

Digital Information Services Activities in 2014

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The Digital Information Services group is responsible for developing and maintaining the Geoscience and Mines Branch (GMB) Geographic Information System and associated databases, the NovaScan publications and maps database, for supplying digital data and services to clients and staff, and for developing and maintaining the GMB Internet website. Permanent Digital Information Services staff consists of Brian Fisher (manager), Jeff Poole (supervisor), Jeff McKinnon (geologist/GIS specialist), Angie Barras (GIS specialist/cartographer), Sonya Cowper (GIS and Map Server specialist) and Susan Saunders (web/desktop publishing technician). David Hapgood finished with us in February 2014 and started again in October 2014 as a replacement for staff on maternity leave. Ian MacInnis was hired in April as a GIS data modeler but resigned his position in September. Student Katelyn Page was hired to work as GIS assistant during the summer of 2014.

Digital Geoscience Data Products

A collection of digital geology maps, databases and images of Nova Scotia (in DXF, ARC export, ArcView shapefiles, TIFF, JPEG and MrSID formats in a UTM projection using the NAD83 datum, and in PDF format) has been developed, and is available for viewing or free download from the GMB website (<http://novascotia.ca/natr/meb/maps/default.asp>). We are now including ArcGIS file geodatabase (GDB) and KML/KMZ formats and are no longer producing the ARC E00 export and DXF formats. A licence agreement is issued with all digital data sets. This agreement allows unrestricted use of the data with the understanding that the Nova Scotia Department of Natural Resources (DNR) remains the owner of the data and is not transferring copyright to the user.

GIS Development

Digital Information Services staff worked together with other GMB staff on numerous projects in 2014. This included providing advice and assistance as requested, along with developing databases and maps for the projects outlined below.

Abandoned Mine Openings (AMO) Database:

Section staff supported Ernie Hennick with the release of a new version of the AMO database (version 5) in November of 2013. A new version of the 1:500 000 scale AMO map was released in January 2014 (OFM ME 2014-001).

Surficial and Coastal Materials Maps of the

Yarmouth and Rockwell Areas: Section staff worked with Dan Utting to publish two 1:10 000 surficial and coastal materials maps of the Yarmouth and Rockwell areas in southwest Nova Scotia. These were completed and released in November 2014 (OFM ME 2014-002 and 003).

Potential Surficial Aquifers of Nova Scotia:

Section staff worked with Gavin Kennedy to create a GIS digital product and cartography for a series of five 1:150 000 to 1:225 000 regional scale potential surficial aquifer maps for the province of Nova Scotia. The digital GIS product and maps were completed and released in November 2014 (DP ME 490 and OFM ME 2014-004 to 008).

Methane in Well Water in Nova Scotia:

Section staff worked with John Drage and Gavin Kennedy on a 1:475 000-scale methane in well water map in Nova Scotia. This map was released in November 2014 (OFM ME 2014-009).

Halifax Bedrock Map:

Section staff worked with Chris White on a new 1:50,000-scale bedrock geology map of the Halifax area (11D/12). This

map was released in November 2014 (OFM ME 2014-010).

Valley Aggregate Project: Section staff and students continued to provide support and enter data collected by Garth Prime into the project databases in 2014. Section staff also set Garth up with the GIS tools to edit and update data on his own.

Cape Breton Compilation Project: Section staff worked with Chris White and Sandra Barr of Acadia University to compile and integrate previous field work and detailed bedrock geological mapping initiatives over the last 25 years on Cape Breton Island. This is a three phase project. The first phase of work was to extract bedrock data from a number of FieldLog databases and AutoCAD drawing files and convert them into ESRI shapefile format. The second phase was to compile and digitize line work from previous mapping under the direction of White and Barr. The third phase is to combine these data and create a series of twenty-five 1:50 000-scale bedrock geology and GIS databases for Cape Breton Island. By the end of 2013, phase 1 was complete and phase 2 was well underway. By the end of 2014 all points and lines were compiled and two generations of polygons have been built and edited. A geologic legend was compiled for the entire island consisting of 346 units and 1833 polygons. The plan is to continue this work into 2015 and produce a series of preliminary maps and a GIS database.

Geoheritage Project: Section staff worked with John Calder in providing GIS support for the location of geoheritage sites that he has been compiling over the past number of years. This also included creating promotional maps for Geology Matters and other presentations.

Parrsboro Mapping: Section staff supported John Calder and his summer student in detailed mapping of the Parrsboro area. We compiled old unpublished data and new field data from notebooks and GPS to add to the GMB databases for future map production and GIS digital product releases.

Valley Bedrock mapping: Section staff have been working with Chris White on compiling

legacy geological data along with new work in a block of Meguma Group rocks that stretches from Torbrook east to the Forest Hill/Wolfville area at the northeastern end of the Annapolis Valley. This will lead to the production of 1:50 000-scale bedrock geology maps along with a GIS digital product.

Registry of Mineral and Petroleum Titles

Database/NovaROC: The new online registry system, called NovaROC, was released on August 26, 2013. GIS staff assisted Registry staff and contractor Pacific GeoTech throughout the year with updates and enhancements to the online registry system. Baselayer and protected area updates were provided to Pacific GeoTech in November 2014 and should be incorporated into an updated version of NovaRoc in 2015.

Drillhole and Drill Core Database: Section staff continue to work on new applications that will allow for the entry of drillhole and drill core data into an SQL Server database, and applications that will allow staff and the public to query the database through the Internet. These efforts were delayed by demands of other projects in the group. These applications should be completed in 2015.

Website Work: In the winter of 2011 Famous Folks was contracted to redesign the GMB website. The template of the website was delivered in the spring of 2011 and the next step was to update and provide new content for the website. Branch and section staff worked on this project throughout the year. The new website was released in July 2014.

GIS Link Project: A new project called GIS Link was initiated late in 2013 and spearheaded by DNR and GeoNova to further efforts at creating a Corporate Geomatics Infrastructure (CGI) for government. In the winter of 2014 GIS staff in the GMB and DNR along with staff of GeoNova got together to develop standards and design an architecture for a Nova Scotia Geomatics Infrastructure (NSGI). This required the efforts of Brian Fisher as business manager, and Jeff Poole, Sonya Cowper and Ian MacInnis as technical consultants along with staff from DNR Crown Lands and DNR Forestry. This work will continue and be expanded in 2015 with efforts by Brian Fisher, Jeff Poole and Sonya Cowper from our section.

Coastal Erosion Project: Ian MacInnis worked with Chantel Nixon on setting up tools to collect data on coastal erosion and worked on developing an initial GIS database of coastal information. This work continued until MacInnis left in August.

Internet Map Server Applications

The section continues to maintain its three primary public internet map server (IMS) interactive map applications. The Nova Scotia Geoscience Maps, Database and Images application generated 238,880 maps (down 30% from 2013); the Nova Scotia Groundwater Maps and Databases application generated 418,019 maps (up 134% from 2013); and the Mineral Resource Land Use Atlas application generated 123,790 maps (up 3% from 2013). The GIS4 map server generated a total of 1,348,715 maps in 2014 for all DNR map services, up 8% from the 1,251,493 maps generated in 2013. The drop in the usage of the Nova Scotia Geoscience Maps, Database and Images application can be attributed to splitting of our audience between this application and the NovaROC map application.

The purpose of the Nova Scotia Geoscience Maps, Databases and Images interactive map application is to provide the public with a single geographic compilation of geoscience maps, databases and images. The application displays a number of different layers from previously released digital products. In 2013 the mineral rights layers were removed, along with the 12% protected lands layers, because they were out-of-date and there were other applications (e.g. NovaROC) that provided more up-to-date information. Nova Scotia Geoscience Maps, Databases and Images application can be accessed at http://novascotia.ca/natr/meb/geoscience-online/geoscience_about.asp.

The purpose of the Nova Scotia Groundwater Maps and Databases application is to provide the public with an interactive IMS service containing layers of spatially referenced maps, databases, grids and images of interest to hydrogeologists, particularly those interested in the hydrogeological properties associated with the identified groundwater regions.

(http://novascotia.ca/natr/meb/geoscience-online/groundwater_about.asp)

The main purpose of the Mineral Resource Land-Use Atlas (MRLU) interactive map application is to provide the public with a single geographic compilation of mineral resource and related land-use information at a reasonably detailed scale of 1:50 000. A key objective is to create a useful reference for practitioners working in land-use and environmental planning, geotechnical firms and groups involved in community economic development. The MRLU displays the location and distribution of mineral and energy resources and related activities as well as aspects of environmental geology that relate to land-use and environmental planning. Special land-use designations on Crown and some privately owned land are shown to indicate how Nova Scotia's land base varies regarding the ability of mineral resource interests to access land and hold secure tenure. (<http://novascotia.ca/natr/meb/geoscience-online/about-mineral-resourc.asp>)

The above applications are on an aging infrastructure using out-of-date software. The GIS group is making a concerted effort to migrate these map services and applications to the latest technology. We are also using this migration as an opportunity to review our databases, map services and applications to provide more and better data and applications with enhanced functionality for our clients. Cowper is working with ArcGIS Server 10.2 and Geocortex to design and develop ArcGIS web mapping-applications for the branch. During the Geology Matters 2014 conference we provided a demo of this work and asked for feedback through a questionnaire.

The GIS group also maintains three simple but more focused Flex applications for the Branch that use ArcGIS Server technology: the Potential for Radon in Indoor Air application (http://novascotia.ca/natr/meb/geoscience-online/radon_about.asp), the Bedrock Acid Rock Drainage Potential for Southwestern Nova Scotia application (http://novascotia.ca/natr/meb/geoscience-online/ard_about.asp) and the Southwest Nova Bedrock Map application (http://novascotia.ca/natr/meb/geoscience-online/sw_nova_about.asp).

The Potential for Radon in Indoor Air application was developed to show areas in the province where people are more likely to be exposed to hazardous radon in indoor air. This application has an address and postal code search capability to help users find their home on the map. It provides a simple high, medium and low risk ranking scheme but emphasizes that the only way to know for sure how much radon is in your home is to test for it no matter where you live.

The Bedrock Acid Rock Drainage Potential for Southwest Nova Scotia application shows the potential of bedrock to generate acid rock drainage (ARD) if it is physically disturbed or exposed. This map uses a simple high, moderate and low ranking scheme to inform landowners and planners about the hazards of ARD if they plan to excavate to bedrock in a given area.

The Southwest Nova Bedrock Map application is an interactive map showing the compilation of geological data and mapping of southwestern Nova Scotia by Chris White published in 2012 (http://novascotia.ca/natr/meb/geoscience-online/sw_nova_about.asp). It shows many map layers including bedrock geologic units, geological contacts, age dates, anticlines/synclines, drillholes, dykes, faults, fossils, bedrock geologic units, geological contacts, gold districts, mines, mineral occurrences, outcrops, quarries, shafts, stockworks, structural data, and shear zones.

Cowper has also built test applications for the Geoheritage and the Valley Aggregate projects that use ArcGIS Online, Story Maps and Story Map Journal templates.

NovaScan

NovaScan is the geoscience publications and maps database on Nova Scotia and its offshore regions. As of December 31, 2014, the database contained 17,163 GMB records, consisting of 8,465 mineral exploration assessment and property reports, 3,970 publications, 1,305 open file reports, 2077 maps and illustrations, 858 theses, 262 contribution series, 200 digital products, and 26 outside publications.

Each month, a list of new publicly released assessment and property reports is generated from NovaScan and posted on the GMB website at <http://novascotia.ca/natr/meb/geoscience-online/monthly-assessment-reports.asp>. The original paper copies of these released reports are filed in the DNR Halifax Library and the Core Library in Stellarton monthly, and PDF versions of these released reports are posted to the GMB website monthly. Quarterly lists of open assessment and property reports are produced and published in the departmental newsletter. One hundred and eighty-three assessment reports were released in 2014.

In order to provide better service to our staff and clients the branch maintains a public search application that allows the public to query records in the NovaScan database using Internet Explorer or Firefox. NovaScan can be searched by title, author/organization, subject, area, map sheet (NTS), map type, licence type, licence number, document type, document number, year and scale. NovaScan is updated monthly as new geoscience maps, open files, theses, mineral exploration assessment reports and property reports become available. The search interface can be accessed at <http://novascotia.ca/natr/meb/geoscience-online/about-novascan.asp>. In 2014, 349 documents were added to the database including 275 assessment reports, 11 open file maps, 4 contribution series, 1 digital product, 42 reports, 2 open file reports and 14 open file illustrations.

Digital Products and Open File Maps Released in 2014

The following new digital products, open file maps, and updated versions of digital products were released in 2014. A complete list of all digital products can be found at <http://novascotia.ca/natr/meb/download/gis-data-maps.asp>. All digital products can be downloaded for free from the URL listed with the product.

Digital Products

DP ME 490, Version 1, 2014: Potential Surficial Aquifers of Nova Scotia, by G. W. Kennedy. Available in SHP, ESRI File Geodatabase, KML/

KMZ formats. Available as a free download from the Geoscience and Mines Branch website: <http://novascotia.ca/natr/meb/download/dp490.asp>.

Open File Maps

Open File Map ME 2014-001: Abandoned Mine Openings: Historic Underground Mining and Advanced Exploration Sites in Nova Scotia, Scale 1:500 000, compiled by the Mineral Development and Policy Section, 2013. Paper copy costs \$5.00. Also available as a free PDF download from the Geoscience and Mines Branch website: http://novascotia.ca/natr/meb/download/mg/ofm/htm/ofm_2014-001.asp.

Open File Map ME 2014-002: Surficial and Coastal Materials Map of the Yarmouth Area, Yarmouth County, Nova Scotia, Scale 1:10 000, by D. J. Utting, 2014. Paper copy costs \$5.00. Also available as a free PDF download from the Geoscience and Mines Branch website: http://novascotia.ca/natr/meb/download/mg/ofm/htm/ofm_2014-002.asp.

Open File Map ME 2014-003: Surficial and Coastal Materials Map of the Rockville Area, Yarmouth County, Nova Scotia, Scale 1:10 000, by D. J. Utting, 2014. Paper copy costs \$5.00. Also available as a free PDF download from the Geoscience and Mines Branch website: http://novascotia.ca/natr/meb/download/mg/ofm/htm/ofm_2014-003.asp.

Open File Map ME 2014-004: Potential Surficial Aquifers for the Western Region of Nova Scotia, Scale 1:200 000, by G. W. Kennedy, 2014. Paper copy costs \$5.00. Also available as a free PDF download from the Geoscience and Mines Branch website: http://novascotia.ca/natr/meb/download/mg/ofm/htm/ofm_2014-004.asp.

Open File Map ME 2014-005: Potential Surficial Aquifers for the Central Region of Nova Scotia, Scale 1:185 000, by G. W. Kennedy, 2014. Paper

copy costs \$5.00. Also available as a free PDF download from the Geoscience and Mines Branch website: http://novascotia.ca/natr/meb/download/mg/ofm/htm/ofm_2014-005.asp.

Open File Map ME 2014-006: Potential Surficial Aquifers for the Northern Region of Nova Scotia (Sheet 1), Scale 1:150 000, by G. W. Kennedy, 2014. Paper copy costs \$5.00. Also available as a free PDF download from the Geoscience and Mines Branch website: http://novascotia.ca/natr/meb/download/mg/ofm/htm/ofm_2014-006.asp.

Open File Map ME 2014-007: Potential Surficial Aquifers for the Northern Region of Nova Scotia (Sheet 2), Scale 1:150 000, by G. W. Kennedy, 2014. Paper copy costs \$5.00. Also available as a free PDF download from the Geoscience and Mines Branch website: http://novascotia.ca/natr/meb/download/mg/ofm/htm/ofm_2014-007.asp.

Open File Map ME 2014-008: Potential Surficial Aquifers for the Eastern Region of Nova Scotia, Scale 1:225 000, by G. W. Kennedy, 2014. Paper copy costs \$5.00. Also available as a free PDF download from the Geoscience and Mines Branch website: http://novascotia.ca/natr/meb/download/mg/ofm/htm/ofm_2014-008.asp.

Open File Map ME 2014-009: Methane in Well Water in Nova Scotia, Scale 1:475 000, by J. Drage and G. W. Kennedy, 2014. Paper copy costs \$5.00. Also available as a free PDF download from the Geoscience and Mines Branch website: http://novascotia.ca/natr/meb/download/mg/ofm/htm/ofm_2014-009.asp.

Open File Map ME 2014-010: Bedrock Geology Map of the Halifax Area, NTS 11D/12, Halifax County, Nova Scotia, Scale 1:50 000, by C. E. White, M. A. MacDonald and R. J. Horne, 2014. Paper copy costs \$5.00. Also available as a free PDF download from the Geoscience and Mines Branch website: http://novascotia.ca/natr/meb/download/mg/ofm/htm/ofm_2014-010.asp.