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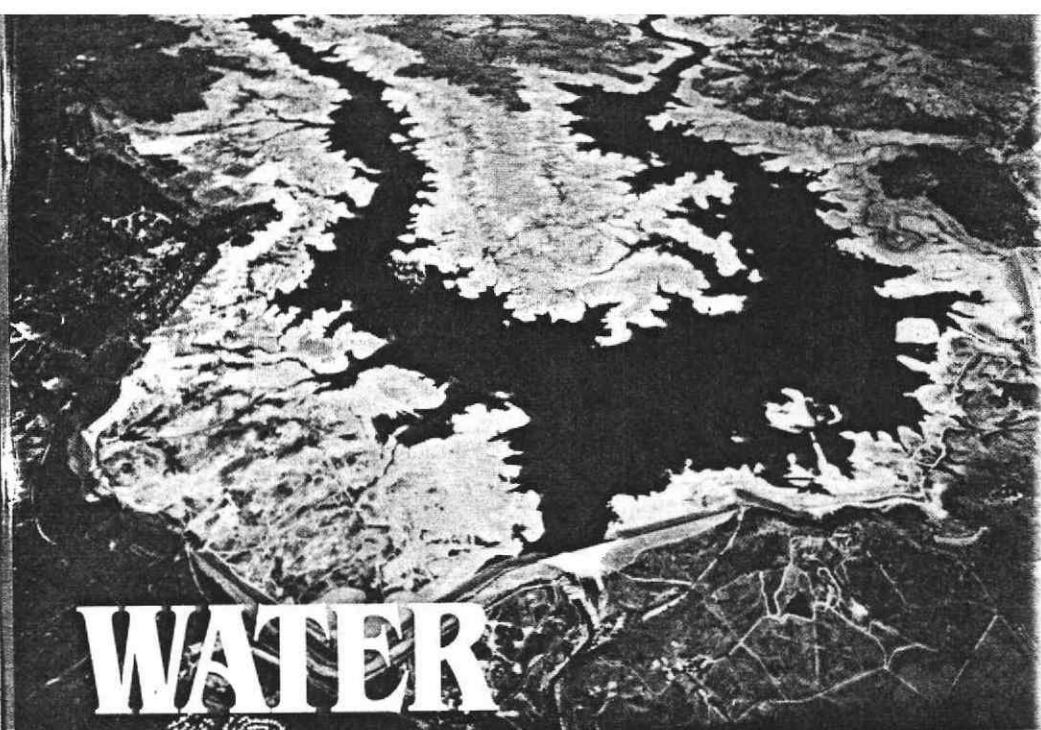
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WATER RESOURCES PLANNING AND MANAGEMENT

Proceedings of the 16th Annual Conference

Edited by Steven C. Harris

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ABSTRACT

The proceedings of the 16th annual Water Resources Planning and Management Conference, which was held on May 22-24, Sacramento, CA, consists of four page extended abstracts for about 200 of the 250 papers presented. Since the theme of the conference was "Water Resources for the Future: The Management Challenge," the sessions covered a wide range of topics having to do with the management of water resources. Some of the topics discussed include ground water modeling and contamination, computer applications for water management, urban drainage, weather modification, reservoirs operations, water transfers, and water use between states and countries. Besides covering a variety of topics, the method of presentation also ranges from the theoretical applications of new engineering technologies to the reports on the successes, and failures, of completed projects, including their technical and social implications.

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FOREWORD

This volume contains the papers presented at the 16th Annual Water Resources Planning and Management Conference which was held in Sacramento, California, May 21 to 25, 1989. The conference theme of "Water Resources for the Future: The Management Challenge" was supported by papers covering water supplies, groundwater supplies, water quality, runoff enhancement, and computer applications. Additional presentations were made in the plenary session on the morning of May 22 by a list of distinguished speakers.

The conference was sponsored by the Water Resources Planning and Management Division and hosted by the Sacramento Section of ASCE. Co-sponsors included the Sacramento Section, California Department of Water Resource, University of California at Davis, California Water Resources Control Board, Hydrologic Engineering Center of the U.S. Corp of Engineers, Bureau of Reclamation, Soil Conservation Service, and California State University at Sacramento.

The members of the conference steering committee include:

Darell Zimbelman, General Chairman
Steven Harris, Technical Chairman
Don Finlayson, Technical Vice Chairman
Sandy Houck, Local Arrangements Committee
John Pulver, Registration Committee
Steve Dalrymple, Publicity Committee
Wendy Cohen and Jay Lund, Local Technical Sessions
Morris McClung, Technical Field Trips
Joe Burns, Keynote Speakers

The members of the Executive Committee of the Division are:

Glenn M. Johnson, Chairman
Darell A. Zimbelman, Vice Chairman
Marshall Sterling Goulding, Secretary
Michael A. Ports
Jerry R. Rogers
Kyle E. Schilling

The papers for the conference were solicited through a "Call for Papers" issued in May of 1988. Potential authors were asked to submit a one paragraph abstract for review by the Technical Program Committee. Also, the technical committees of the Division were requested to submit their requests for sessions and papers by invitation. Originally, the conference was planned for about 30 sessions but because of the overwhelming demand to present papers at the conference, the number of session grew to 60. Even with 60 sessions there were papers

that could not be included, for this reason a poster session was added to accommodate the additional papers.

The session chairmen were delegated the responsibility for organizing the sessions, contacting authors, reviewing the papers, and providing the camera ready papers to the Technical Chairman. The Technical Chairman assigned the papers to the various sessions, except for the invited papers.

There were about 240 papers presented at the conference plus four panel discussions, and thirteen poster papers. Due to the number of papers, the written presentation was restricted to four page extended abstracts in order to have the proceedings less than 1000 pages. The authors were not required to have a written paper in the proceedings in order to make a verbal presentation at the conference. There are a total of about 200 papers in this proceedings. Expanded papers are eligible for publication in the Division Journal because these are extended abstracts and not full papers, without further authorization by the Division.

The Technical Program Chairman would like to thank the local organizers, the session chairmen, and the ASCE staff for the assistance that each person provided to make this proceedings possible.

Technical Program Chairman
Steven C. Harris

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Chairman: Walter Grayman

Participants will include: Dr. Miguel A. Marino, Dr. William Yeh, Dr. Richard H. McCuen,
L.R. Beard, and Dr. Soroosh Sorooshian

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Introduction

The evolution of a typical water resources project (after political approval is obtained) generally proceeds in the following sequence: a group of planners will determine the reservoir size and other project features; designers will draw the plans down to the last rebar; then, after construction, a third group will begin operating the project. Usually, after some time goes by, the operators will formalize criteria by which the project will be operated. The operators will have some flexibility in selecting these criteria, but normally there are legal constraints that dictate certain aspects of the operating rules. Fish flows, power contracts, water demands, and flood control criteria are some of the constraints. Also, since most projects do not come on line at full demand, the rules could change with time. Selection of the operating criteria determines the firm supply and the average supply of the project. In this paper, we examine some of the consequences of this determination.

What Is Firm Yield?

The word "yield" has different meanings to different people and we now define more precisely what we mean. A simplistic definition is given by Clark and Viessman: "If an unregulated stream is to be developed as a primary water source, the safe yield will be the lowest dry-weather flow of the stream. Under this condition, the user will always have an adequate supply provided his maximum requirements do not exceed this minimum flow" (1). Linsley and Franzini define as follows: "The safe, or firm, yield is the maximum quantity of water which can be guaranteed during a critical dry period. In practice, the critical period is often taken as the period of lowest natural flow on record for the stream" (2).

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