NAME

mbotps - Predicts tides using the OSU Tidal Prediction Software (OTPS) distribution.

VERSION

Version 5.0

SYNOPSIS

mbotps [**-A***tideformat* **-B***year/month/day/hour/minute/second* **-D***interval* **-E***year/month/day/hour/minute/second* **-F***format* **-I***datalist.mb-1* **-M** **-O***output* **-R***lon/lat* **-V***]*

DESCRIPTION

MBotps is a utility that predicts tides using the OTPSnc (OSU Tidal Prediction Software) package that can be downloaded at:

http://www.coas.oregonstate.edu/research/po/research/tide/ The OTPSnc utilities are operated in a batch mode using command files with a fairly arcane format. **MBotps** provides a command line interface that allows **MB-System** users to easily obtain tide models for specified locations and times. **MBotps** is built during a normal installation of **MB-System**, but will work only if the OTPSnc package has been installed separately, the program **predict_tide** is in the user's path, and the user has both read and write permission in the directory containing the OTPSnc programs.

MBotps can be operated in two modes. First, users may use the **-R**, **-B**, and **-E** options to specify a location and the beginning and end times of a tidal model for that location. The **-D** option sets the time interval of values in the output tidal model, and the **-O** option sets the output tidal model filename.

Alternatively, instead of specifying a place and time range, the user may specify one or more swath data files using the **-I** option. A tidal model is produced for each swath file in which tidal values are calculated using the sonar navigation locations at intervals specified with the **-D** option, and if the **-M** option is specified, the swath file's processing parameter file is modified so that **mbprocess** applies the tidal model during processing.

AUTHORSHIP

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OPTIONS

−A *tideformat*
This option sets the tide format of the output text tide model files. If *tideformat* = 2 (the default), the tide is output in this format:
year month day hour minute second tide
where the tide value is in meters. If *tideformat* = 1, then the output format is:
time_d tide
where time_d is in seconds since January 1, 1970 and tide is in meters.

−B *yr/mo/da/hr/mn/sc*
This option sets the starting time for for the output tidal model.

−D *interval*
This option sets the time interval between tidal model values in seconds. Default: 60 seconds.

−E *yr/mo/da/hr/mn/sc*
This option sets the ending time for the output tidal model

–F *format*
Sets the data format of the input swath data file specified with the **-I** option. 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 any swath sonar format with timestamps 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 **mbdefaults**.

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

–I *filename*
Sets the input filename. If *format* > 0 (set with the **-f** option) 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".

–M If the **-I** option has been used so that tidal models are created for swath files, then this option causes each swath file's parameter file to be modified so that **mbprocess** will read and apply the ancilliary tidal model file created by **mbotps**.

–O *filename*
Sets the filename of the tidal model output.

–R *longitude/latitude*
Sets the longitude and latitude position at which the tidal model will be calculated.

–V Increases the verbosity of **mbotps**.

EXAMPLES

Suppose one wishes to obtain a tidal model for the location 121W 36N extending at 60 second intervals over the day February 21, 2009. The following will suffice:

```
mbotps -R-125/36 -B2009/02/21/00/00/00 -E2009/02/21/23/59/59 -V
```

The shell output looks like:

```
Program mbotps
Version $Id: mbotps.c 1770 2009-10-19 17:16:39Z caress $
MB-system Version 5.1.2beta12

Lat/Lon/Time file:tmp_mbotps_llt_6995.txt
Constituents to include: m2  s2  n2  k2  k1  o1  p1  q1
Predict OCEAN tide
Interpolate minor constituents

Model:       ss/sandbox/tides/OTPSnc/DATA/Model_tpxo7.2
Model is on grid uniform in lat,lon
Lat limits:    -90.125 90.125
Lon limits:    0.125 360.125
Constituents: m2  s2  n2  k2  k1  o1  p1  q1  mf  mm  m4  ms4 mn4
Predict elevations (m)
Constituents to include: m2  s2  n2  k2  k1  o1  p1  q1
Reading model... done

Results are really in tide_tpxo7.2_model.txt
```

The output tidal model is in the file tide_tpxo7.2_model.txt, which includes data that look like:

```
# Tide model generated by program mbotps
# Version: $Id: mbotps.c 1770 2009-10-19 17:16:39Z caress $
# MB-System Version: 5.1.2beta12
# Tide model generated by program mbotps
# which in turn calls OTPS program predict_tide obtained from:
#     http://www.coas.oregonstate.edu/research/po/research/tide/
# Run by user <caress> on cpu <shepard-9.local> at <Wed Dec 23 01:56:31 2009>
# Model:        ss/sandbox/tides/OTPSnc/DATA/Model_tpxo7.2
# Constituents included: m2  s2  n2  k2  k1  o1  p1  q1
2009 02 21 00 00 00   -0.6870
2009 02 21 00 01 00   -0.6840
2009 02 21 00 02 00   -0.6820
2009 02 21 00 03 00   -0.6790
2009 02 21 00 04 00   -0.6770
2009 02 21 00 05 00   -0.6740
2009 02 21 00 06 00   -0.6710
2009 02 21 00 07 00   -0.6690
.................
2009 02 21 23 54 00   -0.7970
2009 02 21 23 55 00   -0.7960
2009 02 21 23 56 00   -0.7940
2009 02 21 23 57 00   -0.7930
2009 02 21 23 58 00   -0.7910
2009 02 21 23 59 00   -0.7890
```

Now, suppose that one wants to apply tide corrections directly to a set of EM3002 data in GSF format. First, execute **mbotps** with the datalist for the swath data specified as input:

```
mbotps -Idatalist.mb-1 -V
```

The resulting shell output looks like:

```
Program mbotps
Version $Id: mbotps.c 1770 2009-10-19 17:16:39Z caress $
MB-system Version 5.1.2beta12

---------------------------------------

Processing tides for himbb05291.d23.mb121

35602 records read from himbb05291.d23.mb121.fnv

 Lat/Lon/Time file:tmp_mbotps_llt_7413.txt
 Constituents to include: m2  s2  n2  k2  k1  o1  p1  q1
 Predict OCEAN tide
 Interpolate minor constituents

 Model:        ss/sandbox/tides/OTPSnc/DATA/Model_tpxo7.2
 Model is on grid uniform in lat,lon
 Lat limits:    -90.125 90.125
 Lon limits:    0.125 360.125
 Constituents: m2  s2  n2  k2  k1  o1  p1  q1  mf  mm  m4  ms4 mn4
 Predict elevations (m)
 Constituents to include: m2  s2  n2  k2  k1  o1  p1  q1
 Reading model... done
 Results are in tmp_mbotps_llttd_7413.txt
```

Results are really in himbb05291.d23.mb121.tde

The output tide files have the same structure shown above:

```
# Tide model generated by program mbotps
# Version: $Id: mbotps.c 1770 2009-10-19 17:16:39Z caress $
# MB-System Version: 5.1.2beta12
# Tide model generated by program mbotps
# which in turn calls OTPS program predict_tide obtained from:
#    http://www.coas.oregonstate.edu/research/po/research/tide/
# Run by user <caress> on cpu <shepard-9.local> at <Wed Dec 23 23:04:55 2009>
# Model:       ss/sandbox/tides/OTPSnc/DATA/Model_tpxo7.2
# Constituents included: m2  s2  n2  k2  k1  o1  p1  q1
2005 10 18 19 01 36    0.0800
2005 10 18 19 02 36    0.0790
2005 10 18 19 03 36    0.0770
2005 10 18 19 04 36    0.0760
2005 10 18 19 05 37    0.0750
2005 10 18 19 06 37    0.0730
2005 10 18 19 07 37    0.0720
2005 10 18 19 08 37    0.0710
2005 10 18 19 09 37    0.0700
```

In addition to generating *.tde files for each swath file referenced by the input datalist structure, **mbotps** modifies the parameter file associated with each swath file (creating it if necessary) so that tide correction is enabled using the *.tde file and tide format 2. When **mbprocess** is run on the same datalist, the files will be reprocessed, and the processing will include the application of the tide correction to all bathymetry.

SEE ALSO

mbsystem(l), **mbprocess**, **mbset**

BUGS

Installing the Fortran90 OTPSnc package from Oregon State is not particularly easy.