LEE HRENCHUK

BIOLOGIST, IISD Experimental Lakes Area

Lee is part of the fish crew at IISD-ELA. Her research focuses on monitoring and assessing the effects of a variety of environmental perturbations (including mercury deposition, cage aquaculture, endocrine disrupting chemicals, eutrophication and climate change) on fish ecology and behaviour in small, oligotrophic lakes in the boreal shield. Lee conducted aquatic field research in both the Canadian Arctic and in Antarctica before settling more permanently at IISD-ELA. Post-graduate studies included examining the accumulation of mercury in yellow perch as part of the whole-lake Mercury Experiment to Assess Atmospheric Loading In Canada and the United States (METAALICUS) at ELA. Lee is an advocate for communicating science to a broader audience and has volunteered with Fort Whyte Alive, the Manitoba Museum and Fisheries and Oceans Canada to talk about scientific ideas and environmental issues with the public.

Employment

Biologist (IISD Experimental Lakes Area Inc.)

Supervisors: Dr. Michael Paterson, Dr. Vince Palace — April 2014 to present

When IISD Experimental Lakes Area (IISD-ELA) took over operation of ELA from Fisheries and Oceans Canada, I chose to leave my position with DFO and continue my research program with IISD-ELA. My experience and responsibilities at IISD-ELA are much the same as they were with DFO, conducting scientific research to assess the impacts of whole-ecosystem experiments on fish ecology and behaviour at IISD-ELA. My research has focused on monitoring the effects of a variety of environmental perturbations (including mercury deposition, cage aquaculture, endocrine disrupting chemicals, eutrophication, and climate change) on fish in small, oligotrophic lakes in the boreal shield.

My main duties are to oversee field and laboratory operations of the fish crew; design and maintain databases; analyze data and assist in the preparation of scientific manuscripts; hire, train, and directly supervise research assistants and graduate students; participate in scientific conferences and project meetings; conduct administrative tasks; and participate in other ELA research programs as necessary.

Aquatic Science Biologist (Fisheries and Oceans Canada)

Supervisor: Dr. Paul Blanchfield — November 2010 to March 2014

My overall focus has been to conduct scientific research to assess the impacts of whole-ecosystem experiments on fish ecology and behaviour at the Experimental Lakes Area (ELA). My research has focused on monitoring the effects of a variety of environmental perturbations (including mercury deposition, cage aquaculture, endocrine disrupting chemicals, eutrophication, and climate change) on fish in small, oligotrophic lakes in the boreal shield.

My main duties were to oversee field and laboratory operations of the fish ecology crew; design and maintain databases; assist in the preparation of scientific manuscripts; hire, train, and directly supervise research assistants and graduate students; participate in scientific conferences and project meetings; conduct administrative tasks; participate in other ELA research programs as necessary (lake sampling, hydrology, chemistry), and, in 2013, to oversee groceries and shared cooking responsibilities for the core staff at the field camp.

Graduate student (M. Sc., Biological Sciences)

Supervisor: Dr. Paul Blanchfield July 2008 to September 2010

Objective: examine accumulation of mercury by yellow perch (Perca flavescens) from food and water using bioenergetics modelling and a controlled field experiment.

I planned and implemented my research program with assistance from my supervisor; conducted field and lab research according to approved scientific protocols; hired, trained and supervised research assistants; created and managed databases of lab- and field-collected data; and reported my research in a written thesis.

Field research assistant, limnology (Montana State University)

McMurdo Dry Valleys, Antarctica

Supervisors: Marie Sabacka, PhD candidate, and Dr. J. Priscu, Professor January to March 2008

I was a member of a 4-person field research team responsible for collecting and processing water samples from three large, permanently ice-covered freshwater lakes in Taylor Valley (McMurdo Dry Valleys, Antarctica). Our research focus was to monitor the effects of polar night on various in-lake physical, chemical, and biological parameters.

Responsibilities included preparing equipment and food for each sampling excursion (16 days duration); collecting, processing, and archiving water samples using a variety of techniques; entering data into databases; troubleshooting and fixing field and camp equipment; and maintaining healthy relationships among a small team in an extremely remote location.

Field research assistant (Fisheries and Oceans Canada, Experimental Lakes Area)

Supervisor: Dr. Paul Blanchfield May to September 2005 and 2006; September to December 2007

Assisted in conducting field research to assess the impacts of whole-ecosystem environmental perturbations on fish ecology and behaviour. This position improved my knowledge and understanding of all aspects of limnology and aquatic ecology, and gave me experience with the various stages of ecosystem-scale scientific field research, including planning, coordination, sample collection, and database management.

Field Research Coordinator and Field Camp Supervisor (Fisheries and Oceans Canada)

Supervisor: Jim Johnson, Biologist May to September 2007

I was involved in all stages of preparation, set up, and data collection for a remote fisheries research program in Ivvavik National Park, YT. The objective of the research was to monitor species of marine and anadromous fish in coastal Beaufort Sea.

This experience taught me to supervise a crew of several individuals, enhanced my ability to solve problems quickly, allowed me to communicate research objectives to members of the local community, and gave me invaluable experience in planning, coordinating, supervising, and conducting a major field research project.

Education

Master of Science – Biological Sciences University of Manitoba 2011

Supervisor: Dr. Paul Blanchfield (Fisheries and Oceans Canada)

Thesis title*: Accumulation of dietary and waterborne mercury by fish - experimental and whole ecosystem approaches using enriched stable isotopes*.

Bachelor of Science Honours –Biological Sciences University of Manitoba 2007

Supervisors: John Babaluk (Fisheries and Oceans Canada) and Dr. Ric Moodie (University of Winnipeg)

Thesis title: *Fluctuating asymmetry in the slimy sculpin, Cottus cognatus, upstream and downstream of two mine-sites in the Northwest Territories*

Qualifications

Experience conducting whole-ecosystem research to monitor impacts of anthropogenic stressors on freshwater ecosystems

Experience designing, organizing, and leading fisheries research studies in a variety of freshwater and marine ecosystems, and in the laboratory

Experience with database creation and management of fisheries and limnological data (MS Access)

Experience with statistical analysis of fisheries and limnological data (SigmaPlot, Statistica, R, MS Excel)

Experience communicating results of research through oral presentation and in writing

Experience training and supervising others in safe field and laboratory research protocols

Experience with many fish sampling, tissue preparation and sample archival techniques

Experience collecting data and samples for various limnological parameters (physical, chemical)

Experience with analytical procedures for quantifying various chemical parameters in water samples (dissolved inorganic carbon, total dissolved phosphorus, pH, conductivity, oxygen)

Experience assembling, operating, and maintaining solar-powered systems

Experience working in remote locations for long periods of time

Able to take on leadership roles and to supervise others

Able to work well as part of a team

Excellent time management skills and able to manage multiple tasks

Physically fit and capable of working in diverse field conditions, including winter field research

Motivated to continually learn and to take on new tasks

Experience communicating and interpreting scientific ideas and results to a public audience

Certifications

Standard First Aid with CPR (Red Cross)	expires Apr 2018
Transportation of Dangerous Goods Certificate	expires May 2017
Royal Ontario Museum Fish Identification Workshop (ROM)	certified 2013
Marine Emergency Duties A3 course (Transport Canada)	certified 2009
The Experimental Fish online course (Canadian Aquaculture Institute)	certified 2008
ATV Operation (Intola Safety)	certified 2005
Defensive Driving (Intola Safety)	certified 2005
Pleasure Craft Operator Card (Transport Canada)	certified 2005
WHMIS certificate	certified 2006
Canadian Firearms Safety Course	certified 2007
Possession and Acquisition License for Non-Restricted Firearms	certified 2007
Manitoba Driver's License (class 5)	obtained 2000
Previously held: Chainsaw Safety (Intola Safety)	expired 2014

Scholastic Achievement and Awards (selected)

NSERC Alexander Graham Bell Canada Graduate Scholarship ($17,500), University of Manitoba (2009-10)

Dr. Ken Stewart Scholarship in Aquatic Biology and Conservation ($2,500), Fish Futures Inc. (2009)

Experimental Lakes Area Graduate Student Fellowship ($18,700), University of Manitoba (2008-10)

Silver medal for the second highest standing in the Faculty of Science (Honours) 2007-08, University of Winnipeg

Gold medal for the highest standing in the Department of Biology (Honours) 2007-08, University of Winnipeg

Dr. Edgar Van Nuys Allen Memorial Scholarship ($800), Department of Biology, University of Winnipeg (2006)

Student of Highest Distinction Award ($500/y, 3 years), University of Winnipeg (2004-06)

Athletic Scholarship ($1,500/y, 4 years), University of Winnipeg Wesmen Women's Volleyball team (2002-05)

Advanced Early Admission Scholarship ($2,250), University of Winnipeg (2002)

Publications

Charles, C., Gillis, D.M., Hrenchuk, L.E., and Blanchfield, P.J. 2016. A method of spatial correction for acoustic positioning biotelemetry. *Animal Biotelemetry*. *4*(5). DOI: 10.1186/s40317-016-0098-3

Madenjian, C.P., Blanchfield, P.J., Hrenchuk, L.E., Van Walleghem, J.L.A. 2014. Mercury elimination rates for adult northern pike Esox lucius: evidence for a sex effect. *Bulletin of Environmental Toxicology and Chemistry*. DOI: 10.1007/s00128-014-1256-z

Van Walleghem, J.L.A.; Blanchfield, P.J.; Hrenchuk, L.E.; Hintelmann, H. 2013. Mercury elimination by a top predator, *Esox Lucius*. *Environmental Science & Technology*. *47*(9): 4147-4154.

Hrenchuk, L.E.; Blanchfield, P.J.; Paterson, M.J.; Hintelmann, H. 2012. Dietary and waterborne mercury accumulation by yellow perch: a field experiment. *Environmental Science & Technology*. *46*(1): 509-516.

Hrenchuk, L.E., 2010. Accumulation of dietary and waterborne mercury by fish - experimental and whole-ecosystem approaches using enriched stable isotopes. M. Sc. thesis, University of Manitoba, Department of Biological Sciences, 211 pp

Conferences and Presentations (selected)

Hrenchuk, L.E. The Experimental Lakes Area – research history. Red River Basin North Chapter Annual General Meeting. Bird's Hill, MB, Canada. 29 Jan, 2015.

Hrenchuk, L.E.; Blanchfield, P.J.; Van Walleghem, J.L.A.; Rudd, J.W.M.; Hintelmann, H. The response of fish mercury levels to changes in inorganic mercury loading. Canadian Conference for Fisheries Research. Windsor, ON, Canada. 3-5 Jan, 2013.

Hrenchuk, L.E.; Blanchfield, P.J.; Paterson, M.J.; Hintelmann, H.H. Dietary and waterborne mercury accumulation by yellow perch: a field experiment. Aquatic Toxicity Workshop. Winnipeg, MB, Canada. 2-5 Oct, 2011. (oral presentation)

Hrenchuk, L.E., Blanchfield, P.J., Paterson, M.J., and Hintelmann, H.H. Uptake of newly deposited mercury by yellow perch (*Perca flavescens*). Society of Environmental Toxicology and Chemistry Conference. New Orleans, LA, USA. 19-23 Nov, 2009.

Hrenchuk, L.E., Blanchfield, P.J., Paterson, M.J., and Hintelmann, H.H. Uptake dynamics of newly deposited mercury in a boreal aquatic food web. 9th International Conference on Mercury as a Global Pollutant. Guiyang, China. 7-12 Jun, 2009.