- Departamento de Geografia e Planeamento Regional, Universidade Nova de Lisboa [Lisbon, Portugal; http://www.fcsh.unl.pt/]
- e-Geo Center for Geographical and Regional Planning Studies [Lisbon, Portugal; http://e-geo.fcsh.unl.pt/]
- Institute of Marine and Coastal Sciences (IMCS), Rutgers University [New Brunswick, New Jersey, U.S.A.; http://marine.rutgers.edu/main/]
- Louisiana Coastal Protection & Restoration Authority (CPRA) [Baton Rouge, Louisiana, U.S.A.; www.coastal.louisiana.gov/]
- Royal Belgian Institute of Natural Sciences: Management Unit of the North Sea Mathematical Models (MUMM). [Brussels, Belgium; www.mumm.ac.be/]
- University of Wales Trinity Saint David (Swansea Metropolitan University) [Mount Pleasant, Swansea, Wales, U.K.; http://www.uwtsd.ac.uk/]

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 effectivelywithin itsownpurview, the cross-disciplinarynature of coastal studies requires familiarity with other fields aswell. 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.

Advertising, Editorial, and Subscription Information

Advertising and Editorial Office: All advertising and editorial correspondence should be sent to Dr. Charles W. Finkl, Editor-in-Chief, Journal of Coastal Research, 5130 NW 54th Street, Coconut Creek, FL 33073, U.S.A. PHONE: 828-333-2300. E-MAIL: cfinkl@cerf-jcr.com.

Subscription Information: The *Journal of Coastal Research* is a bimonthly publication. Calendar-year (2014) print and online subscription prices for the JCR are: $115.00 for US CERF members / $125.00 for International CERF members ($95.00 for online only), and $519.00 for US institutions / $541.00 for International institutions ($437.00 for online only). Additional surface charges may apply to subscribers located outside of the USA. For additional membership and subscription forms and information, please go to www.CERF-JCR.org. To obtain a membership or subscription form by mail, please send request to Journal of Coastal Research, P.O. Box 7065, Lawrence, KS 66044. Back Issues and Special Issues of the JCR, when available, can be directly purchased at www.CERF-JCR.org.

The *Journal of Coastal Research* is currently surveyed in *Applied Science & Technology Abstracts; Applied Science & Technology Index (H.W. Wilson); Aquatic Sciences & Fisheries Abstracts; BIOBASE; Biological Abstracts; BIOSIS Previews (Thomson); CAB International Abstracts (CABI); CSA Civil Engineering Abstracts (ProQuest); Current Awareness in Biological Sciences (Elsevier); Current Contents/Agriculture, Biology, & Environmental Sciences (Thomson); Ecology Abstracts (ProQuest); Environmental Sciences & Pollution Management; GeoAbstracts [Geographical Abstracts: Physical Geography; Ecological Abstracts; Geological Abstracts; GEOBASE] (Elsevier); GeoRef; Meteorological & Geoastrophysical Abstracts (ProQuest); Oceanic Abstracts (ProQuest); Oceanographic Literature Review (Elsevier); Physical Sciences Digest (CSA, Ebsco); Pollution Abstracts (ProQuest); Referativnyi Zhurnal; Science Citation Index; SciSearch (Thomson); SCOPUS; Water Resources Abstracts (Bethesda); Zoological Record (Thomson).*

Downloaded From: https://complete.bioone.org/journals/Journal-of-Coastal-Research on 29 Mar 2024
Terms of Use: https://complete.bioone.org/terms-of-use