Earth Sciences Sector

Geochemical Data Availability via the Geoscience Data Repository

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Natural Resources Canada – Geological Survey of Canada

Workshop on the Role of Geochemical Data in Ecological and Human Health Risk Assessment
March 17-18, 2010, Halifax, Nova Scotia

Producers of Geochemical Data

Major
- -GSC
- -Provincial surveys: QC, ON, BC, NB, NL

Minor
- -Provincial surveys: AB, SK, MB, NS

Links: http://gsc.nrcan.gc.ca/connections_e.php

Less easy to find and harder to use:
- -Other Government departments, academia, mineral exploration companies, EA reports

Catalogues

- Quebec
  - http://www.mrn.gouv.qc.ca/mines/geologie/geologie-donnees.jsp
- Geological Survey of Canada
  - Geoscience Data Repository
  - http://gdr.nrcan.gc.ca/geochem/index_e.php
- British Columbia Map Place
  - http://www.empr.gov.bc.ca/mining/Geolsurv/MapPlace/

Metadata for Till and Soils

- Development of a catalogue of metadata for till and soil geochemical surveys started after a request from Health Canada for information on geochemical background

- Catalogue contains metadata for GSC, provincial, and other surveys

- Catalogue available as **GSC Open File 5934**;

  Spirito, W. A. and Adcock, S.W., 2009. The Canadian Database of Geochemical Surveys: metadata for 600 geochemical surveys across Canada. Geological Survey of Canada, Open File 5934, 1 CD-ROM. .

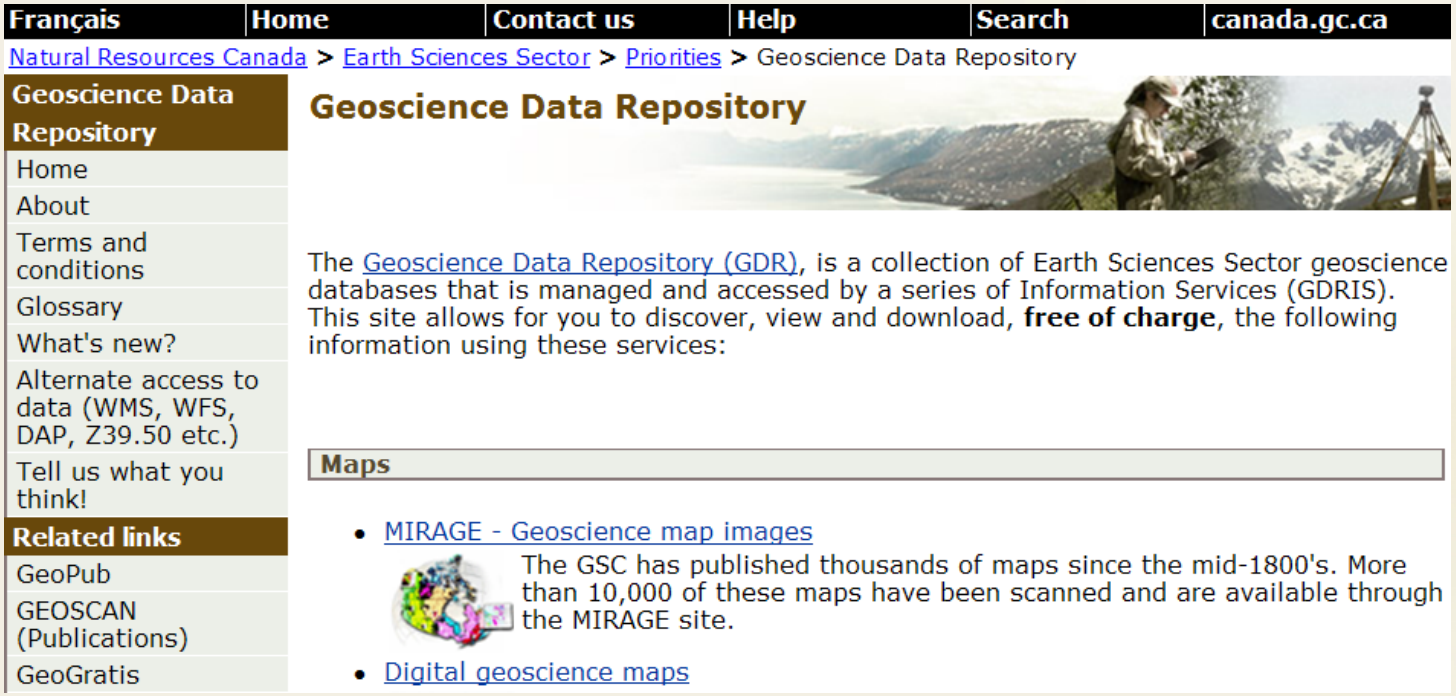
Why Till?

More than 95% of Canada has been glaciated. Till, deposited from glacial ice, is the most widespread surficial deposit. Tills are composed of pebble- to boulder-size clasts of bedrock in a matrix of variable amounts of fine sand, silt, and clay. Over many parts of the Canadian Shield, till forms a discontinuous veneer, 0 - 1.5 m thick. In other areas, e.g., parts of the Prairies and southern Ontario, the till cover is thicker, from several metres to more than 100 metres thick. Since the 1960s, GSC has been carrying out till sampling surveys for mapping and mineral exploration purposes.

For Health Canada purposes, an estimate of geochemical background for soils would have been most appropriate. However, the number of soil surveys undertaken by GSC and the provincial surveys is small. There were insufficient soil data collected systematically and using similar methodology to estimate geochemical background beyond a local scale.

Geoscience Data Repository

The GDR is a repository for GSC data. There is an ongoing effort to add raw data, in a standardized format, for surveys currently in the GDR metadata catalogue. At this time, links to raw data sets in their original format are provided, if available. Non-GSC data sets, if available, can be accessed via links to that organization's web site.



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Natural Resources Canada > Earth Sciences Sector > Priorities > Geoscience Data Repository

Geoscience Data Repository

- Home
- About
- Terms and conditions
- Glossary
- What's new?
- Alternate access to data (WMS, WFS, DAP, Z39.50 etc.)
- Tell us what you think!

Related links

- GeoPub
- GEOSCAN (Publications)
- GeoGratis

Geoscience Data Repository

The Geoscience Data Repository (GDR), is a collection of Earth Sciences Sector geoscience databases that is managed and accessed by a series of Information Services (GDRIS). This site allows for you to discover, view and download, **free of charge**, the following information using these services:

Maps

- MIRAGE - Geoscience map images

  The GSC has published thousands of maps since the mid-1800's. More than 10,000 of these maps have been scanned and are available through the MIRAGE site.

- Digital geoscience maps

http://gdr.nrcan.gc.ca/index_e.php

Geoscience Data Repository

Earth Sciences Sector

At present there are 2 entries in the GDR related to geochemistry.

Geochemistry

- NGR geochemical data

Geochemical point data (lake sediment, stream sediment, lake water, stream water) from the National Geochemical Reconnaissance database

- Geochemical survey metadata

Searchable metadata for over 700 geochemical surveys conducted across Canada since the 1950s.

Geochemical Survey Metadata

- Searchable metadata for over 700 geochemical surveys conducted across Canada since the 1950s. This represents hundreds of thousands of samples.
- Sample media now include vegetation, lake and stream sediments, rocks etc., as well as soil and till.
- Includes links to the original publications and online data, access to *NGR data*.
- extensively cross-linked to other databases and geological organizations.

Geochemical Survey Metadata

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Natural Resources Canada > Earth Sciences Sector > Priorities > Geoscience Data Repository > Canadian Geochemical Surveys

Geoscience Data Repository
- Home

Canadian Geochemical Surveys
- Home/ Download data
- About
- Browse metadata by category
- Help for application

See also...
- Terms and conditions
- System requirements

Geoscience Data Repository

Canadian Geochemical Surveys

This Web site presents a catalogue of geochemical surveys conducted by the Geological Survey of Canada and its Provincial counterparts. The catalogue currently contains over 500 entries. This represents an estimated 80% of the GSC's data holdings and something less than 50% of the Provincial data holdings. For many surveys, the raw geochemical data are available for download. More...

Launch application to search the catalogue

See also:

- Browse by category
- Help for application
- System requirements
- Terms and conditions
- Alternate access to data

http://gdr.nrcan.gc.ca/geochem/index_e.php

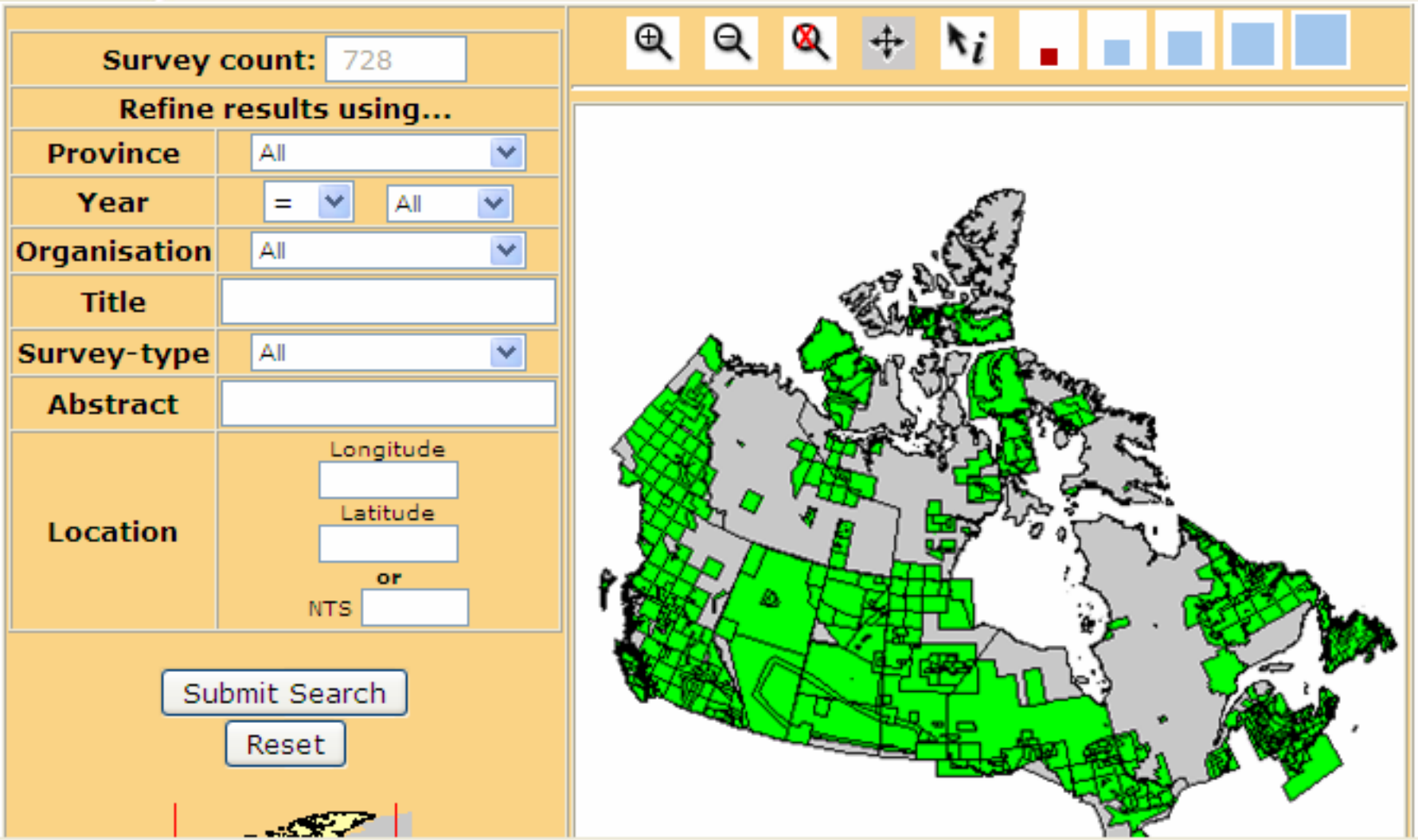
Geochemical Survey Metadata

Contents of the catalogue may be accessed by:

- by viewing a map-based interface
- by browsing index tables organized by category (e.g. by survey or publication)
- by querying a periodic table interface
- by using internet search engines e.g. Google

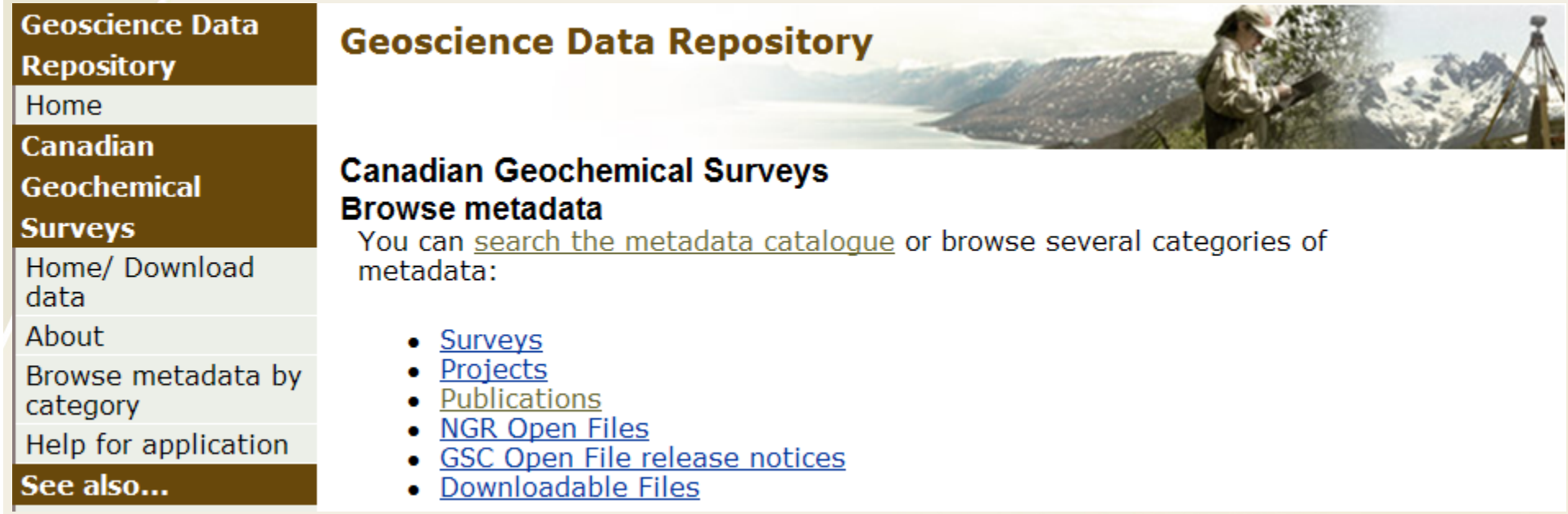
- The home page of the Canadian Geochemical Surveys catalogue is http://gdr.nrcan.gc.ca/geochem/index_e.php .

Map-based Interface



Browsing by Category

Earth Sciences Sector



http://gdr.nrcan.gc.ca/geochem/browse_e.php

Example – Soil Surveys

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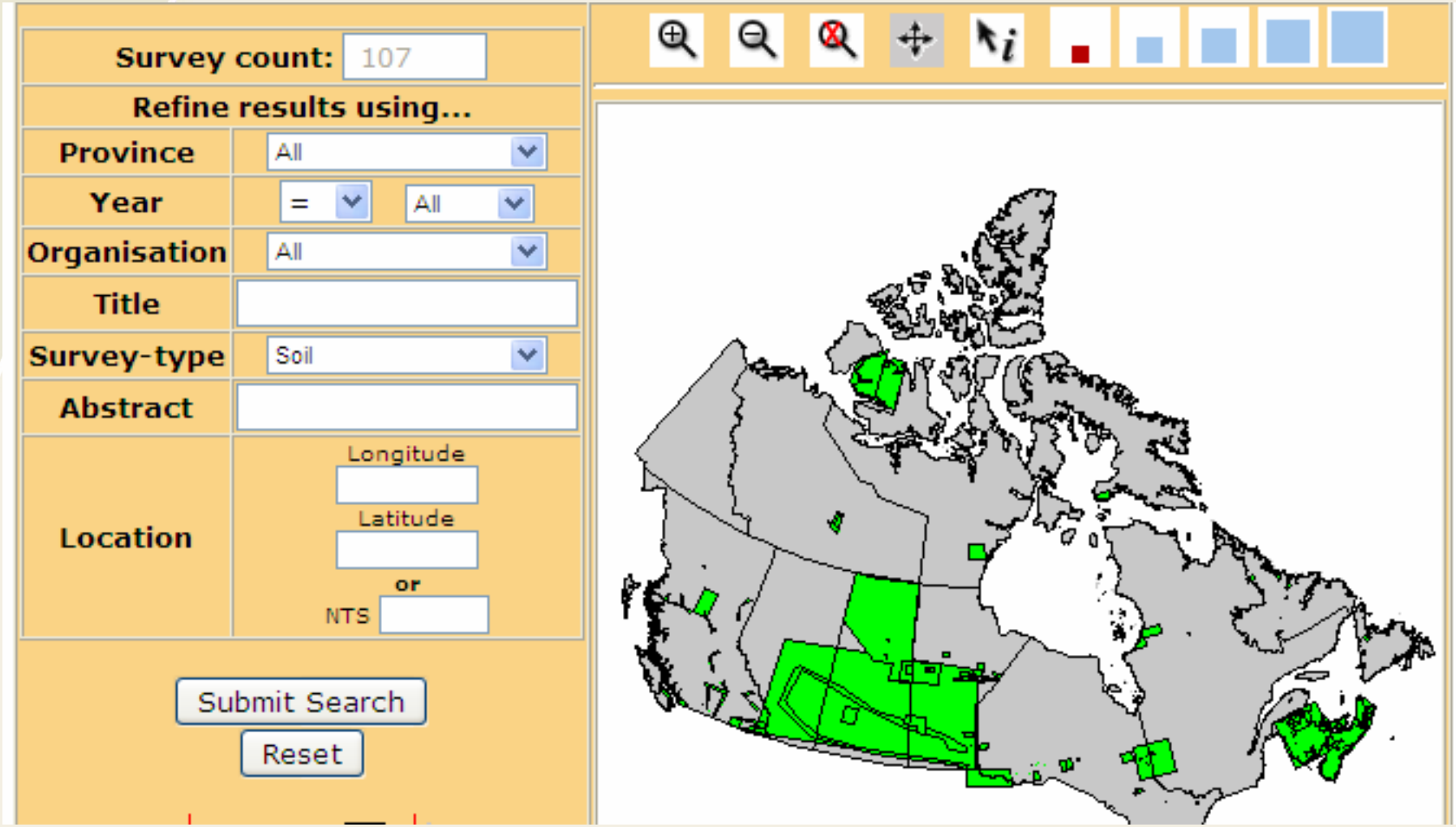
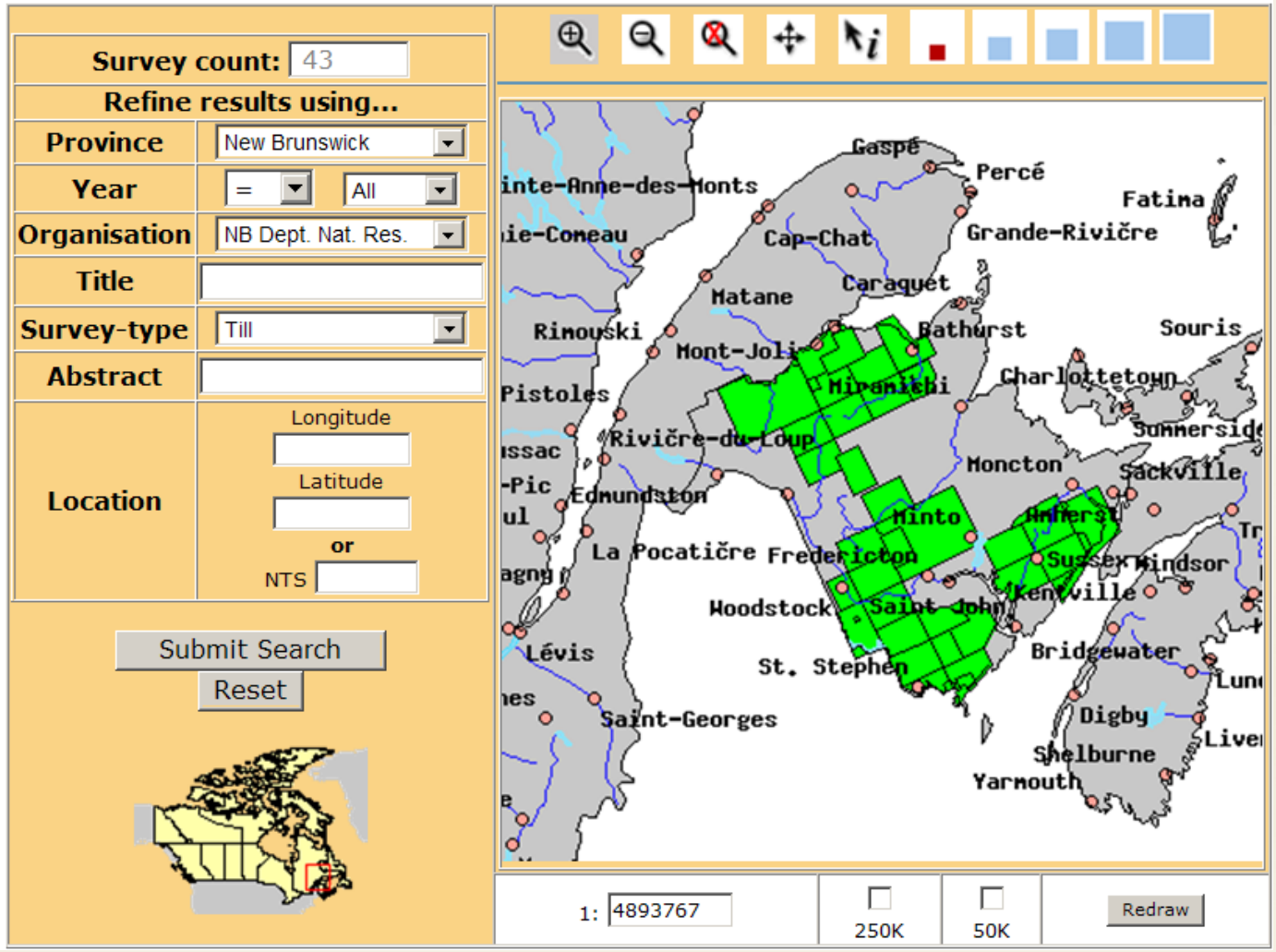


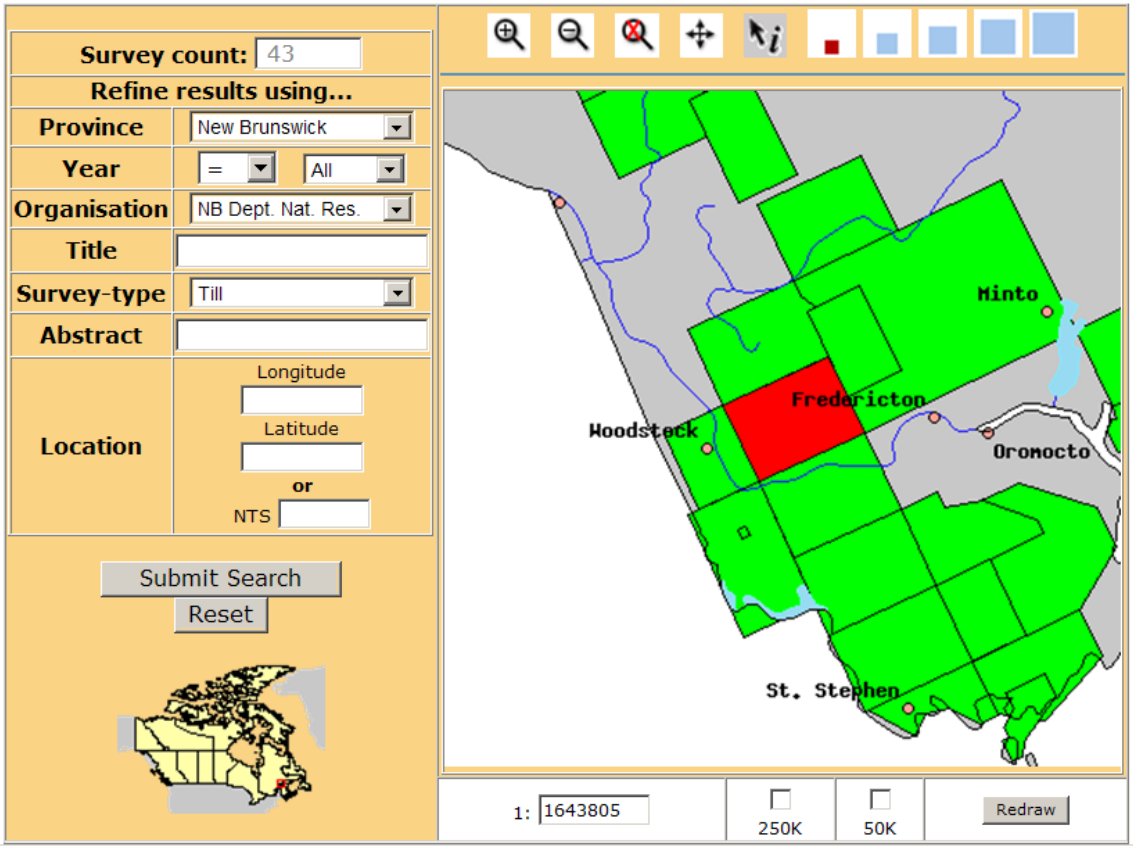
Example - Searching for NB Surveys

Earth Sciences Sector



Example - Survey Selection in NB

Earth Sciences Sector



Query Results

Info	Grouping	Organisation	Survey Year	Dataset	KML
more	Till	NB Dept. Nat. Res.	1995	Till sampling, NTS 21J/3, (Millville), southwest New Brunswick, 1995-1998.	KML

Example - Details and Publications from Selected NB Survey

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Canadian Geochemical Surveys
Survey Metadata

Till **New Brunswick** **1995**

Till sampling, NTS 21J/3, (Millville), southwest New Brunswick, 1995-1998.

Location map (kml)

New Brunswick Department of Natural Resources, Geological Surveys Branch

Survey Description

Extended metadata for this survey are available (see below)

Between 1995 and 1998, till samples were collected from 336 sites in the Millville area, southwest New Brunswick. This includes original and follow-up sampling. Sampling was based on a 2 km grid. Basal lodgement or basal meltout till were collected at the grid point, or as close as possible if it was unavailable at the selected grid point. Sample pits were excavated by hand to at least 0.1 m into the C-horizon if possible. Sample pits were cleaned out and sampled by hand with a stainless steel hunting knife to loosen material. Approximately 5 kg of till was collected. Pebbles were also collected from the C-horizon. The data are published in New Brunswick Department of Natural Resources and Energy Open File 99-11.

Data Description: Paper report, data on diskette.

Quantities Analysed: <0.063 mm fraction of till by INAA for 35 elements; by ICP-ES for 19 elements, S also done on the follow-up samples; Sn by fusion-ICP; Hg by CV-AAS.

Geochem Maps Available: None.

Other Analyses: <2 mm fraction of till used for grain size analyses.

Extended Metadata

- Sample locations
- Sample material
- Preparation laboratory sample material
- Analytical History

Publication History

Index	Publication
1	Seaman, A.A. (1999). Till geochemistry of the Millville (NTS 21 G/12) map area, York and Carleton counties, New Brunswick: site and geochemical data. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Open File 99-11, 85 p. (more)
2	Allard, S. (2004). Levelling methods for regional till geochemistry data from southwestern New Brunswick. *In* Geological Investigations in New Brunswick for 2003, G.L. Martin (Editor). New Brunswick Department of Natural Resources, Minerals, Policy and Planning Division, Mineral Resource Report 2004-4, p.1-20. (more)
3	Seaman, A.A. (1997). Till geochemistry of the east half of the Millville (NTS 21 J/3) map area, York County, New Brunswick. *In* B.M.W. Carroll (Editor), Current Research 1996, New Brunswick Department of Natural Resources and Energy, Geological Surveys Branch, Mineral Resource Report 97-4, p. 225-246. (more)
4	Seaman, A.A. (1998). Till geochemistry of the west half of the Millville (NTS 21 J/3) map area, York and Carleton counties, New Brunswick. *In* Current Research 1997, B.M.W. Carroll (Ed.). New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Mineral Resource Report 98-4, p.75-92. (more)
5	Seaman, A.A. (1999). Follow-up till geochemistry in the Millville (NTS 21J/3) map area, York County, New Brunswick. *In* Current Research 1998, B.M.W. Carroll (Ed.). New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Mineral Resource Report 99-4, p.45-55. (more)
6	Seaman, A.A., Prebble, A.C. (1997). Au, Ag, As, Hg and Sb values in tills of the east half of the Millville (NTS 21J/3) map area, New Brunswick. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Plate 97-19A. (more)
7	Seaman, A.A., Prebble, A.C. (1997). Cu, Pb, Zn, Co and Ni values in tills of the east half of the Millville (NTS 21J/3) map area, New Brunswick. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Plate 97-19B. (more)

Example – Data Download from Selected NB Survey

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Related data
NGR geochemical data
Related links
Geochemistry
Site map

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Canadian Geochemical Surveys
Publication Metadata

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Additional resources for this publication are available here.

Survey coverage

(explain)

Index	Survey
1	Till sampling, NTS 21J/3, (Millville), southwest New Brunswick, 1995-1998. (more)
2	Overburden drilling and till geochemistry survey, 3 areas in northern and western New Brunswick, 1986-1987. (more)
3	Till sampling survey, southern Miramichi Zone, NTS 21J, G, New Brunswick, 1985. (more)

Geochemical Surveys

- Raw data from 65 till surveys (28,508 samples) are available in a standardized format and can be searched via a periodic table.

In Focus:

Raw data for 65 till surveys across Canada are now available in a standardised format, as both KML files and Excel spreadsheets. A KML index map of the 65 surveys is available (see also the KML index map of all 600 surveys). The 65 surveys can also be searched via a periodic table interface. Click on the element of interest, and an index map will be displayed, showing those surveys for which that element was analyzed.

http://gdr.nrcan.gc.ca/geochem/index_e.php

Example – Periodic Table Interface

Canadian Geochemical Surveys
Periodic Table Index

- elements for which raw data are available in a standardised format (65 till surveys to date)

H																	He
Li	Be											B	C	N	O	F	Ne
Na	Mg											Al	Si	P	S	Cl	Ar
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe
Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn
Fr	Ra	Ac	Rf	Db	Sg	Bh	Hs	Mt	Ds	Rg	Uub	Uut	Uuq	Uup	Uuh		Uuo

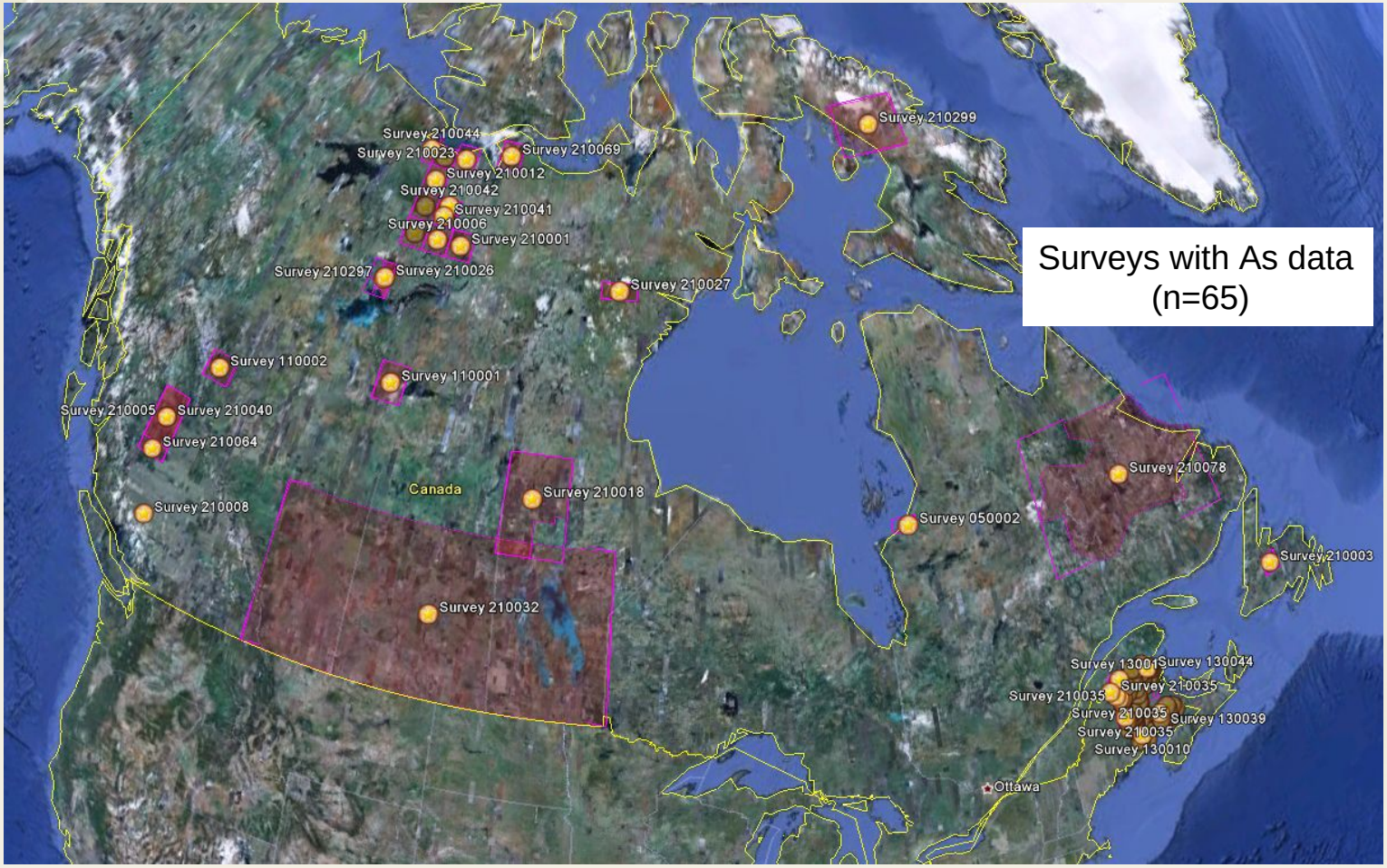
Lanthanides

La	Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu

Actinides

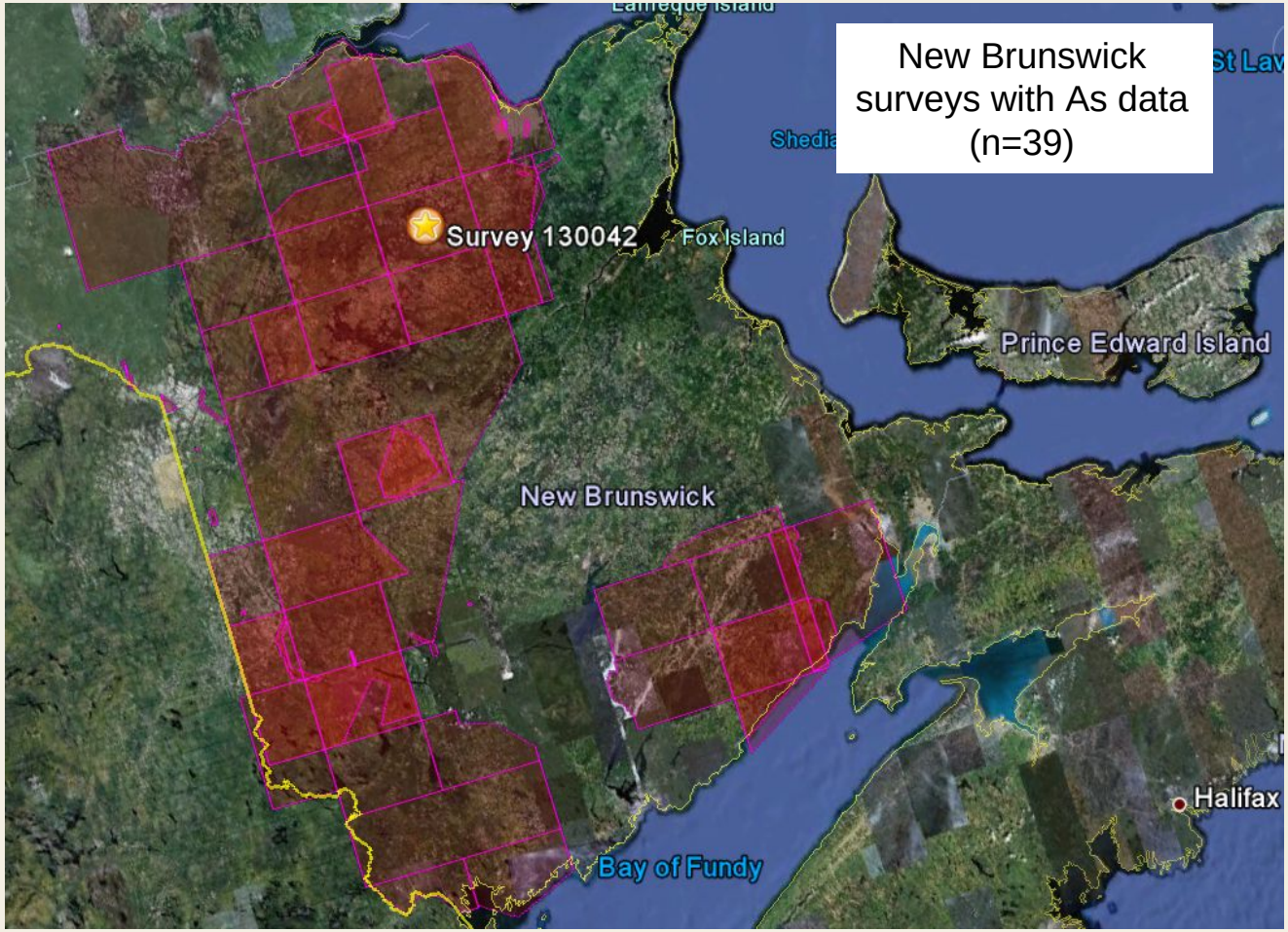
Ac	Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr

Example – Periodic Table Interface



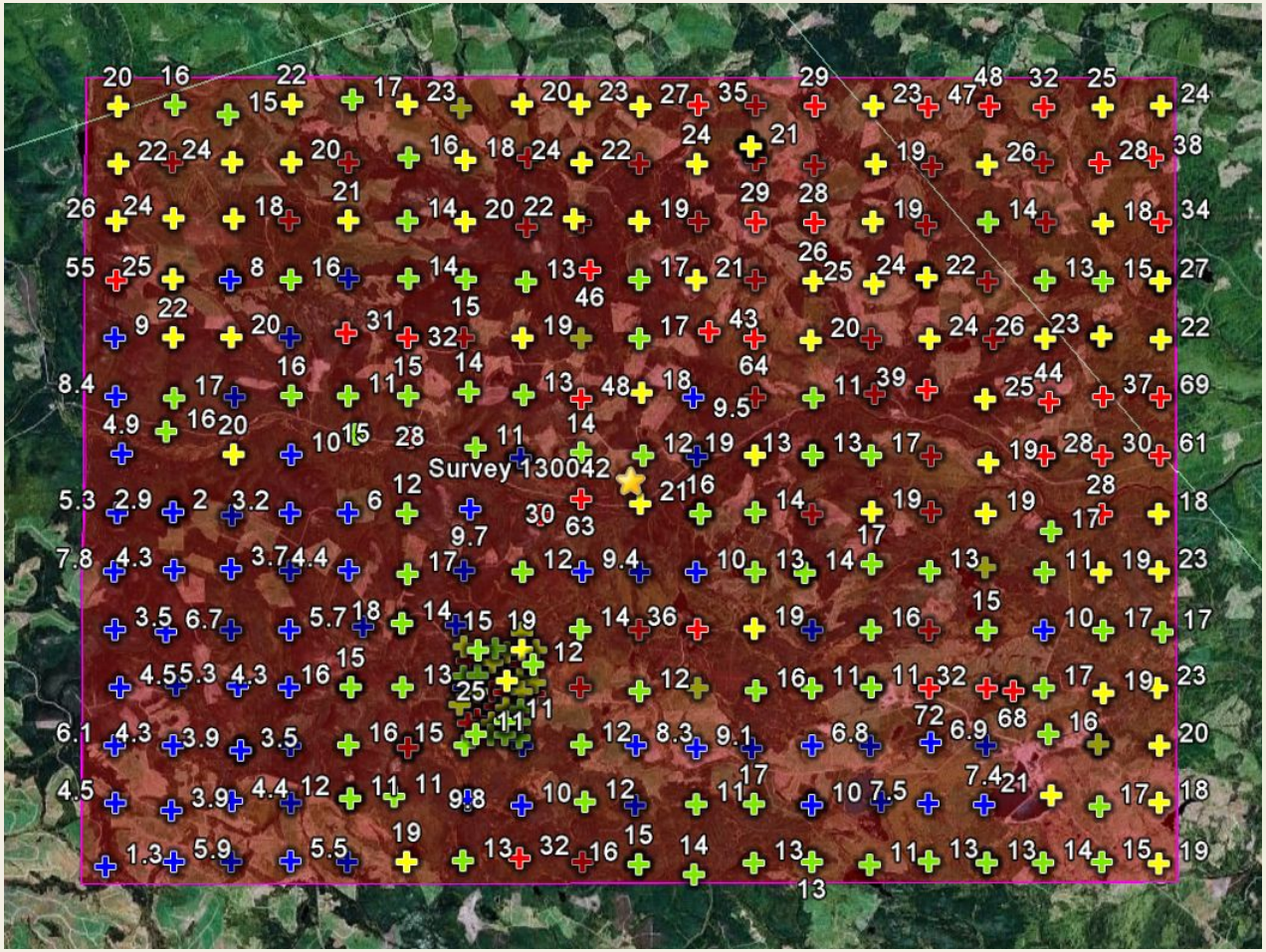
Surveys with As data (n=65)

Example – Periodic Table Interface



Example – Periodic Table Interface

- As concentrations coloured by quartile for one till survey; displayed via Google Earth



GDR User Manual

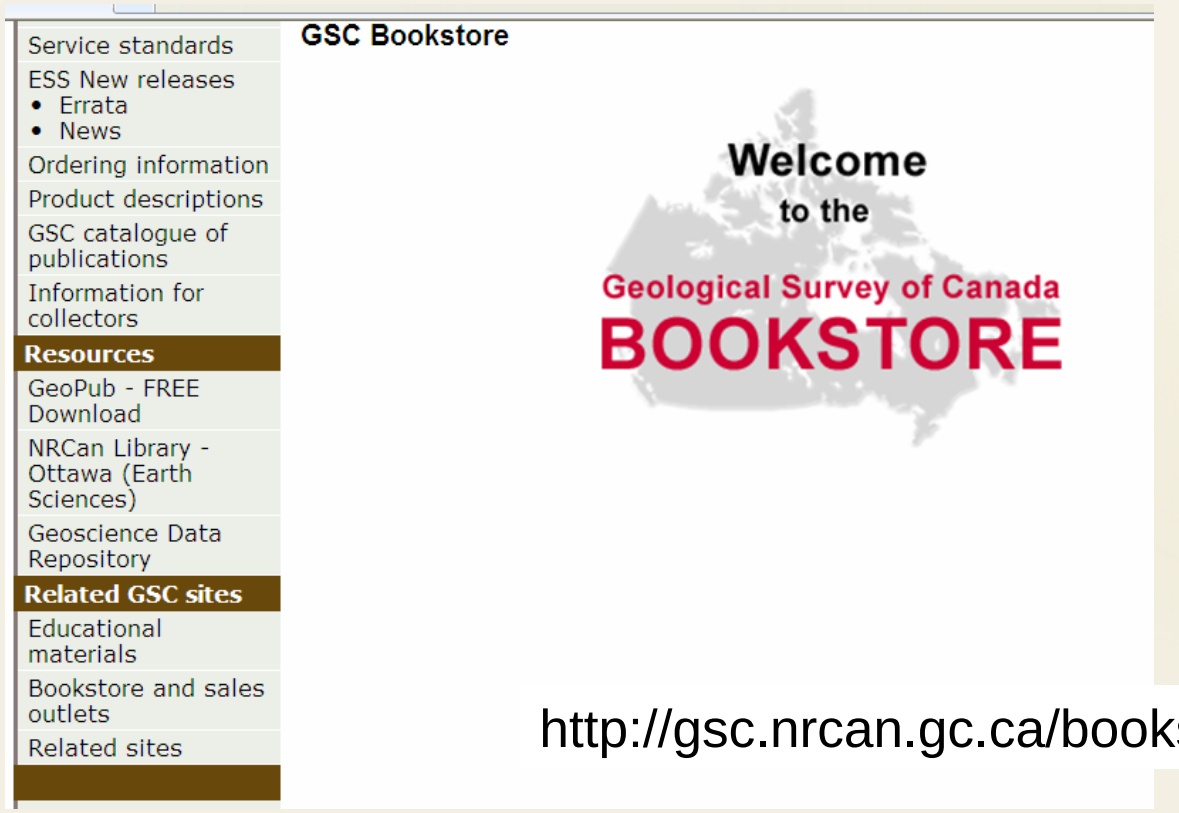
- A manual has been developed to help users navigate and optimize use of the Canadian Geochemical Surveys catalogue on the GDR.

Spirito, W.A. and Adcock, S.W. 2009. The Canadian Database of Geochemical Surveys: User manual for the metadata website. Geological Survey of Canada, **Open File 5936.**

Download at http://geopub.nrcan.gc.ca/moreinfo_e.php?id=248067&_h=5936

GSC Bookstore

The NRCan site - GSC Bookstore – is a portal to access many geoscience databases and services.



- GSC publication catalogue
- GeoPub
- Earth Sciences Sector Library
- GDR

http://gsc.nrcan.gc.ca/bookstore/index_e.php

GeoPub

FREE DOWNLOADS

What's available on GeoPub?

- Geological Survey of Canada publications
- Canada Centre for Remote Sensing articles
- ESS Business Plans and Annual Reviews

http://geopub.nrcan.gc.ca/index_e.php

GSC Library Databases

- Canadian Geographical Names Database
- CGRG Bibliography of Canadian Geomorphology
- Earth Sciences Library Catalogue
- GEOSCAN
- ESS Photo Database
- IngentaConnect
- Provincial & Territorial Geological Survey Publications
- Quakeline - earthquakes
- RESORS - remote sensing (1969 - 1995)
- ScienceDirect - Elsevier science
- Scirus - scientific web search engine
- WEBLEX Canada - Canadian Geological Names
- Canadian Encyclopedia
- GIS Dictionary
- Grand Dictionnaire Terminologique
- Canadian Archaeological Radiocarbon Database (CARD)

Provincial and Territorial Geological Survey Publications

- Links to provincial and territorial geological survey home pages are provided in the GDR metadata catalogue and at http://gsc.nrcan.gc.ca/connections_e.php

RECOMMENDATIONS

- Metadata and links to raw data for geochemical surveys in Canada are available from the Geoscience Data Repository; raw data in a standardised format for 65 till surveys are also available
    - http://gdr.nrcan.gc.ca/geochem/index_e.php
- GSC OF 5934 provides the same information as on the GDR if no internet connection is available; it is a “snapshot” of the GDR at the time the open file was published
    - http://geopub.nrcan.gc.ca/moreinfo_e.php?id=247421&_h=5934
- On-line GSC Bookstore and similar provincial library facilities provide catalogues, databases, and free downloads
    - http://gsc.nrcan.gc.ca/bookstore_e.php