



# Huron River Report

Published quarterly by the Huron River Watershed Council

WINTER 2013



feature  
story

## Trail Towns of the Huron

*Part 1 in a series: the Village of Dexter*

A river renaissance is taking place in the cities and towns along the Huron River. Through RiverUp! ([riveruphuron.org](http://riveruphuron.org)), river corridor revitalization is underway with the goal of making the Huron River the new "Main Street" where residents and tourists recreate, live, gather, commute, and do business. HRWC is leading public and private partners in the largest river communities to incorporate river-based recreation and economies in their visions and plans, downtown development authorities, municipal budgets, and otherwise to maximize the river for community development while balancing its ecological and aesthetic values.

### Trail Towns

The Huron River Water Trail ([huronriverwatertrail.org](http://huronriverwatertrail.org)) is a 104-mile inland paddling trail connecting people to the river's natural environment, its history, and the communities it touches. The Village of Dexter is one of five Trail Towns that is a destination where trail users can venture off the trail to enjoy the scenery, services, heritage, and character of the community. The Village of Milford, City of Ann Arbor, City of Ypsilanti, and City of Flat Rock round out the list of Trail Towns.

*continued on page 4*



Removal of the Mill Pond Dam in 2008 created natural whitewater features in Mill Creek. credit: M. Akemann

## Mapping By Hand • *How it was done over 100 years ago*

HRWC and the University of Michigan's Bentley Historical Library are providing the public with a rare opportunity to view a collection of original historic maps featuring the Huron River drawn from surveys made in the early 1900s. Please join us on Thursday December 5, at 5:30 p.m. at the Bentley Historical Library in Ann Arbor. Speakers include Leonard A. Coombs from the Bentley

Historical Library, Janet Kauffman, a researcher who has used the Huron River Collection maps, and Phil Maly from Stantec who will also bring one of the original survey guns.

The Huron River Valley maps were made by Gardner Williams, a professor at the University of Michigan and consulting engineer, from approximately 1905 to 1922 based on field data collected by surveyors

during that time. These maps most likely were produced to assist the Detroit Edison Company with developing hydroelectric projects along the Huron River Valley.

While different survey instruments were employed in the early twentieth century, the fundamental method used at that time is still used today for most

*continued on page 6*

INSIDE: UPCOMING EVENTS AND WORKSHOPS *Honey Creek Bacteria Sources*  
*EPA, DEQ at odds over wetlands and the Clean Water Act | Failing Septic System Identification*





# Laura's Stream of Consciousness

**W**etlands serve critical functions in a watershed and our watershed is no exception.

- **Biodiversity:** wetlands provide a unique habitat for animals—from fish, amphibians, and macroinvertebrates to birds and mammals.
- **Water quality:** wetlands are like the watershed's kidneys, filtering sediment and pollution and keeping the water in the lakes and streams cleaner.
- **Water quantity:** wetlands act like sponges as they take up excess water in heavy rains and provide a steady and slow replenishment to creeks and rivers in drier periods.

Unfortunately, we have lost approximately two-thirds of our wetlands. We've drained and filled most of these wetlands to plow farm fields and create drier and more buildable land.

This last May, Michigan passed a new wetland law. Is this a positive development? We need a little history to get an answer.

In October 1984, the United States Environmental Protection Agency (EPA) authorized the Michigan Department of Natural Resources (DNR) to administer Section 404 of the Clean Water Act (CWA), which regulates wetlands. Since then, Michigan has been one of two states that administers its own wetland permitting program (New Jersey being the other state). Yet, over the years, environmentalists began to question the state's lax commitment to wetland protection. As a result EPA initiated an informal review of the Michigan

program and reported its findings in November 2002. After a lengthy review and comment period, a final review appeared in May 2008. The review outlines EPA's concerns with Michigan's implementation of the Section 404 permitting program.

These concerns sparked a debate in 2008 to consider handing the program back to the EPA. Michigan decided to keep the program and convened a task force to help it address EPA concerns and make the program viable. This past spring the state legislature passed a bill that purportedly addressed the concerns and improved Michigan's permitting program. Governor Snyder signed the bill into law in early July 2013.

In fact, this new law only heightens HRWC's concerns about the program. The law makes substantial changes that affect the area of jurisdiction, scope of regulated activities, and criteria for review of permits. It provides more exemptions, less protection of wetlands, and weakens criteria for permitting. In addition to the weakened regulations, HRWC is concerned about the lack of federal review and potential Clean Water Act violations. Since the bill takes effect upon the Governor's signature, no time is allotted for required federal review which results in a violation of the Clean Water Act.

The EPA should inform the State of Michigan that implementation of any changes to the state program must be delayed until the federal review process is complete. Not only are the provisions under the new law ineffective until

EPA review, but upon preliminary review of the draft legislation, EPA noted that "the draft legislation also introduces new inconsistencies with Federal law, guidance, or case law." After receiving letters from HRWC and other environmental groups, EPA is currently reviewing the new act. In the meantime, it should prohibit Michigan's Department of Environmental Quality (DEQ) from allowing any applicant to engage in any activity identified by EPA as inconsistent with, thereby, in violation of, the Clean Water Act.

The Environmental Protection Agency (EPA) is holding an informational meeting and public hearing on Wednesday, December 11, 2013, at 6 p.m. (informational meeting) and 7 p.m. (formal public hearing) at the Crowne Plaza Lansing West Hotel in Lansing, Michigan. In addition, EPA is accepting written comments on the proposed revisions through December 18, 2013. To make a comment and to learn more about the CWA Section 404 program in Michigan go to: [www.regulations.gov/#!docketDetail;D=EPA-HQ-OW-2013-0710](http://www.regulations.gov/#!docketDetail;D=EPA-HQ-OW-2013-0710). We encourage you to attend the informational meeting and hearing, and to provide your comments.



Laura Rubin, Executive Director

Two beautiful examples of wetlands, with Superior Township on the left and Northfield Township on the right. credit: HRWC



— Laura Rubin





# Investigating Bacteria Sources • Honey Creek Plan

Over the last two years, HRWC has been investigating Honey Creek in Scio Township in order to determine the extent and sources of bacterial contamination. The creek is currently designated as “impaired” by the State of Michigan because of excessive bacteria levels, making it a risk for human contact. HRWC data previously identified consistently high bacteria counts during wet and dry weather in Honey Creek, and the Michigan Department of Environmental Quality (DEQ) confirmed those results with sampling in 2007. DEQ issued a regulatory statement in 2009 requiring the reduction of bacteria levels.

In December 2011, HRWC, the Washtenaw County Water Resources Commissioner, Scio Township, and other stakeholders launched a project to better understand the source(s) of bacterial contamination in Honey Creek and develop a plan to reduce or eliminate the problem. The DEQ awarded HRWC a grant of nearly \$75,000 to do the work.

## Locating the Sources

The first step to eliminate the problem was to identify likely bacteria sources. The types of bacteria that present health concerns originate in the digestive systems of humans and other animals. The bacteria can get into streams through septic systems illegally connected to waterways, poorly maintained septic fields, runoff from farm animal grazing areas, or areas with a high concentration of pet waste.

HRWC staff and volunteers, with professional lab support, collected and analyzed water samples taken at three different times of the year from targeted locations throughout the creek. The resulting data indicated that bacterial contamination was widespread throughout the Honey Creek watershed, but especially concentrated in three areas: two branches flowing from south of Jackson Road that come together near Staebler Road; a small branch that runs under West Delhi Road; and a branch that runs west along Miller Road.

HRWC also sent a subset of water samples to a laboratory for bacterial source tracking (BST) analysis. The BST analysis identified whether the bacteria were coming from humans, pets, farm animals or wildlife, or some combination of sources. Unfortunately, most samples contained some amount of bacteria sourced from all types of animals tested. Bacteria from bovine sources were particularly prevalent suggesting the broad use of manure-based fertilizer with active bacteria since there are no cattle or dairy farms in the watershed. Dog sources were also strong in several areas, indicating that poor pet waste practices were a source of at least part of the problem. The most alarming finding was from the West Delhi Road Branch where human sources were strongly indicated. That result suggests either an illicit sewer connection to the creek or failing septic systems. HRWC is currently working with the Washtenaw County Water Resources Commissioner and Health Department to investigate further.

## YOU CAN HELP

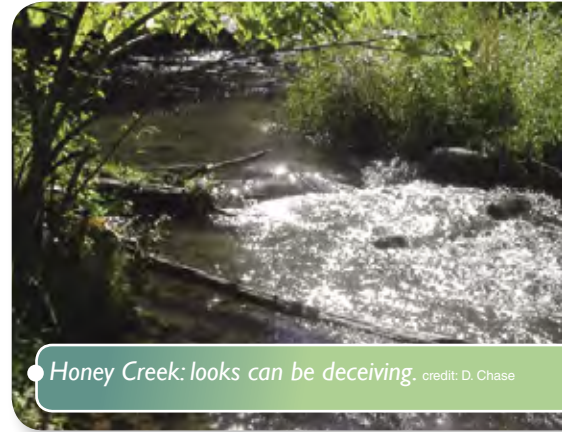
*Learn more! Find links to information about bacteria sources in the creek at [www.hrwc.org/honey-creek](http://www.hrwc.org/honey-creek).*

*Distribute HRWC materials on proper pet waste management in your neighborhood.*

*Contact your local government representatives with your concerns; help establish needed policy changes.*

*Best of all, get to know your neighbors, talk to them about the study, and ask them to contact HRWC to help reduce bacteria in Honey Creek.*

In addition to the sampling, HRWC staff and volunteers conducted neighborhood “windshield surveys” and stream reach surveys or “creek walks” along target branches in order to better identify likely sources. A few possible culprits included dog walk areas with direct stream access, suspect outfalls (i.e. pipe connections),



● Honey Creek: looks can be deceiving. credit: D. Chase

and a chicken coop placed right next to a stream. The surveys found no large sources, however.

## Eliminating the Problem

Upon completion of the study, HRWC used the results to develop a plan to eliminate bacterial sources from Honey Creek. Since the likely sources of bacteria are numerous and varied, the plan uses a multi-pronged approach, including:

- Pet waste education in target neighborhoods;
- Installing fences that keep animals away from the creek;
- Identifying and remediating failing septic systems; and
- Better managing manure application practices on farms and residential properties.

Additionally, some in-stream restoration may help to keep creek flow moving and exposed to light and oxygen (which prevents bacterial growth). Even goose control practices can be used in key locations. HRWC is working with stakeholders to develop and implement many of these approaches.

HRWC presented the plan to key stakeholders and residents in October. “I was not initially aware that there was a problem, and then I thought it must all be from agriculture,” said one resident. “I need to take some of this information back to my neighbors so we can do our part to eliminate the problem.”

— Ric Lawson

First conceptualized for Pennsylvania land-based trails, the Trail Town concept leverages trail-based tourism and recreation for economic and community development in trailside communities along the Great Allegheny Passage. This concept represents a mostly untapped potential on the Huron. Over the course of the next year, the Huron River Report will feature each of the major river communities—Trail Towns along the Huron River—beginning with the Village of Dexter in Washtenaw County.

### At River Mile 63

The Village of Dexter, situated where Mill Creek flows into the Huron River at river mile 63, boasts small town charms, an active arts community, civic pride, and abundant natural assets with land and water trails to connect them. The removal of the Mill Pond Dam in 2008 and subsequent restoration of Mill Creek catalyzed the historic and quaint village to expand its economic and community development opportunities based on the waterway flowing through town.

Village President Shawn Keough describes the new Dexter waterfront as a dream realized. “When I moved to Dexter, Mill Pond was hidden and in poor shape, and the bridge was deteriorating,” recalls Keough. “The community had a vision to remove the dam and restore Mill Creek to its natural streambed,”

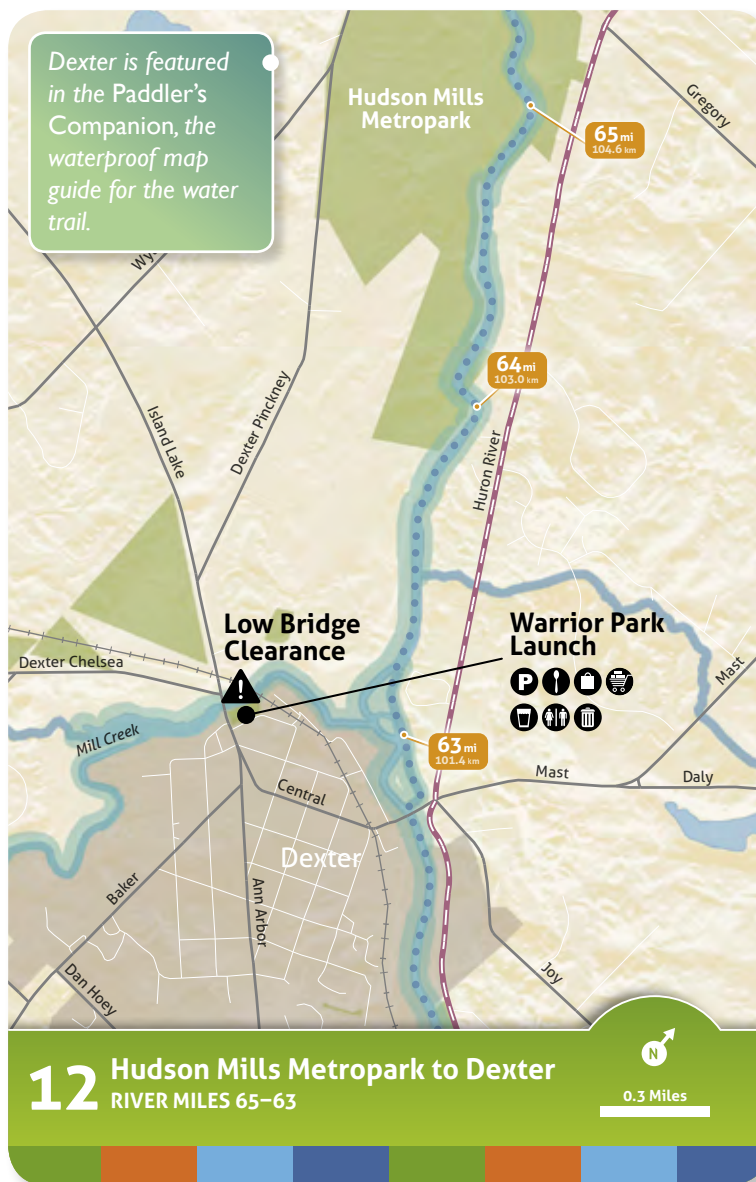
he continues, “We’ve turned the creek into a destination and a gateway into Dexter.”

Dexter has implemented many Trail Town features for the benefit of residents, tourists, and local businesses:

- The creation of the Mill Park to **provide a gateway** into the village and downtown business district;
- Art along the creek and design of store fronts and streetscapes **create a sense of place**;
- Signage and access points provide **a welcoming atmosphere** for Border to Border Trail and Water Trail users;
- **The right mix of services** for trail users such as non-motorized boat launches, a trail network, natural features, fishing docks, restaurants, shopping, banks, and other amenities;
- **Restored habitat** and water quality features for a cleaner and healthier creek;
- **Trail-oriented events** such as Dexter Daze, the Paint Dexter Plein Air Festival, summer band concerts and outdoor performances by the Dexter Community Orchestra; and
- **A whitewater destination** on the American Canoe Association website, drawing paddlers from Ohio, Indiana, and throughout Michigan.

Opportunities for Dexter to build its reputation as a Trail Town include adding lodging, providing a shuttle service for paddlers, as well as signage about water levels and river conditions where the footbridge passes under the railroad bridge.

*continued on the next page*



### Additional Resources

Summary article about Trail Town concept  
[www.liaa.org/downloads/mtncover\\_sept2012.pdf](http://www.liaa.org/downloads/mtncover_sept2012.pdf)

Original concept for businesses along the Great Allegheny Passage [www.trailtowns.org](http://www.trailtowns.org)





### Show Me the Money

Outdoor recreation is big business in this country. In 2006, the Outdoor Industry Association conducted an economic impact report of the outdoor recreation sector following up with a 2008 report specifically for water sports (kayaking, canoeing, stand-up paddling, rafting, canoeing, and motorized boating). The report concludes that outdoor recreation is a larger and more critical sector of the American economy than most people realize. Water sports, after camping, is where people spend the most money (\$86 billion annually). Water sports directly support more than 800,000 jobs annually. River recreation boosts the economy and creates jobs.

Closer to home, researchers at MSU looked at the Detroit River and found that the increase in the number of paddlers was accompanied by positive economic impacts for nearby communities. Spending for equipment was the most common expenditure, including purchases of more than \$1,000. Restaurants and lodging were also popular sources of spending, where a day or overnight trip can be enjoyed.

Dexter's Keough sees the village as a hub for outdoor pursuits as it's situated between Hudson Mills and Delhi Metroparks, along the Border to Border Trail and the Huron River Water Trail, and close to the Pinckney-Waterloo Recreation Areas. He shares, "You just can't plan for all of the ways that people are going to use and enjoy the space along the creek. Since the park construction was done and the trails connected, we've had a ton of cyclists, joggers, kayakers, and fisherman come to town and they spend money at our restaurants and shops. We've

also seen professional photographers having photo shoots with their clients here." Keough is interested in efforts by HRWC to quantify the economic impact of all of these activities on the business community.

Residents, businesses, and visitors are benefitting from the changes that make Dexter more walkable, more accessible, and give a sense of place to this community on Mill Creek. And there's more to come in Dexter. The community has plans for phase 2 of the park from the south end to Shield Road near the schools. Extend-

Improvements include extensive boardwalks and trails along the creek, plus signage kiosks.

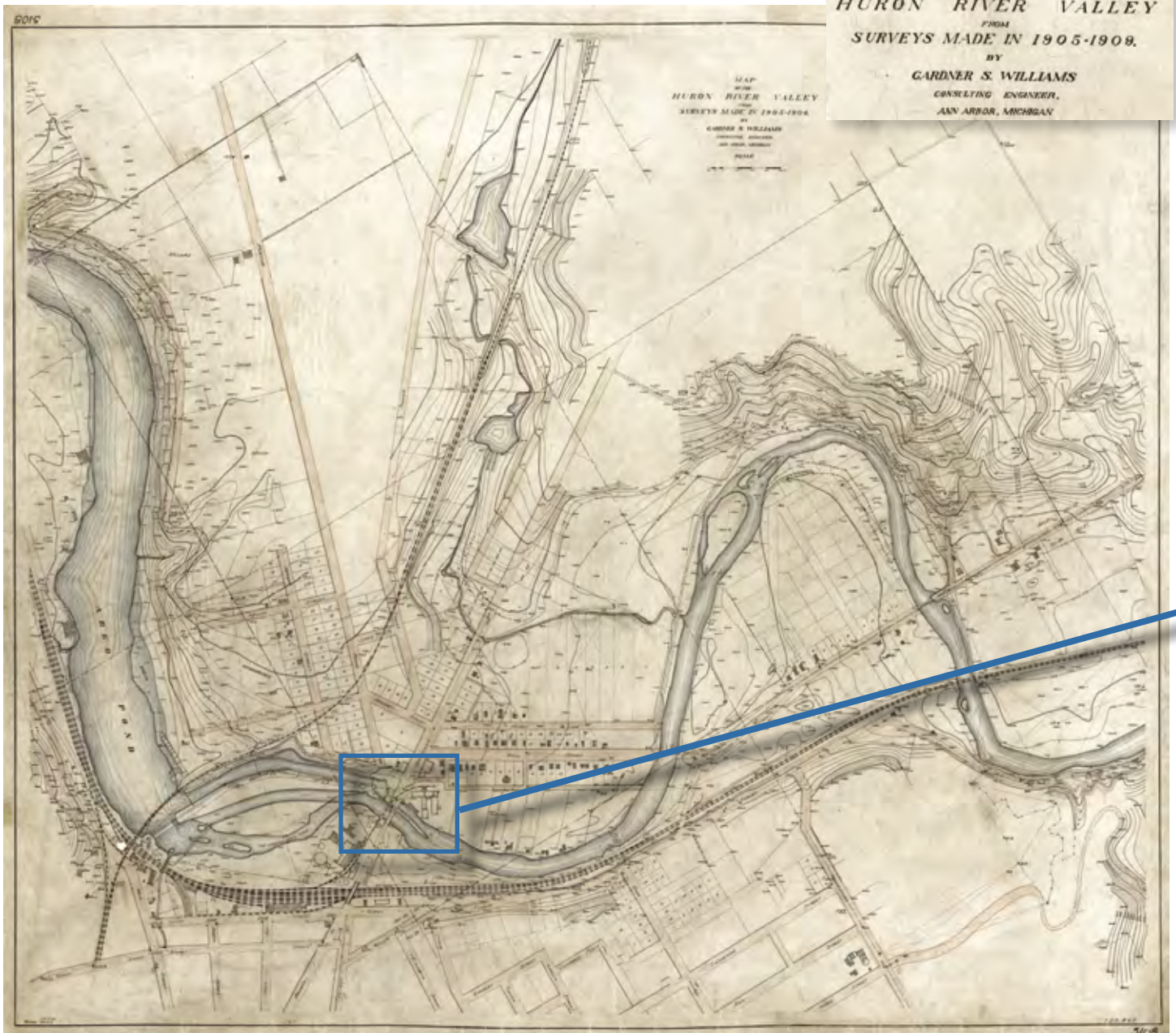
credit, all photos on this page: M. Akemann



ing the trails will provide connectivity for walking and biking from the neighborhoods to the schools and opportunities for outdoor learning along the creek. For Keough, "now is the best time to be President of Dexter because of the fantastic work we've done with our partners, like the Watershed Council, and everybody's on board with this vision to make Dexter a destination and a great place to live."

— Elizabeth Riggs





topographic surveys. Elevation and horizontal position are measured at numerous individual points and recorded in the surveyor's field book. The surveyor also records qualitative surface features such as the presence of water, buildings or roadways. The surveyor's notes typically include sketches showing both surface features and the location of shots, together with the numerical data associated with each shot.

These survey data are compiled to produce an accurate horizontal map of the area. The many individual data points (spot elevations) are then laid over the map to serve as the

basis for drawing topographic grade lines, i.e., lines of constant elevation. Grade lines are usually drawn to the nearest one foot interval minimum (the Huron River maps are drawn on 5-foot intervals). Since spot elevations rarely land on the exact foot, the location of the grade lines has to be interpolated between the various spot elevations. Where today grade lines are drawn by computer, in the time of Gardner Williams this work would have been done by a skilled draftsman, perhaps someone who was training to be an engineer.

Most likely, a preliminary map was drawn in pencil since hand-drawing of

contours entails a fair amount of trial and error. After completing the pencil drawing, the linen was probably placed on a light table and the final drawing traced in ink. The finished paper appears to have been coated in wax to preserve the lines. Another method would be to draw pencil lines on the linen, then over trace; but this would be expected to leave plenty of pencil marks still on the sheets, and such marks are not visible on the Huron Valley maps.

Gardner Stewart Williams was born in Saginaw, Michigan, in 1866.

*continued on the next page*





At left, on page six, is a map of the Huron River Valley by Gardner S. Williams, circa 1909. The detail above is of the Broadway Bridge and the Argo Plant.

This Gardner S. Williams map is from the collection of the University of Michigan's Bentley Historical Library, with thanks to Grafaktri for digital enhancement.

He became a nationally recognized authority in hydraulic engineering and was known for his multiple arch dams, hydroelectric plants, and for developing the Hazen-Williams hydraulic tables. Williams had been a consulting engineering since 1895 and was professor of civil, hydraulic and sani-

tary engineering at the University of Michigan from 1904 to 1911. In 1911 he resigned from the University and devoted his full time to his consulting practice (now known as Stantec).

— Paul Malocha, P.E., Stantec and  
Laura Rubin

## PLEASE JOIN US

for a special viewing of the original Huron River Collection Maps and talks by:

**Leonard Coombs**  
Johanna Meijer Magoon  
Principal Archivist at  
the Bentley Historical  
Library, University  
of Michigan

**Janet Kauffman**  
Author and Researcher

**Phil Maly**  
Construction  
Manager at Stantec

Thursday December 5  
5:30 p.m. at the Bentley  
Historical Library  
1150 Beal Avenue,  
Ann Arbor

RSVP to Margaret  
Smith at x 605 or  
msmith@hrwc.org.

HRWC will offer  
made-to-order print  
reproductions of a  
limited number of maps  
from the collection.  
For details, please also  
contact Margaret.

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Founded in 1965, the Huron River Watershed Council (HRWC) is south-east Michigan's oldest environmental organization dedicated to river protection. HRWC works to inspire attitudes, behaviors, and economies to protect, rehabilitate, and sustain the Huron River system.

HRWC coordinates programs and volunteer efforts that include pollution prevention, hands-on river monitoring, wetland and floodplain protection, public outreach and education, and natural resources planning.

Individuals, local businesses and more than 40 communities support HRWC's work through voluntary membership.



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Laughing Goat Arts

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# The Huron River Watershed







Front row: Laura, Jennifer, Rebecca Esselman, Elizabeth, Margaret and Kris. Back row: Ric, Pam, Jason and Paul.  
Not pictured: Rebecca Foster

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# HRWC Events and Workshops

DECEMBER 2013 • JANUARY • FEBRUARY • 2014

## Winter Stonefly Search

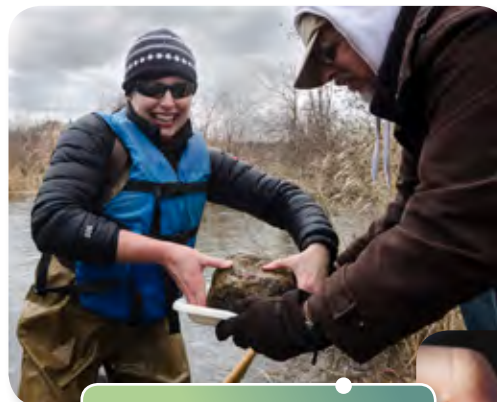
Saturday, January 25 • 10:30 am or noon start times

*Winter Stoneflies are elusive. These underwater creatures avoid most predators by growing during the winter months when most fish are sluggish. They live only in good quality streams so their absence reveals problems in the river and its streams.*

*Join a small team of volunteers and travel to a stream or stretch of the river. Help experienced researchers collect stoneflies, figure out what makes the stream healthy or unhealthy, and gain an understanding of how river ecology works. Children are welcome, but each one must be attended by an adult.*

Meet at NEW Center, Ann Arbor, and then go out to two stream sites somewhere in Livingston, Oakland, Washtenaw and Wayne counties. Takes 4 – 5 hours, part of that outdoors. Dress for the weather.

Register at: [www.hrwc.org/volunteer/stonefly](http://www.hrwc.org/volunteer/stonefly)



Volunteers look for Winter Stoneflies in 2012. credit: J. Lloyd



## Water Quality Monitoring and Training

Saturday, March 22 • 1pm - Classroom Training Session

*Help measure the quality of local rivers and streams this spring and summer! Collect water samples and learn to measure stream flow and sample runoff from rain storms. Teams will be formed based on interest and availability. Sites include one or more stream sites in Washtenaw or Wayne counties. Sampling commitment is 2 or more hours per month April through September, depending on availability and interest. There is a keen need for volunteers willing to work in streams west of Ann Arbor. Attendance at the classroom training is a requirement of participation.*

March 22 classroom training for water quality monitoring will be held at the HRWC offices at the NEW Center in Ann Arbor. Additional hands-on training will occur in the field during the first week of sampling. For more info: [www.hrwc.org/water-quality-monitoring](http://www.hrwc.org/water-quality-monitoring)

Register at: [www.hrwc.org/volunteer/water-sampling](http://www.hrwc.org/volunteer/water-sampling)



Volunteers in the field. credit: J. Lloyd

# h<sub>2</sub>oheroes salt less

For more tips and tools  
go to [www.hrwc.org](http://www.hrwc.org)

Help keep rivers healthy in the winter. Shovel snow and ice early and often to limit your use of sand, salt, and deicing chemicals. When safety requires it, try an alternative to salt.

Deicers, such as magnesium chloride, have fewer adverse environmental impacts and are not as corrosive. Check labels to choose a deicer that fits your conditions and apply it early and sparingly.





*We had a wonderful time and,  
until next year, see you on the river.*

Thank you to everyone who supported HRWC  
and joined us in a toast to the Huron River.



Photo by Derek Schrader



Photo by Derek Schrader



Photo by John Lloyd



Photo by John Lloyd



Photo by John Lloyd



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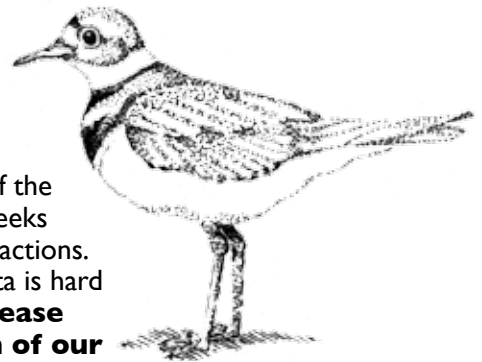


# Support Water Quality Monitoring

*HRWC's monitoring programs are key to understanding the watershed*

Dear Friend of the Huron River,

The foundation of all of our work at HRWC is a solid understanding of the health of the watershed. We need to know the quality of our rivers, creeks and lands in order to identify and measure restoration and protection actions. Pretty much everything we do is based off the data. But monitoring data is hard to collect, takes lots of hours and training, and costs a lot of money. **Please make a year-end contribution to support the foundation of our work in the Huron River.**



HRWC's water quality monitoring programs uniquely address today's greatest challenges with proven results that have been recognized both by the State of Michigan and across the United States. In 1989, HRWC started engaging volunteers to collect data and to effect changes to improve the river. When people learn about something as important as the future of their fresh water, they take action. The Adopt-A-Stream program educates adults and families about river ecology and the impact that everyone has on its quality, while also developing a sense of ownership and a desire to protect the river.

At a state level, HRWC administers the statewide volunteer water monitoring program called the Michigan Clean Water Corps (MiCorps). HRWC has helped 28 stream groups develop and improve their volunteer stream monitoring programs and has also developed a database of water quality monitoring of lakes and streams for the entire state.

Our monitoring programs identify **current water quality conditions and problems that need to be addressed.** For instance, portions of the middle Huron River watershed fail to meet minimum water quality standards or provide designated uses. Ford and Belleville Lakes have restricted recreational use due to the presence of nuisance algal blooms. HRWC's Middle Huron Initiative is working to reduce the quantity of phosphorus and bacteria entering the middle Huron River and develop a cost-effective approach for monitoring and rectifying problems. The result is that we've seen reductions in phosphorus! Other successes include the identification of an oil leak, the breach of a dam, the prevention of a new polluter permit, and more. Not only do our monitoring programs identify problems, they help mark progress and success!

Our water quality monitoring programs have also been building a base of citizen scientists for more than 20 years. In the past year, over 600 citizens volunteered to help us monitor the quality of our land, rivers, and creeks. Your contribution will help ensure that well trained citizen scientists, advocates, and educators will continue to monitor our watershed to protect the future of our fresh water.

Please contribute to HRWC's water quality monitoring programs so we can identify and address current threats and conditions and measure success. You are supporting proven programs that have a track record of protecting and restoring the river.

In gratitude,  
Laura Rubin





# Identifying Failing Septics • *A new approach*

## Closing In on a Potent Pollution

Pollutants—pathogens and phosphorus—from failing septic systems can impact the health of the Huron River and its tributary streams that flow through rural areas. In fact, one of the more perplexing questions about pollution in the Huron has been “how much of a problem are failing septic?” Preliminary work by HRWC and others has suggested that failing septic systems potentially may be responsible for the highest concentrations of phosphorus entering the Middle Huron where a pollution budget mandates phosphorus reduction.

## Enter the Failing Septics Identification Project

HRWC, along with Sanborn Map Company, Washtenaw County and Photo Science Geospatial Solutions, recently concluded a three-year project investigating the use of digital image analysis to detect and identify failing septic systems. Traditionally methods to detect failing septic systems rely on self-reporting and time-of-sale inspections. Funded by the United States Environmental Protection Agency (EPA) and Michigan Department of Environmental Quality (DEQ), project partners (1) developed a method to determine septic system failure probability by analyzing aerial imagery along with existing county septic system records; (2) designed, implemented and evaluated a unique homeowner education campaign; and (3) conducted water quality monitoring in Mill and Honey creeks for *E. coli* and phosphorus.

## More Complicated Than It Looks

Looking at the Mill and Honey creek watershed areas in Scio, Lima, and Freedom townships, project analysts compared aerial imagery to county records. The task was to identify unusual patterns in vegetation (failure signatures) that could be attributed to leaking septic systems after taking weather and seasonal conditions into consideration. A leaking or failing septic system saturates the surrounding soil with nutrients and water which

can lead to unusually vigorous vegetation growth or die-off.

In project years one and two, the team field tested the method by conducting voluntary on-site inspections of roughly 78 septic systems. Results showed that analysts were able to identify most at-risk properties using the aerial imagery, although further refinement of the methodology was still needed.

## A Unique Outreach Approach

In project year three, taking cues from the health marketing field, the team developed an educational brochure about the risks of ignoring the signs of a failing septic system and the benefits (including cost savings) of regular inspections and pump-outs. The piece also presents the County's Public Health Department as an important resource for septic system information and care. Three hundred forty-three households in the project area received this new brochure along with information about EPA's “Septic-Smart” program. Some residents also received their own septic system's individual risk categorization.

An evaluative survey asking if homeowners took any action as a result of the information followed. All survey respondents reported either regular care and/or maintenance of their septic systems or some type of prompted action/change. Ninety-six percent reported that they regularly follow recommended practices.

## Monitoring Results

The project leveraged HRWC Middle Huron monitoring already underway to capture any water quality changes at a larger subwatershed scale, but then also added targeted *E. coli* sampling and biological source tracking (BST) at almost 30 sites across the two focus catchments: Honey and Mill creeks. The results for Honey Creek are discussed on page 3 of this issue. Mill Creek was shown to be consistently high in *E. coli* with no specific “hot spot” branches. Genetic markers were found for all five potential bio-



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logical sources, so no distinct source (human or otherwise) could be identified in any Mill Creek branch.

## Conclusion

Saving money and improving water quality were the main drivers of this project. Could the project team use an innovative approach to detect at-risk failing septic systems and provide a cost-effective approach for resource-limited county health departments? The project overall determined that using aerial image analysis to identify at-risk properties is a viable approach when coupled with strong supporting data such as installation permit records and/or time-of-sale inspections and recommendations. The method requires refinement, including improved supporting data and more information on how failing systems are revealed by impacts to surrounding property. Future work could look at changes over time to properties with septic systems in order to identify failures.

— Pam Labadie, Ric Lawson, and Elizabeth Riggs



*HRWC would like to extend our gratitude to everyone that helped protect the Huron River by giving of their time, talent, in-kind contributions and financial resources.*

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