

Let technology improve California water policy

BY SANDRA L. KERL & MARGARET LEINEN

Torrential rains are periodically pounding California this winter and putting a dent in the most extreme drought conditions of the past 1,200 years. While that's a relief for some 40 million residents, it's also a reminder of the feast-or-famine climate that rules California and creates major challenges for water managers.

These days, we rely heavily on expressways of water vapor known as atmospheric rivers. They provide about half the state's annual precipitation and their share of water deliveries is increasing as climate change drives extreme swings in precipitation. Put simply, the 20th century concept of reliable winter snowpacks and orderly spring runoff filling reservoirs is giving way to all-or-nothing events epitomized by atmospheric rivers and increasingly severe droughts.

Besides the obvious problems created by flooding and scouring fire-ravaged landscapes, atmospheric rivers add greater challenges to decades of reservoir management in California and across the West. Their increasing prevalence requires new science and innovative management tools to make the most of the episodic water supplies they deliver.

A bill in the state Legislature would help ensure California has the science and weather forecasting tools it needs to play by nature's ever-changing rules. Assembly Bill 30, by Chris Ward, D-San Diego, would make breakthrough water management technology standard for the California Department of Water Resources, leveraging previous and existing federal investments. It would foster improvements over time that will lead to more flexible reservoir operations in the future for California to deal with drought and flood.

The strategy is called forecast-informed reservoir operations, and it complements Gov. Gavin Newsom's California Water Supply strategy released in August calling for more reservoir storage capacity to capture runoff from big storms. The governor and Legislature have already provided funding for state water managers to integrate the strategy.

As the name implies, forecast-informed reservoir operations use weather predictions to advise dam operators about how much water to retain or release from reservoirs, enhancing their ability to handle whatever nature serves up while retaining as much water as possible in storage. A [pilot program](#) funded by the U.S. Army Corps of Engineers in

Northern California showed water management using this strategy increased water storage by nearly 20 percent.

While that approach might seem obvious, the reality is that many reservoirs in the West are strictly regulated based on historical averages of winter storms and spring runoff. Under existing rules, the highly variable rainfall from year to year is not directly considered. Complicating the problem, many current guidelines and practices were developed before satellites, radar and advanced numerical models significantly improved weather forecasts.

To address these challenges, researchers at UC San Diego's Scripps Institution of Oceanography and elsewhere developed tools that provide weather forecasters with reliable notice of atmospheric rivers a week in advance. Advancing this research could have taken decades, but sophisticated prediction products have evolved in less than 10 years with funding by the San Diego County Water Authority and other water agencies statewide, along with state and federal support.

In light of the rapid progress, the San Diego County Water Authority and Sonoma Water co-sponsored Assembly Bill 30 as an innovative climate adaptation strategy that doesn't require costly reservoir infrastructure upgrades. Ward should be congratulated for his leadership in supporting next-gen water management and flood reduction efforts that will benefit residents statewide.

Adapting to the new paradigm of climatic uncertainty and extremes will require new approaches to water management. Thankfully, forecast-informed reservoir operations provides compelling evidence that California can continue to thrive with a combination of research, technology and collaboration that sustains our economy and quality of life.

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