

Investigating Groundwater and Surface-Water Bitterroot Valley, Montana Ground-Water Investigation Program



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Bitterroot Focus Watershed
Stakeholders Meeting
Hamilton, MT
February 28th, 2022

Addresses specific groundwater questions across Montana

- ✓ Designed to support science based management in Montana
- ✓ Answer locally identified questions, crucial for water management;

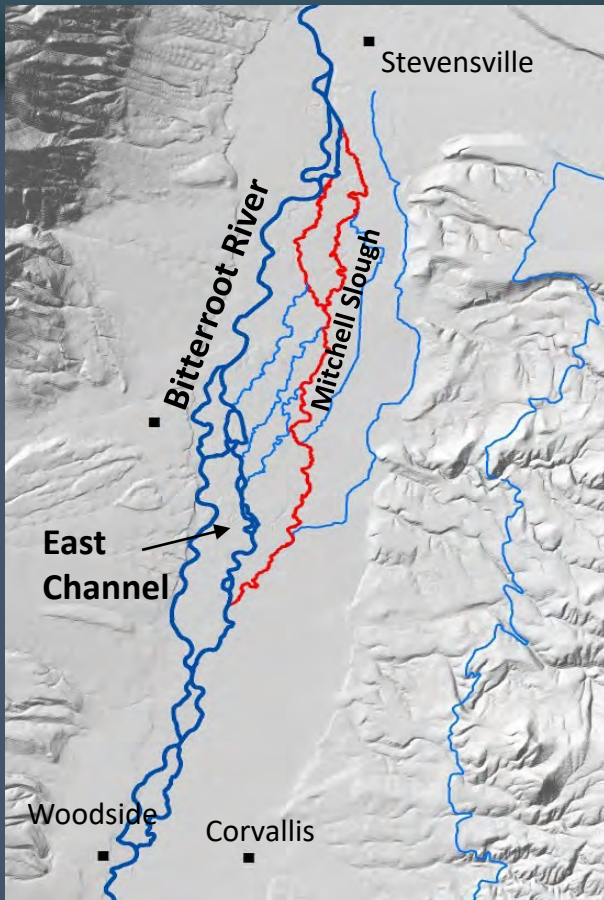


*Understanding impacts and **lack** of impacts, both are equally important. Provide information so aquifers can be managed, Not just used.*

Data Collection Efforts



- Groundwater Data
- Surface-Water Data
- Installation of Wells
- Groundwater Sampling
- Isotope Sampling
- Canal Losses/Gains
- Aquifer Testing
- Surface-Water Synoptic Runs



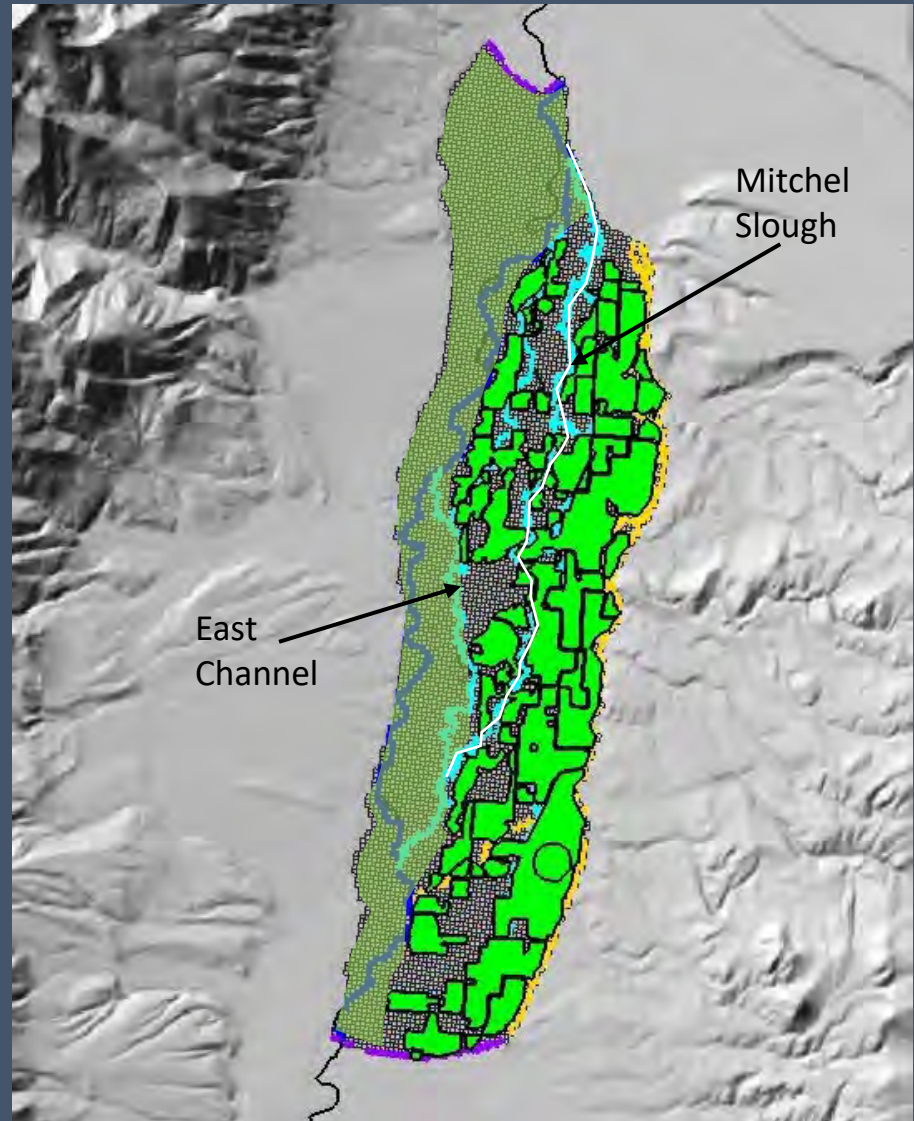
*Photo courtesy of the Ravalli County Conservation District
East Channel choked with sediment*

**To divert or not
divert....**

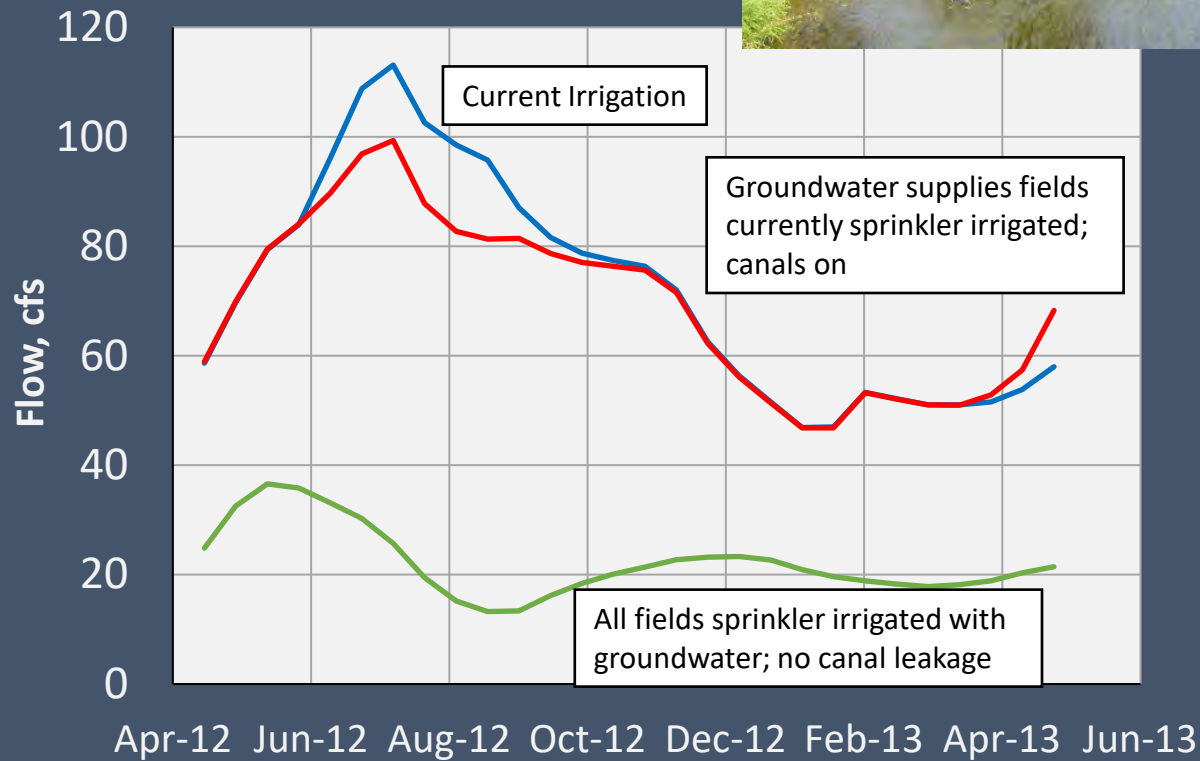
Predicting changes in hydrogeology

Developing
groundwater flow
models

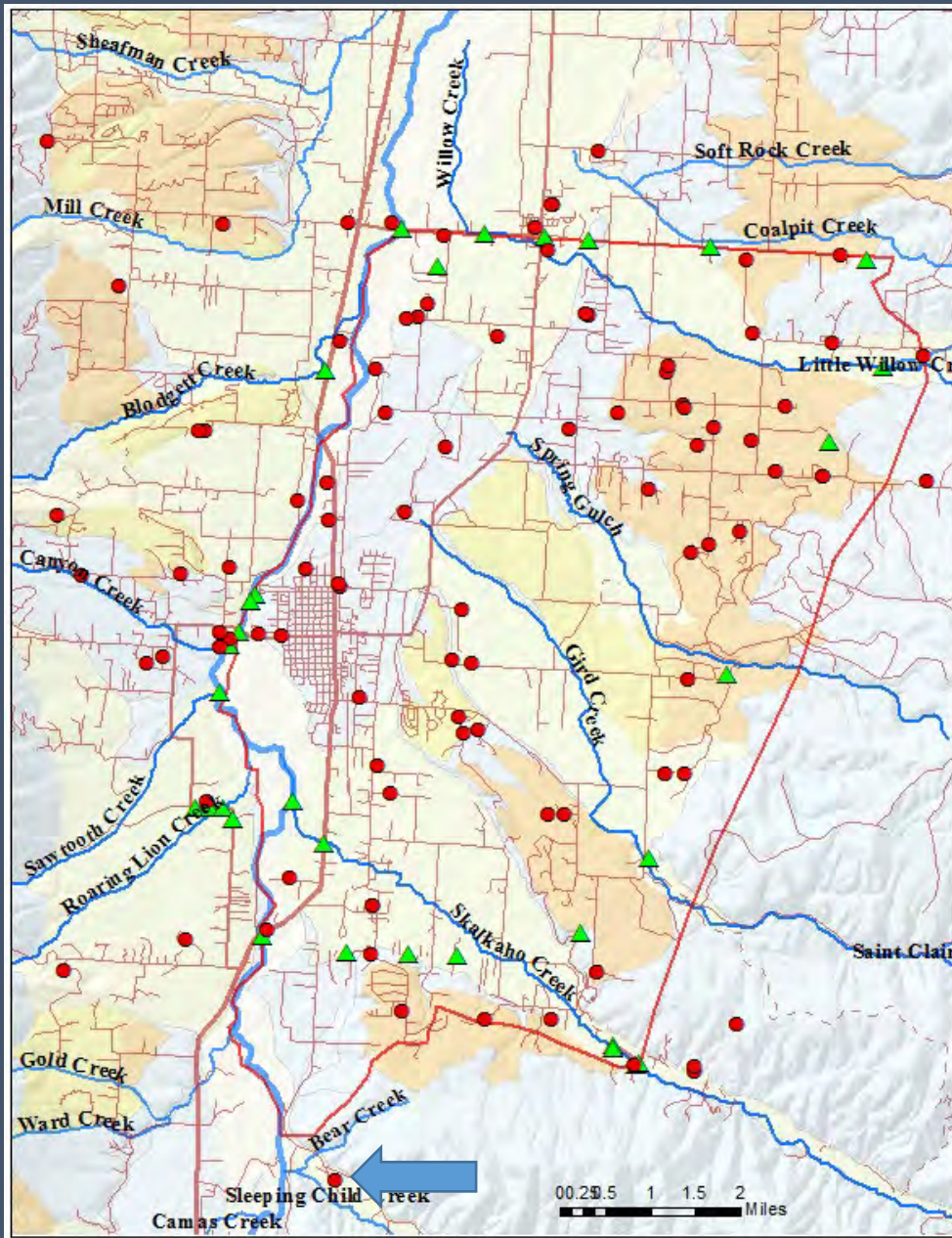
Groundwater
recharge from
irrigated fields



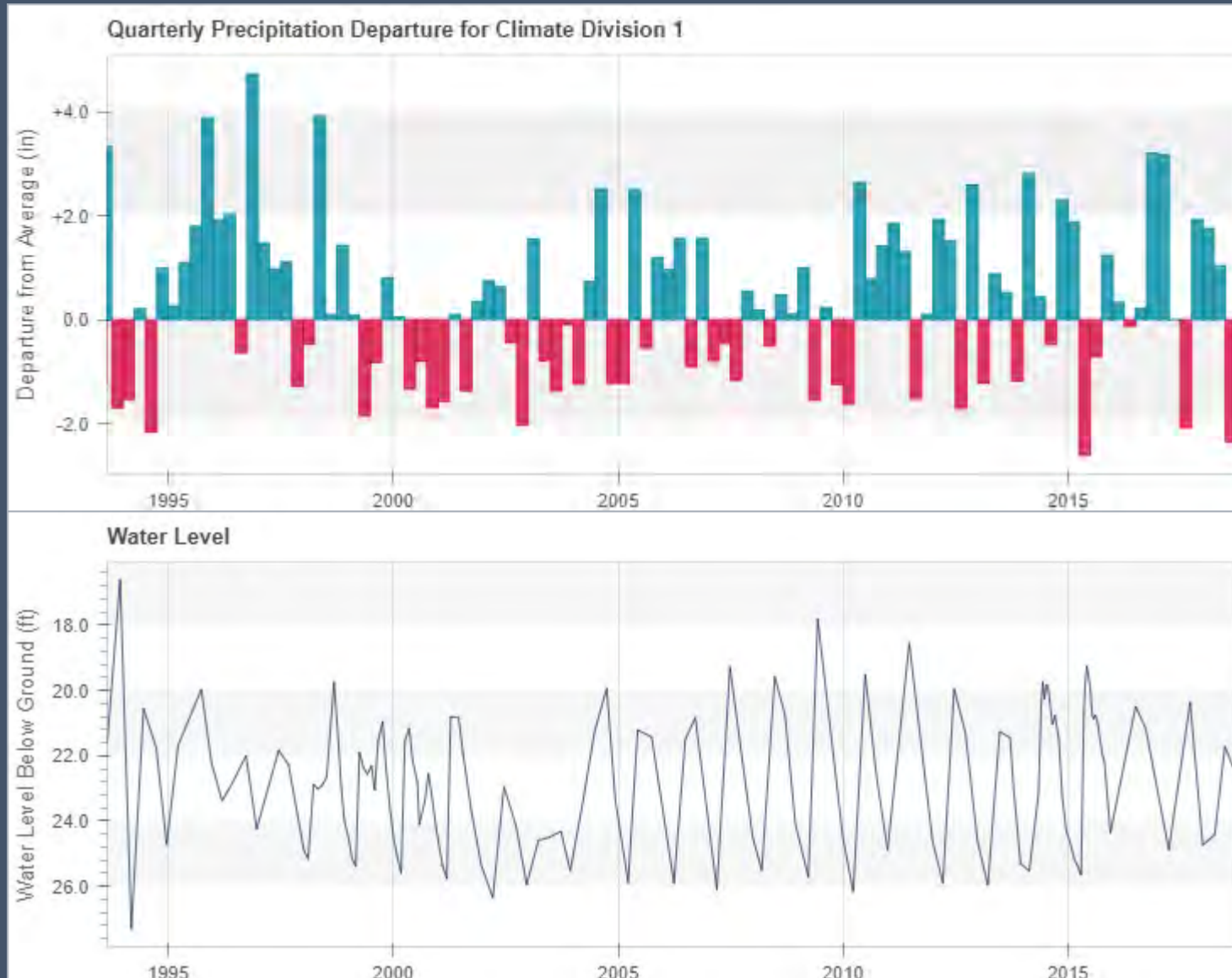
Mitchell Slough outflow



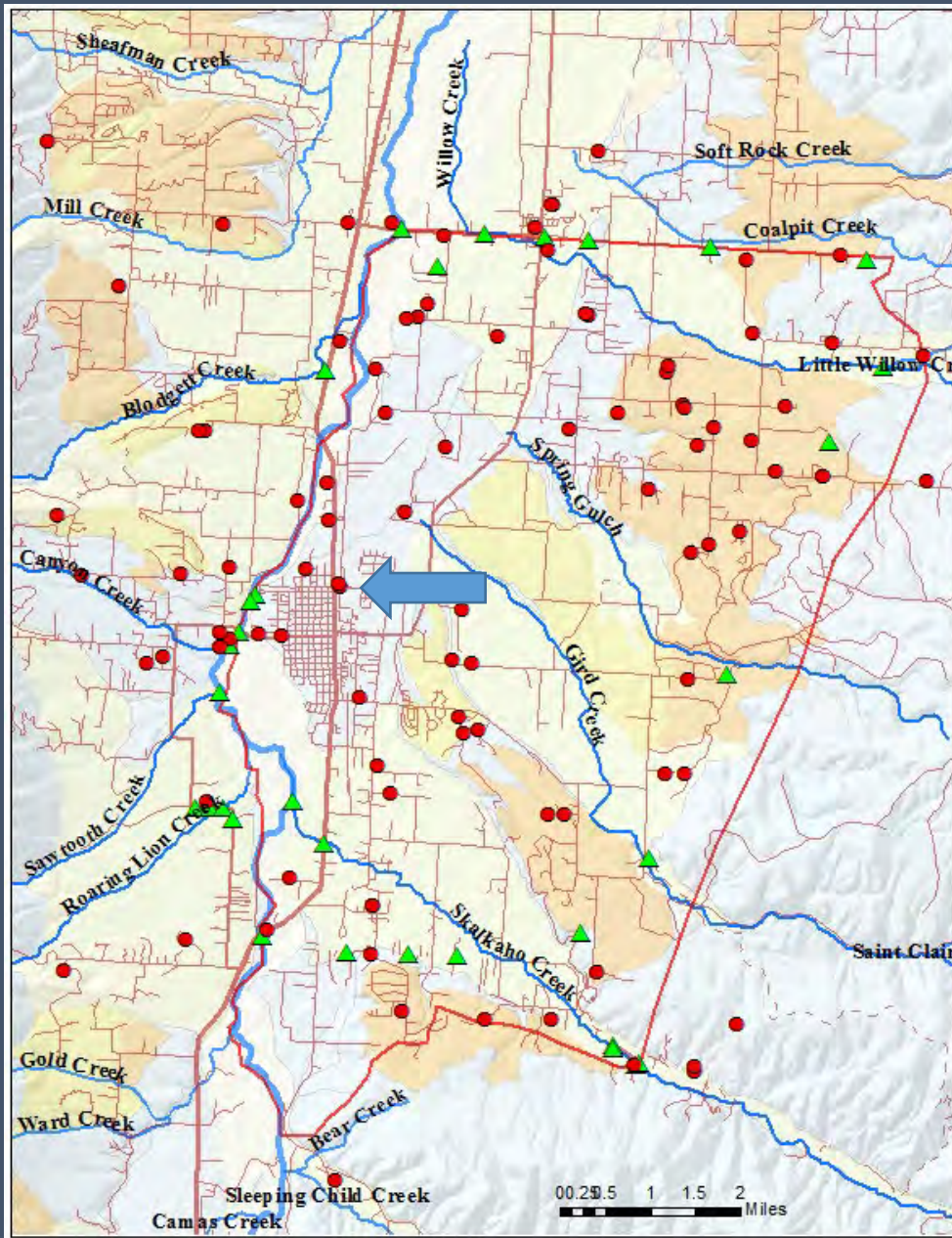
Hamilton Monitoring Network



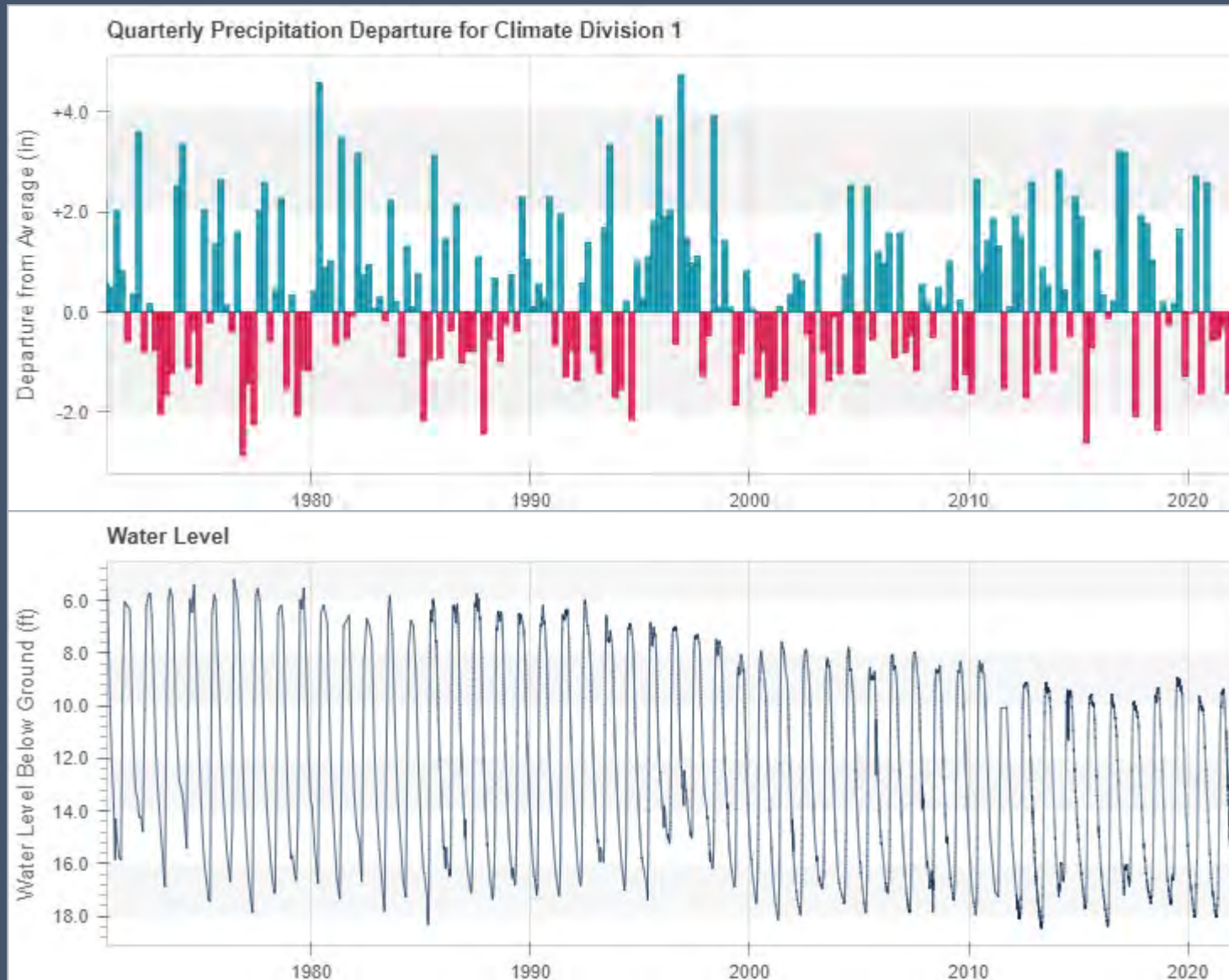
GWIC ID 52962. TD – 36 feet



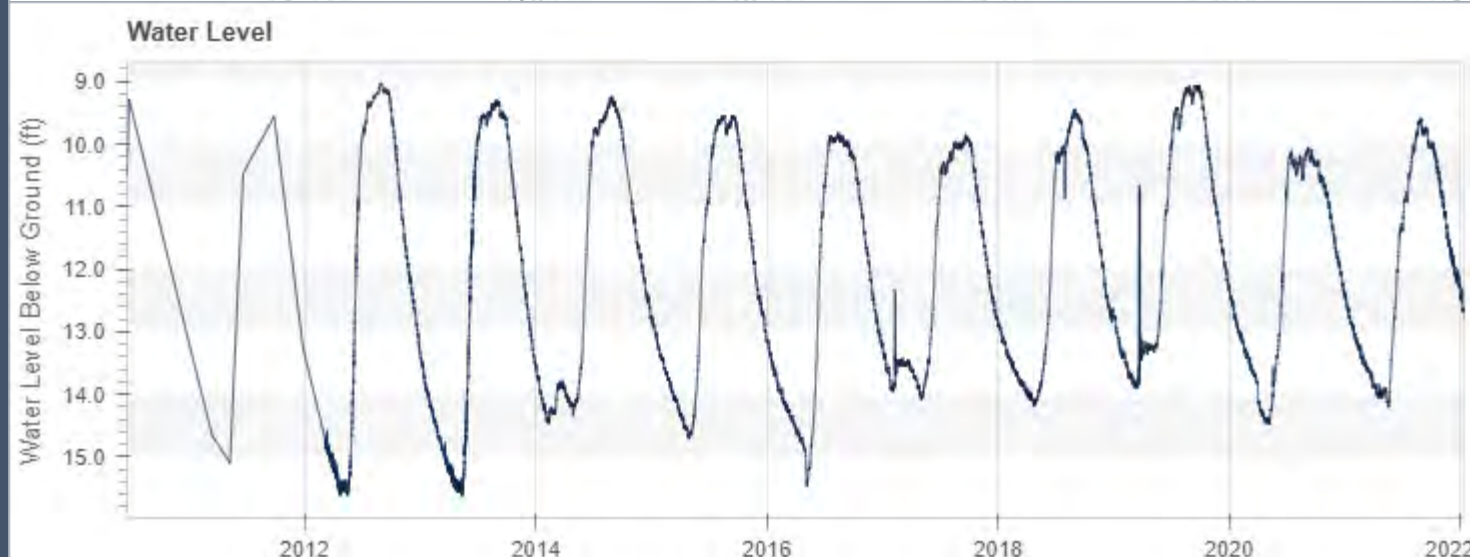
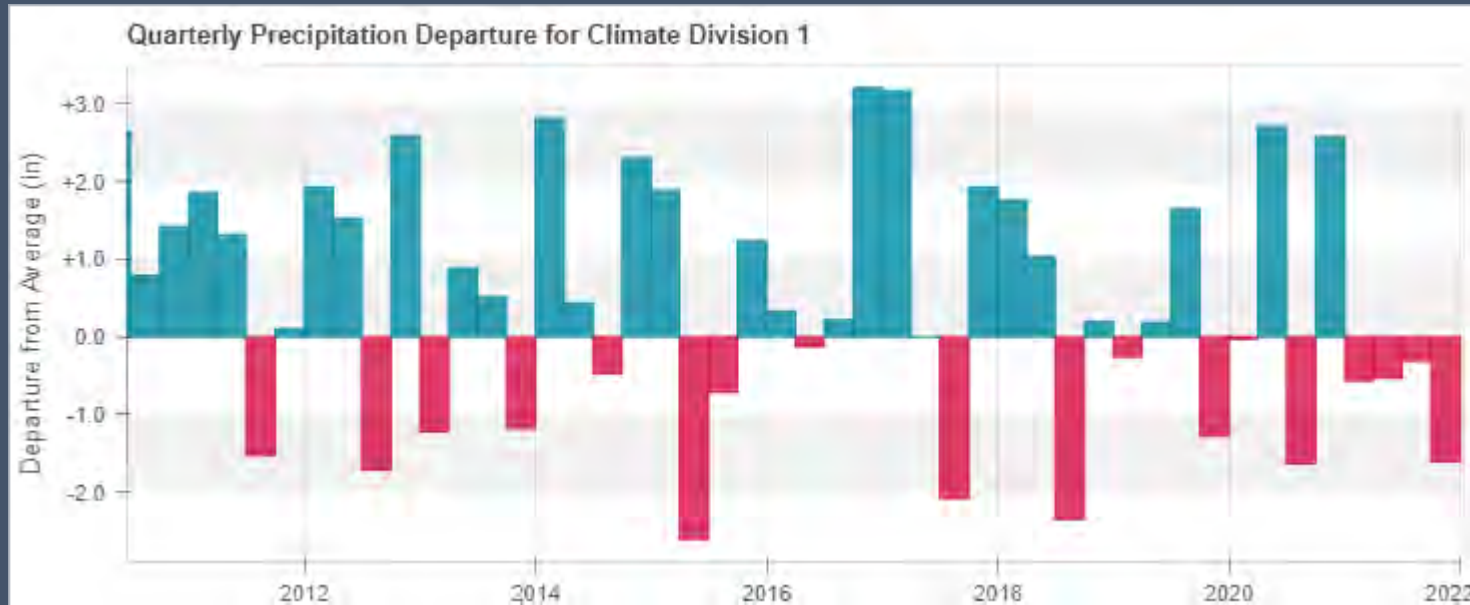
Hamilton Monitoring Network

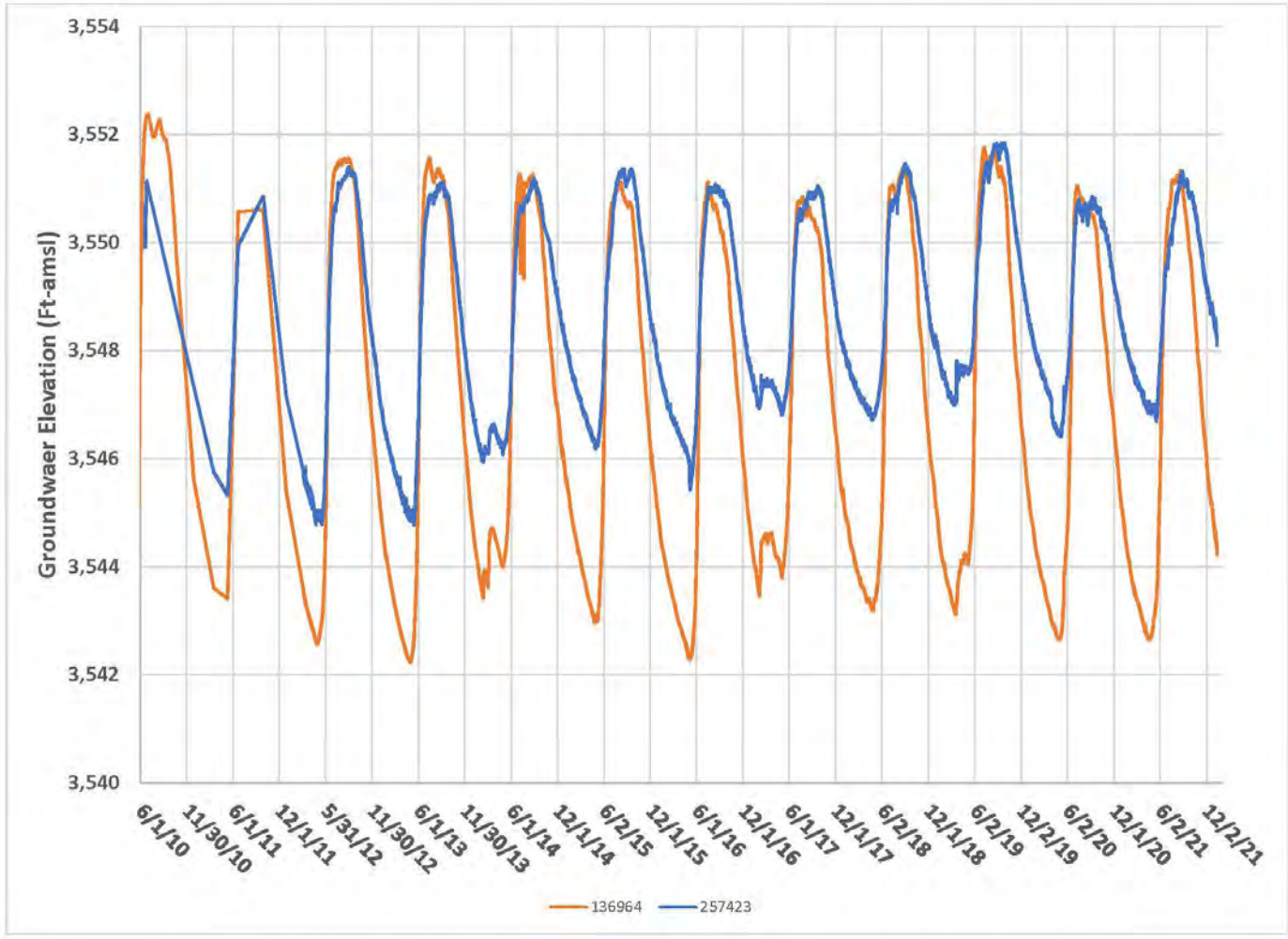


GWIC ID 136964. TD – 40 feet

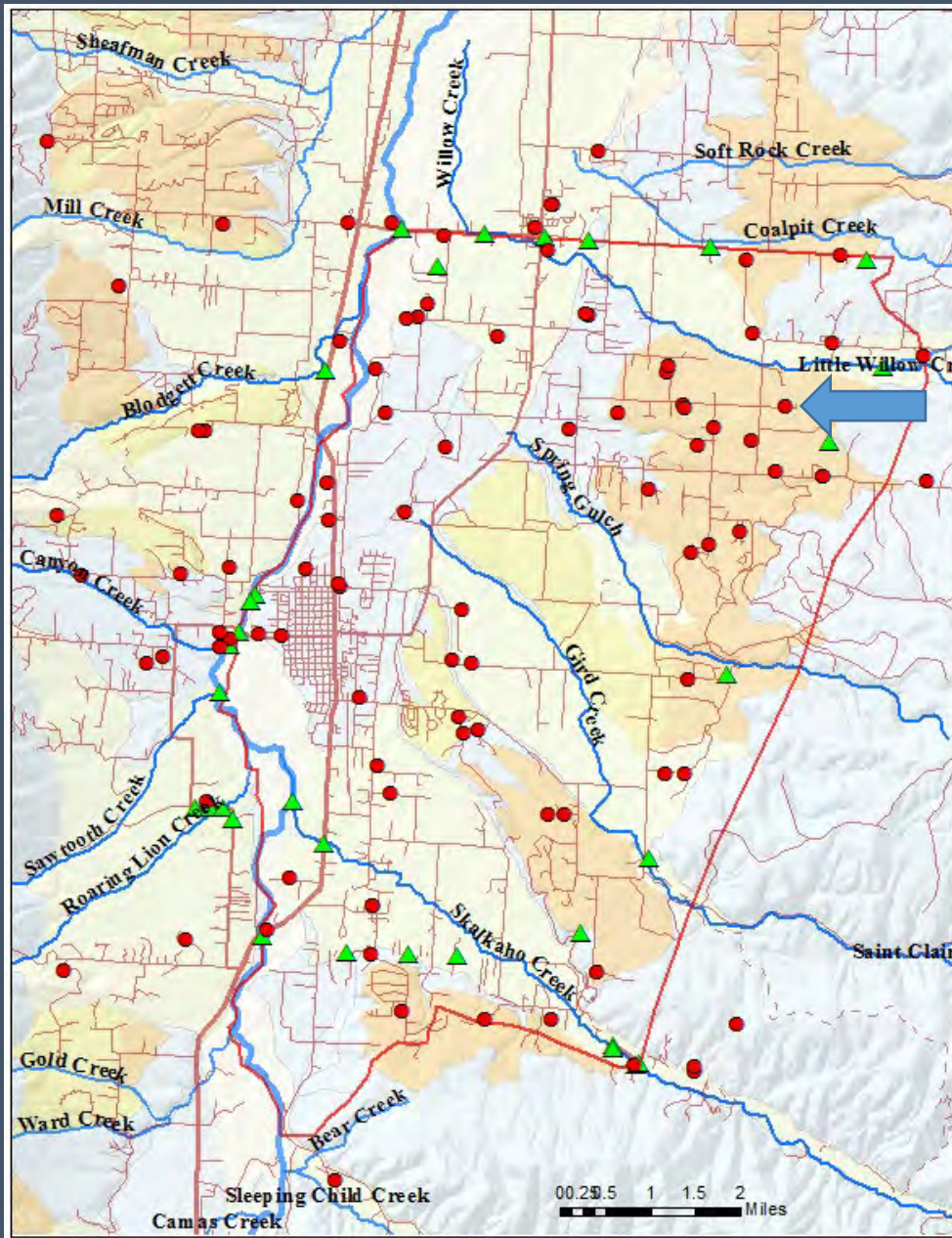


GWIC ID 257423. TD – 168 feet

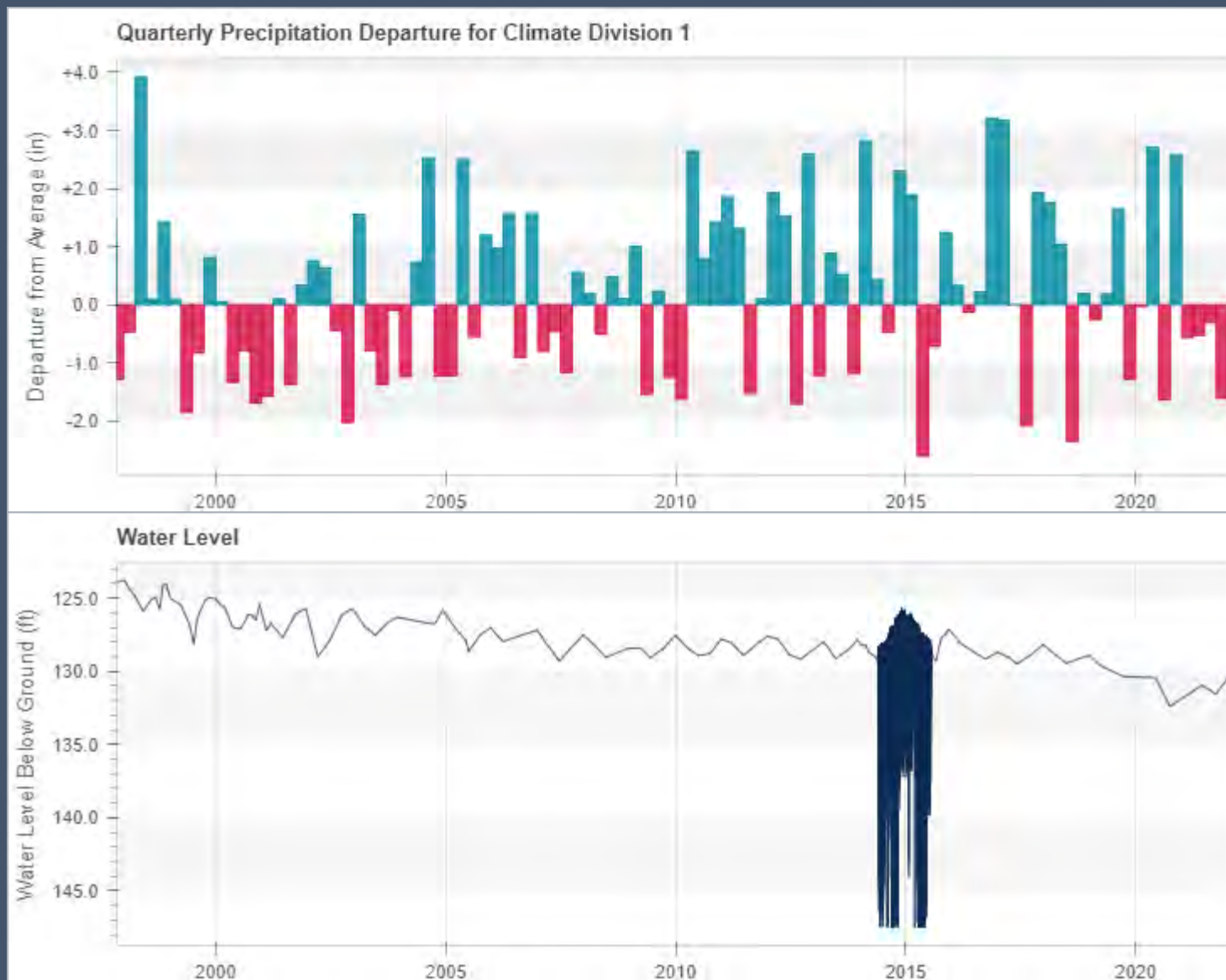




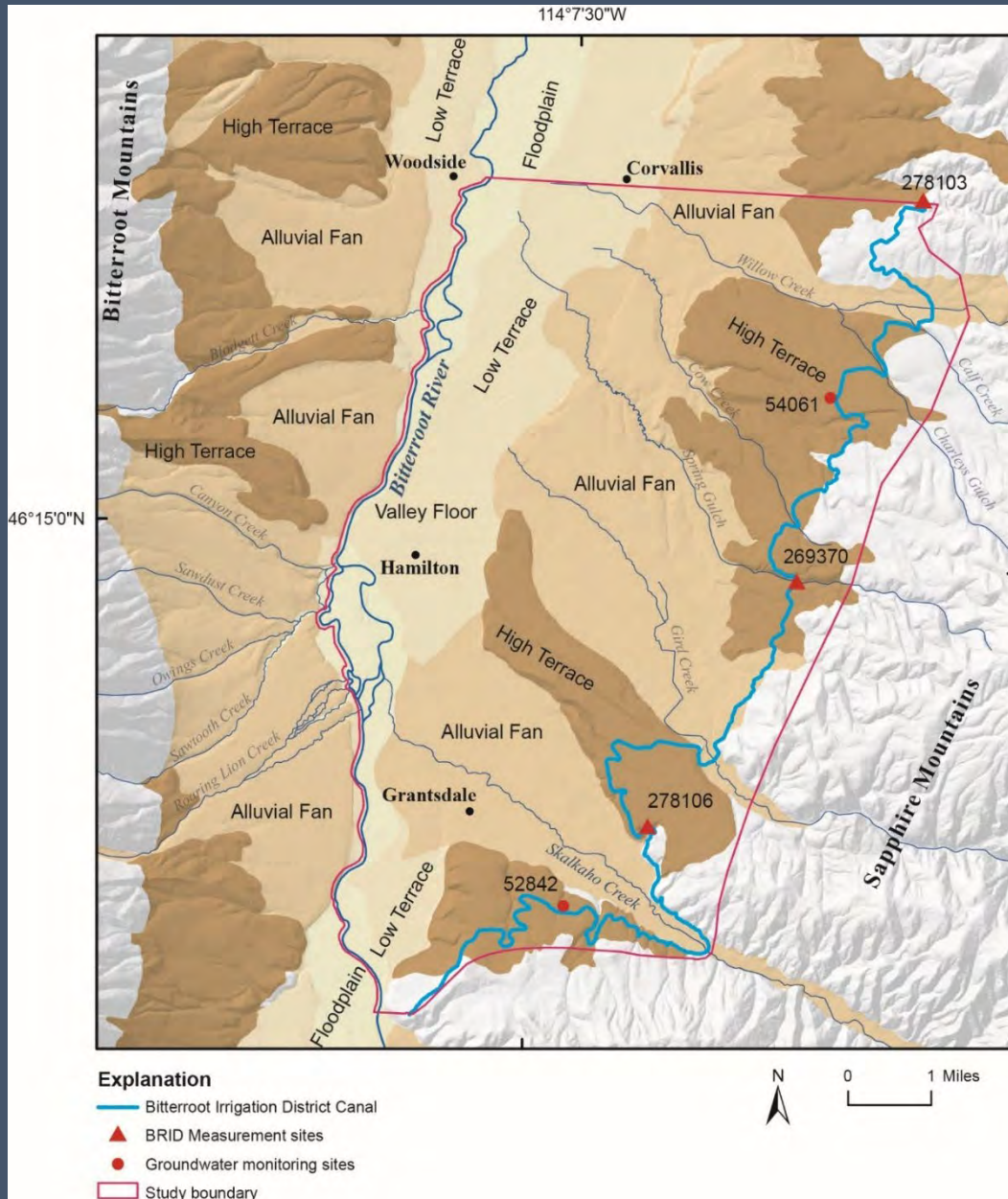
Hamilton Monitoring Network



GWIC ID 84910. TD – 240 feet

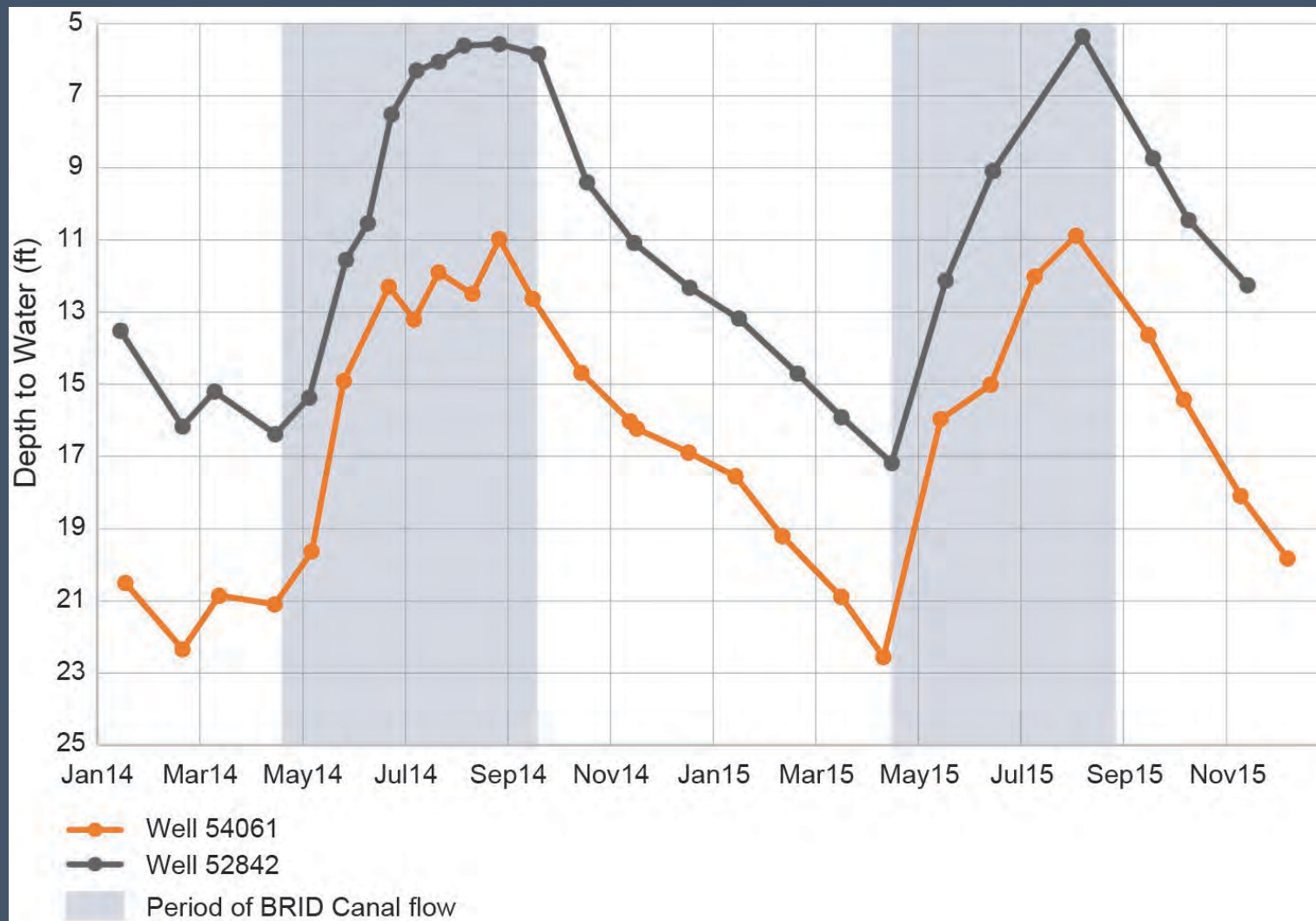


Bitterroot Irrigation District Canal Seepage



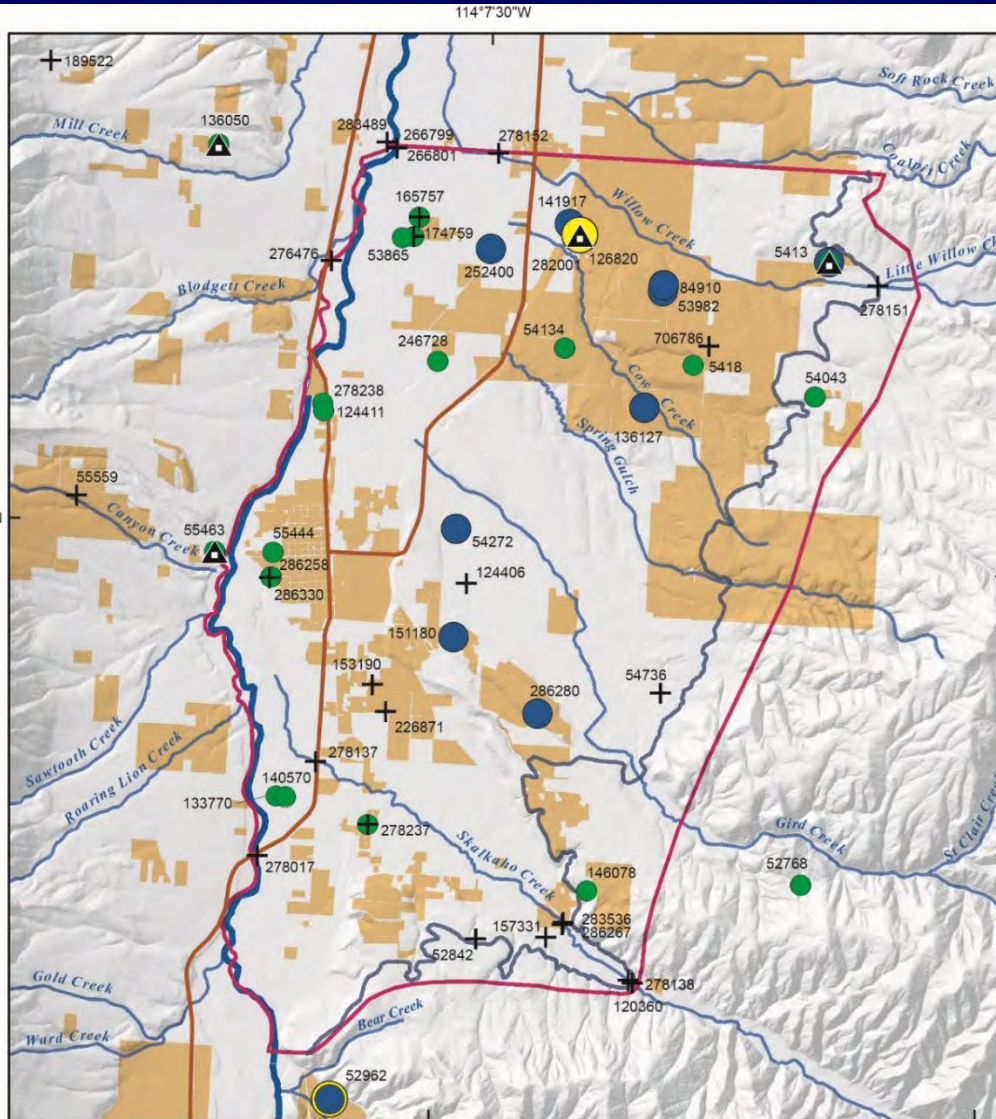
Downgradient Wells from the BRID

Preliminary Results



Average Nitrate Results from Three Samples (2014-2015)

Preliminary Results



Explanation

- USGS & MBMG dataset wells
- Study boundary
- Hamilton subdivisions 2010

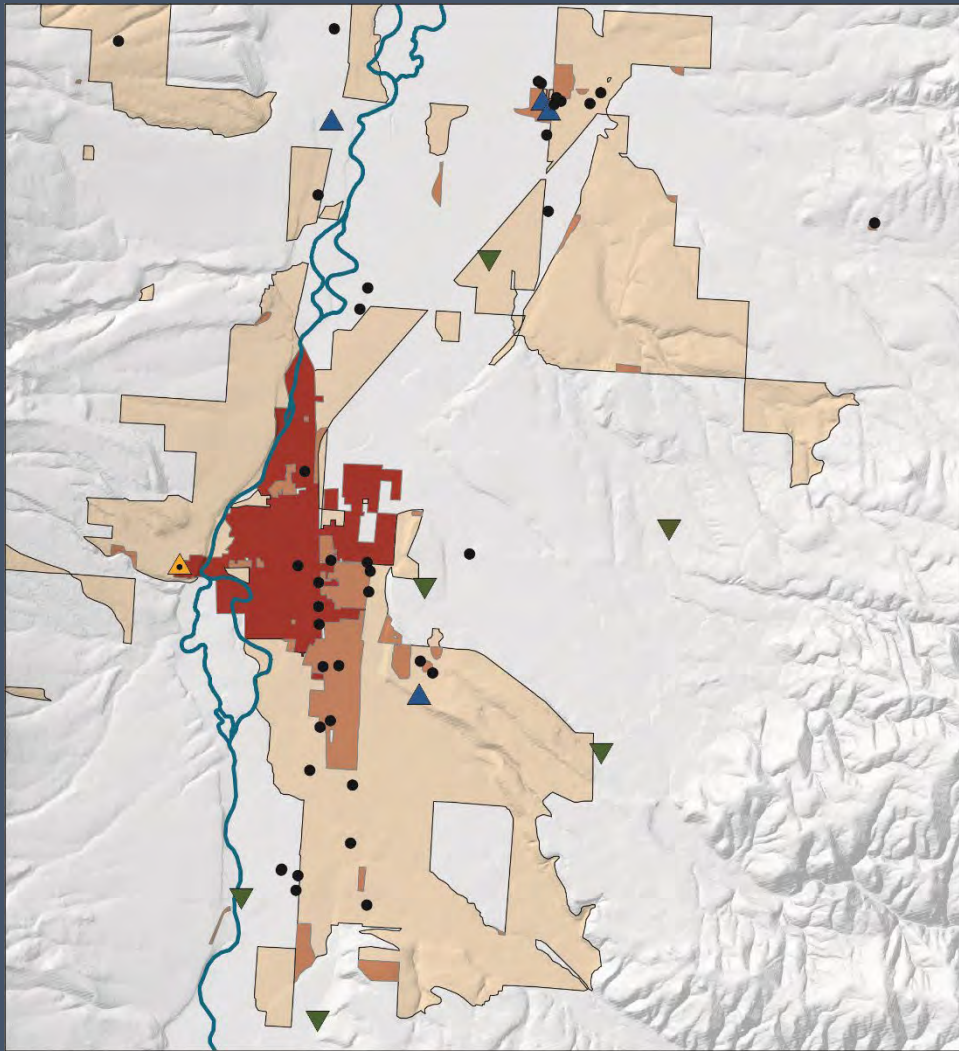
Nitrate-N, mg/l

- 0.0-0.5
- 0.6-1.5
- 1.6-3.0
- 3.1-4.8



Public Water Supply Nitrate Trends (2007-2016)

Preliminary Results



2007-2016 Nitrate Trend

- Increasing [0.59 (mg/l)/yr]
- Slightly Increasing [<0.1 (mg/l)/yr]
- No Apparent Trend
- Decreasing [>-0.1 (mg/l)/yr]

Septic Density 2010

- Moderate
- High
- Critical

0 1 2 Miles



Questions?



Other Subjects, not included:

- Bitterroot River Surface-water Budget
- BRID Seepage Measurements & Calculations

For more information, please contact me.

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