



Newsletter 1

North American Soil Geochemical Landscapes Project

Canadian Project Update, June 2007

Briefly.....

- The 2007 field season for the Project is now in full swing. The protocols manual is drafted. Soil sampling is being undertaken in the Maritimes and the Yukon. Samples are being collected at double the density of 1 sample per 40 km² in the Maritimes. The extra samples will be collected from a site in each grid cell that meets the requirements of the National Forest Inventory grid.
- Collaborations with a number of agencies have been developed as follows:
 - Through Radiation Protection Bureau of Health Canada, complimentary soil gas radon and radiometric data will be collected.
 - Through Healthy Environments and Consumer Safety Branch of Health Canada, the soil samples from summer 2007 will be analyzed to determine the bioaccessible amounts of potentially toxic elements.
 - Through Environment Canada, samples will be analyzed for PAHs (polyaromatic hydrocarbons) as well as for several ecotoxicological components.
 - Through researchers at the provincial geological surveys sampling in the Maritimes will be completed.
- There are plans for a second Project workshop to be held in Ottawa in February 2008. Participants will present first-stage results for the purpose of developing new collaborative partnerships. Plans for sampling in 2008 will be discussed and suggestions will be welcomed. All participants are encouraged to suggest knowledge areas needing further attention or ideas for turning resultant geoscience information into practical tools for environmental risk assessment.





More Details..... Protocol Development

Peter Friske (NRCan-GSC) has completed the first version of the Project field and laboratory protocols manual for mineral soils. The manual includes a set of step-by-step instructions for selecting sites that satisfy the criteria of the GRTS grid system. In addition, the first version of a field manual outlining the procedures for collecting soil gas radon, permeability and gamma ray spectrometry data is drafted.

As part of the Protocol development, Peter and other GSC participants met with Dave Kroetsch (Agriculture and Agri-Foods Canada) to discuss the practicalities of collecting horizon-based soil samples and to dig two test pits at the Ottawa Experimental Farm. Peter and Inez Kettles met with Charles Tarnocai (AAFC) and Dave Kroetsch to discuss methodology for sampling organic and permafrost affected soils. Peter also conducted a test run with Ken Ford (NRCan-GSC) and Jing Chen (HC-Radiation Protection Bureau) at one of the test pits to check procedures for taking radiometric and soil gas radon measurements.



Peter Friske and Dave Kroetsch test protocols at the Experimental Farm



Natural Resources
Canada

Ressources naturelles
Canada

Canada



Mini-Surveys

MARITIMES

A full summer operation is planned to complete soil sampling in the Maritimes. The work kicked off in early June 2007 with a series of field orientation meetings for the Project participants. The group meetings are designed to demonstrate and refine sampling protocols and begin sample collection at some sites. Attention will be paid to recognizing soil horizons for sampling and developing standard methodology for collecting soil density, moisture content, soil radiometric and radon data.

In Fredericton, a crew of over 20 researchers from federal, provincial and academic organizations met in the field to fine tune field protocols. Three researchers from the USGS also joined the activity (see photo).



Field meeting near Fredericton, June 14, 2007. Standing left to right: Jim Kilburn (USGS), Dave Smith (USGS), Laurel Woodruff (USGS), Rex Boldon (NBDNR), Rita Mroz (EC), Rick McNeil (GSC), Parish Arnott (NBDNR), Brad Harvey (GSC), Toon Pronk (NBDNR), Mike Parkhill (NBDNR), Martin McCurdy (GSC), Peter Friske (GSC); Kneeling left to right: Sheldon Hann (AAFC), Sherif Fahmy (AAFC), Ken Ford (GSC) and Marc Desrosiers (NBDNR).





After Fredericton, Peter Friske and Ken Ford will continue on to Amherst, Nova Scotia, for a similar meeting. Participants there will include Terry Goodwin (Nova Scotia Department of Natural Resources), Mike Parson (GSC), Ken Webb (AAFC), Pascal Cyr (AAFC) and a researcher from the National Forest Inventory. Immediately after these sessions field sampling will begin in New Brunswick and Nova Scotia and also in the New England states, the latter led by Laurel Woodruff and Jim Kinburn. Sampling in Prince Edward Island is scheduled for September.

NORTHERN BOREAL AND PERMAFROST AREAS

Peter Friske is collecting stream sediment and water samples in the northern Mackenzie valley as part of a Yukon government programme. By sharing logistics with the project, Peter plans to access and collect soil samples at some of the isolated Project sites. More detailed sampling in and around some northern communities may be undertaken dependent upon the development of partnerships. Peter will be joined by Toon Pronk and Rex Boldon (New Brunswick Department of Natural Resources) and Scott Smith (AAFC- Summerlands, B.C.) for protocol development work in permafrost-affected mineral soils. Plans are in place to meet with several representatives from the USSG to review protocols in Alaska or the Yukon prior to the US undertaking a survey in Alaska.

SOUTHERN ONTARIO

Most of the southern Ontario work is based on existing till geochemistry data sets and the use of archived samples. Rod Klassen (GSC) is preparing a geochemical data release based on the analysis of archived splits.

Rod met with scientists from the Ontario Ministry of the Environment, Ontario Northern Development and Mines, Environment Canada (Soil Quality), and Health Canada (Radiation Protection Bureau) to discuss collaborative activities. One such undertaking is the drafting of a statement for the Soil Quality Guide about the importance of considering geoscience information. Another activity is a 2007 soil gas radon survey with Jing Chen from the Radiation Protection Bureau.

Add-On Activities

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

An Interdepartmental Letter of Agreement between the Radiation Protection Bureau and the Earth Science Sector has been signed to allow generation of information pertinent to the prediction of risk from soil gas radon.





Funds from Health Canada were transferred to NRCan-GSC to purchase equipment and hire a field crew to conduct soil gas radon sampling and ground gamma ray spectrometry in New Brunswick and Nova Scotia. A similar soil gas radon survey is planned for southern Ontario under the direction of Jing Chen of the Radiation Protection Bureau. Funds have also been provided by Health Canada for additional airborne gamma ray spectrometry surveys.

The Project Database and New Approaches To Data Analysis And Interpretation

Work is beginning at GSC to organize the Project database to accommodate new and future data and allow appropriate public access.

Eric Grunsky is developing new geochemical approaches for analyzing and interpreting soil geochemical data and defining “background” soil composition. One of the objectives of continental-scale and international geochemical mapping is to provide a framework into which more detailed geochemical studies can be fitted (see Darnley et al., 1995, A Global Geochemical Database, Final Report of IGCP Project 259, UNESCO Earth Sciences 19). This requires the levelling of geochemical data into the established continental framework. Eric is using data from past sampling surveys of New Brunswick tills, stream sediments and waters for his development work to identify appropriate methods to accomplish this task.

Report on the 2004 Continental Transect Study

In summer 2004 two transects were sampled by the USGS and the GSC using a 40 km stratified random sampling design as recommended by the 2003 tri-national workshop in Denver.

http://minerals.cr.usgs.gov/projects/geochemical_landscapes/t1subtask1.html

The results of the transect studies are to be published in a special issue of the Journal of Applied Geochemistry expected to be available in early 2008. GSC scientists were responsible for the writing up studies of spatial variation (Bob Garrett); the development of a water-leach to estimate bioaccessible amounts of elements in soils (Gwendy Hall, Bob Garrett, Judy Vaive and Pierre Pelchat); and the application of γ -ray spectrometric methods to soil analyses (Bob Garrett, Ken Ford and Peter Holman). These papers are in the final stages of preparation and review.





For More Information or To Make Submissions

To request information or send comments or activity updates, please contact us:

Dr. Andy Rencz at rencz@nrcan.gc.ca at 613-995-4786
or Inez Kettles at inez.kettles@sympatico.ca.



Natural Resources
Canada

Ressources naturelles
Canada

Canada 