

Aeromagnetic Surveying in Wisconsin 1998-99:  
Digital Data Files  
by Robert E. Bracken and Suzanne W. Nicholson  
U.S. Geological Survey Open-File Report 99-527

## DATA DESCRIPTION

### Navigating on this CD

The data products have been placed on this disk in a digital directory structure that allows specific information and data objects to be found quickly. Beginning at the entry point (the main folder), choose among only three sub-folders and examine the contents of the folder you select. Keep following this procedure until you find the desired information or data object. This process is facilitated if you are using an IBM-style PC computer with a Windows operating system and Word or Adobe compatible reading software. In this case, you can navigate among the read\_Nth. files via a system of hyper-links. Begin by opening the [read\\_1st.](#) file in the main folder. The rest should be self-explanatory.

The pdf\_pgm\ folder contains a program for reading .pdf files. A pdf reader will allow you to take advantage of the hyper-linked system.

### Survey Specifications

The flight lines were nominally spaced 800 meters apart and trended North-South with a flight altitude of 304 meters above ground level. Control-lines were spaced 12500 meters apart and trended East-West. However, in the southeast corner of the survey area surrounding Milwaukee, the flight lines were East-West and the control-lines North-South.

The magnetic data were sampled every 0.1 seconds using a Geometrics G-822a cesium sensor and a High-Sense frequency counter, with a resultant resolution of about 0.005 nT per sample. Data samples were effectively taken every 6 meters of ground distance.

Radar, Barometric, and GPS altitudes were recorded and are included in the line data set found elsewhere on this CD. Base magnetometer data were also collected and are supplied as an independent channel in the line data set. Surveying was disallowed during the relatively few periods of greater geomagnetic activity.

Navigation and position recovery were accomplished using a Global

Position System (GPS) and differential corrections. The expected horizontal accuracy is on the order of 3 meters.

Additional details may be found in the appendix, which contains the [logistics report](#) provided by the contractor, High-Sense Geophysics Limited.

#### Survey Time-frame, Location, and Extent

The survey was flown between September 15, 1998 and February 21, 1999. During this time 74,000 line kilometers of magnetic data were collected.

Excluding three previous survey areas, this survey filled the southern one-third of the state of Wisconsin being bounded on East by Lake Michigan, on the South and West by the Wisconsin state line, and on the North by the 44th parallel, but also included a substantial North-East extension over Green Bay. The [index map](#) shows a color map of the complete survey area superimposed on a black and white reference map.

#### Digital Data Products

The original digital data products included 14 line-data files sampled at 1/10 second intervals and 2 gridded data sets, one magnetic data and the other radar-altitude data. This CD contains those data products plus a 1-second winnowed line-data set and Images of a shaded shaded relief map made from the magnetics grid. Following are short descriptions of each:

Line Data, 1/10-second: An ASCII data set consisting of 14 files that have been compressed. The [compressed data files](#), [summaries of the contents of each file](#), and a [channel and format description](#) is given on this CD in the folder named cmpressd\.

Additionally, [programs](#) and [instructions](#) for uncompressing the files ([Bracken, 2000](#)) on various computer types are included under cmpressd\cmprpgms\.

The uncompressed data set will take about 2 Gb of disk space with each file averaging 150 Mb. The formatting of the ascii files is such that "free-form" reads with a fortran program are difficult; specific formats are necessary.

Winnowed Line Data, 1-second: The original 1/10-second data was winnowed by a factor of 10 to a 1-second interval. These [files](#) are included in the winnowed\ folder, taking about 200 Mb. They may be viewed immediately with a good ascii editor. A description of the [winnowing process](#) is included in the folder. Their [summaries](#), and [channel and format description](#) are the same as the original data.

Gridded Data: Two large gridded data sets were provide by the contractor, one is the final leveled [magnetic](#) data, the other of [radar altimeter](#) data. Both grids are provided in [Grid Exchange format](#) and the magnetics grid has been translated to various

other formats as well. They may found in the grid\ folder along with descriptions of the more common formats. Additionally, A usgs standard file (grid) has been included. This file format may be used directly in the USGS potential-field [geophysical-processing software](#) ([Phillips, 1997](#)) also included on this CD in the procpgms\ folder.

Imaged Map: A map was produced from the magnetics grid, and images are provided in various formats for [800](#), [400](#), and [200](#) meter pixel sizes. These may be found in the reports\images\ folder. The light source for shading is from the South-East.