

Longnose Dace Responses to Contaminants Identify Emerging Challenges in Southern Alberta Rivers; Advancing Canadian Wastewater Assets Provides an Innovative Collaboration and Exciting Research Opportunities

Leland Jackson, University of Calgary

Recent studies on longnose dace, an abundant, native minnow in South Saskatchewan River Basin headwaters, has revealed evidence of fairly widespread endocrine disruption. Responses of dace are not restricted to estrogenic effects in male fish, but include either anti-estrogenic or androgenic effects in female fish as well, and appear to lead to severely female-biased sex ratios at a number of sites. Emerging tools from molecular biology coupled to traditional tools from aquatic ecology allow measurement of responses at levels of biological organization that span gene regulation to populations in the field. These results highlight emerging challenges in understanding mechanisms of action of environmental contaminants on natural populations, and the need for innovative approaches to finding solutions. Advancing Canadian Wastewater Assets (ACWA) is a University of Calgary - City of Calgary partnership that will see ecological and engineering research programs embedded within the City's new Pine Creek wastewater treatment plant. This partnership has created unique research opportunities; example applied research problems related to emerging contaminants will be highlighted.

Leland Jackson, Ph.D..

Lee Jackson is an aquatic ecologist who's research seeks to understand how the structure of communities and ecosystems affects their function, how land use determines the delivery of materials (nutrients, contaminants) to rivers, and relationships between local economies and ecological decision making. Following his Ph.D. at McGill University where he studied the role of aquatic macrophytes on trace metal cycling in lakes, he held an NSERC PDF at the University of Wisconsin-Madison. His research at UW-Madison centered on organochlorine contaminant fluxes and fisheries management, and has been used to guide policy development by the International

Joint Commission for the Great Lakes. After leaving Madison, Dr. Jackson held a faculty position at the University of Illinois at Urbana-Champaign. In 1997 he moved to the University of Calgary where he is currently full professor and Associate Head (Graduate Program). His NSERC sponsored research examines the structuring role of rooted aquatic plants in shallow prairie lakes, and blends empirical studies with field experiments to test and develop theory. Current research with the Canadian Water Network seeks to understand land-water coupling in the South Saskatchewan River Basin (with PDF Nicole Nadorozny and MSc student Cecilia Chung). Other research is examining the size of urban point-source inputs on rivers (with M.Sc. student Madison Kobryn), the impacts of *Didymosphenia* ("rock snot") blooms on energy cycling in rivers (with MSc student Cecilia Chung, and undergraduate Kayla Poohachoff), and the utility of longnose dace as biomarkers for nutrient and endocrine disrupting compounds in southern Alberta rivers (with M. Sc. students Suzanne Henderson, Ava Zare and Casey Maier and Joyce MacNeil). He is a principal investigator in the Water Ecology theme of the provincially funded (through the Alberta Ingenuity Fund) Alberta Water Research Institute. He served as a team leader for the Aquatic Ecology section of Alberta's "Water for Life" strategy workshops, and also served on the implementation committee. Dr. Jackson regularly serves on NSF and US-EPA peer review panels and he was recently appointed Executive Director of Advancing Canadian Wastewater Assets (ACWA). He has published 45+ peer-reviewed articles in environmental science and ecology journals.

Dr. Jackson's personal interests include photography, fly tying and fly fishing, and woodworking. He grew up enjoying a number of sports, and currently plays squash. He enjoys watching his son's hockey and soccer, and his daughter's squash.