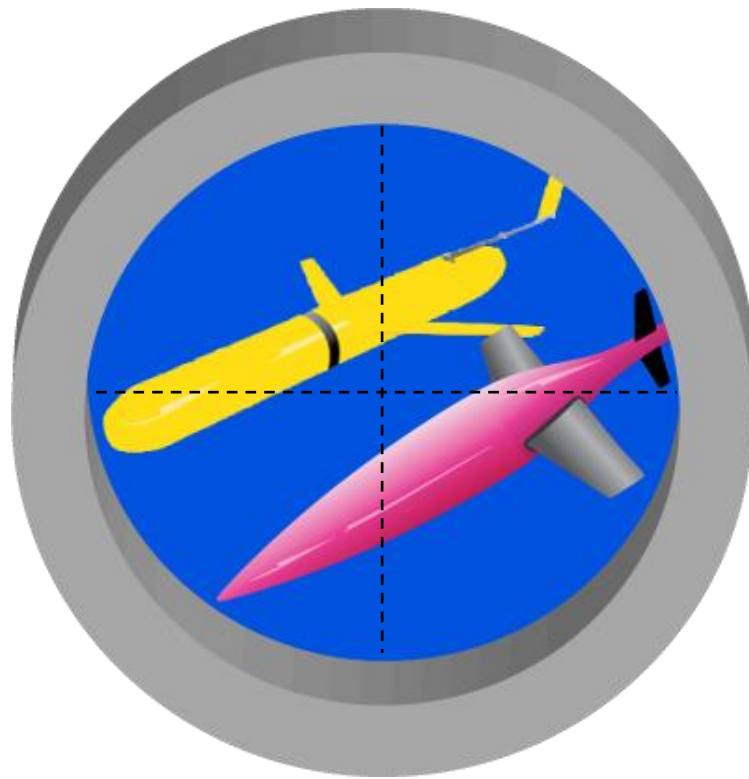


# AUSTRALIAN NATIONAL FACILITY FOR OCEAN GLIDERS (ANFOG)



## ***GLIDERSCOPE v6***

### **Users Manual**

November 2<sup>nd</sup> 2016

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# 1 Introduction

*GLIDERSCOPE* is an Australian National Facility for Ocean Gliders (ANFOG) Windows platform software package designed to allow users quick and easy visualisation of ANFOG's oceanographic data, via a convenient graphical user interface.

In accordance to IMOS (Integrated Marine Observing System) data file convention, ANFOG data formats are based on NetCDF (Network Common Data Form). All of the scientific data are stored with appropriate quality control flags indicating the usability/validity of each data-entry. Although highly informational, NetCDF files can be quite daunting for those who are unfamiliar with the format, or lack the computing set-up to access the data.

Using this *GLIDERSCOPE* software, all users will be able to access the NetCDF files, filter out the bad data and apply a variety of useful data graphical visualisation techniques to examine the data, e.g. using three/four-dimensional plots of water properties, interpolated contour charts, vertical profile plots, water properties comparison charts, etc. Users can easily choose and extract segments of data. Additionally, users can also export their data to text files for easy access in other applications, or into netCDF files to be used with *GLIDERSCOPE* or other applications at a later time.

Useful links:

*GLIDERSCOPE* software download

<http://imos.org.au/gliderscope.html>

*GLIDERSCOPE* sample and tutorial data

<http://imos.org.au/gliderscope.html>

ANFOG data download

<http://imos.aodn.org.au/webportal/>

<http://thredds.aodn.org.au/thredds/catalog/IMOS/ANFOG/catalog.html>

More information about ANFOG

<http://imos.org.au/anfog.html>

Feedback for *GLIDERSCOPE* software or this *GLIDERSCOPE* v6 USERS MANUAL may be sent to the software's author, Dr Mun Woo, at the Australia Facility for Ocean Gliders (ANFOG): [anfog-ecm@uwa.edu.au](mailto:anfog-ecm@uwa.edu.au)

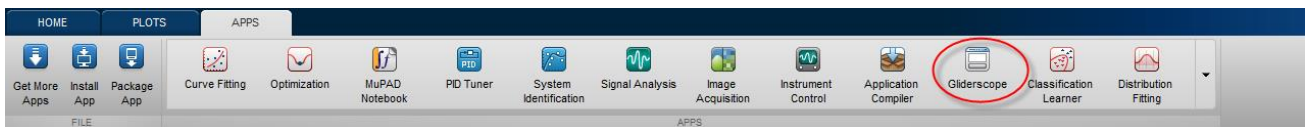
## 2 Installation

### 2.1 First Installation

- Download an appropriate installation package. *Gliderscope* is available in 3 forms:
  - i) Matlab App for computers that have Matlab installed.  
The App version is the most convenient method if you already have Matlab installed. Download *Gliderscope.mlappinstall*, open Matlab, navigate to the file in your current folder and double click it to install into Matlab. This will place a *Gliderscope* button in your Apps toolbar which can be pressed whenever you wish to run *Gliderscope*.
  - ii) Standalone software for Windows computers without Matlab installed.  
Download *GliderscopeV6\_2\_Win.exe* and run it.
  - iii) Standalone software for Mac computers without Matlab installed.  
Download *GliderscopeV6\_2\_mac\_installer.app* and run it.
- During installation, you may be asked for permission to run *MCRInstaller.exe*. Select *OK* to allow this. (If the question does not appear, then manually run *MCRInstaller.exe* from your installation folder afterwards.)

### 2.2 Run the Software

- For the Matlab App, simply click open Matlab and click on the *Gliderscope icon* in the Apps toolbar to run *Gliderscope* (Fig. 1).



**Figure 1. Run Gliderscope by clicking on the Gliderscope icon in the APPS toolbar.**

- For standalone versions, double-click on *GliderscopeV6.exe* to begin using the software.

## 3 Using *GLIDERSCOPE*

To begin using *GLIDERSCOPE*, double-click on the Matlab App or *GliderscopeV6.exe* to start the program.

*GLIDERSCOPE* first helps you to select and extract the data you want, and then lets you easily visualise your chosen data in a variety of ways. As you go along, *GLIDERSCOPE* ‘speaks’ to you from its green talk screen, providing you with useful guidance at every step of the way (Fig. 2).

### 3.1 Load data

#### 3.1.1 ANFOG netCDF data file

- Click on **[Load data]** button (at top left, see Fig. 2) to select which data file you would like to access.

Data files are freely available from <http://imos.aodn.org.au/webportal/>. A sample data file, *sampledata.nc*, has also been included on the *GLIDERSCOPE* download site (<http://imos.org.au/gliderscope.html>).

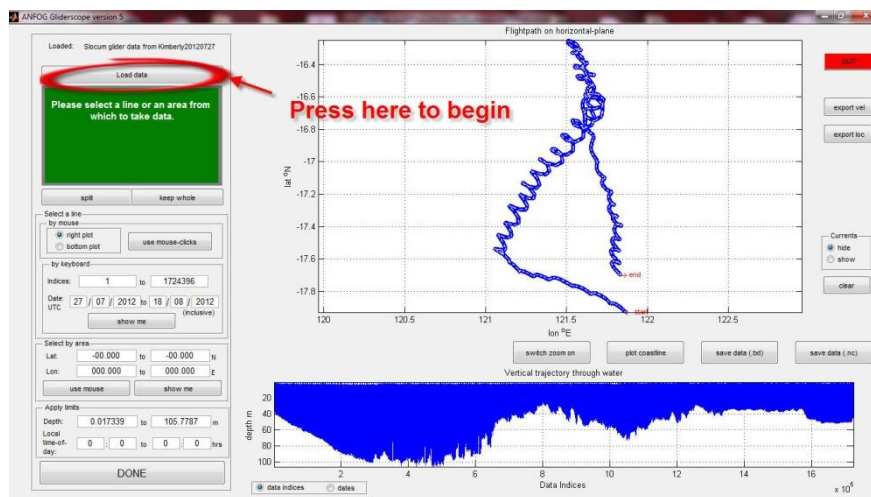
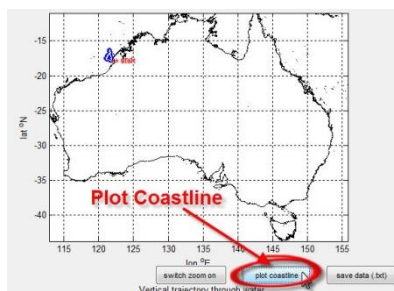


Figure 2. *GLIDERSCOPE*'s main dashboard with controls for loading and extracting data.

#### 3.1.2 Plot coastline data (optional)



\*optional: Press **[plot coastline]** button to see where the glider mission occurred in relation to the Australian coastline (Fig. 3). Coastline data will take longer to load on first run, but subsequently, **[plot coastline]** will plot much more quickly.

Figure 3: Location can be seen in relation to the

Australian coastline by pressing on [plot coastline] button.

- Zoom into the study region by pressing [switch zoom on] and then click-and-drag a box with the mouse (Fig. 4).

\*Handy tips:

- alt-click: zooms out a little
- double-click: zooms out all the way
- mouse-wheel scroll: zooms in/out

- To remove the coastline, press [clear] button (right side on Fig. 4).

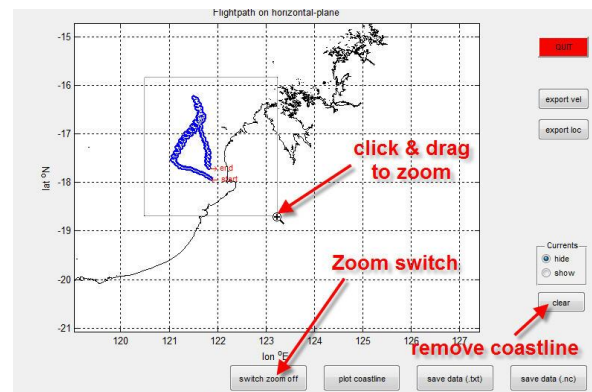


Figure 4. Magnify an area in the map using the zoom function.

### 3.1.3 Examine glider's path

Two plots are displayed illustrating the path that the glider had taken; from an aerial view (Fig. 5) and side view (Fig. 6).

#### *Glider's horizontal path (aerial view)*

- In *GLIDERSCOPE*'s right plot (Fig. 5), an aerial view of the glider's journey is shown as a blue line with white arrows pointing the direction of travel. (White arrows may be more obvious when you zoom in closer. \*use [switch zoom on] and click and drag on the chart.)
- In addition to the glider path, you can also  show or  hide arrows which point the direction of average seawater flow<sup>1</sup>.
- Press [export loc] if you would like to export latitude and longitude data as a text file for use in other applications.
- Press [export vel] if you would like to export the estimated depth mean current velocities as a text file.

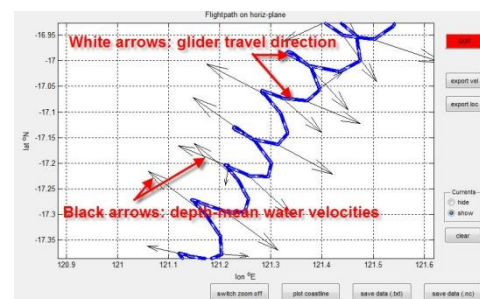


Figure 5. The plot on the right of the dashboard shows an aerial view of the glider path. Using the controls right of the plot, users may choose whether to also display the direction of currents as computed by the glider during its journey.

<sup>1</sup> ANFOG gliders do not carry any current velocity measuring devices. Current velocities are only very rough estimates which the glider has derived using onboard engineering parameters and GPS (Global Positioning System) fixes each time it surfaced. These are not quality controlled.

The exported text files can then be used in other programs, e.g. Excel. The files are named for what the columns of data contain,

e.g. 'lat\_lon\_time.txt' contains

- column 1: Latitude (*lat*)
- column 2: Longitude (*lon*)
- column 3: Time (*time*)

'ucur\_vcur\_lat\_lon\_time.txt' contains

- column 1: Eastward seawater velocity (*ucur*)
- column 2: Northward seawater velocity (*vcur*)
- column 3: Latitude (*lat*)
- column 4: Longitude (*lon*)
- column 5: Time (*time*)

(\* Note: Units of measurement are as shown in Table 1.)

### Glider's vertical path (side view)

- In *GLIDERSCOPE*'s bottom plot (Fig. 6), the vertical glider trajectory is displayed. You may choose to view this chart with data indices or dates on the x-axis. (To zoom in, use [**switch zoom on**] and drag with mouse to zoom.)

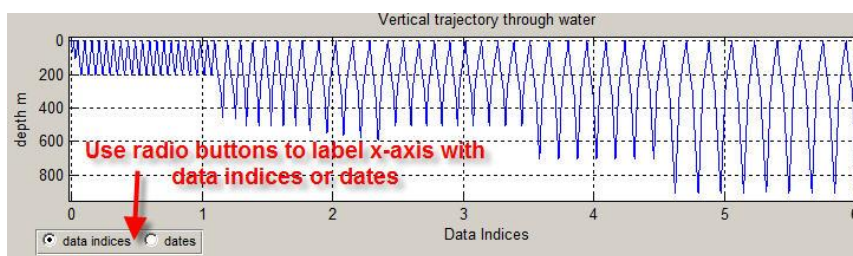


Figure 6. Bottom plot shows the dive paths on a vertical plane.

## 3.2 Extract data

### 3.2.1 Use all available data

- Press [**keep whole**] button (Fig. 7) to proceed with all of the data intact. Use with caution because every glider mission typically produces enormous volumes of high-resolution data which may tax your computer's resources if processed all at once.

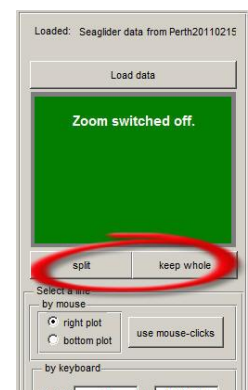


Figure 7. Use [**keep whole**] or [**split data**] to select data of interest.

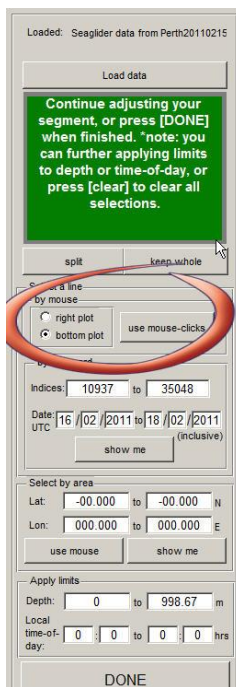
### 3.2.2 Use part of the data

- Press **[split]** button (Fig. 7) to begin defining which part of the dataset is of interest to you.
- When **[split]** is pressed, a control panel appears (Fig. 8). This allows you to select a more specific segment of data.

You may:

#### (i) **Select a line**

This option is especially useful for extracting data to make an oceanographic transect line. Selection can be made by any of the following methods:



#### **By mouse**

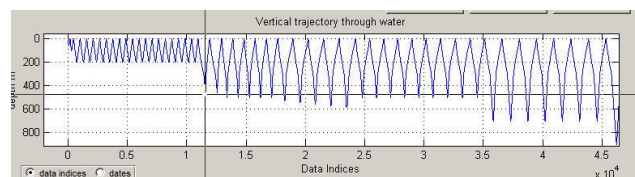
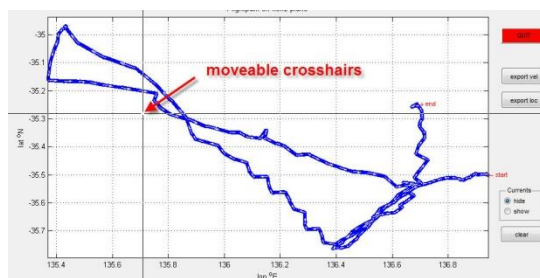
Choose  **right plot** or  **bottom plot** to indicate from which display you would like to select data from.

- Press **[use mouse-clicks]** button to enable the mouse.
- Using your mouse, click your desired start and end points over the chosen plot.

Although cross-hairs (Fig. 9) are provided to help you position your points, your selections need not be very precise, as *GLIDERSCOPE* will always find the data points closest to your mark.

You may use the **[switch zoom on]/ [switch zoom off]** button (Fig. 4) to zoom in for a closer look at any time.

**Figure 8. Control panel to split data; red circle highlights controls for line selection by mouse.**



**Figure 9. Cross-hairs help as your mouse-click the start and end points of your desired line segment; this can be done on either of the 2 charts.**



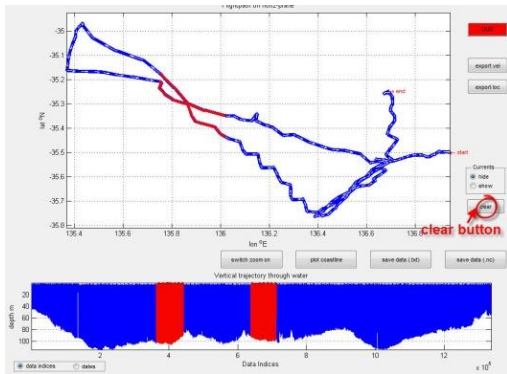


Figure 10. User-selected segment is highlighted in red.

- Finally, your selection is highlighted in red (Fig. 10), and the corresponding data indices, UTC dates and depth range are displayed in the control panel.
- \*optional: pressing **[clear]** button removes red highlighting and reinitialises everything in the control panel.
- If you re-do your mouse selection by pressing **[use mouse-clicks]** again, the existing red highlighting will also be cleared.

### Using zoom

The zoom feature works in both plots, regardless of which radio button (right plot / bottom plot) has been chosen.

- To enable/disable zooming, press **[switch zoom on]/ [switch zoom off]** button.
- Zoom controls -  
Zoom in: Hold down mouse button and drag a rectangle into either plot.

Zoom back out a bit: Hold down ALT-key (on the keyboard) and click once.

Zoom back out all the way: Quickly double-click over the plot.

If you have a scroll mouse, you can spin the scroll to zoom in or out fast.

If your mouse has a right button, pressing it displays other zoom options.

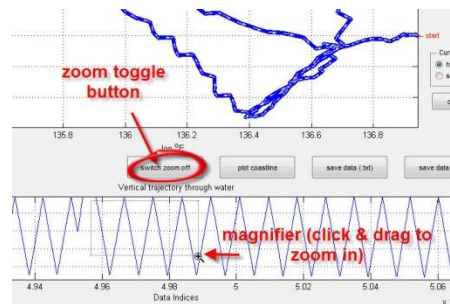


Figure 11. Controls for using zoom.

### By keyboard

- Using the keyboard, you may further tweak your previous mouse-click selection or define a new segment altogether. This may be done by specifying the segment range by typing into textboxes for
  - **Indices**<sup>2</sup> or
  - **Date** (Fig. 12).

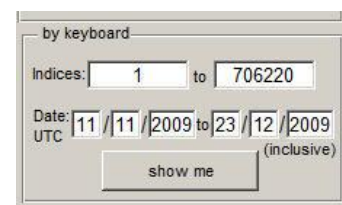


Figure 12. Keyboard input boxes to define start and end points of a segment, and a button to invoke graphical display of segment.

<sup>2</sup> The first entry in the time series is indexed as number 1.

\*Note: Having typed into the **Indices** text boxes, the **Date** will automatically be updated to correspond, and vice versa.

- For a closer look at the data index numbers, you may also use the [**switch zoom on**]/ [**switch zoom off**] button and zoom into the bottom plot (Fig. 11).
- Press [**show me**] if you need to check where these 2 points lay geographically (Fig. 12).
- The user-selected segment will then be highlighted in red (Fig. 10).
- \*optional: pressing [**clear**] button (Fig. 10) removes highlighting and reinitialise all text boxes.

**(ii) Select area**

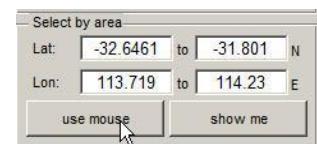
This option is particularly useful when you want to examine data from a specific region, e.g. within a sea canyon or in an ocean eddy. You may indicate the area of interest by mouse or by keyboard.

By mouse

- Press [**use mouse**] button to enable the mouse (Fig. 13).
- Click mouse and drag a box around your area of interest (Fig 14). The shape of this box can be modified using the box handles (little squares on the sides and corners), and the whole box may be moved by placing the mouse pointer within the box and dragging.
- When done, double-click within the box.
- Data that falls within the box will be highlighted in red (Fig. 15), and coordinates of the bounding box will automatically be shown in the **Lat** and **Lon** text boxes (Fig. 13).
- \*optional: pressing [**clear**] button (Fig. 10) removes highlighting and reinitialises all text boxes.

By keyboard

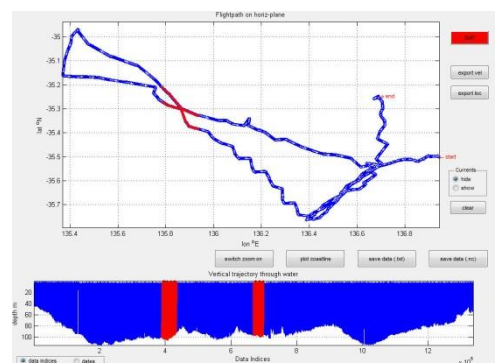
- If you prefer to define your area of interest directly by latitude/longitude coordinates, type into the **Lat** and **Lon** text boxes (Fig. 13).
- \*optional: pressing [**show me**] (Fig. 13) will highlight the data found within your chosen coordinates.



**Figure 13. Control panel for extracting data from a geographical area.**



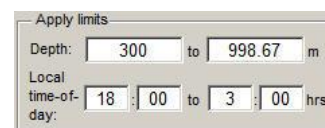
**Figure 14. Define an area of interest using the mouse; remember to double-click in the box when done.**



**Figure 15. Data within a chosen area is selected.**

(iii) **Apply limits**

In addition to any of the previous selections, the data may be further limited to aid your analyses. This may be done by typing into the relevant text boxes as shown in Fig. 16.



**Figure 16. Controls to limit the depth and/or time of day from which to extract data.**

Specifying depth range

If you want to examine data from a particular depth within the water column (e.g. to study surface processes, a subsurface current or dense water cascades near the seabed), you may find it useful to be able to specify and limit the depth range.

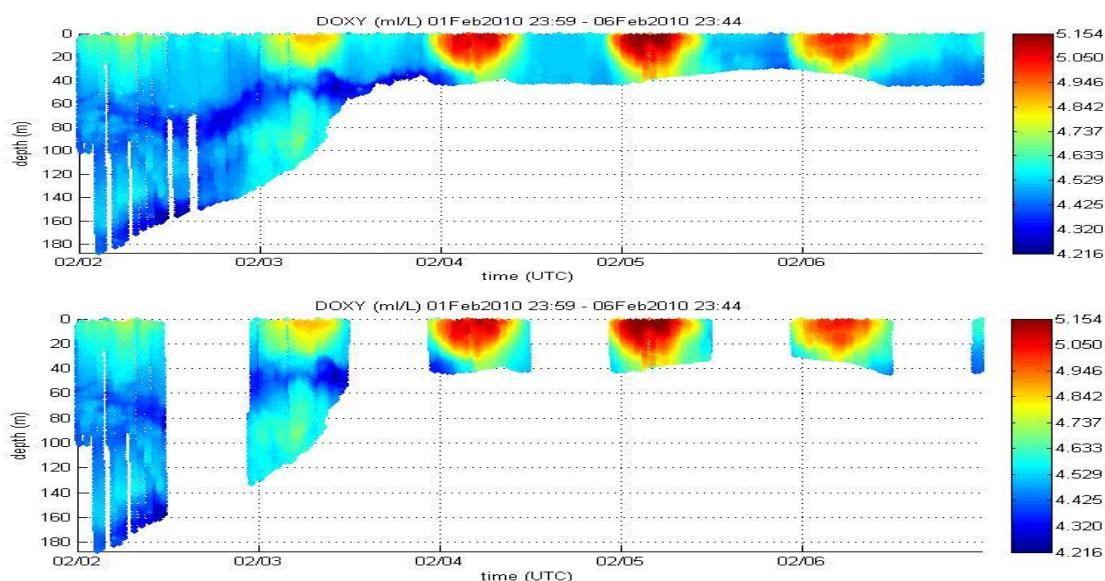
- Using your keyboard, type into the **Depth** boxes to indicate minimum and maximum depths.
- If you accidentally reverse the order of numbers in the **Depth** boxes, do not worry; *GLIDERSCOPE* will automatically sort them out.

Specifying time of day

This option is especially useful if you are interested in examining processes that occur only during certain times of day, e.g. isolating data from daylight hours, we see that the fluctuating pattern of dissolved oxygen in coastal waters may be the result of photosynthetic activity (Fig. 17).

- Using your keyboard, specify the range in the **Local-time-of-day** text boxes. The local time of day may be specified,

\*Note: For more intuitive use, you specify Time-of-day in standard local time, *not* UTC time.

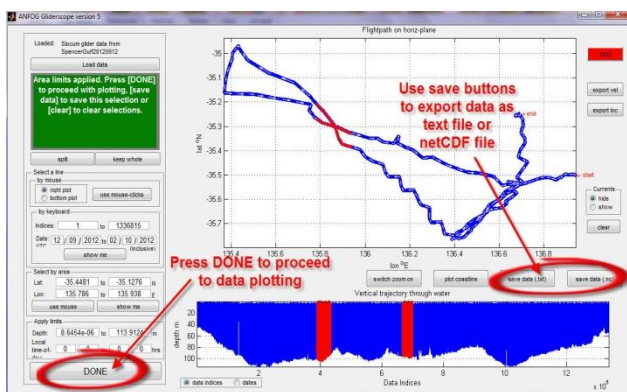


**Figure 17. (Top) A segment of data showing coastal fluctuations of dissolved oxygen concentration; (bottom) when data during daylight hours are isolated and plotted, it is seen that dissolved oxygen maxima coincides with daylight hours.**

### Finalise your selection

Now that data has been extracted, you may proceed to the next stage to visualise the data, or save the data as text files.

- Press **[Done]** when ready to plot up your selected data (Fig. 18).



**Figure 18. Finalise selection and move on to next stage.**

- Optional: Hit **[Save data]** to save the data as text files (.txt) or netCDF (.nc) files (Fig.18). Text files can then be used in other programs, e.g. excel. For the text files, data of each available kind of water property is saved in a separate file with 5 columns of numbers. The files are named for what the columns of data contain,

e.g. *TEMP\_depth\_lat\_lon\_time.txt* contains

- column 1: Temperature (*TEMP*)
- column 2: Depth (*depth*)
- column 3: Latitude (*lat*)
- column 4: Longitude (*lon*)
- column 5: Time (*time*)

(\*Note: Units of measurement as shown in Table 1)

- The netCDF files are generated such that you may read them back into Gliderscope.

Gliderscope filters the data such that only data that has been quality flagged as ‘good’ or ‘interpolated’ data passes into the saved files or into the plotting stage. The only exceptions are data for estimated depth mean current velocities, which receive no quality control. The units of measurement for every type of data is as listed in Table 1.

**Table 1. Parameters exported in text files.**

<b>code</b>	<b>standard name</b>	<b>units</b>
CNDC	Sea water electrical conductivity	S/m
DOX1	Mole concentration of dissolved molecular oxygen in sea water	$\mu\text{mol/L}$
DOX2	Moles of oxygen per unit mass in sea water	$\mu\text{mol/kg}$
CPHL	Mass concentration of chlorophyll in sea water	$\text{mg/m}^3$
PSAL	Sea water salinity	psu
TEMP	Sea water temperature	Celsius
CDOM	Concentration of coloured dissolved organic matter	ppb
VBSC	Volumetric scattering coefficient	$\text{m}^{-1}\text{sr}^{-1}$
BBP	Particle backscattering coefficient	$\text{m}^{-1}$
DENS	Sea water density	$\text{kg/m}^3$
SVEL	Velocity of sound through sea water	m/s
IRRADxxx	Downwelling spectral irradiance in sea water	$\mu\text{W/cm}^2\text{nm}^{-1}$
depth	Water depth downwards from sea surface	m
lat	Latitude	degrees north
lon	Longitude	degrees east
time	Time	days since 12am, Jan 1 <sup>st</sup> 1950
OCRxxx_x	Downwelling spectral irradiance in seawater at xxx.x nm (e.g. OCR470_3 is taken at 470.3nm)	$\mu\text{W/cm}^2/\text{nm}$
UCUR	Eastward seawater velocity	$\text{m s}^{-1}$
VCUR	Northward seawater velocity	$\text{m s}^{-1}$

### 3.3 Data visualisation

*GLIDERSCOPE* evokes a plotter (Fig. 19) to make it very simple for you to produce a variety of useful and attractive data plots. If salinity and temperature data are available (along with the depth and location data), *GLIDERSCOPE* immediately calculates corresponding seawater densities and underwater sound velocities and makes them available to you. As before, *GLIDERSCOPE* ‘speaks’ to you from its green talk screen, providing you with useful guidance at every step of the way.

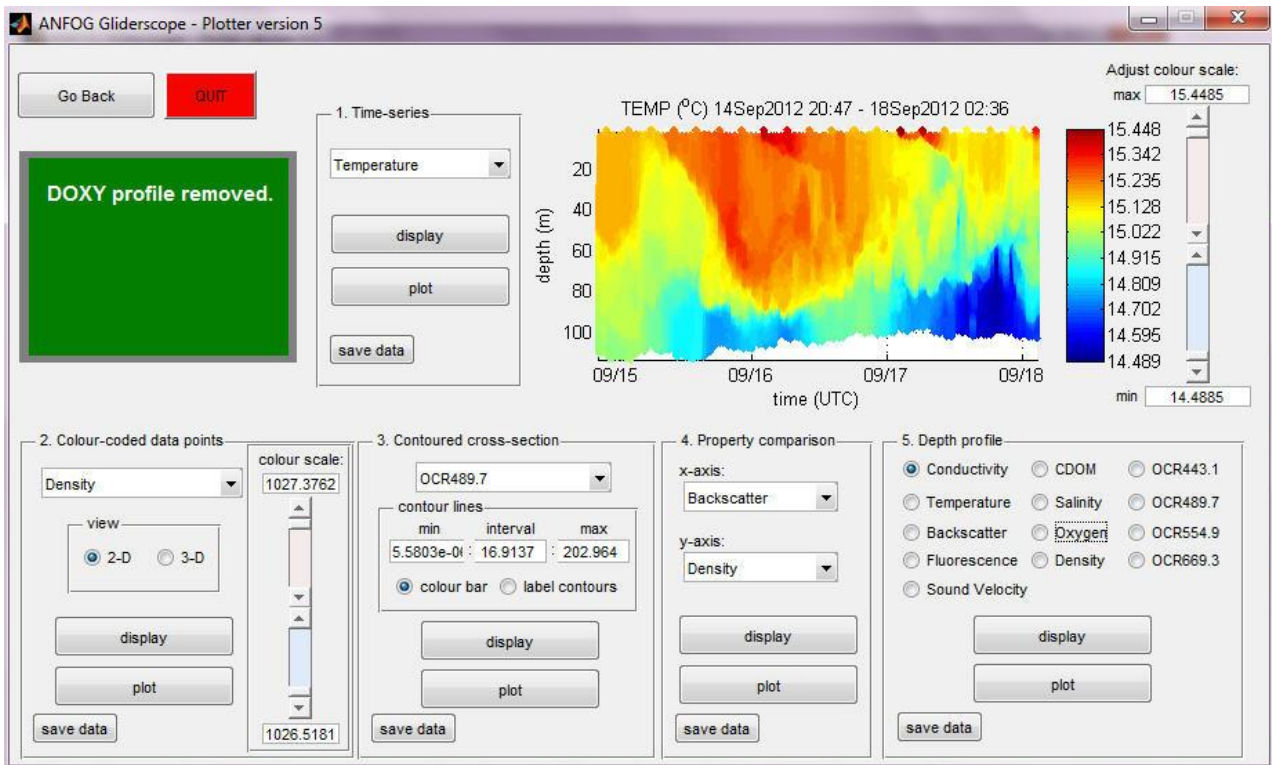
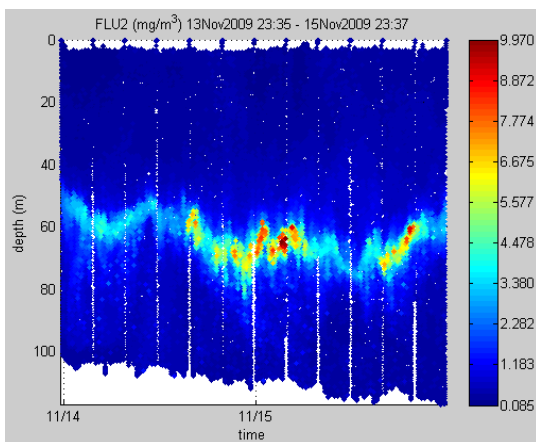


Figure 19. *GLIDERSCOPE*'s plotter dashboard

From each of the 5 plotting control panels of this dashboard (Fig. 19), you will be able to produce the following styles of plots:



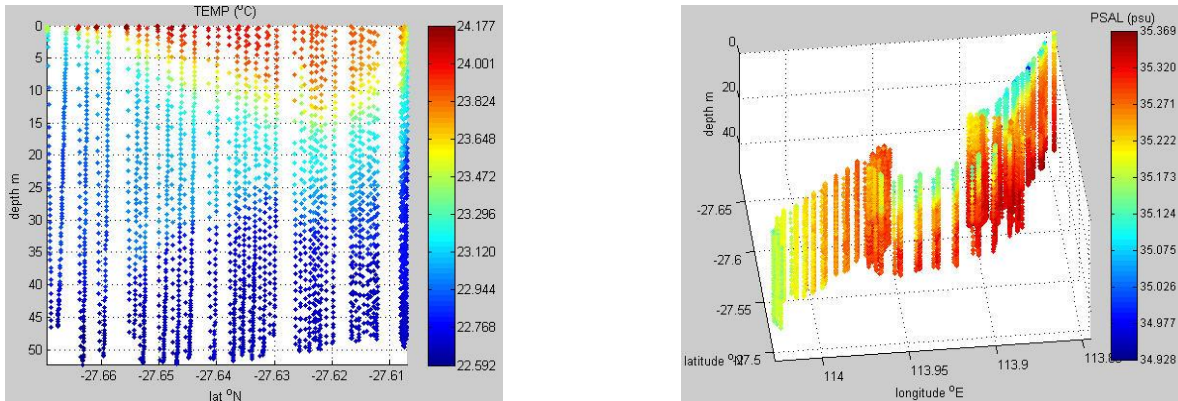
#### *Time-series*

- Time-series of water property data is plotted with time vs. depth axes (Fig. 20). This plot type is particularly useful when the glider performs repeated transect lines, because then it becomes obvious how the seawater's properties evolve with time. (See Section 3.3.1 for instructions to make such a plot.)

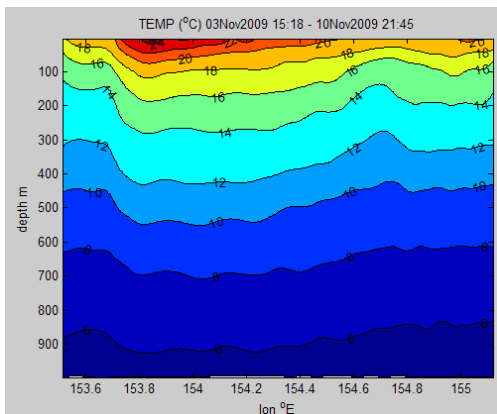
Figure 20. Panel 1 example output: Time-series plot of fluorescence; colour range is user-adjustable.

### Colour-coded data points

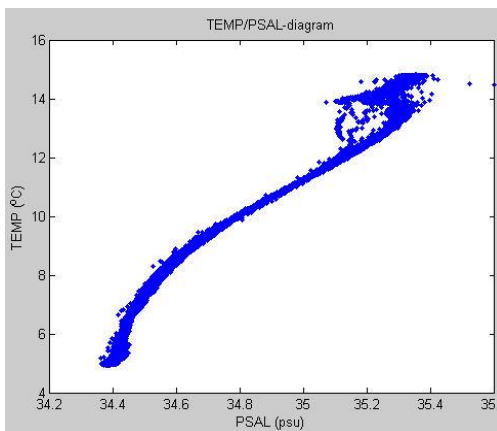
- Glider data are shown as colour-coded points spatially positioned where their measurements had been taken within the ocean (Fig. 21). This type of plot is especially useful for analysing vertical transects of the ocean. (See Section 3.3.2 for instructions to make such plots.)



**Figure 21. Panel 2 example outputs: Temperature data plotted in two-dimensional space (left) and salinity data in three-dimensional space (right); range of colour is user-adjustable and plots (right) can be rotated spatially using the mouse.**



**Figure 22. Panel 3 example output: contoured cross-sectional view of temperature data.**



**Figure 23. Panel 4 example output: Temperature can be compared to salinity data in a T/S diagram.**

### Contoured cross-section

- Glider data across transect lines can also be displayed contoured (Fig. 22). Because data is interpolated, the resulting plot allows you to get an overall visualisation of the general distribution and patterns of the water property.

(See Section 3.3.3 for instructions to make such a plot.)

### Property comparison

- Comparison between any 2 kinds of water properties can be plotted (e.g. TS-diagram, see Fig. 23). This allows you to examine the water property signatures and identify different water masses found in the water column.

(See Section 3.3.4 for instructions to make such a plot.)

## Depth profile

- Data from single dives can be viewed as vertical profiles of water property (Fig. 24). This is especially handy for locating the depth of thermoclines and pycnoclines, or determining the thickness of water masses, deep-chlorophyll maxima, etc.

(See Section 3.3.5 for instructions to make such a plot.)

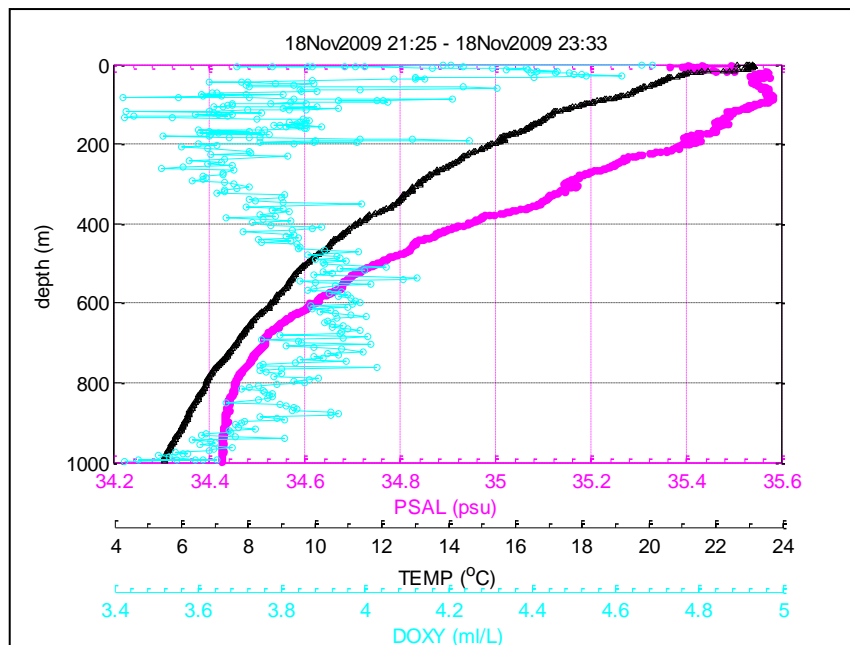


Figure 24. Panel 5 example output: Vertical profiles of water properties sampled in the water column.

You can choose to browse the plots via *GLIDERSCOPE*'s plotter display window (Fig. 19), or export them as separate figure files to be saved or edited.

Data from each plot can also be extracted and saved into text files by pressing [**save data**] at the bottom of respective control panels.

At any time, should you wish to select a different leg of the flight path or load up a different data file altogether, press [**Go Back**] (Fig. 25).

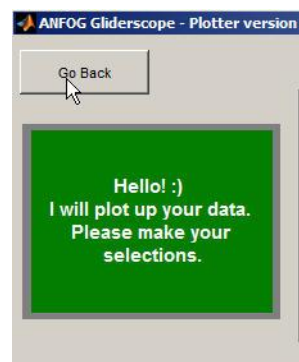


Figure 25. Go back to grab a different segment of data, or load up a different glider data file.



### 3.3.1 Using Control Panel 1: Time-series

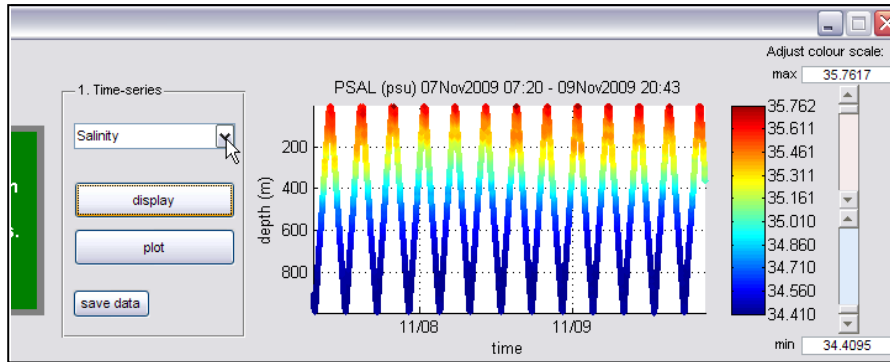


Figure 26. Time-series control panel, chart display area and colour slider. The drop-down menu is populated with data types available for plotting.

- Select a data type from the drop-down menu (Fig. 26). This menu is populated only with data types found to be available in the glider mission (and possibly the addition of density and sound velocity data calculated by *GLIDERSCOPE*).
- Press [**display**] to view time-series plot in the display area beside the time-series control panel, or press [**plot**] to plot in a separate saveable figure (Fig. 26).
- Colour range can be adjusted either by moving the sliders up and down, or by manually typing numbers into the **max** and **min** text-boxes. Then, press [**display**] / [**plot**] again (Fig. 26).

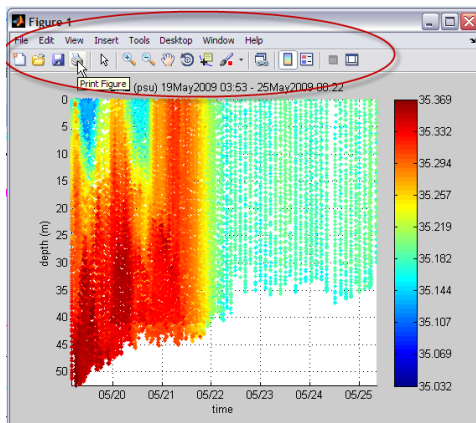


Figure 27. The chart menu and toolbar allows user to do various things to the chart; click on the menu items or roll the mouse over icons to find out what each does.

- If plotted separately, use the chart's toolbar to save, print, manipulate or edit the chart (Fig. 27). A helpful description for each toolbar button appears as you roll your mouse over it.
- Optional: If you require a copy of the data illustrated in this plot, press [**save data**] button (Fig. 26).

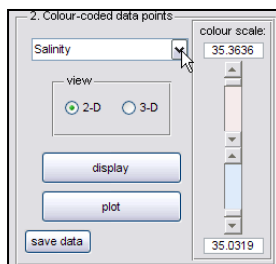
Each saved file contains 3 columns of numbers. The file name reflects which control panel produced it, as well as what data each column contains,

e.g. 'chart1\_DENS\_time\_depth.txt' contains

- column 1: Density (*DENS*)
- column 2: Time (*time*)
- column 3: Depth (*depth*)

(\* Note: Units of measurement are as shown in Table 1.)

### 3.3.2 Using Control Panel 2: Colour-coded Data Points



**Figure 28. Colour-coded data points control panel.**

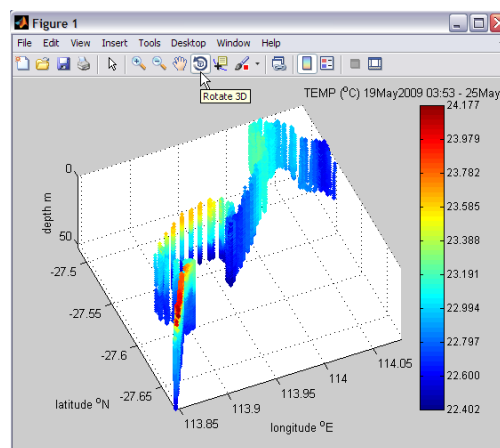
- Select a data type from the drop-down menu (press arrow on Fig 28). This menu is populated only with data types found to be available in the glider mission (and possibly the addition of density and sound velocity data calculated by *GLIDERSCOPE*).
- Select either 2-D or 3-D radiobutton (Fig. 28). This refers to the spatial dimensions in which you want to visualise the data. Data will be plotted as dots in an additional dimension of colour.

- Press [**display**] to produce the plot in the display area, or press [**plot**] to plot in a separate saveable figure (Fig. 28).
- Colour-range can be adjusted either by moving the sliders up and down, or by manually typing numbers into the **colour scale** text-boxes. Then, press [**display**] / [**plot**] again.

\*Note: *GLIDERSCOPE* automatically detects the orientation of the transect and chooses the more appropriate (longer) x-axis to plot on.

Plots in 3-D space are always created as separate figures to allow you access to tools for 3-D rotating, zooming, etc.

- To rotate the figure, first click on the ‘rotate 3D’ icon (as indicated in Fig. 29).
- Then use the mouse to click and drag the figure around, rotating it freely in any direction.
- The chart’s toolbar can also be used to save, print, manipulate or edit the chart (Fig. 29).
- Optional: If you require a copy of the data illustrated in the plot, press [**save data**] button (Fig. 28).



**Figure 29. Data plotted in 3-D space can be freely rotated using the mouse.**

File names reflect which control panel produced them, as well as what data is contained therein,

2-D :

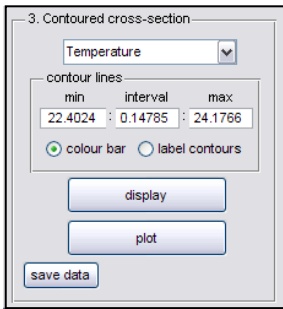
- e.g. ‘chart2\_TEMP\_depth\_lon.txt’
- column 1: Temperature (*TEMP*)
  - column 2: Depth (*depth*)
  - column 3: Longitude (*lon*)

3-D :

- e.g. ‘chart2\_TEMP\_depth\_lat\_lon.txt’
- column 1: Temperature (*TEMP*)
  - column 2: Depth (*depth*)
  - column 3: Latitude (*lat*)
  - column 4: Longitude (*lon*)

(\* Note: Units of measurement are as shown in Table 1.)

### 3.3.3 Using Control Panel 3: Contoured Cross-section



**Figure 30. Contoured cross-section control panel**

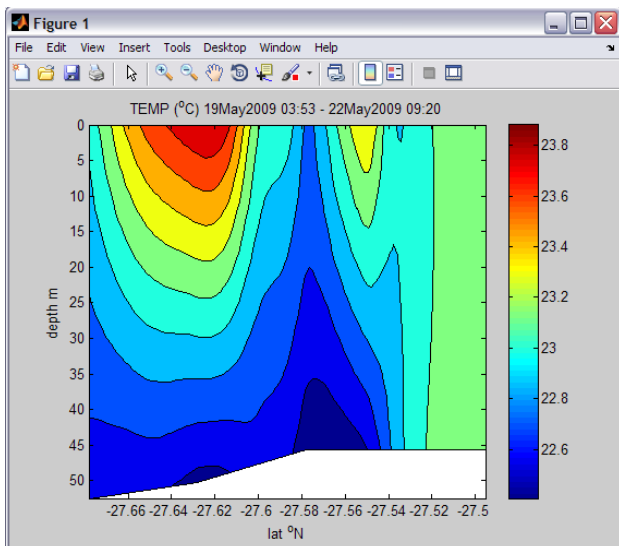
- Select a data type from the drop-down menu. This menu is populated only with data types found to be available in the glider mission (and possibly the addition of density and sound velocity data calculated by *GLIDERSCOPE*).
- Contour values can be user-defined. Just alter the values in the text boxes by typing directly into them (Fig.30).

- Use radio buttons for a chart with a colour bar, or to have contours labelled (Fig. 30).
- Press **[display]** to produce the plot in the display area, or press **[plot]** to plot in a separate saveable figure (Fig. 30).
- If plotted separately (Fig. 31), use the chart's toolbar to save, print or edit the chart. A helpful description for each toolbar button appears as you roll your mouse over it (Fig. 27).
- Optional: Press **[save data]** if saving the plotted data to a text file is required (Fig. 30).

The plotted data is then saved in a three text files,

- e.g.
- 'chart3\_interpTEMP.txt' contains an  $n \times m$  matrix of interpolated temperature data.
  - 'chart3\_lon.txt' contains longitudinal positions for each data point in the above file.
  - 'chart3\_depth.txt' contains depth positions for each data point.

The units of measurement for each type of data is as listed in Table 1.



**Figure 31. Contour plot provides an overview of water property patterns; the white section beneath the plot indicates the limit of glider data, not bathymetry.**

\*\* Note that in contour plots, data interpolation is performed between sampled points. As such, the user is cautioned when interpreting the contour chart. It is suggested that users also plot the data using colour-coded data points, so they may better conceptualise where the real sampling positions lay.

### 3.3.4 Using Control Panel 4: Property Comparison

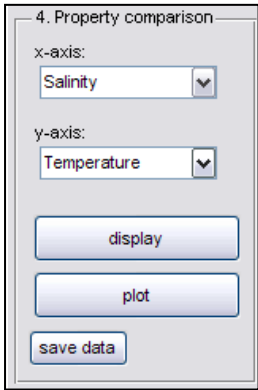


Figure 32. Property comparison control panel.

- Select your required data types for each of the x- and y- axes from the respective drop-down menus. These menus are populated only with data types found to be available in the glider mission (and possibly the addition of density and sound velocity data calculated by *GLIDERSCOPE*).
- Press [**display**] to produce the plot in the display area, or press [**plot**] to plot in a separate saveable figure (Fig. 32).
- If plotted separately (Fig. 33), use the chart's toolbar to save, print or edit the chart. A helpful description for each toolbar button appears as you roll your mouse over it (Fig. 27).

- Optional: Use [**save data**] if saving the plotted data to a text file is required (Fig. 32).

The selected data are then saved in a text file with 2 columns of numbers, one for each axis plotted. The file is named for what the columns of data contain,

e.g. '*chart4\_PSal\_TEMP.txt*' contains

- column 1: Salinity (*PSAL*)
- column 2: Temperature (*TEMP*)

The units of measurement for each type of data is as listed in Table 1.

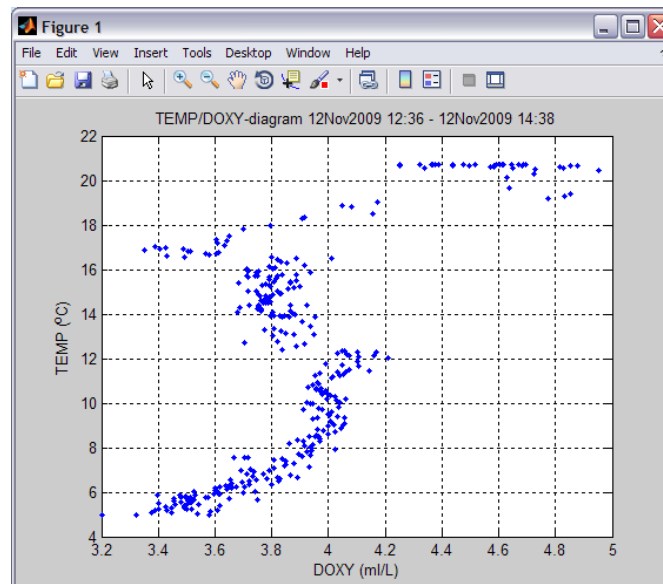
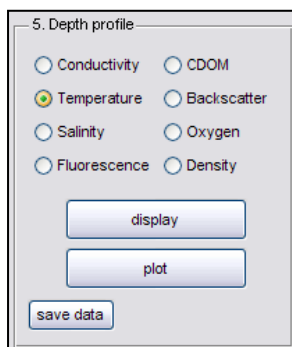


Figure 33. An example of Temperature vs Dissolved Oxygen plot for a single dive.

\*\* Hint: This type of chart may sometimes provide clearer patterns if smaller segments of data (e.g. from a specified depth range or area) are examined (Fig. 29).

### 3.3.5 Using Control Panel 5: Depth-profile



- Select your required data types by clicking on the radio buttons (Fig. 34).
- Press **[display]** to produce the plot in the display area (this option is only available for single data type selection), or press **[plot]** to plot in a separate saveable figure (Fig. 34).
- If plotted separately (Fig. 34), use the chart's toolbar to save, print or edit the chart. A helpful description for each toolbar button appears as you roll your mouse over it (Fig. 27).

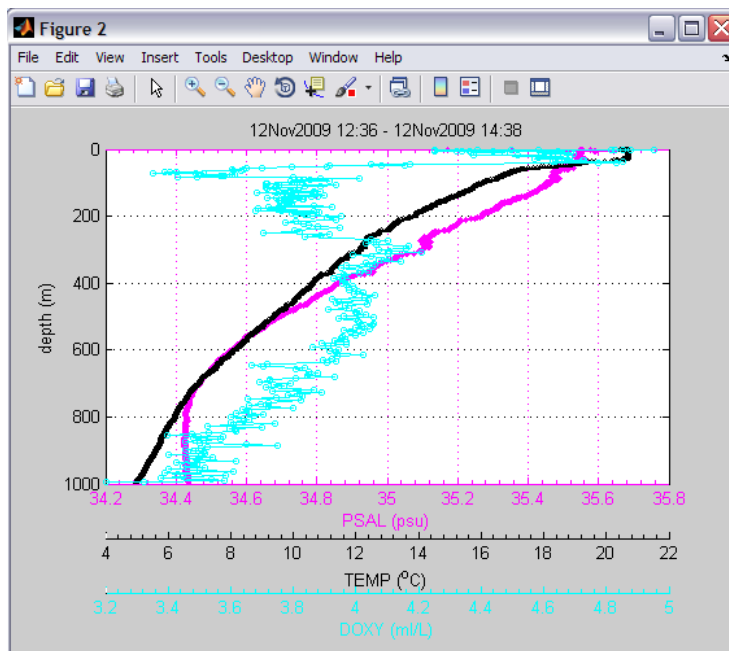
**Figure 34. Depth-profile control panel**

- Optional: Use **[save data]** if saving the plotted data to text files is required (Fig. 34).

The selected data are then saved into text files with 2 columns of numbers, one for each axis plotted. The file is named for what the columns of data contain,

e.g. '*chart5\_TEMP\_depth.txt*' contains  
 - column 1: Temperature (*TEMP*)  
 - column 2: Depth (*depth*)

The units of measurement for each type of data is as listed in Table 1.



**Figure 35. Depth profiles taken from a single dive.**

\*\* Hint: This plotting method is best used with data from a single glider-dive.

## 3.4 Finish

When you have finished plotting and examining your data, you may:

- Press [**go back**] button (Fig. 27) to select another leg of the mission or load a different data file altogether; or
- Finally press the red QUIT button or close all windows to end the *GLIDERSCOPE* program.