Adapting California's Water Governance to a Changing Climate

Adapter la gouvernance de l'eau en Californie au changement climatique

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RÉSUMÉ

Malgré ses racines dans l'Empire espagnol, la Californie est connue pour son approche décentralisée, voire « Far West », de la gestion de l'eau, impliquant littéralement des milliers d'agences, principalement locales et régionales. Les grands fleuves de l'État - en particulier le Sacramento et le San Joaquin, leurs affluents et leur delta - sont au confluent de ce cadre byzantin. Si l'on est généreux, une telle gouvernance peut être considérée comme un « système de systèmes » ; mais si l'on est moins gracieux, cela peut être qualifié de chaos. Alors que le changement climatique continue de modifier les rivières de l'État, une question persistante est de savoir si et comment les institutions de l'eau de l'État changeront également, soit en doublant la décentralisation, soit en exerçant la domination du gouvernement de l'État. Nous observons que c'est en fait les deux. Par exemple, la Californie a, d'une part, renforcé les pouvoirs des acteurs locaux, en particulier pour parvenir à des « eaux souterraines durables », tout en employant un contrôle descendant accru sur d'autres aspects des ressources en eau, comme la gestion du Sacramento-San Delta de la rivière Joaquín. Dans cette présentation, nous passons en revue l'adaptation récente des institutions californiennes au changement climatique et envisageons les leçons potentielles pour d'autres régions à climat méditerranéen et, en fait, pour la Californie elle-même.

ABSTRACT

Despite roots in the Spanish Empire, California is notorious for a decentralized, even "Wild West" approach to water management, involving literally thousands of agencies, mostly local and regional. The state's great rivers—specifically the Sacramento and the San Joaquin, their tributaries and their delta—are at the confluence of this Byzantine framework. If one is charitable, such governance can be viewed as a "system of systems;" but if one is less gracious, it can be characterized as chaos. As the changing climate continues to alter the state's rivers, a persistent question is whether and how the state's water institutions will also change—by either doubling-down on decentralization or exerting the dominion of State government. We observe that it's actually been both. For example, California has on the one hand further empowered local actors—in particular, to achieve "sustainable groundwater"—while at same time employed more top-down control over other aspects of water resources, such as the management of the Sacramento-San Joaquin River Delta. In this presentation, we survey the recent adaptation of California institutions to climate change, and contemplate potential lessons for other Mediterranean-climate regions and, indeed, for California itself.

KEYWORDS

Adaptation, climate change, governance, water management

1 ADAPTING CALIFORNIA'S WATER GOVERNANCE TO A CHANGING CLIMATE

1.1 Decentralized Water Management in a Mediterranean Climate

The state of California enjoys a Mediterranean climate, with some of the most productive irrigated agriculture in the world, and large cities dependent on the water supply derived from winter snow and rains stored in the snowpack, aquifers, and reservoirs (Andrew and Sauquet 2017). Despite its roots in the Spanish Empire, California is notorious for a decentralized approach to water management. For comparison, the US has no national-level framework for managing rivers equivalent to the EU-level Water Framework and Floods Directives; and at the state level, California is arguably more complex than most other US states, with some 20 agencies with overlapping and sometimes conflicting roles in managing the state's water resources. That said, most water management decisions are made at the local level, where well over a thousand water and wastewater agencies, irrigation, levee, and flood control districts, cities, counties, and other forms of bureaucracy, exert some control over myriad aspects of California's water. Moreover, California water management has evolved with three competing legal doctrines that apply to surface water rights: the riparian doctrine (inherited from English common law, giving river-adjacent landowners the right to divert), the prior appropriation doctrine (prevalent in western US states, in which the first users of a water source retain prioirity rights to their use), and pueblo rights (municipal rights inherited from the Spanish legal code).

California is unique among Mediterranean-climate regions in supporting native anadromous salmon in its rivers. However, the survival of these non-Mediterranean species is threatened by human impacts to rivers, such that legal protections of these endangered fish are significant constraints on management actions for water supply, flood control, etc. (Deitch and Kondolf 2015). When the changing economics of water supply and demand, environmental protections for aquatic species, and increasingly apparent climate-induced changes in hydrology are factored in, the result can be likened to a "Wild West" of competing interests and authorities. While this bottom-up governance makes it very challenging to coordinate, much less direct, change in response to new realities, the existence of so many different possible avenues to manage the state's waters also creates some flexibility that might be missing in a more top-down ecosystem (Bouleau and Kondolf 2011).

The state's great rivers—specifically the Sacramento and the San Joaquin, their tributaries and their delta—are at the confluence of this Byzantine framework. As the changing climate continues to alter the state's rivers, the question remains whether and how the state's water institutions will also change. For instance, will the state double-down on the existing, largely bottom-up governance paradigm, or move towards a more centralized scheme? We observe that it's actually been both, perhaps as it only can be in California. In recent years, State Government has on the one hand reinvested heavily in integrated regional water management—thereby cementing the primacy of local actors—while at same time exerted more top-down control over certain aspects of its water resources, including groundwater, drinking water, and water use. In this paper, we explore the institutional response to climate change for two important aspects of California's water resources: regional water management (including sustainable groundwater management) and the Sacramento-San Joaquin River Delta.

1.2 Still Bottom-Up While Also More Top-Down

Since 2002, the Integrated Regional Water Management Program (IRWM) has made available over 1.5 billion USD from public bonds for collaborative water planning and management at the level of "regions" of the state. To qualify for this funding, local agencies and stakeholders must come together to agree on proposed projects and form IRWM groups that meet regularly. The program is largely driven by the promise of funding rather than regulatory consequences, i.e., "carrot" rather than "stick". While some projects address flood risk management and ecological issues, most projects focus on water supply, with some other benefits. Now celebrating its 20th anniversary, IRWM was revolutionary in that for the first time it motivated diverse water stakeholders to sit down and talk, a non-trivial accomplishment in the siloed world of California rivers. However, it has not changed the fundamental dynamics of water policy, as the parties need agree only on the projects for which they seek funding and need not address fundamental conflicts.

In response to continued steep declines in aquifer levels from over pumping (resulting in widespread well failures and subsidence damaging overlying infrastructure), in 2014 the California

Legislature passed the Sustainable Groundwater Management Act (SGMA), requiring formation of local or regional groundwater sustainability agencies (GSAs) charged with returning aquifers to "sustainable" levels. While SGMA indeed reaffirms local control of water management (the GSAs are established through the participation of local stakeholders), engagement is mandatory, in contrast to IRWM groups, as is the end goal of aquifer sustainability. If local actors fail to establish a GSA or ultimately achieve sustainable groundwater management, the State is obligated to intervene and assume this responsibility, an intrusion that would be anathema to most stakeholders accustomed to local control. Funds are available to the local GSAs, so there is some "carrot" involved, but the "stick" is very important and to some degree unprecedented in California water policy, reflecting in part the severity of the groundwater crisis faced by the state in areas such as the San Joaquin Valley, with its industrial agriculture highly dependent upon groundwater, alongside impoverished rural communities running dry. Thus while SGMA directly engages the State in local water management, it also creates an entirely new class of regional agencies that are, paradoxically, different than the existing IRWM groups.

Just as the crisis from uncontrolled groundwater pumping was sufficient to finally impel the state to implement top-down requirements for more sustainable management of groundwater, the critical importance of the inland Sacramento-San Joaquin Delta motivated the state to increase its authority over this important region. The Delta is the source for the largest water projects in the state, including the project that brings water over 1100 km south to the Los Angeles and San Diego metropolitan regions. In addition, the Delta is vital for many aquatic and avian species who reside in or travel through its ecosystem, and is home to over a half million Californians. It is perhaps also the region of California most at risk from climate change, where rising seas meet flooding rivers, and levees must continuously defend subsided islands. In response to this dilemma, the state created yet more agencies and authorities, including the Delta Stewardship Council (responsible for developing and implementing the Delta Plan); the Delta Conservancy (with funding to protect ecologically important lands); the Delta Watermaster (with jurisdiction over water rights, housed within the existing State Water Resources Control Board); and expansion of authority for the existing Delta Protection Commission (with limited land-use jurisdiction). In addition, the state created the Delta Conveyance Program to support the existing, large, interbasin water projects, with the goal of creating water transfer infrastructure that will survive a major earthquake and address other conditions of concern in the Delta.

2 CONCLUSION

Climate impacts in California have deservedly garnered much focus, but less so the state's water institutional framework, originally developed in response to 19th century needs, but which must now adapt to the changing realities of the 21st century. While California retains a mostly decentralized approach to overall water management (e.g., primacy of local actors, IRWM, voluntary agreements on river flows and habitat), on the crucial resources of groundwater and the Sacramento-San Joaquin Delta, we find that the State of California is now generally taking a more top-down approach. Indeed, in response to environmental, climatic, and social change, the State government has responded with the creation of yet more government. These actions include the formation of over a hundred new regional agencies to oversee groundwater (with an explicit State enforcement backstop), and expanded or revived State governance for one region in particular, the Sacramento-San Joaquin River Delta. The recent adaptation of California water institutions to climate change provides a potentially useful comparison for other Mediterranean-climate regions.

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