Global Advances in Research and Management of Aquatic Invasive Species

PRELIMINARY PROGRAM

April 10 to 14, 2016
Fort Garry Hotel
Winnipeg, Manitoba, Canada
The introduction and spread of invasive species in freshwater and marine environments is a worldwide problem that is increasing in frequency.

There are various pathways by which non-indigenous invertebrate, fish, and plant species are introduced, become established and cause significant damage to coastal and freshwater ecosystems, and to the economies that depend upon them. Next to habitat loss, invasive species are considered the greatest threat to native biodiversity.

The Manitoba Environmental Industries Association is hosting the 19th International Conference on Aquatic Invasive Species that will be held in Winnipeg, Manitoba, Canada, April 10-14, 2016.

This conference series is widely considered the most comprehensive international forum on aquatic invasive species and continues to evolve to address new and emerging issues.

Sessions and presentations include the review of accumulated scientific knowledge; presentation of the latest field research; introduction of new technological developments for prevention, monitoring and control; discussion of policy and legislation; and mechanisms to raise awareness with the general public through education and outreach initiatives.

In recent years the conference has typically involved over 300 participants from over 30 countries, representing academia, industry, government agencies, NGOs and other stakeholders involved in the issues. Many are seeking opportunities for international cooperation and collaboration to address AIS issues from a global perspective.
Determining Priorities, Cutting Losses and Managing Conflicts Associated with Aquatic Invasions: A Southern African Perspective

Prof. Olaf Weyl
Principal Scientist, South African Institute for Aquatic Biodiversity
Member of Centre of Excellence for Invasion Biology
Honorary Professor, Department of Ichthyology and Fisheries Science, Rhodes University

Dr. Weyl’s current research focus is geared towards providing information with which to better conserve Africa’s aquatic biodiversity. To this end he has worked on freshwater ecosystems in several African countries including Mozambique, Malawi, Namibia, Botswana, Zambia and South Africa.

His current interests are fisheries, native fish conservation and aquatic invasions. As a result his research is multidisciplinary and includes not only research on natural systems and processes but also research on understanding how humans alter and benefit from aquatic systems.

Recent invasive fish related projects include assessing the impacts of recreational angling species such as carp and bass on native fish and invertebrate communities; parasitological and ecological research on eels; monitoring the recovery of stream ecosystems after alien fish removal using piscicides; impacts of hybridisation resulting from fish introductions; managing fish invasions in protected areas and assessing the role that alien fishes play in subsistence and recreational fisheries in South Africa.

He also provides policy support with regards to inland fisheries and legislation on alien fish management, and is active in the development of decision making tools used by provincial nature conservation departments to assess invasion risks through fish introductions. Lately, he has been actively involved in the development of legislation for managing alien invasive species in South Africa. Engagement with stakeholders demonstrated just how complex it can be when managing alien invasive species that have value to humans, but also cause environmental harm.

Dr. Weyl’s most recent work has been focussed on describing these conflicts and attempting to define potential win-win solutions for multiple stakeholders.

Understanding and Predicting the Impacts of Species Invasions: Old Challenges and New Approaches

Dr. Anthony Ricciardi
Associate Professor
Redpath Museum and School of Environment, McGill University

Dr. Anthony Ricciardi is an Associate Professor in the Redpath Museum and the School of Environment at McGill University, and a McGill Trottier Fellow in Science and Public Policy. For over 20 years, his research has examined the causes and consequences of biological invasions, using field experiments, lab experiments, empirical modeling and meta-analysis. He is an editorial board member for the journal *Biological Invasions* and the journal *Diversity and Distributions*. He also serves on the scientific committee of the Canadian Aquatic Invasive Species Network — an NSERC research group that assesses the risks and mechanisms of invasion in Canada’s lakes, rivers and coastal waters. In recent years, he and his students have sought to identify global patterns and mechanisms that explain variation in the colonization success and impacts of introduced freshwater fishes and invertebrates.

His long-term goal is to develop a predictive understanding of invasions to improve risk assessment and ecosystem management.
Metrics Based on Comparative Functional Responses and Abundance Reliably Predict Invasive Species Identities and Ecological Impacts

Prof. Jaimie T.A. Dick
School of Biological Sciences
Queen’s University Belfast

Jaimie holds a personal Chair in Invasion Ecology at Queen’s University Belfast and is Director of the Queen’s Marine Laboratory, Portaferry. The main thrust of his research is to bring concepts in behavioural and community ecology to answer questions in invasion biology. For example, his use of ‘functional responses’ shows great promise in helping us understand and ultimately predict invasive species in terms of identity and ecological impact. This work is proving successful across trophic and taxonomic groups, with current projects spanning Europe, North America, South Africa and China. Jaimie is former Director of Research, Director of the Quercus Conservation and Biodiversity Centre, and Senior Investigator on ‘Invasive Species Ireland’. Currently, Jaimie’s research group spans the behavioural ecology of invaders, management of invaders through eradication and control, fisheries and invasive species, and the roles of parasites and climate change in invasion impacts.

Facing Aquatic Invasive Species in Europe: From Research to Policy

Elena Tricarico
Research Fellow and Lecturer
Department of Biology, University of Florence

Elena Tricarico obtained her PhD in Ethology and Animal Ecology in 2007. She is a research fellow at the University of Florence, where, since as a student, she has been working on biological invasions in fresh waters — mostly on invertebrates — through different perspectives from behavioral ecology to management. Her work has led her to travel in Europe, USA and Africa where she has established many fruitful collaborations. She has participated in 16 national and 12 European projects (as DAISIE, IMPASSE and LIFE projects) mainly on alien species and their predictive and management issues (e.g., risk assessment, control techniques).

She serves the European Commission as an expert on alien species and she is in the editorial board of the European Alien Species Information Network (EASIN) catalogue for which she partly revised the alien freshwater species. In the last year, she has started dealing with the social perception and public education on alien species. Currently, she is involved in the EU COST Action TD1209 (Alien Challenge) to provide support and implementation for effective and informed decision-making on alien invasive species, and in the EU Marie Curie ITN H2020 “Aquainvad-ED” to develop novel control procedures for aquatic alien species.
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<tr>
<td>8:15 AM</td>
<td>Welcoming Remarks&lt;br&gt;Tracey Cooke, Executive Director, Invasive Species Centre&lt;br&gt;Margo Shaw, Executive Director, Manitoba Environmental Industries Association</td>
<td>Determining Priorities, Cutting Losses and Managing Conflicts Associated with Aquatic Invasions: A Southern African Perspective&lt;br&gt;Prof. Olaf Weyl, Principal Scientist, South African Institute for Aquatic Biodiversity</td>
<td>Facing Aquatic Invasive Species in Europe: From Research to Policy&lt;br&gt;Elena Tricarico, Associate Professor, Department of Biology, University of Florence</td>
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<td>9:10 AM</td>
<td>9:50 AM Networking Break</td>
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<td>10:20 AM</td>
<td>Working Together on Outreach for Asian Carps in the Canadian Waters of the Great Lakes&lt;br&gt;Erin L. Gertzen, Fisheries and Oceans Canada</td>
<td>Achieving Control of Dreissenids throughout Entire Lakes: No, This Is Not Just Wishful Thinking&lt;br&gt;Daniel P. Molloy, University of Illinois at Champaign/Urbana and Molloy &amp; Associates, LLC</td>
<td>Vectors and Pathways</td>
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<td>Asian Carps: Prevention and Early Warning for the Canadian Great Lakes&lt;br&gt;Alison Kirkpatrick, Ontario Federation of Anglers and Hunters</td>
<td>Mesocosms to Advance Aquatic Invasive Species Control&lt;br&gt;Jim Davies, Alberta Innovates - Technology Futures</td>
<td>Past, Present, and Future Freshwater Fish Introductions in Canada&lt;br&gt;Nick Mandrak, University of Toronto Scarborough</td>
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<td>11:00 AM</td>
<td>Baseline Survey of Asian Carp and Invasive Species Knowledge in Ontario&lt;br&gt;Lauren Tonelli, Invasive Species Centre</td>
<td>Invasive Mussel Collaborative: Connecting People, Science and Management&lt;br&gt;Erika Jensen, Great Lakes Commission</td>
<td>10:40 AM Vectors of Aquatic Introductions in the United States: Past and Present, Here and There&lt;br&gt;Matthew Neilson, U.S. Geological Survey</td>
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<td>Great Lakes Sea Grant Network’s Assessment of Asian Carp Research, Education and Outreach Efforts&lt;br&gt;Christopher J. Winslow, Ohio Sea Grant College Program</td>
<td>Great Lakes Restoration Initiative: Developing Tools and Approaches to Manage Aquatic Invasive Species&lt;br&gt;Bill Bolen, U.S. Environmental Protection Agency</td>
<td>A Risk Analysis of the Illegal Trade and Transportation Pathway for Regulated Aquatic Species in the Great Lakes&lt;br&gt;Michael Hoff, U.S. Fish &amp; Wildlife Service</td>
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<td>Games as Instruments of Brazilian Elodea Prevention and Environmental Education in Cascade Reservoirs Region: Jaguara, Volta Grande and Igarapava, Located in Minas Gerais State/Brazil&lt;br&gt;Andrea Carla Leite Chaves, PUC Minas - Pontifícia Universidade Católica de Minas Gerais</td>
<td>Comprehensive Response to the New Zealand Mudsnail Discovery in Wisconsin&lt;br&gt;Maureen Ferry, Wisconsin Department of Natural Resources</td>
<td>Assessing the Potential Movement of Invasive Fishes through the Welland Canal&lt;br&gt;Jaewoo Kim, University of Toronto Scarborough</td>
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<td>First Record and Rapid Geographic Expansion of Spiny Water Flea (Bythotrephes longimanus) in Manitoba, Canada, 2009-2014&lt;br&gt;Wolfgang Jansen, North/South Consultants Inc.</td>
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<td>12:00 PM</td>
<td>Luncheon</td>
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<td><strong>Audience-Driven Outreach</strong></td>
<td><strong>Management and Control</strong></td>
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| **1:30 PM** Research and Implementation of Community Based Social Marketing: A Four Year Case Study in Aquatics  
Gail Wallin, Invasive Species Council of British Columbia | **1:30 PM** Integrated Approach to the Control of the Invasive Bullfrog Lithobates catesbeianus  
Sarah Descamps, PXL Bio-Research — University Hasselt | **1:30 PM** Chicago Area Waterway System as an Invasion Pathway for Crustaceans  
Reuben Keller, Loyola University, Institute of Environmental Sustainability |
| **1:50 PM** From Theory to Practice: Heuristics and Stop Aquatic Hitchhikers!  
Douglas A. Jensen, University of Minnesota Sea Grant | **1:50 PM** Restoration of a Large Freshwater Coastal Wetland, Delta Marsh, Manitoba, Canada: Exclusion of Common Carp (Cyprinus carpio)  
Dale Wrubleski, Ducks Unlimited Canada | **1:50 PM** An Evaluation of Downstream Dispersal of Veliger Larvae as a Mechanism for Spread of Zebra Mussels between Inland Water Bodies in Minnesota  
Michael McCartney, University of Minnesota |
| **2:10 PM** Using the Habitattitude Campaign to Address Pet Release Invasion Pathway in Wisconsin  
Tim Campbell, University of Wisconsin Extension and University of Wisconsin Sea Grant | **2:10 PM** Getting Ahead of the Learning Curve — Ontario Lessons Learned in Response to Aquatic Invasive Species  
Jeff Brinsmead, Ontario Ministry of Natural Resources and Forestry | **2:10 PM** Dreissenid Prevention Across the Pacific Northwest  
Stephen Phillips, Pacific States Marine Fisheries Commission |
| **2:30 PM** What’s in Your…? Water Garden and Aquarium AIS Outreach for the Great Lakes Region  
Greg Hitzroth, Illinois-Indiana Sea Grant & Illinois Natural History Survey | **2:30 PM** Looking into the Crystal Ball: Forecasting AIS Science and Information Needs in Ontario using the Delphi Method  
Jeff Brinsmead, Ontario Ministry of Natural Resources and Forestry | **2:30 PM** Developing a Vector Management Approach to Prevent Introduction and Spread of Marine Biofouling Invasive Species in Newfoundland  
Kyle Matheson, Fisheries and Oceans Canada |
| **2:50 PM** Don’t Move a Mussel: Protecting British Columbia Waters from the Impacts of Invasive Species  
Lisa K. Scott, Okanagan and Similkameen Invasive Species Society | **2:50 PM** A Regional Approach to AIS Spread Prevention in the Adirondack Park Region: Boat Launch Stewards, Boat Inspection, and Decontamination  
Margaret Modley, Lake Champlain Basin Program | **2:50 PM** GLDIATR: Protecting the Great Lakes from the Internet Trade of AIS  
Erika Jensen, Great Lakes Commission |
<p>| <strong>3:10 PM</strong> Break | <strong>3:10 PM</strong> Break | <strong>3:10 PM</strong> Break |</p>
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<td>3:40 PM</td>
<td><strong>Watercraft Inspection and Decontamination Programs in the Western United States</strong>&lt;br&gt;Dee Davis, Pacific States Marine Fisheries Commission</td>
<td><strong>Is the Aquatic <em>Dikerogammarus villosus</em> a ‘Killer Shrimp’ in the Field? – A Case Study on One of the Most Invasive Species in Europe</strong>&lt;br&gt;Meike Kaester, University of Koblenz-Landau</td>
<td><strong>Caution! Some Dreissenid “Early Detection” Methods Are Actually “Early Deception” Methods</strong>&lt;br&gt;Daniel P. Molloy, University of Illinois at Champaign/Urbana and Molloy &amp; Associates, LLC</td>
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<td>4:00 PM</td>
<td><strong>Mussels and Mutts: The Alberta Conservation Canine Program</strong>&lt;br&gt;Cindy Sawchuk, Alberta Environment and Parks</td>
<td><strong>The Trophic Function of <em>Dikerogammarus villosus</em> in the European Rivers Elbe and Rhine and its Impact on the Benthic Community</strong>&lt;br&gt;Claudia Hellman, University Koblenz-Landau</td>
<td><strong>Spread and Invasiveness of the Recently Introduced Chinese Mystery Snail (<em>Bellamya chinensis</em>) in Riverine Ecosystems in The Netherlands</strong>&lt;br&gt;Frank P.L. Collas, Radboud University Nijmegen</td>
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<td><strong>Operation Bait Bucket – Lake Simcoe Ontario. An Education and Awareness Program Focusing on Ice Anglers</strong>&lt;br&gt;Wil Wegman, Ontario Ministry of Natural Resources and Forestry</td>
<td><strong>The Devil is in the Detail; the Impact of Invasive Shrimps on the Reliability of Biotic Indices used to Assess Water Quality in Isle of Man Rivers</strong>&lt;br&gt;Calum MacNeil, Isle of Man Government</td>
<td><strong>Development of a Regional Surveillance Plan for the U.S. Waters of the Laurentian Great Lakes</strong>&lt;br&gt;W. Lindsay Chadderton, The Nature Conservancy</td>
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<td>4:40 PM</td>
<td><strong>A Student Research Project on Invasive Plants and Fishes: An Effective Educational Tool</strong>&lt;br&gt;Alain De Vocht, PXL Bio-Research — CMK, University Hasselt</td>
<td><strong>Comparing the Predatory Impact of Invasive and Native Crabs on Prey Species: A Meta-analysis</strong>&lt;br&gt;Brett Howard, Simon Fraser University</td>
<td><strong>Aquatic Invasive Species Monitoring in Wisconsin, USA</strong>&lt;br&gt;Maureen Ferry, Wisconsin Department of Natural Resources</td>
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<td>5:00 PM</td>
<td><strong>The Florida Invasive Plant Education Initiative</strong>&lt;br&gt;Lyn Gettys, University of Florida, IFAS Center for Aquatic and Invasive Plants</td>
<td><strong>Individual Variation in Sea Lamprey Behaviour Has No Implications on Trapping Success</strong>&lt;br&gt;Emelia M. Myles-Gonzalez, University of Guelph, Department of Integrative Biology</td>
<td><strong>The Spread and Potential Impacts of Freshwater Invasive Island Apple Snails (<em>Pomacea maculata</em>) in Coastal South Carolina, USA</strong>&lt;br&gt;Amy Fowler, South Carolina Department of Natural Resources</td>
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<td>5:20 PM</td>
<td><strong>Invasive Species Education for Waterfowl Hunters</strong>&lt;br&gt;Brook Schryer, Ontario Federation of Anglers and Hunters</td>
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Use of Unique Medium Pressure UV System Firstlight Energy's Shepaug Dam in Connecticut
Rebecca Allen, Firstlight Energy / GDF Suez

Human and Natural Correlates of Freshwater Invasive Species Occurrence
Amy J. Benson, U.S. Geological Survey

Habitat Invasibility and Thresholds of Impact of the Green Crab Invasion in the Southern Gulf of St. Lawrence, Canada
Renée Bernier, Fisheries and Oceans Canada

Engaging Youth on the Impacts and Implications of Aquatic Invasive Species on the Health of the Intertidal Zone in Placentia Bay Newfoundland
Kiley Best, Memorial University

Updating and Implementing the AIS Management Plan for Wisconsin
Tim Campbell, University of Wisconsin Extension

Games as Instruments of Limnoperna fortunei Prevention and Environmental Education in Cascade Reservoirs Region: Jaguara, Volta Grande and Igarapava, Located in Minas Gerais State/Brazil
Andrea Carla Leite Chaves, PUC Minas - Pontifica Universidade Catolica de Minas Gerais

Movements and Habitat Use of the Invasive Species Lithobates catesbeianus in the Valley of the Grote Nete (Belgium)
Sarah Descamps, Hasselt University

Using Functional Responses in the Risk Assessment of Invasive Crayfish
Jaime Grimm, McGill University

A National Comprehensive Website on Aquatic Invaders in the Marketplace – TakeAIM.org
Danielle Hilbrich, University of Illinois

Determining the Effectiveness of the Clean Boats Crew: An Education and Outreach Program Aimed at Preventing the Spread of Aquatic Invasive Species in Lake County, Illinois
Danielle Hilbrich, University of Illinois

Eradication of Tench, an Invasive Fish New to Ontario
Maria Jawaid, Ontario Ministry of Natural Resources and Forestry

Designing and Testing New eDNA Markers for Aquatic Invasive Species
Richard F. Lance, U.S. Army Engineer Research & Development Center

Identifying Geographic Pathways of Zebra Mussel Spread: Minnesota as a Case Study
Sophie Mallez, University of Minnesota

Management of a Marine Invasive Species: Trapping as a Method to Control Abundances of European Green Crab (Carcinus maenas) in Newfoundland
Kyle Matheson, Fisheries and Oceans Canada

A Proposed Framework for Quantitative Risk Assessments of Aquatic Invasive Species in Ontario
Sarah Nienhuis, Ontario Ministry of Natural Resources and Forestry

Wisconsin’s Framework for Aquatic Invasive Species Response
Amanda Perdzock, Wisconsin Department of Natural Resources

Review of Aquatic Invasive Species Disinfection Methods by Species
Amanda Perdzock, Wisconsin Department of Natural Resources

Innovative Solutions for Asian Carp Management
Kristine Pinkney, Invasive Species Centre

Impacts of New Zealand Mudsnails (Potamopyrgus antipodarum) on Ecosystem Metabolism in a Cold Water Stream in Wisconsin, USA
Michael Shupryt, Wisconsin Department of Natural Resources

Spatial and Temporal Distribution of Dreissena polymorpha Larvae in a Warm Monomictic California Reservoir
Mark Sytsma, Portland State University

Asian Carp Canada Spot the Difference Poster Campaign
Lauren Tonelli, Invasive Species Centre

The Impact of Dissolved Oxygen and pH on Zebra Mussel Growth and Mortality in a California Reservoir
Tanya Veldhuizen, California Department of Water Resources

Intensive Sampling to Detect Newly Introduced Aquatic Non-indigenous Species
Sharon Yong, Great Lakes Institute for Environmental Research
Tuesday, April 12, 2016

**Session A: Workshop**

8:30 AM - 5:00 PM

**Zebra and Quagga Mussels: Issues Relating to Infestations in Infrastructures and Open Waters**

**Part I (Morning): Biology, Environmental Requirements and Control of Dreissenid Mussels in Man-made Facilities**  
Renata Claudi, RNT Consulting Inc.

This workshop will cover:

- Life cycle of dreissenid mussels
- Environmental requirements for successful reproduction and survival
- Biofouling issues caused by dreissenid mussels in structures such as:
  - Intake systems
  - Cooling systems
  - Fire protection systems
  - HVAC Systems
  - Potable water treatment plants
- Fouling prevention vs. absolute barrier
- Available control strategies
  - Chemical
  - Non-chemical
- Regulatory environment

**Part II (Afternoon): Infestations in Open Waters**  
Daniel P. Molloy, University of Illinois at Champaign/Urbana and Molloy & Associates, LLC

This workshop will address a wide range of topics relating to zebra and quagga mussel infestations in open waters (e.g., lakes and rivers), including:

- Key impacts of infestations in water bodies
- Key factors determining the risk of:
  - an initial introduction occurring in a water body
  - a population subsequently becoming established and reaching high densities
  - the spread of the infestation to another water body
- Prevention, detection, and rapid response programs and the key elements of designing and executing such programs
- Why an “early” detection program is no guarantee that an initial mussel introduction into a water body will be spotted “early” enough for eradication (i.e., 100% elimination) to be achieved
- Key factors contributing to the rare cases of successful eradication
- Why reductions in their densities throughout entire water bodies is rarely a feasible option
- Current control options for reducing infestations in relatively small, high-value areas, like beaches and docks
- Current and future research directions

Discussion will be encouraged both during the presentation and during a question and answer period.
Tuesday, April 12, 2016

Session A

Workshop

10:40 AM
Zebra and Quagga Mussels: Issues Relating to Infestations in Infrastructures and Open Waters Part I (continued): Biology, Environmental Requirements and Control of Dreissenid Mussels in Man-Made Facilities
Renata Claudi, RNT Consulting Inc.

12:00 PM
Luncheon

Session B

Asian Carps

10:40 AM
Comparing Analysis Techniques of High Throughput Sequencing for Asian Carp Monitoring
Grace McCalla, U.S. Geological Survey

11:00 AM
Early Detection Surveillance Methods for Asian Carps in the Canadian Great Lakes
David Marson, Fisheries and Oceans Canada

11:20 AM
Lessons Learned from Grass Carp 2015 Responses in the Canadian Great Lakes
Becky Cudmore, Fisheries and Oceans Canada

11:40 AM
Law Enforcement Insights to Improve Coordinated and Effective Fishery Management
Jill Wingfield, Great Lakes Fishery Commission

Session C

Ballast Water

10:40 AM
Testing Ballast Water Management Systems – Challenge Water Conditions during More than 100 Test Voyages
Stephan Gollasch, Gollasch Consulting

11:00 AM
Cameron Moser, Excet Inc.

11:20 AM
Comparison of Sampling Devices and Analytic Methods for Ballast Water Compliance Testing
Johanna Bradie, Fisheries and Oceans Canada

11:40 AM
How Effective are Size-separation Techniques for Concentrating Live Organisms ≥10 µm and <50 µm?
Stephanie Robbins-Wamsley, Excet Inc.

12:00 PM
Luncheon
## Tuesday, April 12, 2016

### Session A

**Workshop**

**1:30 PM**

**Zebra and Quagga Mussels: Issues Relating to Infestations in Infrastructures and Open Waters**  
**Part II: Infestations in Open Waters**  
Daniel P. Molloy, University of Illinois at Champaign/Urbana and Molloy & Associates, LLC

### Session B

**Asian Carps**

**1:30 PM**

**Development of a Novel Platform to Control Filter-feeding Aquatic Invasive Fishes**  
Jon J. Amberg, U.S. Geological Survey

**1:50 PM**

**Examining Non-physical Barriers for Fish Movement: Electricity, Water Gun, Boomers, Bubble, Sound, Alarm Cue, and Light**  
Jaewoo Kim, University of Toronto Scarborough

**2:10 PM**

**Bigheaded Carp Behavior and Bioacoustics**  
Brooke J. Vetter, University of Minnesota Duluth

### Session C

**Ballast Water**

**1:30 PM**

**Evaluating Instruments Designed for Rapid, Shipboard Detection of Living Microorganisms in Ballast Water: An Initial Test of Compliance Tools**  
Matthew First, U.S. Naval Research Laboratory

**1:50 PM**

**The Most Probable Number (MPN) Method to Quantify Organisms ≥10 µm and <50 µm: An Update**  
Lisa Drake, U.S. Naval Research Laboratory

**2:10 PM**

**Uniform Response of Organisms in Different Phylogenetic Groups and Size Classes to Ballast Water Treatments**  
Scott Riley, Excet Inc.

**2:30 PM**

**Evaluating Common Carp Responses to Behavioural Barriers in a Mesocosm**  
Paul Bzonek, University of Toronto Scarborough

**2:50 PM**

**The Effect of Temperature on Acoustical Deterrence of Bighead (Hypophthalmichthys nobilis) and Silver Carp (H. molitrix)**  
Kelsie A. Murchy, University of Minnesota Duluth

**3:10 PM**

**Break**

**3:40 PM**

**Workshop: Zebra and Quagga Mussels: Issues Relating to Infestations in Infrastructures and Open Waters**  
**Part II (continued): Infestations in Open Waters**  
Daniel P. Molloy, University of Illinois at Champaign/Urbana and Molloy & Associates, LLC

### Additional Sessions

**3:10 PM**

**Break**

**3:40 PM**

**In situ Observations of Silver Carp Behavior when Presented with Broadband Sound**  
Allen F. Mensinger, University of Minnesota Duluth

**4:00 PM**

**Complex Sound as a Deterrent to Bigheaded Carp Passage**  
Marybeth Brey, U.S. Geological Survey

**4:20 PM**

**Discussion Forum**
# Wednesday, April 13, 2016

## Plenary Session

**8:30 AM**  
**Understanding and Predicting the Impacts of Species Invasions: Old Challenges, New Approaches**  
Anthony Ricciardi, Redpath Museum, McGill University

**9:10 AM**  
**Metrics Based on Comparative Functional Responses and Abundance Reliably Predict Invasive Species Identities and Ecological Impacts**  
Jaimie T.A. Dick, Queen's University Belfast

**9:50 AM**  
**Networking Break**

## Session A  
### Zebra & Quagga Mussel Control

**10:20 AM**  
**The Use of Potassium Chloride to Control Zebra Mussels: Lake Winnipeg Harbours**  
Dan Butts, ASI Group

**10:40 AM**  
**Use of UV Radiation Technology to Prevent Settlement of Quagga Mussel Larvae**  
Jackson A. Gross, Smith-Root Inc.

**11:00 AM**  
**Evaluation of the Effects of Ultra-Violet Light Treatment on Quagga Mussel Settlement and Veligers at Davis Dam**  
Sherry Pucherelli, Bureau of Reclamation

**11:20 AM**  
**Use of Electrified Fields for Dreissenid Mussel Control**  
James A. Luoma, U.S. Geological Survey

**11:40 AM**  
**Microencapsulated BioBullets: An Effective Control Strategy for Invasive Mussels**  
David C. Aldridge, University of Cambridge

**12:00 PM**  
**Luncheon**

## Session B  
### Invasive Fishes: Behaviour & Dispersal

**10:20 AM**  
**Behaviour and Dispersal Potential in Invasive Fish Populations**  
Michael G. Fox, Trent University

**10:40 AM**  
**Behavioural Variation among Round Goby (Neogobius melanostomus) Individuals at Different Stages of the Invasion Process**  
Lida Nguyen-Dang, University of Windsor

**11:00 AM**  
**Life History Shifts in Invasive Populations: Nature or Nurture?**  
Anna C. Rooke, Trent University

**11:20 AM**  
**Changes in the Distribution and Abundance of Rainbow Smelt (Osmerus mordax) in the Nelson River, Manitoba, Canada, 1996-2015**  
Richard Remnant, North/South Consultants Inc.

**12:00 PM**  
**Luncheon**

## Session C  
### Aquatic Plants

**10:20 AM**  
**Sinking Water Soldier Permanently**  
Allison Kirkpatrick, Ontario Federation of Anglers and Hunters

**10:40 AM**  
**Great Lakes Phragmites Collaborative: A Collective Impact Approach to Non-Native Phragmites**  
Heather Braun, Great Lakes Commission

**11:00 AM**  
**Collective Development of a Science Agenda for Managing Non-native Phragmites australis through Microbial Intervention**  
Kurt Kowalski, U.S. Geological Survey

**11:20 AM**  
**Achieving a Consilience of Science and Stakeholders: An Integrated Aquatic Vegetation Management Plan for Lake Tahoe Keys Lagoons**  
Lars W.J. Anderson, WaterweedSolutions

**11:40 AM**  
**Benefits Derived in Louisiana from the Long Term Management and Control of Waterhyacinth (Eichhornia crassipes)**  
Alfred F. Cofrancesco, U.S. Army Engineer Research and Development Center

**12:00 PM**  
**Luncheon**
Wednesday, April 13, 2016

Session A
Zebra & Quagga Mussel Control

1:30 PM
Optimization of Chlorination Strategies for Dreissenid Mussel Control
Scott Poulton, Ontario Power Generation

1:50 PM
Developing a Treatment Method to Protect Alberta’s Irrigation Pipelines from Invasive Dreissenid Mussels
Nicole Seitz Vermeer, Alberta Agriculture and Forestry

2:10 PM
Mortality Responses of Quagga Mussels to KCl Solutions Prepared in Different Source Waters
Christine Moffitt, U.S. Geological Survey

2:30 PM
Control of Dreissenid Mussels with a More Rational Use of Copper
David Hammond, Earth Science Labs, Inc.

2:50 PM
Quest for Durable Foul-Release Coatings
Bobbi Jo Merten, Bureau of Reclamation

3:10 PM
Break

Session B
Invasive Fishes: Diets & Impacts

1:30 PM
Ecological Impact of Ponto-Caspian Invertebrates and Fish in a Shipping Canal Ecosystem
Alain De Vocht, University Hasselt

1:50 PM
No Significant Negative Impact on Native Fish Species during First Years of Colonization by Ponto-Caspian Gobies
Hugo Verreycken, Research Institute for Nature and Forest

2:10 PM
Evaluating and Predicting Impacts of Globally-invasive Freshwater Fishes using Multi-population Comparisons
Suncica Avlijas, McGill University, Redpath Museum

2:30 PM
Food Competition as a Mode of Impact in a Riverine Round Goby Invasion
Dustin Raab, McGill University

2:50 PM
Diet Spectrum and Preference of the Invasive Round Goby (Neogobius melanostomus) in Flanders
Hugo Verreycken, Research Institute for Nature and Forest

3:10 PM
Break

Session C
Aquatic Plants

1:30 PM
Growth of Elodea canadensis (in Swedish lakes): A Head Start for an Invasive Species in Strongly Seasonal Environment
Kristina Tattersdill, Swedish University of Agricultural Sciences

1:50 PM
Vegetative Reproductive Capacity of Crested Floatingheart (Nymphoides cristata)
Samantha N. Sardes, University of Florida, IFAS Center for Aquatic and Invasive Plants

2:10 PM
Ornamentals Behaving Badly
Nicole Kimmel, Alberta Agriculture and Forestry

2:30 PM
Mapping Watershed Degree of Invasion Across the Continental United States
Amy J. Davis, U.S. Environmental Protection Agency

3:10 PM
Break
<table>
<thead>
<tr>
<th>Time</th>
<th>Session A</th>
<th>Session B</th>
<th>Session C</th>
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<tbody>
<tr>
<td>3:40 PM</td>
<td>Evaluating Copper Ion Generator for Control of Quagga Mussels &lt;br&gt;Renata Claudi, RNT Consulting Inc.</td>
<td>Towards Selective Removal of Invasive Fishes and Passage of Native Fishes in Rivers &lt;br&gt;Rob McLaughlin, University of Guelph</td>
<td>Decade of Gene Diversification of Viral Hemorrhagic Septicemia (VHS) Since its First Appearance in the Laurentian Great Lakes &lt;br&gt;Carol A. Stepien, University of Toledo</td>
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<td>4:00 PM</td>
<td>Invertebrate Community Response to Zequanox® in Aquatic Mesocosms &lt;br&gt;Michele Nicholson, Queen’s University</td>
<td>Ecology and Control of Invasive Northern Pike in the Columbia River, Canada &lt;br&gt;Brian Heise, Thompson Rivers University</td>
<td>Determining a Best-Case Effectiveness of a Molecular Method for the Detection of Aquatic Invasives &lt;br&gt;Ryan Scott, University of Windsor</td>
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<td>4:40 PM</td>
<td>The Ins and Outs of Registering a New Product for the Control of Aquatic Invasive Species &lt;br&gt;John F. Fournier, Acadia Regulatory Consulting, LLC</td>
<td>Genetic Patterns of the Invasive Eurasian Ruffe Over Time and Space: Comparing Introductions in the Laurentian Great Lakes versus England &lt;br&gt;Devon J. Eddins, University of Toledo</td>
<td>The Development and Validation of a LAMP Assay and Portable Instrument to Rapidly Detect Invasive Species in Transport as Bait &lt;br&gt;Christopher J. Merkes, U.S. Geological Survey</td>
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<td>5:00 PM</td>
<td>Use of a Differential Simple Stain to Confirm Mortality of Dreissenid Mussels in Field Research Experiments &lt;br&gt;Kelly Stockton-Fiti, KASF Consulting</td>
<td>Is the Trojan Sex Chromosome Strategy Feasible for Controlling Gambusia holbrooki? &lt;br&gt;Lokman Nor Hakim Norazmi, University of Tasmania</td>
<td>How Much Can Environmental DNA (eDNA) Reflect a Local Macroinvertebrate Community in a Freshwater Flowing Habitat? &lt;br&gt;Rosetta C. Blackman, School of Biological, Biomedical &amp; Environmental Sciences, University of Hull</td>
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<td><strong>Dreissenid Mussel EDNA &amp; Genetics</strong></td>
<td><strong>Global AIS Policy &amp; Legislation Drivers</strong></td>
<td><strong>Prevention &amp; Risk Assessment</strong></td>
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<td>Environmental DNA (eDNA) as a Monitoring Tool for Zebra Mussels in Lake Winnipeg</td>
<td>The Roles and Responsibilities of Health Canada’s Pest Management Regulatory Agency</td>
<td>Inter-assessor Reliability of Risk Classifications for Invasiveness of Alien Species</td>
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<td>Timothy Gingera, University of Manitoba</td>
<td>Scott Couture, Health Canada</td>
<td>Rob Leuven, Radboud University Nijmegen</td>
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<td>Development and Testing of High Throughput Sequencing Assays to Detect Aquatic Invasive Species from Environmental Samples</td>
<td>Canada’s Aquatic Invasive Species Regulations</td>
<td>Comparing European Risk Assessments for Invasive Freshwater Invertebrates</td>
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<td>Katy Klymus, University of Toledo</td>
<td>Tracy Kerluke, Fisheries and Oceans Canada</td>
<td>Frances Lucy, Institute of Technology Sligo</td>
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<td>Varying Levels of Different Environment Factors Influence the Decay of Aquatic eDNA</td>
<td>BC Invasive Mussel Prevention Program</td>
<td>Prioritizing Species of Concern under Projected Climate Changes using a Temperature Matching Model</td>
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<td>Richard F. Lance, U.S. Army Engineer Research &amp; Development Center</td>
<td>Martina Beck, BC Ministry of Environment</td>
<td>Tim Johnson, Ontario Ministry of Natural Resources and Forestry</td>
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<td>Improvement of Methods for Detection of Dreissenid Mussels by Microscopy and Polymerase Chain Reaction</td>
<td>Redefining Norms: Alberta’s Approach to Aquatic Invasive Species Prevention and Management</td>
<td>Invasion Risk of AIS Not in the Great Lakes Under Future Climate Scenarios</td>
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<td>Jacque Keele, Bureau of Reclamation</td>
<td>Kate Wilson, Alberta Environment &amp; Parks</td>
<td>Phyllis Higman, Illinois Natural Features Inventory</td>
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<td>Where is the Body? Dreissenid Mussels, Raw Water Testing, and the Real Value of E-DNA</td>
<td>Introduction to the New Ontario Invasive Species Act</td>
<td>Conquering the Cold: Climate Suitability Predictions for the Asian Clam in Cold Temperate North America</td>
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<td>Denise Hosler, Bureau of Reclamation</td>
<td>Ala Boyd, Ontario Ministry of Natural Resources and Forestry</td>
<td>Andrea Morden, McGill University</td>
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<td>10:40 AM</td>
<td><strong>Zebra and Quagga Mussel Population Studies</strong></td>
<td><strong>Regional Collaboration to Protect the Great Lakes and St. Lawrence River</strong></td>
<td><strong>Prevention &amp; Risk Assessment</strong></td>
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</tbody>
</table>
|           | **Invasion History of *Dreissena polymorpha*, the Zebra Mussel in Lough Key, an Irish lake**  
Frances Lucy, Institute of Technology Sligo | **Mike Piskur, Conference of Great Lakes and St. Lawrence Governors and Premiers** | **A Risk Assessment of Golden Mussel (*Limnoperna fortunei*) for Ontario**  
Gerry Mackie, University of Guelph |
| 11:00 AM  | **Zebra Mussel Habitat Selection, Growth and Mortality in Lakes of Northeastern Wisconsin and the Upper Michigan**  
Maureen Ferry, Wisconsin Department of Natural Resources | **Considerations in Governance of Aquatic Invasive Species Management – Experience on the International Great Lakes**  
Gavin Christie, Great Lakes Fishery Commission | **Canadian Columbia Basin: A Collaborative Approach to Aquatic Invasive Species Management**  
Jennifer Vogel, Central Kootenay Invasive Species Society |
| 11:20 AM  | **The Status of Quagga Mussel Populations in Lake Michigan and Complementary Growth Experiments**  
Ashley Baldridge, NOAA | **Spatial Resolution Effects on Predicting the Distribution of Aquatic Invasive Species in Nearshore Marine Environments**  
Ben J. Lowen, Fisheries and Oceans Canada | |
Technical Program Committee Co-Chairs

Jeff Long
Manager, Fisheries Science and Fish Culture, Manitoba Conservation and Water Stewardship

Becky Cudmore
Manager, Asian Carp Program and Aquatic Invasive Species Senior Advisor, Fisheries and Oceans Canada

Technical Program Committee

Sarah Bailey
Fisheries and Oceans Canada

Peg Brady
National Oceanic & Atmospheric Administration

Jeff Brinsmead
Ontario Ministry of Natural Resources and Forestry

Ainslie Chaze
Manitoba Hydro

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U.S. Army Corps of Engineers

Becky Cudmore
Fisheries and Oceans Canada

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Queen’s University Belfast

Nicholas Heisler
International Joint Commission

Douglas Jensen
University of Minnesota Sea Grant Program

Erika Jensen
Great Lakes Commission

Rob Leuven
Radboud University Nijmegen

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Manitoba Conservation and Water Stewardship

Frances Lucy
Institute of Technology, Sligo and Inland Fisheries Ireland

Sophie Monfette
Ontario Federation of Anglers and Hunters

Linda Nelson
U.S. Army Corps of Engineers

Stephen Phillips
Pacific States Marine Fisheries Commission

Scott Poulton
Ontario Power Generation

Tanya Rushcall
Alberta Environment & Parks

Don C. Schmitz
North American Aquatic Invasive Species Network & Florida Department of Environmental Protection

Margo Shaw
Manitoba Environmental Industries Association

Deb Sparks
Invasive Species Centre

Gail Wallin
Invasive Species Council of British Columbia

Kate Wilson
Alberta Environment & Parks

Jill Wingfield
Great Lakes Fishery Commission

Kelly Withers
Invasive Species Centre

Conference Registration

Registrations are to be submitted online through the ICAIS website (www.ICAIS.org).

Refund Policy

Registration fees are refundable, less a $50 administration fee, provided that written notification of cancellation is provided to the Conference Administrator by email before March 6, 2016.

Refunds will not be issued until after the conference.

Hotel Accommodation

The Fort Garry Hotel is the official Conference hotel and is offering Conference participants the rate of CAD $144.00 (plus applicable taxes) single/double occupancy, which includes complimentary high-speed Internet in guest rooms, complimentary 24-hour delivery of coffee/tea/cookies to guest rooms, and complimentary passes to the fitness centre.

The cut-off date for hotel reservations at the special ICAIS rate is March 10, 2016. After that date guest rooms will be provided based on availability and at the prevailing rate at that time. It is strongly recommended to reserve your hotel accommodation early.

Registration Fees  All amounts are in Canadian funds

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<tr>
<th>Category</th>
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<tbody>
<tr>
<td>Session Chair/Speaker/Poster Presenter</td>
<td>$450 + $22.50 GST = $472.50</td>
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<tr>
<td>Conference Participant</td>
<td>$550 + $27.50 GST = $577.50</td>
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<tr>
<td>Full-time Student</td>
<td>$300 + $15.00 GST = $315.00</td>
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<td>Retiree</td>
<td>$350 + $17.50 GST = $367.50</td>
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