Impact of global changes on salmonids population : use of the Dynamic Energy Budget model

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Abstract: During the last decades, it exists an increased interest in understanding the impacts of global change and anthropic disturbances on ecosystems. This global change impact freshwater ecosystem in several dimensions. One of them is the alteration of temperature cycle which directly affect poikilothermic species as salmonids. In addition, extreme events can interfere with river flows creating hypoxia events, and can result in reduced access to food resources and starvation for some species. To cope with the increase in energy expenditure and/or the decrease in food resources related to these disturbances, individuals will have to adopt strategies depending on their physiological limits or life-history traits. For example a salmonid will have to choose to allocate its energy for reproduction, at the expense of its life, or for survival, waiting for better conditions to breed. The Dynamic Energy Budget model is a good tool to understand how a fluctuant environment can interfere on the individual energy physiology, quantifying the energy with a simple system of equations. The first aim of my PhD research work is to develop an individual-based DEB model for *Daphnia magna*, and extend it to *Salmo trutta* in a second time. Then I will confront individuals to different scenarios: (1) ideal conditions, (2) temperature fluctuations, (3) starvation and (4) hypoxia. This model will help to understand the mechanisms used by an individual to adapt to global changes.