

GEO369 – Introduction to Geophysics

Homework – Gridding and contouring using GMT

Due September 21, 2004.

In the contouring lab exercise you contoured the gravity data from the Goodenough Bay by hand. Use the following script to grid and contour the same data using GMT. The gridding step serves to extrapolate the data onto an even grid – a necessity with this program prior to contouring. I fully expect you to need my help with this exercise, so please come and ask for it. Please address the following points:

1. Plot out the contour map created with GMT
2. Comment on the differences between the GMT map and the one you did by hand. For example, what might be some of the undesirable features of the GMT contour map.
3. How might you make the contour map better?
4. Are there any other gridding algorithms out there that might do a better job?
5. Hand in both contour maps and your comments.

Out of a total score of 100, grades will be assigned as follows:

- Presentation (neatness of contour maps, etc): 30%
- Clarity of write up: 20%
- Discussion of differences between the contour maps: 15%
- Discussion of possible improvements: 15%
- Discussion of other gridding algorithms: 10%
- Demonstration of an overall understanding of this assignment: 10%

Change directory to your class6 directory

```
cd GEO369/Class6
```

Open a new file named contour.csh

```
xemacs contour.csh&
```

In the xemacs window type the following (remember that if you want to know what the parameters mean in a GMT command, type `man command`, i.e., `man psxy`, on the command line in your terminal window):

```
#!/bin/csh
```

```
#Set the bounds of the grid and subsequent map  
set R = -R149.6/151.1/-10.4/-9.4
```

```
#For each 0.01 by 0.01 grid cell, calculate the median  
value and place it at the median location
```

```
blockmedian /home/imiloal/amg/GE0369/Class6/Goodenough.xyg  
-I0.01 $R >! Goodenough.bm
```

```
#Use a continuous curvature spline to extrapolate the data  
to an even grid spacing using a tension of 0.5  
surface Goodenough.bm -GGoodenough.grd $R -I0.01 -V -C1 -  
N200 -T.5 -Z1.4
```

```
set J = -JM6.5  
set B = -Balf10m  
set psname = contour.ps  
psbasemap $R $J $B -K >! $psname  
#plot the original xy locations to serve as a guide  
psxy Goodenough.xyg -Sp $R $J -O -K >> $psname  
#contour the data at a 5 gGal contour interval  
grdcontour Goodenough.grd -C5 $R $J -O -K -V >> $psname  
#plot the coastline as a one point wide black line  
pscoast $R $J -Df -Wlp/0 -O -K >> $psname  
psbasemap $R $J $B -O >> $psname  
ghostview $psname&
```