Echoview Tutorial:

Getting Started

www.echoview.com

Contents

Overview

This tutorial is optimized for Echoview 15 and provides an introduction to Echoview.

This tutorial is not intended as a comprehensive user manual.

Further information on Echoview tools and topics can be found in the latest version of the Echoview help file. This can be viewed online and is installed with Echoview. Press F1 when using Echoview to open the help file and read context-sensitive information.

Throughout this tutorial further reading is referred to the Echoview help file or other Echoview learning materials: https://www.echoview.com/support

Prerequisites

This tutorial assumes you have Echoview installed, and the following skills and knowledge:

- Familiarity with a supported Microsoft Windows™ operating system. For more information refer to the Computer requirements page of the Help file.
- A basic understanding of echosounding techniques and hydroacoustic surveying. For more information, see texts such as *Fisheries Acoustics* (Simmonds and MacLennan, 2005, Blackwell Science, Oxford.).

Echoview modules

This tutorial requires a license with the Essentials module. If you do not yet have access to an Echoview license with this module, please contact info@echoview.com. Solution files are also included in the tutorial package to allow you to see the results of module-protected capabilities. Within the solution EV file, Marker regions indicate tutorial selection areas.

Contacting Echoview

For assistance with this tutorial please contact support@echoview.com.

Set up

We recommend extracting or copying the tutorial files to `C:\Echoview Software\Tutorials\`. If the files are not in this folder, use Windows Explorer to search for them. If they are not loaded on your machine, download and reinstall the tutorial from www.echoview.com or from the Echoview USB drive.

Troubleshooting

If you receive a message saying that the version of Echoview you are running cannot read the file you have opened, you may be running an old version of Echoview. You can download the latest version of Echoview from www.echoview.com.

Topic 1: Understanding Echograms

In this topic you will learn:

- about the main features of the Echoview echogram window
- how to use the basic features of the Echoview echogram window to view data

Overview of echograms

An echogram is a pictorial representation of the water column (vertical axis) recorded by an echosounder as a function of time (horizontal axis). Each vertical column of pixels in the echogram represents an individual ping.

In Echoview, the echogram window is the principal interface used to display data for inspection, echo integration and analysis of backscattering strength or other properties. The colors within each column (ping) vary according to the value of each data sample within the ping. A standard echogram presents volume (S_v) or point (TS) backscatter information. Other acoustic, or virtual acoustic data may also be displayed as echograms.

Virtual acoustic data is created by applying an operator (a mathematical or other algorithm) to one or more input acoustic variables.

The Dataflow window tool  is used to manage and show the relationships between raw and virtual variables, geometry objects like platforms and transducers, and 3D objects in an EV file. Virtual lines are introduced in Topic 4: Lines and various virtual acoustic variables are discussed in other Echoview tutorials.

Working with echograms

1. Launch Echoview from the **Start** menu or by double-clicking the Echoview icon on the Desktop, which is created during installation.
2. On the Welcome page, click on the **Open an EV file** option located at the right of the screen. This opens the file explorer window.
3. Browse to the folder in which you extracted the tutorial files, and open `GettingStarted_Topic1.EV`. Echoview will close the explorer window and display the **50 kHz Fileset1: Sv pings** echogram shown in Figure 1.

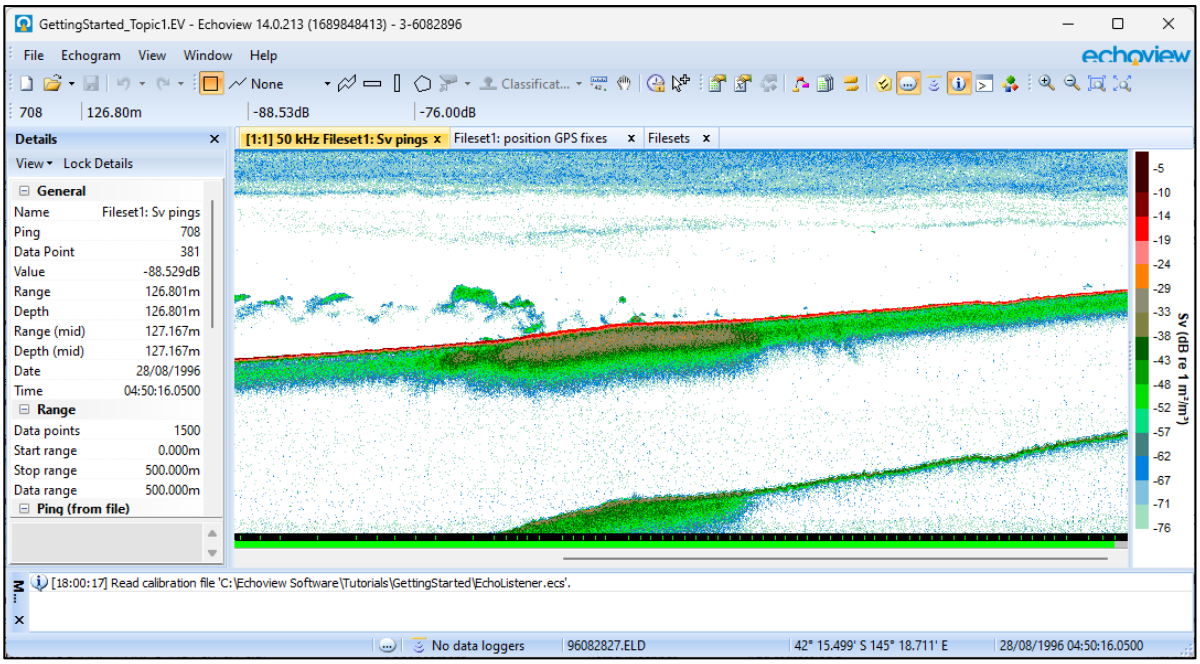


Figure 1. A screenshot of an echogram from GettingStarted_Topic1.EV. The Details and Message dialog boxes are also displayed at the left and bottom of the screen, respectively.

Echogram data values

Immediately above the echogram window is the Information tool bar (Figure 2) showing the ping number, sample depth and sample value corresponding to the pixel beneath the mouse pointer on the echogram. The Color display minimum value is also shown.

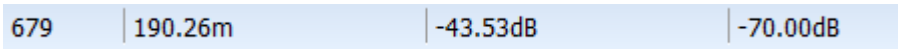


Figure 2. The Information toolbar showing ping number (679), sample depth (190.26 m) and sample value (-43.53 dB) for the pixel (ping sample) beneath the mouse pointer. The Color display minimum value (-70.00 dB) is also given.

Other useful information can be found in the Details dialog box (left most panel in Figure 1) and the Status bar at the bottom of the window (Figure 3). Move the mouse pointer over the echogram and observe the changes on the Information toolbar, the Details dialog box, and the Status bar.

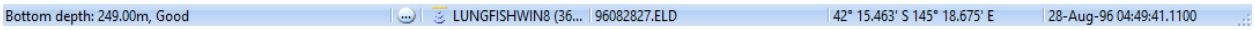


Figure 3. Echoview status bar showing the name of the active line (Bottom depth), its depth/range (depth: 249.00 m), the status (Good) of the active line on the same ping as the selected sample, a Message reminder, the data file name (96082827.ELD), the coordinates (42º 15.463' S 145º 18.675 E) and date/time (28-Aug-96 04:49:41.1100) at which the ping was recorded.

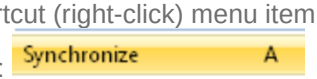
Color scheme

Echoview uses colors to represent the value of each data sample in an echogram. It includes many standard color schemes and allows you to create custom color schemes. The **Color display minimum** and **Color display range** variables can be adjusted to suit the dynamic range of the echogram.

To see what value a color represents you can check the Color Legend (the multi-colored bar Figure 1). For example, samples with a value in the range -70dB to -66dB will be displayed in turquoise.

4. In Echoview, click in the **50 kHz Fileset1: Sv pings** echogram window to bring it into focus.
5. Press the = and - keys on the keyboard (not on the number pad) to increase or decrease the Color display minimum setting. The colors in the echogram and the Color Legend change as the setting is adjusted. Samples with a value below the Color display minimum value are displayed in the color at the bottom of the Color Legend (white in Figure 1).
6. Press Y. The color scheme changes to the alternate palette for the selected color scheme.
7. Press Y again to revert to the primary color scheme.
8. Right-click on the Color Legend to access the Shortcut menu. You can change the color scheme, toggle the alternate color scheme, and change the display settings from this menu.

Tips

- There are many shortcut key combinations in Echoview to make data processing more efficient. Refer to the following pages in the Help file for a full list of shortcuts as well as instructions on how to customize shortcuts:
    - About keyboard shortcuts
    - Echogram keyboard shortcuts
    - User-defined keyboard shortcuts
- If a Shortcut (right-click) menu item has a corresponding keyboard shortcut, it will be shown to the right of the item: 

Navigating

Zooming

Echoview provides a variety of tools to zoom into an echogram. These include the:

- mouse wheel
- zoom icons on the toolbar 
- zoom commands on the Shortcut (right-click) menu
- keyboard shortcuts

The zoom level of the echogram is displayed as a ratio in the echogram tab along with its title. For example the zoom level of the **50 kHz Fileset1: Sv pings** echogram in Figure 1 is [2:1].

Zooming in

1. Click on the **50 kHz Fileset1: Sv pings** echogram to bring it into focus.
2. Click on the **Rectangle**  tool on the toolbar to select it, or press 1.
3. Click and drag on the echogram to form a rectangular selection like the one in Figure 4.

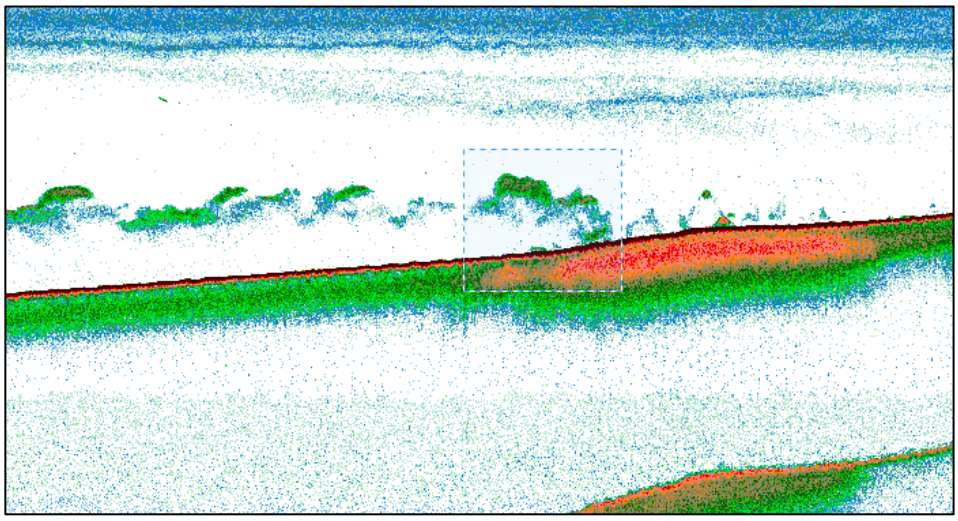


Figure 4. A selection in an echogram made using the Rectangle tool.

4. On the Shortcut menu (right-click), click **Zoom In**.

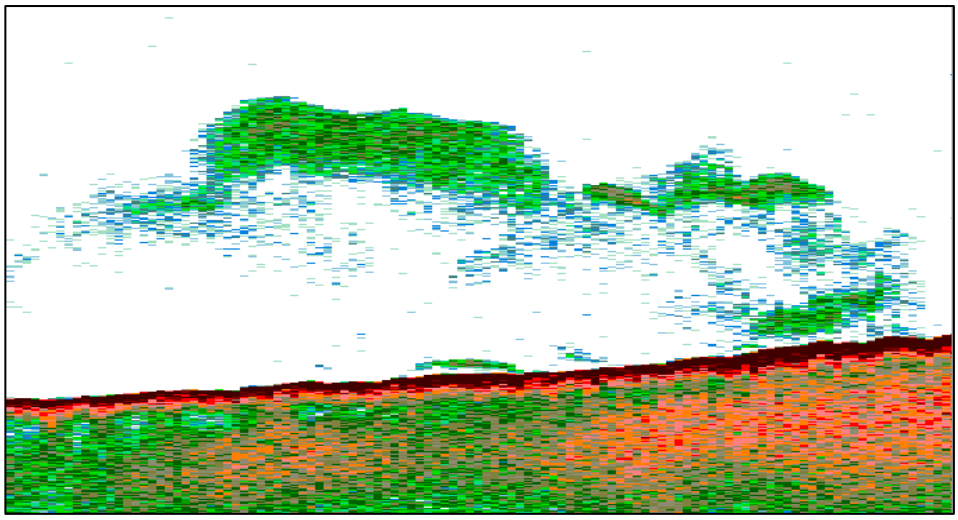


Figure 5. Zoomed into a selection in an echogram.

Zooming out

5. On the Shortcut menu (right-click), click **Zoom Out** to zoom to the previous level.
6. On the Shortcut menu (right-click), click **Unzoom** to zoom out to the minimum zoom level.

Zooming with the mouse wheel

7. With the mouse pointer over the echogram, scroll the mouse wheel to zoom in and out. You will be able to zoom out to a maximum [1:1] ping to pixel ratio.

   Hold down the **Ctrl** key and use the mouse wheel to zoom out beyond a [1:1] ping to pixel ratio.

Scrolling

Vertical and horizontal scroll bars at the right and bottom edges of the echogram window can be used to reposition the area of the echogram currently in view.

1. Use the Rectangle tool to create a selection and zoom in on part of the echogram.
2. Use the horizontal and vertical scroll bars to move around the echogram.
3. Drag the boundaries of the echogram window to resize

Arranging windows

Every window such as the **50 kHz Fileset1: Sv pings** echogram or **Filesets** windows (see Figure 1) can be repositioned or left to float in the Echoview workspace.

1. Left-click the mouse and drag the title bar corresponding to the **50 kHz Fileset1: Sv pings** echogram. Reposition the window in the Echoview workspace. In the figure below, the translucent blue rectangle shows the position of the floating window. Translucent docking guides indicate where the floating window can be snapped.
2. Drag the floating window to one of the docking guides and release it to snap the **50 kHz Fileset1: Sv pings** echogram to that position.
3. Repeat steps 1. – 3. to practice rearranging windows in different configurations.

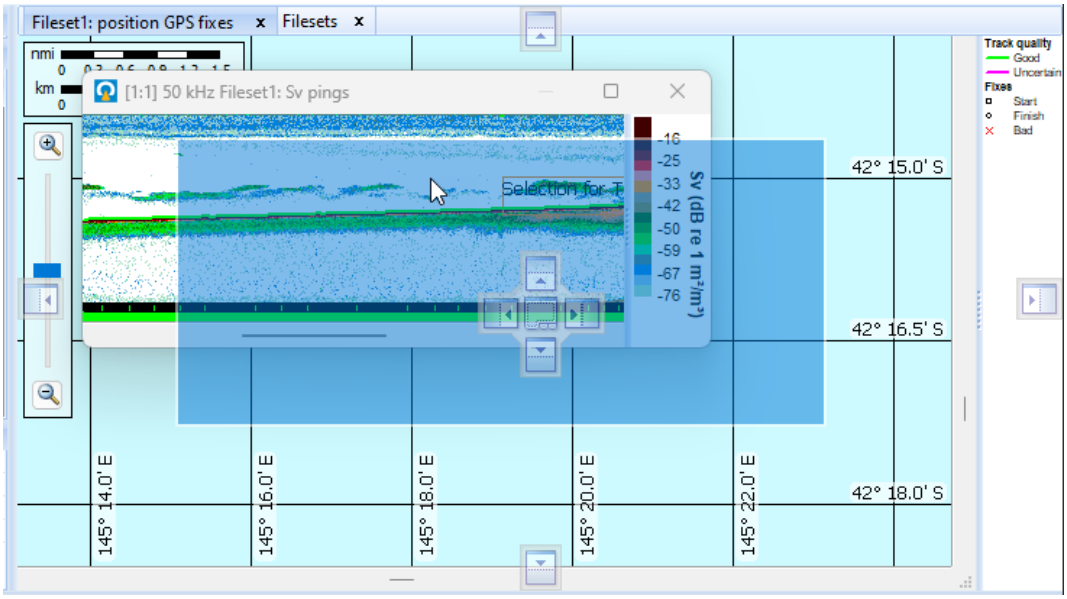


Figure 6. Blue translucent shape indicating the size and position of a floating window, and window placement guides.

Further information

- Read the Navigating Echoview page in the Help file.
- Echoview installs a file called `Echoview shortcuts.cfg` that specifies some of the default keyboard shortcuts that Echoview uses. This file can be modified to customize keyboard shortcuts. For more information, refer to the User-defined keyboard shortcuts page in the Help file.

- Some Echoview actions are available to the Undo or Redo features.
- You can flip the echogram so that depth or range reads from the bottom-up via a setting on the Display page of the Variable Properties dialog box. This is useful for echograms of upward facing transducers.
- Use the Mouse pointer duplication tool  to mirror the mouse position in multiple open echogram windows.

Closing an EV file

Before moving onto the next topic, you should close `GettingStarted_Topic1.EV` without saving changes.

1. On the **File** menu, click **Close**.
2. Click **No** when prompted to save changes to the EV file.
3. This will return you to the Echoview Welcome page.

Topic 2: Understanding Cruise Tracks

In this topic you will learn how to:

- display a cruise track
- display a map
- navigate around the cruise track window

Overview of cruise tracks

A cruise track is a graphical representation of a connected series of GPS coordinates (known as GPS *fixes* in Echoview) collected at the same time as the ping data.

Working with cruise tracks

1. Launch Echoview.
2. On the Welcome page, click on the **Open an EV file** option located at the right of the screen.
3. In the explorer window, browse to the tutorial files folder and open `GettingStarted_Topic1.EV`. Echoview will now display the **50 kHz Fileset1: Sv pings** echogram shown in Figure 1.
4. Click on **View** in the toolbar and navigate to **Cruise Track**, **position GPS fixes**. This opens the **Fileset 1: position GPS fixes** window (Figure 7), which is an example of a cruise track.
5. You may close the **50 kHz Fileset1: Sv pings** echogram and Filesets windows by clicking on the ✕ icons on the respective tabs.

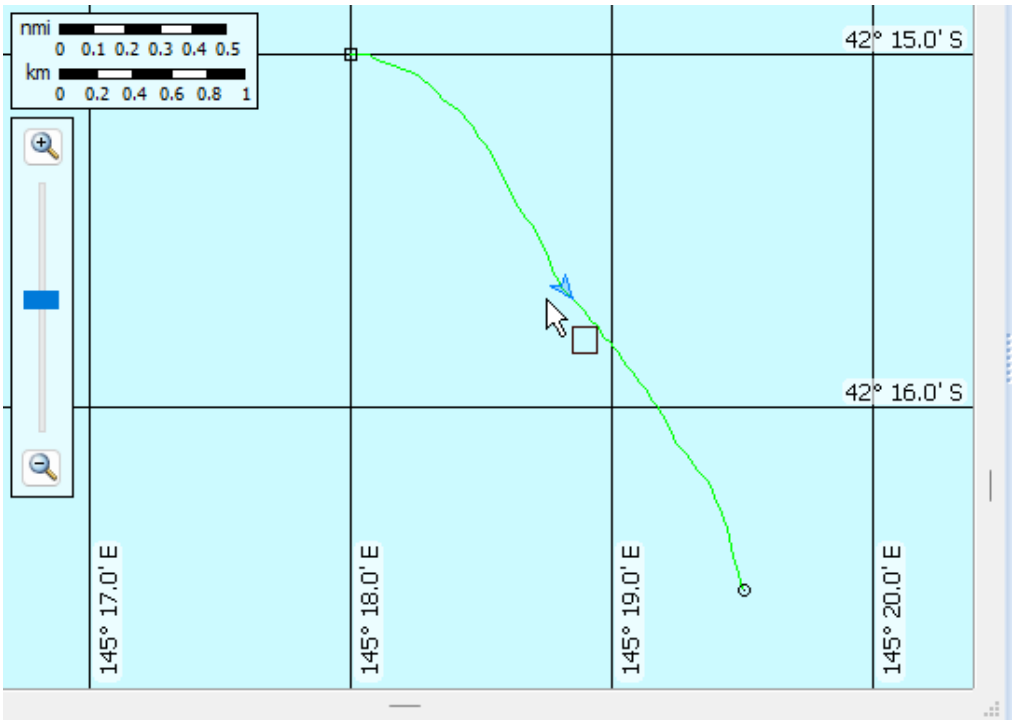


Figure 7. The Fileset1: position GPS fixes window displays a cruise track. The Platform icon  *points and moves in the direction of travel.*

Loading maps

Echoview allows you to load map files into the cruise track window.

6. On the **View** menu, click **EV File Properties**, or press F6.
7. Click the **Mapping** tab (Figure 8).

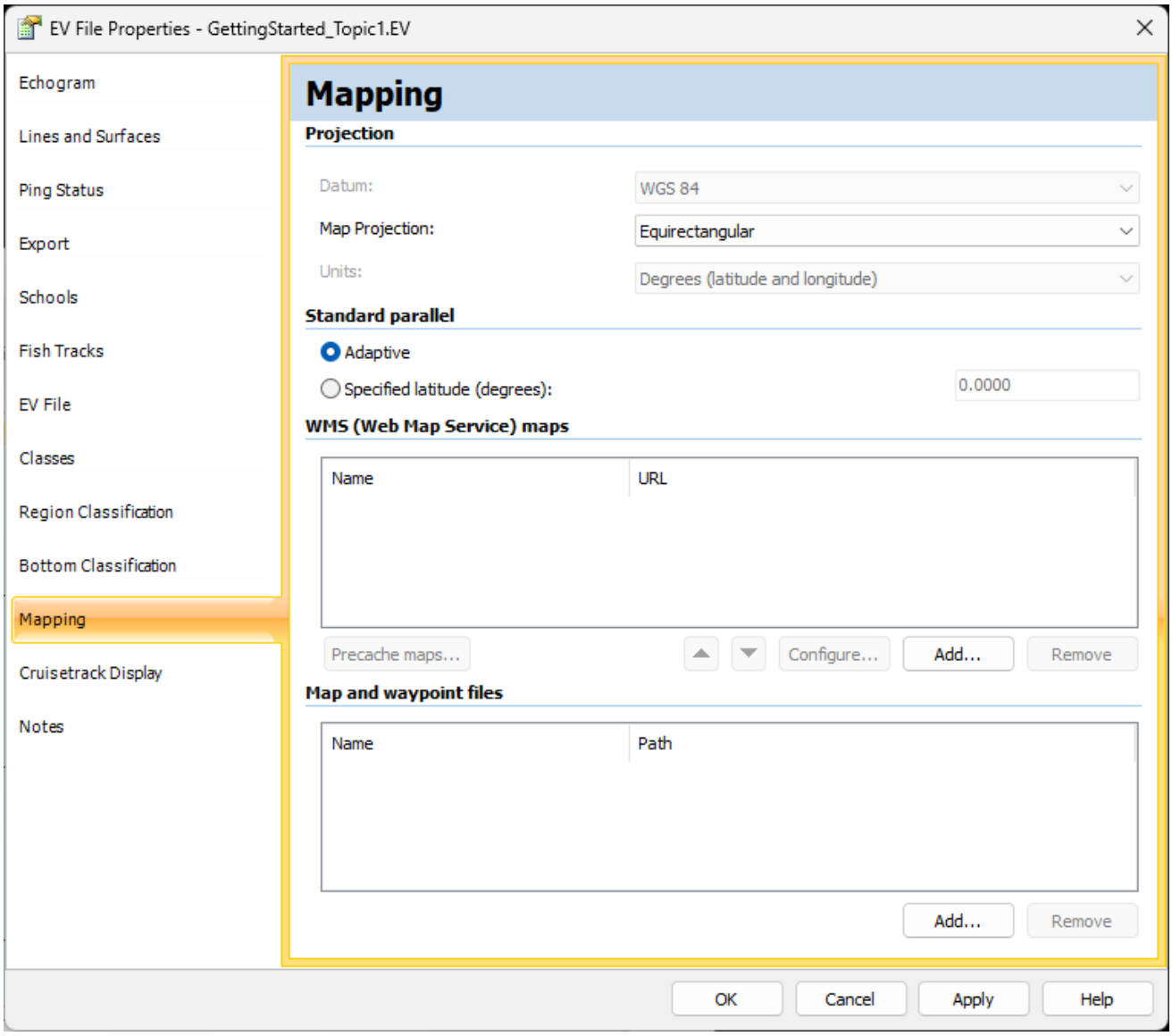


Figure 8. The Mapping page of the EV File Properties dialog box.

8. Scroll down to the **Map and waypoint files** section. Click **Add...** to open the Add Map File explorer window.
9. Select `tasmania2pts.MIF` and click **Open** to close the explorer window and return to the EV File Properties dialog box (Figure 8).
10. Click **OK** on the EV File Properties dialog box.
11. Use the navigation tools to view the map of Tasmania (Figure 9), Macquarie Harbour (Figure 9) or the cruise track (Figure 10).

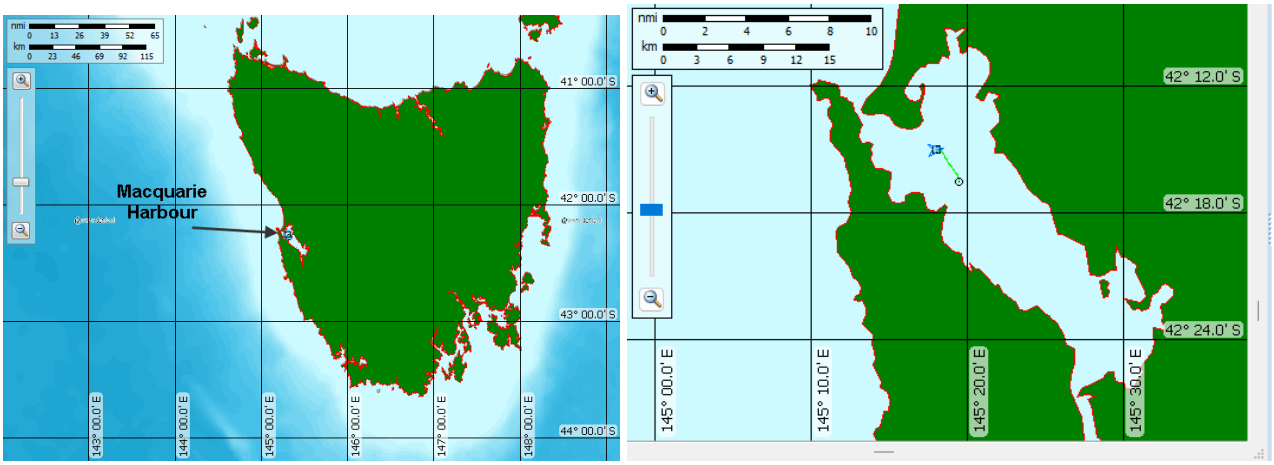


Figure 9. The Fileset1: position GPS fixes window Cruise Track window showing Macquarie Harbour on the map of Tasmania (left), and the zoomed window (right).

Synchronizing echograms with a cruise track

Echoview allows you to synchronize the pings in an echogram with the GPS fixes in a cruise track with the versatile Mouse pointer duplication tool .

12. From the **View** toolbar menu select **Echogram**, **Sv pings**.
13. Arrange the 50 kHz Fileset1: Sv pings echogram and the cruise track windows so that they are displayed side by side.
14. Select the **Mouse pointer duplication tool** .
15. Point to the start icon ☐ of the cruise track (42° 15.0' S 145° 18.0' E in Figure 7) and from the Shortcut (right-click) menu, click **Synchronize**. The result is Figure 10.
16. The mouse pointer platform motion in the cruise track window is duplicated in the echogram. A new cross hair position is displayed in response to each use of **Synchronize.** Away from the Start icon, the cruise track cross hair generally corresponds to the center ping in the echogram window.

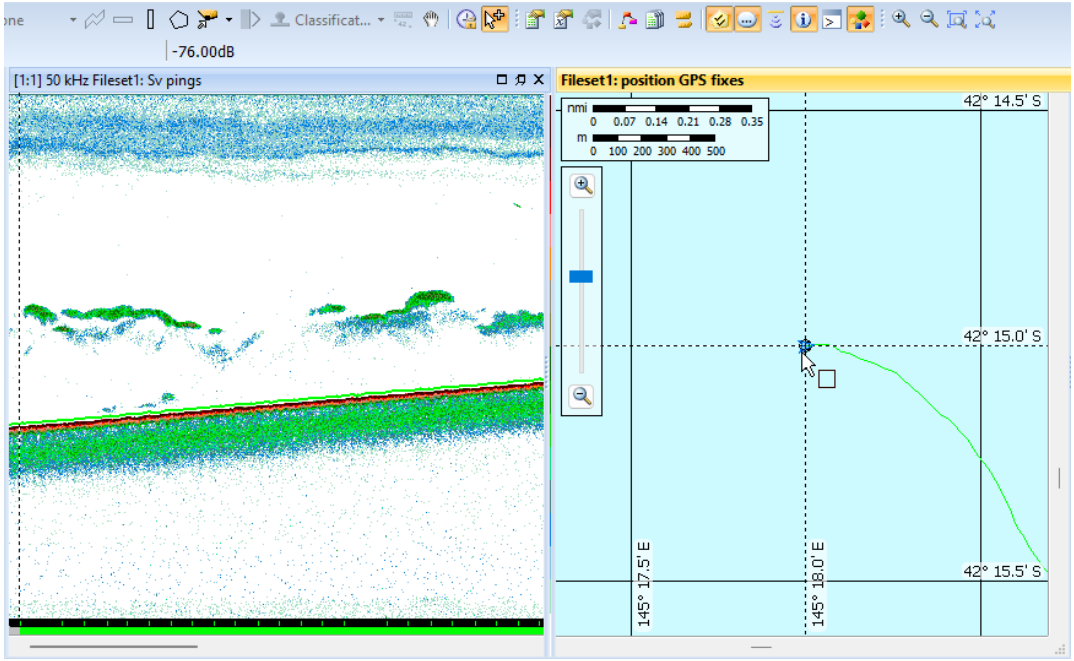


Figure 10. The Mouse pointer duplication tool is active, an echogram is on the right, a cruise track window is on the left. The Platform icon and crosshair are positioned at the cruise track Start icon. The Mouse pointer dashed line is on the ping of the cruise track Start icon.

Further information

- The **Vertical band tool** enables you to make a selection on a cruise track and define regions. For more information, refer to the Using cruise tracks – Define a region page in the Help file.
- To remove a map file from your EV File:
  a. Open the EV File Properties dialog box (press F6)
  b. Click the **Mapping** tab (Figure 7)
  c. Select the map and click **Remove**
  d. Click **OK** on the EV File Properties dialog box
- To store a map in your EV File, but remove it from the cruise track window:
  a. Follow the procedure to Load the map into Echoview
  b. Focus the cruise track window and open the Variable Properties dialog box (press F8)
  c. Click the **Cruise Track Display** page.
  d. Clear the map in the **Map display** section.
  e. Click OK.
- An alternative GPS processing method (to account for initial bad fixes) is available on the Data page of the cruise track Variable Properties dialog box.
- The Echoview status bar displays the calculated area of a rectangular or polygon selection made in a Cruise Track window. Refer to the Echoview Help file page Using cruise tracks for more information.
- Echoview supports ESRI shapes.
- The **Mouse pointer duplication tool**  is supported by these open window types: echograms, cruise tracks, along track displays, line-referenced echograms and some graphs. Refer to the Help file, Echogram navigation: Mouse pointer duplication.
- The Cruisetrack Display page of the EV File Properties dialog box displays the default settings for the cruise track, GPS fixes, GPS grid and background.

Before moving onto the next topic, you should close `GettingStarted_Topic1.EV` without saving changes.

1. On the **File** menu, click **Close**.
2. Click **No** when prompted to save changes to the EV file.
3. This will return you to the Echoview Welcome page.

Topic 3: Files and Filesets

In this topic you will learn:

- about the Filesets window
- how to load data files into Echoview
- about EV files
- how to work with EV files

Working with data files and filesets

Definitions

Data file	Files of data logged from echosounders and other equipment. Data files are usually primary information archived from a survey. Echoview does not modify data files.
Variable	A time-series of measurements of one data type. An acoustic variable, where the data is made up of pings, can be displayed as an echogram. A position variable, where the data is made up of GPS fixes, can be displayed as a cruise track. Refer to the About variables page in the Help file for a full list of variables used by Echoview
Fileset	A collection of data file(s) and the variable(s) derived from those data file(s). These are grouped together in the Filesets window (see Figure 11).

The Filesets window

The Filesets window is used to manage filesets, data files and variables. It can contain a single fileset or multiple filesets. Each fileset will be displayed on a separate tabbed page within the Filesets window.

1. Launch Echoview.
2. On the Welcome page, click on the **Open an EV file** option located at the right of the screen.
3. In the explorer window, browse to your tutorial folder and select `GettingStarted_Topic4.EV`. Echoview will now display the 50 kHz Fileset1: Sv pings echogram
4. On the toolbar click on the **View** menu and select **Filesets** to display the Filesets window (Figure 11) or press F10.

The Filesets window has three distinct sections

- Data Files at the top displays the name and folder of the data file(s) that have been added to the current fileset as well as the time of the earliest and latest ping in each data file.

  The fileset for the EV file in Figure 11 contains two data files and three raw variables (Sv pings, position GPS fixes and a line data sounder-detected bottom).

- Calibration file input section, in the middle, displays the calibration file used for the fileset, if one has been specified. Buttons enable you to browse to add, remove or edit a calibration file.

- Raw Variables section, at the bottom, displays raw variables (S_v, TS, telegrams/tuples and other measurements) that Echoview has derived from the data file(s).

  Raw variables can be organized with the **Transducers** button or the (variable) **Types** button

  Raw variable data may be opened via Window shortcut buttons. For example, the S_v pings variable data may be displayed in the window types: **Echogram** or alongtrack **Cruisetrack** or **Table** or **Variable Properties**. Whereas position GPS fix variable data could be viewed as a **Cruisetrack**, **Table** or **Variable Properties**.

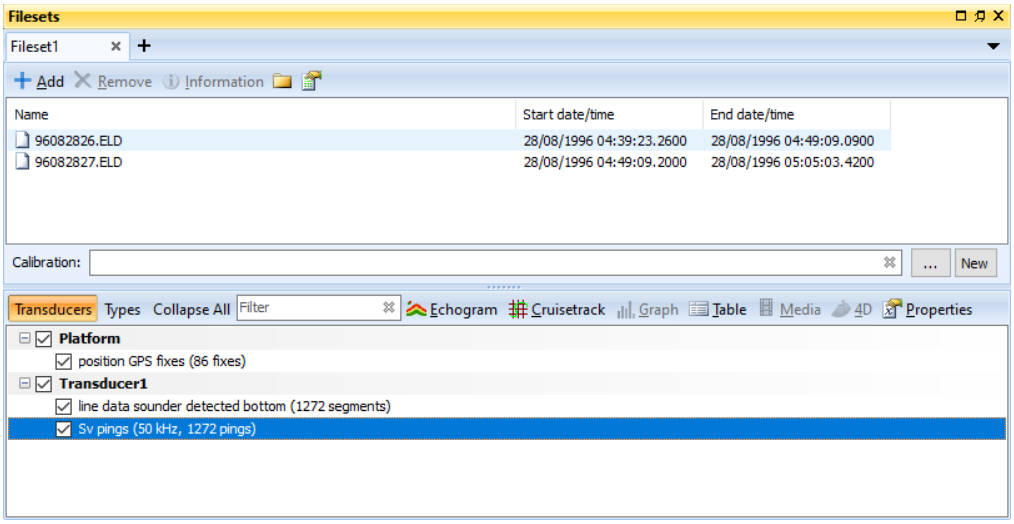


Figure 11. The Filesets window.

Adding multiple data files

Echoview allows you to add multiple data files of the same type to a fileset. For example, multiple data files from the same survey. When Echoview detects common data types in these files it derives a single raw variable that incorporates measurements from these files. This allows you to view data that was logged in multiple data files as a single echogram, and to analyze data in multiple data files through a single variable.

Tips

- For further information about the Filesets window refer to the following pages in the Help file:
    - About the Filesets window
    - Filesets window shortcuts
- You can copy data file paths from the Filesets window.
- Problems in data files are flagged when they are first added to the Filesets window. Flags appear as messages in the Messages dialog box.
- Echoview supports large data files.
- You can use Echoexplore to find and catalog compatible echosounder and sonar data files on your computer. You can download Echoexplore from the Echoview website.

Before moving onto the next topic, you should close `GettingStarted_Topic4.EV` without saving changes.

1. On the **File** menu, click **Close**.
2. Click **No** when prompted to save changes to the EV file.
3. This will return to the Echoview Welcome page.

Working with EV files

EV files are created in Echoview and are used to organize data files and filesets.

You might create a single EV file containing all the data for a complete survey, an EV file for each transect of a survey, or an EV file for each day of a survey.

See the About EV files page in the Echoview Help file for more information on EV files.

Creating an EV file

5. Launch Echoview.

6. On the Welcome page, click on the **File** menu in the toolbar and select **New**. You may also click on the icon in the tool bar, or press Ctrl+N. The Dataflow and Filesets windows are displayed. (If the New EV File dialog box is displayed, click **No Template**.)

Adding data files to an EV file

7. In the Filesets window, click **Add** to open the Add Data Files explorer window.
8. Select the data file `DemoData.ek5` and click **Open**. This closes the explorer window and displays the `DemoData.ek5` file in the **Data Files** section of the Filesets window. This data file contains 14 raw variables that are listed in the **Raw Variables** section (see Figure 12) arranged with respect to Transducer.

   You can add other .ek5 files to this fileset (for example data files from earlier or later in the same survey). Echoview would add the pings from those files to existing variables. This allows you to view a continuous pings in a single echogram rather than separate echograms for each data file (see Adding multiple data files).

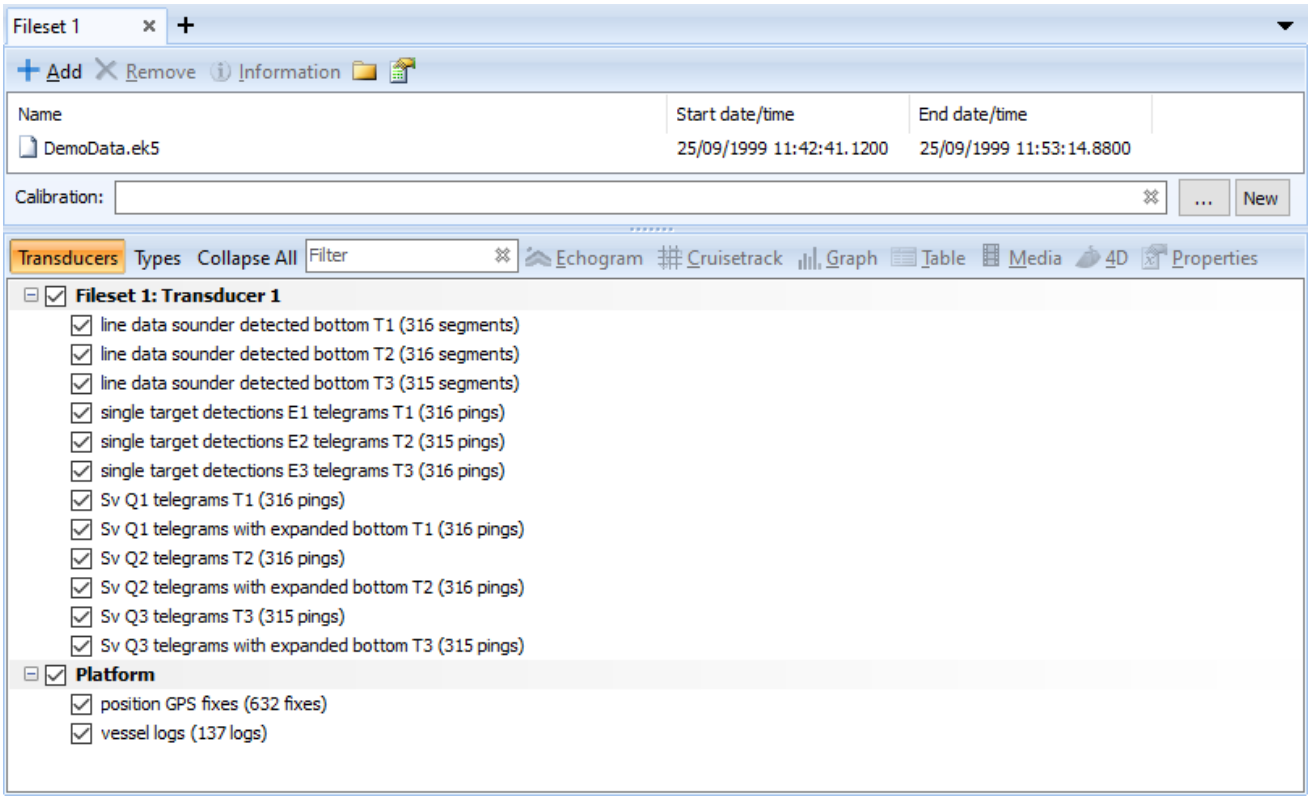


Figure 12. The Filesets window with the Demodata.ek5 data file added.

Displaying the echogram of a variable

9. In the Raw variables section of the Filesets window, click **Sv Q1 telegrams T1 (316 pings)** to select it.
10. Click Echogram to display the echogram of **Sv Q1 telegrams T1**.

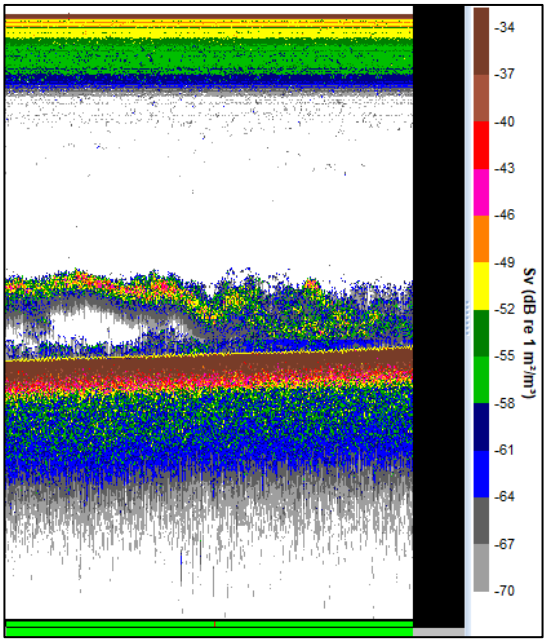


Figure 13. Echogram of the Sv Q1 telegrams T1 variable

11. In the Raw variables section, click **Sv Q2 telegrams T2 (316 pings)** and click Echogram. Echoview displays the echograms for the **Sv Q1 telegrams T1** and **Sv Q2 telegrams T2** variables simultaneously.

Multiple echograms can be displayed in Echoview in this way.

Saving an EV file

12. On the **File** menu, click **Save As** to open the Save As explorer window.
13. Navigate to the tutorials folder.
14. Enter `GettingStarted_Topic3` in the **Filename** text field.
15. Click **Save**. Echoview automatically adds the .EV file extension when you save the file.

Saving your workspace

Your workspace remembers the windows that are displayed in Echoview together with their positions and contents. Echoview can save this workspace in the EV file.

16. Adjust the borders between the windows that are open.
17. Zoom into a part of the S_v echogram
18. On the **File** menu in the toolbar, click **Close**.
19. On the **File** menu, click **Exit**.
20. Launch Echoview.
21. On the Welcome Screen, under Recent files click on `GettingStarted_Topic3`. Echoview opens the EV file, and displays the workspace as you left it.
22. On the **View** menu, open the EV File Properties dialog box by selecting **EV File Properties**.
23. Click the **EV File** tab. Under the **Workspace** section, use the **When EV file is opened** list to configure the Echoview workspace behavior.
24. The workspace is saved in the same folder as your EV file with an .evwx extension.

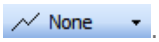
Close `GettingStarted_Topic3.EV` without saving changes.

1. On the **File** menu, click **Close**.

2. Click **No** when prompted to save changes to the EV file.
3. This will return you to the Echoview Welcome page.

Topic 4: Lines

In this topic you will learn about the line tools available in Echoview. There are three kinds of lines in Echoview:

- Raw lines are read from a data file, and cannot be edited or deleted. Examples include sounder detected bottom lines, depth lines and heave lines.
- Editable lines are the most general line type in Echoview, and encompass all lines, other than raw and virtual lines. Editable lines are stored as a series of depth vs. time coordinates. They can be created, edited, and deleted.
- Virtual lines are created from Line operators and may be seen on the Dataflow window  and the Line and Surface tool 

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More information is available on the About lines page in the Help file.

Working with raw lines

Sounder detected bottom line example

Echoview can derive the recorded sounder detected bottom from most data files and displays it as a line on an echogram. These are raw lines and cannot be modified or deleted in Echoview.

1. Launch Echoview.
2. On the Welcome page click on the **Open an EV file** option located at the right of the screen.
3. In the explorer window, browse to your tutorial folder and select `GettingStarted_Topic4.EV`. Echoview will now display the **50 kHz Fileset1: Sv pings** echogram.
4. In Echoview, click in the **50 kHz Fileset1: Sv pings** echogram window to bring it into focus.
5. Open the Shortcut menu (right-click) and select **Variable Properties**.
6. Click the **Lines** page.
7. Toggle the checkbox for **Fileset1: line data sounder-detected bottom** and click **OK**. This closes the Variable Properties dialog box and displays the sounder detected bottom line in the echogram. This is shown in Figure 14.

By default, the sounder detected bottom line appears as a thin yellow line. It lies immediately above the bottom, that is seen as a green, unbroken, and upward sloping region across the middle of the echogram.

A close look at the sounder detected bottom line reveals that it is inaccurate. In this example, it has jumped to the second bottom echo at the bottom right of the echogram. Depending on the current zoom settings in Echoview, you may need to navigate to the right of the echogram to see this.

As the sounder detected bottom is a Raw line it cannot be modified. To fix this problem, we can create a new editable line that is sourced from the sounder detected bottom and modify that instead. We explore this technique with another example in the Creating lines using a line pick algorithm section.

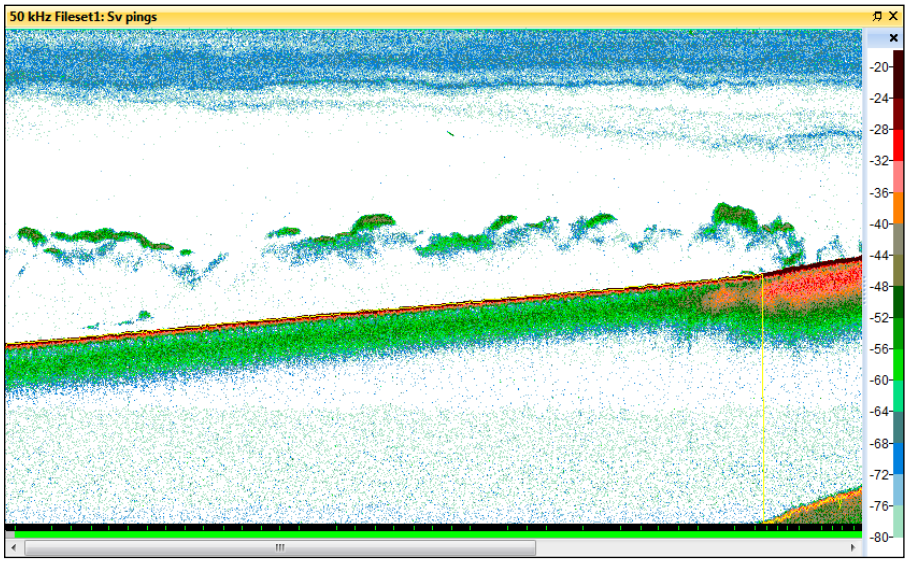


Figure 14. The sounder detected bottom line on the Sv pings echogram is shown in yellow.

Changing line display thickness and color

For increased clarity, Echoview allows you to specify custom line thicknesses and line status colors.

8. Click on the sounder detected bottom line.
9. On the **Shortcut** menu (right-click) and select **Line Properties** to open the Line Properties dialog box.
10. Click the **Display** page and select the **Custom** button.
11. This page allows you to change the line thickness and colors.

    Individual colors describe the state of the line: Good, Bad or Uncertain – usually set by certain threshold properties intrinsic to the line segment. Change these by clicking on the colored squares to access the palette options.

Click **OK** to implement the changes and close the Line Properties dialog box.

Working with editable lines

Overview of editable lines

Echoview allows you to create editable lines by:

- using a line pick algorithm to detect the bottom
- specifying a line at a fixed depth
- applying an offset (linear or angular) to an existing line
- drawing a free-form line by hand

In this section we will introduce creating lines using two examples.

The first uses a line pick algorithm to detect the bottom.

The second specifies a line at a fixed depth.

Refer to the About lines page in the Help file and links within for information on using the other methods.

Line pick algorithm example to detect the bottom

In this exercise, you will create a new line using the line pick algorithm to detect the bottom. This algorithm is tuned for echo integration and will create a line that is just above the bottom echo.

It will also demonstrate how to fix the problem with the sounder detected bottom line that we encountered in the Sounder detected bottom line example.

12. On the toolbar, click on the ▼icon on the **Line and Surface** None button to open the menu, and then click **New Editable Line**.

    Alternatively,

    - click the **Dataflow** icon in the toolbar to open the Dataflow window
    - in the Dataflow window, click **Fileset1: SV pings** to select this variable
    - on the **Shortcut** (right-click) menu for **Fileset1: SV pings**, point to **New**, and click **Editable Line**

    The New Editable Line dialog box is displayed (see Figure 15).

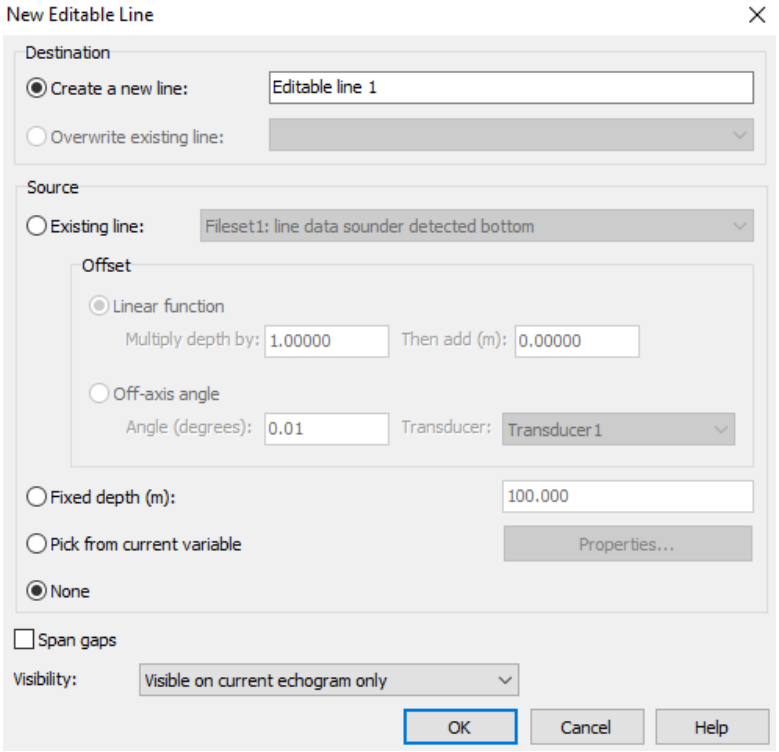


*Figure 15. The New Editable Line dialog box. Clicking on **Help** at the bottom right of the dialog box will open the **New Editable Line dialog box** Help page, where you can learn about the options in this dialog box.*

13. Under the Destination section, click on the **Create a new line:** button. In this example we will call the new line: *New Bottom*.
14. Under the **Source** section, click on the **Pick from current variable** button.
15. Click the **Span gaps** checkbox. This bridges any gaps between disjointed line segments.
16. Click **OK** to close the **New Editable Line** dialog box and display *New Bottom* as a green line on the echogram (see Figure 16).

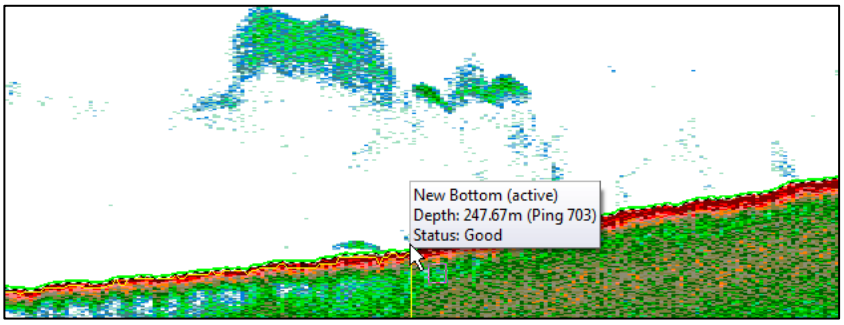


Figure 16. The active New Bottom line as a running line.

Navigate the echogram to see how *New Bottom* and the sounder detected bottom line compare in handling the second bottom echo.

Fixed depth line example

Lines can also be created to span a fixed depth across an echogram. A practical use for such a line could be to exclude the region of an echogram that is corrupted by transducer ringing (see the Transducer ringing page in the Help file).

To find the depth to which the transducer ringing is saturating the echogram:

17. Zoom out of the echogram until the top is visible.
18. Click the **Rectangle** tool on the toolbar and use the cursor to make a rectangular selection at the top of the echogram.
19. Zoom in on the selection.
20. Adjust the **Color display minimum** until it is -79dB.
21. You should see something that resembles Figure 17. If not, repeat steps 18. – 21.

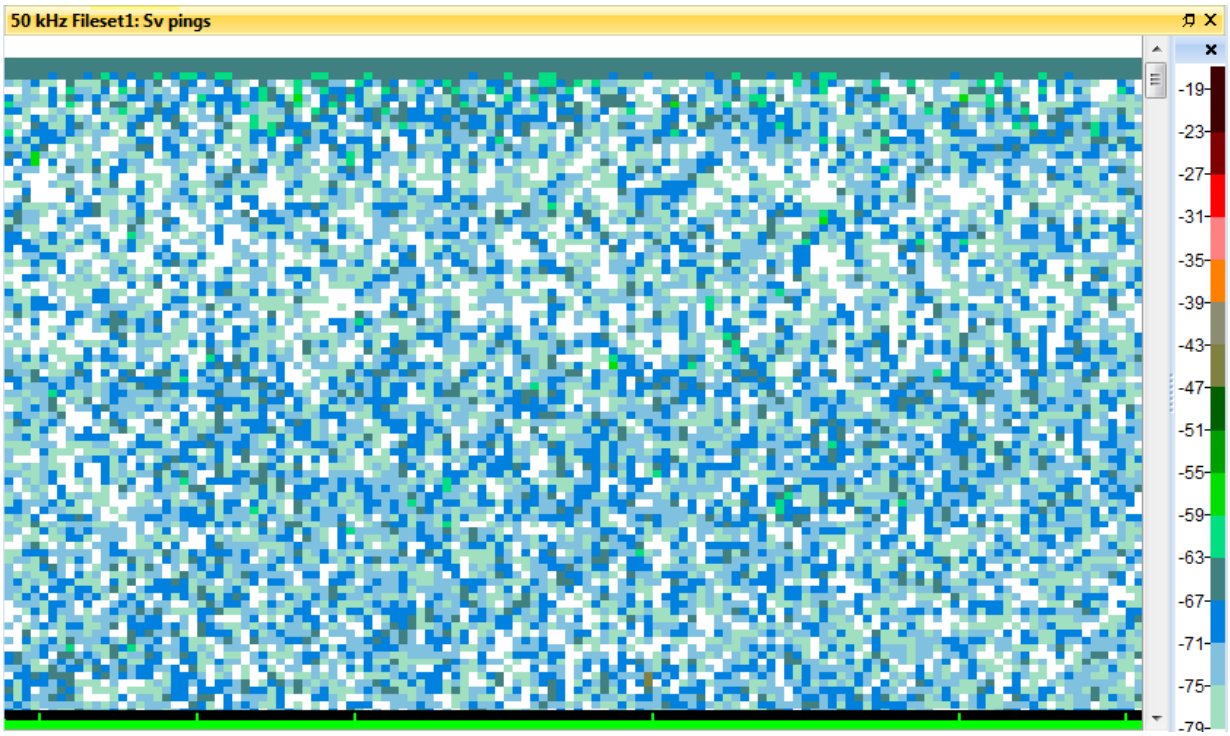


Figure 17. Echogram showing high sample values (the blue-gray band) in the first 2 meters.

22. The solid band at the top of Figure 17 corresponding to -67dB indicates the extent of transducer ringing. Use the mouse to point to the base of this band to obtain the depth from the Information tool bar (Figure 2). It should correspond to a depth of 2 meters.

    We can now create a fixed depth line.

23. On the toolbar, click on the ▼icon on the **Line and Surface** None button to open the menu and then click **New Editable Line**.

    Alternatively,

    - click the **Dataflow** icon in the toolbar to open the Dataflow window
    - on the **Shortcut** menu (right-click) in any empty region, point to **New**, and click **Editable Line**

24. Under the **Destination** section, click on the **Create a new line:** button. You can assign a name to your new editable line by entering it into the text field. In this example we will call it: *Fixed depth line*.
25. Under Source, click the **Fixed depth (m):** button and enter 2.5 into the text field.

26. Click **OK** to close the **New Editable Line** dialog box and to see the *Fixed-depth line* on the echogram (Figure 18).

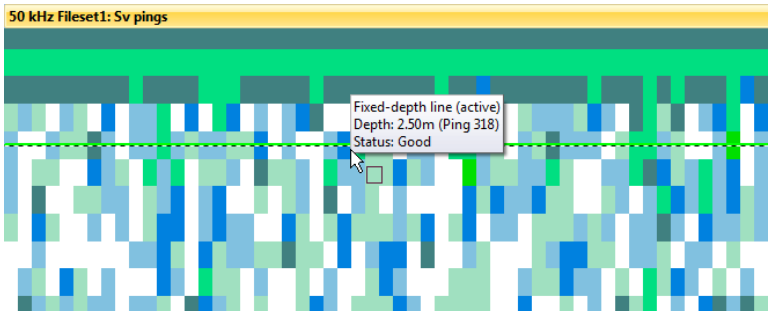


Figure 18. Echogram showing "Fixed-depth line" at a depth of 2.5 meters.

Making modifications to editable lines

Editable lines can be modified. In this exercise, you will learn how to modify the line created in the Line pick algorithm example to detect the bottom exercise.

27. Adjust your echogram window until you see the view in Figure 19.

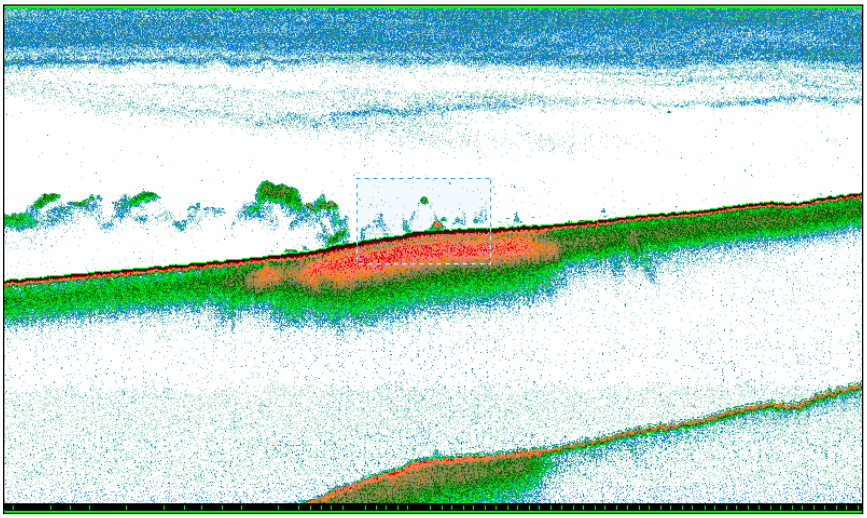


Figure 19. Echogram showing selection to be zoomed.

28. Use the Rectangle tool on the toolbar to select the region shown in Figure 19, and zoom in. The echogram should resemble the image in Figure 20.

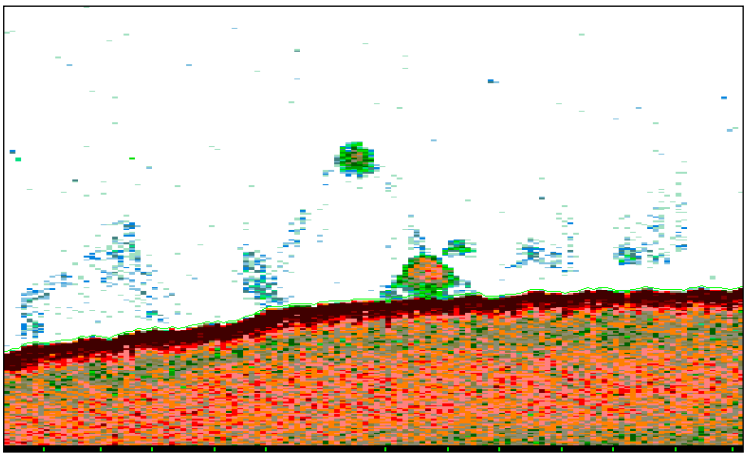
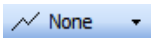


Figure 20. The Fileset1: SV pings echogram zoomed in over selection shown in Figure 19.

29. On the toolbar, click on the ▼icon on the **Line and Surface**  button to open the menu.
30. On the menu, select *New Bottom* (see Figure 21). This is now the active line to which your edits will be applied.

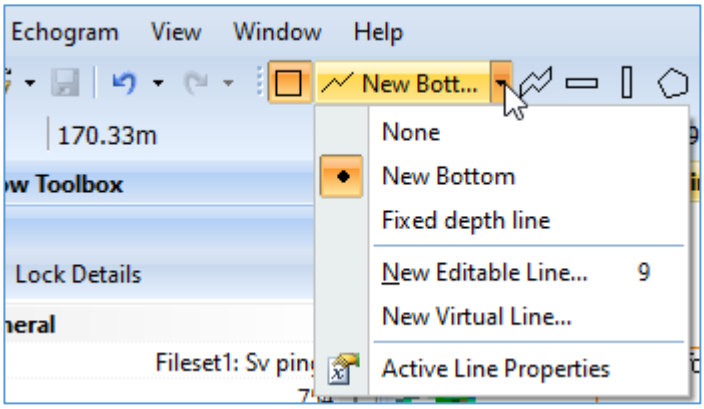


Figure 21. The Line and Surface tool's menu with the New Bottom line selected.

31. Using the left mouse button, progressively click (or click and drag) from left to right over the artefact that appears to be just above the bottom (see Figure 22). **Note:** The line edits you make can be finer than single pings and single-sample depths.

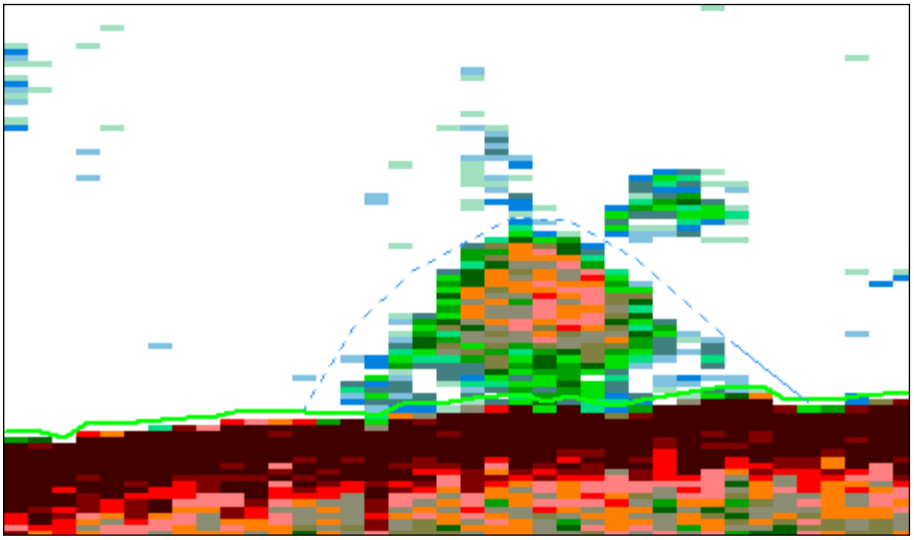


Figure 22. Echogram showing line drawing over bottom object.

32. At the end of the final stroke, release the left mouse button, activate the **Shortcut** (right-click) menu and click **Update Active Line**. The line will be redrawn over the object as shown in Figure 23.

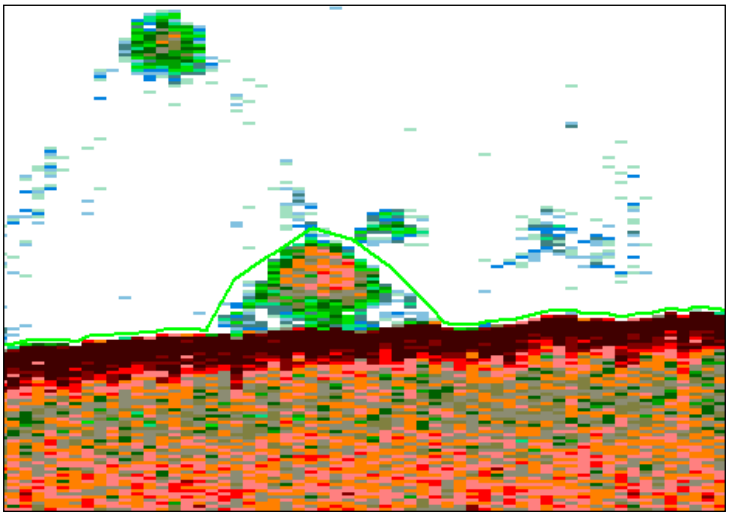


Figure 23. Echogram showing the redrawn line.

Read the Creating, editing, renaming and deleting lines page in the Help file for more information on modifying editable lines.

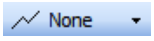
Working with virtual lines

Overview of virtual lines

Virtual lines are lines that are defined relative to any other editable, raw, or virtual line. Any modifications to the reference line will also be reflected in corresponding Virtual line(s). To follow this example in Echoview, first complete the Line pick algorithm example to detect the bottom exercise.

Creating virtual lines

In this example you will create a virtual line that is offset by 10 meters from the *New Bottom* line.

33. Right-click on the echogram to access the Shortcut menu and click **Unzoom**.
34. On the toolbar, click on the ▼icon on the **Line and Surface** 

button to open the menu then click **New Virtual Line**.

    Alternatively,

    - click the **Dataflow**  icon in the toolbar to open the Dataflow window
    - open the **Shortcut** menu using right-click in any empty region, point to **New**, and click **Virtual Line**.

    This opens the **New Virtual Line** dialog box.
35. Under the **Select operator** section, click on **Linear offset,** click **OK**.
36. In the **Line Properties – Linear offset [multiplied by 1.0 plus 0.0m] dialog box**, on the Operands page, under Operand 1, select **New Bottom** from the list. See Figure 24.
37. On the **Linear Offset** page, set **Multiply depth by** to 1.0 and **Then add (m)** to -10.
38. On the **Name and Notes** page, the line name is given by the Dynamic name. Update the **Dynamic name** text 'Linear offset' to *New bottom*.
39. Click **OK**.

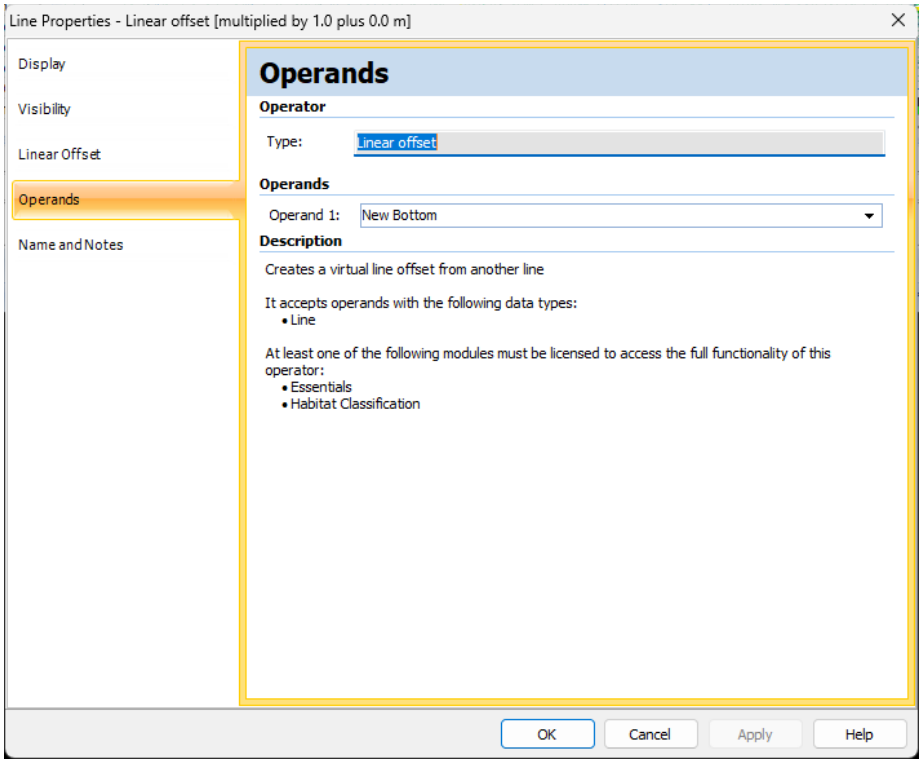


Figure 24. Line Properties dialog box.

40. The virtual line is displayed as a green line 10 meters above *New Bottom*.

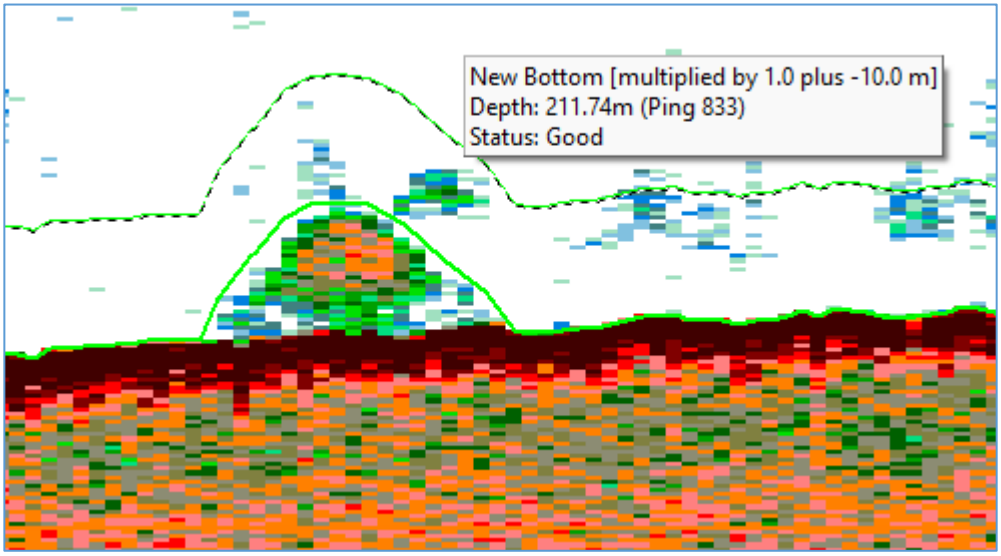


Figure 25. An echogram displaying a virtual line 10 m above the acoustic bottom line.

Try editing the *New bottom* line and observe that the *New bottom [multiplied by 1.0 plus -10 m]* line automatically updates.

Choosing which lines are visible on an echogram

Lines are stored in the EV file. As such, they are available for use across all echograms. In this section, you will learn how to choose which lines are displayed in an echogram. To follow this exercise in Echoview, first complete the Sounder detected bottom line example.

41. Bring the **50 kHz Fileset1: Sv pings** echogram into focus by clicking on it.
42. In the toolbar, click on the **Echogram** menu, then click **Variable Properties** open the Variable Properties dialog box.

43. Click the **Lines** tab (see Figure 26).

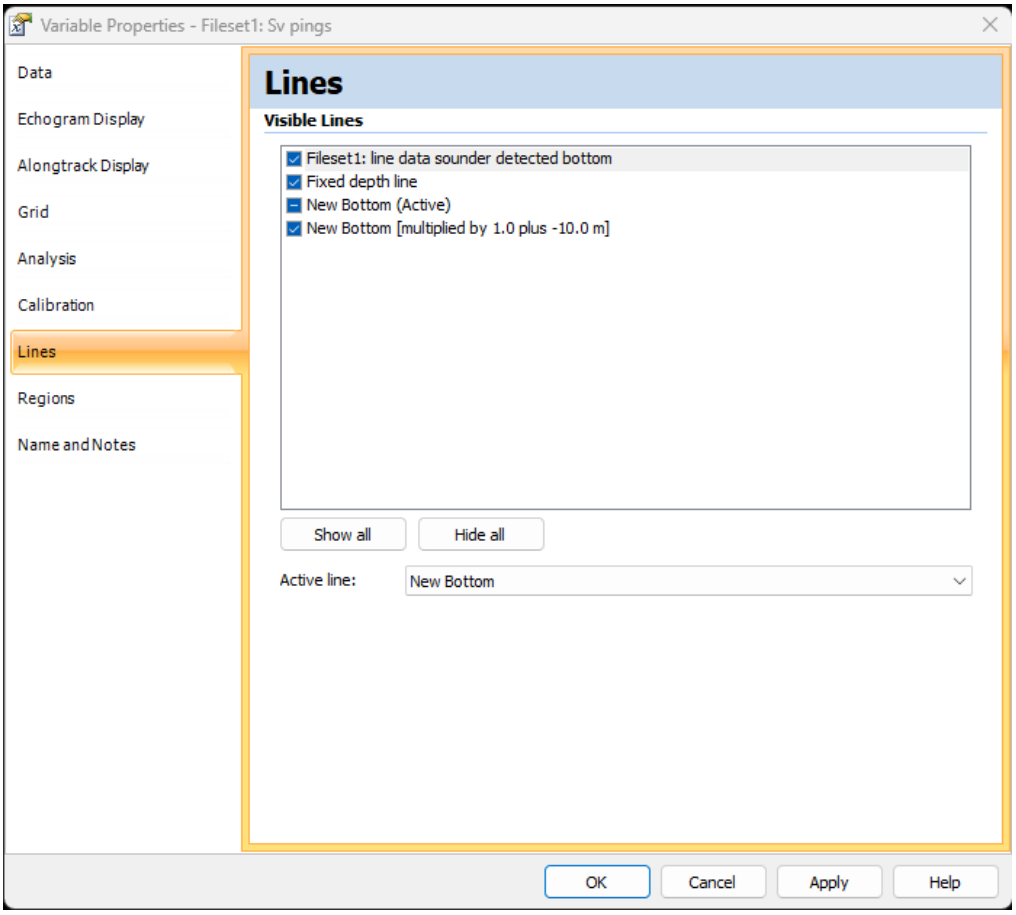


Figure 26. The Lines page of the Variable Properties dialog box.

44. Clear the checkbox for **Fileset 1: line data sounder detected bottom** by clicking on it.
45. Click **OK** to save the changes and close the Variable Properties dialog box. The sounder detected bottom line is no longer displayed on the echogram.

Further information

- Raw lines include sounder detected bottom lines and line data read from data files. Raw lines can represent depths from a sensor (trawl or other types of depth information) or heave. Raw lines cannot be edited but you can derive editable lines from raw lines, which can be modified instead.
- Virtual lines are derived from a Line operator. There are virtual line operators that are equivalent to editable line types and line manipulation operators that can line pick, crop, combine, or filter lines.
- There are several line pick algorithms available. The line pick algorithm is specified under **EV File Properties: Lines and Surfaces**. A line pick is started using **Pick New Line** from the **Shortcut** menu.
- The color and thickness of any line can be customized in the **Line Properties** dialog box.
- For more information about lines, line settings and line uses, refer to the About lines page in the Echoview Help file.
- Dynamic names are made up of plain text and special text that responds to changes in selected settings. For further information refer to the Help file, **Dynamic name** on the **Name and Notes** page of the Line Properties dialog box page.

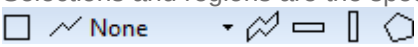
Before moving onto the next topic, close `GettingStarted_Topic4.EV` file.

It is recommended that you save the file with a different name (using Save As) so you can repeat the default exercises on this topic in the future.

Topic 5: Selections and Regions

In this topic you will learn how to make selections and create and edit regions.

Overview

Selections and regions are the specific areas of an echogram that you define using the 

tools in Echoview. They are useful for:

- placing visual markers on an echogram
- defining areas in the echogram for on-screen analyses
- defining areas in the echogram for export analyses
- defining areas to be excluded for analyses (example noise)

Note: This topic does not cover all the uses for Selections and Regions. For more information, refer to the Introduction to Integration and the Introduction to Fish Tracking tutorials and the Help file.

Working with Selections

Selections are transient areas that can be used for on-screen analyses, to define regions, to select the single targets to include in a fish track and more.

1. Open the `GettingStarted_Topic4.EV` file.
2. Display the **50 kHz Fileset 1: Sv pings** echogram and bring it into focus by clicking on it.
3. If there is no grid on the echogram, open the Variable Properties dialog box for the Sv pings variable with F8.
4. Select the Grid page and the settings:
    - Show time/distance grid = Time (minutes).
    - Time between grid lines = 10.0
    - Show depth/range/line-referenced grid = Water surface (depth of zero).
    - Separation (m) = 150.0
5. Click **OK**.

Making selections using the Horizontal band tool and Vertical band tool

The **Horizontal band**  and **Vertical band**  tools allow you to make rectangular selections that span the entire horizontal and vertical dimensions of an echogram.

6. Click the **Horizontal band** tool.
7. Move the mouse pointer to a depth of approximately 200 meters on any ping on the echogram. The depth of the sample at which the mouse pointer is pointing is displayed in the Information tool bar.
8. Click and drag the cursor to depth of approximately 250 meters.
9. Release the mouse button. A horizontal selection is created between the depths of 200 meters and 250 meters.

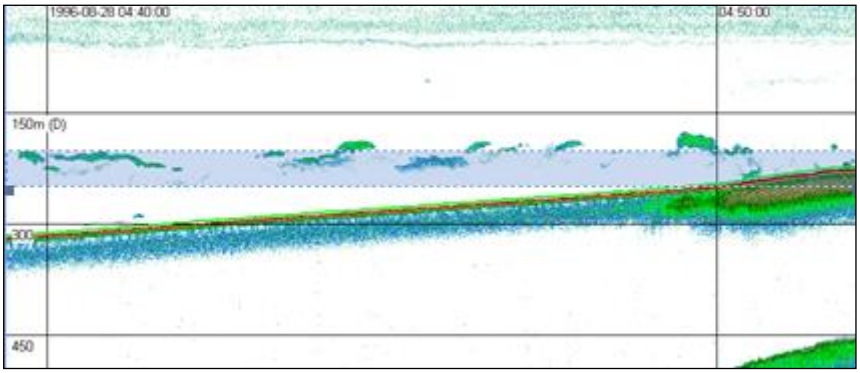


Figure 27 A horizontal selection on an echogram.

10. Use the horizontal scroll bar to scroll to the right. You will notice that the selection spans the entire echogram.

The **Vertical band** tool works in a similar way but defines a selection in the vertical dimension.

Making selections using the Parallelogram tool

The **Parallelogram** tool allows you to make selections of a fixed thickness using the mouse.

In the following example, you will create a selection with a thickness of 15 meters that follows the bottom of the echogram.

11. To improve the color scheme contrast, right-click on the **Color legend** and change the Color scheme to **Magma**. Use the horizontal scroll bar to display the far left of the echogram. Use the Zoom In tool once.
12. Click the **Parallelogram** tool.
13. Move the mouse pointer to a depth of 330 meters at the far left of the echogram.
14. Click and drag on the echogram until the mouse pointer is just above the bottom line (approximately 300 meters) then release the mouse button. **Note:** This sets the initial height of the parallelogram, which will be used for the entire selection.
15. Move the mouse to the point in the echogram just above the bottom where the gradient of the bottom first changes (at approximately 4:52:00).
16. Click just above the bottom at this point. The first section of the parallelogram selection is drawn.

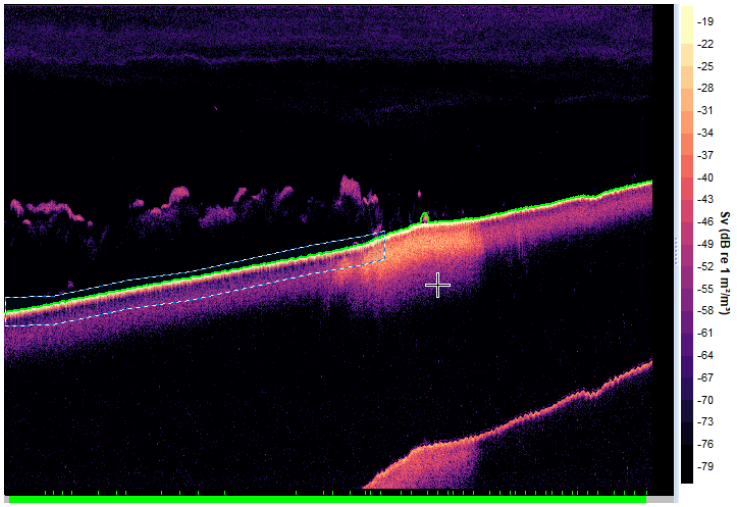


Figure 28. The first part of the parallelogram selection is shown.

17. Position the mouse pointer so it is just above the bottom at the point where the gradient of the bottom changes again.

18. Click left mouse button. The second section of the parallelogram selection is drawn.
19. Position the mouse pointer so it is just above the bottom of the echogram at the right most point that is currently displayed in the echogram window.
20. Click the left mouse button. Another section of the parallelogram selection is drawn.
21. Repeat step 17 further along the echogram as required.
22. If you want to retain the selection, right-click on the **Shortcut** menu, select **Define region**. Otherwise, proceed onto the next section.

Making selections using the Polygon tool

The **Polygon** tool allows you to make selections of any almost shape using a free-hand drawing tool.

23. Click the **Polygon** tool.
24. Click and drag to create a shape of your choosing (for example, draw a selection around a school).
25. When you are ready to close the polygon, on the Shortcut (right-click) menu select **Define Region**.

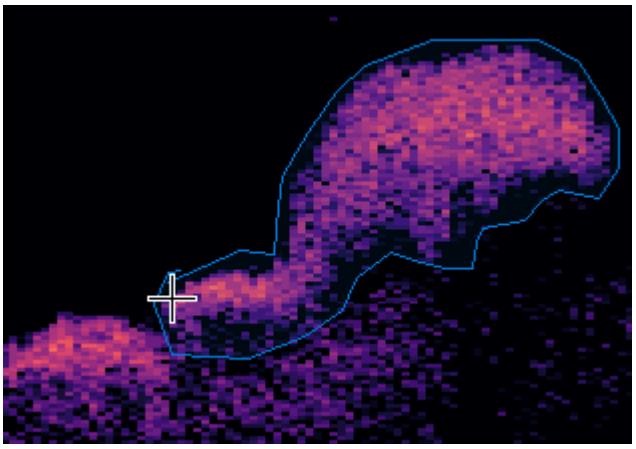


Figure 29. A polygon selection on an echogram

Figure 29: .

Tips

- Echogram windows remember their active tools.
- Left-clicking anywhere on the echogram closes any selection that you have made.

Working with Regions

Overview of regions

Defined regions are selections that persist and can be used for many purposes in Echoview, including:

- placing visual markers on an echogram
- on-screen analysis
- identifying part(s) of an echogram to include in analyses
- identifying part(s) of an echogram to exclude from analyses
- defining fish tracks
- defining schools.

Echograms can be synchronized to the active region. On-screen analysis results can be linked to an active region.

Region types

Echoview has five region types

Analysis	A part of an echogram that you can analyze separately from other parts of the echogram.
Bad data (no data)	A part of an echogram that is unwanted and which can be handled in a specific way during analysis.
Bad data (empty water)	A part of an echogram that is unwanted and which can be handled in a specific way during analysis.
Marker	A part of an echogram that is of interest and, therefore flagged to be handled in a special way. This is neither bad data nor data that needs to be analyzed separately from other parts of the echogram.
Fish track	A selection of closely associated single targets that are assumed to have been generated by one fish. **Note:** Fish-track regions are a special class of region and some of the information/procedures described in this topic do not apply. Fish-track regions are covered in more detail in the **Introduction to Fish Tracking** tutorial.

Note: Aside from region types, Echoview also allows you to create region classes. Read the About region class page in the Echoview Help file for further information.

Creating Regions

You create regions from selections. In this exercise you will create an analysis region using the Rectangle tool, though you may use any of the selection tools introduced in [this section].

26. Right-click on the **Color legend** and change the Color scheme to **EK500**.
27. Click the **Rectangle** tool on the toolbar.
28. Select an area of interest on the echogram.
29. From the **Shortcut** (right-click) menu, click **Define Region**. The region is defined in a translucent rectangular box, and the Region Browser dialog box pops up at the bottom of the Echoview interface (see Figure 30).

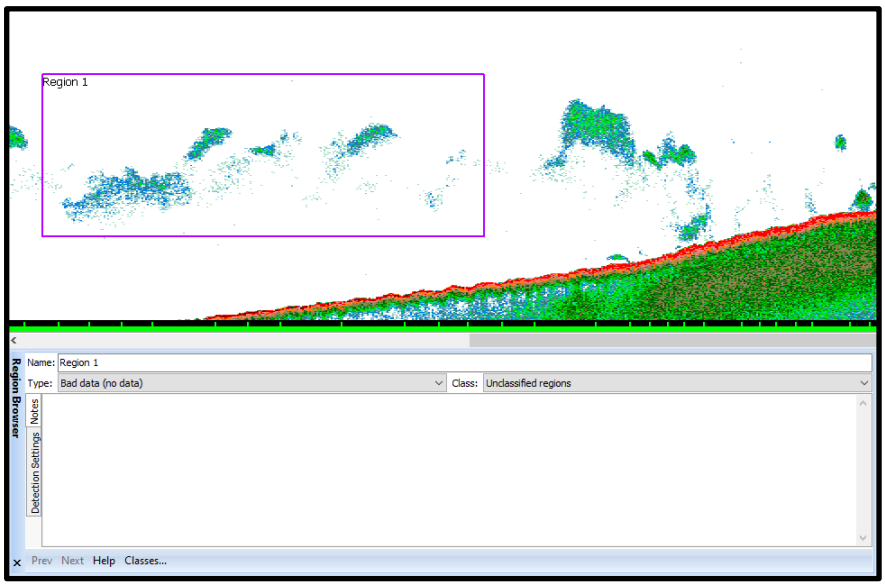


Figure 30. A region is defined in a translucent rectangular box on the echogram, and the Region Browser dialog box pops up at the bottom of the Echoview interface.

30. Label the region by entering a name into the **Name:** text box. In this example, we call it: *Test region*. This change is reflected in the label in the echogram during pauses in your typing.
31. Under the **Type** list select Analysis. This changes the color of the region in the echogram. **Note:** Echoview assigns a different color to each region type.
32. Close the **Region Browser** dialog box by clicking on ✕. This does not affect the regions that have been defined.

Editing region properties and shape

Once you have created a region you can change its properties (for example its name and type) or shape.

You can change the properties of a region using the Region Browser dialog box. To display the Region Browser dialog box, select the region and click the **Region Browser**  icon in the toolbar. You may need to click on the **More buttons**  icon if the Region Browser icon is hidden.

Echoview allows you to change the shape of a region in three ways:

- by moving the nodes (anchor points) of the region
- by redrawing parts of the region boundary
- by nudging the region boundary into the desired shape

You can toggle between these by clicking on the **Region edit**  icon in the tool bar. Read the Editing regions page in the Help file for instructions on using each of these.

Tips

- Region properties include a Notes page where you can input plain text
- You can export a logbook of regions (including their notes and locations) to a csv file by opening the **Echogram** menu and selecting **Export** then **Regions** then **Log Book.**