

SOFTWARE RELEASE NOTICE

1. SRN Number: 378		
2. Project Title: Igneous Activity Technical Assistance, Structural Deformation and Seismicity Technical Assistance		Project No. 06002-01-051 06002-01-061 1005 06002-0291, 311, 1/2/04
3. SRN Title: Surfer Version 8.0		
4. Originator/Requestor: Brandi L. Winfrey		Date: September 14, 2004
5. Summary of Actions		
<input checked="" type="checkbox"/> Release of new software <input type="checkbox"/> Change of access software <input type="checkbox"/> Release of modified software: <input type="checkbox"/> Software Retirement <input type="checkbox"/> Enhancements made <input type="checkbox"/> Corrections made		
6. Validation Status		
<input type="checkbox"/> Validated <input type="checkbox"/> Limited Validation <input checked="" type="checkbox"/> Not Validated Explain: <u>Validation is currently ongoing.</u>		
7. Persons Authorized Access		
Name	Read Only/Read-Write	Addition/Change/Delete
ALL	YES	NO
8. Element Manager Approval: <i>A. Lawrence McKeye</i> Date: <i>9/15/04</i>		
9. Remarks: Software is licensed, commercial, acquired software not to be modified.		

SOFTWARE SUMMARY FORM

01. Summary Date: September 14, 2004		02. Summary prepared by: Brandi L. Winfrey (210)522-5083		03. Summary Action: NEW	
04. Software Date: Oct 1, 2002		05. Short Title: Surfer			
06. Software Title: Surfer Version 8.0 - Surface Mapping System				07. Internal Software ID: Serial Number: WS-063055-1006	
08. Software Type: <input type="checkbox"/> Automated Data System <input checked="" type="checkbox"/> Computer Program <input type="checkbox"/> Subroutine/Module		09. Processing Mode: <input checked="" type="checkbox"/> Interactive <input type="checkbox"/> Batch <input type="checkbox"/> Combination		10. Application Area a. General: <input type="checkbox"/> Scientific/Engineering <input checked="" type="checkbox"/> Auxiliary Analyses <input type="checkbox"/> Total System PA <input type="checkbox"/> Subsystem PA <input type="checkbox"/> Other b. Specific: Igneous Activity, Structural Deformation	
11. Submitting Organization and Address: CNWRA/SwRI 6220 Culebra Road San Antonio, TX 78228			12. Technical Contact(s) and Phone: Golden Software, Inc 809 14 th Street Golden, Colorado 80401-1866 Sales: 800-972-1021 Tech Support: 303-279-1021 www.goldensoftware.com		
13. Software Application: A Powerful Contouring, Gridding, and Surface Mapping Package for Scientists and Engineers. Surfer is a contouring and 3D surface mapping program that runs under Microsoft Windows. It quickly and easily converts data into contour, surface, wireframe, vector, image, shaded relief, and post maps.					
14. Computer Platform Microsoft		15. Computer Operating System: Windows 98, Me, 2000, XP, or higher.		16. Programming Language(s): N/A	
17. Number of Source Program Statements: N/A, only have executable code		18. Computer Memory 32 MB RAM minimum, 64 MB or higher recommended		19. Tape Drives: N/A	
20. Disk Units: 25 MB of free hard disk space		21. Graphics: 800 X 600 minimum monitor resolution			
22. Other Operational Requirements: N/A					
23. Software Availability: <input type="checkbox"/> Available <input checked="" type="checkbox"/> Limited <input type="checkbox"/> In-House ONLY			24. Documentation Availability: <input checked="" type="checkbox"/> Available <input type="checkbox"/> Preliminary <input type="checkbox"/> In-House ONLY		
25. Software Developer: Golden Software, Inc				Date: October 1, 2002 (development kit)	

SSF data
11/29/2004

CENTER FOR NUCLEAR WASTE REGULATORY ANALYSES
QA VERIFICATION REPORT
FOR
→ ACQUIRED SOFTWARE NOT TO BE MODIFIED ←

Software Title/Name: Surfer
 Version: 8.0
 Demonstration workstation: PC
 Operating System: Windows 98 imp.
 User: K. Winfrey

NOTE: Acquired software may or may not meet all requirements and will be evaluated on a case-by-case basis.

Installation Testing [TOP-018, Section 5.6]

Has *installation testing* been conducted for each intended computer platform and operating system?
 Yes: No: N/A:

Computer Platforms: PC Operating Systems: Windows 2000
 Location of Acceptance Test Results: Installation test report (attached)
 Comments: 7/3/02

Software Output [TOP-018, Section 5.5.4]

Is software designed so that individual runs are uniquely identified by date, time, name of software and version?
 Yes: No: N/A:

Date and Time Displayed: _____
 Name/Version Displayed: _____
 Comments:

NOTE: Output identification content and format is typically taken as is.

Medium Documentation [TOP-018, Section 5.5.6]

The physical labeling of software medium (tapes, disks, etc.) contains: Program Name, Module/Name/Title, Module Revision, File type (ASCII, OBJ, EXE), Recording Date, and Operating System(s)?
 Yes: No: N/A:

Comments:

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User Documentation [TOP-018, Section 5.5.7]

Is there a Users' Manual for the software and is it up-to-date? Yes: No: N/A:

User's Manual Version and Date:
 Comments: *in help pages for Version 8.0*

Are there basic instructions for the *installation* and *use* of the software? Yes: No: N/A:

Location of Instructions: *help pages*
 Comments:

Configuration Control [TOP-018, Section 5.7, 5.9.3]

Is the Software Summary Form (Form TOP-4-1) completed and signed? Yes: No: N/A:

Date of Approval: *1/29/2004*

Is the list of files attached to the Software Summary Form complete and accurate? Yes: No: N/A:

Comments:

Is the source code available or, is the executable code available in the case of (acquired/commercial codes)? Yes: No: N/A:

Location of Source Code: _____
 Comments:

Have all the script/make files and executable files been submitted to the Software Custodian?
 Only the executable files are being submitted. Yes: No: N/A:

Location of executable files: _____
 Comments:

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Software Release [TOP-018, Section 5.9]

Upon acceptance of the software as verified above, has a Software Release Notice (SRN), Form TOP-6 been issued and does the version number of the software match the documentation?

Yes: No: N/A:

SRN Number: 338
 Comments:

Software Validation [TOP-018, Section 5.10]

Has a Software Validation Test Plan (SVTP) been prepared for the *range of application* of the software?

Yes: No: N/A:

Version and Date of SVTP: IN PROCESS
 Date Reviewed and Approved via QAP-002: ____
 Comments:

Has a Software Validation Test Report (SVTR) been prepared that documents the results of the validation cases, interpretation of the results, and determination if the software has been validated?

Yes: No: N/A:

Version and Date of SVTR: ____
 Date Reviewed and Approved via QAP-002: ____
 Comments.:

Additional Comments:

[Signature] nov 30, 04
 Software Evaluator/User/Date

[Signature] 11/30/2004
 Software Custodian/Date

INSTALLATION TEST RESULTS
Surfer® Version 8.0

Prepared by

B. Winfrey

Center for Nuclear Waste Regulatory Analyses
San Antonio, Texas

November 2004

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FIGURES

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Figure 1 Results

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1 Environment

1.1 Software

- System: Microsoft Windows 2000
- Computer: Intel® Pentium
- CPU 2.8 GHz
- Memory: 510 MB RAM

1.2 Hardware

- Computer: Intel® Pentium
- CPU 2.8 GHz
- Memory: 510 MB RAM

2 Input Files

The input data file TUTORWS.DAT is a sample file included with the Surfer® 8.0 installation in the SAMPLES folder.

3 References

Help pages for Surfer® 8.0 found under the Help Menu on the Main Menu bar. Lessons 2 and 3 were used for the installation test.

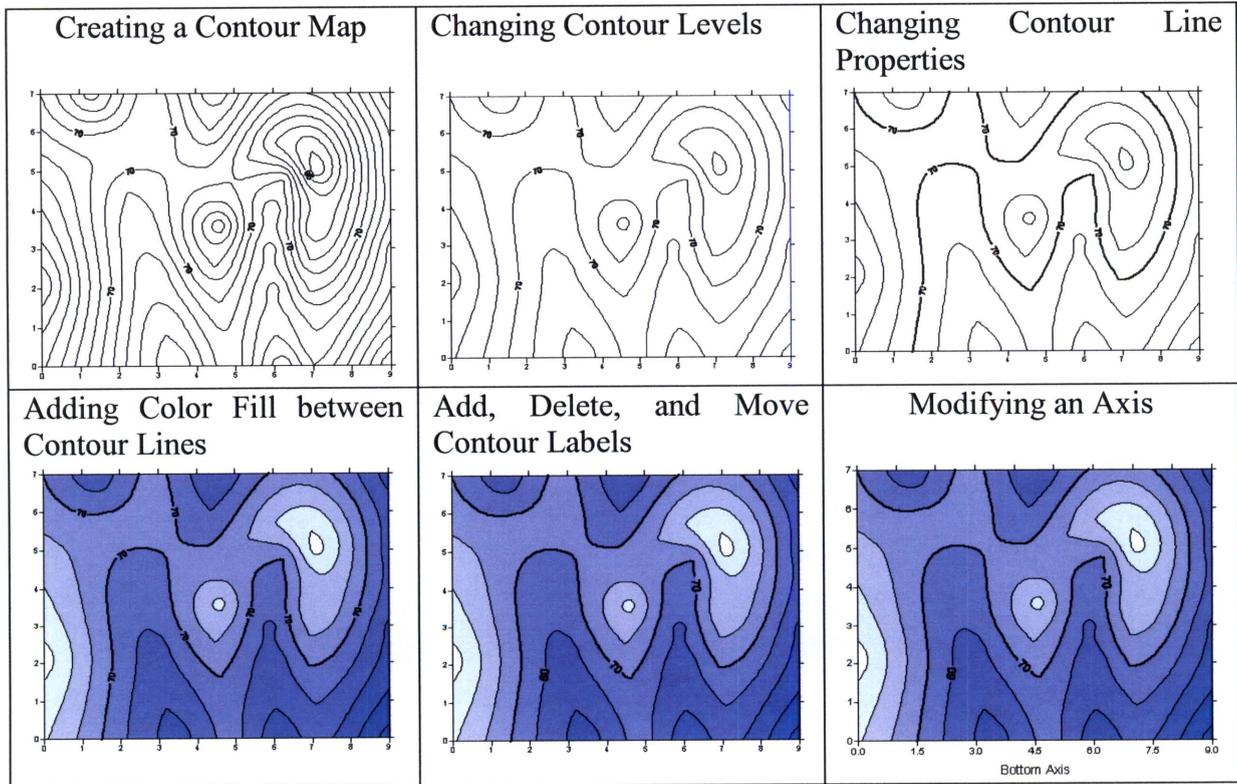
4 Description of Installation Test

The Installation Test was taken directly from the Surfer® Version 8 Help files, found by clicking on the “Help” button on the main toolbar within the software program. See Attachment 1.

5 Results

This installation test was successful and passed. The obtained results shown in Figure 1 are identical to the expected results shown in the Help files. Based on the results of this test, the software appears to have been successfully installed.

Figure 1 Results



Lesson 2 - Creating a Grid File

Grid files are required to produce a grid-based map. Grid-based maps include contour maps, image maps, shaded relief maps, 1-grid vector maps, 2-grid vector maps, wireframes, and surfaces. Grid files are created using the **Grid | Data** command. The **Data** command requires data in three columns, one column containing X data, one column containing Y data, and one column containing Z data. We have included a sample XYZ data file (TUTORWS.DAT) with **Surfer** for you to see how to produce a grid file. After completing the tutorial, if you need to produce an XYZ data file of your data for your work, see Lesson 1 - Creating an XYZ Data File.

To produce a grid file from TUTORWS.DAT:

1. If you have the worksheet window open, click on the **Window** menu and choose **Plot1**. Alternatively, you can create a new plot window with **File | New** (select *Plot Document* and then click OK).
2. Choose the **Grid | Data** command.
3. In the **Open** dialog, click the file TUTORWS.DAT (located in **Surfer's** SAMPLES folder). The name appears in the *File name* box below the list of data files.
4. Click *Open* and the **Grid Data** dialog is displayed. Alternatively, you can double-click the data file name to display the **Grid Data** dialog.
5. The **Grid Data** dialog allows you to control the gridding parameters. Take a moment to look over the various options in the dialog. Do not make changes at this time, as the default parameters create an acceptable grid file.
 - The *Data Columns* group is used to specify the columns containing the X and Y coordinates, and the Z values in the data file.
 - The *Grid Line Geometry* group is used to specify the XY grid limits, grid spacing, and number of grid lines (also referred to as rows and columns) in the grid file.
 - The *Gridding Method* group is used to specify the interpolation method and interpolation options.
 - The *Output Grid File* group is used to specify the path and file name for the grid file.
 - The *Grid Report* option is used to specify whether to create a statistical report for the data.
6. Click OK. In the status bar at the bottom of the window, a display indicates the progress of the gridding procedure. By accepting the defaults, the grid file uses the same path and file name as the data file, but the grid file has a [.GRD] extension.

Gridding using kriging with all data: filling the grid... 11% Time remaining: 5 sec

7. By default, a message appears after gridding the data. Click OK in the grid file has been created message box.
8. If *Grid Report* is checked, a report is displayed. You can minimize or close this report.

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Lesson 3 - Creating a Contour Map

The Map | Contour Map command creates a contour map based on a grid file.

To create a contour map of the TUTORWS.GRD file created in the previous lesson:

1. Choose the **Map | Contour Map | New Contour Map** command, or click the  button.
2. The **Open Grid** dialog is displayed. The grid file you just created (TUTORWS.GRD) is automatically entered in the *File name* box. If the file does not appear in the *File name* box, select it from the file list.
3. Click the *Open* button to create a contour map.
4. The map is created using the default contour map properties.
5. If you want the contour map to fill the window, choose the View | Fit to Window command.

Lesson 3 Contents

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[Changing Contour Levels](#)

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[Next to Opening Map Properties](#)

Opening Map Properties

After creating a map, you can change the map properties. There are several ways to open an object's properties. The most common method is to double-click on the object. Refer to [Properties](#) for alternative methods of opening properties.

[Back](#) to Lesson 3 - Creating a Contour Map

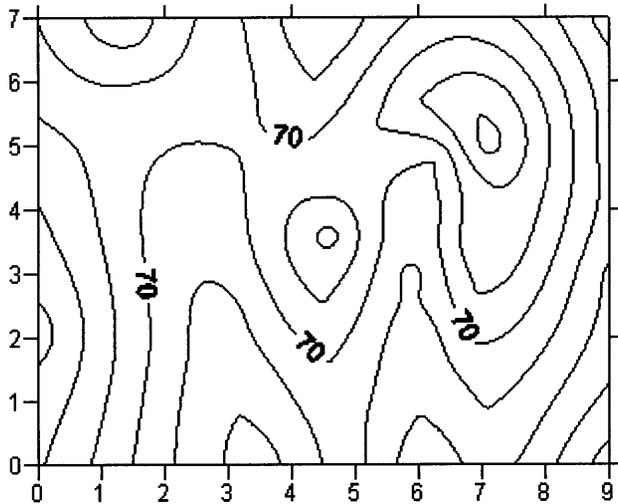
[Next](#) to Changing Contour Levels

Changing Contour Levels

After you create a [contour map](#), you can easily modify any of the map features. For example, you might want to change the contour levels displayed on the map.

To change the contour levels of the map you just created:

1. Place the pointer inside the limits of the contour map and double-click to display the [contour map properties](#) dialog.
2. In the contour map properties dialog, click the [Levels](#) page to display the contour levels and contour line properties for the map. In this example, the contour levels begin at $Z = 20$. Click on the scroll bar at the right to scroll to the bottom. You can see that the maximum contour level is $Z = 105$ for this map and that the contour interval is 5.
3. To change the contour range and interval, click the *Level* button and the **Contour Levels** dialog is displayed. This shows the *Minimum* and *Maximum* contour level for the map and the contour *Interval*.
4. Double-click in the *Interval* box and type the value 10. Click the OK button and the **Levels** page is updated to reflect the change.
5. Click OK in the contour map properties dialog and the map is redrawn with the new contour levels.



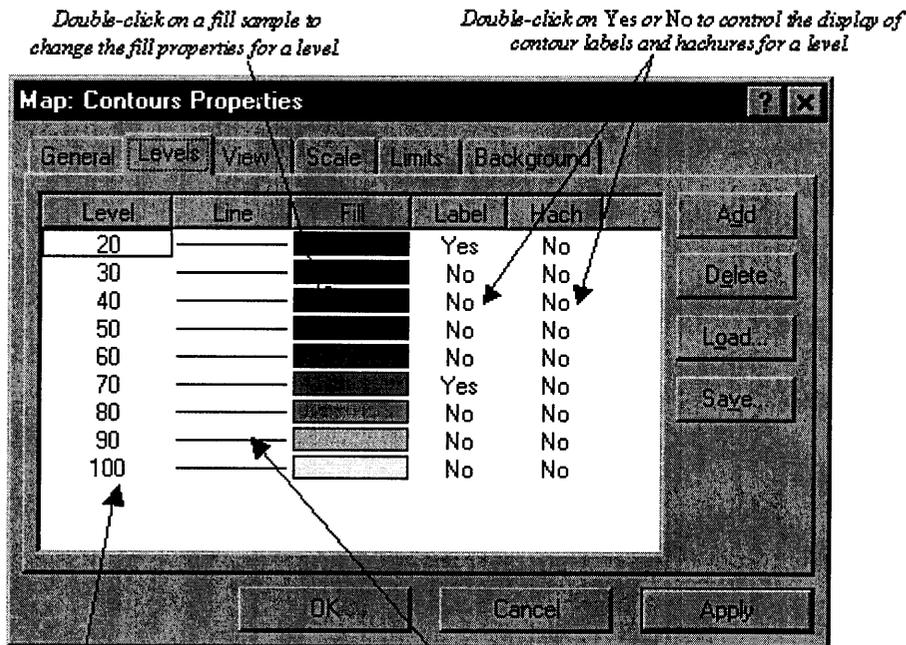
The contour map is redrawn using new contour levels based on 10-foot contour intervals.

[Back](#) to Opening Map Properties

[Next](#) to Changing Contour Line Properties

Changing Contour Line Properties

You can double-click any of the elements in the list on the [Levels](#) page to modify the individual element. For example, you can double-click an individual Z value in the list to change the Z value for that particular contour level. You can also double-click the line style for an individual level to modify the line properties for the selected level. This provides a way to emphasize individual contour levels on the map.



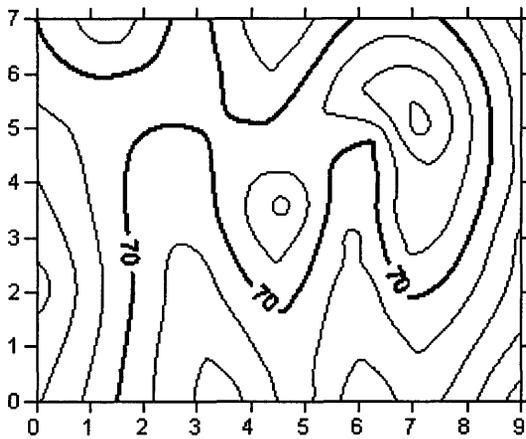
Double-click on the level value to enter a new Z value for a level.

Double-click on a line to change line properties for a level.

You can double-click on individual elements on the Levels page to set specific parameters for the selected level.

To change contour line properties:

1. Double-click the contour map to open the map properties.
2. On the **Levels** page, double-click the line sample for the contour level at $Z = 70$ to open the **Line Properties** dialog.
3. You can select the line color, style, or width for the selected line in the **Line Properties** dialog. In the **Width** box, click the up arrow, and change the width value to 0.030 in. (A width of 0.000 in is equivalent to one pixel width.)
4. Click OK in the **Line Properties** dialog, and the **Levels** page is updated to reflect the change.
5. Click OK in the map properties dialog and the map is redrawn. The contour line at $Z = 70$ is drawn with a thicker line.



The contour line at $Z = 70$ appears bolder than the other contour lines on this map after changing the line properties.

[Back to Changing Contour Levels](#)

[Next to Adding Color Fill between Contour Lines](#)

Adding Color Fill between Contour Lines

Color fill can be assigned to individual levels in the same way as [line properties](#). Alternatively, you can assign colors based on a gradational spectrum between two colors.

The [Levels](#) page in the contour map properties dialog shows a correspondence between a level (under the *Level* button) and a color (under the *Fill* button). The colors are used to fill in the space between the corresponding level and the next higher level. For example, if the contour levels are 20, 30, 40, ..., etc., then the color corresponding to level 20 is used to fill in the space between the level 20 contour and the level 30 contour.

To change color fill:

1. Double-click the contour map to open the contour map properties dialog.
2. Click the *Fill Contours* check box on the [General](#) page.
3. On the **Levels** page, click the *Fill* button to open the [Fill](#) dialog.

4. Click the *Foreground Color* button to open the Color Spectrum dialog. This dialog allows you to select colors to assign to specific Z values. Click on the left anchor point  button above the spectrum, click on the color blue in the color palette, and then click OK. The *Foreground Color* button is now displayed as a gradation from blue to white in the **Fill** dialog.
5. Click OK and the fill colors on the **Levels** page are updated to reflect the change.
6. Click OK and the contour map is redrawn with color fill between the contours.

[Back](#) to Changing Contour Line Properties

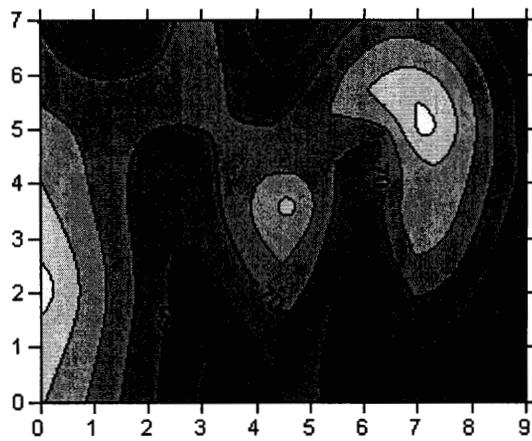
[Next](#) to Add, Delete, and Move Contour Labels

Add, Delete, and Move Contour Labels

Contour label locations can be changed on an individual basis. Labels can be added, deleted, or moved.

To add, delete, and move contour labels:

1. Right-click on the contour map and choose the **Edit Contour Labels** option. You can also edit labels of a selected contour map using the **Map | Contour Map | Edit Labels** command. The pointer changes to a black arrowhead  to indicate that you are in edit mode.
2. To delete a label, click on the label and press the DELETE key on the keyboard. For example, click on a 70 label and then click the DELETE key on your keyboard.
3. To add a label, press and hold the CTRL key on the keyboard and click on the location on the contour line where you want the new label located. Add a 60 contour label to the lower left portion of the map.
4. To move a contour label, click on the label, hold down the left mouse button, and drag the label. Move the 70 contour label on the right portion of the map to the north.
5. To exit the **Edit Contour Labels** mode, press the ESC key.



Contour labels can be moved, added, or deleted.

[Back](#) to Adding Color Fill between Contour Lines

[Next](#) to Modifying an Axis

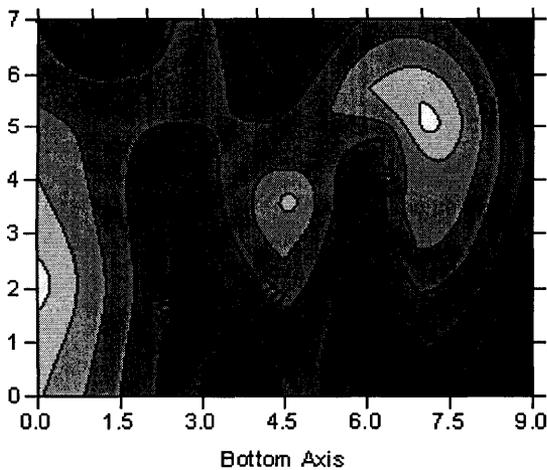
Modifying an Axis

Every contour map is created with four axes: the bottom, right, top, and left axes. You can control the display of each axis independently of the other axes on the map. In this example, we'll change the contour spacing and add an axis label.

To modify an axis:

1. Move the pointer over one of the axis tick labels on the bottom X axis and left-click the mouse. In the status bar at the bottom of the plot window, the words "Map: Bottom Axis" are displayed. This indicates that you have selected the bottom axis of the contour map. Additionally, hollow handles appear at each end of the axis, and solid green handles appear surrounding the entire map. This indicates that the axis is a "sub-object" of the entire map.
2. Double-click on the bottom axis to display the bottom axis properties dialog.
3. In the *Title* box on the General page, type "Bottom Axis" and then click the *Apply* button. This places a title on the selected axis.
4. If you cannot see the axis title, select View | Zoom | Selected. Notice that you do not have to close the properties dialog to select menu commands, toolbar buttons, or objects in the plot window.

5. Click on the **Scaling** page to display the axis scaling options. In the *Major Interval* box, type the value 1.5 and then click the *Apply* button. This changes the spacing between major ticks along the selected axis.
6. Click on the **General** page and then click the *Label Format* button. The **Label Format** dialog is displayed.
7. In the **Label Format** dialog, select the *Fixed* option in the *Type* group. Click on the down arrow on the *Decimal Digits* box and change the value to 1. This indicates that only one digit follows the decimal point for the axis tick labels.
8. Click OK to return to the axis properties dialog.
9. Click OK in the axis properties dialog and the map is redrawn. The axis tick spacing and labels are changed, and the axis title is placed below the map.



You can use the axis properties dialog to change the tick mark and axis title properties.

[Back](#) to Add, Delete, and Move Contour Labels

[Next](#) to Saving a Map

Saving a Map

When you have completed the map or drawing in the plot window, you can save the map to a **Surfer** file [.SRF] containing all the information necessary to reproduce the map. When you save a map, all the

scaling, formatting, and map properties are preserved in the file.

To save a map:

1. Choose the File | Save command, or click the  button. The **Save As** dialog is displayed because the map has not been previously saved.
2. In the *File name* box, type TUTORWS.
3. Click *Save* and the file is saved to the current directory with an [.SRF] extension. The saved map remains open and the title bar changes to reflect the name change.

If you are using the demo version of **Surfer** you will not be able to save the map. Please proceed to [Lesson 4](#).

[Back](#) to Modifying an Axis

[Next](#) to Exporting 3D Contours

Exporting 3D Contours

When you have completed a contour map in the plot window, you can export the contour lines with associated Z values to an AutoCAD DXF file.

To export contour lines:

1. Select the map by clicking on the map in the plot window or by clicking on the word "Contours" in the [Object Manager](#).



You can select the map by clicking on it in the Object Manager (above) or by clicking on the map in the plot window. If you do not see the Object Manager, click View | Object Manager to open it.

2. Choose **Map | Contour Map | Export Contours**.

3. In the **Save As** dialog , type TUTORWS into the *File name* box.

4. Click *Save* and the file is exported to the current directory. This creates a file titled TUTORWS.DXF which can be opened in any program with an AutoCAD DXF import option.

If you are using the demo version of **Surfer** you will not be able to export contours. Please proceed to Lesson 4.

Back to Saving a Map

Next to Lesson 4 - Creating a Wireframe