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# MINERAL INVENTORY PROJECT

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## ABSTRACT

*The mandate of the Mineral Inventory Project is to document geological and mineral resource information on the Province's mineral occurrences, and to make the information available to the public. Updates in 2021 were conducted Province-wide with a focus on areas where mineral exploration is ongoing and new information is being released.*

## INTRODUCTION

The Mineral Inventory Project maintains the principal repository for geological information on the Province's mineral resources. The Mineral Occurrence Data System (MODS) is a digital mineral occurrence database containing over 7300 records. It is recognized as an important mineral exploration tool and is consistently used by the mineral exploration and mining industries (Figure 1). Updating of the database is an ongoing process, and in 2021 it continued on a Province-wide basis using data taken mainly from mineral industry assessment reports, press releases, government publications and academic research.

The MODS consists of summaries of data including location, geological descriptions, mineralogy, deposit type, work histories, resource and/or reserve statistics, analytical results and bibliography on known mineral occurrences. It offers quick and easy access to mineral occurrence information throughout all of Newfoundland and Labrador. The main delivery point for the MODS data is the Geological Survey of Newfoundland and Labrador website. Clients can search the database using either the "Geoscience Atlas" (https://geoatlas.gov.nl.ca/) or the MODS "Search Form" (https://gis.geosurv.gov.nl.ca/mods/mods.asp). It provides a current, high-quality, online mineral deposit database that helps to further define the Province's mineral potential and increase its prospectivity.

## 2021 UPDATES

Areas updated in 2021 include parts of 1L, 2D, 2E, 12A and 12H (Newfoundland, Figure 2), and 13J, 13K, 13L, 13M, 13N and 13O (Labrador, Figure 3). Although updates

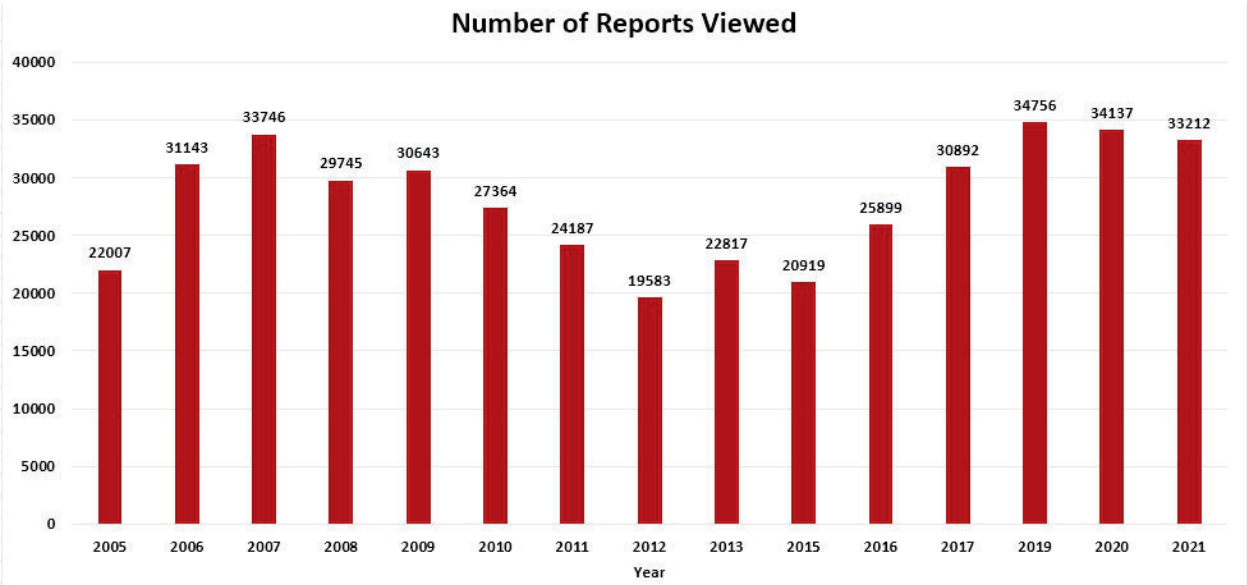


**Figure 1.** *Number of reports viewed per year from 2005–2021 (data for 2014 and 2018 unavailable).*

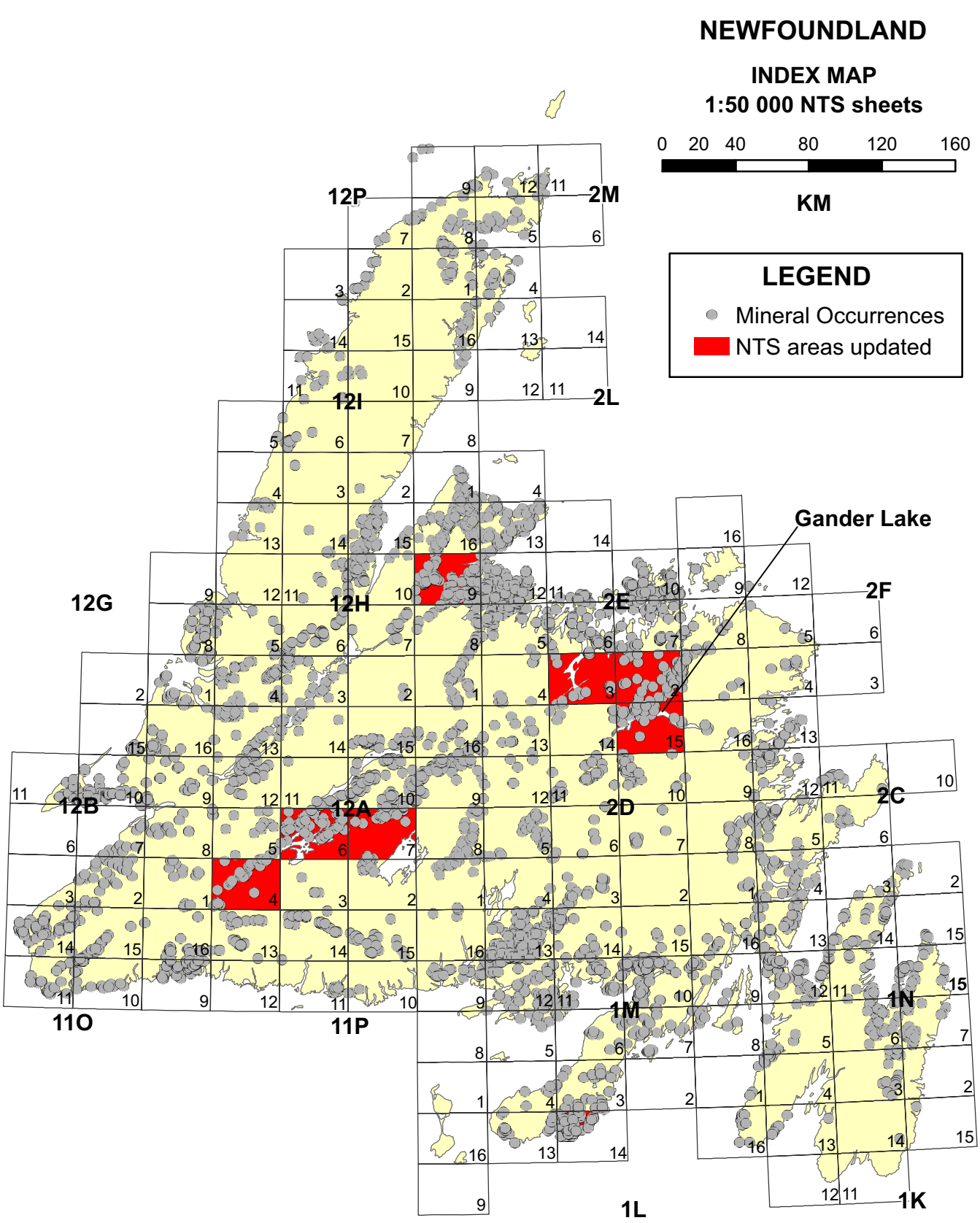


**Figure 2.** *NTS areas updated, Newfoundland.*

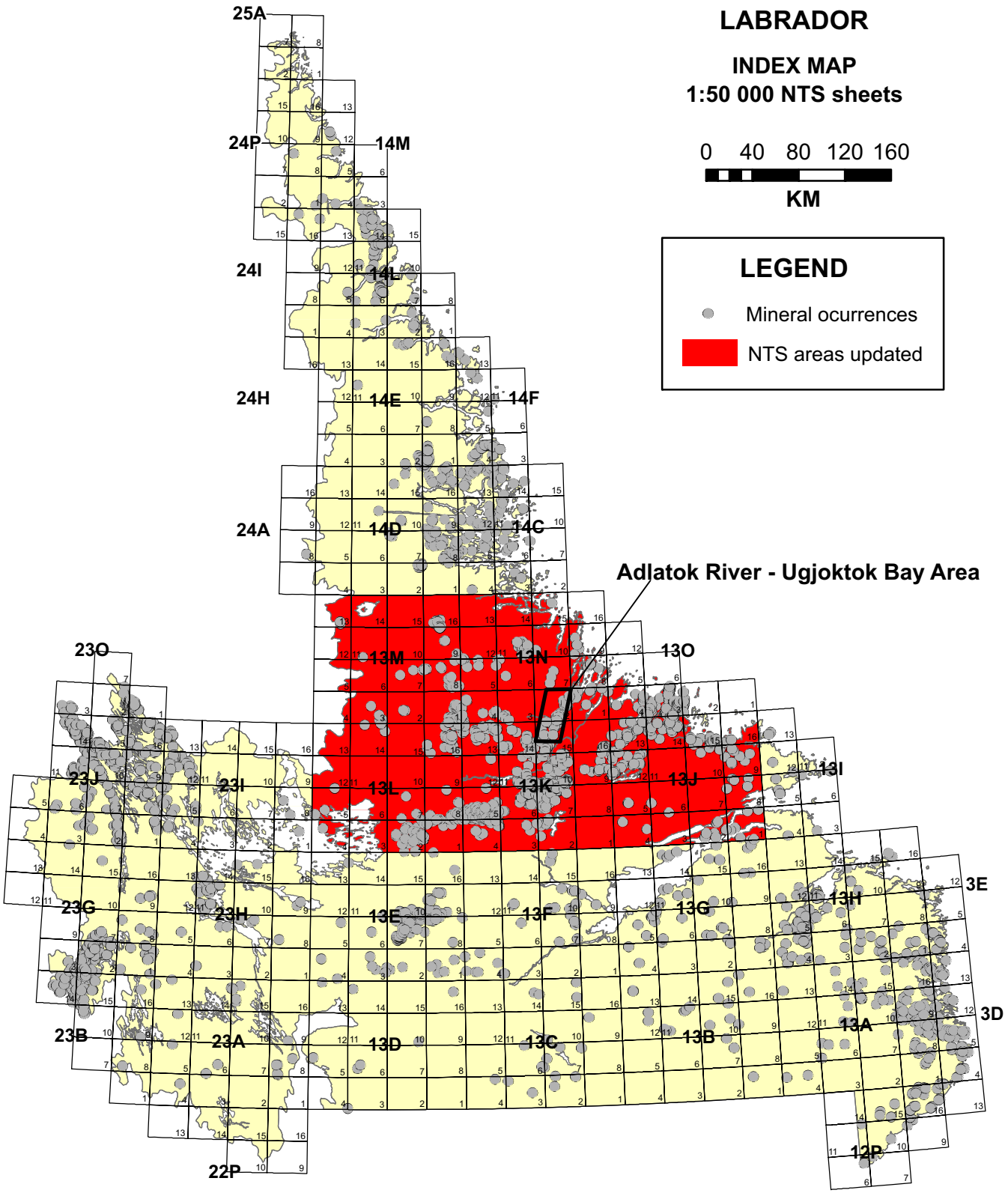


**Figure 3.** *NTS areas updated, Labrador.*

were implemented on a Province-wide basis, a focus was placed on documenting occurrences in areas with ongoing mineral exploration programs, such as; gold exploration in the Gander Lake area located in north-central Newfoundland (Figure 2), and gold exploration in the Adlatok River–Ugjoktok Bay area, central-eastern Labrador (Figure 3).

## GANDER LAKE AREA

Gold exploration in the Gander Lake area began in the early 1980s when efforts by Noranda and other companies and prospectors resulted in many discoveries including the Dome (National mineral inventory number (Nmino) 002D/15/Au007), Road (Nmino 002D/15/Au009) and Keats (Nmino 002D/15/Au010) occurrences along the Appleton Fault Zone; the H Pond (Nmino 002E/02/Au008), Pocket Pond (Nmino 002D/15/Au012) and Lachlan (Nmino 002D/15/Au015) occurrences along the Joe Batts Pond Deformation Zone; the Goose (Nmino 002D/11/Au011), Road Gabbro (Nmino 002D/11/Au009) and LBNL (Nmino 002D/11/Au010) occurrences near Paul's Pond and the Aztec (Nmino 002D/11/Au006), Hornet (Nmino 002D/11/Au008), A-Zone Extension (Nmino 002D/11/Au007) and the Greenwood Pond occurrences near Greenwood Pond (Nmino 002D/11/Au012-18) (Figure 4). Visible gold was noted in many of these showings (Evans-Lambswood, 2020).

New Found Gold Corporation began exploring the area in 2016 and achieved success in finding new occurrences; *i.e.*, Sunday Zone (Nmino 002D/15/Au025), Glass (Nmino 002E/02/Au022), Zone 26 (Nmino 002D/15/Au018) among others, and further defining and expanding on historical occurrences *i.e.*, Keats (Nmino 002D/15/Au010), H Pond (Nmino 002E/02/ Au008), Cokes 1 (Nmino 002D/15/Au021) and Cokes 2 (Nmino 002D/15/Au022) (Figure 4).

Other companies active in the area include Labrador Gold Corporation, with their new gold discoveries, Golden Glove and Big Vein, and Exploits Discovery Corporation with their new gold discovery, Schooner, and their follow-up work on the Little Joanna Gold occurrence.

Mineralization occurs within the Exploits Subzone of the Dunnage Zone along the Dog Bay Line, which is part of a structural corridor between the Dunnage and Gander zones. The area is mostly underlain by Cambrian to Silurian meta-sedimentary rocks of the Davidsville Group. South of Gander Lake, the area also includes the boundary between the Davidsville and Indian Islands groups. The latter mainly comprises Silurian siliciclastic rocks, intruded by the Mount Peyton Intrusive Suite.

Gold mineralization occurs in auriferous quartz veins displaying variable intensity of hydrothermal alteration and sulphide content. Typically, gold occurs in mudstone-hosted, conjugate sets of fault-fill and extensional quartz veins with associated hydrothermal alteration. Occasionally, veins are hosted in sandstone beds as predominantly extensional veins, as sandstone beds are more competent than mudstone (Evans-Lambswood, 2020).

## ADLATOK RIVER–UGJOKTOK BAY AREA

The Adlatok River–Ugjoktok Bay area (Figure 3) is located 40 km southwest of the coastal community of Hopedale. It has a long exploration history, dating back to the late 1950s, when Lundberg Exploration Limited conducted airborne magnetometer and electromagnetic surveys over parts of the Archean Florence Lake Greenstone Belt for British Newfoundland Exploration Limited. Gold mineralization was first discovered in the area in the early 1990s by Falconbridge Limited in the northern portion of the belt (Thurber Dog Lake area), where grab samples from outcrop assayed up to 3.8 g/t Au from a sulphide gossan associated with carbonatized mafic intrusive rocks (McLean, 1993). The area has seen consistent exploration work by various companies (Hussey and Moore, 2005 and references therein) and the mineral exploration rights to the Thurber Dog Lake area are presently held by Labrador Gold Corporation.

The area is underlain by the Florence Lake Greenstone Belt, which consists mainly of greenschist- to amphibolite-facies mafic and ultramafic rocks, and lesser amounts of felsic and intermediate volcanic and volcaniclastic sedimentary rocks (Figure 5). The mafic volcanic rocks include massive, layered and pillowed flows, amphibolite of uncertain protolith, and meta-gabbro. The ultramafic rocks include white- to grey-weathering talc schists containing variable amounts of carbonate and magnesite, and dark-green to black-weathering chlorite and serpentine(?) schists (James *et al.*, 1996). Both, the mafic volcanic rocks and ultramafic schists, are host to quartz-carbonate veins that are subparallel to parallel with respect to the north-south-trending penetrative fabric (Emon *et al.*, 1996; Hussey and Moore, 2005).

Gold mineralization has been outlined over a 3-km-strike length in the Thurber Dog Lake area with values up to 8.26 g/t Au in a grab sample (Labrador Gold Corporation, Press Release, November 22, 2019) and 3.97 g/t Au in a 5-m-chip-channel sample (Cullen and Churchill, 1997). To date, the highest grade mineralization in the area is from quartz veins with iron-carbonate alteration (Labrador Gold Corporation, Press Release, March 13, 2019).

Mineralization is associated with variably altered mafic–ultramafic schists that locally host sulphide-bearing

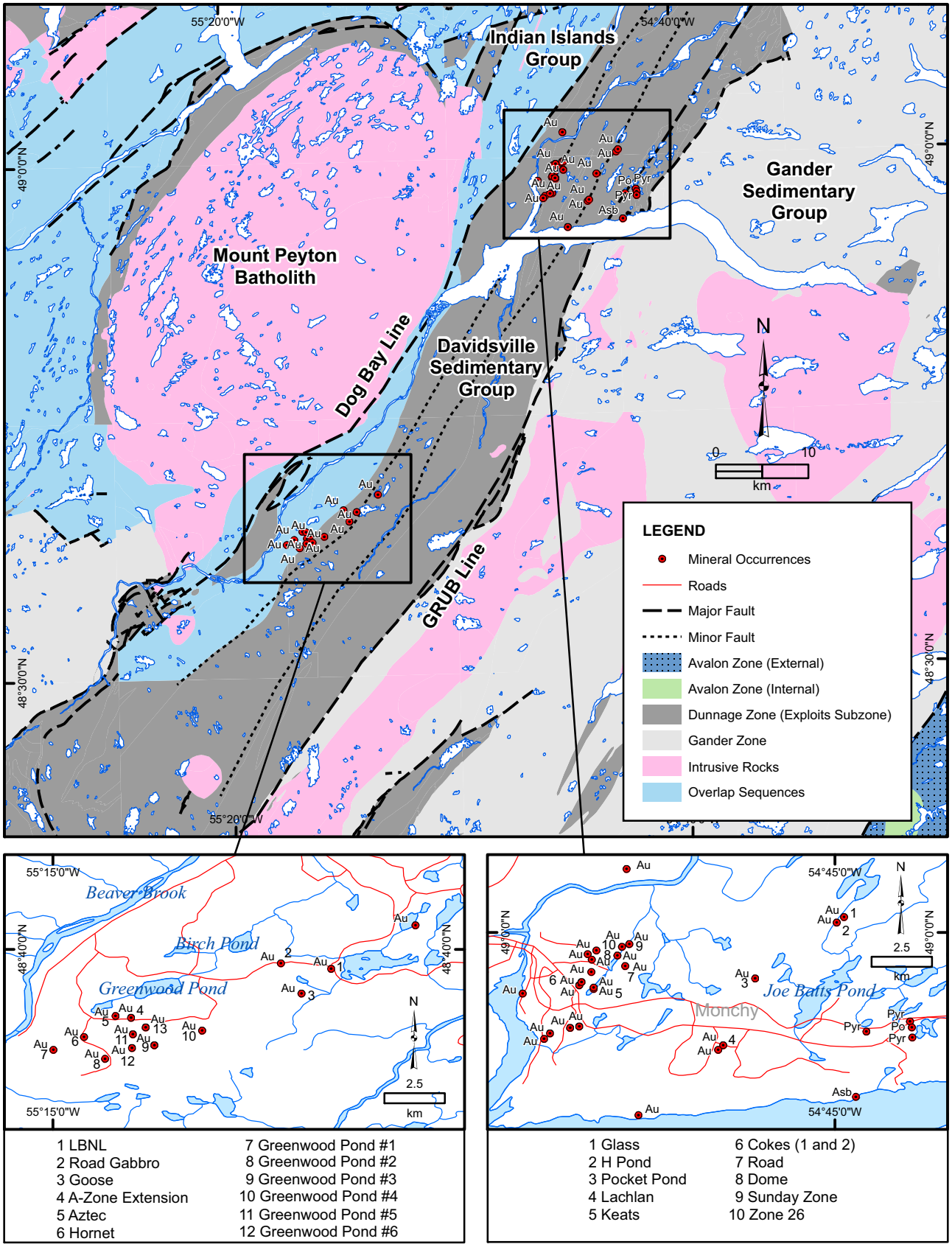


**Figure 4.** *Geology and selected mineral occurrences, Gander Lake area.*

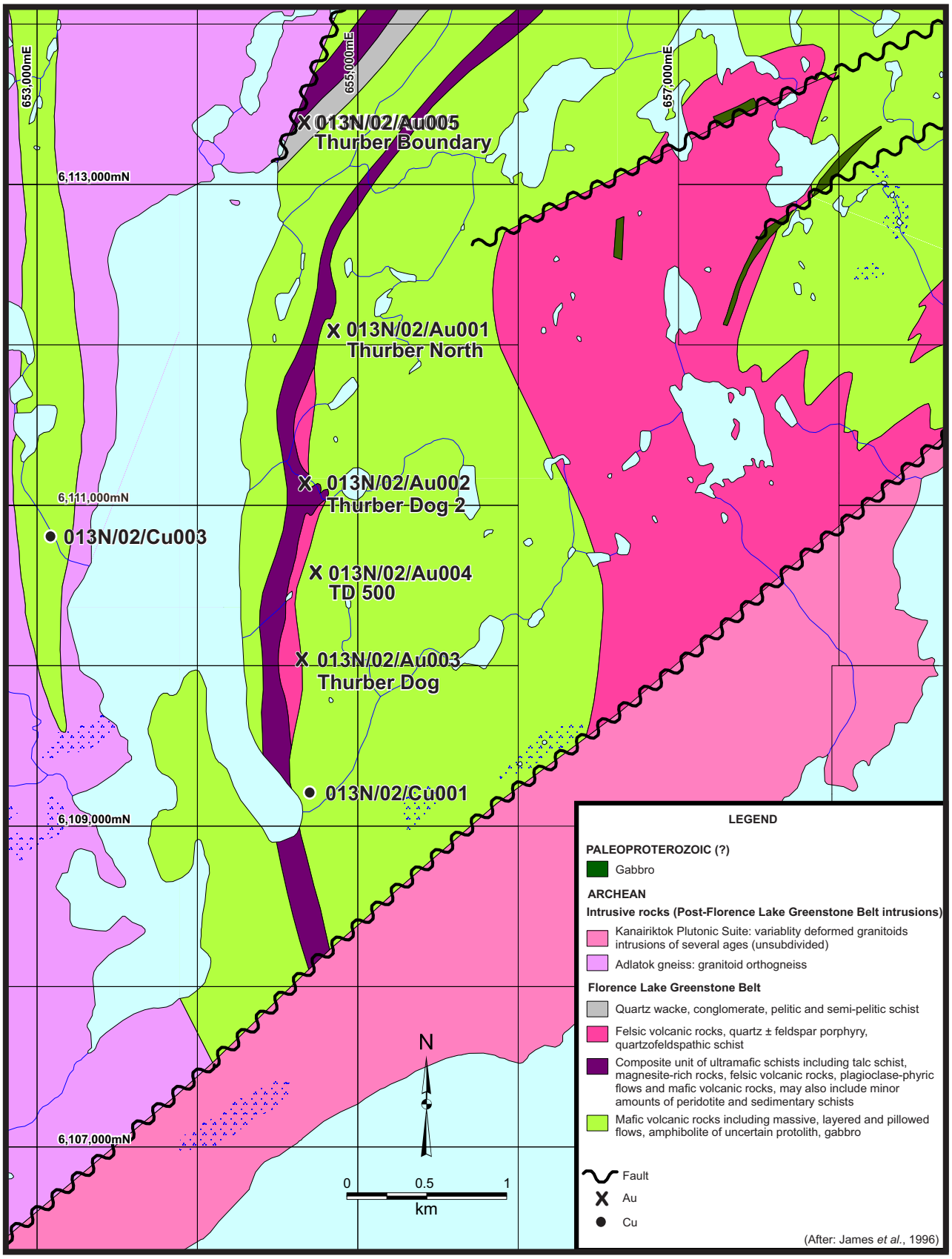


**Figure 5.** *Geology and mineral occurrences, Thurber Dog Lake area (geology after James* et al.*, 1996).*

quartz-vein arrays. Semi-massive to disseminated arsenopyrite, chalcopyrite, and bornite mineralization within, and adjacent to, quartz-carbonate veins has been reported, often occurring in association with locally intense carbonate alteration and shearing (Cullen and Churchill, 1997; Hussey and Moore, 2005). Documented gold occurrences in the area include Thurber North (Nmino # 013N/02/Au001), Thurber Dog 2 (Nmino # 013N/02/Au002), Thurber Dog (Nmino # 013N/02/Au003), TD500 (Nmino # 013N/02/Au004) and Thurber Boundary (Nmino # 013N/02/Au005) (Figure 5). While the known gold occurrences are concentrated in the Thurber Dog Lake area, elsewhere along the greenstone belt, gold values up to 2.46 g/t occur at Shirley (Nmino # 013N/02/Au006) associated with altered mafic volcanic rocks and phyllite that contain varying amounts of arsenopyrite occurring as disseminated grains and as veins of massive arsenopyrite.

Results of Labrador Gold's exploration program demonstrate the potential for gold mineralization to occur in the remainder of the Florence Lake Greenstone Belt. Anomalous gold in soil samples (up to 0.93 g/t) occurs over an approximately 40-km-strike length along the southern section of the greenstone belt. Gold in the soil samples highlighted geological contacts and structural features as zones of potential enrichment (Labrador Gold Corporation, Press Release, January 25, 2018). Structural features such as fold noses, crosscutting structures and jogs in stratigraphy seen at Florence Lake are common sites of gold mineralization in greenstone belts worldwide (Labrador Gold Corporation, website, accessed November 12, 2021).

### NEW COMMODITIES DOCUMENTED

During 2021, the MODS documented the discovery of two new mineral commodities in the Province; namely, lithium and coltan. Both were discovered by Zsuzsanna Magyarosi of the Geological Survey of Newfoundland and Labrador while following up on regional glacial till fluorine geochemical anomalies (Magyarosi, 2019).

The Snowshoe Pond lithium occurrence (Nmino 012A/07/Li001) consists of anomalous lithium values up to 399.4 ppm from samples of coarse-grained pegmatite containing light-green muscovite. The light-green suggests that the muscovite may be lithium bearing. The Snowshoe Pond coltan occurrence (Nmino 012A/07/Cot001) consists of trace amounts of coltan occurring in a coarse-grained pegmatite containing quartz, K-feldspar, plagioclase, muscovite, garnet, biotite, apatite (up to 5%) and trace amounts of zircon, monazite, xenotime, magnetite, hematite, pyrite, gahnite and tourmaline. Although these occurrences are minor, they demonstrate the potential for the pegmatitic rocks in this region of the Province to host these important commodities (Magyarosi, 2020). Lithium has many industrial applications, from lubricating grease and glass fabrication, to glazes for ceramics and batteries, and it will continue to play an increasingly important role in the battery-powered clean air future (Leni, 2017).

Coltan exists in solid solution series between two end-members, columbite $(Fe,Mn)Nb_2O_6$ and tantalite $(Fe,Mn)Ta_2O_6$, where tantalite is the end-member of higher economic importance. Tantalum is derived mostly from the mineral tantalite ($(Fe,Mn)(Ta,Nb)Ta_2O_6$). The electronics industry accounts for about one-half of tantalum consumption, mainly as powder and wire. Electronic capacitors are the leading end use of tantalum owing to tantalum's particular ability to store and release energy. Because of this ability, components can be exceptionally small and are favoured in space-sensitive, high-end applications, such as telecommunications (for cell phones), data storage (for hard drives), and implantable medical devices (for hearing aids and pacemakers) (Schulz *et al.*, 2017).

## MODS USER STASTICS

The MODS is used by mineral explorationists to help guide their exploration programs.

It is used daily by government geologists in land-use planning. The 2021 web server statistics for the MODS indicate that it was accessed 33 212 times (Figure 1). Over the past fifteen years, it has been consistently used, averaging 28 070 hits per year. A hit is logged when the user opens a MODS record. A detailed study of the 2013 web server statistics indicated that the database has a global audience, being accessed from one hundred countries, representing approximately half of the countries of the world. It is accessed most frequently from Canada and the commodity of greatest interest is gold (Stapleton *et al.*, 2015).

## SUMMARY

During 2021, the MODS documented the discovery of two new mineral commodities in the Province, lithium and coltan. These new discoveries demonstrate the potential for the Province to host these important commodities, thus increasing its mineral potential and prospectivity.

Consistent delivery of MODS data continued to be achieved through the query form and the graphical interface, with both updated and new non-confidential records copied to the public domain on a 24-hour basis. This updated database provides the mineral exploration sector and other clients with a more current dataset. The data generated by the Mineral Inventory Project contribute toward longer term benefits evidenced by increased investment in the provincial

mineral exploration and mining industries (Stapleton *et al.*, 2014).

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