International Seminar – Daniel D. Saurette[1, 2]

Title: Applications of Digital Soil Mapping for Land Management. Concepts and Case Studies from Field to Regional Scale

Abstract: The last two decades has seen an exponential increase in research and development of digital soil mapping (DSM) techniques, especially driven by increased access to computing power, access to spatial data, and machine learning. Applying the fundamental concepts of the Scorpan model[†], soil scientists have adopted new tools to transition from conceptual models of soil-landscape relationships to quantitative models with uncertainty estimates. Development of these models has been largely facilitated by access to environmental covariates ranging from proximal sensors to remotely sensed data from aircraft or satellite, coupled with soil observations, providing the foundation for developing predictive models from field to regional to global scales. In this lecture, after a general introduction to the basics of DSM, as well as the main components of its framework, we will explore several case studies, highlighting its application for land management. At the field scale, case studies will include the use of DSM for managing high-value crops, leveraging proximal soil sensing to enhance field data collection, and optimizing sample size for predicting soil carbon. At a regional scale, case studies will include the use of multi-temporal environmental covariates for improved DSM, validation of 3-dimensional DSM models, and updating provincial soil resource maps for Ontario, Canada.

Time and date: Thursday 2nd of May, 14:00-17:00 (CET)

Place: Online - Teams meeting

Teams link: **Join the meeting now**

Meeting ID: 367 441 874 322 - Passcode: cEWmtM

Bio and summary: Daniel is a Land resource Specialist with the Ontario Ministry of Agriculture, Food and Rural Affairs, located in Guelph, Ontario, and a PhD Candidate at the University of Guelph's School of Environmental Sciences. Previous to this role, Daniel was primarily working in the private sector as a soil scientist with a focus on soil survey, classification and mapping since completion of his MSc at the University of Alberta in 2006. His role at OMAFRA is to lead, in a technical capacity, Ontario's soil survey and mapping program. This includes developing a predictive digital soil mapping program, maintaining the Ontario Soil Survey Complex database, leading new soil survey programs to support OMAFRA's initiative to update soil maps across agricultural regions of Ontario, and providing interpretation of soil resource information, such as soil classification and CLI agricultural capability ratings. Daniel is an active member of the soil science community as a member of the Canadian Society of Soil Science, the Canadian Digital Soil Mapping Workgroup, and volunteers his expertise to promote soil science through events such as the Envirothon, the Soils Roadshow, Zone Smart and other public events.

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[†]McBratney et al. 2003. On digital Soil Mapping. Geoderma. 117(1-2): 3-52. https://doi.org/10.1016/S0016-7061(03)00223-4