Reservoir Sedimentation Handbook

DESIGN AND MANAGEMENT OF DAMS, RESERVOIRS, AND WATERSHEDS FOR SUSTAINABLE USE

Gregory L. Morris • Jiahua Fan

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of Dams, Reservoirs, and Watersheds
for Sustainable Use

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*For Daniel, Richard...
and the others of the next generation.*

Preface

When the first author began researching problems of reservoir sedimentation many years ago, the lack of a book-type treatment of the subject became immediately apparent. While there is a significant amount of literature, it is widely scattered, written in several languages, and much of it is "gray literature" published in the form of engineering reports and conference proceedings which is not readily accessible. This handbook is an outgrowth of the need for a comprehensive treatment of this complex subject.

An in-depth treatment of each of the major technical topics is, of course, impossible within the context of a single handbook, and the treatment herein is by no means comprehensive and all-inclusive. The topics in each chapter are themselves of sufficient complexity to warrant book-length treatment. It is hoped that this conceptual overview of the major themes in each topic area, supported with a list of references and case studies, will facilitate the readers' comprehension of existing and potential problems at their own particular reservoir and watershed, and the types of remedial actions that have proved useful at other sites. The authors strongly feel that the most fundamental problem is to properly diagnose a sedimentation issue and select the conceptually appropriate course of action. Once the nature of the problem has been conceptually identified and one or more feasible courses of action identified, the approach to be used for subsequent detailed technical studies will usually be clear.

The first author's research on reservoir sedimentation topic was sparked by Ariel Lugo, and a discussion of problems at Puerto Rican reservoirs several years later with A. Santiago Vázquez. Both authors would like to express their special thanks to María Margarita Irrizarry who, during her term as Executive Director of the Puerto Rico Aqueduct and Sewer Authority, started sediment management activities at the Loíza reservoir. Work at this site initiated the collaboration between the co-authors that eventually resulted in this handbook.

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Production of this handbook also represents a 2-year team effort by personnel at Gregory L. Morris & Assoc. We could not have made it through the long ordeal of manuscript preparation without the capable editorial assistance of Marco Flores, and graphic materials prepared by Elias Castro. Ada Sotto, Sebastian García, Pully Torres, and Miguel Menar helped keep the office running throughout the long writing process. Former employees Guangdou Hu and G.T. Anderson discussed ideas and performed literature searches at university libraries.

The first author greatly appreciates the support by his wife, Miriam, and sons Daniel and Richard, who graciously accepted the long hours and forfeited hiking and kayaking trips. Also gratefully acknowledged are the many years of dedication by his parents, and guidance by many excellent teachers. The second author greatly appreciates more than 45 years of support and help in his sediment research for water resources development by his wife, Song Xiuzhen, and the support of his daughters Ying, Bing, and Xing.

We hope that society will benefit from our collected thoughts about water and sediment management.

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