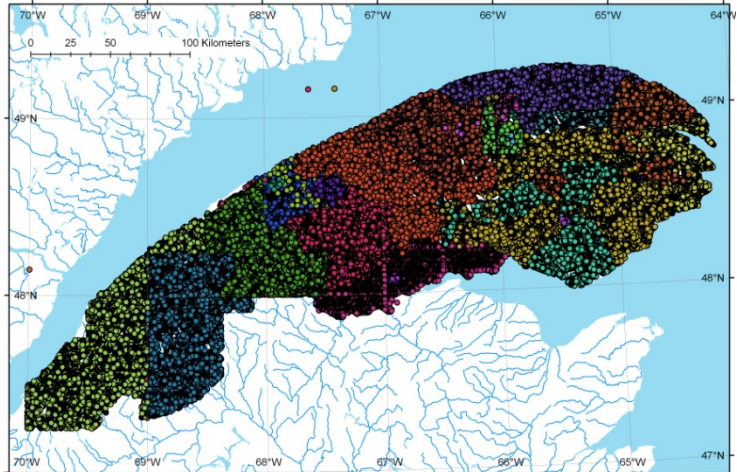


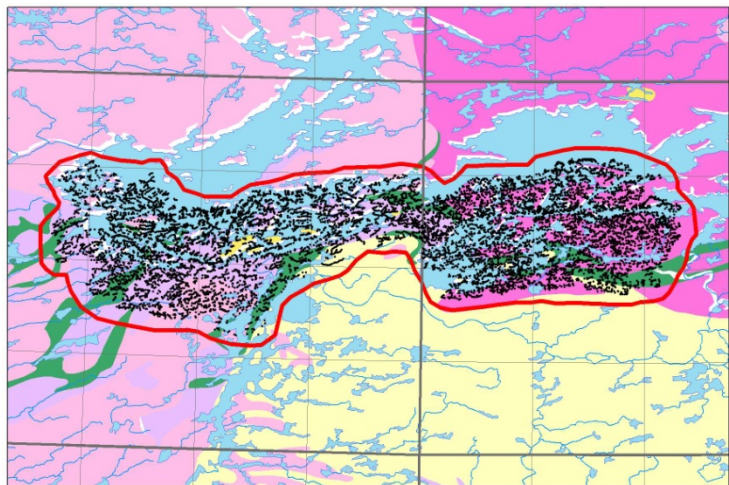
2009-02: Enhancement and interpretation of stream sediment surveys

The geochemistry of stream deposits is an important tool in mineral exploration, but its use raises several questions, for example about the usefulness of stream sediments in a variety of contexts, the choice of elements and medium to be sampled, as well as determining the threshold. Project 2008-09 addressed these questions by studying the database of the southern Grenville Province (1987-1989 surveys). However, the low density of the surveys is an obstacle in studying geochemical signatures of mineralisation in stream sediments. Project 2009-02 aimed to follow up the study with emphasis on two areas where there are high density public databases of stream sediments: La Grande and Gaspé-Lower Saint Lawrence regions.



Stream sediment surveys in the Gaspé and Lower Saint Lawrence region studied as part of project 2009-02.

The Gaspé and the Lower Saint Lawrence were the subject of numerous sampling campaigns and reanalysis of stream sediments since the 1960s. Consequently, several normalisation problems arise when data from different campaigns obtained using different methods are compared. To obtain uniform maps, a data normalisation process must be carried out. Maps normalised for Cu, Co, Ni, Mn, As, Zn and Pb were created for the entire territory. Data for La Grande did not require normalisation.



Stream sediment surveys in the La Grande region studied as part of project 2009-02.

Data from Gaspé and La Grande were separated in several sub-databases, each containing samples analysed with the same method. Three methods were used for determining anomalies in the two regions and a fourth one for the Gaspé data only. Two methods used basic statistics and the others used the CONSOREM software for processing secondary geochemistry data (project 2008-10).

The signatures of the different categories of mineralisation and the different sub-sectors of the two regions were studied using statistical analysis based on conditional probabilities. The analyses identified the best elements and best processing methods for the anomalies of different types of mineralisation in each region.

Case studies were carried out in the main mineralised areas of the Gaspé and La Grande regions. The case studies helped characterise the dispersion of different metals around different types of mineralisation. They also showed that stream sediments are generally an efficient tool for targeting mineralisation, both in James Bay and in the Gaspé. In the Gaspé, stream sediments helped in mapping the zoning in several known hydrothermal-magmatic systems, an innovative data reduction method developed at CONSOREM.

Using case studies and statistics, different composite indices based on percentiles are proposed for each region. The indices allow the targeting of various mineralisations depending on the elements available in each database.

Project 2009-02: Summary	
Objectives	<ul style="list-style-type: none"> • To add value to stream sediment data from the La Grande and Gaspé regions using methods appropriate for anomaly determination. • To determine parameters that can influence the planning of new surveys.
Results	<ul style="list-style-type: none"> • Normalisation of Cu, Ni, Co, Pb, Zn, As, Mn in Gaspé surveys. • Evaluation of the quality of old data by comparing them with recent reanalyses. • Use of 4 methods to define anomalies. • Comparison of the lake-stream efficacy (La Grande). • Statistical study of the association between anomalies calculated using different methods and different types of mineralisation in the Gaspé and La Grande regions. • Case study of the main mineralised areas of the two regions. • Modelling of the Gaspé hydrography. • Development of composite indices to target different types of mineralisation, based on the best methods and elements identified in the case and statistical studies.
Innovations	<ul style="list-style-type: none"> • Recognition of usually little used suites of trace elements, but ones that are effective in a given context (e.g. assemblages with Bi-W-B-Pt for orogenic mineralisation in La Grande; Bi-Te-Sn-In in Gaspé Mines). • Recognition of signatures in stream sediments that are related to zoning in the magmatic hydrothermal systems of the Gaspé.
Special Collaboration	<ul style="list-style-type: none"> • Mélanie Lambert