

## Concurrent sessions - Tuesday, May 18

Time	Room 1 - Bridging Knowledge Systems Between Indigenous and Nonindigenous Communities	Room 2 - Great Lakes HABs: Bridging Ecology, Human Dimensions, and Management	Room 3 - Spread the Word, Engage the World and Using Multidisciplinary Techniques to Understand Contaminants	Room 4 - Spatial Considerations to Great Lakes Fisheries Management	Room 5 - Bridging the Divide Between Great Lakes Research and Youth Engagement	Room 6 - Great Lakes Coastal Storms, Water Levels, and Shoreline Impacts	Room 7 - Improved Prediction Via Model Coupling, Data Assimilation, and Machine Learning	Room 8 - My Lake, Their Lake, Our Lakes: Perspectives from Lakes Michigan to Malawi
9:30	1: Nicholas W Boucher --- Traditional Opening Ceremony	10: Patrick L Lawrence --- Spatial Distribution Model for Manure from Permitted Livestock Facilities, Maumee Watershed, Ohio	19: Nick Schroek --- Carp, climate change and Canadian pipelines: A decade of news and law in Great Lakes media	22: James R. Bence --- Accounting for movement among populations in stock assessment and fishery management		31: Brendan Michael Llew-Williams --- Hydrologic effects of Early Holocene drought on the Upper Great Lakes	40: Peter J Alsip --- An Experimental Biophysical Forecast System to Support Lake Michigan CSMI 2020	49: Lulu Tunu Kaaya --- Building leadership for early-career African women scientists in the African Great Lakes region
9:45	2: Nicholas W Boucher --- Traditional Opening Ceremony - Part 2	11: Christopher G Weisener --- WITHDRAWN: Developing a chemical/bioindicator "toolbox" for Greenhouse Storm Water Pond	20: Shayenna Nolan --- Stories are Data, too! Delivering Science with Impact from the Healthy Headwaters Lab's Storyteller Initiative	23: David G Fielder --- Large-scale fish movement affects metrics of management importance as indicated by quantitative stock		32: Deanna Apps --- Comparison of Events that Led to the 1980s and Recent High-Water Periods and the Impacts to Shoreline Communities	41: Ian Kraucunas --- New U.S. DOE project on coastal observations, mechanisms, and predictions across systems and scales	50: Stella Mbabazi --- Flooding and its impacts on Lake Victoria fisheries, a case of Uganda
10:00	3: Andrea J Reid --- Two-Eyed Seeing: An Indigenous framework to transform fisheries research and management	12: Rebecca M Kreiling --- Phosphorus Retention Potential in the Riverbed Sediments of the Maumee River Basin	21: Sandra Svoboda --- Watch This: Using Facebook watch parties to engage new audiences	24: Matthew S Kornis --- Movements of coded-wire tagged Chinook salmon, lake trout, and steelhead in lakes Michigan and Huron		33: Jamie Ferguson --- Factors contributing to recent extreme water levels and challenges from a water management perspective	42: Zhuoyan Song --- Testing the impacts of multiple factors on nearshore surface water quality in large lakes	51: Dorothy Birungi Namujiga --- Economic and financial impact assessment: An application to Lake Victoria fisheries, Uganda
10:15	4: Alexander T. Duncan --- Ciscoes, Indigenous ecological knowledge, and the Saugeen Ojibway Nation	13: Nicholas W Falk --- In situ Biogeochemical Controls on Suspended and Bed Sediment Phosphorus Buffering in Southern Ontario Headwaters		25: Richard Clark --- Development of stock assessment units for lake trout in Lake Michigan		34: Lauren M Fry --- Implications of surface observation network on historical estimates of net basin supply	43: Umesh Adhikari --- Adaptive data-enabled hydrological and hydraulic modeling platform for the Great Lakes region	52: Edith Gondwe --- Setting small scale fisheries in food and nutrition security themes: Trends in Sub Saharan Africa
10:30	Break	Break	Break	Break	Break	Break	Break	Break
10:45	5: Emily Shaw --- Seasons of research with/by/as the Keweenaw Bay Indian Community	14: Meredith Nevers --- Assessing Cladophora growth in Lakes Michigan, Huron, Erie, and Ontario	58: Abigail G DeMeyer --- Per- and polyfluoroalkyl substances (PFASs) in the Great Lakes atmosphere and precipitation	26: Travis D. Brenden --- A combined Lakes Huron and Michigan catch at age model for Chinook salmon accounting for movement between lakes	63: Marte Kitson --- How to Connect to Educators and Tomorrow's Decision-makers	35: Brent M Lofgren --- Ice Cover's Influence on Lake Evaporation Over Annual and Multi-Annual Periods	44: Narayan K Shrestha --- SWAT-RAVEN coupled model for enhanced streamflow simulation over the Great Lakes region	53: Peter Limbu --- WITHDRAWN: Lessons from fisheries co-management on Lake Tanganyika - Tanzania
11:00	6: Peter Meisenheimer --- Anishinabek/Ontario Fisheries Resource Centre: Key Learnings from the Two-Eyed Seeing Approach	15: Andrew J Bramburger --- The plenism of the plankton; or, Cyanobacteria abhor a vacuum	59: Lee Grapentine --- Monitoring nearshore sediment conditions in the Great Lakes: Applications to research and management	27: John Janssen --- Not all mud; rocky habitat in deep water in the Great Lakes	64: Kristin M TePas --- Bring-a-Teacher-to-Work Week	36: Stephanie Ann Nummer --- Spatial and Temporal Trends in Great Lakes Ice Cover Duration in Response to Climate Change	45: Michael Notaro --- Performance of the NU-WRF Regional Climate Model in the Great Lakes Region	54: Dorothy Banda --- Effectiveness of solar tent dryer on drying time, microbial and fat quality of fishes, Lake Malawi
11:15	7: Steven Alexander --- Bridging Indigenous and Western sciences in aquatic research, monitoring, and management in Canada	16: Derek J Smith --- Individual Microcystis colonies harbor bacterial communities that differ by Microcystis oligotype and with time	60: Tanya Long --- Spatiotemporal trends of polychlorinated biphenyls (PCBs) and mercury in Lake Ontario's nearshore sediment	28: Lisa H Elliott --- The role of spatial watershed characteristics in determining brook trout distribution	65: Karen M Alofs --- Online case studies for teaching science and management in the Laurentian Great Lakes	37: Frank Seglenieks --- Future water levels on the Great Lakes basin based on climate change and stochastic analysis	46: Pengfei Xue --- Assessment of the two-way coupling of FVCOM and NU-WRF in the Great Lakes Region	55: Sharon Gubamwoyo --- Phytoplankton and macroinvertebrates dynamics in the Murchison Bay
11:30	8: David J Young --- Sturgeon thunder: Integrating western science and indigenous knowledge to save a species in peril	17: Hayden Henderson --- Monitoring harmful algal bloom driving dynamics in western Lake Erie using nutrient sensor moorings	61: Bita Allipour Parvizan --- Concentration and Temporal trend of HBCDD in fish tissues from the Great Lakes using UPLC-HRMS	29: Gust M. Annis --- Mapping priority spawning and nursery habitat for ciscoe and lake whitefish	66: Allison K Neubauer --- Scientists to Students! Using Great Lakes video calls to connect with youth learners	38: Miraj Bhakta Kagalstha --- Projections of Great Lakes' water level based on a 3D regional climate modeling system	47: Jenny Apriesnig --- The Consequences of Misrepresenting Feedbacks in Coupled Human and Environmental Models	56: Jessica T Ives --- Impact of mixing on seasonal variations of productivity and phytoplankton communities of Lake Edward
11:45	9: Aaron Pamajewong --- Restoring Native Fish Populations: Developing a Community Based Walleye Program in Shawanana First Nation	18: Justin D. Chaffin --- The HABs Grab: A binational characterization of the Lake Erie cyanobacterial blooms	62: Annie Jacob --- Contaminant monitoring in the Great Lakes by NOAA's Mussel Watch	30: Chris Vandergoot --- Knowledge gaps in Great Lakes fish movement studies: what have we learned over the past decade?	67: Kim T Scribner --- Virtual learning to train community scientists about lake sturgeon and coupled Great Lakes tributary ecosystems	39: Yi Hong --- Towards improved coastal flood modeling for the Great Lakes	48: Haoguo Hu --- Simulating Great Lakes wave conditions with one-way coupled hydrodynamic-wave models	57: Angela Nankabwira --- Algal communities of L. Victoria and small ponds in its basin and response to industrial pollution

<b>12:00</b>	Lunch break	Lunch break	Lunch break	Lunch break	Lunch break	Lunch break	Lunch break	
<b>Time</b>	<b>Room 1 - Bridging Knowledge Systems Between Indigenous and Nonindigenous</b>	<b>Room 2 - Great Lakes HABs: Bridging Ecology, Human Dimensions, and</b>	<b>Room 3 - Using Multidisciplinary Techniques to Understand Contaminants</b>	<b>Room 4 - Spatial Considerations to Great Lakes Fisheries Management</b>	<b>Room 5 - Physical Processes in Lakes</b>	<b>Room 6 - Great Lakes Coastal Storms, Water Levels, and Shoreline Impacts, cont.</b>	<b>Room 7 - Improved Prediction Via Model Coupling, Data Assimilation, and Machine</b>	<b>Room 8 - Operationalizing an Early Warning System for the Great Lakes</b>
<b>13:30</b>	68: Kaitlin Almack --- Panel on Wise Practices in Co-developing Knowledge with Indigenous Communities (75 min)	70: Qianqian Liu --- Probabilistic forecast of microcystin using remote sensing, in situ observations and numerical model	76: Aikebaier Renaguli --- Nontargeted screening of halogenated organic compounds in the Great Lakes fish	81: Daniel Isermann --- Telemetry, genomics, and conventional tagging inform lake whitefish management in northwestern Lake Michigan	87: Eric J. Anderson --- <del>WITHDRAWN: Evaluation of modeled ice thickness using satellite-based ice type classification</del>	93: James Kessler --- Simulating coastal flooding in Lake Michigan with a land-lake coupled framework	99: Jiati Wang --- Impacts of Great Lakes on warm season precipitation using high resolution simulations	104: Michael R. Twiss --- Operationalizing a Great Lakes Early Warning System: Progress by the IJC Science Advisory Board
<b>14:30</b>		71: Cory F McDonald --- Temperature and water column stability explain an algal bloom in the Keweenaw Waterway	77: Joel C Hoffman --- Tracing mercury sources through a Great Lakes coastal wetland food web using a multi-stable isotope approach	82: Christopher M Holbrook --- Use of Lake Erie tributaries by spawning sea lamprey: Implications for lake-wide abundance estimates	88: Sally MacIntyre --- Variability in Near-surface Turbulence in Lakes at Different Latitudes: Implications for Gas Transfer Velocities	94: Pengfei Yue --- Modeling the coastal flooding: a study case in Ludington, Michigan	100: Aditya Wagh --- Using Long short-term memory networks to improve hydrodynamic modeling	105: El-Amine Mimouni --- Multi-gear assessment of scale-based patterns of phytoplankton fluorometry in the St. Lawrence River
<b>14:45</b>		72: Cody Sheik --- Molecular approaches provide insight to past and present Dolichospermum blooms in Lake Superior	78: Ryan Lepak --- Reconstructing the energy pathways and contaminant burden to lake trout in contrasting Great Lakes	83: Matthew Faust --- Do discrete spawning stocks contribute differentially to Lake Erie's walleye fisheries?	89: Daniel Titze --- Development of a Flood Forecasting System for Lake Champlain	95: Zhao Yang --- Convection Systems and Summer Storms over the Great Lakes Region	101: Haiping Ai --- Predicting algal blooms in Lake Erie by random forest and long short-term memory methods	106: Anika Kuczyński --- Predicting algal debris risk at water intakes: an application of the Great Lakes Cladophora Model v3
<b>15:00</b>		73: Jake Callaghan --- Spatial and temporal patterns of Cyanobacteria in Lake Superior	79: Adam Point --- Blood protein diversity as a potential driver for perfluoroalkyl acid trophodynamics in aquatic food webs	84: Todd Hayden --- Windows of opportunity: Telemetry reveals optimal time periods for stocking	90: Daniel Floman --- Lake Surface Topography from Water Gauging, GNSS Observations and Gravimetric Geopotential Models	96: Carleigh Lenard --- Characterizing the 2020 wave climate of Lake Superior with a new network of Spotter buoys	102: David Russell --- Developing a Data Assimilation System for Lake Erie Using the Local Ensemble Transform Kalman Filter	107: Diane Henshel --- Using GIS to Identify Community-Based Critical Infrastructure Weaknesses to Storm-Induced Flooding
<b>15:15</b>		74: Kaela Elizabeth Natwora --- Nitrogen fixation, physiological response of Lake Superior Dolichospermum under varying	80: Gerald Ankley --- Pathway-Based Approaches for Assessing Biological Hazards of Complex Mixtures of Contaminants in the Great Lakes	85: Ed Rutherford --- Modeling larval fish dispersal in Lake Huron and Michigan: implications for population connectivity	91: Jay A Austin --- An abrupt decline in springtime zooplankton diel vertical migration due to a shift in stratification regime	97: John D Lenters --- Waves and circulation on Lake Superior during an intense autumn gale: The Halloween storm of 2020	103: Xingu Ye --- Improved lake surface temperature analysis in Lake Michigan through data assimilation	
<b>15:30</b>	69: Aisling Flayne --- Centring Indigenous knowledge systems to re-imagine conservation translocations	75: Arthur Zastepa --- Toxic and other bioactive metabolites in deep chlorophyll layers of Planktothrix in Georgian Bay, Lake Huron		86: Peter T Euclide --- Drift, stocking, and local adaptation determine walleye reproductive connectivity	92: Jacob Fredrickson --- Spatial Scales and Gradients during Radiatively Driven Convection in Lake Superior	98: Chelsea A Volpano --- Hydrodynamic modelling of storm impacts on a sandy beach: Point Beach State Forest, Lake Michigan		

## Concurrent sessions - Wednesday, May 19

Time	Room 1 - Bridging Knowledge Systems Between Indigenous and Non-Indigenous Communities, cont.	Room 2 - Great Lakes HABs: Bridging Ecology, Human Dimensions, and Management, cont.	Room 3 - Data Driven Innovation: Monitoring, Networking, and Analytics for Great Lakes	Room 4 - Spatial Considerations to Great Lakes Fisheries Management, cont. and Bridging Connections: Rewiring of	Room 5 - Global to Local: Canada's Post-2020 Freshwater Biodiversity Goals and Targets	Room 6 - Great Lakes Coastal Storms, Water Levels, and Shoreline Impacts cont. and Role of Ag BMPs on the Export of Nutrients and	Room 7 - Integrated Modeling and Valuation of Ecosystem Services in the Great Lakes	Room 8 - My Lake, Their Lake, Our Lakes: Perspectives from Lakes Michigan to Malawi, cont.
19:15	108: Julius Otieno Manyala --- Application of Indigenous Knowledge on Fish Breeding Areas and Seasons in Lake Victoria, Kenya	116: Mark AJ Fitzpatrick --- A long term (> 40 years) analysis of algal blooms in the Bay of Quinte, Lake Ontario	125: Dale M Robertson --- Use of SPARROW model results to extrapolate limited monitored loads to large spatial areas	134: Sarah M Larocque --- Combining spatial movements and diet to better understand salmonid ecology in Lake Ontario	133: Mary Thies --- Opening in a Good Way: Land Acknowledgement and Welcome	148: Ethan Theuerkauf --- Nearshore response to coastal Great Lakes storms: insight from recent studies using drones and ROVs	153: Jorge A. Garcia --- Estimating Total Economic Costs of Nutrient Emission Reduction Policies to Halt Eutrophication in the Great Lakes	162: JOSÉ SEBASTIÃO HALAFO --- <del>WITHDRAWN: Seasonal Variations of uzipa (Engraulicypris sardella) Fishery in the Mozambican Portion of Lake</del>
9:30	109: Catherine M Febris --- Committing to reconciliation and accelerating ecosystem restoration through #KindnessInScience &	117: Seth D. Buchholz --- Second generation cyanotoxin detection technology in routine monitoring and citizen science groups	126: Yu-Chen Wang --- Opportunities in predictive modeling and distribution analysis enabled by continuous monitoring	135: Carl R Ruets --- Movement patterns of Yellow Perch in eastern Lake Michigan: implications for harvest	140: Mary Thies --- Introduction: Canada's post-2020 global to local freshwater biodiversity goals and targets	143: Gina Depper --- Identifying community and household vulnerability to storm impacts and climate stressors	154: Jorge Garcia-Hernandez --- Balancing Phosphorus runoff reduction and farmers' utility: An optimization for Lake Erie Area	163: Tchalondwa Kisekelwa --- Environmental investigation of fish in Lake Kivu, a lake with a complex history
9:45	110: Jay T Johnson --- Indigenous Research Sovereignty: Setting a Tribal Agenda for Environmental Research	118: Meghan Klazic --- What's HAB-ning to Lake Erie? Using social-ecological network analysis to target action	127: Subba Rao Chaganti --- Impact of environmental conditions in triggering toxin (microcystin) producing strains to bloom	136: Kaitlyn R McKnight --- Time-scale specific (a)synchrony between Walleye and Yellow Perch dynamics across the Great Lakes	141: Mary Thies --- United Nations Convention on Biological Diversity and the 2021 Global Biodiversity Framework	150: Anna M Harrison --- Using long-term monitoring data to evaluate impacts of Great Lakes water levels on coastal wetlands	155: Mitchell Zischke --- The Impacts of COVID-19 on the Charter Fishing Industry in Lake Michigan	164: Mulugeta Wakjira --- Fish diversity and Fisheries of Omo-Turkana Basin in the face of hydrological modifications
9:00	111: Charles Sampson --- Bkejwanong Wapole Island First Nation: Safeguarding Our Waters Through Sustainable Practices	119: Chelsea Salter --- Investigating the Microbial Dynamics of Microcystin-LR Degradation in Lake Erie Sand	128: Sarah Rachel Bickman --- Rapid, portable, multiplexed detection of harmful algal toxins in the Great Lakes	137: Anthony Taabu-Munyaho --- Rapid recovery of fish stocks in Lake Victoria, East Africa, depicts importance of good management	142: Jim Olson --- <del>WITHDRAWN: A Framework for Great Lakes-St. Lawrence River Basin Public Trust Protection</del>	151: Mary Ellen Miller --- Mapping the bridge between land and lake by modeling wetland hydrological connectivity	156: Gwenneth Lau --- <del>WITHDRAWN: Great Lakes wave energy resource classification and Blue Economy opportunities</del>	165: Muvandja Amizi Fabrice --- River Pusizi: Integrating hydropower production, ecological integrity and sustainable land use
10:15	112: Philomena Kebec --- Discussion on the Chippewa Ceded Territory Traditional Food System Regulatory Project	120: Jordan Murray --- Impact of Harmful Algal Blooms on the Water-Food-Climate-Health Nexus: An Update	129: John Sanderson Wade Higley --- Environmental RNA for Remote, Non-Disruptive, Identification and Population Activity Analyses	138: Herbert Nakiyende --- Emergence of light fishing and the socio-economic implications on the multi-species fisheries in Lake Albert	143: Clara Roudsopp-Hearne --- Key Biodiversity Areas to focus biodiversity conservation in Canada	152: Jim P. Selegean --- Quantifying coastal resilience on Lake Michigan with a nearshore geomorphic vulnerability index	157: Yichun Huang --- Economic costs of eutrophication in the Great Lakes Basin: a preliminary study	166: Anthony Vodacek --- Long-term analysis of Lake Turkana surface temperature and turbidity using Landsat data
0:30	Break	Break	Break	Break	Break	Break	Break	Break
0:45	113: Marty Holtgren --- <del>WITHDRAWN: Multi-cultural strategies for equitable collaboration</del>	121: Joshua Breidenbach --- Exposure to Aerosolized Harmful Algal Bloom Toxin Microcystin-LR Induces Inflammation of the Airways	130: Gregory J Dick --- A Next Generation Research Database to Harness Great Lakes Environmental Omics Data	170: Mohiuddin Munwar --- Assessing decadal changes in primary and bacterial productivity in the Laurentian Great Lakes	144: Tara D Androschuk --- <del>WITHDRAWN: Freshwater biodiversity is under-represented in protected areas in Canada, including</del>	175: Angélica Vázquez-Ortega --- Role of Fe- and Mn-(oxy)hydroxides on Carbon and Nutrient Dynamics in Agricultural Soils	158: Sara Phelps --- Modeling the economic value of Great Lakes restoration through ecological linkages	167: Gary L. Fahnenstiel --- Carbon Fixation Trends in eleven of the World's Largest Lakes: 2003-2018
11:00	114: Katrina Keesig --- Building a holistic research program to address freshwater restoration through a community-centred approach	122: Steven T. Hiller --- HABs Toxin Microcystin-LR Exposure Exacerbates Pre-existing Inflammatory Bowel Disease	131: Alexis M Brown --- An early alert system for harmful algal blooms in Lake Erie	171: Christopher Marshall --- Seasonal Forster Community Trends: Lake Ontario CSMII 2018	145: Scott R. Parker --- Building a Great Lakes Protected Areas Network	176: W. Robert Midden --- A dewatering process that reduces nutrient loss from agricultural fields fertilized with CAFO manure	159: Rute Pinto --- Methodological challenges in integrated hydro-economic modeling of water quality changes	168: Zephanih Ajode Migeni --- Strengthening freshwater experts' collaboration for improved health of the African Great Lakes
11:15	115: Hannah Lee Harrison --- Seeing beneath disputes: reading the stories in natural resource conflict	123: Rene Sakhs Shakhomamadloo --- Microcystin, intracellular and extracellular, of cyanobacteria can cause disease-related effects in fish	132: Reagan M Errens --- Establishing a near real-time phycotoxin monitoring network in Lake Erie	172: Henry A Vanderploeg --- Dreissena feeding and nutrient excretion affects seasonal succession of plankton in Lake Erie	146: Catherine Masson --- The global to local roles of a UNESCO Biosphere Reserve: Protecting, conserving and exploring Great Lakes	177: W. Robert Midden --- Algal-iron hydrogels used in manure treatment fertilize crop growth	160: Roy Brouwer --- What are the Great Lakes worth?	169: Judith Perlinger --- Session 8 Discussion
11:30		124: Apurva Lad --- Pre-existing liver disease increases susceptibility to chronic low-dose Microcystin-LR exposure	133: Patrick D Lorch --- Great Lakes data deluge: Using abundant sensor data to inform recreation and manage watersheds	173: Hunter J Carrick --- Dreissenid Mussel Grazing on Small Plankton Promotes Harmful Algal Blooms in Lake Erie	147: Marina Pusyrens --- Understanding the value of protected areas: case of the Seal River Watershed	178: Alicia M DiCarlo --- The influence of microbial community on sediment equilibrium phosphorus concentration (EPC0)	161: Rute Pinto --- Discussion Panel Session 21	
11:45				174: Kirill Shchapov --- Seasonal changes in zooplankton and seston fatty acid profiles in nearshore regions of Lake Superior	180: Patricia Ann Owl --- <del>WITHDRAWN: Seeking Balance: Natural Law and Great Lakes Anishinabe</del>	179: Tilak Patel --- Assessing method-based differences in sediment phosphorus adsorption capacity (EPC0)		

<b>12:00</b>	Lunch break	Lunch break	Lunch break	Lunch break	Lunch break	Lunch break	Lunch break	Lunch break
<b>Time</b>	<b>Room 1 - Bridging Knowledge Systems Between Indigenous and Nonindigenous</b>	<b>Room 2 - Great Lakes HABs: Bridging Ecology, Human Dimensions, and</b>	<b>Room 3 - Data Driven Innovation: Monitoring, Networking, and Analytics for</b>	<b>Room 4 - Bridging Connections: Rewiring of Great Lakes Food Webs Under</b>	<b>Room 5 - Global to Local: Canada's Post-2020 Freshwater Biodiversity Goals</b>	<b>Room 6 - Role of Ag BMPs on the Export of Nutrients and Contaminants Into Waterways</b>	<b>Room 7 - Analysis of Cumulative Impacts on the Environment</b>	<b>Room 8 - Invasive Species</b>
<b>14:45</b>	181: Kaitlin Almack --- Using the "Two-Eyed Seeing Approach" to Resolve Conflict and Build Trust: A SONQ/MNR/F Case Study	184: Greg Boudreau --- Great Lake beach visitor preferences toward harmful algal bloom and bacterial warnings	187: Kavita Varma --- Training robust neural networks for autonomous plankton classification	193: James M Watkins --- Oligotrophication of the Great Lakes - the zooplankton perspective	199: Catherine Masson --- Part One: Learning from our shared history to honour our responsibilities to future generations	205: Yonas B Dibike --- Impacts of Beneficial Management Practices on Nutrient Loading in a North American Prairie Watershed	211: Douglas D. Kane --- When It Snows It Pours: Recent Increases in Chloride in Lake Erie Tributaries with a focus on the Cuyahoga River	217: Rochelle Sturtevant --- History of introduction and competitive impacts of nonindigenous aquatic plants of the Laurentian Great Lakes
<b>15:00</b>	182: Kia Marin --- Long-standing, collaborative knowledge leads to community-based conservation: Mistassini fisheries	185: Michelle Selzer --- Michigan's Active Adaptive Management Approach to Reduce Lake Erie Harmful Algal Blooms	188: Leo K Idraikh --- Actively controlling Runoff through Data collection	194: Stephanie Figary --- Comparing Lake Ontario's nearshore and offshore zooplankton communities using long term datasets	200: Catherine Masson --- Part Two: Learning from our shared history to honour our responsibilities to future generations	206: Shannon Lee Speir --- Winter cover crops reduce nutrient losses from fields to waterways in two agricultural watersheds	212: Edward Todd Howell --- Parry Sound, an Embayment Complex of Georgian Bay Protected from Dreissenid Mussels	218: Blake C Cahill --- Development and Application of an Adaptive Management Framework for European Frog-bit Management
<b>15:15</b>	183: Nicholas W Boucher --- Dialogue Session on the Two-Eyed Seeing Approach in the Great Lakes (60 min)	186: Heidi Lynne Purcell --- Bridging the Gap Between Prototype and Market Ready: An Evaluation of MIBIO Gen 1 Rapid Toxin Detection	<del>189: Michael Jabot --- WITHDRAWN: The integration of youth-led citizen science to hydrologic monitoring</del>	195: Allison R. Hryciuk --- Biomass Estimates for Benthic Invertebrates of the Great Lakes	201: Marg Thiess --- Science, Law, Policy and Culture for Freshwater Biodiversity Protection: A Guided Discussion	<del>207: Polly C Peterson --- WITHDRAWN: Hierarchical Bayesian model for regionalized agricultural conservation practice effectiveness</del>	213: Scott Cardiff --- Cumulative extent of iron mine influence on water quality in Lake Superior Ojibwe Territories	219: Kevin L Kapuscinski --- Ecological responses to hand removal of European frog-bit
<b>15:30</b>			190: Max B. Herzog --- Smart Citizen Science: Empowering Lake Erie Communities with Technology and Data	196: Toby Joseph Holdo --- Comparing mysid abundance and trends across the five Great Lakes.	202: Loren King --- Wild Swimming as Citizen Science? Immersion, Local Knowledge, and Water Advocacy for Our Great Lakes	208: Megan M Mader --- Water quality and land cover in Lake Michigan drowned river mouths	214: Elaine Ho --- Monitoring for cumulative effects assessment (Cladophora) in the Grand River and Lake Erie	220: Sara E Hansen --- Aggregated occurrence data informs management of invasive European frog-bit
<b>15:45</b>			191: John Coleman --- From Hand-held to Cloud-based Water Monitoring in the Great Lakes Basins	197: Meagan M Kindree --- Invasive species driven changes in trophic level and diet composition of a native stream fish	<del>203: Catherine Masson --- WITHDRAWN: Canada's Boreal Great Lakes: A Freshwater Biodiversity Case Study</del>	209: Marie G Bezold --- Sediment microbial nitrogen dynamics in an agricultural settling pond	215: Michael E Fraker --- Contrasting states of the Lake Erie ecosystem and their implications for ecosystem-based management	221: Ashley K Elgin --- Lake Erie quagga mussel growth estimates and evidence of barriers to local population growth
<b>16:00</b>			192: Ed Verhamme --- The \$500 Observing System: Testing New Tech in Ohio	198: Graceanne Kay Tarsa --- Pound goby productivity on a rocky nearshore reef in Lake Michigan	204: Marg Thiess --- Closing in a Good Way: Summary and Next Steps	210: David W Ure --- Multimetal Hydrogel Composites for the Removal of Inorganic Phosphate from Tile Drainage	216: Esteban Chiriboga --- Characterizing Risk of Crude Oil Pipeline Spills to the Anishinaabeg - Gichigami Tribal Fishery and Fish	222: Audrey Huff --- Environmental variability and nutrient cycling by deep-water quagga mussels in the upper Great Lakes

## Concurrent sessions - Thursday, May 20

Time	Room 1 - Bridging Knowledge Systems: Between Indigenous and Non-Indigenous Communities, cont.	Room 2 - Marine Debris and Microplastics in the Great Lakes: Sources, Impacts, and Solutions	Room 3 - Data Driven Innovation: Monitoring, Networking, and Analytics for Great Lakes, cont.	Room 4 - Bridging Connections: Rewiring of Great Lakes Food Webs Under Ecological Change, cont. and Fish Growth, Health,	Room 5 - Linking Quality Systems With Adaptive Management for Ecological Restoration	Room 6 - Role of Ag BMPs on the Export of Nutrients and Contaminants Into Waterways, cont. and Exploring the Role of	Room 7 - Running Out of Oxygen: Dynamics and Impacts of Hypoxia in Large Lakes	Room 8 - Invasive Species cont.
9:15	223: Rhonda L. Paulsen --- Creating Space for Synergistic Relationships: Two-Eyed Seeing		231: Peter C Ezzelman --- Conducting a Needs Assessment for the Great Lakes	240: Anna Schmidt --- Characterizing trophic linkages across an estuarine gradient in the Laurentian Great Lakes	251: Louis J Blume --- Can't have one without the other: the marriage of quality systems and adaptive management	253: Joey Simoes --- Targeting watershed BMPs with PTMApp on the Eastern Prairies	257: Bopi A. Biddanda --- Deep, dark and deoxygenated: Exploring multi-annual hypolimnetic trends in a Great Lakes estuary	266: Zhiqing Xia --- Multiple factors regulate filtration by invasive mussels: implications for whole-lake ecosystems
9:30	224: Preston Lennox --- The Development of Community-Based Environmental Monitoring Program with Weenusk First Nation		232: Brandon P Wong --- IoT for watershed management and planning: a case study from the Cleveland Metro Region	241: Gordon Paterson --- From pelagic to benthic: a rewiring of the Lake Ontario food-web	246: Maren T Tuttle-Lau --- Process Improvements to a long-term eDNA Monitoring Program	254: Ben Young --- Water quality responses to agricultural BMP implementation in the Silver Creek conservation study	258: Sarah L Bartlett --- Shifting temperature and dissolved oxygen patterns over a multi-decade analysis in Green Bay, Lake Michigan	267: Sergei Katsov --- Quagga mussels now control the phosphorus cycle in the Great Lakes
9:45	225: Ryan Iuzon --- Together with Gigoonyag: Developing an Acoustic Telemetry Array for Ontario waters of Lake Huron		233: Pierre-Denis Pliznier --- TOWARD A MULTI-LAKES MONITORING OF AFRICAN GREAT LAKES	242: Will F Otte --- Diet similarity and trophic overlap of lean and Siscowet lake trout morphotypes across ontogenies	247: Christine E Dumoulin --- Reproducible quality control of multi-input, participant-reported Phragmites management data	255: Douglas R Peersall --- Improving wetlands, soil health and water quality through invasive plant harvest and biomass use	259: Paris Collingsworth --- Spatio-temporal analysis of hypoxia in the Central Basin of Lake Erie	268: John Anderson Zalusky --- Survival, Nutrient Recycling and Tissue Composition of Profundal Quagga Mussels during starvation
0:00	226: Philip A Loring --- Bridging knowledge systems to steward biodiversity: linking local and traditional knowledge and eDNA		234: Craig Hill --- WITHDRAWN: Developing low-cost, open-source observation systems for expanding Great Lakes observation seasons	243: James Last Kaeyombe Atalita --- Lake Turkana trophic structure as a basis for ecosystem approach to fisheries management	248: Tasha R Tucker --- The Phragmites Adaptive Management Framework: Programmatic quality control of participatory data	256: Lauren Ann Weller --- Characterizing Carbon Complexity Across the Land-Water Interface in Agricultural Landscapes	260: Mark D. Rowe --- Simulation of 2019-20 Coastal Upwelling Events in a Lake Erie Hypoxia Forecast Model	269: Rae-Ann MacLellan-Hurd --- Invasive dreissenids effects on sediment nutrient composition and other benthic organisms
10:15	227: James Stinson --- New Journey to Save Fish: Oshki Moadsadiizwin Jaa Bimaa'it Gigooyike		235: Christopher Lee --- Early detection of HABs using low cost, networked sensor buoys.	244: Brent Nawrocki --- Food web structure of the Laurentian Great Lakes - a cross lake comparison	249: Erin Houghton --- Compliance in the watershed: Working outside the treatment plant		261: Devin Grace Gill --- Co-production of a Lake Erie Hypoxia Forecast with Ohio Public Water Systems	270: Harvey A. Bootsma --- Life without mussels: Benthic community response to a mussel removal experiment
0:30	Break	Break	Break	Break	Break	Break	Break	Break
0:45	228: Grace Martin --- FISHES: Fostering Indigenous Small-scale Fisheries for Health, Economy, and Food Security in Saké, NT	275: Paul Helm --- Levels, sources, and fate of microplastics in the Great Lakes / St. Lawrence River - A review	236: Greg Cutrell --- Use of Real-Time Autonomous Nutrient Analyzers in the Maumee River Basin, OH	280: Xiaofei He --- 'Wisconsinites' fish consumption and fish advisory awareness: analysis of 2017-2019 Wisconsin BRFS	250: Matt Jurjona --- Project Manager Perceptions of the Human Wellbeing Benefits from Great Lakes Restoration Efforts	285: Timothy Kevin Cowdry --- Hydrologic change in the St. Louis River Basin from mining in northeastern Minnesota	262: Sergei A. Bicanov --- WITHDRAWN: High Sensitivity of Lake Hypoxia to Physical and Nutrient-Related Anthropogenically-Induced	271: Andrew Camilleri --- Dreissenid mussel distributions in Western Lake Erie in 2018 and 2019: Implications for Nonindigenous Species
1:00	229: Ellorie McKnight --- Identifying challenges to - and recommendations for - reconciliation in environmental science research	276: Peter L Lenaker --- From Rivers to Lakes - The Movement and Distribution of Microplastics from Tributaries to the Great Lakes	237: Lindsay Birt --- Nutrient Reduction through Real-Time Optimization and Control	281: Jacob Burbank --- Seasonal prey consumption by an imperiled small-bodied fish is influenced by riparian vegetation	245: Jason L Fischer --- Setting Measurable Objectives: Determining Ability to Detect Changes in Fish CPUE through Simulation	286: Dan Witala --- Groundwater levels and stream baseflow in Marquette County, Michigan during changing climate	263: Kelly McCabe --- A Reassessment of Phosphorus Distributions with Respect to Hypoxia in Lake Erie's Central Basin	272: Joseph K Connolly --- Lake Ontario Meiobenthic Harpacticoid Copepod Community Impacted by Nonindigenous Species
1:15	230: Nicholas W Boucher --- Traditional Closing Ceremony	277: Sara L Belontz --- Linking tributary inputs and anthropogenic factors to greater microplastic abundances in sediments of Lake	238: Nathan D Zgnilec --- Exploring Techniques for Continuous, Real-Time Bacteria Monitoring in Southeast Michigan	282: Kimberly B Fitzpatrick --- Minimizing cost and uncertainty: assessing marking techniques to distinguish stocked and wild fish	252: John F Bratton --- Lessons learned about quality systems in developing an adaptive management framework for Lake Erie	287: Shu Xu --- Modeling Direct Groundwater Discharge into the Laurentian Great Lakes	264: Christine Kitchens --- Distribution and Speciation of Manganese With Respect to Hypoxia in the Central Basin of Lake Erie	273: Jaks T Kvistad --- WITHDRAWN: Ecology and life history of the invasive rusty crayfish on northern Lake Michigan spawning reefs
1:30		278: Jasmine Thea Yu --- Sources of microplastics in nearshore surface waters of the Great Lakes	239: Joseph D Ortiz --- Spectral decomposition by VPCA using Google Earth Engine: Great Lakes and other locations	283: Wendylee Stott --- Genetic species identification of coregonines from lakes Michigan and Huron		288: Zachary Curtis --- Adaptive Data-enabled Groundwater Management Platform for the Great Lakes Region	265: Paul McKinney --- Autonomous glider-based observations for understanding Lake Erie hypoxia	274: Justin Barker --- Golden mussel overwinter survival at northern invasion front implies high latitude distribution
1:45		279: Juliette M Daily --- Modeling the 3D distribution of microplastic in Lake Ontario and Lake Erie	289: Lauren Marshall --- Integration of Hyperspectral Camera System for Crewed Flyovers	284: Katelyn Cunningham --- Temporal trends in larval lake whitefish (Coregonus clupeaformis) density and growth in Lake Huron				

<b>12:00</b>	Lunch break	Lunch break	Lunch break	Lunch break	Lunch break	Lunch break	Lunch break	Lunch break
<b>Time</b>	<b>Room 1 - Coastal Remote Sensing</b>	<b>Room 2 - Marine Debris and Microplastics in the Great Lakes: Sources, Impacts, and</b>	<b>Room 3 - Improved Measuring of Great Lakes - St. Lawrence River Basin Water Quantity</b>	<b>Room 4 - Fish Growth, Health, and Ecology, cont.</b>	<b>Room 5 - nothing scheuled</b>	<b>Room 6 - Justice, Equity, Diversity, and Inclusion (JEDI) in the IAGLR Community</b>	<b>Room 7 - Running Out of Oxygen: Dynamics and Impacts of Hypoxia in Large Lakes,</b>	<b>Room 8 - Invasive Species, cont.</b>
<b>14:45</b>	290: Karl Bosse --- Impact of COVID-19 Shutdowns on Water Quality in the Great Lakes	296: Christy Tyler --- Microplastic deposition potential in freshwater ecosystems of the Lake Ontario basin	302: Howard W Reeves --- Estimating impacts of groundwater withdrawals on streamflow	308: L. Zoe Almeida --- Maternal experience and recent growth influence growth rate in Lake Erie walleye		312: Jennifer J Josephs --- Social Remediation and Restoration in Great Lakes Areas of Concern Communities	316: Thomas H Jøhngren --- IN SITU MONITORING OF SEDIMENT PHOSPHORUS FLUX DURING SEASONAL HYPOXIA IN THE	321: Jijia Wu --- Analysis on the composition of by-catch in crayfish long trap nets in Poyang Lake
<b>15:00</b>	291: Amy M Marcarelli --- Autonomous and remotely-operated surveys of nearshore river plumes in Lake Superior	297: Nigarsan Kokilathasan --- Nanoplastics: Impacts and Detection in Aquatic Environments - A Review	303: Margo Davis --- Great Lakes Regional Water Use Database: improving data quality	309: Madison Myers --- When the wall comes crumblin' down: Newly available walleye habitat in the Sandusky River, OH		313: Carolyn Foley --- Incorporating Justice, Equity, Diversity, and Inclusion into Research and Fellowship Competitions	317: Hanna Anderson --- Accelerated release of phosphorus from sediments in Lake Erie's central basin is a symptom of anoxia, not hypoxia	322: Mark Labib --- What is the native range of the "invasive" rusty crayfish ( <i>Faxonius rusticus</i> )?
<b>15:15</b>	292: Amanda Grimm --- Updating and expanding the Landsat-based submerged aquatic vegetation map for the Great Lakes	298: Kristina M Chomiak --- Cascading impacts of microplastics on ecosystem function in lakes	304: Jim Nicholas --- Cumulative Impact Assessment of Withdrawals, Consumptive Uses, and Diversions	310: Heather Walsh --- Reproductive Health and Endocrine Disruption in Smallmouth Bass from the Lake Erie Drainage		314: Catherine Masson --- An Ethical Principles Research-to-Action Agenda	318: Josef Ackerman --- Episodes of extreme winds reduce water quality via upwelling into the western basin of Lake Erie	323: Lindsay Chadderton --- Rusty Crayfish on native fish spawning reef: Can fall suppression reduce overwinter egg predation?
<b>15:30</b>	293: Laura Bourgeau-Chavez --- Progress on Developing a Framework for Monitoring Coastal Wetlands with High Resolution Satellite Imagery in	299: Edward Kostelnik --- Synthetic microfiber loads in green algae, Cladophora, in Lake Erie and Lake Michigan	305: Paul J Martin --- Refined Consumptive Use Calculation for High Volume Permits	311: James S Sinclair --- Functional traits reveal the dominant anthropogenic drivers of change in Lake Erie fish assemblages		315: NA --- JEDI discussion	319: Casey M Godwin --- Sediment oxygen demand kinetics in Lake Erie's central basin	324: Austin Bartos --- Estimating habitat occupation and preference of Great Lakes invasive fish using GLAHF and GLANSIS
<b>15:45</b>	294: Michael J Sagers --- A New Underwater Hyperspectral Radiometer System for Improved Bottom Albedo Characterization	300: Colleen Wardlaw --- Microplastics in white sucker ( <i>Catostomus commersonii</i> ) and common carp ( <i>Cyprinus carpio</i> ) from the Thames	306: Esteban Chiriboga --- A Framework for the Analysis of Impacts from Water Withdrawals in the Anishinaabeg-Gichigami Watershed				320: Lyubov E. Burlakova --- Exploring Great Lakes Benthoscaopes: Can we visually delineate freshwater benthic communities?	325: Ellary Christine Marano --- Great Lakes larval fish diets in a post-dreissenid invasion era
<b>16:00</b>	295: W. Charles Kerfoot --- Coastal remote sensing: Comprehensive data integration of stamp sand drift onto Buffalo Reef	301: Jill Bartolotta --- Skip the Straw, Ban the Bag: Does it really work?	307: Laureline Berthot --- Inclusion of wetted perimeter in environmental flow analysis in Southern Québec rivers					326: Paul A Bzonek --- Acoustic deterrent to stop invasive cyprinid: phylogenetic signal found in a fish-community response

## Concurrent sessions -Friday, May 21

Time	Room 1 - Coastal Remote Sensing, cont.	Room 2 - The UN Decade on Restoration: Advancing Restoration With Community	Room 3 - Great Lakes Observing: Advances, Best Practices, Challenges	Room 4 - Biogeochemistry, Bacteria, Benthos, and Lower Trophic Level Ecology	Room 5 - Decision Support Tools: A Bridge from Environmental Monitoring to	Room 6 - Linking Science and Restoration in the Great Lakes Connection Channels	Room 7 - Bridging Knowledge on Detection Methods to Manage Great Lakes Invasive	Room 8 - Invasive Species, cont.
09:30	327: Songzhi Liu --- NOAA Great Lakes CoastWatch Coastal Remote Sensing Data and Integration Efforts	332: George Gardner --- The Property Value Benefits of Remediating the Ashtabula River Area of Concern	336: Cailin Burmaster --- A framework for collaborative glider operations in the Great Lakes	344: Rachel Eveleth --- Lake Erie biogeochemistry in a low-ice winter	352: Keith Morgan Reynolds --- Spatial decision support for environment analysis and planning with the EMDS system	359: John H Hartig --- Checkup: Assessing Ecosystem Health of the Detroit River and Western Lake Erie	368: Susan E. Daniel --- Great Lakes DNA Barcode Reference Library: Mollusca, Annelida, and Minor Phyla	373: Matthew JS Windle --- Downstream expansion of the tubenose goby ( <i>Proterorhinus semilunaris</i> ) in the St. Lawrence River
09:45	328: Michael J Sagers --- A Refined Model to Retrieve Dissolved Organic Carbon in the Great Lakes using Ocean Color Remote Sensing Data	333: Kathleen Colin Williams --- Social and organizational dimensions of Great Lakes remediation, restoration, and revitalization	337: Heather A Dawson --- Requirements for AUVs for scientific data collection in the Laurentian Great Lakes: A questionnaire survey	345: Heather A Niblock --- Assessing the microbial food web of Lake Winnipeg, 2003-2004	353: Kyla Semmendinger --- Exploration of the Sensitivity of Lake Ontario Flow Regulation to Annual Water Supply Forecast Skill	360: Emily Tjner --- Establishing a National Estuarine Research Reserve for the Lake Michigan-Huron Biogeographic Region	367: Kasia J Przybyla-Kelly --- Multiple studies on eDNA detection of invasive round goby in Lakes Michigan and Huron	374: Heather B Reid --- Interpopulatic variation in thermal responses by the invasive round goby ( <i>Neogobius melanostomus</i> )
10:00	329: George Leshkevich --- An in situ IOPIAOP database for Great Lakes satellite bio-optical algorithm development and product validation	334: Stephanie Hickel --- Restoring coastal wetlands to benefit people: Enhanced patterns from the Blue Accounting Database	338: Greg Cutrell --- WITHDRAWN: Use of Real-Time Autonomous Nutrient Analyzers in the Maumee River Basin, OH	346: Elizabeth McKay --- Ecology of giant, filamentous, sulfur-oxidizing <i>Thioploca</i> bacteria in Great Lakes sediments	354: Todd Redder --- A Web-based Decision Support Tool for the Protection and Restoration of Great Lakes Coastal Wetlands	361: Alejandro Molina-Moctezuma --- Restoring connectivity in a Great Lakes connecting channel: challenges and lessons learned	368: Courtney E Larson --- Dreissena Transport from St. Louis River to Apostle Islands Detected in eDNA and Zooplankton surveys	375: Sabrina Jaffe --- Predicting the presence of grass carp eggs based on tributary flow and temperature
10:15	330: Steve Ruberg --- Great Lakes Water Quality and Primary Productivity	335: Saulius Simoliunas --- Public consultation on the Great Lakes Water Quality Agreement	339: Anne E Scofield --- Vertical structure of phytoplankton in the Great Lakes based on fluoroprobe profiles	347: Erin Eberhard --- Heterogeneity of nutrient cycling across wetland-stream lake interfaces of Lakes Superior and Huron	355: Patrick Landisch --- A decision support tool for prioritizing coldwater stream habitat restoration and management	362: Andrew Hanes --- Beneficial use of dredge material restores wetland habitat in the upper Niagara River	369: Colin Neil Brooks --- Applying multispectral drone data to identify extent of Eurasian watermillfoil in northwest L. Huron	376: Ana Rita Gouveia --- A simple Bayesian method to estimate abundance of rare species: using grass carp as a case study.
10:30	331: Robert Shuchman --- Development of Adaptive Hyperspectral Algorithms for Improved Chlorophyll and HABs		340: Ryan C Grow --- Estimating Cisco ( <i>Coregonus artedii</i> ) density in Lake Superior using an up-looking acoustic platform	348: Anett Trebitz --- Nearshore Lake Superior invertebrate biodiversity patterns from two high-density surveys	356: Jonathon Launspach --- Utilizing Qlik to visualize the multiagency spatiotemporal data driving effects-based monitoring	363: David J Spiering --- Lessons learned from the East River Marsh restoration in the Niagara River, Grand Island, NY	370: Elizabeth A Whitmore --- New Monitoring and Detection Methodologies for the Lake Ontario Benthic Cladoceran Community	377: Doug Jensen --- Reporting Underreported Aquatic Invasive Species Sightings in Northeast Minnesota
10:45	Break	Break	Break	Break	Break	Break	Break	Break
11:00			341: Tim Kearns --- A New Marine IoT Technology Platform - Serving All of the Great Lakes	349: Taylor Connolly --- Ecological drivers of zooplankton community characteristics in an Arctic great lake	357: Aisha Chiandiet --- Integrating subwatershed-scale tributary monitoring guides local decision-making	364: Erin Redding --- Supporting the Buffalo-Niagara Common Tern Breeding Population	371: Timothy B Johnson --- Assessing Ontario's vulnerability to aquatic invasive species under climate and human population change	378: Federico Holm --- WITHDRAWN: Assessing the Complex Governance of Aquatic Invasive Species in the Great Lakes
11:15			342: Linden Brinks --- Lakebed 2030: Building a Better Bathymetric Basemap for the Great Lakes	350: Alexander Y. Karatayev --- Benthos of Laurentian Great Lakes: Inventory of lake-wide surveys	358: Brick Fovold --- Data Management Plan Tools for Ecological Restoration	365: Wendy Paterson --- RestoreCorps Long-Term Shoreline Habitat Volunteer Stewardship Program	372: Rebbecca Josephine Johnson --- Bridging Gaps in Aquatic Invasive Species Early Detection Through International Collaboration	379: El K Lower --- Alien Language: Reflections on the Rhetoric of Invasion Biology
11:30			343: Tim Kearns --- Costs and Approaches to Comprehensive High Resolution Mapping of the Great Lakes	351: Claver Sibomana --- Benthic macroinvertebrates diversity and physicochemical parameters in Lake Tanganjika littoral zone				