



City of Goshen

2021 Stormwater Report



Partnerships for Clean Water

In Goshen’s Stormwater Department, we get to look at our City through a unique lens—water. Perhaps more so than most other City Departments, this work necessitates collaboration with partners that stretch across political boundaries. Stormwater drainage paths, rivers, and streams do not begin and end at our City limits.

The ultimate goal of Stormwater Departments across the Country is to improve and preserve water quality for the benefit of humans and other organisms. In Goshen, these goals cannot be met for our watershed without the stewardship of upstream communities. For those downstream, we also must be good caretakers of our water resources.

As co-permittees for our Indiana Municipal Separate Storm Sewer System (MS4) permit, our closest partnership is with the Greater Elkhart County Stormwater Partnership, which includes the government entities of Elkhart County, the City of Goshen, the City of Elkhart, and the Town of Bristol. Year-to-year we share resources to educate on water stewardship, complete inspection duties, and conduct water quality monitoring. Partnering for these efforts

creates a more holistic approach to water resource management in the County.

The pages of this report highlight some of the collaborative efforts we have been a part of in 2021. This includes our Stormwater Partnership efforts, as well as work with the St. Joseph River Basin Commission, the Elkhart River Restoration Association, and the Great Lakes Integrated Sciences and Assessments (GLISA).

The partnerships reflect the small- and large-scale watersheds we find ourselves a part of here in Goshen. The smaller tributary watersheds, like Rock Run Creek and Horn Ditch, begin in the surrounding County. The Elkhart River running through the heart of Goshen makes us a part of the Elkhart River watershed, the St. Joseph River watershed, the Great Lakes watershed, the North Atlantic watershed, and ultimately, the interconnected watershed that is planet Earth.

A huge thank you to all our partners for making 2021 a great year. Cheers to the year ahead!

Jason Kauffman,

Mattie Lehman,



State of the River

Biologic Health



The Goshen Stormwater Department contracts with the City of Elkhart's aquatic biologist, Daragh Deegan, and his summer stream monitoring team to conduct education events with Goshen area students and residents. Students learn about how biological monitoring of our aquatic organisms gives insight into the overall health of our streams and rivers.

Older students help conduct fish surveys, which screen for species variety and abundance in the Elkhart River. Like with smaller aquatic organisms used for monitoring, certain fish species are more or less sensitive to water pollutants, so their presence and absence can serve as a water quality litmus test.

This year, Deegan's team and area students sampled both in Goshen's dam pond and below the dam at Shanklin Park. They surveyed many species that indicate high water quality, including American Brook Lamprey, Golden Redhorse, Horneyhead Chub, Logperch, Longear Sunfish, Mimic Shiner, Northern Hogsucker, Rainbow Darter, Rock Bass, Shorthead Redhorse, and Smallmouth Bass. Possibly the most exciting find was a Greater Redhorse (pictured), which is an Indiana State endangered species.

Chemical Health

This year the City of Goshen partnered with the St. Joseph River Basin Commission (SJRBC) to gather and synthesize chemical water quality data that has been collected by the Greater Elkhart County Stormwater Partnership's summer surface water quality monitoring program since 2009. These efforts mark the first attempt to analyze the massive data set for trends that can inform water quality management decisions.

Kate Barrett, Ph.D. is an aquatic ecologist with the SJRBC and is conducting the analysis with the support of Basin Director Matt Meersman. Their work with Elkhart County's data is part of a larger effort to understand the overall health of the St. Joseph River Watershed.

The analysis will look at parameters monitored as part of the Partnership's program: dissolved oxygen, conductivity, pH, nitrates, phosphorus, chlorides, total suspended solids, and *E. coli*.

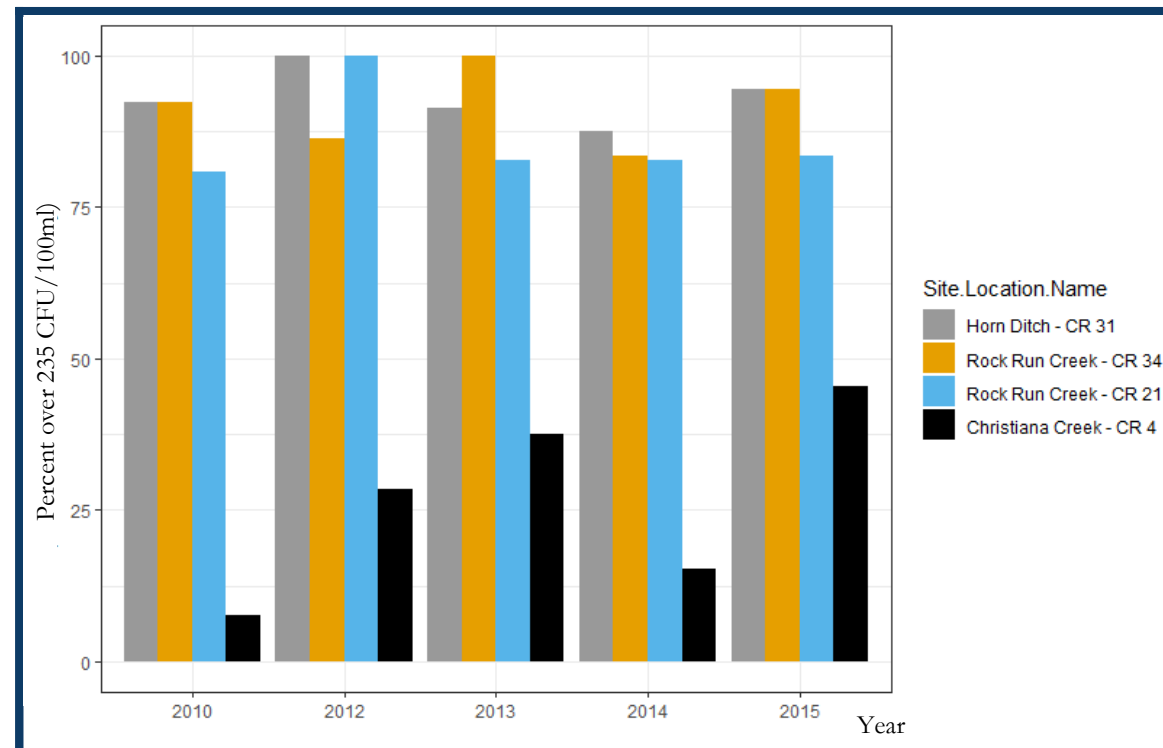
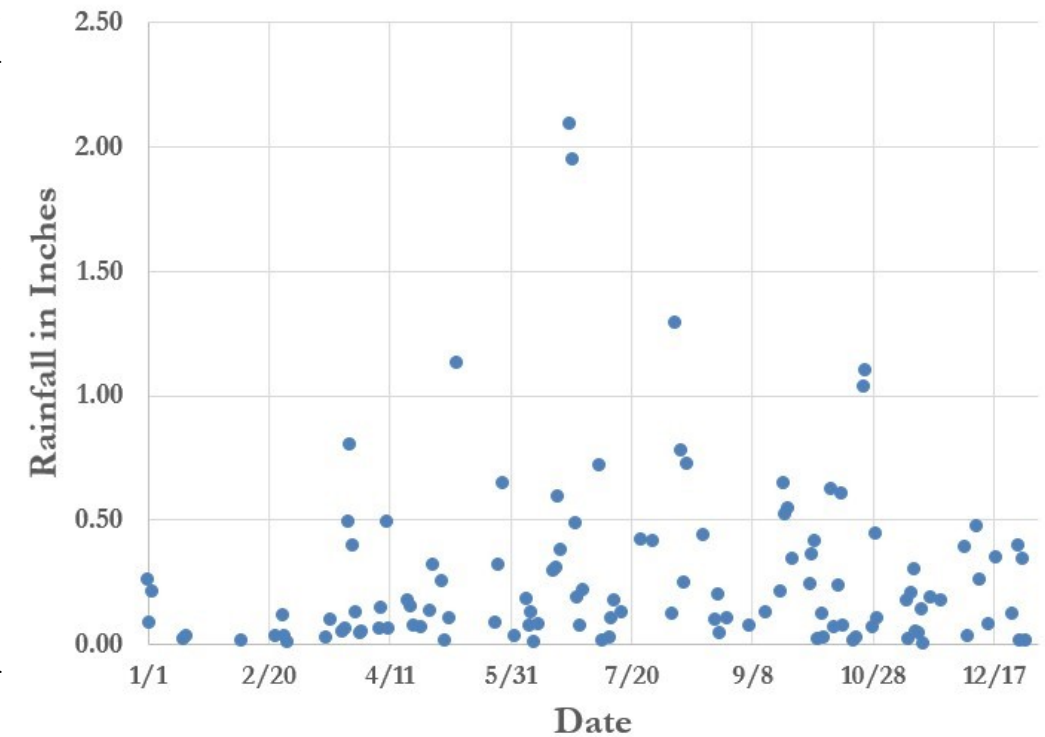
We are so thankful for their work and cannot wait to see the results coming in 2022! For now, check out this sneak peek graph of *E. coli* in Rock Run Creek and Horn Ditch.

Rain Report

In 2021, Goshen had its share of dry and wet days, averaging 117 days of measurable rain (0.01" or more), 17 days with rain events of 0.5" or more, and three days with extreme rain events of 1.25" or more. During the early morning hours of June 26th one such extreme rain event dropped 0.52" of rain in 15 minutes, contributing to roadway flooding at the intersection of Greene Road and SR 119.

Monitoring rainfall is an important part of managing stormwater runoff and its impacts.

2021 Average Daily Rainfall Across Goshen



Percent of Samples that Exceeded the EPA Water Quality Standard for Full-Body Contact (235 CFU/100ml)

The sampling locations in this graph represent the stretch of Rock Run Creek and Horn Ditch that enters the City before emptying to the Elkhart River. Christiana Creek was added as a comparison where water quality is known to be high.

Each year, more than 75% of weekly samples taken from about May-September exceeded the EPA's standard for full body contact.

Today this area is not a great place for a swim; however, armed with this knowledge, the City can continue to collaborate with our partners to reduce agricultural runoff outside City limits (a likely source) and work towards improvement!



2021 Stormwater Program By the Numbers

107+ hours of Stormwater Department staff committed to continuing education

12 issues of the Stormwater Toolbox Newsletter published with an average of 92 "reads" by City staff per issue

7 educational events with Stormwater Department Staff presentations

95 construction site visits to inspect erosion and sediment control measures and pollution prevention practices

15 post-construction stormwater management plans accepted by the Board of Public Works & Safety

15.37 miles of river, stream, and ditch surveyed for illicit pipe discharges

13 illicit discharge incidents detected and addressed

35 projects reviewed to ensure compliance with state and local stormwater regulations

318 storm sewer outfalls inspected and 14 flow samples taken for pollution indicator tests

614 cubic yards of material removed from catch basins by the Water and Sewer Department's vactor trucks

439 catch basins cleaned of accumulated road grit and other captured stormwater pollutants

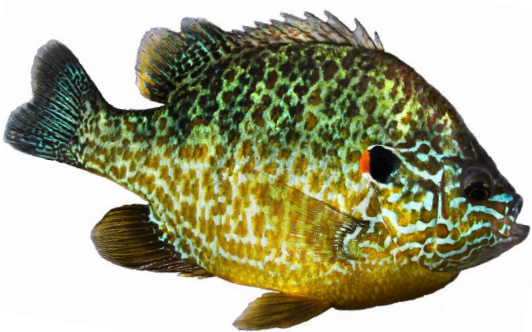
7.26 feet = maximum river height recorded Oct. 26

2.03 feet = minimum river height recorded Feb. 16

26 stormwater issues reported by City staff and investigated by the Stormwater Department

4,168 tons of material collected by Goshen's Street Department with Street Sweepers

42.29 inches of total precipitation averaged across Goshen



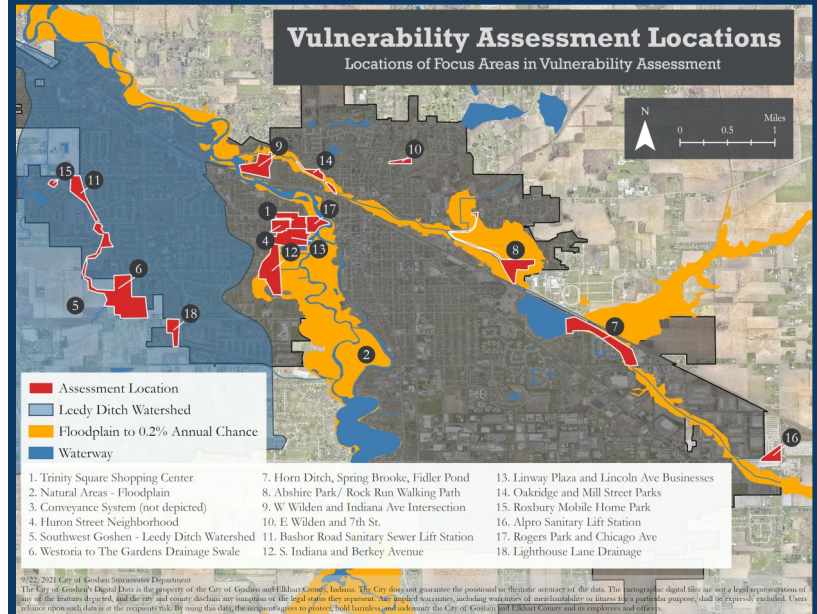
Project Highlights



Climate Change Vulnerability Assessment for Stormwater

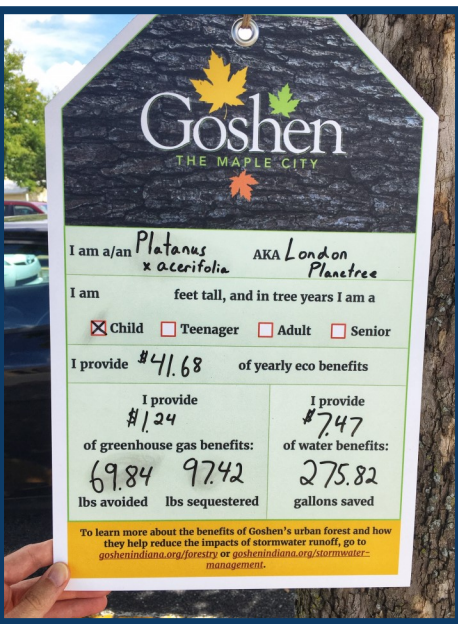
In collaboration with the Great Lakes Integrated Sciences and Assessments (GLISA), the Stormwater Department assessed the particular vulnerabilities of areas across Goshen for their sensitivity to predicted changes in local climate realities and their ability to adapt to increasingly more frequent and intense storm events.

The assessment considered socio-economic disparities, local landscape features of the natural and built environments, and climate predictions. Eighteen different assessment locations were evaluated (see map image). These locations were selected largely based on Goshen's flooding experience in February of 2018 and known areas of drainage problems.



Stormwater Education

Stormwater staff participated in a number of educational events this year, published a monthly newsletter, and created other educational materials for community-wide education.



Plastic Pellets in Rock Run Creek

Found in late 2020, plastic pellet pollution in Rock Run Creek became a focus of pollution reduction efforts in 2021. The Stormwater Department investigated potential sources, worked with industry to clean up and eliminate those sources, and continues to monitor for progress.



Addressing Drainage Concerns

When stormwater runoff from publicly owned properties or right-of-way impacts a private property owner, the City attempts to address the concern. This year, the Stormwater Department coordinated efforts across Departments to investigate, and, when possible, address stormwater drainage concerns of citizens. This year's successes included:

- Installation of a drywell at a small business along S. 9th St. to capture and infiltrate stormwater runoff from the street and sidewalk
- Repair of a ditch along Carter Road to better infiltrate stormwater and reduce stagnant water concerns
- Regrading of an alleyway near N. 5th St. to protect property and homes from stormwater runoff
- Design of a drainage solution for The Crossing subdivision with construction scheduled for 2022

Outfall Survey

Stormwater staff spent the early spring screening stormwater pipe outfalls for signs of pollutant discharges and stream erosion caused by high volume flows.

In 2021, staff canoed or walked lengths within City limits of the Elkhart River, the Millrace, Horn Ditch, and a couple smaller drainage ditches. A total of 14 miles!





The Year Ahead

Ordinance and Program Updates

At the end of 2021, the Indiana Department of Environmental Management (IDEM) released new general stormwater permits that govern both construction sites and MS4 communities. These new permits are the first update in 18 years to Indiana's stormwater regulations, implemented first in the early 1990s.

In 2022, the Stormwater Department will undertake a major education campaign to aid in transitioning sites to the new Construction General Permit requirements. Looking internally, the Department will update its own programmatic structures to ensure compliance with the new MS4 General Permit. This will involve stormwater ordinance updates, consideration of standards and other policies, and other related efforts.

Storm Drain Art Project

In January, look for a call for submissions for the 2022 storm drain art project. Artists will be picked throughout the spring with storm drain murals being painted in May and June.

Join the Stormwater Department in early June for the unveiling, and plan a walking or bike tour to see the amazing things our local art enthusiasts come up with!



Flood Literacy

A number of Stormwater and interdepartmental flood resilience efforts are coming together for public input and dissemination in 2022. Look for the Stormwater and Climate Change Vulnerability Assessment conducted by the Stormwater Department and the Flood Resilience Plan assembled by various City Departments in consultation with Christopher Burke Engineering.

To complement these two major documents, the Stormwater Department will also be releasing a series of Story Maps that highlight flood risk information and tools. The Stormwater Toolbox Newsletter will highlight a number of these themes throughout the year.

Thank you to those we collaborated with in 2021!



Public Works & Utilities
Department of Stormwater
204 E. Jefferson Street
Goshen, Indiana 46528
574-534-2201

bit.ly/goshen-stormwater

Director of Public Works:
Dustin Sailor

Stormwater Coordinator:
Jason Kauffman 537-3832

Stormwater Specialist
Mattie Lehman 537-3818

