

Treasure Valley Groundwater-Level Change Maps

WeSPAM MTAC



Kevin Olson, Hydrogeologist

March 10, 2026



IDAHO DEPARTMENT OF
WATER RESOURCES

Treasure Valley Change Maps

- **Motivation**

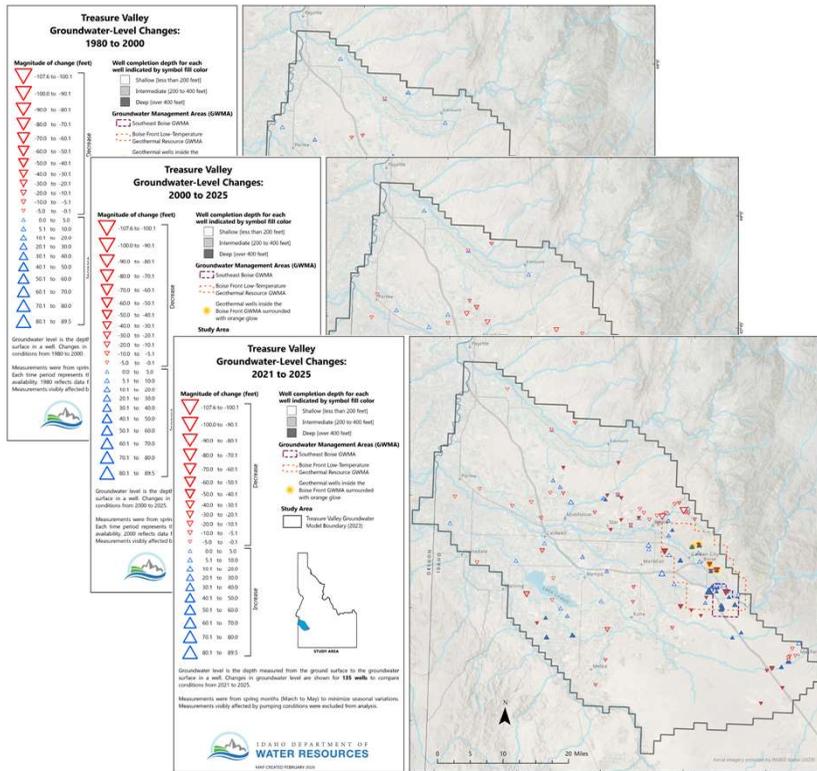
- Increase awareness of groundwater conditions in a region with heavy growth and development.

- **Audience**

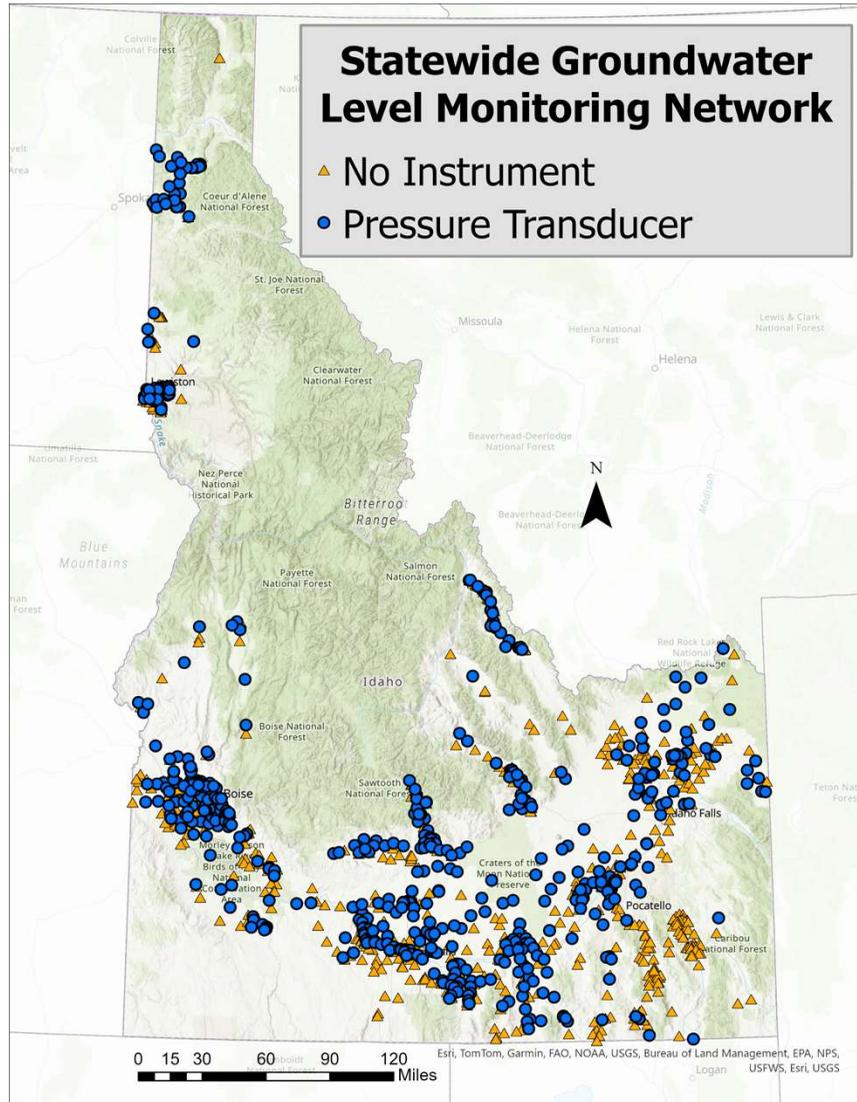
- Presented to legislative committees.
- Publish to IDWR website for public (coming soon).

- **Next Slides**

- IDWR Groundwater-Level Monitoring Program
- Process
- Increasing data availability
- Climate
- Change maps
 - 1980 to 2000
 - 2000 to 2025
 - 2021 to 2025

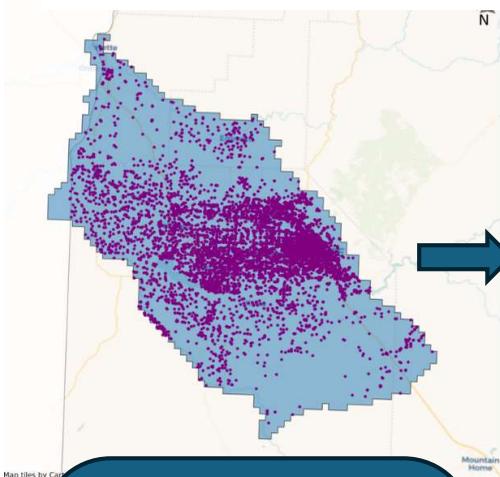


Statewide Groundwater Level Monitoring Program

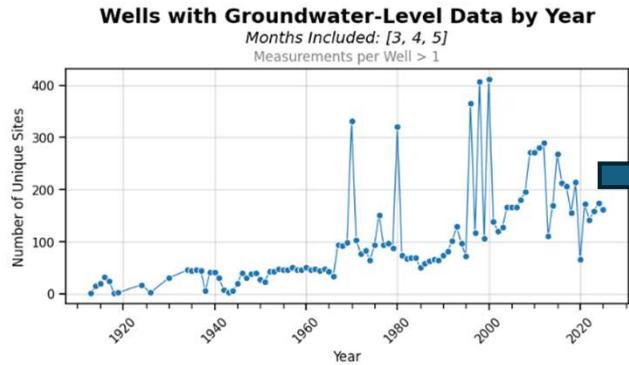


- To support the mission of IDWR it is the duty of the Department to conduct investigations, surveys and studies relative to the extent, nature, and location of the groundwater resources of the state (Idaho Code, §42-231).
- Groundwater quantities are estimated using changes in historical records of groundwater level measurements.
- IDWR's network provides data for water resource managers to evaluate the current conditions of aquifers across the state to be used in water management decisions.
- IDWR staff **manually measures the "depth to water"** in over 1,100 wells throughout Idaho, typically each spring and fall.
- Over 650 wells have been instrumented with **pressure transducers** that continuously measure water levels.
- Data is stored in the **groundwater level database** maintained by IDWR and is available to the public at <https://idwr-groundwater-data.idaho.gov/>.

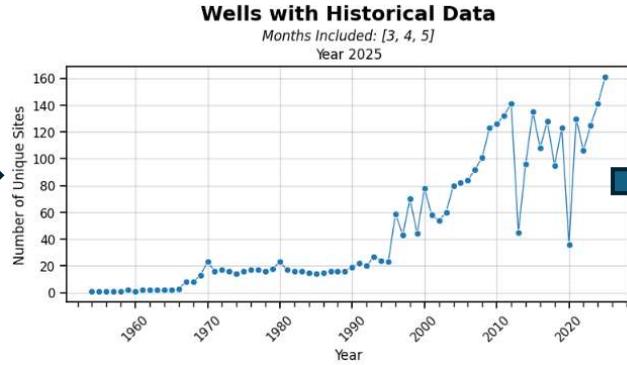
Process



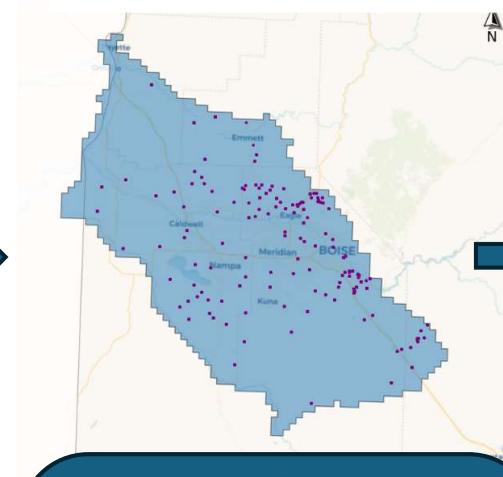
1
Find all wells within study area
[>8000 wells]



2
Find years with the most available data for spring months

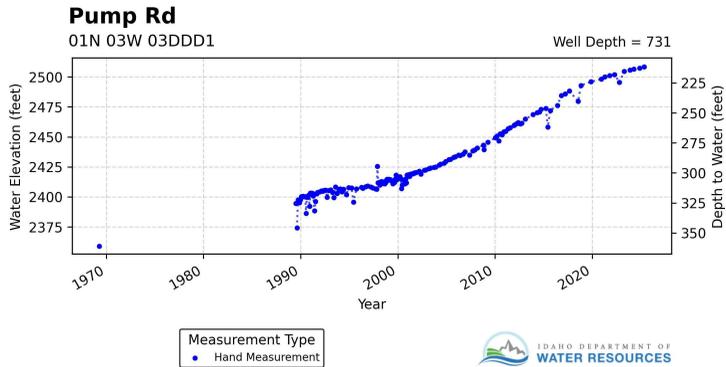
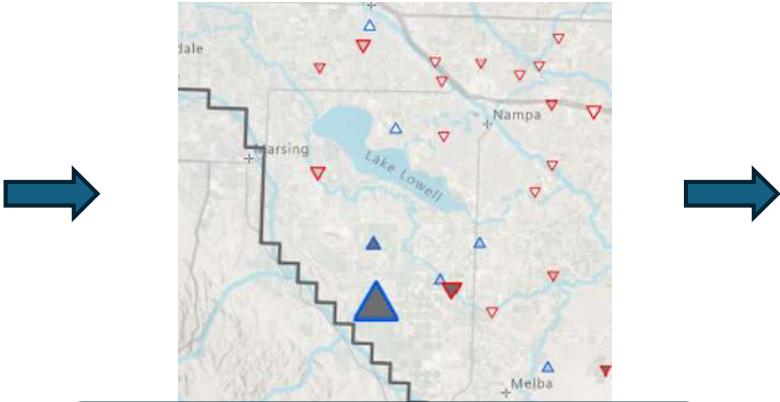


3
Select starting year(s) and explore how many measurements are available for past year(s).



4
Select a previous year for comparison and explore the quantity and spatial distribution of wells

Process



5

Calculate change values.

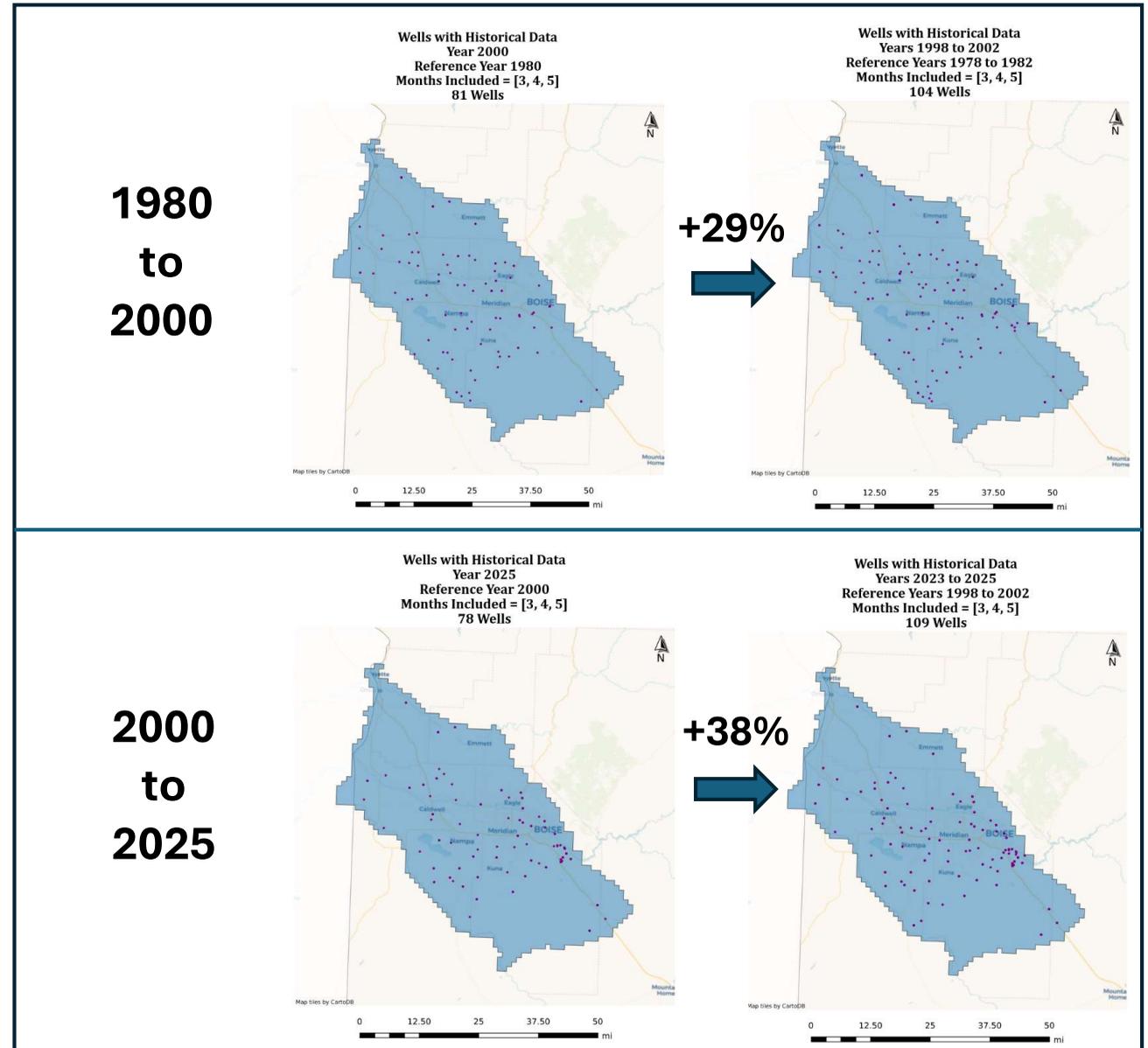
- Multiple values in one year -> Use shallowest
- Multiple values across multiple years -> Use median

6

Audit hydrographs for accuracy

Increasing Data Availability

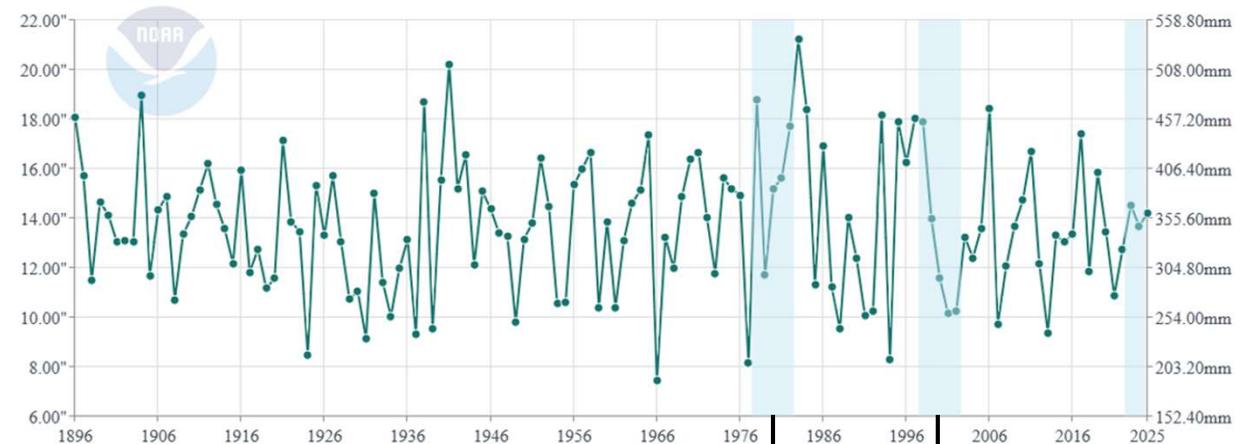
- How to increase the number of wells available for analysis while maintaining data integrity/accuracy?
- Use range of years instead of explicit years
 - 1980 to 2000 -> [1978:1982] to [1998:2002]
 - 2000 to 2025 -> [1998:2002] to [2023:2025]
- Increases data points by ~30%.
- If multiple measurements exist within a year range, then calculate the median.
- Do not apply to narrow time ranges such as 5 years (Example: 2021 to 2025).



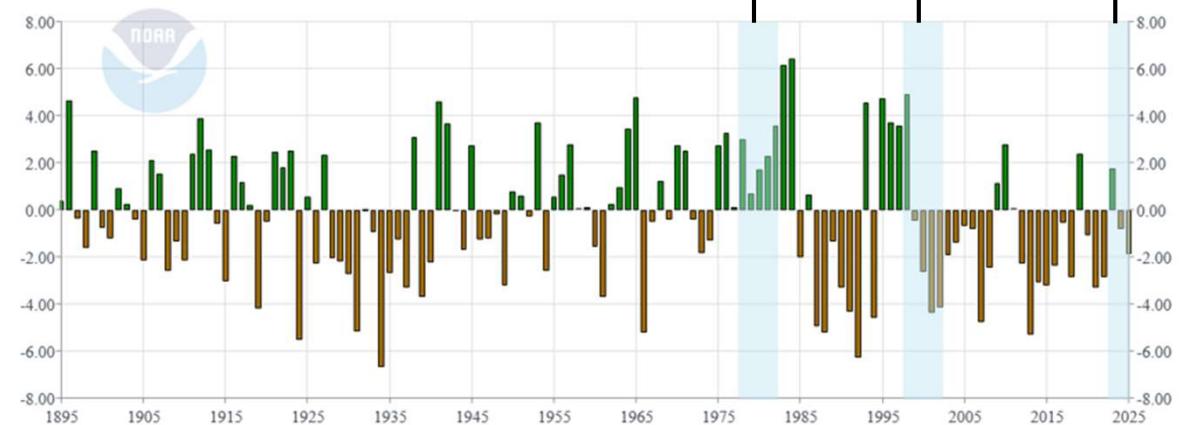
Climate

- Reviewed climate data for context.
 - 1978 – 1982 was relatively wet
 - 1998 – 2002 was relatively dry
 - 2023 – 2025 was average

Idaho, Climate Division 5 Precipitation
September-August

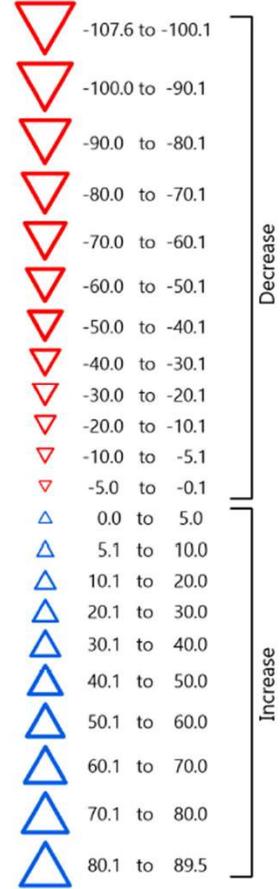


Idaho, Climate Division 5 Palmer Drought Severity Index (PDSI)
August



Treasure Valley Groundwater-Level Changes: 1980 to 2000

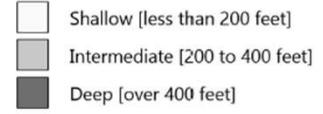
Magnitude of change (feet)



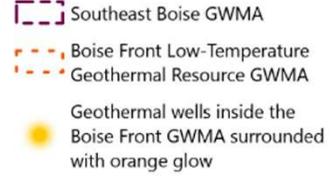
Decrease

Increase

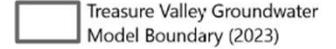
Well completion depth for each well indicated by symbol fill color



Groundwater Management Areas (GWMA)



Study Area



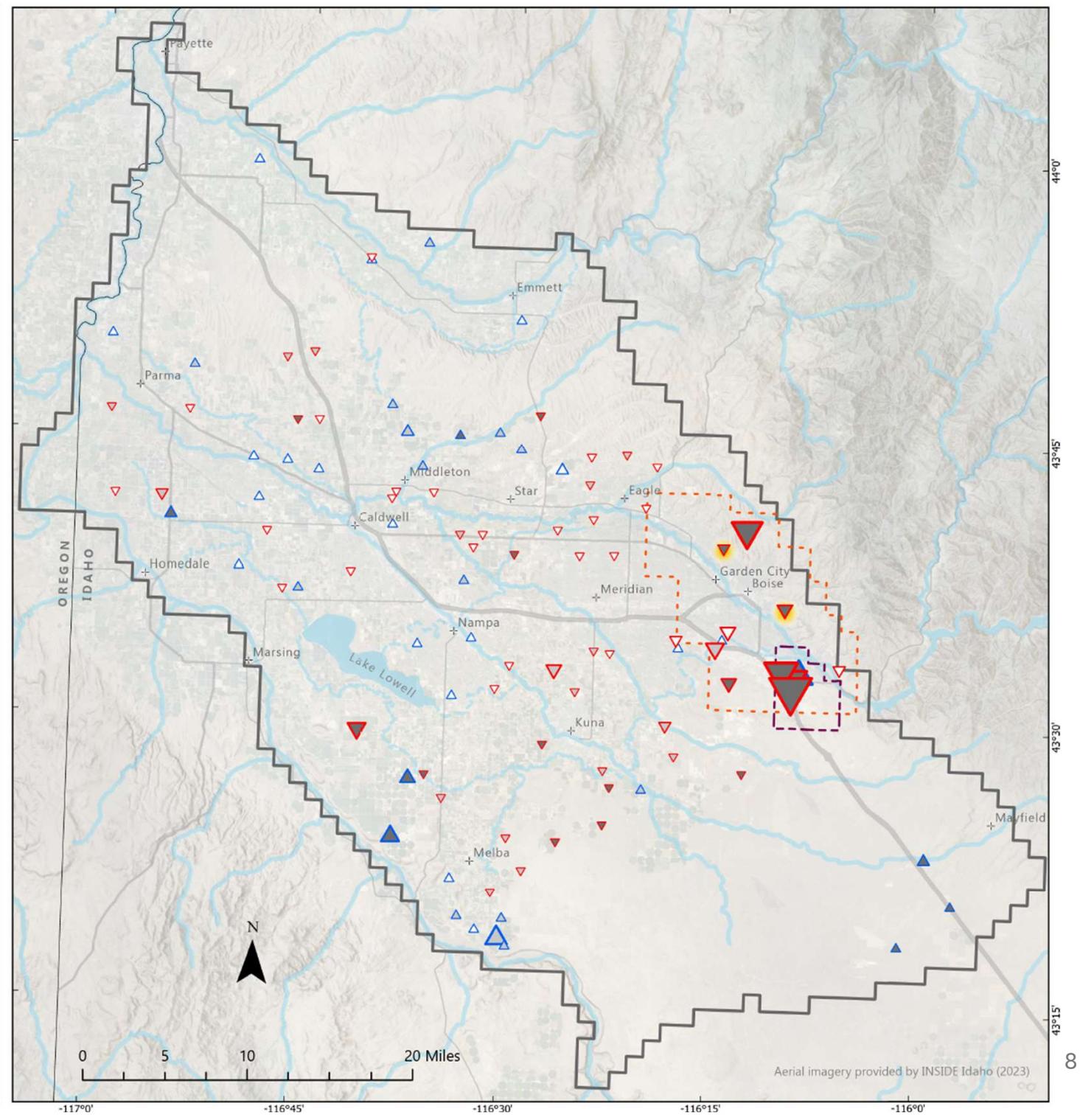
Groundwater level is the depth measured from the ground surface to the groundwater surface in a well. Changes in groundwater level are shown for **106 wells** to compare conditions from 1980 to 2000.

Measurements were from spring months (March to May) to minimize seasonal variations. Each time period represents the median value from a range of years to improve data availability. 1980 reflects data from 1978 to 1982. 2000 reflects data from 1998 to 2002. Measurements visibly affected by pumping conditions were excluded from analysis.



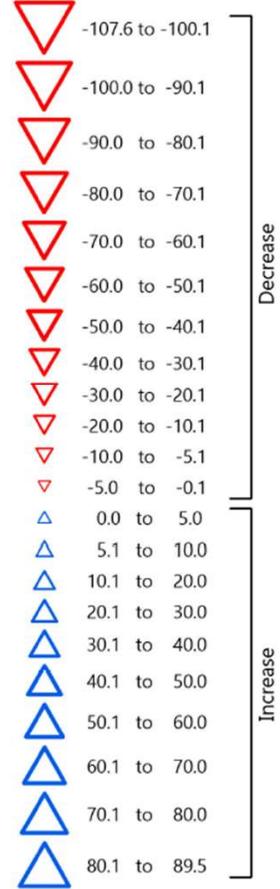
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MAP CREATED FEBRUARY 2026



Treasure Valley Groundwater-Level Changes: 2000 to 2025

Magnitude of change (feet)



Decrease

Increase

Well completion depth for each well indicated by symbol fill color

- Shallow [less than 200 feet]
- Intermediate [200 to 400 feet]
- Deep [over 400 feet]

Groundwater Management Areas (GWMA)

- Southeast Boise GWMA
- Boise Front Low-Temperature Geothermal Resource GWMA
- Geothermal wells inside the Boise Front GWMA surrounded with orange glow

Study Area

- Treasure Valley Groundwater Model Boundary (2023)



STUDY AREA

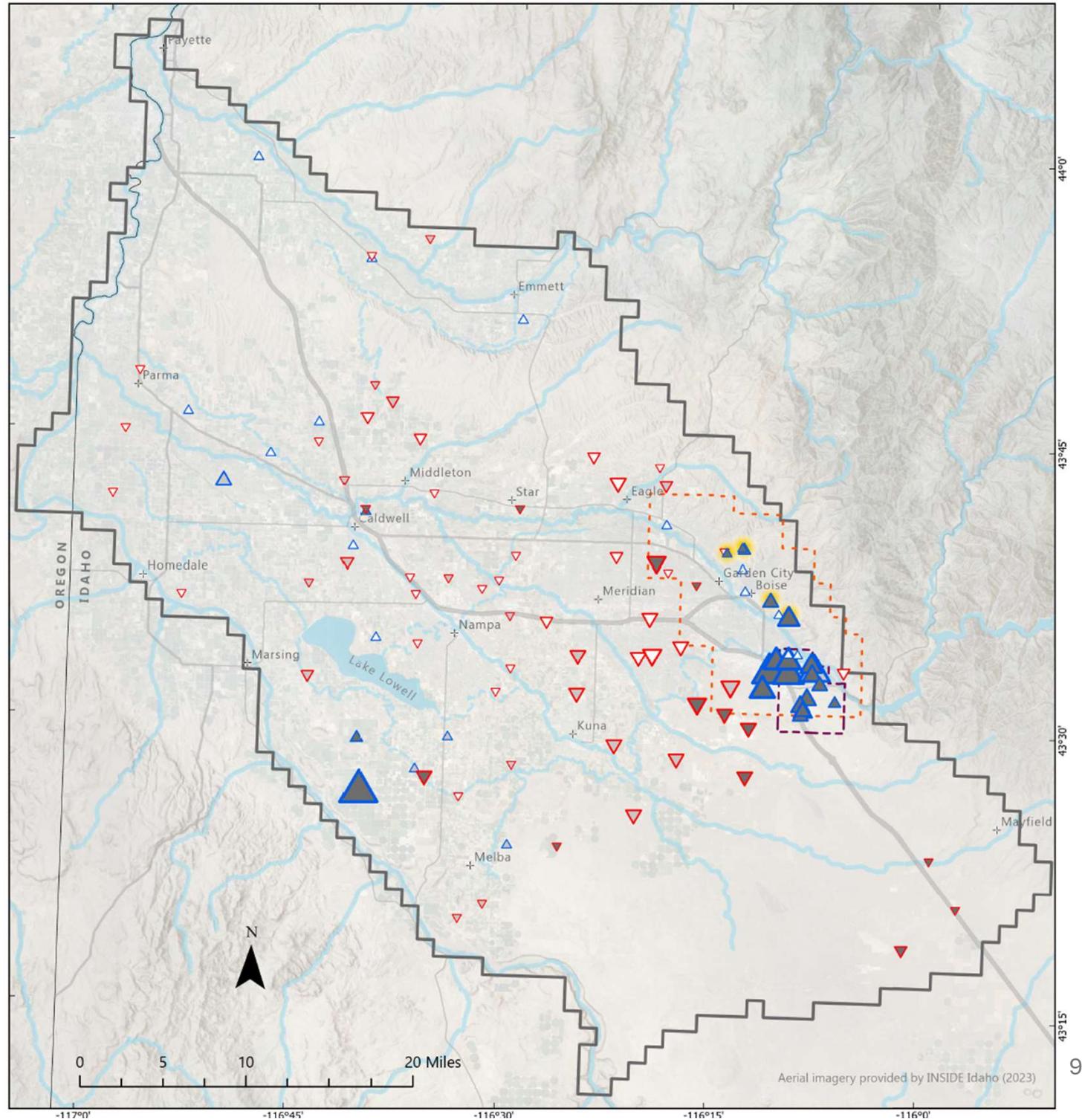
Groundwater level is the depth measured from the ground surface to the groundwater surface in a well. Changes in groundwater level are shown for **115 wells** to compare conditions from 2000 to 2025.

Measurements were from spring months (March to May) to minimize seasonal variations. Each time period represents the median value from a range of years to improve data availability. 2000 reflects data from 1998 to 2002. 2025 reflects data from 2023 to 2025. Measurements visibly affected by pumping conditions were excluded from analysis.



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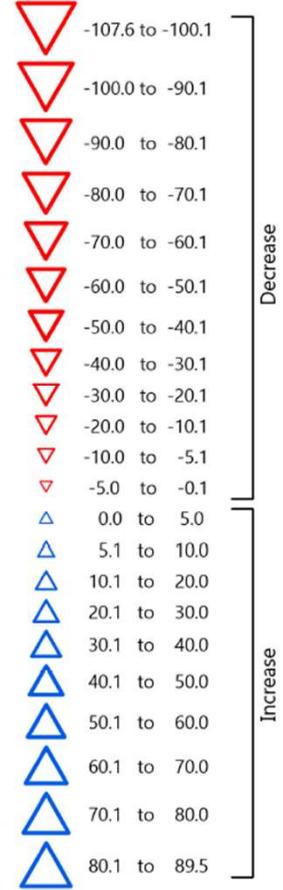
MAP CREATED FEBRUARY 2026



Aerial imagery provided by INSIDE Idaho (2023)

Treasure Valley Groundwater-Level Changes: 2021 to 2025

Magnitude of change (feet)



Decrease

Increase

Well completion depth for each well indicated by symbol fill color

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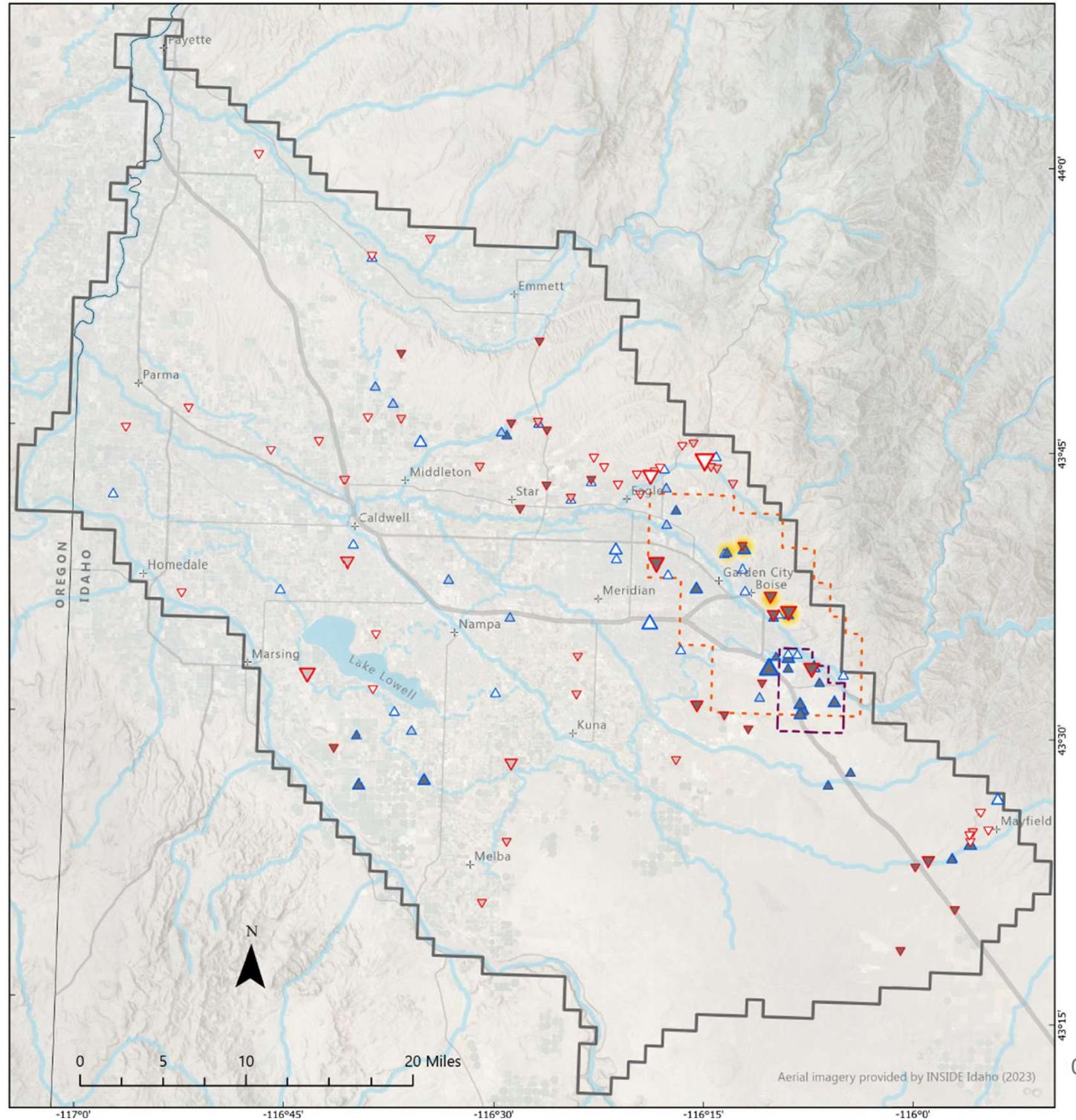
Groundwater level is the depth measured from the ground surface to the groundwater surface in a well. Changes in groundwater level are shown for **135 wells** to compare conditions from 2021 to 2025.

Measurements were from spring months (March to May) to minimize seasonal variations. Measurements visibly affected by pumping conditions were excluded from analysis.



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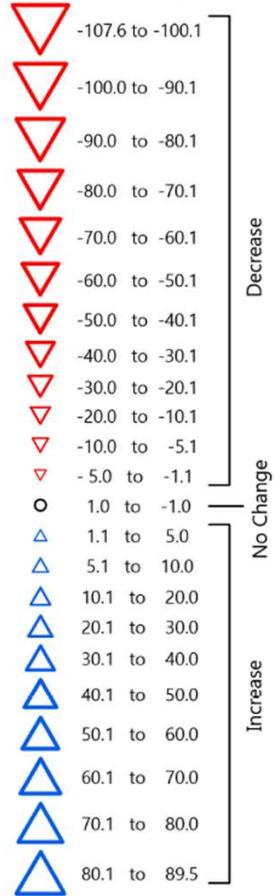
MAP CREATED FEBRUARY 2026



Aerial imagery provided by INSIDE Idaho (2023)

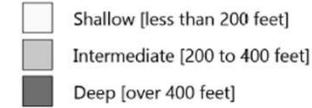
Treasure Valley Groundwater-Level Changes: 2000 to 2025

Magnitude of change (feet)

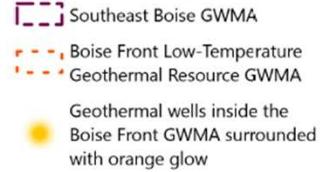


Decrease
No Change
Increase

Well completion depth for each well indicated by symbol fill color



Groundwater Management Areas



Study Area



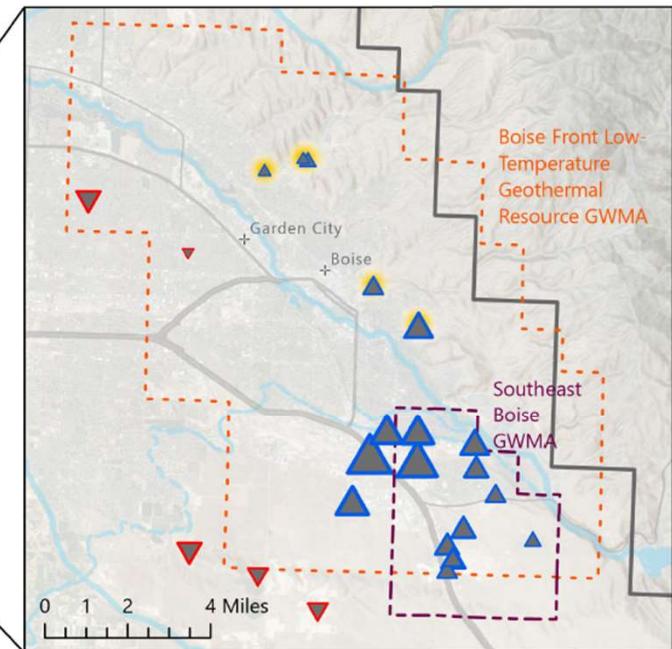
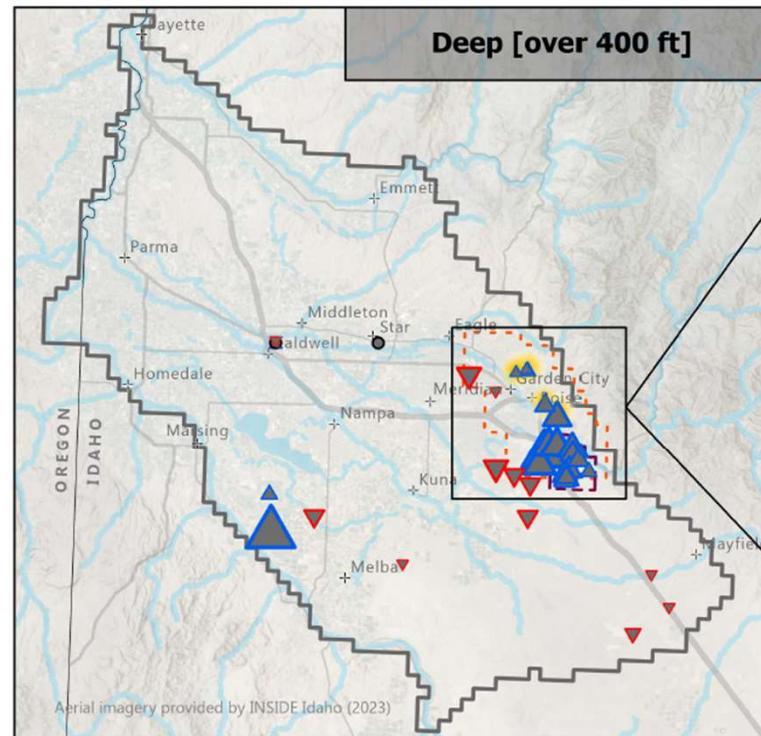
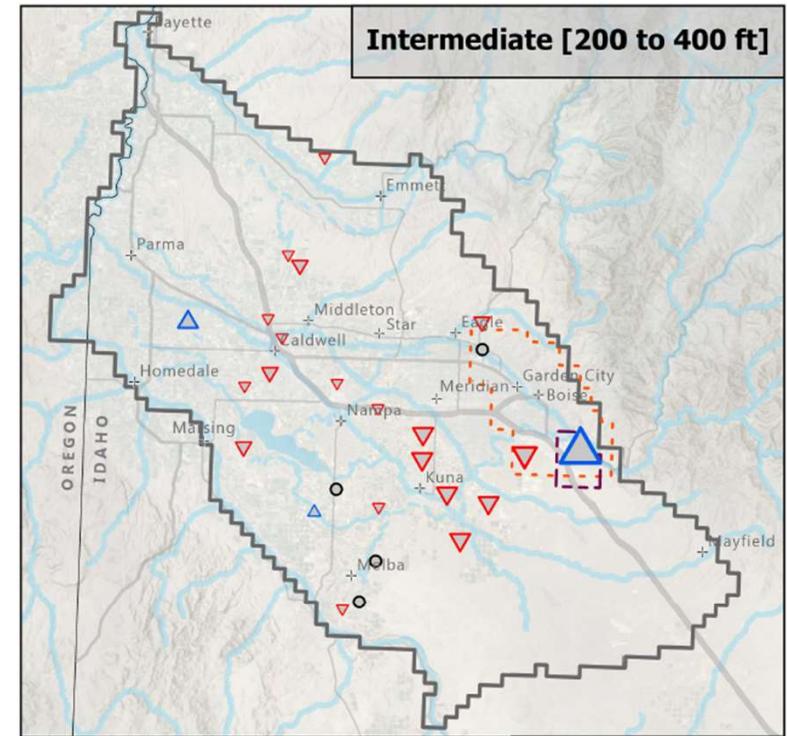
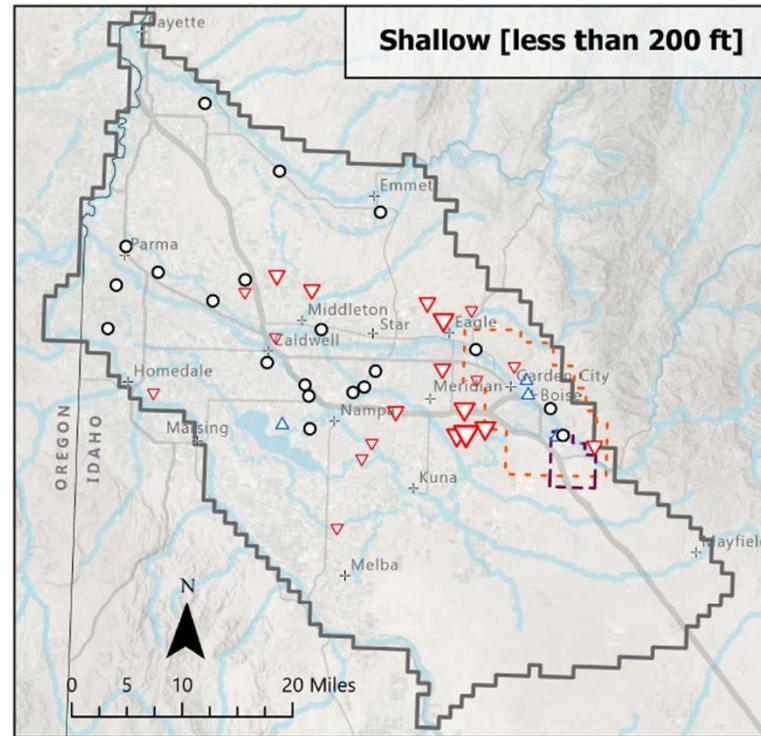
Groundwater level is the depth measured from the ground surface to the groundwater surface in a well. Changes in groundwater level are shown for **115 wells** to compare conditions from 2000 to 2025 for three different categories of well completion depths.

Measurements were from spring months (March to May) to minimize seasonal variations. Each time period represents the median value from a range of years to improve data availability. 2000 reflects data from 1998 to 2002. 2025 reflects data from 2023 to 2025. Measurements visibly affected by pumping conditions were excluded from analysis.



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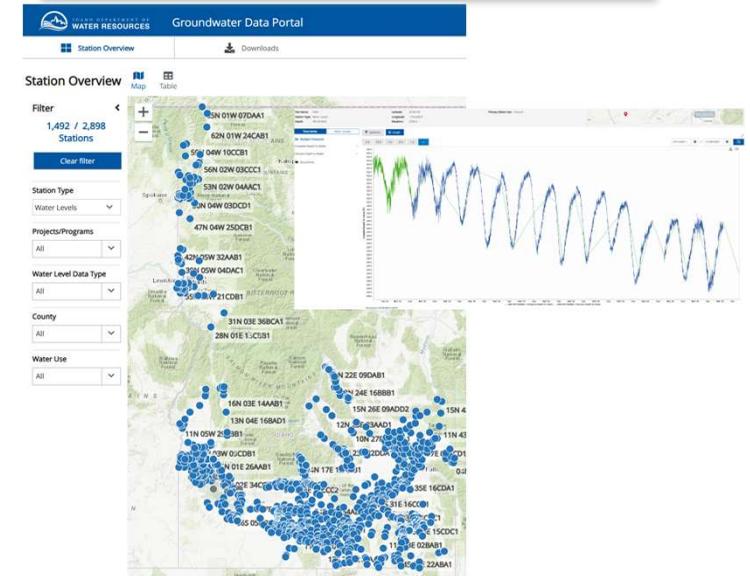
Question?

Visit our public data portal!
<https://idwr.idaho.gov/water-data/groundwater-levels/>

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Interactive Map and Hydrographs



Bulk Download Raw Data

A screenshot of the Bulk Download Raw Data interface. It features a folder icon labeled 'Zipped File' and the text 'Groundwater Level Data: All Historic Data'. To the right, there is a section titled 'Groundwater Level Data: All Historic Data' with the IDWR GIS Section logo and the text 'Idaho Department of Water Resources'. An 'Open Document' button is visible at the bottom right.



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