

Geophysics 150: Home set due Dec. 04, 2000

1. Attached is a gravity and magnetic map for Michigan. There is a equidimensional anomaly in NW Lake County, ~44N, 86W. The originals are on reserve in the library. [The maps are available as *Gravity and Aeromagnetic Anomaly Maps of the Southern Peninsula of Michigan*, Rept. of Investigation 14, Department of Natural Resources, Geological Survey Divison, State of Michigan, 1971.]

a. Model the gravity anomaly with a simple body. What is the depth to the center of the body.? There are other anomalies present so you may wish to remove a regional gradient or try a simple filter like second derivative if you have computer and time. Otherwise get reasonable eyeball fit.

b. Compute magnetic anomaly for your gravity body. You can assume dipole field at latitude about 44 degrees for the site. The declination of the field here is due north which is nice. Get a good eyeball fit by adjusting the magnetization of the body.

c. Do you think same body is causing both anomalies. Is there any significant remanent magnetization? Explain.

Ambitious people can do more on computer.

2. The depth to the basement here is about 1.5 km and the sediments above the basement are not magnetic. How does that effect the shape of your body?