

**COASTAL
ENGINEERING
2018**

Proceedings of the 36th International Conference

COASTAL ENGINEERING 2018

30 July –3 August, 2018
Baltimore, U.S.A.

Edited by

Patrick Lynett

University of Southern California, USA

Abstract: This *Proceedings* contains 550 papers from the 36th International Conference on Coastal Engineering, which was held in Baltimore, Maryland from July 30 to August 3, 2018. The *Proceedings* is divided into six parts: Papers; Waves; Swash, Nearshore Currents, and Long Waves; Sediment Transport and Morphology; Coastal Structures; and Coastal Management, Environment, and Risk. The “Papers” sections includes full length Proceedings papers, covering a broad range of topics including theory, numerical and physical modeling, field measurements, case studies, design, and management. The other sections include abstract and presentation files, as presented at the conference. These submissions provide engineers, scientists, and planners state-of-the-art information on coastal engineering and coastal processes.

Foreword

The 36th International Conference on Coastal Engineering (ICCE 2018) was held in Baltimore, Maryland (U.S.A.) from July 30 to August 3, 2018. The Local Organizing Committee (LOC), led by Nobuhisa Kobayashi, is acknowledged for their dedicated preparation over many years that led to a successful conference with broad participation. Over seven hundred and fifty attendees from 41 countries gathered in the city of Baltimore to discuss research and applications in coastal engineering. The papers and presentations contained in this *Proceedings* cover a wide range of topics including waves; swash, nearshore currents, and long waves; coastal management, risk, and environmental restoration; sediment transport and morphology; and coastal structures. The authors have provided state-of-the-art contributions, and this volume could not be produced without their commitment to solving coastal engineering challenges. The members of the ASCE/COPRI Coastal Engineering Research Council (CERC) and the ICCE 2018 Technical Review Committee reviewed 793 abstracts and accepted the 575 papers to be presented at the conference. The dedication of the Council members has led to the continued high quality and popularity of the International Conference on Coastal Engineering.

Preparation of these proceedings would not be possible without the assistance of many colleagues. Thank you to Dr. Jane Smith, CERC Chairman, Dr. Ron Noble, CERC Vice Chairman, and the entire CERC for their guidance and encouragement. Additional thanks go to Tom Chase and Zoe Tobin at ASCE for answering many requests for information and organizing a successful conference in Baltimore.

Patrick Lynett
University of Southern California
Sonny Astani Department of Civil and Environmental Engineering
plynett@usc.edu

Acknowledgments

LOCAL ORGANIZING COMMITTEE

Chair

Nobuhisa Kobayashi, Ph.D., M.ASCE

Co-Chair

Robert A. Dalrymple, Ph.D., P.E., D.CE, NAE, Dist.M.ASCE

Technical Committee

Lizbeth M. Childs, P.E., M.ASCE

Daniel T. Cox, Ph.D.

Elena Drei-Horgan, Ph.D., A.M.ASCE

Jens Figlus, Ph.D., A.M.ASCE

Tian-Jian Hsu, Ph.D., M.ASCE

Jennifer L. Irish, Ph.D., P.E., D.CE, M.ASCE

David L. Kriebel, Ph.D., P.E., D.CE, M.ASCE

Patrick J. Lynett, Ph.D., M.ASCE

Brian C. McFall, P.E., A.M.ASCE

Jeffrey A. Melby, Ph.D., M.ASCE

Jack A. Puleo, Ph.D., A.M.ASCE

Jane McKee Smith, Ph.D., P.E., D.CE, Dist.M.ASCE

Coastal Engineering Research Council (ASCE/COPRI)

Jane McKee Smith, Chairman, U.S. Army Corps of Engineers, Engineer Research & Development Center

Ronald M. Noble, Vice Chairman, Noble Consultants, Inc.

Patrick Lynett, Secretary, University of Southern California

Daniel T. Cox, Oregon State University

Jennifer Irish, Virginia Tech

David L. Kriebel, U.S. Naval Academy

Iñigo J. Losada, IH Cantabria, University of Cantabria

Jeff Melby, U.S. Army Corps of Engineers, Engineer Research & Development Center

Robert J. Nichols, University of Southampton

Ad Reniers, Delft University of Technology

Shinji Sato, Tokyo University

Technical Abstract Review Committee

Lesley Ewing, California Coastal Commission, USA

Leopoldo Franco, University Roma Tre, Italy

James Kaihatu, Texas A&M University, USA

Peter Nielsen, University of Queensland, Australia

Ioan Nistor, University of Ottawa, Canada

Nobuhito Mori, Kyoto University, Japan

Charitha Pattiaratchi, University of Western Australia, Australia

Sponsorship

The Local Organizing Committee of the 36th International Conference on Coastal Engineering is pleased to acknowledge the significant financial, organizational, and administrative support from the:

American Society of Civil Engineers

The ICCE 2018 Local Organizing Committee also expresses sincere gratitude to all the organizations represented in the technical exhibition.