

PhD or MSc grant available
Université du Québec à Trois-Rivières (Québec, Canada)

Ecosystemic consequences of zooplankton diel vertical migrations on the transport of nutrients and pollutants in lakes

Aim of the project: The objective of this research project is to understand the consequences of zooplankton diel vertical migrations (DVM) on the productivity and the quality of water in boreal oligotrophic lakes. More precisely, this project aims at better understanding the functional coupling between the hypo- and epilimnetic habitats due to DVM in terms of transport of nutrients and pollutants across these two habitats.

DVM are among the most important migration phenomena at a global level, with huge potential consequences for ecosystem functioning. By migrating across layers with different resources, the zooplankton has the potential to couple habitats on the vertical axis, as it has been clearly shown in the ocean. Marine zooplankton DVM, for example, constitute a sort of "biological pump" able to increase the sink of carbon in the oceans, thus contributing to control CO₂ in the atmosphere. The consequences of DVM for lakes are still poorly studied, mainly in terms of nutrient recycling and speciation of contaminants. Our aim is thus to fill this gap by analysing the consequences for the ecosystems of such migrations both in terms of biogeochemical cycles in lakes and of contaminant accumulation within the food web.

Qualifications: We are looking for a highly-motivated student with excellent skills for both field and laboratory work, in addition to a strong background in statistics. Students eligible to NSERC or FQRNT grants will be prioritized.

The selected candidate will start by conducting a meta-analysis on the relationship between the amplitude of DVM in lakes, maximum chlorophyll depth and light penetration. He/she will then participate to the conception and the set up of the experimental protocol, which will include the sampling and the *in situ* incubation of zooplankton (Laurentides lakes) on 24h cycles. The use of specific stable isotopes will allow to trace the transfer of nutrients between the hypo- and the epilimnion. Her/his laboratory work will consist in analysing nutrients and stable isotopes in fatty on samples collected during *in situ* incubations, and to analyse contaminants in both water and animal tissues (p.ex. Hg, As, Se, Cd, Zn). Working language could be either French or English.

Starting date: January 2016

Grant: 21 000 \$/yr for 3 years (PhD); 13 000\$/yr for 2 years (MsC);

Supervision :

Andrea Bertolo (UQTR)

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Please sent a motivation letter, a CV including academic scores, together with the names and the address of three references to the following address: andrea.bertolo@uqtr.ca