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Comments or questions? Please contact:

Doug MacDonald
Nova Scotia Department of Energy and Mines
Geological Survey Division
Geoscience and Mines Branch
P.O. Box 698, Halifax
Nova Scotia, Canada B3J 2T9
Phone 902-424-2510
Douglas.R.MacDonald@novascotia.ca

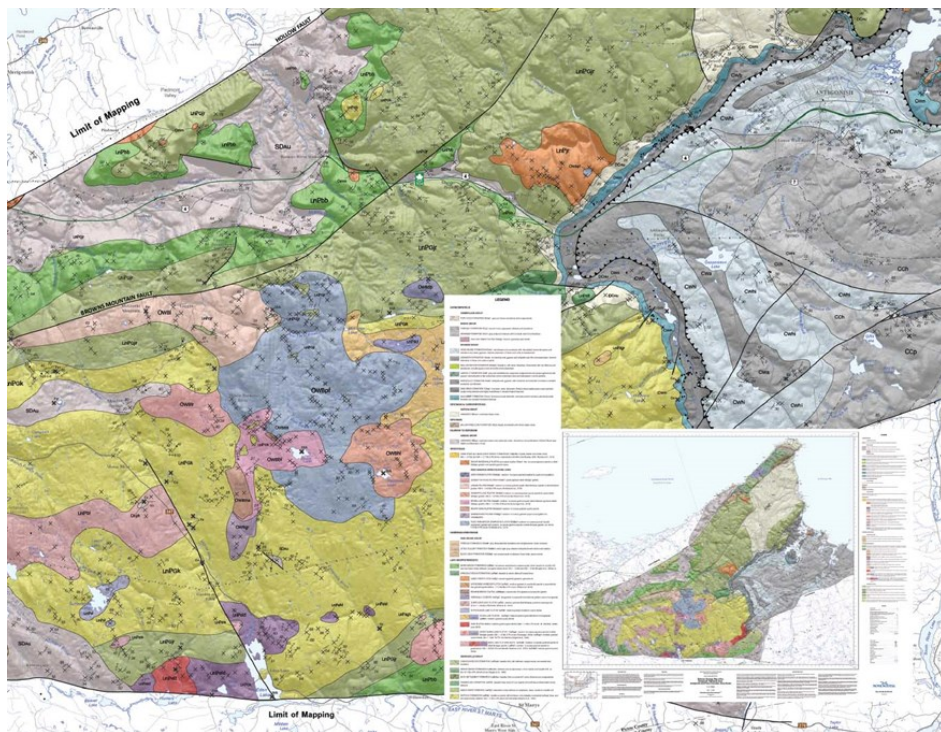
Geoscience and Mines Branch Map Wins a Place in the 2019 Esri Canada Calendar

The Geoscience and Mines Branch was fortunate this year to win a place in the 2019 Esri Canada Calendar. Esri (Environmental Systems Research Institute) is the supplier of ArcGIS software for government. ArcGIS has >40% market share of GIS software worldwide. The map we put forward, and which is presented for the month of December, was Chris White's bedrock geology map of the Antigonish Highlands area, released last year as Open File Map ME 2018-001 (https://novascotia.ca/natr/meb/download/mg/ofm/htm/ofm_2018-001.asp).

The branch has an exceptional team to produce high-quality maps, from the initial work by geologists in the field to Angie Barras's cartographic skill, and a lot of GIS and editorial work in between by staff of the Information Services Section. This team may be small, but the quality of work produced allows us to "punch above our weight," and compete with much larger organizations and GIS infrastructures.

The maps in this year's calendar will be featured at the Esri International Users Conference in San Diego this summer, where they will be seen by over 12,000 discerning GIS professionals. It is satisfying to know that we are able to showcase Nova Scotia and its geological resources to national and international audiences.

Jeff Poole



This Geoscience and Mines Branch map (Open File Map ME 2018-001) was selected to be featured in the 2019 Esri Canada Calendar.

New Staff for Geoscience and Mines Branch

Jonathan Bonaparte

Jonathan Bonaparte joined Energy and Mines in December 2018. Jonathan will be the administrator of the Mineral Resources Development Fund. He will also be part of the team to review and recommend any revisions to the province's mineral royalty regime, and work with the Registry of Mineral and Petroleum Titles in tracking and auditing the royalties received for mineral production. Jonathan received a Bachelor of Business Administration from St. F. X. in 2011, and has worked in private and public sector settings.

Peter Horne

Peter Horne also joined the department in December, starting work as the new coastal geologist. Peter received a B. Sc. from Saint Mary's University in 2005. He then completed an Advanced Diploma in Remote Sensing and GIS from the Centre of Geographic Sciences in 2006, and a Master of Applied Science from Saint Mary's University in 2013, where his thesis was titled *Characterization of intertidal geomorphology based on multi-scale analysis of airborne LiDAR data*. Before joining us Peter spent seven years working as the GIS and UAV Supervisor for Emera Newfoundland and Labrador on the Maritime Link Project.

Jen (Jennifer) Marchand

The department welcomed Jen Marchand in January as the new Exploration Monitor Geologist, located at the Core Library in Stellarton. Jen is a graduate of St. F. X., with a B.Sc. double major in Geology and Aquatic Resources, and is also a graduate of the Centre of Geographic Sciences, with an advanced diploma in GIS. Jen has held several positions with a strong focus on monitoring and compliance for consulting engineer/geology companies in both Fort McMurray and Nova Scotia.

John MacNeil, Diane Webber and Bob Ryan

When National News Gets Personal

In January, news that local geologist Kirk Woodman had been kidnapped in Africa hit many of us in the Geoscience and Mines Branch very hard. The next day's news was worse: Kirk had been murdered. Although we know that every news story has a personal side, this story was personal to many in the local geoscience community.

My greatest memory of Kirk Woodman is from August 1986. Working as a summer student for the former Department of Mines and Energy, Kirk was among the stream sediment sampling teams being landed by helicopter in the wilderness of Cape Breton Highlands National Park. Kirk, who I knew as 'Woody', was paired with junior student Manon Daneau, who went on to become a teacher. I was on the helicopter that dropped them off on the top of a tabletop mountain above an intersection of three rivers. They wore orange rain suits that day and they stood out against the palate of forest greens and greys surrounding them: two orange dots on top of a mountain and surrounded by cliffs, canyons, rivers and waterfalls.

The students we meet and mentor as staff members for Nova Scotia's geological survey are never forgotten, and we note their progress through university and beyond. Most of us feel a very personal pride toward the accomplishments of our students (see article, p. 4). As the helicopter pulled up and away from Kirk and Manon that day, I felt a deep sense of pride in these two young geologists who were accepting a difficult challenge with gusto.

Kirk Woodman went on to manage many projects in Africa, and he made it a point of his work to extend the arms of Canadian ambassadorship to those he touched through his work. More than thirty years after he worked here, I reflect on a life well lived by Kirk, who was a great father, husband and friend. It seems impossible that a man like Kirk could be a victim of violence. I choose to think of Kirk's tolerance and respect for all, qualities he lived by.

Ron Mills



In 1986 and 1987, Kirk Woodman worked as a summer student with the former Nova Scotia Department of Mines and Energy. In this photo, Kirk collects samples as part of a stream sediment survey of northern Nova Scotia.

Mineral Resources Development Fund and the Search for Epithermal Gold in the Cape Breton Highlands

The Geological Survey Division of Energy and Mines has worked to bring attention to potential gold-rich terrains outside of the traditional Meguma Supergroup gold districts. These efforts have met with varying levels of success in promoting new exploration camps, such as iron-oxide copper gold and epithermal terrains. Any tool that can help to enhance our understanding of these under-explored terrains is welcome. Drilling is an essential part of such a strategy, but the loss of government drilling resources decades ago means that drilling is a private sector activity beyond the means of most prospectors. Nova Scotia's Mineral Resources Development Fund (MRDF) was created to enable prospectors and exploration companies to use seed funding and shared funding agreements to advance an exploration project (see *The Geological Record*, v. 5, no. 3, for details of the fund).

Prospector Joe Richman worked on the former INCO-Scominex gold target in the Cape Breton Highlands for a

decade, accessing funds for trenching, re-opening old trenches, and exploring new ones through the MRDF and its predecessor the Nova Scotia Mineral Incentive Program. Joe worked with members of the Geological Survey staff, and considered many different mineralization models for this challenging region, which seemed to defy being characterized as a specific model. Settling eventually on an epithermal model that doesn't quite fit the norm, he signed an option agreement with Transition Metals, a TSX-listed company with expertise in the evaluation of epithermal terrains. Transition had the experience needed for the challenge that Joe's prospect presented, recognizing the exploration model. The company brought in a rotary air blast drill and team from Winnipeg to conduct the drilling program. They met with immediate success, despite a late start and the challenging weather that is typical of the highlands.

In one of the holes, Transition drilled a spectacular section of 22.23 g Au/t over 9.14 m, solidifying the Highlands gold camp as a credible epithermal gold target. The experience was wholly positive for Joe and the Transition team, who were rescued by local woodsmen when winter weather closed in at the end of their program. The local workers used a Timberjack to tow Transition's drilling gear out of the site through a sudden dump of deep November snow.

This is one example of how seed funding and shared funding can help a prospector find the path to a successful mineral development opportunity. It is hoped that other companies will seek out the environment that Transition Metals recognized. The central Cape Breton Highlands not only has spectacular gold grades, but also has the potential for large tonnage deposits as a credible epithermal terrain.

Ron Mills

Geoscience and Mines Branch Moves to New Space in Founder's Square



A large portion of the Geoscience and Mines Branch spent late December and early January moving from space on the fourth floor of Founder's Square to the second floor. On January 16, 2019, Geological Survey Director Brian Fisher invited all staff members of the branch to visit the new space for lunch. This photo was taken in the new GIS lab and represents a rare gathering of most members of staff in an office location.

Geoscience and Mines Branch Summer Students Excel at AUGC 2018

The 68th annual Atlantic Universities Geoscience Conference (AUGC) was hosted by the Dawson Geology Club at Dalhousie University in Halifax from November 1–3, 2018. Approximately 125 students from Memorial, Dalhousie, Saint Francis Xavier, St. Mary's, Acadia, University of Cape Breton, and the University of New Brunswick attended the conference. The students were joined by professors from the local universities and by geoscientists from government and industry. The conference began with an ice-breaker on Thursday evening, and was followed by three wild, wet, and windy field trips on Friday to local geological sites of interest. A 'Jeopardy-style' Challenge Bowl highlighted Friday evening, hosted by the Canadian Society of Exploration Geophysics. Students from Memorial University won the competition and will enjoy a paid trip to Calgary in the spring to take part in the national championship.

Saturday featured 11 oral presentations and 17 poster presentations ranging across all areas of geoscience. Four of the branch's 2018 summer students made presentations at the conference (see photos). Juan Chavez presented a talk on the *Redox state of the South Mountain Batholith, Nova Scotia, Canada: a reconnaissance study* supervised by Dr. James Brennan (Dalhousie University). Kali Gee presented a talk on the *Origin of epithermal-style gold mineralization in the eastern Cobequid Highlands, Nova Scotia, Canada: constraints from S isotopes and pyrite trace element chemistry* supervised by Drs. Jacob Hanley (Saint Mary's University) and Trevor MacHattie, Nova Scotia Energy and Mines (NSEM). Kali was the winner of the Frank S. Shea Memorial Award for best economic geology presentation. Natalie McNeil presented a poster on *The mineralogy, paragenesis, and petrogenesis of the polymetallic (Co-Ni-Au-Ag-Bi) veins of the Nictaux Falls Dam Occurrence, Annapolis Valley, Nova Scotia, Canada* under the supervision of Drs. Erin Adlakha (Saint Mary's University) and Geoff Baldwin

(NSEM). Crystal Smith presented a poster on the *Geochemical and mineralogical dispersal in till from the East Kemptville Sn-Zn-Cu-Ag deposit, southwest Nova Scotia, Canada* supervised by Dr. Ian Spooner (Acadia University) and Denise Brushett (NSEM).

The quality of all the presentations was excellent and congratulations are due to all speakers and poster presenters. The abstracts are published

in the Atlantic Geoscience Society's electronic journal *Atlantic Geology*. The evening awards banquet was held at the nearby Atlantica Hotel, where the guest speaker was Dr. Kathryn Sullivan, a geologist, former chief scientist with the US National Oceanic and Atmospheric Administration, former NASA astronaut, and Dalhousie University alumnus.

Chris White



Photo on the left: From left to right: Kali Gee, Crystal Smith, and Natalie McNeil. Photo on the right: Juan Chavez (left) and James Brennan.



Geoff Baldwin, industry liaison geologist with the Geological Survey Division, speaks with a visitor to the Nova Scotia booth at the Association for Mineral Exploration Roundup 2019, held from January 28 to 31 in Vancouver, BC.

From the Mineral Inventory Files

The Pogue Lake Garnet Schists

Garnet has valuable industrial applications, garnet-coated sandpaper is an example, but the mineral is also prized as a semi-precious gemstone. There are a few places in Nova Scotia's Meguma Terrane where garnet is found in abundance. One such location stands out: the Pogue Lake area about 40 km north of Sheet Harbour and off the road that leads from Dean to Trafalgar (Fig. 1).

Garnet is typically found in highly metamorphosed rocks (schists) that were originally clay and mudstone (pelites), with a high content of Al, Fe, and Mn. In the Pogue Lake area not only is the amount of garnet in the schists significant (~20-25%; Fig. 2A), the garnets also reach impressive sizes (up to 1-3cm; Fig. 2B). Figure 1 shows the lumber road that runs along the east side of Pogue Lake. Just east of that road is a knoll with sporadic outcrops of schist and a blanket of abundant boulders; both outcrops and boulders carry abundant garnet.

It is believed that the garnet schists here are highly metamorphosed units of the pelitic Beaverbank Formation, the uppermost unit of the Goldenville Group (Fig. 1). The Goldenville and Halifax groups constitute the Meguma Supergroup, which underlies much of the province's Eastern Shore. Meguma rocks in this area have been intruded by a suite of mafic-granitic plutons known as the Trafalgar Plutonic Suite. Contact metamorphism related to these intrusions has recrystallized Beaverbank Formation Fe-Mn-Al-rich pelitic units into garnet schists. In addition, some of the plutonic rocks, most notably the dioritic-tonalitic Bog Island Lake Pluton, have ingested a considerable amount of pelite. This contamination has resulted in portions of the pluton, particularly near its borders, having crystallized abundant and large garnets (Fig. 2B).

Garnet-rich areas such as Pogue Lake may have the potential to produce garnet for the abrasives market. A bulk sample test is warranted. In addition, even though garnet is prone to being riddled with inclusions, the area has potential for mineral and gem collectors. Collectors

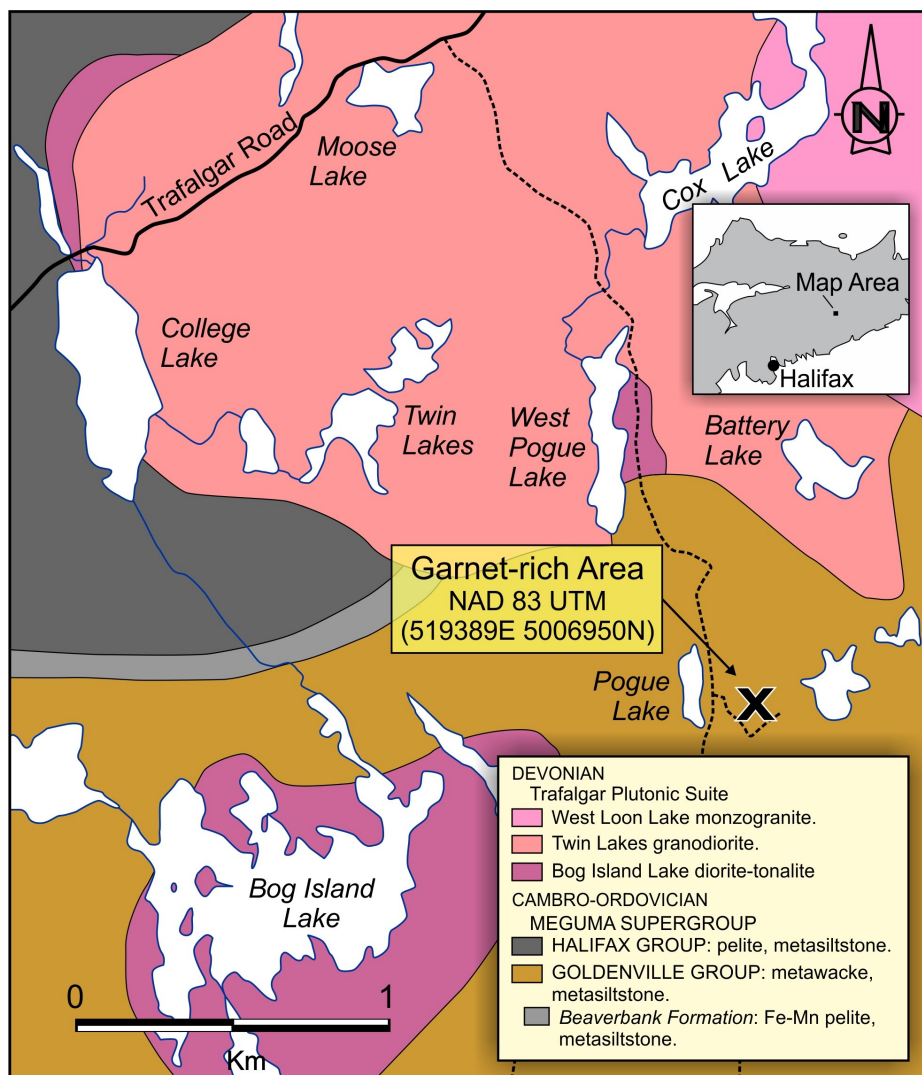


Figure 1. Geology of the Pogue Lake area, Halifax County, showing the location of a garnet schist outcrop and boulder cluster.



Figure 2. A. Photo of typical garnet schist found in the Pogue Lake area. B. Photo of an outcrop of the Bog Island Lake Pluton with large garnets (photo B by Chris White).

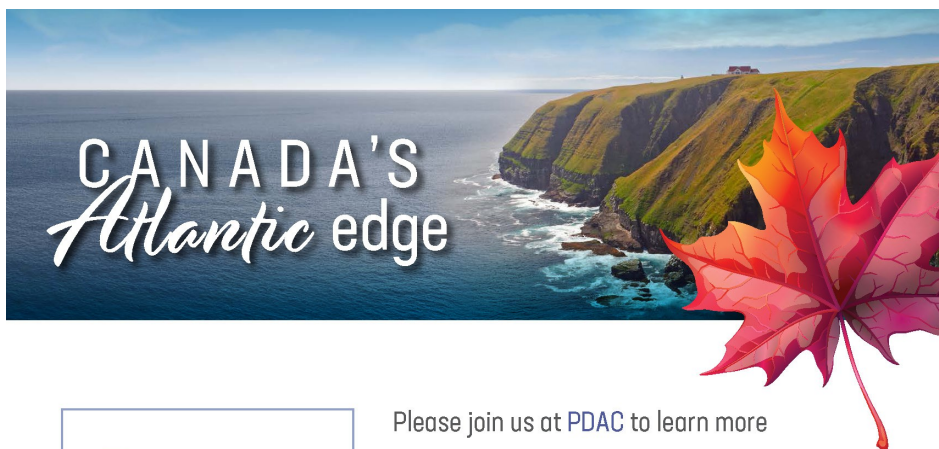
are sure to find impressive specimens. Whether or not inclusion-free, gem-quality crystals are present remains to

be seen, but it's worth a look.

G. A. O'Reilly

Look for the Atlantic Canada Mining Alliance at PDAC

Nova Scotia has partnered with New Brunswick and Newfoundland to raise the profile of mineral opportunities in Atlantic Canada. With support from ACOA (Atlantic Canada Opportunities Agency), the new Atlantic Canada Mining Alliance is hosting an event at PDAC to attract investment to the mineral sector in Atlantic Canada. Details can be found at www.atlanticcanadamineralalliance.com.



Save
THE
Date

Register Here

Please join us at PDAC to learn more about Mineral Sector Investment and Trade Opportunities in Newfoundland and Labrador, Nova Scotia and New Brunswick.

Tuesday March 5, 2019

Room 202D (North Building)
Metro Toronto Convention Centre

2:00-4:00 pm: Short Atlantic Canada project presentations by exploration and mining companies.

4:00-6:00 pm: B-2-B reception. Meet explorers, producers, government officials, and regional service and supply companies.

Presented by the Atlantic Canada Mining Alliance

For more information please contact Sean O'Brien seanobrien@miningnl.com or 709-685-9508



Special Note

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.

Dates to Remember

March 3-6, 2019

Prospectors and Developers Association of Canada (PDAC) 2019 Convention, Metro Toronto Convention Centre, Toronto, ON. For more information please visit the web site <http://pdac.ca/convention>.

April 11, 2019

Mining Association of Nova Scotia Annual General Meeting, Inn on the Lake, 3009 Highway 2, Fall River, NS. For more information please visit the web site www.tmans.ca/home.

April 28-May 1, 2019

Canadian Institute of Mining (CIM) Convention, Palais des Congres de Montreal, Montreal, QC. For more information please visit the web site <https://convention.cim.org>.

May 12-15, 2019

GAC-MAC-IAH/CNC 2019, Quebec City Convention Centre, Quebec City, QC. For more information please visit the web site <https://gacmac-quebec2019.ca>.

June 13-14, 2019

Mining Society of Nova Scotia 133rd Annual General Meeting and Conference, Keltic Lodge, Ingonish, Nova Scotia. For more information, please visit the web site www.miningsocietyns.ca.