California Sleepwalks into Water Crisis

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California's Governor Jerry Brown ordered mandatory reductions in water use on April 1st, it came as no surprise in a state that's experienced an extended and unprecedented drought. Against this backdrop, the governor's 2014 Sustainable Groundwater Management Act and last week's water-use cuts appear to many water experts to be too little too late. So what can California do to shore up its dwindling water supply? Charles ICELAND, Director Aqueduct with WRI's Food, Forests, and Water Programs, brings us his analysis. H2o 2015 April.

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When
California's Governor Jerry Brown ordered mandatory reductions in water use on April 1st, it came as no surprise in a state that's experienced an extended and unprecedented drought. Now in its fourth year, the drought has fueled groundwater pumping by farmers, lowering water tables, driving land subsidence, and damaging roads, bridges and other infrastructure. Snow-capped mountain ranges no longer have snow. Citizens in some smaller communities worry they'll loss access to water altogether. And banks and corporations are beginning to ask if they're now exposed to potential risks and losses. Against this backdrop, the governor's 2014 Sustainable Groundwater Management Act and last week's water-use cuts appear to many water experts to be too little too late.

So what can California do to shore up its dwindling water supply?

Charles ICELAND

Aqueduct Director with WRI's Food, Forests, and Water Programs

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A Complex Water System
- As WRI noted last year, about two-thirds of California's irrigated agriculture faces extremely high levels of water stress. The state has developed a complex web of dams, aqueducts and pipelines to move water from relatively water-rich areas to relatively water-scarce agricultural and urban areas. Even in "average" years, this highly engineered solution is precarious. In drought years, the arrangement begins to crumble.

Doc. Aqueduct / World Resources Institute

sources: Water stress, WRI
Aqueduct 2013; Irrigated lands, Ozdogan and Gutman 2008 sage.wisc.edu

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3 Steps for a More Water-Secure Future - In order to confront the current water crisis and potential future ones, California can take three immediate steps:

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Integrate water supply and demand data and link them to regulatory actions. California lacks a state-wide integrated assessment of water supply, mostly because groundwater availability remains such a large unknown. There is also relatively little integration of water supply and water-demand data. Without such data, California is "flying blind" on water management: Decision-makers lack information on baseline water resource conditions, so they cannot determine sustainable water usage or recommend effective courses of action. It is also crucial that such data be explicitly linked to regulations that permit the state to step in and order cuts in water usage when demand begins to outstrip supply.

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Increase drought resilience. Is the current drought due to climate change? Will such droughts become more prevalent in the future? We cannot fully answer these questions yet. What makes sense right now, however, is to make California more "drought-proof." The Netherlands - which is vulnerable to flooding from rivers and from the sea - has put in place a number of "flood-proofing" measures that protect it against low-probability, high-impact flood events (floods that are expected to occur once every 1,250 years). It's time for California to develop a package of drought-proofing measures that protect it against low-probability, but high-impact droughts.

The $7.5 billion bond measure passed by California voters last November to help the state cope with drought (by, for example, promoting water conservation and

constructing more water-storage facilities) is a good start. Whats really needed, though, is an effort that models what a 1-in-1,000-year drought would look like in California, and then implements a cohesive strategy - including contingency measures - that would allow the state and its citizens to successfully weather such a crisis.

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Determine the role of agriculture in its future.
Through its agriculture, California helps feed itself and the rest of the world. Yet agriculture - which accounts for 80 percent of California's total water demand - is also the crux of the problem. Part of the solution to this problem lies in cultivating less thirsty crops, and part of it lies in using more water-efficient technologies and practices. A recent study by the Pacific Institute found that a combination of agricultural technologyâ€”such as shifts from flood irrigation to sprinkler- and drip-irrigation systemsâ€”and management scenarios could together reduce agricultural water use in the state by 17 percent. Should these efforts come up short, however, Californians may decide to decrease the role of agriculture in the state's economy (agriculture only comprises about 2 percent of California's economy, so its value in purely economic terms is low). If California and other similarly water-stressed parts of the world all decided to decrease agricultural production, however, there would be huge repercussions for global food prices and food security.

The water problem
in California has entered crisis stage, and the old order may be poised for a fall. What happens in California will be - as is often the case - closely watched around the world as a harbinger of things to come.Â .

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Aqueduct is the most current, comprehensive, and high-resolution global water risk assessment and mapping tool available. It is completely free and available to all users and is now a key resource for many analysts and decision-makers concerned with water risk. Charles oversees Aqueduct's strategy development and management, and is currently working to develop an Aqueduct Global Flood Risk Analyzer with a number of Dutch research partners.

Charles previously partnered with several major multinational corporations, including Mondi Group, Rio Tinto, Akzo Nobel, and BC Hydro, to develop, road test, and apply an innovative methodology for assessing corporate risks and opportunities stemming from ecosystem change. Prior to that, he worked at the World Environment Center, where he developed innovative supply chain environmental management pilot programs for Alcoa, Johnson & Johnson, Dow Chemical, and General Motors. He has also worked at the Office of the United States Trade Representative, the United

States House of Representatives, and the Peterson Institute for International Economics. In addition, he worked in the banking and finance sector for several years and is a Chartered Financial Analyst (CFA). Charles earned his undergraduate degree from Yale University and a master's degree in international affairs from Columbia University. He, his wife Debbie, and sons Matthew and Josh live in Bethesda, MD.

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