Natural Resources Canada | Ressources naturelles Canada

GEOLOGICAL SURVEY OF CANADA
OPEN FILE 8204

U-Pb zircon geochronology constraints on timing of plutonism and sedimentary provenance from the Clearwater Fiord-Sylvia Grinnell Lake area, southern Baffin Island, Nunavut

N.M. Rayner

2017

Celebrating 175 yrs

Canada

GEOLOGICAL SURVEY OF CANADA
OPEN FILE 8204

U-Pb zircon geochronology constraints on timing of plutonism and sedimentary provenance from the Clearwater Fiord-Sylvia Grinnell Lake area, southern Baffin Island, Nunavut

N.M. Rayner

2017

© Her Majesty the Queen in Right of Canada, as represented by the Minister of Natural Resources, 2017

Information contained in this publication or product may be reproduced, in part or in whole, and by any means, for personal or public non-commercial purposes, without charge or further permission, unless otherwise specified.
You are asked to:
- exercise due diligence in ensuring the accuracy of the materials reproduced;
- indicate the complete title of the materials reproduced, and the name of the author organization; and
- indicate that the reproduction is a copy of an official work that is published by Natural Resources Canada (NRCan) and that the reproduction has not been produced in affiliation with, or with the endorsement of, NRCan.

Commercial reproduction and distribution is prohibited except with written permission from NRCan. For more information, contact NRCan at nrcan.copyrightdroitdauteur.rncan@canada.ca.

doi:10.4095/299720

This publication is available for free download through GEOSCAN (http://geoscan.nrcan.gc.ca/).

Recommended citation

Rayner, N.M., 2017. U-Pb zircon geochronology constraints on timing of plutonism and sedimentary provenance from the Clearwater Fiord-Sylvia Grinnell Lake area, southern Baffin Island, Nunavut; Geological Survey of Canada, Open File 8204, 1 .zip file. doi:10.4095/299720

Publications in this series have not been edited; they are released as submitted by the author.

INTRODUCTION

OVERVIEW

This report presents a compilation of Sensitive High Resolution Ion Microprobe (SHRIMP) U-Pb geochronological results from 11 samples (nine metaplutonic and two metasedimentary rocks) from southern Baffin Island. The analytical work presented here utilizes samples collected during geological mapping of the Clearwater Fiord-Sylvia Grinnell Lake area in the summer of 2015. Field and analytical work was carried out as part of Natural Resources Canada's Geomapping for Energy and Minerals (GEM2) Baffin program.

REGIONAL GEOLOGY

Bedrock mapping of the Clearwater Fiord–Sylvia Grinnell Lake area was completed during eight weeks of strategic, helicopter-assisted fieldwork in the summer of 2015. The bedrock in the area is dominated by metaplutonic[1] rocks ranging in composition from gabbro to syenogranite (St-Onge et al., 2016a-j). Crosscutting relationships define a relative chronology of emplacement for the various phases which can be broadly summarized as a transition from mafic through to more silicic compositions (Weller et al., 2015). A suite of samples from the various granitoid phases was collected for U-Pb dating to corroborate field crosscutting relationships and test correlations with regional plutonic suites, including the Cumberland Batholith and the Qikiqtarjuaq Plutonic Suite (Figures 1, 2).

Enclaves, screens, and panels of metasedimentary rock are engulfed by the extensive plutonic rocks. The metasedimentary strata dominantly comprise quartzite, psammite, and semipelite with minor marble and calc-silicate components. Two samples of quartzite were collected for detrital U-Pb geochronology. The composition, association, and context of the metasedimentary rocks in the Clearwater Fiord - Sylvia Grinnell Lake area are similar to those recorded on adjacent western Hall Peninsula (e.g. Steenkamp et al., 2016) and to the south across Frobisher Bay on Meta Incognita Peninsula (St-Onge et al. 2015), both of which have been correlated with the type Lake Harbour Group assemblage (St-Onge et al., 1996; Scott et al, 1997, 2002).

This report consists of a brief summary of the U-Pb results, followed by separate sections for each sample containing location coordinates, lithological and zircon descriptions, detailed presentation of the geochronological results, and preferred interpretation. A data table containing all SHRIMP analytical results are given in the accompanying Microsoft Excel spreadsheet.

[1] As most of the plutonic rocks in the field area are penetratively deformed metamorphic rocks, the prefix 'meta' is furthermore omitted for brevity.

Figure 1. Simplified geological map of southern Baffin Island. Figure modified from St-Onge et al. 1997, with additional geology mapped by St-Onge et al. on Foxe Peninsula (2006), Sanborn-Barrie et al. on Cumberland Peninsula (2009-2011). Steenkamp et al., on Hall Peninsula (2012-2014) and by St-Onge et al., on Meta Incognita Peninsula (2014).

SUMMARY OF RESULTS

The new geochronology results from the Clearwater Fiord – Sylvia Grinnell Lake area presented herein can now be used to calibrate the legend of the geological maps (St-Onge et al., 2016a-j), permit correlations with other regional sedimentary sequences and plutonic suites, and shed light on the tectonometamorphic evolution of the area.

Both quartzite samples yield almost exclusively Paleoproterozoic detritus but are distinct from one another. The southern quartzite (15SAB-R32A) is characterized by dominantly 2.5 Ga and 2.4-2.3 Ga detrital zircon grains, age modes previously identified in Lake Harbour Group rocks (Tasiyuak gneiss) 80 km east-southeast on Hall Peninsula (Scott et al., 2002; Rayner, 2015) and inferred to be sourced from relatively local Meta Incognita microcontinent basement. In contrast, the northern quartzite (15SAB-S002B) contains only ca. 1.9 Ga detritus. Similar profiles have been determined for psammite over 300 km to the southeast on Hall Peninsula (Scott et al., 2002, Rayner, 2014).

Table 1. Summary of SHRIMP U-Pb results from the Clearwater Fiord-Sylvia Grinnell Lake area.

Metasedimentary Rocks		Metam.	MDA	Modes
Sil-quartzite	15SAB-S002B	1857±4 Ma	~1903 Ma	1.9 Ga
Gt-quartzite	15SAB-R32A	1838±9 Ma	~2330 Ma	2.3-2.4, 2.5 Ga

Metaplutonic Rocks		Metam.	Xtal.	Inherit.
Gabbro/diorite	15SAB-S16A	1840±20 Ma	1865±9 Ma	
Gt-Sil-leucogranite	15SAB-D106A		1852±11 Ma	1881±8 Ma
Bt-Gt monzogranite	15SAB-D236B		1840±6 Ma	1971, 1915 Ma
Bt-Gt monzogranite	15SAB-D77A		1853±8 Ma	2584 - 1944 Ma
Sugary bi-monzogranite	15SAB-D283B		1886±5 Ma	
Sugary monzogranite	15SAB-D278A		1891±7 Ma	
Bi-Opx-monzogranite (megacrystic)	15SAB-D283A		1887±4 Ma	
Bi-Opx-monzogranite (megacrystic)	15SAB-R74A	1856±4 Ma	1895±4 Ma	
Bi-Opx-monzogranite (megacrystic)	15SAB-D236A	1840±4 Ma	1896±8 Ma	2496 - 1963 Ma

Abbreviations: Metam., metamorphic overprint age; MDA, maximum age of deposition; Modes, prominent detrital age peaks from probability density diagrams; Xtal, igneous crystallization age; Inherit, inherited zircon age; Gt, garnet; Bi, biotite; Opx, orthopyroxene; Sil, sillimanite. See text for details.

Three samples of orthopyroxene-bearing monzogranite plus two fine-grained biotite monzogranite samples yield crystallization ages between 1896-1886 Ma. These ages suggest that the range of the coeval Qikiqtarjuaq plutonic suite as identified on Cumberland Peninsula (Sanborn-Barrie et al.

Figure 2. Simplified geological map of the Clearwater Fiord–Sylvia Grinnell Lake area showing the locations of 11 geochronology samples discussed in this report. Bedrock geology from St-Onge et al., 2016 (a-j). The lithological codes from the published maps are shown in brackets in the legend and the ages shown in bold are derived from this report. Abbreviated sample numbers shown (and used in the text), all are preceeded by 15SAB-.

2013, Rayner et al. 2012) can be extended to the southwest. Younger ages between 1865-1840 Ma, coeval with the Cumberland Batholith (Whalen et al. 2010), are typically recorded in orthopyroxene-absent rocks in this area. Both plutonic and metasedimentary rocks also record metamorphic zircon growth and/or Pb-loss between 1857-1838 Ma.

ANALYTICAL PROCEDURES

Samples were disaggregated using standard crushing/pulverizing techniques followed by density separation using the Wilfley table and heavy liquids. A magnetic separator was used to isolate a zircon separate.

SHRIMP analytical procedures followed those described by Stern (1997), and Stern and Amelin (2003). Briefly, zircon grains were cast in 2.5 cm diameter epoxy mounts (along with fragments of the GSC laboratory reference zircon (z6266, with 206Pb/238U age = 559 Ma). The mid-sections of the zircon were exposed using 9, 6, and 1 µm diamond compound, and the internal features of the grains (such as zoning, structures, alteration, etc.) were characterized in back-scattered electron mode (BSE) utilizing a Zeiss Evo 50 scanning electron microscope. The count rates at eleven masses including background were sequentially measured with a single electron multiplier. Off-line data processing was accomplished using SQUID2 (version 2.50.11.10.15, rev. 15 Oct 2011). The 1σ external errors of $^{206}Pb/^{238}U$ ratios reported in the data table incorporate the error in calibrating reference material. Common Pb correction utilized the Pb composition of the surface blank (Stern, 1997). Details of the analytical session, including spot size, number of scans, calibration error, and the applications of any intraelement mass fractionation (IMF) corrections are given with the samples. Isoplot v. 4.15 (Ludwig, 2003) was used to generate concordia plots and calculate concordia ages and weighted means. The error ellipses on the concordia diagrams and the weighted mean errors are reported at 2σ. AgeDisplay (Sircombe, 2004) was used to generate the probability density diagrams.

ACKNOWLEDGEMENTS

The field observations, relationships, and the development of geological hypotheses to be tested through geochronology are the result of an engaging and fruitful collaboration with Marc St-Onge, Owen Weller, Brendan Dyck, and the 2015 Clearwater Fiord-Sylvia Grinnell Lake bedrock mapping team. Their careful observations in the field underpin this report. We are grateful for the support and assistance of the staff of the Geochronology and Mineralogy Laboratories of the Geological Survey of Canada. Raymond Chung, Ron Christie, Robyn Vezina, and Allan Lion are thanked for their careful efforts in preparing high-quality mineral separates and SHRIMP mounts. Robyn Vezina is also thanked for her work drafting the figures herein. We recognize Tom Pestaj for his excellent work in the production of ion probe mounts as well as SHRIMP instrument tuning and troubleshooting. Pat Hunt provides us with the necessary high-quality scanning electron microscope images for targeting SHRIMP analytical sites. A thorough review of this report by Owen Weller and Natasha Wodicka greatly improved the clarity of this manuscript.

RESULTS

Sample number:	**15SAB-R32A**
GSC Laboratory number:	11573
Location coordinates:	Lat: 66° 27' 20.8", Long: -69° 11' 33.3" ; NAD83
Lithology:	Garnet-bearing quartzite
Mount ID:	IP788
U-Pb standard and reproducibility:	6266, 0.8% (1σ)
External error in U-Pb:	0.24% (1σ)
$^{207}Pb/^{206}Pb$ Standard:	z1242 (2679.6±0.2Ma, 95% confidence)
Measured value (±95% confidence):	2674±4 Ma
IMF correction applied?	Yes (1.0037)
Interpreted Age:	**ca. 2330 Ma**
Preferred Interpretation:	**Maximum age of deposition**
Interpreted Age:	**1838±9 Ma**
Preferred Interpretation:	**Overprint**

Sample description

Station 15SAB-R32A dominantly consists of garnet-biotite-sillimanite pelite interbedded on the cm- to m-scale with garnet-bearing quartzite (Figure 3a). Bedding in these metasedimentary rocks is transposed into parallelism with the tectonic fabric. A sample of the quartzite in the southwestern corner of the map area (Figure 2) was collected for detrital zircon U-Pb geochronology to characterize the provenance of the detritus and compare with other metasedimentary rocks across southern Baffin Island.

Zircon description

The zircon grains recovered from the quartzite are pale to medium brown with a stubby, prismatic shape. In BSE images the zircon cores are typically oscillatory-zoned and surrounded by unzoned rims (Figure 3b inset). Clear, colourless overgrowths are visible in plain light (Figure 3c inset).

U-Pb results and Interpretation

Sixty-seven analyses were carried out on 57 individual zircon grains, targeting both cores and unzoned rims (Figure 3b). The rims return ages between 2010 Ma and 1817 Ma. The weighted mean $^{207}Pb/^{206}Pb$ age of thirteen such rims (excluding 2 older results where the analytical site may have overlapped a core) is 1838±9 Ma (MSWD = 1.9) and is interpreted as the age of a metamorphic overprint on the quartzite. The Th/U ratio of the unzoned zircon rims ranges between 0.04 and 0.20, with an average of 0.10 (Table 2).

The remaining 52 analyses of detrital zircon yield ages between 2790 Ma and 2155 Ma, with the majority of analyses within the 2.6-2.3 Ga range, and dominant modes at 2.5 Ga and between 2.4-2.3 Ga (Table 2; Figure 3b, c). Replicate analyses on the youngest detrital grains (e.g. grains 19, 20, and 107) were not reproducible. Thus the maximum age of deposition is best constrained by the youngest cluster of analyses from multiple grains, which is centered at ca. 2330 Ma.

Figure 3 a) Field expression of quartzite interbedded with pelite. U-Pb sample was taken from the massive quartzite . b) Concordia diagram illustrating all U-Pb SHRIMP results. Error ellipses are at the 95% confidence level. Grey ellipses indicate the analyses from zircon rims. White ellipses represent analyses of detrital zircon. Inset: Representative BSE images of dated zircon. Black ellipses show analysis sites. See data table for results. c) Probability density diagram and histogram (bin width 25 Ma) illustrating the provenance profile of the detrital zircon from sample 15SAB-R32A. Dark grey curve represents analyses within 10% of concordance. Light grey curve represents all detrital data (replicates and metamorphic zircon rims excluded). Inset: Plane light photomicrograph of the zircons mounted for SHRIMP analysis. White arrows indicate grains with overgrowths.

Sample number:	**15SAB-S002B**
GSC Laboratory number:	11575
Location coordinates:	Lat: 66° 52' 23.5", Long: -69° 12' 16.4" ; NAD83
Lithology:	Sillimanite-bearing quartzite
Mount ID:	IP822
U-Pb standard and reproducibility:	6266, 0.8% (1σ)
External error in U-Pb:	0.21% (1σ)
$^{207}Pb/^{206}Pb$ Standard:	z1242 (2679.6±0.2Ma, 95% confidence)
Measured value (±95% confidence):	2679±5 Ma
IMF correction applied?	No
Interpreted Age:	**ca. 1903 Ma**
Preferred Interpretation:	**Maximum age of deposition**
Interpreted Age:	**1857±4 Ma**
Preferred Interpretation:	**Overprint**

Sample description

A finely bedded sillimanite-bearing quartzite was collected from the northwest corner of the map area (Figure 2). It is exposed as rusty weathering, narrow panels (2-5 m wide, 10's of m long) within extensive biotite monzogranite (Figure 4a).

Zircon description

The zircon recovered from the quartzite can be classified into two morphological groups. The majority of the zircon grains are medium brown, equant prisms (Figure 4b) are characterized by a high intensity (bright) BSE response consistent with their high U content. These grains are typically mantled by a thin rim of altered zircon and in rare cases contain a core of oscillatory zoned zircon (Figure 4c inset). A subordinate population of pale brown to colourless zircon, with an aspect ratio of 2:1 to 3:1 (Figure 4b) are characterized by a lower intensity BSE response, and fine-scale oscillatory zoning is preserved.

U-Pb results and Interpretation

Forty-eight analyses were carried out on 45 individual zircon grains yielding ages between 1932 Ma and 1844 Ma. The youngest analyses are characterized by low Th/U ratios (0.05-0.08) and are derived exclusively from the unzoned equant grains or unzoned rims that dominate the zircon population (Table 2). The weighted mean $^{207}Pb/^{206}Pb$ age of these 14 analyses is 1857±4 Ma (MSWD = 3.1; Figure 4c inset) and is interpreted as a fluid-related or thermal overprint likely caused by the emplacement of the host biotite monzogranite. The excess scatter in this result is likely related to the high precision of these high U analyses and may not be the result of a geological disturbance. The remaining 34 analyses of zircon (including cores) with high Th/U ratios (0.18-0.76) yield ages between 1932-1867 Ma and are interpreted as detrital (Figure 4c). As most of these grains were small and fractured, it was not possible to do replicate analyses to constrain the age of the youngest grain. The maximum age of deposition is best estimated by the maxima of the Gaussian distribution of data at 1903 Ma. This zircon source is not present in the southern quartzite (R32A).

Figure 4 a) Field expression of rusty quartzite panel within monzogranite. b) Plain light photomicrograph of the zircons mounted for SHRIMP analysis. c) Probability density diagram and histogram (bin width 10 Ma) illustrating the provenance profile of the detrital zircon from sample 15SAB-S002A. All detrital analyses are within 10% of concordance. Inset: Concordia diagram illustrating all U-Pb SHRIMP results. Error ellipses are at the 95% confidence level. Grey ellipses indicate the analyses from unzoned zircon rims and equant grains. White ellipses represent analyses of detrital zircon. BSE images of grain 6 shows both a detrital core with an unzoned overgrowth.

Sample number:	**15SAB-D236A**
GSC Laboratory number:	11566
Location coordinates:	Lat: 66° 55' 51.4", Long: -69° 03' 16.7" ; NAD83
Lithology:	K-feldspar megacrystic biotite-orthopyroxene monzogranite
Mount ID:	IP808
U-Pb standard and reproducibility:	6266, 1.3% (1σ)
External error in U-Pb:	0.26% (1σ)
$^{207}Pb/^{206}Pb$ Standard:	z1242 (2679.6±0.2Ma, 95% confidence)
Measured value (±95% confidence):	2679±3 Ma
IMF correction applied?	No
Interpreted Age:	**1896±8Ma**
Interpretation:	**Igneous crystallization**
Interpreted Age:	**1840±4 Ma**
Interpretation:	**Overprint, intrusion of D236B**

Sample number:	**15SAB-D236B**
GSC Laboratory number:	11567
Location coordinates:	Lat: 66° 55' 51.4", Long: -69° 03' 16.7" ; NAD83
Lithology:	Medium grained biotite-garnet monzogranite
Mount ID:	IP822
U-Pb standard and reproducibility:	6266, 0.8% (1σ)
External error in U-Pb:	0.21% (1σ)
$^{207}Pb/^{206}Pb$ Standard:	z1242 (2679.6±0.2Ma, 95% confidence)
Measured value (±95% confidence):	2679±5 Ma
IMF correction applied?	No
Interpreted Age:	**1840±6Ma**
Preferred Interpretation:	**Igneous crystallization**

Sample description

Samples D236A and D236B were collected from the same locality in the northwest corner of the project area (Figure 2), and are discussed together. The outcrop consists of a brown weathering, very coarse-grained, K-feldspar megacrystic biotite-orthopyroxene monzogranite (D236A), which is cut by a white to pale pink weathering medium-grained monzogranite (D236B) that occurs as transposed dykes (Figure 5a). The older lithology (D236A) contains 3-5 cm feldspar megacrysts that exhibit rapakivi textures, with a K-feldspar core surrounded by recrystallized plagioclase. The younger monzogranite phase (D236B) contains 2-3 mm burgundy garnet. Both are strongly foliated, defined by the flattening of K-feldspar and the alignment of biotite in the case of D236A, and by the alignment of biotite in D236B.

Zircon description

Zircon grains recovered from the megacrystic monzogranite (D236A) are relatively large (ca. 200 µm in length) prismatic and pale brown in colour (Figure 5b). Fine fractures are visible in plain light. Facets and terminations are slightly rounded and resorbed. Zoning is typically faint in BSE

Figure 5 a) Field expression of the intrusive relationship between the K-feldspar megacrystic monzogranite (D236A - host; grey unit) and biotite-garnet monzogranite (D236B-light pink intrusive dykes) at the sampling locality. b) Plain light photomicrograph of the zircons mounted for SHRIMP analysis. c) Concordia diagram illustrating U-Pb SHRIMP results. Error ellipses are at the 95% confidence level. Light grey ellipses indicate the analyses that were pooled to determine the crystallization age. White ellipses are interpreted to be inherited. Dark grey ellipses are interpreted to represent an overprint related to the intrusion of the younger magmatic phase (D236B). Inset: Representative BSE images of dated zircon. Black ellipses show analysis sites. See data table for results.

images (Figure 5c inset), although a small number of grains preserve dark (low U) cores surrounded by bright (high U) unzoned rims (not shown). The zircon grains recovered from the cross-cutting medium-grained monzogranite (D236B) are notably smaller (ca. 40 µm) and have an equant to stubby prismatic morphology (Figure 6a). These zircon grains are strongly altered as evidenced by their dark BSE response with wormy or patchy textures (Figure 6b).

U-Pb results and Interpretation

Thirty-nine analyses were carried out on 31 individual zircon grains from megacrystic monzogranite D236A. The age data define three groups (Figure 5c). The five oldest analyses yield ages between 2496 Ma and 1963 Ma. These analyses are interpreted to represent inherited zircon. No replicates were conducted on these older grains to evaluate the geological significance of their dates. A cluster of 19 analyses of primarily faintly zoned zircon yield a weighted mean $^{207}Pb/^{206}Pb$ age of 1896±8 Ma (MSWD = 2.7). The youngest 15 analyses form a single population with a weighted mean $^{207}Pb/^{206}Pb$ age of 1840±4 Ma (MSWD = 1.09). All unzoned zircon lie within this group, although the youngest population is not defined exclusively by this morphology. The absence of clear trends or groupings in zonation style, U concentration, or Th/U ratio with age, makes an unambiguous interpretation of these two dates is difficult (see discussion below for age interpretation).

Fifteen analyses were carried out on 15 individual zircon grains from the cross-cutting medium-grained monzogranite D236B (Figure 6c). Only this relatively small number of analyses was possible given the highly altered nature of the zircon. Two oscillatory-zoned, relatively low U, unaltered zircon grains give ages of 1915 Ma and 1971 Ma (grains 25 and 78, respectively), which are interpreted as inherited. The remaining 13 analyses yield a Tukey's biweight mean age of 1840±6 Ma. As these zircon grains are high in U (1300-5500 ppm), their individual dates are very precise and thus a robust Tukey's biweight mean calculation was used to minimize the effects of any outliers. The 1840±6 Ma age is interpreted to be the crystallization age of the cross-cutting monzogranite.

While zoning characteristics and chemical signatures do not clearly differentiate the two ages from sample D236A (1896±8 Ma and 1840±4 Ma), the field relationship with cross-cutting sample D236B suggests that the 1896±8 Ma is the best interpretation for the crystallization age for the megacrystic monzogranite. The 1840±4 Ma age likely records the infiltration of fluids related to the younger magmatic pulse, as it overlaps in age with D236B.

Figure 6 a) Plain light photomicrograph of the zircons mounted for SHRIMP analysis. b) Representative BSE images of dated zircon. Black ellipses show analysis sites. See data table for results. c) Concordia diagram illustrating U-Pb SHRIMP results for biotite-garnet monzogranite (D236B). Error ellipses are at the 95% confidence level. Grey ellipses indicate the analyses that were pooled to determine the crystallization age. White ellipses are interpreted to be inherited.

Sample number:	**15SAB-R74A**
GSC Laboratory number:	11574
Location coordinates:	Lat: 64° 40' 35.8", Long: -68° 44' 10.1" ; NAD83
Lithology:	K-feldspar megacrystic biotite-hornblende-magnetite-orthopyroxene monzogranite
Mount ID:	IP788
U-Pb standard and reproducibility:	6266, 0.8% (1σ)
External error in U-Pb:	0.24% (1σ)
$^{207}Pb/^{206}Pb$ Standard:	z1242 (2679.6±0.2Ma, 95% confidence)
Measured value (±95% confidence):	2674±4 Ma
IMF correction applied?	Yes (1.0037)
Interpreted Age:	**1895±4 Ma**
Preferred Interpretation:	**Igneous crystallization**
Interpreted Age:	**1856±4 Ma**
Preferred Interpretation:	**Overprint**

Sample description

The sample was collected in the southwest part of the map area, from a large, clean homogeneous outcrop of K-feldspar megacrystic (2-4 cm) monzogranite (Figure 2, Figure 7a). The mafic assemblage includes biotite, hornblende, orthopyroxene (largely resorbed), and magnetite. This is a volumetrically significant phase in the area.

Zircon description

Abundant prismatic zircon grains were recovered. These are typically pale brown and a number of grains appear to have distinct cores in plain light (Figure 7b). The cores are also pale brown but are surrounded by a halo of orange iron oxide staining and radiating fractures. In BSE images, cores typically consist of altered zircon surrounded by unzoned to faintly zoned zircon (Figure 7c inset). In the case of zoned rims, the zoning is subparallel to that in the cores.

U-Pb results and Interpretation

Thirty-five analyses of thirty grains define two age populations. A cluster of 13 analyses of primarily faintly zoned zircon, typically cores or the interior parts of grains, yield a weighted mean $^{207}Pb/^{206}Pb$ age of 1895±4 Ma (MSWD = 2.3) (Figure 7c). The youngest 22 analyses yield ages between 1870 Ma and 1834 Ma and define a weighted mean $^{207}Pb/^{206}Pb$ age of 1856±4 Ma (MSWD = 2.3). This cluster of analyses consists largely of unzoned, faceted zircon tips, but it is not defined exclusively by them. While there is no definitive textural or chemical evidence from the zircon grains pointing to a clear interpretation of these two ages, other samples of biotite-orthopyroxene monzogranite (e.g. 15SAB-D236A, D283A) are interpreted to be ca. 1890 Ma in age. Thus, based on similar field relationships and composition with this sample, we interpret the 1895±4 Ma age as the crystallization age. Younger zircon ages in this sample may reflect a thermal or fluid overprint related to penetrative regional metamorphism and/or the ca. 1.85 Ga regional magmatism known in the area (e.g. 15SAB-D077A, D236B, this study, Whalen et al. 2010).

Figure 7 a) Field photograph showing the igneous texture of the sampled K-feldspar megacrystic orthopyroxene monzogranite. b) Plain light photomicrograph of the zircons mounted for SHRIMP analysis. c) Concordia diagram illustrating U-Pb SHRIMP results. Error ellipses are at the 95% confidence level. Grey ellipses indicate the analyses that were pooled to determine the crystallization age. White ellipses are a younger population inferred to represent a metamorphic/magmatic overprint. Inset: Representative BSE images of dated zircon. Black ellipses show analysis sites. See data table for results.

Sample number:	**15SAB-D283A**
GSC Laboratory number:	11570
Location coordinates:	Lat: 65° 39' 37.5", Long: -68° 36' 39.2" ; NAD83
Lithology:	K-feldspar megacrystic biotite-orthopyroxene monzogranite
Mount ID:	IP808
U-Pb standard and reproducibility:	6266, 1.3% (1σ)
External error in U-Pb:	0.26% (1σ)
$^{207}Pb/^{206}Pb$ Standard:	z1242 (2679.6±0.2Ma, 95% confidence)
Measured value (±95% confidence):	2679±3 Ma
IMF correction applied?	No
Interpreted Age:	**1887±4 Ma**
Preferred Interpretation:	**Igneous crystallization**

Sample number:	**15SAB-D283B**
GSC Laboratory number:	11571
Location coordinates:	Lat: 65° 39' 37.5", Long: -68° 36' 39.2" ; NAD83
Lithology:	Sugary biotite monzogranite
Mount ID:	IP808
U-Pb standard and reproducibility:	6266, 1.3% (1σ)
External error in U-Pb:	0.26% (1σ)
$^{207}Pb/^{206}Pb$ Standard:	z1242 (2679.6±0.2Ma, 95% confidence)
Measured value (±95% confidence):	2679±3 Ma
IMF correction applied?	No
Interpreted Age:	**1886±5 Ma**
Preferred Interpretation:	**Igneous crystallization**

Sample description

Samples D283A and D283B were collected from the same locality west of Irvine Inlet (Figure 2), and they are here discussed together. The outcrop consists of a brown weathering, very coarse-grained, locally K-feldspar megacrystic monzogranite (D283A), which is intruded by pale grey/buff weathering fine-grained biotite monzogranite (D283B) (Figure 8a). The older lithology contains biotite and orthopyroxene, and the 3-5 cm feldspar megacrysts are zoned, with a K-feldspar core surrounded by plagioclase (Figure 8b). Both samples exhibit a moderate to strong foliation, oriented 190°/55° and defined by alignment of biotite.

Zircon description

Zircon grains recovered from D283A are large, clear, colourless prisms with few inclusions and fractures (Figure 8c). Oscillatory zoning is visible in plain light and in BSE images. Some grains have low U interior regions, but the zoning in these "cores" is parallel to the zoning in the outer part of the grain (Figure 8d, e.g. grain 15). Zircon grains recovered from D283B are similar in size and shape but are typically pale brown in colour and appear more altered in BSE images (Figure 9a, b).

U-Pb results and Interpretation

For coarse-grained monzogranite D283A, twenty one analyses were carried out on 17 individual zircon grains, yielding ages between 1902 Ma and 1825 Ma (Figure 8e; Table 2). The crystallization age is given by the weighted mean $^{207}Pb/^{206}Pb$ age 1887±4 Ma (n = 17, MSWD = 1.03). This population includes both high U, outer portions of the zircon grains, and the inner, low U portions, indicating that the observed internal structure reflects compositional zonation only. Four young (1825-1858 Ma) analyses are excluded from the calculation. Replicate analyses of these same grains yield older ages, suggesting that some of the scatter in the data is the result of Pb-loss. Twenty-five analyses were carried out on 21 grains from sample D283B, yielding ages between 1912 Ma and 1849 Ma (Figure 9c; Table 2). The crystallization age is given by the weighted mean $^{207}Pb/^{206}Pb$ age 1886±5 Ma (n = 23, MSWD = 2.6), identical within error to the host coarse-grained phase. Two young (1849-1859 Ma) analyses are excluded from the calculation and are inferred to have experienced minor Pb-loss.

Figure 8 a) Field expression of the intrusive relationship between the K-feldspar megacrystic orthopyroxene monzogranite (D283A - host) and the sugary biotite monzogranite (D283B- intrusion) at the sampling locality. b) Field photograph showing the zoned feldspars from D283A. c) Plain light photomicrograph of the zircons from D283A mounted for SHRIMP analysis. d) Representative BSE images of dated zircon. Black ellipses show analysis site. See data table for results. e) Concordia diagram illustrating U-Pb SHRIMP results. Error ellipses are at the 95% confidence level. Grey ellipses indicate the analyses that were pooled to determine the crystallization age. White ellipses are excluded from the calculation of the mean.

Figure 9 a) Plain light photomicrograph of the zircons from D283B mounted for SHRIMP analysis. b) Representative BSE images of dated zircon from D283B. Black ellipses show analysis site. See data table for results. c) Concordia diagram illustrating U-Pb SHRIMP results for the sugary biotite monzogranite. Error ellipses are at the 95% confidence level. Grey ellipses indicate the analyses that were pooled to determine the crystallization age. White ellipses are excluded from the calculation of the mean.

Sample number:	**15SAB-D278A**
GSC Laboratory number:	11569
Location coordinates:	Lat: 66° 55' 13.1", Long: -68° 50' 58.7" ; NAD83
Lithology:	sugary monzogranite
Mount ID:	IP822
U-Pb standard and reproducibility:	6266, 0.8% (1σ)
External error in U-Pb:	0.21% (1σ)
$^{207}Pb/^{206}Pb$ Standard:	z1242 (2679.6±0.2Ma, 95% confidence)
Measured value (±95% confidence):	2679±5 Ma
IMF correction applied?	No
Interpreted Age:	**1891±7 Ma**
Preferred Interpretation:	**Igneous crystallization**

Sample description
Sugary, fine-to-medium grained pink weathering monzogranite (Figure 10a) is a relatively common, but volumetrically minor magmatic phase in the Clearwater Fiord–Sylvia Grinnell Lake area. The shape preferred orientation of flattened quartz grains defines a weak planar fabric. This sample was collected from an outcrop west of Irvine Inlet, in the central part of the map area (Figure 2).

Zircon description
Abundant clear, colourless stubby prismatic zircon grains were recovered (Figure 10b). The grains incorporate a small number of clear inclusions and few fractures. In BSE images the zircon grains are characterized by an unusual patchy, irregular zoning, typically characterized by low U (dark in BSE) outer portions (Figure 10c inset).

U-Pb results and Interpretation
Twenty-eight analyses on 23 individual zircon grains yield $^{207}Pb/^{206}Pb$ ages between 2312 Ma and 1872 Ma (Figure 10c; Table 2). However, about 50 % of the analyses, those from the low U (and high Th/U) outer portions of the grains, exhibit unusual U-Pb discordance (up to 23%) with variable $^{207}Pb/^{235}U$ and $^{207}Pb/^{206}Pb$ ratios at relatively constant $^{206}Pb/^{238}U$. The anomalously high ^{207}Pb could be due to a cryptic analytical issue (e.g. unaccounted isobar); however, all analytical parameters (e.g. UO/U) appear normal. True excess ^{207}Pb could be due to 1) an anomalous, enriched uranium composition with low $^{238}U/^{235}U$; or 2) incorporation of excess ^{231}Pa (protactinium), an intermediate daughter product of the ^{235}U decay scheme (Mortensen et al., 1992; Anczkiewicz et al., 2001). It is beyond the scope of this report to determine the cause of this anomalous isotopic behaviour. Making the usual assumption that a concordant analysis indicates a closed isotopic system, considering only data within 5% of concordance, the weighted mean $^{207}Pb/^{206}Pb$ age is 1891±7 Ma (n=17, MSWD = 1.5), which is interpreted to represent the crystallization age of the sugary biotite monzogranite.

Figure 10 a) Field photograph showing the weathered pink (and lichen-covered) surface of sample D278A. b) Plain light photomicrograph of the zircons mounted for SHRIMP analysis. c) Concordia diagram illustrating U-Pb SHRIMP results. Error ellipses are at the 95% confidence level. Grey ellipses indicate the analyses that were pooled to determine the crystallization age (dashed outline excluded from the calculation). White ellipses are a population with a cryptic discordance that may be related to excess ^{207}Pb. See text for discussion. Inset: Representative BSE images of dated zircon. Black ellipses show analysis sites. See data table for results.

Sample number:	**15SAB-D077A**
GSC Laboratory number:	11564
Location coordinates:	Lat: 64° 53' 06.0" , Long: -67° 56' 39.6" ; NAD83
Lithology:	Garnet-biotite monzogranite
Mount ID:	IP808
U-Pb standard and reproducibility:	6266, 1.3% (1σ)
External error in U-Pb:	0.26% (1σ)
$^{207}Pb/^{206}Pb$ Standard:	z1242 (2679.6±0.2Ma, 95% confidence)
Measured value (±95% confidence):	2679±3 Ma
IMF correction applied?	No
Interpreted Age:	**1853±8Ma**
Interpretation:	**Igneous crystallization**

Sample description

This coarse-grained, K-feldspar megacrystic, garnet-biotite monzogranite was collected east-southeast of the McKeand River field camp (Figure 2). It is massive to weakly foliated, containing 2-10 mm burgundy garnet (Figure 11a).

Zircon description

The recovered zircon grains are typically pale to medium brown, with strongly resorbed facets giving them a rounded appearance (Figure 11b). Clear, colourless prismatic grains preserving sharp facets are rare. In BSE images, the majority of the zircon grains are relatively bright and unzoned, surrounded by a thin (5 µm) rind of altered zircon (dark in BSE, Figure 11c inset, grain 28). Faint, fine-scale oscillatory zoned zircon is rare (Figure 11c inset, grain 25).

U-Pb results and Interpretation

A total of 28 analyses on 24 separate grains were conducted, yielding $^{207}Pb/^{206}Pb$ ages between 2584 Ma and 1828 Ma (Figure 11c; Table 2). The six oldest analyses (2584-1944 Ma) are from faintly zoned, low U zircon that are interpreted to be inherited. The data is insufficient to demonstrate whether these dates reflect true ages of inheritance or rather are affected by Pb-loss and thus minimum ages. The remaining 22 analyses yield a Tukey's biweight mean age of 1853 ± 8 Ma, which is interpreted as the igneous crystallization age of the monzogranite. A Tukey's biweight mean was used as the wide range of U concentrations from these zircon (87-7700 ppm) results in highly variable counting statistic errors for the $^{207}Pb/^{206}Pb$ ages. Thus the calculation of a mean weighted by precision biases the results towards high U zircon (and thus relatively precise) that are chemically but not morphologically distinct.

Figure 11 a) Field photograph showing the igneous texture of the garnet-biotite monzogranite. b) Plain light photomicrograph of the zircons mounted for SHRIMP analysis. c) Concordia diagram illustrating U-Pb SHRIMP results. Error ellipses are at the 95% confidence level. Grey ellipses indicate the analyses that were pooled to determine the crystallization age. White ellipses are from zircon analyses interpreted as inherited. Inset: Representative BSE images of dated zircon. Black ellipses show analysis sites. See data table for results.

Sample number:	**15SAB-D106A**
GSC Laboratory number:	11565
Location coordinates:	Lat: 64° 59' 54.5", Long: -67° 42' 26.4" ; NAD83
Lithology:	Sillimanite-biotite-garnet leucogranite
Mount ID:	IP808
U-Pb standard and reproducibility:	6266, 1.3% (1σ)
External error in U-Pb:	0.26% (1σ)
$^{207}Pb/^{206}Pb$ Standard:	z1242 (2679.6±0.2Ma, 95% confidence)
Measured value (±95% confidence):	2679±3 Ma
IMF correction applied?	No
Interpreted Age:	**1881±8Ma**
Preferred Interpretation:	**Inheritance**
Interpreted Age:	**1852±11 Ma**
Preferred Interpretation:	**Igneous crystallization**

Sample description

A sample of strongly-foliated, white weathering leucogranite was collected from a relatively large exposure approximately 50km east of the McKeand River field camp (Figure 2). The presence of sillimanite and small lavender garnet (Figure 12a) suggests the contribution of a metasedimentary source to the melt.

Zircon description

In plain light the zircon recovered from the leucogranite is typically pale brown and prismatic (not shown). Facets and terminations are well-developed to slightly resorbed. Concentric zoning and abundant fine fractures are apparent. In BSE images, the zoning and fracturing observed in plain light is more apparent (Figure 12b). Many zircon grains are surrounded by a thin rim of altered zircon (dark in BSE, Figure 12b, grains 61-64). A small number of zircon grains have bright tips or thin rims that appear to be unzoned in BSE, although it is worth noting that zoning is faint in most zircon grains from this sample (e.g. Figure 12b, grain 61).

U-Pb results and Interpretation

We carried out 38 analyses on 36 individual zircon grains that yielded ages between 2894 Ma and 1824 Ma (Figure 12c; Table 2). The twenty analyses younger than 1950 Ma can be discriminated into two populations associated with distinct morphologies. Zoned zircon, or analyses from the inner portions of zircon grains, yield a weighted mean $^{207}Pb/^{206}Pb$ age of 1881 ± 8 Ma (n = 12, MSWD = 3.1). The results from 5 analyses of unzoned tips yield a weighted mean $^{207}Pb/^{206}Pb$ age of 1852 ± 11 Ma (MSWD = 2.4). Chemical characteristics such as U concentration or Th/U ratio do not correlate with age. Ages older than 1950 Ma are documented consistently from the innermost parts of grains (with or without obvious overgrowths) and are interpreted as inherited.

Elsewhere in the field area, similar sillimanite-biotite-garnet leucogranite rocks are observed cutting biotite-garnet monzogranite dated in this study at ca. 1850 Ma. Thus we interpret the crystallization age of the leucogranite to be 1852 Ma as recorded by rare zircon tips. The presence of sillimanite and lilac-coloured garnet suggests derivation at least in part, through partial melting of metasedimentary rocks that could be the source of the >1950 Ma zircon. The sources of inherited 1880 Ma zircon may instead be related to the abundant ca. 1875-1900 Ma magmatism in the area.

Figure 12 a) Field photograph of sample D106A showing a strong tectonic fabric and pale lilac garnet (inset). b) Representative BSE images of dated zircon. Black ellipses show analysis site. See data table for results. c) Concordia diagram illustrating U-Pb SHRIMP results. Error ellipses are at the 95% confidence level. Grey ellipses indicate zircon analyses from low Th/U rims that were pooled to determine the crystallization age. White ellipses are interpreted as inherited. Those inherited zircon analyses shown with a solid outline form a single population with an age of 1881 Ma, those with a dashed outline are excluded from any calculation.

Sample number:	**15SAB-S016A**
GSC Laboratory number:	11576
Location coordinates:	Lat: 66° 48' 15.3", Long: -69° 18' 55.7" ; NAD83
Lithology:	Clinopyroxene-orthopyroxene-hornblende -biotite diorite
Mount ID:	IP822
U-Pb standard and reproducibility:	6266, 0.8% (1σ)
External error in U-Pb:	0.21% (1σ)
$^{207}Pb/^{206}Pb$ Standard:	z1242 (2679.6±0.2Ma, 95% confidence)
Measured value (±95% confidence):	2679±5 Ma
IMF correction applied?	No
Interpreted Age:	**1865±9 Ma**
Preferred Interpretation:	**Igneous crystallization**
Interpreted Age:	**1840±20 Ma**
Preferred Interpretation:	**Overprint**

Sample description
This outcrop in the northwest part of the map area (Figure 2) consists of fine-grained, foliated diorite cut by a coarse-grained syenogranite. A sample of the clinopyroxene-orthopyroxene-hornblende-biotite diorite was collected for geochronology (Figure 13a).

Zircon description
In plain light, the zircon from the diorite appear as pale brown, prismatic grains, cut by a network of fine fractures with resorbed facets and terminations giving them an ovalized appearance (Figure 13b). In BSE images the grains are characterized by bright (high U), oscillatory zoned cores, surrounded by unzoned, lower U rims (Figure 13c inset).

U-Pb results and Interpretation
Twenty analyses were carried out on 17 individual grains. Analysis of 13 cores yields ages between 1873 and 1833 Ma (Figure 13c; Table 2). This range overlaps with the analyses of seven unzoned zircon rims that yield ages between 1864 Ma and 1814 Ma. Both cores and rims exhibit a wide range of Th/U ratios (0.25-2.20) and 50% of these have Th/U greater than 1, as is commonly observed in mafic rocks. The weighted mean $^{207}Pb/^{206}Pb$ age of the cores is 1852±8 Ma (n=13, MSWD = 4.7) while that of the unzoned rims is 1840±20 Ma (n = 7; MSWD = 2.2). The excess scatter in the population of zircon core analyses may be due to Pb-loss. By excluding the four youngest analyses and one anomalously high U analysis (11576-4.1), the weighted mean $^{207}Pb/^{206}Pb$ age is recalculated at 1865±9 Ma (n=8, MSWD = 1.9). Based on textural observations (oscillatory zoning in zircon cores) and field observations (the presence of a second, younger magmatic phase), we infer a crystallization age of 1865±9 Ma and ascribe the 1840±20 Ma to an overprint, possibly related to the intrusion of the syenogranite. Note that both ages overlap within error and thus may not resolve two separate geological events.

Figure 13 a) Field photograph showing fine-grained, foliated diorite (S16A) cut by a coarse-grained syenogranite. b) Plain light photomicrograph of the zircons mounted for SHRIMP analysis. c) Concordia diagram illustrating U-Pb SHRIMP results. Error ellipses are at the 95% confidence level. Grey ellipses indicate the analyses from zircon cores that were pooled to determine the crystallization age. White ellipses represent analyses of zircon rims. Inset: Representative BSE images of dated zircon. Black ellipses show analysis sites. See data table for results.

REFERENCES

Anczkiewicz R., Oberli F., Burg J.P., Villa I.M., Gunther D., Meier M., 2001. Timing of normal faulting along the Indus Suture in Pakistan Himalaya and a case of major Pa-231/U-235 initial disequilibrium in zircon; Earth and Planetary Science Letters, v. 191, p. 101-114.

Ludwig, K.R., 2003. User's manual for Isoplot/Ex rev. 3.00: a Geochronological Toolkit for Microsoft Excel; Special Publication 4, Berkeley Geochronology Center, Berkeley, 70 p.

Mortensen, J.K., Roddick, J.C., Parrish, R.R.,1992. Evidence for high levels of unsupported radiogenic ^{207}Pb in zircon from a granitic pegmatite: Implications for interpretation of discordant U-Pb data; EOS Transactions, American Geophysical Union, v. 73, p. 370.

Rayner, N M., 2015. New (2013-14) U-Pb geochronological results from northern Hall Peninsula, southern Baffin Island, Nunavut; Canada-Nunavut Geoscience Office, Summary of Activities 2014, p. 31-44.

Rayner, N M., 2014. New U-Pb geochronological results from Hall Peninsula, Baffin Island, Nunavut; Canada-Nunavut Geoscience Office, Summary of Activities 2013, p. 39-52.

Rayner, N.M.; Sanborn-Barrie, M.; Young, M.D.; Whalen, J.B., 2012. U-Pb ages of Archean basement and Paleoproterozoic plutonic rocks, southern Cumberland Peninsula, eastern Baffin Island, Nunavut; Geological Survey of Canada, Current Research (Online) no. 2012-8, 28 p., doi:10.4095/291401

Sanborn-Barrie, M; Young, M; Whalen, J.B. 2013., Geology, Qikiqtarjuaq, Baffin Island, Nunavut; Geological Survey of Canada, Canadian Geoscience Map 39, (ed. prelim.); 1 sheet, doi:10.4095/292016

Scott, D.J., St-Onge, M.R., Wodicka, N., Hanmer, S., 1997. Geology of the Markham Bay-Crooks Inlet area, southern Baffin Island, Northwest Territories; Geological Survey of Canada Paper 1997-C, p. 157–166.

Scott, D.J., Stern, R.A., St-Onge, M.R., McMullen, S.M., 2002. U-Pb geochronology of detrital zircons in metasedimentary rocks from southern Baffin Island; implications for the Paleoproterozoic tectonic evolution of northeastern Laurentia; Canadian Journal of Earth Sciences, v. 39, no. 5, p. 611-623

Sircombe, K.N., 2004. AGEDISPLAY: an Excel workbook to evaluate and display univariate geochronological data using binned frequency histograms and probability density distributions; Computers and Geosciences, v.30, p.21-31.

Steenkamp, H M; Gilbert, C; St-Onge, M R., 2016. Geology, Beekman Peninsula (south), Baffin Island, Nunavut, NTS 25-P (south) and 15-M (part); Geological Survey of Canada, Canadian Geoscience Map 267, (ed. prelim.), 2016, 1 sheet, doi:10.4095/297351

Stern, R.A., 1997. The GSC Sensitive High Resolution Ion Microprobe (SHRIMP): analytical techniques of zircon U-Th-Pb age determinations and performance evaluation; Radiogenic Age and Isotopic Studies, Report 10, Geological Survey of Canada, Current Research 1997-F, p. 1-31.

Stern, R.A., and Amelin, Y., 2003. Assessment of errors in SIMS zircon U-Pb geochronology using a natural zircon standard and NIST SRM 610 glass; Chemical Geology, v. 197, p. 111-146.

St-Onge, M.R., Hanmer, S., and Scott, D.J., 1996. Geology of the Meta Incognita Peninsula, south Baffin Island: tectonostratigraphic units and regional correlations; in Geological Survey of Canada, Current Research 1996-C, p.63–72.

St-Onge, M.R., Wodicka, N. and Ijewliw, O., 2007. Polymetamorphic evolution of the Trans-Hudson Orogen, Baffin Island, Canada: Integration of petrological, structural and geochronological data; Journal of Petrology, v. 48, p. 271–302.

St-Onge, M R; Rayner, N M; Steenkamp, H M; Skipton, D. R., 2015. Bedrock mapping of eastern Meta Incognita Peninsula, southern Baffin Island, Nunavut. Canada-Nunavut Geoscience Office, Summary of Activities 2014, 2015; p. 105-118

St-Onge, M.R., Weller, O.M., Dyck, B.J., Rayner, N.M., Chadwick T., and Liikane, D., 2016a. Geology, Sylvia Grinnell Lake (north), Baffin Island, Nunavut. Geological Survey of Canada, Canadian Geoscience Map 253E (preliminary); Canada-Nunavut Geoscience Office, Open File Map OFM2016-10E, scale 1:100 000, 1 sheet.

St-Onge, M.R., Weller, O.M., Dyck, B.J., Rayner, N.M., Chadwick T., and Liikane, D., 2016b. Geology, Sylvia Grinnell Lake (south), Baffin Island, Nunavut. Geological Survey of Canada, Canadian Geoscience Map 254E (preliminary); Canada-Nunavut Geoscience Office, Open File Map OFM2016-11E, scale 1:100 000, 1 sheet.

St-Onge, M.R., Weller, O.M., Dyck, B.J., Rayner, N.M., Chadwick T., and Liikane, D., 2016c. Geology, Amittok Lake (north), Baffin Island, Nunavut. Geological Survey of Canada, Canadian Geoscience Map 255E (preliminary); Canada-Nunavut Geoscience Office, Open File Map OFM2016-12E, scale 1:100 000, 1 sheet.

St-Onge, M.R., Weller, O.M., Dyck, B.J., Rayner, N.M., Chadwick T., and Liikane, D., 2016d. Geology, Amittok Lake (south), Baffin Island, Nunavut. Geological Survey of Canada, Canadian Geoscience Map 256E (preliminary); Canada-Nunavut Geoscience Office, Open File Map OFM2016-13E, scale 1:100 000, 1 sheet.

St-Onge, M.R., Weller, O.M., Dyck, B.J., Rayner, N.M., Chadwick T., and Liikane, D., 2016e. Geology, Clearwater Fiord (north), Baffin Island, Nunavut. Geological Survey of Canada, Canadian Geoscience Map 257E (preliminary); Canada-Nunavut Geoscience Office, Open File Map OFM2016-14E, scale 1:100 000, 1 sheet.

St-Onge, M.R., Weller, O.M., Dyck, B.J., Rayner, N.M., Chadwick T., and Liikane, D., 2016f. Geology, Clearwater Fiord (south), Baffin Island, Nunavut. Geological Survey of Canada, Canadian Geoscience Map 258E (preliminary); Canada-Nunavut Geoscience Office, Open File Map OFM2016-15E, scale 1:100 000, 1 sheet.

St-Onge, M.R., Weller, O.M., Dyck, B.J., Rayner, N.M., Chadwick T., and Liikane, D., 2016g. Geology, McKeand River (north), Baffin Island, Nunavut. Geological Survey of Canada, Canadian Geoscience Map 259E (preliminary); Canada-Nunavut Geoscience Office, Open File Map OFM2016-16E, scale 1:100 000, 1 sheet.

St-Onge, M.R., Weller, O.M., Dyck, B.J., Rayner, N.M., Chadwick T., and Liikane, D., 2016h. Geology, McKeand River (south), Baffin Island, Nunavut. Geological Survey of Canada, Canadian Geoscience Map 260E (preliminary); Canada-Nunavut Geoscience Office, Open File Map OFM2016-17E, scale 1:100 000, 1 sheet.

St-Onge, M.R., Weller, O.M., Dyck, B.J., Rayner, N.M., Chadwick T., and Liikane, D., 2016i. Geology, Irving Inlet (south), Baffin Island, Nunavut. Geological Survey of Canada, Canadian Geoscience Map 261E (preliminary); Canada-Nunavut Geoscience Office, Open File Map OFM2016-18E, scale 1:100 000, 1 sheet.

St-Onge, M.R., Weller, O.M., Dyck, B.J., Rayner, N.M., Chadwick T., and Liikane, D., 2016j. Geology, Irving Inlet (north), Baffin Island, Nunavut. Geological Survey of Canada, Canadian Geoscience Map 262E (preliminary); Canada-Nunavut Geoscience Office, Open File Map OFM2016-19E, scale 1:100 000, 1 sheet.

Weller, O.M., Dyck, B.J., St-Onge, M.R., Rayner, N.M. and Tschirhart, V., 2015. Completing the bedrock mapping of southern Baffin Island, Nunavut: plutonic suites and regional stratigraphy; in Summary of Activities 2015, Canada-Nunavut Geoscience Office, p. 33–48.

Whalen, J.B., Wodicka, N., Taylor, B.E., Jackson, G.D., 2010. Cumberland batholith, Trans-Hudson Orogen, Canada: Petrogenesis and implications for Paleoproterozoic crustal and orogenic processes. Lithos, Volume 117, Issues 1-4, June 2010, Pages 99-118.