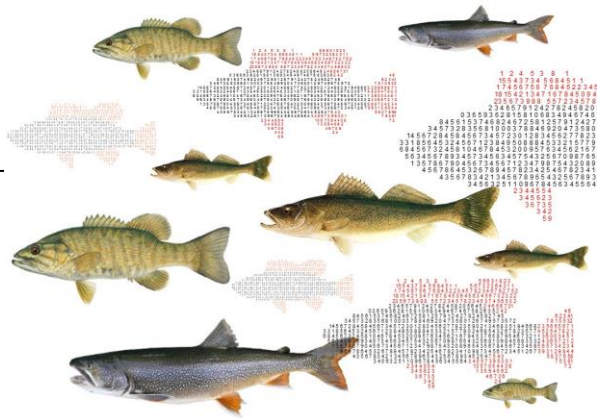
NSERC Canadian Network for Aquatic Ecosystem Services

Theme 3, Project 3.3.3
Expanding biomass size spectra models



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Abstract
The relative importance of environmental temperature and prey availability in shaping somatic growth rate and reproductive allocation in freshwater fish has been the subject of much recent theoretical and empirical work. In this project, we use extensions of the biphasic growth model of Lester et al (2004) to make a quantitative assessment of: (i) the nature of the constraints that the seasonal water temperature cycle places on juvenile somatic growth rate; (b) the nature of the constraints that the prey size spectrum places on reproductive allocation and the consequences for adult somatic growth We will use six data sets that document continent-wide variation in the life-time somatic growth patterns of 2 cold water species (lake trout in North America, brown trout in Europe), 3 cool water species (walleye and yellow perch in North America, European perch in Europe) and 1 warm water species (smallmouth bass in North America). This comparative analysis will test predictions of optimal life history theory that in turn will allow a more mechanistic understanding of the response of fish populations to changes in climate and community structure.

Keywords:
Size spectrum, life history, fish, climate change, predation

Geographic Location: Canada, United States, Norway

How does your project link to Canadian aquatic ecosystem services?
This project will provide subsidies to extend the theory underlying the community size spectrum models used in Project 3.3. More specifically, we will generate and test predictions about intraspecific variability and developmental plasticity in the size distributions of important fish species inhabiting temperate zones.