

SECTION REVIEW 2015

Overview

The Geochemistry, Geophysics and Terrain Sciences Section covers a range of geoscience, including aggregate resource assessments; till- and lake-sediment geochemical surveys; surficial geological and ice-flow mapping; geophysical surveys, compilations and interpretation; environmental initiatives, including geological hazard mapping and coastal erosion monitoring; and laboratory services including geochemical and particle-size analyses. The section currently has a staff of 11, with a new geologist expected to join the section in November.



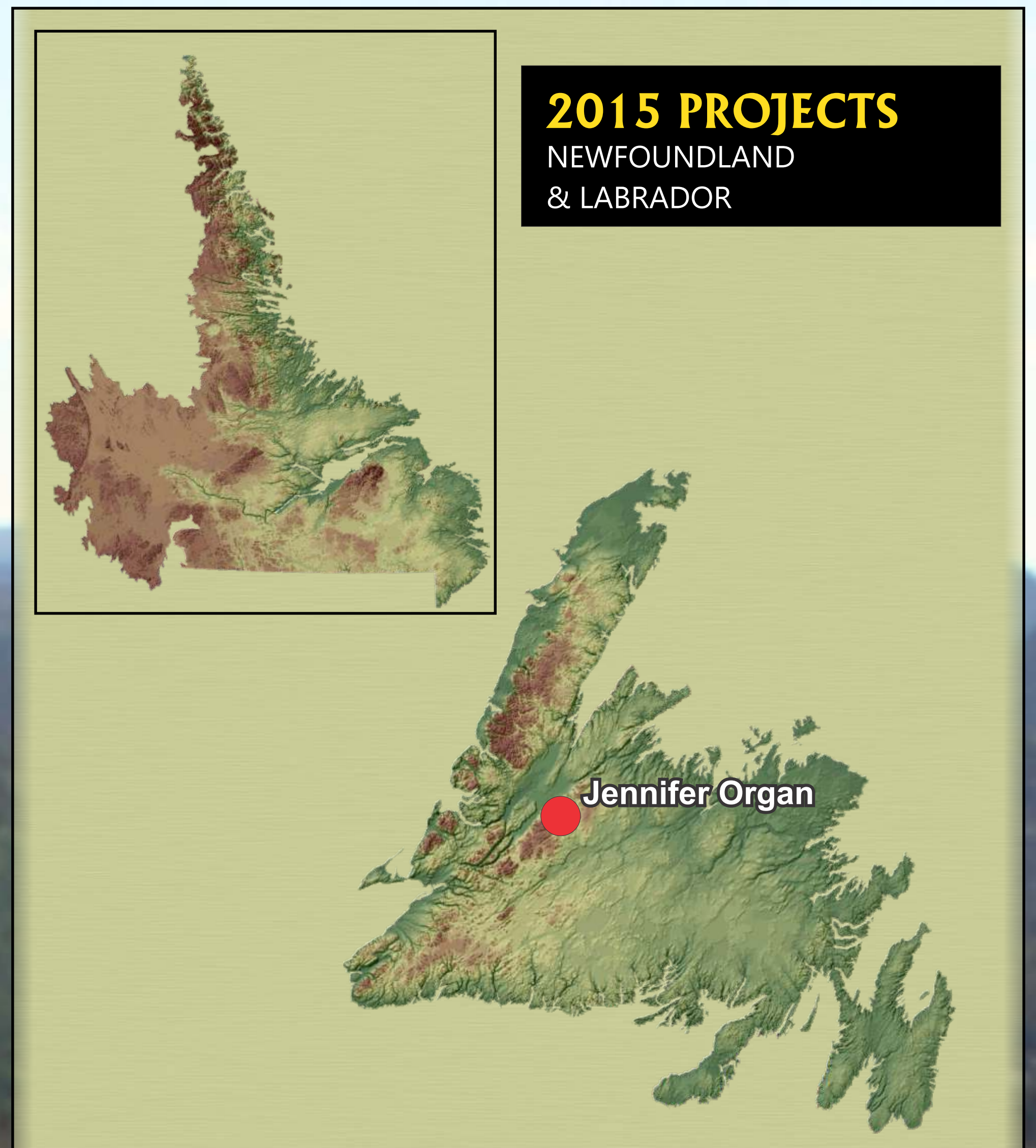
Quaternary Mapping



Jennifer Organ carried out surficial mapping and sampling of NTS 12H/02, 03 and 12A/14 in central Newfoundland. Thick deposits of locally derived glacial diamicton form blankets and hummocky terrain, interspersed by bogs, on the Topsails Plateau, where bedrock outcrops are rare. Outcrops are more common along the western edge of the Long Range Mountains, where eroded meltwater channels carved in the thick diamicton are evidence of copious amounts of meltwater produced during the late stages of deglaciation. Thick glaciolacustrine sands mark the presence of former glacial Lake Howley along the south shore of Grand Lake.

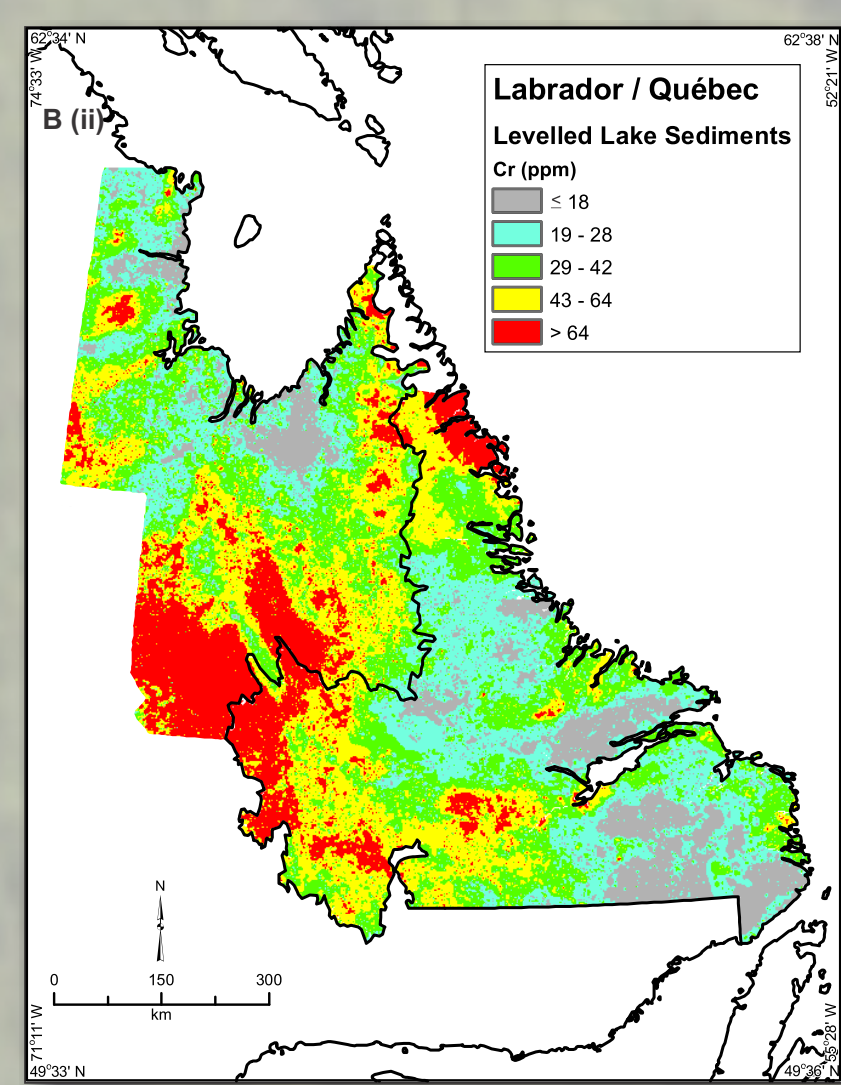
Jennifer was afforded the opportunity to examine a freshly dug trench and backhoe pits at the Moosehead gold prospect near Bishop's Falls. The main trench provided a 5 m exposure through two till units overlying bedrock. Mineralized boulders were identified at the contact between the two till units. Sixteen samples were collected at 50-cm intervals to provide a geochemical profile. The clasts from both till fabrics record an orientation which parallels the northward ice flow within the area. Thirteen samples were collected from 4 backhoe pits. These data will add to the known stratigraphy of the area and the provincial geochemistry database. The main trench section also provides insight into sedimentation within the Exploits Ice Stream.

At the request of the town, Jennifer also reported on the potential for a landslide at a site near Harbour Breton.



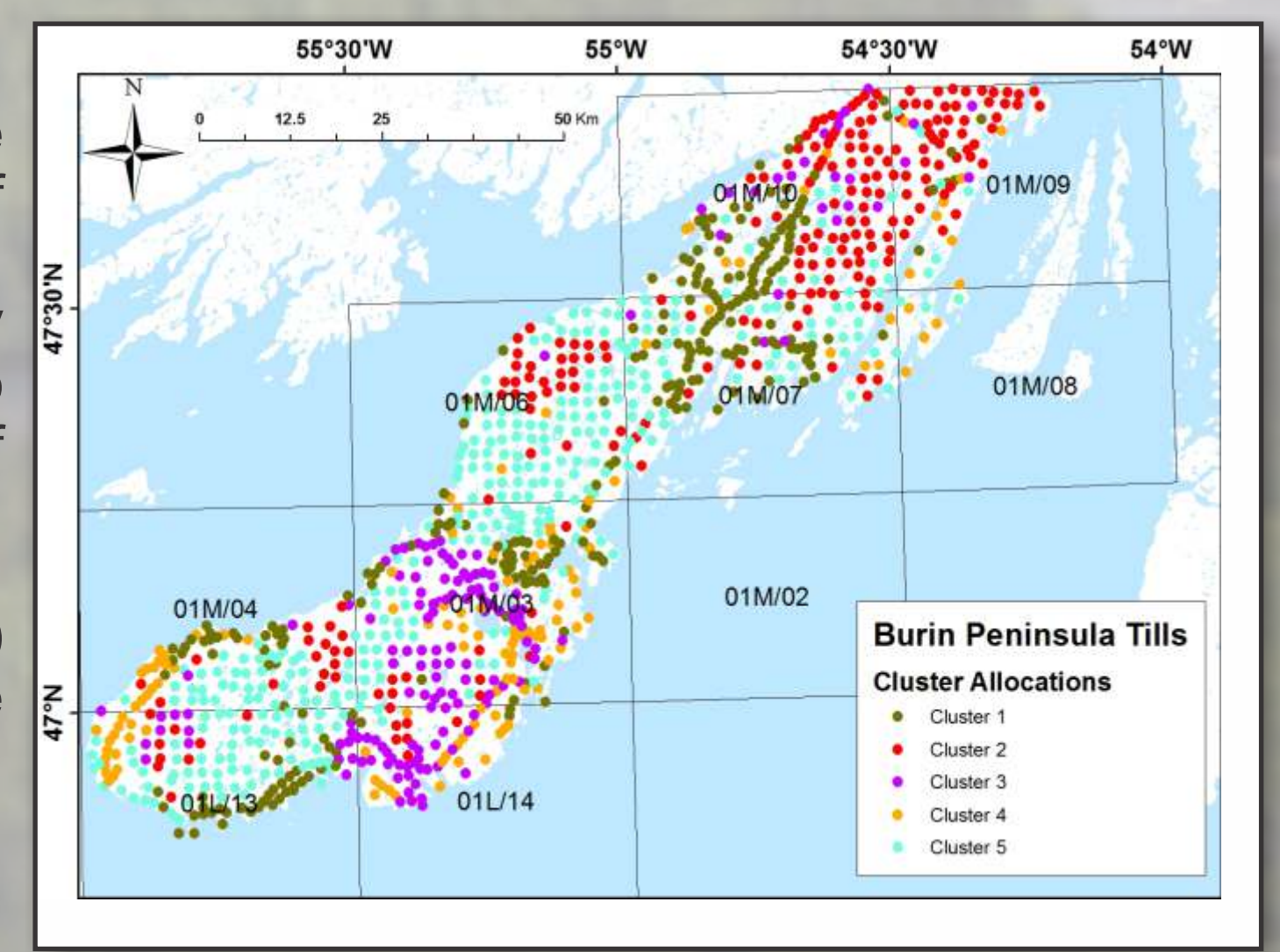
2015 PROJECTS NEWFOUNDLAND & LABRADOR

Regional Geochemistry

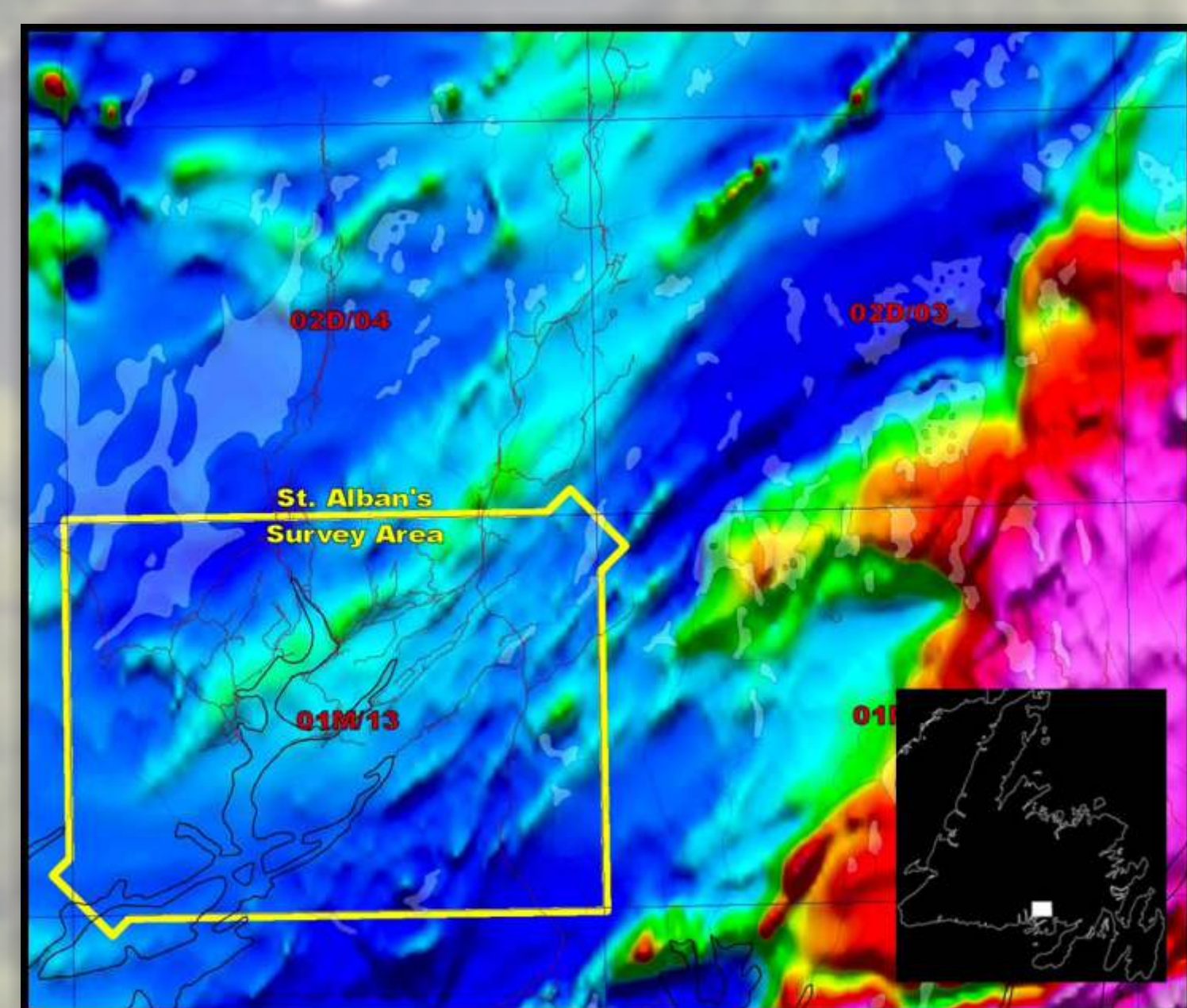


In cooperation with geochemists from the Geological Survey of Canada, **Steve Amor** continues to work on the production of integrated geochemical maps of Labrador and the adjacent part of Québec. A batch of samples from the National Geochemical Reconnaissance Program in Labrador is being re-analyzed by methods that will allow better harmonization with the Québec data. He also provides advice to prospectors and exploration companies on the effective use of geochemical methods.

Steve read a paper at the 2015 Canadian Quaternary Association (CANQUA) conference in St. John's in August entitled "Multivariate Analysis of the Composition of Tills from the Burin Peninsula", which is also the subject of an upcoming open-file report.



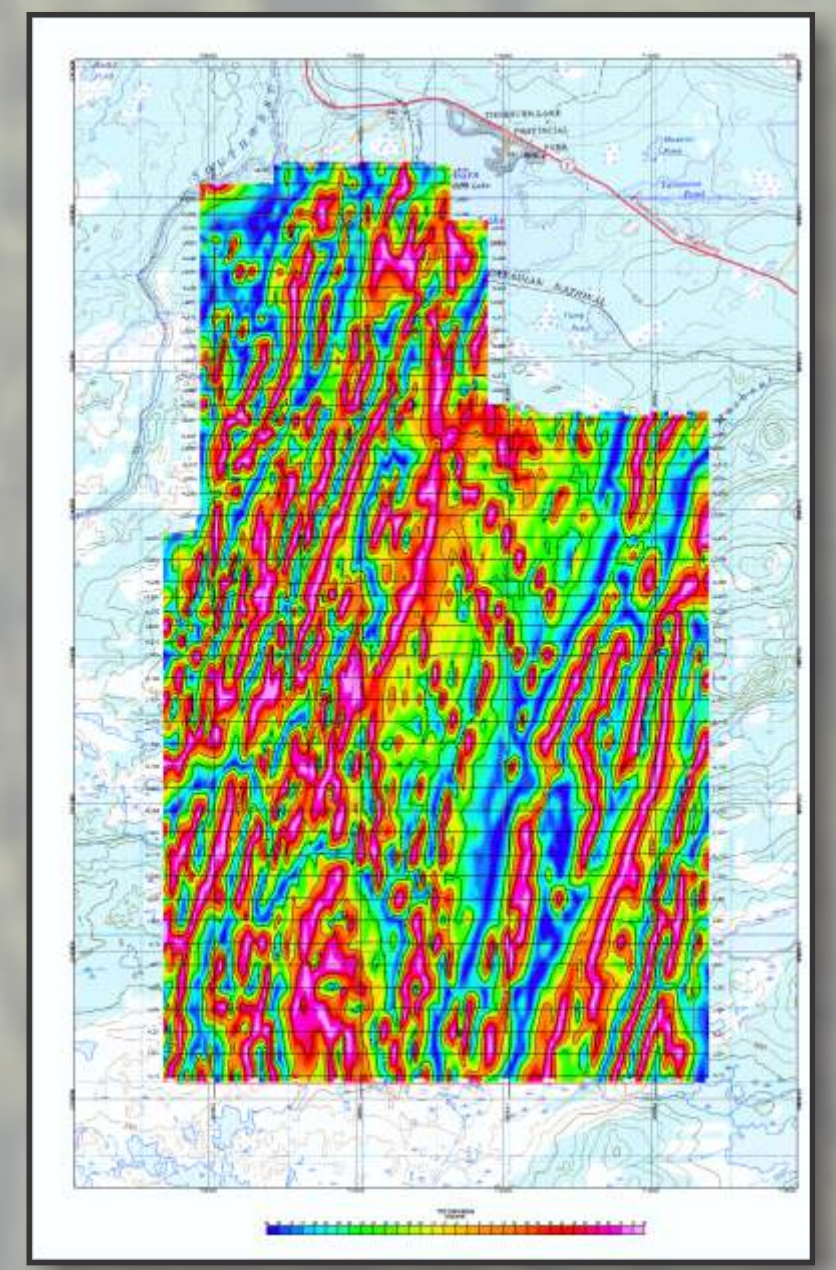
Geophysics



Gerry Kilfoil and **Robyn Constantine** continue to reprocess and index geophysical data to create high-quality, lucid geophysical maps from recently released results of airborne geophysical surveys flown by the private sector. The map to the right shows the tilt derivative of the magnetic field, as measured during an airborne survey over Silver Spruce's Big Easy gold property, near Clarenville. The tilt derivative enhances the linear features in the magnetic signature, and in this image there are prominent SSW-NNE-trending linear features which correspond to the regional strike of bedrock geology, as well as a few more subtle cross-cutting features oriented approximately NNW-SSE, which probably represent faults or dikes.

A contract airborne gradient magnetic, radiometric and VLF-EM survey of NTS 01M/13 took place in October and results are expected to be released in the first half of 2016. The map to the left shows the area of planned coverage. An earlier, low-resolution regional survey indicated the presence of several subtle magnetic linears, which the current survey will be expected to define more precisely. The new, detailed survey results will provide assistance and support for prospecting and bedrock geological mapping studies.

As in previous years, geophysical guidance has been provided to prospectors and exploration companies on request.



Environmental Geology



In addition to working on an open-file report on her monitoring of coastal erosion over the last five years, **Melanie Irvine** has continued to provide advice to stakeholders and has been familiarizing herself with the use of the UAV (drone) to facilitate her work. Melanie also co-chaired a session entitled "Evolution of the coastal zone: recent advances in coastal knowledge" at the CANQUA conference. Several other section members were active participants at the conference.

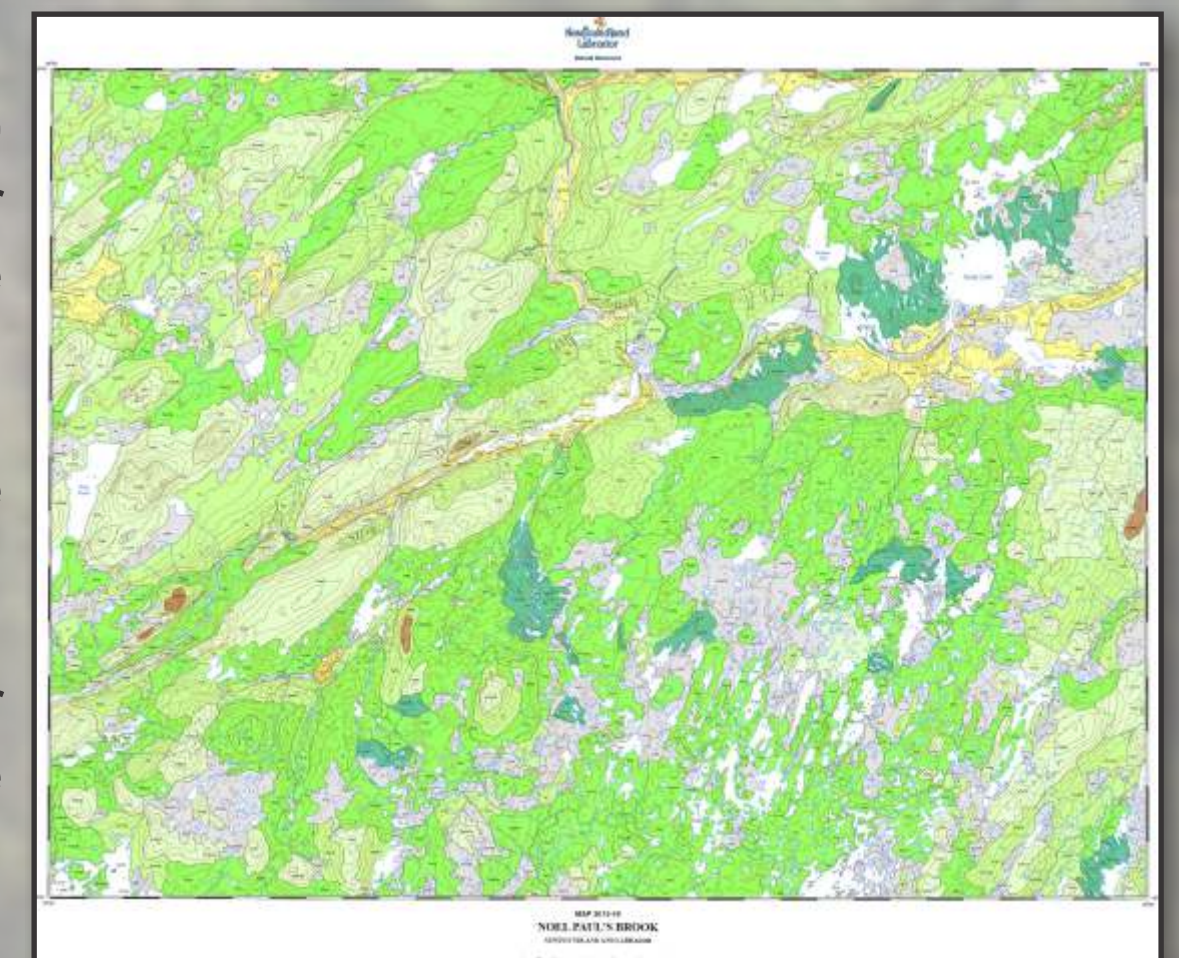


Digital Data

David Taylor continued to coordinate the integration of digital data with the online Geoscience Atlas. Three new 1:50 000 digital surficial geology maps have been added to the Geoscience Atlas bringing the total to 110 for the Island and 38 for Labrador. New striation data collected during the 2015 field season are currently being edited and will be added to the online dataset.

Work on the aggregate resources dataset has been completed and is now available online. Similar updates, to include the most recent data, have been made to the surficial landform dataset.

A new initiative started in 2015, to scan and rectify approximately 2000 1:15,840 scale digital Peatland inventory maps, for the Island initially, commissioned by the Department of Forest Resources and Lands in 1980. To date, these maps are currently only available as transparencies; approximately 750 maps have been scanned and rectified.



Laboratory Services

The Geochemical Laboratory of the Department of Natural Resources is mandated with the task of performing all analytical requirements of the Geological Survey. The Geochemical Laboratory is located in the Howley Building, Higgins Line, St. John's. The laboratory carries out analysis for approximately 65 elements with an annual production of over 200 000 determinations. Most of the analyses for trace and major elements are carried out using Inductively Coupled Plasma-Emission Spectrometry (ICP-ES) and Inductively Coupled Plasma-Mass Spectrometry (ICP-MS). Other selective methods for LOI, FeO, Fluoride, Conductivity and pH are also used. The laboratory also maintains an archive of all samples collected by Geological Survey geologists and submitted for analysis.

As well as handling samples of rock and till collected by survey geologists, **Chris Finch** and his staff, **Rosauro Roldan**, **Lisa Connors** and **Jennifer Kelly** have begun analyzing water samples as part of an initiative by the Department of Environment and Conservation to monitor the quality of well water throughout the island. A pilot study produced multielement analyses of water samples from more than 200 wells collected by residents of Torbay.

