

MINERAL OCCURRENCE DATA SYSTEM

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ABSTRACT

The Mineral Occurrence Data System (MODS) is a three-part database consisting of a manual Mineral Inventory File, mineral occurrence maps on geological bases and a computerized Mineral Inventory Database. The MODS contains information on about 4500 mineral occurrences and is designed to offer fast and easy access to information of the province's mineral resources.

INTRODUCTION

The Mineral Occurrence Data System (O'Driscoll *et al.*, 1991) consists of a manual Mineral Inventory File, mineral occurrence maps on geological bases and a computerized database. The project is designed to offer an efficient information service about all the mineral occurrences in Newfoundland and Labrador (Figure 1).

Most of the MODS information was compiled from a systematic search of mineral exploration company-assessment files. Other sources of information include publications of the Newfoundland Department of Natural Resources (Geological Survey), the Geological Survey of Canada, published news items, publications in geological and mining journals, and personal communications from mining-company and government personnel.

MANUAL MINERAL INVENTORY FILE

The manual Mineral Inventory File is part of the National Mineral Inventory and consists of mineral occurrence reports that summarize all data on known mineral occurrences in the province. The file presently contains about 4500 reports, which include coverage for the Island of Newfoundland (Figure 2) and selected areas in Labrador (Figure 3).

The Mineral Inventory File is continually being updated. This file was started in 1978, and since then, new geological mapping and exploration have been carried out and many new occurrences have been discovered. Updates were done in the past only on land-tenure and major-mineral occurrences. Areas that have been updated with new mineral occurrence descriptions include all of NTS 12A, and major parts of NTS 12B and 12H map areas. In addition, industrial minerals for all of the Island of Newfoundland have been documented.

Mineral occurrence maps containing updated geological bases have been published at a 1:250 000 scale and are available upon request from the Geological Survey, Publications and Information Section. In addition, selected areas have been published at 1:50 000 and 1:100 000 scales. These maps contain locations, a listing and a brief description of the occurrences. An industrial minerals map of the Island of Newfoundland at 1:1 000 000 scale on a geological base, is also available. This map contains locations, a listing and a brief description of the various mineral occurrences.

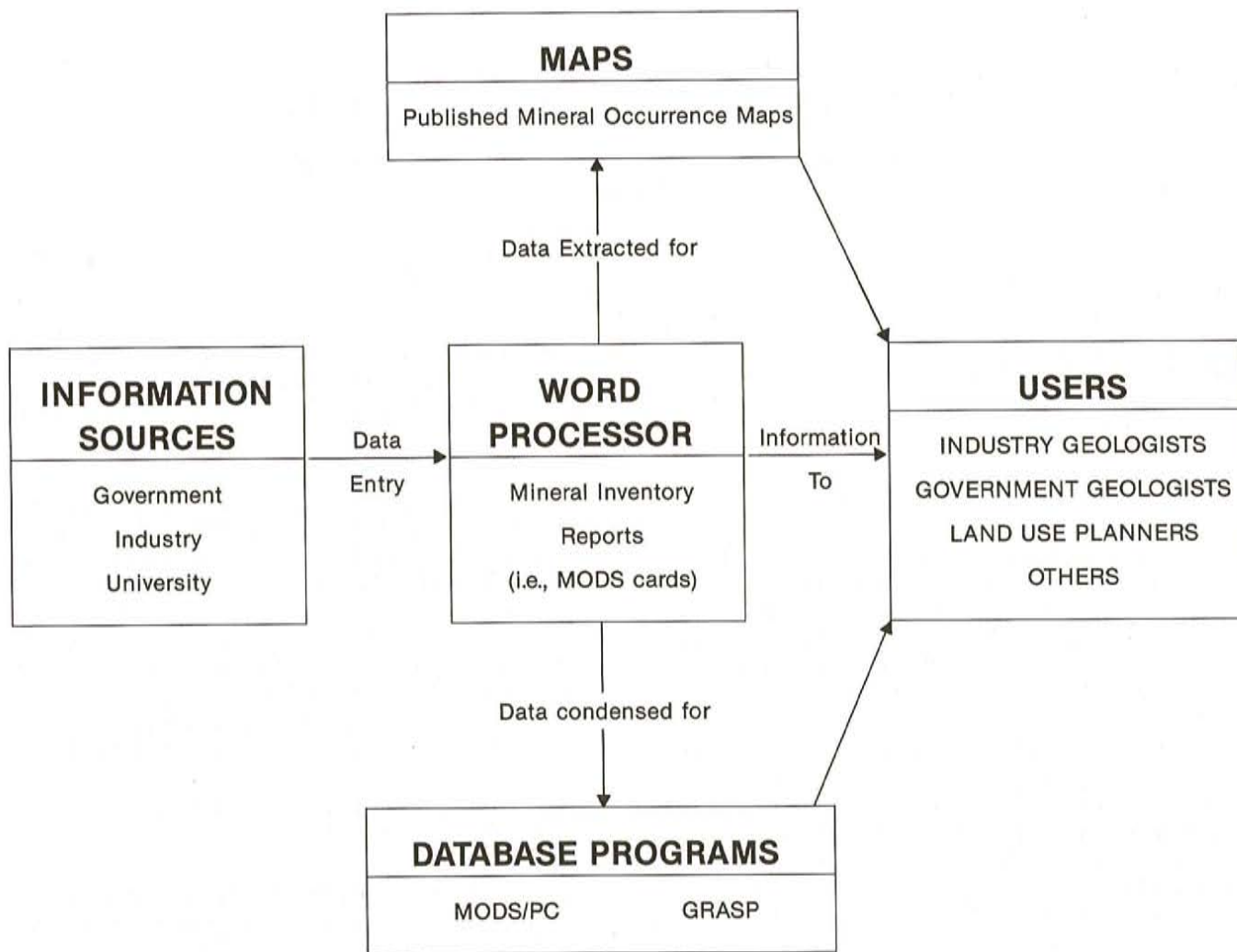
COMPUTERIZED MINERAL INVENTORY DATABASE

Since 1978, a computerized Mineral Inventory Database, which parallels the manual file, has been developed and maintained. This database contains information selectively extracted from the manual file and presently resides on a Hewlett Packard 9000/750 Unix-based network server, located at the Geological Survey offices on Bonaventure Avenue, St. John's. The Geological Retrieval and Synopsis Program (GRASP) developed by the United States Geological Survey (Bowen and Botbol, 1975) is used to manage and manipulate the database. Although GRASP is a powerful program that allows complex searches to be performed, it is not user friendly or available for microcomputers. Up until 1991, in order for users to access the computerized Mineral Inventory Database a visit to the Geological Survey offices and the help of MODS personnel were required.

DEVELOPMENT OF MODS/PC

As a result of the proliferation of microcomputers and the need for easier access to MODS information, it was decided to develop a microcomputer version of this information system in 1990 (Stapleton *et al.*, 1991; Stapleton

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The three components of the Mineral Occurrence Data System (MODS) are mineral inventory reports, mineral occurrence maps and the computerized database. These can be used either individually or collectively.

A user may study the mineral occurrence map of an area to identify occurrences of interest and can then peruse the mineral inventory reports to find detailed information on one or more specific mineral occurrence(s).

Occasionally a user may want less detailed information on all occurrences of a particular type, for example, vein type, located over a large geographic area. Particular information can be selected from the database and saved on disk, displayed on screen or printed out in a report.

Mining company personnel or individuals interested in claim staking will first want to assess an area's mineral potential. Information retrieved by searching MODS/PC can be used to focus and define geographic areas of interest. More detailed information can be obtained from mineral inventory reports or from the list of references given in each report.

Figure 1. Organization and operation of the Mineral Occurrence Data System.

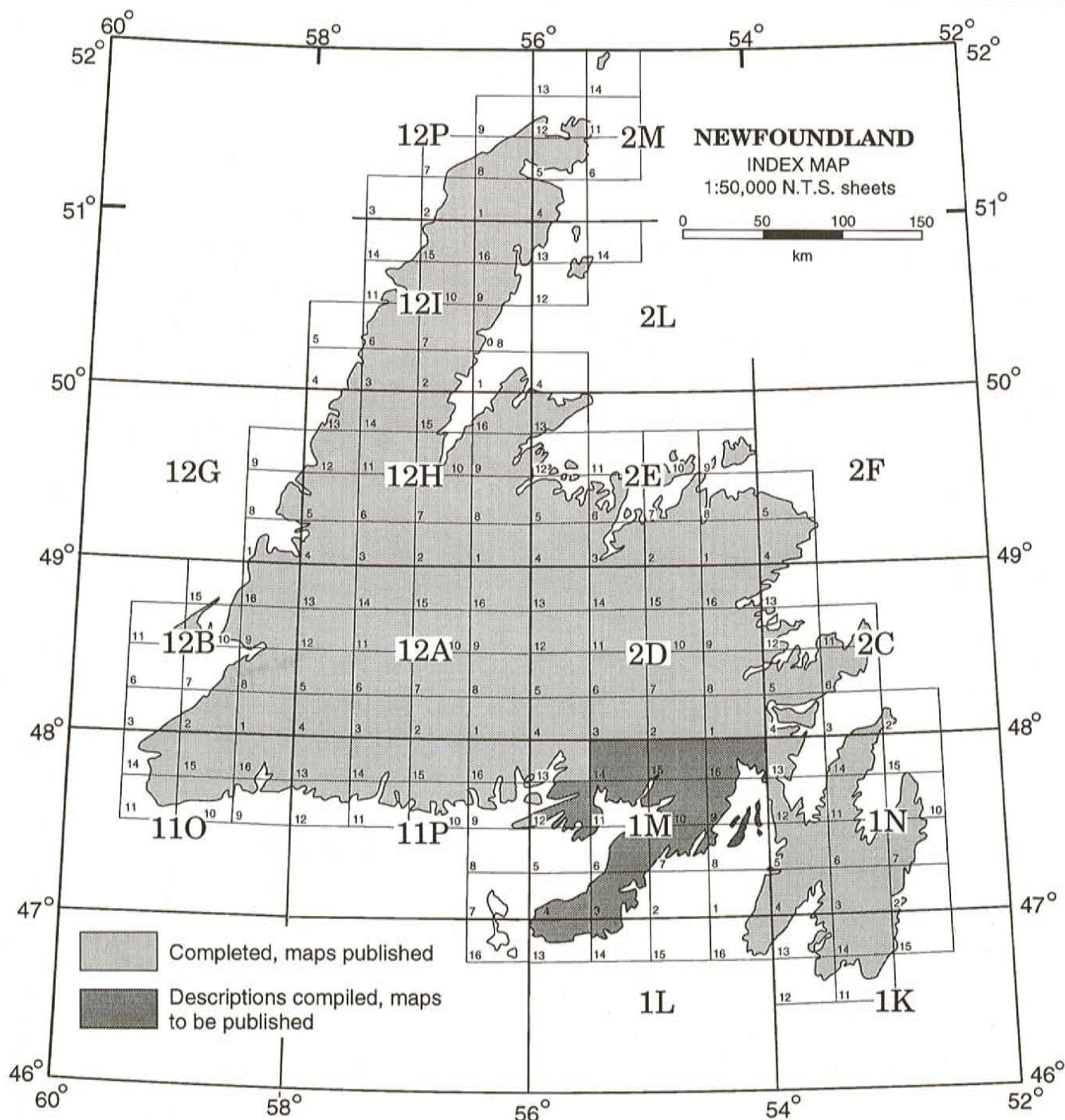


Figure 2. Index map for Mineral Occurrence Data System project, insular Newfoundland.

and Parsons, 1991). The Mineral Occurrence Data System microcomputer application (MODS/PC V1.1) was written in-house by W. Keith Parsons, Systems Analyst with the Geological Survey. It was written in the R:Base Database language (V2.11) and compiled using the R:Base compiler (V1.02). R:Base was chosen as the development tool because of the program's support of long string fields and the availability of a vendor-supplied compiler.

The minimum system requirements needed to run the MODS/PC program include an IBM-compatible

microcomputer with an 80286 processor, 640 K of RAM, a hard disk, and a CGA videocard/monitor. As well, the system must have at least 475 K of free memory. To achieve this, certain memory resident programs may have to be deactivated.

The MODS/PC system is distributed on one 3½" diskette in a compressed format. An installation program (*install.exe*) aids the user in setting up the system by checking the target microcomputer's parameters, copying files to the hard disk, and decompressing these files. PKZIP, the industry-standard

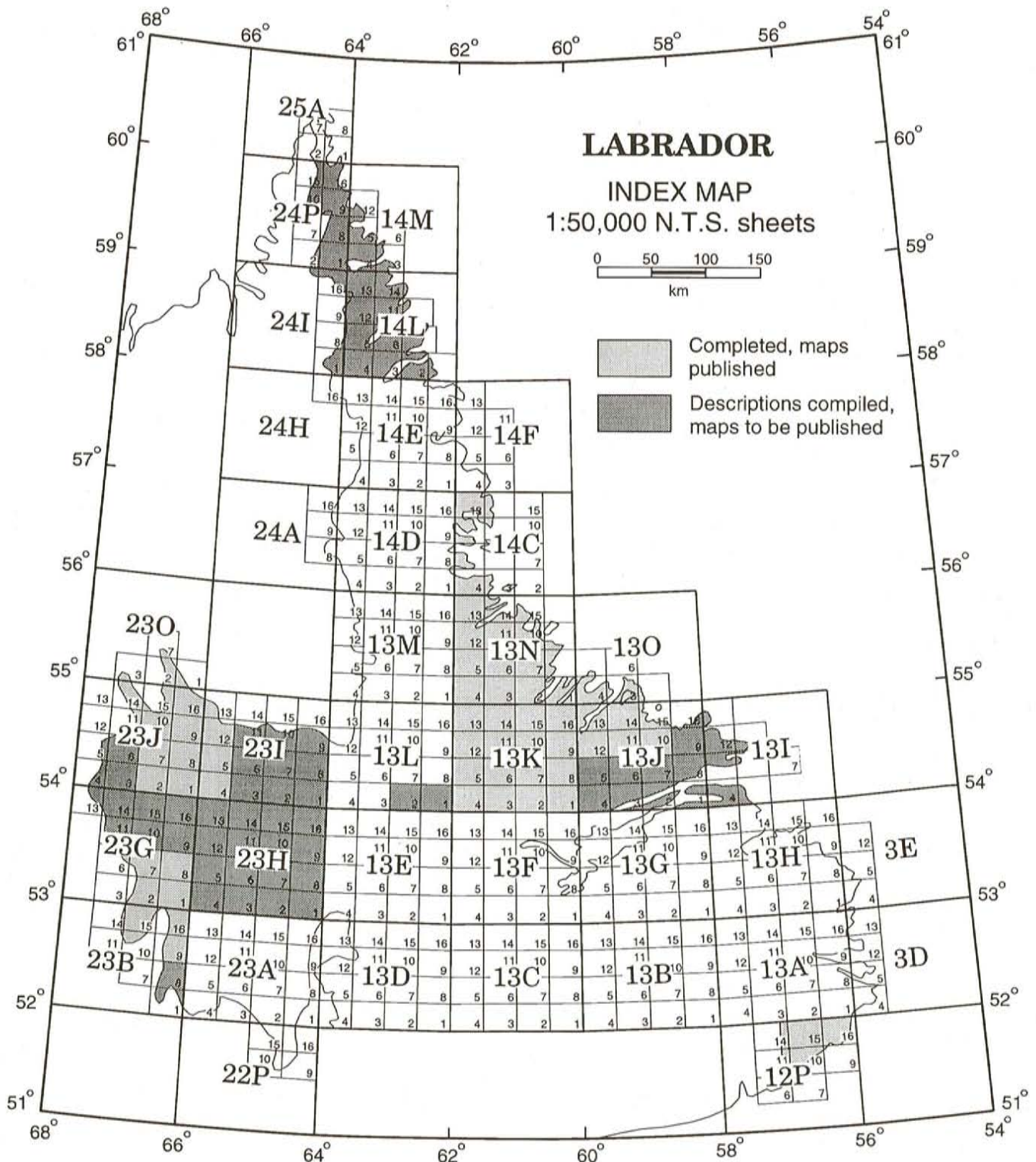


Figure 3. Index map for Mineral Occurrence Data System project, Labrador.

compression utility distributed by PKware Inc., is used to compress the MODS/PC system. Possession of the compression software is unnecessary as the files are in a self-extracting executable format. The compression ratio is better than ten to one, so considerable hard-disk space is required to install the databases.

The user may select between Newfoundland occurrences (2682 records occupying 6.5 Mb), Labrador occurrences (1347 records occupying 3.3 Mb) or a demonstration dataset (168 records occupying 454 kb). The program itself occupies about 400 kb of hard-disk space.

The MODS/PC program is menu-driven and provides the user with complete access to the computerized Mineral Occurrence Data System. The program allows the user to search, view and output occurrences from the database. Custom-designed searches are achieved by setting conditions and using Boolean logic to combine these conditions in different ways. Data portability is provided by the ability to write data to an ASCII delimited file. This allows input of a user-selected dataset to other application programs such as spreadsheets and databases or portability to other types of computer systems such as non-DOS microcomputers, workstations, or mainframes. Full user documentation is supplied with the program.

Each mineral deposit is described by a single MODS record, which has fifty-nine information fields. More detailed information on the deposit can be obtained by consulting key references listed in each record or by examining the hard-copy mineral-inventory reports maintained at the Geological Survey offices. These reports will allow information to be traced back to its source publication.

NEW MINERAL OCCURRENCE REPORTS

For insular Newfoundland, work focussed on documenting information on gold occurrences that were discovered by the mineral exploration industry during the late 1980s early 1990s. New mineral inventory reports have been compiled on 84 occurrences in the Gander and eastern Dunnage zones. These include new reports on 76 gold, 5 base-metal and 3 industrial mineral occurrences. New mineral inventory reports were also compiled on NTS 2E/13, 30 gold and 1 base-metal; NTS 2E/5, 2 gold and 1 base-metal; and NTS 2E/12, 7 gold and 5 base-metal, occurrences.

In Labrador, efforts focussed on documenting mineral occurrence information north of 50° latitude. There is a national park proposed for the Torngat Mountains, thus the areas mineral potential had to be assessed. New mineral inventory reports have been compiled for the following areas in northern Labrador: NTS 14L, 45 base-metal, 18 iron, 9 industrial mineral; NTS 14M, 2 base-metal, 1 iron, 1 industrial mineral; NTS 14F, 1 base-metal; NTS 24I, 2 industrial mineral, 1 base-metal; and NTS 24P, 2 industrial mineral.

MODS/PC VERSION (1.1)

Since its release in 1991, MODS/PC has been very well received. Presently, there are 86 companies and individuals on the subscribers list. Plans are currently being made to release a second update (V1.1), in early spring 1995. This update will append approximately 300 new records to the datafiles. There will be no change made to the software.

WORK IN PROGRESS

Work in progress for insular Newfoundland includes the compilation of the geology and the minor updating of mineral-

occurrence information on the Belleoram and St. Lawrence map areas (NTS 1M, 1L).

In Labrador, mineral occurrence information is being compiled on the Pinware terrane (NTS 2M/13, 12P/10 and 12P/16). The Pinware map region offers several previously unrecognized mineral exploration targets, namely (i) supracrustal rocks, (ii) alkalic recrystallized granitoid rocks (iii) layered mafic intrusions, (iv) posttectonic granites, and (v) pegmatites. In addition, there is potential for industrial-mineral resources (Gower *et al.*, 1994).

MODS USERS

The MODS is used primarily by mineral-exploration company personnel, however, it is also used by mineral-exploration consultants, geotechnical consultants, personnel and students of academic organizations and the general public.

The MODS is used daily by government geologists in land-use planning. Advice is given to various departments of government in establishing wilderness areas, hydro developments, provincial and national parks, and any other developments that may conflict with future mineral exploration and development. In addition, municipal councils and the Department of Municipal Affairs are advised of the location, extent, and nature of mineral deposits in specific areas, so that new housing and commercial developments, municipal parks, water reservoirs and sewage-disposal systems can be located, where possible, in areas of low-mineral potential.

Copies of the file are made available to the various agencies of the federal government such as the Mineral Policy Sector and the Geological Survey of Canada. These are then adapted to the National Mineral Inventory, MINSYS and CANMINDEX.

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