

# The Geological Record

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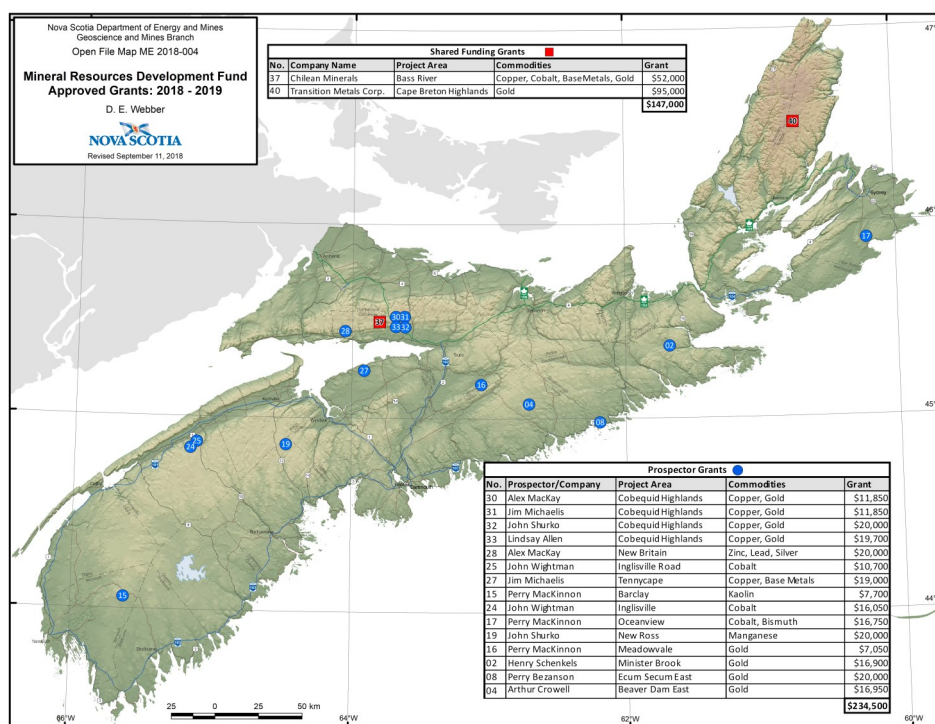


## First Grants Approved for Mineral Resources Development Fund

Projects are well underway for successful grant recipients (see the map below) of the new Mineral Resources Development Fund (MRDF). The 2018 - 2019 MRDF comprises seven funding streams that support private-sector mineral exploration, the development of new mines, university research, innovation in the mining sector, marketing and promotion of investment opportunities, training of young people, and initiatives to build public confidence in mining. The map shows the locations of two Shared Funding Grants and fifteen Prospector Grants. Prospectors will also be supported by Marketing Grants for travel and promotion of their prospects throughout the year. The fund will also support two Education/Outreach/Engagement Grants, four Research Grants, one Innovation Grant and one Major Project Grant.

After the first grants were announced, some successful applicants were unable to carry out the projects they had proposed, leaving extra funds (about \$75,000) available. On October 3, 2018, a second call for applications was issued for Prospector Grants and for Shared Funding Grants. More information about the Mineral Resources Development Fund, including forms, details of projects, and grant recipients, can be found at <https://novascotia.ca/natr/meb/mrdp.asp>.

Diane Webber



## Status of the Transition from DNR to the Department of Energy and Mines

The transition of the province's Geoscience and Mines Branch to the new Department of Energy and Mines is now official. With the help of the Public Service Commission, personnel transfers were completed on September 4, 2018.

The former Department of Natural Resources ceased to exist on July 5, 2018, when the Government of Nova Scotia announced the new department name, new Minister (the Honourable Derek Mombourquette), and permanent Deputy Minister (Simon d'Entremont). Minister Mombourquette has authority and control over the geoscience and mines file, including the *Mineral Resources Act* and all other pieces of relevant legislation. At the same time, the Department of Lands and Forestry was created to ensure that the forestry industry has a dedicated departmental focus.

For the Department of Energy and Mines, there are a number of tasks to complete over the next several months, including drafting a Memorandum of Understanding with the Department of Lands and Forestry that will better define the working relationship between the two departments and ensure business continuity. The MOU will address issues like continued use and maintenance of fleet vehicles, use of helicopters, how the departments might co-manage the library, co-operation on Integrated Resource Management projects, and other matters.

Work on a new website that will integrate information on energy, geoscience, and mines for the new department will also continue over the next months. For now, geoscience and mines information is still available on the website <https://novascotia.ca/natr/meb>.

*Simon d'Entremont, Deputy Minister, Nova Scotia Department of Energy and Mines, and Donald James, Executive Director, Geoscience and Mines Branch*

## Introducing the Geological Survey Division

I am very pleased to announce that the former Geological Services Division of the Geoscience and Mines Branch has been officially renamed the Geological Survey Division. Unofficially we will be known as the Nova Scotia Geological Survey. This name change was approved by Deputy Minister of Energy and Mines Simon d'Entremont on September 25.

The name Geological Survey Division has been adopted to better align our name with other federal, provincial and state government organizations across North America that have similar responsibilities and have "geological survey" as part of their name. The division staff was unanimous in support for this change, and we are pleased to join the ranks of many colleagues in a variety of geological surveys.

*Brian Fisher, Director, Geological Survey Division*

## Industry Liaison in Energy and Mines

Interest in the mineral resources of Nova Scotia wanes and waxes to the beat of a global economy. With metal prices presently strong, and new research and development driving advancement of innovative products requiring non-traditional raw materials, companies are investigating whether our region has the necessary resources. This summer, there were several indications that mid-level to larger companies are taking an interest in Nova Scotia.

Most inquiries are from local companies, but several inquiries from outside the province have been helping to drive interest as well. Interest in Meguma gold is spiking, and the advent of Acadian Mining's Moose River gold mine, which demonstrates that Nova Scotia deposits are viable, is a big help. Newer, innovative mill types are giving miners the ability to mine concentrations of gold that are less than one gram per tonne. This means that newer targets with leaner tenors and greater tonnages are on the menu. Larger tonnages mean financiers can amortize loans over longer periods, so financing becomes easier to obtain and, in return, the province will see economic benefits over longer periods in our rural regions. Requests for information about Meguma gold this summer came from Quebec, Ontario, Alberta, British Columbia, Newfoundland, and Australia.

Elon Musk's promise to mass produce cheap electric cars has the world's mining industry strongly focused on both lithium, for advanced battery technology, and cobalt, which is used in ferrous-based alloys to transfer energy efficiently. Nova Scotia has had interested parties inquire about traditional as well as non-traditional sources of these elements, which have been recorded in this province in a number of different environments, from S-Type granites to mantle-tapping deep sutures and deep seated ancient rocks.

The province was visited this summer by a large multi-national company to look at base-metal resources that might be ready for development. These types of companies are more interested in turn-key operations than doing grassroots or even line-work exploration, and although the province has a limited number of deposits and sites that fit into that category, the company representative spent three days investigating and discussing what the province might have to offer this corporation, which produces niche metal products for the automotive industry. The company was impressed with what Nova Scotia had to offer.

The new, modernized *Mineral Resources Act* and associated regulations will be proclaimed soon. The new act, which includes two-year exploration licenses and the dissolution of "special licenses" for commodities, will contribute to an environment that will attract more companies and investment to Nova Scotia.

*Ron Mills*



## Geologists Tamara Moss and Diane Webber Begin New Roles

Tamara Moss is changing jobs to become the new Industrial Minerals Geologist for the Geoscience and Mines Branch. Tamara has been the Exploration Monitoring Geologist, based in Stellarton, for the last year and a half, but will soon be assuming new duties as Industrial Minerals Geologist, based in Halifax. She will continue the role of exploration monitor until that position is filled. Tamara received a B.Sc. from Dalhousie University in 2006, and an M.Sc. from Acadia University in 2010, where she studied a copper-molybdenum deposit in Chile. She has also worked on exploration and mining projects in northern Ontario, Quebec and the Maritimes.

Diane Webber was the successful candidate for the position of Manager of Geoscience Information Services in the Geoscience and Mines Branch. Diane began her new duties on September 4. After many years working in industry as a Geologist, Senior Project Geologist, Chief Mine Geologist, and Director of External Relations and Communications, Diane joined DNR in 2009 as Senior Geologist – Industry Liaison. Since then Diane has taken on many roles and responsibilities, including acting as Manager of Resource Evaluation and Engagement, Acting Director of Organizational Strategy and Renewal, and for the last 10 months as Acting Manager of Geoscience Information Services. While serving as acting manager, Diane was largely responsible for designing and implementing the Mineral Resources Development Fund (<https://novascotia.ca/natr/meb/mrdp.asp>).

Please join us in welcoming Tamara Moss and Diane Webber to their new responsibilities in the new Department of Energy and Mines.

*Bob Ryan and Brian Fisher*

## Resources for Future Generations 2018

Three geologists from the Geoscience and Mines Branch, Chris White, John Drage, and Brian Fisher, attended the Resources for Future Generations (RFG 2018) conference, held in Vancouver, BC, from June 16 to 21. The conference was held under the auspices of the International Union of Geological Sciences (IUGS), with its Canadian partners the Canadian Federation of Earth Sciences (CFES); Canadian Institute of Mining, Metallurgy and Petroleum (CIM); Geological Association of Canada (GAC); and Mineralogical Association of Canada (MAC). The conference was designed to mobilize industry, academia, all levels of governments, civil society, and First Nations and indigenous people to explore resource and related sustainability issues facing future generations.

Final registration fell short of the expected 3000 participants for a variety of reasons, ranging from the expensive registration, to government travel restrictions, to timing conflicts with field work. This did not detract from the success of the event, however, at which the nearly 2000 professional participants enjoyed a well-organized conference and trade show with a full technical program of plenary, oral, and poster sessions, and pre- and post-conference short courses, workshops and field trips.

Presentations by John Drage, Chris White, and co-authors, included (1) a new, cost-effective way to monitor drought conditions in Nova Scotia aquifers, which has far-reaching implications beyond aquifers in Nova Scotia, and (2) building an integrated geological map and database highlighting new interpretations of the geology in Cape Breton Island. For more information on the conference, including abstracts, please visit <http://www.rfg2018.org>.

*Chris White*

## Trevor G. MacHattie 1974 - 2018

The Geoscience and Mines Branch sadly announces the passing of our friend and colleague Trevor MacHattie in October 2018.

Trevor was born in Antigonish and followed his interest in geology to St. Francis Xavier University (B.Sc.), Memorial University of Newfoundland (M.Sc.), and the University of Alberta (Ph.D.). Coming to work at the Nova Scotia Department of Natural Resources represented a homecoming for Trevor and his wife Nicole.

Once he joined us, Trevor's passion for geology was both inspirational and contagious. With a natural affinity for collaboration with creative thinkers, he spread that enthusiasm throughout the Maritimes geoscience community and farther. Trevor made us better, and we will miss him beyond measure.

*Staff and management of the Geoscience and Mines Branch*



*Trevor MacHattie on one of his first days with the Department of Natural Resources in October 2007.*

## Susan Saunders Retires as Webmaster

In August 2018, Geoscience and Mines Branch webmaster Susan Saunders retired after more than 35 years with the departments of Mines, Mines and Energy, and Natural Resources. Susan became the first webmaster for the branch 20 years ago with the inception of online publishing and the branch web site. The branch was early to embrace the use of technology to make information more widely available on all aspects of geoscience and mines in Nova Scotia. This effort expanded when the branch became a government leader in the dissemination of georeferenced (GIS) data.

The transition from desktop publishing to web publishing was a challenge that Susan accepted with gusto. The documents that Susan posted online would number in the thousands. Her work has been a cornerstone of our effort to make geoscience information as widely available as possible, and to make it available for free.

To my colleague of 33 years I offer my thanks and best wishes.

*Doug MacDonald*



*Susan Saunders enjoying the coastal geology near Mabou on a field trip in 2013.*

## Gem and Mineral Show Rocks Parrsboro

Rock and gem shows have been growing in scope and popularity throughout North America, and the Nova Scotia Gem and Mineral Show has grown too. The 2018 event in Parrsboro, held on the third weekend of August, recorded its best-ever attendance this year. Attendees stood in a line that stretched over 100 m, while they braved a light rain to gain entry to the event in the Parrsboro Arena. Final attendance figures topped over 4,200: an impressive event for a town of 1200!

Organizer Fred Walsh (see photo, below) arranged educational walks led by Tim Fedak to Wassons Bluff and Clarke's Head, by Howard Donohoe in the Five Islands area, and by John Calder to Western Bay, near Partridge Island. Exotic specimens at the show, however, capture the attention of many attendees. On sale from around the world were rocks and minerals in crystalline form, raw to cut and polished gems, and fine finished jewelry from foreign artisans, local Mi'kmaq, and Canadian metal and jewelry smiths. People from all over the Maritimes regularly travel to Parrsboro for this show, filling every hotel, bed and breakfast, campground, and restaurant to capacity for the weekend.

*Ron Mills*



*Nova Scotia Prospectors Association President Matt Abel (L) and Vice President Fred Walsh (R) at the 2018 Gem and Mineral Show.*

## Update: A New Drought-Monitoring Network for Shallow Aquifers in Nova Scotia

I would like to thank all the community volunteers who have offered their water wells to be part of the new, real-time monitoring network for shallow aquifers in Nova Scotia. The Spring 2018 issue of the *Geological Record* (v. 5, no. 2, p. 4) included an article about the new network and asked for volunteers to participate. The network relies on community volunteers to install a water meter in their dug well and provide access to their home WiFi network to allow the water meters to transmit daily water level information via the internet.

Enough volunteers have now come forward to expand the network across the province, from Yarmouth County to Cape Breton County. The network currently includes four monitoring sites and will be expanded in the fall of 2018 with the addition of the new volunteer wells. Results from the network can be viewed here:

<https://nsdnr.maps.arcgis.com/apps/webappviewer/index.html?id=6bf832eb26ac4b1a8d9f757bea61541e>.

*John Drage*



## From the Mineral Inventory Files

### The Spectacular South Manchester Hematite Vein

Nova Scotia's Bay of Fundy region is well known as a world class mineral- and rock-collecting region, but it is less commonly known that excellent collecting locales occur in all areas of the province. Speaking for myself, a pleasing spin-off of visiting thousands of mineral occurrences for Mineral Inventory compilation was frequently finding spectacular rock and mineral specimens. These are usually found loose in the waste-rock piles that occur at mineral prospects and old mines, but often there are excellent bedrock exposures too. For the most part these sites are well off the beaten path. In South Manchester, Guysborough County, however, a mineralized site of spectacular scale and appearance is found that is well exposed and just a few tens of metres from a well-travelled road (Fig. 1).

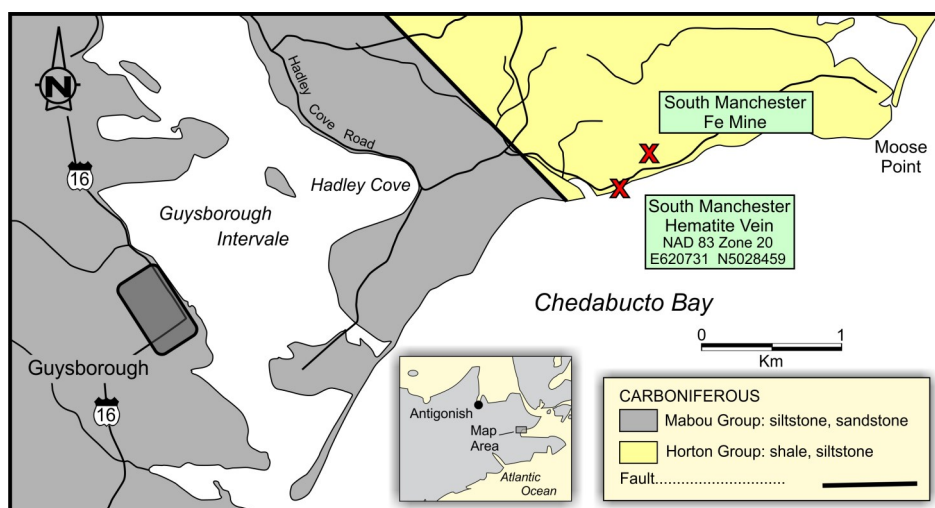
South Manchester was home to the long-abandoned South Manchester Fe Mine (NSMinOcc #F06-004). This deposit is one of many dozens of vein deposits of hematite-ankerite-siderite that occur along the regional Cobequid-Chedabucto Fault Zone (CCFZ). Many of these vein deposits reached mineable size and produced Fe for much of the 19<sup>th</sup> and early 20<sup>th</sup> century. The South Manchester mine was just a small one. Discovered in 1881, it operated sporadically until the 1930s, producing just a few thousand tons of specular hematite ore.

The deposit comprises a series of parallel veins, breccias and lenses of mixed massive and specular hematite, intruded along a north-trending fault zone. Of particular note is an impressive mineralized zone of specular and massive hematite containing numerous vugs infilled with calcite and quartz, well exposed along the shore of Chedabucto Bay (Fig. 2). The zone has a northerly trend, is exposed for 12-15 m along the shore, and is above water only at medium and low tide. The eastern 5-6 m of the zone is an intricately mixed vein of massive and specular hematite with vugs of calcite and minor quartz. The remainder of the zone is a breccia of

mixed fragments of wallrock, and hematite and calcite veins. About 50 m east along the beach are outcrops of highly faulted Horton Group sediments carrying numerous vuggy veins and breccias of dogtooth spar (calcite) and euhedral quartz. Many carry minor specularite. It is apparent that this entire shoreline section represents a faulted and veined zone with associated Fe mineralization. This is probably a portion of the same northerly trending faulted zone that hosts the South Manchester Fe Mine, just to the north.

In my opinion, this is by far the best, and most spectacular, exposure of hematite in the province. It seems likely that most of the abandoned iron mines along the CCFZ have similarly mineralized veins, but they are either heavily overgrown or not exposed. For mineral collectors and those just interested in viewing a unique exposure of a mineralized zone, South Manchester is a site you have to see. Have fun collecting!

*G. A. O'Reilly*



**Figure 1.** Geology of the South Manchester, Guysborough County, area showing the location of the South Manchester Fe Mine and hematite vein.



**Figure 2.** Photo of the hematite vein and breccia exposed on the Chedabucto Bay shoreline at South Manchester, Guysborough County.

## An Update on Nova Scotia's Cliffs of Fundy Aspiring Geopark

*"The first impression on arriving in the Cliffs of Fundy Aspiring Geopark (CFAG) is of a strongly community driven initiative with passionate volunteers and stakeholders, a well organized and effective steering committee, and great progress, all set on a backdrop of an internationally significant geological story."* So begins the report of the Canadian National Committee for Geoparks' (CNGC) evaluation mission of the Cliffs of Fundy Aspiring Geopark. Dr. Pierre Verpaerst, formerly with the Geological Survey of Quebec, simply described the aspiring geopark as "impressive", a testimony not only to the exceptional geological story recorded in the cliffs of the "Parrsboro Shore", but also to the work of the Cumberland Geological Society and Geopark Steering Committee, representing community, entrepreneurial, municipal and provincial partners. With this confirmation by the CNGC, the stage is set for Cliffs of Fundy to submit its formal application to the CNGC and Canadian Commission for UNESCO, and on to UNESCO and the Global Geoparks Network for desktop evaluation and its ultimate field evaluation. In September, Project Co-ordinator Marlee Leslie, Devin Trefry (Municipality of Colchester), and the author (Nova Scotia Department of Energy and Mines, Geological Survey Division) represented Cliffs of Fundy at the 8<sup>th</sup> UNESCO Conference on Global Geoparks in Italy. The conference was attended by 850 registrants from 60 countries. It is here that one senses the incredible potential for Nova Scotia to join this worldwide network of countries sharing their desire to connect and develop partnerships through geology and geotourism.

As in any new project of grand scale, concerns have been raised about how this initiative might affect the status quo. Here are some answers to those questions:

- *Will we still be allowed to collect mineral specimens, such as agate, from the shore?* Yes. There will be no change to provincial policy.
- *Will UNESCO intervene in any of our businesses or activities?* No. UNESCO has no jurisdiction over any activities in another country or province.
- *Will the geopark restrict anything that people walking along the shore do now?* No. A geopark is not a legal entity, it is a brand that recognizes the connection between a region's geological and cultural heritage, with an aim to promote sustainable economic growth, especially in rural areas of the world.
- *Who will run the geopark?* Each Global Geopark has an independent, self-governing management structure that includes its funding partners, and most importantly, community stakeholders.

The Cliffs of Fundy Global Geopark has great potential to bring economic growth to this region of the province, not by changing it, but by bringing it to the attention of the world. The park will be bounded by the Portapique River in the east and Cape Chignecto in the west, ranging north to Apple River and the drainage divide of the Cobequid Highlands. Individual adventure tourism businesses, tourist accommodations, private campgrounds, the Provincial Parks of Five Islands and Cape Chignecto, and community and provincial museums such as the Age of Sail Museum and the Fundy Geological Museum, all stand to benefit economically with the increased exposure that Global Geoparks bring. A cost-benefit analysis of UNESCO designations across the UK identified Global Geoparks as having the greatest economic impact, bringing in more than £8 million (approximately \$15 million) in revenue in 2014 alone.

Communities from Bass River to Advocate are excited about their aspiring geopark, another example of how our region's geology can enrich lives in Nova Scotia.

John Calder

## Special Notes

### E-mail Notification

If you would like to receive an e-mail notice (with hot links) when new maps, digital products and publications are released, or when a new issue of *The Geological Record* is released, please send your e-mail address to [DNR.Library.List@novascotia.ca](mailto:DNR.Library.List@novascotia.ca).

### Geoscience and Mines Branch Report of Activities 2017-2018

Report ME 2018-001 was released in September, and is available on the branch website <https://novascotia.ca/natr/meb/pdf/18re01.asp>.

## Dates to Remember

### October 31-November 3, 2018

Mineral Resources Review 2018, Delta St. John's Hotel and Conference Centre, 120 New Gower Street, St. John's, NL. For more information please visit the website <http://www.nr.gov.nl.ca/nr/mines/mineral.html>.

### November 1-3, 2018

Atlantic Universities Geoscience Conference, Dalhousie University, Halifax, NS. For more information please visit the web page <https://auge2018.weebly.com>.

### November 4-6, 2018

New Brunswick Exploration, Mining, and Petroleum Conference, Fredericton Convention Centre, Fredericton, NB. For more information please visit the website [http://www2.gnb.ca/content/gnb/en/departments/erd/energy/content/conference/Conf\\_home.html](http://www2.gnb.ca/content/gnb/en/departments/erd/energy/content/conference/Conf_home.html).