



JURASSIC COAST, DORSET, ENGLAND

Source: Journal of Coastal Research, 33(5)

Published By: Coastal Education and Research Foundation

URL: <https://doi.org/10.2112/1551-5036-33.5.ii>

Journal of

Coastal Research

VOL. 33, NO. 5 • CERF • September 2017



Published by

An International Forum for the Littoral Sciences

Charles W. Finkl

Editor-in-Chief



Year of Service

JOURNAL OF COASTAL RESEARCH

An International Forum for the Littoral Sciences

CHEF-HERAUSGEBER

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

BOOK REVIEW EDITOR

Luciana S. Esteves
Faculty of Science and Technology
Bournemouth University
Dorset, England, U.K.
lesteves@bournemouth.ac.uk

EDITOR-IN-CHIEF

Charles W. Finkl

Coastal Education and Research Foundation, Inc. [CERF]

Editorial Offices:
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

RÉDACTEUR-EN-CHEF

DEPUTY EDITOR-IN-CHIEF

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
17600 River Ford Drive
Davidson, NC 28036, U.S.A.
jon@mediamine.net

MITHERAUSGEBER

Edward J. Anthony
Coastal Geomorphology
Dunkerque, France
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
Vanda Claudino-Sales
Coastal Dynamics, Dunes
Ceará, Brazil
Mark Crowell
Coastal Zone Management
McLean, Virginia
Omar Defeo
Sandy Beach Ecology
Montevideo, Uruguay
J. Javier Diez
Coastal Geomorphology
Madrid, Spain
Joseph F. Donoghue
Coastal Morphology & Hazards
Orlando, Florida
Jean Ellis
Aeolian Sediment Transport
Columbia, South Carolina
Luciana Esteves
Coastal Flooding & Erosion
Bournemouth, England, UK
Niki Evelpidou
Sea-Level Change,
Palaeogeography
Athens, Greece
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
Allen Gontz
Geophysics, Stratigraphy
San Diego, California
Gary B. Griggs
Coastal Engineering & Hazards
Santa Cruz, California
Pramod Hanamgond
Coastal Geomorphology
Belgaum, India
Hans Hanson
Coastal Protection
Lund, Sweden
Simon Haslett
Paleoceanography
Swansea, Wales, UK
David Hill
Nearshore Hydrodynamics
Corvallis, Oregon
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. Kelleat
Coastal Geomorphology
Essen / Cologne, Germany

ASSOCIATE EDITORS

Joseph T. Kelley
Sea-Level Change
Orono, Maine
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. Lacey
Coastal Landforms & Processes
West Branch, Iowa
Stephen P. Leatherman
Barrier Islands, Beach Erosion
Miami, Florida
Charles Lemckert
Environmental Fluid Dynamics
Southport, Qld, 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
Gonzalo C. Malvárez-García
Beach Morphodynamics
Seville, Spain
Ashish J. Mehta
Coastal Engineering
Gainesville, Florida
Nobuo Mimura
Environmental Engineering
Ibaraki, Japan
Fatima Navas
Coastal Morphodynamics
Seville, Spain
Robert Nicholls
Global Climate Change
Southampton, England, UK

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
Carlos Pereira da Silva
Coastal Zone Management
Lisbon, Portugal
Michael Phillips
Coastal Geomorphology
Swansea, Wales, UK
Orrin H. Pilkey, Jr.
Coastal Geology
Durham, North Carolina
Paolo A. Pirazzoli
Sea-Level Changes
Paris, France
Robert 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
Daniele Scarponi
Marine Paleocology
Bologna, Italy
Anja Scheffers
Coastal Hazards,
Palaeoclimatology
Lismore, NSW, Australia
Vic Semeniuk
Mangroves
Perth, WA, Australia

COMITÉ DE REDACTION

Douglas J. Sherman
Coastal & Aeolian Geomorphology
Tuscaloosa, Alabama
Andrew D. Short
Coastal Geomorphology
Sydney, NSW, Australia
Pravi Shrestha
Coastal Engineering
Irvine, California
Alejandro J. Souza
Coastal & Sediment Processes
Liverpool, England, UK
Tom Spencer
Biogeomorphology
Cambridge, England, UK
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
Ian J. Walker
Coastal Dunes & Sediments
Tempe, Arizona
Ping Wang
Beach Morphodynamics
Tampa, Florida
Phil Watson
Sea-Level Change
Gosford, NSW, Australia
Allan Williams
Coastal Geology
Swansea, Wales, UK
Harry F. Williams
Paleotempestology
Denton, Texas
Colin D. Woodroffe
Coastal Geomorphology
Wollongong, NSW, Australia
Robert S. Young
Coastal Processes
Cullowhee, North Carolina
Guoliang Yu
Sediment Transport
Shanghai, 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.

© 2017 Coastal Education and Research Foundation, Inc. [CERF].

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



JOURNAL OF COASTAL RESEARCH

An International Forum for the Littoral Sciences

Supporting Scientific Institutions



- Consorzio Nazionale Interuniversitario per le Scienze del Mare (Co.N.I.S.Ma.) [Rome, Italy; www.conisma.it/]
- Delft University of Technology [Department of Hydraulic Engineering, Delft, The Netherlands; <http://www.citg.tudelft.nl/over-faculteit/afdelingen/hydraulic-engineering/>]
- Duke University [Earth and Ocean Sciences Division, Durham, North Carolina, U.S.A.; <https://nicholas.duke.edu/marinelab>]
- Griffith University [Center for Infrastructure Engineering and Management, Southport, Queensland, Australia; <https://www.griffith.edu.au/>]
- Ibaraki University [Center for Water Environmental Studies, Mito, Japan; <http://www.cwes.ibaraki.ac.jp/>]
- International Geographical Union (IGU) [Commission on Coastal System (CCS); <http://www.igu-ccs.org/>]
- Royal Belgian Institute of Natural Sciences [Management Unit of the North Sea Mathematical Models (MUMM), Brussels, Belgium; <http://www.mumm.ac.be/EN/index.php>]
- Rutgers University [Institute of Marine and Coastal Sciences (IMCS), New Brunswick, New Jersey, U.S.A.; <http://marine.rutgers.edu/main/>]
- Universidad de la República [Marine Science Unit, Montevideo, Uruguay; <http://www.imber.info/Science/National-Network/URUGUAY>]
- Universidade Nova de Lisboa [e-Geo Center for Geographical and Regional Planning Studies, Lisbon, Portugal; <http://e-geo.fcsh.unl.pt/>]
- University of California, Santa Cruz [Institute of Marine Sciences, Santa Cruz, California, U.S.A.; <http://ims.ucsc.edu/>]
- University of Delaware [School of Marine Science and Policy, Newark, Delaware, U.S.A.; <http://www.ocean.udel.edu>]
- University of Maine [Climate Change Institute, Orono, Maine, U.S.A.; <http://climatechange.umaine.edu/>]
- University of Sydney [Coastal Studies Unit, Sydney, New South Wales, Australia; <http://sydney.edu.au/>]
- University of Szczecin [Institute of Marine and Coastal Science, Szczecin, Poland; <http://www.wnoz.zti.km.szczecin.pl/en/1/inom/structure/>]
- University of Ulster [Environmental Sciences Research Institute, Coleraine, Northern Ireland; <http://www.ulster.ac.uk/es/research/>]
- University of Wales, Trinity Saint David [Swansea Metropolitan University, Mount Pleasant, Swansea, South Wales, U.K.; <http://www.uwtsd.ac.uk/>]
- U.S. Army Corps of Engineers [Coastal and Hydraulics Laboratory (CHL), Vicksburg, Mississippi, U.S.A.; <http://chl.erdc.usace.army.mil/>]
- U.S. Geological Survey [National Wetlands Research Center, Lafayette, Louisiana, U.S.A.; <http://www.nwrc.usgs.gov/>]

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.

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 (2017) 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 & Geostrophysical 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).



Jurassic Coast, Dorset, England. Durdle Door is a natural sea arch created by wave erosion in the limestone cliffs along the Dorset coast of southwest England, near West Lulworth. The arch has formed on a concordant coastline where bands of rock possessing contrasting hardness run parallel to the shore. The rocks here are of Jurassic Age, originally consisting of a band of resistant Portland limestone that has been drastically tilted upwards. With a rock strata bedding that is nearly vertical, weaker, easily eroded limestone beds are selectively coupled with stronger, much thicker bands of chalk. This geologic feature has allowed mechanical weathering through wave attack to specifically remove the weaker rock layers, creating this spectacular arch.

The arch is actually on private property as part of the Lulworth Estate, but is currently open to the public. Around this part of the coast nearly all of the limestone has been removed by sea erosion, with the remainder forming the small headland that includes the arch. UNESCO teams continually monitor the condition of both the arch and adjacent beach. The name Durdle is derived from the Old English 'thirl' meaning bore or drill. (Photograph taken 30 September 2015 by Gary Griggs, University of California, Santa Cruz [UCSC], Santa Cruz, California, U.S.A.)

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. (Deceased),
Charles W. Finkl, Jr., Rhodes W. Fairbridge (Deceased),
and Maurice L. Schwartz (Deceased)



**President &
Executive Director:**
Charles W. Finkl

**Senior Vice President &
Assistant Director:**
Christopher Makowski

Secretary:
Heather M. Vollmer

Executive Assistant:
Barbara Russell

Regional Vice Presidents

North America

James R. Houston
Victor V. Klemas
Orrin H. Pilkey, Jr.

South America

Vanda Claudino-Sales
Omar Defeo

Oceania

Charles Lemckert
Anja Scheffers
Vic Semeniuk
Andrew D. Short

Western Europe

Luciana Esteves
Carlos Pereira da Silva
Michael Phillips
Marcel J.F. Stive

Eastern Europe

Niki Evelpidou
Kazimierz K. Furmanczyk

Southeast Asia

Nobuo Mimura

Board of Directors (Trustees)

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

Lifetime Members

Frédéric Bouchette	Stephen P.	Yoshiki Saito
Yong-Sik Cho	Leatherman	Charles Thibault
Nicholas K. Coch	Charles Lemckert	Erik van Wellen
Hany Elwany	Gonzalo C.	Ya Ping Wang
Kazimierz K.	Malvárez-Garcia	Wei Zhang
Furmanczyk	Fatima Navas	
Björn Kjerfve	Philip D. Osborne	

Patron Members

Lindino Benedit	Carl H. Hobbs, III	Norbert P. Psuty
Georges Chapalain	Timothy W. Kana	Robert S. Young

CERF Society Information

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, M.ASCE

Dr. Charles W. Finkl is President and Executive Director of the Coastal Education and 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 33 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.

International Coastal Symposium (ICS) Official Meeting of CERF

The International Coastal Symposium (ICS) was originally set up by Per Bruun (deceased) and Charlie Finkl as the official meeting of the Coastal Education and Research Foundation (CERF), with one of the first meetings 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 May of 2018 in Busan, South Korea. For more information, please visit www.cerf-jcr.org.

Journal of Coastal Research

VOL. 33, NO. 5 (pages 997–1242)

ISSN 0749-0208

September 2017

CONTENTS

RESEARCH ARTICLES

Boulder Ridges and Washover Features in Galway Bay, Western Ireland	Wibke Erdmann, Dieter Kelletat, and Miriam Kuckuck	997
Coastal Eolian Sand-Ramp Development Related to Paleo-Sea-Level Changes during the Latest Pleistocene and Holocene (21–0 ka) in San Miguel Island, California, U.S.A.....	Curt D. Peterson, Jon M. Erlandson, Errol Stock, Steve W. Hostetler, and David M. Price	1022
Mesozooplankton Dynamics in Relation to Environmental Factors and Juvenile Fish in a Subtropical Estuary of the Gulf of Mexico	Hui Liu, Xinsheng Zhang, Qing Yang, Tao Zuo, and Antonietta Quigg	1038
Natural Coastal Dune-Field Landforms, Plant Communities, and Human Intervention along Buenos Aires Northern Aeolian Barrier	Silvia Marcomini, Rubén López, Pablo Picca, Nora Madanes, and Lila Bertolín	1051
Progradation of a Beach Ridge Plain between 5000 and 4000 Years BP Inferred from Luminescence Dating, Coquimbo Bay, Chile	Evan A. Hart, Frank W. Stapor, J. Enrique Novoa Jerez, and Charles J. Sutherland	1065
Using the Presence of Seagrass <i>Posidonia oceanica</i> to Model the Equilibrium Profile Parameter A of Sandy Beaches in Spain	Luís Aragonés, Isabel López, Yolanda Villacampa, and Francisco J. Navarro-González	1074
Determining the Effects of Major Cations (K^+ , Na^+ , Ca^{2+} , Mg^{2+}) and pH on <i>Scirpus mariqueter</i> to Assess the Heavy Metal Biototoxicity of a Tidal Flat Ecosystem	Longli Dong, Xiaoping Li, Xiaochen Liu, Kun He, and Xue Jiang	1086
The Phenology of Sand Crabs, <i>Lepidopa benedicti</i> (Decapoda: Albuneidae)	Zen Faulkes	1095
Development of Shore Platforms along the NW Coast of Italy: The Role of Wind Waves	Marta Pappalardo, Lorenzo Cappietti, Isabel Arozarena Llopis, Alessandro Chelli, and Letizia De Fabritiis	1102
Comparison of Fish Assemblages in Two Adjacent Macrotidal Estuaries Altered by Diking	Sun-Wan Hwang, Keun-Hyung Choi, and Sun-Do Hwang	1113
First Account of Parmales (Chrysophyceae) in Sediment Trap Samples from the Alfonso Basin, Gulf of California, Mexico	Heriberto Rochín-Bañaga, Jörg Bollmann, Mara Y. Cortés, and Fernando Aguirre-Bahena	1121
Establishment and Biomass Allocation of Black and Red Mangroves: Response to Propagule Flotation Duration and Seedling Light Availability....	L.T. Simpson, T.Z. Osborne, and I.C. Feller	1126
Sediment Texture and Geochemistry of Beaches between Redi-Vengurla, Sindhudurg, West Coast of India.....	Pramod T. Hanamgond, Praveen B. Gawali, B.V. Lakshmi, J.L.V. Mahesh Babu, and K. Deendayalan	1135
Nutrient Distribution in Coral Reef Degraded Areas within Sanya Bay, South China Sea	Jing Guo, Kefu Yu, Yinghui Wang, Daoquan Xu, Xueyong Huang, Meixia Zhao, Hongqiang Yang, and Ruijie Zhang	1148
Longshore and Cross-Shore Morphological Variability of a Berm–Bar System under Low to Moderate Wave Energy	Uxía López-Dóriga and Óscar Ferreira	1161
Measuring Stable Carbon and Nitrogen Isotopes in <i>Mytilus galloprovincialis</i> to Elucidate the Sources of Organic Matter in Three Different Near-shore Marine Environments	Paola Rumolo, Mariamichela Carannante, Serena Gherardi, Stella Tamburrino, Mattia Vallefuoco, Renata Migliaccio, Carla D'Argenzio, and Marco Barra	1172
Storm Waves on the East Coast of Korea: 20 Years of Wave Hindcasting	Hwusub Chun and Kyungmo Ahn	1182
Distribution of Dissolved, Suspended, and Sedimentary Heavy Metals along a Salinized River Continuum	Xi Yang and Zhong-Liang Wang	1189
Heavy Metal Concentrations Found in Seston and Microplankton from an Impacted Temperate Shallow Estuary along the Southwestern Atlantic Ocean	M.D. Fernández Severini, D.M. Villagran, F. Biancalana, A.A. Berasategui, C.V. Spetter, M.N. Tartara, M.C. Menéndez, V.A. Guinder, and J.E. Marcovecchio	1196
Distribution of <i>Phragmites australis</i> Communities with Different Habitat Salinity.....	Jang-Sam Cho, Jeom-Sook Lee, and Jong-Wook Kim	1210

TECHNICAL COMMUNICATIONS

ULISES: An Open Source Code for Extrinsic Calibrations and Planview Generations in Coastal Video Monitoring Systems	Gonzalo Simarro, Francesca Ribas, Amaya Álvarez, Jorge Guillén, Óscar Chic, and Alejandro Orfila	1217
Rip Current Measurements at Three South Florida Beaches	Stephen B. Leatherman	1228

DISCUSSION AND REPLY

Discussion of: van Gaalen, J.F.; Tebbens, S.F., and Barton, C.C., 2016. Longshore Sediment Transport Directions and Rates from Northern Maine to Tampa Bay, Florida: Literature Compilation and Interpretation. <i>Journal of Coastal Research</i> , 32(6), 1277–1301.....	Joseph T. Kelley and Duncan M. FitzGerald	1235
Reply to: Kelly, J.T. and FitzGerald, D.M., 2017. Discussion of: van Gaalen, J.F.; Tebbens, S.F., and Barton, C.C., 2016. Longshore Sediment Transport Directions and Rates from Northern Maine to Tampa Bay, Florida: Literature Compilation and Interpretation. <i>Journal of Coastal Research</i> , 32(6), 1277–1301.	Joseph F. van Gaalen, Sarah F. Tebbens, and Christopher C. Barton	1237

IN MEMORIAM

Prof. João José Bigarella (1923–2016)	1239
Prof. Gaspar Soares de Carvalho (1920–2016)	1242



VOL. 33, NO. 5, September 2017

Journal of Coastal Research

CERF