



Newsletter 2

North American Soil Geochemical Landscapes Project

Canadian Project Update, September 2007

Briefly.....

- The 2007 field season has been filled with accomplishments.
- In New Brunswick and Nova Scotia, soil samples have been collected at the tri-national sites, and also in some areas at double the site density.
- The first sets of soil gas radon data were obtained in New Brunswick, Nova Scotia and Southern Ontario.
- There has been development work on the sampling protocols for permanently frozen mineral soils in the northern Yukon Territory along the Dempster and Top of the World highways.
- Also in northern Canada, samples were collected at tri-national sites near Arctic Red River in Northwest Territories.
- Back at the office, through a partnership between GSC and ACME Labs (Burnaby, BC), a mini-project for testing different types of aqua regia and related extractions and sample ball-milling procedures has been initiated
- Plans are in progress for a second workshop, to be held February 27-28, 2008. Participants will present first-stage results and seek new collaborative partnerships. Areas for new mini-surveys for 2008 will be selected. All participants are encouraged to suggest potential areas and the rationale for new mini-surveys.





More Details.....

2007 Mini-Surveys

MARITIMES

New Brunswick

By the end of August, Mike Parkhill, Marc Desrosiers, Heather Campbell and others from New Brunswick Department of Natural Resources completed sampling (a total of 62 sites) in the northern half of the province. In the southern half, sampling by Toon Pronk, Rex Boldon and Parish Arnott (NBDNR) is nearly completed. Radon and soil radiometric analyses and permeability have been measured at all sample sites. Also, as part of the Environment Canada add-on activity initiated by Rita Mroz, a bulk sample was collected from surface materials (0 – 30 cm) at every fifth site. These bulk samples will be analyzed for selected ecotoxicological components.

The New Brunswick group plans to end the tri-national sampling in Grand Manan with a small field conference. At this meeting the group will evaluate the tri-national field procedures and make recommendations for future surveys. A great summer in New Brunswick!



Mike Parkhill and Louis Cyr (NBDNR) collecting a sample near the United States border. (Photo: Marc Desrosiers).





*A typical tri-national site in southern New Brunswick.
(Photo: Toon Pronk)*

Nova Scotia

During the week of June 18, Peter Friske and others from GSC met the Nova Scotia contingent of the Maritimes Project in Amherst, Nova Scotia. The meeting was set up to provide field training for the tri-national sampling protocols and included participants from Nova Scotia Department of Natural Resources (NSDNR), Environment Canada (EC) and Agriculture Canada (AAFC). Once the orientation session was completed the Nova Scotia field team was established - Terry Goodwin (NSDNR) led the field sampling, supported by summer students Jennifer Noade (NSDNR), Jiaying Cheng (NSDNR) and Gerry McCormick (EC). On several occasions, the group was joined by Ken Webb (AAFC) and Dave Langille (AAFC).

In less than 9 weeks the team covered the entire province, from Cape North to Yarmouth. Soils were sampled in accordance with the tri-national protocols at a total of 54 sites. A very successful field season!



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Nova Scotia field team at work. Left to right: Ken Webb (AAFC), Terry Goodwin (NSDNR), Dave Langille (AAFC), Jen Noade (NSDNR), and Jiaxing Cheng (NSDNR). (Missing is team member, Gerry McCormick (EC), who took the photo).



Jen Noade (NSDNR) and Gerry McCormick (EC) collecting a sample.



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NORTHERN BOREAL AND PERMAFROST AREAS

Northern Mackenzie Valley

Peter Friske, Martin McCurdy and Rick McNeil from GSC collected stream sediment and water samples in the northern Mackenzie valley as part of a Yukon government programme. By sharing logistics with the project, Peter's group, with help from Toon Pronk and Rex Boldon (NBDNR), accessed tri-national sites in the northern Yukon and near Arctic Red River, Northwest Territories.

Peter with Toon and Martin also met with Scott Smith (AAFC-Summerlands, B.C.) and Karen McKenna (Cryogeographic Consulting). The group started the sampling work in the Dawson area along the Dempster and Top of the World highways. The main objective of the meeting was to develop the tri-national protocols for sampling cryosols (permanently frozen soils). On account of the disruption and recycling of sediments that characterize these soils, the choice of intervals in the soil profile for sampling is not straightforward. The group, after testing different types of sampling equipment and examining frozen soils at numerous locations, decided that more work is needed on the cryosol protocols before there is further sampling in permafrost areas. There are plans for more field testing at the beginning of the 2008 field season.



Toon Pronk (NBDNR), Scott Smith (AAFC) and Karen McKenna (Cryogeographic Consulting) examine permafrost-affected soils. (Photo: Peter Friske, GSC)





Scott Smith (AAFC) and Toon Pronk (NBDNR) digging a soil pit in the northern Yukon. (Photo: Martin McCurdy, GSC)

SOUTHERN ONTARIO

In August Rod Klassen (GSC) and Jing Chen (Radiation Protection Bureau, Health Canada) carried out sampling along a transect across Southern Ontario. The survey was undertaken to relate emission patterns of soil radon gas to the geochemical and geological properties of soils.



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Rod reported from the field that regional differences in Ra patterns were evident from the first stages of the survey.



Field crew from southern Ontario. From left to right: Rod Klassen (GSC) and the following from HC-Radiation Protection Bureau - Jim Ly, Lauren Bergman, Jessica Wierdsma, and Jing Chen.



Jessica Wierdsma and Jim Ly from HC-Radiation Protection Bureau at work in southern Ontario. (Photo: Rod Klassen)



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Add-On Activities

SOIL RADON POTENTIAL MAPPING AND GROUND AND AIRBORNE GAMMA RAY SPECTROMETRY SURVEYS

Earlier in the year an Interdepartmental Letter of Agreement between the Radiation Protection Bureau (Health Canada) and the Earth Science Sector (Natural Resources Canada) was signed to permit the collection of data related to the assessment of risk from soil gas radon. Funds were made available by Health Canada to NRCan-GSC to support the field and laboratory activities related to measuring soil gas radon and generating new ground and airborne gamma ray spectrometry data.

Patterns of variation in the sets of soil gas radon data from pilot studies in the Maritimes and southern Ontario will be compared to the patterns associated with the new and existing gamma ray spectrometry data as well as geochemical and related data for soils and tills. In addition, the field protocols used for this year's pilot project will be re-examined and adjusted as necessary before the start of the 2008 field season.

TESTING OF ANALYTICAL PROTOCOLS FOR PARTIAL EXTRACTIONS

Examination of the information posted on the provincial and federal government web sites reveals variability in the methodology specified for generating the soil geochemical data needed to satisfy the requirements for environmental assessments and regulations pertaining to land use and development and contaminated site remediation. Information is in many cases limited when it comes to the partial extractions, mostly aqua regia or near equivalent treatments, and to the preparation of the <2 mm fraction for analysis.

The Geological Survey of Canada has initiated a research project to test and compare the element data obtained using different formulations for partial extractions and also the ball-milling procedures. Tests will be conducted using the methodologies specified in the different sets of regulations and also some others used extensively for mineral exploration, environmental and surficial mapping purposes. John Gravel from ACME Labs (Burnaby, B.C.) is partnering with the GSC to undertake this important project. The tests of the different aqua regia-style formulae will be undertaken on certified reference materials and the ball-milling work on selected C horizon samples.





The Project Database

Work is ongoing at GSC to organize the Project database to accommodate new and future data and allow appropriate public access. The database will be built to provide easy access to tables of field data and analytical results that, in turn, can be imported into other database systems and GIS.

News from Our International Partners

Peter Friske was in contact with Laurel Woodruff, Bill Cannon, and Larry Gough of the USGS. At the time of his conversations, they were heading to Alaska to start the tri-national sampling along the pipeline route from the southern part of Alaska to Prudhoe Bay. Later this year there will be joint discussions between the groups at USGS and GSC about the sampling protocols for cryosols, based on their experiences this summer in permafrost terrain.

For More Information or To Make Submissions to the Next Newsletter

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