Water Policy and Innovation Service

Supporting Community Adaptations to Persistent Water Shortages

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[DIALOGUE DRAFT VERSION 2.0]

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About the Water Policy and Innovation Service
The Water Policy and Innovation Service is a joint project of Portland State University, Eastern Oregon University, Oregon State University, and Southern Oregon University. The Service leverages expertise in water and policy to meet the needs of particular projects. The Service's goal is to provide objective, third party analysis of options and considerations to the collaboratives and decisionmakers wrestling with some of Oregon's toughest water policy challenges.

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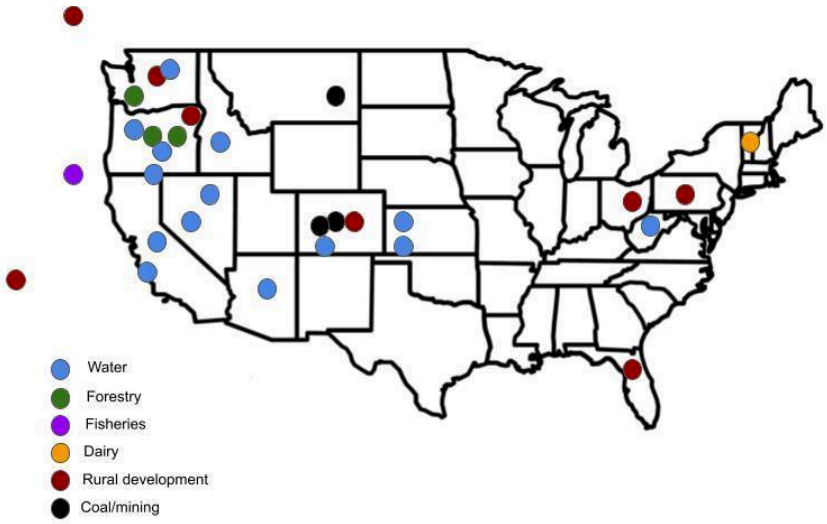
i. Executive Summary

Across Oregon, there are communities dealing with the daunting challenge of adapting to life with persistent water shortages. Changes in snow and rainfall linked to climate, significantly depleted groundwater, or deteriorating water infrastructure will likely force an increasing number of communities[1] to consider adjusting how they use water, and as a result, their mix of economic activity. In March 2025, Oregon Governor Tina Kotek's office and the Legislative Water Caucus called for an objective gathering of policy options for how Oregon might better support communities adapting their local economies to persistent water shortages. In response, the Water Policy and Innovation Service (Service) produced the following report. The intention of this analysis is to inform dialogue and action on possible solutions by giving policymakers a "full deck" of options, and potential considerations. It is not intended to be a recommendation.

In its assessment, the Service reviewed 26 case studies to learn how other states are helping communities whose economies and social cohesion depend on a scarce natural resource (see Figure i.1). It also interviewed 27 national and state experts in rural development, resilience planning, and water management to include their viewpoints.

Figure i.1. The 26 Case Studies in Water, Forestry, Fishing, and Mining Used for this Analysis



Readers should note that this analysis employs a "stewardship economy" lens, a concept used by Wallowa Resources. A stewardship economy is an economy shaped by the need, and responsibility, to manage land, water, and communities sustainably. A hallmark of this model is retaining a baseline level of employment, capital, and businesses in the natural resource sector to carry out the stewardship of land and water.[2]

[1] For this document, we did not look at communities facing increasing demand for water (e.g., from data centers or growing population bases) because those places *tend to* have more diversified economies and less water scarcity.
[2] Wallowa Resources. (2025). About Us. Accessed at https://www.wallowaresources.org/aboutus.

The Water Policy and Innovation Service (Service)[3] is an offering of Portland State University's National Policy Consensus Center (NPCC), Eastern Oregon University (EOU), Oregon State University (OSU), and Southern Oregon University (SOU). The Service completes analysis, designed to be third-party, objective, and useful, at the request of at least two parties with different perspectives of a statewide water policy issue that's of interest to both the state and Oregon communities.

Findings

Three guiding "pillars" emerged during the assessment, which were used to organize the policy options presented in this report. All three are needed to support communities during a significant change process. Research and interviewees suggest that any policy action should:

1. Enable community participation and leadership of changes with good information and a good plan;
2. Take action that is coordinated and intentional, with maximum flexibility on timing and requirements, and accountability, so that adaptation can occur and efficiency can improve; and
3. Remain resilient over time by diversifying economic activity of the community and maintain core services and infrastructure.

Figure i.2 Policy Options to Support Community Adaptations to Water Shortages

[3] Water Policy Service. (2025). https://www.pdx.edu/policy-consensus-center/water-policy-and-innovation-service.

Our dialogue indicated that Oregon is generally well positioned to support communities who want to use water more sustainably and/or diversify their economies. However, interviewees noted that the state programs and services already in place do not always work effectively, or in a coordinated fashion, to meet the specific needs of communities responding and adapting to change, especially as it relates to persistent water shortages. Any actions Oregon takes will need to find ways to knit together support from its existing programs and resources. That "knitting" may require strong coordination amongst state executive branch agencies. Ways to connect multiple policy actions range from little state investment and no legislative change to significant state investment and legislative changes. For example:

- **Approach A:** No additional budget and a focus on existing administrative programs and actions. This could include a governor's executive order directing state agencies to A) use their authorities to support communities adapting local economies to persistent water shortages, and B) partner with Oregon foundations to fund community actions.

- **Approach B:** Create a $10-$40 million public-private partnership between the state and philanthropic donors to distribute flexible block grants to communities adapting local economies to persistent water shortages. The partnership could include A) flexible state and foundation funds to implement community change strategies; B) additional flexibility in water-use rights with accountability protections, similar to those for drought emergency declarations; and C) directed research and technical assistance.

- **Approach C**: If Approach B were piloting actions, Approach C represents full implementation needed to meet the scope of Oregon's problem (See Table 1). This could include comprehensive investment in water availability data and innovation research, more flexibility in water-use rights to meet the range of needs for people and ecosystems, and clear water use efficiency goals. It could also include an explicit revision to the "state-local-federal" funding relationship for rural infrastructure and services – where local governments need to develop the local tax base to maintain infrastructure and sustain core services, but state and federal funds are available for bigger investments when new infrastructure or bigger adaptations are needed.

I. Context & Problem Definition

An increasing number of Oregon communities are dealing with the daunting challenge of changing how they use water in the face of persistent water shortages (see Table 1).[4] These shortages could be caused by multi-year droughts in specific counties and basins, long-term groundwater declines, deteriorating water infrastructure, or declines in water availability due to climate-related changes in snowpack and rainfall. In some cases, water shortages can be attributed to the overallocation of water-use rights to surface and groundwater, before there was a clear understanding of how much water might be available or how best to balance water needs for agriculture, fish, wildlife, people, and all other water uses.

As a result, severe water shortages can look like slow-moving disasters that affect a broad swatch of businesses, services, and other aspects of a local community.[5] Looking at ways to reduce water consumption requires an all-hands-on-deck approach across industry sectors.

In Oregon, water-dependent businesses (agriculture, manufacturing, healthcare, etc.) contribute approximately half (48%) of the state's total economic output and close to half (44%) of the state's employment.[6]

Irrigated agriculture alone consumes 78% of the surface and groundwater used in Oregon and contributes $7.3 billion each year to Oregon's economy.[7] Farmers grow a mix of forage crops (55% of irrigated acreage), including vegetables, grains, grasses, corn, orchards, berries, mint, hops, beans, etc. Farming, cities, and industry are not the only uses of water. Water to support ecosystems is essential to Oregon, and to key aspects of local economies (e.g., recreation).

Communities and their economies will always be dependent on water, but the mix of water-dependent economic activities and technologies *can* adapt to the availability of water. Adapting local economies to persistent water shortages can happen with or without intervention from Tribal, local, state, or federal policymakers. It can happen forcibly due to external shocks or stressors, or it can be initiated intentionally over time with the support of affected communities.

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[4] For this document, we did not look at communities facing increasing demand for water (e.g., from data centers or growing population bases), because those places tend to have more diversified economies and less water scarcity.
[5] This memo does not focus on actions needed to avoid a water-related crisis, just how to support communities to adapt to an existing water availability crisis.
[6] Pilz, D., Kruse S., Raucher R., Clements J., Gardner T., Odefey J., Madsen T., Purkey A., Sheridan C., McCoy A., Ehrens A.. (2023). The Business Case for Investing in Water in Oregon. Accessed at https://www.oregon.gov/owrd/WRDPublications1/230721_FINAL_Business_Case_for_Water_in_OR.pdf.
[7] Ibid.

Table 1.1. Defining Community for this Memo

Place-Based Water Planning defines community to mean, "the people impacted by the water resources of the planning area, entities with an interest or obligation related to water resources or ecosystems in or impacted by the planning area, and federal, state, local, and tribal governments."[8] This report uses the term community more narrowly to focus on the economic needs of people who live, work or play within a geography.

In March 2025, the Office of Governor Kotek and the Water Caucus of the Oregon Legislature inquired if the Water Policy and Innovation Service (Service) could support an exploration of how other states have helped communities change their core uses of water and the economic activities dependent on that water in the face of persistent water shortages.

Table 1.2 Defining a Water-Dependent Economy Facing Water Shortages

For the purposes of this document, the assessment team focused on communities facing "persistent, significant water shortages" where irrigated agriculture is integral to the local economy. We defined those as counties where agriculture earnings were greater than 5% of total county earnings; and, as counties experiencing severe drought most of the last six years and/or have areas of concern or significant concern for groundwater. There are other economic sectors dependent on water, but manufacturing, healthcare, and other sectors are often less exposed to persistent water shortages than irrigated agriculture.

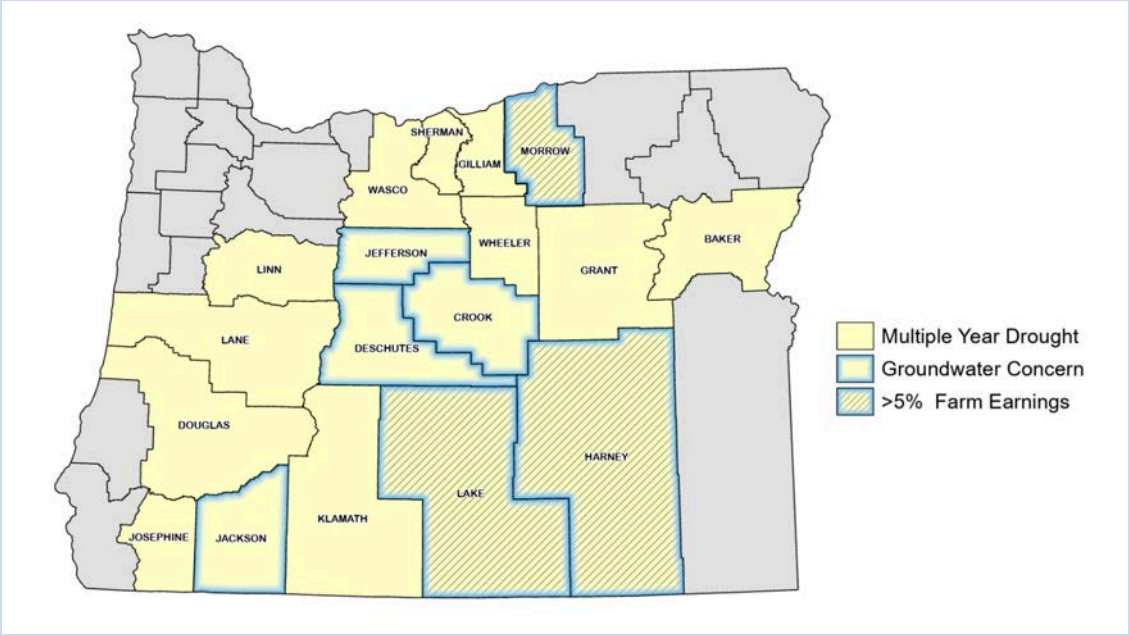
Across Oregon, 18 of 36 counties have experienced severe drought across more than half the county and more than half the time in the last six years.[9] Within those 18 counties, there are seven counties with groundwater basins of concern or significant concern because of decreasing water yields from pumping and/or declining groundwater levels.[10] In Oregon, there are also eight counties where farm employment is more than 10% of total employment AND farm earnings are more than 5% of all county earnings.[11] Three counties – Lake, Morrow, and Harney–are experiencing both surface and groundwater scarcity conditions *and* depend on agriculture for more than 5% of county earnings.

[8] Oregon Administrative Rules § 690-602-0200(5). (2026). Accessed at https://secure.sos.state.or.us/oard/ruleSearch.action.

[9] The 18 counties had a mean drought severity and coverage index greater than 150 for weeks between 2018 and 2025. This means that more than 50% of the area in those counties experienced severe (D2), extreme (D3), or exceptional (D4) drought more than 50% of the weeks during that time. Akyuz, F. A. (2017). Drought Severity and Coverage Index. United States Drought Monitor. https://droughtmonitor.unl.edu/About/AbouttheData/DSCI.aspx.

[10] Oregon Water Resources Department. (2021). Oregon Groundwater Resource Concerns Assessment. Accessed at https://www.oregon.gov/owrd/WRDReports/2021_Groundwater_Resource_Concerns_Report.pdf.

[11] Headwaters Economics. (2025). Economic Profile System, A Profile of Agriculture: Oregon. Accessed at https://headwaterseconomics.org/apps/economic-profile-system/41000.



These are some early indicators of the communities who may need to act to adjust water uses and economic activity the most. There are other Oregon river and groundwater basins with water challenges (e.g., the Klamath, Umatilla, or Deschutes River Basins and Lincoln County), but those counties have a broader mix of economic activity beyond agriculture, so they were not the focus of this analysis.

The results presented in this report aim to provide policymakers with a "full deck" of options, and potential considerations, to inform dialogue and their actions on possible solutions for Oregon communities facing change due to persistent water shortages.

The Service does not recommend particular courses of action, nor does it make an assessment on the viability of these actions politically, or otherwise. The Service made this assessment to include policy options that *could* be viable and come from examples that are *comparable enough* to be worth presenting to Oregon policymakers.

This analysis looks at policy options through the lens of the "stewardship economy," a concept used by Wallowa Resources. A stewardship economy is shaped by the need, and responsibility, to manage land, water, and

communities sustainably. Using this lens to explore how state policy can support communities through change is a recognition that:

- Communities have both a need and responsibility for sustainable land and water management;
- Thriving people, ecosystems, and economies are inseverable;
- There needs to be enough people and capital focused in the natural resource economy to have sufficient capacity to steward land and water in a place; and
- Achieving sustainability is not a one-time effort but an ongoing commitment of people to live with the land and water they rely on.

The assessment team asked how state policy actions might lead to "more successful" adaptations in core water uses and economic diversity for communities. In particular the analysis seeks to answer:

- Are there potential actions the State of Oregon could take to help communities manage changes to A) their core uses of water, to achieve more sustainable water management, and/or B) their economic activity, to achieve a stable or thriving economy?
- What are the lessons learned from other states that make those changes or transitions likely to be more successful?
- How might a "successful adaptation" be defined (e.g., investment and jobs continue in the natural resource sector, people have jobs, local communities stay socially connected, the environment is healthy)?
- What are the possible roles states can play in supporting changes or transitions? And what are the situations where state agencies and legislatures should not proactively engage in supporting changes (i.e., let communities lead and let things play out)?

To answer these questions, this analysis explores how other states are supporting communities whose economies and social cohesion depend on a scarce natural resource. It also explores viable analogs where communities have A) diversified their local economy by growing other sectors in addition to natural resources (e.g., mineral resources, fisheries, or timber) or reduce dependence on a singular economic sector (e.g., manufacturing); and B) adjusted to a more sustainable use of a natural resource in ways that continued supporting the availability of people and resources to steward land and water.

For the purposes of this report, the Service focused on communities where irrigated agriculture is integral to the local economy, because agriculture uses three quarters of the water used in Oregon and is particularly sensitive to localized water availability. Several reviewers of this memo's Dialogue Draft Version 1.0 commented that the memo does not fully acknowledge the water needed to support ecosystems, and the multiple state policies that seek to strike the right balance between instream and out-of-stream uses. We acknowledge how important those

policies are, and any options in this memo need to be considered within the context of those existing policies and the need to sustain a balance.

The findings of this analysis emphasize actions to manage water use more sustainably to ensure that critical economic sectors, like agriculture, and the community as a whole remain viable.

Finally, this report keeps the concept of "tipping points" in mind, where if an economic sector, service, or demographic shrinks or grows beyond a certain point, the fundamental structure of a local economy or an ecosystem's functions can change.

The audience for this analysis is the Oregon legislature, state executive branch agencies, and Tribal and local governments–the entities who are positioned to plan, organize, and implement policy actions to aid communities changing in response to persistent water shortages.

Table 1.3. Problem Definition

Eighteen of Oregon's 36 counties are experiencing regular drought, and three of those counties have more than 5% of their jobs and county income in agriculture. Communities have both a need and responsibility for sustainable land and water management. Thriving people, ecosystems, and economies are inseparable. There needs to be enough people and capital focused in the natural resource economy to have sufficient capacity to steward land and water in a place. Achieving sustainability is not a one-time effort but an ongoing commitment of people to live with the land and water they rely on.

The State of Oregon can take actions to help communities manage water use more sustainably to ensure that critical economic sectors, like agriculture, and the community as a whole remain viable.

II. Policy Research Methods and Approach

The findings in this report followed a series of process steps to define A) the problem to be resolved, B) the kinds of options and considerations that would be useful to explore, and C) the format for delivering those findings. The Governor's natural resource advisors and the Legislative Water Caucus co-chairs and staff initiated defining the problem. From there, we explored potential case studies, relevant literature, and other published information. That initial "landscape scan" around possible actions to help communities adjust and adapt, and what constituted a "more or less successful change or transition," was reviewed by the Governor's office and Water Caucus staff. Then we conducted a series of informal interviews with state and national experts in rural development, resilience planning, and water management to identify further options, develop considerations, explore formats for delivering the findings, and reaffirm the problem definition and what a successful change or transition would look like (see Appendix A for a list of interviewees). A Version 0.9 "Dialogue Draft" was sent to all people interviewed for this report to check for accuracy and to incorporate their feedback, and then a revised Version 1.0 Dialogue Draft was released for input from anyone. This 2.0 version was slightly revised based on three comments we received.

2.1. Inspiration from other sectors and places

Most of the research for this report focused on learning what could be gleaned from other places and sectors. Based on the initial landscape scan, the most relevant lessons for Oregon communities facing water shortages seemed to come from:

- Communities facing changes in timber markets and less access to logs;
- The commercial fishing industry needing to reduce harvests to be sustainable;
- Mining and oil and gas communities as minerals were depleted or pricing changed; and
- Groundwater-dependent farming communities using less water and/or using alternative water supplies.

There were also broader themes that emerged around rural economic vitality and the challenges of managing natural resources shared across communities (see Table 2.1.).

Table 2.1. Elinor Ostrom's Rules for Managing the Commons

Dr. Ostrom made a career studying the management of "common pool resources," a natural resource (e.g., groundwater) that is difficult to exclude use of, but when used, is not available to others. Some of the following principles come from her research and seemed consistent with many of the policy options that emerged during our research and interviews.[12]
The commons have a boundary which defines a place and a specified community with access to the benefits of the commons. People are more likely to follow the rules for managing the commons when local people have a hand in writing them to meet local ecological needs. Commons don't run on goodwill but on accountability to people following the rules they set. When issues come up, resolving them should be informal, cheap, and straightforward. Water in Oregon is governed by laws back to 1910. Rules for governing the water commons won't count for anything if a local authority doesn't recognize them as legitimate.

Some things can be managed locally, but some might need wider regional or state cooperation–for example, an irrigation network might depend on a river that others also draw on upstream.

We examined case studies across industry sectors and around the world but focused mostly on communities and situations with lessons transferable to Oregon. The investigation of case studies also focused on the change management and transition interventions communities implemented, the role state agencies and legislatures played, and the characteristics motivating communities to change. For some of the case studies, we also evaluated change processes against the concept of "more successful change" presented in Figure 2.2. below.

2.2. Knowing "successful change" when you see it

A successful change will likely be different for each local community based on A) the circumstances driving a change, and B) the community's own vision for what a post-change future might look like. An essential first step that could affect a successful change is the community's understanding and ownership of a problem. Where a community has a sense of ownership in the problem definition and goals, and where local leadership is supported as needed with technical assistance, there is likely to be greater alignment around collective solutions. Where a community has an unaligned understanding of the problem, more resources may go towards defending existing rights and resisting change activities rather than embracing the need for a change.

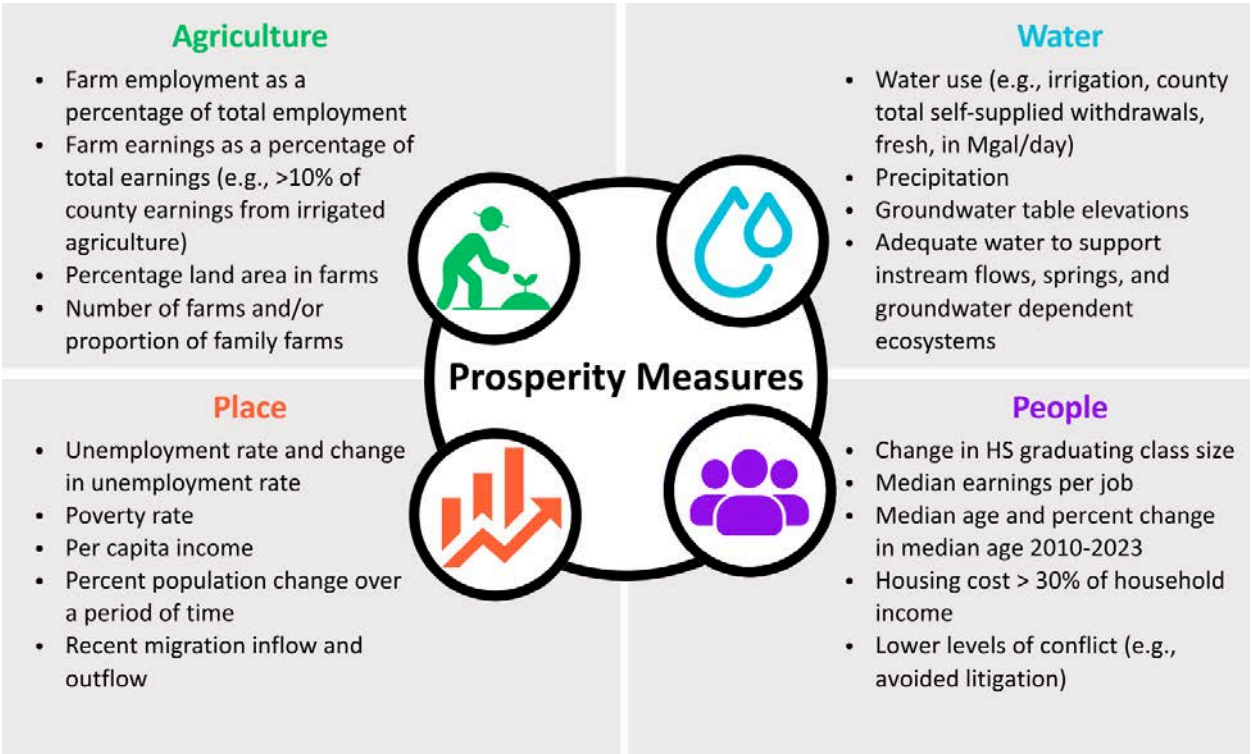
[12] Williams, J. (2018, January 15). Elinor Ostrom's 8 rules for managing the commons. *The Earthbound Report.* Accessed at https://earthbound.report/2018/01/15/elinor-ostroms-8-rules-for-managing-the-commons/.

Several interviewees remarked that lessons from change management are generally universal. Other interviewees noted that rural economic development strategies – whether they focused on economic growth or "compassionately managing" an economic contraction – needed to change focus from "attracting new jobs and business" to "supporting community wellbeing" or a "stewardship economy".[13] Those interviewees noted that water shortages might heighten the need for new rural development lenses, as well as a broader need to re-imagine how the State of Oregon supports its rural communities.

Figure 2.2. below presents some possible indicators that could help a community and/or the State of Oregon track progress during a change, adaptively manage programs and actions, and evaluate the effectiveness of policy actions. The framework provided is just one example, a starting point. Any community would want to begin a change conversation with what success looks like for them.

Figure 2.2. Example Prosperity Indicators to Guide Successful Change

Any community will want to prioritize what's most important to them when faced with change. The list of prosperity measures below is presented as a menu of example indicators and is not meant to be exclusive nor presented in order of priority. Ideally, a smaller set of indicators would be tracked. Many of these indicators are taken from Headwaters Economics' Economic Profile System.[14]



[13] Wallowa Resources. (2025). See note 2.

[14] Headwaters Economics. (2025). Economic Profile System. Accessed at https://headwaterseconomics.org/apps/economic-profile-system.

III. Case Study Examples of Change

A wide range of case studies were explored based on a range of variables affecting why and how communities might change in response to persistent natural resource shortages. The list of case studies explored are summarized in Table 3 below. In every case study, the community went through a change in water use and/or economic activity. Some maintained their dependence on using a natural resource, but did so in a more sustainable way (e.g., Sublimity, OR). Others shrunk the natural resource sector of the economy, but in a way that maintained a similar rural character and identity for the community (e.g., Newport, OR and the groundfish fishery). Some underwent more fundamental changes required to diversify economic sectors (e.g., Centralia, WA). The state and communities in the case studies made adaptations in response to a major natural resource business closing (e.g., a mine, mill, or dairy farm) or to state or federal regulations managing declining resources (e.g., fisheries or groundwater declines). In all scenarios, state policies provided flexibility to local communities for "how" change happened, and change was ultimately embraced and shepherded by members of the community. That change would not have been possible without some support from state or federal agencies to facilitate the change.

Table 3. Case Study Example Summary

#	Location	Key Finding	Source
1	Stayton - Sublimity, OR	Irrigation efficiency actions that stabilized groundwater without requiring a transition away from irrigated agriculture.	**Environmental Quality Incentives Program** *Natural Resources Conservation Service; Oregon Watershed Enhancement Board* https://www.nrcs.usda.gov/programs-initiatives/eqip-environmental-quality-incentives/oregon/environmental-quality-incentives
2	Eastern Snake River Plain Aquifer, ID	Integrating surface and groundwater management to approach water scarcity issues more holistically.	**Comprehensive Groundwater Management Plan** *Idaho Water Resources Board* https://idwr.idaho.gov/iwrb/water-planning/camps/espa/
3	California	Support landowners in repurposing irrigated farmland to recharge groundwater, restore habitat, etc. with financial incentives and technical support.	**Multibenefit Land Repurposing Program** *California Dept. of Conservation* https://www.conservation.ca.gov/dlrp/grant-programs/Pages/Multibenefit-Land-Repurposing-Program.aspx
4	San Luis	Step-wise groundwater use	**Groundwater Conservation Easements**

	Valley, CO	reductions via conservation easements rather than outright and immediate retirement.	*Colorado Water Conservation Board; Colorado Open Lands* https://coloradoopenlands.org/wp-content/uploads/Groundwater-Conservation-Easements-for-Aquifer-Recovery-in-the-San-Luis-Valley-web.pdf
5	High Plains Aquifer, KS	Community-defined groundwater reduction targets over state mandates. Direct financial support to irrigators voluntarily reducing groundwater use.	**Local Enhanced Management Areas** *Kansas Dept. of Agriculture* https://www.agriculture.ks.gov/divisions-programs/division-of-water-resources/managing-kansas-water-resources/local-enhanced-management-areas **Water Transition Assistance Program** *Kansas Water Office* https://www.agriculture.ks.gov/divisions-programs/division-of-conservation/water-conservation-programs
6	Upper Arkansas River Basin, KS	Incentivize landowners to voluntarily convert irrigated farmland to dryland farming (native grasses) via technical support and compensation.	**Conservation Reserve Enhancement Program** *USDA Farm Service Agency; Kansas Dept. of Agriculture* https://www.agriculture.ks.gov/divisions-programs/division-of-conservation/water-conservation-programs
7	Nevada	Voluntary water right reduction/retirement with financial compensation that is scaled to basin status (over-pumped, stable, etc.).	**Nevada Water Conservation and Infrastructure Initiative** *Nevada Dept. of Conservation and Natural Resources* https://dcnr.nv.gov/divisions-boards/conserve-nevada/nwcii
8	Diamond Valley, NV	Agrivoltaics are being explored as further incentives for water reduction.	**Feasibility of Agrivoltaics Coupled with Groundwater Rights Retirement Study** *Eureka County; The Nature Conservancy* https://www.eurekacountynv.gov/departments/natural-resources/feasibility-of-agrivoltaics-coupled-with-groundwater-rights-retirement-study/
9	Vermont Farm to Plate, VT	Support small-scale food production and value-added processing. Facilitate partnerships and markets that	**Vermont Agriculture and Food System Strategic Plan** *Vermont Sustainable Jobs Fund* https://www.vtfarmtoplate.com/vermont-agricu

		encourage direct-to-consumer sales.	lture-food-system-plan-2021-2030
10	Washington, Oregon, and California Coast	Successful implementation of catch limits, seasonal closures, and gear restrictions to manage species rebound.	**Pacific Coast Groundfish Fishery's Trawl Catch Share Program** *NOAA Fisheries* https://www.fisheries.noaa.gov/west-coast/sustainable-fisheries/west-coast-groundfish-trawl-catch-share-program
11	Oakridge, OR	Successful economic transition from timber to outdoor recreation and tourism (mountain biking) through promotional efforts and local investments in recreation infrastructure like trails.	**The Oakridge Area Rural Tourism Studio** *Travel Oregon* https://industry.traveloregon.com/programs/oregon-tourism-studios/willamette-valley/oakridge/
12	Oregon	Support economic analysis to guide economic diversification	**Economic Opportunity Analysis (Statewide Planning Goal 9)** *Oregon Dept. of Land Conservation and Development* https://www.ci.sisters.or.us/media/21256 https://www.cityofjohnday.com/planning/page/economic-opportunities-analysis-cities-grant-county
13	Florida and Colorado	Promote flexible economic development programs for distressed communities.	**Rural Economic Development Initiatives** *Florida Commerce; Colorado Dept. of Local Affairs* https://floridajobs.org/community-planning-and-development/community-partnerships/rural-economic-development-initiative https://dlg.colorado.gov/REDI-notice-of-funding-availability
14	Colstrip, MT	Early and targeted conversations to address impending change. Support early strategic planning led by local stakeholders. Set up a grant program to support adjustments.	**Colstrip Impacts Foundation** *Montana Community Foundation* https://mtcf.org/local-cfs/colstrip-impacts-foundation

15	Tule Lake and Upper Klamath Lake, CA	Flexible strategy that gave landowners options and short-term test cases for repurposing land.	**Walking Wetlands Program** *U.S. Fish and Wildlife Service* https://www.fws.gov/story/2021-11/walking-wetlands
16	Central Pennsylvania	Multi-county hub for small business and entrepreneur support integrating economic development and conservation.	**Wilds Cooperative of Pennsylvania** *PA Wilds Center for Entrepreneurship* https://www.pawildscenter.org/businesses
17	Pajaro Valley, CA	Incentivise managed aquifer recharge on private land via water bill rebates.	**Distributed Stormwater Collection and Managed Aquifer Recharge** *Resource Conservation District of Santa Cruz County* https://www.rcdsantacruz.org/managed-aquifer-recharge
18	Chaffee County, CO	Local sales tax to fund forest health, sustainable agriculture, and outdoor recreation.	**Common Ground Fund** *Chaffee County* https://www.chaffeecounty.org/departments/commissioners/common_ground_fund_program.php
19	Gunnison Valley, CO	A values-based vision, developed by the community, for how change will unfold.	**One Valley Prosperity** *One Valley Leadership Council* https://communitybuilders.org/project/gunnison-valley-colorado-ovpp/
20	Australia	Strengthen relationships between indigenous and non-indigenous peoples in all policy and levels of government.	**Reconciliation Action Plans** *Reconciliation Australia* *https://www.reconciliation.org.au/*
21	Washington, Alaska, and Pennsylvania	Help communities access federal grants to support responses to changes in their natural resource economy.	**FundHubWA** *Washington Dept. of Commerce* https://fundhub.wa.gov/ **Denali Commission** *Independent Federal Agency* https://denali.gov/

			Appalachian Regional Commission *Independent Federal Agency* https://www.arc.gov/
22	Washington	Improve farm business efficiency by combining on-farm technical assistance, research, and financial assistance.	**The Washington Soil Health Initiative** *Washington Conservation Commission; Washington Dept. of Agriculture; Washington State University* https://washingtonsoilhealthinitiative.com/
23	Deschutes Basin, OR	Avoid authorizing new water uses when there are already significant water shortages.	**Deschutes Groundwater Mitigation Program** *Oregon Water Resources Department* https://www.oregon.gov/owrd/programs/waterrights/permits/deschutesgroundwatermitigation/pages/default.aspx
24	Culler's Run, WV	Incentivize a group approach among farmers to reduce surface water nitrate contamination.	**Articles: Farmers as Producers of Clean Water** *https://doi.org/10.1016/j.ecolecon.2010.11.020* *https://doi.org/10.1016/j.jenvman.2012.01.002*
25	Arizona	Increase access to extension, research, and technical assistance to aid change.	**Arizona Water Innovation Initiative** *Arizona State university* https://azwaterinnovation.asu.edu/
26	Wallowa, OR	Support workforce development defined by prioritizing transferable skills needed locally.	**The Stewardship Economy** *Wallowa Resources* https://www.wallowaresources.org/aboutus

IV. Options and Considerations for Oregon

Across all case studies, state agencies and legislatures supported communities as they adjusted their core water uses and adapted their economic strategies in the face of persistent natural resource shortages. Those actions, and other concepts developed by the Water Policy and Innovation Service, are described in this section. The Service does not recommend particular courses of action, nor does it make an assessment on the viability of these actions politically, or otherwise. Some of the options here may not include a full list of pros and cons (e.g., where water right flexibility could risk ecosystem health, or where more rigid enforcement could limit innovation).

The Service has made an assessment to include options that *could* be viable and come from examples that are *comparable enough* to be worth presenting to Oregon policymakers. They aim to provide policymakers with a "full deck" of options, and potential considerations, to inform dialogue and their actions on possible solutions for Oregon communities facing change due to persistent water shortages.

Table 4.0. Oregon Water Law and Water Rights

Throughout this report, you will see references to water use rights, which are rooted in Oregon law. "Under Oregon law, all water belongs to the public. With some exceptions, cities, irrigators, businesses, and other water users must obtain a permit or license from the [Oregon] Water Resources Department to use water from any source – whether it is underground, or from lakes or streams. Generally speaking, landowners with water flowing past, through, or under their property do not automatically have the right to use that water without authorization from the Department."[15] This report did not include a full analysis of the legal viability of some of these options for Oregon, but other states are implementing the options presented here.

The policy options presented below are organized under three "pillars" (See Figure 4.0) – all of which are needed to support communities during a change process. Research and interviewees suggest that any policy actions should:

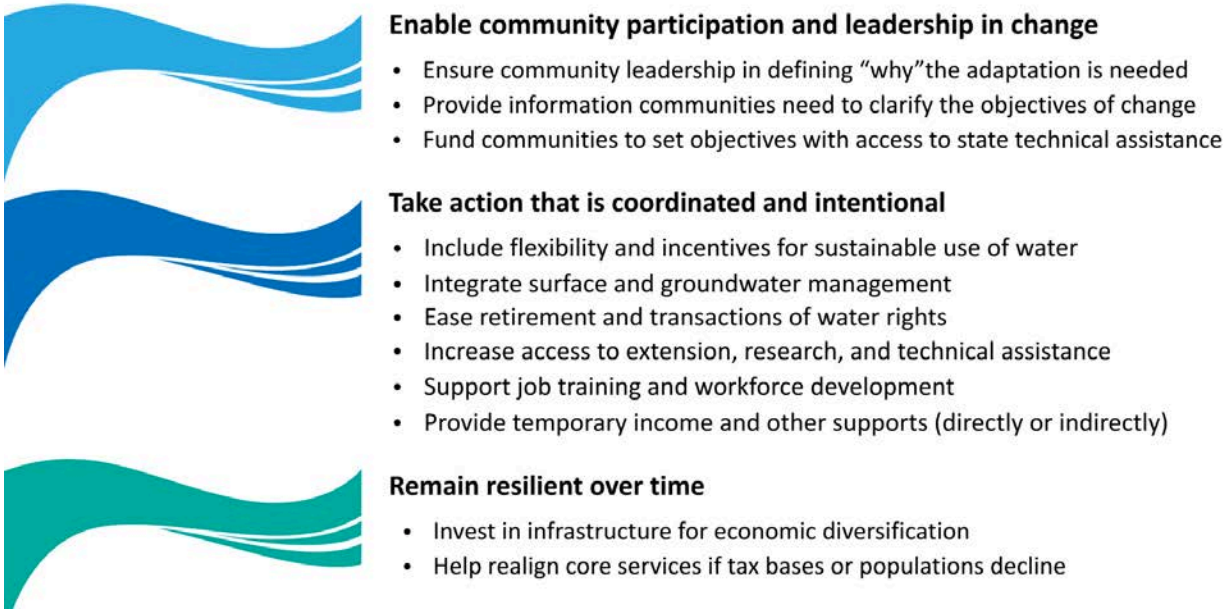
> **Pillar 1**: Enable community participation and leadership of the adaptation with good information and a good plan;

[15] Oregon Water Resources Department. (2024). Water Rights in Oregon: An Introduction to Oregon's Water Laws. Accessed at https://www.oregon.gov/owrd/WRDPublications1/aquabook.pdf.

Pillar 2: Take action that is coordinated and intentional with maximum flexibility on timing and requirements, so that adaptation can occur and efficiency can improve; and

Pillar 3: Remain resilient over time by diversifying the economic activity in the community and by maintaining core services and infrastructure.

Figure 4.0. Policy Options to Support Community Adaptations to Water Shortages



4.1. Pillar 1: Enable community participation and leadership in changes

4.1.1. Ensure community leadership in defining "why" the adaptation is needed

Any successful change process begins with some kind of shared understanding of why change is needed and which problems are trying to be solved. Agreement on objectives for change and community ownership of the process are rooted in a common purpose – the community's "why."

Oregon's land use planning system's Goal 1 requires "the opportunity for citizens to be involved in all phases of the planning process."[16] Oregon's Water Resources Department has rules to "invite and support meaningful involvement of disproportionately impacted communities in the development, implementation, or both, of community engagement plans for water projects eligible to be supported by authorized Oregon Water Resources Department grants and loans."[17]

Oregon's nine federally recognized Tribes are sovereign governments, some with recognized water rights linked to treaty rights. Tribes rely on the water within ceded lands and reservations for their businesses, growing crops, supporting ecosystems and traditional foods, and for drinking water. Changing or reducing water use rights for Tribes when many Tribes are still asserting their treaty and other rights to water and land is a layer of a community's "why" that is important to acknowledge and include.

Table 4.1.1. Oregon's Place-Based Integrated Water Resources Planning

The Oregon Water Resources Department administers the place-based planning program via grants, data, and technical assistance. Four areas have completed state-recognized plans. The plans help gather information, articulate current and future water needs for people, the economy, and the environment, and develop solutions and priorities to meet water needs.[18] Table 1.1. above points to the rules in place-based planning creating roles for interests across the state to engage in local and regional water planning.

4.1.2. Provide information communities need to clarify the objectives of change

Providing accurate and timely information at the scales communities need to plan for their future came up repeatedly during interviews as an important role for state and federal governments. Some examples of the types of information include A) an accurate estimate of resource availability, B) forecasts for future environmental and economic trends, and C) examples of new technologies and management strategies that use less water without impacting economic activity or ecological health. For one interviewee, this information is important to helping identify where water scarcity exists, and where it could be an issue in the near future.

Table 4.1.2 describes some of the considerations for community adaptations and changes that stem from Indigenous and Traditional Ecological Knowledge and the lived experience of farmers and ranchers.

[16] Department of Land Conservation and Development. (2025). Goal 1: Citizen Involvement. Accessed at https://www.oregon.gov/lcd/op/pages/goal-1.aspx.
[17] Oregon Administrative Rules § 690-601-0100 to 690-601-0700. (2025). Accessed at https://secure.sos.state.or.us/oard/ruleSearch.action.
[18] Oregon Water Resources Department. (2025). Place-Based Integrated Water Resources Planning. Accessed at https://www.oregon.gov/owrd/programs/planning/placebasedplanning/pages/default.aspx.

Table 4.1.2. Understanding Indigenous and Traditional Ecological Knowledge and the Lived Experience of Farmers and Ranchers

Since time immemorial, Tribes have adapted to seasonal scarcity and periods of drought. In addition to Tribes, there are farming and ranching families who have lived in places for multiple generations and have witnessed cycles of drought. Communities today can learn about the practices and ways of the people before and how they adapted to water shortages in the past.

There are resources using Traditional Ecological Knowledge available to inform resilience and adaptation planning for Tribal Nations and communities.[19] There are also frameworks centered in reconciliation that can support planning and change management in traditional ways.[20]

An accurate and precise estimation of the amount and availability of the resource

Before asking, or requiring, a community to make major changes in response to resource scarcity, it is important to be sure there is, in fact, scarcity. For example, according to one interviewee, an early assessment in the Stayton-Sublimity critical groundwater area called for reducing the acreage of irrigated agriculture. Yet, farmers were able to stabilize groundwater levels quickly by implementing more efficient irrigation practices, without requiring changes to the economic or community structure.[21] Another interviewee mentioned the importance of understanding surface-groundwater interactions. An evaluation of Oregon's place-based planning program noted the importance of gathering "packages" of necessary data together early on once a planning group has decided to convene and begin a planning process.[22]

Precise estimation of resource availability is also important for managing a smaller resource base going forward. For example, NOAA Fisheries collects a lot of data to support the Pacific Coast Groundfish Fishery's Trawl Catch Share Program. This includes information on how many fish are available to catch, the health of the fish population, and the exact number and kinds of fish caught by each vessel. This is an information-intensive and costly program, but it enables the kinds of flexibility fishermen need and asked for to support adapting the industry in

[19] US Climate Resilience Toolkit. (2025). Tribal Nations. Accessed at https://toolkit.climate.gov/topic/tribal-nations.
[20] Yellowstone to Yukon Initiative. (2025). Exploring Ethical Space: Land-based reconciliation in the Y2Y geography. Accessed at https://y2y.net/blog/entering-ethical-space-land-based-reconciliation-in-the-kootenay-columbia/.
[21] Much, J. (2015, October 8). West Stayton farmers featured for efficiency. *Statesman Journal*. Accessed at https://www.statesmanjournal.com/story/news/local/stayton/2015/10/08/w-stayton-farmers-featured-efficiency/73165202/.
[22] McLain, R., Boyers, S., Downey, J, and Davis, E.J. (2022). Oregon's Place-Based Integrated Water Resources Planning Program: A Participatory Evaluation. National Policy Consensus Center and Oregon State University Cooperative Extension. Accessed at https://www.oregon.gov/owrd/Documents/McLain%20et%20al%20april%2027%202022%20place%20based%20planning%20evaluation.pdf.

response to a fisheries crisis.[23] In another example, the proposed Harney Basin Groundwater Rules in Eastern Oregon recognized that precise estimation of groundwater availability can be difficult and built in an adaptive management approach that called for incremental reductions of water use over time.[24]

Forecasts for future environmental and economic trends to support scenario planning
Several interviewees mentioned how state and federal agencies could provide forecasts to inform the objectives of change. Interviewees mentioned forecasts such as precipitation patterns with climate change, groundwater recharge rates, demographic and migration changes, local and state budget estimates, likely demand for agricultural products locally, regionally, and internationally, and economic trends that could point to more diversified economic opportunities. A lot of the federal agency capacity for these forecasts may be significantly limited going forward due to federal budget cuts.

Technical assistance to access and use this information also came up
Not all communities have the capacity to access and analyze the datasets needed for planning their future. In addition, some of those datasets are structured in a way that makes them inaccessible or unusable, especially for Tribes and small rural communities (e.g., by requiring software or specialized skills to turn data into meaningful information). Oregon has services that connect communities to information (e.g., cooperative extension, regional development officers at Business Oregon, community engagement staff at agencies, natural hazard reduction planners, and Regional Solutions coordinators). These services are not always focused on the kinds of information needed to support communities planning for change. One interviewee noted that it is helpful to have technical assistance providers be a part of community conversations so they know how to engage, and the community does not have to seek them out or spend a lot of time getting providers up to speed.

4.1.3. Fund communities to set objectives with access to state technical assistance

Throughout our research, nearly every interviewee pointed to the importance of centering change plans on a community or region's vision – one that the community has developed itself – for their desired future and how any transitions might unfold. For example, Gunnison Valley, Colorado's One Valley Prosperity Project set a values-based vision after coal mines closed.[25] In some cases, states set goals, expectations, or sideboards designed to protect public health, the environment, or the availability of water for current and future water users. But communities

[23] Sheehan, J. (Host). (2023, October 12). From Collapse to Sustainability: West Coast Groundfish Are Back [Audio Podcast Episode]. *Dive In with NOAA Fisheries.* Accessed at https://www.fisheries.noaa.gov/podcast/collapse-sustainability-west-coast-groundfish-are-back.
[24] Oregon Water Resources Department. (2025). Harney (Division 512) Rulemaking. Accessed at https://www.oregon.gov/owrd/programs/policylawandrules/OARS/Pages/Division-512-Rulemaking.aspx.
[25] Community Builders. (2025). Gunnison Valley, Colorado | One Valley Prosperity Project. Accessed at https://communitybuilders.org/project/gunnison-valley-colorado-ovpp/.

with clear objectives, and a plan they built and own, emerged as an important dimension. Visions and objectives for change could be folded into plans communities are already doing (e.g., long-range and comprehensive planning, infrastructure capital improvement plans, community health improvement plans, etc.). Some of the important options for community-led change processes are described below.

Early, clear, and inclusive communications

Some interviewees noted that rural economic development can feel like it happens behind closed doors, with a new business or initiative emerging already close to a done deal. In other cases, communities started broad conversations early on about future changes.[26] One interviewee suggested that large corporate farms and industrial users may have greater capacity to engage with economic or regulatory planning processes versus family farms or low-income rural residents who may lack resources to participate meaningfully in a planning process or shifting water management strategies. Yet, another interviewee noted that large or corporate landowners may be located in other places, and their presence may make it more difficult for multi-generational farmers and ranchers to have conversations about shared stewardship and sacrifice. County governments and local nonprofits can sometimes help include the perspectives of small farms and all area residents.

Some interviewees also pointed to the power of using reconciliation for including the histories, cultures, and rights of Indigenous people. For example, Reconciliation Australia[27] is the lead body that supports reconciliation that strengthens relationships between Aboriginal and Torres Strait Islander peoples and non-Indigenous peoples in all policy and levels of government, for the benefit of all Australians. Reconciliation Australia facilitates dialogues and supports reconciliation action plans that create a stronger sense of unity through inclusion.

Having a local convenor for setting change objectives who is connected to the community, trusted, and has capacity

In some cases, change management processes are led by local convenors from counties and local economic development districts. Local convenors may not be experts in water or agriculture. In other communities, local hospitals or Coordinated Care Organizations have led wildfire recovery and included wildfire resilience in their community health improvement plans.

Several interviewees mentioned the importance of aligning discussions on objectives for change with existing timelines for updating other plans local governments oversee (e.g., long range land use plans, capital improvement plans for infrastructure, natural hazard mitigation and emergency preparedness plans, or required community health improvement plans).

Coordinating state agency response with local and Tribal governments

[26] National Association of Counties. (2023, February 21). Even a 'Colstrip' has economic options. Accessed at https://www.naco.org/articles/even-colstrip-has-economic-options.
[27] Reconciliation Australia. (2025). Accessed at https://www.reconciliation.org.au/reconciliation/what-is-reconciliation/.

Several interviewees pointed to how successful, and important, coordinated agency responses are for managing change well. In Oregon, interagency responses are structured for post-fire recovery as part of a disaster declaration, and there are Regional Solutions coordinators in the Governor's office responsible for helping community and economic development projects move forward. In another example, the Oregon Plan for Salmon and Watersheds was established in 1997 by state leaders, with strong leadership from the governor and legislature, to restore salmon and watershed health.[28] The Oregon Plan institutionalized state investment in salmon recovery – led by local communities via watershed councils, coordinated across agencies, and connected with long-term federal investment. For one interviewee, the strong leadership behind the Oregon Plan was essential in helping agencies coordinate.

An interviewee also noted how agency rulemaking or other policy decisions can be challenging if not coordinated with a community's vision for change. That interviewee noted the importance of state agencies ensuring that the timing and sequence of setting state goals is in sync with community visioning.

Local groundwater management capacity and authority

Colorado,[29] California,[30] and Kansas[31] all used local groundwater managers to help the agricultural sector adapt to a more sustainable form. Kansas's groundwater management districts have the authority to recommend Locally Enhanced Management Areas (LEMAs) to the State of Kansas with plans for water use goals and control measures.[32] Local groundwater managers are accountable to meeting state expectations and staying within state sideboards but have the flexibility to work with local water users to meet sustainability goals.

Having clear objectives as a pre-condition for additional funding

The Natural Resources Conservation Service and Oregon Watershed Enhancement Board in Oregon both have versions of strategic investment funds that require clear objectives with desired outcomes and strategic plans to manage change as pre-conditions to access large grants available over multiple years. Oregon Watershed Enhancement Board also provides grants so communities have the capacity to create a plan and engage community members to build and support those plans. These are programs with existing funding structures and guidance for helping communities through changes, based on the respective community's shared goals.

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[28] Oregon Watershed Enhancement Board. (2025). Oregon Plan for Salmon and Watersheds. Accessed at https://www.oregon.gov/oweb/resources/pages/opsw.aspx.
[29] Colorado Revised Statutes Title 37 (2025). Accessed at https://colorado.public.law/statutes/crs_title_37,_water_conservation_and_irrigation_districts,_conservation_and_irrigation_districts.
[30] California Water Code § 10723. (2025). Accessed at https://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?lawCode=WAT&sectionNum=10723.
[31] Kansas Statutes Annotated § 82a-1041. (2025). Accessed at https://www.ksrevisor.gov/statutes/chapters/ch82a/082a_010_0041.html.
[32] Kansas Department of Agriculture. (2018). Fact Sheet: Local Enhanced Management Areas. Accessed at https://www.agriculture.ks.gov/home/showpublisheddocument/4958/638466570307230000.

Facilitate access to federal support grants

Several states also helped communities access federal grants and/or specific federal legislation to support responses to changes in their natural resource economy. For example, Washington's Department of Commerce launched FundHubWA, a website providing grant writing technical assistance to help Washington organizations and communities access federal climate and energy funding.[33] Regional, federal commissions, like the Denali Commission[34] in Alaska and the Appalachian Regional Commission[35] in the eastern United States, have helped attract federal funds to high needs areas.

4.2. Pillar 2: Take action that is coordinated and intentional

4.2.1. Include flexibility and incentives for sustainable use of water

When a community has their vision in hand for the future they want, and they have agreed that some kind of change is needed, it can still be difficult to adapt to a new way of using water. Online research and a number of interviewees noted that communities in the midst of significant changes in water use and/or economic activity may need some additional flexibility, above and beyond what programs and policies typically offer. Other interviewees emphasized that flexibility must go hand in hand with accountability to demonstrate progress toward desired outcomes (e.g., sustainable water use, healthy ecosystems, thriving economies). States like California and Kansas set water use goals in regulation but provided flexibility in how those goals were met (see Section 4.1.3 for more on how states set goals with communities). Oregon rules require use of water without waste, but there is also room for water conservation and more efficient water use.[36] Sometimes, departures from standard rules or practices can be met with threats of litigation, which can discourage communities from trying to adapt. Some of the noted flexibility options are described below.

Focus first on incentivizing efficient water use

Online research showed that the most prevalent actions involved improving water use efficiency. This includes action to improve soil management so water is retained longer, upgrading irrigation infrastructure to get the same or better crop yields with less evaporation, and using better information for more precise irrigation (e.g., soil moisture measurements, irrigation scheduling software, and technology in satellites or farm equipment).

Efficiency could also include switching crop types (or crop rotations) to use less water in a year or over a three to five year rotation. However, switching crops is not something that happens

[33] Washington Department of Commerce. (2025). FundHub WA. Accessed at https://fundhub.wa.gov/.
[34] Denali Commission. (2025). Denali Commission Story. Accessed at http://www.denali.gov/.
[35] Appalachian Regional Commission. (2025). Investing in Appalachia's economic future. Accessed at https://www.arc.gov/.
[36] Oregon Administrative Rules § 690-410-0060. (2026). Accessed at https://oregon.public.law/rules/oar_690-410-0060.

quickly. There needs to be a market for the crop, storage, maybe new equipment, and the right knowledge, market connections, and conditions to grow a new crop successfully. Farmers may need help switching farm infrastructure for new crops or accessing markets for new crops. Two interviewees cautioned that higher efficiency needs to be viewed in the context of altered ecosystems and hydrology. In some Oregon watersheds, reducing flood irrigation has reduced bird habitat; and, increasing field drainage has reduced shallow groundwater recharge, which affects nearby streamflow.

Policy actions can also look to improve farm business efficiencies by reducing farming costs for things like fuel, chemicals, seed, and labor through established supply cooperatives, like Farmers Supply Cooperative in Ontario, Oregon and Grange Cooperative Supply Association in the Rogue Valley.[37] In another example, the Washington Soil Health Initiative combines on-farm technical assistance, research, and financial assistance to help farms operate sustainably.[38]

Water users can manage for reduced yields or dryland farming

In several examples farm communities intentionally reduced the water used on a field, knowing the fields' yields would be lower. This also meant using less than their full water right. Lower yields meant less income, but it was still enough for a business to stay profitable most years. Other farm communities began adopting dryland farming, an agricultural practice where farmers rely on soil moisture and rainfall to grow crops instead of irrigation. These options are not always available where the hydrology or economic connectivity does not provide viable crop types for these strategies.

One interviewee noted the option of developing five-acre gardens within a broader pattern of commodity crops. This option could increase local sales of high-value vegetable crops while using less water overall.

Like any change, the risks and costs for individual farmers need to be understood, and they may be different within a community. Farms, and farm communities, also need to be mindful of maintaining access to capital and lending as they change water use (i.e., reduced yields or acreages may impact an operation's ability to secure bank loans).

The state could expand protections for conserved water

Oregon water users need to make beneficial use of the water in their water rights at least once every five years. This can be a disincentive to water conversation, but Oregon already has several provisions to protect conserved water from being forfeited (e.g., when implementing conservation practices[39] or enrolling farmland in a federal Farm Bill conservation program[40]). Colorado also offers an example of how water conservation could be encouraged: the state does

[37] United States Department of Agriculture, Rural Development. (2025). Cooperative Services. Accessed at https://www.rd.usda.gov/programs-services/services/cooperative-services.
[38] Washington Soil Health Initiative. (2025). Home. Accessed at https://washingtonsoilhealthinitiative.com/.
[39] Oregon Revised Statutes § 540.610(3). (2026). Accessed at https://oregon.public.law/statutes/ors_540.610.
[40] Oregon Administrative Rules § 690-17-0800(2)(d). (2026). Accessed at https://secure.sos.state.or.us/oard/ruleSearch.action.

not consider unused water rights as abandoned if enrolled in a conservation program, making it more attractive for users to participate in water conservation strategies.[41] Oregon itself has a similar program where any person may purchase, lease, or gift all or a portion of a water right for conversion to an in-stream use for a specified period of time.[42]

Several interviewees noted there is not a strong incentive for small farms to invest in costly upgrades to water irrigation infrastructure that could lead to increased water conservation. This underscores the importance of access to programs like the USDA's Environmental Quality Incentives Program and Energy Trust of Oregon's rebates for upgraded irrigation systems. However, administrators of these programs should recognize that technological improvements should be embedded within a broader conservation strategy. Otherwise, increased efficiency can lead to the "water rebound effect," where improved efficiencies in water delivery lowers the marginal cost of water, and consequently, incentivizes increased agricultural production and water use.[43] [44]

State and local programs start with more flexibility until the future becomes more certain

Early in a phase of change, water users may be hesitant to make permanent changes to their water uses and water rights. Oregon has provisions to allow for temporary leasing and transfers of water use. In another example, California created a Multibenefit Land Repurposing Program (MLRP)[45] that allows for both permanent farmland conversion projects with permanent benefits and term projects that provide benefits for a minimum of ten years.

Projects under MLRP are designed to reduce groundwater use and create at least one additional co-benefit, such as enhancing habitat, providing community recreation, supporting renewable energy, reducing flood risk, and conserving soils. The California Department of Conservation provides funds as a "block grant" to a regional coordinator who has contracting flexibility to redistribute those funds and invest with local partners. This provides regional leaders and local landowners with the flexibility to invest state funds in unique land repurposing programs and projects of their own design, that align with their regional priorities, and to customize incentive structures and contract arrangements.

The term project option provides farmers with the flexibility to return to farming at the conclusion of their contract. Many MLRP participants, however, recognize there may be more

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[41] Colorado Revised Statutes § 37-92-103(2)(b)(ii). (2025). Accessed at https://colorado.public.law/statutes/crs_37-92-103.
[42] Oregon Revised Statutes § 537.348. (2025). Accessed at https://oregon.public.law/statutes/ors_537.348.
[43] Wallandar, S. (2017). USDA Water Conservation Efforts Reflect Regional Differences. *Choices.* Accessed at https://www.choicesmagazine.org/UserFiles/file/cmsarticle_603.pdf.
[44] Frivold, G. and Bai, T. (2016, August). Irrigation Technology Choice as Adaptation to Climate Change in the Western United States. *Journal of Contemporary Water Research and Education, 158(1),* 62–77. Accessed at https://doi.org/10.1111/j.1936-704X.2016.03219.x.
[45] Environmental Defense Fund. (2021, March). Advancing Strategic Land Repurposing and Groundwater Sustainability in California. Accessed at https://www.edf.org/advancing-strategic-land-repurposing-and-groundwater-sustainability-california.

conservation value in longer-term or permanent options. The majority of approved MLRP projects permanently convert farmland to new uses, such as groundwater recharge basins with wetland habitat elements, restored upland habitat, and community recreational trails. One MLRP grant recipient is pursuing a "floating permanency" approach where there is a permanent, regional commitment amongst multiple landowners to a conservation outcome (e.g., acre-feet of reduced groundwater pumping or acres of wetland habitat), but where and how those outcomes are met can rotate across a different mix of fields over time. A similar approach was used by the Walking Wetlands Program at Tule Lake, also in California, where a wetland acreage rotation system was established in which there is enough wetland acreage at the right time of year in the right geographic patterns to support migratory birds.[46] California has set up several other regional block grant programs that give regional leaders more flexibility to invest state funds, such as the Regional Forest and Fire Capacity Program.[47]

4.2.2. Integrate surface and groundwater management

Online research pointed repeatedly to policy options that better connect the management of surface and groundwater (sometimes called "conjunctive management" or "conjunctive use") since these two sources of water are linked to the health of economies and ecosystems. Some of the options for better integrating surface and groundwater management are discussed below.

Standardize coordinated surface and groundwater management

Oregon, Idaho, and Washington codes call for conjunctive management[48] but are still in the process of coordinating that management structure in practice. Other reports have claimed that conjunctive management of surface and groundwater is what helps incentivize aquifer recharge programs such as in the East Snake River Aquifer system.[49] [50]

Avoid authorizing new water uses when there are already significant water shortages

Sometimes outdated water availability information or missing information can lead to authorizations for large, new water uses that could exacerbate water shortage issues. The current Oregon Water Resources Department's (OWRD) Water Availability Reporting System

[46] United States Fish and Wildlife Service. (2021, November). Walking Wetlands. Accessed at https://www.fws.gov/story/2021-11/walking-wetlands.

[47] California Department of Conservation. (2025). Regional Forest and Fire Capacity Program. Accessed at https://www.conservation.ca.gov/dlrp/grant-programs/Pages/Regional-Forest-and-Fire-Capacity-Program.aspx.

[48] Oregon Administrative Rules § 690-009-0010. (2025). Accessed at https://secure.sos.state.or.us/oard/ruleSearch.action.; Washington Revised Codes § 90.44.030. (2025) Accessed at https://app.leg.wa.gov/rcw/.; Idaho Administrative Code § 37.03.020. (2014). Accessed at https://adminrules.idaho.gov/rules/current/.

[49] Idaho Administrative Code § 37.03.11 (2022). Accessed at https://adminrules.idaho.gov/rules/current/37/370311.pdf.

[50] Cohen, R. (2020, July 13). Five Years After Water Rights Agreement, Idaho's Largest Aquifer Is Improving. *Boise State Public Radio.* Accessed at https://www.boisestatepublicradio.org/news/2020-07-13/five-years-after-water-rights-agreement-idahos-largest-aquifer-is-improving.

(WARS) uses streamflow data from 1958 to 1987, while water demand is calculated from research in the early 1990s. OWRD is currently developing the Surface Water Information Modeling System (SWIMS) that will be based on streamflow data from 1990 to 2020. SWIMS will be available in 2030.[51] Oregon has also authorized water mitigation programs (e.g., Deschutes Groundwater Mitigation Program[52]) where new water uses are allowed if mitigated by an equal or larger amount of water being put back in the stream.

Use excess surface water to recharge groundwater and use groundwater to supplement surface water

In some contexts, it is possible to use a technique known as "source-switching," in which excess surface water is used to recharge groundwater or groundwater is used to supplement surface water. These kinds of “source-switching” activities can work when the hydrologic patterns in a place support predictable “surpluses” of water in a given season or set of years. For example, the City of Portland often switches its drinking water source to groundwater in the summer, allowing surface water to replenish and support habitat, then uses surface water for the rest of the year, allowing the groundwater fields to recharge in winter and spring. However, source-switching can also inadvertently move scarcity from one source to another (e.g., surface irrigation switching to groundwater can impact aquifer stability).

The other issue to consider is whether and how groundwater recharge or surface water augmentation should be used for instream uses or downstream water users. For example, the Pajaro Valley Water Management Agency in California uses “recharge net metering” to give credit for up-gradient farmers who recharge groundwater. The concept is derived from renewable energy net metering. Farmers who use their water right(s) to recharge groundwater are given a financial credit on their bill that offsets the costs of future groundwater pumping fees and costs, and recognizes the value that those farmers are providing. This was one option for the problem of “water I put in the ground doesn’t have my name on it.”[53] This approach may not always be geologically possible.

Manage snowpack and land to increase water supply and availability

Several examples from online research pointed to improved forest management that helped retain snow in upland forests longer into the spring and summer, sustaining stream flows and groundwater recharge.[54] Other examples pointed to constructed wetlands and recharge basins in alpine meadows, wetlands, or fields adjacent to streams. These actions rejoined some of the

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[51] Oregon Water Resources Department. (2025). Integrated Water Resources Strategy. Accessed at https://www.oregon.gov/owrd/programs/Planning/IWRS/Documents/2025%20IWRS_w%20appendices.pdf.
[52] Oregon Water Resources Department. (2025). Deschutes Groundwater Mitigation Program. Accessed at https://www.oregon.gov/owrd/programs/waterrights/permits/deschutesgroundwatermitigation/pages/default.aspx.
[53] Resource Conservation District of Santa Cruz County. (2025). Managed Aquifer Recharge. Accessed at https://www.rcdsantacruz.org/managed-aquifer-recharge.
[54] Dickerson-Lange, S. E.,Vano, J.A., Gersonde, R., and Lundquist, J.D. (2021, September 14). Ranking forest effects on snow storage: A decision tool for forest management. *Water Resources Research, 57,* Accessed at https://doi.org/10.1029/2020WR027926.

historic surface-groundwater connections that sustained the right quantity and quality of water during the important times of year for crops, people, and fish and wildlife.[55]

4.2.3. Ease retirement and transactions of water rights

Several case studies pointed to state actions that made it easier to lease, retire, or otherwise agree not to use all or a portion of the water that a water-right holder is allowed to use, both permanently and temporarily. Some of those case studies also included easing water right transfers, so that current water use could adjust to a different mix of instream and out-of-stream uses. Some of those options are described below.

Use the USDA Conservation Reserve Enhancement Program

The Conservation Reserve Enhancement Program (CREP) is a USDA Farm Bill program administered by the Farm Services Agency that provides payments to farmers who change farm fields from crops to conservation purposes. Some states have defined those "conservation purposes" to include reducing water use. During CREP contracts, at least one conservation practice needs to be in place (e.g., planting native grasses).

Different state programs use different designs. Idaho and Nebraska cease irrigation while fields are enrolled in CREP. Colorado and Kansas require permanent water right retirements. After the contracts have expired, farmers can practice dryland farming in the High Plains Aquifer region of both Kansas and Colorado.[56] Oregon's Harney Groundwater Basin is using an enhanced version of CREP to offer voluntary water right retirements to groundwater irrigators. However, the CREP programs may have eligibility requirements (e.g., farm income limits) or water right pricing that make it difficult for larger farms, or farms where water represents most of the value of the land, to participate.

Treat water right retirements like conservation easements

Colorado's conservation easement statutes explicitly allow conservation easements for groundwater use reduction and water conservation, which allows water users to access similar funding and tax treatment as other kinds of conservation easements (e.g., for protecting fish and wildlife habitat). This program is being used in Colorado's San Luis Valley.[57] The San Luis Valley program allows for partial use of a water right at declining steps over 10 years to

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[55] United States Department of Agriculture, Natural Resources Conservation Service. (2025). Restoring Riparian and Wet Meadow Resilience. Accessed at https://www.wlfw.org/wp-content/uploads/2021/09/Restoring-Riparian-and-Wet-Meadow-Resilience-Section-WLFW-Science-Rollup-FINAL.pdf.

[56] Rosenberg, A. B. (2020, October 5). Incentives to Retire Water Rights Have Reduced Stress on the High Plains Aquifer. *Amber Waves.* United States Department of Agriculture, Economic Research Service. Accessed at https://www.ers.usda.gov/amber-waves/2020/october/incentives-to-retire-water-rights-have-reduced-stress-on-the-high-plains-aquifer.

[57] Wright, K., Brammer, T., Regan, S. (2024, March 22). Groundwater Conservation Easements. Property and Environment Research Center. Accessed at https://www.perc.org/2024/03/22/groundwater-conservation-easements/.

revegetate center pivot-irrigated fields with native plants. Within the easement, some pivot-irrigated fields, and their associated water rights, were fully retired, others reduced use by 50%. Colorado SB22-028 also created the groundwater compact compliance and sustainability fund with $20 million in 2022 to help finance groundwater use reduction and sustainability efforts in the Rio Grande River Basin and the Republican River Basin, such as buying and retiring irrigation wells and irrigated acreage in the river basins. The Colorado Water Conservation Board administers the fund and can make expenditures from the fund based on recommendations from the board of directors of the Rio Grande Water Conservation District or the Republican River Water Conservation District. A conservation district's recommendations must first be approved by the state engineer.[58]

Create state funds to purchase and retire water rights

Some states have programs or initiatives to fund the purchase and retirement of water rights. Examples of states with such programs include Nevada (SB36 and AB104,[59] and Nevada Water Conservation and Infrastructure Initiative[60]), Kansas (Kansas Water Transition Assistance Program[61]), and Oregon (Oregon Watershed Enhancement Board Water Acquisition Grants[62]). However, these programs often are not funded at levels that match demand for water right retirements. For example, according to California's Multibenefit Land Repurposing Program, the payments offered in these programs rarely fully replace the on-farm revenue lost by switching from traditional agriculture, or the revenue that flows to small businesses and local governments as a result of traditional farming activity.[63] Oregon has two programs – Allocation of Conserved Water Program and Split Season Leasing Program – that allow farmers to use a portion of their water right (either by volume and/or timing) and dedicate conserved water to put back in stream.[64] However, these programs may need to be paired with other programs that enhance other on-farm revenue or a community's economic diversification.

Additionally, payments for reduced water use can be provided to groups of water users rather than just individuals. For example, some Oregon programs allow irrigation districts to access

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[58] Colorado Revised Statutes § 37-60-134. (2025). Accessed at https://law.justia.com/codes/colorado/title-37/water-conservation-board-and-compacts/general-and-administrative/article-60/part-1/section-37-60-134/.

[59] Alonzo, A. (2025, April 6). In the nation's driest state, two bills seek to buy back and retire unused water rights. *The Nevada Independent.* Accessed at https://thenevadaindependent.com/article/in-the-nations-driest-state-two-bills-seek-to-buy-back-and-retire-unused-water-rights.

[60] Nevada Department of Conservation and Natural Resources. (2025). Nevada Water Conservation and Infrastructure Initiative. Accessed at https://dcnr.nv.gov/divisions-boards/conserve-nevada/nwcii. Note that NWCII was funded with federal American Rescue Plan Act (ARPA) funds and has no state appropriations currently.

[61] Kansas Department of Agriculture. (2025). Water Conservation Programs. Accessed at https://www.agriculture.ks.gov/divisions-programs/division-of-conservation/water-conservation-programs.

[62] Oregon Watershed Enhancement Board. (2025). Water Acquisition Grants. Accessed at https://www.oregon.gov/oweb/grants/Acquisitions/Pages/water-acquisitions.aspx.

[63] Environmental Defense Fund. (2021, March). See note 45.

[64] Oregon Water Resources Department. (2025). Flow Restoration in Oregon. Accessed at https://www.oregon.gov/owrd/programs/waterrights/is/flowrestoration/.

incentives on behalf of their members, but this leaves a gap in support for groups of farmers who are not organized as a district. In West Virginia, a pilot program in Cullers Run paid an informally-organized group of farmers for water quality and quantity outcomes based on measurements taken at the bottom of the watershed.[65]

4.2.4. Increase access to extension, research, and technical assistance

Innovation and creativity are important to successful changes. For example, easier permitting and funding access could encourage the upgrading of irrigation delivery systems in ways that reduce water use, pumping costs, and create renewable energy. A new variety of drought-resistant crops could reduce water demand, or new GPS-enabled equipment could lower the cost of precision irrigation. Interviewees suggested that the state of Oregon's research and innovation capacities could be offered to communities to identify new irrigation technologies, explore pros and cons of different crops or crop rotations, and combinations of new on-farm practices that can reduce water use without reducing farm revenue.

Oregon State University's agricultural research stations are already looking into advances in agriculture to meet emerging demands from climate and economic changes. The Agriculture Water Management Technical Assistance Program was created within Oregon State University's Cooperative Extension Service and Agricultural Experiment Station in 2023.[66] The program places agricultural water management specialists in various regions to work on agriculture water use reduction with tools, information, and on-farm demonstration projects. The Oregon Agriculture Water Management Technical Assistance Program is also charged with partnering with agricultural producers to check accuracy of data, and experiment with new technologies and approaches. One interviewee noted that the Extension Service's current irrigation efficiency research capacity is limited. California has a similar Water Efficiency Technical Assistance Program[67] that helps farmers implement water conservation measures. Eastern Oregon University has an agricultural entrepreneurship program, but the program is limited in where onsite positions can be placed.

Some of these options are seeking to develop completely new ways of doing things, rather than just promoting "best practices" that optimize the current ways of doing things. For example, the Arizona Water Innovation Initiative[68] is a $40 million state-funded project housed at Arizona State University that deploys new approaches and technologies to increase water conservation and water use efficiency across the state. The project is designed to promote collaboration

[65] Maille, P. and Collins, A. (2008). Controlling Pollution with Opportunities, not Regulations. Presentation to USDA-CSREES National Water Conference, February 3-7, 2008, Sparks, Nevada.
[66] Oregon State University. (2025). Agricultural Water Management in Oregon. Accessed at https://agwater.org/about.
[67] California Department of Food and Agriculture. (2025). Water Efficiency Technical Assistance Program. Accessed at https://www.cdfa.ca.gov/oars/technical/weta.html.
[68] Arizona State University. (2025). Arizona Water Innovation Initiative. Accessed at https://azwaterinnovation.asu.edu/.

between agricultural, industrial, municipal, and tribal water users. It experienced an early success in Cochise County's Sulphur Springs Valley, where a consensus-based community planning effort, supported by the Arizona Water Innovation Initiative, led to the Sulphur Springs Alliance[69] to increase recharge and reduce water use. Yet, some basins in Cochise County chose a different path. In 2022, county voters approved Proposition 422 to restrict groundwater use in a new Douglas Groundwater Basin Active Management Area, but voters rejected Proposition 422 to set up similar restrictions in the Willcox Basin by a 2-to-1 margin.[70]

4.2.5. Support job training and workforce development

Research pointed to options regarding job training and workforce development to help move workers from one sector to another (e.g., from coal mining to data coding). Interviewees spoke to the concept of supporting "career pathways," which is about creating a workforce where people have lots of choices and can move in and out of various careers. Some examples include conversions in the Columbia Gorge around a "climate resilience workforce initiative," recognizing that healthcare workers, foresters, emergency managers, and others are all part of a workforce that prevents, responds to, and recovers from wildfires. These kinds of initiatives are less about a specific job category or industry, and more about the transferable skills needed locally to build climate resilience and adapt to changes. In another example, Wallowa Resources in Northeast Oregon uses the idea of a "stewardship economy" where jobs and economic development are shaped by the need, and responsibility, to manage for the sustainability of both land and communities."[71]

Some interviewees mentioned that any jobs created during or after a change should be focused locally wherever possible – and that increasing the number of jobs in state agencies or outside of the community were less beneficial than jobs embedded within local businesses, governments, and nonprofits. That said, it can sometimes be difficult to justify a full-time position focused just on water use efficiency and change management in small communities (i.e., there may not be enough activity to support a full-time position over time). Some interviewees mentioned the value of Oregon's Resource Assistance for Rural Environments (RARE),[72] an Americorps grantee program that embeds volunteers in rural communities for several years. The RARE program's federal funding was rescinded in early 2025, but then reinstated as of June 6, 2025. Due to the funding uncertainty, the RARE Americorps program is paused for the '26-'27 service year.

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[69] Sulphur Springs Alliance. (2025). Accessed at https://www.sulphurspringswateralliance.org/.
[70] Migoya, C. (2024). In the Willcox and Douglas groundwater basins, residents bet on unity to solve issues. Arizona Republic. Accessed at https://www.azcentral.com/story/news/local/arizona-water/2024/08/29/sulphur-springs-water-alliance-looks-for-common-ground-in-water-issues/74909992007/.
[71] Wallowa Resources. (2025). See note 2.
[72] University of Oregon. (2025). Resource Assistance for Rural Environments. Accessed at https://rare.uoregon.edu/.

Similar to RARE, but at the national scale, the Economic Recovery Corps (ERC) is a capacity building program launched by the Department of Commerce's Economic Development Administration (EDA) and the International Economic Development Council (IEDC).[73] The ERC was launched in 2022 in the wake of both the 2008 financial crisis and COVID19 pandemic to provide communities across the United States, predominantly rural, with essential staff to assist with strategic planning and economic development. Through their competitive grant process, ERC was able to embed these communities, so-called "development deserts," with experienced, mid-career professional staff for 30-month tenures, known as "fellows." An early indicator of ERC's success is the additional $135 million gained by participating local governments and regional nonprofits. Much of that funding came from state and federal grants for which ERC fellows have the resources and expertise to manage.[74]

Interviewees noted a number of challenges with existing job training and workforce programs. Farmers are rooted in place, with the land, so may not be able to easily move between jobs or to new communities. For example, who decides what jobs farmers should train for? What happens if people are training for jobs that don't exist or become obsolete in three to five years? When interviewees were directly asked about training and workforce development, they worried that job training programs could negatively reinforce existing economic activities or poverty (i.e., by training people into low-wage job categories or jobs related to past economic activities rather than future opportunities). Others mentioned that many of the federal workforce and job retraining programs work well when a single, major factory or mine shuts down, but may not be available with a longer-term decline that affects a more distributed industry with lots of small businesses (e.g., oil and gas, or farming). For example, the Oregon and federal Worker Adjustment and Retraining Notification (WARN) Act requires 60-day notices to the state prior to a business closing that affects more than 50 employees.[75]

4.2.6. Provide temporary income and other supports (directly or indirectly)

Sometimes, there is just no replacing the revenue foregone from losing access to a natural resource. In such cases, programs that address the revenue gap are helpful. For example the federal National Oceanic and Atmospheric Administration runs the Fishery Resource Disaster Assistance Program[76] that provides economic relief to fishermen affected by a fishery closure. Similarly, USDA provides the Emergency Assistance for Livestock, Honey Bees, and Farm-Raised Fish Program that compensates farmers for livestock losses due to eligible disease, certain

[73] Pipa, A., Aley, A. (2025, August 6). EDA's Economic Recovery Corps is bringing much-needed capacity to rural places seeking to attract investment. Accessed at EDA's Economic Recovery Corps is bringing much-needed capacity to rural places seeking to attract investment | Brookings

[74] There are currently two participating ERC fellows in Oregon serving with Philippine American Chamber of Commerce of Oregon (PACCO) and Wallowa Resources.

[75] Higher Education Coordination Commission. (2025). WARN Act Notifications – Worker Adjustment and Retraining Notification. Accessed at https://www.oregon.gov/highered/about/workforce/pages/warn.aspx#.

[76] NOAA Fisheries. (2025). Fishery Resource Disaster Assistance. Accessed at https://www.fisheries.noaa.gov/national/funding-financial-services/fishery-resource-disaster-assistance.

adverse weather, and feed and water shortages.[77] The Secure Rural Schools Program passed by Congress in 2000 was designed to mitigate lost timber revenue to rural schools and counties that depended on timber sales from federal forests in the Northwest. The program includes payments to local governments for schools, roads, county projects, and projects on federal lands.[78] Table 4.2.6 explores the tools connected to drought or other state disaster declarations in more detail.

Table 4.2.6. Exploring the Role of State Disaster Declarations and Emergency Powers

"The Governor by proclamation may declare a state of emergency at the request of a county governing body or after determining that an emergency has occurred or is imminent."[79]

In 2025, Washington's Governor declared a drought declaration for 19 watersheds,[80] which opened up funding for relief and flexibility to secure water supplies. The Oregon Governor can also declare drought disasters based on projected water access. For example, Oregon's Drought Readiness Council received a 2024 request for a drought declaration from Wallowa County, conferred with Oregon's Water Supply Availability Committee, and recommended Governor Kotek issue a drought declaration. The declaration unlocks a number of drought-related emergency tools, including assistance to local water users. Drought declarations also allow the Water Resources Department to expedite review processes and reduce fee schedules.[81] The Oregon Governor can also declare disasters for economic reasons (e.g., for Morrow and Umatilla Counties in 2025).[82] The elements of a disaster declaration include:

- Local Request
- Scientific Evaluation
- Impact Assessment
- Coordination Among Agencies
- Threshold Conditions

[77] United States Department of Agriculture, Farm Service Agency. (2025) Emergency Assistance for Livestock, Honeybees, and Farm-Raised Fish (ELAP). Accessed at https://www.fsa.usda.gov/resources/programs/emergency-assistance-livestock-honeybees-farm-raised-fish-elap.
[78] United States Department of Agriculture, United States Forest Service. (2025). Secure Rural Schools Program. Accessed at https://www.fs.usda.gov/working-with-us/secure-rural-schools.
[79] Oregon Revised Statutes § 401.165. (2025).Accessed at https://oregon.public.law/statutes/ors_401.165.
[80] Washington State Department of Ecology. (2025). Drought Response. Accessed at https://ecology.wa.gov/water-shorelines/water-supply/water-availability/statewide-conditions/drought-response.
[81] Office of the Governor of Oregon. (2024, October 24). Governor Kotek Declares Drought Emergency in Wallowa County. Accessed at https://apps.oregon.gov/oregon-newsroom/OR/GOV/Posts/Post/governor-kotek-declares-drought-emergency-in-wallowa-county.
[82] Office of the Governor of Oregon. (2025, January 13). Governor Kotek Declares State of Emergency Due to Risk of Economic Shutdown in Morrow and Umatilla Counties. Accessed at https://apps.oregon.gov/oregon-newsroom/OR/GOV/Posts/Post/governor-kotek-declares-state-of-emergency-due-to-risk-of-economic-shutdown-in-morrow-and-umatilla-counties.

The tools unlocked with a disaster declaration might include:

- Emergency Water Management Tools: Water right holders in a drought-declared county can access expedited, short-term authorizations such as: temporary emergency water use permits (e.g., using groundwater when surface water is unavailable); temporary transfers of water rights (changing use, location, or type of use); temporary instream leases, substitutions, exchanges, and special option agreements; preference for human consumption or stock water uses, if needed. These tools are processed faster and with reduced fees but are not permanent solutions.
- Financial Assistance: The declaration unlocks eligibility for state and federal financial aid programs, including USDA Emergency Farm Loans for agricultural producers suffering losses and USDA Emergency Community Water Assistance Grants for emergencies that threaten the availability of safe, reliable drinking water (e.g., water line repairs, new wells, reservoirs, treatment plants, etc.).
- Access to Federal Programs: Counties with a disaster designation may qualify for a range of USDA disaster assistance programs, including emergency loans and grants, and other relief programs for affected producers and communities.
- Coordinated State Support: State agencies are directed to coordinate and prioritize support for affected counties, streamlining the delivery of aid and services, and enabling the implementation of water conservation or curtailment plans if necessary.
- Public Awareness and Technical Assistance: The declaration increases public awareness of drought conditions and provides technical support to water right holders and local governments, including access to information, application assistance, and water conservation guidance.

In Oregon, ReOregon was established in response to the 2020 Labor Day wildfires by Oregon Housing and Community Services (OHCS) and is a program under OHCS's Disaster Recovery and Resilience (DRR) Division.[83] The program uses federal block-grant disaster recovery funds from Housing and Urban Development (HUD) to support rebuilding for homeowners, rental assistance for renters, affordable housing development for communities, and Planning, Infrastructure, and Economic Revitalization (PIER). The PIER program can fund community resilience plans, building public facilities, and infrastructure to improve resilience.[84] The HUD program must be linked with a Presidential disaster declaration, but Oregon does have programs that kick in with a state disaster declaration.

[83] Oregon Housing and Community Services. (2025). ReOregon. Accessed at https://www.oregon.gov/ohcs/disaster-recovery/reoregon/pages/default.aspx.
[84] Oregon Housing and Community Services. (2025). Planning, Infrastructure, and Economic Revitalization (PIER) Program. Accessed at https://www.oregon.gov/ohcs/disaster-recovery/reoregon/community-support-services/Pages/about-pier.aspx.

California has the California Underserved and Small Producers Program (CUSP), which is designed to facilitate support for small- and medium-scale agricultural producers and socially disadvantaged farmers and ranchers through direct relief grants. Direct Assistance Providers act as administrators of the CUSP Direct Relief Grant Program and distribute relief grants to aid in addressing specific financial needs due to drought, extreme weather, and other climate impacts in California.[85]

4.3. Pillar 3: Remain resilient over time

4.3.1. Invest in infrastructure for economic diversification

The options offered in Sections 4.1 and 4.2 focus on shifting practices within the agricultural economic sector while achieving more sustainable water use levels. Section 4.3 explores how communities might remain resilient over time via economic diversification. Whether communities are adapting to water shortages or other stresses, it may be important to diversify economic activity, in addition to agriculture, to alleviate dependence on agriculture alone. Some of those options are discussed below.

Invest in the infrastructure needed to attract new business and support entrepreneurs

State and local governments can help rural communities access new economic opportunities by investing in the kinds of infrastructure that businesses, entrepreneurs, and residents need. Examples include access to high-speed internet, good transportation connections for goods and people, low-cost energy and other utilities, and high-quality schools and other residential services. Several interviewees noted that this needs to be done in coordination with reductions in water or other natural resource use, and not in a silo of its own. They also expressed a concern that while such infrastructure is valuable, it could accelerate economic transitions away from investments in land and water.

Look at opportunities to raise local revenue

There are options to raise local revenue. New tax measures or fees can be politically difficult to pass or could be limited by existing state laws. Yet, some local governments have raised revenue to support economic adaptation. For example, Chaffee County, Colorado faced a range of threats from wildfire and heavy tourism. Residents passed Measure 1-A in 2018 to set up a 0.25% local sales tax to create the Common Ground Fund with community-led grants for forest health, sustainable agriculture, and outdoor recreation management.[86]

Regionalize economic development strategies and community services

[85] California Department of Food and Agriculture. (2025). California Underserved and Small Producer Program. Accessed at https://www.cdfa.ca.gov/cusp/.
[86] Chaffee County. (2025). Common Ground Fund. Accessed at https://www.chaffeecounty.org/departments/commissioners/common_ground_fund_program.php.

Some states offer training and investments for industrial and small business clusters. For example, Central Pennsylvania grew a regional cluster of "maker" entrepreneurs that started in one community and then expanded to neighboring communities.[87] Other states have created incentives or requirements that encourage merging drinking water or sewer services into more regional entities that can provide high-quality services at lower costs. However, regionalization can mean less local control over services.

Other states have taken actions that more directly reduce household or business annual expenses. This includes low-income household utility assistance for electricity, gas, or water. It might also include property tax breaks for new businesses.

Look at high-potential economic trends and sectors that require less water

Some states are looking at emerging opportunities to diversify their economies. Several interviewees noted that "both and" strategies for diversification were important: The strategies that worked best sustained agriculture, forestry, or fishing *and* added other economic activity. Some of the trends that came up during research and interviews included:

- Vermont initiated a local food initiative after the decline of the dairy industry to grow local food consumption to 5% of total foods consumed. It succeeded in that goal and is now looking to 20% local food consumption. The initiative supported market access, marketing, and other connections that allowed farming communities to maintain their rural character and farming identity. It did not, however, replace the total economic value the dairy industry once provided;[88]
- One interviewee noted the demand for data centers as a possibility for bringing in new revenue to local communities. Data centers use water, so reducing water use in one sector to allow for the potential economic opportunity from data centers will be controversial in some places.
- Oregon is adjusting its land use rules to match the growing demand for agritourism, where growing crops is combined with tourist experiences like overnight stays or restaurants. Agritourism can create conflicts between traditional farming located adjacent to expanding agritourism hubs.[89] Agritourism can also open new opportunities to increase on-farm income and employment.[90] One interviewee noted that local Oregon farmers were interested in a local operator who could run a variety of micro-agritourism

[87] Ryan, S., Hettler, P. (2023, August). Community and Economic Impact of the Pennsylvania Wilds. Center for Rural Pennsylvania. Accessed at https://www.rural.pa.gov/publications/research-reports.
[88] Vermont Sustainable Jobs Fund. (2025). Farm to Plate. Accessed at https://www.vtfarmtoplate.com/vermont-agriculture-food-system-plan-2021-2030.
[89] Rhoades, A. (2025, July 22). 'We'll lose a lot': Agritourism operators in Oregon fear new rules will stifle business. *KOIN*. Accessed at https://www.koin.com/local/well-lose-a-lot-agritourism-operators-in-oregon-fear-new-rules-will-stifle-business/.
[90] Sorte, B., Fery, M., Comerford, A. (2024, February). An Initial Economic Impact Estimate of Agritourism in Oregon's Willamette Valley. OSU Extension Service. Acessed at https://extension.oregonstate.edu/catalog/em-9421-initial-economic-impact-estimate-agritourism-oregons-willamette-valley.

opportunities on small farms and pay farmers for farm access and some of their time to share what they're doing over a lunch or dinner.

- Outdoor recreation was noted by several interviewees as one of the broad areas of economic opportunity for rural communities across the country; and outdoor recreation in the West has been part of the rural economic base since the early 1900s.[91] One study estimated that Oregonians participated in 1.4 billion outdoor recreation activity days in 2017 with a total net economic value of $63.2 billion.[92] However, outdoor recreation was viewed by other interviewees as another version of an "extractive" industry that moves the local economy to rely on low-wage service jobs without bringing sufficient value back to the community. Another interviewee noted that the key to a successful outdoor recreation sector is building the relationships between the people who visit a place and the people who live in a place. Good tourism infrastructure is important, too. For example, Wallowa Resources in northeast Oregon operates campgrounds and maintains trails, but also connects with visitors in ways where visitors become donors, invest in local entrepreneurs, or even move to Wallowa County.[93]
- Diamond Valley, Nevada is exploring the co-location of farming and solar energy production.[94] Similar to outdoor recreation, some interviewees noted energy generation may not have the same local economic value as agriculture and may not support sustaining the natural values and rural identity a community holds dear.

Expand public-private partnerships for rural economic development

Several interviewees noted that more public-private partnerships could help provide the kinds of coordination needed for regional economic "clusters" or business and entrepreneur assistance (e.g., relocation services or help to small businesses get started and grow successfully).

Some states have specific Rural Economic Development Initiatives (REDI) and/or rural economic offices. For example, Florida's REDI[95] program allows state agencies to waive match requirements or other eligibility requirements for state grants. The Colorado REDI is a grant program for rural communities focused on economic diversity and resilience in the face of "local

[91] City of Oakridge. (2025). Economic Development: Oakridge is open for business!. Accessed at https://www.ci.oakridge.or.us/ed.
[92] Rosenberger, R. (2018). Oregon Outdoor Recreation Metrics: Health, Physical Activity, and Value (Part B). Accessed at https://www.oregon.gov/oprd/PRP/Documents/SCORP-2018-Total-Net-Economic-Value.pdf.
[93] Wallowa Resources. (2025). Recreation. Accessed at https://www.wallowaresources.org/recreation.
[94] Saito L, Tibbitts J, Gower P, Zimmerman G, McHugh D. (2024). Resolving groundwater overuse: Feasibility of agrivoltaics coupled with groundwater rights retirement. Eureka County. Accessed at https://www.eurekacountynv.gov/departments/natural-resources/feasibility-of-agrivoltaics-coupled-with-groundwater-rights-retirement-study/.
[95] Florida Commerce. (2025). Rural Economic Development Initiative. Accessed at https://floridajobs.org/community-planning-and-development/community-partnerships/rural-economic-development-initiative.

disruptions and economic recovery from industry transitions, loss of industry, climate change, and natural disasters."[96]

4.3.2. Help realign core services if tax bases or populations decline

One interviewee mentioned the single most important action a state could take to support rural communities undergoing significant change in response to persistent water shortages is to ensure local governments stay fiscally solvent and able to provide a minimal level of core services. This may involve a deeper conversation around which level of government is responsible for which share of services.

For example, in the early 1990s, property tax limits (e.g., Proposition 13 in California) forced a significant realignment of state-county fiscal responsibility for services like health, human services, and roads. In Oregon, more responsibility was taken on by the state. California's Legislative Analyst Office (a nonpartisan support for the state legislature) identified some principles to consider when re-aligning the state-county fiscal relationship:

- The county or state's share of costs should be commensurate with their ability to control costs;
- there should be flexibility to adjust the fiscal relationship as needs change;
- revenue should be enough to cover costs; and,
- funding is transparent and understandable.[97]

Online research also pointed to changing how community services are provided. Some examples include:

- Increasing tele-services;
- opening regional service hubs to service multiple communities; or,
- moving some services, like transit, to on-demand.

The research also suggested focusing on primary schools and healthcare as core services to protect, then using those facilities as hubs from which to provide other services in age-friendly ways (i.e., inclusive of needs for both youth and seniors).

Another example of increasing a community's tax base might come from the federal Social Impact Partnerships to Pay for Results Act (SIPPRA),[98] a $100 million fund in the federal Treasury Department, that paid for social innovation projects, contracted by local governments,

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[96] Colorado Department of Local Affairs. (2025). Rural Economic Development Initiative. Accessed at https://dlg.colorado.gov/REDI-notice-of-funding-availability.
[97] Barocio, J., Chu, C. (2018, October 15). Rethinking the 1991 Realignment. Legislative Analysts Office. Accessed at https://lao.ca.gov/Publications/Report/3886.
[98] US Department of the Treasury. (2025). SIPPRA- Pay for Results. Accessed at https://home.treasury.gov/services/social-impact-partnerships/sippra-pay-for-results.

nonprofits, or other partners, based on two outcomes: A) increased federal tax revenue, or B) decreased federal service expenditures. The contracts allowed for flexibility on *how* to achieve outcomes. Oregon has used similar value-based payments in its Medicaid program,[99] and there are examples of more community- and Indigenous-led outcomes-based contracts in Canada.[100]

[99] Rowland, R. and Daly, A. (2023). Oregon's Value-Based Payment Roadmap for Coordinated Care Organizations: Third Annual Progress Report. Center for Health Systems Effectiveness. Accessed at https://www.ohsu.edu/sites/default/files/2024-08/OR%20VBP%20Roadmap%20Third%20Interim%20Report_0.pdf .

[100] Tomljanovic, S., Gopalakrishnan, S., Kiddell-Monroe, R., and Virudachalam, V. (2025). How to Finance Community-Led Solutions. Stanford Social Innovation Review, Fall 2025. Accessed at https://ssir.org/articles/entry/community-driven-outcomes-contracts-model.

V. Fitting Options Within the Oregon Context

Oregon has existing policies, agency programs, and people already in place to help communities recover from natural disasters, manage water more sustainably, and grow local business and economic opportunity (see Section 5.1). However, interviewees noted that they do not always work effectively, or in a coordinated fashion, to meet the specific needs of communities affected by persistent water shortages. There are a number of state agencies, many with independent commissions, and local and Tribal governments that have roles to play. Strong coordination is needed for an issue like community adaptation that touches so many levels of government across a range of policy areas.

Additionally, we heard from several experts supporting communities with resilience planning or disaster response that "drought" or "agriculture" or "rural economic development" was not part of their expertise. Also, interviewees could not point to an "off-the-shelf" state program or state approach that Oregon should look to for inspiration.

Any actions Oregon takes will need to find ways to knit together support from its existing programs and resources. This section describes how Oregon might "knit together" existing policies and programs to meet the needs of communities adapting to persistent water shortages. These example policy approaches include varying levels of state investment and need for legislative change (Section 5.2). Potential barriers and challenges to implementing any of the policy options is also discussed (Section 5.3).

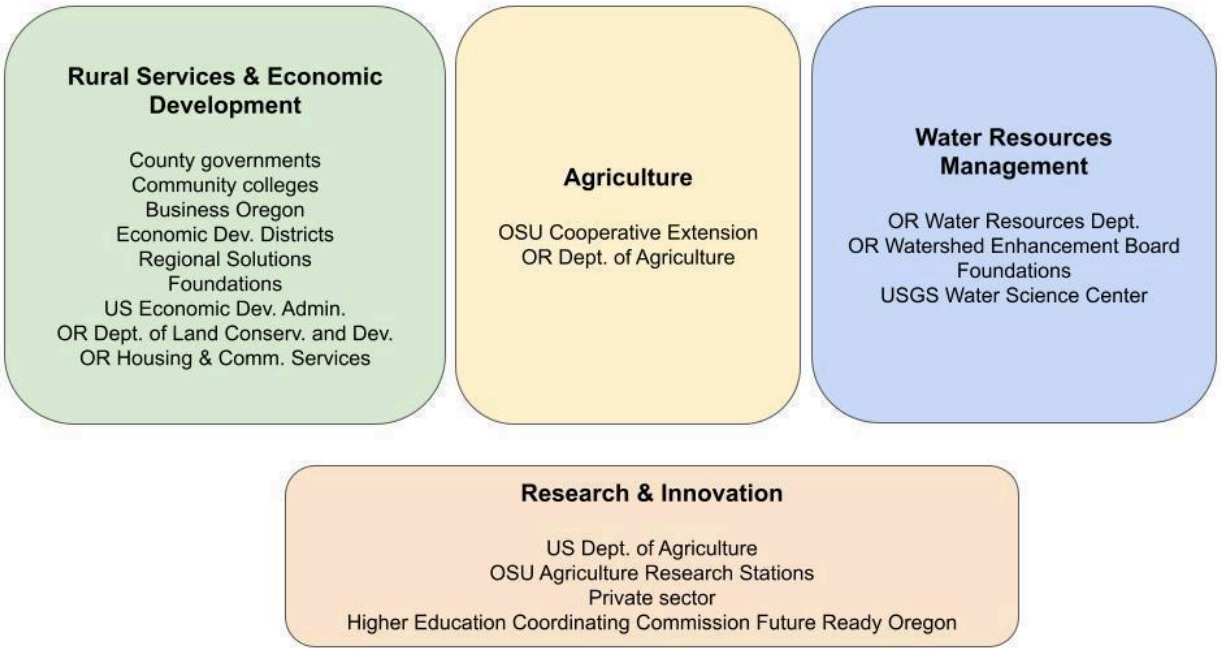
5.1. Existing policy assets, programs, and resources in Oregon

Oregon already has many of the programs and services needed to implement the options presented in Section 4. Business Oregon, Department of Land Conservation and Development, Regional Solutions, and Economic Development Districts cover all of Oregon and can fund and help communities craft adaptation objectives. Oregon Water Resources Department and Oregon Watershed Enhancement Board have grant programs and regulatory options in place to encourage water efficiency, transfer water rights, and retire water rights. And, Business Oregon, Oregon Department of Agriculture, and the federal Economic Development Administration have economic development programs. See Figure 5.1. for some of the entities that support the kinds of rural economic development, agriculture innovation, water resources management, and research that changing communities could access more easily.

County and local governments will be the frontline defense for communities affected by persistent water shortages and the resulting changes in economic development and local services. They are closest to maintaining local infrastructure and providing core community services. Yet, county governments have historically focused on services and land use, and less

on rural economic development, mentioned one interviewee. County leadership on economic development is important, and counties may need technical assistance or capacities to be those leaders. Oregon has economic development financial assistance (e.g., Business Oregon's Water/Wastewater Financing Program[101] and the Oregon Department of Land Conservation and Development's Economic Opportunity Analysis Grants[102]) as well as planning and technical assistance (e.g., economic development districts and Business Oregon's Regional Development Officers). Oregon Water Resources Department has a place-based planning program with grants and technical assistance that can support planning.[103] The Governor's Regional Solutions coordinators also help integrate state agencies with local economic development needs. In some cases, local nonprofits can provide the capacity needed to support change management, especially in regards to initiating change and facilitating community visioning processes; also, nonprofits can access some funding that government cannot.

Figure 5.1. Existing Entities Providing Technical and Financial Assistance



[101] Business Oregon. (2025). Water/Wastewater Financing Program. Accessed at https://www.oregon.gov/biz/programs/WWF/Pages/default.aspx.
[102] Oregon Department of Land Conservation and Development. (2025). Economic Development. Accessed at https://www.oregon.gov/lcd/up/pages/economic-development.aspx.
[103] Oregon Water Resources Department. (2025). See note 18.

The Oregon Watershed Enhancement Board (Focused Investment Partnerships[104]) and USDA Natural Resources Conservation Service (Regional Conservation Partnership Program[105]) have experience with coordinated, landscape-scale habitat, soil, and water conservation.

There are groups focused on agriculture innovation and sustainable agriculture. Oregon State University's (OSU) Cooperative Extension Service and the USDA Natural Resources Conservation Service help implement water conservation practices. There are also supports for community planning. University of Oregon's Institute for Policy Research and Engagement and the Oregon Department of Land Conservation and Development (DLCD) help local governments with disaster and resilience planning. DLCD and the Oregon Department of Transportation grant funds to regions for growth management plans. Research and development is occurring all the time at OSU's agriculture research stations.

Implementation funds are also available from the USDA (e.g., the Enhanced Conservation Reserve Enhancement Program, the Environmental Quality Incentives Program), the Oregon Water Resources Department (e.g., Well Abandonment, Repair and Replacement Fund, the Harney Basin Domestic Well Remediation Fund), and the Oregon Watershed Enhancement Board (e.g., water acquisition grants).

There are also policy vehicles that can introduce flexibility on how water is used in a place. For example, the Oregon Water Resources Department (OWRD) allows for voluntary agreements that, with commission approval, can give flexibility to water users on groundwater management. Similarly, rotation agreements can provide flexibility in surface water management. State drought declarations also provide some flexibility. There are also programs that support post-disaster recovery through Oregon Housing and Community Services and the Oregon Department of Emergency Management.

5.2. Approaches to knitting multiple policy actions together

The Water Policy and Innovation Service (Service) does not make recommendations for specific policy or advocate for specific solutions. Interviewees recognized that the issue of "communities adapting to persistent water shortages" touched many aspects of rural economic development, water resource management, and even the fundamental vision for the roles of and relationships between state, local, Tribal, and federal governments. Those interviewees also requested that the Service try to organize some of the policy options into example approaches for knitting together multiple policy actions for communities A) facing an existing, persistent water shortage, and B) whose economies rely on irrigated agriculture.

[104] Oregon Watershed Enhancement Board. (2025). Focused Investment Partnerships. Accessed at https://www.oregon.gov/oweb/grants/pages/fips.aspx.
[105] US Department of Agriculture. (2025). Regional Conservation Partnership Program. Accessed at https://www.nrcs.usda.gov/programs-initiatives/regional-conservation-partnership-program.

One interviewee noted that the collection of Oregon state agencies could be much more coordinated and clear about a vision for when and where to apply different policy options. For example, what are the conditions that could inform where to start with place-based planning, prioritizing voluntary incentives and agreements, or when regulatory goals and tools are needed? For that interviewee, that kind of unified vision could help with transparent communication and easier implementation. Another interviewee also suggested prioritizing actions in basins that have already been closed to further water appropriation, as a way to ensure conserved water is not further appropriated to new uses. This section presents some example policy approaches.

5.2.1. Approach A: No additional state budget or new legislation

This approach might include a Governor's executive order, or provisions in other executive orders, to direct state agencies to use their authorities to support communities adapting to persistent water shortages. This might include actions such as:

- Directing Regional Solutions staff to prioritize time to help communities adapting to persistent water shortages, and Business Oregon to make it clear that its Water/Wastewater Financing Program[106] is available to help communities with economic development and planning for change management;
- Clarifying that a county, after a specified number of state drought declarations over a specified period of time, is more easily eligible for some of the flexibility or resources available during drought or other emergency declarations;
- Directing existing resilience planning capacity in the Governor's office, the Department of Land Conservation and Development (DLCD), and Oregon universities to ensure communities facing persistent, severe water shortages are included within their scope of services;
- Directing state agencies to provide the information and staff needed to help affected communities with resource availability, economic trends, etc. to manage the changes they want to make. This direction could require additional funding, or could be done within existing information and technical assistance budgets.

The executive and legislative branches can also work with state and national philanthropies and federal agencies to put together a pot of grant funds that are available to communities adapting to persistent water shortages (e.g., a $5 million fund with some funding for convening, planning, and seeding implementation actions). There may be existing state programs to support this,

[106] The Business Oregon Water/Wastewater Financing Program is currently limited to funding discrete water infrastructure projects - most commonly drinking water, wastewater, and occasionally stormwater - or studies tied to municipal utility system needs and project feasibility. Any planning to adapt to persistent water shortages needs to have that nexus. For the Financing Program to invest in broader economic diversification or transition planning, updated rules or budget may be required.

such as the place-based planning program (OWRD) or Oregon Watershed Enhancement Board grants. Examples of relevant funding sources from federal programs include the Environmental Quality Incentives Program (USDA)[107] to share the cost of irrigation efficiency improvements on farms; the Regional Conservation Partnership Program (NRCS)[108] to achieve locally-defined goals; and the WaterSMART Program (Bureau of Reclamation) for sustainable water use.[109]

The state's research and technical assistance services (e.g., OSU extension, USDA, and the private sector) could develop a "change support" agenda to focus research support to the agriculture communities facing severe water shortages. Developing the agenda could require a small amount of funding for staff time.

5.2.2. Approach B: Legislative changes to authorize a public-private partnership

The state legislature could expand authorities within Business Oregon – or create a new fund housed somewhere like Business Oregon, Oregon Treasury, DLCD, or Oregon Water Resources Department – dedicated expressly to support communities facing significant economic transitions as they adapt to persistent water shortages. Generally, this approach could create all the policy authorities needed but wait to appropriate significant funds until available.

The chosen agency could receive funds from state and federal government, philanthropy, and the private sector. Or in communities with major water users, those water users could voluntarily contribute to the fund to support future adaptations or transitions (e.g., endowment funds set up in mining states like Montana or Colorado, or community benefit agreements with energy developers or utilities).

Table 5.2.2. Example Water Resilience Impact Partnership

Looking at the federal Social Impact Partnerships (Section 4.3.2.) and California's Multibenefit Land Repurposing Program (Section 4.2.3.), here is an example of what a public-private partnership might look like:

1. The legislature authorizes $40 million in lottery-backed bonds that the Oregon Treasury or a state agency could use to enter into contracts with a county or Tribal government, or a multi-organization partnership to purchase water resilience outcomes.
2. Those water resilience outcomes could be A) a water-use reduction percentage target that's needed to achieve stability, B) increased local or state government tax and other revenue, and/or C) decreased state expenditure on health, human, transportation,

[107] US Department of Agriculture. (2025). Environmental Quality Incentives Program. Accessed at https://www.nrcs.usda.gov/programs-initiatives/environmental-quality-incentives-program.
[108] US Department of Agriculture. (2025). See note 105.
[109] US Bureau of Reclamation. (2025). WaterSMART. Accessed at https://www.usbr.gov/watersmart/.

and other government services in the local area. The water-use outcome is directly tied to resource management, but the local/state tax revenue and government service expenditures are indicators of local economic vitality and/or lack of economic stress.

3. Outcome payments would only be available as outcomes were verified, so the program would be paired with flexible philanthropic funds (e.g., through seed grants or a program-related investment loan) to provide local partnerships with the cash flow needed to organize, implement, and monitor outcomes.
4. Eligible applicants would be local and Tribal governments from counties facing a drought or groundwater concern and where agriculture earnings are more than 5% of the total county earnings. This is about 10 of Oregon's 36 counties. Eligible applicants would need to demonstrate the types of actions that will lead to outcomes, who will do the work, how outcomes will be measured, and consistency with any relevant plans.
5. The final outcome payment would be provided on the condition that a strategy is put in place to sustain the actions beyond the course of the contract.

Each contract could be about $5 million over six years, where Year 1 is focused on organizing, Years 2-3 initial outcomes appear, Years 4-5 real impact shows up, and Year 6 focuses on sustaining the benefits achieved through the change. Five million dollars may not get very far, but it could be a start. For example, the Farm Services Agency allocated $58 million for the Harney Valley Groundwater Conservation Reserve Enhancement Program over 15 years.[110]

Such a fund could be paired with technical assistance for communities and a peer-support network to foster collaboration. For example, the Oregon Watershed Enhancement Board and USDA Natural Resources Conservation Service have a Technical Assistance Grant Program for farm, private forest, and range management planning that could be used or augmented.[111]

The legislature could also use a similar approach to Nevada[112] and expand to purchase and retire water use rights for communities with an acknowledged place-based water plan or a number of state drought declarations within a five-year period.

Oregon has been making advances in getting better information on water availability and use to support communities in A) using water sustainably, and B) making changes in water use needed to reach sustainability. This work could continue and be expanded to support community change processes. For example, required water use data collection and reporting can help

[110] USDA Farm Services Agency. (2023). Programmatic Environmental Assessment: Harney Valley Groundwater Conservation Reserve Enhancement Program, Harney County, Oregon. Accessed at https://www.fsa.usda.gov/sites/default/files/documents/ea_proposed_harney_valley_groundwater_crep_final5423.pdf.

[111] Oregon Watershed Enhancement Board. (2025). NRCS/OWEB Technical Assistance Grant Program. Accessed at https://www.oregon.gov/oweb/grants/pages/nrcs-oweb-ta.aspx.

[112] Alonzo. (2025). See note 59.

planning. A lot of the options in the approach B examples could require more significant investment and authorization to be done well at scale across Oregon.

5.2.3. Approach C: More comprehensive state funding

Some very fundamental issues around governance and community wellbeing came up during this research that points to a need to look at the fiscal relationship between local, state, and federal governments. Similarly, especially with groundwater, there may be a need to explore more deeply the role of government in funding and maintaining private drinking water wells and other private infrastructure linked to public or community benefits. The examples in this approach assume a relationship where state and federal governments play a central role in financing the capital costs of new and upgraded infrastructure; and the major investments needed for changes in rural communities facing significant and persistent water shortages. Whereas local governments commit to funding the ongoing resilience and maintenance of the infrastructure and services needed for the community.

For example, the State of Oregon allocated $50 million of state funds used to match about $160 million in federal funds from Natural Resources Conservation Service and Bureau of Reclamation for irrigation system modernization projects that are then maintained by irrigation districts.[113]

Similar to some of the examples in approach B, approach C could include community accounts and state endowments capitalized with the funds needed to support communities. Moving through a change process may take three or more state bienna funding cycles, so those funds would need to be available over time. Funding could also progress from early seed funds to the larger amounts needed for implementation. For example, California's Multibenefit Land Repurposing Program was funded for $40 million in its first year, $50 million in its second year, and now $200 million from Proposition 4-Climate Bond.[114]

The legislative options in approach C could be more comprehensive in what they require, but also funded at a level in which the State of Oregon shares in the cost burden of local communities meeting those requirements (e.g., water use measurement and reporting through the Water Measurement Cost Share Program Revolving Fund[115], domestic well upgrades via Well Abandonment, Repair, and Replacement Fund[116], etc.). Flexibility could also be expanded by delegating water management in regions facing scarcity to local water conservation boards with clear state sideboards and the flexibility to work with local water users, similar to Colorado or Kansas (see Section 4.1.3).

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[113] Oregon Water Resources Department. (2025). Irrigation Modernization Funding: Frequently Asked Questions. Accessed at https://www.oregon.gov/owrd/WRDFormsPDF/Irrigation_Modernization_FAQ.pdf.
[114] California Natural Resources Agency. (2025). Proposition 4-Climate Bond. Accessed at https://resources.ca.gov/Bonds-Oversight/Proposition-4-Climate-Bond.
[115] Oregon Revised Statutes § 536.021. (2025). Accessed at https://oregon.public.law/statutes/ors_536.021.
[116] Oregon Water Resources Department. (2025). Well Abandonment, Repair and Replacement Fund (WARRF). Accessed at https://www.oregon.gov/owrd/programs/gwwl/warrf/pages/default.aspx.

Finally, the state could build a public-private research and innovation partnership that invests significantly; grows some of the best talent within Oregon; attracts innovators from outside Oregon; and, accelerates new technology, practices, crops, etc. that require less water and create new business opportunities in rural Oregon.

5.3. Potential challenges to implementing these options

Based on our interviews and research, any combined approach of policy options to support communities adapting to persistent water shortages will face barriers, especially due to local, state, and federal funding scarcity, and the number of systems that might be involved. The State of Oregon needs to recognize and trust the innovation and leadership that communities want to bring to their change process. Supporting change works better when adaptations to persistent water shortages are accounted for in existing programs, plans, and other policy actions.

Funding will also be needed over longer time horizons than two years, yet most grants or budgets can only commit on one- to two-year cycles. The State of Oregon can work with philanthropies and federal agencies to make longer-term commitments. Oregon's capital construction budget sets expenditure authority for six years.[117] The Oregon Watershed Enhancement Board's Focused Investment Partnership allows its board to commit funding for up to six years, but those funds are still allocated on a biannual basis.[118]

This report focuses on communities that recognize the need to adapt to persistent water shortages and want support. Not all communities may see the need for change, or a significant group of people within a community may not want change, which can lead to swings in local leadership and policy priorities. There may also not be local support for raising the local revenue needed to sustain adaptations for infrastructure and services. In such cases, should the state provide support? If yes, how and what support?

During the research, some interviewees noted that sometimes the infrastructure, service levels, or economic base in a community may not be viable for making the desired adaptations. In such cases, what's the State's role? Is a thoughtful and specific plan sufficient in itself to merit State support, or do enabling conditions need to exist to demonstrate readiness?

[117] Legislative Fiscal Office. (2011). Budget Information Brief 2011-4. Accessed at https://www.oregonlegislature.gov/lfo/Documents/Oregons%20Budget%20Process.pdf.
[118] Oregon Watershed Enhancement Board. (2025). See note 104.

VI. Next Steps and Conclusion

Since time immemorial, communities of people in Oregon have moved in and moved out of areas as a result of natural resource availability. Communities have adapted and changed. In more recent history, Oregon communities still remember the major changes in the timber industry when the spotted owl and salmon became protected under the Endangered Species Act. Today, significant and persistent water shortages exist, and actions to more sustainably manage water are being taken by communities, the Oregon Water Resources Department, and other government entities. This report was requested by the Oregon Governor's office and the Oregon Legislative Water Caucus in recognition that regulatory action to stabilize water use alone will not sustain the vital rural communities essential to Oregon's future.

The actions that the State of Oregon can implement to enable community ownership of change, fund and authorize community-led action, and support community resilience over time are complex and intertwined with multiple objectives. As one interviewee said, "There is no substitute for well-coordinated government agency action, centered around a shared goal that matters." How to live that sentiment will be Oregon's challenge.

The Water Policy and Innovation Service (Service finds that some of the following next steps are relevant to the case of Oregon:

- Work with national experts in rural economic development (e.g., Aspen Institute) and rural resilience planning to further develop "policy package" recommendations for Oregon and other western states;
- Actively collaborate with Tribes and experts in Traditional Ecological Knowledge to integrate Indigenous perspectives and practices into strategies for sustainable land and water management;
- Host a conversation in Oregon, but focused on western states, to explore what a public-private partnership could look like to support communities adapting to persistent water shortages;
- Continue to recognize that significant, persistent water shortages are a form of economic disaster affecting multiple, small businesses, but one that may need different responses than other types of disasters;
- Learn, more deeply, what actions have worked or not with Oregon communities facing persistent water shortages (e.g., the Umatilla, Klamath, and Deschutes basins); and
- Pilot some kind of coordinated approach with a community, taking lessons learned from some of the landscape-level coordinated investment programs in Oregon.

The Water Policy and Innovation Service is happy to provide briefings on this analysis, support convenings of leaders to discuss next steps, and otherwise encourage people to take these

options and turn them into the kinds of actions that make sense for Oregon's communities and the state as a whole.

The Service wants to thank everyone again who contributed to this report, and for the intent and care so many people have for the wellbeing of Oregon communities. The opportunity, and challenge, ahead is how to proactively address significant, persistent water challenges when communities are also facing a myriad of other stresses. We think Oregon is up for seizing that opportunity.

Appendix A. List of Interviewees and Comments on Dialogue Draft Version 1.0

The following experts and commenters provided feedback that informed this analysis. Not all of their feedback was included, and there are parts of this analysis that they might agree with, and parts that they might disagree with.

Anna Schiller and **Rachel O'Connor**, Environmental Defense Fund
Brenda Smith and **Chad Karges**, High Desert Partnership
Chandra Ferrari and **Courtney Crowell**, Governor Kotek's office
Chris Estes, Aspen Institute Community Strategies Group
Danielle Gonzalez and **Maggie Sommers**, Oregon Water Resources Department
Ed Tabor and **Jon Unger**, Business Oregon
Harmony Burright, Oregon Legislative Water Caucus
Kristin Smith, Headwaters Economics
Laurel Harkness, Rural Voices for Conservation Coalition
Margi Hoffmann, **Leann Bleakney**, and **Rudy Salakory**, Northwest Power Planning and Conservation Council
Nils Christoffersen, Wallowa Resources
Olga Morales and **Laura Landes**, Rural Community Assistance Partnership
Rep. Mark Owens, and **Stacy Clark**, Chief of Staff
Rep. Ken Helm, and **Greg Minz**, Legislative Director
Ron Alvarado, former USDA Natural Resources Conservation Service
Shad Hatten, Oregon Water Resources Department
Tony Pipa and **Adam Aley**, Brookings Institution
Kimberly Priestly and **Lisa Brown**, Water Watch
Yancy Lind
Paul Demaggio