



New National Research Council Report on Managing the Colorado River Basin to Address Hydroclimatic Variability

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The National Research Council recently released a report entitled *Colorado River Basin Water Management: Evaluating and Adjusting to Hydroclimatic Variability*. The report examines hydrologic and hydroclimatic trends on the Colorado River to improve river management and drought preparedness.

Background

Direct stream flow measurements on the Colorado River began in the late 1890s. In the 1970s the stream flow data began to be complimented with indirect evidence from tree-ring studies. This new data helped scientists reconstruct the region's past hydroclimate conditions. More recently, the water years of 2002 and 2004 were among the 10 driest years on record in the Colorado River's upper basin states. These recent drought conditions renewed interest in predicting the Colorado River's future flows based on its historic flows. To address these interests, in 2005, the National Research Council's Water Science and Technology Board formed a committee to review scientific studies on the Colorado River's hydrologic and hydroclimatic trends affecting river flows. The committee's task was to produce "an improved hydrologic baseline" for managing the Colorado River.

The Committee Report

The report's findings and recommendations are focused in three areas: (1) hydroclimatic data and sciences; (2) realities of Colorado River Management; and (3) improving drought preparedness: cooperation, science, and planning.

While admitting that there is no consensus regarding precipitation trends in the future, the report concludes that "the preponderance of the scientific evidence suggests that warmer future temperatures will reduce future Colorado River streamflow and water supplies. Reduced streamflow would also contribute to increasing severity, frequency, and duration of future droughts." (National Research Council, *Colorado River Basin Water Management: Evaluating and Adjusting to Hydroclimatic Variability* (2007), prepublication copy, 3.)

For many years, the early gaged stream flow measurements formed the scientific understanding of the Colorado River basin's flows. Recent tree-ring based studies can estimate streamflows over hundreds of years. This new information has transformed the scientific understanding of the basin's hydrology and has confirmed the stream monitoring data to show that the river's mean annual flow is subject to fluctuations. Based on this new data, the report concludes that "fluctuations in Colorado River mean flows over long-range time scales are likely to continue into the future. . ." (Id. at 4.) The new data also shows that historically the river's flows have been much lower than reflected in the gaged record and assumed in the 1922 Colorado River Compact allocations. The report also concludes, based on tree-ring reconstructions of past river flows, that future droughts in the basin will likely recur and that they may exceed the droughts of recent history.

Regarding management of the Colorado River, the report finds that despite decreas-

es in per capita use, expanding populations have increased urban water use. These increasing demands are impeding the ability of water managers to address drought conditions in the basin. Technology and conservation are a start to coping with shortage conditions, but the report concludes that these "in the long run will not constitute a panacea for coping with the reality that water supplies in the Colorado River basin are limited and that demand is inexorably rising." (Id. at 7.)

Lastly, the report recommends "a comprehensive, action-oriented study of Colorado River region urban water practices and changing patterns of demand . . ." (Id. at 9.) This study should address demographic projections for the region, local and regional water demand forecasts, long-term impacts from agriculture-urban transfers, and contemporary urban water policies and practices. (Id.)

Conclusion

The committee's report pulls together the scientific data regarding the effect of hydroclimatic variability on Colorado River flows and how the river should be managed in light of such data. It also identifies data gaps and is a plea to conduct additional studies to directly address these issues. The report is not a doomsday prediction, but it does make clear the serious Colorado River management issues that should be addressed immediately. For more information, visit <http://www.nationalacademies.org>.