

SHORT COURSE

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ADVANCED CONCEPTS IN THE EVALUATION AND INTERPRETATION OF GEOCHEMICAL DATA

Monday, December 3, 2018,

9:00-17:00

Université Laval - Pavillon Laurentienne

LAU-1334

Registration:

Students (50\$+tx), Professionals (250\$+tx)

Online registration:

https://commerceweb.ulaval.ca/shopping/chaire_ag_nico_eagle_en_exploration_minerale/event/geochemical_data/Detail.view

Geochemical data collected from government and exploration industry surveys are derived from un-modified (bedrock) to modified (weathered, transported) media that are comprised of minerals. Minerals are ordered structures governed by atomic forces which impose “structure” (mineral stoichiometry) in the way the elements are associated. Rocks, till, soils and other forms of sample media are mixtures of minerals and thus represent a complex array of structured mineral material. In order to discover and interpret the structure in geochemical data, a range of statistical methods are required.

This short course will present the pre-processing methods to deal with non-detect and closure issues of geochemical data, and will examine the use of multivariate statistical methods for discovering and validating processes related to mineral stoichiometry and other processes.

COURSE CONTENT :

09:00-12:00

- 1) Geochemical survey data – understanding the importance of sampling scale.
- 2) Geochemical data spaces – element and geospatial domains.
- 3) The impact of the constant sum (closure) problem on interpreting geochemical data.
- 4) The use of logratios to overcome the constant sum problem
- 5) Dealing with values reported at less than the detection limit (censoring), non-detects and zeros.
- 6) Visualizing multielement geochemistry using methods of multivariate data analysis
- 7) Discussion

12:00-13:00 Lunch (included in registration)

13:00-17:00

- 8) The concept of Process Discovery – pattern recognition and element associations for process model testing.
- 9) The concept of Process Prediction/Validation – model testing using multivariate statistical techniques.
- 10) Discussion



Eric Grunsky is a professional geoscientist (P.Geo. British Columbia) whose career has included field mapping and applied research at: the Geological Survey of Canada, Ottawa, the Division of Exploration and Mining, CSIRO, Australia, the Alberta, British Columbia and Ontario provincial geological surveys. His research has focused on the application of multivariate statistical methods and spatial statistics applied to geochemical data. He was the recipient of the Krumbein Medal (2012) and the Felix Chayes Prize (2005) by the IAMG, in recognition for his work in applied geochemistry. Eric has published extensively in peer-reviewed journals and government reports. He has also presented numerous short courses for the interpretation of geochemical survey data. He is the Secretary General for the International Association for Mathematical Geosciences (IAMG) [2016-2020], a fellow of the Association of Applied Geochemists (AAG) and a member of the Geochemical Society. Eric is a Professor at the China University of Geosciences, Beijing, China; an Adjunct Professor at the University of Waterloo, Canada and a member of the Advisory Board for the Metal Earth Project.

**Chaire de recherche industrielle
CRSNG - Agnico Eagle en exploration minérale**

