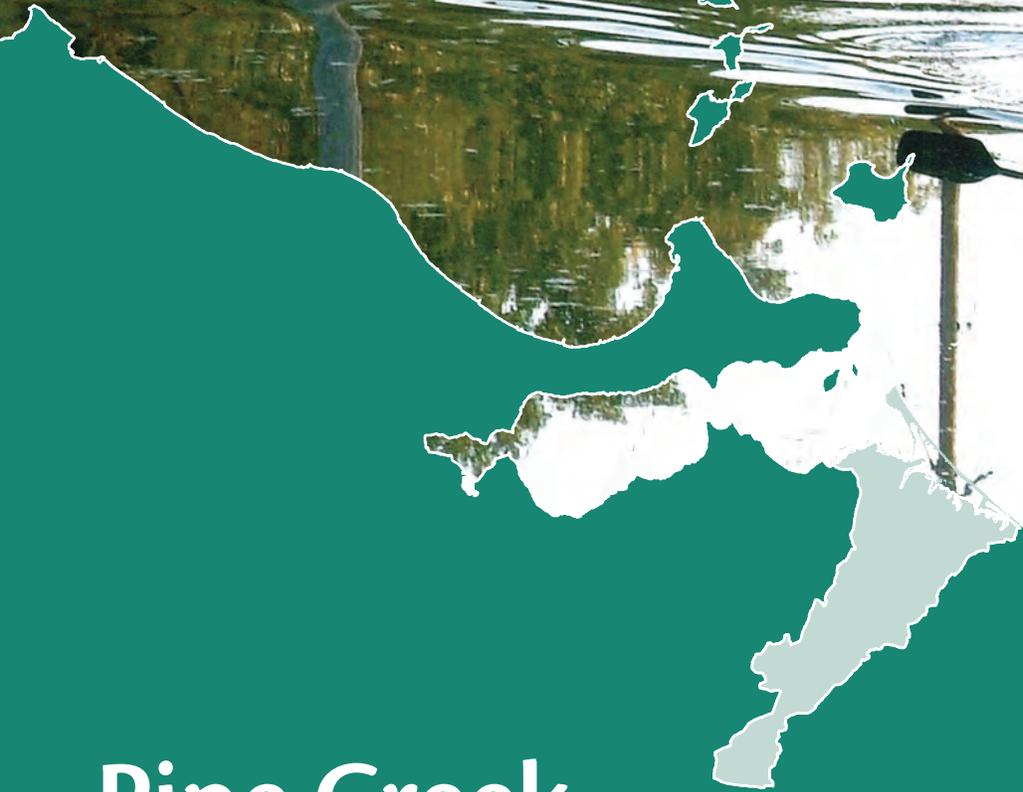
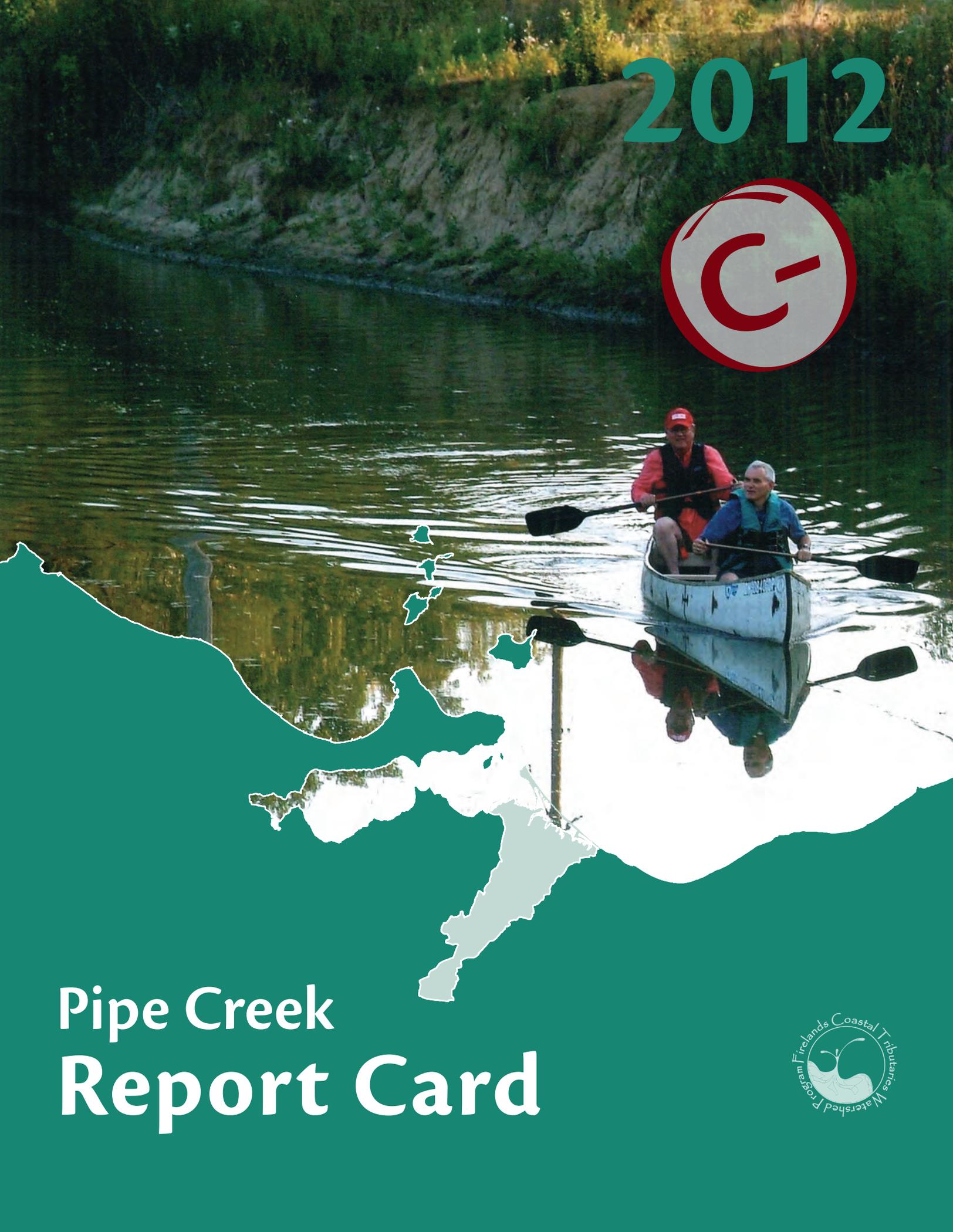


2012



Pipe Creek Report Card



Firelands Coastal Tributaries Watersheds

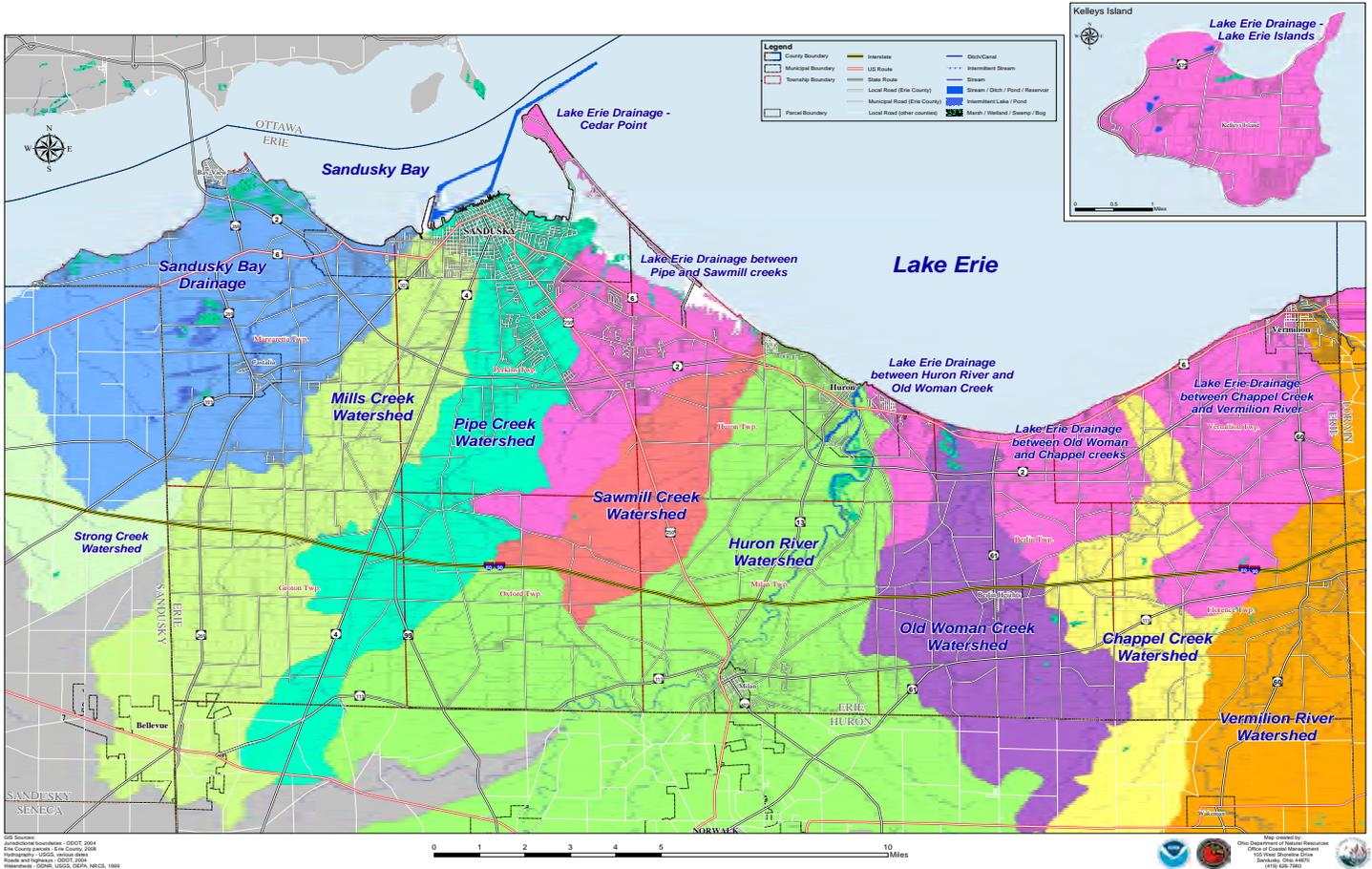
Erie County is unique because most of its drainage includes small streams that empty directly into the Sandusky Bay and Lake Erie. As you travel across the county, you will cross small drainage areas called "watersheds" that define where rainfall and snow melt will flow to a stream or tributary. Many of us don't think about where our water came from or where it is going as it passes under a road bridge, but

understanding watershed systems helps us make decisions that keep water clean and keep Lake Erie healthy.

The Firelands Area coastal tributaries are made up primarily of small creek systems: Cold Creek, Mills Creek, Pipe Creek, Sawmill Creek, Old Woman Creek, and Chappel Creek. These creeks differ greatly in the geology, soil type, water sources, natural habitats, and land use which make the

Firelands an area of great diversity for our residents, tourists, as well as native and migratory wildlife.

The Firelands coastal tributaries are important to the overall health of Lake Erie. Much of the pollutants affecting the Lake come from the watersheds that drain to it. Monitoring helps identify what streams need the most attention to reduce polluted run-off.



What does a watershed program do?

The Firelands Coastal Tributaries Watershed Program is a partnership of local, state, and federal agencies, local businesses and volunteer groups that work together to improve the small streams within the Firelands area.

The partners of this program understand that each small watershed in our area is unique and needs special attention for effective management. Because our tributaries do not combine into larger river systems, they must be managed separately, using a "ground up" approach. We currently

have a state endorsed management plan for the Old Woman Creek Watershed and hope to plan for additional streams in the area to reduce non-point source pollution entering Lake Erie.

This program engages our local community in watershed stewardship activities such as stream monitoring, rain barrel building, restoration projects and in-field agricultural conservation. Clean water means healthy communities. Together we can improve our streams and Lake Erie.

A storm-driven system

When it rains, it drains; and these storm events move pollutants through the watershed. When Pipe Creek's flow is low to normal, we often find little nutrient and sediment pollution. However, during and after a storm, the creek will turn light brown from being laden with sediment and often carries excess nutrients that contribute to algal blooms in Lake Erie. Storms are more intense and frequent in the spring and fall, leading to higher pollutant concentrations than in the summer.

What makes up Pipe Creek?

Pipe Creek is a 48.5-square-mile watershed made up of three main streams: Pipe Creek, Hemminger Ditch, and Plum Brook. Pipe Creek begins in Huron County east of Bellevue and empties into East Sandusky Bay near the Cedar Point Causeway. The lake shoreline is a mix of coastal marsh and heavily altered land use for shipping, boating, and erosion control. The watershed consists of approximately 41% developed land, 39% agricultural land, and 20% natural areas. Land use has changed drastically in the past 15 years with the conversion of 9,250 acres of agricultural land to residential and commercial purposes.



A key feature of Pipe Creek is the wetlands in both the creek and estuary areas.

Pipe Creek is part of a karst geological region, which is characterized by a series of sinkholes and underground rivers flowing through cracks and cavities in the



In many urbanized areas, Pipe Creek has been modified and controlled.



limestone bedrock. The unique geology of Pipe Creek makes it ideal for limestone quarry operations, but at a higher risk for potential groundwater pollution.

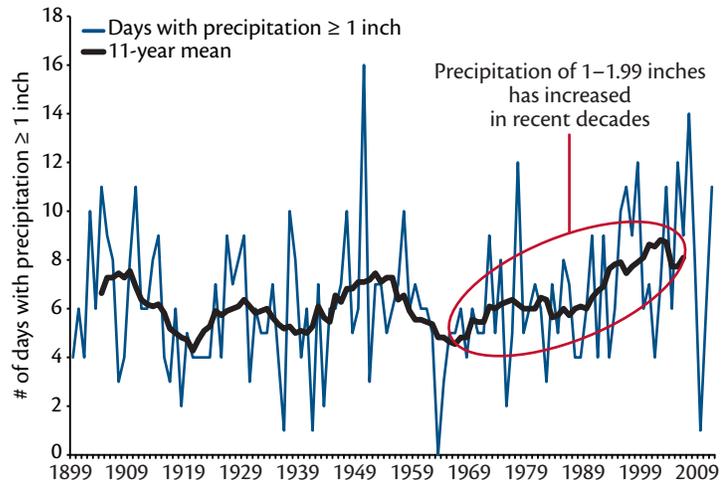
Key drivers

Pipe Creek's water quality is affected by many types of land uses, such as urban development, agricultural row-crop and livestock farms, commercial and industrial areas, and limestone quarries. New

developments built with green practices help to reduce impacts from impervious (hard surfaces) runoff. However, aging infrastructure in older developments with combined sanitary and storm sewer systems adds sediment, nutrient, and bacterial pollution in the urbanized areas of the watershed. Heavier storms and loss of natural stream and wetland habitat have also reduced the stream's ability to effectively handle the excessive flush of pollutants from rain events.

Dry year, although rainfall events increasing

Over the last few decades, this region has experienced an increase in the number of days per year with precipitation measuring at least one inch (figure). Despite observed increases in storm intensity, in 2012, Pipe Creek experienced drought-like conditions in the summer months. Drought conditions began to develop in north-central Ohio in early summer, according to the U.S. Drought Monitor, and reached peak intensity in July and early August. Because Pipe Creek, like many watersheds, is a storm-driven system, water quality responds to storm activity for the year. 2011 was a very wet year, resulting in poor water quality in samples analyzed. In 2012, there was slightly better water quality, due to the lack of storms, not because of improving land stewardship.



Historical records show the overall trend of increasing 1–1.99 inch storms in the last 40 years.

How does this affect the water quality of Pipe Creek? Overall, Pipe Creek scored a 42%, C-, which is considered moderately poor health, and was primarily due to poor nitrate scores at all sites. Comparing the headwater scores to the lower watershed did not reveal any major differences, suggesting pollutants affecting the scores occur at several locations in the watershed. Sampling sites such as Strecker Rd and

Bogart Rd both had grades of D, the lowest scores, due to elevated nitrate and soluble reactive phosphorus concentrations. The sites with the highest scores, all C's, were Harris Rd, Oakland Cemetery, and Perkins Ave. These scores may be a result of polluted water being diluted by cleaner groundwater. Both Harris Rd and Oakland Cemetery are downstream of

quarry discharges that pump low-nutrient groundwater into the stream. Perkins Ave is sometimes affected by lake water influence, which can lower the concentration of pollutants as well.

Turbidity scored better than the other two water quality indicators, suggesting reduction in nutrient input will greatly improve creek health.



Nitrate



Soluble reactive phosphorus



Turbidity



Bacteria



Benthic community



Vital Signs Indicators

Monitoring in Pipe Creek

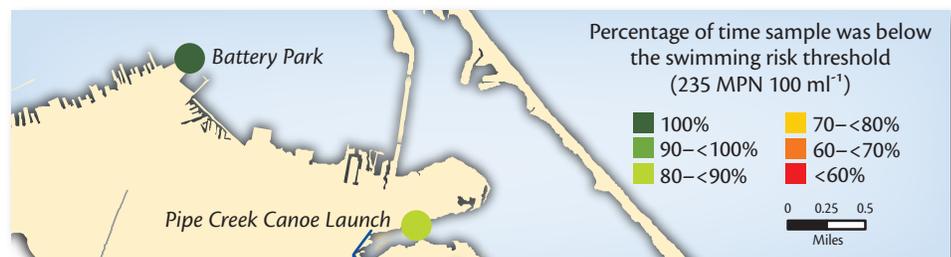
Monthly water samples are analyzed for these parameters from April through November by the Volunteer Stream Monitoring Program. Future monitoring will include benthic macroinvertebrates (aquatic worms and insect larvae) and an increase in the frequency and number of samples.

The aim of this report card is to provide a transparent, timely, and geographically detailed assessment water quality for Pipe Creek in 2012. Scores are determined by comparing three indicators (nitrate, soluble reactive phosphorus, and turbidity) to scientifically derived ecological thresholds or goals. These three indicators are combined into one overarching Water Quality Index, which is presented as the site or watershed grade. Vital Signs Indicators (dissolved oxygen, water temperature, pH, and ammonia) are considered basic diagnostic indicators that are not included in the Water Quality Index. If one or more of the vital signs do not score well it is an indication of a serious problem in the creek.

Bacteria, an indicator of human safety

Determining if recreational areas are safe for swimming is accomplished by measuring certain bacteria as an indicator. These bacteria serve as a surrogate for the presence of pathogens which may cause illness in humans. Bacteria in the water come from a variety of sources, including failing septic systems, pet waste, and livestock, often after heavy rainfall.

In Pipe Creek, there are two lake sites (see map) where indicator bacteria are measured by the Erie County Health



Department three to four times weekly. In 2012, Battery Park, received a 100% score meaning there was no detected risk of getting sick while swimming. The Pipe Creek Canoe Launch site, on the other

hand, received an 80% score. This site is located at the mouth of Pipe Creek and was most likely lower because of a higher potential of influence of pollutants that come directly from the watershed.

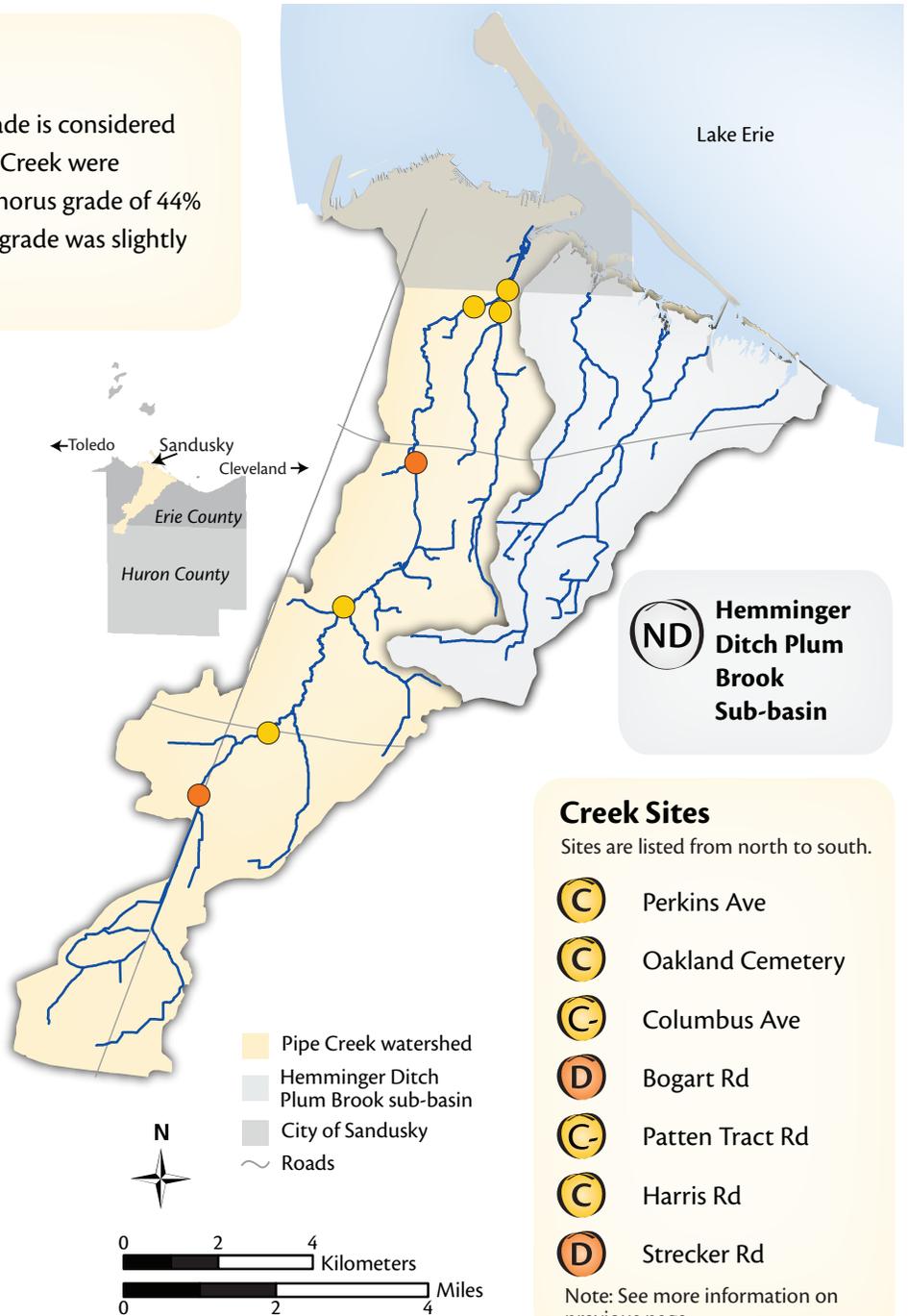
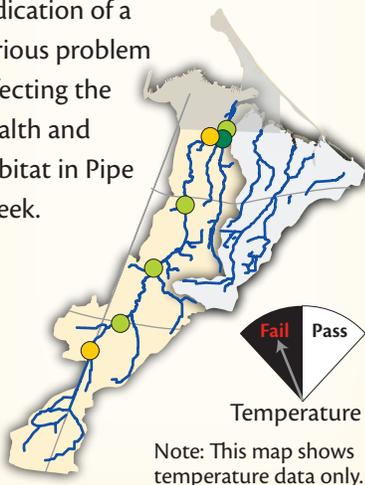
Pipe Creek 2012 Report Card

C Pipe Creek

Pipe creek scored a 42% for 2012. This grade is considered moderately poor. Nutrient scores in Pipe Creek were moderately poor and poor, with a phosphorus grade of 44% and a nitrate grade of 30%. The turbidity grade was slightly better at 54%, a moderate score.

Vital Signs Indicators

The Vital Signs Indicators, consisting of dissolved oxygen, pH, water temperature, and ammonia revealed mixed scores. All indicators except temperature scored well. Elevated temperatures recorded at several sites may have been a result of low water levels in the creeks. If temperature continues to fail it could be an indication of a serious problem affecting the health and habitat in Pipe Creek.



Creek Sites

Sites are listed from north to south.

- (C)** Perkins Ave
- (C)** Oakland Cemetery
- (C)** Columbus Ave
- (D)** Bogart Rd
- (C)** Patten Tract Rd
- (C)** Harris Rd
- (D)** Strecker Rd

Note: See more information on previous page.

What do these grades mean?

- (A)** 80–100%: All water quality indicators meet desired levels. Quality of water in these locations tends to be very good, most often leading to preferred habitat conditions for aquatic life.
- (B)** 60–80%: Most water quality indicators meet desired levels. Quality of water in these locations tends to be good, often leading to acceptable habitat conditions for aquatic life.
- (C)** 40–60%: There is a mix of good and poor levels of water quality indicators. Quality of water in these locations tends to be fair, leading to sufficient habitat conditions for aquatic life.
- (D)** 20–40%: Some or few water quality indicators meet desired levels. Quality of water in these locations tends to be poor, often leading to degraded habitat conditions for aquatic life.
- (F)** 0–20%: Very few or no water quality indicators meet desired levels. Quality of water in these locations tends to be very poor, most often leading to unacceptable habitat conditions for aquatic life.
- (ND)** No Data (ND) is a designation used for areas where there is either insufficient or no data to give a grade on desired health levels.

People working together for clean water

To reduce our greatest creek stressors (nutrient and sediment pollution, and habitat loss), we as a community need to work together. Whether you live in the city or on a farm of tens to thousands of acres, each of us has a role to play in reducing the impacts that come from our respective lifestyles. We thank many of our Firelands Area residents and landowners who are already working to improve our soil and water and encourage others to restore and protect Lake Erie. To find out more about how you can help, see the back page of this report card.

Going green in the urban community

Urban communities face numerous water quality concerns including stormwater runoff, flooding, combined sewer overflows, and more. To improve water quality, local communities are working together to reduce pollution in their urban areas. The Erie County Clean Water Coalition (CWC) has established goals that reflect the community's values and promote healthy water for generations to come. One of the goals of the CWC is to encourage the use of low impact development (LID) and balanced growth. LID uses nature as a model to manage rainfall by reducing, storing, and cleaning stormwater runoff. Balanced growth links land use planning to the health of watersheds by promoting the protection of sensitive natural areas while driving sustainable growth.

The new Perkins Township Administration Building is a great example of LID in action. As part of the redevelopment plan, runoff was reduced by installing pervious concrete in the building's parking stalls. Pervious pavement



A demonstration shows the infiltration of newly installed porous pavement at the Perkins Township Administration Building.

provides an area to collect and infiltrate stormwater, which reduces runoff effects such as downstream flooding and water pollution. Perkins Township is “paving

the way” by being a model of good stewardship with actions which benefits our environment and community.

Staying green in the agricultural community



Grass buffers along farm fields keep sediment and nutrients from entering Pipe Creek.

Our local farmers work with the Erie Soil and Water Conservation District and the Natural Resource Conservation Service to address nutrient loss and soil erosion impacting Pipe Creek and many other local streams. Through a program called The Farm Bill and other grants, farmers volunteer to receive advice on how to reduce polluted runoff and improve soil health. Practices installed through these programs include conservation practices such as “no-till” and leaving crop residue (commonly seen as corn stalk stubs) on fields throughout the winter, managing fertilizer and animal waste properly, and maintaining or enhancing natural areas and buffers to waterways.

Compared to other watersheds in Erie County, Pipe Creek has the highest percentage of natural grass buffers on farm land through the Conservation Reserve Enhancement Program. These buffers help protect over 3.3 miles of stream from sediment entering the creek. Agricultural conservation is good for Lake Erie and is profitable for the farmer.

You can help!

N = nitrogen
P = phosphorus
 = sediment

WHAT YOU CAN DO	WHO BENEFITS	WHAT'S REDUCED
Leave a natural area along a stream or ditch	Grass or wooded buffers help filter pollutants and reduce flood damage	N P 
Remember to inspect and pump out your septic system every 3–5 years	A properly maintained septic system prevents costly repairs and untreated sewage discharge in our streams	N P 
Help your community develop a plan that supports low impact development	Smart development fosters growth and protects the local resources and character of a community	N P 
Follow the “4Rs” of fertilizer use: R ight source, R ight amount, R ight place, R ight time	The “4Rs” approach promotes the wise use of fertilizer by farmers, residents, and landscapers to reduce costly nutrient loss that pollutes our streams	N P
Plant cover crops	Cover crops build healthy soils that help hold back nutrients and water and increase crop yields	N P 
Plant a rain garden or install a rain barrel	Rain gardens and rain barrels help reduce stormwater runoff and can cut down on landscaping costs	N P 
Install a drainage management system	Managing field drainage reduces nutrient loss while saving water for when your crops need it the most	N P
Properly manage animal waste	Storing and disposing of animal waste properly reduces nutrients and prevents harmful bacteria from fouling beaches	N P

Learn more

If you would like to learn more about the development of this report card or watersheds in the Firelands Area visit the following websites:

eriecleanwater.org oldwomancreek.org
ian.umces.edu eriecohealthohio.org



Join our volunteers to get involved in many opportunities at Pipe Creek.

Get involved

We could use your help to improve our watershed. If you are interested in being a volunteer contact Breann Hohman, watershed coordinator for the Erie Soil and Water Conservation District at 419-626-5211 or bhohman@eriecounty.oh.gov.

Available Opportunities:

- Stream monitoring
- Invasive plant removal
- Habitat restoration
- Litter clean-ups



Volunteers help Pipe Creek in many ways, including collecting water samples.



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