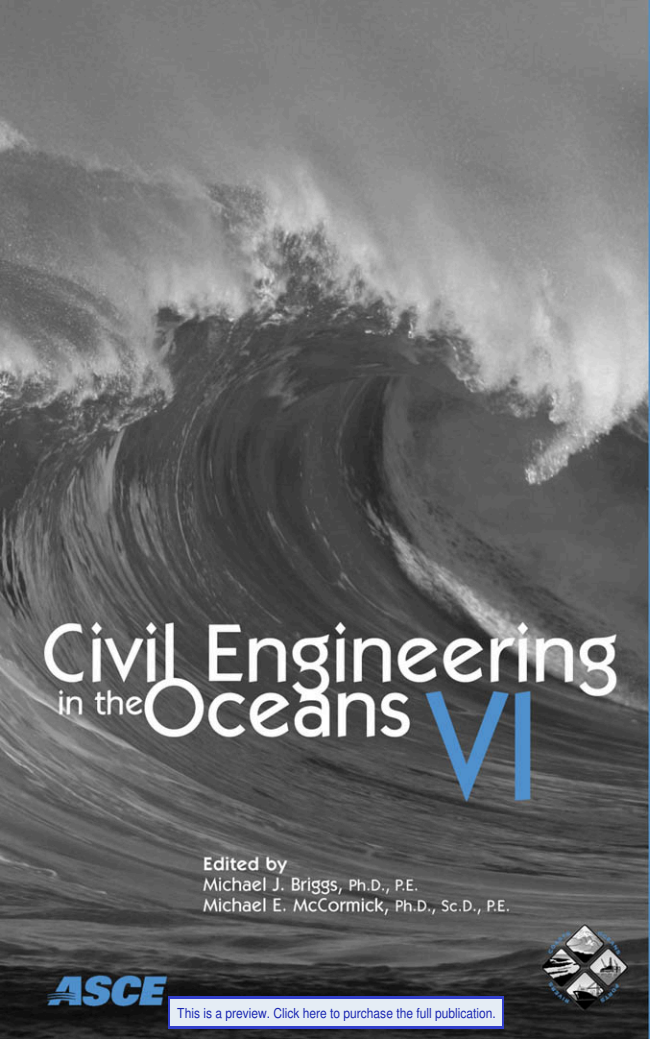

Civil Engineering in the Oceans VI

Edited by
Michael J. Briggs, Ph.D., P.E.
Michael E. McCormick, Ph.D., Sc.D., P.E.

ASCE

CIVIL ENGINEERING IN THE OCEANS VI

PROCEEDINGS OF THE INTERNATIONAL CONFERENCE

October 20-22, 2004
Baltimore, Maryland

SPONSORED BY
Committee on Ocean and Offshore Engineering
of The Coasts, Oceans, Ports, and Rivers Institute (COPRI)
of the American Society of Civil Engineers

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ASCE

Published by the American Society of Civil Engineers

Cataloging-in-Publication Data on file with the Library of Congress.

American Society of Civil Engineers
1801 Alexander Bell Drive
Reston, Virginia, 20191-4400

www.pubs.asce.org

ISBN 0-7844-0775-4
Manufactured in the United States of America.

Foreword

The Civil Engineering in the Oceans VI (CEO6) conference was held in parallel with ASCE's Baltimore 2004 Civil Engineering Conference and Exposition at the Baltimore Convention Center in Baltimore's Inner Harbor, October 20-22, 2004. This was the sixth in this unique series of conferences dedicated to the multidisciplinary civil engineering problems encountered in the coastal and deep ocean. The CEO series, initiated in 1967, is sponsored by the American Society of Civil Engineers (ASCE) and its Coasts, Oceans, Ports, and Rivers Institute (COPRI).

The theme of CEO6 was "Meeting the New Challenges of the 21st Century." Civil engineering in deep and shallow water continues to be a major issue both in the United States and abroad. Tremendous engineering strides have been made in the oceans in the last 50 years, and the demands of the new century offer opportunities for even more exciting and technically challenging projects.

The CEO concept serves as an excellent vehicle for such technology transfer in the fields of wave and wave forces, hydrodynamics, coastal and offshore structures, harbors and marine transportation, marine geotechnical engineering, and education. Besides its broad technical content highlighting the latest advances, CEO6 featured six keynote addresses offering insightful perspectives on historical and emerging trends.

- Dr. Leon E. Borgman, Emeritus Professor, University of Wyoming
- Capt. David M. Balk, Director, Ocean Facilities Program, U.S. Navy
- Dr. James R. Houston, Director, US Army Engineer Research and Development Center
- Prof. Billy L. Edge, WH Bauer Professor in Dredging Engineering, Texas A&M University
- Prof. Robert A. Dalrymple, Johns Hopkins University
- Prof. Robert G. Dean, Emeritus Professor, University of Florida

Abstracts were reviewed by two reviewers and 48 peer-reviewed papers were selected for presentation in 10 sessions over the three-day conference. This conference proceedings is organized with the Keynote papers in the front and the technical papers organized by subject matter. It is hoped that this CEO6 Proceedings will ultimately serve as a comprehensive handbook on state–of–the–art coastal and ocean engineering.

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Acknowledgments

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New Nonparametric Methods in Risk Analysis Based on Resampling Techniques and Empirical Simulation

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Abstract

There has been an explosion of development in new nonparametric methodology in the last several decades, as workers in statistics sought to escape the tyranny of parametric and normality assumptions for problems that were clearly often not Gaussian and not easily described by the usual standard distribution functions. Methods have been developed which allow one to proceed from raw data sets directly to simulations of possible future new data with a bare minimum of parametric assumptions. Many of these techniques are now being introduced into engineering practice and decision-making. The presentation reviews the univariate and multivariate methods growing out of the resampling procedures, and their extensions for use in extremal statistics and the estimation of risk.

Introduction

Resampling or empirical simulation techniques (EST) are methods which generate synthetic samples from a data set, under the assumption that the sample statistical behavior resembles that for the true population closely enough to be useful in error evaluation and similar decision topics. Figure 1 illustrates this process. This is done with the full realization that additional real data would be more desirable and valid. Usually, however, cost and/or time limitations prevent acquiring more actual measurements. It may even be physically impossible to obtain more data, and resampling is a way to "wring" as much information and guidance as possible out of the available measurements.