



EPEX 2019

Energy Prospectors Expo

OPI 57th Conference and Trade Show



April 29th and 30th, London, Ontario



WHAT IS EPEX?

EPEX highlights the multifaceted nature of Ontario's oil, natural gas and salt industries and how they fit into Ontario's energy landscape. EPEX identifies opportunities to help other energy sectors. After all, we're all doing the same thing but in different ways -- and that is why the OPI and OGSR Library wanted to bring everyone together.

ENERGY PROSPECTORS EXPO

Each one of you is an important collaborator in this conference and your participation highlights the multidimensionality of our energy sector in Ontario.

The EPEX logo is a tesseract, a four-dimensional shape with 24 faces, chosen to represent the complexities and multiple layers of energy production in Ontario.

EPEX is about more than prospects – it's about exploring.

Join us in the plenary session and let's start generating collaborative energy!

Social Media #epex2019

We're live online. Follow the conference, post pictures and ask questions on twitter using the hashtag:

#epex2019

Let's see your favourite conference photo!



Schedule of Events

Day 1 - Monday, April 29th

Length	Time	Event	Presenters
4 hr	9:00	<i>Glacial Geology Field Trip</i>	Shuo Sun, OGSR Library
4 hr	12:00	Trade Show Booth Setup	Trade Show Exhibitors
4 hr	4:00	Trade Show Opens	Trade Show Exhibitors
		Ontario Petroleum Institute's <i>Welcome to the Industry Reception!</i>	Students, Investment Groups, Industry Exhibitors, Public Welcome!

Day 2 - Tuesday, April 30th

Length	Time	Event	Presenters
60 min	7:35	Breakfast	
	8:00	Trade Show Opens	Trade Show Exhibitors
		Poster Hall Set-up and Opening	Poster Exhibitors
15 min	8:35	Official Conference Opening	Welcoming remarks
40 min	8:50	Plenary	OPI, OGSRL, and Industry present <i>Oil Exploration Live!</i> How to explore and drill for oil in Ontario. MC: Candace Freckelton
60 min	9:30	Morning Networking Break, Poster Contest, Core Display	Trade Show Exhibitors, Student Poster Contestants, Core Display
		BLOCK 1: OIL EXPLORATION AND PRODUCTION	MODERATOR: Candace Freckelton
20 min	10:30	<i>Integrating large subsurface databases in the Michigan Basin for analyses of field redevelopment strategies</i>	Jonathan Garrett, Consumers Energy
20 min	10:50	<i>Recent resurgence in the Devonian Dundee play – Central Michigan Basin</i>	Bill Van Sickel and Collin Gray, West Bay Exploration Co.
20 min	11:10	<i>A 3-D Tour of the Paleozoic Bedrock Geology of Southern Ontario</i>	Terry Carter, Carter Geologic
15 min	11:30	<i>Block 1 Panel Discussion</i>	

95 min	11:45	Networking Lunch and Keynote Speaker	Trade Show Exhibitors, Keynote Speaker
10 min	1:20	Student Poster Awards	Student Poster Exhibitors
		BLOCK 2: ENERGY STORAGE	MODERATOR: Pei Ying Ng
20 min	1:30	<i>Embracing uncertainty in numerical models</i>	Robert Walsh, Geofirma
20 min	1:50	<i>Compressed air energy storage: Learnings from #1 and where the future of the technology lies</i>	Katherine Peretick, NRStor
20 min	2:10	<i>Economic perspective on compressed air energy storage (CAES)</i>	Allan Fogwill, CERl
15 min	2:30	<i>Block 2 Panel Discussion</i>	
30 min	2:45	Intersession Break	Trade Show Exhibitors
		BLOCK 3: ACADEMIC RESEARCH AND OUTLOOK	MODERATOR: Pei Ying Ng
20 min	3:15	<i>Compressed air energy storage</i>	Matthew Davison, Western University
20 min	3:35	<i>The Anthropocene - proposed GSSP in varved sediments from Crawford Lake, Milton, Ontario</i>	Francine McCarthy, Brock University
20 min	3:55	<i>Past, Present, and Future Outlook for Lagasco</i>	Jane Lowrie and Jennifer Nisker, Lagasco
15 min	4:15	<i>Block 3 Panel Discussion</i>	
60 min	4:30	Closing Remarks - Wine and Cheese Start Submit your conference survey to enter the prize draw!	Trade Show Exhibitors
	5:30	Trade Show Closes/Tear-down	
3 hrs	7:00	Brews, Bowling, Business Networking Evening	



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OPI President's Welcome

It is my pleasure to once again welcome all attendees and guests to EPEX 2019: OPI 57th Conference and Trade Show.

Thank you to all who are participating - sponsors, presenters, exhibitors and volunteers – for your continuing support of this very important event that brings the industry together.

My appreciation and thanks to the OPI Conference Committee chaired by Ian Colquhoun for their work in organizing the Conference.

We hope you enjoy EPEX 2019. Thank you for attending.

Dale Holland, President
Ontario Petroleum Institute

Conference Chair's Remarks

The OPI conference is a time for all of us in the oil and gas industry to come together, share newly acquired knowledge and to update each other on our current business activities. The idea of collaboration between the energy sectors is not new since the launch of EPEX in 2018 but it is one that needs nourishing and further exploration in the years to come.

We petroleum geoscientists and engineers see that our industry is on the brink of a rebirth and we talk about this through our conference and while attending other industry trade shows, such as NAPE and PDAC, to encourage companies to come into Ontario and explore for economic oil and gas deposits that we know remain under our feet. Our new OPI booth panels reflect what we believe to be viable and valuable sources of energy to all Ontarians.

Our industry is passing through a new phase of existence where there has been amalgamation of most of the oil and gas assets in Ontario into a single entity. This signals a time to redefine ourselves and encourage outsiders that have the patience and dedication to explore and develop natural resources to join us and provide both the competition and collaboration that is required to reinvigorate our industry. Please join us in the celebration of our industry that provided us work as young professionals, gave us the ability to grow and develop as individuals, and allowed us to come together as friends, colleagues and respectful competitors.

Ian M. Colquhoun, Conference Chair

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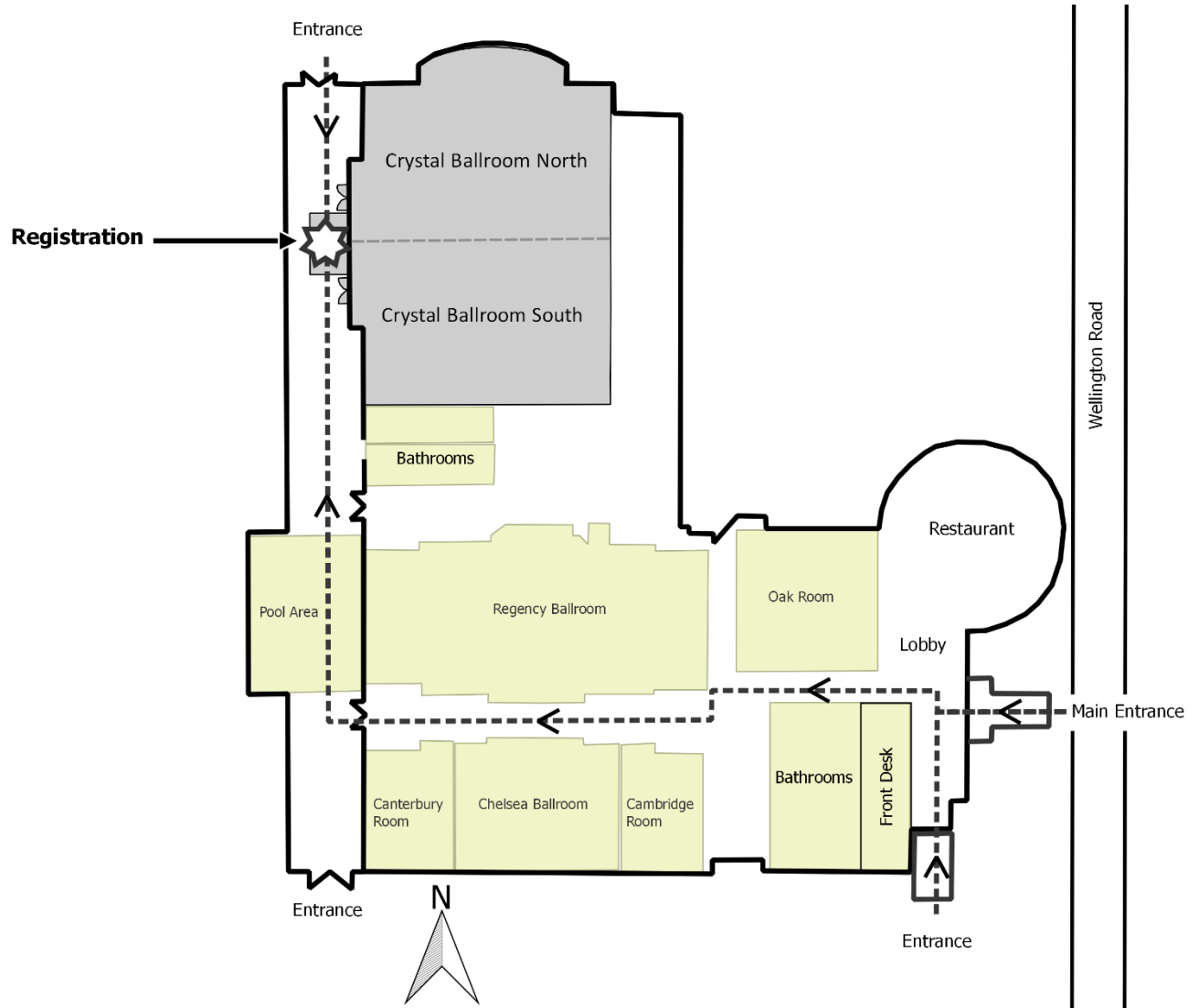
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Venue Map

Best Western Plus Lamplighter Inn & Conference Centre

Crystal Ballroom North – Will host the Trade Show Exhibitors, Networking, Student Poster Exhibitors, and Rock Core Display.

Crystal Ballroom South – Will host the Plenary and Speaker Blocks.



Thank You Sponsors!

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Plenary Summary

EXPLORATION LIVE! Just eighteen years ago Ontario was drilling over 100 petroleum wells per year. Today's drilling levels are down significantly so let's fire up a rig and see what it takes to drill a new Ontario petroleum well in this action-packed plenary session.

Ontario Petroleum Institute (OPI); Oil, Gas and Salt Resources Library (OGSRL); and Industry collaborate again to investigate what it takes to explore and develop petroleum resources and other opportunities in Ontario.

The plenary team has been busy since EPEX 2018 capturing scenes from our current Ontario petroleum industry. We've followed the drilling of one well from start to finish and documented the beginnings of an exciting new prospect.

In this plenary session the team steps through the roles of each organization in encouraging and supporting the exploration and drilling process. Starting with the exploration phase, the OPI examines what it takes to get started, reviews the regulatory regime, and highlights elements of our service industry here to help in the process.

See our mini-documentary on drilling a new well start to finish. What resources were used? How was the prospect developed? This is where OGSRL comes in to help with data.

Our presentation from the industry highlights new collaborations and new prospects and leaves us uplifted and inspired by a live trip to the field on an active drilling rig. Economic energy production could be right beneath our feet – that's why we keep exploring.

Above all the plenary aims to present the resources that we need to explore, produce, innovate and collaborate in Ontario.



Core Display

Presented by:

Shuo Sun – Geological Laboratory Technician; Oil, Gas and Salt Resources Library

Select Cores of Ontario

The following cores will be made available during the core display segment at the first coffee break:

Well Licence	Location (COUNTY-Township-Lot-Concession)	Well Name	Core Number	Box Number	Rock Formation	Significance
T007188	Lambton-Sarnia	MOE Deep Obs. 1	954	58, 67-74, 80-81	Dundee	Hydrocarbons, porosity types and carbonate lithofacies
T006825	Essex-Mersea	Cons et al 33822	910D	3-9	Trenton Group	Hydrothermal dolomitization and porosity types
T003563	HURON-Goderich-2-MC	Domtar Goderich S.T.#1	1072	96, 100, 126, 156-159	Salina	Energy Storage – Potential for compressed air energy storage (CAES) in caverns

The OGSR Library has initiated a catalogue of high-resolution core photographs to help our clients conduct their research remotely and more efficiently. Each core is photographed dry, wet, and under ultraviolet light. Over 13,000 photographs have been taken of approximately 4,350 core boxes.

A small number of photographs for the above cores have been printed in the back of this program.

Student Poster Competition

University and college students were invited to submit posters on themes of Ontario Energy or Geology.

Posters are available for viewing outside of the main speaking area, behind the registration desk. Judging for the competition will take place during the first coffee break at 9:30AM. All conference participants are encouraged to read the posters and welcome the students.

An OGSR Trust Scholarship will be awarded to the author of the top poster and two OGSR Trust Awards of Merit will be awarded to the top runner-up entries.

Congratulations to our 2018 winners:



OGSR Trust Scholarship:

Mailyng Aviles (left): Estimation of Exhumation in the Foredeep Depozone of the Western Canada Foreland Basin Using a Compaction-based Method Approach

OGSR Trust Award of Merit Winners:

Lindsay Debono (center): The Upper Contact Unit (roof rocks) of the Sudbury Igneous Complex, North Range, Sudbury Impact Structure

Matea Drljejan (right): Finding order in chaos: Stratigraphy and sedimentology of the Lower Cretaceous Late Albian Viking and Joli Fou formations

Jon Garrett - Abstract

Integrating Large Subsurface Databases in the Michigan Basin for Analyses of Field Redevelopment Strategies

Jon Garrett, a Geologist at Consumers Energy in Jackson, MI, will present ongoing research related to integrating large subsurface databases (e.g., geological, petrophysical, geophysical, and production data) in order to more effectively evaluate relationships between various data types and formats. Improved accessibility of extensive subsurface data allows for efficient and scalable visualization and analyses. Domain knowledge can then be used to make decisions to enhance existing assets and identify new development opportunities. The presentation will include examples comparing a variety of subsurface data for evaluation of redevelopment strategies pertaining to both gas storage and enhanced oil recovery reservoirs.

Bill Van Sickle and Colin Gray - Abstract

Recent Resurgence in the Devonian Dundee Play – Central Michigan Basin

The Dundee Formation in Michigan has produced nearly 374 Million Barrels of Oil. Of that 374 Million, 134 Million (36%) is attributed to Hydrothermally altered reservoirs. The Dundee Play has seen increased activity in the past several years. Much like the Ordovician Trenton-Black River, recent Dundee success is credited to exploration by 3D seismic. Because the Trenton-Black River and Dundee reservoirs have hydrothermal origins, both share similar reservoir qualities and facies relationships. This consists of a chaotic mix of fractured vugular and matrix porosities resulting in varying degrees of permeability.

Terry R. Carter – Abstract

A 3-D Tour of the Paleozoic Bedrock Geology of Southern Ontario

T.R. Carter¹, F.R. Brunton², J. Clark⁴, L. Fortner⁵, C. Logan³, H.A.J. Russell³, M. Somers⁴, L. Sutherland⁶, K. Yeung²

1 Geological consultant, London, Ontario

2 Ontario Geological Survey (OGS), Ministry of Energy, Northern Development & Mines, Sudbury, Ontario

3 Geological Survey of Canada (GSC), Natural Resources Canada, Ottawa, Ontario

4 Oil, Gas, & Salt Resources Library (OGSRL), London, Ontario

5 Petroleum Operations Section, Ministry of Natural Resources & Forestry, London, Ontario

6 Western Libraries, University of Western Ontario

After three years of development and seven model iterations, the first regional 3-D geological model of the Paleozoic bedrock of southern Ontario is complete. The model encompasses all 110,000 km² of the Western St. Lawrence Lowlands region of southern Ontario, except for Manitoulin Island.

The model is constructed in Leapfrog© Works (Aranz Geo Limited) - an implicit modelling application, with 56 layers representing 70 Paleozoic bedrock formations, the Precambrian basement, and overlying unconsolidated sediments. Layers were constructed using formation depth data from 26,950 petroleum borehole records in the Ontario Petroleum Data System (OPDS), supplemented by hundreds of deep bedrock boreholes compiled by OGS. Formation depth data in the borehole records comprise the primary data input for the 3-D model. Model layers are based on a new lithostratigraphic chart prepared for this project. A new digital bedrock topography surface has also been constructed and is combined with a new digital subcrop geology map that approximate and constrain the subcrop surface of each modelled formation and better align the layers with expert knowledge and mapped geology. Model development was an iterative cycle of interim model construction, expert geological appraisal to identify errors/inconsistencies, followed by QA/QC editing of formation depth data using well records, geophysical logs, drill cuttings and drill core.

This project has generated a robust lithostratigraphic model which is a logical next step in the evolution of regional geological mapping. Practical applications of the model include; hydrogeological modelling of groundwater systems, natural resource extraction (e.g., water, gypsum, salt, gas, oil, aggregate), site selection for nuclear waste disposal, exploitation of geothermal energy, public outreach and education, identification of gaps in data and knowledge, and shortcomings in modeling algorithms. Users must recognize that the model is a data-driven algorithmic representation of the actual bedrock geology subject to future improvement and is not a substitute for detailed geological mapping.

This presentation illustrates how the model can be used to visualize geological features of the bedrock of southern Ontario with a tour of 3D scenes created using free viewer software provided by Leapfrog. Model publication will likely occur in 2019 as simultaneous releases of Open File reports by the GSC and OGS, with subsequent posting on the website of the OGSRL.

Keynote Speaker

Message from the Minister of Natural Resources and Forestry



Hon. John Yakabuski

Our government was elected on a promise to cut red tape, create jobs, and promote economic growth. We recognize the important role the oil and natural gas industry continues to play in driving Ontario's economy.

Since the province's first oil well began production in 1858, approximately 93 million barrels of oil and 1.35 trillion cubic feet of natural gas have been produced in Ontario, almost all of it in the southwestern part of the province. Because of the continuous search for new oil and gas pools, other industries - such as salt solution mining and underground hydrocarbon - now also contribute to our province's economy.

My ministry is committed to helping industry keep pace with changes in the sector. In 2018, the Province amended Ontario Regulation 245/97 under the *Oil, Gas and Salt Resources Act* to include the regulation of compressed air energy in salt caverns. An existing cavern in Goderich is the first in Canada to use new, innovative technology which involves compressing air into a cavern at times of low energy demand, storing it until the demand is higher, and releasing it to power turbines. The Ontario Petroleum Institute's work in promoting the viability of Ontario's hydrocarbon sector is reflected in new, external investors exploring similar opportunities in our province.

We all know that the oil and gas exploration and production sector has experienced challenges and a decline in activity in recent years. We also know that Ontario's petroleum sector is evolving to meet growing energy demands. This is evident in the transition from drilling traditional exploration wells to the use of hydrocarbon storage wells. I am aware of your concerns for the future of the industry. That is why we are committed to continuing to work with your industry representatives to remove unnecessary administrative burdens and improve regulatory processes. It is part of our government's commitment to reduce barriers and ensure Ontario is open for business and open for jobs.

The OPI-MNRF Hydrocarbon Sector Working Group is an excellent example of the benefits we gain from maintaining an open dialogue on these issues. This collaborative approach between industry and government has resulted in improved processes, and this past year there was an increase in industry outreach and information sessions that kept you informed of regulatory efficiencies and key developments.

Robert Walsh - Abstract

Embracing Uncertainty in Numerical Models

Numerical models are tools for quantification of subsurface processes, typically used in order to aid in decision making. This is a difficult undertaking. To understand subsurface processes, we use models: conceptual models, analytical models, and sometimes numerical models. To populate such models we need information, but the subsurface is largely opaque to us, and the available methods of data acquisition are typically difficult and expensive. As a result, we frequently rely on sparse data sets, subject to significant uncertainty. One option to address this uncertainty is to embrace it by developing many versions of the numerical model with different parameter combinations, informed by scientific and engineering knowledge. The model versions are often described as sensitivity cases (in the case of a deterministic sensitivity analysis) or as realizations (in the case of a probabilistic sensitivity analysis). Here we present two examples of sensitivity analyses where the application of uncertainty improved our understanding of the system, and our confidence in the model predicted behaviour.

For the first example, we describe modelling studies assessing the feasibility of increasing the maximum pressure in an underground natural gas storage reservoir. This required an assessment of the potential for pressure and gas propagation in the caprock, and the geomechanical response to pressure change in the storage reservoir and connected secondary storage zones. To assess the impact of some key, but uncertain, model parameters, 35 sensitivity cases with alternate parameter sets were assessed. These sensitivity cases included changes in the mechanical properties of caprock and storage formations, increases in gas mobility in the caprock, and reduced minimum principal stress.

For the second example, we examine the application of probabilistic modeling in the context of radionuclide transport from a deep geological repository. Probabilistic simulations were used to investigate the relative importance of various transport processes and the sensitivity to parameters describing the processes. In this approach, univariate and multivariate statistics are used to determine the significance of individual parameters to a selected performance metric. Transport simulations were conducted for each of several hundred realizations and metrics describing peak uptake of radionuclides at a well were extracted from simulation results. The significance of the independent variables (the sampled geosphere parameters) was assessed in terms of their correlation and contribution to variability in the dependent variables (well-transport peak value and time). This approach allowed us to quantify what parameters were most significant, and identify thresholds for certain parameters, below which their impact became insignificant. This type of information improves our understanding of the system, increases our confidence in the model results, and may help guide future field characterization efforts by identifying the most significant parameters – and the required level of sensitivity in field measurements.

Many of the methods developed in the radioactive waste field are directly applicable to petroleum engineering problems in southern Ontario, including delta pressure modeling, compressed air energy storage development, and potentially wellbore integrity. The probabilistic nature of these analyses could allow them to be seamlessly integrated into risk assessment frameworks currently employed by the industry.

Katherine Peretick – Abstract

Compressed Air Energy Storage: Learnings from #1 and Where the Future of the Technology Lies

NRStor is developing the world's first commercial fuel-free compressed air energy storage (CAES) facility on a salt cavern in Goderich, ON. The project is in the process of commissioning, and once running will provide the Ontario Independent Electricity System Operator (IESO) with energy storage services to help balance the electrical grid. Built on a solution-mined salt cavern, the facility will be able to provide 1.75 MW of power for a 4 hour duration during peak usage hours, and will be able to withdraw 2 MW of power during low system usage hours. The first-of-a-kind nature of the project has resulted in regulatory changes, academic advances, and other significant learnings for future CAES projects.

Allan Fogwill – Abstract

Economic Perspective on Compressed Air Energy Storage (CAES)

CAES is an electricity storage technology that can be used to manage the variability in output of wind and solar PV energy systems to ensure their adaptation will not adversely impact electricity system reliability. Availability of suitable geology across the country makes CAES an attractive electricity storage technology for Canadian provinces.

Ontario has a large fleet of wind and solar PV generation in Canada. Specifically, South Western Ontario has an advantage to create CAES projects, as many wind farms are located closely to suitable geologic formations that could be used to store energy underground.

CERI's research will present the economic and environmental impacts of CAES technology in comparison with other power generation options, in terms of levelized cost of electricity (LCOE) and Carbon Emissions Intensity; show a comparison between Ontario and other Canadian provinces; and highlight associated benefits and challenges.

Matt Davison – Abstract

The Outlook for Compressed Air Energy Storage of Electricity in SW Ontario

Authors: Matt Davison, Rupp Carriveau

Wind turbines allow the generation of energy from a clean, free, and renewable source, the wind. In Ontario, a low carbon electricity economy has been developed which relies primarily on wind power and nuclear power, eliminating the need for dirty coal fired power production. However, the wind does not always blow, and nuclear plants must run on a nearly all or nothing basis. This is a challenge for the economics of the power market. Energy storage represents a helpful way to cope with these challenges. A promising way to store electrical energy is via Compressed Air Energy Storage (CAES, essentially a gas turbine with the compression phase separated in both space and time from the combustion phase, and with the compression being done via an electrical pump). CAES requires an appropriate geological container which abound in SW Ontario as Devonian reefs. The additional availability of other infrastructure makes CAES a potentially economically viable strategy to solve Ontario power market problems. My talk will provide a high level introduction to CAES and its outlook in our region.

*Francine McCarthy- Abstract***The Anthropocene – Proposed GSSP in Varved Sediments from Crawford Lake, Milton, Ontario**

Since the pollen of corn and other cultivars was identified in sediments from the middle of the last millennium, many studies have been conducted on in Crawford Lake. Varved sediments in the deep dolostone basin of this small lake near the edge of the Niagara Escarpment in Milton, Ontario provide annual resolution through the last millennium, dating Iroquoian agricultural settlement between 1268 and 1486 CE and EuroCanadian land clearing beginning ~1822 CE. Organic-walled microfossils are exceptionally preserved in the anoxic bottom waters that inhibit bioturbation, and dinoflagellates germinated from cysts in varves dating to the early 1820s – the oldest record of viable cysts in the world. The varved record of Crawford Lake is one of nine locations being investigated as GSSP candidates for the Anthropocene Series, with a proposed base at AD 1950 (the “bomb spike”).

In addition to annual resolution, other attractive features of the Crawford Lake section include its easily accessible location and protection by Conservation Halton since the first archeological investigation discovered artifacts and evidence of longhouses. The reconstructed Iroquoian village is a popular attraction for school children and the general public. The site offers a perfect opportunity to inform people about the geologic time scale and the conventions regulating the erection of formal intervals of geologic time. It is hoped that interest in the Anthropocene, keenly debated among the geoscience and broader community, will draw attention to geoheritage and its value in the broader societal context, particularly in clearly distinguishing between diachronous anthropogenic impact and the proposed boundary between the Holocene and Anthropocene Series.

Jane Lowrie and Jennifer Nisker – Abstract

Lagasco Inc. – Looking Towards the Future

Lagasco Inc. is a London, Ontario based Exploration and Development oil and gas company, producing more than 500 bopd and 10Mmcf/d from over 1000 wells in southwestern Ontario. As of this year, Lagasco purchased a substantial amount of Dundee's oil and gas assets. Moving forward after the merge and looking into the future, Lagasco revisits their strategies and goals as the leader of the petroleum industry in Ontario.

Exhibitor Biographies

Baker Hughes

Baker Hughes, a GE company is the world's first and only fullstream provider of integrated oilfield products, services and digital solutions. Drawing on a storied heritage of invention, BHGE harnesses the passion and experience of its people to enhance productivity across the oil and gas value chain. BHGE helps its customers acquire, transport and refine hydrocarbons more efficiently, productively and safely, with a smaller environmental footprint and at lower cost per barrel. Backed by the digital industrial strength of GE, the company deploys minds, machines and the cloud to break down silos and reduce waste and risk, applying breakthroughs from other industries to advance its own. With operations in over 120 countries, the company's global scale, local know-how and commitment to service infuse over a century of experience with the spirit of a startup – inventing smarter ways to bring energy to the world.

BHGE has been in operation locally supporting the Ontario oil and gas Industry for over 30 years, providing a wide range of services supporting both the upstream and downstream sectors of the Ontario industry.

The BHGE wireline services group provides a complete suite of downhole electric wireline logging services for every well environment, including cased-hole advanced formation evaluation, production and reservoir engineering and petrophysical and geophysical data-acquisition services. BHGE is the major provider of casing inspection services for the vast bulk of underground storage wells present in Ontario with continuous enhancement in service delivery over the years. The local crew has over an average of 25yrs of individual experience with proven service and safety records.

BHGE defines ***"Generating Collaborative Energy"*** as having a sense of joint ownership of our client's operational challenges by deploying our subject matter experts to work with clients to evaluate their needs and then engineer solutions from our wide range of innovative technologies to match each application.

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- Cam Lock, and Bauer



Oil, Gas and Salt Resources Library

The management of Ontario petroleum well data by the Oil, Gas and Salt Resources (OGSR) Library is now in its 21st year and represents a rare case of an industry-funded petroleum data centre. Collection of oil well data in the Province occurred shortly after the first hand-dug well of 1858. Government management of public petroleum well data was handed over to the industry to be maintained in trust in 1998.

The OGSR Library has prioritized the digitization and modernization of the data catalogue to provide maximum value to industry. In response to these initiatives, industry and government partners have engaged with the Library on more complex and innovative projects that would not have been possible otherwise. The Library has also engaged with data users outside of the traditional petroleum industry by highlighting the applicability of petroleum data to Universities, environmental consultants, and groundwater researchers, evolving the Library into a geoscience research centre.



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Oil Museum of Canada

The Oil Museum of Canada is a designated National Historic Site, situated on the world's first commercial oil field. Located in Ontario's first designated Industrial Heritage District, and designated under the Ontario Heritage Act, the museum preserves and interprets the important history of Lambton's contributions to the worldwide oil industry. The ten-acre site features four historic buildings with reconstructed spring-pole and three-pole derricks dominating the property. A series of jerker lines, pumping stations, storage tanks and oil wagons combine with the material in the museum collection to bring the fascinating story of the oil industry to life. The main exhibition centre, constructed in 1960, houses over 9,000 artifacts that interpret the international influence of Lambton's proud oil heritage.

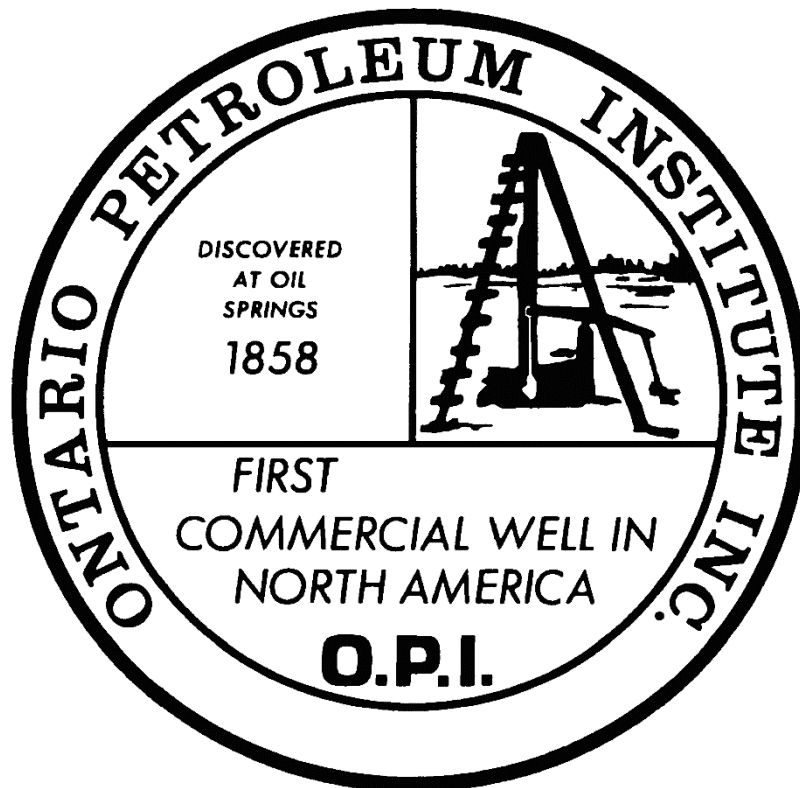


Ontario Petroleum Institute

The OPI is a non-profit industry association that represents the oil and natural gas exploration and production, hydrocarbon storage and salt solution-mining industries of Ontario.

Generating collaborative energy recognizes the value of the various source of energy produced in the province. Oil and natural gas is an important source of the province's energy supply, safely and sustainably produced by industry to meet consumer needs, and contribute to the economic prosperity of Ontario communities.

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Pinchin Ltd.

Pinchin Ltd. is one of Canada's largest environmental engineering, health and safety consulting firms. Pinchin employs over 900 fully trained expert staff with proven methods and quality standards in 40 offices across the country. Established in 1981 by Dr. Don Pinchin to provide consulting services to the asbestos abatement industry, the company now provides services in:

- Building Science & Sustainability,
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- Environmental Monitoring and Compliance,
- Geotechnical,
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- Training in all aspects of these fields.

Most of Pinchin's clientele are based on deep-rooted relationships with a concrete foundation in trust and understanding. We understand the nature and urgency of transactions and client needs. Canadian businesses and their financial institutions rely on Pinchin to identify conditions that may result in unacceptable risk. We continue to be an active partner in our industry and community. We have staff that sit on boards and committees across Canada to represent our clients and help shape policy and legislation that has a direct impact on your business and bottom line.

We go the extra step to find custom solutions that work for your legal obligations and your business priorities because sometimes, complying with legislation is not enough. Pinchin holds hundreds of seminars and courses annually across Canada that provide the knowledge and understanding to help our clients feel confident in the decisions they may need to make.



For more information or to contact your local Pinchin office please visit www.pinchin.com

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Established in 1962, Stream-Flo Industries Ltd. is a worldwide manufacturer and supplier of wellhead and Christmas tree equipment, gate valves, actuators and check valves. Stream-Flo is a family owned Canadian company and has been working with the underground gas storage stakeholders in the Ontario region for over 10 years, developing long term partnerships and providing automated valve systems that ensure fail-safe operation of wellhead shut in equipment.

Stream-Flo Ltd.

8726 Fallbrook Drive

Houston, TX

77064

Tel: (832)647 0710



Wellmaster Pipe and Supply Inc.

P.O. Box 456, 1494 Bell Mill Road
Tillsonburg, Ontario
Canada N4G 4J1

Phone: 519-688-0500
Toll Free: 1-800-387-9355

wells@wellmaster.ca

www.wellmaster.ca

Wellmaster Pipe & Supply Inc. and its predecessors have served the North American energy and drilling sector with on-time delivery of high-quality products and services since 1949. Wellmaster specializes in API grade coupling

- ✓ API casing, thread and couple end finishing
- ✓ Reamed and drifted couplings
- ✓ Adapter couplings
- ✓ Weld rings
- ✓ Drive shoes
- ✓ line pipe couplings

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Key to Wellmaster's success has been strategic investments in technology and innovation. Wellmaster has been a member of the Innovators Alliance for more than 15 years. Over last 3 years around 4 million invested in new technology, process and equipment.

Wellmaster currently has 16 lathes with plans to add additional production lathe capacity in 2019/20.

Wellmaster has earned multiple awards as an elite supplier by its customers and been recognized twice by the Tillsonburg Chamber of Commerce for excellence in industrial achievement.

The Wellmaster team is looking forward to seeing our long-term clients at EPEX 2019 and showing new clients our commitment to **"Make a Difference"** in their operations.



Sponsor Details

Company Name	Sponsor Level	Contact & Information
Oil, Gas and Salt Resources Library 	Platinum	669 Exeter Road London, Ontario, Canada N6E 1L3 Telephone: (519) 686-2772 Email: info@ogsrlibrary.com The OGSR Library is a not for profit geoscience research centre specializing in the subsurface geology of Ontario, focused on data associated with wells drilled under the Oil, Gas and Salt Resources Act. We offer geological, data management, GIS and media services to both members and non-members.
Baker Hughes 	Gold	Name: Laniya Oladapo Position: Resource Manager Office Address: 796 Ontario Street, Sarnia, ON N7T 1M7 Canada Phone: 519 332 8030 Cell: 519 312 9657 Email: dapo.laniya@bhge.com
Harold Marcus Limited 	Gold	Phone: 519-695-3734 Email: dmarcus@haroldmarcus.com Website: www.denmarbrines.com Business address: 15124 Longwoods Road, RR3, Bothwell, ON N0P 1C0 Den-Mar Brines Limited is an excellent source for quality, cost-effective material for dust control, road stabilization, anti-icing and de-icing agents. As members of the AORS and OGRA, Den-Mar dedicates itself to customer satisfaction from our product quality to delivery.
Lagasco Inc. 	Gold	1030 Adelaide St. S., Unit B London, Ontario N6E 1R6 519-433-7710
American Refining Group 	Silver	77N. Kendall Ave. Bradford, PA 16701 Tel: (814)-368-1263
Dale Holland, Holland Testers 	Silver	22240 Wheatley Road. RR3 Wheatley, ON NOP 2P0 519-825-3680 Holland Testers Ltd. and Wheatley Wireline Services is located in Wheatley, Ontario and was established in 1988. We pride ourselves on exceptional service. We offer a variety of oil and gas well services, such as drill stem and production testing, service and production tools, inflatable packers, annulus casing packers, stage tools and drill bits.
Weatherford Canada Ltd. 	Silver	Dave Tipping Operations Manager Weatherford 25351 Kent Bridge Road Dresden Ontario N0P-1M0 Main: +1.519.683.2010 Fax: +1.519.683.2577 Mobile: +1.519.436.3541 dave.tipping@ca.weatherford.com www.weatherford.com

Elexco Land Services Ltd.

Silver

Suite #101 – 557 Southdale Road E
 London, Ontario,
 Canada N6E 1A2
 Name: Niki Clarke
 Email: nclarke@elexco.ca
 Tel: 519-686-0470
 Toll Free: 800-603-5263 (Land)
 Fax: 519-686-9088



Elexco is a full-service land company providing land consulting and land administration services for the renewable energy, oil and gas, utility and telecommunication industries in North America. Services include land acquisitions, land negotiations, right of way, oil and gas leasing, easements, title curative, land registration, GIS services, customized mapping and seismic permitting.

West Bay Exploration

Silver

West Bay Exploration Company
 231.946.0200
 mae@wbeco.net
 www.westbayexploration.com
 13685 S. West Bay Shore Dr
 Traverse City, MI 49684



235497 Ont. Inc., Oil & Gas
 Energy (Ed Welychka)

Bronze

Field Office, Attn Ed Welychka
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 London Ontario
 N6K 1E2
 EDW@Allenergyex.com
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Jim McIntosh Petroleum
 Engineering Ltd.

Bronze

Jim McIntosh
 Phone: (519) 878-1006
 e-mail: jim.mcintosh.p.eng@sympatico.ca
 Address: 479 Grandview Av, London, ON, N6K 2T4

Jim McIntosh Petroleum Engineering provides full-service engineering services to the upstream oil and gas business primarily in SW Ontario. Services include drilling program design, implementation, and supervision, completion design and supervision, production facility design, equipment procurement, installation, and operational assistance, reservoir engineering including reserve report generation, secondary recovery design and approvals, and well abandonment design and supervision.

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 N4G 4J1



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<http://www.ogsrlibrary.com/catalogue>

Presentations from EPEX 2018 are available on the OGSR Library YouTube channel:

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Acknowledgements

Conference Chair:

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Rhys Paterson

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Matt Dupont (video)

Ben Somers (audio)

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Candace Freckelton

Pei Ying Ng

Keynote Speaker:

Hon. John Yakabuski

Welcoming Messages:

Dale Holland (OPI President)

Ian Colquhoun (Conference Chair)

Poster Judges:

Laurent de Verteuil

Mark Emery

Student Liaisons:

Hanna Rzyszcak (Western)

Special Thanks

Shuo Sun (Core display & Glacial geology field trip)

Maia Somers (Core display assistant)

Craig Irwin (Glacial geology field trip & program)

Liz Sutherland (Western promotion)

Jug Manocha (Block 2 questions)

Micki Beam (Registration assistance)

Networking Event Host and Catering:

Palasad South, London

Conference Survey and Feedback

What did you think of EPEX 2019?

Please take time to complete the survey enclosed in this program. Your feedback is much appreciated and incredibly valuable in helping us to deliver a better conference for you next year.

Return your completed survey to the registration desk.

See you in 2020!

Core Photos

The OGSR Library catalogues 1,185 rock cores from 1,000 different Paleozoic wells from all parts of Ontario, including several from the far north basins. The OGSR Library rock core and rock chip (~13,000 locations) catalogue represents Ontario's most significant and comprehensive resource for Paleozoic rock research and direct access to deep Paleozoic bedrocks.

These cores are accessible to anyone for research purposes. A selection of cores was prepared by OGSR Library for EPEX to create an immersive hands-on experience with the geology and demonstrate cores can be found for just about any research purpose. The cores listed below have been matched to the relevant EPEX Blocks and sample photos can be found on the pages that follow.

Block 1 – Oil Exploration and Production

Photo 1: Well Licence T007188, Core 954, Box 58, Top Depth 162 meters, Dry

Photo 2: Well Licence T007188, Core 954, Box 58, Top Depth 162 meters, Wet

Photo 3: Well Licence T007188, Core 954, Box 58, Top Depth 162 meters, UVF

Significance: Oil staining at top of Dundee fm.

Block 2 – Energy Storage / Block 3 – Academic Research and Outlook

Photo 4: Well Licence T003563, Core 1072, Box 96, Top Depth 331.32 meters, Dry

Significance: Salt mining, salt solution mining, cavern storage and compressed air energy storage

Well Licence:
T007188
Well Name:
MOE Deep Obs. 1
Well Location:
LAMBTON Sarnia 12 - R4
Core Number:
954
Top Depth:
41.20 m
Bottom Depth:
303.00 m



Box Number:
0068
Top Depth (m):
0160.20
Total Number of Boxes:
0150
Bottom Depth (m):
0162.00




Well Licence: **T007188**
Well Name: **MOE Deep Obs. 1**
Well Location: **LAMBTON Sarnia 12 - R4**
Core Number: **954**
Top Depth: **41.20 m**
Bottom Depth: **303.00 m**



Box Number: **0068**
Top Depth (m): **0160.20**
Total Number of Boxes: **0150**
Bottom Depth (m): **0162.00**



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Well Licence: **T007188**
Well Name: **MOE Deep Obs. 1**
Well Location: **LAMBTON Sarnia 12 - R4**
Core Number: **954**
Top Depth: **41.20 m**
Bottom Depth: **303.00 m**

Box Number: **0068**
Top Depth (m): **0160.20**
Total Number of Boxes: **0150**
Bottom Depth (m): **0162.00**



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Well Licence:
T003563

Well Name:
DOMTAR GODERICH S.T.#1

Well Location:
HURON Goderich 2 - MC

Core Number:
1072

Top Depth:
87.17 m

Bottom Depth:
498.96 m



Box Number:

0096

Total Number of Boxes:


0159

Top Depth (m):

0331.32

Bottom Depth (m):

0334.37


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Glacial Geology Field Trip

Presented by Shuo Sun & Craig Irwin



Medway Creek – Glacial Till (top)

The Coves – Oxbow Lake (bottom left)

Whisperwood Park – Moraine (bottom right)

Glacial Geology Field Trip in London, Ontario

Monday April 29th from 9am - 1pm

Field Trip Guide(s):

Shuo Sun, PhD – Geological Laboratory Technician, OGSR Library

Shuo Sun is now working as the Geological Laboratory Technician at the Oil, Gas and Salt Resources Library, London, Ontario. He is now working on geologic projects of the Silurian-Devonian carbonate sedimentation in southern Ontario. Shuo obtained his BSc and MSc in at the China University of Geosciences, Beijing and his PhD at University of Western Ontario.

Craig Irwin, MSc – GIS & Database Clerk, OGSR Library

Craig has been with the OGSR Library since 2018, most recently as GIS & Database Clerk. Craig uses geologic data and GIS to complete large scale, long-term projects at the Library by creating, maintaining and interpreting geologic databases. Craig completed a MSc in Physical Geography and BSc Specialization in Environmental Science at Western University. He has a keen interest in studying the Earth's biotic and abiotic processes, specializing in aquatic environments.

Trip Itinerary

Begin - Best Western Plus Lamplight Inn & Conference Centre (696 Wellington Rd)

1st Destination – The Coves & Thames River

2nd Destination – Medway Creek

3rd Destination – Sifton Bog

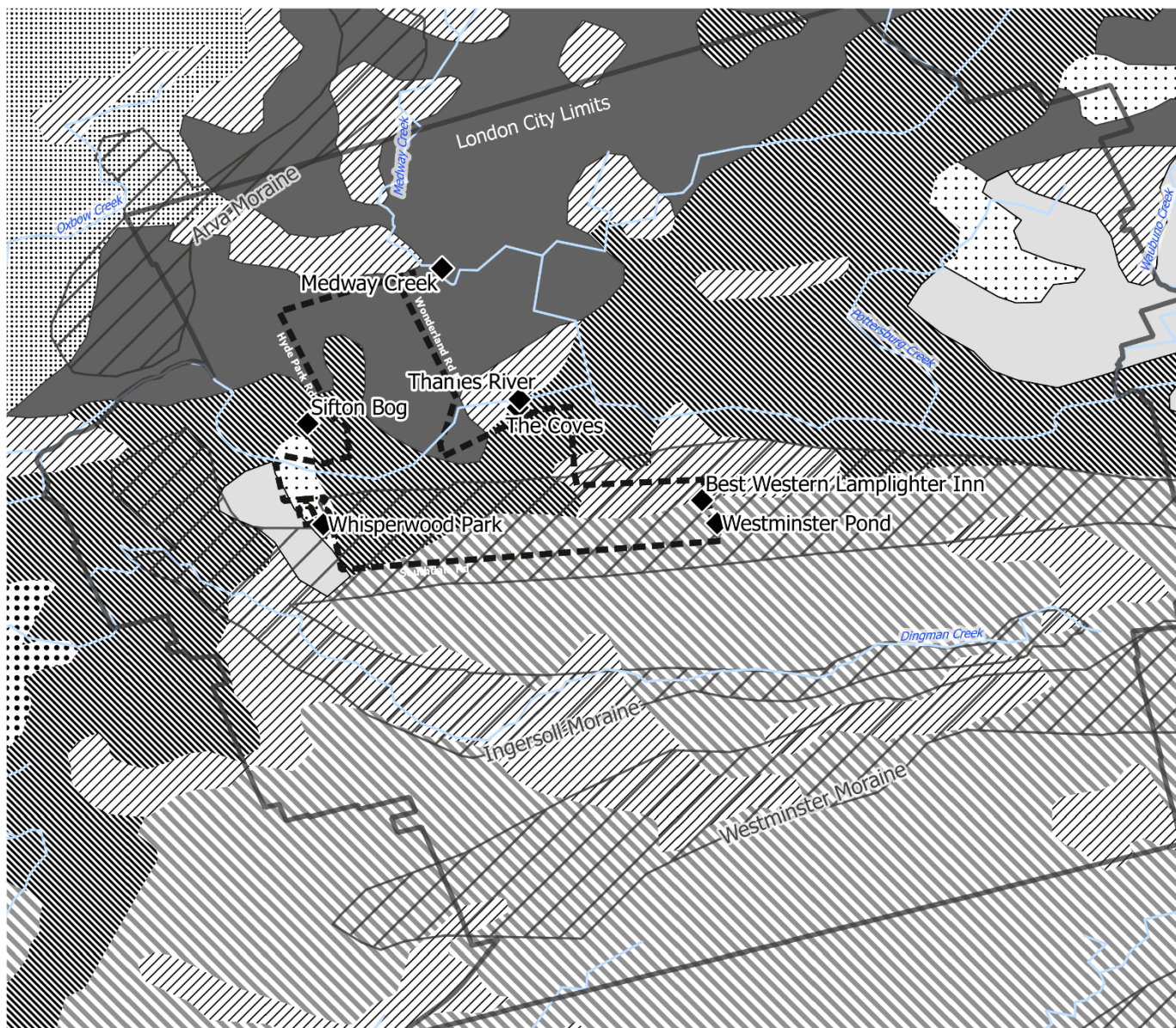
4th Destination – Whisperwood Park

5th Destination – Westminster Ponds

End - Best Western Plus Lamplight Inn & Conference Centre

Description:

Explore the features left behind in London, ON from the Wisconsin Glaciation 10,000 – 15,000 years ago. Glacial processes shaped the Thames River watershed's current physiography during the Wisconsin glacier, leaving behind ridges, glacial till and kettle ponds. Material, in the form of stones, gravel, sand and clay, were deposited as the glacier retreated. The accumulation of these materials created moraines. Three major moraines surround London, the Arva moraine in the north, and the Ingersoll and Westminster moraines running through the southern portion of the city. This guided tour presents an exciting opportunity learn about the geology and geomorphology of London!



**Glacial Geology Field Trip
 EPEX 2019**

Legend

- ◆ Field Trip Stops
- - - Trip Route
- ▨ Moraines

Geology

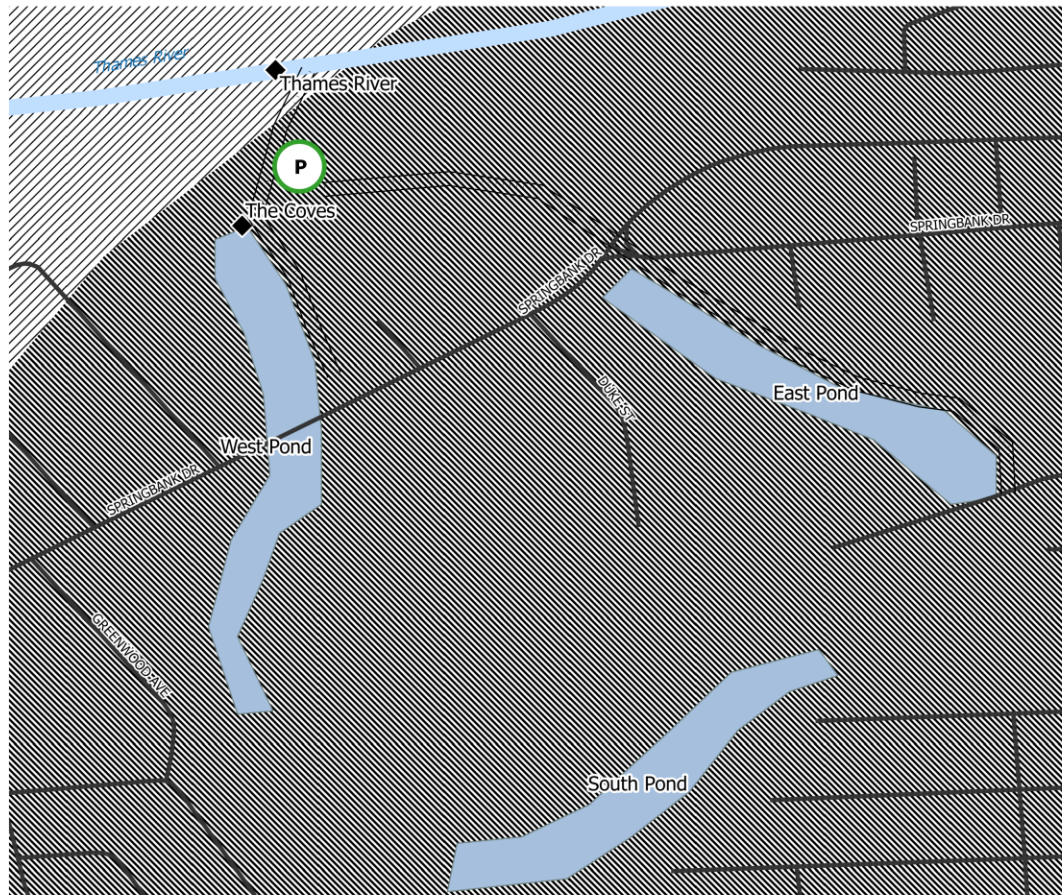
- Catfish Creek Till
- Fluvial deposits
- Glaciofluvial ice-contact deposits
- ▨▨▨ Glaciofluvial outwash deposits
- ▨▨▨▨ Glaciolacustrine deposits
- ▬ Organic deposits
- ▨▨▨▨▨ Port Stanley Till
- Rannoch Till
- ▬▬▬ Tavistock Till

Location Map



1st Destination: The Coves and Thames River

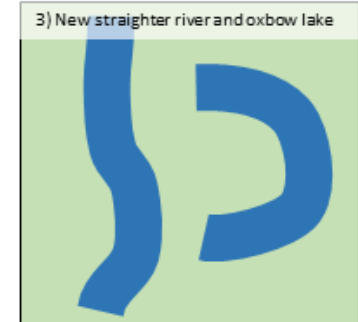
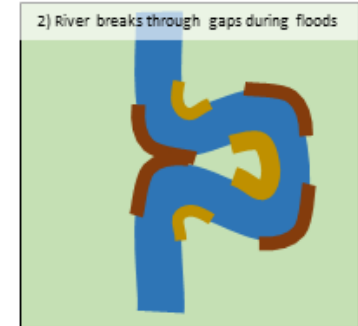
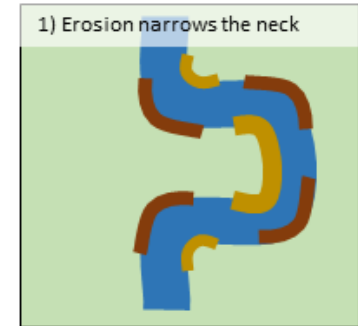
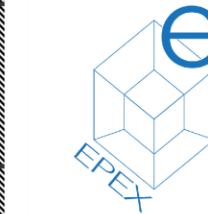
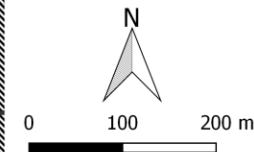
The Coves are a set of three oxbow lakes that used to be connected to the Thames River. As the Thames River meandered and eroded, a new main channel formed because water flow follows the path of least resistance. The abandoned channels gradually became disconnected over time and are now termed West Pond, East Pond and South Pond. The tour will showcase the West Pond and Thames River.



The Coves - London, ON

Legend

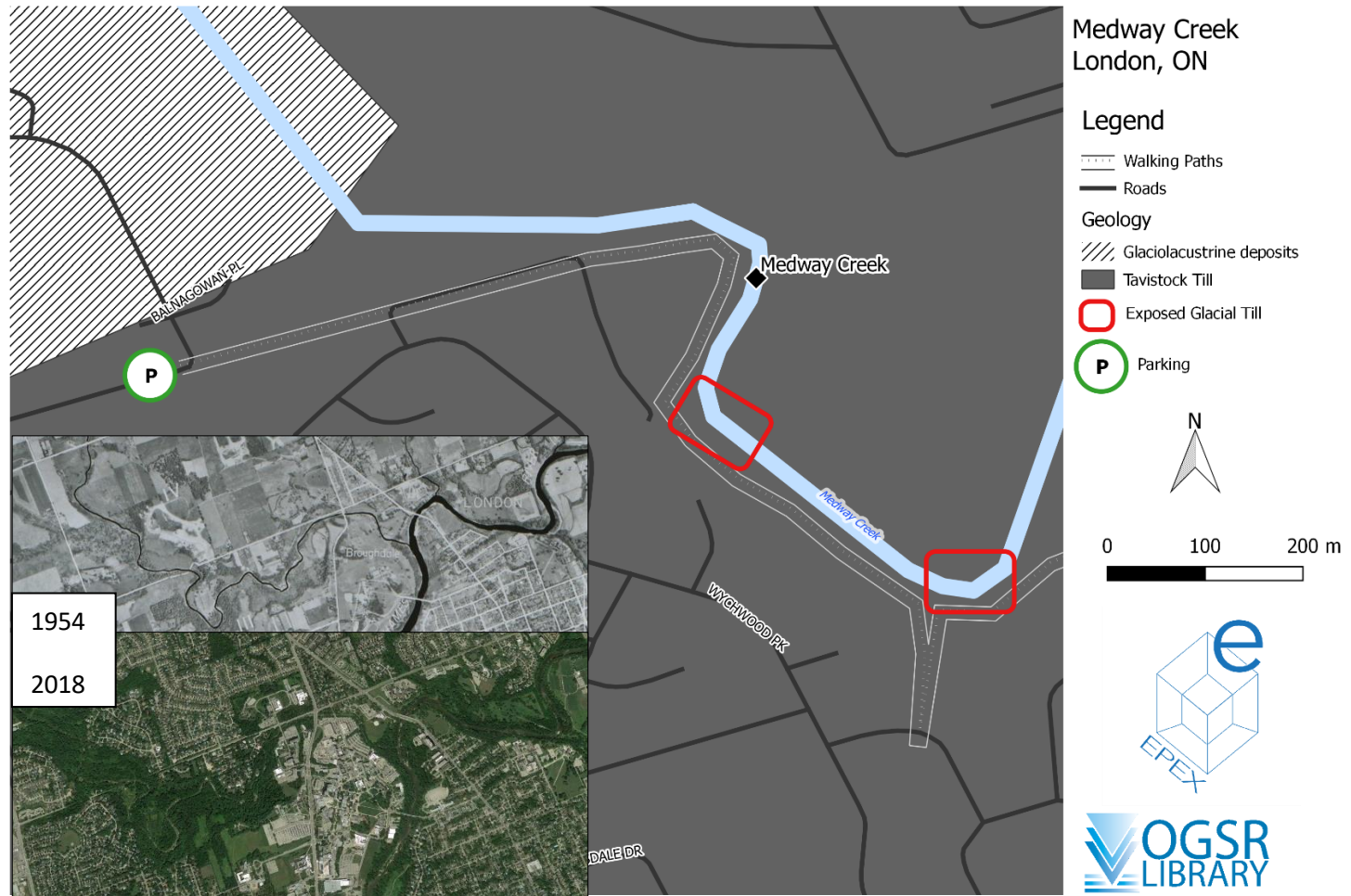
- Walking Paths
- Roads
- Water Features
- Geology**
- Glaciofluvial outwash deposits
- Glaciolacustrine deposits
- Parking



- Erosional area
- Depositional area

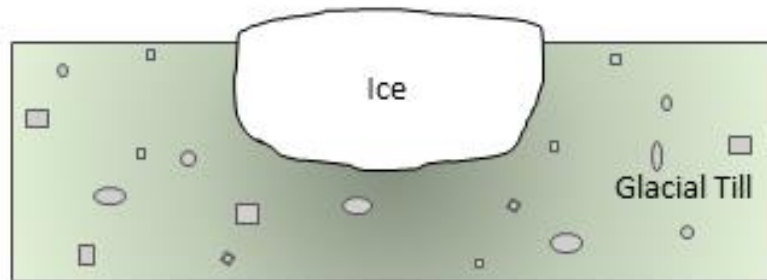
2nd Destination: Medway Creek

Medway Creek is an alluvial, meandering single channel river with broad well-developed floodplains. Bedrock is composed of glacial till (fine clay with a gravel matrix) which was left behind after the Wisconsin glacier. At its outlet, Medway Creek joins the Thames River which can be seen on the Western University campus. Urbanization in London has influenced the flow regime of the river, with increased high flow events contributing to accelerated erosion.

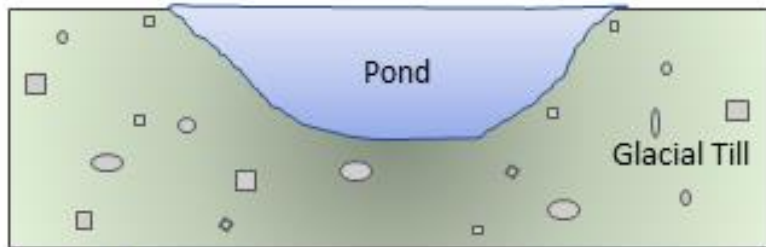


Formation of Kettle Ponds and Bogs

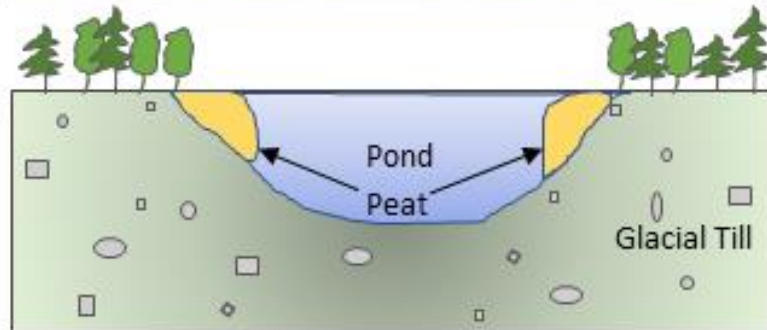
1) Stranded ice block



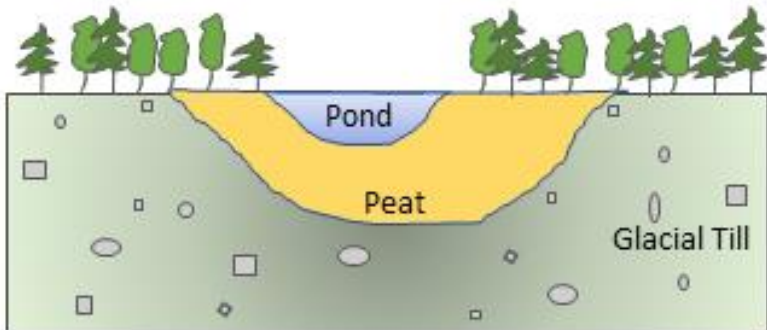
2) Kettle pond (Westminster Ponds)



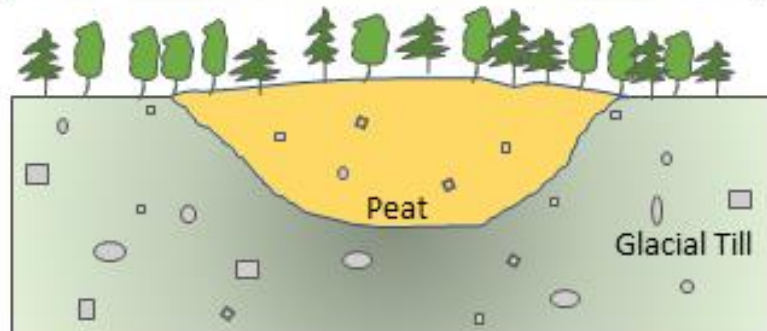
3) Plant colonization begins



4) Mid-life of a bog (Sifton Bog)

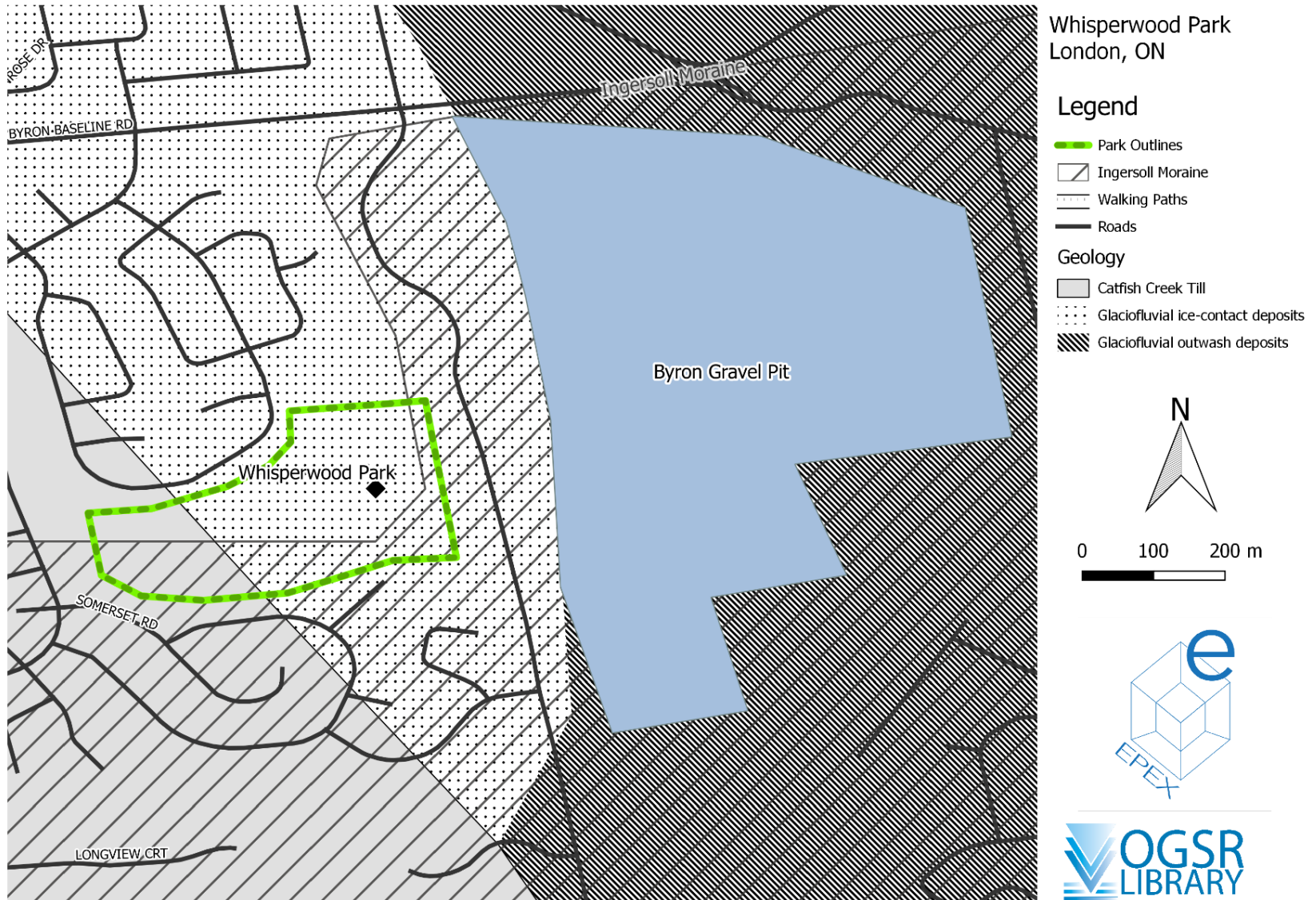


5) Raised bog



4th Destination: Whisperwood Park

The Ingersoll Moraine runs east-west through London and represents the northern extent of the Lake Erie ice lobe. The Byron Gravel Pit, which is still operational, mines gravel and stone from the moraine for commercial uses. The edge of the Ingersoll moraine can be seen to the east and south from Whisperwood Park.



5th Destination: Westminster Ponds

The Westminster Ponds are located south of the Ingersoll Moraine and north of the Westminster moraine in southeast London. These kettle ponds are permanent depressions left behind in the glacial sediment from blocks of ice melting during the Wisconsin glaciation period. The ponds are fed by surface runoff and are not naturally connected by a stream, resulting in water slowly draining between them through bog and wetland area.



