Development of a background soil chemistry/toxicology database for the Atlantic Region and the North American Soil Geochemical Landscapes Project (NASGLP)

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The need for baseline soil geochemical data to effectively assess and manage natural resources and the risk of environmental hazards is well recognized. One particular application of such data is to complement the ecological and human health risk assessment processes. While other jurisdictions have established background soil data, at present, there is limited data on the background soil chemistry for the Atlantic Region. Environment Canada-Atlantic (EC-Atlantic), in partnership with other stakeholders, has undertaken the development of a background soil conditions for the region. In addition to standard chemical analyses, the sampling protocols also include subjecting a portion of the soils to several soil toxicity tests which provides a biological aspect to the chemical data interpretation. Samples have been collected throughout the Atlantic Region over the past 4 years and the resulting data is being collated in a GIS-based database. A key purpose of this research is provide risk assessors with additional data in which to incorporate into their risk calculations, further strengthening the scientific validity of the risk assessment process.

The North American Soil Geochemical Landscapes Project (NASGLP) is a tri-national initiative between US, Canada and Mexico designed to understand the amount and origin of variation in soil geochemistry and to establish a consistent methodology for determining these characteristics. For Canada, this project is being lead by Natural Resources Canada with in-kind support being provided by EC-Atlantic, Health Canada, Agriculture Canada and several provincial departments of natural resources. EC-Atlantic has partnered with NASGLP in order to exchange protocols and data, allow comparisons between the sampling protocols at each site (discrete sample vs. composite samples, horizon-based sampling vs. integrated 0–30 cm sampling, etc.) and optimize sampling efforts between the two projects. NASGLP sampling occurred in between June and September 2007 resulting in the collection of approximately 175 samples from Nova Scotia and New Brunswick. These samples are to be analyzed for metals, polycyclic aromatic hydrocarbons (PAHs), total organic carbon, pH, and grain size. In addition, bulk soil samples were collected at 30 sites for the purposes of toxicological testing. Chemical and toxicological results are pending.