AN ABSTRACT OF THE DISSERTATION OF

Misty Freeman for the degree of Doctor of Philosophy in Public Policy presented on June 2, 2016.

Title: Complicating the Rural in Oregon's Water Policymaking

Abstract approved: _____

Denise H. Lach, Major Professor

The state of Oregon is divided in important ways along rural and urban lines, including the way people make a living, individual and group relationships with the natural world, political ideologies, and personal values. This rural-urban divide has assisted policymakers in making decisions that balance the needs of Oregonians on either side, but it does not allow for a nuanced understanding of the diverse needs of rural places. Water policy in the state of Oregon offers a timely opportunity to study the continuing relevance of the rural-urban divide as a tool for policymakers. An analysis of a suite of recent state water policies and interviews with professionals involved in water policy at the state level provide background to understand key issues affecting Oregon as a whole. Three rural case studies offer insight into how water issues are affecting different rural communities differently around the state. Research findings illustrate that rural-urban differences continue to have importance in policymaking in Oregon, particularly with respect to the challenge of community capacity and the rural-urban power dynamic in state level decisionmaking. However, of equal importance is the

diversity of rural places themselves. Findings suggest that individualized consideration is important to address water issues that differ by community, such as drought, decreased snowpack, changed timing and volume of streamflows, and other issues that require custom solutions to meet diverse rural needs.

Complicating the Rural in Oregon's Water Policymaking

by
Misty Freeman

A DISSERTATION

submitted to

Oregon State University

in partial fulfillment of
the requirements for the
degree of

Doctor of Philosophy

Presented June 2, 2016
Commencement June 2016

Doctor of Philosophy dissertation of Misty Freeman presented on June 2, 2016

APPROVED:

Major Professor, representing Public Policy

Director of the School of Public Policy

Dean of the Graduate School

I understand that my dissertation will become part of the permanent collection of Oregon State University libraries. My signature below authorizes release of my dissertation to any reader upon request.

Misty Freeman, Author

ACKNOWLEDGMENTS

My sincere thanks to my committee for helping me through the grueling process of the Ph.D. Dr. Denise Lach, Dr. Brent Steel, Dr. Brenda Bateman, Dr. Sally Duncan, and Dr. Jacob Hamblin, and Dr. Jonathan Kaplan, your willingness to take the time for me is much appreciated, and your feedback has been fantastic. Special thanks to my advisor, Dr. Denise Lach, whose expertise and insightful questions grew me as a student and as a person. Thank you to my academic mentors, including Dr. Brent Steel, Dr. Dwaine Plaza, Dr. Mark Edwards, and Dr. Andrew Valls for giving me great advice and sharing your experience with me.

Thank you to the people who shared their perspectives with me throughout this project. Consultations and official interviews were critical to helping me understand water issues, policies, and politics in Oregon and beyond.

This project would not have happened without the encouragement and support of my ENTIRE family, whose love got me through! I especially want to thank my mother for reminding me of the joy in my life. Thank you to my dad, whose knowledge about water and agriculture were vital to me asking the right questions and who was always willing to talk water with me when others' eyes would glaze over. Thank you to my dear friend Jack, whose calls and texts were a welcome distraction from water policy. Thank you to Racquel, Harmony, Julie, and Kim, who taught me why water is so important. Thank you to Juliana for

keeping me healthy throughout this process. Deepest thanks to Emily, whose emails and visits refreshed me like no other. Thanks to my dissertation group, Emily, April, and Rosario, for providing a sounding board and working through this alongside me. Thank you to my church families at Circle and Grant Street for keeping me focused on the bigger picture and cheering me on in this pursuit.

Most of all, thank you to my husband and best friend, James, who believed in me every moment of every day. Thank you for your patience and adventurous spirit, and for showing me how to put my faith in God even when things got rough. This dissertation is dedicated to you.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

Personal Statement

In my previous research, I spent time exploring the concept of cultural competence. The idea behind cultural competence is that service providers, especially practitioners in occupations such as social work and mental health counseling, can be more effective by learning about the backgrounds of the various people they serve, so that they can tailor services to meet the needs of those people (Weaver, 2008).

It is my view that researchers like myself are also more effective when practicing cultural competence, which suggests being aware of the culture—history, belief system, customs, way of speaking, and more—of interviewees. Cultural competence urges empathy and flexibility in the way interactions take place to make the client, or in this case, the respondent, feel at ease and be able to express themselves genuinely and without fear.

One way I practiced cultural competence in my research was to do my homework about the issues involved in my research and know what to expect from respondents (Yin, 2014). I also made sure I knew something about where my interviewee was coming from before we met, and listened carefully to them, allowing them to define themselves and what they thought, in their own terminology. This involved paying attention not only to the words that were said,

but observing the mood and words unsaid (Yin, 2014). I worked hard to be aware of the preconceptions I came with, and most importantly, I found a way to make a connection with each respondent.

As I practiced cultural competence throughout this research, a key requirement was for me to be aware of my own culture and how it affected my interactions and responses. Maxwell (2013) writes that to try and separate one's research from the rest of who we are is to pretend that any of us can truly be objective. Our whole selves influence what we choose to study and how we study it. For example, my culture affected the very research question I believed needed to be studied: "How do water issues affect different rural communities differently around Oregon?"

Each of us will "start where we are" (Lofland, et al., 2006) when it comes to research, and my interest in rural communities was influenced by my upbringing. I grew up in the agricultural San Joaquin Valley of California, with the smell of dairy cows and the gentle waft of tomatoes from the nearby food processing plant. I come from a family that packed fruit in the summers and advised farmers on pest control and crop nutrition. I grew up going hunting and fishing, learned to fire a gun at an early age, and have a collection of recipes for preparing venison. My family vacations included camping, hiking, and visiting

natural places, including Yosemite National Park, near our home. When I was older, I lived in a very rural and remote area in central California, where I saw how state and federal policies were developed with urban, rather than rural, communities in mind. I also saw that solutions for rural communities, when available, came in a one-size-fits-all that did not necessarily meet the needs of my community.

My experience was not all rural, though. I also grew up in the city in the midst of a rural place, going to schools that taught me from a young age the importance of natural resources and the environment from a different perspective. One memory that stands out is from fourth grade. Our class was so concerned about the destruction of the rain forests in South America that we signed a petition to stop it. And I went a step further, arranging to take the petition to several middle school classes in the area to tell them about what was happening. I started studying the environment in college at the University of California, Santa Cruz, where one of my favorite courses was Green Politics, and then in graduate school at Oregon State University, as a part of a Rural Studies minor, I found myself learning about the importance of natural resources and environmental issues to rural communities. My experience living and working in rural communities, living and working in cities, and my education in rural studies, environment,

natural resources, and public policy helped me connect with people in my study coming from a variety of backgrounds.

As I progressed through my research, I found connections with interviewees took different forms. In many instances, I made a professional connection with those interested in similar topics of study and work, and who share similar educational background and ideological perspectives. In other cases, I found myself making a more personal connection. One example is a farmer who dressed and talked and looked like my grandfather. The connection was emotional, and in exercising cultural competence, I noted and reflected upon how that personal connection felt different, perhaps even uncomfortable, compared to the professional connections with other subjects.

Ultimately, however, my success as a culturally competent researcher is not predicated on being able to somehow disconnect from my own culture to relate to the interviewee without any biases and assumptions (Weaver, 2008). Instead, my goal was to listen carefully (Yin, 2014) to the culture that interviewees defined for themselves, staying open to ideas that I was not familiar with or that made me uncomfortable, taking note when I was empathizing or connecting too fully, and giving interviewees space to discuss the topic at hand in their own context.

The personal goal I set for my research (Maxwell, 2013) was to give voice to the varied needs of rural communities. I chose this because of my experience in Oregon state politics, especially in the legislative process; my previous research into the challenges faced by rural communities around Oregon; and the literature on rural-urban relationships that has been central to my graduate work. What I believe I am observing is a moment of flux and pain in Oregon, where outcomes for rural and urban dwellers is, on average different, and rural communities are becoming an increasingly marginalized group. What I hope to accomplish is to bring tools to policymakers to understand how to address that imbalance, while also ensuring that urban communities are equitably treated.

1. Introduction

The state of Oregon is divided in important ways along rural and urban lines, including the way people make a living, individual and group relationships with the natural world, political ideologies, and personal values. This rural-urban divide has assisted policymakers in making decisions that balance the needs of Oregonians on either side. However, to simplify communities' differences in needs, preferences, and consequences in policymaking to the rural-urban divide alone misses important differences among rural places. This study uses water issues as a vehicle to gain a more nuanced understanding of rural places in the state of Oregon.

I argue that the rural-urban divide is essential concerning issues related to capacity, especially human and financial capitals, as well as in consideration of power dynamics of decisionmaking across rural and urban lines. At the same time, rural communities require individual attention in the face of water issues, taking into account the most critical problems facing each and developing nuanced solutions to meet diverse needs.

The research question providing the foundation for the study was "How do water issues affect different rural communities differently around Oregon?" An

analysis of a suite of recent state water policies and interviews with professionals involved in water policy at the state level provided background to understand key issues affecting Oregon as a whole. Three rural community case studies offered insight into the different experiences of rural communities around the state.

Research findings illustrate that rural-urban differences continue to have importance in policymaking in Oregon. However, of equal importance is the diversity of rural places themselves. The goal of the project is to provide additional knowledge about rural communities that will improve water policymaking and offer a template for investigating diverse needs of rural communities in other contexts as well.

The findings from state level data provide important information about water issues that can be generalized to the state of Oregon. Findings from each of the three case studies are generalizable only to the community, which underscores the basic argument of this paper: that rural communities are different enough from one another to merit individual consideration. However, in comparing and contrasting the three cases, differences and similarities provide clues for decisionmakers within Oregon to work through the tricky business of not only balancing the needs of urban communities on one hand and rural on the other,

but also the diverse needs of varied rural communities. Additionally, this work provides insights to those who study rural places generally, with ideas for how to study differences between rural and urban places in a way that does not marginalize the myriad rural communities and their unique characteristics.

2. Background

Literature Review

Rural and Rural-Urban Themes

One approach to studying rural places in the US is to juxtapose them against urban ones using the idea of a rural-urban divide. This concept argues that rural and urban places are marked by different cultures, political ideologies, ways of life, primary industries, and more, which has caused a divide between them (Clucas, et al., 2011). This is especially important when it comes to decision making in shared political jurisdictions like states, where differences separating rural and urban populations result in clashing goals and priorities (Seltzer, et al., 2011).

Some scholars prefer the term rural-urban interdependence to the rural-urban divide because it is, by definition, less divisive and perhaps more hopeful (Emshoff; Seltzer, et al., 2011). Interdependence focuses on shared or complementary interests of rural and urban populations and offers encouragement to work past differences. Historically, rural and urban have remained interdependent despite differences, particularly when complementary

industries exist in each, for example, timber harvesting and processing in a rural community and home construction in an urban one.

Whether one prefers to describe the relationship as a divide or as interdependence, the concept remains the same: this is a theoretical approach to studying rural places in comparison to (or contrast to) urban ones.

However, in some cases, comparing rural and urban is not enough. This is because often, rural communities are as different from one another as they are from urban areas (Flora & Flora, 2008). This diversity among rural places includes differences in policy problems facing communities, which require different solutions, and are therefore of importance to decisionmakers.

This paper uses water policy to help understand when the rural-urban comparison is most beneficial in decisionmaking and when diversity of rural communities requires a more nuanced, perhaps "custom" approach.

The state of Oregon began as a rural place where nearly everyone lived in the "country," a description that Michael Woods (2011) explains came from the term "contra," or in contrast to the city. As the economy of the state evolved, people began to cluster together in cities, and urban places experienced a different

economic, social, and cultural trajectory from places that remained rural (Clucas, et al., 2011).

One of the results was a difference in resources, which authors including Castle (1998) and Flora and Flora (2008) use to study rural places. These resources are termed "capitals," and include inventory of all potential resources, from natural resources (natural capital) to community relationships (social capital), and more. In this project, of particular significance is human capital, which is the number of people in a community and their capabilities, including education, training, and experience. Not to be underestimated is the importance of how many people are available to do jobs that need to be done. Business administration scholars and economists use the concept of economies of scale to describe how larger enterprises are able to accomplish more because they have more resources to do so (Riley, 2004). Jessop (2002) uses this principle to describe political economies of scale, which can be used to think about rural and urban communities. A small town has to accomplish the basics: providing safe drinking water and treating wastewater; ensuring safety; planning for the future, and more, regardless of the size of the population. Larger communities must provide the same basics and have more human capital (Castle, 1998; Flora & Flora, 2008) with which to accomplish this task, allowing them to also accomplish additional and optional duties.

In addition to human capital, financial capital is similarly limited in rural communities, and suffers from the same problem: minimum levels of services and duties must be accomplished regardless of the size of the community. This puts a strain on smaller populations and makes it difficult to do more than minimum requirements. A larger community must provide services for a larger number of people, but the basic infrastructure required is the same and costs less per capita.

Climate Change, Wicked Problems, and Clumsy Solutions

Policymaking based on the nuanced needs of different places is particularly important to address water challenges related to climate change effects (Morton & Rudel, 2014). The Intergovernmental Panel on Climate Change 2013 report describes increasing global temperatures and resulting climactic changes, as well as predicted impacts around the globe. The Oregon Climate Change Research Institute and their partners provide important forecasts for climate change impacts around the state of Oregon (Dalton, et al., 2013). Climate change is predicted to affect Oregon in a variety of ways in the coming years, including longer and more severe periods of drought, more frequent storms of greater intensity, decreased snowpack and increased rain (IPCC, 2013). Oregon is likely

to see different patterns across the state due to its varied geography (Dalton, et al., 2013). In the case of water policy, manifestations of climate change and the uncertainty of future precipitation patterns, including the geographic differences around the state (Dalton, et al., 2013), make for a wicked problem.

Wicked problems like climate change are so complex and far reaching that it is difficult to define the problem we want to solve, much less develop solutions to it (Rittel & Webber, 1973). This is partly because it affects different places quite differently, resulting in varied needs and preferences for solutions. Where needs are diverse, centralized decisionmaking that offers a single solution, or even a dual solution that relies on a rural-urban dichotomy, may not be sufficient. Instead, scholars have stressed the need for decentralized decisionmaking that focuses on the diverse needs of communities. Scholars have argued that regional or place-based policymaking could offer alternatives to address difficult problems facing rural Oregon (Bastasch, 1998; Cid & Pouyat, 2013; Clucas, et al., 2011; Larson & Lach, 2008). Clumsy solutions, rather than elegant, streamlined, and one-size-fits-all solutions, are particularly well suited to the challenges of climate change (Verweij, et al., 2005). Clumsy solutions bring in a variety of ways of knowing and wisdom; leave space for goals that differ based on ideological perspectives; and are inclusive of the needs of a variety of actors, which

dovetails with another important consideration in rural-urban policymaking, power dynamics.

Power Dynamics

Another reason to complicate the rural-urban divide in Oregon is to address the role of power in policymaking. A number of scholars challenge decisionmakers to be aware of how power dynamics influence policies, shaping some and excluding others, and offer that being intentional about inclusion of different kinds of knowing can help (Flyvbjerg, 1998; Mitchell, 2002; Nelson & Vucetich, 2009; Wolf, 2012; Young, 2002). The rural-urban power dynamic is critical to acknowledge because rural interests may be subsumed to the needs and preferences of urban places, based on capital and power in urban centers (Flint & Krogman, 2014). However, power dynamics within and between rural places have similar issues to be addressed.

Power in decisionmaking also comes from how we measure success, and the science we use to make choices (Jasanoff & Wynne, 1998). There is power in holding the legitimate measures and having one's data trusted. The rural-urban divide continues to be important in Oregon, where authorities that hold the keys

to measuring and decisionmaking are located in urban centers, away from many of the communities that are affected by those choices.

Project Goals

This research adds to the literature on rural communities by illustrating that individual communities are more complex than a single pattern for "rural," by tying the concept to governance, especially decisionmaking and implementation processes and systems in environments experiencing a rural-urban divide. I would like to offer some ideas for thinking at once about the rural-urban divide and things that rural places have in common, while also noting important characteristics that distinguish rural communities, and which need to be considered when developing and implementing policies that affect them.

I chose the state of Oregon for this research for several reasons: first, as a student at Oregon State University, Oregon is where I live and what I know. Communities, rural and urban, are familiar to me, and over the last several years, I have worked for the state legislature in different capacities and been exposed to the importance of the rural-urban divide shorthand in state level decisionmaking. In perhaps no other area is this divide more critical and complex than in natural resource decisions, and specifically, water issues. As

Oregon has begun seeing changes in the hydrograph in the amount of precipitation, less snow and more rain, more severe storms, more drought, and changing seasons, water has moved to the forefront of rural, and arguably Oregonians', minds.

My goal is to "complicate" the rural by considering how water issues affect different rural places around the state of Oregon. With this information, not only would I like to add to the literature on rural communities, I wish to offer policy recommendations to the state of Oregon and to the case study communities, each of whom is dealing with very real, very immediate water challenges.

What is Rural?

It is important to understand what is meant when people talk about "rural." Definitions of rurality have been the source of debate for many years. There are currently several different measures in use by the US government for the purposes of classifying communities as rural, urban, or something in between. The first federal measure is the US Census. The Census does not measure "rural," but it does measure urban communities. This standard focuses on *population density*. The measure counts groupings of 50,000 or more people as Urban Areas (UAs) and groupings of 2,500-49,999 people as Urban Clusters (UCs). By

elimination, any population and territory outside of these is considered rural (Census Bureau, 2010).

The US Office of Management and Budget uses *population size* within a county and integration with an urban center to determine whether a county is metropolitan, micropolitan, or non-core. A metropolitan county includes at least one core urban area with a population of 50,000 or more; a metropolitan statistical area is a county or collection of counties that has a population nucleus of 50,000 or more and adjacent communities with a high level of integration with the population nucleus, with a population totaling 100,000. A micropolitan county has at least one core urban area with a population between 10,000 and 49,999; a micropolitan statistical area is a county or collection of counties with a population nucleus. A non-core county has neither (Oregon Office of Rural Health).

The Federal Office of Rural Health Policy uses the US Census definitions of UAs and UCs, and incorporates commuting into their measurement of rural using Rural-Urban Commuting Areas (RUCAs). This measure focuses on *geographic remoteness* as an indicator of rurality and provides a continuum of classifications that indicate the percent of people within a community that commute regularly to the nearest urban core or urban area (Oregon Office of Rural Health).

None of these measurements is a definitive way to classify rural and urban places.

The Census measure focuses on population density, that is, the number of people clustered together in a community. Some argue that this definition over-represents rural because it captures some suburban communities in the measure. The OMB definition looks at population size more generally, and since counties can be large or small in geographic area, 50,000 people in a county the size of Harney County, Oregon (10,266 sq. mi.) would be very different that the same number of people in a county with much less geographic area. In Harney County, this many people might still seem rural. The Federal Office of Rural Health Policy's definition looks not only at the population center, where people are clustered, but how the surrounding communities are linked to it. This measure focuses on geographic remoteness as a characteristic of rural and captures suburban areas in counts of urban, where they might be considered rural in the Census calculation.

An additional measure of rurality is used by the Oregon Office of Rural Health (see Figure 1), which I argue combines the most effective features of each of the three listed above. It identifies urbanized areas of 40,000, a 10-mile radius

around that “centroid,” or population nucleus, and population density by county (Oregon Office of Rural Health, 2012). This measure captures the OMB concept of population size as indicator of urban; the Census Bureau’s concept of population density as an indicator of urban; and the Federal Office of Rural Health’s definition of geographic proximity to an urban area as an indicator of urban. By contrast, all areas not within these population centers or the surrounding 10 miles are considered rural. The measure also denotes a frontier county, one that is especially sparse, where the population density within the county is less than 6 people per square mile.

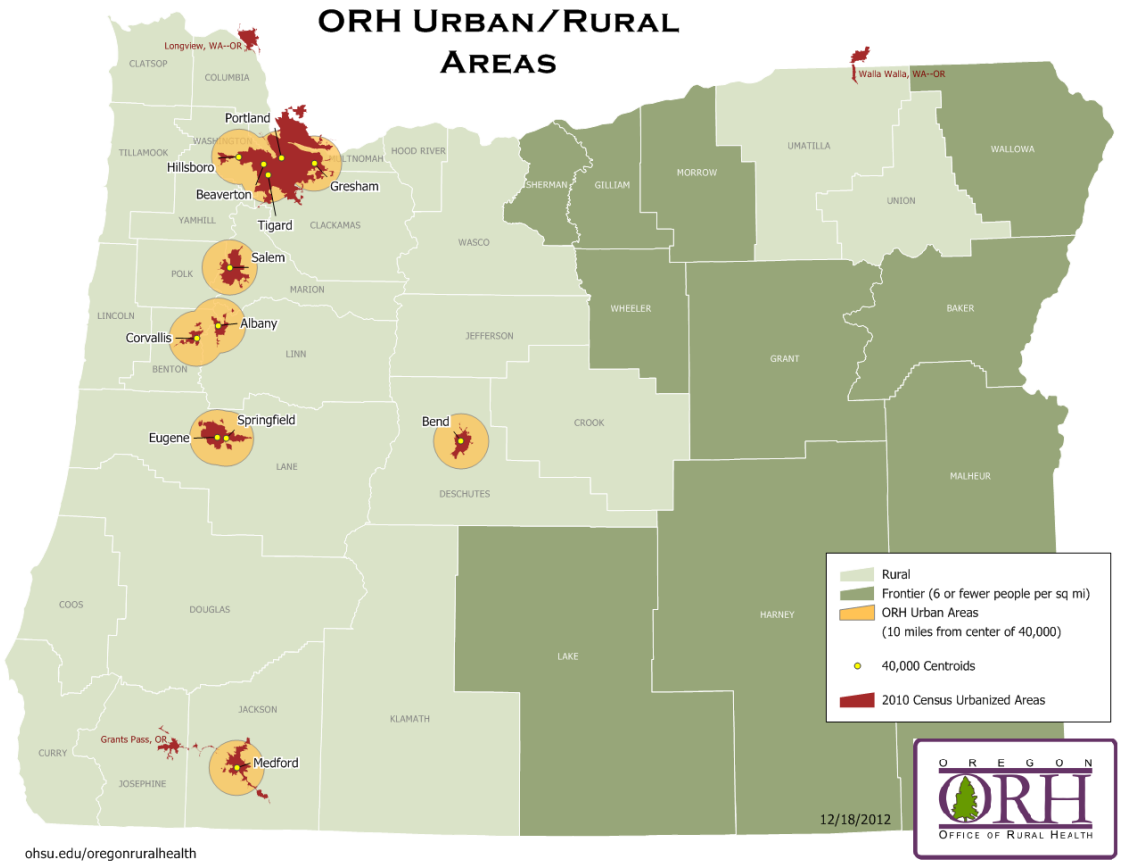

Figure 1. Oregon Office of Rural Health. (2012). Urban-Rural Areas Map.

About Oregon

Oregon is home to about 4 million people. It ranks 27th of the 50 US states in population size, and ranks 9th in geographic area, at over 98,000 square miles. On average, there are less than 40 people per square mile. This makes Oregon a relatively sparsely populated state, compared, for example, to the state of

Connecticut, which has nearly as many people as Oregon (3.6 million) but ranks 48th in geographic area and has about 740 people per square mile.

Oregon became the 33rd US state in 1859, 83 years after the first thirteen states entered the union, and many more years after European settlers came to America. Today, after less than 160 years of statehood, many Oregon residents can trace their lineage back to white settlers and state founders. Others can trace their lineage back to one of the many tribes that still make their home in Oregon today.

Like many places in the country, Oregon was home for generations to bands and tribes of Indians before white settlers came to the area. Many harms were perpetrated against these groups in an effort to make room for settlers and set up their way of life. During the 1950's, 109 bands and tribes were terminated across the country by the US government in an effort to assimilate remaining tribal people into American culture; 62 of these were in Oregon. Since then, nine tribes have been restored to federal recognition (Oregon Blue Book, 2013). Today the state has a higher percentage of American Indian or Alaska Native population than the US—about 2.8% of the population identifies as AI/AN alone or in combination with one or more races (US Census Bureau, 2010).

Oregon is a popular domestic migration destination. In 2012, 54% of people living in the state were born elsewhere. Of those, 44% were born in another US state (see Figure 2). Numbers of foreign born in Oregon are increasing, doubling from less than 5% of the population in 1990 to 10% of the population in 2013. Oregon has a higher percentage of people identifying as white than the US as a whole, and lower percentage of those identifying as black/African American, Asian, and Hispanic or Latino. The racial and ethnic makeup was influenced by early territory, and later state, laws making it difficult for people of color to make a home in Oregon. For example, in 1843, territory leaders passed legislation that both prohibited slavery in what is now known as Oregon and required blacks to leave the area within three years. The "Lash Law" passed a year later decreed that blacks were to be lashed with a whip twice a year until they moved away, and in 1859, Oregon became the first US state with an official "Exclusion Law," one that barred blacks from settling there, in the state constitution (Rector, 2010).

Oregon has a median income and per capita income lower than US figures (see Table 1). Additionally, the percent of people experiencing poverty in Oregon is higher than that of the country. However, the state has a higher percentage of people graduating from high school and with bachelor's degrees than the US average.

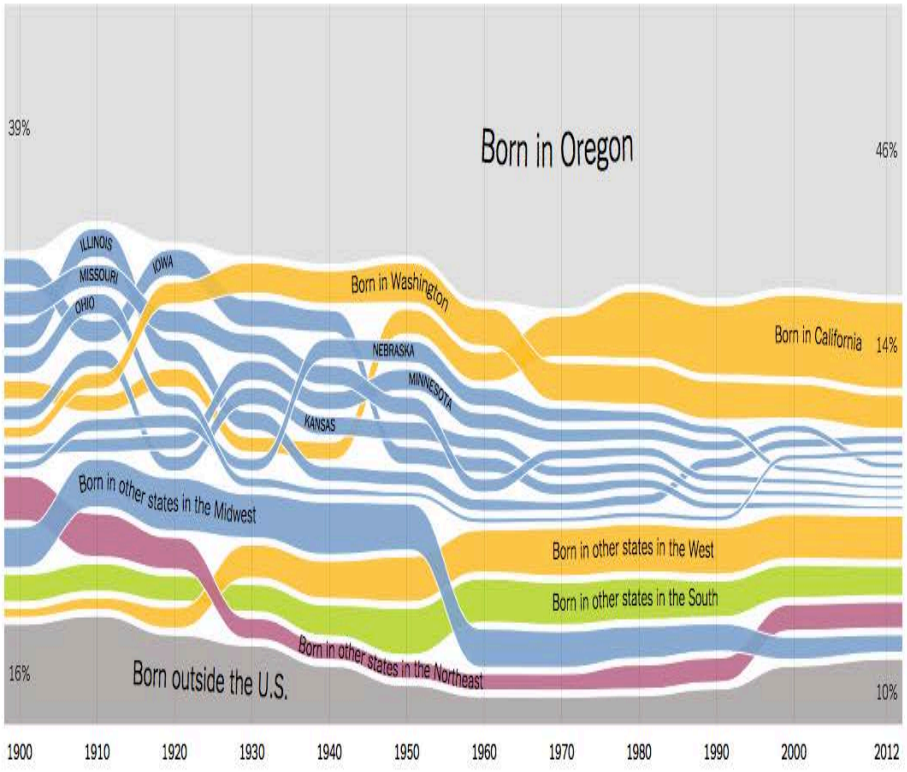

Figure 2. The New York Times. (2012). Where People Living in Oregon Were Born.

The state of Oregon offers a timely opportunity to develop a further understanding of the rural-urban divide through the vehicle of water policy. Literature on common challenges experienced by rural communities, power dynamics in decisonmaking, climate change, wicked problems, and clumsy solutions set the stage to explore how water issues affect different rural communities differently around Oregon.

	Population (est. 2015)	Land Area (2010)	Pop per sq. mi. (2010)	Race/Ethnicity (est. 2014)	Median Income (2010-14)	Education, 25 yrs+ (2010-14)	Poverty Rate (est. 2014)
Oregon	4,028,977	95,988 sq. mi.	39.9	White only: 87.9% Black/African American only: 2.0% American Indian/Alaska Native only: 1.8% Asian only: 4.3% 2 or more races: 3.6% Hispanic/Latino: 12.5%	$50,521	HS Grad: 89.5% BA+: 30.1%	16.6%
US	321,418,820	3,531,905 sq. mi.	87.4	White only: 77.4% Black/African American only: 13.2% American Indian/Alaska Native only: 1.2% Asian only: 5.4% 2 or more races: 2.5% Hispanic/Latino: 17.4%	$53,482	HS Grad: 86.3% BA+: 29.3%	14.8%

Table 1. Oregon Demographic Profile, US Census Data, 2010-2014.

3. Methods

To gain an understanding of how water issues affect different rural places differently around the state of Oregon, I conducted a study in multiple parts. This included performing an analysis of recent state water policies, interviewing professionals involved in water policymaking at the state level, and then choosing three case study communities to illustrate differences across rural Oregon. This was a cross-sectional approach that captured data at a particular period in time, fall 2015 and winter 2016.

First, to get a feel for recent water policies, I conducted an analysis of legislation related to water over the last ten years (2007-2016). Using two search engines available through the state legislature, I found all proposed bills and analyzed their content, concentrating on those that were signed into law. I focused on the content of four primary policies that came out of the legislature and have shaped the current path of water policy and planning in the state: the Integrated Water Resources Strategy, which was part of House Bill 3369 (2009), Place-Based Integrated Water Resources Planning authorized by Senate Bill 266 (2015), Feasibility Study Funding in House Bill 1069 (2008), and the Water Supply Development Account for implementation funding in Senate Bill 839 (2013).

In order to get a more in depth understanding of water issues and recent policies in Oregon, I conducted semi-structured qualitative interviews with a purposive sample of 39 respondents professionally involved in water policymaking at the state level. I designed the interview guide to focus specifically on issues related to water storage based on the results of the policy analysis. Prior to finalizing the interview guide, I consulted with several water experts who said that water storage, while just one of a suite of policies designed to meet Oregon's water needs, was central to the policy conversation taking place at the state level. They suggested augmenting my research with a second timely policy area: drinking water quality.

I chose potential interviewees for this wave of interviews in three ways: First, from people I knew to be involved with water policymaking at the state level from my time working in the Oregon Legislature, where I worked as a nonpartisan Committee Services intern supporting five natural resource and environmentally-focused committees during the 2013 legislative session, as an intern working with the Coastal Caucus on the Oregon Coast Economic Summit (2014-15), and supporting a State Senator during the 2015 legislative session. Most respondents were those who would be present in a typical water-related legislative hearing. I also chose interviewees who have served or currently are serving on water taskforces or studies at the state level. Finally, I chose interviewees to represent the range of ideological perspectives and types of entities involved in water issues, to include organizations focused on human uses, including irrigation, environmental

and conservation groups, policymakers, regulators, attorneys, academics, tribes, and more. Interviews ranged in length from about twenty minutes to ninety minutes. Most lasted about an hour (see Interviewee Profile in the Appendix).

The questions I asked state-level respondents included what the interviewee's organization does and how their work relates to water policy in Oregon, and whether and how they are involved with rural communities (see Interview Protocol attached as Appendix). I asked them to describe state policy conversations about water storage, groundwater and surface water conditions, how different geographic areas around the state are affected by water storage, and about Senate Bill 839 (2015) and related taskforces that have studied technical and governance aspects of water storage. I asked respondents to describe state policy discussions about drinking water quality, including main concerns and differences by geographic areas. Interviewees were asked how water issues are affecting rural and urban places differently, and how different rural communities are affected differently around the state. I asked what remains unaddressed with regard to water storage, drinking water quality, or water issues in general in Oregon, and which rural communities the respondent would like to know more about.

For the final phase of the project, I took a closer look at three rural communities around the state to illustrate how water issues affect each in different ways. I chose three communities that put forth applications for funding through the Oregon Water

Resources Department's new Place-Based Integrated Water Resources Planning program, set out in SB 266 (2015). The first round of applications for funding through the program were due December 2015, at which time sixteen self-identified water "communities" submitted proposals. I chose communities that provided a maximum variation of cases (Flyvbjerg, 2001) and which represent different kinds of rural. These are:

- The Pudding River Watershed, co-convened in Salem and Silverton, focused on eastern Marion and southern Clackamas Counties
- The Mid-Coast Basin, convened in Newport, focused on Lincoln County
- Subregion 1712 of the Malheur Basin, convened in Burns, focused on Harney County

Prior to selecting these cases, I reviewed each of the sixteen applications and compared and contrasted characteristics of the communities that submitted them. Fourteen of the sixteen applications came from rural communities. I chose cases based on geographic isolation/proximity to an urban center; population; and population density, which are indicators of rurality used by the Oregon Office of Rural Health (2012). Yet the demographic data were not uniformly applied. Because the Place-Based Planning exercise is intentionally locally driven, stakeholders were free to come together based on common water issues and identify for themselves their water community, often across typical political boundaries of cities and counties. In the cases of the Mid-Coast Basin and Subregion 1712 of the Malheur

Basin (Harney County), the communities track roughly with county borders. However, the Pudding River Watershed is a community within Marion County, and which crosses the political border of Clackamas County, while remaining distinct from the larger demographic character of either county. Table 2 provides details about the three case study communities.

	Malheur Basin (Subregion 1712)	Pudding River Watershed	Mid-Coast Basin
Cities	Burns, Hines, Crane, Buchanan, Princeton, Diamond, Frenchglen, Riley	Aurora, Brooks, Gervais, Hubbard, Molalla, Mt. Angel, Silverton	Newport, Lincoln City, Toledo, Depoe Bay, Seal Rock
Convening City Population	Burns: 3,000 (non-core)	Silverton: 9,000 (non-core)	Newport: 10,000 (micropolitan)
Nearest County Population	Harney Co: 7,000 (frontier)	Marion Co: 326,000 (metropolitan)	Lincoln Co: 46,000 (rural)
County Pop Density	.7 people/sq mi	267 people/sq mi	47 people/sq mi
Geographic Isolation	High	Low	Medium
Miles to Metro	Bend: ~130 mi	Salem: ~15 mi	Corvallis: ~50 mi
Region	Southeast	Willamette Valley	Coast
Economic Drivers	Hay, cattle	Wet/irrigated agriculture, food processing	Tourism, fisheries

Table 2. Case Study Communities at a Glance

Interviewees for each case were chosen in two ways: first, stakeholders listed as supporters or partners on the application were chosen as potential interviewees; and second, respondents were asked during the interview for names of any person I should not miss talking with about their community. Based on the size of the community and complexity of water issues facing it, I interviewed different numbers

of people to achieve saturation, which was indicated when I found myself hearing the same information and not learning anything new. In the Pudding River Watershed, I interviewed nine stakeholders; in the Mid-Coast Basin, I interviewed twelve; and in the Malheur Basin, I interviewed fourteen, for a total of 35 community-level interviews.

Before approaching community interviewees, the interview guide I designed focused on water storage issues and left out questions about drinking water quality (see Interview Protocol attached as Appendix). This was because respondents at the state level were much more concerned about water storage, and because I wanted to allow time to hear about the communities' Place-Based Planning application and process, while keeping the interviews at the length of about an hour. However, it quickly became apparent that individual communities had more diverse concerns, and in order to get a complete understanding of the situation, I changed my questions to be more open-ended and allow the respondent to describe water issues relevant to their context. The questions I asked community level stakeholders began with what the interviewee's organization does and how their work relates to water issues in their community. I asked them to identify and describe the top two or three water concerns for the community. Respondents were asked about the process to develop their Place-Based Planning applications and about what their ideal outcome would look like, should they receive funding to proceed with the water planning

process. Finally, I asked respondents who I should not miss talking with about water issues in their community.

Of the 74 total interviews, 56 were audio recorded, and 17 took place over the telephone or were not recorded. Recordings and notes from the interviews were transcribed and coded for themes.

Interview Analysis

Themes from the interview data were separated into two categories, those from the literature, and in situ themes, meaning those that surfaced in the data. For each category, I identified several sets of themes. These were initial larger groupings of ideas that constitute my primary codes, which were then honed into narrower and more exact secondary themes, which helped me organize the large amount of data in my qualitative interviews.

Themes from the literature included the following sets: 1) rural themes and rural-urban divide or interdependence; 2) climate change, wicked problems, and clumsy solutions; and 3) power: within communities and between communities and the state.

In situ themes included the following sets: 1) geographic context-specific themes; 2) water issues; 3) governance and policy; 4) politics, money, and legal issues; 5) other key themes (see Figure 3).

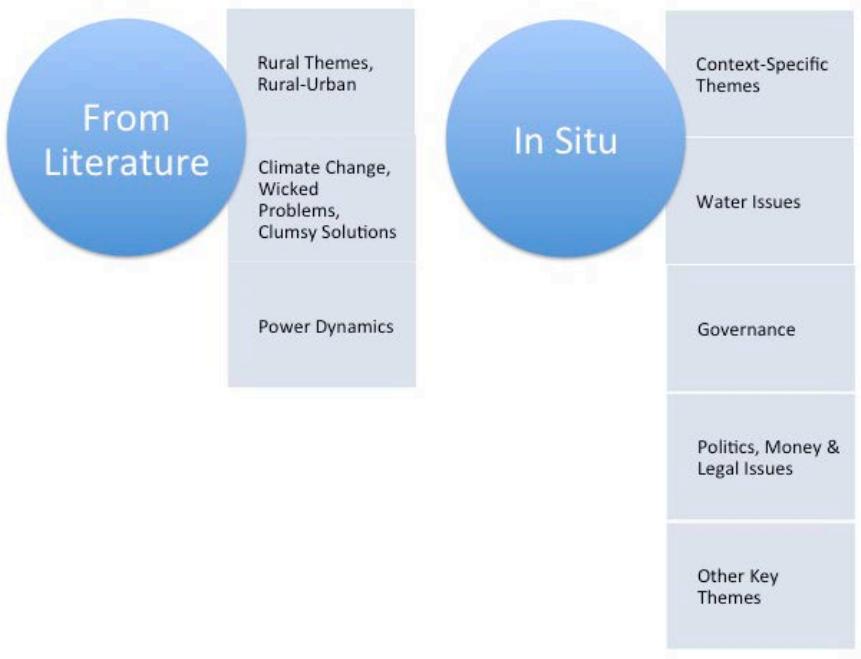

Figure 3. Theme Coding Overview

As described in Figure 4, rural themes included conversations about the definition of rural, which was epitomized by one respondent's comment, "It depends what you mean by 'rural.'" As discussed earlier, rurality can be a difficult concept to wrap one's head around. I did not definitively tell respondents what counts as "rural," but allowed them to tell me about their own perception of rural. In addition to the

secondary theme "Definitions of Rural," I used tertiary themes describing the different measures most often used, including population count, population, density, and geographic remoteness, as well as a category for other measures. This set also includes comments referring to or describing both the rural-urban divide and rural-urban interdependence. These consist of the secondary themes of rural economies, use of urban tax dollars for rural benefit, capacity, and the conflation of rural and geography. Tertiary themes under rural economies include the concept of water as intimately tied to the livelihood of rural people or communities, agriculture, and a category for other rural economic issues such as unemployment, single industry, and more.

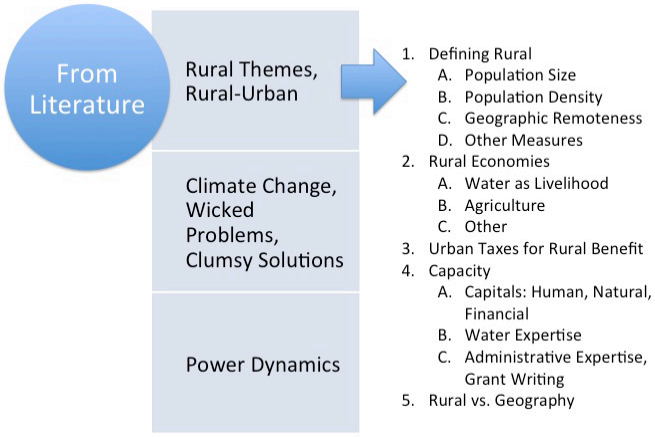

Figure 4. Theme Coding: Rural, Rural-Urban Themes

Climate change, wicked problems, and clumsy solutions are three vast areas of research that I have lumped into a single theme (Figure 5). I did this because respondents spoke of climate change often, either by naming it overtly or by

alluding to its occurrence and results. However, wicked problems and clumsy solutions were not in the vocabulary used by interviewees. Although respondents did not speak the words "wicked problems" or "clumsy solutions," I extrapolated these concepts from their comments. For example, the way they described grappling with climate change and related manifestations fell into the category of "wicked problems." One example is that some stakeholders, concerned about intense storms with heavy precipitation in the winter and longer and drier-than-normal summers, have proposed removing water from the Columbia River and other sources to store it for use in the summer. However, seemingly excess flows in the winter serve important purposes, such as sending messages to fish that it is time for the next stage of the spawning cycle. These "seasonally varying flows" were the focus of a taskforce put in place by Senate Bill 839 (2013), designed to understand the functions served by high flow periods, with a goal of protecting those, while also gauging how much water might be diverted for use during low flow periods. With stakeholders whose values are potentially conflicting, for example, for setting aside winter water for human use in the summer versus preserving water instream for ecological functions, the taskforce's work was difficult to define: should the measure be how much water can be removed, or how much water is needed for fish and other functions? Similarly, many of the solutions currently being explored to address manifestations of climate change sounded like "clumsy solutions" to my ears, incorporating not one-size-fits-all solutions, but geographically varied and locally driven ones. For example, Place-Based Integrated Water Resources Planning,

set out in Senate Bill 266 (2015), relies on communities to identify their top water challenges and take an active role in developing solutions. Although not termed as such by interviewees, I have categorized them this way because they align with the concept of "clumsy solutions" discussed by Verweij, et al (2006).

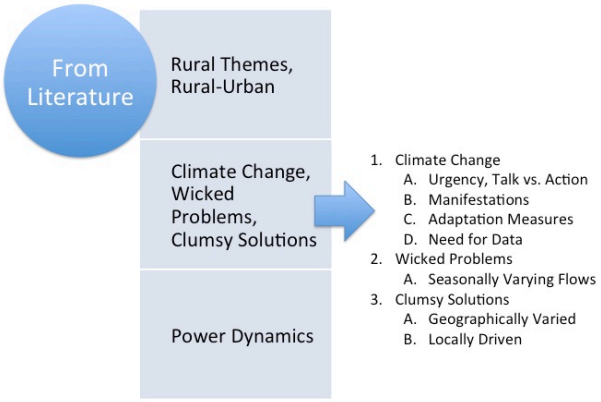

Figure 5. Theme Coding: Climate Change, Wicked Problems, Clumsy Solutions

Power dynamics are an important theme in the literature about the interaction between rural and urban communities (Figure 6). There are two types of power dynamics that I sought to identify in the data. These include power between the state and the community and power among actors within the community. This idea includes whose voices are heard, who is invited and how they are invited to participate in working through policy problems and developing solutions, and the relative influence of different kinds of stakeholders. Where collaborative partnerships are concerned, a key factor is whether partners are "all in," meaning they are risking not getting everything they want or need and are committed to

seeing the partnership through even if the verdict is not wholly satisfying to them. For communities, this is often not a choice; it is a privilege to be invited to the table for collaboration at all as an entity that does not have authority to make final decisions. For state interests, however, agencies and organizations may have the authority to override community wishes or to leave the collaboration when outcomes threaten their position. Within a community, there are some who will have more resources than others, typically in the form of human capital, financial capital, and more. These resources make it possible for their interests to be represented in ways those with fewer resources are not. To achieve equity, community leaders may need to be intentional about who is at the table to discuss issues that affect the community.

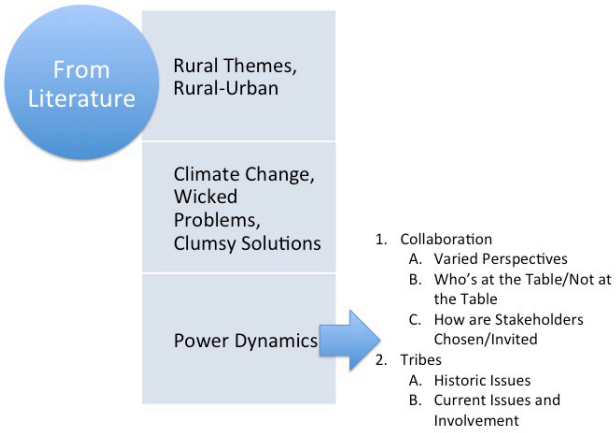

Figure 6. Theme Coding: Power Dynamics

In addition to themes from the literature that I sought in the interview data, a number of other sets of themes emerged in situ, that is, from the interviews

themselves. I organized these into five sets, with a sixth used for my reference: context-specific themes; water issues; governance; politics, money, and legal issues; and other key themes; and places, people, and organizations referenced by the respondent.

Context-specific themes (Figure 7) are comments that refer to a specific or geographic area or community; secondary themes included specific issues and solutions.

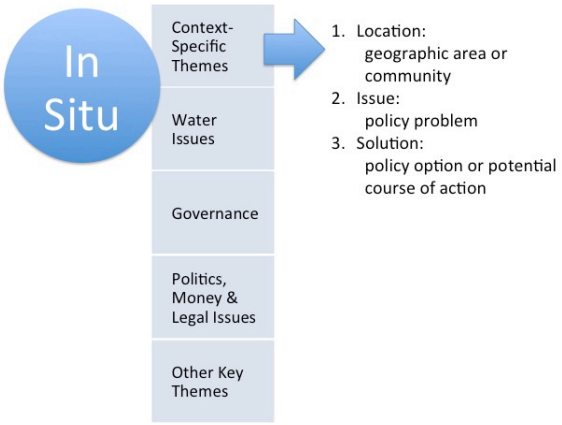

Figure 7. Theme Coding: Local Problems

Water issues (Figure 8) are comments regarding the most frequent water issues mentioned by respondents, including water quantity, water quality, multiple competing uses for water, and infrastructure for the treatment and delivery of water; secondary themes included water storage and types of surface and groundwater storage, alternatives to water storage, drinking water quality and

different sizes of water systems used by households and communities, and multiple benefit possibilities for addressing water quantity and quality issues through collaboration of competing interests

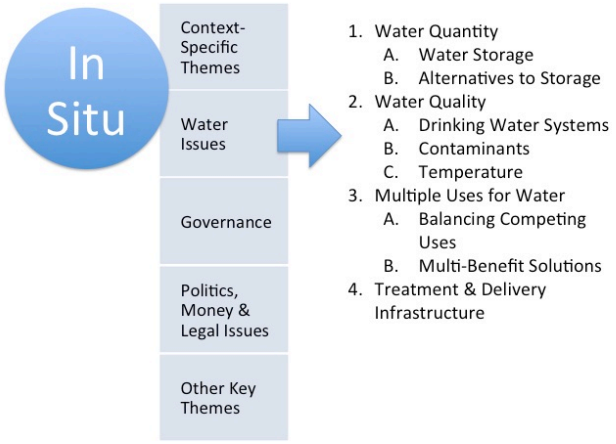

Figure 8. Theme Coding: Water Issues

Governance issues (Figure 9) are comments related to policies, policy processes and formation, policy implementation, federal policies and issues, and unintended consequences of policy.

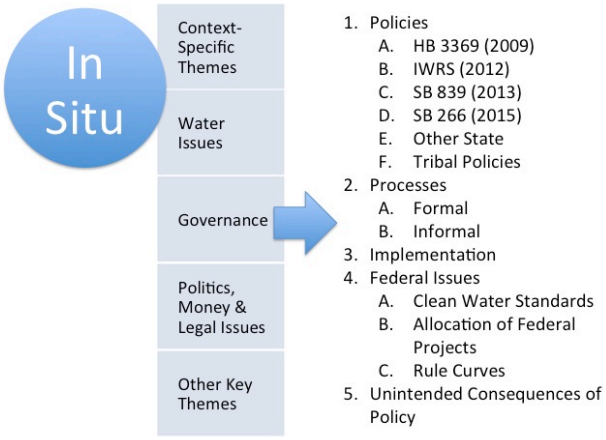

Figure 9. Theme Coding: Governance

Politics, money, and legal issues (Figure 10) includes comments that refer to the push and pull of stakeholders to achieve a preferred policy result; influences related to money, including funding, and the need for funding; legal aspects of policy shaping, including but not limited to environmental challenges and fish issues.

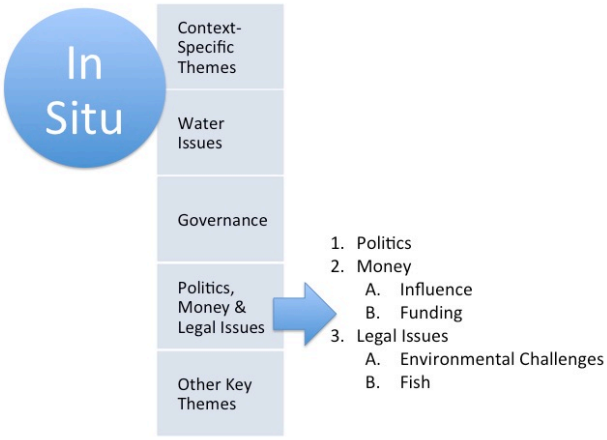

Figure 10. Theme Coding: Politics, Money & Legal Issues

Other key themes (Figure 11) include issues not initially associated with the water quantity and quality concerns of the research design, but which emerged as important related matters; among them, Western water law or prior appropriation doctrine for water rights, science and legitimacy of information, the connection between water policy and land use, and potential use of market solutions, including water pricing, in the future.

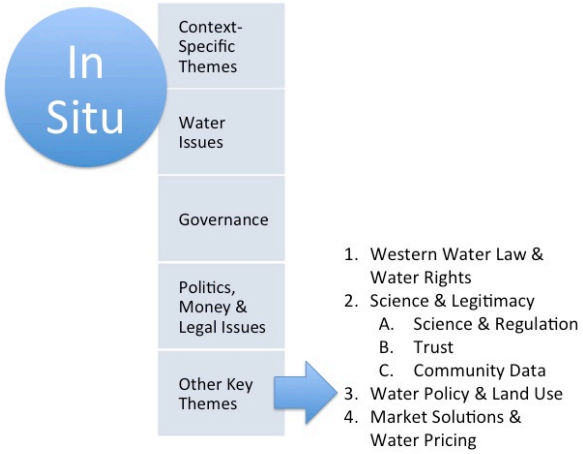

Figure 11. Theme Coding: Other Key Themes

Finally, I noted the reference to places (meaning geographic locations or communities), specific people, and organizations or agencies made by the respondent. This was to have a quick reference to the number of respondents mentioning a specific place, person, or organization, and to be able to find related quotations quickly.

Results from the interviews were analyzed for common themes across responses, areas of disagreement, and unique themes that point to place-specific or stakeholder-specific concerns. To accomplish this, I coded the transcribed interviews, identifying primary and secondary themes. To maintain the confidentiality of respondents, results of the data are being reported in aggregate. Quotations have been chosen to illustrate important concepts from the data.

These methods were chosen to explore how water issues are affecting rural communities differently around the state of Oregon. An analysis of recent state water policies, interviews with state level policy professionals, and three rural community case study communities provide important data on the usefulness of the rural-urban divide as a tool for decisionmakers and when individualized solutions are necessary.

4. Oregon Water Policies

In order to study water policy in Oregon, I first had to understand the background. I did this by conducting an analysis of recent legislation related to water in the state and by learning about other important history and policies that influence decisions about water today. In this section, I provide information about the number and content of recent state legislation relating to water; discuss four specific measures that connect directly to this project; and touch on historical and current state and federal policies with direct relevance to this research.

State Legislative Measures Relating to Water

The Oregon State Legislature is a "citizen legislature" that does not remain in session year round. Instead, they meet during odd numbered years for a full legislative session, which begins in February and may not exceed 160 days. In even numbered years, a short legislative session is held, beginning in February and not exceeding 35 days (Oregon State Legislature). The bulk of legislative work takes place during full sessions, when much more legislation is proposed and there is additional time for legislative committees and both chambers to work through measures.

I used two search engines available through the state legislature to find all proposed measures related to water during the regular and short sessions of the legislature over the last ten years (2007-2016). I found a total of 148 measures proposed during this period that included water or irrigation in the "relating to" clause, a tag line at the start of a measure that indicates the subject of the measure. Other measures contained reference to water within the text, but because water was not the focus, they were not included in my count. An example is Senate Bill 1530 (2016), which contains the word water in the text, but which relates to mining and would have required state agencies to work with federal agencies to address placer/suction dredge mining rules.

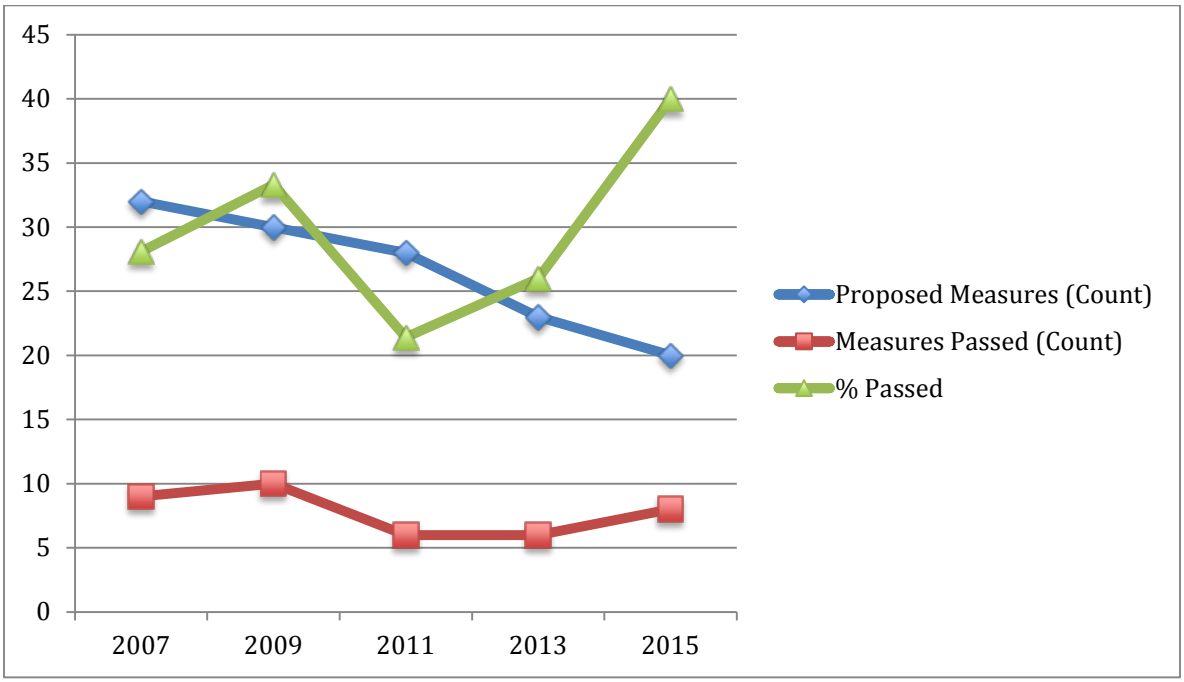

Figure 12. Number of Proposed, Passed State Legislative Water Measures, 2007-2016

Of the 148 measures, 42 passed out of the legislature (Figure 12). These were either signed into Oregon law or forwarded to federal lawmakers, as in the case of Senate Joint Memorial 201 (2016), which urges Congress to continue to set aside funds for prevention of aquatic invasive species.

Many of the water-related measures passed during this decade were related to fees or administrative issues, for example, Senate Bill 261 (2015), which increased the fee for inspecting ballast water on a vessel to $88. However, during each session for which one or more measures were passed, three subject areas surfaced that came up frequently in the interview findings. These are measures to address water quantity or supply, water quality, and water rights (Table 3).

Legislative Session	Proposed Legislation Related to Water	Number Passed and Signed	% Passed	Passed Water Quantity	Passed Water Quality	Passed Water Rights
2007	32	9	28%	0	2	2
2008	1	1	100%	1	0	0
2009	30	10	33%	1	2	1
2010	1	0	0%	0	0	0
2011	28	6	21%	0	2	1
2012	2	0	0%	0	0	0
2013	23	6	26%	1	2	2
2014	4	0	0%	0	0	0
2015	20	8	40%	1	0	2
2016	7	2	29%	1	0	0

Table 3. Recent State Legislative Water Measures Passed, Oregon State Legislative Information System Data, 2007-2016

Discussion of Oregon Water Measures

Four recent water measures passed by the legislature are particularly helpful in understanding the context of this research. Chronologically, the measures unfolded with funding for feasibility studies first (House Bill 1069, 2008), then the Integrated Water Resources Strategy was authorized (House Bill 3369, 2009), implementation funding was appropriated (Senate Bill 839, 2013), and finally the Place-Based Planning program was funded (Senate Bill 266, 2015). However, as all four bills are

now in place, they are part of an ideally linear process that communities may use to address the full range of water-related issues facing them:

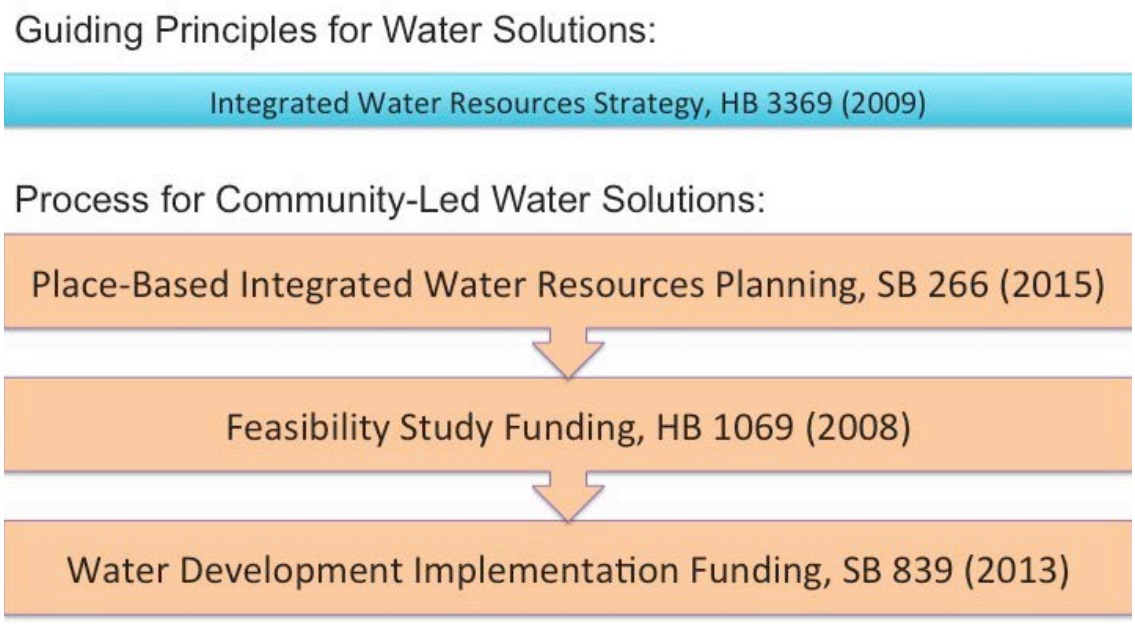

Figure 13. Key Oregon Policies to Address Community Water Problems

House Bill 3369 (2009): The Integrated Water Resources Strategy

The Integrated Water Resources Strategy (IWRS) was authorized by the state legislature as part of House Bill 3369 in 2009. The process of developing the IWRS was led by the state Water Resources Department and involved collaboration with stakeholders from various government agencies, non-governmental and public organizations, private businesses and citizens to develop a vision for the future of

Oregon's water. Several of my interviewees pointed out that while getting from today to the future is heavily contested by stakeholders, it is encouraging that people from very different backgrounds and perspectives can agree that in the future stakeholders want an Oregon with abundant, clean water to serve a variety of human and ecological purposes. To achieve this vision, stakeholders articulated a framework with four overarching goals for the state (Oregon Water Resources Department, 2012):

1. Improve our understanding of Oregon's water resources
2. Understand instream and out-of-stream needs
3. Understand the coming pressures that affect our needs and supplies
4. Meet Oregon's water resource needs

Stakeholders chose not to include any goals, objectives, critical issues, or recommended actions in the strategy that could not be approved through consensus, which means that stakeholders either all agreed, or those who disagreed did not protest its inclusion. The strategy stressed that specific actions to be taken would be developed as bottom-up plans, and the process to create the strategy itself was undertaken with the same goal, that those affected and interested in the outcome of such processes and plans would be able to make their voices heard along the way. Ultimately, the Integrated Water Resources Strategy brought stakeholders together to determine priorities for the state and recommendations for

how long-term goals could be met; however details related to next steps were not included in this effort.

House Bill 3369 was also originally intended to be a water supply development plan, which would provide funding for infrastructure projects. Strict requirements for environmental protections were included in the legislation as a condition of public funding, and was never used for this purpose. This bill was a precursor to Senate Bill 839 (2013).

Senate Bill 266 (2015): Place-Based Integrated Water Resources Planning

Ideally, communities would come together around water concerns and apply for funding and assistance from the state in the next phase of the process. This effort is intended to be collaborative, with the community self-identifying as a collection of people and organizations with common interests in a shared water system.

Place-Based Planning encountered opposition at the legislature in committee for a few reasons. First, many find water planning to be reminiscent of land use planning, which has been the source of controversy for decades in Oregon. Second, the nature of place-based planning processes is that they begin rather ill-defined; for decisionmakers allocating funds and binding authority, this can be frightening. Finally, and perhaps most reflecting the rural-urban divide, there is concern about

place-based plans supplanting western water rights by designating “highest and best uses” for water for something outside the purview of the prior appropriation system. Still, the bill was easily passed in both chambers, with a combined total 74 “aye” votes, 11 nays, and 5 excused (Oregon State Legislature).

Oregon’s land use planning system, put into place in the mid-1970s, was controversial and had unintended and significant consequences that the state has still not recovered from or determined quite how to address. Senate Bill 100 (1973) started a process by which communities would develop a plan for growth, and then designate urban growth boundaries that would restrict uses other than farm and forestry outside the boundaries. The goal was to prevent urban sprawl that was manifesting in many cities around the country after WWII as a result of policies such as federally backed loans for families to purchase new homes in suburbs and appropriations for highways. One of the key reasons for land use planning in Oregon was to protect open spaces and farmland from being gobbled up by urban centers (Oregon Department of Land Conservation and Development). The downsides to the land use plans were several. For one thing, the process was seen as somewhat top-down governance, and communities that had worked with stakeholders to develop a plan for their area had to get approval from the state for that plan. After the plans were in place, making changes was (and continues to be) extremely difficult. This began by design, so that by entering into a binding agreement, communities would not easily override their plans and make the effort fruitless. Eventually, however,

farmers, who were protected from urban sprawl, found themselves wanting to retire or sell a part of their property for additional revenue or split up property to support additional family members. Unfortunately, the plans made this difficult as well. Specifically, parcel sizes were (and continue to be) strictly enforced, and local planning commissions and the state Land Use Board of Appeals have ultimate say in whether a situation exists that merits exemption from these rules. The result is that farmland stays in large parcel sizes, and additional residences on a property are subject to review and limited. Farmers, then, often do not have the option of selling off part of their property for additional revenue or dividing the parcel for additional family members, and the sale of the entire property nets a lower price than a property within the urban growth boundary because of the restrictions on the land's use. One state senator said, "…if you liked land use planning in Oregon you're gonna love Place-Based Planning" (Thomsen, 2015), giving voice to the fear that water plans will encounter the same difficulty as those made for land use: a plan that is too easily overridden makes the investment of time and resources pointless, while a plan that is too restrictive makes it difficult to account for unforeseen effects. The latter is of particular importance to rural communities that may not have the power to effect change should their interests, especially economic, be threatened.

Second, opposition to place-based planning resulted because the program was not well defined at the start. Because the entire basis of place-based planning is defined by the communities that participate in it, there is a necessary trade-off between this

style of bottom-up governance and state control over a program. For decisionmakers, this is a risky proposition; there is the possibility that local leaders will come up with very different ideas than experts at the state level would choose. The outcomes of projects proposed by communities are also hard to predict, when the planning is not directed by state leadership.

Finally, opposition surfaced out of concern that place-based planning efforts would override or seek to overturn the prior appropriation system that is the basis of western water law. The issue here is that water rights holders, especially senior agricultural irrigators, could potentially be pressured or coerced into giving up their water rights for the sake of meeting other state-defined objectives.

The good news about Place-Based Planning is that objections have been taken into account and appear to be used to make the program stronger. First, place-based efforts have been intentionally distanced from land use planning by being voluntary and locally driven. Communities that do not wish to take part in planning processes are not compelled to do so. And in fact, it is only a small number that have, at this point, been chosen to participate. This answers, at least in part, the objection about investing in an ill-defined and unproven (within Oregon) technique, as a relatively small appropriation of $750,000 has been set aside for initial efforts. The funding, in coordination with supportive services provided by state agency staff, will support an initial four pilot projects around the state (Oregon Water Resources Department,

2016). As part of the process, stakeholders are guided by the ideals and goals in the Integrated Water Resources Strategy, and continue to be constrained by existing water laws. This dovetails into concerns about prior appropriation laws; while there is consideration for the need to be flexible with perverse incentives to maximize water use ("use it or lose it") and other challenges of prior appropriation with water rights temporary transfers and leases, this law has not been successfully challenged and remains a foundational feature obligating planners.

Senate Bill 1069 (2008): Feasibility Study Funding

Senate Bill 1069 established the Water Conservation, Reuse and Storage Grant Program. The funding provided through the program is available, contingent upon a local match, to pay for feasibility studies for projects for communities. The grant cycle takes place every two years, and feasibility grants have been awarded three times. The 2009-11 cycle awarded 21 recipients a total of $1.3 million; the 2011-13 cycle awarded 18 recipients $1.1 million (a 19th recipient declined); and the 2013-15 cycle awarded 14 recipients just over $700,000 (Oregon Water Resources Department).

A study was commissioned by the 2007 legislature in response to water supply concerns in Oregon. Funding was allocated for the Oregon Water Supply and Conservation Initiative, which supported the study. A 2007 bill to fund studies of

potential conservation, reuse, and storage projects was not passed, but set the stage for SB 1069, which was introduced as a committee bill by the Senate Committee on Environment and Natural Resources, chaired by Senator Brad Avakian. The measure was carried on the floor in the House by Republican and rural Representative Bob Jenson from Pendleton and Democratic and urban Representative David Edwards from Hillsboro. Senator Avakian carried SB 1069 in the Senate. The bill was passed almost unanimously by both chambers, with 86 aye votes and four absent members not voting (Oregon State Legislature).

Senate Bill 839 (2013): Water Supply Development Account

Senate Bill 839 (SB 839) was passed by a combined margin in both chambers of 89 "aye" votes to 1 nay. The work on this bill took place over the course of at least a year before it was put into law, spearheaded by a diverse group of water interests that came together in informal meetings to prepare for presenting the idea of public funding for water storage projects to the legislature for authorization and funding. A group of state level policy professionals, and stakeholders representing a broad array of organizational values and political ideologies, formed a group known informally as the "Water Avengers" to address water availability in the state. Water storage, which had been a taboo topic for some years after a legacy of environmental harms from in stream dam projects, was becoming a popular policy solution to adapt to the changes in the hydrograph associated with climate change

that were affecting communities around Oregon. In 2009, House Bill 3369 had been intended to set up a program to help communities develop water storage projects; however, the bill was heavily influenced by legislators' political goals and did not meet the functionality test for communities, which were unable to use the funding due to restrictions in the bill. One person said:

> *…we are going to have a $20 million water investment in water infrastructure, and I said, 'how are you going to disburse the funds? [Laughs] You got no program, because nobody is willing to use the program that was created,' and it was House Bill 3369 (Non-profit Staff).*

The Water Avengers brought forward a legislative concept that had been agreed upon by the group's diverse interests to make it easy for legislators to say yes. With help from champions such as Rep. Cliff Bentz, the bill was honed and found almost unanimous approval in both chambers. Yet some are still concerned that environmental standards in SB 839 pose too many restrictions. One respondent said it is time to test the theory:

> *…we started this conversation with the fact that no one would use the HB 3369 program because the environmental hurdles were too high, and then we are again facing where folks are saying, 'look we are not going to use SB 839 because the environmental hurdles are too high, though they are lower than*

> *they were in HB 3369,' so that's why I said, 'ok, enough water law talking, enough policy talking, is time to actually get out on the ground [and] do a project (Non-profit Staff).*

Other Relevant Policies

A number of other policies, state, federal, and tribal, have contributed and continue to have an impact on water issues in Oregon, and though they do not feature prominently in the interview findings, they provide background upon which today's water conversations rest. An exhaustive list is not provided here, but I would like to briefly highlight a handful.

First, in 1902, the US government passed the National Reclamation Act that provided authority and funding to divert water into large storage projects for irrigation projects and flood control. The Bureau of Reclamation was tasked with building this infrastructure and developing contracts with irrigation districts and others for use of the water (Bastasch, 2006). The US Army Corps of Engineers works closely with the Bureau of Reclamation and is responsible for regulating and operating dams and reservoirs for purposes of flood control, hydroelectric power, and more, authorized by the federal Flood Control Act of 1936 (Bastach, 2006). In recent years, the state of Oregon has made recommendations to the Bureau to adjust allocations of water originally earmarked specifically for irrigation and flood control

only to take into account other out of stream and in stream values. Recommendations have also been made to the Corps to adapt rules for management of reservoirs to account for changes in the hydrograph related to climate change. Specifically, releasing water from reservoirs for flood control may be less necessary in spring and changing this rule may be an opportunity to take advantage of water storage for longer dry periods later in the year (Bastasch, 2006).

Drinking Water Quality is largely governed by federal standards set forth in the Clean Water Act amendments and Safe Drinking Water Act set forth in the 1970s (Vig & Kraft, 2013). In Oregon, the responsibility for monitoring and regulating pollutants and temperature of surface water sources to federal standards belongs to the Department of Environmental Quality. Drinking water standards are monitored and regulated by the Oregon Health Authority. Water quality in certain areas falls to other organizations, for example, monitoring and regulating water quality on federal forest lands falls to the Forestry Department (Bastasch, 2006; Legislative Committee Services, 2014).

Another key policy is the 2001 Oregon State Tribal Government-to-Government law. The relationship between the nine federally recognized tribes in Oregon and the state is complex because each is recognized as a sovereign nation existing and operating within the borders of the US. Technically, the state of Oregon is not a peer to the tribes, in the same way that the state is not a peer of the country of Canada.

The benefit of this is to allow tribes to live according to policies that make sense for their people; the drawback is that state policymakers and implementers have not historically been required to consider tribal consequences to programs and actions. The 2001 law institutionalized an obligation for state agencies to communicate with tribes, learn about local tribes, develop a policy for addressing tribal concerns, attend a yearly agency-tribal summit, and report on the government-to-government process annually (Legislative Commission on Indian Services, 2016). This policy is particularly important for water issues, which concern shared or complementary resources. Water is not only essential to life, but is considered by many Northwest tribes to be, as the Confederated Tribes of the Umatilla Indian Reservation put it, one of the prized "first foods," and critical to the other first foods, including salmon, wild game, roots, and berries (Cooke, 2009).

Summary

Recent state level water policies help provide background for understanding findings from state and rural community case study interviews. The current focus in the state legislature on developing water conservation, reuse, and storage infrastructure to assist communities in addressing problems related to physical system changes such as drought and reduced snowpack set the stage for the key concerns voiced by state level water policy professionals and help show the complexity of addressing the needs of diverse rural areas. Other relevant policies

mentioned point toward important areas for future research or critical links not explored elsewhere in the paper.

5. Results of State Level Interviews

As expected, state level findings were noticeably different from the community case study findings. Stakeholders at the state level provided a big picture view of water issues in Oregon. Interviews were focused on water storage and drinking water quality, which are currently of particular relevance in the state. To develop my interview protocol, I drew on what I learned about water policies in Oregon through my prior work at the state legislature, supporting the work of an individual legislator, the Coastal Caucus, and several legislative committees that dealt directly or indirectly with issues of water, as well as consultations with several people suggested by my doctoral committee. I chose a purposive sample of 39 professionals involved in water policy at the state level in various capacities. These respondents included people who would be present at a typical water-related legislative hearing in Oregon, representing a range of ideological perspectives and entities that are involved in water issues, including organizations focused on municipal and agricultural uses, environmental and conservation groups, policymakers, regulators, attorneys, academics, tribes, and more. Interviews ranged in length from about 25 minutes to an hour and a half; most interviews lasted about an hour.

The benefit of qualitative research is that it provides rich data about the subject matter, which is certainly true about the information I received from my interviewees. Respondents told a story of which each had a piece, and the major

findings provide the background about water issues in Oregon and set us up to understand how water issues affect rural communities around the state. Four key findings emerged from the state level interview data:

1. Water policy is influenced by state history and political baggage
2. Leadership plays an important role in fostering interdependence, rather than competition between rural and urban Oregon
3. Physical system changes are affecting communities, especially rural communities, around the state
4. A perfect storm of changing climate, Western water law, and the rural-urban divide are causing serious water issues in Oregon

Each is discussed in detail below using information from the interviewees.

State History and Politics

Water policy in Oregon is influenced by state history and political baggage. Two fundamental examples of this are land use planning and Western water law. A number of respondents spoke at length about the connections between water and land use policies. The Integrated Water Resources Strategy likewise highlights this important link, noting that protections for water and land are critical to ensuring

"long-term sustainability of Oregon's ecosystems, economy, and quality of life" (IWRS, 2012).

First, interviewees told me that the connection between the two topics has deterred stakeholders from engaging in water planning up until recently, and that often simply using the word "plan" can shut down a discussion. One respondent described in detail a well-meaning program with unintended consequences:

> *You've got to go back to the late 60s and early 70s, and that's when the state of Oregon adopted this land use law. The land use law was very controversial for a lot of people. It was painful to go through, but the purpose of the land use law was to delineate city and urban areas, farming areas, prevent sprawl into farming areas, so they created a [policy where] you identify your urban area and your urban growth boundary, and you confine your activities to that and leave the farmers alone. Let them do their thing (Agency Staff).*

The 1973 law required each city and county to develop a comprehensive plan, which would demarcate the future urban growth boundary and limit development outside of that line. The process was made mandatory and is guided by the state. Although it requires local stakeholder involvement, decisions made by stakeholders are subject to approval by the state. Changes to plans continue today to be difficult to make, subject to veto by the state (Department of Land Use and Conservation).

The Water Resources Department did not technically need to obtain permission from the legislature to engage in the statewide visioning process that led to the Integrated Water Resources Strategy (2012), but because so many stakeholders around Oregon were concerned about a result that would mirror land use comprehensive plans, the Department chose to go through legislative channels to legitimize the work. What stakeholders were most concerned about are the same things that drove opposition to Senate Bill 266 (2015): that the planning process would be driven by urban ideologies of highest and best use of the resource; have a disproportionate cost to rural industries, communities, and ways of life; that local decisions would need permission from the state and could be vetoed; and that plans would be ironclad and inflexible (Oregon State Legislature).

Several respondents offered that earlier water planning efforts, which resulted in Basin Programs or Basin Plans, a part of water administration in the state from 1955 through the 1990s, were plagued with similar problems. Basin Plans were meant to integrate an inventory of available water with a study of beneficial uses for said water (Bastasch, 2006). Interviewees who referenced Basin Plans cited top-down governance as a key failing, especially because plans formed jurisdictions that did not coincide with communities' sense of water community, and indicated that current policies were an important revisioning of how water policymaking should work in Oregon, community-driven and guided by statewide principles. Not all

respondents supported this idea however; one stakeholder voiced a preference for more centralized decisionmaking around water:

> *…there are a lot of people who'd like [the place-based planning] approach because it's a sign of…more local control; water is a public resource and it's a state resource, and it needs to be managed so that we don't have this patchwork balkanized approach to water around the state (Non-Profit Staff).*

Other respondents mentioned the connection to land use as an indispensible part of water planning. Specifically, respondents noted that to make land use decisions, the state needs comprehensive groundwater information, as well as an understanding of how groundwater and surface water interact and the recharge patterns of aquifers. As one respondent put it:

> *…if counties are going to make appropriate land use decisions they need to know where the underground water is (Agency Staff).*

One respondent from rural Oregon argued that it is important to discuss differences between Place-Based Planning and land use planning, and to illustrate how the former can be particularly beneficial for rural communities. They said:

> *The problem when we talk about water is a lot of people are thinking this water thing is going to work the same way as the land use plan. One of the differences is everybody had to go through the land use planning process. They don't have to go through the place-based plan; they can do it if they want. They can go it on their own if they want. But if they want some help from the state, some financing, this is the way you want to do it, then you can get some help, but you don't have to do that (Agency Staff).*

Another critical piece of history and political baggage is Western water law. Respondents brought up the significance of the prior appropriation doctrine that is foundational to Western water law and which is sometimes explained as "first in time, first in right." The queue is important in Oregon, especially because respondents described water as an "overpromised" resource where all basins in the state are overallocated. Water rights are based on average flow, and when flows are below average, junior water rights holders receive water only to the extent that there is still some available after more senior water rights holders take what they are legally entitled to take.

These rules include what respondents described as perverse incentives, where senior water rights holders can lose their allotment if they do not use it, and so are incentivized to use more than they need, even in the face of a shortage. One respondent summed up the difficulties of the Western water rights system:

> *We have policies that say anybody who has their own water right can pump 'x' number of million gallons a day. No one can drink that much water, but nobody wants to change it because they don't want to give up something that they currently have…Then we have our ancient policies with respect to water for surface water and others about the oldest right gets the deal. Is that a good way to manage water? It is the way the west has chosen to manage water, but does it really work well to give everybody who needs part of it what they need? (Legislator)*

Interviewees called prior appropriation "set in stone," "hard to get around," and "the third rail of water policy." In spite of what respondents called forward movement in the legislature to approve some pilot project temporary water rights transfers, interviewees sounded sure that prior appropriation is both problematic and not going away.

Role of Leadership in Fostering Interdependence

Leadership plays an important role in fostering interdependence, rather than competition, between rural and urban Oregon. A champion or charismatic leader can be critical to the success of a policy, and water policies in Oregon are no exception. In my interviews, a number of respondents mentioned being an integral

part of the development of Senate Bill 839 in particular, or mentioned the names of others who were, as a moment that signified a change in direction for Oregon water policy. The legislators cited most frequently whose actions led to the bill were Jefferson Smith (D-Portland), Bob Jenson (R-Pendleton), Jackie Dingfelder (D-Portland), and Cliff Bentz (R-Ontario). These names are important because these individuals were discussed as champions of water generally, people who used their positions to focus state attention on issues related to water. It is notable that all except Cliff Bentz have moved on to other positions, and some interviewees were concerned about a possible vacuum in water leadership that might lead to less focus or political will to invest in water issues. An example is the issue of drinking water quality in residential wells that are exempt from testing requirements, which has been an area of concern because contaminants like arsenic and nitrates are unregulated. One respondent described the leadership vacuum this way:

> *…when Senator Dingfelder was here, she was very, very interested in [drinking water quality in residential wells] and there were frequent updates and interactions. Now that she's left, [I don't know of] anybody who has followed that project in that same kind of way (Legislative Staff).*

Smith and Jenson were the legislators most closely tied to House Bill 3369 (2009), which was the precursor to the water development program in Senate Bill 839 (2013). Respondents described the passage of HB 3369 as a difficult time in the

water community, because it was developed largely by the legislators to address the need for water storage with what interviewees called "environmental sideboards" in place before allocating public funds for water development and storage projects. In describing the disappointment of the bill, one respondent said:

> *What ultimately passed was all well and good, but was never going to get implemented and actually used because the requirements were so far out of reach (Agency Staff).*

The legislators named above are also important because they represent something about the rural-urban relationship in Oregon. Jefferson Smith (D-Portland) and Jackie Dingfelder (D-Portland) both represented urban districts in the city of Portland, while Bob Jenson (R-Pendleton) represented and Cliff Bentz (R-Ontario) continues to represent large rural geographic areas of the state. All brought their own experience, training, concerns, and perspectives to bear on water issues to help the legislature work on these knotty issues. Dingfelder and Bentz were both credited by respondents as instrumental in working toward greater balance in Senate Bill 839, incorporating environmental protections while making sure the program works for intended communities. One respondent described the outcome of SB 839 in this way:

> *There are folks who feel hurt in one way or another by the process, …that there's something about the 839 bill in particular that just about anybody can say they like or don't like, which should indicate it was probably a pretty good compromise. Being able to find that right mix where people will build a project and it pencils out [as] economically viable and also provides environmental benefits and helps do all those things, and finding that right balance (Non-profit Lobbyist).*

One of the important aspects of SB 839 is that it included instituting taskforces specifically assigned to investigate seasonally varying flows and the needs of watersheds, governance, and economic viability before approving future water storage projects. However, the follow up on taskforce work and reports is and will continue to be critical to future policy. Now that Dingfelder, in particular has gone, one respondent is concerned that "no other individual legislator is so focused on making water policy a priority" (Legislative Staff).

Stakeholders who came together to form a group known informally as the "Water Avengers" played another key role. Respondents described how these state level policy professionals, many of whom were interviewed for this project, were aggravated by direction of progress or lack of progress they perceived in addressing water availability problems through policy over the last several legislative sessions. One respondent described the frustration after the 2009 session, which produced

House Bill 3369, a water development bill that did not meet the needs of communities, in these words:

> *Water is hard, really, really hard, to get any sort of compromise or agreement…if you decide to just go behind closed doors, write a bill, exclude people from the conversation, and ram it through [the legislative process]…the community will revolt, and it did. Folks were like, no way, no how, we are not going to use that. It doesn't matter if you put money into that program, we are not going to use it, we've got serious issues with that bill (Non-profit Lobbyist).*

To combat this, the Water Avengers came together outside of the formal legislative system to negotiate their positions and develop an understanding of where they could compromise, how they could work together to achieve common or complementary goals, and where the line in the sand was for each stakeholder, specific issues or stances on which they could not bend. The goal was to bring forward policy concepts to legislators that would meet their collective needs in a way that previous legislation had not.

This group became champions of another sort that did much of the hard work of determining issues of critical importance and reasonable policies that could meet the needs of stakeholders coming from diverse perspectives. One legislator described how important this process was from his perspective:

> *Unfortunately, legislative time and political capital is a zero-sum game. If I have to spend all this time on a policy and it's like beating my head against a wall, it's a waste of time. We [legislators] focus on our areas of passion, and there's usually a correlation between urgency of the matter and how much time we are willing to spend on it (Legislator).*

The work done by legislators and collaborative interests to support the process shows that water is indeed a cross-cutting issue—one that deeply affects both rural and urban communities. It underscores the idea of the relationship as interdependence rather than divide because both rural and urban interests had a stake in the success of water policies, including SB 839, which respondents largely communicated was a step in the right direction, though not without its problems. The policy process, too, requires different kinds of champions, leaders in the formal legislative process and behind the scenes. Yet politics plays out inevitably in legislative system, as one respondent noted:

> *Senate Bill 839 was an attempt to actually put something on the books that might have a chance of being successful. It was a dialogue between agricultural, municipal, and environmental interests who we believed were reasonable. We hashed that whole thing out. Ultimately though what people oftentimes forget is that you can come to an agreement with a bunch of people*

> *around a table and put that agreement to paper and put it in the form of a bill, but the minute it gets introduced as a bill, you don't own it anymore and there are 90 other opinions out there and they get to have a say… It passed overwhelmingly but there were some very hurt feeling because one of the big things that this [SB] 839 did was actually get the water providers or water users and the environmentalists to sit down and try to understand each other's perspectives. It was very successful in that regard. There was a lot of trust built as a result of 9, 10, 12 months worth of work that we put into putting this bill together. Ultimately, much of that work was unraveled as a result of legislators putting their fingerprints on that bill and some environmentalists [were not] happy with what some of the changes were (Non-profit Lobbyist).*

After the passage of SB 839, Senate Bill 266 (2015) initiated the Place-Based Integrated Water Resources Planning program, which was designed with diverse communities in mind, including rural places. However, support for SB 266 by rural legislators was not forthcoming, and illustrates the lingering effects of political baggage at the state level. Those who were most vocal in opposing the bill were from rural communities, and were concerned with the potential for a repeat of the Oregon land use planning process, which bears a legacy of being top-down, rigid governance with unintended and serious consequences for rural Oregon.

Impacts of Physical System Changes

Physical system changes are affecting communities, including rural communities, around the state. Although none of my interview questions specifically referenced it, almost every respondent talked about climate change, its current manifestations, and forecasts for the future. Not every interviewee was comfortable using the term "climate change," which several apologetically explained was because of the baggage that comes with the term. One person described how the science of changes in climate was perfectly acceptable to them; however, neither they nor the people they represent were fully convinced of anthropogenic causes of the changes, the ability of human behavior to make a difference in future outcomes, or that putting the full weight of resources behind tackling climate change in the way some environmental leaders propose is the best way of dealing with the problem (County Official). Some skirted the issue entirely by using the phrase "the new normal," which I came to understand is a term often used by professionals in the water policy community to talk about the issue at hand without imposing a normative view of the solutions available to address it.

Those describing climate change with no reservations said things like the disappearing of snow caps and reservoirs is an "incontrovertible fact," and that the state of Oregon needs a "sense of urgency" to move beyond talking about these issues and develop a plan to address them. Several pointed out that while climate

change was a taboo subject in public circles not many years ago, “five years of drought will change attitudes.”

The problems most talked about by respondents are changes to the hydrograph, which is the plot of volume and timing of precipitation throughout the year. Warming temperatures have already begun to manifest in less snowpack in the winter and are predicted to continue this trend. The snow provides a natural reservoir system for winter precipitation that melts off and is available for use in the warmer months of the year. Without this natural storage, the water may still come, but at different times than when people need it, and they may not be able to capture and store water. High flows from earlier snow melt runoff are predicted to result in different streamflow timing and volume, creating turbidity and sediment in winter months, and longer dry seasons and low flow periods (Dalton, et al., 2013).

These manifestations are localized, however, and solutions are not easily generalized and elegant. Drought, for example, affects different communities differently. Respondents described that for places that rely on rain, no rain simply means no water. On the coast, low flows result in saltwater intrusion that can have serious impacts on drinking water quality. For communities that currently rely on surface water storage in the winter and snow melt in the summer, too much winter water can tax surface water storage systems. Respondents noted that it is more

difficult for communities without surface water storage capability to adapt to changes.

Changes to the physical system have been a critical factor in recent water legislation in Oregon, which has provided an avenue for funding and support for adaptation strategies that include water storage, reuse, and conservation projects. One key example is Senate Bill 839 (2013). The bill provided funding for water storage projects to adapt to drought and decreased snowpack by capturing and storing water for use during dry periods, but it also carved out a requirement for the state to find out more about how the system is changing. As a part of the bill, a taskforce was assigned to study the functions of high flows in the winter and the impact of removing water during this period. One respondent explained the importance of conducting a study before allocating high winter flows:

> *These higher flow events which some people would call floods or other people would call ecological flows, [some people believe] you can just chop the top of the curve off the hydrograph and put it in a storage project and we're all the better for it. That's not true ecologically. We really don't have the mechanisms in place in Oregon yet to understand and then protect those ecological flows that do things like create spawning habitat for salmon or send migration cues to different species or they perform all these functions that we really don't have*

> *a handle on yet, and yet some would say, winter water is kind of in excess, we can just store it and call it good (Non-profit Organization Staff).*

Yet it is not the first time a study of the function of winter flows has taken place. Although a study such as this was not new, participants approached it with a new set of eyes. In particular, two interviewees discussed how changes in precipitation timing has led agricultural interests to focus on winter flows in a way they had not been previously.

> *…there's a general misunderstanding or lack of awareness of the importance of high flow events. I think a lot of folks look at the problem as being low flows in late summer/early fall, and that's the problem that needs to be addressed, and that's what needs to be protected. That's true, it certainly does, but you also have highly valuable flows that occur earlier in the year that from a biological perspective people are aware of, you have those high flow events that trigger salmon migrations, you have high flows that are important for stream morphology, and so I think that discussion is new. The discussion of low summer flows has definitely been around, but the discussion about the importance of protecting these other flows that are important to the ecology of the stream are at least new in terms of the water policy discussion, the water storage discussion. That's not a new subject area, [hydro]geologists obviously have been studying that for some time. In terms of incorporating that into the*

> *discussion with water development, I think that's relatively new. I think people are just getting used to that and building up their knowledge of that subject area (Non-Profit Organization Staff).*

There are tradeoffs that respondents suggested need to be thought about carefully when it comes to diverting or storing water for human uses, or even shared uses, in drier periods. One respondent describes this consideration and the implications for rural communities in Oregon:

> *There's a tradeoff that you have to deal with, and we have put in a system that puts a lot of [environmental protections] in a lot of our passed bills, so that may be a stumbling block with respect to figuring out how to get water… Have we done the kinds of analyses to figure out how much water we really do have? How much the water table is going down on the east side [of the state]? Do we have a chance to recover that? We don't know the answer so we don't know the policy that we should have over there… There are a lot of things to have conversations about, but every one is litigious, and every one of them is a big lift, so most people don't choose to go there. The effects of global warming and the affects of this climate change are going to force us to have to go to some of those places because otherwise, [rural communities will] just dry up and go away. That's the other option. Maybe a state doesn't have small rural communities, it only has big cities where they can actually have the resources*

> *to do it and the rest of them die up and become ghost towns. It's happened before in the West (Legislator).*

A Perfect Storm: Climate Change, Western Water Law, and the Rural-Urban Divide

A perfect storm of changing climate, Western water law, and the rural-urban divide are contributing to serious water issues in Oregon. Geographic variability of climate change effects coincide with the rural-urban divide in Oregon, as availability of abundant, clean water in Portland is not a problem, "they're fine for decades," said one respondent, even in the face of multi-year droughts in most other parts of the state. Another respondent explained:

> *It'll be interesting to you because if you talk to people in Portland who have Bull Run water, they're not going to know if there's a problem with water… and that's probably interesting information to have since that's a very large population who don't really care. It's not going to be an issue to them (Legislator).*

Not only is water availability more of a challenge outside of Portland, rural communities rely on water for their livelihoods, especially with primary industries that include agriculture, fisheries, recreation, and tourism. However, urban interests have been instrumental in raising the alarm about harms to fish, wildlife, and the

natural system by overallocation of water and historical water storage practices like in-stream dams. With respect to water use, one urban respondent described how creating a pricing system for water could help Oregonians use less:

> *We haven't really truly priced water very many places in the west in terms of what its total cost is to society, to the environment… We don't charge anything for it, it's free. Yeah, farmer Jones pays for the infrastructure and the district pays for the infrastructure, but water is free. Aside from sunshine, that's probably the only resource that we do that with…look at the electricity world and [how] we've been able to conserve…because electricity has a price signal and people go, gosh, I have to pay for this so I better use it judiciously. We could do the same thing with water if we had price signals on it (Non-profit Staff).*

Key issues of climate change include changes in the hydrograph that manifest in different amounts of precipitation that come at different times, and perhaps in different forms than Oregon is used to receiving. Several stakeholders mentioned Western water law as a barrier to dealing effectively with manifestations of climate change and adapting to ensure water is available to meet needs around the state. The value taken into account when allocating water is whose right came first; some argue that this produces a systematic bias towards agriculture, which holds many of the oldest water rights in the state. Unfortunately, said several respondents, prior

appropriation doctrine is so engrained that little can be done to change it. Others, like this respondent, think Oregon has already gone too far in eroding water rights through transfers:

> *We haven't created a meaningful water storage project in Oregon probably in the last 50 years. To add insult to injury, we are seeing the reallocation of water stored for irrigation to other higher and better public trust purposes. The Oregon Supreme Court determined that a water right is a private property right, which would be a constitutionally protected right. Yet we see this insidious reallocation of water for other purposes, and since there isn't a complete taking, it doesn't rise to the constitutional level (Legislator).*

This perfect storm represents an opportunity for leaders to take the role of framing the rural-urban relationship as that of interdependence, rather than competition. Like some of the policy innovators in formal legislative and informal or behind the scenes processes working on SB 839, leaders have the chance to create a sense of urgency about issues critical to rural and urban residents, and incorporate a "triple bottom line" that requires projects to provide economic, social, and environmental benefit. This phrase was used by many interviewees and has evidently been a centerpiece of Water Avengers discussions, particularly around Place-Based Planning, as a vital aspect of evaluating grant applications. However, explicit triple bottom line requirements were not included in the text of SB 266 the way they were

in SB 839. One respondent was upset about this and argued that while the concept of a triple bottom line is admirable, "It's not in the rules; it's not in the statute…[and it is the] legal relationship that will determine how people behave." Still, other respondents indicated that in the future, there is an opportunity to use this perfect storm to formally include rural, urban, economic, social, and environmental needs into water policy.

Summary

Interviews with state level policy professionals revealed four key findings, that water policy is influenced by state history and political baggage; that leadership plays an important role in fostering a sense of rural-urban interdependence; that physical system changes are affecting communities, especially rural communities, around the state; and that a perfect storm of changing climate, Western water law, and the rural-urban divide are causing serious water issues in Oregon. These themes provide critical background about the state and serve as a benchmark with which to develop a deeper understanding of rural case study communities, noting ways that issues affecting cases are similar and different than results for the state.

6. Background on Case Study Communities

After interviewing professionals involved in water policy at the state level, I chose three case studies to take a closer look at how water issues affect different rural communities differently in Oregon. My goal was to capture the maximum variation of cases (Flyvbjerg, 2001), which I did by comparing cases representing different types of rural.

The cases were chosen from a list of 16 self-identified communities that submitted applications for funding through the OWRD's Place-Based Integrated Water Resources Planning program (Place-Based Planning) (Oregon Water Resources Department, 2015). This new program was funded by the state legislature in 2015 through Senate Bill 266 as an effort to continue the work recommended in the Integrated Water Resources Strategy (IWRS) (2012). It provides communities with a method to engage with the state to develop a bottom-up water plan tailored to the specific needs of the place in which they live. Place-Based Planning is a voluntary program administered through the Oregon Water Resources Department that provides opportunity to address water challenges, including issues of water shortage, in particular due to drought, groundwater depletion, and changes in the hydrograph associated with climate change (Oregon Water Resources Department, 2015).

Groups of stakeholders with common water interests, typically located in a shared watershed or basin, came together to develop and submit Place-Based Planning applications. Criteria for funding included committing to work with a broad range of stakeholders to collaboratively identify water problems faced by the community; developing a better understanding of water supplies and water quality in the region; considering current and future needs for water; and identifying and prioritizing potential policy solutions to meet community needs. All work is required to fit into the framework laid out in the IWRS (2012).

Fourteen of the 16 applications were submitted by rural communities (Table 4). The largest city in each of these communities includes one without any incorporated city; eight non-core cities (under 10,000 pop.); and five micropolitan cities (10,000-49,999 pop.). The remaining two applications were for a community of suburbs outside of Portland that abuts rural land, and for a community that tracks roughly with the Medford Metropolitan Statistical Area, which is home to over 200,000 people but is relatively geographically isolated (Oregon Water Resources Department, 2015; US Census Bureau, 2015).

Selection of cases for this research was not random and does not reflect every rural community within the state. Cases were chosen from this list purposively, as water stakeholders were self-identified in the applications signifying the urgency of water issues facing them and their willingness to work together to find solutions.

Place-Based Integrated Water Resources Planning Applicants
December 2015

Rural	Applicant ID Region-Basin-District-Name	Applicant(s)	Largest City: Population (2013)
✓	E-08-06-UpperGrandeRonde	Union County	La Grande: 13,074
✓	E-09-08-Powder	Powder Valley Water Control District	North Powder: 428
✓	E-12-10-MalheurLake	Harney County Watershed Council	Burns: 2,728
✓	NC-06-21-LowerJohnDay	John Day Partnership	Condon: 709
✓	NC-07-05-WallaWalla	Walla Walla Basin Watershed Council	Milton-Freewater: 7,099
✓	NW-01-01-NorthCoast	North Coast Land Conservancy	Seaside: 6,453
✓	NW-02A-02-UpperWillamette	Lane Council of Governments	Cottage Grove: 9,795
✓	NW-02B-02-SouthSantiam	South Santiam Watershed Council	Lebanon: 15,930
✓	NW-02B-16-EolaAmityWalnut Hills	Eola-Amity Hills Winegrowers Association	No City
✓	NW-02B-16-PolkWatersheds	Polk County	Dallas: 14,807
✓	NW-02B-16-Pudding	Marion County and City of Silverton	Silverton: 9,369
NO	NW-02C-18-Tualatin	Tualatin River Watershed Council	Beaverton: 93,542
✓	NW-18-01-MidCoast	City of Newport	Newport: 10,117
✓	SC-14-17-Klamath	Withdrawn from consideration by applicant	Klamath Falls: 21,207
NO	SW-15-13_14_19-Rogue	Rogue Basin Partnership	Medford: 77,677
✓	SW-17-19-LowerRogue	Wild and Scenic Rivers	Brookings: 6,374

Table 4. Place-Based Integrated Water Resources Planning Applicants, data from Oregon Water Resources Department (2015) and US Census Bureau (2013).

Each of the three case studies I chose self-identified as communities with shared water issues as a part of the OWRD's Place-Based Integrated Water Planning Initiative. With 14 rural communities to choose from, I selected three cases that represented different kinds of rural (Figure 14). For the purposes of analyzing differences and similarities, this poses a problem of scale. In two of the cases, the "community" tracks roughly with the county, making collection of demographic data relatively simple. The third case, however, is a watershed. The watershed is part of a county and a small piece of the watershed crosses over into a second county, both of which have much different demographics from the watershed.

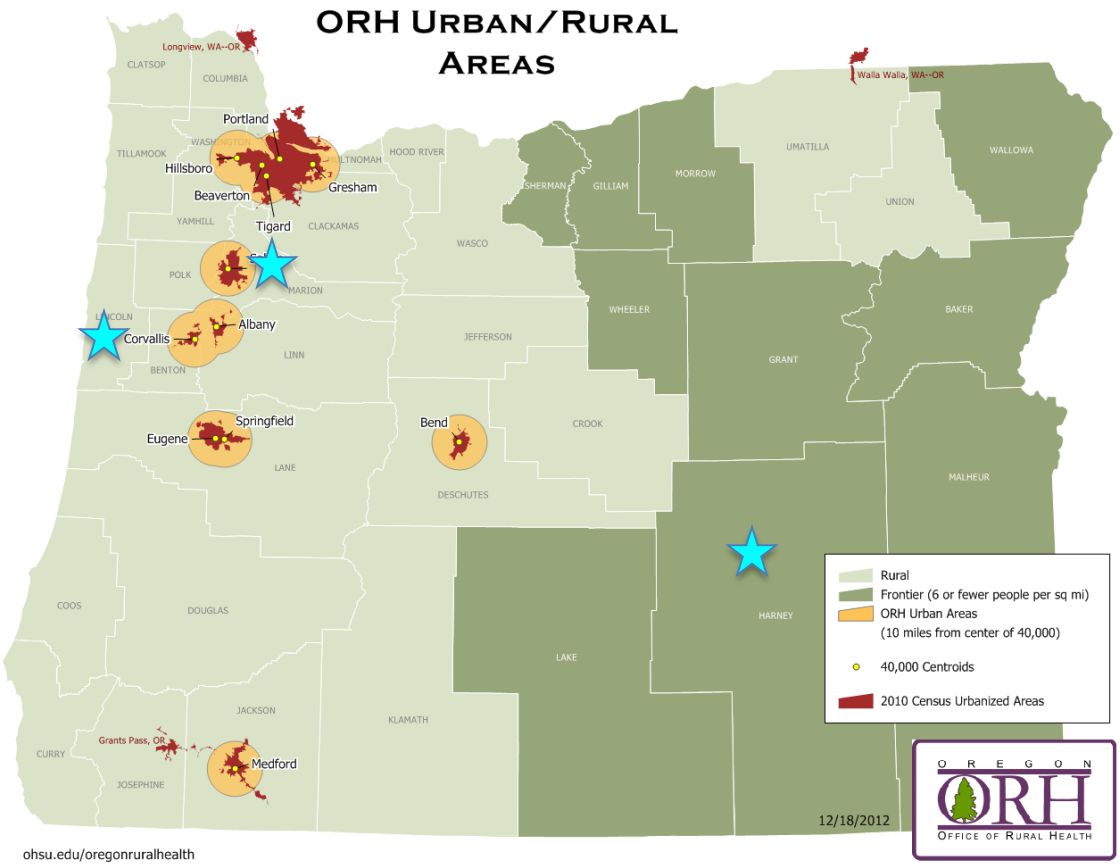

Figure 14. Case Study Communities (2015) Indicated on Oregon Office of Rural Health Map (2012).

First, I chose the Malheur Basin as a community that has a low population count (less than 3,000 people in the largest city of Burns and 7,000 in the nearest county); low population density within Harney County, the county that tracks most closely with the study area (0.7 people per square mile); and a high level of geographic isolation, being over two hours drive from the nearest urban center of Bend. This case represents the most traditional definition of rural.

Next, I chose the Pudding River Watershed, which does not track well with a county, and is, in fact, quite different in character from the urban centers in Marion and

Clackamas Counties in which the watershed is located. The application lists seven cities within the watershed, including Aurora, Brooks, Gervais, Hubbard, Molalla, Mt. Angel, and Silverton. The watershed is a rural pocket in the midst of an urban corridor along Interstate 5, just 15 miles outside of the state capitol of Salem, which indicates a low level of geographic isolation. The area is home to about 28,000 people and is not densely populated, though the closest county, Marion, is (see Table 6). Important to note is that while the watershed technically includes the area where the City of Woodburn is located, this micropolitan city has its own municipal water rights and infrastructure for treating and delivering water that is considered by stakeholders to be separate from the water needs and issues facing the rest of the watershed. This case represents a rural area in close proximity to an urban center, but which has relatively low population and population density.

Finally, I chose the Mid-Coast Basin, which tracks closely with Lincoln County. This basin, which is actually a collection of micro-basins, is located primarily along the central coast of the Pacific Ocean, in a string of cities from Lincoln City in the north to Yachats in the south. The basin extends inland to include the cities of Siletz and Toledo. This community has the highest population and population density of the three cases, but has a medium level of geographic isolation, being located about 50 miles from the nearest urban center, which is also on the other side of the Oregon Coast Range mountains.

In addition to offering a spectrum of population count, population density, and geographic isolation, the three cases also offer a range of geography. In Oregon, this is particularly helpful, since the geography around the state is so varied and is closely related to water issues. From west to east, the Mid-Coast Basin is located along the coast; the Pudding River Watershed is located in the Willamette Valley; and the Malheur Basin is located in eastern Oregon. A summary of case study characteristics is displayed in Table 5.

	Malheur Basin (Subregion 1712)	**Pudding River Watershed**	**Mid-Coast Basin**
Cities	Burns, Hines, Crane, Buchanan, Princeton, Diamond, Frenchglen, Riley	Aurora, Brooks, Gervais, Hubbard, Molalla, Mt. Angel, Silverton	Newport, Lincoln City, Toledo, Depoe Bay, Seal Rock
Convening City Population	Burns: 3,000 (non-core)	Silverton: 9,000 (non-core)	Newport: 10,000 (micropolitan)
Nearest County Population	Harney Co: 7,000 (frontier)	Marion Co: 326,000 (metropolitan)	Lincoln Co: 46,000 (rural)
County Pop Density	.7 people/sq mi	267 people/sq mi	47 people/sq mi
Geographic Isolation	High	Low	Medium
Miles to Metro	Bend: ~130 mi	Salem: ~15 mi	Corvallis: ~50 mi
Region	Southeast	Willamette Valley	Coast
Economic Drivers	Hay, cattle	Wet/irrigated agriculture, food processing	Tourism, fisheries

Table 5. Case Study Communities at a Glance

Pudding River Watershed

The Pudding River Watershed is located in the Willamette Valley of Oregon, west of the Cascades mountain range and east of Interstate 5 (Table 6). It encompasses 528 miles, or approximately 338,000 acres, primarily in eastern Marion County and extending into south Clackamas County at the northern end.

	Population (2010 Census Data)	Size	People Per Sq. Mile
Pudding River Watershed	27,569	528 sq. mi.	52
Marion County	315,335	1,194 sq. mi.	264
Clackamas County	375,992	1,879 sq. mi.	200

Table 6. Demographic Data Comparing Pudding River Watershed to Marion and Clackamas Counties (2010 US Census Data)

The Pudding River Watershed includes the area served by the Pudding River and its tributaries, including Abiqua Creek, Butte Creek, Little Pudding River, and Silver Creek. The Pudding River originates in the Cascade Mountains and flows into the Molalla River, which in turn flows into the Willamette River. Average rainfall in Silverton is 47.5 inches annually (Oregon Climate Service).

The watershed includes the Marion County cities of Aurora, Brooks, Gervais, Hubbard, Mt. Angel, and Silverton, and the Clackamas County city of Molalla, whose combined populations are 27,569 (2010 Census Data). Agriculture is the primary

industry within the watershed, especially nurseries, grapes for wine, and blueberries, hazelnuts, and other food crops.

The demographics of Pudding River Watershed cities look more like Marion County than Clackamas County in many ways, including median age and representation of American Indian/Alaska Native and Hispanic/Latino population (Table 7).

	Pop (2010 Census)	Median Age in Years (2010 Census)	% Pop 18yrs+ (2010 Census)	Racial/Ethnic Makeup (2010 Census)	Median Household Income (2014 ACS)	% Pop with HS Diploma (2014 ACS)	% Pop with BA or higher (2014 ACS)	Poverty Rate (2014 ACS)
Aurora, Marion County	918	39.6	72.2%	89.7% White 0.9% AI/AN 6.3% Other 10.9% Hispanic/Latino	$72,656	93.0%	41.9%	10.3%
Brooks, Marion County	398	37.9	74.6%	75.4% White 3.0% Asian 18.6% Other 26.4% Hispanic/Latino	$49,375	91.7%	17.4%	31.2%
Gervais, Marion County	2,464	26.3	62.7%	52.4% White 3.7% AI/AN 38% Other 67.1% Hispanic/Latino	$51,172	69.6%	10.7%	23.1%
Hubbard, Marion County	3,173	30.1	66.3%	73.3% White 2.3% AI/AN 0.9% Asian 19.4% Other 36.3% Hispanic/Latino	$48,474	71.5%	12.4%	19.4%
Mt. Angel, Marion County	3,286	37.1	73.0%	82.6 White 1.0% AI/AN 12.1% Other 26.1% Hispanic/Latino	$41,984	85.6%	13.2%	11.5%
Silverton, Marion County	9,222	35.8	71.6%	89.0% White 0.8% AI/AN 1.0% Asian 5.9% Other 12.3% Hispanic/Latino	$53,929	91.0%	29.5%	16.2%
Marion County	315,335	35.1	73.6%	78.2% White 1.1% Black/African American 1.6% AI/AN 1.9% Asian 0.7% Nat Hawaiian/Pac Is 12.6% Other 24.3% Hispanic/Latino	$47,360	83.6%	21.7%	19.1%
Molalla, Clackamas County	8,108	31.4	33.4%	86.9% White 1.0% AI/AN 0.8% Asian 7.5% Other 14.5% Hispanic/Latino	$52,193	88.6%	14.8%	7.7%
Clackamas County	375,992	40.6	76.3%	88.2% White 0.8% Black/African American 0.8% AI/AN 3.7% Asian 3.1% Other 7.7% Hispanic/Latino	$64,700	92.8%	32.0%	9.7%
State of Oregon	3,831,074	38.4	77.4%	83.6% White 1.8% Black/African American 1.4% AI/AN 3.7% Asian 5.3% Other 11.7% Hispanic/Latino	$50,521	89.5%	30.1%	16.7%

Table 7. Demographic Profile, Pudding River Watershed Communities

The key stakeholders that came together to develop the watershed's application for Place-Based Integrated Water Planning (Place-Based Planning) grant funds included:

- Marion County
- The City of Silverton
- The City of Mt. Angel
- Clackamas Soil and Water Conservation District
- East Valley Water District
- Marion Soil and Water Conservation District
- Pudding River Watershed Council

In the fall of 2015, these organizations founded a new organization, the Pudding River Watershed Place-Based Planning Group (PRWPG) for the purposes of preparing the application and starting a collaborative water planning process.

According to stakeholders, the Oregon Water Resources Department was integral in encouraging collaboration and the development of a Place-Based Planning application in the Pudding River Watershed. The PRWPG includes varied interests that have been encountering difficulty with water planning or achieving water goals, and a collaborative effort is hoped to help create forward momentum for all parties. Respondents described that after a joint Silverton/Mt. Angel project was withdrawn from state consideration, the Water Resources Department reached out:

> *So, in the meantime then these grants came out and we were approached by the state of Oregon. The water resource department has the place-based planning grants, …[and] they contacted us and said are you aware of these grants? We want to come and talk to you (Municipal Staff).*

At the request of PRWPG members, Marion County Commissioner Sam Brentano served as the convener the application, which involves serving as the public face of the project. The application was administered by the City of Silverton City Manager.

Within the Pudding River Watershed, the East Valley Water District (East Valley) has been working on developing a water supply for farmers for many years. East Valley members have invested large sums of money seeking an appropriate location for a reservoir, and the group is currently working with the Water Resources Department on a plan to develop Drift Creek by converting adjacent farmlands, which form a natural basin, into an off-stream reservoir. Two previous locations for a reservoir have been rejected by East Valley after studies revealed costs for those sites to be cost prohibitive to develop, and controversy surrounding conversion of farmlands, as well as concern about fish populations and habitat, have held up the Drift Creek project. One respondent said:

> *…the first site was Buck Creek, and that was too big a site, and then after the '93 earthquake, that one became too costly with seismic activity they had up there; that [brought us to] Rock Creek which is kind of out north east of Mount Angel and that site [had too many] wetlands to mitigate, that was cost prohibitive, so we moved and found this other site. No matter where we go, we are torn on--everybody's tight, but I mean, we need the water. I live in Silverton, and even Silverton is running out of water this year. They didn't run out, but there wasn't enough water in one of the creeks, and they had to use the backup last year (Irrigator).*

The cities of Silverton and Mt. Angel have been considering joining forces to provide municipal water supplies through an interconnected system. The cities are located about four miles apart, and the city councils have worked off and on with the Water Resources Department on a potential aquifer storage and recharge project that would serve both communities. The on-again, off-again relationship between Silverton and Mt. Angel has been the cornerstone of this potential collaboration. One respondent described the relationship between the two cities in this way: "The communities, you know, get along and like to not like each other periodically, that ebbs and flows…" On their own, Mt. Angel has had occasional issues with water quality and pressure, and Silverton is confronting aging infrastructure for water delivery and wastewater treatment.

At this point, collaboration has not involved other watershed communities, but stakeholders see Place-Based Planning as an opportunity to have a larger conversation. In the past, the Pudding River Watershed Council has been successful in facilitating collaborative conversations around water quality issues in the area, although three respondents noted that the group suffered from lack of funding to accomplish projects. One interviewee described:

> *…it's always been kind of a struggling council as far as bringing in project dollars, you know, they can agree on wanting to do good work but actually doing projects is difficult (Regional Organization Staff).*

Another interviewee noted that a lack of issues related to environmental or species concerns has influenced the Watershed Council's lack of funding:

> *…there are other councils that get funding just because of the fish they have or other political issues in their particular watershed… but in Pudding I think there is just farming as one of the bigger issues. If you don't have money to do restoration, that makes it hard to do [collaborative projects], but is greatly needed in that watershed (Regional Organization Staff)*.

Other respondents noted that community relationships were damaged by the Watershed Council's previous leadership, including "burned bridges" with the

Oregon Watershed Enhancement Board for project funding. The new coordinator has been working on repairing and building relationships in the watershed.

The soil and water conservation districts in Clackamas and Marion Counties are also interested in building relationships and working with stakeholders on voluntary conservation and water quality projects, in addition to those they have completed in the past or are currently working on, which offers another potential avenue for community collaboration.

Key issues for the Pudding River Watershed include water quantity for agricultural irrigation; water quality in Mt. Angel, where taste, odor, sediment, and color present a problem; infrastructure repair and replacement in Silverton, where post-WWII pipes and systems have reached the end of their useful life and in Mt. Angel, where dead end pipelines are creating water pressure difficulties. The Pudding River Watershed Place-Based Planning application requested $300,000 grant funds and $82,500 of technical assistance from the Water Resources Department, with matching partner funds and in-kind contribution of over $1 million. Funds and assistance would go towards “further defining the scope of the place-based plan, assessing water resources within the Pudding River watershed, and implementing a planning strategy with feasible solutions that achieve multiple water resources objectives” (PRWPBPG, 2015).

Mid-Coast Basin

The Mid-Coast Basin is located along the central coast of Oregon, from Lincoln City on the northern end to Yachats on the southern end, and east to Siletz and Toledo. The basin comprises a collection of separate watersheds that lie within the political boundaries of Lincoln County. This area was delineated as part of the application process for Place-Based Integrated Water Resources Planning (Place-Based Planning).

Lincoln County is home to approximately 46,000 people within 1,194 square miles (764,160 acres). Tourism is the largest industry in Lincoln County. Visitors to the area come for natural beauty and outdoor recreation such as fishing, kayaking, kite flying, and whale watching. Tourists also enjoy the Chinook Winds Casino Resort, the Lincoln City Outlet Mall, the Oregon Coast Aquarium, Oregon State University's Hatfield Marine Science Center, and more.

The water supply for the basin is rain-based, with communities nearest the coast receiving an average of 65-90 inches of rain per year (Oregon Climate Service). Lack of surface water storage makes it difficult to capture precipitation for use during the dry summer months, which corresponds to the time of year that tourists significantly increase the population of water users. Groundwater storage has been difficult in the area because of the geology and proximity to the ocean, both of which

contribute to saltwater intrusion and brackish water. Surface water storage has been difficult to develop because most of the rivers and streams are home to species of fish, especially Chinook (*Oncorhychus tshawytscha*) and Coho (*Oncorhynchus kisutch*) salmon and Steelhead trout (*Oncorhychus mykiss*).

Need for stable and sufficient water supply for the community of Newport was a major impetus for the development of the Mid-Coast Basin's Place-Based Planning application. Newport Public Works Director, Tim Gross, took on the convener role and is administering the application, seeking to collaborate with stakeholders throughout the region to meet basin-wide needs. In addition to water supply, the application cited water quality, ecological health, climate change adaptation, and earthquake and tsunami resilience as important areas for collaboration in the Mid-Coast Basin.

A difficulty in collaboration between communities in the Basin is the natural terrain that influences travel and commerce patterns of the population. Residents in Lincoln City rarely travel south of Cape Foulweather, just south of Depoe Bay, which one respondent described as "like a wall" between Lincoln City and the rest of the Basin. Instead, Lincoln City residents often travel east to McMinnville or Salem for shopping. On the south end of the Basin is another natural obstacle; Cape Perpetua separates Yachats from the communities farther south on the coast, including

Florence and Reedsport. Yachats residents often work with Waldport and other communities to the north to meet their needs.

There is also a power dynamic between Newport and the other communities within the basin because of the size and relative wealth of Newport. In many ways, Newport makes the Mid-Coast Basin case the least rural of the three cases. Despite its geographic isolation to major urban centers of the state, including the Coast Range Mountains, one respondent explained that the population of about 10,000 is misleading:

> *…one of the challenges we have in Newport is that we may only have ten thousand people who live here permanently, but our work force population probably pushes us to twenty thousand people or more. And in the summer time we can have sixty or seventy thousand people in our community. We have a rather large commercial fishing fleet and they are huge water users. They use more than half of our water that we produce for the fish manufacturing and so our infrastructure system is disproportionate to our population. We are probably more equivalent to a sixty or seventy thousand person town, both the distribution and collection system. So we kind of dwarf our neighbors (Municipal Staff).*

Key water issues in the Mid-Coast Basin include water quantity for municipal use by Newport, Yachats, Beverly Beach, Port Orford, Seal Rock, and potentially others; water quality related to high winter flows that create turbidity and sediment that taxes water treatment systems and threatens drinking water quality; water quality related to low summer flows that lead to saltwater intrusion on drinking water supply and increased temperatures that threaten fish habitat; infrastructure repair and replacement for post-WWII water delivery and/or wastewater treatment systems in Toledo, Newport, Seal Rock, and Yachats; and resilience planning for anticipated Cascadia earthquake and corresponding tsunami event. The Place-Based Planning application for the Mid-Coast Basin requested $330,300, with county matching funds, as well as Water Resources Department assistance to engage with stakeholders and technical assistance to develop an understanding of current and future water demands and plan for the future (Mid-Coast Basin, 2015).

	Population (2010 Census)	Median Age in Years (2010 Census)	% Pop 18years+ (2010 Census)	Racial/Ethnic Makeup (2010 Census)	Median Household Income (2014 ACS)	% Pop with HS Diploma (2014 ACS)	% Pop with BA or Higher (2014 ACS)	Poverty Rate (2014 ACS)
Depoe Bay	1,398	56.6	90.3%	92.9% White 1.5% AI/AN 1.2% Asian 1.5% Other 4.8% Hispanic/Latino	$45,047	93.5%	33.5%	16.9%
Lincoln City	7,930	46.2	81.6%	83.7% White 3.5% AI/AN 1.5% Asian 7.1% Other 13.2% Hispanic/Latino	$35,524	85.8%	21.9%	23.7%
Newport	9,989	43.1	80.0%	84.1% White 2.1% AI/AN 1.6% Asian 7.5% Other 15.3% Hispanic/Latino	$40,448	90.6%	28.9%	18.5%
Seal Rock	1,600*	Not available	Not available	Not available	Not available	Not available	Not available	Not available
Siletz	1,212	42.0	75.5%	69.7% White 18.4% AI/AN 1.5% Other 5.0% Hispanic/Latino	$39,063	83.1%	5.7%	24.0%
Toldeo	3,465	37.6	75.2%	89.9% White 0.6% Black/African American 3.8% AI/AN 0.5% Asian 1.2% Other 4.7% Hispanic/Latino	$44,034	80.8%	10.3%	20.2%
Waldport	2,033	53.0	84.2%	91.2% White 0.8% Black/African American 1.1% AI/AN 1.0% Asian 0.5% Other 3.3% Hispanic/Latino	$38,264	89.7%	16.7%	12.6%
Yachats	690	62.3	95.1%	95.2% White 1.7% AI/AN 0.6% Asian 0.7% Other 4.8% Hispanic/Latino	$44,150	92.6%	43.6%	13.1%
Lincoln County	46,034	49.6	82.7%	87.7% White 3.5% AI/AN 1.1% Asian 3.4% Other 7.9% Hispanic/Latino	$42,429	88.4%	24.3%	15.6%
State of Oregon	3,831,074	38.4	77.4%	83.6% White 1.8% Black/African American 1.4% AI/AN 3.7% Asian 5.3% Other 11.7% Hispanic/Latino	$50,521	89.5%	30.1%	16.7%

*Estimate from Mid-Coast Place-Based Planning Application (2015)

Table 8. Demographic Profile, Mid-Coast Basin Communities

Subregion 1712 of the Malheur Basin (Harney County)

Subregion 1712 of the Malheur Basin is located primarily in Harney County, in southeastern Oregon. The Basin is the most geographically remote and traditionally "rural" of the cases. The Basin is 17,300 sq. miles (6.3 million acres), including nearly all of Harney County and small sections of Grant (north), Malheur (east), and Lake (west) Counties. The federal government owns about 75% of the land in Harney County, which has a population of 7,422. Its two incorporated cities are Burns, with a population of 2,806 and Hines, with a population of 1,563. There is less than one person per square mile in the county.

The primary industries in the area include cattle and sheep ranching and raising alfalfa for hay. Harney County has a higher median age than the state of Oregon, and the median annual income for Harney residents is just 70% of the state median annual income. The percent of households below the poverty line is several percentage points higher than the state average, and in the cities of Burns and Hines, over 30% of the population is in poverty (Table 9). Average rainfall in Burns is 10.57 inches annually (Oregon Climate Service).

The Harney County Migratory Bird Festival held each April brings tourists to learn about, look for, and celebrate birds in the area. Winter snow melts on the hills on the north and south sides of the basin flood acres of fields, providing spring irrigation

that also serves as habitat to many species of birds that migrate through the area. One respondent described:

> *…these meadows play such an important role in our industry here, for agricultural industry and then also for migratory birds, being an extremely important stop over point for along the Pacific flyway (Burns Resident).*

Timber was once a more pronounced part of the economy in Harney County, but like many rural communities in Oregon, the county saw changes during the 1980s and 90s with improved technology that reduced the number of workers required to log and process timber, as well as protections for old growth Ponderosa Pine and the spotted owl, all of which contributed to the demise of the industry in the area (Robbins, 2011).

It is worth noting that during the time I was present in Harney County, anti-government activists had taken over the Malheur National Wildlife Refuge, just outside of the town of Burns where I was staying. This situation made national and even international news, as this armed group seized a federal building and remained there for six weeks (Johnson, 2016). The group, made up of assorted militia members from around the country and led by members of a well known anti-government activist family involved in a similar standoff in Nevada in 2014, came to Harney County as a demonstration against the prison sentences of a father-son pair

of local ranchers convicted of arson on public land, and used the platform to protest federal land use policies, and in particular federal ownership of land and restrictive environmental regulations. What began as a peaceful march on the Refuge turned into an armed seizure of the building that lasted from January 2nd to February 11th, 2016, and resulted in one death, disruption of schools, destruction of culturally important tribal relics that were stored on the property.

This event was important to Harney County because it brought up important issues of concern to Harney County residents, and the continued prodding of the media resulted in neighbors taking stances on land use, the convicted ranchers' actions and punishment, government and law enforcement, and more. After a short time, residents were experiencing schisms in their relationships over issues that were not new to them, but which were brought to the surface with an urgency and in a divisive manner by outside forces. One respondent's comment sums up the sentiment that local people were not receptive to the methods of the protestors:

> *There's no question there are issues we need to address, but not like this (Landowner).*

Harney County respondents in this study noted that long earned trust in the community that has led to successful collaborations on other topics will be put to the test with the coinciding of this incident and water planning.

Key water issues in Harney County include water quantity for agricultural irrigation and domestic wells; water quality, including pockets of arsenic, boron, and other contaminants in groundwater; and a need to understand characterization of aquifers and their groundwater resources, groundwater and surface water interactions, and aquifer recharge rate and process. The Harney County Place-Based Planning application requested Water Resources Department assistance to compile "an agreed upon scientific understanding of water resources in the Harney Basin and a collective understanding of the causes of current declines in groundwater resources." The application also requested $205,500 with county matching to facilitate development of an "actionable, fundable, and well-supported integrated water resources plan in the Harney Basin…to have sustainable water resources so that we can maintain the vital agricultural sector of our community" (Harney County, 2015).

	Population (2010 Census)	Median Age in Years (2010 Census)	% Pop 18yrs+ (2010 Census)	Racial/Ethnic Makeup (2010 Census)	Median Household Income (2014 ACS)	% Pop with HS Diploma (2014 ACS)	% Pop with BA or higher (2014 ACS)	Poverty Rate (2014 ACS)
Buchanan	**	**	**	**	**	**	**	**
Burns	2,806	44.5	78.5%	92.2% White 2.6% American Indian/AN 0.7% Asian 0.7% Other 4.7% Hispanic/Latino	$34,952	87.0%	15.9%	17.1%
Crane	129	40.8	69.8%	93.8% White 2.3% Black/African American 0.8% American Indian/AN 2.3% Other 3.9% Hispanic/Latino	$53,750	100%	25.2%	30.9%
Diamond	**	**	**	**	**	**	**	**
Frenchglen	12*	**	**	**	**	**	**	**
Hines	1,563	42.5	75.9%	94.9% White 1.0% American Indian/AN 1.2% Other 3.1% Hispanic/Latino	$26,250	88.5%	16.5%	30.5%
Princeton	**	**	**	**	**	**	**	**
Riley	**	**	**	**	**	**	**	**
Harney County	7,422	45.2	77.6%	91.9% White 3.1% American Indian/AN 1.3% Other 4.0% Hispanic/Latino	$35,828	87.7%	16.9%	21.1%
State of Oregon	3,831,074	38.4	77.4%	83.6% White 1.8% Black/African American 1.4% AI/AN 3.7% Asian 5.3% Other 11.7% Hispanic/Latino	$50,521	89.5%	30.1%	16.7%

*Estimate. **Data not available for these unincorporated communities

Table 9. Demographic Profile, Harney County Communities

Summary

The three rural communities chosen as case studies represent different kinds of rural, from a more traditional idea of rural in Harney County, with high geographic remoteness and low population and population density, to the Pudding River Watershed, an agricultural community with relatively low population and population density just 15 miles from the state capitol. A third community, the Mid-Coast Basin, is relatively geographically remote, located about an hour away and on the other side of the Coast Range Mountains from the nearest urban center, but is home to the largest population of the three. These cases provide an opportunity to explore how water issues affect different rural communities differently around Oregon.

7. Results of Community Level Interviews

At the state level, interviewees provided background about Oregon's overall water issues to set the stage for understanding the three case study communities included in this project. All three cases are rural communities that put forth an application for grant funding for Place-Based Integrated Water Resources Planning through SB 266 (2015). By taking a closer look at the most significant issues facing these communities we can begin to answer the research question that provides the foundation for this project:

How do water issues affect different rural communities differently around Oregon?

State level stakeholders described how history and political baggage, especially land use policies and Western water law, have influenced water policy in the state today. They talked about how champions are critical to the success of policies and how the role of leadership involves balancing the needs of rural and urban communities. Respondents explained the importance of climate change and physical system changes, and they described how a perfect storm of climate change, Western water law, and economic system transformation have contributed to water problems in Oregon.

Case study respondents were similarly concerned about physical system changes stemming largely from climate change, but they described an array of individual issues. Some of these reflected problems common to rural communities, including economy of scale issues; connections between water and livelihoods; and difficult power dynamics that shape state or regional decisionmaking processes. Each also told their own story of water issues strongly influenced by local and state history and political baggage. And all described leaders or champions that have been critical to making water a priority and focusing efforts in the community. Ultimately, there are the four major findings across the case studies:

1. Rural communities share many challenges in common
2. Some issues facing rural communities are different and require individual consideration
3. History and political baggage influences water issues, and especially collaboration around water
4. The role of leaders is to make water a priority and focus community efforts

Each is discussed in relation to the interviews below.

Shared Rural Challenges

The underlying assumption embedded in the research question is that water issues are affecting different rural communities differently around Oregon. In many ways this is true; however, findings suggest that the rural communities featured in this project share many challenges in common. Specifically, the cases demonstrated commonality in economy of scale issues; connections between water and livelihoods; and difficult power dynamics that shape state or regional decisionmaking processes. Each of these is of critical importance in the struggle to address water issues affecting rural communities.

The case study communities are experiencing difficulties related to economies of scale, or lack thereof. One example is the issue of repair and replacement of infrastructure for water delivery and wastewater treatment, which is of great concern to several of the cities that make up the Mid-Coast Basin and the Pudding River Watershed. In these two cases, as is the case for many communities across the state and the country, post-WWII infrastructure that was paid for largely with federal funds through the Clean Water Act and Safe Drinking Water Act are at the end of their useful life. One respondent described:

> *It used to be the infrastructure of the United States was built out in the 1950s and when Eisenhower was here and they did a whole lot of public work stuff*

> *and there were money for sewer systems and there was money for water systems and there was money for national highways, and they really did a whole lot of work… Between the 30s and the 60s, a lot of investment was made by the federal government, and cities felt, 'I need a new sewer plant, I can go and talk to the federal government, they'll take care of it, and we can get it done.' Now that money isn't there so…many of these small communities are going to have a hard time keep up with it (Legislator).*

Because of changes to federal policy, dollars to accomplish repairs and replacement are now fewer, more competitive to attain, and almost exclusively loans, rather than grants. The effect is that small populations have to finance infrastructure that will be paid for over multiple generations, ratepayers experience hefty hikes in their water bills, or both. One respondent described this phenomenon in the Mid-Coast Basin:

> *…in order to get the funding for the improvements that we needed in our collection and distribution system, in order to qualify for funding, the bank said 'your water rates are so low, we don't believe you can collect enough from your customers to pay us back,' so we had to raise our [water] rates dramatically, like two hundred percent (Municipal Staff).*

Each of these cases is particularly affected by water because it is tied to the livelihoods of the community. In the Mid-Coast Basin, respondents noted that

tourism, fisheries, and the Georgia Pacific paper plant are key economic drivers for the area that use large amounts of water. In Pudding River, agriculture, especially nurseries, blueberries, hazelnuts, grapes, and other crops, is the largest economic driver in the region, and also the largest user of water. In Harney County, cattle ranching and alfalfa hay are key economic drivers and largest users of water. In each of these areas, cutting off water supply has serious economic consequences for fishermen, restaurant owners, growers, grocery store owners, hotel managers, and more.

All three cases demonstrate difficulties related to power dynamics, either within the community, between the community and the state, or both. These shape regional and state decisionmaking processes. In the Pudding River Watershed, the county system is less likely to represent the needs of rural communities in their area because they make up a relatively small part of the jurisdiction. One respondent described that the County Commissioner "didn't know me when I first started because there are 22 cities in Marion County." Within the Watershed, respondents described both internal conflicts and conflicts between the community and the state, but community power appeared most important. For example, in explaining the history of a potential aquifer storage and recovery project in the Pudding River Watershed, one respondent said:

> *The communities, you know, get along and like to not like each other periodically, that ebbs and flows and so there is a lot of suspicion in the part of Mount Angel residents that Silverton would just gouge them for water so, the project in terms of how is been received by Mount Angel residents has been up and down (Municipal Staff).*

In the Mid-Coast Basin, there is a power imbalance between Newport as a micropolitan center and the rest of the communities in Lincoln County. A key point of contention is that the median income for Newport residents is several thousand dollars per year higher than other Mid-Coast cities; unemployment rates and poverty rates are also lower. One respondent described Cape Foulweather as "a wall" separating Lincoln City and Newport, where people who live north of this landmark do business within Lincoln City or inland at Salem or Portland, while those who live south of Cape Foulweather rarely venture to Lincoln City. Another respondent similarly commented:

> *I very, very seldom get to Lincoln City or do anything there…why go to Lincoln City when I can come back home to get whatever I need, that I can get in Lincoln City? (Newport Resident)*

Another difficulty in the Mid-Coast Basin is that Newport has the capacity and the champion who is facilitating Place-Based Planning. The top goal for Newport is to

develop a reservoir, potentially at Rocky Creek just south of Depoe Bay, to serve as a stable source of water for the region. However, while goals for Newport and Seal Rock may align, Toledo is likely to experience serious consequences if a water development at Rocky Creek replaces water supply from the Siletz River, which Toldeo relies on for revenue.

In Harney County, stakeholders are diverse, but power dynamics were characterized almost exclusively as the community versus outside interests. Respondents described frustration with state policies that they called "politically driven," modeled in cubicles in Salem, and without consideration for the economic and social consequences of the community. One respondent underscored the seriousness of these power dynamics:

> *Rural folks can't take this anymore. We're undoing their ability to make a living that undoes the social fabric of our community, which turns socially folks against government – county, city, state, federal… We need to get heard so there's got to be a different way to bring this stuff forward instead of a single letter that says no more water rights, particularly when people have tens of thousands if not hundreds of thousands of dollars invested to get to the point where they can drill a well and then be told no… you get these decisions that are being made after the fact they're saying, let's do some place-based planning, that's like a pat on your head. Just sit over in the corner, be quiet,*

> *we'll help you with some planning, we'll move ahead. We gotta do it ahead and it's gotta come from the ground up. We don't need someone at PSU [Portland State University] or the governor saying we'll come in and fix you. Communities don't like that. Nobody knows how the water works better than we do. I know that my neighbors pivot when it comes on and sucks my water level down 20 feet. No big deal, I'm still way below that. I know when he shuts it off it comes back. I know that, water resources doesn't know it. We're putting in five more pivots out there, yeah, we ought to be talking about what that means and can we assure folks that we're not undoing each other. This community is known for working together and I want to keep being the leader, I mean us, not me personally, I mean this community, being the leader and trying to find those solutions. If there's a policy that ought to be in place is how do you go to the community first, not last? How do you get there so we all get a voice in this? We know it the best. It's our neighbors, it's our ground, and we take care of it (County Official).*

One respondent did mention that while birds and other wildlife are a priority in Harney County, environmental protections are often non-starters at community gatherings, and so often they are not even brought up. Additionally, sometimes conversations about changing irrigation or cropping techniques to conserve water have not been well received by some stakeholders.

Context-Specific Problems

Some issues facing rural communities are different and require individual consideration. Among these are manifestations of climate change and confounding factors that are affecting water availability in each location. Geography is a key consideration, including primary source of water, precipitation levels, natural and manmade storage options, presence of fish and wildlife, and proximity to urban centers and decsionmaking centers. Land use and forest management practices affecting the watershed or basin complicate water issues differently in each community. The result is that in each rural case, context-specific issues are considered a priority.

In the Pudding River Watershed, climate change is manifesting in drought and longer dry periods in the summer and fall. Snowpack, which has served as a natural reservoir for the area so that melting snow feeds local streams during warmer months, has been noticeably less in recent years, and warmer days earlier in the year have also led to decreased access to water during summer and fall. In some locations, groundwater levels have been dropping. This has been noted especially in wells that tap into basalt aquifer(s) located away from the Willamette River's more abundant alluvial aquifer. However, like Harney County, the structure of aquifers, interaction between surface and groundwater, and recharge rates are not fully understood.

In the Mid-Coast Basin, climate change manifestations including more severe storms in the winter and longer dry periods in the summer are particularly affecting the area. In the winter, too much water results in turbidity and sediment that stresses water treatment infrastructure and affects drinking water quality; in the summer, too little water increases temperatures and results in low flows that can be harmful to fish and can allow saltwater intrusion into drinking water. Several respondents referenced a particularly damaging storm that recently caused problems ranging from rockslides to broken pipes that left communities with a list of expensive repairs. One respondent described:

> *…so, on a normal day we treat about one and a half million gallons. But on December seventeenth [2015] during all the rain we were getting we were up around seventeen million (Municipal Staff).*

> *The storm event that we'll likely receive federal declaration of emergency from president any day now that occurred in mid December last year actually created a break in our system…and we ended up having to replace a 300 foot section (Municipal Staff).*

The Mid-Coast Basin relies heavily on surface water fed by rain, and as one respondent put it, "no rain means no water" for this basin. For many years, there has

been interest in developing water storage along the Mid-Coast, but environmental and cost barriers have gotten in the way. Longer dry periods are particularly important for tourist-based economies, which result in peak population at the hottest and driest parts of the year. Additional concerns about a potential Cascadia earthquake event and related tsunami resilience loom large in the minds of coastal communities.

In Harney County, climate change is manifesting in drought and decreased snowpack that feeds the basin and earlier snow melt. Dropping groundwater levels have been reported in some areas, and has been the impetus for a basin-wide suspension of groundwater well permitting, pending the results of a study. Forest management and public land management around the basin confound effects of climate change and reduced availability of water; species such as juniper that absorb lots of water in the root system are contributing to changes in the water cycle of the area.

History & Political Baggage

History and political baggage influences water issues, and especially collaboration around water. While this concepts holds true across the three cases, each case has a different manifestation of history and political baggage influencing water conversations in the community today. A key reason for concern is that

collaborations require trust, which takes a long time to build, a short time to break, and perhaps an even longer time to replenish.

In the Pudding River Watershed, the history of the watershed council, a potential collaborative aquifer storage and recovery (ASR) project between Mt. Angel and Silverton, and the East Valley Water District's plans for developing water storage set the stage for the community's current water discussion. First, the Watershed Council, which began work in the 1990s, was a promising avenue for coordinating the water needs of diverse stakeholders; however, in spite of good ideas, the council had a difficult time obtaining funding and making projects happen. Respondents also described that the leader of the organization was abrasive and burned many bridges, including one with the Oregon Watershed Enhancement Board (OWEB), which provides funding for watershed projects.

The ASR project was described by respondents as the product of an on-again, off-again relationship between the cities of Mt. Angel and Silverton. The two collaborated to obtain funding for the state to study the feasibility of such a project, which would inject surface water into an underground aquifer during the winter when flows were abundant, and the water would be available for use during the drier months. This type of storage offers the advantage of sidestepping impacts to fish and other ecological harms typically associated with instream dams and reservoirs. However, such projects tend to be expensive and the yield is difficult to

anticipate because of underground aquifer construction and water movement. Unfortunately, the potential for collaboration has not been fully realized yet; the Mt. Angel leadership has had reservations about the power dynamic that would result from Silverton controlling the city's main source of water, and Silverton leadership has had reservations about the cost of the project and its benefits. One respondent explained that the Oregon Water Resources Department encouraged stakeholders to use the place-based planning call for proposals as an opportunity to revisit the ASR project:

> *…we were approached by the state of Oregon because they found out, the water resource department that has the place-based planning grants, they had the ASR grant that we kind of turned our head on it, or turned around from it [for the second time]. So they contacted us and said are you aware of these grants? We want to come and talk to you (Municipal Staff).*

Finally, the Pudding River water conversation is colored by the efforts of irrigators, specifically the East Valley Water District, to develop a water storage project. The goal of the project is to ensure stable access to water for agriculture, which is a key economic driver of the region. This group has been working on the project for many years, and is now working on getting approval for a diversion and reservoir site off Drift Creek. The Drift Creek location is the third site to be studied, and irrigators have sunk large costs into this process. Politically, there is concern about the third

site, which would cover over farmland currently in use outside the Pudding River community. Additionally, the East Valley Water District has concerns that involvement in collaboration with other interests may either give stakeholders the impression that EVWD wants to drum up support for their project, or that the state will expect EVWD to subsume its efforts to a larger regional plan.

In the Mid-Coast Basin, three specific historical and political legacies were apparent. First, Lincoln City and Newport have an on-again, off-again relationship that is best illustrated with the Rocky Creek water storage project. The two cities originally partnered to apply for water rights on Rocky Creek and set out to create a stable source of water that would allow the Mid-Coast to grow while sharing in the large development costs. However, leadership in both cities changed, and Lincoln City was no longer interested in investing in the project. Recently, Newport has revived the application and is continuing alone, hoping that the Place-Based Planning process can open the doors to collaboration on the expensive project with others in the basin. One respondent explained:

> *Now the city [of Newport] I think has recognized the need for additional water rights for decades, and that started a regional water consortium that was kind of led by Lincoln City and Newport twenty years ago looking at developing Rocky Creek. They had this kind of conglomeration of communities and water districts and things and it became so political and so many factions and not*

> *really well led that it sort of fell apart so the water rights application that was put in for Rocky Creek sat uncompleted at Water Resources for a decade (Municipal Staff).*

Meanwhile, the relationship between Toledo and Seal Rock has been fraught with tensions over water supply and infrastructure. Respondents described that the two currently have a 30-year contract for Toledo to provide water to Seal Rock, but that the relationship has been strained by a lawsuit that Seal Rock won against Toledo. The current manager of the Seal Rock Water District used to work as the Public Works Director for the city of Toledo, where he was involved in planning for capital improvements. Difficulties stemming from lack of control over water infrastructure have led Seal Rock to begin pursuing other options for water, while Toledo's high price tag infrastructure costs rely on selling water to Seal Rock and Georgia Pacific to make ends meet. One interviewee commented on the contract between Toledo and Seal Rock Water District:

> *When you really look at the history, it is a phenomenal opportunity and collaborative effort between these two agencies and the state to effectively establish water rights on the Siletz River for the District…and everything went well, [but] like most agencies, they evolve and they grow and regulations change, environments change, people change, philosophies change and then your elected folks have taken a different position on situations and the*

> *relationship between the city and the district didn't go so well, there was a lawsuit that complicated things and the district won a lawsuit against the city of Toledo (Municipal Staff).*

Finally, related to infrastructure, there are many possibilities to pool resources and overcome economy of scale challenges, in the Mid-Coast, but they run into a problem like Aesop's fable of the ant and the grasshopper. Some communities have invested significant resources in infrastructure, and others have not. As post-WWII water infrastructure reaches the end of its useful life in communities around the basin, some have been proactive in maintaining and planning for repairs and replacement of pipes and systems. Others have not, and face much larger and more difficult problems. The first group I liken to the ant, which budgets carefully and stores up for lean times; the second I liken to the grasshopper, which does not plan ahead and relies on the ant when times are hard. Politically, no matter how much it makes sense on paper for the ant and the grasshopper communities to join forces to meet the challenges of climate change or aging infrastructure, this is a hard sell to proactive communities. One respondent described these two types of philosophies:

> *Sometimes some communities get lucky in the fact that they are close to a water supply or they have things that make theirs easier and cheaper or they manage it better over time. To me, some communities are smart enough to paint their house and do the repairs along the way. Others just let the thing fall*

> *apart and then they have to buy a new house every so often and they are shocked at how expensive houses cost. It's a difference between being reactionary and proactive in terms of your management. Reactionary you fix things when they fall apart and break. If you're proactive, you try to do things to prevent catastrophic failures by doing regular maintenance (Engineer).*

In Harney County, historical and political baggage comes in the form of intervention by outside forces. Respondents talked about several instances when interests from urban places or state or federal government have come into the county to direct them. One instance was that of the potential endangered species listing of the sage grouse, common to the area. To list the sage grouse would have meant potentially harmful changes to agriculture, especially cattle ranching, in Harney County, which is a key economic driver of the region. Community stakeholders came together and developed a hard-won plan to mitigate harms to sage grouse and stave off restrictions to land use. Other examples of this outside intervention include the Steen's Mountain Management and Cooperative Protection Act (2000), which was a compromise developed by local stakeholders in response to outside interest in making the area a national monument, which would have disrupted working lands; and the recent occupation of the Malheur Wildlife Refuge by anti-government militia determined to use a Harney County arson sentencing case as an opportunity to protest federal land use policy in the West (Johnson, 2016).

Currently, conversations about the future of water in Harney County are seriously influenced by an abrupt shutoff of groundwater permitting by the Water Resources Department in 2015. While respondents described that groundwater levels were decreasing, both due to decreased supply and increased demand, the decision to place a moratorium on permits signified a change from a default position of approving permits to a default position of denying them, overnight. One respondent said this was not surprising, since the state was supposed to be monitoring water levels, and they "were not minding the store," allowing irrigation wells to tap into groundwater at concerning rates. Respondents differed in opinion regarding the support for or rejection of the moratorium; however, concern about the future of the community was universal. A rules advisory committee was formed to help the Water Resources Department develop a plan to mitigate impacts to the 32 landowners whose water permit applications were caught "in limbo," as many respondents described it, at the time of the moratorium. However, the rules from the Department did not make sense from the point of view of stakeholders and caused further frustration. Concern about the results of the upcoming groundwater study being a foregone conclusion, namely that once the state has shut off permitting in the county, like other similar situations around the state, Harney residents anticipate never seeing another permit issued. One respondent said:

> *Historically, I believe they've done it [declared a moratorium on groundwater permits] seven times around the state, had groundwater areas [listed]…started*

> *this process and never issued another permit ever again for irrigation. I don't believe we're going to be any different, which gives us great concern (Landowner).*

Leadership

The role of leaders is to make water a priority and focus community efforts. Like state level respondents, community respondents described the importance of leaders to champion water policy. No specific organization or individual is designated across the state to facilitate the collective water interests in a community. In some communities, this role is taken on by the Watershed Council; in other places, the watermaster or a non-profit organization takes up the mantle. However, without that champion, it is difficult to produce the necessary momentum to address complex issues like those associated with water. Respondents described champions as those who have stepped forward to lead water conversations in their community, despite the shared challenge of lack of capacity to do so. Champions are not only willing to put themselves out there, they give time and resources, often supported by an organization for whom they work, to accomplish the task. In order to be effective, leaders need to be able and willing to subsume their own interests to the goal of having a meaningful and balanced community conversation that meets not only their own needs but those of diverse stakeholders. Finally, the community

needs to buy in, or have faith that this leader can remain objective in bringing them together to identify priorities and develop solutions.

In the Pudding River Watershed, several relatively new leaders have come forward to head a community-wide water conversation. This group developed the Place-Based Planning application in short order and is made up of people with experience in collaboration, including previous work in other contexts. However, the community is still seeking the champion to step forward and lead the process. Currently, the leaders participating all represent their own interests and constituencies; none is willing or able to subsume these to the facilitation of watershed goals. There are somewhat high siloes in place in the watershed that enable leaders to avoid collaborating and focus on their own systems, which are functional, if not optimal. One respondent said, "we don't need to be a part of this effort, we are pretty stand alone." Another respondent described the process this way:

> *What I observed is everyone was talking about [Place-Based Planning] but in the context of their own projects and their own interest and not as a group, not a collaborative group. There was nothing collaborative until we got together in that room in the City Council chambers. I didn't see anything collaborative at all in the process. We were doing what we needed to do to, you know, deal with*

> *our water needs and water interest and others were doing the same (Municipal Staff).*

The risk in the Pudding River Watershed is a high cost of time and resources with a potential low benefit, if the collaboration does not yield results. To address this, there has been some discussion of bringing in a scholar who grew up in the area to work across jurisdictions and assist in collaborative practices.

In the Mid-Coast Basin, siloes are also high. The coast was described by one respondent as a "backbone of communities strung in a line" along the coast, each with less efficient, yet standalone, systems of their own. A champion has come forward to encourage collaboration in the basin; this is the relatively new Public Works Director for the City of Newport, who one respondent termed "a visionary." He is interested in pushing forward a regional conversation that includes, but is not limited to, Newport's desire for development on Rocky Creek. However, this collaboration is, like Pudding River, still new, and the stakeholders who need to be involved are still assembling. Previous collaborations in the basin have taken place among Mayors and other leadership; however because they have been dependent upon personal relationships of those holding positions or offices of leadership, turnover has resulted in difficulty maintaining those efforts.

In Harney County, respondents reported a successful history of collaborative efforts among diverse stakeholders. Recent events related to the Malheur Wildlife Refuge occupation have challenged this, and public community meetings held during the occupation offered a glimpse of this tension (Zaitz, 2016). Several interview respondents, though not asked outright about the occupation, offered that the dialogue, especially in the media, about land use, the role of government, and the actions of militia members had caused harm to community relationships. As people were pushed to take sides publicly on these complex issues, respondents described a situation of "neighbor versus neighbor," which compromised trust required for collaborations to be successful. One respondent described that their neighbor came out for the protestors and against "government." This person was upset because people living on their street work for Harney County, Oregon State University, and local law enforcement, and said that because so many people work in public jobs, the community would collapse without the people who make up government (Landowner).

Still, with respect to water issues, the Harney County Watershed Council, and specifically the Coordinator Karen Moon, is poised to lead efforts to address water availability, including negotiating with the state to conduct a thorough study to understand aquifer structure, interactions between surface and groundwater, and recharge rates around the basin. Several leaders stand behind this champion, and have the momentum to be successful. This is evidenced by the Place-Based Planning

application, for which Moon is the convener, and names 18 other organizations as partners (Harney County Watershed Council, 2015). Many of these have already been working together on a recent Rules Advisory Committee to help the state determine how to handle 32 groundwater rights applications that were awaiting approval at the time the moratorium on groundwater permits was put into place.

Summary

Case study interviews yielded rich data about three rural communities in Oregon. The water issues in each case were different, influenced by geography, water availability, manifestations of climate change, land use, and other factors that comprised their individual situations. Like state level interviews, community members revealed that local history and political baggage play a key role in the success or failure of collaborative efforts to address water. The cases had some things in common, however, including challenges related to capacity, especially human and financial capital. Respondents also voiced the importance of leadership in bringing water issues to the forefront and uniting diverse interests in efforts to address them.

8. Discussion

One way to study rural places, especially in the state of Oregon, is to compare (or contrast) them with urban ones. The findings from this research reveal that this remains an important tool for decisionmakers thinking about water policy, who can understand the common challenges faced by rural communities by thinking about a rural-urban divide. However, the findings also reveal differences among three rural case study communities that point to the benefit of individual consideration and nuanced solutions to meet the needs of diverse communities. Using the literature on different kinds of capitals, political economies of scale, and power in decisionmaking helps tease out of the data a pattern for when to use the rural-urban divide as a tool for policymakers; while the literature on climate change, wicked problems, and clumsy solutions demonstrates ways that custom policies tailored to local or regional needs is best. The role of leaders in fostering the notion of rural-urban interdependence, rather than competition, is critical to the success of such an approach. Table 10 summarizes main findings in the state and community level interviews, including the history and political baggage, physical system changes, and power dynamics that come together with each area's key water issues to make an argument for both using and complicating the rural-urban divide as a tool.

	Key Water Issues	History & Political Baggage	Physical System Changes	Power Dynamics
Pudding River Watershed	• Water quantity: agricultural irrigation • Water quality: Mt. Angel, taste, odor, sediment, color • Infrastructure: Silverton repair & replace; Mt. Angel pressure and dead ends • Drift Creek and ASR projects	• No uniting organization; many leaders but no one ready to be the champion • Ag does not want Place-Based Plan to replace Drift Creek efforts • Watershed Council, history of collaborative planning, little action or funding; leader burned bridges; just getting started with new leadership • ASR project starts and stops	• Drought, less snowpack to provide summer flows • Well/groundwater levels dropping in some areas • Infrastructure breaking down, reaching end of useful life • 1993 earthquake revealed fault line between Mt. Angel wells	• Internal struggles with siloed, reproduced structures • Jurisdictions all "okay" on own, but exploring collaboration because of drought

	Key Water Issues	History & Political Baggage	Physical System Changes	Power Dynamics
Mid-Coast Basin	• Water quantity: Newport, Yachats, Beverly Beach, Port Orford, Seal Rock, possibly others • Water quality: high winter flows cause turbidity, sediment; low summer flows cause saltwater intrusion, higher temperatures unsuitable for fish • Infrastructure repair & replacement: Toledo, Newport, Seal Rock, Yachats • Earthquake/tsunami resilience	• Previous attempts between Newport & Lincoln City to collaborate on storage at Rocky Creek not successful • Past basin collaborations based on personal relationships; turnover equals lost momentum • Ant and grasshopper issues as barrier to pooling resources for infrastructure and planning	• Drought (no snowpack), longer dry seasons, heavier winter storms (Dec '15) • Too much or not enough water • Siletz River overallocated, threat to fish habitat, though cities have the water rights to withdraw	• Lincoln City somewhat detached from south county • Newport has more capital than others • High siloes in "backbone" string of coastal communities, reproduced structures

	Key Water Issues	History & Political Baggage	Physical System Changes	Power Dynamics
Harney County	• Water quantity: ag irrigation & domestic wells • Water quality: pockets of arsenic, boron, other contaminants • Need scientific data: map aquifer(s), understand recharge and groundwater/surface water interactions	• Abrupt moratorium on groundwater permits caused fear and uncertainty • History of outside interests intervening, e.g. timber industry decline, sage grouse, Steen's Mt., Wildlife Refuge occupation • History of successful community collaborations	• Drought, earlier snow melt, longer dry season • Well/groundwater levels dropping in some areas • Surge in water permits, ag irrigation over last decade • Juniper encroachment, forest management practices contributing to changes in water availability	• Within community, differences of opinion, but well-developed collaborative networks and trust • Trust somewhat challenged by recent Wildlife Refuge occupation, needs some rebuilding • Main conflict is residents vs. outside interests • Balancing ag/ranching/economic uses of water with domestic/conservation/birds/wildlife uses

	Key Water Issues	History & Political Baggage	Physical System Changes	Power Dynamics
State of Oregon	• Water quantity: increased demand for water, especially by ag and municipalities; decreased supply during summer/fall due to changing hydrograph; seeking suite of tools to include water storage, conservation, reuse as adaptation strategies • Water quality: few issues statewide, but in some areas, arsenic (naturally occurring) and nitrates (fertilizer, septic); emerging contaminants beyond current technology to treat; temperature concerns, especially affecting fish habitat (related also to quantity)	• Land use planning system: rigid, top-down, unintended harms to rural, esp. ag • Western water law constricting options for meeting increasing needs with decreasing supply	• Drought in almost all counties, esp. 2015 • Timing and form of precipitation changing • Lower snowpack, earlier snow melt, longer dry season • More severe winter storms, esp. Dec. 2015	• Portland has abundant source of clean water, some unaware or unconcerned about state water challenges • Nearly 60% of state population lives in Tri-County area: Multnomah, Washington, and Clackamas Counties

Table 10. Summary of Case Study and State Findings.

The main findings at the state level had much in common with the main findings in the three case study communities. For example, the data show that history and political baggage, including success and failure in previous collaborative efforts, influence water policy today. At the state level, interviewees focused on the controversial legacy of Oregon's land use policy that has shaped suspicion around state-level planning efforts and the obstacle that Western water law poses to developing innovative solutions to meet the state's changing supply and demand while upholding the doctrine of prior appropriation. In the case studies, however, history and political baggage informs communities' willingness to risk collaboration with one another and with the state; and past success and failure, along with hard won trust among stakeholders colors current efforts. Oregon's recent water policies also reflect the importance of history and political baggage. A prime example is House Bill 3369 (2009), which was intended to provide funding for water infrastructure and storage projects, subject to "environmental sideboards." However, while the bill did provide foundation for the Integrated Water Resources Strategy visioning process, the infrastructure development aspect of the bill was a failure because communities could not meet the requirements. Frustration by state level water stakeholders over this outcome informed a new way of developing solutions that involved a wide range of interests hashing out differences before bringing a proposal to the legislature, and making it easy for legislators to say yes to a concept that could meet the needs of environmental protections and the function of community water projects.

Another link between state level and case study interview findings is the role of leadership. In both contexts, a leader can act as a champion to raise water issues to be a priority. At the state level, leaders who seek relationships and negotiate across ideological and rural-urban districts can foster a sense of interdependence, rather than competition, among rural and urban places. For case studies, leadership means the difference between moving forward in collaborative planning or not. A leader who is a champion can unite diverse interests, rally individuals and organizations to devote precious resources, including time and political capital, to solving water problems, and a neutral leader is needed to subsume their own interests to facilitate a balanced conversation. In recent Oregon water policies, champions were essential to bringing a sense of urgency to water problems and reaching out to develop balanced legislation that not only meets the needs on paper but is functional as well.

At the state level, interview findings highlighted the importance of physical system changes from climate change to creating urgency around water issues. Drought especially has motivated a conversation about the potential to store high winter flows to meet human and ecological needs in low flow periods. Storage, in combination with a suite of tools that includes conservation and reuse efforts, is being discussed as an adaptation strategy to meet changes in the hydrograph. State level interviewees described a perfect storm of climate change, Western water law, and the rural-urban divide, however, with Western water law limiting the tools

available to solve water problems while providing perverse incentives for senior water rights holders to use more water than needed to preserve their allocation, and a disproportionate impact of changes in the hydrograph on rural communities[1]. Recent water legislation has focused on climate change adaptation strategies in creating funding for planning, feasibility studies, and implementation of water conservation, reuse, and storage.

Community case studies also focused on physical system changes, specifically changes in the hydrograph associated with climate change and exacerbated by situational elements. For the Pudding River Watershed, this means natural reservoir systems of snowpack, which have been less in recent years, and melting earlier, may need to be supplemented by a secondary system for capturing winter water for use in summer, potentially through off stream surface storage or underground aquifer storage. For the Mid-Coast Basin, reliance solely on rain for water supply creates problems of either too much or not enough water throughout the year. Heavier rains in the winter cause damage to infrastructure and water quality issues; longer dry periods and low flows bring their own set of troubles related to water-hungry industries and tourists. In Harney County, juniper encroachment and forest or public land management practices coincide with a significant increase in the

[1] It should be noted that while a perception of perverse incentives related to Western water law was described by respondents, state policy provides that if precipitation or other conditions negate the need for irrigation, there is no jeopardy for water rights holders who use less than their allotment. Water rights holders only need to keep infrastructure maintained and operational, demonstrating they are ready, willing, and able to use the water.

number of agricultural irrigators in the area to intensify results of drought and declining groundwater levels.

These diverse manifestations of climate change illustrate that this is a wicked problem (Rittel & Webber, 1973), complex and far reaching enough to make even defining the problem difficult. Because effects are shown to be different from place to place, developing solutions is also a challenge. Rather than seeking a "rural" solution, these findings underscore literature that suggests regional or place-based policymaking is essential (Bastasch, 2006; Cid & Pouyat, 2013; Clucas, et al., 2011; Larson & Lach, 2008), and that clumsy solutions, not elegant, streamlined, or one-size-fits-all solutions, are what is needed (Verweij, et al., 2005).

Yet as case study findings demonstrate through physical system changes that some issues require individual consideration, they also reveal that the three rural communities shared challenges related to the rural-urban divide. Specifically, findings support the literature that argues lack of sufficient human and financial capital (Castle, 1998; Flora & Flora, 2008), inefficient or siloed systems rather than economies of scale (Jessop, 2002), and power dynamics within the community or between the community and the state (Flyvbjerg, 1998; Mitchell, 2002; Flint & Krogman, 2014) hamper rural communities, in this case, in water policymaking.

Figure 15 illustrates categories of problems for which the rural-urban divide remains an important decisionmaking tool. Figure 16 illustrates categories of problems for which a community level custom solution would be more effective.

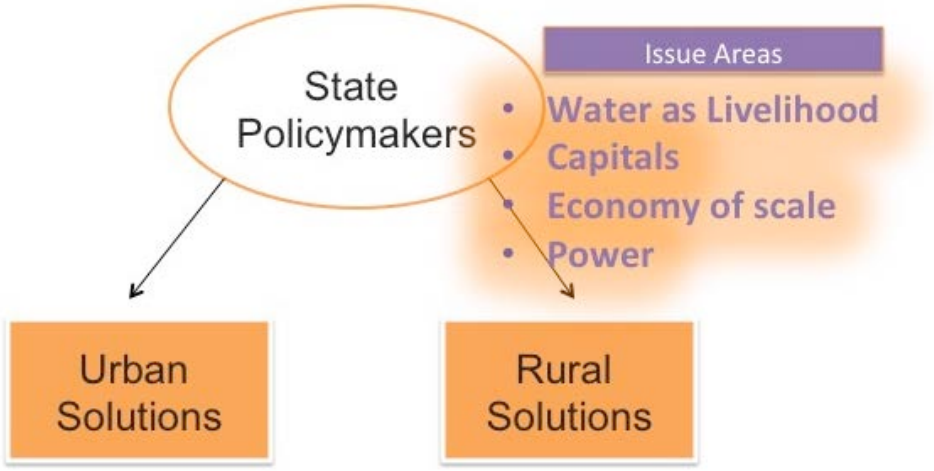

Figure 15. The Rural-Urban Divide as a Policymaking Tool

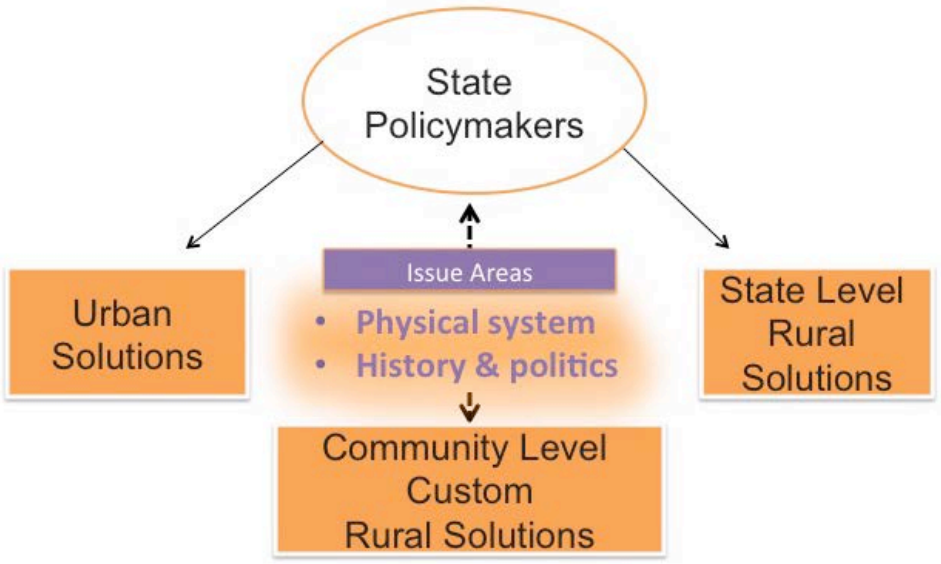

Figure 16. Custom Rural Solutions

State Level Policy Recommendations

The findings from this research suggest that water issues affect different rural areas differently around Oregon but that certain common challenges related to being rural pose barriers for communities. Additionally, the importance of leadership is a shared concept across the case study communities. For policymakers at the state level, I offer two categories of recommendations to help rural communities be effective in addressing water needs. First, findings suggest overarching support that rural communities may need, and second, findings provide clues to help individualized or custom solutions find success.

Figure 17 describes the four key findings from case study interviews in the far left column. These are that rural communities share many challenges in common; some issues facing rural communities are different and require individual consideration; that history and political baggage influences water issues, and especially collaboration around water; and that the role of leaders is to make water a priority and focus community efforts.

With respect to common rural challenges, I argue that common issues suggest common solutions. Three areas I recommend developing a streamlined approach to supporting rural communities in meeting their water needs are assessing, building and maintaining capacity; evaluating impacts of water issues on rural economic systems; and developing awareness of, and tools to address, power dynamics in state/community decsionmaking and within the community. Two areas I suggest considering power dynamics are being intentional about inclusion of rural voices in state decisionmaking, especially where discussions are held or decisions made geographically distant from communities, and acknowledging that power in decisionmaking also comes from how we measure success and what data is considered legitimate for making choices (Jasanoff and Wynne, 1998; Verweij, et al., 2005; Young, 2002).

The role of leadership was also common across the rural communities, and findings suggest that leaders help tremendously to prioritize water and focus community

efforts. I recommend that to the extent possible, the state consider supporting local leaders with limited capacity by providing resources to serve in such a role, in addition to other duties in the community. Where leaders liaise between the community and the state, consider supporting remote participation, occasional travel for face-to-face meetings, and supporting state staff to travel to communities. Another possible solution would be to develop a system that supported neutral water facilitators in communities around the state; this could even the playing field for some communities that do not have non-profit, non-governmental, or other neutral leadership with capacity to lead.

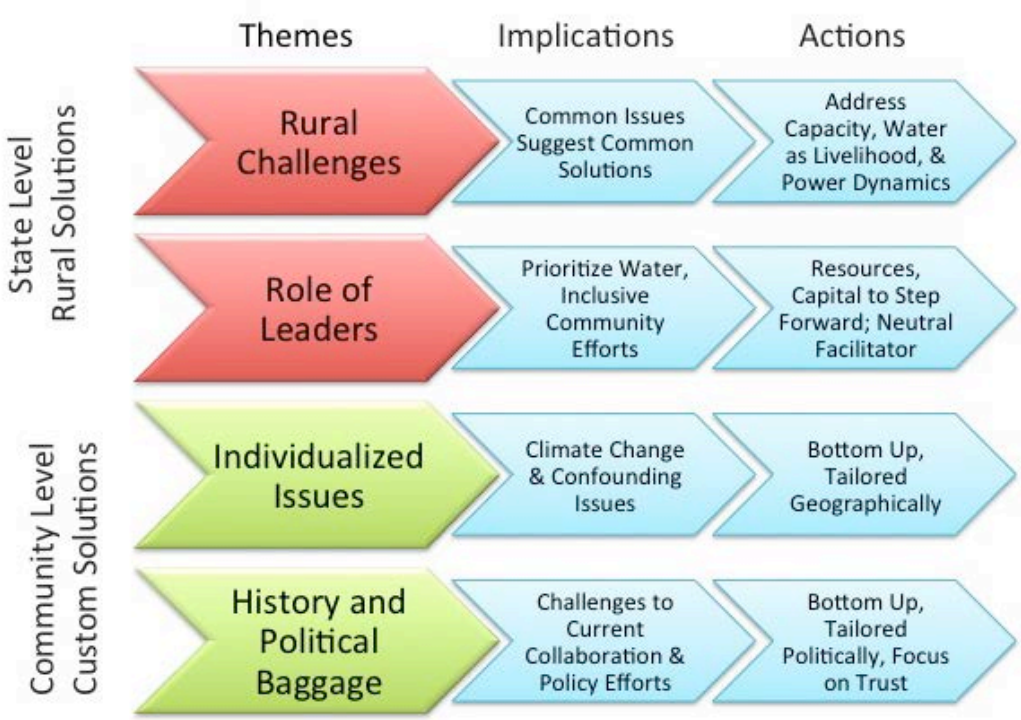

Figure 17. Community Level Themes

Figure 17 highlights individualized issues and history and political baggage as areas where rural communities need tailored solutions. With respect to individualized issues, top water needs differ from community to community, especially due to the complex problems of climate change and confounding local circumstances. I recommend that these solutions be bottom up and locally driven, involving the community in defining its most critical water issues. Custom solutions that are tailored geographically and respond to diverse situations are critical.

However, history and political baggage, unique to each community, poses challenges to collaboration within the community and between the community and the state. I recommend that addressing this aspect of policy is critical to the success of collaborative efforts and guidance by community concerns would provide a bottom up style process. Solutions may be tailored politically to the individual situation, and the outcome desired is to build and maintain the trust that is the foundation of successful collaboration.

Ultimately, each community's water solutions will be as unique as the communities themselves. Yet there will be common elements as well. It may be helpful to think of these solutions as semi-custom built, like a home that starts with a basic floor plan offered by a contractor to meet common needs, but which has custom elements

selected for the distinctive needs and preferences of those who live there and will be using the home everyday.

Finally, I offer recommendations to the three case study communities.

Pudding River Watershed

Key issues facing the Pudding River Watershed include changing climate manifestations such as drought, low snowpack, and decreasing groundwater supplies; aging infrastructure in need of repair and replacement; and drinking water quality concerns. Respondents described that the past history of goal setting led by the local watershed council has been hampered by lack of funding to carry out projects and collaborative relationships that have been harmed by previous leadership. Potential collaboration between Mt. Angel and Silverton has also stopped short of completion.

To the Pudding River Watershed, I suggest that the Place-Based Planning application process be the beginning of an intentional effort to overcome siloes and develop a state-of-the-art collaboration in order to achieve economy of scale and build capacity to address large, long-term, costly water issues. Specifically, changes in the hydrograph are likely to cause long-term problems related to drought, low snowpack, and dropping groundwater that would be more effectively addressed by

putting stakeholder heads and resources together. Repairs and replacement of water treatment and delivery infrastructure would likewise benefit from the economy of scale that Pudding River Watershed communities would have together. Additionally, while it appears that agricultural irrigators and different cities have diverging interests, there may be promise in developing shared solutions such as surface or underground storage and common infrastructure.

Interviews revealed that while previous attempts to collaborate on projects in the watershed have not been successful, new leaders quickly and effectively came together to develop the community's Place-Based Planning application. These leaders, listed in the application, represent a variety of interests and organizations and bring with them expertise and experience in collaborative decisionmaking from previous posts.

It is important to note that the Pudding River partners did not receive Place-Based Planning grant funding in the first round. But regardless of grant funding decisions, my recommendation is that leaders take advantage of the momentum developed through the application process and be brave and determined to collaborate, regardless of history, political baggage, and risk of failure. I also suggest engaging with potential partners listed on the Place-Based Planning application, again using the momentum and excuse of the process to foment partnerships that might yield

innovative collective solutions. The watershed is home to several leaders with collaboration experience who can accomplish much in this context.

Figure 18 describes how these policy recommendations fit together. First, the role of leadership is to guide collaboration, drawing on the experience and expertise of the relatively new group of leaders in the watershed. This has already begun, with the Place-Based Planning application, which could serve as the momentum needed for continued community collaboration. The benefits to this exercise, which is time and resource intensive, is to provide economy of scale to currently siloed communities to face changes in the physical system and address infrastructure needs. New leaders, changing conditions, and a state policy environment that is supportive of locally-driven solutions may be an ideal situation to foster future successes for Pudding River Watershed stakeholders working together.

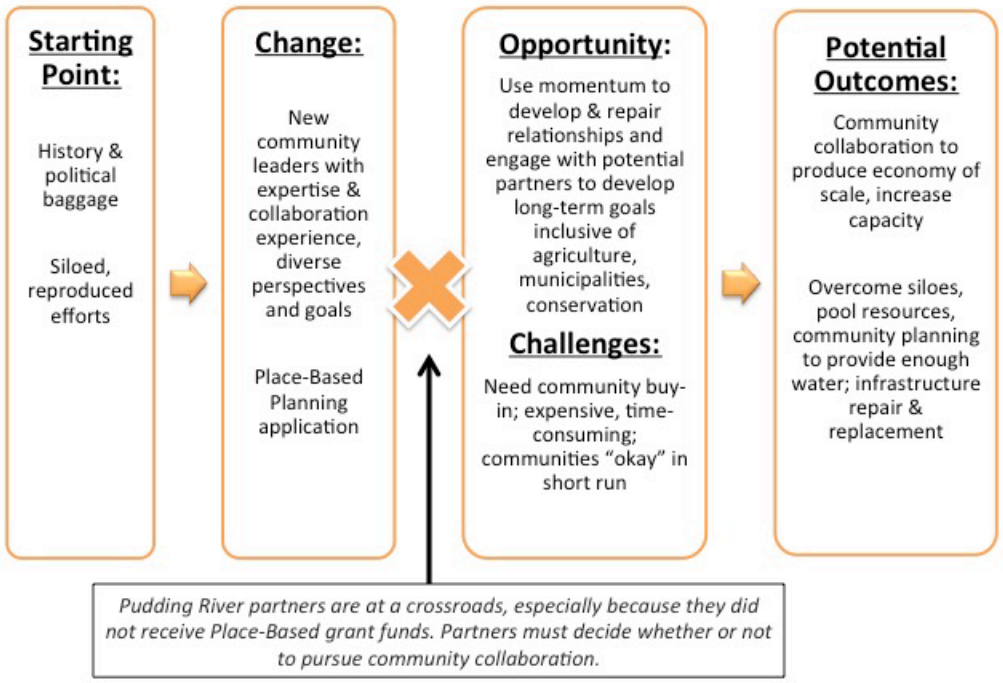

Figure 18. Policy Recommendation Framework for Pudding River Watershed

Mid-Coast Basin

In the Mid-Coast Basin, power dynamics mimicking the rural-urban divide at the state level between the micro-urban center of Newport and the rest of the more traditionally rural communities make it important to consider how decisions are made, including which concerns will be prioritized and whose voices are heard in the process of local planning. This is similar to the state level findings related to decision making processes dominated by urban voices experiencing different water challenges than rural communities. In that dynamic, recommendations focus on finding ways to incorporate rural voices in the process. In the Mid-Coast Basin, the goal is to be inclusive of diverse needs and to avoid marginalizing small communities.

I recommend that as the Place-Based Planning process proceeds, leaders work intentionally and quickly to find facilitation that does not represent Newport and allows Newport to be a participant in their own right. This is important for two reasons: first, to balance power dynamics that may lead to Newport's needs and preferences overshadowing other communities or lead to smaller communities refusing to participate; and second, because the needs and preferences of Newport are also important and deserve to be represented in the conversation as well. In order to achieve a balanced, inclusive community collaboration, I suggest that engaging with partners from Lincoln City to Yachats, and east to include Siletz and

Toledo, including county commissioners, mayors, city administrators and public works departments will be important to representing the diverse needs of the area.

One theme from the interviews was that the historical baggage of "ant" and "grasshopper" communities has prevented collaborations to address infrastructure challenges. The idea is that, as in Aesop's fable of the ant and the grasshopper, some communities have budgeted and invested steadily along the way to maintain and repair infrastructure so they would be ready for the day water treatment and delivery systems reached the end of their useful lives. These are like the ant. On the other hand, some communities have not invested over time and now that infrastructure repair and replacement is reaching crisis level, the price tag is much higher. These are like the grasshopper. I suggest that even in the face of this frustrating reality, changing conditions, from aging infrastructure to severe storms and prolonged low flows that damage systems, as well as diminished funding to pay for repairs and replacement may make the time right to pool resources anyway. This economy of scale could be achieved in a variety of ways, including shared infrastructure, administration, and natural and financial resources. Additionally, I suggest making use of human and financial capital within the basin to collective benefit by teaming up with districts and cities with leaders who have experience and networks related to funding.

Figure 19 illustrates these policy recommendations, which address key areas of the role of leadership, history and political baggage, and economy of scale that findings show are of particular importance to the Mid-Coast Basin.

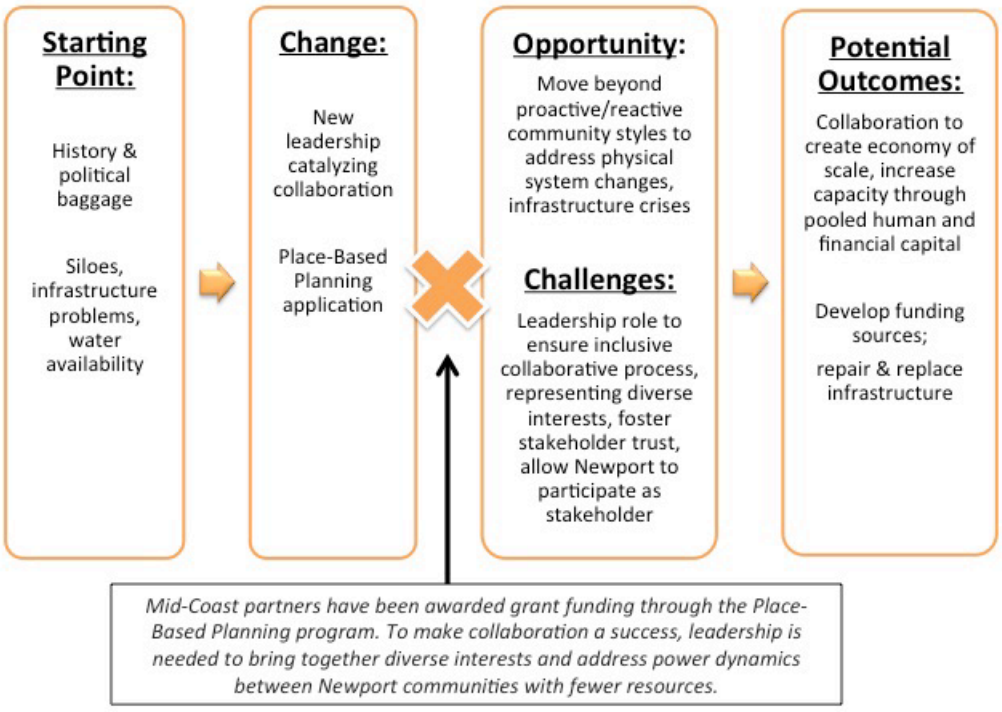

Figure19. Policy Recommendation Framework for Mid-Coast Basin

Harney County

In Subregion 1712 of the Malheur Basin (which I refer to as Harney County), I am reminded of the power dynamic between rural and urban places. This case represents the most traditional understanding of the rural-urban divide where there is not only a power concentrated in urban decisionmakers, but decisionmaking centers are geographically distant from Harney County. Urban centers are also experiencing different challenges and physical system realities than those in Harney County. Because of this, I recommend that as Place-Based Planning proceeds, the community invest in a champion to liaise between Harney County and the state, to include traveling and interacting face-to-face with agency staff and community stakeholders. The goal is to cultivate Harney County's voice by developing relationships with decisionmakers in urban Oregon.

As in all three case studies, water is intricately tied to livelihood in Harney County. Yet in Harney County, there is imminent concern about availability for current and future economic development that is more pronounced than the other two case studies. I suggest that in the dire situation of the recent groundwater permit moratorium, community leaders take the opportunity to partner with the state on a thorough and state-of-the-art study of water in the basin, particularly if these data are to set a baseline for the next nearly 50 years, as the 1968 data have for today.

As one respondent mentioned, no one wants Harney County to run out of water. However, there are diverse and sometimes conflicting interests within the community. Looking forward 50 years, stakeholders from myriad perspectives can agree that the goal is to have a healthy basin with abundant, clean water. The difficulty lies in disagreement about how to get there. I suggest being strategic about involving potential opponents to local planning early to avoid problems later in the policy process. I recommend engaging with environmental interests, those representing senior water rights holders, and others who are especially troubled by groundwater depletion in Harney County to understand and address concerns in a way that makes sense for the community. Consider convening a meeting with people and organizations representing a spectrum of ideas and employing a neutral facilitator to help develop workable solutions before presenting them to decision makers in Salem. Finally, I offer that the planning process might involve considering expectations for agricultural water use and future supply and how to balance improvements in efficiency of water use with the benefits of flood irrigation for migrating birds and other wildlife.

Figure 20 depicts the policy recommendations for Harney County and shows that power dynamics, water as livelihood, and the context-specific groundwater permit moratorium are of central concern for this case study community.

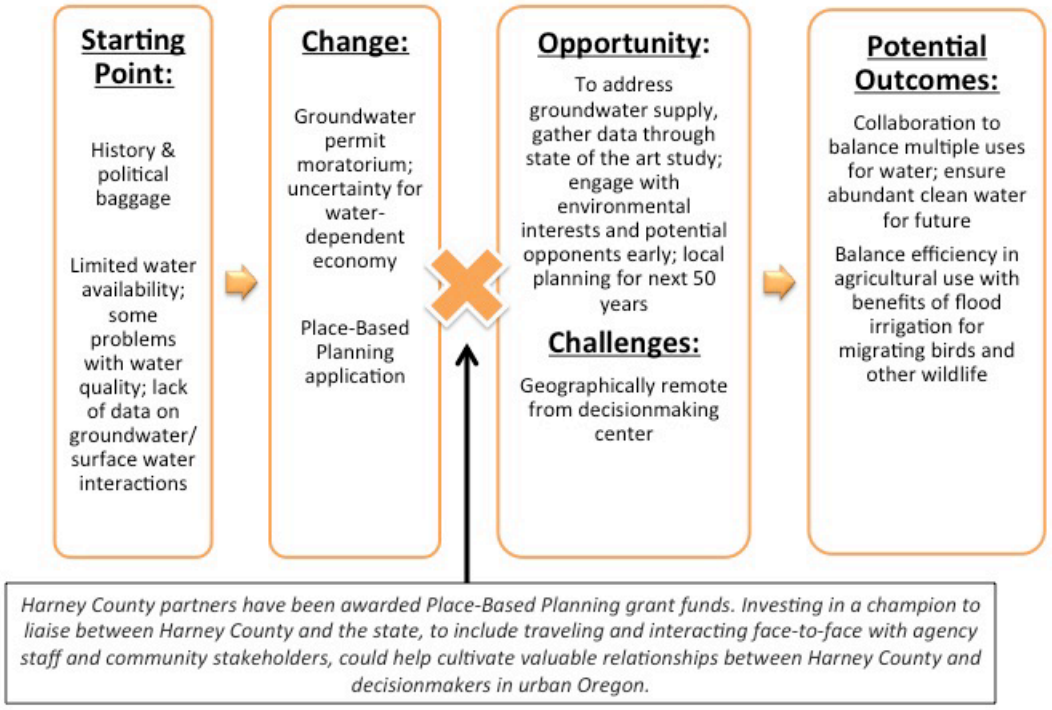

Figure 20. Policy Recommendation Framework for Harney County

Limitations and Areas for Future Study

The methodology of this study relies heavily on qualitative research findings to develop conclusions about rural communities and water policy in Oregon. Qualitative interview data are rich and provide deep understanding of a particular context. Three main challenges were posed by these data. First, because of the sheer amount of rich information contained in the 74 interviews, many interesting topics discussed by respondents are not included here, foremost among them, an exploration of the role of tribes in water policy in Oregon. This would have been a significant departure from the treatment of the data I chose, but consideration of tribal/state history and political baggage in connection with how water issues affect certain specific rural communities in Oregon would be an area for future study.

Second, the very argument that provides the foundation for this research is that rural communities are diverse and different enough from one another to merit individual consideration. With respect to case study interviews, this means that findings provide rich data on the three rural communities studied here; however, one would need to explore many more cases within the state to definitively defend my hypothesis regarding the rural-urban divide and custom solutions to be generalizable.

Third, due to the nature of the political cycle, turnover within these positions, and the timing of the interviews, it is worth noting that some interviewees were not in office or serving in their post when legislation was created or when problems began. This is a challenge when looking at policies that are evolving before our eyes and which have a relatively long history of being a knotty problem for communities, the state, and beyond.

Another area for future study would be to tease apart the concepts of rurality and geography in Oregon, and water would be an excellent vehicle for doing so. One of the two place-based planning applications submitted by an urban center was from the Medford area. This would not be considered rural by definitions of population or population density. However the city's geographic remoteness from other urban centers in Oregon, in connection with the water issues connected to its drier climate make it possibly more like some rural communities in Oregon than other urban ones. This situation suggests that one area for further study is the relationship between geography and rurality.

Finally, a more in depth consideration of the complex community interactions, perhaps in a longitudinal study, would provide further insights that I may not have captured here. Similarly, longer or additional interviews with the respondents would allow a future researcher to develop a detailed plan for rural and custom

solutions for each community, as respondents reveal more nuances about community issues and dynamics.

9. Conclusion

Water policy in the state of Oregon offers a timely opportunity to study the rural-urban divide as a tool for decisionmakers. Changing climate manifestations are resulting in a "new normal" that looks very different from one rural community to the next, as are other factors, including changing rural economies. The results of studying three diverse rural communities within Oregon illustrate that the rural-urban divide is still a useful tool for policymakers considering problems and potential solutions at the state level. This is because rural communities do share certain challenges that continue to be relevant. Among these, two are most salient: 1) the challenge of capacity, in the form of human and financial capital, which makes provision of public services more difficult and expensive per capita than for a larger community; and 2) the rural-urban power dynamic that accompanies state level decisionmaking and the definition of the public interest.

At the same time, a more nuanced method is necessary to address the individual concerns of diverse rural communities throughout the state. Rural communities' top water problems often do not fit with the state's top water priorities, and also do not fit with the top water priorities of other rural communities. Particularly with the differentiated effects of drought, decreased snowpack, and changed timing and volume of winter flows, creating custom solutions that take into account geography, water availability, and other factors is critical to meeting rural needs.

Appendices

INTERVIEWEE PROFILE

In qualitative research, there is often a tension between providing enough detail about the interviewees, who they are, what organizations and perspectives they represent, while protecting confidentiality. The following is presented to give the reader a better sense of the respondents involved in this project.

About State Level Interviewees:

- Chosen to represent individuals and organizations that would be present at a typical state legislative hearing on water
- Some have served or are serving on taskforces or workgroups related to water
- Represent range of ideological perspectives, including Republican and Democrat, and organizations focused on municipal, agricultural, and environmental use of water
- Individuals and organizations included:
    - Legislators and legislative staff
    - Other water policymakers, including executive branch policy advisors
    - Agency staff representing water, environment, and related concerns
    - Environmental and conservation groups

- Irrigation organizations
- Municipal water providers
- Water attorneys
- Academics
- Tribal natural resource department staff
- Representatives of counties and cities

About Community Case Study Interviewees:

- Titles and jobs of stakeholders involved in water issues in each community case study were different
- Partners and supporters listed in each community's Place-Based Planning application were contacted as potential interviewees
- Snowball sample, interviewees were asked who should not be missed in a conversation about water in their community
- Interviewees included:
    - Local policymakers, state legislators, county representatives
    - City or community administrators, managers, Mayors
    - Municipal staff from public works and related agencies
    - Water engineers and technical specialists
    - Watershed council members
    - Soil and water conservation district staff

- Irrigation district staff and irrigators
- Environmental and conservation groups
- Concerned community members
- Tribal natural resource department staff

Respondents were interviewed until saturation was reached, meaning hearing the same ideas each time and nothing new. However, due to the nature of the political cycle, turnover within these positions, and the timing of the interviews, it is worth noting that some interviewees were not in office or serving in their post when legislation was created or when problems began. It is also worth noting that results are limited by what respondents choose to reveal and how much ground can be covered in an hour-long interview.

INTERVIEW GUIDE
WAVE 1: Policy Professionals

Part I: Introduction

1. Please describe what you do—what is your job? What is your role in water policy? How are you involved with rural communities?

Part II: Water Storage

1. Water Storage:
    a. What is the current situation in Oregon with regard to water storage?
    b. How do surface and groundwater storage differ in Oregon?

2. How are current Oregon water storage policies affecting communities? What geographic areas are most affected by water storage issues? Why?

3. SB 839: Program offering funding for research as well as grants and loans for water projects, including water storage and delivery:
    a. What is the current status of this policy?
    b. What is the background of this policy: How did it come about? Who was involved in identifying and defining the issue? Drafting and shaping solutions? Advocating for or against the policy?
    c. How is this policy affecting or likely to affect different rural communities?

4. What remains unaddressed with regard to water storage in Oregon?

Part III: Drinking Water Quality

1. Drinking water quality:
    a. What is the current situation in Oregon with regard to drinking water quality?
    b. What are some of the main concerns for drinking water quality?
    c. Who is responsible for regulating drinking water quality?
    d. Which waters are regulated? Which are not?
    e. How does regulation differ by land use or designation (such as agricultural, residential, etc.)?

2. How are communities affected by drinking water quality? How does this differ by geographic location?

3. What are the differences in regulations between urban and rural communities, generally?

4. How do different rural communities ensure water quality? What differences exist between public and private water systems? What happens when water systems are not subject to regulation?

5. What remains unaddressed with regard to drinking water quality in Oregon?

Part IV: Lessons for the Future

1. What communities in Oregon should I explore to gain more information about differential impacts, needs, and preferences with regard to water policies?

2. Are there specific people I should talk to at the community level? If so, who are they?

INTERVIEW GUIDE
WAVE 2: Rural Community Case Studies

Part I: Introduction

2. Please describe what you do—what is your job? What is your role in water policy in your community?

Part II: Water Storage & Other Water Challenges

5. Water Storage:
    a. What is the current situation in your community with regard to water storage?
    b. How do surface and groundwater storage differ in your community?
    c. What geographic areas are most affected by water storage problems? Why?
6. What is the current situation in your community with regard to drinking water quality?
7. What are the most important water-related challenges facing your community?
8. How are current Oregon water storage policies affecting your community?

Part III: Place-Based Planning Application

1. Please describe your community's recent application for Place-Based Planning funds through the OWRD.
    a. What would the funds help do to address water problems in the community?
    b. What other tools are available to help address these water problems?
    c. What was the process to develop this proposal?

Part IV: Lessons for the Future

3. What examples can you give about policies related to water storage that worked particularly well in your community? Examples of policies that did not work well?

4. Are there specific people in your community that I should talk to about participating in developing the Place-Based Planning application? If so, who are they?

References

Bastasch, R. (1998). *The Oregon Water Handbook.* Corvallis: OSU Press.

Brown, D. & Schafft, K. (2011). Rural People & Communities in the 21st Century: Resilience & Transformation. Malden, MA: Polity Press.

Castle, E. (1998). A Conceptual Framework for the Study of Rural Places. American Journal of Agricultural Economics, Vol. 80, pp. 621-631.

Cid, C., & Pouyat, R. (2013). Making Ecology Relevant to Decision Making: The Human-Centered, Place-Based Approach. *Frontiers in Ecology and the Environment , 11*, pp. 447-448.

Clucas, R., Henkels, M., & Steel, B. (2011). The Politics of One Oregon: Causes and Consequences of the Rural-Urban Divide and Prospects for Overcoming It. In M. Eds. Hibbard, E. Seltzer, B. Weber, & B. Emshoff, *Toward One Oregon: Rural-Urban Interdependence and the Evolution of a State* (pp. 113-142). Corvallis: Oregon State University Press.

Dalton, M., Mote, P., & Snover, A. (2013). *Climate Change in the Northwest: Implications for Our Landscapes, Waters, and Commuities.* Oregon Climate Change Research Institute. Washington, DC: Island Press.

Eds. Hibbard, M.; Seltzer, E.; Weber, B.; and Emshoff, B. (2011). *Toward One Oregon: Rural-Urban Interdependence and the Evolution of a State.* Corvallis, OR: Oregon State University Press.

Emshoff, B. (2011). A New Oregon Trail. In Hibbard, Seltzer, Weber, & Emshoff, *Toward One Oregon* (pp. 7-10). Corvallis: OSU Press.

Flint, C., & Krogman, N. (2014). Contemporary Water Issues in Rural North America. In C. Bailey, L. Jensen, & E. Ransom, *Rural America in a Globalizing World* (pp. 190-207). Morgantown: West Virginia University Press.

Flora, C. & Flora, J. (2008). Rural Communities: Legacy and Change. Boulder, CO: Westview Press.

Flyvbjerg, B. (1998). *Rationality & Power.* Chicago: University of Chicago Press.

Intergovernmental Panel on Climate Change, Working Group I. (2013). *Climate Change 2013: The Physical Basis.* Cambridge: Cambridge University Press.

Jasanoff, S. & Wynne, B. (1998). Science and Decisionmaking. In Eds. Rayner, S. & Malone, E. Human Choice and Climate Change. Battelle Press.

Jessop, B. (2002). "The Political Economy of Scale." In Eds. Perkmann & Sum, *Globalization, Regionalization & Cross-Border Regions (*pp. 25-49). Hampshire, England: Palgrave MacMillan UK.

Johnson, K. (2016). Rural Oregon's Lost Prosperity Gives Standoff a Distressed Backdrop. The New York Times.

Larson, K., & Lach, D. (2008). Participants and Non-Participants of Place-Based Groups: An Assessment of Attitudes and Implications for Public Participation in Water Resource Management. *Journal of Environmental Management , 88*, pp. 817-830.

Lofland, J., et al. (2006). Analyzing Social Settings: A Guide to Qualitative Observation and Analysis. Belmont, CA: Wadsworth.

Martin, S., & Weber, B. (2011). A Tale of Two Oregons: Common Aspirations, Different Contexts, and Critical Interdependencies in Urban and Rural Oregon. In Hibbard, Seltzer, Weber, & Emshoff, *Toward One Oregon* (pp. 17-40). Corvallis: OSU Press.

Maxwell, J. (2013). Qualitative Research Design: An Interactive Approach. Los Angeles: Sage Publications.

Miles, M., et al. (2014). Qualitative Data Analysis: A Methods Sourcebook. Thousand Oaks, CA: Sage Publications.

Mitchell, T. (2002). *Rule of Experts: Egypt, Techno-Politics, Modernity.* Berkeley: University of California Press.

Morton, L., & Rudel, T. (2014). Impacts of Climate Change on People and Communities of Rural America. In C. Bailey, L. Jensen, & E. Ransom, *Rural America in a Globalizing World.* Morgantown: West Virginia University Press.

Nelson, M., & Vucetich, J. (2009). On Advocacy by Environmental Scientists: What, Whether, Why, and How. *Conservation Biology* , 1090-1101.

Oregon Department of Land Conservation and Development. DLCD Farmland Protection Program. State of Oregon. http://www.oregon.gov/lcd/pages/farmprotprog.aspx.

Oregon Legislative Information System. (2016). Oregon State Legislature. https://olis.leg.state.or.us/liz/2015I1.

Oregon Office of Rural Health. (2010). Rural Definitions. Oregon Health and Science University. http://www.ohsu.edu/xd/outreach/oregon-rural-health/data/rural-definitions/.

Oregon Water Resources Department. (2012). Oregon's Integrated Water Resources Strategy. https://www.oregon.gov/owrd/Pages/law/integrated_water_supply_strategy.aspx.

Oregon Water Resources Department. (2015). Place-Based Integrated Water Resources Planning. https://www.oregon.gov/owrd/Pages/Place_Based_Planning.aspx.

Rector, E. (2010). Looking Back in Order to Move Forward: An Often Untold History Affecting Oregon's Past, Present, and Future. Coaching for Educational Equity. https://www.portlandoregon.gov/bps/article/412697.

Riley, G. (2004). Markets and Market Failure. tutor2u.

Rittel, H., & Webber, M. (1973). Dilemmas in a General Theory of Planning. *Policy Sciences* , 155-169.

Robbins, W. (2006). Hard Times in Paradise. Seattle: University of Washington Press.

Seltzer, E., et al. (2011). Reframing Our Common Cause in an Interdependent World. In Hibbard, Seltzer, Weber, & Emshoff, *Toward One Oregon* (pp. 159-166). Corvallis: OSU Press.

United State Census Bureau (2010). 2010 Census Urban Area FAQs. https://www.census.gov/geo/reference/ua/uafaq.html.

Verweij, M., et al. (2006). "Clumsy Solutions for a Complex World: The Case of Climate Change." Public Administration, Vol. 84, No. 4, pp. 817-843.

Weaver, H. (2008). Striving for Cultural Competence: Moving Beyond Potential and Transforming the Helping Professions. In Eds. Dana, R. & Allen, J. Cultural Competency Training in a Global Society. New York: Springer.

Wolf, A. (2012). Spiritual understandings of conflict and transformation and their contribution to water dialogue. *Water Policy , 12*, 73-88.

Wolters, E. A., & Hubbard, M. (2014). Oregon water: Assessing differences between the Old and New Wests. *The Social Science Journal , 51* (2), 260-267.

Woods, M. (2011). Rural. New York: Routledge.

Yin, R. (2014). Case Study Research: Design and Methods. Los Angeles: Sage Publications.

Young, I. M. (2000). *Inclusion and Democracy.* New York: Oxford University Press.