

MB-System at a glance

http://www.mbari.org/data/mbsystem/html/mbsystem_man_list.html

Dealing with incoming hull-mounted multi-beam survey data

1. Put downloaded raw file(s) on heckel, in a new directory named with the official cruise ID.
2. If compressed file is .tar.gz: `gunzip <filename.tar.gz>` first,
then `tar xvf <filename.tar>`
If compressed file is .tgz: `gunzip < filename.tgz | tar xvf -`
3. Make datalists in the new directories
 - a. run `mbdataformat` to see list of supported formats and IDs;
`mbinfo -I <filename>` will show you what format a file is
`mbinfo -L 0` forces longitude to be positive
 - b. make datalist: `mbm_makedatalist`
or, for example for format 41 (as from Atlantis):
`ls -l(note: numeric "one") *.mb41 | awk '{print $1" 41"}' > datalist.mb-1`
 - c. `mbdatalist -z` will make a `datalistp.mb-1` file.
 - d. add `<new directory>/datalist.mb-1 -l` to datalist(s) in directory(ies) above the new one to make datalist(s) recursive back to to host institution level
4. Special needs: (a) Simrad, as from Kilo Moana, and (b) GSF
 - a. Make a datalist of the raw files (=mb56 → `datalist-raw.mb-1`).
Translate to mb57:
`mbm_copy -f57 -I datalist-raw.mb-1`
Make a datalist (`datalist.mb-1`) of the mb57 files:
`ls -l("one") *.mb57 | awk '{print $1" 57"}' > datalist.mb-1`
and run `mbdatalist -z`
 - b. GSF files have suffixes like .d01 (mbinfo will confirm the format);
make datalists with the format code = 121.
5. Run `mbdatalist -O -V` to go through recursive datalist structure, check if ancillary files exist and are younger than data, and make ancillary files if appropriate.
`mbdatalist -N -V` overwrites .inf and etc. files if you need to start over.

AUV survey data: Put in assigned MappingAUVOps directory. Run steps as detailed in process.cmd. To work on the files on Tempest, mount directory as \\Tempest\\MappingAUVOps200x\\etc. To reference files in MB-System scripts, the corresponding path is /Volumes/MappingAUVOps200x/etc.

Edit multibeam data

1. Find appropriate data set directory to work inside on heckel
(all data is now in /Volumes/RAID/caress/swathdata/surveys/)
`cd /Volumes/RAID/caress/swathdata/surveys/UH/0307/`
2. Show all files involved in a lat/lon box, output to text file
`mbdatalist -Rwest/east/south/north > <filename.txt>`
-I if datalist is in another directory
3. To change sound velocity profile used (must specify approx draft of ship)
`mbset -I datalist.mb-1 -P SVPFILE:filename.svp -P DRAFT:5.18 -V`
`mbprocess -I datalist.mb-1`

- N - not annotated* *NF*
4. To make nav track plot (or, open in mbgrdviz and enable nav)
`mbm_plot -NF -F-1 -I ../datalist.mb-1 -X FR... -G2 -D0/1 -O ...`
 (-NF annotates the tracklines, -X runs shell script, -G2 etc for bathy)
 5. Filter (suggest copying out .par files first in case of screw up)
`mbareaclean -I<datalist.mb-1> -M -B (not -G) -S (try 25,50)`
 algorithms don't work so well on steep slopes)
 6. Edit data with mbedit
`mbedit &` (& or `ctrl-z`, bg will run mbedit in the background)
 File → to load data (.mb41, etc. are the raw files; use appropriate format ID)
 View → Waterfall or Along track
 Key macros: e,r,z,2,3
 7. To tarball edit files only for ftp to someone who has the raw data already
 - A. Create directory structure that mimics that on heckel but in home directory
 - B. Create command file to take all files edited recently (specify month) and copy edit files to each subdirectory in the new target directory structure
`ls -l | grep esf | grep <month> | grep -v tmp |`
`awk '{ print "cp \"$9\" ~/<path>/" }' > cp.cmd ($9=9th field)`
`chmod +x cp.cmd`
`source cp.cmd`
 - C. Tarball the directory: do from the directory above target directory:
`tar cvf <tarfilename.tar> <directoryname>`
`gzip <tarfilename.tar>`
 - D. Ftp the tarball. Instruct users to unzip (gunzip), untar (`tar xvf` or `xvpzf`), copy the edit files into the appropriate directories in their archive, reassociate them with the raw files by running `mbdatalist` from the directory above any directories involved (`mbdatalist -Idatalist.mb-1 -v -Q`) reprocess the data with `mbprocess` (`mbprocess -Idatalist.mb-1`) and `regrid`.

Process and grid edited data

1. Process on highest datalist to cover files involved
`mbprocess -Idatalist.mb-1`
2. Grid the processed datalist (e.g., `datalistp`) within the desired bounds (for ~4000m water, cellsize of 100 to 150m for SeaBeam). Default is bathymetry (-A2) use -A4 for sidescan
`mbgrid -I datalistp.mb-1 -f5 -A2 -Rw/e/s/n -O <gridname>`
`-E<cellsize>/0! -N -C2`
3. Execute resulting .cmd file by typing the .cmd filename at the command line
4. Transform to ESRI ASCII Raster format for importing into ArcView
`mbm_grd2arc -I <gridname.grd> -v -O <gridname.asc>`

Make a new datalistp from subset of an old datalist

`mbdatalist -I datalist.mb-1 | grep em120 > em120_datalistp.mb-1`

In first line of new datalist, put \$PROCESSED so it will use processed files if they exist.

Create a command file to grid, create an E-size .ps file of slope-shade, a haxby sunshade TIFF image, and convert the grid to ASCII raster format, employing all survey data, with a preference to processed data. Don't want larger than 5000x5000 cell grid or MB will crash, 4000x4000 for ESRI.

1. Create (or edit an existing) command file script (suggest `<gridname.cmd>`)

```
mbgrid -I /Volumes/RAID/caress/swathdata/surveys/datalistp.mb-1 \
-O <gridname> \
-R w/e/s/n \ (w/e/s/n = West,East,South,North bounds for grid)
-A2 -F5 -N \
-K21 or -K15 \ (if you want GeoWare Wessel-Smith predicted topography included)
-J UTM05N \ (if you want UTM projection; zone 05N = Hawaii, 10N = Monterey)
-C2 \ (if you want interpolation)
-X2 \ (to extend interpolation consideration beyond bounds, use only on small grids)
-V \ (if you want to see all files; take off to show only those with data in the region)
-E<cellsize>/<cellsize> (for grids never to be used in ESRI)
-E<cellsize>/0! (for ESRI grids to be made, cells need to be square, hence /0! Cellsize might be
40 m for deep water EM300 data, 150m for SeaBeam. Maximum grid size: 4000x4000 cells.)
```

```
mbm_grdplot -I <gridname.grd> \
-G5 -D0/1 -T -Z <min/max> \
-V -PE \
-O <filename_slope>
<filename_slope.cmd>
```

(-T masks the land; -Z overrides default min/max of the gridded data, also affecting the color palette; -C<interval>, -MCA<interval> for contours; -MTW for coast; -MGQ sets dpi; -A for slope shade intensity; -S histogram equalize...use -W to run against a CPT file you create from hist equal; omit -PE for letter sized plot; -U1 to force it to be portrait; -L "title": "Depth(m)". To make lat axis labels || to axis, at command line type: gmtset OBLIQUE_ANNOTATION = 33.)

```
mbm_grdtiff -I<gridname.grd> \
-G5 -D0/1 -V -O <filename_slope>
<filename_slope_tiff.cmd>
```

G - color
D flip color / flip shade (D/1 flips color)
MWI - Swathdata

```
mbm_grd2arc -I<gridname.grd> \ (creates ESRI ASCII raster file, make ESRI grid with ArcToolbox,
-V -O<gridname.asc> Conversion Tools → From Raster → ASCII to Raster)
```

2. Make executable (chmod +x <filename.cmd>) and type <filename.cmd> to run

Plot gridded data (type ghostview *.ps to see plots, xv *.tif to see images)

Note that mbm_grdtiff -R option requires decimal degrees and can't take dd:mm:ss format.

1. Postscript, slopeshade, letter-size plot, no contours, haxby colors
mbm_grdplot -I<gridname.grd> -G5 -D0/1 -V -O<plotfilename>
2. Registered TIFF, slopeshade, haxby colors
mbm_grdtiff -I<gridname.grd> -G5 -D0/1 -V -O<filename_colorslope>
3. Registered TIFF, slopeshade, grayscale
mbm_grdtiff -I<gridname.grd> -G5 -D0/1 -W1/5 -V -O<filename_grayslope>
4. Registered TIFF, hillshade, haxby colors (default), letter-size (default), with haxby colors covering only a determined range (optional; overrides default color scaling)
mbm_grdtiff -I<gridname.grd> -G2 -V -O<filename_colorshd> -Z min/max
5. Registered TIFF, hillshade, grayscale
mbm_grdtiff -I<gridname.grd> -G2 -W1/5 -V -O<filename_grayshd>
6. Registered TIFF of sidescan data (use mbmosaic first)
mbmosaic -A4 -1/<priority file> -R w/e/s/n/ -O<filename_ss> -N -E<cellsize>/0!
gsf format data: per beam amplitude, use -A3
mbm_grdtiff -I<gridname.grd> -G1 -W1/4 -S -V -O<filename_ss>

Mbm plot

-N -F1 -I datalist -X

-G2 -D0/1 -O out put

To make maps using predicted topo only

grdraster 15 -Rw/e/s/n -Goutput.grd (note no spaces for GMT commands; use 21 for higher res)

Unix stuff

Tail -f <file_list.txt> to view a log file as it grows

Use & at end of command line to start process in the background

ctrl z to pause process (ctrl c to end it)

bg to put process in background, where closing the shell window won't kill it

fg to put it in foreground

ps -a or ps -ael to view process list; kill -9 <PID> to kill process

ef | grep paje to view entire process list restricted to paje

top to view top processes running on machine.

q to get out of man pages

du <filename> to get disk usage (file sizes) of directory/file

nedit <filename> & or use vi to edit

command.cmd >& list & (note spaces) writes all verbage, including core dumps, to a file named list and performs command.cmd in the background.

To break between lines in GMT scripts use > characters, in MB-System use # characters.

Define shell window names in .xinitrc

Change lonflip preference from within .mbdefaults

If encounter permissions problems, login as caress_local.

To give recursive read/write permissions: sudo chmod -R g+rw <directory> (or *)

To make myself the owner: sudo chown -R paje <directory> (or *)

To log in from a Mac

1. Mount heckel (Finder window: Go → Connect to network server; type

aftp://heckel.shore.mbari.org; select RAID from pulldown.

2. Start X11.

3. (a) Work locally for more efficient graphics; (b) work on heckel for more efficient computations:

a. At command line, type cd /Volumes/RAID/etc to navigate into heckel.

b. At command line, type xhost + then ssh heckel and log in as user paje;

cd /Volumes/RAID/etc

Don't close the lid on a Mac laptop while a process is running!

More MB-System misc

To output nav as x,y: mblist -F-1 -I datalistp.mb-1 -OXY -V -X <filename.xy> Nav data → x,y file

To decimate nav: awk '{if (NR%5==0) {print}}' input file > decimated file Take every 10 Nav lines

To output GRD grid as x,y: grd2xyz file.grd > output.txt also mbm→grd zero.

To find min longitude in a survey: grep "MinimumLongitude" *.inf

Reading text files in to mbm_grdplot

To get datafile read with mbm_grdplot, file must be long,lat and no column titles.

For reorganizing data (as in "long,lat" from file containing "site lat long"):

cat file.txt | awk '{print \$3,"",\$2}' > newfile.txt

For red dots (note no spaces; don't need for lines):

-MXSc0.1c 0.1cm circles

-MXW1/255/0/0 red outlines

-MXG255/0/0 red fill

For one pixel lines, as for nav: -MXW1p

To read in the text file, *after* all the above: -MXI<filename_xy.csv>

control C - quit.