

Open Data

An overview of current policies, benefits, and challenges of requiring water data integration

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Water data have an enormous potential to enhance sustainability, improve management, and inform decision-making when they are freely available and easily accessible. “Open data”, as it’s called, is especially useful when it is consolidated in a single, open platform or data hub from which data can easily be searched, downloaded, republished, and otherwise utilized as needed. In the world of water, having access to open data helps to facilitate a more complete and accurate understanding of current and forecasted water conditions (e.g., quality, location, and quantity) and demand, enabling informed management, policies, and planning. However, water data are collected by numerous agencies at state and federal levels (as well as by utilities, the industrial and agricultural sectors, and nonprofits, among other organizations). Because these data are published on a variety of platforms using different formats and standards they are often fragmented and difficult to access or discover.

“Open data policies have the potential to increase the participation, interaction, self-empowerment and social inclusion of open data users and providers alike, stimulating economic growth and realizing many other advantages.”

- (Zuiderwijk and Janssen, 2014)

Why then, don’t agencies share their data and integrate datasets on a common, open platform for the benefit of all? There are many reasons. For one, doing so is simply not required. With tight budgets and limited resources, agencies lack the ability (and incentive) to create a data-sharing dynamic above and beyond the infrastructure already in place. In addition to the resource barrier, there are numerous challenges agencies face (e.g., reputational risk, data privacy, technology gaps, etc.) that must be overcome for open water data to be realized. Open data laws, however, are a solution. By creating a policy framework for

sharing, integrating, and standardizing data, open data laws are enabling a transition to open data at both state and federal levels. Nonetheless, data privacy laws and fears over the misinterpretation of data remain a setback for data sharing.

In January 2019, Congress passed the Open, Public, Electronic, and Necessary Government Data (OPEN) Act as a part of the Foundations for Evidence-Based Policymaking Act (Austin et al., 2019). The OPEN Act is the result of national leaders recognizing the necessity of data for evidence-based policymaking and, likewise, the need for and benefit of using quality data in agencies' decision-making processes. The act requires data to be open unless it must otherwise be protected for confidentiality or national security reasons.

Specifically, the OPEN Act requires federal agencies to make all government data public and accessible (i.e., machine-readable), requires agencies to have a Chief Data Officer, and creates a Chief Data Officers Council to manage data standards (Austin et al., 2019; Bur, 2019). Although the OPEN Act does not provide associated federal funding (meaning federal agencies still lack a strong incentive to publish *quality* data in addition to opening their data to the public), it creates an initial incentive to break down data silos and upgrade data management systems/processes (Austin et al., 2019).

Similarly, many states have been pursuing open data laws. Currently, fifteen states have open data policies (either laws or executive orders) and two (California and New Mexico) have laws specific to open water data (Internet of Water, 2020). A 2020 study by the Internet of Water found, however, that the connection between open data policy and data hubs/portals is not so black and white. Although the existence of open data legislation is a gateway to open water data, many states have open data or even data hubs without the existence of specific open data policies. Nonetheless, the quality of data hubs was more closely related to whether states had open data legislation. In states like California, where extended drought and increasing demand have been exacerbating already scarce water resources, an open water data law has been adopted to ensure quality data exists to support sustainable water management.



The Open and Transparent Water Data Act (AB 1755) in California, signed in 2016, requires numerous water-related agencies across the state to work together to “create, operate, and maintain a statewide integrated water data platform; and to develop protocols for sharing, documentation, quality control, public access, and promotion of open-source platforms and decision support tools related to water data” (*AB 1755: Open and Transparent Water Data Platform for California*, 2020). Implementation of AB 1755 requires identifying a data steward – one person assigned to each data set in the open data platform from the relevant agency who is responsible for publishing, removing, maintaining, and curating data for users. Likewise, it lists protocols for publishing, data standards, and accessing data.

New Mexico, following California’s lead and building largely on AB 1755, passed their own Water Data Act (HB 651) in 2019. As a state with incredibly little available freshwater, New Mexico has also been highly interested in improved, data-based water management. Stacy Timmons, Associate Director of Hydrology Programs at the New Mexico Bureau of Geology and Mineral Resources, was the project lead for the New Mexico Water Data Initiative. In an interview, Stacy noted that, having legislation that specifically asked agencies to look into new data tools and practices

and explore other options was very helpful (Stacy Timmons, interview with the Internet of Water, 2020). In addition, the legislation instigated conversations around data, building a network of people willing to reach out and suggest or try new solutions when agencies otherwise would have operated business-as-usual.

Although a few states have demonstrated a determination to overcome the barriers to open data and data sharing, key challenges – namely data privacy laws – remain an obstacle to open water data. Many states have one or multiple data privacy laws ranging from the disposal of records and security standards laws to laws on identity theft and the protection of personal information, among others (Ramirez, 2020). Consumers’ increasing demand for (and right to) privacy along with the threat of fines and lawsuits for data breaches or unlawful use of consumer data adds a layer of complexity to the plight for increased data sharing.



Despite data-sharing mandates making exemptions for sensitive data sets, some water data, albeit anonymized, can still be traced back to individual properties or locations and thus extrapolated to an individual's activities, finances, operations, etc (Zipper et al., 2019). As a result, the nuances of state law make it easier for agencies to avoid sharing data in the absence of open data laws as well as create a barrier to passing open data legislation (Lively, n.d.).

Moving forward, the task remains for lawmakers and data providers alike to ensure open access to information without inadvertently causing harm to individuals or communities. Citizens have a right to information, and as K. B. Allen noted in his 1992 article, access to government information is a fundamental tenet of American democracy (Allen, 1992). The public needs access to the best information available to fully exercise their right to self-government. As an expansion, decision-makers and agencies need the best information available to fulfill their missions, serve the public, and adequately prepare for the future. Yet, as members of an increasingly digital society predicated on big data and connectivity, it remains impertinent that individuals' and communities' privacy are protected.

When it comes to water, the challenges agencies face regarding water management, monitoring, and planning will only grow in coming years as will those associated with data sharing and privacy. Accordingly, open water data policies will become increasingly relevant and necessary to facilitate structured, regulated data sharing that both improve decision-making and protects consumers/data providers. With state policies such as those in California and New Mexico and the federal OPEN data initiative, a foundation has been laid from which others can learn and adapt their own open water data laws. Only with widespread data sharing and collaboration will water managers be equipped with the tools they need to ensure informed decision-making and a sustainable water future.



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Household consumption of water data, if made available, can be used to shame high water users during droughts (Zipper et al., 2019). Likewise, digital trace data from YouTube and web images has been used to estimate long-term water records and snowpack. Similarly, social media postings have been used to collect data on crop planting dates. Such surveillance of an individual's property and web activity can then be interpreted as a violation of privacy and property rights.

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