NAME

mbextractsegy – extracts subbottom profiler, center beam reflection, or seismic reflection data from swath data supported by MB-System and rewrites it as a SEGY file.

VERSION

Version 5.0

SYNOPSIS

mbextractsegy [**–B***yr/mo/da/hr/mn/sc* **–E***yr/mo/da/hr/mn/sc* **–F***format* **–I***file* **–J***xscale/yscale/maxwidth* **–L***startline/lineroot* **–M** **–O***segyfile* **–Q***routetimefile* **–R***routefile* **–S***sampleformat* **–T***timeshift* **–U***rangethreshold* **–Z***plotmax* **–V** **–H**]

DESCRIPTION

MBextractsegy is a utility for reading a swath sonar data file or files, extracting subbottom profiler, center beam reflection, or seismic reflection data, and outputting that selected data as a SEGY file. Parameters such as sonar depth, seafloor depth, and position are embedded into the SEGY data. The SEGY files are output in a form used by the seismic reflection processing package **SIOSEIS**. A "sinf" file containing statistics about the content of the SEGY file is created automatically by **MBextractsegy**; this file is named by adding a ".sinf" suffix to the SEGY filename.

At present, the only swath data formats from which subbottom data can be extracted are format 88 (Reson 7k format), format 132 (Edgetech Jstar format), and format 133 (Edgetech Jstar format).

The extracted segy data file(s) can be organized three ways. If the **–O** option is used to specify a single segy output file, then all of the segy data will be output to that single file. If either the **–Q** or **–R** options are used to specify a survey route file that includes the waypoints covered while collecting the data file(s) referenced by **–I***file*, then the output segy data will be broken up by the sequential lines defined by the waypoints. The **–Q** option specifies a route file that includes the time at which each waypoint is reached in the data, and the **–R** option specifies a route file of the form exported by **MBgrdviz**. In the waypoint-driven case each output segy file will be named using the line root name specified by **–L***startline/lineroot* with a sequential line number starting from *startline*. If neither the **–O** or **–L** options are used, each input swath file will have a corresponding segy output file with the ".segy" suffix added to the original filename.

MBextractsegy also generates a "first cut plot" script that will generate grayscale section plots in Postscript of each segy file using the programs **MBsegygrid** and **mbm_grdplot**. The **–Z** sets the trace value corresponding to the maximum grayscale (black) in the section plots.

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OPTIONS

–B *yr/mo/da/hr/mn/sc*
This option sets the starting time for data allowed in the input data. The **–E** option sets the ending time for data. If the starting time is before the ending time, then any data with a time stamp before the starting time or after the ending time is ignored. If instead the starting time is after the ending time, then any data between the ending and starting time will be ignored. This scheme allows time windowing both inside and outside a specified interval. Default: *yr/mo/da/hr/mn/sc* = 1962/2/21/10/30/0. **–E** *yr/mo/da/hr/mn/sc*
This option sets the ending time for data allowed in the input data. The **–B** option sets the starting

time for data. If the starting time is before the ending time, then any data with a time stamp before the starting time or after the ending time is ignored. If instead the starting time is after the ending time, then any data between the ending and starting time will be ignored. This scheme allows time windowing both inside and outside a specified interval. Default: *yr/mo/da/hr/mn/sc* = 2062/2/21/10/30/0.

–F *format*
Sets the data format used if the input is read from stdin or from a file. If *format* < 0, then the input file specified with the **–I** option will actually contain a list of input swath sonar data files. This program uses the **MBIO** library and will read or write any swath sonar format supported by **MBIO**. A list of the swath sonar data formats currently supported by **MBIO** and their identifier values is given in the **MBIO** manual page. The default format is set using the program **mbdefaults**..

–H This "help" flag cause the program to print out a description of its operation and then exit immediately.

–I *infile*
Sets the input file path. If *format* > 0 (set with the **–f** option or **mbdefaults**) then the swath sonar data contained in *infile* is read and processed. If *format* < 0, then *infile* is assumed to be an ascii file containing a list of the input swath sonar data files to be processed and their formats. The program will read the data in each one of these files. In the *infile* file, each data file should be followed by a data format identifier, e.g.:

    datafile1 11
    datafile2 24

This program uses the **MBIO** library and will read or write any swath sonar format supported by **MBIO**. A list of the swath sonar data formats currently supported by **MBIO** and their identifier values is given in the **MBIO** manual page. Default: *infile* = "stdin".

–J *xscale/yscale/maxwidth*
Sets the scale of the default section plots. The *xscale* value is in inches per shot, and the *yscale* value is in inches per second. The *maxwidth* value sets the maximum plot width in inches. If *xscale* and the shot range imply a width greater than *maxwidth*, then the section will be broken up into multiple plots. Default: *xscale* = 0.01; *yscale* = 75; *maxwidth* = 45.0

–L *startline/lineroot*
This option sets the starting line number and the output filename root used when **–R** is specified so that data are output according to planned survey lines. Default: *startline* = 1; *lineroot* = "sbp".

–M
This option causes **mbextractsegy** to omit data during turns when extracting into line files according to a specified set of waypoints (**–R** option). The traces will not be output until the heading is within 15 degrees of the next survey line's bearing.

–O
This option sets the output SEGY file path. If neither **–O** nore **–R** are invoked, the output SEGY filename (or files if a datalist is being processed) will be the input swath filename with ".segy" appended.

–Q *routetimefile*
This option specifies route file containing the times that the survey reached the intended waypoints. This text file consists of lines of the form:

    count waypoint longitude latitude heading time_d

where count is just an integer counter starting at 0, waypoint is the waypoint number starting at 0, longitude and latitude are the waypoint position in decimal degrees, heading is the heading in decimal degrees, and time_d is the unix or epoch time (time since 00:00:00 January 1, 1970) in decimal seconds that the survey reached this waypoint. This file can be generated from an **mbgrdviz** route file and survey data using the program **mbroutetime**. If *routetimefile* is specified, **mbextractsegy** will output SEGY data in files corresponding to the planned survey lines. The output SEGY file names will be based on *lineroot* and will include the line number starting with *starline*, both of which are specified using the **–L** options. If neither **–O** nore **–R** are invoked, the output SEGY filename (or files if a datalist is being processed) will be the input swath filename with ".segy" appended.

–R *routefile*
This option specifies an **mbgrdviz** route file containing the intended waypoints of the survey. If *routefile* is specified, **mbextractsegy** will output SEGY data in files corresponding to the planned survey lines. The output SEGY file names will be based on *lineroot* and will include the line number starting with *starline*, both of which are specified using the **–L** options. If neither **–O** nore **–R** are invoked, the output SEGY filename (or files if a datalist is being processed) will be the input swath filename with ".segy" appended.

–S *sampleformat*
Sets the sample format desired for use in the output SEGY file. Options include:

    MB_SEGY_SAMPLEFORMAT_NONE 1
    MB_SEGY_SAMPLEFORMAT_TRACE 2
    MB_SEGY_SAMPLEFORMAT_ENVELOPE 3
    MB_SEGY_SAMPLEFORMAT_ANALYTIC 4

MB_SEGY_SAMPLEFORMAT_TRACE implies that the seismic trace is in the original, most raw form with both positive and negative values. MB_SEGY_SAMPLEFORMAT_ANALYTIC implies that the trace has been been transformed from the original time series to an analytic signal containing both real and imaginary parts. Both the real and imaginary signals are stored in the SEGY file. MB_SEGY_SAMPLEFORMAT_ENVELOPE implies that the analytic signal has been reduced back to a single real, positive-only envelope signal by taking the magnitude of the real and imaginary parts at every sample. It is important to note that this option only sets the desired sample format, and the program may find it necessary to store the data in an alternate form. For instance, if the user specifies MB_SEGY_SAMPLEFORMAT_TRACE or MB_SEGY_SAMPLEFORMAT_ANALYTIC but the swath file only contains envelope data, the data will be written in the envelope form. The default value of MB_SEGY_SAMPLEFORMAT_NONE allows the program to choose the most appropriate sample format.

–U *rangethreshold*
If the **–R** option is specified, **mbextractsegy** breaks up the output into files corresponding to survey lines specified in a route file. This option sets the threshold distance in meters used to determine when a waypoint along the route has been reached; the program considers the next waypoint reached when the range to the waypoint becomes smaller than *rangethreshold* and then ceases to decrease. Default: *rangethreshold* = 25 m.

–Z *plotmax*
Specifies the trace value corresponding to the maximum grayscale (black) in the section plots. Default: *plotmax* = 50.

–V This option increases the verbosity of **mbextractsegy**, causing it to print out messages regarding its progress to stdout.

EXAMPLES

Suppose that one has collected a set of Reson 7k datafiles incorporating multibeam sonar data, sidescan data, and subbottom profiler data, and that the filenames are:

    20040722_152111.s7k
    20040722_154429.s7k
    20040722_160809.s7k

In order to extract the subbottom data into segy files, one can use **mbextractsegy** on each file in turn, for example:

    mbextractsegy –I 20040722_152111.s7k

which yields the following output:

    2527 records output to segy file 20040722_154429.s7k.segy

In this command the 7k file format id of 88 is inferred from the ".7k" filename suffix.

One may also input a datalist file referencing all of the 7k files. The contents of a datalist file (typically named datalist.mb-1) would look like:

```
20040722_152111.s7k 88
20040722_154429.s7k 88
20040722_160809.s7k 88
```

where the second column is the data format id (see the **mbsystem** man page for a discussion of datalist files). To operate on all the files in a single command, use:

```
mbextractsegy –I datalist.mb-1
```

which yields the following output:

```
2527 records output to segy file 20040722_154429.s7k.segy
2568 records output to segy file 20040722_160809.s7k.segy
2569 records output to segy file 20040722_163148.s7k.segy
```

In this command the datalist format id of −1 is inferred from the ".mb-1" filename suffix.

Use of the **−V** option causes **mbextractsegy** to output information about every tenth record written to a segy file. So:

```
mbextractsegy –I 20040722_152111.s7k –V
```

which yields the following output:

```
2527 records output to segy file 20040722_154429.s7k.segy
Outputting subbottom data to segy file 20040722_152111.s7k.segy
file:20040722_152111.s7k record:10 shot:65 2004/204 15:20:42.083 samples:8330 interval:64 usec minmax: 0.000000 17487.244141
file:20040722_152111.s7k record:20 shot:75 2004/204 15:20:47.698 samples:8330 interval:64 usec minmax: 0.000000 16525.875000
......... lines omitted ..........
file:20040722_152111.s7k record:2510 shot:2565 2004/204 15:44:05.893 samples:8330 interval:64 usec minmax: 0.000000 17616.189453
file:20040722_152111.s7k record:2520 shot:2575 2004/204 15:44:11.507 samples:8330 interval:64 usec minmax: 0.000000 31888.093750
2527 records output to segy file 20040722_152111.s7k.segy
```

MBextractsegy also generates a "sinf" file containing statistics about the data in the segy file 20040722_152111.s7k.segy. The contents of the sinf file 20040722_152111.s7k.segy.sinf are:

```
SEGY Data File:      20040722_152111.s7k.segy

File Header Info:
  Channels:                        1
  Auxiliary Channels:              0
  Sample Interval (usec):          64
  Number of Samples in Trace:      8330
  Trace length (sec):              0.533120
  Data Format:                     IEEE 32 bit integer
  CDP Fold:                        0

Data Totals:
  Number of Traces:                2527
  Min Max Delta:
    Shot number:                   56     2582     2527
    Shot trace:                    1      1        1
    RP number:                     56     2582     2527
    RP trace:                      1      1        1
    Delay (sec):                   0.000000 0.000000 0.000000
    Range (m):                     0.000000 0.000000 0.000000
```

```
    Receiver Elevation (m):   −224.030000 −2.860000 −221.170000
    Source Elevation (m):     −224.030000 −2.860000 −221.170000
    Source Depth (m):         2.860000 224.030000 −221.170000
    Receiver Water Depth (m): 51.510000 487.670000 −436.160000
    Source Water Depth (m):   51.510000 487.670000 −436.160000

Navigation Totals:

  Start of Data:
    Time:  07 22 2004 15:20:37.029000  JD204
    Lon: −121.8573     Lat:   36.7755

  End of Data:
    Time:  07 22 2004 15:44:15.438000  JD204
    Lon: −121.8572     Lat:   36.7952

Limits:
  Minimum Longitude:    −121.8574   Maximum Longitude:    −121.8572
  Minimum Latitude:       36.7755   Maximum Latitude:       36.7952
```

SEE ALSO

mbsystem(1), **mbsegyinfo**(1), **mbsegylist**(1), **mbsegygrid**(1), **SIOSEIS**(http://sioseis.ucsd.edu/)

BUGS

Doesn’t support all of the data formats containing subbottom or center beam reflection data..