

Hydrosystems Engineering Uncertainty Analysis (McGraw-Hill Civil Engineering)

By Yeou-Koung Tung, Ben-Chie Yen

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Failure of hydrosystems, such as dams, levees, storm sewers, or pollution control systems, pose threats to the public safety and health as well as potentially inflict enormous damages on properties and environments. Many failures of hydrosystems are mainly attributed by the existence of various uncertainties, including inherent natural randomness and the lack of complete understanding of involved geophysical processes. It is therefore essential to systematically quantify the degree of uncertainty for the problem in hand so that reliability assessment and risk-based design of hydrosystems can be made. The conventional approach of frequency analysis of heavy rainfalls or large floods consider only portion of the uncertainties involved in hydrosystem engineering problems. Over the past two decades or so, there has been a steady growth on the development and application of uncertainty analysis techniques in hydrosystems engineering and other disciplines. The aim of this book is to bring together these uncertainty analysis techniques in one book and to demonstrate their applications and limitations for a wide variety of hydrosystem engineering problems.

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Editorial Review

From the Back Cover
APPLYING UNCERTAINTY ANALYSIS FOR SOUNDER HYDROSYSTEMS ENGINEERING

Focusing on issues of vital civic interest, this comprehensive practice manual teaches the application of uncertainty analysis for more sustainable hydrosystem design and management. Created by internationally respected authorities, *Hydrosystems Engineering Uncertainty Analysis* deals with the uncertainties inherent in engineering projects such as dams, levees, and storm sewer systems. Going beyond unpredictability in geophysical processes such as extreme rainfalls and floods, Drs. Tung and Yen address uncertainties arising from imperfect models, imprecise parameters, data errors, and other sources. The authors call on work in uncertainty analysis from the past two decades to provide and illustrate mathematical tools of varying sophistication available for quantifying the integrated effect of different uncertainties and making the uncertain more knowable.

Hydrosystems Engineering Uncertainty Analysis is the only volume that:

- Brings together in a single resource all mathematical uncertainty analysis methods relevant to hydrosystem risk and reliability issues
- Demonstrates uses and limitations of uncertainty analysis in the broadest possible range of hydrosystem engineering problems
- Provides the tools needed to better protect systems, citizens, and the environment against failure in critical hydrosystem projects
- Shows engineers and students how to perform expert uncertainty analysis for reliability assessments and risk-based design
- Offers examples of each application
- Provides sets of Q & A's for self-testing after every chapter

About the Author
Yeou-Koung Tung, Ph.D., is a Professor of Civil Engineering at Hong Kong University of Science and Technology. The author of numerous technical papers on hydrology and risk analysis, he received his B.S. in Hydraulic Engineering from Tamkang University, Taiwan and his M.S. and Ph.D. in civil engineering from the University of Texas at Austin.

Ben-Chie Yen, Ph.D., (deceased) was a Professor of Civil and Environmental Engineering at the University of Illinois at Champaign-Urbana. He held a B.S. in civil engineering from National Taiwan University and M.S. and Ph.D. degrees in civil engineering from the University of Iowa. He worked with surface water and urban hydrology problems, risk and reliability analysis, and open channel and river hydraulics for more than 30 years, and was the author of over 200 published technical papers and co-author of eight books.

Users Review

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Joshua Bush:

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