



MEMORANDUM

TO: Water Resources Commission

FROM: Justin Iverson, Groundwater Section Manager *JL*

SUBJECT: Agenda Item B, September 5, 2019
Water Resources Commission Meeting

Walla Walla Groundwater Update

I. Introduction

This informational report provides an update on the Department's work related to the Walla Walla Basin.

II. Background

The Walla Walla Basin, located in northeastern Oregon, is a productive agricultural area. Historically the crops included peas, orchard fruits, alfalfa, corn, and dry-land wheat. In recent years, existing and new agricultural areas are becoming vineyards. While grapes use less water than some traditional irrigated crops, the total irrigated acreage has increased as dry-land farms convert to irrigated vineyards.

Surface water is generally fully appropriated. In regards to groundwater, an unconsolidated sedimentary alluvial aquifer overlays a series of Columbia River Basalt Group aquifers. Irrigation from the alluvial aquifer began in the early 1900s. Irrigation from the basalt aquifers began in the 1940s and has increased in recent years. The City of Milton-Freewater has relied on the basalt aquifer system for municipal water supply since the 1940s.

Groundwater levels are declining in both the alluvial and basalt aquifer systems. Department staff have made a concerted effort to meet with the local groundwater user community since May 2016 to build understanding of this issue. In May 2017, the Commission amended the Umatilla Basin Program rules (OAR 690-507-0030) to designate the basalt aquifers in the Walla Walla Basin as a Serious Water Management Problem Area (SWMPA).

The 2019 legislature funded a portion of the Department's Policy Option Package (POP) #102, which was developed to help the Department better understand and manage groundwater resources sustainably to protect existing users. These actions are called for in Recommended Actions 1A, 1B, 1C and 3B of the 2017 Integrated Water Resources Strategy.

As authorized in House Bill 5043, POP #102 includes six new positions and authorizes \$800k (\$300k of Exempt Use Fee funds) to conduct a second cooperative basin study in addition to the ongoing Harney Basin cooperative study. The Department has committed to studying the Walla Walla Basin and planning efforts are well underway.

III. Initial Basin Study Planning and Activity

In addition to ongoing Department data collection in the basin (refer to Director's report updates since 2017), the Department has begun geologic mapping of the basin and development of the cooperative basin study.

Geologic Mapping:

Geologic mapping of the basin by the Oregon Department of Geology and Mineral Industries (DOGAMI) began in July 2019. The impact of geologic structures (faults and folds) on the basalt groundwater flow system underlying the central portion of the Walla Walla Basin is a source of uncertainty. With existing data there is a lack of precision of mapped faults and their hydraulic properties. Many additional faults are likely hidden and have not been mapped in significant detail due to thick overlying sediments in the middle of the basin.

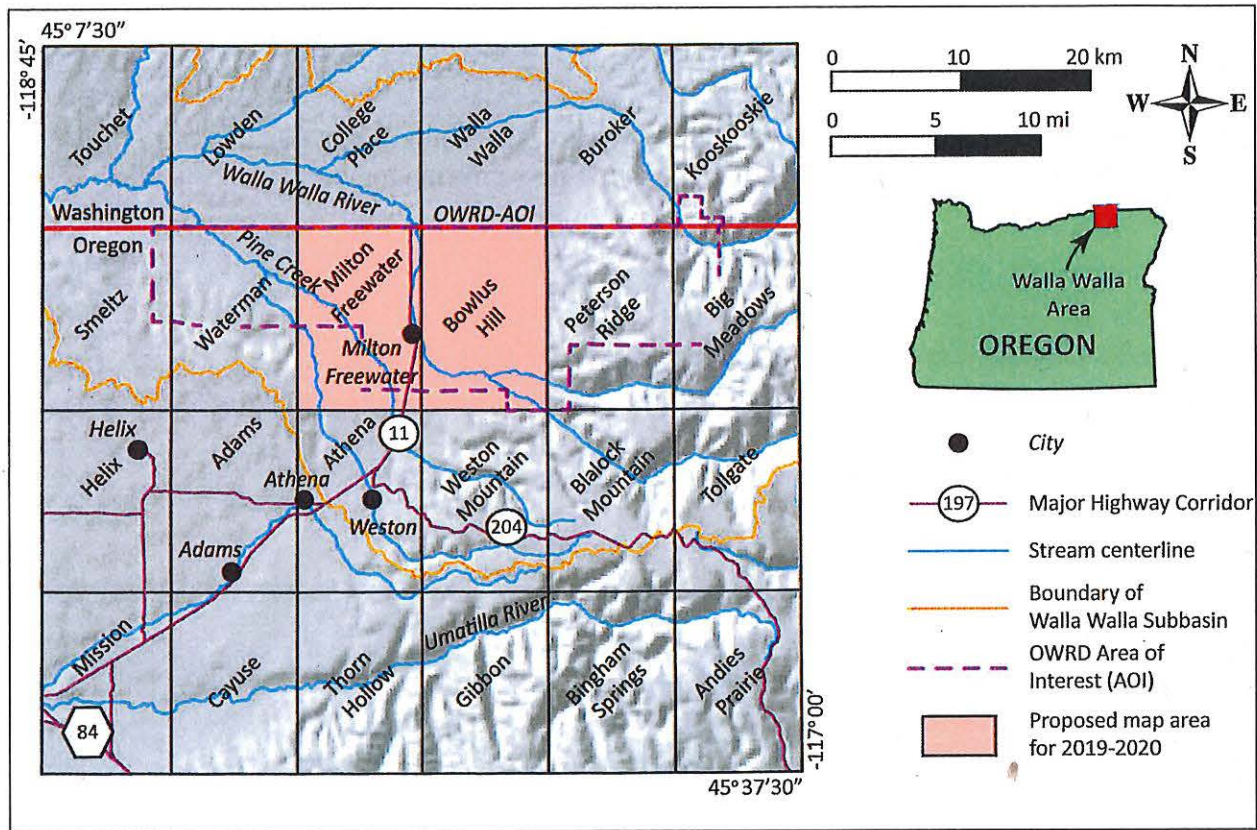
The objective of the mapping project is to produce detailed geologic maps and supporting geodatabases of an area covering somewhat less than 100 square miles in the vicinity of Milton-Freewater (see Figure 1). The mapping will be published as DOGAMI Geological Map Series (GMS) maps covering the defined project area. The mapping and publication will be a collaborative effort, including contributions from OWRD.

Cooperative Basin Study:

The Department typically evaluates groundwater and surface water resources through cooperative, cost-share science programs with the U.S. Geological Survey (USGS), DOGAMI, and other scientific partners. State funds are leveraged through federal cost-match funds when partnering with these agencies.

Basin studies help define the overall groundwater budget of an area, including groundwater recharge from precipitation and other sources and groundwater discharge to surface water, wells, and direct evapotranspiration. The studies develop a broad understanding of surface and groundwater systems and the results are published in peer-reviewed reports. Information obtained through studies is used by the Department to manage the State's increasingly limited groundwater resources, and maximize the consumptive and non-consumptive uses of water in each basin (see Attachment 1).

Figure 1. Location of the Walla Walla Basin Geologic Mapping Project area. Salmon-colored area will be mapped during 2019-2020. Figure courtesy of DOGAMI.



Department staff are currently engaged with the USGS to draft a scope and budget to study the Walla Walla Basin. The key goals of the study will include quantifying groundwater-surface water interaction, characterizing the sedimentary and basalt aquifer systems, and defining the connectivity of basalt aquifers within the basin flow system.

At question is how much of the basin in Washington State will be included in the final study scope of work. Ideally the study would, with the support of State of Washington, encompass the entire basin to the surface water divide between the Walla Walla river and either the Touche river or Snake river in southeast Washington. The Department is currently meeting with the Washington Department of Ecology and the Confederated Tribes of the Umatilla Indian Reservation to discuss potential collaboration on the basin study, as well as other water management efforts.

The Department is committed to providing a forum for regular engagement with local stakeholders and other interested parties during the study process. Similar to our recent efforts in the Harney Basin, the Department intends to foster an open exchange of information, data, and ideas between residents, other interested parties, and the OWRD and USGS Groundwater Study

Team. The POP #102 package included funding for a new public engagement position; the public engagement plan for the Walla Walla basin will be developed soon after this position is filled.

IV. Conclusion

The Department is initiating groundwater study work in the Walla Walla Basin. Staff will update the Commission as these efforts progress and new information becomes available.

Attachment 1: Background Information on Groundwater Basin Studies

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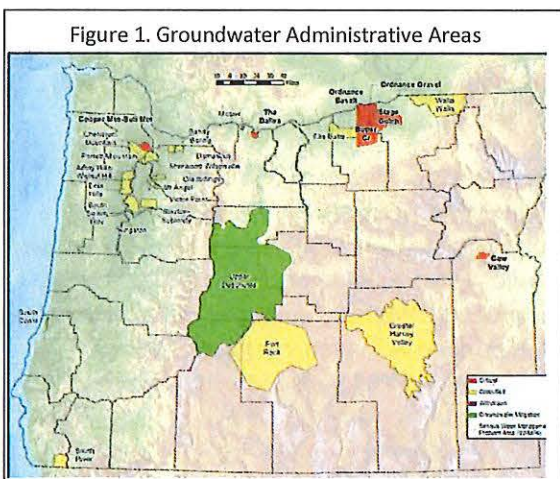
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Background Information on Groundwater Basin Studies

Groundwater: A Limited Resource

Oregon's groundwater supplies are showing signs of stress and, in some locations, groundwater aquifers are not capable of sustaining additional development. The State has designated more than 20 groundwater administrative areas where water levels were declining at unsustainable rates. In other areas groundwater availability is limited because additional groundwater development will further affect already fully-appropriated surface water bodies to which groundwater is tributary and constitutes a critical component of summer baseflow. Water Resources Department groundwater administrative areas are identified in Figure 1.

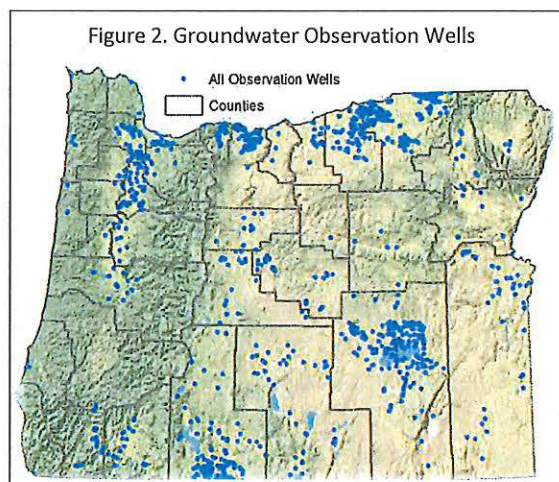


Groundwater Management and Data

The Oregon Water Resources Department monitors and manages groundwater. Twelve staff hydrogeologists and a supervising hydrogeologist collect and analyze data and information on the state's groundwater

resources, provide technical input into groundwater right transactions and regulation, and help facilitate solutions to water supply challenges.

Groundwater is a complex resource; therefore, the Department uses a number of data sources, as available, to understand it. These include water-level measurements from more than 1,400 observation wells state-wide (Figure 2), geologic maps, geophysical logs, drill cutting analysis, and other technical data. In addition, in some basins, the Department has conducted in-depth basin-scale groundwater studies. Additional work remains to characterize groundwater resources in many areas of the state.



Basin Studies

To better understand and manage the resource, Oregon's Integrated Water Resource Strategy (IWRs) calls for additional groundwater investigations and improved water resources data collection.

The Department typically evaluates groundwater and surface water resources

through cooperative, cost-share science programs with the U.S. Geological Survey (USGS), Oregon Department of Geology and Mineral Industries (DOGAMI), and other scientific partners. State funds are leveraged through federal cost-match funds when partnering with these agencies.

Basin studies help define the overall groundwater budget, including groundwater recharge from surface water, groundwater discharge to surface water, and available water for new allocation. The studies develop a broad understanding of surface and groundwater systems and the results are published in peer-reviewed reports. Information obtained through studies is used by the Department to manage the State's increasingly limited groundwater resources, and maximize the consumptive and non-consumptive uses of water in each basin.

The Department currently has resources to engage in one cooperative groundwater basin study with the USGS at any given time. Its current model relies on engaging five to six Department staff to work with three to five staff from the USGS to intensify data collection in the study area over an approximate three-year period, and then subsequently transition to data analysis and report publishing over an approximate two-year period. Development of a numerical groundwater flow model may follow to assess the impacts of future water management scenarios.

The Department has completed three cooperative basin studies since the 1990s in portions of the Deschutes, Willamette, and Klamath and is currently working to study the Harney Basin.

There are twelve areas the Department has identified as a priority for groundwater basin study work in the future. The highest priority basins are the Harney Basin (in progress, with

initial study due in 2020 and management tools to follow), the upper Walla Walla Basin, and the sedimentary aquifer system of the Lower Umatilla Basin. These three basins present groundwater allocation and management challenges related to over-appropriation of water resources and declining groundwater level trends. This group is followed by subbasins or regionally important aquifer systems with documented declining groundwater level trends limiting availability of new groundwater permits or with emerging groundwater management challenges. This tier includes basalt aquifers in portions of the Hood, Lower John Day, and Umatilla basins, the Deschutes Basin aquifer system underlying the rapidly urbanizing Bend-Redmond-Prineville area, the sedimentary aquifer systems of the upper John Day Basin, and the northern Goose and Summer Lakes Subbasin. Finally, aquifer systems in the Grande Ronde Basin and the Rogue Basin are tributary to State Scenic Waterways, and local officials from the Powder Basin have asked the Department to identify potentially available groundwater.

The Governor's 2019-2021 Recommended Budget Package #102 for the Department proposes to increase resources to allow for two studies to be conducted concurrently. The next priority study area is the Walla Walla subbasin. These additional resources would support completion of the twelve priority basin studies approximately twice as fast as is possible with current budget resources – likely in 30 years instead of 60 years.

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