GEOSCIENCE DATA MANAGEMENT

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INTRODUCTION

Within geoscience survey organizations information transfer has always been a crucial component of operations, whether for encouraging mineral exploration, supporting mineral potential evaluation, government policy development, land use planning, engineering applications, or many of the other uses of earth resource data. Acquisition, research and contemplation of information by the geoscientist is the beginning; providing easy public access to accurate, comprehensive geoscience information and informed interpretation is the goal. The survey geoscientist has always been in the information business; what is being experienced in the 'information age' is a revolution in the means of processing, managing and accessing that information. Not surprisingly, therefore, geoscientists are increasingly involved, and variably enthused or disillusioned, with hardware, software, systems development, compatibility and crashing.

Geoscience data/information in Provincial survey repositories has been acquired from many sources over several decades and exists in a wide type and quality range of numerical, graphical, textual, and map formats. Observations recorded 20, 50, 100 years ago are often still significant. The simple cumulative volume of this information alone makes comprehensive detailed assessment by manual processes time-consuming and error-prone. The time required by a geological mapper or mineral explorationist to provide an assessment of an area is either increasingly consumed in background compilation, or the investigator proceeds in ignorance of past work, perhaps missing important features or expensively duplicating previous efforts. In these circumstances the promises of computers are as seductive as they are inevitable. But what can the current technology do, is it worth the cost and how much will it cost?

Most Provincial surveys have entered into 'computerization' and, based upon different program priorities, have entered at different points in the information stream. The purpose of this short article is to report briefly on the progress of the geoscience database management system, GEOSIS, under development in the Ontario Geological Survey.

GEOSIS

In 1985 the Mines and Minerals Division, Ontario, initiated a program to improve the accessibility of geoscience information by creating a province-wide computerized Geoscience Spatial Information System, GEOSIS, which is a map-related database management system designed to effectively integrate computerized geoscientific, map, report, and exploration information.

The GEOSIS program is an extension of the existing Ontario Geological Survey computerized publishing system. In addition to creating a spatial database of the map and report data flowing through the computerized publishing system from this time forward, Geosis is designed ultimately to incorporate information now contained in geoscience information folios, assessment files, mineral deposit inventories, chemical analysis data files, and report and map index files.

A pilot study, funded under the Canada Ontario Mineral Development Agreement, COMDA, was conducted by the Ontario Geological Survey in 1985/86 to test the feasibility and effectiveness of the essential aspects of GEOSIS. The pilot project was successfully completed in November 1986 and work is proceeding on the full development of the database management system.

A critically important aspect of any geological feature is its geological environment, its spatial relationship to other adjacent or distant geological features. Maps have been used for centuries because of their ability to display not only positional data but also spatial relationships. Spatial information systems are designed to permit the geoscientist to work with map data and descriptive data from several different sources simultaneously and thus mimic the spatial portrayal capability of maps.

The pilot study has tested the feasibility and effectiveness of all aspects of GEOSIS including database design and use, data input methods and costs, and user interface friendliness. The technological capabilities now available in data input methods such as text scanning, graphics and map scanning and digitizing bring the conversion of large volumes of existing information to computerized databases within the realm of practical possibilty. Linked with the expanded power of microcomputers, the enormous storage capacity of optical disks and the current capabilities of network operating systems, the development of an integrated, spatially-related database management system is possible.

The objective of GEOSIS is to provide explorationists, geoscientists and other users from government, industry and universities, at their place of work, with a cost effective and integrated method of accessing geoscience data collected and managed by the Mines and Minerals Division.

CONCLUSION

The understanding gained from the GEOSIS pilot project indicates it is practical to build a spatially related database management system. A complete system with comprehensive databases will take many years, large expenditures and will engender ongoing maintainance. A clear strategy with well defined, staged objectives is essential in order to maximize cost benefit, avoid wastage (the dollar potential of which is very large) and to provide direction and control to the implementation process.

This will not be a simple matter in that a strategy will be required to adjust to progressive technological developments, concurrent management system development, database building, applications implementation and fluctuation in support committment while continuing to maintain a satisfactory level of information service.