### **Adventures in Managing Water**

# Adventures in Managing Water

Real-World Engineering Experiences

Edited by Daniel (Pete) Loucks and Laurel Saito

Sponsored by

Environmental and Water Resources Institute of the American Society of Civil Engineers



PUBLISHED BY THE AMERICAN SOCIETY OF CIVIL ENGINEERS

#### Library of Congress Cataloging-in-Publication Data

Names: Loucks, Pete, author.

Title: Adventures in managing water : real-world engineering experiences / edited by Pete Loucks. Description: Reston, Virginia : American Society of Civil Engineers, [2019] | Includes bibliographical references and index. Identifiers: LCCN 2019011530| ISBN 9780784415337 (softcover : alk. paper) | ISBN 9780784482278 (pdf) Subjects: LCSH: Watershed management—Case studies. | Water-supply—Case studies. Classification: LCC TC413 .A38 2019 | DDC 628.1—dc23 LC record available at https://lccn.loc.gov/2019011530

Published by American Society of Civil Engineers 1801 Alexander Bell Drive Reston, Virginia 20191-4382 www.asce.org/bookstore | ascelibrary.org

Any statements expressed in these materials are those of the individual authors and do not necessarily represent the views of ASCE, which takes no responsibility for any statement made herein. No reference made in this publication to any specific method, product, process, or service constitutes or implies an endorsement, recommendation, or warranty thereof by ASCE. The materials are for general information only and do not represent a standard of ASCE, nor are they intended as a reference in purchase specifications, contracts, regulations, statutes, or any other legal document. ASCE makes no representation or warranty of any kind, whether express or implied, concerning the accuracy, completeness, suitability, or utility of any information, apparatus, product, or process discussed in this publication, and assumes no liability therefor. The information contained in these materials should not be used without first securing competent advice with respect to its suitability for any general or specific application. Anyone utilizing such information assumes all liability arising from such use, including but not limited to infringement of any patent or patents.

ASCE and American Society of Civil Engineers—Registered in U.S. Patent and Trademark Office.

Photocopies and permissions. Permission to photocopy or reproduce material from ASCE publications can be requested by sending an email to permissions@asce.org or by locating a title in the ASCE Library (http://ascelibrary.org) and using the "Permissions" link.

Illustrations by Angela Liu and Alicia Wang. Interior design and composition by Robert Kern, TIPS Technical Publishing, Inc.

Errata: Errata, if any, can be found at https://doi.org/10.1061/9780784415337.

Copyright © 2019 by the American Society of Civil Engineers.

All Rights Reserved.

ISBN 978-0-7844-1533-7 (print) ISBN 978-0-7844-8227-8 (PDF)

Manufactured in the United States of America.

25 24 23 22 21 20 19 1 2 3 4 5

## Contents

Foreword ix Introduction xi

Part I	Adventures in Africa 1
	Water Planning in Egypt: Reusing the Nile 1 Leon Hermans
	The Vision Kid 4 Leif Lillehammer
	Wuthering Heights—Tales from the Kingdom in the Sky 6 Leif Lillehammer
	Digging a Well in Africa 8 Hugo A. Loáiciga
	Water for Food in North Africa 11 Pete Loucks
	Water from the Desert in Libya 14 Pete Loucks
	A Water Management Story from South Africa 15 Ronnie Mckenzie
	The Ultimate Water Manager 18 <i>H. P. Nachtnebel</i>
	From Working on the Railroad to Hydrologic Modeling—A Life of Lessons 20 Geoff Pegram
	Navigating in the Estuaries of Mozambique 24 Hubert Savenije
	A água sabe o caminho (The Water Knows the Way) 26 <i>Hubert Savenije</i>
	Developing an Acceptance of Systems Methods for Water Resources Planning and Management in South Africa 28 Oskar Sigvaldason and Thinus Basson
Part II	Adventures in Asia 33
	Regulation of Lake Baikal 33 Mikhail Bolgov, Alexander Buber, and Alexander Lotov
	Attempting Integrated Water Management in Bhutan 36

Leon Hermans Political Challenges of a Water Expert in Iran 38 Pete Loucks and Laurel Saito, editors

Khong, the Mother of Water 43 Leif Lillehammer Enjoying Caviar in the USSR 44 Pete Loucks Growing Qat in Yemen 45 Pete Loucks Peace Talks on Water in the Middle East 46 Jerome Delli Priscoli Combating Water Scarcity in Jordan 48 David E. Rosenberg Building Collaborative Networks 52 Laurel Saito Working with Farmers of the Sihu Basin(四湖流域), Hubei, China 54 Slobodan P. Simonovic Restoring the Marshes of Mesopotamia (Part 1) 57 Euaene Z. Stakhiv Restoring the Marshes of Mesopotamia (Part 2) 61 Eugene Z. Stakhiv Building Bridges with Water 67 Emily Barbour Developing Drainage During Droughts 72 Graeme Dandy "Optimizing" a Piped Irrigation System 74 Graeme Dandy Part IV Adventures in Europe ..... 77 Years of Experience versus Computer Models 77 Thomas Ackermann Technical and Cultural Exchanges in Ukraine 81 Lily Baldwin Long-Term Water Resources Planning—Almost 50 Years Later 85 Janusz Kindler Working Behind the Curtain 89 Pete Loucks Changing a Culture in Portugal 90 Pete Loucks Insiders, Outsiders, Funds, and Perseverance: Ingredients for Transboundary Water Management 92 H. P. Nachtnebel A Conversation During an Athenian Drought 95 David Purkey

	<ul> <li>Floods Can Damage Careers in Communist Countries 100 Andreas H. Schumann</li> <li>How Water Probing Changed My Life Forever 104 Andreas H. Schumann</li> <li>One Talk Leads to a Regional Program 108 Uri Shamir</li> <li>Trying to Keep Lake Balaton Blue 110 László Somlyódy and Pete Shanahan</li> </ul>
Part V	Adventures in the Americas
	<ul> <li>Water Crises Are for Everyone 115 Benedito (Ben) Braga</li> <li>A Lock and Dam Story: Part 1. Background 119 Ben Dysart</li> <li>A Lock and Dam Story: Part 2. My Involvement 123 Ben Dysart</li> <li>A Lock and Dam Story: Part 3. Lessons on How Government Works 127 Ben Dysart</li> <li>Lessons I Learned from Western Movies and TV Shows 131 David T. Ford</li> <li>Inventing GIS 135 Walter M. Grayman and Richard M. Males</li> <li>Rescuing a Beautiful River 138 Neil Grigg</li> <li>How a Civil Engineer Learned to Work with People 142 Stacy M. Langsdale</li> <li>Managing Our Nation's Water Resources When It Rains a Lot: An Example 146 Deborah H. Lee</li> <li>Into the Realm of the Patagonian Andes 148 Leif Lillehammer</li> <li>Managing Lake Water Levels 149 Pete Loucks</li> <li>Restoring the Everglades 152 Pete Loucks</li> <li>Mistaken Objectives 154 Pete Loucks</li> <li>The Challenges and Rewards of a Career Managing Water 157 Lindell Ormsbee</li> <li>Following My Interests and Instincts 160 Laurel Saito</li> <li>Starting It Simple 162</li> </ul>
	Uri Shamir

Red River "Flood of the Century" through Human Eyes 164 Slobodan P. Simonovic
A Computer Program Named Randy Raban 168 Slobodan P. Simonovic
As Is Often Said, "Rome Was Not Built in a Day" 171 Jery Stedinger
Cleaning Up Pollution and...Wait, What, Where? 174 Cristiane Queiroz Surbeck
Engineering Your Own Education 177 Desiree Tullos
Effective Communication 180 Desiree Tullos

#### Part VI Adventures in International Organizations ...... 183

The Dublin Principles on Water and the Environment 183 Jerome Delli Priscoli
The World Water Council (WWC) and World Water Forums (WWF) 185 Jerome Delli Priscoli
Changing the Terms of Discourse in World Water Debates 187 Jerome Delli Priscoli
Developing a World Bank Water Sector Strategy 192 Jerome Delli Priscoli

Index 195 About the Authors 211

## Foreword

We who inhabit this earth are here because of the earth's natural resources. Water is one of them, and we all know that without water, life and many of the goods and services we enjoy would not exist. But having access to water in the right amounts and qualities to meet our needs is not always possible without the infrastructure we design and operate and the institutions we create to manage it. Managing the water nature gives us can be a challenge due to the way water is linked to our social structures, economies, ecological systems, and landscapes. It requires and involves individuals trained in multiple disciplines. Engineering is one of them. In this book, some of us who have devoted much of our professional careers, whether just beginning or nearly ending, to water resources planning and management, share some of our experiences addressing issues related to water. The scale of these issues range from local to international.

We have written these essays in hopes that they will be of interest to and even entertain you. Our stories are written especially for those beginning their professional training. There are lots of lessons and moments of enlightenment in these essays. They deal with a wide variety of water projects and experiences encountered by engineers, planners, economists, and social scientists. Some of our attempts to address them were successful, some were not. But all of them involved an adventure—dealing with people directly impacted by what we were doing.

All of us in this profession have a number of stories that, if told, would be both inspirational and educational, as well as fun to hear or read. We who are involved in water resources systems planning and management are indeed fortunate to have each other as colleagues. We admit that much of what we know and do, and get invited to do, results from our association with each other. We who are in this "club" invite our young student readers to join. We need you to help us meet society's needs for clean, reliable water supplies, deal with floods and droughts, and work toward reducing the uncertainties and conflicts among people that characterize our work. Perhaps these vignettes will give you a hint about how managing water and addressing related issues can change peoples' lives as well as their natural environments.