Water Budgets and Rate Structures: Innovative Management Tools
[Project #3094]

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OBJECTIVES:
The objectives of this study were to examine water budgets and their potential value to North American water utilities and the varying applications of the water budget concept that have been adapted to different conditions. Key research issues included different practical approaches to water budget rate structures, the benefits and challenges of these approaches, the potential uses of water budgets during drought, and important steps in the water budget implementation process.

BACKGROUND:
Water budgets—volumetric allotments of water to customers based on customer-specific characteristics and conservative resource standards—are an innovative means of improving water use efficiency. Once thought to be impractical because of technological constraints, water budgets linked with an increasing block rate structure have been implemented successfully in more than 20 utilities. As utilities develop advanced customer information systems and geographical information systems, these rate structures are expected to be applied more broadly. Water budget rate structures are attractive to water agencies searching for stable revenue generation, improved customer acceptance, increased water use efficiency, augmented affordability of nondiscretionary customer water consumption, and improved drought response.

HIGHLIGHTS:
Key elements and findings of this research project included the following:
• Definition of a water budget
• Explanation of water budget-based rates
• Discussion of water budgets and cost of service requirements
• Case studies of water budget implementation across the country
• Formation of water budgets (indoor and outdoor) for different customer classes
• Billing system requirements
• Implementation costs, issues, and solutions
• Measured conservation savings from implemented water budget rate structures
• Water budgets unique potential as a drought response tool
• A tool kit for utilities interested in implementing water budget based rates

APPROACH:
An extensive literature review was conducted using bibliographic and web-based searches. The researchers conducted
numerous structured interviews with water agencies that have already implemented water budgets and water agencies interested in the concept, but not yet using water budgets. This research focused on the technical ability and readiness of the agency as well as the potential barriers to implementation. Agencies also provided annual reports, consumption data, information on customer classes, and information on customer billing systems. Case studies on implemented water budget programs were developed by the research team and reviewed by agency personnel to ensure accuracy. Case studies were chosen to be illustrative of the successes and challenges involved in implementing a water budget rate structure.

RESULTS/FINDINGS:
Water budget-based water rates, also known as individualized, goal-based, and customer specific rates, are block rates where the block is defined by using one or more customer characteristics. Water budget-based rate structures can be thought of as an increasing block rate structure where the block definition derives from a water budget that defines an efficient level of water use for each customer. Implemented in more than 20 agencies, while still primarily a California and western states phenomena, water budgets have found support in a broad range of agencies from moderate-sized systems to very large utilities. Water budgets are no longer an exclusive “boutique” rate structure for select technologically savvy providers. These rate structures have been adopted by a broad range of providers, each using their own version of the water budget concept. Landscape water budgets were the original basis for the formulation of these rate structures and are the foundation of the majority of implementations examined in this report.

The implementation of water budget-based rate structures has been made possible by the advent of computerized utility billing systems that can incorporate specific customer-level information into a billing calculation. None of the water budget formulas or calculations studied by the research team was particularly complex or complicated. Most modern, database centered, utility billing systems can probably be adapted to incorporate water budgets without significant effort. Many of the utilities that have implemented water budget-based rate structures have experienced substantial conservation savings attributable to the rate structure and accompanying customer outreach programs.

IMPACT:
Although water budgets have been implemented by water providers in North America for nearly 20 years, they have only been used by a handful of utilities until recently. As population increase and climate uncertainties place heightened demand and stresses on water systems, more utilities are seeking new tools for water conservation and drought response. Water budget-based rate structures are one of the most effective tools available to water providers to provide a meaningful price signal, reduce water waste, increase efficiency, and manage drought response in a sensible and equitable manner.

RESEARCH PARTNERS:
City of San Diego Water Department

PARTICIPANTS:
Fifteen North American utilities and conservation organizations participated in this project.