NAME

mbsvpselect – Mbsvpselect chooses and implements the best available sound speed model for each swath file in a survey

VERSION

Version 5.0

SYNOPSIS

mbsvpselect -N -V -Idatalist -Ssvplist -Pmode[/criteria[/submode]]

[-P0, -P1, -P2/period, -P3/range, -P3/range/1] **mbsvpselect [–C –D –F***format* **–H –I***file* **–M***mode* **–O –P –S –V –Z]**

DESCRIPTION

Mbsvpselect chooses and implements the best available sound speed model for each swath file in a survey. The user provides a list of the available sound speed models and specifies the criteria used for model selection. The program uses mbset to turn on bathymetry recalculation by raytracing through the sound speed model selected for each swath file.

Description:

The tool aims to help users to automatically apply the sound velocity correction to the survey files. since most surveys involve several SVPs, the seletion of the appropriate SVP for each survey profile is still missing in MB-System.

After finding the appropriate svp for each profile based on the choosed method, the results are copied to a txt file that shows each survey profile with the corresponding SVP. the tool also calls mbset automatically so no need to assign SVP to the data. it is done automatically.

There are 5 methods for choosing the appropriate SVP for each survey profile. These methods are:

1. Nearest SVP in position: the middle position of each survey profile
   is calculated and the geodesics (shortest distance on the ellipsoid)
   to all SVPs are calcualted. and the SVP with the shortest distance is
   chosen. when the middle position of the survey profile is calculated
   there is an option to check for 0 lat 0 long wrong values. if it is
   found at the starting the geodesic will be calculated to the end of
   the profile.

2. Nearest in time: the time interveal between the starting time of
   the profile and the time of the SVP, and the SVP with the shortest
   interval will be chosen.

3. Nearest in position within time: a default time radius from the
   profile is set as 10 hours, and within this period the nearest SVP
   in position is chosen. if none of the SVPs are within this period the
   nearest in position will be taken despit of the period threshold. The
   period threshold can be set by the user.

4. Nearest in time within range: similar to the previous option but
   this time a default range of 10000 meters is set and within this range
   the svp nearest in time is chosen. also this 10000 meter value could
   be set by the user.

5. Nearest in season within range: similar to the previous option the
selected SVP could be chosen based on the month only not on the year.
it means within the specified range the user could chose either the svp
nearest in time or the svp nearest in month (this could be interpreted
as the svp that falls in the same seasonal period despite of the year
when it was taken).

Mbsvpselect reads the .inf file of each swath file referenced in a recursive datalist structure to determine the location and collection time of the relevant data. The ancilliary *.inf, *.fbt, and *.fnv files must be created first. The water sound speed models (called SVPs by convention as an acronym for Sound Velocity Profiles) to be used must include one of three supported file headers specifying the time and location of the model.

University of Bremen SVP headers:
MB-SVP 2011/01/08 19:30:00 -52.965437 -36.986314
(keyword yyyy/mm/dd hh:mm:ss latitude longitude)

MB-System SVPs as now output by mbsvplist:
#MB-SVP 2011/01/08 19:30:00 -36.986314 -52.965437
(keyword yyyy/mm/dd hh:mm:ss longitude latitude)

CARIS sound velocity header format:
Section 2013-150 23:22:18 -57:02:01 -26:02:18
(keyword yyyy-yearDay hh:mm:ss latitude (degree:min:sec) longitude (degree:min:sec))

Mbsvpselect supports SVP files with single models or files with multiple models where new headers occur between models.

Instructions:

1) Set up a survey (or surveys) for MB-System processing in the usual way,
including creating a datalist file referencing the swath data of interest
and generating the ancilliary *.inf, *.fbt, and *.fnv files for each of
the swath files. 2) Create an svplist file (analagous to a datalist, but referencing the
relevant SVP files). Each SVP file is expected to be a text file with
depth-sound speed pairs on each line (depth in meters, sound speed in
meters/second) excepting for a header line at the start of each discrete
model. Any of the header formats listed above will work.
that refers to a local svp datalist. the local datalists includes 3) In order to turn on bathymetry recalculation by raytracing through the
most appropriate sound speed model for each swath file, call mbsvpselect:

```
mbsvpselect -N -V -Idatalist -Ssvplist [-P0, -P1, -P2/period, -P3/range, -P3/range/1]
```

-N is the option to check 0 latitude 0 longitude in the survey lines.
-V verbosity.
-I input datalist
-S input svp datalist
-P the method for choosing the svp where:
-P or -P0 is the nearest in position
-P1 is the nearest in time
-P2 is nearest in position within time (default time period is 10 hours)
-P2/time is nearest in position within specified time period (in hours)
-P3 is nearest in time within range   (default range is 10000 meters)
-P3/range or -P3/range/0 is nearest in time within specified range (in meters)

-P3/range/1 is nearest in month (seasonal) within specified range in meter.

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OPTIONS

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

–I *datalist*
Sets the input datalist file, where *datalist* is 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 *file* 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 operate on 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: *file* = "datalist.mb-1".

–N
Causes the program to check for SVPs with zero longitude and latitude values.

–P
This option sets the criteria by which **mbsvpselect** selects the sound speed model to be used for each swath file.

-P or -P0	nearest in position
-P1	nearest in time
-P2	nearest in position within time
-P2/time	nearest in position within specified time period
-P3	nearest in time within range
-P3/range	nearest in time within specified range
-P3/range/0	nearest in time within specified range
-P3/range/1	nearest in month (seasonal) within specified range

The times are specified in hours and the ranges in meters. The default time period is 10 hours and the default range is 10000 meters.

–S *svplist*
Sets the input svplist file, where *svplist* is an ascii file containing a list of the input sound speed model or SVP files. The program will read the location and time stamp information for all of the models in each one of these files. In the *svplist* file, each SVP file should be on a separate line, e.g.:

```
svpfile1
svpfile2
```

Default: *file* = "svplist.mb-1".

–V Normally, **mbsvpselect** works "silently" without outputting anything to the stderr stream. If the **–V** flag is given, then **mblist** works in a "verbose" mode and outputs the program version being used and all error status messages.

EXAMPLES

Suppose you are working in a directory called Survey_1 containing swath files that need to have the bathymetry recalculated by raytracing through water sound speed models. The local datalist file might contain something like:

13349457_3934_2845.mb88 88
13645323_3433_5543.mb88 88
46372536_6563_4637.mb88 88
64362825_6344_2635.mb88 88

or, if you use absolute passwords, something like:

/MyMac/User/Survey_1/13349457_3934_2845.mb88 88
/MyMac/User/Survey_1/13645323_3433_5543.mb88 88
/MyMac/User/Survey_1/46372536_6563_4637.mb88 88
/MyMac/User/Survey_1/64362825_6344_2635.mb88 88

By convention, this datalist will be named something like datalist.mb-1, where the ".mb-1" suffix indicates to MB-System programs that this is a datalist file. As documented elsewhere, datalist files can contain entries that reference datalists rather than single files; thus datalists can be recursive.

Suppose that the water properties were variable during this survey, with the variability dominated by location.Further suppose that there are three SVP files in a separate directory with names such as svp1.svp, svp2.svp, and svp3.svp. Each of these files contains a single model derived from CTD casts at a particular place and time indicated in the single header line. In that directory one can create an svplist file named SVP_list.mb-1 with contents:
svp1.svp
svp2.svp
svp3.svp Since mbsvpselect allows svplists to be recursive (like datalists), one can create a second svplist named my_svplist.mb-1in the survey processing directory that references the first with an entry like:

/MyMac/User/Survey_1/SVP_folder/SVP_list.mb-1 -1

In order to turn on bathymetry recalculation for all of the swath files referenced by datalist.mb-1 using the most appropriate of the available sound speed models, run mbsvpselect with arguments like:

mbsvpselect -N -V -I datalist.mb-1 -S my_svplist.mb-1 -P2/50

Here the -P2/50 option specifies that the sound speed model to be used for each file will be the closest one collected within 50 hours of the swath data. The bathymetry recalculation will be turned on using an mbset call of the form:

mbset -Idatalist.mb-1 -PSVPFILE:/MyMac/User/Survey_1/SVP_folder/svp1.svp

Following the mbsvpselect usage, mbprocess must be run to actually reprocess the swath data, including bathymetry recalculation by raytracing.

SEE ALSO

mbsystem(1), **mbprocess**(1), **mbset**(1), **mbsvplist**(1)

BUGS

The bugs are special because they are from Egypt, Germany, and Brazil.