

MINERAL OCCURRENCE DATA SYSTEM

G.J. Stapleton, J.L. Smith and T. Adams
Mineral Deposits Section

ABSTRACT

The Mineral Occurrence Data System (MODS) is the principal repository for geological information on the Province's mineral resources and comprises summaries of data on more than 6700 mineral occurrences. It offers fast and easy access to the data and is searchable from the Geological Survey of Newfoundland and Labrador website (<http://www.nr.gov.nl.ca/nr/mines/Geoscience/index.html>).

INTRODUCTION

The Mineral Occurrence Data System (MODS) is the principal repository for geological information on the Province's mineral resources and is a two-part infobase consisting of a mineral occurrence database, and a collection of mineral occurrence maps (Stapleton *et al.*, 2000). The MODS comprises summaries of data on known mineral occurrences, and is designed to offer fast and easy access to relevant information. It contains more than 6700 mineral occurrence descriptions, covering all of Newfoundland and Labrador. The main delivery point for the MODS data is the Geological Survey of Newfoundland and Labrador website (<http://www.nr.gov.nl.ca/nr/mines/Geoscience/index.html>). Clients are able to search the database using either the 'Mineral Deposit (MODS) Index Search Form' or 'Geoscience Atlas'.

MINERAL OCCURRENCE DATABASE

MODS (ORACLE)

The MODS data are housed within the Oracle database management system; however, data entry is achieved using an application of MS-Access database software (Stapleton *et al.*, 2005); MS-Access connects to the Oracle database using object database connectivity technology. In addition to increasing the security of the MODS data, Oracle will be the common database platform for all of the Geological Survey's databases, which will enable more efficient sharing of information between the databases. The MODS internet application is dynamically linked to the Oracle database, giving clients same-day access to updated information.

DELIVERY MECHANISMS

GeoScience OnLine

Most MODS users access the system *via* the internet from the Geological Survey's website. Detailed MODS data can be queried and viewed in a map environment in conjunction with other geoscientific datasets online, using the Geoscience Atlas map viewer.

MapInfo™ and ArcView™

Selected fields (Table 1) from the mineral occurrence database are also available on CD-ROM as part of the Geoscience Atlas of Newfoundland (Davenport *et al.*, 1999a) and the Geoscience Atlas of Labrador (Davenport *et al.*, 1999b). Both operate as 'turn key' systems on personal computers in MapInfo™ and ArcView™ formats. These publications enable clients to better visualize georeferenced data in broader geoscientific contexts. Updated MODS GIS datasets are available for download from the Geoscience Atlas.

MINERAL OCCURRENCE MAPS

Mineral occurrence maps on geological bases have been published at 1:250 000 scale, and selected areas published at 1:50 000 and 1:100 000 scales. An industrial minerals map for insular Newfoundland, at 1:1 000 000 scale, on a coloured geological base, is also available. These maps provide the location, minerals present and status of each occurrence. Mineral occurrence locations are also plotted on 1:50 000-scale topographic maps and are available for viewing at the Geological Survey's offices in St. John's, NL.

Table 1. Fields and field descriptions from MODS for GIS record

Depname	Usual name
Altname	Alternate name
Recid	Record ID number
Nmino	National mineral inventory number
Comname	Major commodity present
Modslabel	Symbol for major commodity present
Commods	Secondary commodities present
Deptype	Deposit type; coded genetic classification of deposit
Desc	Description of deposit type
Status	Indicating amount of work done and hence the amount of information available on a deposit
	Producer - Commodity is extracted for sale
	Developed Prospect - Reserves or demonstrated resources of the commodity can be calculated but the commodity has not yet been produced (<i>i.e.</i> , three dimensional data plus grade)
	Past Producer Dormant - The commodity is no longer produced, although there are known reserves or demonstrated resources
	Past Producer Exhausted - The commodity is no longer produced and there are no longer reserves or demonstrated resources
	Prospect - Two dimensional data and grade are available but not enough data to calculate reserves
	Showing - Mineralization exists in outcrop with little information known about its spatial extent. Assay data exists
	Indication - An indication of the existence of the commodity, <i>i.e.</i> , field observation, map symbol
Depchar	Deposit description
Geoprov	Geological province
Tectbelt	Tectonostratigraphic zone
Strunit	Stratigraphic unit
Stratigrap	Stratigraphic age of the host unit
Rocks	Rock type(s) associated with deposit
Trench	Trenching? y = trenching done
DDH	Number of drillholes into the deposit
Working	Type of mine workings
	Underground - u
	Open Pit or Quarry - o
	Underground and Open Pit - uo
Adit	Adit? y = adit present
Shaft	Shaft? y = shaft present
Utmeast	Easting coordinate
Utmnorth	Northing coordinate
Utmzone	UTM Zone

The MODS project has also published six, on demand, thematic mineral occurrence maps on geological bases. These are, Epigenetic Gold and Related Mineralization, Newfoundland; Copper and Associated Mineralization, Newfoundland; Zinc-Lead and Related Mineralization, Newfoundland; Mississippi Valley Type Lead-Zinc Mineralization, Newfoundland; Volcanogenic Massive Sulphide Deposits, Dunnage Zone, Newfoundland; and Metallic Mineral Occurrences of the Avalon Zone, Newfoundland.

All maps are available, upon request, from the Geological Survey's Geoscience Publications and Information Section.

MINERAL COMMODITIES SERIES PROJECT

Since the late 1990s, the Geological Survey has produced several 'Mineral Commodities Series' reports, which are short summaries of particular commodities with emphasis on their geological settings and exploration potential. The primary information base for developing such reports is the MODS and work continued in 2012 on two reports. These reports include molybdenum, tungsten and tin (a combined treatment), and iron ore. The iron-ore report was published in the fall of 2012.

A new contribution to the 'Mineral Commodities Series' reports, a report for the combined treatment of barite and fluorite, was initiated in 2012 and is currently under development. This report will provide a brief summation of barite and fluorite commodities within the Province, including their geological setting and production history. The MODS database will serve as a critical foundation in the creation of the report and will provide means of location data, and occurrence descriptions.

DATA ENTRY AND EDIT UPDATE

The record levels of mineral exploration in recent years continue to generate a tremendous amount of new mineral occurrence information. In 2012, updates were implemented on a Province-wide basis by accessing mineral deposit information from mineral industry press releases and assessment reports as they gained public-domain status. Areas updated include 1L, 1M, 1N, 2C, 2D, 2E, 11O, 12A, 12G, 12H, 12I (Newfoundland) (Figure 1) and 3D, 13A, 13F, 13J, 13K, 13L, 13M, 14D, 14E, 23B, 23H and 23J (Labrador) (Figure 2). In 2012, consistent delivery of new information through both the Online Query Form and Geoscience Atlas was achieved with updates occurring on a 24-hour basis.

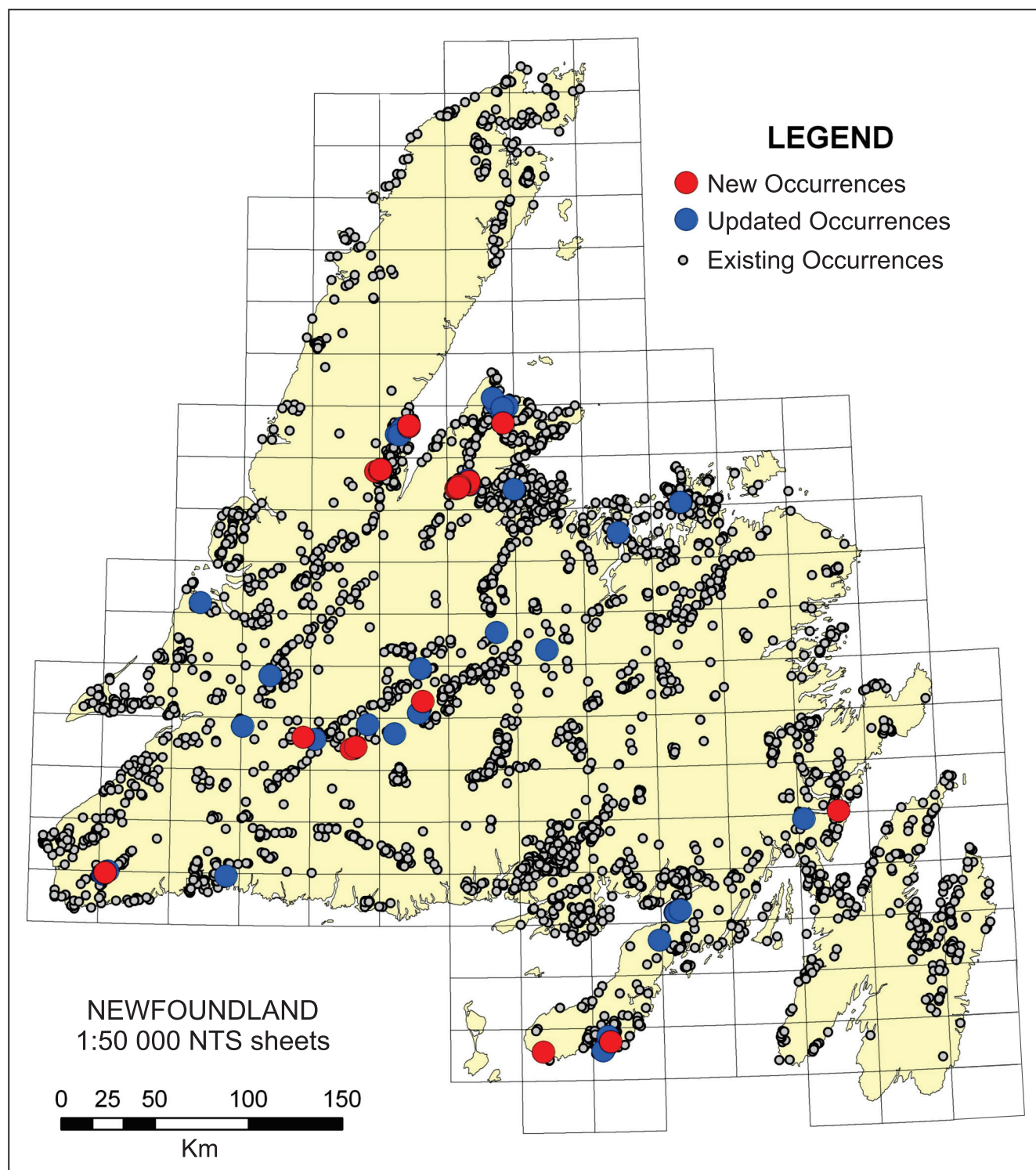


Figure 1. *New and updated occurrences for insular Newfoundland.*

MODS USERS

The MODS is used by mineral-exploration company personnel and consultants, independent prospectors, personnel and students of academic organizations and the general

public. It is also used daily by government geologists in land-use planning. Advice is given to various government departments through the Interdepartmental Land Use Committee referral process on establishing wilderness areas, hydro developments, provincial and national parks, cottage

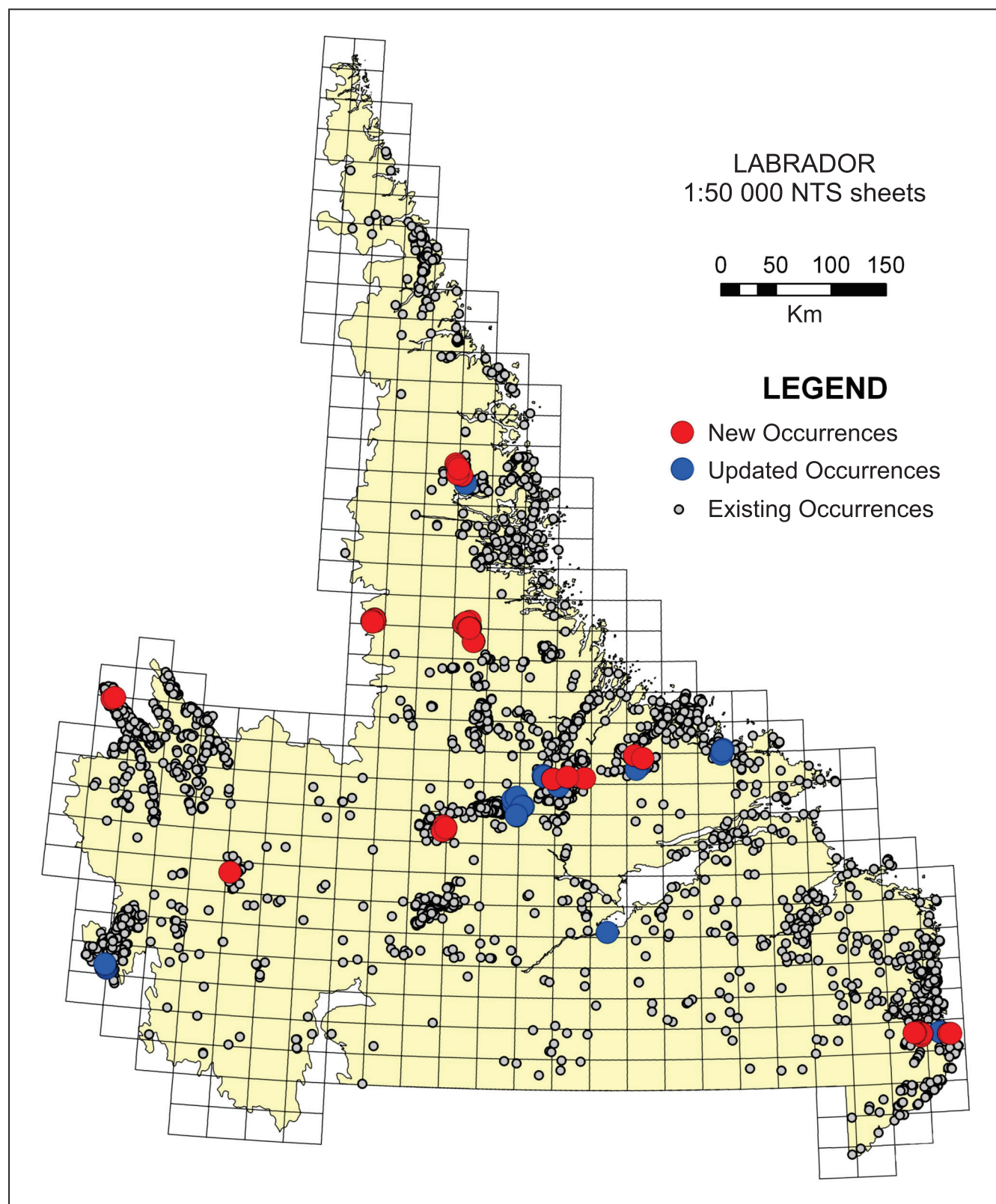


Figure 2. *New and updated occurrences for Labrador.*

developments, water reservoirs, *etc.*, so that, where possible, these developments proceed in areas of low mineral potential.

The MODS data are made available to various federal government agencies such as the Minerals and Metals Sector and the Geological Survey of Canada of Natural Resources Canada, and the Mineral Deposits Subgroup of the Canadian Geoscience Knowledge Network (Stapleton and Smith, 2004).

REFERENCES

- Davenport, P.H., Nolan, L.W., Butler, A.J., Wagenbauer, H.A. and Honarvar, P.
1999a: The Geoscience Atlas of Newfoundland. Newfoundland Department of Mines and Energy, Geological Survey, Open File NFLD/2687, version 1.0.
- Davenport, P.H., Nolan, L.W., Wardle, R.J., Stapleton, G.J. and Kilfoil, G.J.
1999b: The Geoscience Atlas of Labrador. Newfoundland Department of Mines and Energy, Geological Survey, Open File LAB/1305, version 1.0.
- Stapleton, G.J. and Smith, J.L.
2004: Mineral Occurrence Data System. *In* Current Research. Newfoundland Department of Mines and Energy, Geological Survey, Report 04-1, pages 265-267.
- Stapleton, G.J., Smith, J.L. and Parsons, W.K.
2005: Mineral Occurrence Data System. *In* Current Research. Newfoundland and Labrador Department of Natural Resources, Geological Survey, Report 05-1, pages 253-256.
- Stapleton, G., Smith, J.L., Pollock, J.C. and Way, B.C.
2000: Mineral Occurrence Data System. *In* Current Research. Newfoundland Department of Mines and Energy, Geological Survey, Report 2000-1, pages 341-348.

