OREGON WATER RESOURCES DEPARTMENT

Surface Water Information Modeling System

Technical Advisory Group

Meeting #4 – Acknowledging Feedback

Purpose

This document summarizes feedback from members of the SWIMS Technical Advisory Group during meeting #4 on July 7, 2026, and describes how feedback will be considered during development.

Meeting procedure

Prior to the meeting, two draft reports were provided to provide context for the presentations and prepare for discussion. The meeting began by recapping main topics of discussion for the prior TAG meeting and providing a status update on project developments. Preliminary findings for two in-progress data analyses were briefly mentioned. Presentations on the two draft reports (see meeting theme below) were then given during the first half of the meeting while the second half allowed for TAG members to provide feedback and suggestions for consideration. SWIMS project team members engaged in discussion for clarification, but the focus was on obtaining feedback from TAG members.

Meeting theme

The theme of SWIMS TAG meeting #4 was to provide overviews of the methods incorporated into the current water availability modeling framework in the Water Availability Reporting System to calculate expected demands for irrigation and municipal use types and discuss potential sources of data and methods for designing these workflows in SWIMS. Providing overviews of the current modeling strategy allowed TAG members to suggest strategies for modifying design decisions. Highlighting modern sources of data and science as potential alternatives provided TAG members an opportunity to suggest strategies for ensuring appropriate use of information prior to making design decisions. Important design considerations relate to the role of water use data in naturalizing streamflows and calculating water availability and setting reasonable assumptions for expected demands and return flows.

Feedback summaries and acknowledgement

Water use and the water availability modeling framework

Topic:

The role of water use data and information in the water availability modeling framework including streamflow naturalization and the calculation of water availability. Streamflow naturalization refers to correcting gaged streamflow to reflect upstream water use to establish reference conditions from which to derive water availability. Data sets

maintained by Oregon Water Resources Department to support water use calculations in the modeling framework were highlighted, including the geospatial framework, Water Right Information System, Water Use Reporting, and measured diversion data.

Discussion question:

- Which water use metric(s) best represents expected demands of water users?
- Which water use metric(s) best represents impacts to streamflow?

Feedback summary:

Feedback related to the role of water use irrespective of quantifying expected demands (see following topics regarding irrigation and municipal use) was largely focused on naturalizing streamflow. A main point of consideration related to the data used in the add-back method incorporated in the current framework and suggestions for modification in SWIMS. The current approach used average consumptive use data during the gaged period of interest to represent the amount to add-back to gaged streamflow (i.e., impacted condition) to represent natural streamflow. It was suggested that the current approach may incorrectly assume that all users can meet average water demands during dry periods or lower flow conditions. There was also a question of whether storage demands would be included in naturalizing streamflows. Other questions were less related to streamflow naturalization, but more so towards estimating natural streamflow in general, including mentions of small ungaged basins and strategies for updating estimates over time.

Another point of consideration related to the concept of return flows and implicit assumptions that are made regarding expected demands and water availability. It is not only important to consider the spatial scale of return flows (e.g., to the stream), but also the temporal scale (e.g., monthly). Particular mentions of canals distributing water over miles and out-of-basin diversions may invalidate assumptions related to the spatial and temporal scale of return flows if not appropriately accounted for or defended when quantifying the expected demand.

Acknowledgement:

The concern over the assumption that average water demands are met during dry periods is valid. One possible approach to improve streamflow naturalization is through use of the Statewide ET dataset, which provides monthly metrics of consumptive use for irrigation based on gridded weather data. This dataset would allow for more accurate estimates of expected demands during dry, average, and wet conditions. This process is also likely to benefit by using historical demand data associated with municipal water use. Storage demands will also be accounted for in streamflow naturalization. There are several sources of data that can assist with this task, including permitted water right data, reservoir evaporation (from Statewide ET), and historical storage release data. Accounting for reservoir storage is expected to be a topic for discussion at a future TAG

meeting. Combined, these improvements will better reflect more realistic representation of natural flow conditions under variable climate conditions.

Estimation of natural flow conditions in small ungaged watersheds is a known challenge for the project team. One strategy that has been taken to improve flow estimation in these watersheds was to evaluate potential for streamgage installation and expand the monitoring network to include representation in smaller basins. The project team focused gage installations in these watersheds to increase the amount of data available for building models to reliably and more appropriately extrapolate conditions to small, ungaged locations via regression. It should be noted that data collected by recently installed gages is not expected to be used in the initial development of SWIMS. However, the modeling system and architecture are being designed to ingest new data for more efficient and frequent updates as conditions change in the future. As new data becomes available and conditions change, the model can be tested and evaluated to determine if updates are necessary.

The challenge related to accounting for or defending assumptions regarding return flows is complex. An approach currently implemented in the modeling framework is that out-of-basin transfers are assumed to be entirely consumptive, meaning return flows are not assumed to be available for later use. This assumption seems logical to carry over to SWIMS. Return flows are likely to be best informed through focused basin studies, though lessons learned through current and future basin projects by OWRD are not expected to inform the SWIMS project. The movement of water via withdrawal (i.e., point of diversion) and appropriation (i.e., place of use) and associated return flows on a spatial scale could benefit from an improved geospatial framework (e.g., NHDPlus V2; see TAG Meeting #3), though the temporal scale of return flows likely requires further investigation into hydrogeologic properties related to transmissivity and attenuation that are beyond the scope of the SWIMS project and capabilities of the modeling system. Without explicitly accounting for return flows, this challenge may be addressed by deciding which water use metric (e.g., permitted diversion, applied water, consumptive use) best reflects impacts to natural streamflow when determining water availability.

Irrigation consumptive use

Topic:

The sources of data and alternative methods considered to quantify expected demands for irrigation in the current framework. The project team presented an overview of Statewide ET (evapotranspiration) as an alternative data set for estimating expected demands associated with irrigation in SWIMS.

Discussion questions:

- What data, information, or assumptions must be considered to support appropriate use of the Statewide ET dataset?

- What differences in assumptions or data are necessary when considering concept of add-backs to naturalize streamflow compared to expected demands to debit water availability?

Feedback summary:

There was a significant amount of feedback regarding expected demands associated with irrigation water use including considerations related to water use metrics in the Statewide ET dataset, validation of the dataset, the appropriate metric to represent expected demands, and adjustments to seasonal and overall irrigation water use patterns as a result of a changing climate. Comments related to each point are summarized in the following bullets:

- Water use metrics in Statewide ET: there were some questions related to the metrics offered by the dataset and what they represent. One question related to whether the consumptive use characteristic is water supply limited (i.e., actual evapotranspiration). There was also caution over uncertainty associated with the data in areas where shallow groundwater is a source of water to meet crop water requirements.
- Validation of Statewide ET data: it was emphasized that the data provided by the Statewide ET dataset be compared to observed data, such as information collected by flowmeters or information in the Water Use Reporting database, at least on a regional scale to determine patterns in seasonality and type of use (e.g., crop type, irrigation method). A general word of caution was provided regarding the use of the dataset to estimate ET in non-agricultural landscapes, such as forests.
- Metric to represent expected demands: a suggestion was made to consider the permitted or allowed diversion associated with the water right as the expected demand for debiting water availability as opposed to the portion consumed by crops (i.e., consumptive use). Another comment emphasized the importance of considering whether consumptive use (i.e., crop water demands) is appropriate for representing the expected demands if it does not consider the evaporation component associated with different irrigation types and associated efficiencies.
- Water use in a changing climate: it was suggested that changes in irrigation patterns and the growing season have likely resulted in changes to water use over recent decades. There was a question as to whether there are plans to incorporate adjustments to how expected demands are accounted for to adapt to these changes as the climate continues to change.

Acknowledgement:

The water use metrics available in the Statewide ET dataset reflect water supply limited conditions (i.e., actual evapotranspiration) which can help better reflect natural flow conditions under varying climate conditions (see previous section) and also better

estimate actual water use when calculating water availability. While the dataset offers a more technologically advanced representation of water use, it is still in its infancy and comes with recognized limitations that must be considered and accounted for where possible. There are known limitations in areas where shallow groundwater interferes with effective precipitation and may affect crop water use estimates. At minimum, these limitations must be recognized when using the Statewide ET dataset and will be addressed as science and research becomes available to account for the interference appropriately.

The project team expects to validate the Statewide ET dataset to evaluate how the data compares to measured water use data on a regional scale. Comparing flow meter data to water use metrics such as applied water, which is estimated based on consumptive use and irrigation efficiency variables, will indicate whether there are any spatial or temporal biases in the dataset that must be accounted for prior to implementing in the modeling framework. There are also challenges with relating delineated fields in the dataset to permitted water rights in the Water Right Information System which represents paper water rights on a geospatial scale.

There are several metrics (e.g., permitted diversion, applied water, consumptive use) that could be used to represent the expected demand of an irrigation water right when calculating water availability. The question of which best represents the impact on natural streamflow and water availability is a major question the project team is strategizing to decide on and is seeking input from agency staff, such as representatives of the Field Services Division. Calculating water availability using several metrics could provide information on a range of more to less conservative scenarios. The range of scenarios may be helpful in situations where it is difficult to account for or make reliable assumptions regarding return flows.

The Statewide ET dataset offers an advanced representation of actual irrigation water use in relation to climate conditions and can provide an indication of how patterns in use have changed over spatial and temporal scales. Given the annual production of this data and in combination with reported and measured water use data, it is expected that the modeling framework can be updated to account for expected demands associated with irrigation to reflect the changes in agricultural operations.

Municipal consumptive use

Topic:

The sources of data and methods used to quantify expected demands for municipal water use in the current framework. The project team identified several data sources for quantifying expected demands of municipal water use and comparing and validating estimates, including Water Management and Conservation Plans (WMCP), Integrated Water Availability Assessments (US Geological Survey), and Enforcement and Compliance History Online (Environmental Protection Agency).

Discussion questions:

- How can data and information from the USGS Integrated Water Availability Assessment support quantification of municipal water use?
- What approaches (e.g., QA/QC) or assumptions (e.g., re-use, prohibited discharge to streams) can better inform reliability of various data sources for quantifying municipal water use?
- Any suggestions on how to handle the complex problem of utilities whose wastewater leave the basin?
- Is inferring municipal consumed use from seasonal demand shape defensible?
- If we determine consumptive rates differently due to climate range, should these rates vary by region, and on what basis?

Feedback summary:

The feedback related to municipal water use in the modeling framework centered on historical water use data to support streamflow naturalization, assumptions regarding seasonal use patterns, and accounting for expected demands in the calculation of water availability. It was suggested that historical water use data, including WMCPs, be used to support add-backs to calculate natural streamflow. This information could also support the development of seasonal use curves that should be scaled to align with future demands as based on the permitted amount. If necessary to hindcast use in the absence of historical records, demand could be reasonably estimated using population data.

Acknowledgement:

The acknowledgement of historical municipal demand records aligns with the approaches considered by the project team to estimate municipal water use. The distinction between methods to account for historical use in streamflow naturalization compared to estimation of expected demands in water availability calculations is noted with appreciation for suggestions on accounting for seasonality and potential sources of data.