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International Association for Great Lakes Research

59th ANNUAL CONFERENCE ON GREAT LAKES RESEARCH

University of Guelph June 6-10

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59th Annual Conference on Great Lakes Research



June 6–10, 2016 University of Guelph

#iaglr2016

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Cover design and conference logo by Jenifer Thomas

Message board and Jobs/Career Boards will be conveniently located at the registration area in Rozanski Hall. Make sure to post/check for job and career notices!

Rozanski 109 is available as a work space, a place for small group meetings and workshops. Please check the schedule on the door.

> Use the conference hashtag #iaglr2016



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EXHIBITORS

Welcome Conference Exhibitors!

Exhibits are open daily in the Rozanski Hall Concourse.

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AML Oceanographic

2071 Malaview Avenue Sidney, BC V8L 5X6 amloceanographic.com

Aquatic Informatics Inc.

2400-1111 West Georgia Street Vancouver, BC V6E 4M3 aquaticinformatics.com

Canadian Centre for DNA Barcoding 50 Stone Road East

Guelph, ON N1G 2W1

Clearpath Robotics

1425 Strasburg Road, Suite 2A Kitchener, ON N2R 1H2 *clearpathrobotics.com*

Elsevier

Radarweg 29 1043 NX Amsterdam Netherlands *elsevier.com*

Environmental Analytical Systems

286 Mask Island Drive Barry's Bay, ON K0J 1B0 enviro-analytical.com Fluid Imaging Technologies 200 Enterprise Drive Scarborough, ME 04074 *fluidimaging.com*

Great Lakes Fishery Commission 2100 Commonwealth Bouldevard, Suite 100 Ann Arbor, MI 48105 *glfc.org*

Great Lakes Observing System 229 Nickels Arcade Ann Arbor, MI 48104 *glos.us*

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seagrant.noaa.gov

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International Joint Commission, Great Lakes Regional Office

100 Ouellette Avenue, 8th Floor Windsor, ON N9A 6T3 *ijc.org*

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Shedd Aquarium

1200 South Lake Shore Drive Chicago, IL 60605 *sheddaquarium.org* U.S. Department of Commerce, NOAA Great Lakes Environmental Research Laboratory 4840 South State Road Ann Arbor, MI 48108 glerl.noaa.gov

U.S. Geological Survey, Great Lakes Science Center 1451 Green Road Ann Arbor, MI 48105 glsc.usgs.gov



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We extend our deepest appreciation to our sustaining members. Their annual contributions over the years provide a valuable source of support for IAGLR. We invite your organization to join their ranks in supporting Great Lakes research. Our current sustaining members include:

Great Lakes Fishery Commission Ann Arbor, MI *Since 1979*

Great Lakes Protection Fund Evanston, IL *Since 1992*

JOIN IAGLR

If you're interested in supporting the scientific community in the exploration, discussion, and resolution of Great Lakes issues, consider joining IAGLR. Individual or sustaining memberships are available. Further information may be found on our website, iaglr.org.

IAGLR members receive the following benefits:

- Online and print subscription to the Journal of Great Lakes Research
- Annual Conference on Great Lakes Research registration discount
- LAGLR Notes, an e-mail news service
- Access to our private LAGLR Membership Directory
- Job Board to advertise or explore employment opportunities
- Recognition through prestigious IAGLR awards
- Free Contents Direct email alerting service. Additional discounts available from Elsevier
- Eligibility for election to serve on the IAGLR Board of Directors
- Access to and/or volunteer for IAGLR's *Expert Directory*
- Opportunities to work on IAGLR committees
- Networking resources
- Post news of interest on our website
- Reduced fees, with full benefits, for students, retirees, and young professionals!
- And much more...

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Conference Program Chairs Paul Sibley, University of Guelph

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IAGLR Assistant Conference Coordinator Christine Manninen

IAGLR Business Manager Wendy Foster

IAGLR Communications Director Paula McIntyre

Student Judging Coordinator Theresa Qualls, NEW Water, Green Bay Metropolitan Sewerage District

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glos.us/challenge

SPECIAL EVENTS

Welcome Reception Monday, June 6 6–9 p.m. Science Complex Atrium

Welcome and Plenary featuring Alfred Wüest

Tuesday, June 7 11:10 a.m.–12:20 p.m. Rozanski Hall, Room 104

Poster Social

Tuesday, June 7 6–8:30 p.m. Science Complex Atrium

Business Lunch Wednesday, June 8 12:20–1:40 p.m. Creelman Hall

Barbecue Wednesday, June 8 6–9 p.m. Creelman Hall

Grad Student Mixer

Wednesday, June 8 8:30 p.m.–? Science Complex Atrium

Plenary featuring William Dennison Thursday, June 9 11:10 a.m.–12:20 p.m. Rozanski Hall, Room 104

Editors' Reception Thursday, June 9

5–6 p.m. University Club Board Room, University Centre 5th floor

Banquet & Awards Ceremony

Thursday, June 9, 6–9 p.m. Creelman Hall

IAGLR Awards

IAGLR Lifetime Achievement Award for important and continued contributions to Great Lakes research

John R. Vallentyne Award for outreach and education

Anderson-Everett Award for outstanding contributions to the Association

Chandler-Misener Award for outstanding article in the Journal of Great Lake Research

Editor's Award

Elsevier Best Reviewer Award for the Journal of Great Lakes Research

Elsevier Young Scientist Award

Elsevier Young Student Award

IAGLR-HydroLab Best Student Paper - 2015

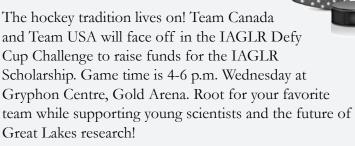
IAGLR-HydroLab Best Student Poster - 2015

IAGLR Appreciation Awards

IAGLR Scholarships

IAGLR-OMNR Student Travel Award IAGLR Scholarship Norman S. Baldwin Fishery Science Scholarship David M. Dolan Scholarship Paul W. Rodgers Scholarship

IAGLR Defy Cup Challenge



OVERVIEW OF CONFERENCE ACTIVITIES

MONDAY, June 6

8:30 a.m.–4:30 p.m. IAGLR Board Meeting University Club Board Room, University Centre, 5th Floor

4–8 p.m. **Registration** Science Complex Atrium

6–9 p.m. Welcome Reception Science Complex Atrium

TUESDAY, June 7

7:30 a.m.–5 p.m. **Registration** Rozanski Hall Concourse

8–11 a.m. Concurrent Sessions Rozanski Hall / MacKinnon Bldg.

11:10 a.m.–12:20 p.m. Welcome & Plenary: Alfred Wüest Rozanski Hall, Room 104

12:20–1:40 p.m. Buffet Lunch Creelman Hall

2–6 p.m. Concurrent Sessions Rozanski Hall / MacKinnon Bldg.

6–8:30 p.m. **Poster Social** Science Complex Atrium

WEDNESDAY, June 8

7:30 a.m.–5 p.m. **Registration** Rozanski Hall Concourse

8 a.m. –12:20 p.m. **Concurrent Sessions** Rozanski Hall / MacKinnon Bldg.

12:20–1:40 p.m. Business Lunch Creelman Hall

2–4:20 p.m. Concurrent Sessions Rozanski Hall / MacKinnon Bldg.

3:20–4:20 p.m. JGLR Publishing Workshop Wednesday, June 8 Rozanski Hall, Room 106

4–6 p.m. **IAGLR Hockey** Gryphon Centre (Gold Arena)

6–9 p.m. **Barbecue** Creelman Hall

8:30 p.m.-? Graduate Student Mixer Science Complex Atrium Sponsored by Rockland Scientific International

THURSDAY, June 9

7:30–5 p.m. **Registration** Rozanski Hall Concourse 8–11 a.m. Concurrent Sessions Rozanski Hall / MacKinnon Bldg.

11:10 a.m.–12:20 p.m. Plenary: William Dennison Rozanski Hall, Room 104

12:20 a.m.–1:40 p.m. **Buffet Lunch** Creelman Hall

1:40–6 p.m. Concurrent Sessions Rozanski Hall / MacKinnon Bldg.

5–6 p.m. Editors' Reception University Club Board Room, University Centre, 5th Floor

6–9 p.m. Banquet & Awards Ceremony Creelman Hall

FRIDAY, June 10

7:30 a.m.–Noon Registration Rozanski Hall Concourse

8 a.m.–12:20 p.m. Concurrent Sessions Rozanski Hall / MacKinnon Bldg.

12:20–1:40 p.m. Buffet Lunch Creelman Hall

PLENARY, TUESDAY, JUNE 7

11:10 a.m.–12:20 p.m. Rozanski Hall, Room 104



No quick fix to hypoxia: A long time-scale exercise

Featuring Alfred Wüest

Swiss Federal Institute of Aquatic Science and Technology; École polytechnique fédérale de Lausanne, Switzerland

More than 30 years ago, the responsible agencies of two local regional governments decided to install bubble-plume devices for oxygenation (summer) and artificial mixing (winter) in three lakes on the Swiss Plateau. The original goals were to (i) extend the breathable "living space" for fish in the oxygen-depleted deep water, (ii) reduce phosphorus release from anoxic sediments by enhancing the oxygen level at the sediment-water interface, and (iii) eventually reduce oxygen consumption via decreased in-situ organic matter production. Whereas the first goal was well achieved, the second and third goals turned out to be failures. Due to the enormous volume of monitoring data from these lakes and due to more recent measurements of oxygen and reduced substances at the sediment-water interface, we finally have a much clearer picture of oxygen consumption in deep-water layers. In this talk, Wüest will highlight some of the developments that have improved our understanding in this "long time-scale exercise" and discuss implications for other large lakes.

About

Alfred is a research scientist and head of the Aquatic Physics Group in the Department Surface Waters - Research & Management at the Swiss Federal Institute of Aquatic Science and Technology (EAWAG) and the Margaretha Kamprad Chair of Physics of Aquatic Systems Laboratory and Director of the Limnology Center at the École polytechnique fédérale de Lausanne (EPFL), Switzerland. While his primary research involves the study of small-scale physical processes in lakes (e.g., stratified turbulence, boundary layer mixing, double-diffusion), he is also actively involved in research on lake ecology (e.g., nutrient/ biogeochemical fluxes) and the management and restoration of lakes. His work is interdisciplinary and involves collaborations with aquatic biologist, chemists, geologists, and managers responsible for water use in lakes throughout Europe (e.g., various Swiss lakes, Lake Constance), Asia (Lake Baikal), Africa (Lake Kivu, Lake Nyos) and Antarctica (Lake Vostok). He has authored 116 peer-reviewed (ISI entry) papers, 22 book chapters and more than 2,000 pages of expert/ consulting services mainly to water authorities.

PLENARY, THURSDAY, JUNE 9

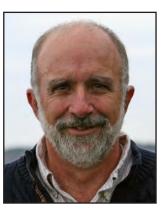
11:10 a.m.–12:20 p.m. Rozanski Hall, Room 104

How is your ecosystem doing? Developing scientifically based report cards

Featuring William Dennison University of Maryland Center for Environmental Science

A basic question that is asked by scientists, resource managers, policy makers and interested citizens is simply "How is your ecosystem doing?" When I was asked this question regarding an embayment that I had been studying in Australia, I gathered my graduate students and developed a simple qualitative report card (A-F) in the late 1990s. This garnered considerable attention, so we set about to develop a scientifically rigorous version of the report card. We created an ecosystem health monitoring program and expanded the report card to include the catchments. Years later, relocated on Chesapeake Bay, I set about to develop a report card using an established monitoring program. This resulted in the Chesapeake Bay report card, which was incorporated into governance structures and supported restoration targeting. Several other report cards were undertaken, including Long Island Sound, Willamette River, and the Great Barrier Reef. The largest report card effort was devoted to the extensive Mississippi River basin, and it included various socio-economic indicators as well as ecological indicators. Partnering with WWF, our team is now developing strategies for report card replication and multiplication in a Basin Report Card Initiative. I would like to propose a Great Lakes report card, and will present some preliminary concepts to answer the question "How are the Great Lakes doing?"

Bill is Vice President for Science Applications at the University of Maryland Center for Environmental Science (UMCES). Bill leads the Integration and Application Network (LAN), a collection of scientists interested in solving, not just studying, environmental problems. LAN is a collection of science integrators and science communicators that work closely with various agencies, foundations, and non-government organizations to develop integrated science products using principles of effective science communication. Bill was involved for ten years with the Healthy Waterways program in Queensland, Australia. He joined UMCES in 2002 and is involved in the Chesapeake Bay Program, currently serving as the inaugural cochair of the Science and Technical Assessment & Reporting group. Bill and his team of science integrators and science vommunicators have pioneering novel science communication techniques including an online conceptual diagram creator using the LAN symbol library. The LAN team produces a suite of environmental report cards globally. Bill's research career has focused on submerged aquatic vegetation, eutrophication, and water quality. He has authored over a hundred scientific papers, two dozen book chapters, a dozen books, and numerous science communication products, including newsletters, brochures, blogs, websites, and apps.



@BillCDennison

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JGLR Publishing Workshop Reviews: How to Give and Take

3:20–4:20 p.m. / Rozanski Hall, Room 106

You may have wondered how reviewers are selected or how you can become a reviewer yourself. Perhaps you've been asked to write a review for a paper and just didn't know where to start. In this workshop, we'll discuss how reviewers are selected, how to write a helpful and meaningful review, and how you, as an author, should approach the reviews you receive. Please plan to attend the *Journal of Great Lakes Research* Publishing Workshop, open to all conference participants.

Discussion

Should IAGLR co-host a meeting in Europe in 2018?

3:40-4:20 p.m. / Rozanski Hall, Room 103

IAGLR is an international organization that promotes large lakes research, yet it is typically viewed as a binational association focused primarily on the Laurentian Great Lakes. At a European Large Lakes Symposium (ELLS) in 2015, it was suggested that ELLS "join forces" with IAGLR and host a joint, international meeting at Lake Geneva (France / Switzerland) in 2018. Following this year's special session on "Big Lakes - Small World," we invite IAGLR participants to join in a discussion about the interest, logistics, and feasibility of holding a joint IAGLR / ELLS meeting in 2018. All options are on the table, ranging from a small, special session to a full-blown, integrated joint meeting that is co-hosted by both organizations. Please come and let your voice be heard on this important topic!

THURSDAY, JUNE 9

Editors' Reception (Invitation only) 5–6 p.m. / University Club Board Room, University Centre, 5th Floor

Each year the *Journal of Great Lakes Research* is supported by a group of dedicated associate editors and the ongoing efforts of the IAGLR Publications Committee. We want to take this time to thank you for your efforts and get your feedback on how the journal is doing and what we can do better. If you're one of these hard-working folks, please join us.

FRIDAY, JUNE 10

Agricultural Research Gaps Workshop

10:20 a.m.-12:20 p.m. / Rozanski 109

This workshop, organized and sponsored by the Ontario Ministry of Agriculture, Food and Rural Affairs, seeks to create a prioritized list of agricultural research gaps that will be shared with all participants. This workshop will consist of two parts. Part 1 will include a panel discussion of recent agricultural research that has informed Great Lakes decision-making. Part 2 will consist of small group discussions to reveal and prioritize participants' opinions on where agricultural research gaps exist and how to address them. Please plan on joining us on the last morning of the conference, and help us find Great Lakes solutions for sustainable agriculture and healthy Great Lakes!

PLANNER

	Monday	Tuesday	Wed	nesday
8:00				
8:20				
8:40				
9:00				
9:20		Break		
9:40				
10:00			Bi	reak
10:20				
10:40				
11:00				
11:20		Plenary: Alfred Wüest		
11:40		<i>Rozanski Hall, Rm. 104</i> (starts at 11:10)		
12:00				
12:20				
12:40		Buffet Lunch	IAGLR Bus	siness Lunch
1:00		Creelman Hall	Creeli	man Hall
1:20				
1:40				
2:00				
2:20				
2:40				
3:00				
3:20		Break		
3:40				
4:00				
4:20				
4:40			IAGLR Ho	ockey Game
5:00			Gryphon Cen	tre (Gold Arena)
5:20				
5:40				
6:00	Welcome	Poster Social	BBQ	
7:00	Reception Science Complex	Science Complex Atrium	Creelman Hall	
8:00	Atrium			
8:30				Grad Student Mixer
9:00				Science Complex
10:00				Atrium
11:00				

PLANNER

Thursday	Friday	
		8:00
		8:20
		8:40
		9:00
Break		9:20
		9:40
	Break	10:00
		10:20
		10:40
		11:00
Plenary: William Dennison		11:20
Rozanski Hall, Rm. 104 (starts at 11:10)		11:40
		12:00
		12:20
Buffet Lunch	Buffet Lunch	12:40
Creelman Hall	Creelman Hall	1:00
		1:20
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		2:20
		2:40
		3:00
Break		3:20
		3:40
		4:00
		4:20
		4:40
		5:00
		5:20
		5:40
		6:00
Banquet & Awards Creelman Hall		7:00
		8:00

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Below is a snapshot of sessions grouped by theme. The tables show the time block for which each session is scheduled. The AM sessions generally start at 8 a.m. and PM sessions start after lunch and end by 6 p.m. See exact times in the Daily Session Overview section beginning on page 18.

	-	т м		W		N Th		ĥ	F
Trophic and Food Web Dynamics	AM	PM	AM	PM	AM	PM	AM		
Microbial ecology of the Great Lakes: From genomes to geochemistry									
Production and dynamics of lower trophic levels									
Food web dynamics in the Great Lakes: Processes and patterns									

Fisheries & Fisheries Management

Effects of social-ecological complexity on dynamics of harvested fish stocks			
The time is now: Researching solutions to restoring Coregonids across the Great Lakes			
Biology and ecology of Great Lakes fish			
Restoration, conservation and management of freshwater fish			

Physical Processes & Limnology

Physical processes in lakes				
Physical ecology in large lakes and their watersheds				
Interactions between large lakes and regional climate				
Big lakes - Small world: Global stressors of large-lake ecosystems				
Watershed processes: Contemporary and past perspectives				

SESSIONS BY THEME

	Т		Т		т		т		т		Т		Т		т		Т		Т		Т		т		Т		т		Т		Т		Т		т		W		Т	h	F
Stressors in the Great Lakes	AM	PM	AM	PM	AM	PM	AM																																		
Turning green water back to blue: Research on Lake Erie HABs																																									
Molecular approaches to understanding drivers of CyanoHABs & toxin/metabolite production																																									
Genetic approaches & examples for understanding biodiversity and invasive species																																									
Emerging priorities for non-native species prevention and control																																									
Impact of invasive species on littoral-pelagic coupling																																									
Diseases and pathogens of the Great Lakes and inland waters																																									
Sources, fate, impacts & management of microplastics in the Great Lakes environment																																									
Environmental chemistry: Discoveries, trends & implication of chemical identification																																									
Environmental 'omics: New tools for aquatic ecosystem science & management																																									
Mitigating nutrient loadings to Great Lakes from agricultural non-point sources																																									
Nutrient speciation, sources & transport processes in Great Lakes watersheds: Part I																																									
Nutrient forms, sources & transport processes in Great Lakes watersheds: Part II																																									

Monitoring, Analysis and Modelling

Ecological connections in Lake Michigan: Insights from the 2015 CSMI intensive field year			
Long-term monitoring: Challenges and achievements			
Understanding & predicting nutrient transfer from agricultural sources to surface waters			
Interdisciplinary approaches to solve problems relating to Great Lakes coastal wetlands			
Big bays big problems: Research and management of Great Lake embayments			
Modeling & assessment of agricultural BMPs on pollutant reduction to the Great Lakes			
SPARROW modelling in the Great Lakes Basin			

SESSIONS BY THEME

	-	Г	٧	V	Т	ĥ	F
Watershed Case Studies	AM	PM	AM	PM	AM	PM	AM
Integrated management and monitoring of Lake Simcoe and its watershed							
The state of the Lake Ontario ecosystem: Changing ecology, food web and integrity							

Remote Sensing & Detection Techniques

Remote sensing, visualization and spatial data applications for the Great Lakes		
Beyond the buoy: Ecoinformatics to spur relationships & collaboration in the Great Lakes		
From data to decisions: A decade of progress for the Great Lakes Observing System		
Emerging monitoring technologies for assessing the health of the Great Lakes-St. Lawrence		
Using acoustics as a tool for ecosystem-based aquatic research and monitoring		

Integrative (urban) Planning and Ecology

Blue communities: Integrating ecology, urban planning, design and social science to revitalize coastal communities			
Sustaining ecosystem services in an era of Great Lakes urbanization			
A framework for managing water use in the Great Lakes-St. Lawrence River Basin			
One Water: Integrating water systems for sustainable Great Lakes water quality			

Governance, Education and Outreach

Governance frameworks & indicators: Multi-level applications in the Great Lakes region			
Great Lakes education and outreach			
Undergraduate civic engagement in Great Lakes restoration and stewardship			

DAILY SESSION OVERVIEW

Tuesday, June 7

Morning Sessions

8-11	Effects of social-ecological complexity on dynamics of harvested fish stocks	MacKinnon 117
8 –11	Nutrient speciation, sources and transport processes in Great Lakes watersheds: Part I	MacKinnon 120
8–11	Production and dynamics of lower trophic levels	Rozanski 101
8 –9:20	Impact of invasive species on littoral-pelagic coupling	Rozanski 102
8 –11	Interactions between large lakes and regional climate	Rozanski 103
8-11	Big bays big problems: Research and management of Great Lake embayments	Rozanski 105
8-11	Environmental 'omics: New tools for aquatic ecosystem science and management	Rozanski 106
9:40–11	Biology and ecology of Great Lakes fish	Rozanski 102
9:40–11	Physical processes in lakes	Rozanski 104

Afternoon Sessions

2-5:40	Using acoustics as a tool for ecosystem-based aquatic research and monitoring	MacKinnon 117
2-3:20	Nutrient speciation, sources and transport processes in Great Lakes watersheds: Part I	MacKinnon 120
2-3:20	Production and dynamics of lower trophic levels	Rozanski 101
2-6	Biology and ecology of Great Lakes fish	Rozanski 102
2–5	Interactions between large lakes and regional climate	Rozanski 103
2-6	Physical processes in lakes	Rozanski 104
2-4:40	Big bays big problems: Research and management of Great Lake embayments	Rozanski 105
2-5:40	Great Lakes education and outreach	Rozanski 106
3:40-5:20	Nutrient forms, sources and transport processes in Great Lakes watersheds: Part II	MacKinnon 120

WEDNESDAY, June 8

Morning Sessions

8–12:20	SPARROW modelling in the Great Lakes Basin	MacKinnon 117
8–12:20	The state of the Lake Ontario ecosystem: Changing ecology, food web and integrity	MacKinnon 120
8–11:40	Environmental chemistry: Discoveries, trends, and implication of chemical identification	Rozanski 101
8–12:20	Remote sensing, visualization, and spatial data applications for the Great Lakes	Rozanski 102
8–11:40	Turning green water back to blue: Research on Lake Erie HABs	Rozanski 103
8–12	Physical processes in lakes	Rozanski 104
8–12	The time is now: Researching solutions to restoring Coregonids across the Great Lakes	Rozanski 105
8–10	Beyond the buoy: Ecoinformatics to spur relationships and collaboration in the Great Lakes	Rozanski 106
10:20-12	Blue communities: Integrating ecology, urban planning, design, and social science to revitalize coastal communities	Rozanski 106
Afternoon Se	essions	
2–4	Governance frameworks and indicators: Multi-level applications in the Great Lakes region	MacKinnon 117
2–4:20	Understanding and predicting nutrient transfer from agricultural sources to surface waters	MacKinnon 120

2–4	Environmental chemistry: Discoveries, trends, and implication of chemical identification	Rozanski 101
2–3:40	Remote sensing, visualization, and spatial data applications for the Great Lakes	Rozanski 102
2-4:20	Big lakes - Small world: Global stressors of large-lake ecosystems	Rozanski 103
2–4	Sustaining ecosystem services in an era of Great Lakes urbanization	Rozanski 104
2–4:20	Ecological connections in Lake Michigan: Insights from the 2015 CSMI intensive field year	Rozanski 105
2_3.40	Blue communities: Integrating ecology urban planning design and social science to	Rozanski 106

2–3:40 Blue communities: Integrating ecology, urban planning, design, and social science to Rozanski 106 revitalize coastal communities

DAILY SESSION OVERVIEW

THURSDAY, June 9

Morning Sessions

8–11	Understanding and predicting nutrient transfer from agricultural sources to surface waters	MacKinnon 120
8–11	Long-term monitoring: Challenges and achievements	Rozanski 101
8–11	Integrated management and monitoring of Lake Simcoe and its watershed	Rozanski 102
8–9:20	Big lakes - Small world: Global stressors of large-lake ecosystems	Rozanski 103
8–11	Emerging priorities for non-native species prevention and control	Rozanski 104
8–11	Ecological connections in Lake Michigan: Insights from the 2015 CSMI intensive field year	Rozanski 105
8–10:40	A framework for managing water use in the Great Lakes-St. Lawrence River Basin	Rozanski 106
9:40–11	Governance frameworks and indicators: Multi-level applications in the Great Lakes region	MacKinnon 117
9:40–11	Microbial ecology of the Great Lakes, from genomes to geochemistry	Rozanski 103
Afternoon	Sessions	
1:40–5:20	Interdisciplinary approaches to solve problems relating to Great Lakes coastal wetlands	MacKinnon 117
1:40-6	Mitigating nutrient loadings to Great Lakes from agricultural non-point sources	MacKinnon 120
1:40–5	Long-term monitoring: Challenges and achievements	Rozanski 101
1:40-4:40	Integrated management and monitoring of Lake Simcoe and its watershed	Rozanski 102
1:40-6	Physical ecology in large lakes and their watersheds	Rozanski 103
1:40-6	Emerging priorities for non-native species prevention and control	Rozanski 104
1:40-5:20	Genetic approaches and examples for understanding biodiversity and invasive species	Rozanski 105

1:40-5:20Emerging monitoring technologies for assessing the health of the Great Lakes-
St. LawrenceRozanski 106

DAILY SESSION OVERVIEW

FRIDAY, June 10

Morning Sessions

8–12:20	From data to decisions: A decade of progress for the Great Lakes Observing System	MacKinnon 117
8–12	Modelling and assessment of agricultural BMPs on pollutant reduction to the Great Lakes	MacKinnon 120
8–12:20	Sources, fate, impacts, and management of microplastics in the Great Lakes environment	Rozanski 101
8–10	Restoration, conservation and management of freshwater fish	Rozanski 102
8–2:20	Food Web Dynamics in the Great Lakes: Processes and ratterns	Rozanski 104
8–10	One Water: Integrating water systems for sustainable Great Lakes water quality	Rozanski 105
8–10	Diseases and pathogens of the Great Lakes and inland waters	Rozanski 106
8:20–12:20	Molecular approaches to understanding drivers of CyanoHABs and toxin/metabolite production	Rozanski 103
10:20-12:20	Watershed processes: Contemporary and past perspectives	Rozanski 105
10:20-12:20	Undergraduate civic engagement in Great Lakes restoration and stewardship	Rozanski 106

	MacKinnon 117	MacKinnon 120	Rozanski 101	Rozanski 102
	Effects of social- ecological complexity on dynamics of harvested fish stocks Co-Chairs: Kevin Reid and Thomas Nudds	Nutrient speciation, sources & transport processes in Great Lakes watersheds: Part I Co-Chairs: Chris Parsons, Mohamed Mohamed, Madeline Rosamond, and Chris Wellen	Production and dynamics of lower trophic levels <i>Co-Chairs: Ralph Smith and</i> <i>Hunter Carrick</i>	Impact of invasive species on littoral- pelagic coupling Chair: Scott McNaught
8:00	T.D. Nudds The DAAM Project for Great Lakes Fisheries: Evolution of an Academic- Industry-Government Partnership	K.J. Van Meter Confounding Complexity or Emerging Simplicity: Biogeochemical Regimes in Anthopogenic Watersheds	A.J. Bramburger Do they know about shrinkage? Decreasing diatom cell size in the Great Lakes (1900-2015)	S. Stefanoff Examining the Drivers of Primary Production Patterns Along the South-East Shoreline of Lake Huron
8:20	Previous Presentation Continued	M.C. Eimers Changes in Total Phosphorus and Nitrate Concentrations in Lake Ontario tributaries	E.D. Reavie Hypoxia in Lake Erie is mostly driven by diatoms	H.A. Bootsma Nearshore nutrient cycling, algal production, and trophic structure in Lake Michigan
8:40	D. Gíslason A comparative test of harvest-induced change in length at maturation for four Lake Erie fishes	T. Maavara Nutrient Stoichiometry in the Grand River Watershed: The Role of Groundwater Silicon	G.K. Nurnberg The Potential Impact of Central Basin Hypoxia and Internal Loading on North Shore Water Quality	B.K. Ginn Zebra to quagga mussels: impacts of species change/ habitat expansion on benthos and coldwater fish
9:00	F. Zhang Non-stationary structure of fishery models: time-varying effects of ecological processes on fish recruitment	M.S. Rosamond SRP:TP in Rivers and Streams in the Great Lakes Basin: Range and Relevance	O.E. Senar Dissolved organic matter promotes cyanobacterial dominance in oligotrophic lakes	A.S. McNaught The Role of <i>Hemimysis</i> <i>anomala</i> in the Nearshore Food Webs of Lakes Michigan and Huron
9:20	BREAK		1	1

Rozanski 103	Rozanski 104	Rozanski 105	Rozanski 106	
Interactions Between Large Lakes and Regional Climate Co-Chairs: John Lenters, Peter Blanken, Branko Kerkez, and Andrew Gronewold		Big Bays Big Problems: Research and Management of Great Lake Embayments Co-Chairs: Ed Verhamme, Val Klump, and Craig Stow	Environmental 'omics: New tools for aquatic ecosystem science and management Co-Chairs: Noreen Kelly, Felicity Ni, Andre Simpson, and George Arhonditsis	
P.D. Blanken Points on a Map: Spatial Variability in Great Lakes Surface Energy Budgets from GLEN Observations		J.V. Klump Keeping the eye on the ball: Why our embayment systems deserve special attention	A.J. Simpson Elucidating Environmental Stress through <i>in-vivo</i> NMR spectroscopy	8:00
K.J. Fries Improving Spatiotemporal Estimates of the Great Lakes Surface Energy Balance		N.I. Kalejs An Assessment of Reef Restoration Potential in Saginaw Bay, Lake Huron	Previous Presentation Continued	8:20
U. Charusombat Validation of lake evaporation in NOAA- GLERL's physical models		D.K. Rucinski Modeling Ecosystem Responses to Nutrient Load Reductions using the Saginaw Bay Ecosystem Model	D.B.D. Simmons The proteome and metabolome of plasma from caged goldfish deployed in Cootes' Paradise	8:40
B.M. Lofgren WRF-Hydro and Atmosphere-Land Coupled Modeling at NOAA-GLERL		S.P. Sowa Optimizing management actions to benefit multiple ecological & socioeconomic factors in Saginaw Bay	O. Birceanu Effects of Routine Lampricide Treatments on Stress Response in a Non- Target Fish, the Rainbow Trout	9:00
		1	BREAK	9:20

	MacKinnon 117	MacKinnon 120	Rozanski 101	Rozanski 102		
	Effects of social- ecological complexity on dynamics of harvested fish stocks Co-Chairs: Kevin Reid and Thomas Nudds	Nutrient speciation, sources and transport processes in Great Lakes watersheds: Part I Co-Chairs: Chris Parsons, Mohamed Mohamed, Madeline Rosamond, and Chris Wellen	Production and dynamics of lower trophic levels Co-Chairs: Ralph Smith and Hunter Carrick	Biology and Ecology of Great Lakes Fish <i>Co-Chairs: Paul Sibley and Soren</i> <i>Brothers</i>		
9:40	A.J. Debertin Social-ecological Dynamics and the Persistence of the Lake Erie Gillnet Fishery	M. Stone Impact of wildfire on phosphorus speciation and sorption behavior of sediment in Alberta rivers	<u>A. McClymont</u> Zooplankton community dynamics along the Trent Severn Waterway	S.M. Gray The Influence of Turbidity on the Physiology of Imperiled Blackline Shiners in the Great Lakes		
10:00	T.D. Nudds Compensatory responses of managers and harvesters to changes in Lake Erie walleye abundance	T.M. Lozier Hydroclimatic Influences on Potential Phosphorus Mobilization from Crop Residue and Cover Crops	J.A. Marino Assessing drivers of Lake Michigan zooplankton dynamics using state-space models	N.E. Jones Resource Subsidies from Adfluvial Fish Increase Stream Productivity		
10:20	K.B. Reid Pragmatic governance for Anthropocene fisheries	J.M. Rutledge Landscape Characteristics Driving Spatial Variation in Nutrient Loading to the Nottawasaga River	<u>C.J. Nowicki</u> To eat or be eaten? The Ups and Downs of Zooplankton Diel Vertical Migration in Lake Huron	<u>D. Raab</u> Context-dependence of food competition in riverine Round Goby invasions		
10:40	R.L. McLaughlin Contribution of Next- generation Fisheries Research Networks to Resolving Wicked Fisheries Problems	L.A. Slone Can Lower Great Miami River Sediment Compensate for Nutrient Over-enrichment?	M.B. Pawlowski Lake Superior zooplankton community trends and the roles of climate change and invasive species	<u>A. Happel</u> Comparison of models that utilize fatty acids to provide estimates of diet composition		
11:10	WELCOME & PLENARY, Rozanski Hall, Room 104					
12:20	20 BUFFET LUNCH, Creelman Hall					

Rozanski 103	Rozanski 104	Rozanski 105	Rozanski 106	
Interactions Between Large Lakes and Regional Climate Co-Chairs: John Lenters, Peter Blanken, Branko Kerkez, and Andrew Gronewold	Physical Processes in Lakes Co-Chairs: Mathew Wells, Reza Valipour, Chin Wu, and Cary Tory	Big Bays Big Problems: Research and Management of Great Lake Embayments Co-Chairs: Ed Verhamme, Val Klump, and Craig Stow	Environmental 'omics: New tools for aquatic ecosystem science and management Co-Chairs: Noreen Kelly, Felicity Ni, Andre Simpson, and George Arhonditsis	
<u>H. Daher</u> Climate as a Driver of Regional Ice Cover	<u>A. Oveisy</u> Numerical modeling of ice cover on stormwater ponds	<u>M. Sayers</u> Satellite Derived Historical Trends of CyanoHAB Blooms in Three Eutrophic Basins of the Great Lakes	V. Kovacevic 1H NMR Metabolomics of <i>Daphnia</i> Responses to Triclosan, Carbamazepine and Ibuprofen Exposure	9:40
D.M. Wright The Influence of Lake Surface Temperatures on a Cold Frontal Passage Over Lake Superior	<u>R.R. Arifin</u> Investigating Summer Thermal Stratification in Lake Ontario	E.M. Verhamme Western Lake Erie Ecosystem Model: An operational model for the scientific and management community	N.E. Kelly Modelling the Daphnia Metabolome: Insights and Lessons Learned	10:00
Y. Zhong Attributing the Heterogeneous Warming of the Laurentian Great Lakes to Lake Depth and Climate Zones	<u>R. Roman-Botero</u> Seasonal thermal stratification of three tropical andean reservoirs	J.V. Klump What will it take to restore Green Bay?	<u>F. Ni</u> Toward the Development of An Ecophysiological Daphnia Model to Examine Toxicity and Nutrition	10:20
J.D. Lenters Predicting Lake Superior stratification dates and surface temperature following the 2015-16 El Niño	L. Leon High-Resolution Modeling for Developing Nearshore Ecosystem Objectives in Lake Erie: Hydr&WatQuality	R.A. Lehr Characterizing the magnitude and mechanism of climate change impacts in the Chequamegon Bay of Lake	T.A. Edge EcoBiomics: New Federal Genomics Research Project	10:40
WELCOME & PLENARY, Rozanski Hall, Room 104				
		BUF	FET LUNCH, Creelman Hall	12:20

	MacKinnon 117	MacKinnon 120	Rozanski 101	Rozanski 102
	Using acoustics as a tool for ecosystem- based aquatic research and monitoring Co-Chairs: Erin Dunlop and Jeremy Holden	Nutrient speciation, sources and transport processes in Great Lakes watersheds: Part I Co-Chairs: Chris Parsons, Mohamed Mohamed, Madeline Rosamond, and Chris Wellen	Production and dynamics of lower trophic levels Co-Chairs: Ralph Smith and Hunter Carrick	Biology and Ecology of Great Lakes Fish Co-Chairs: Paul Sibley and Soren Brothers
2:00	E. Dunlop & J. Holden Beyond density: Emerging applications of fisheries acoustics in the Great Lakes	S.E. Sine Paradigm Shift: Does River Metabolism Mask the Isotopic Signal of Nitrate Sources?	K. Mehler Benthic invertebrate assessment in the lower Niagara River: Distribution and community structure.	J.K. Kosiara Assessment of yellow perch movement between coastal wetland and nearshore waters of the Great Lakes
2:20	J.P. Holden The Use of Mobile Hydroacoustic Surveys to Assess Predator Species Abundance in Lake Ontario	<u>C. Irvine</u> Seasonal phosphorus dynamics of Hopewell Creek and its tributaries in a multiple land-use watershed	G.J.E. Michaud Spatio-temporal Variation of Phytoplankton Nutrient Status in the Upper Great Lakes Region	Z.S. Feiner Importance of fatty acid complexity to reproductive fitness in yellow perch (<i>Perca</i> <i>flavescens</i>)
2:40	M.G. Walsh Using Hydroacoustics to Investigate Patterns in Alewife Distribution in Lake Ontario	A.L. James Investigating Seasonal Variation and Surrogate Measures of Phosphorus Loading to Lake Nipissing, ON	H.J. Carrick Dynamics of Picoplankton in Lake Superior: Close Coupling Between Growth and Grazing Losses	L.Z. Almeida Do Yellow Perch <i>Perca</i> <i>flavescens</i> Egg Skeins Deter Predation?
3:00	M.R. DuFour Hydroacoustic abundance estimates and Walleye (<i>Sander</i> <i>vitreus</i>) avoidance behavior: a tale of two ships	D. Depew Unravelling Phosphorus Dynamics in the nearshore of eastern Lake Erie	E.K. Butts Dynamics of key phytoplankton populations in Lake Michigan: Biomass, growth, and grazing losses	T.D. Malinich Yellow Perch as a Model for Understanding Morphological Plasticity and Phenotypic Diversity
3:20	BREAK	1	1	1

Rozanski 103	Rozanski 104	Rozanski 105	Rozanski 106	
Interactions Between Large Lakes and Regional Climate Co-Chairs: John Lenters, Peter Blanken, Branko Kerkez, and Andrew Gronewold	Physical Processes in Lakes Co-Chairs: Mathew Wells, Reza Valipour, Chin Wu, and Cary Tory	Big Bays Big Problems: Research and Management of Great Lake Embayments Co-Chairs: Ed Verbamme, Val Klump, and Craig Stow	Great Lakes Education and Outreach <i>Co-Chairs: Helen Domske and</i> <i>Kristin TePas</i>	
<u>C. Xiao</u> Projected Hydroclimatological Responses of the Great Lakes to Global Warming	K.M. Danner Wave tank and numerical experiments to determine fate of microcystin in coastal sediment	S.B. Watson Microbial Water Quality and Harmful Algal Bloom Risk Management in Hamilton Harbour and Beaches	<u>E. Everhardus</u> Building Durable Great Lakes Education Partnerships	2:00
<u>A.R. Erler</u> Climate Change Impacts in the Great Lakes Basin based on High-resolution Regional Climate Projection	K.A. Labuhn Conveyance Change in the St. Clair River	S.D. Campbell Factors Influencing Water Quality in Sheltered Embayments of Eastern Georgian Bay, Lake Huron	H.M. Domske Great Lakes Sea Grant Network's Effective Aquatic Invasive Species Programming	2:20
R.B. Rood Ensemble of Climate Models for Great Lakes Decision Making	H. Bolkhari Delft3D and SWAN simulations of waves and storm surge in the Cataraqui Region of Lake Ontario	D. Kobiliris Why Models Should Talk to Each Other? Lessons Learned from the Hamilton Harbour	K.M. TePas Live, From The Field, It's Great Lakes Science!	2:40
H.R. Bravo Impacts of climate change on the transport of bacteria in Great Lakes urban coastal waters		D.K. Kim Machine Learning Applications to Ecological Research in Great Lakes	T.F. Hansen A Highly Interactive Computational Fluid Dynamics Model	3:00
	1	1	BREAK	3:20

	MacKinnon 117	MacKinnon 120	Rozanski 101	Rozanski 102
	Using acoustics as a tool for ecosystem- based aquatic research and monitoring Co-Chairs: Erin Dunlop and Jeremy Holden	Nutrient forms, sources and transport processes in Great Lakes watersheds: Part II Co-Chairs: Hans Dürr, Madeline Rosamond, Krista Chomicki, and William Taylor	Production and dynamics of lower trophic levels Co-Chairs: Ralph Smith and Hunter Carrick	Biology and Ecology of Great Lakes Fish <i>Co-Chairs: Paul Sibley and Soren</i> <i>Brothers</i>
3:40	R.R. Budnik Use of DIDSON to Monitor Emigration of Stocked Juvenile Steelhead Trout	C.F. Drury Managing Reactive Nitrogen in the Great Lakes Basin		<u>E. Bruestle</u> Lake Sturgeon Diet Composition and Trophic Position in the Lower Niagara River
4:00	C.T. Karboski Identifying Lake Trout Thermal and Depth Habitat Preference with Pop-up Satellite Tags	S.L. Schiff Do Catchment Hotspots Control P & N Export To Lake Erie During An Extreme Snowmelt Event?		Z. Biesinger Lake Sturgeon Seasonal and Spawning Habitat Use in the Lower Niagara River
4:20	S.F. Colborne Using Acoustic Telemetry to Monitor Bowfin and Largemouth Bass in the Detroit River	M. Shafii Modeling Stream Nitrate Concentrations in a Snow- dominated Catchment in Southwestern Ontario		C.L. Kozel Diet of Young-of-the-Year and Juvenile Lake Trout in Lake Champlain
4:40	L.K. Peterson Evaluating Methods for Estimating Mortality of Great Lakes Walleye using Acoustic Telemetry	N.B. Basu A Statistical Approach to Quantifying Nutrient Lag Times in the Grand River Watershed		<u>M.M. Kindree</u> The Effect of Sampling Gear and Effort on the IBI in the Huron-Erie Corridor Areas of Concern
5:00	N. Klinard Movement and Habitat Use of Sunfish in the Detroit River Revealed Using Acoustic Telemetry	P. Doan Modelling of phosphorus internal loading in the Bay of Quinte, Canada		A.C. Maguffee Evaluating Differences in Otolith Chemistry of Lake Michigan Chinook Salmon to Identify Natal Origin
5:20	J.L. Fischer Getting Physical: Guiding Habitat Restoration with Velocity and Substrate Mapping			N.A. Connelly Adherence to Fish Consumption Advisories by Urban Anglers in the Great Lakes Region
5:40				L.R. Tessier Effects of Body Size & Life Stage on TFM Uptake, Excretion & Metabolism in Sea Lamprey (<i>P. marinus</i>)
6:00	POSTER SOCIAL, Science	e Complex Atrium		

Rozanski 103	Rozanski 104	Rozanski 105	Rozanski 106	
Interactions Between Large Lakes and Regional Climate Co-Chairs: John Lenters, Peter Blanken, Branko Kerkez, and Andrew Gronewold	Physical Processes in Lakes Co-Chairs: Mathew Wells, Reza Valipour, Chin Wu, and Cary Tory	Big Bays Big Problems: Research and Management of Great Lake Embayments Co-Chairs: Ed Verhamme, Val Klump, and Craig Stow	Great Lakes Education and Outreach Co-Chairs: Helen Domske and Kristin TePas	
W. Eckert Longterm Changes in P- Cycling of a Subtropical Lake due to Man-Made Perturba- tions and Climate Change	J. Xu Upgrading NOAA's Great Lakes Operational Forecast System	J. Medellin-Azuara Integrated Environmental Modeling of Estuarine Systems	M.A. Martz Leveraging Research, Education and Outreach Staff to Develop a Basin- wide Marine Debris	3:40
K.A. St.Pierre Source or Sink?: Climate Change Impacts on CO2 and Hg Cycling in High Arctic Lake Hazen	M.C. Wilson Optimization of vertical mixing parameterizations using GOTM in FVCOM	<u>S. Cadena</u> Phosphorus Dynamics and Mechanism of Release in Sediments of the Bay of Quinte, Canada	<u>B. Schryer</u> Asian Carps: Prevention and Early Warning for the Canadian Great Lakes	4:00
<u>A. Jabbari</u> Numerical simulations of dissolved oxygen concentrations in Lake Trout lakes	E.J. Anderson Contaminant Transport and Flow Exchange in the Straits of Mackinac	<u>E.M. Wilcox</u> Utilities Without Borders	<u>C.E. Thorn</u> Six Streams Initiative: A Community Driven Water Quality Outreach Program	4:20
<u>K. Chutko</u> River Stable Water Isotope Patterns in Large Shield Basins in Northeastern and Central Ontario	J.A. Shore Twenty-eight Years of Hydrodynamic Variability in the Bay of Quinte		F.L. Bevacqua IJC to Provide Link between Great Lakes Science and the Public	4:40
	M.A. Cooke Linking large-scale weather patterns with small-scale mixing variability in an Alaskan Arctic lake		T.E. Tesfaye Collaboration through Libraries: The Impact of Digital Libraries for the Water Resources	5:00
	B.R. Sutherland Particle Transport in Stratified Lakes: Laboratory Experiments		L. Fry Exploring the possibilities: A new scenario-based water level outlook tool	5:20
	<u>S.D. Jazi</u> Particle Deposition Beneath Sediment Laden Plumes			5:40
		POSTER SOCIA	L, Science Complex Atrium	6:00

	MacKinnon 117	MacKinnon 120	Rozanski 101	Rozanski 102
	SPARROW modelling in the Great Lakes Basin <i>Co-Chairs: Glenn Benoy and Dale</i> <i>Robertson</i>	The state of the Lake Ontario ecosystem: Changing ecology, food web and integrity Co-Chairs: Mohiuddin Munawar and James Watkins	Environmental Chemistry; Discoveries, trends, and implication of chemical identification Co-Chairs: Elizabeth Murphy, Daryl McGoldrick, Robert Letcher, and Bernard Crimmins	Remote Sensing, Visualization, and Spatial Data Applications for the Great Lakes Co-Chairs: George Leshkevich and Robert Shuchman
8:00	G.A. Benoy Binational SPARROW Modelling to Address Water Quality Issues in Transboundary Basins	<u>M. Fitzpatrick</u> Microbial Food Web Dynamics in the Deep Chlorophyll Maxima: Lake Ontario and Beyond	J.E. LaFontaine Spatial Contaminant Patterns of Metals in a Great Lakes Area of Concern	<u>G. Leshkevich</u> CoastWatch - Delivering Environmental Satellite and In Situ Data to the Great Lakes User Community
8:20	R.S. Burcher Development of the SPARROW Stream Networks for the Great Lakes and Winnipeg River Basins	<u>M. Munawar</u> Structure and Function of Lake Ontario Phytoplankton Communities: Long Term Changes, 1970 to 2013	K.M. Stevack Assessing Historical and Emergent Sediment Contamination in Three Lake Ontario Areas of Concern	<u>J. Lekki</u> Airborne Hyperspectral Imaging for monitoring Harmful Algal Blooms in the Great Lakes region
8:40	<u>I. Vouk</u> Source and land-to-water delivery variables for a bi- national SPARROW model	L.G. Rudstam Zooplankton Community Regulation in Lake Ontario: Inferences from Spatial Distributions	R.L. Lepak Utilizing Hg Stable Isotope Ratios to More Fully Resolve Hg Processes and Sources in the Great Lakes	R. Sawtell Next day generation of water quality products to support NASA Hyperspectral Imaging of Lake Erie
9:00	D.A. Saad Load Estimation Methods for Binational Midcontinental Nutrient SPARROW Models	T.J. Holda State of <i>Mysis diluviana</i> in Lake Ontario in 2013: Context over time and space	<u>A. Visha</u> Total Mercury (THg) Trends Across Trophic Levels in the Canadian Great Lakes	<u>M.T. Cline</u> Analysis of Coincident HICO and Airborne Hyperspectral Images Over Lake Erie Western Basin HABs
9:20	D.M. Robertson SPARROW Watershed Modeling of the Entire Great Lakes Basin	P.W. Glyshaw Trends in the Benthic Macroinvertebrate Community in Lake Ontario Through 2013	<u>L. Richman</u> Dioxin and Furan Contamination in the Whalesback Channel: Legacy of the Pulp and Paper Industry	A.J. Vander Woude Chlorophyll a and Phycocyanin from Hyperspectral Airborne and Hand-held Sensors on Lake Erie
9:40	<u>C.M. Johnston</u> Accessing SPARROW Model Results Through Online Tools	E.T. Howell Nearbed Phosphorus, Cladophora and Dreissenid Mussels Over a Productivity Gradient in Lake Ontario	R.D. Kangabam Ecotoxicological Risk Assessment of Organochlorine Pesticides Residues in Water of Loktak Lake	<u>R.T. Ford</u> Assessing the Utility of Landsat 8 for Monitoring Cyanobacteria in the Great Lakes Region
10:00	BREAK			

Rozanski 103	Rozanski 104	Rozanski 105	Rozanski 106	
Turning Green Water back to Blue: Research on Lake Erie HABs Co-Chairs: Patrick Lawrence and Carol Stepien	Physical Processes in Lakes Co-Chairs: Mathew Wells, Reza Valipour, Chin Wu, and Cary Tory	The time is now: Researching solutions to restoring Coregonids across the Great Lakes Co-Chairs: Dimitry Gorsky and Ellen George	Beyond the Buoy: Ecoinformatics to Spur Relationships and Collaboration in the Great Lakes <i>Chair: Samuel Molnar</i>	
D.K. Hoffman Water column ammonium dynamics affecting harmful cyanobacterial blooms in Lake Erie	<u>A. Linares</u> Characterizing and forecasting meteotsunami hazards in northern Lake Michigan	C.R. Bronte Opportunities and challenges for coregonine restoration the Great Lakes-a general overview	S.P. Sowa Great Lakes Inform: an online platform specifically designed to support landscape scale collaboration	8:00
E.L. Hillis Varying Responses of Primary Production and Chlorophyll <i>a</i> due to a Changing Lake Erie	<u>C.H. Wu</u> Regional Characteristics of Meteotsunamis in the Laurentian Great Lakes	<u>C.R. Bronte</u> A retrospective analysis of coregonine stocking efforts for restoration	J.P. Smith "MVC" environmental informatics software foundation for relationship- based collaborative science	8:20
J. Chen Algal Blooms Can Turn Lake Erie to a Carbon Sink	L. Arneborg Wind driven Water Exchange between the two main Basins of Lake Vänern	<u>W. Stott</u> Genetic Diversity Among Great Lakes Cisco Species: Exploring Taxonomic and Population Boundaries	<u>C. Menza</u> Biogeographic Assessments: A Tool for Information Synthesis in Spatial Planning	8:40
A.M. Brandel Isolation and Characterization of Lake Erie Bacteria that Degrade the Microcystin Toxin MC-LR	<u>B. Hlevca</u> Exchange Between Coastal Embayments and a Large Lake Primarily Driven by Water Level Oscillations	R.L. Eshenroder Source Populations for Reintroduction of <i>Coregonus</i> <i>artedi</i>	O.C. Gates Cities Impacts & Adaptation Tool: Climate Data Localization & Resources for Great Lakes Communities	9:00
M.J. Hoffman Comparing Methods for Finding Lagrangian Coherent Structures for the 2011 Lake Erie Algal Bloom	V. Cheng Towards Linking Water Level Fluctuations with Water Quality in South- Eastern Georgian Bay	T.E. Pitcher Inducing reproduction in bloaters <i>Coregonus hoyi</i> to support L. Ontario reintroduction efforts	T. Slawecki Identification and Assessment of Information Flows to Improve Great Lakes Water Quality Decisions	9:20
<u>J.D. Chaffin</u> Accuracy of Data Buoys for Monitoring Cyanobacterial Blooms in Lake Erie	C.J. McConnell The Simplified Isotope Mass Balance Approach in Seasonally Stratified Lakes, South-Central Ontario		S.J. Cole Great Lakes Blue Accounting - Collaborating on Shared Goals and Metrics	9:40
			BREAK	10:0 [,]

	MacKinnon 117	MacKinnon 120	Rozanski 101	Rozanski 102
	SPARROW modelling in the Great Lakes Basin Co-Chairs: Glenn Benoy and Dale Robertson	The state of the Lake Ontario ecosystem: Changing ecology, food web and integrity Co-Chairs: Mobiuddin Munawar and James Watkins	Environmental Chemistry; Discoveries, trends, and implication of chemical identification Co-Chairs: Elizabeth Murphy, Daryl McGoldrick, Robert Letcher, and Bernard Crimmins	Remote Sensing, Visualization, and Spatial Data Applications for the Great Lakes Co-Chairs: George Leshkevich and Robert Shuchman
10:20	R.W. Jenkinson Nutrient Delivery in the Red-Assiniboine River Basin using a Binational SPARROW Model	J.M. Watkins Nearshore Assessment of Lake Ontario South Shore Using Emerging Technologies	<u>A. Javed</u> A Bayesian Assessment of Contaminant Temporal Trends in Lake Erie Fish Communities	R.A. Shuchman Phytoplankton Group Determination using Hyperspectral Remote Sensing in Western Lake Erie
10:40	D.M. Robertson Changes in Phosphorus Loading to Lake Michigan Caused by Future Changes in Land Use and Climate	G.L. Boyer Harmful Algal Blooms in Lake Ontario: It is More than a Lake Erie Issue	E.W. Murphy A Probability-Based Assessment of Contaminants in Great Lakes Fish Fillet	J.D. Ortiz Optical differentiation of algal toxicity and its correlation with microcystin in Sandusky Bay, Lake
11:00	S. Kaluskar Why Bayesian? Integrating SPARROW with Bayesian Inference Techniques	Z.J. Gozum Projecting Water Quality Trends in Cootes Paradise and Their Implications for the Hamilton Harbour	D.J. McGoldrick Trends of polybrominated diphenyl ethers in Canadian fish	M. Sayers Inherent and Apparent Optical Property Observations and Trends in Western Lake Erie for 2015
11:20	<u>M.L. Allerton</u> Bayesian Watershed Modelling to Support Adaptive Management in the Southeastern Georgian Bay Area	B. Metcalfe Has the Feeding Behaviour of Lake Trout Changed In Response To Shifts in the Prey Fish Community?	<u>C. Shunthirasingham</u> Temporal Trends of SVOCs in the Canadian Great Lakes Basin	K. Zolfaghari Evaluation of MERIS Chlorophyll-a Retrieval Algorithms for Optically Complex Lake Erie
11:40	A. Richards Evaluating uncertainty in nutrient loading using a Bayesian framework: Bay of Qunite case study	M. Hossain Assessing uncertainty in a Lake Ontario Ecopath model: An application of linear inverse model		M. Xu Regionally and Locally Adaptive Models for Retrieving Chlorophyll Concentration in Inland Lakes
12:00	<u>S.S. Qian</u> R Implementation of SPARROW	Y. Shimoda Development of an Ensemble of Models for Predicting Eutrophication in the Bay of Quinte		A.I. Paltsev Exploration of spatial and temporal changes in chlorophyll a of lakes in Ontario
12:20	BUSINESS LUNCH, Creelr	nan Hall		1

WEDNESDAY, JUNE 8

Rozanski 103	Rozanski 104	Rozanski 105	Rozanski 106	
Turning Green Water back to Blue: Research on Lake Erie HABs Co-Chairs: Patrick Lawrence and Carol Stepien	Physical Processes in Lakes Co-Chairs: Mathew Wells, Reza Valipour, Chin Wu, and Cary Tory	The time is now: Researching solutions to restoring Coregonids across the Great Lakes Co-Chairs: Dimitry Gorsky and Ellen George	Blue Communities: Integrating Ecology, Urban Planning, Design, and Social Science to Revitalize Coastal Communities Co-Chairs: Jeff Schaeffer, Doug Pearsall, and Richard Norton	
J.F. Bratton Just-in-Time Data Delivery: Adaptation of HABs Researchers to Changing Data Sharing Expectations	<u>M. Prescott</u> A Multi-Year Study of Mixing and Stratification Using Buoy Observations, Lake Nipissing, Ontario	T.B. Johnson Post-stocking Behaviour, Habitat Use, & Survival of Hatchery-reared Bloater Using Acoustic Telemetry	<u>R.K. Norton</u> Public Trust Duties, Liabilities, Powers, and Constraints Along Laurentian Great Lakes Shores	10:20
R.S. Bejankiwar Economic Benefits of Reducing Harmful Algal Blooms in Western Lake Erie	M.G. Wells Variations of temperature and dissolved oxygen during under-ice convection in lake Simcoe	R.L. DeBruyne Dynamics of Lake Whitefish Spawning and Larval Drift in the St. Clair-Detroit River System	Previous Presentation Continued	10:40
P.L. Lawrence Lake Erie HABs Decision- Making Support for Maumee Watershed Stakeholders	M. Chowdhury Thermocline movements cause striking variations in near-bed stratification and benthic mixing	E.G. George Spawning Behavior and Early Life History of Cisco in Chaumont Bay, Lake Ontario	E.A. Stainsby Ontario's Lakeshore Capacity Assessment: Drafting a New Approach	11:00
U.A. Uduma Risk assessment of Cyano- toxins for small drinking water treatment plants in Québec and Alberta	<u>B. Flood</u> Estimation of flushing rates driven by large amplitude internal waves in a coastal embayment	L.M. Collis Diet Analysis of Larval Cisco (<i>Coregonus artedi</i>) in Chaumont Bay, Lake Ontario	M.A. Breederland Small Harbor Sustainability in Michigan: Strategies and Lessons Learned from 4 Coastal Communities	11:20
	J.P. Selegean On the origins of the aggradation at the mouth of the Ahnapee River in Lake Michigan	M.E. Herbert Restoration of critical Coregonid and Lake Trout reef spawning habitat in northern Lake Michigan	D.R. Pearsall Coastal Restoration in Western Lake Erie: Improving Nature and Resilience in Coastal Communities	11:40
	<u>E. McKnight</u> Baseline Characterization of Spatial and Teppford Dynamics for Khuane Lake, Yukon		B. Lidbetter Wetland Restoration Design for McLaughlin Bac, M student capston design	12:00
		BUSINE	ESS LUNCH, Creelman Hall	12:20

WEDNESDAY, JUNE 8

	MacKinnon 117	MacKinnon 120	Rozanski 101	Rozanski 102
	Governance Frameworks and Indicators: Multi-level Applications in the Great Lakes Region Co-Chairs: Carolyn Johns, Gail Krantzberg, and Debora VanNijnatten	Understanding and predicting nutrient transfer from agricultural sources to surface waters Co-Chairs: Kimberley Schneider, Pamela Joosse, Natalie Feisthauer, and Keith Reid	Environmental Chemistry; Discoveries, trends, and implication of chemical identification Co-Chairs: Elizabeth Murphy, Daryl McGoldrick, Robert Letcher, and Bernard Crimmins	Remote Sensing, Visualization, and Spatial Data Applications for the Great Lakes Co-Chairs: George Leshkevich and Robert Shuchman
2:00	C.M. Johns Water Governance Frame- works & Water Governance Indicators: Transboundary & International Applications	K.D. Schneider IROWC-P: A National Indicator to Predict the Risk of P Loss from Agricultural Soils to Surface Water	W.E. Johnson Great Lakes Mussel Watch: Refocusing Contamination Monitoring and Assessment to include CECs	P. Petchprayoon Detecting Changes of Evaporation and Total Water Storage over a Large Lake from Multi-Satellites
2:20	D.L. VanNijnatten Fashioning Indicators for the Basin Context: Outcome, Output and Governance Indicators	Q.M. Ketterings Developing a New P Index for New York with Stakeholder Input	J. Guo Flame Retardants Distribution in the Great Lakes Atmosphere and Fish	<u>G. Kang</u> Identifying and Quantifying Upwellings in Lake Michigan over past 21 years with Moving Window Method
2:40	<u>G. Krantzberg</u> Nearshore Governance That Is Inclusive of Science and Policy Making	<u>E.A. Dayton</u> On-Field Ohiol: Evaluation/Revision of the Ohio Phosphorus Risk Index	<u>A.K. Greaves</u> In Vitro Metabolism of Organophosphate Triester Flame Retardants in Herring Gulls (<i>Larus argentatus</i>)	A.G. Grimm Identification of likely Lake Trout spawning habitat using multispectral remote sensing
3:00	C. O'Neill New frameworks for collaborative governance under Ontario's Great Lakes Protection Act, 2015	L.J. Evans Predicting Phosphate Retention in Agricultural Soils using a Soil Adsorption /Precipitation Computer	J.W. Truong Tris(chloropropyl) Phosphate (TCPP) in Toronto Tributaries, Rain and Waste Water Effluent	<u>G. Leshkevich</u> Light Transmittance Through Ice and Snow Cover on the Great Lakes
3:20	K.F. Friedman The use of formal science management integration systems to manage risk in the Great Lakes	T.W. Bruulsema Crop Nutrition Industry Action Opportunities for Sustainable Phosphorus Management	M.S. Milligan Identification and quantitation of chloro- methoxy-phenol analogues in Great Lakes fish	<u>C.N. Brooks</u> Evaluating the spread and control of Eurasian watermilfoil through remote sensing technologies
3:40	<u>W. Leger</u> An Adaptive Management Framework for the On- Going Review of Great Lakes Water Level Regulation	M.S. Rosamond Has Total Phosphorus Export from Small, Agricultural Streams in Ontario Changed Since the 1970s?	<u>M. Robson</u> Halogenated Organic Contaminants in Passive Samplers from Lake Ontario Waters and Wastewaters	
4:00		I. llampooranan Modeling Nutrient Legacies and Time Lags in Agricultural Watersheds: A Midwestern Case Study		

WEDNESDAY, JUNE 8

Rozanski 103	Rozanski 104	Rozanski 105	Rozanski 106	1
Big Lakes - Small World: Global Stressors of Large-Lake Ecosystems Co-Chairs: John Lenters, Orlane Anneville, Nico Salmaso, and Tomas Höök	Sustaining ecosystem services in an era of Great Lakes urbanization Co-Chairs: Christopher Wellen, Stephen Oni, Trevor Dickinson, and Chris Parsons	Ecological connections in Lake Michigan: Insights from the 2015 CSMI intensive field year Co-Chairs: Beth Hinchey-Malloy, Bo Bunnell, and Paris Collingsworth	Blue Communities: Integrating Ecology, Urban Planning, Design, and Social Science to Revitalize Coastal Communities Co-Chairs: Jeff Schaeffer, Dong Pearsall, and Richard Norton	
<u>N. Salmaso</u> Expansion of New Cyanobacteria to the Large Italian Lakes: Ecological and Management Implications	W.T. Dickinson Ontario River Flows into the Great Lakes Have Changed as a Result of Climate Change & Urbanization	<u>E.K. Hinchey</u> Lake Michigan 2015 CSMI Field Year Overview	M. St John Assessment of Degradation of Aesthetics as a Beneficial Use in the Toronto Area of Concern	2:00
<u>C. Capelli</u> Distribution of <i>Dolichospermum</i> in European waterbodies: a multidisciplinary approach	<u>C.E. Charbonneau</u> Hydrologic Analysis Supporting Green Infrastructure Design and Urban Wetland Protection	R.J. Miller Application of Underwater Gliders to Map Nearshore- Offshore Gradients During 2015 Lake Michigan CSMI	<u>A. Bradford</u> Hydrologic and Water Quality Benefits of Green Infrastructure Retrofit of Commercial Property	2:20
F. Soulignac Using 3D modelling for understanding spatio- temporal heterogeneities of phytoplankton abundance	L.E. McPhillips Maximizing Ecosystem Services in Stormwater Detention basins: A Focus on Nutrient Cycling	A.E. Scofield Primary and Secondary Production Patterns in Southern Lake Michigan: Insights from CSMI 2015	M.A. Gregory Financial Incentives for Green Infrastructure Through Stormwater User Fees	2:40
<u>S. Sharma</u> Direct observations of ice seasonality reveal changes in climate over the past 320-570 years	T. Aziz Valuation and historical reconstruction of ecosystem services in the Grand River watershed	H.J. Kane Distribution and abundance patterns of benthic invasive species in nearshore Lake Michigan habitats	J.S. Schaeffer Reconciliation Ecology: a Tool for Enhancing Urban Coastal Habitats	3:00
J.D. Lenters Long-term warming of the world's large lakes: Results from the Global Lake Temperature Collaboration	<u>G. Comeau</u> Periphyton Community Structure along Rural-Urban Gradients in Lake Ontario Tributaries	<u>A.Y. Karatayev</u> Underwater Video is an Effective Tool to Reveal <i>Dreissena</i> Spatial Distribution and Biomass	K.O. Lutsky EXTRA: situating a place for 'time' within the littoral Great Lakes	3:20
Discussion of potential for a joint IAGLR / European Large Lakes Symposium in 2018	<u>C.C. Wellen</u> Chloride Storage Across a Gradient of Urban Watersheds in Southern Ontario, Canada	M.A. Hutton Assessing a Secondary Consumer through Space and Time: The Story of L. Michigan <i>Bythotrephes</i>	JGLR Workshop Learn how reviewers are selected, how to write a meaningful review, and how authors should approach the reviews received.	3:40
Discussion Cont'd		L.A. Eaton An exploration of spatiotemporal variation in the Lake Michigan <i>Mysis</i> <i>diluviana</i> population	Workshop cont'd	4:00

	MacKinnon 117	MacKinnon 120	Rozanski 101	Rozanski 102
		Understanding and predicting nutrient transfer from agricultural sources to surface waters Co-Chairs: Kimberley Schneider, Pamela Joosse, Natalie Feisthauer, and Keith Reid	Long-Term Monitoring: Challenges and Achievements Co-Chairs: Alexander Karatayev, Lars Rudstam, Lyuhov Burlakova, and James Watkins	Integrated management and monitoring of Lake Simcoe and its watershed Co-Chairs: Danijela Puric- Mladenovic, Jill Crossman, and Joelle Young
8:00		<u>M. Narini</u> Water Quality Impacts to Phytoplankton in the Nottawasaga River and Minesing Wetland	<u>C.J. Palmer</u> Establishing Measurable Quality Objectives for Assessing Ecological Monitoring Variables	<u>J. Osmok</u> Lake Simcoe & South Eastern Georgian Bay Community Stewardship Program
8:20		S.P. Sowa Thinking outside the lake: How might Lake Erie nutrient management efforts benefit streams?	H.A. Zhou Atmospheric Mercury Temporal Trends in the Northeastern Great Lakes Region from 2005 to 2014	B. Thompson Developing a Multi-Sectoral Approach to Reduce Chloride Loading in the Lake Simcoe Watershed
8:40		K.E. Thomas Development of nutrient criteria for tributaries of Lake Erie: a field and mesocosm approach	S. Fernando Evaluation of Emerging Contaminants in Great Lakes Fish using GCxGC-HRT	D. Puric-Mladenovic Assessing natural cover quality in the Lake Simcoe Watershed
9:00		N.J.T. Pearce Seasonal Variation of Agricultural Best Management Practice Effects on Stream Water Quality	D.M. Robertson Improved Nutrient and Sediment Loading estimated using Continuous Surrogate Regression Techniques	<u>S. Varga</u> Critical Baseline Data on Wetlands in the Lake Simcoe Watershed
9:20	BREAK		1	1

Rozanski 103	Rozanski 104	Rozanski 105	Rozanski 106	
Big Lakes - Small World: Global Stressors of Large-Lake Ecosystems Co-Chairs: John Lenters, Orlane Anneville, Nico Salmaso, and Tomas Höök	Emerging priorities for non-native species prevention and control Co-Chairs: Lindsay Chadderton, Sarah Cook, and Erika Jensen	Ecological connections in Lake Michigan: Insights from the 2015 CSMI intensive field year Co-Chairs: Beth Hinchey-Malloy, Bo Bunnell, and Paris Collingsworth	A framework for managing water use in the Great Lakes-St. Lawrence River Basin <i>Chair: Jennifer Keyes</i>	
S.J. Guildford Evidence of P Deficiency in an N limited Great Lake	K.L. Bowen Could <i>Dreissenid veligers</i> be the Lost Biomass of Invaded Lakes?	D.B. Bunnell Does proximity to high- loading tributaries enhance production in Lake Michigan?	J. Staples Reporting Ontario's Water Use under the Great Lakes- St. Lawrence River Basin Sustainable Water Resources Agreement	8:00
C.M. Groff Dreissenid Mussels, Freshwater Microbialites, and Nutrient Enrichment in Mexico's Laguna Bacalar	O.M. Alian Automated Measurement of Enzymatic Activity for Monitoring Live Organisms in Ballast Water	D.G. Simpkins Influence of River Plumes on Distribution, Composition and Structure of Nearshore Lake Michigan Fish	<u>S.J. Cole</u> Human Use of the Great Lakes Water Resources: What We Know and Don't Know	8:20
R. Roesch Lake Constance fish and fisheries: intensively influenced by re- oligotrophication and stickleback	K. Stanislawczyk Comparison of traditional and novel techniques for detecting and identifying rare zooplankton	D.E. Eppehimer Lake Michigan Larval Fish Densities and Growth Rates across a Nutrient Gradient	P.W. Allen Protecting the Great Lakes from Harmful Withdrawals and Diversions: Progress and Prospects	8:40
A.W. Milt Optimizing Barrier Removals in the Great Lakes Basin	E.R. Stadig Optimizing Trap Design for Capture of Amphipods in western Lake Erie	D.J. Wells Thermocline Formation Timing Affects Lake Michigan Larval Fish Phenology and Recruitment Potential	<u>K. Todd</u> Ontario's Water Resource Information: An Update on Spatial Data, Tools and Applications	9:00
	1	1	BREAK	9:20

	MacKinnon 117	MacKinnon 120	Rozanski 101	Rozanski 102	
	Governance Frameworks and Indicators: Multi-level Applications in the Great Lakes Region Co-Chairs: Carolyn Johns, Gail Krantzberg, and Debora VanNijnatten	Understanding and predicting nutrient transfer from agricultural sources to surface waters Co-Chairs: Kimberley Schneider, Pamela Joosse, Natalie Feisthauer, and Keith Reid	Long-Term Monitoring: Challenges and Achievements Co-Chairs: Alexander Karatayev, Lars Rudstam, Lyubov Burlakova, and James Watkins	Integrated management and monitoring of Lake Simcoe and its watershed Co-Chairs: Danijela Puric- Mladenovic, Jill Crossman, and Joelle Young	
9:40	G.B. Arhonditsis Evaluating criteria for the delisting of Beneficial Use Impairments in Great Lakes Areas of Concern	D.K. Reid Tile Drains as Conduits for P Loss from Agricultural Land - Myths and Reality	C.C. Wellen How much data is needed to robustly detect changes in water quality in agricultural watersheds?	M. Shapiera Integrative monitoring and rapid response to Water Soldier (<i>Stratiotes aloides</i>) in the Lake Simcoe watershed	
10:00	<u>A. Mandelia</u> Life After Delisting for Former Great Lakes Areas of Concern	J. Plach Subsurface P Export from Agricultural Lands across Southern Ontario: Transport- or Supply- limited?	J.J.H. Ciborowski Zoobenthic Indicators of the Condition of Lake Erie and the Great Lakes Nearshore	S.E. MacKay Resident Attitudes, Perceptions and Practices regarding Fertilizer Use in the Lake Simcoe Watershed	
10:20	S.E. Cooke Multi-agency Implementation of the Grand River Water Management Plan	W.V. Lam Climate Drivers of Runoff and Phosphorus Export Through Agricultural Tile Drains Under Sandy Loams	L.E. Burlakova What's on the bottom? Spatial gradients and temporal changes in Great Lakes benthic communities	<u>T. Choudhury</u> Use Of Woodchip Biofilters For In-Field Nutrient Treatment	
10:40	<u>S. Simoliunas</u> The Road Not Taken by Great Lakes Water Authority	S.K. Frey Tile drainage management influences on nutrient movement following swine manure applications	S.E. Daniel The effect of <i>Dreissena</i> on vertical distribution and abundance of Oligochaeta in Lake Erie	D. Lembcke Can we Implement Environmental Flows in a catchment not experiencing low flow stress?	
11:10	PLENARY, Rozanski Hall, Room 104				
12:20	BUFFET LUNCH, Creelman	n Hall			

Rozanski 103	Rozanski 104	Rozanski 105	Rozanski 106	
Microbial Ecology of the Great Lakes, from Genomes to Geochemistry Co-Chairs: Maureen Coleman, Vincent Denef, and Kevin Meyer	Emerging priorities for non-native species prevention and control Co-Chairs: Lindsay Chadderton, Sarah Cook, and Erika Jensen	Ecological connections in Lake Michigan: Insights from the 2015 CSMI intensive field year Co-Chairs: Beth Hinchey-Malloy, Bo Bunnell, and Paris Collingsworth	A framework for managing water use in the Great Lakes-St. Lawrence River Basin Chair: Jennifer Keyes	
L.E. Kinsman-Costello Microbial ecology and biogeochemistry of a high- sulfur submerged sinkhole in Lake Huron, MI	J. Vanden Byllaardt Dead or alive? Developments in the detection of aquatic invasive species in ballast water	P.M. Armenio Round 2 of Lake Michigan CSMI: are biota rolling with the punches?	E. Gazendam Stream-Habitat Assessment Tool for Restoration Projects	9:40
R.M. McKay Metatranscriptome Analysis of Lake Erie's Winter Diatom Bloom	D.A.R. Drake Demographic Parameters and Allee Effects Dictate Ballast-mediated Spread in the Great Lakes Basin	J.F. Cavaletto Spatial Organization of Pelagic and Benthic Food Webs in Southern Lake Michigan in 2015	L. Fry Advances in binational coordination of overlake precipitation data for Great Lakes water management	10:00
<u>S. Shirani</u> The role of neutral evolution in the biogeography of cyanobacteria populations of lake systems	K.M. Hebebrand Potential Spread of Hydrilla (<i>Hydrilla verticillata</i>) to the Great Lakes Basin	C.J. Foley Importance of terrestrial inputs to small-bodied, nearshore fishes in Lake Michigan	<u>E. Fausto</u> State of Climate Change Science in the Great Lakes Basin	10:20
M.B. Duhaime Lake Erie Viruses: 'Viromic' Approaches to Track the Killers of Erie's Blooming Microbes	S.A. Fera Predicting establishment and spread of invasive species in the Great Lakes under climate change	<u>J. Hoffman</u> Stable Isotope Differences Among the Lake Michigan 2015 CSMI Transects		10:40
PLENARY, Rozanski Hall, Room 104				
		BUF	FET LUNCH, Creelman Hall	12:20

approaches to solve problems relating to Great Lakes Coastal wetlands Ca-Chairs: Paria Chou-Frauer, Chaiter Markie, and Linder Bordloadings to Great Lakes from agricultural non- point sources Ca-Chairs: T.Q. Zhang and Chin, S. TanChailenges and Ca-Chairs: Machine Markie, and James Watkinsand monitoring of Lake Sincoe and its watershed Ca-Chairs: T.Q. Zhang and Chin, S. TanChailenges and Ca-Chairs: Machine Machine, and James Watkinsand monitoring of Lake Sincoe and its watershed Ca-Chairs: T.Q. Zhang and James Watkinsand monitoring of Lake Sincoe and its model to the spotted turtle (Cleanny) gattatic)1:40S.E. Fraser Long-term habitat changes be from agricultural Lands: Progresses and PerspectivesP.D. Collingsworth Trends in total phosphorus and choophyll in Lake Eric insights from two monitoring programsA. Gudimov Probabilistic Assessment of Nutricine Baseline Export in Lake Simcoe Watershed wid SPARROW Model2:00C.E. Markle Can thermal characteristics be used to identify Blanding's bisolved Phosphorus Statification for Targeting Dissolved Phosphorus Reduction ProgramsC.A. Stow Exploratory Data Analysis on Factors Related to Microcystic Concentration in Western Lake EricP.K. Jurjans Using Oblique Imagery to Imarove Shoreline Mapping of Lake Sincoe2:00N.J. Wood The invasive mute swan inpacts on submerged appropriate vegation in Michigan's coastal wethandsJ.R. Cober Impact of Freeze-Thaw Cycle Magnitudes on the Release of Phosphorus From Cover CropsJ.F.B. Stille Integrated Restoration Prointization using Long Term Monitoing and Modelling DataD.O. Evans Stable isotop		MacKinnon 117	MacKinnon 120	Rozanski 101	Rozanski 102
Long-term habitat changes before and after extirpation of the spotted turtle (<i>Clemmys</i> guttatic)Mitigating Phosphorus Loss from Agricultural Lands: Progresses and PerspectivesTrends in total phosphorus and chlorophyll in Lake Eric: insights from two monitoring programsProbabilistic Assessment of Nutrient Baseline Export in Lake Sincoe Watershed with SPARROW Model2:00<		approaches to solve problems relating to Great Lakes coastal wetlands Co-Chairs: Patricia Chom-Fraser,	loadings to Great Lakes from agricultural non- point sources Co-Chairs: T.Q. Zhang and Chin, S.	Challenges and Achievements Co-Chairs: Alexander Karatayev, Lars Rudstam, Lyubov Burlakova,	watershed Co-Chairs: Danijela Puric- Mladenovic, Jill Crossman, and Joelle
Can thermal characteristics be used to identify Blanding's turtle overwintering sites?Implications of Phosphorus Stratification for Targeting Dissolved Phosphorus Reduction ProgramsExploratory Data Analysis on Factors Related to Microcystin Concentration in Western Lake ErieUsing Oblique Imagery to Improve Shoreline Mapping of Lake Simcoe2:20N.J. Wood The invasive mute swan impacts on submerged aquatic vegetation in Michigan's coastal wetlandsJ.R. Cober Impact of Freeze-Thaw Cycle Magnitudes on the Release of Phosphorus From Cover CropsJ.F.B. Stille Integrated Restoration Prioritization using Long Term Monitoing and Modelling DataD.O. Evans Stable isotopes and plant pigments in sediment cores map changes in trophic state over two centuries2:40L.M. Boyd Are current indices appropriate for determining wetland health under water- level disturbances?C.E. Spiese Phosphate Desorption by Glyphosate in the Maumee River Watershed: Implications for WesternR.G. Biastoch Detecting Responses in Benthic Invertebrate 	1:40	Long-term habitat changes before and after extirpation of the spotted turtle (<i>Clemmys</i>	Mitigating Phosphorus Loss from Agricultural Lands:	Trends in total phosphorus and chlorophyll in Lake Erie: insights from two monitoring	Probabilistic Assessment of Nutrient Baseline Export in Lake Simcoe Watershed with
2:20The invasive mute swan impacts on submerged aquatic vegetation in Michigan's coastal wetlandsImpact of Freeze-Thaw Cycle Magnitudes on the Release of Phosphorus From Cover CropsIntegrated Restoration Prioritization using Long Term Monitoing and Modelling DataStable isotopes and plant pigments in sediment cores map changes in trophic state over two centuries2:20L.M. Boyd Are current indices appropriate for determining wetland health under water- level disturbances?C.E. Spiese Phosphate Desorption by Glyphosate in the Maumee 	2:00	Can thermal characteristics be used to identify Blanding's	Implications of Phosphorus Stratification for Targeting Dissolved Phosphorus	Exploratory Data Analysis on Factors Related to Microcystin Concentration in	Using Oblique Imagery to Improve Shoreline Mapping
Are current indices appropriate for determining wetland health under water- level disturbances?Phosphate Desorption by Glyphosate in the MaumeeDetecting Responses in Benthic InvertebrateA Synthesis of Multiple2:40Wetland health under water- level disturbances?River Watershed: Implications for WesternCommunities to Increasing Stream Chloride in Toronto,Watershed	2:20	The invasive mute swan impacts on submerged aquatic vegetation in	Impact of Freeze-Thaw Cycle Magnitudes on the Release of Phosphorus From	Integrated Restoration Prioritization using Long Term Monitoing and	Stable isotopes and plant pigments in sediment cores map changes in trophic state
	2:40	Are current indices appropriate for determining wetland health under water-	Phosphate Desorption by Glyphosate in the Maumee River Watershed:	Detecting Responses in Benthic Invertebrate Communities to Increasing	A Synthesis of Multiple Stressors in the Lake Simcoe
P. Samarasin Species richness and sampling for detection of fish species-at-risk in Ontario wetlandsN.R. Aloysius Changing characteristics of precipitation and its impact on nutrient delivery to Lake ErieA.S. Chiandet Testing Influences of Driver Gradients on the Nearshore Nutrient Regime in Eastern Georgian BayK.Y. Lee Browning of Lake Simcoe and potential ecological consequences	3:00	Species richness and sampling for detection of fish species-at-risk in Ontario	Changing characteristics of precipitation and its impact on nutrient delivery to Lake	Testing Influences of Driver Gradients on the Nearshore Nutrient Regime in Eastern	Browning of Lake Simcoe and potential ecological
3:20 BREAK	3:20	BREAK			

Rozanski 103	Rozanski 104	Rozanski 105	Rozanski 106	
Physical Ecology in Large Lakes and their Watersheds Co-Chairs: Shaylah Tuttle-Raycraft and Josef Ackerman	Emerging priorities for non-native species prevention and control Co-Chairs: Lindsay Chadderton, Sarah Cook, and Erika Jensen	Genetic approaches and examples for understanding biodiversity and invasive species Co-Chairs: Carol Stepien, Jeffrey Ram, Katy Klymus, and Andrew Mahon	Emerging Monitoring Technologies for Assessing the Health of the Great Lakes-St. Lawrence Co-Chairs: Michael Twiss and Lizbu Wang	
S.M. Brothers Could Lake Erie Be Experiencing a Brownification-Anoxia Feedback Loop?	J.D. Midwood Non-Native Starry Stonewort in Lake Ontario	<u>A.R. Mahon</u> Using Active and Passive Molecular Tools for Surveillance in Aquatic Environments	M.R. Twiss Current status of Emerging Technologies in the LGL- SLR: Results of a basin-wide survey in 2015	1:40
L.E. Harris The Effect of Velocity on the Carbon Isotope Fractionation of Aquatic Macrophytes	D.G. Uzarski Faucet snail (<i>Bithynia</i> <i>tentaculata</i>) occurrence across the Great Lakes basin in coastal wetlands	<u>J.L. Ram</u> Digging Deeper into Benthic Biodiversity	K.K. Arend Long-term water quality monitoring at Old Woman Creek National Estuarine Research Reserve	2:00
N. Nakhaei Hydrodynamic and biogeochemical modeling of stormwater ponds	S. Avlijas Evaluating and predicting impact of Tench (<i>Tinca tinca</i>), a globally introduced cyprinid	K.E. Klymus High-Throughout Sequencing Assays to Detect Aquatic Invasive Species from Environmental Samples	M.M. Corbiere Multiscale Mapping of Lake Champlain Algal Blooms	2:20
M.D. Rowe Post-dreissenid spatial distribution of chlorophyll in a Lake Michigan biophysical model	H.S. Embke Assessing Spawning Locations of Naturally Spawned Grass Carp Eggs in a Great Lakes Tributary	<u>C.A. Stepien</u> Genetic History of the VHS Fish Virus' Decade in our Great Lakes: Still Here and Mutating!	<u>A.D. Weinke</u> Time-series buoy observatory allows monitoring of unforeseen and difficult to track lake phenomena	2:40
J.M. Majarreis Dissipation of TKE and implications for phosphorus fluxes in the nearshore of East Basin, Lake Erie	T. McNeil Why Is Purple Loosestrife on the IUCN's 100 of the World's Worst Invasive Species List?	<u>C.A. Currier</u> Detection Probabilities of Environmental DNA (eDNA) and Traditional Sampling for Unionid Mussels	<u>C.B. Fuller</u> Comprehensive Iterative Adaptive Operational Model for Comprehensive Inland and Coastal Monitoring	3:00
			BREAK	3:20

	MacKinnon 117	MacKinnon 120	Rozanski 101	Rozanski 102
	Interdisciplinary approaches to solve problems relating to Great Lakes coastal wetlands Co-Chairs: Patricia Chom-Fraser, Chantel Markle, and Lindsey Boyd	Mitigating nutrient loadings to Great Lakes from agricultural non- point sources Co-Chairs: T.Q. Zhang and Chin, S. Tan	Long-Term Monitoring: Challenges and Achievements Co-Chairs: Alexander Karatayer, Lars Rudstam, Lyubor Burlakova, and James Watkins	Integrated management and monitoring of Lake Simcoe and its watershed Co-Chairs: Danijela Puric- Mladenovic, Jill Crossman, and Joelle Young
3:40	T.J. Calappi Establishment of Compensating Works Gate Movement Limits to Prevent Fish Stranding	K.D. Barnswell Remediation and Restoration Strategies to Reduce Non- point Source Pollutants Entering Lake Erie	T. Darwish A long-term Monitoring Study on Smallmouth Bass Nesting in the Bruce Power Discharge Channels	J. Young The Zooplankton Community of Lake Simcoe: Indicators of the Effects of Multiple Stressors
4:00	A.N. Kneisel Impact of <i>Phragmites</i> Invasion on Macroinvertebrate Communities in Wetlands of Thunder Bay, MI	L.T. Johnson Linking 4R nutrient stewardship at the farm to water quality from the field to watershed	B.A. Wheelock Factors Affecting Current Distribution of Anurans in Great Lakes Coastal Wetlands	<u>A.R. Challice</u> Assessing the sustainability of re-opening a limited recreational fishery for Cisco in Lake Simcoe
4:20	S.L. Endres Monitoring the effectiveness of <i>Phragmites australis</i> treatment for the Great Lakes coastline	<u>J. Ju</u> Fate and Transport of Land Applied Waste Greenhouse Feed Water During Field Infiltration Tests	B. Felipe Martinez Monitoring and Evaluation of Water Quality of Taal Lake, Taal Batangas Philippines	R. Melzer Lake Simcoe: Great Lakes "lessons learned" and Ontario's new Great Lakes Protection Act
4:40	D.M. Haak Introducing the <i>Phragmites</i> Adaptive Management Framework (PAMF)	J.D. Igras Quantifying agricultural best management practices in Ontario`s Grand River Watershed	R.W.K. Tang Bay of Quinte Long-Term Submerged Aquatic Vegetation Monitoring: A Modelling Approach	
5:00	K.C. Chisholme A Multidisciplinary Approach to Coastal Wetland Design	J.R. Smudde A Utility-Led Agricultural Based Adaptive Management Pilot Study in Silver Creek- Green Bay, WI		
5:20		<u>C.S. Tan</u> Drainage Control and Water Recycling to Reduce Nutrient Loadings to Great Lakes		
5:40		M.F. Bowman Invertebrate community response to cumulative anthropogenic stress in the Laurentian Great Lakes		

Rozanski 103	Rozanski 104	Rozanski 105	Rozanski 106	
Physical Ecology in Large Lakes and their Watersheds Co-Chairs: Shaylah Tuttle-Raycraft and Josef Ackerman	Emerging priorities for non-native species prevention and control Co-Chairs: Lindsay Chadderton, Sarah Cook, and Erika Jensen	Genetic approaches and examples for understanding biodiversity and invasive species Co-Chairs: Carol Stepien, Jeffrey Ram, Katy Klymus, and Andrew Mahon	Emerging Monitoring Technologies for Assessing the Health of the Great Lakes-St. Lawrence Co-Chairs: Michael Twiss and Lizhu Wang	
<u>C.R. Farrow</u> Effects of Riverine Inputs on Phytoplankton Community Structure	P. Bzonek Common Carp movement in response to acoustic and strobe-light barriers in a mesocosm	N.T. Marshall A High-Throughput Sequencing Assay to Detect and Identity Composition of Dreissenid Communities	J.P. Smith Tools of the data Smithe's trade	3:40
D. Gao The Effects of Collector Motion on Particle Capture	J.J. Davis Entrainment, retention, and transport of freely swimming fish in junction gaps between barges	A.A. Vasquez Biogeography of <i>Eurytemora</i> <i>carolleeae</i> in the Great Lakes revealed by phylogeny and morphology	<u>C.M. Riseng</u> A geospatial framework and spatially referenced decision tools for Great Lakes management	4:00
<u>K. Tran</u> Selective Feeding of Freshwater Mussels: Implications for Resource Partitioning	J.K. Brinsmead A Risk Assessment Framework to Support the Ontario Invasive Species Act	D.J. Eddins Population Genetics of Invasive Eurasian Ruffe over Time and Space	<u>B. Kerkez</u> More Science for the Buck: Real-time Data For the Study of the Great Lakes	4:20
J.D. Ackerman Algal flux affects the clearance rates of recently metamorphosed freshwater mussels	P.A. Green Emergency treatment of ballast for aquatic invasive prevention: Moving beyond testing to treatment	P.T. Euclide Effect of Fish Dispersal Ability on Sensitivity to Habitat Fragmentation in a Large Lake	S.A. Ruberg Observing Systems Technology Development at NOAA/GLERL	4:40
S. Tuttle-Raycraft The Effect of Suspended Sediment Flux on the Suspension Feeding of a Freshwater Mussel	J.K. Brinsmead Getting Ahead of the Learning Curve: Ontario Lessons Learned in Response to Aquatic Invasive Species	<u>A. Trebitz</u> Challenges and Progress in Making DNA-based Monitoring Operational - AIS Early Detection as Testbed	W.J.S. Currie A living e-doc on Great Lakes emerging technologies	5:00
J.L. Jonas Habitat use and spawning behavior of a unique Lake Trout population in Elk Lake, MI	C.D. Robichaud Field plots in Phrag: Revealing mechanisms of <i>Phragmites</i> success			5:20
L. Cruz-Font Thermal Biology Explains Fish Behaviour During Upwelling Events in a Large coastal Embayment	G.M. Howell An Investigation of Invasive <i>Phragmites</i> Restoration Treatments in a Lake Erie Coastal Marsh			5:40

	MacKinnon 117	MacKinnon 120	Rozanski 101	Rozanski 102
	From Data to Decisions: A decade of progress for the Great Lakes Observing System Co-Chairs: Kelli Paige, Ed Verhamme, and Tom Johengen	Modelling and assessment of agricultural BMPs on pollutant reduction to the Great Lakes Co-Chairs: Yongbo Liu, Luis Leon, and Isaac Wang	Sources, Fate, Impacts, and Management of Microplastics in the Great Lakes Environment Co-Chairs: Patricia Corcoran and Paul Helm	Restoration, Conservation and Management of Freshwater Fish. Chair: Nicholas Mandrak
8:00	K.K. Paige Cultivating a Data Community to Maximize Potential of the Great Lakes Observing Enterprise	S.A. Nummer Effect of Conservation Practices on Agricultural Nutrient Loss	Tutorial	S.E. Campbell Functional Traits of Failed Fish Introductions in the Great Lakes
8:20	K.R. Knee MyGLOS: A Customizable View into the Great Lakes Observing System	B. Gharabaghi Evaluation of Agricultural Management Practices for Protection of the Great Lakes Water Quality	<u>P. Helm</u> Microplastics in and entering nearshore surface waters of the lower Great Lakes	L.G. Simard Can Suppression Inform Restoration? Insights from Lake Trout in Yellowstone Lake
8:40	K. Koch GLOS HABs Data Viewer: How DMAC Helps HABs Data Flow from Researchers to Decision Makers	Y. Liu Place-based Modelling for Assessing Water Quantity Effects of BMPs under Climate Change	M.D. Rennie First Estimate of Microplastic Pollution in Lake Winnipeg	S.F. Farha Lake Trout Spawning Habitat Selection in the Divatmond Island Refuge Daradigm or Paradox?
9:00	M.G. Billmire Sharing Great Lakes remote sensing data through integrated web portals	K.G. Panjabi Incorporation of Variable Source Area Runoff Generation Mechanism into the Hydrology of the AGNPS Model	M.B. Duhaime Microbial Trash Surfers: Modeling Transit and the Ecology of the Great Lakes Plastic Microbiome	J.J. Sherman A habitat suitability model for possible lake sturgeon reintroduction in the Maumee River
9:20	M.R. Paufve Compiling 50 Years of Data for Lake Ontario: Collaborative Data Management and Historical Trends	R.B. Confesor Achieving Nutrient Load Reduction Targets in the Western Lake Erie Basin: A Multi-Model Approach	L.M. Rios Mendoza Microplastics as a source of Persistent Organic Pollutants in the Laurentian Great Lakes	<u>J.L. Jonas</u> Identification of Origins of Juvenile Steelhead Using Otolith Chemical Signatures
9:40	O.C. Gates Great Lakes Adaptation Data Suite: Climate Data Focused on Adaptation Decision- Making	H. Shao An Open Source GIS-based Decision Support System for Watershed Evaluation of BMPs	A.M. Ballent Microplastic Contaminant Loads in Lake Ontario Sediments with a Focus on Toronto, Canada	R.A. Castaneda A novel detection technique for fishes at risk
10:00	BREAK		1	1

Rozanski 103	Rozanski 104	Rozanski 105	Rozanski 106	
Molecular approaches to understanding drivers of CyanoHABs and toxin/metabolite production Co-Chairs: Timothy Davis, Silvia Newell, and George Bullerjahn	Food Web Dynamics in the Great Lakes: Processes and Patterns <i>Chair: Neil Rooney</i>	One Water: Integrating Water Systems for Sustainable Great Lakes Water Quality Chair: Bill Trenouth	Diseases and Pathogens of the Great Lakes and Inland Waters Chair: Kevin Strychar	
	I.C. Harding The Effect of <i>Bythotrephes</i> <i>longimanus</i> Invasion on Cisco Growth in Lake Superior	S. Molnar Tools for Implementing Integrated Water Management	M. Short A Newly Isolated Algal Virus Cultivated from the Bay of Quinte Infects the <i>Haptophyte</i> <i>Chrysochromuli</i>	8:00
<u>N.V. Ivanova</u> Rapid Assessment of Algal and Bacterial Community Composition and Harmful Blooms Using DNA Barcoding	T.R. Hrabik The Role of Demersal prey in Mediating Diel Vertical Movement by Siscowet in Lake Superior	C.A. Zimmer Applying a Vulnerability Assessment Framework to Identify Stressors and Maintain Healthy Great Lakes	N.R. Gezon Understanding viral pathogens and their role in Diporeia decline in Lake Michigan	8:20
C.E. Givens Changes in Bacterial Communities in Relation to Harmful Algal Bloom Formation and Toxin Occurrence	Y.P. Yongabo Lake Kivu Fish Stock and its Sustainable Exploitation	<u>A.L. Lenarduzzi</u> A Decision Support Tool for Sustainable Water Management and Planning	M.Z. Wu Accumulation and Distribution of Fecal Indicator Bacteria near the Shoreline at Freshwater Beaches	8:40
T.W. Davis Investigating the Role of Reactive Oxygen Species in Driving Bloom Toxicity in western Lake Erie	R.D. Briland Cyanobloom impacts on higher consumers in western Lake Erie	<u>A. Singh</u> Development of a Low Impact Development and Urban Water Balance Modeling Tool	M. Luttenton Early detection of cercarial dermatitis (swimmer's itch) and its relationship between particular nut	9:00
C.K. Knight Patterns in Space and Time of <i>Microcystis</i> Sediment Seed Stock Viability in Western Lake Erie	C.J. Houghton Relative use of wetland and nearshore habitats by sportfishes of Green Bay	T. Boston Watershed Decision Support Systems: Policy, Planning and Cumulative Effects Assessment Applications	<u>N. Nemeth</u> The Red Fox (<i>Vulpes vulpes</i>) as a Potential Sentinel for <i>Blastomyces dermatitidis</i> in Ontario, Canada	9:20
J.D. Chaffin Interactive Effects of N, P, and Light on Cyanobacteria Growth and Microcystin Production	C.L. Yanos Evaluating Importance of Nutrient and Productivity Gradients on Lake Erie Fish- Community Structure	Tutorial	<u>G. Whelan</u> Who is next? Some thoughts on the likely next pathogen and fish health challenges for the Great Lake	9:40
		1	BREAK	10:00

	MacKinnon 117	MacKinnon 120	Rozanski 101	Rozanski 102		
	From Data to Decisions: A decade of progress for the Great Lakes Observing System Co-Chairs: Kelli Paige, Ed Verhamme, and Tom Johengen	Modelling and assessment of agricultural BMPs on pollutant reduction to the Great Lakes Co-Chairs: Yongbo Liu, Luis Leon, and Isaac Wang	Sources, Fate, Impacts, and Management of Microplastics in the Great Lakes Environment Co-Chairs: Patricia Corcoran and Paul Helm	Restoration, Conservation and Management of Freshwater Fish. Chair: Nicholas Mandrak		
10:20	C.M. Holbrook The Great Lakes Acoustic Telemetry Observation System: First five years		B.Y. Dean Microplastics in beach and bottom sediments of Lake Erie and its tributaries			
10:40	J.S. Beugly Targeting audiences for buoy data: a case study in southern Lake Michigan	G. Golmohammadi Assessing Tile Drainage Impact on Water Budget and Sediment Yield in an Agricultural Watershed	M.J. Hoffman Modeling Plastic Input and Transport in the Great Lakes			
11:00	W. Xu Spatio-temporal Kriging Analysis of Lake Bottom Dissolved Oxygen in the Central Basin of Lake Erie	M.E. Herbert Watershed-scale modelling of drainage practices to improve water quality in Western Lake Erie	K.E. Munno Microplastic Ingestion By Shape in Several Species of Fish from Lake Ontario			
11:20	D.G. Stuart Improvements in Monitoring and Prediction of Western Lake Erie Harmful Algal Blooms	A.A. Ameli Assessment the Appropriateness of Best Management Practices in Controlling Eutrophication	J.A. Pate Studying Microplastics in the Great Lakes: A Citizen Science Model			
11:40	S.L. LaBuhn Estimating summertime primary production via in- situ monitoring in Green Bay, Lake Michigan	L. Wong Optimization of Beneficial Management Practice in the SWAT Model for Grand River Watershed	<u>L. Erdle</u> Education Opportunities in Microplastics for Youth			
12:00			P.L. Corcoran Microplastics as global markers of the Anthropocene			
12:20	BUFFET LUNCH, Creelman Hall					

Rozanski 103	Rozanski 104	Rozanski 105	Rozanski 106		
Molecular approaches to understanding drivers of CyanoHABs and toxin/metabolite production Co-Chairs: Timothy Davis, Silvia Newell, and George Bullerjahn	Food Web Dynamics in the Great Lakes: Processes and Patterns <i>Chair: Neil Rooney</i>	Watershed processes: Contemporary and past perspectives Co-Chairs: Roberto Quinlan and Jaclyn Cockburn	Undergraduate Civic Engagement in Great Lakes Restoration and Stewardship Chair: Glenn Odenbrett		
<u>A. Zastepa</u> Do nitrogen forms influence microcystin variant composition in Lake Erie and Ontario surface waters?	M.S. Kornis Spatiotemporal patterns in trophic niche overlap among five Lake Michigan salmonine species	J. Medellin-Azuara Managing for Droughts: Recent Impact Studies for California	W.D. Burns SENCER: A Community of Transformation	10:20	
<u>E. Davenport</u> Diel Metatranscriptomics of the 2014 Lake Erie Microcystis Bloom	<u>G. Paterson</u> Ecological Tracers Indicate Basin Specific Ecologies for the Lake Huron Food Web	F.M.G. McCarthy Non-pollen palynomorphs as biomonitors of anthropogenic impact on Lake George, NY	Previous Presentation Continued	10:40	
<u>J. Lu</u> qPCR and RT-qPCR of Harmful Cyanobacteria at Lake Harsha, OH, during Summer	J.T. Ives Mechanisms and Function of Food Webs in Large Freshwater Lakes: Lake Ontario as a Model	N.L. Riddick Wendat (Huron) Impact on Lake Simcoe: Paleolimnological Evidence	<u>G.C. Odenbrett</u> Undergraduate Engagement in Great Lakes Restoration, Research, and Stewardship: GLISTEN	11:00	
<u>T. Tuttle</u> Seasonal investigation of the Planktothrix cyanobacterial bloom community in Sandusky Bay	Y.C. Kao How Will Salmonine Stocking Levels, Nutrient Inputs, and Mussel Trajectories Influence Lake Michigan	F.A. Fitzpatrick Baseline Mining-Related Geochemical Assessment of Water and Sediment in the Bad River Mouth	J.J. Minesky Creating Synergies for Great Lakes Ecosystem Restoration & Sustainability Via Undergraduate Courses	11:20	
K.A. Meyer Incorporating Great Lakes Isolates of <i>Microcystis</i> sp. to Comparative Genomics Studies	<u>A.M. McLeod</u> The Lake Huron Story: Putting The Pieces Together Using Contaminant Tracers	<u>M.A. Atieh</u> Prediction of Sediment Rating Curve Parameters for Ungauged Basins	A.C. Tyler Partnerships for Wetland Restoration to Achieve Regulatory, Conservation and Educational Goals	11:40	
<u>R. Saati</u> Molecular Profiling of Harmful Algal Blooms in Hamilton Harbour, Lake Ontario	J. Yang Spawning Site Location of Commercial Anadromous <i>Coilia nasus</i> in the Poyang Lake, China	K. Eckman Factors Contributing To Community Resilience in Extreme Climatic Conditions	D.J. Taylor Addressing Community Water Issues with Adult and Adolescent Learners Through Service Learning	12:00	
BUFFET LUNCH, Creelman Hall					

STATE OF LAKE MEETINGS

We are pleased to announce that IAGLR is partnering with several other organizations to arrange a series of *State of Lake* meetings. These meetings aim to better connect Great Lakes research activities with management, education, and extension interests. Contact Tomas Höök, thook@purdue.edu, or Chad Cook, chad.cook@ces.uwex.edu, for more information.



State of Lake Michigan Conference

In fall of 2017, IAGLR will collaborate with University of Wisconsin Extension, UW Green Bay, and the Great Lakes Beach Association to launch the first of these meetings:

2017 State of Lake Michigan Conference Green Bay, Wisconsin

SCIENCE COMPLEX ATRIUM

Trophic and Food Web Dynamics (FWD) Fisheries & Fisheries Management (FFM) Physical Processes & Limnology (PPL) Stressors in the Great Lakes (SGL) Monitoring, Analysis & Modeling (MAM) Watershed Case Studies (WCS) Remote Sensing & Detection Techniques (RST) Integrative (urban) Planning and Ecology (IPE) Governance, Education and Outreach (GEO)

Trophic and Food Web Dynamics (FWD)

- FWD-1 BOZIMOWSKI, A.A. Nutrient limitation of algal biofilms in Great Lakes coastal wetlands: Gradients and their influence
- FWD-2 COLLIER, K. Microbial community partitioning between ice and water during winter in large lakes
- FWD-3 CZESNY, S.J. Fatty acid profiles of lake trout reveal variability in trophic connections across spatial scale
- FWD-4 HOFFMANN, J.M. Quantifying trophic position and niche overlap among morphotypes of lake trout in Lake Superior
- FWD-5 JOHNSON, R.J. Emerald shiner prey item analysis in the upper Niagara River
- FWD-6 MORATZ, C.C. Growth and ecology of Bowfin (Amia calva) in Green Bay, Lake Michigan
- FWD-7 ODEGARD, J.L. The role of functional diversity in biotic resistance of exotic fishes and invertebrates in wetlands
- FWD-8 O'REILLY, K.E. Quantifying Lake Michigan coastal wetland-nearshore linkages for sustaining sport fisheries
- FWD-9 REAVIE, E.D. Phytoplankton community change-points across gradients of nutrients and invasive mussels
- FWD-10 WÄNGBERG, S.A.

Phytoplankton and bacteria in Lake Vänern: Biomass, production and dependence of physical factors

Fisheries & Fisheries Management (FFM)

- FFM-1 ALLEN, B.A. Effects of multiple stressors on the fish communities of the Credit River watershed
- FFM-2 ANDERSON, R.M. Development of a rapid zooplankton assessment tool for fisheries research and management
- FFM-3 BANNISTER, A.E. Who is fishing the Great Lakes? Identifying risky behaviors in anglers
- FFM-4 COYLE, B.P. Diet and growth of larval lake whitefish in the St. Clair-Detroit River system
- FFM-5 FLECK, S.J. Habitat use of larval fish in the macrophyte beds of Niagara River wetlands
- FFM-6 HEER, T. Predicting Asian carp spawning in the tributaries and nearshore of the Canadian Great Lakes basin
- FFM-7 HORNSBY, R.L. Movements of black bass after tournament displacement in the Bay of Quinte and eastern Lake Ontario
- FFM-8 JAWAID, M. Tench eradication project: Midhurst District, MNRF
- FFM-9 LI, Y. Bayesian variable selection for the determination of factors related to fish movement distance
- FFM-10 MACDONALD, J.L. Variation in yellow perch (*Perca flavescens*) growth rate in the Great Lakes
- FFM-11 MITCHELL, K.T. The reproductive effects of thiamine deficiency in three populations of Atlantic salmon
- FFM-12 PENNUTO, C.M. Mottled sculpins exhibit a moderate response to instream habitat improvements in Elton Creek

Physical Processes & Limnology (PPL)

- PPL-1 ANNEVILLE, O. Plasticity in phytoplankton annual periodicity: An adaptation to long-term environmental changes
- PPL-2 ARMSTRONG, M.R. Creating a budget: Preliminary measurements of hydrology in Laguna Bacalar, Mexico
- PPL-3 BEIGZALI, N. Numerical simulations of sediment oxygen demand in Lake Erie
- PPL-4 BYUN, K. Hydrological responses to climate change in the midwest Great Lakes watersheds
- PPL-5 ELBAGOURY, D. Identifying and assessing the impacts of phosphorus loads in eastern Nottawasaga Bay
- PPL-6 GUO, J. Hydrological landscape classification assess flow regime to climate variability in Ontario, Canada
- PPL-7 HEWITT, B.A. Effects of climate change on lake ice phenology and consequential ecosystem impacts on boreal lakes
- PPL-8 IRAMBONA, C. Moisture recycling over the Laurentian Great Lakes as simulated by the CRCM5
- PPL-9 JABBARI, A. Evaluation of inertial dissipation and structure function methods within bottom boundary layers
- PPL-10 JOHNSTON, J.W. Unravelling the natural rhythm of the upper Great Lakes preserved in ancient shorelines
- PPL-11 JORDAN, N.B. Coastal bluff evolution adjacent to shoreline protection structures in Lake Michigan

- PPL-12 KASTER, J.L. Conserving a world class lake: Laguna Bacalar,
 - Mexico
- PPL-13 KIRKWOOD, A.E. Assessment of land-use impacts on water quality and phytoplankton communities in the Vermilion

PPL-14 LI, W.

River

Evaluating trends and patterns of glacial isostatic adjustment near Lake Superior

- PPL-15 LIN, S.Q. Sediment resuspension modeling in Lake Erie
- PPL-16 MORRISON, S. Delineating the subsurface to reconstruct coastal history at sites in Lake Superior and Lake Huron
- PPL-17 PERLOV, D. Tracking hypoxia in the central basin of Lake Erie using a paleolimnological approach
- PPL-18 THOMPSON, M.A. Carbon budget of mangroves in freshwater and brackish systems of the Yucatan Peninsula
- PPL-19 VAN PATTER, J. Evaluating suspended load flux after a 500-year runoff event
- PPL-20 ZHENG, Y. Effects of multiple stressors on brook trout populations in the Greater Toronto Area

Stressors in the Great Lakes (SGL)

- SGL-1 BARNSWELL, K.D. Developing models for predicting Microcystin concentrations at Ohio recreational lakes
- SGL-2 BURKE, H.E. Effects of surficial geology on Lake Erie tributary water and sediment phosphorous concentrations

- SGL-3 CHEN, E.S. Algal concentration reduced by ultraviolet light treatment
- SGL-4 DEAN, B.Y. Microplastics in beach and bottom sediments of Lake Erie and its tributaries
- SGL-5 DERMINIO, D.S. Effects of nutrient limitation on the photosynthetic efficiency of *Microcystis aeruginosa*
- SGL-6 DIFALCO, R. Agricultural drainage tile density compared to natural soil drainage
- SGL-7 DULAL-WHITEWAY, C.J. Fish-killing activities of *Prymnesium parvum*
- SGL-8 EL-ANSARI, O. Ecophysiology and toxin production of the benthic freshwater cyanobacterium *Lyngbya wollei*
- SGL-9 FAKOURI BAYGI, S. Comprehensive emerging chemical discovery: Polyfluorinated compounds in Lake Michigan trout
- SGL-10 GATCH, A.J. Mercury dynamics in aquatic food webs of the Finger Lakes, New York
- SGL-11 GOODFELLOW, B. Quantifying fecal egestion and assimilation efficiency in two species of fish using a dual tracer
- SGL-12 GRAY, D.K. Rapid accumulation of plastic debris on southern Lake Erie beaches
- SGL-13 GRIGORAKIS, S. Determining the gut retention coefficient of two types of plastic in goldfish
- SGL-14 HENDRICKS, A.N. The effects of ice cover on fish exposure to Methyl Mercury (MeHg)
- SGL-15 LANE, D. In-vivo metabolomics: A powerful tool towards understanding real time environmental toxicity

- SGL-16 LIAGHATI MOBARHAN, Y. Comprehensive multi-phase in-vivo NMR spectroscopy
- SGL-17 LIN, H. Spatial and temporal variability in PCB levels in lake trout (*Salvelinus namaycush*) in Lake Superior
- SGL-18 MARKOVIC, S. Phosphorus cycling in Hamilton Harbour sediments
- SGL-19 MEHDIZADEH ALLAF, M. Yeast cell as a bio-model for measuring the toxicity of harmful algal blooms
- SGL-20 MURPHY, E.W. An approach to define the impacts of chemicals of emerging concern on fish and wildlife health
- SGL-21 MYERS, J.A. Effects of nitrogen on phosphorus flux from wetland sediments: Implications for nutrient management
- SGL-22 NAGATO, E.G. Metabolomics detects changes in Daphnia magna exposed to Malathion, Diazinon and Bisphenol A
- SGL-23 NEWSTED, J.L. Effects of Bis(2,4,6-tribromophenoxy)ethane (BT-BPE) in mink (*Mustela vison*)
- SGL-24 OSTER, B.T. Mapping sedimentary phosphorus sources in a Great Lakes headwater watershed
- SGL-25 PARSONS, C.T. Seasonal biogeochemical processing of nutrients in a groundwater-fed stream
- SGL-26 POINT, A.D. Perfluoroalkyl acid extraction and quantification optimization and basinwide temporal insights
- SGL-27 QAZAZI, M.S. Genetic diversity of water mites in western Lake Erie

- SGL-28 RABY, M. Species sensitivity distributions for acute toxicity of neonicotinoids to aquatic invertebrates
- SGL-29 RAKHIMBEKOVA, S. Fate and transport of septic-derived nutrients to the Great Lakes through a permeable sandy aquifer
- SGL-30 RIDENOUR, C.H. Silicon cycling through the Hamilton Harbour Area of Concern
- SGL-31 SIWULA, P.J. Dissolved oxygen and primary productivity of a neotropical freshwater ecosystem
- SGL-32 SMITH, Z.J. More than Microcystins? Analytical methods for paralytic shellfish toxins in the Great Lakes
- SGL-33 STROPE, E.K. Nutrient sample collection methods: Does pore size really matter?
- SGL-34 SU, G. In vitro metabolism of the flame retardant SAY-TEX120 and breakdown products using microsomal assays
- SGL-35 SZABO, J.L. Environmental factors can help explain the domination of wetlands by invasive hybrid cattails
- SGL-36 TENTINGER, S.H. Does a new benthic predator alter leaf litter breakdown by crayfish in a heterotrophic stream?
- SGL-37 WAGNER, N.D. Metabolomic responses to sub-lethal contaminant exposure in neonate and adult *Daphnia*
- SGL-38 WANG, H. Mercury atmospheric deposition to and runoff from catchments in Michigan's upper peninsula
- SGL-39 WINTER, C.L. Fecal bacterial contamination accompanying tourism growth

SGL-40 ZHANG, R.Y.

Phosphorus speciation in surface sediments of a Chinese hypertrophic lake

Monitoring, Analysis & Modeling (MAM)

- MAM-1 CEVAER, A.G. Historic and current benthic macroinvertebrate community in the Niagara River
- MAM-2 CONNOLLY, J.K. An assessment of Laurentian Great Lakes rotifer communities
- MAM-3 DITTRICH, M. Sediment geochemistry in southeastern Georgian Bay: Impact of land use on phosphorus loading

MAM-4 GOLMOHAMMADI, G. Predicting the areas contributing flow in an agricultural watershed using SWAT model

MAM-5 GRIMSTEAD, J.P. Thresholds in benthic macroinvertebrate communities associated with agricultural land use patterns

MAM-6 HOLLENHORST, T. Sub aquatic 3D visualization and temporal analysis utilizing ArcGIS online, story maps and 3D apps

MAM-7 JOHNSON, L.B. Great Lakes Environmental Indicators (GLEI): New tools for assessing condition of coastal ecosystems

MAM-8 MCDANIEL, T. Power analysis for trend detection of water quality parameters for a national monitoring network

MAM-9 SALONI, S.

Evaluating hydrologic connectivity in the prairie potholes of southern Alberta

MAM-10 SNIDER, D.M.

Causes and consequences of hypolimnetic oxygen depletion in Georgian Bay embayments (Honey Harbour)

MAM-11 SWEENEY, S.J.

Agricultural landscapes of Ontario's western Lake Erie basin: Map product coverage for the past decade

MAM-12 YU, A.W.

Assessing the spatial distribution and physical drivers of cyanobacterial blooms in western Lake Erie

MAM-13 ZHOU, C.L.

Mercury temporal trends in top predator fish of the Laurentian Great Lakes from 1999 to 2014

Watershed Case Studies (WCS)

- WCS-1 BOLTON, R.P. Tracking trends in shoreside benthic communities of Lake Simcoe, ON Canada - 2005 to 2015
- WCS-2 FUTIA, M.H. Evaluation of egg thiamine concentrations in Lake Ontario salmonids
- WCS-3 HANCOCK, H. Characterization of the trophic status in Lagoon City water canals, Brechin, ON
- WCS-4 KELLY, N.I. Long-term monitoring of the Lake Simcoe recreational fishery: 1961-2015
- WCS-5 NIBLOCK, H. Assessing phytoplankton community trends in Lake Ontario: Index stations vs. spatial surveys
- WCS-6 RINCHARD, J. Assessment of thiamine deficiency in lake trout from Cayuga Lake and Lake Ontario

Remote Sensing & Detection Techniques (RST)

RST-1 GUILLARD, J. Assessing food availability of coregonid larvae with acoustic methods in large deep lakes

RST-2 LEISTI, K.E.

Relating dissolved oxygen levels to fish distribution from hydroacoustics in Hamilton Harbour

- RST-3 TORBICK, N.T. Mapping spatiotemporal changes in lake temperature in the northeast USA
- RST-4 WAZ, A. Automating the identification of altered wetlands

Integrative (urban) Planning and Ecology (IPE)

- IPE-1 PADOVAN, P.M. Hydrogeomorphic adjustment in urban hybrid channel restoration projects
- IPE-2 RITCHIE, S.D. Overwintering success of headstarted Blanding's turtles in a restored wetland complex
- IPE-3 SARAZEN, J.C. The effect of antecedent soil moisture conditions on green roof runoff water quality and quantity

IPE-4 SIMONSON, M.A. Identifying relationships between the Lake Erie coastline and the nearshore fish community

Governance, Education and Outreach (GEO)

GEO-1 KELSEY, M.K. Using public input to design science exhibits that promote public understanding of invasive species

GEO-2 XAYKONGSA, A.

Using geologic knowledge to explain patterns and variations in 3D physical models of the Great Lakes

Oral Presentations

All presentation slots are 20 minutes in duration and are strictly enforced. Your presentation should be at most 15 minutes, leaving the remaining time for questions and the transition to the next speaker.

An LCD projector and dedicated computer will be in each of the rooms where the sessions will be held. All presentations must be loaded on the computer in the session room where you are to give your presentation prior to the start of your session. These computers run PowerPoint on a Windows environment only and are passwordprotected. Only the assigned student volunteer can load the presentations. Presenters may not use their own laptops.

Please label your presentation file as follows:

DayofMonth_Room Name_HH:MM_Lastname

(e.g., 07_Rozanski102_11:50_Smith)

You can verify the day, room number and time of your presentation by visiting the program page on the conference website at iaglr.org/conference/abstracts/listsession.php.

Uploading Your Talk

You have three options:

1) For those presenting on Tuesday, please bring your presentation on a USB flash drive to the registration desk in the Atrium of the Science Complex from 4 to 9 p.m. (e.g., Registration and Welcome Reception). Volunteers will be available to assist with the uploading.

2) For those presenting after Tuesday, bring your presentation on a USB flash drive to the Speaker Ready Room (Room 107 Rozanski) before 4 p.m. the day prior to your talk for uploading. Volunteers will be available to assist with the uploading.

We strongly encourage you to upload your talk the day before. However, if this is not possible:

3) Bring your presentation on a USB flash drive to the room in which your session is being held Presentations can be uploaded between **7:30 a.m. and 10 min prior to the first talk of the session** or d**uring morning and afternoon breaks from Tuesday to Friday**.

Poster Presentations

The poster social will take place on the evening of **Tuesday**, **June 7** in the Atrium of the Summerlee Science Complex from **6 to 8:30 p.m**. Presenters can begin mounting their poster in their assigned space after lunch on Tuesday. Mounting must be completed before 5:30 p.m Tuesday evening and we encourage presenters to leave their posters up as long as possible. Posters need to be removed by Thursday 4:30 p.m.

Mounting Your Poster

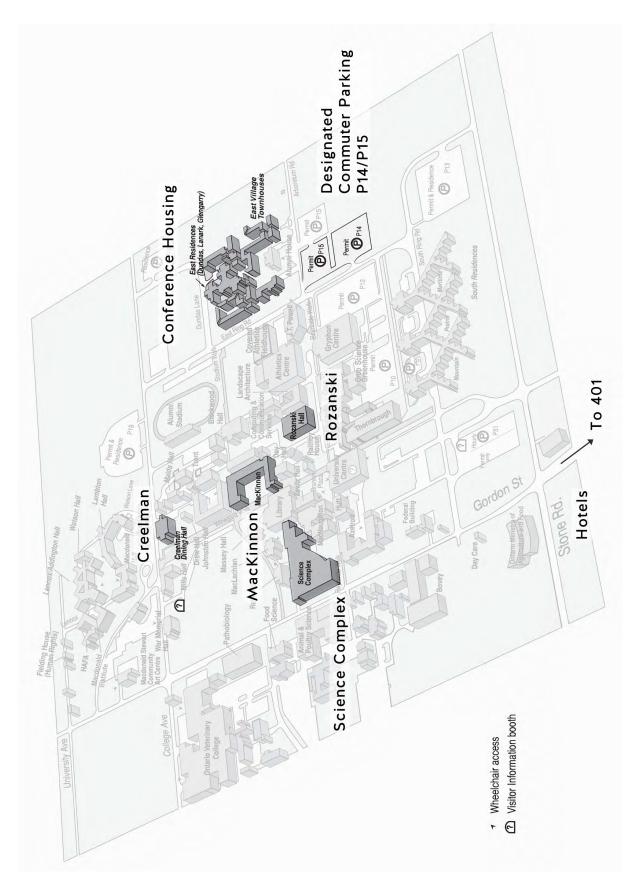
Each poster board will have an area of 120 cm x 90 cm (4' x 3'). All poster material must be confined to the space provided. Posters will be hung with tacks which the conference will be provided. Student volunteers will be present in the poster area to assist between 1:30 pm and 5:30 pm on Tuesday. Presenters are expected to tend their poster during the evening poster session to answer questions. This is especially important for student presenters who are candidates for the Best Poster IAGLR-HydroLab Award.

How to Make an Amazing Poster

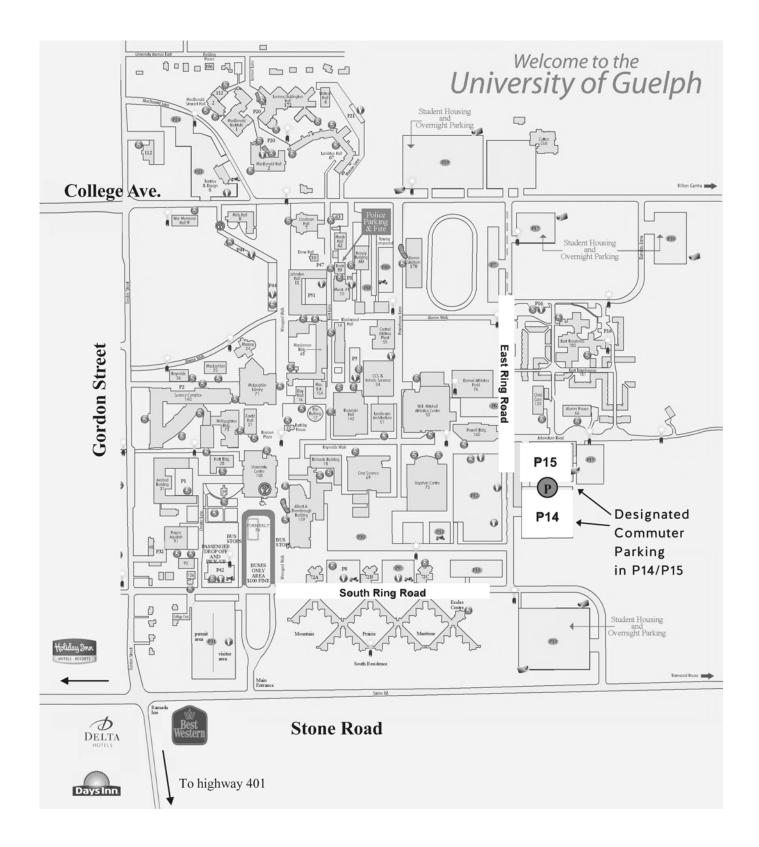
Experience shows that a majority of posters are still caught in the archaic practice of writing a manuscript on a large sheet of paper. This is so 21st century. Few people will stop to read a verbose and complicated poster. You can do better. Effective posters use bullet points with minimal words, provide meaningful images and pictures that convey far more than words can, and present data in simple and straightforward figures that emphasize the main (bulleted points). Drop the tables with endless numbers, the highly complex figures, the background you think will look cool but just makes it difficult to read your poster, and the endless text that gives Herman Melville a run for his money. For better advice on making an effective poster, check out:

http://www.esf.edu/outreach/esfhs/summit/documents/ ScientificPostersREV.pdf

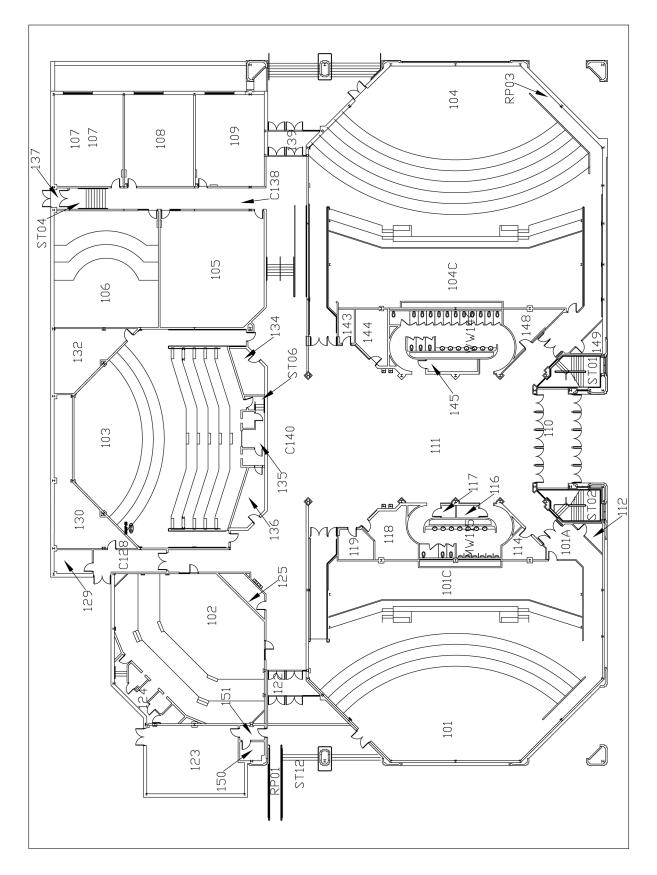
Presentations and posters are the property of the presenter. We do not encourage any recording of oral or poster presentations, and we urge you to respect intellectual property by seeking permission of the presenter and by provided due credit if you wish to record images. CAMPUS MAP



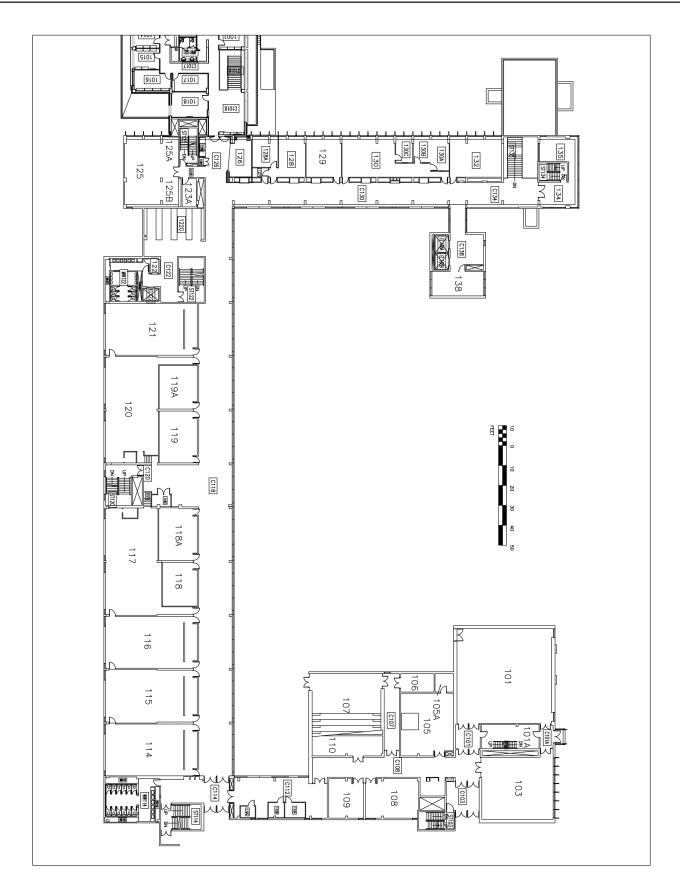
PARKING MAP



ROZANSKI HALL / FIRST FLOOR



MACKINNON / FIRST FLOOR



THE CITY OF GUELPH

Come and enjoy this city to remember.

The City of Guelph was founded on April 23, 1827, by Scottish novelist John Galt of the Canada Co., a British land settlement firm. The town centre, considered to be one of Canada's first planned towns, resembles a European city centre, with public squares, broad main streets, and narrow side streets. The historical tradition of the public square has been enhanced by the recent construction of Market Square, with its spectacular water feature.

The Speed and Eramosa rivers have long been important for the region. Prior to the colonization era, Aboriginal peoples met to trade along the Speed River. For the early city, the rivers provided drinking water and power for mills. Today, the rivers continue to serve important community functions for their views, wildlife, and recreational trails.

Guelph really began to grow when the Grand Trunk Railroad reached the town from Toronto in 1856. Many prominent buildings were constructed during that era, most by local architects, builders, and stone carvers who used locally quarried, amber-hued limestone, giving Guelph the visual unity still seen in older parts of the city. A key historical building is the Church of Our Lady, completed in 1883 and still towering over the city today. The Convent has been converted into the Guelph Civic Museum, which presents exhibits and interactive displays on the history of the city.

From its initial settlement, Guelph was an attractive

town for both industry and citizens. By 1915, the city boasted lively sports and music cultures and offered a free public library, daily and weekly newspapers, free postal delivery, 18 churches, a public and separate school system, a business college, and the agricultural college that later formed an integral part of the University of Guelph. The city owned its own utilities, street railway system, and fire fighting force and had a varied industrial base of almost 100 industries.

Guelph has since become a vibrant modern city of 122,000 people, known for its high quality of life, community spirit, and green initiatives. With a leading research university, diverse manufacturing, high tech enterprises, a thriving arts scene, and a dynamic cultural core, it is one of Canada's fastest growing regions.



THINGS TO DO

Downtown Guelph and its surroundings are known for diverse dining options as well as boutique and antique shopping. Activities for all ages include hiking, golfing, canoeing, kayaking, swimming, and enjoying the area's rich arts and culture scence.

Nature Experiences

The University of Guelph's own Arboretum contains thematic gardens as well as natural trails that preserve and showcase native Ontario plants. The Arboretum is located just a 5 minute walk from Rozanski Hall. Walkers, joggers, and bikers will delight in Guelph's extensive system of trails and parks, many with river views. One easy access point to the river-side trails is located near the Boat House Tea Room at the bottom of Gordon Street, just a 15-minute walk from the university. A short drive from Guelph, the Halton Hills Conservation Areas include many prominent local nature hotspots such as Mountsberg Conservation Area and Crawford Lake. These parks form part of the Niagara Escarpment, a UNESCOdesignated World Biosphere Reserve.

Town & Markets

The historic core of downtown Guelph offers diverse dining and boutique shopping opportunities. The downtown Guelph Farmers' Market is held on Saturday from 7 a.m. to noon. A bustling staple of the Guelph community, the market offers fresh baked goods, produce, and local crafts. Just outside of Guelph, Strom's Farm and Bakery and the Aberfoyle Antique Market (open Sundays) are features of the local shopping landscape. Stone Road Mall, with over 150 retailers and services, is within walking distance of the university.

Art and History Museums

The Art Gallery of Guelph (including the Macdonald Stewart Art Centre) is located right on campus. The collection features three centuries of Canadian art, including contemporary art, a unique collection of Inuit drawings, and an outdoor sculpture garden, which is open to the public at any time. The Guelph Civic Museum in downtown Guelph is an historic former convent, now a museum detailing the history of Guelph through exhibits and artefacts. McCrae House in Guelph is the birthplace of John McCrae (1872-1918), doctor, soldier, and author of "In Flanders Fields," the poem that captured the sentiments of World War I and is still recited today.



The Guelph Arboretum as seen from above, showing the traditional English, Italian, and Japanese gardens.



This statue, titled *The Family*, is a central feature of Guelph's downtown core.



The Macdonald Stewart Art Centre features both a typical gallery and Canada's largest outdoor sculpture park.

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HOST AN IAGLR CONFERENCE!

Each spring, we hold our *Conference on Great Lakes Research* at a site alternating between Canada and the United States. The IAGLR Board of Directors considers proposals from host institutions based on the following criteria:

- 1. proposed scientific program and workshops,
- 2. conference facilities and logistics, and
- 3. location.

If you're interested in hosting a future conference, contact the Conference Committee Chair at confchair@iaglr.org. We'd love to hear from you!



From Cities to Farms: Shaping Great Lakes Ecosystems

IAGLR 2017 International Association for Great Lakes Research DETROIT, MICHIGAN COBOCENTER MAY 15-19 60th Annual Conference on Great Lakes Research

AGLR