

LAKE, TILL, AND ROCK GEOCHEMISTRY

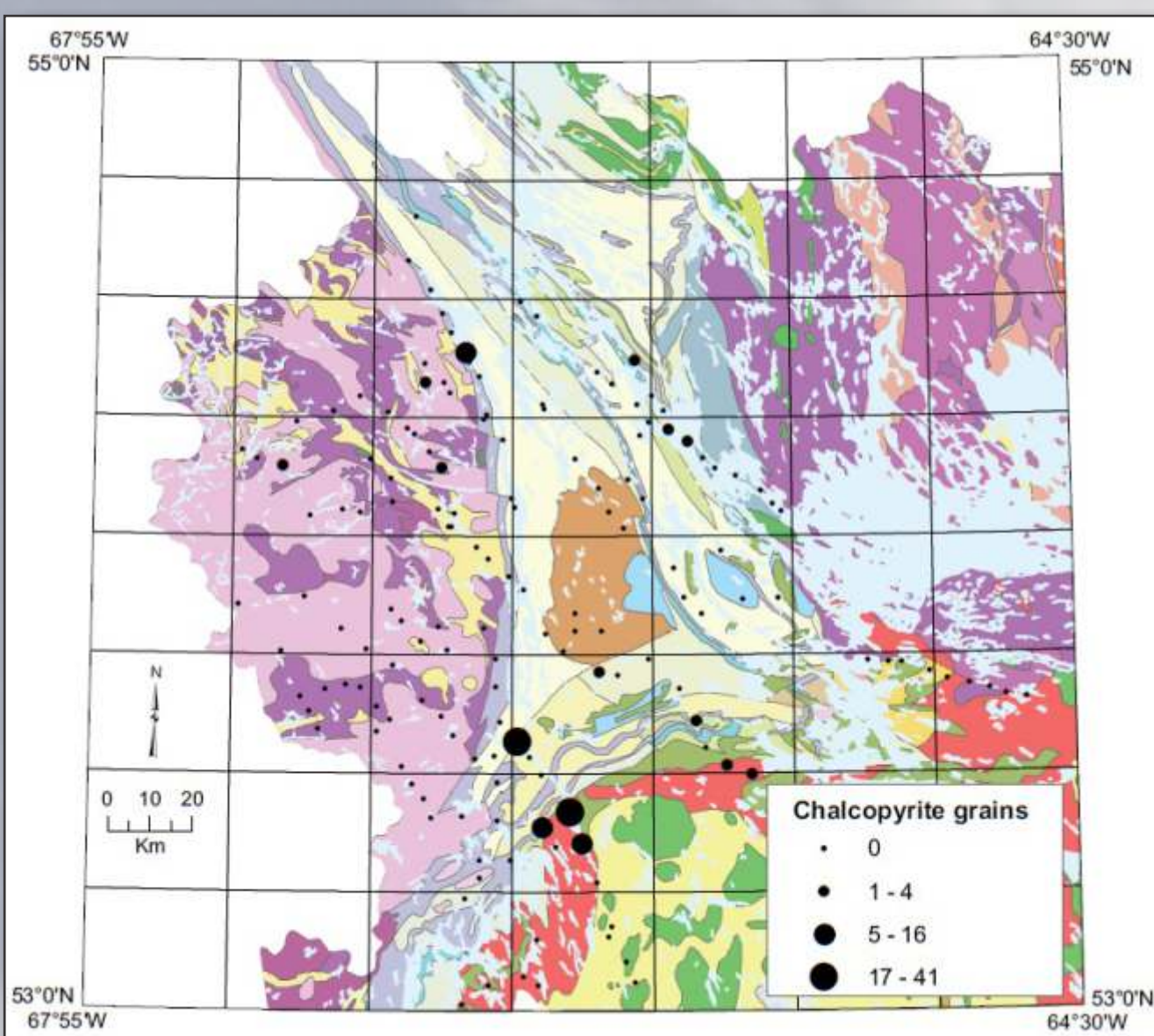
Recent and Current Work

LABRADOR GEOCHEMICAL DATA

In May 2013, Open Files 231/0101 ("A High-Density Lake-Sediment and Water Survey in the Knox Lake Region, Western Labrador") and LAB/1616 ("A High-Density Lake-Sediment and Water Survey in the Fraser Lake Region, Western Labrador") were released. Subsequently, in October 2013, these were followed by a third open file, "A High-Density Lake-Sediment and Water Survey in the Alexis River Region, Southeastern Labrador" (Open File 13A/0089).

The open files and attached data cover detailed surveys conducted in Labrador by the Geochemical Laboratory of the Newfoundland and Labrador (GSNL), Department of Natural Resources, in 2009, 2010 and 2011 respectively. The ICP-ES analyses were performed by the GSNL laboratory while neutron-activation analyses were done by Becquerel Labs.

Open File LAB/1621, to be released before the end of 2013, contains previously unpublished digital rock data for 70 rock samples collected as part of stream sediment and water surveys in northern Labrador conducted in 1991 and 1992. Previously LAB/1016 (1994) included only rock data for 9 trace elements. The new release will include data for 45 unique trace elements including several rare earth elements, platinum, palladium and uranium.



RESULTS OF 2012 ESKE-SAMPLING DATA

Bulk esker gravel samples submitted to Overburden Drilling Management for extraction and identification of indicator minerals proved to contain very few kimberlite indicator minerals (KIMs), although results suggest that the composition of the gravels reflects local geology to a considerable degree. There is evidence of mineralization of other kinds in the area sampled, including copper and barite.

Work in progress on older and more recently released lake-sediment data from Labrador suggests that while the content of certain elements is strongly controlled by the amount of clastic, inorganic material in the sediment, it is possible to model this component statistically and compensate for it. The Labrador Background map shows standardized magnesium residuals in lake sediment. As well as highlighting parts of the Harp Lake intrusion, they indicate a previously undocumented Mg dispersion train from the Strange Lake REE-RM deposit. Red dots: > 1.95; orange dots: > 1.12



SURFICIAL GEOLOGICAL MAPPING

Mapping and till geochemistry sampling were completed in the St. Alban's and Cold Spring Pond areas (NTS 2M/13 and 12A/01) in the first of a multiyear field program in the Bay d'Espoir area. The main field objectives were to: collect samples for a regional till geochemical survey, complete surficial mapping and reconstruct the glacial history of the area to support mineral exploration activities. 233 samples were collected from the C- or BC-horizons of hand dug pits. The accompanying photograph was taken from a sample site ~ 10 km south of Conne River where till is discontinuous and occurs as a very thin veneer.

Nine previously unrecorded striation sites were recorded and indicate that the area was affected by southerly ice-flow (~179°) ranging from 110° to 280°. Clast fabrics were measured from diamicton exposures, and the lithology of clasts retrieved from diamictons will provide an indication of provenance. These data will provide further details on sediment genesis and paleo-ice flow directions.



Jennifer Organ conducted surficial mapping and till sampling in north-central Newfoundland, focusing on the Sheffield Lake map area (12H/07), plus fill-in sampling of the Dawe's Pond and Springdale NTS map areas (12H/01, and 08). Samples were collected from the C- or BC- horizons of hand-dug pits at 921 sites, which were visited by truck, ATV or helicopter. The surficial geology is dominated by thick deposits of locally derived diamicton-form till blankets and hummocky terrain on the Topsails Plateau and adjacent areas, and thin veneers (<2m) of till towards the coast where bedrock is more prevalent. Broad valleys leading from the Topsails Plateau northward toward the coast are filled with glaciofluvial material that forms both eskers and hummocks. Where glaciofluvial valley systems empty into Halls Bay at both Springdale and South Brook, they form large deltaic systems (gravel and mud) that reach a maximum elevation of 75 m asl. Glaciolacustrine muds have been identified within the Birchy Lake – Indian Brook Valley and Sheffield Lake areas. Forty-one new striation measurements were made. Of these, five were multi-directional, from which relative age relationships were determined for three. These new data are similar to those of previous researchers and are consistent with regional ice-flow trends.

The photograph shows a glaciofluvial complex on the Topsails Plateau. Note the sandy bifurcated glaciofluvial ridges, cutting a transverse gravel boulder-strewn ridge that is cut by the stream on the right.



GEOCHEMICAL ORIENTATION SURVEYS

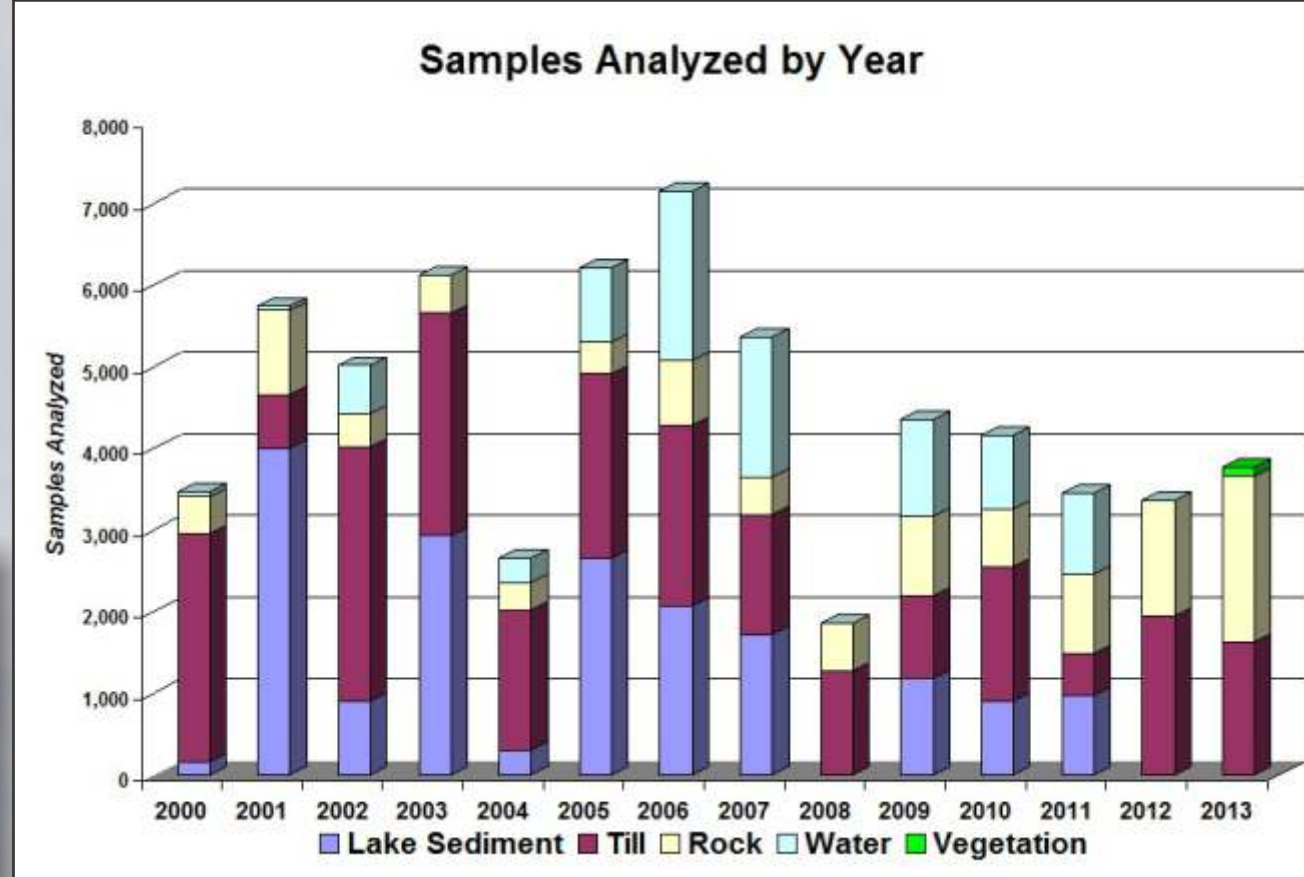
A Mercury Instruments Tracker 3000 IP vapour measuring device was tested along one transect line over the LeMarchant VMS deposit in central Newfoundland. The same line was used to collect black spruce twigs and bark, in order to evaluate the potential of biogeochemistry in prospecting for deposits of this type.



EVALUATING UNTESTED ANOMALIES

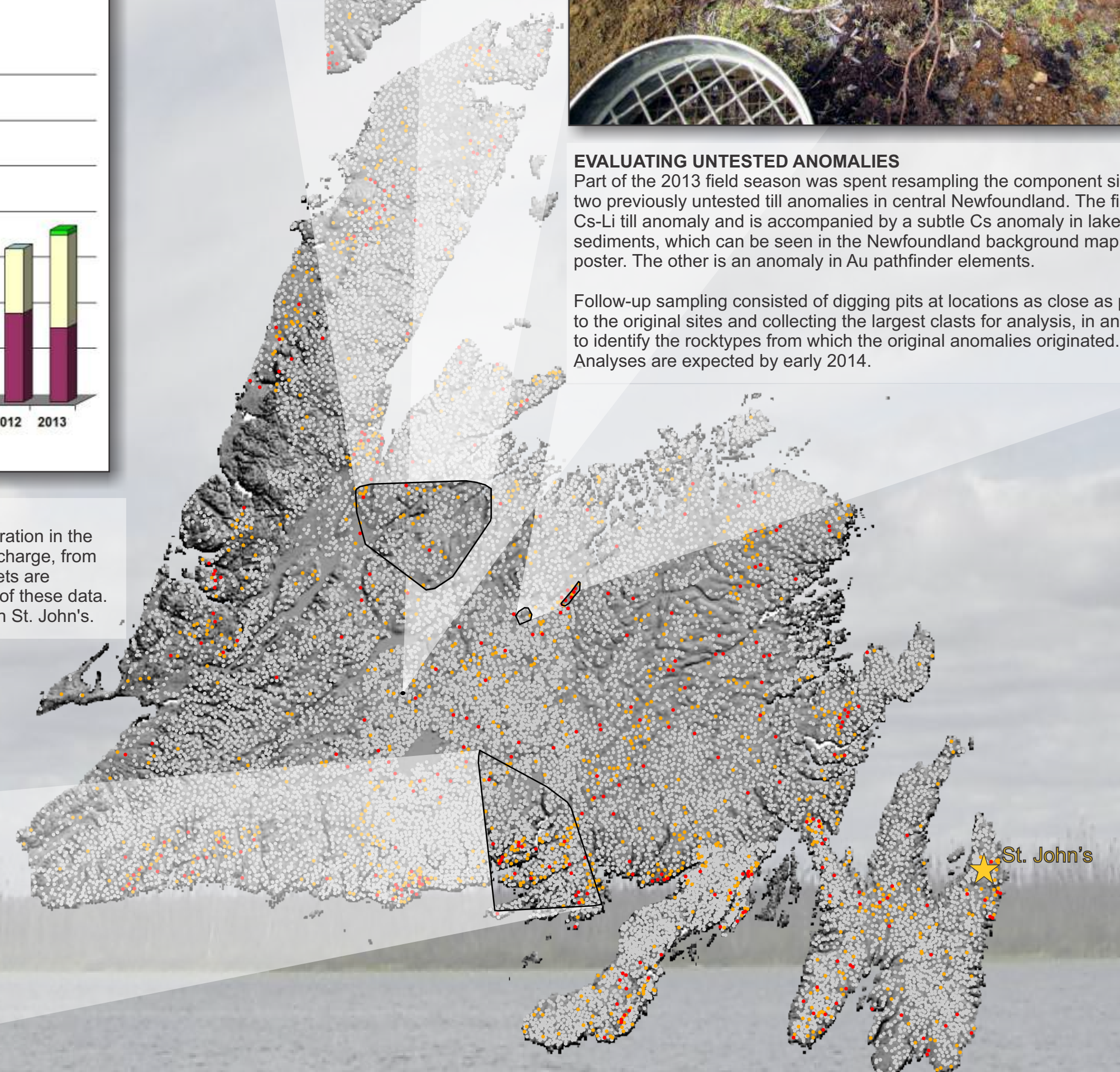
Part of the 2013 field season was spent resampling the component sites of two previously untested till anomalies in central Newfoundland. The first is a Cs-Li till anomaly and is accompanied by a subtle Cs anomaly in lake sediments, which can be seen in the Newfoundland background map in this poster. The other is an anomaly in Au pathfinder elements.

Follow-up sampling consisted of digging pits at locations as close as possible to the original sites and collecting the largest clasts for analysis, in an attempt to identify the rocktypes from which the original anomalies originated. Analyses are expected by early 2014.



GEOCHEMICAL ANALYSES

The Geological Survey of Newfoundland and Labrador supports mineral exploration in the province by making surficial geochemical data available for download, free of charge, from one of the most user-friendly websites in North America. New exploration targets are continuing to be recognized through detailed examination and re-examination of these data. Most of the analyses are performed "in house" at the GSNL's own laboratory in St. John's.



Cs values in lake sediment, filtered to highlight local maxima using method described in OF NFLD/3167. Red dots: Index > 97.5-percentile; orange dots: > 90-percentile.