Analyzing drought and water availability in Valley County to support local decision-making


Credit: visitidaho.org


Credit: USBR

November 12, 2026 | P&Z Commission Meeting

Grace Peven, Ph.D., Research Scientist, IWRRI

NW Philanthropy Thriving Communities Grant

IWRRI
Idaho Water Resources Research Institute

VALLEY SOIL & WATER
CONSERVATION DISTRICT

IWRRI addresses critical water research needs







Research complex & urgent water questions

Training the next generation of water professionals

Connect stakeholders, researchers, and students

Improved access to **data**

Translate knowledge to support decision-making

Identifying and addressing water quantity issues in Valley County

VALLEY SOIL & WATER CONSERVATION DISTRICT

PHILANTHROPY NORTHWEST

NW Philanthropy Thriving Communities Grant

Goal: Synthesize and prioritize watershed management goals, decision-making tools and dataset, and conduct hydrologic data analysis to support local decisions.
Timeline: Project wrap-up in June 2027

Research questions

- How does multi-year drought impact surface water supply?
- **How does development impact groundwater supply?**

Approach

1. Synthesize available well data for the county to summarize gw level and well depth trends.
2. Estimate groundwater pumping across all sectors (irrigation, municipal, domestic)
3. Estimate groundwater supply across sub-watersheds in the county using modeled hydrologic data.

Outcomes

- Better understanding of groundwater supply and demand in Valley County
- Online data dashboard and tool to support decision makers
- Final report

Estimating Groundwater Pumping in Long Valley

Diverse demand requires different approaches

Irrigation

19
groundwater irrigation rights

DATA
Satellite ET (OpenET, 5 yrs), water rights, climate

METHOD
Water budget to estimate groundwater use

+

Municipal

3
metered municipal systems

DATA
Monthly meters: McCall, Donnelly, Cascade

METHOD
Compile monthly and annual totals per municipality

+

Rural residential

5,927
Houses supplied by a well

DATA
McCall household meters plus parcel data

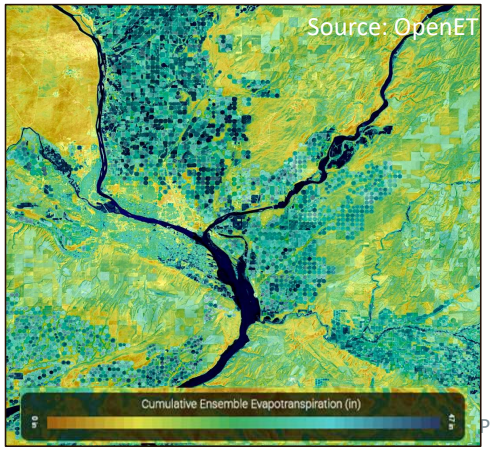
METHOD
Apply per-home rate to every parcel with a well

=

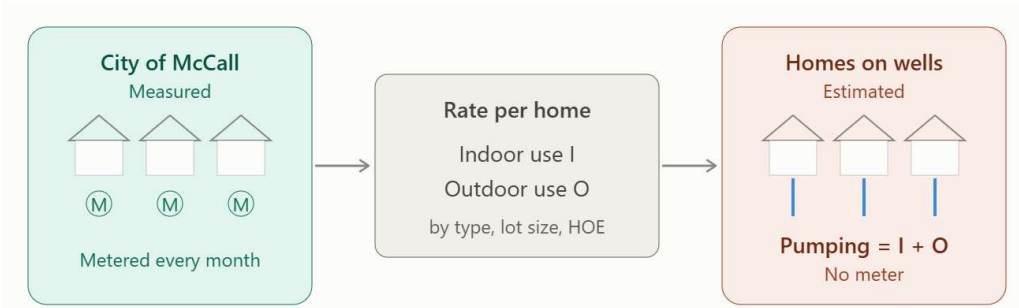
Total groundwater pumping

acre-ft / year
estimate in progress

RESULT
Per-parcel map of pumping and the share of use by sector





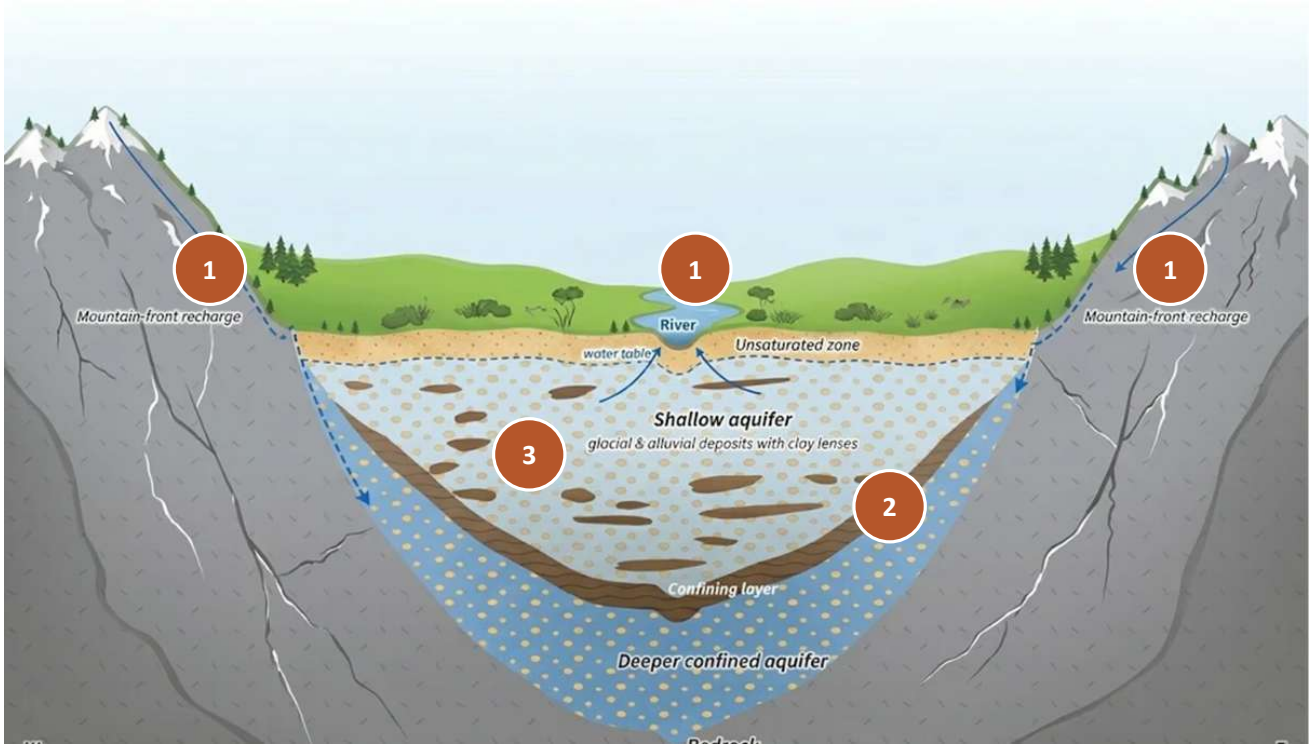


Understanding groundwater supply

1 **Recharge**
Where, when, how much water enters the aquifer

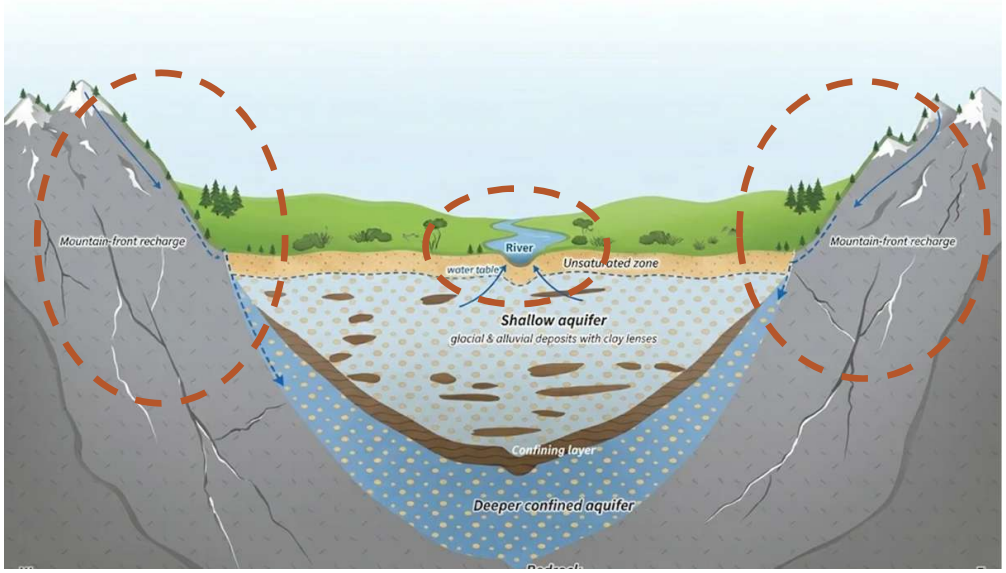
2 **Aquifer properties**
Depth, thickness, water yield, and storage of water

3 **Change over time**
Whether water levels are rising, falling, or steady



Recharge: where water enters the aquifer

1 Recharge | 2 Aquifer properties | 3 Change over time

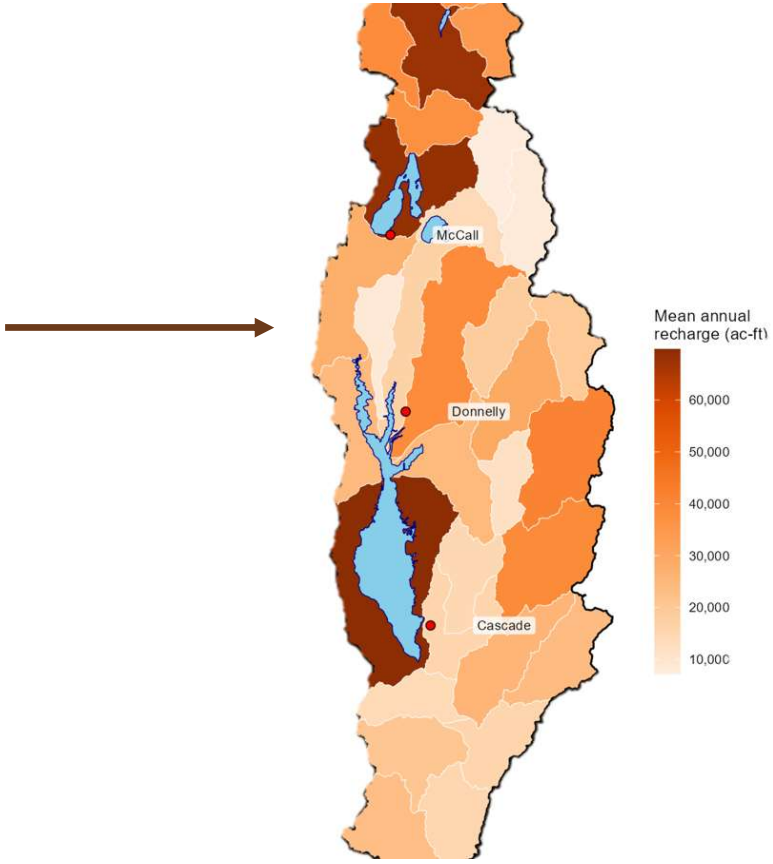


Sources: Snowmelt, rainfall, and surface water

How to estimate: Hydrologic models containing land surface, subsurface, and climate data can be used to estimate recharge

Location: The most recharge occurs around large surface water bodies and at higher elevations

Limitations: Knowing recharge doesn't tell you where the water will go in the subsurface or how long it will stay

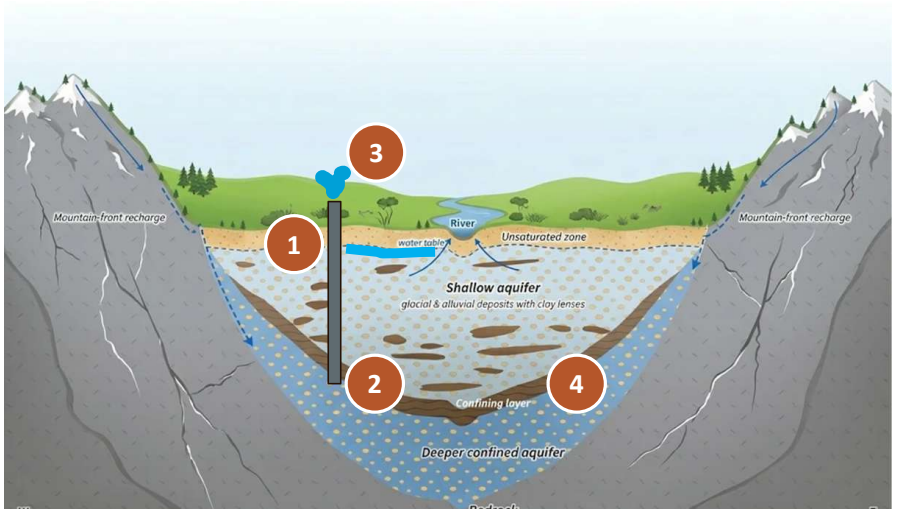


Mean annual recharge by watershed using WRF-Hydro model outputs

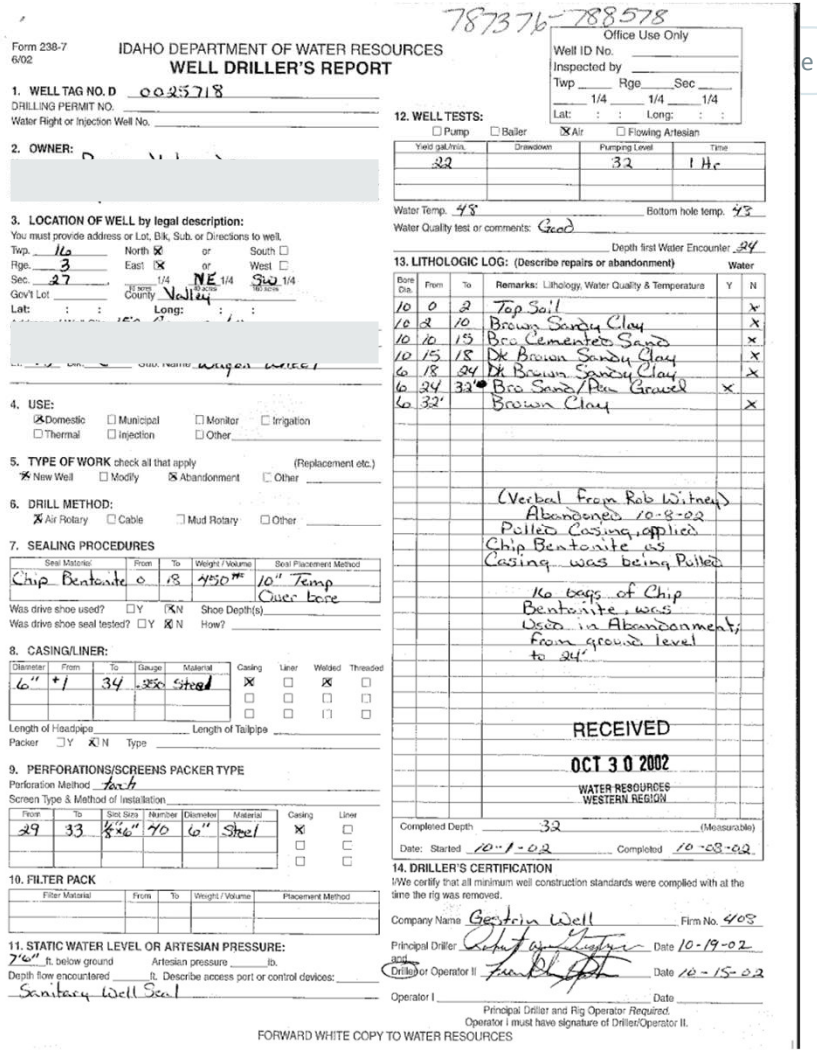
Aquifer properties: well drilling reports

>7,000

well drilling reports in Valley County



1. Static water level
2. Well depth
3. Production rate (gpm)
4. Subsurface geology



787376-788578

Form 238-7 6/02

IDAHO DEPARTMENT OF WATER RESOURCES
WELL DRILLER'S REPORT

Office Use Only
Well ID No.
Inspected by
Twp ___ Rge ___ Sec ___
___ 1/4 ___ 1/4 ___ 1/4
Lat: : : Long: : :

1. WELL TAG NO. D 0025718
DRILLING PERMIT NO.
Water Right or Injection Well No.

2. OWNER:

3. LOCATION OF WELL by legal description:
You must provide address or Lot, Blk, Sub. or Directions to well.
Twp. 16 North ☒ or South ☐
Rge. 3 East ☒ or West ☐
Sec. 27 1/4 NE 1/4 SW 1/4
Gov't Lot County Valley
Lat: : : Long: : :

4. USE:
☒ Domestic ☐ Municipal ☐ Monitor ☐ Irrigation
☐ Thermal ☐ Injection ☐ Other

5. TYPE OF WORK check all that apply (Replacement etc.)
☒ New Well ☐ Modify ☒ Abandonment ☐ Other

6. DRILL METHOD:
☒ Air Rotary ☐ Cable ☐ Mud Rotary ☐ Other

7. SEALING PROCEDURES

Seal Material	From	To	Weight / Volume	Seal Placement Method
Chip Bentonite	0	18	450 lbs	10" Temp Over bore

Was drive shoe used? ☐ Y ☒ N Shoe Depth(s)
Was drive shoe seal tested? ☐ Y ☒ N How?

8. CASING/LINER:

Diameter	From	To	Gauge	Material	Casing	Liner	Welded	Threaded
6"	+1	34	.250	Steel	☒	☐	☒	☐

Length of Headpipe Length of Tailpipe
Packer ☐ Y ☒ N Type

9. PERFORATIONS/SCREENS PACKER TYPE
Perforation Method Torch
Screen Type & Method of Installation

From	To	Slot Size	Number	Diameter	Material	Casing	Liner
29	33	1/16"	40	6"	Steel	☒	☐

10. FILTER PACK

Filter Material	From	To	Weight / Volume	Placement Method

11. STATIC WATER LEVEL OR ARTESIAN PRESSURE:
7'6" ft. below ground Artesian pressure ___ lb.
Depth flow encountered ___ ft. Describe access port or control devices:
Sanitary Well Seal

12. WELL TESTS:
☐ Pump ☐ Bailer ☒ Air ☐ Flowing Artesian

Yield gal./min.	Drawdown	Pumping Level	Time
22		32	1 Hr

Water Temp. 48 Bottom hole temp. 48
Water Quality test or comments: Good
Depth first Water Encounter 24

13. LITHOLOGIC LOG: (Describe repairs or abandonment)

Bore Dia.	From	To	Remarks: Lithology, Water Quality & Temperature	Water Y	Water N
10	0	2	Top Soil		X
10	2	10	Brown Sandy Clay		X
10	10	15	Bro Cemented Sand		X
10	15	18	Dk Brown Sandy Clay		X
6	18	24	Dk Brown Sandy Clay		X
6	24	33'	Bro Sand/Fine Gravel	X	
6	32'		Brown Clay		X

(Verbal from Rob Witney)
Abandoned 10-8-02
Pulled Casing, applied
Chip Bentonite as
Casing was being Pulled

140 bags of Chip
Bentonite, was
Used in Abandonment;
From ground level
to 24'

RECEIVED
OCT 30 2002
WATER RESOURCES
WESTERN REGION

Completed Depth 32 (Measurable)
Date: Started 10-1-02 Completed 10-08-02

14. DRILLER'S CERTIFICATION
I/We certify that all minimum well construction standards were complied with at the time the rig was removed.
Company Name Gerstin Well Firm No. 403
Principal Driller and/or Operator II Date 10-19-02
Operator I Date 10-15-02
Principal Driller and Rig Operator Required.
Operator I must have signature of Driller/Operator II.

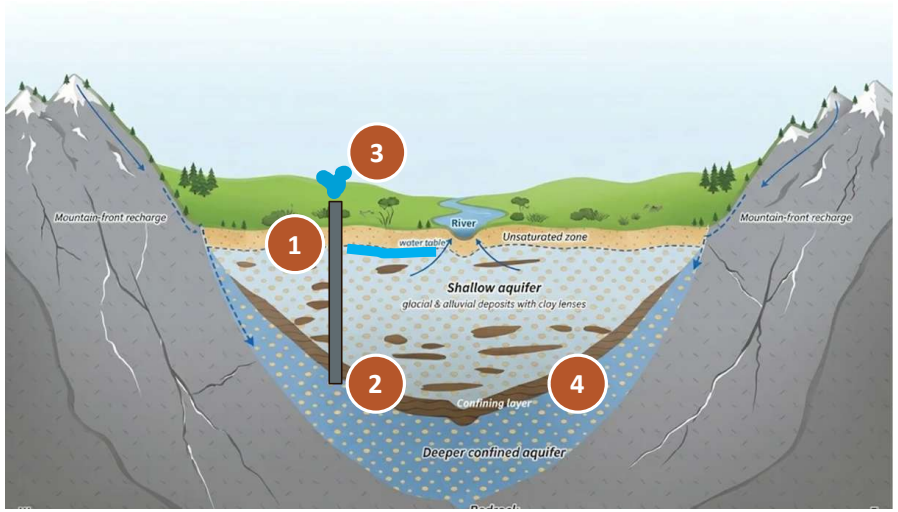
FORWARD WHITE COPY TO WATER RESOURCES

Aquifer properties: well drilling reports

1 Recharge | **2 Aquifer properties** | 3 Change over time

>7,000

well drilling reports in Valley County



1. Static water level
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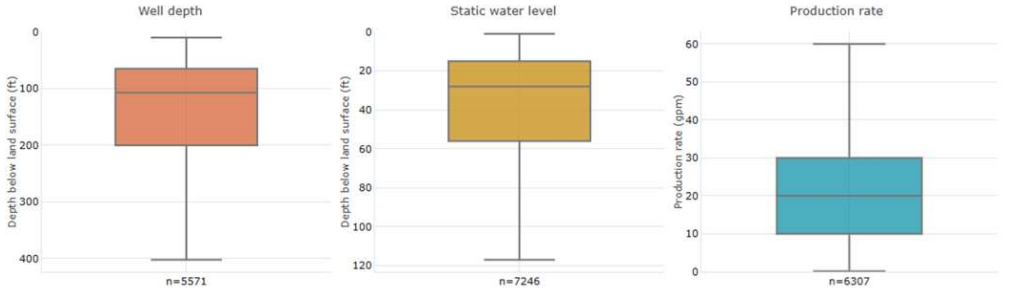
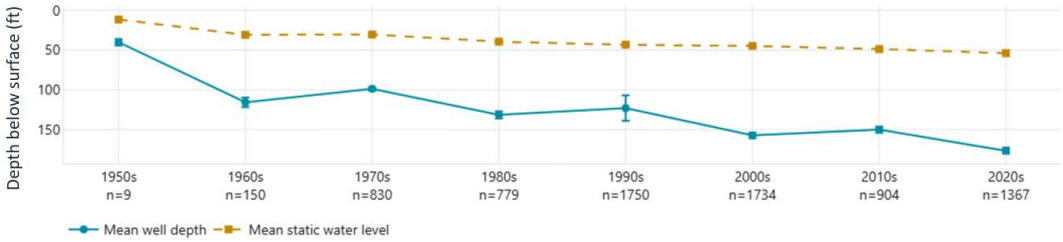
4. Subsurface geology

Summary of well depth, water level, and production rate in Valley County



Decadal change in well depth and water level in Valley County



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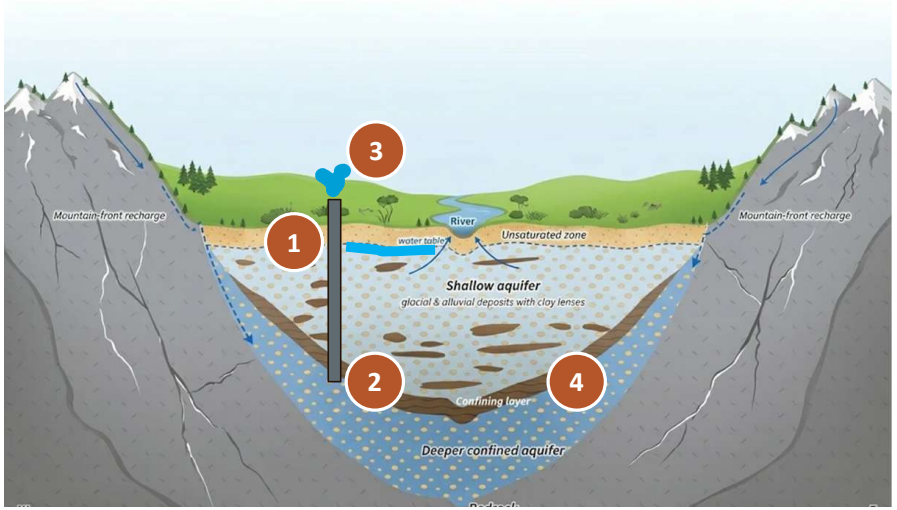
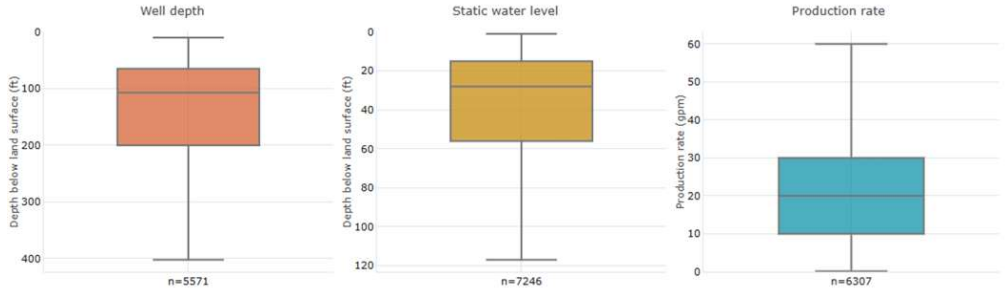
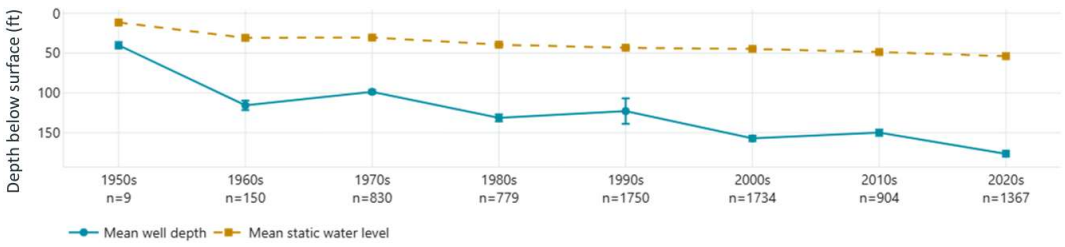


Summary of well depth, water level, and production rate in Valley County



Decadal change in well depth and water level in Valley County



1. Static water level
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3. Production rate (gpm)
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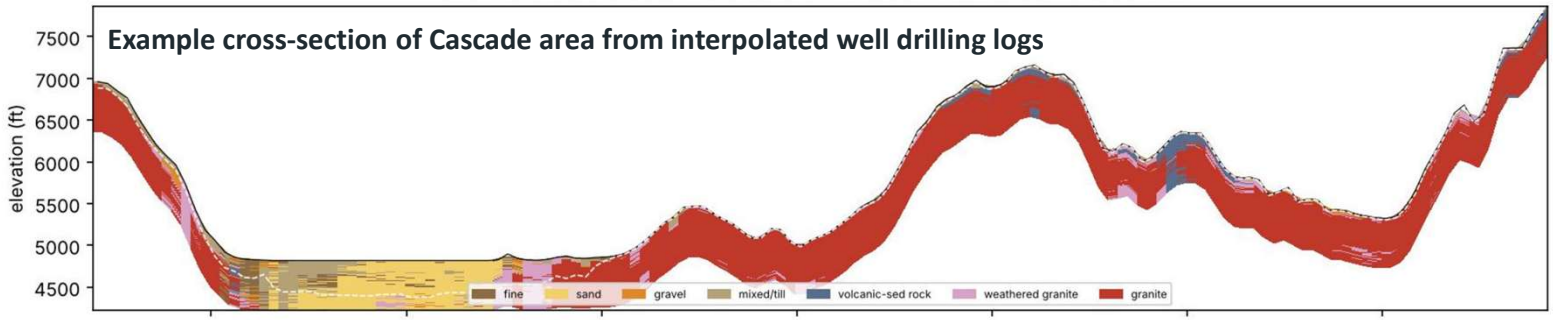
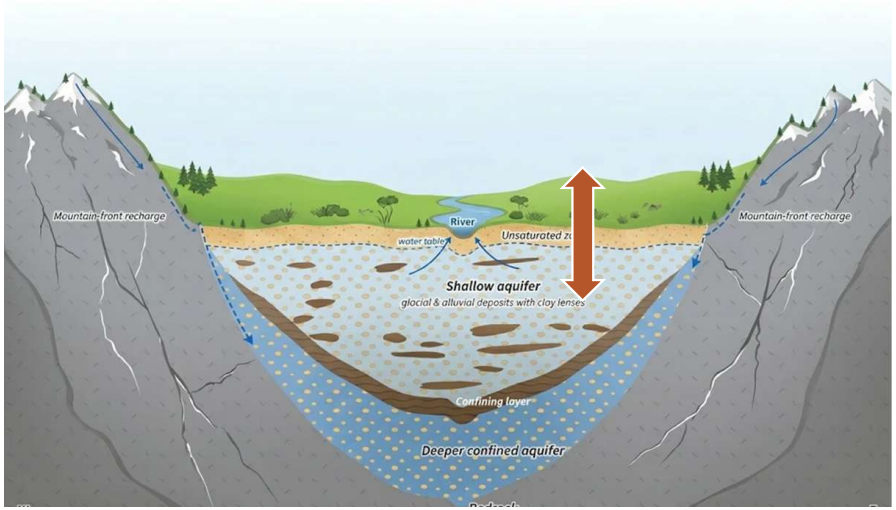
Example cross-section of Cascade area from interpolated well drilling logs



Change over time: monitoring wells

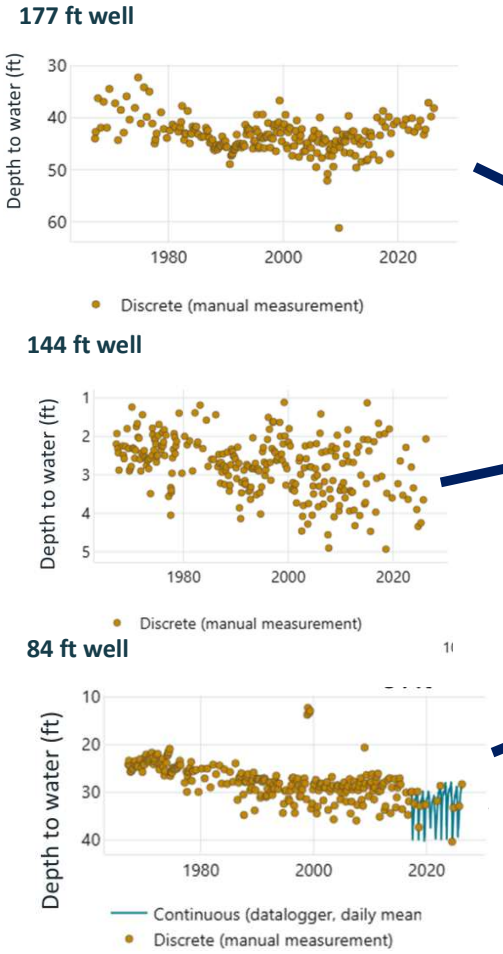
8

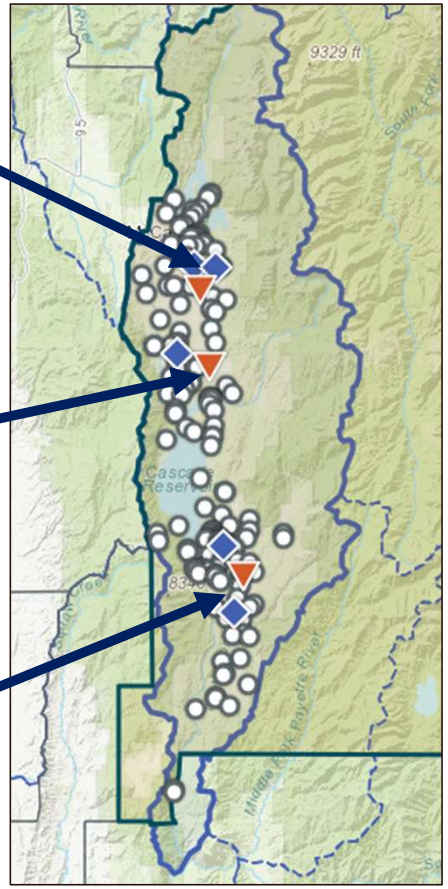
long-term monitoring wells



Repeated measurements in the same wells show whether the water table is rising, falling, or stable over time.

Limitations: monitoring wells provide information for one location but may not be representative of the larger aquifer





Next steps

1. Estimate groundwater supply across Long Valley using hydrologic model outputs and integrate into overall groundwater budget.

2. Identify opportunities for monitoring and modeling where estimates are limited or where the greatest uncertainty exists.

Tool demonstration

Online data dashboard for water and development decisions

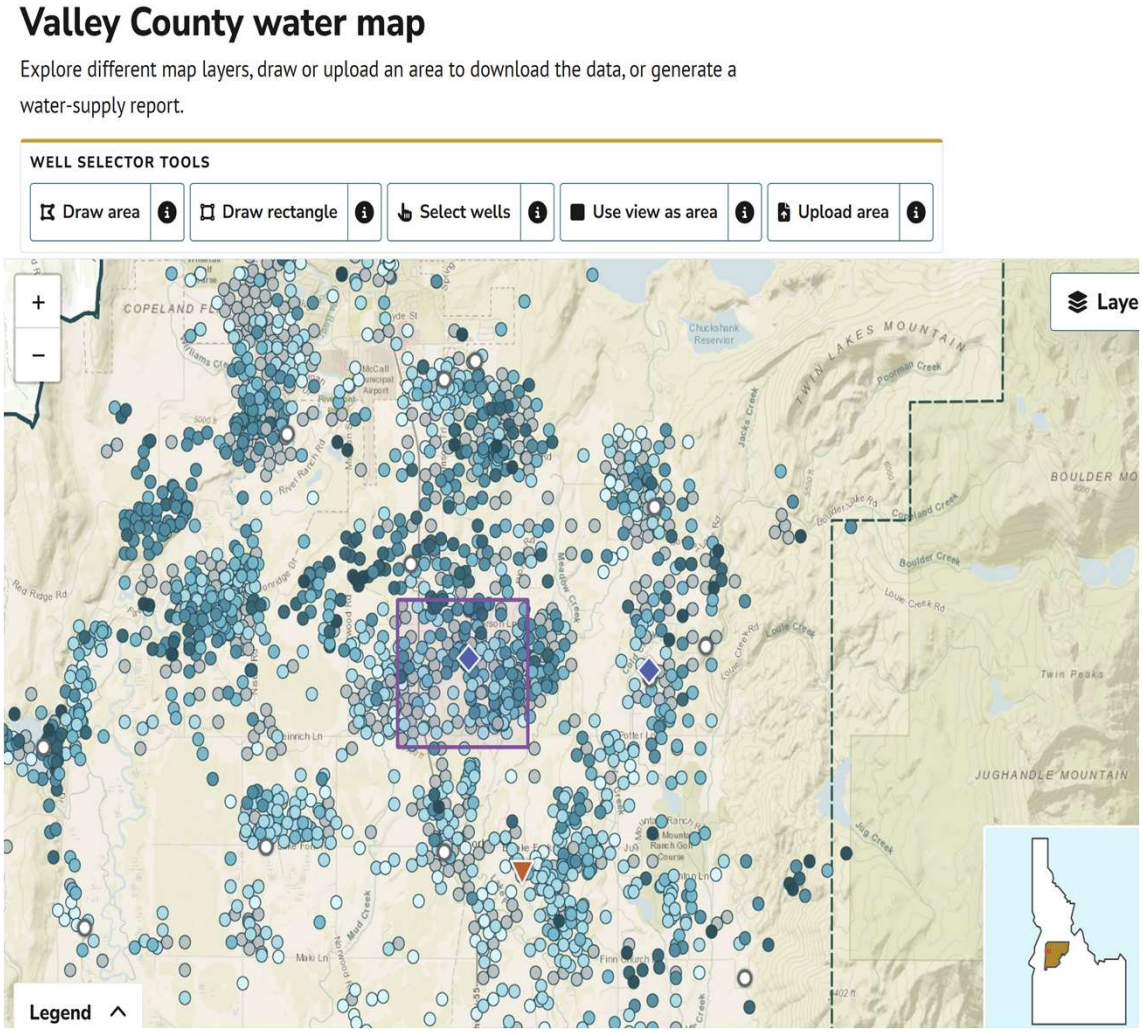
Valley County Water Data Dashboard

Purpose: Make relevant water data in Valley County accessible and useful for planning

Functionality: Visualization of data. Users can select an area of interest and available data is summarized and interpolated.

Key datasets: well drillings reports, monitoring wells, geology, soils, water rights.

All data from publicly available datasets (USGS, IDWR, NRCS, etc.)



Valley County water map

Explore different map layers, draw or upload an area to download the data, or generate a water-supply report.

Select a custom area of interest

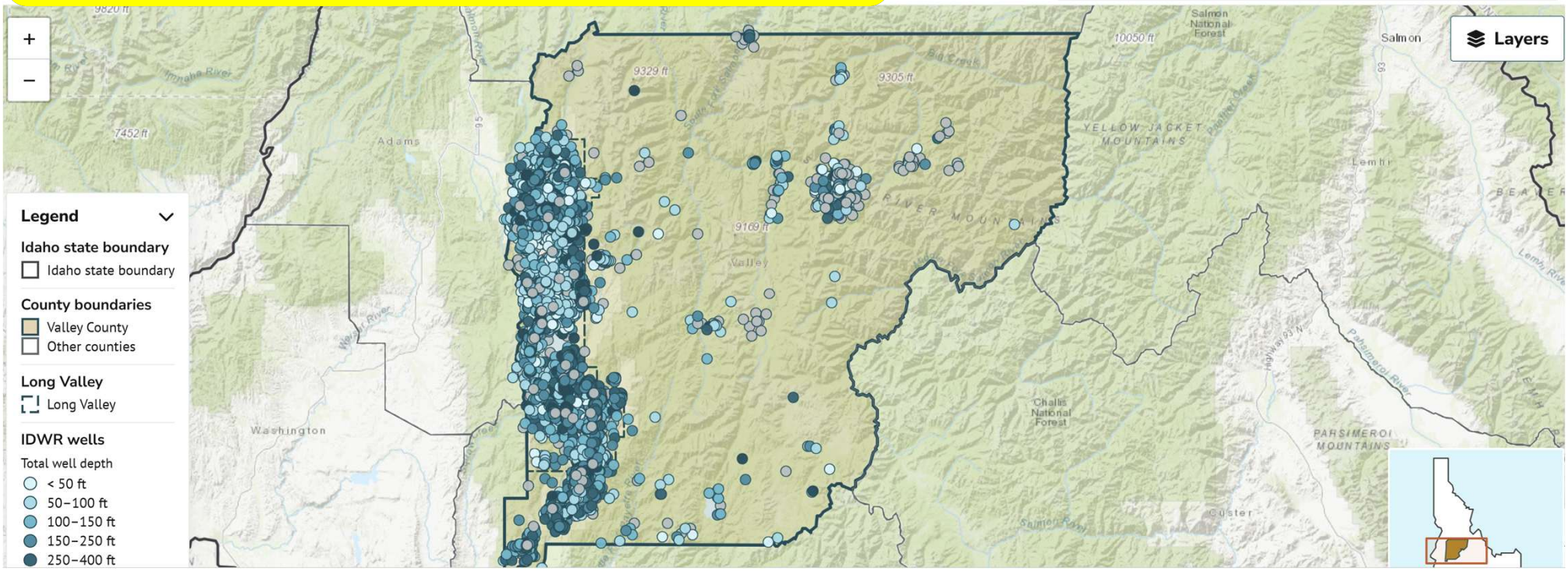
Explore groundwater related data

WELL SELECTOR TOOLS

Draw area | Draw rectangle | Select wells | Use view as area | Upload area

YOUR SELECTION

Clear | Download data | Generate water-supply report



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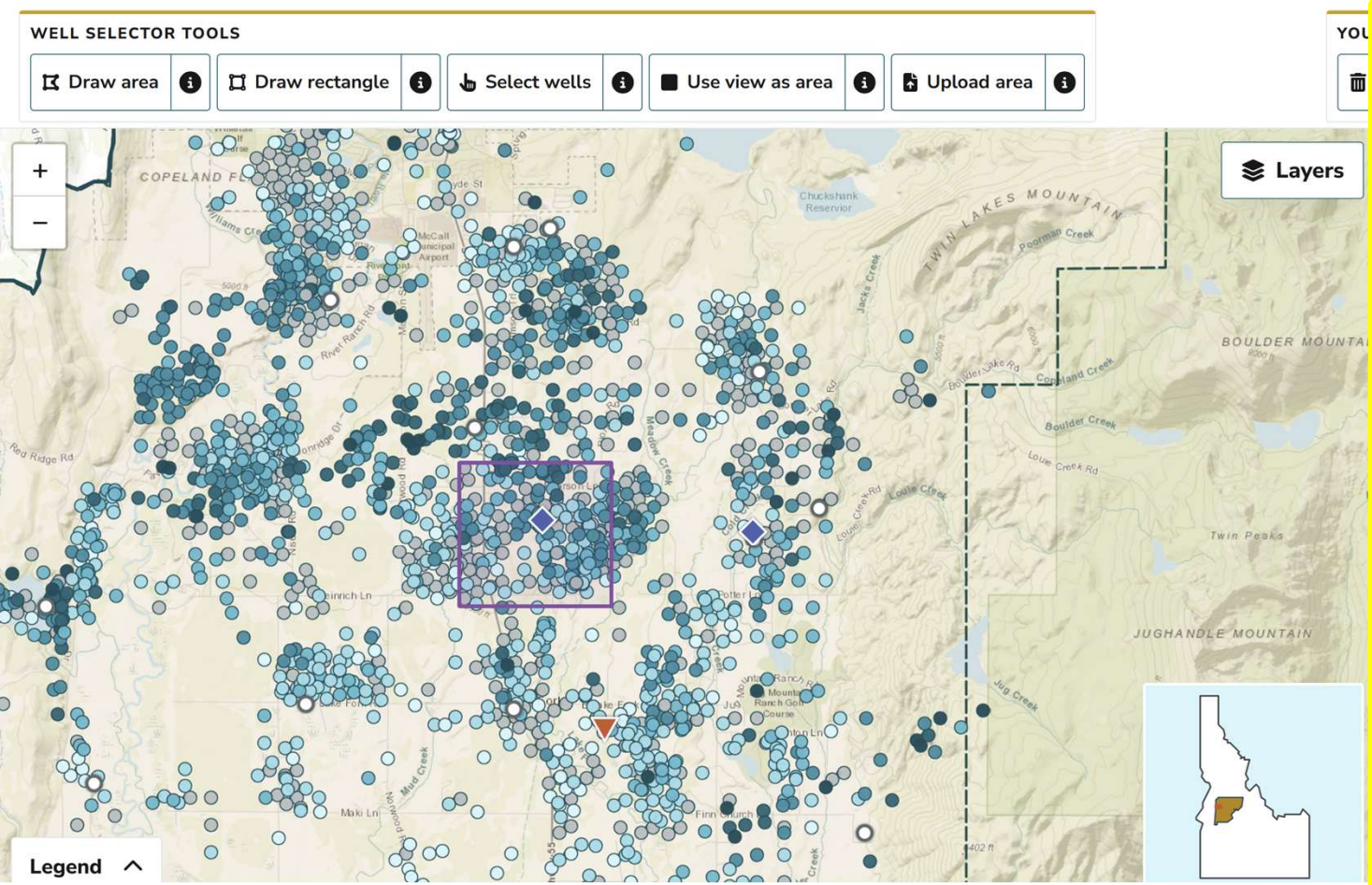

Area of interest report

Close

Area **1,177** acres Search area (0 mi) **1,177** acres

Generated Nov 10, 2026, 6:34 AM MT

A. Summary | B. Wells | C. Groundwater supply | D. Groundwater demand | E. Water rights | F. Physical | Notes

Disclaimer: This report summarizes publicly available records (IDWR, USGS, NRCS, IGS, Valley County) and preliminary products calculated by the dashboard, for planning and screening only. Well records are self-reported at construction and may be incomplete or contain errors, and statistics describe wells near the area, not conditions at any one site. This report is not intended for legal, regulatory or water-rights determinations; consult IDWR and a qualified professional before making water-supply decisions. See the Methods page for how each value is computed.

Note: This report includes wells drilled before 1990.

Most wells drilled before 1990 were located with the quarter-quarter method, before GPS: the record names the 40-acre quarter-quarter section the well is in, and the well is placed at the centre of that section. Its position on the map may not reflect where it was actually drilled, and several

Feedback

- How would you use this dashboard as part of your decision-making process?
- What additional information do you want to see in this dashboard?
- What additional functionality do you want to see?

Thank you!

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VALLEY SOIL & WATER
CONSERVATION DISTRICT

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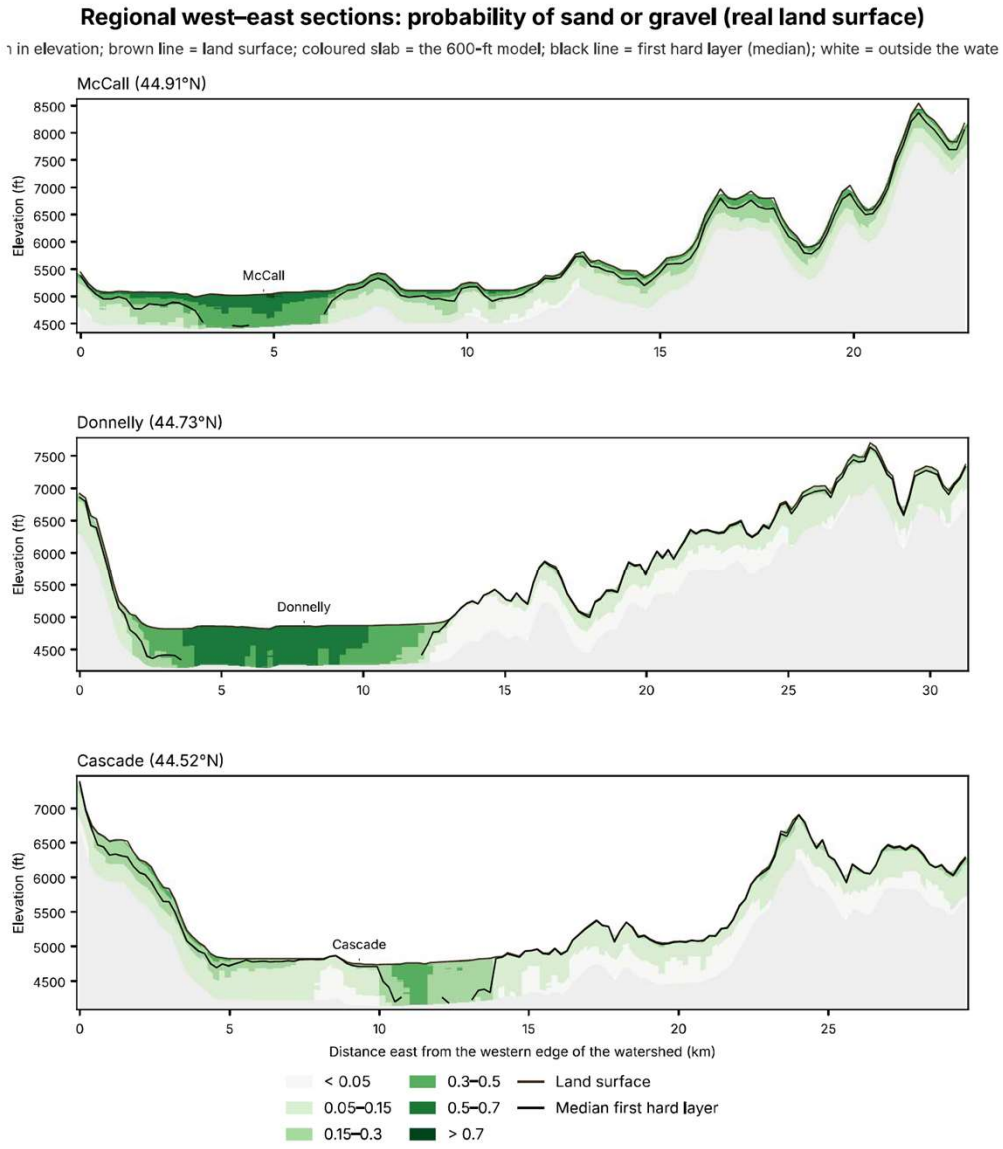
Regional west–east sections: probability of sand or gravel (real land surface)
in elevation; brown line = land surface; coloured slab = the 600-ft model; black line = first hard layer (median); white = outside the wate
McCall (44.91°N)
Elevation (ft)
McCall
Donnelly (44.73°N)
Donnelly
Cascade (44.52°N)
Cascade
Distance east from the western edge of the watershed (km)
< 0.05
0.05–0.15
0.15–0.3
0.3–0.5
0.5–0.7
> 0.7
Land surface
Median first hard layer

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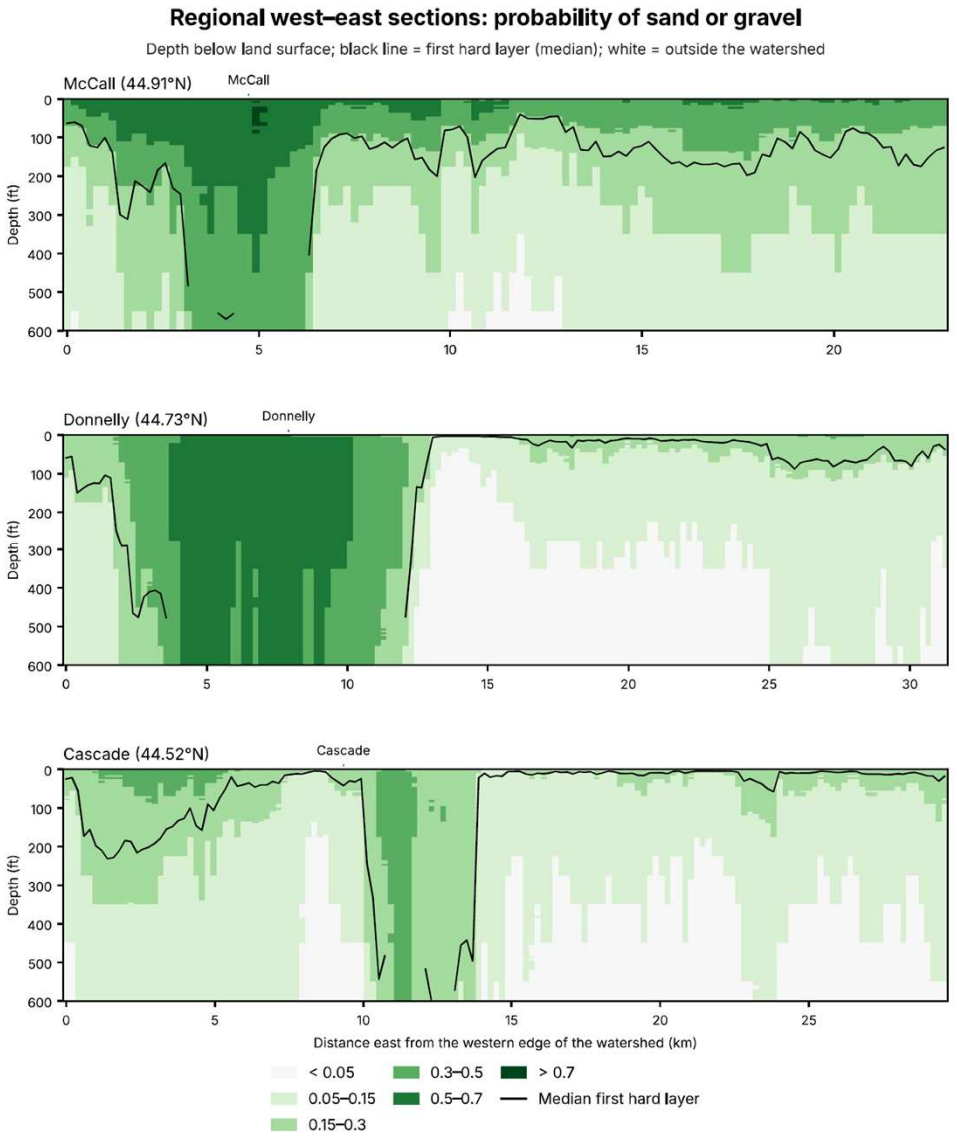
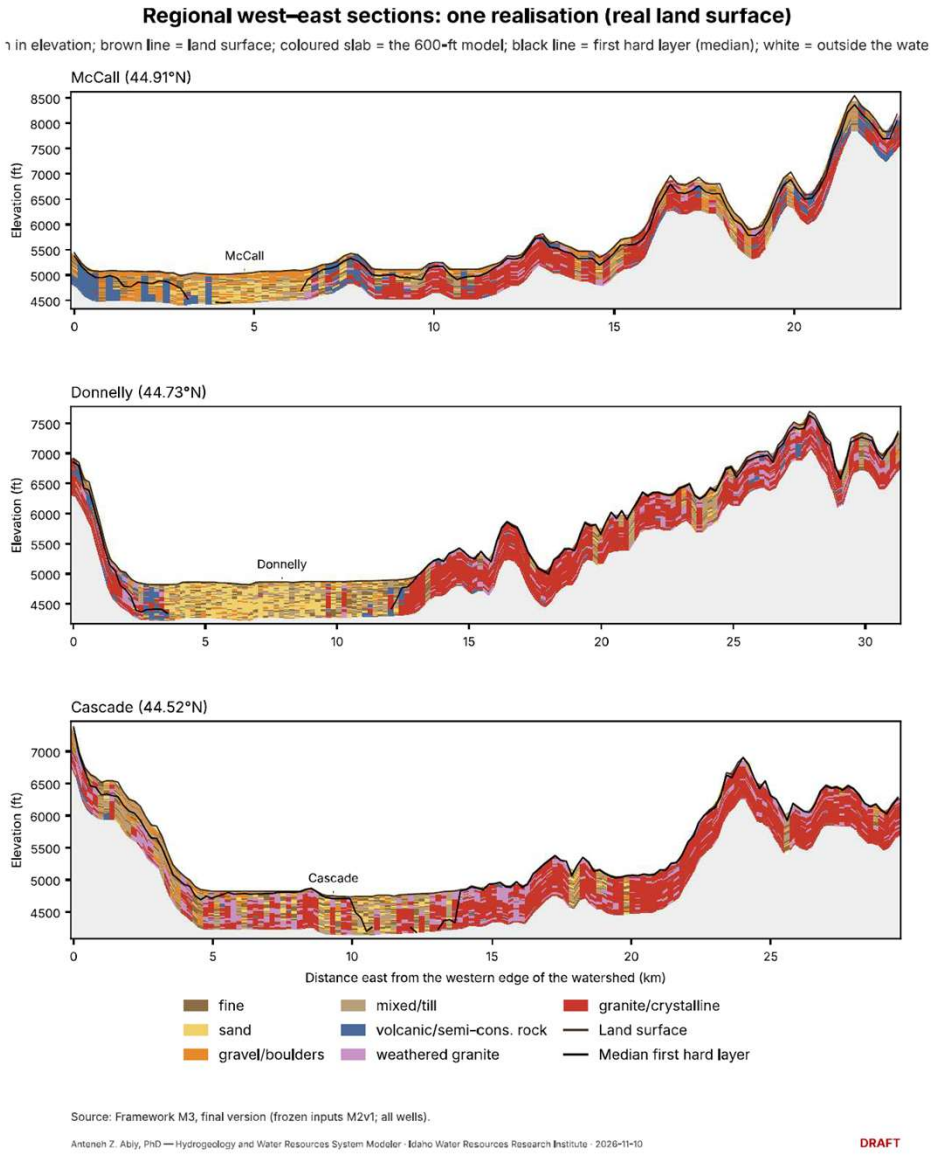

Regional west–east sections: probability of sand or gravel
Depth below land surface; black line = first hard layer (median); white = outside the watershed
McCall (44.91°N)
McCall
Donnelly (44.73°N)
Donnelly
Cascade (44.52°N)
Cascade
Depth (ft)
0
100
200
300
400
500
600
0
5
10
15
20
25
30
Distance east from the western edge of the watershed (km)
< 0.05
0.05–0.15
0.15–0.3
0.3–0.5
0.5–0.7
> 0.7
Median first hard layer

DRAFT


Regional west–east sections: one realisation (real land surface)
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McCall (44.91°N)
Elevation (ft)
McCall
Donnelly (44.73°N)
Donnelly
Cascade (44.52°N)
Cascade
Distance east from the western edge of the watershed (km)
fine
sand
gravel/boulders
mixed/till
volcanic/semi-cons. rock
weathered granite
granite/crystalline
Land surface
Median first hard layer
Source: Framework M3, final version (frozen inputs M2v1; all wells).
Anteneh Z. Abiy, PhD — Hydrogeology and Water Resources System Modeler · Idaho Water Resources Research Institute · 2026-11-10
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