

# **Conference on Coastal Engineering Practice 2011**

**San Diego, California, USA  
21-24 August 2011**

**Volume 1 of 2**

**Editors:**

**Orville T. Magoon  
Ronald M. Noble**

**Donald D. Treadwell  
Young C. Kim**

**ISBN: 978-1-61839-211-4**

**Printed from e-media with permission by:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571



**Some format issues inherent in the e-media version may also appear in this print version.**

Copyright© (2011) by the American Society of Civil Engineers  
All rights reserved.

Printed by Curran Associates, Inc. (2011)

For permission requests, please contact the American Society of Civil Engineers  
at the address below.

American Society of Civil Engineers  
1801 Alexander Bell Drive  
Reston, VA 20191

Phone: (800) 548-2723  
Fax: (703) 295-6333

[www.asce.org](http://www.asce.org)

**Additional copies of this publication are available from:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571 USA  
Phone: 845-758-0400  
Fax: 845-758-2634  
Email: [curran@proceedings.com](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)

# TABLE OF CONTENTS

## VOLUME 1

### PLENARY

<b>Sea Level Trends and Accelerations Based on U.S. and Global Tide Gauges</b> .....	1
<i>R. G. Dean, J. R. Houston</i>	

### CASE HISTORIES OF COASTAL PROJECTS

<b>A Case Study on the Use of Advanced Fiber Wrap Composites for Timber Pile Repair and Protection of a Pier Structure</b> .....	10
<i>T. Jiménez, D. Kost, J. Percival</i>	
<b>Design and Construction of Kaunalapau Harbor Breakwater Island of Lanai, Hawaii</b> .....	15
<i>Scott P. Sullivan</i>	
<b>Stabilization of the Tutong River Entrance, Brunei: A Comprehensive Coastal Engineering Project</b> .....	29
<i>A. Mariani, J. T. Carley, D. Rayner, B. M. Miller, R. J. Cox, Kok Kong Chin</i>	
<b>The Forecast of Anapa Bay-Bar Coast Evolution and Sand Body Thickness Change</b> .....	42
<i>R. D. Kosyan, B. V. Divinskiy, A. R. Kosyan, V. V. Krylenko, M. V. Krylenko, S. B. Kuklev</i>	
<b>Jet Grouting for the Re-Support of Pier 11A in San Diego, CA</b> .....	56
<i>S. Arora, J. Kinley</i>	
<b>Over Twenty-Five Years of Applied Coastal Engineering in Alaska</b> .....	64
<i>Harvey N. Smith, Ruth A. Carter</i>	
<b>Corrosion Protection for Concrete Structures in Marine Environments</b> .....	78
<i>D. B. McDonald</i>	
<b>Development of Inner Harbor Navigation Canal Hurricane Surge Barrier Project Hydrodynamics through Deterministic Methods, Physical Modeling, and Numerical Modeling</b> .....	89
<i>Jena F. Gilman, Peter Grant, Jake San Antonio, Mizan Rashid</i>	
<b>Sediment Nourishment at Orchard Beach, the Bronx, New York</b> .....	103
<i>Diane Rahoy, David Yang, Lynn Bocamazo, Shewen Bian, Frank Verga, Anthony Ciorra, Bill Tai</i>	
<b>Design and Construction of the Lake Borgne Surge Barrier in Response to Hurricane Katrina</b> .....	117
<i>Scott R. Huntsman</i>	
<b>Long-Term Monitoring and Effectiveness of Sediment Cap, Former Campbell Shipyard, San Diego, California</b> .....	131
<i>Rolf Schottle, Larry McCauley, Bill Hays</i>	
<b>Indian River County—Sector 3 Beach and Dune Restoration Project</b> .....	145
<i>Michael Walther, Tem Fontaine</i>	
<b>Sediment Transport Modeling and Application for Ocean Beach and San Francisco Bight, CA</b> .....	158
<i>H. Li, L. Lin, F. Wu, L. C. Andes, J. G. Zoulas</i>	
<b>Regional Beach Restoration and Monitoring in San Diego County: A 10-Year Retrospective</b> .....	170
<i>Greg Hearon, Brady Richmond, Shelby Tucker</i>	
<b>Sustainable Concrete Mix Designs for 100-Year Service Life for Bridges in San Diego County Coastal Environments</b> .....	184
<i>B. G. Smith, M. Creveling, J. W. Teig</i>	
<b>Maintenance of Navigable Depths at the Hawaii Kai Marina and Entrance Channel: Oahu, Hawaii</b> .....	198
<i>Michael Whelan, Rob Walker, Tracy Stofferahn</i>	
<b>The Life and Death of North America's First Man-Made Surfing Reef</b> .....	212
<i>Craig B. Leidersdorf, Brady Richmond, Chad E. Nelsen</i>	
<b>Capacity Enhancement at Coastal Disposal Sites</b> .....	226
<i>R. David Espinoza, Michael F. Houlihan</i>	
<b>Operation, Maintenance, and Repair of Coastal Wastewater Outfalls: San Francisco, Boston, Los Angeles County, and San Diego</b> .....	235
<i>Brian J. Van Weele, Donald D. Treadwell</i>	

## **COASTAL ENVIRONMENT, WATER QUALITY, AND WETLANDS RESTORATION**

<b>Numerical Modeling Studies of San Elijo Lagoon Restoration Project</b> .....	248
<i>Weixia Jin, Xiuying Xing, Chris Webb, Doug Gibson</i>	
<b>Modeling Study of Bacterial Dispersion for Marine-Coastal Waters, According to the European Directives</b> .....	262
<i>L. Scroccaro, L. Colugnati, G. Umgiesser, G. Mattassi</i>	
<b>Masonville Dredged Material Containment Facility: Mitigation Design Including Shore Protection, Reef Creation, and Wetlands Restoration</b> .....	274
<i>Peter W. Kotulak, Kristen Piggott</i>	
<b>Influence of Small Rivers' Runoff on the Hydrochemical Structure of Coastal Waters of the North-Eastern Black Sea</b> .....	286
<i>A. V. Kostyleva, O. I. Podymov, P. N. Makkaveev, A. A. Polukhin</i>	
<b>Restoring Malibu Lagoon: A Case Study in Collaborative Coastal Restoration</b> .....	298
<i>Marc Beyeler, Steve Seville, Mark Abramson</i>	
<b>Water Quality Study for a Coastal Development at the Bahia de los Sueños, Baja California, Mexico</b> .....	312
<i>Wenkai Qin, Ronald M. Noble</i>	
<b>Hydraulic Effects of Proposed Knik Arm Crossing</b> .....	326
<i>J. Colonell, P. Mineart, J. Gambino</i>	

## **COASTAL HAZARDS AND RISK MANAGEMENT**

<b>A Joint Hydraulic/Structural Methodology for the Rehabilitation of the Crescent City Marina</b> .....	340
<i>J. O. Toilliez, M. P. Jorgensen</i>	
<b>Operational Oceanographic System for the Southern Coastal Waters of Korea</b> .....	351
<i>Hak Soo Lim, Chang S. Kim, Kwang Soon Park, Jae Seol Shim</i>	
<b>Application of Coastal Engineering Principles in Response to the Deepwater Horizon Disaster: Lessons Learned in Coastal Alabama</b> .....	359
<i>Bret M. Webb, Scott L. Douglass, Caren R. Dixon, Beau Buhring</i>	
<b>Sea Level Rise Impact Assessment and Mitigation Alternatives Development for Balboa Island and Little Balboa Island, City of Newport Beach, California</b> .....	373
<i>Ying Poon, Brett Sanders, Randy Mason, Robert Stein</i>	
<b>Comparison of Two Severe Storms in Terms of Wave Characteristics Based on Recorded Field Data</b> .....	384
<i>Alireza Jafari, Nick Cartwright, Peter Nielsen</i>	
<b>Estimation of Storm Surge Inundation and Hazard Mapping</b> .....	396
<i>Jae Seol Shim, Jong Joo Yoon</i>	
<b>Coastal Engineering for Veterans Drive Improvements</b> .....	410
<i>Manish Aggarwal, Jerald Ramsden</i>	
<b>Vulnerability Assessment of Climate Change Impact on Groundwater Salinity in the Nile Delta Coastal Region—Egypt</b> .....	422
<i>I. A. Elshinnawy, H. O. Abayazid</i>	
<b>Seawall-Waves Interaction and Impact on Sediment Morphology</b> .....	436
<i>Nabil M. Ismail, Walid El-Sayed</i>	
<b>Coastal Structures and Sea Level Rise: Adaptive Management Approach</b> .....	449
<i>John R. Headland, Dilip Trivedi, Russell H. Boudreau</i>	

## **COASTAL SEDIMENT PROCESSES**

<b>Subaqueous Cohesive Sediment Gravity Flows from Open Water Pipeline Dredge Disposal: Laboratory Experiments and Mathematical Modeling</b> .....	460
<i>M. R. Chowdhury, F. Y. Testik</i>	
<b>Modeling Regional Sediment Transport and Barrier Elongation on Long Island Coast, United States</b> .....	473
<i>Le Xuan Hoan, Hans Hanson, Magnus Larson, Shigeru Kato, Shin-ichi Aoki</i>	
<b>Prediction of the Siltation in the Intake of Nuclear Power Plant Using the Water Depth Monitoring and Coupled Model</b> .....	487
<i>Bum-shick Shin, Kyu Han Kim</i>	
<b>Analysis of Morphological Changes in the Gold Coast Seaway</b> .....	495
<i>M. Sedigh, R. Tomlinson, A. Golshani, Nick Cartwright</i>	

<b>Influence of JONSWAP Wave Spectra Form on Frequency Spectrum of Suspended Sediment Transport Values</b> .....	509
<i>I. S. Podymov, J. Grüne, R. D. Kos'yan, T. M. Podymova</i>	
<b>Cohesive Sediment Transport Modeling: Application to the Madura Strait, Indonesia</b> .....	522
<i>Nita Yuanita, Muhammad Ali Rini, Undang Heriawan</i>	
<b>Numerical Modeling of Wind-Waves and Its Effect on Sediment Transport—An Investigation of Spectral Terms</b> .....	537
<i>S. K. Khatri, I. R. Young</i>	
<b>Enhancement of Cross-Shore Profile Evolution Models for Sustainable Coastal Design</b> .....	548
<i>Mohamed A. K. Elsayed, Nabil M. Ismail</i>	

## VOLUME 2

### EROSION AND SHORELINE PROTECTION

<b>In the Wet Placement of Articulated Concrete Block Mat by Divers</b> .....	561
<i>Eric Thorkildsen</i>	
<b>Analytic Solution Shoreline at Jetty under Varying Wave Climate</b> .....	566
<i>Todd L. Walton Jr., R. G. Dean</i>	
<b>Event Ranking Methods for Calculation of 100-Year Wave Runup on Levees at Oakland International Airport, California</b> .....	580
<i>Jeremy Bricker, P. Mineart, Sathish Murugaiah, John Paxton, Rajendram Arulnathan, Samuel Won, Frank Lobedan</i>	
<b>Surfability: A Proposed Scale for Surfable Waves</b> .....	594
<i>Chuck Mesa</i>	
<b>Landslide Repair and Severe Erosion Mitigation Case Studies in Sensitive Coastal Areas</b> .....	605
<i>James Chincholo, Colby Barrett</i>	
<b>Wave Effects on Bathymetric Depressions</b> .....	616
<i>L. Bassetti, Sean O'Neil</i>	
<b>Propeller Wash on a Slope</b> .....	627
<i>Ayşe Yüksel Ozan, Kubilay Cihan, Yalçın Yüksel</i>	
<b>Geotextile Tube Solution for Dos Bocas PEMEX Marine Facilities Beach Erosion Problem in Tabasco, Mexico</b> .....	640
<i>Felix Tseng, Zoe Lin, Alfonso Solis, Marco Sánchez</i>	
<b>The Hub Effect on a Propeller Scour Around a Pile</b> .....	650
<i>Kubilay Cihan, Ayşe Yüksel Ozan, Yalçın Yüksel</i>	
<b>Rockefeller Refuge Gulf Shoreline Protection Demonstration</b> .....	658
<i>Brett L. Geesey, Daniel J. Heilman, Ronald L. McPherson</i>	
<b>The 2012 San Diego Regional Beach Sand Project</b> .....	672
<i>Chris Webb, Shelby Tucker</i>	
<b>Determination of Wave Transmission Coefficients for Oyster Shell Bag Breakwaters</b> .....	684
<i>Richard J. Allen, Bret M. Webb</i>	
<b>Shore Protective Revetment Crowned with Pedestrian Walkway at Strand Beach, California</b> .....	698
<i>Chia-Chi Lu, Thomas J. Fischetti, Ronald M. Noble</i>	
<b>Extreme Total Water Levels for Twin Lakes Beach, Santa Cruz, CA</b> .....	707
<i>C. Fassardi, L. Bassetti, J. Davies</i>	
<b>Determination of Shoreline Evolution: A Case Study</b> .....	721
<i>H. Anil Ari Güner, Yalçın Yüksel, Esin Özkan Çevik</i>	
<b>Efficacy of Stone Filled Marine Mattresses for Cable Protection in a Nearshore Mixed Sediment Environment</b> .....	732
<i>M. Dalon, R. Muñoz, D. Gaffney, J. Fiske</i>	
<b>Monitoring Shore Protection Projects along the Florida Panhandle Using Three-Dimensional Spatial Data</b> .....	742
<i>Lauren M. Dunkin, John McCormick</i>	
<b>Myrtle Beach (2001-2010)—Another Decade of Beach Monitoring Surveys after the 1997 Federal Shore-Protection Project</b> .....	753
<i>Timothy W. Kana, Haiqing Liu Kaczowski, Philip A. McKee</i>	

<b>What's Left of the Malibu Coastline and a Method to Replenish the Beaches</b> .....	766
<i>Reinard T. Knur</i>	
<b>Behavior of Shore Protection Structures in Alexandria, Egypt, during the Storm of December 2010</b> .....	780
<i>B. El-Sharnouby, A. Soliman</i>	
<b>Predictability of Beach Nourishment Project Performance in Florida</b> .....	793
<i>R. G. Dean, Luciano Absalonsen</i>	

## **LOCAL, STATE, AND FEDERAL INVOLVEMENT IN PLANNING, DESIGN, AND CONSTRUCTION OF COASTAL PROJECTS**

<b>Applying the Design/Build Project Delivery Method to Shore Protection and Other Coastal Works Projects</b> .....	807
<i>James E. Spady</i>	
<b>The Challenges of Permitting Coastal Projects in the 21<sup>st</sup> Century</b> .....	820
<i>Walter F. Crampton</i>	

## **PORTS, HARBORS, AND MARINE TRANSPORTATION**

<b>Skagway Small Boat Harbor—Vertical Wave Barrier</b> .....	831
<i>Nels Sultan, Steve Spencer, Todd Nottingham, Lisa Dale</i>	
<b>Passing Vessel Hydrodynamic Model Validations in Complex Waterways</b> .....	846
<i>S. Fenical, F. Salcedo</i>	
<b>Cruise Ship Maneuvering and Berthing at Pier 27 Cruise Terminal, San Francisco, CA</b> .....	855
<i>K. Von Blohn, J. Davey, M. Tirindelli, S. Fenical</i>	
<b>Elastic Buckling Capacities of Piles Subject to Partial Section Loss</b> .....	868
<i>Breanna Bailey, Prashant Deopurkar, L. U. Sankar Samudrala, Lakshmana Rao Upputuri</i>	
<b>Field Observations and Numerical Modeling of Infragravity Waves</b> .....	878
<i>Yang Zhang, Hemming Schäffer, Chris Carr, Sean O'Neil</i>	
<b>Coastal Engineering for Renovation of San Francisco Marina West Yacht Harbor</b> .....	892
<i>M. Hobson, F. Filice, S. Fenical, M. Tirindelli</i>	
<b>Floating Breakwater Modeling and Design for Oyster Point Marina</b> .....	903
<i>David Dykstra, Xiuying Xing, Christopher Devick</i>	
<b>Final Monitoring Results for Kaunapau Harbor Breakwater, Lanai, Hawaii</b> .....	917
<i>Jessica H. Podoski, Thomas D. Smith, Lyndell Hales</i>	
<b>Modeling Support of the St. Johns River Project, Jacksonville, FL</b> .....	931
<i>Dennis W. Webb, Philip T. Sylvester</i>	
<b>Wave Amplification at Harbor Entrance Due to Submerged Shoal</b> .....	945
<i>Hyung Seok Yoo, Byung Guk Min, Kyu Han Kim, Sungwon Shin</i>	
<b>Utilizing Vessel Based Mobile Laser and Bathymetry Survey Techniques for Survey of Four Southern California Breakwaters</b> .....	957
<i>T. J. Mitchell, M. N. Chang</i>	
<b>Site Planning and Hydraulic Design of a Cargo Seaport Exposed to Typhoons and Tsunamis—A Project Case in the Philippines</b> .....	970
<i>E. C. Cruz</i>	
<b>Measurement of Structure Response to Ferry Berthing Loads</b> .....	984
<i>Jonathan Hutchinson, Andrew T. Metzger</i>	
<b>Port of Long Beach Sustainable Design and Construction Guidelines</b> .....	1020
<i>Renée Yarmy, Doug Sereno</i>	
<b>Boat-Wake Observations at Jensen Beach, Florida</b> .....	1034
<i>A. Sheremet, U. Gravois, M. Tian, T. K. Blankenship</i>	

## **SUSTAINABLE COASTAL DEVELOPMENT**

<b>Sustainable Coastal Development in Response to Natural and Anthropogenic Impacts As Well As to Climate Change</b> .....	1043
<i>I. Bröker, K. Mangor</i>	

<b>Renewable Ocean Energy</b> .....	1057
<i>Billy L. Edge, Nancy M. White</i>	
<b>Defining Engineering Guidance for Living Shoreline Projects</b> .....	1064
<i>Rob Walker, Bonnie Bendell, Louise Wallendorf</i>	
<b>Demand Forecasting for Yacht Tourism Planning in Turkey</b> .....	1078
<i>A. Karanci, I. Guler, A. Ergin, A. C. Yalciner</i>	
<b>Current Challenges in Coastal Management in the Netherlands: Examples of Pilot Projects</b> .....	1088
<i>J. P. M. Mulder, J. A. van Daljsen</i>	
<b>Vacuum Sewers—A Viable Alternative for Wastewater Collection and Transport in Coastal Areas</b> .....	1102
<i>Soma Bhadra, Denny Moss</i>	
<b>Sustaining Port Development through Impact Mitigation</b> .....	1113
<i>Michael Ludwig, Douglas Clarke</i>	
<b>Author Index</b>	