A MINERAL DEPOSIT DATABASE FOR MICROCOMPUTERS

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ABSTRACT

Mods/PC is a menu-driven program for IBM-compatible microcomputers that provides the user with access to the computerized mineral inventory system. The MODS database presently contains information on approximately 4000 metallic, non-metallic, fossil fuel, rare-earth element and radioactive mineral deposits. 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 Branch, 95 Bonaventure Avenue, St. John's, Newfoundland.

INTRODUCTION

The Mineral Deposit Database for microcomputers represents the most recent step in the evolution of the Geological Survey Branch's Mineral Occurrence Data System (MODS).

The Mineral Occurrence Data System (Figure 1) initially began in 1971 as a manual Mineral Inventory File. It consisted of very brief data recorded on 8- by 11-inch cards for each mineral occurrence and a series of topographic maps showing locations (Hsu, 1974). In 1976, a folio of mineral occurrence maps was published at a scale of 1:250,000. These were accompanied by a booklet of mineral occurrence tables (Douglas, 1976a, b) that contained very brief descriptions compiled from the Mineral Inventory File.

In 1978, the system underwent a major revision. The information contained on mineral inventory cards was greatly increased so that presently, there is a summary report on each occurrence. Location maps having geological bases were systematically compiled and published at 1:250,000 scale (some at 1:100,000 and 1:50,000).

At the same time (1978), the computerization of MODS began. The data record was defined and the Geological Retrieval and Synopsis Program (GRASP) was chosen as the database program (Missan *et al.*, 1979). GRASP was developed by the United States Geological Survey (Bowen and Botbol, 1975) as a geological storage and retrieval system to be used primarily by geologists. The computerized MODS system first resided on an IBM 370/158 (MVS) located at Newfoundland and Labrador Computer Services and was accessed by a high-speed terminal from the Department of Mines and Energy.

In 1987, the computerized MODS database and GRASP were ported to a Hewlett Packard 9000/560 Unix-operated minicomputer located at the Geological Survey Branch of the Department of Mines and Energy. It was found that this in-house database system did not serve industry very well, as a visit to the Geological Survey Branch was necessary in order to gain access.

DEVELOPMENT OF MODS/PC

With 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. The Mineral Occurrence Data System microcomputer application (MODS/PC V1.0) was written in-house by W. Keith Parsons, Systems Analyst with the Department of Mines and Energy. 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 four 5¼" diskettes 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 uncompressing these files. PKZIP, the industry standard compression utility distributed by PKware Inc., is

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[1] Computer Unit

INFORMATION SOURCES
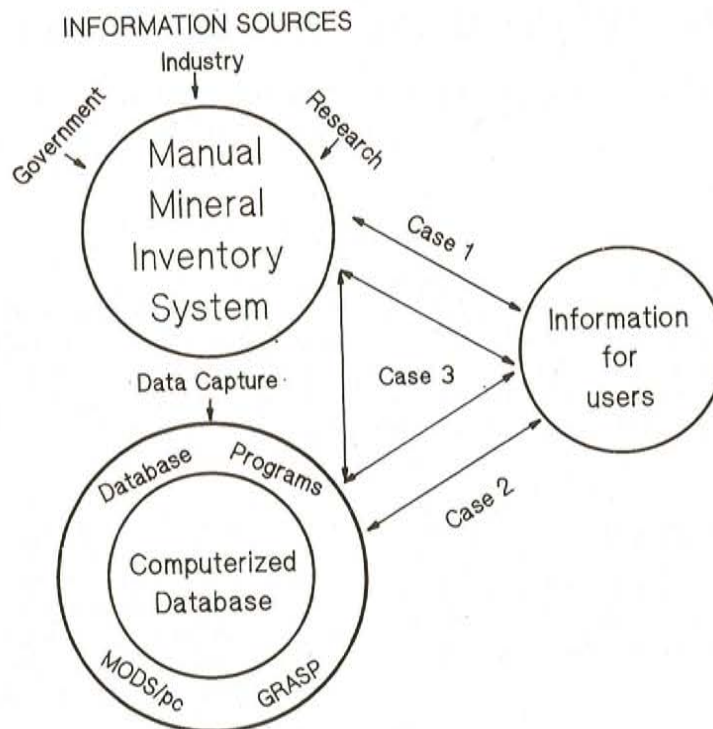
The Mineral Occurrence Data System can be used in three ways.

Case 1: The user wants detailed information on a specific mineral occurrence or group of mineral occurrences in a specific area. This information can be retrieved quickly using the manual mineral inventory file.

Case 2: The user wants less detailed information on all occurrences of a particular type, ie. vein type, located over a large geographic area. The computerized mineral deposits database can provide this information in printout format along with a computer generated location map.

Case 3: The user wants detailed comprehensive information on all occurrences of several types over a large geographic area. The purpose being to access the regions mineral potential and hopefully zero in on an area for field investigation and staking. In this case the computerized mineral deposits database is searched and used to narrow down and define specific occurrences or areas of interest. The more detailed manual mineral inventory reports can then be provided. The user can then use references contained in the manual reports to locate other information sources.

Figure 1. *Sketch illustrating how MODS is used.*

used to compress the MODS/PC system. However, possession of this software is unneccessary 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.

Only one data set may be installed at a time. The user may select between Newfoundland occurrences (2566 records occupying 6.1 mb.), Labrador occurrences (1259 records occupying 3.0 mb.) or a demonstration dataset (164 records occupying 420 K). The program itself occupies about 400 K 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, minicomputers, or even mainframes. Full user documentation will be supplied with the program.

The MODS database, which is primarily designed as an index to the mineral deposits and occurrences of Newfoundland and Labrador, contains information on approximately 4000 metallic, non-metallic, fossil fuel, rare-earth element and radioactive mineral deposits. Rocks used for their chemical properties or building stone are also included.

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 Branch, 95 Bonaventure Avenue, St. John's, Newfoundland. These reports will allow information to be traced back to its source publication.

Most of the MODS information was compiled by a systematic search of mineral exploration company assessment files. Other sources of information included publications of the Newfoundland Department of Mines and Energy, the Geological Survey of Canada, news items from the press, publications in geological and mining journals, and personal communications from mining-company and government personnel.

Version 1.0 of the MODS/PC system will be released to the public by April, 1991. Periodically, upgrades to the system will be made available to the user. Subsequent releases will update the current records, add new occurrences, and provide revisions to the program. The MODS/PC program will be upgraded to version 3.1 of R:Base once a new compiler is released by Microrim Inc. The revisions will produce a modernized user interface, faster access times, and improved report generation. The R:Base compiler produces object files compatible with common 3rd-generation languages such as C. Future versions of MODS/PC may make use of this ability to add graphical options such as plotting and mapping to the program.

In the future, when optical disk technology becomes widely used, it is planned to release all of the MODS reports on optical disk. This will enable subscribers to have the entire Mineral Occurrence Data System, including maps, MODS/PC and reports, in-house.

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