



第3章 Tree和Elements

3.6 Pointset & Polygon

OpenTect6.6中Pointset与Polygon是分开的

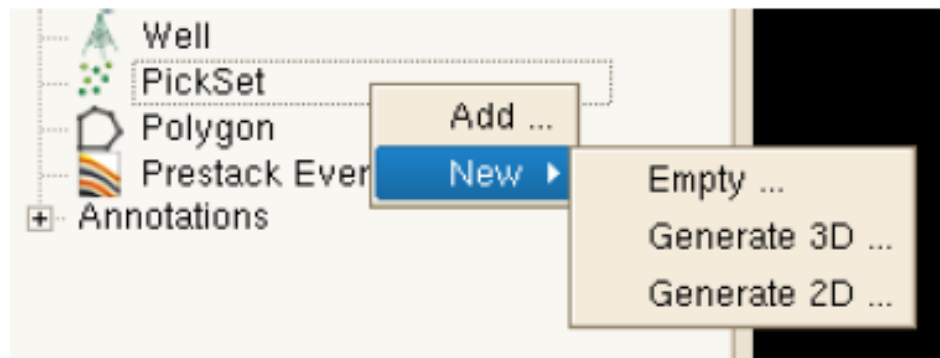
Elements	Color
Scene 1	
<input checked="" type="checkbox"/> In-line	
<input checked="" type="checkbox"/> Cross-line	
<input checked="" type="checkbox"/> Z-slice	
<input checked="" type="checkbox"/> Volume	
<input checked="" type="checkbox"/> Random Line	
<input checked="" type="checkbox"/> 3D Horizon	
<input checked="" type="checkbox"/> Fault	
<input checked="" type="checkbox"/> FaultSet	
<input checked="" type="checkbox"/> FaultStickSet	
<input checked="" type="checkbox"/> Body	
<input checked="" type="checkbox"/> Well	
<input checked="" type="checkbox"/> PointSet	
<input checked="" type="checkbox"/> test	
<input checked="" type="checkbox"/> Polygon	
<input checked="" type="checkbox"/> poly	
<input checked="" type="checkbox"/> Prestack Events	
> Annotations	



3.6 Pointset & Polygon

A *pointset* is a set of locations. They have multiple uses in OpenText such as for data extraction in crossplot or neural network workflows.

The drop down menu gives the option to **Add...** an existing pointset or to create a **New** one. The new pointset will either be manually picked in the 3D scene or automatically generated.



创建pointset:

Add..

New

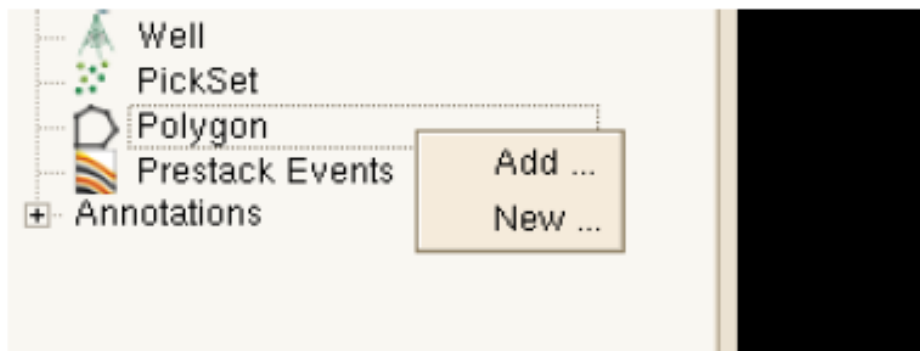
Pointset是位置的集合。用于交汇图的数据挖掘或神经网络 workflow。



艰苦朴素
求真务实

3.6 Pointset & Polygon

A Polygon is a close line defined as connected points. It defines an area that can be used to define an area of subselection for example. The drop down menu gives the option to either **Add...** an existing polygon or to create a **New...** by manually picking on a loaded surface (either horizon or Z-slice) in the 3D scene.



多边形(Polygon)是连接点形成的封闭线。定义一个区域，用于子区域选择。

Add..

New

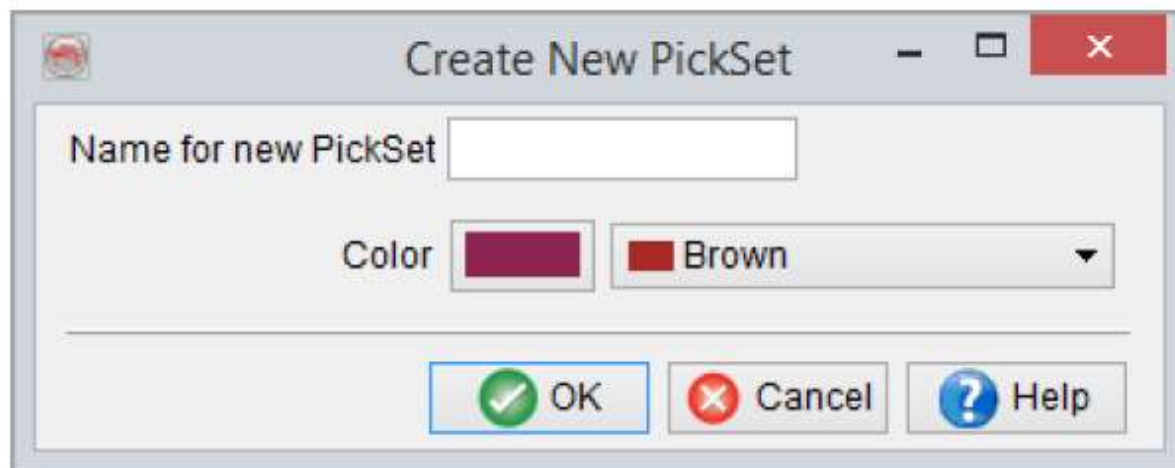


3.6.1 Manual & Empty Pointsets

When an empty pointset is added to the scene, the locations (of object) can be picked manually. This type of pointset is generally used for supervised neural network training (see the dGB plugins help documentation).

To create an empty pointset: 创建空的点集(pointset)

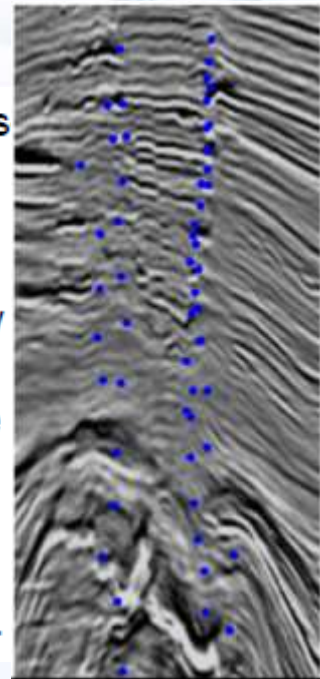
1. Click on the *pointset* element
2. Select *New > Empty* from the drop down menu.
3. In the pointset Creation window, give a name and press OK to insert an empty pointset in the tree.





3.6.1 Manual & Empty Pointsets

4. Start picking locations in the 3D scene on data displayed in the 3D scene (inline, cross line, z-slice or horizon).
 - To start picking, please make the pointset active by clicking on it in the scene or in the tree (If active, it will be highlighted).
 - Each click will add a point. If the point is wrong, it can be removed by using **Ctrl** key and left mouse-button click.
5. In the tree, right-click on the name of the pointset you are interpreting and select Save as... to save your pointset. The pointset will be saved as a *.pck file - the default OpenTect format for pointsets and polygons, which consists of position information (X/Y coordinates) and Z (in sec, meters or feet). In some cases the .pck file may also contain directions, inline/crossline dips, inline/crossline numbers and text information.



Example of manual picking. These points will be used in Neural Network training.

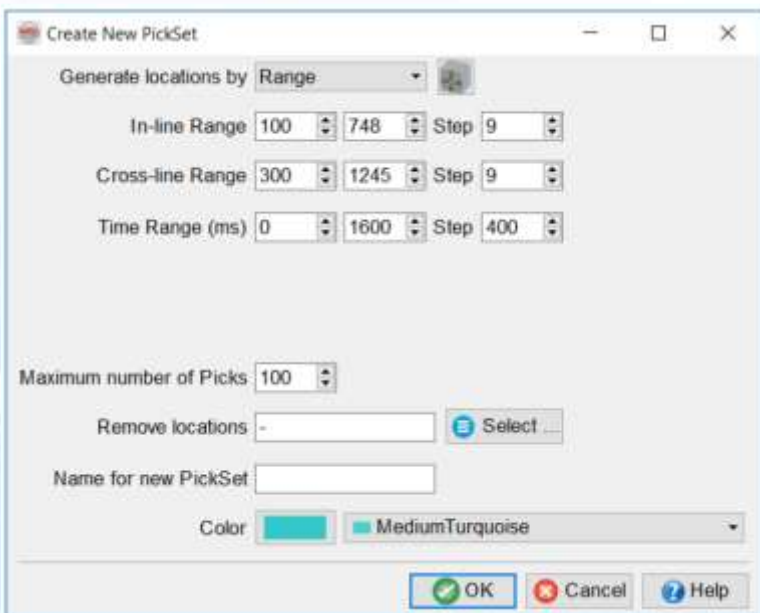
手动选择一些点集，用于神经网络的训练。



3.6.2 Generate Random Points (3D)

Randomly generated points are very useful especially for property prediction or object detection. This type of pointset has been defined in first place for unsupervised neural network training (see dGB Plugin documentation for more details, specifically: Unsupervised waveform segmentation (UVQ)).

To generate a random pointset, click on the tree element pointset/Polygon and in the drop down menu, select: *New pointset > Generate 3D...* The following window pops up.



生成一些随机的点集（3D）用于属性预测或目标检测常用于无监督的神经网络训练，特别是UVQ

生成步骤： New pointset > Generate 3D..



Generate locations by provides several extraction options (see below).

Generate locations by Range

In-line Range Well Step 9

Cross-line Range Polygon Step 9

Time Range (ms) Table Step 400

Horizon

Body

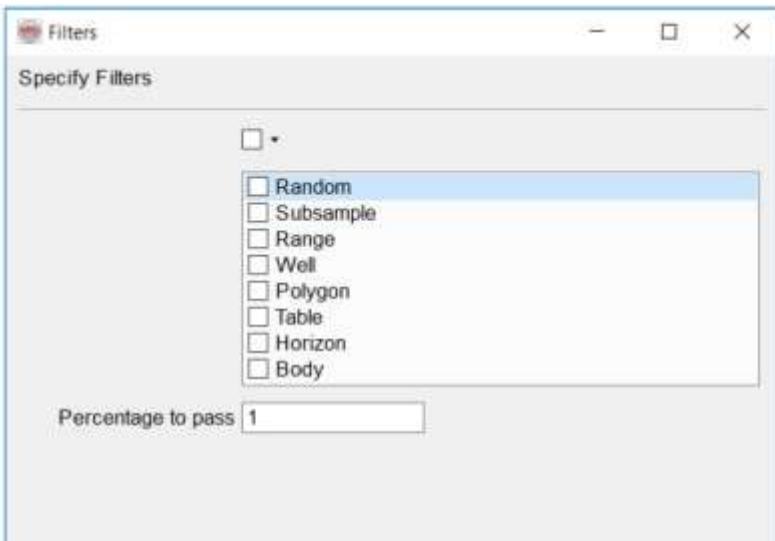
生成随机点集的位置有好几种

A user-defined number of random points are created depending on the specified location type. If selecting:

- Range: specify the inline, crossline and time range (or depth range if in a depth survey).
- Well: select one or more well(s) and specify a time range (or depth if in a depth survey). Optionally add traces in the inline and/or crossline direction around the well track for the location selection.
- Polygon: select a stored polygon and specify the time range (or depth range if in a depth survey).
- Table: select either an already saved pointset or a Table file. The table file needs to be X-Y-Z with no header.
- Horizon: select a horizon and select if you want the points to be extracted along the selected horizon or the interval from that selected horizon to a second horizon to be selected.
- Body: select if you want the extraction to be inside or outside the body that you selected. If outside, you need to specify the inline, crossline and z ranges for the extraction. By default the outside box is the full survey box.



Optionally, a rejection filter can also be applied by selecting *Remove locations* (see window below). It passes each random position according to a selected filter (random, polygon, subsample, table, surface...). It is useful to avoid random points in unwanted regions e.g. by providing a polygon.



通过过滤(filter), Remove一些位置。
根据选择的filter(几种方式)。

The number of random location to be extracted needs to be specified.

The pointset creation is finalized by giving it an appropriate name, selecting a color to be used for its display and clicking Ok. 指定提取的随机位置的数目。



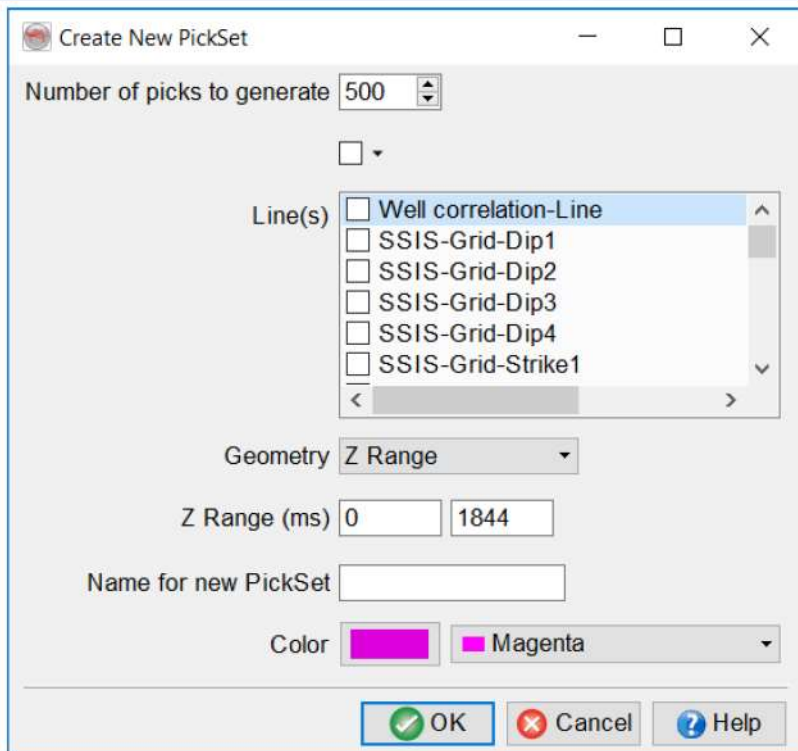
The name can always be changed later from the pointset manager. The color can also be modified later on from the right-click menu on the pointset name > Display > Properties. 设置创建点集的名称, 选择显示的颜色, 点击OK



3.6.3 Generate Random Points (2D)

Random points for the 2D data can also be used for the same purposes and workflows as random 3D picks.

The 2D pointset creation window (see below) is launched by clicking in the tree on *pointset/Polygon* and selecting in the drop down menu *New pointset> Generate 2D...*



生成2D随机的点集，与3D随机点集生成类似。
点击Tree中的Pointset，选择下拉菜单：
New Pointset > Generate 2D ..



Random (2D) pointset creation window

创建2D随机点集的窗口

The number of points to be in this given set needs to be specified. As this extraction is done in 2D, the 2D line(s) where the locations will be extracted need to be selected. The location can be restricted with the Geometry selection (see below). It depends upon the purpose/objective. For instance, if the objective is to detect facies by using random vectors (points) on a surface, then horizon geometry shall be provided.

Geometry	Z Range
Z Range (ms)	Z Range On Horizon Between Horizons

If selecting:

- Z Range: specify the inline, crossline and time range (or depth range if in a depth survey)
- On Horizon: select a horizon along which the positions will be picked.
- Between Horizons: select two horizons in between which the points will be extracted.

The pointset creation is finalized by giving it an appropriate name, selecting a color to be used for its display and clicking Ok.



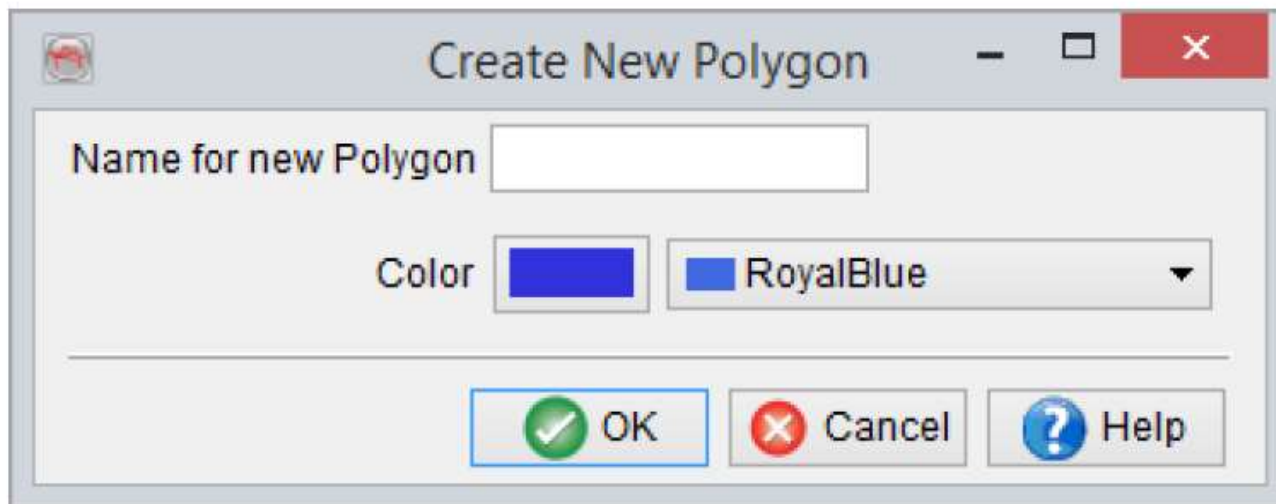
The name can always be changed later from the pointset manager. The color can also be modified later on from the right-click menu on the pointset name > Display > Properties.



3.6.4 Polygon

A polygon is a close line connecting locations.

A new Polygon can be created by clicking on *pointset/Polygon* and in the drop-down menu select *New Polygon...* The following window pops up.





The polygon creation is finalized by giving it an appropriate name, selecting a color to be used for its display and clicking Ok.

命名和显示（颜色设置）



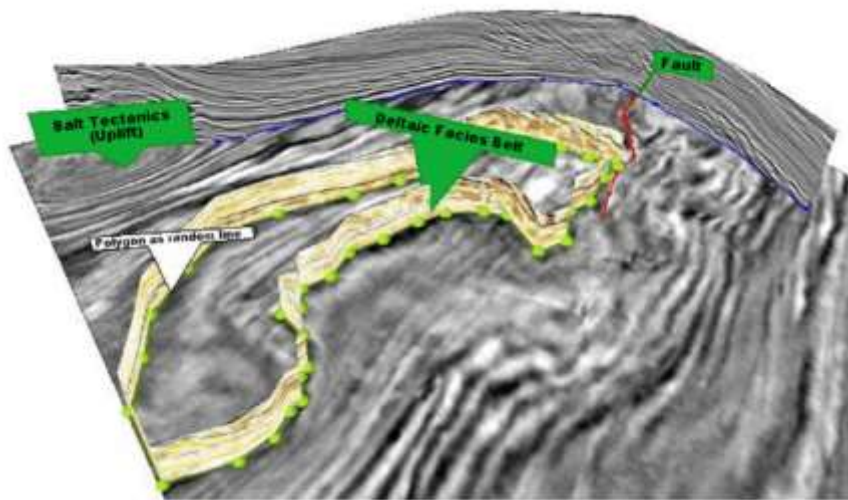
The name can always be changed later from the pointset/Polygon manager.

The color can also be modified later on from the right-click menu on the polygon name > Display > Properties.

To start interpreting a polygon, it needs to be activated by clicking on the element in the tree. Polygon are picked only on z-slice and horizons. Display a plane in the 3D scene, activate the polygon and start picking. The points will be connected by a line.

Double-clicking will close the polygon. Save the polygon by right-click on its name in the tree > Save. When the polygon is active in the tree, each click will result in a new point. To remove a point, press Ctrl and click on the point to delete. Move a point by clicking on it and dragging it.

In the following picture we can see two examples of polygon pointsets, closed polygon (deltaic facies belt), and non closed polygon (fault pointset).



保存多边形，双击封闭多边形。多边形是**active**时，每次点击生成一个新的**point**。按**Ctrl**，删除一个点。点击一个点，移动，拖拽。

务实

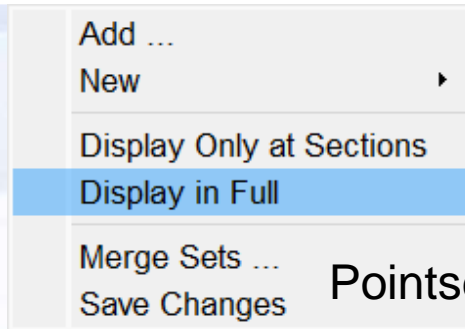
求真 务实 求是 明德



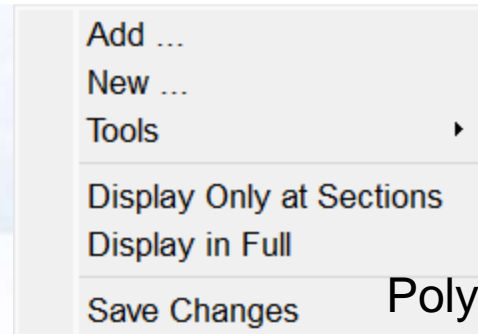
3.6.5 Pop-Up Menus

pointset/Polygon Element Pop-up Menu

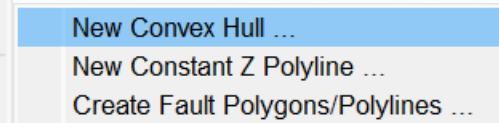
This is the menu right-click menu accessed from the main pointset/Polygon element when at least one pointset/polygon is already loaded (see pictures below).



Pointset



Polygon



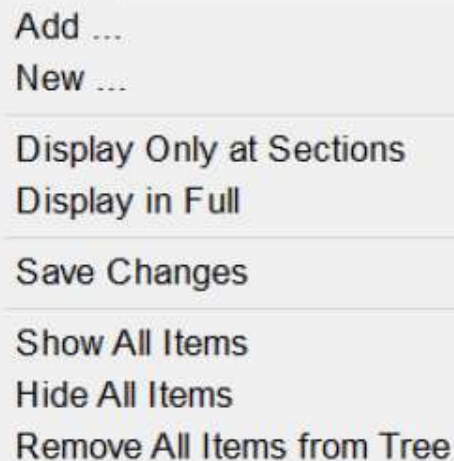
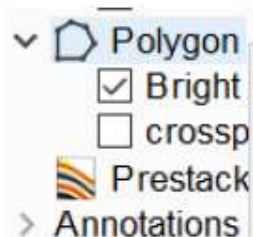
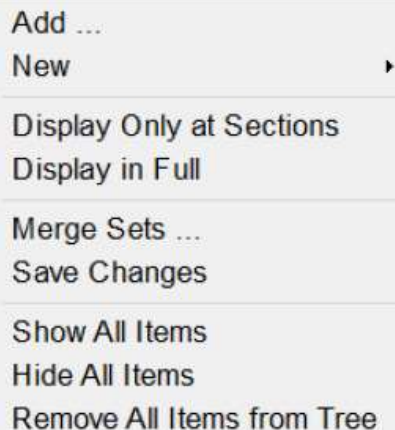
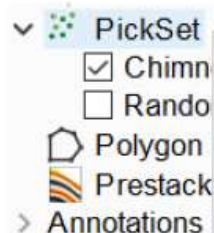
多边形多了一个**Tools**

It contains the following menu items.

- **Add ...**: load a stored pointset/polygon in the 3D scene and tree.
- **New**: Create a new pointset/polygon (see 3.6 pointset & Polygon).
- **Display only at sections**: Display points only intersecting the displayed elements (plane (s) and/or horizon(s)) in the 3D scene. This mode enables picking in a new location without being distracted by previously picked points throughout the survey box.
- **Display in Full**: Display all the points of the pointset or the full polygon within the survey box.
- **Merge Sets**: (for pointsets only) Merge stored pointsets into a new pointset. A window pops up and the sets can be selected. A name for the output set should be defined. pointsets can also be merged from the pointset Manager.
- **Save changes**: The pointset/polygon changes can be saved and reloaded at any time during the building process.



When more than one pointset/polygon are loaded in the tree, the menu has additional entries:

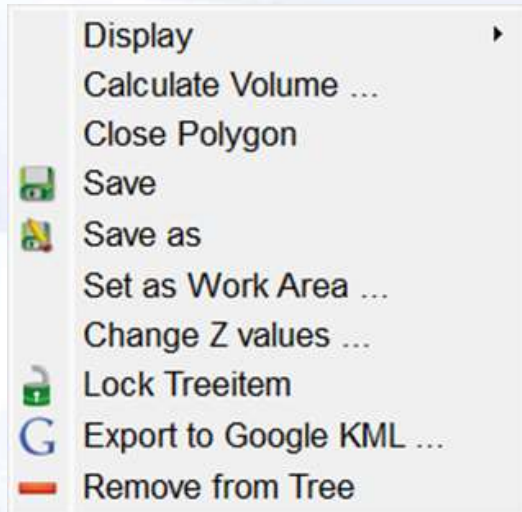
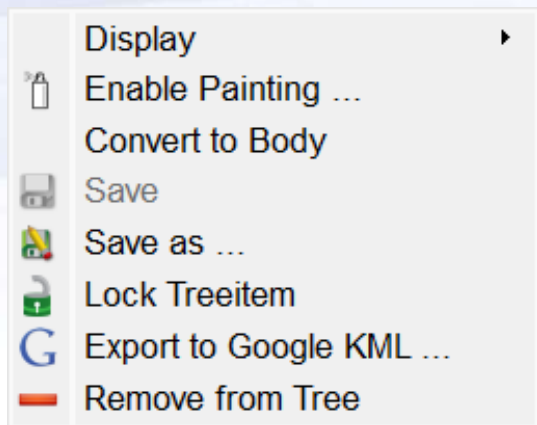


- Show all items: Display all the pointsets/polygons from the tree in the 3D scene.
- Hide all items: Unselect all the pointsets/polygons from the tree. They are no more displayed in the 3D scene.
- Remove all items: Remove all the pointsets/polygons from the tree



pointset / Polygon sub-elements Pop-up Menu

If at least one pointset or polygon is loaded in the tree, then the following options are available from the right-click menu (see picture below):



比较一下pointset与polygon的弹出菜单的差异。



- **Calculate Volume:** In OpendTect, an estimated volume can be computed from a polygon to a given surface. The velocity default is set to 3000 m/s. Negative thicknesses can either be discarded or taken into account.

Calculate volume

Volume estimation: polygon to horizon

Calculate to Demo 5 --> FS7

☐ Ignore negative thicknesses

☒ Upward

Velocity(m/s) 3000

Estimate volume

==> Area 12.06318665 (sq km)

==> Volume 411.58770752M m³ (2588.80883789M bbl)

Close Help

Polygon, 计算多边形到某表面的体积。
默认速度是3000m/s

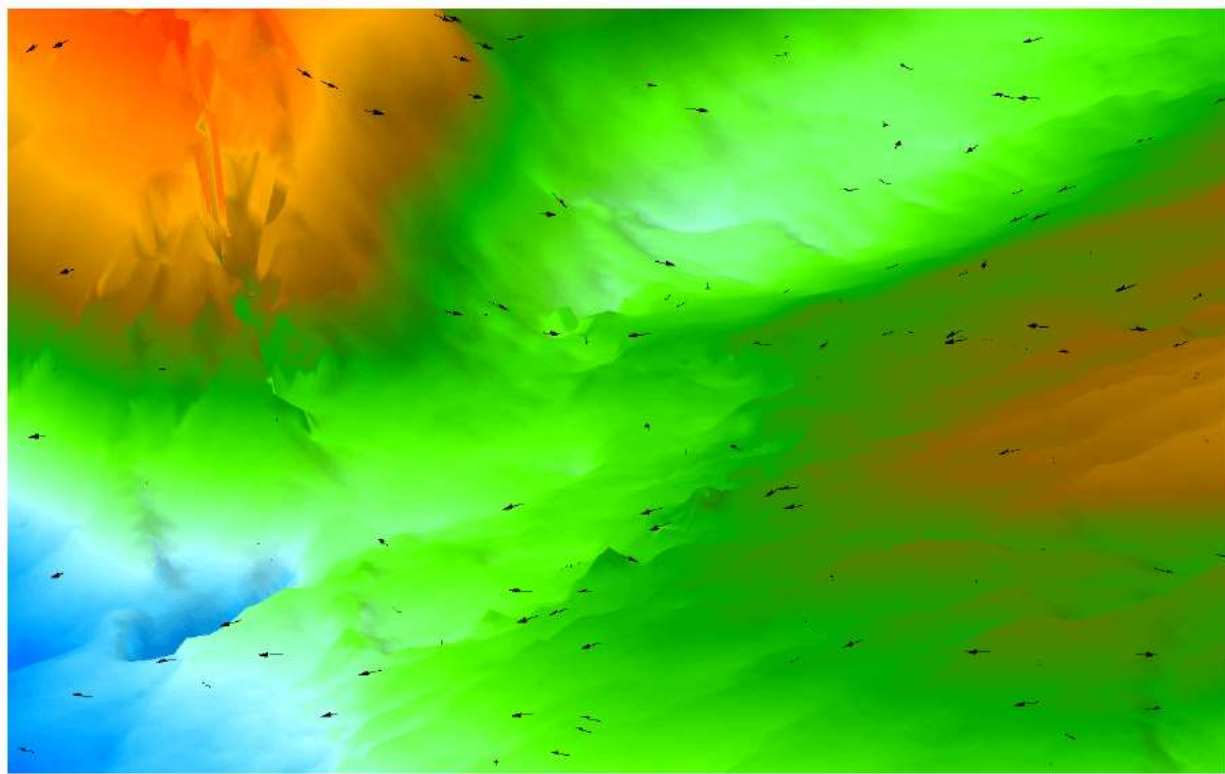


- **Convert to body:** *(for pointset only)* Convert the pointset into a body.
- **Create Body:** *(for polygon only)* Create a body using the polygon as a constraining area. It requires a top and bottom horizon between which the body would be created. This feature is only enabled if SSIS plugin is loaded (or licensed).
- **Close polygon:** *(only when interpreting a new polygon)* During, and at the end of a picking session, pointsets should be stored.
- **Display:**
 - **Display only at sections:** Display points only intersecting the displayed elements (plane(s) and/or horizon(s)) in the 3D scene. This mode allows to pick new locations without being distracted by previously picked points throughout the survey volume.
 - **Properties:** In this window the *Type*, *Size* and *Color* of the point markers in the 3D scene can be set. The type *Arrow* is also automatically used when the point is given directional information in the Set directions option under the pointset pop-up menu.
 - **Set direction:** *(for pointset only)* Display direction, guided by the SteeringCube/attribute. This helps to understand the geological dips and fluid flow. It is assigned by setting a direction to each point based on dip and azimuth information (attributes). In the pop-up window (see below), specify either a SteeringCube or two attributes providing the polar dip and azimuth in degrees. A velocity of 2000 m/s will be used in time survey to convert the dip from degrees to $\mu\text{s/m}$ if the dip angle data is read from a stored cube instead of the dip angle attribute. Do not forget after setting the directions to save you pointset and change the display type to "Arrow".

弹出菜单下的一些功能



An example of setting direction (black arrows) to a pointset.

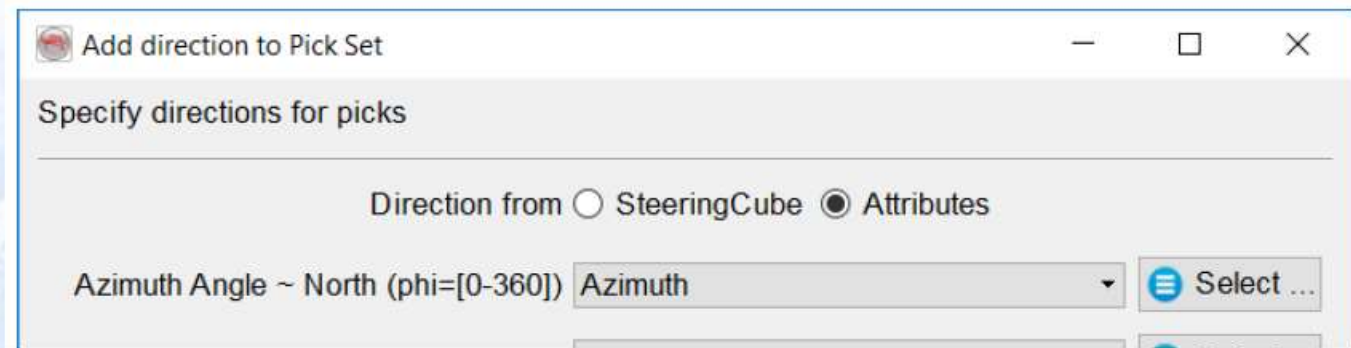
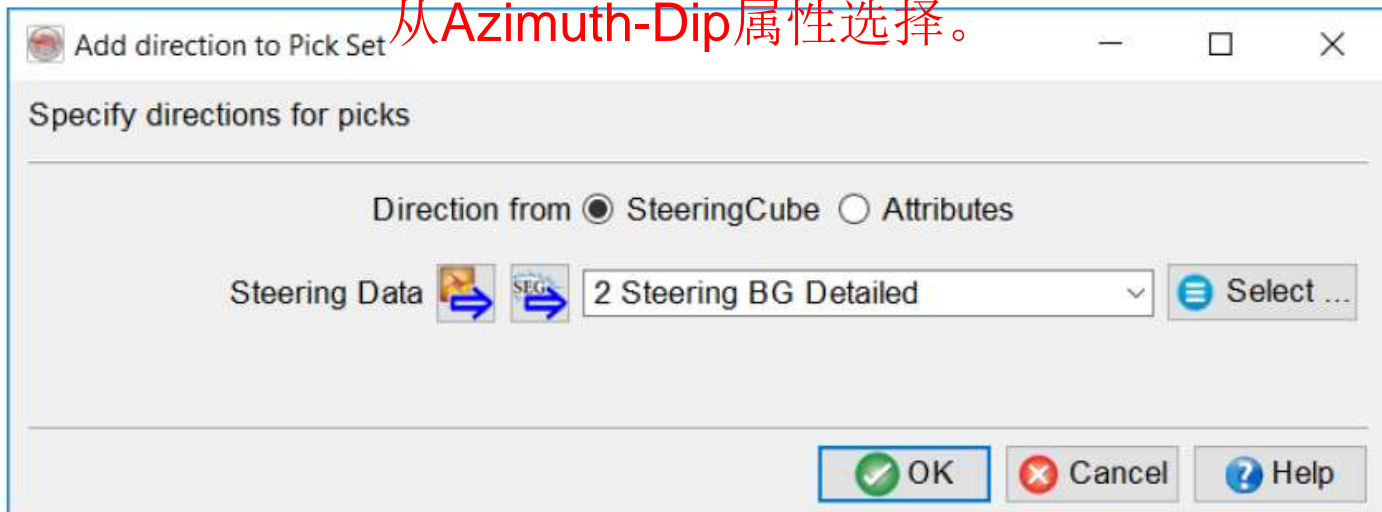


设置Pointset的方向（黑色箭头）



When setting the direction for a given pointset, you can select to get the direction from a SteeringCube or from the Azimuth and Dip attributes (stored or on the fly) (see picture below)

设置点集的方向，可以从SteeringCube选择（Pro用户），或者从Azimuth-Dip属性选择。





- **Save/Save As:** Either overwrite the stored input by using option Save or store as new pointset / polygon by using Save As option.
- **Lock / Unlock:** Lock the selected object. It prevents accidental removing, moving or displaying data on the object. Clicking "Unlock" enables editing again.
- **Remove:** Remove pointset/polygon from tree.



Removing any unsaved pointset/polygon will result in complete loss of the unsaved interpretation.

- **Export to Google KML:** Export selected polygon to a Google KML file. When selected, the following export window is launched. Fill in the output KML parameters and write/select the output file location. Press the 'Ok' button to export the polygon in the selected location. The feature will prompt an additional conversion dialog if the conversion settings for the survey are not defined. For further information, please refer to the Survey Selection section.

弹出菜单下的其他一些功能。

