CITY OF Ames

Caring People ◆ Quality Programs ◆ Exceptional Service

MEMO

Item No. 1

To: Mayor and City Council

From: Tracy Peterson, P.E., Municipal Engineer
Neil Weiss, P.E., Assistant Director of Water & Pollution Control

Date: March 23, 2021

Subject: Story County Water Monitoring & Interpretation Plan, 2021-2030

In 2020, 24 members of a planning team began meeting by Zoom to take a comprehensive look at stream and lake monitoring in Story County. After state support for volunteer water quality monitoring ended, Story County had proposed creating a local program, while the City of Ames continued to provide laboratory services for watershed projects. However, it became apparent we needed an inventory of the data that had already been collected by various agencies and guidelines for how the data could best be used before we could make plans for additional monitoring. **Prairie Rivers of Iowa (PRI) convened the group of stakeholders to grapple with this challenge and create a plan**. Those who served on the planning team include:

- Story County Conservation (Mike Cox, Jerry Keys and Margaret Jaynes)
- City of Ames (Tracy Peterson, Liz Calhoun, Neil Weiss, Dustin Albrecht, Maryann Ryan and Ashley Geesman)
- City of Nevada (Jordan Cook and Jeremy Rydl)
- City of Gilbert (Sonia Arellano-Sundberg)
- City of Huxley (Rita Connor and Mark Kahler)
- Iowa State University Leopold Center for Sustainable Agriculture (Mark Rasmussen)
- Izaak Walton League (Zack Moss and Paul Readhead)
- Story County Soil and Water Conservation District Commissioner (Kayla Bergman)
- Story County Community Foundation (Jennifer Dieter)
- Prairie Rivers of Iowa (Penny Brown Huber and Dan Haug).

The Story County Water Monitoring & Interpretation Plan, 2021-2030 has now been completed. The outline of the plan mirrors how the planning team walked through and understand the information and also ensure that all members were all on the same page. Chapters in the plan reflect those learning curves: (1) Why do we want data? (2) Where do we want data? (3) What data is already available? (4) How do we interpret the data once we have it? (5) How can we collect new data? (6) Goals for future monitoring.

This plan is the first of its kind in Iowa where a county-wide plan has been developed. It provides a working document for meeting goals and strategies as the planning team continues to meet and support effective, practical stream and lake water quality monitoring efforts.

City staff and PRI would like to offer City Council an option to have a PowerPoint presentation to help synthesize the information and to answer questions. **The entire planning committee has targeted the end of March for a public press release and launch of the monitoring plan across Story County and the state. The report will be distributed, including to City Council and other member agencies, at that point.**

Meetings with other member agencies have been scheduled for a 15-20 minute PRI PowerPoint plan presentation by PRI, as follows:

- 2/17 at 9:30 a.m. Story County Watershed Assessment team
- 3/8 at 5:30 p.m. Story County Conservation Board and
- 3/8 at 6:30 p.m. Nevada City Council
- 3/9 at 10:00 a.m. Story County Supervisors
- 3/15 at 6:30 p.m. Gilbert City Council
- 3/17 at 9:00 a.m. Story County Soil & Water Commission
- 3/17 at 3:30 p.m. Story County Community Foundation Board

On March 9th, Ames City Council made a motion to hear this presentation as part of the March 23rd meeting agenda.

Story County Water Monitoring & Interpretation Plan

2021-2030

With financial support from: Story County, City of Ames, Story County Community Foundation, ISU Leopold Center for Sustainable Agriculture, Outdoor Alliance of Story County, Renewable Energy Group, Story County SWCD

Prairie Rivers of Iowa

Presenter: Dan Haug
March, 2021

What's at stake?

City of Ames' role

- Water Pollution Control Laboratory
  - 15 samples/month
- Media Production Services
  - Helped create 2 watershed awareness videos
- Planning Team
  - Maryann Ryan, Tracy Petersen, Liz Calhoun, Neil Weiss, Ashley Geesman, Dustin Albrecht

Planning Team

- Story County
- City of Ames
- City of Nevada, City of Gilbert, City of Huxley
- Story County Soil & Water Conservation District
- Story County Community Foundation
- Leopold Center for Sustainable Agriculture
- Izaak Walton League of America

Purpose statement

To collect and analyze water sampling data

To increase residents' knowledge and understandings

And identify problems in our watersheds,

To support and improve water quality

The Plan

- Plan:
  - 4 pages of goals, 80 pages of supporting material needed to fill in details
- Presentation follows the chapters
  1. Why do we want data?
  2. Where do we want data?
  3. What data is already available?
  4. How do we interpret data once we have it?
  5. How can we collect new data?
  6. Goals & Strategies, 2021-2030

Why Do we want Data?

Needs that motivated this plan

- Local leadership for volunteer monitoring
  - IOWATER program ended in 2016
- Data for new watershed projects
  - Story Countywide Watershed Assessment
  - Headwaters of the South Skunk River WMA
- Interpret data for existing watershed projects
  - ~~Squaw~~ Ioway Creek WMA
- Coordination of monitoring efforts and reuse of data

What data is already available?

Over 244,000 records from 428 stations!

Where is data stored?

Water quality

1. Water Quality Portal (EPA, USGS, USDA, etc.)
2. AQuIA (Iowa DNR)
3. IOWATER database (IDNR) → Clean Water Hub
4. Iowa Water Quality Information System (U of I)
5. Offline (City of Ames, ISU)

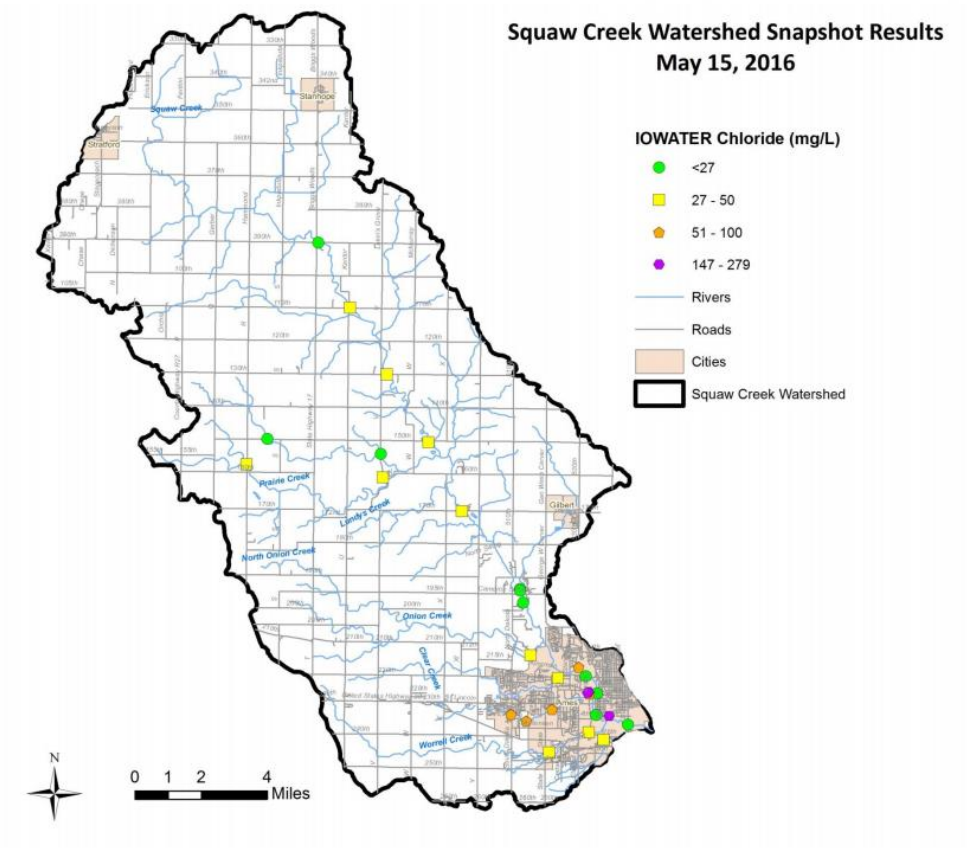
Water quantity

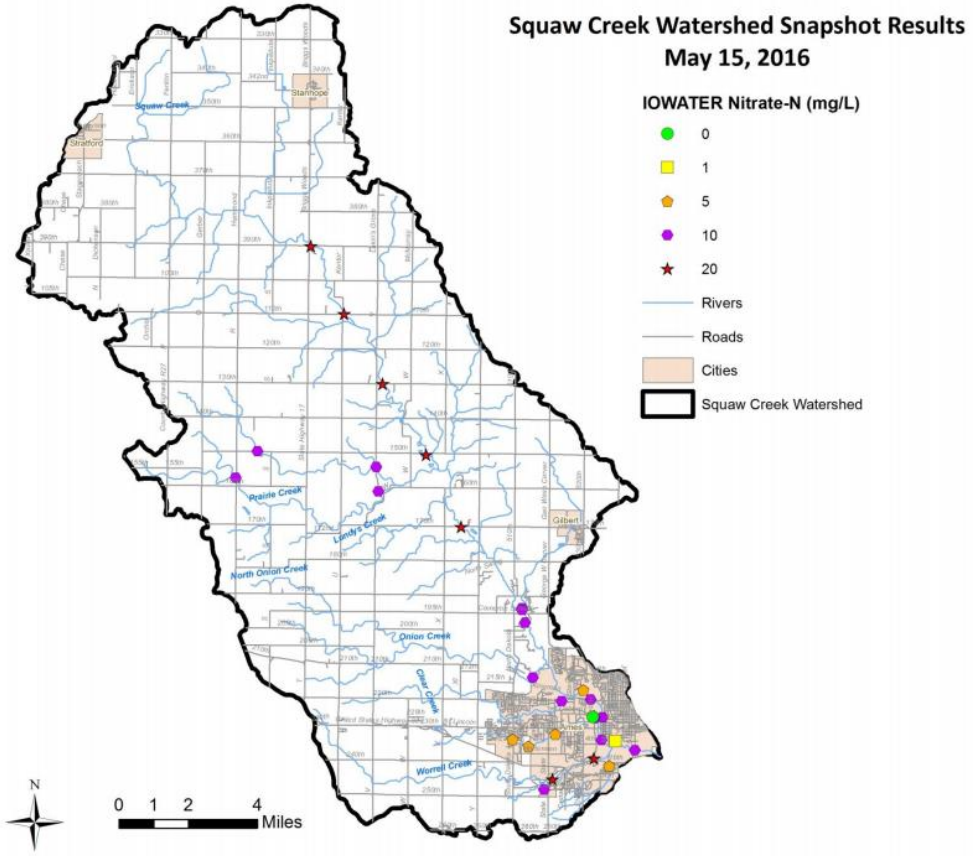
1. National Water Information System (USGS)
2. Iowa Flood Information System (U of I)

Biological monitoring

1. BioNet (Iowa DNR)
2. IOWATER database (IDNR) → ??

Volunteers (IOWATER)





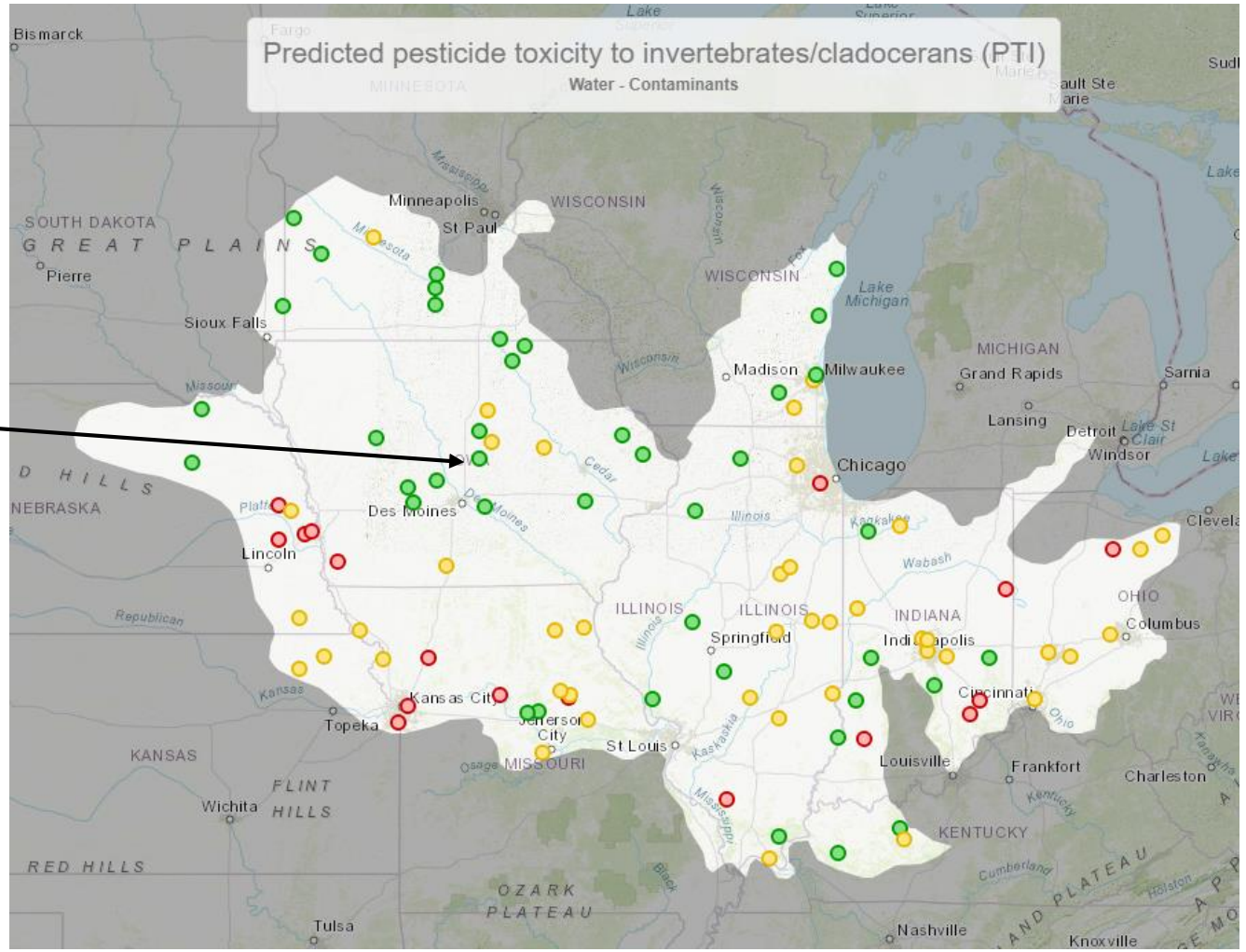
Midwest Regional Stream Quality Assessment (USGS)

Site Scorecard

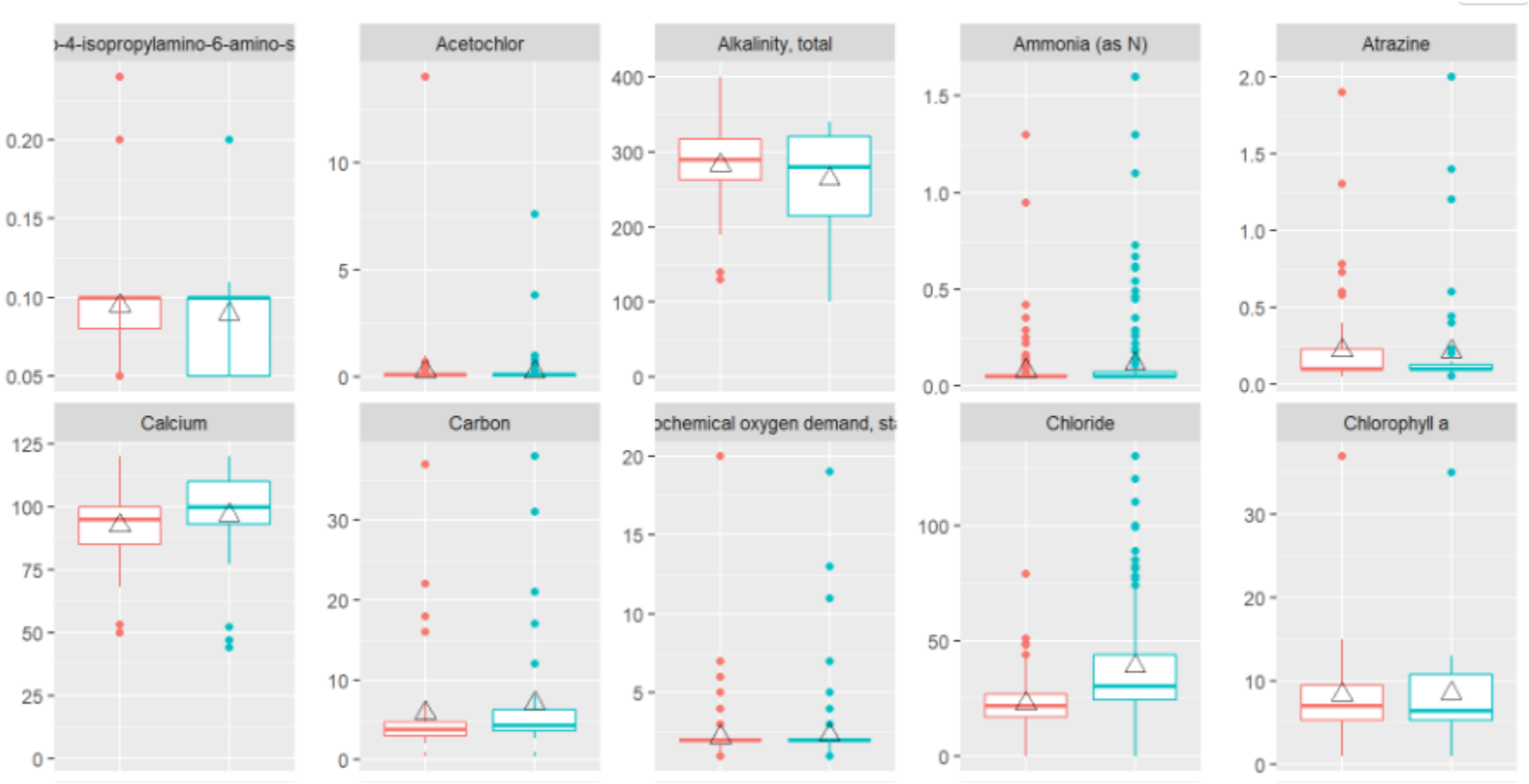
Unnamed Trib To East Br Indian Creek near Zearing, IA

Site Sampled May 2013 - Oct 2013

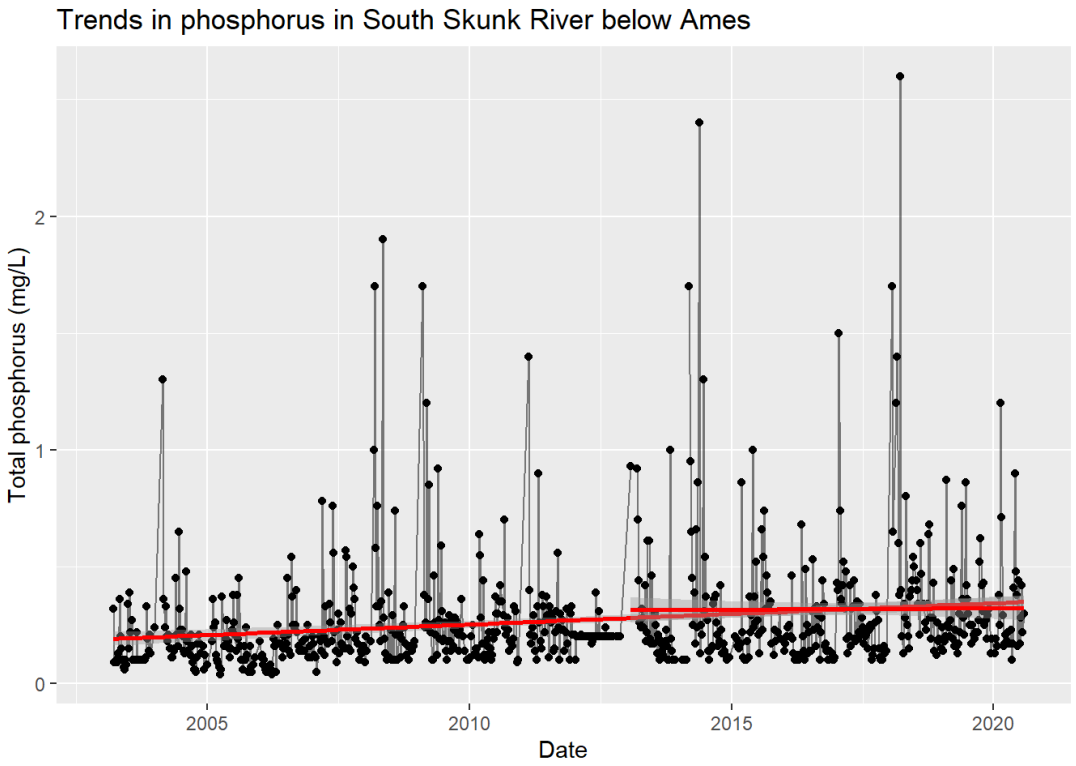
	Metric	Value	Unit	Score
Water - Nutrients and Dissolved Oxygen				
Info	Total Nitrogen	19.35	mg/L	High
Info	Total Phosphorus	0.25	mg/L	High
Info	Daytime Dissolved Oxygen Minimum	4.85	mg/L	Low
Water - Contaminants				
Info	Predicted pesticide toxicity to invertebrates/cladocerans (PTI)	0.05	Normalized toxicity units	Low
Sediment - Contaminants				
Info	Benchmark quotient (BQ5)	0.69	Normalized toxicity units	Medium
Info	Pyrethroid pesticides	Medium	See Info	Medium
Habitat				
Info	Riparian Developed	22%	Percentage of riparian buffer	Medium
Info	Percent Fine Sediment	73%	Percentage of ecological reach	High
Ecology				
Info	Macroinvertebrate MMI	39.27	Scaled 1 to 100	Fair
Info	Fish MMI	46.06	Scaled 1 to 100	Poor



Iowa DNR (AQuIA)



City of Ames

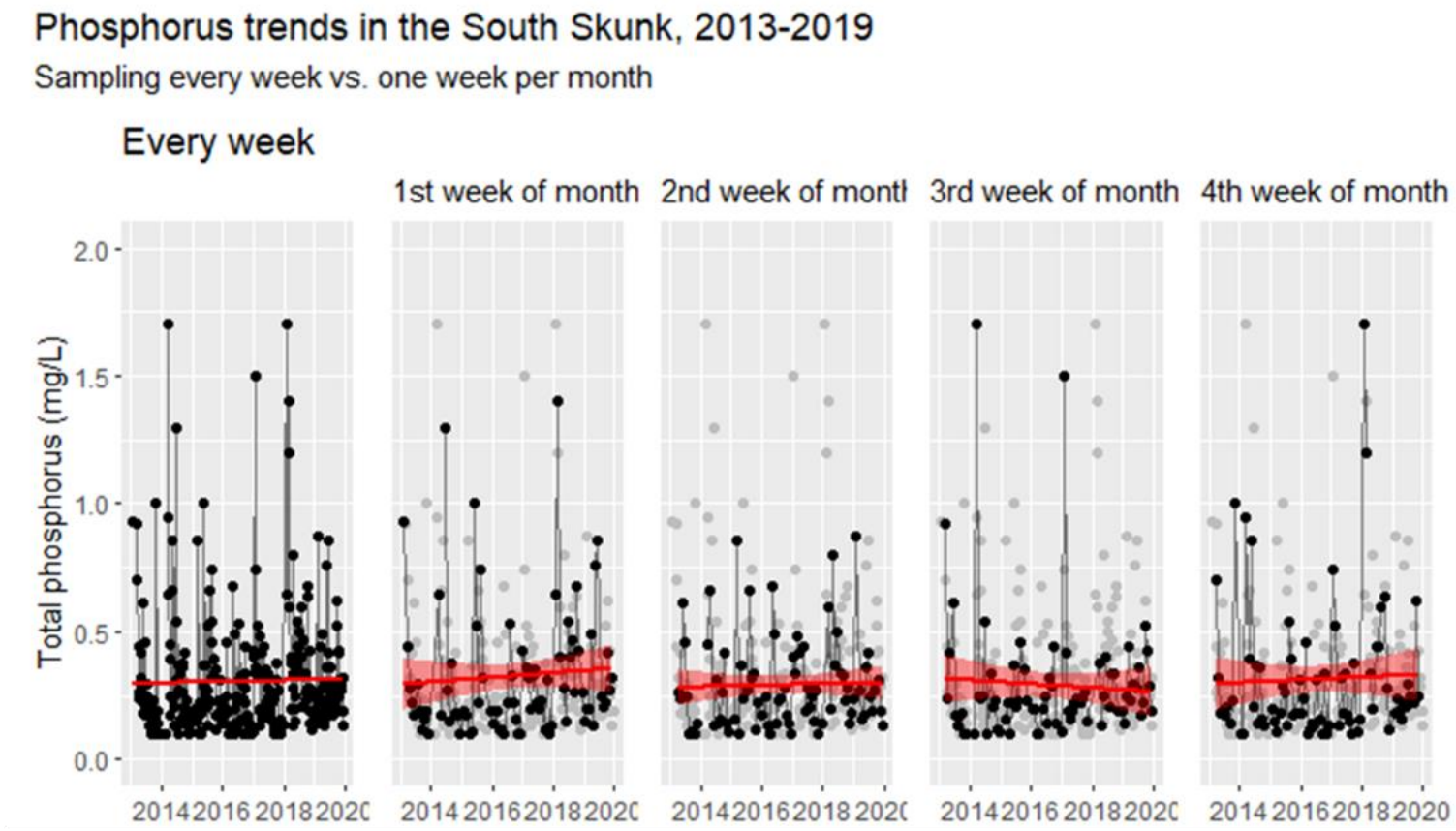


- Weekly monitoring of South Skunk River, since 2003

How do we interpret data once we have it?

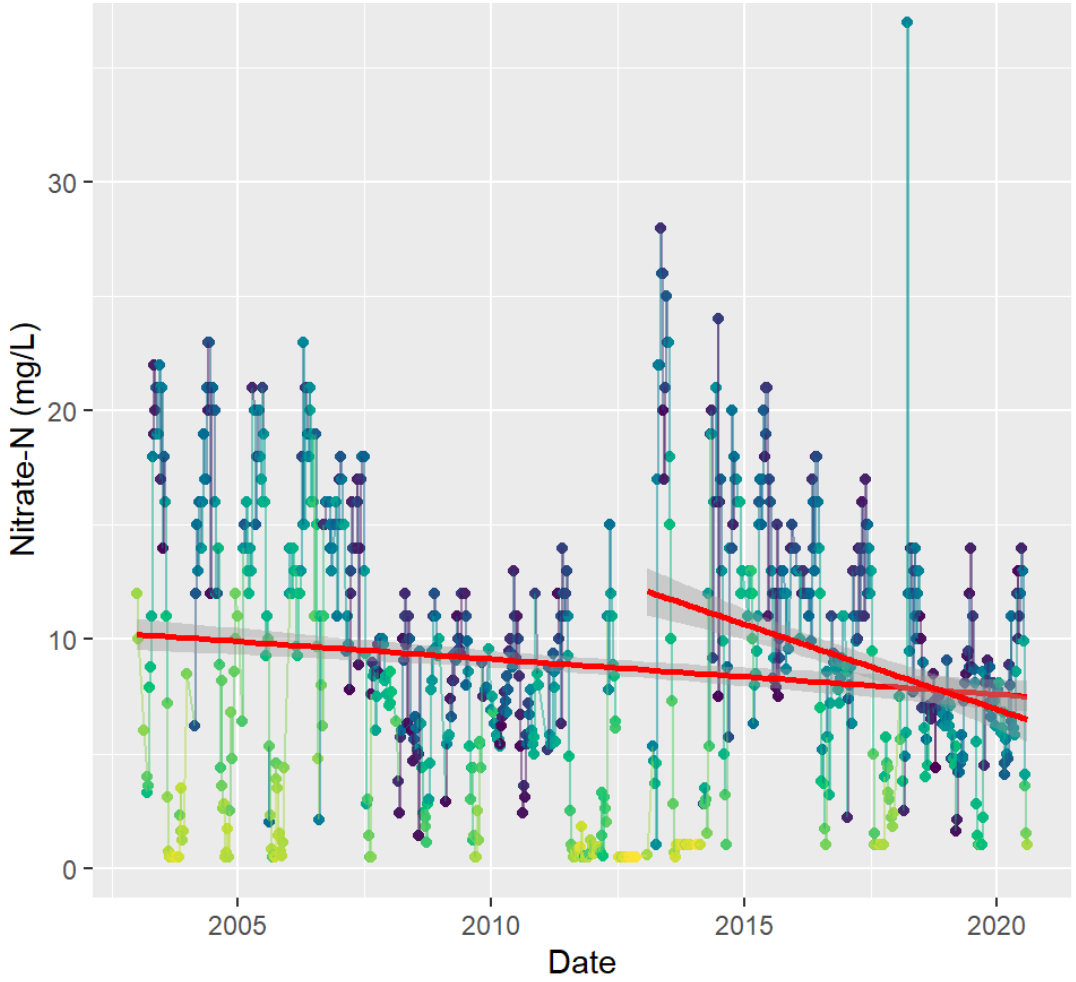
- Compare to standards (does it support recreation or aquatic life)
- Compare same site across time (trends)
- Compare multiple sites at same time (land mgmt)

Trends
(Is it a statistical fluke?)



Best fit trend (in 7 yrs)	+0.01 mg/L	-0.04 mg/L	+0.02 mg/L	-0.05 mg/L	+0.13 mg/L
90% Confidence Interval		-0.27 to +0.19	-0.10 to +0.14	-0.22 to +0.12	-0.13 to +0.38

Trends (long-term)



Where do we want data?

Streams with designated uses

Impaired waters

Perennial streams

Streams in every hydrologic unit

Streams with USGS gages

Where do we want data?

~~Streams with designated uses~~

~~Impaired waters~~

~~Perennial streams~~

~~Streams in every hydrologic unit~~

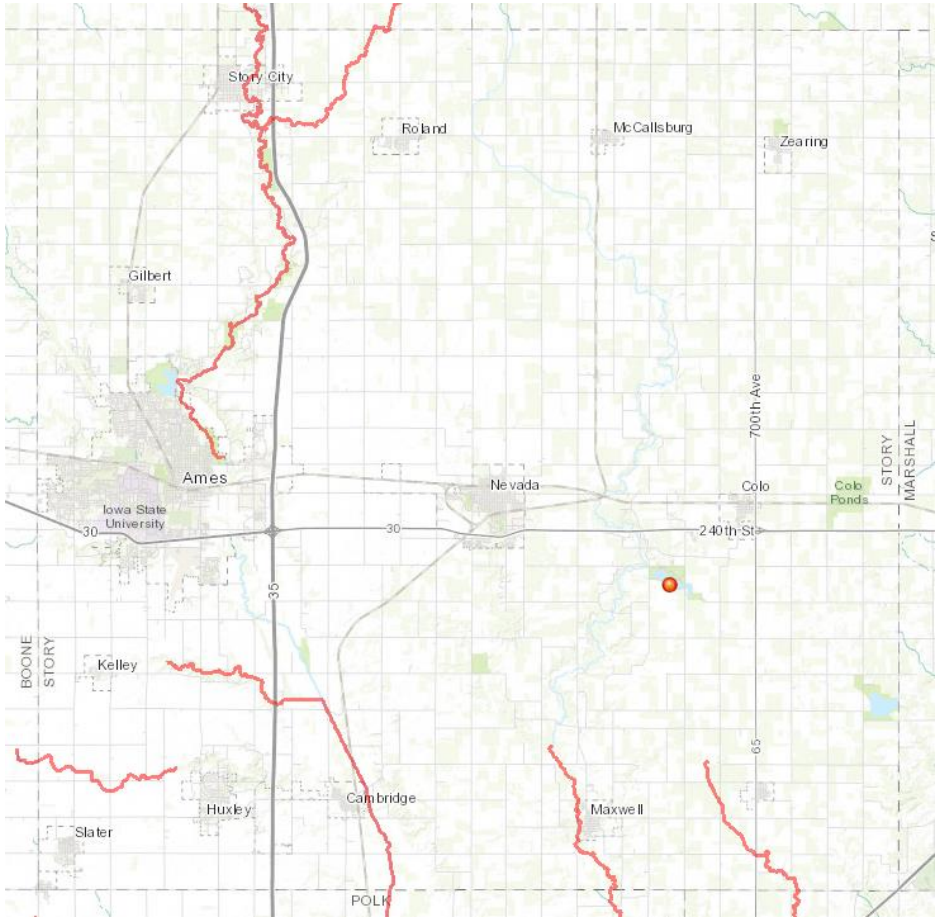
~~Streams with USGS gages~~

Common sense and experience of the team

Weird exceptions!

Inconsistent maps!

Impaired waters List (Iowa DNR, 2020 cycle)



- Only 5/34 streams were assessed for recreation
  - 2 of those **we** tested!
- Only 18/34 streams were assessed for aquatic life

Common Sense Approach

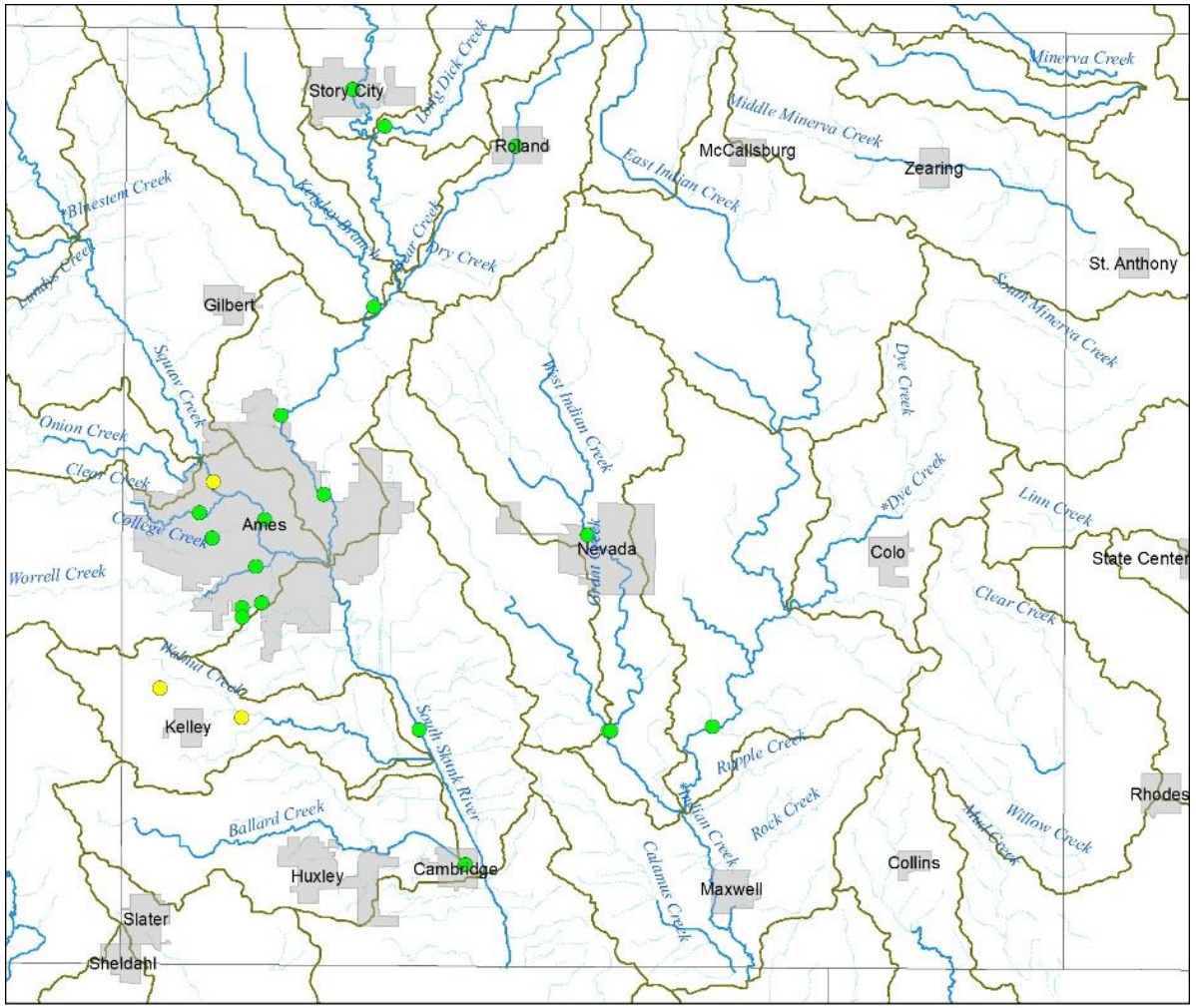
- Test *E. coli* at locations where people contact the water
  - Canoe access points
  - County parks
  - City parks
- Volunteer monitoring all over the county

How can we collect new data?

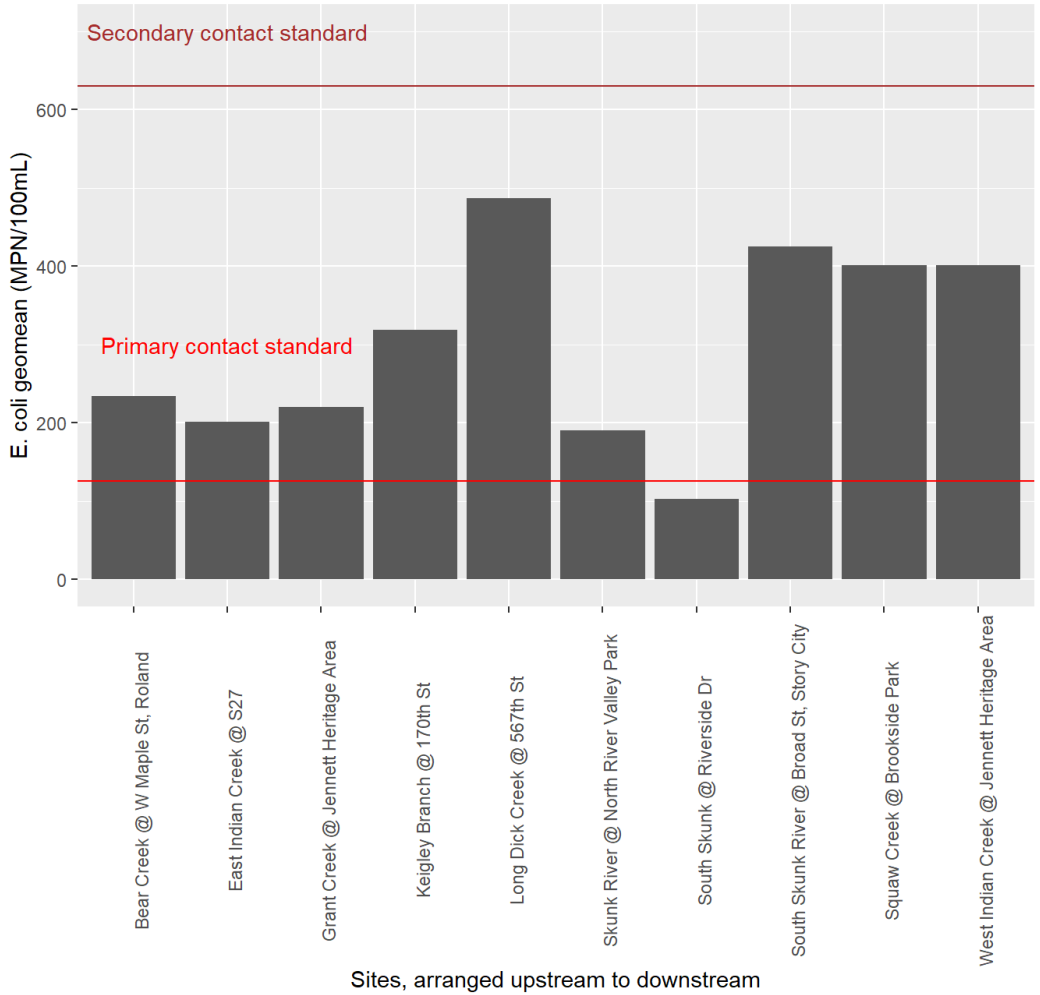
Volunteer Testing

- Story County Conservation assembled 17 kits
  - Monthly volunteer monitoring
  - 9 volunteers have started monitoring
- Volunteer events
  - May 2020: 28 volunteers
  - Oct 2020: 13 volunteers

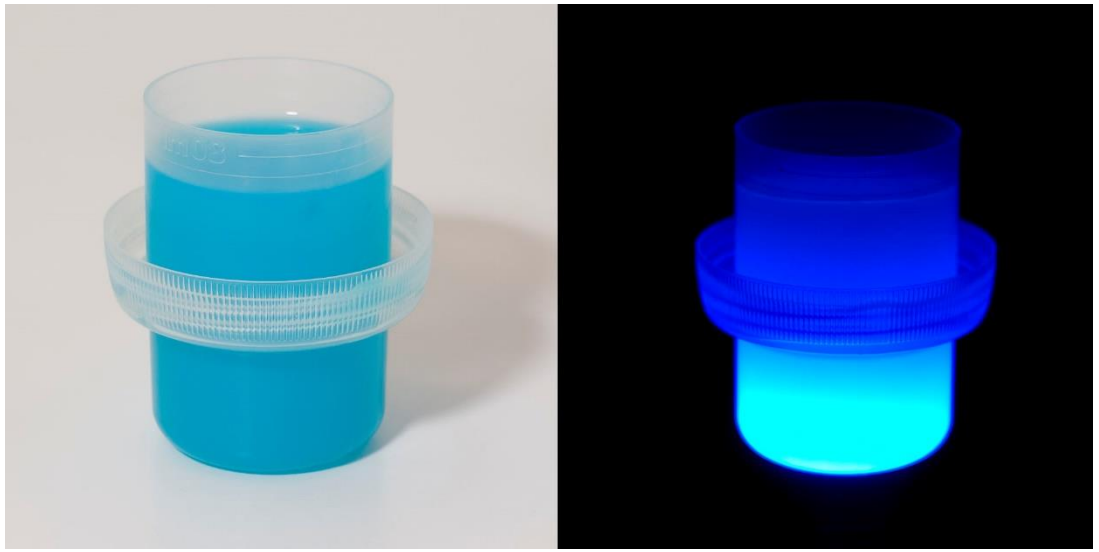
Monthly Lab tests (15 sites)



E. coli bacteria (2020)



Follow-up on E. coli

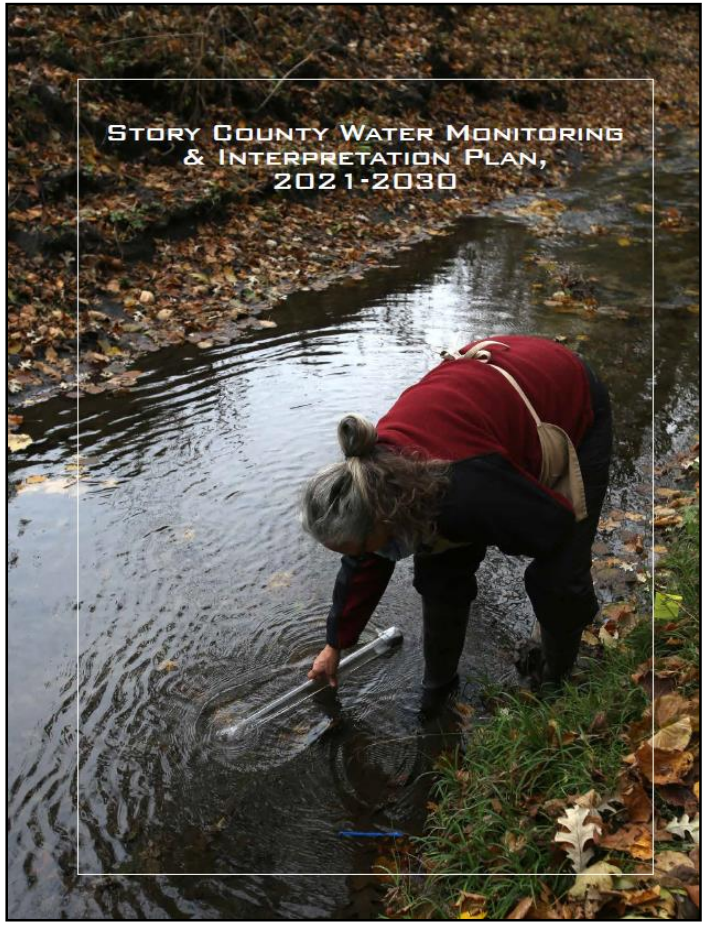


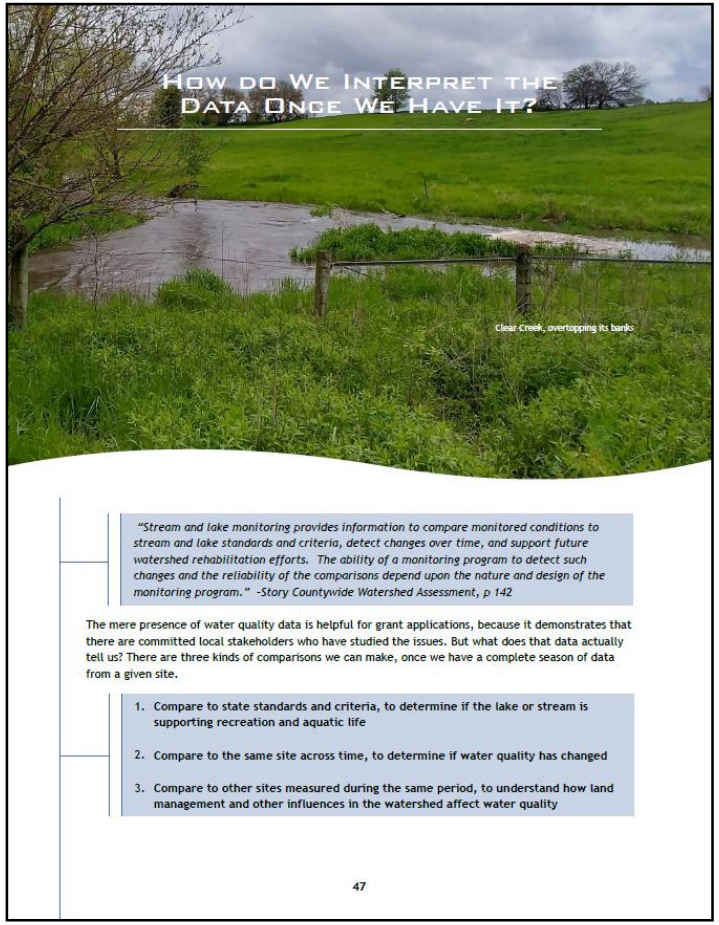
- Optical brighteners are an indicator of wastewater
- Relatively quick and cheap to test
- Jake Petrich, ISU Chemistry, will be testing sensitivity and longevity of brighteners
- Potential to narrow down locations of septic/sewer issues

Goals & Strategies, 2021-2030

1. To increase awareness of water quality in Indian Creek and South Skunk River, recognize progress, and engage stakeholders who can positively impact those watersheds
2. To expand monitoring efforts to cover more of the county
3. To identify and promote actions that improve and sustain the water quality and system resiliency of the lakes and rivers through which water travels
4. Strengthen the working relationships between current and future partners and we implement the monitoring plan

Please read and ask questions!





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