**Winter condition of Atlantic salmon parr and pre-smolts experiencing hydropeaking flow regimes.**

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For many fishes, winter represents the period when significant energy reserves (i.e. lipids) are depleted and body condition is reduced. Some Atlantic salmon spend 2-3 winters in streams that experience hydropeaking flow regimes where fluctuations in flow (2-50 times) are realized on a daily basis. The combination of limited physiological capacity and environmental stressors associated with hydropeaking flows may impose limiting conditions for the survival and development of overwintering Atlantic salmon parr. We investigated the effects of winter hydropeaking flows on wild Atlantic salmon parr (41 – 168 mm), by introducing daily peaking flow regime changes in large outdoor mesocosms with natural substrate and various habitats. We assessed changes in the overwintering condition of Atlantic salmon parr by evaluating changes in condition factor (K), estimated fat content (using bioelectrical impedance analysis (BIA)), and the ability of parr to complete smoltification (NaK-ATPase activity). During our first winter experiment (Feb-May 2012), we simulated a daily hydropeaking flow regime that created a 2-fold increase in flow with a 2-fold increase in velocity compared with a control group with a stable flow regime. We found no significant changes in growth, condition factor, lipid content, or NaK-ATPase activity between hydropeaking and control mesocosms suggesting that low increases in flow and velocity do not affect the overwintering condition of Atlantic salmon parr. In a subsequent experiment (January-May 2013), we are currently testing the effects of an increased instream velocity (3-4 fold). Preliminary results suggest the increased velocity does not affect the condition of Atlantic salmon parr.