Update on Greenfields Bench Groundwater Study

Montana Bureau of Mines and Geology, Ground Water Investigation Program

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Montana State Geologic Survey

- Established in 1919 to provide reliable and unbiased earth science information
- Non-regulatory, applied research
  - Geologic Mapping
  - Geohazards/Earthquake studies
  - Economic Geology
  - Environmental Assessment
  - Data Preservation
  - Groundwater
- **All data we collect is available to the public**

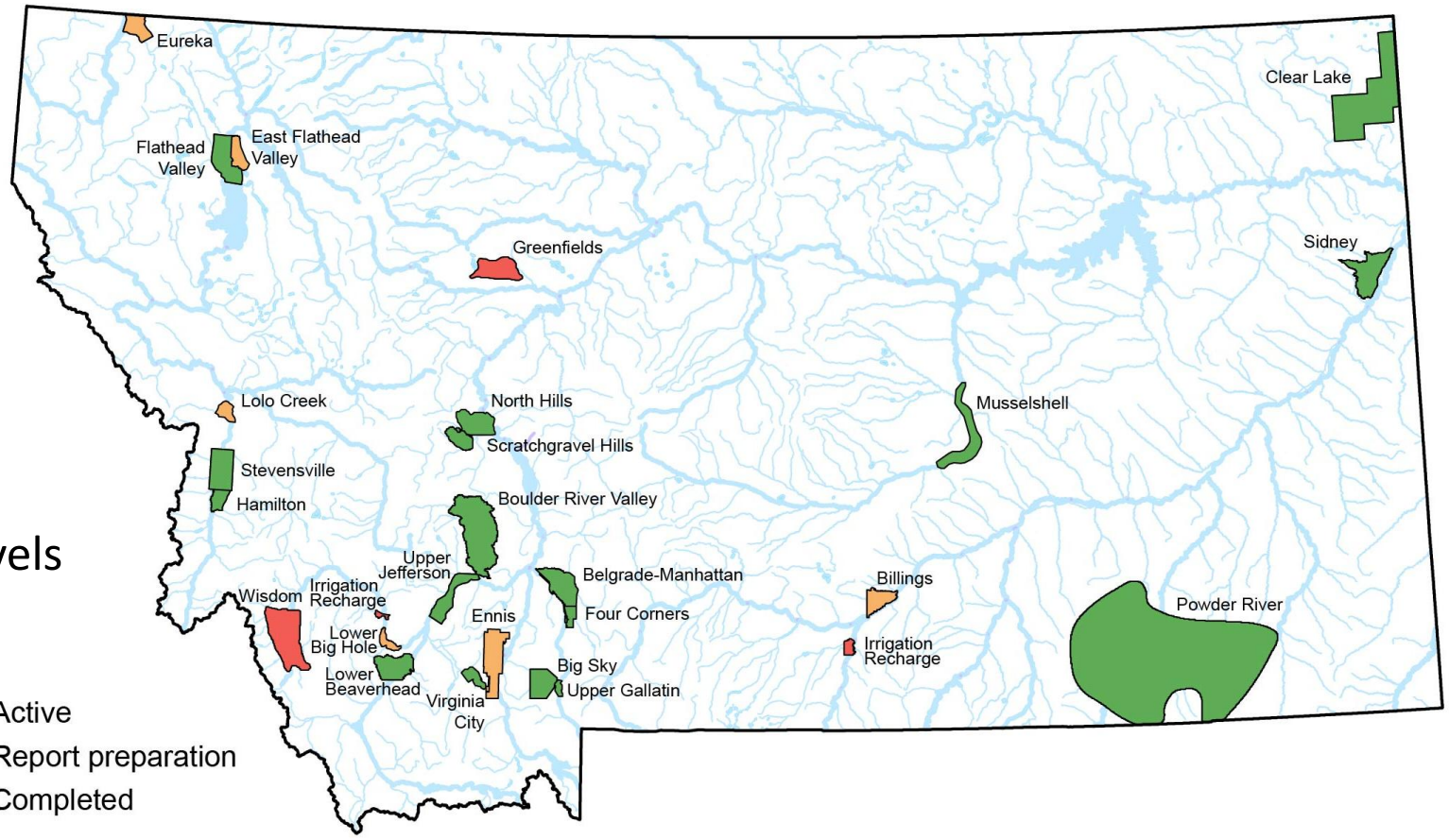
http://www.mbmg.mtech.edu/

Ground Water Investigation Program

- GWIP encompasses site-specific studies of groundwater resource concerns that support statewide and local decisions regarding water

- GWIP answers locally identified questions regarding water resources

- Topics include:
  - Land-use change impacts on groundwater and surface-water levels
  - Effects of increased groundwater withdrawals
  - Water quality
  - Drought



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Project Purpose

- Water shortages are widespread
- Long water delivery time from the reservoir can result in unused irrigation water discharging to Muddy Creek
- Greenfields Irrigation District (GID) has proposed irrigation/water delivery improvements
  - Re-regulation ponds

How will groundwater respond to potential changes in the canal delivery system and irrigation practices?

Main Canal at 4th Ln

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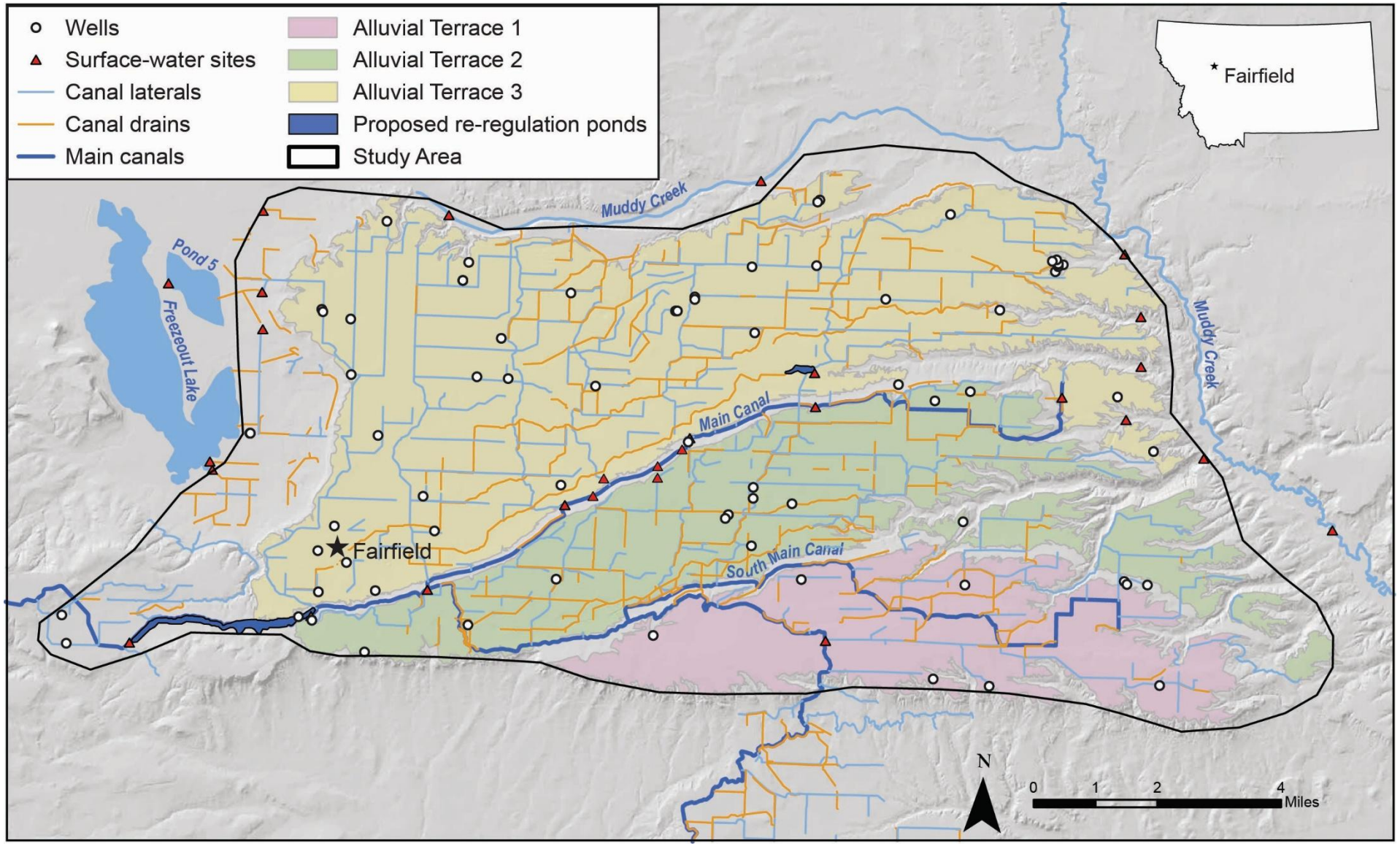
Monitoring Network



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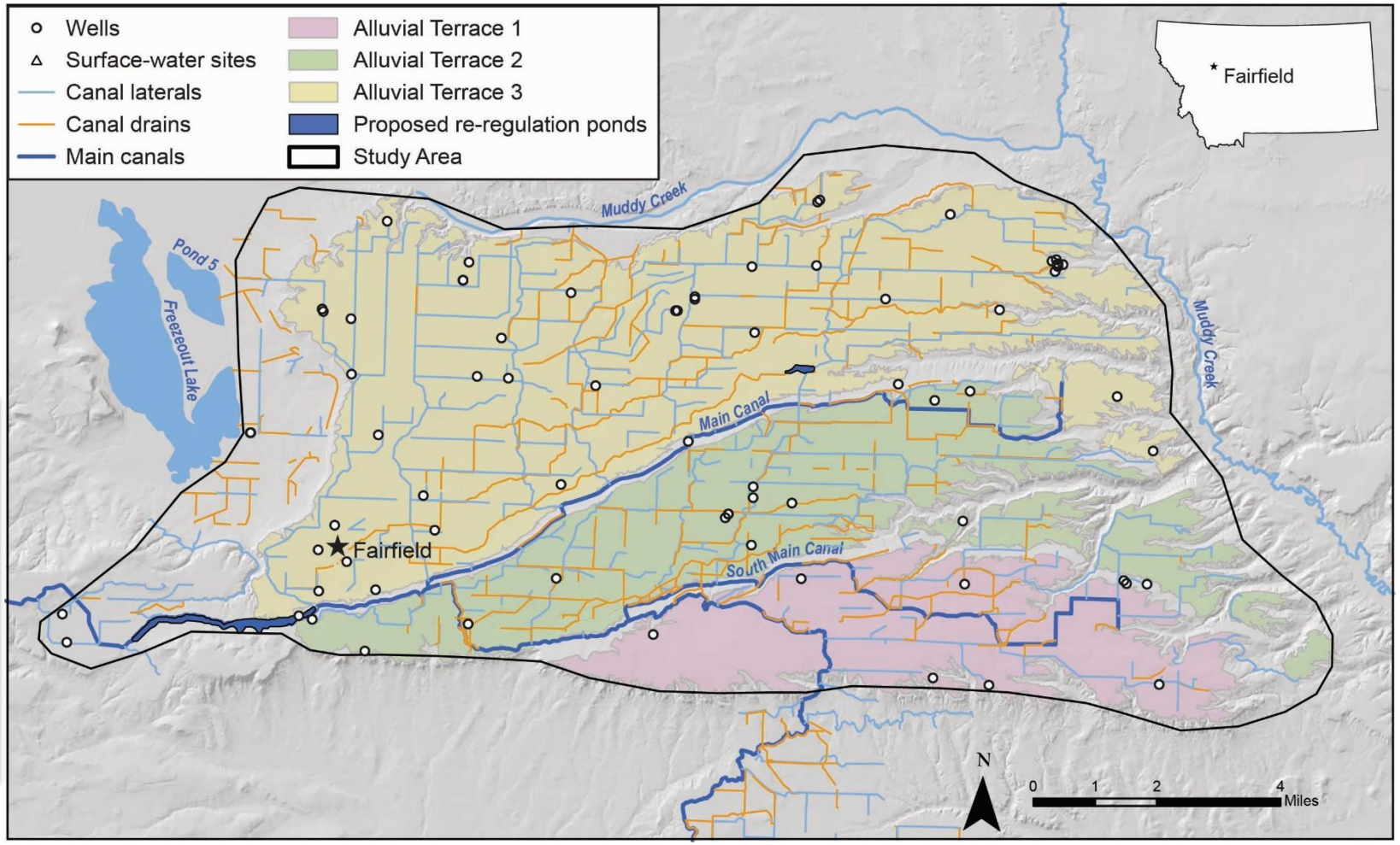
Groundwater Monitoring Network

-76 wells

-Monthly static water levels

-Hourly water levels in 30 wells



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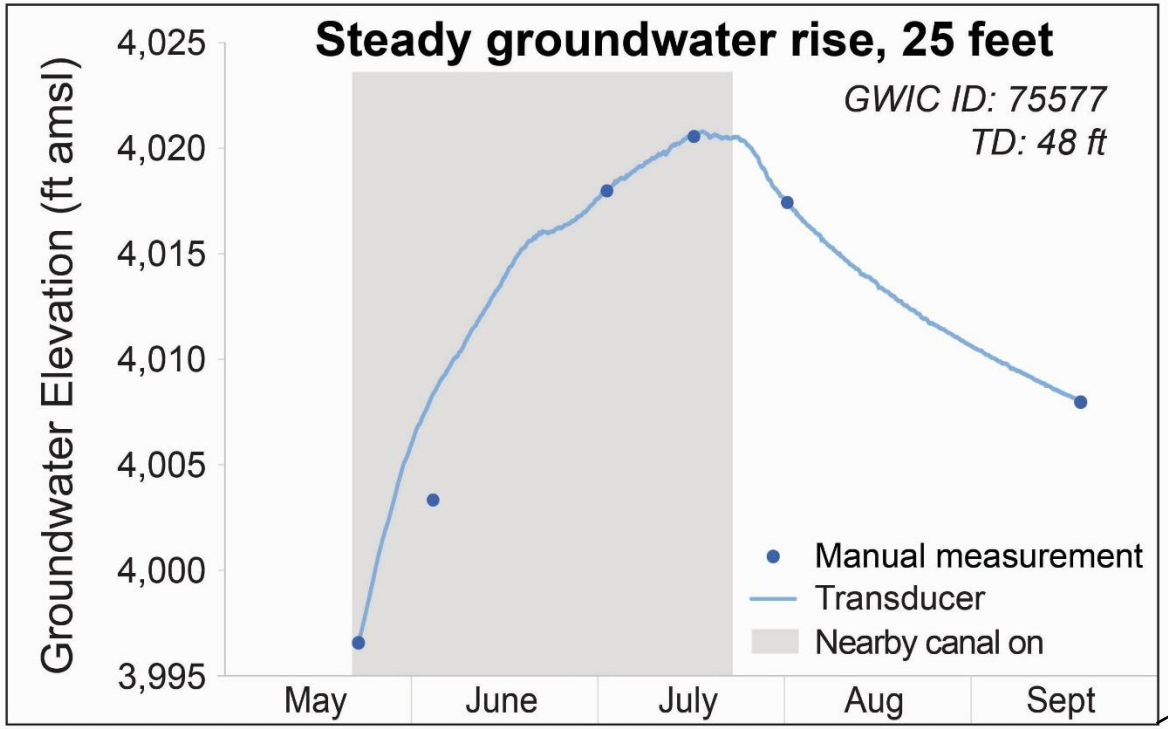
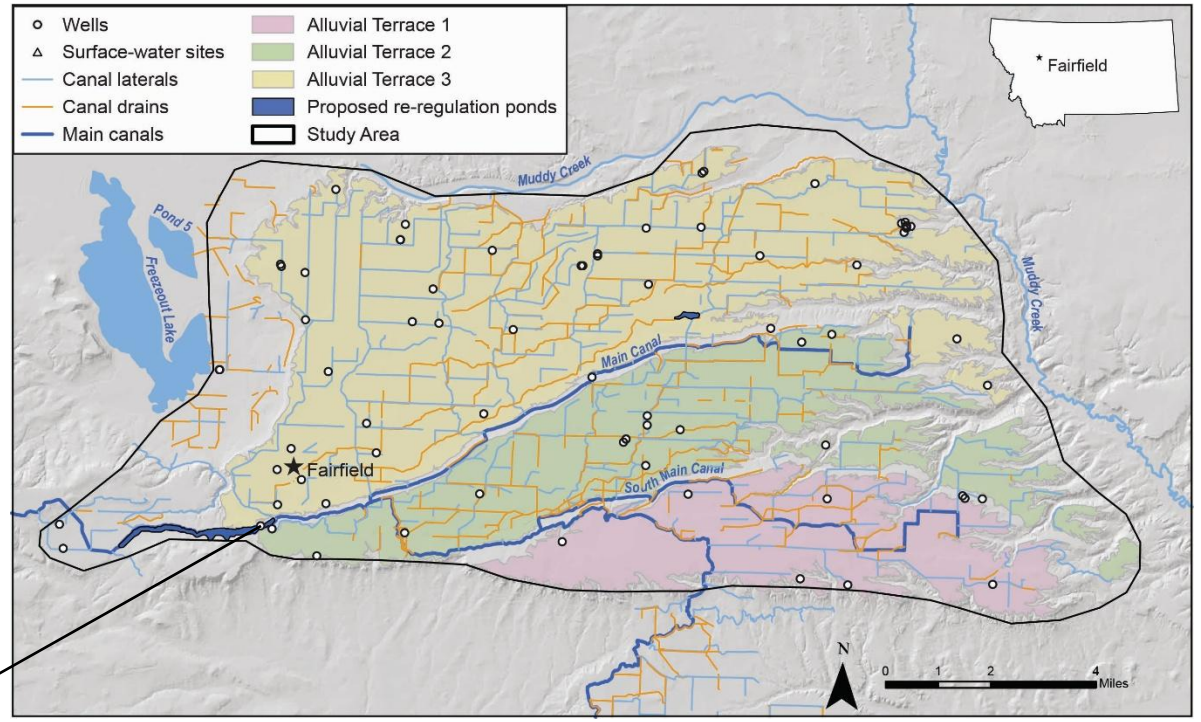
Groundwater Monitoring Network





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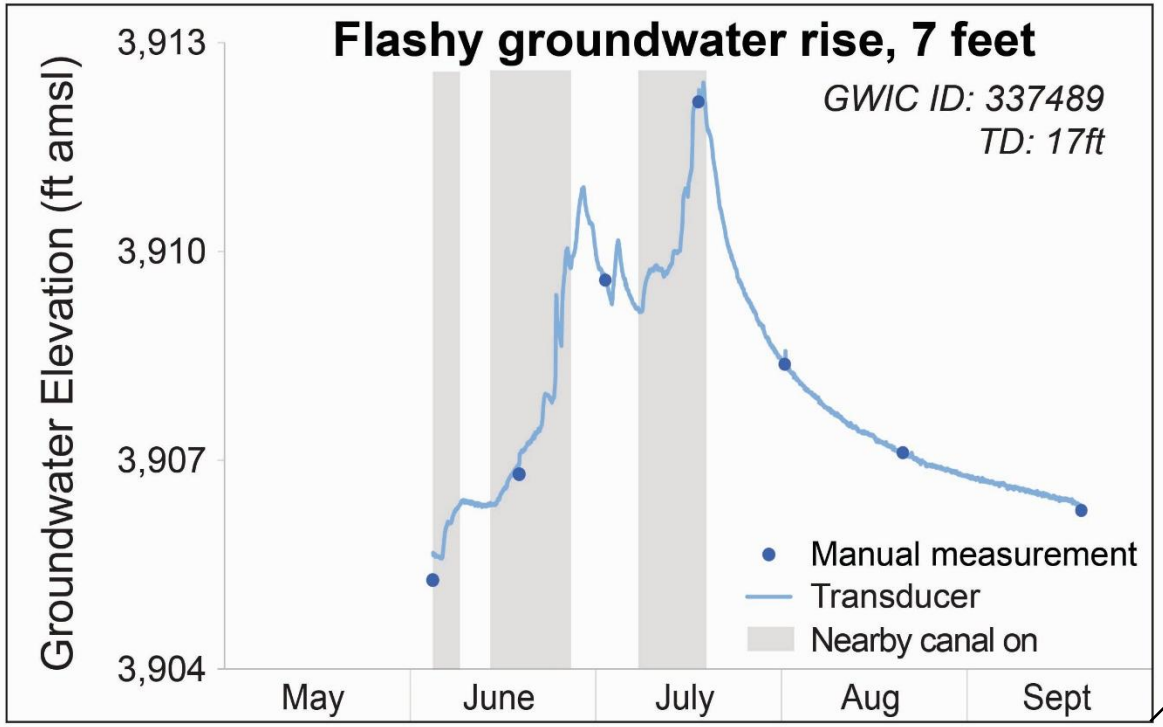
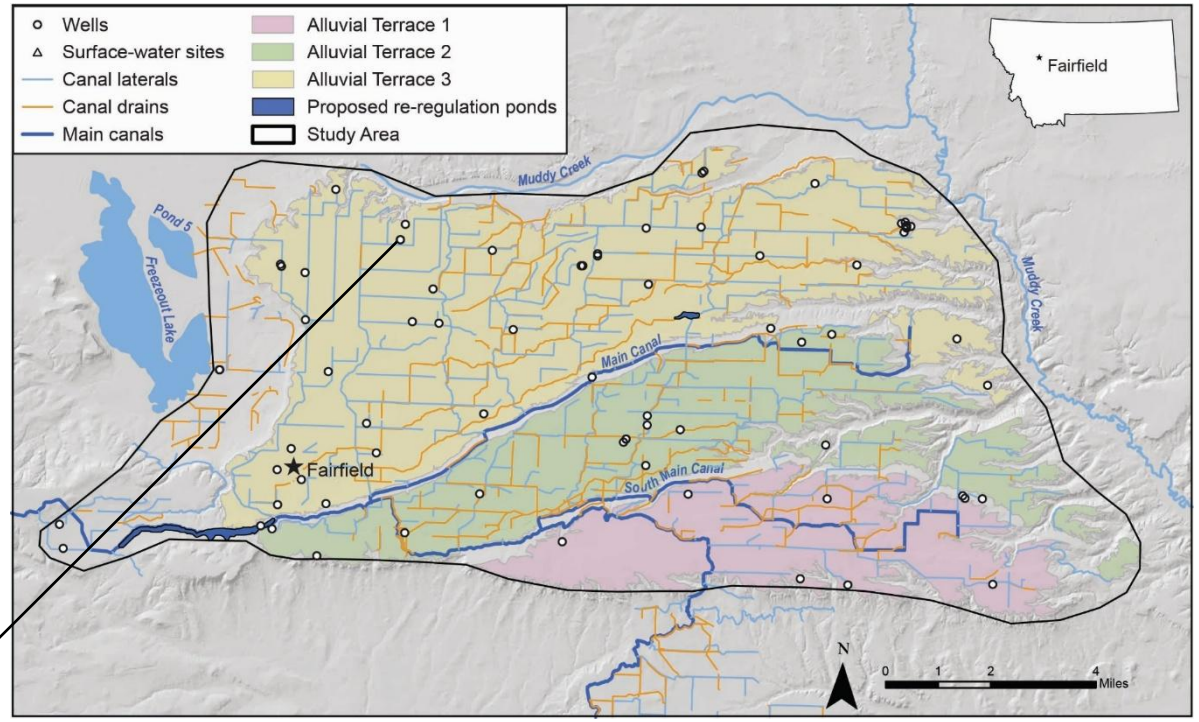
Groundwater Monitoring Network





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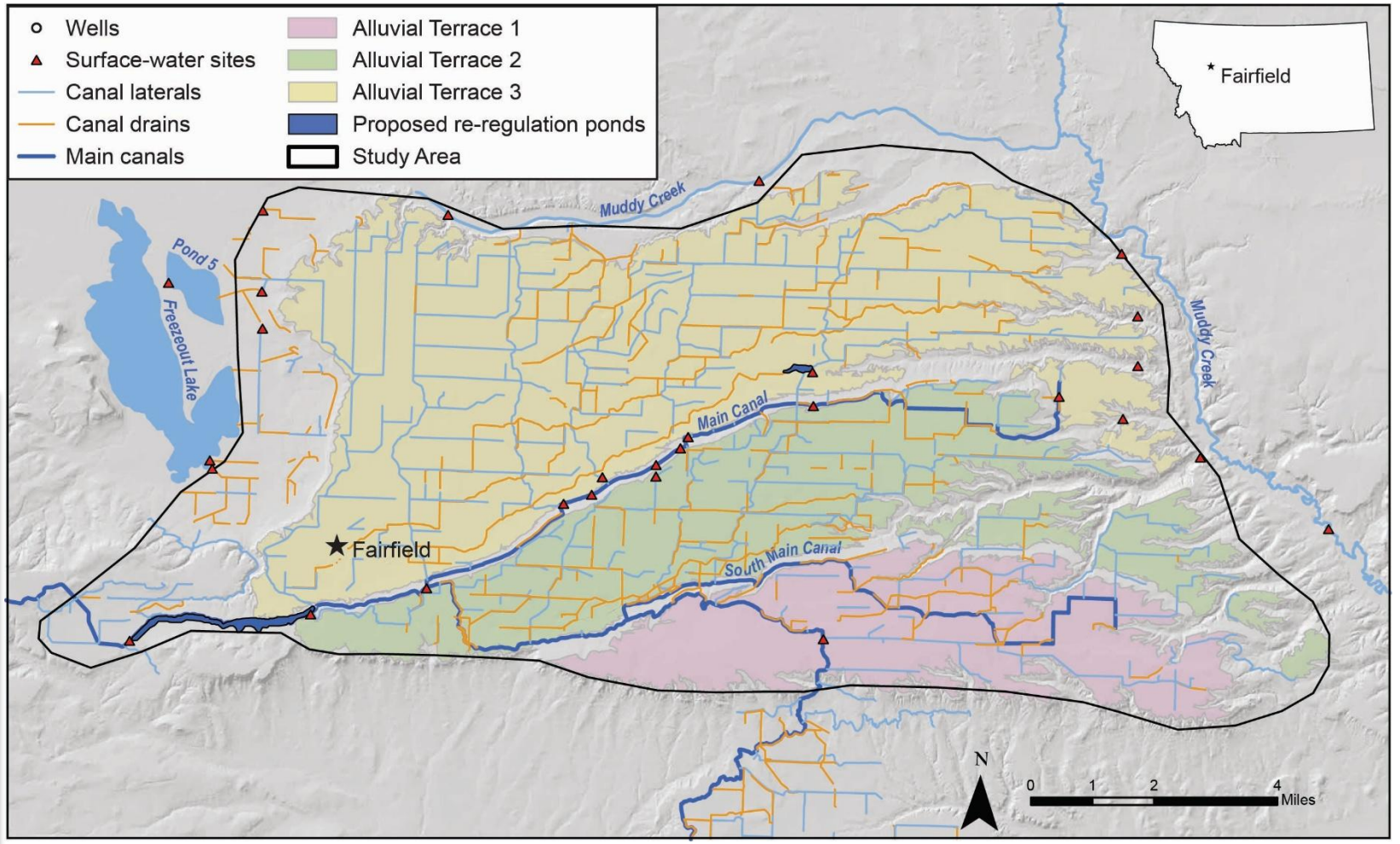
Surface-Water Monitoring Network

-28 sites

-Monthly discharge measurements

-Hourly water levels



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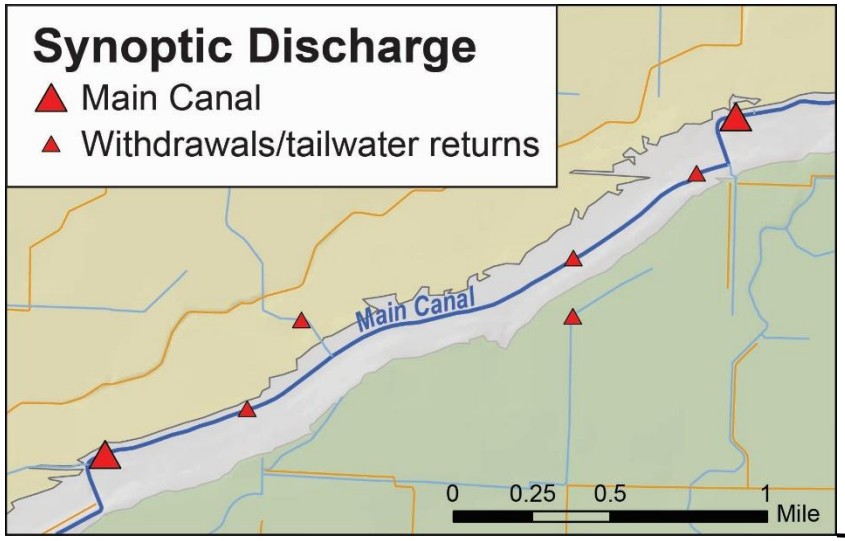
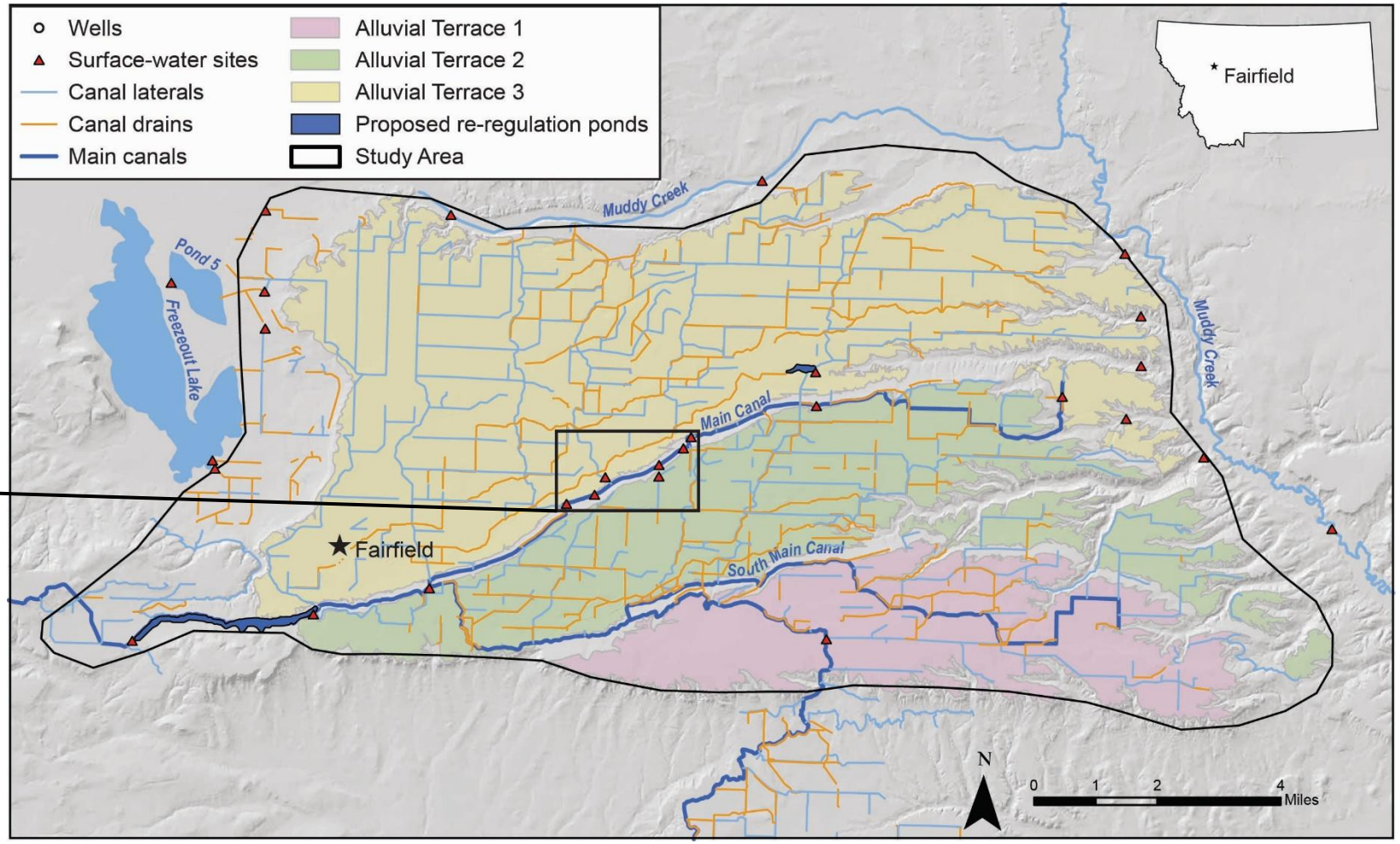
Surface-Water Monitoring Network



Preliminary data show canal seepage losses range from 4.1 to 4.9 cfs/mi at this location.



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Future Work

- Data collection will continue in 2026
- Develop a conceptual model and groundwater budget to quantify the relationship between irrigation and groundwater
- Create a groundwater flow model to test how different scenarios would impact groundwater

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Thank you!

- Landowners for allowing monitoring access
- GID and SRWG for proposing the project

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