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Unusual weather conditions led to the watershed-wide flooding in February. Giant conglomerated masses of ice, such as the one in this photo, were left south of Brantford after the flood receded.











The Grand impacted by jams

he GRCA is analyzing the conditions that led to major flooding throughout the Grand River watershed during the midwinter melt in February.

Canadian ice experts and GRCA staff spent days in the field following the event, taking a closer look at the ice and debris left in the floodplain and beside the riverbanks through Cambridge and Brantford.

Hundreds of emergency service and municipal staff worked to keep people and property safe as they responded to this event. Roads were closed, people were evacuated and infrastructure was protected in many communities. A better understanding of this flood will help the GRCA and its partners prepare for future ice jams and the more frequent flooding that may result from climate change.

"We learn from each flood. The understanding that we gained from the flood last June helped us

with our response to this event," says Dwight Boyd, Director of Engineering for the GRCA.

GRCA staff relied heavily on weather forecasts to anticipate the flooding that could take place. They issued the first flood warning for parts of the watershed on Friday, February 16. The next message, on February 18, was a warning for the entire watershed. The messages came regularly after that with more specific information.

The flooding happened at a tricky time, as it was the beginning of the Family Day long weekend. It was ideal that lots of notice allowed emergency response staff and the general public to prepare. This is often not possible, Boyd says. As always, a flood model was used to predict flooding, but ice jam release is very hard to predict. As soon as the flood was finished, it was time to gather more information. This analysis is crucial in the aftermath of any flood.

"The better we understand this flood, the better





In late January, the Grand River in Cambridge above Parkhill Dam was already in a jam. This is the view from Riverbluffs Park. Two January melts had broken up the sheet of ice into ice chunks, but these remained in place. This set the scene for the even bigger ice jam in February that extended five kilometres upstream from Parkhill Dam.

prepared we will be for the next major ice jam that comes along. Ice jams form quickly and are more complex and less predictable," says Boyd. "It's much harder to predict when an ice jam will break and the bulk of the water will move down the river. There are so many more variables than with a spring

The Canadian Coast Guard's HMS Griffin ice breaker broke up the ice in the southern Grand River to minimize flooding.

flood."

GRCA staff worked throughout the February event to monitor watershed and weather conditions. They used the reservoirs to store runoff to reduce peak flows and later released it to the river to reduce the downstream flooding.

What happened

Weather over the course of the winter set up the conditions for this flood. The winter of 2018 was one of the coldest on record, forming very strong ice throughout the watershed. The winter of 2014 was similar but the melt was more gradual and the ice eased out of the river without major issues.

Some of the very thick ice broke up during two mid-January melts. But plunging temperatures soon followed the weather events and ice jams formed on the river in three locations — Cambridge, Brantford and Cayuga.

A quick drop in temperature following each of these events created a different kind of ice in the river, called frazil ice. Frazil ice can turn entire sections of the river to slush. That slush plugs up gaps in the ice jams, further restricting water flow in these areas. Ice experts believe that restriction to river flow caused by this frazil ice ultimately led to the catastrophic release of the Cambridge ice jam that stretched approximately five kilometres upstream of Parkhill dam.

When the weather system arrived on February 19, it brought 40 to 60 mm of

rainfall to the watershed. This rainfall added to the 50 to 70 mm of water content in the snowpack that began melting with the warm temperatures.

Preplanning and early warnings were critical in ensuring that municipal partners across the watershed were prepared and could help residents quickly.

Hard to predict ice breakup

When the ice did break in Cambridge, it moved out suddenly with no warning and sounded like a freight train, according to observers. A Waterloo Regional Police officer captured the moment on video in the early morning of February 21. The video shows full-sized trees along with the ice chunks being swept with tremendous force along the river.

The peak flow through Cambridge reached 1,100 cubic metres per second (cms) when the ice jam released. Were ice jams not a factor in this event, river flows would have peaked in the range of 600 cms. The ice jam release was similar to a dambreak. Ice and debris damaged a water main under the Concession Street bridge, communications and other infrastructure. If the water had not been regulated by upstream reservoirs, it would have been in the range of 1,400 cms.

"We were very fortunate that the ice jam in Cambridge released when it did. The guardrails along Highway 24 snapped like toothpicks. Thankfully, no one was driving in the area at 2:00 a.m." Boyd says.



The Nith River overflowed its banks in New Hamburg on February 21. The Nith River doesn't have any reservoirs to hold back water. The GRCA's role in managing the flood in communities along the Nith is about predicting when and where a flood will take place and working with flood coodinators to keep people and properties as safe as possible.

In Brantford, thousands of people had to be evacuated from their homes, due to the flood risk. By the time flows had peaked and moved downstream, it impacted properties and infrastructure in the communities of Grand Valley, Waldemar, Drayton, Cambridge, Glen Morris, Paris, Brantford, Six Nations, Cayuga and Dunnville.

Complex communications

During a flood emergency, GRCA staff are responsible for communicating important information about the river to municipal staff and first responders throughout the watershed. These agencies use this information to warn and protect residents, secure infrastructure and respond to emergencies.

GRCA staff work closely with Community Emergency Managers and Flood Coordinators to prepare and plan for flood emergencies. A critical component of this planning involves reviewing communication roles and responsibilities.

Just the week prior to the February flood, the GRCA's annual flood coordinators meeting brought together nearly 100 municipal staff and first responders to discuss past events and plan for the upcoming year. As part of this planning

process, an annual flood warning test is conducted to ensure the warning system is functioning properly. The 2018 test was conducted with a 100 per cent success rate from all watershed communities. This is one of the many processes in place to plan for flooding.

The GRCA website also plays an important role from a communications perspective. Information shared on the GRCA website allows the public, emergency responders and media to find information about current water conditions and flood messages. At the peak of the flood event in Brantford on February 21, the GRCA website was receiving 7,500 page views per hour. The website diverts potential phone calls and allows staff to focus on managing the flood event and provision of information to municipal emergency responders and police.

While ice jam flooding was a significant element of this flood event, it was a large, watershed-wide event. Flows in the Nith River through New Hamburg and other communities along the on the river were the third highest on record since 1951, only exceeded by April 1975 and December 2008. The Canadian Coast Guard responded to a request to break ice at the mouth of the Grand River where it empties into Lake Erie.

Efforts of the Coast Guard helped avoid ice jam flooding in the communities of Dunnville and Port Maitland.

Members from federal, provincial and municipal levels of government attended the GRCA's Annual General Meeting in February to express their thanks to the GRCA board and staff for the response to the flood earlier that week.

Appreciation came from Cambridge MPP Kathryn McGarry, Cambridge MP Bryan May and Brant County Mayor Ron Eddy, who said he had never seen a flood this severe in Brantford.

During the meeting, Minister McGarry said she was honoured to thank staff and the GRCA board for their incredible work to keep citizens informed and safe during floods.

A detailed report about this flood is part of the March 23, 2018 GRCA meeting agenda and is available online at http://calendar.grandriver.ca/directors.

You can map your property

During the February flood, the Map Your Property tool on the GRCA website was very active.

One use of this tool is to find out if all or part of your property is within the floodplain. You can quickly find this out and create a map of your property in four steps.

- 1. On <u>www.grandriver.ca/propertymaps</u>, click the name of your municipality.
- 2. Review the disclaimer pop-up.
- 3. Type your address in the address box.
- 4. A map of the property will come up and you can pan, zoom and turn map layers on and off using the menu on the left side. You can also print the map.

There are more than 100 layers on this map providing information such as roads, infrastructure and wetlands. This GIS information is updated regularly.

Many planners, consultants and residents use this tool regularly and it is available to everyone.



2018 GRCA budget

he GRCA will spend more than \$34 million this year on programs that protect water quality, reduce flood damages, protect natural areas, support responsible development and provide outdoor recreation and environmental education.

Municipalities will contribute about \$11.3 million in general municipal levy to the GRCA this year, about 33 per cent of the total budget. The municipal levy portion is up 2.5 per cent this year, which works out to approximately \$10.72 per watershed resident.

Government grants totalling just over \$4.9 million represent about 15 per cent of the budget. This includes \$800,000 from municipalities towards the Rural Water Quality program. The remainder is primarily provincial grants, which include funding of over \$1.5 million for the Source Protection Program.

The GRCA generates more than \$15.3 million or 44 per cent of its own revenue through revenue sources such as camping fees, park admissions, nature centre programs, hydro sales, property rentals, tree sales, planning permits, and donations raised by the Grand River Conservation Foundation (GRCF).

Municipal General Levy

The municipal levy portion of the budget is calculated using the "Modified Current Value Assessment" under Regulation 670/00 of the Conservation Authorities Act. Due to the December 21, 2017 decision of the Mining and Lands Commissioner, the 2018 levy apportionment does not include an adjustment for the City of Hamilton, which had been made to the levy apportionment since 2001. As a result, Hamilton's share of the total levy has increased from 2.4 per cent to 12.6 per cent and the amount apportioned to all other participating municipalities has decreased by an equivalent amount. Further information about this change is outlined in the January 26, 2018 board report, Budget 2018 - General Levy Apportionment Update. The City of Hamilton has advised the GRCA that it has requested a Judicial Review of the Mining and Lands Commissioner's decision. Currently, it is not

known whether that request will be granted and if there is potential for adjustments to the 2018 levy apportionment.

Drinking Water Source Protection

The GRCA continues to work on the development and implementation of a Drinking Water Source Protection Plan for each of the four watersheds in the Lake Erie Source Protection Region, including the Grand River watershed, as part of the provincial Source Protection Program under the Clean Water Act, 2006. All four Source Protection Plans are approved and in effect. In addition to supporting municipalities and other agencies in implementing the plans, the GRCA's focus in 2018 is on updates to the Grand River Source Protection Plan, including water quantity risk assessment studies, development of water quantity policies, updating water quality vulnerability assessments, and the development of an annual progress reporting framework.

Water Management Plan

The Water Management Plan was endorsed in 2014 as an update to the 1982 Grand River Basin Study that charts a course of actions to reduce flood damages, ensure water supplies, improve water quality and build resilience to deal with climate change. Municipal, provincial and federal government and Six Nations Water Managers meet quarterly to report on the progress of the commitments in the Plan. Annual progress reporting is projected through to 2019. Technical work on a state of the water resources report started in 2018 and is planned to be completed in 2019.

Grand River Parks

The GRCA operates 11 active parks in the Grand River watershed, offering a wide array of activities including camping, fishing, swimming, hiking and skiing. These parks are user-supported through gate admission, equipment rental fees, and camping revenues and receive no tax dollars to support their operation. Following three very successful operating seasons, the parks will continue to focus on infrastructure reinvestment in 2018. This reinvestment will primarily focus on

WHAT'S HAPPENING

projects that will enhance the visitor experience including improved washroom facilities, playgrounds and access control gates at park entrances.

Emerald Ash Borer

During 2018, the GRCA will continue to address the impacts of Emerald Ash Borer on GRCA lands and will continue to seek financial resources to manage this infestation. About \$400,000 will be spent this year responding to damage caused by the invasive insect. Most of the money will go to remove hazardous trees in the areas where the infestation is the highest.

Rural Water Quality Program

\$800,000 is expected to be available to farmers to help them undertake projects to protect water quality on their land including tree planting, erection of fences along water courses, construction of manure storage tanks and other projects. The money comes from municipalities within the Grand River watershed, while the GRCA manages the program.

Water Control Structures

Major water control capital projects planned for 2018 include upgrades to backup generators and fuel systems at Guelph and Woolwich dams, refurbishment of the gates at Woolwich Dam, a gate failure modes analysis of the Conestogo Dam gates, installation of new stoplog gains and stoplogs at Caledonia Dam, and continued maintenance of portions of the Brantford, Bridgeport, Cambridge and New Hamburg dikes. Design of the repair of a portion of the Cambridge riverwall is being coordinated with a City of Cambridge project to build a river level walkway at the base of the floodwall.



New fishing line recycling Then the Grand River Parks open

hen the Grand River Parks open in May, they will have new containers to recycle fishing line, thanks to a partnership with the KW Cambridge Bass Masters Club.

Members of the fishing club built 18 fishing line recycling containers for the parks. These have been installed by park staff at boat launches and other locations where anglers will have easy access to them.

Fishing line is a danger to wildlife, which can become entangled in it. Birds sometimes use it as material for nesting, in which case it poses a danger to hatchlings and adults alike.

"The containers will help keep used fishing line from impacting fish and wildlife within our parks," explains Robert Messier, GRCA Ecologist. "We're really pleased that the Bass Masters have volunteered to help."

Messier said that when he dropped by the GRCA's mechanic shop last summer, a lawn mower was undergoing a \$300 repair due to an encounter with fishing line. An outboard motor also had to be repaired that day for the same reason. The equipment of visitors and cottagers may also be damaged, so improper disposal of fishing line costs money and aggravation.



Receptacles for fishing line have been installed at Grand River Parks



A new outdoor skills program at Shade's Mills Park is popular. The workshops take place the last Sunday of each month to giving people the skills to enjoy outdoor activities.

Donated materials

Materials to construct the containers were donated by IPEX HomeRite Products in Mississauga. In fact, the company donated twice as much material as was needed in order to make more containers to be placed at other locations within the watershed. Members of the Grand River Fish Plan are working with community partners on this.

Last fall, volunteers at a cleanup at Belwood Lake Park removed 335 kilos of garbage from the Belwood Lake shoreline, including 700 metres of fishing line and more than 60 lures and bobbers.

Learn outdoor skills at Shade's Mills Park

Outdoor enthusiasts can expand their skills through hands-on workshops at Shade's Mills Park in Cambridge on the last Sunday of each month.

Outdoor skill sessions on fire making and navigation that took place early in the year were popular. Upcoming sessions will cover skills such as knots and shelter building, tree identification, and interior backpacking and camping. This new program has something for everyone — beginners, experts and families with older children.

"People seem to really enjoy developing their outdoor skills, so we are very pleased to be able to offer this new program," says Brian Hunt, Park Superintendent.

The workshops generally take place the

Upcoming outdoor skills workshop schedule

April - Knots and shelter building

May - Outdoor tools

June – Fishing techniques and equipment

July – Interior backpacking and camping **August** – Tree and plant identification, including edible plants

September – GPS navigation

October – Advanced fire starting

November - Winter survival skills

fourth Sunday of the month, 10 a.m. to 2:30 p.m. with a half-hour lunch break. Advanced registration is recommended as there are only 25 spots. Park entrance fees apply for those who don't have an annual Park Membership.

The series is presented in partnership with Sail Outdoor store in Cambridge, which brings a range of gear for people to try. All you need to bring is enthusiasm and a bag lunch.

The cost is \$20 to register online at www.grandriver.eventbrite.ca. Children must be at least 10 years old and accompanied by an adult to participate. Children over the age 14 are welcome to attend on their own. Please dress appropriately for the weather, as most of the time is spent outdoors.

For more details and a full listing of park events, visit <u>www.grandriver.ca/events</u> and you may also subscribe to receive event information.





Apotex Pharmachem is an environmental leader in Brantford and helped start the Brant Tree Coalition, which works with the community to get thousands of trees in the ground each spring.

Brantford's Apotex Pharmachem receives award

potex Pharmachem Inc. received a 2017 Watershed Award from the Grand River Conservation Authority (GRCA) for its leadership in planting trees in Brantford.

Apotex became involved in 2005, when the City of Brantford needed bigger trees for parks. Company staff planted 225 trees on a small unused piece of land across the road from their plant. The trees grow in the nursery until they have a girth of 7.5 to 10 cm (three to four inches), when they are replanted in city parks. Jim Berhalter, VP Global Finance at Apotex, is the lead for this company initiative.

In 2006, with financial aid from Apotex, the first tree planting by several community groups and companies took place and the Brant Tree Coalition was established, with Berhalter as the co-founder of the Coalition. It is made up of companies that share a commitment to plantings and work with several partners to increase the tree canopy.

This is an important issue in Brantford. In 2004, a GRCA report found that Brantford was the city in the watershed with the

WATERSHED AWARDS

smallest canopy, at 23.5 per cent. The city soon set a goal of 40 per cent tree canopy.

Since 2006, the Brant Tree Coalition has grown in membership and annual planting events. Apotex has continued to financially support tree planting and provide leadership to the Tree Coalition.

"Apotex has given tree planting in the city a big boost and has been working hard to green the city," said Brantford resident and Earth Day volunteer Chuck Beach, who nominated the company for the award.

The Tree Coalition took on the Forest in the City project, a big, 32-hectare (78-acre) site that took five years to complete. The new forest is on land beside Braneida Industrial Park in Brantford and is bordered by Henry Street, Garden Avenue and Highway 403. This land could not be developed, and now 58,000 native trees have been planted there. Numerous community groups have taken part, including the Rotary

Club, high schools and TD Tree Day participants. A Carolinian forest with trails, bridges and lots of beauty is now at this location, and only a little work is left to do.

Over the years, Apotex has provided \$100,000 to support the initiatives of the Coalition, Berhalter said.

"Apotex has done so much for the Brant Tree Coalition," said Jessica Robbins, GRCA Forestry Specialist. "Jim comes to every meeting, helps on planting days and on every occasion. The company itself has to be very committed to tree planting in Brantford, and has been, ever since the beginning."

The legion of dedicated tree planters is growing in Brantford each year. All the high schools in Brantford now bring students to plant trees.

"I think the most rewarding part every year for me is when I see the kids come out and have an environmental experience they might not have had otherwise," Berhalter said. "This could generate interest in the environment that will stay with them for the rest of their lives."

Cambridge City Green

ambridge City Green's stewardship initiative connects city residents to their local environment as they make their city a better place to live and work.

This city initiative received a 2017 Watershed Award from the Grand River Conservation Authority (GRCA) at a special event in October.

Cambridge City Green started in 1993 to oversee a community action plan for the environment. This includes litter cleanups, an annual educational event and Cambridge Stewardship, which got underway in 2007. Since then, it has racked up some impressive results by planting 12,000 trees, shrubs and wildflowers of 175 species. The work has been carried out during 90 planting events by over 75 groups at 30 locations in the city.

"The goal is to plant bigger trees, such as 25 big native trees, instead of 200 seedlings. But it's really about the people, not just the plants or the parks. We try to find people with an affinity to the piece of land," said

Paul Willms, the Sustainability Planner for Cambridge and the staff liaison for this program.

He recalls working with one company, Frito Lay, at a park close to where many employees live. The trees were planted during a dry year. After the planting, Willms got a call from one of the volunteers, who told him not to worry about the trees, because the employees had already organized themselves to water the trees twice a week.

"We've learned that if people have a connection to the project, there is the highest likelihood that they will stay engaged. We have a community garden, a pollinator garden and schoolyard plantings. We also have businesses planting on their own land," he said. "Each group will flavour it in the way they want."

A pollinator garden was undertaken by the Ancient Mariners Canoe Club, beside their clubhouse, and the club also developed



Tree planting has become a spring ritual in Cambridge, thanks to City Green.

educational displays to explain the project. The displays have been brought to city events, and now pollinator gardens are expanding to schools. The Mariners have also been maintaining the garden and improving it as they learn more about the soil, the plants and the pollinators.

In addition to planting events, the Cambridge Stewardship has worked with the Mill Creek Rangers to stock trout at Soper Park for several years. It has been a key community partner and helped to bring local citizens, school groups, community groups and city officials out to help, giving the Rangers the chance to teach stewardship to younger kids.

It's not all about trees and plants — animals also benefit from the work of Cambridge Stewardship. When five snapping turtles were discovered laying eggs in a wood chip pile that had been set up for a City Green project, the area was protected so the young snappers could emerge in the fall.

Do you know a watershed hero?

They're the individuals, families, groups and businesses who put their time and energy into improving the Grand River watershed.

Many do it without recognition, satisfied with the legacy they leave for future generations.

The GRCA thinks they deserve to be acknowledged and is looking for nominations for the annual watershed awards. These awards have been given out since 1976.

There are two award categories:

- Honour Roll Awards are presented for a sustained record of environmental achievement over an extended period of time
- Watershed Awards are for outstanding examples of environmental work.

Nominations can come from anyone in the watershed. The deadline is May 1, 2018. More information on the program, including short videos of past winners and a nomination form, are online at www.grandriver.ca/awards.

The winners will be honoured at a special event in October.

Join Cambridge City Green for a tree plant at Dumfries Conservation Area on May 10. For information, check the calendar on the back page.

GRCF

Apply now for 2018 scholarships

Students who are planning a career in an environmental field may be eligible to apply for one of three scholarships offered by the Grand River Conservation Foundation. The deadline to apply for these scholarships is May 31, 2018.

Here is some information about each scholarship:

- The SC Johnson Environmental Scholarship (\$4,000) helps a university or college student continue study in the conservation or environmental field.
- The McEwen Clean Water Prize (\$3,000) is for an undergrad or graduate student with a strong interest in protecting, developing and restoring clean water resources.

Details and applications can be downloaded from the Foundation website at www.grcf.ca or are available by contacting the Foundation in Cambridge at 1-1-877-29GRAND or 519-621-2763 ext. 2372. The email address is dhartley@grandriver.ca.



Allie Leadbetter receives the 2017 McEwen Clean Water Prize from Murray McEwen.



THE GRAND CALENDAR

Brant Community Tree Plant, Saturday, April 28, 10 a.m. to noon

Bring your friends and family to plant trees for future generations at Jacob's Woods Park in St. George. This planting is hosted by the CELP class from Paris District High School. For more information, call 519-442-3342. Please bring work gloves and be sure to dress for the weather.

Cache In Trash Out at Bannister. Wrigley, and FWR Dickson, Sunday, April 29, 9 a.m. to 2 p.m.

Cache In Trash Out (CITO), is an ongoing environmental initiative supported by the worldwide geocaching community. Local geocachers are hosting a CITO event in North Dumfries. Entry is free, and bags, rubber gloves, maps and instructions are provided. Please bring your GPS, work gloves and wear boots. Rain or shine. Registration and information is online at www.citopinehurst.eventbrite.com.

Upper Grand Trailway Tree Plant, Saturday, May 5, 10 a.m. to noon

Come to the Grand Valley Trail to help plant trees along the Upper Grand Trailway. Planting starts at the trail entrance along County Road 25 in Grand Valley. Bring your shovel. The local Lion's Club will provide hot



Join us at the GRCA tree sale May 11 to pick up trees to plant on your property.

dogs and beverages after planting.

Forests Ontario Community Tree Plant, Saturday, May 5, 10 a.m. to

Support a family-friendly community reforestation project at Laurel Creek Nature Centre, rain or shine. Please bring gardening gloves, boots and a lot of energy. Wee ones may want smaller spades. Forests Ontario and the GRCA will supply trees, mulch and shovels. High school students can complete community service hours when they bring their forms.

Please register online at www.ForestsOntario.ca.

Dumfries Conservation Area Tree Plant, Cambridge, Thursday, May 10, 6:30 p.m. to 8:30 p.m.

This family-friendly event in Cambridge offers the chance to help with a local reforestation project. Volunteers are asked to bring their own gardening gloves and lots of energy. High school students can complete community service hours when they bring their forms. This event is being held by City Green, the City of Cambridge and the GRCA. Enter Dumfries Conservation Area at Dunbar Road and Pine Street and follow the signs to the planting and parking area.

In the event of severe weather, this planting will be rescheduled for Monday, May 14.

Annual GRCA Tree Sale Friday, May 11, 8 a.m. to noon

The sale takes place at the forestry barn at GRCA head office. Trees available include small bare-root seedlings, small potted trees and five to seven foot saplings of many species. The sale also includes native wildflower seed mixes and wildflower plugs. Cancelled orders, trees not picked up and nursery overruns are part of this sale. It is first come, first served and lineups start early. Once the sale starts, five or six vehicles are brought to the loading dock. As those people leave, more cars are brought in. The most popular trees sell out quickly, but there are always trees available at the end of the sale. More information is available at www.grandriver.ca/events.

Free admission for Mother's Day at **Rockwood Park, May 13**

Admission is free on Mother's Day at Rockwood, as a thank you from the GRCA and park staff to our visitors. Mini-putt will also be free for the day, thanks to the generous support of Tracey Morrow at Trillium West Real Estate Brokerage. Tracey will be on hand to help families with equipment and offer some pro tips. Camping and boat rental fees will still apply.

For a full list of GRCA events and any updates, check or subscribe online at www.grandriver.sa/events.

About Grand Actions:

This newsletter is produced several times a year by the Grand River Conservation Authority.

More information:

Current and back issues as well as complete subscription information is available online at www.grandriver.ca/GrandActions.

Submission deadlines:

The 15th of February, April, June, August, October and December. Submissions may be edited for length or style. Photos and event information is also welcome. We do our best to publish items, but we are not able to guarantee publication.

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