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Technical Appendix

Water and the California Economy

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Economic Size of California’s Water Management System, Late 2000s

In this appendix, Ellen Hanak and Elizabeth Stryjewski describe the sources and methods used to estimate water management expenditures and employment.

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Economic Size of California's Water Management System, Late 2000s

This appendix provides information on data sources and methods used to estimate local, state, and federal expenditures and employment on water management, as presented in the text table on p. 4 of *Water and the California Economy* and reproduced below (Table 1). Our goal was to present an overview of annual expenditures and employment for the range of local, state, and federal entities involved in managing water supply, wastewater, floods, and aquatic ecosystems in the late 2000s. Where possible, we present averages over several years to minimize the effects of spending anomalies in individual years. We relied on a variety of data sources, including published information, unpublished estimates provided by state and federal agency officials, and our own estimates for some missing entries, as documented in the table notes. The table excludes some types of expenditures for which information was unavailable.¹ Getting information on the California share of federal agency expenditures was not always straightforward; in general, these estimates do not include headquarters expenditures or staff efforts on California programs. To avoid double counting, the table does not include \$720 million in state grants to local agencies and \$481 million in federal grants under state and federal expenditures, since these grant revenues help fund local expenditures included elsewhere in the table.²

The table lists the primary functional responsibility of each agency or type of agency, making it possible to provide a rough breakdown of expenditures by function (Figure 1). However, this breakdown provides an incomplete picture of expenditures on aquatic ecosystems, because the only agencies for which ecosystem management is listed are the regulatory agencies: the state Department of Fish and Game and its two federal counterparts (U.S. Fish and Wildlife Service and National Marine Fisheries Service). Water supply, wastewater, and flood management entities also devote some resources to aquatic ecosystem management as part of their obligation to mitigate environmental impacts of their primary activities.

¹ This list includes flood control activities undertaken directly by city governments rather than county flood control agencies and stormwater management activities undertaken by municipal and county governments rather than municipal wastewater agencies or county flood control agencies.

² The table notes include information on grants by agency. Conservation-oriented grants from the U.S. Department of Agriculture (USDA), not included here, may also have some water management benefits (for instance, if they facilitate the management of irrigation water drainage). Between 2004 and 2010, California received nearly \$11 million under the Conservation Innovation Grant Program (Natural Resources Conservation Service, *Conservation Innovation Grants: Identifying New Conservation Tools and Practices* [U.S. Department of Agriculture, January 2012]). Other USDA conservation-oriented programs may have provided additional support.

TABLE 1
Economic size of California's water management system, late 2000s

	Annual expenditures (2009 \$, millions)			Annual employment
	Operating	Investment	Total	
Local agencies ^{a/}	17,568	12,730	30,298	44,130
Water supply (public)	10,430	5,859	16,289	34,261
Water supply (private)	798	2,606	3,404	1,598
Wastewater (public)	5,511	3,941	9,452	5,098
Flood management (public)	829	324	1,153	3,173
State agencies ^{b/}	1,985	1,084	3,069	5,669
Department of Water Resources ^{c/}				
– State Water Project	952	379	1,331	1,517
– Other water supply	97	–	97	871
– Flood management	165	174	339	449
State Water Resources Control Board ^{d/}				
– Water quality	424	–	424	1,375
– Water rights	11	–	11	80
Department of Fish and Game (ecosystems) ^{e/}	173	1	174	1,093
Department of Public Health (drinking water quality) ^{f/}	80	–	80	206
California Public Utilities Commission (private water utilities) ^{g/}	83	–	83	68
Water-related general obligation debt repayment ^{h/}	–	530	530	–
Federal agencies (California programs)	374	136	510	3,012
U.S. Bureau of Reclamation (water supply) ^{i/}	207	–	207	937
U.S. Army Corps of Engineers (flood management) ^{j/}	47	136	183	1,246
U.S. Environmental Protection Agency (water quality) ^{k/}	8	–	8	56
U.S. Fish and Wildlife Service (ecosystems) ^{l/}	58	–	58	400
National Marine Fisheries Service (ecosystems) ^{m/}	54	–	54	373
Total local, state, and federal	19,927	13,950	33,877	52,811

SOURCES: Author estimates using California State Controllers' Office detailed local government data files (local public water and wastewater agency expenditures); California State Controller's Office Government Compensation in California database (special district employment); State Controller's Office Cities and Special District Annual Reports (local flood expenditures); California Public Utilities Commission (local private agencies); Governor's Budgets (state agency expenditures); State agencies (employment); Federal agencies (expenditure and employment).

NOTES: Investment expenditures generally include capital outlays, interest payments on debt, and loss on sale of assets. Operating expenditures generally cover all other expenditures. To avoid double counting, the table excludes \$720 million in state grants to local agencies and \$481 million in federal grants (details below).

a/ For local public agencies, expenditures are for 2006/07 through 2009–10 and employment is for 2009–10. For private water utilities, data are for 2009–10. Capital outlays for water and wastewater special districts are calculated as the change in fixed assets. Capital outlays constituted 71 and 77 percent of investment expenditures for public wastewater and water agencies, respectively. City and county agency employment was estimated using the ratio of operating expenditures to employment for special districts. Flood control expenditure data are not available for cities and stormwater management expenditures by city and county governments are not available for localities where this task is not covered by wastewater utilities or county flood control agencies. Data on private water companies exclude those with fewer than 500 connections.

b/ State agency data are for 2006–07 through 2009–10 except the Department of Public Health, which begins in 2007–08.

c/ The Department of Water Resources also provided an annual average of \$126 million for water supply and \$222 million for flood management to local agencies. Most of the expenses for the State Water Project are reimbursed by local water agencies.

d/ Includes expenditures by the nine regional water quality control boards. The State Water Resources Control Board also provided an annual average of \$200 million for water quality improvements to local agencies.

e/ Sums shown here represent half of agency totals, to approximate the share devoted to aquatic species and habitat. The Department of Fish and Game also provided an annual average of \$30 million in assistance to local agencies.

f/ Employment was estimated by pro-rating employment in the environmental health program area by the proportion of environmental health expenditures on water. The Department of Public Health also provided an annual average of \$142 million to local agencies for drinking water supply.

g/ Water-related expenditures were estimated by pro-rating the proportion of total agency expenditures by the share of employees working on water-related issues.

h/ For a list of bonds, see Hanak et al. 2011, Table 2.9. In addition, the Department of Water Resources repaid an annual average of \$463 million during this period on debt incurred for the State Water Project (SWP). This total is excluded from the table because it is repaid by local agencies (and included under local expenditures). In recent years, general obligation bond repayments have been increasing and SWP debt repayments have been falling.

i/ Employment is for 2011–12 and expenditures are for 2008–09 through 2010–11 and include both operating and investment accounts. The California share of multi-state and bureau-wide programs is approximated. From 2008–09 through 2010–11, the Bureau also provided an estimated \$121 million per year in grants to California.

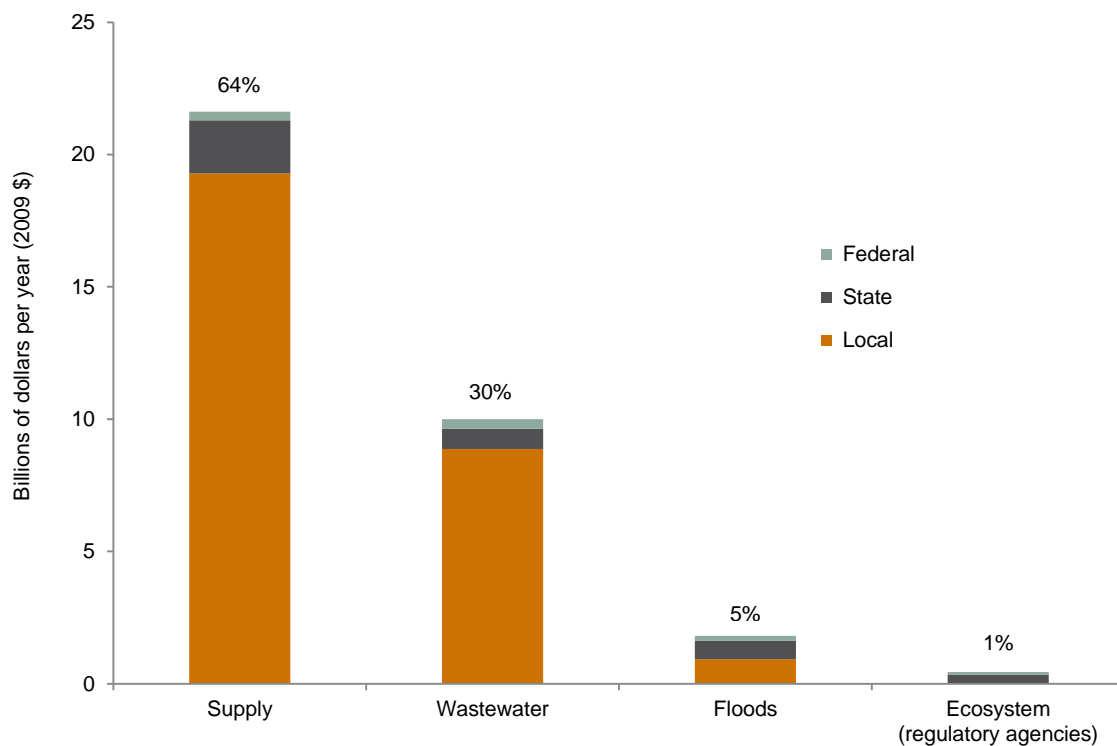
j/ Expenditures are for 2006–07 through 2010–11 (from Army Corps headquarters) and employment is for 2011–12 (from Sacramento and San Francisco field offices) and does not include the Los Angeles office.

k/ Employment is for 2011–12 and operational expenditures are estimated based on average costs per employee. From 2008–09 through 2010–11, the Environmental Protection Agency also provided an annual average of \$360 million in grants for water quality to California, most of which went to local agencies. Grants were unusually high in 2009–10 (\$683 million), reflecting contributions from the American Recovery and Reinvestment Act.

l/ Employment is for 2011–12 and represents half the total, to approximate the share devoted to aquatic species and habitat. Operational expenditures are estimated based on Environmental Protection Agency average employee costs (note k).

m/ Employment is for 2011–12. Operational expenditures are estimated using Environmental Protection Agency average employee costs (note k).

FIGURE 1
Water sector spending by function, late 2000s



SOURCE: See Table 1.

NOTE: Agency expenditures are allocated by function. State Water Resources Control Board expenditures for water quality are included under the wastewater heading. State reimbursement of general obligation bonds is allocated evenly across all four functions. State and federal expenditures include grants to local agencies (and local expenditures exclude these grants).



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