State of Oregon
DEQ Department of Environmental Quality

Appendix T: Lessons Learned

Oregon Water Data Portal Phase 2

Introduction

The OWDP project team held a virtual forum in June 2025 to identify lessons learned during Phase 2 (2023-2025) of the Oregon Water Data Portal (OWDP) project. Facilitated by the Internet of Water at Duke University, this meeting brought together diverse perspectives from agencies involved in the project in different capacities. Representatives from the Oregon Department of Environmental Quality, Watershed Enhancement Board, Water Resources Department, Department of Agriculture, Department of Land Conservation and Development, the Internet of Water at the Center for Geospatial Solutions, and the Institute for Natural Resources at Oregon State University either participated in the discussion or provided written responses to the discussion questions.

What follows captures the key insights, achievements, and challenges identified by the group. Participants' reflections reveal both the accomplishments of a dedicated multi-agency team and the systemic obstacles that impede large-scale data integration efforts. Ultimately, the lessons learned are intended to inform Phase 3 of the OWDP project and may provide valuable insights for similar initiatives in other states.

Key achievements and successes

The project successfully launched a pilot portal that demonstrates the value of integrated water data. When the team realized they would not be able to hire key technical staff at the agency, they shifted to expanding the contracts and role of the Institute for Natural Resources and Internet of Water as the primary developers of the pilot portal infrastructure. Additionally, after determining that the Socrata platform would not provide the structure necessary to implement the vision, the team pivoted to using a combination of ESRIHub with an Internet of Water custom-built data integration add-on. Despite significant staffing and resource constraints, this strategic approach enabled the team to achieve key elements of the vision within the compressed project timeline. The pilot portal became operational and proved successful in beta testing, providing a concrete example of what integrated water data access could look like for Oregon.

State agencies built new relationships and achieved successful collaboration through their shared work on the water data portal. Multiple participants noted that this project brought state agencies together in ways that previous efforts had not. Agencies began talking to each other more frequently and actually working together on specific technical challenges. This collaboration overcame the common problem of government agencies working in silos that prevent effective communication and coordination. The new relationships and working partnerships established during Phase 2 create a strong foundation for Phase 3 to build upon.

The project team achieved the greatest success when tackling specific tasks with small groups of subject matter experts. When the team moved from general planning to the specifics of building the portal and connecting databases, they were able to encounter and tackle challenges more effectively. The most productive periods occurred when small groups dedicated a significant portion of their time to working through specific implementation details, maintaining momentum and focus that enabled them to get results. The combined

surface water temperature dataset exemplifies this approach, as it forced agencies to work through technical challenges together and produce a concrete deliverable.

Challenges and obstacles

The inability to hire key technical staff at state agencies created a fundamental implementation capacity gap that forced a late-stage project pivot. Plans for staffing were ultimately not pursued, requiring the team to contract out the technical work. This decision came midway through Phase 2, after time had already been dedicated to the search process, compressing the project timeline and constraining what could be accomplished. The reliance on contractors also presents risks to project continuity and limits the state's ability to adapt the product as needs change over time. Without dedicated technical staff at the lead agency or participating state agencies, the project depended on subject matter experts volunteering their time to work on discrete aspects of the project. This approach leaves the state without anyone to maintain a holistic technical understanding of the portal's development and carry that institutional knowledge forward.

Communication challenges with executive leadership limited the project's ability to maintain ongoing support and engagement for project goals. Securing executive buy-in for a project that serves statewide water data goals—which often fall outside the scope of individual agency leaders' regular priorities—requires sustained investment in education and relationship-building. Without a full-time project manager, the team struggled to maintain the systematic documentation and regular communication channels necessary to keep executives engaged with a complex, multi-agency initiative. The lack of comprehensive project documentation made it difficult to communicate progress and challenges to executive-level decision-makers who needed to understand both the project's value and its requirements. These documentation and communication gaps ultimately hindered efforts to secure the continued executive support essential for project success.

Risk aversion around increasing data accessibility required careful attention to context and interpretation for each dataset. While the water data published on the pilot portal is already public and available through records requests, making it more easily accessible raised concerns about potential misuse or misinterpretation. Agencies were cautious about ensuring users had adequate context to correctly interpret the data, especially for information with legal implications like water rights. Each dataset has its own challenges and needs input from different people for approval, which takes time. This careful approach, while time-intensive, helped build trust and demonstrated that data could be shared responsibly.

Learning from false assumptions

The project team identified several critical assumptions made at the beginning of Phase 2 that proved incorrect. They expected that existing open data portal technology would provide a more feasible pathway than it ultimately offered, and that SME teams and technical teams would function the same way as they had during Phase 1's planning focus. This proved problematic when Phase 2 required intensive implementation work. The team also assumed they could guide the project toward specific use cases in relative isolation, but discovered that legislation, external policy pressures, and inter-agency politics had much more influence on project direction than anticipated. The project revealed that much of the water data they hoped to integrate either doesn't exist in digital form or exists in formats requiring substantial processing before integration. Additionally, the agency most in need of specific data is often not the one responsible for collecting it, requiring coordination at the state level. These discoveries highlighted that data must be viewed as a resource requiring dedicated investment and stewardship, and that multi-agency coordination was more complex than initially expected.

Action planning for improvement

Implement the Recommended Governance Plan by building out dedicated project teams with clear roles and responsibilities. The Recommended Governance Plan, developed by the project team during Phase 2, provides a solid foundation for organizing the work. To be successful, it requires staffing the lead agency and identifying specific individuals from other agencies who can commit substantial time to the project rather than treating it as an additional responsibility. The possibility that the lead agency may change makes implementing this governance plan even more critical to maintain the interagency relationships and preserve the collaborative momentum achieved during Phase 2.

Conduct a comprehensive review of the pilot portal in relation to long-term water data portal needs and overall project vision. The pilot portal represents an important proof of concept, but it likely does not constitute the final product Oregon needs. A thorough assessment should evaluate what aspects of the pilot meet user needs and what gaps remain. The project team should also evaluate whether the portal architecture developed for the pilot can achieve the vision of integrated water data articulated in the legislation that spurred this project. This review should inform decisions about whether to build upon the existing pilot platform or develop an alternative approach for the full-scale portal.

Establish a memorandum of understanding between agencies that clearly defines project goals and commits necessary resources and staffing. Future success requires explicit agreement on common goals and buy-in from all participating agencies, along with clear commitments to provide dedicated staff time for the project. This MOU should address both the shared vision for integrated water data and specific staffing allocations that agencies will provide to support the work. Without this formal agreement on goals and staffing commitments at the agency level, the project will continue to face competing priorities and insufficient capacity across participating organizations.

Maintain and strengthen relationships with other states pursuing similar water data integration efforts. Oregon's work connects to broader national efforts and continuing to talk and share best practices with states like New Mexico, Texas, and California provides valuable learning opportunities and mutual support. Regular meetings among this group of states could facilitate knowledge sharing, help sustain momentum and reveal opportunities for collaboration. These relationships also provide examples and insights that can inform Oregon's approach and help identify potential challenges.

Invest in data education and advocacy across state government to build understanding of data as a strategic asset. Many challenges stem from a fundamental lack of understanding about the value of integrated data systems among leadership and staff across agencies. Oregon needs project champions at different agencies who can communicate the importance of integrated water data and help agencies understand how improved data management serves their individual missions. This education effort should target both technical staff and executive leadership, and cover key data management best practices that enable effective integration. Building this understanding is essential to create the organizational culture needed to support long-term success.

Expand engagement to include local governments, municipal service areas, and university partners. The state-level focus of Phase 2 represents only one component of Oregon's broader water data ecosystem. Local governments and municipal utilities maintain significant water data resources. The university system, particularly Oregon State University, has established relationships and credibility that could help bring these additional partners into the effort. They also offer valuable technical resources and research capabilities, and provide opportunities to engage students in supporting the project's development and implementation.

Conclusion

Phase 2 of the Oregon Water Data Portal project demonstrates both the tremendous potential and significant challenges of multi-agency data integration initiatives. The team's success in launching a functional pilot portal and fostering unprecedented inter-agency collaboration provides a strong foundation for future work. However, the project also revealed systemic obstacles that extend beyond technical challenges to encompass organizational culture, resource allocation, and political commitment.

The project's experience echoes broader patterns in government data initiatives: technical solutions are often the least difficult component, while organizational change, sustained resource commitment, and executive leadership support represent the most significant barriers. The pilot portal proves that integrated water data access is technically feasible and valuable to users. The relationships built during Phase 2 provide a foundation for continued collaboration. However, realizing the full vision will require sustained political commitment, dedicated funding and staffing, and a fundamental shift in how agencies approach data as a shared resource rather than individual assets. Without such commitment, the project risks remaining a well-intentioned pilot rather than evolving into the comprehensive resource Oregon's water management challenges require.

The participants' final reflections emphasize that water data shapes how we understand the world around us. In an era of increasing water challenges, Oregon's ability to make informed decisions depends on having integrated, accessible, and reliable water information. The lessons learned from Phase 2 provide a roadmap for achieving this goal, but success will ultimately depend on sustained commitment from leadership across all levels of government.

Non-discrimination statement