OREGON
WATER RESOURCES DEPARTMENT

Item I - Groundwater Allocation Process Rulemaking

Oregon Water Resources Commission

November 17, 2023

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Objective

Update groundwater allocation rules to be more sustainable and protective of existing water right holders, both instream and out-of-stream.

Integrated Water Resources Strategy (IWRS)

Recommended Actions

10.G – Strengthen water quantity & water quality permitting programs

11.E – Develop additional groundwater protections

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Presentation Overview

A. Rulemaking Need
B. Rulemaking Process
C. Rules Advisory Committee (RAC) & Public Input
D. Statutory Framework
E. "Reasonably Stable Groundwater Level"
    A. Science
    B. Proposed Rule language
F. "Potential for Substantial Interference (PSI)"
    A. Science
    B. Proposed Rule Language
G. Options to Meet Future Water Needs
H. Next Steps

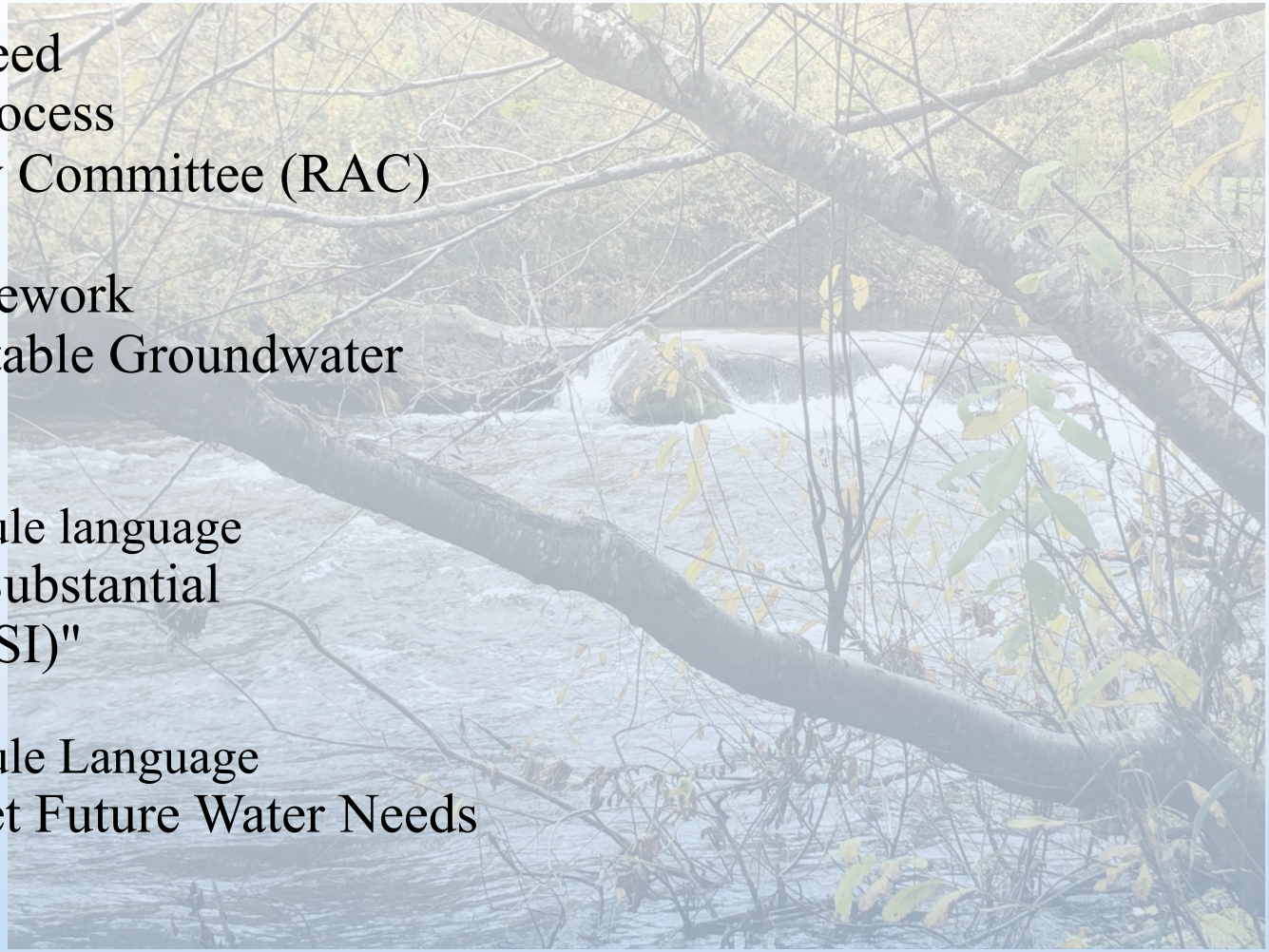

Photo: Rickreall Creek.(Polk Co.) during wet weather month.

Rulemaking Need

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Dry Well, Klamath Basin

Photo: Governor Brown and Klamath County Commissioner Minty visit a home with a dry well and emergency water tanks for domestic use.

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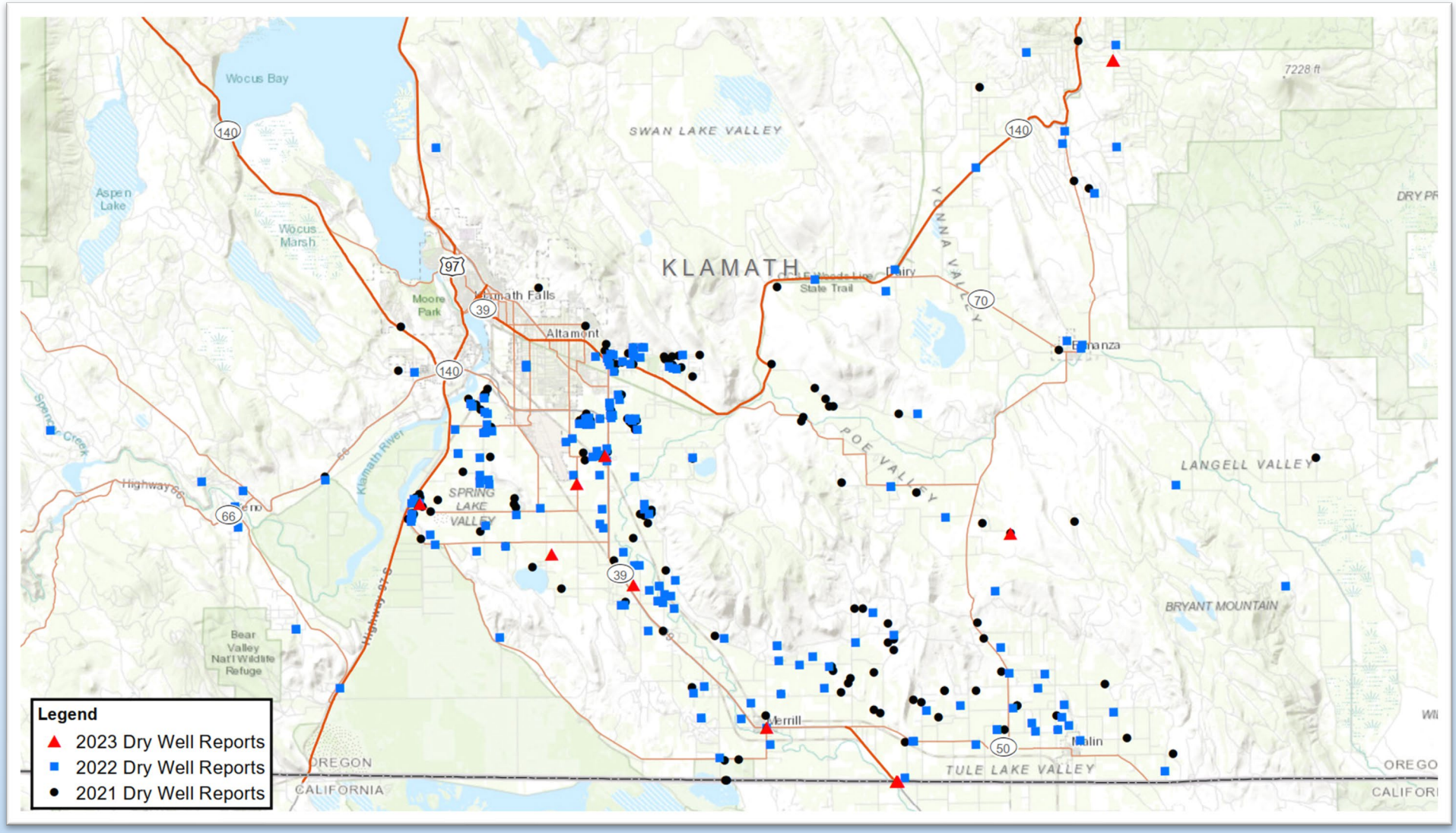
Dry Wells, Klamath Basin



Source: OWRD

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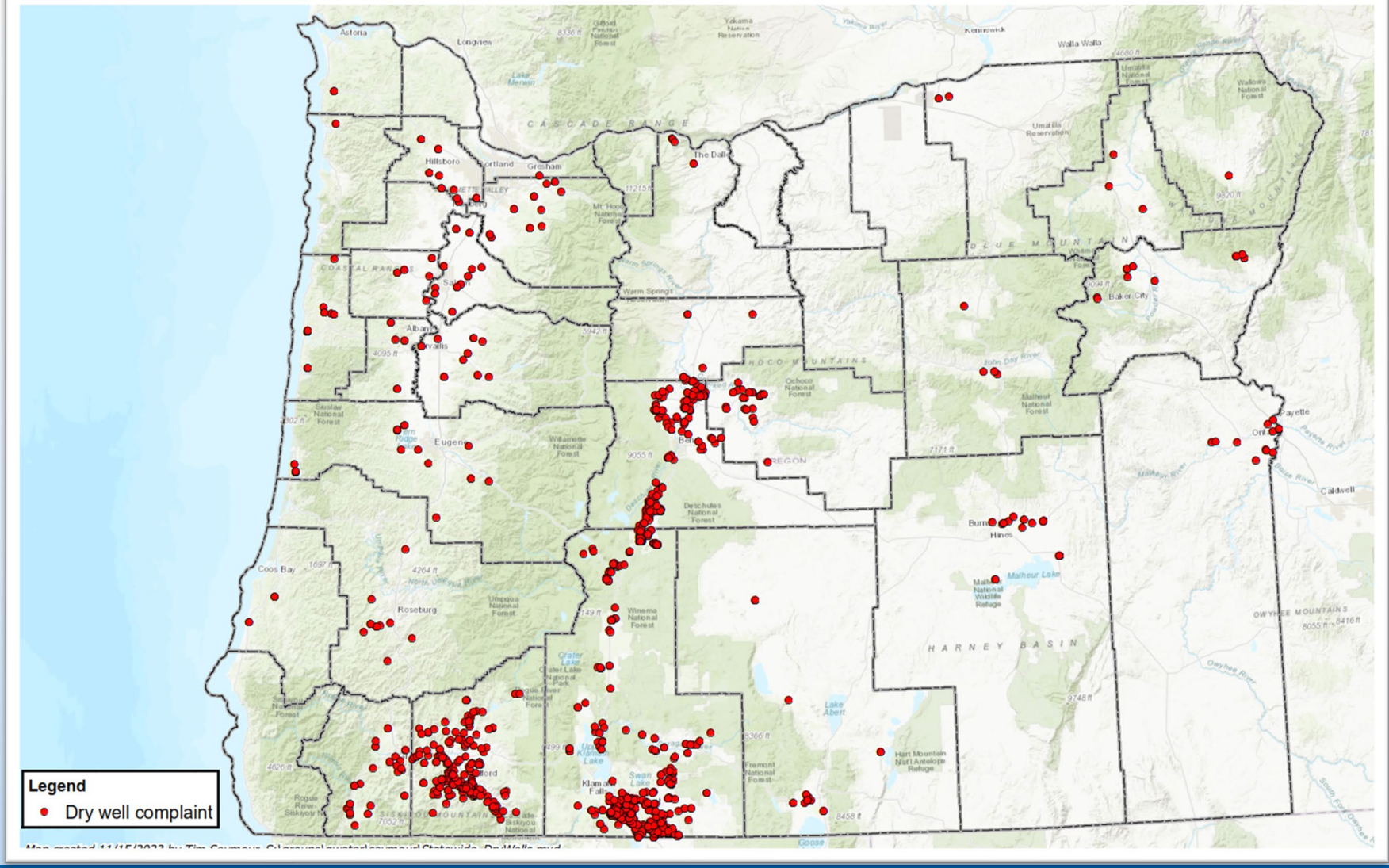
Dry Wells, State-Wide



Source: OWRD

Dry Wells, State-Wide

Domestic Dry Wells:

- 1,225 dry well complaints since July 2021
- Average cost to deepen or replace a well is $26,500

State-Wide Risk (all water wells):

- Up to 13,000 wells may go dry given a water level drop of 25 feet
- Up to 51,000 wells may go dry given a water level drop of 50 feet

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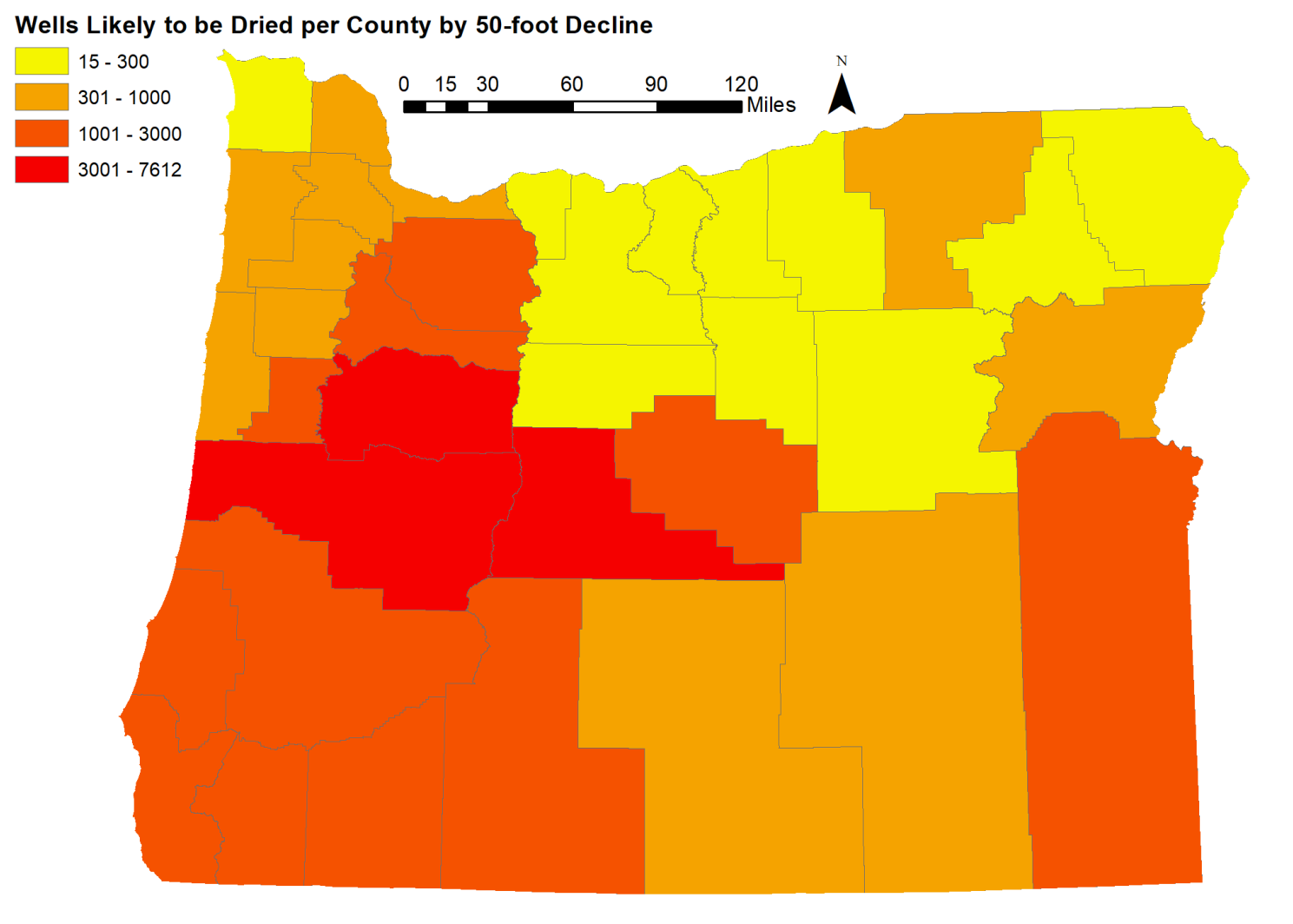
Wells at risk of going dry from a hypothetical decline of 50 feet



Source: OWRD

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Eagle Creek, Willamette Basin

Photo: OWRD, Eagle Creek in late-August

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Rock Creek, Powder Basin

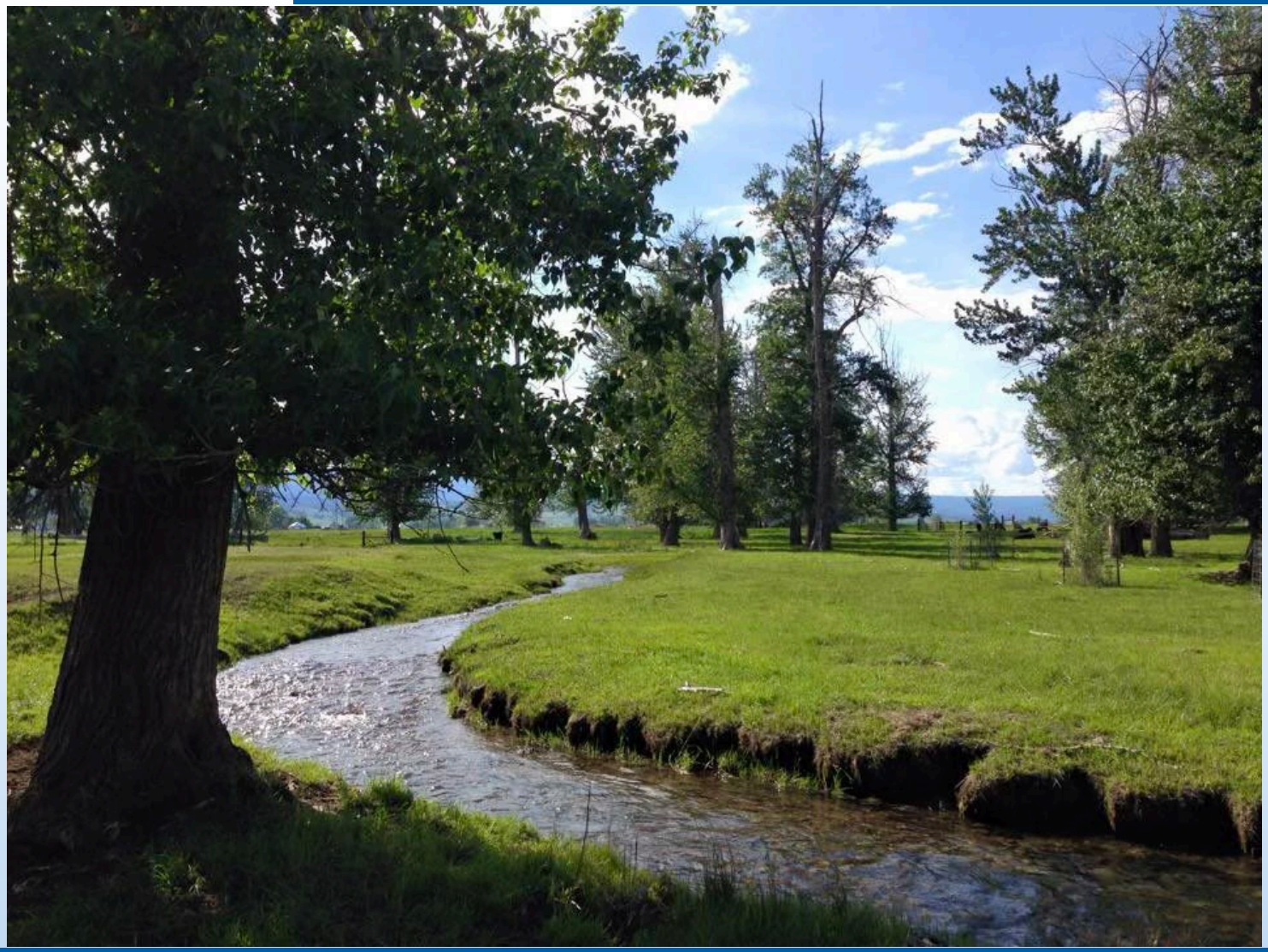

Photo: OWRD

Rock Creek, Powder Basin

Surface Water Rights:	Priority dates	Acres Served
Month water use begins: January	Latest priority date: 1994	Total authorized acres: 20,843
	1908	13,441
June	1898	10,750
July	Early 1880s	5,000
August	Early 1868	1183

***depends on crops, calls for water, weather, and other factors. May turn on and off depending on conditions.**

Photo: OWRD

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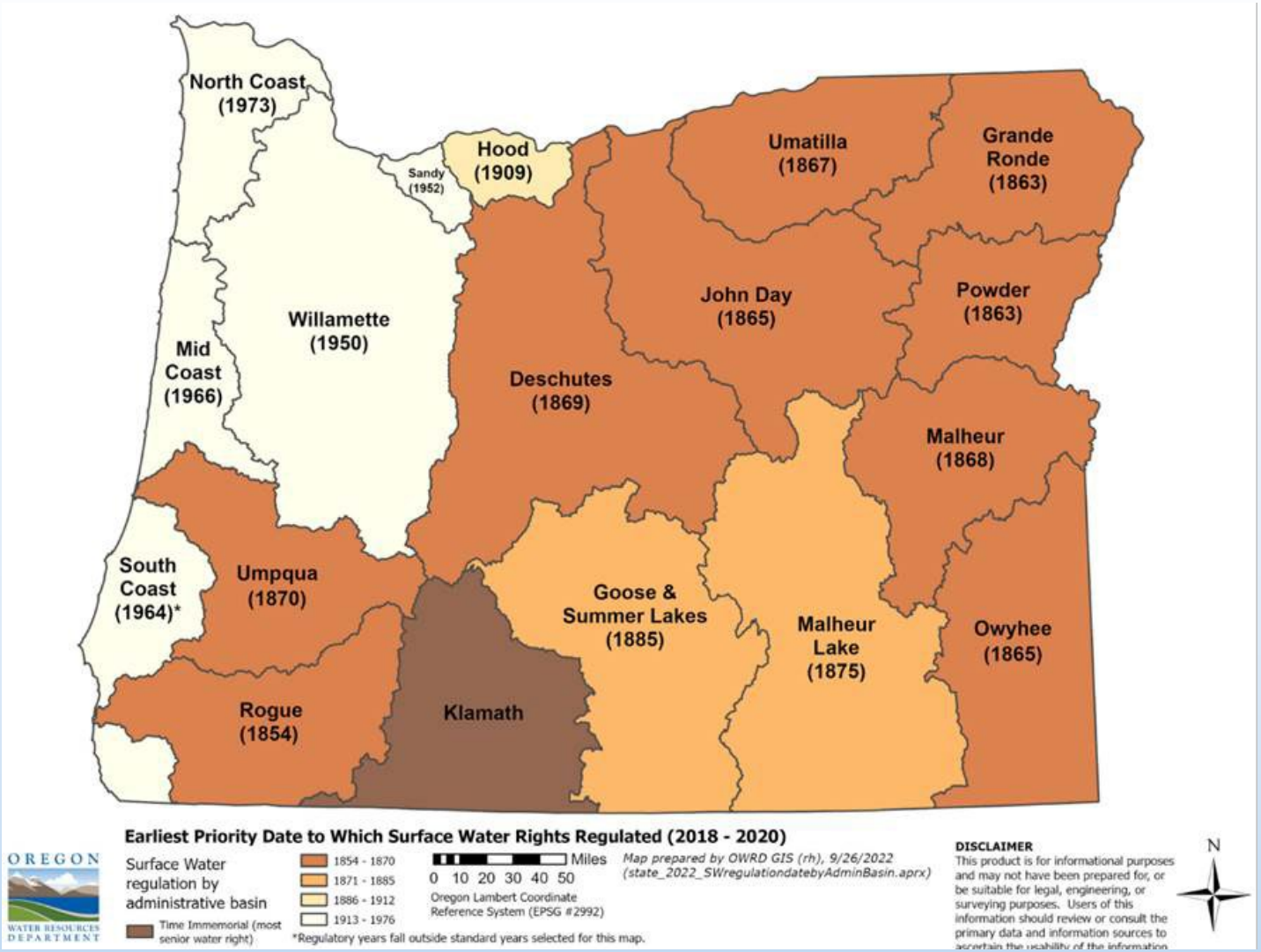
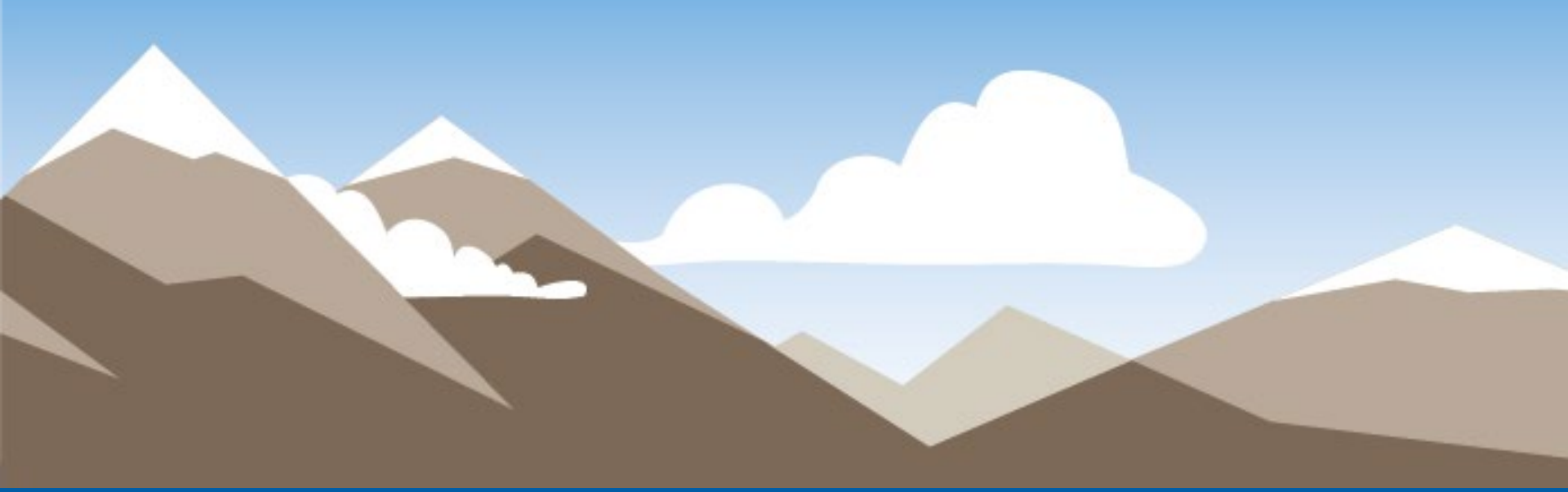
Surface Water Regulation, State-Wide





Rulemaking Process

Efforts to Date

Public involvement has included

- Public outreach
  - 5 meetings in Fall 2022
- RAC meetings
  - 6 meetings since April 2023
  - 2 more planned (Dec 14, 2023; Jan 23, 2024)
- GWAC engagement
  - 7 meetings since March 2023
- Regular Commission updates
  - since December 2021
- Additional public outreach as needed/requested
  - Tribes, Local Governments, Legislators, Governor's Office

RAC Roster

47th Ave Farms
Anderson Perry & Associates
Applied Economics, OSU
Association of Oregon Counties
Atmospheric Science, OSU
Central Oregon Cities Organization
Citizen-at-Large
Confederated Tribes of the Umatilla Indian Reservation
Deschutes River Conservancy
Dunn Carney/Oregon Cattlemen's Association
Environmental Law, Willamette University
Exempt Well User
Grown Rogue
GSI Water Solutions
Jefferson County Commission
Klamath Irrigation District
Klamath Tribes
League of Oregon Cities
Northwest Groundwater Services
Oregon Association of Nurseries
Oregon Environmental Council
Oregon Farm Bureau
Oregon Lakes Association
Oregon Water Resources Congress
Pacific Hydro-Geology, Inc.
Rancher
Seven Hills Winery
The Nature Conservancy
Verde
WaterWatch

RAC & Public Input

General Feedback

Objectives

- Draft rules meet Commission's objectives
- Some question how rules balance competing statutory objectives

RAC Process

- Transparent and responsive
- Clarity of proposed rules improved over time

Urgency

- New rules are long overdue
- Failure to act will increase costs long term
- Failure to act jeopardizes existing water uses and ecosystems
- Some suggest slowing process down for more input/data

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Science & Data

Science

- Robust
- Adaptive
- Precautionary/forward looking
- Department should wait until HB 2018 (water budgets) are complete

Desire for Basin Specific criteria

- Upper Deschutes Basin

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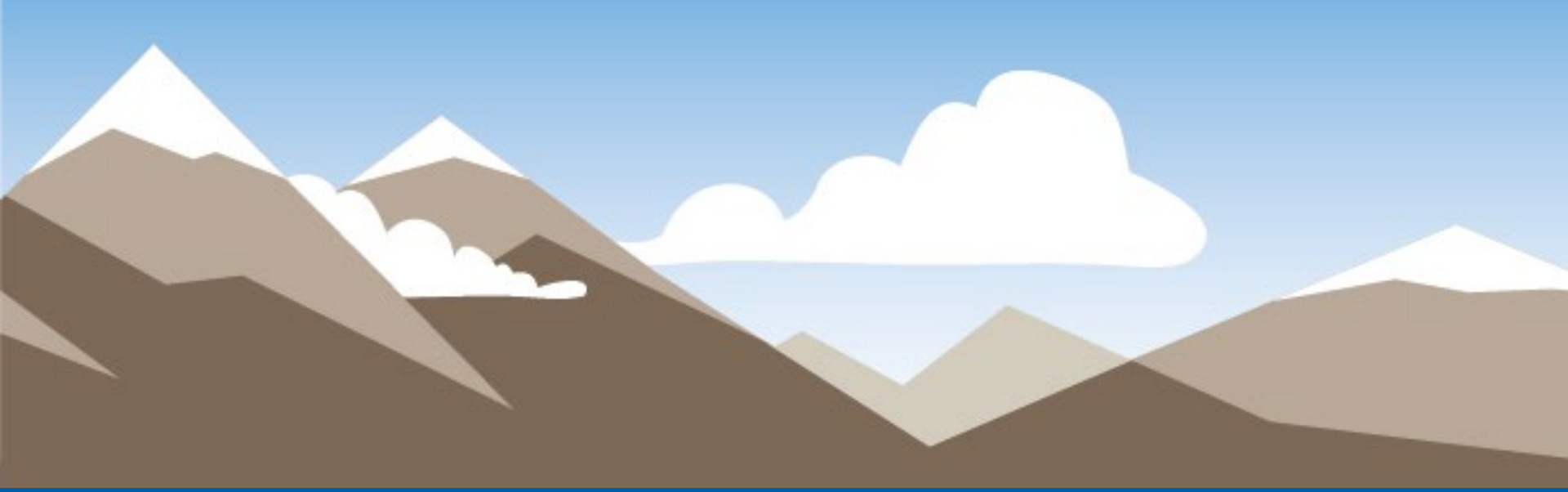
Economic Impacts

Concerns about future availability

- Agriculture expansion
- Future municipal demands, including housing
- Investments/economic growth
- Feasibility of alternatives (e.g., transfers, AR/ASR, conservation)
- Cost to applicants to provide data

Cost of not acting

- Certainty for investments made in reliance on water rights
- Impacts of water level declines on existing wells
- Potential need to curtail under a Critical Groundwater Area



Statutory Framework

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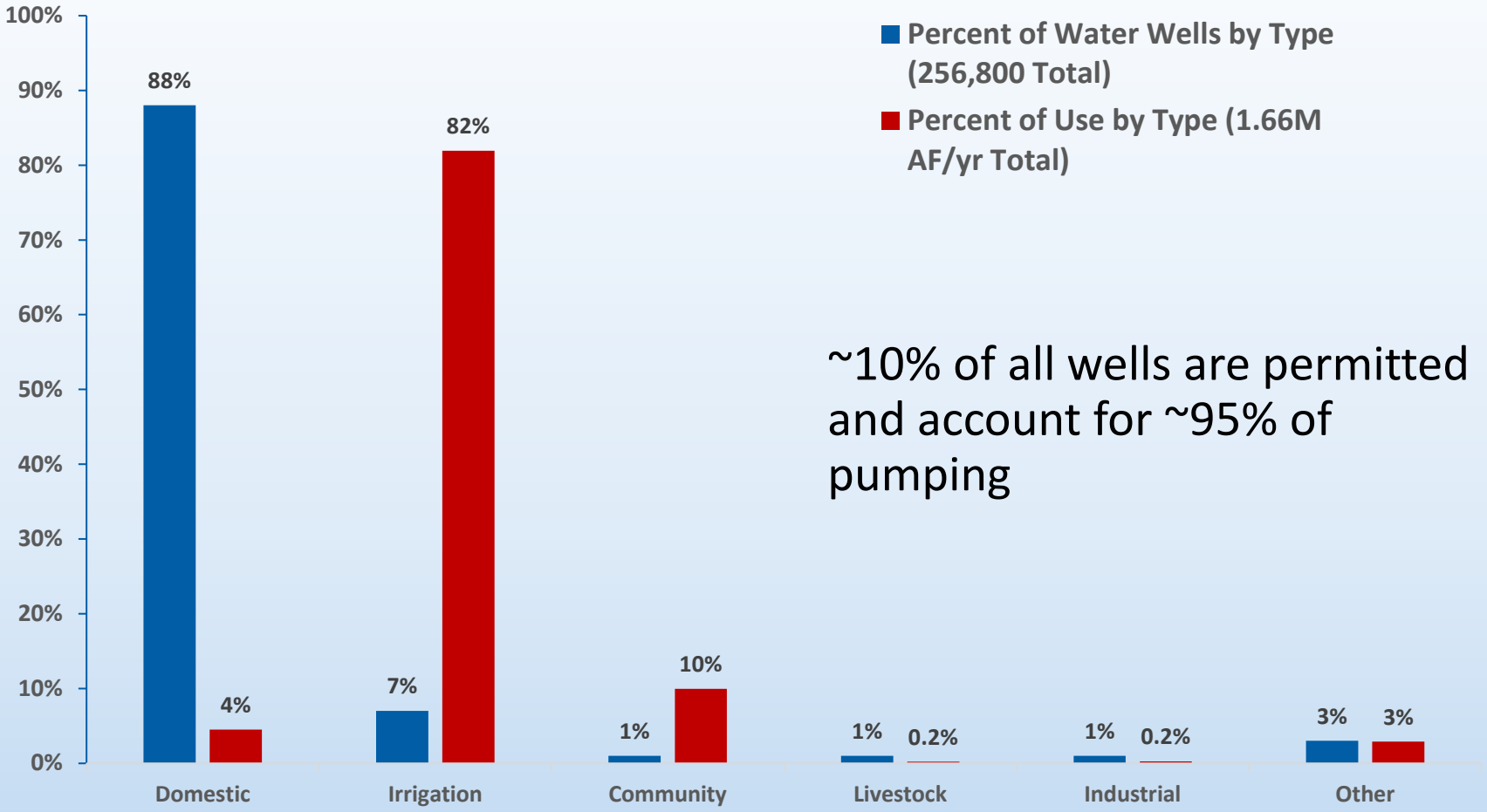
Wells in Oregon



~10% of all wells are permitted and account for ~95% of pumping

Sources: Use from USGS (Dieter and others, 2018, Estimated use of water in the United States in 2015: Circular 1441, 65 p., https://dx.doi.org/10.3133/cir1441); Well type from OWRD

Allocation in Statute

ORS 537.621(2)(a), the "four-part test":

- Use is allowed in the basin
- Water is available
- Existing rights will not be injured
- Meets additional Commission standards and rules

ORS 537.621(2)(b), other public interest criteria in statute addressed as needed

Photo: OWRD, well pumping to irrigation ditch in the Klamath Basin

Water is Available if…

Current Rules:

Requested source is available if not over-allocated:

- Allocate up to the full annual recharge volume
- Avoid short-term, acute impacts to surface water

Proposed Rules:

Requested source is available only if:

- Water levels are Reasonably Stable
- Hydraulically connected surface water is available for further appropriation
- Aquifer can likely produce requested rate

Reference: OAR 690-008, -009, -300, -400; https://www.oregon.gov/owrd/programs/GWWL/GW/Pages/Groundwater-Rulemaking.aspx

690-0300-0010(57)(d)-(f) "Water is Available"

(57) "Water is Available," when used in OAR 690-310-0080, 690-310-0110 and 690-310-0130, means: ...

(d) The requested groundwater source exhibits reasonably stable water levels, as defined in OAR 690-008-0001; and

(e) The proposed groundwater use will not substantially interfere with existing rights to appropriate surface water, as per the definition of "substantial interference" in OAR 690-008-0001 and the rules governing groundwater interference with surface water in OAR 690-009-0010 through 0040; and

(f) The total requested rate of groundwater allocation is obtainable by the expected yield of the well(s) proposed in the application given best available information.

Defining “Reasonably Stable Water Level”

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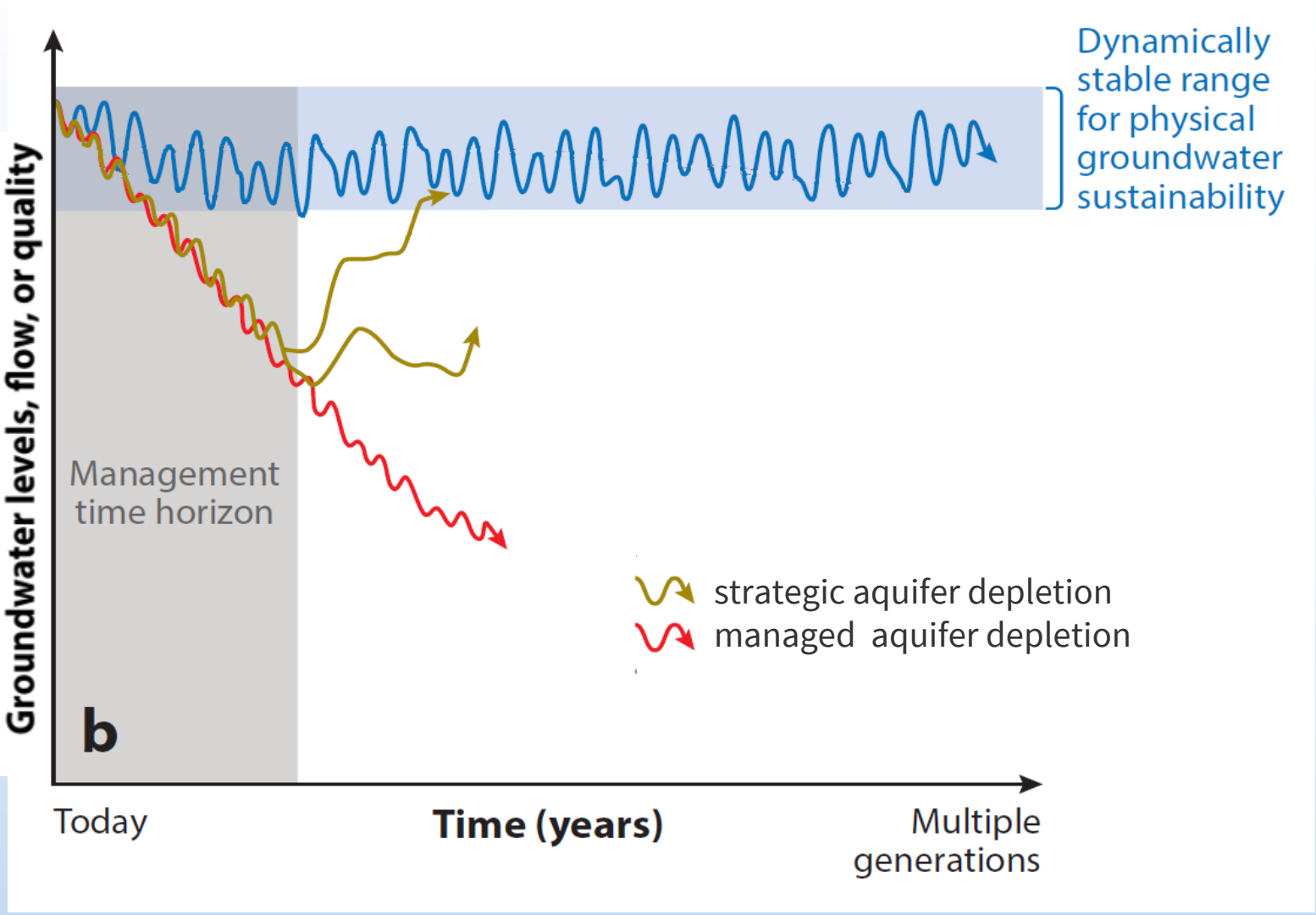
Reasonably Stable Water Levels Science-Based Framework



Excerpted and modified from: Gleeson and others, 2020, Annual Review of Earth and Planetary Science, 48, 431-63 (Figure 2b). Available at: https://www.annualreviews.org/doi/10.1146/annurev-earth-071719-055251

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Reasonably Stable Water Levels

Developed definition of Reasonably Stable Water Levels to:

- Accommodate dynamically stable range
- But identify declining levels relatively quickly
- Limit changes back and forth between stable and not
- Protect against long, slow declines toward levels meeting the definition of Declined Excessively

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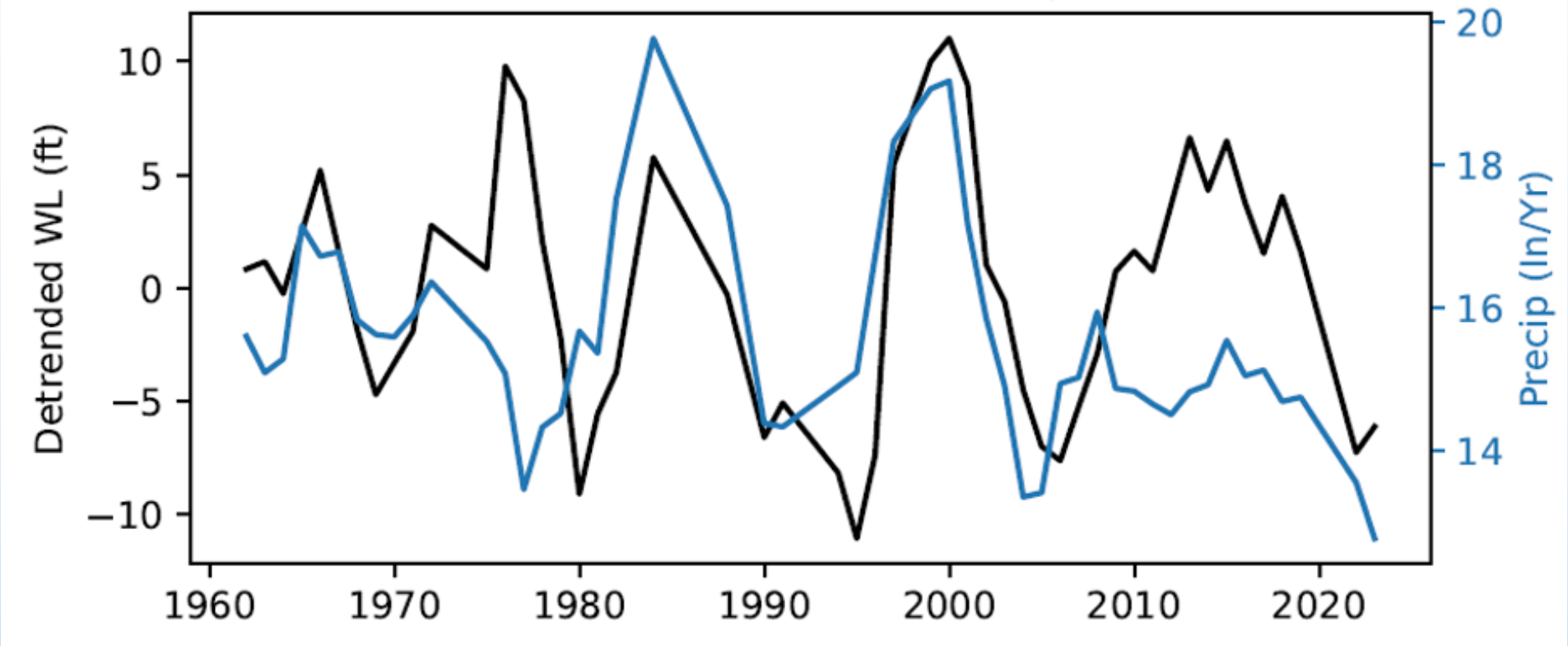
Dynamically stable range

DESC 3016



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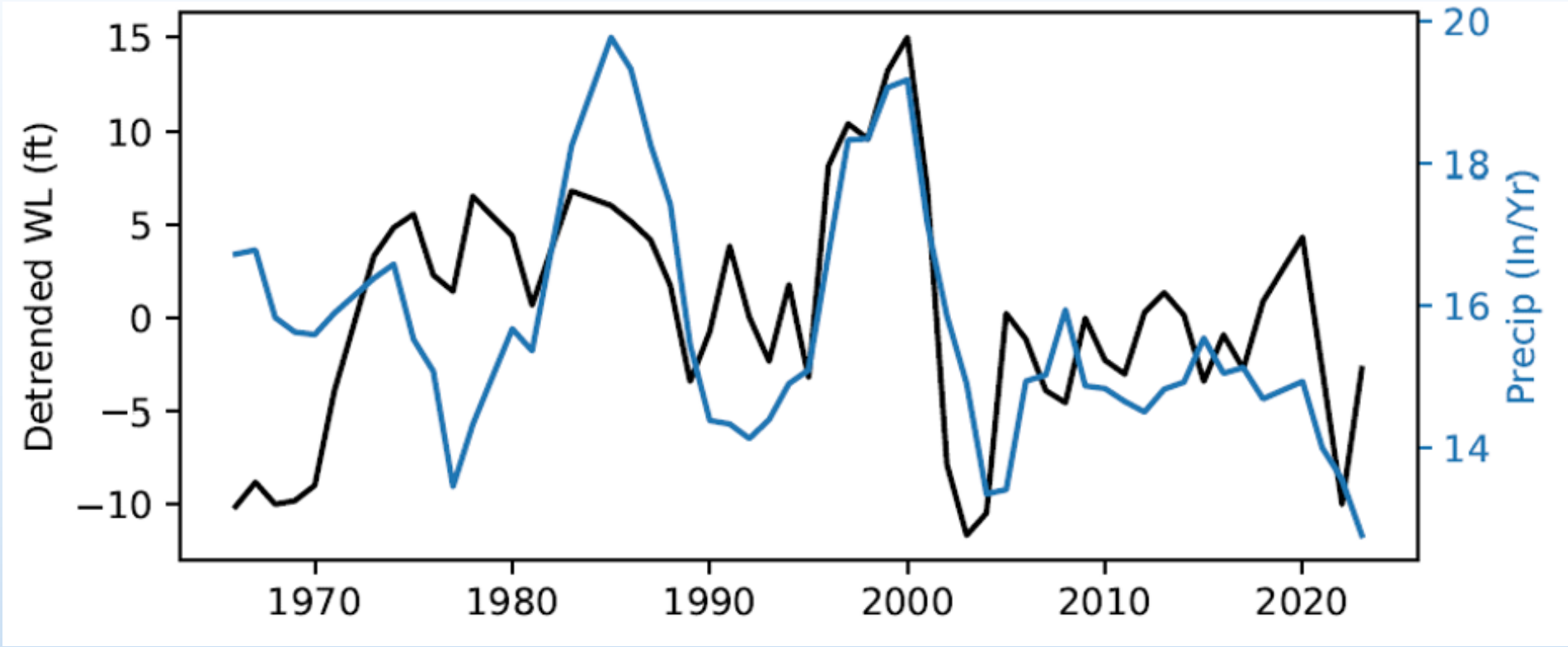
Dynamically stable range

KLAM 12893



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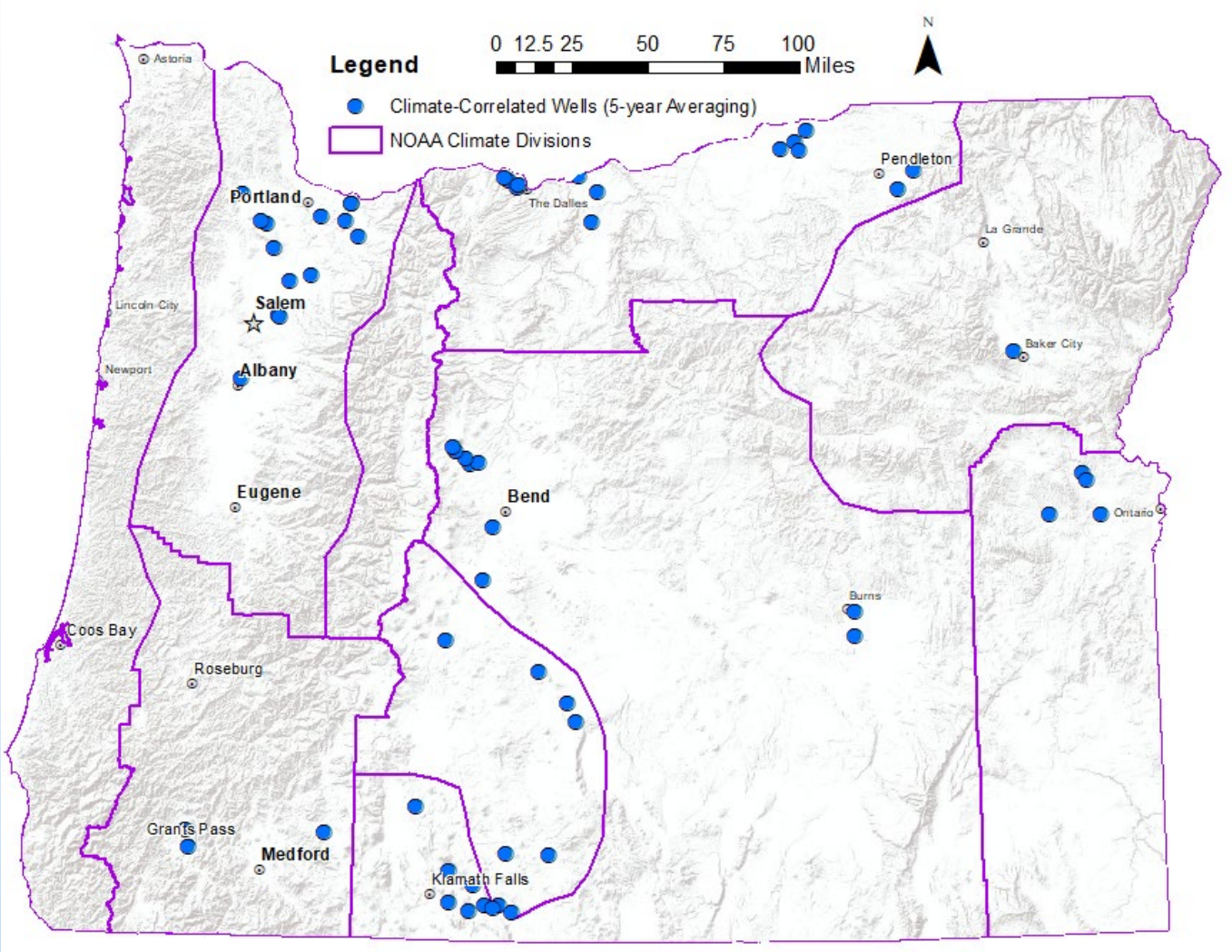
Dynamically stable range



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Reasonably Stable Water Levels

In short, Reasonably Stable Water Levels defined as:

- Less than 0.5 feet water level decline averaged over 5-20 years
- No more than 25 feet of total decline from highest known water level
- Need at least 5 years of recent data, otherwise “not available”
- Option for basin program rules to provide a local definition that is no less stringent than Declined Excessively

690-008-0001(1)-(2)
"Annual High Water Level"

STATUTORY ~~GROUND WATER~~GROUNDWATER TERMS

690-008-0001

Definition and Policy Statements

A number of terms are used in the statutes, ORS 537.505–537.795, prescribing the management of ~~ground water~~ groundwater in Oregon. These rules define terms to qualify and clarify the statutes. In all statutes and rules employed in the management of ~~ground water~~ groundwater by the Water Resources Department and Commission, the following definitions shall apply, unless the context requires otherwise:

(1) "Annual High Water Level" in a groundwater reservoir or part thereof means the highest elevation (shallowest depth) static groundwater level that exists in a year.

690-008-0001(9)(a)
"Reasonably Stable Groundwater Levels"

(9) "Reasonably Stable Groundwater Levels" means:

(a) The Annual High Water Levels as measured at one or more representative wells in a groundwater reservoir or part thereof:

(A) indicate no decline or an average rate of decline of less than 0.5 feet per year over any immediately preceding averaging period with duration between 5 and 20 years. Four Annual High Water Levels are required to calculate the rate of change, and at least one of these must have been measured between 5 and 20 years before the year under evaluation. If either of these conditions is not met, then data are insufficient to perform this test, and the Department will presume that water levels are not reasonably stable; and

(B) compared with the highest known static water level, have not declined or have declined by less than the smaller of 25 feet and 8% of the greatest known saturated thickness of the groundwater reservoir.

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690-008-0001(9)(b)-(d) "Reasonably Stable Groundwater Levels"

(9) "Reasonably Stable Groundwater Levels" means:

(b) Water level data must be available in the year under evaluation to perform the tests in (a). However, in the absence of current data, a finding of reasonable stability may be presumed to persist for a maximum of 5 years beyond the most recent Annual High Water Level.

(c) If groundwater has not yet been extracted or authorized for extraction from the groundwater reservoir, then water levels may be presumed to be reasonably stable.

(d) The limits in part (a) of this definition may be superseded by limits defined in a basin program rule adopted pursuant to the Commission's authority in ORS 536.300 and 536.310. However, the maximum allowable rate of decline in the revised part (a)(A) may not exceed 3 feet per year, and the maximum allowable total decline in part (a)(B) may not exceed the smaller of 50 feet and 15% of the greatest known saturated thickness of the ground-water reservoir.

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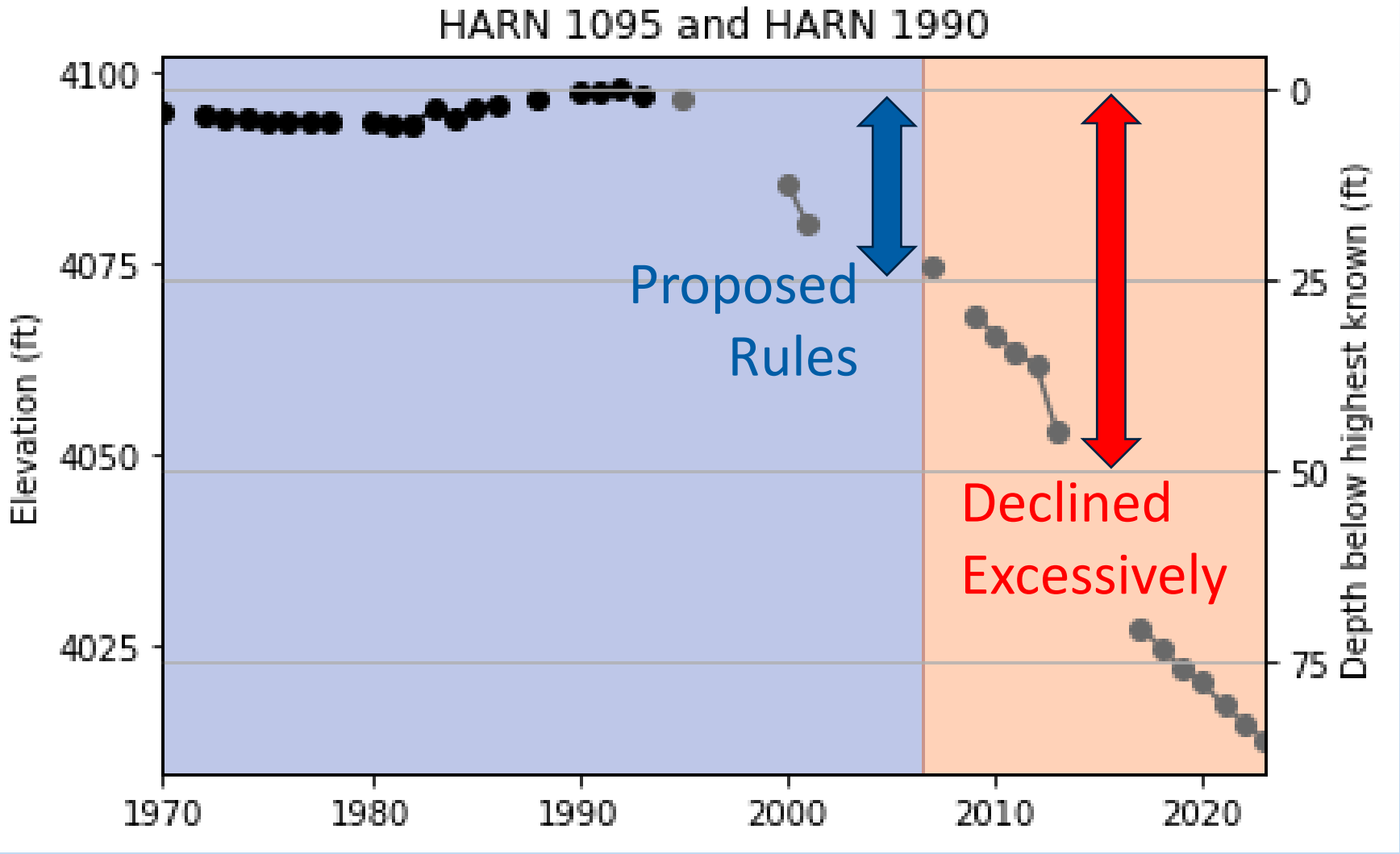
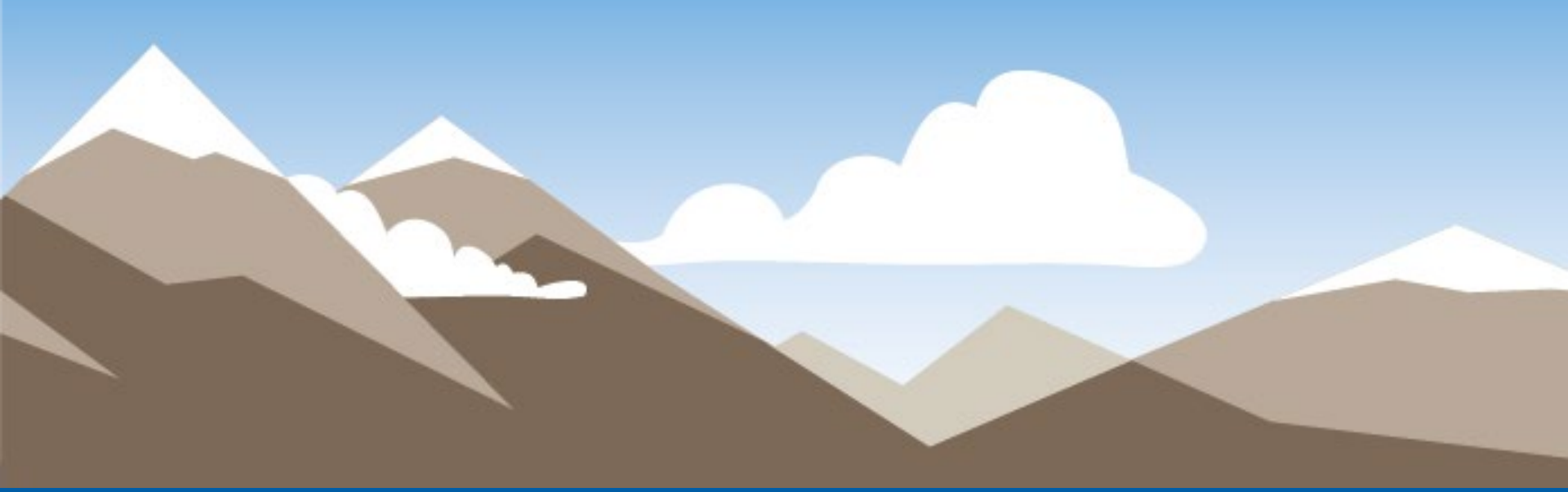
Reasonably Stable Water Levels Harney Basin Example



Source: OWRD



Redefining "Potential for Substantial Interference" (PSI) with Surface Water

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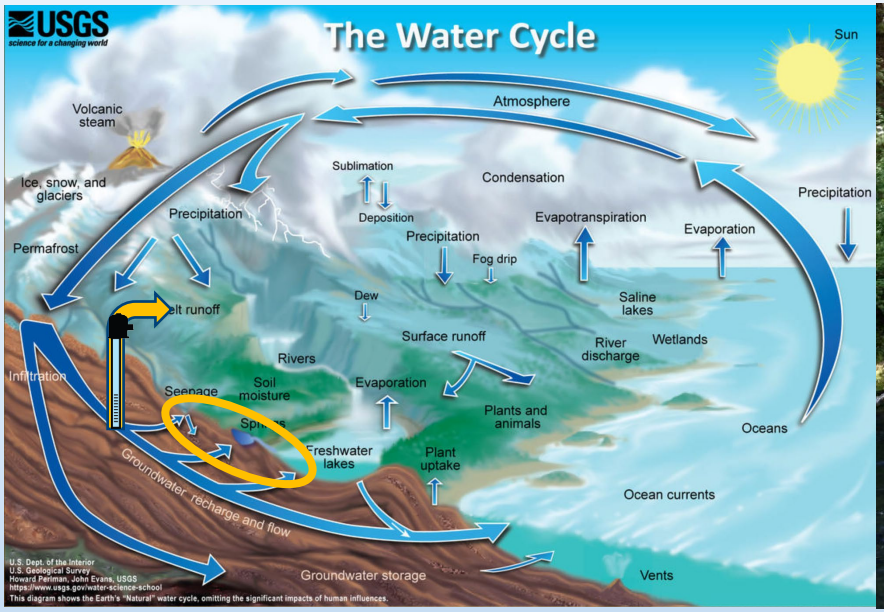
The Source of Water to Wells

"All water [pumped] by wells is balanced by a loss of water somewhere."

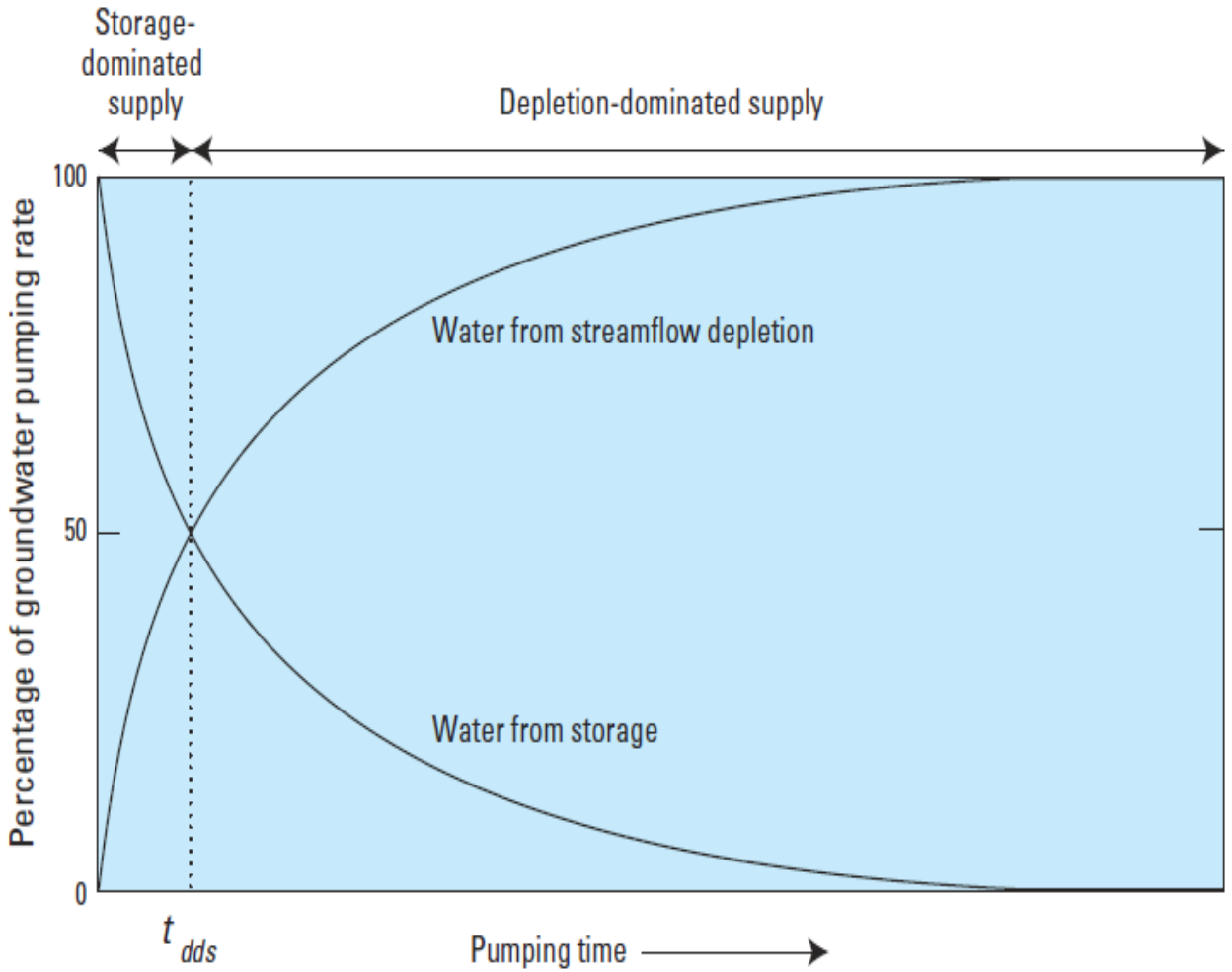
- C.V. Theis, 1940: The Source of Water Derived From Wells



Source: Theis, C.V., The Source of Water Derived From Wells; Essential Factors Controlling the Response of an Aquifer to Development. First published by the American Society of Civil Engineers in its Civil Engineering magazine (p. 277-280), Available online at *https://water.usgs.gov/ogw/pubs/Theis-1940.pdf*

The Source of Water to Wells

- Hydraulically connected wells capture surface water when pumped
- Given enough time, 100% of pumping rate will be supplied by surface water depletion

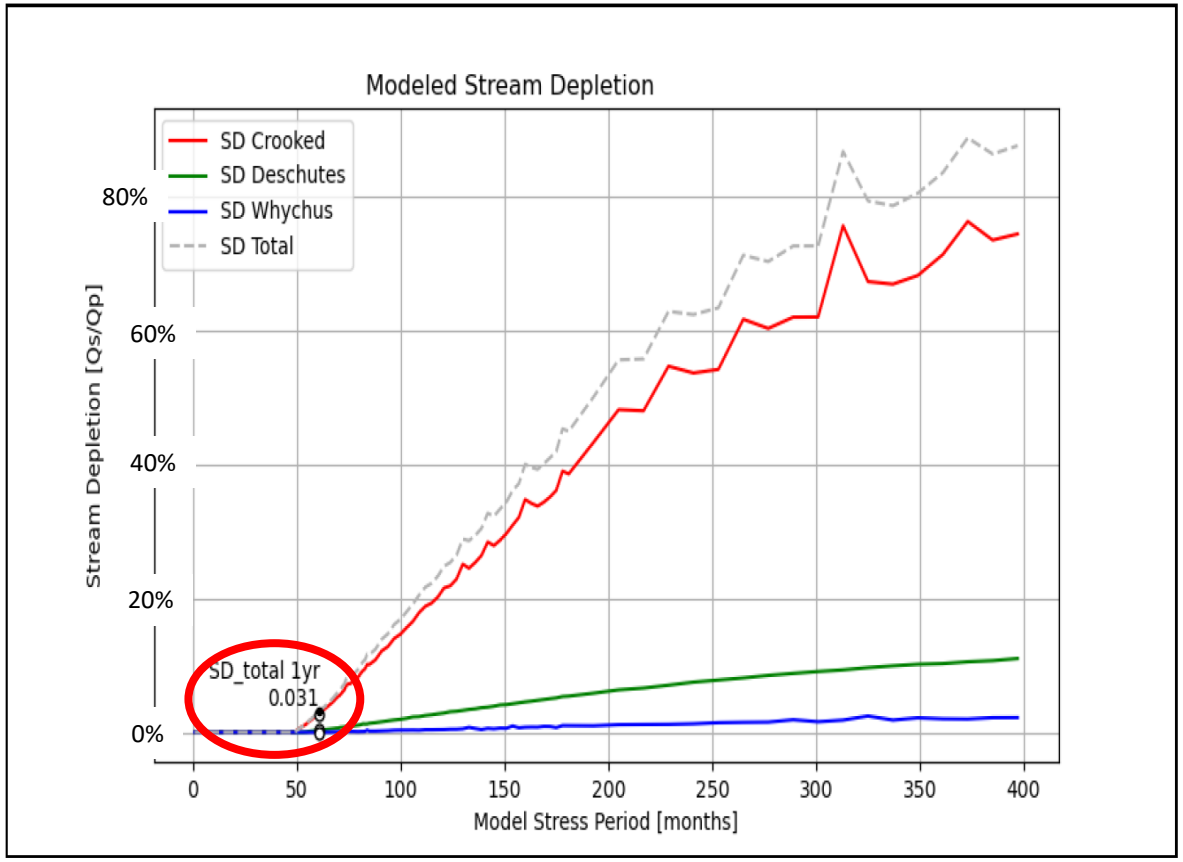


Source: Barlow, P.M., and Leake, S.A., 2012, Streamflow depletion by wells—Understanding and managing the effects of groundwater pumping on streamflow: U.S. Geological Survey Circular 1376, 84 p. (Also available at *http://pubs.usgs.gov/circ/1376/*.)

Longer-Term Impacts Example

- Current allocation practice assesses impacts after 1 year and within 1 mile
- In this case >80% of the pumping rate comes from stream depletion after 30 years pumping 4 wells located 20+ miles from streams

Figure 1: Stream-depletion curve, pumping starts at month 49 and continues at a constant rate for 29 years until the end of the model scenario (month 397).



Source: OWRD

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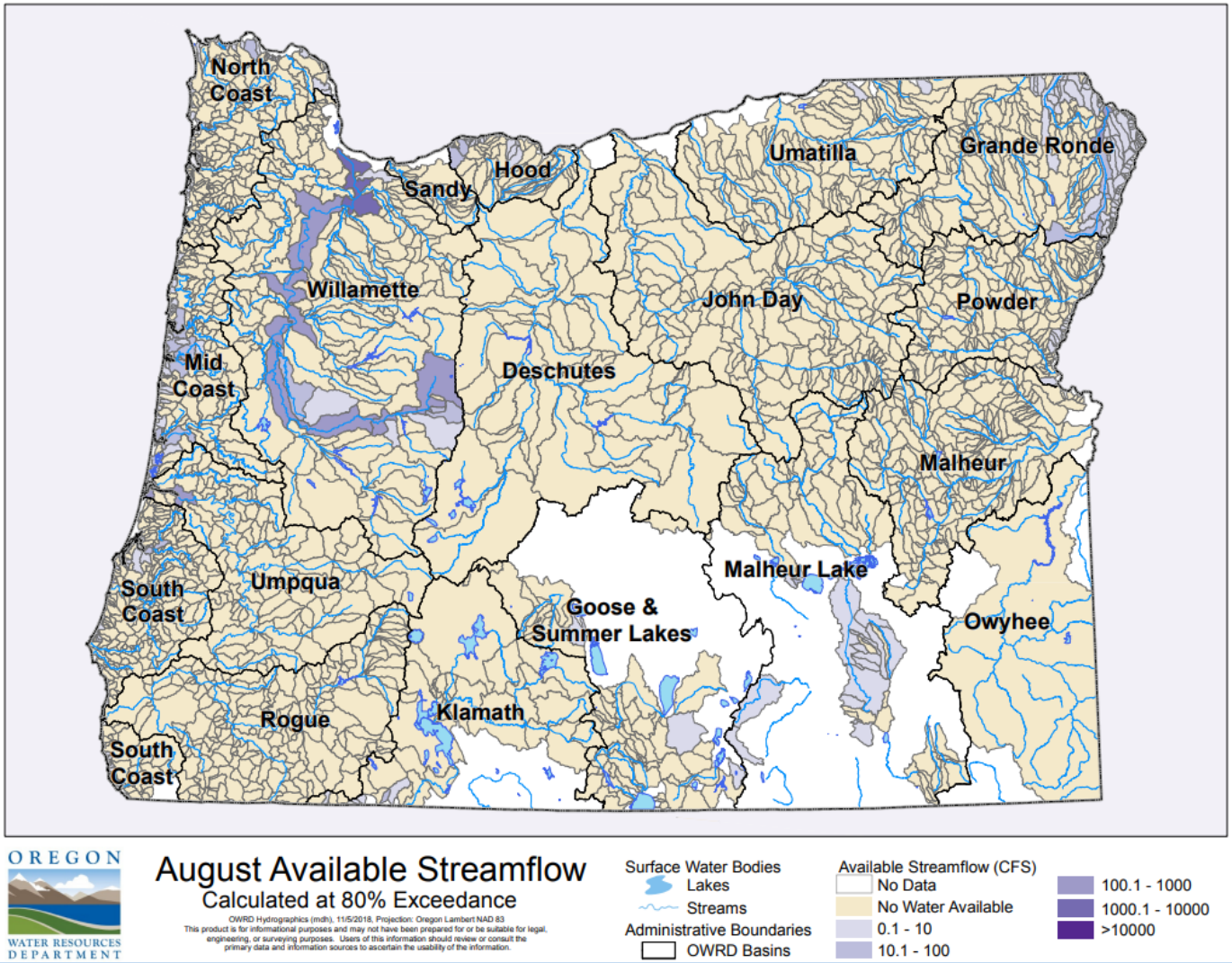
Surface Water Availability

Proposed rules mean hydraulically connected groundwater availability would closely match surface water availability



Source: OWRD

Hydraulic Connection & "Potential for Substantial Interference" (PSI)

Current rules

PSI determination

- < 1 mile, < 1 year
- ignores long-term, cumulative impacts to already over-appropriated surface water sources

Proposed rules

PSI determination

- groundwater source is hydraulically connected with surface water source
- regardless of timing or magnitude of impact

Substantial Interference

- when Div 8 criteria are met

690-009-0040(1) - Determination of Hydraulic Connection and PSI

(1) Hydraulic connection and the potential for substantial interference with a surface water source shall be determined by the Department according to these rules. These determinations shall be based upon the application of generally accepted hydrogeologic principals using best available information concerning the hydrologic system of interest and the well(s) under consideration.

(a) Appropriate information that is provided in the application or in the public comment period for the application shall be considered in the process of making these determinations.

(b) Best available information includes, but is not limited to, pertinent water well reports, aquifer test analyses, hydrologic and geologic studies and reports, groundwater and surface water elevation data, available numerical and analytical groundwater flow models, and any other information that is used in applying generally accepted hydrogeologic principals and methodologies.

690-009-0040(2)-(3) - Determination of Hydraulic Connection and PSI

(2) A determination of hydraulic connection is a prerequisite for a determination of the potential for substantial interference.

(3) A determination of the potential for substantial interference with a surface water source shall at a minimum include application of the generally accepted hydrogeological principles described in the following subsections to the specific use and wells under consideration:

(a) "The Source of Water Derived from Wells: Essential Factors Controlling the Response of an Aquifer to Development" by C. V. Theis, 1940; and,

(b) "Streamflow Depletion by Wells – Understanding and Managing the Effects of Groundwater Pumping on Streamflow" by P. M. Barlow and S. A. Leake, 2012.

690-009-0040(4)-(6) - Determination of Hydraulic Connection and PSI

(4) The potential for substantial interference with a surface water source exists if the well(s) under consideration will, over the full term of the proposed or authorized groundwater use, obtain water from streamflow depletion.

(5) For the purposes of issuing a permit for a proposed groundwater use, a finding of potential for substantial interference with a surface water source may mean that water is not available for the proposed groundwater use if the use will substantially interfere with a surface water source as per the definitions in OAR 690-008-0001 and OAR 690-300-0010.

690-008-0001(10)(a)(A)-(B) "Substantial interference" et al.

(~~8~~10) “Substantial ~~or Undue~~ I interference," “substantially interfere,” “undue interference,” or “unduly interfere” means the spreading of the cone of depression of a well to intersect a surface water ~~body~~ source or another well, or the reduction of the ~~ground water gradient and flow~~ groundwater levels as a result of pumping or otherwise extracting groundwater from an aquifer, which contributes to:

(a) ~~A reduction in surface water availability to an extent that~~ Depletion of a surface water with which the groundwater use has the Potential for Substantial Interference (OAR 690-009-0020(4)) and that:

(A) ~~One or more senior appropriators are unable to use either their permitted or customary quantity of water, whichever is less~~ is already over-appropriated during any period of the year and is the source for a surface water right having a priority date senior to priority date(s) of the groundwater appropriation(s); or

(B) is administratively or statutorily withdrawn with an effective date senior to the priority date(s) of the groundwater appropriation(s); or

690-008-0001(10)(a)(C)-(E) "Substantial interference" et al.

(C) is restrictively classified with an effective date senior to the priority date(s) of the groundwater appropriation(s); or

(D) is the source for one or more existing surface water rights that have been regulated off due to insufficient supply to satisfy senior surface water rights and that have priority dates senior to the priority date(s) of the contributive groundwater appropriation(s) or is subject to a rotation agreement to address limited surface water supplies among surface water rights that have priority dates senior to the priority date(s) of the groundwater appropriation(s); or

(E) ~~(B) An adopted minimum streamflow or instream water right with an effective date senior to the causative ground water appropriations(s) cannot be satisfied~~ has a minimum perennial streamflow or instream water right that is unmet during any period of the year and has an effective date or priority date that is senior to the date(s) of the groundwater appropriation(s).

690-008-0001(10)(b),(c) "Substantial interference" et al.

~~(8~~(10) “Substantial ~~or Undue I~~interference,” “substantially interfere,” “undue interference,” or “unduly interfere” means the spreading of the cone of depression of a well to intersect a surface water ~~body~~ source or another well, or the reduction of the ~~ground water gradient and flow~~ groundwater levels as a result of pumping or otherwise extracting groundwater from an aquifer, which contributes to:

(b) The ~~ground water~~groundwater level being drawn down to the ~~eco`nomic level~~Economic Pumping Level of the senior appropriator(s); or

(c) One or more of the senior ~~ground water~~groundwater appropriators being unable to obtain either the permitted or the customary quantity of ~~ground water~~groundwater, whichever is less, from a reasonably efficient well that fully penetrates the aquifer where the aquifer is relatively uniformly permeable. However, in aquifers where flow is predominantly through fractures, full penetration may not be required as a condition of substantial or undue interference.

Options to Meet Water Needs

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Goals

Increase water supply resiliency and meet instream and out of stream water needs now & into the future

Photo: OWRD, Crooked River

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Why Several Tools?

- Growth via diverse strategies

- Los Angeles
  - 1M people, consistent water use since 1970
- Las Vegas
  - 23% less water; 800,000 more people

Photo: NY Times, *Arizona Limits Construction Around Phoenix as Its Water Supply Dwindles, 2023*

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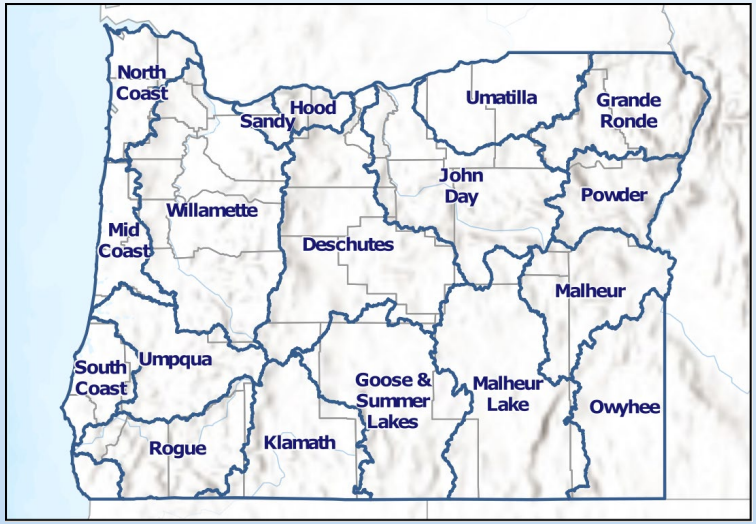
Tools Available: Local Planning

Place-based plans to inform local needs and solutions

Basin Program Rules



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Tools Available: Conservation & Efficiency

Water Management & Conservation Plans	<10% system losses
Funding Programs (Water Project Grants & Loans)	Funding incentives
Allocation of Conserved Water	Water put to new uses and/or lands, plus instream benefit

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Tools Available: Transfers

Point of Diversion,
Point of Appropriation

Place of Use,
Type of Use

Combination

Tools Available: Aquifer Storage & Recharge

Underground storage for use during peak demand and low availability

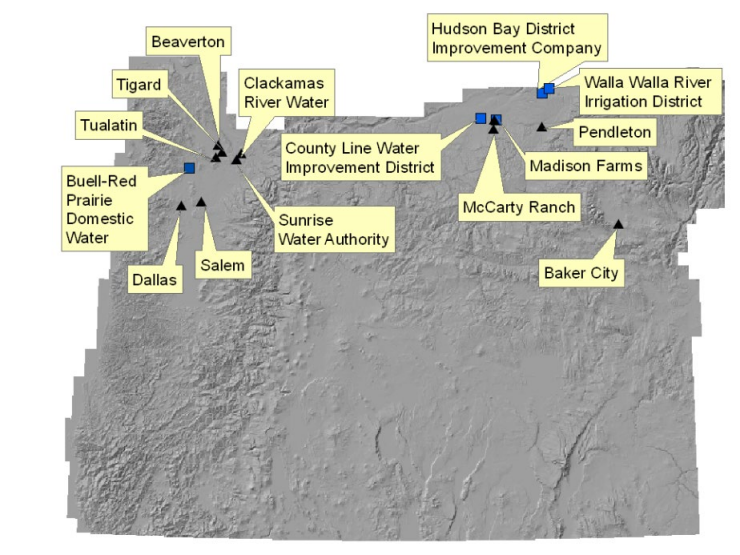

Photo: OWRD, Agricultural ASR well near Hermiston, OR

OWRD, 2008 distribution of AR & ASR projects statewide.

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Tools Available: Municipal Re-Use

Recycling re-used water for beneficial use

- City of Hermiston
  - Recycled water to irrigators in the summer months
- City of John Day
  - 80M gallons to users that in lieu of new surface water diversions

Photo: Top: City of Hermiston wastewater treatment plan
Bottom: City of John Day Greenhouses supported by re-used water

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Evaluating Potential Tools

Adapting existing tools

- Transfer timelines
- Conservation incentives
- Water Management & Conservation Plan guidance

Developing new tools

- Lessons learned

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Evaluating Potential Tools

BASIN & REGIONAL PLANNING

MARKET BASED APPROACHES

MITIGATION PROGRAMS

CONSERVATION INCENTIVES

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Evaluating Potential Tools

BASIN & REGIONAL PLANNING

Washington: watershed management plans

California: local groundwater sustainability plans

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Evaluating Potential Tools

MARKET BASED APPROACHES

Colorado: alternative transfer methods

California: groundwater banks

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Evaluating Potential Tools

MITIGATION PROGRAMS

Colorado & Washington: Mitigating impacts of new appropriation

Idaho: Mitigation planning to avoid curtailment

OREGON WATER RESOURCES DEPARTMENT

Evaluating Potential Tools

CONSERVATION INCENTIVES

Nevada: Water Conservation & Infrastructure Initiative

Next Steps

Next Steps

Continue evaluating options for meeting future needs

Additional public involvement to include

- More RACs and/or public outreach, as needed
- Publication of Notice of Proposed Rulemaking
  - Early Spring 2024
- 90-Day Public Comment Period
  - Early Spring 2024
- Multiple public hearings (hybrid) held around state
  - Tentatively: Bend, LaGrande, Medford, Salem
- Presentation to Commission for adoption
  - Summer 2024

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