

# Information Services Activities in 2015

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The 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 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). Angie Barras was on maternity leave for the year and not having her cartographic skills available impacted map production this year. David Hapgood worked with the group from October 2014 until the end of May 2015.

## Digital Geoscience Data Products

A collection of digital geology maps, databases and images of Nova Scotia (in ESRI shapefiles, ArcGIS file geodatabase, KML/KMZ, DXF, ARC export, 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/download/gis-data.asp>). We have produced ArcGIS file geodatabase (GDB) and KML/KMZ formats for a number of years 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

Information Services staff worked together with other GMB staff on numerous projects in 2015. This included providing advice and assistance as requested, along with developing databases and maps for the projects outlined below.

**Valley Aggregate Project:** Section staff continued to provide support and enter data collected by geologist Garth Prime into the project databases in 2015. Section staff also assisted Mr. Prime with the GIS tools to edit and update data on his own. GIS staff also built a test application for the Valley Aggregate project using an ArcGIS Online story map journal template.

**Cape Breton Compilation Project:** Section staff worked with geologists Dr. Chris White and Dr. Sandra Barr of Acadia University to compile and integrate previous field work and detailed bedrock geological mapping initiatives over the last 25 years in Cape Breton Island. By the end of 2014 all legacy points (e.g. outcrops) and lines (e.g. contacts and faults) were compiled, and two generations of polygons had been built and edited. In 2015 this information was reviewed and corrected. Where available, more current geological data were incorporated in the database for selected areas. The current geologic legend compiled for the entire island consists of 350 units and 1850 polygons. The plan is to continue this work into 2016 and produce a series of preliminary maps and a GIS database.

**Geoheritage Project:** Section staff worked with geologist Dr. John Calder in providing GIS support for the location of geoheritage sites that Dr. Calder has been compiling over the past number of years.

This also included creating promotional maps for the Atlantic Geoscience Society and other presentations. This project experienced delays due to the demands of other projects, but the GIS group is planning to release an online interactive story map (Fig. 1), the final geoheritage list as a digital product, a map service and an Open File Map in 2016.

### Valley Bedrock and Antigonish Highlands

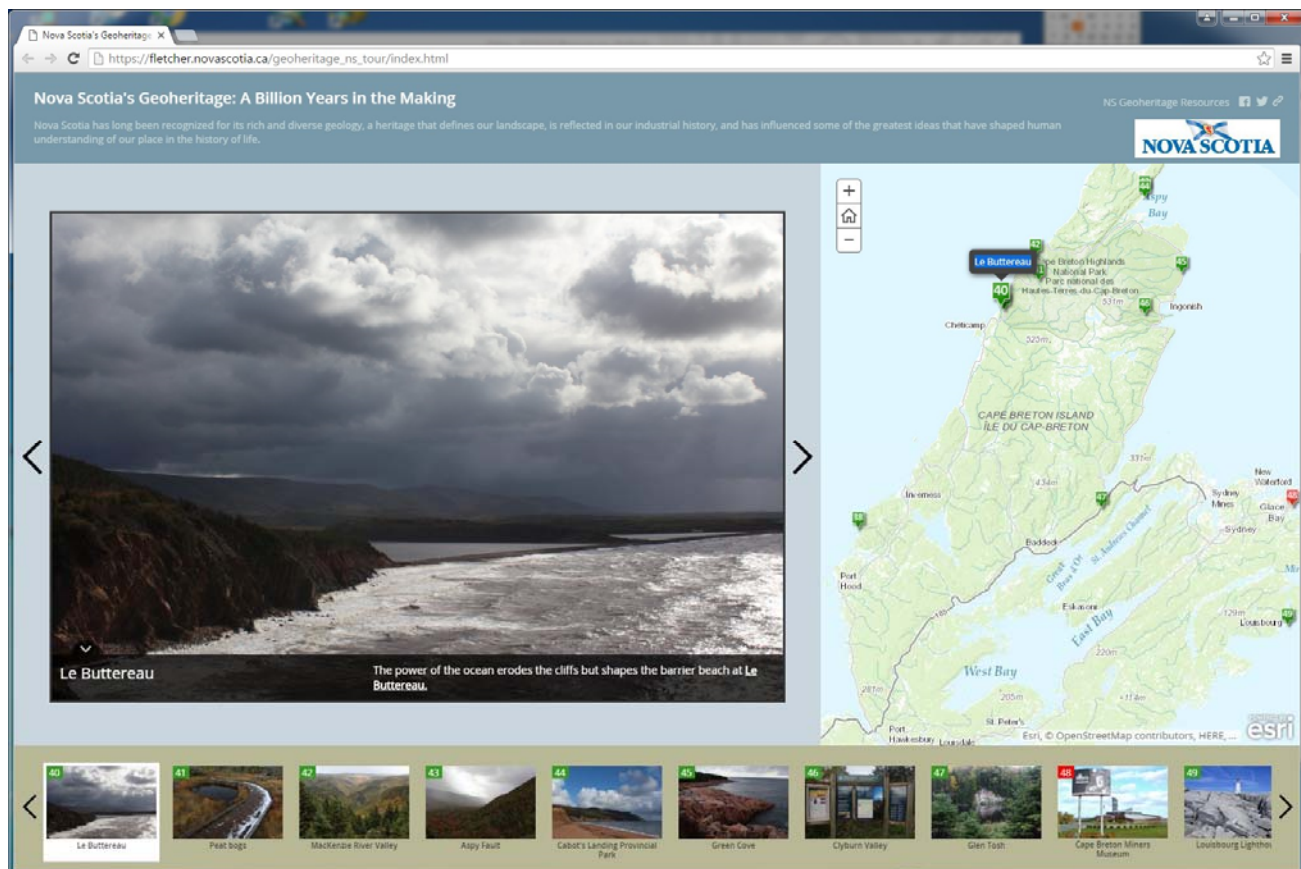
**Mapping:** Section staff have been working with geologist Dr. Chris White on compiling legacy geological data along with new work in a block of Meguma Group rocks that stretches from Torbrook east to the Forest Hill/Wolfville area at the northeastern end of the Annapolis Valley and another block in the Antigonish Highlands. This will lead to the production of 1:50 000-scale bedrock geology maps along with two digital products.

### Registry of Mineral and Petroleum Titles

**Database/NovaROC:** 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 incorporated into an updated version of NovaROC in 2015. GIS staff also worked with Registry Staff to release a new GIS digital product (DP ME 493), Nova Scotia Mineral Rights Database (NovaROC). This product replaced digital product DP ME 051, Nova Scotia Mineral Rights Database. This product contains all the mineral rights licence and lease data that are contained in NovaROC. The product will normally be updated daily at 2:00 AM each morning and be available for download at that time.

**Drillhole and Drill Core Database:** Section staff completed 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. We are also in the process of updating the digital product and map service for the drillholes (<http://novascotia.ca/natr/meb/download/>



**Figure 1.** An example of the online interactive story map 'Nova Scotia's Geoheritage: A Billion Years in the Making.'

[dp003.asp](#)). The drillhole and drill core query applications and updated digital product will be made available to the public early in 2016 (<http://novascotia.ca/natr/meb/geoscience-online/databases.asp>).

**Nova Scotia Geomatics Infrastructure:** In 2014 GIS staff in the GMB and other branches of DNR along with staff of GeoNova got together to develop standards and design an architecture for a Nova Scotia Geomatics Infrastructure (NSGI). This work continued in 2015 with efforts by Brian Fisher, Jeff Poole and Sonya Cowper from our section.

**Server Migration Project:** In the winter of 2015 a major project was initiated by the Information, Communications and Technology (ICT) Services Branch of the Internal Services Department to upgrade aging Windows 2003 server infrastructures to modern Windows 2012 servers within the provincial government. DNR's aging database and map server infrastructure was included in this. DNR, working with the NSGI, upgraded its physical server infrastructure as well as its database and Internet map server technologies and applications. On the map-server side, this was a total rebuild of map services and applications from ArcIMS to current ArcGIS Server and Geocortex technologies. This work required a lot of time from the GIS group through the whole of 2015 to meet server retirement deadlines in July and October 2015.

**Open Data Program:** In the fall of 2015 GIS staff worked with staff from the NSGI and Internal Services to contribute data to the Open Data Program initiated by the provincial government. These data will be made available through the Province of Nova Scotia Open Data Portal early in 2016.

**Coastal Erosion Project:** GIS staff worked with Chantel Nixon on setting up tools to collect data on coastal erosion and worked on developing a GIS database of coastal information.

## Internet Map Server Applications

The section continues to maintain three primary public Internet Map Server (IMS) interactive map applications: the Geoscience Atlas, the

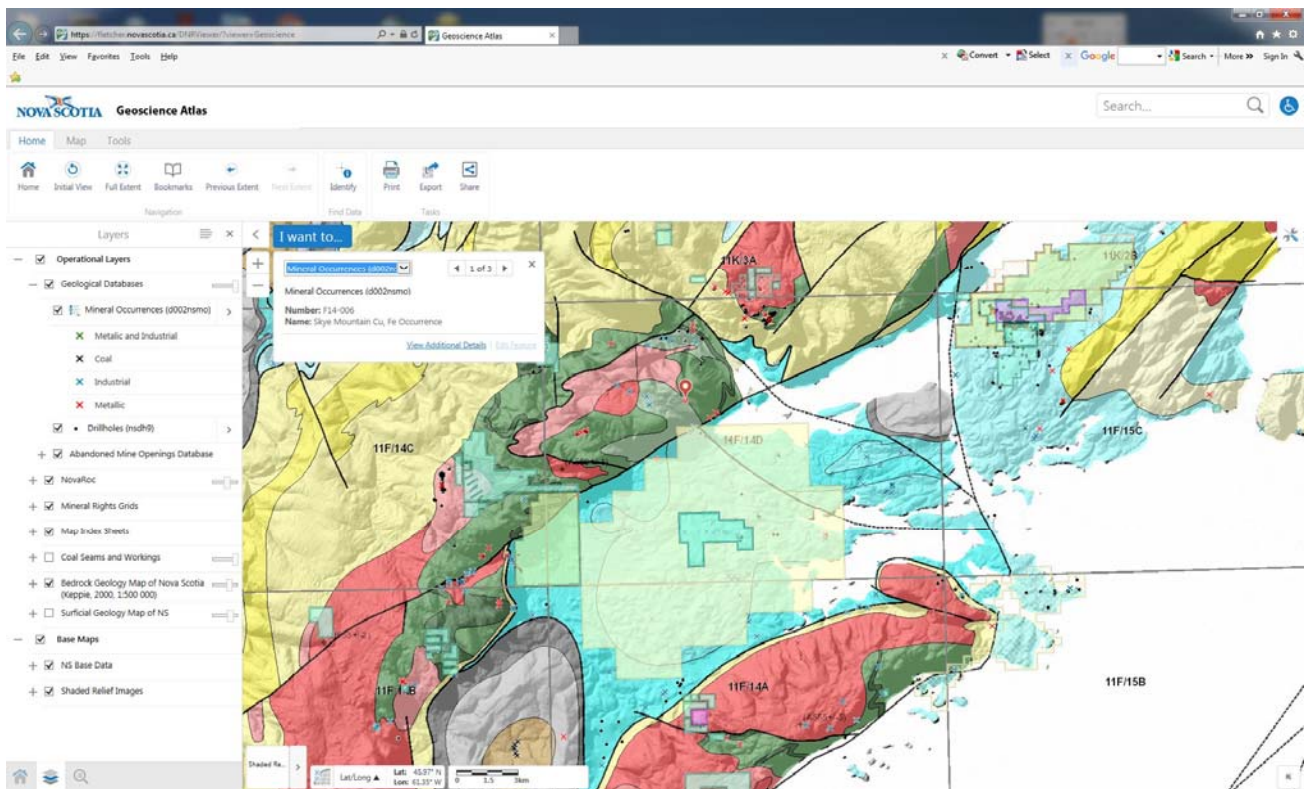
Groundwater Atlas and the Mineral Resource Land-Use Atlas. Over the past year these applications have been rebuilt on a new server infrastructure using the latest Internet map server technologies. This work required a great deal of time by Sonya Cowper and Jeff Poole in 2015. We now have a platform for the future to help us maintain our traditional PC clients but also devices like tablets and cellular phones. We have no statistics this year for these services and applications, but we hope to next year.

All the applications are built using ArcGIS Server and Geocortex and have a common 'look and feel' and consistent behavior and placement of tools in the interface. The roller wheel on the mouse now works to zoom in and out and panning is simply a left mouse click plus hold-and-drag just like Google Earth. Geographic coordinates are now presented in UTM (X/Y) and latitude and longitude. The printing templates are much improved, allowing users to create better map products at definable scales and in PDF and standard image formats. Maps can also now be exported and shared via Facebook and other social media. These applications all use HTML5 behind the scene, which makes them compatible with most browsers and do not require any plug-ins to run.

This year we replaced our old Geoscience Maps, Databases and Images interactive map application with the Geoscience Atlas application (Fig. 2). The purpose of this 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. Mineral occurrences, drillholes and abandoned mines openings are present along with the provincial bedrock geology map and shaded relief imagery. Mineral rights information is available again in the application through a connection to NovaRoc and is up-to-the-minute in its currency. We have also added provincial surficial geology map layers, which were not in the old version of this application. The URL link to the Geoscience Atlas application is <https://fletcher.novascotia.ca/DNRViewer/?viewer=Geoscience>.

The purpose of the new Groundwater Atlas application is to provide the public with an





**Figure 2.** An example of the Geoscience Atlas application with shaded relief imagery turned on, transparency adjusted for the bedrock geology, NovaRoc mineral rights layers turned on and a mineral occurrence selected.

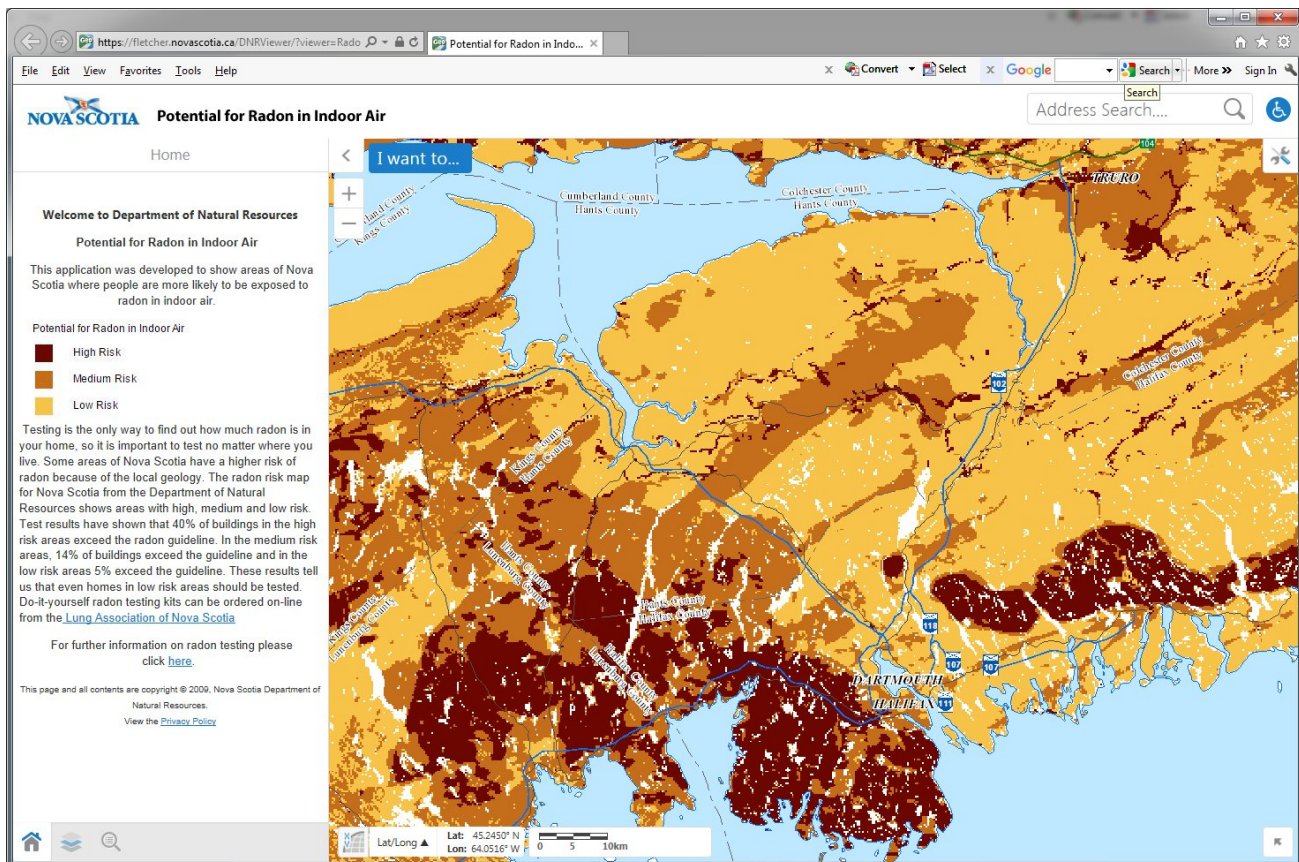
interactive IMS application containing layers of spatially referenced maps, databases, grids and images of interest to hydrogeologists, particularly those interested in the hydrogeological properties associated with the identified groundwater regions. The URL link to the Groundwater Atlas application is <https://fletcher.novascotia.ca/DNRViewer/?viewer=Groundwater>.

The main purpose of the new 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. The URL link to the Mineral Resource Land-Use Atlas application is <https://fletcher.novascotia.ca/DNRViewer/?viewer=MRLU>.

The GIS group also maintains three simple but more focused applications for the branch that use ArcGIS Server technology. These applications were migrated from Flex to HTML5 Geocortex applications in 2015. These are the Potential for Radon in Indoor Air application (<https://fletcher.novascotia.ca/DNRViewer/?viewer=Radon>), the Bedrock Acid Rock Drainage Potential for Southwestern Nova Scotia application (<https://fletcher.novascotia.ca/DNRViewer/?viewer=ARD>) and the Southwest Nova Bedrock Map application (<https://fletcher.novascotia.ca/DNRViewer/?viewer=SouthWestNova>).

The Potential for Radon in Indoor Air application (Fig. 3) was developed to show areas in the province where people are more likely to be exposed to hazardous radon in indoor air. This



**Figure 3.** An example of Potential for Radon in Indoor Air application zoomed into central Nova Scotia. Address searches are possible with this application by typing in an address or postal code in the box in the upper right of the application.

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 in southwestern Nova Scotia by Chris White published in 2012 ([http://novascotia.ca/natr/meb/geoscience-online/sw\\_nova\\_about.asp](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.

## NovaScan

NovaScan is the geoscience publications and maps database on Nova Scotia and its offshore regions. As of December 31, 2015, the database contained 17,212 GMB records, consisting of 8,484 mineral exploration assessment and property reports, 3,994 publications, 1,310 open file reports, 2,078 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. Ninety-one assessment reports were released in 2015

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 an Internet browser. 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, publications, open files, theses, mineral exploration assessment reports and property reports become available. The search interface can be accessed at <https://gesner.novascotia.ca/novascan/>

[DocumentQuery.faces](#). In 2015, 49 documents were added to the database comprising 19 assessment reports, 24 reports, 5 open file reports and 1 open file illustration.

## Digital Products Released in 2015

The following new digital product was released in 2015. All digital products can be downloaded for free from the URL listed with the product.

### Digital Products

**DP ME 493, Nova Scotia Mineral Rights Database (NovaROC).** Digital product compiled by B. E. Fisher, J. C. Poole and J. D. MacNeil. Available in SHP and GDB formats. Available as a free download from the MRB website at <http://novascotia.ca/natr/meb/download/dp493.asp>.