OREGON WATER RESOURCES DEPARTMENT

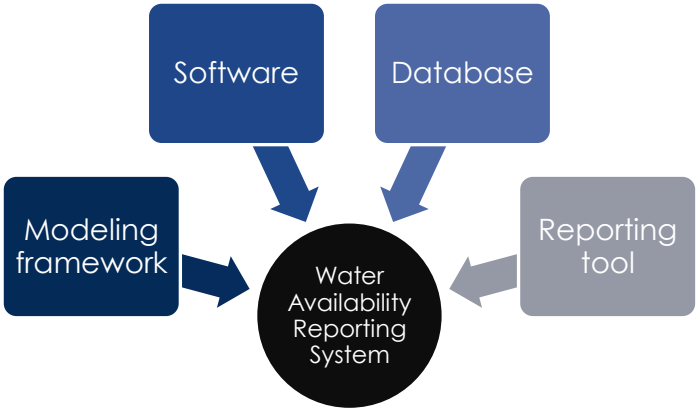
Updating Oregon's Water Availability Model

Creation of Technical Advisory Group

Background

During the 2023-2025 biennium, the Governor's Office for the State of Oregon allocated funding to the Water Resources Department through Policy Option Package #111 to support an update to the Water Availability Reporting System. The system is used to calculate water availability for Oregon watersheds and make that information available to support decision making for responsible allocation of surface waters. Water availability describes if and when how much water is available for appropriation so that new water right holders can expect use of water a reasonable amount of time to meet their demands. A major need for the update to the system is to produce information that is more reflective of today's climate, since the information that is currently available represents streamflow conditions of the historic period from 1958 to 1987. Four separate components make up WARS:

- *Modeling framework*: conceptual model that includes workflows to derive water availability using data and computations.
- *Software*: provides user-interface for interacting with databases and performing calculations.
- *Database*: houses data and model outputs.
- *Reporting tool*: makes information available to support decision making for end users.



Seeking Technical Experts to Inform the Modeling Framework

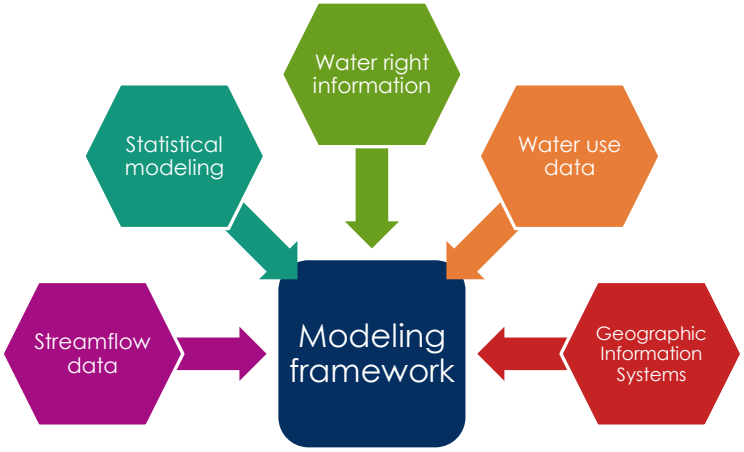
The project team is forming a Technical Advisory Group (TAG) that will help inform the modeling framework in order to develop a workflow that is technically sound, well supported by the scientific community, and meets the original standards and requirements of the Water Availability Program.

The project team is recruiting experts with knowledge in the following subject areas:

- *Water data*: streamflow, spring, groundwater, reservoir.
- *Statistical modeling*: model selection, uncertainty, regression analysis, classification, stationarity.
- *Hydrologic modeling*: surface water-groundwater interactions, natural streamflow, streamflow estimation.
- *Water use*: consumptive use, crop water use, municipal use, storage.

- *Climate science*: precipitation, temperature, atmospheric trends.
- *Geographic Information Systems*: spatial resolution, data availability, geospatial data.
- *Data analysis*: data quantity, data quality, interpreting results.

The Modeling Framework



The modeling framework consists of workflows that describe the flow of data, information, and computations used to derive water availability for watersheds across the state. Original development of the model relied heavily on science, research, and available data to inform the workflow. The model relies on measured streamflow data and a geostatistical approach via regional regression equations that estimate monthly natural streamflow for over 2,200 Oregon watersheds (i.e., geospatial framework). Natural streamflow is defined as flow occurring in the absence of human influences, such as damming, irrigation, and other water management activities. It provides the basis for calculating water availability after debiting expected demands such as consumptive uses and instream flow requirements. Key questions regarding the modeling framework relate to:

- Historical streamflow record used to calculate flow metrics.
- Naturalizing streamflow by accounting for use demands.
- Coverage and spatial resolution of the geospatial framework.
- Incorporation of recently available water use information.
- Consideration of surface water-groundwater interactions.
- Statistical methods used to estimate flow on a statewide scale.
- Model development, selection, and calibration.

Core Values

Decision making and consideration of how the model is developed is guided by several core values:

- *Accessibility*: the model is understandable by a broad audience, including managers, researchers, policymakers, and other interested parties.
- *Scientifically defensible*: model development is informed through scientific investigations and analyses and peer-review.
- *Updatable*: data sets and relationships between them are easy to update in order to re-calculate water availability with regular frequency.

- *Reproducibility*: documentation of model workflows ensure information produced by the model is replicable.

Project Status

The project is scheduled to be completed and implemented into Department operations by the end of December 2029. A project team with subject matter expertise in water resources modeling, information technology, policy, and communications has established a high-level scope and timeline. Beginning in January 2025, the project team began mapping the model workflow and identifying decision points regarding data inputs and processes (i.e., requirements) that are critical for informing how water availability is calculated. The project team will then develop a scope of work that details various hydrologic investigations that will inform requirements for model development.

Expected Involvement

Scope

The modeling framework is expected to be composed of many sub-processes where input data is transformed, and the resulting output is stored and/or fed as input to the next sub-process. The data and methodology requirements of each sub-process or component of the overall modeling framework will be informed via analysis and literature review. The project team is developing a scope of work that outlines a series of hydrologic investigations including questions and objectives that will help inform the modeling framework and, ultimately, determine how water availability is calculated.

Each hydrologic investigation will be documented in a technical memorandum that discusses input data, primary methodology and alternatives considered, model parameters, and results. The TAG will be provided an opportunity to review the memos with a focus on the core values listed above and the scientific integrity of the analyses used to support decision making regarding the modeling framework. A final report that summarizes the findings and decisions of each technical memorandum will be peer-reviewed and published as an agency open-file report on OWRD's webpage.

The following questions generally describe information the project team will be seeking:

- Is the purpose of each hydrologic investigation clear?
- Are the results useful for model development, reproduceable, and relevant to decision making in the context of the model purpose (i.e., surface water allocation)?
- Is the approach well designed, executed, explained, and transparent?
- Are data and information appropriately cited?
- Are assumptions and limitations explicit and justified?
- Is documentation accurate and understandable?

Timing

In Summer 2025, the project team will hold an on-boarding meeting and later share the scope of work with the TAG to seek feedback regarding the proposed plan to inform model development. Between September 2025 and June 2027, the project team will conduct hydrologic investigations and draft technical memos. Upon completion of each work product (i.e., scope of work, technical memos), the project team will hold a two-hour meeting with the TAG to summarize work and results and allow the TAG an opportunity to provide oral feedback. Work products will then be shared with the TAG, who will then have 30 business days to review and provide comments. The project team will then have 30 business days to review and respond to comments. Revisions will be discussed at the following meeting, along with the next memo discussion.

Expected commitments of the TAG include:

- Recurring meetings (approximately every three months; two hours each) to discuss project developments and provide feedback.
- Ad-hoc meetings as necessary.
- Opportunity to review anticipated total of six technical memorandums between September 2025 and June 2027.

Contact

If you are interested in participating on the TAG to support the project, please reach out to the project coordinator with any questions or to learn more about the opportunity.

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