



Oregon

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Water Resources Department

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MEMORANDUM

TO: Water Resources Commission

FROM: Brenda Bateman, Senior Policy Coordinator

SUBJECT: Agenda Item B, November 20, 2008
Water Resources Commission Meeting

Oregon Water Supply and Conservation Initiative: November 2008 Update

I. Issue Statement

The Oregon Water Resources Commission and Water Resources Department have long recognized the need for data to help better understand, manage, and plan for Oregon's water resources. The Oregon Water Supply and Conservation Initiative, approved by the 2007 Oregon Legislature, is a modest step in this data gathering process.

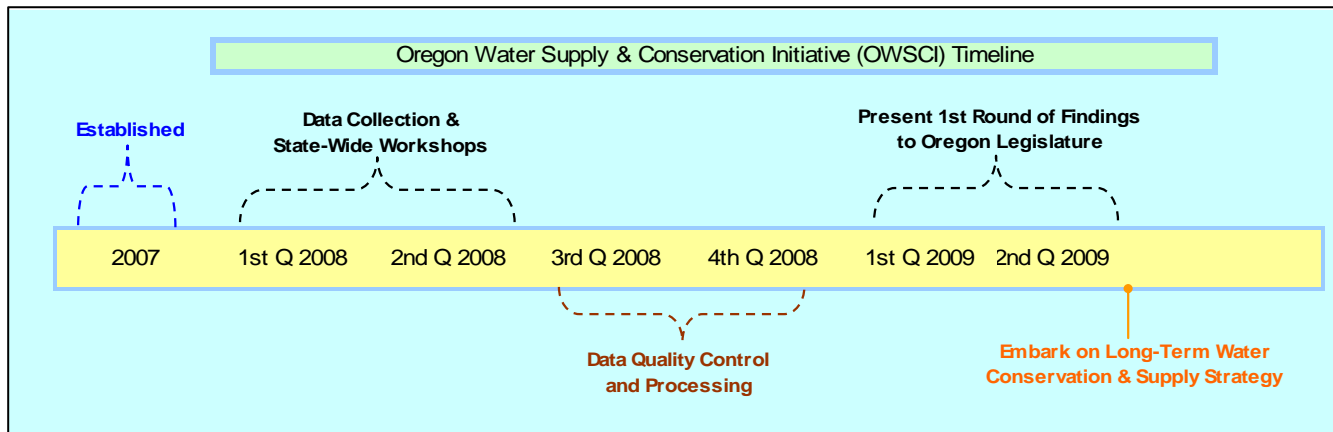
The following report is an update of work begun in 2007, in five issue areas:

- 1) a state-wide water demand forecast
- 2) an inventory of potential water conservation projects
- 3) an inventory of potential above- and below-ground water storage projects
- 4) grant funding for community and regional planning efforts, and
- 5) basin yield and peak flow analyses (not funded in 2007).

The first phase of the Oregon Water Supply and Conservation Initiative (OWSCI) is scheduled for completion in June 2009.

II. Background

State Water Resources Engineer, Barry Norris, supervised the OWSCI project, working with a combination of internal staff members and outside private contractors. Below is a timeline for the Initiative. The Department completed data collection during the summer, and will spend the remainder of the 2008 conducting data quality checks and processing the data into a user-friendly format on the Department website.



The Department will present results of the Oregon Water Supply and Conservation Initiative to the 2009 Oregon Legislature, identifying information gaps, lessons learned, recommendations about the level of resources and general approach needed to continue to build Oregon’s long-term, integrated water conservation and supply strategy.

III. Discussion

In addition to data, two important products that will result from this Initiative include the methodology used to collect and process information, and also the database into which the Department will place future data.

A peer review group, comprised of three colleagues from the U.S. Geological Survey, Oregon State University, and Portland Water Bureau, as well as a series of stakeholder meetings and workshops helped the project team develop and revise its methodology.

Component #1: Water Demand Forecast

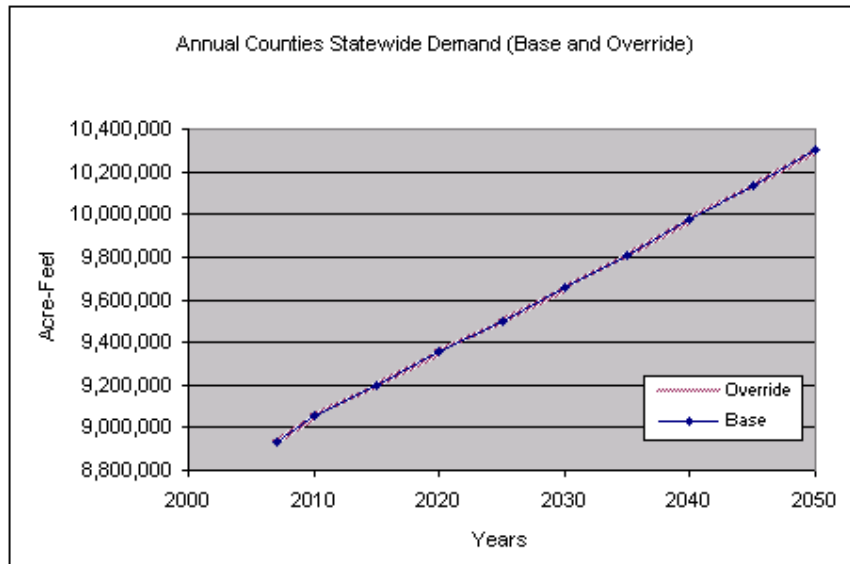
The last time the state conducted a water demand forecast was in 1969, under the auspices of the then Water Resources Board, the precursor to today’s Water Resources Department. Entitled *Oregon’s Long-Range Requirements for Water*, the forecast took a 100-year approach, looking out to the year 2070. The 1969 report predicted a population in Oregon of 8.8 million people by 2070, with an out-of-stream water demand totaling 80 million acre feet per year. Today, with Oregon’s population of 3.7 million and an out-of-stream water demand totaling about 9 million acre feet, it is certainly on the population growth path mapped out by that previous forecast.

The 2008 water demand forecasting team included Department staff, and a private sector consortium comprised of HDR Engineering and Cogan Owens and Cogan. The team took a two-tiered approach to demand forecasting, starting with already-existing reports and data (e.g., state population projections and irrigated acreage projections) to broadly characterize what Oregon’s future water demands might look like. The project team then “ground-truthed” this data at the

local level using surveys and interviews of large water users (e.g., cities, drinking water districts, irrigation districts, etc.).

The project team calculated today’s total statewide out-of-stream water demand at approximately 9.1 million acre feet, and projected that in 2050, the total would increase to about 10.3 million acre-feet, based on projected growth in the municipal, domestic, industrial, and agricultural sectors. Given the many uncertainties, the results actually show a range of demands, between 9.5 and 11 million acre feet for out-of-stream demand.

Scenario 1. The project team ran three out-of-stream water demand scenarios. The first scenario is the “base case” described above and shown in the line graph below.



The accompanying table shows the breakdown of water demand by water-use sector. Note that demand for water is projected to rise across all sectors, between now and 2050. Agricultural use of water in Oregon represents and will likely continue to represent approximately 80 percent of all water use in

Oregon. The greatest increase in the agricultural sector will likely come from Baker, Gilliam, Grant, Harney, Morrow, Sherman, and Umatilla Counties. The greatest increase in the municipal sector will likely come from Clackamas, Deschutes, Josephine, Lincoln, Polk, Washington, and Yamhill Counties.

Annual Counties Statewide Demand (Base) (Acre-Feet)					
Years	Municipal Systems	Domestic Wells	Industrial	Agricultural	Total
2007	539,036	80,295	533,622	7,780,349	8,933,302
2010	559,123	83,242	533,622	7,880,804	9,056,791
2015	595,570	88,750	533,622	7,983,558	9,201,500
2020	634,641	94,600	535,084	8,088,667	9,352,992
2025	671,637	100,215	533,622	8,196,188	9,501,661
2030	709,440	105,917	533,622	8,306,180	9,655,160
2035	746,890	111,610	533,622	8,418,704	9,810,826
2040	786,675	117,749	535,084	8,533,822	9,973,330
2045	825,817	123,870	533,622	8,651,597	10,134,907
2050	868,885	130,566	533,622	8,772,096	10,305,170

Scenarios 2 and 3. The project team also ran two additional scenarios to account for the potential influence from two significant variables: climate change and water conservation. Under the *climate change scenario*, the project team divided the state in three “climate zones,” and estimated how demand for water might increase in each because of likely changes in temperature and precipitation. Under such a scenario, the total demand statewide increases, ranging between 9.8 and 11.3 million acre-feet per year. Under the *conservation scenario* (independent of the climate change scenario) the project team assumed a very aggressive overall conservation rate of 25 percent state-wide and found total demands reduced to approximately 7.4 to 8.3 million acre-feet. Clearly, such savings would require significant investment, as well as substantial changes in how the public uses water.

The project partners developed a spreadsheet, to help policymakers and stakeholders experiment with their own assumptions in a number of areas that affect overall demand for water, including: population growth, per capita use of water, irrigated acreage, crop requirements, and water conservation.

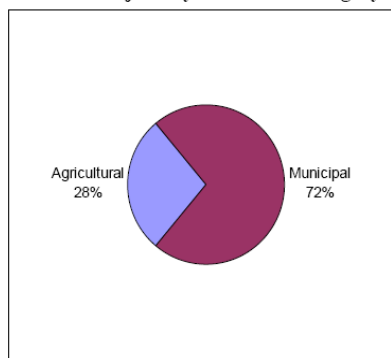
The Water Resources Department is developing a method for the public to access the model interactively, by entering different assumptions and creating new demand forecasts on-line. Users will have the option to experiment with numbers statewide, county-by-county, or basin-by-basin to see what effect differing assumptions could have on the water demand forecast.

Instream Assessments. The project team also conducted an assessment of instream needs for ecological purposes, on an annual volume basis. The team identified approximately 11 million acre-feet of need in the Willamette Basin, between 3 and 4 million acre-feet in the Coastal Basins, and 1 to 4 million acre-feet in the Deschutes, Rogues, Umpqua, Klamath, and Grande Ronde Basins. These numbers refer to instream need today, and assume the needs will not change between now and 2050. The Department plans to make available HDR’s full report on-line.

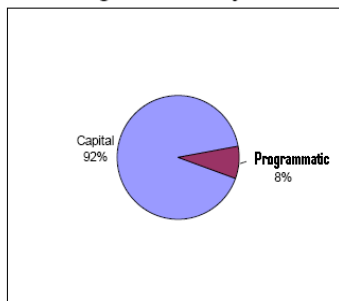
Component #2: Inventory of Conservation Opportunities

The same private contractor and project team also surveyed water users to determine what potential conservation opportunities have been identified in Oregon but not yet pursued because of institutional, regulatory, or other barriers. The purpose of this question was to identify what types of public policies or resources might increase the amount of water conservation in Oregon. More than 96 respondents participated, from the agricultural community (18 respondents),

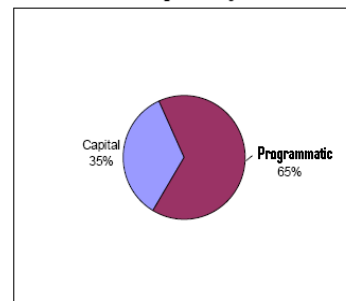
Projects by Water Use Category



Capital vs Programmatic Agricultural Projects



Capital vs Programmatic Municipal Projects



municipalities (79), and other categories (4). Among them, they identified 135 projects—36 agricultural and 96 municipal. Each description included the type of conservation project and its current status, the location of the project, the potential public benefits, potential water savings, potential barriers to implementation, and estimated costs. Again, the Department plans to display the compiled results on an interactive map by county.

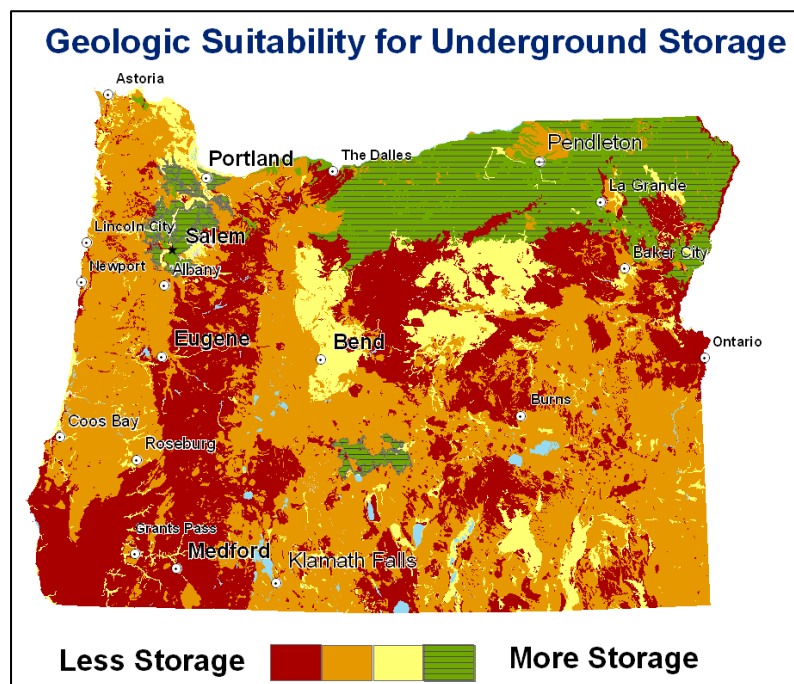
A peer review group, comprised of three colleagues from the U.S. Geological Survey, Oregon State University, and Portland Water Bureau, as well as a series of stakeholder meetings and workshops helped the project team develop and revise its methodology for Components #1 and #2.

Component #3: Inventory of Potential Storage Opportunities

Department staff members are constructing an inventory of potential water storage opportunities in Oregon, including both above and below-ground sites. In this first phase, the project team wants to collect as much existing information as possible so that the Department can serve as a clearinghouse for storage information. No attempt was made during this stage to assess the ecological or economic feasibility of these projects. The Department plans to post this information so that communities can avoid “reinventing the wheel,” in terms of site investigation. This information will also help the state identify and prioritize possible future projects. Again, the project team intends to show results on an interactive map on the Department’s website.

Highlights of the Below-Ground Storage Projects:

- 54 aquifers evaluated
- Areas with Columbia River Basalt aquifers score highest for their potential to store water.
- Other aquifer types with storage potential include volcanoclastic (pumice deposits in the Fort Rock Basin), as well as glacial and fluvial layers (west of Pendleton and throughout southeastern Oregon).
- Aquifers with little storage potential include Coast Range marine sediments, Western Cascades volcanics, and Klamath Mountain metamorphics, although there may be local exceptions.



Above-Ground Storage:

To date, the Department has mapped the location of 1,228 potential above-ground storage sites. This information came from staff, other state, local, and federal agencies, and the general public. The Department has researched each site and linked all available information to the project, including capacity curves, reservoir inundation areas, and site maps.

Above-Ground Storage Identified to Date			
BASIN	# of Sites	BASIN, continued	# of Sites
North Coast	16	Malheur	4
Willamette	514	Owyhee	2
Sandy	32	Malheur Lakes	17
Hood	34	Goose and Summer Lakes	14
Deschutes	145	Klamath	15
John Day	61	Rogue	129
Umatilla	70	Umpqua	10
Grande Ronde	13	South Coast	39
Powder	39	Mid Coast	74
	Continued→	TOTAL # IDENTIFIED	1,228
COUNTY	# of Sites	COUNTY, continued	# of Sites
Baker	35	Lake	14
Benton	20	Lane	195
Clackamas	113	Lincoln	36
Clatsop	3	Linn	63
Columbia	7	Malheur	3
Coos	38	Marion	56
Crook	59	Morrow	14
Curry	4	Multnomah	11
Deschutes	21	Polk	42
Douglas	13	Sherman	22
Gilliam	1	Tillamook	11
Grant	52	Umatilla	62
Harney	19	Union	7
Hood River	8	Wallowa	10
Jackson	77	Wasco	46
Jefferson	19	Washington	35
Josephine	48	Wheeler	2
Klamath	20	Yamhill	42
	Continued→	TOTAL	1,228

Component #4: Regional and Community-Based Water Supply Planning

The Department awarded grants to 16 communities in 2008 for use in their water supply planning efforts. These awards total \$200,000 and are meant to help communities that are taking a regional approach to meeting their current and future water needs. Applicants were eligible for up to \$20,000 per project and had to provide at least an additional 25 percent cost share. More than 30 applicants responded, requesting more than \$600,000 in total.

Projects were scored according to four grant criteria:

- (1) demonstration of a regional approach;
- (2) involvement of local officials;
- (3) involvement of diverse stakeholders;
- (4) closely tied to land-use, climate change, water quality or other related water supply issues.

The communities receiving grants represent diverse locations across the state, as well as a mix of counties, cities, and districts. The list features a wide variety of water supply projects, ranging from water conservation, banking, storage, and transmission, to policy road-maps, instream (environmental) issues, and out-of-stream (municipal and agricultural) demand forecasts.

The recipients of 2008 Oregon Water Supply and Conservation Grants are listed below, with a brief description of each proposed project.

Recipients of 2008 Community Water Supply Planning Grants

Grant Recipient	Brief Project Description
1. Baker County	Undertake hydrologic analysis of the Powder River Basin, including storage of winter water.
2. Benton County	Conduct a county-wide water analysis and demand forecast.
3. Central Oregon Cities Organization (COCO), with the Deschutes Basin Board of Control and the Deschutes River Conservancy	Market the Deschutes Water Alliance Water Bank.
4. Clackamas River Water Providers	Model streamflows in the Clackamas River, including the effect that releases from Timothy Lake may have on water quality and quantity.
5. Crook County	Determine how unallocated water in the Prineville Reservoir can be utilized, while maintaining existing reservoir uses.
6. East Valley Water District	Identify potential pipeline routes, for water delivery.
7. Southern Willamette Valley Municipal Water Providers, led by Eugene Water and Electric Board (EWEB)	Develop a plan to address technical and policy obstacles to using U.S. Army Corps of Engineers reservoirs in the Willamette Basin

	for municipal and industrial purposes.
8. Northwest Coastal Water Supply Task Force, led by the City of Seaside	Forecast water demands at the municipal and county level in Clatsop County.
9. Oregon Water Trust in Jackson County	Assess the possibility of a water bank in Jackson County.
10. Polk County and Lincoln County	Study water needs in Polk and Lincoln counties; conduct feasibility study of a storage project on the Upper Siletz River.
11. Umatilla County	Map potential beneficiaries of a project to replace ground water rights with available surface water.
12. City of Sisters	Development of a water management and conservation plan.
13. City of Florence	Development of a water management and conservation plan.
14. Heceta Water District	Development of a water management and conservation plan.
15. City of Aurora	Development of a water management and conservation plan.
16. City of Union	Development of a water management and conservation plan.

Component #5: Basin Yield and Peak Flow Analysis

This component remained unfunded during 2008. Previously, the Department has conducted water availability studies to determine the rate of stream flows, but has not conducted detailed basin yield analyses to estimate the volume of water that will run off from each Basin each month. Nor, has it conducted peak flows analyses to determine where, when, and in what magnitude peak flows occur in Oregon's streams and rivers. The Department will request resources from the 2009 Legislature to conduct these basin yield and peak flow analyses.

This information is crucial for fulfilling the Agency's mission to address Oregon's water supply needs, by assessing the viability of new water conservation, supply or storage projects and for assuring that scenic waterway flows and peak fish flows are protected. Although the raw data already exist in-house, no staff resources are available to produce the analysis required to determine basin yield or peak flows. This analysis is a multi-year effort, updated thereafter with additional data layers as they become available.

Although this work was not funded in 2007, the Department believes that the information generated by a basin yield and peak flow analysis will provide baseline information the state needs to track the effects of climate change, the monthly availability of water, and peak flows for fish and environmental needs.

IV. Conclusion

The Peer Review Group, which assisted the project team with the development of Components #1 and #2, held its final meeting to review these Components on Aug. 25, 2008. Following the meeting, the reviewers sent a formal assessment to Director Ward, which read in part:

“...the work met the objectives of the contracts and we agree the methods and analysis used by the contractor were appropriate for these projects. Information contained in the conservation inventory contract would have benefited from a stronger survey response. However, the information that was received is valuable and can be used as a good basis for future work.

The water needs assessment exceeded our expectations, and we are pleased with the outcome. The assessment model is highly functional and will serve as a basis for future generations of water modeling techniques.”

The Department held its final stakeholder meeting to unveil project results on September, and received similarly positive responses from the attendees. Since then, County officials have invited the Department to share the methodology and assumptions behind the OWSCI components, so that local officials can build upon this work and begin to formulate even more specific studies and projects to suit their local needs.

Public outreach is critical to the success of continued data collection and future water planning. Stakeholders not only have good ideas about methodology, but they are a valuable source of data and source of support. Future water planning will require a dedicated staff to seek out, document, and publish the input that comes from the public, as well as from advisory groups, and technical groups. The Department’s 2009-11 budget request includes Policy Option Package #102, “Developing and Communicating an Integrated Water Resources Strategy,” which requests three Department staff – a water demand forecaster, technical writer, and public outreach coordinator – to conduct such work.

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