

# GROUNDWATER QUALITY CANYON AREA – BIG SKY

Gallatin Local Water Quality District

January 23, 2019

Christine Miller M.S.

Water Quality Specialist/Hydrogeologist

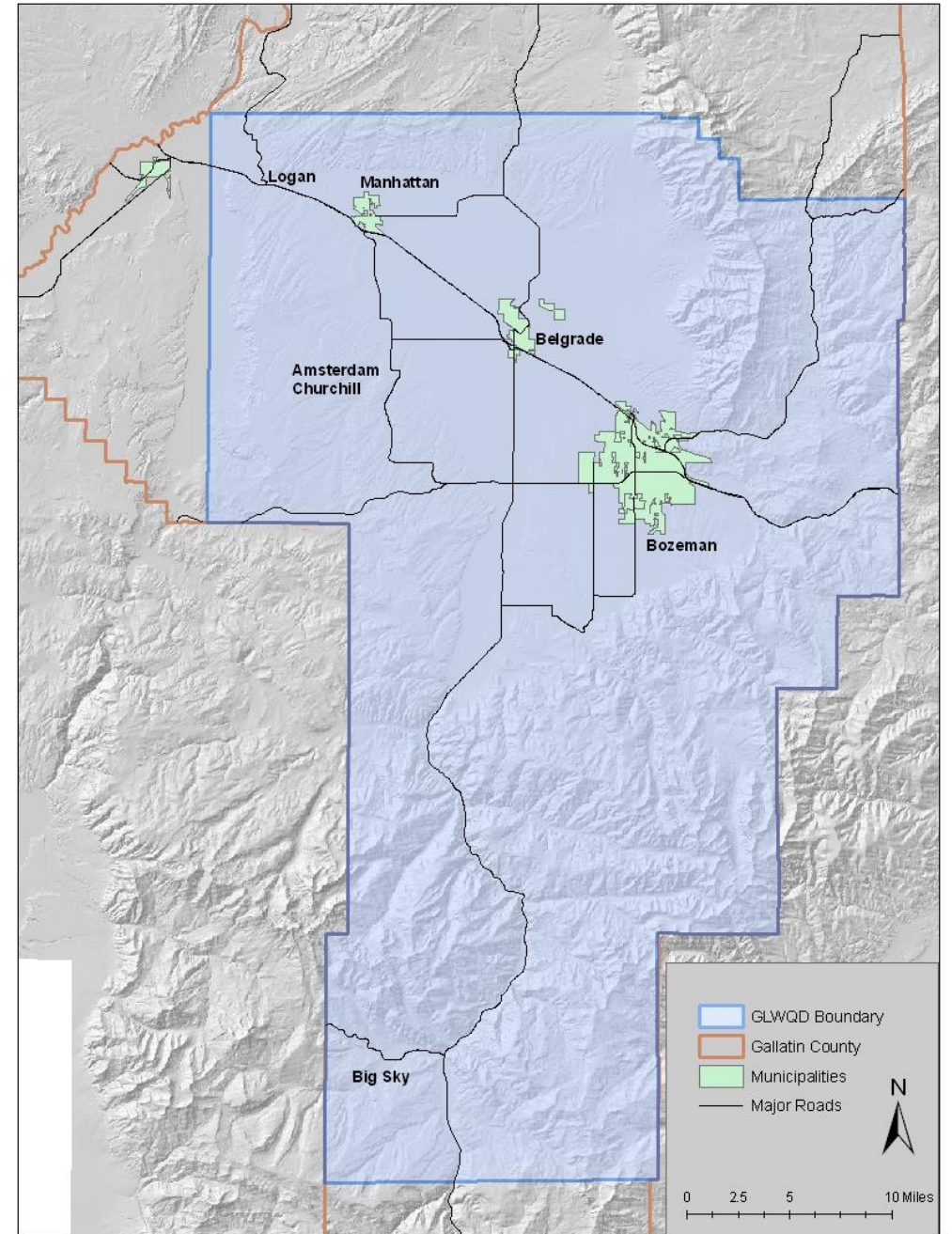
[christine.miller@gallatin.mt.gov](mailto:christine.miller@gallatin.mt.gov)

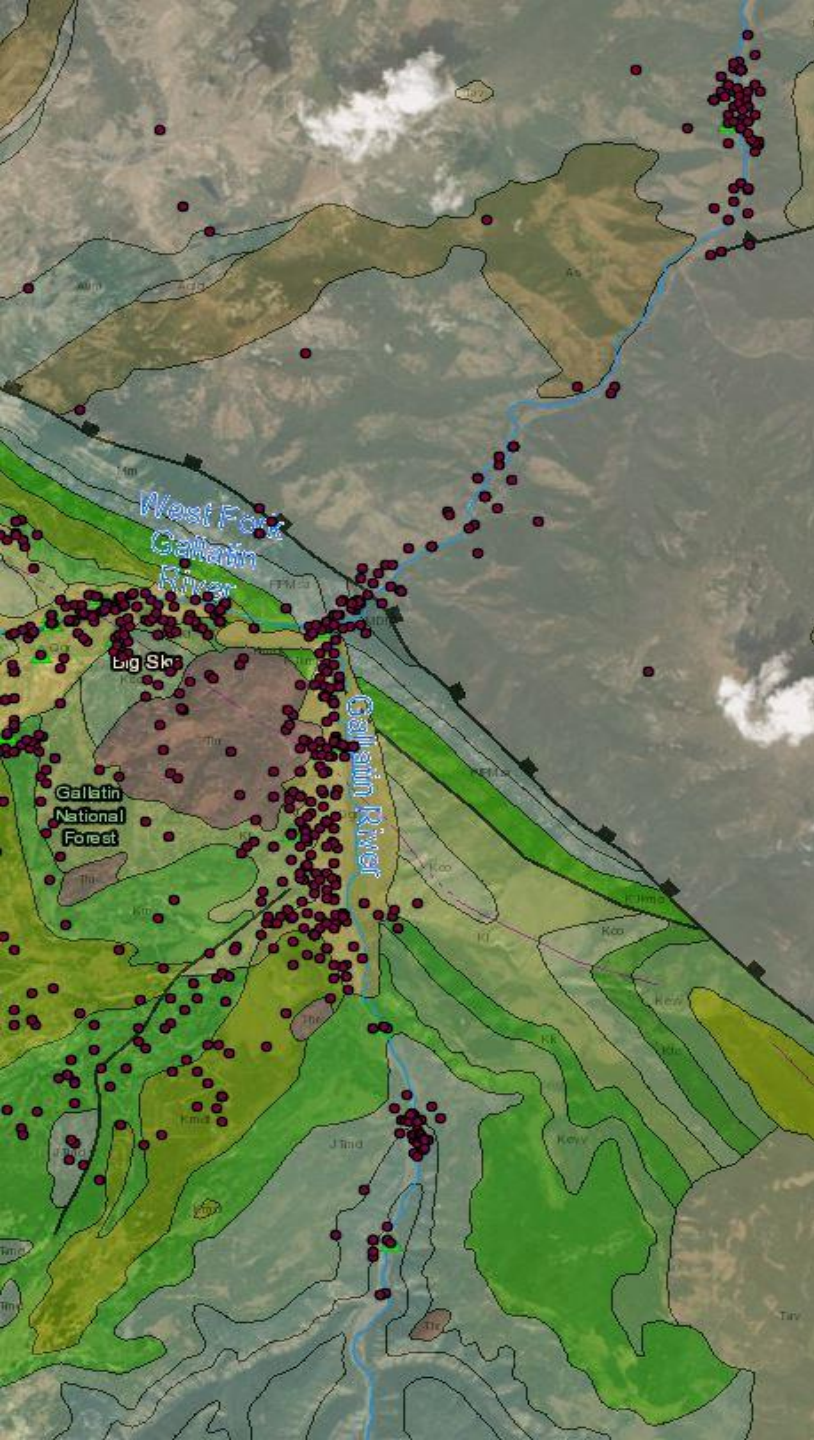
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## GALLATIN LOCAL WATER QUALITY DISTRICT

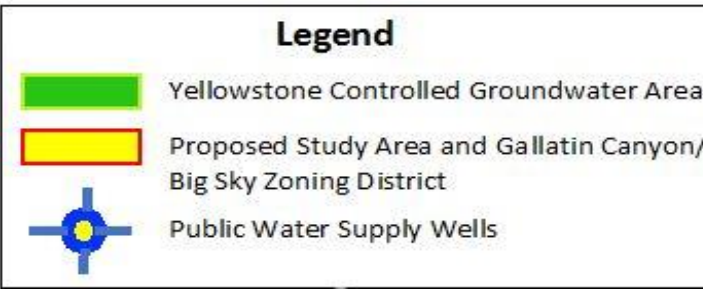
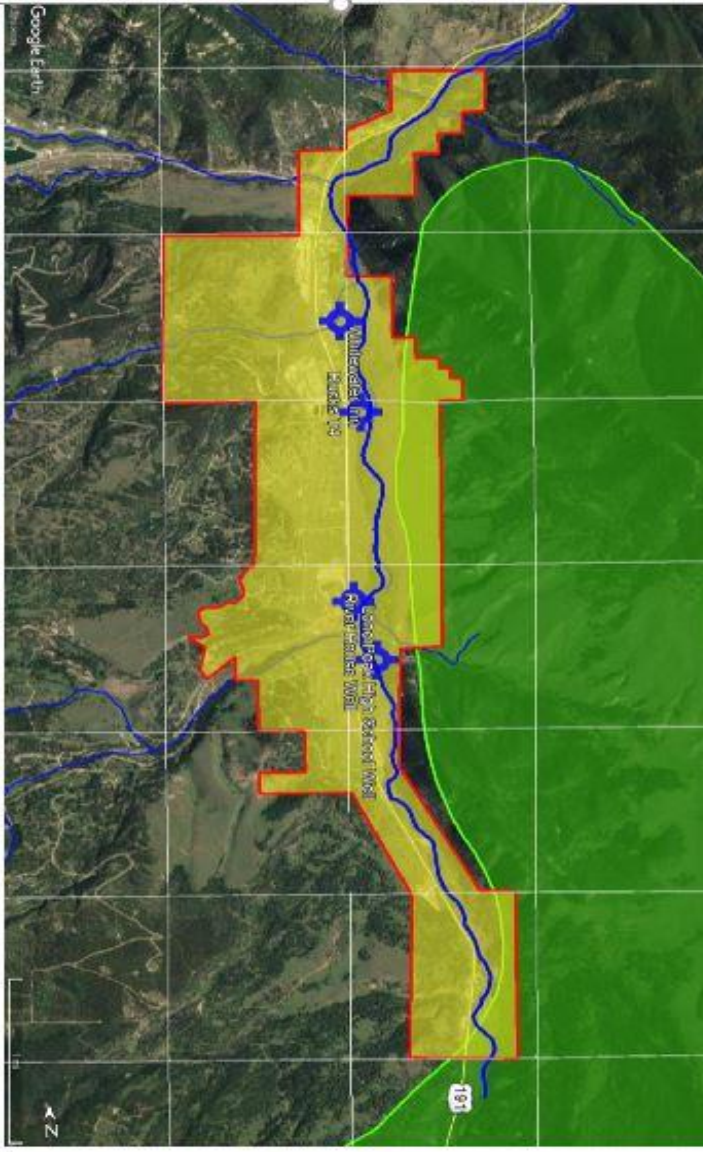
- Non-regulatory department
- Monitoring/Research
- Education/Outreach
- Information Collection/Dissemination





## CHARACTERISTICS BIG SKY & CANYON AREA

- Headwaters of the Gallatin Watershed
- Complex geologic setting
- Wells in proximity to river
- Water quality and availability?
- Proximity to Yellowstone Controlled Groundwater Area



# WATER SUPPLY

## PRIVATE, DOMESTIC WELL

- Less than 35 gpm, 10 acre-ft/yr\*
- Drill well and put to use
- File a Notice of Groundwater Development with DNRC
- **NO water quality/testing regulations**
- **Well owner responsible for providing good quality drinking water**

## MUNICIPAL & PUBLIC WATER SUPPLY (PWS)

- **Regulated by MT DEQ**
  - System design standards
  - Several different classifications; depending on number of connections, population served, amount of time served
  - Water quality monitoring required; parameters & testing frequency
- Designated PWS Operator needed

\*Some PWS wells fit this definition (Exempt well).

# SHALLOW VS. DEEP WELLS

## SHALLOW WELL

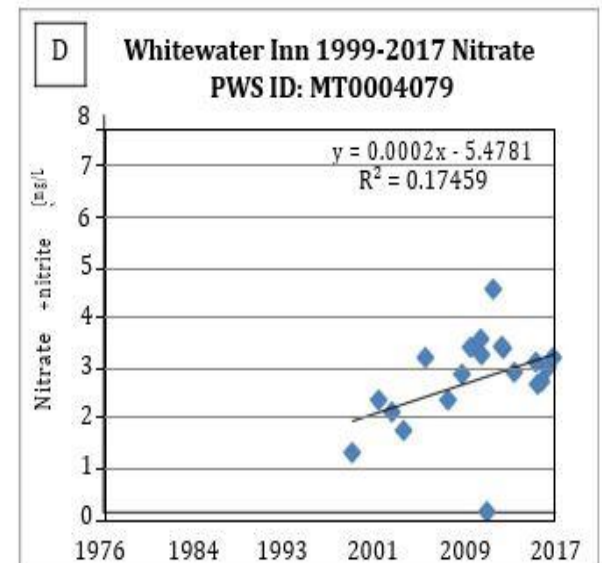
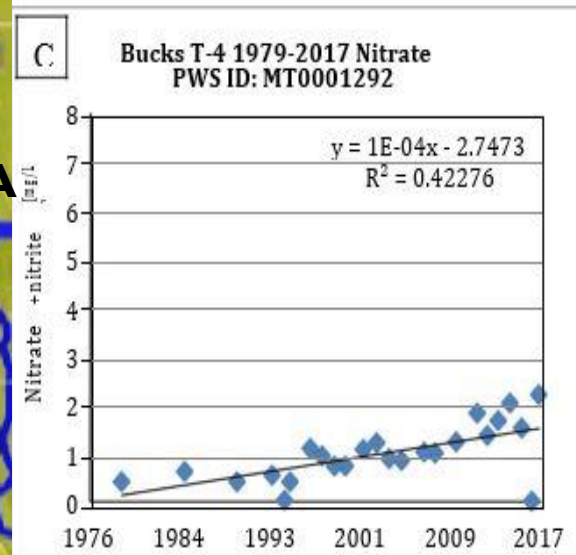
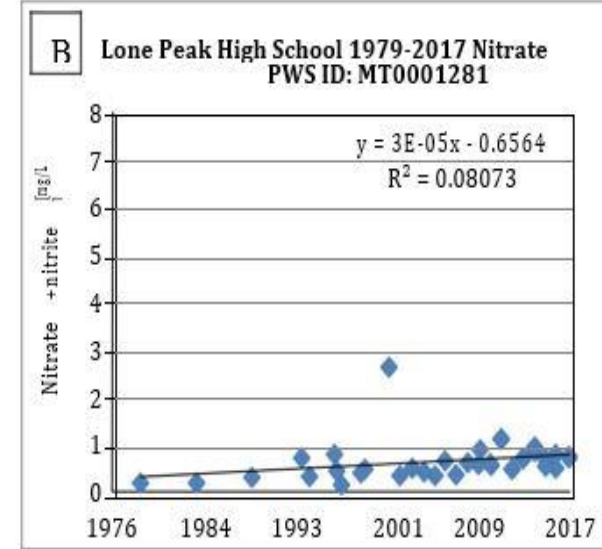
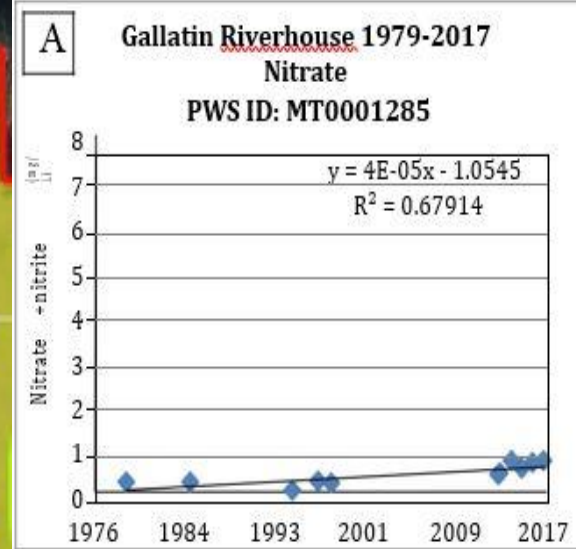
- Susceptible to contamination from land use activities
- Surface water influence - close proximity to river – higher potential for microorganism contamination
- Susceptible to drought
  - May have to drill deeper....

## DEEP WELL

- Productivity could be low (gpm)
- “Challenging” water chemistry (salts, arsenic)
- Treatment systems expensive
- \$\$\$ drilling

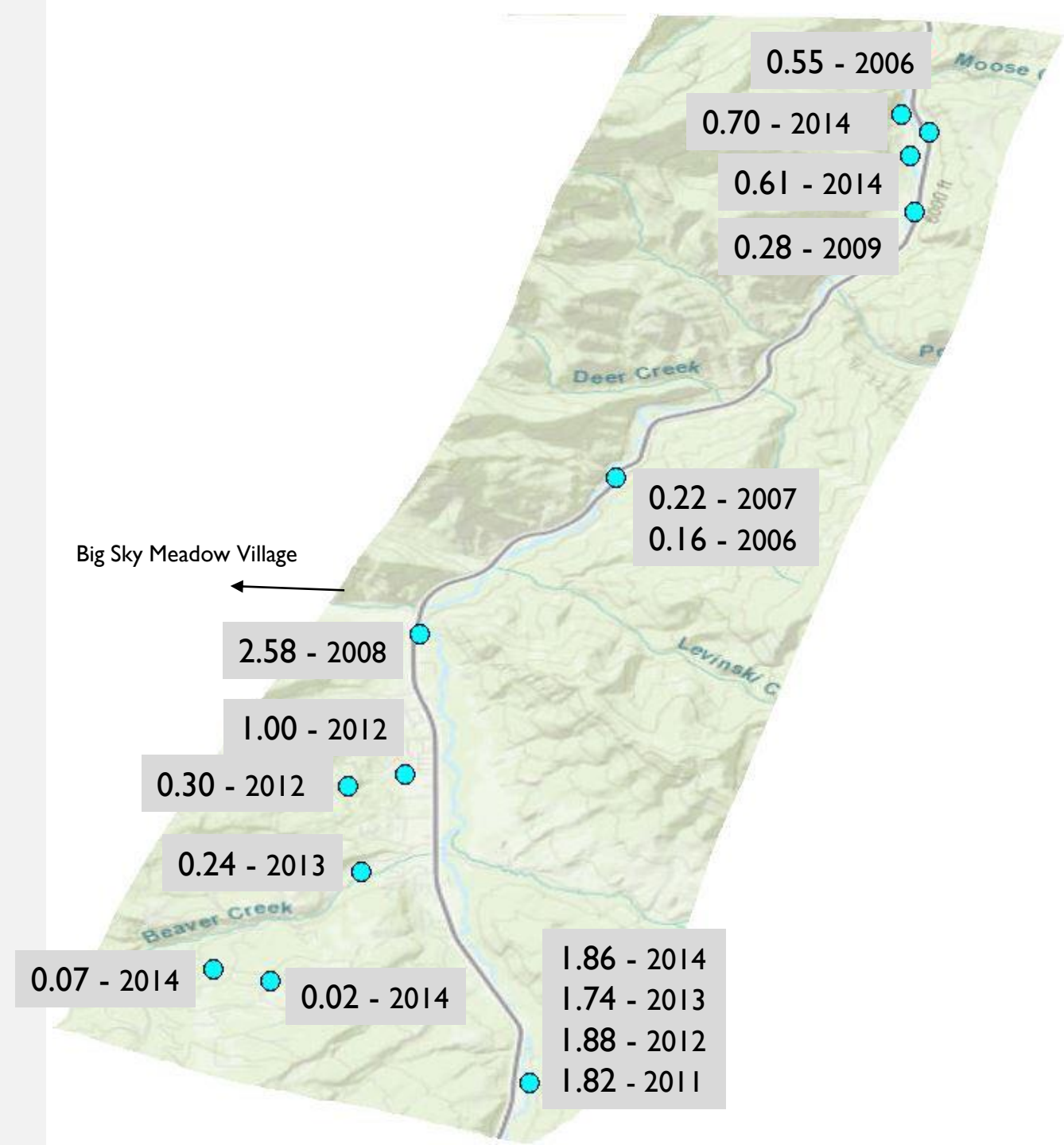
# PWS NITRATE CONCENTRATIONS

- Data: Drinking Water Watch – MT DEQ
- Examples: PWS wells completed in a shallow sand and gravel aquifer
- Graphs arranged in order from South to North (A, B, C, D)
- Nitrate concentrations increasing:
  - Over time for each PWS well
  - From south to north



## NITRATE IN DOMESTIC WELLS

- Data from 2006 – 2014
- 12 domestic wells
- 0.02 – 2.58 mg/L
- Snapshot in time of water quality (samples collected at different times of year)
- Owners encouraged to test annually:
  - nitrate, bacteria
  - consider arsenic screening



## NITRATE: WHY THE CONCERN?

- Sources: Naturally-occurring, wastewater, fertilizer, animal waste
- Background nitrate level < 2 mg/L
- EPA Maximum Contaminant Level (MCL) = 10 mg/L
- Presence at high levels may indicate other contaminants are present
- Long-term ingestion of drinking water with nitrate levels even below the EPA MCL associated with negative health effects
- Quarterly sampling required when a PWS reaches 50% of the MCL (5 mg/L)
  - Increased cost and effort for PWS



# GLWQD WELL AWARENESS COURSES

## INTRODUCTORY

- Groundwater basics
- Basics of well care and maintenance
- Identifying potential contaminant sources
- Septic system basics
- \$20 advanced registration fee

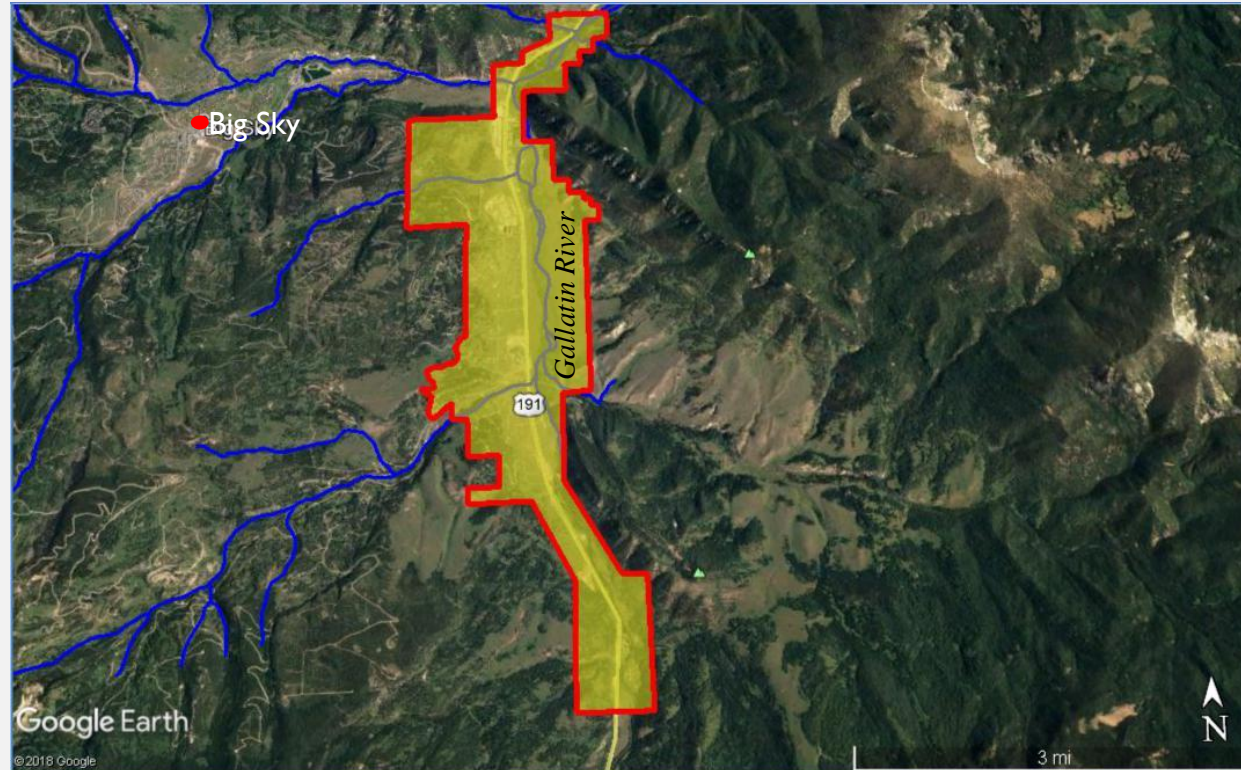
## ADVANCED

- Learn how to do a well assessment
- Water treatment
- Septic system basics
- \$20 advanced registration fee

GAUGING INTEREST FOR SESSIONS IN  
BIG SKY...

# Upper Gallatin River Corridor

## 2018 GWIP Nomination



Assess the cumulative effects of existing and future development on water quality and quantity.

Contact: Ginette Abdo, 496-4152, [gabdo@mtech.edu](mailto:gabdo@mtech.edu)