

Upper Deschutes Basin Groundwater Mitigation Program: Lessons and Future Opportunities

PNWS-AWWA Section Conference 2025



Outline

- Overview of Hydrogeologic and Regulatory Context
- What is the Deschutes Basin Mitigation Program?
- How Does It Work?
- Challenges
- Opportunities
- Lessons
- Questions

The Deschutes Basin Mitigation Program is a framework for groundwater permit holders to offset the impacts of groundwater pumping on the Deschutes Scenic Waterway.

Regulatory Context – Oregon Scenic Waterway Act



- Oregon Scenic Waterways Act passed by ballot initiative in 1970.
- “Highest and best use of the waters within a scenic waterway are recreation, fish, and wildlife uses.”

Regulatory Context – Oregon Scenic Waterway Act



- State required to “maintain free flowing character of waters in quantities necessary for recreation, fish, and wildlife uses.
- “No diversion of water that otherwise would enter a scenic waterway may be permitted unless the requirements of the act are met.”

Hydrologic Context: Recharge and Groundwater Flow

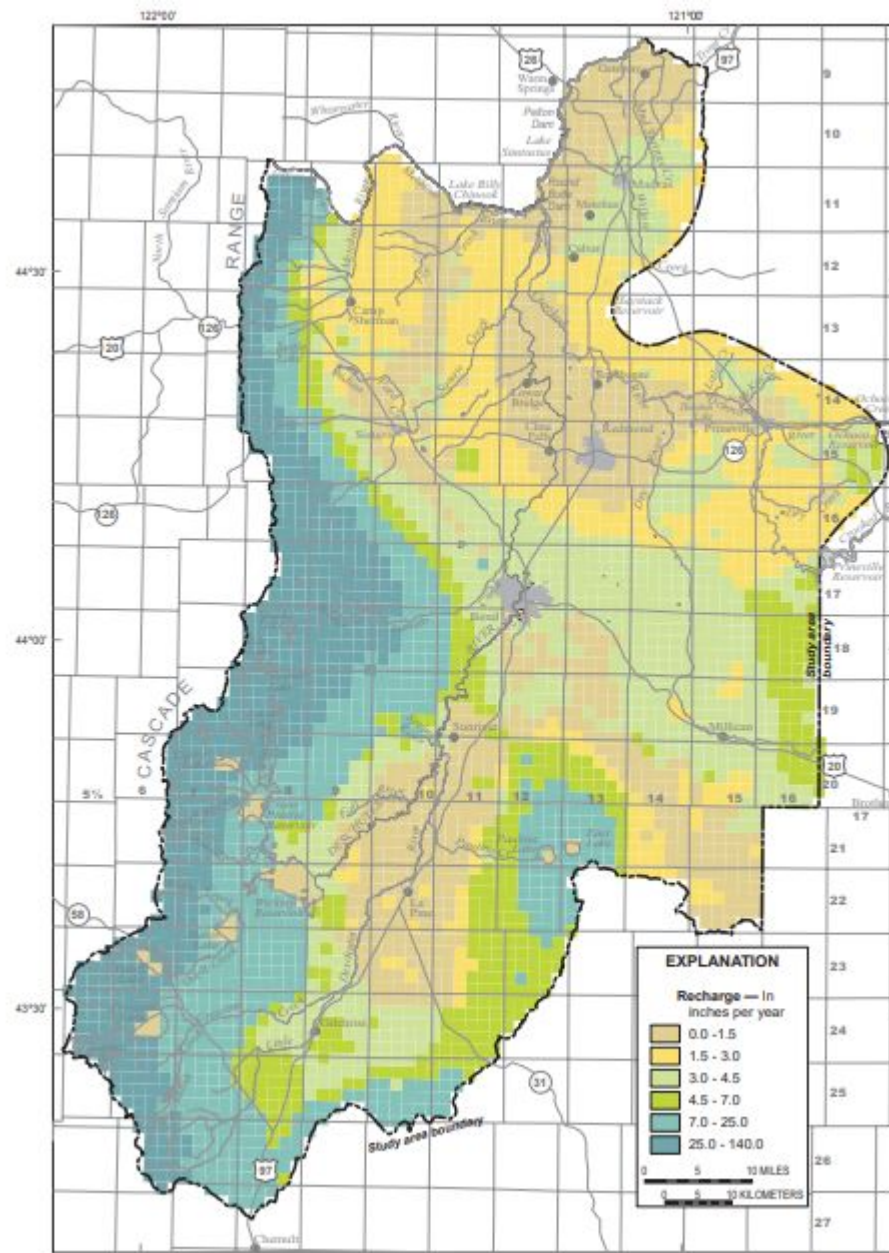
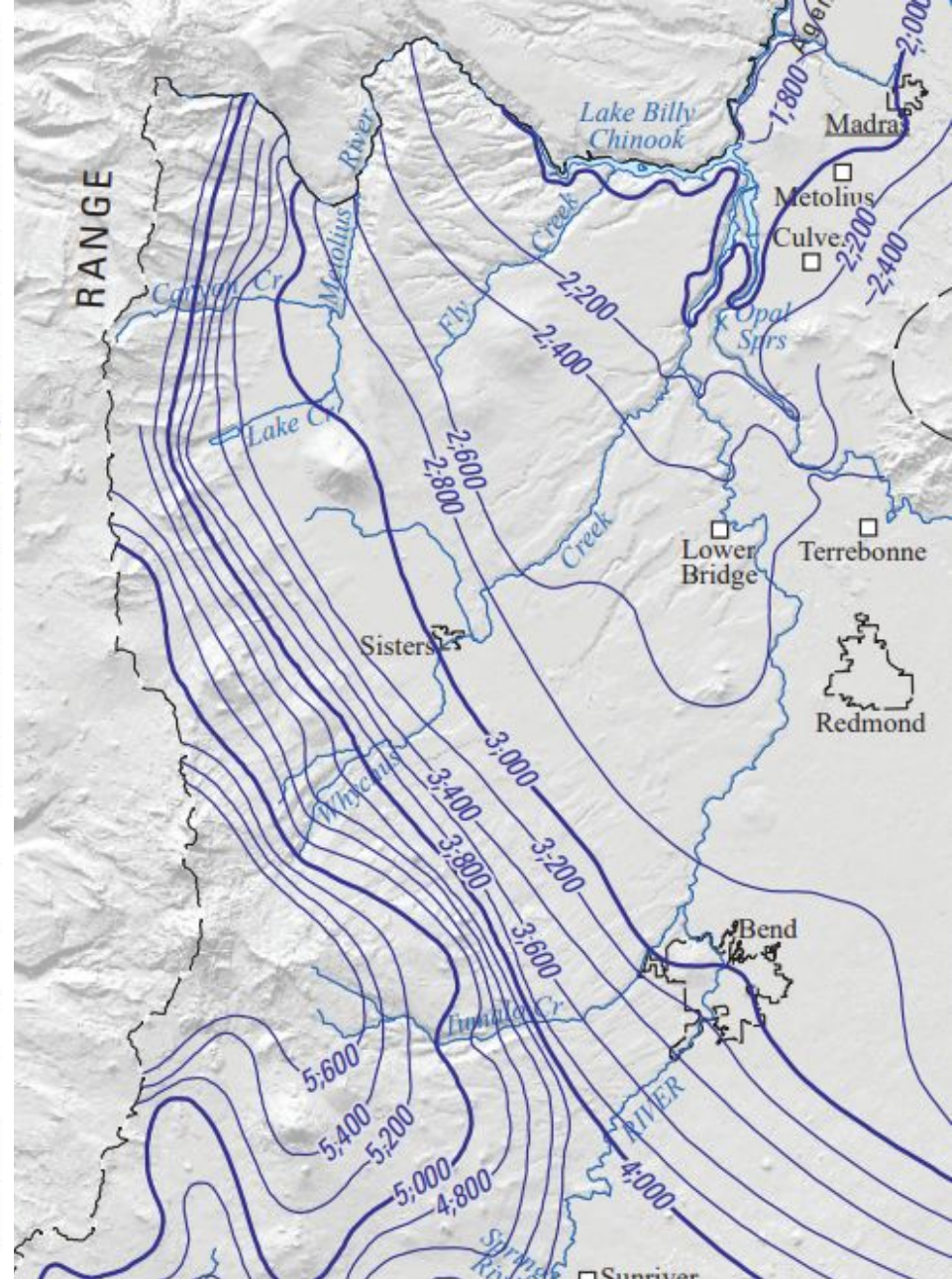


Figure 6. Deep Percolation Model grid and estimated recharge from infiltration of precipitation, 1993–95.



Hydrologic Context: Areas of Discharge

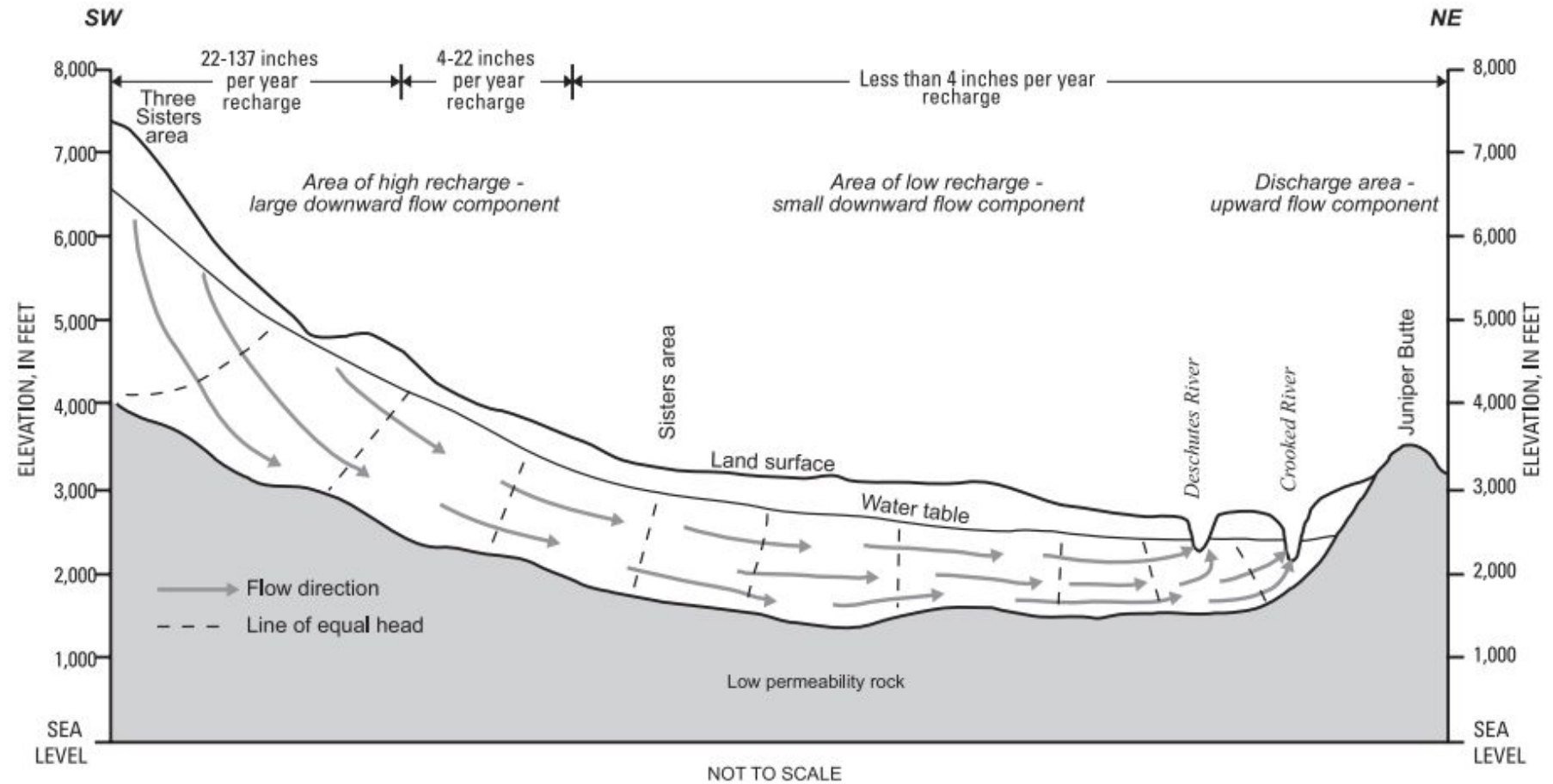


Figure 29. Diagrammatic section southwest-northeast across the upper Deschutes Basin, Oregon, showing flow directions and lines of equal hydraulic head.

Unnamed Spring in Crooked River Canyon – below Hollywood Grade



Hydrogeologic Context

City of Redmond Well

9

(8) WELL TESTS: Minimum testing time is 1 hour

☒ Pump ☐ Bailer ☐ Air ☐ Flowing Artesian

Yield gal/min	Drawdown	Drill stem/Pump depth	Duration (hr)
3501	4.4	510	12

Temperature 55 °F Lab analysis ☐ Yes By _____

Water quality concerns? ☐ Yes (describe below) TDS amount 98 mg/L
From To Description Amount Units

Deschutes Valley Water District Well 3

(8) WELL TESTS: Minimum testing time is 1 hour

<input type="checkbox"/> Pump	<input type="checkbox"/> Bailer	<input type="checkbox"/> Air	<input checked="" type="checkbox"/> Flowing Artesian
Yield gal/min	Drawdown	Drill stem at	Time
<u>4,500</u>	<u> </u>	<u> </u>	<u>2hr</u>

Temperature of water 53 Depth Artesian Flow Found 253

Was a water analysis done? ☐ Yes By whom _____

Did any strata contain water not suitable for intended use? ☐ Too little

☐ Salty ☐ Muddy ☐ Odor ☐ Colored ☒ Other Sandy

Depth of strata: 3' - 216'

Regulatory Context: Mitigation Program Concept and Rulemaking

- USGS/OWRD study establishes connection between surface and groundwater in Upper Deschutes.
- Scenic Waterway Legislation allows for mitigation to “ensure maintenance of free-flowing character of the scenic waterway in quantities necessary for recreation, fish and wildlife...”
- OWRD embarks on rule making process for Upper Deschutes Basin Mitigation Program
- 2002 – Rules adopted and subject to immediate legal challenge.
- 2005 – Court of Appeals finds rules don’t “**ensure** maintenance...” and throws rules out.
- ~~Also 2005 – Legislature affirms that rules meet requirements of Scenic Waterway Act.~~

Important Takeaways

- Unique hydrogeologic framework of the Upper Deschutes Basin means that groundwater pumping found to affect Lower Deschutes Scenic Waterway.
- OWRD believes it has statutory authority to address through administrative program.
- Ultimately requires legislative intervention.

What is the Upper Deschutes Basin Mitigation Program?

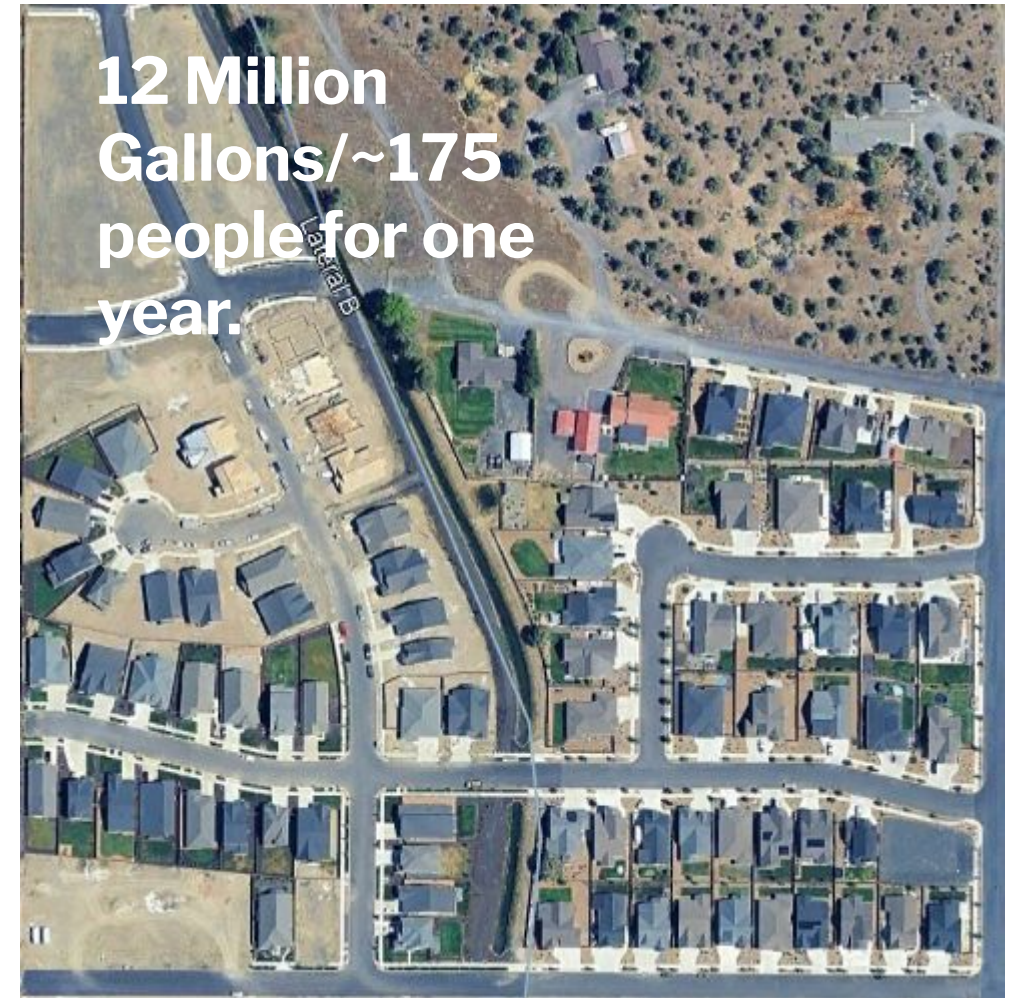
- Framework for groundwater permit holders to offset the impacts of groundwater pumping on the Deschutes Scenic Waterway.
- Mitigation credits have generally been created from surface water rights legally transferred instream and protected from the Upper Basin to the Lower Basin.
- Structured to provide instream flow restoration benefit in Middle Deschutes River.
- Municipalities can mitigate incrementally as they grow.
- Early Deschutes Water Alliance Bank facilitates instream transfer of water rights from urbanizing lands for flow restoration and mitigation credit creation.

Mitigation Program at Work



**1.8 AF/acre
Consumptive**

10.6 acres of irrigation within Redmon, OR Urban Growth Boundary transferred instream, protecting ~6 to 18 MG instream and allowing ~12 MG of groundwater pumping.



**12 Million
Gallons/~175
people for one
year.**

Challenges

- Great recession slows growth; coincides with declining water demands.
- Irrigation districts face increasing uncertainty; have other water supply needs to attend to.
- Leads to decline of DWA Bank Model.
- Other ways of creating mitigation contemplated by rules, but ultimately constrained by administrative interpretations.

What is mitigation?

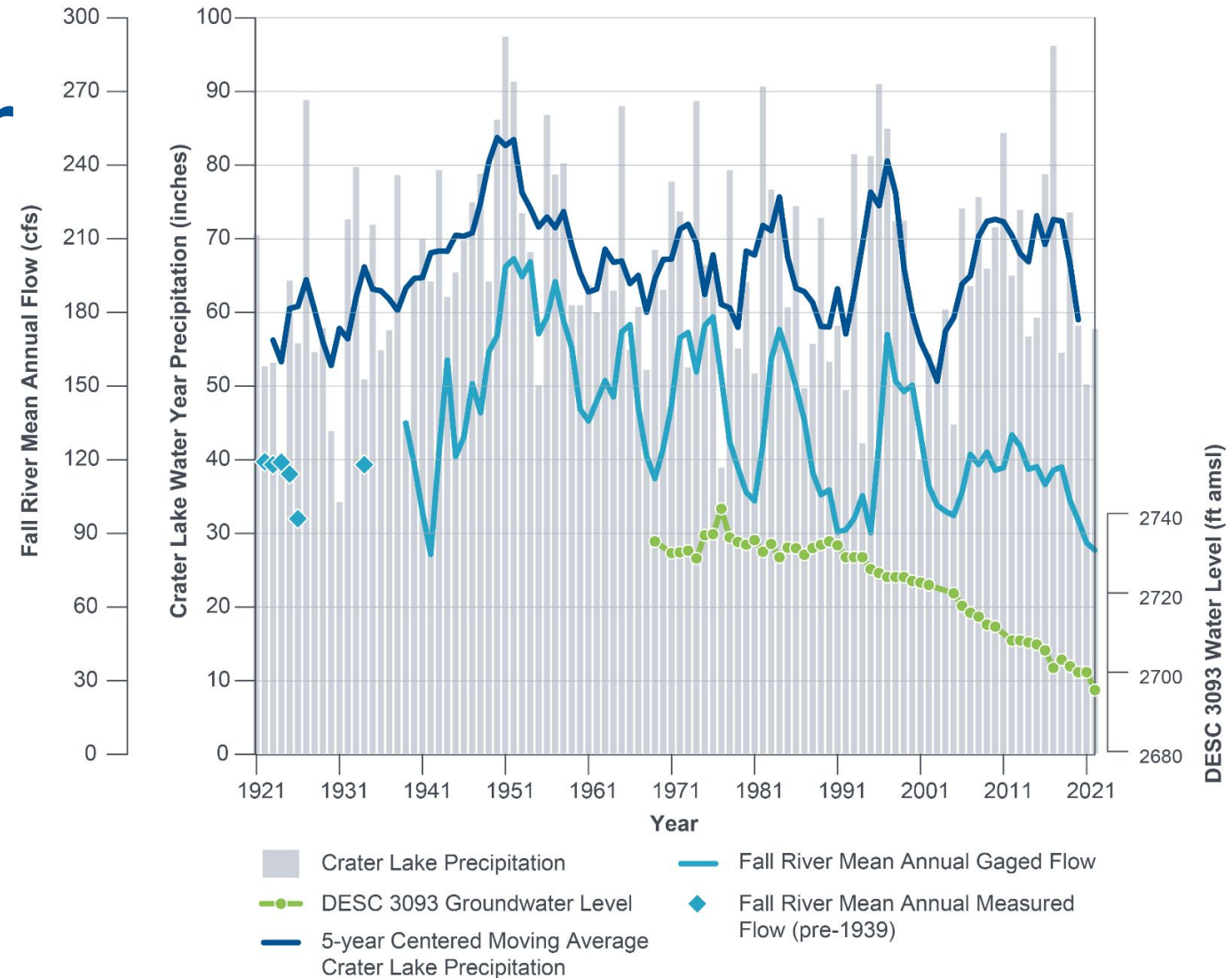
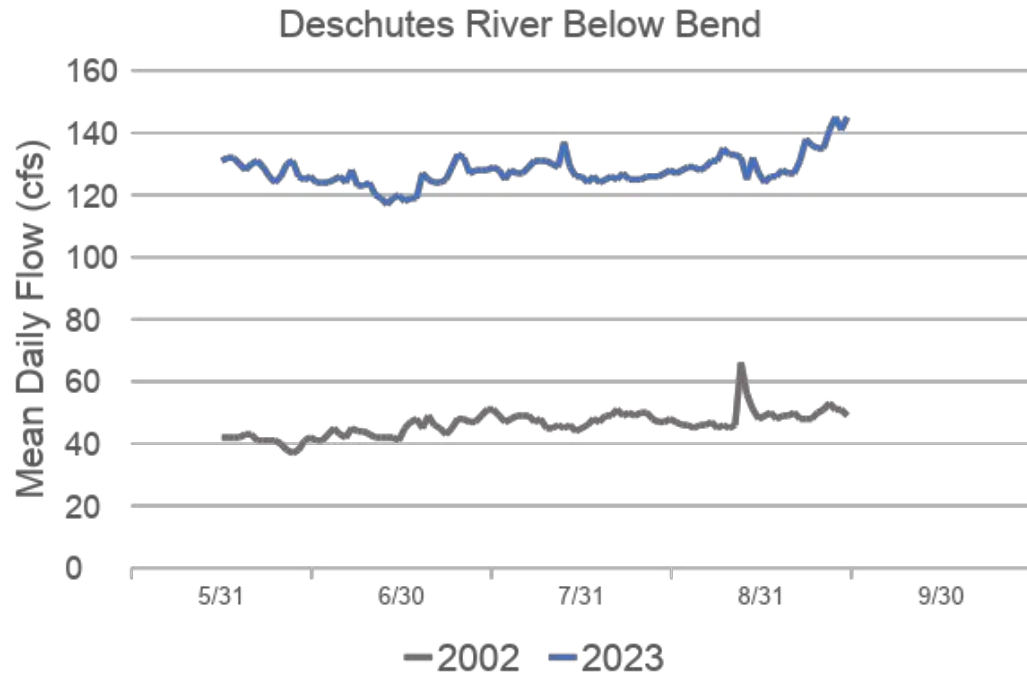
“Payment in lieu of” Mitigation:

- Used in contexts such as:
 - Wetland mitigation
 - ODFW fish passage fund
 - Bundle dollars from small project to implement large projects with greater benefits
-

Deschutes Basin “Mitigation”:

- Began life as administrative program
- “Moderating” impacts of groundwater pumping
- Impacts and mitigation are tied to individual applications

The Bigger Pictur



Bigger Picture: Groundwater Declines

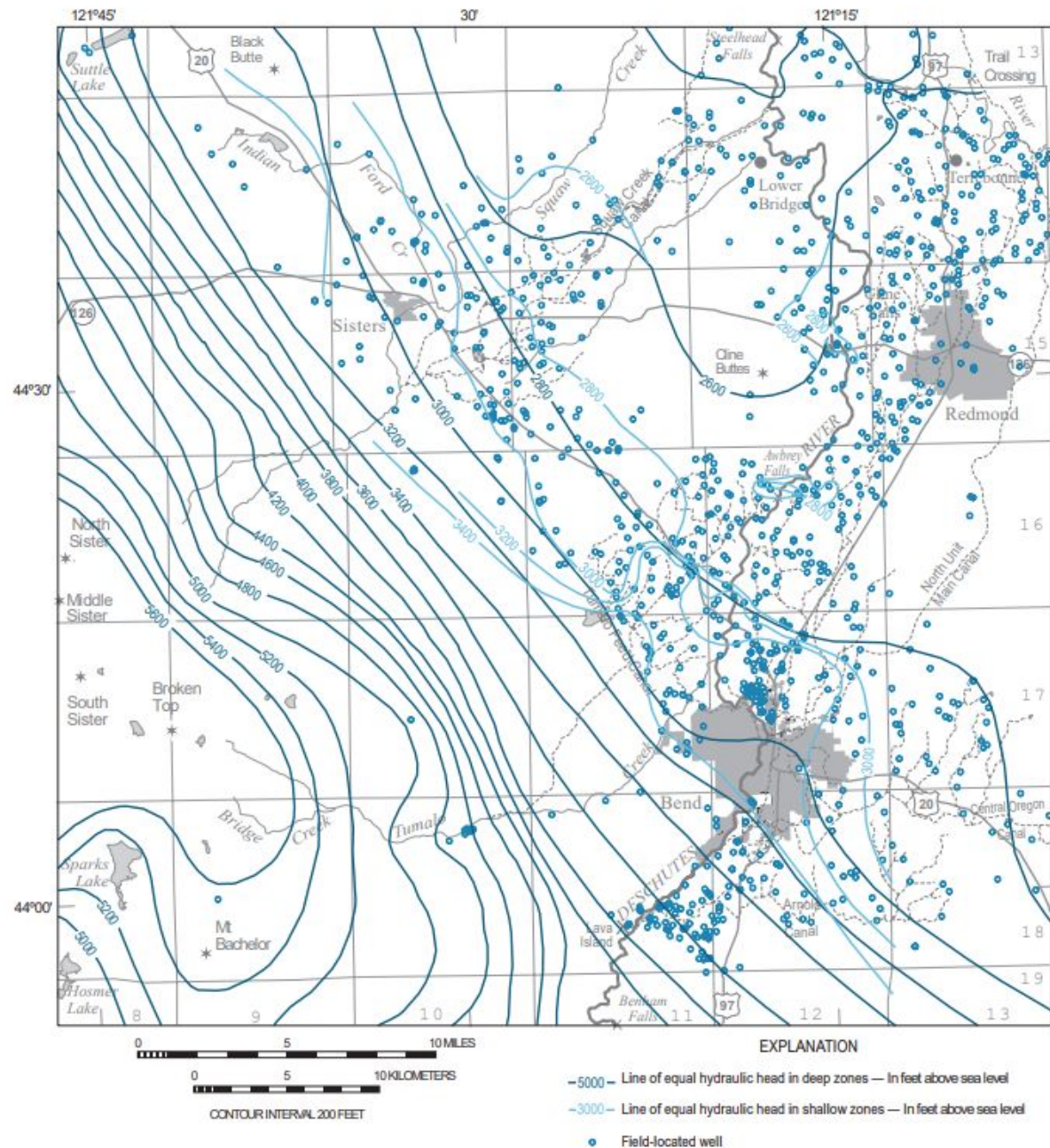
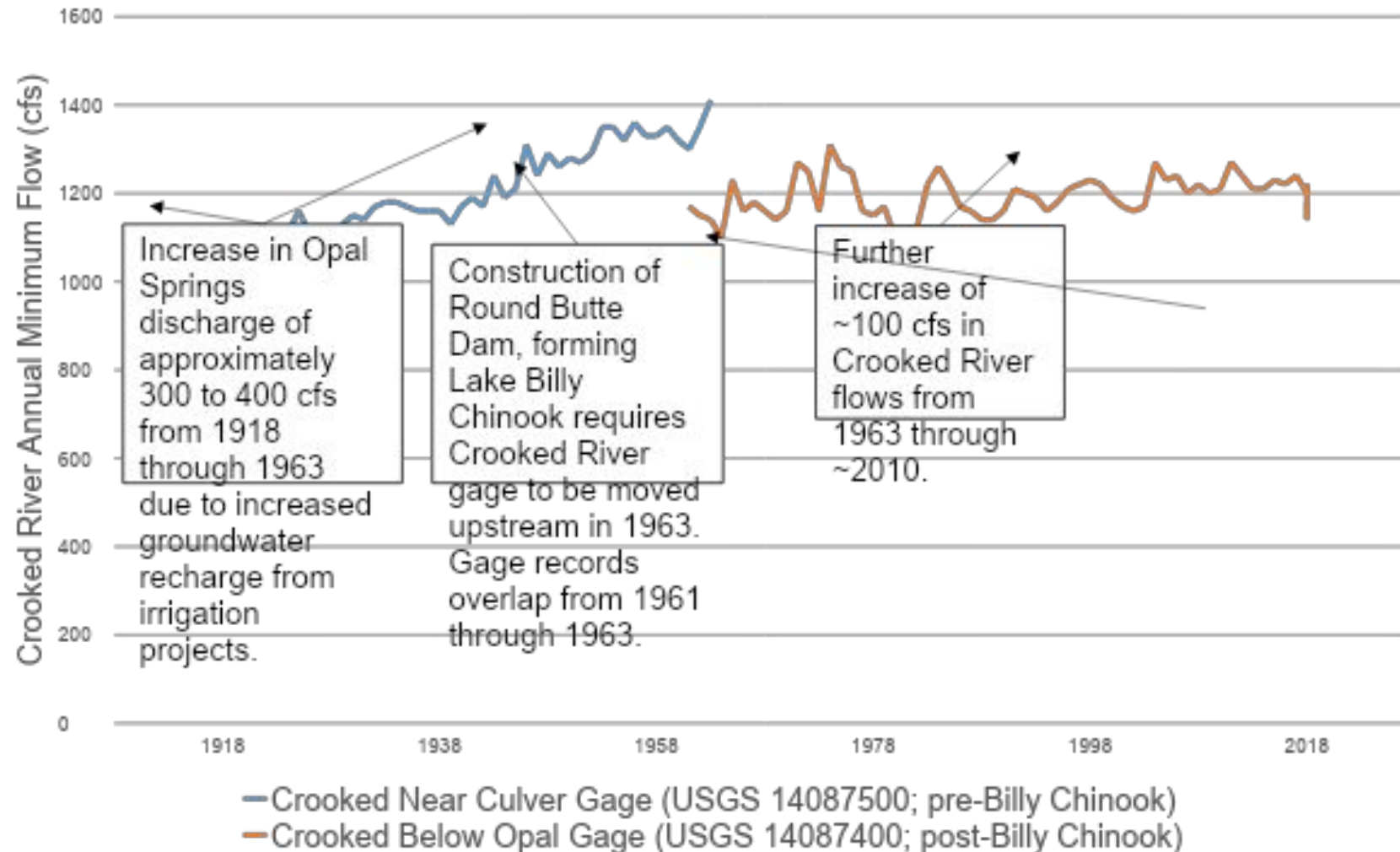


Figure 30. Generalized lines of equal hydraulic head for shallow and deep water-bearing zones in the central part of the upper Deschutes Basin, Oregon. (Elevated heads in shallow zones are due to infiltration of water from leaking irrigation canals, on-farm losses, and stream leakage.)

The Bigger Picture



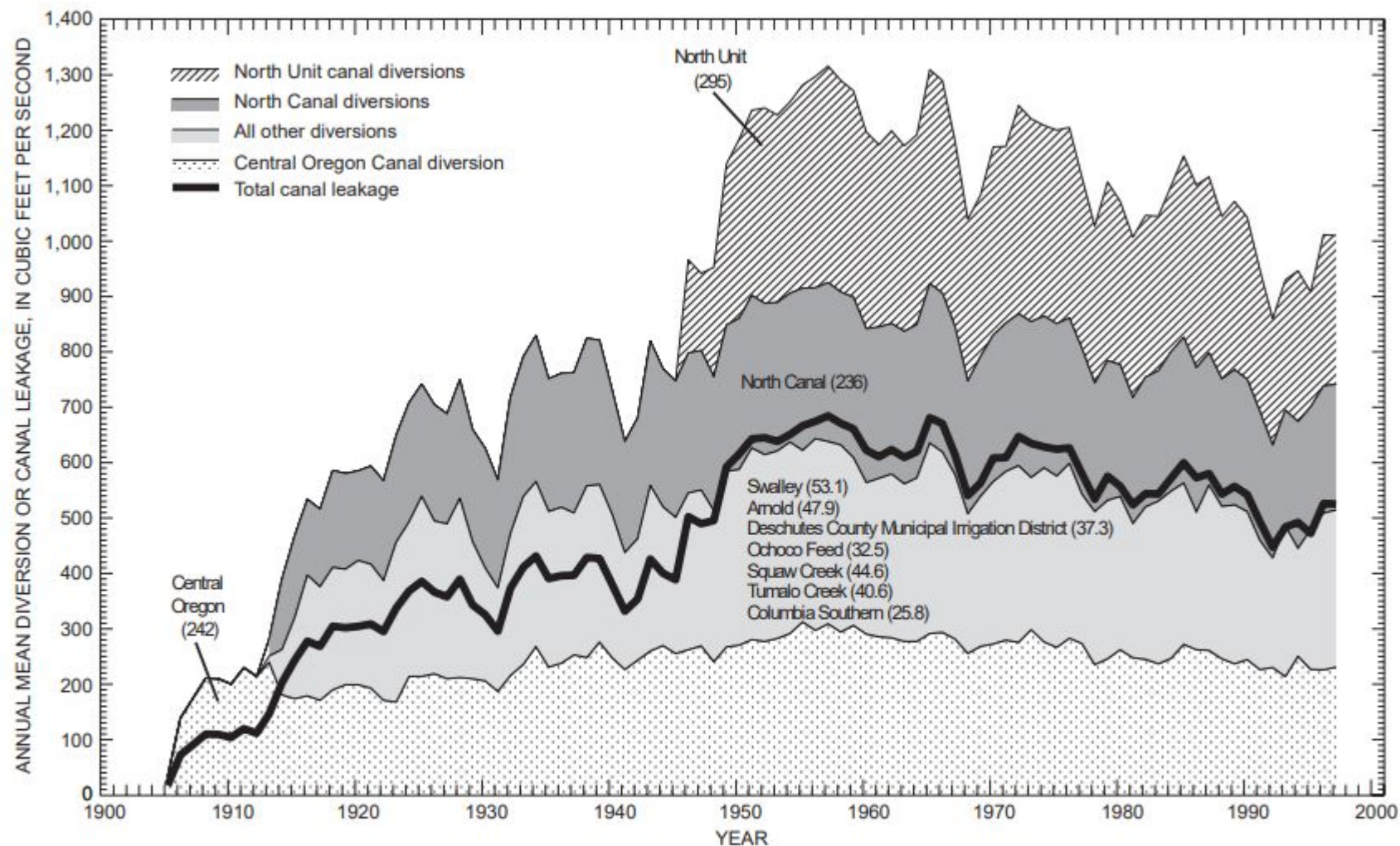
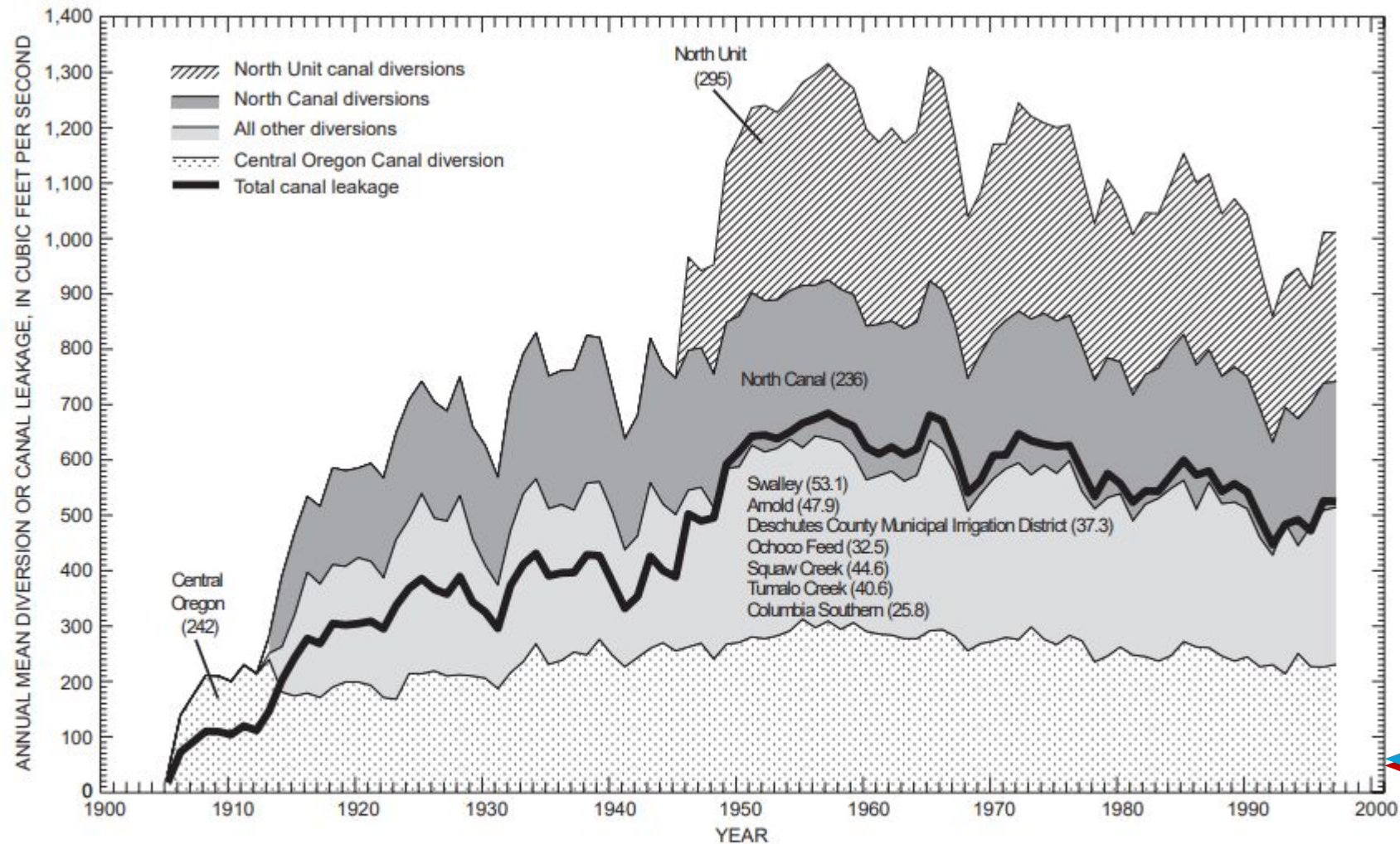


Figure 10. Annual canal diversions and estimated annual mean canal leakage in the upper Deschutes Basin, Oregon, 1905–97. (Mean annual discharge, in cubic feet per second, is shown in parentheses for the period of record for each diversion.)



Approximate water
supplier pumping +
exempt wells.

Approximate water
supplier pumping.

Figure 10. Annual canal diversions and estimated annual mean canal leakage in the upper Deschutes Basin, Oregon, 1905–97. (Mean annual discharge, in cubic feet per second, is shown in parentheses for the period of record for each diversion.)

Challenges

- Mitigation opportunities more likely to come from marginal farmland.
 - Higher cost.
 - Less restoration value.
- Cities competing with federal government as restoration funder.
- Restoration of Middle Deschutes reach no longer the highest priority.
- Concern about groundwater declines.
 - Public mistakenly blames public supply pumping.

Opportunities

- Alignment of mitigation program with current basin-wide restoration goals and activities.
 - Artificial recharge?
 - Shoulder season flow restoration?
- Work collaboratively to create multi-benefit projects with greater overall restoration value.
 - Direct greater share of municipal ratepayer funds to restoration.
- **Is the mitigation program set up to do this?**

Deschutes Water Bank Concept

- Legislation pending.
- Primarily intended to facilitate water movement amongst irrigation districts, but allows for instream water movement.
- May provide a pathway for larger scale projects.
- Provide a mechanism for oversight to help stakeholders be more comfortable with outside-the-box projects.

Lessons

- Regulatory vs. statutory programs
- Build collaborative support
- Know how you fit in the bigger picture
- “Payment in lieu of” option
- What if market participants don’t show up?
- Be seen



Questions
?