Life history variation and contaminant stress in lake trout, *Salvelinus namaycush*

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**Project Abstract**
We propose to use venture funds from the Center for Water Sciences (CWS) to develop methods to determine concentrations of candidate ubiquitous organic contaminant(s) in lake trout tissue. We are specifically interested in linking the physiological aspects of life history strategies to susceptibility to contaminants in lake trout populations and this grant would provide support for an important first step which is to develop procedures and techniques to identify contaminants in lake trout tissue. Potential candidate contaminants include: perfluorinated organic compounds such as perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA), polyaromatic hydrocarbons (PAHs), mercury polychlorinated biphenyls (PCBs), dioxin, and polybrominated diphenyl ethers (penta and deca). We will measure contaminant concentrations in muscle, lipid and eggs from previously collected and frozen lake trout samples and relate contaminants to life history strategies, such as reproductive investment and lipid mobilization rates. Once we establish a candidate contaminant and determine patterns of accumulation we would apply for funds to determine if life history determines susceptibility to contaminants by sampling additional lake trout populations, in particular, we propose to collect samples from stocks with extreme life history attributes such as river spawners and siscowet from Lake Superior. We also wish to explore how contaminant loads and patterns affect the health of individuals and survival and ecological performance of offspring using laboratory experiments We propose to develop simulation models that incorporate such life history information and determine if present risk assessment (if any) underestimates population impact. This research will assist applications to two proposals offered by the Environmental Protection Agency (EPA) Science to Achieve Results (STAR) program. The first RFP is titled “Research for Outcomes and Accountability: Development of Novel Environmental Health Outcome Indicators” and opens June 2008. The second RFP is titles “Community-based Cumulative Risk Assessment Research” which opens September 2008.