# December 5th, 2024, GLWQD Board Meeting Minutes

**Board:**
Traig Howels
Alan English
John Edwards
Jennifer Boyer
Kris Menicucci

**Guests:**
Sydney Lyons
Brittney Krahn
Danika Holmes
Lori Christenson

**Liaisons:**
Ron Edwards

**Staff:**
Drew Shafer
Xiang Fan
Travis Horton

## Public Comment on Non-agenda Items

## September Board Meeting Minutes – Discussion and Action

*Traig – Change 'RIP' to 'RIB' in Board updates*
**Motion to approve September Board Meeting Minutes. Approved.**

## Manager Updates

*Drew* – At the beginning of October, I gave a presentation on local surface water quality at the Gallatin Watershed Council's Bike Tour with approximately 15 to 20 people in attendance.

At AWRA, I presented on 'The State of the Surface Water Monitoring Network' and Xiang presented with Adam Sigler on Linking datasets and partners to characterize nitrate in Gallatin Valley groundwater. One of the Keynote speakers, Sheila Murphy, a research hydrologist with the USGS, gave a talk on water quality responses after wildfires. Our historical surface water data on Bridger Creek could potentially be used to better help us understand what drives changes in water quality after a wildfire.

As part of the agreement between GWC and Simms for their wader donation, Tess and I wrote a blog post "A Day in the Life of the Gallatin Stream Teams: Citizen Science in Action'. The blog post can be found on GWC's website and will eventually be published on Simms blog page "The Plug".

All surface water monitoring data has been sent to DEQ to be uploaded to the water quality portal.
I will be presenting at the Gallatin Water Science Symposium on February 19th.
Working on a Surface Water Quality Report.

*Jennifer*- Once the Surface Water Quality Report or Water Dashboard is completed, talk with Whitney to include it on the Gallatin County Website banner.

## Board Member Updates

Traig – In October, the Town of Manhattan Public Works Supervisor and I met with Kristi Kline, the rural source water specialist and toured the current delineation area to get her the information she needs to

complete the Source Water Protection Certification. We should have the certification after the first of the year. Hopefully by April, we will have the updates needed to make it current.

*Kris* – In the development stages of building a new (third) water tower to expand capacity. Will need to expand the wastewater system too. Working with the airport to reach an agreement regarding water or wastewater. The City of Belgrade has grown 33% in the last 4 years, the growth is making it challenging to update the necessary infrastructure.

Alan – Changes in staffing at MBMG. John LaFave, manager of the Groundwater Assessment Program is now the Research Division Chief. I have taken over managing the Groundwater Characterization Program, under the Assessment Program. Mike Richer will be managing the Groundwater Monitoring side. Looking forward to working with GLWQD staff to update the Groundwater Monitoring Network Program as well as the Big Sky monitoring. Looking forward to an update regarding LWQD Manager position.

*Jennifer* – Two weeks ago the commission had an intent to adopt motion for the Future Land Use Map. At the next commission meeting on December 10th, the commission will vote on the Future Land Use Map adoption. We have received a lot of public comments on the adoption of the FLUM.
At the last Planning Coordination Committee Meeting, we had a presentation by Chris Saunders from the Gallatin Water Collaborative, on new mapping opportunities. There are new hydrography mapping efforts through the USGS. Can more accurately map our watercourses including our ditch systems. 50/50 cost share. Would map based on hydrologic map units. Mapping the valley floor would cost roughly $50,000, if we map the entire Gallatin Watershed, it would cost roughly $250,000. The USGS would like soft commitments from partners in early 2025. Contracting would start in April. Could have data available end of 2025. Would love to see departments that would be directly impacted by the mapping to contribute some funds to this project. DEQ has pledged $15,000. USGS and Montana State Library is willing to give a webinar.
*Drew* – The sub watersheds of interest are the Upper East Gallatin, Hyalite, and the Lower East Gallatin.

*John*- I want to express how amazed I am of the progress we have made in 2024 in Gallatin County in water quality issues.

*Travis* – We are working through updates to the Chapter 3 Health Code, next week there will be our last review by the Environmental Health Subcommittee. We will then engage with a public outreach component. One of the most significant proposals in the update is new and expanded sources of wastewater will be required to have 'Level II' treatment in a basin that is already impaired by nitrate. EHS and GLWQD staff started discussing the monitoring networks and workplans. I have drafted a workplan goal for the GLWQD to continue to retrieve historic nitrate data from old COSA files which go back to the 1970's.
We are still working through the hiring process.

*Jennifer* – Once the Manager gets on board, we will have a lot of work to do to match our workplans with staffing and funding and build out how we will make incremental changes.

*Ron* – Will be retiring as the manager for the Big Sky Water and Sewer District at the end of the year. We have been working on a new wastewater treatment plant that is a 50 million dollar project and have been building it for 3 years and have hired a number of new operators to run the plant. The new plant can run 950,000 gallons a day and built more storage to eventually run 3,000,000 gallons a day. Yellowstone Club is in their second year of using treated wastewater for snowmaking.

## February Board Meeting Agenda – Discussion

*Jennifer* – Would like to have an initial meeting with the new manager to start to scope out our workplans, staffing, and funding draft to then bring to the Board for feedback.
*Alan* – Update on the LWQD's monitoring plans.
*Jennifer* – An update for how much funding we have secured for the 3DHP mapping opportunity.
*Jennifer* – Look at the Strategic Plan and Staff can give a preview of how they see their 2025 workplan coming together. Funding gaps, opportunities, collaborations, etc.
Drew – Would like to give my Gallatin Water Science Symposium presentation.

**Motion to adjourn meeting. Approve.**

| ANNUAL WORK PLAN | Gallatin Local Water Quality District | | |
|---|---|---|---|
| Fiscal Year 2025/2026 (Calendar Year 2025) | | | |
| **PRIORITY AREA: Characterizing aquatic resources through monitoring and research, data collection and analysis, and dissemination and distribution of meaningful water quality and quantity data** | **WORK OBJECTIVES/TASKS** | **EXPECTED OUTCOMES/RESULTS** | **Timeframe** |
| **Surface Water Monitoring Network** | | | |
| *Drew is the lead team member for the SWMN. This will continue to monitor the 17 surface water sites described in the SAP. We will work in conjunction with volunteers from Stream Teams in the GWC. Both the manager, and Hydrogeologist will also likely fill in as needed.* | Coordinate and conduct Gallatin Stream Teams volunteer monitoring training with GWC. | Volunteer training held in May or June; Likely another to be held in July/August. | May/June and July/August |
| | Conduct water chemistry sampling, stream flow and stream stage measurements (manual and with data loggers) and collect field parameters as outlined in SAP | Sampling activities completed at 17 monitoring stations for water chemistry (except ammonia, which will only be during the growing season) & all stations for flow/stage measurements. | April-October |
| | Ongoing data management and record keeping. | After each field event, enter data into appropriate electronic locations, file site photos electronically, complete and scan field forms. | December-December |
| | Perform QA/QC evaluation of water quality data and format for required databases. Send to DEQ and other organizations that utilize data. Store data in GLWQD Database | Data product is deliverable to end users. | November-March |
| | Maintain stream gaging instrumentation and water quality equipment. Repair the DO sensors on both YSIs. One needs to be complete prior to April 2025. The other will be completed as needed. | Equipment is ready for use for next field season | April-October |
| | Send data summary and thank you letters to participating landowners. Ask permission for next field season. | Landowner data summary and thank you letters mailed. Access retained | Dec |
| | Maintain the SAP so that it remains current and accurately reflects the sampling design for the SWMN. | SAP updated, as needed, including deviations of field activities. | Jan |
| | Assess SWMN to determine sampling frequency for future field season. Identify and assess potential new locations to be added to the network. | Increase efficiency of sampling time and expand SWMN coverage | November |
| | Prepare annual monitoring budget to be included with District fiscal year start-up budget. | Proposed budget reviewed and approved by LWQD Manager. | Mar |
| **Recreation Waters Monitoring Network** | | | |
| *Program was previously overseen by interns and/or seasonal technicians. There is not an established schedule for the sites that have been monitored in the past and some sites are monitored by other organizations. A need to standardize site selection and schedule has been identified.* | Communicate with municipalities to determine locations with high recreational use that are not being monitored. | Cutback on overlap of rec water monitoring to increase coverage in the district and integrate our program with others in the county. | May-September |
| | Monitor for HAB as needed and E.Coli when feasible. | Ensure monitoring occurs if HABs are expected and monitor prior to high use weekends. | May-September |
| | Establish monitoring sites that will be the responsibility of LWQD and determine an appropriate sampling frequency. | RWMN is more structured and consistent into the future. | May-September |
| **Groundwater Monitoring Network** | | | |
| *Xiang is the lead team member for the GWMN. Xiang has identified 57 wells that will make up the network; wells are sampled for water quality parameters in a two year period.* | Coordinate with GWC to identify Stream Teams volunteers that would be interested in asssisting with GWMN. | Volunteer training held in May or June. | May or June |
| | Conduct water chemistry sampling on the wells from GWMN that are due to be sampled in 2025. | Sampling is completed to grow the GWMN database | May-July |
| | Take water depth measurements on all GWMN wells. | Sampling is completed to grow the GWMN database | March-September |
| | Ongoing data management and record keeping. | After each field event, enter data into appropriate electronic locations, file site photos electronically, complete and scan field forms. | December-December |
| | Perform QA/QC evaluation of water quality data and format for required databases. Send to MBMG and other organizations that utilize data. Store data in GLWQD Database. Complete Consumer Confidence Report | Data product is deliverable to end users. | November-March |
| | Maintain pumps and water quality equipment. Repair the DO sensors on both YSIs. One needs to be complete prior to April 2025. The other will be completed as needed. | Equipment is ready for use for next field season | April-October |
| | Send data summary and thank you letters to participating landowners. Ask permission for next field season. | Landowner data summary and thank you letters mailed. Access retained | Dec |
| | Maintain the SAP so that it remains current and accurately reflects the sampling design for the GWMN. | SAP updated, as needed, including deviations of field activities. | Dec |
| | Prepare annual monitoring budget to be included with District fiscal year start-up budget. | Proposed budget reviewed and approved by LWQD Manager. | Mar |
| **Big Sky Nutrient Monitoring** | | | |
| *Xiang is the lead for GLWQD to collect data from 8 wells and 1 spring associated with the Big Sky Nutrient Monitoring project.* | Conduct water chemistry sampling on the locations within the BSNM that are due to be sampled in 2025. | Sampling is completed to continue the nutrient monitoring | April-October |
| | Perform QA/QC evaluation of water quality data and format for required databases. Send associated partners with BSNM that utilize data. Store data in GLWQD Database. | Data product is deliverable to end users. | November-March |
| | Ongoing data management and record keeping. | After each field event, enter data into appropriate electronic locations, file site photos electronically, complete and scan field forms. | December-December |
| **Data Dissemination and Distribution** | | | |
| *We have extensive amounts of data that are stored in project specific locations as well as historic data that is not digitized. This makes it difficult to understand what historic data we have access to and where it is located. A need has been identified to improve database storage as well as our ability to share the data that we house.* | Continue digitzing and cataloging paper data. MSU students under Adam Sigler have helped with this in the past. | Historic data that is difficult to access is digitally stored. | December-December |
| | Incorporate all historical surface and groundwater data, Stream Teams data, and GWMN and SWMN data into one database. | Database containing the data we have stored in created. | December-December |
| | Develop protocol for data management. | Database is consistently updated. | December-December |
| | Develop means for the public to access data. Considerations will be given to ArcGIS dashboards, interactive maps, and protocols for making a request | Data is more easily accessed by the public. | December-December |
| **PRIORITY AREA: Reaching and impacting varying audiences through engaging education and outreach programs.** | **WORK OBJECTIVES/TASKS** | **EXPECTED OUTCOMES/RESULTS** | **DATE DUE** |
| **MS4** | | | |
| *As the county adopts MS4 procedures, there are priority areas that will likely be assigned to GLWQD.* | Complete tasks relating to Public Eductation and Outreach for MS4 | LWQD assists in meeting the requirements of this section of the MS4 permit | December-December |
| | Complete tasks relating to Public Involvement and Particpation for MS4 | LWQD assists in meeting the requirements of this section of the MS4 permit | December-December |
| **Well Educated** | | | |
| *Well Educated is a cost sharing program for well testing of domestic wells.* | Continue to provide well testing kits and information to interested homeowners. | Homeowners have improved access to well testing information. | December-December |
| | Hold a well testing clinic for public outreach. | Increase public awareness of the program and offer a venue to answer questions we | May, June, or July |
| **Website** | | | |
| | Continue to update website with public outreach events and meetings to ensure the public has a means of staying informed. | Maintain an up-to-date website. | December-December |
| | Add means to access data and other monitoring information with Story Maps, Dashboards, Interactive Maps, and other GIS products accessible through the website. | Create a website that offers more data products to end users. | December-December |
| **PRIORITY AREA: Building our capacity and enhancing our organizational strengths to improve our capabilities.** | **WORK OBJECTIVES/TASKS** | **EXPECTED OUTCOMES/RESULTS** | **DATE DUE** |
| **GWC Volunteers** | | | |

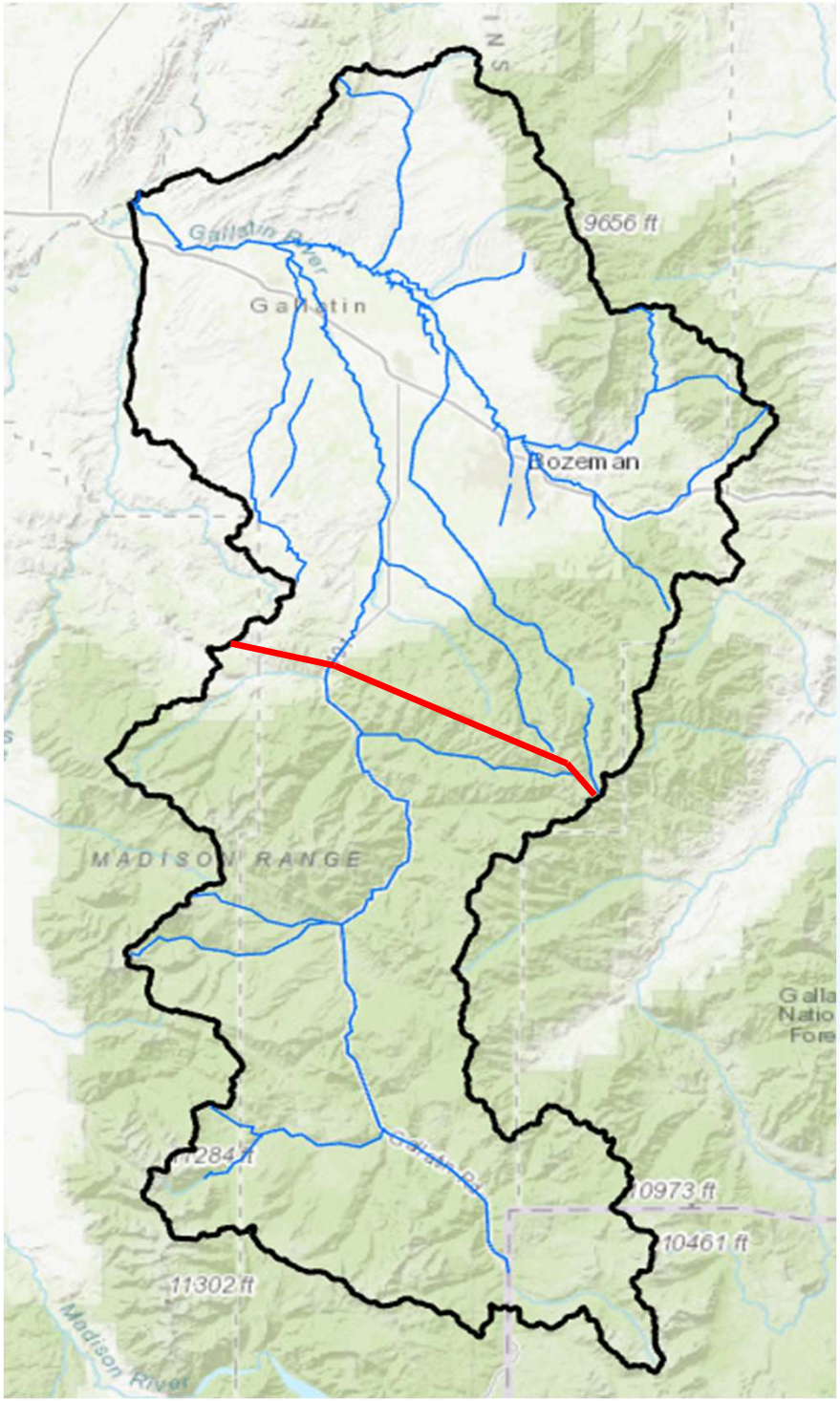
| | | | |
|---|---|---|---|
| *Gallatin Watershed Council and their Stream Teams volunteers provide assitance to staff in the form of man-hours to complete monitoring.* | Continue to collaborate with GWC and Stream Teams to provide training to volunteers who will in turn assist in the monitoring networks. | Increased capactity to complete monitoring. | December-December |
| **Grants and Outside Funding** | | | |
| *LWQDs funding is derived from taxes, however additional money from grants and outside programs can help extend our capabilities.* | Continue to work with organizations like DEQ to find grant money that can be used to support monitoring efforts. | Lower costs associated with monitoring will open up funding to be used to expand capabilities | December-December |
| **PRIORITY AREA: Implementing projects to improve water quality and quantity** | **WORK OBJECTIVES/TASKS** | **EXPECTED OUTCOMES/RESULTS** | **DATE DUE** |
| *GLWQD has mostly been centered around monitoring activities. This is a relatively new addition to the strategic plan to allow for efforts to be put into physical projects.* | Use GIS to identify potential opportunities for projects to improve water quantity and quality. Tools available include developing Reletive Elevation Models and Digital Elevation Models to identify areas of channel disturbance, as well as streams that have direct input from surrounding stormwater or potential wastewater | Potential areas that could benefit from quantiy/quality projects are identified | December-December |
| | Identify projections that could be implemented under MS4 permitting such as infiltration basins, constructed wetlands, etc. for stormwater. | Potential areas that could benefit from quantiy/quality projects are identified. | December-December |
| | | | |

| | Without Grant Money | | With Grant Money | |
|---|---|---|---|---|
| | FY25 | FY26 | FY25 | FY26 |
| Total Available Funds Start | $486,402.00 | $373,017.00 | $486,402.00 | $387,658.00 |
| Projected Monitoring Budget | $52,928.00 | $43,127.00 | $28,486.00 | $36,427.00 |
| Projected MS4 | $75,000.00 | $0.00 | $75,000.00 | $0.00 |
| Projected Personnel | $225,198.00 | $285,553.00 | $225,198.00 | $285,553.00 |
| Other Expenses | $60,258.00 | $60,258.00 | $60,258.00 | $60,258.00 |
| Total Projected Expenses | $413,385.00 | $402,551.00 | $398,744.00 | $395,851.00 |
| Total Available Funds Finish | $73,017.00 | -$29,534.00 | $87,658.00 | -$8,193.00 |
| Taxes Collected | $300,000.00 | $300,000.00 | $300,000.00 | $300,000.00 |

# Surface Water Quality in the Gallatin Watershed

Drew Shafer, GLWQD Water Quality Specialist

Gallatin Water Science Symposium, 2025




## Causes for Impairment:

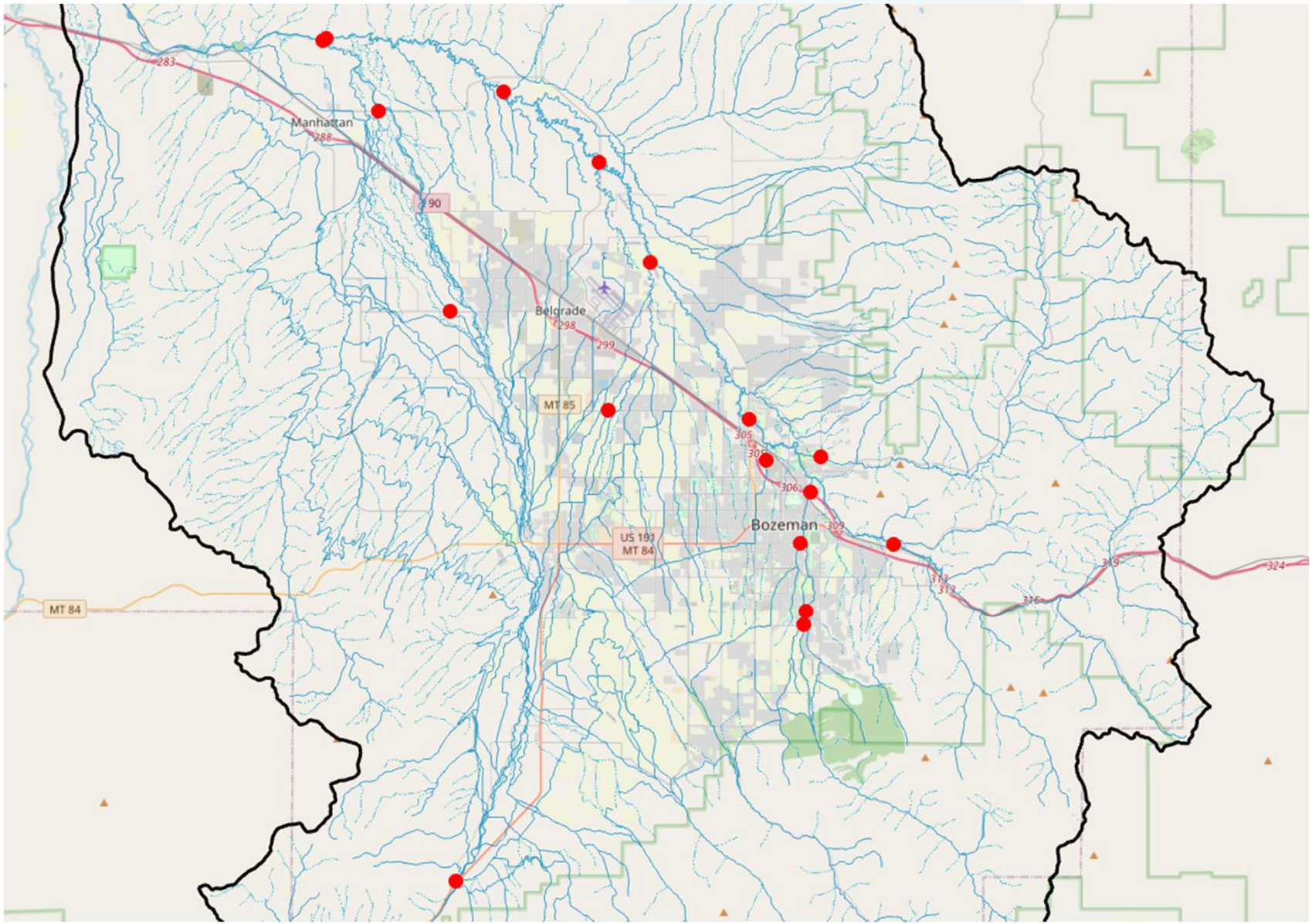
### Pollutants

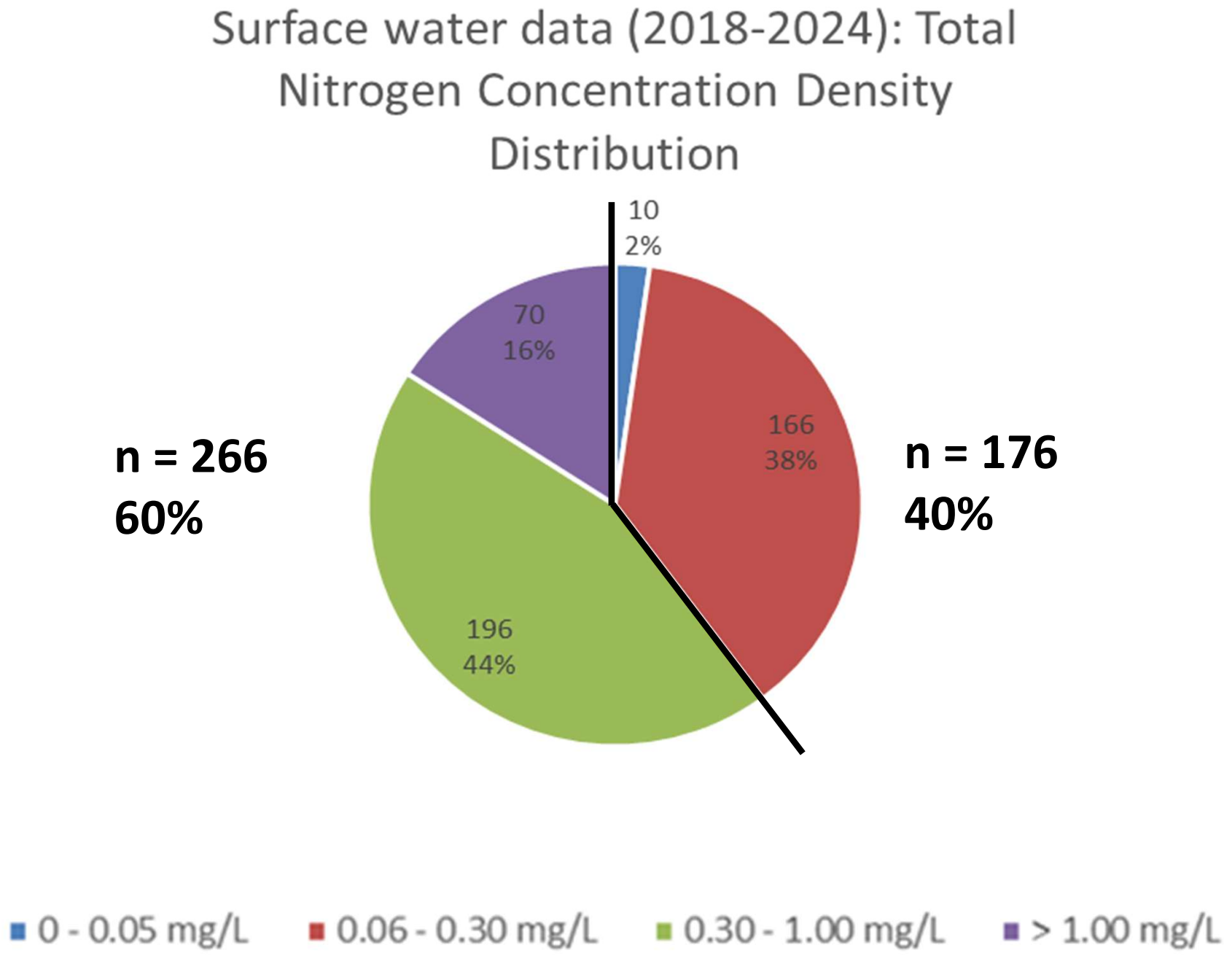
- Nitrate + nitrite
- Total nitrogen
- Total phosphorus
- Sedimentation/siltation
- E. Coli
- Fecal Coliform

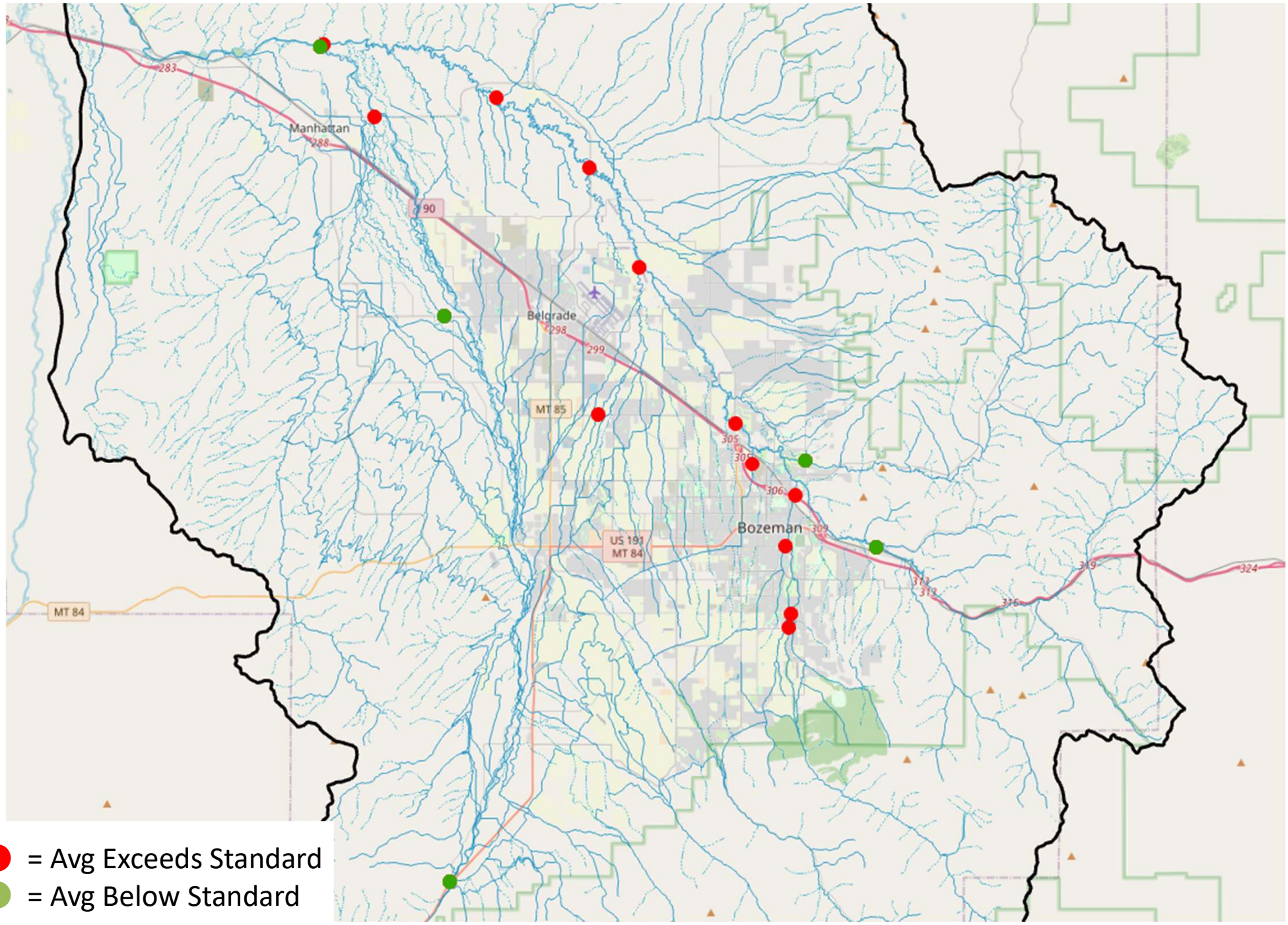
### Non-Pollutants

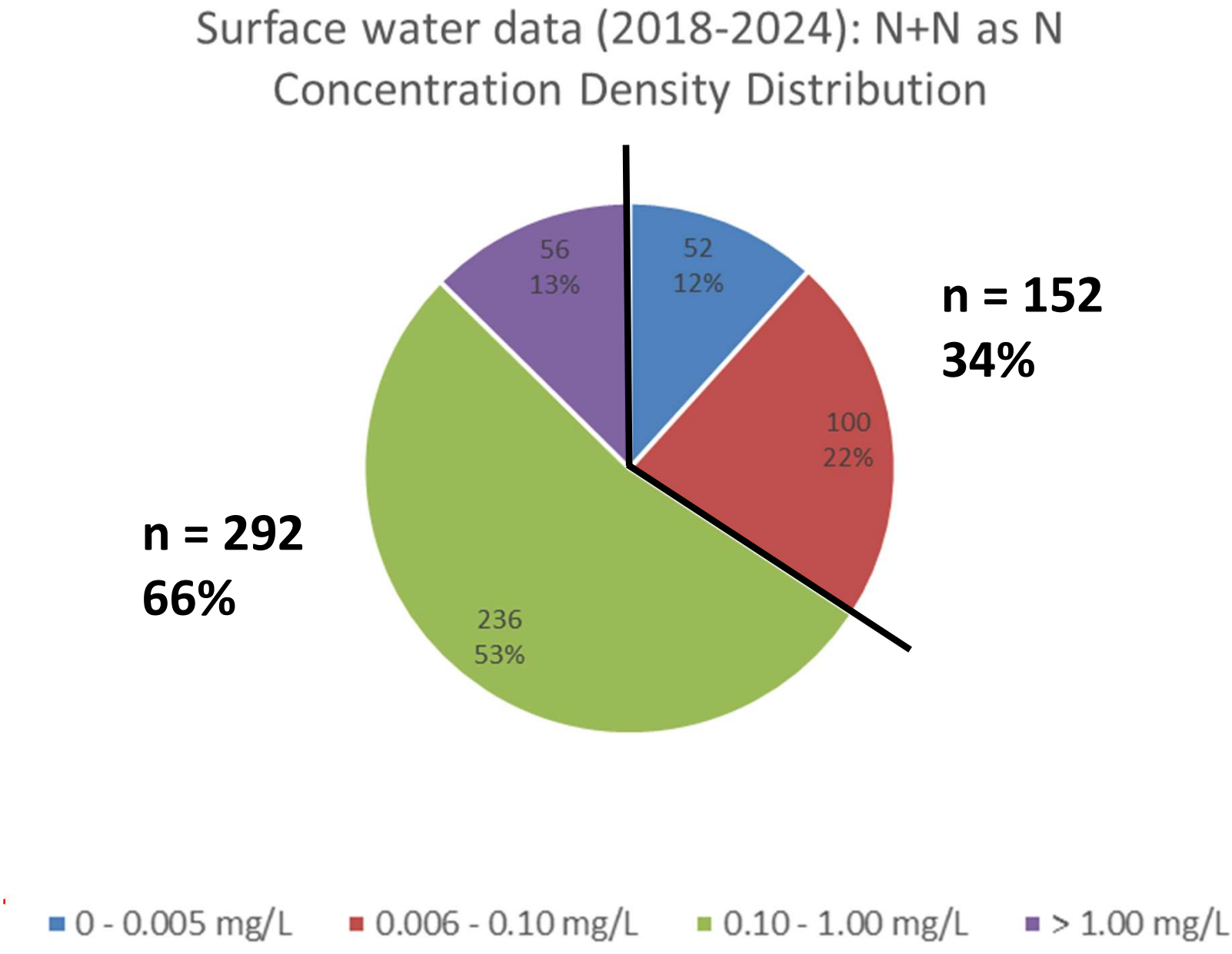
- Chlorophyll-*a*
- Excess algal growth
- Flow regime modification
- Alteration in stream-side vegetative covers
- Physical substrate habitat alterations
- Other anthropogenic substrate alterations

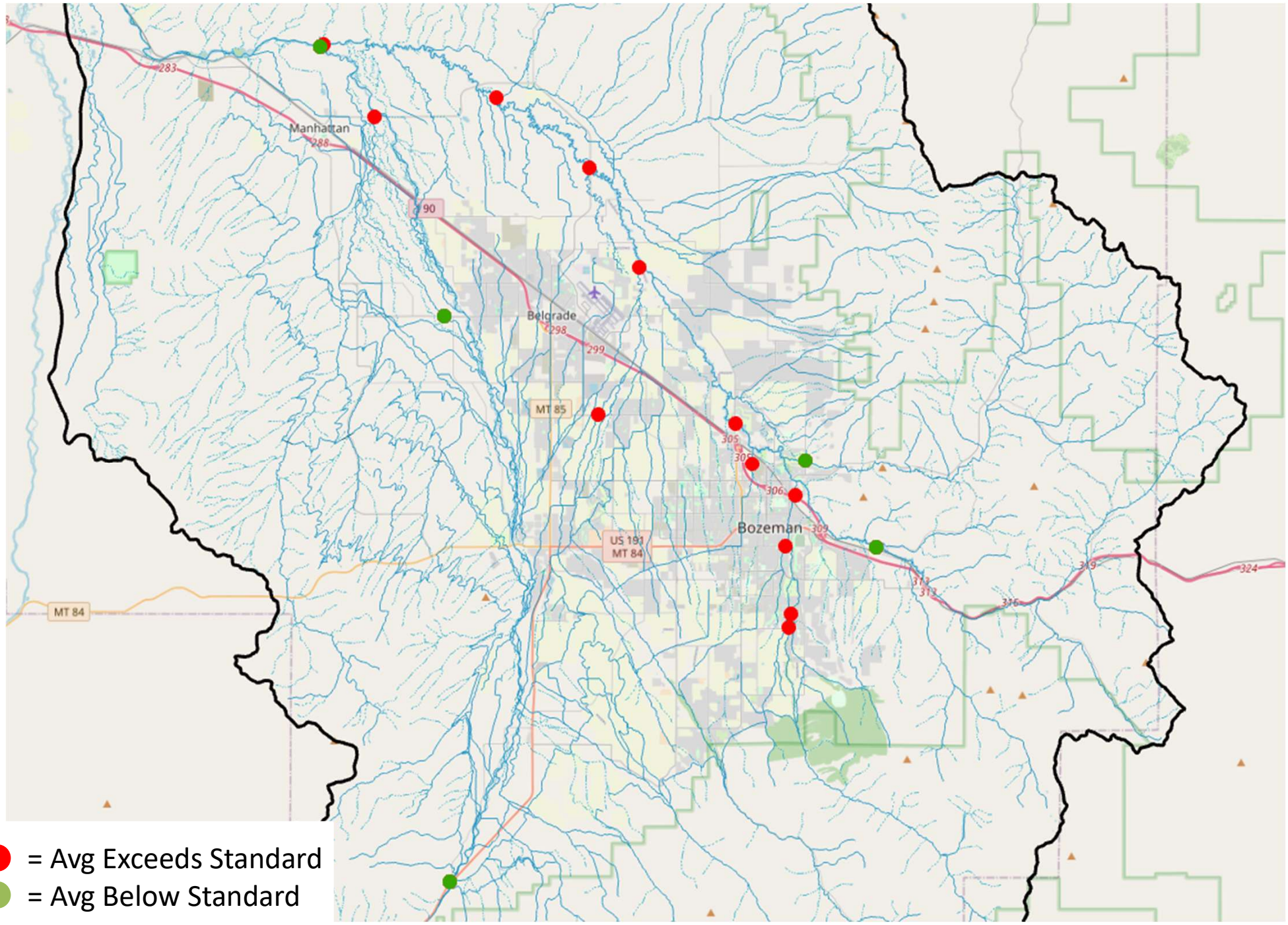
# Spatial Variation of Surface Water Quality across the Gallatin Valley

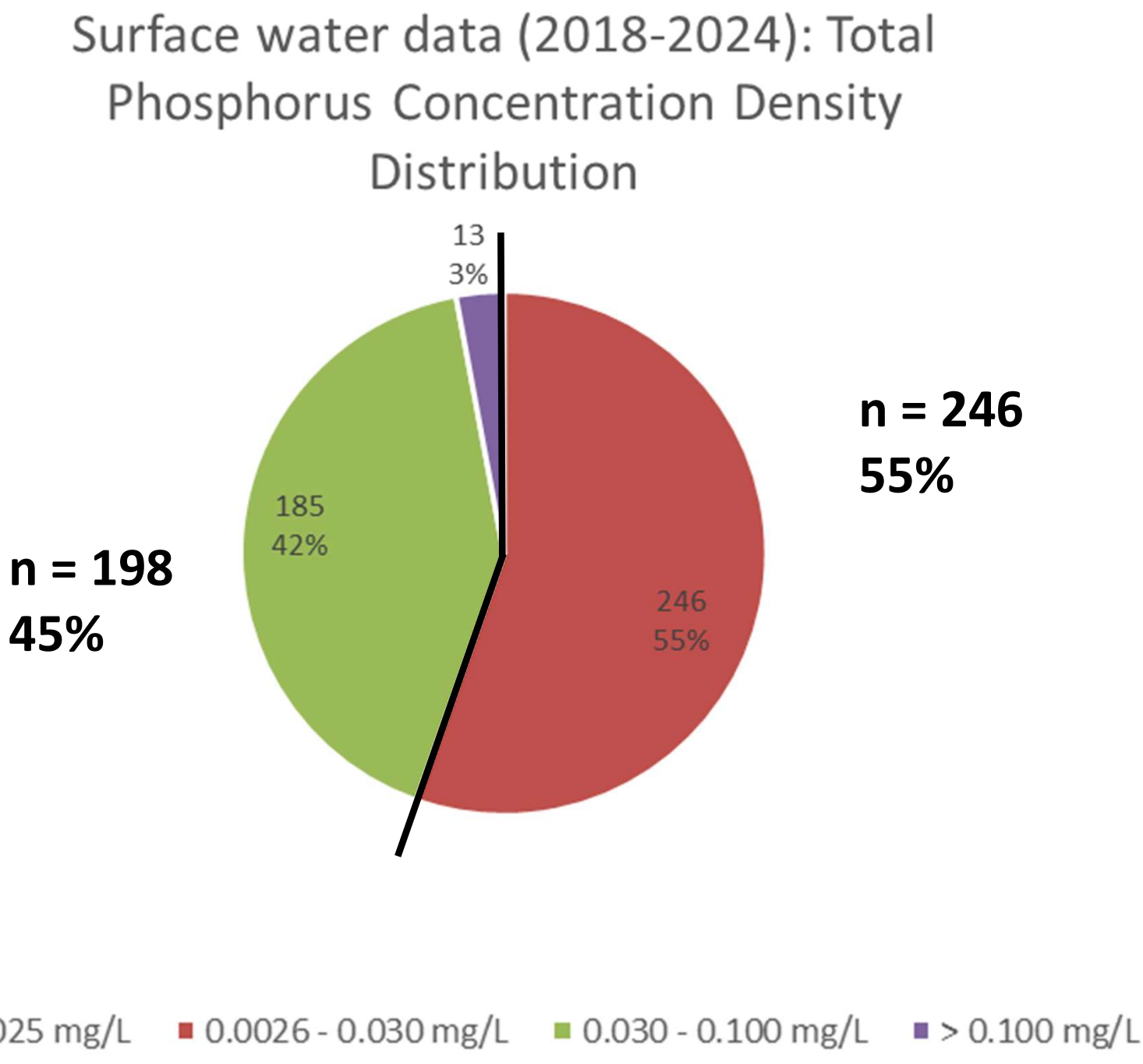


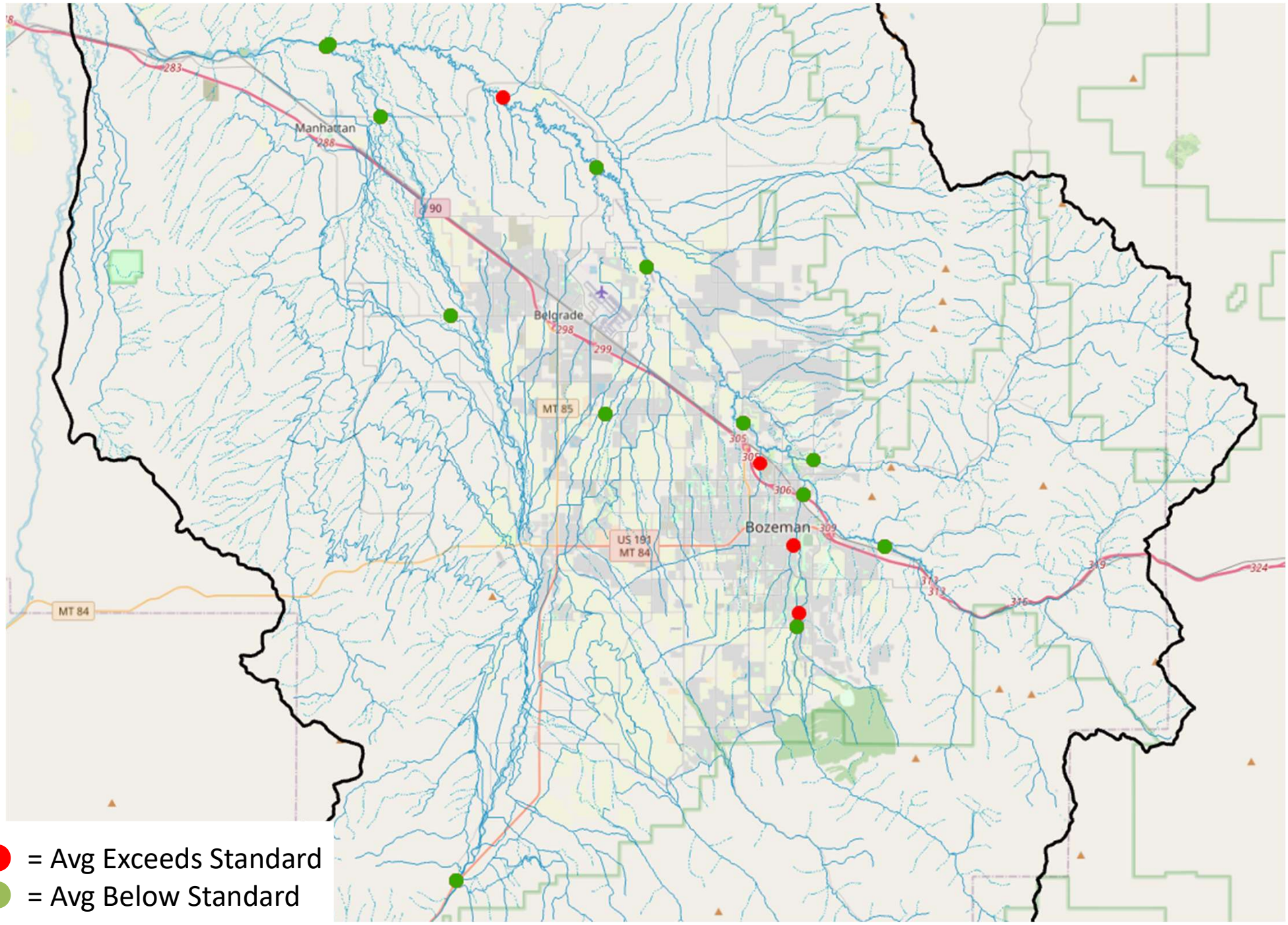

Surface water data (2018-2024): Total Nitrogen Concentration Density Distribution
10
2%
166
38%
196
44%
70
16%
n = 266
60%
n = 176
40%
0 - 0.05 mg/L
0.06 - 0.30 mg/L
0.30 - 1.00 mg/L
> 1.00 mg/L


Manhattan
Belgrade
Bozeman
MT 85
US 191
MT 84
MT 84
90
283
288
298
299
305
306
309
324
= Avg Exceeds Standard
= Avg Below Standard

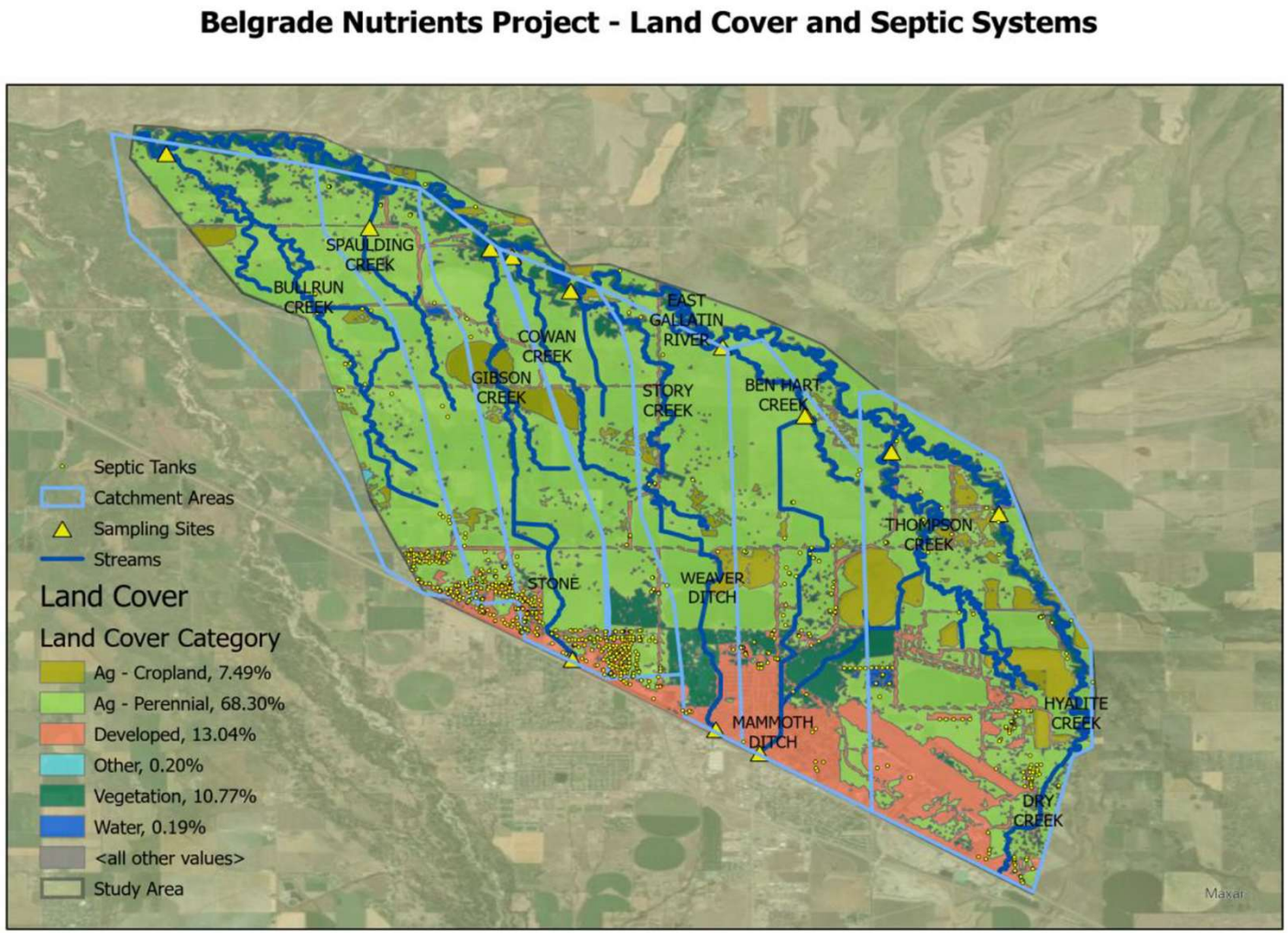

Surface water data (2018-2024): N+N as N
Concentration Density Distribution
52
12%
100
22%
236
53%
56
13%
n = 152
34%
n = 292
66%
0 - 0.005 mg/L
0.006 - 0.10 mg/L
0.10 - 1.00 mg/L
> 1.00 mg/L


Manhattan
Belgrade
Bozeman
MT 85
US 191
MT 84
MT 84
90
283
288
298
299
305
306
309
324
= Avg Exceeds Standard
= Avg Below Standard

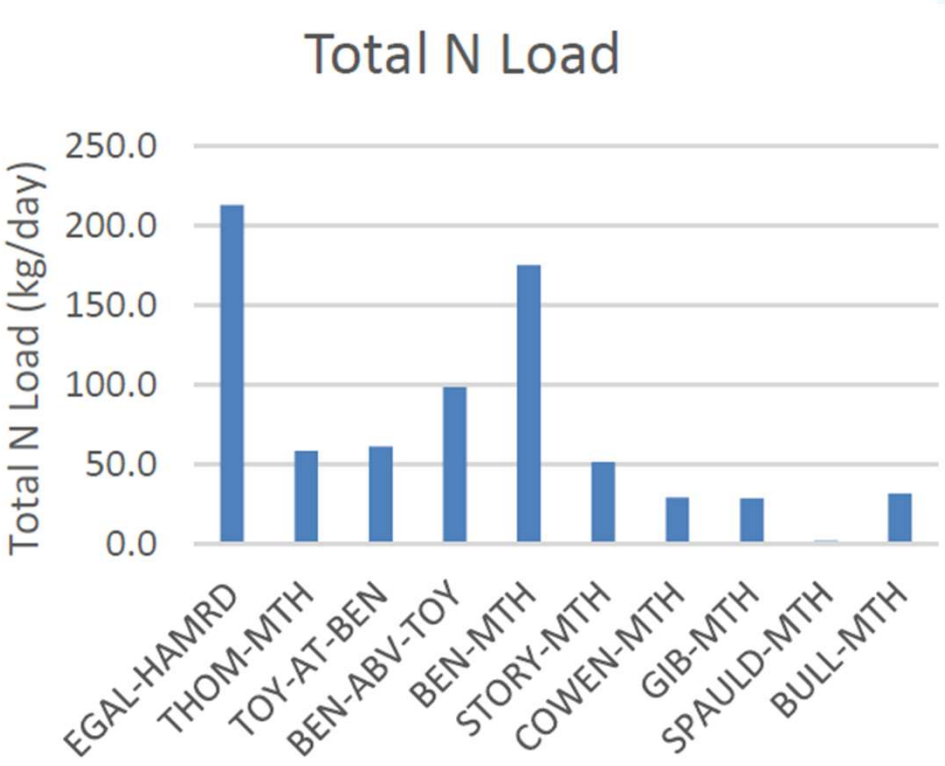

Surface water data (2018-2024): Total Phosphorus Concentration Density Distribution
13
3%
185
42%
246
55%
n = 198
45%
n = 246
55%
0 - 0.0025 mg/L
0.0026 - 0.030 mg/L
0.030 - 0.100 mg/L
> 0.100 mg/L

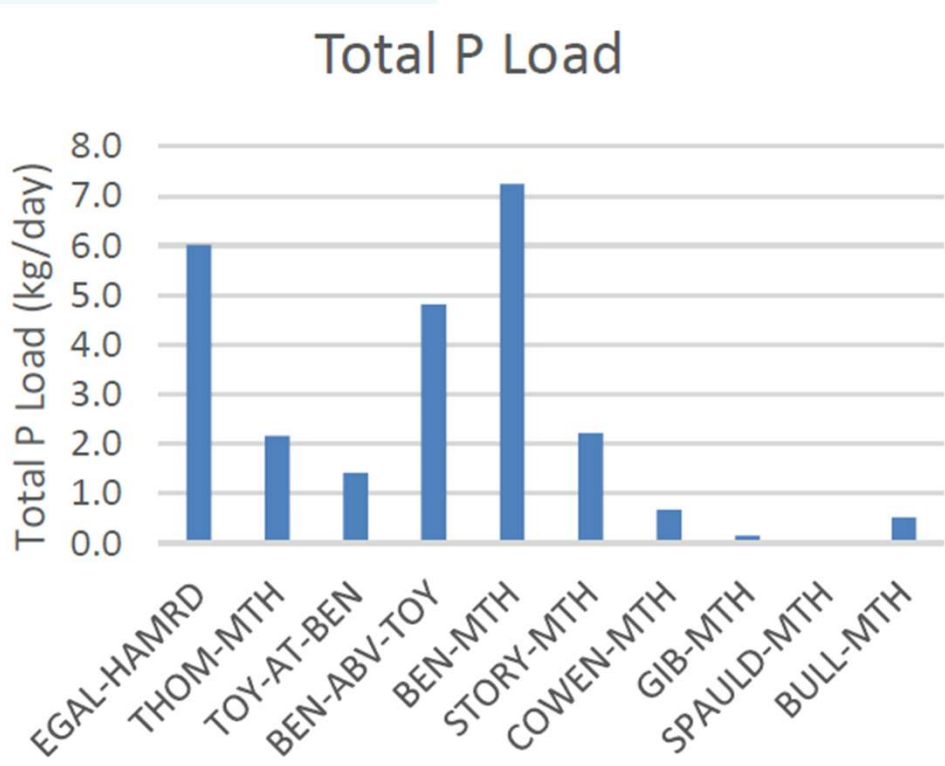

Manhattan
Belgrade
Bozeman
MT 85
US 191
MT 84
MT 84
90
283
288
298
299
305
306
309
313
316
324
= Avg Exceeds Standard
= Avg Below Standard

# Belgrade Spring Creek Synoptic Winter Sampling, 2021




Imagery from ESRI World Imagery; Streams from USGS National Hydrology Dataset; Roads from Montana Transportation Framework; Landcover from USGS Cropscape data; Catchment areas drawn from USGS DEM.

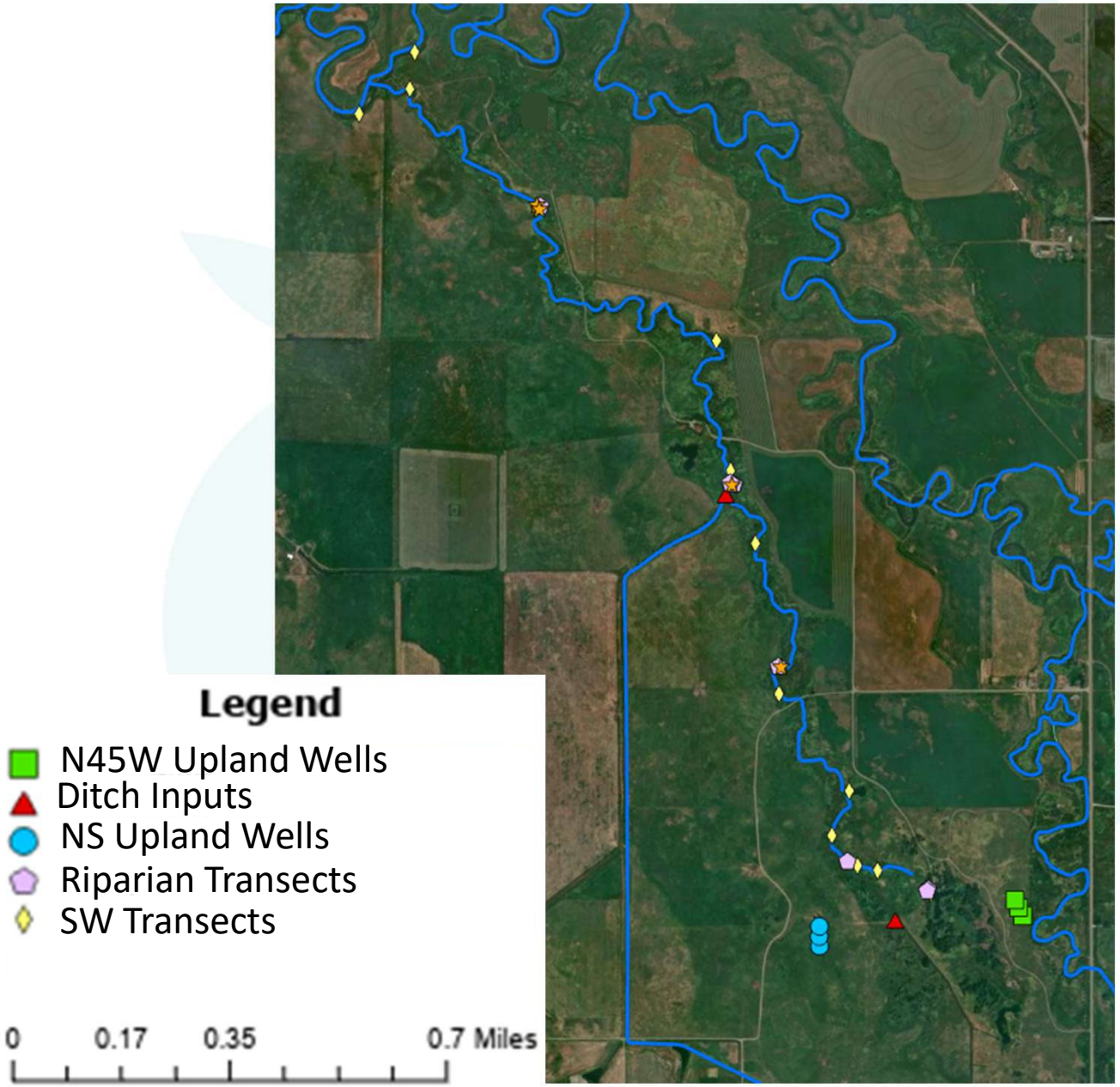

Total N Load
Total N Load (kg/day)
250.0
200.0
150.0
100.0
50.0
0.0
EGAL-HAMRD
THOM-MTH
TOY-AT-BEN
BEN-ABV-TOY
BEN-MTH
STORY-MTH
COWEN-MTH
GIB-MTH
SPAULD-MTH
BULL-MTH


Total P Load
Total P Load (kg/day)
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
EGAL-HAMRD
THOM-MTH
TOY-AT-BEN
BEN-ABV-TOY
BEN-MTH
STORY-MTH
COWEN-MTH
GIB-MTH
SPAULD-MTH
BULL-MTH

# Ben Hart Creek Project


Imagery from ESRI World Imag ion Framework; Landcover from USGS Cropscape data; Catchm

# Ben Hart Creek Site locations

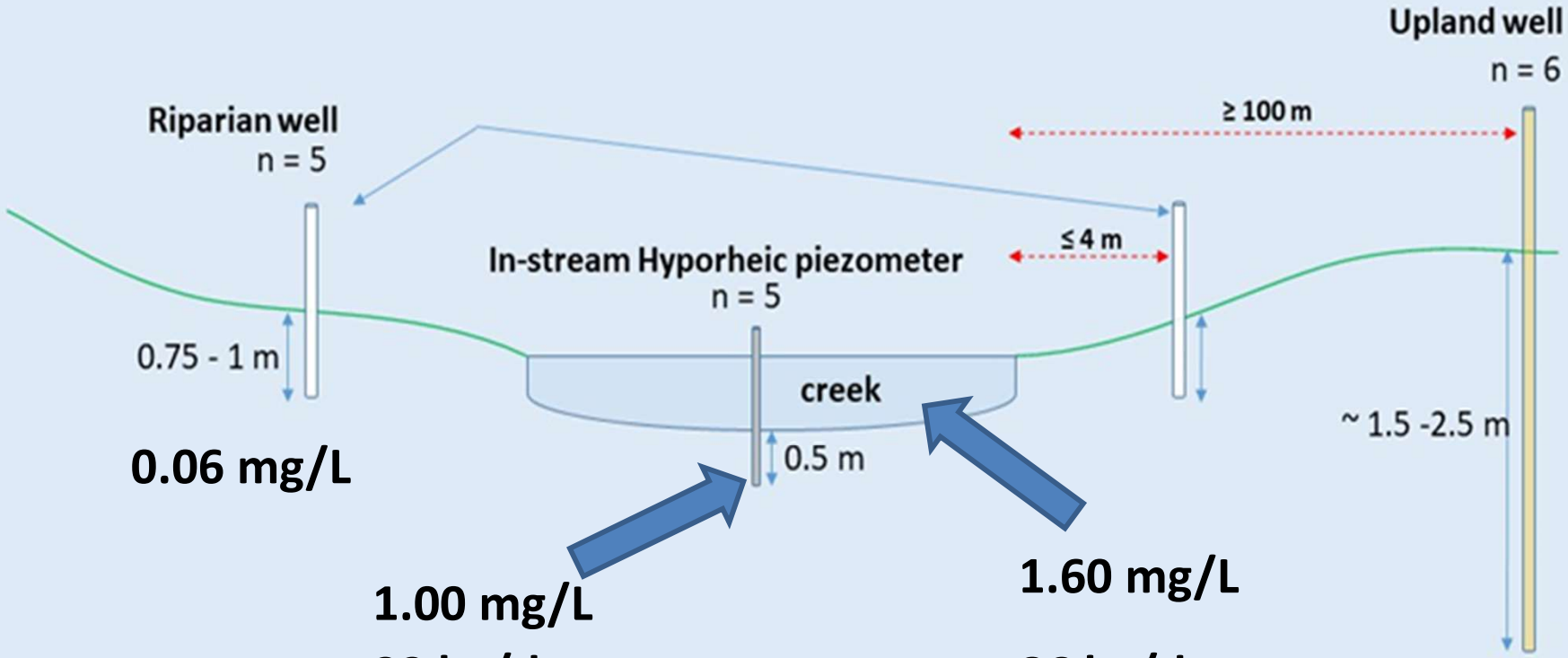


**Ditch Inputs = 46 – 68%**

**Groundwater upwelling = 32 - 54%**

**NS Wells = 0.40 mg/L**

**N45W Wells = 0.01 mg/L**



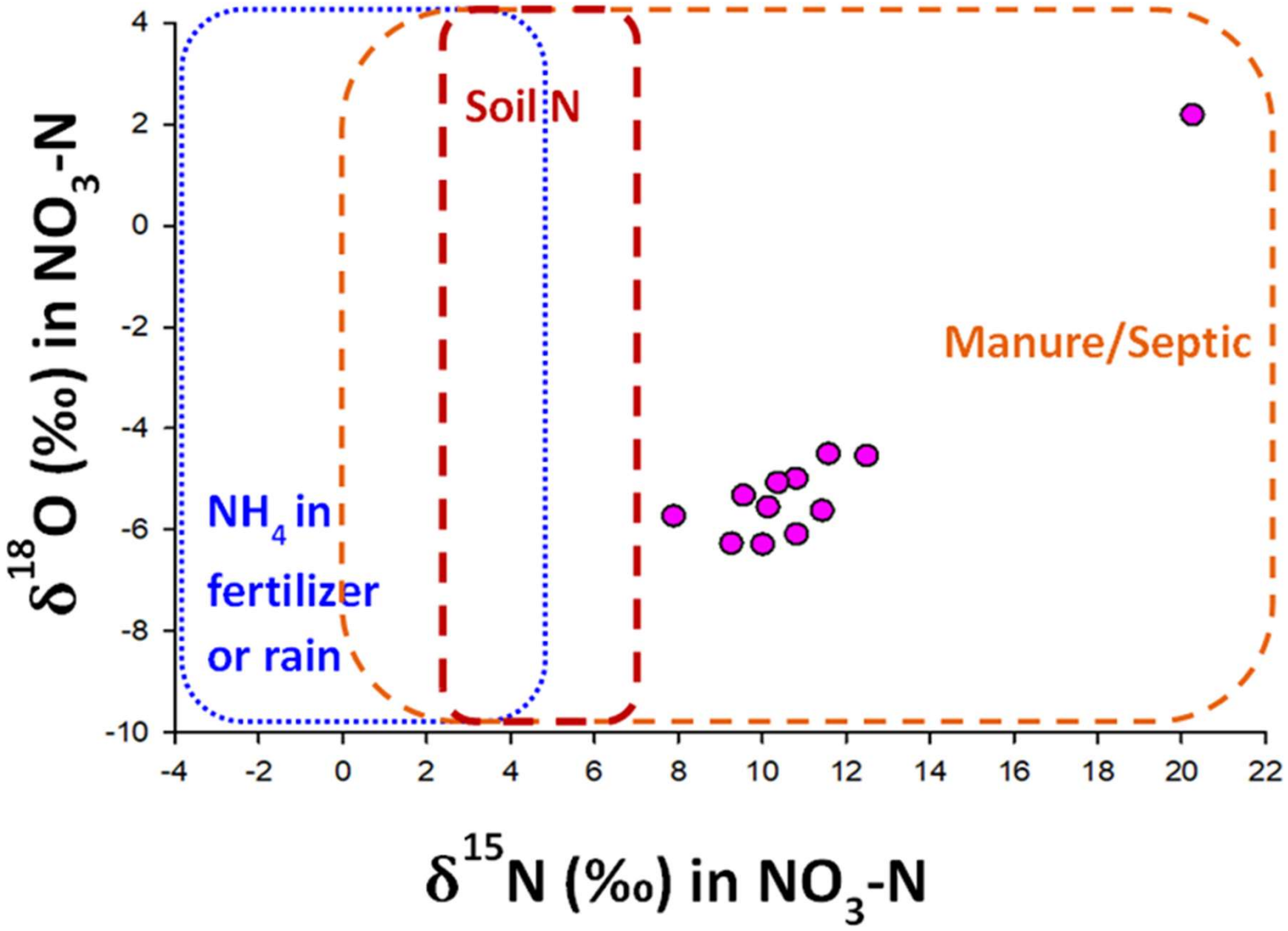

**0.06 mg/L**

**1.00 mg/L**

**22 kg/d**

**1.60 mg/L**

**86 kg/d**


Soil N
Manure/Septic
NH4 in
fertilizer
or rain
δ18O (‰) in NO3-N
δ15N (‰) in NO3-N
4
2
0
-2
-4
-6
-8
-10
-4
-2
0
2
4
6
8
10
12
14
16
18
20
22

# Summary

- 25 stream segments in the Gallatin Watershed do not fully support aquatic life.
- 70% of SWMN sites exceed WQS for TN and nitrate; 24% for TP during the growing season.
- Ben Hart Creek is the largest SW contributor of TN and TP to the East Gallatin in the Belgrade area.
- Ben Hart Creek nitrate is enriched, suggests an organic nitrate source.