

Wisconsin Geological and Natural History Open-file Report 2001-03

PRELIMINARY ANALYSIS OF AEROMAGNETIC DATA IN SOUTHERN WISCONSIN: THE ROLE OF PRECAMBRIAN BASEMENT IN PALEOZOIC EVOLUTION

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This Wisconsin Geological and Natural History Survey Open-file Report is the diagrams, data, and text for a poster presentation at the 47th Annual Institute on Lake Superior Geology (ILSG) held in Madison, Wisconsin, May 9-12, 2001.

The files include

518,198	Figure_1.bmp	Shaded relief map with bedrock geology
170,834	Figure_1.jpg	Shaded relief map with bedrock geology
519,390	Figure_1.tif	Shaded relief map with bedrock geology
522,294	Figure_2.bmp	Shaded relief map with contours
155,984	Figure_2.jpg	Shaded relief map with contours
523,486	Figure_2.tif	Shaded relief map with contours
1,643,574	Figure_3.bmp	Contour map
145,390	Figure_3.jpg	Contour map
1,645,880	Figure_3.tif	Contour map
28,160	ILSGAbstract.doc	ILSG Abstract
3,243	ILSGAbstract.TXT	ILSG Abstract
5,787	ILSGAbstract.wp8	ILSG Abstract
6,464,300	SOWISC.DAT	grid in ASCII XYZ
590,586	SOWISC.GRD	USGS binary grid
2,391,278	SOWISC.AGR	USGS ASCII grid
	WOFR.doc	Readme file in Microsoft Word
	WOFR.txt	Readme file in ASCII txt
	WOFR.wp	Readme file in WordPerfect

The state diagrams were made by digitally blending the data from 5 surveys flown between 1948 and 1999. Flight lines are 800m apart or less for southern Wisconsin, giving the aeromagnetic map nearly uniform specifications. All surveys were either flown at or continued to an elevation of 305m above terrain prior to assembling into a grid. The data interval of the grid is 500 m.

In the ILSG presentation, we show a preliminary analysis of the total field aeromagnetic data south of 43.5° in Wisconsin, for which there is little Precambrian information either from outcrop or cuttings from deep boreholes.

The data from the individual survey was project from longitude-latitude into a UTM projection with a central meridian of -90 longitude, base latitude of 00 . A false easting of 500,000 was added.

The point data from of the individual aeromagnetic data reports were interpolated into individual binary, USGS-style grids by using a minimum curvature gridding algorithm (program MINC, Phillips, 1997) at 500 m gridding interval. USGS grids and binary point files were

WOFR.TXT

manipulated using USGS (DOS) software for the PC (Phillips, 1997). This freeware may be downloaded from <ftp://greenwood.cr.usgs.gov/pub/open-file-reports/ofr-97-0725/pfofr.htm>. SOWISC.GRD is the USGS binary grid, SOWISC.AGR is the USGS ASCII grid, and SOWISC.DAT is the grid data in ASCII. Conventions for gridding the data were: origin [Easting 319500, 500-meter interval, 597 columns, 4703500; Northing 4703500, 500-meter interval, 243 columns]. Large grid values (1.0E+39) represent areas of no data.

The TIF, BMP and JPG images of the diagrams produced from the SURFER software.

Figure_1 Shaded relief map of total field aeromagnetic data with superposed geology from Mudrey, Brown and Green (1982)

Figure_2 Shaded relief map of total field aeromagnetic data with superposed colored contours at 50 nanoteslas (gammas).

Figure_3 Total field aeromagnetic data contoured at 20 nanoteslas (gammas).

REFERENCES

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Mudrey, M. G., Jr. Flight-line aeromagnetic data for Dodge, Fond du Lac, and Calumet Counties, southeastern Wisconsin: Wisconsin Geological and Natural History Survey Open-file Report WOFR 1996-03, 2 p. with 1 CD-ROM.

Mudrey, M. G., Jr., 1998, Flight-line gridded aeromagnetic data for Kenosha, Racine, and Walworth Counties, southeastern Wisconsin: Wisconsin Geological and Natural History Survey Open-file Report WOFR 1998-06, 2 p. + 1 3.5-in. diskette.

Mudrey, M. G., Jr., Brown, B. A., and Greenberg, J. K., 1982, Bedrock Geological Map of Wisconsin: Wisconsin Geological and Natural History Survey, State Map 18.

Phillips, J. D., 1997, Potential-Field Geophysical Software for the PC, version 2.2: U. S. Geological Survey Open-File Report 97-725 34 p.

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