OREGON
WATER RESOURCES DEPARTMENT

HOUSE INTERIM COMMITTEE ON AGRICULTURE, LAND USE, NATURAL RESOURCES, AND WATER

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Oregon Water Resources Department

November 7, 2023

Groundwater Development

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Key Groundwater Concept

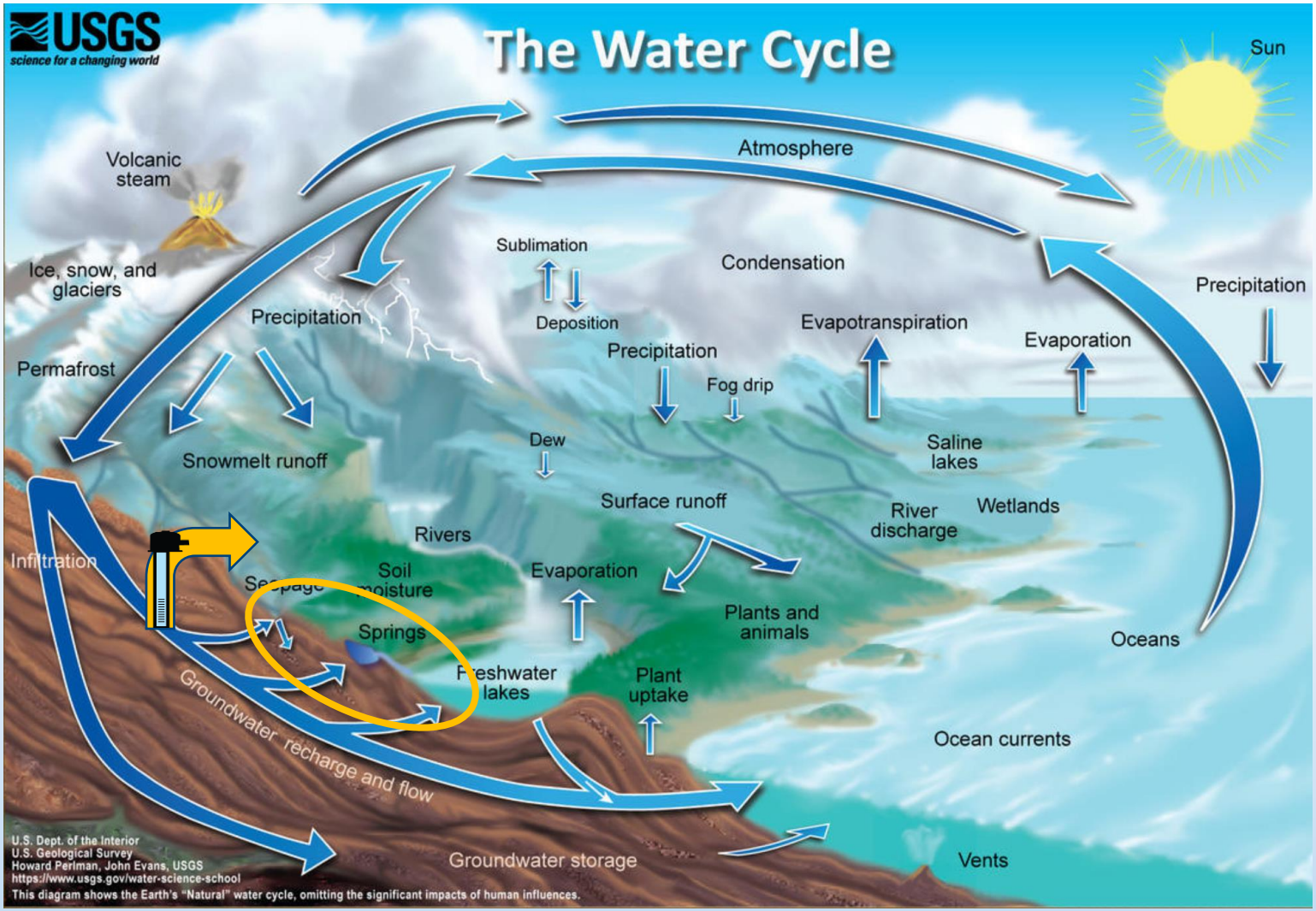

Figure Source: USGS (https://www.usgs.gov/special-topics/water-science-school/science/fundamentals-water-cycle)

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Key Groundwater Concept

Photo: OWRD, Unnamed spring discharging to the Metolius River

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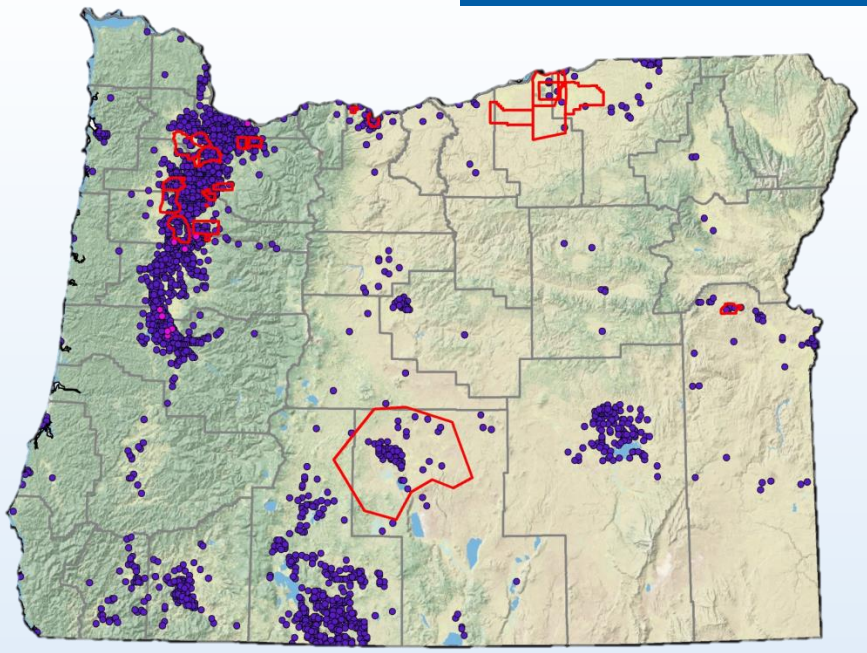
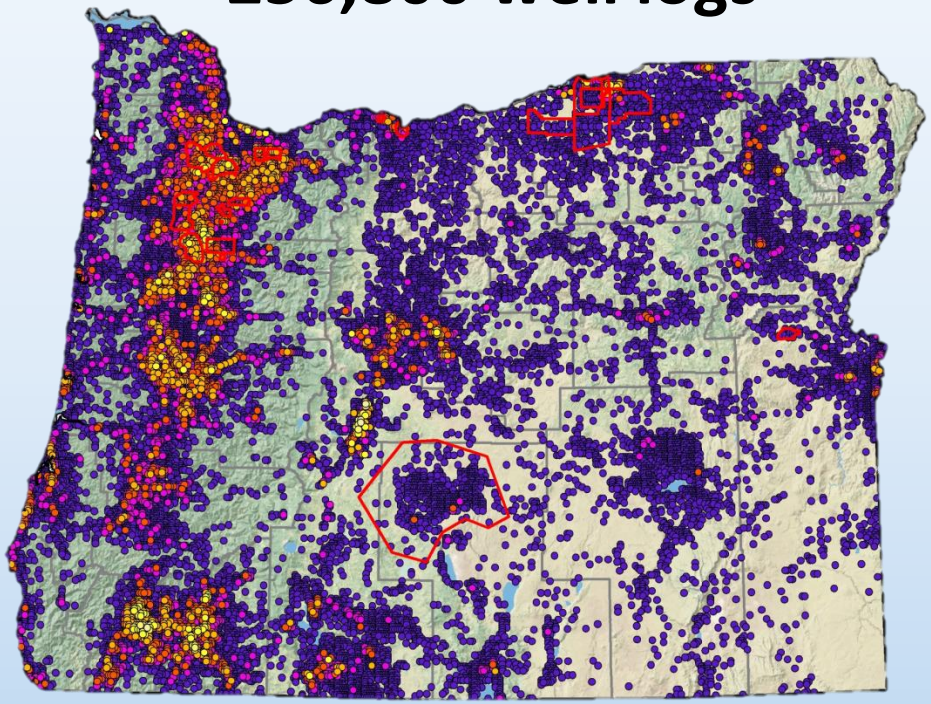
Groundwater Development



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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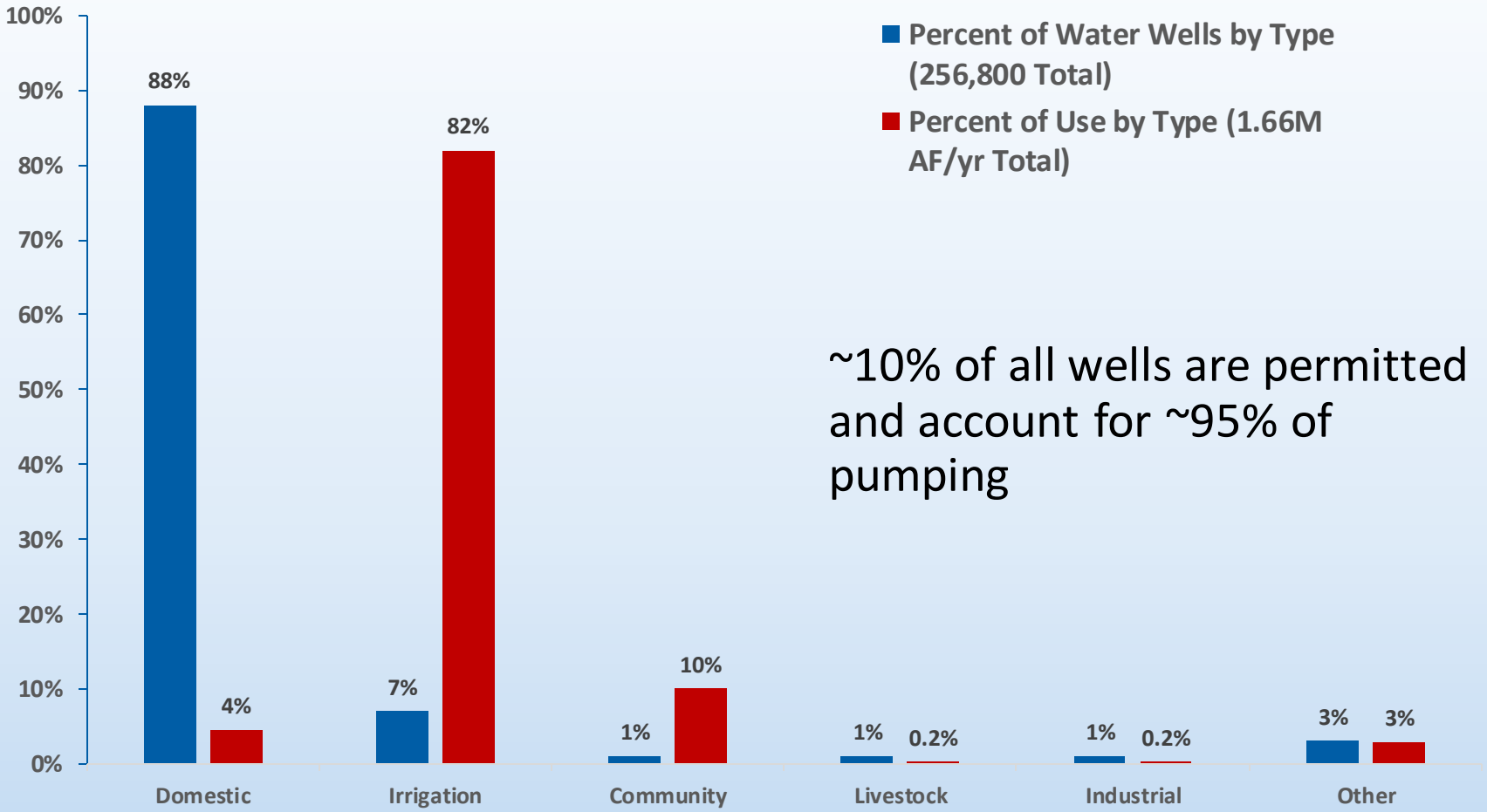
Wells in Oregon



~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

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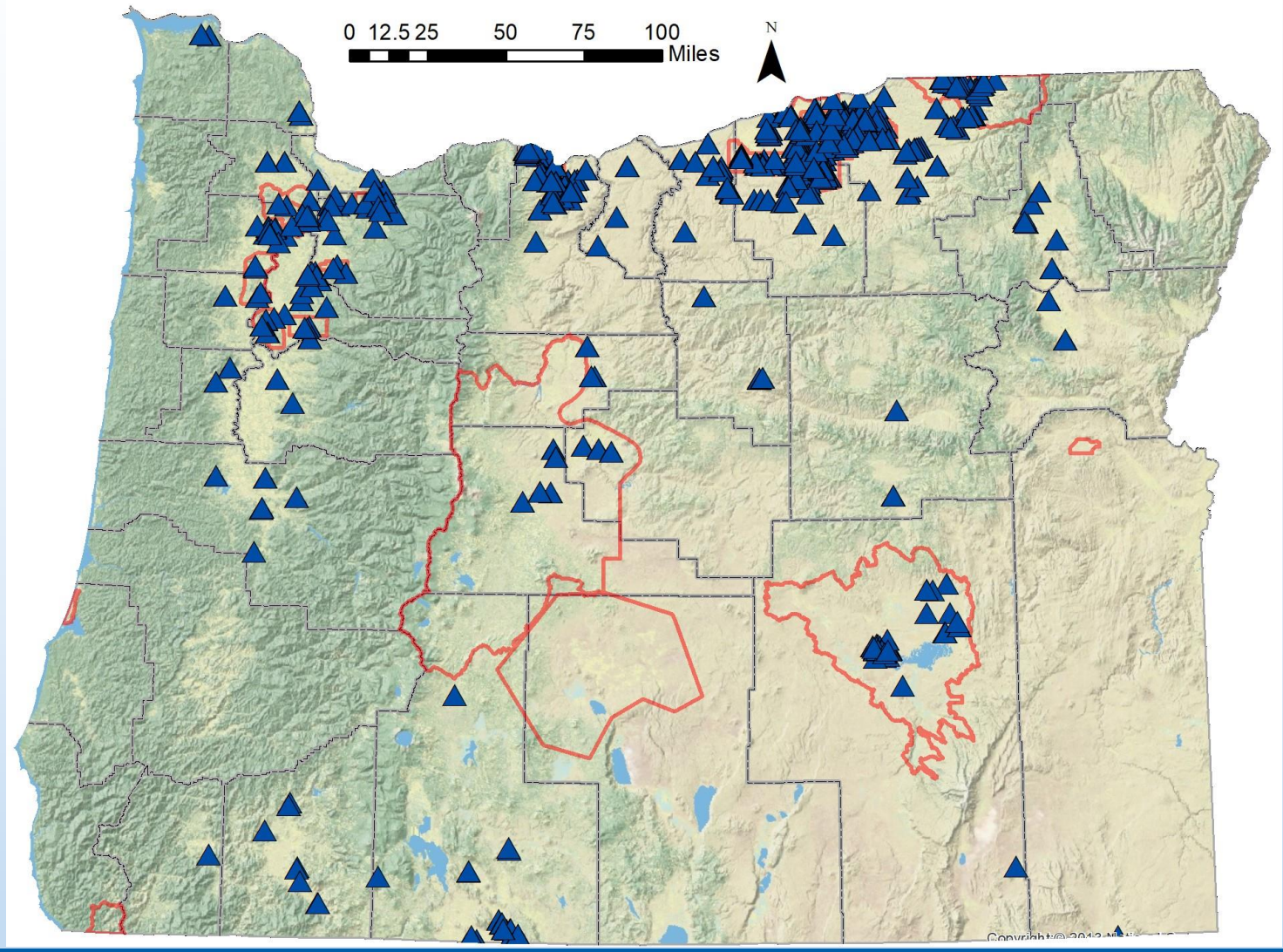
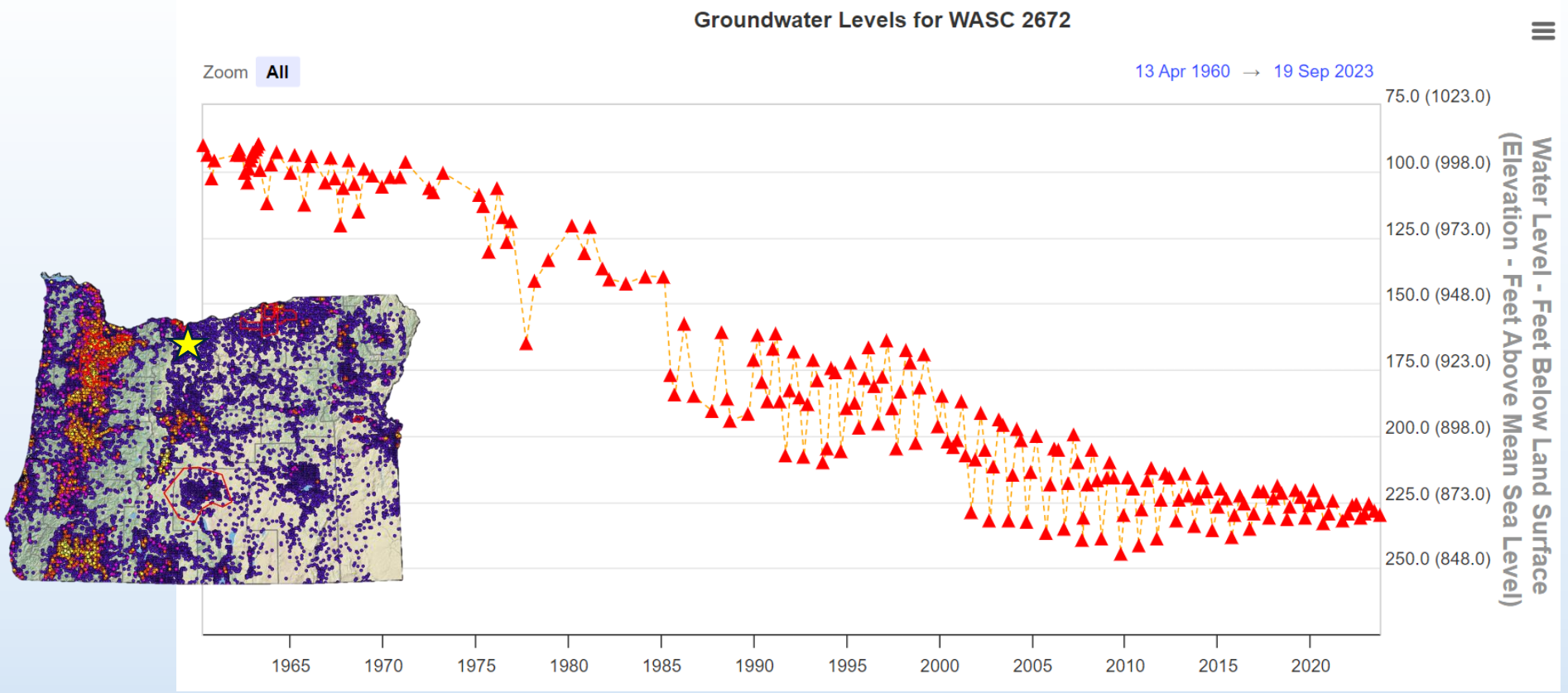
Over-Allocation: Excessively Declined Water Levels



Source: OWRD

Over-Allocation: Excessively Declined Water Levels



Development has led to 125 feet of water level decline over ~60 years in this area.

Source: https://apps.wrd.state.or.us/apps/gw/gw_info/gw_hydrograph/Hydrograph.aspx?gw_logid=WASC0002672

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Impacts of Over-Allocation

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

Photo: Crooked River, nearly dry

Groundwater Allocation Rulemaking

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 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

Reference: OAR 690-008, -009, -300, -400

Water is Available if…

Current Rules:	Proposed Rules:
Requested source is available if not over-allocated:	Requested source is available only if:
• Allocate up to the full annual recharge volume	• Water levels are Reasonably Stable
• Avoid short-term, acute impacts to surface water	• Hydraulically connected surface water is available for further appropriation

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

GW Allocation Rulemaking

Extensive Public Involvement:

- Commission agenda items – since December 2021
- GWAC engagement - 7 meetings since March 2022
- Public outreach – 5 meetings in Fall 2022
- RAC meetings – 6 meetings since April 2023; 2 more planned in December and January
- Additional outreach and meetings as requested

All rulemaking information and public meeting recordings are available on the Department's website.

Key Issue 1: Defining "Reasonably Stable Water Level"

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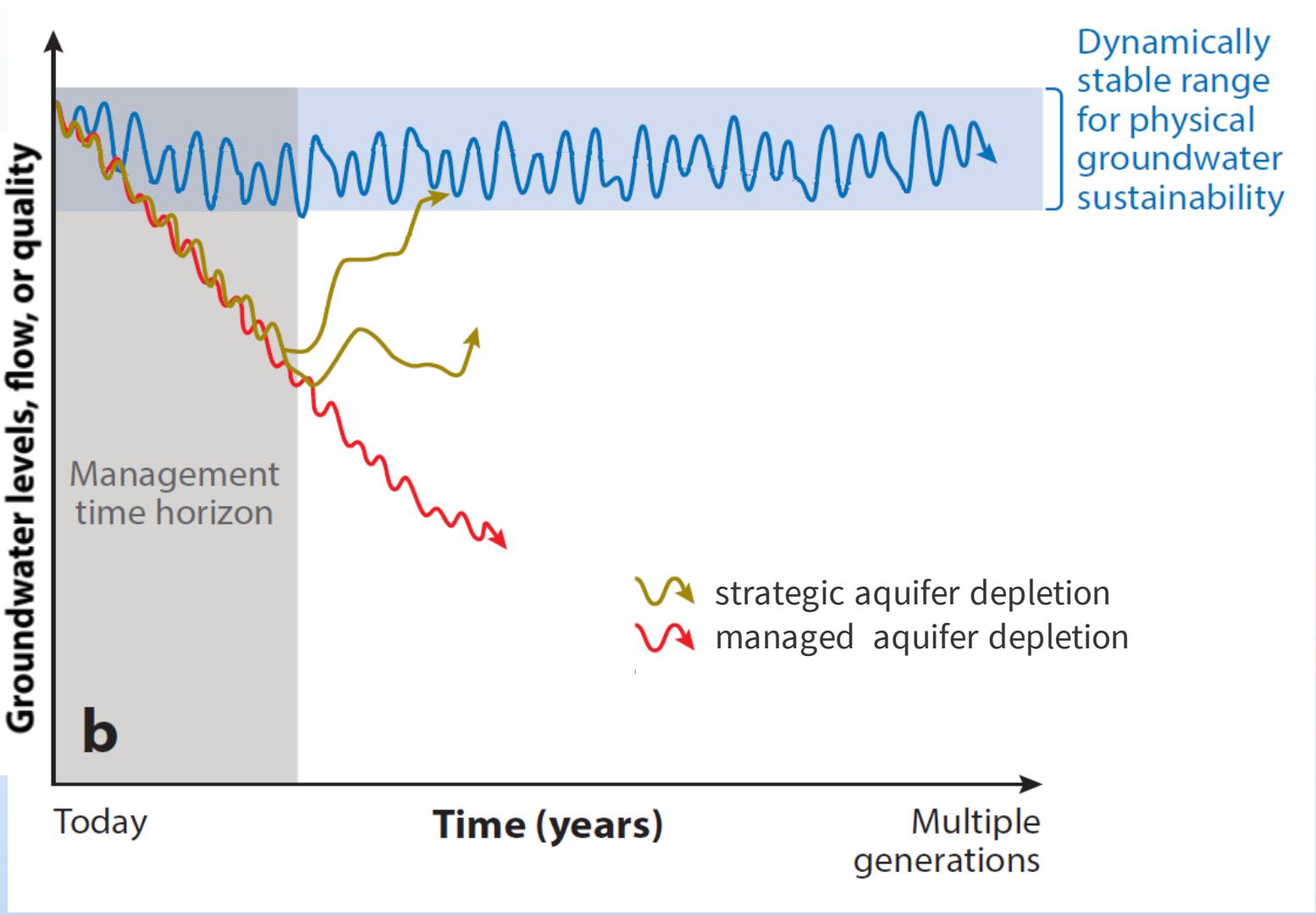
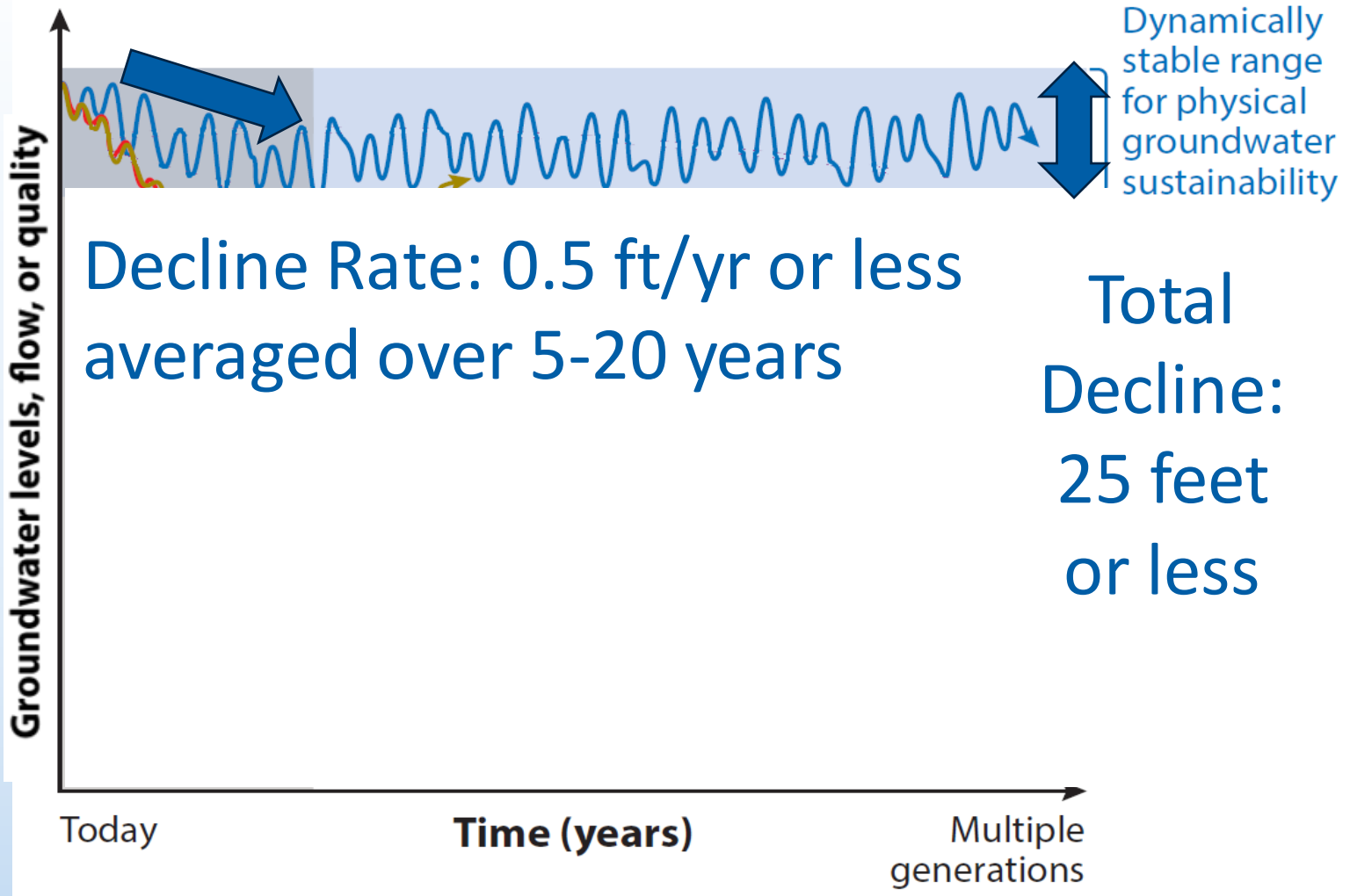
Reasonably Stable Water Levels Science-Based Framework



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

Reasonably Stable Water Levels Data-Driven Threshold Definitions



Decline Rate: 0.5 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

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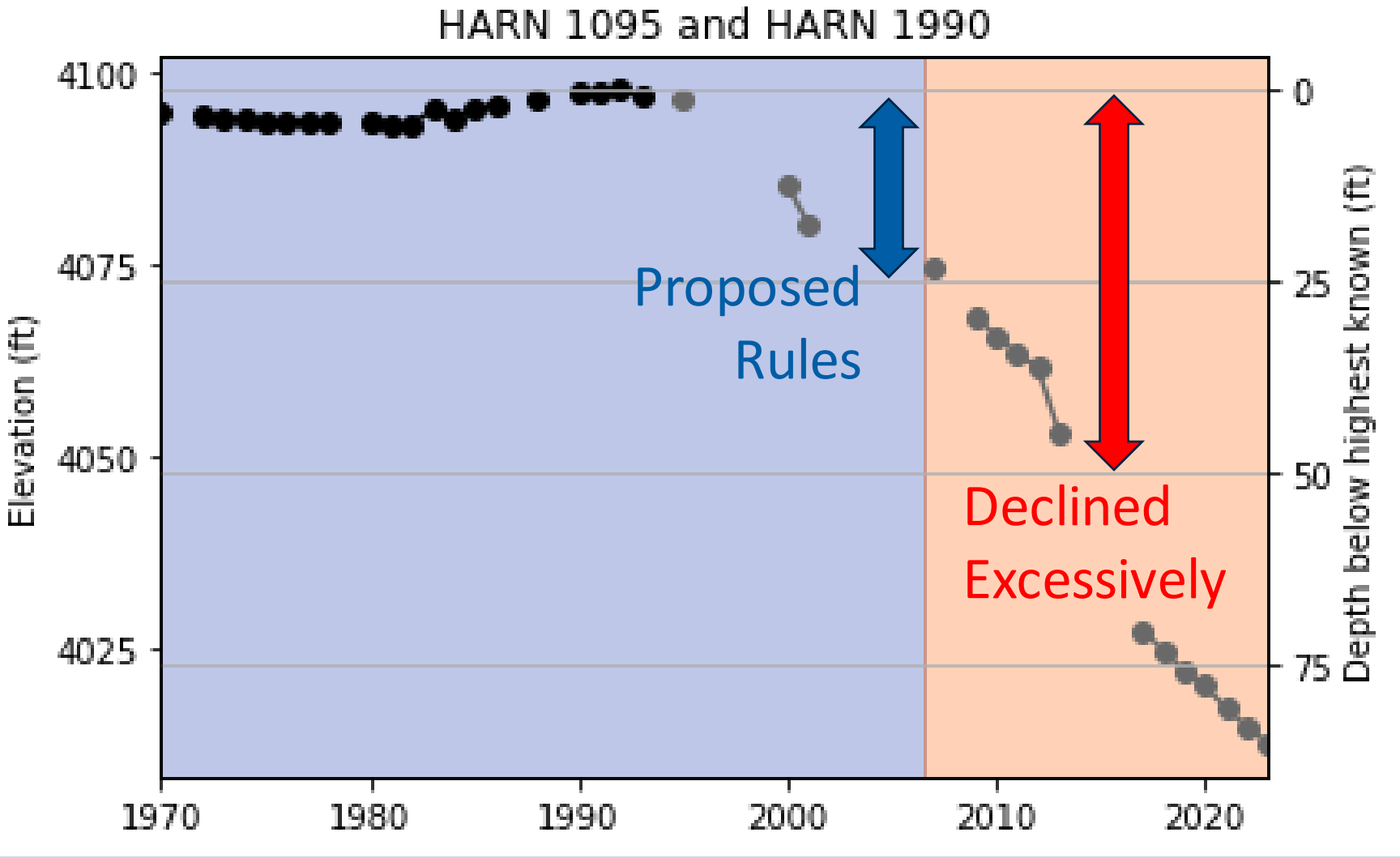
Reasonably Stable Water Levels Harney Basin Example



Source: OWRD

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Impacts of Not Maintaining Reasonably Stable Water Levels

Domestic Dry Wells:

- 1,225 dry well complaints since July 2021
- Average cost to deepen 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

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

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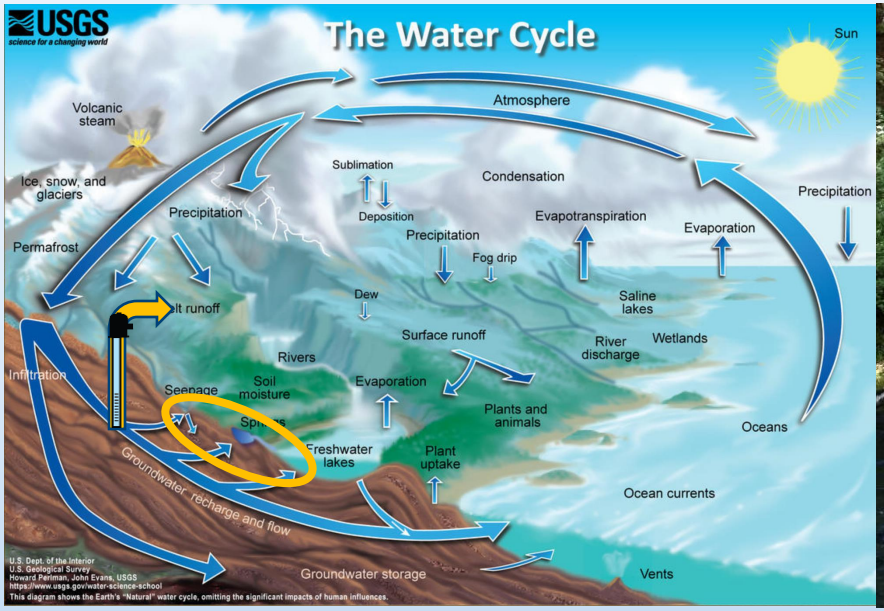
The Source of Water to Wells

"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*

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Streamflow in August comes from Groundwater

Photo: OWRD, Eagle Creek in late-August

Implications

Meeting Future Needs

Existing Options:

- Conservation Incentives
- Aquifer Storage/Recharge
- Water Re-use
- Transfers

Potential New/Future Opportunities:

- Market based approaches
- Mitigation programs
- Outcomes from basin and regional planning

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Closing Thoughts

- Cost of inaction is too high
- Growth and economic expansions are possible
- Adaptation and innovation is an Oregon value

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