

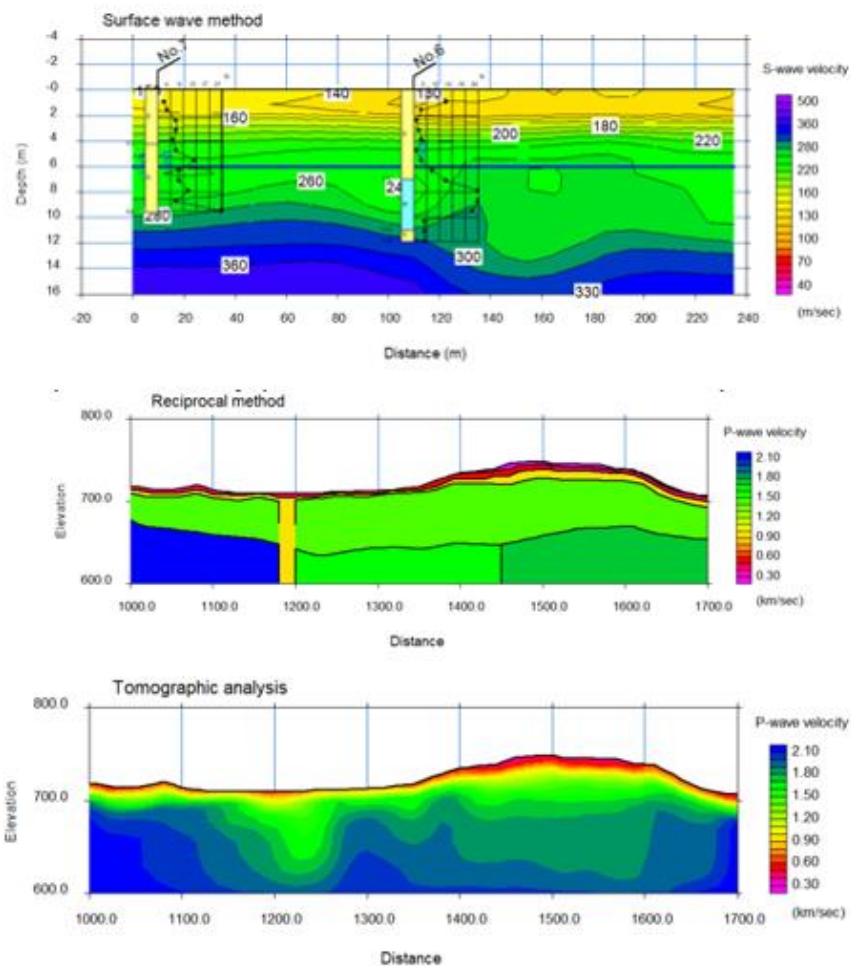


GEOPlot USER'S MANUAL

Software for Seismic Data Visualization

Manual v. 2.0
PN 770-00120-01

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








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










2018, 2024

Koichi Hayashi / Craig Lippus

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APPENDICES

APPENDIX A	Procedure for Plotting a Velocity Section or Grid on a Google Map	A-2
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1 INTRODUCTION

Welcome to GeoPlot™! GeoPlot is an easy-to-use, yet powerful program that allows you to:

- Read in and display your seismic data.
- Read in and display your resistivity data.
- Integrate topography data with your seismic/resistivity data.
- Edit and annotate figures.
- Convert figures to alternative formats.
- Integrate well log data and seismic/resistivity data figures.
- Carry out calculations and manipulations with your geophysical data.

GeoPlot is the module that allows for refraction, surface wave, and resistivity data visualization and manipulations. Other SeisImager™ modules call on GeoPlot for reading, displaying, editing, annotating, and converting their data outputs. GeoPlot provides advanced tools for geophysical data analysis and interpretation that are not present in other SeisImager modules.

GeoPlot may be used to carry out advanced calculations and allows for the integration of various geophysical data sets. For example, surface wave analysis-derived shear wave velocity data may be integrated with resistivity data to produce cross-plots to aid with interpretation.

SeisImager™ is the master program that consists of seven modules for refraction, downhole, and surface-wave data analysis. The individual modules are Pickwin™, Plotrefa™, WaveEq™, PSLog™, SPACPlus™, and GeoPlot™. The Surface-wave Analysis Wizard™ is not a separate module but automatically calls on specific functions from Pickwin, WaveEq, and GeoPlot. The overall structure of SeisImager is shown below:

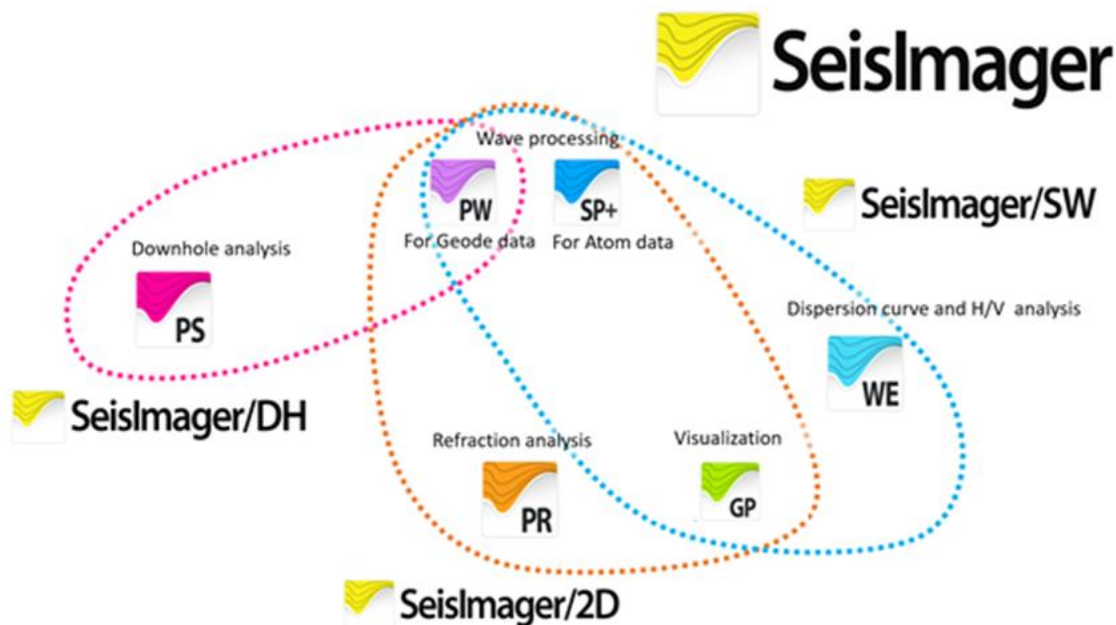


Figure 1: SeisImager family of applications.

Section [2](#) of this manual describes software installation, and Section [3](#) and all its sub-sections describe the function of the various menu items.

Although this manual can be printed, **it was designed as an online resource, and includes many internal and external hyperlinks**. It will be updated on a semi-regular basis, and a current version will always be available for [download](#) on our site. Be sure to display the navigation tool bar in Acrobat Reader (as of this writing, the toggle switch was F8) to simplify navigation:



Figure 2: Acrobat Reader navigation tool bar.

If your version of Acrobat Reader does not have the above tool bar, use *Alt+Left Arrow* to return to the previous view after clicking on a link.

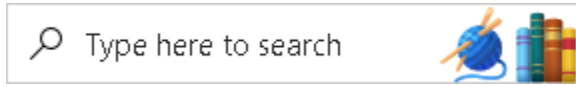
The manual makes liberal use of color, so if you elect to print it, using color is highly recommended. There are also links to online videos, so an internet connection is useful (some of these videos are also available [here](#) and can be stored on your hard drive for offline viewing).

Finally, we are very interested in your constructive criticism of both this manual and the software itself. Please contact us at sales@geometrics.com with any comments you might have.

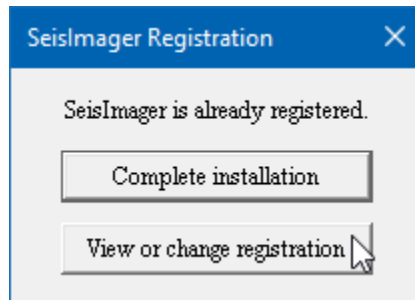
***Note:** GeoPlot includes many features that are very rarely used, and only then by a select few, often only those who requested the features in the first place. The average user will generally have no need for them. In the interest of completeness, these features, although not described, are included in this manual, with a pointer to our support email. If you see something that you think you might wish to make use of, please contact SeisImager support.*

***Note:** All software exhibits instabilities on occasion. GeoPlot is no exception, but this is rare. If GeoPlot does become unstable, use the following procedure:*

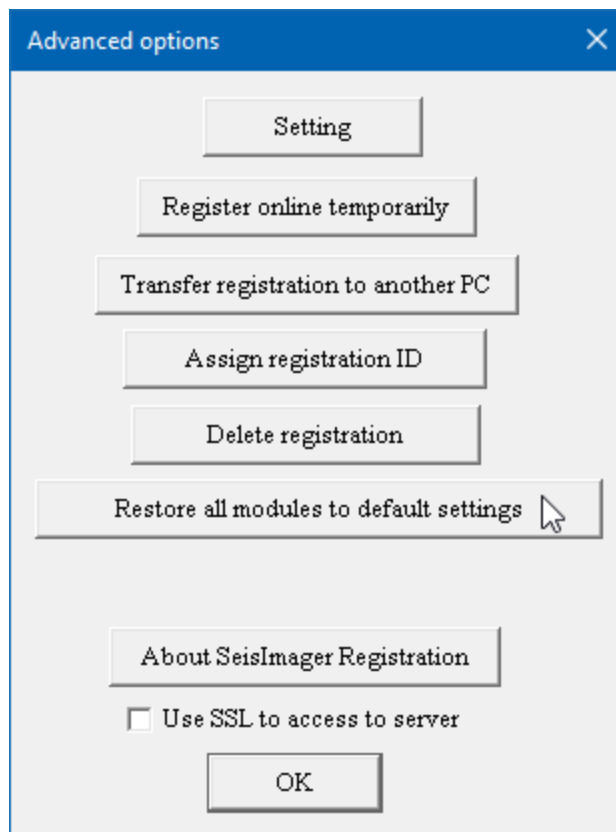
- *Close all SeisImager modules.*
- *In the Windows search box,*



Type in “SeisImager Registration.” You will see the following:



- *Select **View or change registration**. You will be presented with the **SeisImager Registration** dialog box.*
- *Select **Advanced options** (upper right) and then press **Restore all modules to default settings** and then press **OK**.*



***Note:** Throughout this manual, you will find that certain menu items are greyed out. There are two reasons for this. The most common is that the feature is not applicable to that dataset or that point in time. The other reason is that some items may not be available under your license.*

2 INSTALLING THE SOFTWARE

The SeisImager USB stick is supplied (1) for trial evaluation of the programs, (2) for purchase, rental, or upgrade of one or more of the programs, or (3) with purchase of an ES-3000™, Geode™, or StrataVisor NZXP™, or Atom™ seismograph, which all include the Lite version of SeisImager/2D. The USB contains all programs and all documentation.

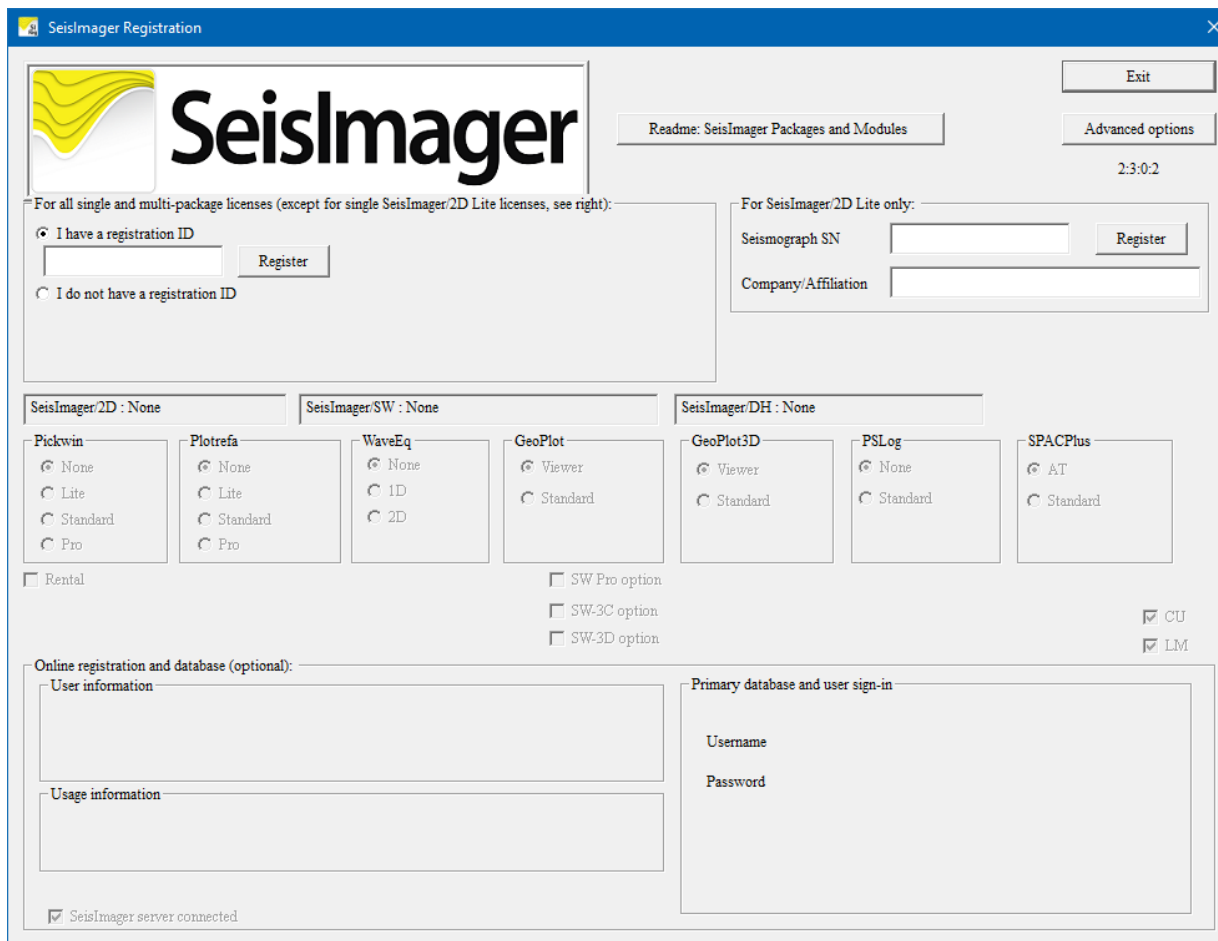
Occasionally, there will be a software release in between USB releases. In this situation, the USB will be labeled with a notice to [download](#) the latest version.

***Note:** Even if the USB is not labeled with instructions to do so, it is best practice to download and install the latest software prior to installation, as SeisImager is updated frequently. The USB is convenient, especially if you do not have an internet connection. However, if you **do** have an internet connection, we highly recommend that you skip the USB for installation altogether. If you do so, be sure to download the newest [documentation](#) as well.*

***Note:** You must have administrator rights to install the software. After installation by an administrator, users with lower-level privileges can use the software.*

To install or update the software, click on the file named **SeisImager.msi** (or SeisImager_XXXX.msi). If SeisImager is already installed on your computer, you will be prompted to remove it or repair it. Remove the software, run SeisImager.msi again, and then simply follow the prompts.

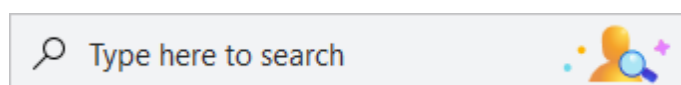
After the installation is complete, you will be presented with the registration screen:



The SeisImager Registration window is a software interface for registering the SeisImager software. It features a title bar with the text "SeisImager Registration" and a close button. The main area is divided into several sections:

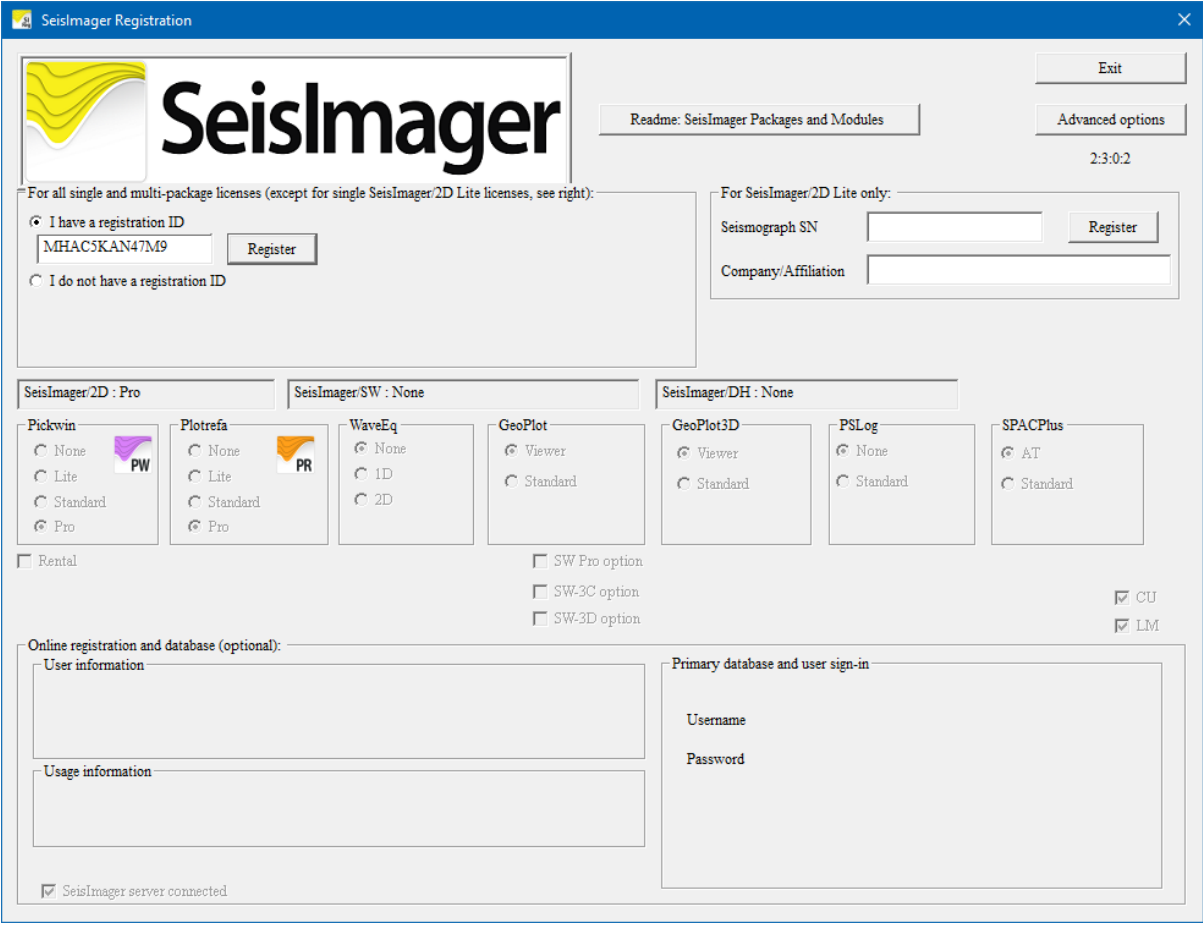
- Header:** Includes the SeisImager logo, a "Readme: SeisImager Packages and Modules" button, an "Exit" button, and an "Advanced options" button. The version number "2.3.0.2" is displayed.
- Registration Options:** A section for "For all single and multi-package licenses (except for single SeisImager/2D Lite licenses, see right):" with two radio buttons: "I have a registration ID" (selected) and "I do not have a registration ID". A "Register" button is next to the "I have a registration ID" option.
- SeisImager/2D Lite only:** A section for "For SeisImager/2D Lite only:" with input fields for "Seismograph SN" and "Company/Affiliation", and a "Register" button.
- Product Selection:** A grid of product selection boxes for "SeisImager/2D : None", "SeisImager/SW : None", and "SeisImager/DH : None". Each box contains radio buttons for "None", "Lite", "Standard", and "Pro".
- Options:** Checkboxes for "Rental", "SW Pro option", "SW-3C option", "SW-3D option", "CU", and "LM".
- Online registration and database (optional):** A section with two input fields: "User information" and "Usage information".
- Primary database and user sign-in:** A section with input fields for "Username" and "Password".
- Status:** A checkbox labeled "SeisImager server connected" is checked.

If you already have a registration ID, indicate as such, type it in, and press *Register*. If you do not have an ID, *click I do not have a registration ID*, and send your keyword and order number or seismograph serial number to support@geometrics.com. You will be given a registration ID that will enable the products that you purchased or rented. You may return to this screen later by typing “SeisImager Registration” into the Windows search box at the lower left of your desktop:



The programs enabled by the registration ID will be reported in a series of messages. Click *OK* to accept each message.

After these messages have appeared, the register will reflect the programs that have been registered, as shown below. In this case, Pickwin Pro™ and Plotrefa Pro™ are the programs that have been registered.



SeisImager Registration

Readme: SeisImager Packages and Modules

Advanced options

2:3:0:2

For all single and multi-package licenses (except for single SeisImager/2D Lite licenses, see right):

☒ I have a registration ID
 MHAC5KAN47M9

☐ I do not have a registration ID

For SeisImager/2D Lite only:

Seismograph SN

Company/Affiliation

SeisImager/2D : Pro SeisImager/SW : None SeisImager/DH : None

Pickwin
☐ None ☒ Lite ☐ Standard ☐ Pro

Plotrefa
☐ None ☐ Lite ☐ Standard ☐ Pro

WaveEq
☐ None ☐ 1D ☐ 2D

GeoPlot
☒ Viewer ☐ Standard

GeoPlot3D
☐ Viewer ☐ Standard

PSLog
☒ None ☐ Standard

SPACPlus
☒ AT ☐ Standard

☐ Rental

☐ SW Pro option
☐ SW-3C option
☐ SW-3D option

☒ CU
☒ LM

Online registration and database (optional):

User information

Usage information

Primary database and user sign-in

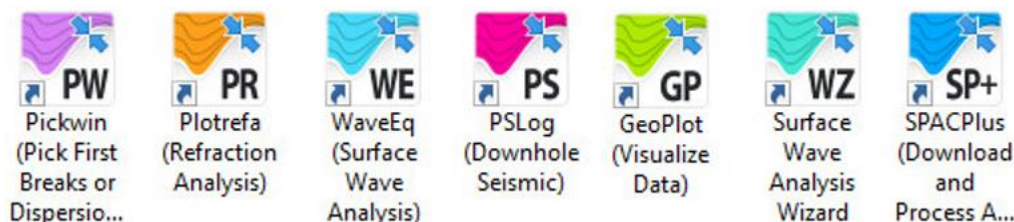
Username

Password

☒ SeisImager server connected

Typically, installing an upgrade of the software does not require re-registration, but if you are upgrading from a version older than April 2007, you will need to re-register.

Once installed, the program modules can be opened directly through the desktop icons shown below:



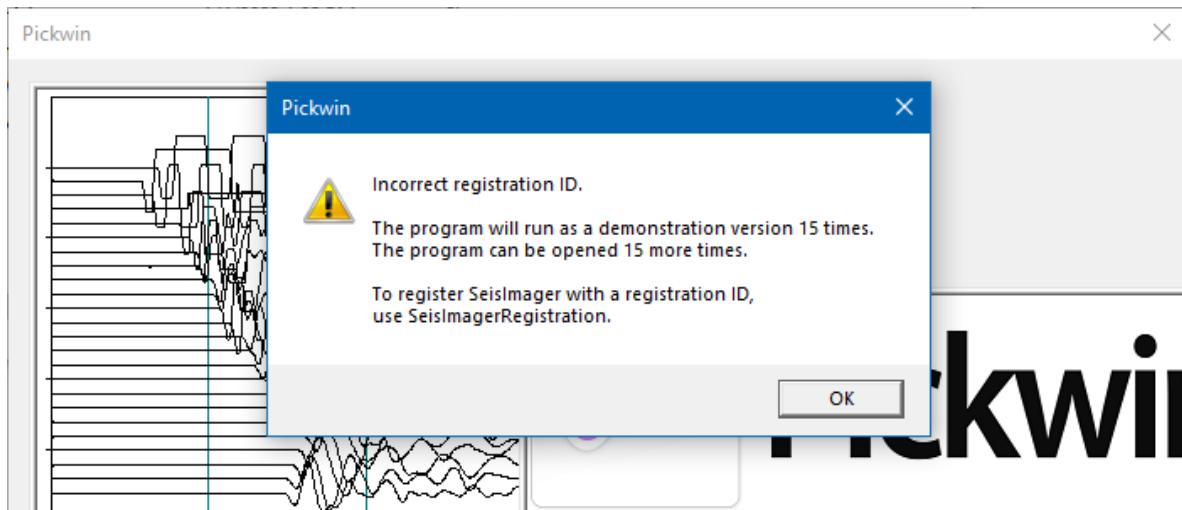
The Surface-wave Analysis Wizard is not a separate module but automatically calls on specific functions from Pickwin, WaveEq, and GeoPlot to walk you through the analysis process. All of the icons (shortcuts) will be copied to your desktop regardless of which program(s) has been purchased or will be used. You may wish to create a folder for the various shortcuts to avoid


cluttering on your desktop. Alternatively, you may elect to simply delete the shortcuts that you did not purchase/rent the rights to.

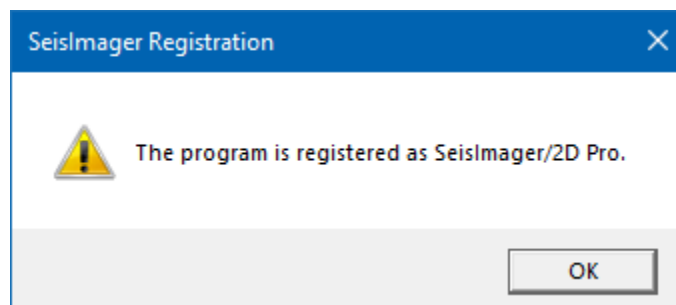
To begin using the software, double-click the appropriate shortcut.

For registered installations, the module opens and is ready for use. The other registered modules are ready for use as well.

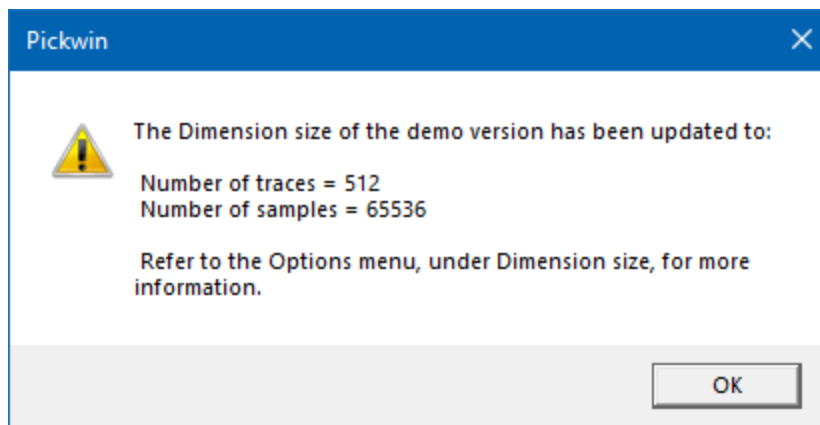
For unregistered installations running in demonstration mode, you will be presented with the message shown below. Press *OK*.



To enter a registration ID after your 15 times in demonstration mode, go to the Windows search box (lower left) and type “SeisImager” to find the SeisImager Registration  program as shown above. Open the register and email the keyword to support@geometrics.com with your order number and seismograph serial number (if you purchased the software with a seismograph), and we will reply with a registration ID to enable the version of the software you have purchased. Once received, enter the registration ID and press *OK*. You will see a message like the following:



Once the software is registered, the data input dimensions of the demonstration version will be updated to reflect the limits of the program purchased. You will see a message like the one below. Press *OK*.



This completes the description of all possible registration pathways.

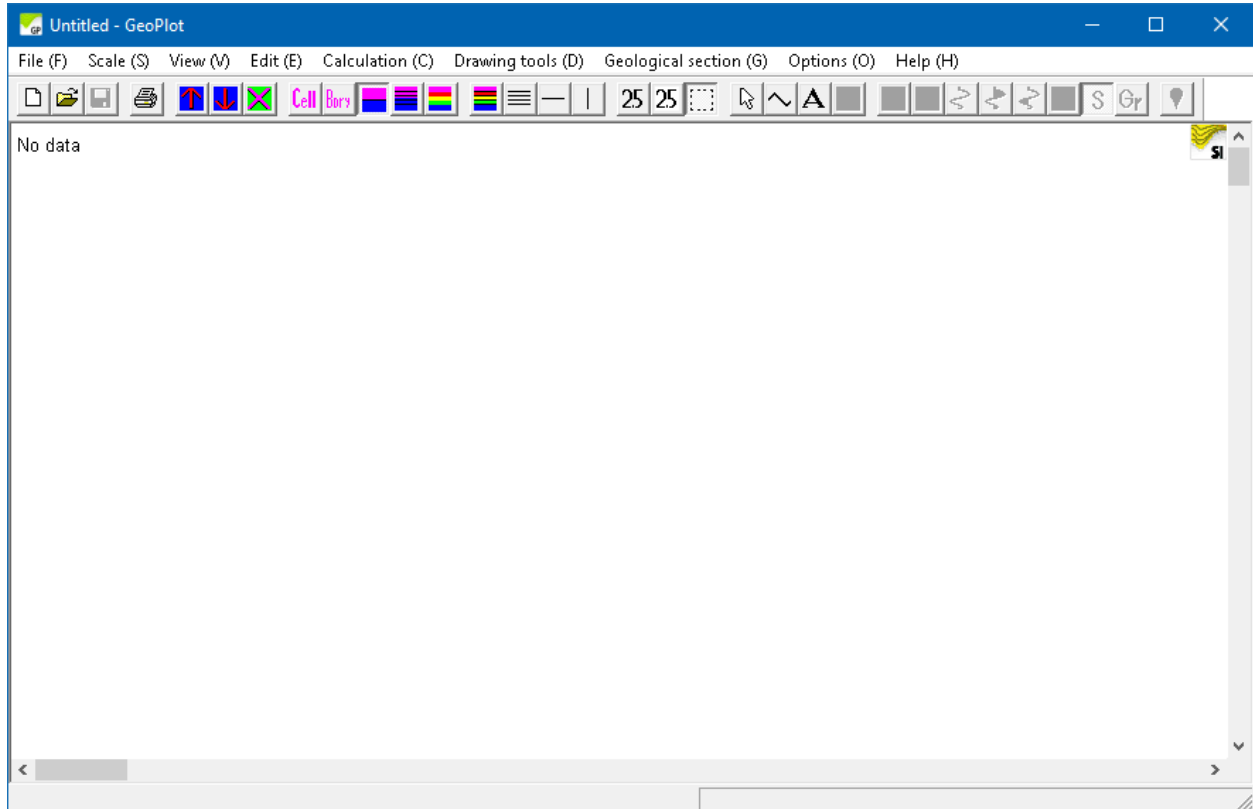
As mentioned previously, the Lite version of SeisImager/2D comes free with all seismograph purchases, so if you have purchased GeoPlot with a seismograph, you are also entitled to the Lite version of SeisImager/2D. If you do not already have a license for SeisImager/2D, Lite or otherwise, but would like to order a copy, please contact us at support@geometrics.com.

A general recommendation when using the SeisImager suite is to close and reopen the software modules or open a second instance of the software modules to start new, separate analyses. The programs are efficient and quickly launch so this is easy to do and will prevent complications when processing data.

3 THE GEOPlot MODULE



Click on the  shortcut to start GeoPlot. You will see the following:



The user-interface of GeoPlot consists of a series of menus along with a tool bar. We will now discuss in detail the various menus and features of GeoPlot.

3.1 FILE MENU

Click on *File* to reveal the **File** menu:


File (F)

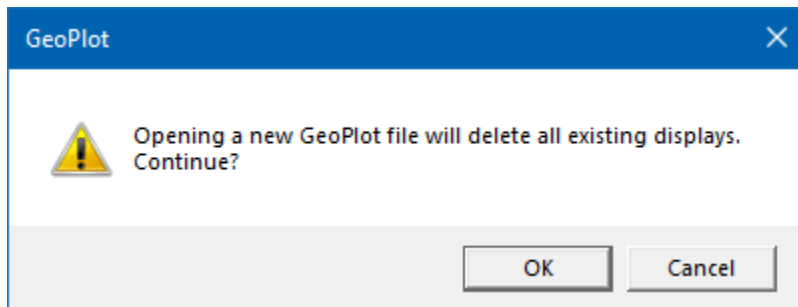
New GeoPlot File	
Open GeoPlot File (O)	Ctrl+O
Save GeoPlot File (S)	Ctrl+S
Save GeoPlot File as (A)	
Import 2D section from database	
Upload a current 2D section to database	
Open Refraction (.vs), Surface-wave(.pvs), or Resistivity(.ovs) files	
Save Refraction (.vs), Surface-wave(.pvs), or Resistivity(.ovs) files	
Open RES2DINV file (.xyz)	
Save (x, z, variable) formatted file (.txt)	
Save CAD-formatted file (.dxf)	
Save UCD file (.inp)	
Open waveform file (.dat, .sg2)	
Open topography data file (.txt)	
Save topography data file (.txt)	
Open XML file	
Save XML file	
Advanced options	>
Text format GeoPlot (tetragon grid or polygon) file	>
Print(P)	Ctrl+P
Print preview(V)	
Page setup(R)	
1 2D MASW(China NT)-2.geo	
2 MASW inverted result-all-m (1).geo	
3 FIVTANKS(8bit).geo	
4 C:\Users\...\a_all_new.geo	
Exit (X)	

3.1.1 NEW GEOPLOT FILE

File (F)

New GeoPlot File

Click on *New GeoPlot File* or press  to clear the screen of all data. Note that the present data will be totally cleared and will be unable to be recovered. You should save your work before selecting this option. You will see the following warning:



3.1.2 OPEN GEOPLOT FILE [CTRL+O]


File (F)

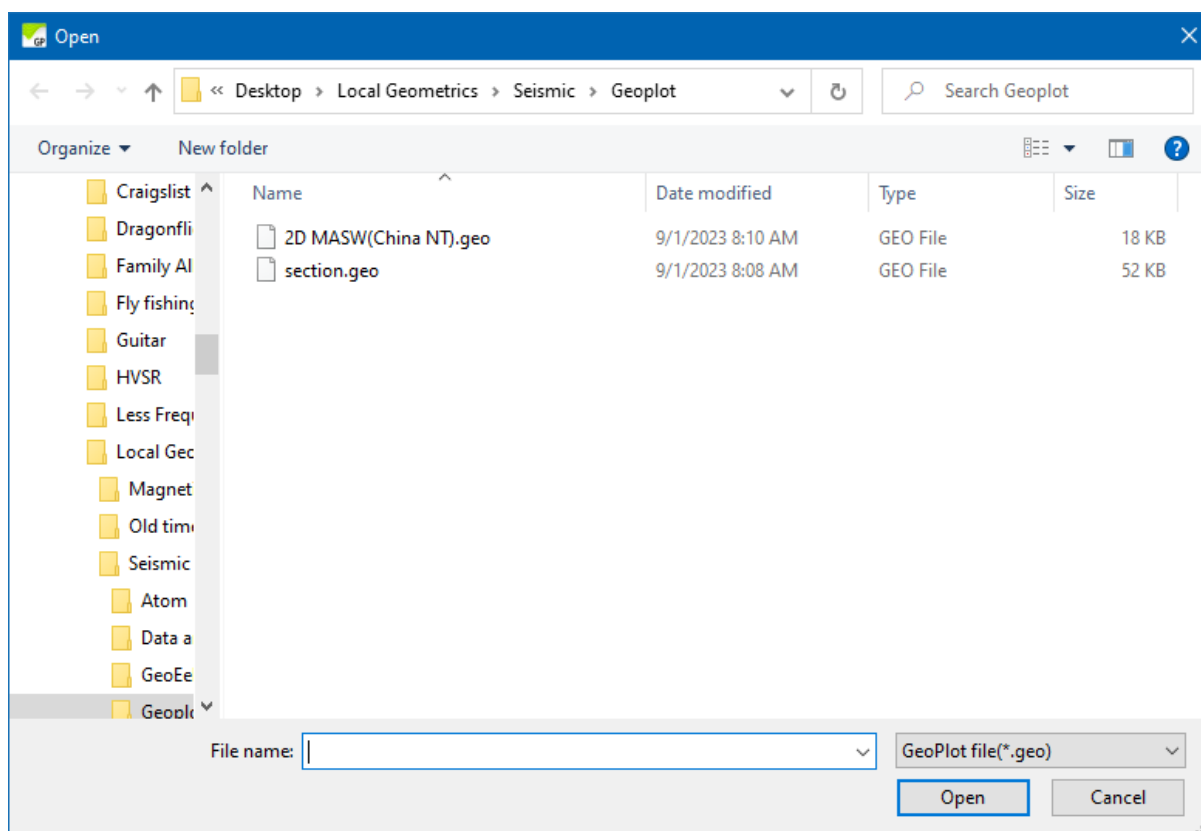
New GeoPlot File

Open GeoPlot File (O)

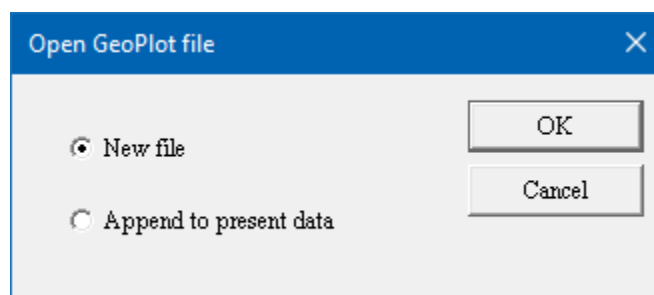
Ctrl+O

This opens an existing GeoPlot file.

Select *Open* or press  to read in a file. You will see the following dialog box:

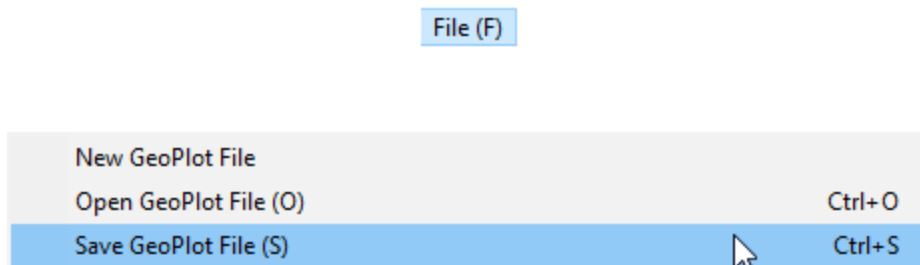



Find the folder your data resides in and open it. GeoPlot files have a “.geo” extension, so this is the default, and only “.geo” files will be displayed. Choose the file you want to read in by double-clicking on it. If you are reading a “new” file, simply select the file to be opened and the plot will be displayed. If you open an additional GeoPlot file while you already have a plot displayed, you will be presented with the following dialog box:



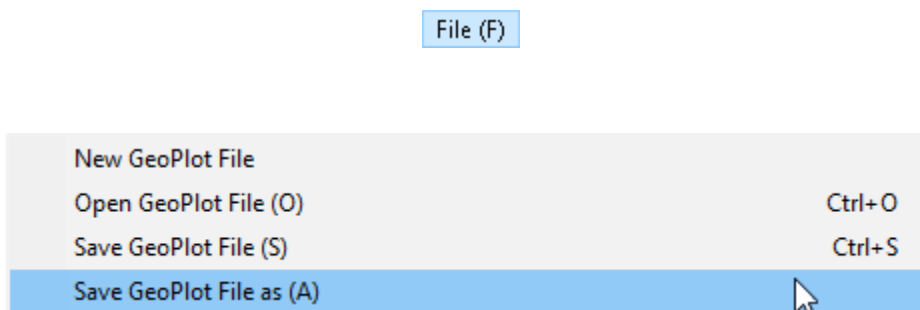
Select *Append to present data* if you want to display multiple plots at the same time and press *OK* to continue. If you are trying to read in a new file, choose *New file* and the new file will be displayed. Note that the present file will be cleared if you open a new one without saving it.

3.1.3 SAVE GEOPLOT FILE [CTRL+S]



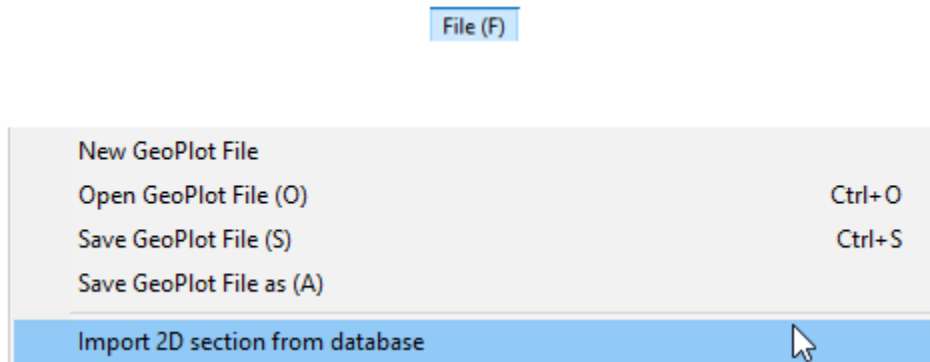
To save a GeoPlot file after editing, choose *Save GeoPlot File* or press . A GeoPlot file can be saved at any time in the processing flow and will reflect the extent of the results at the time of saving. You might like to save your results during each step of the processing flow. To do so, use the Save As option and provide the current file a new filename.

3.1.4 SAVE GEOPLOT FILE AS



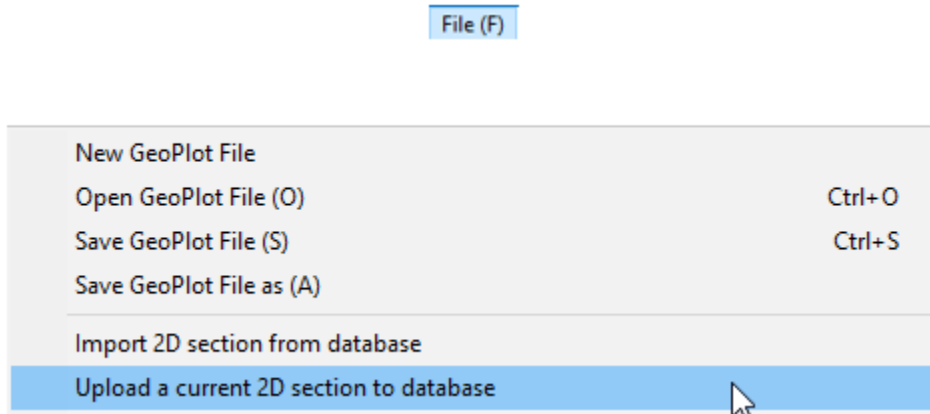
To save a GeoPlot file with a different name after editing, select *Save GeoPlot File As*. You will get a dialog box identical to the one above. Provide a filename and press Save. The extension will default to the GeoPlot-standard “.geo.”

3.1.5 IMPORT 2D SECTION FROM DATABASE



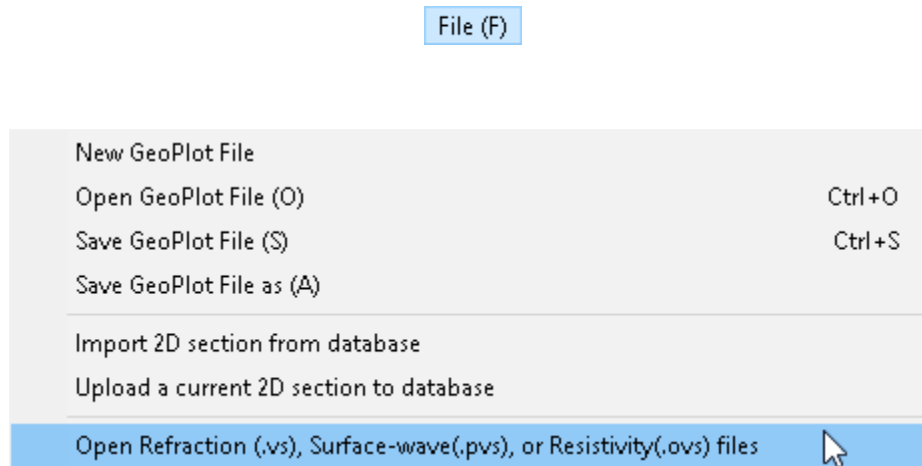
Geometrics maintains an online geophysical database containing data from around the world. Some of it is public. If you would like access to this database, please contact support@seisimager.com to open an account.

3.1.6 UPLOAD A CURRENT 2D SECTION TO DATABASE



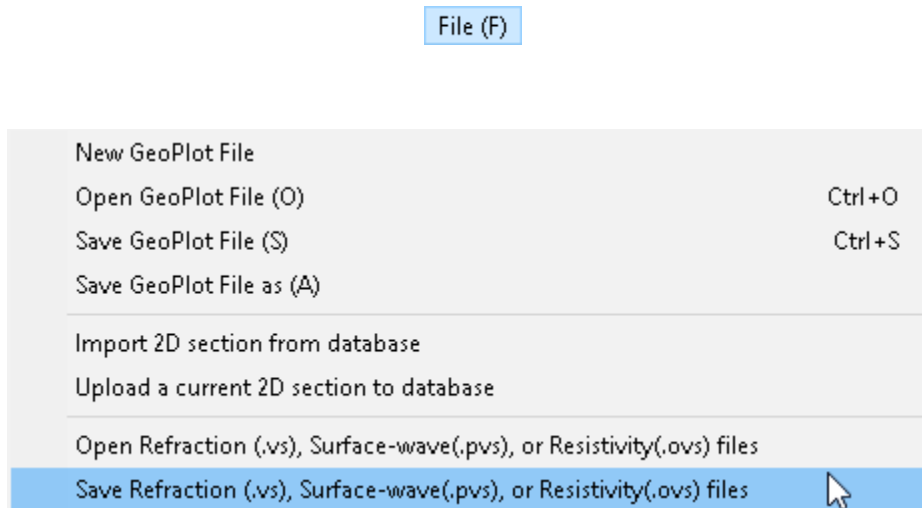
You may also contribute your data to the online database; it may be private (you use only) or public (downloadable by others). Please contact support@seisimager.com to open an account.

3.1.7 OPEN REFRACTION (.VS), SURFACE-WAVE (.PVS) OR RESISTIVITY (.OVS) FILES



This command works identical to that described in Section [3.1.2](#) on Page 13.

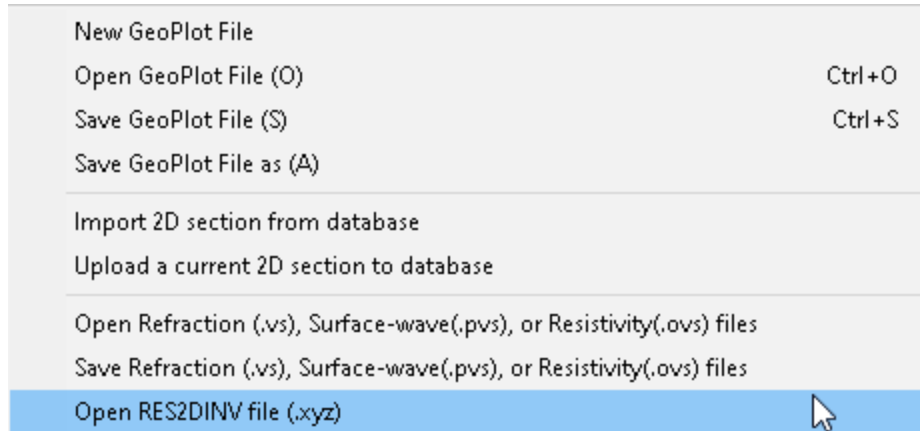
3.1.8 SAVE REFRACTION (.VS), SURFACE-WAVE (.PVS) OR RESISTIVITY (.OVS) FILES



This command works identical to that described in Section [3.1.3](#) on Page 15.

3.1.9 OPEN RES2DINV FILE (.XYZ)

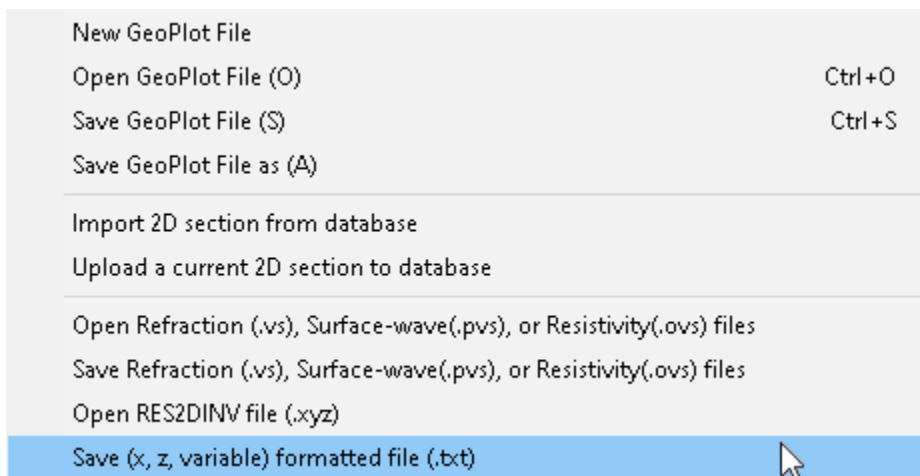
File (F)



This opens an existing Geotomo™ RES2DINV file. This command works identical to that described in Section [3.1.2](#) on Page 13.

3.1.10 SAVE (X, Z, VARIABLE) FORMATTED FILE (.TXT)

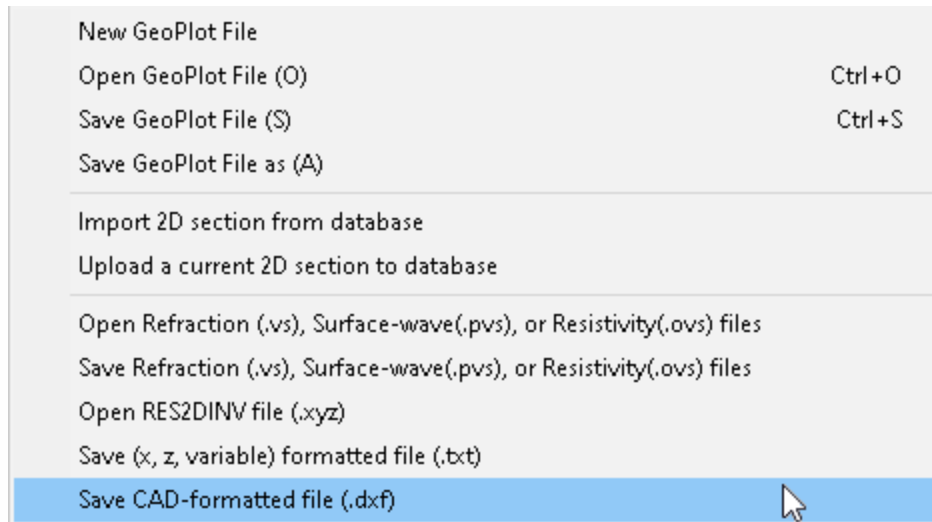
File (F)



This saves a file as a Surfer™ ASCII xyz file. This command works identical to that described in Section [3.1.3](#) on Page 15.

3.1.11 SAVE CAD-FORMATTED FILE (.DXF)

File (F)

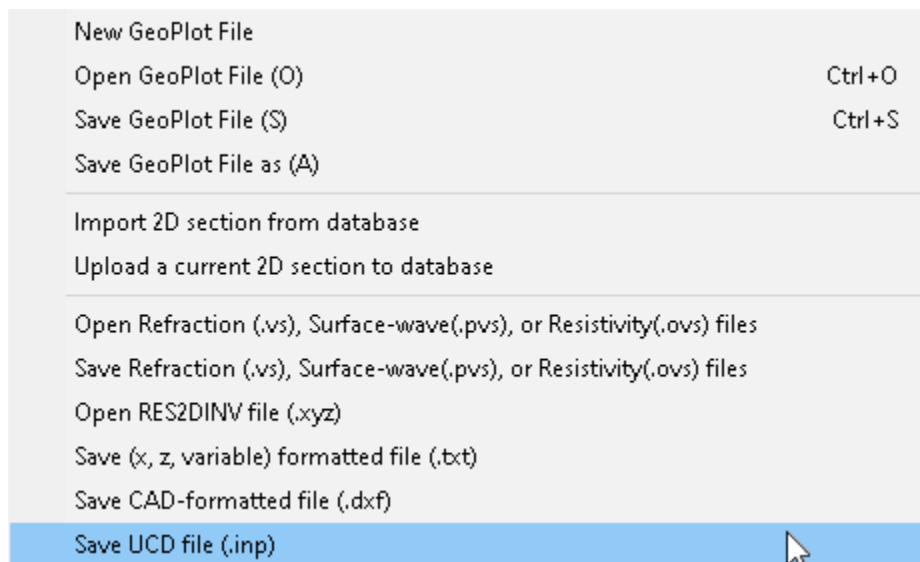


This saves a file in a CAD-standard DXF file. This command works identical to that described in Section [3.1.3](#) on Page 15.

3.1.12 SAVE UCD FILE (.INP)

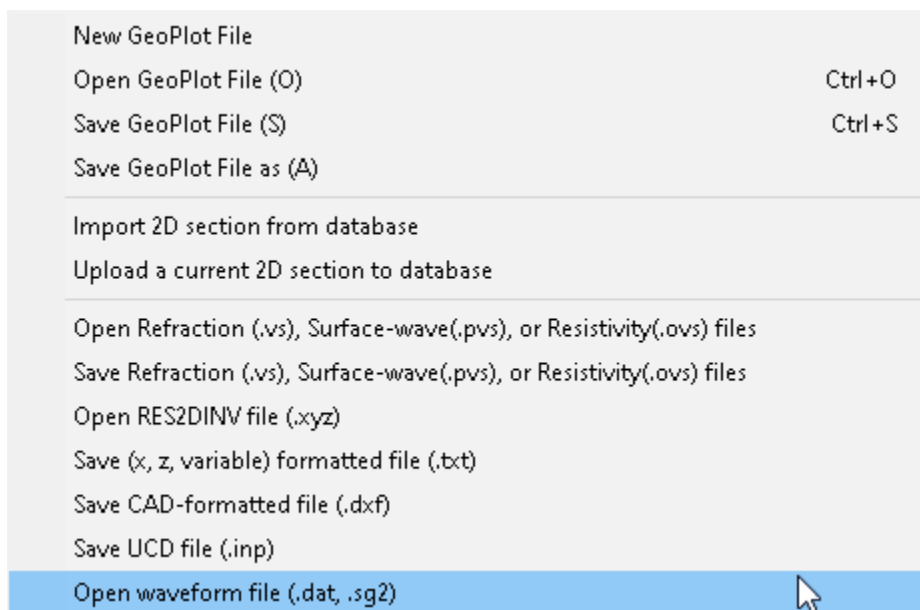
This saves a standard UCD file. This command works identical to that described in Section [3.1.3](#) on Page 15.

File (F)



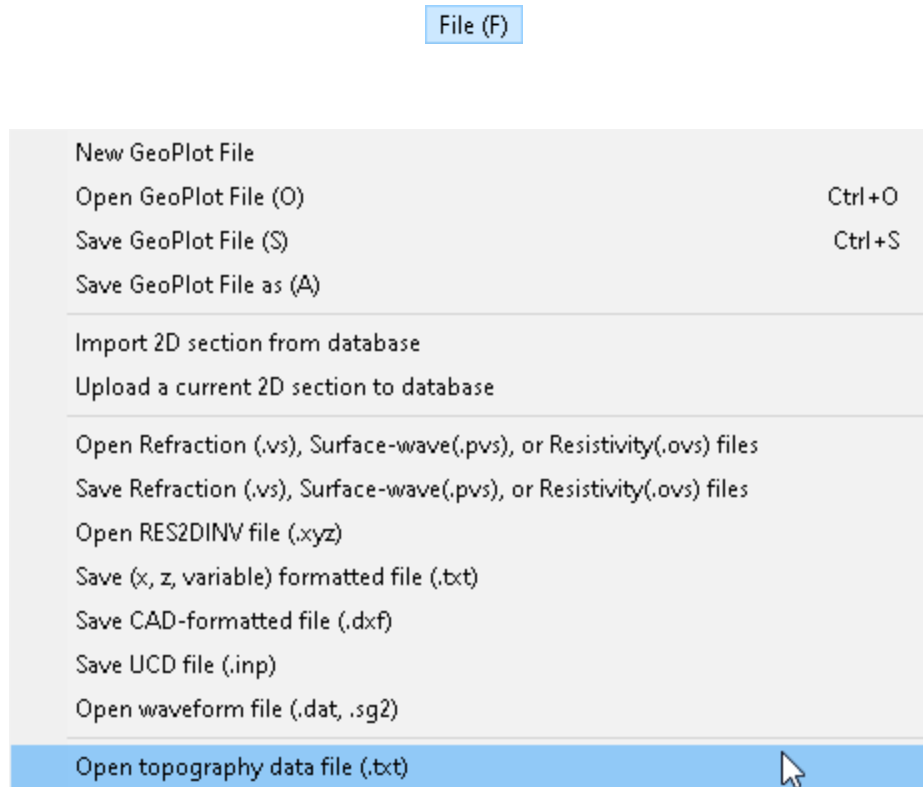
3.1.13 OPEN WAVEFORM FILE (.DAT, .SG2)

File (F)



This opens a standard SEG-2 file (generally, seismic or GPR). This command works identical to that described in Section [3.1.2](#) on Page 13.

3.1.14 OPEN TOPOGRAPHY DATA FILE (.TXT)



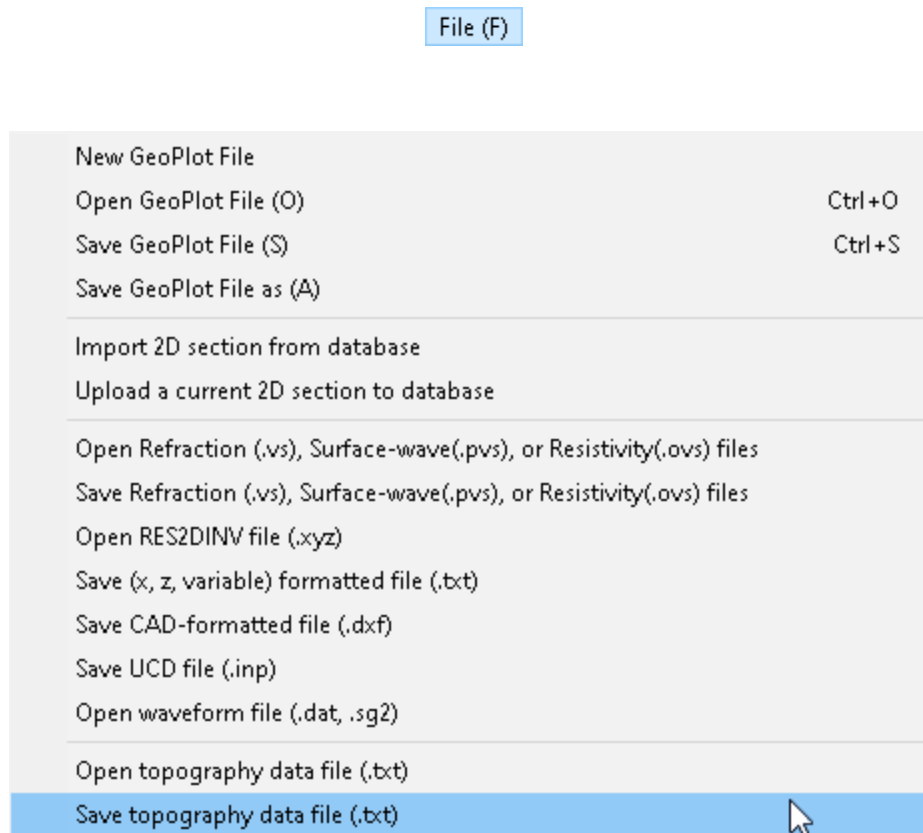
If you have relative or absolute topography data, these should be stored in an ASCII-columnar file as shown below:

```
0.0 100.0
50 102.0
100 105.0
150 104.0
200 108.0
250 101.0
300 97.0
350 94.0
400 90.0
450 80.0
500 85.0
```

The left column is the location, and the right column is the elevation. You may read in this elevation or topography file and incorporate it into your GeoPlot model.

This command works identical to that described in [Section 3.1.2](#) on Page 13.

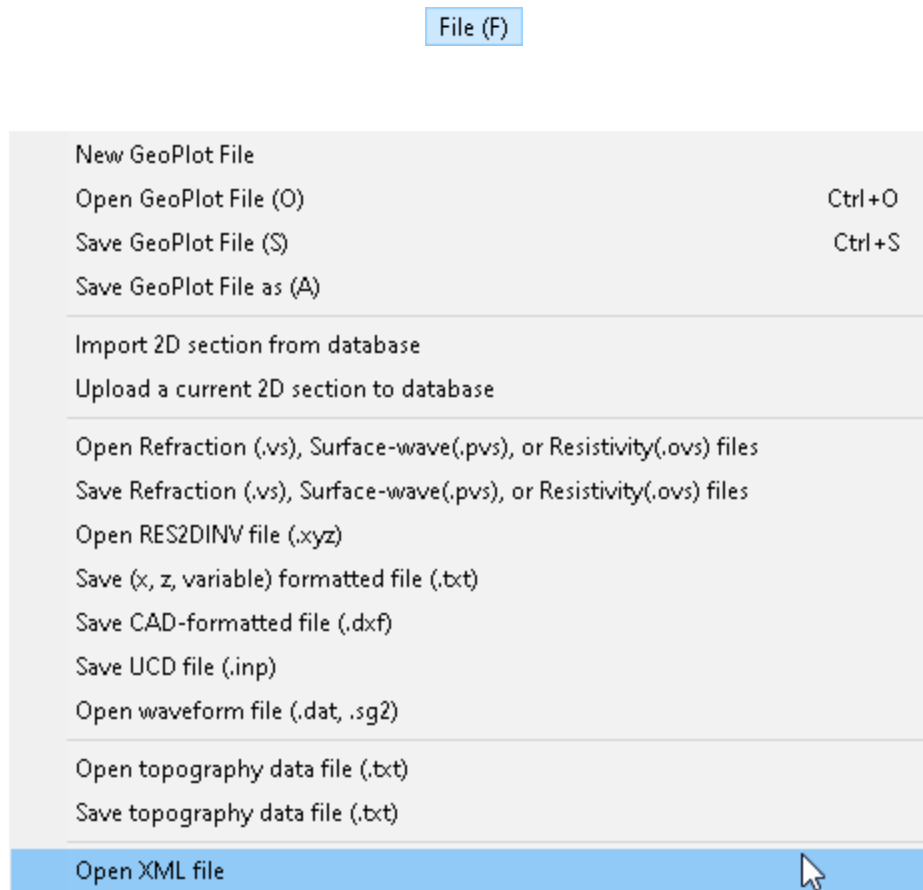
3.1.15 SAVE TOPOGRAPHY DATA FILE (.TXT)



To save topography data after editing, choose *Save topography data file*. You will see a dialog box, then choose a file name and press *Save*. The extension will default to “txt”.

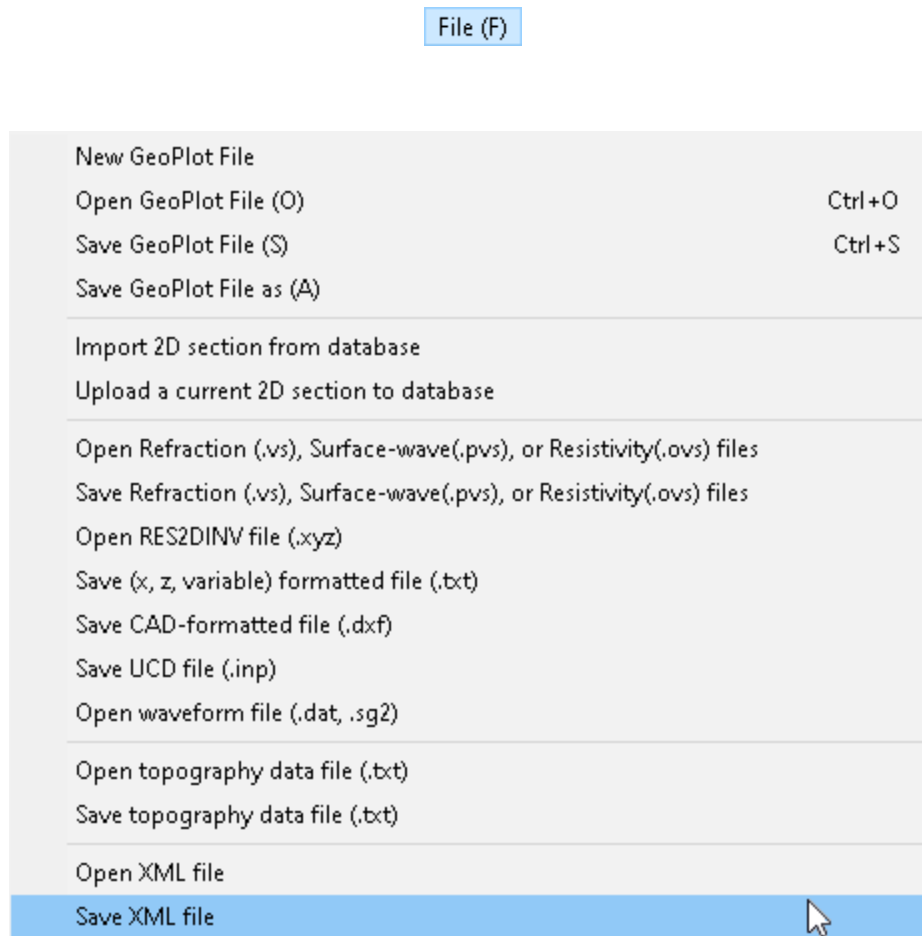
This command works identical to that described in Section [3.1.3](#) on Page 15.

3.1.16 OPEN XML FILE



This opens a standard XML file. This command works identical to that described in Section [3.1.2](#) on Page 13.

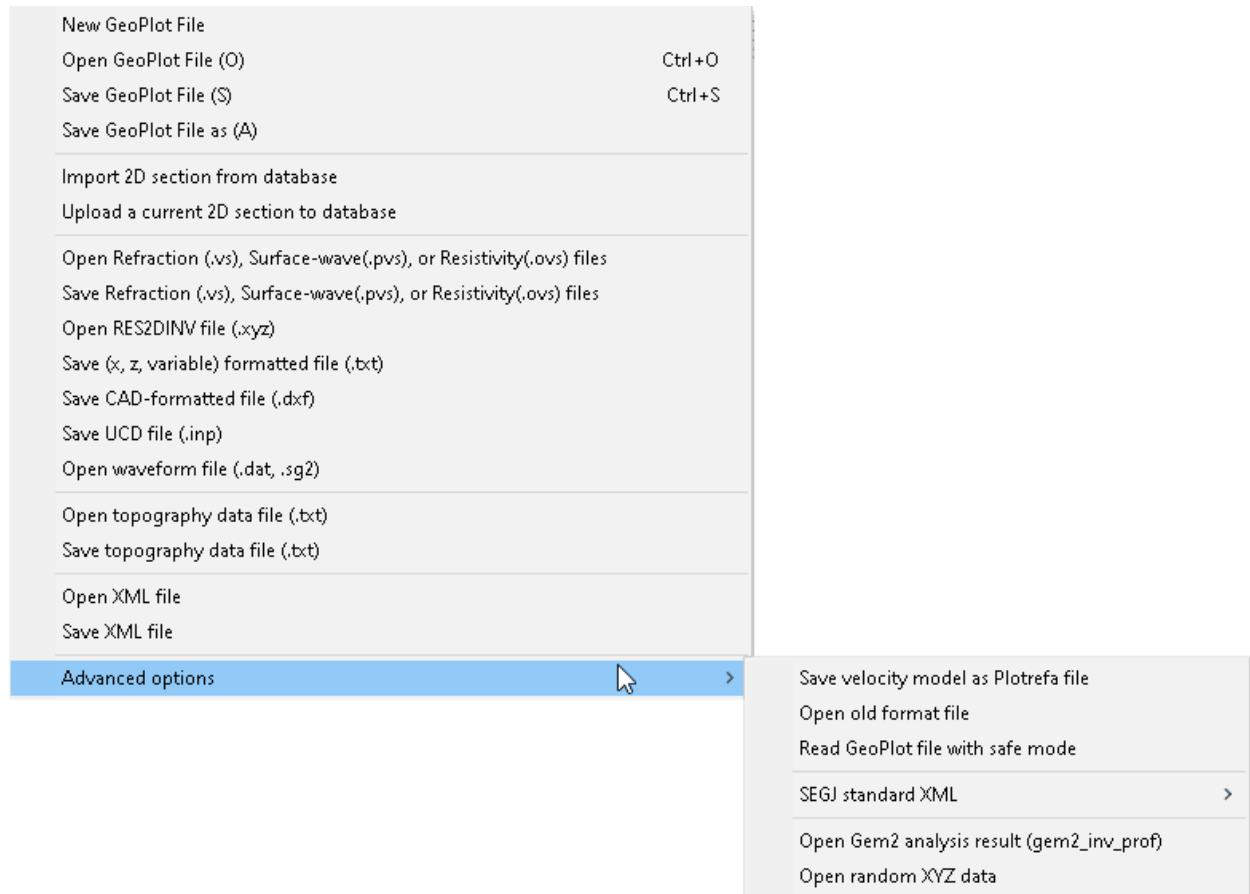
3.1.17 SAVE XML FILE



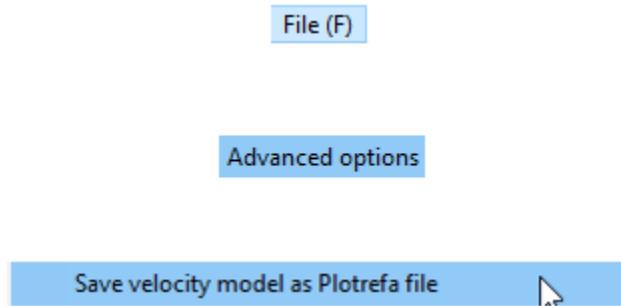
This saves the data to a standard XML file. This command works identical to that described in [Section 3.1.3](#) on Page 15.

3.1.18 ADVANCED OPTIONS

File (F)

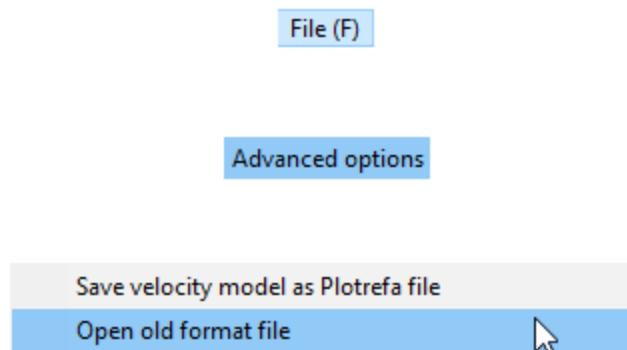


3.1.18.1 SAVE VELOCITY MODEL AS PLOTREFA FILE



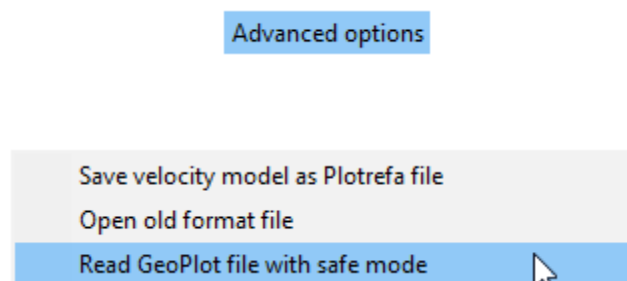
You may save any GeoPlot-compatible velocity model to a standard Plotrefa file for use with SeisImager/2D's Plotrefa module. Select *Save velocity model as Plotrefa file* and provide a file name.

3.1.18.2 OPEN OLD FORMAT FILE



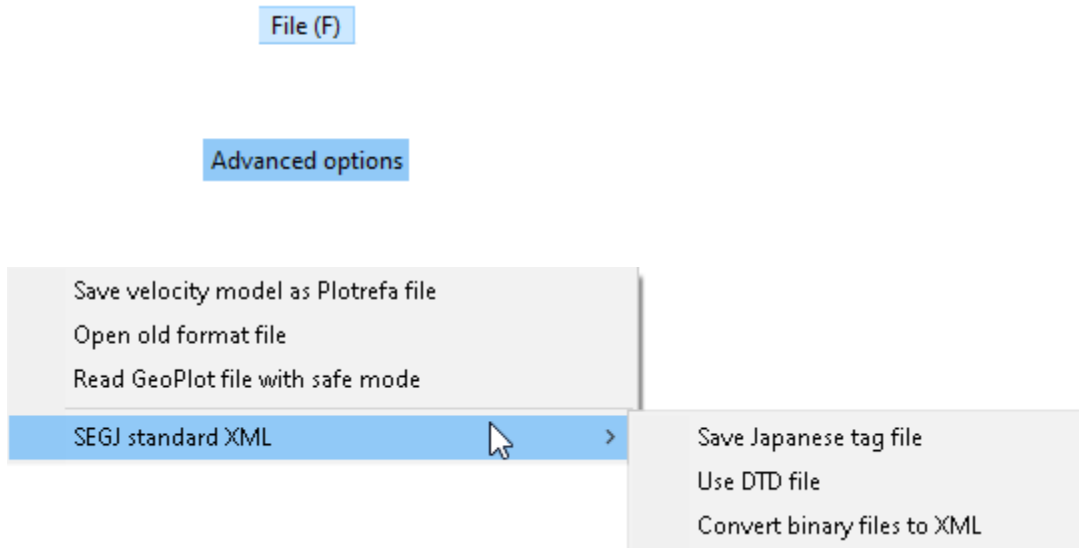
This feature is highly specialized and rarely used. Please contact support@seisimager.com for assistance.

3.1.18.3 READ GEOPLOT FILE WITH SAFE MODE



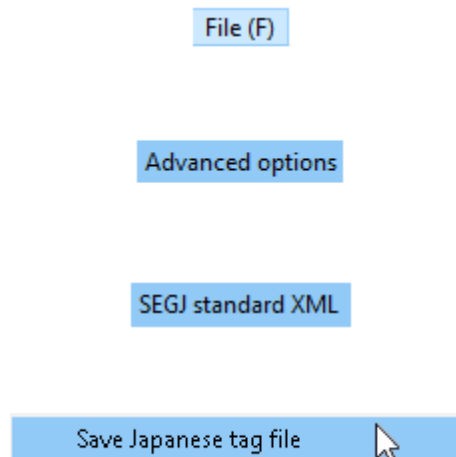
This feature is highly specialized and rarely used. Please contact support@seisimager.com for assistance.

3.1.18.4 SEGJ STANDARD XML



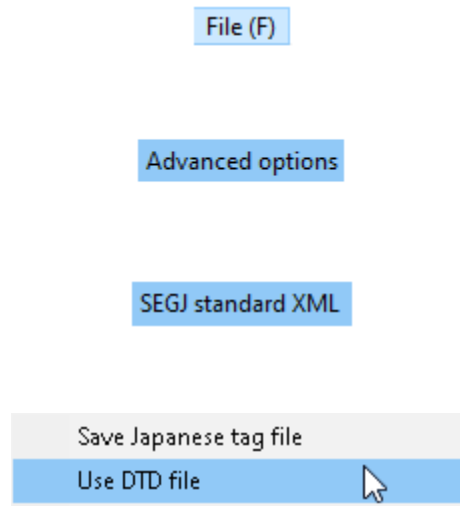
This feature is highly specialized and rarely used. Please contact support@seisimager.com for assistance.

3.1.18.4.1 SAVE JAPANESE TAG FILE



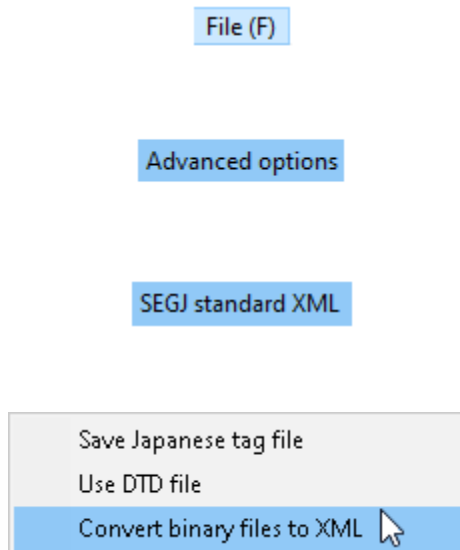
This feature is highly specialized and rarely used. Please contact support@seisimager.com for assistance.

3.1.18.4.2 USE DTD FILE



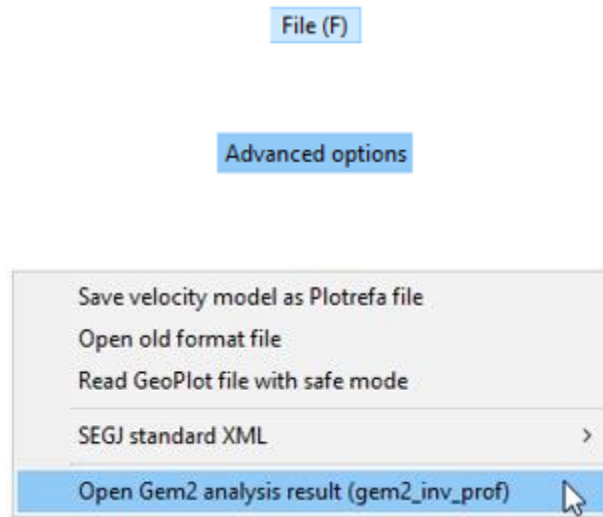
This feature is highly specialized and rarely used. Please contact support@seisimager.com for assistance.

3.1.18.4.3 CONVERT BINARY FILES TO XML



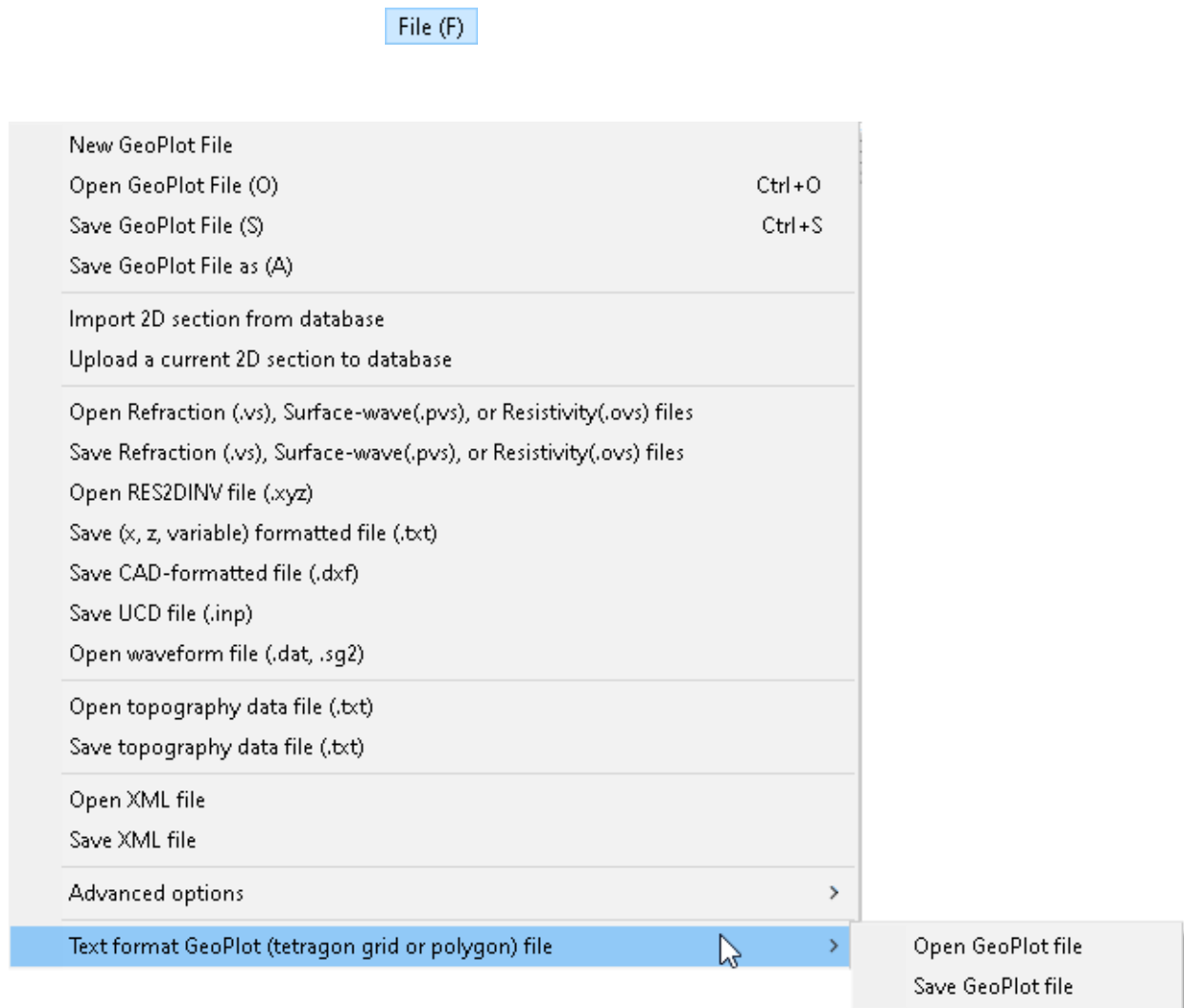
This feature is highly specialized and rarely used. Please contact support@seisimager.com for assistance.

3.1.18.5 OPEN GEM2 ANALYSIS RESULT (GEM2_INV_PROF)

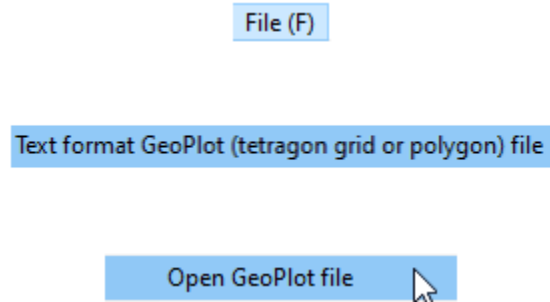


This feature is highly specialized and rarely used. Please contact support@seisimager.com for assistance.

3.1.19 TEXT FORMAT GEOPLOT (TETRAGON GRID OR POLYGON GRID) FILE

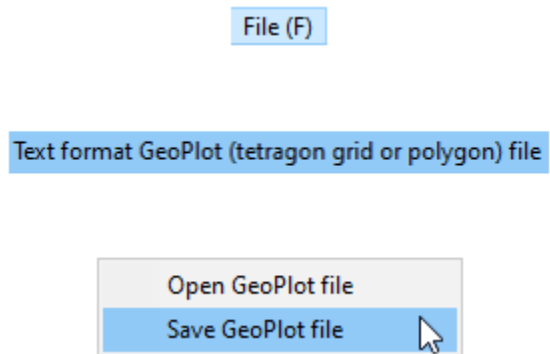


3.1.19.1 OPEN GEOPLOT FILE



This option is used for opening ASCII-format GeoPlot files (standard GeoPlot files are binary). This command works identical to that described in Section [3.1.2](#) on Page 13.

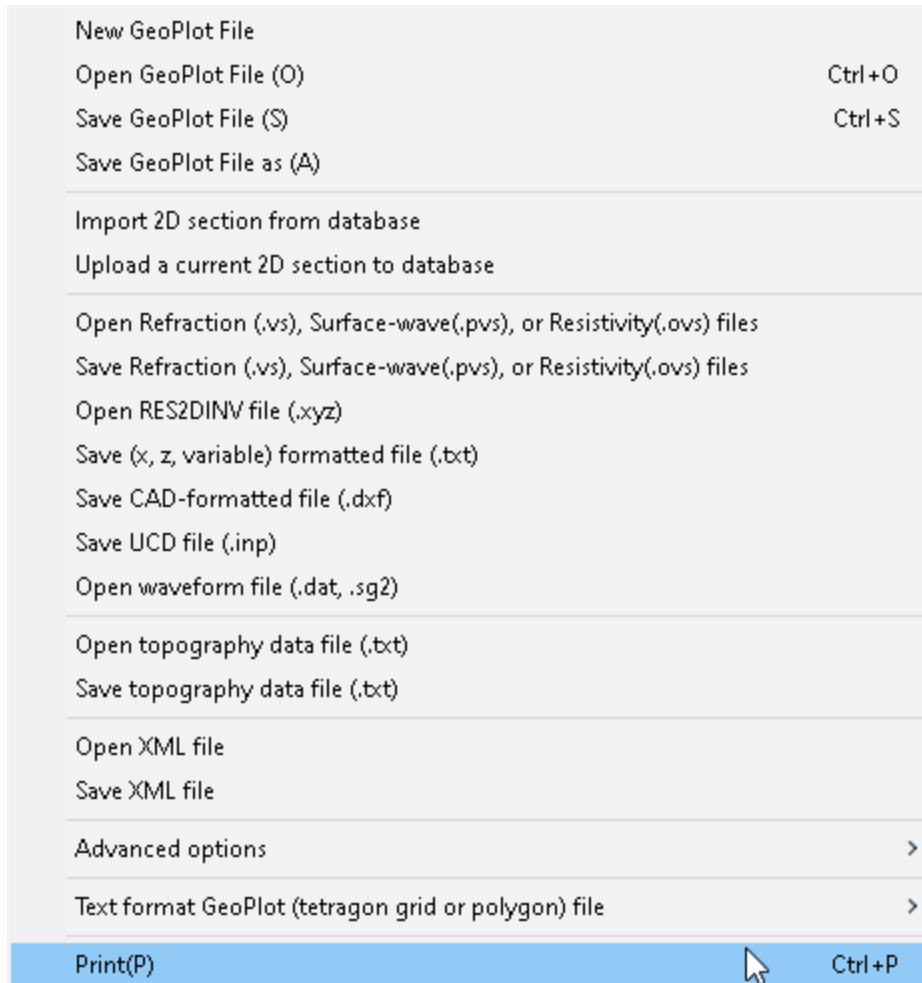
3.1.19.2 SAVE GEOPLOT FILE



This option is used to save a binary GeoPlot file to ASCII format. You may convert binary to ASCII by using *File / Open GeoPlot file* and then *File / Text format GeoPlot (tetragon grid or polygon) file / Save GeoPlot file*.

3.1.20 PRINT [CTRL+P]

File (F)



To print the current GeoPlot display, choose *Print (P)*, press *Ctrl-P*, or click the *Print*  button.

Print

Printer

Name:

HP DeskJet 2700 series

Properties...

Status:

Ready

Type:

HP DJ 2700 series PCL-3

Where:

USB001

Comment:

☐ Print to file

Print range

☒ All

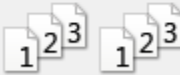
☐ Pages from: 1 to:

☐ Selection

Copies

Number of copies:

1



☒ Collate

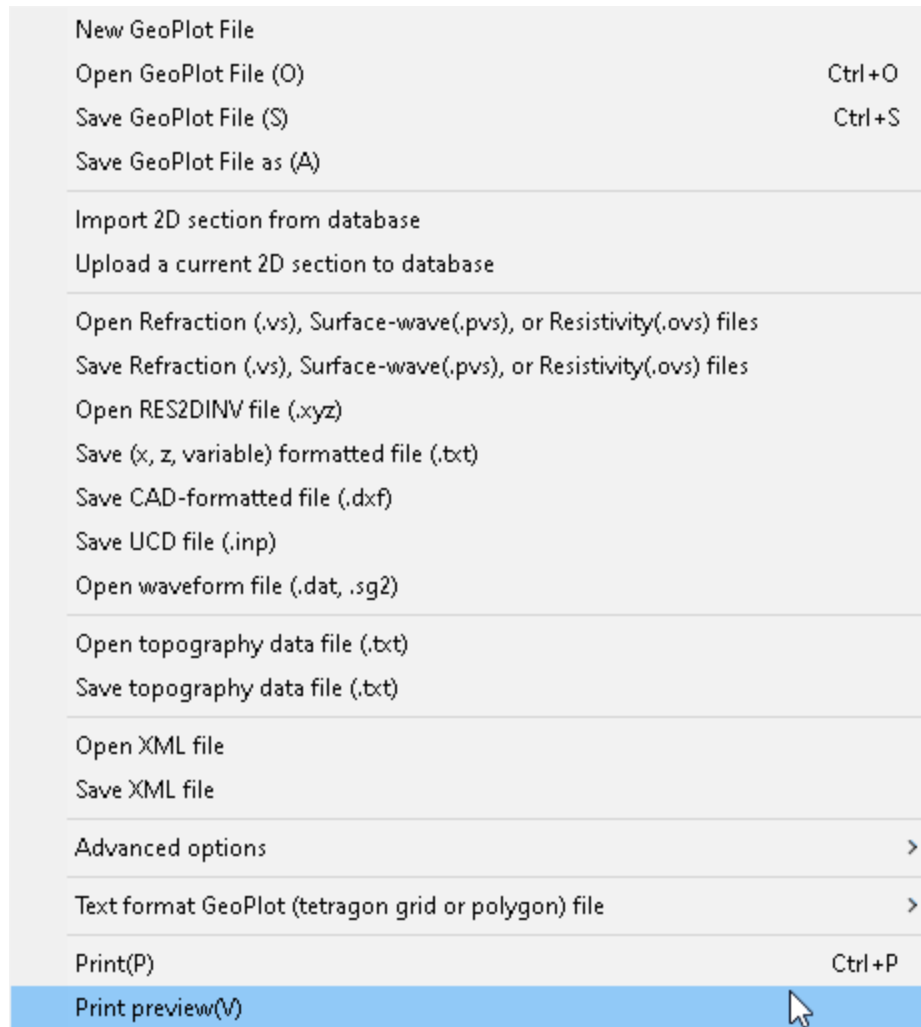
Help

OK

Cancel

3.1.21 PRINT PREVIEW

File (F)



To preview the GeoPlot display before printing, select *Print preview*.

3.1.22 PAGE SETUP

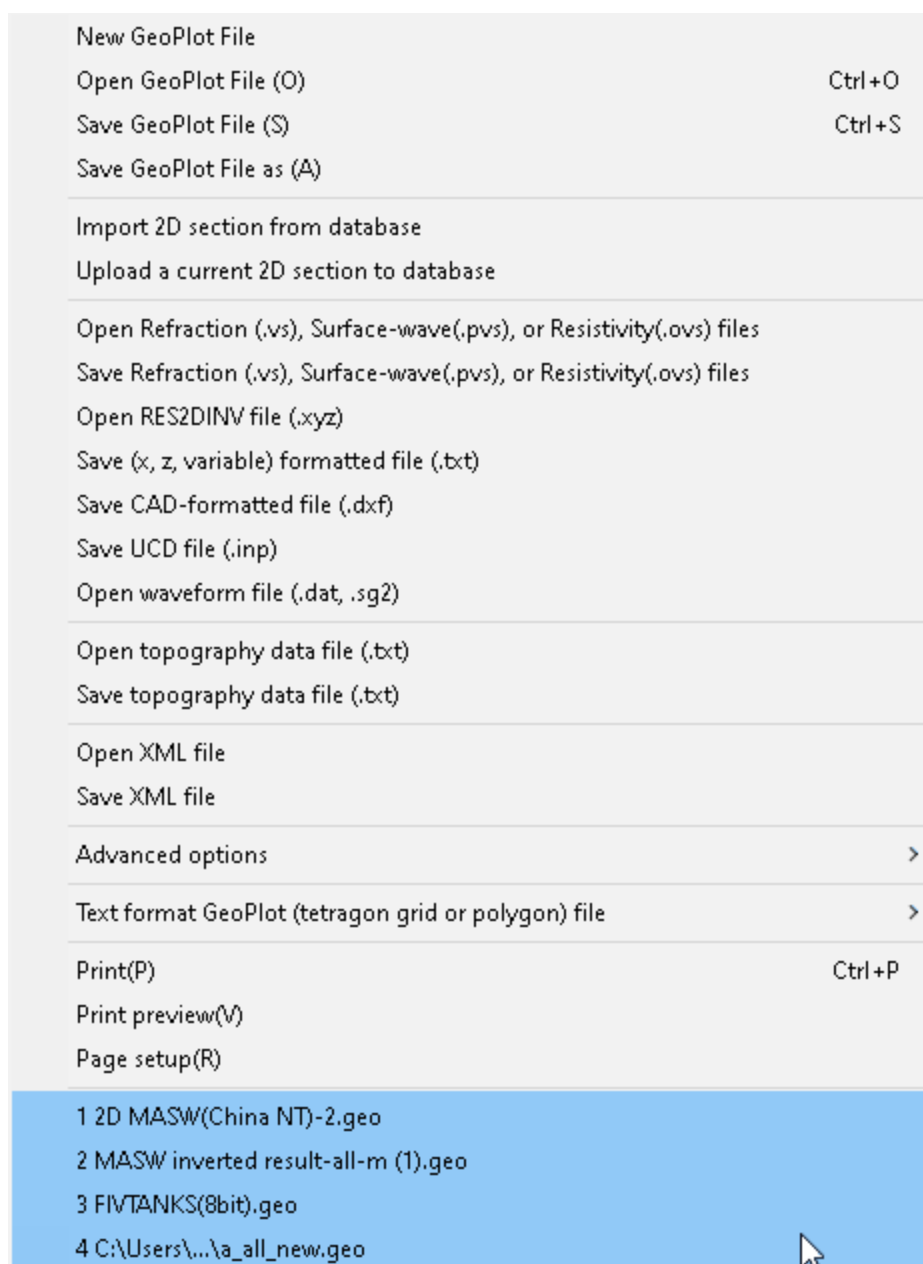
To set up a page for printing, select *Page set up*.

File (F)



3.1.23 RECENT FILES

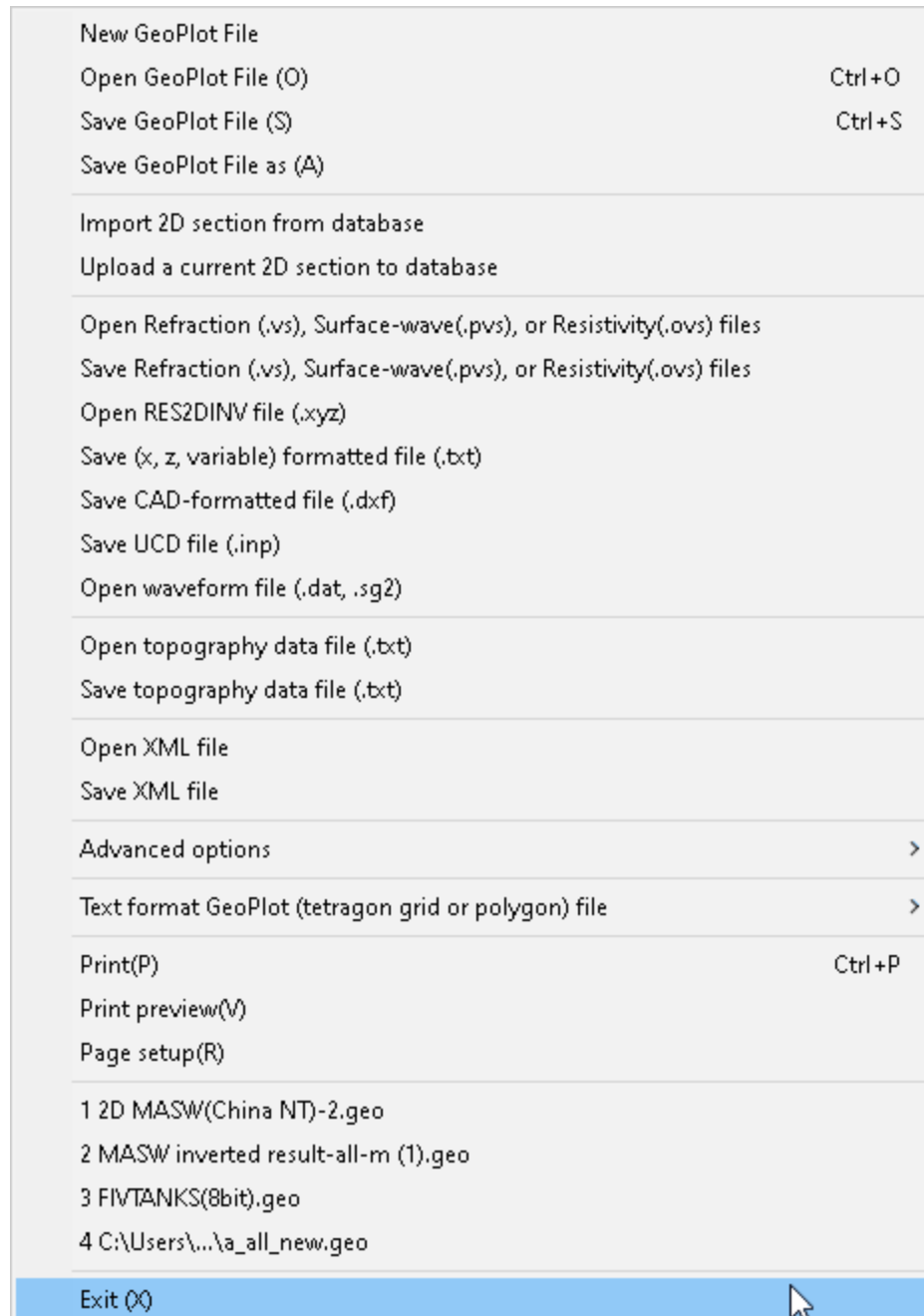
File (F)



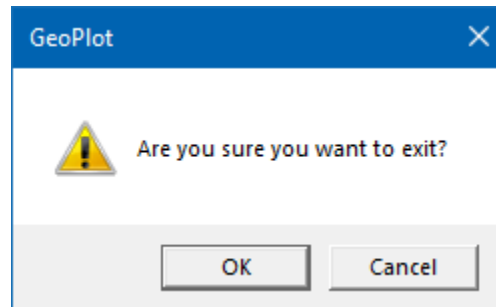
This option displays up to the last five recently opened files for convenient access. Simply select the desired file you wish to open.

3.1.24 EXIT

File (F)



To exit the GeoPlot module, choose *Exit*. You will see the following dialog box:

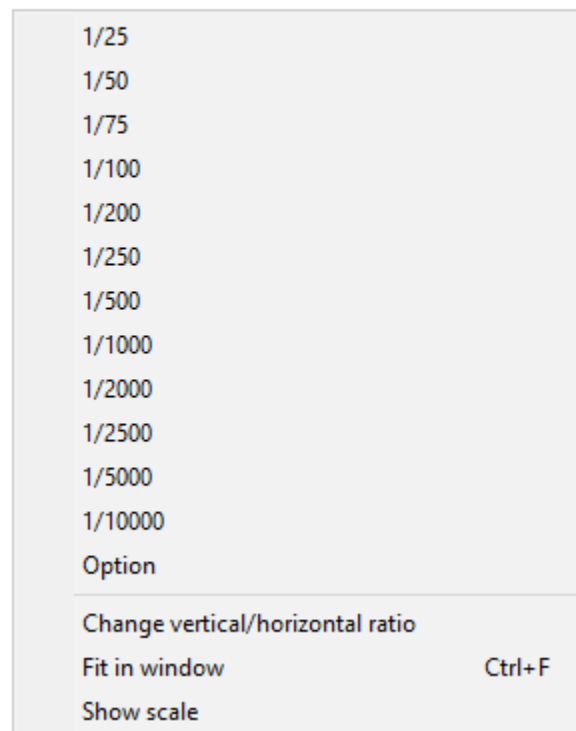


Press *OK* to exit GeoPlot or press *Cancel* to continue using GeoPlot.

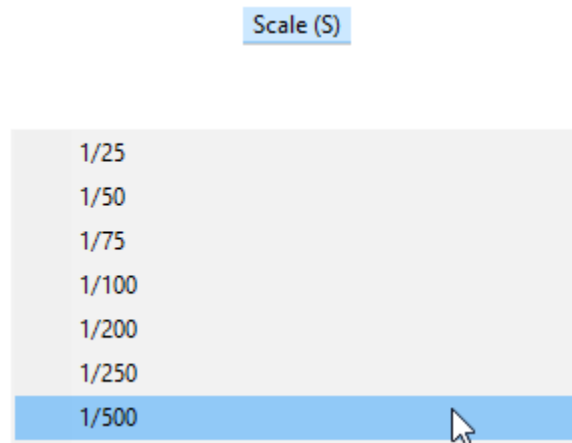
3.2 SCALE MENU



Click on *Scale* to reveal the **Scale** menu:

Scale (S)



3.2.1 SELECT SCALE

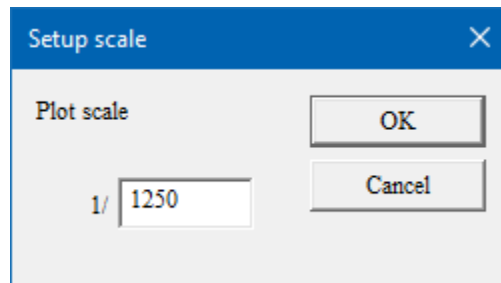


Choose from any one of the scales listed. Alternatively, you may increase/decrease the scale by pressing the tool buttons   or the up- and down-arrow keys.

3.2.2 OPTION



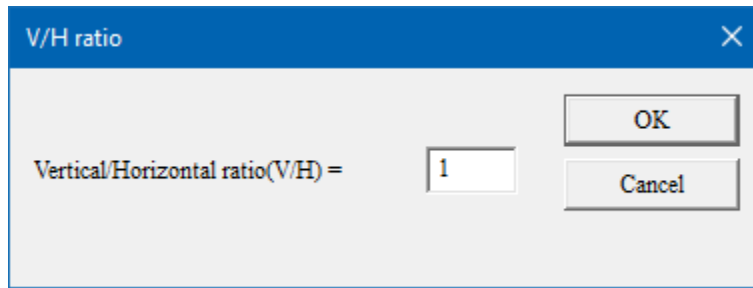
To enter a custom scale, select *Option* and enter the desired scale.



3.2.3 CHANGE VERTICAL/HORIZONTAL RATIO

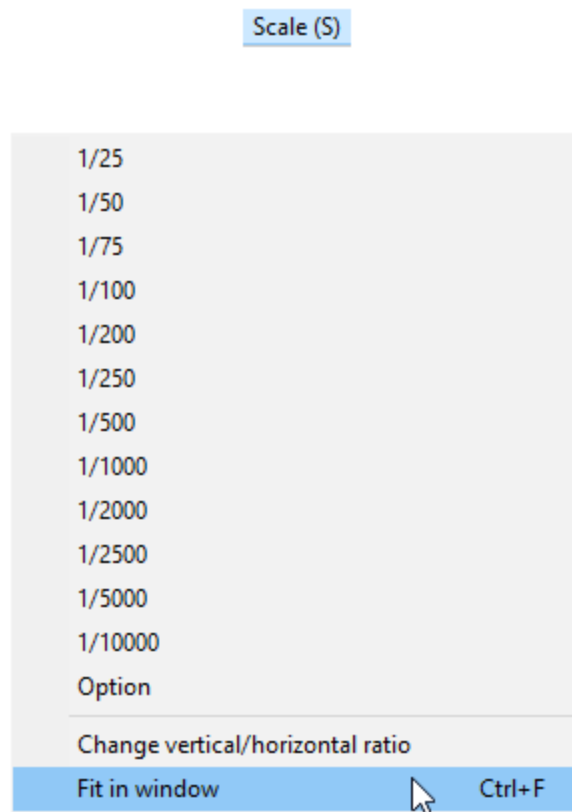


You may change the vertical exaggeration by selecting *Change vertical/horizontal ratio*. This presents the following dialog box:



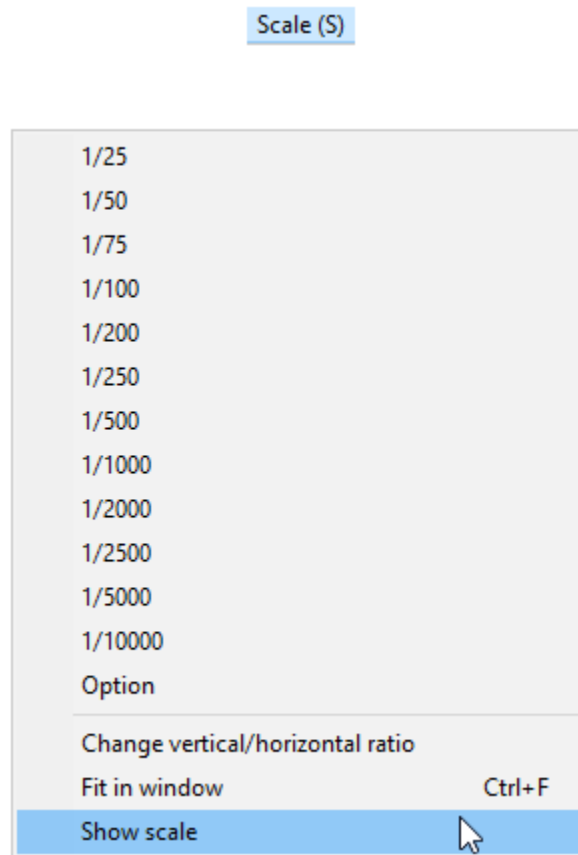
Type in the desired ratio and press *OK*.

3.2.4 FIT IN WINDOW [CTRL+F]



This option will automatically scale the plot to fit in the window. Simple press *Ctrl+F*.

3.2.5 SHOW SCALE



This is a toggle switch that turns on and off the scale display. See below, circled in red.

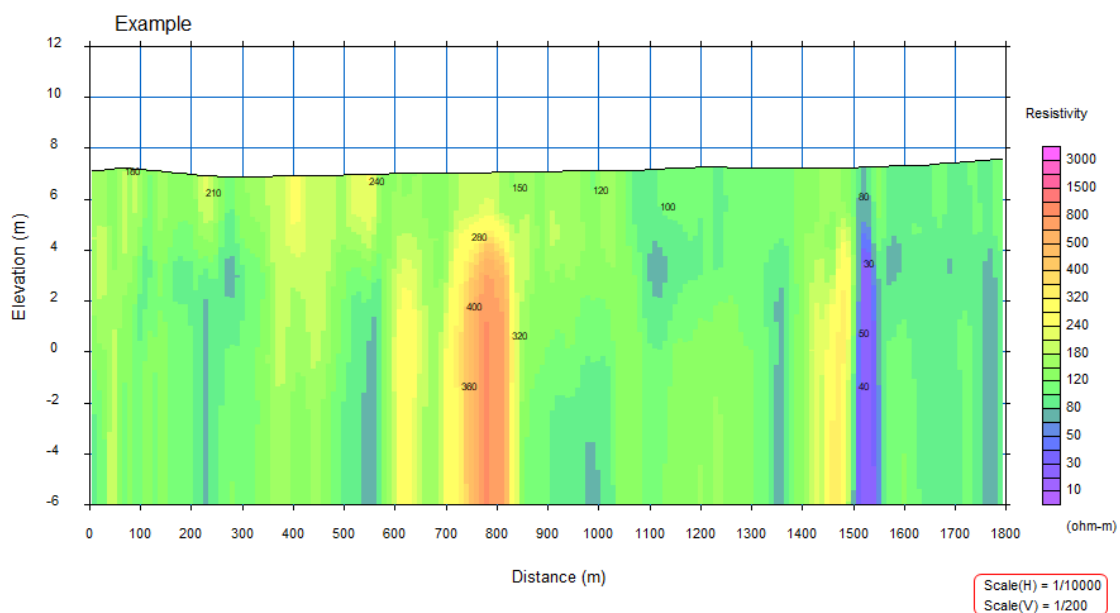
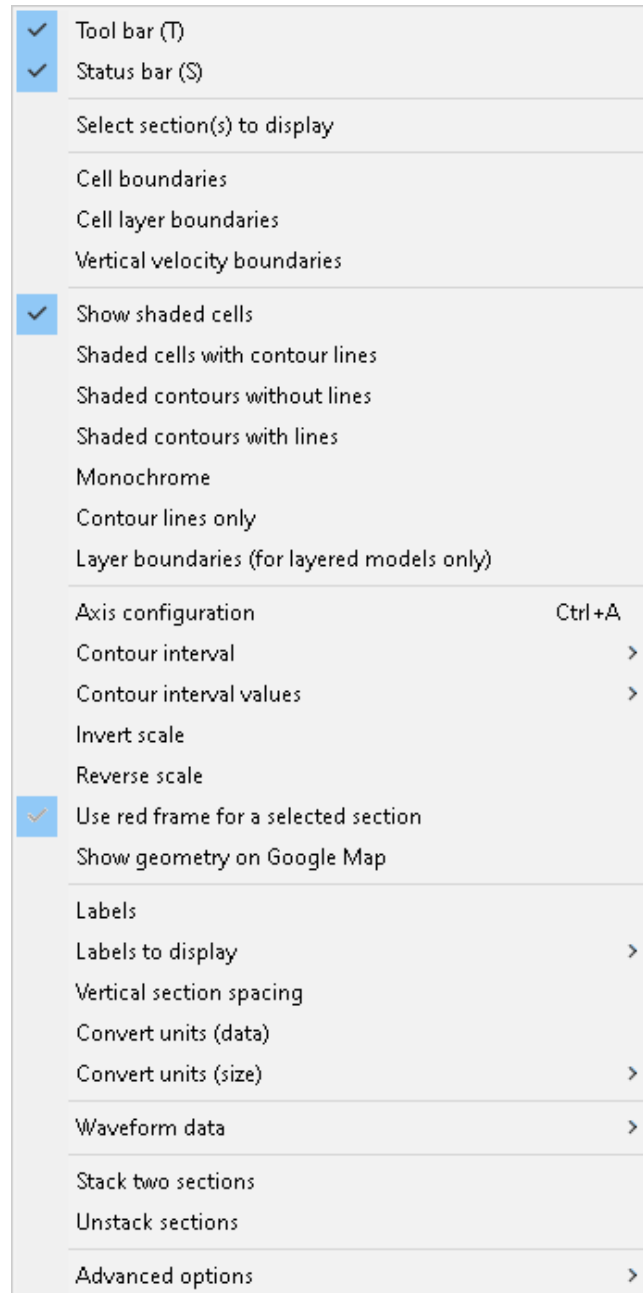


Figure 3: Example display including scale in the lower right-hand corner.

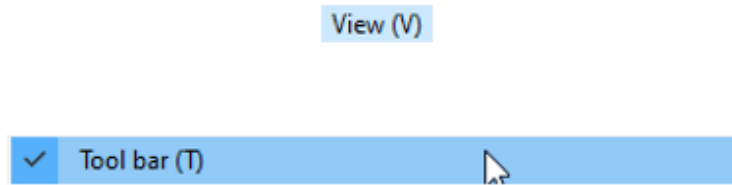
3.3 VIEW MENU

Click on *View* to reveal the **View** menu:

View (V)



3.3.1 TOOL BAR



This option toggles on/off the Tool Bar. The functions of the various buttons are described in the following sections.



Figure 4: GeoPlot tool buttons.

3.3.1.1 OPEN NEW GEOPLOT FILE

Please see Section [3.1.1](#), Page 13.

3.3.1.2 OPEN GEOPLOT FILE

Please see Section [3.1.2](#), Page 13.

3.3.1.3 SAVE GEOPLOT FILE

Please see Section [3.1.3](#), Page 15.

3.3.1.4 PRINT CURRENT IMAGE

Please see Section [3.1.20](#), Page 32.


3.3.1.5 ENLARGE SCALE

Please see Section [3.2.1](#), Page 39.

3.3.1.6 REDUCE SCALE

Please see Section [3.2.1](#), Page 39.

3.3.1.7 EXIT CURRENT EDITING MODE

In the **Edit** menu, depending on which option you choose, you may enter an “Edit Mode”. When finished, you must exit the edit mode before doing anything else. For example, if you select *Modify layer boundary (point by point)*, you will enter an edit mode. The  button exits the editing mode you are currently in.

3.3.1.8 SHOW CELL BOUNDARIES

Please see Section [3.3.4](#), Page 56.

3.3.1.9 SHOW CELL LAYER BOUNDARIES

Please see Section [3.3.5](#), Page 57.

3.3.1.10 SHOW SHADED CELLS

Please see Section [3.3.7](#), Page 59.

3.3.1.11 SHOW SHADED CELLS WITH CONTOUR LINES

Please see Section [3.3.8](#), Page 60.

3.3.1.12 SHOW SHADED CONTOURS WITHOUT LINES

Please see Section [3.3.9](#), Page 61.

3.3.1.13 SHOW SHADED CONTOURS WITH LINES

Please see Section [3.3.10](#), Page 62.

3.3.1.14 SHOW CONTOUR LINES

Please see Section [3.3.12](#), Page 64.

3.3.1.15 SHOW LAYER BOUNDARIES (FOR LAYERED MODELS ONLY)

Please see Section [3.3.13](#), Page 65.

3.3.1.16 SHOW VERTICAL VELOCITY BOUNDARIES

Please see Section [3.3.6](#), Page 58.

3.3.1.17 SHOW LABELS

Pressing this button will show the velocity labels in a velocity model with no background. It works well when the model colors are light.

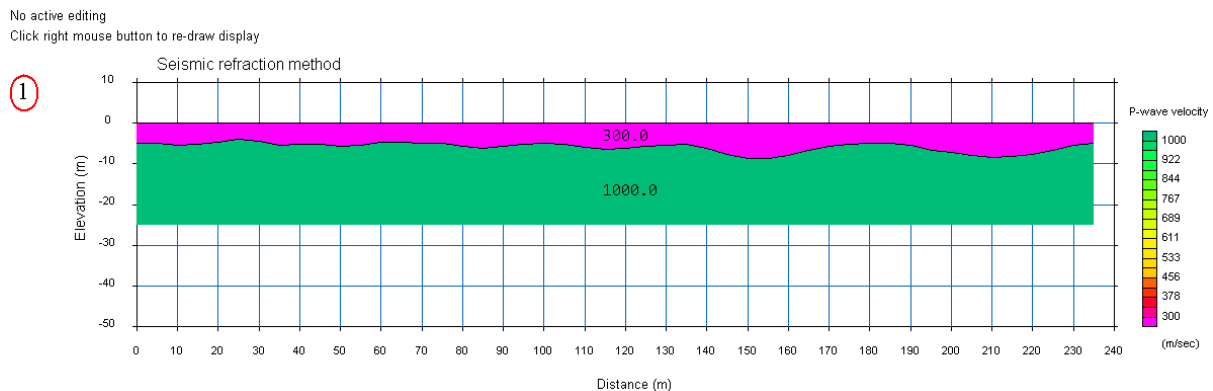


Figure 5: Velocity labels shown with no background.

3.3.1.18 SHOW LABELS WITH BACKGROUND

When model colors are dark, and contrast with the velocity labels is minimal, this button will highlight the labels with a white background.

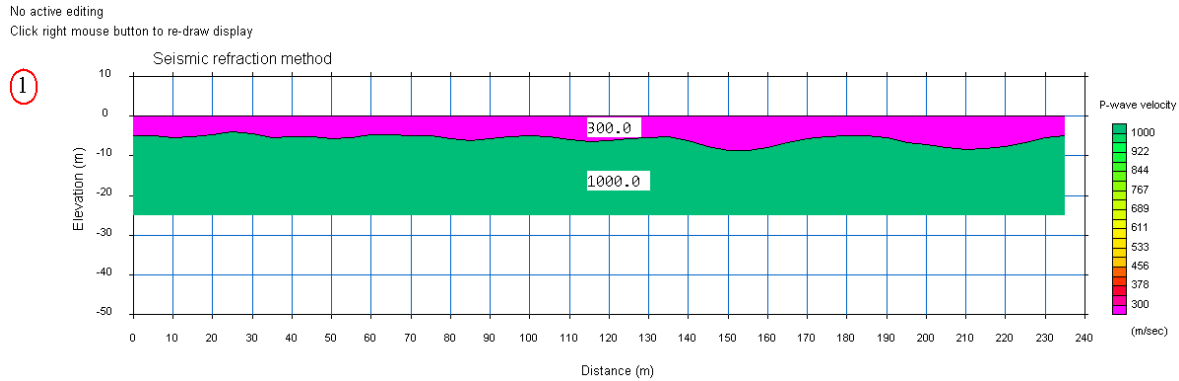


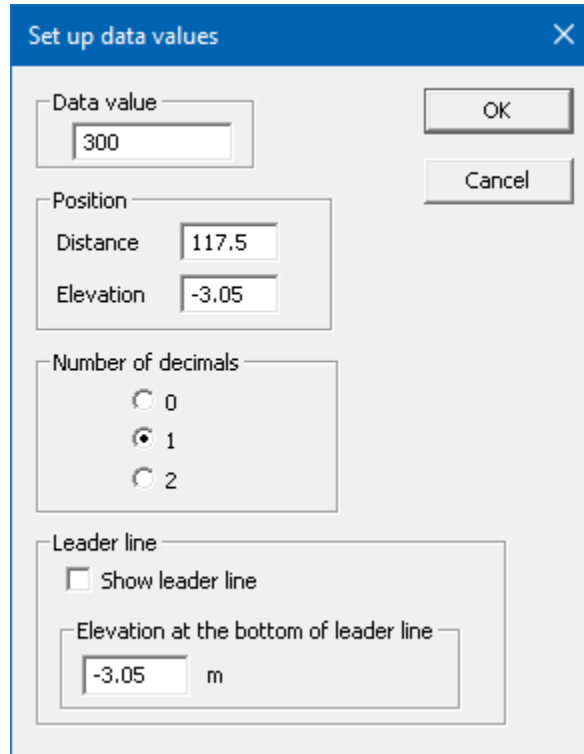
Figure 6: Velocity labels shown against a white background for better visibility.

3.3.1.19 REMOVE LABELS

This button toggles the velocity labels on and off.

3.3.1.20 SELECT AN OBJECT

This button is used to select an object, such as a text label, for editing. For instance, double-clicking on a velocity label reveals the following dialog box:



Set up data values

Data value:

Position:

Distance:

Elevation:

Number of decimals:

☐ 0

☒ 1

☐ 2

Leader line:

☐ Show leader line

Elevation at the bottom of leader line:

m

OK Cancel

3.3.1.21 DRAW LINES USING MOUSE


3.3.1.22 INSERT TEXT

Please see Section [3.6.6.2](#), Page 226.


3.3.1.23 MODIFY LAYER BOUNDARY USING THE MOUSE

Please see Section [3.4.4](#), Page 122.

3.3.1.24 REDUCE WAVEFORM AMPLITUDE

When displaying a waveform file, such as a refraction record, you may reduce the amplitudes of the traces using the  button or the left-arrow key.

3.3.1.25 ENLARGE WAVEFORM AMPLITUDE

When displaying a waveform file, such as a refraction record, you may increase the amplitudes of the traces using the  button or the right-arrow key.

3.3.1.26 TRACE SHADING TOOL BUTTONS

When displaying a waveform file, such as a refraction record, you may display the waveforms as wiggle trace or shaded area. In the shaded area display, you may shade either the negative or positive peaks. These options are illustrated below.

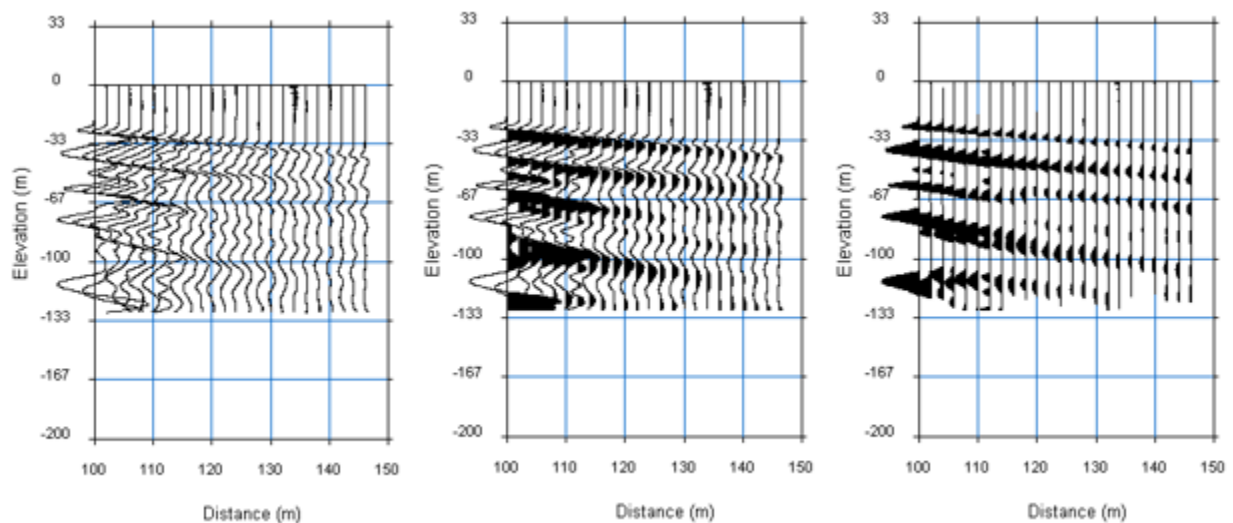


Figure 7: Trace shading: Wiggle trace (left), positive shading (middle), and negative shading (right).

3.3.1.27 SHOW WAVEFORM AS BITMAP

Select this option to view the waveforms in a color amplitude plot. An example is shown below.

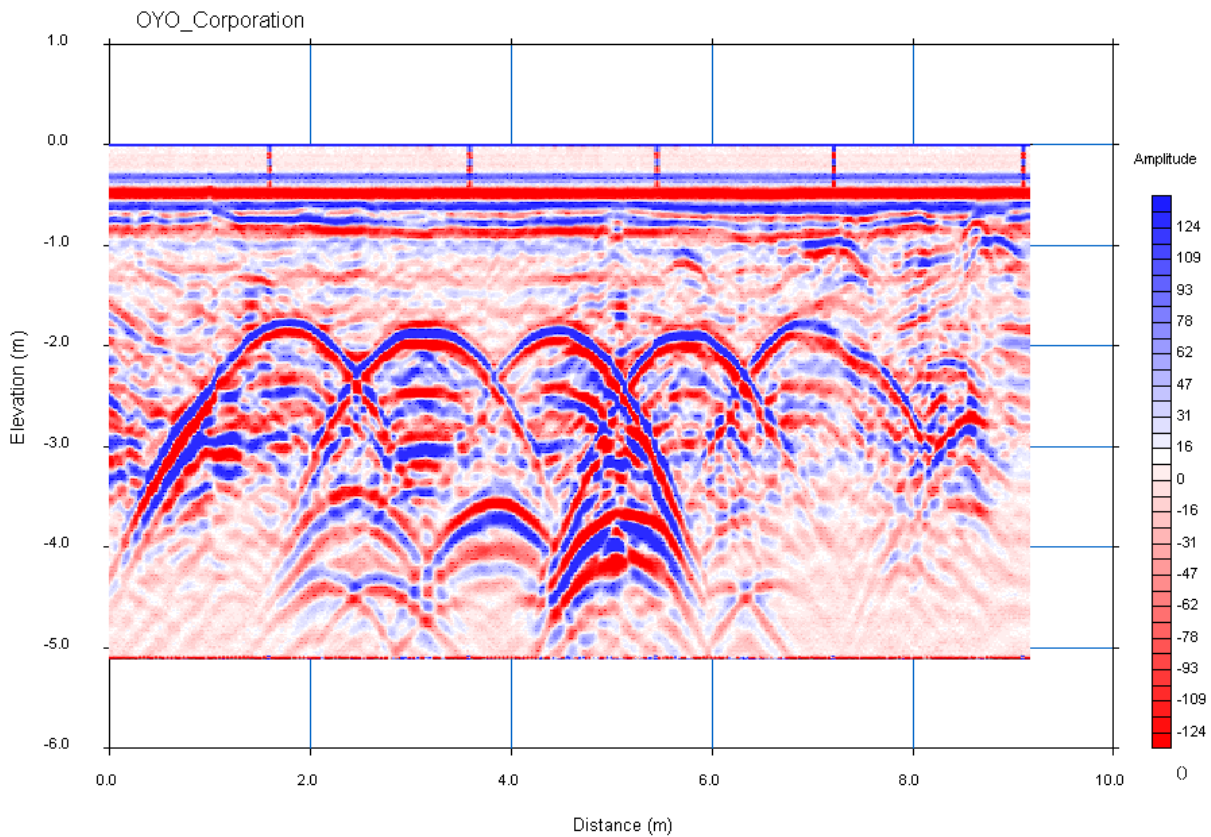



Figure 8: Color amplitude (bitmap) plot.

3.3.1.28 SHOW CROSS SECTION

Press the  button to display any cross sections you have created and/or imported. In this example, there are six. They are compressed vertically to fit on a single page:

No active editing
Click right mouse button to re-draw display

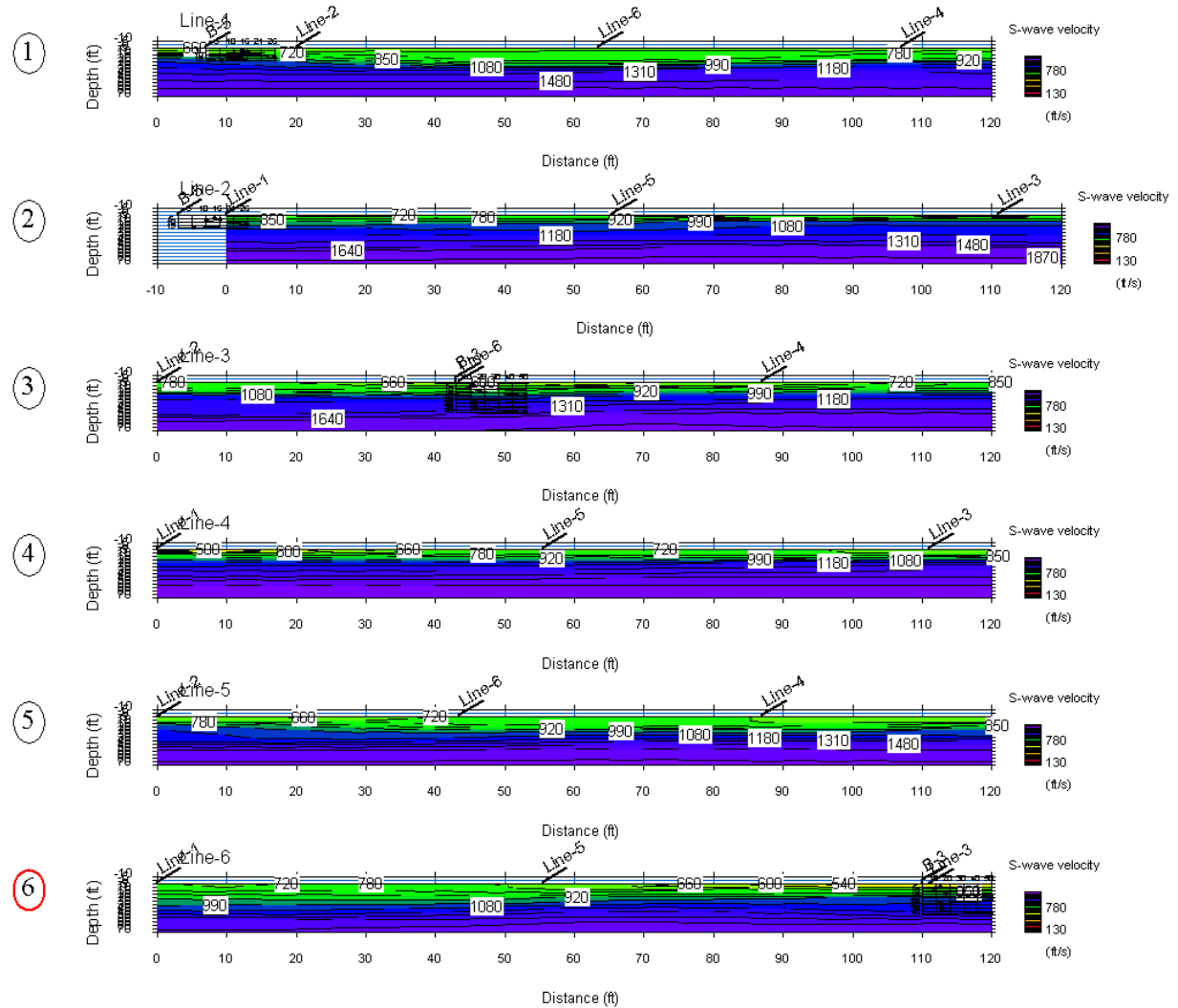


Figure 9: Collection of six cross sections displayed in compressed view.

To display in a more pleasing scale, we press *Ctrl-F* to fit them in the window horizontally:

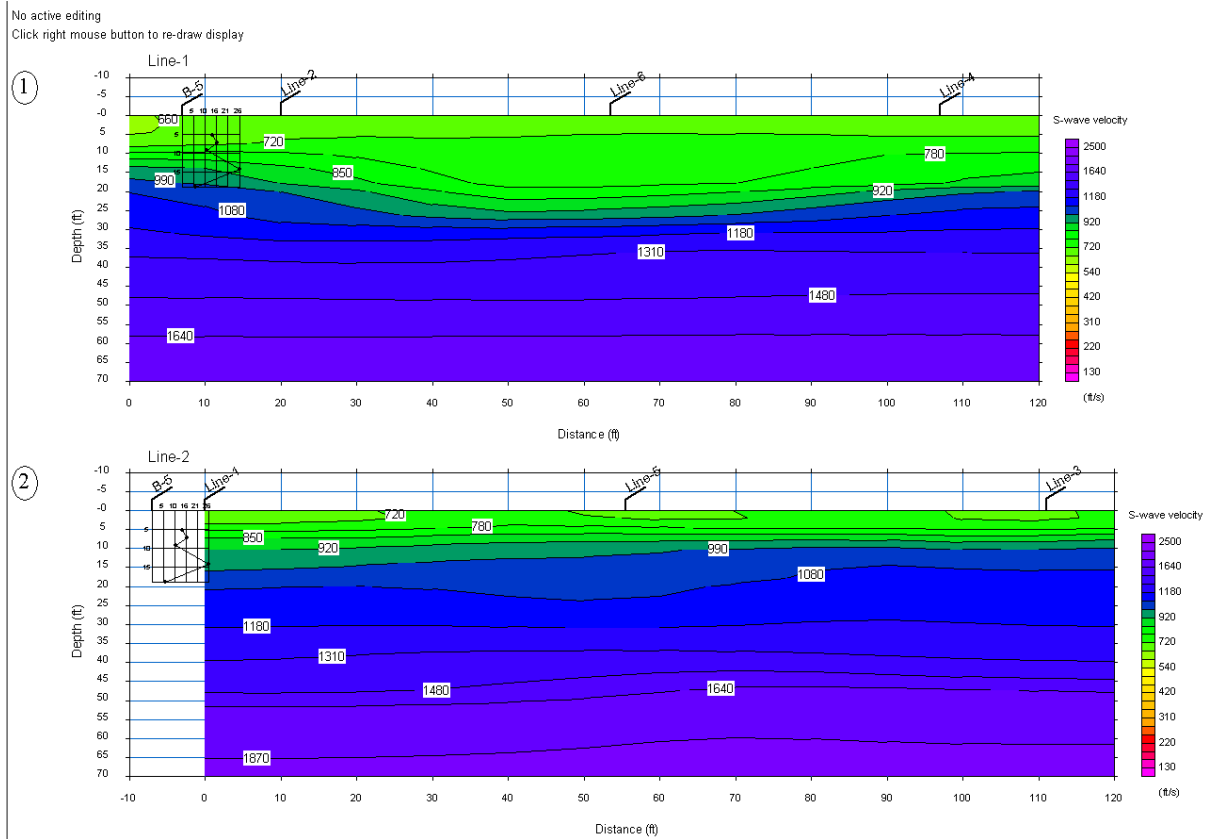



Figure 10: Two of the above six cross sections displayed in expanded view.

You may now scroll through the cross sections vertically.

3.3.1.29 SHOW SURVEY LINE GEOMETRY

In the above case, the cross sections are tagged with GPS and can be displayed in map view by pressing the  button. (The GPS coordinates have been removed as the data is proprietary.)

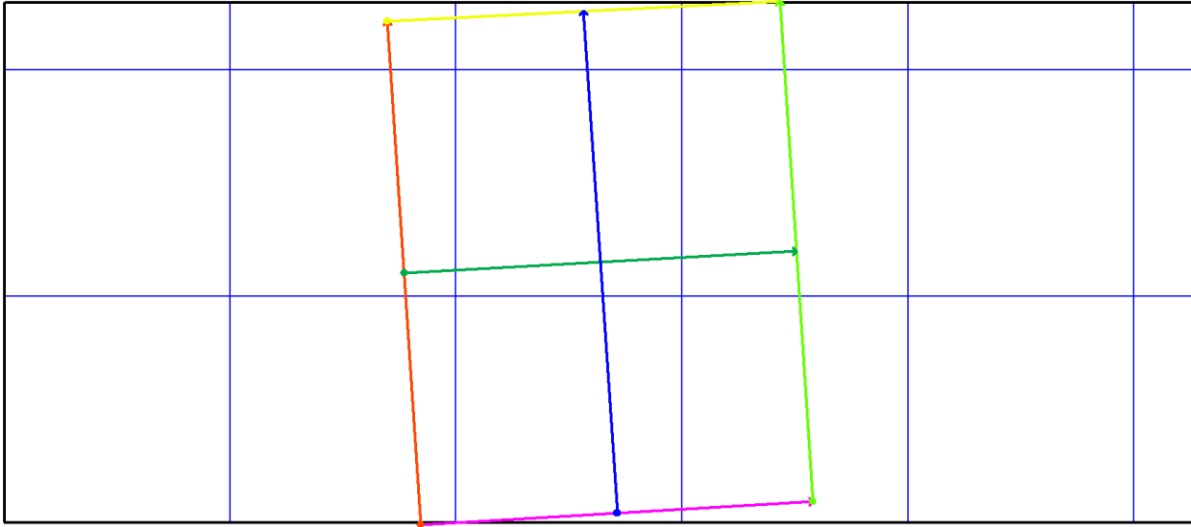


Figure 11: Survey line geometry.

3.3.1.30 SHOW SURVEY LINES ON GOOGLE MAP


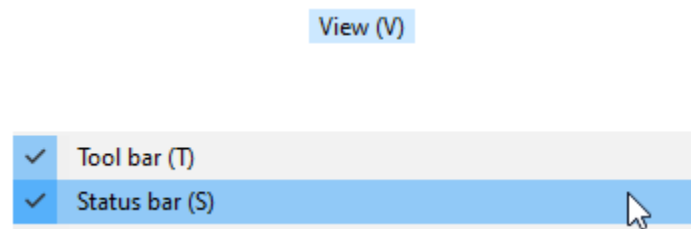
If you wish to show the survey line Geometry on a Google Maps[®] base map, press the  button:



Figure 12: Survey line geometry shown on a Google Maps base map.

Note that this option requires that you have the SeisImagerMap module installed. See Note on Page [92](#). Also see [Appendix A](#).

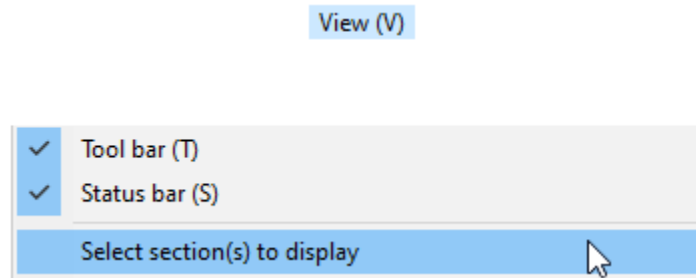
3.3.2 STATUS BAR



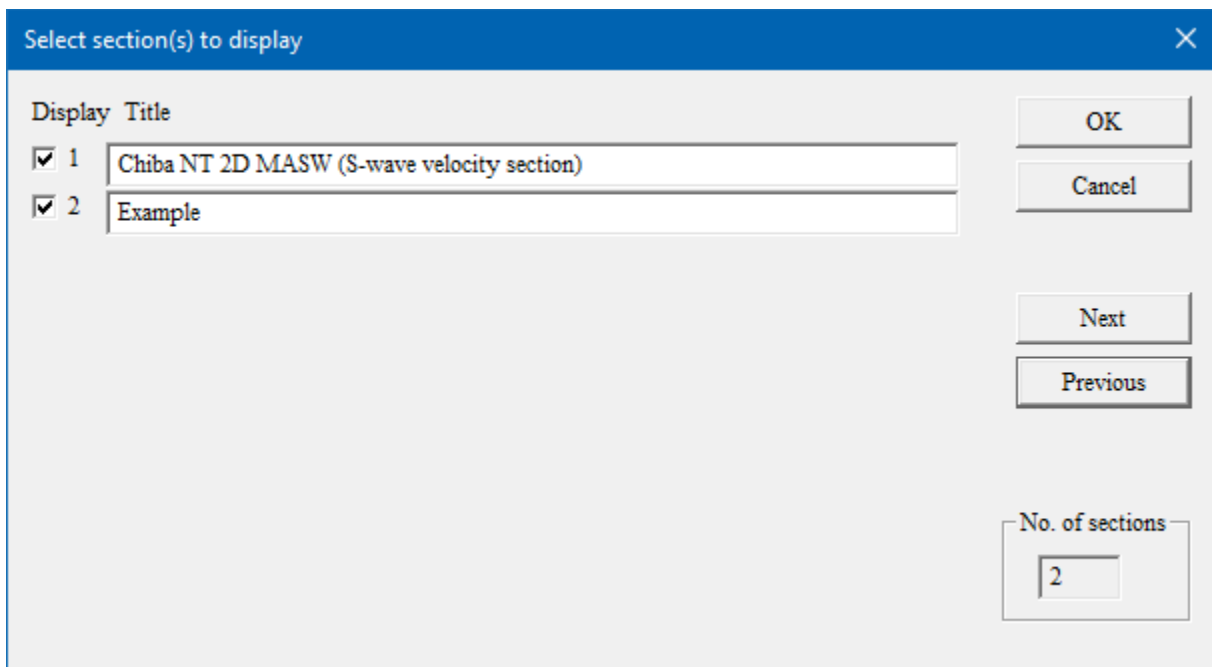
This option toggles on/off the *Status Bar* at the bottom of the page.



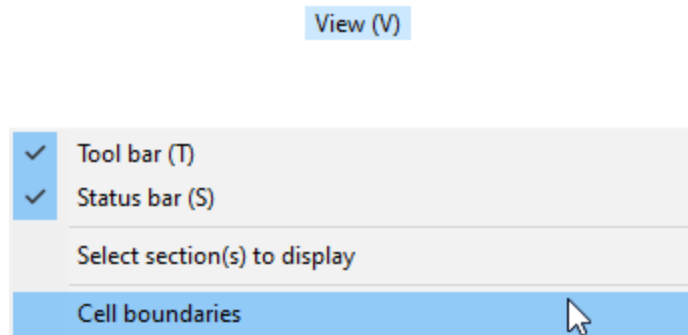
3.3.3 SELECT SECTION(S) TO DISPLAY




If you have imported more than one plot by using the Append option, you may display a subset of the plots using this option. Simply check the box next to the section(s) you wish to display.



3.3.4 CELL BOUNDARIES



Click on the *Cell boundaries* toggle switch or the  button to turn on/off the display of the model's cells.

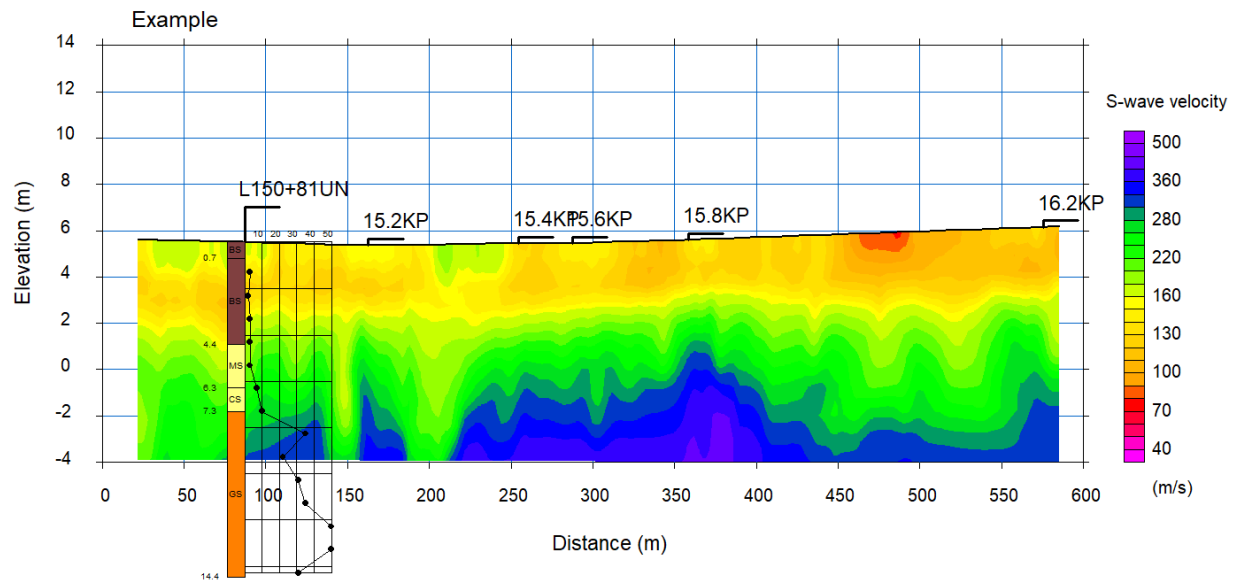


Figure 13: Velocity model (cells not displayed).

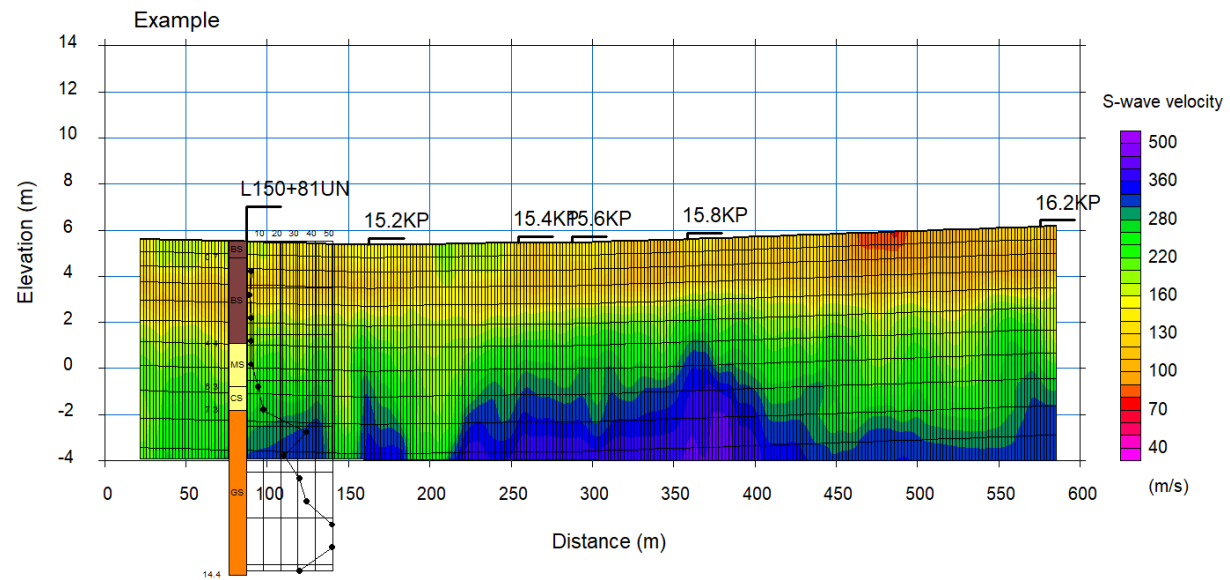
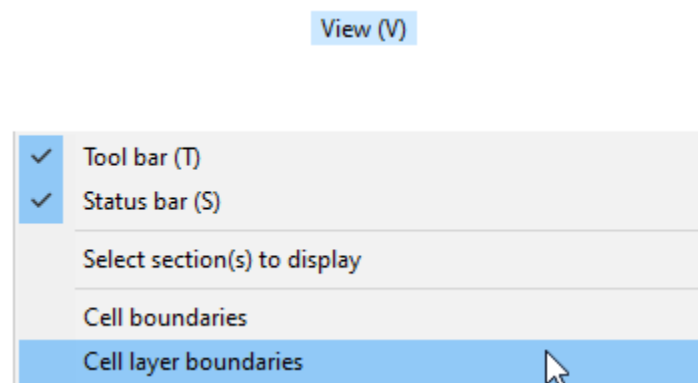



Figure 14: Velocity model with cells displayed.

3.3.5 CELL LAYER BOUNDARIES



Click on the *Cell layer boundaries* toggle switch or the  button to turn on/off the display of the model's cell layer boundaries.

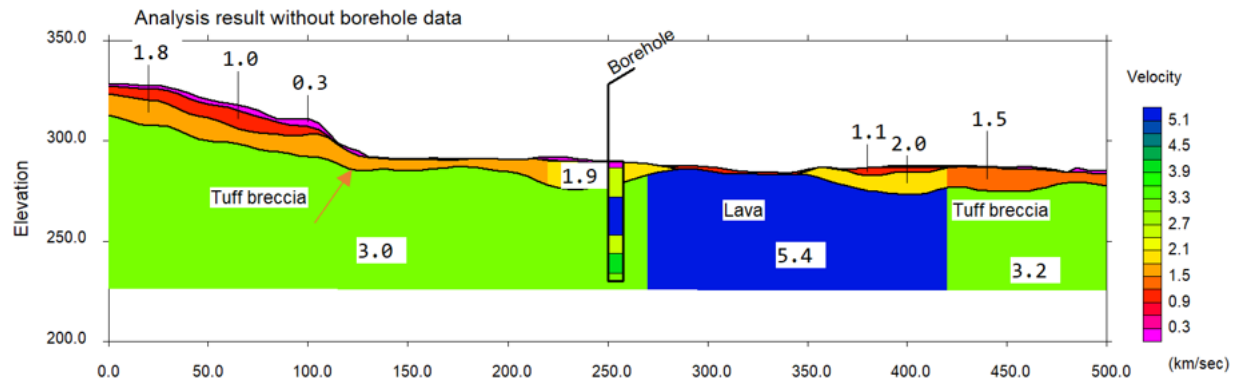
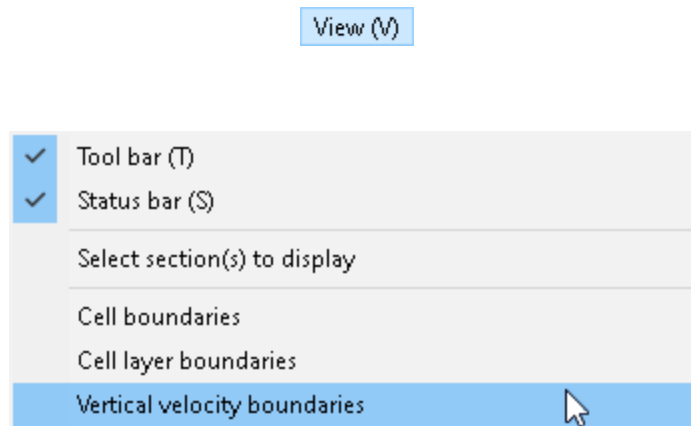



Figure 15: Velocity model with cell layer boundaries displayed.

3.3.6 VERTICAL VELOCITY BOUNDARIES



Click on the *Vertical velocity boundaries* toggle switch or the  button to turn on/off the display of the model's vertical velocity boundaries. This is only applicable to layered models with vertical velocity contrasts caused by dikes, etc. This feature is most useful when the velocity contrasts (and color contrasts) are relatively small. It is also useful when displaying the model in monochrome mode.

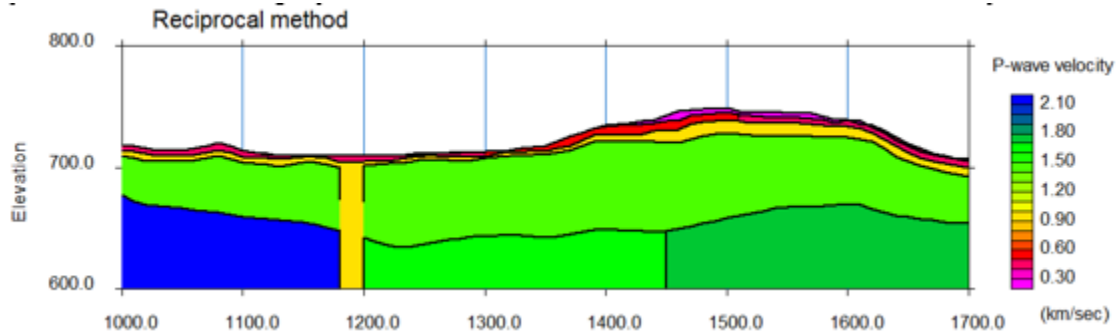
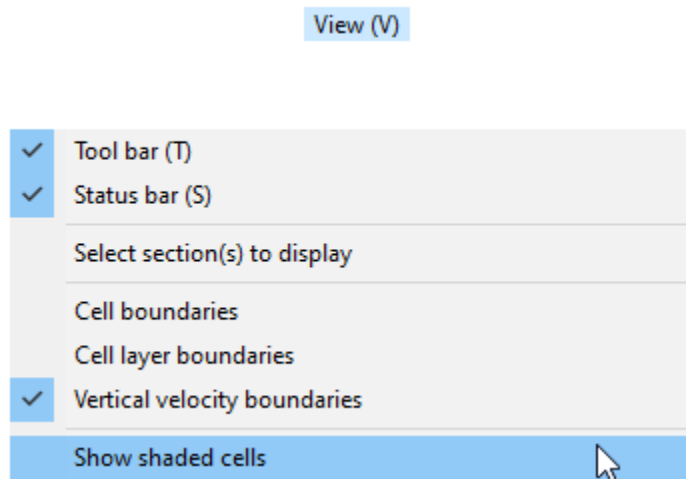



Figure 16: Layered velocity model with vertical velocity boundaries displayed.

3.3.7 SHOW SHADED CELLS



Click on the *Show shaded cells* toggle switch or the  button to shade/unshade the model's cells.

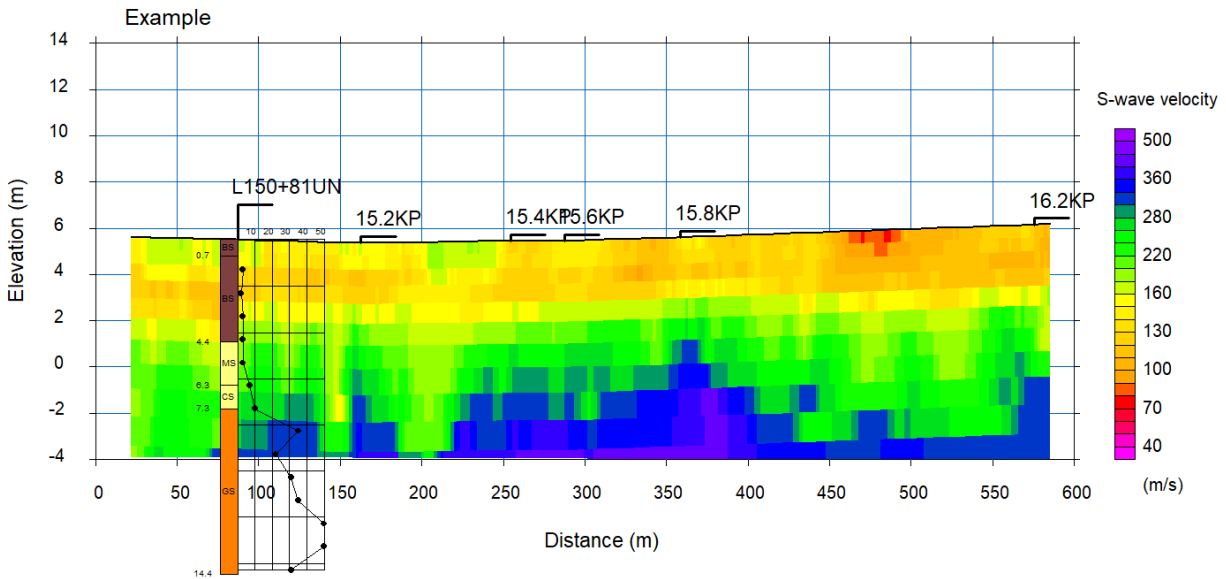
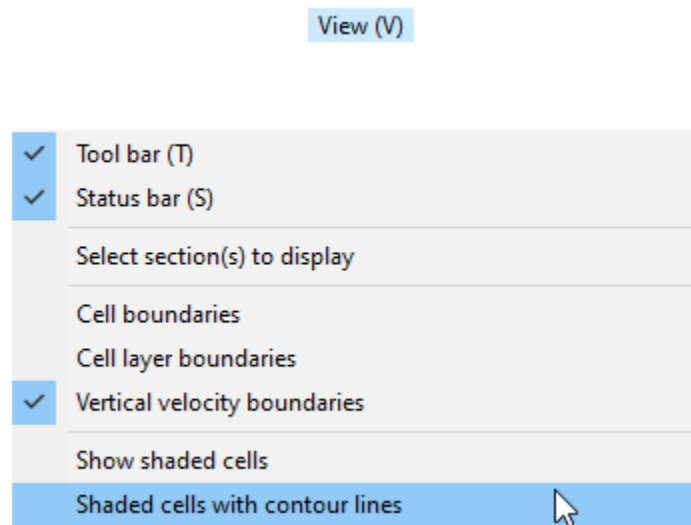



Figure 17: Velocity model with shaded cells displayed.

3.3.8 SHADED CELLS WITH CONTOUR LINES



Click on the *Shaded cells with contour lines* toggle switch or the  button to shade/unshade the model's cells and draw contour lines on the model.

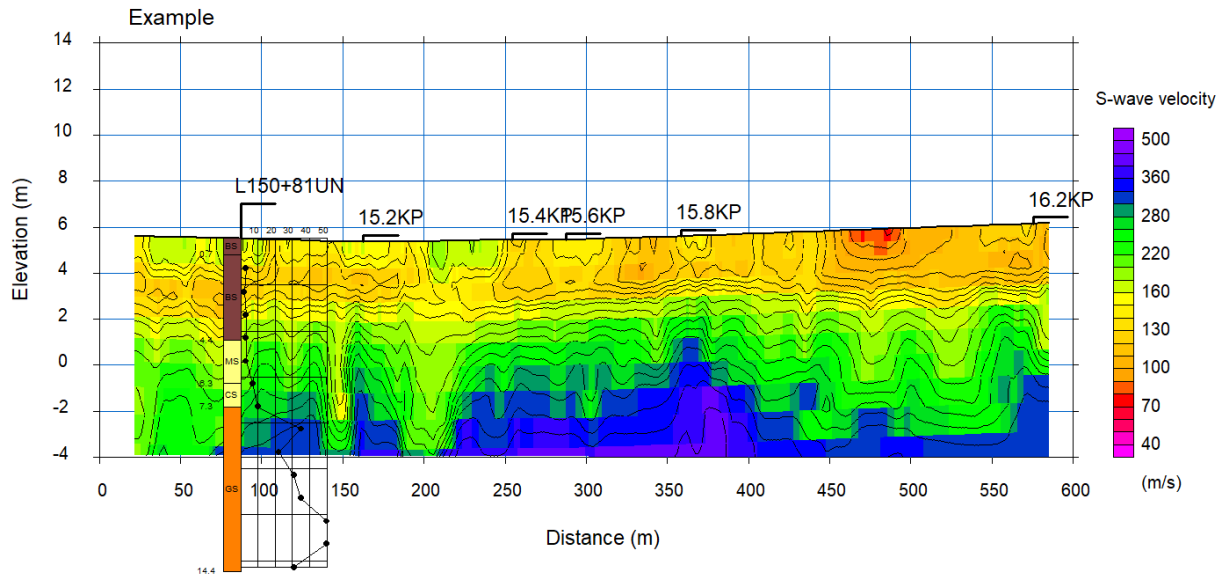
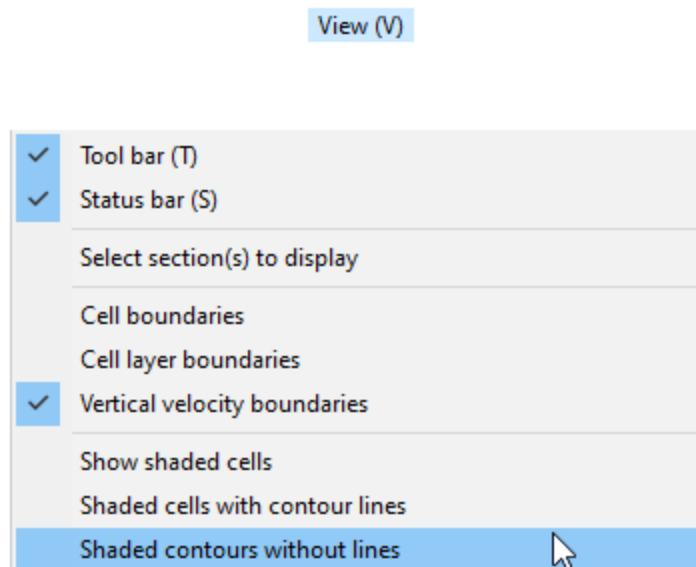



Figure 18: Velocity model with shaded cells and contour lines displayed.

3.3.9 SHADED CONTOURS WITHOUT LINES



Click on the *Shaded contours without lines* toggle switch or the  button to shade/unshade the model's cells without drawing contour lines on the model.

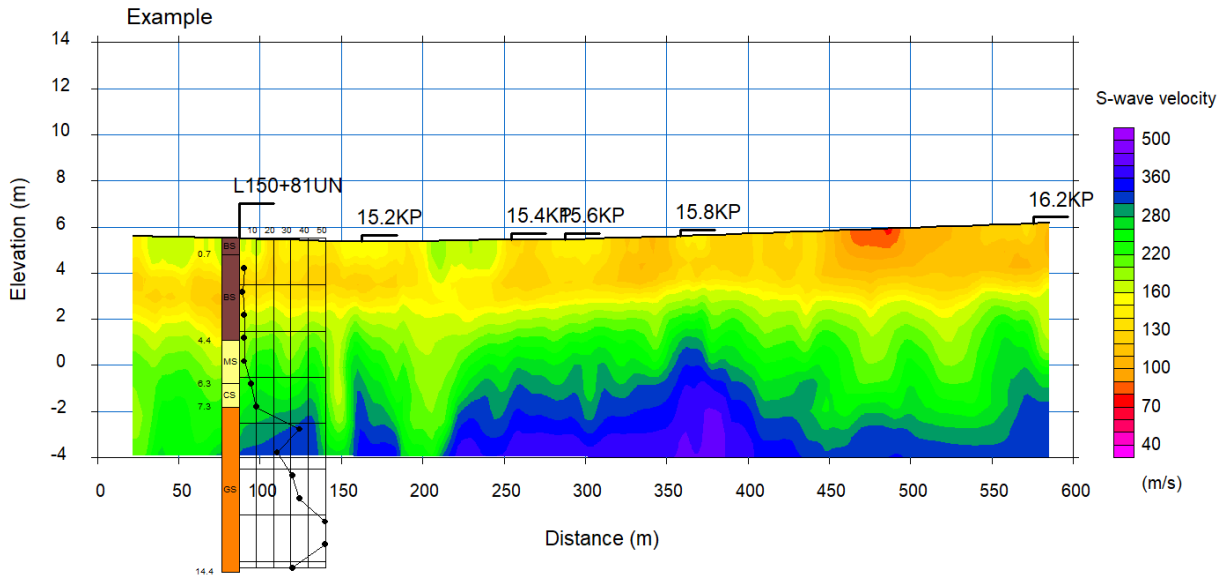
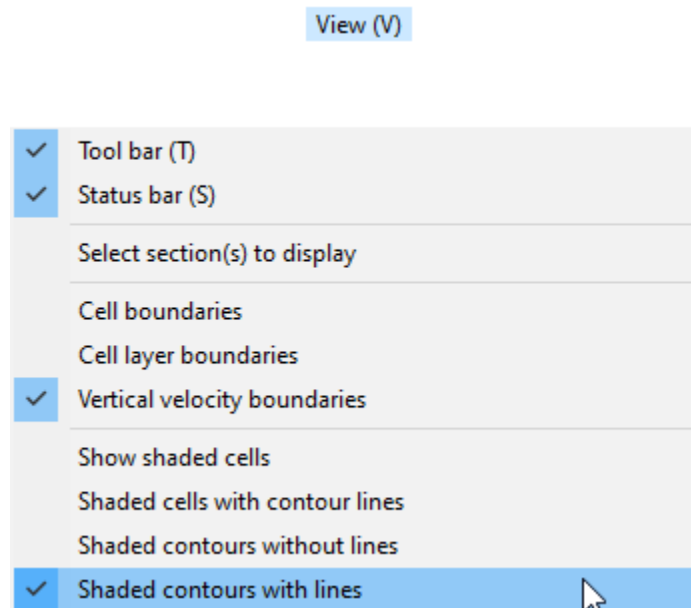



Figure 19: Velocity model with shaded contours but no contour lines displayed.

3.3.10 SHADED CONTOURS WITH LINES



Click on the *Shaded contours with lines* toggle switch or the  button to shade/unshade the model's cells and draw contour lines on the model.

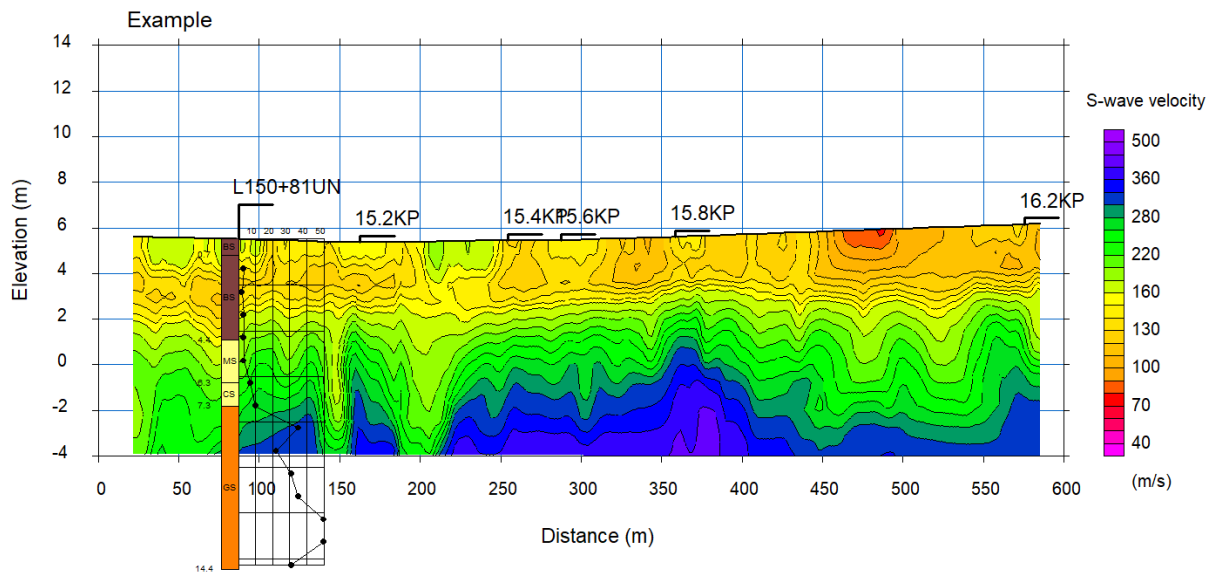
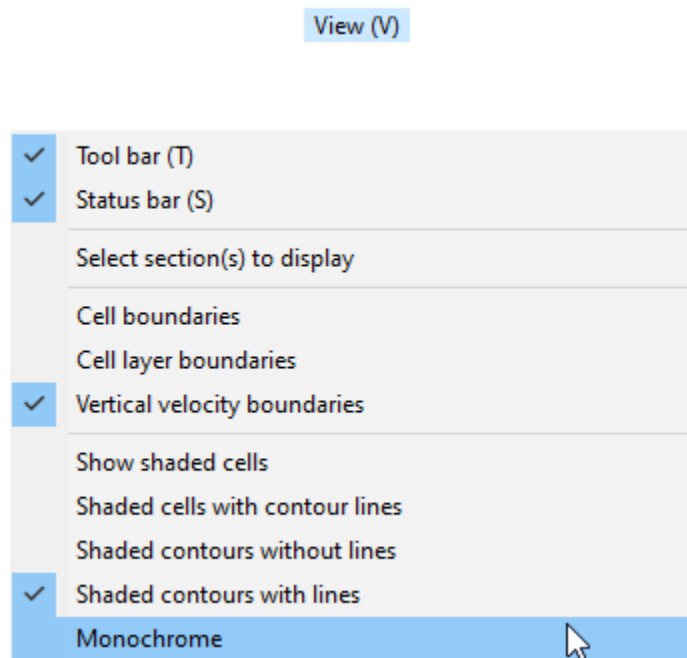


Figure 20: Velocity model with shaded contours and contour lines displayed.

3.3.11 MONOCHROME



Click on the *Monochrome* toggle switch to display the model in shades of grey.

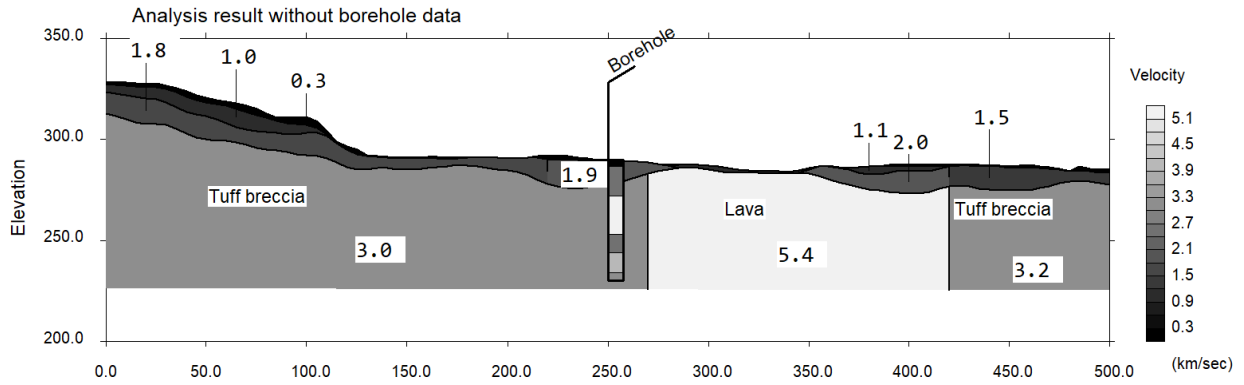
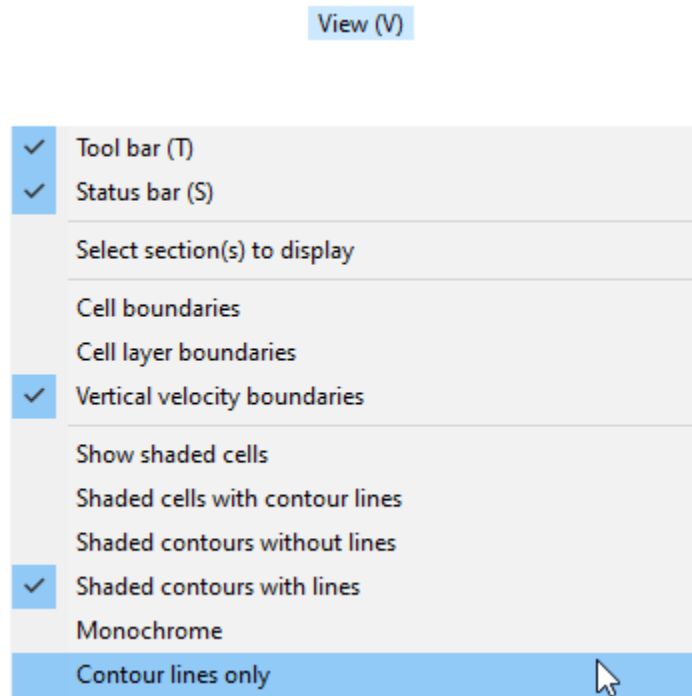



Figure 21: Monochrome display.

3.3.12 CONTOUR LINES ONLY



Click on the *Contour lines only* toggle switch or the  button to only draw contour lines on the model.

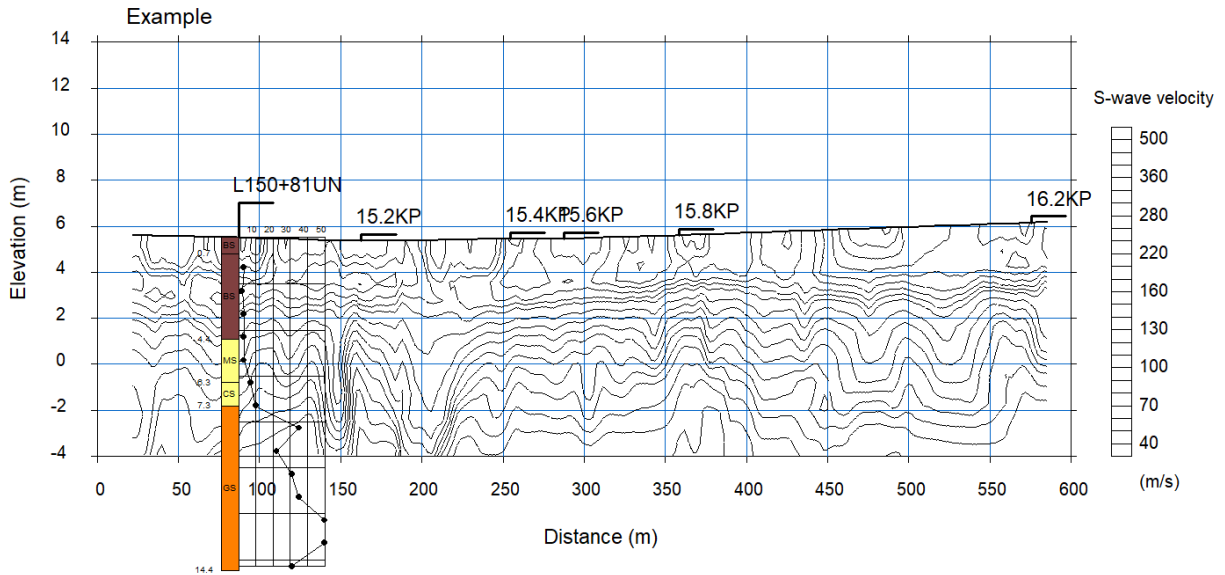
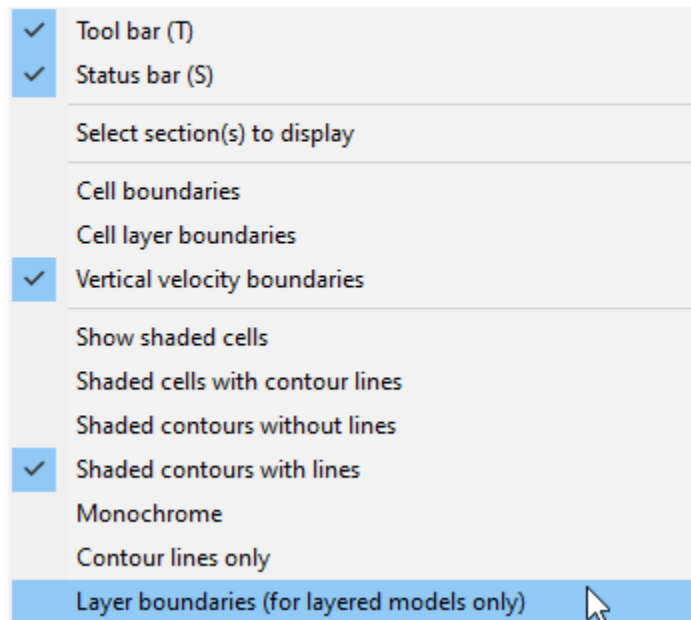


Figure 22: Velocity model with only contour lines displayed.

3.3.13 LAYER BOUNDARIES (FOR LAYERED MODELS ONLY)

View (V)



Checking *Layer boundaries (for layered models only)* displays the layers without color:

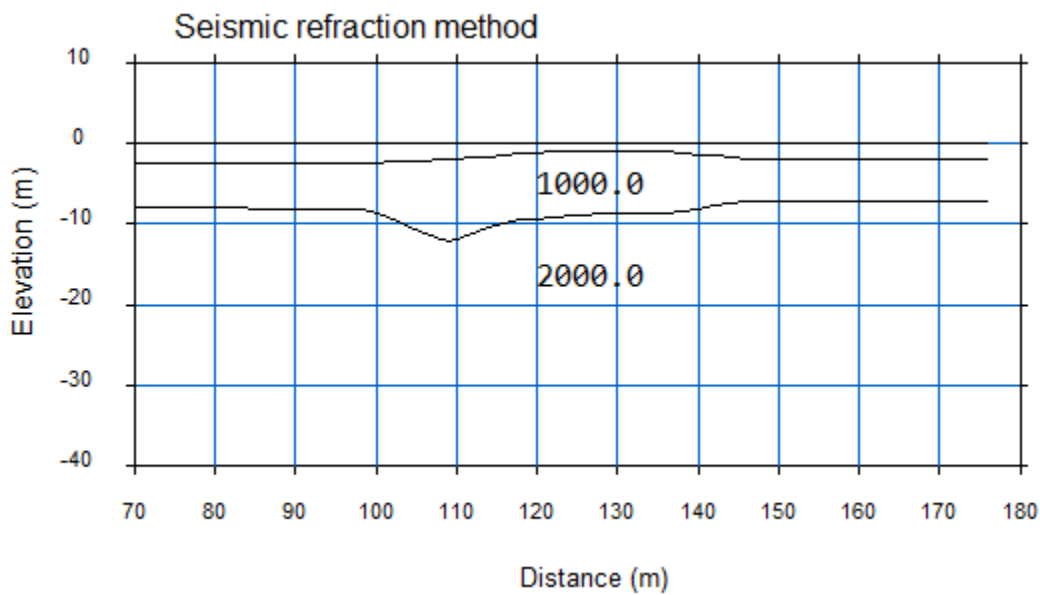
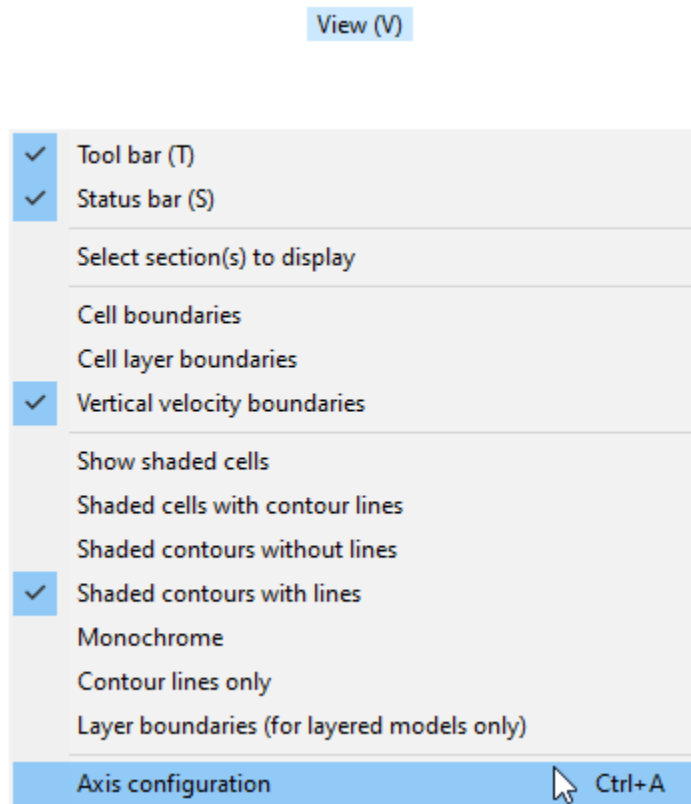
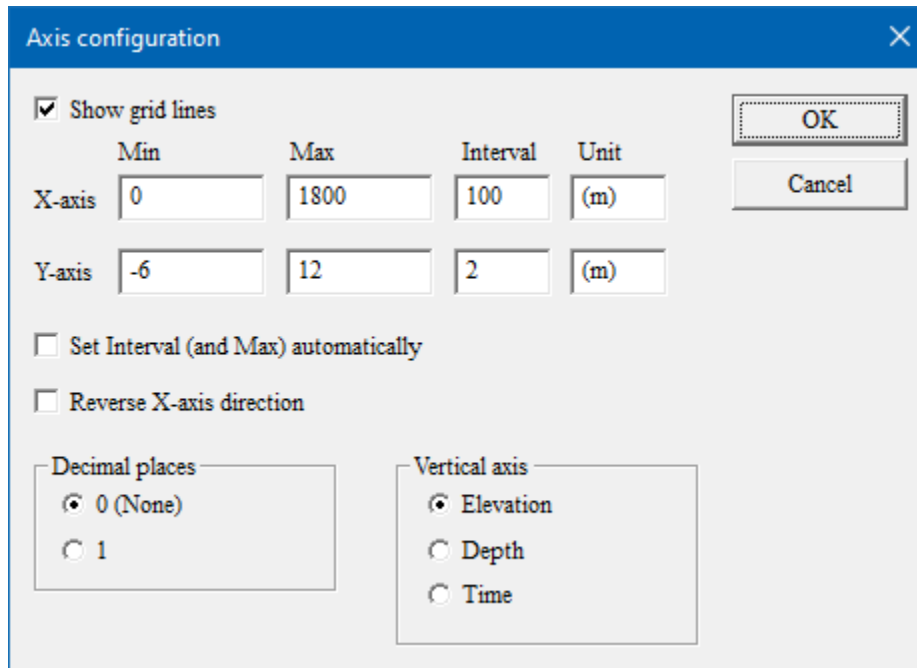


Figure 23: Velocity model with only layer boundaries displayed.

3.3.14 AXIS CONFIGURATION [CTRL+A]



The axes may be configured manually by selecting *Axis configuration* or *Ctrl+A*. The following dialog will be displayed:



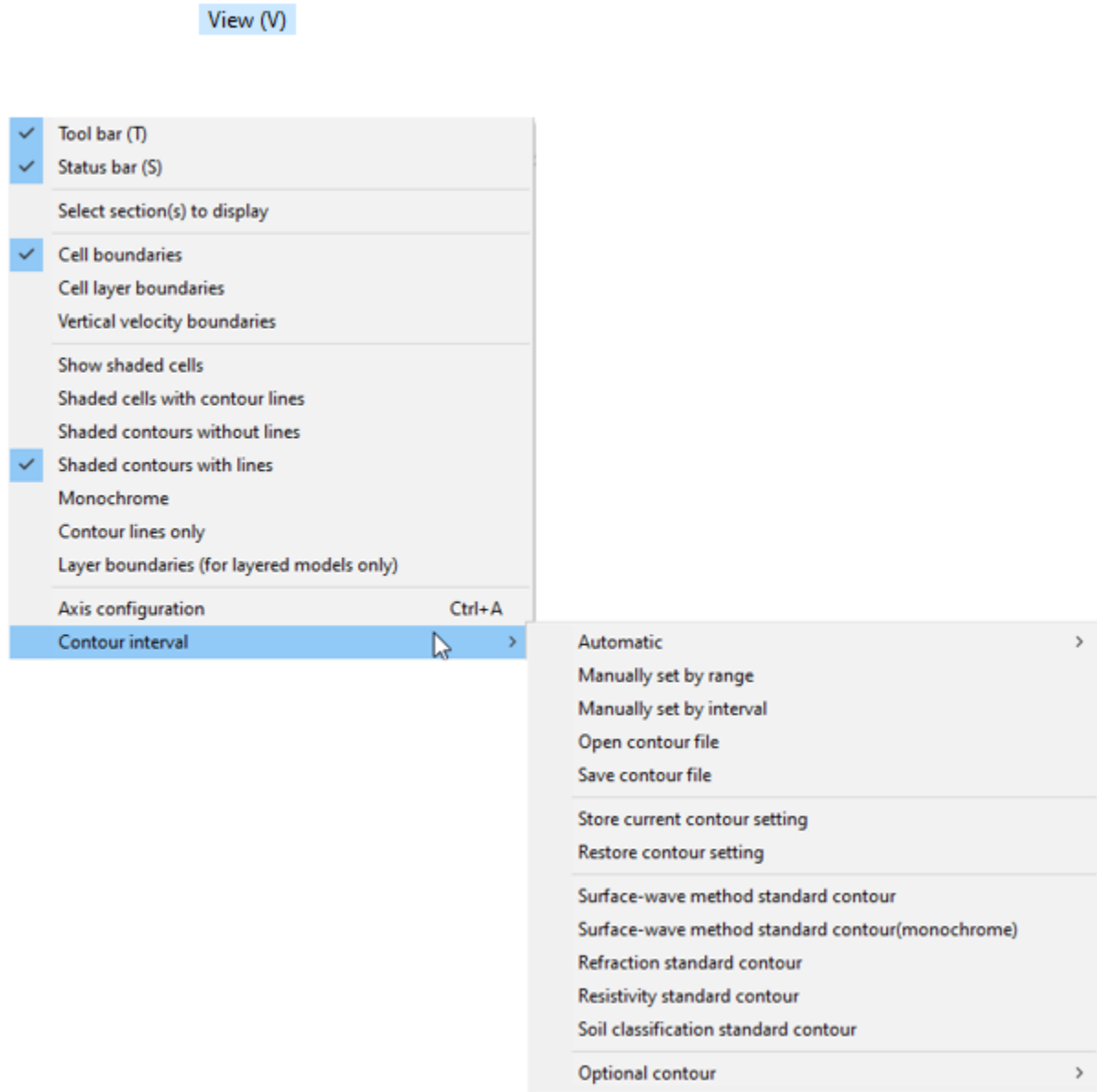
The image shows a software dialog box titled "Axis configuration" with a close button (X) in the top right corner. The dialog contains several settings for axis display:

- ☒ Show grid lines
- Buttons: OK, Cancel
- Input fields for X-axis and Y-axis with columns for Min, Max, Interval, and Unit:

	Min	Max	Interval	Unit
X-axis	0	1800	100	(m)
Y-axis	-6	12	2	(m)
- ☐ Set Interval (and Max) automatically
- ☐ Reverse X-axis direction
- Decimal places:
 - ☒ 0 (None)
 - ☐ 1
- Vertical axis:
 - ☒ Elevation
 - ☐ Depth
 - ☐ Time

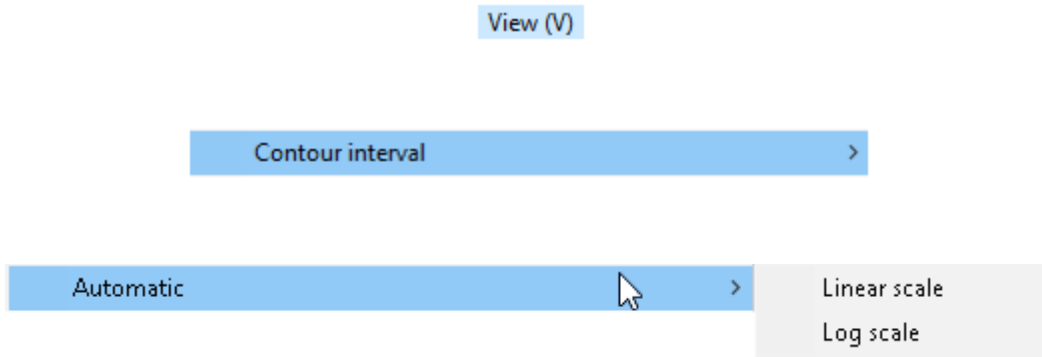
Set the parameters as desired and press *OK*.

3.3.15 CONTOUR INTERVAL



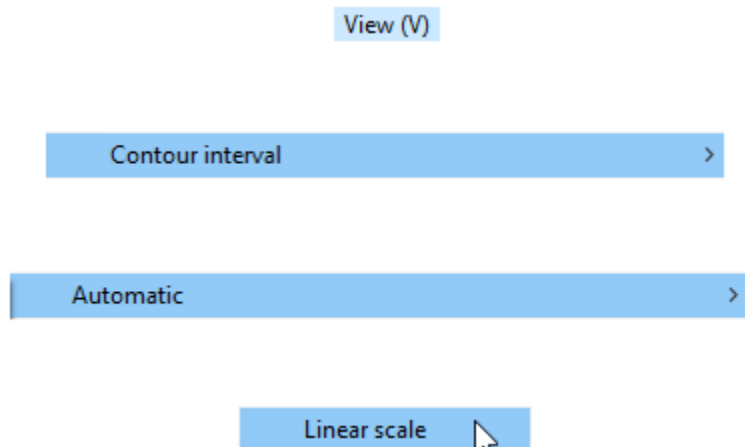
3.3.15.1 AUTOMATIC

GeoPlot is extremely flexible when it comes to contour settings. The various control options are described below, but due to the large number of combinations of possible settings, and the interplay between them, it is impossible to describe everything. The best way to learn is to practice on a sample data set, and we encourage you to do so.



You have complete control over how contours intervals are set. Most often, you can let the program set them automatically; just select *Contour interval / Automatic* and the most pleasing contour interval for the data will be chosen. You will be prompted for *linear scale* (most common) or *log scale*; see below.

3.3.15.1.1 LINEAR SCALE



If you select *Automatic*, you must choose a *linear* or *log scale* for the contour lines. Below is an S-wave velocity plot with contour lines displayed in a linear scale.

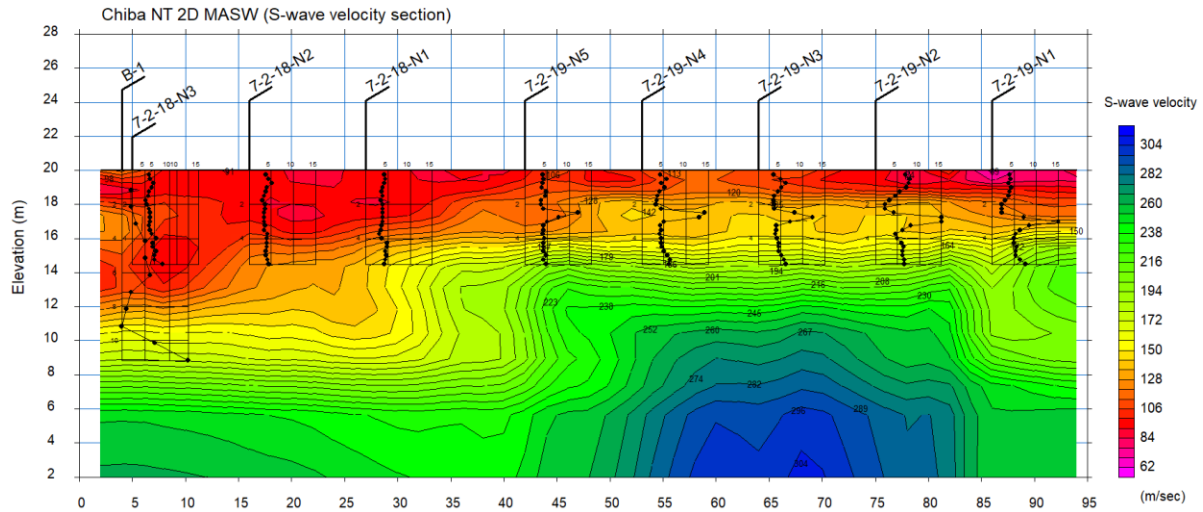
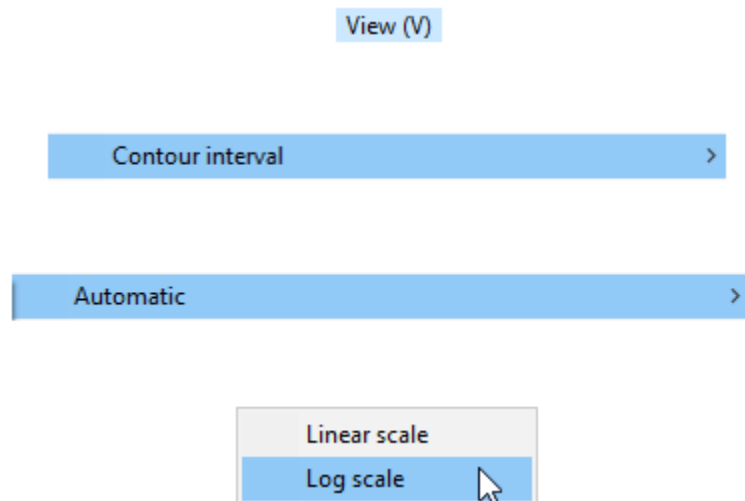


Figure 24: Linear-scale contour interval.

3.3.15.1.2 LOG SCALE



Below is the same plot as in the previous section with log scale chosen:

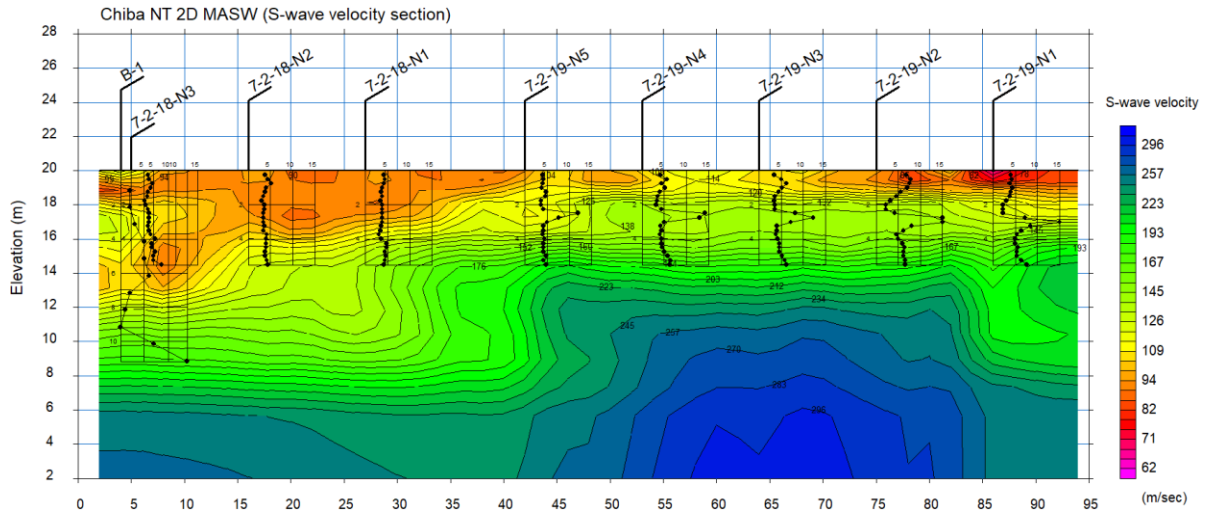
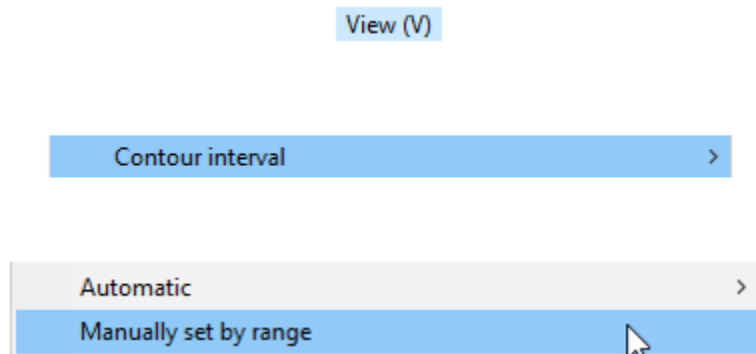
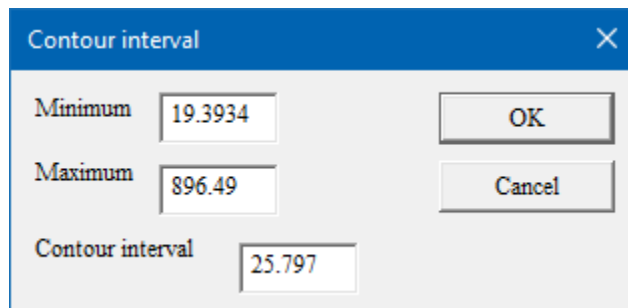


Figure 25: Log-scale contour interval.

3.3.15.2 MANUALLY SET BY RANGE

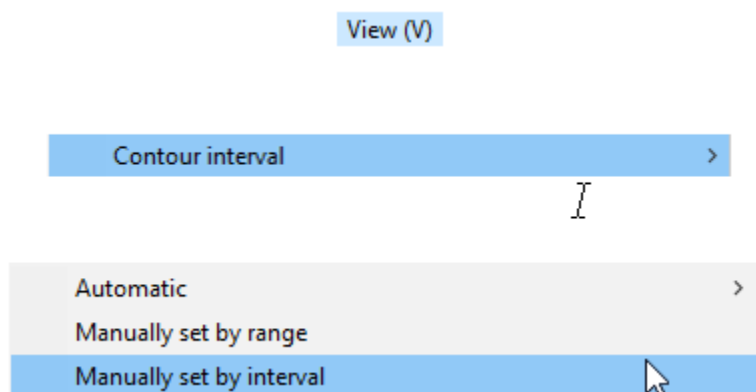


You may set the contour interval manually as well. Select *Contour interval / Manually Set By Range* to reveal the following dialog. Type in the *Minimum* and *Maximum* contours along with the *Contour interval*.

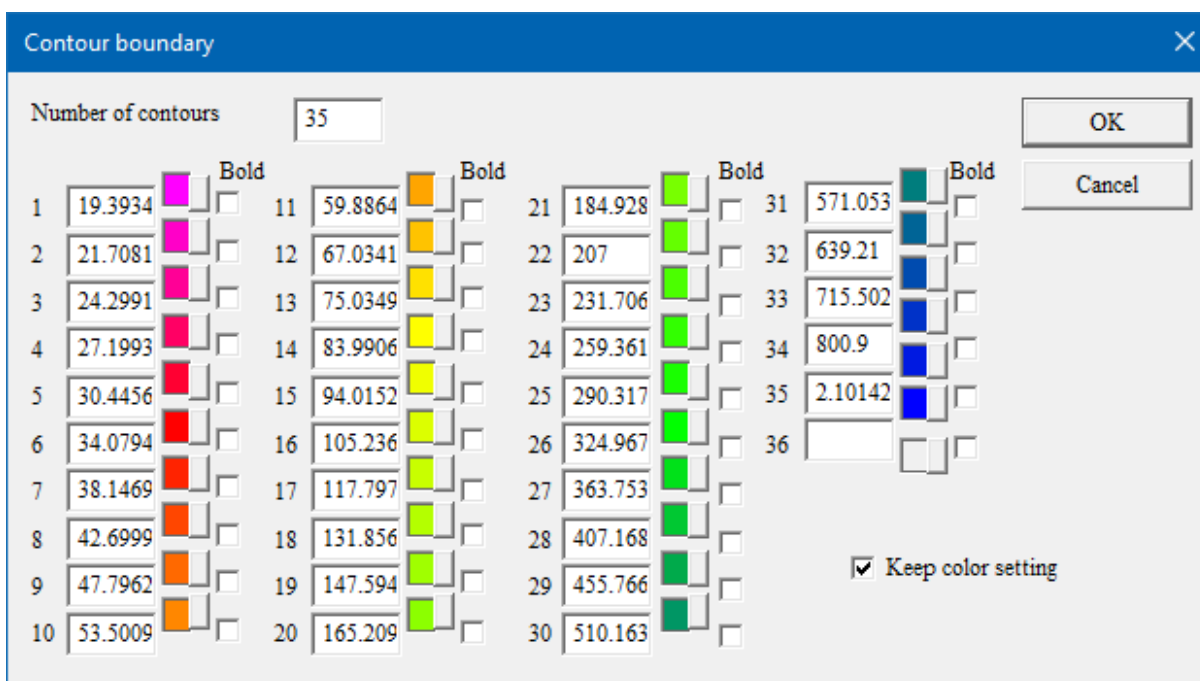


Note: You may save this configuration for future use. See Section [3.3.15.5](#) on Page 75.

3.3.15.3 MANUALLY SET BY INTERVAL



For even more control, select *Contour interval / Manually Set By Interval* to reveal the following dialog box:



The 'Contour boundary' dialog box has a title bar with a close button. It contains a 'Number of contours' field set to 35. Below this is a table of 35 contours, each with a value, a color swatch, and a 'Bold' checkbox. The colors transition from red to yellow, green, and blue. At the bottom right, there is a 'Keep color setting' checkbox which is checked, and 'OK' and 'Cancel' buttons.

Contour	Value	Color	Bold
1	19.3934	Red	<input type="checkbox"/>
2	21.7081	Red	<input type="checkbox"/>
3	24.2991	Red	<input type="checkbox"/>
4	27.1993	Red	<input type="checkbox"/>
5	30.4456	Red	<input type="checkbox"/>
6	34.0794	Red	<input type="checkbox"/>
7	38.1469	Red	<input type="checkbox"/>
8	42.6999	Red	<input type="checkbox"/>
9	47.7962	Red	<input type="checkbox"/>
10	53.5009	Red	<input type="checkbox"/>
11	59.8864	Yellow	<input type="checkbox"/>
12	67.0341	Yellow	<input type="checkbox"/>
13	75.0349	Yellow	<input type="checkbox"/>
14	83.9906	Yellow	<input type="checkbox"/>
15	94.0152	Yellow	<input type="checkbox"/>
16	105.236	Yellow	<input type="checkbox"/>
17	117.797	Yellow	<input type="checkbox"/>
18	131.856	Yellow	<input type="checkbox"/>
19	147.594	Yellow	<input type="checkbox"/>
20	165.209	Yellow	<input type="checkbox"/>
21	184.928	Green	<input type="checkbox"/>
22	207	Green	<input type="checkbox"/>
23	231.706	Green	<input type="checkbox"/>
24	259.361	Green	<input type="checkbox"/>
25	290.317	Green	<input type="checkbox"/>
26	324.967	Green	<input type="checkbox"/>
27	363.753	Green	<input type="checkbox"/>
28	407.168	Green	<input type="checkbox"/>
29	455.766	Green	<input type="checkbox"/>
30	510.163	Green	<input type="checkbox"/>
31	571.053	Blue	<input type="checkbox"/>
32	639.21	Blue	<input type="checkbox"/>
33	715.502	Blue	<input type="checkbox"/>
34	800.9	Blue	<input type="checkbox"/>
35	2.10142	Blue	<input type="checkbox"/>
36			<input type="checkbox"/>

Indicate the number of contours, the value of each contour, and the color of the shading. You may make selected contours bold (red) if desired. To change a color, press the button next to it to display a palette:

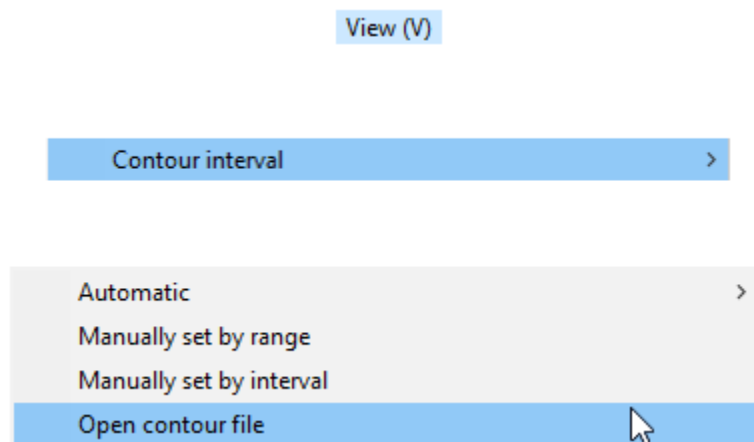


When done, press *OK*. The contours and shading will be modified accordingly.

Check *Keep color setting* to apply these colors to GeoPlot3D.

Note: You may save this configuration for future use. See Section [3.3.15.5](#) on Page 75.

3.3.15.4 OPEN CONTOUR FILE



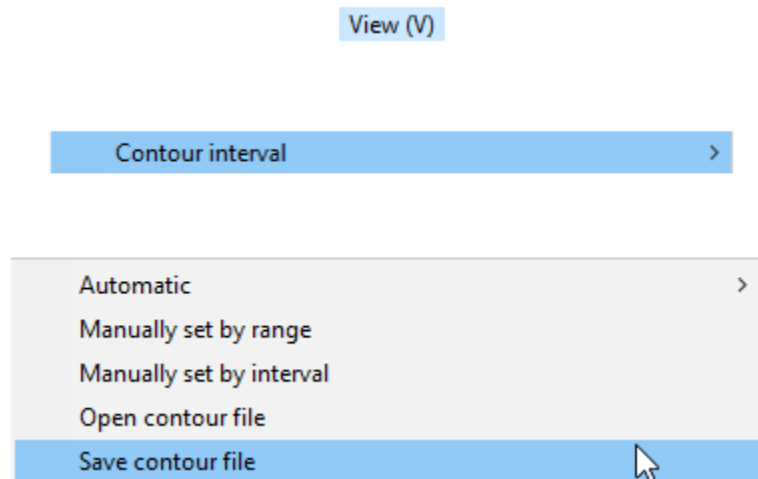
If you have created a custom contour file, you may apply that contour interval to the current model. Select *Open contour file*. Choose the appropriate contour file, and the contour interval will be configured accordingly. Below is an example of a contour file:

12 {number of contours}

10.0 20.0 30.0 55.0 100.0 180.0 300.0 550.0 1000.0 1800.0 3000.0 5500.0 {value of each contour.}

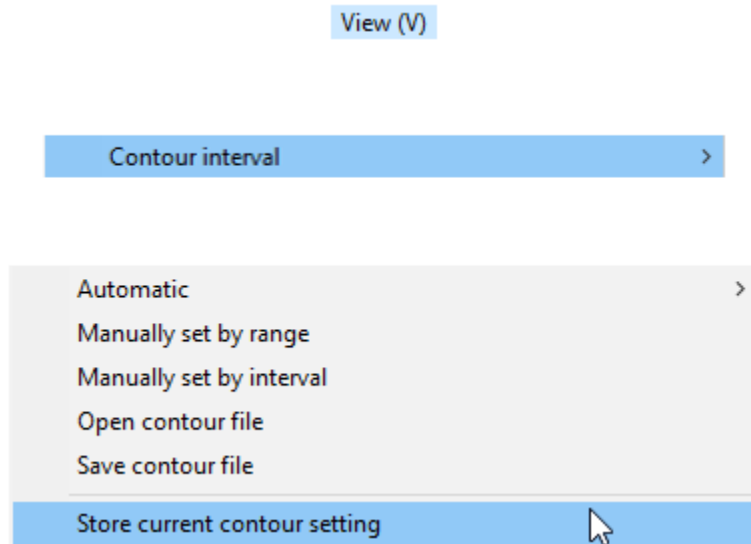
The file extension is “.txt”.

3.3.15.5 SAVE CONTOUR FILE

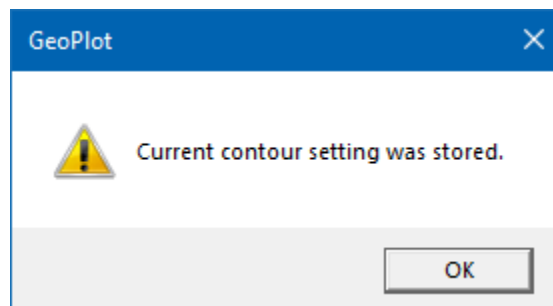


If you have created a custom contour interval manually, you may save this configuration for use on subsequent models. Select *Save contour file*. You will be presented with a dialog box; provide a file name and press *Save*.

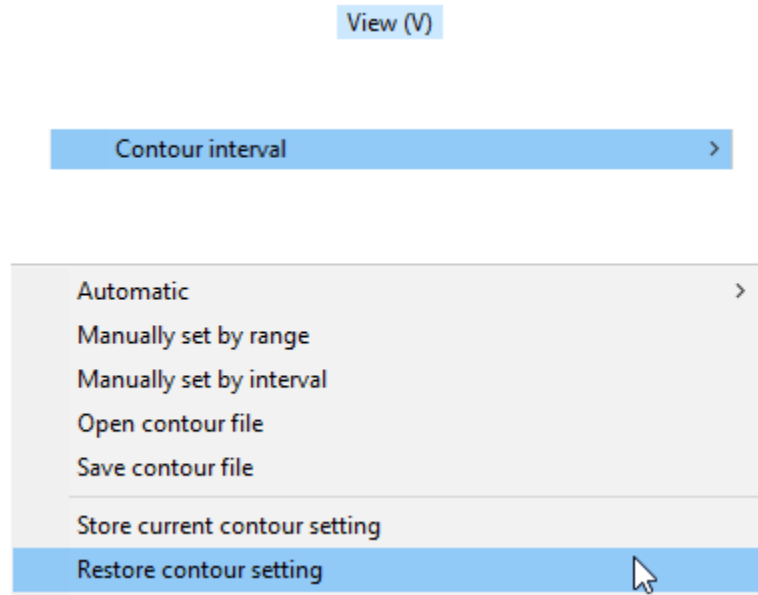
3.3.15.6 STORE CURRENT CONTOUR SETTING



You may also store *internally* – in memory - whatever the current contour settings happen to be. These will be applied automatically to all plots unless you change them. This is not the same as saving the settings to a file as described above. You will see the following message when you select this option:



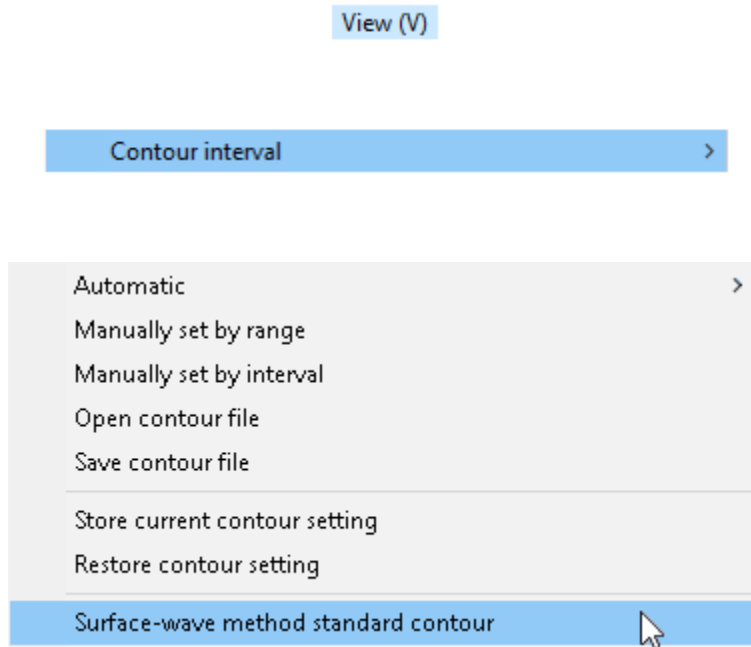
3.3.15.7 RESTORE CONTOUR SETTING



If you are manually setting up contours and make a mistake, you can always go back to where you started. Selecting *Restore contour setting* will restore the current settings with whatever happens to be stored in memory.

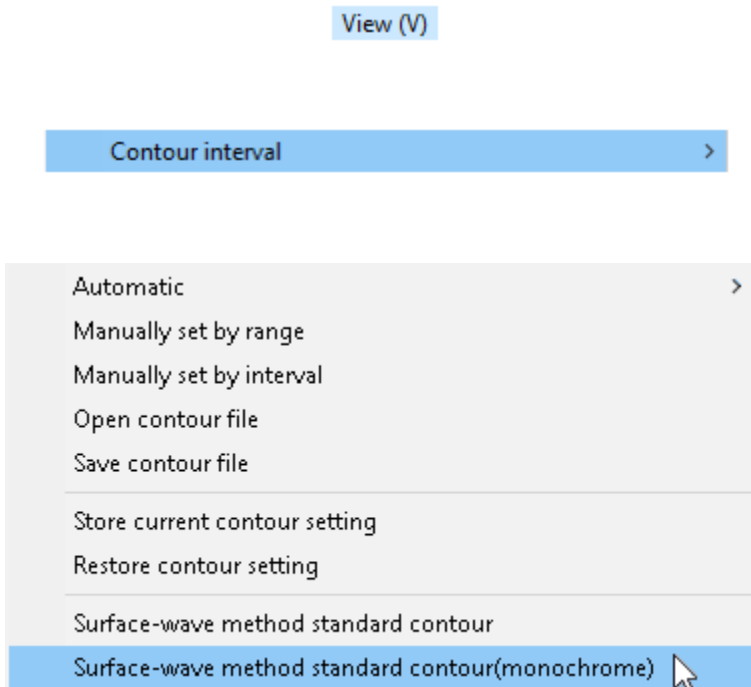
3.3.15.8 SURFACE-WAVE METHOD STANDARD CONTOUR

GeoPlot is applicable to various types of data sets, including seismic surface-wave, seismic refraction, resistivity, etc. Each of these has particular characteristics which lend them to using pre-loaded contour settings. As such, GeoPlot contains, internally, contour settings for each. These, at a minimum, may be used as starting points for manual modification if necessary.



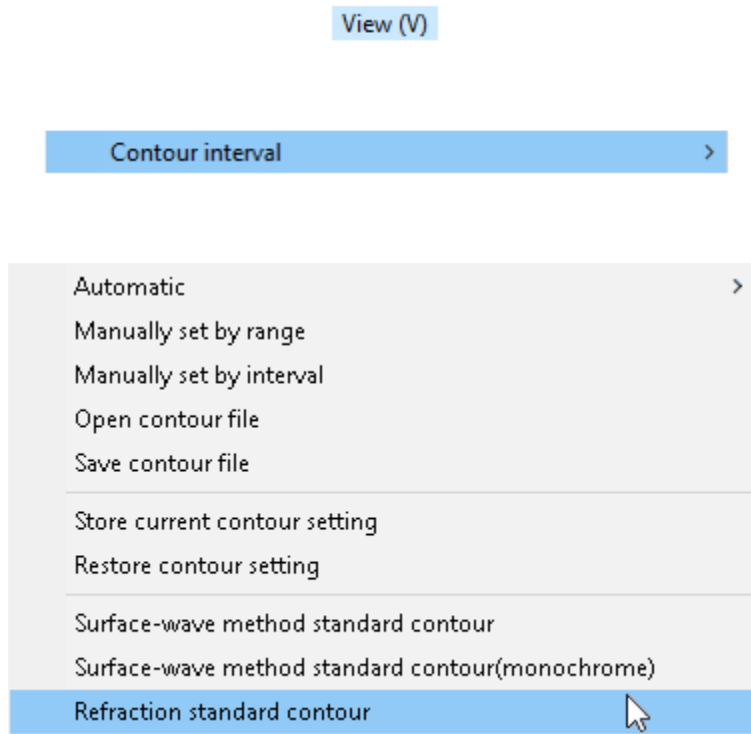
GeoPlot offers a standard contour setting for the Surface wave Method. Select this option if you would like to apply it to your surface-wave data.

3.3.15.9 SURFACE WAVE METHOD STANDARD CONTOUR (MONOCHROME)



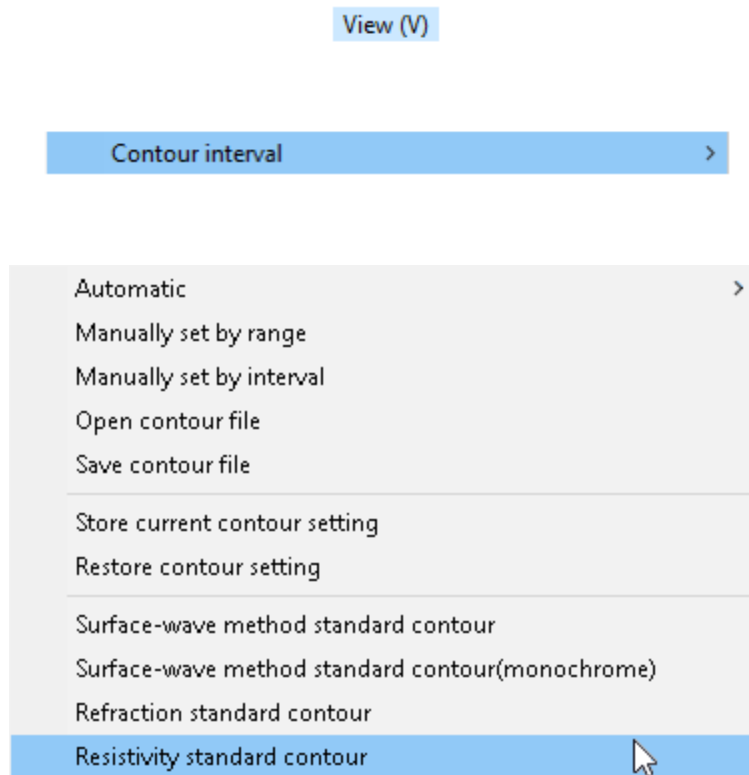
GeoPlot offers a standard monochrome contour setting for the Surface-wave Method. Select this option if you would like to apply it to your surface-wave data.

3.3.15.10 REFRACTION STANDARD CONTOUR



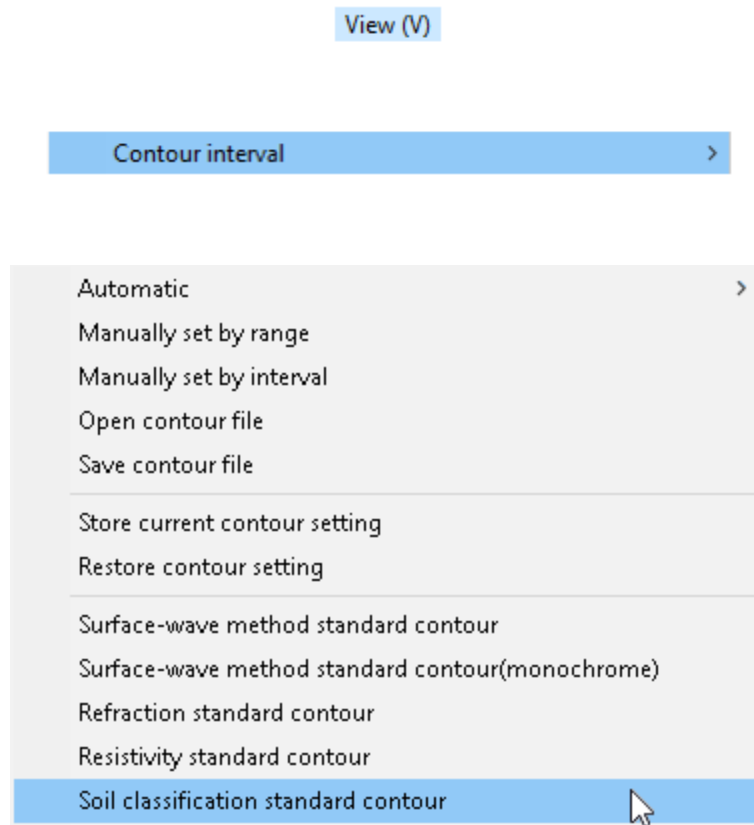
GeoPlot offers a standard contour setting for the Seismic Refraction Method. Select this option if you would like to apply it to your refraction data.

3.3.15.11 RESISTIVITY STANDARD CONTOUR



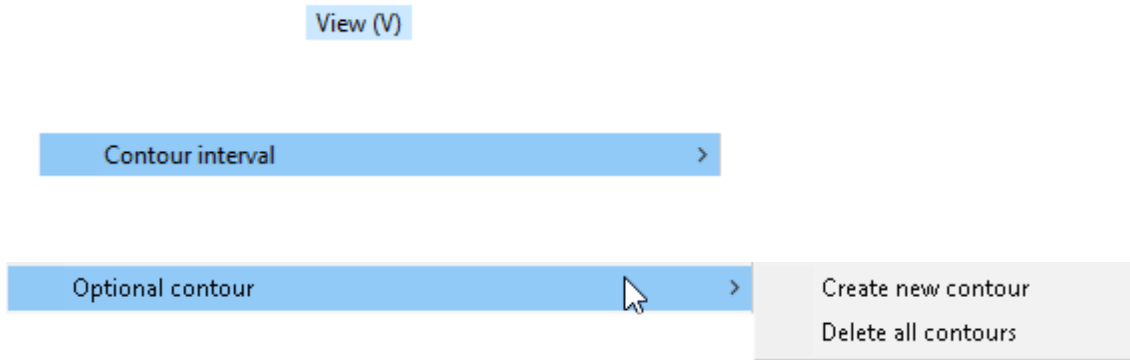
GeoPlot offers a standard monochrome contour setting for the Resistivity Method. Select this option if you would like to apply it to your resistivity data.

3.3.15.12 SOIL CLASSIFICATION STANDARD CONTOUR



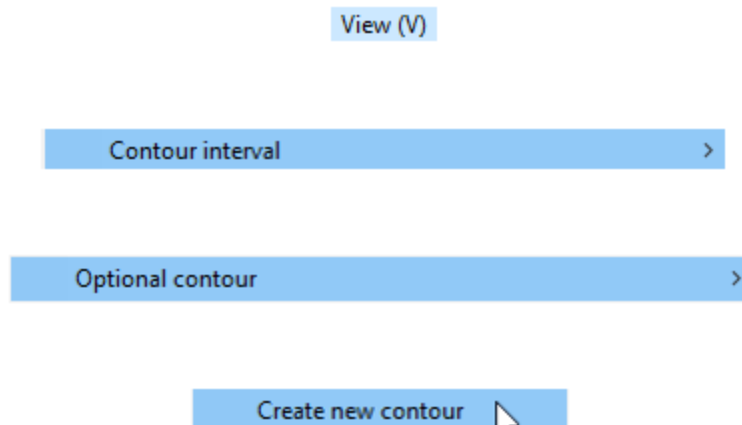
GeoPlot offers a standard contour setting for soil classification data. Select this option if you would like to apply it to your soil classification data.

3.3.15.13 OPTIONAL CONTOUR

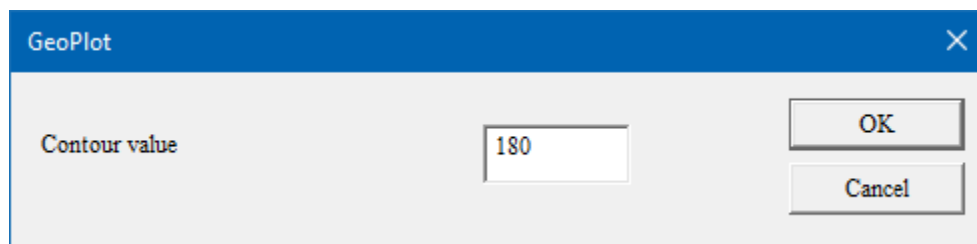


Continue.

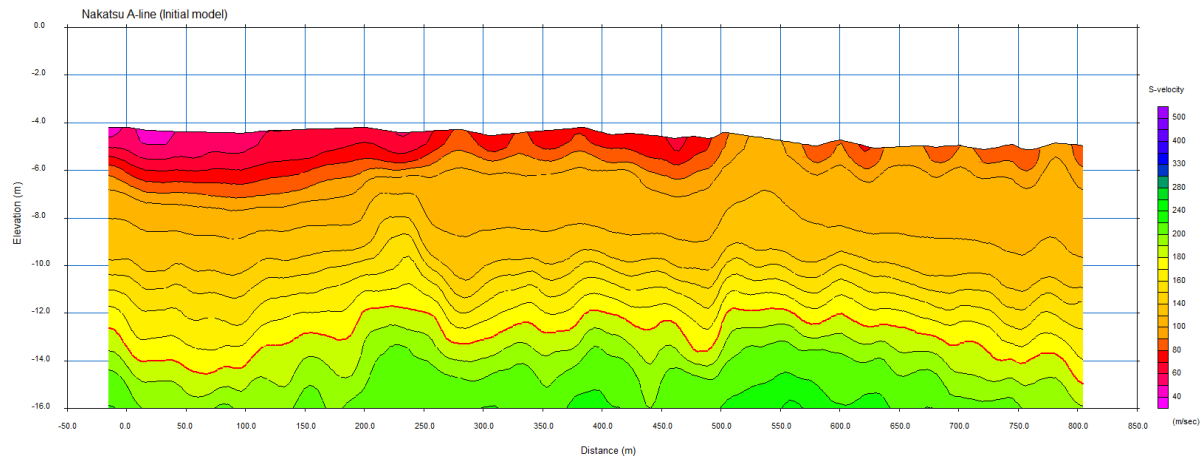
3.3.15.13.1 CREATE NEW CONTOUR



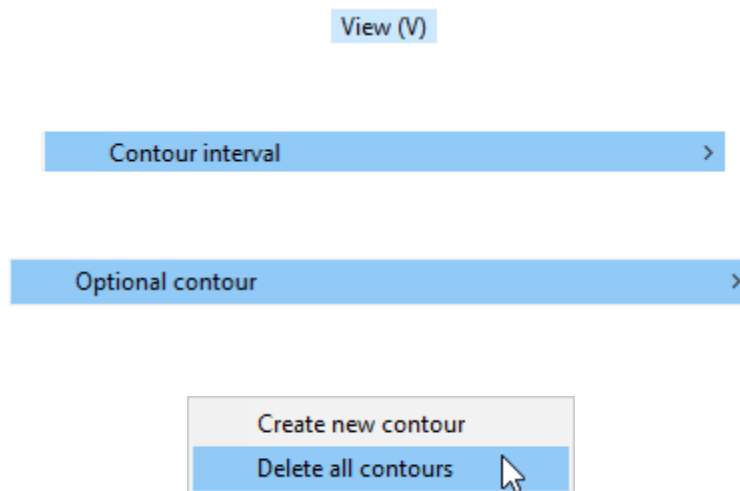
You may insert (or highlight) individual contour lines wherever you wish. Select *Optional Contour / Create new contour*, type in the value, and press *OK*.



In the figure below, the 180 m/sec contour has been highlighted in red:



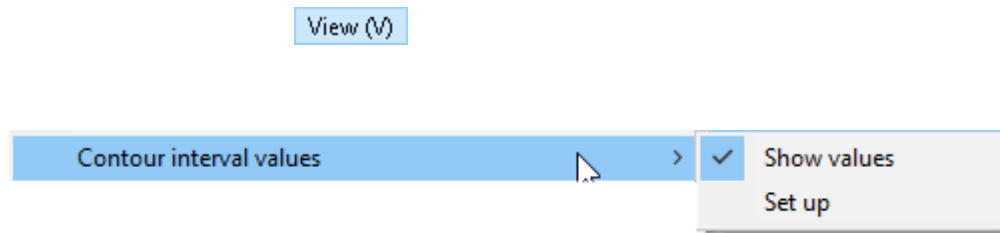
3.3.15.13.2 DELETE ALL CONTOURS



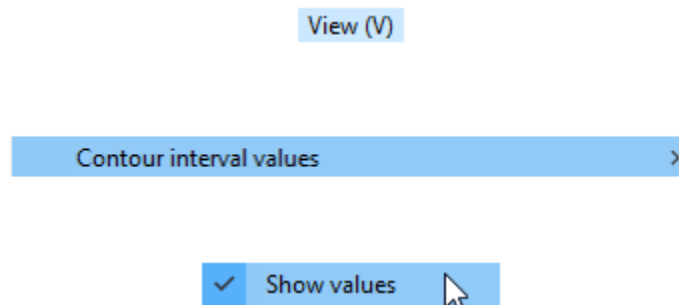
Select *Delete all contours* to remove optional contours.

3.3.16 CONTOUR INTERVAL VALUES

Contour lines may be labeled as desired.



3.3.16.1 SHOW VALUES



Enable the *Contour interval values / Show values* toggle switch to label the contour lines as shown in the figure below.

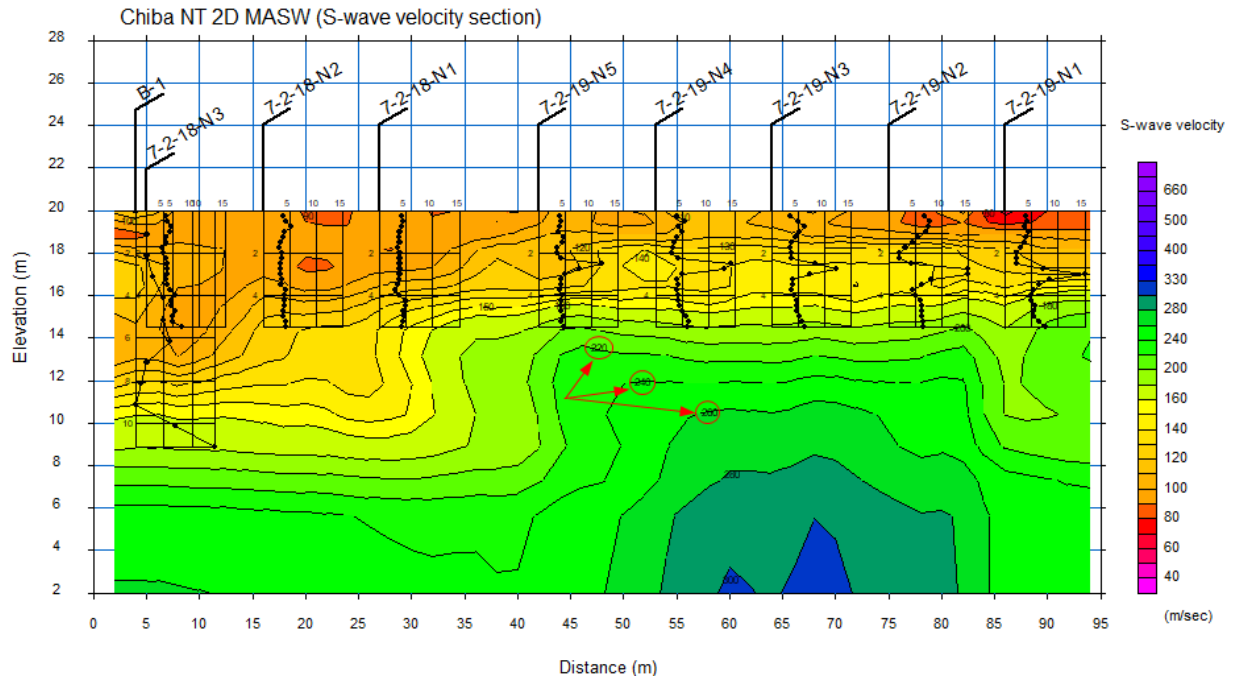
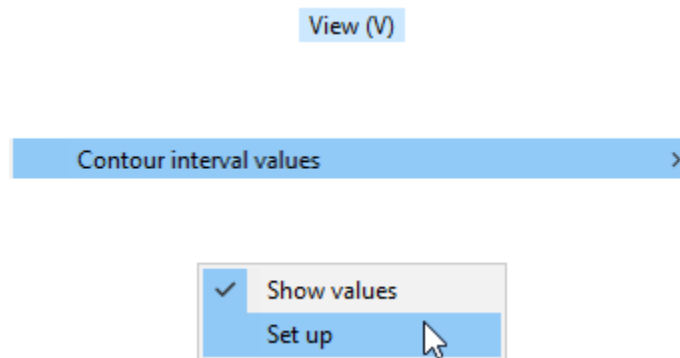
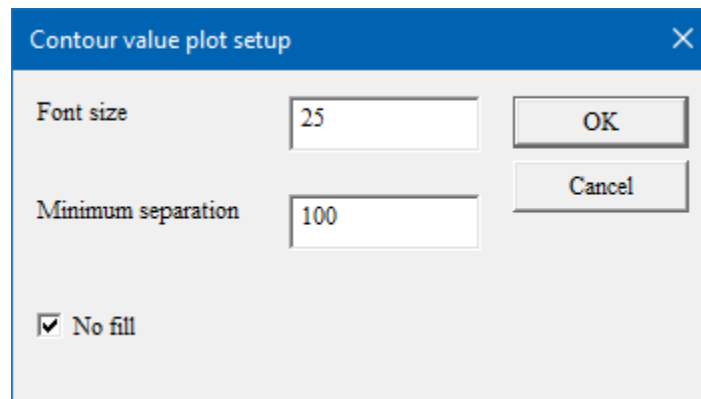


Figure 26: MASW velocity plot showing contour line labels.

3.3.16.2 SETUP

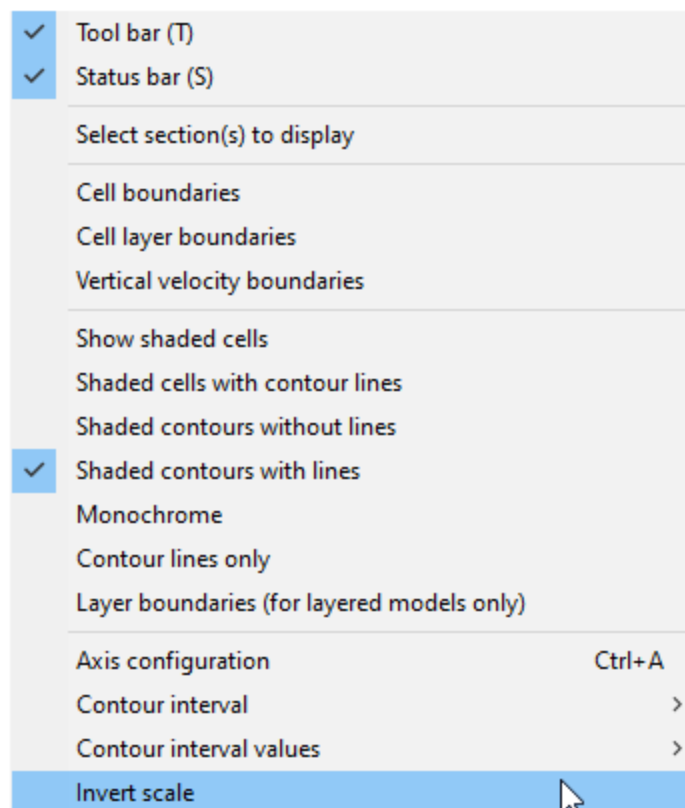


It is generally not desirable to label every contour. And the font size must be chosen appropriately. Experiment with the **Contour value plot setup** dialog until you get the desired result.



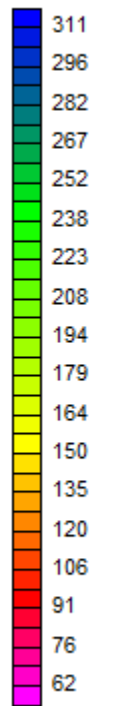
3.3.17 INVERT SCALE

View (V)



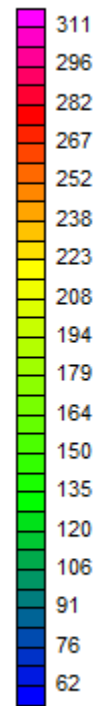
Select *Invert scale* to invert the colors used in the plot:

S-wave velocity



(m/sec)

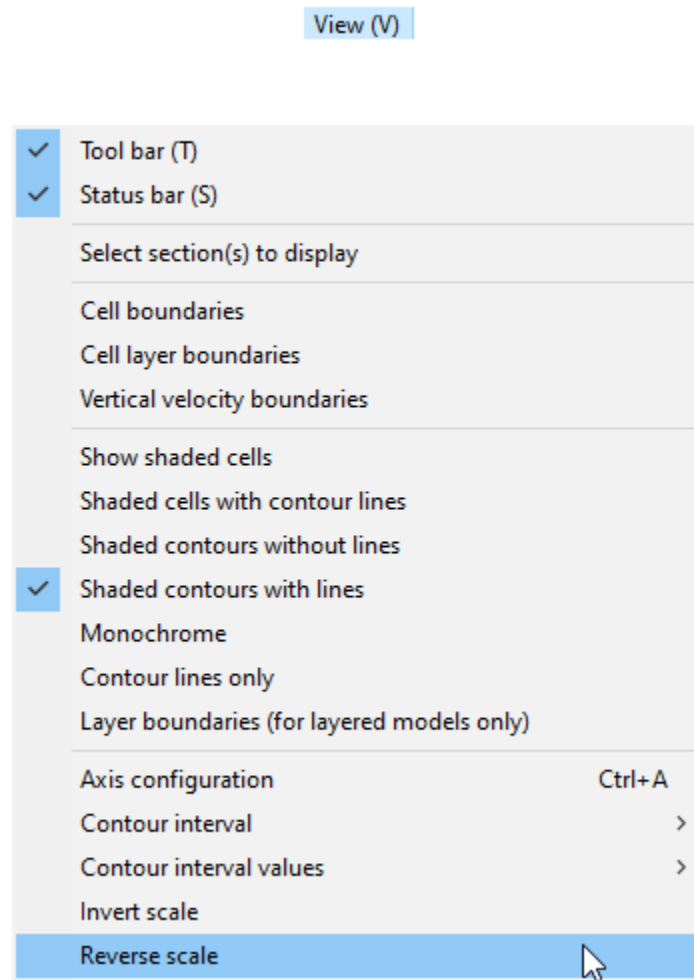
S-wave velocity



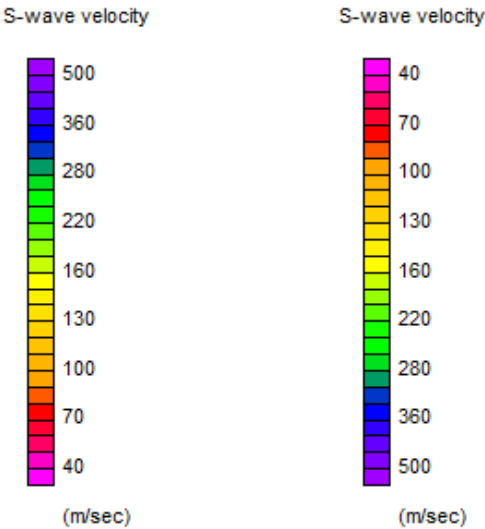
(m/sec)

Note: This feature does not work if you have set the contours manually. In this case, select **View / Contour interval / Automatic**, then select **Invert scale**.

3.3.18 REVERSE SCALE



Select *Reverse scale* to flip the scale from increasing downward to decreasing downward and vice-versa:



3.3.19 USE RED FRAME FOR A SELECTED SECTION

View (V)

☒

Tool bar (T)

☒

Status bar (S)

Select section(s) to display

Cell boundaries

Cell layer boundaries

Vertical velocity boundaries

Show shaded cells

Shaded cells with contour lines

Shaded contours without lines

☒

Shaded contours with lines

Monochrome

Contour lines only

Layer boundaries (for layered models only)

Axis configuration

Ctrl+A

Contour interval

>

Contour interval values

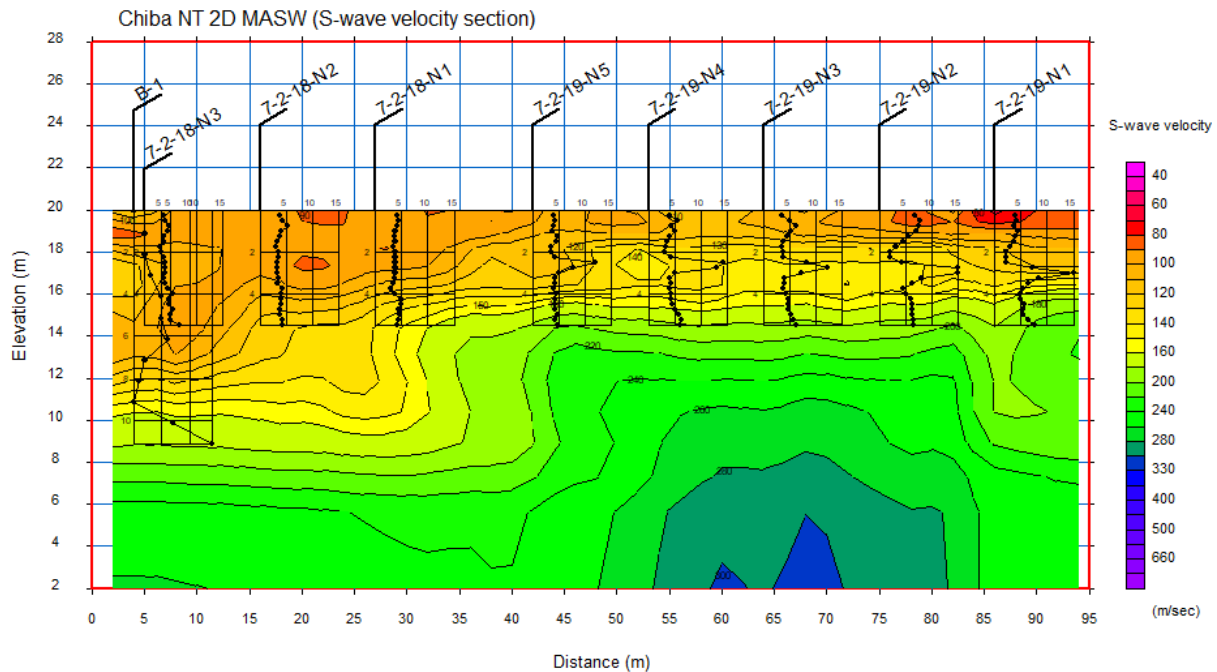
>

Invert scale

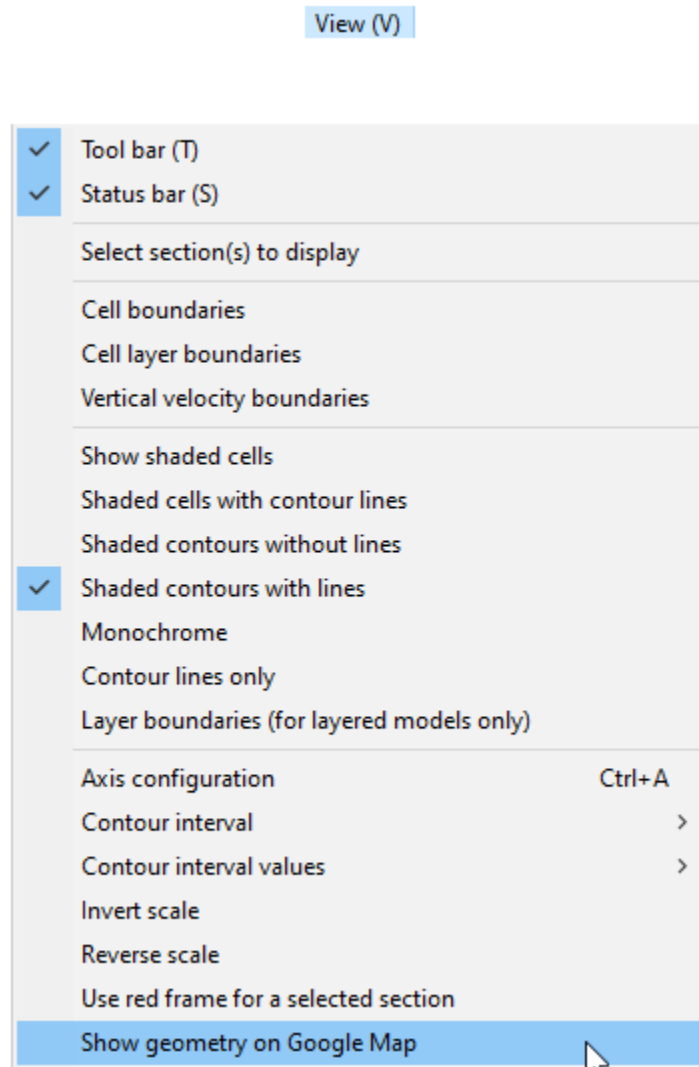
Reverse scale

Use red frame for a selected section

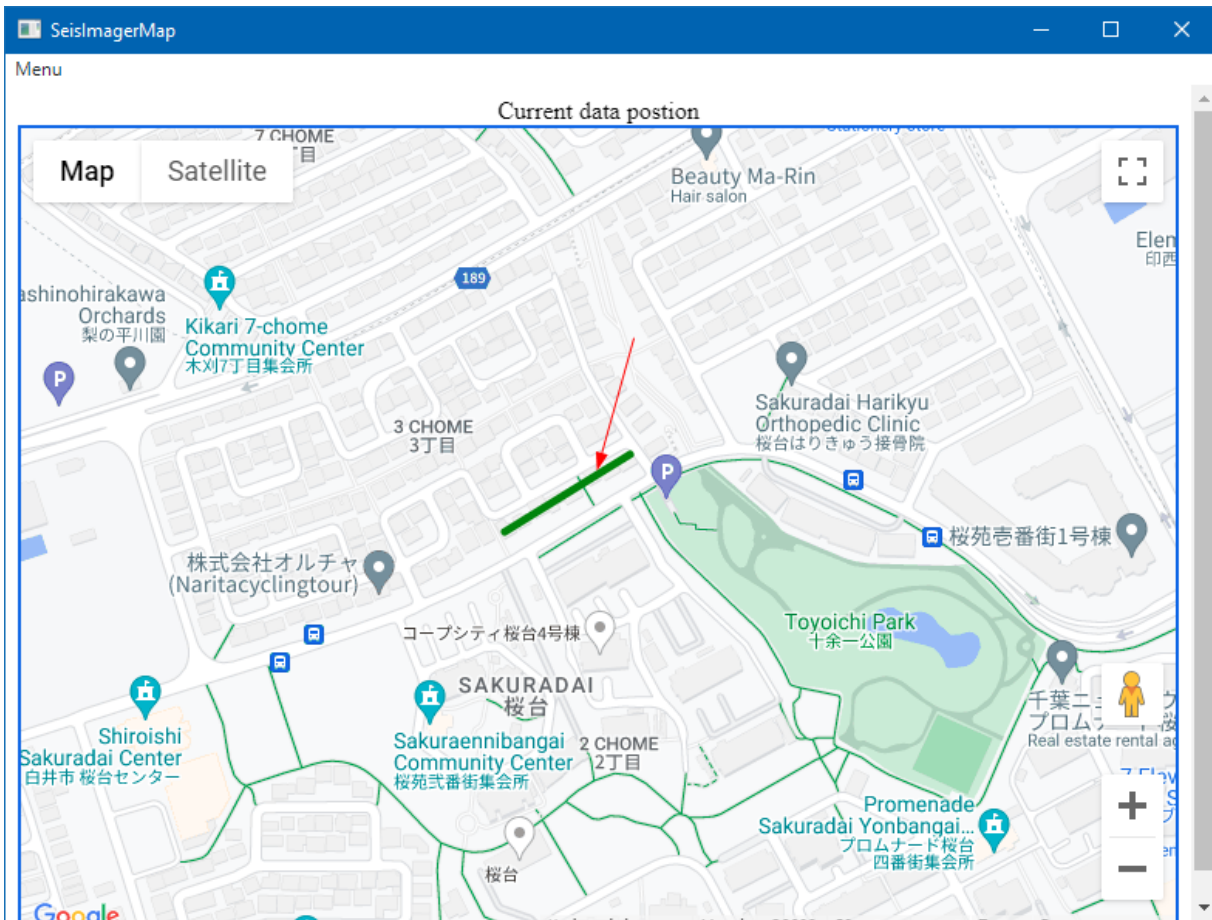
This is a toggle switch that will draw a red frame around whichever plot is on the screen and selected. An example is shown below. This makes it more obvious which section you are editing (see Section [3.4.2](#) on Page 120).



3.3.20 SHOW GEOMETRY ON GOOGLE MAP



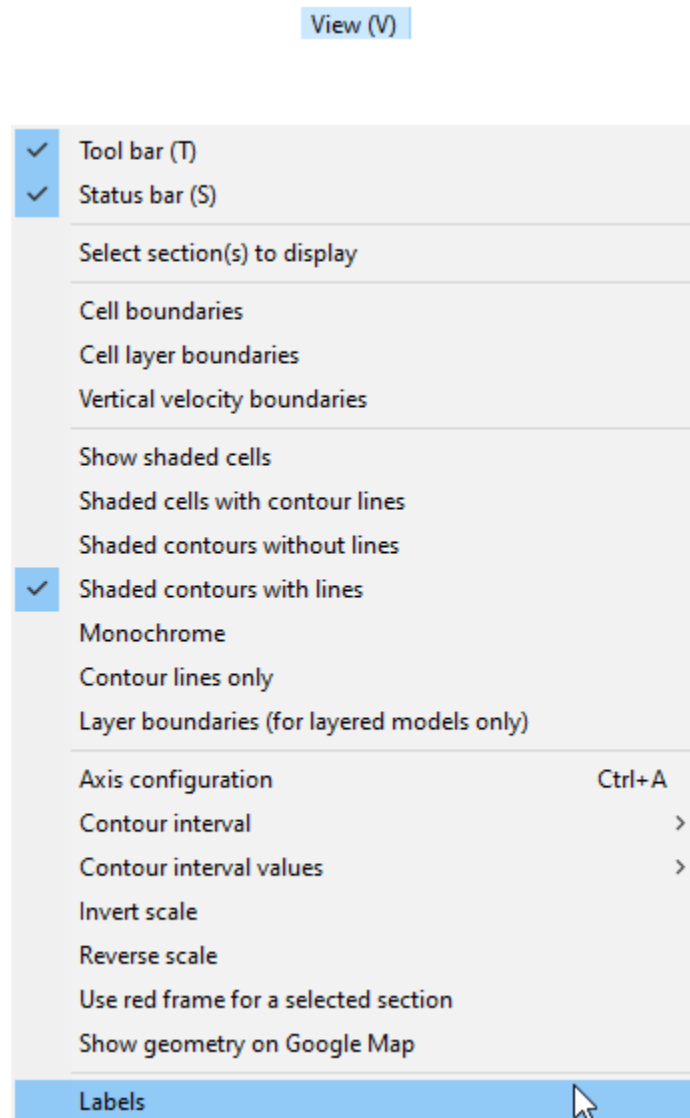
If your model includes latitude and longitude, it can be displayed on Google Maps:



Note: You must have *SeisImagerMap.exe* installed on your computer to use this function. You may download it here: <https://seisimager.com/download.htm>. Pay careful attention to the path where it is installed, because *GeoPlot* will ask you to specify the location of *SeisImagerMap.exe*.

Note: *GeoPlot* automatically detects whether your model includes latitude and longitude. If it does not, then **Show geometry on Google Map** will be greyed out.

3.3.21 LABELS



You may label the plot and the scale as desired. Select *View / Labels* and fill in the resulting dialog box:

Edit title and legend ✕

Title

Chiba NT 2D MASW (S-wave velocity section)

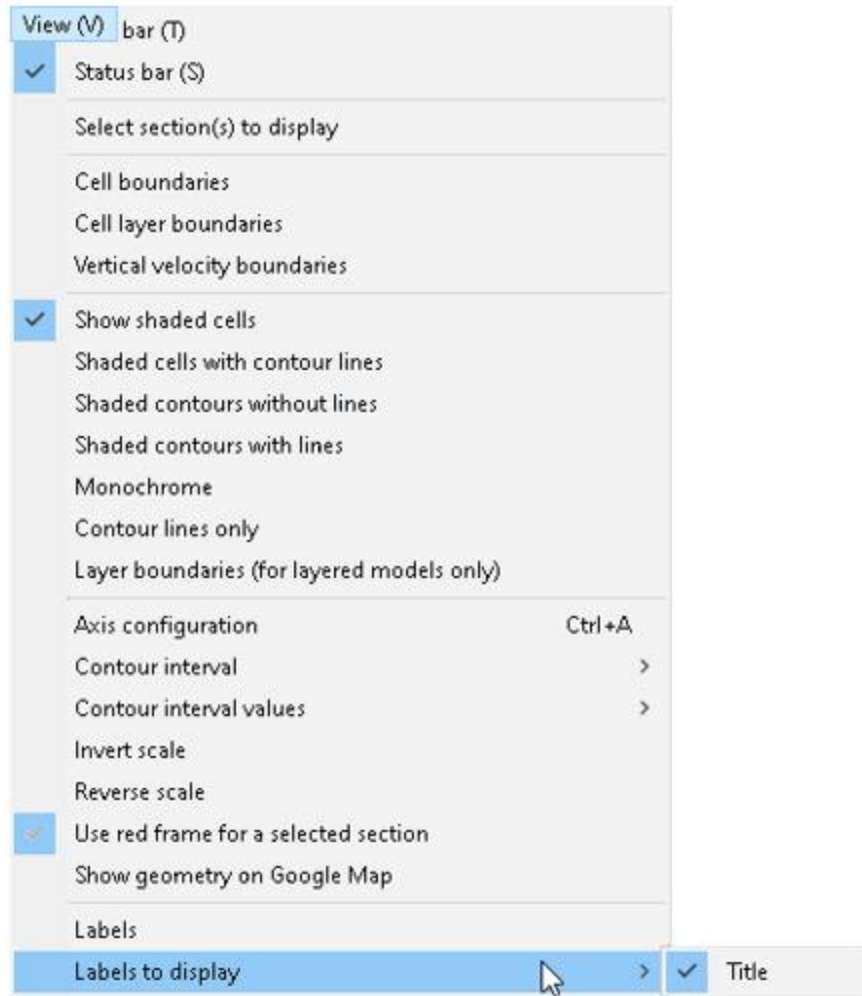
Scale **Units**

S-wave velocity (m/sec)

OK **Cancel**

3.3.22 LABELS TO DISPLAY

View (V)



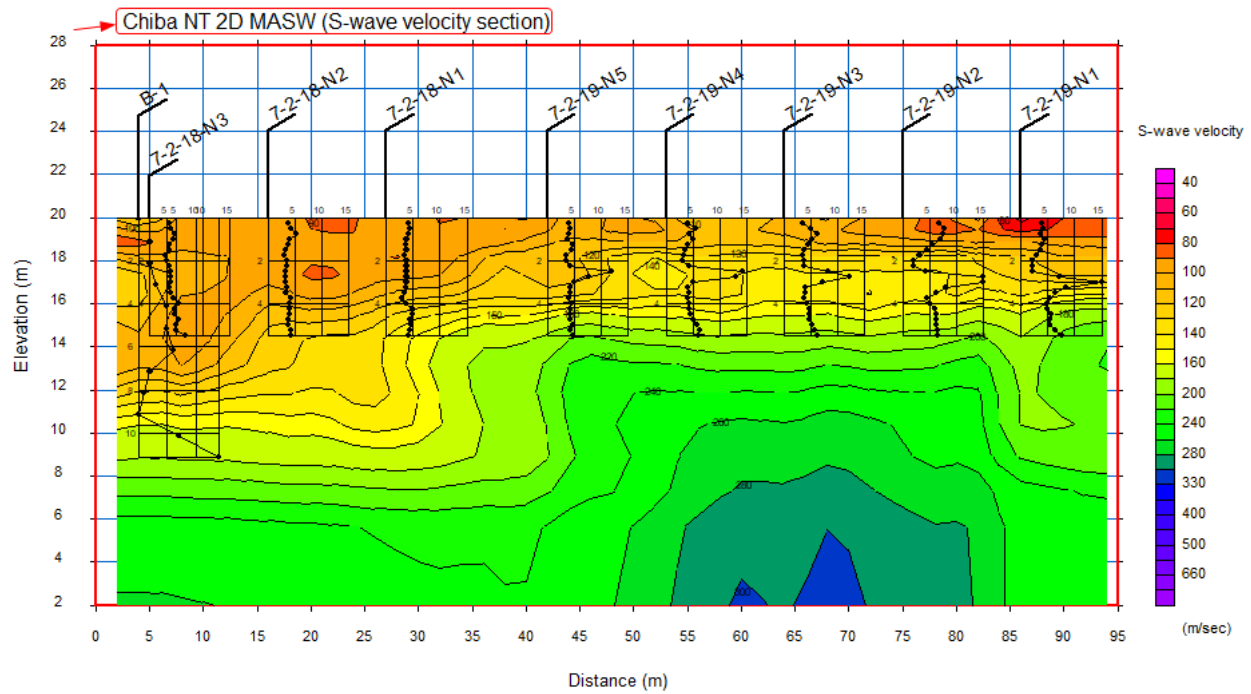
3.3.22.1 TITLE

View (V)

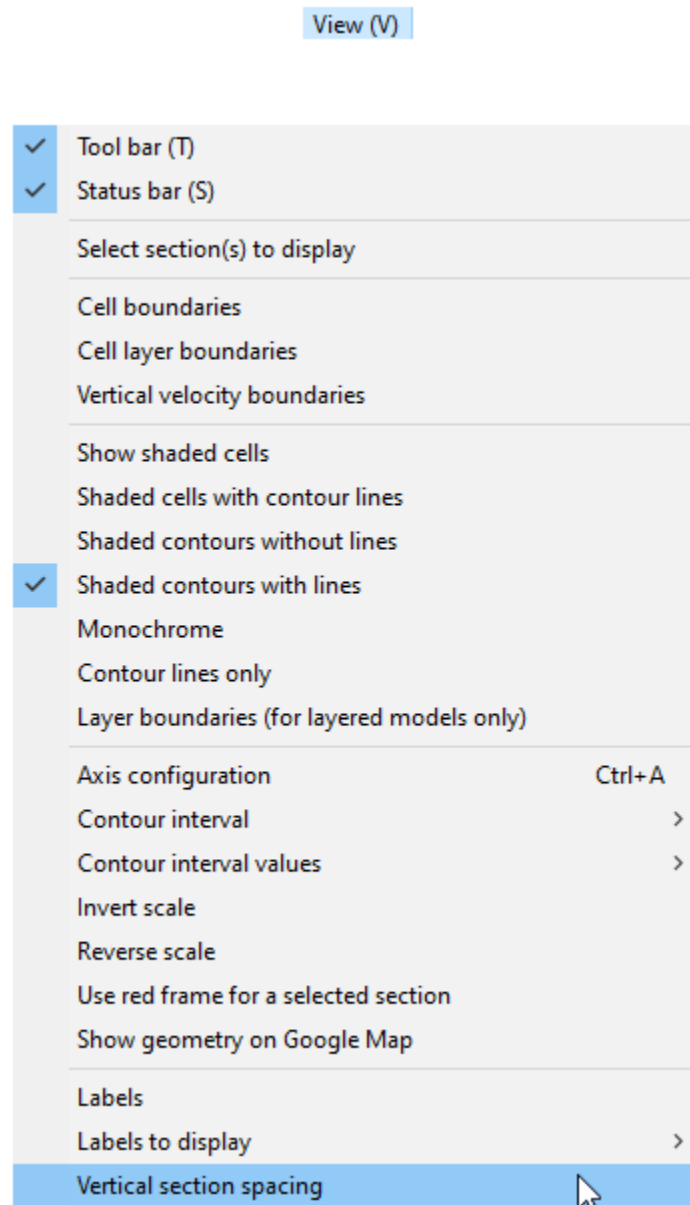
Labels to display >

☒ Title

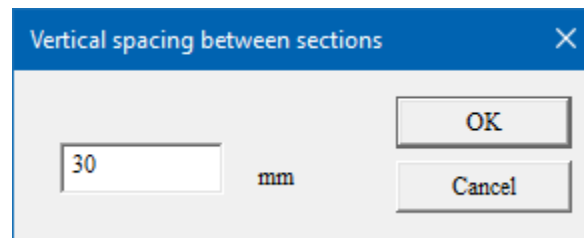
You may toggle on/off the plot title as desired.



3.3.23 VERTICAL SECTION SPACING

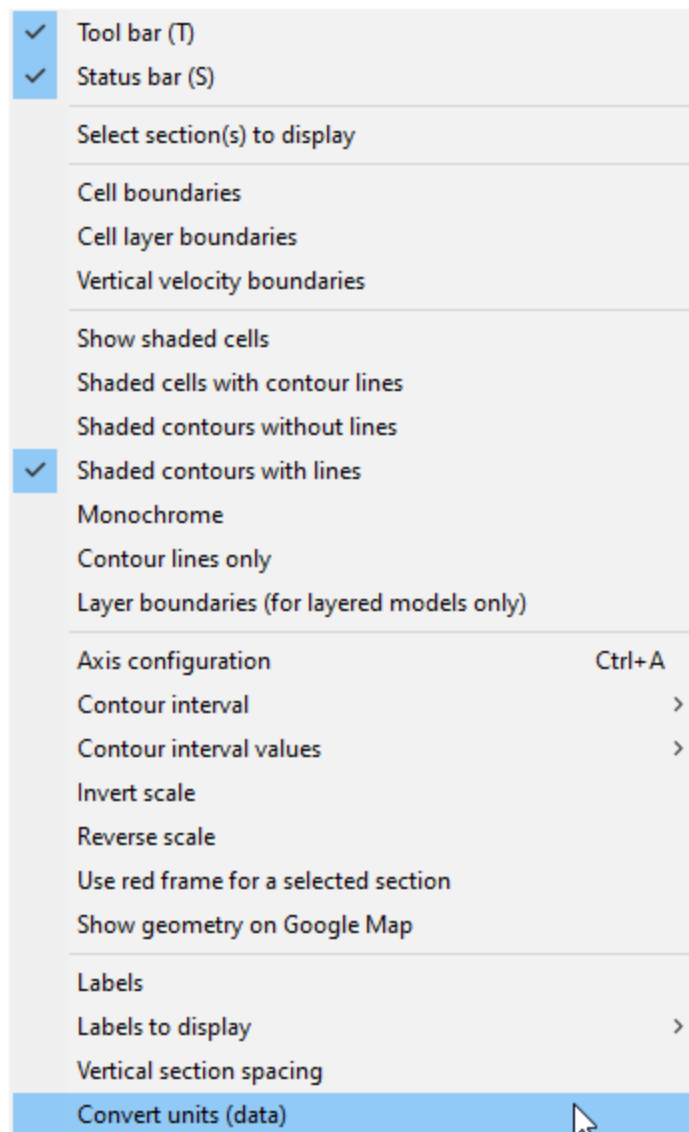


You can control the vertical spacing between sections simultaneously displayed on the screen. Select *View / Vertical section spacing* and enter the number in mm.

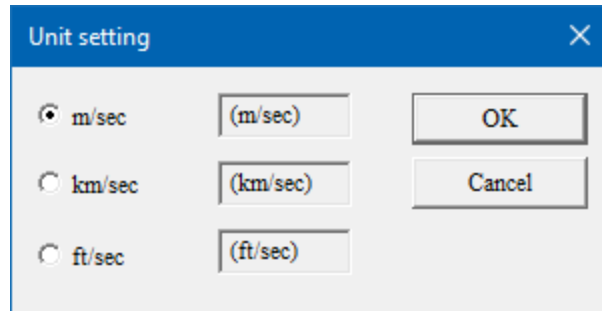


3.3.24 CONVERT UNITS (DATA)

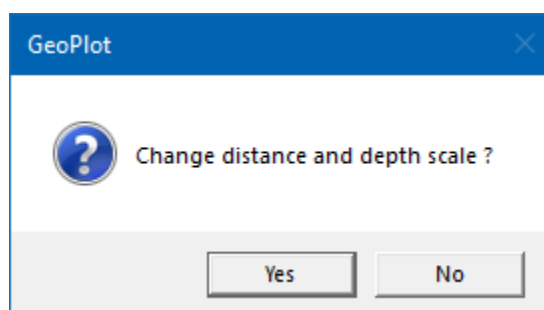
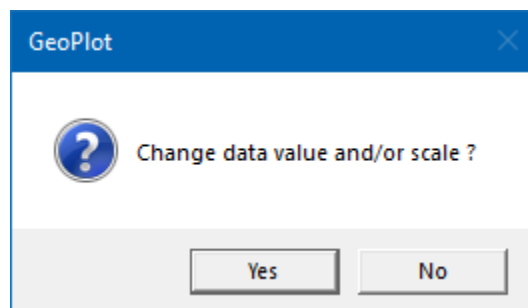
View (V)



Selecting *View / Convert units (data)* allows you to convert from one set of units to another. For instance, if you have acquired your data and made all your measurements in m/sec, and the client changes his/her mind and wants in ft/sec, select *Convert units (data)* and choose the new units.



You will be prompted as follows:



Answer the prompts, and your data will be displayed accordingly. You may save the new model by selecting *File / Save GeoPlot file*.

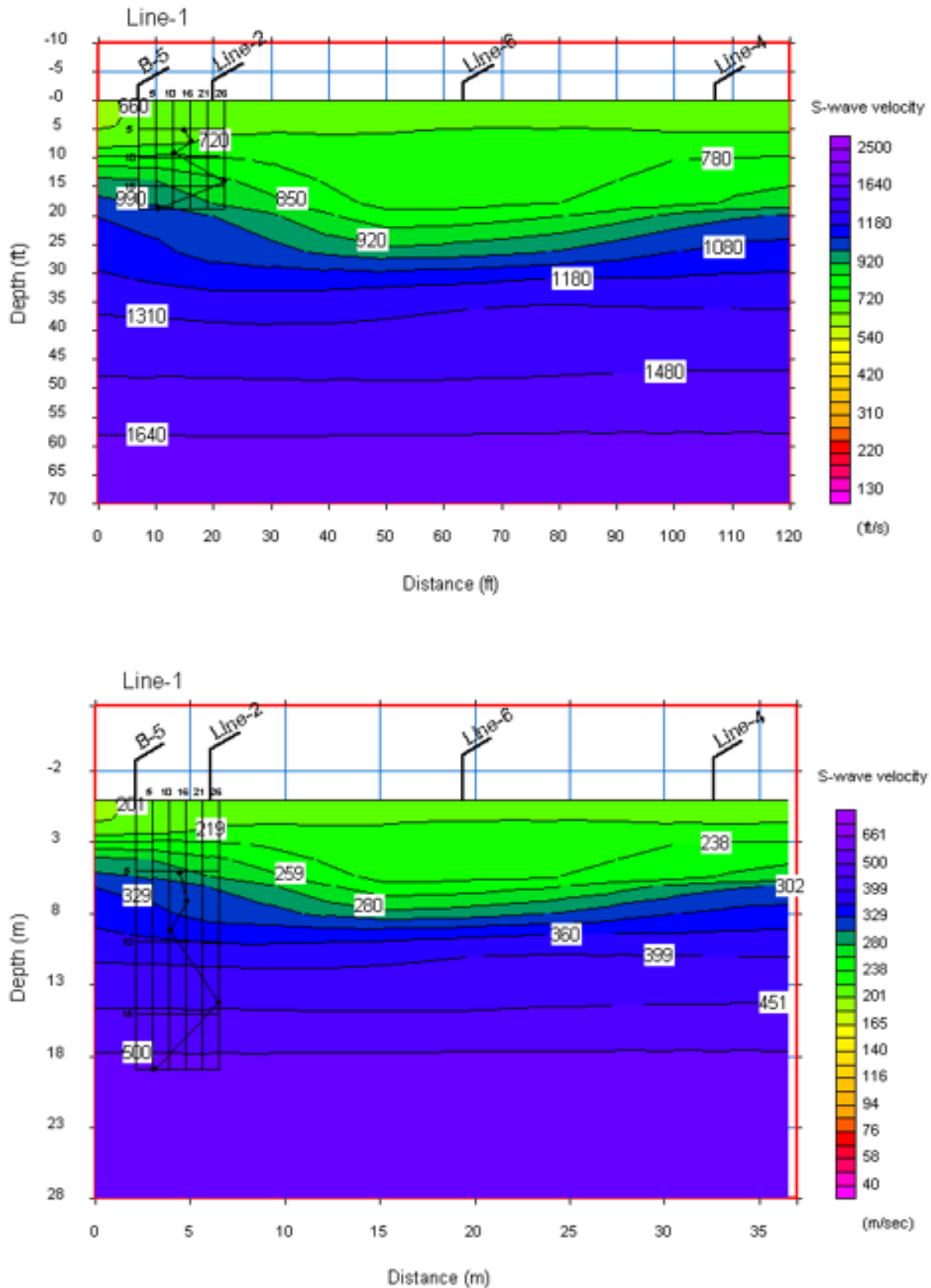
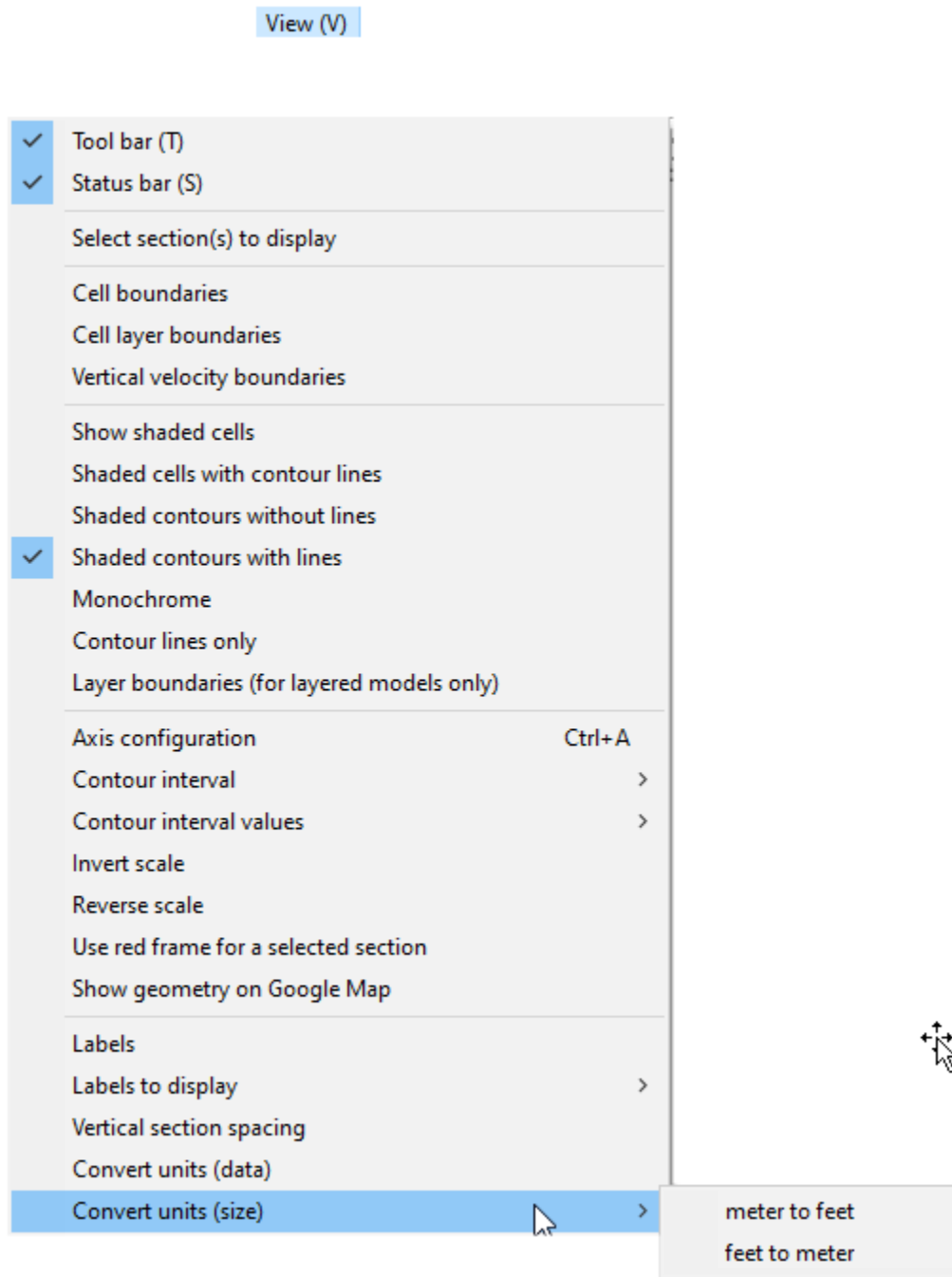


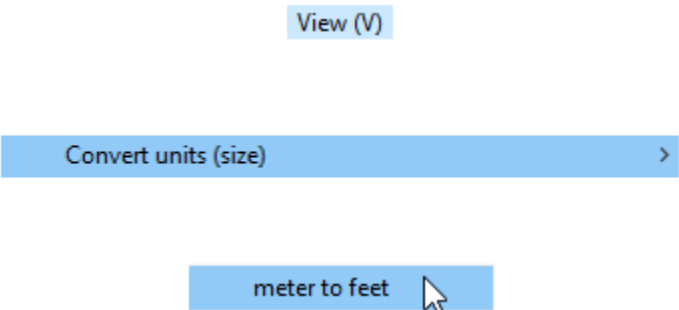
Figure 27: Example of **Convert units (data)**. The top section is original in m/sec; bottom is in ft/sec.

3.3.25 CONVERT UNITS (SIZE)



Select *Convert units (size)* to convert the axes between meters and feet. This does not affect the data itself, just the labels on the axes. If your data are in m/sec, and you convert to feet, your velocities will still be denoted in m/sec.

3.3.25.1 METER TO FEET



Shown below is a conversion from meters to feet. Only the axes have been affected.

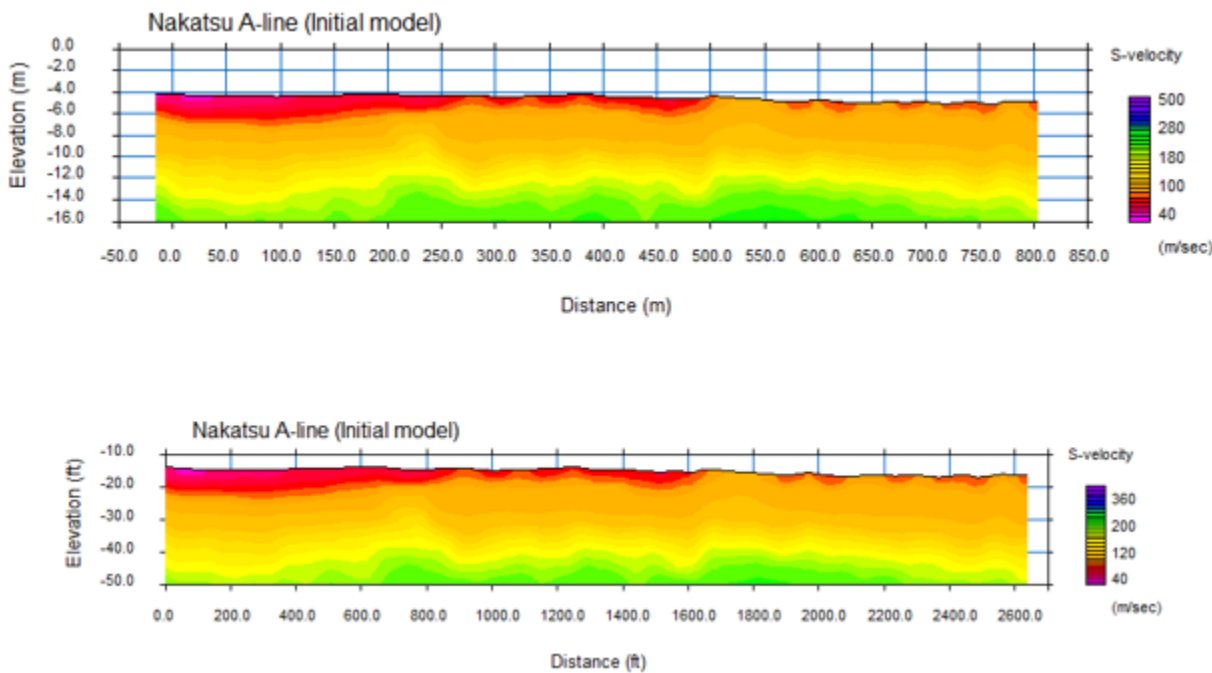


Figure 28: Top – original model, in meters. Bottom - same model, converted to feet.

3.3.25.2 FEET TO METER

View (V)

Convert units (size) >

meter to feet

feet to meter

Self-evident; reverse of above.

3.3.26 WAVEFORM DATA

View (V)

✓

Tool bar (T)

✓

Status bar (S)

Select section(s) to display

Cell boundaries

Cell layer boundaries

Vertical velocity boundaries

✓

Show shaded cells

Shaded cells with contour lines

Shaded contours without lines

Shaded contours with lines

Monochrome

Contour lines only

Layer boundaries (for layered models only)

Axis configuration

Ctrl+A

Contour interval

>

Contour interval values

>

Invert scale

Reverse scale

✓

Use red frame for a selected section

Show geometry on Google Map

Labels

Labels to display

>

Vertical section spacing

Convert units (data)

Convert units (size)

>

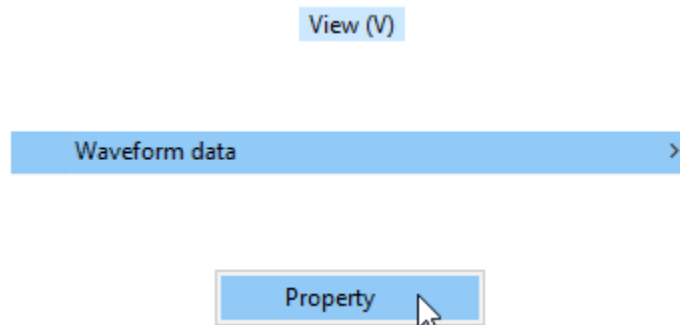
Waveform data

>

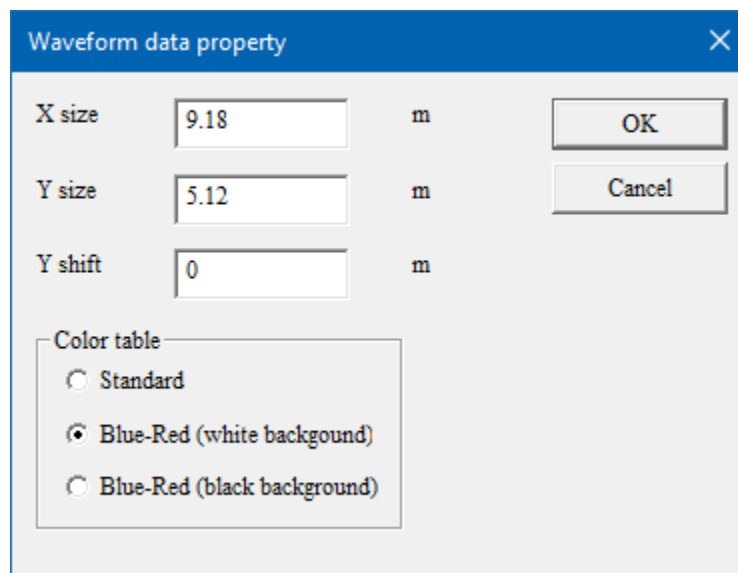
Property

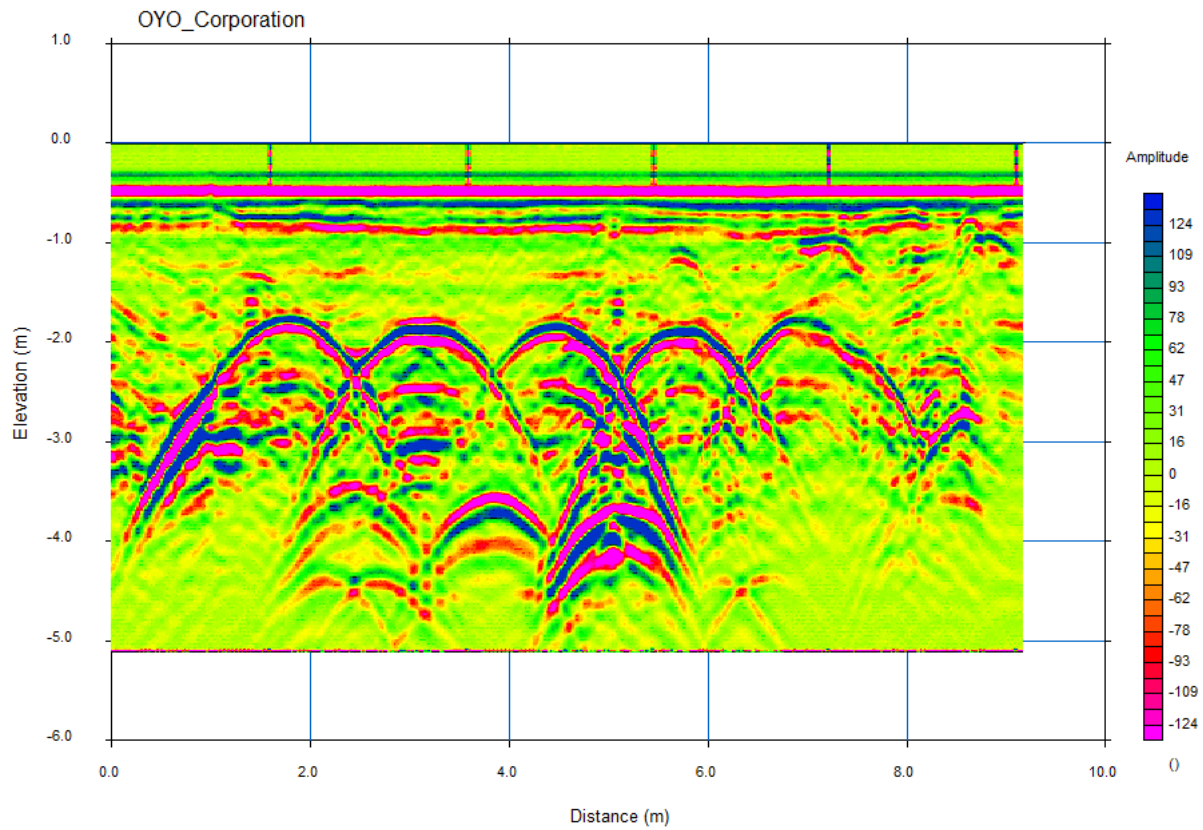
Continue.

3.3.26.1 PROPERTY

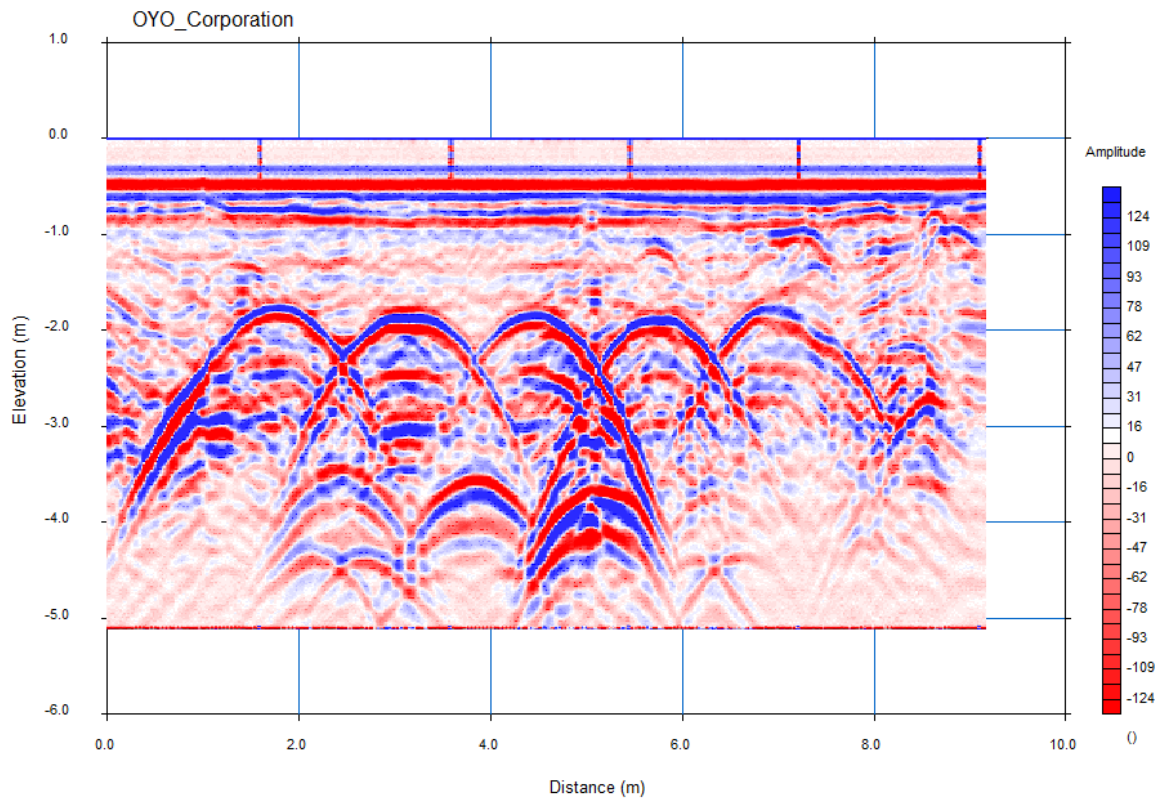


You may read in and display any GeoPlot-formatted file and edit some of the display parameters.



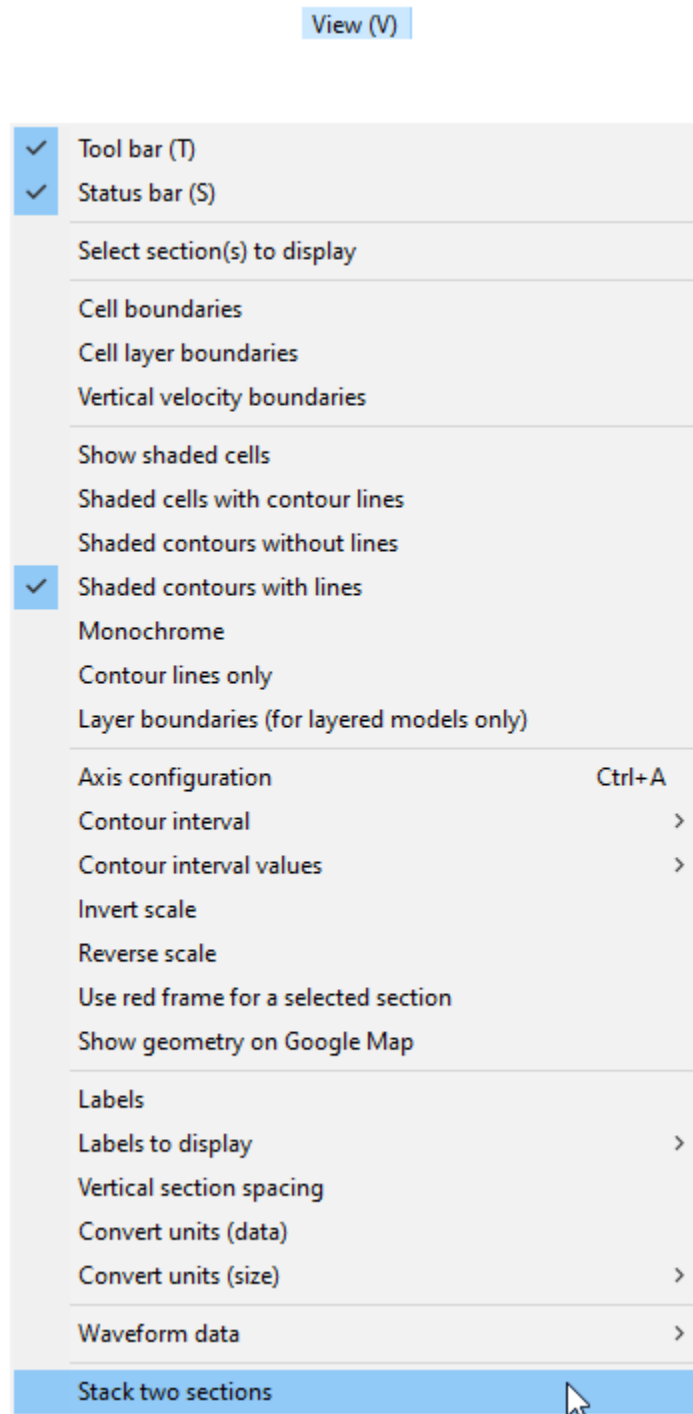


For example, the above GPR data is displayed in “standard” colors, but others are available:



You may also alter the X and Y scales and shift the section up or down in elevation.

3.3.27 STACK TWO SECTIONS



If you have two sections with different display attributes, like the two shown below in Figure 29, you may merge them into one.

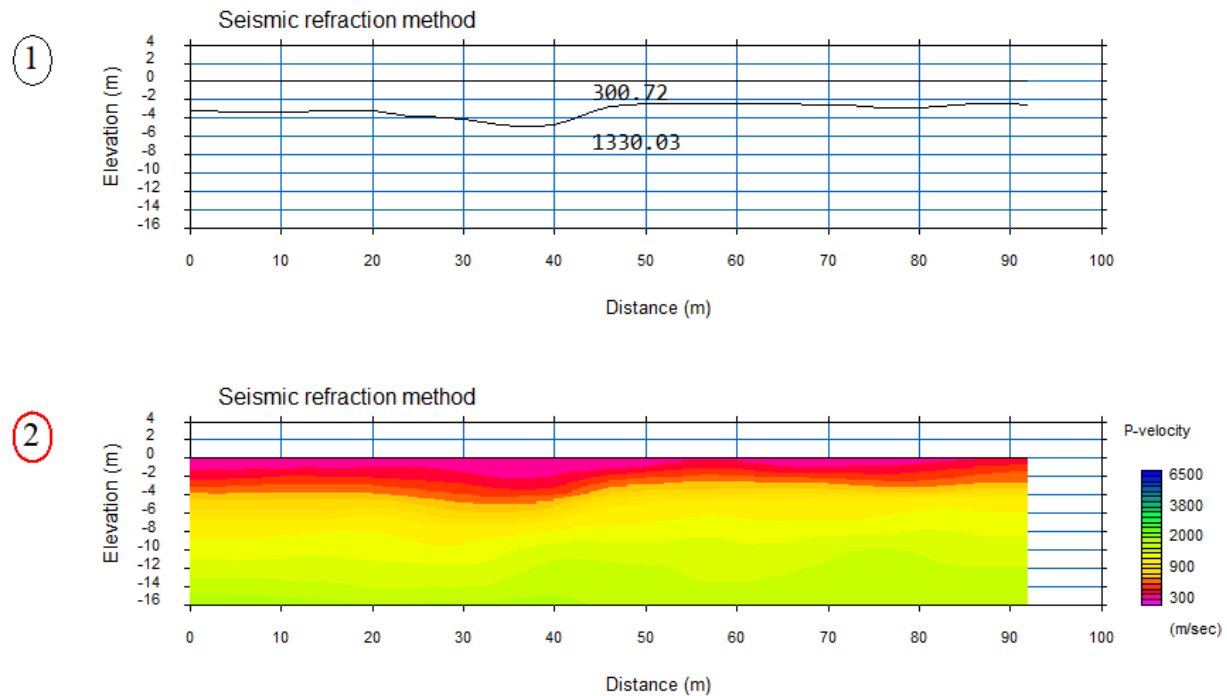
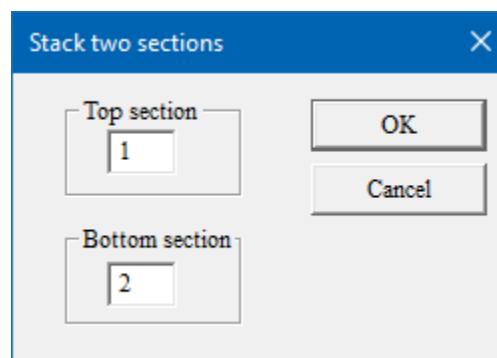


Figure 29: Two views of the same velocity section having different display attributes.

Select *Stack two sections* and indicate the numbers of the sections you wish to stack:



Stack two sections

Top section

1

Bottom section

2

OK

Cancel

The two sections will be combined into one:

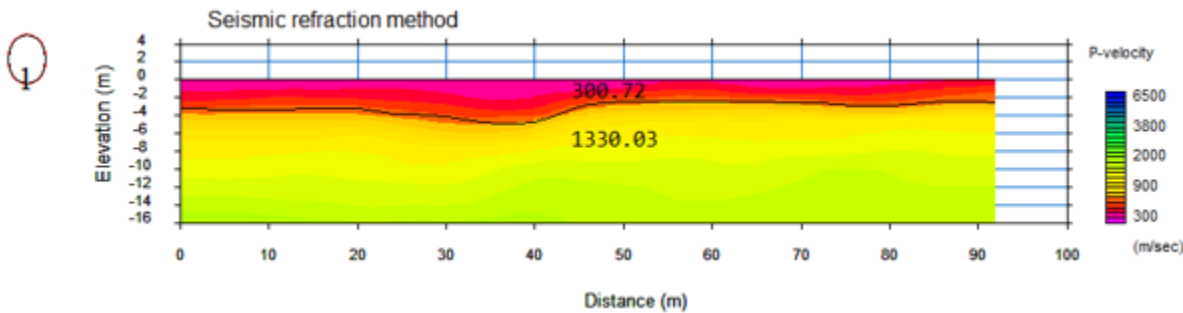
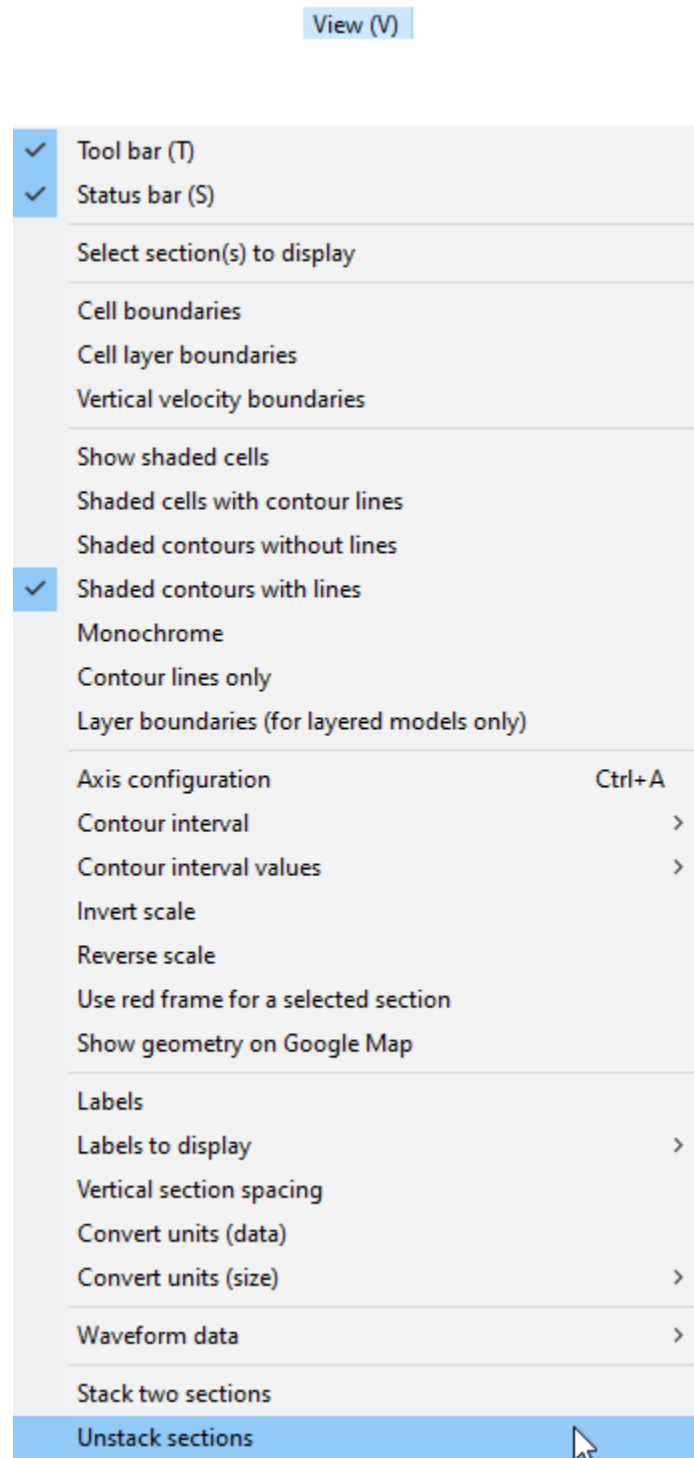


Figure 30: Stacked section.

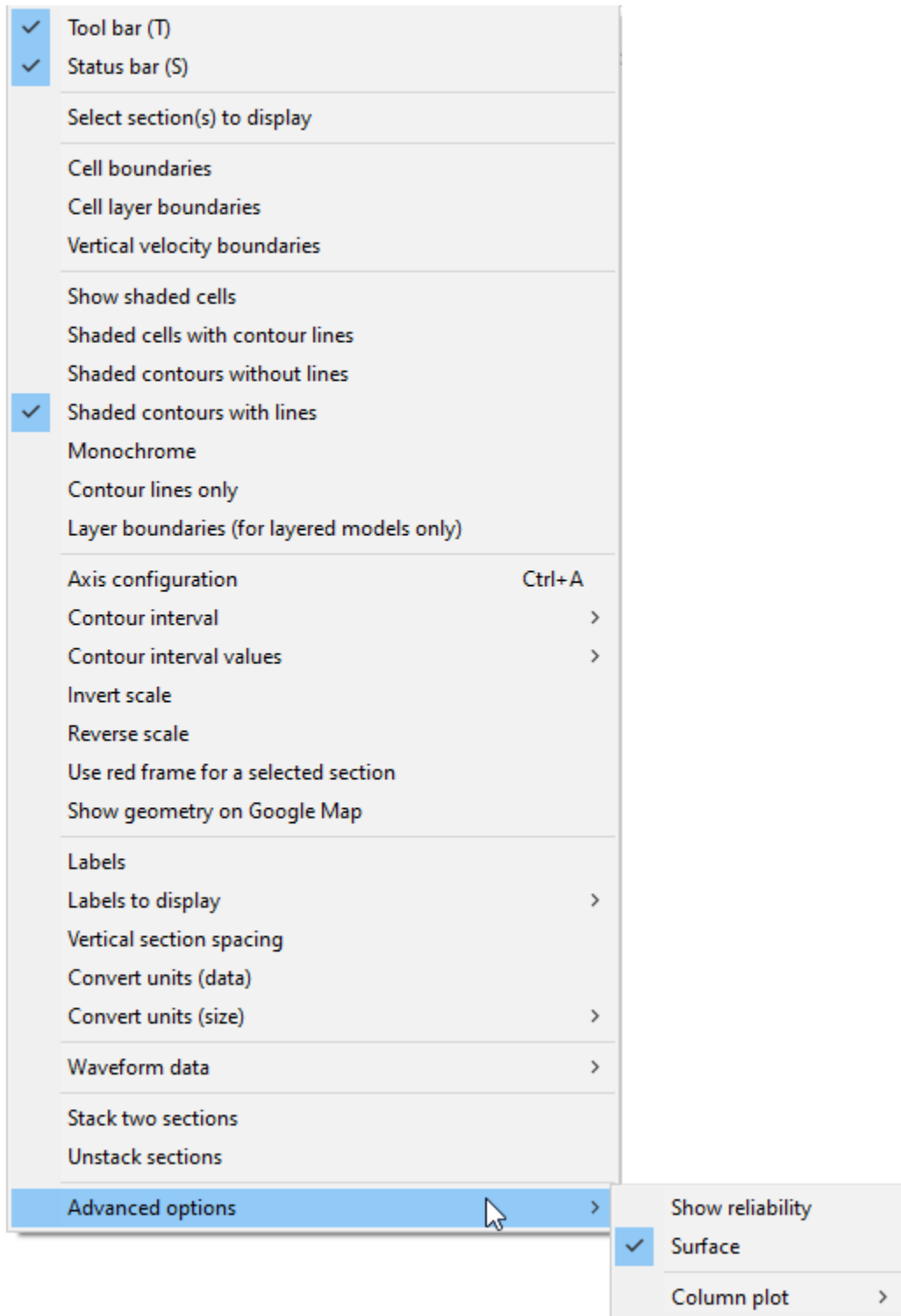
3.3.28 UNSTACK SECTIONS



This is self-evident; it simply unstacks any stacked sections.

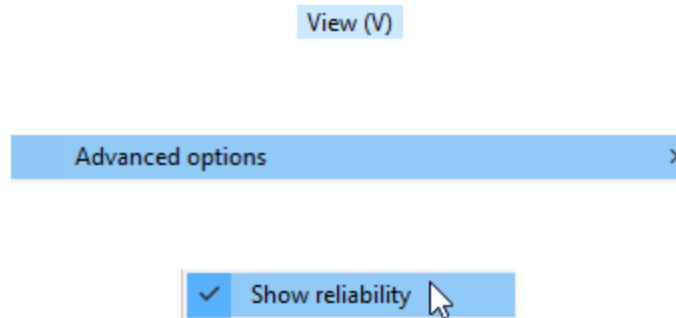
3.3.29 ADVANCED OPTIONS

View (V)



Continue.

3.3.29.1 SHOW RELIABILITY



If you wish, you may indicate the approximate depth of penetration of surface waves along the cross-section. Refer to Figure 31. Note that according to the 1/3 wavelength rule, penetration at that location is significantly less than is shown in Figure 32, the cross-section it was used to build (this particular V_s profile is located at the left end of the cross-section).. In general, penetration tends to be deepest near the center of the spread, tapering off toward the ends. This is because the frequency range toward the ends of the line is relatively narrow, limiting depth penetration.

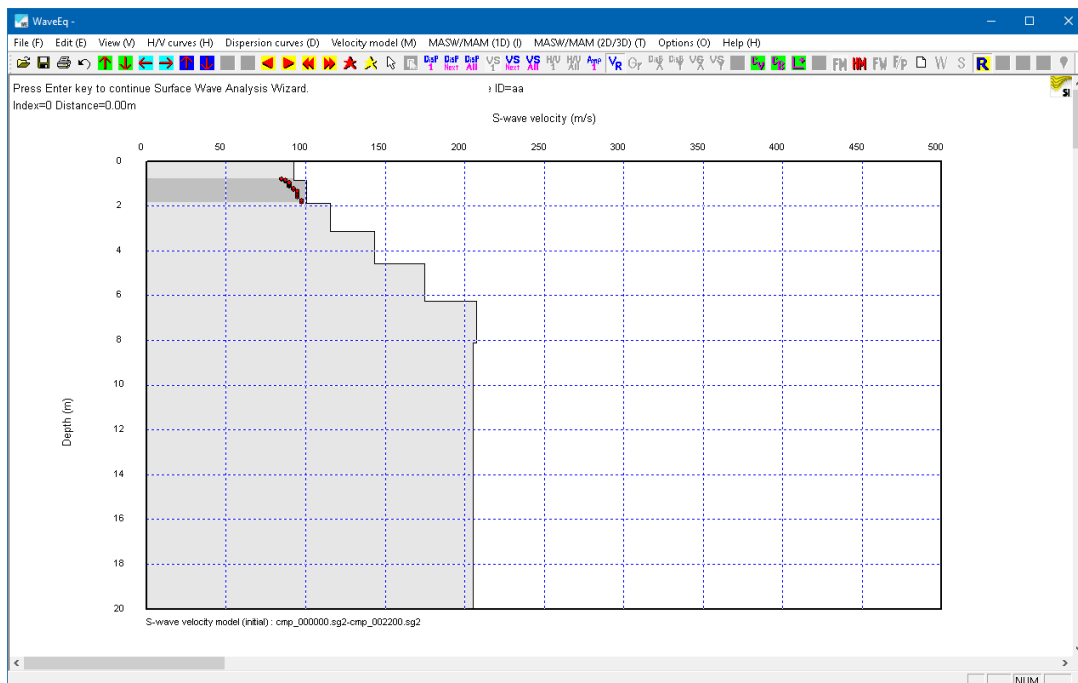


Figure 31: Velocity model showing 1/3 wavelength approximation.

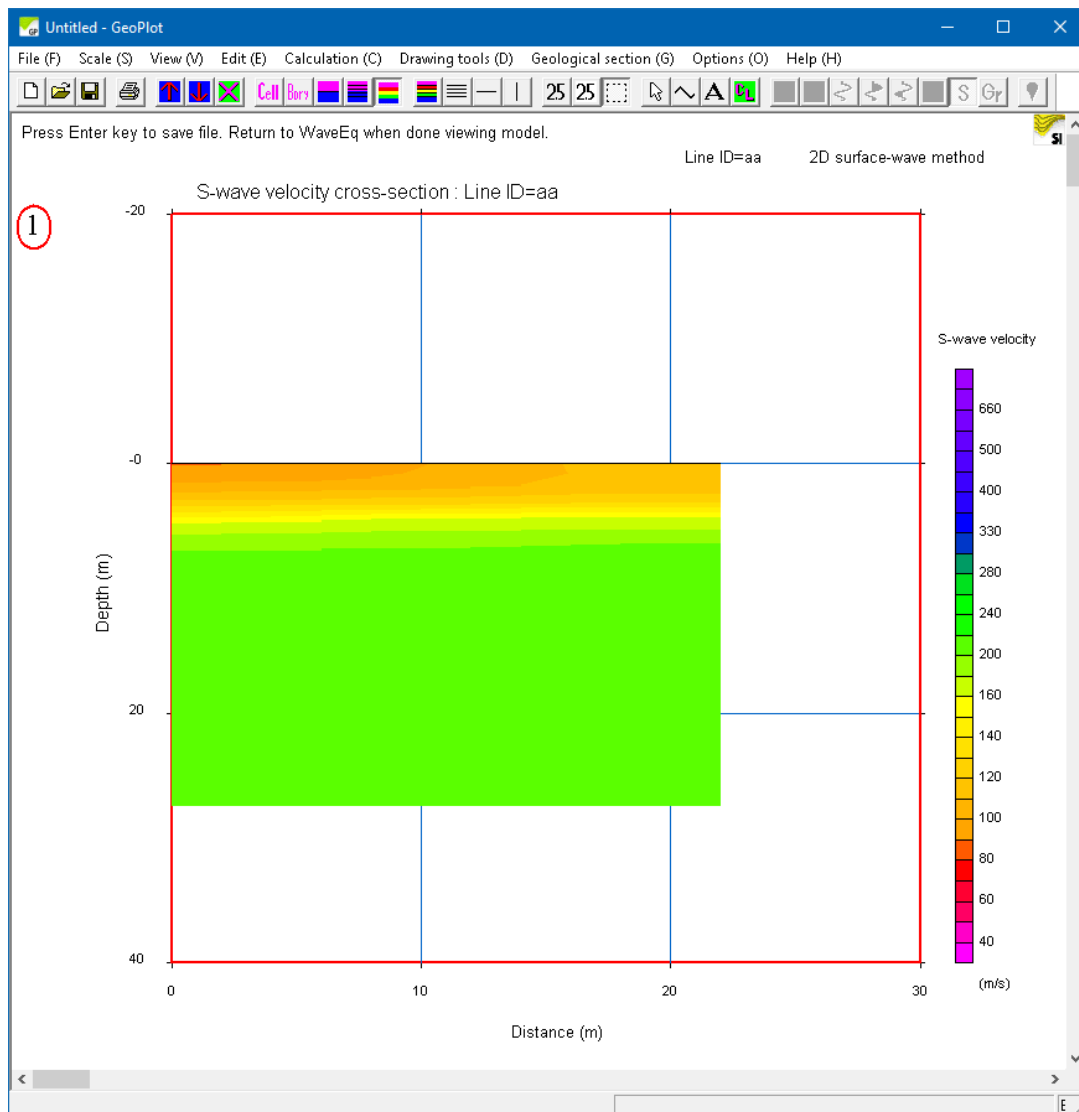


Figure 32: 2D velocity model.

Figure 33 shows each V_s profile along the survey line. Note the tapering of max V_R (max depth of red dots, marked by a transition from dark to light grey) toward the ends. Max V_R is a measure of data “reliability” and is a good estimate of the depth of penetration.

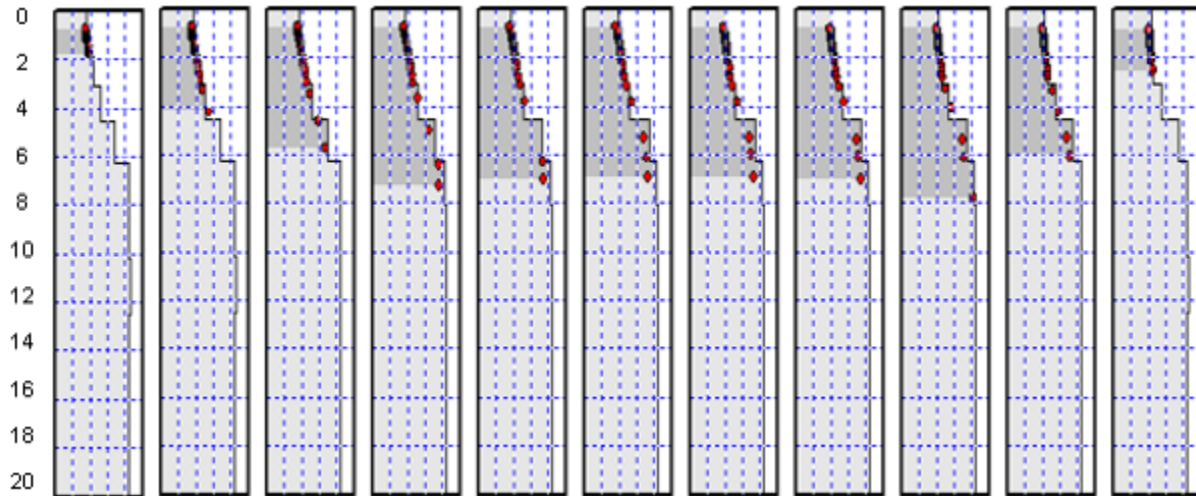


Figure 33: All 11 V_s profiles plotted side-by-side.

If we select *View / Advanced options / Show reliability* (this is a toggle switch), we can see this reflected in the cross section:

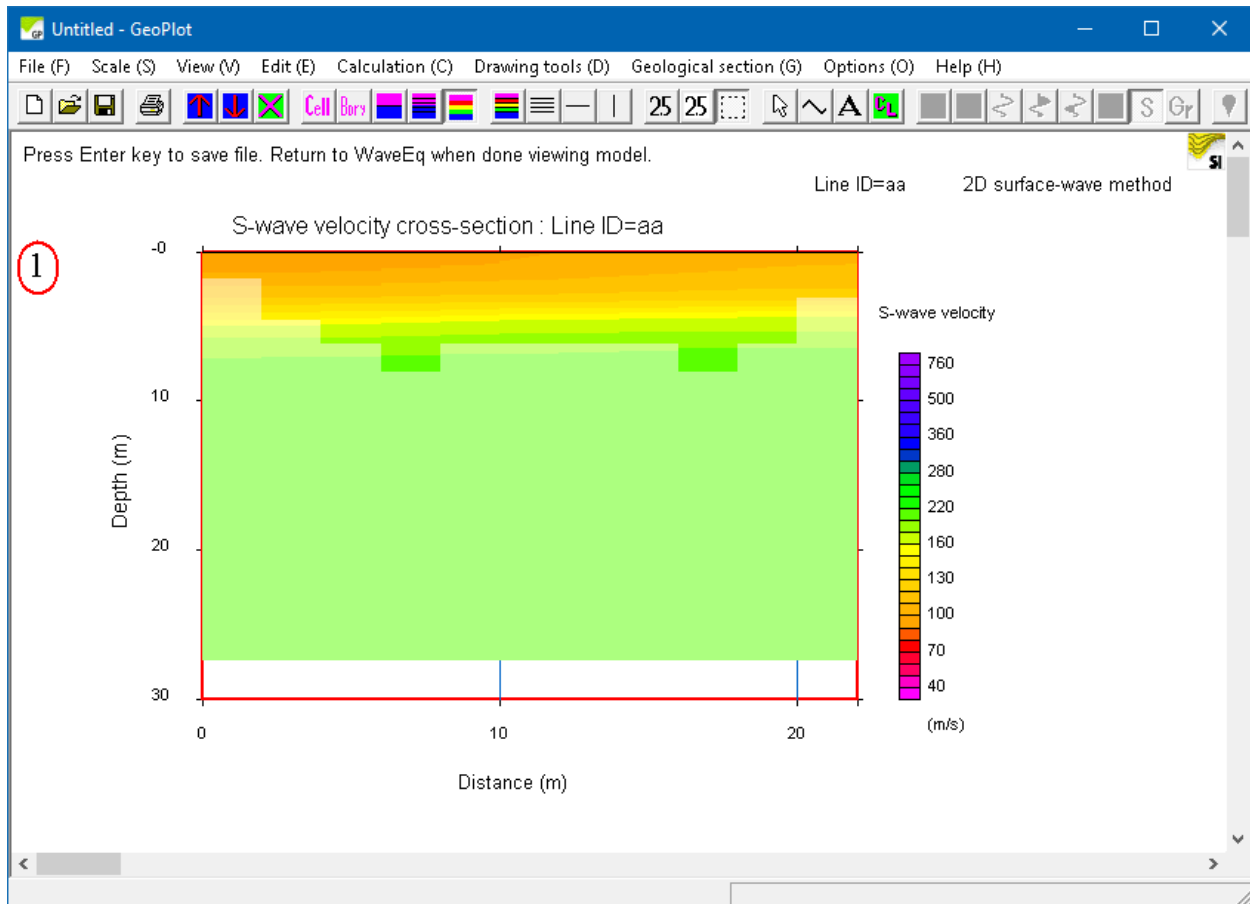
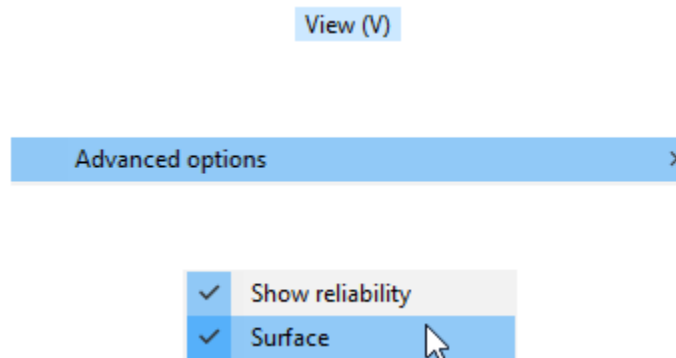


Figure 34: S-wave velocity section with **Show reliability** enabled. Compare to Figure 33.

The pale-colored zone is the “zone of unreliability”. The top of this zone represents the *approximate* depth of penetration based on the $1/3$ wavelength approximation ($\max V_R$).

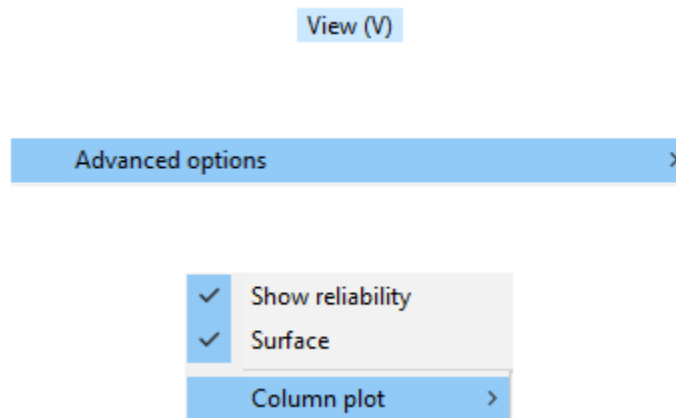
If you wish, you may remove the unreliable data and only display the zone of reliability. See Section [3.4.18.9](#) on Page 186.

3.3.29.2 SURFACE



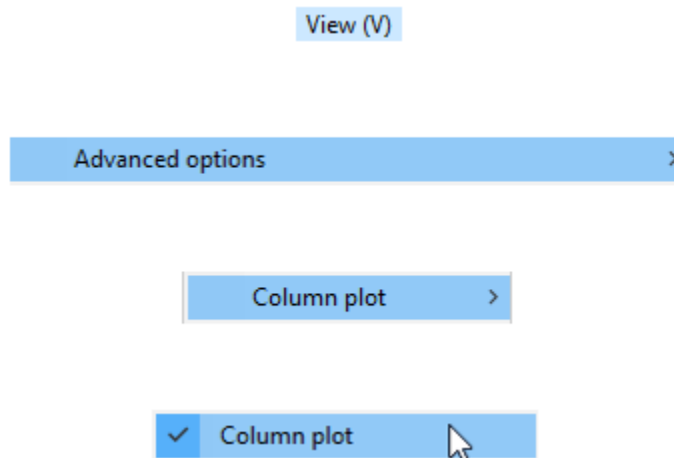
This feature is highly specialized and rarely used. Please contact support@seisimager.com for assistance.

3.3.29.3 COLUMN PLOT



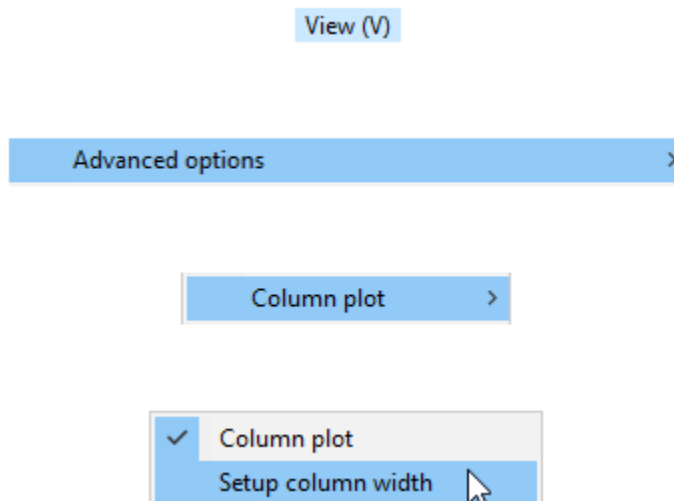
Continue.

3.3.29.3.1 COLUMN PLOT



This feature is highly specialized and rarely used. Please contact support@seisimager.com for assistance.

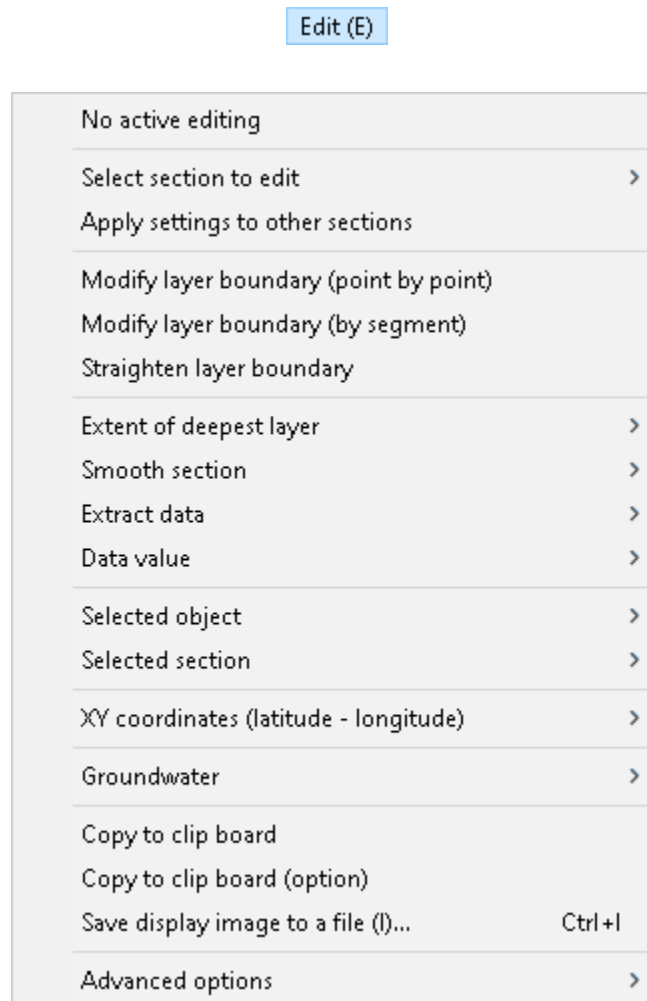
3.3.29.3.2 SETUP COLUMN WIDTH



This feature is highly specialized and rarely used. Please contact support@seisimager.com for assistance.

3.4 EDIT MENU

Click on *Edit* to reveal the **Edit** menu:



Use the **Edit** menu to edit your plots and save them.

3.4.1 NO ACTIVE EDITING

Edit (E)

No active editing



Selecting this option simply disables editing.

3.4.2 SELECT SECTION TO EDIT

Edit (E)

No active editing

Select section to edit



	none
<input checked="" type="checkbox"/>	1
<input type="checkbox"/>	2
<input type="checkbox"/>	3
<input type="checkbox"/>	4
<input type="checkbox"/>	5
<input type="checkbox"/>	6
<input type="checkbox"/>	7
<input type="checkbox"/>	8
<input type="checkbox"/>	9
<input type="checkbox"/>	10

You may read in more than one section at a time using the *Append* function (Section [3.1.2](#), Page 13). If you do, you must choose which section to edit – you can only edit one at a time. Select the section you wish to edit here.

Note: You may also select which section to edit by clicking on the number to the left of it, as shown below. The active section number will be circled in red.

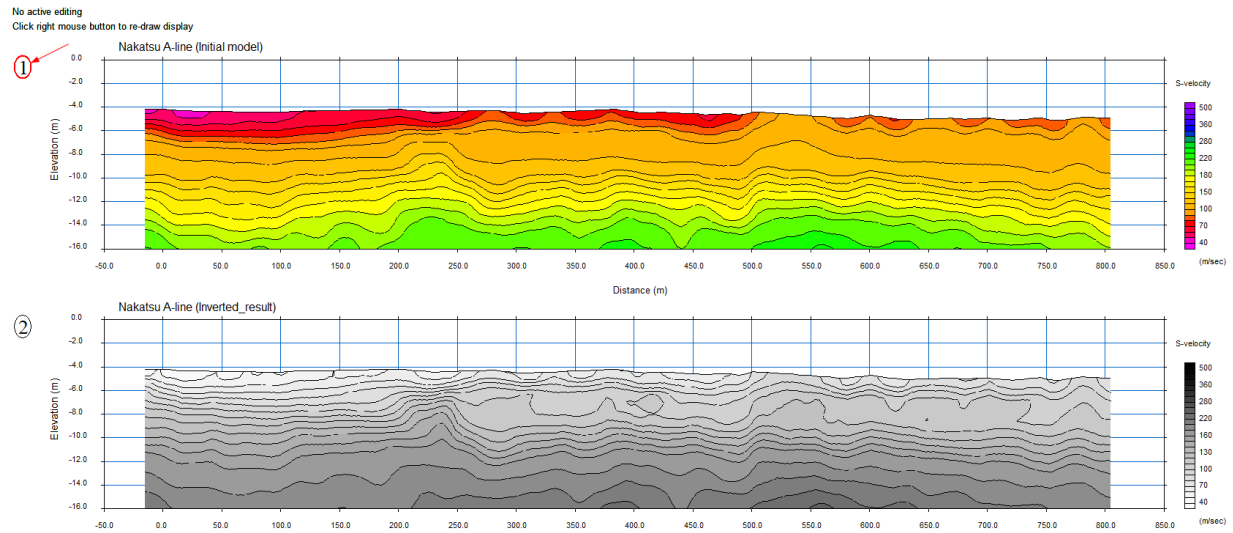
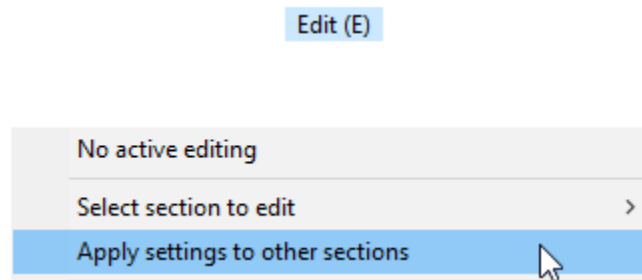
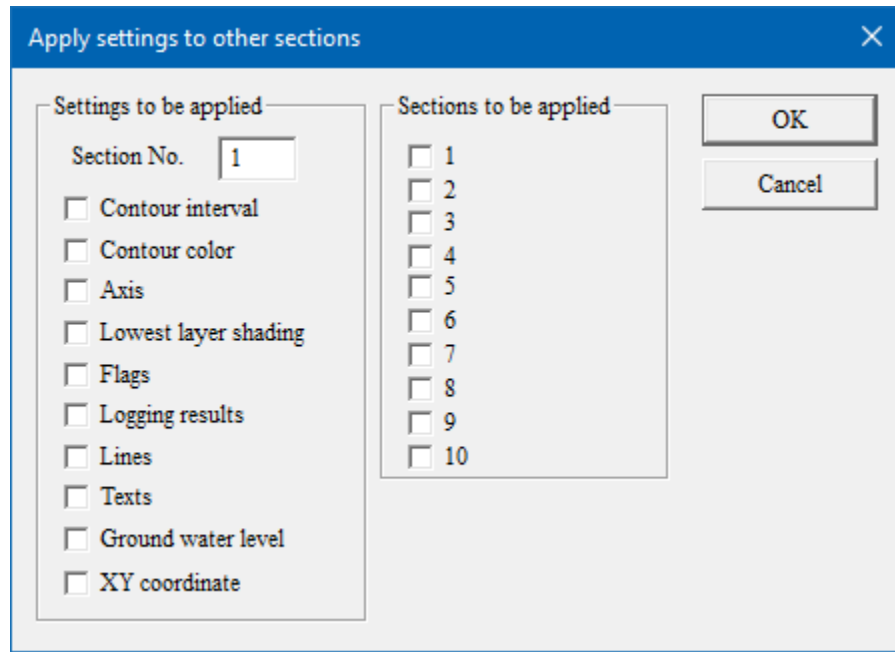


Figure 35: Red circle indicating which section is active and being edited.

3.4.3 APPLY SETTINGS TO OTHER SECTIONS



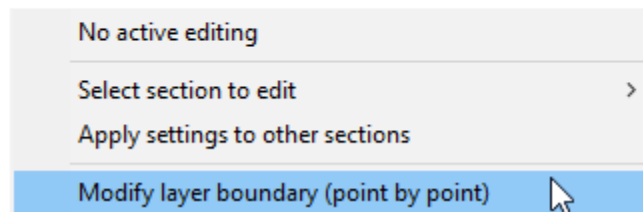
Once you have a plot looking the way you want, you may apply selected settings to other sections that you have read in and appended. *Select Edit / Apply settings to other sections* to reveal the following dialog:



On the left, indicate which section you wish to apply the settings *from*, along with the specific settings you wish to apply. On the right, check off which sections you wish to apply the settings *to*. Press *OK*.

3.4.4 MODIFY LAYER BOUNDARY (POINT BY POINT)

Edit (E)



You may modify the velocities and geometry of your velocity model.

Below is a synthetic velocity model:

Edit: Modify layer boundary using the mouse

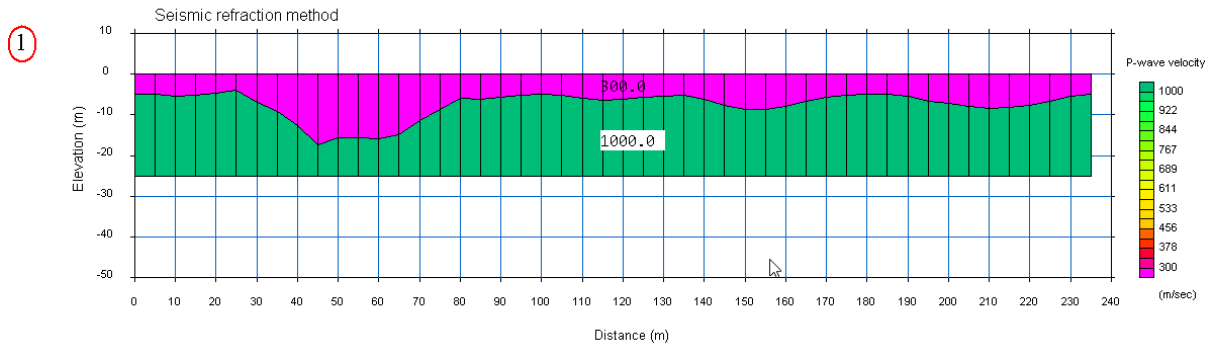


Figure 36: Synthetic velocity model.

To change the geometry of the velocity boundaries on a point-by-point basis, click on *Modify layer boundary (point by point)*. The individual velocity cells will be displayed. You may change the depth of any layer by clicking on a cell intersection and dragging the red dot to the desired depth:

Edit: Modify layer boundary using the mouse

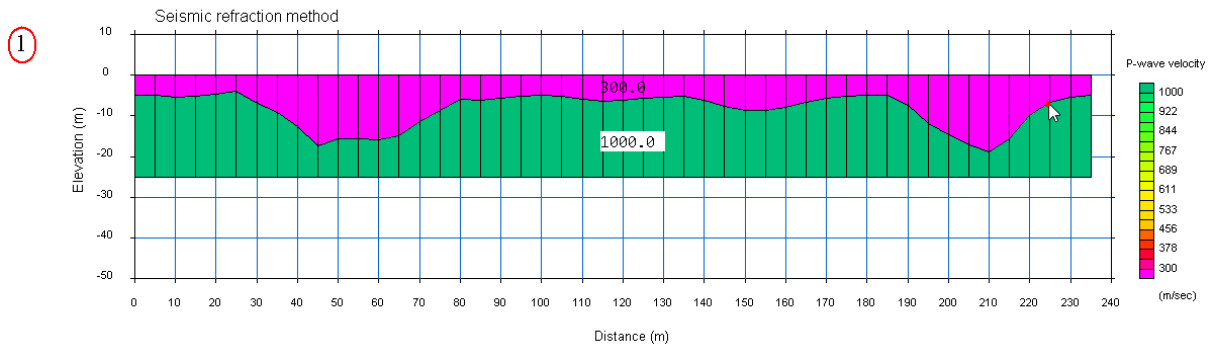
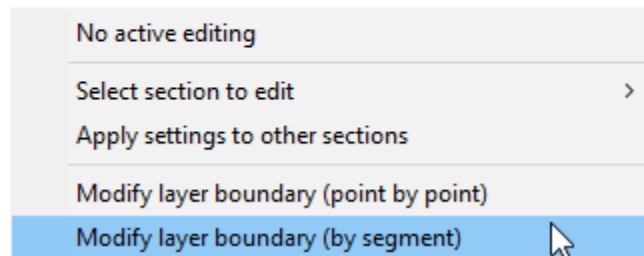


Figure 37: Modified layer boundary.

3.4.5 MODIFY LAYER BOUNDARY (BY SEGMENT)

Edit (E)



In addition to moving individual points, you can also grab an entire segment of a boundary and move it. Choose *Modify layer boundary (by segment)*. Click on one end of the segment you wish to move. A red dot will be displayed (see arrow). Now, click on the other end:

Edit: Modify layer boundary using the mouse

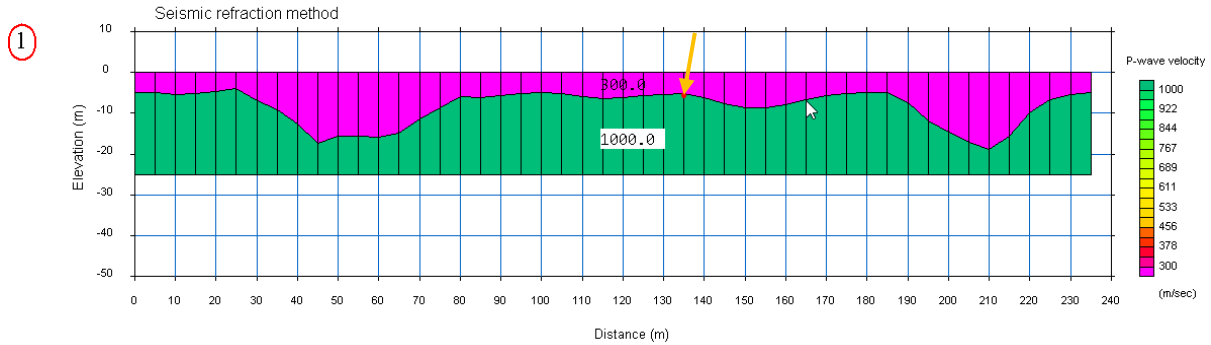


Figure 38: Left end of segment marked by red dot.

Drag the second red dot to the desired depth:

Edit: Modify layer boundary using the mouse

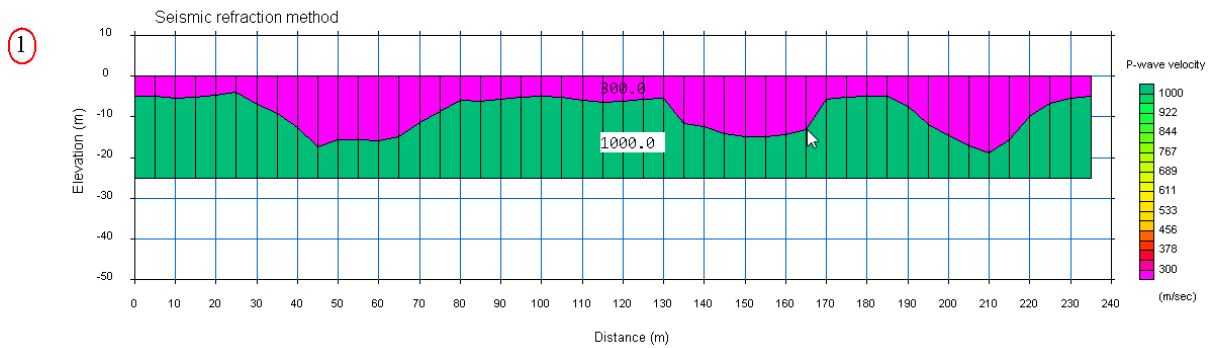
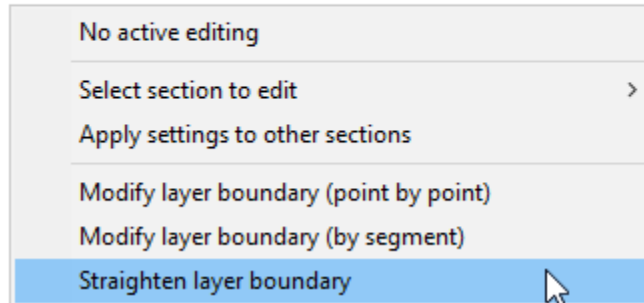


Figure 39: Segment modified.

3.4.6 STRAIGHTEN LAYER BOUNDARY

Edit (E)



If you wish to straighten the layer boundary between two points, choose *Straighten layer boundary*. Click on the first end of the segment you wish to straighten:

Edit: Modify layer boundary using the mouse

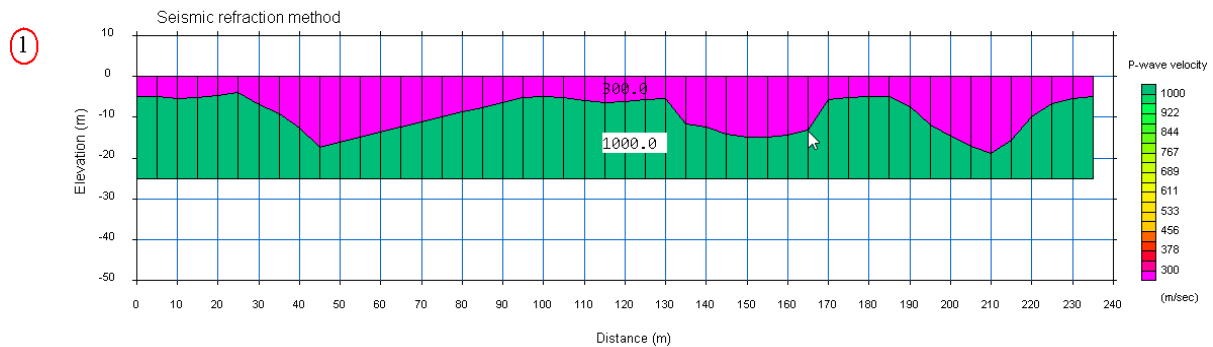


Figure 40: Left limit of segment to be straightened.

Then click on the other end of the segment:

Edit: Modify layer boundary using the mouse

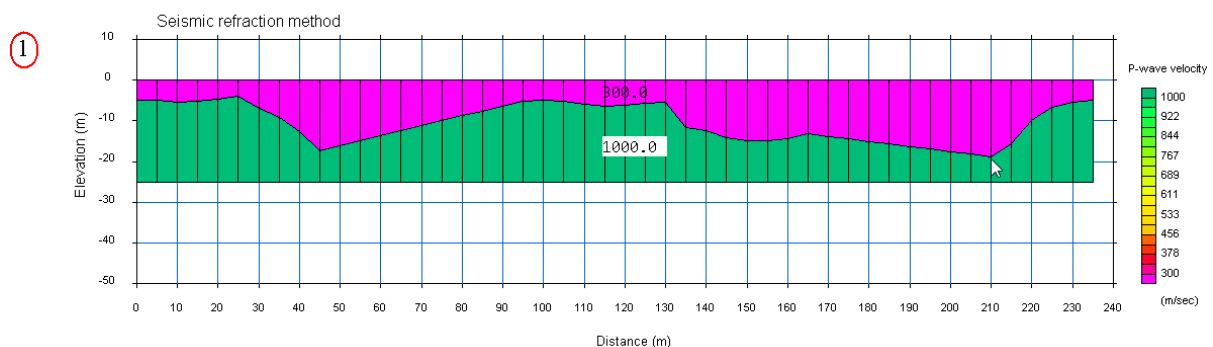
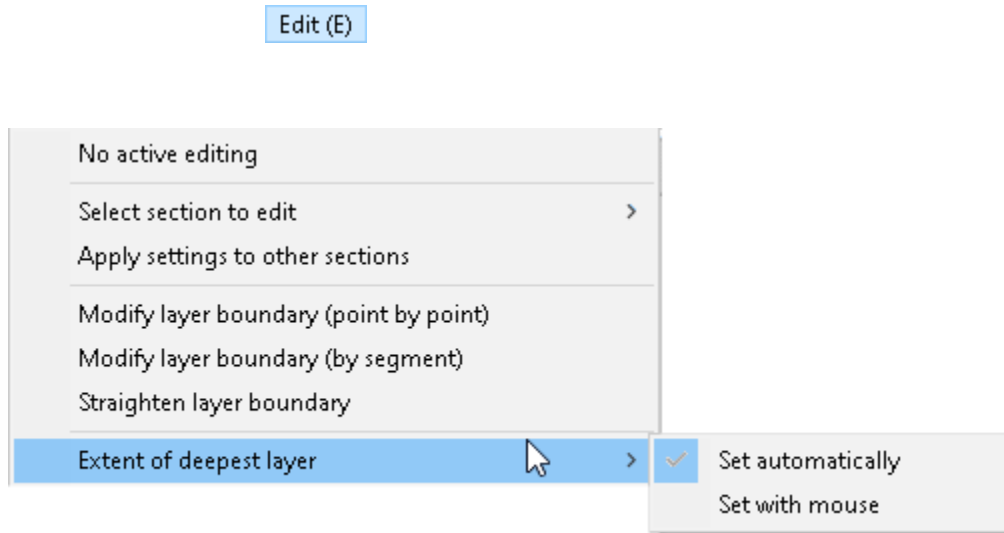


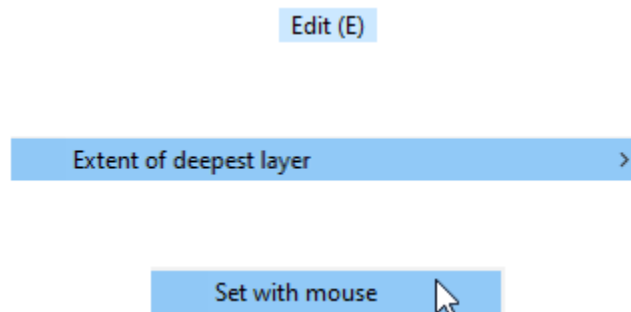
Figure 41: Segment straightened.

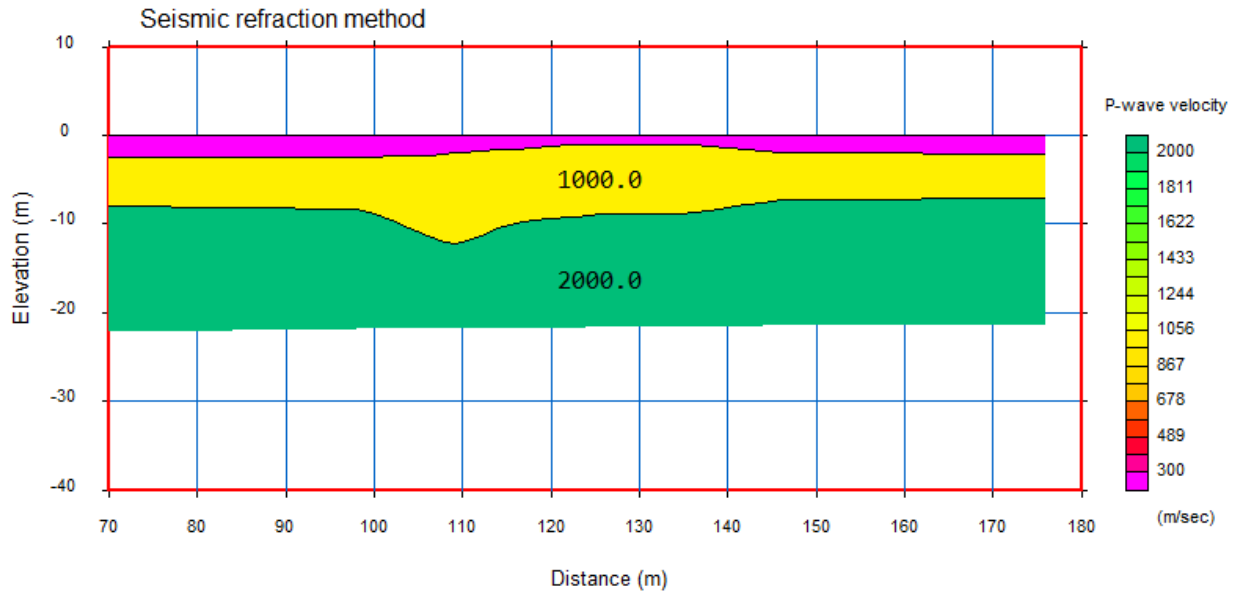
The layer segment will be a straight line between the two points.

3.4.7 EXTENT OF DEEPEST LAYER

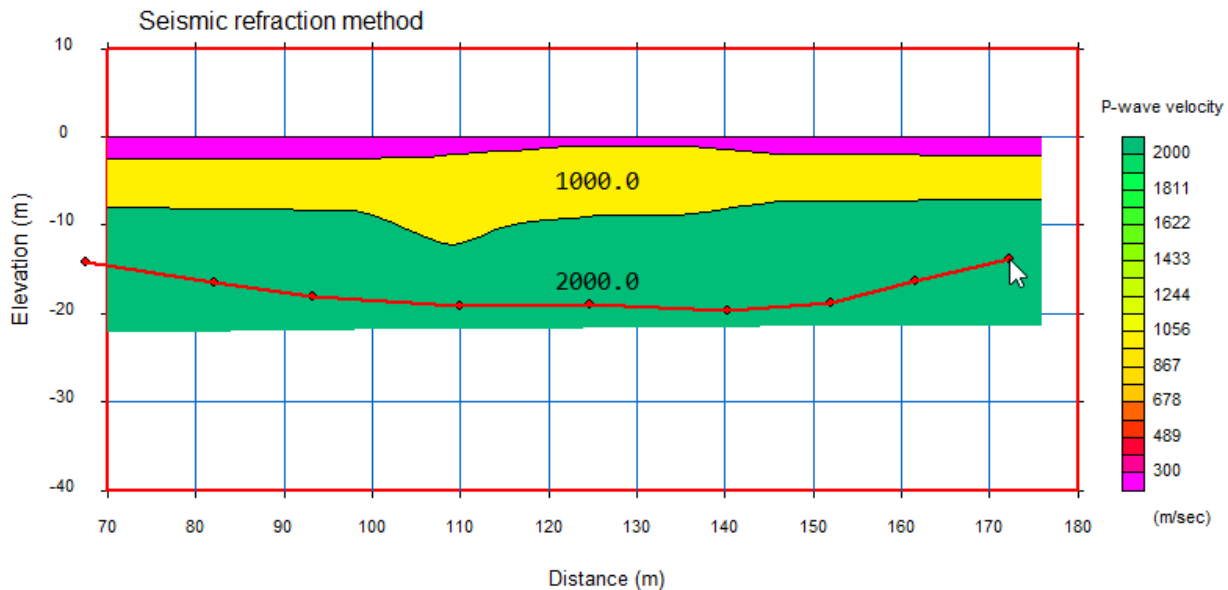


3.4.7.1 SET WITH MOUSE

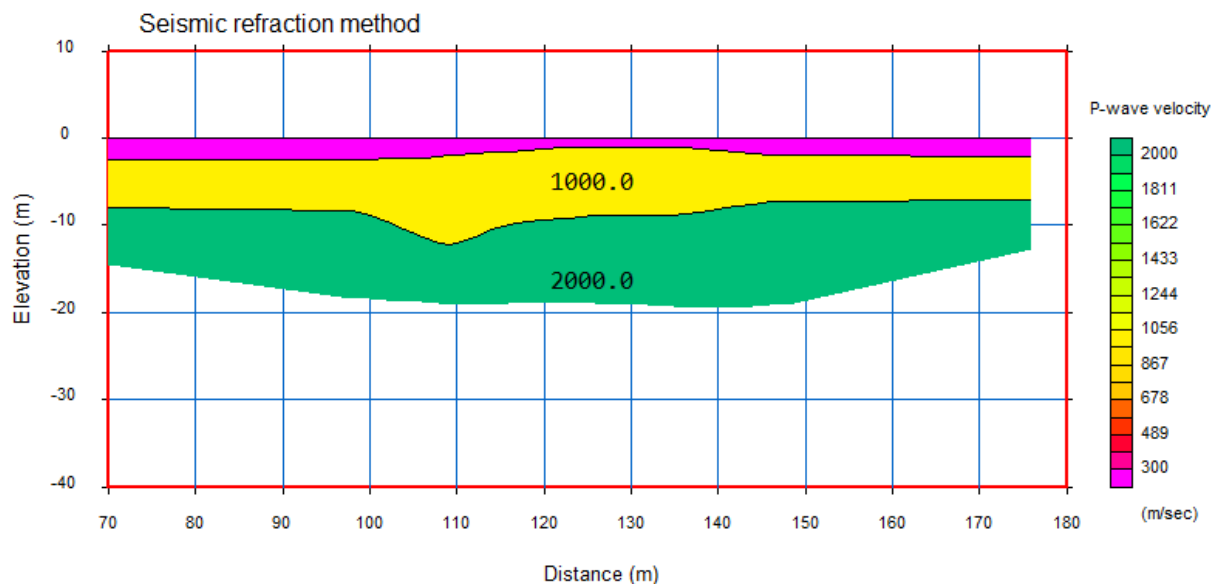




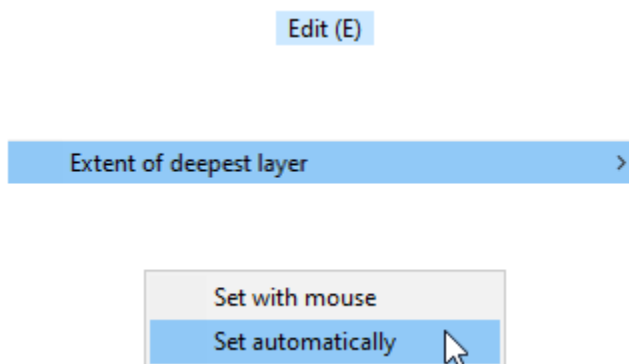
To modify the deepest layer with a mouse, begin by clicking outside the section to the left, as shown below. Then click from left to right at the appropriate depths. Finally, click to the



right, again outside of the section. The portion of the section below the resulting line will be deleted.



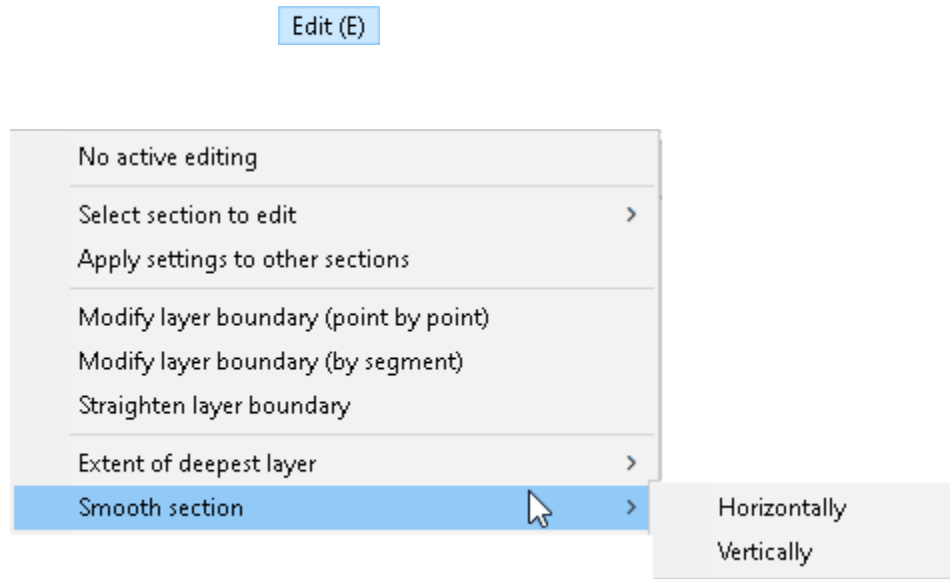
3.4.7.2 SET AUTOMATICALLY



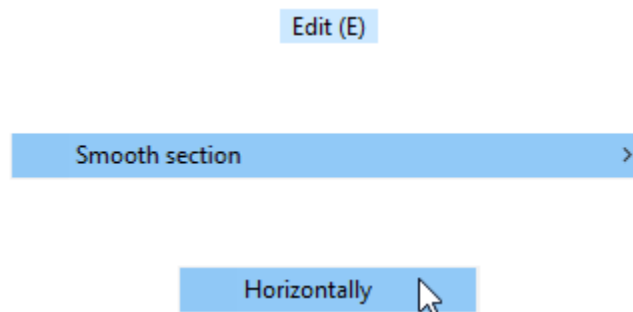
With layered models, sometimes the thickness of the deepest layer is greater than that justified by the data. You may modify the thickness of the deepest layer manually, or let GeoPlot do so automatically, based on cell configuration and rule-of-thumb. If you are working with surface-wave data, see Section [3.4.18.9](#) on Page 186 and the discussion in the SeisImager/SW manual on this topic (search for “1/3 wavelength rule”).

3.4.8 SMOOTH SECTION

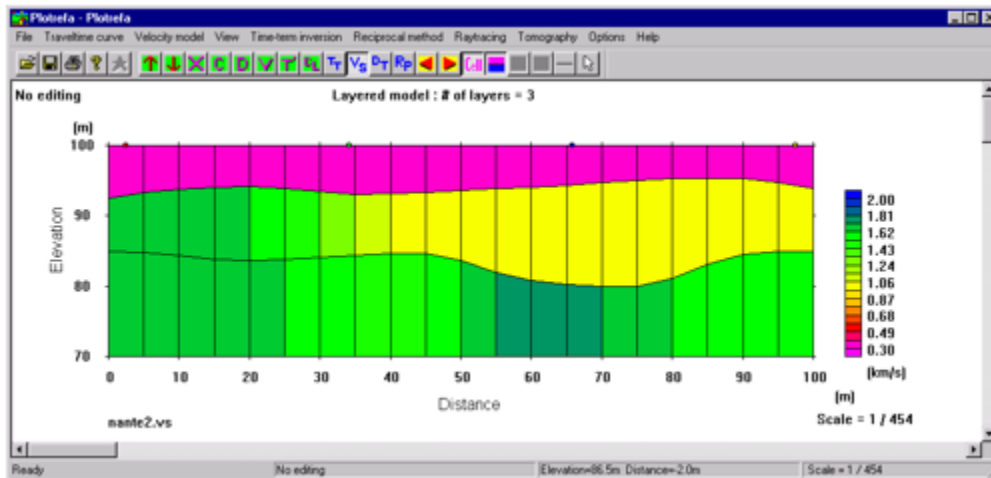
The layer boundaries and velocity transitions can be smoothed. To smooth layer boundaries, choose *Smooth section* from the sub-menu:



3.4.8.1 HORIZONTALLY



To smooth out horizontal velocity changes, choose *Horizontally*:



3.4.8.2 VERTICALLY

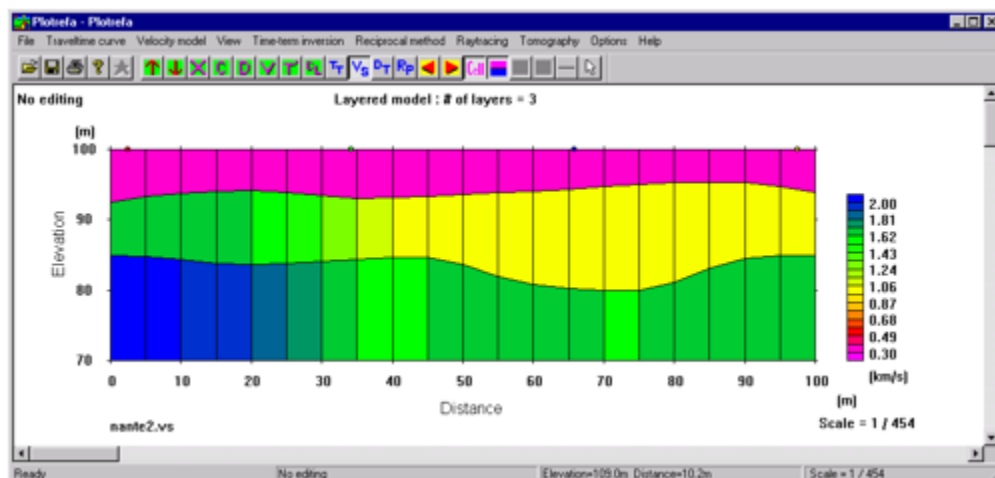
Edit (E)

Smooth section

Horizontally

Vertically

To smooth out vertical velocity changes, choose *Vertically*:



With both of the above smoothing operations, each time you click, a little more smoothing occurs. For instance, in the above model, the layers were smoothed twice. In the one below, it has been smoothed five times:

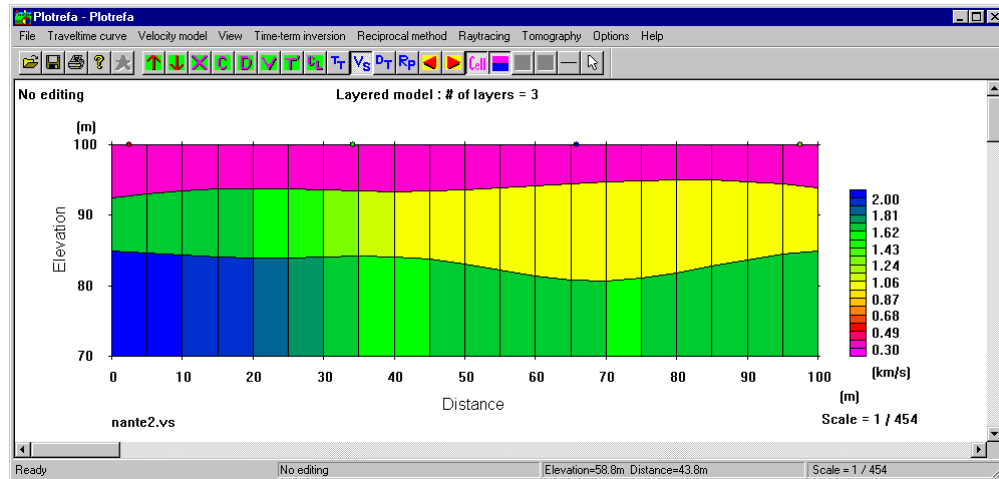
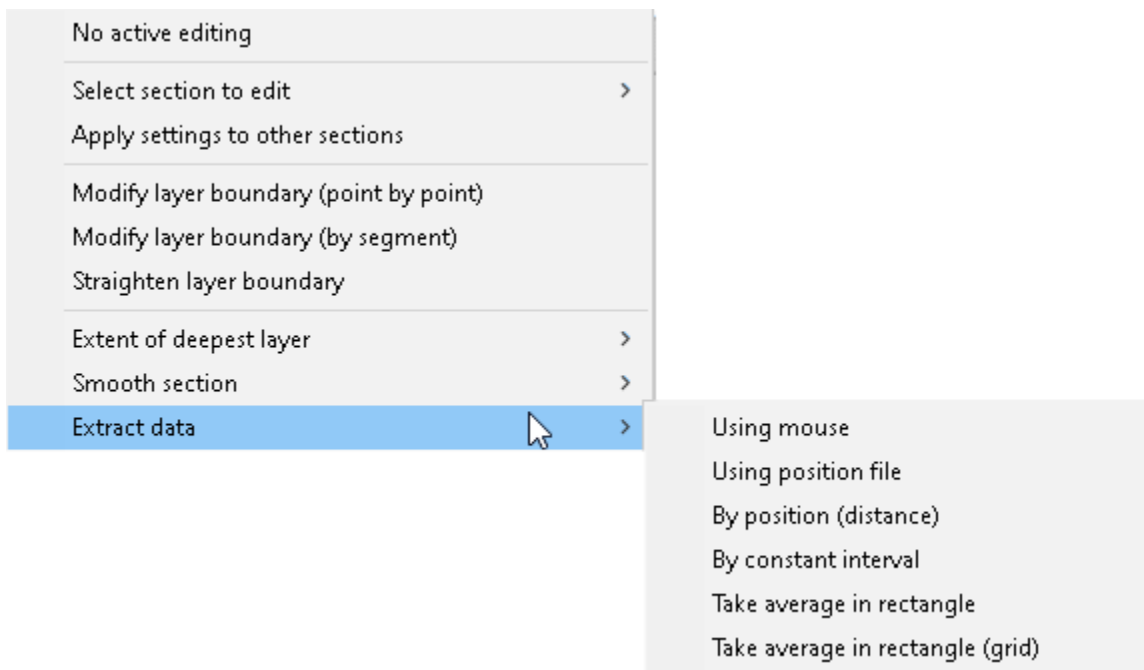


Figure 42: Smoothed velocity model:

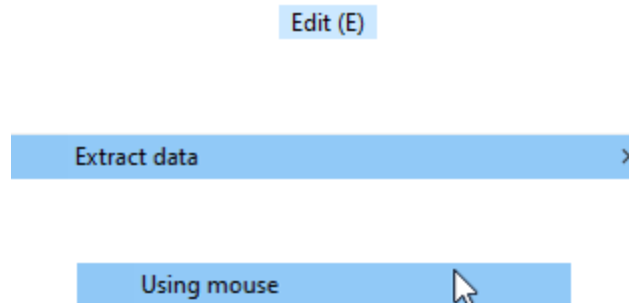
3.4.9 EXTRACT DATA

Edit (E)



You may extract “chunks” of data using the *Extract data* option.

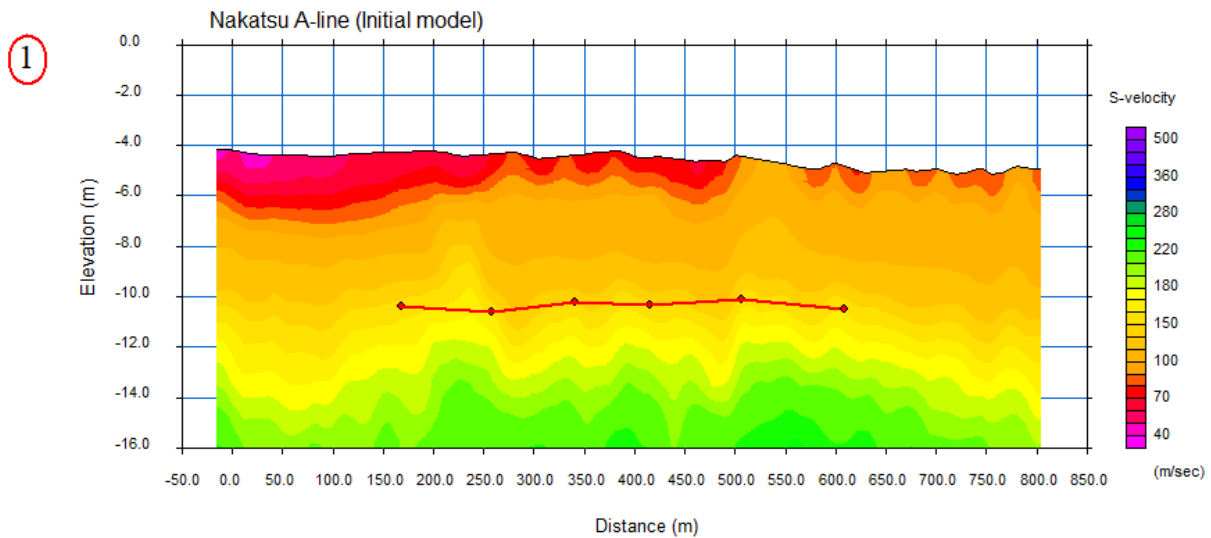
3.4.9.1 USING MOUSE



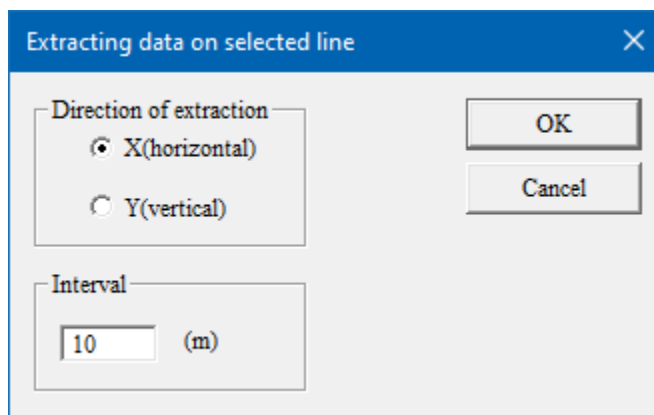
Using the mouse, click from left to right along the section to draw a series of line segments. Double-click when done.

Edit: Extracting data

Use left mouse button to position line nodes. Double-click to complete line



You will see the following dialog box:



Extracting data on selected line

Direction of extraction

☒ X(horizontal)

☐ Y(vertical)

Interval

10 (m)

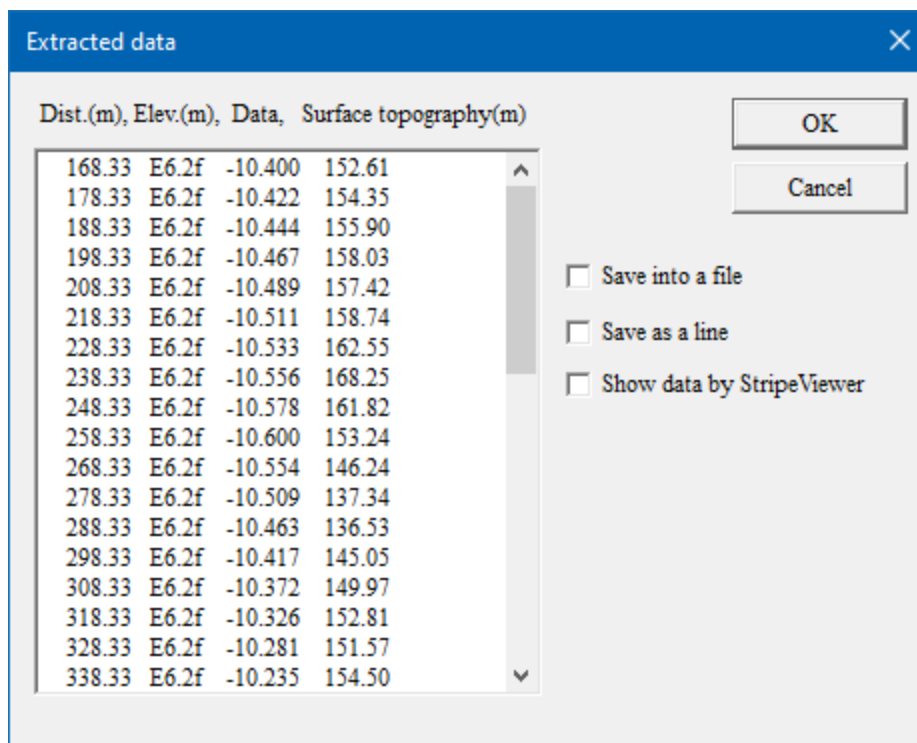
OK

Cancel

Select the *Direction of extraction* and the *Interval* as desired.

Note: The horizontal or vertical length of the line must be greater than the interval.

Press *OK*. At this point, you may do any combination of three things.



Extracted data

Dist.(m)	Elev.(m)	Data	Surface topography(m)
168.33	E6.2f	-10.400	152.61
178.33	E6.2f	-10.422	154.35
188.33	E6.2f	-10.444	155.90
198.33	E6.2f	-10.467	158.03
208.33	E6.2f	-10.489	157.42
218.33	E6.2f	-10.511	158.74
228.33	E6.2f	-10.533	162.55
238.33	E6.2f	-10.556	168.25
248.33	E6.2f	-10.578	161.82
258.33	E6.2f	-10.600	153.24
268.33	E6.2f	-10.554	146.24
278.33	E6.2f	-10.509	137.34
288.33	E6.2f	-10.463	136.53
298.33	E6.2f	-10.417	145.05
308.33	E6.2f	-10.372	149.97
318.33	E6.2f	-10.326	152.81
328.33	E6.2f	-10.281	151.57
338.33	E6.2f	-10.235	154.50

OK

Cancel

☐ Save into a file

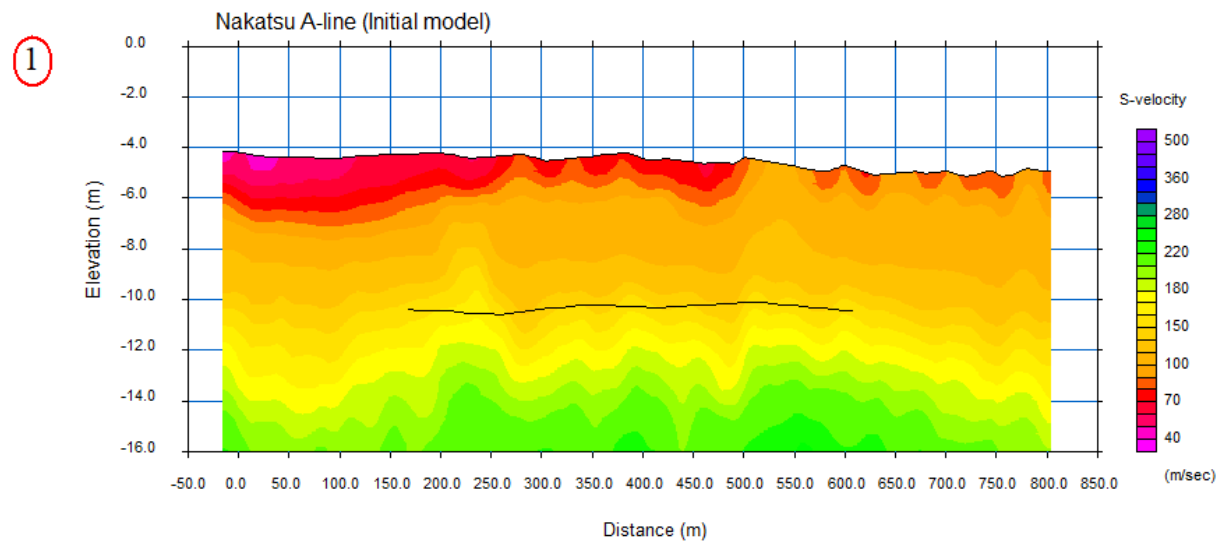
☐ Save as a line

☐ Show data by StripeViewer

You may save the extracted data to an ASCII file (format is self-evident), you may save the line on the section, (see below), and you may view the data using StripeViewer™.

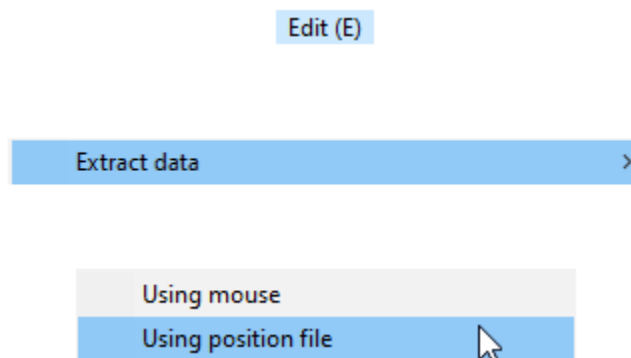
No active editing

Click right mouse button to re-draw display



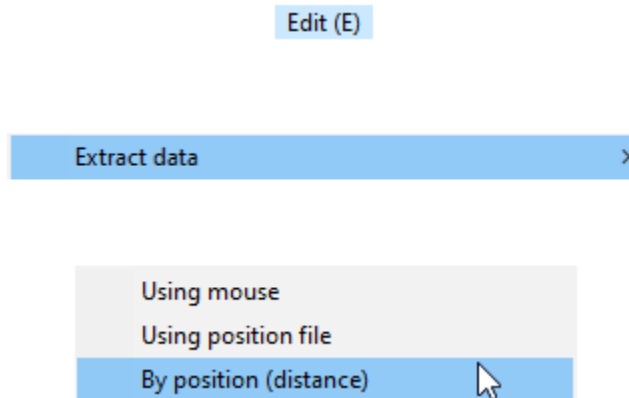
Note: StripeViewer is a third-party application and must be installed on your PC. Contact support@seisimager.com for assistance.

3.4.9.2 USING POSITION FILE

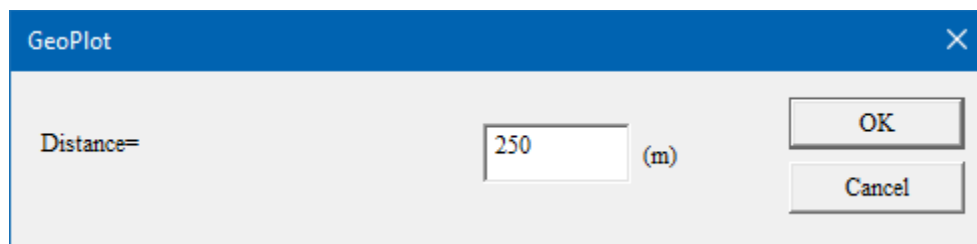


In lieu of using a mouse, you may also provide an ASCII (x,z) position file to direct which data to extract. Simply create a space, tab, or comma-delimited x,z ASCII-columnar file and provide the file name when prompted. The output options are identical to those outlined in the previous section.

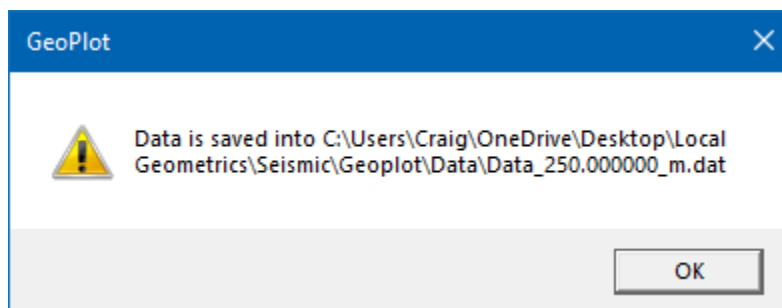
3.4.9.3 BY POSITION (DISTANCE)



To extract the data at a particular distance along the section, select *By position (distance)*. You will see the following dialog:



Enter a distance, press *OK*, and the data will be saved to a file:



The file for this example is shown below. Annotation is in bold.

Distance, depth (middle), Property, Elevation max., elevation min.

250.000000 0.267857 66.033600 -4.376375 -4.912089

250.000000 0.844780 73.377022 -4.912089 -5.530221

250.000000 1.504121 91.374054 -5.530221 -6.230771

250.000000 2.245879 106.499557 -6.230771 -7.013738

.

.

.

250.000000 0.000000 66.033600 **Distance, depth (min.), property**

250.000000 0.535714 66.033600 **Distance, depth (max.), property**

250.000000 0.535714 73.377022 **Distance, depth (min.), property**

250.000000 1.153846 73.377022 **Distance, depth (max.), property**

.

.

.

Depth (middle), property

0.535714 66.033600

1.153846 73.377022

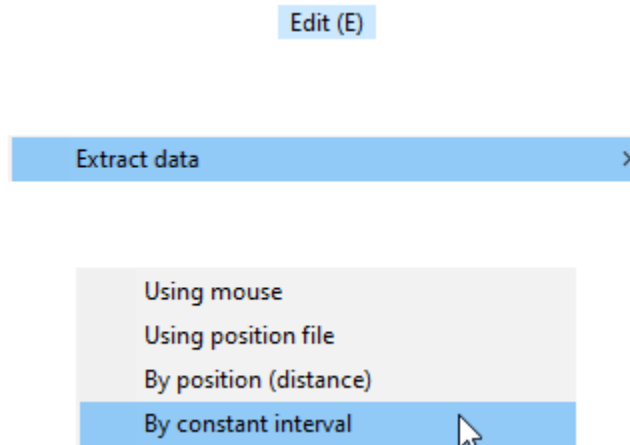
1.854396 91.374054

.

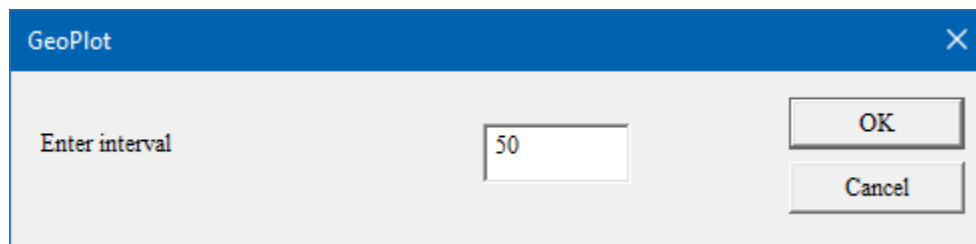
.

.

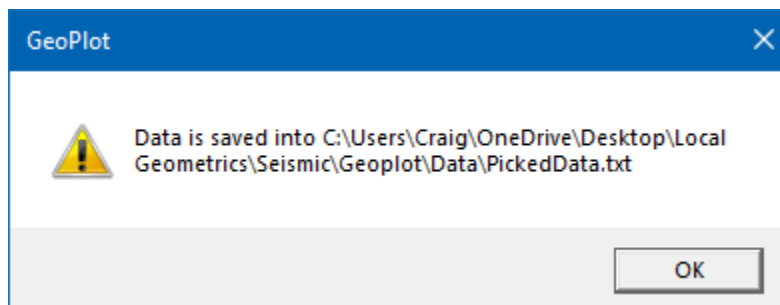
3.4.9.4 BY CONSTANT INTERVAL



Data can also be extracted at a constant interval. Select *By constant interval* to reveal the following dialog box:



Enter an interval and press *OK*. The data will be saved, and the path will be shown.



The file for this example is shown below. Annotation is in bold.

Distance, depth, property, elevation

```

35.000000 0.267857 46.544147 -4.637863
35.000000 0.844780 54.676384 -5.214787
35.000000 1.504121 65.705055 -5.874127
35.000000 2.245880 81.877838 -6.615886
35.000000 3.070055 100.409126 -7.440062
35.000000 3.976649 118.880943 -8.346655
35.000000 4.965660 129.309738 -9.335666
35.000000 6.037089 143.426987 -10.407095
35.000000 7.190935 158.312408 -11.560941
35.000000 8.427198 169.747742 -12.797204
35.000000 9.745880 178.254883 -14.115886
35.000000 11.146978 201.386215 -15.516985
35.000000 12.630493 202.162186 -17.000500
35.000000 15.803570 255.638809 -20.173576
35.000000 20.625000 377.297333 -24.995007
85.000000 0.267857 53.602211 -4.695309
  
```

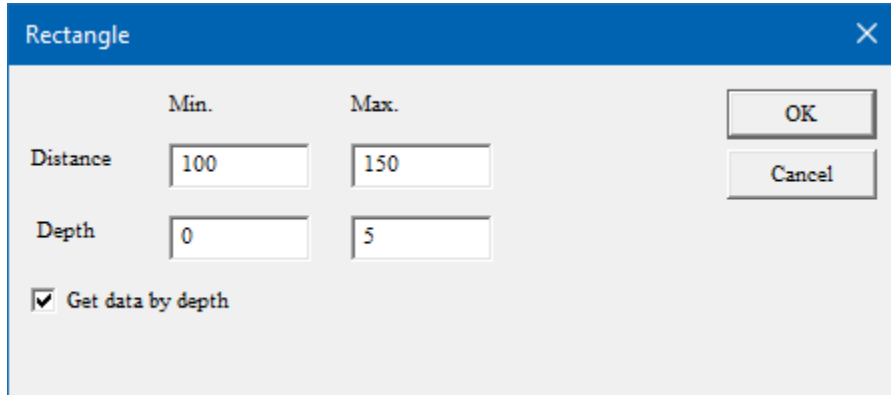
3.4.9.5 TAKE AVERAGE IN RECTANGLE

Edit (E)

Extract data >

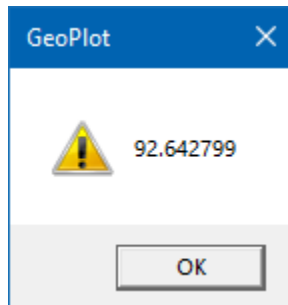
Using mouse
 Using position file
 By position (distance)
 By constant interval
Take average in rectangle

Selection this option will reveal the following dialog:



The **Rectangle** dialog box is shown with a blue title bar and a close button (X). It contains two rows of input fields. The first row is labeled "Distance" and has two sub-labels: "Min." with a value of 100 and "Max." with a value of 150. The second row is labeled "Depth" and has two sub-labels: "0" and "5". Below these fields is a checkbox labeled "Get data by depth" which is checked. To the right of the input fields are two buttons: "OK" and "Cancel".

Define the rectangle you wish to find the average in and indicate whether to extract by depth or elevation (check or uncheck the box). The average value will be displayed:



The **GeoPlot** dialog box is shown with a blue title bar and a close button (X). It contains a yellow warning triangle icon with a black exclamation mark. To the right of the icon is the numerical value 92.642799. Below these elements is a single button labeled "OK".

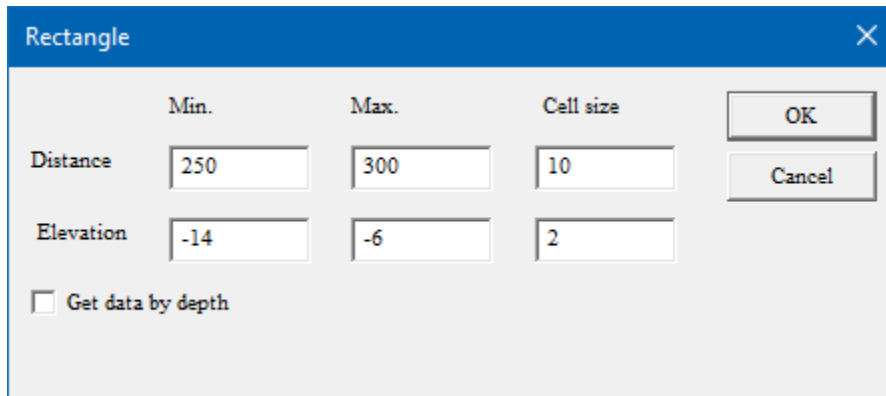
3.4.9.6 TAKE AVERAGE IN RECTANGLE (GRID)

Edit (E)

Extract data >

Using mouse
Using position file
By position (distance)
By constant interval
Take average in rectangle
Take average in rectangle (grid)

You may extract the average data value in multiple rectangles by choosing *Take average in rectangle (grid)*. You will be presented with the following dialog:



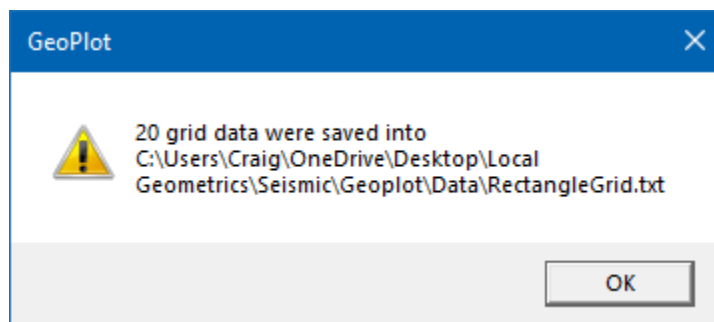
The dialog box titled "Rectangle" contains the following fields and controls:

	Min.	Max.	Cell size
Distance	250	300	10
Elevation	-14	-6	2

☐ Get data by depth

OK Cancel

Define the grid (multiple rectangles) and indicate whether to extract the data based on elevation or depth (check or uncheck the box). Press *OK*. The data will be saved, and the path will be shown.



The file for this example is shown below. Annotation is in bold.

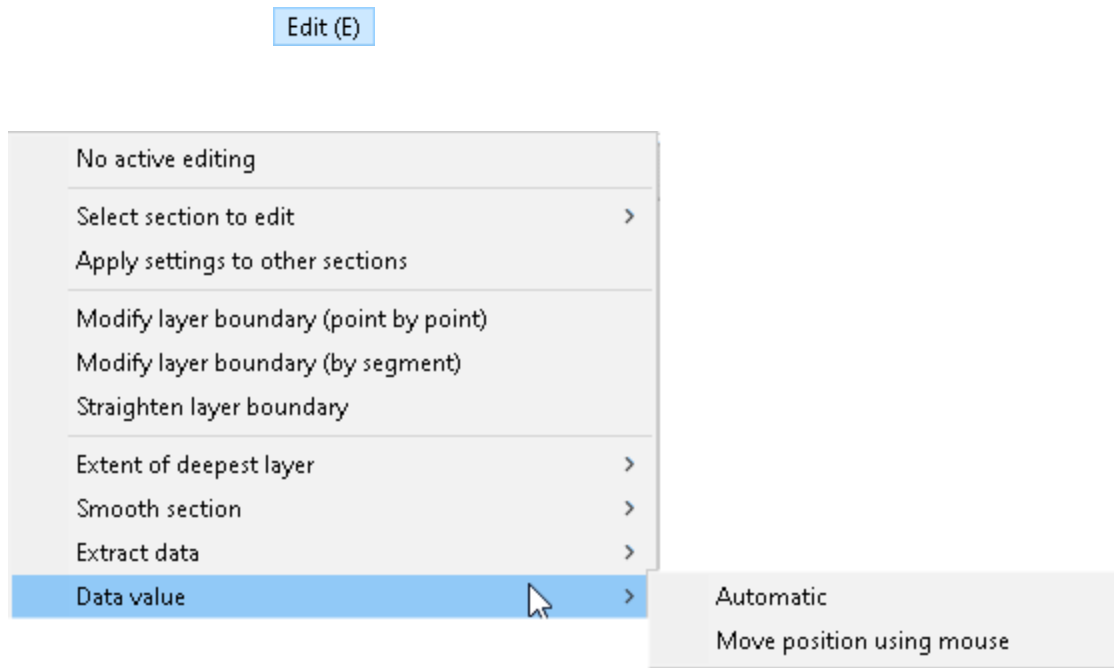
x index, z index, x min, x max, depth min, depth max, property

```

0 0 250.000000 260.000000 -14.000000 -12.000000 190.428284
0 1 250.000000 260.000000 -12.000000 -10.000000 166.036896
0 2 250.000000 260.000000 -10.000000 -8.000000 133.980179
0 3 250.000000 260.000000 -8.000000 -6.000000 108.711670
1 0 260.000000 270.000000 -14.000000 -12.000000 181.788696
1 1 260.000000 270.000000 -12.000000 -10.000000 160.332382
1 2 260.000000 270.000000 -10.000000 -8.000000 128.632278
1 3 260.000000 270.000000 -8.000000 -6.000000 108.483643
2 0 270.000000 280.000000 -14.000000 -12.000000 175.473099
2 1 270.000000 280.000000 -12.000000 -10.000000 149.487000
2 2 270.000000 280.000000 -10.000000 -8.000000 124.902733
2 3 270.000000 280.000000 -8.000000 -6.000000 108.003029
3 0 280.000000 290.000000 -14.000000 -12.000000 176.205627
3 1 280.000000 290.000000 -12.000000 -10.000000 145.142960
3 2 280.000000 290.000000 -10.000000 -8.000000 123.593018
3 3 280.000000 290.000000 -8.000000 -6.000000 108.079857
4 0 290.000000 300.000000 -14.000000 -12.000000 179.302658
4 1 290.000000 300.000000 -12.000000 -10.000000 147.723251
4 2 290.000000 300.000000 -10.000000 -8.000000 124.592438
4 3 290.000000 300.000000 -8.000000 -6.000000 106.898819

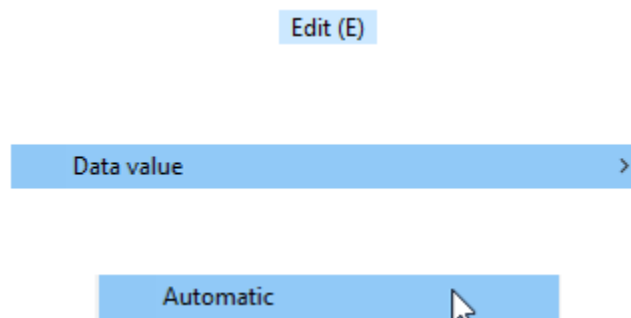
```

3.4.10 DATA VALUE

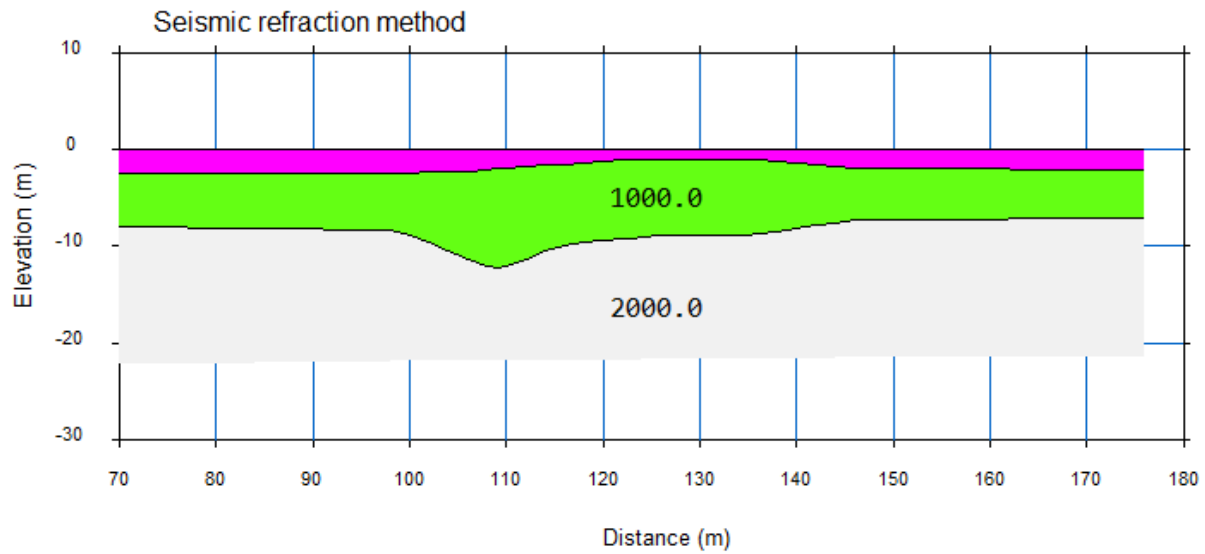


Data values, such as velocities in a refraction section, can be positioned automatically or manually.

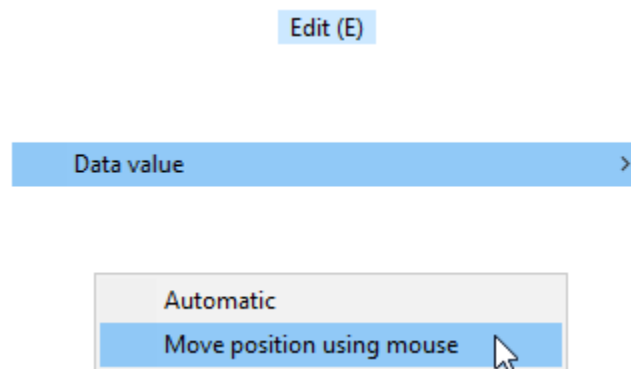
3.4.10.1 AUTOMATIC



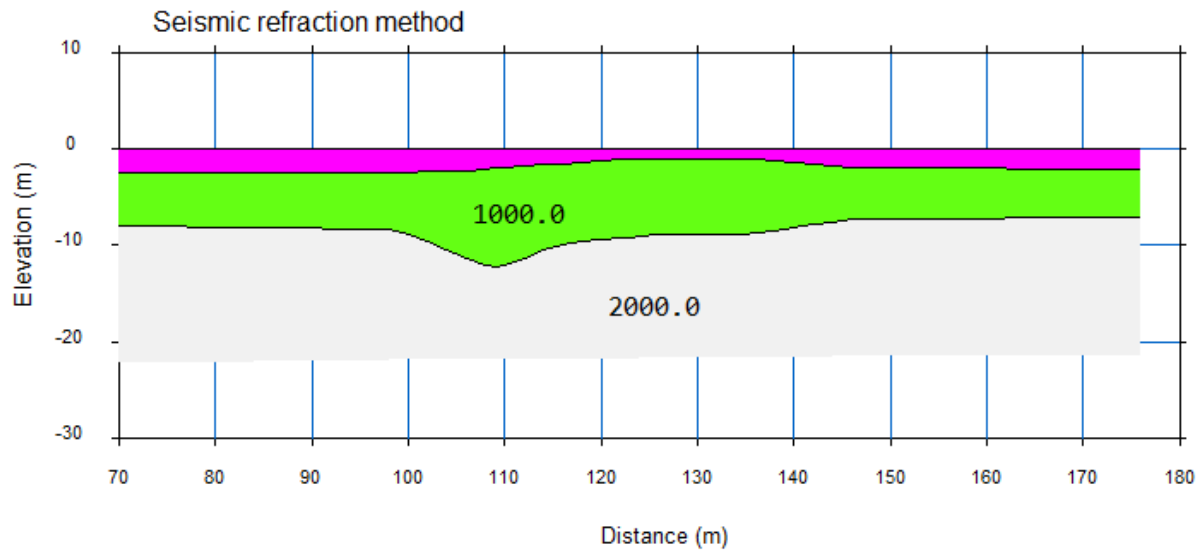
Choosing *Edit / Data Value / Automatic* allows the program to automatically position the data value “optimally”. The velocity labels in the below velocity section have been positioned automatically.



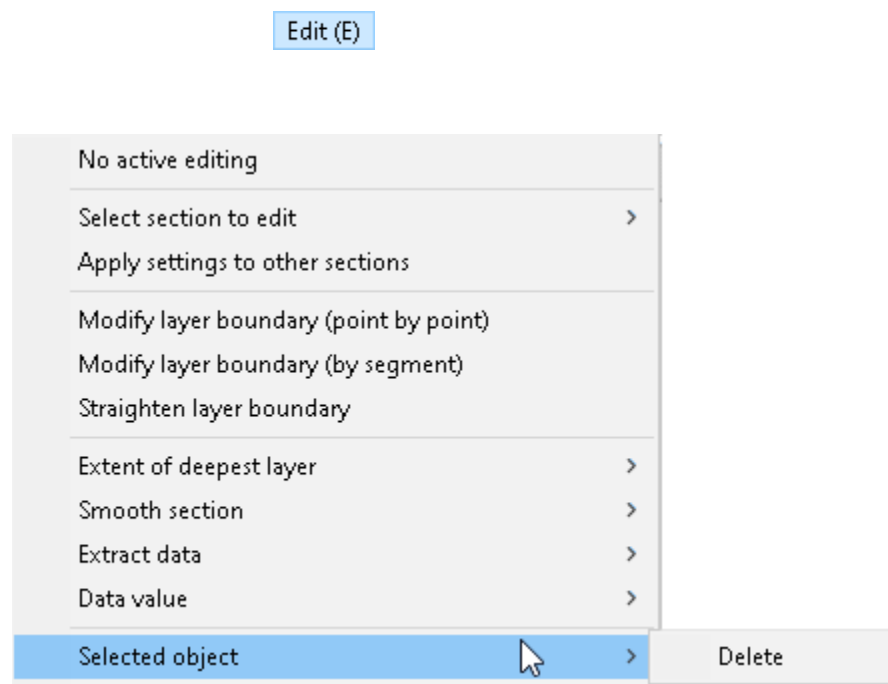
3.4.10.2 MOVE POSITION USING MOUSE



In the following figure, the 1000 m/sec label has been moved to the left using the mouse. Just click and drag.

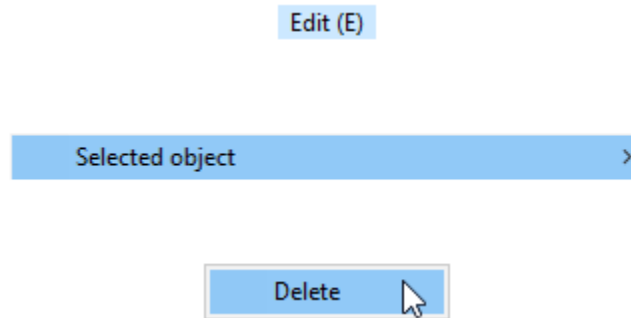



3.4.11 SELECTED OBJECT



“Objects” are items like flags, lines, and text labels that have been added to the section using the **Drawing Tools** menu.

3.4.11.1 DELETE



You may delete an object from a section by clicking on it and choosing *Edit | Selected object | Delete*. For example, in the following figure, we have selected a flag by clicking on the  button and then clicking on the **root** of the flag (note position of cursor). The flag will turn red. It may now be deleted.

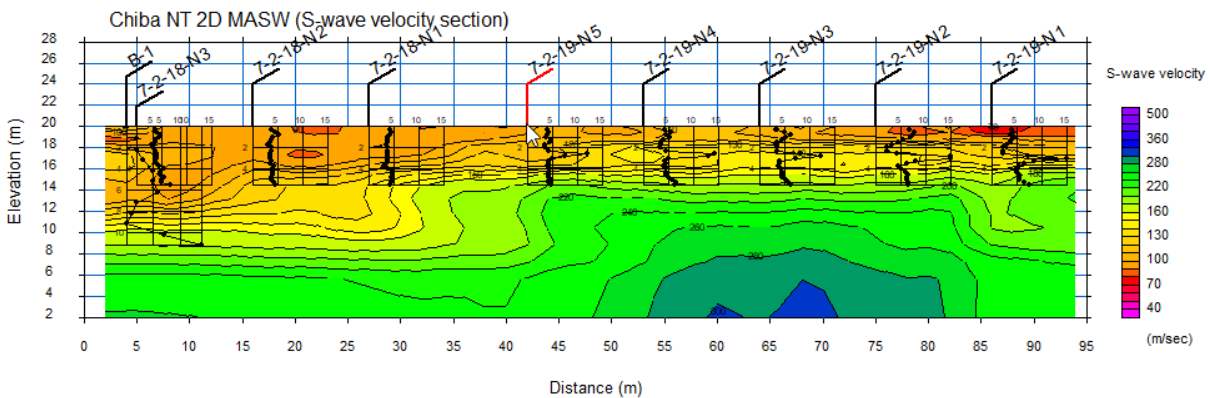
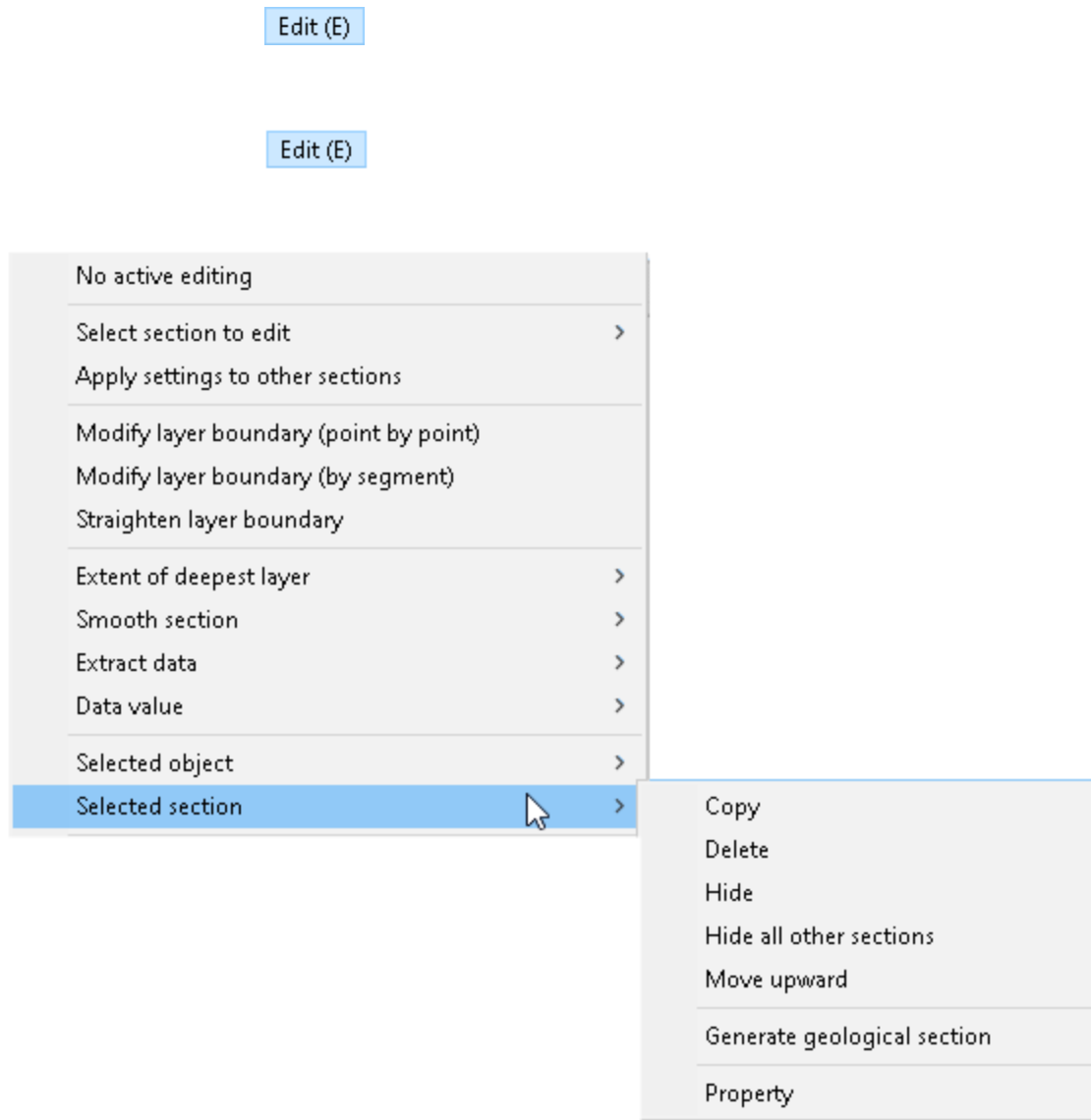


Figure 43: Deleting a flag.

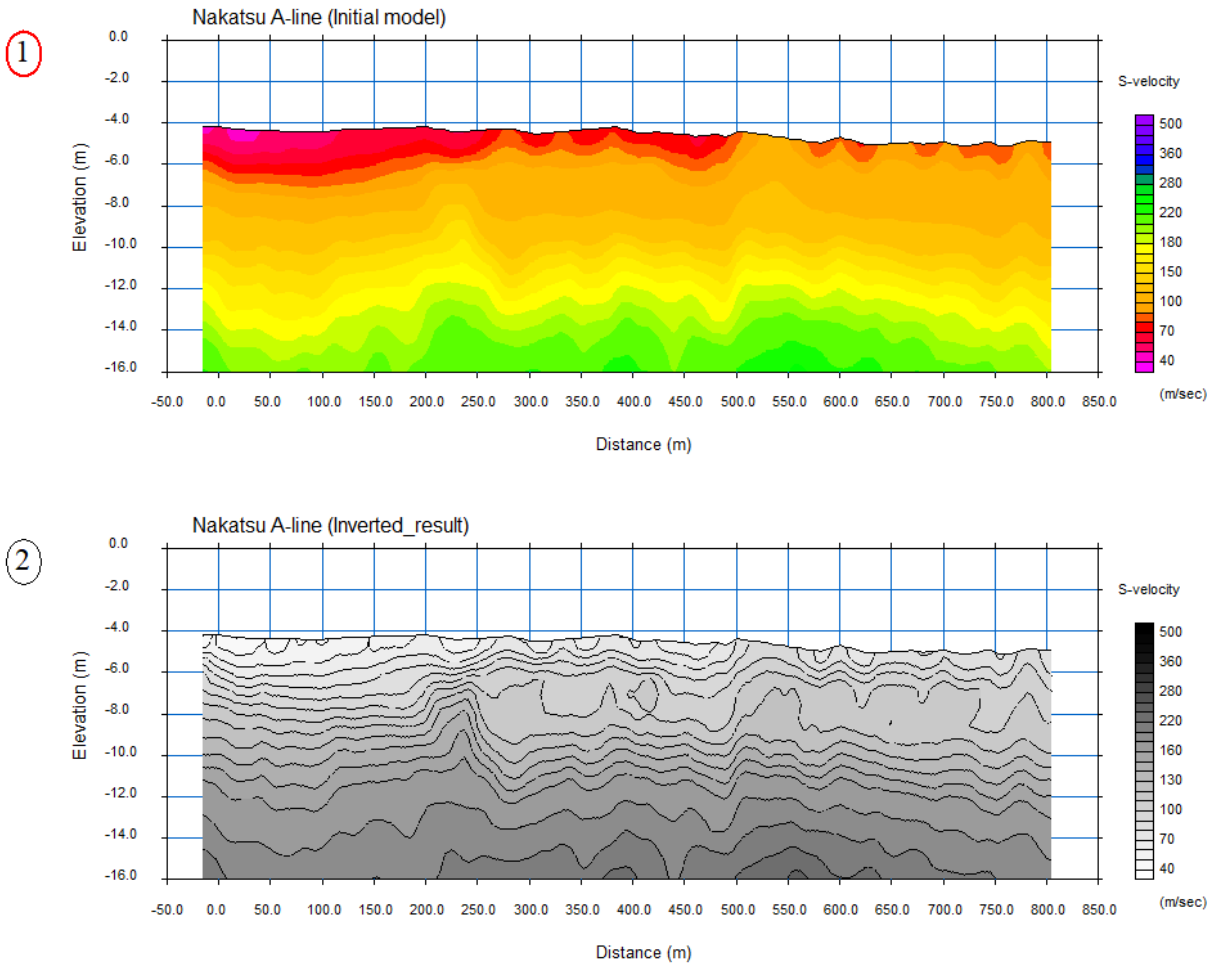
3.4.12 SELECTED SECTION



GeoPlot allows you to read in and display multiple sections. For instance, see below.

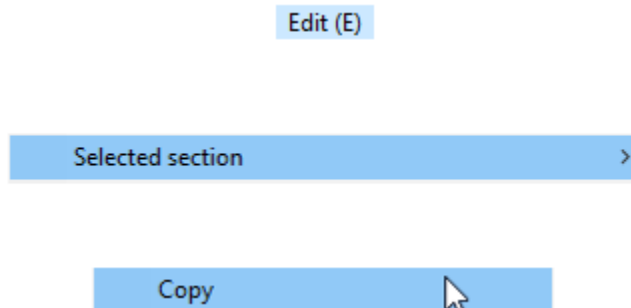
No active editing

Click right mouse button to re-draw display



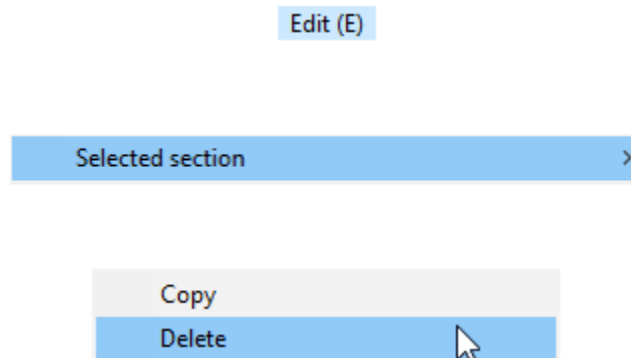
Two versions of the same section have been created, and both have been read in and displayed on the screen (see Section [3.1.2](#), Page 13). In the above figure, Section 1 has been selected, as evidenced by the red circle. (To select a section, simply click on its number).

3.4.12.1 COPY



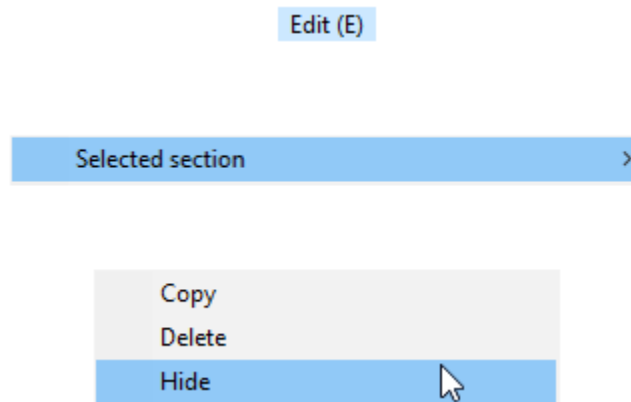
To reproduce the selected section, choose *Copy*. In the above example, Section 1 will be reproduced as Section 3, and can then be edited as desired and saved with Sections 1 and 2.

3.4.12.2 DELETE

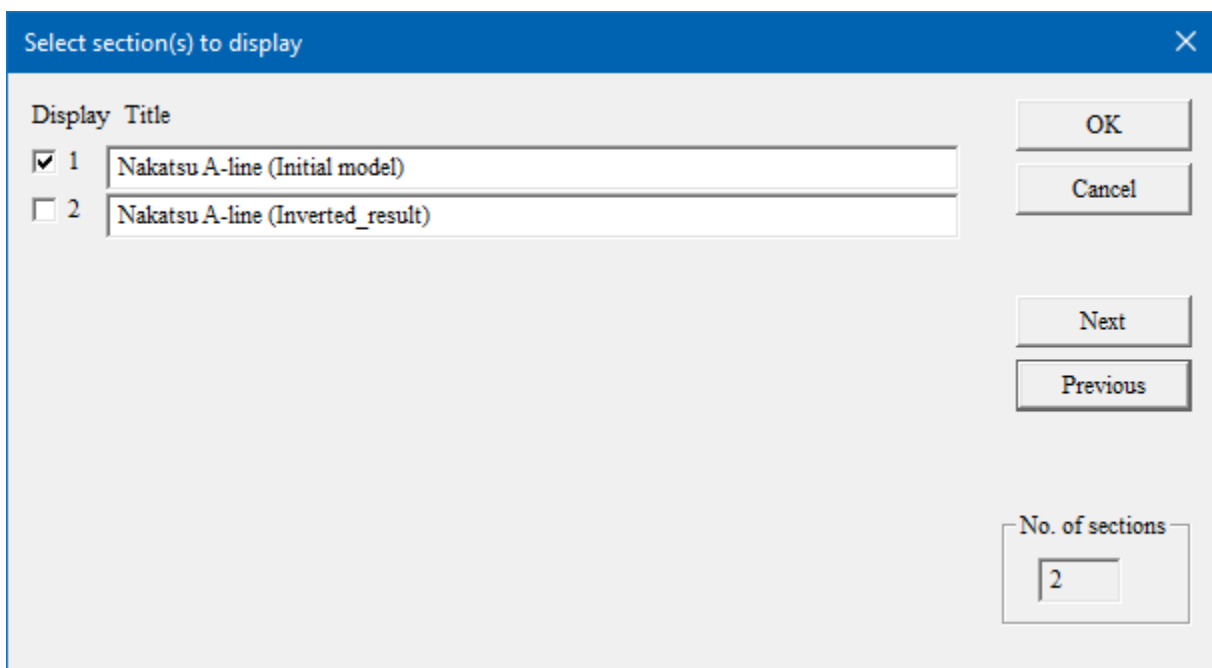


Selecting *Delete* removes the selected section from the screen and from memory. However, it does not remove it from the file stored on the hard drive unless you select *File / Save GeoPlot file*.

3.4.12.3 HIDE

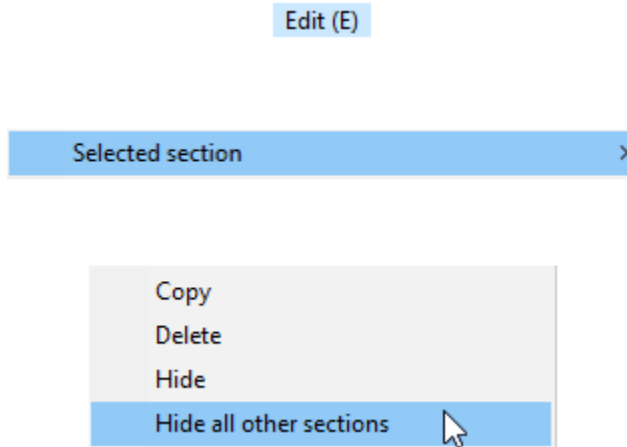


Selecting *Hide* removes the selected section from the display but **not** from memory. To unhide, click on *View / Select section(s)* to display, and you will see the following dialog:



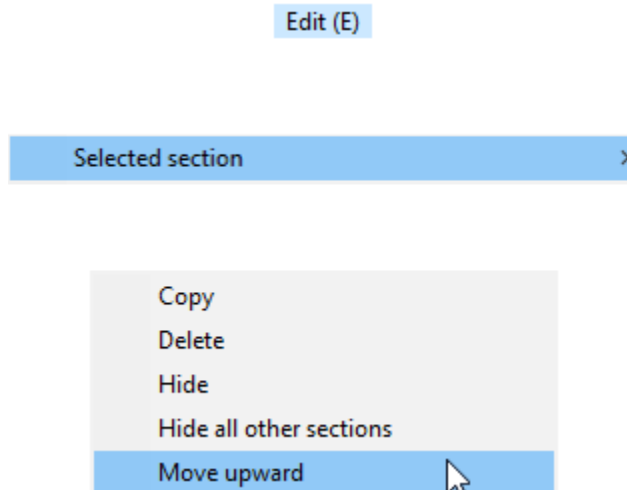
Check the boxes of the sections in memory that you wish to display (Section [3.3.3](#), Page 55).

3.4.12.4 HIDE ALL OTHER SECTIONS



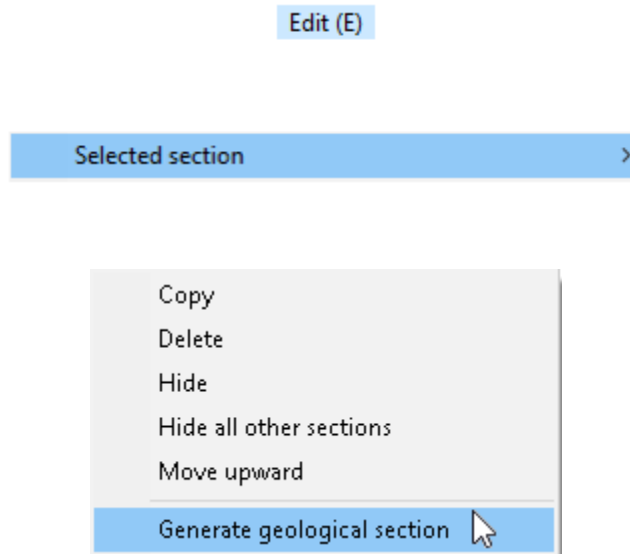
This option hides all unselected sections. They may be retrieved as described above.

3.4.12.5 MOVE UPWARD



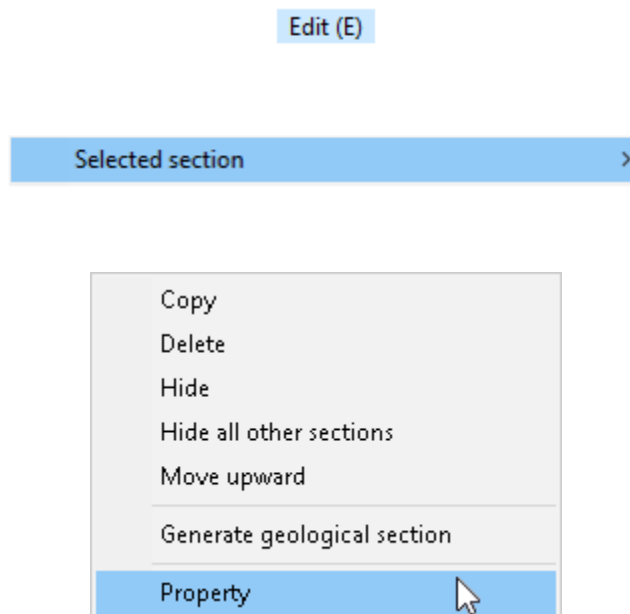
You may rearrange the displayed plots by selecting a plot (Section [3.4.2](#), Page 120) and choosing *Move upward*. It will be moved up one position. For instance, Plot #3 will become Plot #2. You may do this as many times as you need to get things arranged as desired.

3.4.12.6 GENERATE GEOLOGICAL SECTION



This feature is highly specialized and rarely used. Please contact support@seisimager.com for assistance.

3.4.12.7 PROPERTY



This feature displays information about the selected section. When chosen, you will see the following:

Dialog [X]

Line length (m)

Number of cells in X

Number of cells in Y

Data definition

☒ Cell (element)

☐ Node

3.4.13 XY COORDINATES (LATITUDE – LONGITUDE)

Edit (E)

No active editing

- Select section to edit >
- Apply settings to other sections
- Modify layer boundary (point by point)
- Modify layer boundary (by segment)
- Straighten layer boundary
- Extent of deepest layer >
- Smooth section >
- Extract data >
- Data value >
- Selected object >
- Selected section >
- XY coordinates (latitude - longitude) >**

Show XY coordinates Ctrl + G
 Import latitude - longitude to a selected section (distance lat. lon.)
 Export latitude - longitude of a selected section to KML file
 Import XY (or latitude - longitude) coordinates to all sections
 Export XY (or latitude - longitude) coordinates of all sections
 Export latitude - longitude of all sections to KML file
 Project XY to a selected line
 Enable to copy latitude - longitude from clipboard

3.4.13.1 SHOW XY COORDINATES [CTRL+G]

Edit (E)

XY coordinates (latitude - longitude) >

Show XY coordinates

Ctrl+G

	Cross-section title	Start	EW(longitude)-start	NS(latitude)-start	End	EW(longitude)-end	NS(latitude)-end	Number of nodes	
1	Chiba NT 2D MASW (S-wave velocity section	2	140.105535	35.80288	94	140.104658	35.802451	0	Node Map
2									
3									
4									
5									
6									
7									
8									
9									
10									

OK
 Cancel
 Next
 Previous
 No. of sections
 1

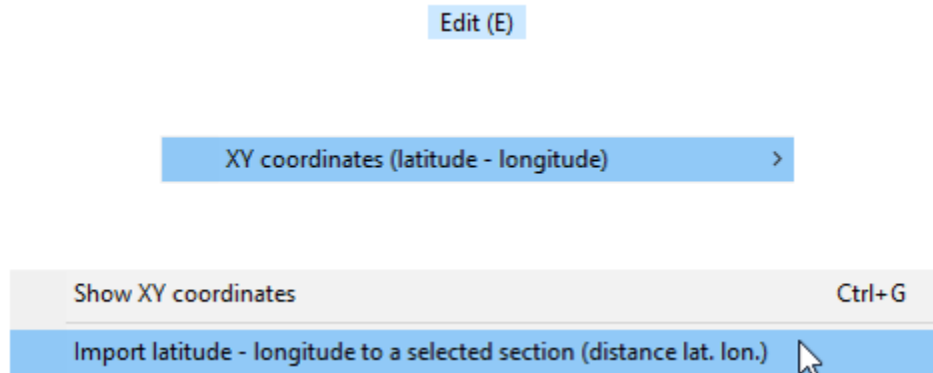
☒ Latitude and longitude
☐ UTM (UTM zone = 54)
☐ Japanese XY (coordinate number = 1)
☐ Reverse X and Y (X:N-S, Y:E-W)

Clipboard
 Latitude
 Longitude
 Check clipboard

Lat/Long to Japanese XY
 Lat/Long to UTM
 Flip Lat/Long

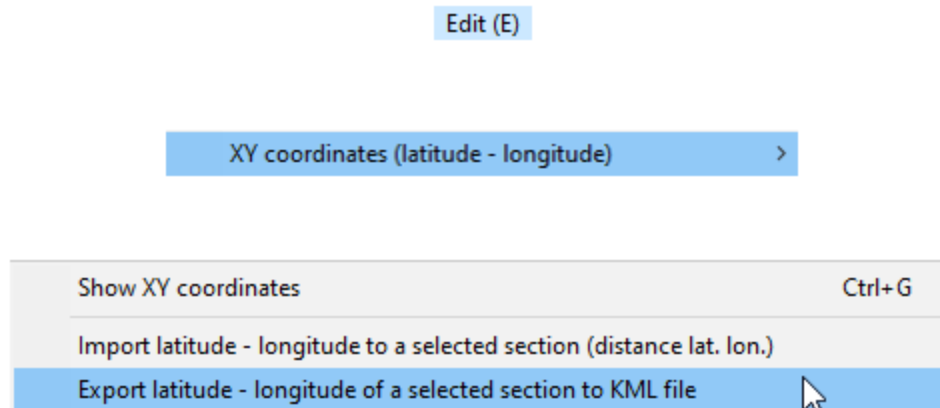
Most of the parameters in the above dialog box are self-evident. If you need assistance, contact support@seisimager.com. Also see Section [3.4.13.8](#), beginning on Page 157.

3.4.13.2 IMPORT LATITUDE – LONGITUDE TO A SELECTED SECTION (DISTANCE LAT. LON.)



If you have latitudes and longitudes for your section, use this option to import them into the selected section. The file should be ASCII-columnar, and tab-, space-, or comma-delimited.

3.4.13.3 EXPORT LATITUDE – LONGITUDE OF A SELECTED SECTION TO KML FILE

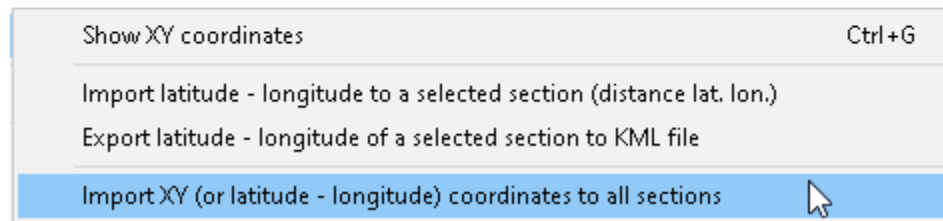


If a selected section contains latitudes and longitudes, they may be exported to a KML file. The section can then be shown on Google Earth (see Section [3.3.20](#), Page 91).

3.4.13.4 IMPORT XY (OR LATITUDE – LONGITUDE) COORDINATES TO ALL SECTIONS

Edit (E)

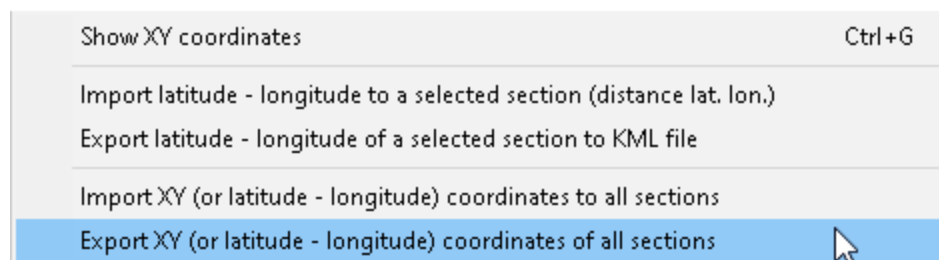
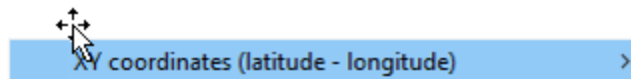
XY coordinates (latitude - longitude) >



This is the same as described in Section [3.4.13.2](#) above, except that it applies to all of the displayed sections, not just the selected one.

3.4.13.5 EXPORT XY (OR LATITUDE – LONGITUDE) COORDINATES OF ALL SECTIONS

Edit (E)



This function exports the latitudes and longitudes of all sections to an ASCII-columnar file.

3.4.13.6 EXPORT LATITUDE – LONGITUDE OF ALL SECTIONS TO KML FILE

Edit (E)

XY coordinates (latitude - longitude) >

Show XY coordinates	Ctrl+G
Import latitude - longitude to a selected section (distance lat. lon.)	
Export latitude - longitude of a selected section to KML file	
Import XY (or latitude - longitude) coordinates to all sections	
Export XY (or latitude - longitude) coordinates of all sections	
Export latitude - longitude of all sections to KML file	

This is the same as described in Section [3.4.13.3](#) above, except that it applies to all the displayed sections, not just the selected one.

3.4.13.7 PROJECT XY TO A SELECTED LINE

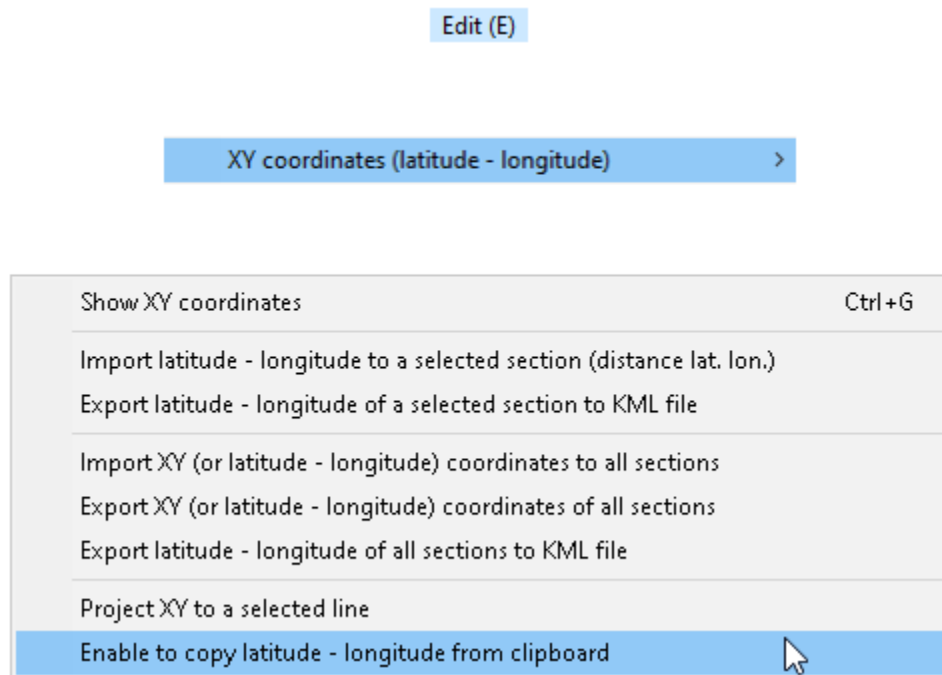
Edit (E)

XY coordinates (latitude - longitude) >

Show XY coordinates	Ctrl+G
Import latitude - longitude to a selected section (distance lat. lon.)	
Export latitude - longitude of a selected section to KML file	
Import XY (or latitude - longitude) coordinates to all sections	
Export XY (or latitude - longitude) coordinates of all sections	
Export latitude - longitude of all sections to KML file	
Project XY to a selected line	

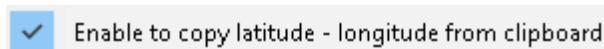
This feature is highly specialized and rarely used. Please contact support@seisimager.com for assistance.

3.4.13.8 ENABLE TO COPY LATITUDE – LONGITUDE FROM CLIPBOARD



This is a toggle switch that allows you to copy coordinates from the clipboard into your model. This is best illustrated by an example.

Imagine that you wish to assign latitude and longitude to a 2D model using Google Maps. To do so, click on *Enable to copy latitude – longitude from clipboard*. You should now see a check mark in front of it:



In Google Maps, right-click on one end of the survey line. You will see the following:

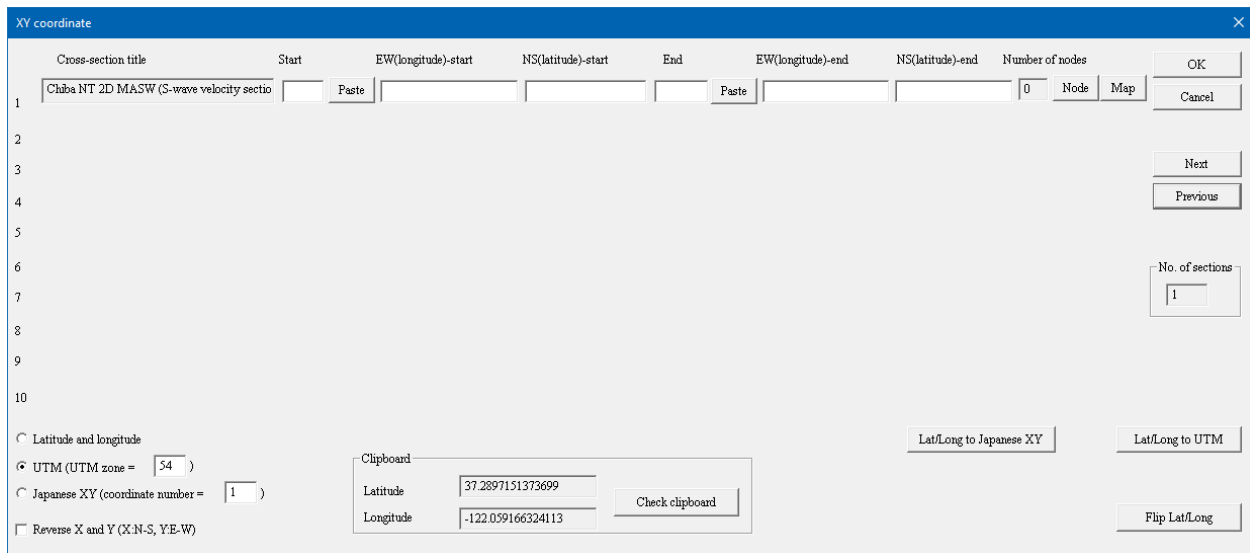
37.28582, -122.05963

[Directions from here](#)
[Directions to here](#)
[What's here?](#)
[Search nearby](#)
[Print](#)
[Add a missing place](#)
[Add your business](#)
[Report a data problem](#)
[Measure distance](#)

Click on the coordinates, and they will be copied to the clipboard. You will see this confirmation at the bottom of the map:

Copied to clipboard

To assign the coordinates to your model, select *Edit / XY coordinates (latitude – longitude) / Show XY coordinates* (or simply press *Ctrl+G*). The following dialog box will be presented:



XY coordinate

	Cross-section title	Start	EW(longitude)-start	NS(latitude)-start	End	EW(longitude)-end	NS(latitude)-end	Number of nodes	
1	Chiba NT 2D MASW (S-wave velocity sectio	Paste			Paste			0	Node Map
2									
3									
4									
5									
6									
7									
8									
9									
10									

☐ Latitude and longitude
☒ UTM (UTM zone =)
☐ Japanese XY (coordinate number =)
☐ Reverse X and Y (X-N-S, Y-E-W)

Clipboard

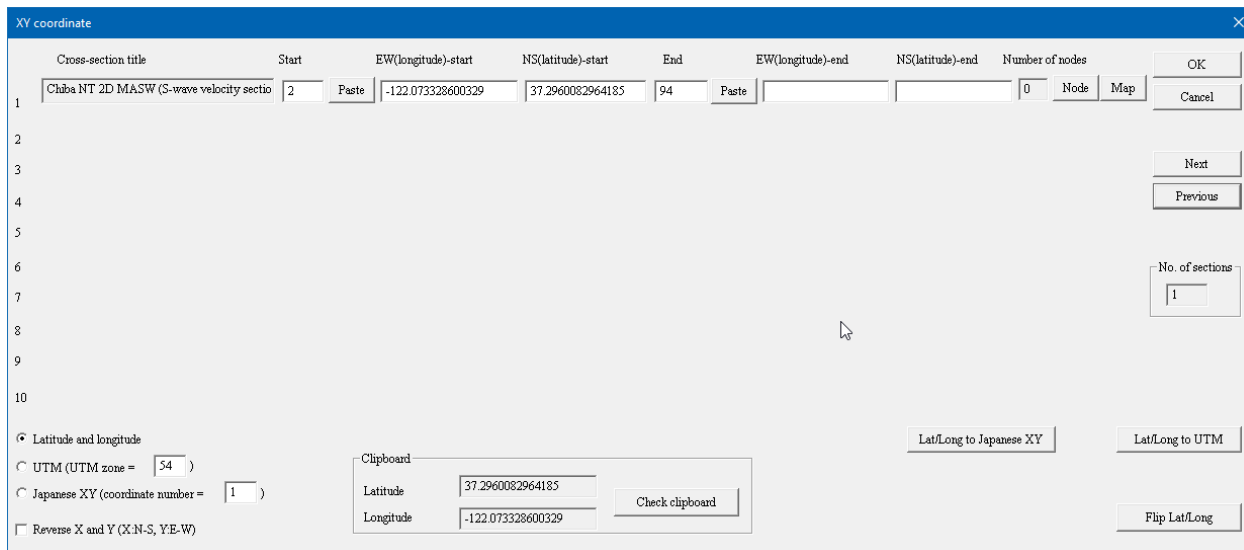
Latitude	37.2897151373699
Longitude	-122.059166324113

Check clipboard

Lat/Long to Japanese XY
 Lat/Long to UTM
 Flip Lat/Long

No. of sections:
 Next
 Previous
 OK
 Cancel

At the bottom, press *Check clipboard* and make sure the coordinates are correct. If so, press the left *Paste* button at the top left. You should see the coordinates populate the latitude and longitude fields:



The 'XY coordinate' dialog box contains the following elements:

- Table:**

	Cross-section title	Start	EW(longitude)-start	NS(latitude)-start	End	EW(longitude)-end	NS(latitude)-end	Number of nodes
1	Chiba NT 2D MASW (S-wave velocity sectio	2	Paste	-122.073328600329	37.2960082964185	94	Paste	0
2								
3								
4								
5								
6								
7								
8								
9								
10								
- Buttons:** OK, Cancel, Next, Previous.
- Other fields:**
 - No. of sections: 1
 - Latitude and longitude:
 - ☒ Latitude and longitude
 - ☐ UTM (UTM zone = 54)
 - ☐ Japanese XY (coordinate number = 1)
 - ☐ Reverse X and Y (X-N-S, Y-E-W)
 - Clipboard:
 - Latitude: 37.2960082964185
 - Longitude: -122.073328600329
 - Check clipboard
 - Lat/Long to Japanese XY
 - Lat/Long to UTM
 - Flip Lat/Long

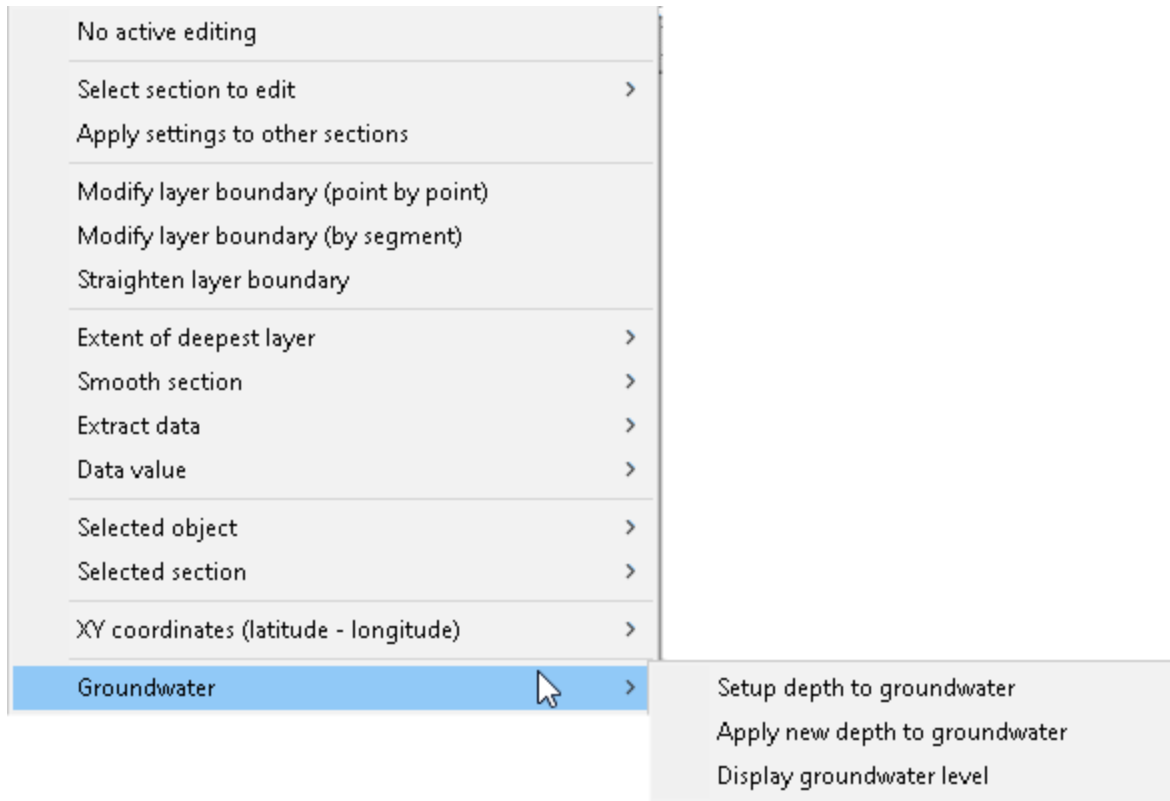
Repeat the process for the other end of the line.

Most of the other parameters in the dialog should be self-explanatory. If you need assistance, contact support@seisimager.com.

Note: Do not skip the **Check clipboard** step. This is the step that copies the coordinates from the clipboard into GeoPlot and must be done to paste the coordinates into the fields.

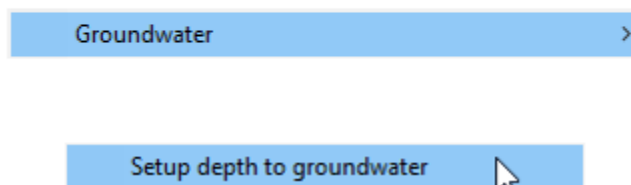
3.4.14 GROUNDWATER

Edit (E)

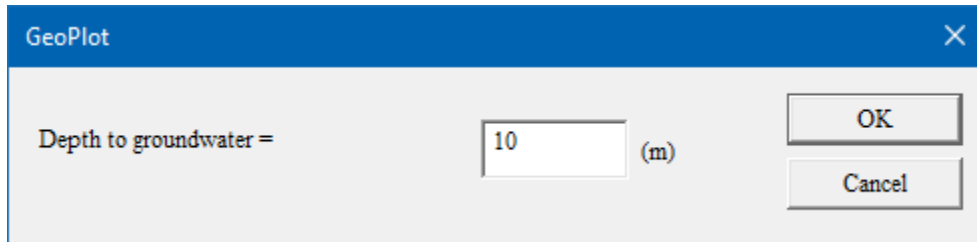


3.4.14.1 SETUP DEPTH TO GROUNDWATER

Edit (E)



If you wish to include the water table in your plot, select *Setup depth to groundwater* and type in the depth.



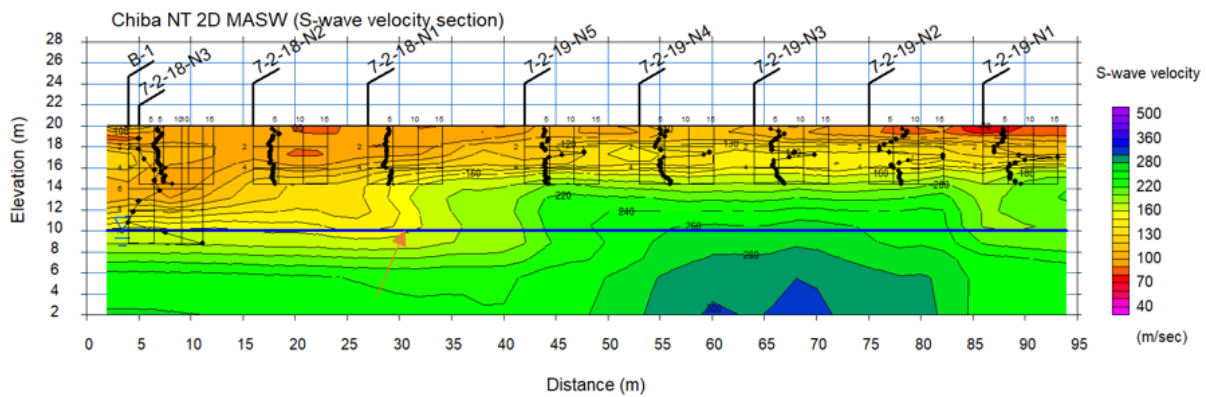
GeoPlot

Depth to groundwater = (m)

OK

Cancel

The water table will be indicated with a blue line:



3.4.14.2 APPLY NEW DEPTH TO GROUNDWATER

Edit (E)

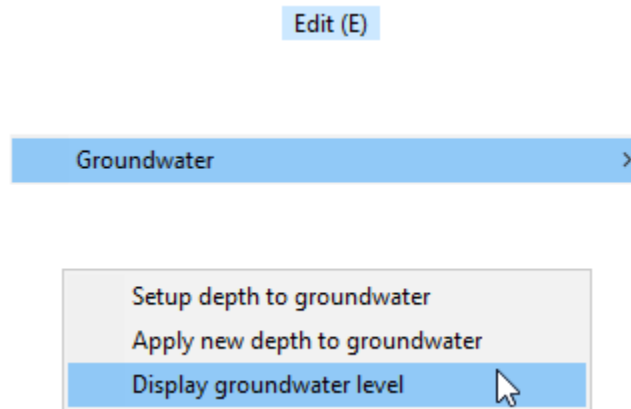
Groundwater >

Setup depth to groundwater

Apply new depth to groundwater

If you have a groundwater depth file, select *Apply new depth to groundwater* and read in the file. The file should be an x,z file in ASCII-columnar format. It may be tab-, space-, or comma-delimited.

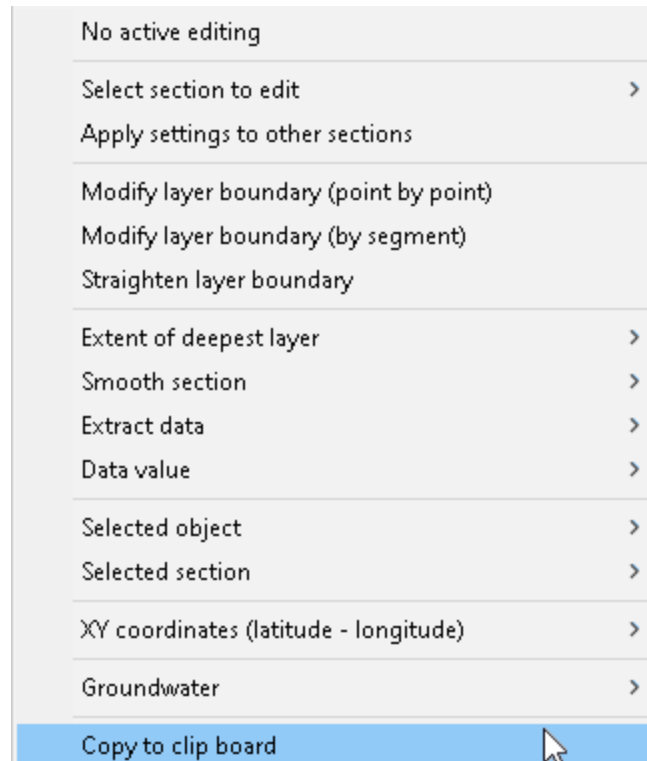
3.4.14.3 **DISPLAY GROUNDWATER LEVEL**



This is a simple toggle switch which turns off/on the groundwater level display.

3.4.15 COPY TO CLIPBOARD

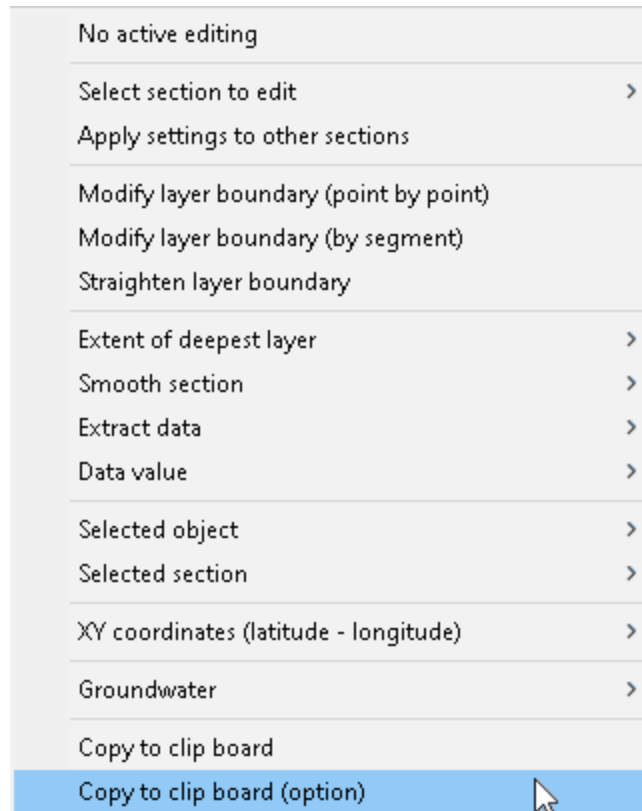
Edit (E)



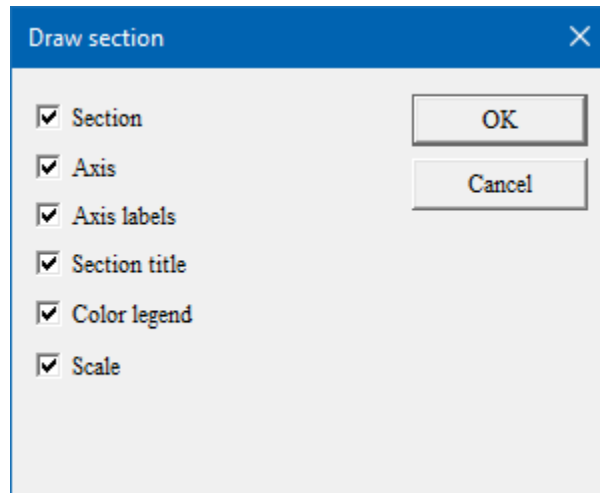
You may copy the *selected* (see Section [3.4.2](#), Page 120) plot to the clipboard for pasting into other applications. Simply select the desired plot and choose *Copy to clip board*.

3.4.16 COPY TO CLIPBOARD (OPTION)

Edit (E)



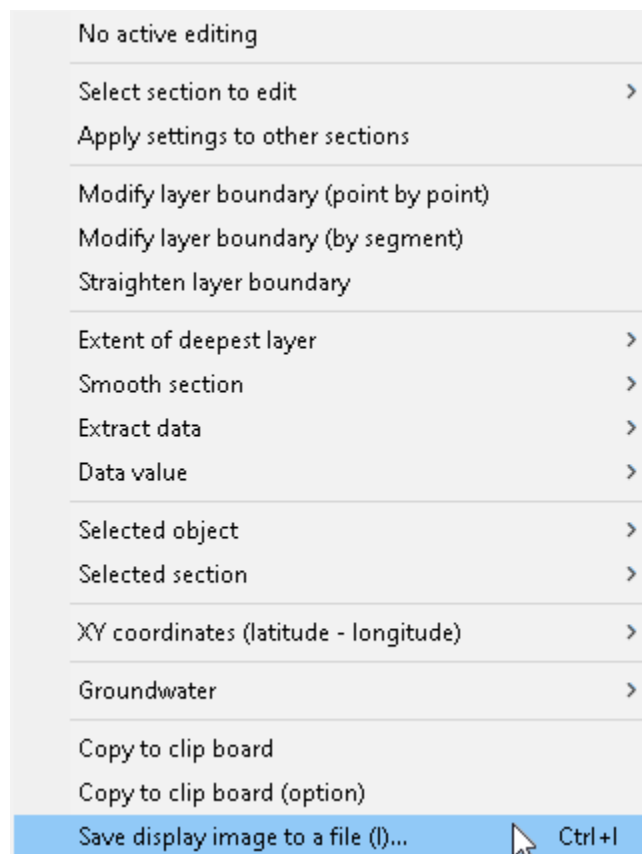
To copy selected components of the plot to the clip board, choose *Copy to clip board (option)* to reveal the following dialog:



Choose the components you want and press *OK*.

3.4.17 SAVE DISPLAY IMAGE TO A FILE (CTRL+I)

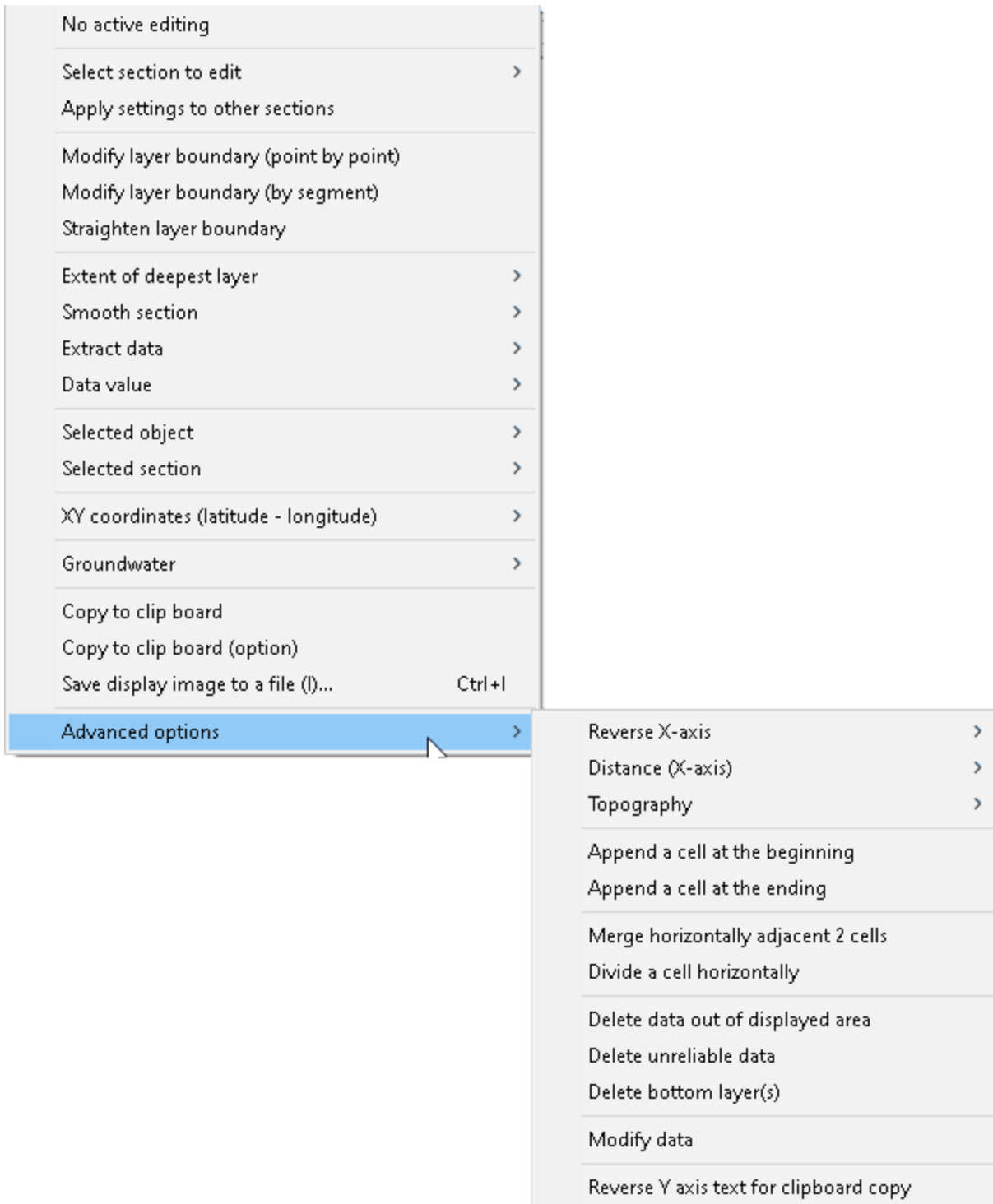
Edit (E)



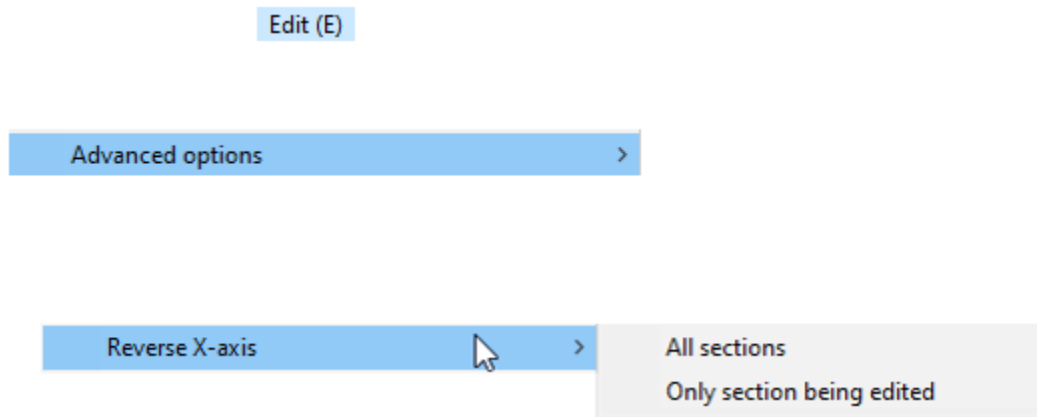
You may write the *selected* (see Section [3.4.2](#), Page 120) plot to a graphics file (PNG, JPG, GIF or BMP) for later use in other applications. Select a plot and choose *Save display image to a file* (or press *Ctrl+I*) and type in a file name.

3.4.18 ADVANCED OPTIONS

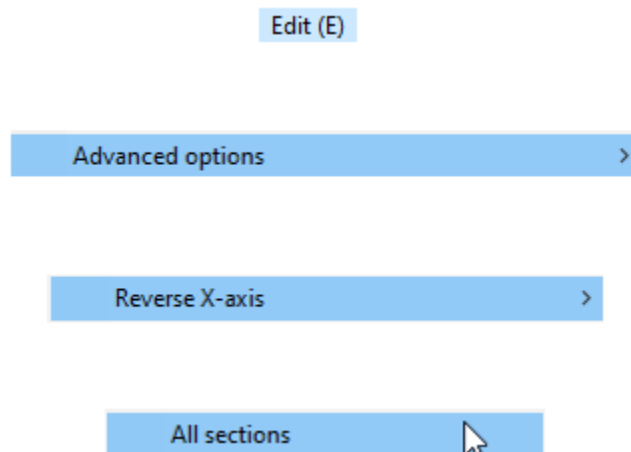
Edit (E)



3.4.18.1 REVERSE X-AXIS



3.4.18.1.1 ALL SECTIONS



You may reverse the X-axis of all sections at once. Select *Reverse X-axis / All Sections*. You will see the following confirmation. Press *Yes* to proceed.



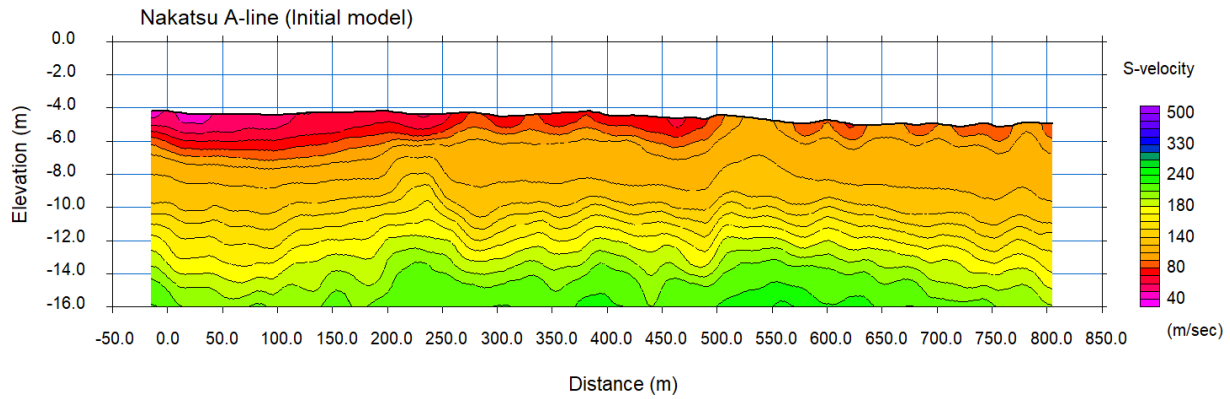


Figure 44: Before reversal of X-axis.

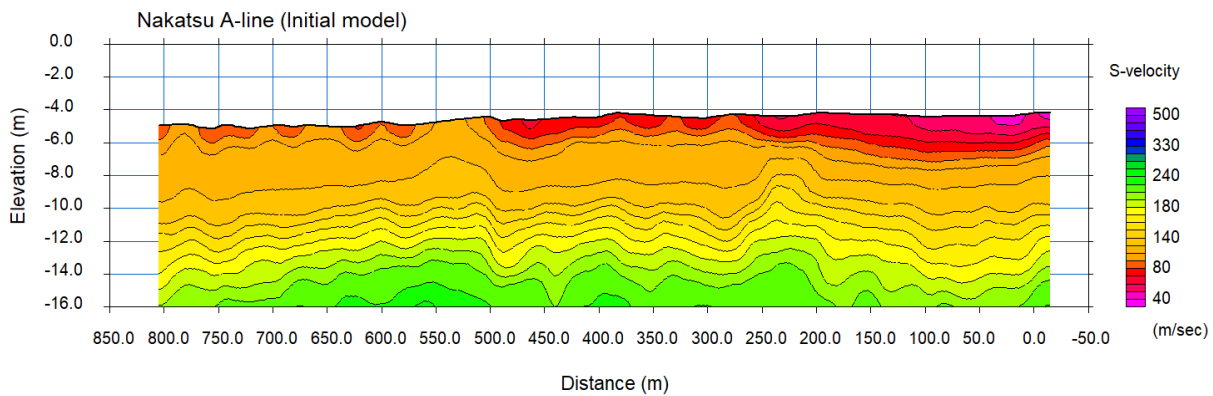
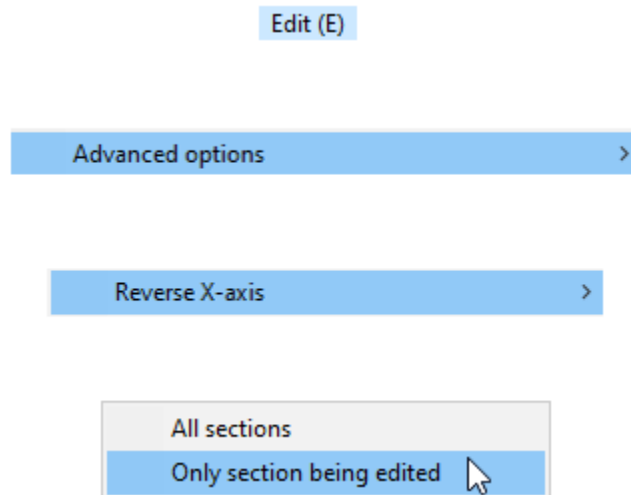


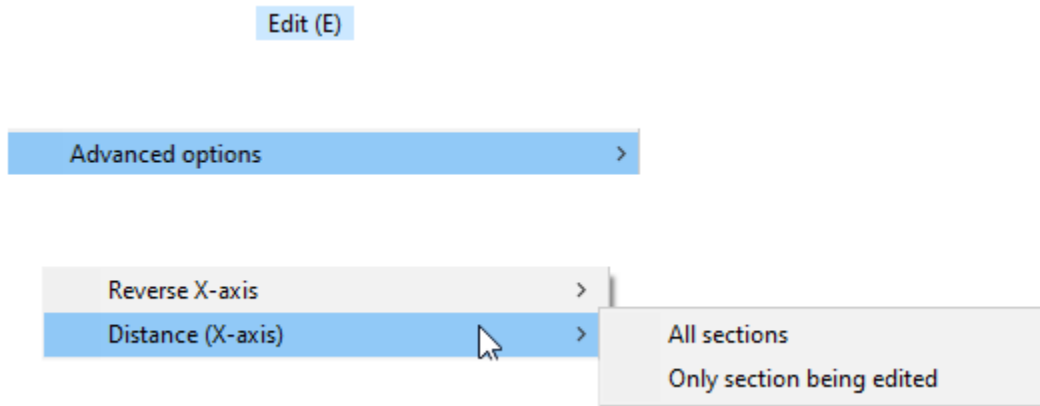
Figure 45: After reversal of X-axis. Note change in X-axis labels.

3.4.18.1.2 ONLY SECTION BEING EDITED

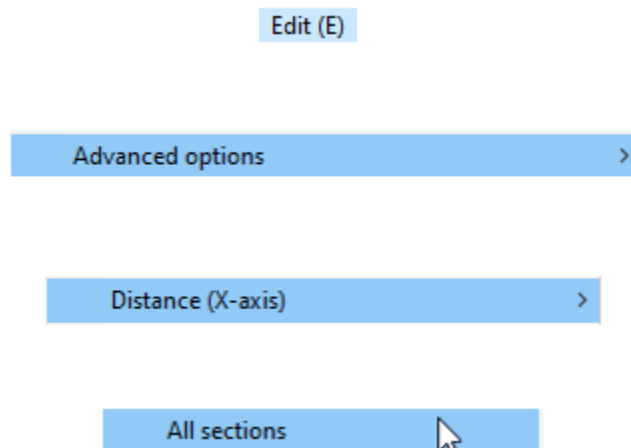


If you wish to flip the X-axis for only the selected section, choose *Only section being edited* and press *Yes* when prompted.

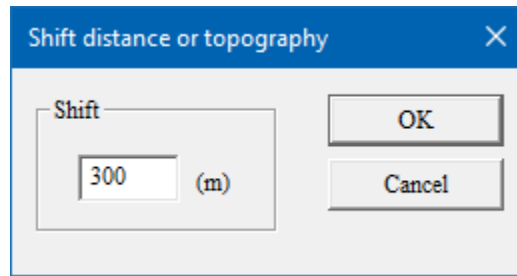
3.4.18.2 DISTANCE (X-AXIS)



3.4.18.2.1 ALL SECTIONS



You may shift the X-axis of all sections at once. Select *Distance (X-axis) / All Sections*. You will see the following dialog:



Provide a positive or negative number and press *OK*. The X-axis will be shifted to the right or left accordingly.

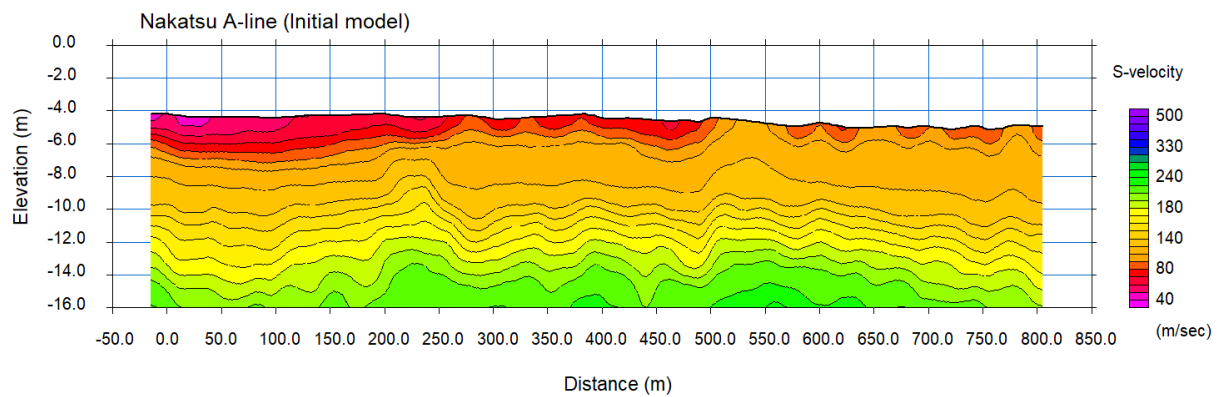


Figure 46: Before X-axis shift.

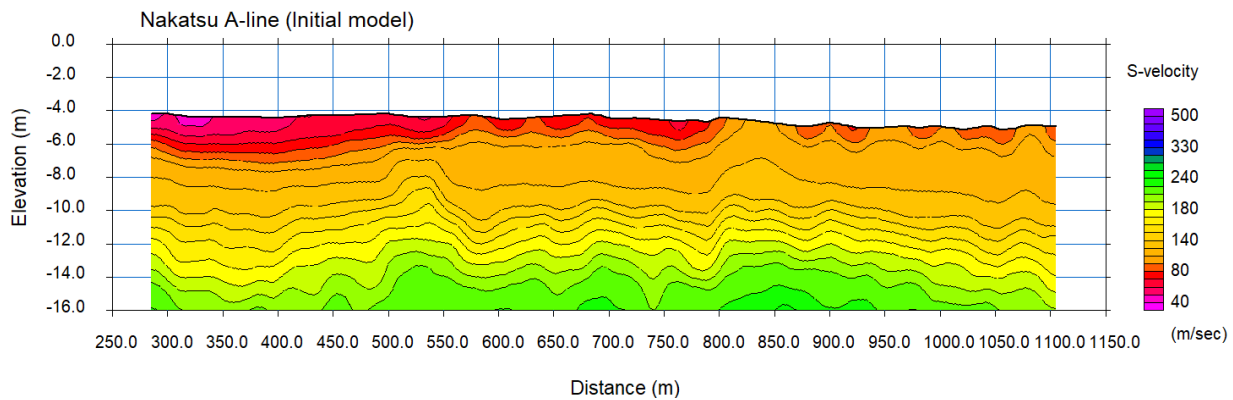
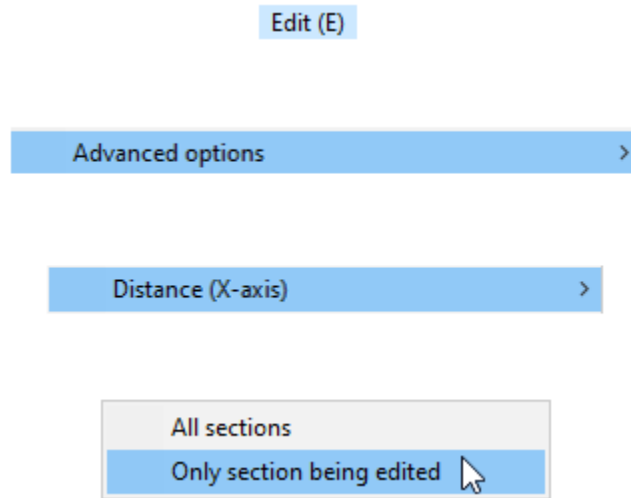


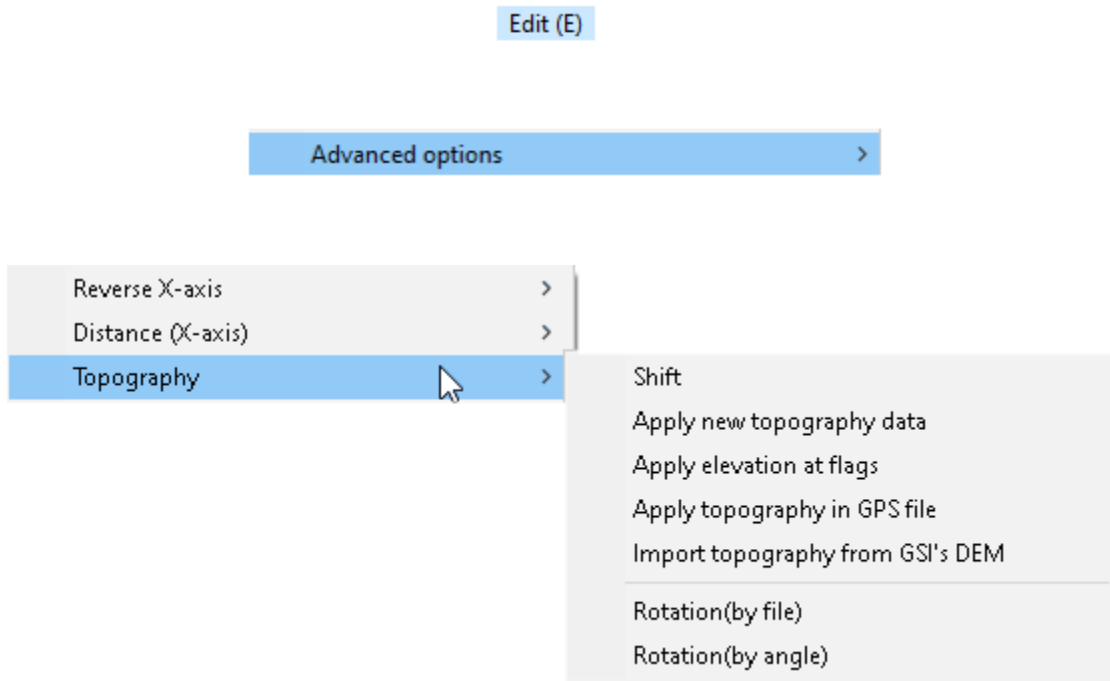
Figure 47: After X-axis shift. Note change in X-axis labels.

3.4.18.2.2 ONLY SECTION BEING EDITED



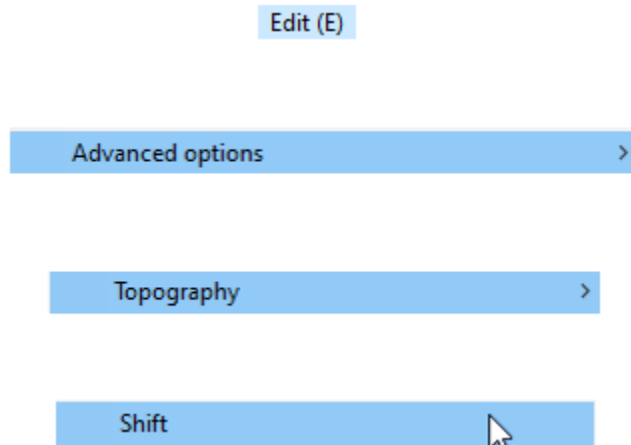
If you wish to shift the X-axis for only the selected section, choose *Only section being edited* and provide a positive or negative number.

3.4.18.3 TOPOGRAPHY

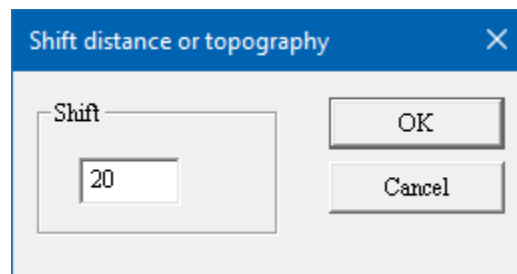


Continue.

3.4.18.3.1 SHIFT

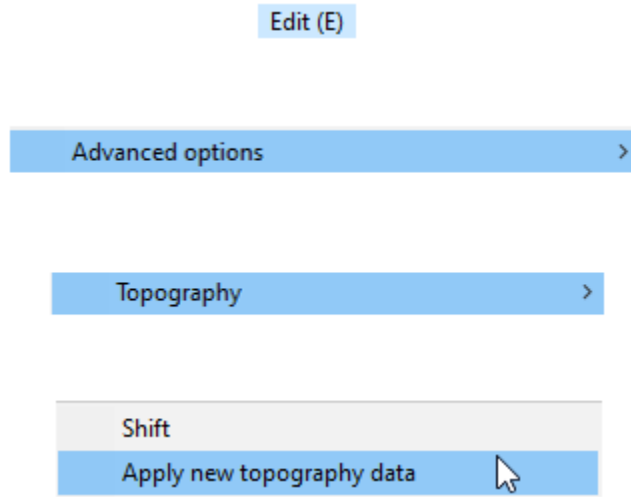


To shift the topographic profile of the section you are now editing, select *Edit / Advanced options / Topography / Shift*. The following dialog box will appear:



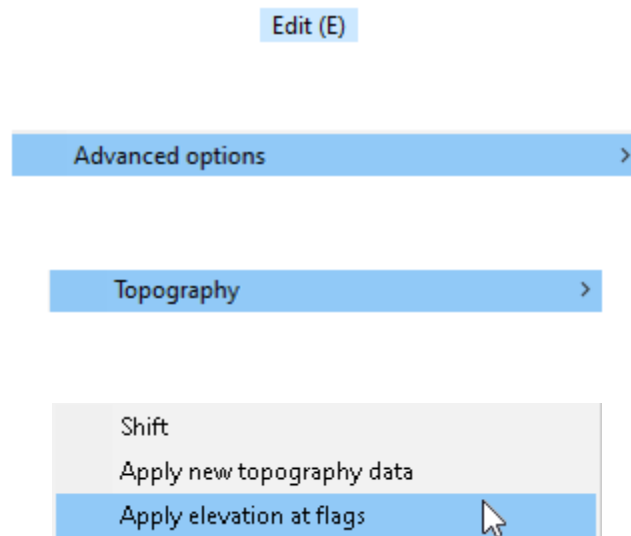
Enter the amount you would like to shift in the units you are working in (negative number shifts left) and press *OK*.

3.4.18.3.2 APPLY NEW TOPOGRAPHY DATA



You may import a new topography file at any time. Select *Edit / Advanced options / Topography / Apply new topography data* and choose the appropriate file. The format should be ASCII-columnar; comma-, space-, or tab-delimited.

3.4.18.3.3 APPLY ELEVATION AT FLAGS



If your model includes flags, and the flags have elevations associated with them, you can apply the flag elevations to your model. Select *Edit / Advanced options / Topography / Apply elevation at flags*. Below is a velocity plot with three flags.

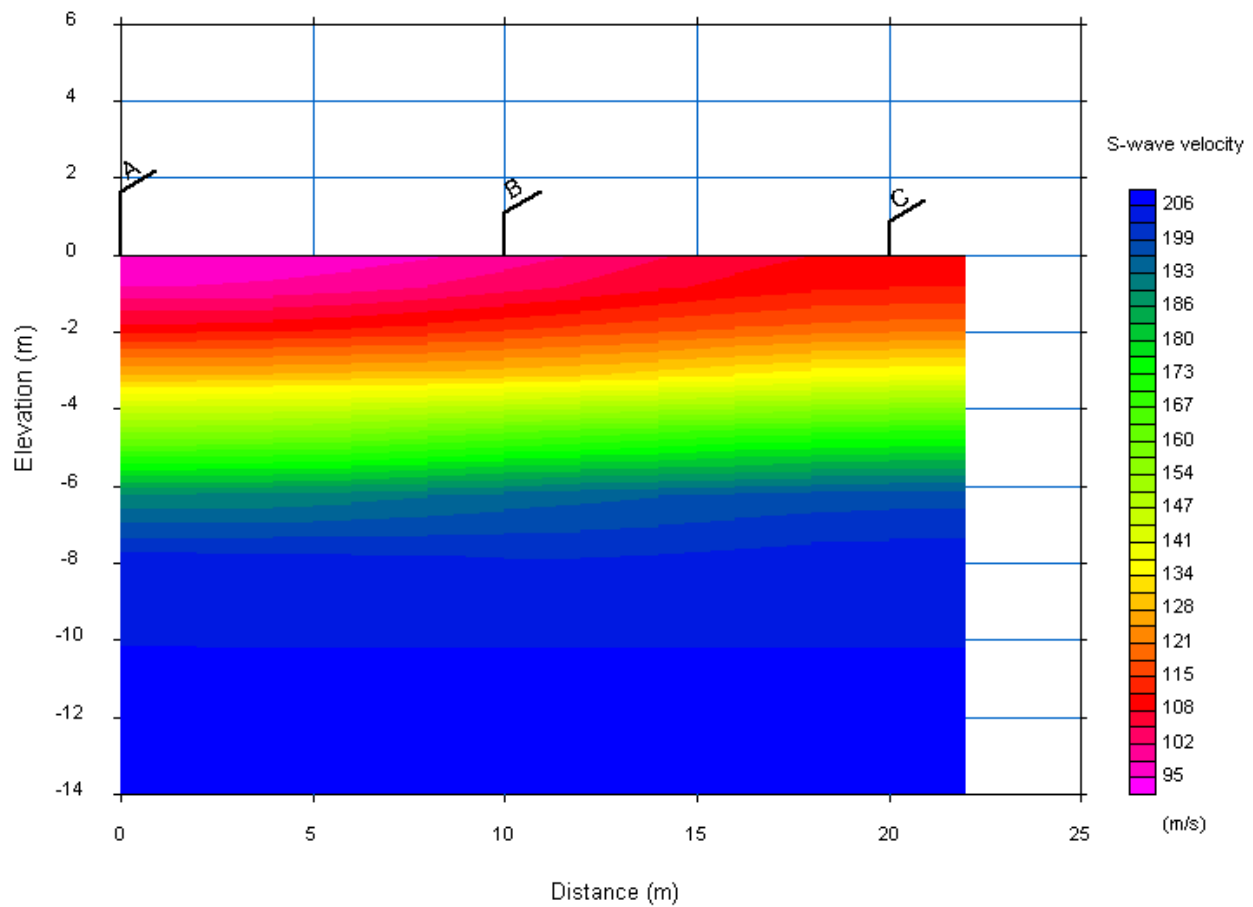


Figure 48: Velocity plot with flags.

If you select *Drawing tools / Show log and file list*, you will be presented with the following dialog:

Visible	Distance (m)	Caption	Post active	Post distance (km)	Location active	Latitude (degree)	Longitude (degree)	Elevation (m)	
<input checked="" type="checkbox"/>	0	A	<input checked="" type="checkbox"/>	-10000	<input checked="" type="checkbox"/>	0	0	1	OK
<input checked="" type="checkbox"/>	10	B	<input checked="" type="checkbox"/>	-10000	<input checked="" type="checkbox"/>	0	0	3	Cancel
<input checked="" type="checkbox"/>	20	C	<input checked="" type="checkbox"/>	-10000	<input checked="" type="checkbox"/>	0	0	2	Next
									Back

Flags A, B, and C are at elevations of 1, 3, and 2 m, respectively. Applying elevations at flags, we get:

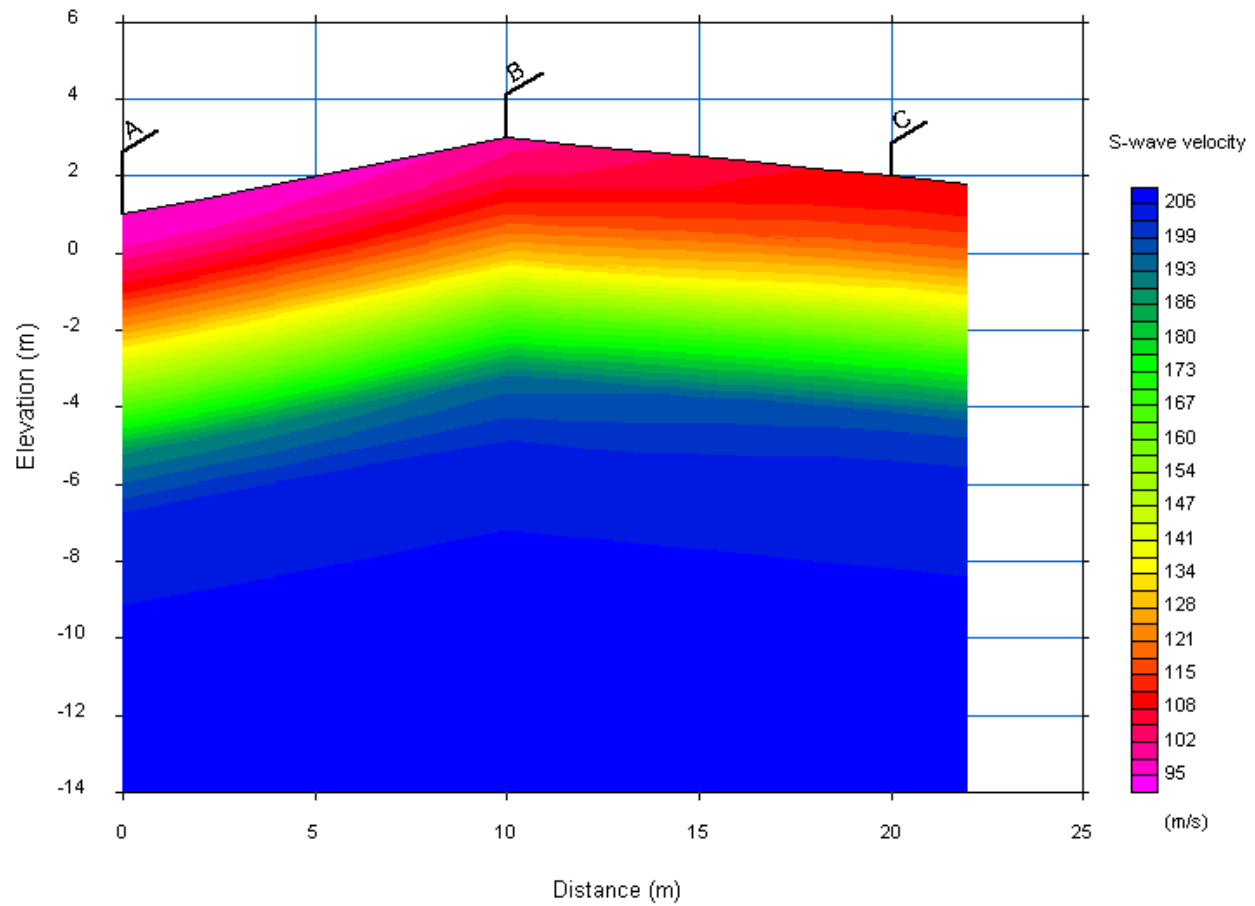
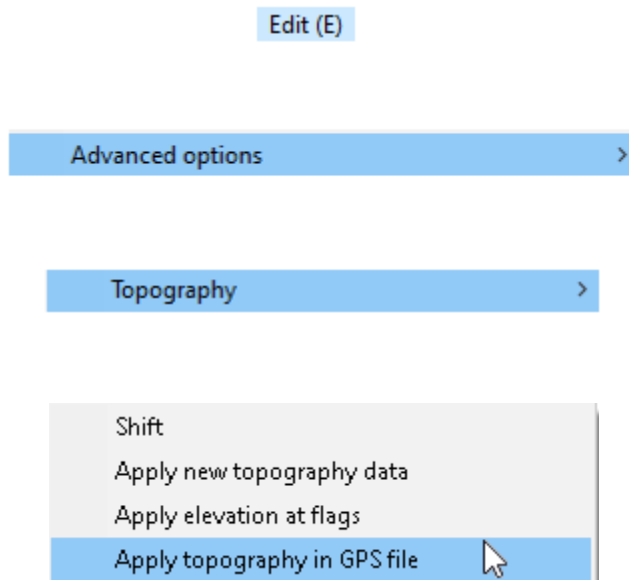


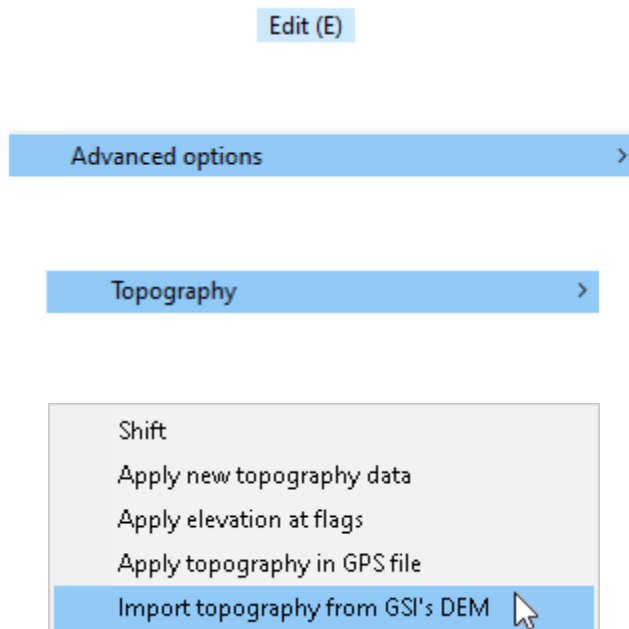
Figure 49: Velocity plot with flag elevations applied.

3.4.18.3.4 APPLY TOPOGRAPHY IN GPS FILE



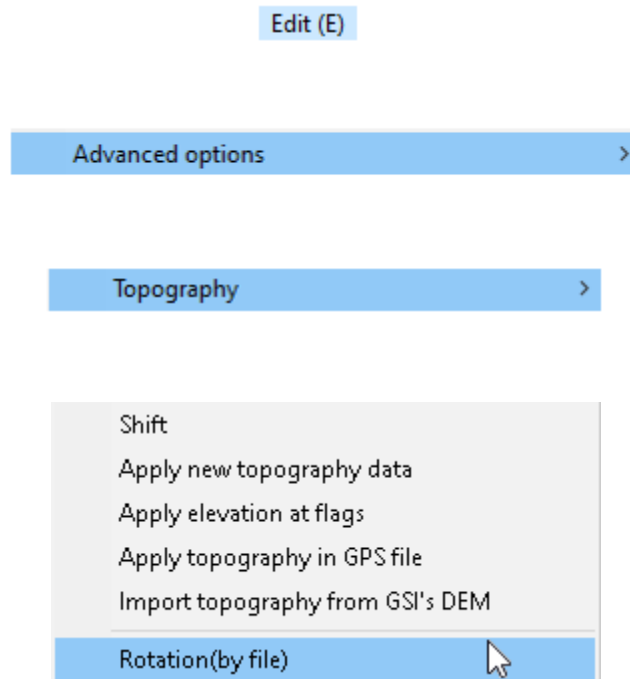
If a GPS was used to record an NMEA string along with your data, such as with an OhmMapper or magnetometer, you may apply that to your data as a topography file. Select *Edit / Advanced options / Topography / Apply topography in GPS file*. Note that there are many NMEA formats, including \$GPGGA, \$GPGLL, \$GPRMC, etc. Please contact support@seisimager.com for assistance.

3.4.18.3.5 IMPORT TOPOGRAPHY FROM GSI'S DEM



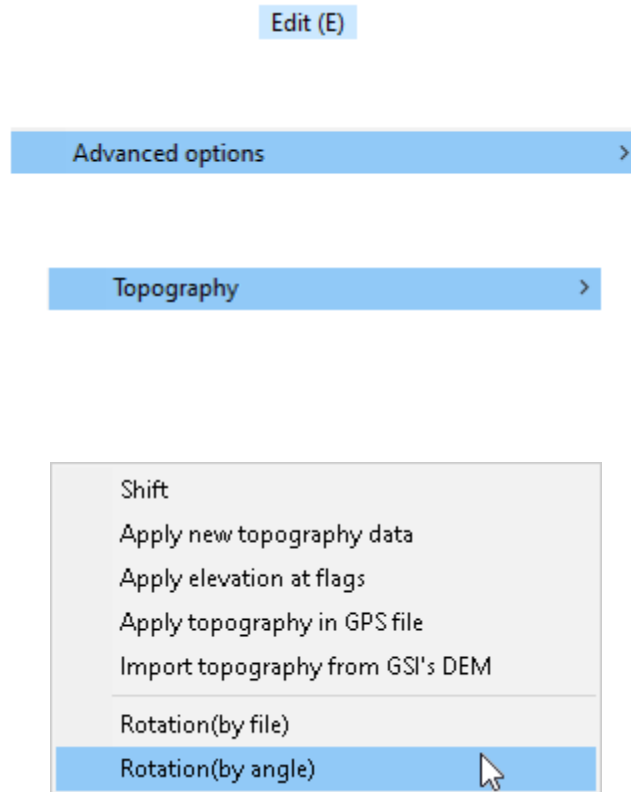
This feature is highly specialized and rarely used. Please contact support@seisimager.com for assistance.

3.4.18.3.6 ROTATION (BY FILE)

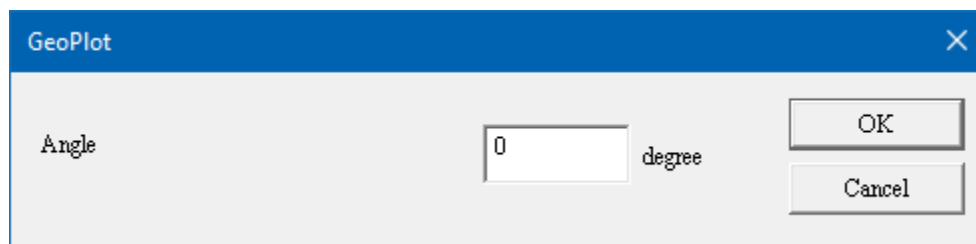


This feature is highly specialized and rarely used. Please contact support@seisimager.com for assistance.

3.4.18.3.7 ROTATION (BY ANGLE)



A simple clockwise or counterclockwise rotation of the model can be accomplished by selecting *Edit / Advanced options / Topography / Rotation (by angle)*:



Enter the rotation angle (negative number is clockwise) and press *OK*.

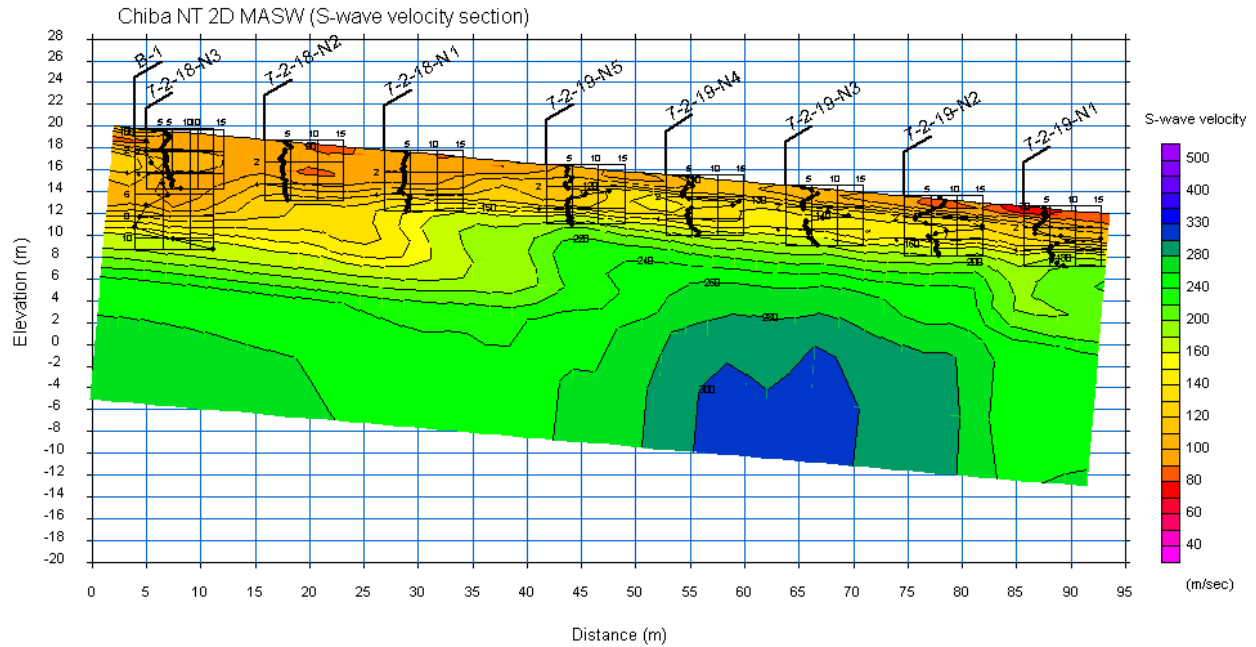
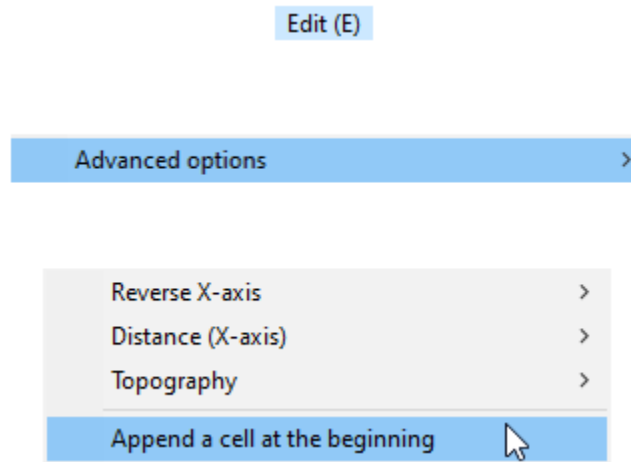
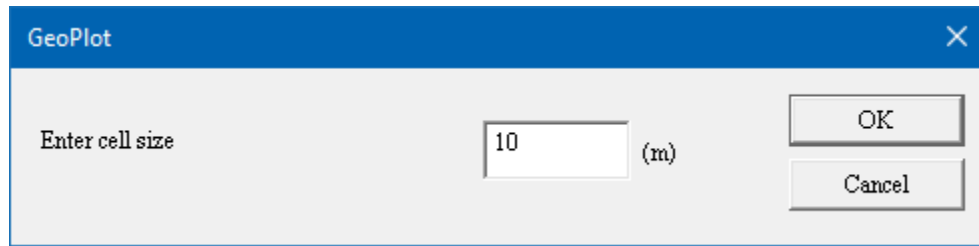


Figure 50: Rotated section.

3.4.18.4 APPEND A CELL AT THE BEGINNING



You may extrapolate a model to the right or left by appending cells. Select *Append a cell at the beginning* to reveal the following dialog:



We will append a 10m cell to the left side of the model. Press *OK* and compare the two figures below:

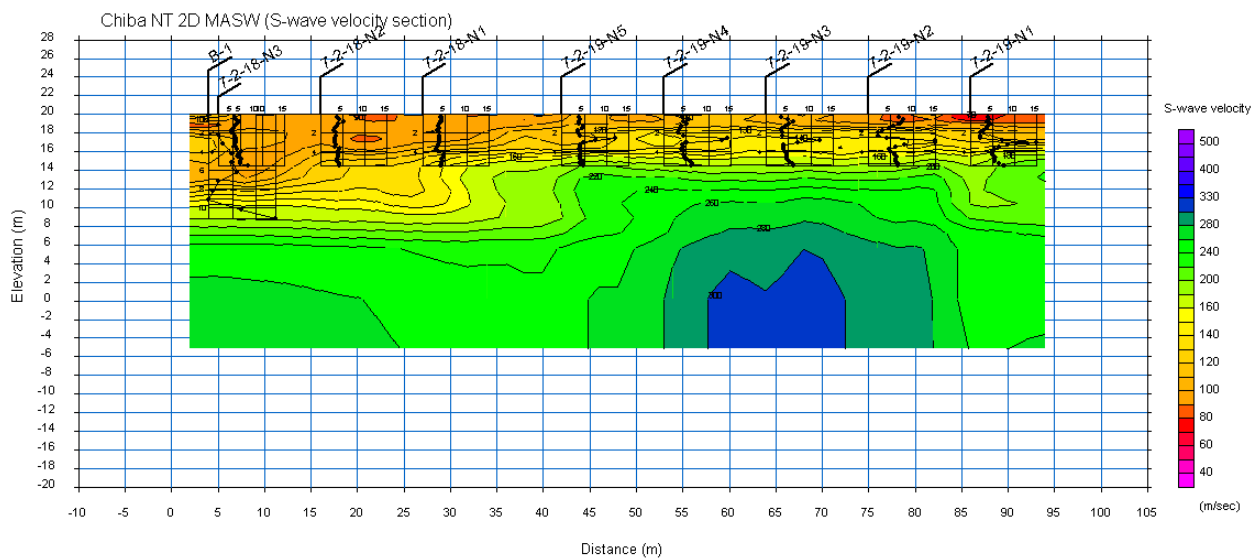


Figure 51: Original model.

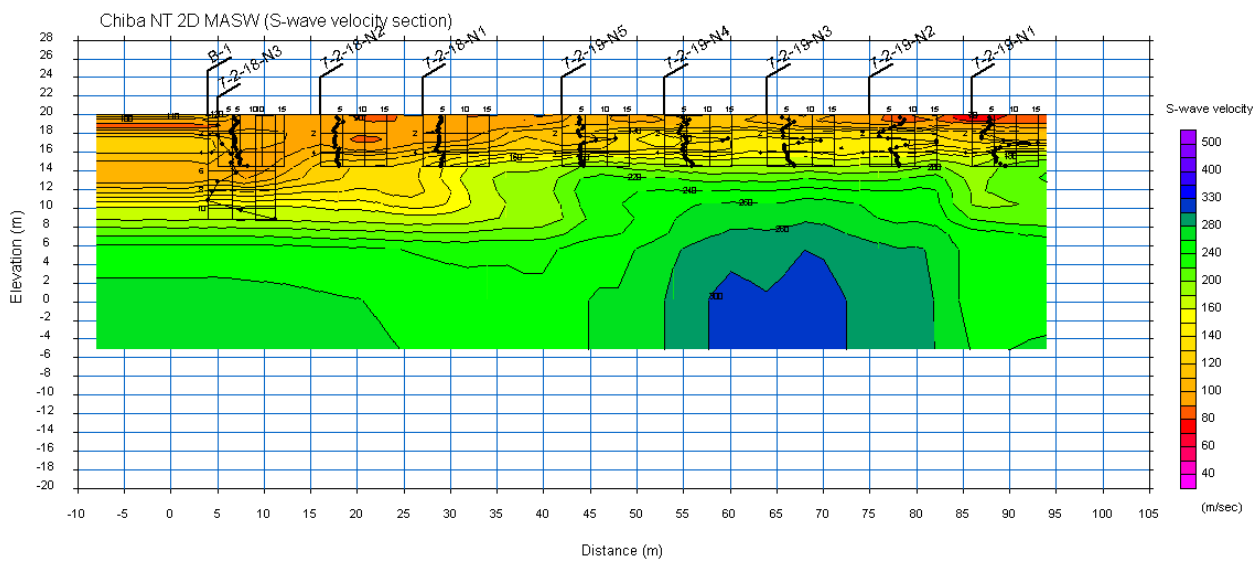
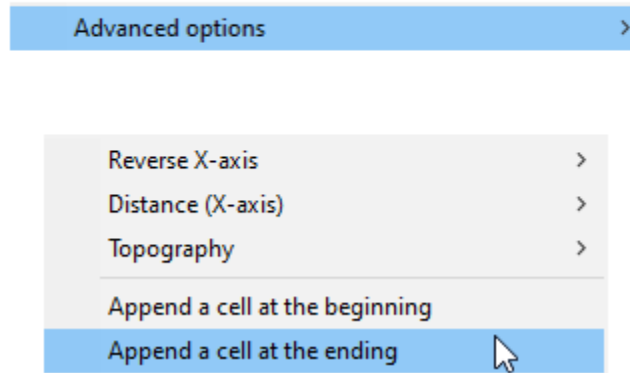


Figure 52: Model in Figure 51 after appending 10m cell to the left end.

3.4.18.5 APPEND A CELL AT THE ENDING

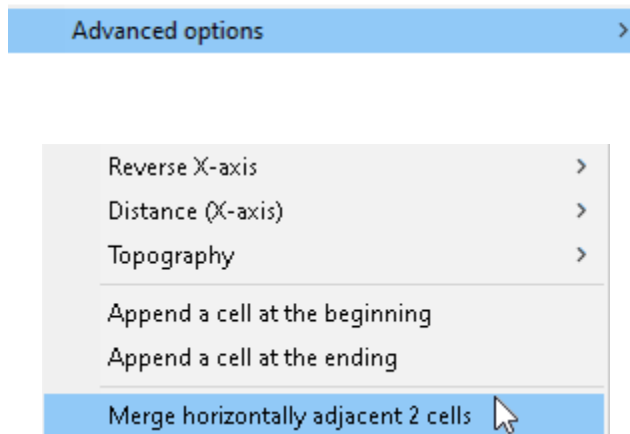
Edit (E)



Self-evident: see prior section.

3.4.18.6 MERGE HORIZONTALLY ADJACENT 2 CELLS

Edit (E)




This feature is highly specialized and rarely used. Please contact support@seisimager.com for assistance.

3.4.18.7 DIVIDE A CELL HORIZONTALLY

Edit (E)

Advanced options >


- Reverse X-axis >
- Distance (X-axis) >
- Topography >
- Append a cell at the beginning
- Append a cell at the ending
- Merge horizontally adjacent 2 cells
- Divide a cell horizontally** 

This feature is highly specialized and rarely used. Please contact support@seisimager.com for assistance.

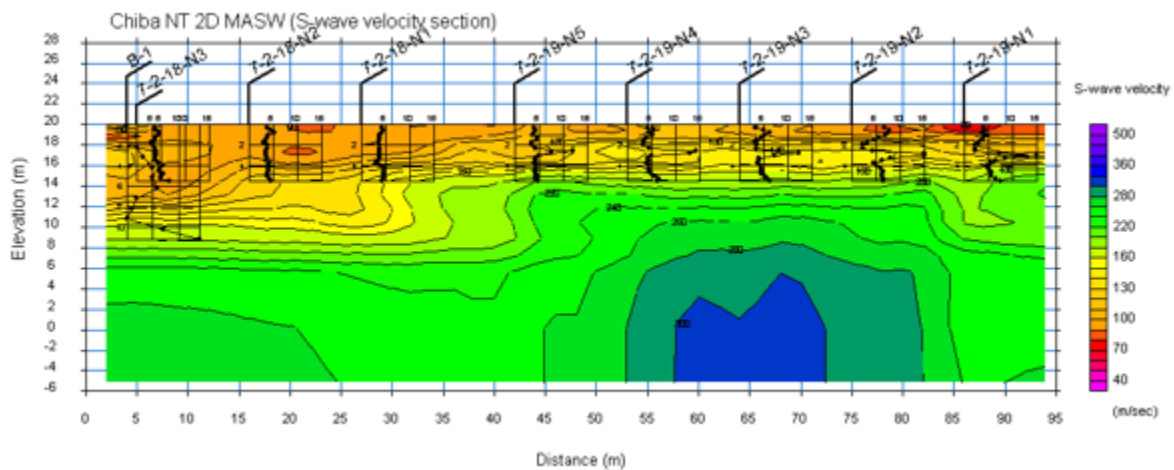
3.4.18.8 DELETE DATA OUT OF DISPLAYED AREA

Edit (E)

Advanced options >

- Reverse X-axis >
- Distance (X-axis) >
- Topography >
- Append a cell at the beginning
- Append a cell at the ending
- Merge horizontally adjacent 2 cells
- Divide a cell horizontally
- Delete data out of displayed area 

You may permanently delete unshown data. This is best illustrated by an example. In the below model, we wish to focus on the high-velocity intrusion on the right side. First, we select *View / Axis configuration* (or press *Ctrl+A*) to bring up the **Axis Configuration** dialog box. We modify



the axis limits as shown:

Axis configuration
✕

☒ Show grid lines

OK

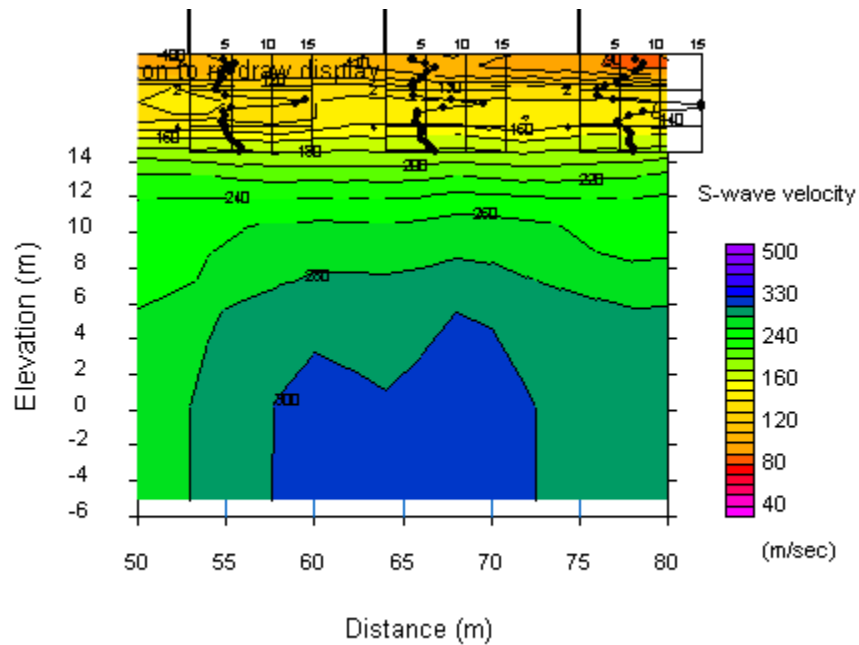
Cancel

	Min	Max	Interval	Unit
X-axis	50	80	5	(m)
Y-axis	-6	14	2	(m)

☐ Set Interval (and Max) automatically
☐ Reverse X-axis direction

Decimal places
☒ 0 (None)
☐ 1

Vertical axis
☒ Elevation
☐ Depth
☐ Time



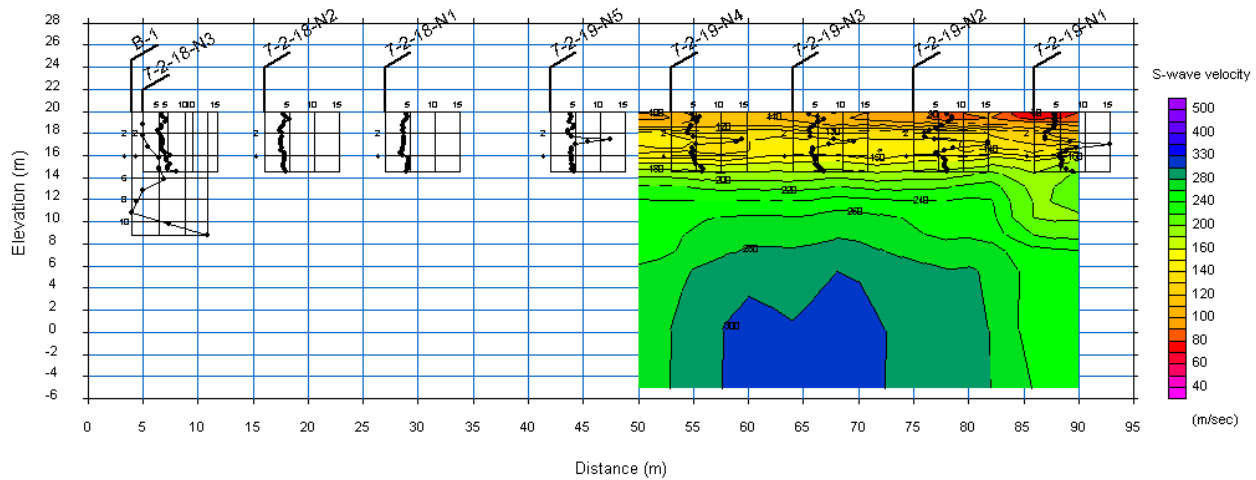
Distance (m)

The data outside the axis limits is still there, it is just not displayed. If we now select *Edit / Advanced options / Delete data out of displayed area*, it can be removed, and the section can be saved under a different file name. This operation can be confirmed by returning the axes to their original configuration:

185

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 PN 770-00120-01

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 July 2024



3.4.18.9 DELETE UNRELIABLE DATA

Edit (E)

Advanced options >

- Reverse X-axis >
- Distance (X-axis) >
- Topography >
- Append a cell at the beginning
- Append a cell at the ending
- Merge horizontally adjacent 2 cells
- Divide a cell horizontally
- Delete data out of displayed area
- Delete unreliable data

You may trim the section automatically based on data reliability. Simply select *Edit / Advanced options / Delete unreliable data* and anything below V_R will be removed, as illustrated in the model below.

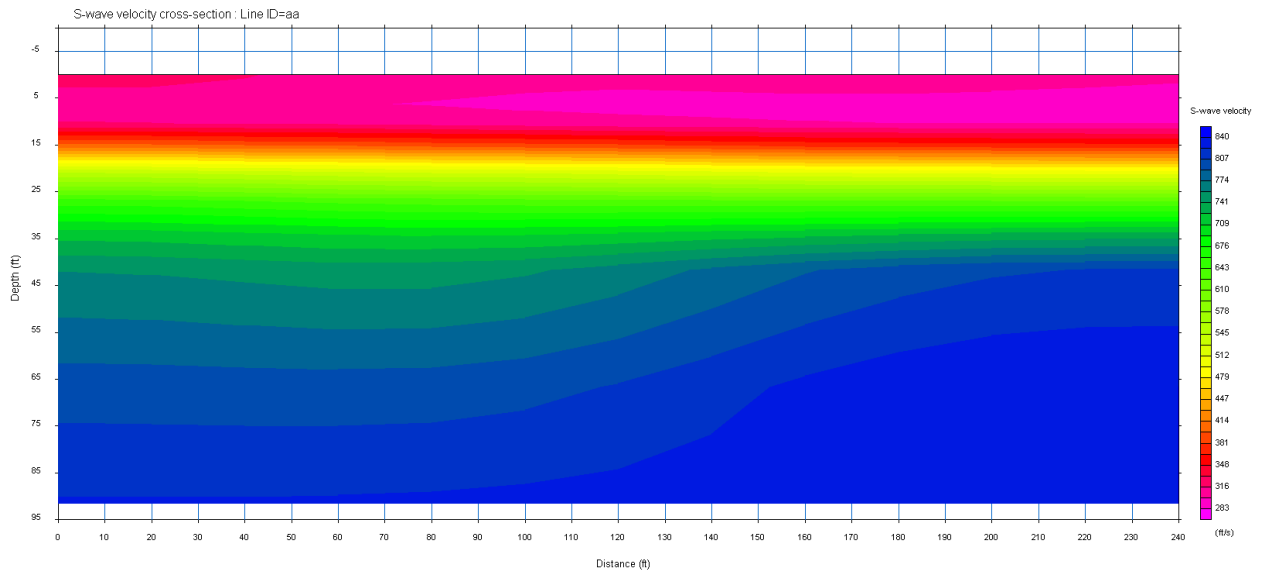


Figure 53: 2D model before removing unreliable data. The implication is that velocities down to 90 feet are known, even at the edges of the geophone array. This is physically impossible given the source locations and geophone array particulars (not shown).

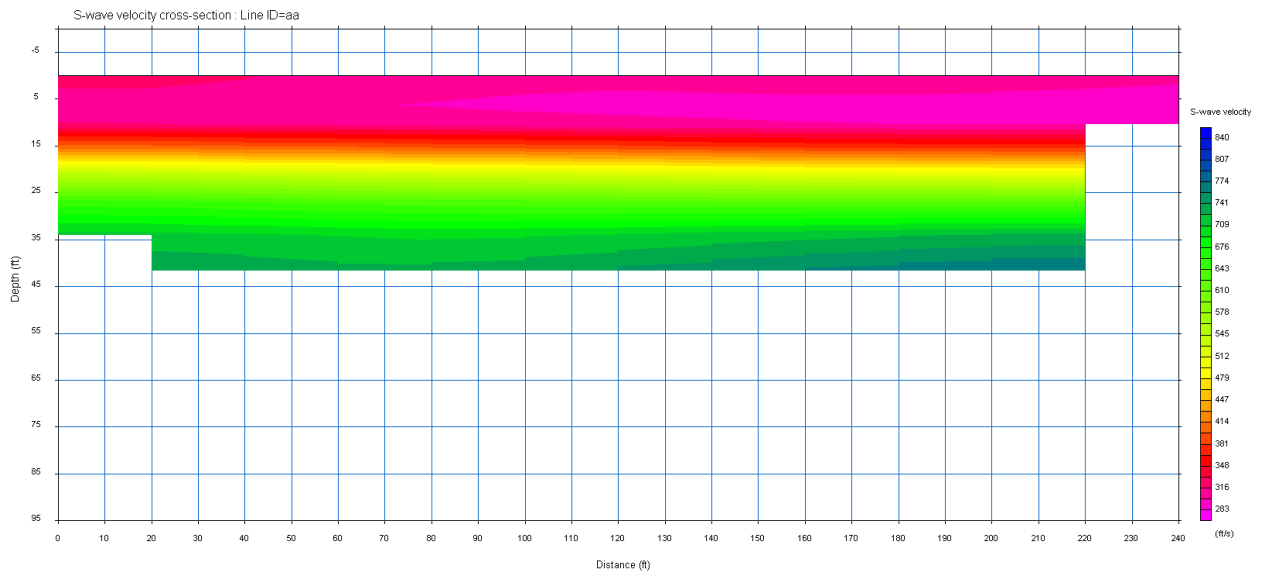
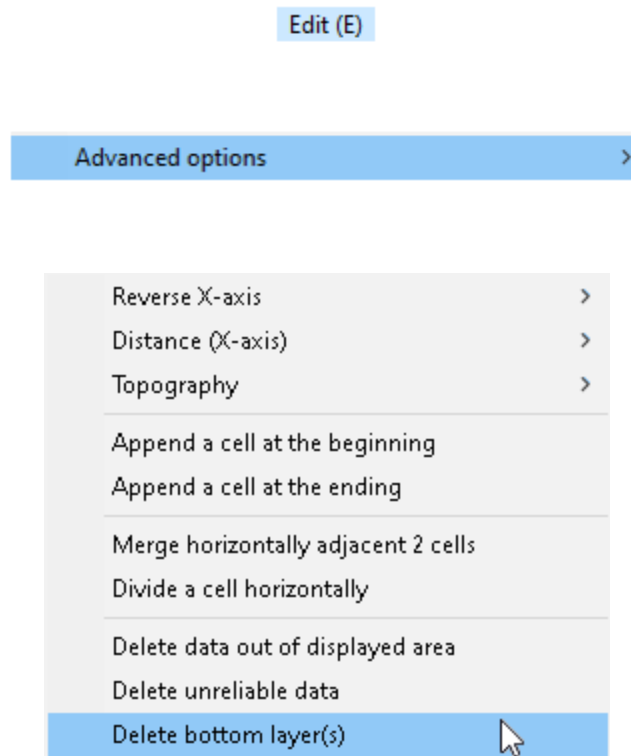
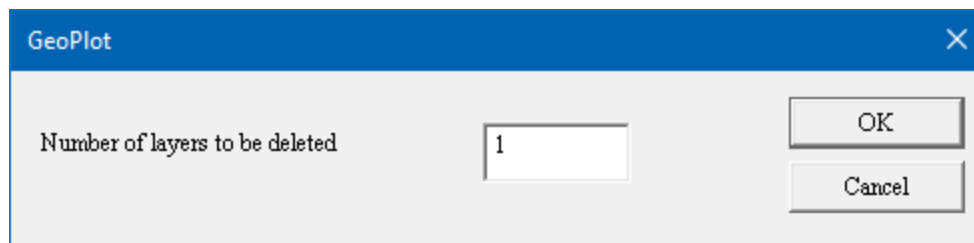


Figure 54: 2D model after unreliable data has been removed. Compare to Figure 53 above.

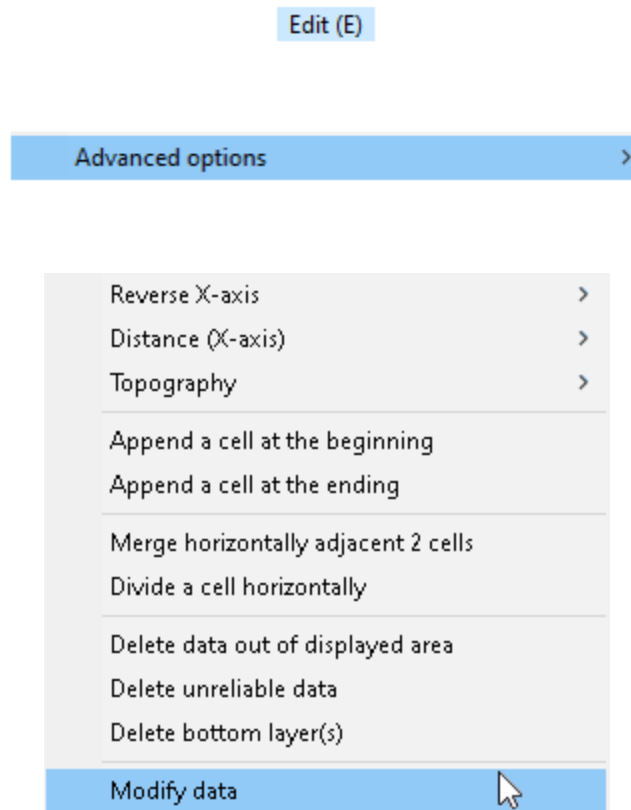
3.4.18.10 DELETE BOTTOM LAYER(S)



This feature allows the removal of layers from the bottom up. Select *Edit / Advanced options / Delete bottom layer(s)*. You will be prompted for the number of layers to delete:



3.4.18.11 MODIFY DATA

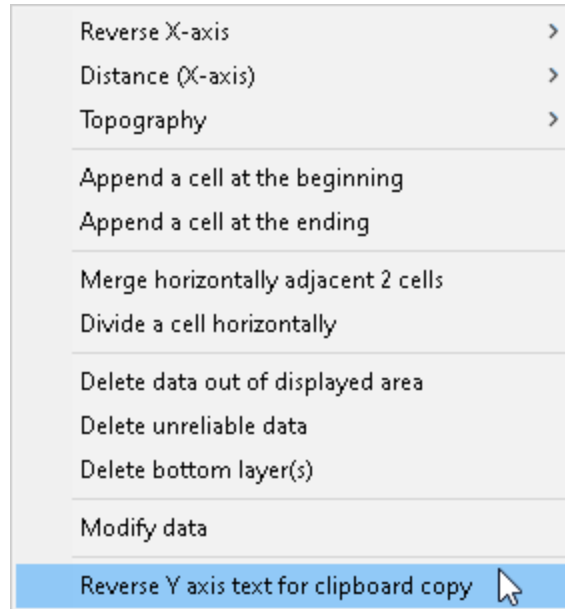


This feature is highly specialized and rarely used. Please contact support@seisimager.com for assistance.

3.4.18.12 REVERSE Y-AXIS TEXT FOR CLIPBOARD COPY

Edit (E)

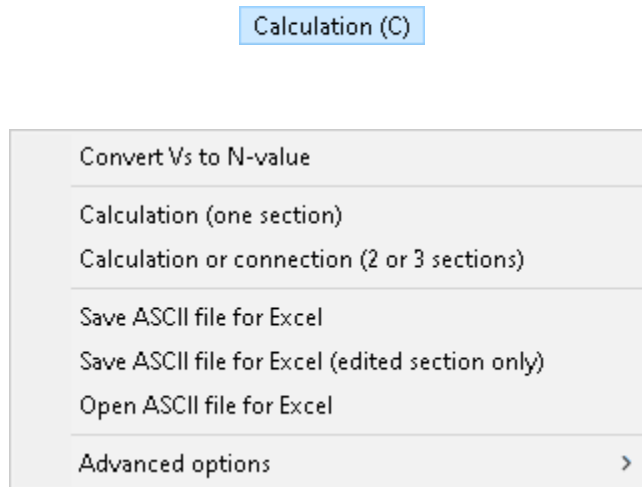
Advanced options >



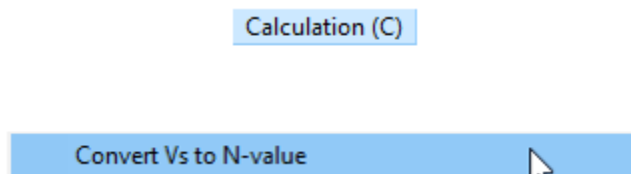
This feature is highly specialized and rarely used. Please contact support@seisimager.com for assistance.

3.5 CALCULATION MENU

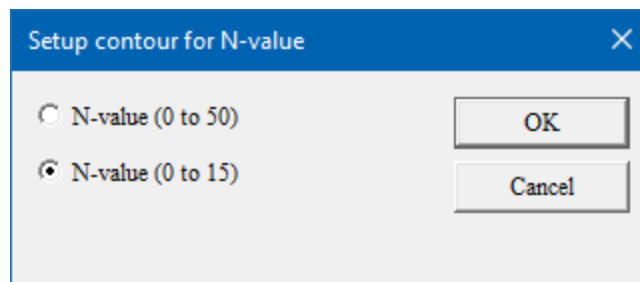
Click on *Calculation* to reveal the **Calculation** menu:



3.5.1 CONVERT VS TO N-VALUE



A V_s plot can be converted to an N-value plot. Choose *Convert to N-value* and select the appropriate range for your data:



Below is a sample N-value plot.

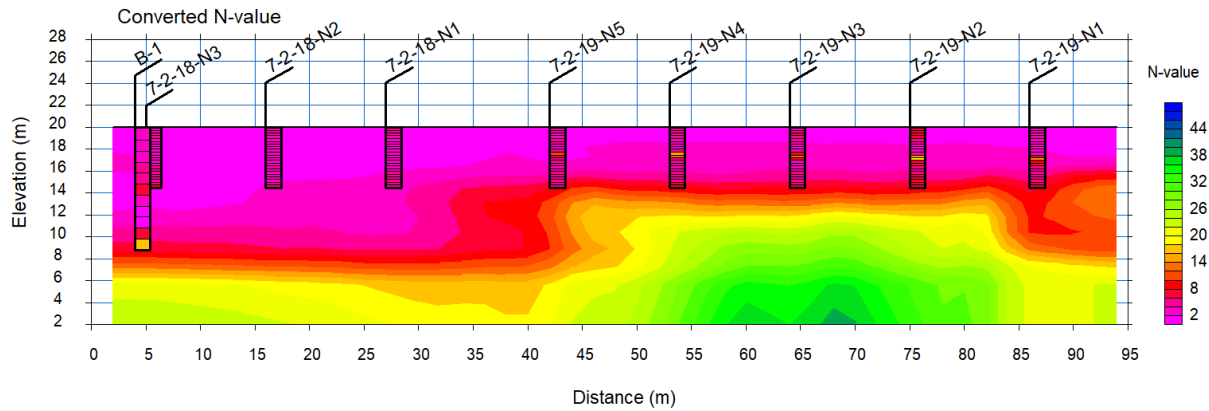
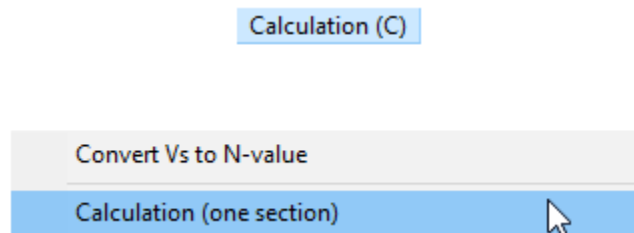


Figure 55: Example N-value plot.

3.5.2 CALCULATION (ONE SECTION)



This feature allows various mathematical transformations of a 2D section. It is highly specialized and rarely used by the average seismic practitioner. Please contact support@seisimager.com for assistance.

Calculation for 1 section [X]

Calculation

☒ + : addition
☐ - : subtraction
☐ * : multiplication
☐ / : division

Value:

OK
Cancel
Advanced menu

Vs and N

☐ from Vs to N-value Constant (default: 97m/s) m/sec
☐ from N-value to Vs Multiplier (default: 0.314)

Vs and Density

☐ from Vs to Density Constant (default:) kg/m
 Multiplier (default:)

☐ Convert Vs to N-value of Swedish Weighted Sounding
☐ Convert Vs to Vp

3.5.3 CALCULATION OR CONNECTION (2 OR 3 SECTIONS)

Calculation (C)

Convert Vs to N-value
 Calculation (one section)
Calculation or connection (2 or 3 sections)

This feature allows various mathematical transformations between 2D sections. It is highly specialized and rarely used by the average seismic practitioner. Please contact support@seisimager.com for assistance.

Calculation between 2 (or 3) sections

Data A	Calculation	Data B
<input checked="" type="radio"/> 1	<input checked="" type="radio"/> A+B	<input type="radio"/> 1
<input type="radio"/> 2	<input type="radio"/> A-B	<input checked="" type="radio"/> 2
	<input type="radio"/> A*B	
	<input type="radio"/> A/B	
	<input type="radio"/> A/B*100-100	
	<input type="radio"/> B-A	
	<input type="radio"/> B/A	
	<input type="radio"/> B/A*100-100	
	<input type="radio"/> Connect or average	
	<input type="radio"/> Crossplot	
	<input type="radio"/> Soil classification (polynomial) A:VS B:Resistivity	
	<input type="radio"/> Soil classification (neural network) A:VS B:Resistivity	
	<input type="radio"/> Poisson's ratio A:VP B:VS	
	<input type="radio"/> Shear modulus A:VS B:Density	

OK Cancel

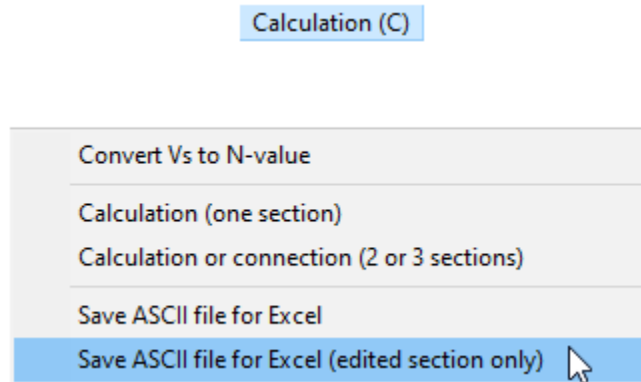
3.5.4 SAVE ASCII FILE FOR EXCEL

Calculation (C)

Convert Vs to N-value
Calculation (one section)
Calculation or connection (2 or 3 sections)
Save ASCII file for Excel

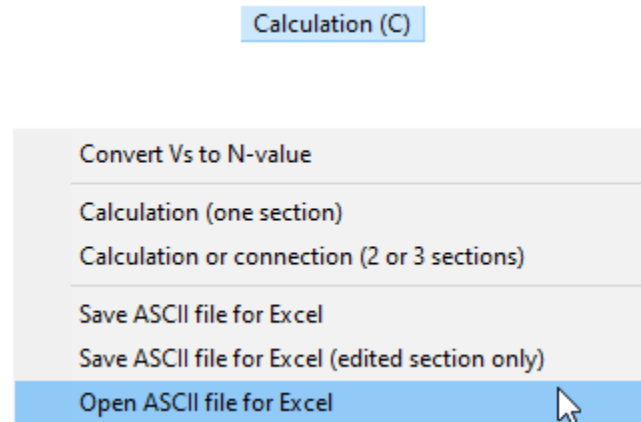
This feature is highly specialized and rarely used. Please contact support@seisimager.com for assistance.

3.5.5 SAVE ASCII FILE FOR EXCEL (EDITED SECTION ONLY)



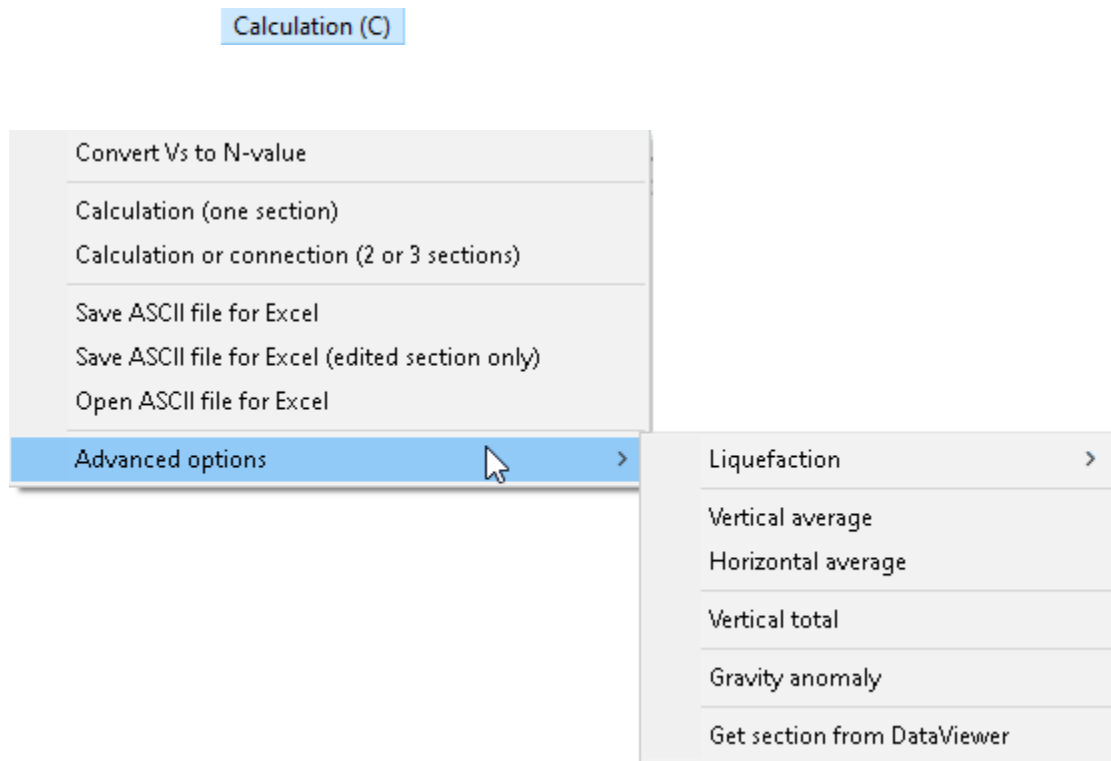
This feature is highly specialized and rarely used. Please contact support@seisimager.com for assistance.

3.5.6 OPEN ASCII FILE FOR EXCEL

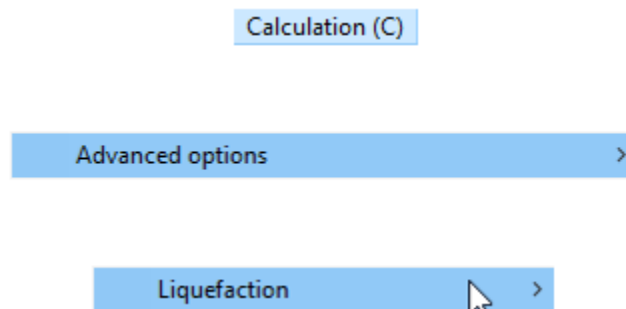


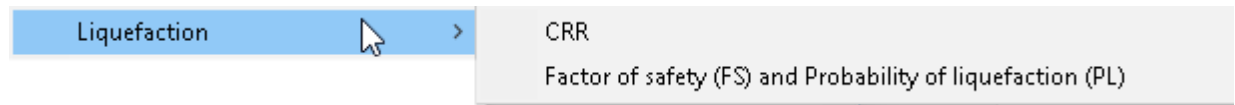
This feature is highly specialized and rarely used. Please contact support@seisimager.com for assistance.

3.5.7 ADVANCED OPTIONS

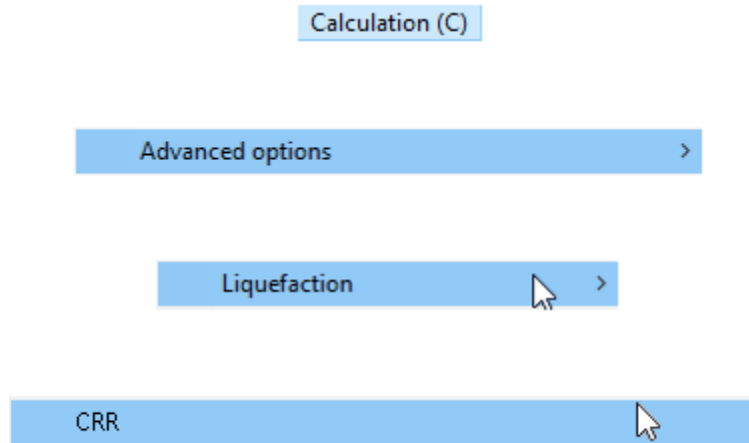


3.5.7.1 LIQUEFACTION



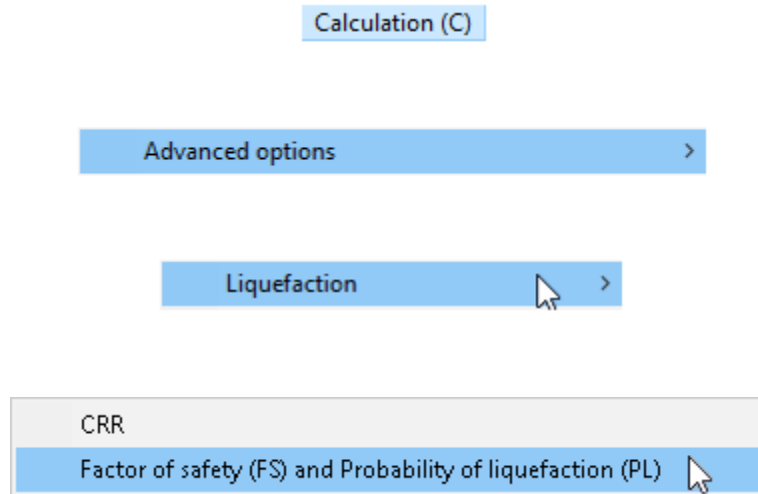


3.5.7.1.1 CRR



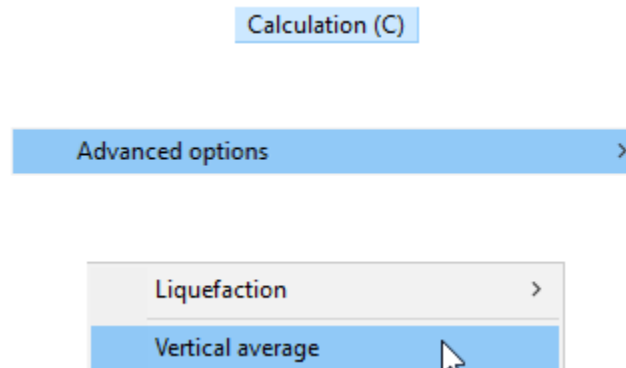
This feature is highly specialized and rarely used. Please contact support@seisimager.com for assistance.

3.5.7.1.2 FACTOR OF SAFETY (FS) AND PROBABILITY OF LIQUEFACTION (PL)



This feature is highly specialized and rarely used. Please contact support@seisimager.com for assistance.

3.5.7.2 VERTICAL AVERAGE



This feature is highly specialized and rarely used. It allows you to calculate the average velocity in the vertical direction across the section. The section is made up of velocity cells; this function will calculate the average velocity of all the cells in a particular column (within the depth limits you specify; see below) and write them, along with V_{MIN} and V_{MAX} , to a file. An example file is shown below.

Float numbers
×

Enter minimum depth to be averaged !

0

m

OK

Cancel

Enter maximum depth to be averaged !

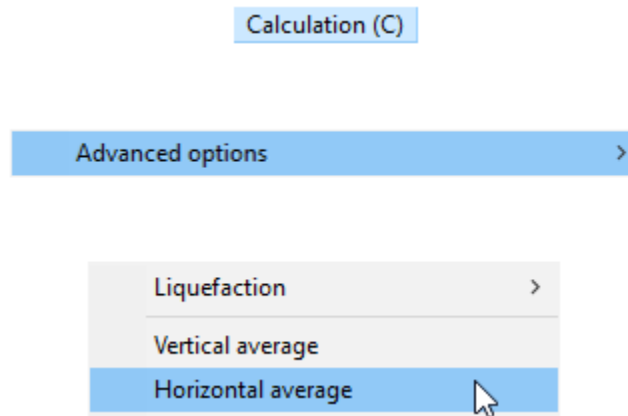
19.75

m

2.000000	176.103989	75.275925	267.711517
4.000000	178.885956	86.927208	267.688110
6.000000	172.059860	87.469612	267.431335
8.000000	171.415649	86.110168	267.099548
10.000000	173.234818	89.610344	266.679749
12.000000	173.081863	89.862022	266.126282
14.000000	174.189850	91.158089	265.417450
16.000000	174.457840	87.115540	264.523468
18.000000	172.708405	89.224213	263.686890
20.000000	173.681152	85.444908	262.747437
22.000000	171.401535	87.385010	261.337921
24.000000	170.771576	90.398209	259.728302
26.000000	171.742432	89.490669	257.925812
28.000000	173.848495	88.448792	255.932205
30.000000	175.632980	90.474007	253.878830
32.000000	179.544846	88.091820	252.151672
34.000000	185.601013	88.917107	251.098358
36.000000	188.049255	86.429436	248.702103
38.000000	186.649567	87.152321	245.934906
40.000000	191.152573	91.747673	246.960785
42.000000	201.229828	96.437172	253.684189
44.000000	213.365997	104.780067	263.875244
46.000000	212.966949	96.427704	259.518341

Table 1: Example vertical average velocity file. Columns are X , V_{AVG} , V_{MIN} , and V_{MAX} .

3.5.7.3 HORIZONTAL AVERAGE

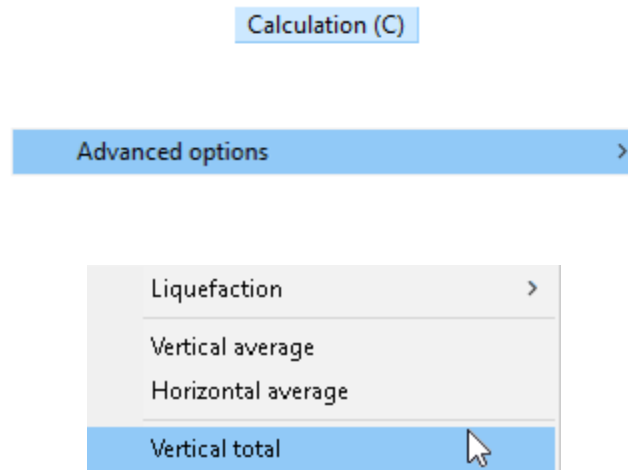


This feature is also rarely used but works in a similar fashion to that described in the previous section. It calculates the horizontal average velocity in each row of cells and writes this information to a file, an example of which is provided below.

```
-0.550001 97.031570
-1.150000 92.391975
-1.849999 110.368835
-2.650001 121.085876
-3.550001 120.916603
-4.550002 133.362518
-5.649997 158.582809
-6.850003 178.279907
-8.149997 189.047379
-9.549995 205.319427
-11.050011 208.259476
-12.650000 223.884491
-14.349998 253.189743
-19.750000 268.954376
-25.150011 272.365295
```

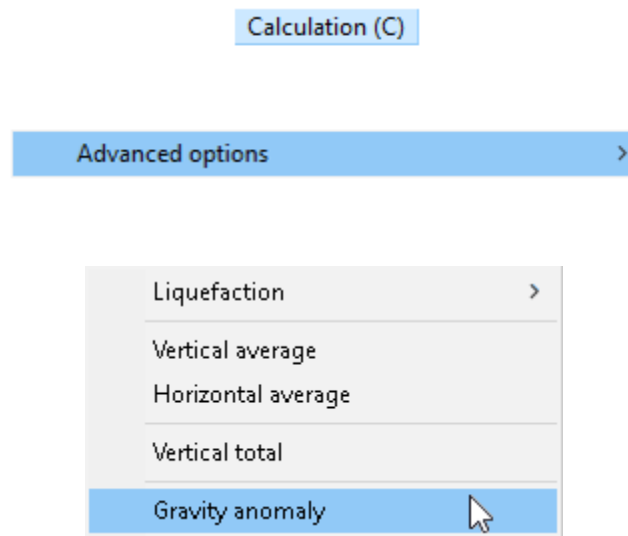
Table 2: Example horizontal average velocity file. Columns are Y , V_{AVG} .

3.5.7.4 VERTICAL TOTAL



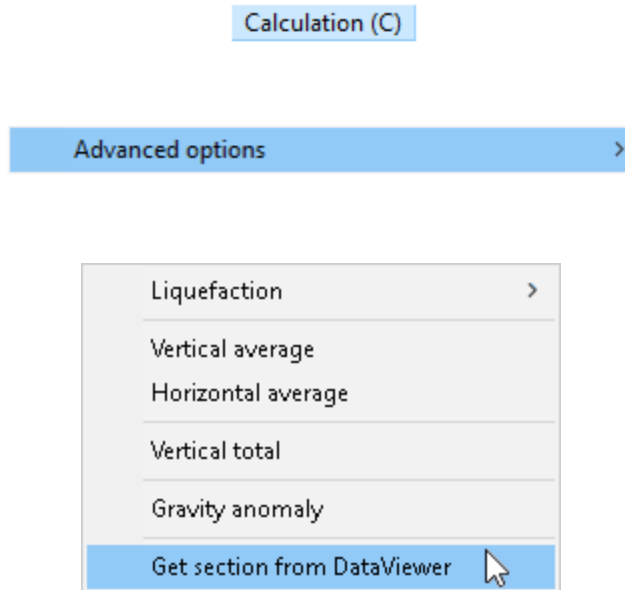
This feature is highly specialized and rarely used. Please contact support@seisimager.com for assistance.

3.5.7.5 GRAVITY ANOMALY



This feature is highly specialized and rarely used. Please contact support@seisimager.com for assistance.

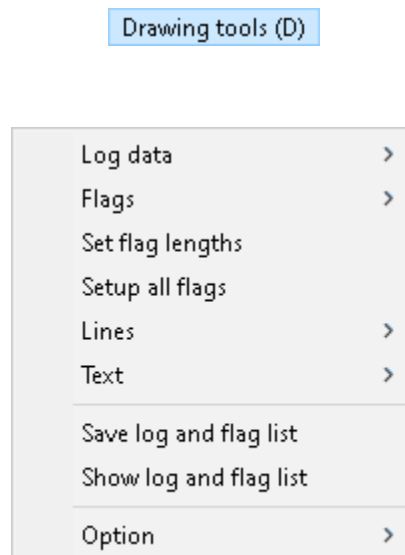
3.5.7.6 GET SECTION FROM DATAVIEWER



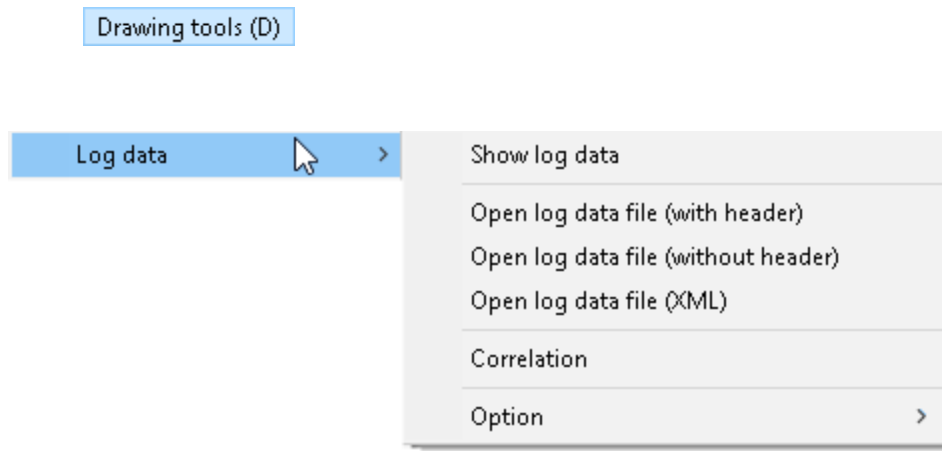
This feature is highly specialized and rarely used. Please contact support@seisimager.com for assistance.

3.6 DRAWING TOOLS MENU

Click on *Drawing Tools* to reveal the **Drawing Tools** menu:

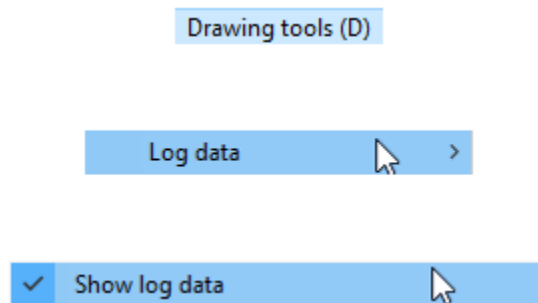


3.6.1 LOG DATA



Continue.

3.6.1.1 SHOW LOG DATA



If you have log data, you may display it on the plot as shown below. Just click on the *Show log data* toggle switch:

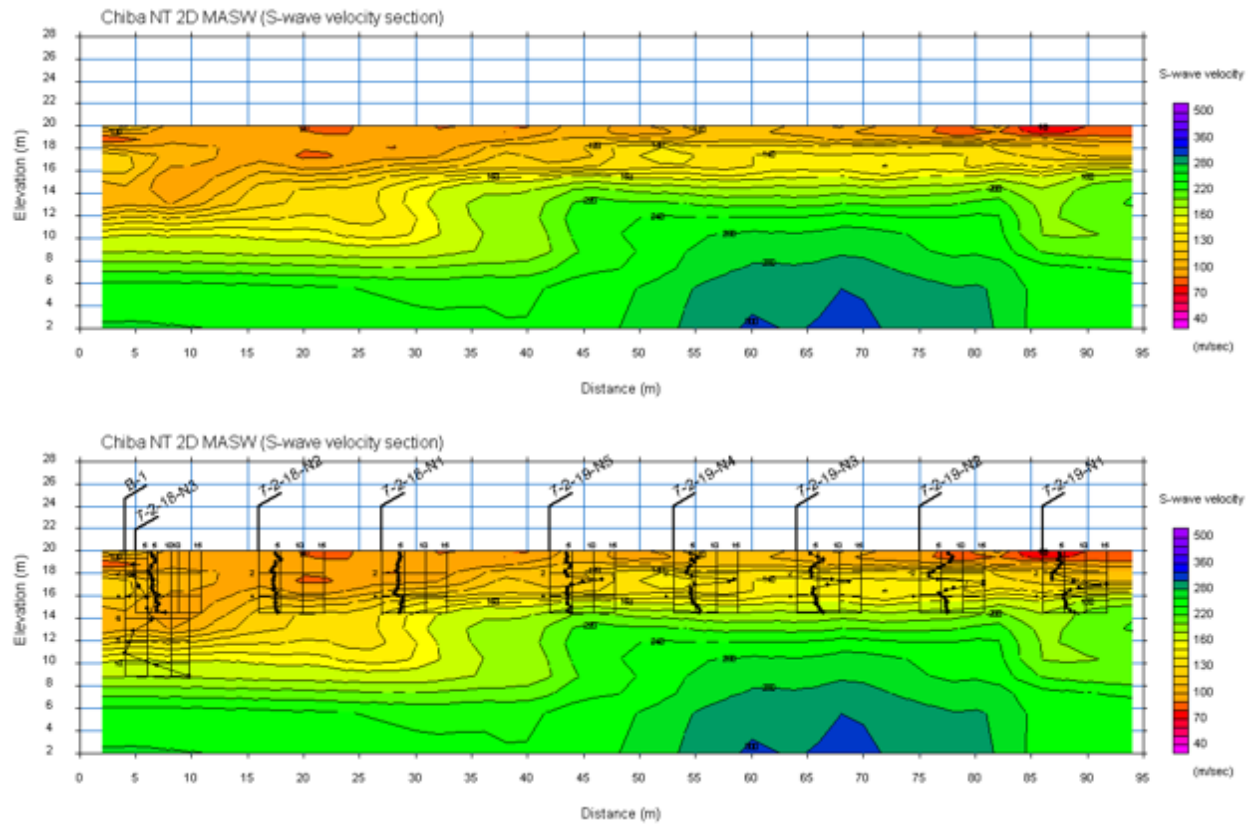
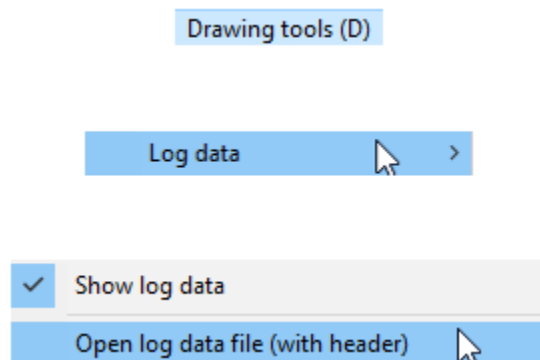


Figure 56: S-wave velocity section with log data shown (bottom).

3.6.1.2 OPEN LOG DATA FILE (WITH HEADER)



This option will open a log file of the following format, which includes a header. Annotation is to the right of the colon.

B-1	:	comment
(km/sec)	:	legend (unit)
45.0 0.0	:	the location and the elevation of the logging point
4	:	the number of the data
2.0 0.3	:	the elevation of the 1 st boundary, the data value
5.0 0.8	:	the elevation of the 2 nd boundary, the data value
18.0 1.5	:	the elevation of the 3 rd boundary, the data value
20.0 2.0	:	the elevation of the 4 th boundary, the data value

Double-click at the surface position of one of the displayed logs, and the following dialog box will be displayed:

Log view setting
✕

Log

☒ Show log

Color

☐ Color

☒ Show data label and depth

3

 width (mm)

Line

☐ Line-1
☐ Line-2
☒ Line 3 (N-value)

15

 Width (mm)

	Min.	Max.	Int.
Data axis	<div style="border: 1px solid #ccc; padding: 2px 10px;">0</div>	<div style="border: 1px solid #ccc; padding: 2px 10px;">15</div>	<div style="border: 1px solid #ccc; padding: 2px 10px;">5</div>
Depth			<div style="border: 1px solid #ccc; padding: 2px 10px;">2</div>

2

 Text size (mm)

Comment

Comment 7-2-18-N1

Unit

Log location

Distance

27

 (m)

Elevation

20

 (m)

Soil column
☐ Show soil column

Ground water (negative value does not show depth)

Depth

-1

 (m)

OK

Cancel

Flag

Distance post

-10000

 (km)

Angle

30

 degree

Text size

4

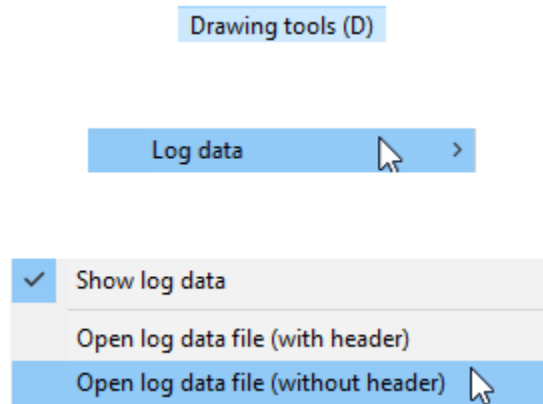
 (mm)

Length

4.08889

Specify the necessary log display parameters. These should be self-evident; experimentation will be instructive. Press *OK*. If you need assistance, contact support@seisimager.com.

3.6.1.3 OPEN LOG DATA FILE (WITHOUT HEADER)

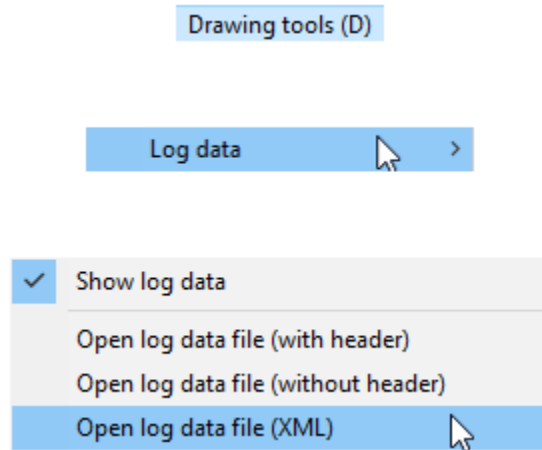


This option will open a log file of the following format, which does not include a header. Annotation is to the right of the colon.

2.0 0.3	: the elevation of the 1 st boundary, the data value
5.0 0.8	: the elevation of the 2 nd boundary, the data value
18.0 1.5	: the elevation of the 3 rd boundary, the data value
20.0 2.0	: the elevation of the 4 th boundary, the data value

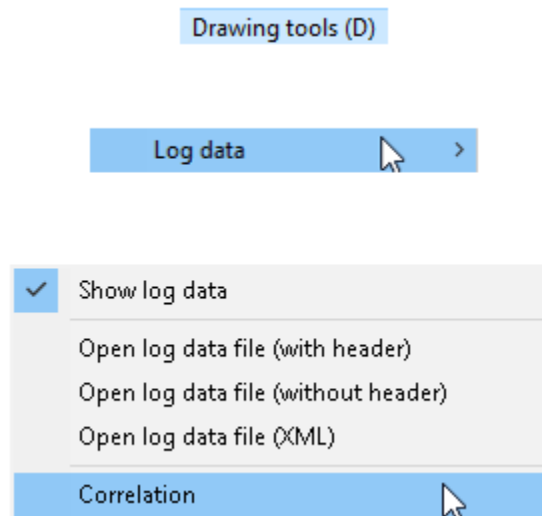
Double-click at the surface position of one of the displayed logs, and the above dialog box (previous section) will be displayed. Specify the necessary log display parameters. These should be self-evident; experimentation will be instructive. Press *OK*. If you need assistance, contact support@seisimager.com.

3.6.1.4 OPEN LOG DATA FILE (XML)

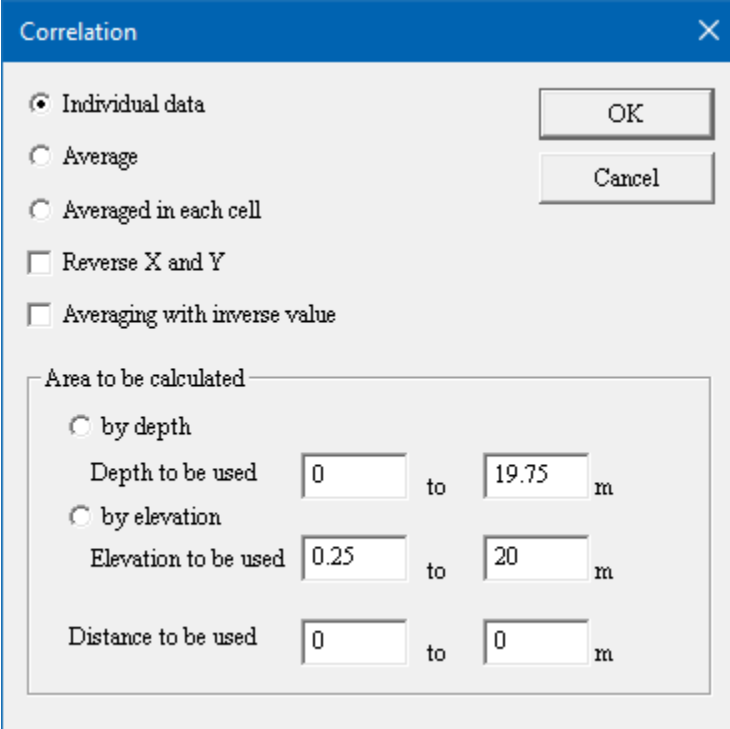


Selecting *Drawing tools / Log data / Open log data file (XML)* opens an XML-formatted log data file.

3.6.1.5 CORRELATION



If the current log data includes N-value information, you may correlate N-values with s-velocities using this function. The results will be written to a file. Select *Drawing tools / Log data / Correlation* to reveal the following dialog box:



Individual data: Click on *Individual data*, press *OK*, and a correlation file for each log will be created.

```

4.000000 -0.800000 36.000000 0.139237
4.000000 -1.300000 50.000000 0.140400
4.000000 -2.300000 60.000000 0.147407
4.000000 -3.300000 60.000000 0.146369
4.000000 -4.300000 34.000000 0.147097

```

Columns are x-location ,elevation
(or depth) , N-value, s-velocity

Average: Click on *Average*, enter the *Depth to be used* and press *OK*. The average correlation file will be automatically created. The average correlation file is stored as shown below:

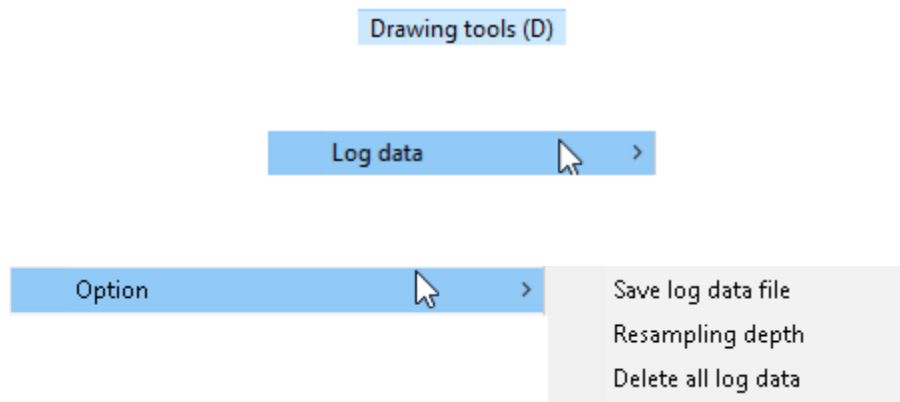
4.000000 5.642857 0.129320 0.139237 0.147407 B-1
 19.000000 7.909091 0.131865 0.107759 0.208504 B-2

x-location, average N-value ,
 average s-velocity , minimum s-
 velocity, maximum s-velocity, title
 of log

Averaged in each cell: Under this option, the data will be averaged in each cell.

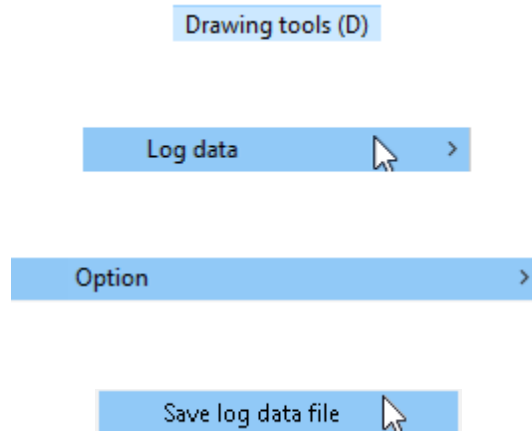
Other parameters in the dialog box should be self-evident. If you need assistance, please contact support@seisimager.com.

3.6.1.6 OPTION



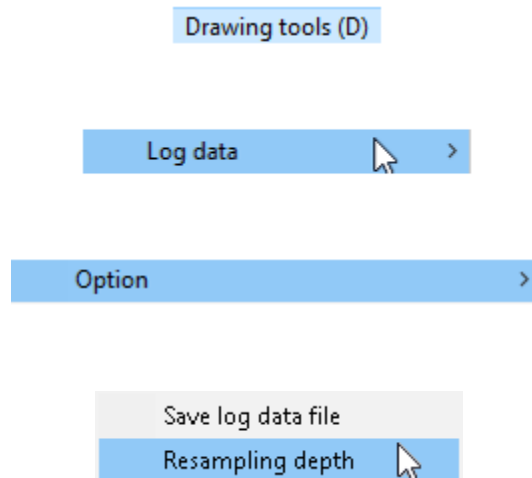
Continue.

3.6.1.6.1 SAVE LOG DATA FILE



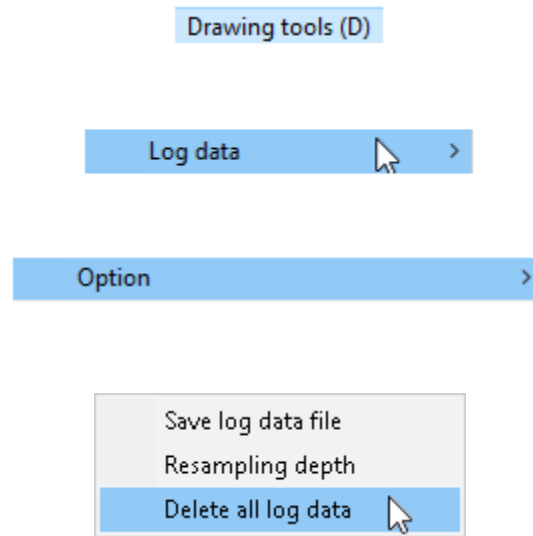
This feature is highly specialized and rarely used. Please contact support@seisimager.com for assistance.

3.6.1.6.2 RESAMPLING DEPTH

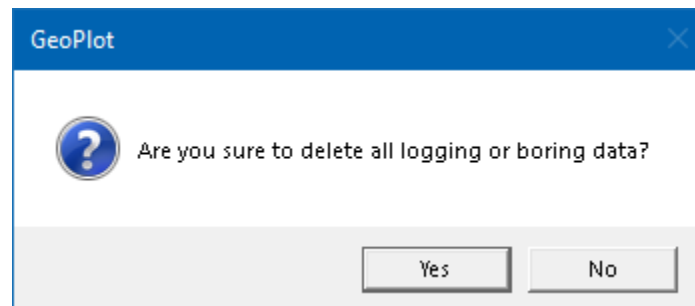


This feature is highly specialized and rarely used. Please contact support@seisimager.com for assistance.

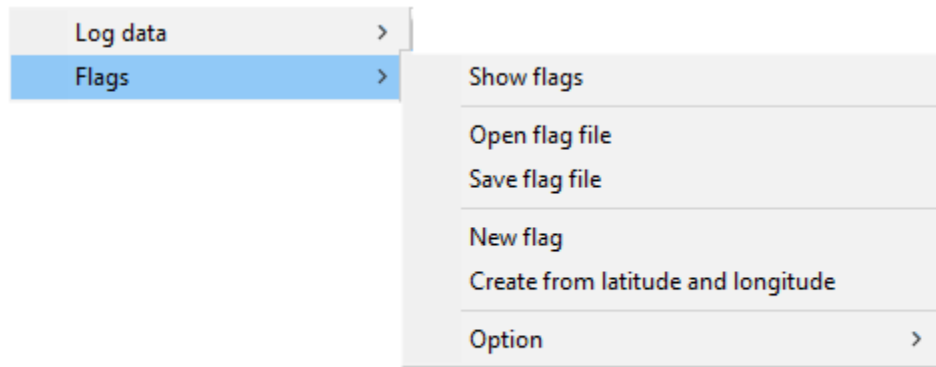
3.6.1.6.3 DELETE ALL LOG DATA



This command deletes all the logs from the plot. Note that log files automatically include flags, so the flags will disappear as well.

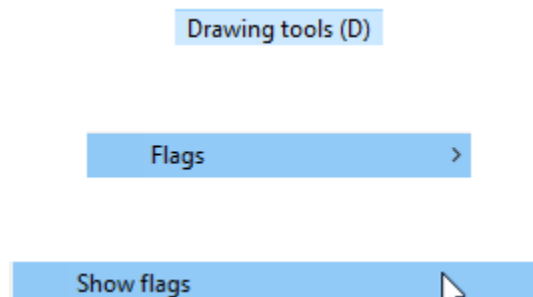


3.6.2 FLAGS



Continue.

3.6.2.1 SHOW FLAGS



Flags (see following sections) may be toggled on and off using the *Show flags* toggle switch.

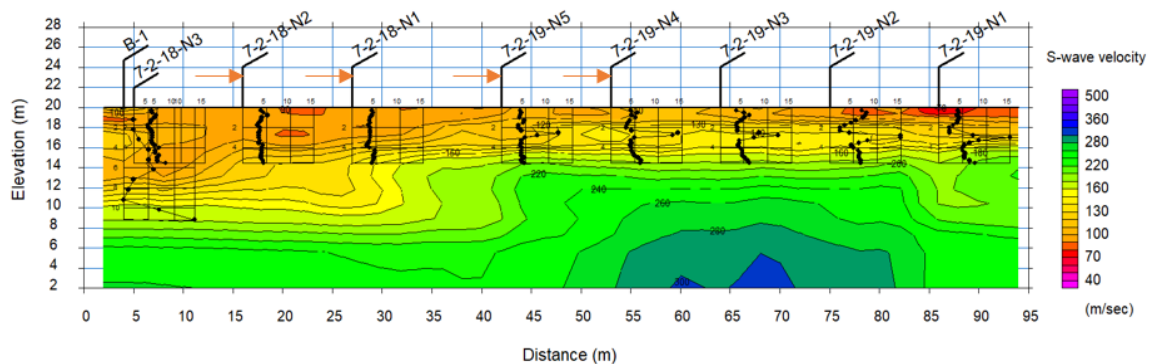
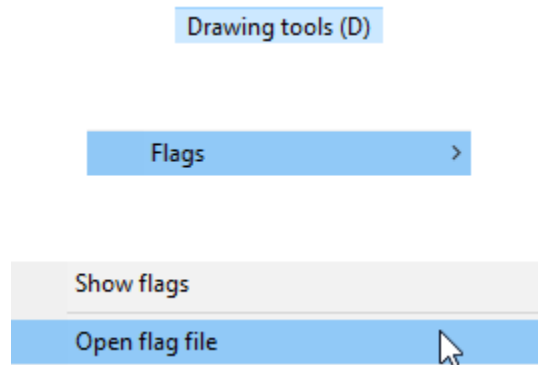


Figure 57: S-wave velocity plot showing flags.

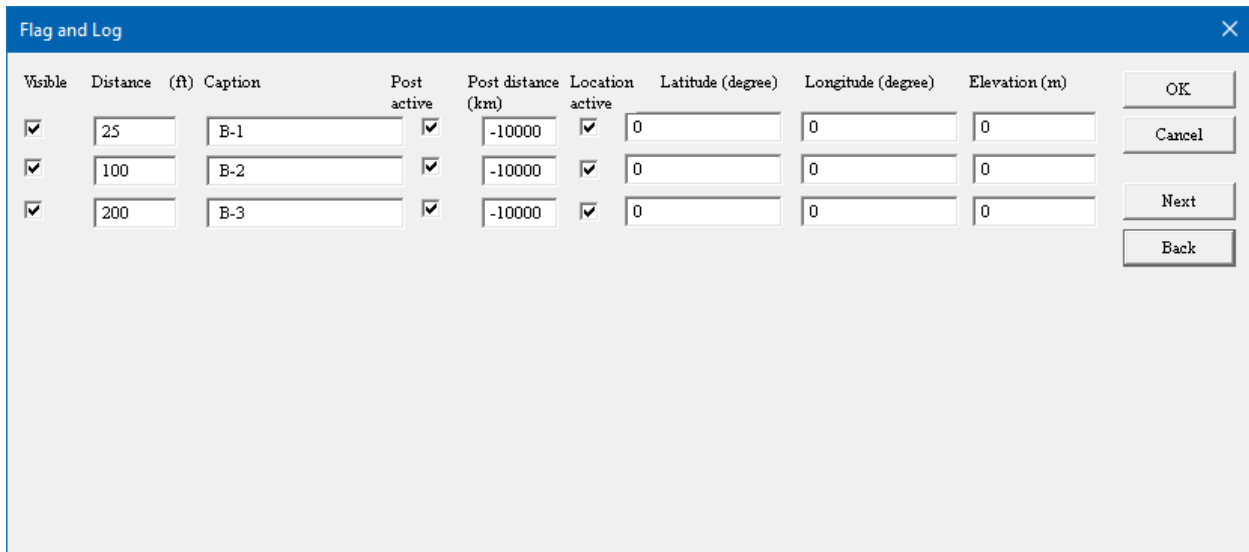
3.6.2.2 OPEN FLAG FILE



This option reads in a flag file of the following ASCII-columnar format and draws the flags on the velocity plot. Annotation is to the right.

```
1, 25.000000, B-1, 1, -10000.000000, 0, 0.000000, 0.000000, 0.000000
1, 100.000000, B-2, 1, -10000.000000, 0, 0.000000, 0.000000, 0.000000
1, 200.000000, B-3, 1, -10000.000000, 0, 0.000000, 0.000000, 0.000000
```

Visible, distance, caption (flag name), post active, post distance, location active, latitude, longitude, elevation.



The 'Flag and Log' dialog box contains a table with the following data:

Visible	Distance (ft)	Caption	Post active	Post distance (km)	Location active	Latitude (degree)	Longitude (degree)	Elevation (m)
<input checked="" type="checkbox"/>	25	B-1	<input checked="" type="checkbox"/>	-10000	<input checked="" type="checkbox"/>	0	0	0
<input checked="" type="checkbox"/>	100	B-2	<input checked="" type="checkbox"/>	-10000	<input checked="" type="checkbox"/>	0	0	0
<input checked="" type="checkbox"/>	200	B-3	<input checked="" type="checkbox"/>	-10000	<input checked="" type="checkbox"/>	0	0	0

Buttons on the right: OK, Cancel, Next, Back.

The flag file may be created outside of GeoPlot, but more commonly, the *Drawing tools / Flags / New flag* command is used to place the flags, and then the *Drawing tools / Flags / Save flag file* command is used to save the flag file in the above format.

In this case, we do not have latitude or longitude, and the elevation of each flag is zero.

Note: If the flag file is created and saved outside of GeoPlot, **make sure that the file name extension is .csv.**

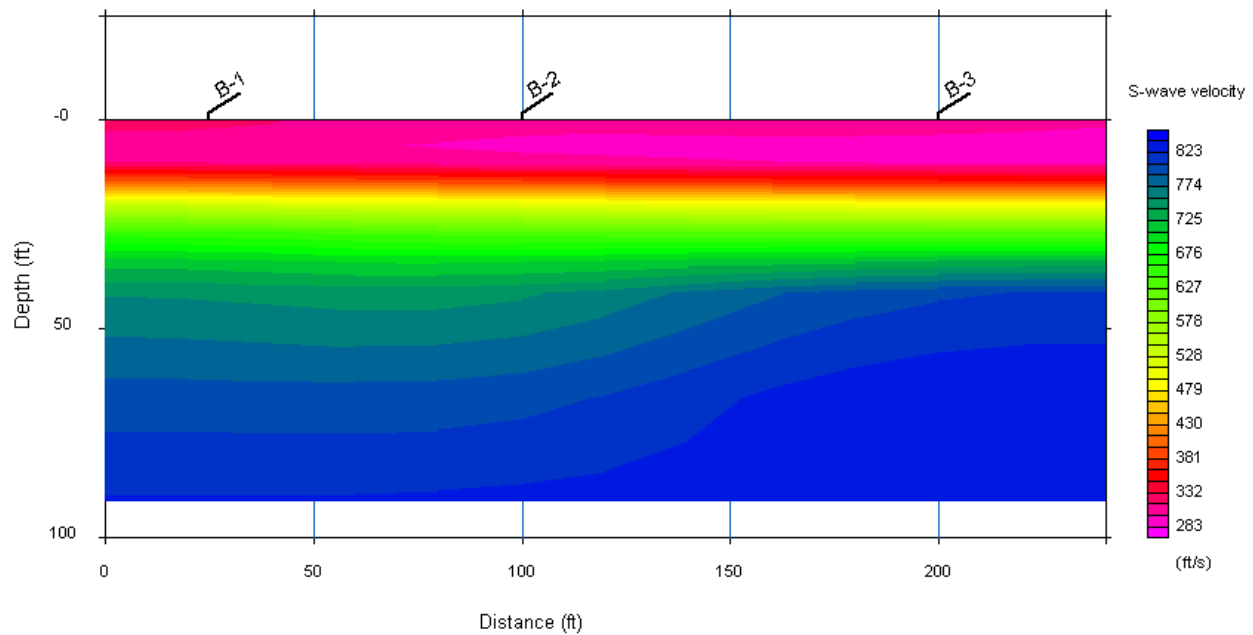
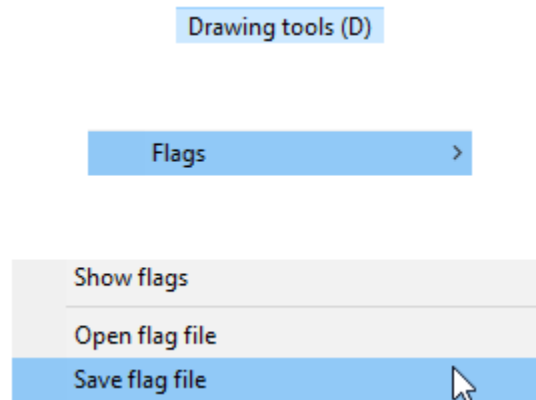


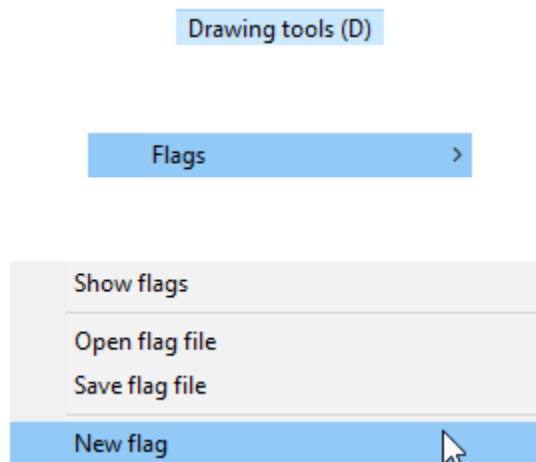
Figure 58: Flags read in and plotted from a flag file.

3.6.2.3 SAVE FLAG FILE



This command saves a flag file as described in the previous section.

3.6.2.4 NEW FLAG



You can add a new flag to a plot by selecting *New flag* and filling out the following dialog box:

Edit flag

Distance

35

(m)

Text on flag

Gravity Measurement

Post distance

0

Angle

30

Text size

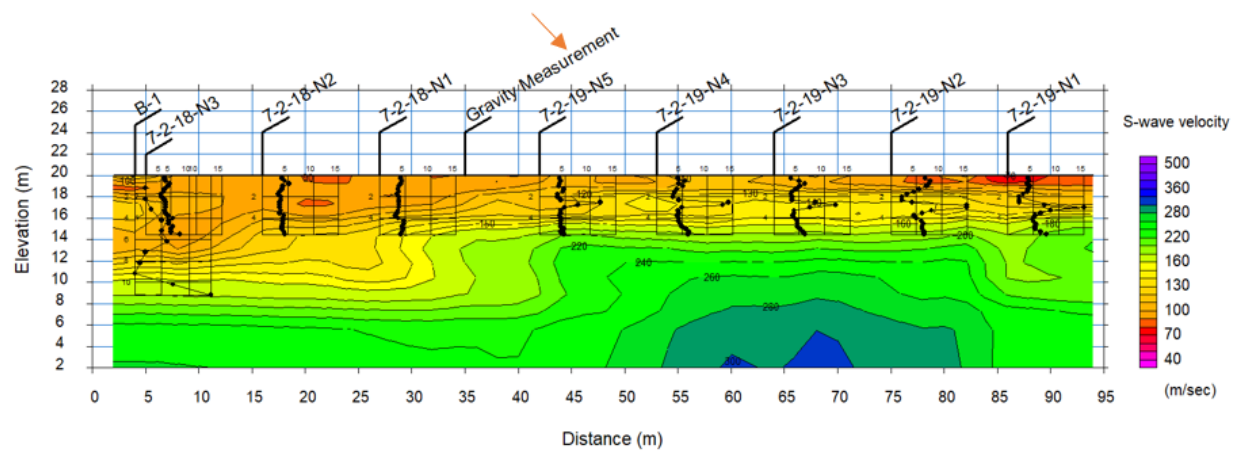
4

(mm)

OK

Cancel

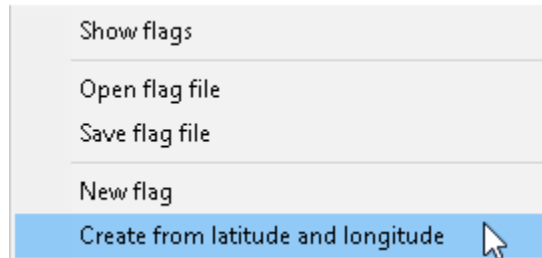
The new flag will appear on the plot.



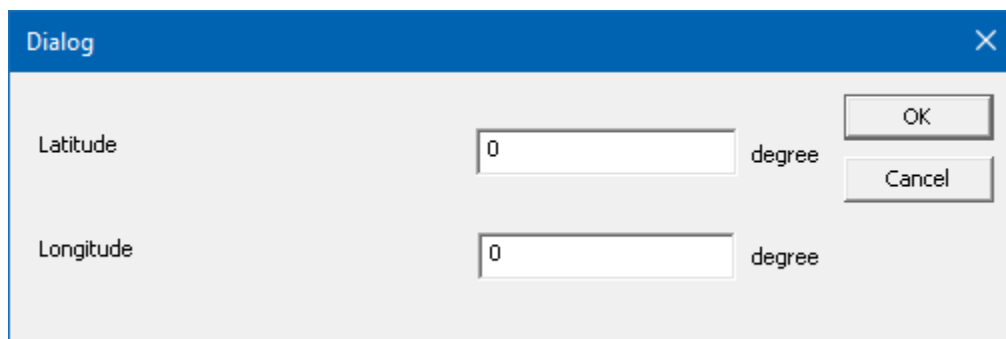
3.6.2.5 CREATE FROM LATITUDE AND LONGITUDE

Drawing tools (D)

Flags

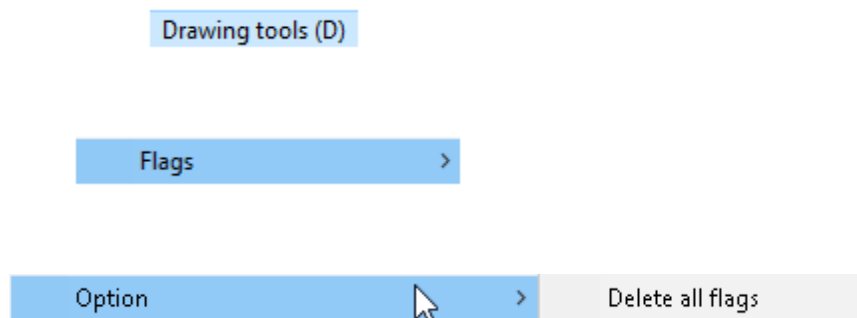


You may add a flag to a plot by selecting *Drawing tools / Flags / Create from latitude and longitude*. The following dialog box will appear:

A screenshot of a dialog box titled 'Dialog'. It has a blue header bar with a close button (X) in the top right corner. The dialog contains two input fields: 'Latitude' and 'Longitude'. Both fields have the value '0' entered. To the right of each input field is the text 'degree'. In the bottom right corner of the dialog, there are two buttons: 'OK' and 'Cancel'.

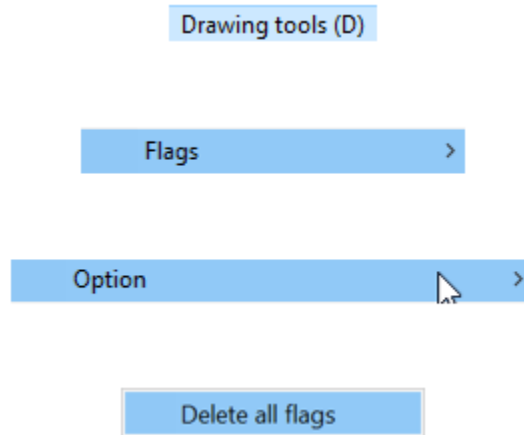
Key in or paste in the latitude and longitude of the flag and press *OK*.

3.6.2.6 OPTION



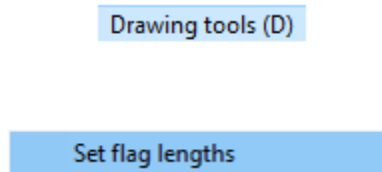
Continue.

3.6.2.6.1 DELETE ALL FLAGS



You may delete the flags from a plot by selecting *Drawing tools / Flags / Option / Delete all flags*.

3.6.3 SET FLAG LENGTHS



Flag lengths can be adjusted manually. Select *Drawing tools / Set flag lengths*. A small circle will appear on each flag. Click (the circle will turn red) and drag the circle up or down to adjust the flag length. Right-click when done.

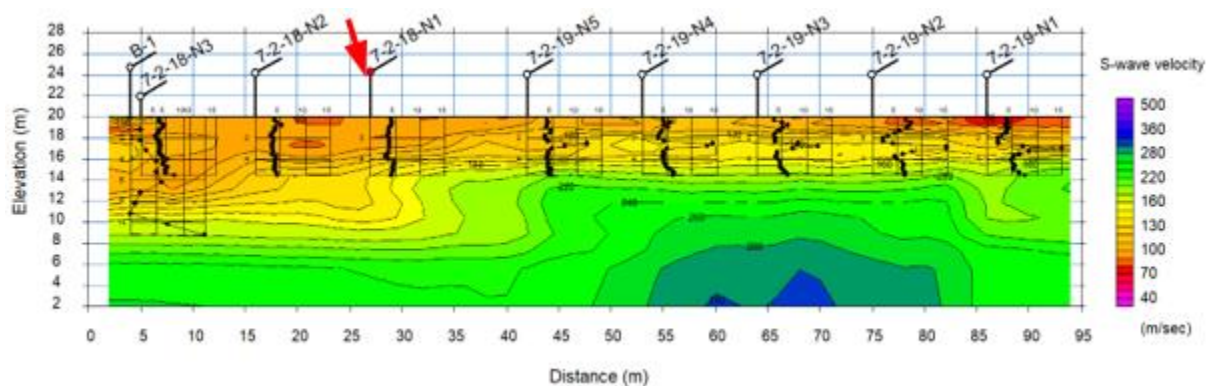


Figure 59: Adjusting the flag length. 7-2-18-N1 has been selected for adjustment.

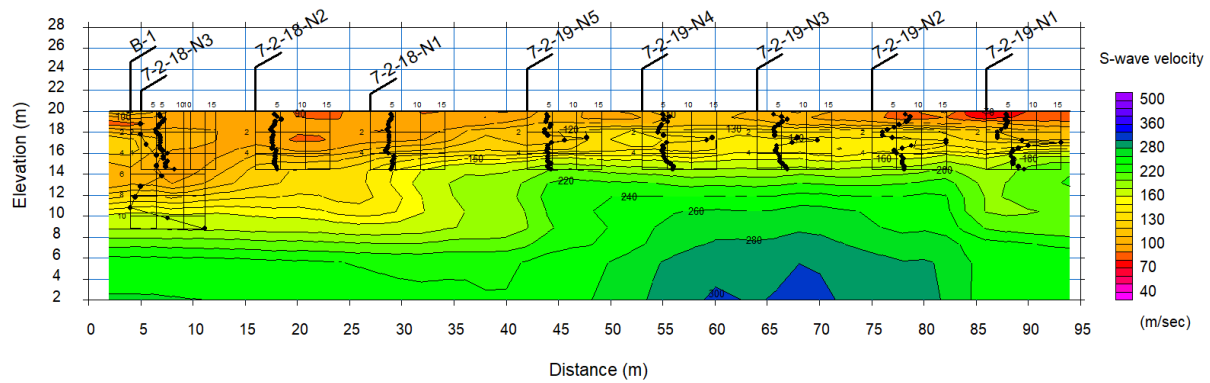


Figure 60: Adjusted flag.

3.6.4 SETUP ALL FLAGS

Drawing tools (D)

Setup all flags

Choose *Setup all flags* to set the flag angle and text size. This will apply to all flags in the plot.

Edit flag

OK

Cancel

Angle

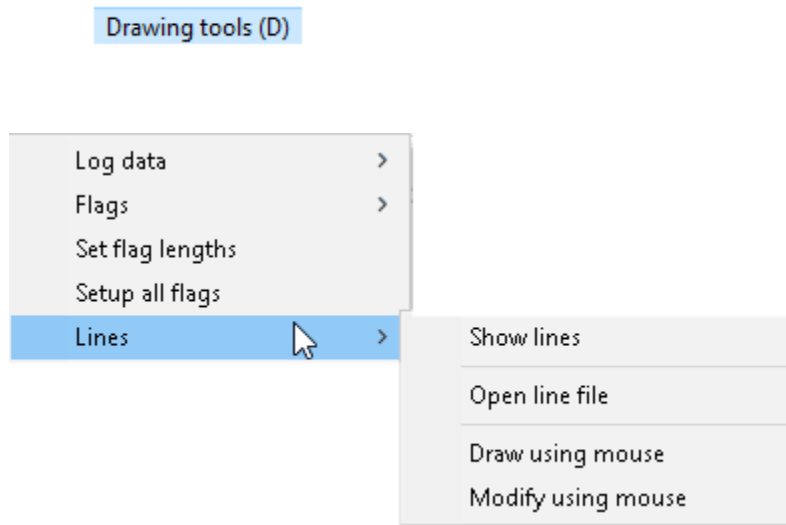
30

Text size

4

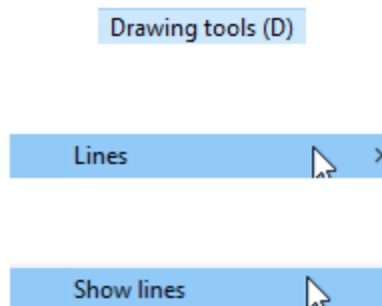
(mm)

3.6.5 LINES



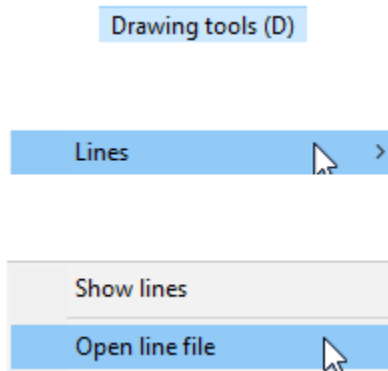
Continue.

3.6.5.1 SHOW LINES

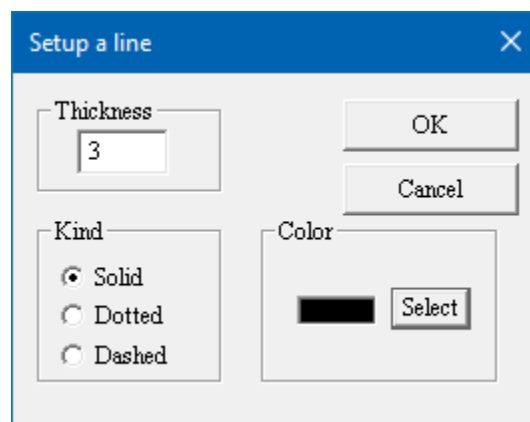


If you have drawn lines on the plot (see following sections), you may determine whether they are displayed by using the *Show lines* toggle switch.

3.6.5.2 OPEN LINE FILE

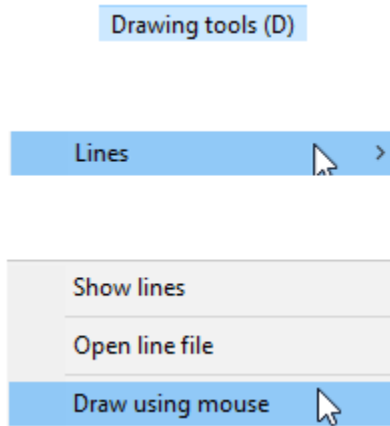


A line file is an ASCII-columnar x,z file that defines a line. It can be delimited by spaces, commas, or tabs. Opening a line file will display it on the section. You may then double-click on the line to reveal the following dialog box:



Set your line properties and press *OK*.

3.6.5.3 DRAW USING MOUSE



Lines may be drawn on the plot by selecting *Lines / Draw using mouse*.

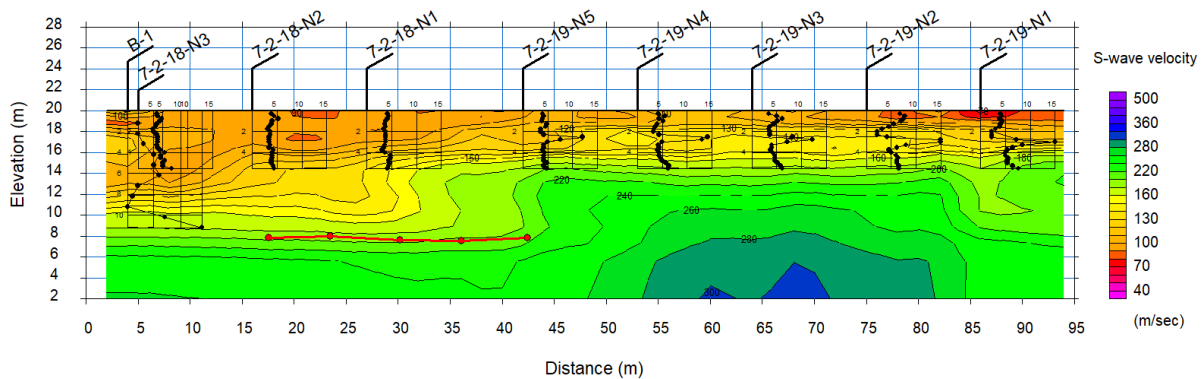


Figure 61: Drawing a line on a plot.

Use the left mouse button to create the nodes of the line, double-clicking on the last node.

Note: Left clicking on the section will result in values being displayed, as shown below. You may eliminate them by right-clicking.

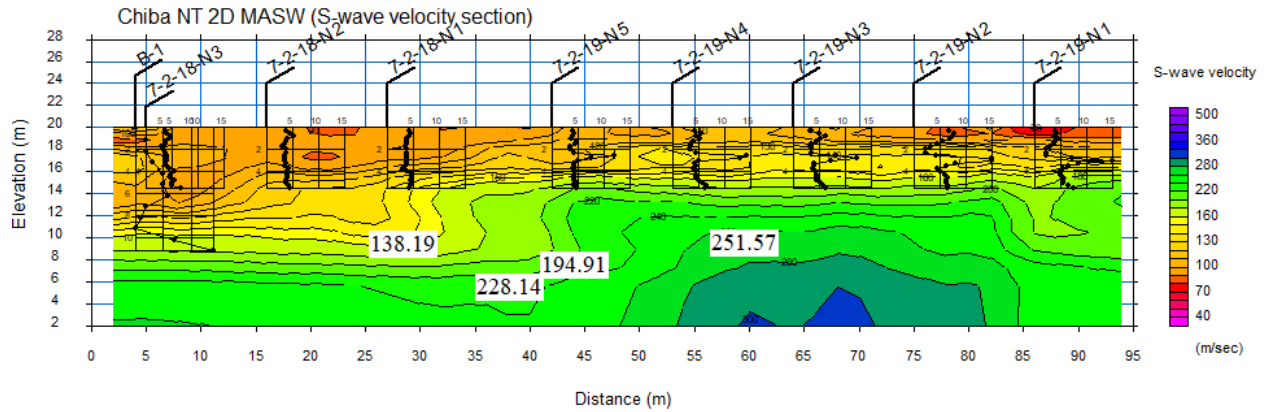
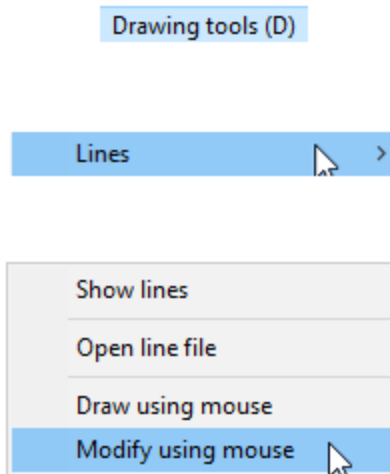


Figure 62: Velocity labels displayed on an S-wave velocity plot, a result of left-clicking on the section. To remove them, simply right-click anywhere on the plot.

3.6.5.4 MODIFY USING MOUSE



Existing lines may be modified by selecting *Modify using mouse*. When you choose this option, all lines on the plot will become “active” and the nodes will be displayed, as shown below.

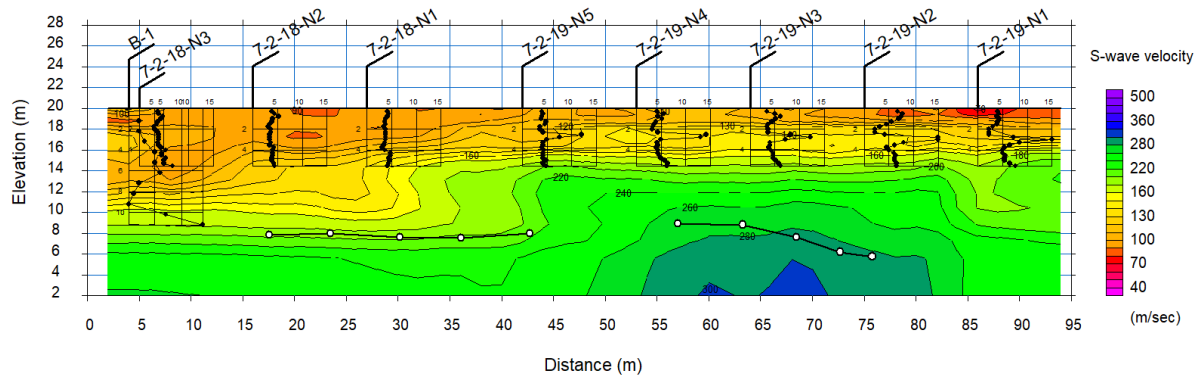
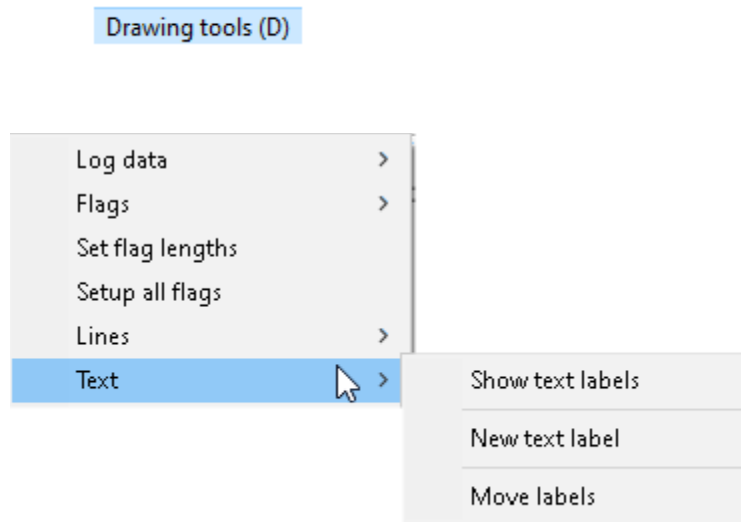


Figure 63: Modifying an existing line with the mouse.

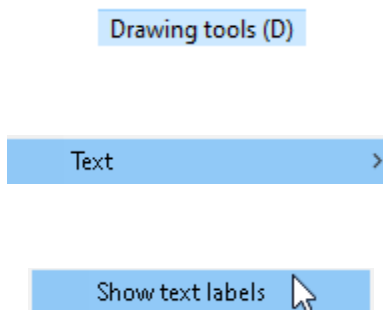
Click and drag the nodes as desired, and right-click when done.

3.6.6 TEXT



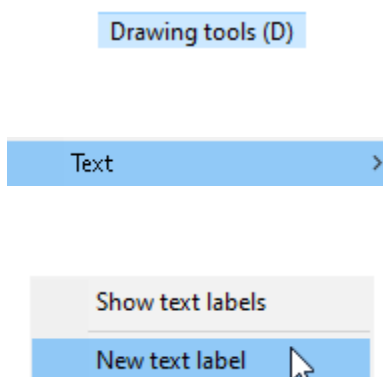
Continue.

3.6.6.1 SHOW TEXT LABELS



If you have added text labels to the plot (see following sections), you may determine whether they are displayed by using the *Show text labels* toggle switch.

3.6.6.2 NEW TEXT LABEL



Text labels may be added to the plot by selecting *New text label*. Then click on the plot where you want the text label to reside; a red dot will appear, and the **Text input** dialog box will appear. Enter the specifics and press *OK*. Your text label will appear on the plot to the right of where the red dot was.

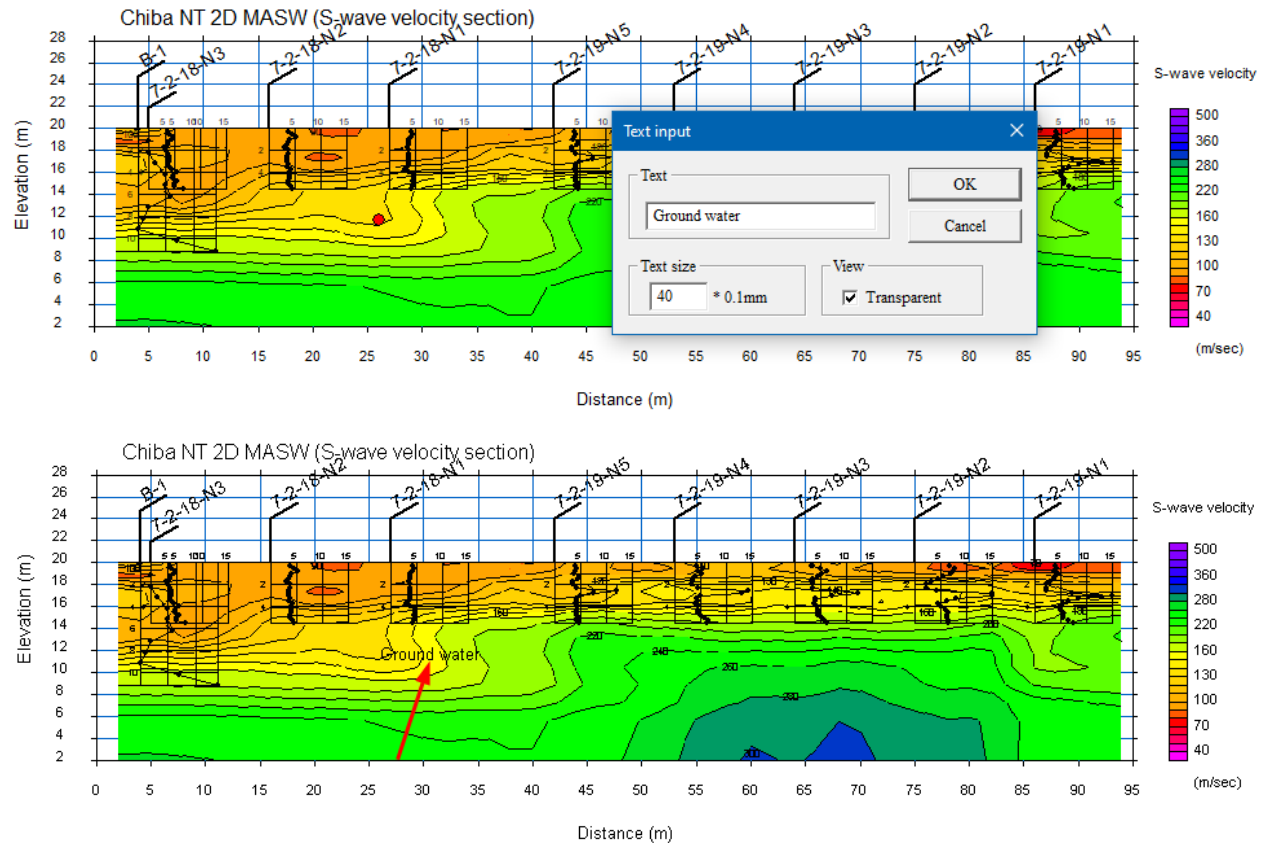
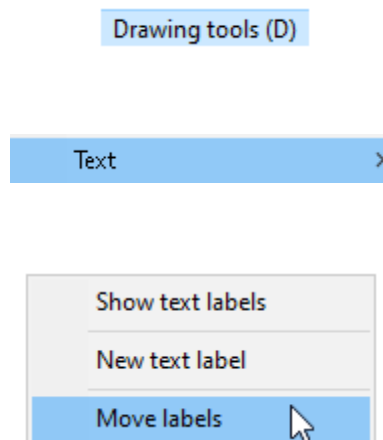


Figure 64: Adding a text label to a plot (see arrow)

3.6.6.3 MOVE LABELS



To move an existing label, select *Move labels*, click on the text label you wish to move, and drag it to the new position.

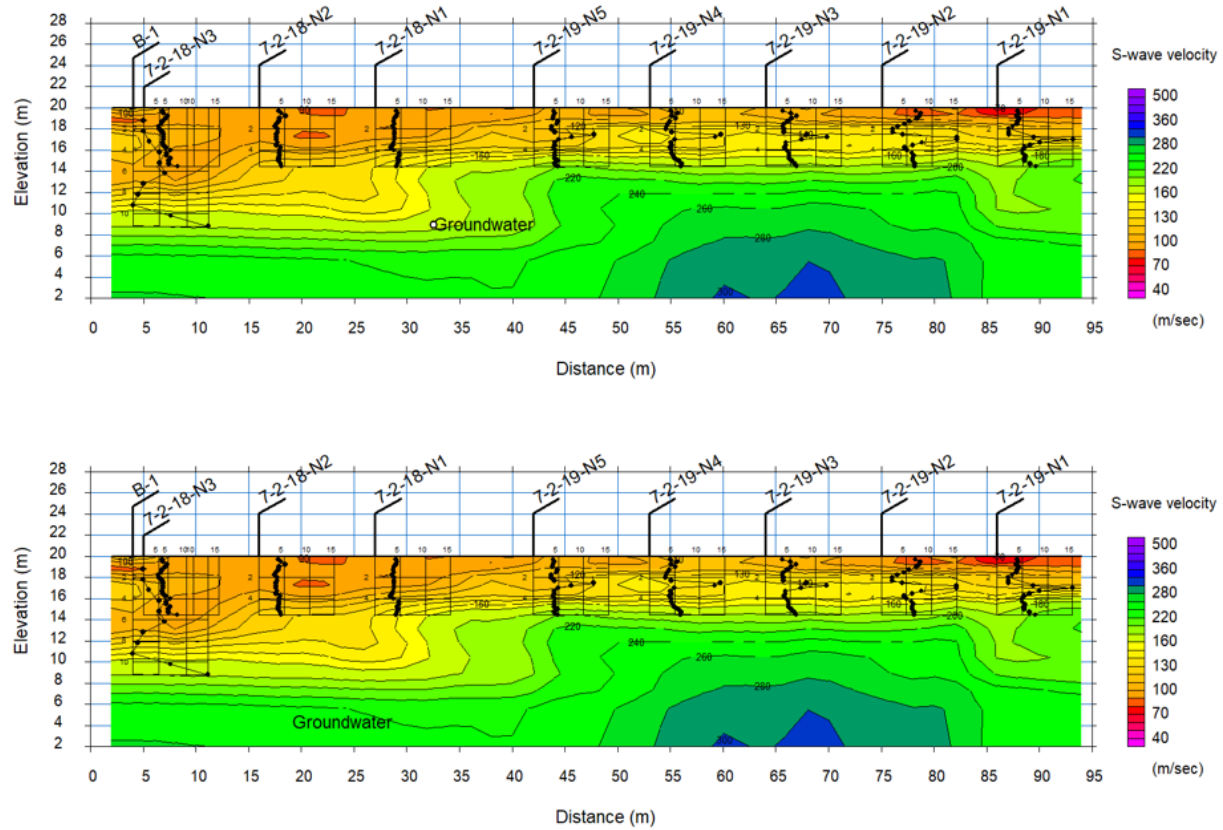
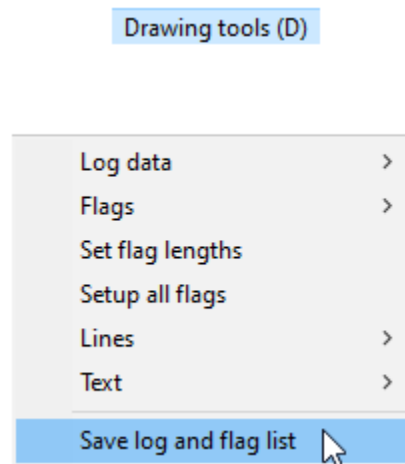


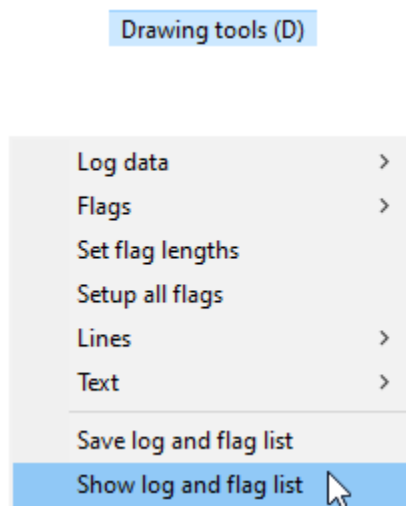
Figure 65: Moving a text label.

3.6.7 SAVE LOG AND FLAG LIST



Flags and logs may be saved to a file for later retrieval. Select *Save log and flag list* and provide a file name.

3.6.8 SHOW LOG AND FLAG LIST



You may update the flags (whether they are visible, their distance along the line, flag caption etc.) here. If you have questions about these items, please contact support@seisimager.com.

Visible	Distance (m)	Caption	Post active	Post distance (km)	Location active	Latitude (degree)	Longitude (degree)	Elevation (m)
<input checked="" type="checkbox"/>	4	B-1	<input checked="" type="checkbox"/>	-10000	<input checked="" type="checkbox"/>	0	0	20
<input checked="" type="checkbox"/>	5	7-2-18-N3	<input checked="" type="checkbox"/>	-10000	<input checked="" type="checkbox"/>	0	0	20
<input checked="" type="checkbox"/>	16	7-2-18-N2	<input checked="" type="checkbox"/>	-10000	<input checked="" type="checkbox"/>	0	0	20
<input checked="" type="checkbox"/>	27	7-2-18-N1	<input checked="" type="checkbox"/>	-10000	<input checked="" type="checkbox"/>	0	0	20
<input checked="" type="checkbox"/>	42	7-2-19-N5	<input checked="" type="checkbox"/>	-10000	<input checked="" type="checkbox"/>	0	0	20
<input checked="" type="checkbox"/>	53	7-2-19-N4	<input checked="" type="checkbox"/>	-10000	<input checked="" type="checkbox"/>	0	0	20
<input checked="" type="checkbox"/>	64	7-2-19-N3	<input checked="" type="checkbox"/>	-10000	<input checked="" type="checkbox"/>	0	0	20
<input checked="" type="checkbox"/>	75	7-2-19-N2	<input checked="" type="checkbox"/>	-10000	<input checked="" type="checkbox"/>	0	0	20
<input checked="" type="checkbox"/>	86	7-2-19-N1	<input checked="" type="checkbox"/>	-10000	<input checked="" type="checkbox"/>	0	0	20

Visible: Check this box if want the flag or log (and flag) visible on the plot.

Distance: Distance of flag or log from end of line.

Caption: Label applied to flag or log.

Post Active: Checking this box enables the *Post distance* field.

Post distance: Posts are rarely used. If you wish to use posts in your cross-section, please contact support@seisimager.com.

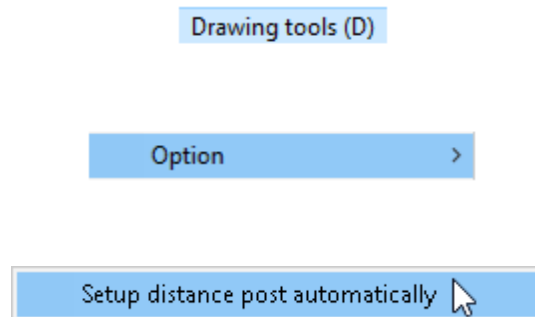
Location active: Checking this box enables the latitude, longitude, and elevation fields. These are self-evident.

3.6.9 OPTION



Continue.

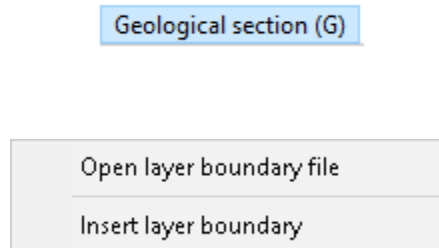
3.6.9.1 SETUP DISTANCE POST AUTOMATICALLY



This feature is highly specialized and rarely used. Please contact support@seisimager.com for assistance.

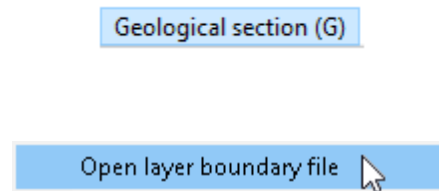
3.7 GEOLOGICAL SECTION MENU

Click on *Geological Section* to reveal the **Geological Section** menu:



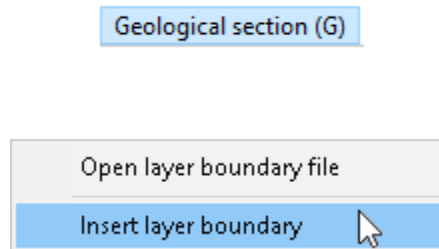
Continue.

3.7.1 OPEN LAYER BOUNDARY FILE



This feature is highly specialized and rarely used. Please contact support@seisimager.com for assistance.

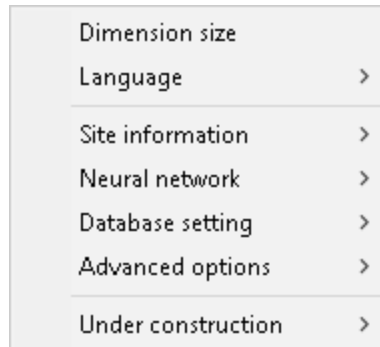
3.7.2 INSERT LAYER BOUNDARY



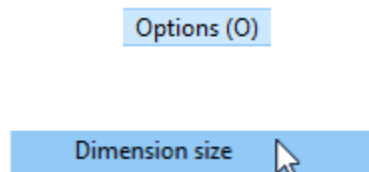
This feature is highly specialized and rarely used. Please contact support@seisimager.com for assistance.

3.8 OPTIONS MENU

Click on *Options* to reveal the **Options** menu:



3.8.1 DIMENSION SIZE



To view or change the program data input allowances, select *Dimension size*.

Dimension size [X]

WARNING: The default program dimensions may be increased; however, your PC memory may be insufficient for larger dimensions. You may encounter an error next time you try to open the program and the dimensions will need to be reduced.

To reduce the dimensions, press the Shift key when double-clicking the program icon (consult the manual for full details).

	Present size	Maximum size
# of sections	<input type="text" value="20"/>	<input type="text" value="5000"/>
# of horizontal cells	<input type="text" value="1000"/>	<input type="text" value="10001"/>
# of vertical cells	<input type="text" value="100"/>	<input type="text" value="1001"/>

☐ Change dimension size

Password for upgrade

Your keyword is

OK

isv=31

1 SW3D

Present size reflects the current dimensions for # of sections, # of horizontal cells, and # of vertical cells. *Maximum size* shows the largest possible dimensions.

To change the dimensions, enter the new value(s), check *Change dimension size*, and press *OK*.

Dimension size [X]

WARNING: The default program dimensions may be increased; however, your PC memory may be insufficient for larger dimensions. You may encounter an error next time you try to open the program and the dimensions will need to be reduced.

To reduce the dimensions, press the Shift key when double-clicking the program icon (consult the manual for full details).

	Present size	Maximum size
# of sections	<input type="text" value="40"/>	<input type="text" value="5000"/>
# of horizontal cells	<input type="text" value="1500"/>	<input type="text" value="10001"/>
# of vertical cells	<input type="text" value="500"/>	<input type="text" value="1001"/>

☒ Change dimension size

Password for upgrade

Your keyword is

OK

isv=31

1 SW3D

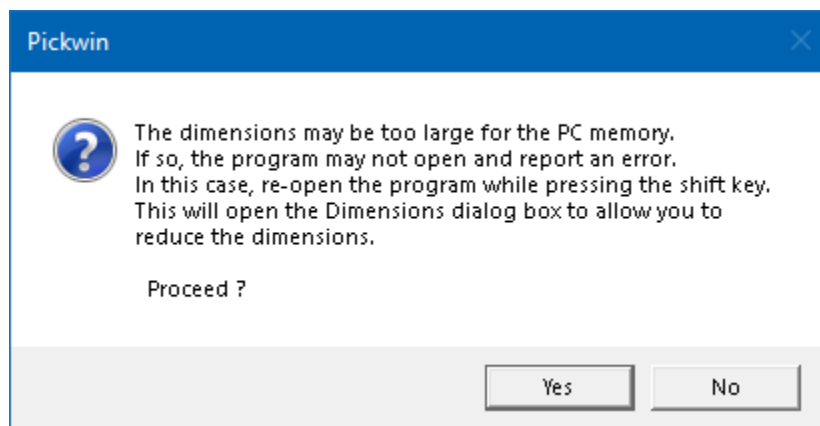
GeoPlot [X]

Memory has been allocated !

OK

Press *OK* and restart the program.

Note: If a very large value is entered, a warning message will appear before you are allowed to restart the program. It is recommended that you do not proceed; select **No** and reduce the dimensions.

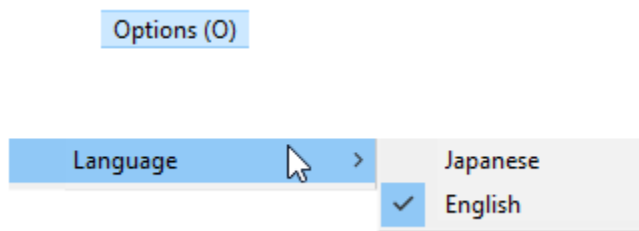


If you proceed and indeed the PC has insufficient memory, the program will no longer be able to open. To lower the values and recover the program, open the **Dimension size** dialog box directly by pressing the *Shift* key while double-clicking the program icon.

***Note:** Sometimes the program will simply crash rather than post the above message. If that happens, use the procedure outlined on Page [3](#) to restore the system defaults.*

If a program upgrade is purchased, the new registration password can be directly entered in the **Dimension size** dialog box in the *Password for upgrade* field; however, it is strongly recommended to upgrade via the SeisImager Registration program instead.

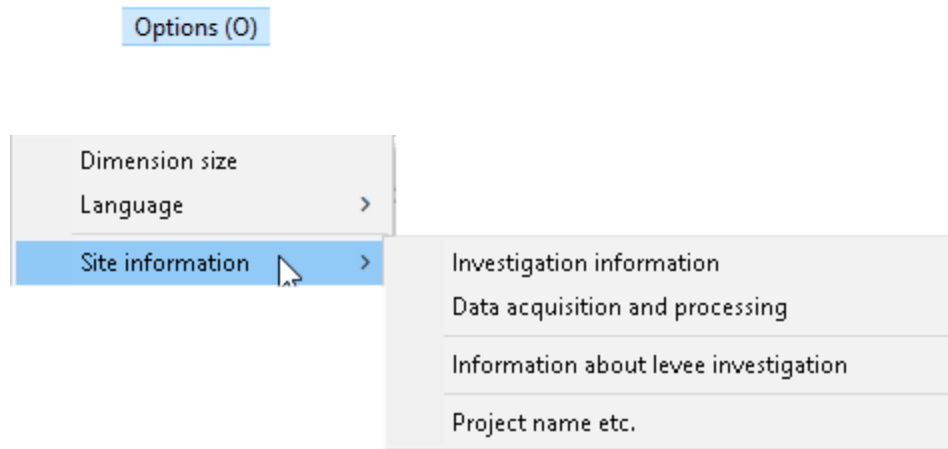
3.8.2 LANGUAGE



You may toggle the language between Japanese and English.

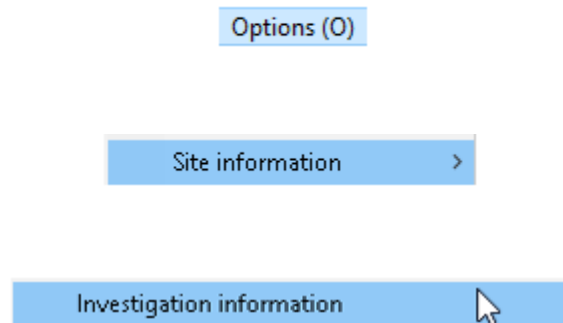
***Note:** This only affects the labels on the plot. It does not affect the program menus.*

3.8.3 SITE INFORMATION

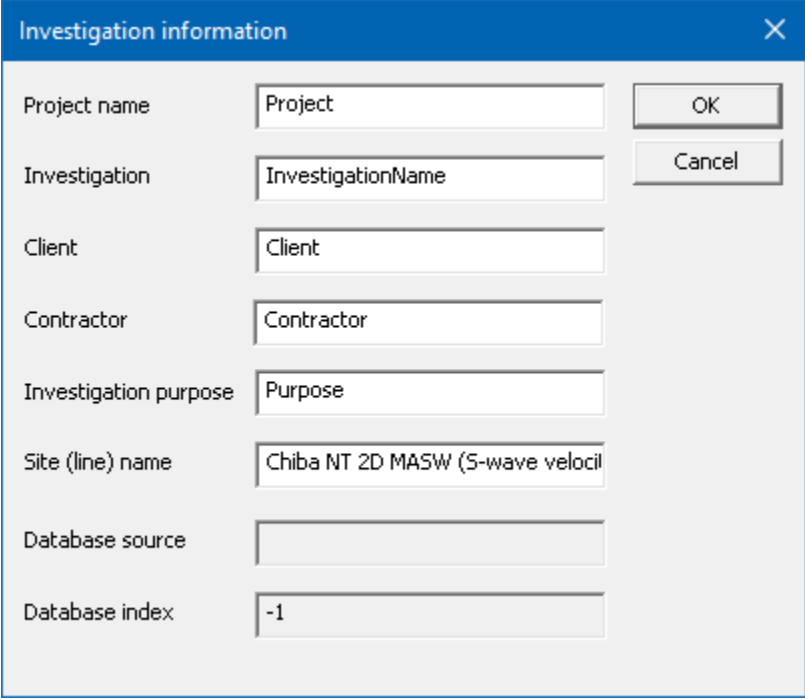


Continue.

3.8.3.1 INVESTIGATION INFORMATION



Selecting *Options / Site information / Investigation information* brings up the following optional form.



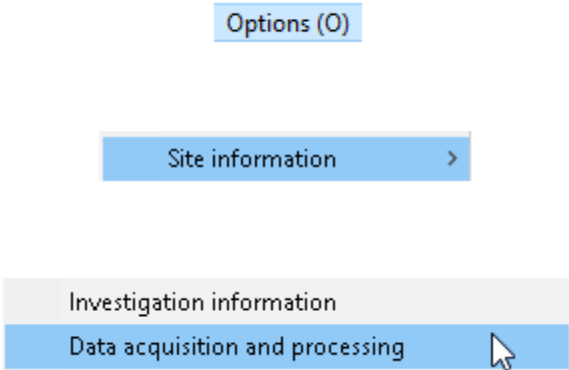
The dialog box titled "Investigation information" contains the following fields and buttons:

Field	Value
Project name	Project
Investigation	InvestigationName
Client	Client
Contractor	Contractor
Investigation purpose	Purpose
Site (line) name	Chiba NT 2D MASW (S-wave velocit
Database source	
Database index	-1

Buttons: OK, Cancel

Fill it out accordingly and press *OK*. This information will now be stored in the GeoPlot (.geo) file.

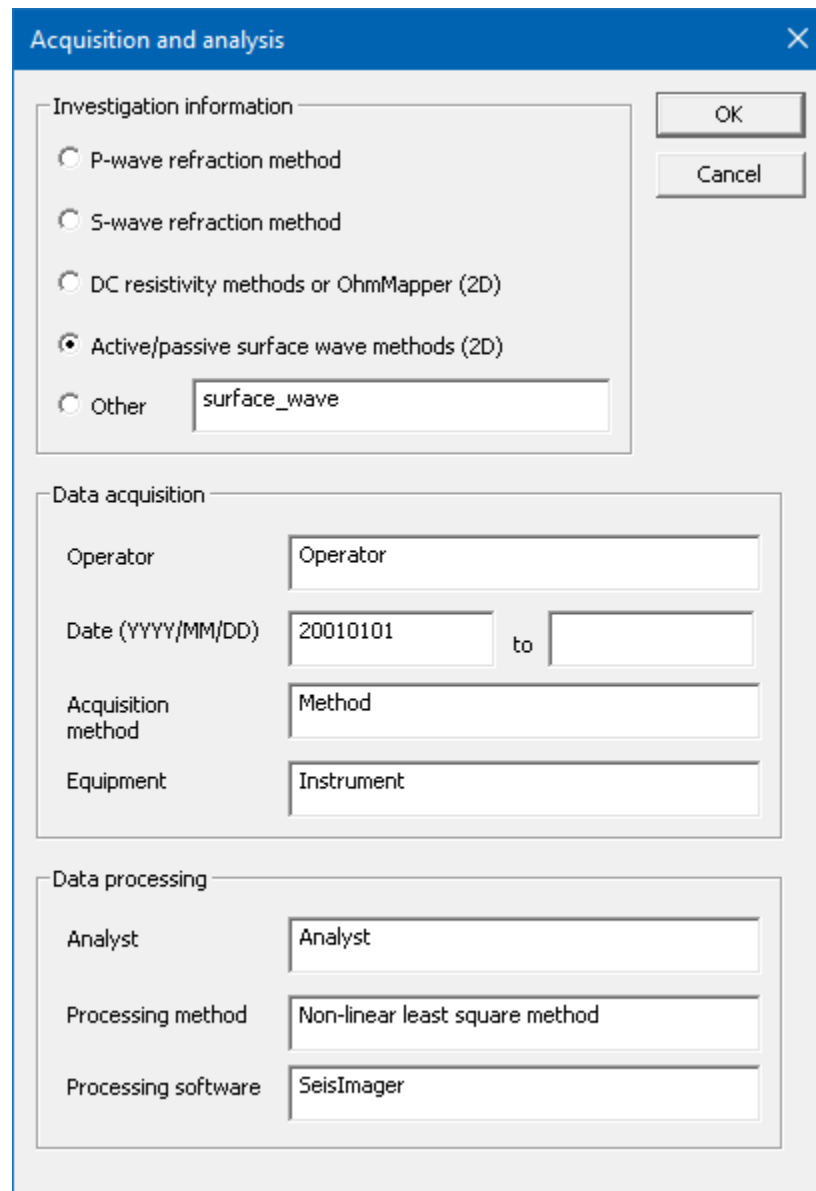
3.8.3.2 DATA ACQUISITION AND PROCESSING



The navigation menu consists of the following items:

- Options (0)
- Site information >
- Investigation information
- Data acquisition and processing (highlighted with a mouse cursor)

Selecting *Options / Site information / Data Acquisition and processing* brings up the following optional form.



The dialog box titled "Acquisition and analysis" contains three main sections: Investigation information, Data acquisition, and Data processing. The Investigation information section has five radio buttons: P-wave refraction method, S-wave refraction method, DC resistivity methods or OhmMapper (2D), Active/passive surface wave methods (2D) (which is selected), and Other. The Other option has a text field containing "surface_wave". The Data acquisition section has four text fields: Operator, Date (YYYY/MM/DD) with a value of 20010101 and a "to" field, Acquisition method with a value of Method, and Equipment with a value of Instrument. The Data processing section has three text fields: Analyst, Processing method with a value of Non-linear least square method, and Processing software with a value of SeisImager. There are OK and Cancel buttons in the top right corner.

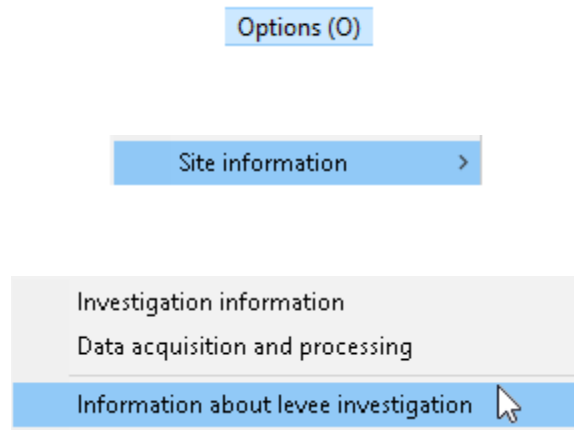
Investigation information	
<input type="radio"/>	P-wave refraction method
<input type="radio"/>	S-wave refraction method
<input type="radio"/>	DC resistivity methods or OhmMapper (2D)
<input checked="" type="radio"/>	Active/passive surface wave methods (2D)
<input type="radio"/>	Other <input type="text" value="surface_wave"/>

Data acquisition	
Operator	<input type="text" value="Operator"/>
Date (YYYY/MM/DD)	<input type="text" value="20010101"/> to <input type="text"/>
Acquisition method	<input type="text" value="Method"/>
Equipment	<input type="text" value="Instrument"/>

Data processing	
Analyst	<input type="text" value="Analyst"/>
Processing method	<input type="text" value="Non-linear least square method"/>
Processing software	<input type="text" value="SeisImager"/>

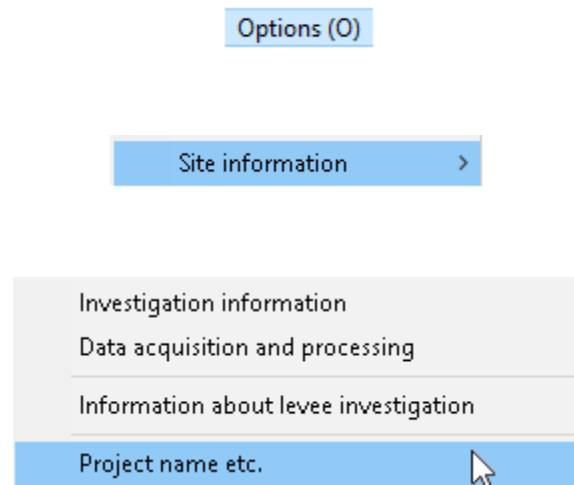
Fill it out accordingly and press *OK*. This information will now be stored in the GeoPlot (.geo) file.

3.8.3.3 INFORMATION ABOUT LEVEE INVESTIGATION



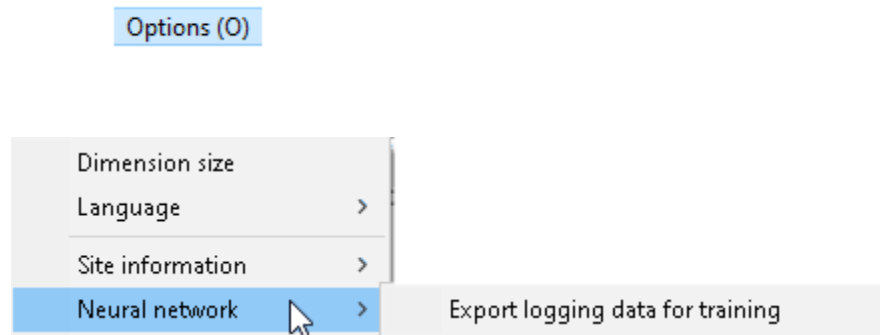
This feature is highly specialized and rarely used. Please contact support@seisimager.com for assistance.

3.8.3.4 PROJECT NAME, ETC.



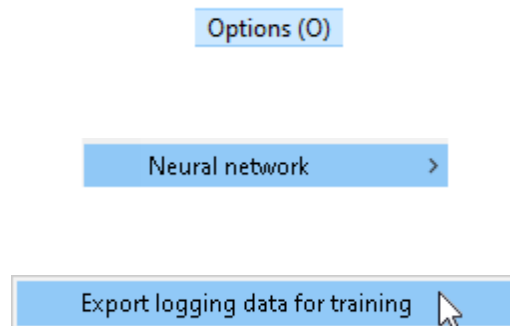
This feature is highly specialized and rarely used. Please contact support@seisimager.com for assistance.

3.8.4 NEURAL NETWORK



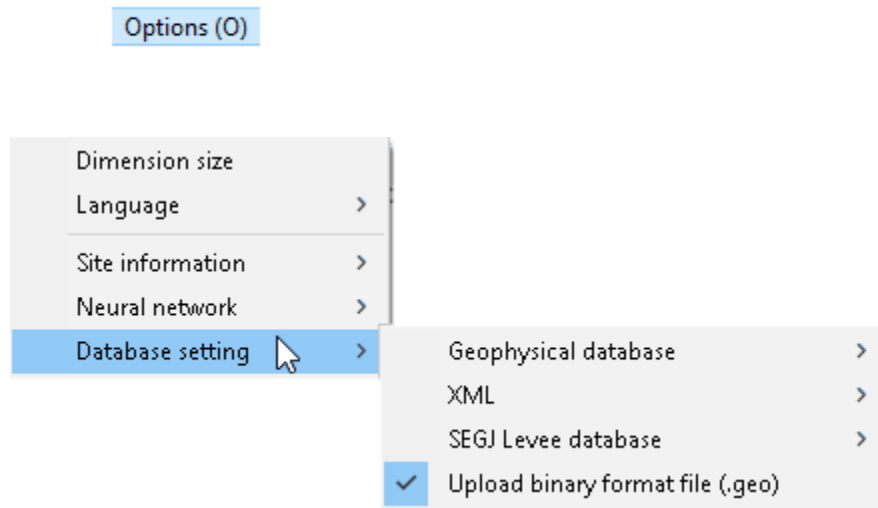
Continue.

3.8.4.1 EXPORT LOGGING DATA FOR TRAINING



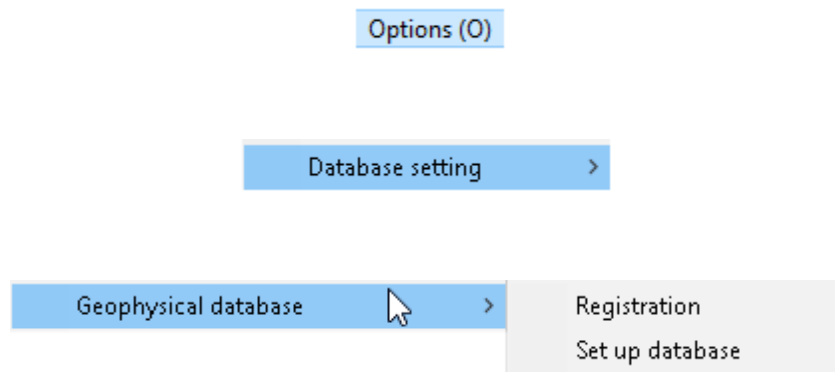
This feature is highly specialized and rarely used. Please contact support@seisimager.com for assistance

3.8.5 DATABASE SETTING



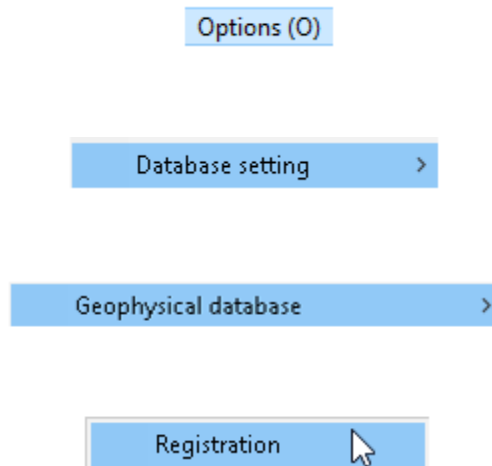
Continue.

3.8.5.1 GEOPHYSICAL DATABASE



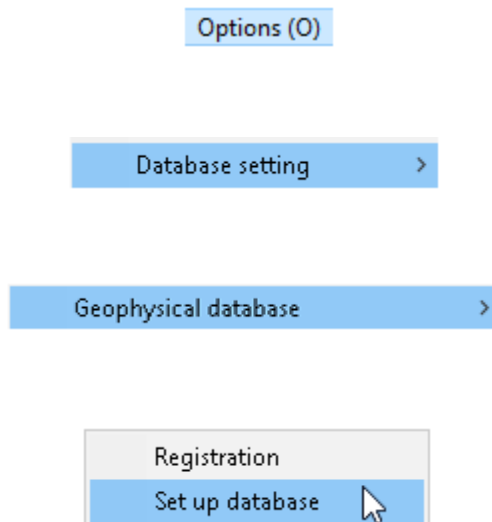
Continue.

3.8.5.1.1 REGISTRATION



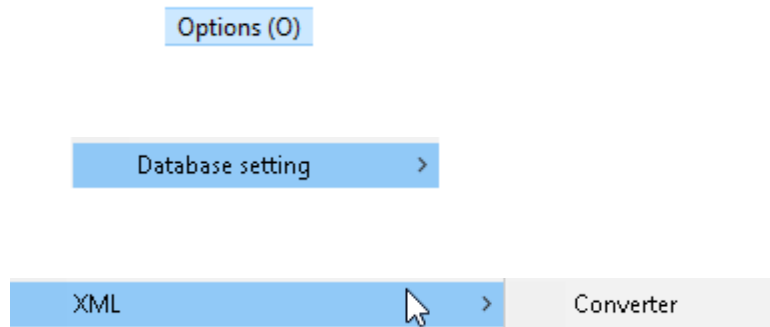
This feature is highly specialized and rarely used. Please contact support@seisimager.com for assistance.

3.8.5.1.2 SETUP DATABASE



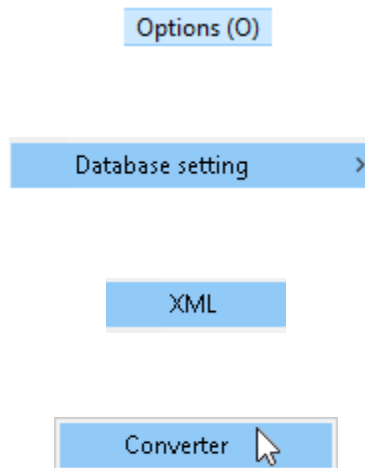
This feature is highly specialized and rarely used. Please contact support@seisimager.com for assistance.

3.8.5.2 XML



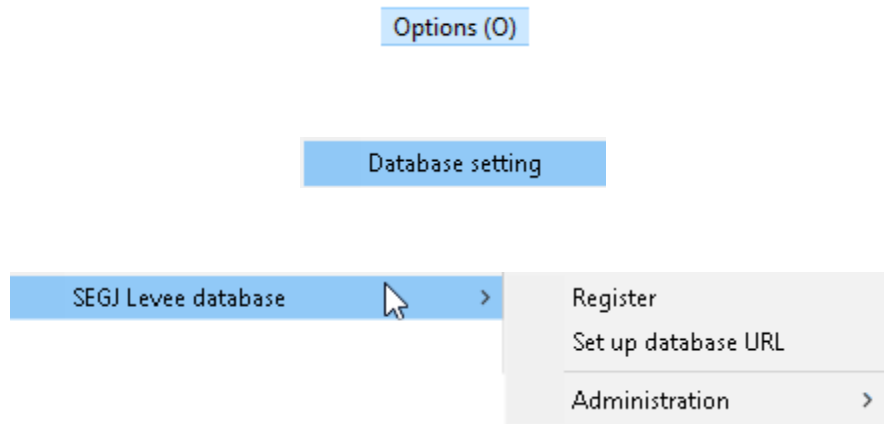
Continue.

3.8.5.2.1 CONVERTER



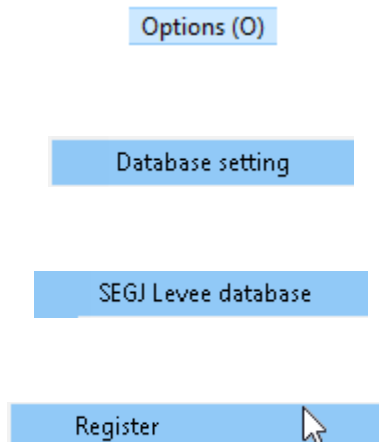
This feature is highly specialized and rarely used. Please contact support@seisimager.com for assistance.

3.8.5.3 SEGJ LEVEE DATABASE



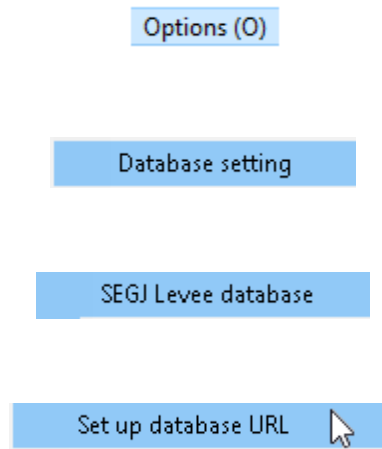
Continue.

3.8.5.3.1 REGISTER

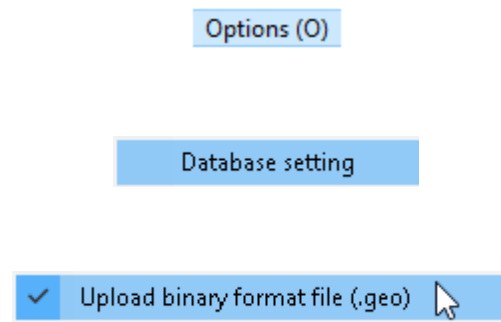


This feature is highly specialized and rarely used. Please contact support@seisimager.com for assistance.

3.8.5.3.2 SET UP DATABASE URL

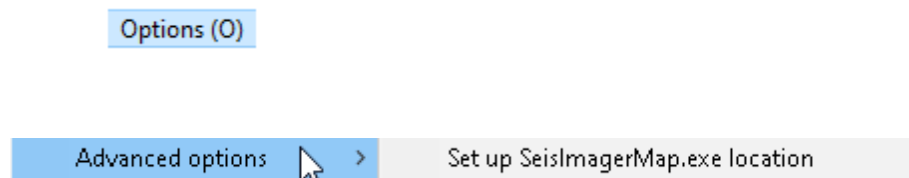


3.8.5.4 UPLOAD BINARY FORMAT FILE (.GEO)



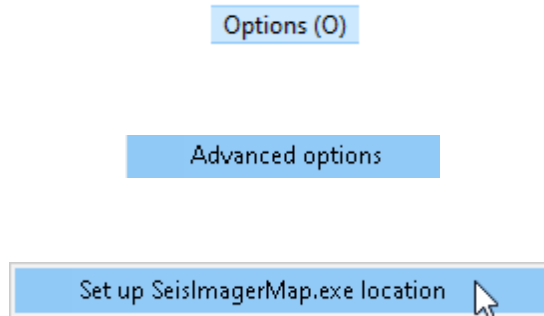
This feature is highly specialized and rarely used. Please contact support@seisimager.com for assistance.

3.8.6 ADVANCED OPTIONS



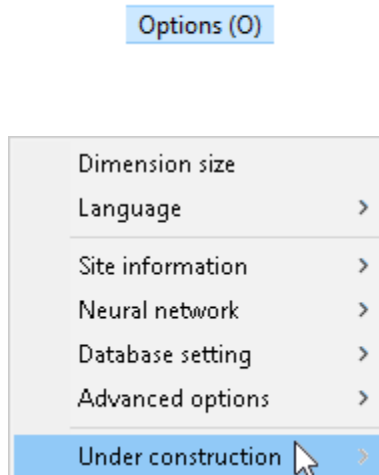
Continue.

3.8.6.1 SETUP SEISIMAGERMAP.EXE LOCATION



SeisImagerMap allows you to show your survey lines on a Google Map if you have it installed and if your data is tagged with latitude and longitude. If you have installed SeisImagerMap.exe, this function will allow you to tell SeisImager the path. See Section [3.3.1.30](#) on Page 53.

3.8.7 UNDER CONSTRUCTION



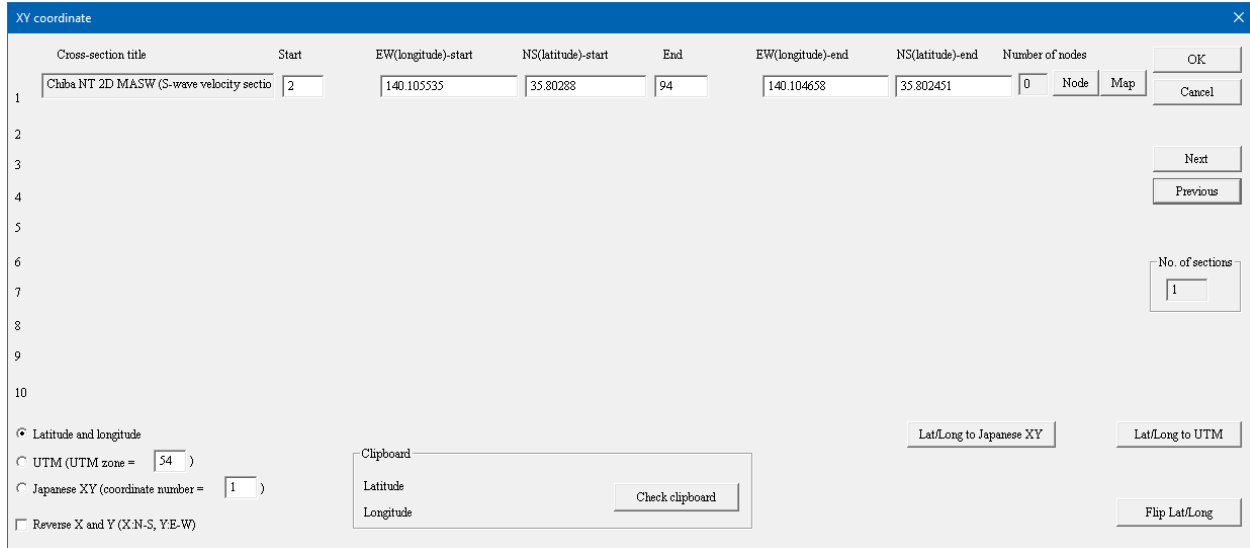
This is just a placeholder for future features.

APPENDICES

APPENDIX A PROCEDURE FOR PLOTTING A VELOCITY SECTION OR GRID ON A GOOGLE MAP

You may use GeoPlot and SeisImagerMap (see Note on Page [92](#) and Section [3.8.6.1](#) on Page 246) to plot a survey line or grid on a Google Maps basemap. To do so, you must first assign latitude and longitude to the ends of each section. There are two ways you can accomplish this. The first is to type them in – this assumes you used a GPS receiver in the field and located the end of each line. The second is to extract them from Google Maps.

If you have field-measured latitudes and longitudes (or UTM coordinates), select *Edit / XY coordinates (latitude - longitude / Show XY coordinates* (or press *Ctrl+G*), type them in to the dialog box, and indicate the coordinate type in the lower left-hand corner. If you use UTM coordinates, be sure to indicate the UTM zone.




	Cross-section title	Start	EW(longitude)-start	NS(latitude)-start	End	EW(longitude)-end	NS(latitude)-end	Number of nodes
1	Chiba NT 2D MASW (S-wave velocity section)	2	140.105535	35.80288	94	140.104658	35.802451	0
2								
3								
4								
5								
6								
7								
8								
9								
10								

☒ Latitude and longitude
☐ UTM (UTM zone = 54)
☐ Japanese XY (coordinate number = 1)
☐ Reverse X and Y (X-N-S, Y-E-W)

Clipboard: Latitude, Longitude

Buttons: OK, Cancel, Next, Previous, No. of sections (1), Lat/Long to Japanese XY, Lat/Long to UTM, Flip Lat/Long, Check clipboard

If you do not have field-measured coordinates, but can find the section position on a map or aerial photo, follow the procedure outlined in Section [3.4.13.8](#), Page 157, to get them from the basemap.

Once you have entered the coordinates, press the  button to show the line on a coordinate grid:

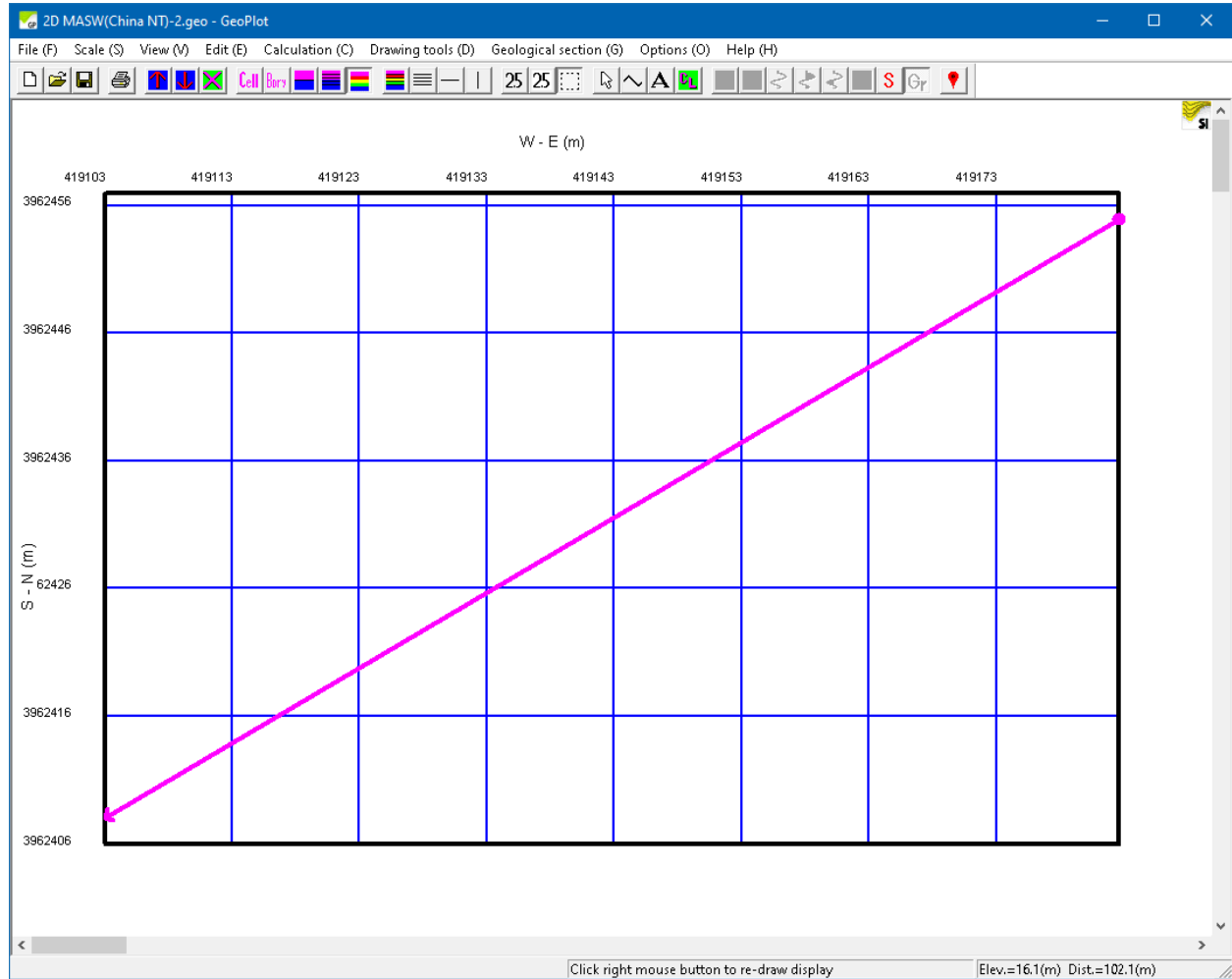


Figure A-1: Survey line plotted on coordinate grid.


To show the survey line on a map or aerial photo, press the  button:



Figure A-2: Survey line plotted on Google Maps basemap.

Geometrics, Inc. takes no responsibility for any interpretation of data or effects resulting from use of the SeisImager software package or its support of the SeisImager software package.