Applications of Geographic Information Systems in Quaternary geology

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Terrain Sciences Division of the Geological Survey of Canada currently operates two Geographic Information Systems: UNIX version of ARC/INFO on a Sun Sparcstation and ATLAS GIS. ATLAS GIS is a vector base system running under DOS. The system does not have all the capabilities of a full-fledged GIS, but with user friendly interface and low overhead, it is an ideal desktop GIS. ARC/INFO is a powerful analytical tool with both vector and (version 2) raster based capabilities. Terrain Sciences Division is compiling a library of ARC/INFO data sets, available for querry and display by both Mac and PC users, however, all analytical functions will be resident on the Sparcstation.

A Paleogeographic Atlas of Canada, for the period 18,000 to 1,000 years B.P., is being compiled using ARC/INFO GIS. The atlas will consist of a series of "time-slice" maps depicting ice margin positions, glacial lakes, and paleocoastlines, in conjunction with associated pollen sample sites of each period.

Geochemical data sets collected by Terrain Sciences Division can be entered into the info data engine of ARC/INFO, thus permitting the display of geographic location of samples for any area; retrieval and display of sample subsets; and extraction of samples containing specific values and construction of three-dimensional surface plots.

GIS are being used to store and manipulate information on the surficial geology, geomorphology and permafrost conditions in the Mackenzie Valley Corridor. This information will be combined with digital terrain models, borehole stratigraphy, and ground thermal information to produce predictive impact maps of terrain sensitivity to changing climatic conditions.