Appendix U: Oregon Water Data Portal Project Considerations – Moving Forward

July 2025The long-term success of the OWDP depends not only on availability of sufficient resources for managing and developing the portal, but also on addressing several structural issues. A number of those issues that have been encountered so far are described in the following appendix.

Environmental justice

Data is crucial to informing the way we see the world around us. Without it, we may be missing important insights and understandings. When data are not available, issues for which state agencies have a responsibility, such as environmental justice, are at a higher risk of being inadequately addressed. (Oregon continues to elevate and prioritize addressing environmental justice issues regardless of current Federal policies.) Making all appropriate data available to all interested parties is an important aspect in the state's efforts on environmental justice, and the best way to do that (for water, at least) is through the OWDP.

Agency-Specific data systems and data management modernization needs

The largest challenge to the success of the OWDP project, by far, is the state of data systems and management within the several state agencies which hold responsibility for critical water data. The variable states of datasets and data systems maturity can lead to tensions that hamper progress on OWDP development. Key questions include: 1) Should the OWDP focus on publishing the easiest datasets, or the ones most relevant for answering priority questions?* 2) How should the quality of different types of data be standardized, and should the OWDP guide users to data of a particular level of quality by default or not?* And 3) Should the OWDP require that its datasets be hosted in core data systems, or accept data from inferior systems?* Each of these critical questions is discussed below, demonstrating the trade-offs inherent in each pathway.

Should the OWDP focus on publishing the easiest datasets, or the ones most relevant for answering priority questions?

Some water data are already in good shape and can be used to support the respective locally managed program, then gathered and consolidated for statewide decision-making purposes. Many other necessary decision-making data are in inaccessible electronic locations, in disorderly paper form or not collected at all. Some data are in mature data systems but have serious quality or completeness issues, such that they have significant limitations for use in statewide decision making. Some datasets have been collected for agency projects with key information for general use neglected, or otherwise have not been managed for statewide decision-making purposes. We estimate that considerably less than half of all water data for state agency processes can be made available for appropriate decision-making without extensive preparatory work.

As a result, the datasets that exist do not fully represent the scope and magnitude of data necessary to properly support decision-making around water and water infrastructure. An ideal process for developing the OWDP would identify and prioritize the decisions that need to be made based on the water data portal, and then develop and publish datasets required to support those 'use cases'. However, developing and prioritizing

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use cases is time-consuming, and it frequently reveals the need for datasets that do not yet exist. Each agency has provided a list of existing data sets as part of the OWDP effort and their present management state has been at least partially assessed. This list should be expanded to include datasets that are not being collected and that support priority use cases.

As an alternative, the OWDP could prioritize publishing the datasets that are already most mature, the "low-hanging fruit". Many of the datasets included in the pilot OWDP fall into this category, and other states that have pursued similar efforts have also prioritized publishing the most mature datasets first. This approach is appealing because it would support achieving quantitative metrics of success, publishing larger numbers of datasets through the OWDP. However, if the goal is supporting particular decisions of interest to a planning or management community, the most mature datasets may not be the most relevant. If the goal is functionality, it may be worth the expense of preparing the relevant data for publication, not just publishing the most.

How should quality of different types of data be standardized, and should the OWDP guide users to data of a particular level of quality by default?

Agencies are sensitive to potential misuse and misunderstanding of published data. Data are often of limited quality or incomplete in some meaningful way, which may not be understood by non-data-scientist members of the public. Data being released to the public may cause questions or arguments which then must be responded to and may invite criticism of agency methods and work selections. Agencies must balance the time commitments necessary to untangle such data arguments and misunderstandings, against the benefits of greater transparency and functionality, as well as potential time savings when the public can access data without requesting it from staff.

Formal Change Management needs to be applied to this portion of the project, such that state agencies are able to manage the data and data processes responsibly while minimizing potential problems and inefficient use of staff time.*

Concerns about data quality and integrity become magnified when considering large datasets and those from disparate sources. All agencies and other contributing entities should clearly state the recommended uses and data limitations for each dataset.

The accuracy, uncertainty, or confidence of individual records may vary within a dataset, such that a dataset's description alone cannot guide a user in deciding which records to use. Many of these datasets have individual ratings of data quality that reflect this variable confidence, but those ratings vary across different datasets. To make them easier to interpret, the OWDP should seek to standardize data 'accuracy' levels and/or data warning framework such that it is clear the accuracy being presented. That will be a substantial challenge with so many different types and sources of data.

A separate but related question of data quality is the degree to which the OWDP should guide users toward data of some sufficient level of quality. Some agencies will restrict their sharing of data through the OWDP to those of sufficient quality. For example, OWRD shared through the pilot OWDP only its surface water temperature data with a rating of "provisional" or "published", not sharing the "raw" or "preliminary" data. However, negotiating to that level of refinement took significant time, and some agencies may share data of lower quality through the OWDP. In those cases, should the OWDP restrict the quality of data to those most likely to be useful, perhaps requiring a user to opt-in to view or download data of a lower quality? To the extent that the OWDP is a tool for making decisions instead of a data repository, it becomes more important to manage the quality of data made available. However, that work is expensive. An unfiltered data repository is cheaper in the short run but may lead to greater conflict due to misinterpreted (or misused) data later. In other words, addressing agency sensitivity to data publication may require greater investment in data quality representation.

To what extent should the OWDP require that its datasets be hosted in core data systems?

Large numbers of water data sets are currently housed in spreadsheets, desktop databases, and proprietary instrument data stores. These ad-hoc storage solutions limit quality control and sharing of data, and publishing them through the OWDP might require ongoing staff time to regularly upload fresh copies of the datasets. In order for the OWDP to function efficiently, each of the supporting datasets should instead be stored in a core data system that can share data through the OWDP consistent with its data standards. However, requiring that supporting datasets exist in a core data system may become a critical obstacle for state agencies, local or Tribal partners with insufficient resources to develop core data systems. Creating a blanket requirement for supporting datasets to be in core data systems may motivate some useful data development work, but it may also exclude some relevant datasets that would not be able to achieve that, or it could substantially delay their publication and support of a priority use case. The OWDP could consider different requirements for state agencies than for local or Tribal partners, but such a nuanced policy would also likely cause conflict with state agencies and may result in confusion about data quality assurance.

Datasets resulting from water projects or small water programs, for which acquiring individual databases would be impractical, might benefit from a data warehouse. The data warehouse would allow storage and retrieval of heterogeneous datasets and serve the data management functions of a "core system" within the OWDP infrastructure scheme.

Data privacy and permissions

Not all data can be safely made available to all persons. First responders, for example, should have access to sensitive data that many others should not. The pilot OWDP cannot restrict access to particular datasets, and instead all offered data are accessible to all portal users. In the permanent OWDP, data need to be accessible in a permissioned way, such that privileged data can be accessed by those with privileged data credentials.*

Basic privacy needs and concerns have been listed with each agency's Open Data inventories, however, a universal set of privacy 'levels' needs to be determined. This needs to be a joint effort with the other agencies, and with Oregon State University (OSU) and Oregon Department of Administrative Services (DAS).*

University, local government and Oregon Tribal involvement

Oregon water decision-making data will remain dramatically incomplete without local government data being included. Oregon's municipal, county and special service district data make up a substantive portion of the total actionable water decision-making data of the state. These data need to be collected, managed and made broadly available at the state level along with the federal, state and volunteer data in order to meet user and customer demand. Local governments are managed as independent organizations, however, with their own responsibilities and concerns. The state government leadership of the OWDP project should develop a legal and policy framework which does not interfere with the local government but does collect the data needed to present the full decision-making picture via the OWDP. Local governments should be partnered with in a way that respects who and what they and their responsibilities are but acknowledges that contributing to the decision-making data picture for their region or the whole state is also their responsibility.*

Oregon's Higher Education System seems to have a trusted model for this kind of relationship, and in some cases actually has existing projects or relationships which could be used to accomplish this. The OWDP project has worked with OSU, Portland State University and Portland Community College to accomplish project tasks, and has had discussions with OSU about working together with local governments to accomplish such collaborations. The state's executive agencies could benefit from partnering with the University system and local community colleges to engage local governments.*

In a similar manner to local governments, Oregon's tribes need to have the opportunity and support to participate in the OWDP. Tribes have expressed interest in the OWDP project, though Tribal staff time appears to be at a premium. Additionally, specific attention and planning needs to take place to address and respect Tribal data sovereignty.*

Chief Data Officer involvement

A number of the necessary tasks identified by the OWDP project require collaboration between groups of state agencies. The pilot portal itself, and the development of the permanent portal require collaborative efforts of many of the 18 state level water data agencies, and participation by an unknown number of local agencies. Many datasets which are consumed by the processes of one agency are generated or collected by the processes of one or more other agencies. In essence, these processes need to be supported and governed at the state level. Interagency data standards and Standard Procedures need to be developed and implemented, and will need to be consistent with existing procedures.* The lead agency does not have identical responsibility to state-wide data interests, and some decision maker that accurately represents state data priorities needs to be in charge. These tasks all appear to be under responsibility owned by the office of the state's Chief Data Officer (CDO). The responsibilities of this office are many and potentially competing, however, and additional staff may need to be added in order to assume this burden.

Water DOGs (Data Organizational Group), which has begun to be organized, is a group of state agency staff-level representatives with responsibility for interagency data. This group may be able to assist the CDO in managing OWDP efforts.

Water decisions cannot be made using water data alone. Climate data, cleanup data, etc. are necessary inputs for water decisions. Some infrastructure can be used across agencies and for multiple programs. This, also is the province of the CDO.

Efficient utilization of water data monies

There have been significant State, Federal and local investments toward making data available in localized, non-uniform, limited data efforts. Existing examples include efforts to centralize data in Groundwater Management Areas, compiling and sharing data in the Southern Willamette GWMA, Klamath Basin and various efforts around basin and place-based planning and the Lower Umatilla Basin GWMA. There are new opportunities and Southern Oregon Extension desires for a community water data repository. These efforts will continue to grow as water data is required of community efforts and transparency is expected. This exemplifies the need and cost justification for an OWDP when the communities are individually tackling the problem themselves. This is also unfortunate in that the money is spent on a local/limited effort with no apparent intention of integrating or connecting with a more diverse and growing dataset.

An expansive and inclusive water data portal does not happen overnight. However, opportunities may exist to utilize region-specific data stewardship initiatives in a manner that addresses a local community problem while also growing the OWDP one piece at a time. As a result of building the OWDP pilot portal, a basic infrastructure now exists that has the ability to evolve over time, as resources are made available.

* To be pursued when planning the permanent Water Data Portal

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