California Water Data Consortium

BAY AREA COUNCIL ECONOMIC INSTITUTE

Investing in a Modern Water and Ecological Data System to Better Serve California

"Crucial to achieving the water supply actions described [in California's Water Supply Strategy] is a common, readily available set of facts about water supply and use, better forecasting, and integrated use of data and technology. Water rights modernization and reform are critical to ensuring we can efficiently and effectively adapt to a changing climate."

– California's Water Supply Strategy

By passing the Open and Transparent Water Data Act[1], California has taken a major step forward in upgrading its water data infrastructure and better managing the state's water resources. While we've made significant progress in advancing open data in the state[2], we must continue modernizing our water data system. The Newsom Administration's Water Resilience Portfolio and California's Water Supply Strategy both highlight the importance of investing in better water data infrastructure that will help us respond faster to water and climate emergencies, protect Californians and wildlife species, improve access to safe, affordable drinking water, and support adaptation to climate change.

The California Water Data Consortium recommends a $353 million investment to modernize California's siloed and inaccessible water data infrastructure. Investing in a modern water data system would pay for itself. Estimates show that California could gain up to $780 million in economic benefits in the water management sector alone.[3]

- The State is currently planning to invest $75 billion over the next 20 years in water infrastructure projects. With better data, the State can optimize these investments and ensure solid returns.
- Data infrastructure is critical to the security and effective operation of our water systems. The proposed $353 million is just over one percent of the $27 billion authorized by water bonds passed since 2000. The annual operations and maintenance of the updated water data system are projected to cost less than 0.5% of California's yearly water spending.[4]

Investing in water and the information necessary to proactively manage California's water and ecological systems, particularly in a rapidly changing climate, benefits everyone living and working in California. To modernize our siloed and inaccessible water data infrastructure, investments of time and financial resources are critically needed in the following four areas.

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[1] California Department of Water Resources, Open and Transparent Water Data Act Implementation Journal

[2] Strategic Plan for Assembly Bill 1755, the Open and Transparent Water Data Act, April 2018; and Protocols for Assembly Bill 1755, the Open and Transparent Water Data Act

[3] Water Data is Essential Infrastructure, Redstone Strategy Group, May 2018

[4] Paying for California's Water System, Public Policy Institute of California, May 2021

"Supporting our San Joaquin Valley's underserved communities during periods of crisis requires high-quality accessible water data that can be used to inform decision-making and planning. Investments in water infrastructure are not only critically important to support planning, they also ensure coordinated and prudent spending across agencies and organizations."

– Eddie Ocampo, Self-Help Enterprises

1. **Water Data Policy and Legislation**

Build pathways to ensure that water data legislation and policy leverages existing data resources, fosters cross agency/program data systems, and encourages data collection to improve governmental services.

Leverage existing legislative fellowship programs to support ongoing integration of data expertise into relevant data legislation and policies. Develop readily accessible, searchable inventories or data catalogs of existing datasets and data standards that legislative staff and others are aware of and use. Ensure that technical and regulatory policy makers jointly craft legislation that is simple to implement and adaptable to future technological change. Identify groups and organizations with strong legislative, policy, and technical outreach skills to continue building water and ecological data coalitions to work together.

Example Outcomes

- Transparent, inclusive processes that identify cost effective information requirements and uses that inform policy and legislative development.
- Rationalized, flexible policies, legal frameworks, and processes using the best available data, that support innovative management approaches responsive to stakeholder needs.

Invest

Data infrastructure is critical to the security and effective operation of our water systems. The proposed $353 million is just over one percent of $27 billion and is a small price to pay considering the importance of high-quality water data and the resulting understanding of water availability and quality.

2. **Water Data Leadership**

Invest in developing and retaining water and ecological data leadership and expertise shared across agencies and within individual state agencies or departments.

Water and ecological data modernization efforts require strong data leadership at a variety of levels - from the executive team to line staff. Identify external groups and organizations with strong technical capacity and communication skills to engage with open water data and support improved water data processes at the state and local level.

Example Outcomes

- Trusted, interdisciplinary teams that work across state and local agencies/sectors to identify critical data requirements, address unique needs, and align goals.
- Stakeholders who are actively engaged in coordinating, promoting, and data sharing, and accountability.

- Confidence in the water and ecological data collected and published by state agencies and departments.

Innovate

These critical water data infrastructure investments are needed now more than ever given increasing climate variability and the rapidly evolving technology landscape. New technologies like Artificial Intelligence and IoT sensor networks have the potential to greatly improve California's ability to understand water resource availability and quality, and quickly respond to dangerous conditions when they occur.

3. **Cross-Agency Governance and Technology**

Continue investing in cross-agency data infrastructure and data governance[5] structures to support timely and proactive water and ecological decision-making.

Invest in existing and new water and ecological data governance structures to improve the quality of existing data assets and ensure any new state-collected data are high-quality and useful. Build on existing expertise and resources by coordinating data efforts and initiatives under a common data governance framework that identifies the basic roles and processes required to manage data effectively. Define and fund dedicated roles responsible for data management – including developing, coordinating, and implementing protocols for data collection, documentation, quality control, verification, and data publication. Invest in technology that supports state water data collection, management, and sharing to enable coordinated data processes across agencies and departments. Coordinated data processes include development of common metadata and data standards, application programming interface interoperability and documentation, data taxonomies, and more.

Example Outcomes

- High-quality, machine-readable data that provides a foundation for data analysis and emerging capabilities such as generative AI.
- The best quality data that decision makers can rely on to achieve California's water stewardship goals.
- Opportunities for the State to continue to serve as trusted data stewards to protect and manage critical water data for the benefit of agencies and water stakeholders.

Simplify

Water infrastructure includes the data systems used by state and local water managers to collect, manage, and transact water data. With better water data infrastructure, state and local water managers can more easily meet operational needs, whether managing on-farm water use, operating public drinking water systems, or collecting regulatory information.

[5] Data infrastructure refers to the physical and virtual data infrastructure that supports the storage, processing, and management of data with an organization or institution. By contrast, data governance refers to the overall rules or structures within an institution (e.g., company, department, state, country) regarding the availability, usability, integrity, and security of data. See: https://datagovernance.com/defining-data-governance/

4. **Sustained Collaboration and Coordination**

Continue investing in bridging organizations to support ongoing collaboration and coordination between state agencies and departments and with a diversity of non-state partners.

Continue building spaces to pilot innovative technologies and solutions for existing water and ecological data collection, curation, and publication needs. Build communities of practice to test and provide feedback on existing and developing water and ecological data collection and reporting practices and data requirements; to support awareness of the value of a data modernization; and to develop and propagate a broader data culture that values information, data science skills, and data-driven decisions. Create community engagement opportunities for individuals and organizations across state agencies and departments in the field of water data, actively engage individuals or groups who have been historically underrepresented in the water data space.

Example Outcomes

- A trusted community of practice that includes expertise of the diverse community of water stakeholders to advance effective data approaches across agencies and sectors.
- Multiple water entities engaged to collaboratively develop and pilot policies and management processes using the best available information.
- A diversified funding model supporting the extensive work required at all organizational levels.

Automate

Modern water data infrastructure includes near real-time telemetry capabilities, where water data are automatically transferred to the cloud (web). Investments in telemetered water data transmission equipment can greatly reduce the burden associated with manually reading meters and can improve overall data quality by eliminating transcription mistakes.

Funding for this report and other project services has been provided in full or in part from the Budget Act of 2022 and through an agreement with the California Department of Water Resources.

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