



The 52nd Annual Drainage Engineers Conference

The 2021 Drainage Engineers Virtual Conference was delivered on Zoom.

Drainage Conference Program

Ross W. Irwin Scholarship Recipients

From Trickle to Flood: The Development of My Interest in Water Resources Conservation

Jacob Martin | Water Resources Engineer in Training, Aquafor Beech Limited

A description of Jake Martin's journey into an education and career in water resources. This presentation walks through Jake's ever-growing passion for the conservation of water resources and protection of natural spaces. Jake will describe how he developed his connection with water resources and his experience in the Water Resources Engineering program and recipient of the 2019 Ross W. Irwin Scholarship at the University of Guelph.



Jake Martin is an alumni of the Water Resources Engineering Program at the University of Guelph. He completed the co-op program with three civil engineering and stormwater management consulting firms, and now works as an engineer in training with Aquafor Beech in Guelph, Ontario. During university, Jake became involved in the OWWA/WEAO Guelph Student Chapter and moved into a co-president role with the club for his final two years of University. This club focused on the promotion of the water industry and connecting students in the various water resources industries of Ontario including water/wastewater treatment, stormwater management, and conservation. Jake's work currently focuses on stormwater

management design including Low Impact Development, urban stormwater management, stormwater master plans, and various stormwater monitoring programs.

Outside of his education and work, Jake enjoys time outdoors and often near water. Jake has had the privilege to grow up on the banks of the Grand River and access to the Great Lakes. Many of Jake's hobbies are tied to our local water resources, including canoeing, swimming, and waterskiing! Growing up with a close connection to recreational activities and the ecosystems supported by our water resources, Jake hopes to continue sharing his passion for the protection of water resources through his professional role and volunteer experience.

Interests in Water Resources Engineering and Plans for Protecting Water Resources in the Future

Emily Cline | Civil Engineering Masters Student, University of Saskatchewan

Emily Cline was the recipient of the 2020 Ross W. Irwin Scholarship. The Ross W. Irwin scholarship is presented every year to one student in the Water Resources Engineering Bachelor's degree program at the University of Guelph who demonstrates academic excellence in soil and water conservation coursework and is actively involved in water conservation issues. Ms. Cline will describe her interests in water resources engineering and talk about her plans for protecting water resources in the future.



Emily Cline was the recipient of the Ross W. Irwin Scholarship in her senior year of Water Resources Engineering at the University of Guelph. She is now pursuing her Master's of Science at the University of Saskatchewan in Civil Engineering, looking at ways to mitigate plant water stress while improving irrigation efficiency through remote sensing applications.

The Endangered Species Act, 2007 and Activities Under the Drainage Act

Kathleen Buck | Regional Species at Risk Specialist, Species at Risk Branch, Ministry of the Environment, Conservation and Parks

Kathryn Markham | Management Biologist, Species at Risk Branch, Ministry of the Environment, Conservation and Parks

This session will provide an overview of the Endangered Species Act, 2007 (ESA), its regulations, policies and processes and it will provide general guidance to drainage practitioners on requirements relating to species at risk and the ESA.



Kathleen Buck has been working as a management biologist out of the Aylmer District MNRF office since 2017. She is currently working with the Species at Risk Branch of MECP where she works with Proponents through the process of obtaining permits and other authorizations under the Endangered Species Act. Prior to that, she spent a few years working as a fisheries protection biologist at DFO, reviewing applications and providing advice under the Fisheries Act and the federal Species at Risk Act. She currently lives in London, where she enjoys hiking around south western Ontario and spending time with family and friends.

Kathryn Markham has been a management biologist with Species at Risk Branch of MECP since April 2019. Prior to her transition to MECP with the Endangered Species Act (ESA) program, Kathryn worked for the Ministry of Natural Resources and Forestry for eight years, with most of that time in Aylmer District as a biologist. She also has experience in species at risk (SAR) policy and fish and wildlife from technical positions in Aylmer and Guelph Districts, MNRF. Kathryn's current role as a management biologist is to review projects to assess potential impacts to species at risk (SAR) or protected habitat and provide guidance on the ESA, authorizations/processes and species at risk. Kathryn lives in London with her family and currently spends as much time outdoors as possible, encouraging her toddler's interest in nature.

Climate Change and Drainage Engineering: Reviewing Signposts on the Way

Paul Marsh | Principal Engineer, EWA Engineering

Climate Change is altering every continent and country. It is and will continue to affect Ontario and the farm drainage community.

We will look at the future climate for southern Ontario and speculate on what impacts that future will have on the practice of drainage engineering. The presentation reviews current methods for drainage engineering and makes recommendations on future practices consistent with Engineers Canada Guidelines.



Paul Marsh is an experienced engineer with 35 years of work, most of that in a consulting engineering role. He was a township engineer and drainage superintendent 33 years ago in Bosanquet.

Paul has worked on large diameter—1m to 3m—water transmission pipelines, 3P water system upgrades in Saint John, NB, including pumping and PE slip lining and new transmission main construction. He has done energy efficiency studies for water systems, system studies focused on asset management, and reliability and capital/operational improvement plans.

Committee roles include:

- 2010: WEAO/OWWA climate change committee member, chair
- 2013: CWWA climate change committee member
- 2021: PEO climate change group

Overview of the Drainage Act Changes: Minor Improvements and Updating an Engineer's Report During Construction

Tim Brook, P.Eng. | Drainage Program Coordinator, Ontario Ministry of Agriculture, Food and Rural Affairs

This presentation will provide an overview of the recent changes made to the Drainage Act and the associated regulations. Drainage systems under the Drainage Act are designed and constructed to provide a long service life; however, there are times when it is necessary to make improvements to the drain due to changes in land use, agricultural practices, and technology. Minor improvement projects involve changes that are needed to address a specific need of only one property rather than the entire drainage works.

This presentation will provide an overview of the process to complete a minor improvement project on an existing drain. An engineer's report adopted by municipal by-law forms the legal basis for the construction of a drainage system under the Drainage Act. Once the by-law adopting the engineer's report has been passed, the project is authorized for construction and the drain must be constructed in accordance with the drawings and specifications; however,

during construction, unforeseen circumstances may be discovered that require design changes to be contemplated. This presentation will also provide an overview of the process to update an Engineer's Report due to unforeseen circumstances during construction.



Tim Brook has been working in the water industry for the past 24 years in both the private and public sectors. He is a licensed professional engineer and holds both a bachelor's and master's degree in engineering.

In his various roles with the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA), Tim has worked with various stakeholders on water management and drainage topics.

He is currently OMAFRA's drainage program coordinator, where he provides program leadership, oversight, and engineering expertise to administer the delivery of the Drainage Act, Agricultural Drainage Infrastructure Program, Agricultural Tile Drainage Installation Act, and Tile Drainage Act.

Big Marsh Drain

Gerard Rood, P.Eng. | Drainage Engineer, Rood Engineering Inc.

Eric Chamberlain | Drainage Superintendent, Township of Pelee

Gina MacVeigh | Senior Aquatic Biologist, Natural Resource Solutions Inc.

The Township of Pelee is located in the western Lake Erie Basin. The Township of Pelee is comprised of nine islands, the largest being Pelee Island. Pelee Island is heavily dependent on the drainage system under the Drainage Act. The majority of Pelee Island is under lake level and requires 3 mechanical pump stations, 7 large canals, and 50 feeder municipal drains. Two of the larger canals are the Drain No. 2 and West Branch Drain No. 1. Big Marsh West Branch Drain No. 1 is 1,417 lineal metres and outlets at the West Shore Pump Station. West Shore Pump Station is one of two pump stations in the Big Marsh Drainage Scheme. The Big Marsh Drain No. 2 is 4,026 lineal metres and directs flows from the east side of Pelee Island to the pump stations located on the west and north ends of the island.

In 2015, the Township of Pelee submitted an application under the Small Community Fund to improve and maintain the Big Marsh Drain No. 2 and West Branch Drain No. 1. The Township was successful in obtaining the grant for the project and Township Council appointed Rood Engineering Inc. to prepare an engineer's report pursuant to Section 78 of the Drainage Act. The major drainage works in this project included the brushing, sediment removal, and

lowering of one culvert. In addition, the project was identified as having Species at Risk (SARA) mussels. The Township and Rood Engineering hired Natural Resource Solutions Inc. to assist in managing the endangered species under both Provincial Endangered Species Act and Federal Species at Risk Act. One of the environmental requirements was to complete the construction in two phases over two years. West Branch Drain No. 1 was completed in 2019 and Big Marsh Drain No. 2 was completed in 2020 with some minor restoration and habitat creation being completed in 2021. This project is required to be complete and submitted by October 2021 in order to obtain the grants under the Small Community Fund.



Gerard Rood graduated from the University of Waterloo in 1979 and started working full time with McGeorge and Barry Consulting Engineers in Chatham. In 1990, he began working with N.J. Peralta Engineering and since 2011 with Rood Engineering Inc.

Work has included drainage reports for simple new bridge projects to multiple bridge replacements on a Municipal drain, to major covered and open drain projects including bank stabilization works. Reports have also been prepared for subsequent connections and updated maintenance schedules of assessment.

Mr. Rood's firm specializes in drainage engineering pursuant to the Drainage Act, R.S.O. 1990. Rood Engineering Inc. has a Certificate of Authorization from Professional Engineers Ontario. Mr. Rood is also a registered consulting engineer. He has been on the O.S.P.E. Land Drainage Committee since 2011 and has made presentations at the Drainage Engineers Conference and at the Drainage Training Sessions.



Eric Chamberlain graduated in 1996 with a diploma in Civil Engineering Technology from St. Clair College.

In the fall of 1997, Eric was hired by the Town of Leamington in the position of AutoCAD Drafting and Engineering Inspector. In 2000 and after amalgamation, Eric was promoted to the position of drainage superintendent for the Municipality of Leamington. In the Spring of 2001, Eric attended the school of Sid Vander Veen at the Ontario Ministry of Agriculture, Food and Rural Affairs and received a Drainage Superintendent Certificate. Since then, Eric has been the drainage superintendent for the Municipality of Leamington, the Town of Lakeshore, and the Town of Amherstburg. In addition, Eric was on the Drainage Superintendents Association of Ontario Executive Board from 2003 to 2008, holding the position of president in 2007-2008. Currently, Eric is the Manager of Roads and Fleet for the Town of Amherstburg.

In 2017, the Township of Pelee sent a letter to the local municipalities in Essex County looking for Drainage Superintendent Services. The Town of Amherstburg submitted a proposal with Eric being the personnel who would provide the Drainage Superintendent Services. In February 2018, Eric had an interview with the Township of Pelee to review the plans and projects on Pelee Island. In the spring of 2018, the Township of Pelee and Town of Amherstburg entered into an agreement for Drainage Superintendent Services. Eric started providing Drainage Superintendent Services in April of 2018.

Gina MacVeigh graduated from Sir Sandford Fleming College in 2006 with a Fish & Wildlife Technician diploma and in 2007 with an Environmental Technician Diploma.

She started on contract at NRSI back in 2009, and became a full-time permanent employee after six months, and has never left.

Prior to working at NRSI, Gina worked for federal, provincial, and municipal agencies in the aquatic field. She is a senior aquatic biologist at NRSI and specializes in SAR fish and mussels, with expertise in obtaining permits under various legislation and agencies. She regularly works on multidisciplinary protect teams and contributes aquatic biology information, and provides guidance regarding environmental constraints and opportunities.

NRSI was established in 1998 and provides natural environment consulting services. Today, NRSI comprises over 45 full-time staff including 35 talented and knowledgeable team of biologists who provide a broad range of professional services.

Great Lake Shorelines

Stephen Jackson | Flood and Erosion Safety Service Coordinator, Maitland Valley Conservation Authority

Construction near the shoreline of Great Lakes has unique complexities due to the coastal processes involved. This presentation will look at the drivers for Great Lakes water levels and coastal processes.



Steve Jackson is a professional engineer with 20 years' experience in the public and private sectors in rural Southern Ontario.

He currently works for the Maitland Valley Conservation Authority (MVCA), where he has been employed for 12 years. He supervises Flood Forecasting as well as Planning and Regulations. Prior to MVCA, Steve worked for a consulting engineer for seven years on a diversity of rural projects.

This presentation will be an overview of my company (AMG Environmental) with a special focus on the importance of monitoring rainfall through the use of flow monitors for storm sewers and/or rain gauges. I will also discuss some of the important water quality parameters and the technology associated with accomplishing that.

Tim Dick

Director of Drainage, Asset and Waste Management, Municipality of Chatham-Kent
The presentation will chronicle the creation and experiences of the Drainage Board Tim began his municipal career in 1988 with the former City of Chatham and worked in several positions within the engineering Department. In 1995, he became the Works and Drainage Superintendent for the Township of Chatham, remaining in this position until 1998 when the amalgamation of Chatham-Kent took place.

The amalgamation merged 23 former municipalities into one new, single tier entity. Tim became the first Manager of Drainage for the new municipality. In 2003, his role changed to Director of Drainage, Environmental and Fleet and in 2007, Director, Drainage, Asset and Waste Management. Since 1995, one of Tim's primary responsibilities has been municipal drainage. During the tenure of Chatham-Kent beginning in 1998, all matters of drainage have been handled by a Council appointed "Drainage Board" which was the first of it's kind in Ontario and was authorized through private member's bill P R 19.

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