NAME

MBgrdviz – Simple interactive 2D/3D visualization of GMT grids.

VERSION

Version 5.0

SYNOPSIS

MBgrdviz [-I*gridfile* **–T –V –H**]

DESCRIPTION

Overview

MBgrdviz is an interactive 2D/3D visualization tool for **GMT** topography grid files. **MBgrdviz** can be used for general data visualization and also has features integrating it with swath mapping data processing and swath survey planning.

Once a topographic grid has been read, it may be displayed either as a 2D map or as a 3D model. The 2D view can be panned and zoomed; the 3D view also allows arbitrary rotations of both the topography model and the viewpoint.

In addition to the primary topography, other data sets (e.g. sidescan sonar mosaics) can be read and displayed as overlays on the topography. Navigation of ships or underwater vehicles can be read and displayed; if associated with swath data the extent of mapping coverage can be displayed. Site data (individual point locations) can be read, displayed, interactively created and modified, and saved. Route data (collections of waypoints) can also be read, displayed, interactively created and modified, and saved.

The topography data can be shown using a number of colortables. The colortables can be linearly stretched between minimum and maximum values, or applied using a histogram equalization. The display may also be shaded using an illumination model, slope magnitude, or overlay grid data. Overlay data can be displayed draped on the topography. Topographic contours can be displayed using a user defined contour interval.

In addition to modifying the view, users can interact with the display in several ways. Users can pick single points on the surface to determine position and topography values, or pick and drag to determine range and bearing between two locations. Arbitrary rectangular regions with north-south and east-west boundaries or arbitrarily oriented rectangular areas can be defined by picking and dragging. The data within a region can be opened as a new display; areas can be used for survey planning.

Topographic profiles associated with two-point picks, selected navigation, or selected routes can be displayed in a separate window and saved.

MBgrdviz can be used to select swath data files for editing or analysis using other **MB-System** tools. If survey navigation has been read and displayed, a user may interactively select files of interest, and then start up the interactive waterfall bathymetry editor **MBedit** to work on those files. Also available are the interactive, visualization based bathymetry editor **MBeditviz**, the navigation editor **MBnavedit**, and the water sound speed modeling tool **MBvelocitytool**.

MBgrdviz supports as many as ten displays deriving either from reading topography grids or extracting user defined regions from existing displays.

Starting Up

When **MBgrdviz** is invoked on the command line, a single window comes up with the title **MBgrdviz** and two menus: **File** and **Help**. The **Help** menu contains a single item named **About**, which brings up a simple information window including the MB-System release version identifier. The **File** menu contains several items, but initially only the **Open Primary Grid** and **Quit** items are enabled. Selecting **Open Primary Grid** brings up a filesystem browser window that allows users to find and select the desired **GMT** topography grid. By default, the browser filter is set to display only files ending with a ".grd" suffix. Users can change this filter (e.g. setting it to "*" will display all files) and then hit the **Filter** button to relist the files as desired. Once the desired topography grid file has been located and selected so that its full path appears in the **Selection** text item, clicking the **OK** button will cause **MBgrdviz** to read the grid and open an **MBview** display window. Initially, the topography will be displayed in 2D, or map view mode. The default color table will be "Haxby", and the topography will be shaded using slope magnitude.

Picking, Zooming, Panning in 2D View

MBgrdviz will initially be in the "pan and zoom" mouse mode.

In this mode, if the cursor is over topography when the left button is clicked, a red X will appear at the pick point and an info window on the left side of the **MBview** display window will show the longitude, latitude, and topography value of the pick point. If the left button is used to drag the cursor from one location to another, both the pick and release points will be shown as red Xs and a red line will be displayed in between. The info window will show both the start and end positions and also the range and bearing between the two locations.

The middle button can be used to pan by clicking, holding down, and moving the cursor.

The right button can be used to zoom the display by clicking, holding down, and moving the cursor up to zoom in or down to zoom out.

Manipulating a 3D View

The user can switch from 2D map view to 3D view mode using the <View->3D Display> menu item (and can switch back using the<View->Map Display> menu item). In the 3D view mode, picking, panning, and zooming are done in the same fashion as in the map view. However, the display is a perspective view that includes both rotation of the topographic model and of the viewpoint. To rotate the model, select the "Rotate Model" button (or the <Mouse->Rotate Model> menu item). The left button can be used to pick topography, the middle button will rotate the model when clicked and dragged, and the right button will change the vertical exageration when clicked and moved up (more exageration) or down (less exageration). To rotate the viewpoint, select the "Rotate View" button (or the <Mouse->Rotate View> menu item). The left button can be used to pick topography, the middle button will rotate the model when clicked and dragged, and the right button will change the vertical exageration when clicked and moved up (more exageration) or down (less exageration).

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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 *gridfile*
Sets a GMT grid file to be read and displayed at startup. This option is usually used only when **MBgrdviz** is started automatically from some other process.

–T Sets a test grid to be calculated and displayed at startup.This allows the program to be tested even when a grid file is unavailable.

–V Normally, **MBgrdviz** outputs limited information to the stderr stream. If the **–V** flag is given, then **MBgrdviz** works in a "verbose" mode and outputs the program version being used, all error status messages, and a large amount of other information including all of the beams flagged or zeroed.

INTERACTIVE CONTROLS: MBgrdviz Startup Window

[MBgrdviz]:<File->Open Primary Grid>
This menu button pops up a file browser that allows the user to select an input **GMT** grid file. If the OK button is clicked, **MBgrdviz** will attempt to read a topography grid from the specified file. If successful, a new **MBview** window will appear displaying the topography.

[MBgrdviz]:<File->Open Site>
This menu button pops up a file browser that allows the user to select an input site file. A site file specifies one or more individual locations that can be displayed and interactively moved. Site files are text with each line delineating a single site with white space delimited columns

[MBgrdviz]:<File->Open Route>

[MBgrdviz]:<File->Open Navigation>

[MBgrdviz]:<File->Open Swath>

[MBgrdviz]:<File->Save Site>

[MBgrdviz]:<File->Save Route>

[MBgrdviz]:<File->Quit>
This button causes the program to exit (mostly) gracefully.

[MBgrdviz]:<Help->About>
This button causes the program to bring up a dialog showing the program's name, version, and authors.

INTERACTIVE CONTROLS: MBview Main Window

[MBview]:<View->Map Display>

[MBview]:<View->3D Display>

[MBview]:<View->Topography>

[MBview]:<View->Topography Slope>

[MBview]:<View->Overlay>

[MBview]:<View->No Shading>

[MBview]:<View->Shading by Illumination>

[MBview]:<View->Shading by Slope>

[MBview]:<View->Shading by Overlay>

[MBview]:<View->Topography Contours>

[MBview]:<View->Sites>

[MBview]:<View->Routes>

[MBview]:<View->Navigation>

[MBview]:<View->Draped Navigation>

[MBview]:<View->Haxby Colortable>

[MBview]:<View->Bright Rainbow Colortable>

[MBview]:<View->Muted Rainbow Colortable>

[MBview]:<View->Grayscale Colortable>

[MBview]:<View->Flat Gray Colortable>

[MBview]:<View->Sealevel Colortable>

[MBview]:<Controls->Colors and Contours>

[MBview]:<Controls->2D Controls>

[MBview]:<Controls->3D Controls>

[MBview]:<Controls->Shading>

[MBview]:<Controls->Resolution>

[MBview]:<Controls->Projections>

[MBview]:<Controls->Site List>

[MBview]:<Controls->Route List>

[MBview]:<Controls->Navigation List>

[MBview]:<Mouse->Full>

[MBview]:<Mouse->Reset>

[MBview]:<Mouse->Clear>

[MBview]:<Mouse->Pan and Zoom>

[MBview]:<Mouse->Rotate Model>

[MBview]:<Mouse->Rotate View>

[MBview]:<Mouse->Shading>

[MBview]:<Mouse->Pick Area>

[MBview]:<Mouse->Edit Sites>

[MBview]:<Mouse->Edit Routes>

[MBview]:<Mouse->Pick Nav>

[MBview]:<Action->About MBview...>

[MBview]:<Action->Open Overlay Grid>

[MBview]:<Action->Open Site File>

[MBview]:<Action->Open Route File>

[MBview]:<Action->Open Navigation>

[MBview]:<Action->Open Swath File>

[MBview]:<Action->Save Site File>

[MBview]:<Action->Save Route File>

[MBview]:<Action->Save Route as Winfrog PTS File>

[MBview]:<Action->Save Route as Winfrog WPT File>

[MBview]:<Action->Save Route as Degrees + Decimal Minutes File>

[MBview]:<Action->Save Route as Hypack LNW File>

[MBview]:<Action->Save Profile File>

[MBview]:<Action->Open Selected Nav in MBedit>

B [MBview]:<Action->Open Selected Nav in MBeditviz>

B [MBview]:<Action->Open Selected Nav in MBnavedit>

B [MBview]:<Action->Open Selected Nav in MBvelocitytool>

[MBview]:<Action->Open Region as New View>

[MBview]:<Action->Generate Survey Route from Area>

[MBview]:<Dismiss->Dismiss>

[MBview]:<Full>

[MBview]:<Reset>

[MBview]:<Clear>

[MBview]:<Pan and Zoom>

[MBview]:<Rotate Model>

[MBview]:<Rotate View>

[MBview]:<Shading>

[MBview]:<Pick Area>

[MBview]:<Edit Sites>

[MBview]:<Edit Routes>

[MBview]:<Pick Nav>

INTERACTIVE CONTROLS: MBview Colors and Contours Window

[Colors and Contours]:{Data Color Bounds}"Minimum"

[Colors and Contours]:{Data Color Bounds}"Maximum"

[Colors and Contours]:{Data Color Bounds}<<Cold-to-Hot><Hot-to-Cold>>

[Colors and Contours]:"Data Contour Interval"

[Colors and Contours]:{Data Slope Color Bounds}"Minimum"

[Colors and Contours]:{Data Slope Color Bounds}"Maximum"

[Colors and Contours]:{Data Slope Color Bounds}<<Cold-to-Hot><Hot-to-Cold>>

[Colors and Contours]:{Overlay Color Bounds}"Minimum"

[Colors and Contours]:{Overlay Color Bounds}"Maximum"

[Colors and Contours]:{Overlay Color Bounds}<<Cold-to-Hot><Hot-to-Cold>>

[Colors and Contours]:<Apply>

[Colors and Contours]:<Dismiss>

INTERACTIVE CONTROLS: MBview Colors and Contours Window

[2D Parameters]:{View Offset}"X"

[2D Parameters]:{View Offset}"Y"

[2D Parameters]:{View Offset}"Zoom"

[2D Parameters]:<Apply>

[2D Parameters]:<Dismiss>

INTERACTIVE CONTROLS: MBview Colors and Contours Window

[3D Parameters]:{Model Orientation & Zoom}"Azimuth"

[3D Parameters]:{Model Orientation & Zoom}"Elevation"

[3D Parameters]:{Model Orientation & Zoom}"Zoom"

[3D Parameters]:{View Orientation & Zoom}"Azimuth"

[3D Parameters]:{View Orientation & Zoom}"Elevation"
[3D Parameters]:{View Orientation & Zoom}"Zoom"

[3D Parameters]:"Vertical Exageration"

[3D Parameters]:{Pan}"X"

[3D Parameters]:{Pan}"Y"

[3D Parameters]:<Apply>

[2D Parameters]:<Dismiss>

INTERACTIVE CONTROLS: MBview Colors and Contours Window

[Shading Parameters]:{Shading by Illumination}"Amplitude"

[Shading Parameters]:{Shading by Illumination}"Azimuth"

[Shading Parameters]:{Shading by Illumination}"Elevation"

[Shading Parameters]:{Shading by Slope}"Amplitude"

[Shading Parameters]:{Shading by Overlay}"Amplitude"

[Shading Parameters]:{Shading by Overlay}"Center"

[Shading Parameters]:{Shading by Overlay}<<Cold-to-Hot><Hot-to-Cold>>

[Shading Parameters]:<Apply>

[Shading Parameters]:<Dismiss>

INTERACTIVE CONTROLS: MBview Colors and Contours Window

[Rendering Resolution]:<Dismiss>

[Rendering Resolution]:==Low Resolution Dimension==

[Rendering Resolution]:==High Resolution Dimension==

[Rendering Resolution]:<Dismiss>

[Rendering Resolution]:<Dismiss>

INTERACTIVE CONTROLS: MBview Colors and Contours Window

[Projections]:{Display Projection}<<Geographic><UTM><Spheroid>>

[Projections]:<Dismiss>

INTERACTIVE CONTROLS: MBview Colors and Contours Window

[Site List]:|Site List|

[Site List]:<Delete Selected Sites>

[Site List]:<Dismiss>

INTERACTIVE CONTROLS: MBview Colors and Contours Window

[Route List]:|Route List|

[Route List]:<Delete Selected Routes>

[Route List]:<Dismiss>

INTERACTIVE CONTROLS: MBview Colors and Contours Window

[Navigation List]:|Navigation List|

[Navigation List]:<Delete Selected Navigation>

[Navigation List]:<Dismiss>

MOUSE ACTIONS

KEYBOARD ACTIONS

MBGRDVIZ ROUTE FILES

MBGRDVIZ SITE FILES

SEE ALSO

mbsystem(1)

BUGS

This program is not done, nor is it adequately documented.