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2024 Changes to Oregon's Groundwater Allocation Rules

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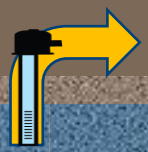
Presentation to WSWC Groundwater Workshop

April 22, 2025



Background

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Impacts of Over-Allocation

- Drying up of wells; increased pumping costs
- Reduced streamflow
- Curtailment of rights in which people have invested
- Water quality deterioration

Photo: OWRD, Crooked River, nearly dry

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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.

Photo: OWRD, Hibbard Spring, Harney County

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Rulemaking Principles

1. Promote sustainable groundwater use while recognizing the prior appropriation doctrine by ensuring:

    a. Reasonably stable groundwater levels are determined and maintained, and

    b. Groundwater contributions to streamflow are maintained where streamflow is already fully allocated to existing water right holders.

2. Base rule changes in science, law, and Oregon's groundwater data.

3. Only issue additional groundwater rights where information exists to confirm that water is available for further appropriation.

Key Groundwater Concepts

- Groundwater is a flowing component of the water cycle
- The source of groundwater pumped from wells is:
  - storage (gw levels)
  - streamflow depletion (gw discharge to springs and stream baseflow)

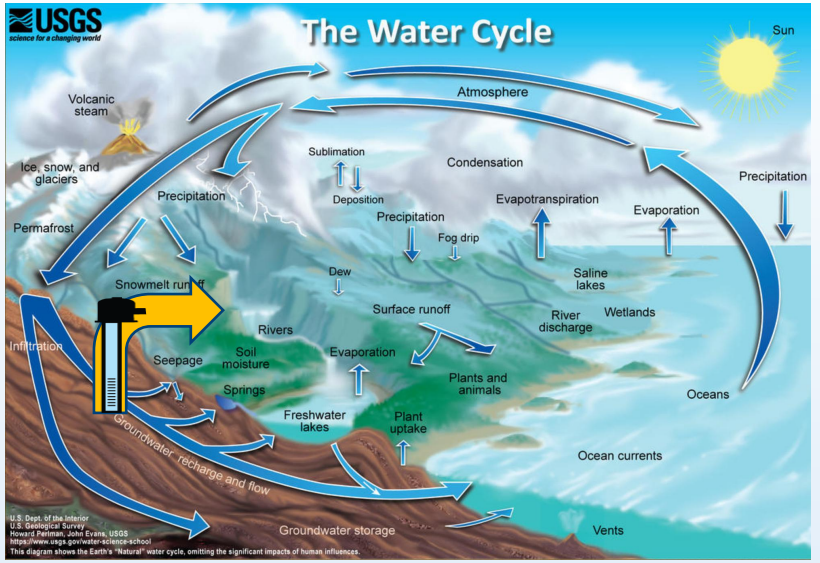

Photo: OWRD, Unnamed spring discharging to the Metolius River
Figure Source: USGS (https://www.usgs.gov/special-topics/water-science-school/science/fundamentals-water-cycle)

2024 Groundwater Allocation Rule Changes

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

…and (2)(b) Other public interest criteria in statutory policy can be addressed as needed

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

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Water is Available if…

Old 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; while allowing long-term and cumulative impacts

New Rules:

Requested source is available only if:

- Groundwater level trends are Reasonably Stable
- Hydraulically connected surface water is available for further appropriation
- Aquifer physically capable of producing the requested rate

Scope of Rulemaking

New rules apply to:

- Potential New Permitted Groundwater Uses

New rules do not apply to:

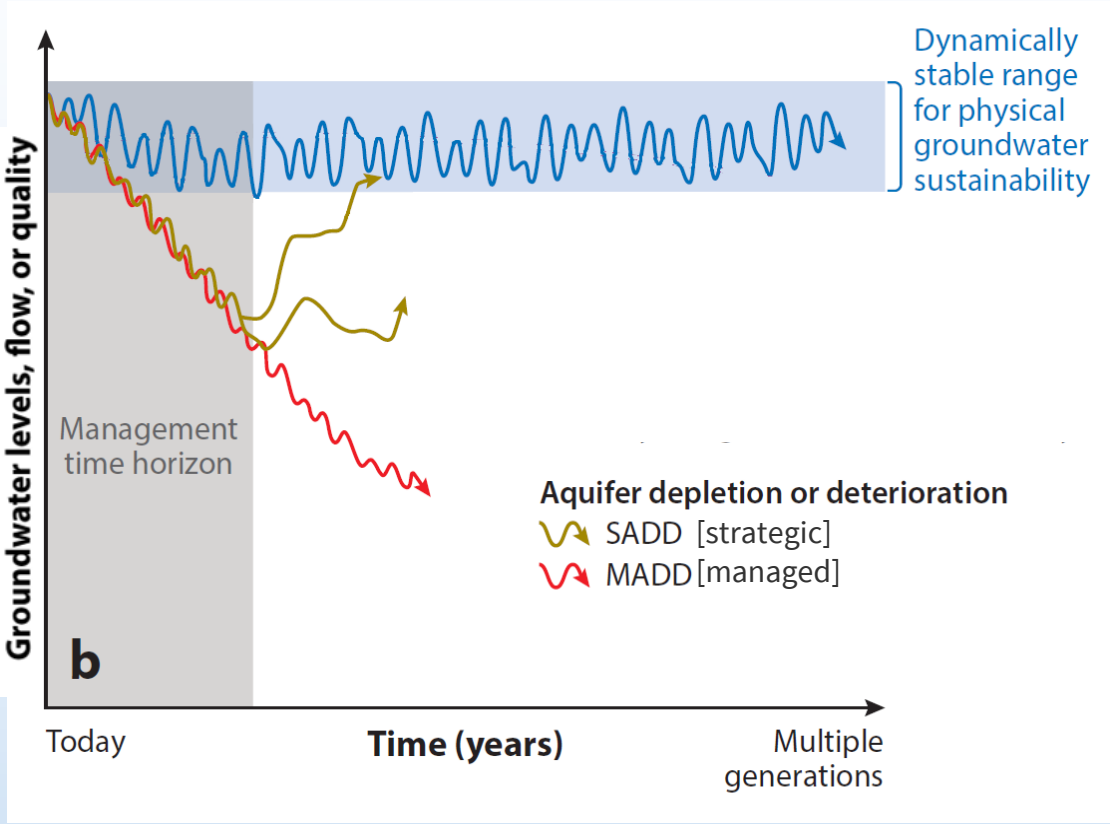
- Existing permit holders
- Exempt groundwater users
  - Domestic
  - Small livestock
  - Small single industrial and commercial use

Key Rule Change 1: Defining “Reasonably Stable Water Level”

Sustainable Means:

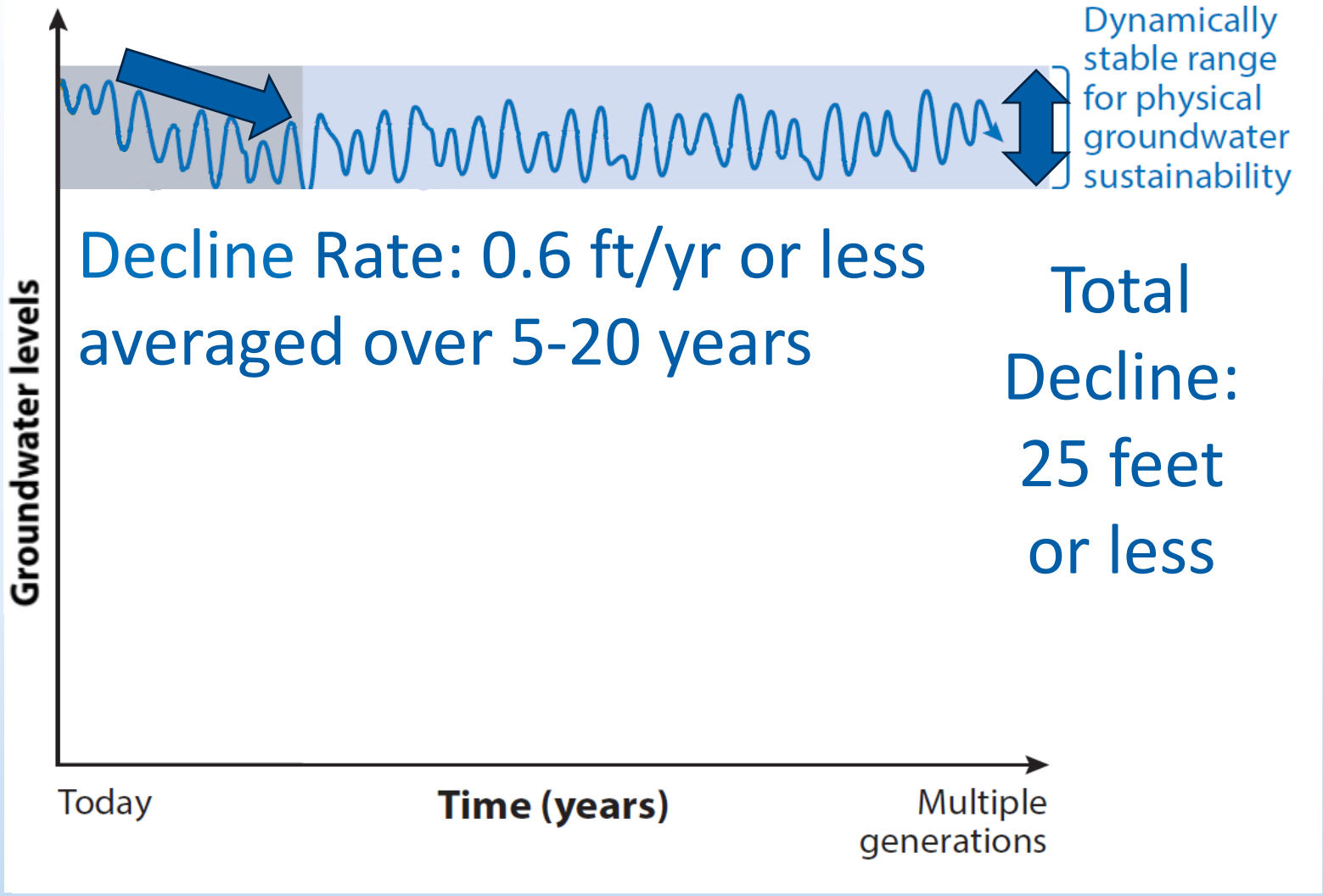
"Groundwater sustainability is maintaining long-term, dynamically stable storage [water levels] and flows [from recharge to discharge areas] of high-quality groundwater …"

– Gleeson et al, 2020



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

RSGL: Data-Driven Threshold Definitions



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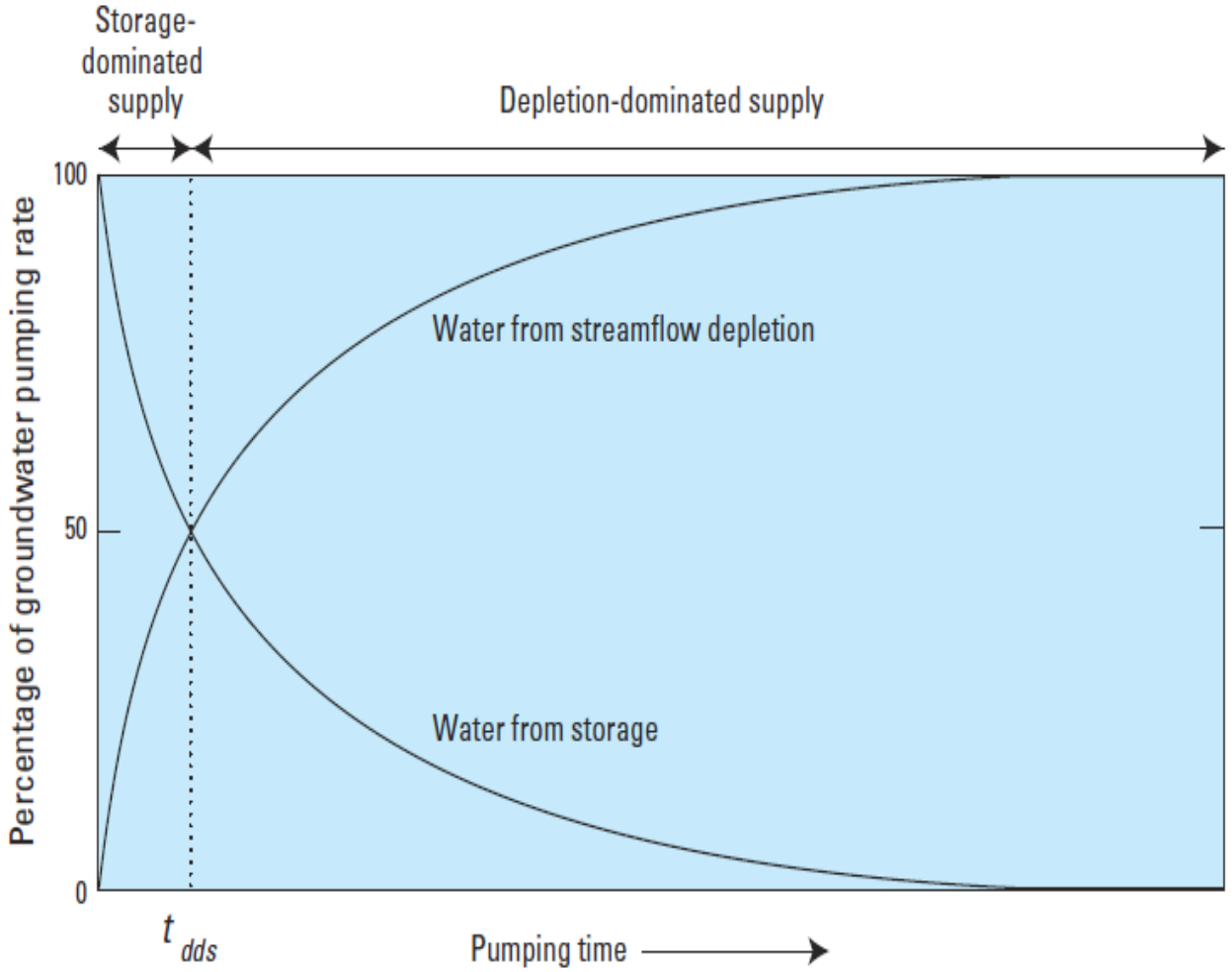
Key Rule Change 2: Redefining "Potential for Substantial Interference" (PSI) with surface water

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/*.)

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Baseflow is Groundwater

Photo: OWRD, Eagle Creek, baseflow in late August

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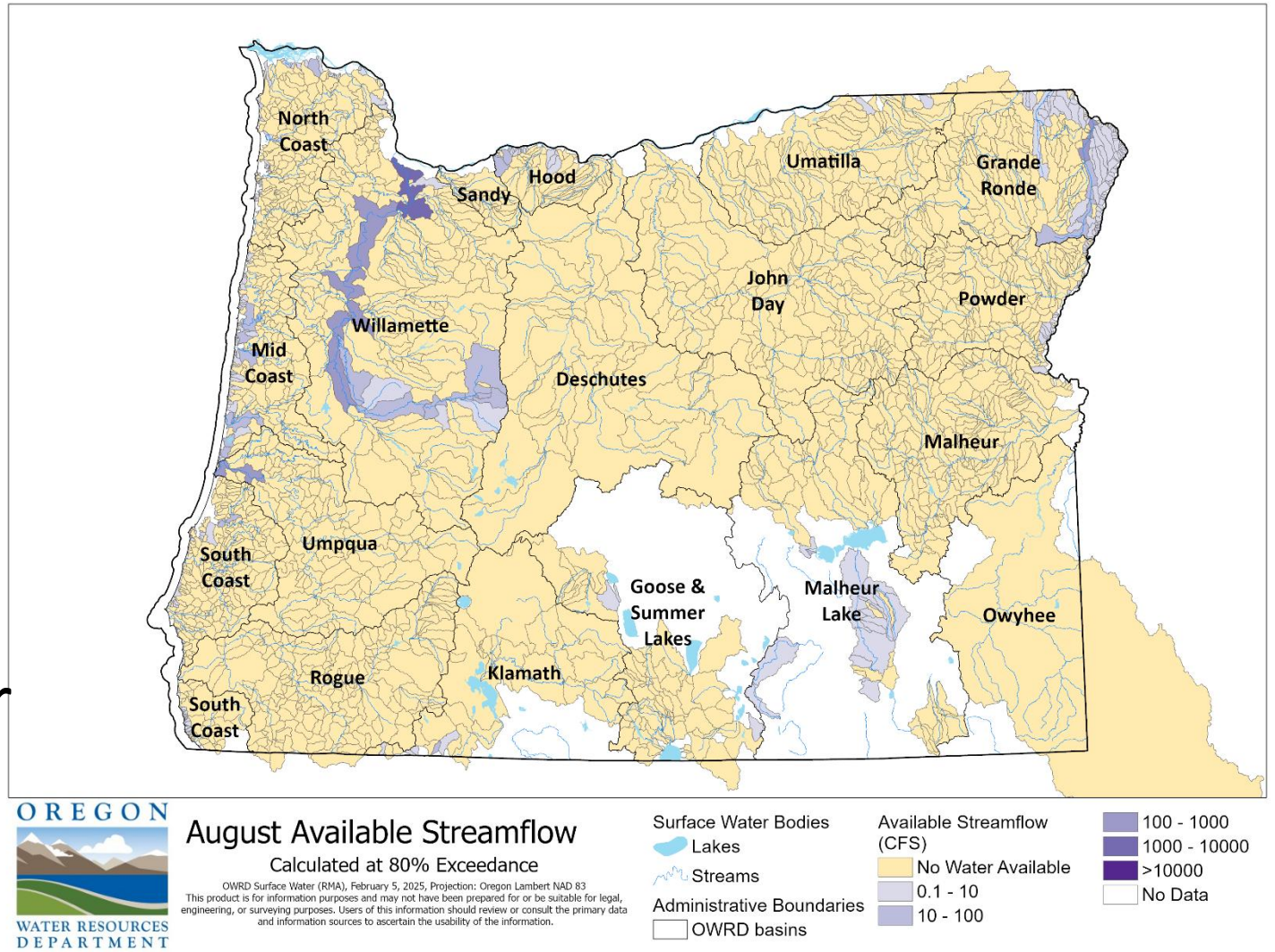
Surface Water Availability

Adopted rules mean hydraulically connected groundwater availability closely matches surface water availability



Source: OWRD

Implications

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Water Supply Alternatives

- Conservation & Efficiency
- Reuse
- Aquifer Storage and Recovery/ Aquifer Recharge
- Transfers
- Repurposing existing rights
- Interties
- Mitigation, water markets

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Reference Slides from Past Presentations

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Key Groundwater Concept

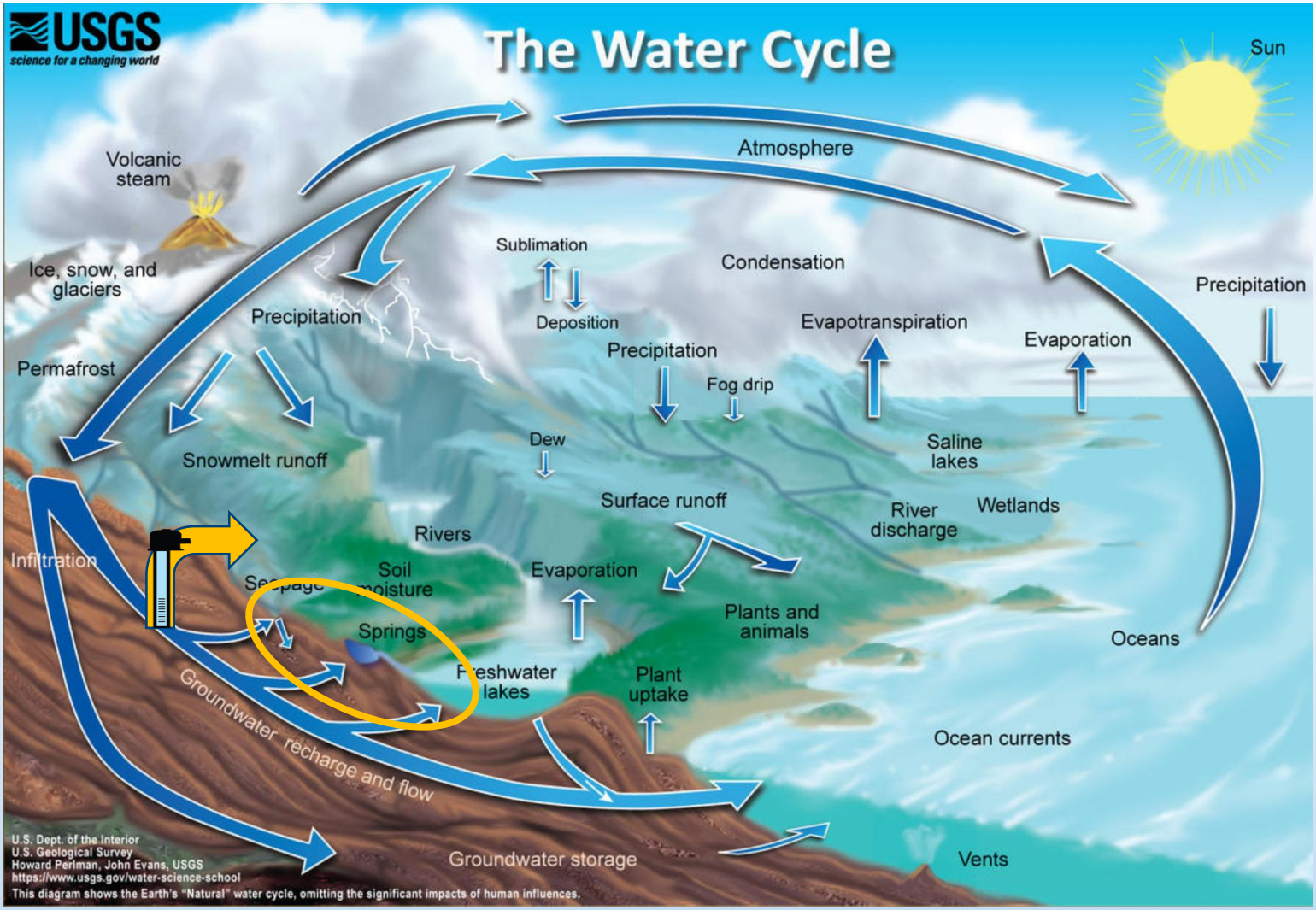

Figure Source: USGS (https://www.usgs.gov/special-topics/water-science-school/science/fundamentals-water-cycle)

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Key Groundwater Concept

Photo: OWRD, Unnamed spring discharging to the Metolius River

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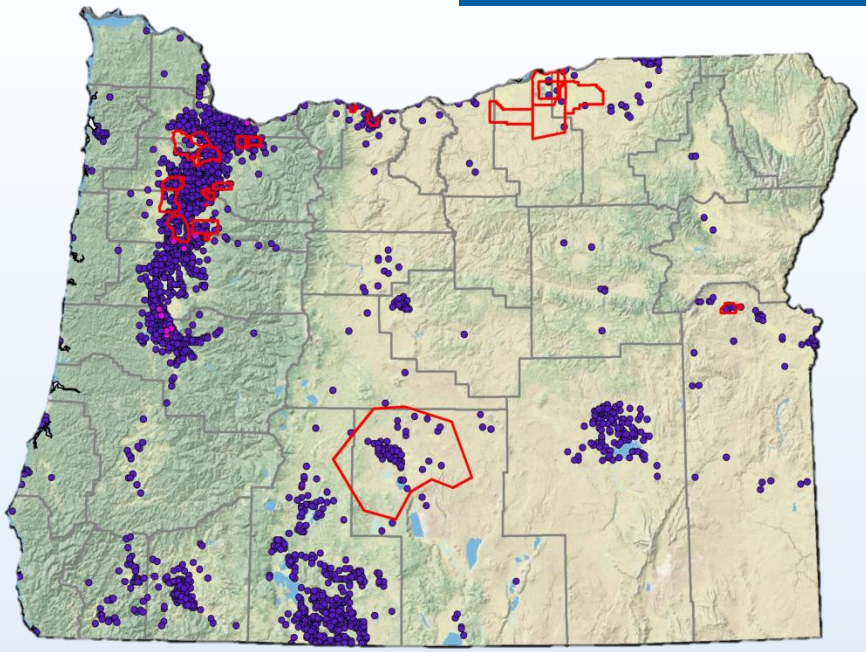
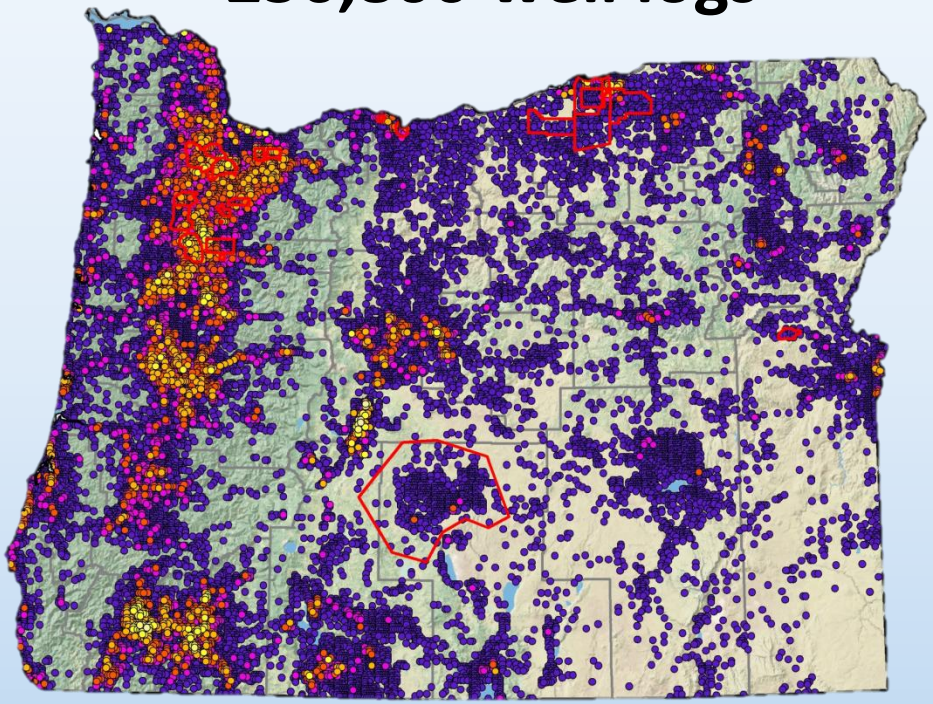
Groundwater Development



1955
4,660 well logs

2016
256,800 well logs



Density of Water Well Logs per 640 Acres

1 - 16	(<= 1 well / 40 acres)
17 - 32	(<= 1 well / 20 acres)
33 - 64	(<= 1 well / 10 acres)
65 - 128	(<= 1 well / 5 acres)
129 - 256	(<= 1 well / 2.5 acres)
257 - 320	(<= 1 well / 2.0 acres)
>320	(<= 1 well / 1.0 acres)

Counties

Ground Water Restricted Areas

Source: OWRD

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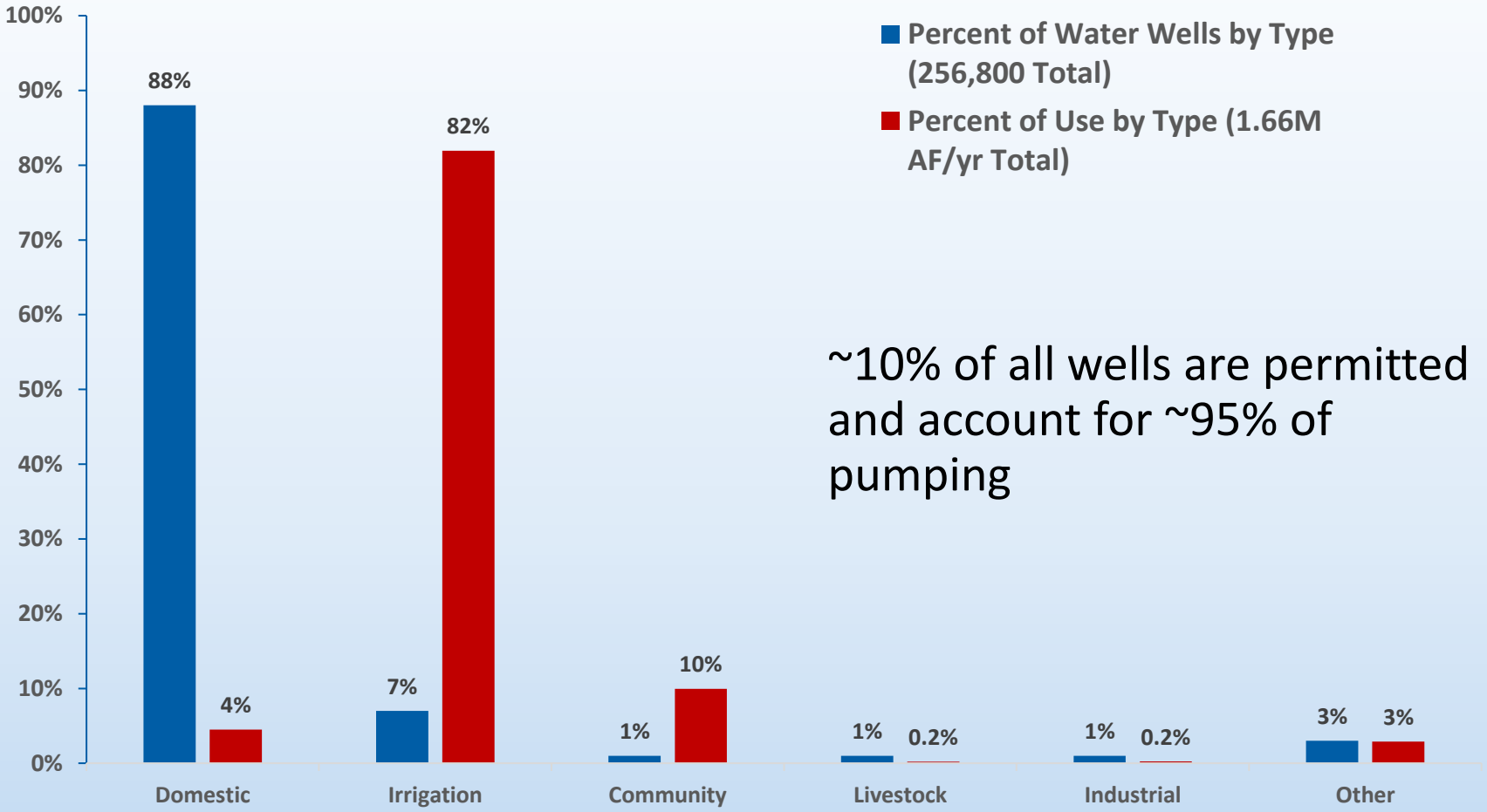
Wells in Oregon



~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

Need for Rulemaking

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Impacts of Over-Allocation

- drying up of wells or increased pumping costs
- reduced streamflow
- curtailment of rights that people have invested in
- deterioration of water quality

Photo: Crooked River, nearly dry

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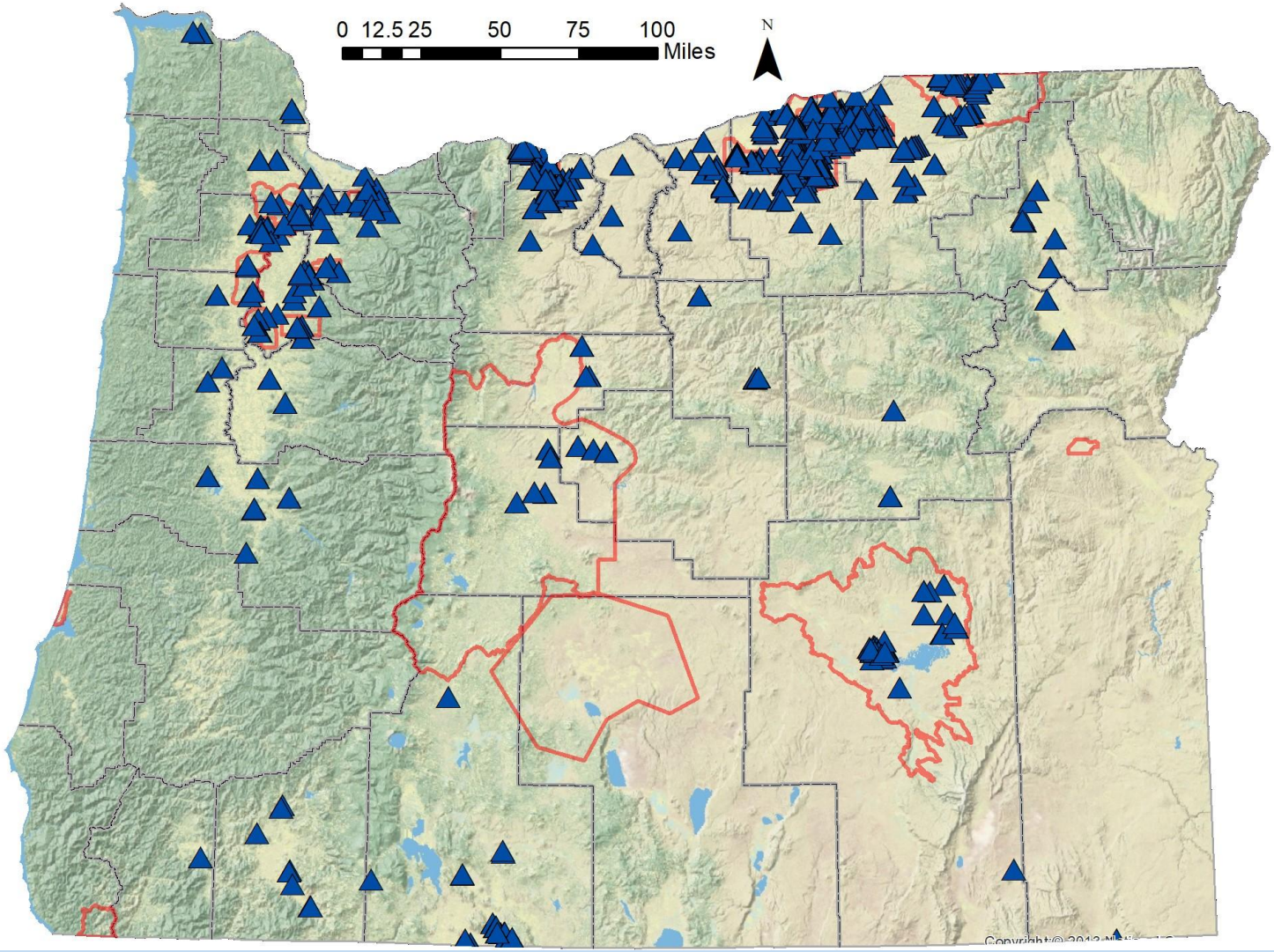
Signs of Over-Allocation

Excessively Declined Water Levels

(>50 ft from highest known)



Source: OWRD

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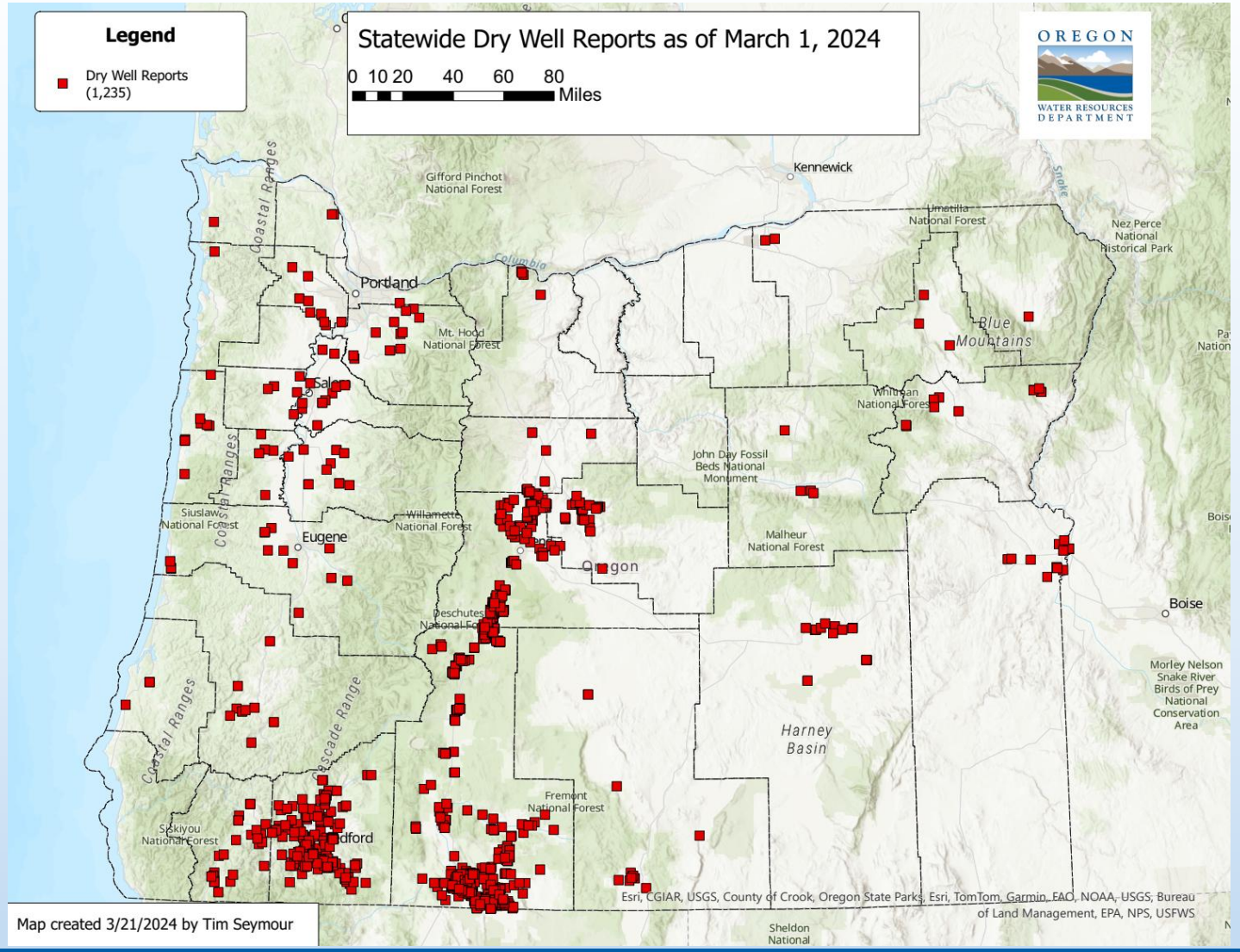
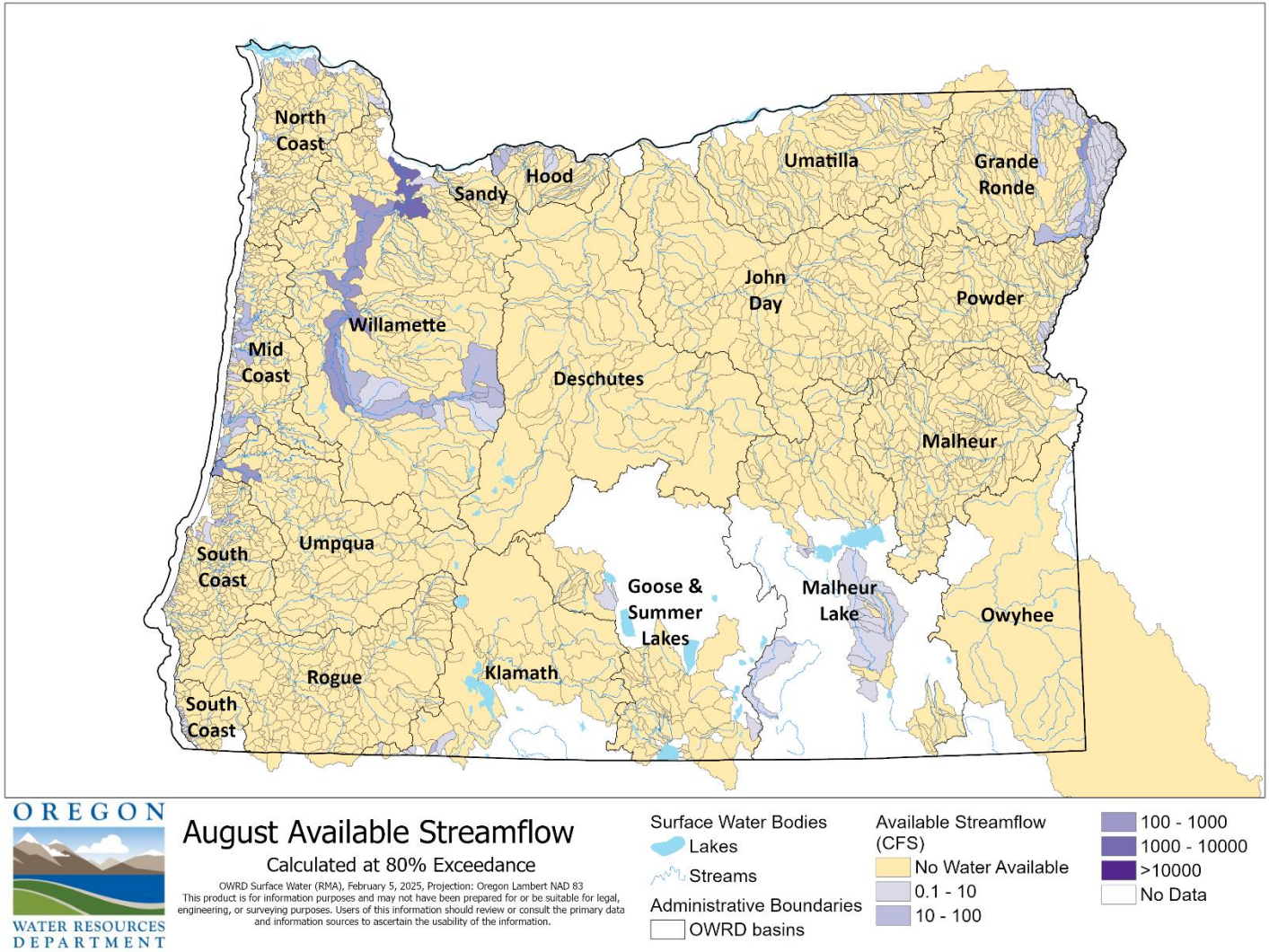


Source: OWRD

Signs of Over-Allocation

Surface Water Availabilit in August



Source: OWRD

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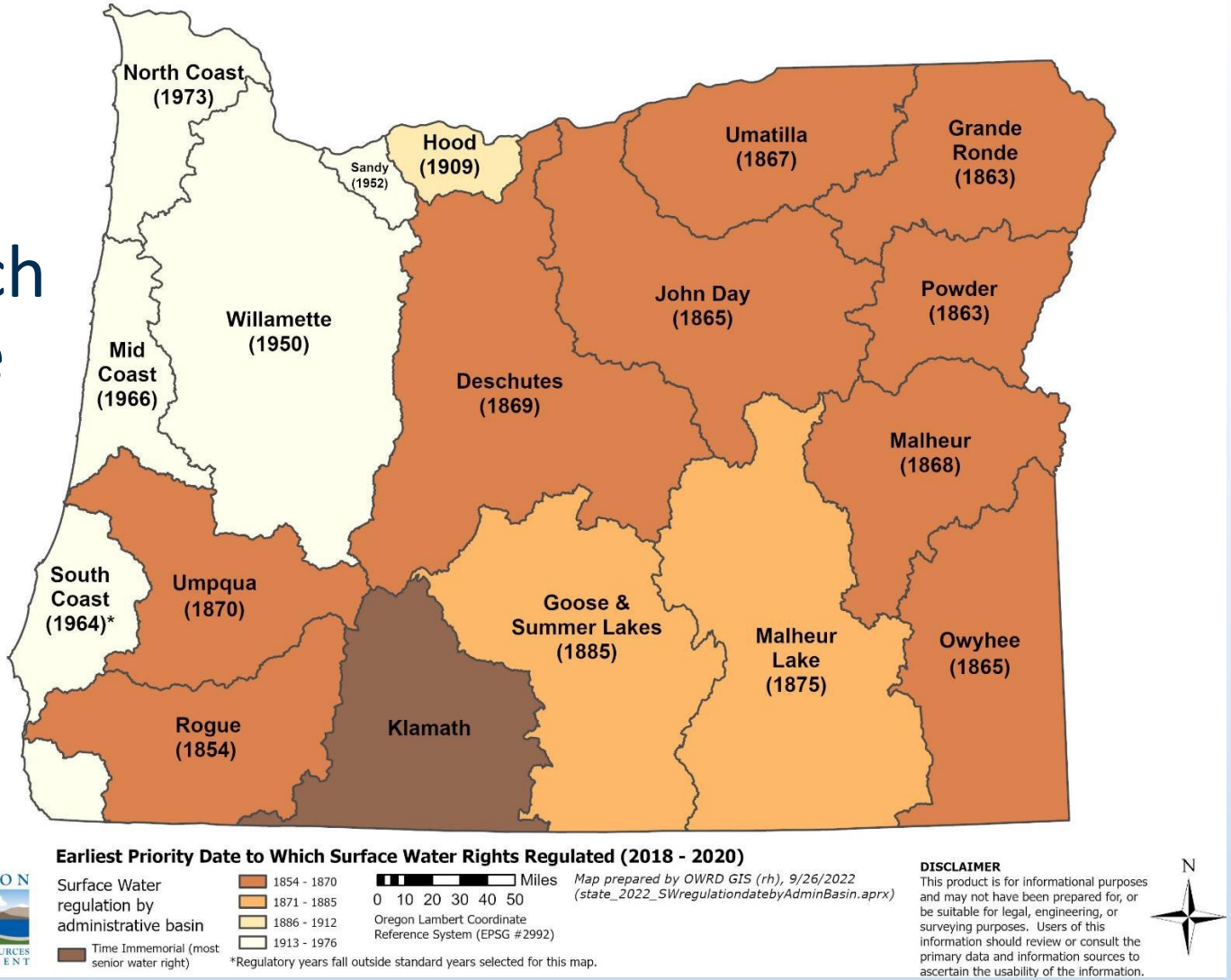
Signs of Over-Allocation

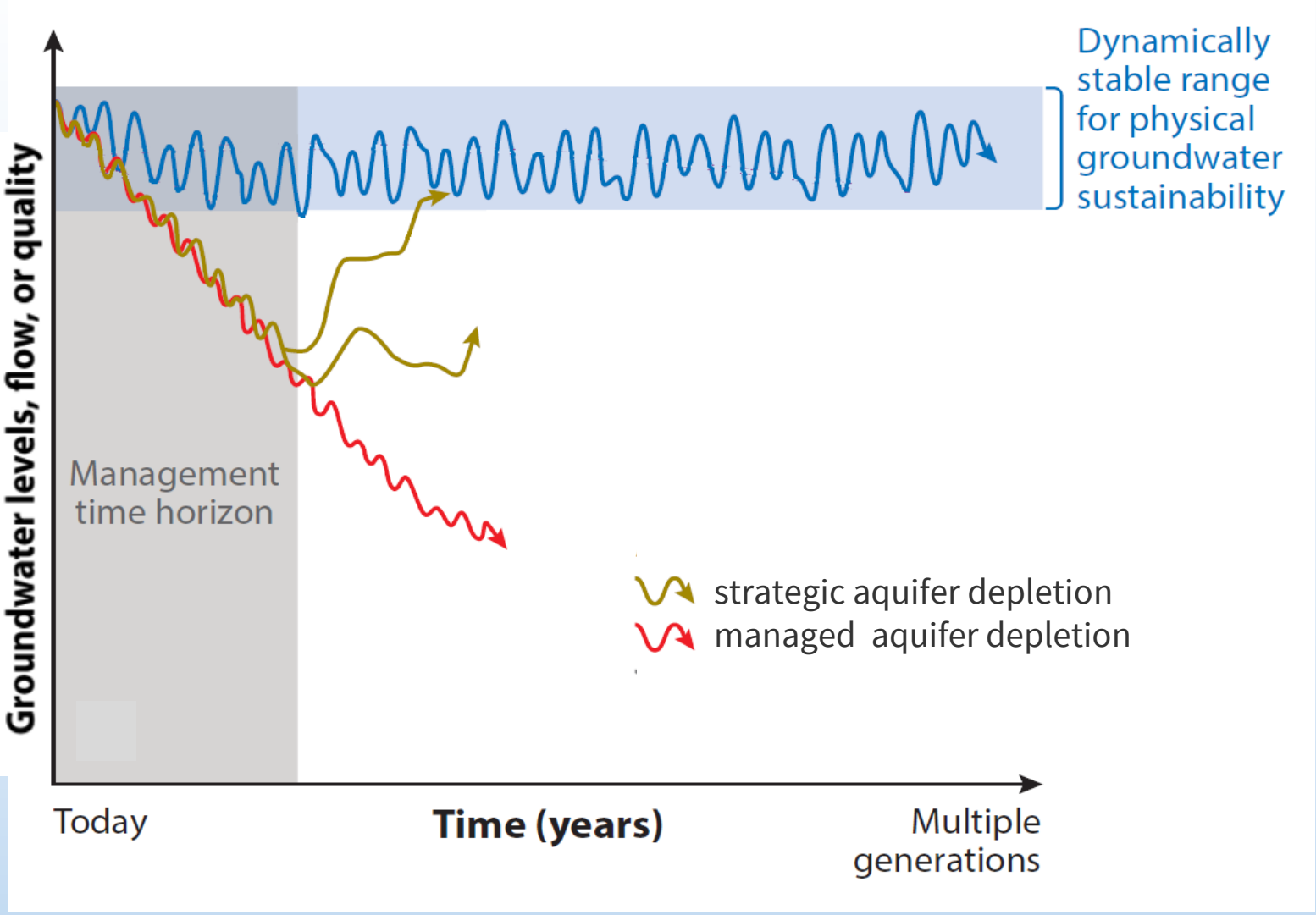
Surface Water Regulation (earliest in each Administrative Basin)



Source: OWRD

Key Issue 1: Defining Reasonably Stable Groundwater Levels

Reasonably Stable Groundwater Levels Science-Based Framework



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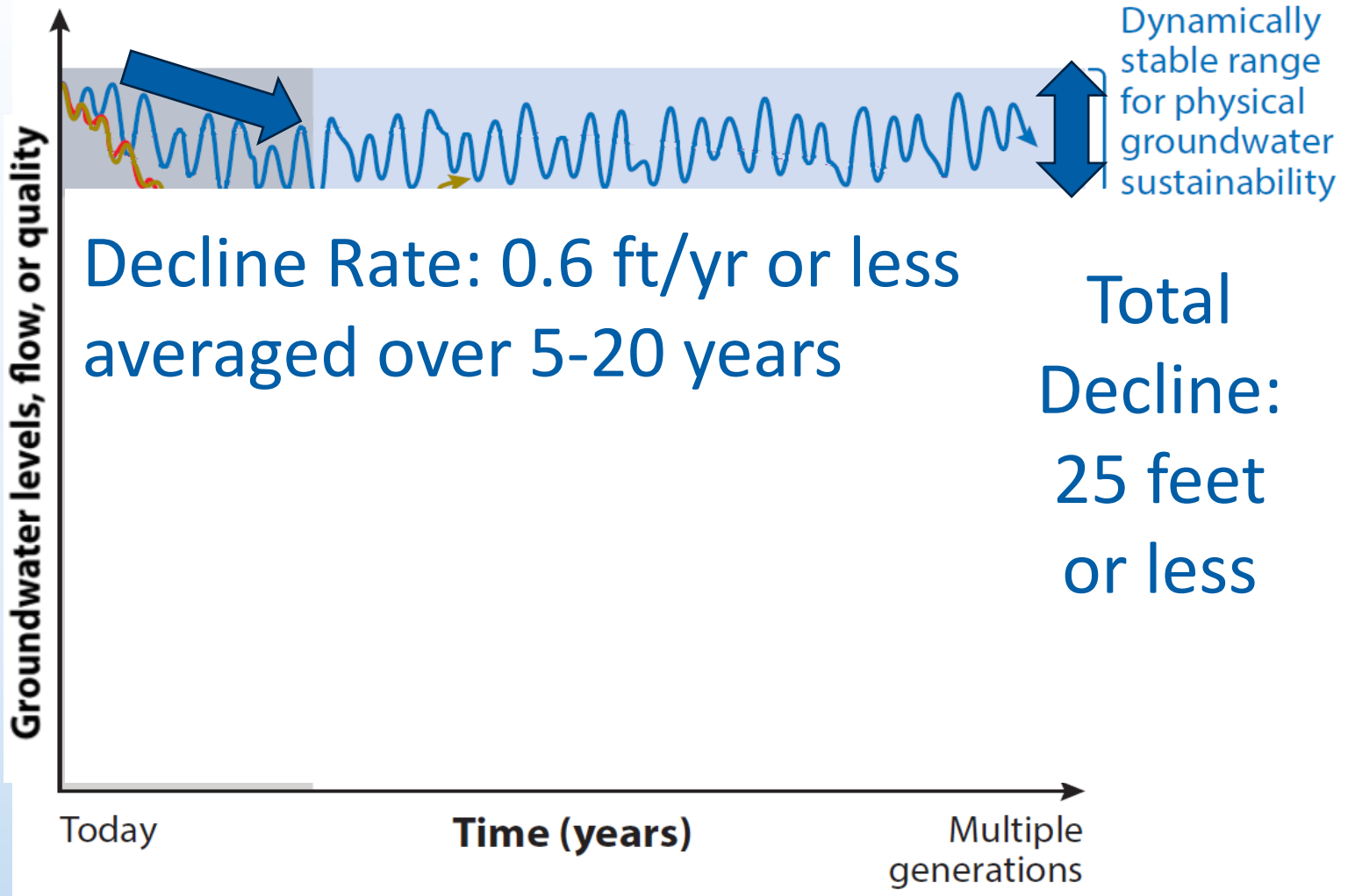
Reasonably Stable Groundwater Levels Data-Driven Threshold Definitions



Decline Rate: 0.6 ft/yr or less averaged over 5-20 years

Total Decline: 25 feet or less

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

Reasonably Stable Groundwater Levels Proposed - OAR 690-008-0001(9)

- Water level declines no more than 0.6 ft/yr or 25 ft total
- From highest known water level
- Water level must be available:
  - From the aquifer; can be from a neighboring well
  - 5 years of data minimum
  - Final data point within the past 5 years

Additional Considerations:

- Highest known water level can be set below human-caused water level rises
- Assume reasonably stable if no prior development
- Basin rules can re-define
  - Impacts to existing wells, ecosystems, and long-term sustainability must be assessed

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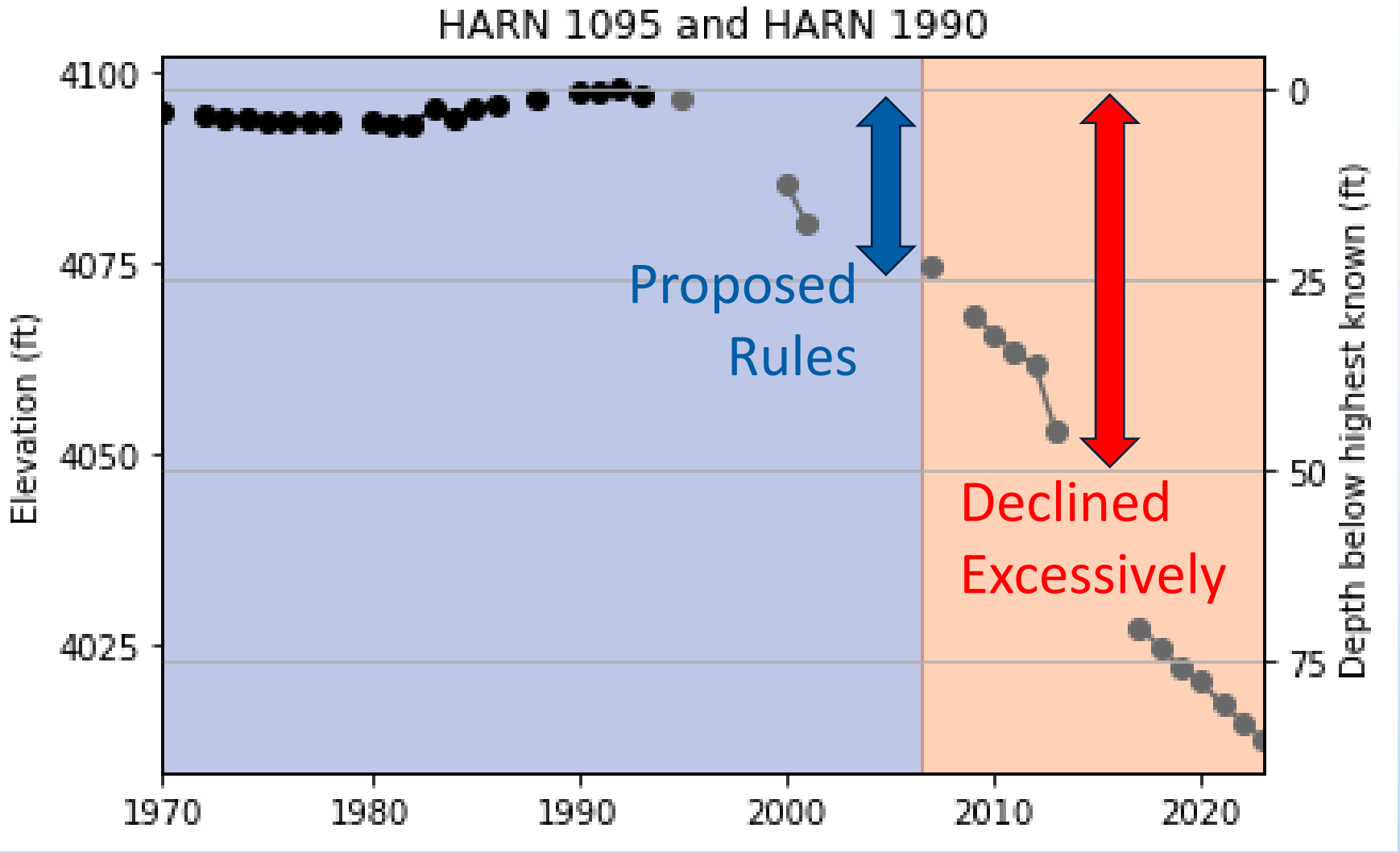
Reasonably Stable Groundwater Levels Harney Basin Example



Source: OWRD

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Impacts of Not Maintaining Reasonably Stable Groundwater Levels

Domestic Dry Wells:

- 1,235 dry well complaints since July 2021
- Average cost to deepen a well is $26,500
- $9M+ in public investments; ongoing demand

State-Wide Risk (all water wells):

- Up to 15,000 wells at risk of going dry given a water level drop of 25 feet
- Up to 55,000 wells at risk of going dry given a water level drop of 50 feet

Key Issue 2: Redefining Potential for Substantial Interference (PSI) with Surface Water

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Streamflow in August comes from Groundwater

Photo: OWRD, Eagle Creek in late-August

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Groundwater Contributes Flow

Photo: OWRD, Sprague River

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HC and PSI: How the test works

- Hydraulic Connection (HC) is prerequisite for Potential for Substantial Interference (PSI)
- Potential for Substantial Interference (PSI) follows from Barlow & Leake (2012):
  - For surface waters hydraulically connected to a pumped aquifer, “the volume of depletion will equal the volume pumped.”
- If PSI, then allocate only if downstream surface water is sufficient to meet existing senior uses

Public Comment Themes

Oral & Written Comments

- 1,310 commenters: 1,431 written; 60 oral
  - Residents of 33 Oregon counties, Arizona, Washington, California
  - 3 of Oregon's 9 Federally Recognized Tribes
- Most commenters recognized need to do more to manage groundwater sustainably
- Many commenters supportive of science-based approach in new rules

RSGL Comments: Scientific Basis

Comments

- Scientific approach is robust/appropriate
- Other criteria should be included (e.g., aquifer thickness, groundwater dependent ecosystem needs)

Response

- Reasonably stable groundwater levels are independent of aquifer thickness
- Some groundwater dependent ecosystems, and up to 14,000 existing water wells in Oregon, may be impacted by water level fluctuations less than 25 feet, but proposed thresholds strike a balance of many concerns

HC and PSI Comments: Thresholds

Comment:

- There is no time or magnitude component in the evaluation HC or PSI

Response:

- HC is a conceptualization of the groundwater flow system, not a specific quantity determination
- The HC and PSI evaluation are based on the application of generally accepted hydrogeological principles to a specific proposed use, as required in statute

Basin-Level vs. Statewide Approach

Comments

- Department should study/adopt rules at basin level
- Not all basins are experiencing groundwater level declines
- Statewide approach is equitable and robust to basin-to-basin variability

Response

- Statewide approach is most cost-effective and protective
- Science-based approach relies on data from each county and administrative basin
- Implementation relies on site-specific data
- Basin program rules may define Reasonably Stable Groundwater Levels

Adequacy of Existing Management Tools

Comments

- Existing management tools are/are not adequate

Response:

- New rules needed because current rules have led to groundwater level declines and long-term impacts to hydraulically connected surface waters
- Existing management tools (e.g., Critical Groundwater areas) are implemented to remediate rather than prevent groundwater level declines