
*5th International Conference
on Natural Channel Systems*



NATURAL CHANNELS
Linking Processes to Practice

2016 Preliminary Program

September 26th & 27th, 2016

Marriott Gateway on the Falls

Niagara Falls, Ontario

2016 KEYNOTE SPEAKERS



Master of Ceremonies • Serge Metikosh

Serge Metikosh, is a Sr. Fish Habitat Biologist and President of Fish Habitat Solutions Inc. with more than 40 years of experience as a Fish and Fish Habitat Biologist and as an environmental impact assessment practitioner. Before starting Fish Habitat Solutions Inc. in 2012, Serge Metikosh was a Principal and Senior Fish Habitat Biologist at Golder Associates Ltd in Calgary for 15 years. As a consultant, Serge Metikosh's focus was on his clients with technical and strategic advice for obtaining regulatory approval for various resource development projects throughout Canada. He has been Project Manager and Discipline Lead on numerous pipeline, oil and gas, coal mining and diamond mining projects and has prepared Environmental Impact Statements and applications for authorizations under the Fisheries Act. This work included issue scoping, the design and implementation of baseline studies, analysis and reporting, development of mitigation strategies, determination of residual effects and development of Offsetting Plans. In addition to being involved with projects in the preconstruction and approval stages, Mr. Metikosh also participated in their construction and operation phases. Mr. Metikosh's work in relation to the construction and operation phases of resource development projects focused on the implementation of mitigation measures for various aspects of construction, implementation of No Net Loss Plans, as well as the design and implementation of effects monitoring studies required as conditions of regulatory approval.

Prior to joining Golder Associates Ltd. in 1997 Mr. Metikosh was a Senior Fish Habitat Biologist with Fisheries and Oceans Canada (DFO) in Burlington Ontario where he was responsible of the delivery of the Fish Habitat Management program in Ontario. He is familiar with the regulatory requirements of the Fisheries Act, DFO's Policy for the Management of Fish Habitat (including the guiding principle of No Net Loss) and the Canadian Environmental Assessment Act. He was also instrumental during his time with DFO in promoting and supporting major science-based guidance documents for watershed planning and the Natural Channel Systems Initiative. Mr. Metikosh has kept up to date with changes in Federal legislation that have taken place over the last several years and continues to provide advice to his clients on policy and implementation issues related to the fisheries protection provisions of the amended Fisheries Act. He has developed guidelines and procedural manuals for DFO and other government and industry organizations related to the Fisheries Act and CEEA.



Keynote Speaker • Chester Watson

Chester Watson is an Emeritus Professor of Civil Engineering and presently is a private consultant. His career spans industrial water supply, construction of municipal water and waste water conveyance and treatment, teaching advanced level University classes, short courses and conference lectures pertaining to stream restoration. He has lectured in the U.S., U.K., Canada, and China, and has written numerous publications.

Dr. Watson is an engineer with experience in fluvial morphology, erosion, and sediment transport in modified and managed watersheds and streams. Much of his career has been spent in the study and rehabilitation of incised stream channels caused by watershed modification and channelization, and an equal portion of his career has been in the study of large rivers, particularly the Mississippi river. He is presently engaged with an advisory role in a physical model of the drainage from Mount St. Helens.



Keynote Speaker • Colin Thorne

Colin Thorne is Professor and Chair of Physical Geography at the University of Nottingham. His educational background is in environmental sciences, civil engineering and physical geography. He has published 9 books and over 130 refereed journal papers and book chapters. To date, his work has nearly 8,000 citations, including one paper that has been cited over 800 times. He has an h-index of 44 and an i10-index of 99. During a career spanning four decades, he has held posts with UEA, Colorado State University, the University of London, USDA National Sedimentation Laboratory, USACE Waterways Experiment Station, NOAA Fisheries, and currently, the University of Nottingham. He is also a visiting Professor at Tsinghua University, China and an Affiliate Professor at both Portland State and Colorado State Universities.



Professor Thorne is an environmental scientist with expertise in erosion, sediment transport and sedimentation in natural, modified and managed rivers, particularly with respect to the restoration of lost river functions, form and habitat. Internationally, Thorne's experience with rivers extends to the basins of the Awash, Brahmaputra, Clutha, Columbia, Ganges, Mekong, Mississippi, Missouri, Parana, Salado, San Juan, Toutle, Yangtze, and Yellow Rivers, including research on a number of the alluvial deltas associated with these watercourses.

Through his research and consultancy work, Thorne has acquired particular skills in expert knowledge elicitation, stakeholder engagement, multi-criteria analysis and risk assessment (qualitative and quantitative). He is adept at working with stakeholders in the co-production of knowledge and delivering key messages to non-specialist decision makers in ways they understand and can act on, as evidenced by uptake in the UK of the principles of 'natural flood management' and 'working with natural processes'. He currently leads a 9-university consortium investigating the generation of multiple flood risk benefits using Blue-Green infrastructure (<http://www.bluegreencities.ac.uk/bluegreencities/index.aspx>).

Keynote Speaker • Marc Gaboury

Marc Gaboury has over 28 years of experience in fish habitat restoration and enhancement, environmental impact assessment, and research. He has worked throughout British Columbia, Yukon, Canadian prairies and eastern United States. He has worked cooperatively on research, impact assessment and restoration projects with First Nations in Manitoba and British Columbia, including Cowichan Tribes, Cree, Haida, Lheidli T'enneh, Huu-Ay-Aht, T'Sou-ke, Nisga'a Lisims Government, Okanagan Nation Alliance, Nuw-chah-nulth, and Uchucklesaht First Nations.



Marc has extensive experience in preparing integrated watershed restoration plans and the design and construction of fish habitat restoration structures. He has co-authored comprehensive restoration plans for the Okanagan, Englishman, Coldwater and Cowichan rivers in B.C. and designed specific treatments to restore stream habitats and watershed processes in another 58 watersheds in B.C. and 15 in Manitoba. He has also designed and constructed fishways for low head dams, as well as backwatering schemes for existing culverts to allow fish passage.

Marc is a Registered Professional Biologist with the College of Applied Biology of British Columbia.

2016 SESSIONS

DAY ONE – Monday, September 26

10:45 AM - 12:15 PM

Room: Oakes North East

M1A Innovation

Streamline Your Design with Civil3D

Randy Brook and Hamish Trenam, Stantec Consulting Ltd.

Innovative Stream Restoration Techniques: Dam Removal, Channel Reconstruction, and Large Wood Placement in the Pacific Northwest Region of the US

Dr. Janine Castro, US Fish and Wildlife Service and NOAA National Marine Fisheries Service

The Use of Unmanned Aerial (UAV) Technologies to Detect Groundwater Inputs in the Credit River

Ken Glasbergen, CrossWind Geomatics. Inc.

Room: Hennepin South

M1B Southern Ontario Procedure

Meander Belt Width Procedures: Developing a Regional Model for Southern Ontario

Imran Khan, Beacon Environmental Limited

Regional Reference Curves for Small and Medium Watercourses in Southern Ontario

Trevor Chandler, Stantec Consulting Ltd.

Limitations and Misuse of the Rapid Geomorphic Assessment for Preliminary Characterization of Channel Stability

Robin McKillop, Palmer Environmental

Room: Hennepin North

M1C Historical Context

Twenty Plus Years Since the Rural Ontario Data Base and Relationships was Produced. Looking Back to Look Forward

Bill Annable, University of Waterloo

Applied Fluvial Geomorphology: Where Have We Come from, Where Do We Go?

Dr. Roger T.J. Phillips, Western University and Aquafor Beech Limited

The Evolution of Natural Channel Design Practice in the Maritimes: From Digger Logs to Holistic Channel Realignment

John Parish, Matrix Solutions Inc.

Room: Oakes South

M1D Climate Change

Pilot Study - Environmental and Infrastructure Vulnerabilities to Climate Change - Implications for Natural Channels

Karen Hofbauer, Matrix Solutions Inc.

Freedom Space for Rivers: An Economical Approach to Sustainable Management in a Changing Climate

Joanna Eyquem, AECOM

State of Climate Change Science and Practice in the Great Lakes Basin: A Focus on Climatology, Hydrological and Ecological Effects

Edmundo Fausto, Ontario Climate Consortium - Toronto and Region Conservation Authority



DAY ONE – Monday, September 26

2:15 PM - 3:45 PM

Room: Oakes North East

**M2A
Natural Resources:
Challenges and
Opportunities**

**Pipeline Associated
Watercourse Crossings
Fisheries Self-
Assessment Tool**
Lucas Warner, Stantec
Consulting Ltd.

**Once Upon a Gravel
Pit: Reconnecting
Floodplain through
Aggregate Extraction**
Crystal Allan, Grand River
Conservation Authority

**Treatments to Mitigate
Aquatic Habitat
Impacts Associated
with Land and Resource
Developments**
Marc Gaboury, LGL
Limited

Room: Hennepin South

**M2B
Tools**

**The Science and
Practice of Erosion
Threshold Theory in
Applied Geomorphology**
Dr. Roger T.J. Phillips,
Western University and
Aquafor Beech Limited

**The Applicability
of Using Fractional
Bedload Transport
Modelling as a
Tool to Predict
Geomorphic Change:
A Novel Framework
for Practitioners Using
Commonly Available
Data**
Jeff Hirvonen,
GeoProcess Research
Associates and University
of Waterloo

**A Tool to Optimize
Understanding of
Hydromorphological
Characteristics
for French River
Management and
Restoration (CARHYCE)**
Frederic Gob, Université
Panthéon-Sorbonne, Paris

Room: Hennepin North

**M2C
Habitat Banking**

**Proponent-Led Habitat
Banking**
Brent Valere, Fisheries
and Oceans Canada

**Regulatory Approvals
for Stream Restoration -
Two Approaches to DFO
Authorization**
Jessica Kellerman, City of
Waterloo

**Recreational Fisheries
Conservation
Partnerships Program**
Cynthia Mitton-Wilkie,
Fisheries and Oceans
Canada

Room: Oakes South

**M2D
Monitoring – TRCA**

**Evaluating the
Effectiveness of Stream
Rehabilitation Projects:
Lessons Learned from
10 Years of Monitoring**
Dean Young, Toronto
and Region Conservation
Authority

**Temporal Changes
in Terrestrial Biota
Observed through
Toronto and Region
Conservation
Authority's Natural
Channel Design
Monitoring Program
2-14 Year Post
Restoration**
Lyndsay Cartwright,
Toronto and Region
Conservation Authority

**Evaluating the Effect of
Natural Channel Design
on Fish and Benthic
Macroinvertebrate
Communities**
Raymond Biastoch,
Toronto and Region
Conservation Authority

2016 SESSIONS

DAY ONE – Monday, September 26

4:15 PM - 5:45 PM

Room: Oakes North East

M3A In Stream Techniques

Evaluating Stream Restoration Designs with Engineered Log Jams in Experimental River Channels
Michael S. Gallisdorfer, University at Buffalo

The “Threshold” of Habitat: Spawning Salmon in a Restored Threshold Channel
Jeff Muirhead, Stantec Consulting Ltd.

2-D Hydraulic of Proposed Fish Ramp to Design for Fish Passage Potential
Bradley Burrows, Ecosystem Recovery Inc.

Room: Hennepin South

M3B Approaches

A Process-Based Approach for Proposing Ecological Flows for Geomorphic Purposes
Ashraf Zaghal, MMM Group

Engineering Design Meets Geomorphic Design
Steve Braun, Matrix Solutions Inc.

Restoring Rivers as Part of Flood Risk Management - Recent Experience Gained from Projects in Scotland and England
Colin Thorne, Nottingham University

Room: Hennepin North

M3C Fish Habitat

Changes in Fisheries Act, Policy and Review Process
Thomas Hoggarth, Fisheries and Oceans Canada

Fish Habitat Offsetting in Pristine Wilderness: Regulatory Challenges
Heather Amirault and David Luzi, Stantec Consulting Ltd.

Brook Trout Creek Restoration under Challenging Conditions
Laura Lawlor, GHD Limited

Room: Oakes South

M3D Monitoring – 2

Assessment of the Performance of a Riffle-Pool Restoration Project over Two Years of Floods Using Radio Frequency Identification (RFID)
Bruce MacVicar, University of Waterloo

Long-Term Erosion Monitoring on Niagara Escarpment Watercourses
Anna C.J. Howes, Aquafor Beech Ltd

How Dynamic Are Our Streams? How Stable Are Our Designs?
John Parish, Matrix Solutions Inc.



DAY TWO – Tuesday, September 27

8:30 AM - 10:00 AM

Room: Oakes North East

T1A **Biology**

Restoring Ecological Functions – TUC Loweville Project

Jack Imhof, Trout Unlimited

First Nations Engagement in Developing and Rehabilitating Watersheds - Natural Channels

Jon Bisset, Canadian Columbia River Inter-tribal Fisheries Commission

Fish, Benthic Insects, and Trees of Riparian Ecosystems Mexico's Northeastern Rio San Juan

Jose Navar, Tecnológico Nacional de Mexico

Room: Hennepin South

T1B **Case Studies 1**

How to Communicate a Natural Channel Design Effectively

Sarah Matchett, Conservation Halton

Little Stewart Creek Abstract

Brandon Spaugh, North State Environmental

Buckhorn Creek: Removal of an Old Low Head Hydroelectric Project and Restoration of the Creek on the Floor of the Drained Reservoir

Darrell Westmoreland, North State Environmental

Room: Hennepin North

T1C **Agricultural Drains 1**

Application of Natural Channel Design (NCD) Principles in Agricultural Drainage

Scott Robertson, Stantec Consulting Ltd.

Using a Systematic Approach to Natural Channel Designs and Agricultural Stewardship

Sarah Fleischhauer, Maitland Valley Conservation Authority

The Scott Drain – Integrating Natural Channel Design, Controlled Drainage and Agricultural Practices

Geoff King, Maitland Valley Conservation Authority

Room: Oakes South

T1D **Sediment Transport 1**

River Bank Rehabilitation in Sandbed Channels

Ahmed Siddiqui, GEO Morphix Ltd.

Where Does All the Sediment Go? Modelling the Sixteen Mile Creek Sediment Plume

Jeffrey Doucette, GHD Limited

The Evolution of Gravel-Bed Morphology Due to Changing Hydrologic Regimes: A Case Study of an Urban Watercourse in Southern Ontario, Canada

Ben Plumb, University of Waterloo

2016 SESSIONS

DAY TWO – Tuesday, September 27

10:30 AM - 12:00 PM

Room: Oakes North East

T2A Redside Dace

Natural Channel Design for Redside Dace

Shari Faulkenham, Matrix
Solutions Inc.

Implementation of Natural Channel Projects for Redside Dace; The Lessons Learned in Implementing Two Ecologically Different Projects

Ralph Toning, Toronto
and Region Conservation
Authority

Review of Redside Dace Habitat Corridor Realignments: Morphology, Sedimentology and Habitat Suitability within Aged Natural Corridor Designs

Paul V. Villard, GEO
Morphix Ltd.

Room: Hennepin South

T2B Case Studies 2

Avonhead Creek Daylighting Project: Field Monitoring Techniques to Understand Watershed Hydrology

Jayeeta Barua and Karen
Chisholme, Credit Valley
Conservation Authority

Reconstruction of Amberlea Creek Valley Corridor to Protect Frenchman's Bay Provincially Significant Wetland

Robert Amos, Aquafor
Beech Ltd

The Do's and Don'ts of Natural Channel Realignments

Shawn R. Taylor,
Ecosystem Works Inc.

Room: Hennepin North

T2C Agricultural Drains 2

Lost Land Reclamation in N.O.T.L Irrigation Channel

Brandon Cormier, Devron
Sales Ltd.

Use of Drainage Act Assessments to Evaluate Costs of Rural Natural Channel Design

Tim Brook, Ontario
Ministry of Agriculture,
Food and Rural Affairs

Educating the Appropriate Target Audience for Stewardship Initiatives

Jacqui Empson Laporte,
Ontario Ministry of
Agriculture, Food and
Rural Affairs

Room: Oakes South

T2D Sediment Transport 2

Sediment Budget of the Rhine River for Fractions Clay/Silt Sand & Gravel

Stefan Vollmer, Federal
Institute of Hydrology
(BfG), Koblenz, Germany

The Quasi-Stability of Urban Stream Channels and the Importance in Bed Material Transport

Bill Annable, University of
Waterloo

Bedload Transport in Urbanized Creeks with and without Stormwater Management

Elli Papangelakis,
University of Waterloo



DAY TWO – Tuesday, September 27

2:00 PM - 3:30 PM

Room: Oakes North East

T3A Erosion and Sediment Control

Erosion and Sediment Control for Stream Restoration in Canada
Harry Reinders, R & M Construction

Erosion and Sediment Control for Stream Restoration in the US
Darrell Westmoreland, North State Environmental

Erosion and Sediment Control: Can We See the Forest for the Trees?
Brad Fairley, Stantec Consulting Ltd.

Room: Hennepin South

T3B Stormwater

Using Green Infrastructure to Meet Environmental Flow Needs
Cassie Schembri, Credit Valley Conservation Authority and Wolfgang Wolter, Ecosystem Recovery Inc.

The Influence of Erosion Control Criteria on Stormwater Management Facility Design
Aaron Farrell, Amec Foster Wheeler and John Parish, Parish Aquatic Services

Designing Stormwater Management Facilities to Minimize Downstream Watercourse Impacts
Mike Gregory, Computational Hydraulics International

Room: Hennepin North

T3C Modelling

The Effects of Aquatic Vegetation Growth on Discharge Calculation in Natural Watercourses: A High-Resolution Study Featuring Novel Techniques
Lorenzo Brignoli, University of Waterloo

Using Two-Dimensional Hydraulic Modelling to Quantitatively Assess Fish Habitat Improvements
Nick Hodges and Joanna Eyquem, AECOM

Habitat Suitability Modelling
Amanda McKay, Matrix Solutions Inc.

Room: Oakes South

T3D Urban Streams

The Role of Eco-Hydraulics in the Restoration of a Degraded Urban Stream
Ian D. Smith, Urban & Environmental Management Inc.

Urban Channel Rehabilitation - a Fine Balance
Jeff Daniel, GHD Limited

Sediment Management on the North Fork of the Toutle River
Chester Watson, Biedenham Group



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