

Appendix L: Long-Term Agency-Level OWDP Projects

Draft Version (June 2023)

This Appendix remains unchanged from the June 2023 Phase 1 Report, however remains a good example of potential agency projects to support the OWDP. Since 2023, some of these projects may be underway or cancelled. The project team opted to re-include this version in the 2025 Phase 2 report as a reference.

Building a single point of access water data portal requires easily accessible data from reliable, trusted data sources. The analysis necessary to build the OWDP will generally reveal weaknesses in our respective agency-level business processes and technology infrastructure. It is likely that each agency that is responsible for water data will have a number of long-term projects to undertake to make their data ready for publishing or to create the appropriate data sets. The OWDP project itself will have multiple long-term issues which will need follow up. There are likely to be issues and data sets which will be joint efforts between Oregon state agencies and the OWDP project.

The projects listed below are initial and informal draft write ups, not yet evaluated or validated by the respective agency's IT staff or executive management. The OWDP project staff will collect project lists such as these for all of the state's water data agencies, and for data sets needed for which no state agency currently has responsibility or authority. In some cases, as determined jointly by the respective agency and the OWDP project, the project may assist in further develop of the agency project. Additional agencies are expected to participate in the future.

A second source of likely agency data projects is the list of Data Needs, derived from the Oregon Water Core Team's 2018 efforts. The perspective of that list is different from the draft write-ups below and is very dated relative to the speed of technology change in Oregon. This list will need to be analyzed and turned into agency-level water data project write-ups, similar to what the attached drafts will become. Some projects have no identified agency and may become work of the project itself.

Water decision-making data is necessary to the future of the state of Oregon. However, the agency (not this project) is the working level of State government. In all cases, this project will honor the responsible agency's authority and wishes while seeking to provide analysis and resources, such that all portions of state government become better able to fulfill their various responsibilities and generate data for the portal as an automatic byproduct of daily work.

For various reasons, not all agencies will have the resources necessary to pursue long-term projects that will support their own business processes, and better state-wide water data and information. Agencies are the working level of state government. The OWDP project is dependent on data and information, and most of all on subject matter expertise from the state water data agencies. The OWDP project may need to meet with agencies with resource challenges and negotiate resources and assistance to be able to support the work needed for these agencies' water data projects.

This appendix is included as material to estimate impact of statewide agency water data projects.

Draft project list

Oregon Department of Environmental Quality

Translation or other formats

Español | 한국어 | 繁體中文 | Русский | Tiếng Việt | العربية

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The Oregon Water Data Portal (OWDP) is a long term project that aims to produce an internet accessible, single point of access for all of Oregon's water decision-making data and information. Geospatial data, tabular data, documents and reports, and data parcels such as FLIR or satellite data will be available that would support important decisions about management, planning and investing in water resources including natural and human-made water infrastructure throughout the state. Data and information will come from and be accessible to federal agencies, tribes, state agencies, special service districts, local governments, the regulated community, nonprofits, and the public. Participating state agencies will need to identify and change processes to make this project attainable. Below are summaries of some of the major workflow improvements that are proposed for DEQ.

1. **Develop methodology, data flows and a location (GIS) data layer for identifying and understanding groundwater impacts related to DEQ's regulatory programs.** Develop an inter-agency data collection and integration strategy designed to manage data necessary to handle known groundwater uses and issues in Oregon. Concentrate on the areas associated with known issues and GWMA's. Data is now known to probably include, at a minimum:
 - a. Onsite program permits (septic tank locations)
 - b. Cleanup
 - c. Haz/Emergency response
 - d. UIC well sites
 - e. UST program data
 - f. WPCF land application sites
 - g. DEQ-associated monitoring wells
 - h. Groundwater management areas data
 - i. Other needed hydrography data as determined
 - j. State and local data from other agencies

The primary audience for this data layer is state and local water agencies, to support locating or understanding impacts to groundwater. Other state agencies such as WRD, ODA and OHA have data that could be used to support the development of this layer. This project should be pursued with all relevant agencies informed or actively involved. OWDP will develop a set of data standards for maintenance and operations that will apply, and expectations for how these data will be managed to allow for inclusion in the portal automatically.

2. **Develop a geographical data infrastructure of DEQ's Onsite Wastewater Management Program.** The DEQ's septic system program manages the construction, alteration, repair, operation, and maintenance of onsite wastewater treatment systems. DEQ is currently making progress in upgrading and streamlining the way information is accepted, processed and shared with DEQ through, "Your DEQ Online", a public facing web-based system; however, the intent of this system does not get the information formatted to a geographical database. Specifically, DEQ currently receives paper documents and scanned pdfs of data that does not create a framework for ease of data accessibility. The location of septic tanks are not in a geographical warehouse available to DEQ or the public. Improvements needed to the program would include a new state data framework, including geographical location of all new and current septic tanks extracted from submitted forms or reports and committed to a database.
3. **Establish the capability to identify, by query, Publicly Owned Treatment Works (POTWs) that need infrastructure improvements to meet the Clean Water Act requirements.** Within DEQ's National Pollutant Discharge Elimination System (NPDES) Program for the POTWs, there is a need for

DEQ to determine what small communities are continuously failing to meet technology-based effluent limitations on a long-term compliance level. The number of small POTW's operating with outdated permits and functioning on old technology due to lack of funding is a problem within Oregon. Long compliance schedules and discharge violations have been accepted as normal by DEQ due to lack of funding within those small communities. DEQ needs to be able to identify what POTWs need to update infrastructure by identifying the small communities with over extended compliance schedules and inability to meet discharge requirements.

- POTW NPDES permits that have been administratively extended
- POTW NPDES permits with compliance schedule
- POTW NPDES permits with variances
- POTW CWSRF Applicants – on Intended Use Plan, but projects not yet underway

We may also want to consider including Drinking Water Provider Applicants – on DWSRF IUP, but projects not yet underway (OHA, DEQ, Business Oregon)

4. **Agency level environmental data submission procedure and repository warehouse.** A handful of programs within DEQ have developed ways of managing environmental data (as opposed to Permitting and Regulatory data, DEQ's other main data flow) but overall DEQ's environmental data is not centralized or easily accessible. Some managed data, like DEQ permitted data through EPA's NetDMR and laboratory data through Ambient Water Quality Management System (AWQMS) are achieved through different web-based tools that are specific to program needs. Most environmental data submitted to DEQ are not standardized, readily available, or in a serviceable format (e.g. data submitted in pdf document or paper report). DEQ collects environmental data for developing standards, assessing water quality, determining Total Maximum Daily Loads (TMDLs), prevention and elimination of water pollution from nonpoint sources and numerous other decisions responsible for protecting and enhancing the state's natural resources. These data come from federal and state agencies, universities, consultants, regulated entities and volunteers and often DEQ is the only state agency holding these data. Decisions are based on data submitted to DEQ but reproducibility is difficult as the data are not stored following concentric procedures. These decisions are potentially effective for many decades and can affect human health, environmental health, and the livability and economy of Oregon, and are subject to review and challenge. To improve DEQ's success as a science-based agency, it needs a procedure to receive and process all environmental data into an accessible and serviceable centralized data warehouse.
 - a. This effort would be agency-wide at DEQ, to include Air, Land, and Water, programs headed in the regions and the DEQ laboratory
5. **Develop a Mixing Zone database.** DEQ's NPDES permittees are often assigned a "mixing zone" at the outfall(s) of the permitted facility. Each mixing zone is defined using non-standardized geometric tools. The location of the origin of the mixing zone is the location of the geographical point of permitted outfall. The data set of these points is key to connecting the state's primary water quality permitting and regulatory data flows to its environmental data, which is an extremely important function. At the most recent evaluation of DEQ's needs these data sets existed, but were out of date and not adequately supported by data infrastructure or business processes. DEQ's permitting and regulatory data structures are currently being redeveloped, such that this situation needs to be reexamined and probably developed as a DEQ data project.
 - a. Update the 2008 NPDES permitted Outfall location database geographic data layer
 - b. Identify the boundary of a mixing zone associated/approved/required by the terms of the NPDES permit associated with the outfalls

Oregon Water Resources Department

The Oregon Water Data Portal (OWDP or “data portal”) is an ambitious project that may span decades. It is currently being led by DEQ, but supporting the OWDP will require significant ongoing resources from OWRD. This document attempts to summarize some of the main contributions that are likely to be expected of OWRD during each of the remaining stages of the project.

1. **Pilot Data Portal (Stage 2).** During the 2023-2025 biennium, if the OWDP is further funded by the Legislature, the plan is to set up a pilot portal. DEQ is expected to continue managing the project during the pilot phase, and the pilot portal is being designed to limit the required participation by agencies like OWRD. However, OWRD will likely be expected to:
 - a. Continue to collaborate with the project leadership, including:
 - i. Steering committee
 - ii. Subject matter expert (SME) workgroup
 - iii. Stakeholder engagement workgroup
 - iv. Technical workgroup
 - b. Connect the portal to OWRD datasets that are already in core data systems, such as the Water Rights Information System (WRIS), Groundwater Information System (GWIS), and Water Availability and Reporting System (WARS). To the greatest extent possible the features of the pilot data portal will be limited to leverage existing Application Program Interfaces (APIs) that already exist to serve WRIS and GWIS to external websites, to avoid needing to create new services on a tight timeline. Nonetheless, expertise from OWRD Information Services, Water Rights, Groundwater, and Surface Water staff will be necessary to ensure that data accessed through the Portal is appropriately represented and limited for the supported use cases.
 - c. Develop Policy Option Packages to support the collection, management, and service of datasets that were not ready for the pilot phase of the portal (see below).
2. **Full Data Portal (Stage 3).** If the data portal is supported by stakeholders enough to receive continued funding through the 2025 Legislature and beyond, then it will be expanded to answer more questions. Some of those questions (or use cases) will depend on data that were not yet mature enough to be connected through the data portal during its pilot stage.
 - a. Continued collaboration with project leadership, as described above.
 - b. Hosting the data portal. The initial discussions suggested creating an entity independent of the data sources, such as a standalone organization, to host the data portal. The DAS Office of Open Data could alternately serve as an independent arbiter without the regulatory associations tied to DEQ and OWRD. However, OWRD will likely serve a significant fraction of the data hosted through the data portal, and it may be nominated as the ultimate keeper of the OWDP. This would represent a significant program with ongoing requirements for management.
 - c. Continue to connect (and potentially create APIs) for more OWRD datasets that are already in core data systems.
 - d. Ongoing support for API and tools to appropriately limit and summarize OWRD databases.
 - e. Collection, management, and service of datasets that were not ready for the pilot phase of the portal. This work is expected to be supported by agency-specific policy option packages, which may be developed and funded over coming biennia.

Example datasets that may need to be generated or further managed to support the full data portal include:

1. **Statewide characterization of aquifers** sufficient to support generation of aquifer-specific groundwater budgets. While groundwater budgets are not a complete solution for water management,

they do [provide a useful foundation](#) and were the most highly requested item among long-term priorities indicated by non-state stakeholder groups in a survey. Currently, OWRD develops a hydrogeologic framework for a major hydrologic basin as part of cooperative Groundwater Basin Studies with the USGS. These studies support development of a large-scale water budget and numerical model, but they do not resolve individual aquifers well enough to develop aquifer-specific groundwater budgets in many parts of the state. Further, they have only been substantially completed in 4 of 18 basins, and the results are not compiled into a coherent dataset. The 2021 Legislature funded OWRD and the USGS to develop basin-wide groundwater budgets across Oregon, but these also lack the detail necessary to support aquifer-specific budgets. One project that could be motivated by the data portal is creation of a database to compile spatial characterizations of aquifers in Oregon, along with associated evaluations of their connections with other aquifers and surface water bodies, as well as estimates of aquifer-specific recharge and discharge.

2. **Forecasts of water availability and demand under climate change scenarios.** Stakeholders also strongly prioritized understanding the likely impacts of climate change on water quantity, including supply and demand. OWRD currently engages in drought modeling but has not integrated long-term climate forecasts into its water availability or use tools. Demand for this information through the portal could motivate funding to support OWRD in this work.
3. **Success protecting instream flows.** Stakeholders have indicated significant concern about protecting and restoring streamflows and the life that depends on them, including understanding where and when instream flow targets are being met or not. OWRD tracks instream rights in WRIS, but estimating whether particular instream flow requirements are being met requires some combination of ad-hoc observations and detailed evaluation and modeling of streamflows from streamgages that may be distant from the instream right's reach. Demand for this information through the data portal could motivate and fund OWRD to develop a coherent method and dataset for evaluating success at protecting instream flows.
4. **Combined water infrastructure dataset.** OWRD currently tracks the capacity and condition of dams across the state, and these data are available through OWRD webapps and via the Army Corps of Engineers. OWRD also tracks well logs. However, data on transmission infrastructure like canals and pipes is typically kept by operators like irrigation districts and municipal water utilities. Further research is needed to determine whether this transmission infrastructure would be important to share through the data portal along with other built water infrastructure, but if so, then OWRD could play a role in compiling these data along with miscellaneous infrastructure like tide gates. Stakeholders also indicated that natural water infrastructure is important to access via the portal. Floodplains and wetlands are likely best tracked by OWEB, but source water areas including headwaters, aquifer recharge zones and even aquifers themselves (see item (i) above) may be considered important infrastructure to begin tracking.

Oregon Department of Agriculture

ODA long term goals – data support, access and distribution

Preface: As part of the framing and scoping of the proposed Oregon Water Data Platform 'ODWP', following are future data projects which will have ties to the portal.

1. **New dataset – ODA WQ Programs**

Water Quality Program will have a database to track program and partner effectiveness, costs, associated partner inputs, and area outcomes; this will include each ODA WQ program, including SOWs, Focus Areas, SIA's and future programs. This database is to include a 'Project Layout' to visualize Status and timeline of each Program 'SOW/FA/SIA/...' by Management Area, Partner, Location, or All(unfiltered). Along with the timeline, stored will be vegetation status GIS files, to show vegetation changes. Basic data export will allow for data integration into other reporting mechanism or consumption. Protected data entry into the DB, along with the data export, will allow for the elimination of time consuming and error prone flat files.

2. **New dataset – ODA Monitoring Data**

Water Quality Program will have a database to input and display partner collected monitoring data. This is a visualization tool for outreach and education on Agricultural Water Quality project data, a service to the partners, as well as provide a common statewide tool to re-use known methods and data displays across the state. Datasets contained within the database can be designated as automatically shared with DEQ according to a completed DEQ SAP.

3. **Expanded dataset – ODA WQ GeoData**

Water Quality Program will have a geodatabase that shows Program Areas in relation to watersheds, agriculture and ag practices by year or biennium. Included in this database are the Ag WQ Management Areas, watershed council & soil and water conservation district boundaries, NHD Hucs. Layers available (by year or biennium) for display in relation to these are ODA WQ Program Areas, CAFO areas, Ag Lands, current DEQ 303d Integrated Report Layer.

4. **New dataset – ODA WQ Climate Change**

Water Quality Program will have a climate change database to assist Oregon Agriculture adapt, assess, educate, quantify, and implement on-the-field climate actions. Base geo layers will include crop/vegetation type, area, irrigation practices, with layers of conservation measures such as tillage practices, wetland practices, cover crops, crop rotations.

5. **New dataset – Statewide Crop and Sprinkler System Inventory**

Protecting water quality in conjunction with enhancing Oregon Agriculture is reliant on having access to the data relevant to the utilization and distribution of agricultural water; 80% of Oregon's total water consumed is by agriculture. Programs to improve sprinkler system efficiencies have immediate benefits in reducing water use, increased water in streams for fish & wildlife, and reducing waste of water and contained nutrients to groundwater and streams. Data regarding sprinkler system types and inventory allow prioritization of area programs, as well as quantification of potential benefits. Crops grown in all areas of Oregon adapt to changing markets, climate, and available water. The quantity of water needed for agriculture is mostly determined by the type and quantity of crops, along with the sprinkler system types. This data is needed for both short-term best management plan development and local analysis, and long-term area-wide crop/climate change assessments. This dataset will utilize, further refine, and add to OWRD's digitization efforts of the OpenET program, and is being done in cooperation with their efforts.

Institute for Natural Resources

Efforts that contribute to data informed water decision-making in Oregon

The following Oregon Explorer tools support data informed water decision-making in Oregon at different geographic scales (local, statewide, and regionally). Once the OWDP framework is solidified, we will be in a better position to assess whether these tools, including their functionality and associated data, will best be

integrated internally to the OWDP or externally (or not at all) and the associated integration costs. These would be potential long-term projects (FY25/27 and beyond) that could add to the spectrum of OWDP uses for accessing water data and associated content. Each of these tools were developed by the Oregon Explorer program in collaboration with Oregon Water Resources Department (OWRD) and other partners. The intent would be to continue the collaboration with OWRD and existing partners in any future OWDP integration efforts.

1. **Mid-coast Water Planning Map Viewer: Supporting water action planning at the local level.**

The Mid-Coast Water Planning Partnership (MCWPP) is an inclusive community forum that examines water use in their region, identifies water challenges, and proactively balances water needs. The Mid-Coast Water Planning Map Viewer was developed to support collaborative development of a [water action plan](#). There is additional need to develop mapping and reporting tools that support the implementation of agreed upon water actions in this geographic area. One of the eight imperatives listed in their action plan specifically addresses monitoring and data sharing. The MCWPP is one of four place-based water planning groups in the state that have developed water action plans.

Original project cost was \$140,200 (includes project facilitation by Creative Resource Solutions). The estimated cost to integrate the Mid-Coast Water Planning Map viewer into the OWDP and enhanced to support implementation of water actions and report on progress is anticipated to be higher due to the high number of actions that are associated with new data gathering efforts and reporting needs.

Needed next steps: This tool is sponsored by the MCWPP and would require approval from the MCWPP to be integrated in the OWDP and endorsed by the Oregon Water Resources Department to be expanded for use by other place-based planning groups in Oregon.

2. **Oregon Water Map Viewer (Beta): Informing water planning states.** Building on the Mid-Coast Water Planning Map Viewer, the Oregon Water Map Viewer makes accessible readily available statewide water-related data and information generated by the Oregon Water Resources Department and partner agencies (Oregon Department of Fish and Wildlife, Oregon Department of Environmental Quality, Oregon Department of Agriculture) to support water planning throughout Oregon. It includes a reporting feature that dynamically generates a “water report” for a user defined area of interest (user drawn or uploaded) or a pre-defined area of interest of a selected county, watershed, watershed council, or Agricultural Water Quality Management. The water map viewer and preliminary water reporting tool helps users characterize the status, assets, and needs of each “place” with respect to water condition using available data and information.

Original project cost was \$31,100 leveraging foundational work associated with the Mid-Coast Water Planning Map Viewer. The funding also covered development of a Water Planning landing page on the Oregon Explorer. The estimated cost to integrate the Oregon Water Planning Map viewer into the OWDP and enhanced to support implementation of water actions and report on progress statewide would be significantly higher and would depend on the number of approved action plans in the state and the associated data collection efforts and reporting needs.

Needed next steps: This tool is sponsored by the Oregon Water Resources Department and would require approval from the Oregon Water Resources Department to be integrated in the OWDP.

3. **Columbia River Basin Evapotranspiration Mapping Tool: Evaluating water use regionally.**

Water planning and management requires quantifying aspects of water budgets from the field to the basin scale. Stakeholders within the Columbia River Basin (CRB) are reliant on

evapotranspiration (ET) data from irrigated lands for water management, water rights, hydrologic modeling and prediction, and water planning. This mapping tool provides summarized evapotranspiration (ET) data at the 12-digit hydrologic unit level from the [OpenET Data Explorer](#) for the CRB. There is an additional need to expand the geographic extent of consumptive use water reporting beyond the Columbia Basin watershed to include the full statewide extent and provide ET estimates beyond irrigated agriculture water use.

Original project cost was \$240,000 (includes Washington, Idaho and Desert Research Institute). The estimated cost to integrate the Columbia River Basin Evapotranspiration Mapping Tool into the OWDP and expanded to support mapping and report of water consumption estimates statewide in partnership with the Desert Research Institute OpenET program could be less if the focus remains on irrigated agriculture water use but expanded for application to the whole state.

Needed next steps: This tool is sponsored by the Oregon Water Resources Department and would require approval from the Oregon Water Resources Department to be integrated in the OWDP for statewide application and use. DRI would also need to be funded to develop the OpenET data aggregations at the HUC-12 scale for the State of Oregon.

Oregon Watershed Enhancement Board

OWEB has been a strong partner with the Oregon Water Data Portal project team. At this time, this agency does not have any long-term projects as they utilize WRD data for their work. There is one missing data set in the attached "Missing data" worksheet for OWEB.

Oregon Department of Forestry

Under OAR 340-042-080(2), the Oregon Department of Forestry is the Designated Management Agency (DMA) for water quality protection from nonpoint source discharges or pollutants resulting from forest operations on non-federal forestlands within the state. The Forest Practices Act rules sets expectations for water quality outcomes and prescribes required best management practices. The Forest Practices Act has provisions for both criminal and civil penalties if forest operators do not comply with water protection regulations.

ODF uses the following data sources to implement the FPA rules: stream layers, fish distribution, landslide hazard areas, geological site specific data, critical resource information (wetlands, rivers, waterbodies, endangered species -birds, amphibians, fish), cultural resource areas, wild and scenic areas, landowner tax lot information, road layers, landslide risk areas). The ODF fire program uses additional data sources related to fire protection.

Starting in 2023, ODF will be tracking specific water quality parameters related to issued DEQ TMDL's

The Oregon Department of Forestry's Forest Resource Division is undergoing significant program changes with the recent Private Forest Accord Agreement and resulting rule changes. ODF is currently working with Terrainworks (contractor) and ODFW on a new fish distribution model and flow duration model. The fish distribution data layers should be ready by July 1, 2023. The flow duration model day is not anticipated to be complete until around 2026. ODF is also working on the development of a steep slopes model for Western Oregon. The model will help determine the steep slopes most vulnerable to mass wasting if a timber harvest activity were to take place.

As part of the Private Forest Accord and resulting rules ODF will need to develop Forest Road Inventory Assessment (FRIA) for large forest landowners and for small forest landowners conducting certain operations. Large landowners will be required to provide ODF with a pre-inventory completed by 2025 and a full inventory by 2029. Small forestland owners will also need to provide a Road Condition Assessment (RCA) when conducting certain harvest operations on their property. ODF has also been tasked with developing a statewide abandoned roads inventory. ODF is still working on determining how to conduct such an inventory. The FRIA,

RCA and abandoned roads inventory still need platforms developed to manage and track the information over time. The goal of the three inventories is to identify areas of concern that are contributing to potential stream water quality degradation and then fixing issues identified.

ODF is working with ODFW on the fish distribution and stream layer data.

ODF will be working with DEQ in the future on water quality monitoring and possibly effective shade gap ground verification.

Most data layers ODF uses come from other sources.

Steep Slopes – Need to be publicly viewable May 1 to allow landowners time to plan for rule implementation January 1, 2024

Streams Data Layers– Need to be completed and in FERNS July 1, 2023.

Road inventory data will be an ongoing data collection and tracking process. Working on identifying a platform to receive and track the information landowners provide. (Starting 1/1/2024 - Years 5-20).

The abandoned road inventory project needs a plan and funding (Starting 1/1/2024 - Years 5-20).

Oregon Health Authority

1. **Public Health Water Recreation Advisory Portal.** Oregon Health Authority issues recreational public health advisories related to fecal contamination in marine waters at ocean beaches, cyanotoxins in recreational freshwater locations, and fish and shellfish consumption advisories. There are no formal databases for any of these data; data are maintained as documents of different formats in shared server drives. This makes retrieval of information related to advisories difficult and prone to individual analyst filing conventions. There is also currently no way for the public to easily determine what kind of recreational advisories may be in place for a particular waterbody. One must visit separate websites to glean this information. A map-driven interactive portal would allow users to readily see different recreational public health advisories for particular waterbodies.

Assign public health advisories to geo-referenced waterbodies (lakes, ocean beaches, river stretches) and facilitate internal retrieval of data related to current and past advisories.

This is a one to two-year project.

2. **Expand geodatabase for public water system facility locations and service area boundaries.**

Collecting water system facility locations and service area boundaries will fill a data gap. Service area boundaries will help multiple agencies in emergency response efforts and to identify disadvantaged communities. Facility location data (wells, treatment plants, storage tanks, etc.) will also help emergency response efforts.

Water System Locations- expand service area boundary dataset and update previously collected data; acquire permission to share publicly. We currently have boundaries for ~400 out of ~3200 public water systems.

ODHS Office of Resilience and Emergency Management is in the process of hiring someone whose responsibilities will include collecting and updating service area boundaries. We have discussed creating a MOU and project plan but have not yet begun those efforts.

This project is expected to take three to five years.

Oregon Department of Fish and Wildlife

1. **Develop a stream temperature monitoring program and associated data management infrastructure.** ODFW is developing a stream temperature monitoring program to:

- a. obtain stream temperature estimates for each stream reach in the State of Oregon to describe broad spatial patterns in the thermal regimes throughout the year
- b. develop a statewide network of coupled water temperature and discharge-telemetered gages to monitor and forecast water temperatures in waterways with water temperature-related fish issues
- c. intensively monitor temperature select basins to understand fine-scale patterns, research new covariates, and understand different applications of the data,
- d. map thermal heterogeneity to identify cold water patches and thermal refuge locations, and
- e. determine the appropriate repository for thermistor data.

Successful development of the stream temperature monitoring program, its data repository, and resultant analyses/models will inform fish management and habitat conservation actions, and result in tangible improvements to the status of important fish species (e.g., sensitive, ESA listed, or economically important) and their habitat. Developing an agency strategy for monitoring, analyzing, and reporting water temperature would benefit numerous species while enabling and informing a myriad of management actions. Examples of management actions include protective angling closures during warm conditions, instream water right transfers, addressing limiting factors for species recovery, and targeting locations to implement restoration and protection efforts.

The program has been in development with existing staff as time allows over the last two biennia, but resource limitations have not allowed for a concerted effort. Data management needs include dedicated staffing to assist in collecting, storing, and curating temperature data, and providing high-level technical support (data analysis and modeling).

This program would develop and curate existing and new water temperature datasets (ODFW-Water Temperature Datasets - continuous water temperature monitoring at multiple locations) to support sharing through existing public data repositories (e.g., DEQ's Ambient Water Quality Monitoring System, AQMS), and/or the OWDP and to facilitate other data gaps, identified below).

This project will support addressing the following data gaps:

- Species Temperature and Flow (Species Specific Vulnerability Assessments & Flow from BiOp, ISWRs, other methods)
- Cold Water Resources (Identification and Mapping Reach-scale temperature estimates based on empirical temperature data obtained from instream thermistors or model estimates.
- Distribution Projections for Native and Non-Native Fish (i.e., presence under future scenarios).

This program is informed by temperature modeling currently in development by NOAA, USGS, and other partners. It also requires establishing effective partnerships with other entities collecting stream temperature data. Data could complement DEQ's Ambient Water Quality Monitoring data and provide data for DEQ's Call for Data (Integrated Report).

This program should be considered a long-term, sustained effort (10 years+), but some datasets (e.g., water temperature data) could start becoming available during the 2025-27 biennium.

ODFW's Oregon Fish Passage Barrier Data Standard (OFPBDS) dataset contains barriers to fish passage in Oregon watercourses. Barriers are structures which do, or potentially may, impede fish movement and migration. Barriers can be known to cause complete or partial blockage to fish passage, they can be completely

passable, or they may have an unknown passage status. The OFPBDS database is the most comprehensive compilation of fish passage barrier information in Oregon, but it does not represent a complete and current record of every fish passage barrier within the state. Consistency in attribution also varies among data originators. Dataset attributes, including some key attributes such as fish passage status, are often unknown or incomplete. Fish passage status is a key attribute but many barrier features have an unknown passage status.

Efforts to address deficiencies in data currency, completeness and accuracy are ongoing and are often limited by lack of sufficient resources, including resources for field verification of barrier status. Field verification of barrier features and their attributes will be an important component to making this dataset current, comprehensive, and accurate.

This project provides the basis for the Oregon Fish Passage Barrier Database and helps to inform the Fish Passage Priority List.

Fish passage barrier data are compiled from multiple agencies, counties, watershed councils and tribes into the OFPBDS geodatabase. The OFPBDS dataset currently contains over 40,000 barrier features from 19 separate sources including: Oregon Department of Fish and Wildlife (ODFW), Oregon Department of Transportation (ODOT), Oregon Department of Water Resources (OWRD), Oregon Department of Forestry (ODF), Oregon Watershed Enhancement Board (OWEB), Oregon Department of Land Conservation and Development (DLCD), US Bureau of Land Management (BLM), US Forest Service, Nez Perce Tribe, Benton SWCD, Washington county, Lower Columbia River Estuary Partnership and watershed councils representing the Rogue, Umpqua, Siuslaw, Santiam, Calapooia, Clackamas and Scappoose basins.

The OFPBDS is currently made publicly available, but continued refinement should be considered a sustained and long-term project (10+ years). Progress is limited by availability of resources for data compilation, management, and field verification.

ODFW's Oregon Fish Habitat Distribution dataset describes areas of suitable habitat believed to be used currently or historically by native or non-native fish populations. This information is based on sampling, the best professional opinion of Oregon Dept. of Fish and Wildlife or other natural resources agency staff biologists or modeling. Data representing current habitat for anadromous and resident salmonid species are generally more comprehensive than data for non-game and non-native fish species. All datasets are subject to update as new information becomes available. Data are updated, as resources allow, to refine species distributions and improve coverage for non-game and non-native fish species.

The Oregon Fish Habitat Distribution dataset is currently made publicly available, but continued refinement should be considered a sustained and long-term project (10+ years). Progress is limited by availability of resources for data compilation and management, and by data collection/availability for some species (e.g., non-game and non-native fish species).

Supplemental document

ODA USBR WaterSmart grant application abstract (for add-on to larger DEQ application)

Title: ODA Data Workflow and Oregon State Crop, Crop Growth and Sprinkler System Inventory

Submitted By: Rob Hibbs, rob.hibbs@oda.oregon.gov; Jenn Ambrose, jenn.ambrose@oda.oregon.gov

Date: May 10, 2023

Objective #1: ODA Data Workflow Container

- Develop a workflow, educational materials, and web container to hold collaborative data and documents for local community partners in agricultural water quality
- Provide an attractive and intuitive web space to support overall education, process transparency and data collaboration.
- Leverage Esri HUB architecture to funnel resources appropriately.
- Address equity in access to basic GIS tools and web display

Objective #2: ODA Cropland & Sprinkler Data Inventory

- Develop Statewide Crop Field Boundary and Sprinkler System Inventory Geodatabase
- Develop Statewide Crop Stage Growth Patterns Database

Why: The infrastructure

The Oregon Dept of Agriculture is updating its data flow, storage and sharing capabilities. This project will enable faster implementation and infrastructure growth with the data model.

ODA is the designated management agency for water quality concerns across agricultural lands, and we intend to build a collaborative site for sharing and displaying data. Collaborative tools are needed for sharing data, process, and document workflow among the agricultural water quality partners, such as Soil and Water Conservation Districts and Watershed Councils; many are separately developing GIS applications for the same purpose. This effort will foster potential for analysis baselines and standardized data collection through transparency and common tools.

The cropland and sprinkler information

Consumptive use of water and nutrients by agricultural crops at a regional scale can only be estimated or forecasted with quality crop and sprinkler system data. The data utilizations are many:

- Mass balance calculations and forecasts of water and nutrient inputs in nitrate contaminated ground water management areas.
- Water quality/riparian area assessments utilizing the methods of irrigation
- Standard dataset to provide assessment information for ODA Strategic Initiative Area (SIA) Evaluations/Assessments
- Prioritizing sprinkler type upgrade opportunities for water quality and quantity efficiencies
- The data will also be utilized in climate change, drought and crop forecasting scenarios.
- Modeling development and verification data

How: The infrastructure

A common data portal, ArcGIS HUB, will allow for:

- secure, protected, partner viewing and data entry,
- sharing high-level educational materials such as AgWQMA, links to Area Plans, and ODA-contacts,
- monitoring analysis, restoration, and compliance progress,
- displaying management area map that allows for community partners to share GIS layers for multi-dimensional water quality analysis,
- entering data via data entry forms that will allow multi-user facilitation of data inputs by water quality partners.

The cropland and sprinkler information

State Crop and Sprinkler System input will be input by State Partners, such as Soil and Water Conservation Districts, Watershed Council's, and/or State Agencies.

Once digitized and updated, it will be a goal to get the area updated approximately every 3 years.

Priority Management Areas for the collection of the Crop and Sprinkler data will be in the existing contaminated Groundwater Management Areas, specifically the Lower Umatilla Basin, the South Willamette Valley, and Malheur. Following those areas, prioritized will be areas of intense drought concern, such as the Klamath Basin and other areas within Eastern Oregon.

Who: Oregon Department of Agriculture, Oregon Water Resources Dept, Oregon Dept of Environmental Quality. Local Partners – SWCD, Watershed Councils

ODA Key Personnel

Rob Hibbs – Monitoring Specialist

Jenn Ambrose – GIS Specialist

Diana Walker – GIS Coordinator

Mark Salvo – Information Systems Specialist

Deliverables

The infrastructure

- Database architecture, servers and license setup and testing
- Software installation, license and integration: SQL Server, Arc Server, Arc Pro
- Functionality test in development environment
- Transition development environment into production environment
- Design and Develop ODA Management Area/Partner SQL database
- Design, develop and build ODA Management Area website/dashboard/data
 - Management Area (MA) activities, drop down list of activities
 - Partner information
 - Scope-of-Work (SOW) Entry/Display/Submission, overall entry view
 - Funds Utilized/Available – Hours Available with hourly rate info
 - MA history of SOW Data = TA, Landowner, NRCS
 - SOW Entry Status – Dates submitted/Due Dates coming
 - Focus Area (FA) – Storage/Entry

The cropland and sprinkler information

- Acquire/digitize/load 2023 Cropland for beta testing
- Design & Develop Database Cropland SQL database
- Fieldmaps/data input/edit form design
- Create education materials to explain field data collection
- Create/print map series for field data collection
- Field data collection tools procurement
- Create QA/QC Methods and practices (process sheets) for Field Collaborator's and ODA
- Develop/design production layer compilation, publication and archive processes
- Design, develop and build website/dashboard/data
 - Sprinkler type quantities and pct
 - Crop type quantities and pct
 - Color coded map of fields: crop types, sprinkler types
 - Overlay options of streams, DEQ Integrated Report (303d) Streams, ODA CAFO

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