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Adaptability and adaptations of California's water supply system to dry climate warming

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Abstract

Economically optimal operational changes and adaptations for California's water supply system are examined for a dry form of climate warming (GFDL CM2.1 A2) with year 2050 water demands and land use. Economically adaptive water management for this climate scenario is compared to a similar scenario with the historical climate. The effects of population growth and land use alone are developed for comparison. Compared with the historic hydrology, optimized operations for the dry climate warming scenario raise water scarcity and total operation costs by $490 million/year with year 2050 demands. Actual costs might be somewhat higher where non-economic objectives prevail in water management. The paper examines the economical mix of adaptation, technologies, policies, and operational changes available to keep water supply impacts to such modest levels. Results from this screening model suggest promising alternatives and likely responses and impacts. Optimized operations of ground and surface water storage change significantly with climate. Dry-warm climate change increases the seasonal storage range of surface reservoirs and aquifers. Surface reservoir peak storage usually occurs about a month earlier under dry-warm climate change.

Keywords

Water Scarcity | Water Market | Water Resour Plan Manage | Surface Water Storage | Urban Water Demand

These keywords were added by machine and not by the authors. This process is experimental and the keywords may be updated as the learning algorithm improves.