BC GeoMap QUEST update: Bedrock Geology of Quesnel Terrane, central British Columbia
Mise à jour du GeoMap C-B QUEST: Géologie du terrane Quesnel de la Colombie-Britanique centrale

Geoscience BC

Natural Resources Canada / Ressources naturelles Canada

Introduction

This collaboration of the British Columbia Geological Survey, Geological Survey of Canada and Geoscience BC brings together experts in geophysical, geochemical, bedrock and surficial geology to use new information to create a better bedrock map for the poorly exposed region along the belt from Williams Lake north through Prince George to Williston Lake. It concentrates primarily on geophysical and geochemical data recently acquired by Geoscience BC through its QUEST Program. The new bedrock map will be made through a training and awareness raising workshop (done) and followup interpretation, drafting, evaluation and finalization of a the new map. The workshop was held March 11 - 13, 2009. The key output will be a digital map and database available from various sources including the BCGeoMap layer on www.MapPlace.ca

This poster highlights the project, its key data sets, its approach, the principle experts, some interesting geological interpretations and the anticipated product.

This work is a contribution to the Edges Project of the Natural Resources Canada, GeoMapping for Energy and Minerals Program (GEM).

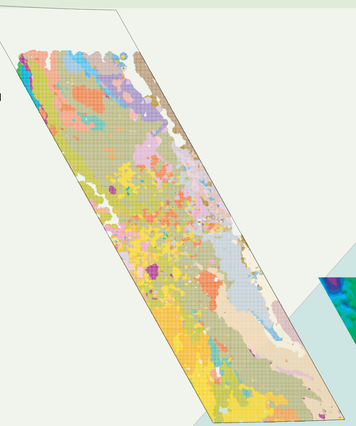
For further information contact:

Jim Logan
British Columbia Geological Survey
jim.logan@gov.bc.ca
(250) 952 0436

Participants at the March 11-13 workshop being briefed on the use of various geochemical signatures in the delineation of particular rock types. From left to right: Paul Gammon (GSC), Paul Schiarizza (BCGS), Ray Lett (BCGS), JoAnne Nelson (BCGS), Mike Thomas (GSC), Colin Barnett (GBC) and Peter Kowalczyk (GBC).

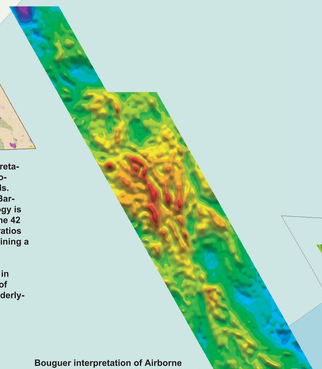
Missing from pictures on this poster are: Jim Logan (BCGS), Bert Struik (GSC), Wayne Jackaman (GBC), and Fil Ferri (BCMEMPR, Oil and Gas Division)

Poster by L.C. Struik



Neural network bedrock geology interpretation as determined from 42 regional geochemical elements for 1 km square grids. Geoscience BC QUEST dataset (Colin Barnett). The characteristic bedrock lithology is represented by the chemical ratios of the 42 elements. The characteristic chemical ratios were determined in a grid square containing a known bedrock lithological outcrop.

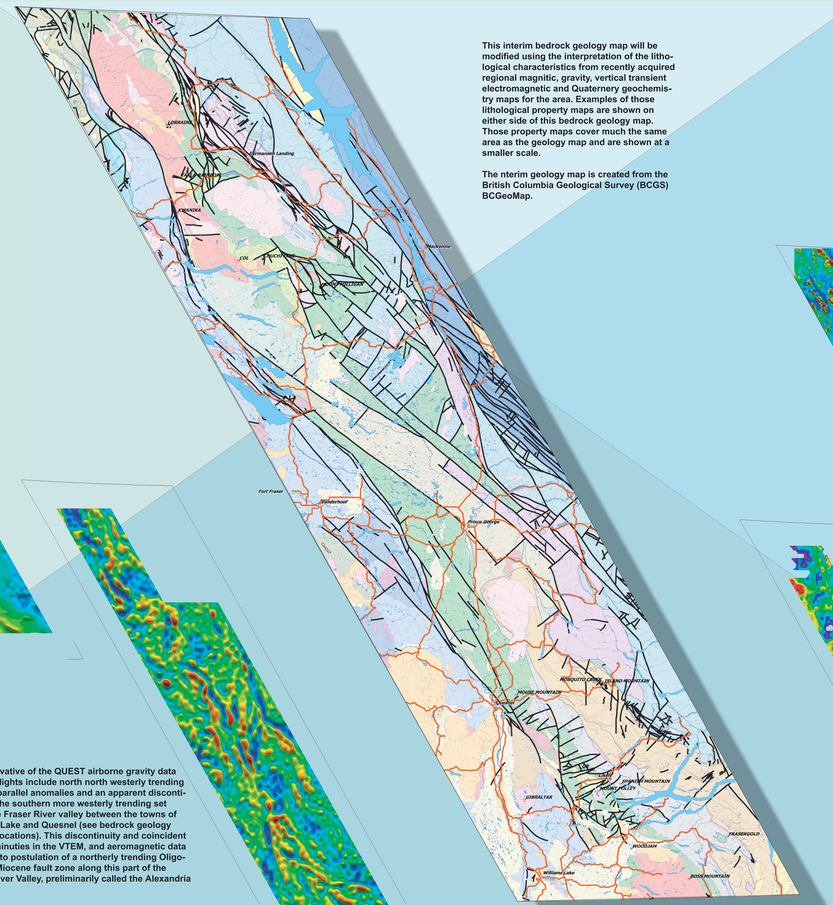
Much discussion about the application in areas of thick glacial cover. Chemistry of thick till may not reflect much of the underlying bedrock signature.



Bouguer interpretation of Airborne gravity. Geoscience BC QUEST dataset.

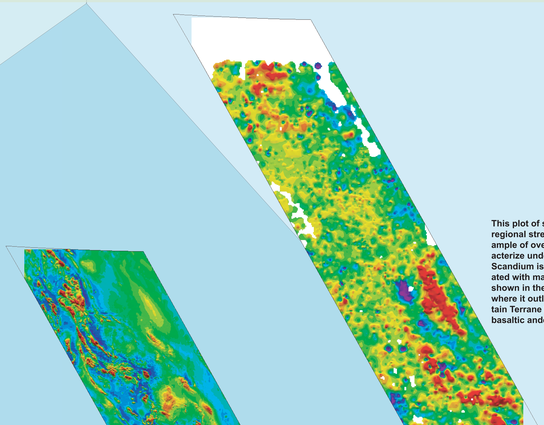
The significance of of the northerly trending positive gravity anomolies in the central area of the map are being evaluated for their potential representation of Quesnel Terrane Triassic and Jurassic units.

First derivative of the QUEST airborne gravity data set. Highlights include north north westerly trending triple of parallel anomalies and an apparent discontinuity of the southern more westerly trending set along the Fraser River valley between the towns of Williams Lake and Quesnel (see bedrock geology map for locations). This discontinuity and coincident discontininuties in the VTEM, and aeromagnetic data have led to postulation of a northerly trending Oligocene to Miocene fault zone along this part of the Fraser River Valley, preliminarily called the Alexandria fault.

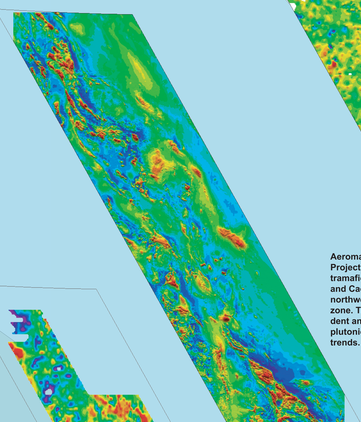


This interim bedrock geology map will be modified using the interpretation of the lithological characteristics from recently acquired regional magnitic, gravity, vertical transient electromagnetic and Quaternery geochemistry maps for the area. Examples of those lithological property maps are shown on either side of this bedrock geology map. Those property maps cover much the same area as the geology map and are shown at a smaller scale.

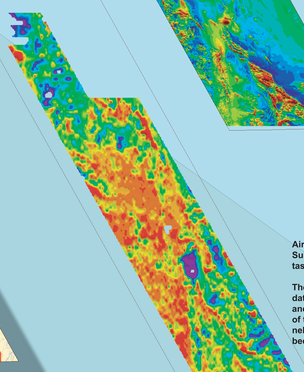
The nterim geology map is created from the British Columbia Geological Survey (BCGS) BCGeoMap.



This plot of scandium concentration in regional stream sediments is one example of over 42 elements used to characterize underlying bedrock units. Scandium is characteristically associated with mafic volcanic rocks, as shown in the southern part of this map where it outlines areas of Slide Mountain Terrane basalt and Quesnel Terrane basaltic andesite.

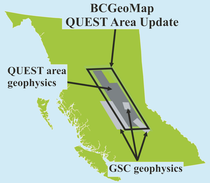


Aeromagnetic dataet from the Geoscience BC QUEST Project. The anomalies coincide with known mafic and ultramafic igneous rocks of the Slide Mountain, Quesnel and Cache Creek terranes, and parallel various regional northwest trending fault traces, such as the Pinchi Fault zone. The magnetic signature has been used with coincident and absent gravity signatures to delineate various plutonic bodies and mafic volcanic and sedimentary trends.



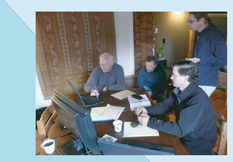
Airborne Vertical Transient Electromagnetic Survey (VTEM). Geoscience BC QUEST dataset.

These data clearly delineate unconsolidated Quaternary units where they are thick and conductive bedrock lithologies in areas of thin Quaternary cover, such as in Quesnel Terrane rocks near Mount Polley (see bedrock map for locations).



Location of the bedrock reinterpration area and coverage of various datasets. The GSC geophysical datasets used in the project are not displayed in this poster.

BCGeoMap
on MapPlace.ca



One of the working groups using GIS software to integrate various of the datasets to test hypotheses explaining discontinuities in the gravity and magnetic datasets. From left to right: Colin Barnett (GBC), Travis Ferbey (BCGS), Mitch Mihalynuk (BCGS) and Paul Gammon (GSC).