

Watersheds Update

It Takes Collaboration and Teamwork!



April 19, 2022
City Council Workshop



1

Watersheds Update

City of Ames Public Works Department:

John Joiner, Director
Tracy Peterson, Municipal Engineer
Cesar Cintron, Civil Engineer II
Liz Calhoun, Stormwater Resource Analyst
Jake Moore, Stormwater Specialist

City of Ames W&PC Department:

John Dunn, Director
Neil Weiss, Asst Director
Maryann Ryan, Laboratory Supervisor
Ashley Geesman, Enviro. Engineer
Dustin Albrecht, Enviro. Specialist

Prairie Rivers of Iowa:

Penny Brown Huber, Executive Director
Jessica Butters, Pollinator Conservation Specialist
Dan Haug, Water Quality Specialist



2

Watersheds Update

Streams in Ames



- ❑ Onion Creek: 880 feet
 - ❑ Clear Creek: 6,565 feet
 - ❑ College Creek: 6,880 feet
 - ❑ Worle Creek: 5,450 feet
 - ❑ loway Creek: 9,387 feet
 - ❑ South Skunk River: 7,730 feet
- Total =36,892 feet or 6.99 miles



3

UPDATE TO COUNCIL: WATER QUALITY MONITORING IN STORY COUNTY

2022-04-19

Dan Haug, Water Quality Specialist

4

April 19, 2022 Ames City Council Workshop: Watersheds Update

Class A1
Presumptive Use

NOT ASSESSED

Class A1
Presumptive Use

WINOFI

Bacteria: Indicator Bacteria- E. coli

Support Level	Water in Need of Further Investigation (WINOFI)
Impairment Code	3b - Use potentially impaired based on an evaluated assessment.
Cause Magnitude	Moderate
Status	Continuing
Source	Unknown: Source Unknown
Source Confidence	Low
Cycle Added	2018
Impairment Rationale	Geometric mean criterion exceeded
Data Source	Special project/study

On this day in loway Creek, *E. coli* bacteria was 10x the primary contact recreation standard.

5

Accomplishments, 2021

STORY COUNTY WATER MONITORING & INTERPRETATION PLAN: 2021-2030

Water Quality Monitoring in Story County, Iowa
2021 Annual Report

6

Partners

	\$\$	Training	Events	
Kits	Lab	Database	Data analysis	
				
\$\$	\$	\$	\$	
			 	

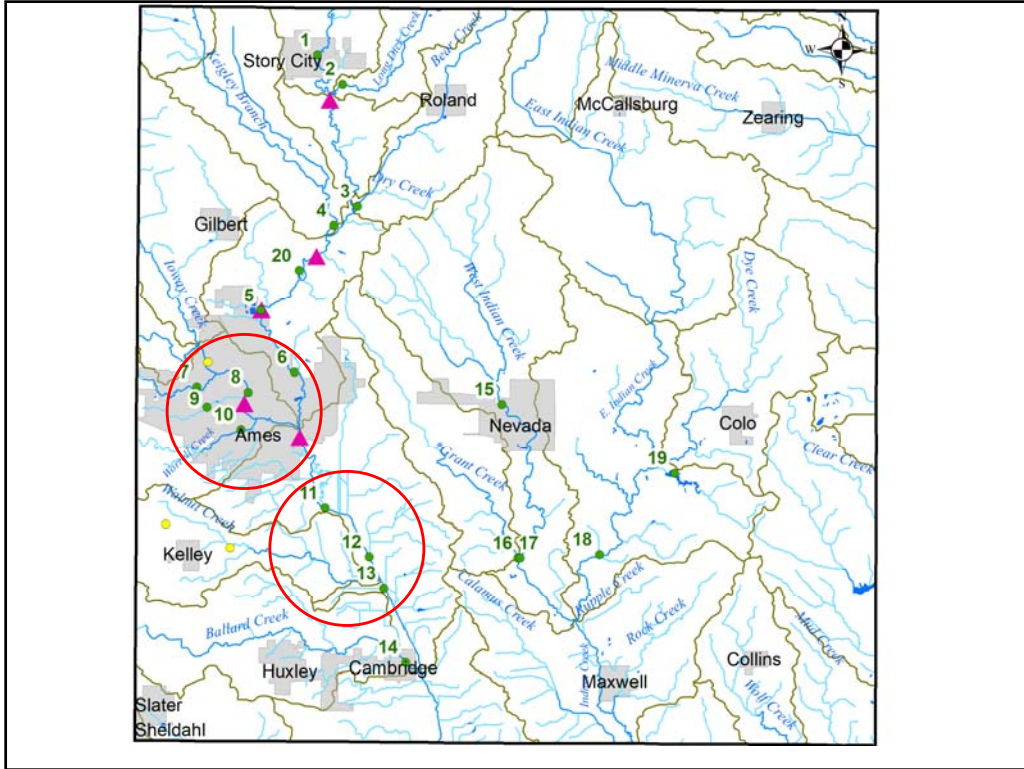
7

Lab testing



8

April 19, 2022 Ames City Council Workshop: Watersheds Update



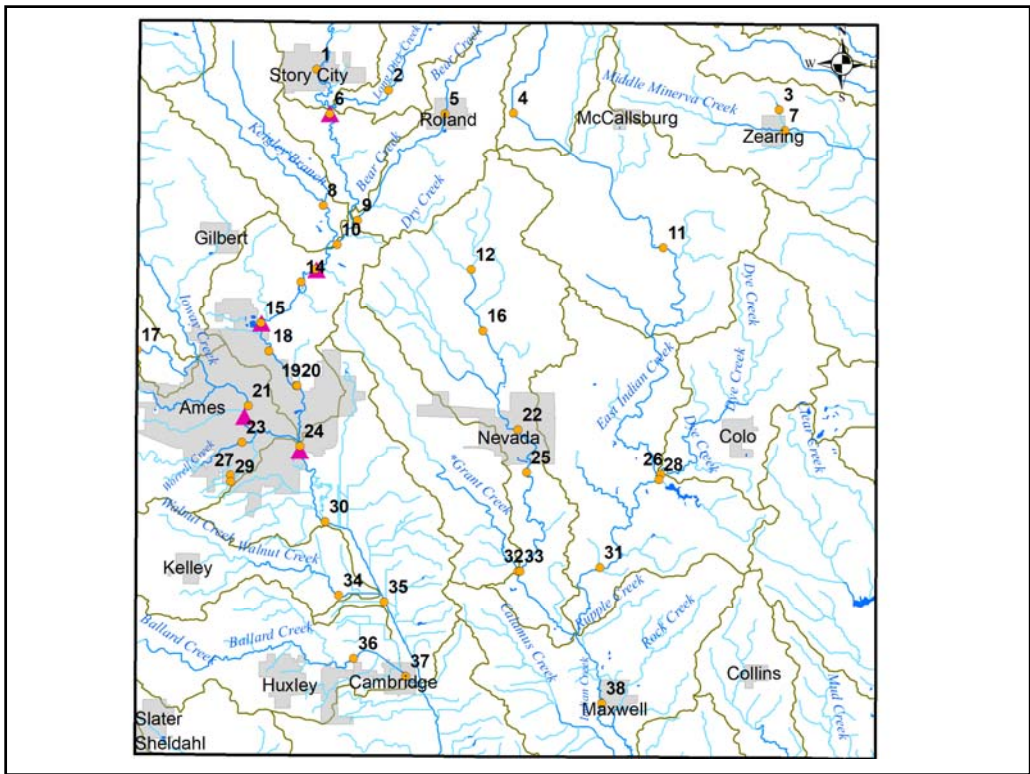
9

Volunteer testing in the field

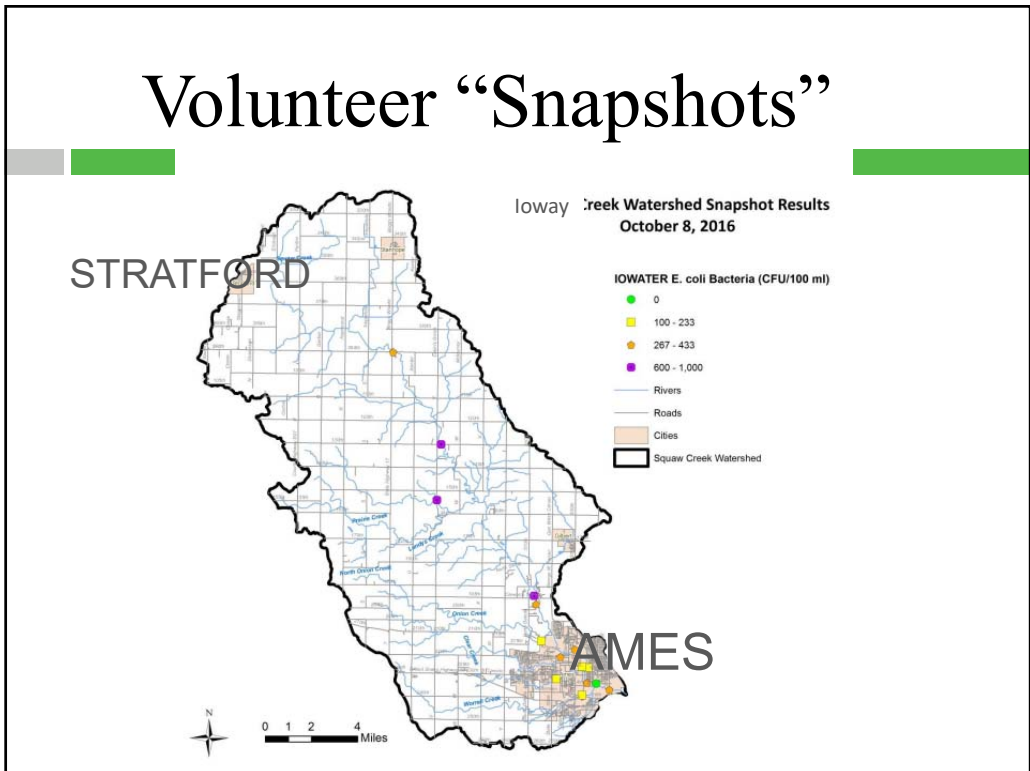


10

April 19, 2022 Ames City Council Workshop: Watersheds Update

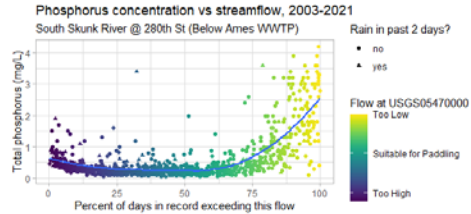
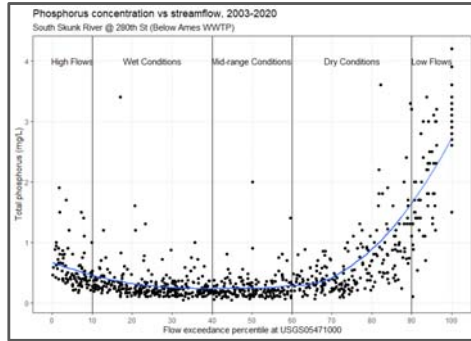


11



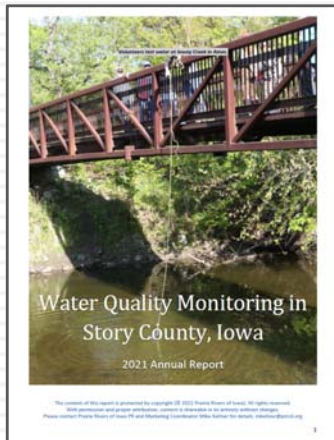
12

Interpreting and communicating the data



13

Findings, 2021



Duff Hygiene and Nutrient Losses
This year was the dry to have much influence on Duff hygiene. Focusing on normal to wet periods will help to identify hot spots where conservation practices are needed and evaluate whether conservation practices are working.



Nutrient Enrichment and Algae Blooms in Lakes and Streams
During dry conditions, the highest nutrient levels are below wastewater treatment plants.



Fish and the Insects They Eat
Low dissolved oxygen is harming invertebrates in some streams. Effluent from wastewater treatment plants could be a factor, but some patterns are still unexplained.



Recreation and Waterborne Illnesses
E. coli bacteria was usually low at swimming beaches and parts of the South Skunk River, but high in most creeks. We can narrow down likely sources of contamination by checking whether bacteria is highest during low flows or high flows.



Erosion and Sediment Impacts on Aquatic Life
Unexcused stormwater from older neighborhoods can have extremely high levels of sediment, phosphorus, and bacteria.

14

Key findings from 2021 monitoring



Gulf Hypoxia and Nutrient Losses

This year was too dry to have much influence on Gulf Hypoxia. Focusing on normal-to-wet periods will help to identify hot spots where conservation practices are needed and evaluate whether conservation practices are working.



Nutrient Enrichment and Algae Blooms in Lakes and Streams

During dry conditions, the highest nutrient levels are below wastewater treatment plants.



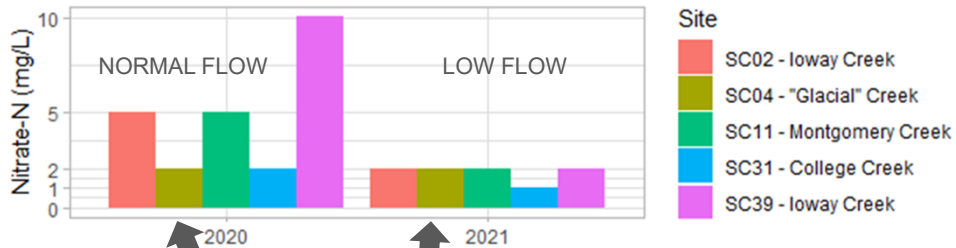
Fish and the Insects They Eat

Low dissolved oxygen is harming invertebrates in some streams. Effluent from wastewater treatment plants could be a factor, but some patterns are still unexplained.

15

Low nitrate almost everywhere

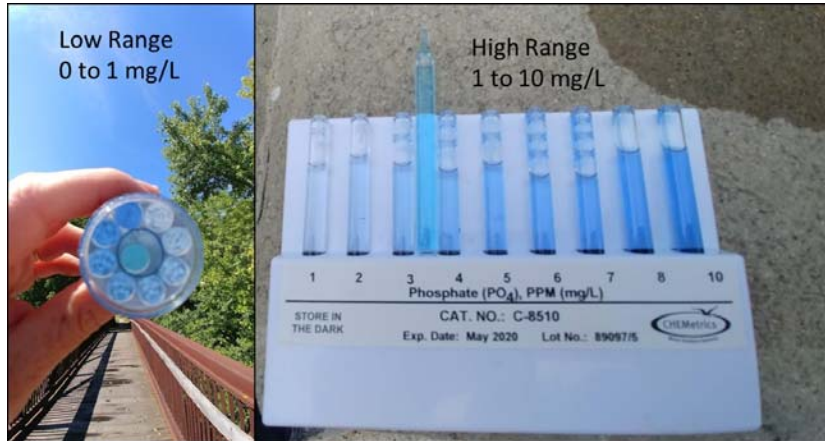
Differences between sites, measured at two May snapshots



CREP Wetland

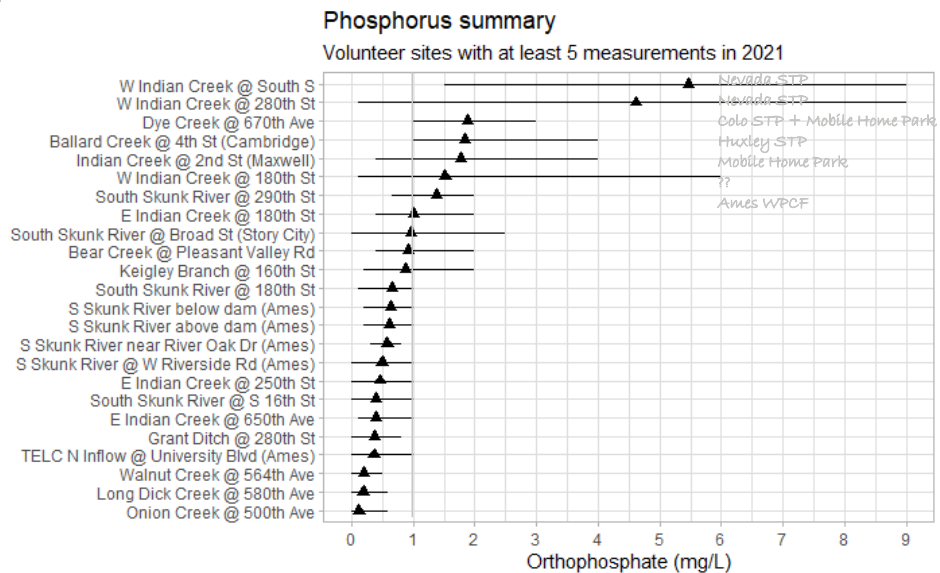
16

High phosphorus



17

High phosphorus: volunteer results



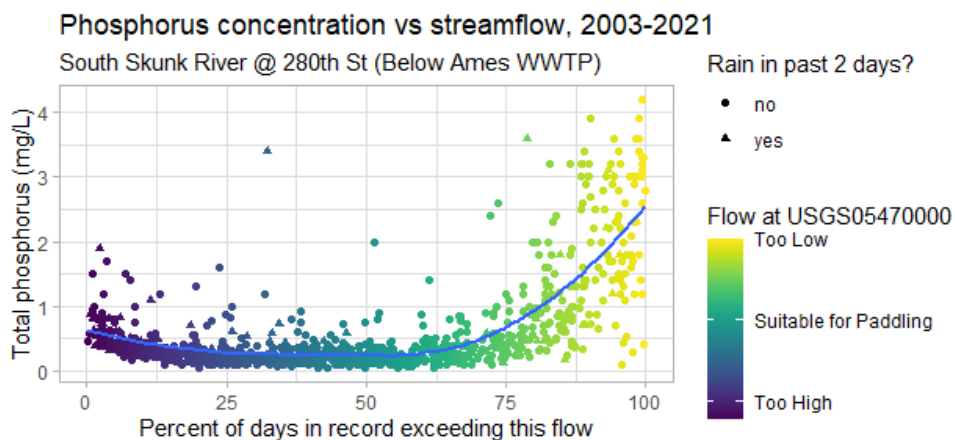
18

Outfall from Ames WPCF



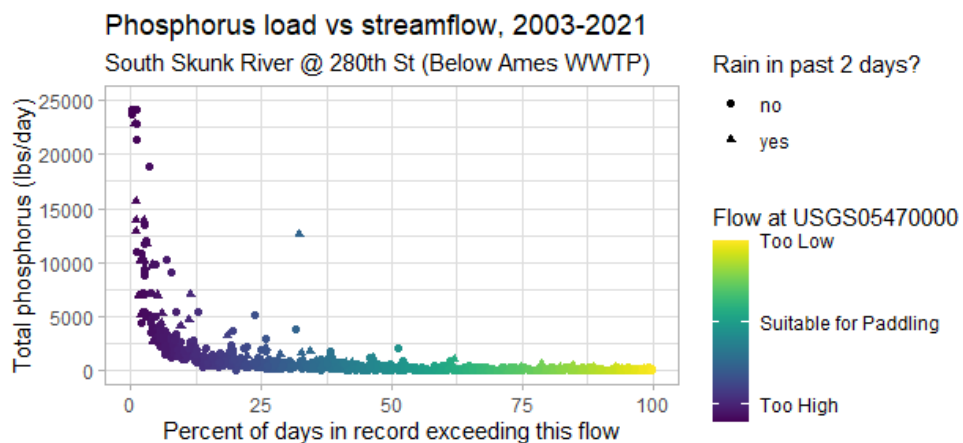
19

High phosphorus: lab testing



20

Low flows not important for Gulf



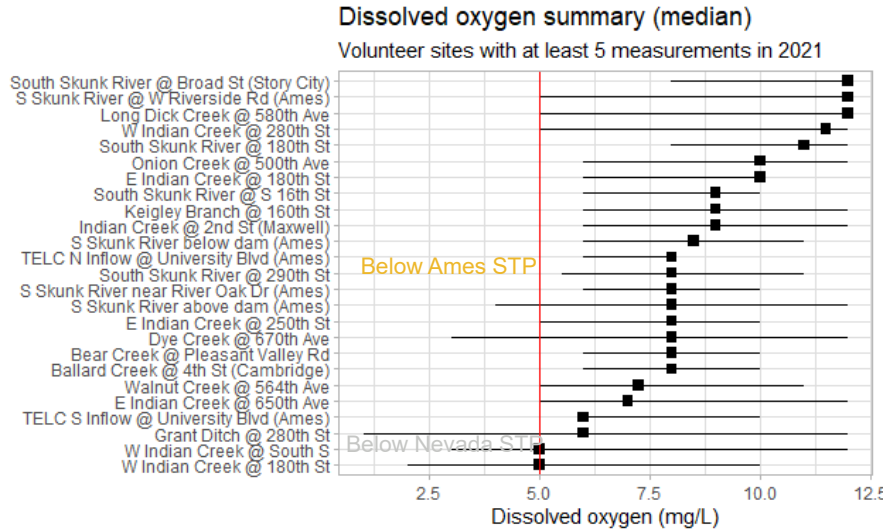
21

Is effluent affecting creek critters?



22

Is effluent affecting creek critters?



23

Key findings from 2021 monitoring



Recreation and Waterborne Illnesses

E. coli bacteria was usually low at swimming beaches and parts of the South Skunk River, but high in most creeks. We can narrow down likely sources of contamination by checking whether bacteria is highest during low flows or high flows.

24

Bacteria results, 2021

South Skunk River



Ioway Creek



25

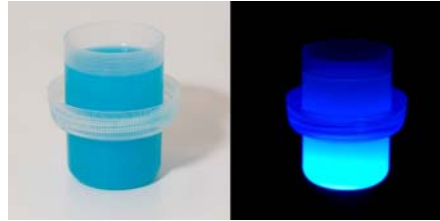
Bacteria results, 2021

- Lakes are safer for swimming than

Site	Number of samples (need 7)	Samples exceeding <i>E. coli</i> standard	<i>E. coli</i> geomean (MPN/100mL)
West Peterson Park Lake (beach)	15	2	17
Hickory Grove Lake	15	3	58
S. Skunk River @ N River Valley Park	8	1	72
S Skunk River @ W Riverside Rd (Ames)	8	1	98
S. Skunk River @ Broad St, Story City	8	3	134
Bear Creek @ Pleasant Valley Road	7	3	159
West Indian Creek @ 280 th St (Nevada)	8	7	315

26

Narrowing down bacteria sources



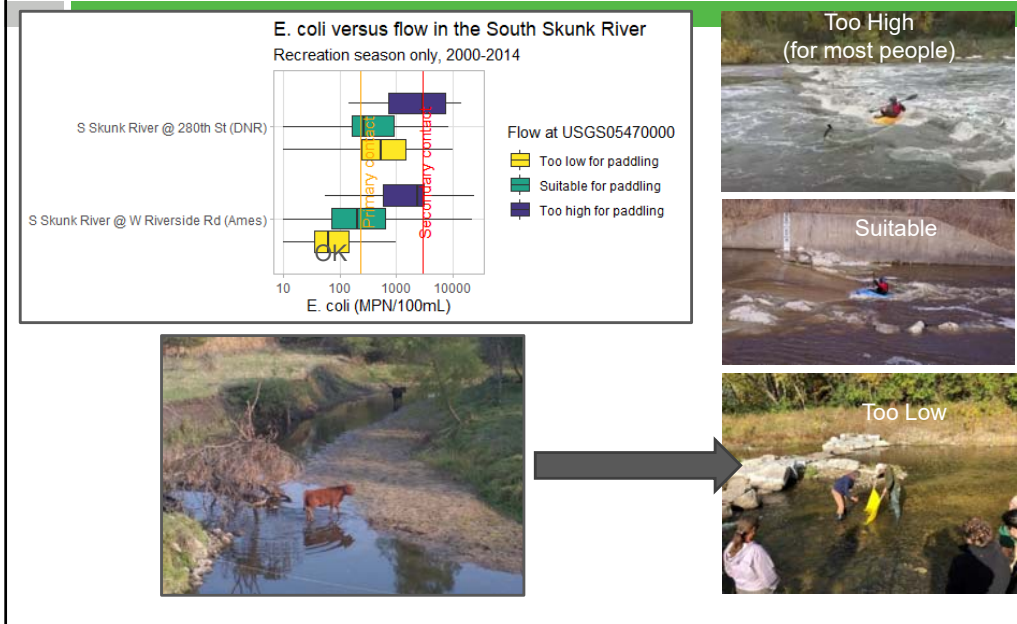
27

Narrowing down bacteria sources



28

Narrowing down bacteria sources



29

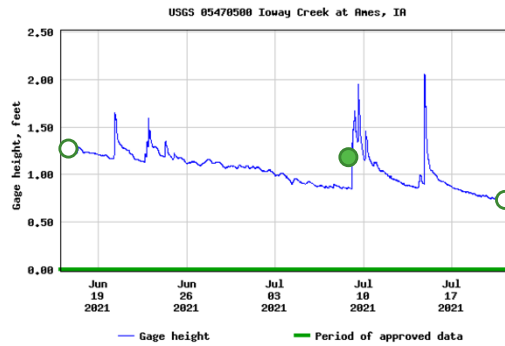
Key findings from 2021 monitoring



30

Many pollutants worse after rain...

Ioway Creek @ 6th St	TSS (mg/L)	E. coli (CFU/100 mL)	Total Phosphorus (mg/L)	Nitrate-N (mg/L)
June 16, baseflow	7	904	0.14	5.50
July 9, storm event	1,316	25,200	1.42	0.60
July 21, baseflow	7	441	0.17	1.00



31

...from areas not treated by ponds

TSS	1 mg/L	TSS	1006 mg/L
E. Coli	20 CFU/100mL	E. Coli	53,200 CFU/100m
Phosphorus	0.02 mg/L	Phosphorus	0.79 mg/L



32

Connection between storm sewers and creeks



33


W&PC WATERSHED UPDATE



34

Watershed-based Nutrient Reduction

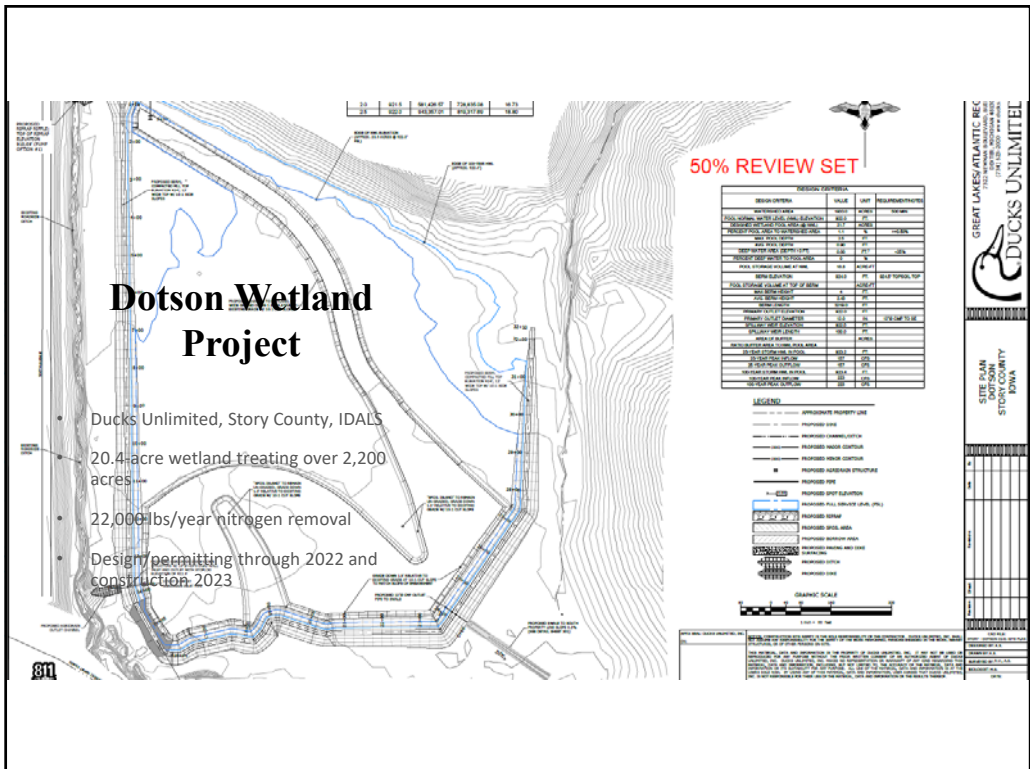
- \$200K/Year Investment “Outside the Fence”
- Iowa Nutrient Reduction Exchange
- DNR Memorandum of Understanding



35

Dotson Wetland Project

- Ducks Unlimited, Story County, IDALS
- 20.4-acre wetland treating over 2,200 acres
- 22,000 lbs/year nitrogen removal
- Design/permitting through 2022 and construction 2023



QUANTITIES			
DESCRIPTION	UNIT	AMOUNT	REMARKS
PROPOSED WETLAND	SQ FT	20.4	
PROPOSED CHANNEL	SQ FT	1000	
PROPOSED STRUCTURE	NO.	1	
PROPOSED TOTAL			


36

Story County Edge-of-Field Project

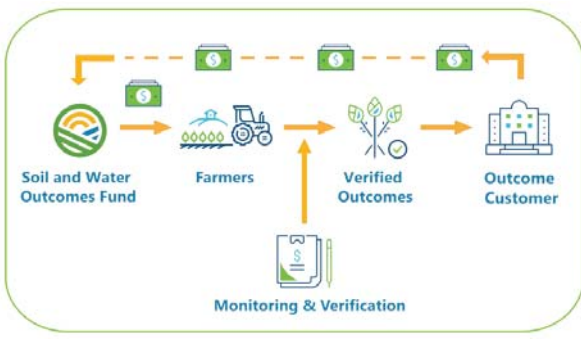
- Story County, Polk County, JEO Consulting Group, Heartland Co-op, Natural Resource Conservation Service, IDALS, and Iowa State University.
- Central Fiscal Agent Funding Model
- 25+ Bioreactor/Saturated Buffer Sites
- Construction Summer/Fall 2022
- Landowner outreach already starting for 2nd round



37



Soil and Water Outcomes Fund




- Partnership with Iowa Soybean Association
- Cover Crops placed on 4000+ acres in Story County
- Nutrient Reductions (2020,2021)
 - 120,000 lbs Nitrogen
 - 7,000 lbs Prosperous

38

Land Retirement – Moore Memorial Park


- Partnership with Ames Parks & Recreation Department
- 40 Acres Prairie Restoration
- IFA Grant Funding
- Seeding Anticipated Early Summer




39

AMES WATER TREATMENT PLANT OPEN HOUSE

APRIL 23, 2022
10 AM - 2 PM



The City of Ames Water & Pollution Control Department invites you to attend the Water Treatment Plant Open House on Saturday, April 23, from 10 AM - 2 PM. The event will offer public tours, community engagement, kids activities, and more!



1800 E. 13th Street | Ames, IA 50010 | 515.239.5150
www.CityOfAmes.org/Water

40

Public Works Update

- ❑ Ames was the 15th city to be granted the award.
- ❑ Award aligns with the City's principles of promoting, restoring and protecting our waterways and the Prairie Rivers of Iowa's mission to promote economic development through the restoration and conservation of Iowa's cultural and natural resources.

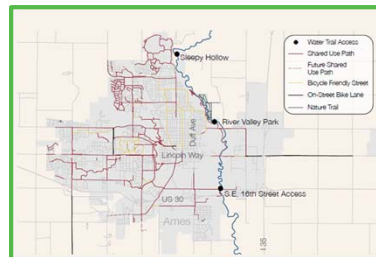


41

Iowa River Town of the Year 2021

Efforts to Promote Streams

- ❑ 3 access points to the newly designated Skunk River Water Trail
- ❑ S. Skunk River low-head dam mitigation project in North River Valley Park
- ❑ Over 9 miles of shared use paths along streams
- ❑ Streambank stabilization projects using methods from the newly developed Iowa River Restoration Toolbox
- ❑ Watershed signs at bridges to encourage stewardship and discourage dumping
- ❑ Annual cleanup events that have removed 17 tons of trash from local rivers



42

Watersheds Update

Low Head Dam Modification: loway Creek @ Lincoln Way



- ❑ Completed in 2017
- ❑ Modified grade-control sheet pile with concrete cap with v-notch weir
- ❑ Series of rock weirs below sheet pile
- ❑ Bank regrading and stabilization
- ❑ Bench at base of bank slope for safety

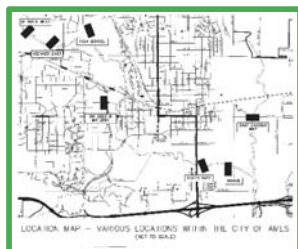
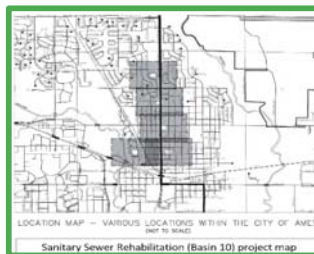


43

Watersheds Update

Sanitary Sewer Improvements

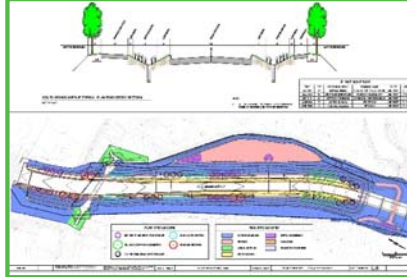
- ❑ Annual projects since 2015
- ❑ CIP Program Annual Avg \$4,466,600
- ❑ Fix fractures:
 - ❑ Spot Repair
 - ❑ Lining
 - ❑ MHs
- ❑ Upcoming:
 - ❑ High School Area
 - ❑ Veenker Golf
 - ❑ Worle Creek
 - ❑ Manatt's/Dayton
 - ❑ Basin 12



44

Watersheds Update

- S. 5th St. and S. Grand Ave.
- Wetland (92 Acre Watershed, treats WQ and Channel Protection Volumes (3.08" rain)
 - Water Quality Basin (WQ Vol. for 1.25" rain),
 - Bioswales along roadway, and
 - all Native Vegetation
- \$100,000 WQI Grant IDALS



45

Watersheds Update



Welch Avenue
Tree Trenches
and
Permeable Pavers

Treats Water
Quality Volume for
1.25" rain

\$100,000 WQI
Grant IDALS



46

Watersheds Update



Homewood Slope Stabilization

Stabilized extreme erosion added Native Vegetation



47

Watersheds Update



Loway Creek Restoration And Flood Mitigation

\$3.75M FEMA Grant



Pocket Wetlands



Removed approx. 750 tons trash, car parts, and tires

Tree Logs use for: Rootwads on project, Furniture, Trim, Pallets, and Homebuilding



48

Watersheds Update



Concept Plan 2021

Loway Creek Brookside Park

\$100,000 WQI IDALS Grant

\$500,000 WIF Grant

\$336,609 SRF Sponsored Project Grant



Preliminary Plan 2022

49

Watersheds Update



Concept Plan 2021

Loway Creek Brookside Park

3 Public Meetings Summer 2021

Feedback Rec'd

Worked w/ Stakeholders

New Alignment

3 Public Meetings March/April 2022



Preliminary Plan 2022

50

Watersheds Update

loway Creek Brookside Park

- Reduce tree removal on private property
- Stabilize eroded banks
- Add natural in-stream practices like rock and log riffles, j hook vanes, cross vanes, toe wood
- Reduce flow from top of bank
- Relieve pressure from stream on east slope
- New oxbow to improve water quality from storm sewer outlet
- Use on-site wood and soil to rebuild east slope and stabilize stream banks
- Reuse material on-site (cut/fill)
- Reconnect floodplain with bench

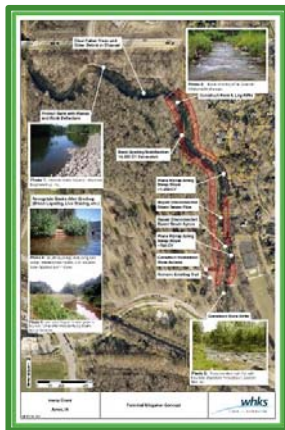


Preliminary Plan 2022



51

Watersheds Update



Concept Plan 2021

loway Creek Brookside Park

Work with Adjacent Property Owners & Parks staff

75% Design Public Meetings Summer 2022

Permitting

Construction Winter 2022/23



Preliminary Plan 2022



52

Watersheds Update

Construction Site Runoff Control Program Tracking

SWPPP Reviews/Approvals	2019-2020	2020-2021	2021-22
Single Family Homes	59	84	60
Commercial Reviews	13	10	12
Preliminary Plats	1	4	6
Plat additions with Public Improvements	2	2	2
City Project SWPPP Reviews	10	5	2
NOIs Filed for GP #2			
Total Projects	24	14	9
City Projects	5	4	1
Iowa State University Projects	6	2	1
Story County Projects	1	0	0
School District Projects	1	0	0
Private Projects (Gas Stations, Subdivision, Apartments, Hotels, Building Additions, Commercial Businesses)	11	8	7
Weekly (City Project) & Quarterly Inspections (Private Sites)			
Total Conducted	471	563	544
City Projects	248	418	299
Private Projects (Commercial)	161	88	121
Single Family Inspections (Home Lots)	62	57	124
Enforcement Actions			
Number of Compliance Issues (Private Projects)	165	60	70

53

Watersheds Update

Post Construction Program Plan Review and Approval

Type of Development	2019-2020		2020-2021		2021-2022	
	# Plans Reviewed	# Plans Approved	# Plans Reviewed	# Projects Approved	# Plans Reviewed	# Projects Approved
New Development	5	5	11	8	7	1
Redevelopment	0	0	4	4	4	4
Total	5	5	15	12	11	5

In addition, 25 site plans and subdivisions were reviewed and determined that they were part of a regional watershed that considered the proposed conditions or the proposed development was below ordinance thresholds for stormwater management.



54

Watersheds Update



Building Community through Conservation
Stone Brooke Subdivision Management Plan



Coming Soon! Storm Drain Art
Ames Public Art Commission
(7 designs from 6 persons)
(3 Campustown, 4 Downtown)

55

Watersheds Update



Ames High Bee Club Plants Natives in 24th Street Bio-Cell



Friends of Parks Groups

56

Watersheds Update

2021 Smart Watersheds Cost Share Rebate Program



Rebate Program	2019-2020	2020-2021	2021-2022
Rain Barrels	16	27	18
Composters	47	22	15
Soil Quality Restoration (1 approved but not completed)	3	12	6
Native Landscaping (1 approved but not planted)	1	6	6
Rain Gardens	2	1	0
Tree Voucher Event-Partnership with Ames Trees Forever (not held in 2020 or 2021)	100	0	0
Native Tree Rebate	N/A	35 applications, 58 trees	59 applications, 84 trees
Total Rebate Applications	69	103	104

57

Watersheds Update

2021 Watershed Outreach Events



CitySide Articles

Month	Article Topic
April	<ul style="list-style-type: none"> Virtual Earth Day on KHOI announcement Virtual EcoChat announcement focusing on trees and tree rebate
May	<ul style="list-style-type: none"> Skunk River Low Head Dam project celebration announcement 10 Year Story County Water Monitoring Report announcement
June	<ul style="list-style-type: none"> Iowa Creek Flood Mitigation Project Moving Forward Native Tree Rebate Ames Named "Tree City USA"
August	<ul style="list-style-type: none"> Canoes, Kayaks, & Paddle Board Rentals at Ada Hayden Park
September	<ul style="list-style-type: none"> Ioway Creek Stabilization Plans Pregracke Talk Rescheduled
October	<ul style="list-style-type: none"> Rummage RAMPage helps Non-Profits, recycles Materials community" Rebates Offered for Water Conservation
February	<ul style="list-style-type: none"> City Partners to Monitor Health of Local Waterways

Social Media Posts

DATE & SUBJECT	# LIKES, SHARES AND COMMENTS
Apr 2- Prairie burn in Christofferson Park	51
Apr 10 Stash the Trash Continues	3
Apr 11 Earth Day Appreciation on the Air - KHOI	3
Apr 11, Apr 17, Apr 24, Apr 30 Low Head Dam Celebration Announcements	187
Apr 29 Yard Waste Day Announcement	11
May 4 EcoChats Resource Recovery	1
May 9 Tree Planting Announcement	18
May 27 Smart Watersheds rebates	49
June 1 EcoChats Water	3
June 7 College Creek Cleanup	9
June 9, June 13 and June 18 No-Charge Waste Day	39
June 13 Native Tree Rebate	26
June 26, July 17 Rummage RAMPage Announcement	168
July 5 EcoChats-Watersheds	9
July 28 Outdoor Water Conservation Tips	18
Aug 25 Iowa State University WelcomeFest	9
Aug 31 Water Conservation/drought	40
Sep 5 and Sep 29 Chad Pregracke Announcement	78

Sep 16, Sep 18 River Town of the Year Events Announcement	29
Sep 28 Watershed Month Proclamation	4
Sep 30 Prairie River of Iowa Wild and Scenic Film Festival	6
Oct 1 Stream Cleanup Announcement	12
Oct 6, Oct 11 Fall Tree Plantings	15
Oct 7 Ioway Creek cleanup	12
Oct 8, Oct 22, Nov 9 Fall No-Charge Waste Days	34
Oct 12 Volunteer for Water Quality Snapshot	9
Oct 18 Native Landscaping Program	23
Oct 22 Ada Hayden Fishing Pier Ribbon Cutting	79
Oct 24, Oct 25 Nov 3, Nov 1, Nov 18, Nov 23, Nov 28, Nov 30, Dec 3, Dec 10, Dec 20, Mar 7, Mar 9, Mar 11 Climate Action Plan	184
Dec 18, Jan 18, Feb 23 Dog Waste Pickup	93
Feb 7 Ecochats are Back	2
Feb 13 Storm Drain Art Call to Artists	42
Feb 17, Feb 22 ISU Sustainapolloza	9
Feb 23-Dog waste pickup	35
Mar 1, Mar 3, Mar 9 Ioway Creek Restoration/Brookside Park Project Public Outreach Meetings	49
TOTAL	1359



KASI and KHOI Radio Interviews

58

Watersheds Update

2021 Watershed Outreach Events



Date	EcoChat Subject	# Attendees
Apr 2021	Trees	29
May 2021	Reduce/Reuse/Recycle	39
Jun 2021	Water	26
Jul 2021	Watersheds	42
Feb 2022	Climate Action Plan	10
Mar 2022	Watersheds	17

- Iowa State University Sustainapoolza Event
- Smart Trash Program Partnership
- Distribution of Deicer Brochure to Local Snow Removal Businesses
- Distribution of Letter to Local Carpet Cleaners
- Update to the Inspection and Maintenance Practices of Non-City Owned Stormwater Practices form

59

Watersheds Update

2021 Watershed Outreach Events



October 2021 Watershed Awareness Month Proclamation



60

Watersheds Update

2021 Watershed Outreach Events



- ❑ Thu., September 30 Speaker: Chad Pregracke, Living Lands and Water-City Auditorium
- ❑ Fri., October 1 -Film Festival Collaboration with Prairie Rivers of Iowa – City Auditorium
- ❑ Sat., October 2: Stream Cleanup, Ioway Creek



61

Watersheds Update

2021 Watershed Outreach Events

Event/Group	Date	# Participants	Weight of Trash Collected
Stash the Trash	April 10	237	1,940 pounds (1 tire)
Ioway Creek Cleanup	October 2	29	2,500 pounds (13 car tires)
Outdoor Alliance/ Workiva Corp.	March 17	12	1,220 pounds



March 17 Workiva- Outdoor Alliance cleanup



October 2, 2021 Ioway Creek Cleanup

62

Watersheds Update

Ioway Creek Clean-up

Oct. 2, 2022



63

Watersheds Update

Upcoming Watershed Events



- Wed., April 20: Pollinator Task Force
- Thurs., April 28: EcoChat @ Library, Birds, Bees & Pollinators
- April 29 to April 30: Stash the Trash
- Sat., April 30: Ioway Creek Cleanup
- Sat., October 1: EcoFair

Go to Prairie Rivers of Iowa website www.prrcd.org to register and for more upcoming watershed related events

www.cityofames.org/stormwater

64

Water Quality Monitoring in Story County: 2021 Highlights

Accomplishments in 2021

- Local partners released a 10-year plan for water quality monitoring in Story County. Prairie Rivers of Iowa gave 12 presentations about the plan to stakeholders.
- Staff and volunteers from 9 organizations met 7 times in 2021 to implement the plan and provide direction and support for monitoring efforts.
- The City of Ames Water & Pollution Control laboratory tested water samples from 15 stream sites monitored monthly and 3 sites monitored weekly.
- Story County Conservation launched a volunteer monitoring program. Staff, 17 volunteers, and one business used field kits to monitor streams and lakes around the county.
- Story County Conservation partnered with Iowa DNR to do weekly bacteria testing of 2 swimming beaches at county lakes: Peterson Park West and Hickory Grove Lake.
- Local partners engaged new volunteers through 2 water monitoring events, a training event with the Izaak Walton League, and a cleanup of trash in Loway Creek. In addition, local partners organized 4 in-person events and 3 webinars that offered opportunities for Story County residents to learn about water quality issues and solutions.
- Prairie Rivers of Iowa used special equipment to collect 40 samples of runoff from creeks and storm sewers during 5 rainstorms, with the help of volunteers.
- Prairie Rivers of Iowa published 12 articles about water quality and watersheds on their blog, as well as posting regular water quality updates and real-time data streams on a web page dedicated to monitoring efforts in Story County



Find the full report and updates on water quality in Story County at:

www.prrcd.org/story-county-water-monitoring



Key Findings from 2021 monitoring

Issues	Metrics	Findings
Recreation and waterborne illnesses	<i>Escherichia coli</i> (<i>E. coli</i>) bacteria	<i>E. coli</i> was usually low at swimming beaches and parts of the South Skunk River, but high in most creeks. We can narrow down likely sources of contamination by checking whether bacteria is highest during low flows or high flows.
Gulf Hypoxia and nutrient losses	Nitrogen and phosphorus load	This year was too dry to have much influence on Gulf Hypoxia. Focusing on normal-to-wet periods will help to identify hot spots where conservation practices are needed and evaluate whether conservation practices are working.
Nutrient enrichment and algae blooms in lakes and streams	Total phosphorus, orthophosphate, nitrate	During dry conditions, the highest nutrient levels are below wastewater treatment plants.
Fish and the insects they eat, stream and lake ecology	Index of benthic macroinvertebrates, dissolved oxygen, chloride	Low dissolved oxygen is harming invertebrates in some streams. Effluent from wastewater treatment plants could be a factor, but some patterns are still unexplained.
Erosion and sediment impacts on aquatic life	Total suspended solids, transparency	Untreated stormwater from older neighborhoods can have extremely high levels of sediment, phosphorus, and bacteria.