OREGON WATER RESOURCES DEPARTMENT

Assessing Impacts of Canal Leakage on Groundwater Levels in the Upper Deschutes Basin

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New Groundwater Allocation Rules

OAR 690-008-0001 (9) "**Reasonably Stable Groundwater Levels**" means that Annual High Water Levels, based on observed trends over time, remain within a range consistent with sustaining the function and character of a groundwater reservoir indefinitely, and:

(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 0.6 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; one must have been measured in the year to which the evaluation of reasonably stable applies, and at least one must have been measured between 5 and 20 years prior; and

(B) **have not declined by more than 25 feet from a reference level to the level in the year to which the evaluation of reasonably stable applies. The reference level shall be the highest known water level unless Annual High Water Levels have been measurably increased by human activity, in which case the Department may set a different reference level using best available information.**

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Historic Canal Leakage

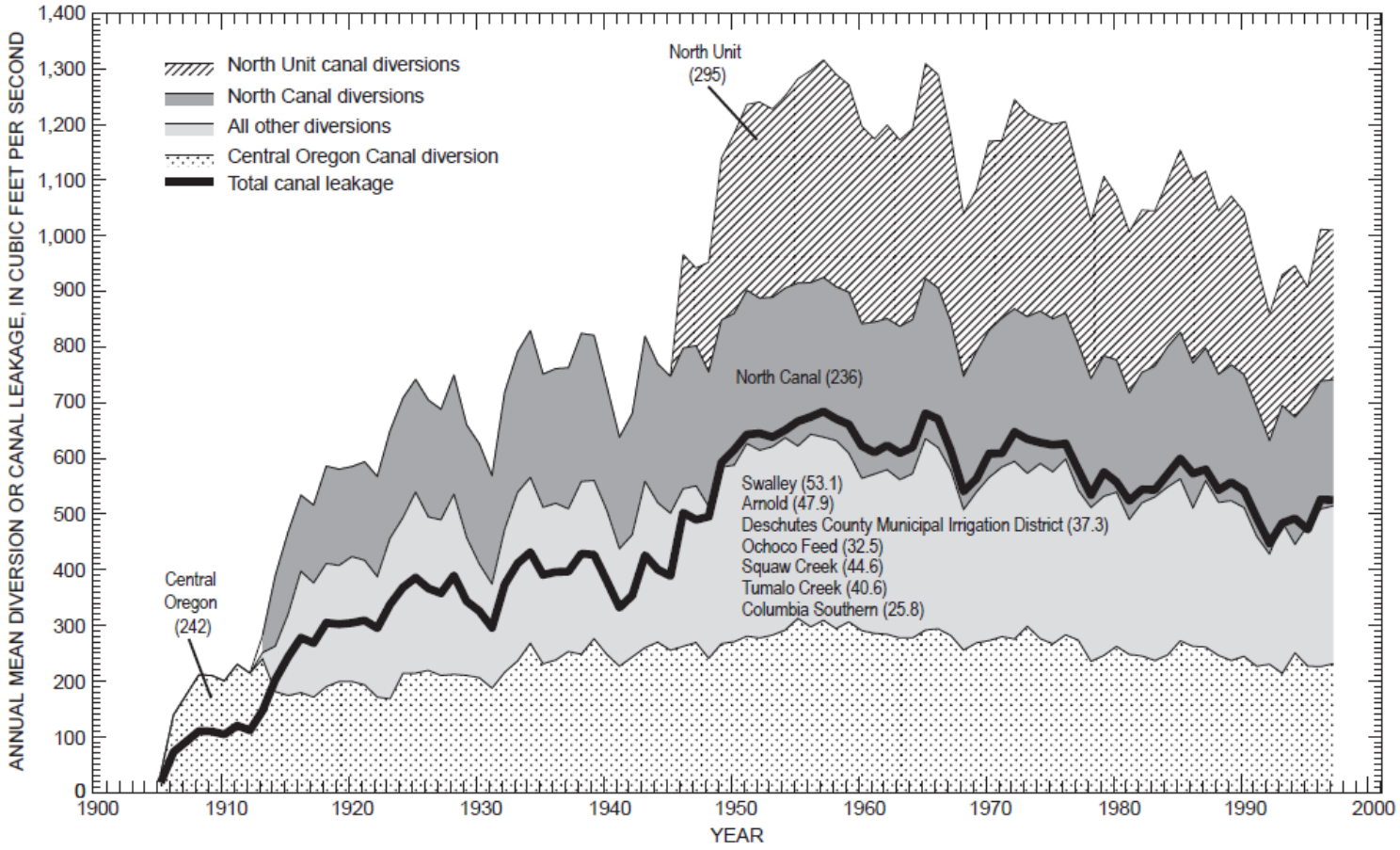

Figure 10. Annual canal diversions and estimated annual mean canal leakage in the upper Deschutes Basin, Oregon, 1905–97. (Mean annual discharge, in cubic feet per second, is shown in parentheses for the period of record for each diversion.)

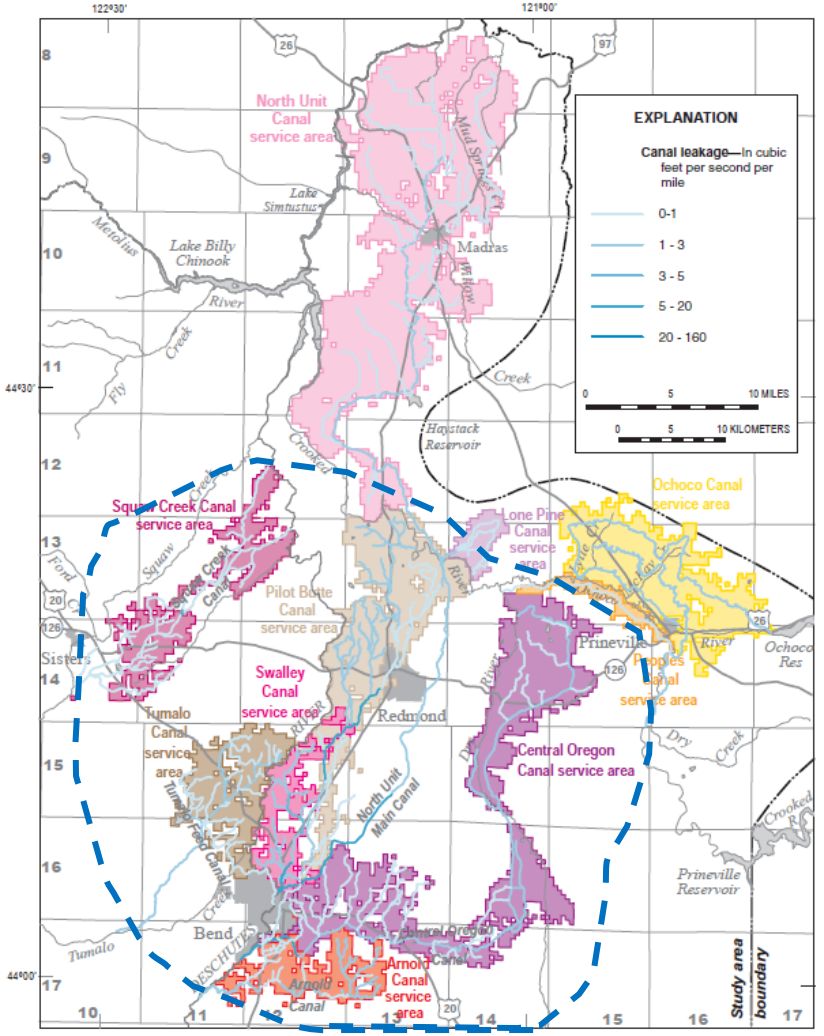

Figure 9. Mean annual recharge from canal leakage and on-farm losses in the upper Deschutes Basin, Oregon, 1993–95.

Gannett, M.W., Lite, Jr., K.E., Morgan, D.S., and Collins, C.A., 2001, Ground-water hydrology of the upper Deschutes Basin, Oregon: U.S. Geological Survey Water-Resources Investigations Report 00-4162, 74 p.

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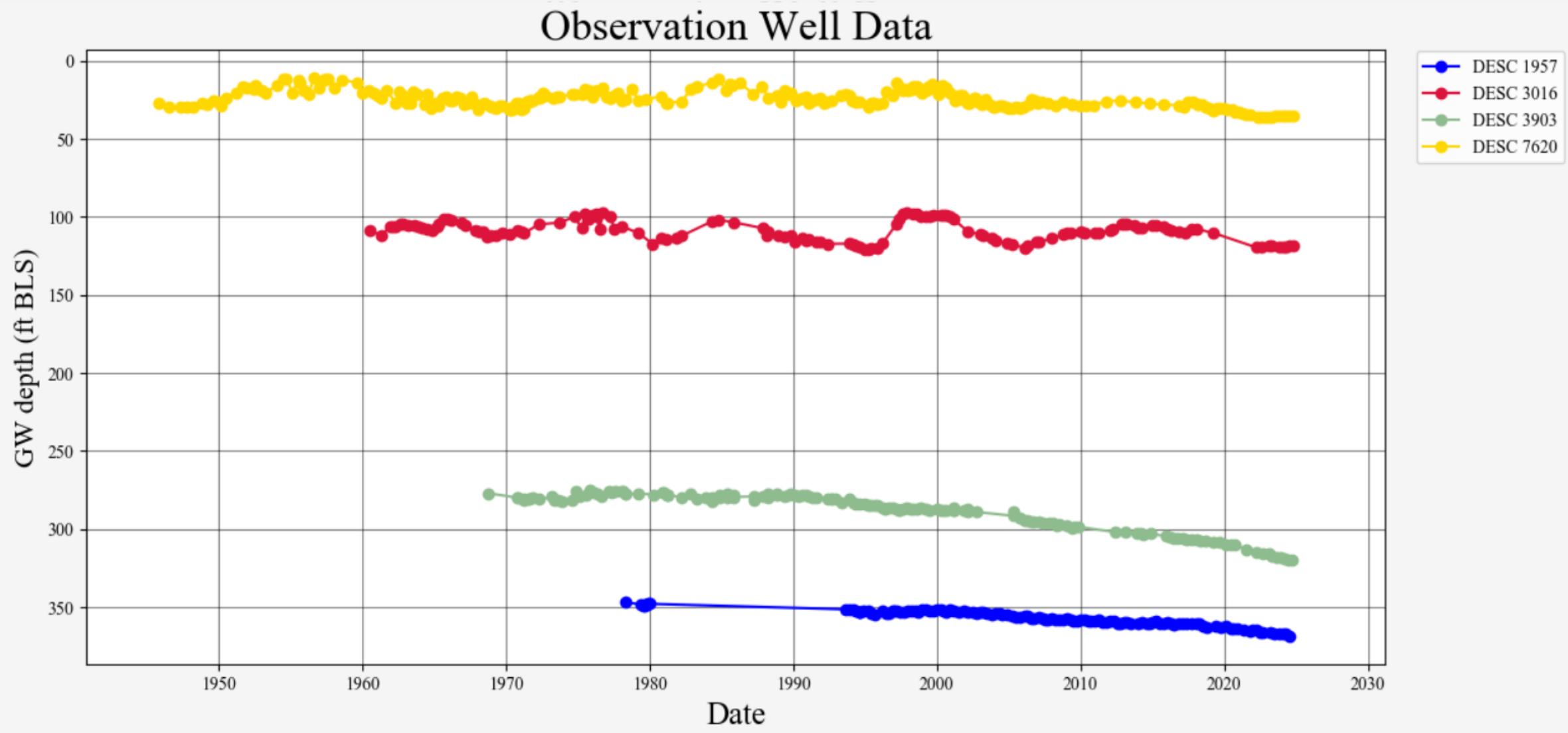
Groundwater Level Data



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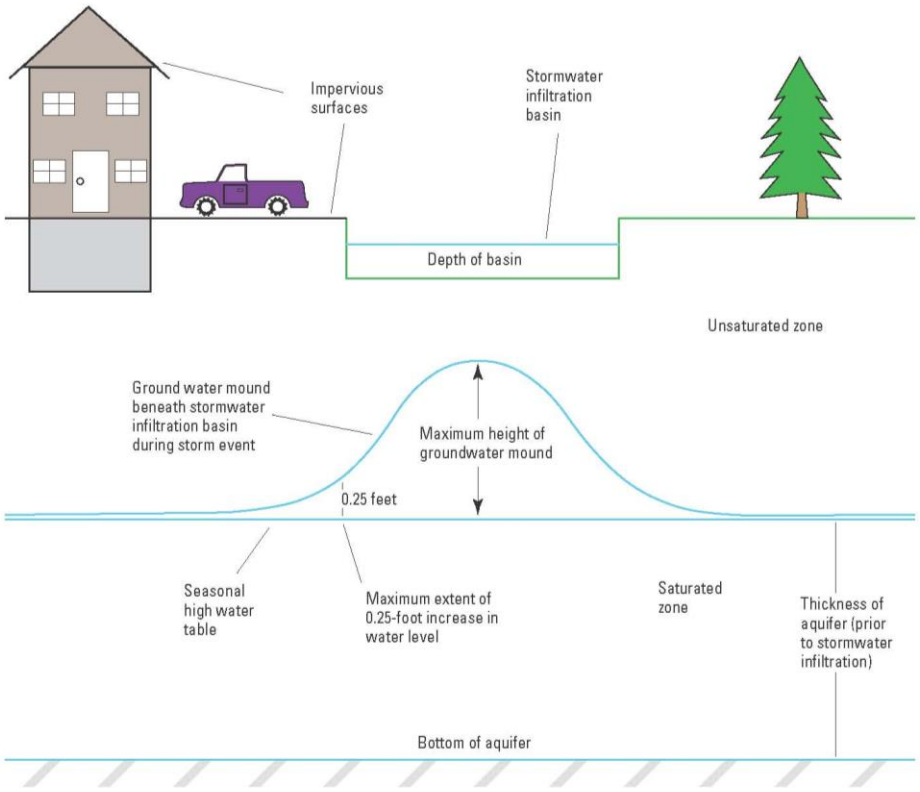
Project Goals

- Estimate how much groundwater levels in the center of the Upper Deschutes basin have risen in response to historic canal leakage.
- Provide context for applying new groundwater allocation rules in the Deschutes basin.



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Methodology

- Full scope and timeline under development.
- Potential methods and data sources:
  - Groundwater modeling.
  - Historic and current groundwater level data.
  - Short-term observed groundwater response to canal leakage.
  - Updating canal piping projects and pumping estimates.
  - Streamflow records.

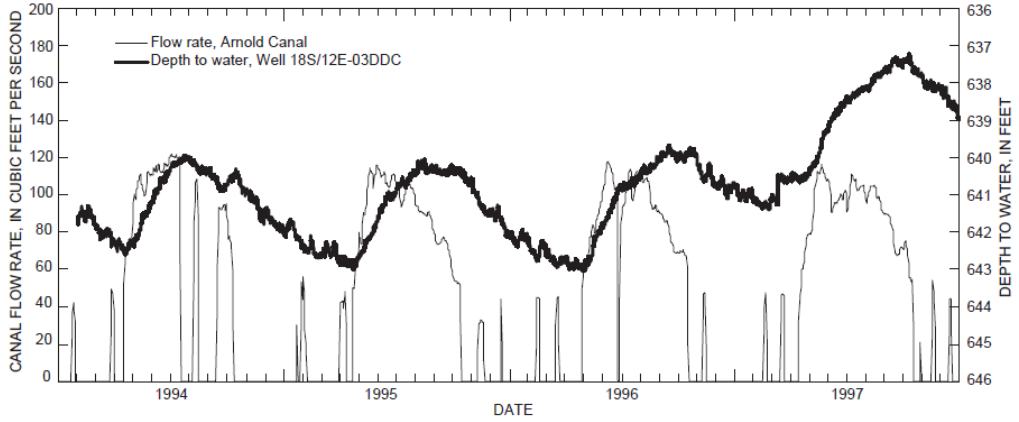

Figure 35. Relation between static water-level variations in a deep well near Bend, Oregon, and flow rate in a nearby irrigation canal.

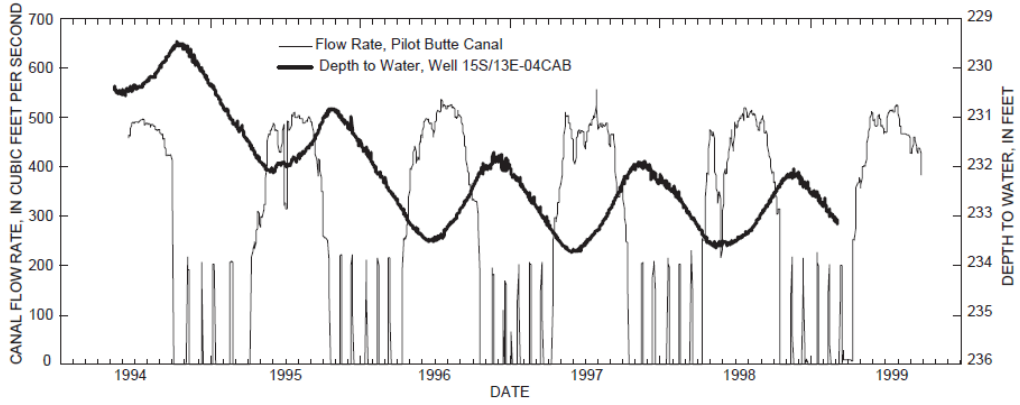

Figure 36. Relation between static water-level variations in a well near Redmond, Oregon, and flow rate in a nearby irrigation canal.

Process

- Core technical work:
  - Determine project scope and timeline.
  - Develop methodology.
  - Review work products.
- Public involvement:
  - Updates provided to and feedback sought from DBWC and other basin interests.
  - Public comment possible through OWRD's Groundwater Advisory Committee (GWAC).
- Open-File Report:
  - Opportunity for peer review.
  - To be published by OWRD.

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