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A Comprehensive Assessment of Barnegat Bay-Little Egg Harbor, New Jersey

Guest Editors: G.A. Buchanan, T.J. Belton, and B. Paudel



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Special Issue #78

An International Forum for the Littoral Sciences

Charles W. Finkl
Editor-in-Chief

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An International Forum for the Littoral Sciences

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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 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.

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COVER PHOTOGRAPH

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Barnegat Bay-Little Egg Harbor, New Jersey, U.S.A. This Special Issue of the *Journal of Coastal Research* (JCR) focuses on the comprehensive research conducted on the Barnegat Bay-Little Egg Harbor estuary in New Jersey, USA. More than three years of comprehensive ecosystem data were collected and numerous research projects were completed to fill in key data gaps and to define baseline conditions. This information, along with extensive water quality data, provides an exceptional view of Barnegat Bay's current status and ecosystem health. Interestingly, data were collected prior and subsequent to landfall of Superstorm Sandy in the State, which provided a tremendous opportunity to compare conditions of the estuarine ecosystem and assess potential impacts. These data were also used to support water quality improvement (*e.g.*, development of nutrient criteria) and advance habitat restoration on the bay.

Front Cover Photograph Descriptions; Clockwise from top left corner:

(A) Saltmarsh surface on island in northern Barnegat Bay, New Jersey looking south towards Route 37 bridge showing undercutting of bank, and marsh 'chunk', a likely remnant from Hurricane Sandy, photo taken May 2013. Photo credit: Gary Buchanan

(B) Dr. Tracy Quirk (Louisiana State University) taking salt marsh elevation measurements from a Surface Elevation Table (SET) at mouth of West Creek on Barnegat Bay, New Jersey. Photo credit: Thomas Belton

(C) Tide Pool and Maritime Forest, Edwin B. Forsythe National Wildlife Refuge, New Jersey. This refuge protects more than 47,000 acres of southern New Jersey coastal habitats, sizeable portions of which are along Barnegat Bay's western shoreline. Per the U.S. Fish and Wildlife Service the refuge is in one of the Atlantic Flyway's most active flight paths. Photo credit: Thomas Belton

(D) Bay shoreline, tidal wetland and mud flat in the Edwin B. Forsythe National Wildlife Refuge, New Jersey. Photo credit: Thomas Belton

(E) Field crew launching a boat for a Winter SET Deployment (Academy of Natural Sciences of Drexel University): Sedge Islands Marine Conservation Zone, Island Beach State Park, Barnegat Bay, New Jersey. Photo credit: Thomas Belton

(F) Bayside hardened shoreline with adjacent housing, Barnegat Bay. Photo credit: Thomas Belton

(G) Sunset from a northern bayside home over Barnegat Bay looking west from Normandy Beach (Brick Township), New Jersey. Photo credit: Gary Buchanan

(H) Satellite photo of Superstorm Sandy centered just offshore New Jersey: NASA GODDARD MODIS RAPID RESPONSE TEAM. NASA's Aqua satellite captured a visible image of Sandy's massive circulation on Oct. 29 at 2:20 p.m. EDT, 2012. Sandy covers 1.8 million square miles, from the Mid-Atlantic to the Ohio Valley, into Canada and New England.

(I) Center picture: Barnegat Lighthouse on Barnegat Inlet is located on the northern tip of Long Beach Island, New Jersey. Originally lit in 1859, it was regarded as one of the most crucial "change of course" points for coastal vessels. Vessels bound to and from New York along the New Jersey coastline depended on Barnegat Lighthouse to avoid the shoals extending from the shoreline. It was restored in 2009 and is now a state park. http://www.state.nj.us/dep/parksandforests/parks/barnlig.html

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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.

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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.

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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.

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