

# **Climate Change Preparedness of Oregon Municipal Water Providers in Snow-Transient Basins**

Becca Bartleson and Bob Doppelt

Climate Leadership Initiative, Institute for a Sustainable Environment

University of Oregon

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## Introduction

In summer of 2007 the Climate Leadership Initiative (CLI) at the University of Oregon surveyed municipal water providers serving populations of over 4,500 people located within snow-transient basins in Oregon about their preparedness for the potential effects of climate change. Prior to the survey, maps were produced for CLI identifying low elevation watersheds in the state where slight temperature increases were likely to turn snow into rain, thus reducing snowpack and causing earlier snowmelt.<sup>1</sup> Municipal water supplies in these "snow-transient basins" could experience changes to their water supply regimes if storage systems were not situated in locations capable of capturing rain runoff or if snowmelt occurring earlier in the year.

The goals of the CLI survey were threefold: 1) to determine which water supply systems could potentially be at risk; 2) to determine the extent to which local providers were aware of the potential risks to their systems posed by rising temperatures; and 3) to ascertain how many providers had developed climate preparation plans or policies.

## Methodology

CLI identified areas with high populations in Oregon whose drinking water source was located in snow-transient basins. Drinking water districts representing a population of over 4,500 located within a snow-transient basin were determined by comparing the location of communities with the basin maps. Upon determining which cities were located in snow-transient basins, local water providers and public works officials were identified. Phone interviews were then held, posing questions about their water source, climate change awareness and preparation, plans for increased water supply capacity, water conservation measures, and other issues (see appendix for questions).

## Respondents

The total population that depends on water from snow-transient basins was estimated to be over 1.54 million. According to the U.S. Census Bureau, Oregon's total population in 2006 was approximately 3.7 million. This suggests that a little less than half of Oregon's population depends on water from snow-transient basins.

Forty-five water providers that serve an area with a population exceeding 4,500 were identified in the basins. Thirty-five of the identified providers were interviewed by phone. The remaining ten providers were not interviewed because a person knowledgeable about the water supply systems was unavailable or could not be identified during the time the

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<sup>1</sup> The snow-transient basin maps were developed by Alan Hamlet of the Climate Impacts Group at the University of Washington under contract with CLI.

research was conducted. The providers we interviewed serve a population totaling over 1.47 million people.

### Survey Findings

1. Of the thirty-five suppliers interviewed, only five said their water providers have *formally* planned for the potential risks of climate change. Some examples of current activity include:

- The City of Baker City has addressed climate change in their water facility plan. Their main concern lies with reduced snow-pack and its affect on the source of their water supply.
- Eugene Water and Electric Board has allocated money for research jointly carried out by Oregon State University and the U.S. Forest Service on how climate change will affect the McKenzie River, Eugene's water supply.
- The Pendleton Water District has implemented an aquifer recovery and storage plan (ASR) in response to a diminishing aquifer. The system is intended to help them prepare for any future water shortages caused by climate change.
- The Portland Water Bureau, in cooperation with the Climate Impacts Group and the University of Washington, produced a report called "The Impacts of Climate Change on Portland's Water Supply: An Investigation of Potential Hydrologic and Management Impacts on the Bull Run System." According to the Water Bureau the finding were preliminary, but important in helping them consider how climate change may affect the region's drinking water system. Portland is also involved with a coalition of water providers, mostly from the western United States, that work on identifying ways to incorporate research done by Universities and other research facilities for practical application by water municipalities. The group is in the beginning stages and has been together approximately one year.

2. Nineteen interviewees said that they had *not formally addressed* climate change:

- Several providers said that they have discussed the potential for climate change to affect their water source but had not instituted studies or developed plans to address the issues.
- At least one provider said their water district is in the process of evaluating possible affects and has been attending climate change conferences, but have implemented no policy changes as of yet.
- Several providers said that climate change is something they think federal or state agencies are addressing, or should be addressing.

3. Eleven providers said they *have not addressed climate change and are not worried* about the affects on their district. Providers gave a wide variety of reasons for this:

- In the event of decreased water supplies, one provider said that their first assumption would be that the problem was related to neighboring communities over-pumping wells, not reduced supplies caused by climate change.
- Several providers remarked on how normal seasonal changes in snow-pack will have a greater affect that the long-term effects of climate change.

- One provider said that his district hasn't reached full capacity for its water rights and there's room for expansion in their ability to meet demand.
- Another said the surface source that supplies his district is large enough that he does not foresee any problems for many years to come.
- Others said their aquifers are old enough that climate change wouldn't affect their supply for fifty years or more.

4. Twelve of the providers are members of the Regional Water Providers Consortium<sup>2</sup>, an organization that provides a forum for collaboration on water issues among providers in the Portland Metropolitan area.

- The Consortium has a regional conservation program that addresses balancing water supply and demand in the event of a drinking water source being adversely affected by climate change.
- They have also conducted workshops on climate change to help increase the understanding of the impacts on water providers.

5. Twenty-six providers said they are concerned about population growth and have implemented measures in the recent past, or will be implemented in the near future, to address this issue. These measures were not necessarily linked with the potential impacts of climate change, but represent the types of actions that could resolve concerns.

- Examples of measures include identifying new water supplies, applying for water rights on alternative sources, applying for increased water rights on current sources, implementing an aquifer storage and recovery plan, creating alliances and planning with neighboring water districts, implementing conservation programs, designing treatment and pumping facilities for potential increased demands, and adjusting billing rates to accommodate future growth.

6. Thirty-one providers have an approved Municipal Water Management and Conservation Plan from the State Water Resources Department, are in the process of creating a plan, or have implemented some conservation methods on their own. Conservation plans are required by the state as part of the process for renewing a permit for water rights. This could also be an effective method for addressing the potential risks of climate change.

- Nine of the providers said they've seen a drop in demand since they've implemented water conservation measures.
- Eight providers said that with fluctuations in factors such as population growth, industrial decline and system upgrades, it is impossible to tell right now whether their programs have had an effect.

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<sup>2</sup> Regional Water Providers Consortium members subject to this study: Boring Water District 24, Clackamas River Water District, City of Lake Oswego, Oak Lodge Water District, Milwaukie Municipal Water District, South Fork Water Board (supplies water to West Linn and Oregon City), Sunrise Water Authority, City of Wilsonville, City of Fairview, City of Gresham, City of Portland and the City of Sandy.

## Conclusions

It appears from our research that only a small number of municipal drinking water providers in highly populated, snow-transient basins have formally taken into account the potential risks of climate-change driven supply reductions. More than a quarter of the providers expressed doubt that climate change would adversely affect their drinking water source.

Drinking water providers generally consider population growth to be their largest concern. Most districts extrapolate twenty or more years' growth when they plan future facilities, update existing facilities, collaborate with neighboring providers, plan for increased water rights or apply for water rights on different sources. This planning is usually outlined in a water master or facility plan for that specific provider.

Most providers have implemented or submitted state-mandated conservation programs in order to renew their water right permits. These plans are generally considered by the providers to be effective in decreasing their consumers' water demand.

One issue that was continually raised throughout the interviews was the subject of responsibility. Many water providers said they thought federal or state government agencies were conducting supply studies, which meant they did not need to pursue such studies. For example, a number mentioned that the USGS monitors flows in their surface water drinking water source. Several providers also said they report information on supply to the state Water Resources Department and that consequently any responsibility for water source availability and possible future declines would reside with the WRD.

## Recommendations

1. The small number of drinking water providers in snow-transient basins that are formally addressing the potential risks of climate change suggests that a major educational effort for water suppliers may be warranted to increase awareness and understanding of the risks and benefits of early planning.
2. The Water Resources Department should consider ways to encourage water suppliers to assess their potential risks. One option may be to include a requirement that all water conservation plans include provisions addressing how the provider has considered the potential risks that rising temperatures pose for their water supply system.
3. Studies that have been conducted by federal or state agencies on the potential effects and solutions to rising temperatures on Oregon municipal water supplies should be made readily available to all providers.
4. Where studies of how climate change may affect a particular water source are warranted but not available, water providers should consider funding such research. If sufficient funds are not available from local sources, funds from state or federal sources should be identified. The new Oregon State University System Climate Change Research Institute could be considered as one option for completing such studies.

5. Following on the previous point, comprehensive regional studies of the impacts of climate change on water resources, and on municipal water supplies in specific, should become a top priority, especially in regions such as the Willamette Valley where so many people are dependent on water from snow-transient basins. Key water providers, local governments, the new Oregon State University System Climate Change Research Institute and key stakeholders should consider forming consortiums for this purpose.

## Appendix

### A: Thirty-five identified Oregon water providers interviewed

Ashland Water District  
Baker City  
Boring Water District 24  
City of Canby (water system run by Veolia)  
Clackamas River Water District  
City of Cottage Grove  
City of Creswell  
City of Dallas  
City of the Dalles  
Eugene Water and Electric Board  
City of Fairview  
City of Grants Pass  
City of Gresham  
Junction City  
City of Klamath Falls  
City of Lake Oswego  
City of Madras  
Medford Water Commission  
Milwaukee Municipal Water District  
City of Monmouth  
Oak Lodge Water District  
City of Ontario  
Oregon City  
City of Pendleton  
City of Portland Water Bureau  
City of Roseburg  
City of Scappoose  
Springfield Utility Board  
City of St Helens  
South Fork Water Board  
Sunrise Water Authority  
City of Troutdale  
City of Umatilla  
City of West Linn  
City of Wilsonville (Veolia operates the plant)

### B. Ten providers not interviewed:

City of Hermiston  
City of Hood River  
City of Independence  
City of La Grande  
City of Milton-Freewater  
The City of Molalla

City of Sandy  
City of Stayton  
City of Sutherlin  
City of Winston

C: Geographic Range of Water Suppliers Interviewed

Water suppliers interviewed are found within these counties:

Baker  
Clackamas  
Columbia  
Douglas  
Hood River  
Jackson  
Jefferson  
Josephine  
Klamath  
Lane  
Malheur  
Marion  
Multnomah  
Polk  
Umatilla  
Union  
Wasco

D: Phone Interview questions

1. Name of water district?
2. Title of person speaking with?
3. What cities does your system supply drinking water to?
4. Is this a publicly or privately owned water district?
5. What is the source of your water?
6. Where does your water source originate?
7. Does that source originate from rain, snowmelt or a combination of the two?
8. If snow or combination, has climate change been addressed in your water district?
9. What is the population of the area you serve?
10. Have you considered how population growth will affect the water supply? How has your district addressed this?

11. Are there any large companies or industries in your area that use a significant portion of the municipal water?
10. Any future plans for having large water dependent industries or companies move into your district?
11. If yes, have you developed any strategies to meet the increased demand?
12. Have you considered how climate change could factor into increasing demands?
13. What steps, if any, have you taken to conserve water? Introduce new technologies?
14. If yes, how much did these measures cost and what is the long-term gain for your area?
15. How old is your water collection/distribution/treatment system?
16. Do you have any plans to upgrade your system?
17. How is your drinking water collected? How is it stored? How many reservoirs? What is their total capacity?
18. What is your maximum capacity? Have you ever reached that? What is the highest level you have reached?
19. Are there any large agricultural operations in your district that you supply water to? Do you know where they obtain their water?
20. Contact information?