



WATER RESOURCES RESEARCH GRANT PROPOSAL

Project ID: CA3981

Title: Modeling and Optimization of Water Quality in a Large-Scale Regional Water Supply System

Focus Categories: Management and Planning, Water Supply

Keywords: reservoirs, network flow model, multiobjective analysis, systems analysis, nonlinear programming, regional water supply systems, optimization of water resources systems, water resources planning and management

Start Date: 03/01/2001

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Federal Funds: \$12,914

Non-Federal Matching Funds: \$22,903

Congressional District: 23

Principal Investigator:

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Abstract

Southern California is experiencing increase demands on the water supply. The objective of this proposal is to develop a multicommodity flow model that can be used to optimize water distribution in a regional water distribution system with blending requirements imposed as a set of constraints. The expected results will include a mathematical model that determines, for the decision-maker, the optimal water distribution policy. The objectives to be considered include minimizing the total shortage in water supply, minimizing the deviation of reservoir storage from the preset targets, minimizing reservoir spills, and maximizing the resources usage. The proposed model can be used for sensitivity analysis to identify the bottlenecks in the system, that is, constraint to which the optimal water supply policy is most sensitive. If the bottleneck involves physical constraints, this information will assist in capacity expansion planning. Arrangements have been made with the Metropolitan Water District of Southern California for collaborative participation to maximize the immediate applicability of the proposed methodology.