

Tutorial TLS03

EN

Terrestrial LIDAR:
Semi-automatic crown segmentation

Goal

In a terrestrial LIDAR point cloud, isolate the trees to obtain a cloud of points per tree.

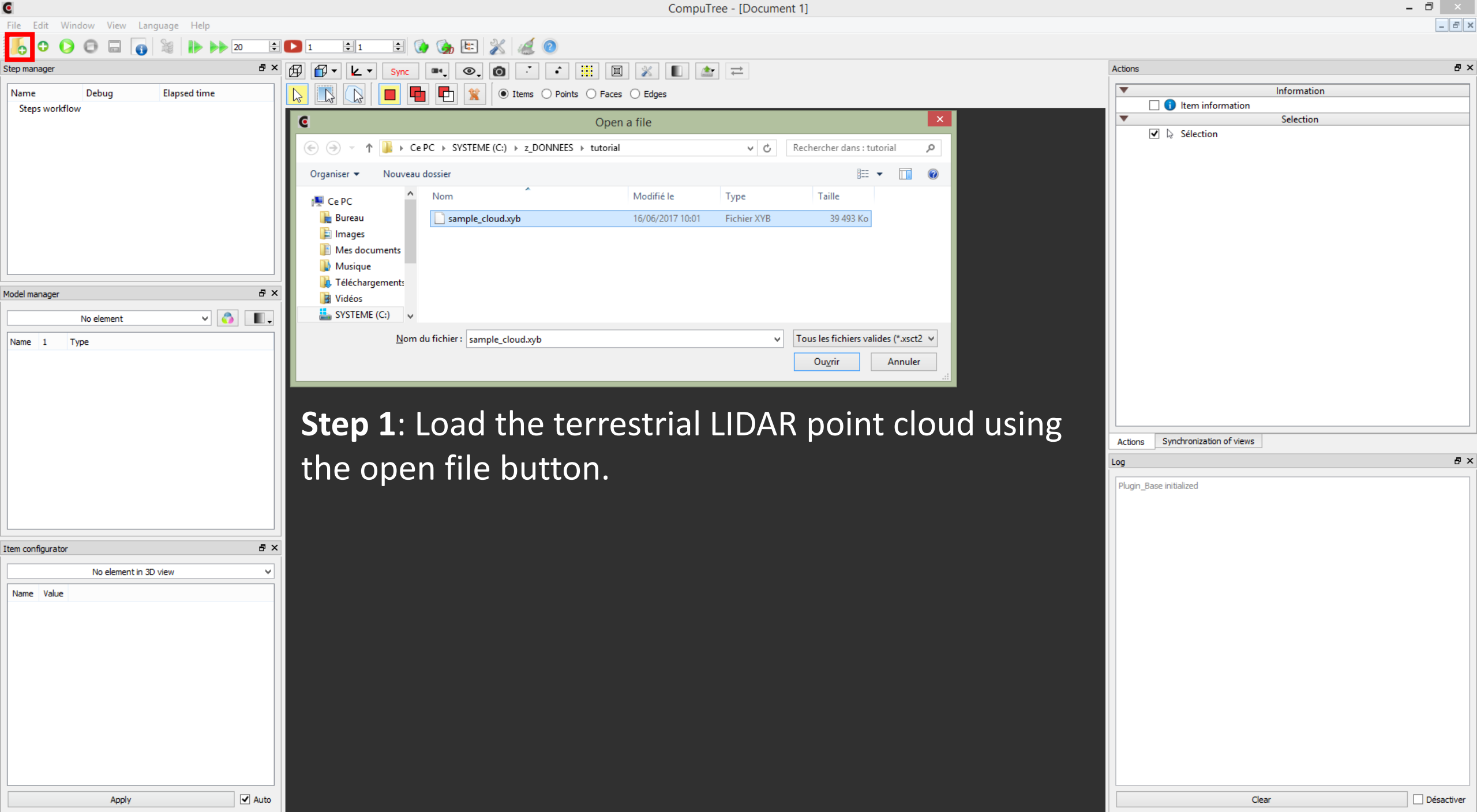
Interest

The crown segmentation allows:

- To compute indicators of crown shape (vertical projection, ...)
- To be able to apply reconstruction algorithms operating on a tree scale

Require

- A terrestrial LIDAR point cloud





Step manager

Name Debug

Steps workflow

- 4 - Points, Fichier XYB (sample_cloud.xyb)
 - ☒ Result

Model manager

Result (4)

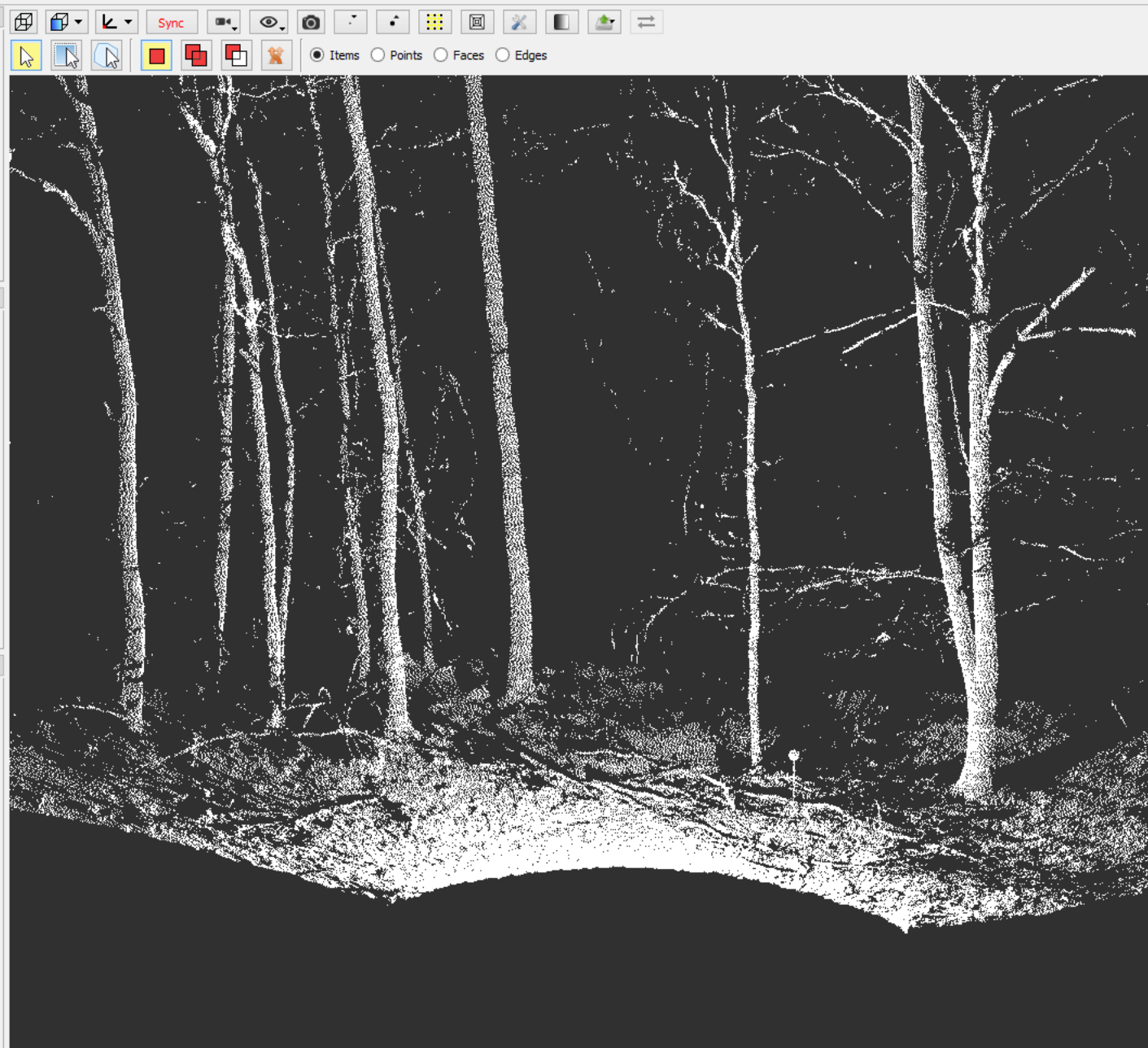
Name	1	Type
Result		
Group	<input type="checkbox"/>	Std group
Scène	<input checked="" type="checkbox"/>	Point scene
Intensité	<input type="checkbox"/>	Point quint16 attributes
Scanner	<input type="checkbox"/>	Scan position
File header	<input type="checkbox"/>	XYB Header

Item configurator

Item with points

	Name	Value
1	Points	<input checked="" type="checkbox"/> Activate
2	Bounding Shape	<input type="checkbox"/> Activate
3	Bounding Shape center	<input type="checkbox"/> Activate

Apply ☒ Auto



Steps

Search for steps...

Configuration

Steps name

Configuration

Favorites

- Load
- Export
- Workflow
- Points
- 3D geometry
- Voxels
- 2D geometry
- Rasters / Images
- Meshes
- Metrics
- Others
- Work in progress (Beta)

Replace to default position

☒ During Computree launch, place at last known position

Step 2 and 3: Classify ground / vegetation points.
Generate a Digital Terrain Model.

These steps are described in detail in the tutorial:

TLS01:
terrestrial LIDAR

terrestrial LIDAR

Ground point detection and DTM creation

ONF Plugin: fast but simplistic approach

× Steps

Search for steps...

Configuration

Steps name Configuration

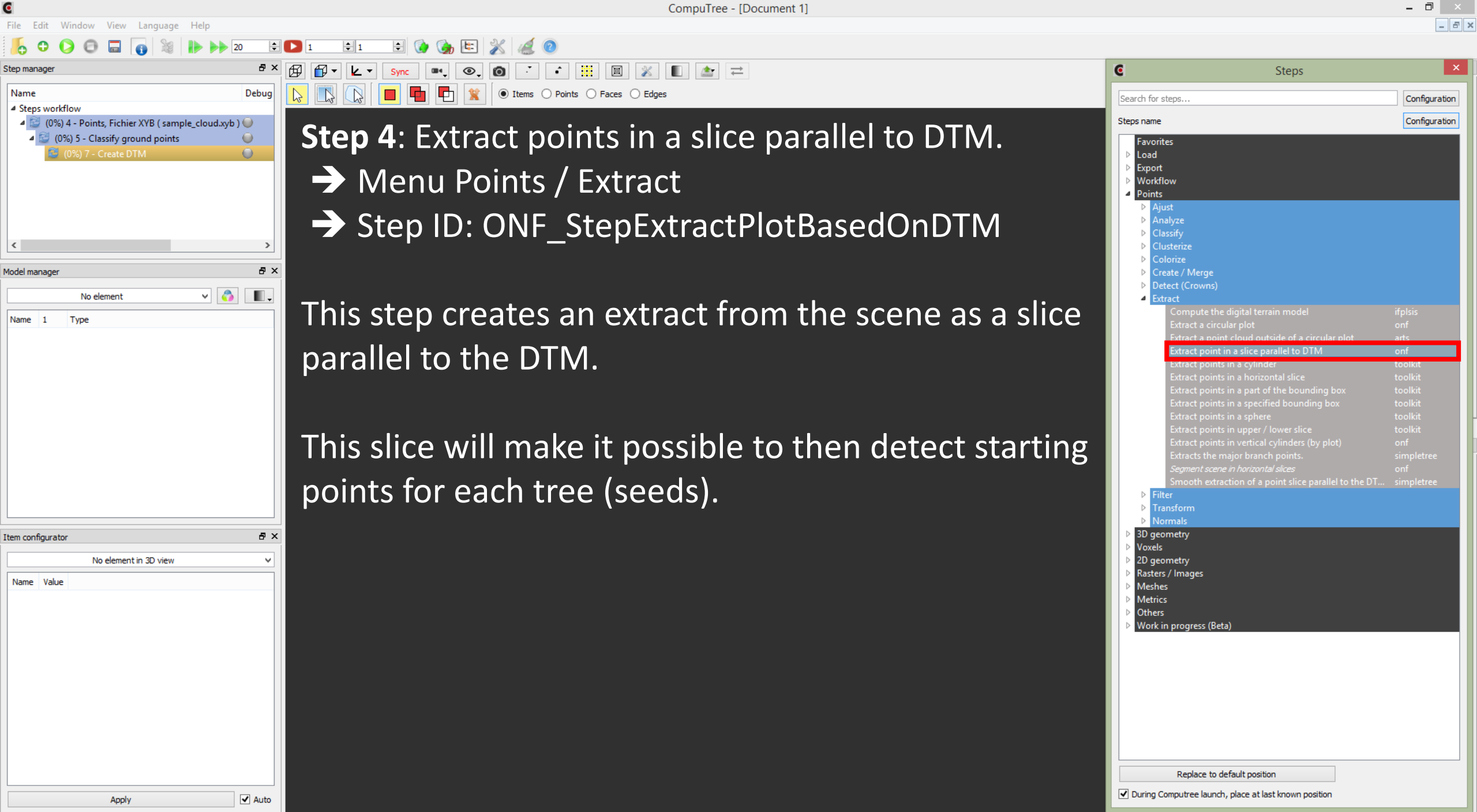
- ▶ Favorites
- ▶ Load
- ▶ Export
- ▶ Workflow
- ▲ Points
 - ▶ Adjust
 - ▶ Analyze
 - ▲ Classify

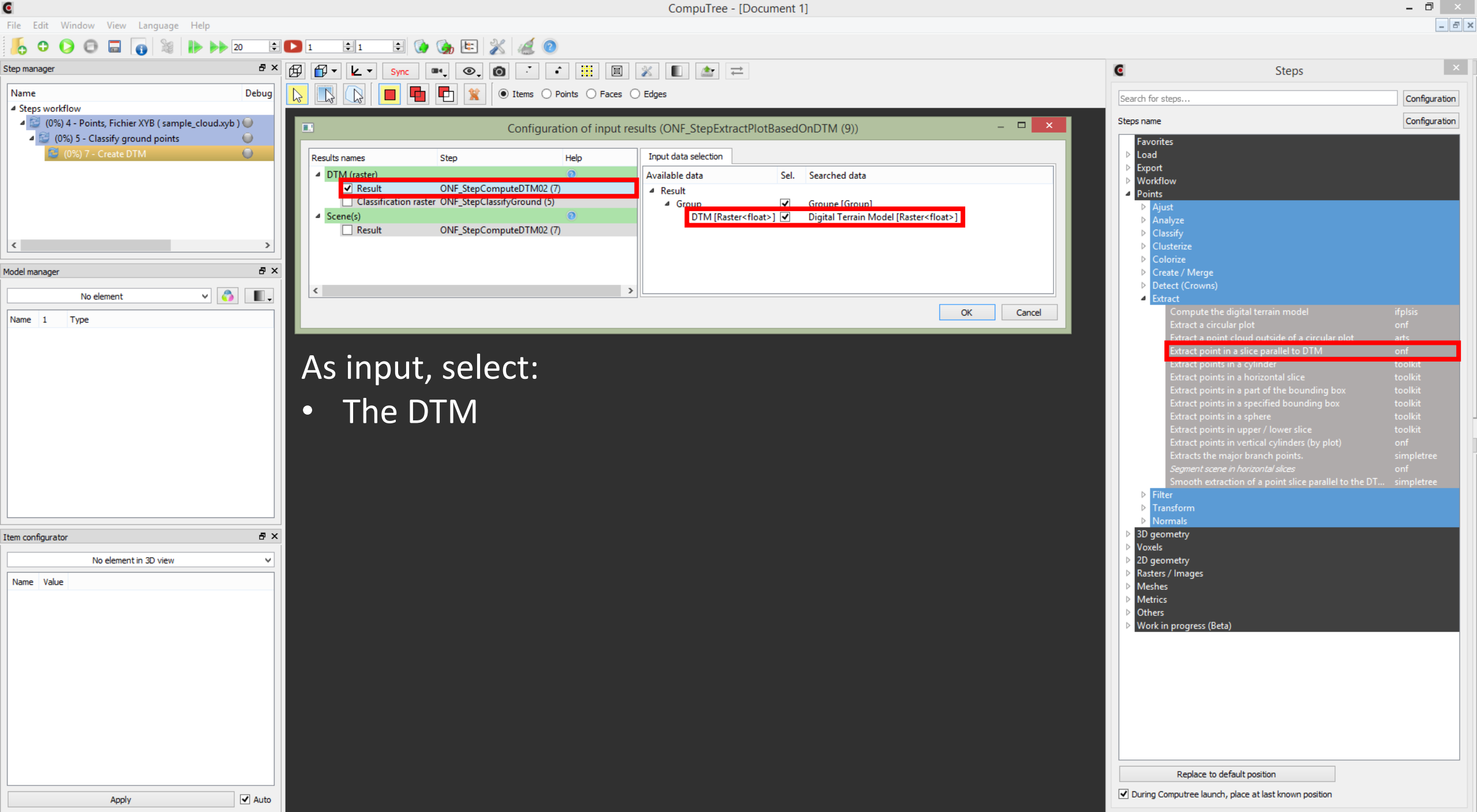
Classify ground points	onf
------------------------	-----
 - ▶ Clusterize
 - ▶ Colorize
 - ▶ Create / Merge
 - ▶ Detect (Crowns)
 - ▶ Extract
 - ▶ Filter
 - ▶ Transform
 - ▶ Normals
- ▶ 3D geometry
- ▶ Voxels
- ▶ 2D geometry
- ▲ Rasters / Images
 - ▶ Create / Merge
 - ▲ Digital elevation models

Compute hillShade raster	onf
Compute slope raster	onf
Convert DEM to point cloud	onf
Convert TIN to DTM	onf
Create DSM (Zmax)	onf
Create DSM and DHM	onf
Create DTM	simpletree
Create DTM	onf
Create maxima point cloud	onf
Create Segmented CHM	simpletree
Filter maxima by neighbourhood	onf
Gaussian filter optimized by maxima number	onf
Modify DEM	onf
Pit filling	ignlif
Upper outliers removing	ignlif
 - ▶ SEGMA

Map one attribute by cluster (raster)	onf
---------------------------------------	-----
- ▶ Meshes
- ▶ Metrics
- ▶ Others
- ▶ Work in progress (Beta)

☒ During Computree launch, place at last known position





CompuTree - [Document 1]

File Edit Window View Language Help

Step manager

Name Debug

Steps workflow

- (0%) 4 - Points, Fichier XYB (sample_cloud.xyb)
- (0%) 5 - Classify ground points
- (0%) 7 - Create DTM

Model manager

No element

Name 1 Type

Item configurator

No element in 3D view

Name Value

Apply Auto

Configuration of input results (ONF_StepExtractPlotBasedOnDTM (9))

Results names	Step	Help
DTM (raster)		
<input checked="" type="checkbox"/> Result	ONF_StepComputeDTM02 (7)	
<input type="checkbox"/> Classification raster	ONF_StepClassifyGround (5)	
Scene(s)		
<input checked="" type="checkbox"/> Result	ONF_StepComputeDTM02 (7)	

Input data selection

Available data	Sel.	Searched data
Result		
Group		
Scène [Point scene]	<input checked="" type="checkbox"/>	Groupe [Group]
Vegetation points [Point scene]	<input checked="" type="checkbox"/>	Scene [Point scene]
Ground points [Point scene]	<input type="checkbox"/>	Scene [Point scene]

OK Cancel

Steps

Search for steps...

Configuration

Steps name

Configuration

Favorites

- Load
- Export
- Workflow
- Points
 - Ajust
 - Analyze
 - Classify
 - Clusterize
 - Colorize
 - Create / Merge
 - Detect (Crowns)
 - Extract
 - Compute the digital terrain model ifplsis
 - Extract a circular plot onf
 - Extract a point cloud outside of a circular plot arts
 - Extract point in a slice parallel to DTM onf**
 - Extract points in a cylinder toolkit
 - Extract points in a horizontal slice toolkit
 - Extract points in a part of the bounding box toolkit
 - Extract points in a specified bounding box toolkit
 - Extract points in a sphere toolkit
 - Extract points in upper / lower slice toolkit
 - Extract points in vertical cylinders (by plot) onf
 - Extracts the major branch points. simpletree
 - Segment scene in horizontal slices onf
 - Smooth extraction of a point slice parallel to the DT... simpletree
- Filter
- Transform
- Normals

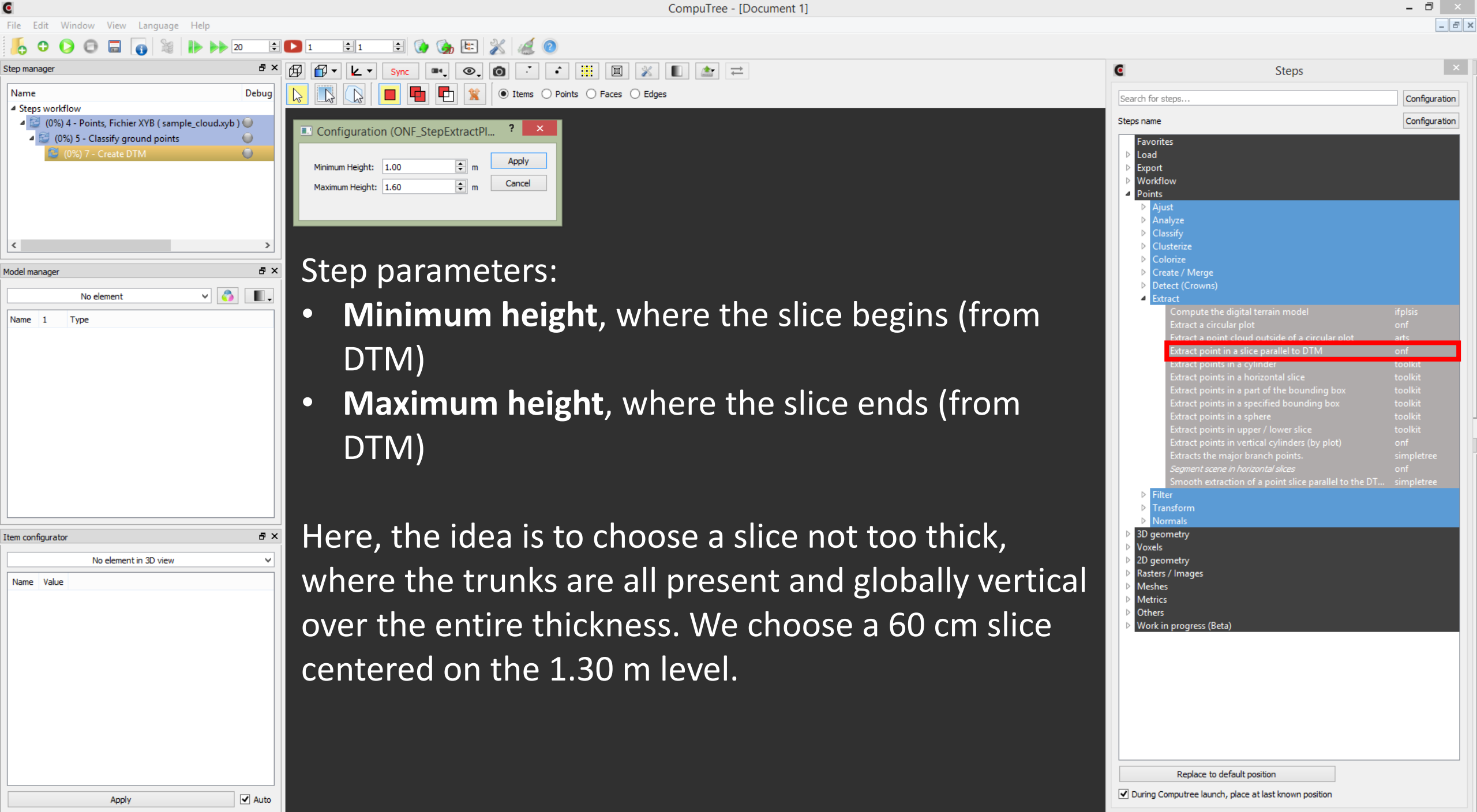
- 3D geometry
- Voxels
- 2D geometry
- Rasters / Images
- Meshes
- Metrics
- Others
- Work in progress (Beta)

Replace to default position

☒ During Computree launch, place at last known position

As input, select:

- The DTM
- The vegetation scene: warning this box is not checked by default.



Step manager

Name Del

- 4 - Points, Fichier XYB (sample_cloud.xyb)
 - ☐ Result
- 5 - Classify ground points
 - ☐ Classification raster
 - ☐ Result (COPY)
- 6 - Create DTM
 - ☐ Result (COPY)
- 7 - Extract point in a slice parallel to DTM
 - ☒ Result (COPY)

Model manager

Result (COPY) (7)

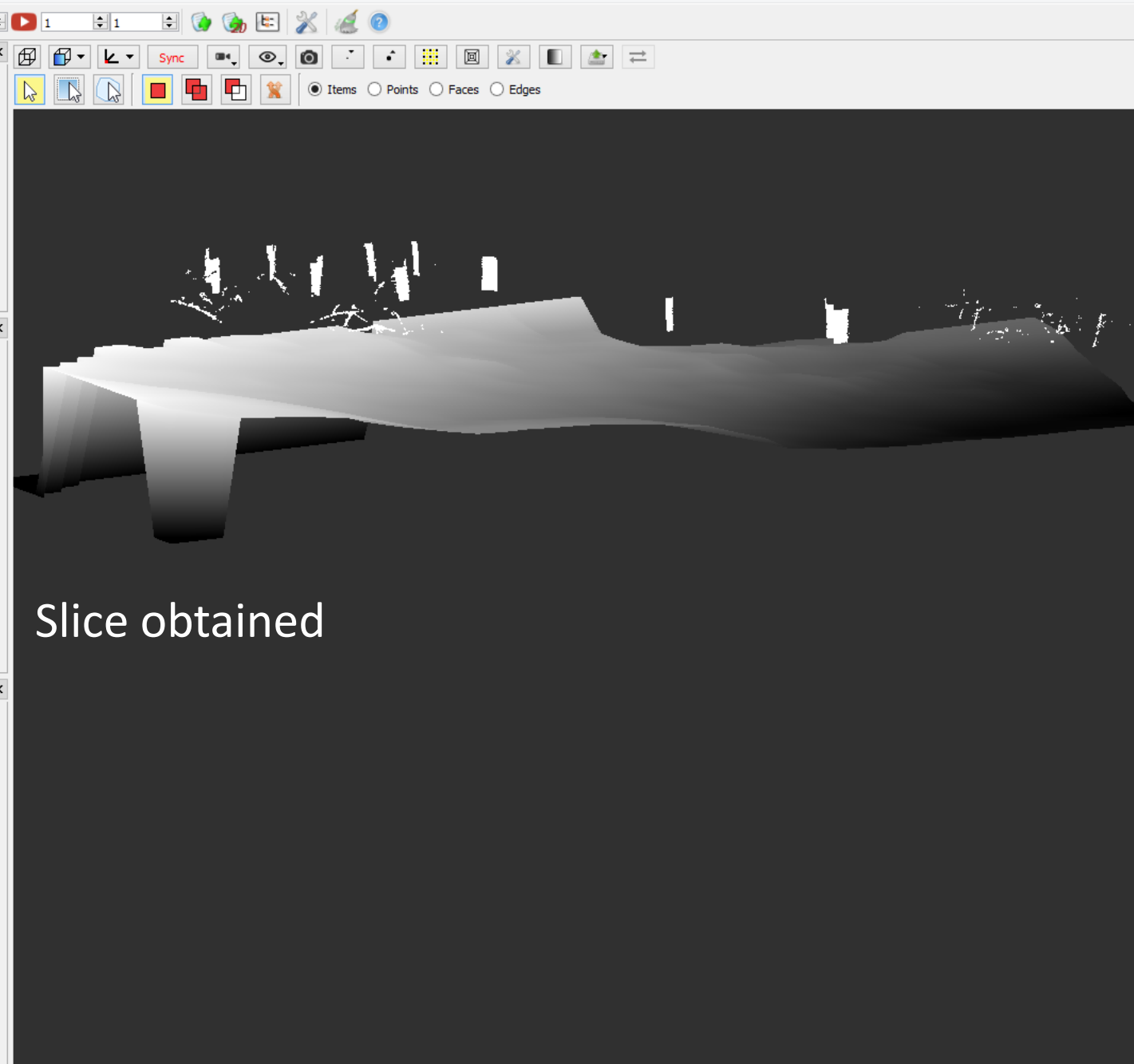
Name	1	Type
Result		
Group	<input type="checkbox"/>	Std group
Scène	<input type="checkbox"/>	Point scene
Intensité	<input type="checkbox"/>	Point quint16 attributes
Scanner	<input type="checkbox"/>	Scan position
File header	<input type="checkbox"/>	XYB Header
Vegetation points	<input type="checkbox"/>	Point scene
Ground points	<input type="checkbox"/>	Point scene
DTM	<input checked="" type="checkbox"/>	Raster<float>
Extracted scene	<input checked="" type="checkbox"/>	Point scene

Item configurator

Raster<float>

	Name	Value
7	Raster mode: show grid	<input type="checkbox"/> Activate
8	3D mode	<input checked="" type="checkbox"/> Activate
9	3D mode: link cell centers	<input type="checkbox"/> Activate
10	3D mode: Show relief	<input checked="" type="checkbox"/> Activate
11	3D mode: scale	<input type="checkbox"/> Activate
12	3D mode: Zmin for scaling (m)	0
13	3D mode: Zmax for scaling (m)	5
14	Colorization by unique values	<input type="checkbox"/> Activate

Apply ☒ Auto



Steps

Search for steps... Configuration

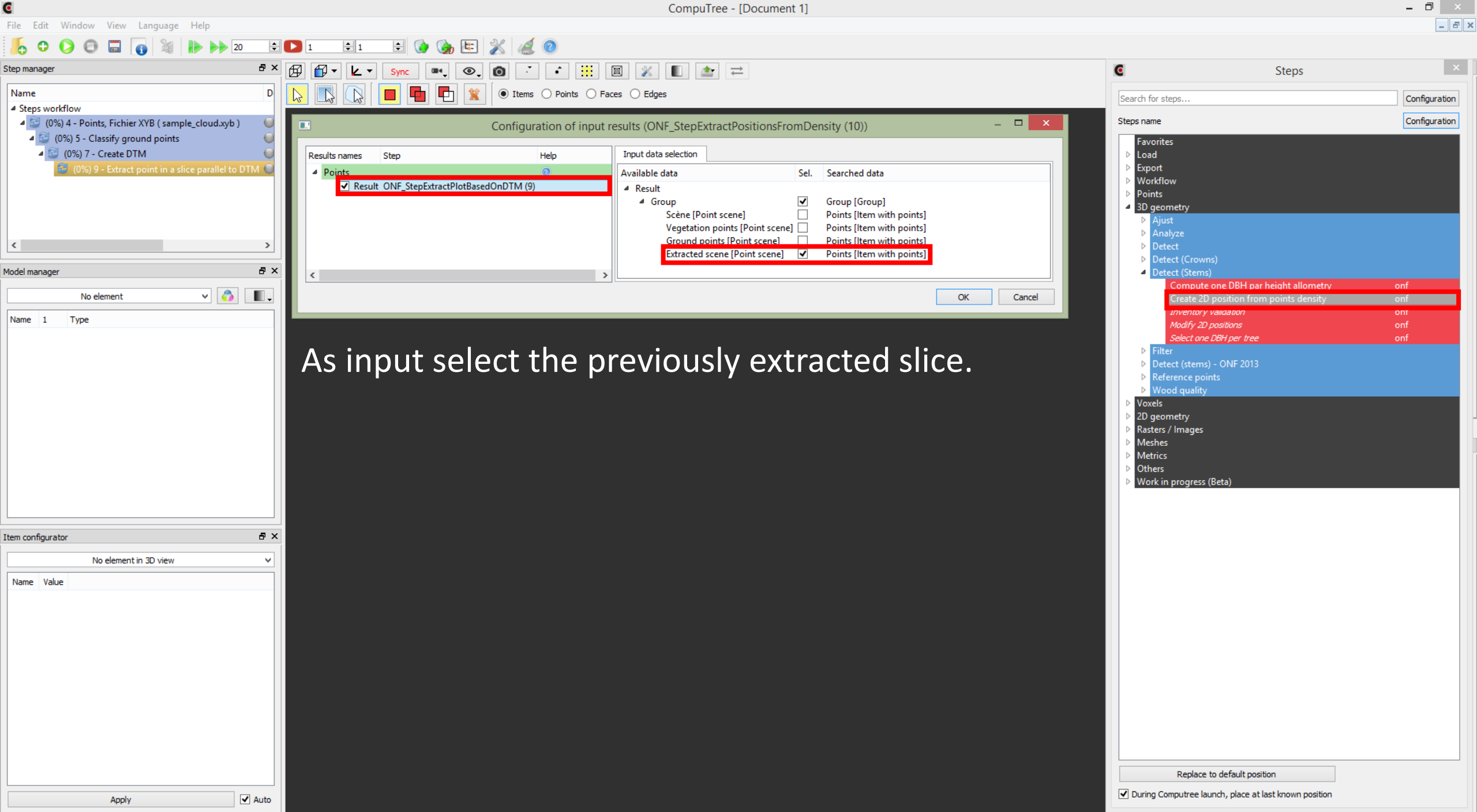
Steps name Configuration

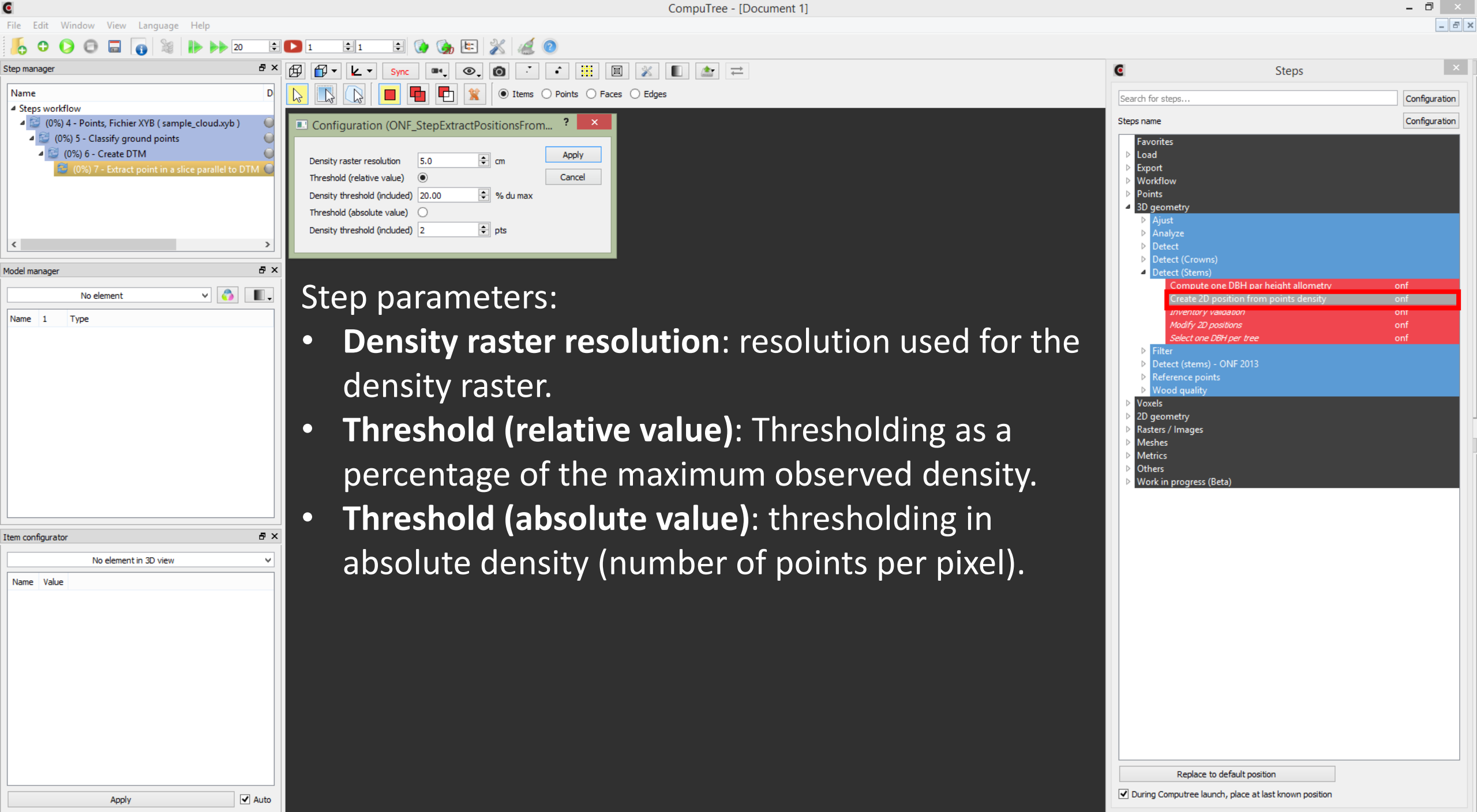
Favorites

- Load
- Export
- Workflow
- Points
- 3D geometry
- Voxels
- 2D geometry
- Rasters / Images
- Meshes
- Metrics
- Others
- Work in progress (Beta)

Replace to default position

☒ During Computree launch, place at last known position





This step requires calibration with respect to the input data:

Too high resolution leads to seeds merging. Too low resolution leads to an excess of seeds created.

Relative thresholding works well if the density of the cloud in points per m^2 does not vary too much (cloud previously regularized). Otherwise it is preferable to choose an absolute threshold.

Steps

Configuration

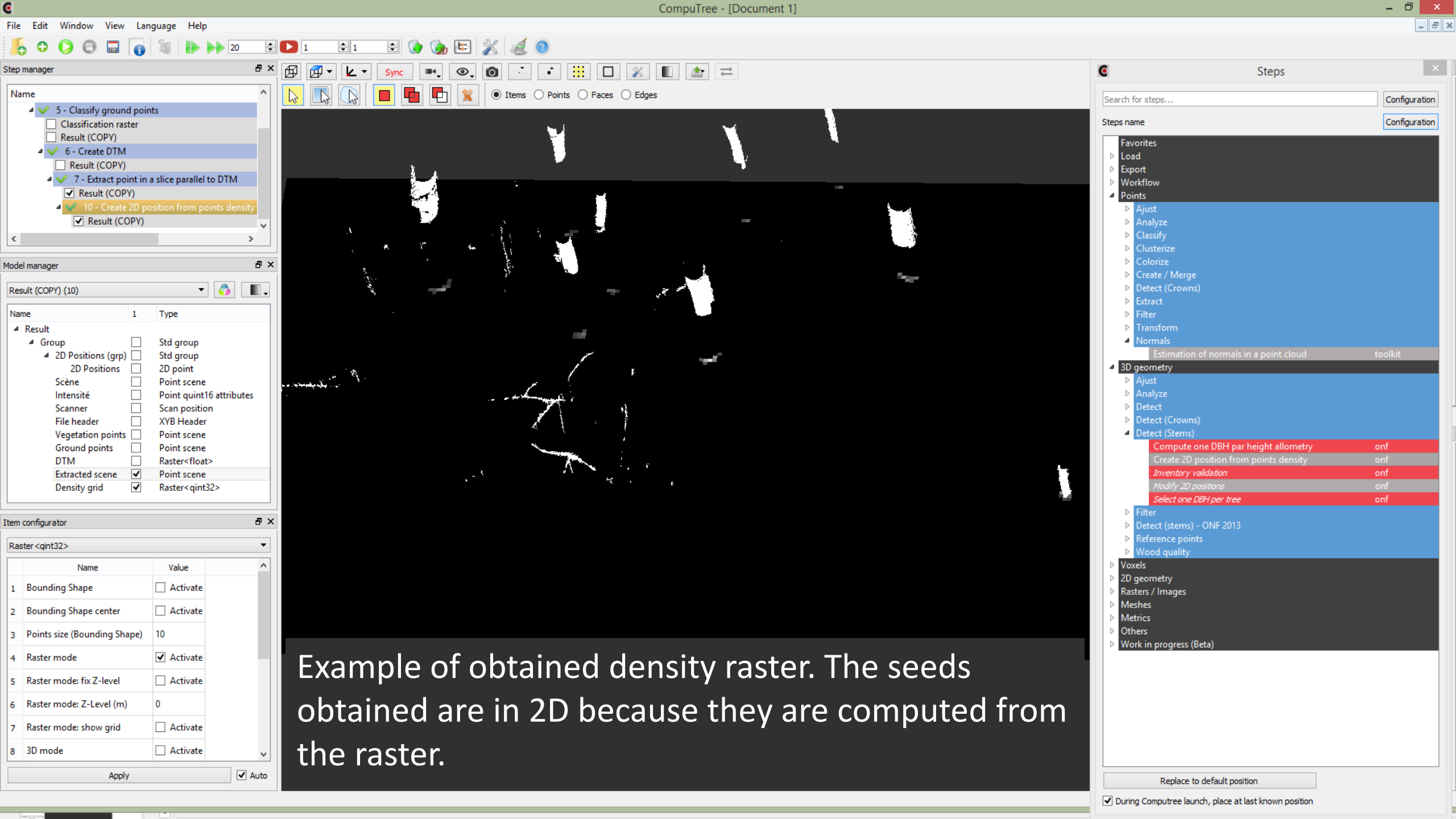
Steps name
Configuration

- Favorites
- Load
- Export
- Workflow
- Points
- ▾ 3D geometry
 - Adjust
 - Analyze
 - Detect
 - Detect (Crowns)
 - ▾ Detect (Stems)

Compute one DBH par height allometry	onf
Create 2D position from points density	onf
<i>Inventory variation</i>	oni
<i>Modify 2D positions</i>	onf
Select one DBH per tree	onf
 - Filter
 - Detect (stems) - ONF 2013
 - Reference points
 - Wood quality
- Voxels
- 2D geometry
- Rasters / Images
- Meshes
- Metrics
- Others
- Work in progress (Beta)

Replace to default position

☒ During Computree launch, place at last known position



Example of obtained density raster. The seeds obtained are in 2D because they are computed from the raster.

➔ Step ID: ONF_StepCreatePointGrid

It consists of creating a voxel grid, where each box references the list of points it contains in 3D.

This will subsequently establish neighbourhood relations between boxes, and make the link with the points at any time for representation.

In reality in this script, it is this grid that is segmented and not the point cloud itself.

Search for steps...

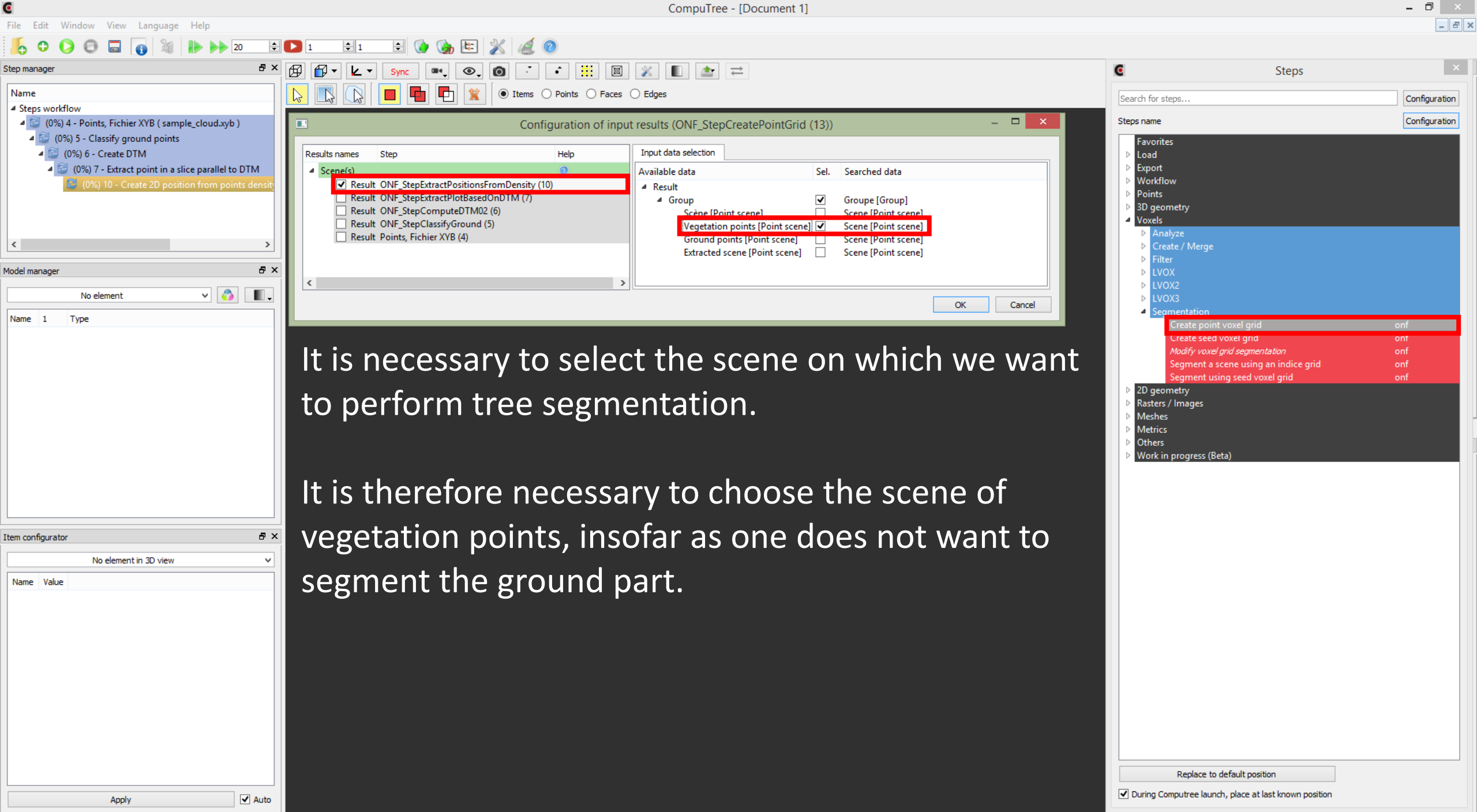
Configuration

Steps name Configuration

- Favorites
- Load
- Export
- Workflow
- Points
- 3D geometry
- Voxels
 - Analyze
 - Create / Merge
 - Filter
 - LVOX
 - LVOX2
 - LVOX3
 - Segmentation
 - Create point voxel grid onf
 - Create seed voxel grid ont
 - Modify voxel grid segmentation onf
 - Segment a scene using an indice grid onf
 - Segment using seed voxel grid onf
- 2D geometry
- Rasters / Images
- Meshes
- Metrics
- Others
- Work in progress (Beta)

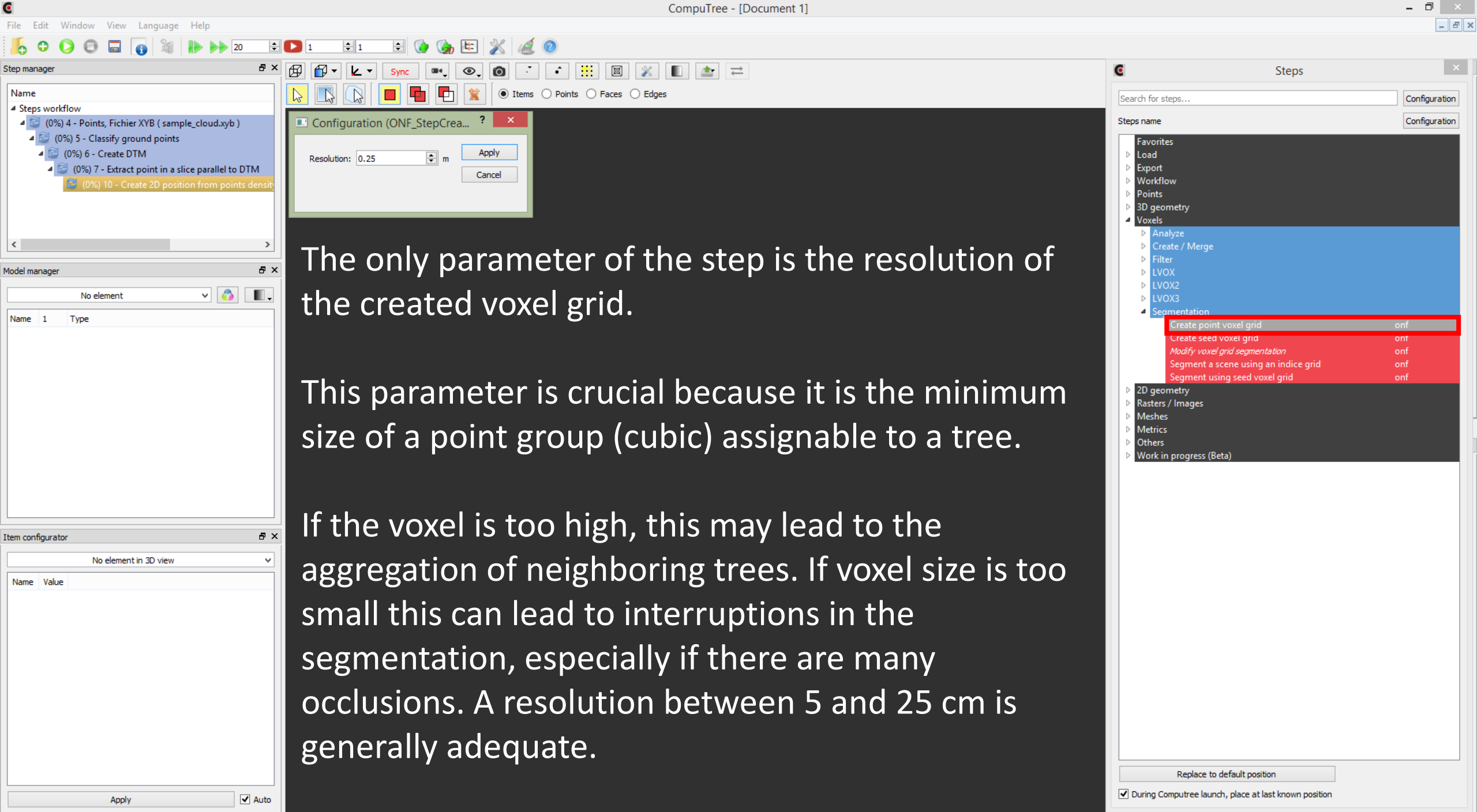
Replace to default position

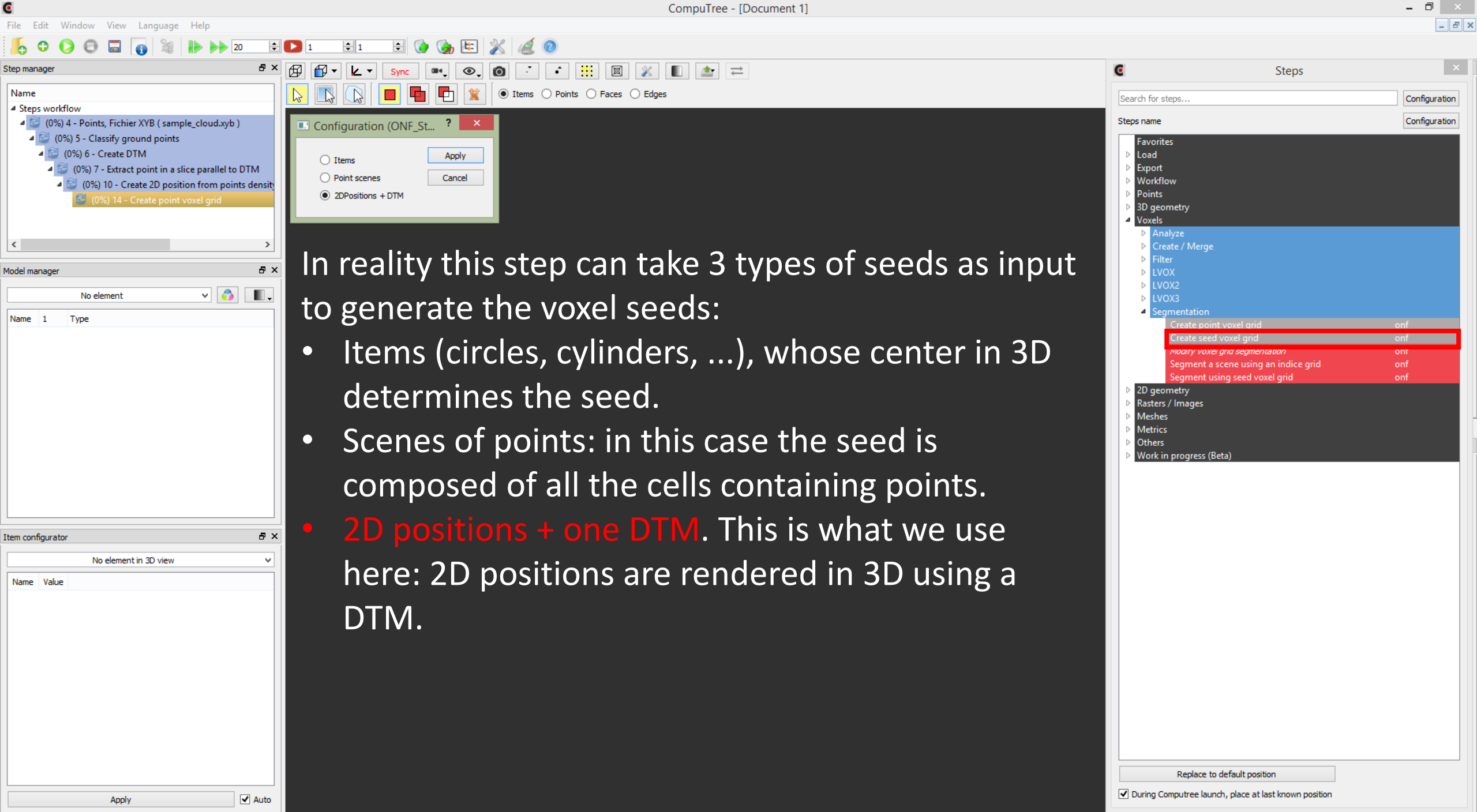
☒ During Computree launch, place at last known position



It is necessary to select the scene on which we want to perform tree segmentation.

It is therefore necessary to choose the scene of vegetation points, insofar as one does not want to segment the ground part.





Step manager

Name

Steps workflow

- (0%) 4 - Points, Fichier XYB (sample_cloud.xyb)
- (0%) 5 - Classify ground points
- (0%) 6 - Create DTM
- (0%) 7 - Extract point in a slice parallel to DTM
- (0%) 10 - Create 2D position from points density
- (0%) 14 - Create point voxel grid

Model manager

No element

Name	1	Type

Apply

Auto

Configuration of input results (ONF_StepCreateSeedGrid (15))

Results names	Step	Help
<input checked="" type="checkbox"/> 2D Positions		
<input checked="" type="checkbox"/> Result	ONF_StepCreatePointGrid (14)	
<input type="checkbox"/> Result	ONF_StepExtractPositionsFromDensity (10)	
<input type="checkbox"/> Result	ONF_StepExtractPlotBasedOnDTM (7)	
<input type="checkbox"/> Result	ONF_StepComputeDTM02 (6)	
<input type="checkbox"/> Result	ONF_StepClassifyGround (5)	
<input type="checkbox"/> Classification raster	ONF_StepClassifyGround (5)	
<input type="checkbox"/> Result	Points, Fichier XYB (4)	
<input type="checkbox"/> DTM		
<input type="checkbox"/> Result	ONF_StepCreatePointGrid (14)	
<input type="checkbox"/> Result	ONF_StepExtractPositionsFromDensity (10)	
<input type="checkbox"/> Result	ONF_StepExtractPlotBasedOnDTM (7)	
<input type="checkbox"/> Result	ONF_StepComputeDTM02 (6)	
<input type="checkbox"/> Classification raster	ONF_StepClassifyGround (5)	
<input type="checkbox"/> Grid		
<input type="checkbox"/> Result	ONF_StepCreatePointGrid (14)	

Input data selection

Available data	Sel.	Searched data
<input checked="" type="checkbox"/> Result		
<input checked="" type="checkbox"/> Group	<input checked="" type="checkbox"/>	Groupe [Group]
<input checked="" type="checkbox"/> 2D Positions (grp)	<input checked="" type="checkbox"/>	Groupe [Group]
<input checked="" type="checkbox"/> 2D Positions [2D point]	<input checked="" type="checkbox"/>	2D Position [Item]
<input type="checkbox"/> Scene [Point scene]	<input type="checkbox"/>	2D Position [Item]
<input type="checkbox"/> Intensité [Point quint16 attributes]	<input type="checkbox"/>	2D Position [Item]
<input type="checkbox"/> Scanner [Scan position]	<input type="checkbox"/>	2D Position [Item]
<input type="checkbox"/> File header [XYB Header]	<input type="checkbox"/>	2D Position [Item]
<input type="checkbox"/> Vegetation points [Point scene]	<input type="checkbox"/>	2D Position [Item]
<input type="checkbox"/> Ground points [Point scene]	<input type="checkbox"/>	2D Position [Item]
<input type="checkbox"/> DTM [Raster<float>]	<input type="checkbox"/>	2D Position [Item]
<input type="checkbox"/> Extracted scene [Point scene]	<input type="checkbox"/>	2D Position [Item]
<input type="checkbox"/> Density grid [Raster<qint32>]	<input type="checkbox"/>	2D Position [Item]
<input type="checkbox"/> Point grid [Point 3D Grid]	<input type="checkbox"/>	2D Position [Item]

OK Cancel

Input data must then be selected as follows:

1. The 2D positions of step 5

Steps

Search for steps...

Configuration

Steps name

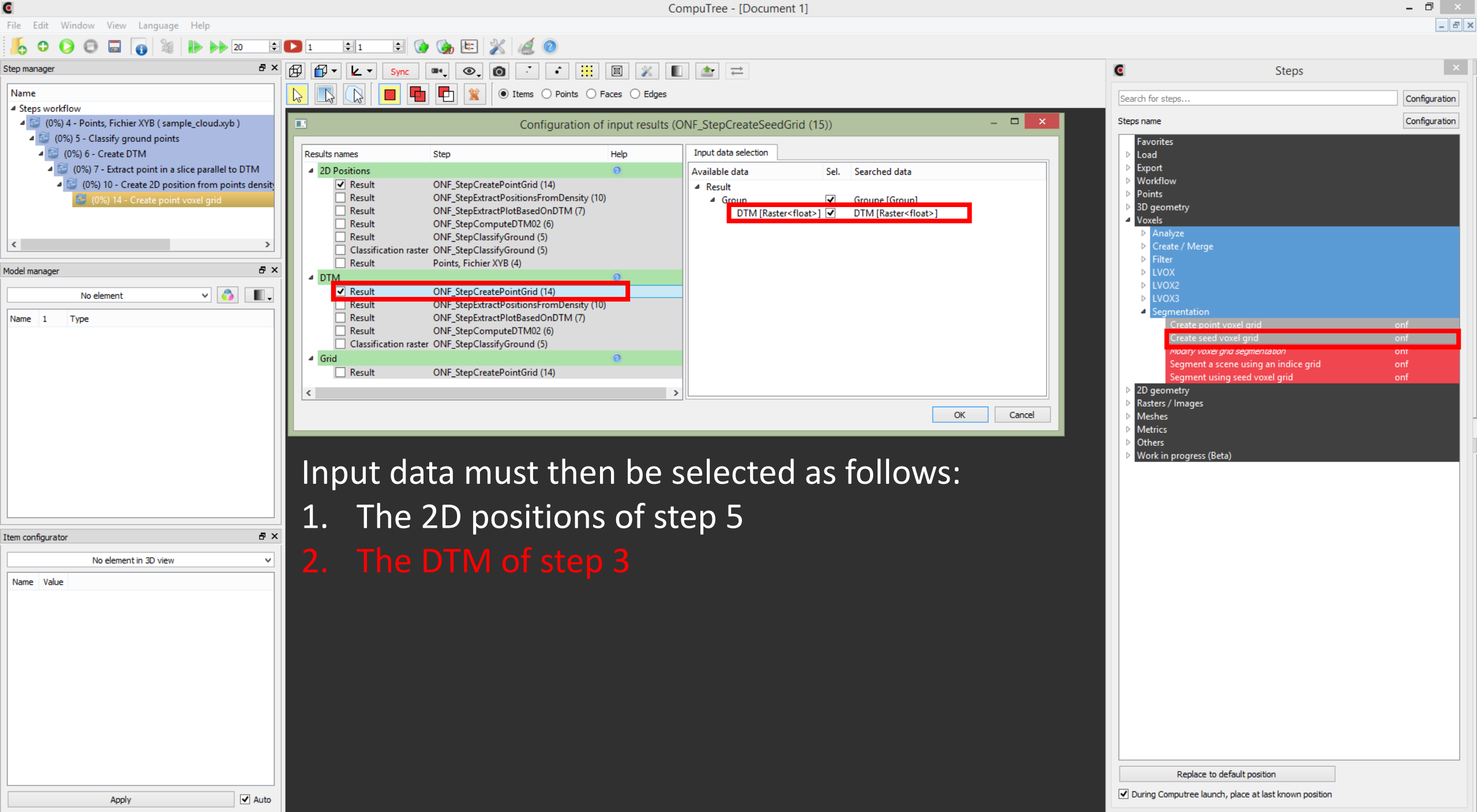
Configuration

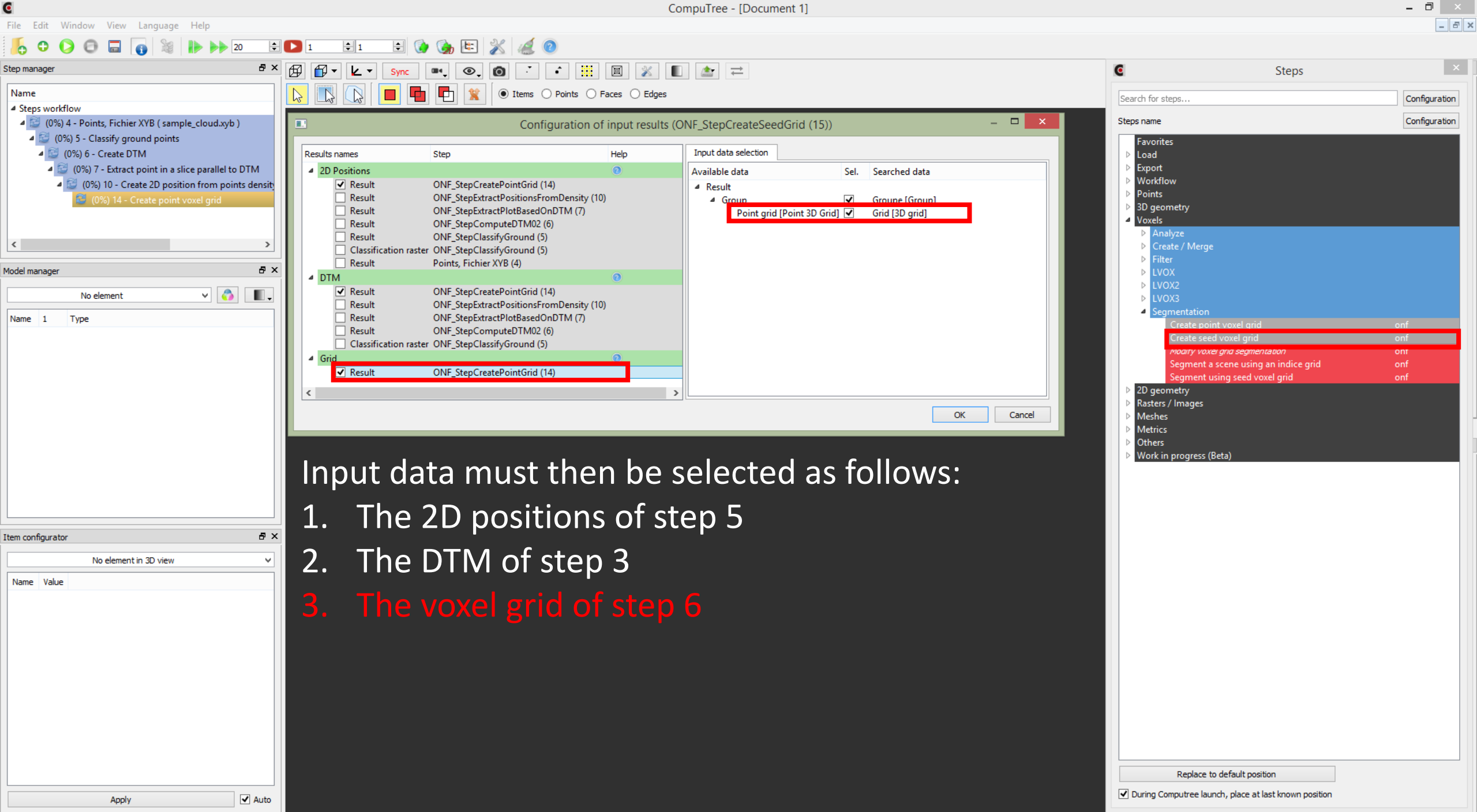
Favorites

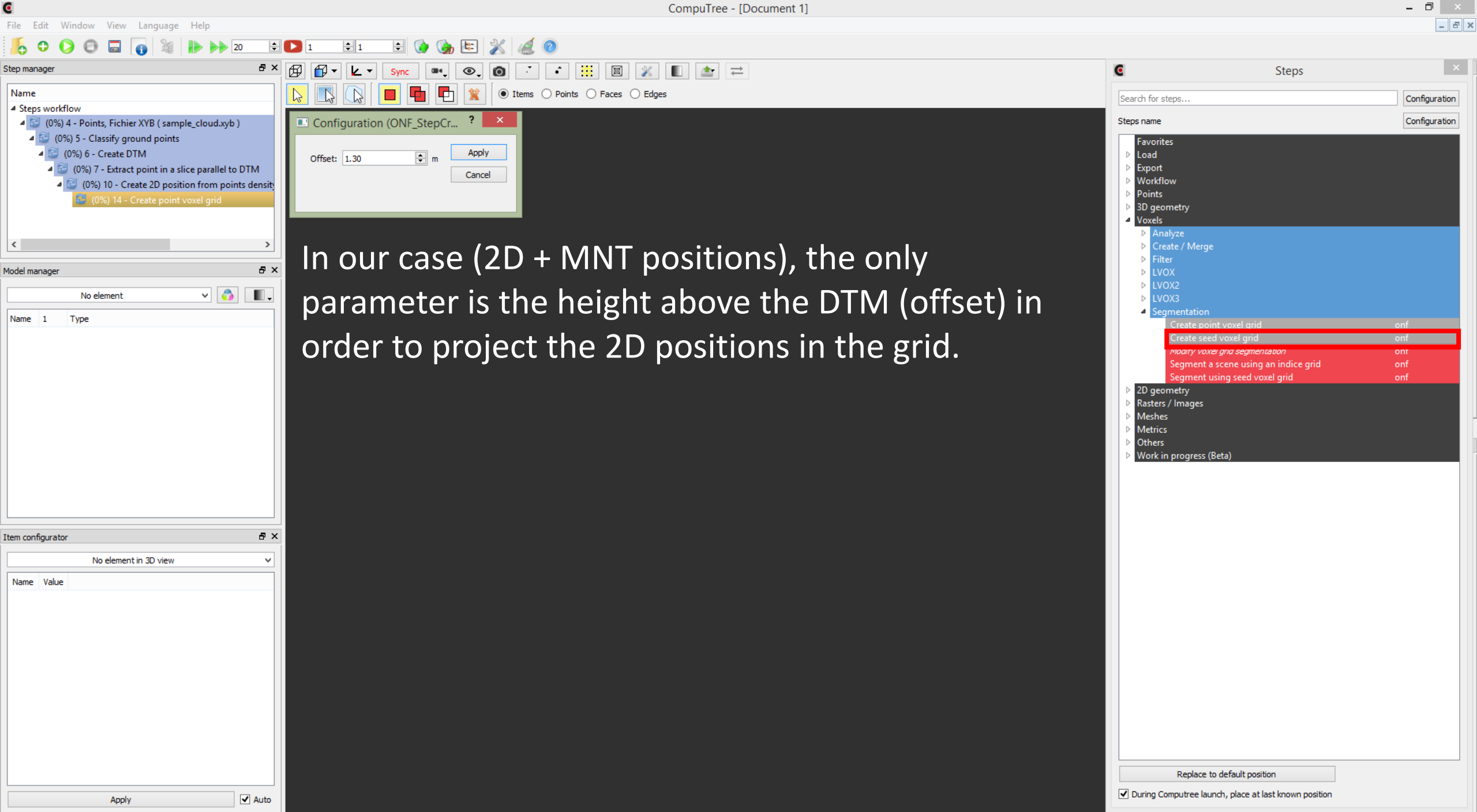
- Load
- Export
- Workflow
- Points
- 3D geometry
- Voxels
 - Analyze
 - Create / Merge
 - Filter
 - LVOX
 - LVOX2
 - LVOX3
 - Segmentation
 - Create point voxel grid onf
 - Create seed voxel grid onf
 - Moody's voxel grid segmentation onf
 - Segment a scene using an indice grid onf
 - Segment using seed voxel grid onf
- 2D geometry
- Rasters / Images
- Meshes
- Metrics
- Others
- Work in progress (Beta)

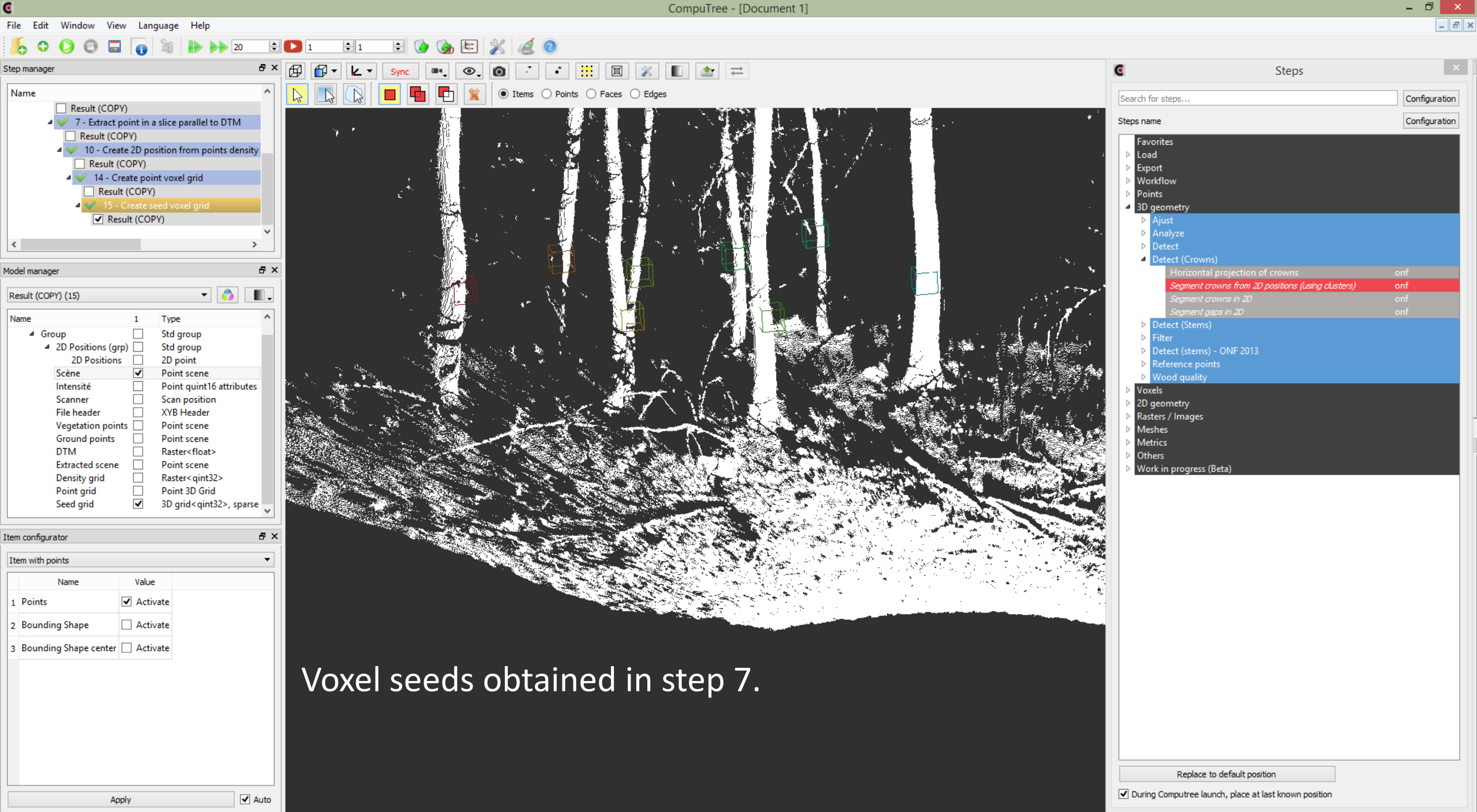
Replace to default position

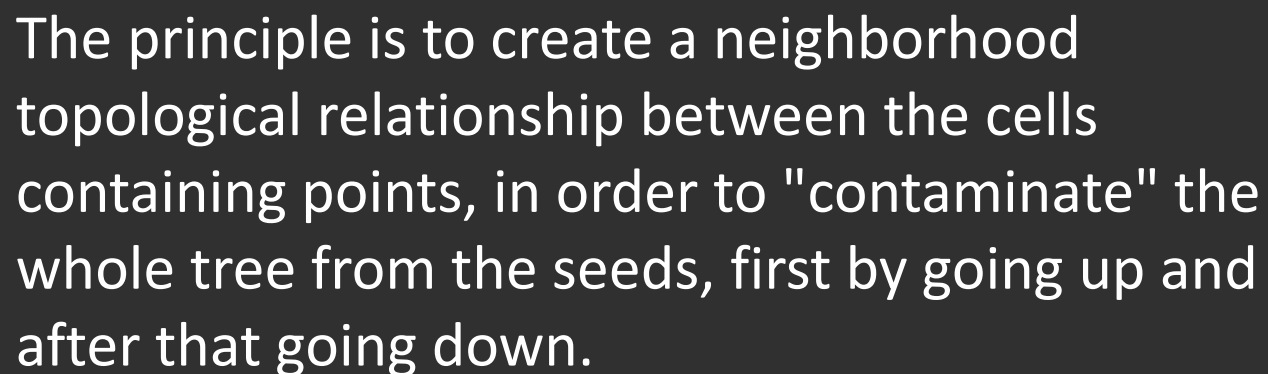
☒ During Computree launch, place at last known position











For each voxel not attributed to a cluster, it determines which cell already assigned is the nearest (cell centers), among the cells of a search area below. This cell becomes the topological parent of the voxel, which is now assigned to the cluster.

- Maximum searching distance in Z
- Maximum searching distance in XY

The screenshot shows the 'Steps' panel with a search bar at the top. The 'Voxels' category is expanded, revealing a list of steps. The step 'Segment using seed voxel grid' is highlighted with a red border and a red background. The status 'onf' is visible next to it. Other steps include 'Analyze', 'Create / Merge', 'Filter', 'LVOX', 'LVOX2', 'LVOX3', 'Segmentation', 'Create point voxel grid', 'Create seed voxel grid', 'Modify voxel grid segmentation', 'Segment a scene using an indice grid', '2D geometry', 'Rasters / Images', 'Meshes', 'Metrics', 'Others', and 'Work in progress (Beta)'.

Step manager

Name

▲ Steps workflow

▲ (0%) 4 - Points, Fichier XYZ (sample_cloud.xyz)

▲ (0%) 5 - Classify ground points

▲ (0%) 6 - Create DTM

▲ (0%) 7 - Extract point in a slice parallel to DTM

▲ (0%) 10 - Create 2D position from points density

▲ (0%) 14 - Create point voxel grid

▲ (0%) 15 - Create seed voxel grid

Model manager

No element

Name	1	Type
------	---	------

Item configurator

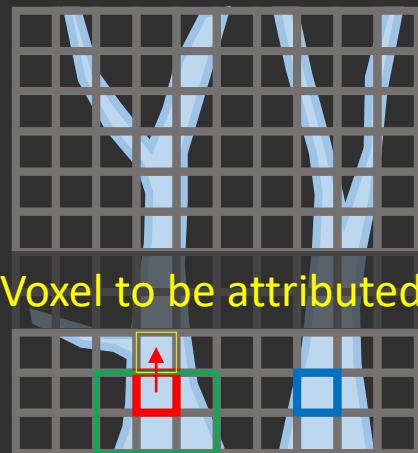
No element in 3D view

Name	Value
------	-------

Apply

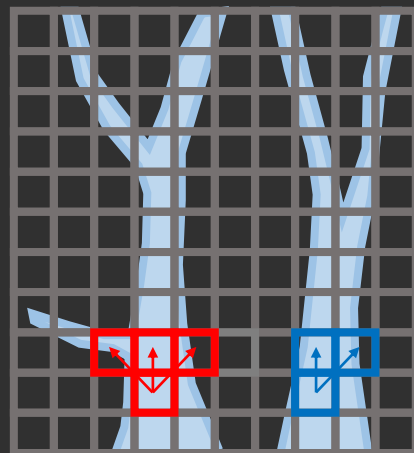
☒ Auto

Illustration of how the algorithm works:

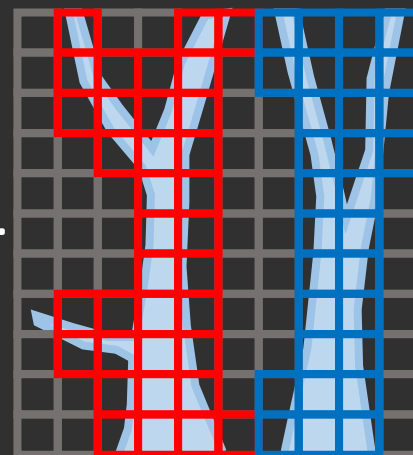
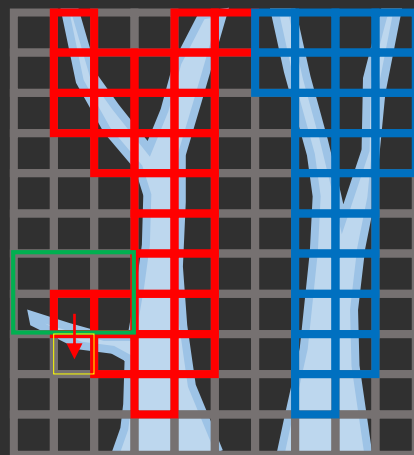
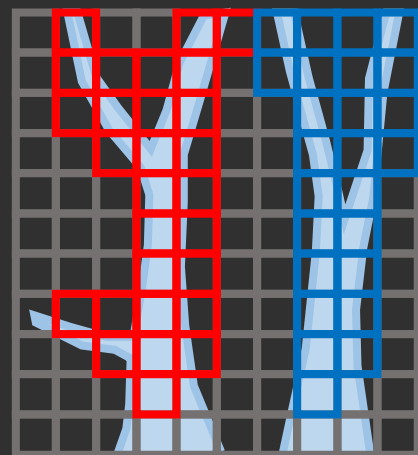
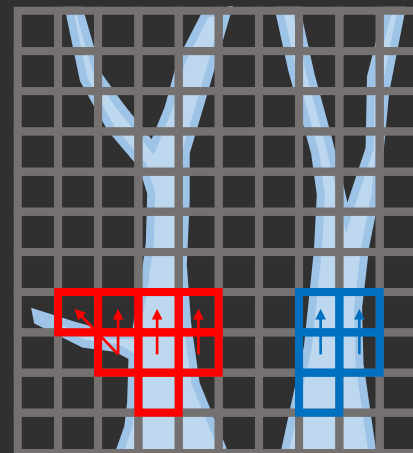


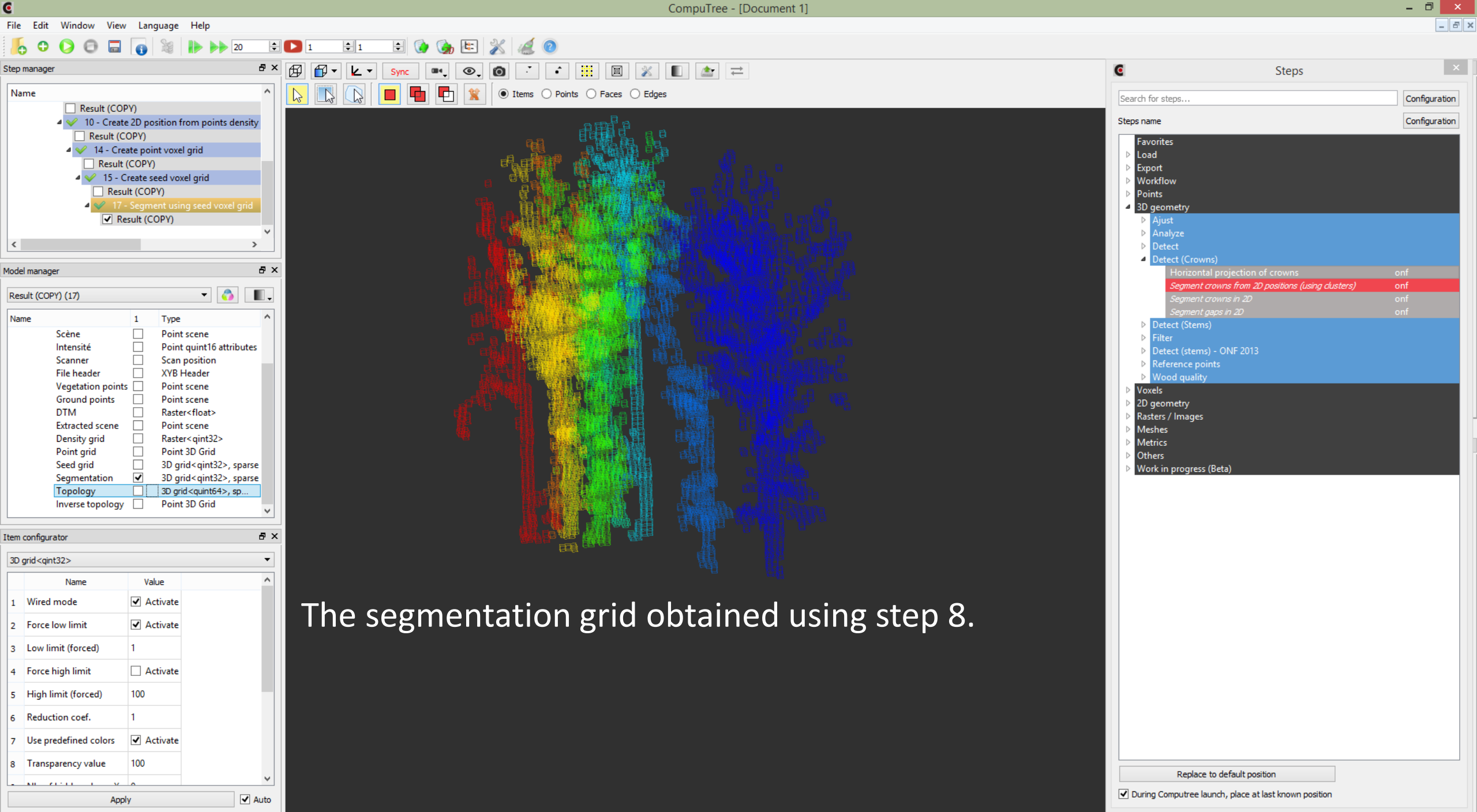
Voxel to be attributed

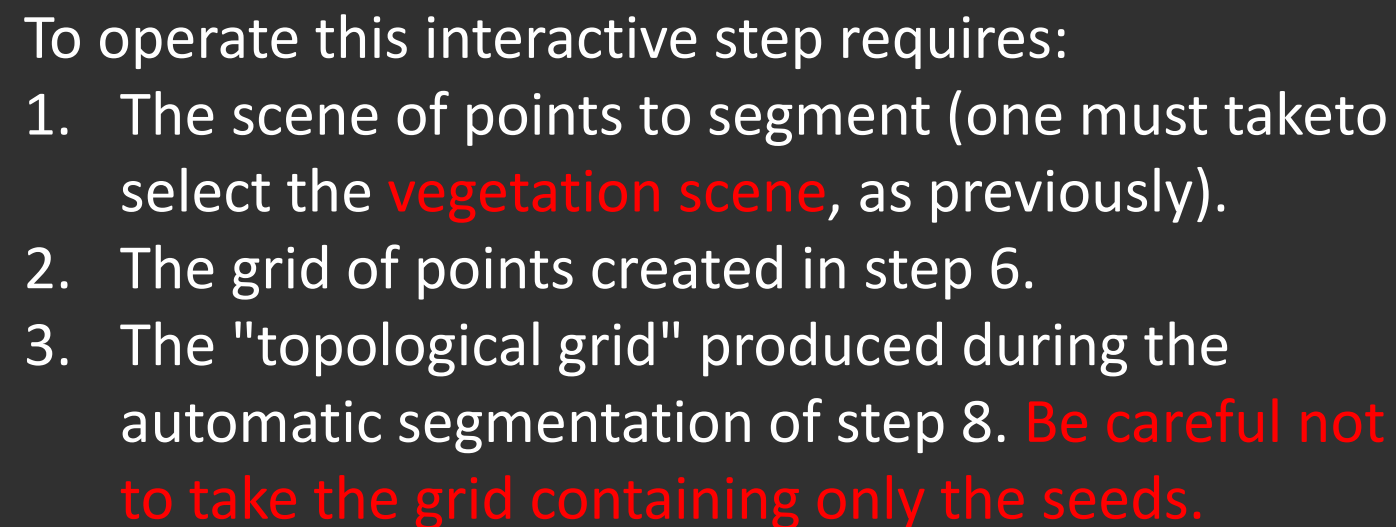
Search area
(Z = 1 px, XY = 2 px)



Clusters A and B

[illegible]





This step has a unique parameter.

In the interactive part, it is possible to validate the clusters once they are considered complete.

If **keep only validated trees** is enabled, only clusters corresponding to trees that have been explicitly validated will be retained as output. Otherwise all clusters are kept.

Unless identified need, it is preferable not to activate this option.

Steps

Search for steps...

Configuration

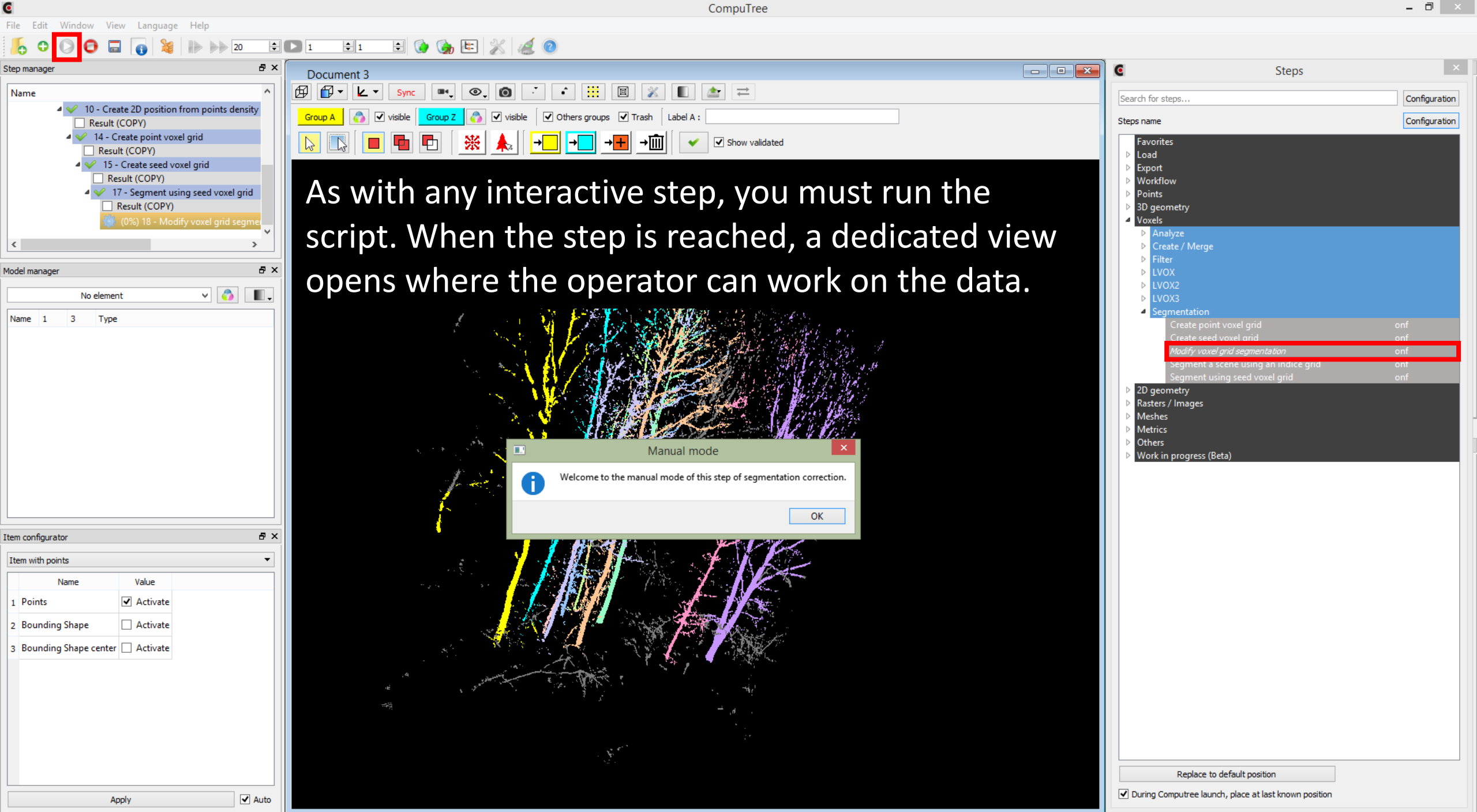
Steps name

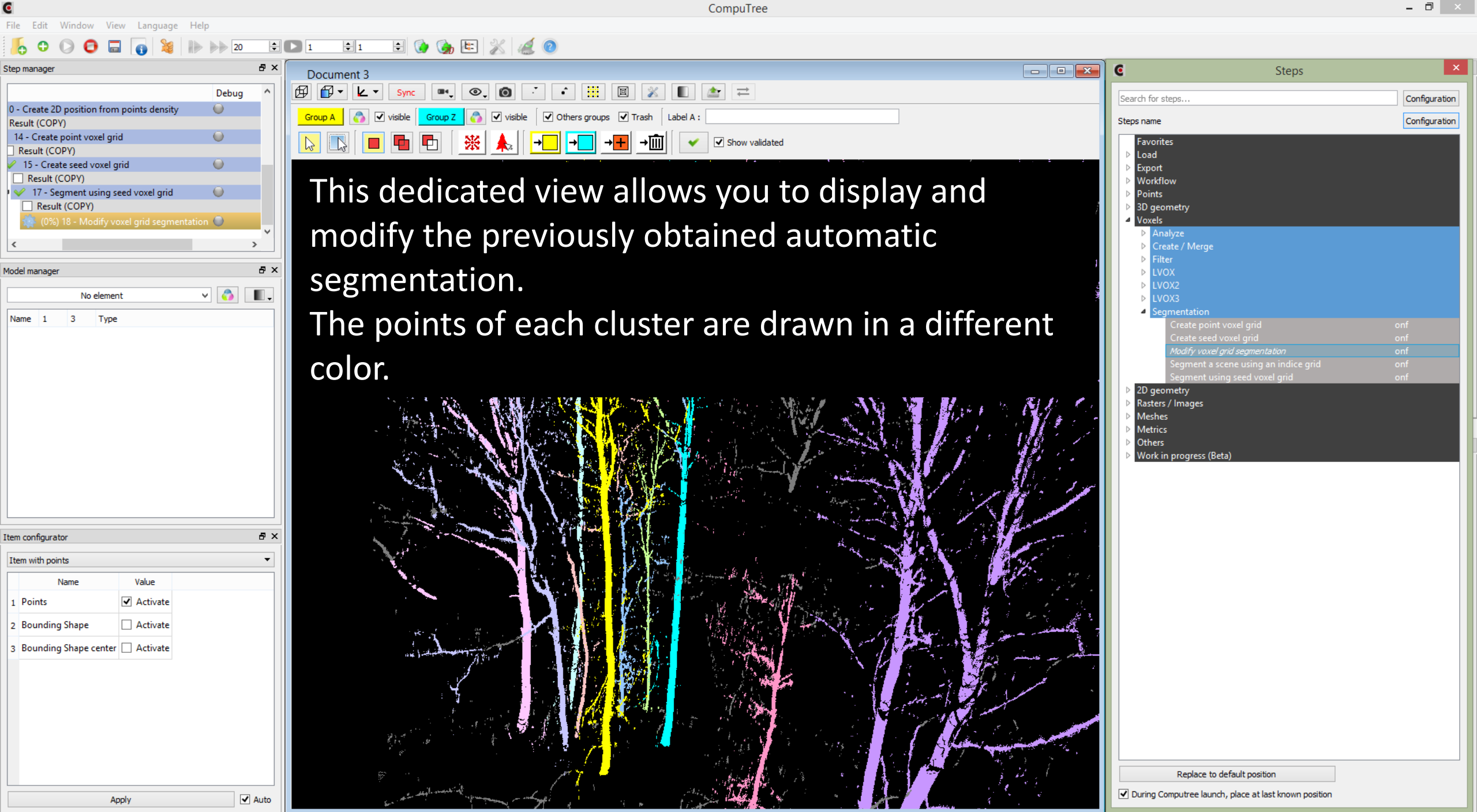
Configuration

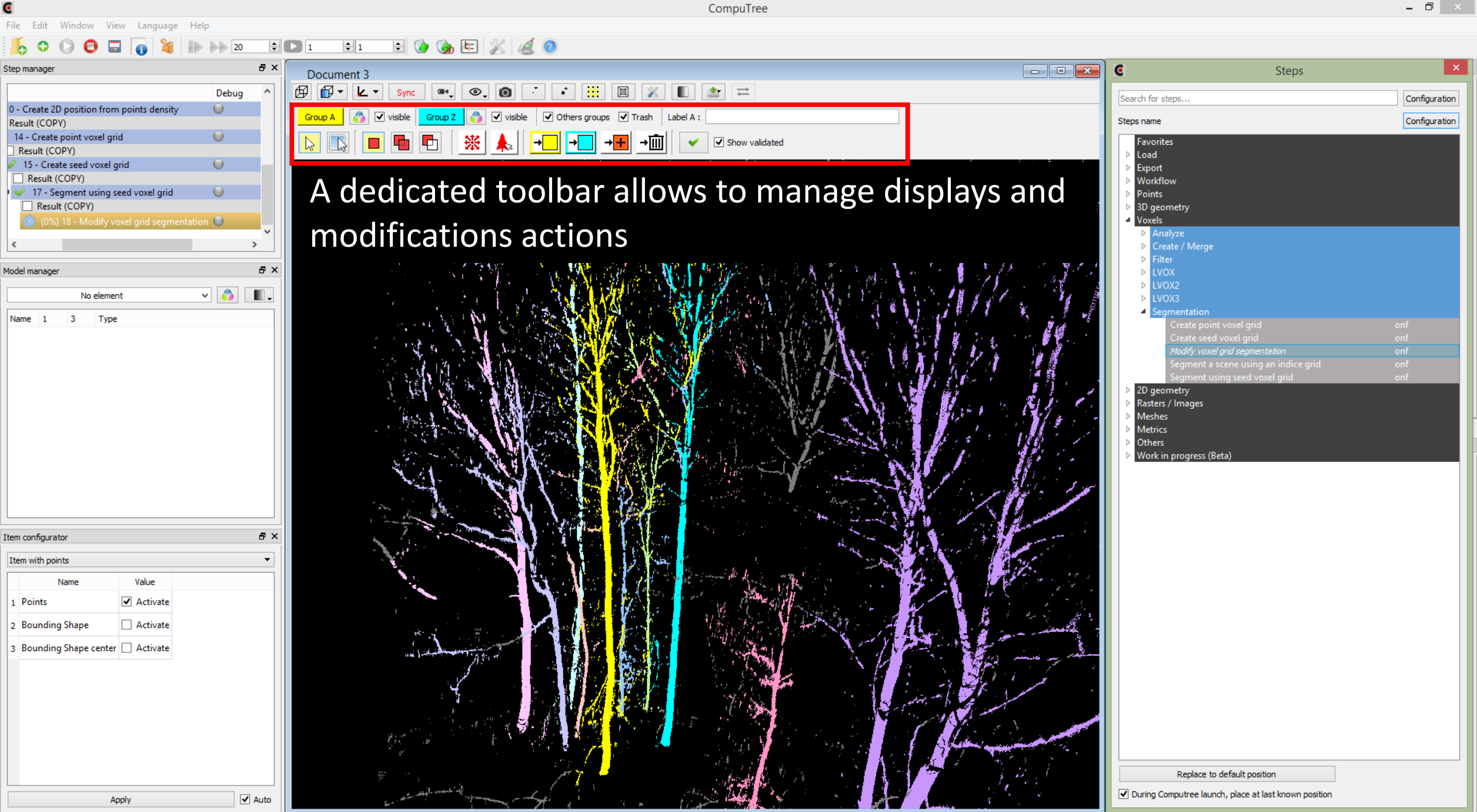
- Favorites
- ▶ Load
- ▶ Export
- ▶ Workflow
- ▶ Points
- ▶ 3D geometry
- ▲ Voxels
 - ▶ Analyze
 - ▶ Create / Merge
 - ▶ Filter
 - ▶ LVOX
 - ▶ LVOX2
 - ▶ LVOX3
 - ▲ Segmentation
 - Create point voxel grid onf
 - Create seed voxel grid onf
 - Modify voxel grid segmentation onf**
 - Segment a scene using an indice grid onf
 - Segment using seed voxel grid onf
- ▶ 2D geometry
- ▶ Rasters / Images
- ▶ Meshes
- ▶ Metrics
- ▶ Others
- ▶ Work in progress (Beta)

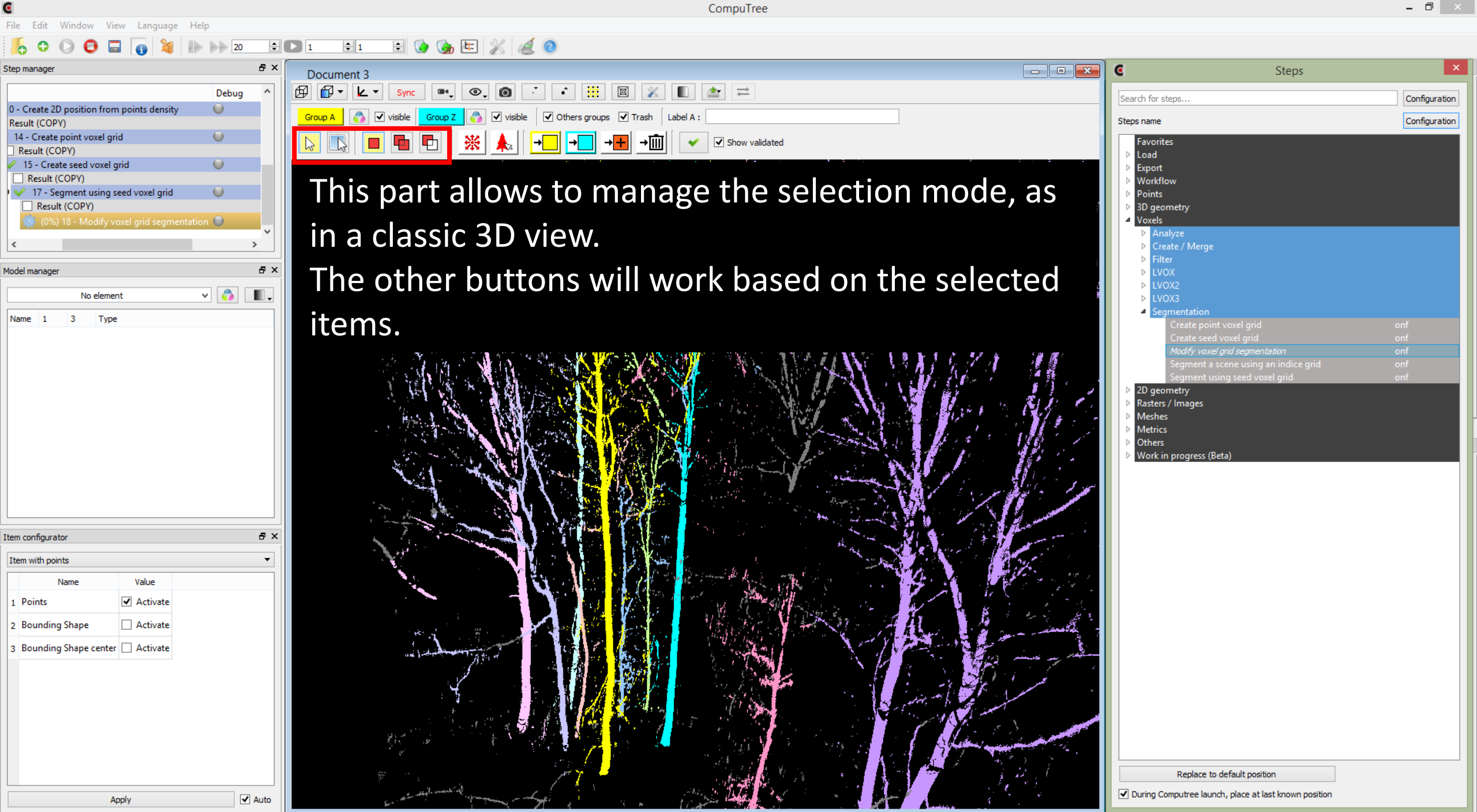
Replace to default position

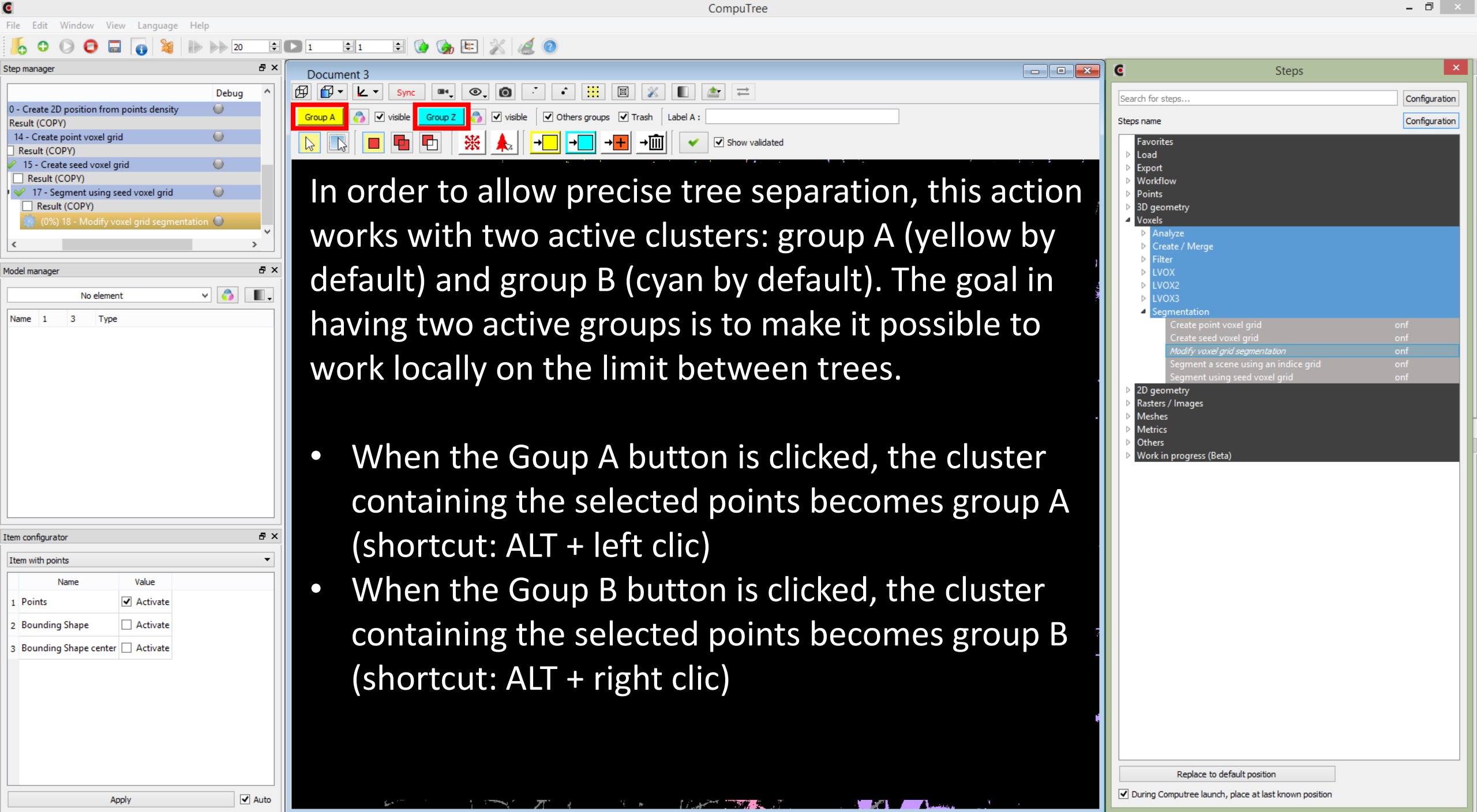
☒ During Computree launch, place at last known position

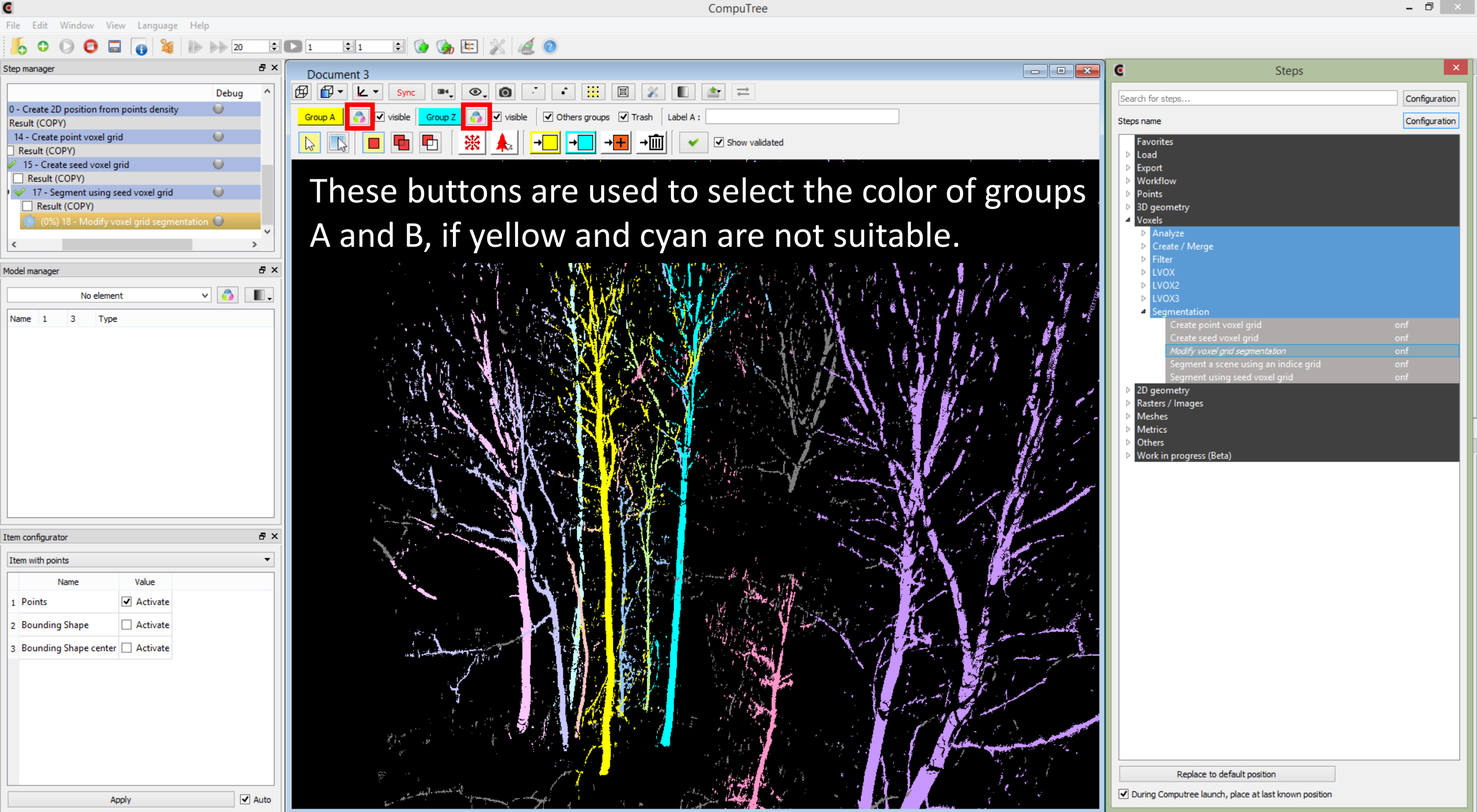












Step manager

	Debug
0 - Create 2D position from points density	
Result (COPY)	
14 - Create point voxel grid	
<input type="checkbox"/> Result (COPY)	
15 - Create seed voxel grid	
<input type="checkbox"/> Result (COPY)	
17 - Segment using seed voxel grid	
<input type="checkbox"/> Result (COPY)	
(0%) 18 - Modify voxel grid segmentation	

The screenshot shows a window titled "Model manager". At the top, there is a search bar containing the text "No element" and a dropdown arrow. To the right of the search bar are two icons: a multi-colored circle icon and a document icon with a dropdown arrow. Below the search bar is a table with four columns: "Name", "1", "3", and "Type". The table is currently empty.

Name	1	3	Type
------	---	---	------

Item configurator













Item with points

	Name	Value
1	Points	<input checked="" type="checkbox"/> Activate
2	Bounding Shape	<input type="checkbox"/> Activate
3	Bounding Shape center	<input type="checkbox"/> Activate

Apply ☒ Auto

Document 3

Group A ☒ visible Group Z ☒ visible ☐ Others groups ☒ Trash Label A :

            ☒ Show validated

These check boxes are used to show / hide the different groups:

- Group A
- Group B
- The other groups (all clusters that are not in group A or group B)
- The trash, where are all the points that are not assigned to a cluster (non-segmented)

Steps

Steps name

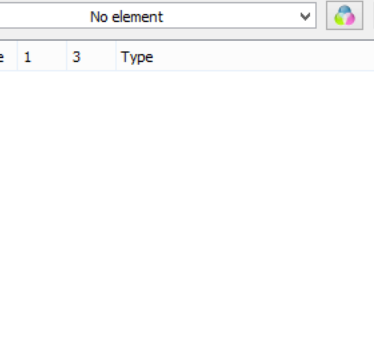
Favorites		
▷ Load		
▷ Export		
▷ Workflow		
▷ Points		
▷ 3D geometry		
▲ Voxels		
▷ Analyze		
▷ Create / Merge		
▷ Filter		
▷ LVOX		
▷ LVOX2		
▷ LVOX3		
▲ Segmentation		
Create point voxel grid		onf
Create seed voxel grid		onf
Modify voxel grid segmentation		onf
Segment a scene using an indice grid		onf
Segment using seed voxel grid		onf
▷ 2D geometry		
▷ Rasters / Images		
▷ Meshes		
▷ Metrics		
▷ Others		
▷ Work in progress (Beta)		

☒ During Computree launch, place at last known position

Step manager

Debug

- 0 - Create 2D position from points density
- Result (COPY)
- 14 - Create point voxel grid
- Result (COPY)
- ✓ 15 - Create seed voxel grid
- Result (COPY)
- ✓ 17 - Segment using seed voxel grid
- Result (COPY)
- ⚙️ (0%) 18 - Modify voxel grid segmentation



The screenshot shows the 'Model manager' window. At the top, there is a search bar with the text 'No element' and a dropdown arrow. To the right of the search bar are two icons: a colorful circular icon and a black and white icon. Below the search bar is a table with four columns: 'Name', '1', '3', and 'Type'. The table is currently empty.

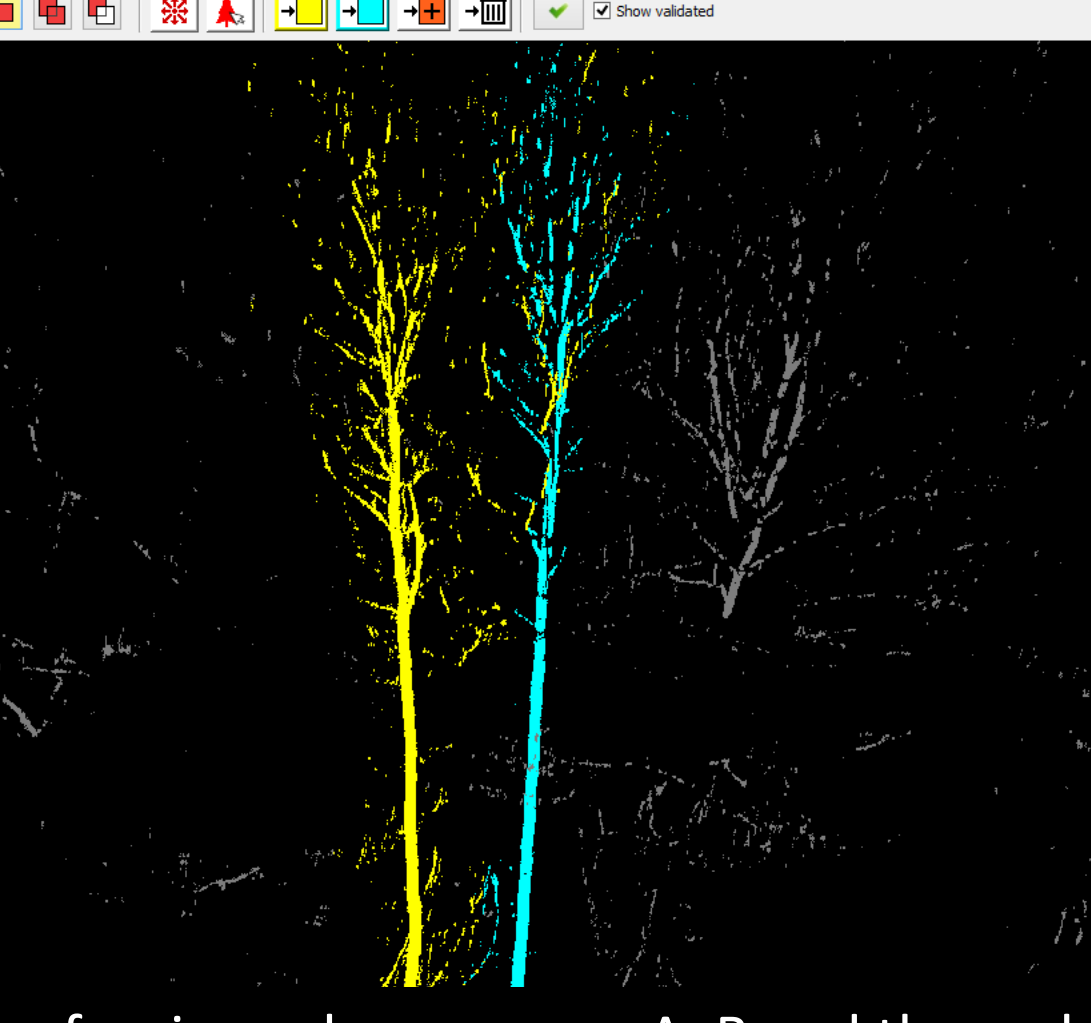
Name	1	3	Type
------	---	---	------

Item configurator

Item with points

	Name	Value
1	Points	<input checked="" type="checkbox"/> Activate
2	Bounding Shape	<input type="checkbox"/> Activate
3	Bounding Shape center	<input type="checkbox"/> Activate

Apply ☒ Auto



The screenshot shows a software interface for a 3D scene. The main view displays a dark, textured background with two trees highlighted in yellow and cyan. The interface includes a toolbar at the top with various tools and a panel on the right with checkboxes for 'visible' and 'Trash'. The text at the bottom of the image reads: "Case of a view where groups A, B and the garbage can be seen, the other groups are hidden".

Steps

Configuration

Steps name Configuration

- Favorites
- Load
- Export
- Workflow
- Points
- 3D geometry
- ▾ Voxels
 - Analyze
 - Create / Merge
 - Filter
 - LVOX
 - LVOX2
 - LVOX3
 - ▾ Segmentation

Create point voxel grid	onf
Create seed voxel grid	onf
<i>Modify voxel grid segmentation</i>	onf
Segment a scene using an indice grid	onf
Segment using seed voxel grid	onf
- 2D geometry
- Rasters / Images
- Meshes
- Metrics
- Others
- Work in progress (Beta)

Replace to default position

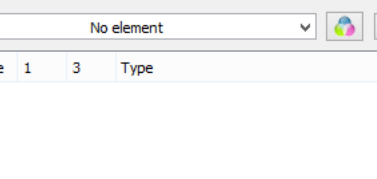
☒ During Computree launch, place at last known position



Step manager

Debug

- 0 - Create 2D position from points density
- Result (COPY)
- 14 - Create point voxel grid
- Result (COPY)
- 15 - Create seed voxel grid
- Result (COPY)
- 17 - Segment using seed voxel grid
- Result (COPY)
- (0%) 18 - Modify voxel grid segmentation



The screenshot shows the 'Model manager' window. At the top, there is a search bar with the text 'No element' and a dropdown arrow. To the right of the search bar are two icons: a colorful circular icon and a grey rectangular icon with a dropdown arrow. Below the search bar is a table with the following columns: 'Name', '1', '3', and 'Type'. The table is currently empty.

Item configurator

Item with points

	Name	Value
1	Points	<input checked="" type="checkbox"/> Activate
2	Bounding Shape	<input type="checkbox"/> Activate
3	Bounding Shape center	<input type="checkbox"/> Activate


Apply ☒ Auto

Document 3

Group A ☒ visible Group Z ☒ visible ☐ Others groups ☐ Trash Label A :

☒ Show validated

Case of a view where only groups A and B are visible



Steps

Configuration

Steps name

Configuration

Favorites

▸ Load

▸ Export

▸ Workflow

▸ Points

▸ 3D geometry

▾ Voxels

▸ 2D geometry

▸ Rasters / Images

▸ Meshes

▸ Metrics

▸ Others

▸ Work in progress (Beta)

Analyze

Create / Merge

Filter

LVOX

LVOX2

LVOX3

▾ Segmentation

Create point voxel grid

Create seed voxel grid

Modify voxel grid segmentation

Segment a scene using an indice grid

Segment using seed voxel grid

onf

onf

onf

onf


onf

Replace to default position

☒ During Computree launch, place at last known position

The screenshot shows the 'Model manager' window. At the top, there is a search bar with the text 'No element' and a dropdown arrow. To the right of the search bar are two icons: a colorful circular icon and a black and white icon. Below the search bar is a table with four columns: 'Name', '1', '3', and 'Type'. The table is currently empty.

Name	1	3	Type
------	---	---	------



Document 3

Group A ☒ visible Group Z ☐ visible ☐ Others groups ☐ Trash Label A :

Case of a view where only group A is visible

NB: Only visible items can be selected. Hiding an item is therefore a way to "protect" it.

Steps

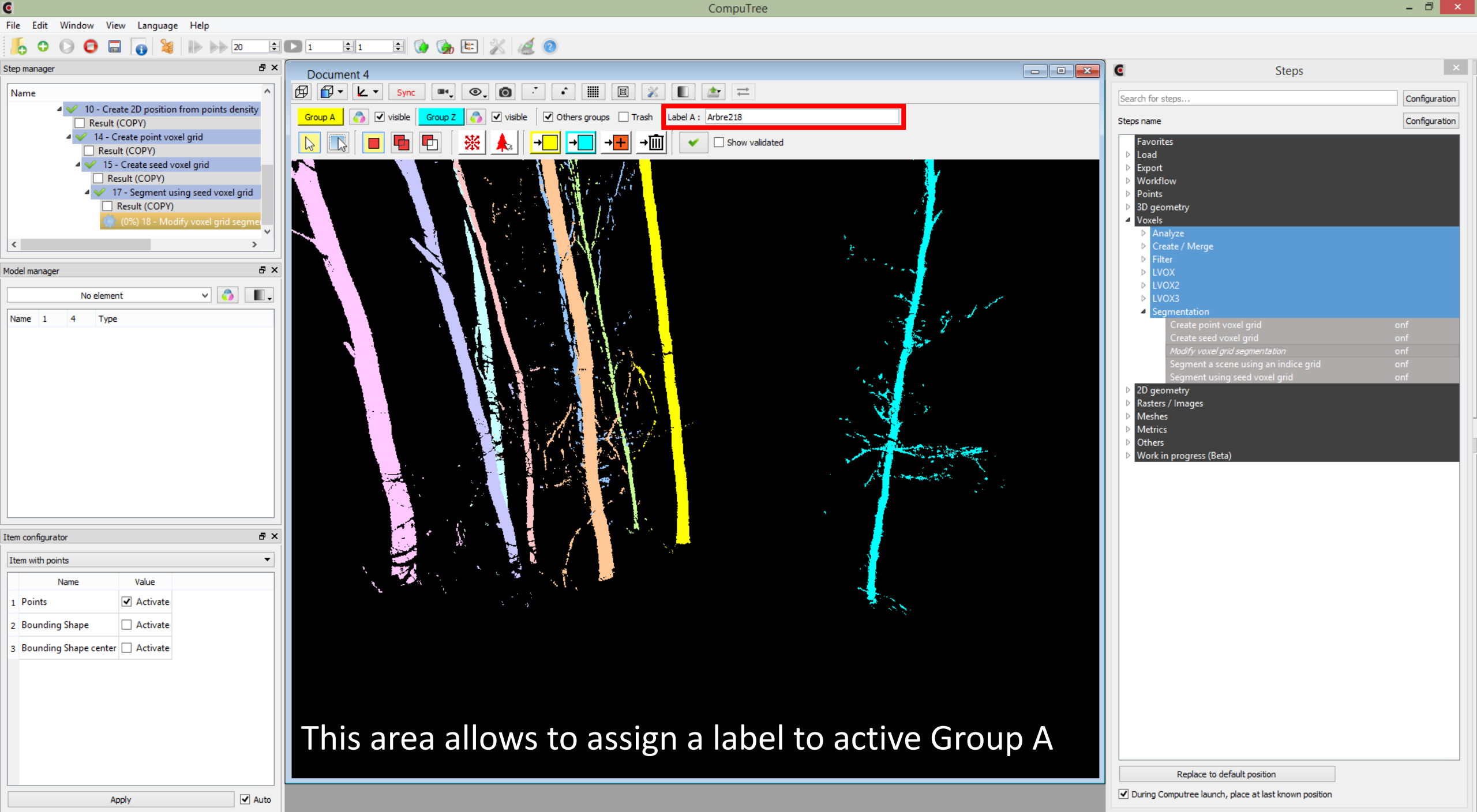
Configuration

Steps name
Configuration

Favorites		
▸ Load		
▸ Export		
▸ Workflow		
▸ Points		
▸ 3D geometry		
▾ Voxels		
▸ Analyze		
▸ Create / Merge		
▸ Filter		
▸ LVOX		
▸ LVOX2		
▸ LVOX3		
▾ Segmentation		
Create point voxel grid		onf
Create seed voxel grid		onf
<i>Modify voxel grid segmentation</i>		onf
Segment a scene using an indice grid		onf
Segment using seed voxel grid		onf
▸ 2D geometry		
▸ Rasters / Images		
▸ Meshes		
▸ Metrics		
▸ Others		
▸ Work in progress (Beta)		

Replace to default position

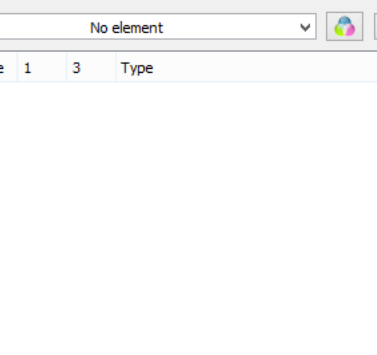
☒ During Computree launch, place at last known position





Step manager

	Debug
0 - Create 2D position from points density	
Result (COPY)	
14 - Create point voxel grid	
<input type="checkbox"/> Result (COPY)	
15 - Create seed voxel grid	
<input type="checkbox"/> Result (COPY)	
17 - Segment using seed voxel grid	
<input type="checkbox"/> Result (COPY)	
(0%) 18 - Modify voxel grid segmentation	



The screenshot shows the 'Model manager' window. At the top, there is a search bar with the text 'No element' and a dropdown arrow. To the right of the search bar are two icons: a colorful circular icon and a document icon with a dropdown arrow. Below the search bar is a table with the following columns: 'Name', '1', '3', and 'Type'. The table is currently empty.


Name	1	3	Type
------	---	---	------

Item configurator

Item with points

	Name	Value
1	Points	<input checked="" type="checkbox"/> Activate
2	Bounding Shape	<input type="checkbox"/> Activate
3	Bounding Shape center	<input type="checkbox"/> Activate

Apply ☒ Auto



This button extends selection of all points that have been assigned to a cluster from a selected area

Steps

Configuration

Steps name
Configuration

Favorites		
▷ Load		
▷ Export		
▷ Workflow		
▷ Points		
▷ 3D geometry		
▲ Voxels		
▷ Analyze		
▷ Create / Merge		
▷ Filter		
▷ LVOX		
▷ LVOX2		
▷ LVOX3		
▲ Segmentation		
Create point voxel grid		onf
Create seed voxel grid		onf
<i>Modify voxel grid segmentation</i>		onf
Segment a scene using an indice grid		onf
Segment using seed voxel grid		onf
▷ 2D geometry		
▷ Rasters / Images		
▷ Meshes		
▷ Metrics		
▷ Others		
▷ Work in progress (Beta)		

Replace to default position

☒ During Computree launch, place at last known position

Step manager

	Debug
0 - Create 2D position from points density	
Result (COPY)	
14 - Create point voxel grid	
<input type="checkbox"/> Result (COPY)	
15 - Create seed voxel grid	
<input type="checkbox"/> Result (COPY)	
17 - Segment using seed voxel grid	
<input type="checkbox"/> Result (COPY)	
(0%) 18 - Modify voxel grid segmentation	


The screenshot shows the 'Model manager' window. At the top, there is a search bar with the text 'No element' and a dropdown arrow. To the right of the search bar are two icons: a colorful circular icon and a grey rectangular icon. Below the search bar is a table with four columns: 'Name', '1', '3', and 'Type'. The table is currently empty.

Item configurator

Item with points ▼

	Name	Value
1	Points	<input checked="" type="checkbox"/> Activate
2	Bounding Shape	<input type="checkbox"/> Activate
3	Bounding Shape center	<input type="checkbox"/> Activate

Apply ☒ Auto



Document 3

Group A ☒ visible Group Z ☒ visible ☐ Others groups ☐ Trash Label A :

1. You should select the starting area

2. Then click on the button

Steps

Configuration

Steps name Configuration

- Favorites
- ▷ Load
- ▷ Export
- ▷ Workflow
- ▷ Points
- ▷ 3D geometry
- ▾ Voxels
 - ▷ Analyze
 - ▷ Create / Merge
 - ▷ Filter
 - ▷ LVOX
 - ▷ LVOX2
 - ▷ LVOX3
 - ▾ Segmentation

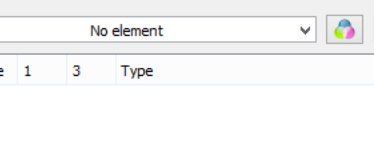
Create point voxel grid	onf
Create seed voxel grid	onf
Modify voxel grid segmentation	onf
Segment a scene using an indice grid	onf
Segment using seed voxel grid	onf
- ▷ 2D geometry
- ▷ Rasters / Images
- ▷ Meshes
- ▷ Metrics
- ▷ Others
- ▷ Work in progress (Beta)

Replace to default position

☒ During Computree launch, place at last known position



Step manager

	Debug
0 - Create 2D position from points density	<input type="radio"/>
Result (COPY)	
14 - Create point voxel grid	<input type="radio"/>
<input type="checkbox"/> Result (COPY)	
✓ 15 - Create seed voxel grid	<input type="radio"/>
<input type="checkbox"/> Result (COPY)	
✓ 17 - Segment using seed voxel grid	<input type="radio"/>
<input type="checkbox"/> Result (COPY)	
⚙️ (0%) 18 - Modify voxel grid segmentation	<input type="radio"/>



Model manager

No element

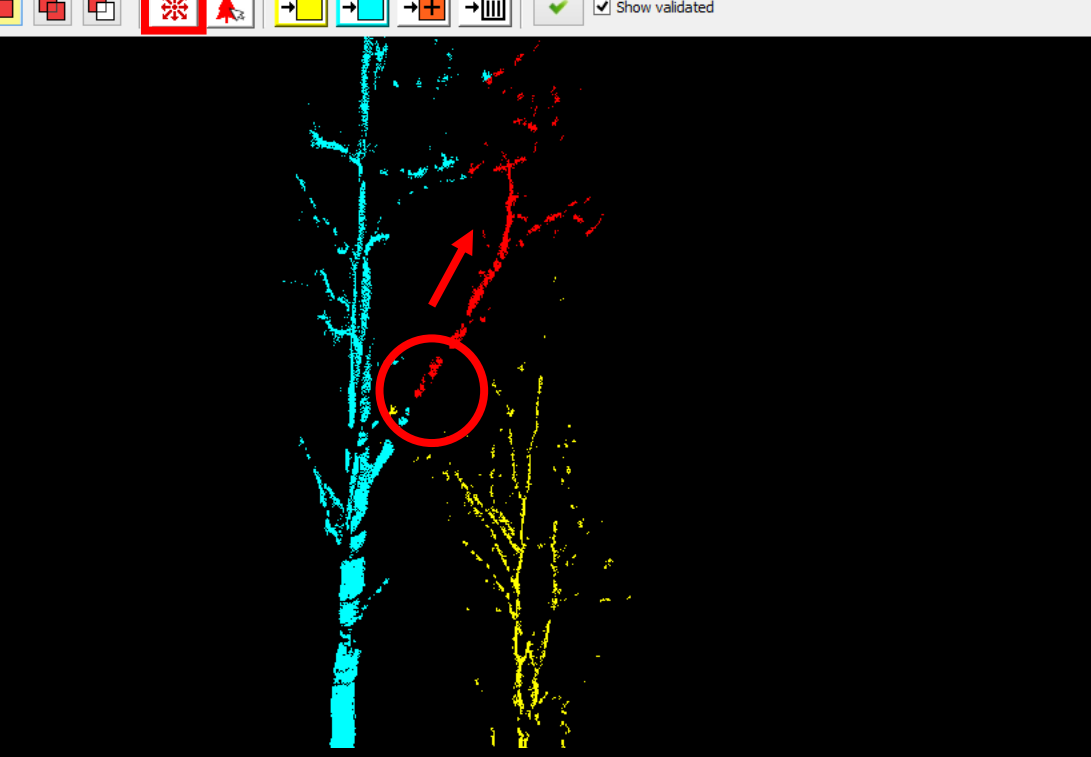
Name	1	3	Type
------	---	---	------

Item configurator

Item with points

	Name	Value
1	Points	<input checked="" type="checkbox"/> Activate
2	Bounding Shape	<input type="checkbox"/> Activate
3	Bounding Shape center	<input type="checkbox"/> Activate

Apply ☒ Auto



The selection is then extended to all points that have been assigned to the cluster from the start area.

To do this, the action uses the topology created during automatic segmentation in step 8

C

Steps

Configuration

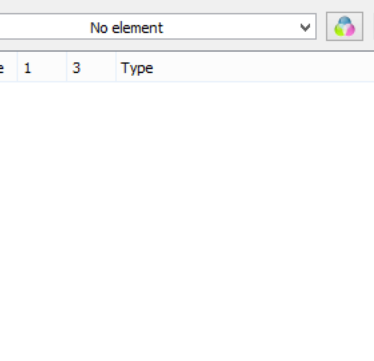
Steps name

Configuration

Favorites		
▷	Load	
▷	Export	
▷	Workflow	
▷	Points	
▷	3D geometry	
▲	Voxels	
▷	Analyze	
▷	Create / Merge	
▷	Filter	
▷	LVOX	
▷	LVOX2	
▷	LVOX3	
▲	Segmentation	
	Create point voxel grid	onf
	Create seed voxel grid	onf
	<i>Modify voxel grid segmentation</i>	onf
	Segment a scene using an indice grid	onf
	Segment using seed voxel grid	onf
▷	2D geometry	
▷	Rasters / Images	
▷	Meshes	
▷	Metrics	
▷	Others	
▷	Work in progress (Beta)	

Replace to default position

☒ During Computree launch, place at last known position



The screenshot shows the 'Model manager' window. At the top, there is a search bar with the text 'No element' and a dropdown arrow. To the right of the search bar are two icons: a colorful circular icon and a gray square icon with a downward arrow. Below the search bar is a table with four columns: 'Name', '1', '3', and 'Type'. The table is currently empty.

Item configurator

Item with points ▼

	Name	Value
1	Points	<input checked="" type="checkbox"/> Activate
2	Bounding Shape	<input type="checkbox"/> Activate
3	Bounding Shape center	<input type="checkbox"/> Activate


Apply ☒ Auto

Document 3

Group A Group Z Others groups Trash Label A : Show validated

This button allows you to select all the points of a cluster.

1. You should first select one or more points
2. Then click on the button



Steps
✕

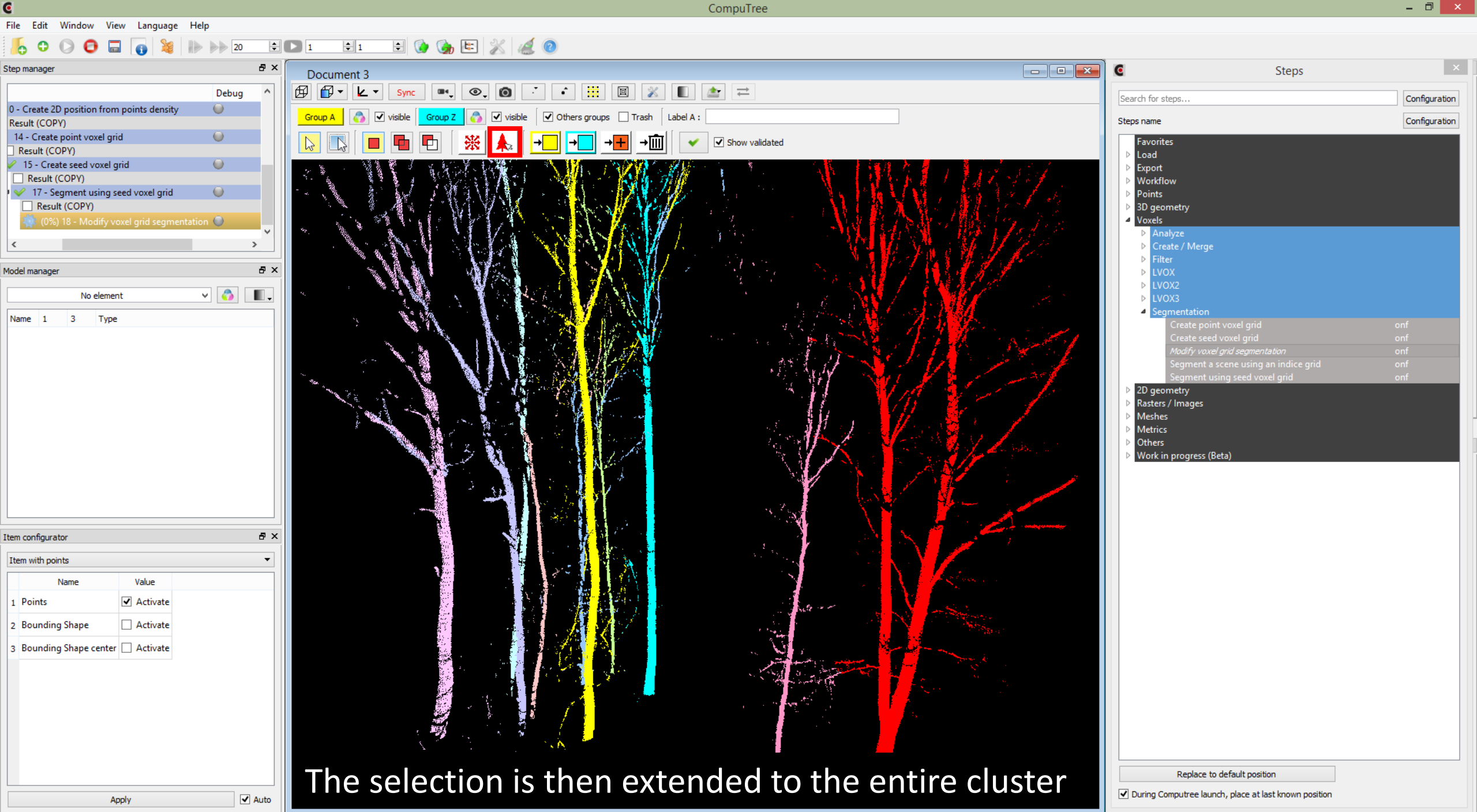
Configuration

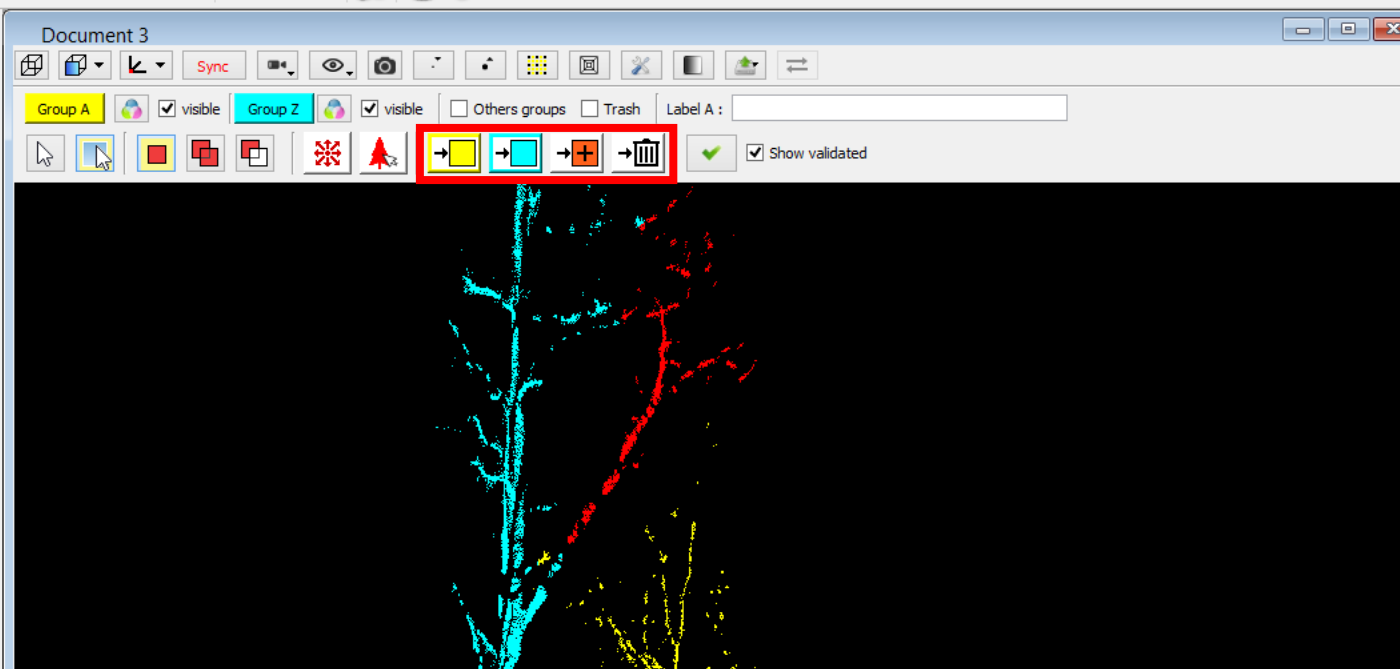
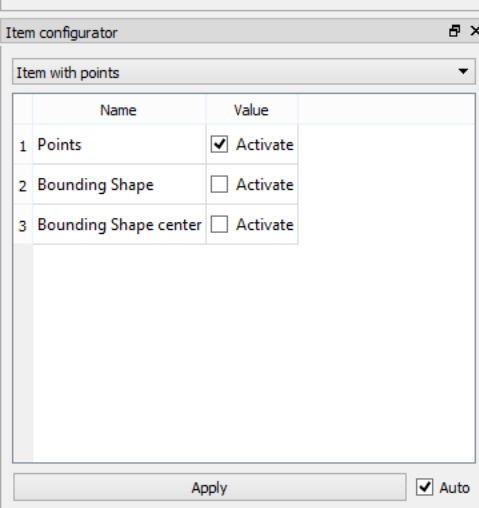
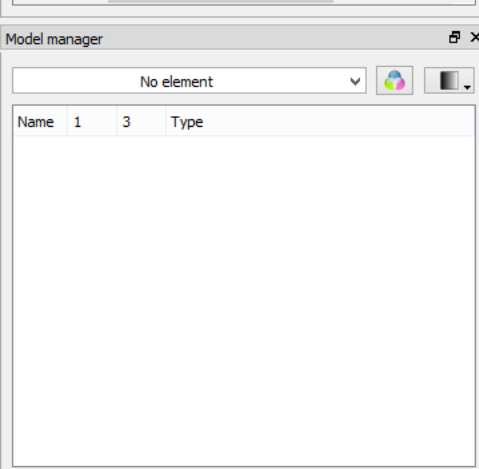
Steps name Configuration

Favorites		
▷ Load		
▷ Export		
▷ Workflow		
▷ Points		
▷ 3D geometry		
▾ Voxels		
▷ Analyze		
▷ Create / Merge		
▷ Filter		
▷ LVOX		
▷ LVOX2		
▷ LVOX3		
▾ Segmentation		
Create point voxel grid		onf
Create seed voxel grid		onf
<i>Modify voxel grid segmentation</i>		onf
Segment a scene using an indice grid		onf
Segment using seed voxel grid		onf
▷ 2D geometry		
▷ Rasters / Images		
▷ Meshes		
▷ Metrics		
▷ Others		
▷ Work in progress (Beta)		

Replace to default position

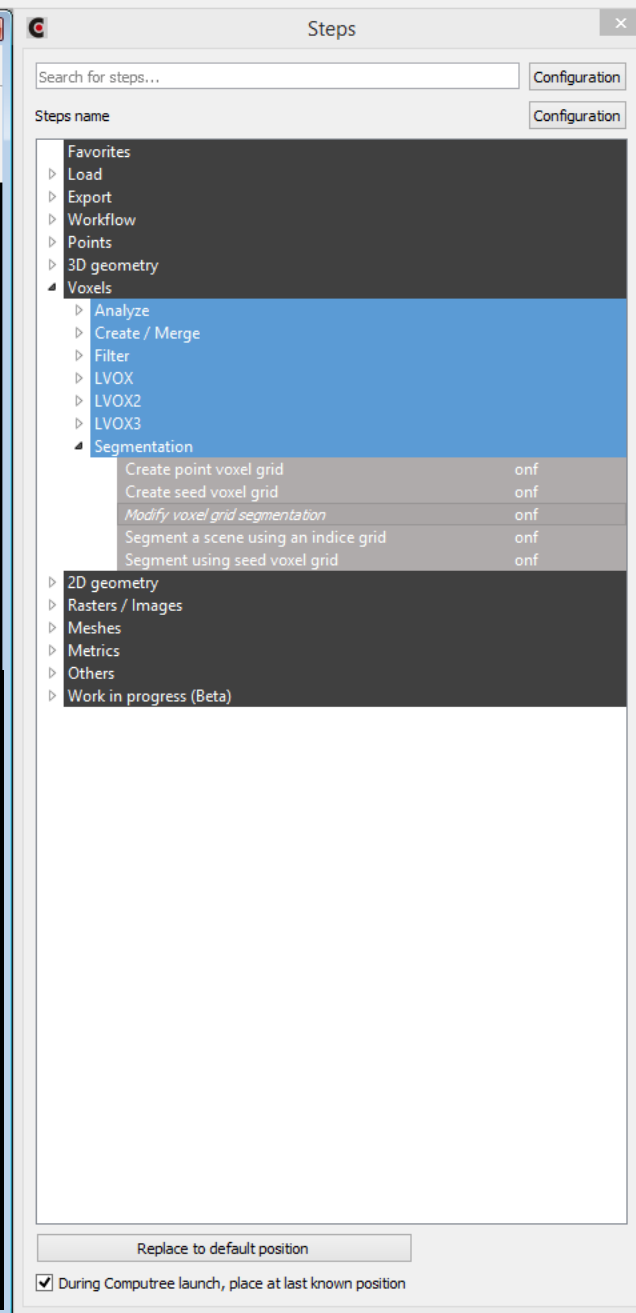
☒ During Computree launch, place at last known position

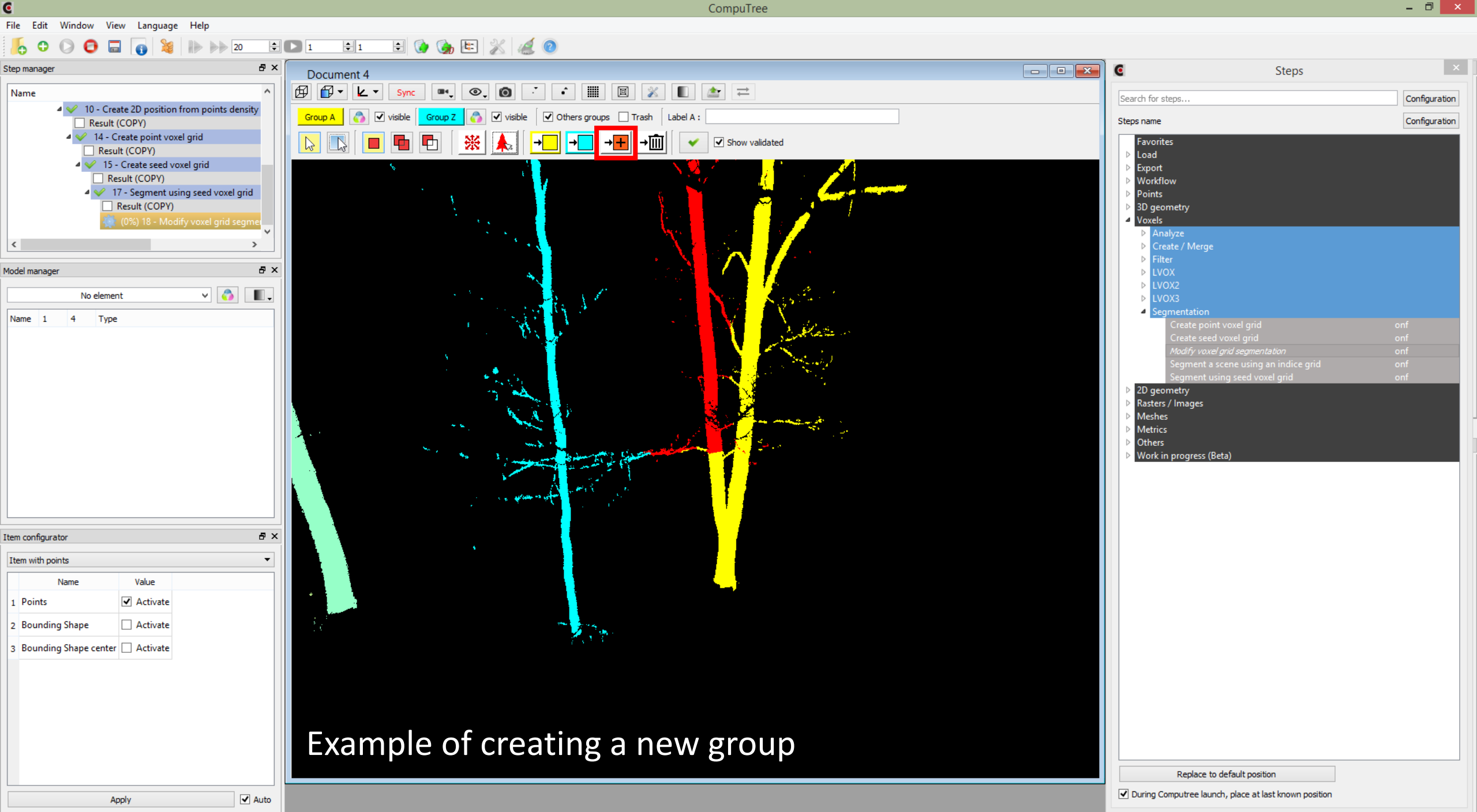


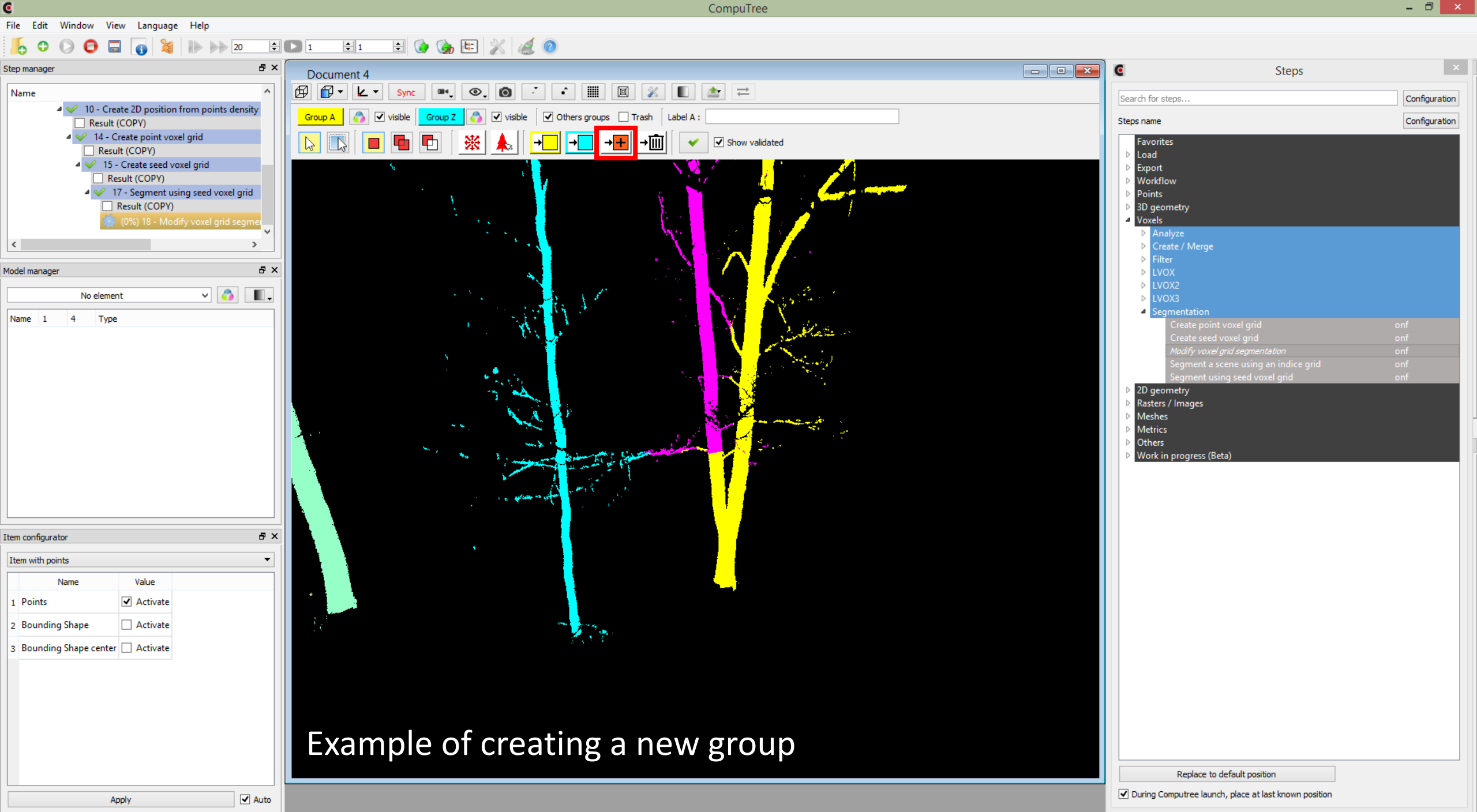


Once a selection has been made (manually, by colonization or by selection of an entire cluster), this series of buttons makes it possible to move the selected points:

- In Group A
- In Group B
- In a new group (created at this time)
- In the trash



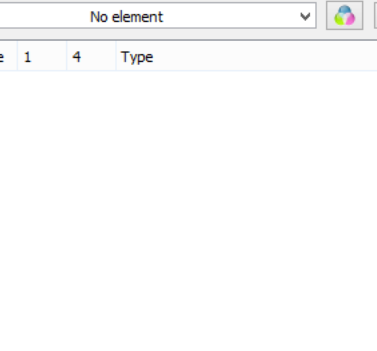




Step manager

Name

- ✓ 10 - Create 2D position from points density
 - ☐ Result (COPY)
- ✓ 14 - Create point voxel grid
 - ☐ Result (COPY)
- ✓ 15 - Create seed voxel grid
 - ☐ Result (COPY)
- ✓ 17 - Segment using seed voxel grid
 - ☐ Result (COPY)
- ⚙ (0%) 18 - Modify voxel grid segment



The screenshot shows the 'Model manager' window. At the top, there is a search bar containing the text 'No element' and a dropdown arrow. To the right of the search bar are two icons: a color wheel and a document icon with a dropdown arrow. Below the search bar is a table with four columns: 'Name', '1', '4', and 'Type'. The table is currently empty.

Name	1	4	Type
------	---	---	------

Item configurator

Item with points

	Name	Value
1	Points	<input checked="" type="checkbox"/> Activate
2	Bounding Shape	<input type="checkbox"/> Activate
3	Bounding Shape center	<input type="checkbox"/> Activate

Apply ☒ Auto

Document 4

Group A ☒ visible Group Z ☒ visible ☒ Others groups ☒ Trash Label A :

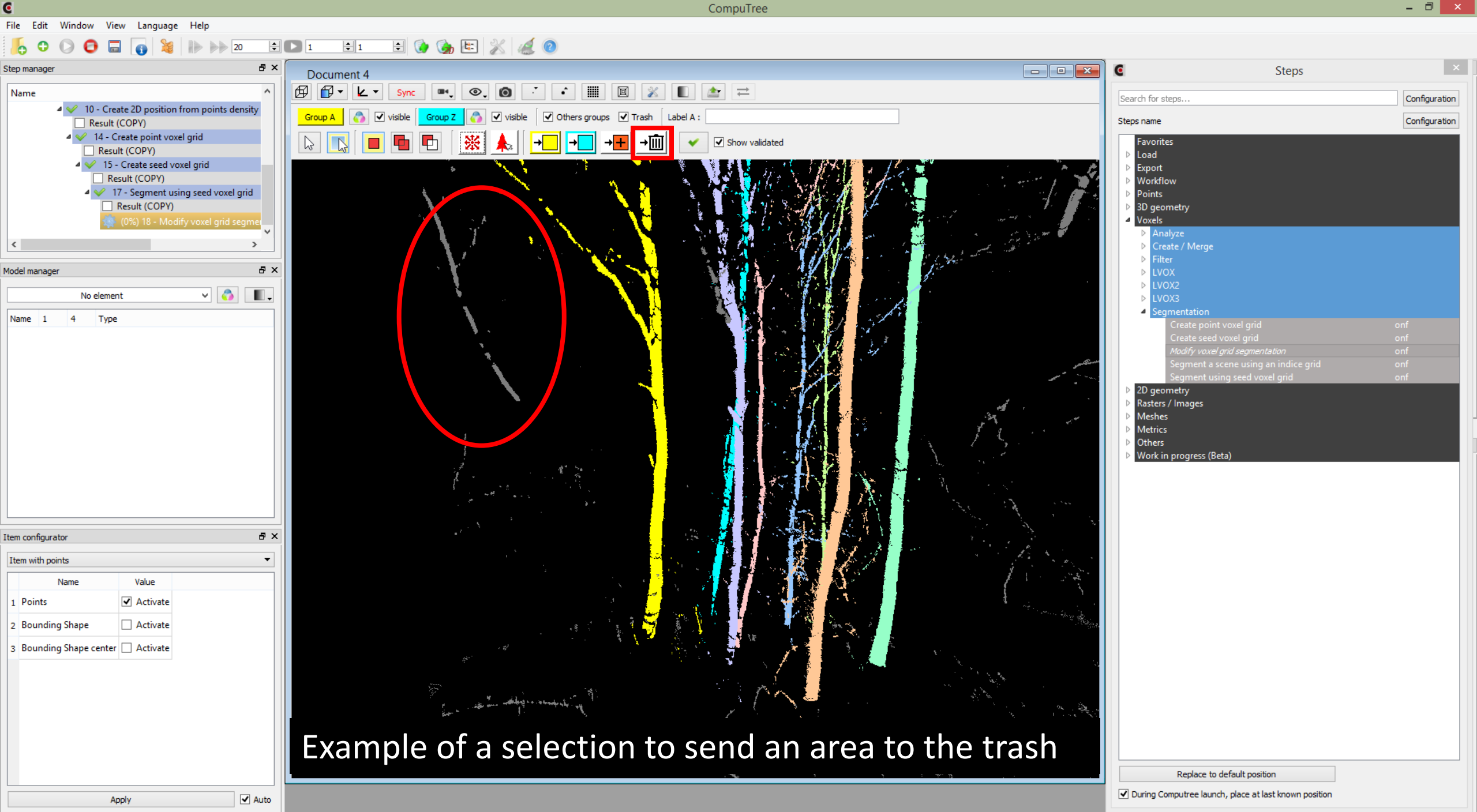
☒ Show validated

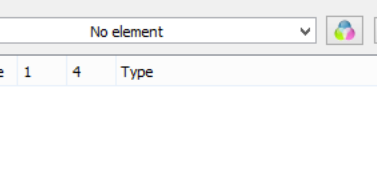
Example of a selection to send an area to the trash

The screenshot displays the 'Steps' panel of the CompuTree application. It features a hierarchical tree structure for organizing workflow steps. The 'Voxels' category is currently selected and expanded, revealing several sub-steps. Within the 'Segmentation' sub-category, five specific actions are listed, each followed by a status indicator 'onf'. Below the main tree, there are two controls: a button to 'Replace to default position' and a checked checkbox for 'During Computree launch, place at last known position'.

Category	Sub-Category	Step Name	Status
Favorites		Load	
		Export	
		Workflow	
		Points	
		3D geometry	
Voxels	Analyze		
	Create / Merge		
	Filter		
	LVOX		
	LVOX2		
	LVOX3		
	Segmentation		
		Create point voxel grid	onf
		Create seed voxel grid	onf
		<i>Modify voxel grid segmentation</i>	onf
		Segment a scene using an indice grid	onf
		Segment using seed voxel grid	onf
2D geometry			
Rasters / Images			
Meshes			
Metrics			
Others			
Work in progress (Beta)			

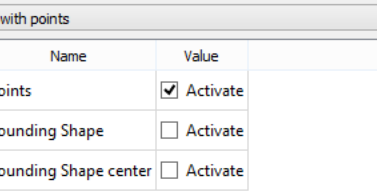
Example of a selection to send an area to the trash





The screenshot shows the 'Model manager' window. At the top, there is a search bar with the text 'No element' and a dropdown arrow. To the right of the search bar are two icons: a circular icon with three colored dots (blue, green, red) and a square icon with a black and white gradient. Below the search bar is a table with the following structure:

Name	1	4	Type



Item configurator

Item with points ▼

	Name	Value
1	Points	<input checked="" type="checkbox"/> Activate
2	Bounding Shape	<input type="checkbox"/> Activate
3	Bounding Shape center	<input type="checkbox"/> Activate

Apply ☒ Auto

This button is used to validate a cluster. Validated clusters are displayed in green.

Steps

Search for steps...

Configuration

Steps name

Configuration

▶ Favorites

▶ Load

▶ Export

▶ Workflow

▶ Points

▶ 3D geometry

▶ Voxels

▶ Analyze

▶ Create / Merge

▶ Filter

▶ LVOX

▶ LVOX2

▶ LVOX3

▶ Segmentation

▶ 2D geometry

▶ Rasters / Images

▶ Meshes

▶ Metrics

▶ Others

▶ Work in progress (Beta)

Create point voxel grid

Create seed voxel grid

Modify voxel grid segmentation

Segment a scene using an indice grid

Segment using seed voxel grid

onf

onf

onf

onf

onf

Replace to default position

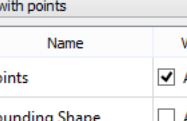
☒ During Computree launch, place at last known position

Step manager

Name

- ✓ 10 - Create 2D position from points density
 - ☐ Result (COPY)
- ✓ 14 - Create point voxel grid
 - ☐ Result (COPY)
- ✓ 15 - Create seed voxel grid
 - ☐ Result (COPY)
- ✓ 17 - Segment using seed voxel grid
 - ☐ Result (COPY)
- ⚙ (0%) 18 - Modify voxel grid segment

The screenshot shows a window titled "Model manager" with a standard Windows interface. At the top, there is a search bar containing the text "No element" and a dropdown arrow. To the right of the search bar are two icons: a color wheel and a document icon with a dropdown arrow. Below the search bar is a table with four columns: "Name", "1", "4", and "Type". The table is currently empty, with no data rows visible.



Item configurator

Item with points

	Name	Value
1	Points	<input checked="" type="checkbox"/> Activate
2	Bounding Shape	<input type="checkbox"/> Activate
3	Bounding Shape center	<input type="checkbox"/> Activate

Apply ☒ Auto

This box allows to show / hide validated clusters. NB: If in the step parameter, "keep only validated trees" option has been selected, only clusters in green will be retained. The others will be lost.

The screenshot displays the 'Steps' window in the CompuTree application. It features a search bar at the top and a tree view of available steps. The 'Voxels' category is selected and expanded, revealing several sub-steps. The 'Segmentation' sub-step is also expanded, showing five specific actions, each with an 'onf' status. Below the tree view, there are two controls: a button to 'Replace to default position' and a checked checkbox for 'During Computree launch, place at last known position'.

Category	Sub-category	Step Name	Status
Favorites		Load	
Favorites		Export	
Favorites		Workflow	
Favorites		Points	
Favorites		3D geometry	
Voxels	Analyze		
Voxels	Create / Merge		
Voxels	Filter		
Voxels	LVOX		
Voxels	LVOX2		
Voxels	LVOX3		
Voxels	Segmentation		
Voxels	Segmentation	Create point voxel grid	onf
Voxels	Segmentation	Create seed voxel grid	onf
Voxels	Segmentation	<i>Modify voxel grid segmentation</i>	onf
Voxels	Segmentation	Segment a scene using an indice grid	onf
Voxels	Segmentation	Segment using seed voxel grid	onf
2D geometry			
Rasters / Images			
Meshes			
Metrics			
Others			
Work in progress (Beta)			

This box allows to show / hide validated clusters.
NB: If in the step parameter, "keep only validated trees" option has been selected, only clusters in green will be retained. The others will be lost.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	-----

Name	Value
------	-------

[illegible]☒ Auto☒ During Computree launch, place at last known position☒ During Computree launch, place at last known position

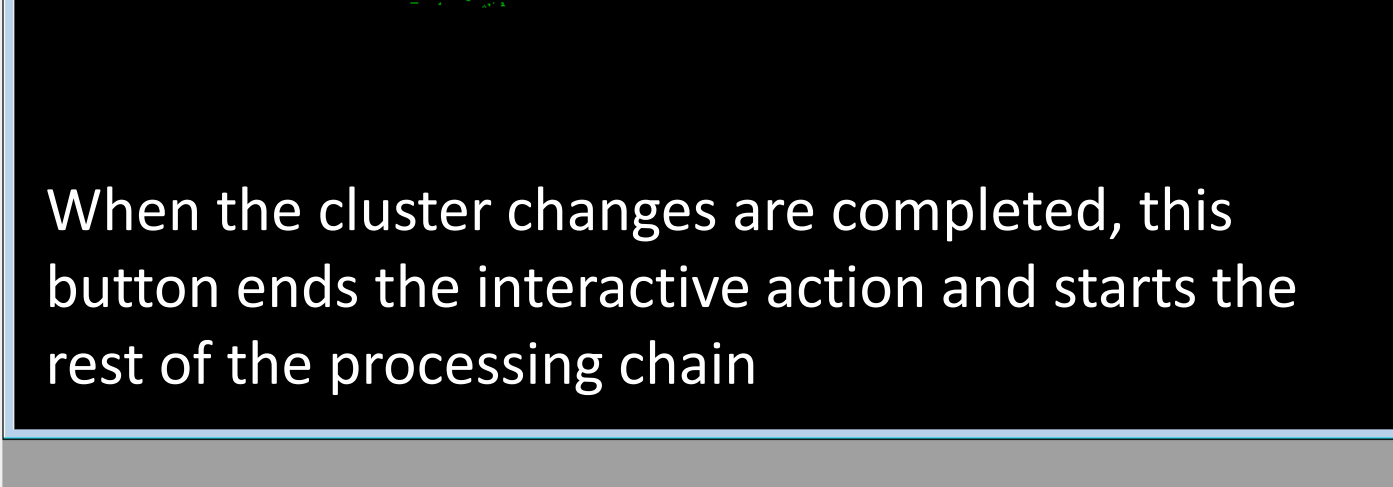
The screenshot displays the ParaView software interface with three panels visible:

- Step manager:** This panel shows a list of processing steps. The steps listed are:
 - 10 - Create 2D position from points density (checked)
 - Result (COPY) (unchecked)
 - 14 - Create point voxel grid (checked)
 - Result (COPY) (unchecked)
 - 15 - Create seed voxel grid (checked)
 - Result (COPY) (unchecked)
 - 17 - Segment using seed voxel grid (checked)
 - Result (COPY) (unchecked)
 - (0%) 18 - Modify voxel grid segment (disabled, indicated by a gear icon)
- Model manager:** This panel shows a dropdown menu set to "No element". Below the dropdown is a table with the following structure:

Name	1	4	Type
- Item configurator:** This panel shows a dropdown menu set to "Item with points". Below the dropdown is a table with the following structure:

	Name	Value
1	Points	<input checked="" type="checkbox"/> Activate
2	Bounding Shape	<input type="checkbox"/> Activate
3	Bounding Shape center	<input type="checkbox"/> Activate

 At the bottom of this panel are buttons for "Apply" and "Auto".



When the cluster changes are completed, this button ends the interactive action and starts the rest of the processing chain

Steps

Search for steps...

Configuration

Steps name

Configuration

Favorites

▶ Load

▶ Export

▶ Workflow

▶ Points

▶ 3D geometry

▾ Voxels

▶ Analyze

▶ Create / Merge

▶ Filter

▶ LVOX

▶ LVOX2

▶ LVOX3

▾ Segmentation

▶ Create point voxel grid

▶ Create seed voxel grid

▶ Modify voxel grid segmentation

▶ Segment a scene using an indice grid

▶ Segment using seed voxel grid

▶ 2D geometry

▶ Rasters / Images

▶ Meshes

▶ Metrics

▶ Others

▶ Work in progress (Beta)

onf

onf

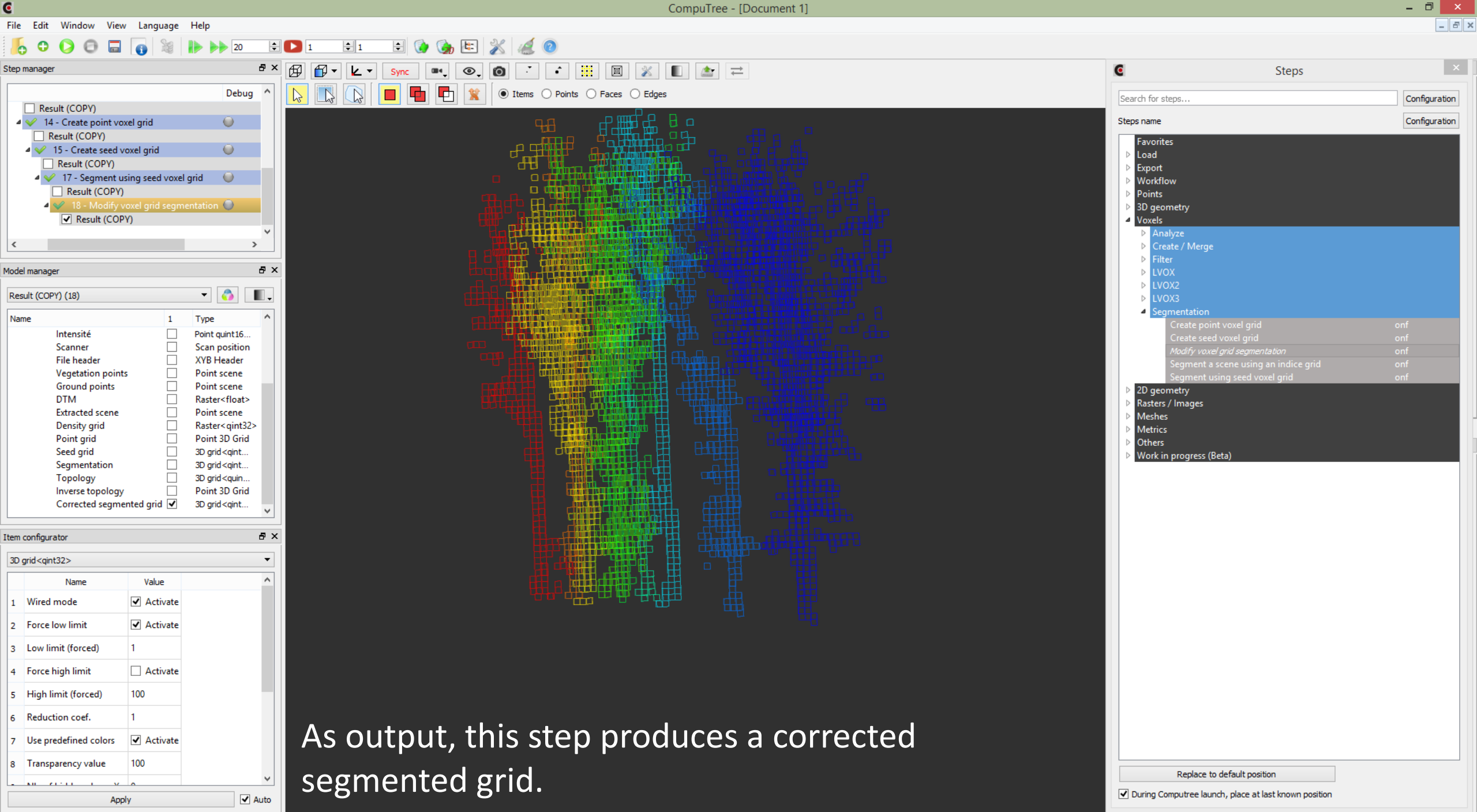
onf

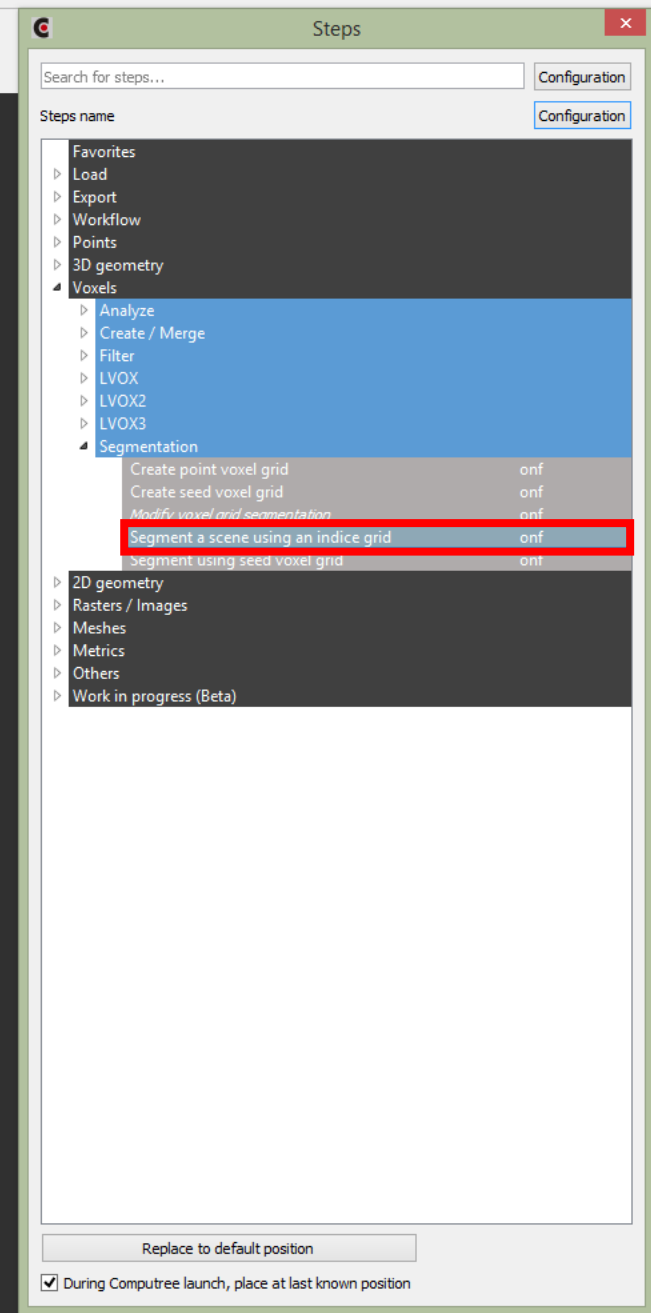
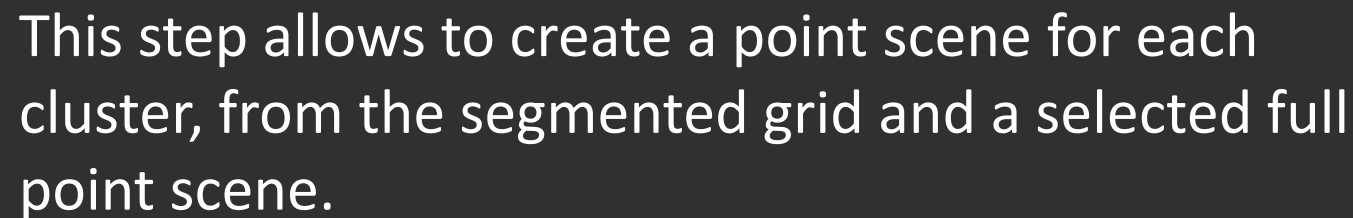
onf

onf

Replace to default position

☒ During Computree launch, place at last known position





CompuTree - [Document 1]

File Edit Window View Language Help

Step manager

Debug

- ☐ Result (COPY)
- ☒ 14 - Create point voxel grid
- ☐ Result (COPY)
- ☒ 15 - Create seed voxel grid
- ☐ Result (COPY)
- ☒ 17 - Segment using seed voxel grid
- ☐ Result (COPY)
- ☒ 18 - Modify voxel grid segmentation
- ☒ Result (COPY)

Model manager

Result (COPY) (18)

Name	1	Type
Intensité	<input type="checkbox"/>	Point quint16...
Scanner	<input type="checkbox"/>	Scan position
File header	<input type="checkbox"/>	XYB Header
Vegetation points	<input type="checkbox"/>	Point scene
Ground points	<input type="checkbox"/>	Point scene
DTM	<input type="checkbox"/>	Raster<float>
Extracted scene	<input type="checkbox"/>	Point scene
Density grid	<input type="checkbox"/>	Raster<qint32>
Point grid	<input type="checkbox"/>	Point 3D Grid
Seed grid	<input type="checkbox"/>	3D grid<qint...
Segmentation	<input type="checkbox"/>	3D grid<qint...
Topology	<input type="checkbox"/>	3D grid<qint...
Inverse topology	<input type="checkbox"/>	Point 3D Grid
Corrected segmented grid	<input type="checkbox"/>	3D grid<qint...

Item configurator

No element in 3D view

Apply ☒ Auto

Configuration of input results (ONF_StepExtractPointsFromGrid (19))

Results names Step Help

- ☒ Grids
 - ☒ Result ONF_StepModifyVoxelSegmentation (18)

Input data selection

Available data	Sel.	Searched data
Group	<input checked="" type="checkbox"/>	Groupe [Group]
Scène [Point scene]	<input type="checkbox"/>	Scene to be segmented [ite...
Vegetation points [Point scene]	<input checked="" type="checkbox"/>	Scene to be segmented [ite...
Ground points [Point scene]	<input type="checkbox"/>	Scene to be segmented [ite...
Extracted scene [Point scene]	<input type="checkbox"/>	Scene to be segmented [ite...
Seed grid [3D grid<qint32>, sparse]	<input type="checkbox"/>	Indice grid [3D grid<qint32>...
Segmentation [3D grid<qint32>, sparse]	<input type="checkbox"/>	Indice grid [3D grid<qint32>...
Corrected segmented grid [3D grid<qint32>, sparse]	<input checked="" type="checkbox"/>	Indice grid [3D grid<qint32>...

OK Cancel

Steps

Search for steps...

Configuration

Steps name

Configuration

Favorites

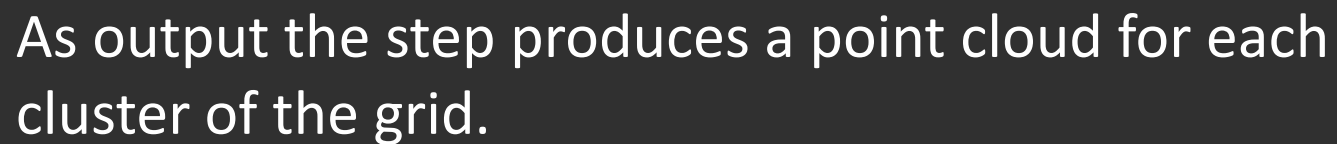
- Load
- Export
- Workflow
- Points
- 3D geometry
- Voxels
 - Analyze
 - Create / Merge
 - Filter
 - LVOX
 - LVOX2
 - LVOX3
 - Segmentation
 - Create point voxel grid onf
 - Create seed voxel grid onf
 - Modify voxel grid segmentation onf
 - Segment a scene using an indice grid onf**
 - Segment using seed voxel grid onf
- 2D geometry
- Rasters / Images
- Meshes
- Metrics
- Others
- Work in progress (Beta)

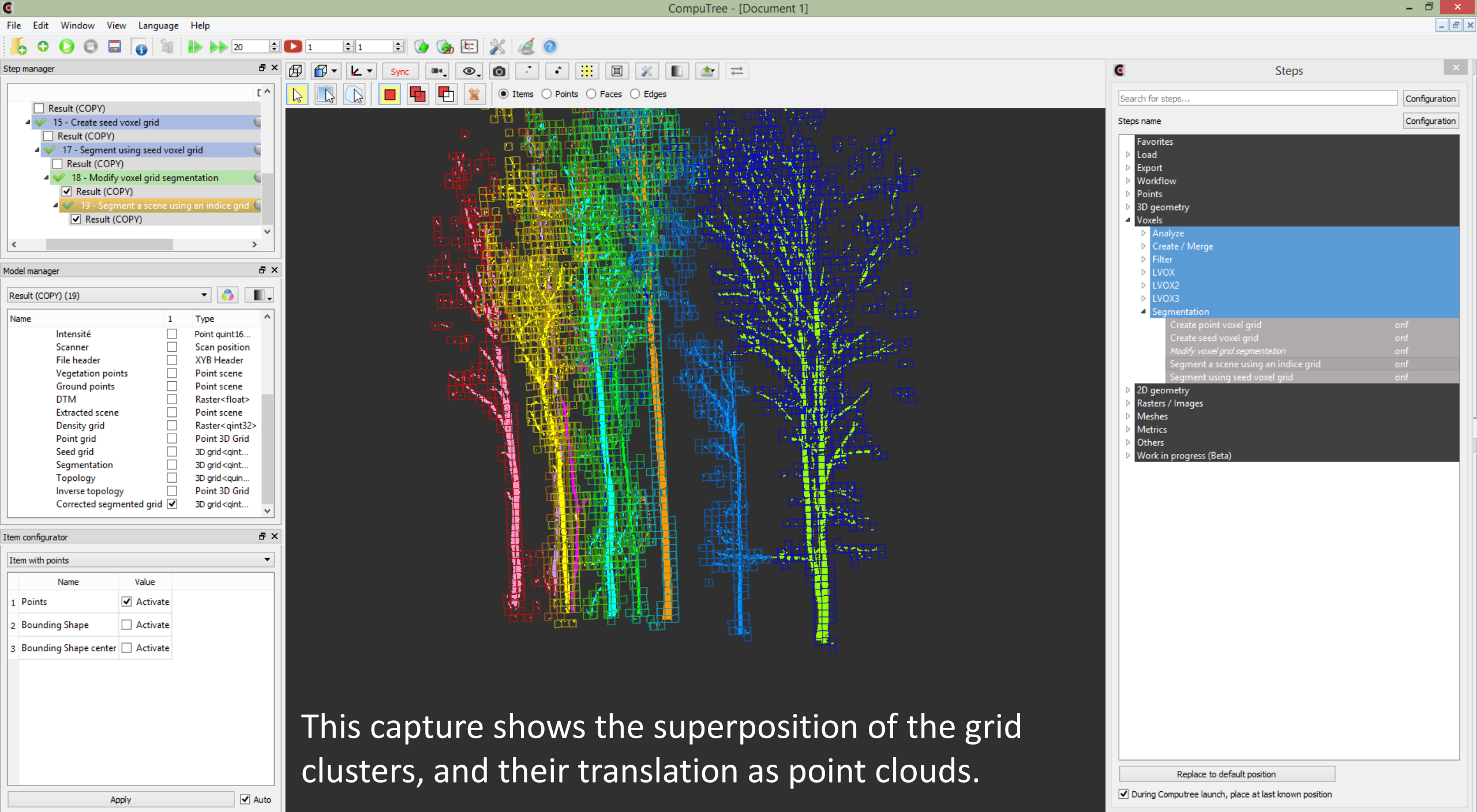
Replace to default position

☒ During Computree launch, place at last known position

Input data should then be selected as follows:

- The vegetation scene
- The **corrected** segmented grid





- ➔ Menu 3D Geometry / Detects (Crowns)
- ➔ Step ID: ONF_StepComputeCrownProjection

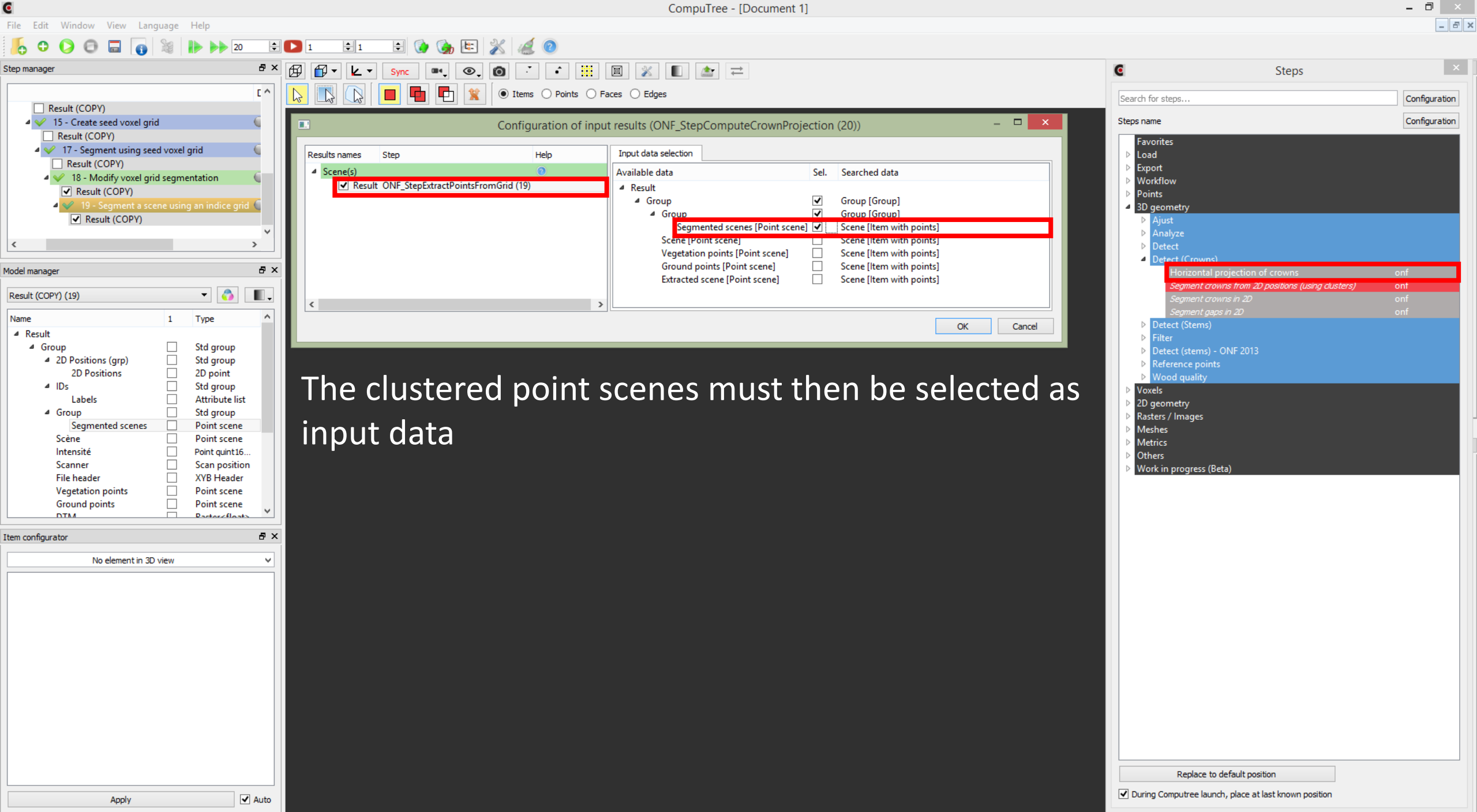
➔ Menu 3D Geometry / Detects (Crowns)

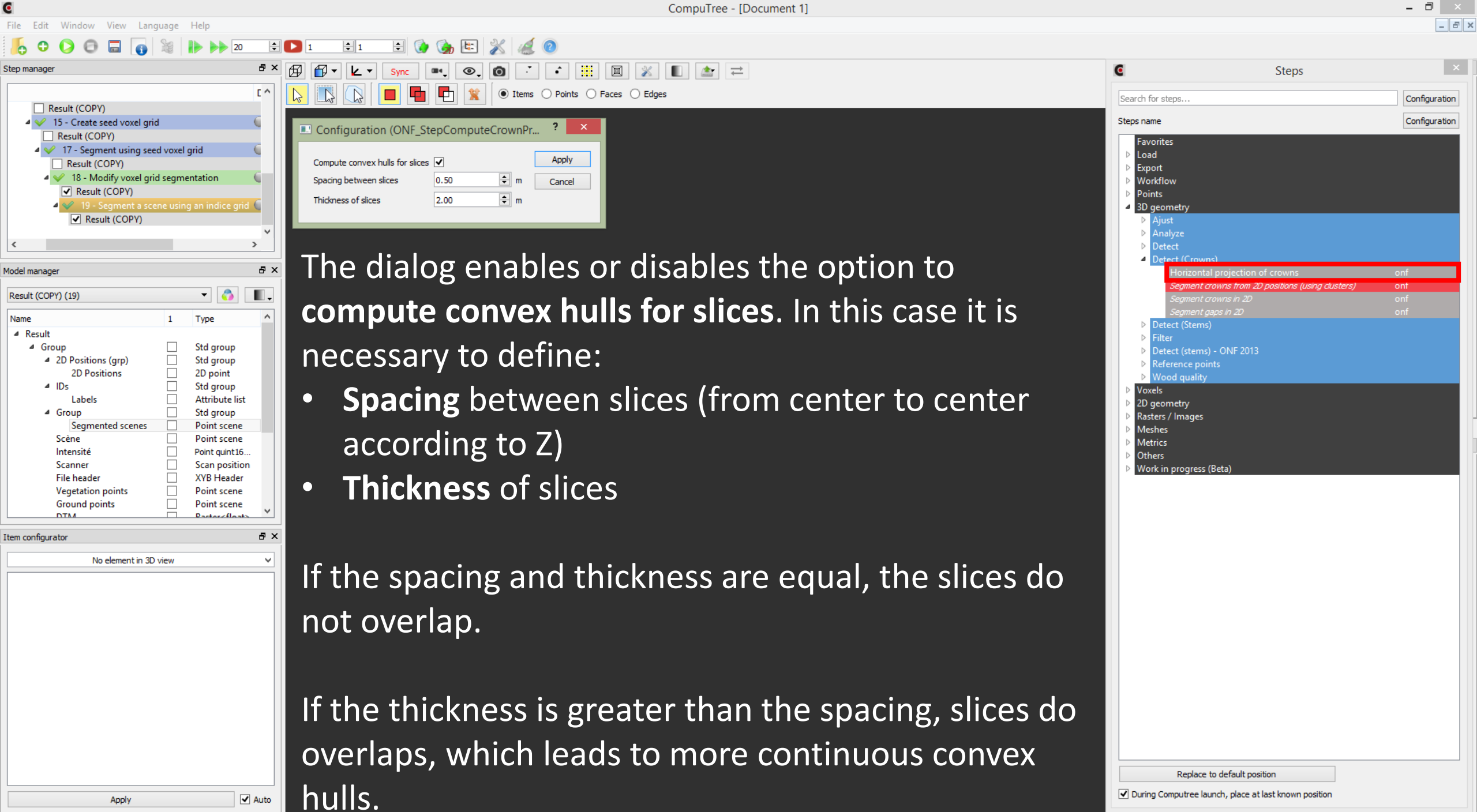
➔ Step ID: ONF_StepComputeCrownProjection

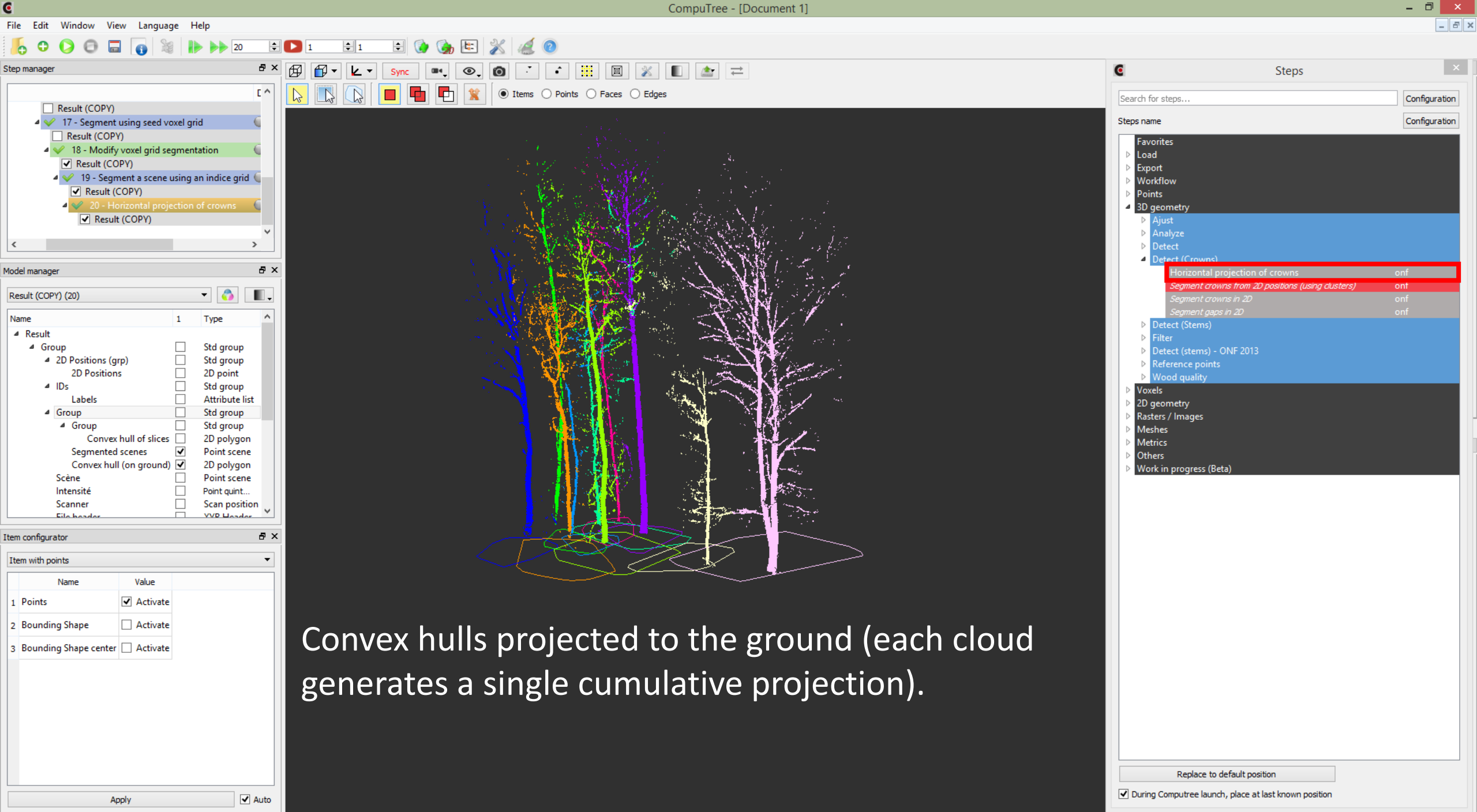
- The convex hull projected on the ground for each point cloud
- The convex hull of successive horizontal slices for each point cloud

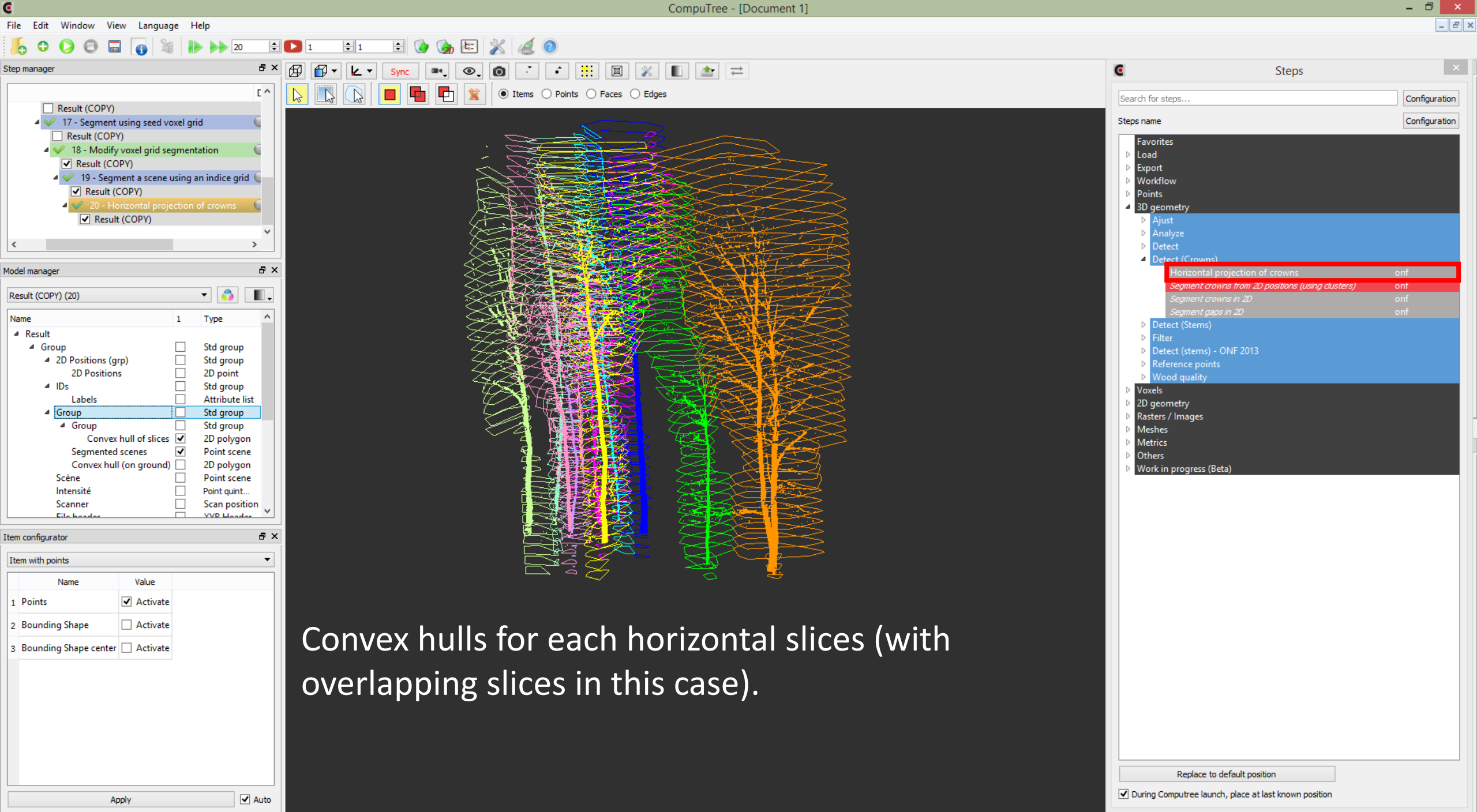
- The convex hull projected on the ground for each point cloud
- The convex hull of successive horizontal slices for each point cloud

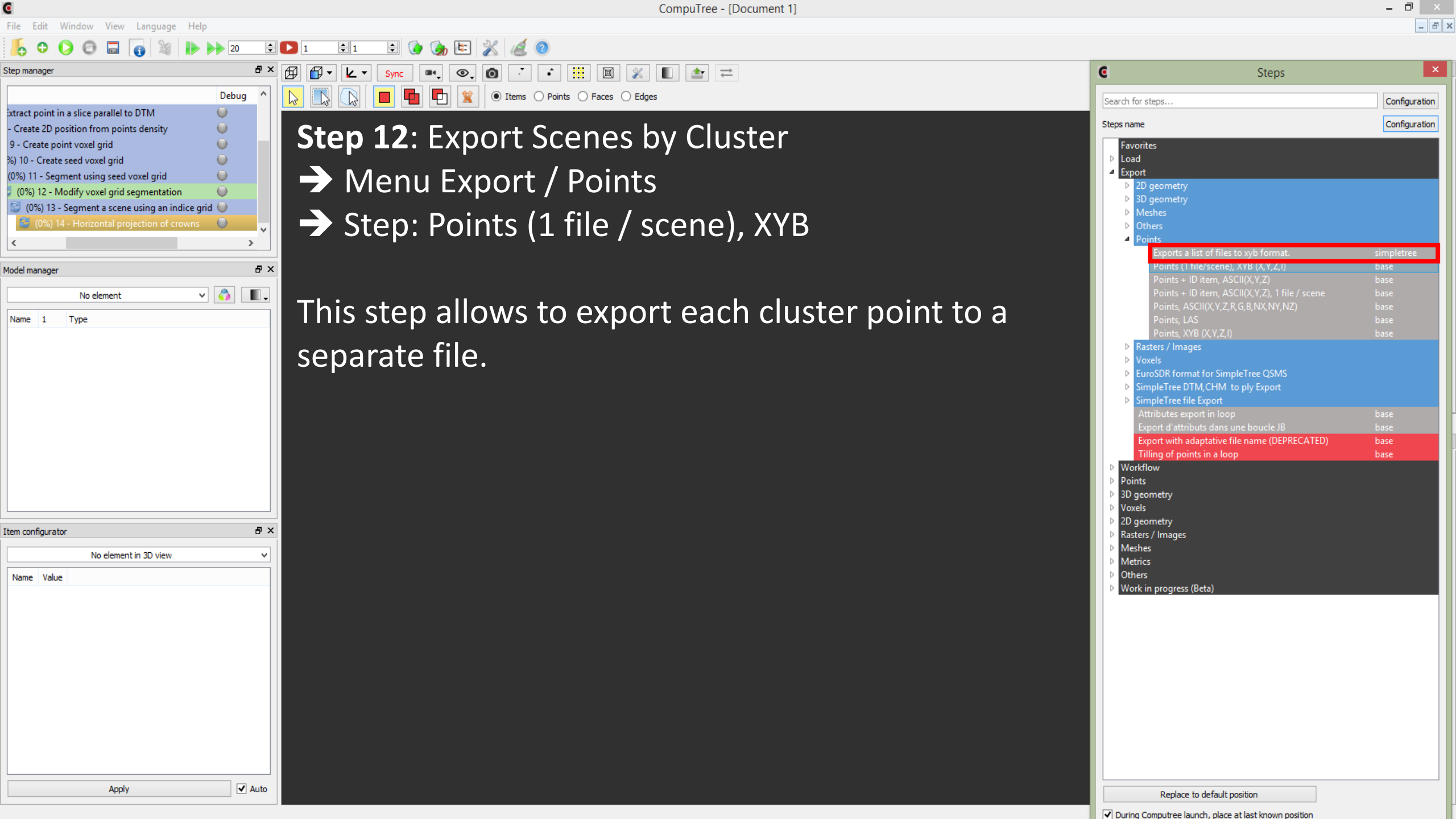
The screenshot displays the 'Steps' panel of the CompuTree application. At the top, there is a search bar labeled 'Search for steps...' and two 'Configuration' buttons. Below this, a tree view lists various processing steps. Under the '3D geometry' category, the 'Detect (Crowns)' sub-category is expanded, showing several options. The option 'Horizontal projection of crowns' is selected and highlighted with a red rectangular box; next to it, the status 'onf' is displayed. Other visible options include 'Segment crowns from 2D positions (using clusters)' (status: ont), 'Segment crowns in 2D' (status: onf), and 'Segment gaps in 2D' (status: onf). Further down the list, other categories like 'Detect (Stems)', 'Filter', 'Voxels', and '2D geometry' are also visible.











Step 12: Export Scenes by Cluster

→ Menu Export / Points

→ Step: Points (1 file / scene), XYB

This step allows to export each cluster point to a separate file.



Step manager

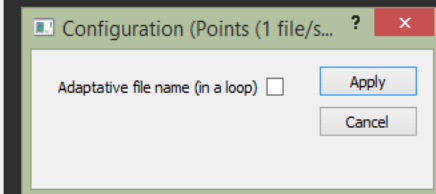
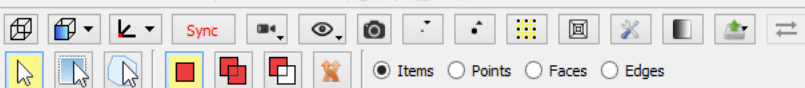
- Debug
- Extract point in a slice parallel to DTM
 - Create 2D position from points density
 - 9 - Create point voxel grid
 - (0%) 10 - Create seed voxel grid
 - (0%) 11 - Segment using seed voxel grid
 - (0%) 12 - Modify voxel grid segmentation
 - (0%) 13 - Segment a scene using an indice grid
 - (0%) 14 - Horizontal projection of crowns

Model manager

No element		
Name	1	Type

Item configurator

No element in 3D view		
Name	Value	
Apply		<input checked="" type="checkbox"/> Auto



Do not check this box, useful only when using script loops

Steps

Search for steps...

Configuration

Steps name

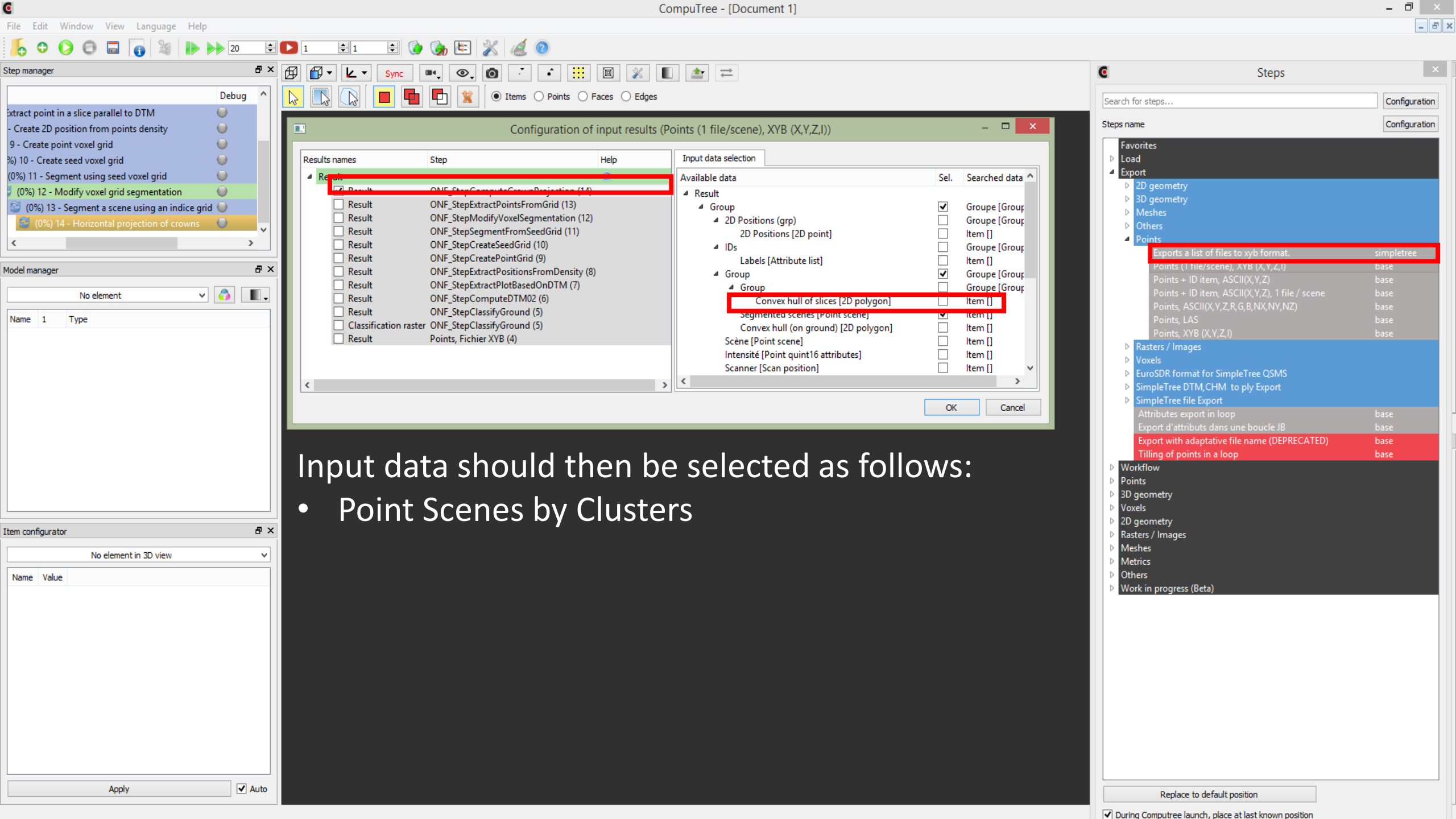
Configuration

Favorites

- Load
- Export
 - 2D geometry
 - 3D geometry
 - Meshes
 - Others
 - Points
 - Exports a list of files to xyb format. simpletree
 - Points (1 tile/scene), XYB (X,Y,Z,I) base
 - Points + ID item, ASCII(X,Y,Z) base
 - Points + ID item, ASCII(X,Y,Z), 1 file / scene base
 - Points, ASCII(X,Y,Z,R,G,B,NX,NY,NZ) base
 - Points, LAS base
 - Points, XYB (X,Y,Z,I) base
 - Rasters / Images
 - Voxels
 - EuroSDR format for SimpleTree QSMS
 - SimpleTree DTM, CHM to ply Export
 - SimpleTree file Export
 - Attributes export in loop base
 - Export d'attributs dans une boucle JB base
 - Export with adaptative file name (DEPRECATED) base
 - Tilling of points in a loop base
 - Workflow
 - Points
 - 3D geometry
 - Voxels
 - 2D geometry
 - Rasters / Images
 - Meshes
 - Metrics
 - Others
 - Work in progress (Beta)

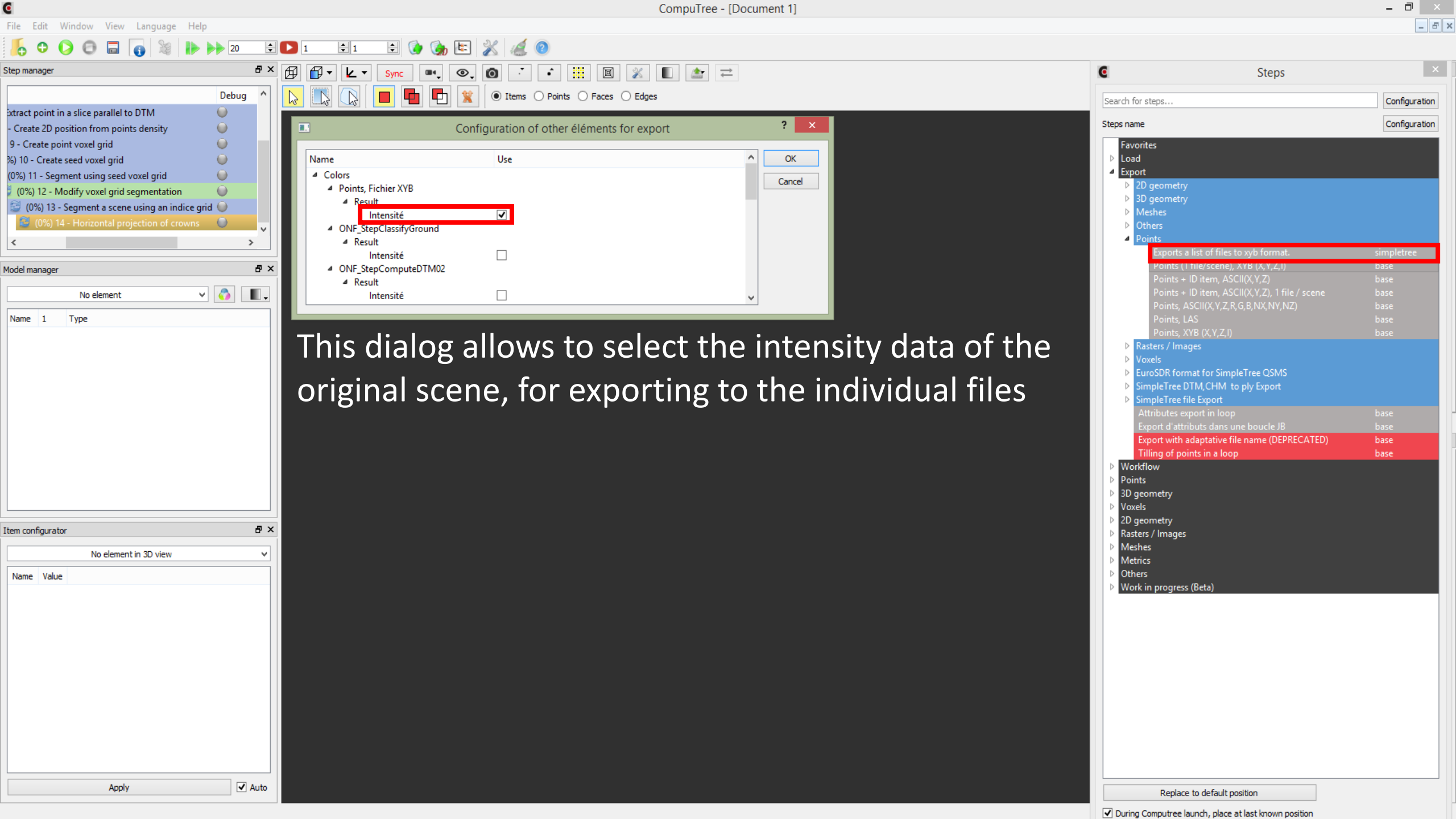
Replace to default position

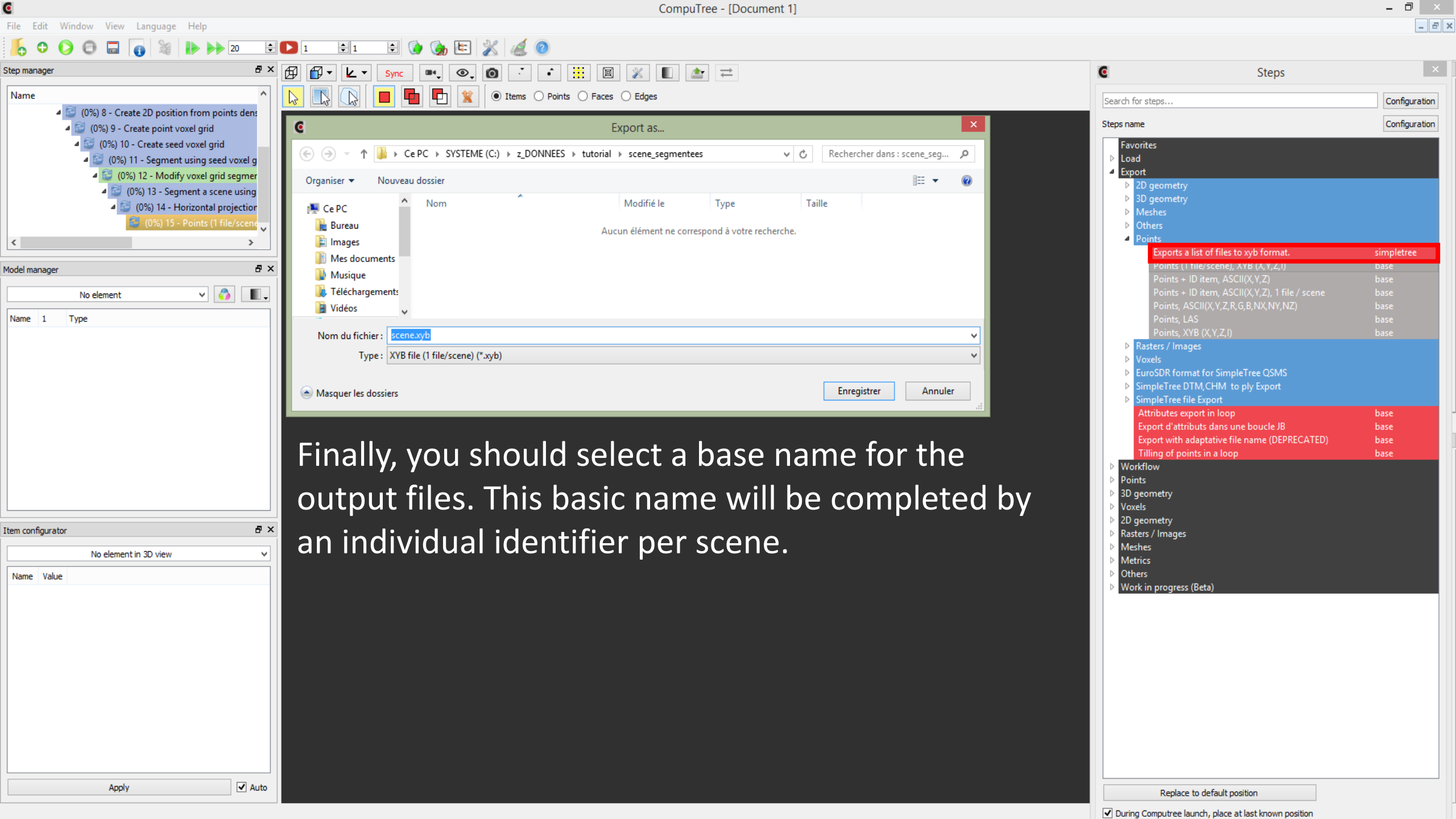
☒ During Computree launch, place at last known position



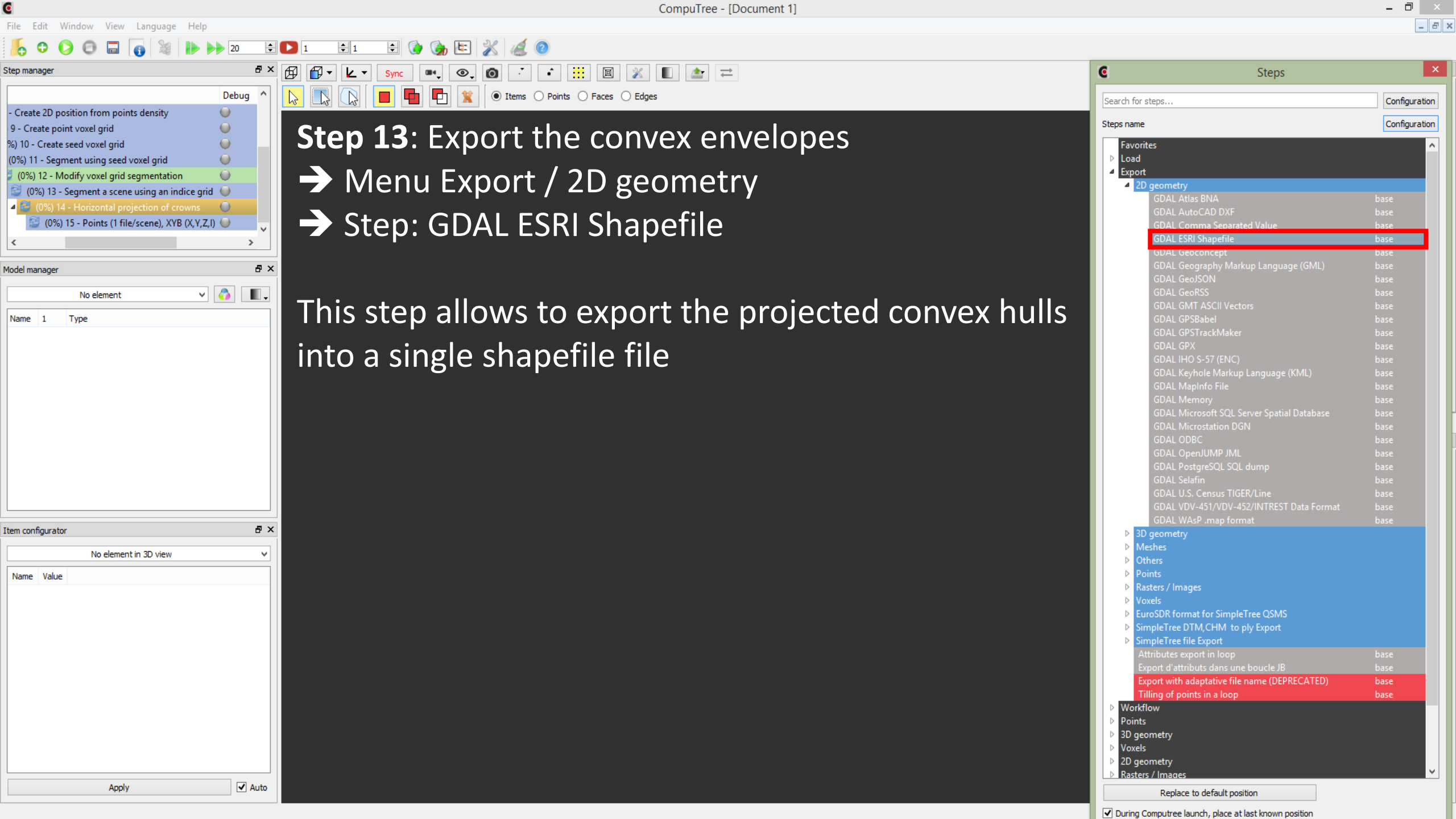
Input data should then be selected as follows:

- Point Scenes by Clusters





Finally, you should select a base name for the output files. This basic name will be completed by an individual identifier per scene.



Step 13: Export the convex envelopes

- ➔ Menu Export / 2D geometry
- ➔ Step: GDAL ESRI Shapefile

This step allows to export the projected convex hulls into a single shapefile file

Steps

Search for steps...

Configuration

Steps name

Configuration

Favorites

Load

Export

2D geometry

GDAL Atlas BNAbase

GDAL AutoCAD DXFbase

GDAL Comma Separated Valuebase

GDAL ESRI Shapefilebase

GDAL Geoconceptbase

GDAL Geography Markup Language (GML)base

GDAL GeoJSONbase

GDAL GeoRSSbase

GDAL GMT ASCII Vectorsbase

GDAL GPSTrackMakerbase

GDAL GPXbase

GDAL IHO S-57 (ENC)base

GDAL Keyhole Markup Language (KML)base

GDAL MapInfo Filebase

GDAL Memorybase

GDAL Microsoft SQL Server Spatial Databasebase

GDAL Microstation DGNbase

GDAL ODBCbase

GDAL OpenJUMP JMLbase

GDAL PostgreSQL SQL dumpbase

GDAL Selafinbase

GDAL U.S. Census TIGER/Linebase

GDAL VDV-451/VDV-452/INTREST Data Formatbase

GDAL WAsP .map formatbase

3D geometry

Meshes

Others

Points

Rasters / Images

Voxels

EuroSDR format for SimpleTree QSMS

SimpleTree DTM,CHM to ply Export

SimpleTree file Export

Attributes export in loopbase

Export d'attributs dans une boucle JBbase

Export with adaptative file name (DEPRECATED)base

Tilling of points in a loopbase

Workflow

Points

3D geometry

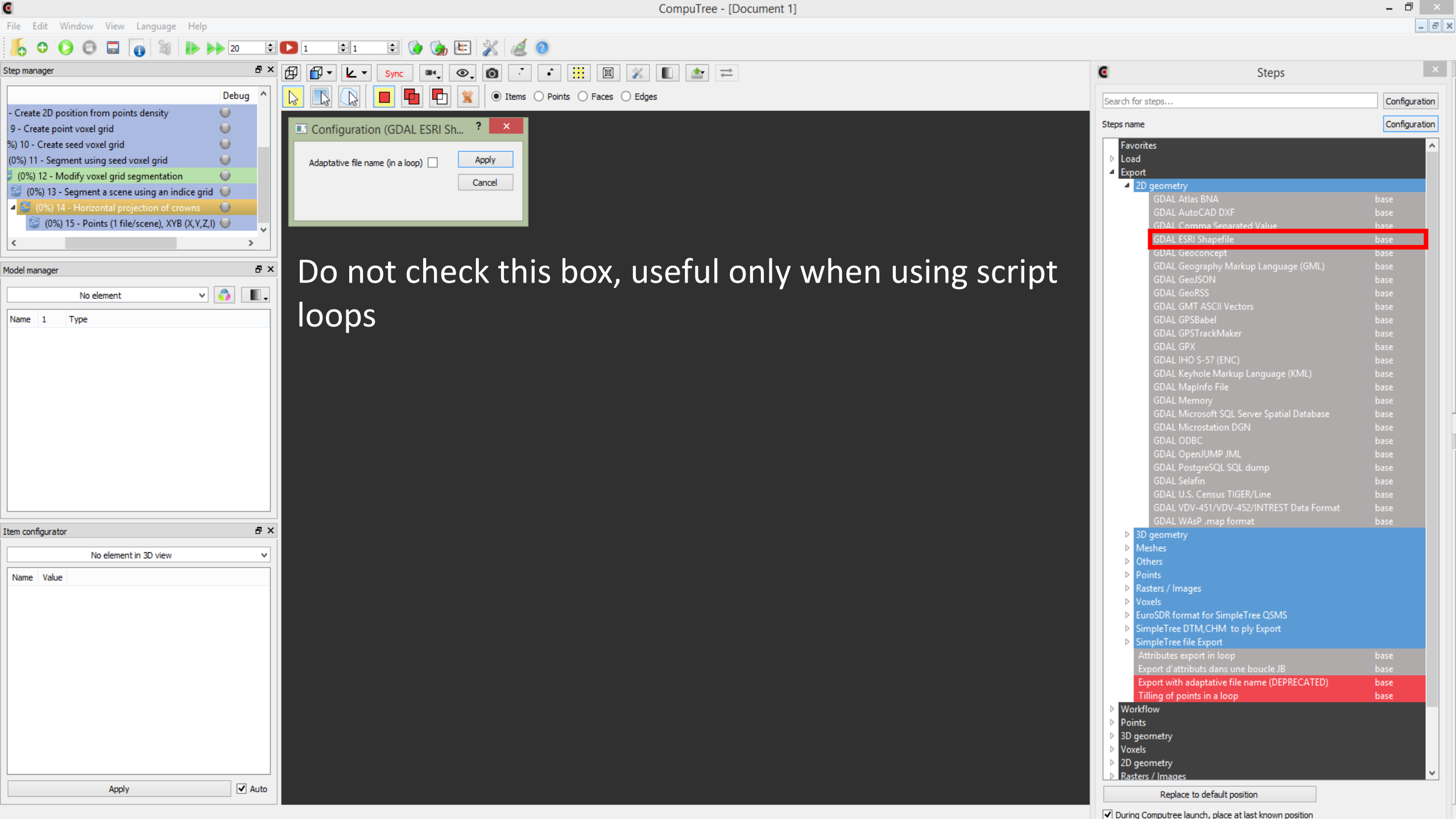
Voxels

2D geometry

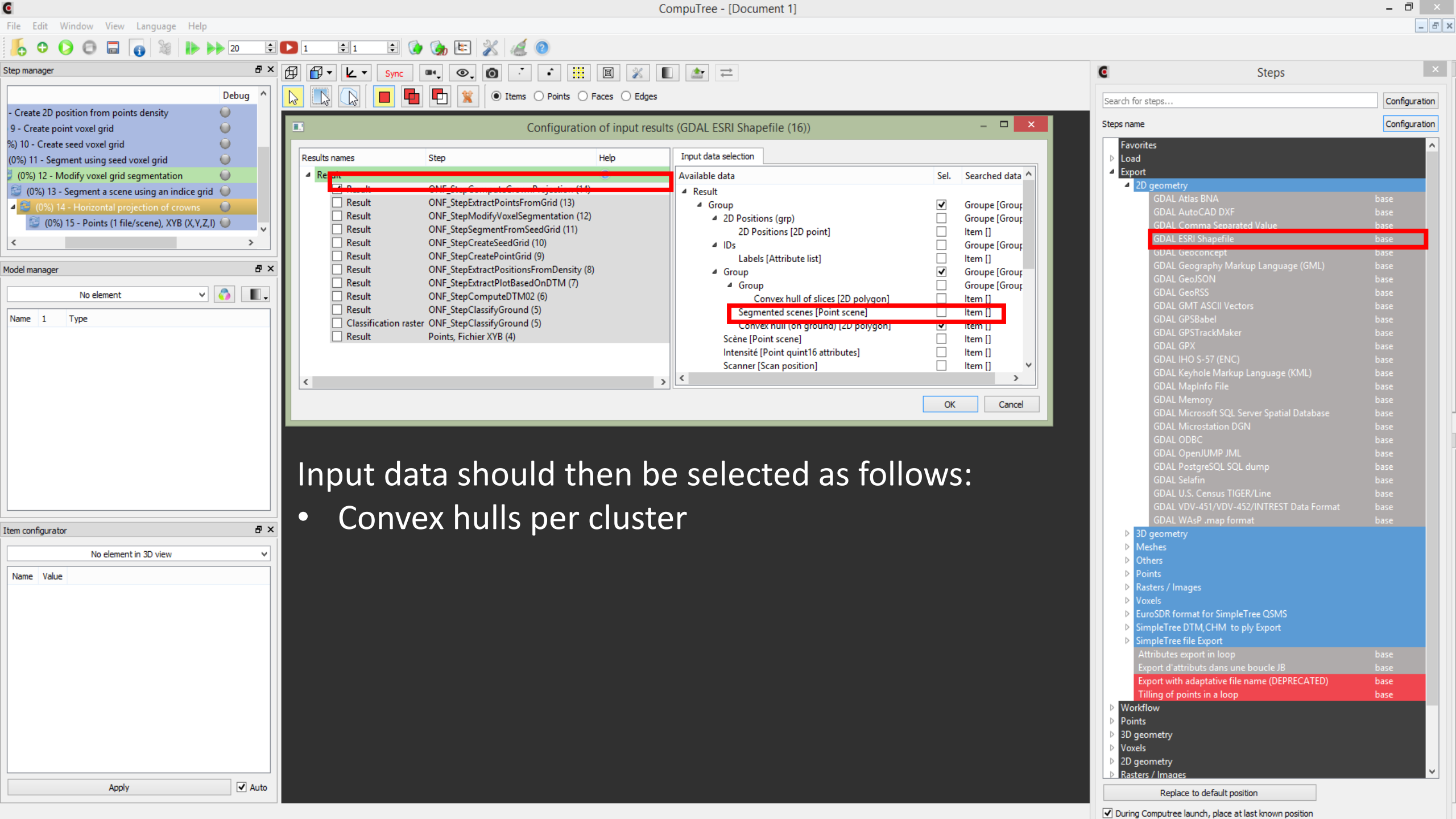
Rasters / Images

Replace to default position

☒ During Computree launch, place at last known position

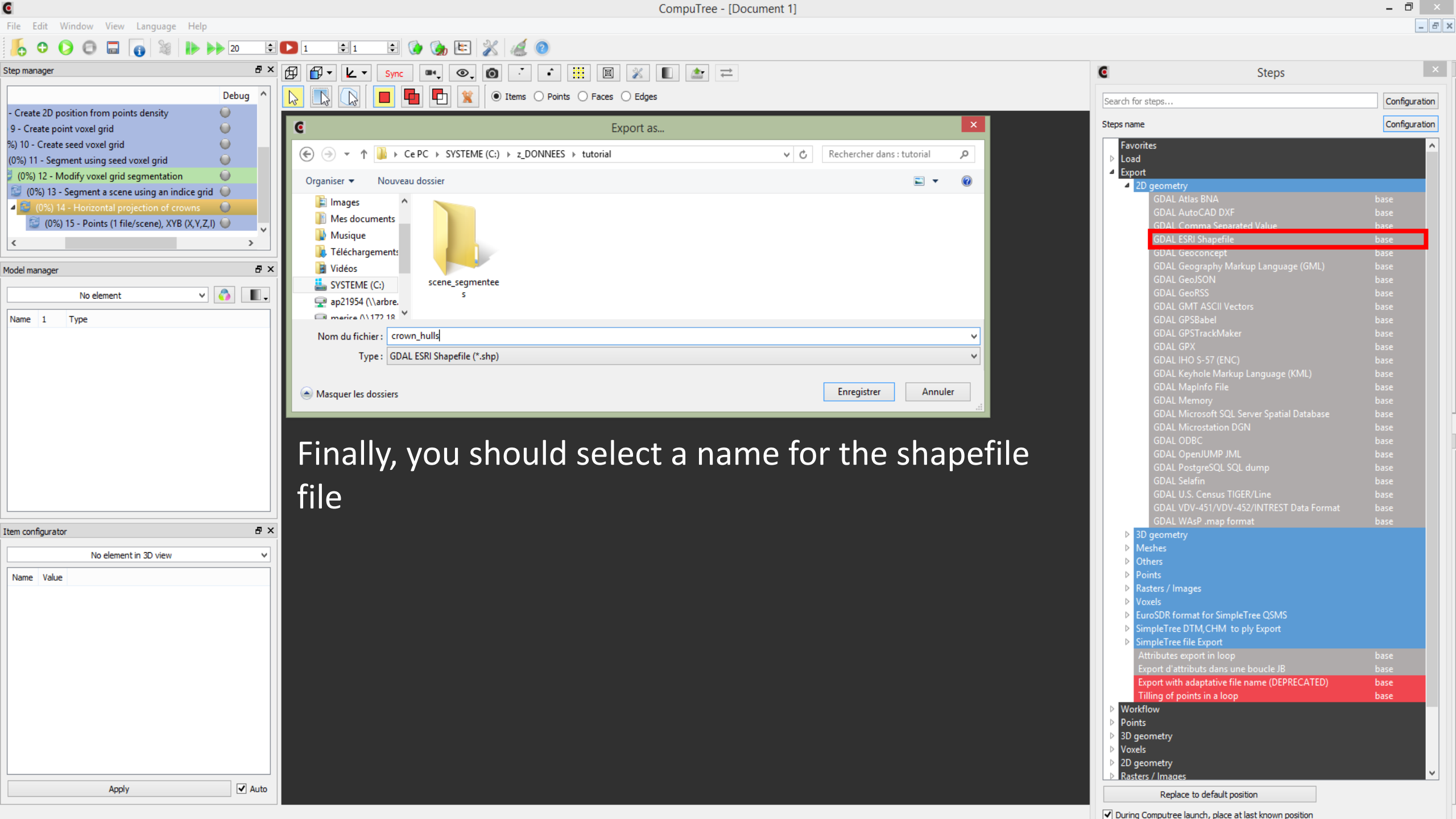


Do not check this box, useful only when using script loops



Input data should then be selected as follows:

- Convex hulls per cluster



Finally, you should select a name for the shapefile file

- ➔ Menu Export / 3D Geometry
- ➔ Step: Attributes / Items in groups

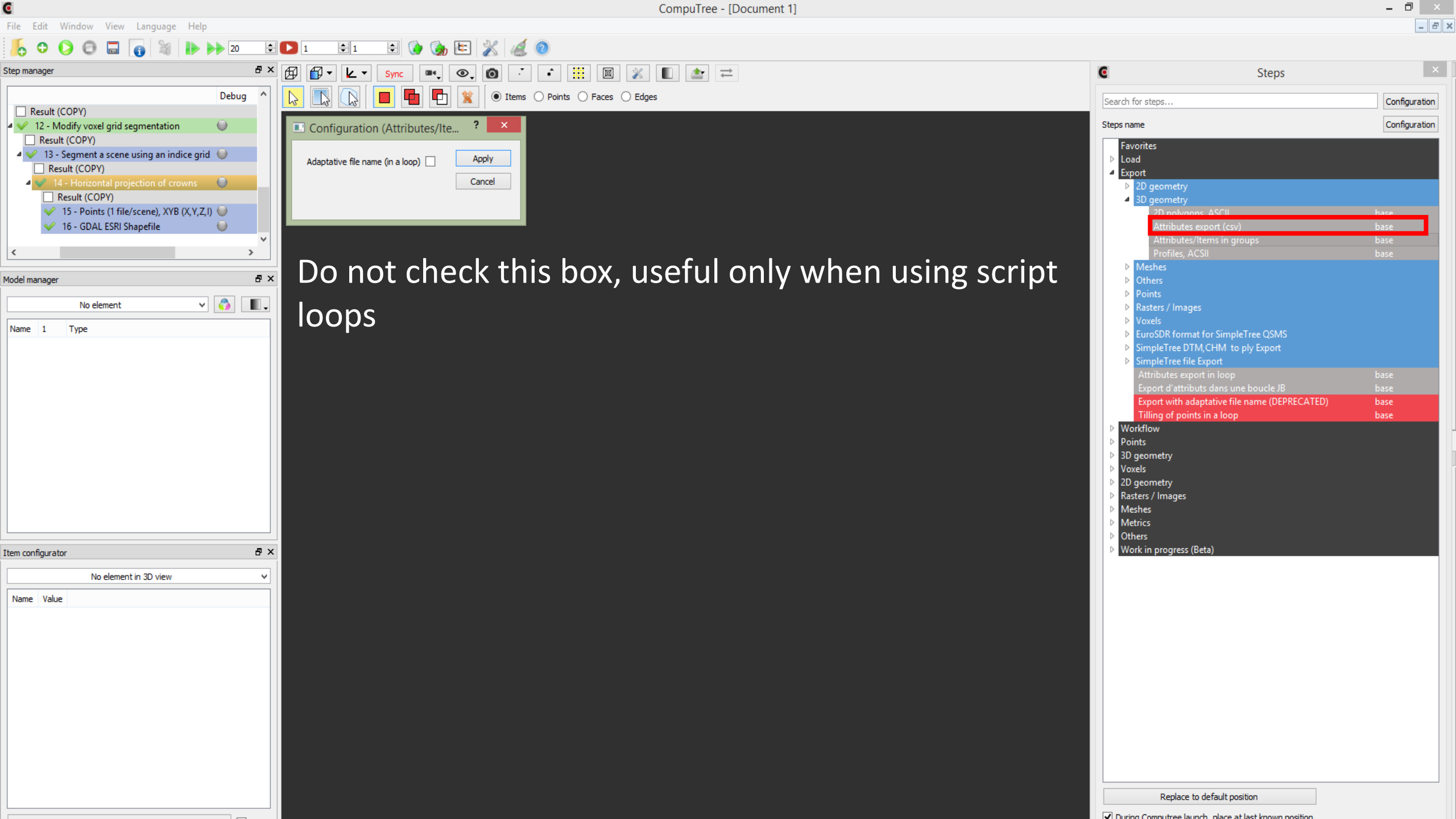
This step makes it possible to export a table making it possible to make the link between the identifiers of the scenes and the identifiers of the convex hulls

The screenshot shows the 'Steps' dialog box in QGIS. The 'Export' step is expanded, showing a list of export options. The 'Attributes export (csv)' option is highlighted with a red rectangle. Below the list, there is a 'Replace to default position' button and a checkbox labeled 'During Computree launch, place at last known position' which is checked.

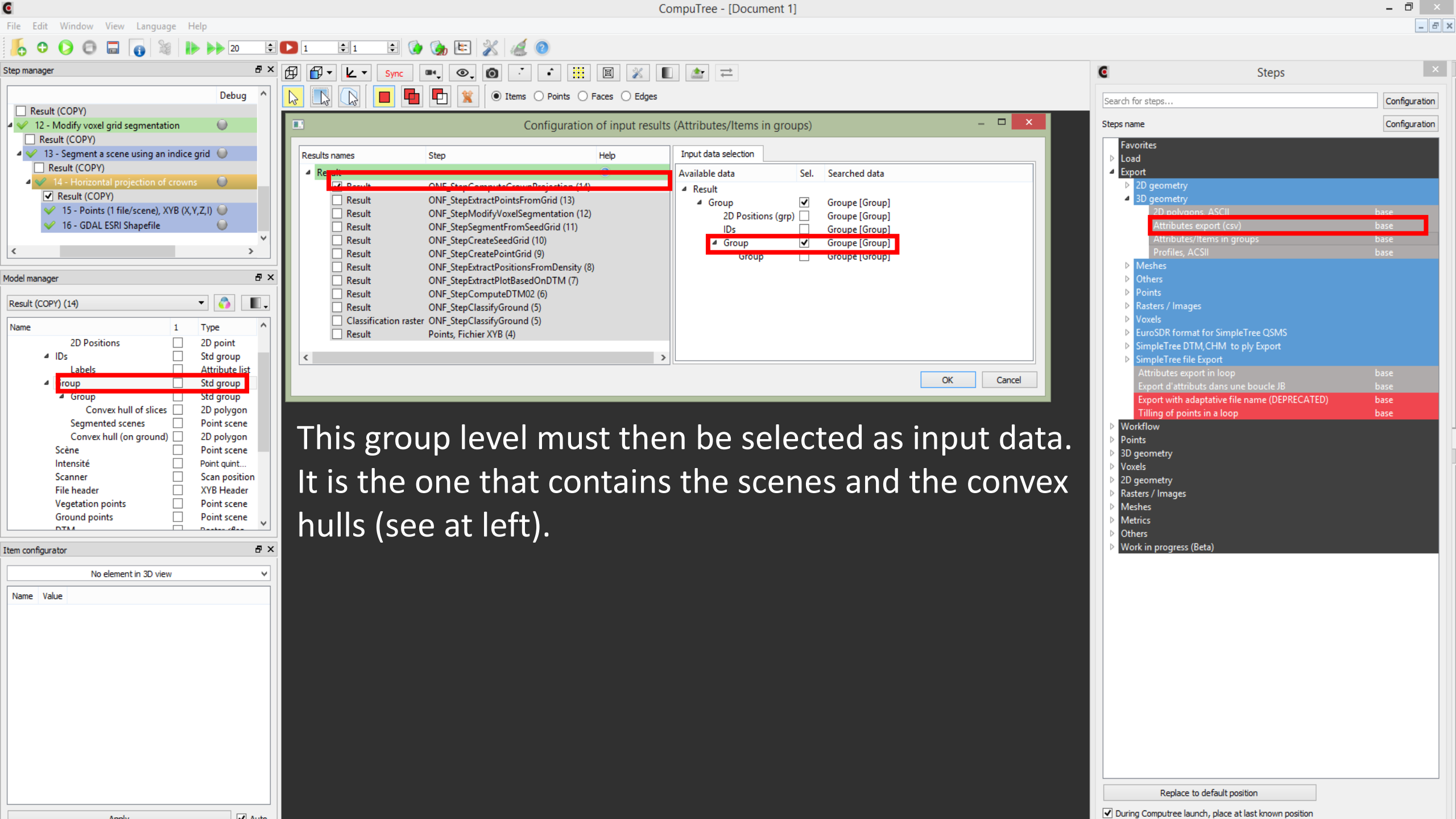
Step Name	Configuration
Load	
Export	
2D geometry	
3D geometry	
2D polylines, ASCII	base
Attributes export (csv)	base
Attributes/Items in groups	base
Profiles, ASCII	base
Meshes	
Others	
Points	
Rasters / Images	
Voxels	
EuroSDR format for SimpleTree QSMS	
SimpleTree DTM, CHM to ply Export	
SimpleTree file Export	
Attributes export in loop	base
Export d'attributs dans une boucle JB	base
Export with adaptative file name (DEPRECATED)	base
Tilling of points in a loop	base
Workflow	
Points	
3D geometry	
Voxels	
2D geometry	
Rasters / Images	
Meshes	
Metrics	
Others	
Work in progress (Beta)	

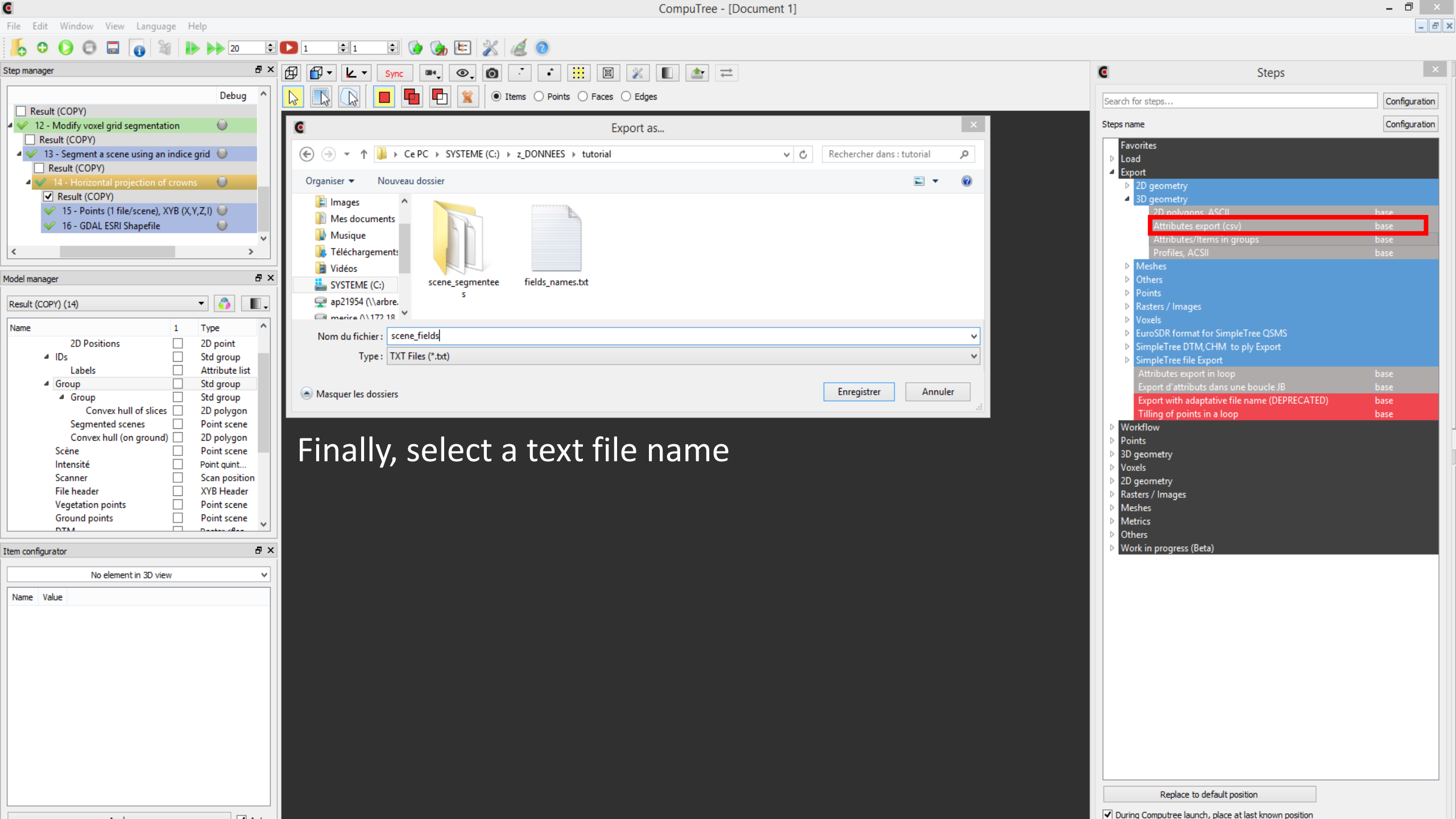
Replace to default position

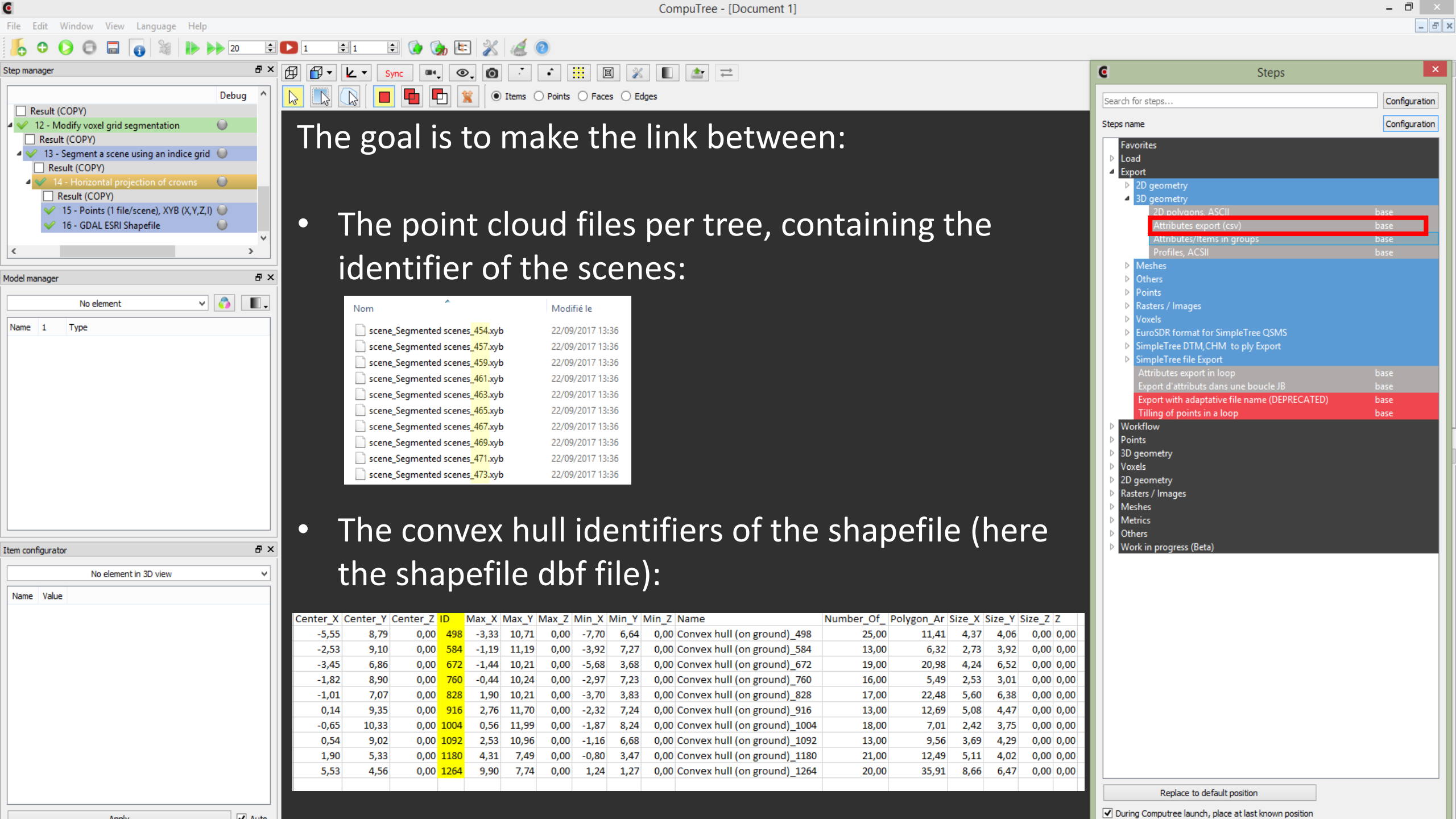
☒ During Computree launch, place at last known position

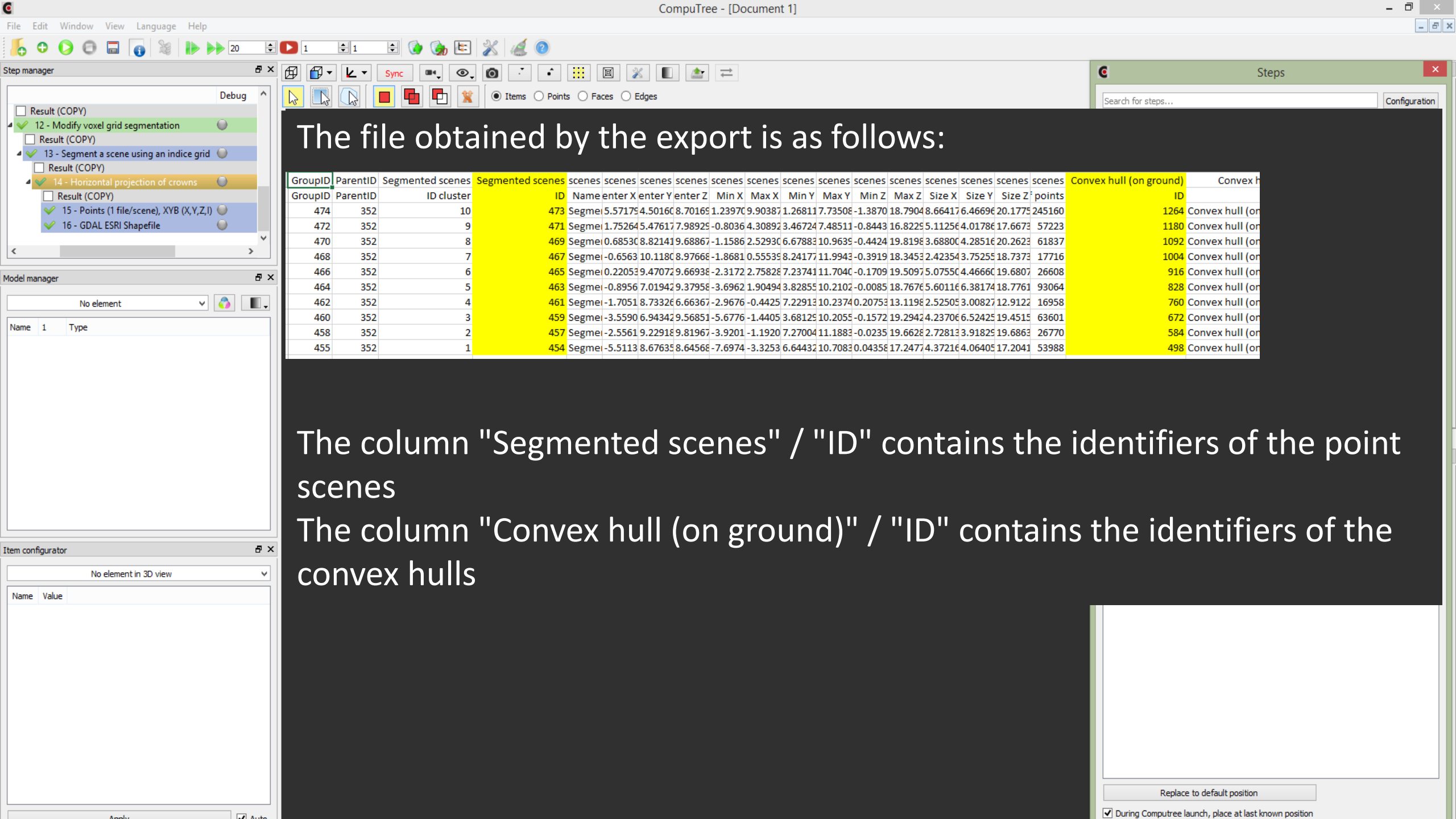


Do not check this box, useful only when using script loops









The file obtained by the export is as follows:

GroupID	ParentID	Segmented scenes	Segmented scenes	scenes	scenes	scenes	scenes	scenes	scenes	scenes	scenes	scenes	scenes	scenes	scenes	scenes	scenes	Convex hull (on ground)	Convex h
GroupID	ParentID	ID cluster	ID	Name	enter X	enter Y	enter Z	Min X	Max X	Min Y	Max Y	Min Z	Max Z	Size X	Size Y	Size Z	points	ID	Convex hull (on
474	352	10	473	Segme	5.57175	4.50160	8.70165	1.23970	9.90387	1.26811	7.73508	-1.3870	18.7904	8.66417	6.46696	20.1775	245160	1264	Convex hull (on
472	352	9	471	Segme	1.75264	5.47617	7.98925	-0.8036	4.30892	3.46724	7.48511	-0.8443	16.8225	5.11256	4.01786	17.6673	57223	1180	Convex hull (on
470	352	8	469	Segme	0.68530	8.82141	9.68867	-1.1586	2.52930	6.67883	10.9635	-0.4424	19.8198	3.68800	4.28516	20.2623	61837	1092	Convex hull (on
468	352	7	467	Segme	-0.6563	10.1180	8.97668	-1.8681	0.55535	8.24177	11.9943	-0.3919	18.3453	2.42354	3.75255	18.7373	17716	1004	Convex hull (on
466	352	6	465	Segme	0.22053	9.47072	9.66938	-2.3172	2.75828	7.23741	11.7040	-0.1709	19.5097	5.07550	4.46660	19.6807	26608	916	Convex hull (on
464	352	5	463	Segme	-0.8956	7.01942	9.37958	-3.6962	1.90494	3.82855	10.2102	-0.0085	18.7676	5.60116	6.38174	18.7761	93064	828	Convex hull (on
462	352	4	461	Segme	-1.7051	8.73326	6.66367	-2.9676	-0.4425	7.22913	10.2374	0.20753	13.1198	2.52505	3.00827	12.9122	16958	760	Convex hull (on
460	352	3	459	Segme	-3.5590	6.94342	9.56851	-5.6776	-1.4405	3.68125	10.2055	-0.1572	19.2942	4.23706	6.52425	19.4515	63601	672	Convex hull (on
458	352	2	457	Segme	-2.5561	9.22918	9.81967	-3.9201	-1.1920	7.27004	11.1883	-0.0235	19.6628	2.72813	3.91825	19.6863	26770	584	Convex hull (on
455	352	1	454	Segme	-5.5113	8.67635	8.64568	-7.6974	-3.3253	6.64432	10.7083	0.04358	17.2477	4.37216	4.06405	17.2041	53988	498	Convex hull (on

The column "Segmented scenes" / "ID" contains the identifiers of the point scenes

The column "Convex hull (on ground)" / "ID" contains the identifiers of the convex hulls