

CLIMATE CHANGE PREPAREDNESS: DRINKING WATER IN THE PORTLAND, OREGON REGION

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Background

- ▣ Part of five-region project funded by NSF/EPA
- ▣ Extension of ULTRA-Ex funding and results from an EPA study: forward-looking regions
- ▣ Assessment of water management organizational structures (1 of 4 factors chosen for examination)
- ▣ Overriding questions: To what extent are regional governments anticipating, monitoring, and preparing for changes in water resources due to climate change? Are there particular attributes of the work that might be instructive for other regions?

Our specific research questions:

(1) Are water providers in the Portland, Oregon metropolitan region anticipating and planning for climate change impacts on water quantity?

(2) If so, how?

(3) If not, why not?

Highly exploratory in nature; water planning, like land use planning, is conducted at the local level.

Study area: Biophysical context:

7 county area – Focus on 3 Oregon and 1
Washington urban counties

Population: 2.2 million

1970-99 to 2041-70, scientists project:
NW warming of 1.1°C to 4.5°C
Rainfall change -5% to +14%
Seasonal variation

Major sectors :

Urban demand

Fish and wildlife habitat

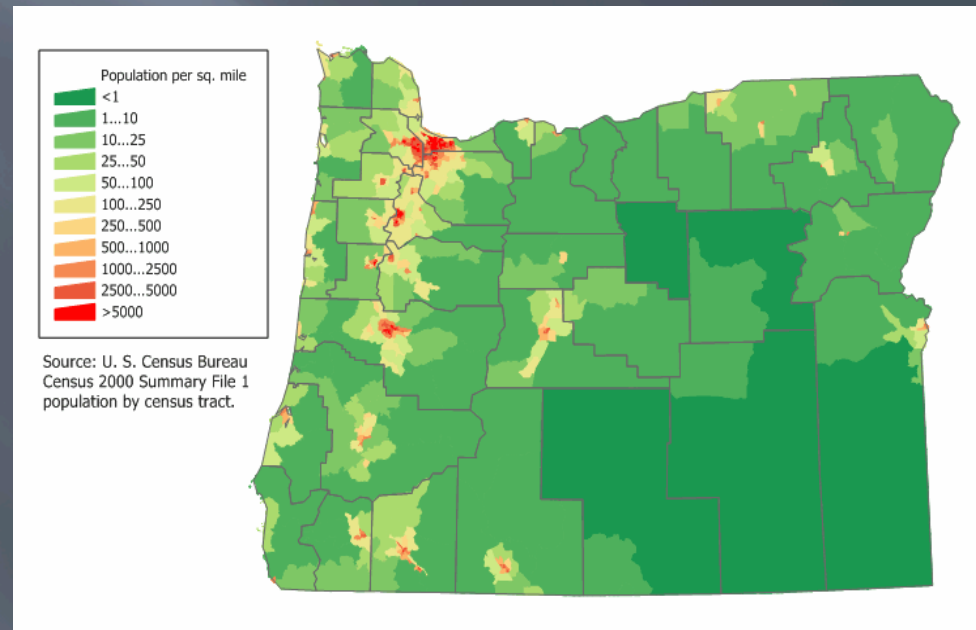
Agriculture

Energy production

(70% hydro power)

Flooding

(not responsibility of
water providers)



Anticipated Impacts on water quantity in Portland Metro Region

- ▣ Higher demand due to population growth
 - Top third growth rate among US cities – 4th outside sunbelt
 - 2000– 2030, 1.37-1.70 % annual projected rate
 - **Climate migrants?**
- ▣ Stream flows impacts
 - Reduced snow pack (spring peak earlier, winter heavier, late summer lower)

Intensified competition for water among humans, wildlife, energy, agriculture

Research design

- To what extent are local water providers aware of and actively planning for anticipated climate change impacts?
 - **Background**
 - Describe major sources of water (what might be the scope of the impact?) (Denisse and Alan)
 - Describe the institutional structure and planning processes of water service providers (who ought to be responding?) (Khanh and Connie)
 - **Data collection methods**
 - Archival research – review of documents
 - Interviews (sampling of water providers)
 - **Analysis**
 - Qualitative analysis of awareness of likely climate change impacts
 - Qualitative analysis of which water providers are planning for anticipated negative impacts due to climate change and how, or if not, why not

Oregon: 6 Main Sources of Drinking Water

- 1) Bull Run River
- 2) Clackamas River
- 3) Tualatin River Basin
- 4) Willamette River
- 5) Groundwater (several different aquifers)
- 6) Jones Creek and Boulder Creek





City of Portland Bull Run Dominance



Serves 934,000 people (2014)

- Retail:
 - 48% of total consumption
- Wholesale:
 - 42% of total consumption



Jamie Francis/The Oregonian

From forest to faucet, we deliver the best drinking water in the world.



Regional Water Providers Consortium (1997)

- A group of 22 water providers , the City of Portland and Metro (14 cities and 8 special districts)
- Voluntary, non-binding collaborative
- Purpose:
 - Promote **voluntary coordination** of individual and collective actions of Consortium participants implementing the *Regional Water Supply Plan for the Portland Metropolitan area*;
 - Provide a forum for the **study and discussion of water supply issues** of mutual interest to participants, and to coordinate the responses of participants to such issues;
 - Provide a forum for **review and discussion of water resource-related actions** by individual participants. Issues to consider may include statewide land use goals, comprehensive plans, regional plans, or land use regulations;
 - Establish **an avenue for public participation** in water supply issues in addition to public participation activities of each participant.

Oregon Sub-regional Water Provider Entities

Joint Water Commission

Hillsboro
Forest Grove
Beaverton
Tualatin Valley WD

Clackamas River Water Providers

Estacada
Lake Oswego
Gladstone
Tigard
Clackamas River Water
Oak Lodge Water District
Sunrise Water Authority
South Fork Water Board

Regional Water Providers Consortium

(1997)

Beaverton
Clackamas River W. D.
Forest Grove
Gladstone
Gresham
Hillsboro
Lake Oswego
Metro
Milwaukie
Oak Lodge W. D.
Portland
Raleigh W. D.
Rockwood Water PUD
Sandy
Sherwood
South Fork W. B.
Sunrise Water Authority
Tigard
Tualatin
Tualatin Valley W. D.
West Slope W. D.
Wilsonville

Willamette River Water Providers

Tigard
Tualatin
Sherwood
Hillsboro
Tualatin Valley Water District

Coordination activities among providers:

- ▣ Regional Water Providers Consortium
 - Research, planning, education and outreach)
- ▣ Other Sub-regional Entities
 - Develop storage capacity (reservoirs)
 - Develop “new” water sources (pumping stations and filtration plants)
 - Protect water rights: Willamette and Clackamas rivers
 - Increase in municipal partnerships within subregions
- ▣ Plans not to renew contracts with City of Portland (2016)

Sub-regional entity : Clark County Water Utility Coordinating Committee (WUCC) - Vancouver

- Vancouver (230,000 retail customers)
 - 100% groundwater.
 - Four different aquifers: the Troutdale, the Upper and Lower Orchards, and the Sandy River Mudstone
 - The **Troutdale Aquifer** is one of the three aquifers that Portland draws water from its Columbia South Shore Well Fields
 - **Private wells** provide water to **24%** of population
 - Clark County Coordinated Water Supply Plan, 1983, updates in 1991, 1999, and 2011.
 - Looking to develop surface water sources.

All WA cities project sufficient water until 2024

Public Fails to Recognize Need for Infrastructure Investment

- ❑ Water utilities historically conducted little public education
- ❑ Public benefited from past investments;
- ❑ Water is heavily subsidized (insufficient funds for maintenance and renewal)
- ❑ Increased conservation has highlighted the tension between the societal need for conservation and the provider's need for revenue.
 - As use decreases, revenues decrease unless rates are raised. Therefore, customers who have increased water efficiency see water rate increases and feel penalized rather than rewarded.

The Politics of Local Water: Portland



Portland City Council must approve water rate increases.

Example: 2013 Portland Budget and Water Rate Hikes

- In 2012, PWB projected need for a 14.8% water rate increase
- The Water Bureau, under pressure from elected officials, brought down rate increase to 6-7%
- Mayor's budget proposal brought it down to 3.2%

Citizens groups (Friends of the Reservoirs and Portland Water Users Coalition) launched a campaign to take Water and sewer rates out from city control to create a separate "People's Utility District." (May 2014 ballot)

Summary of Institutional Scan

- ▣ Oregon communities (in region) are highly dependent on surface water sources.
- ▣ Washington communities (in region) rely primarily on ground water.
- ▣ Oregon and Washington systems are almost completely independent. (Share Troutdale aquifer)
- ▣ Major changes occurring over next 10 years – reduced demand in Bull Run g(2016), greater reliance on other regional rivers; WA shortages by 2024, unless action is taken; looking to surface sources.

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Summary of Findings

- ❑ Oregon water managers are aware of climate change impacts.
- ❑ Oregon water providers are developing alternative sources to accommodate higher demand, rather than climate change impacts.
- ❑ Water providers are constrained by rate and tax payers' antipathy to higher costs for developing water resources and facilities
- ❑ Oregon institutional arrangements are in transition from highly centralized to more decentralized system, which may be more resilient to changes.

Conclusion

- ▣ As local entities, water providers, rate payers' attitudes trump climate change preparations.
- ▣ Local control and cost are the primary drivers of water providers' behavior.
- ▣ A multi-nodal system and system redundancies might constitute constructive actions in the event of climate change.
- ▣ Climate change preparations should be framed either as part of complementary actions OR at a higher scale.

Research Areas

- ▣ Role of institutions (and embedded actors, e.g. bureaucrats), the media) in mediating relationship between humans and nature
- ▣ Using negotiation theory to describe and prescribe collective decision making (on “science-intensive” topics) (Oregon Consensus)
- ▣ The emergence, development and/or transfer of innovative urban planning strategies and practices across multiple scales, sectors and geographies (Urban Sustainability Accelerator, China Program)