Project 3.2 Quantitative Frameworks to Improve the Analyses of Ecological Communities

Wagner da Costa Moreira, PhD candidate

Université du Québec à Montréal.

wagners.mor@gmail.com

br.linkedin.com/in/wagnermoreira

Supervisors:

Pedro Peres-Neto, Université du Québec à Montréal.

Nigel Lester, Ontario Ministry of Natural Resources and Forestry

Abstract

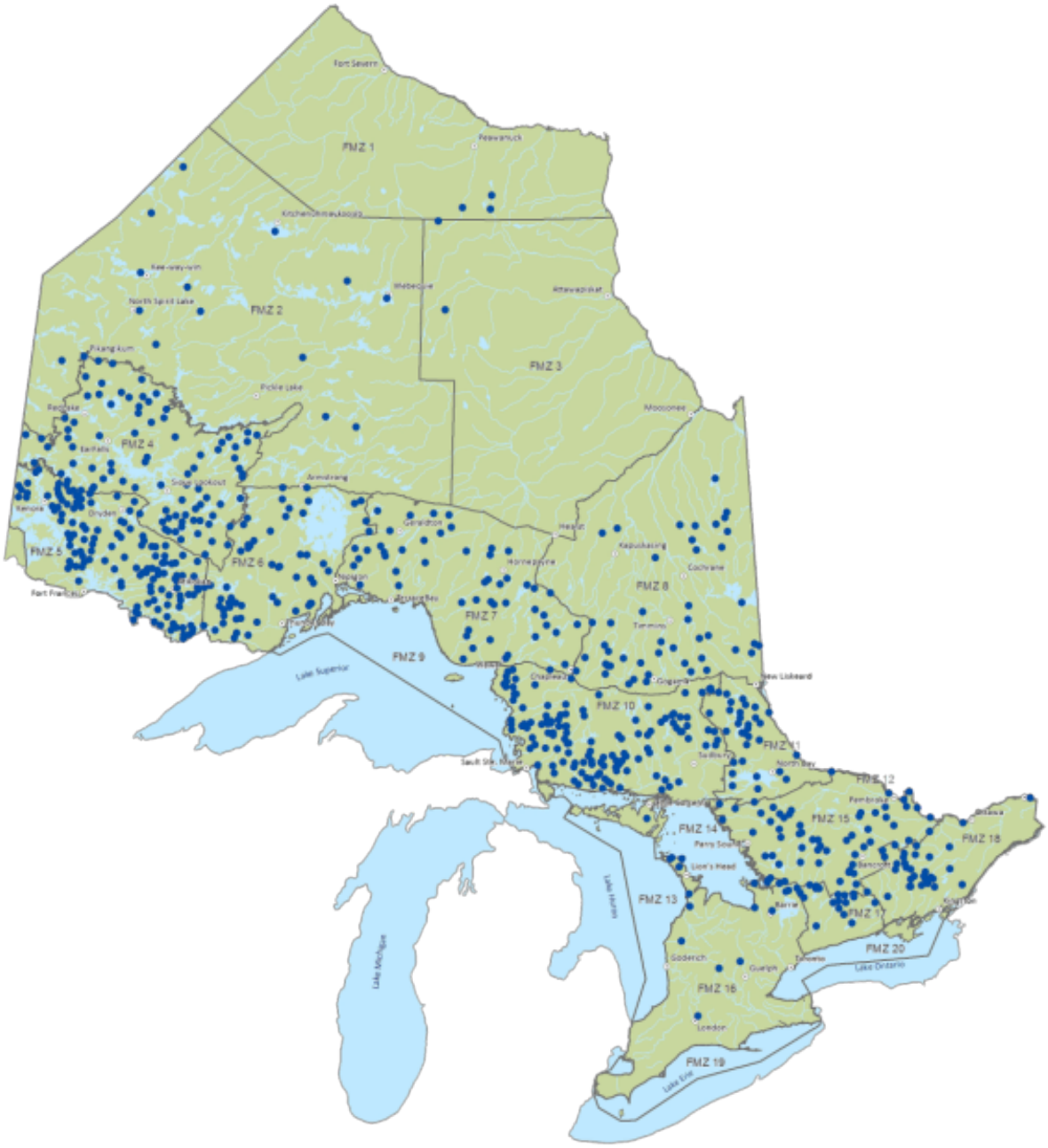
The analysis of wildlife – habitat relationships has always been a central issue in ecology, being a relatively young subject, yet big accomplishments were achieved in the field in these last six decades. It has become a relevant tool to explore, comprehend and satisfactorily answer specific questions about the intricacies and mechanisms underlying species patterns. The *savoir-faire* generated by ecological modelling and its quantification of species-environment relationships is critical for conservation planning and ecosystem/population management. I propose: (i) the development a quantitative framework based on GLMs for analysis of multispecies data, using variation partitioning to better understand the different contributions of group of variables; (ii) a comparison of an ensemble of species distribution modelling approaches to be applied to important sport fish species that coexist in watersheds of Ontario, in order to understand the roles of different abiotic parameters on these species, and also study how the introduction of biotic factors like competition interfere with SDM modelling predictability; (iii) the investigation of how to relate fish productivity to SDMs, since this information can be useful for fisheries management of stocks, at the same time minimizing data gathering costs.

Keywords: Ecological modelling, generalized linear models, variation partitioning, species distribution models, ensemble methods, fish productivity.

How does your project link to Canadian aquatic ecosystem services?

The study of quantitative modelling approaches play a crucial role on the understanding of environmental processes that influence fish distribution and potential fish production, being both directly related to fishing practices, which consist of a key ecosystem service.

Geographic Location: Ontario watersheds, data collected from MNR's Broad Scale Fish Community Monitoring program



over 700 watersheds in Ontario were included in the analysis