# What's New in Surfer 16?

There are many very exciting new features in Surfer 16! We focused on increasing usability, improving workflows to increase time savings, and including the most popular new features requested. The top new features are listed below. A more complete list of the new features can be found by clicking the ? button in the upper right corner of the program to open the Help. On the **Contents** page in the Help, navigate to **Surfer 16 | Introduction | New Features**.

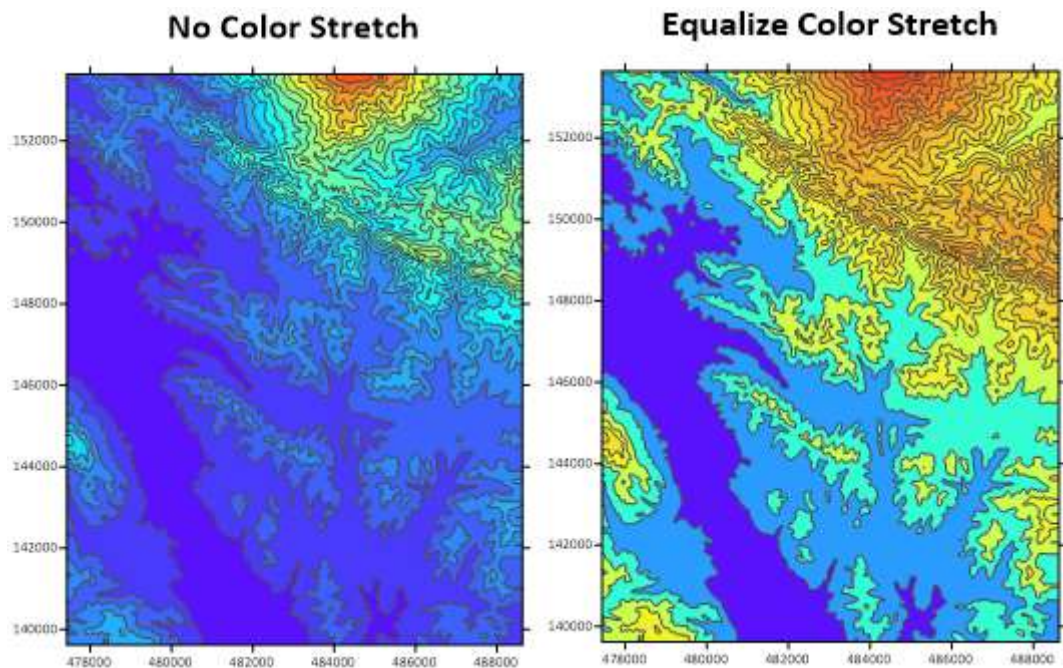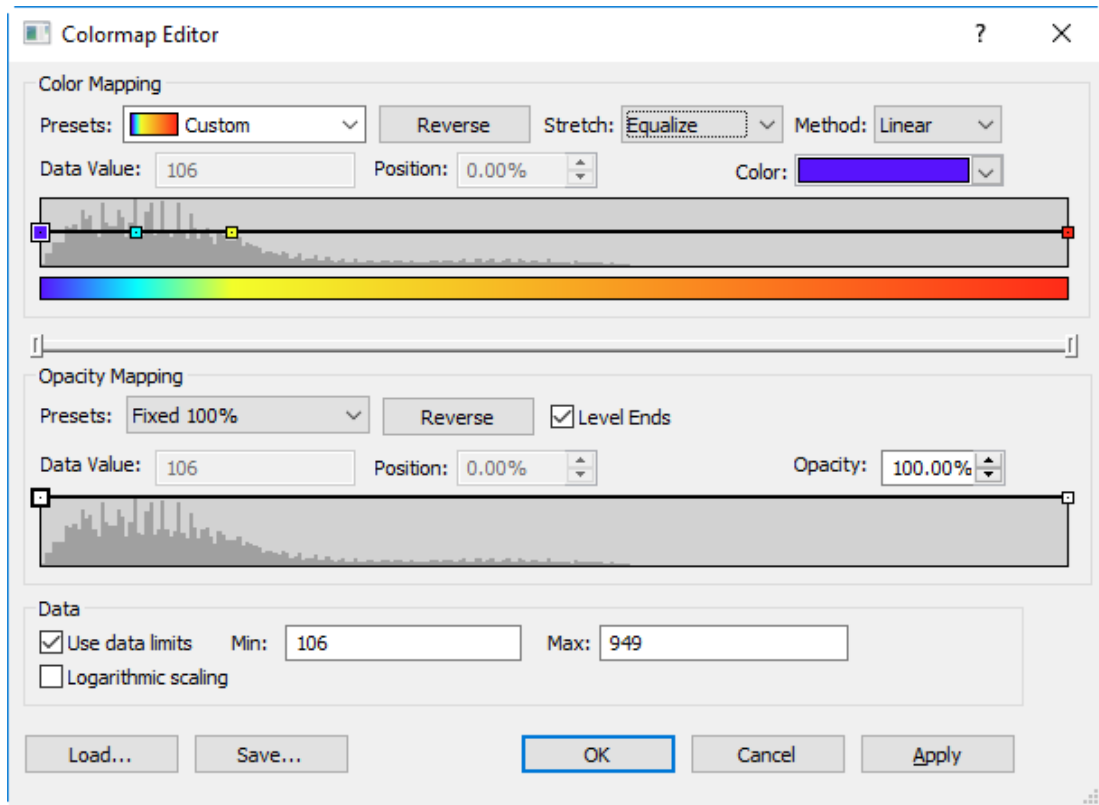## 1. View point data in true 3D space in the 3D View

View and explore your XYZ point data in 3D! If your point data used for Post, Classed Post, or Base from Data maps contains a Z component (or some other component value for each XY point), you can now show this data in the 3D View. These points can be colored, sized and have 2D or 3D symbols. You can display this data along with your surface, contour and color relief maps in true 3D!
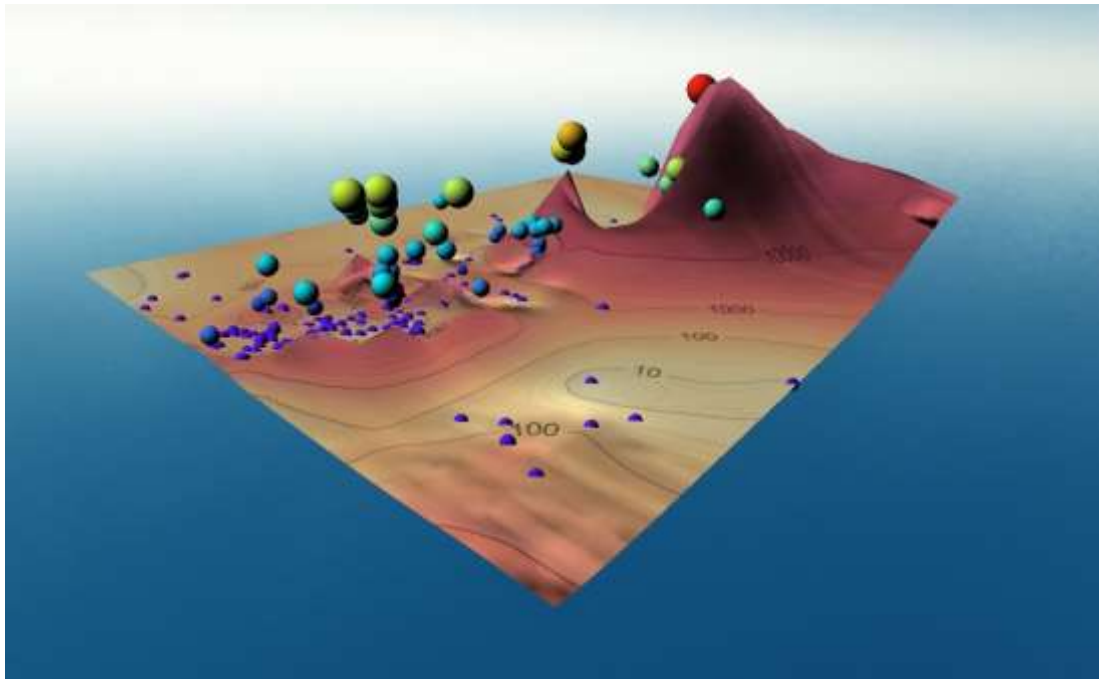
2. Visualize your data more effectively with the new Colormap Editor

You told us and we listened! You wanted a better Colormap Editor, with more flexible and powerful options for representing your data - and we have provided!

- New colormap presets better fit your data
- Separate color mapping and opacity mapping allows more control over how to best represent your data. Easily set the fill to be gradually transparent or opaque, or insert or delete opacity nodes to get the transparency settings you need.
- The histogram behind both the colormap and opacity map shows the spread of values in your data, so you can easily see where you need more colors or different opacity settings to represent the data
- Change the colormap stretch to Evenly distribute (equal spacing between nodes) or Equalize (a.k.a. equal area stretch, nodes are placed so that the same amount of data is between each node pair)
- Change the colormap method to different options for interpreting the color gradation from node to node
- Select between linear or logarithmic scaling for the colormap values to emphasize small changes in the colors

Colormap Editor

Color Mapping
Presets: Custom | Reverse | Stretch: Equalize | Method: Linear
Data Value: 106 | Position: 0.00% | Color:

Opacity Mapping
Presets: Fixed 100% | Reverse | ☑ Level Ends
Data Value: 106 | Position: 0.00% | Opacity: 100.00%

Data
☑ Use data limits | Min: 106 | Max: 949
☐ Logarithmic scaling

Load... | Save... | OK | Cancel | Apply

No Color Stretch

Equalize Color Stretch

3. Create contours with equal area in each interval

Are you tired of spending painstaking hours calculating equal-area intervals for your contour maps? That's all in the past, Surfer now does it for you with the click of a button! Simply change the level method to Equal area and specify the number of contour intervals you would like. The area per interval is handily displayed for your reference. Histogram equalization can be essential to detect and image subtle variations when more extreme values also exist.

Simple Contour Method
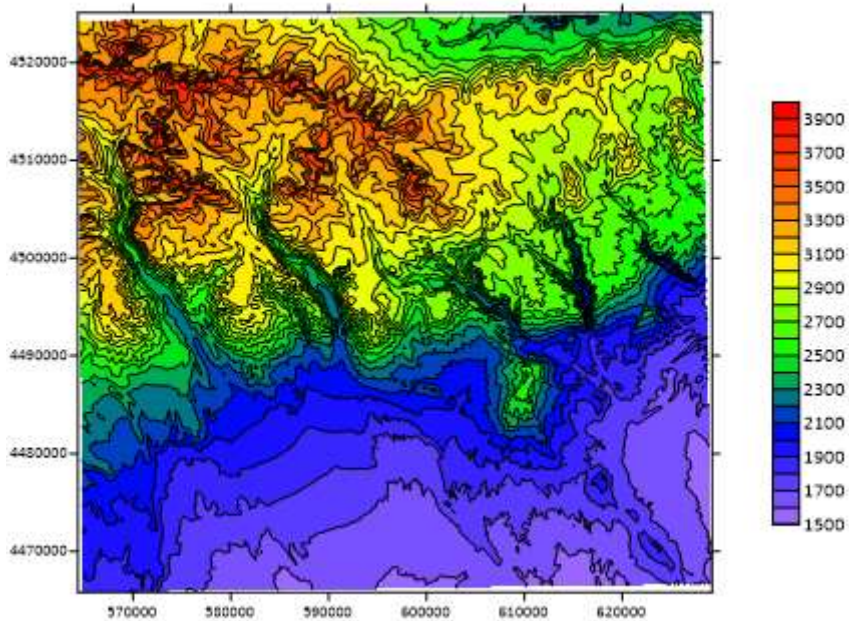
Equal Area Contour Method

Area per contour interval approx.: 339,816,370 m²
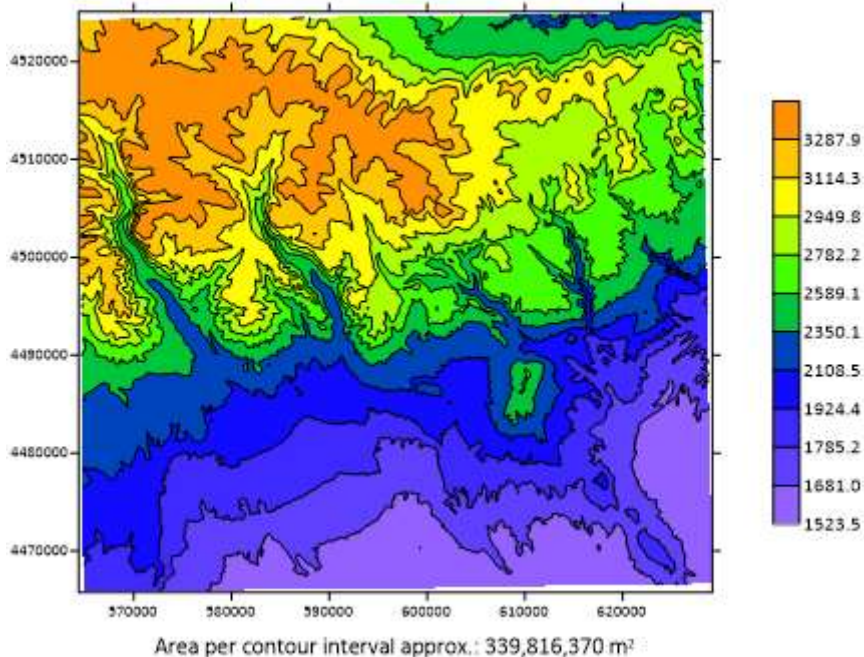
### 4. Duplicate map layers, and move or copy objects to other base layers

You can now duplicate maps, map layers and other objects with the click of a button! Once you have your layer just the way you want it, you don't have to recreate all the settings for each grid file to create new maps. Simply duplicate the layer and swap out the grid file!

In addition, you can move or copy objects in vector base layers with ease! Even better, you can now simply drag and drop objects from one base layer to another, You can even drag drawn objects from the plot window, like text or polygons, straight into a vector base layer. Different coordinate systems? No worries, Surfer takes care of everything for you on the fly.
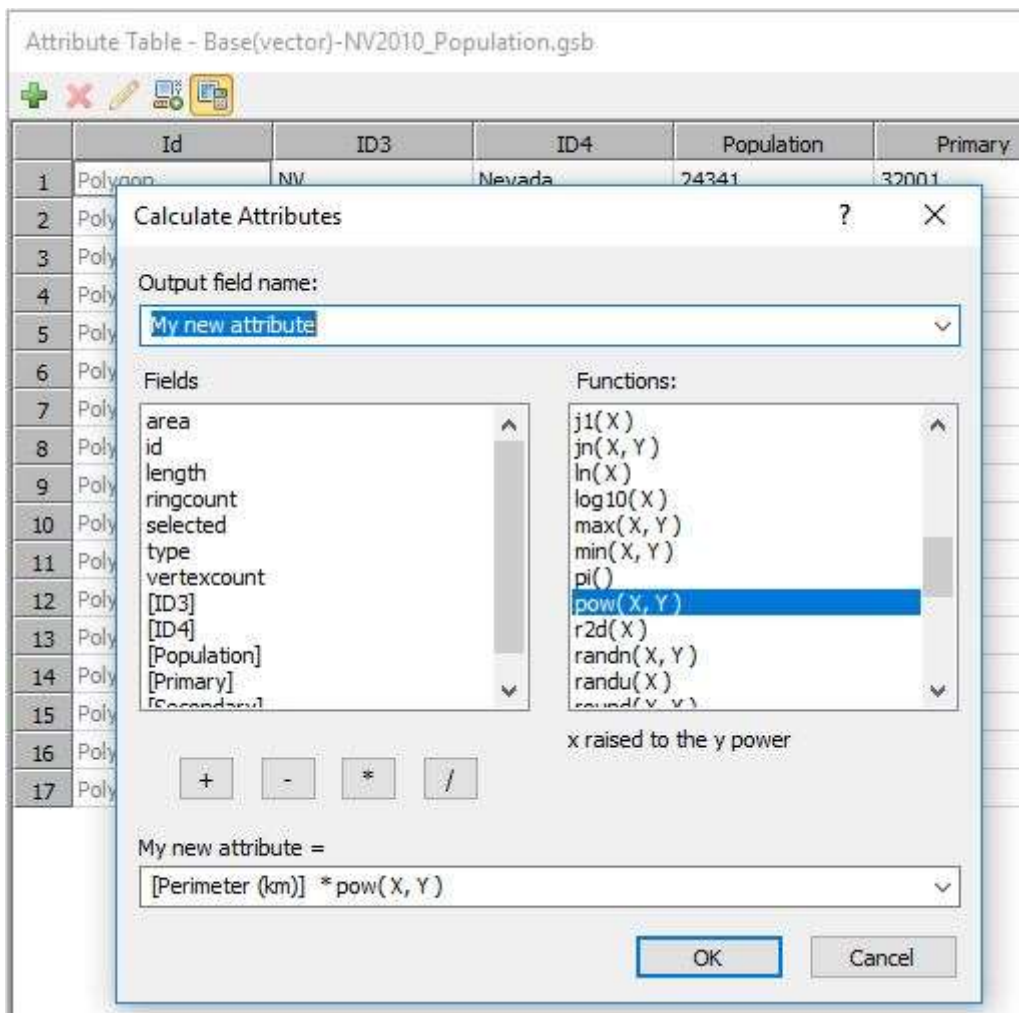
5. Attribute Table

These new features will greatly increase the usability of the Attribute Table and the Base Symbology feature, released in Surfer 15.

- Add the geometry as attributes to your vector base layers. You can either add the geometry attributes to one object at a time, or add the geometry attributes for all objects in the entire layer from the Attribute Table. Choose which geometry to add as attributes (e.g. area, length, XY point position, etc), and choose which units to use! For example, add polygon areas in square kilometers, or polyline lengths in miles.
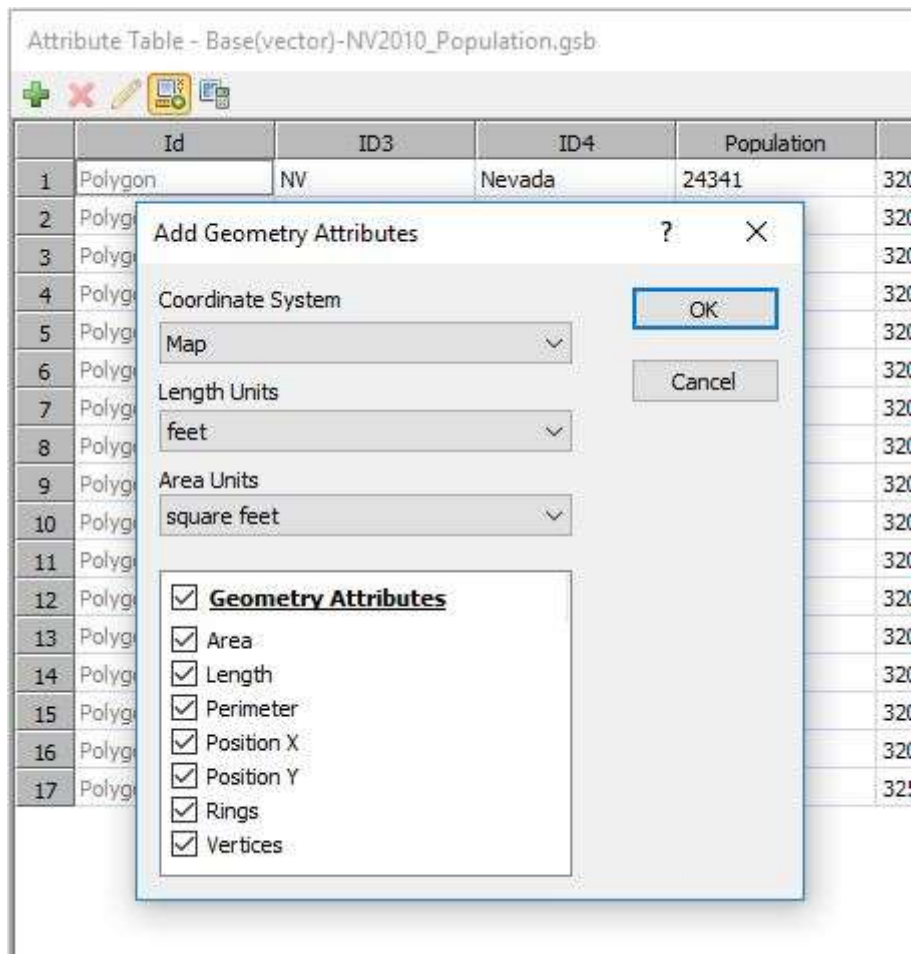

- Perform mathematical calculations on fields in the Attribute Table! This is tremendously useful when new attributes must be created based on results from existing attributes.

Attribute Table - Base(vector)-NV2010_Population.gsb

	Id	ID3	ID4	Population	Primary
1	Polygon	NV	Nevada	24341	32001
2	Poly				
3	Poly				
4	Poly				
5	Poly				
6	Poly				
7	Poly				
8	Poly				
9	Poly				
10	Poly				
11	Poly				
12	Poly				
13	Poly				
14	Poly				
15	Poly				
16	Poly				
17	Poly				

Calculate Attributes   ?   ✕

Output field name:

My new attribute

Fields

area
id
length
ringcount
selected
type
vertexcount
[ID3]
[ID4]
[Population]
[Primary]
[Secondary]

Functions:

j1(X)
jn(X, Y)
ln(X)
log10(X)
max(X, Y)
min(X, Y)
pi()
pow(X, Y)
r2d(X)
randn(X, Y)
randu(X)
round(X, Y)

x raised to the y power

[+] [-] [*] [/]

My new attribute =

[Perimeter (km)] * pow(X, Y)

OK   Cancel

6. Change the height or width of color scales and scale bars

Change the height and width of color scales, or the height of map scale bars, in the scale bar properties without distorting the text labels! Now your color scales and scale bars can look their finest.
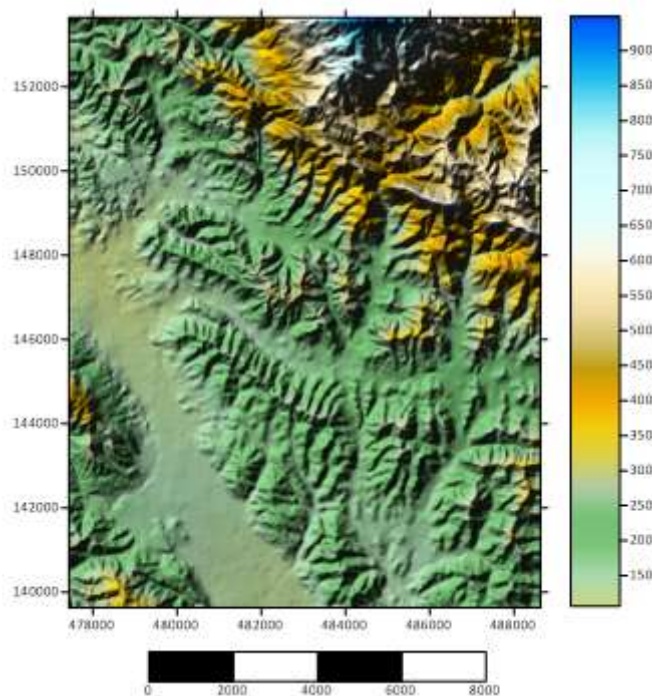
7. Display contour line properties on the color scale

Contour line properties can now be displayed on the color scale! See the contour line properties with or without contour fill.
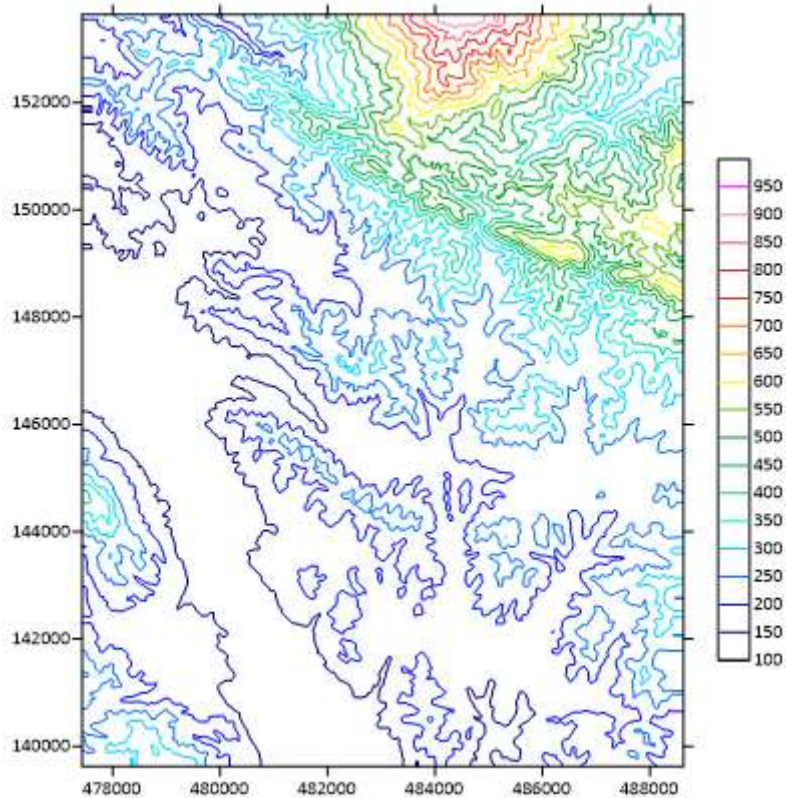
8. Query

Improve the versatility of your Query operations with these new tools:

- Export the results of your query to a file for use in other software
- Move or copy selected objects from a query to a new map layer, so you can easily identify or edit the query results

9. Gridding

- Grid your data with the new gridding option, kriging with external drift. Specify a grid of another variable for the external drift.
- Copy the geometry settings from another grid file! Accept the default extents and resolution for the output grid geometry, or select any existing grid and Surfer will automatically enter the same geometry settings. This option is available wherever you need to specify the geometry for an output grid file.
- Advanced options has an updated property-manager style user interface

10. Automation

We added the following commands (previously only available through the user interface) to our Scripter automation model:

- Add and edit graticule layers
- Perform queries
- Save gridding and volume reports
- Perform geoprocessing commands:
    - line thinning
    - line smoothing
    - buffer
    - create intersection points
    - change type
    - connect polylines

- o union, interesect, or difference of polygons
- o break polyline
- o break polyline at intersections
- o combine island/lakes
- o split island/lakes

11. Import/Export

- Import ESRI File Geodatabase (.FGDB)
- Export GPX from the plot window
- Save the worksheet as a DBF, perfect for editing your SHP attributes

12. Coordinate Systems added:

- Adindan | Adindan / UTM zone 35N (EPSG 20135)
- Africa Arc 1960 / UTM Zone 35N (EPSG 21095)
- Africa Arc 1960 / UTM Zone 36N (EPSG 21096)
- Africa Arc 1960 / UTM Zone 37N (EPSG 21097)
- Gabon | M'poraloko / UTM zone 32S (EPSG 26692)
- Mozambique | Moznet / UTM zone 38S (EPSG 5629)
- Guinea | Conakry / UTM zone 28N (EPSG 31528)
- Guinea | Conakry / UTM zone 29N (EPSG 31529)
- Australian GDA2020 coordinate systems and datum
- Luxembourg 1930 Gauss (EPSG 2169)

13. Many More!

- Legends: control line spacing between layers or items, and control the size of the fill samples
- Base layers: format numeric labels, apply a colormap to the unclassed and classed symbols symbologies, change the units for the geometry (e.g. length, area, perimeter) of vector objects.
- 3D View: control the shading detail and scale factor for surfaces, pan with mouse while in trackball mode.
- Point clouds: display the number of points and XYZ extents on the Info tab of layer properties.
- Apply buttons! The **Colormap Editor**, advanced contour **Levels for Map**, and the classed post map **Classes for Map** dialogs all have Apply buttons!
- The Shaded Relief and Color Relief layer types have been combined into one map type with different terrain representation options.