
Sputnik Agro user manual

Release 1.4

Geoscan

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About Sputnik Agro

Sputnik Agro is a geographic information system for precision agriculture.

Sputnik Agro provides specialists with the necessary set of tools for solving problems of land inventory, crop control and agrotechnical measures, land reclamation planning and risk management. The software provides full-fledged workflow with raster maps in the multi-spectral range, digital elevation models and vector maps.

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System requirements

Minimum configuration:

- Windows 7, 8, 10 (64-bit), Linux (Mint, Ubuntu), Mac OS
- CPU: Intel Core i3
- 1 GB of disk space
- 4GB RAM
- Video card: Nvidia, AMD, Intel HD 4000 and newer, 1GB VRAM, OpenGL 2.1 support

Recommended configuration:

- Windows 7, 8, 10 (64-bit), Linux (Mint, Ubuntu), Mac OS
- CPU: Intel Core i5 / i7 and better
- 1 GB of disk space
- 8GB RAM
- Video card: Nvidia, AMD, 1GB VRAM, OpenGL 2.1 support

Spuntik Agro is distributed for Windows operating systems. Follow the installation instructions for your operating system to complete the installation.

2.1 Windows

1. Run Sputnik Agro installation package (administrator privileges are required).
2. Follow the onscreen intructions to complete the setup .
3. After installation is finished. KML and KMZ files will be associated with Sputnik Agro.
4. To start the application choose **Start > Sputnik**.
5. In case of issues during instalation process, read :doc: *Errors_fixing* chapter.

Attention: You need to have administrator privileges to install Sputnik Agro and license driver. In Spuntik Agro is installed without administrator privileges, software may not work properly.

3.1 Online activation

To activate Sputnik Agro via Internet:

1. Make sure you have internet access
2. Start Sputnik Agro, use **Activation...** command from **Help** menu
3. Paste your license key to **Enter the product key** input field and click **Activate**

Important: In case activation is failed, first check if you pasting the key in right format, the format of key should be: XXXXXXXXX-XXXX-XXXX-XXXX-XXXXXXXXXXXX

3.2 Offline activation

Important: You need to use additional PC with Internet access to activate Sputnik Agro on PC without Internet access.

To activate Sputnik Agro on PC without Internet access:

1. Download offline [activation utility](#)
2. Start RUS utility on PC with Sputnik Agro installed. In the **Collect Status Information** tab check **Installation of new protection key** option and click **Collect information** button. In the **Collect information** dialog box, set the name and path to save *.c2v file.
3. Start web-browser on PC with Internet access and open the [link](#)
4. Login in to Activation service using your license key a password
5. Select **Offline Activation** option.

6. Upload *.c2v file and click **Generate** button, *.v2c file will be generated.
7. On PC with Sputnik Agro installed open RUC utility. In the **Apply License File** tab select *.v2c file and click **Apply license** button.

3.3 Activation in case of OS reinstalling

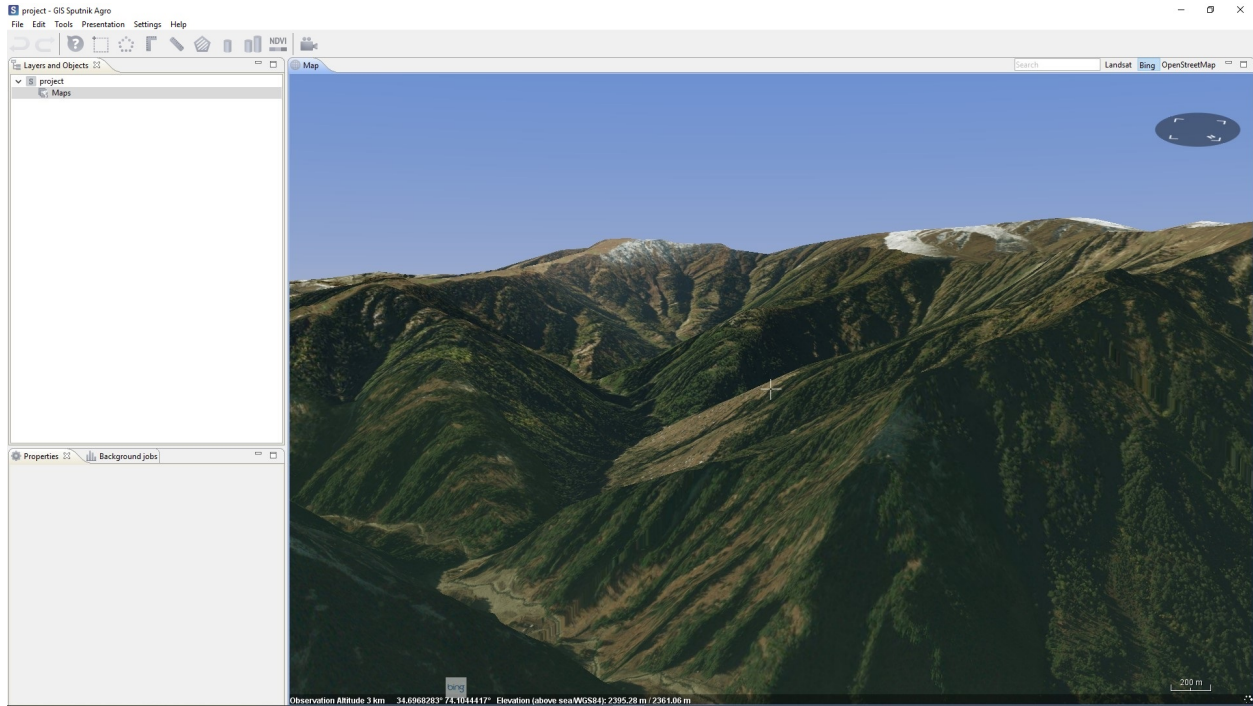
To activate Sputnik Agro in case of OS reinstalling follow the list of instructions bellow:

1. First you need to get *.v2c key. To get it open <https://license.geoscan.aero> in your web browser and use your license key as login.
2. On the user registration page fill the information or click **Register later**
3. Click **View** button in the **Previous Activation** menu.
4. In the **generated keys** menu click **V2C File**. It will be downloaded.
5. Open http://localhost:1947/_int_/checkin.html in your web-browser, select you *.v2c file and click **Apply** button.

4.1 GUI

Spuntik Agro GUI consists of:

- Main menu
- Toolbar
- **Layers and objects** window
- **Properties** window
- **Map** window
- **Background jobs** window



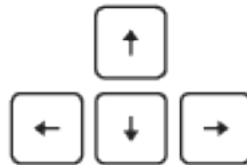
4.2 Hotkeys

Action	Hotkey
Open file	Ctrl + O
Undo	Ctrl + Z
Redo	Ctrl + Y
Delete	Delete
Select all	Ctrl + A
Clear selection	Ctrl + D
Fullscreen	F11
Rectangular selection	Ctrl + R
Reset view to northup	N
Reset angle to top-down view and rotate map to north-up viewp	R

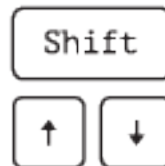
Scaling (zoom in/zoom out)



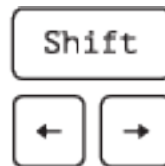
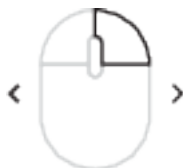
Moving (globe rotation around its center)



Clockwise / Counterclockwise rotation (globe rotation around the point on its surface)



Changing the vertical angle of the view (globe rotation around the point on its surface)



Inspecting high-altitude objects (Moving along high object)



Working with different datasets can be simplified by switching between Sputnik Agro projects. Every project automatically stores a set of parameters:

- A list of maps and drawings, loaded by the user;
- Last position of the 3D Map window camera;
- Location, visibility and size of UI objects.

6.1 Projects management

To create new project choose **Project** command from **New** submenu of **File** menu.

To open existing project choose **Project** command from **Open** submenu of **File** menu.

To open recent project choose one of available projects from **Recent projects** submenu of **File** menu.

To import any type of data into the project choose **File** command from **Open** submenu of the **File** menu.

6.2 Additional information

By default raster imported raster maps are aligned with default SRTM elevation model. SRTM terrain data has 90 m spatial resolution and vertical accuracy about 1 m. Level of details can be increased by loading a local DEM.



Data at the bottom of the **Layers and Objects** list display above the layers at top.
Use checkboxes in the **Layers and Objects** list to turn layers visibility on and off.



7.1 Raster maps

Sputnik Agro supports the following raster map extensions: *.tiff, *.ecw, *.jpg, *.kmz and elevation models extensions: *.tiff and *.kmz. Read more about working with raster map in chapter [Raster maps tools](#)

7.2 Vector maps

Sputnik Agro supports the following raster map formats: *.shp and *.kml. Read more about working with *.kml in chapter [KML tools](#), about working with *.shp in chapter [Shapefiles tools](#).

7.3 Drawings

Sputnik Agro support drawings in *.dxf format. It is not available to import *.dxf file into project as a map layers and view it in the **Map** window. You can view *.dxf files in 2D **Drawings viewer** . Read more about working with *.dxf in chapter [Drawings tools](#).

7.4 WMS/WMTS services

Sputnik Agro support importing data from WMS and WMTS services with feature request option. Read more about working with WMS/WMTS services in chapter [WMS.WMTS_tools](#).


7.5 Aerial survey



Sputnik Agro have number of tools for working with aerial imagery and UAV telemetry data:

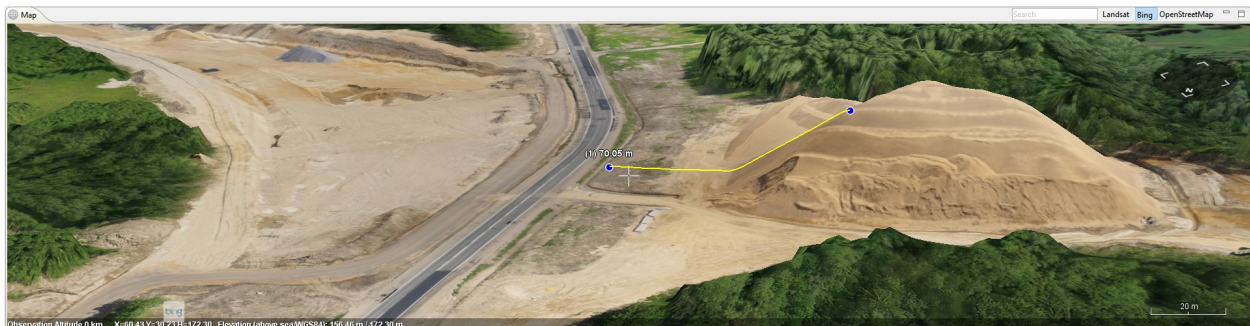
- Visualisation of aerial survey telemetry in the **Map** window
- Viewing images
- Projecting aerial images on map

You need to have aerial survey telemetry file in *.txt format to be able to analyze it. Read more about working with survey in chapter *Working with UAV telemetry files*.

8.1 Ruler


 **Ruler** tool displays distance between two points on surface.

To measure distance with **Ruler** click left on  icon in the toolbar, then select two points on the surface to measure the distance between them. Or select existing line and click left on  icon in the toolbar to measure its length.

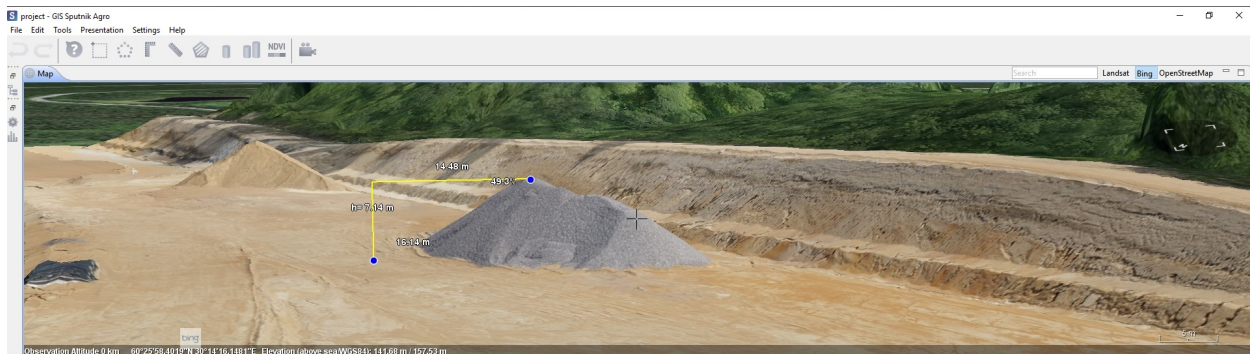


It is possible to change the position of the selected point. Click once left at a point, then drag it by the surface. When length for polygon is measured, its value saves to polygon extended data, you can use **Information tool** to display the volume value when you need.


8.2 Corner ruler



 **Corner ruler** tool displays slope, horizontal distance, actual distance and elevation between two points located on surface.

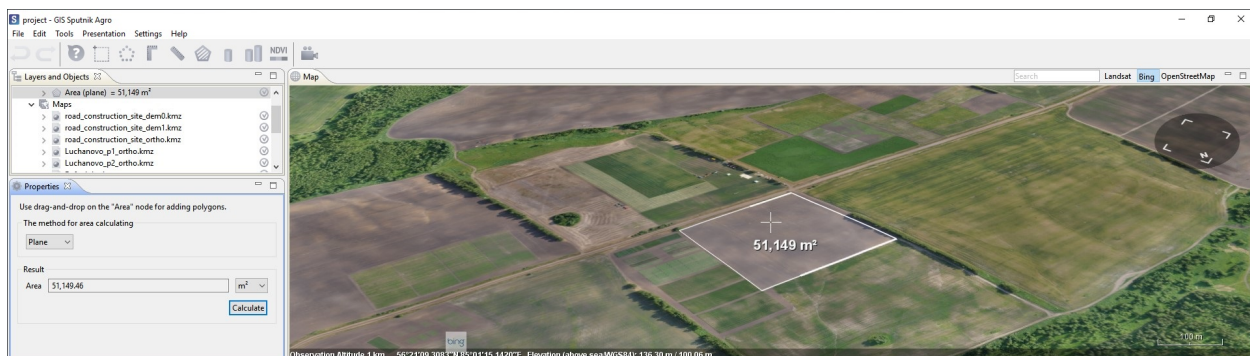
To perform measurements with **Corner ruler** click left on  icon in the toolbar, then select two points on the surface to perform measurements.




8.3 Area

 **Area tool** displays surface area of a polygon on surface.


To measure area of polygon click left on  icon in the toolbar and draw a polygon. Or select existing polygon and click left on  icon in the toolbar.





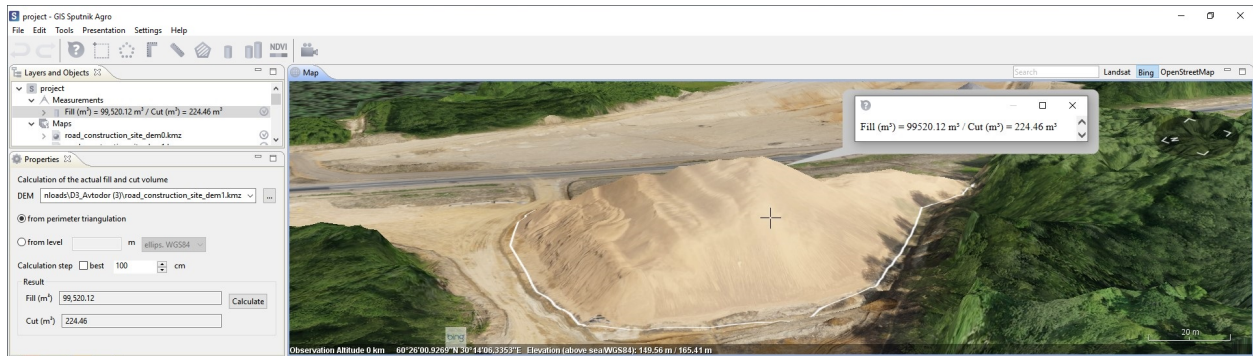
Important: Depending on the area measured, the result can be displayed in square meters, hectares or square kilometers. Area can be calculated on a plane or DEM surface.

When area of polygon is measured, its value saves to polygon extended data, you can use  Information tool to display the area value when you need.


8.4 Volume

 **Volume tool** calculates the volume of an area of DEM.


To calculate volume click left on  icon in the toolbar and draw a polygon. Or select existing polygon and click left on  icon in the toolbar.



Important: In case there is only one DEM in the Layers and Objects list, Sputnik Agro use that DEM for measurements. Otherwise it is necessary to drag and drop selected DEM from Maps folder to **Measurements > Volume object**.

When volum for polygon is measured, its value saves to polygon extended data, you can use  Information tool to display the volume value when you need.

8.5 Volume difference

 **Volume difference tool** calculates the difference between two DEMs of the similar area, captured with a time interval. It is possible to calculate cut and fill volumes and highlight the areas that have changed.


To calculate volume difference between two DEMs click on the  icon on the toolbar and then draw a polygon to measure the volume difference. Select Initial DEM and final DEM by moving it from Maps folder to **Measurements > Volume difference**.

Some parameters can be set before the calculation begins:

- Difference threshold (altitude difference between one point of two different DEMs to be included into calculation);
- Calculation step or turn «best» on.

The less the values of the calculation step and the difference threshold, the more time needed to finish the calculation. Press **Calculate** button when setup is finished. After calculation is finished you can see the result in the Fill and Cut fields in the **Properties** window.



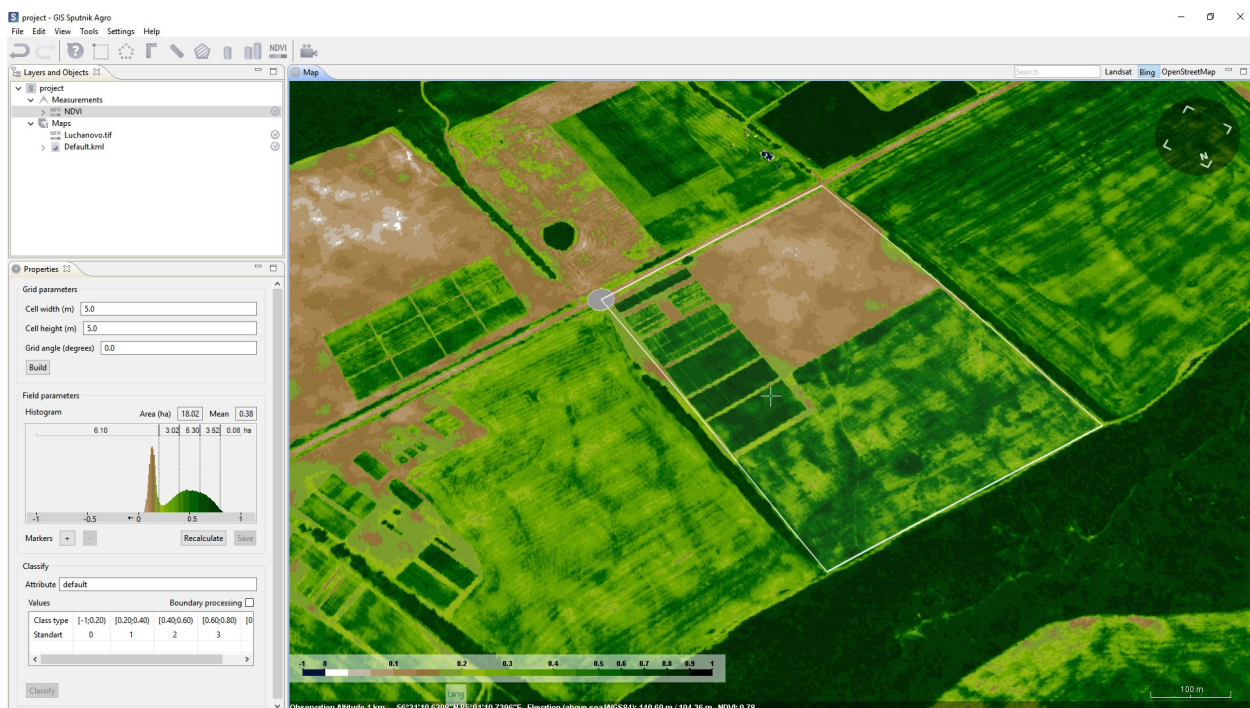
When volume difference for polygon is measured, its value saves to polygon extended data, you can use  **Information tool** to display the volume value when you need.

Crop inspection and analysis

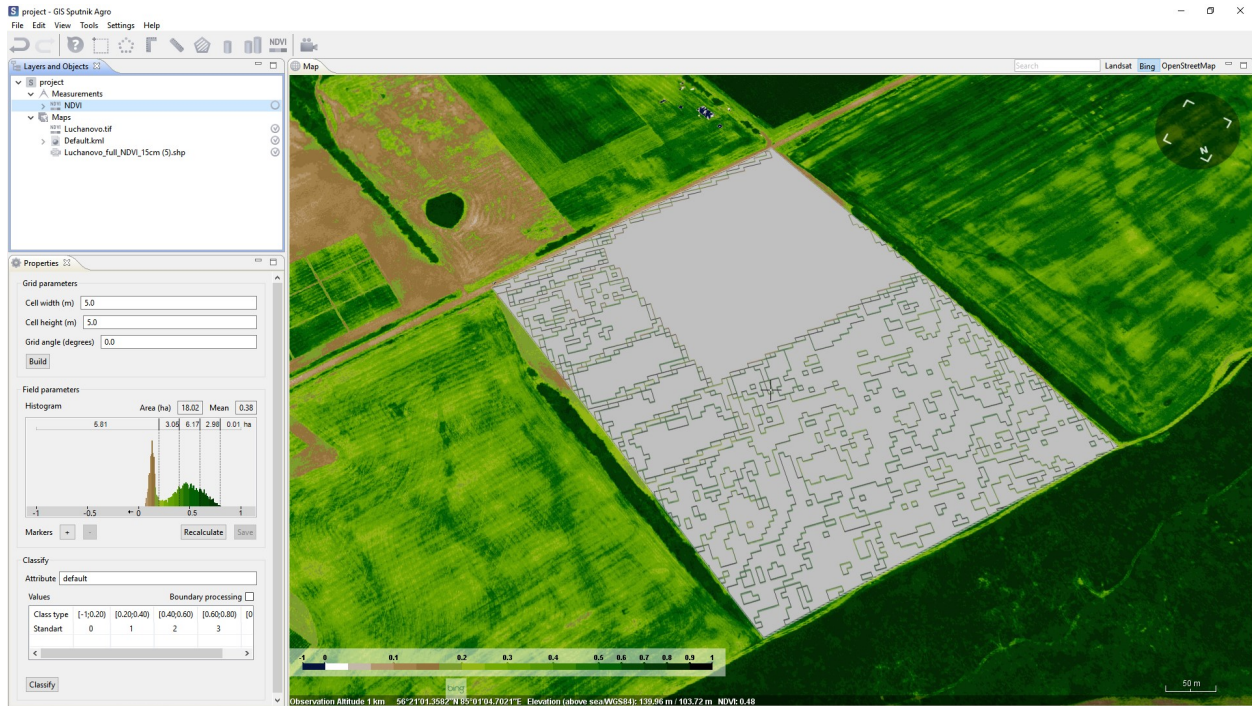
9.1 Prescription generation

Open NDVI orthophoto, click right mouse button on it and select **NDVI** **Display as NDVI**.

To calculate NDVI values for area of your interest, select **Tools > NDVI calculation**. Select area of your interest with polygon. After that, you could see the histogram of NDVI values for your area. You can export histogram data to *.txt file if you need.

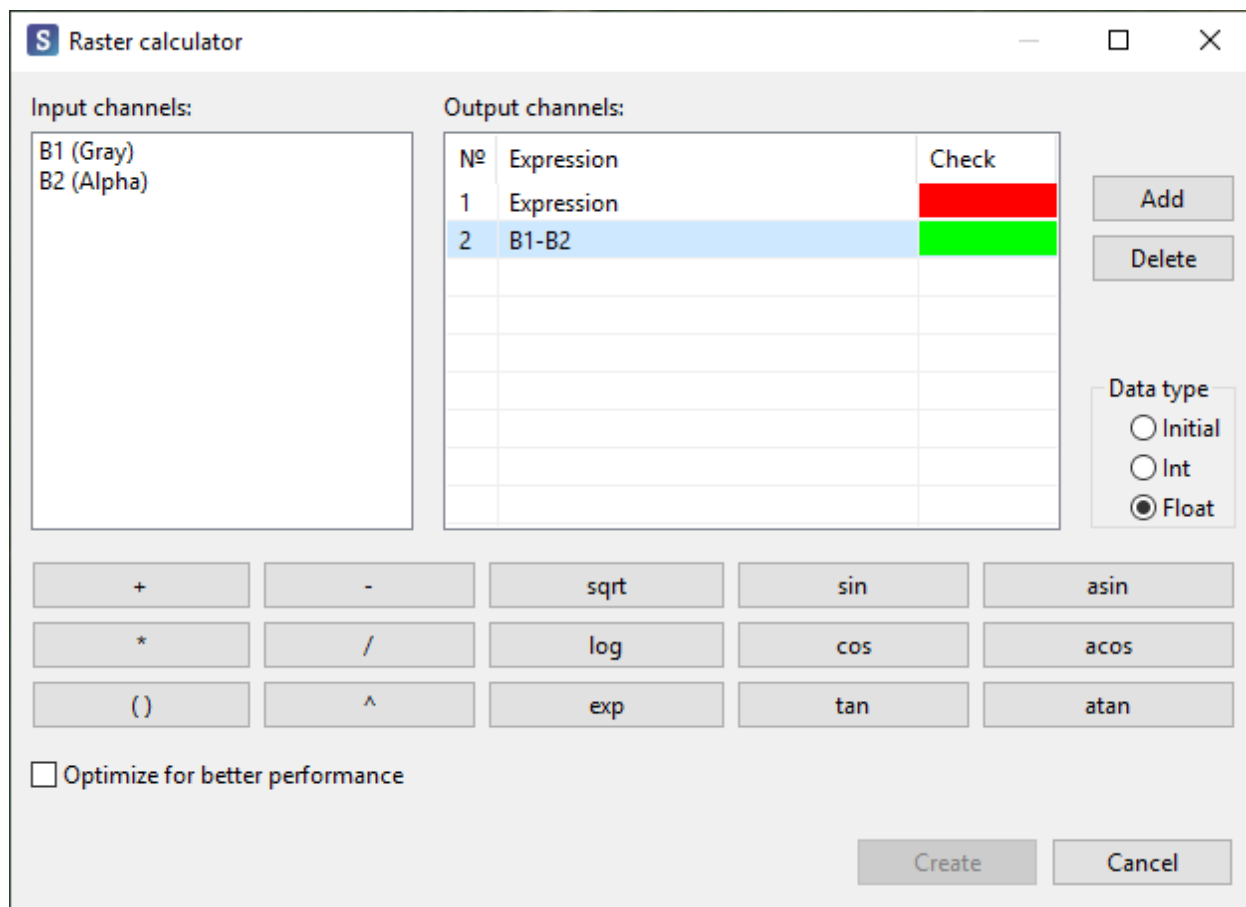


Then setup network parameters and click **Create**. Setup attribute name for output *.shp file, you can change class ranges moving the sliders on histogram, and press **Vectorize**.




9.2 Raster calculator

The satellite agro implemented **Raster calculator**, which provides pixel-by-pixel execution of mathematical operations on raster datasets. To work with the Raster calculator, in the **Layers and features** window, select the raster to edit and run **Tools > Raster calculator**.



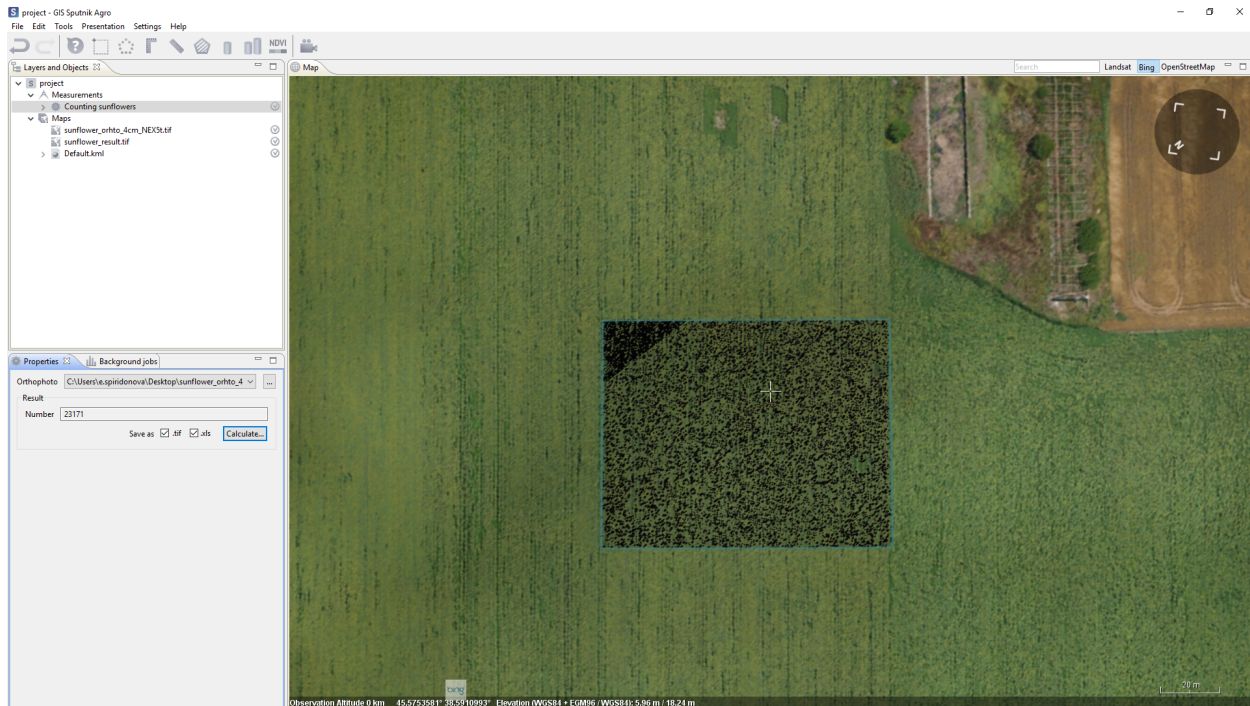
Both manual and graphical introduction of formulas for calculation are available in the tool dialog. In the section **Input channels**- displays the number of channels that has the selected image. The expression is specified in the **Output channels** section, color indicator, in the **Check** column, whether the expression is correctly written (green) or not (red). To add or remove expressions, click the appropriate buttons. In Sputnik Agro You can set the output data type (Source, Int, Float). For faster processing, enable checkbox - **Optimize to speed up**.

9.3 Counting sunflowers


The Sputnik Agro is available to perform the  **Counting sunflowers** in automatic mode and save the result in formats *.tif, *.xls. Run the **Tools > Calculation of sunflowers**. In the **Maps** window, specify the search area. In the **Properties** window, specify the orthophoto by which to search. Specify which files to generate with the results by enabling the checkbox in the appropriate formats:

- in the format *.tif will be saved to the visual component, I found the sunflowers in the form of point objects;
- in the file format *.xls will form a table with numeric values.

To perform calculations, press **Calculate...** In the dialog box that appears **Select calculation parameters** set **search Threshold** and click **OK**. The **Map** window displays the result of the found objects, **Number** is shown in the **Properties** window.



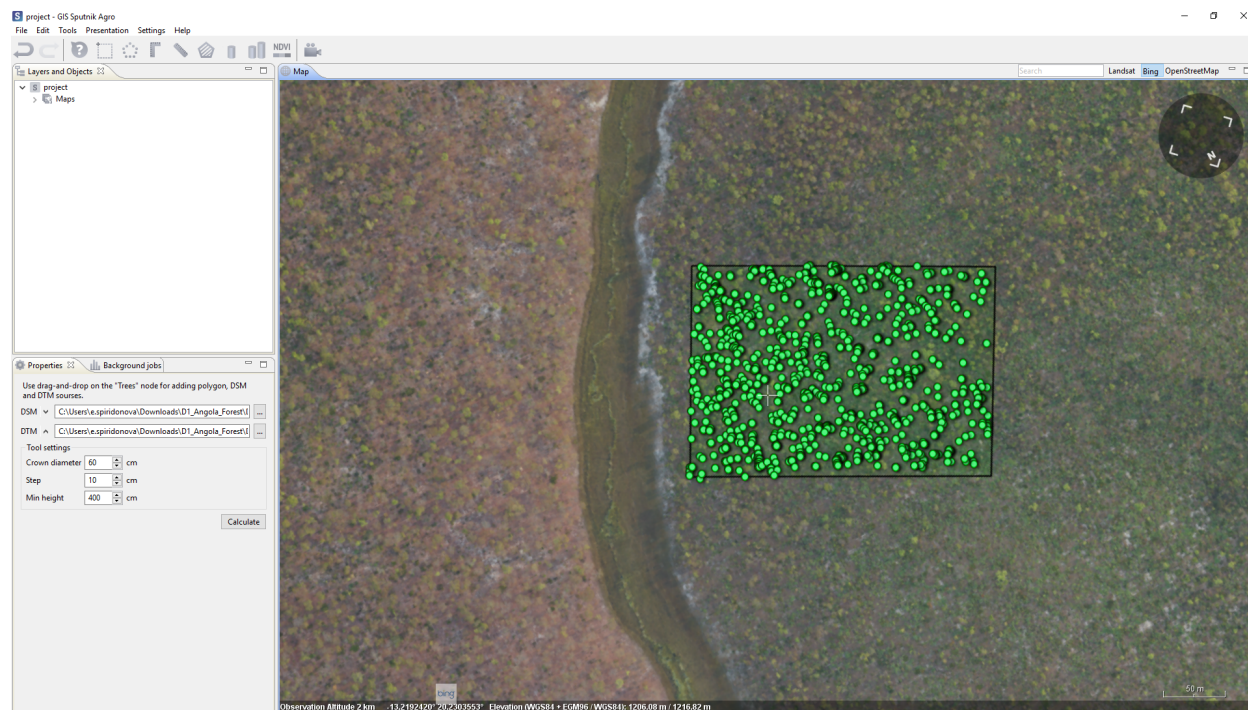
9.4 Calculate trees

 **Calculate trees** can automatically search for trees and export the results in *.kmz formats. As the source data, you will need a digital surface model (DSM) and a digital elevation model (DEM).

Select **Calculate trees** from the main menu **Tools**. In the **Maps** window, select the area to search for trees. In the **Properties** window, specify the path to the DSM and DEM files. In section **Tool settings** specify:

- Crown diameter;
- The step with which the algorithm will perform the search;
- Minimum height.

Press **Search** to start the algorithm. In the dialog box, specify the name and path to the file with the result. In the **Maps** window, the result will be displayed, the found trees will be displayed as point objects.



9.5 Processing of RAW multispectral remotely sensed data

Sputnik Agro allows to preprocess RAW multispectral aerial photography, for further photogrammetric processing. Software supports the preprocessing of data obtained using:

- UAV Geoscan 201 Agro / Agrogeodesy
- UAVs equipped with a GITUP G3 DUO NDVI multispectral camera

Select **File > Import > Aerial photography** and choose directory with photos and *.txt file with coordinates.


If you need to process all photos, click right mouse button on Aerial photos object and select NDVI converter. If you need to process photos in the area of your interest, select it with polygon, click right mouse button on photo icon and select NDVI converter.


Next, setup the output channels, for NDVI orthophoto false RGB and NDVI channels combination recommended, and select calibration plate to setup calibration coefficient. Press **OK** to start the processing.

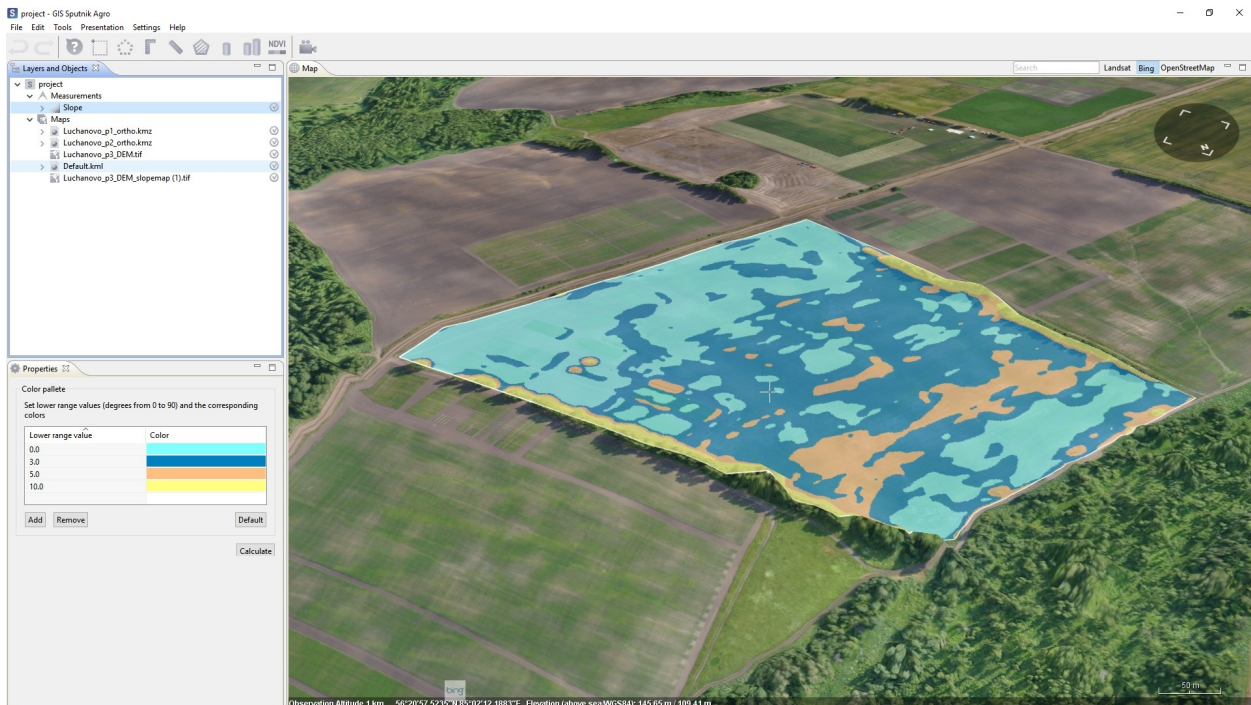
Available output channels:

- **False RGB** – Appropriate for aligning, photorealistic image. Three channels,
- **16 bits TIFF NDVI** – Inappropriate for aligning, should be used along with false RGB channel. One channel, 8 bits TIFF
- **R NDVI NIR** – Appropriate for aligning, inappropriate for export to GeoTIFF. Three channels, 16-bits TIFF. Can be used for export to KML.

10.1 Slope map


 **Slope map** tool allows to calculate slope map for given area on DEM.

To start slope map calculation choose  tool from **Tools** menu and draw the polygon to calculate the slope map within it. In the **Properties** window set up color palette for the slope map and click **Calculate** button. In the **Calculate slope maps** window select elevation model to calculate slope maps for, names and formats for the output and click **OK**

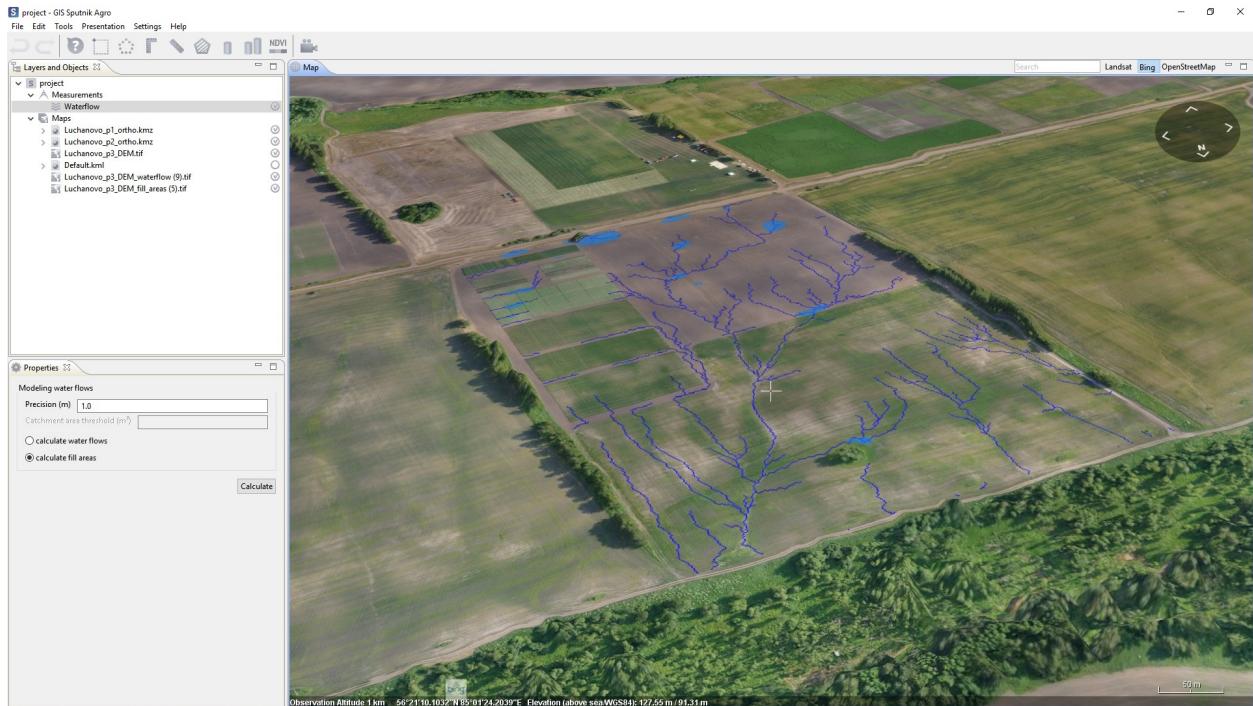


Note: It is possible to change default slope map color palette, to do that choose **Preferences** command from **Settings** menu, in the **Preferences** window switch to **Slope map** tab and set the default color palette parameters.


10.2 Waterflow calculating

Tool  **Waterflow calculating** calculates water drain lines and water basins areas using DEM. Select **Tools > Waterflow calculating**. Select area of your interest, using polygon.

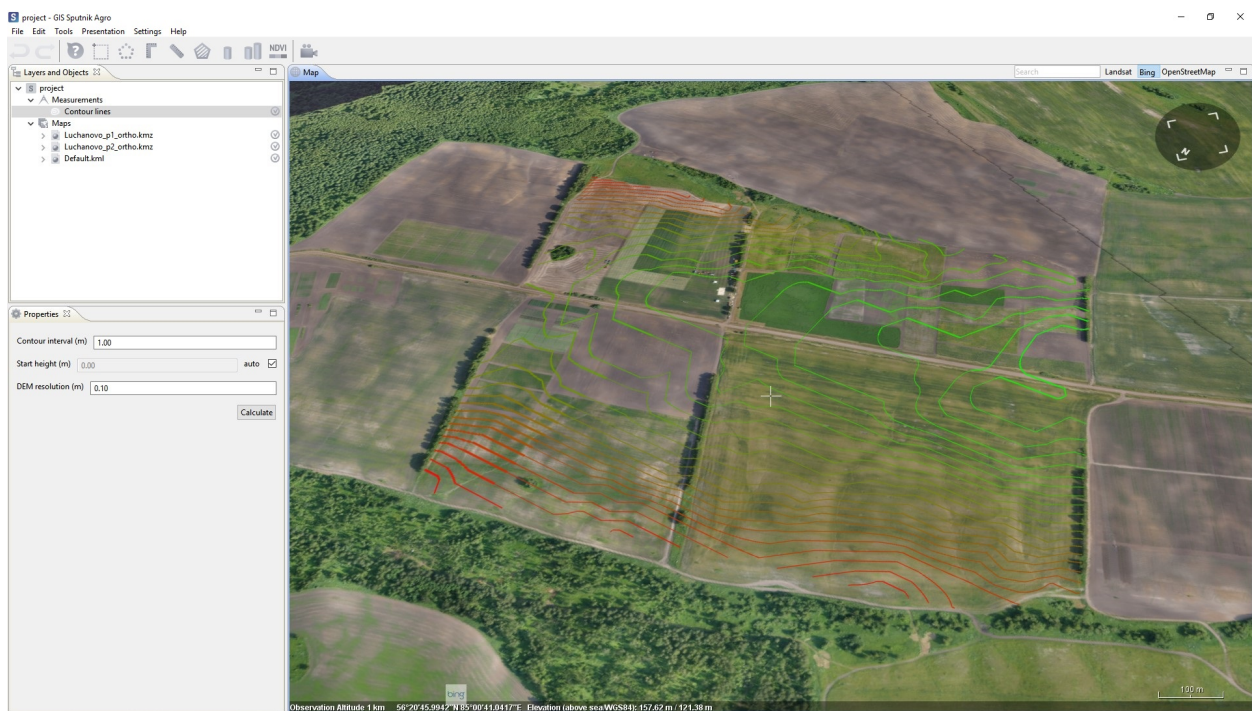
Setup type and parameters of calculation, click **Calculate**. Select DEM layer for the area of your interest and click **OK**. Calculation result, will be represented as vector *.shp layer for «water flows» and represented as raster *.tiff layer for «fill areas»




11.1 Contour lines


 **Contour lines** allows to calculate contour lines for given area on DEM.

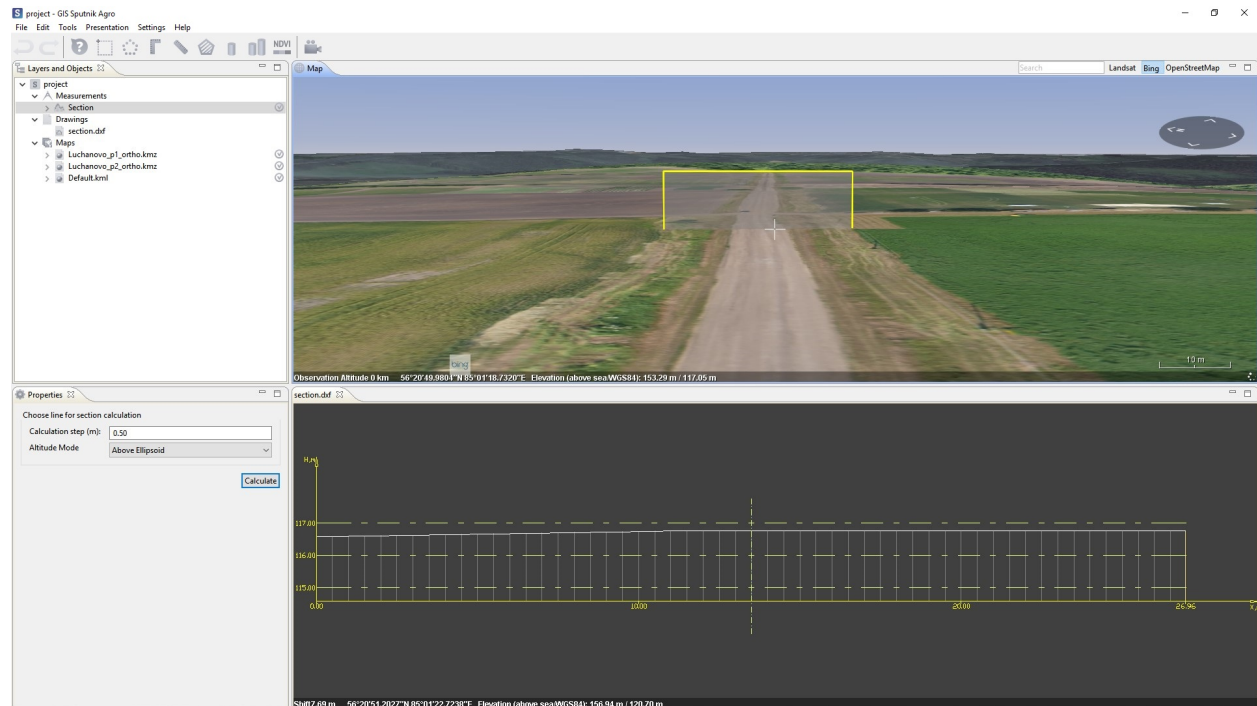
To start conctour lines calculation choose  tool from **Tools** menu and deliniate area to calculate contour lines within it. Set up *Contour interval* and *DEM resolution* in the **Properties** window and click **Calculate** button.



11.2 Cross section


 **Cross section** allows to generate cross section for given baseline in *.dxf format.


To start cross section generation choose  tool from **Sections** submenu of **Tools** menu and draw a baseline. Set up *Calculation step* and *Altitude mode* in the **Properties** window and click **Calculate** button. In the **Save** dialog box select the name and directory to save the output and format and click **Save** button. It is available to generate cross section in *.dxf, *.csv and *.txt formats.

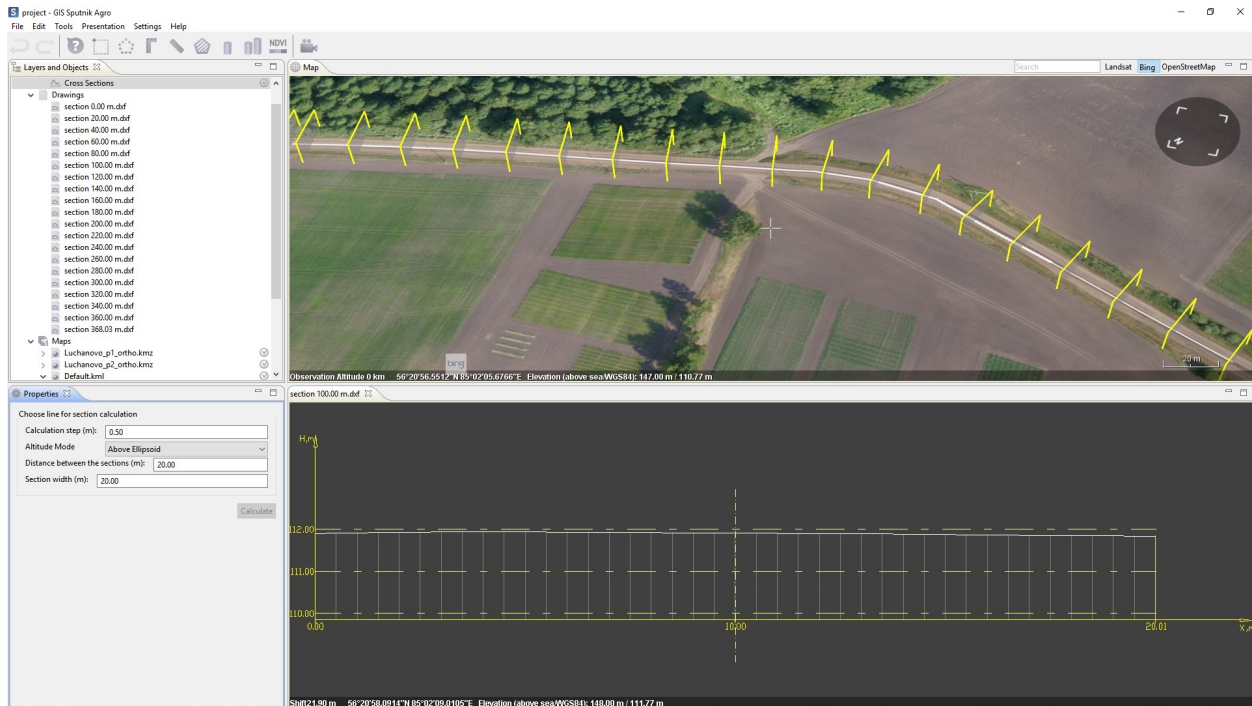


After section generation is finished it will be displayed in the **Drawing viewer** window.


11.3 Cross sections

 **Cross sections** allows to generate custom set of cross sections perpendicular to given baseline and aligned to the left and to the right of the baseline by half of the section width value.

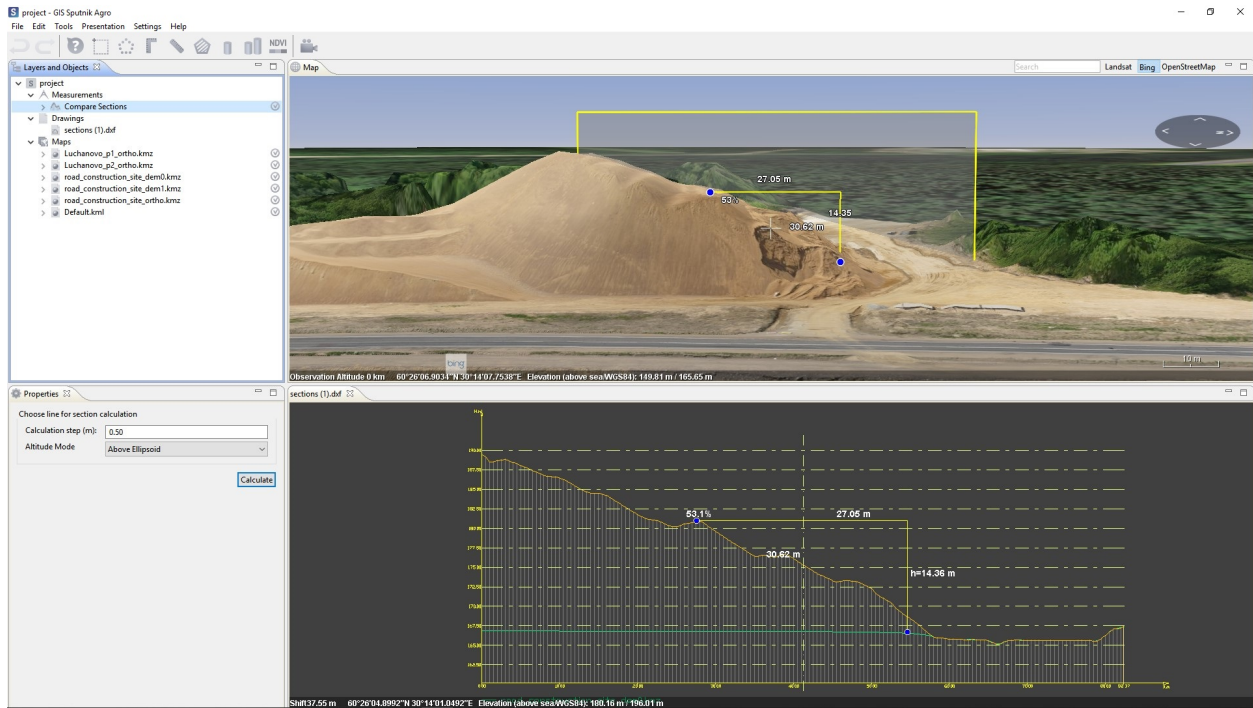
To start cross sections generation choose  tool from **Section** submenu of **Tools** menu and draw a baseline. Set up *Calculation step*, *Distance between the sections*, *Section width* and *Altitude mode* in the **Properties** window and click **Calculate** button. In the **Save** dialog box set up the name and directory to save the output and format and click **Save** button. It is available to generate cross sections in *.dxf, *.csv and *.txt formats.




11.4 Section comparing


 **Compare sections** and **Compare cross sections** tools allows to generate cross section or set of cross sections for multiple DEMs on one *.dxf drawing.

To start sections comparing choose one available section comparing tools from **Sections** submenu of tools menu and draw a baseline. Set up parameters in the **Properties** window and click **Calculate** button. In the **Calculate sections for elevation models** window select elevation model to calculate sections for, set up the name and directory to save the output and format.

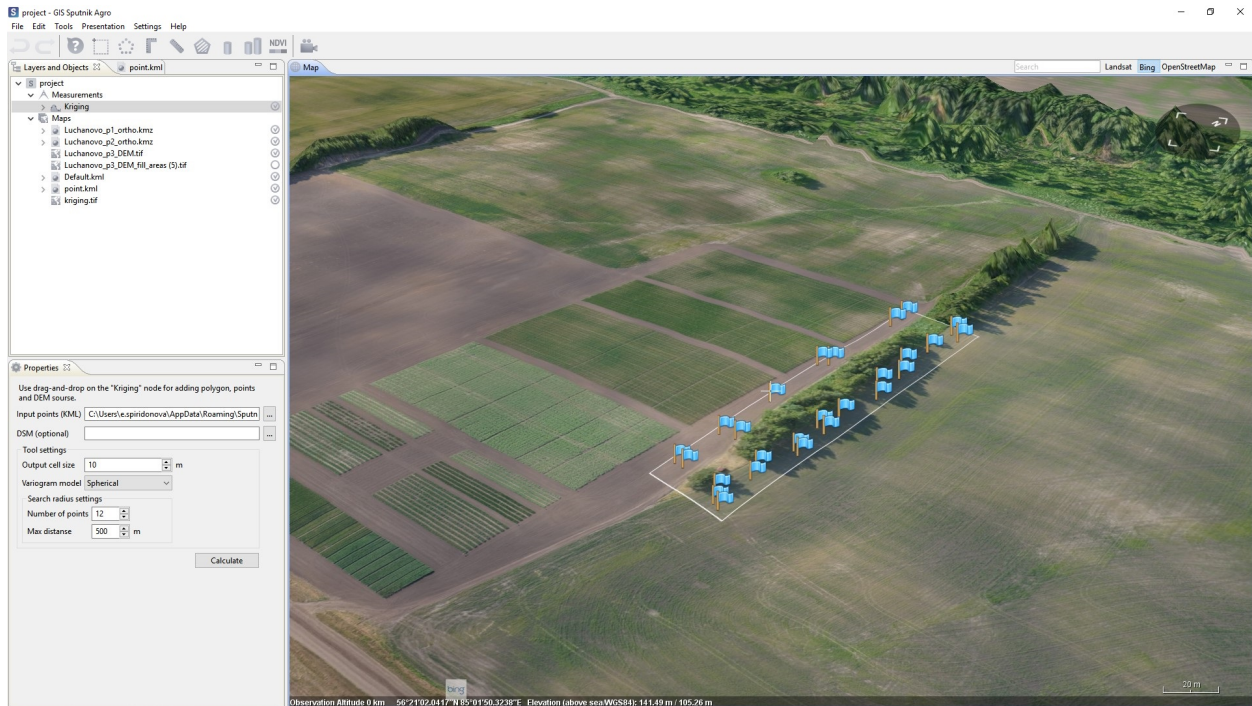


11.5 Kriging interpolation

 **Kriging interpolation** allows to build elevation model from given set of points.


To start building elevation model choose  tool from **Tools** menu and draw a polygon to build elevation model within it. Import *.kml file with points into Sputnik Agro and drag it from **Maps** folder into **Kriging interpolation** node. In the **Properties** window set up the *Variogram model* and other parameters if needed, click **Calculate** button.



In case you have points coordinates in *.txt file, create empty polyline, right-click on and choose **Edit coordinates..** command. In the **Edit coordinates** window select coordinates reference system and paste coordinates from *.txt file. To create points from polyline, right-click on it and choose **Create points..** command.



Important: Keep in mind that vertical datum, used for altitude measurements in *.kml files is the WGS84 EGM96 Geoid.

11.6 Relief editor

 **Relief editor** tool allows to edit elevation models. **Relief editor** tool may be used to build DEM from DSM by deleting buildings and other objects, the other usage scenario is to model new surface features.

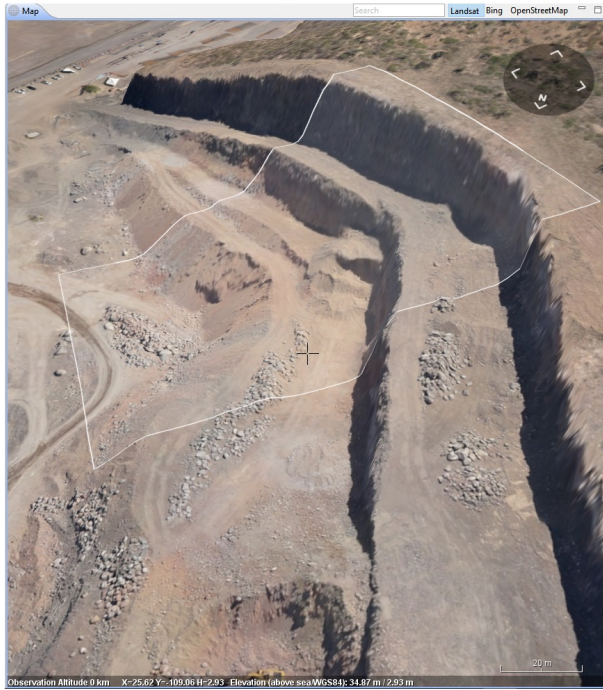
To start relief editing choose  command from from **Edit relief** submenu of **Tools** menu. Now you can draw polygons to delineate relief feature you want to modify. Double click to finish polygon drawing and start to draw the next one. To finish polygon drawing click  button on the toolbar or press **Enter** button.

In case you need to delete features from surface - just delineate them with polygons, the part of elevation model within given polygons will be interpolated with respect to polygons node.

In case you need to model new surface feature - draw it as polygon and set the needed elevation for each polygon node using **Coordinates editor**.

Before starting calculation choose if you want to edit current file or create a copy of it and click **Calculate** button.


Before



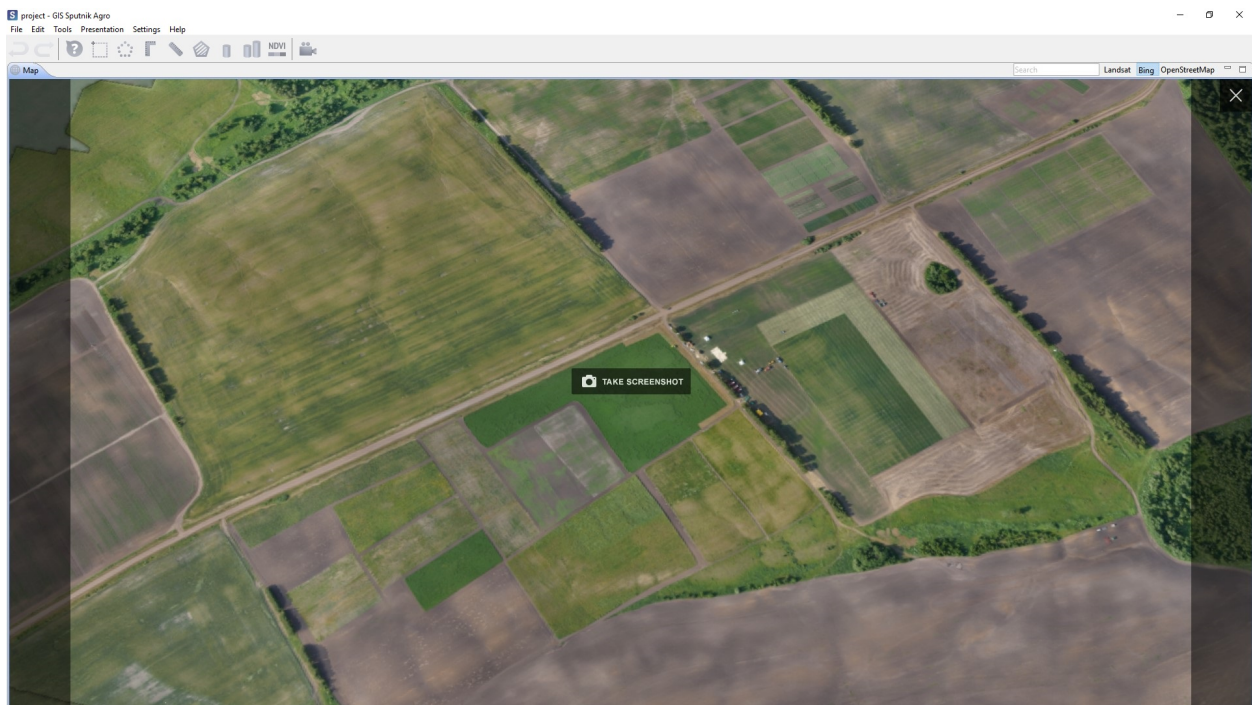
After





12.1 Screenshot

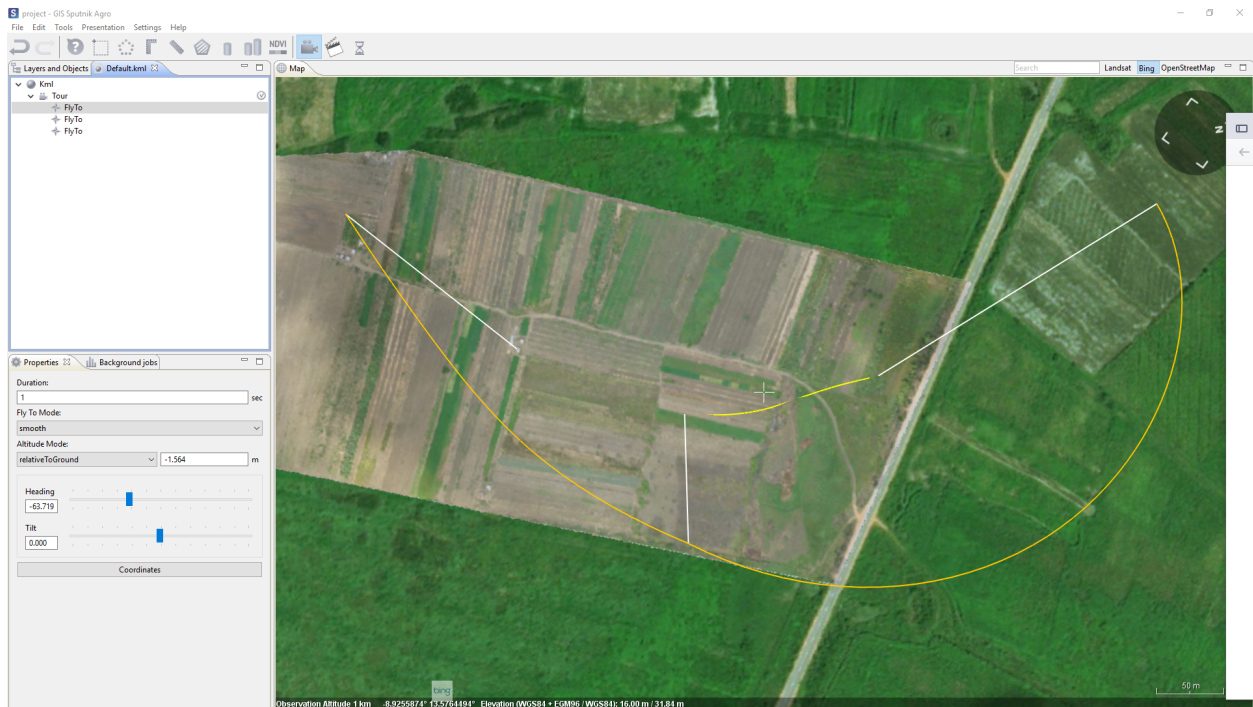
 **Screenshot** tool allows to create high resolution screenshots of 3D models and other data imported into the project.



To create screenshot choose one of available resolutions or **Custom size** command from **Screenshot** sub-menu of the **View** menu. To take screenshot click **Take Screenshot** button in the **Map** window.




12.2 Video tour

 **Tour** tool allows to create video tour around the 3D model, or other data imported into the project, and render it in high resolution. To start video tour creation click  icon on the toolbar. You can change key position parameters and delay parameters in the **Properties** window. Location of key position can be changed in the **Map** window, to do that drag key position node in the **Map** window. To change key position altitude, press **Shift** button and drag it.

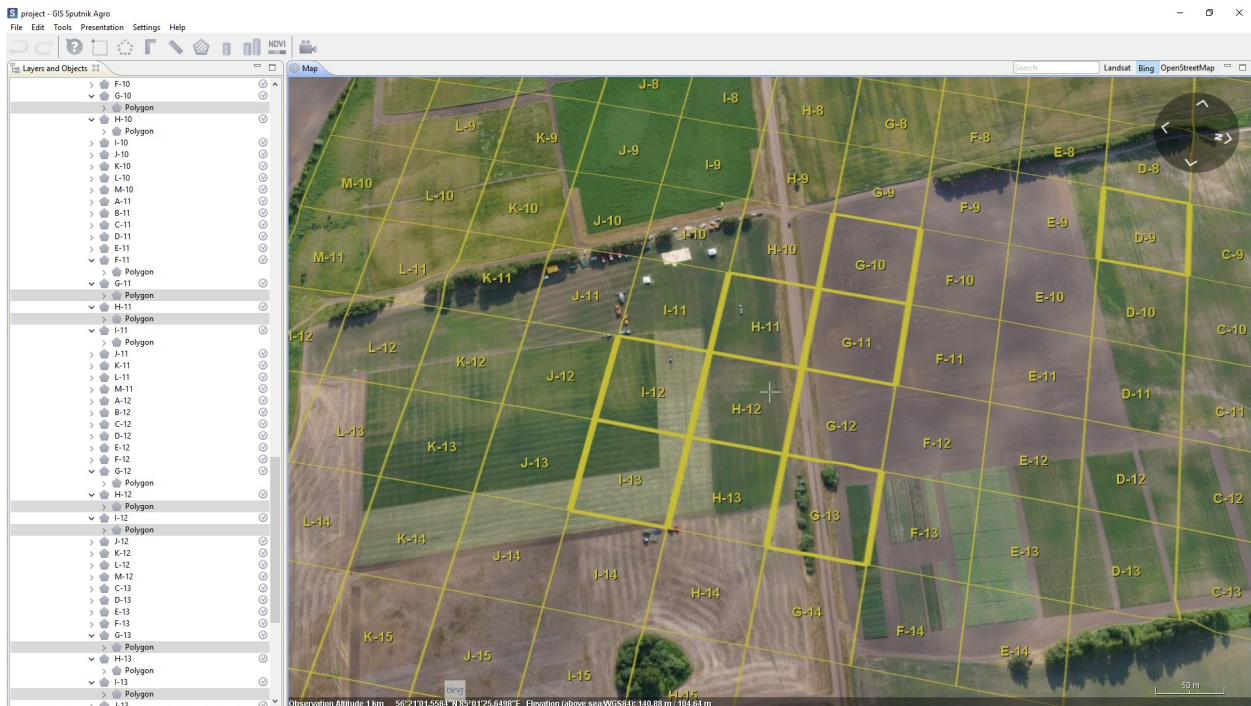


To play video tour use  and  buttons on the toolbar. To render a video from video tour right-click the tour in the **Layers and objects** window and choose **Video recording...** command. In the **Video settings** window set rendering parameters and click **Record...** button.

13.1 Creating a Grid

The  **Grid** tool is used to create a regular grid with indexed cells.

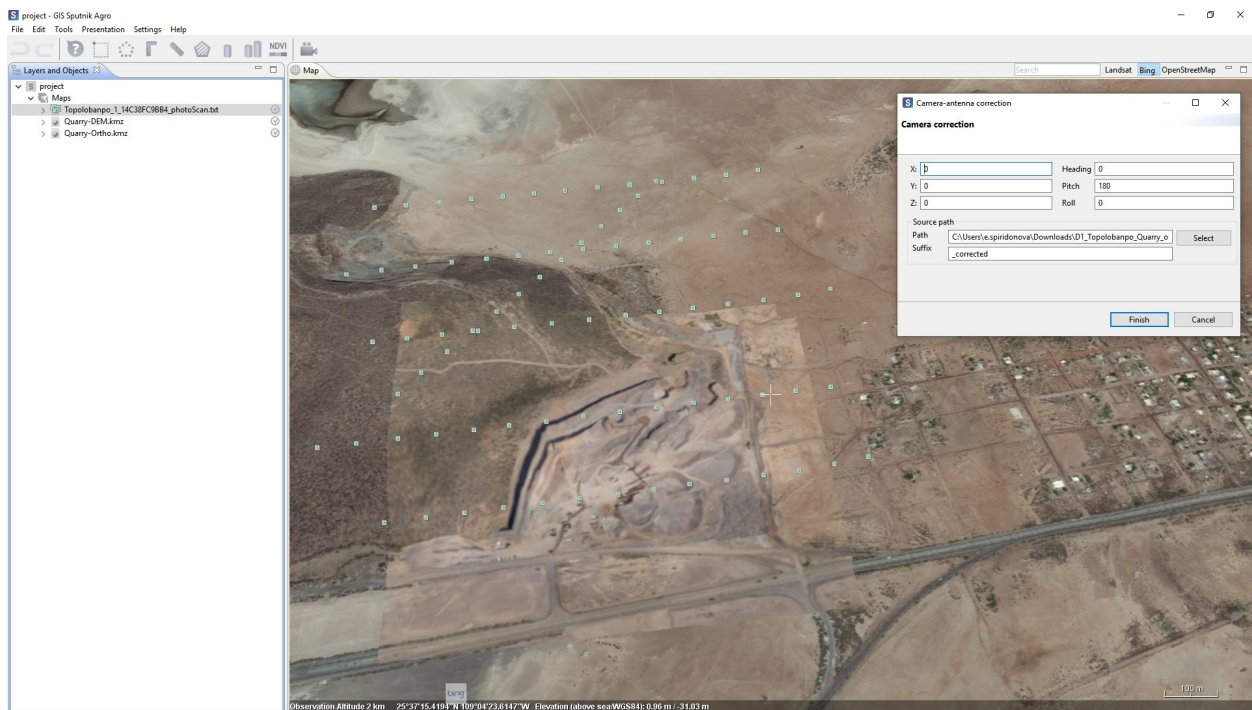
To create a grid in the **Layers and objects** window, select *.kml file containing a polygon bounding region for the grid. Select **Create grid** from **Tools** menu. In the dialog box, set the grid size in kilometers. Specify the path to save the result and press **OK**.



Note: To select several squares from the grid, hold down the **Ctrl** key and then click the square in the grid one by one.

13.2 Camera-antenna correction

The program Sputnik Agro has the ability to correct the distance between the antenna and the onboard GPS receiver UAV. For correction, add a text document with the coordinates of the photo centers. In the **Tools** section, select **Camera-antenna correction**. Camera-antenna correction is also available in the context menu of the file. In the **Map** window that appears, specify the necessary correction parameters.

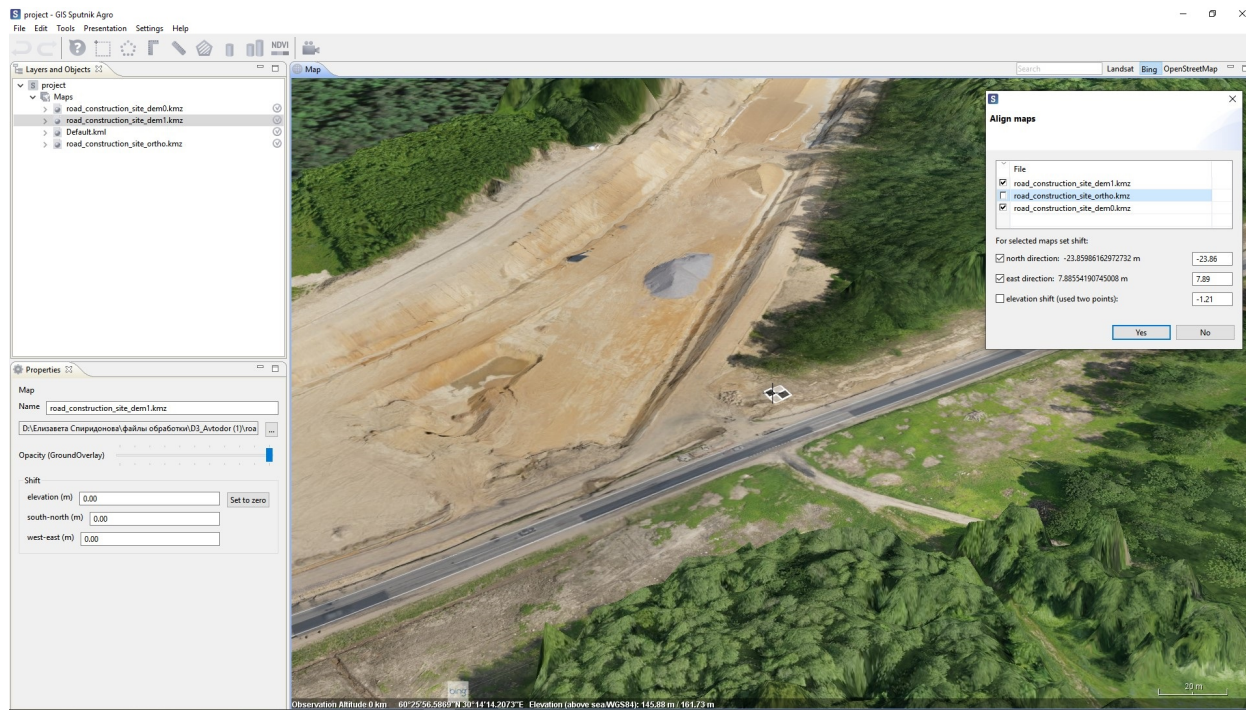


Important: the **Suffix** is added automatically by the program, if it does not appear, use **_corrected**.

13.3 Align maps

In the Sputnik Agro program, a tool for **Align maps** relative to each other is implemented. You need to load orthophotos into the **Map** window. In the **Tools** menu, select **Align maps**.

In the **Layers and objects** window, click one of the orthophotos, then select a point on the **Map** and click the left mouse button, a marker in the form of a red point appears, select the corresponding point on the second orthophotos. After that, the shift of the second card will be calculated and it will be shifted to the required distance.



Note: You can shift the orthophoto in the **Properties** window of the selected orthophoto. Shift parameters can be set: by height, by direction (South-North and West-East).

Working with Altum, Sequoia and RedEdge cameras

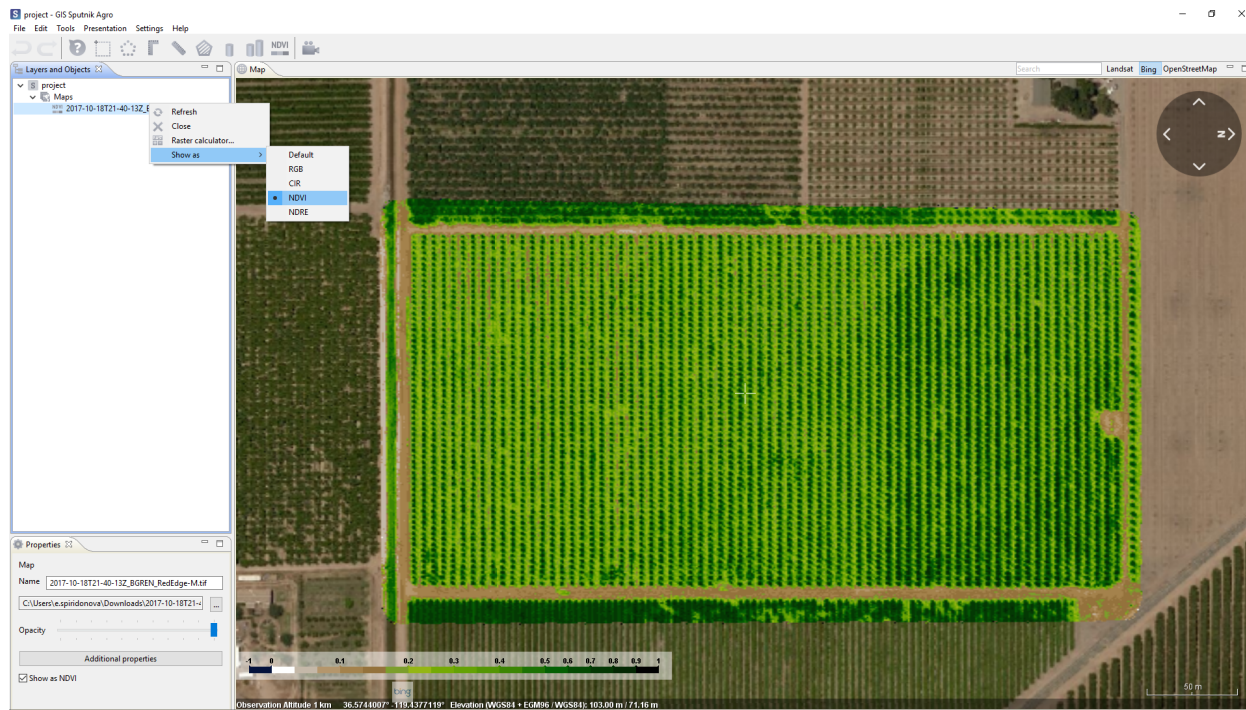
For multiband rasters obtained by photogrammetric processing of data from Altum, Sequoia and RedEdge cameras, visualization presets are available.

There are several types of raster display for each camera:

Camera type	Raster display modes
Sequoia	CIR, NDVI, NDRE
RedEdge	RGB, CIR, NDVI, NDRE
Altum	CIR, NDVI, NDRE

In the **Visualization** tab, You can set the camera type by selecting the appropriate option from the drop-down list. To display the image according to the selected camera format, press **Apply**.

In the context menu of the raster in the **Layers and objects** window, select **Show as** and according to the camera type, the options described above will be offered.



15.1 Optimisation and re-projection

To speed up the rendering of raster maps in *.tiff format needs to optimize them. In some cases you may need also to reproject raster map into other coordinate reference system.

To optimise or reproject raster map chose **Raster map** command from **Import** submenu of **File** menu. In **Import raster map** window select the raster or several rasters and click **Next** button. Check the *Optimize* box for optimisation. To reproject raster map into other coordinate system double click on it, in the **Coordinate systems** window select one of available coordinate systems and click **OK** button. To finish import procedure, click **OK** button.

15.2 Visualistaion

Sputnik Agro provides several visualisation modes for raster maps: single band, multiband, color palette. Default visualisation mode depends on raster map type:

Map type	Number of channels	Stored value type	The default display
Multispectral images	> 3	int	the image in the natural or pseudo color
RGB raster maps	3	int	the image in the natural color
Height map (DEM/DSM)	1	float	relief
Other single-band rasters	1	float	relief
Other single-band rasters	1	int	monochrome image

To change raster map visualisation mode click **Additional properties** in the **Properties** window. In the **Additional properties** window switch to **Visualisation** tab and set up visualisation mode.

The program supports pre-configured visualization modes of Altum, Sequoia and Red Edge multispectral cameras. For more information, see **Working with Altum, Sequoia and RedEdge cameras**

15.2.1 Single band mode

Single band mode is a default mode for 1 or 2 bands raster maps. You may set up which band will be visualised in the **Map** window.

This mode is the **default** mode for displaying single-band rasters when file loaded into the program.

To switch to this mode, in the drop-down list **Visualization mode** select **Single-Channel**. In this mode, You can set the Max and Min thresholds of values to display.

Important: This mode can also be used to display a single channel of a multiband raster.

15.2.2 Multyband mode

Multiband mode is a **default** mode for 3 or > 3 bands raster maps. You may set up which bands will be interpreted as Red, Green, Blue bands and visualise raster map in pseudo color mode.

To switch to this mode, in the drop-down list **Visualization mode** select **Multi-Bands**.

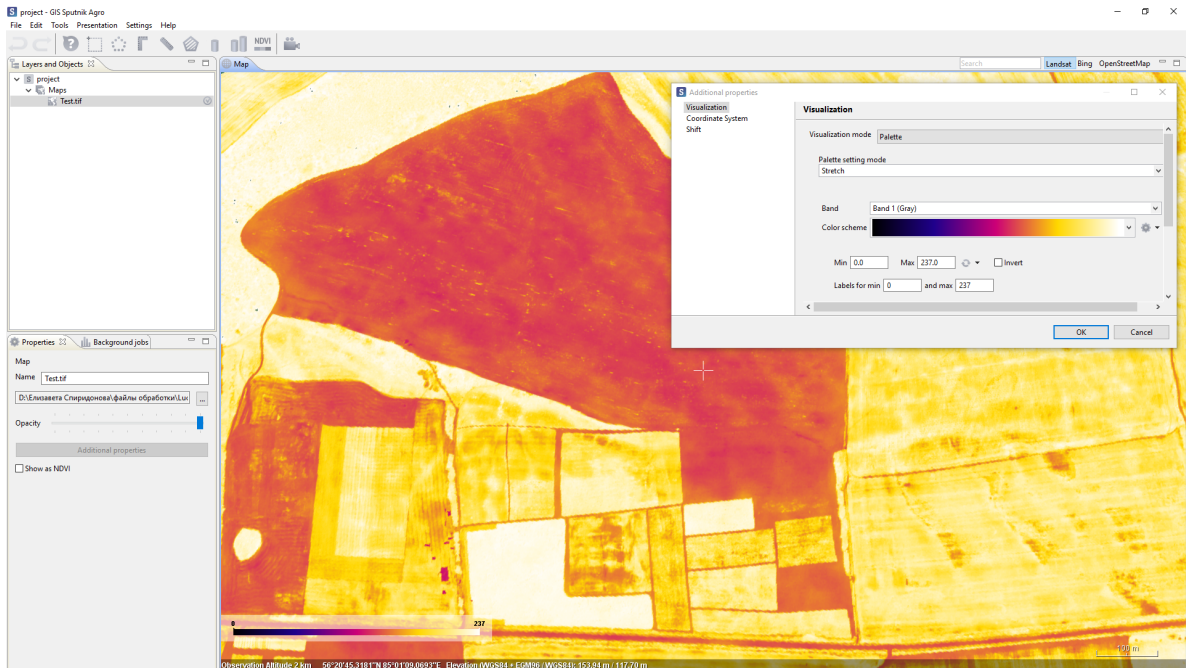
15.2.3 Palettes

Palettes is not a default visualisation mode for any type of raster map. You may use it with any type of raster map to style one of its bands.

There are three palette-setting mode in Sputnik Agro:

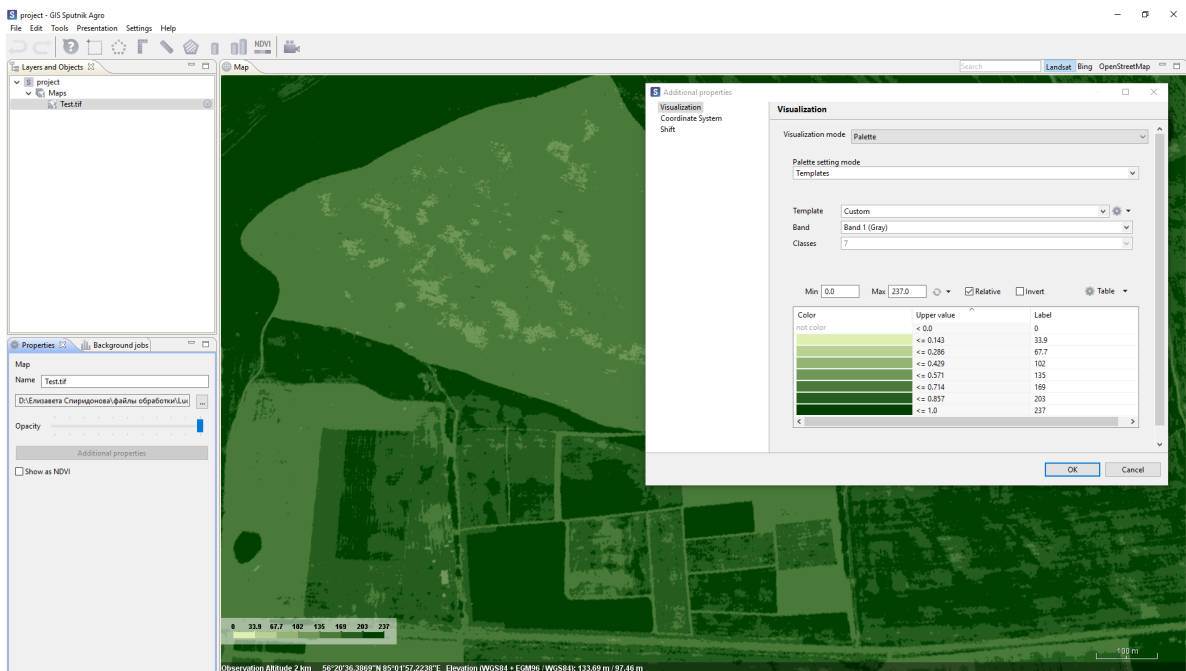
- **Stretch**

Set band, color scheme and additional parameters and click **OK** button to finish. To set off the palette right-click raster map in the **Layers and objects** window and chose **Default** command from **Show as** menu.



- **Classify**

Select band, number of classes and color scheme. Set additional parameters and click **OK** button to finish. Check *Relative* box to translate the raster values to relative mode (from 0 to 1). If raster has a float type values, it will be interpreted as elevation model. Check *Hide elevation* box to interpret raster map as image.

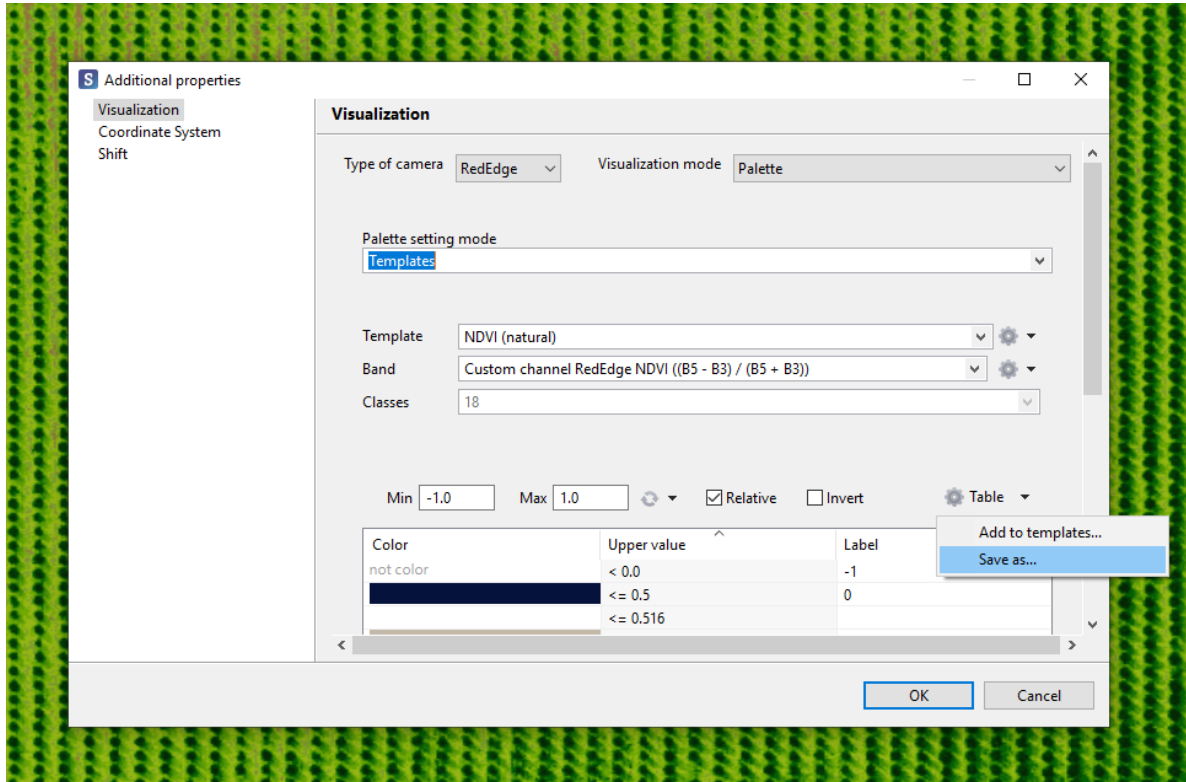


- **Templates**

You can create or load templates. To create templates, click **Table** and select **Add to templates...**. The file will be added to the list of existing templates.

To load palette in the **Template** section, select **Load...** from the context menu. The added palette





can be edited and saved to a new file. Select the **Save as...** in the context menu of the section **Table**.



16.1 Geometry creation

Sputnik Agro allows to perform basic edit operations for *.kml files. To create new *.kml file choose **KML** command from **New** submenu of **File** menu.

New *.kml file will be opened in edit mode. When edit mode for *.kml file activated a set of specific tools appears in the toolbar:

Icon	Tool
	Create Point
	Create line
	Create ring
	Create polygon

16.2 Editing

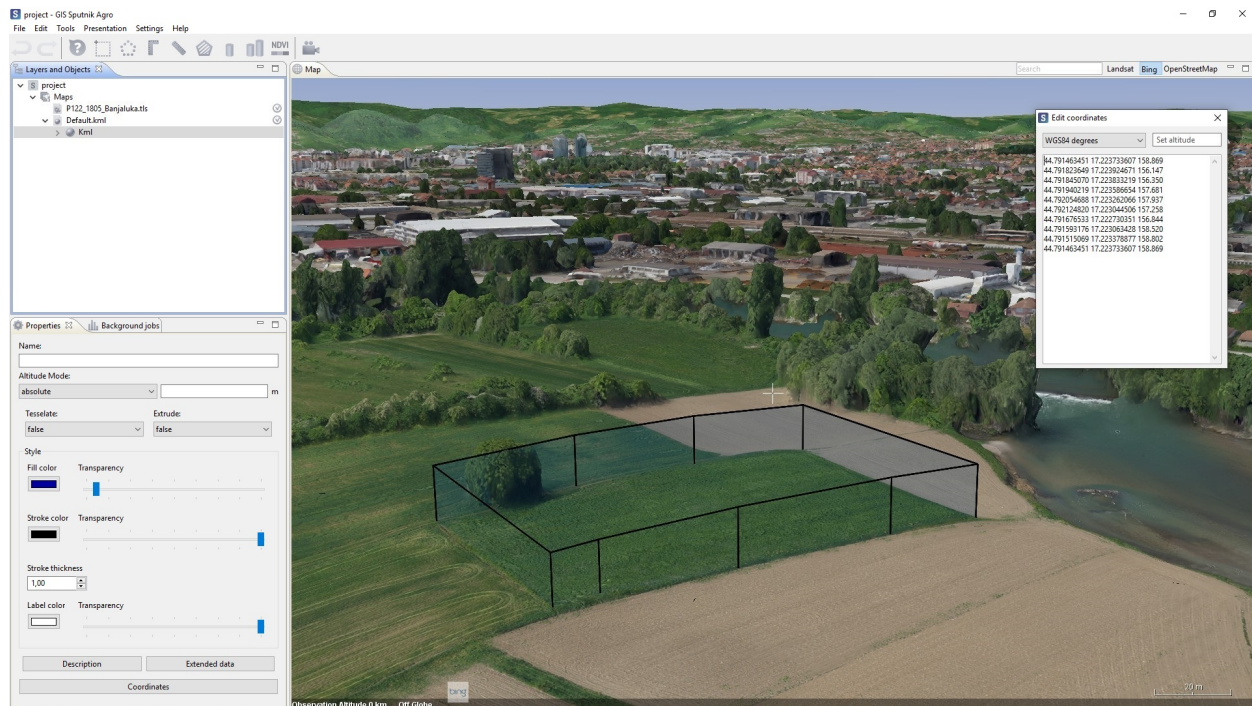
To open *.kml in edit mode select it in the **Layers and objects** window and choose **Open editor** command from context menu.

To edit geomtry node, click left mouse button on it in the **Map** window and drag.

To edit coordinates of geometry manually, select it and choose **Edit coordinates..** command from context menu.

In **Edit coordinate** dialog box it is available to:

- change separated node coordinates
- set the elevation for all geometry nodes
- set the coordinate representation mode



16.3 Style

To configure geometry style, select it in the **Layers and objects** window and configure style properties in the **Properties** window.

When several geometries are selected, you can configure common style for all selected geometries.

When folder or multigeometry is selected, you can configure common style for all geometries inside folder or multigeometry.

16.4 Geometry visualisation properties

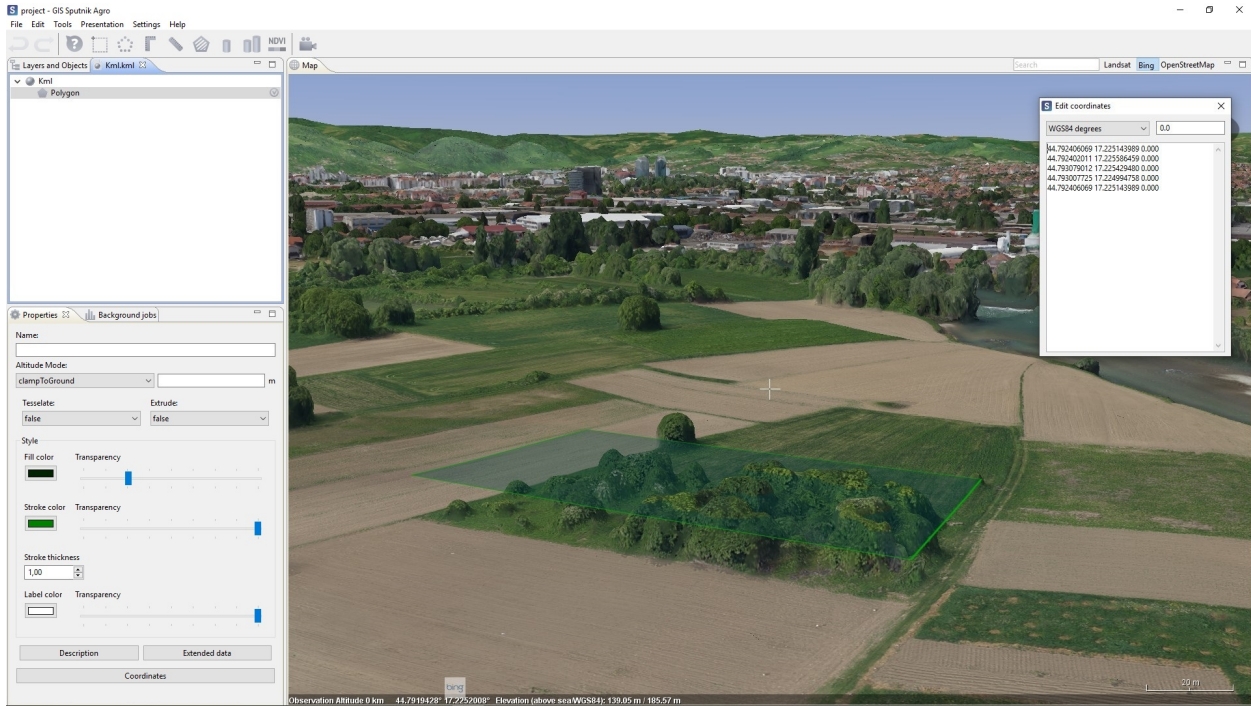
Sputnik Agro tools allow to draw 2D and 3D geometry objects.

Three altitude modes for geometries are available:

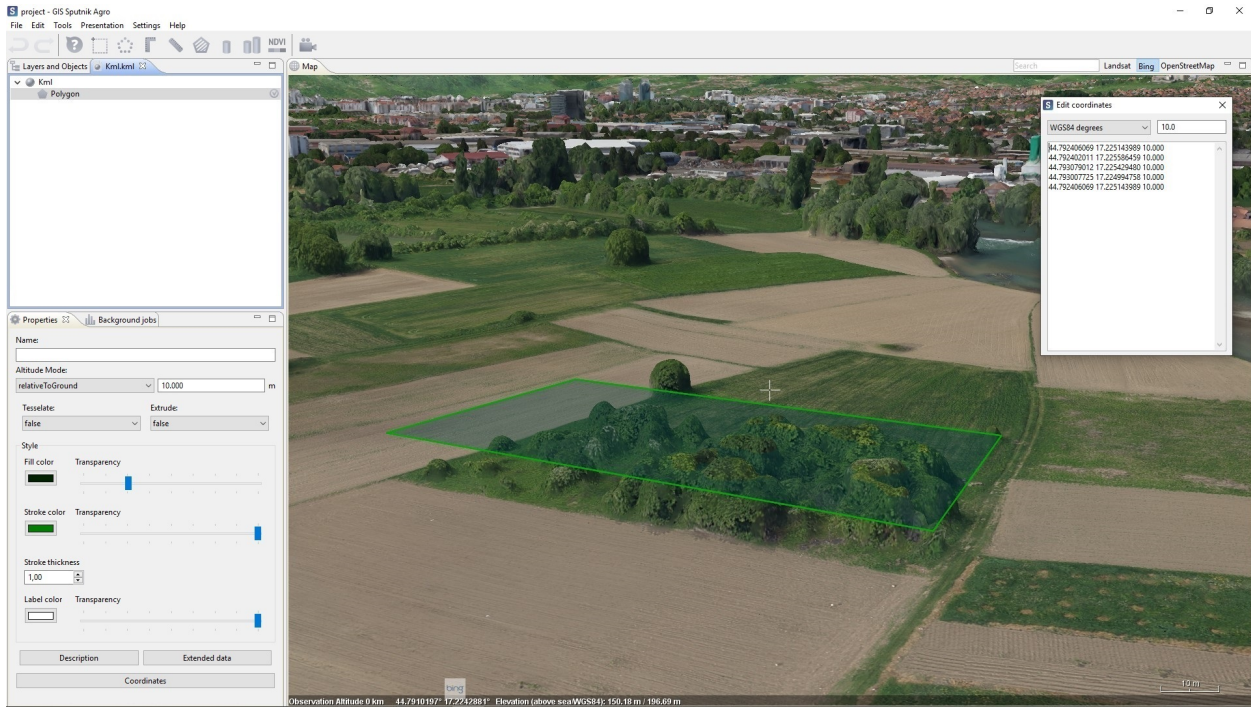
- clampToGround / clampToSeaFloor;
- relativeToGround / relativeToSeaFloor ;
- absolute.

Default mode for geometry objects is clampToGround.

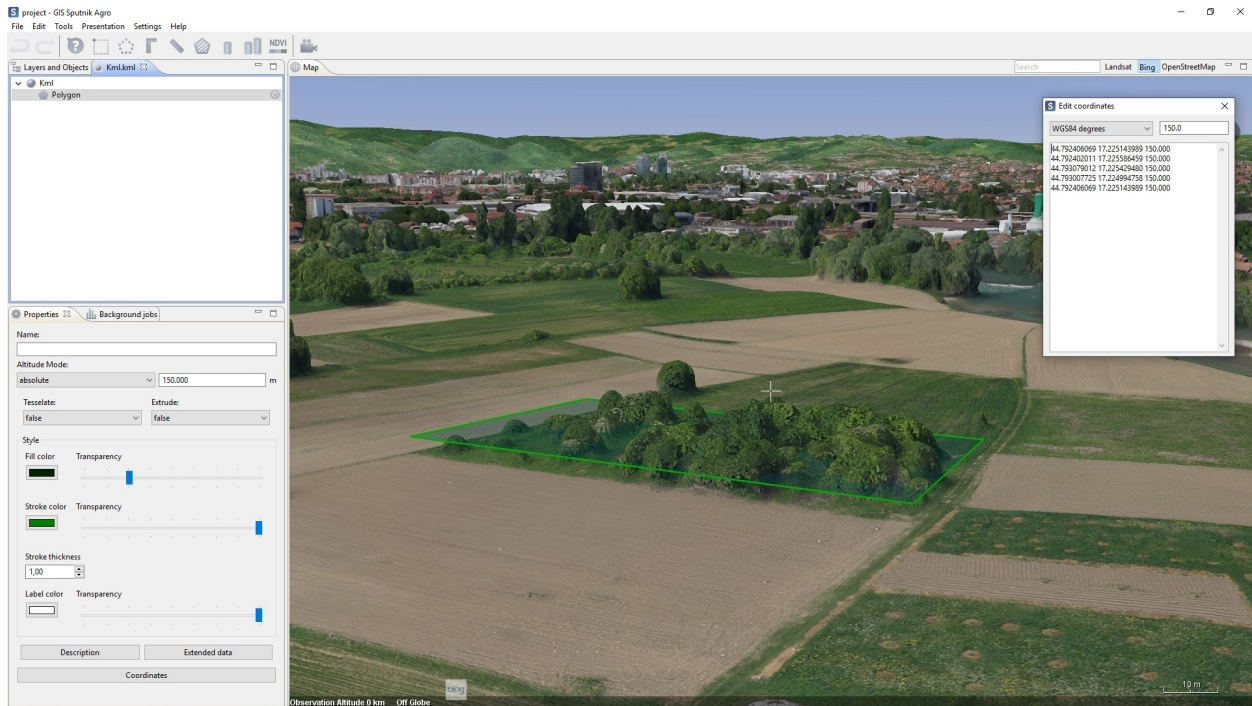
Example: clampToGround mode



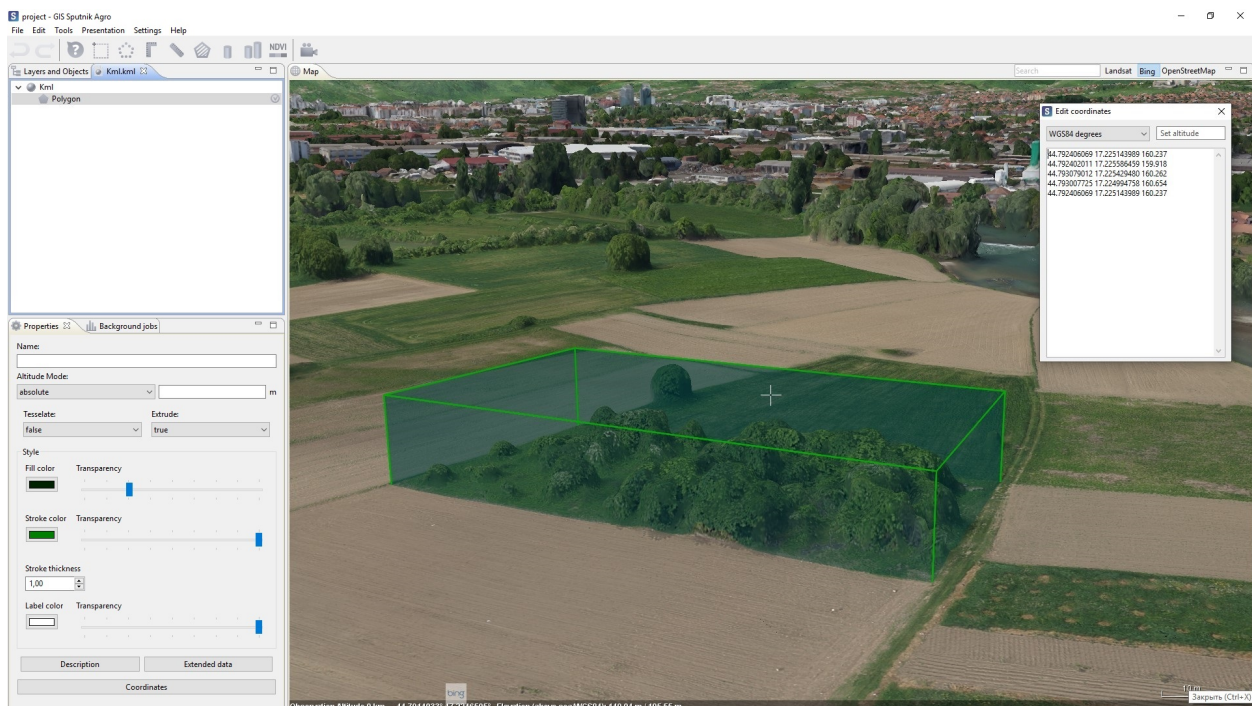
Example: relativeToGround mode



Example: absolute mode



To create 3D geometry objects (only available in absolute or relativeToGround mode) switch extrude mode. To switch extrude mode of geometry object, choose **Change extrude property** in its context menu.



16.5 Geometry operation

Sputnik Agro has a wide range of tools to convert between different types of geometry and perform boolean operations on two or more polygons.

Select two or more polygons in the **Layers and Objects** window or in the 3D map window, then call the context menu by clicking right mouse button. You can perform the following operations:

Union – polygons dissolve into one polygon or, if there are no common points, become a multigeometry feature. Intersect - only the common points are copied to the resulting polygon(s). Difference – the common points of the polygon(s) are subtracted from the first selected polygon. Symmetrical difference – only the non-common points are copied to the resulting polygon(s).

It is possible to transform geometry objects from one type to another:

	from point	from lines	from ring	from polygon
Create points		+	+	+
Create line	+		-	-
Create ring	+	+		-
Create polygon	+	+	+	

To transform geometry objects form one type to another, select two or more objects in the **Layers and Objects** window and choose one of available transformations in its context menu.

To create buffer, select geometry and choose **Create buffer** command from its context menu.

16.6 Export

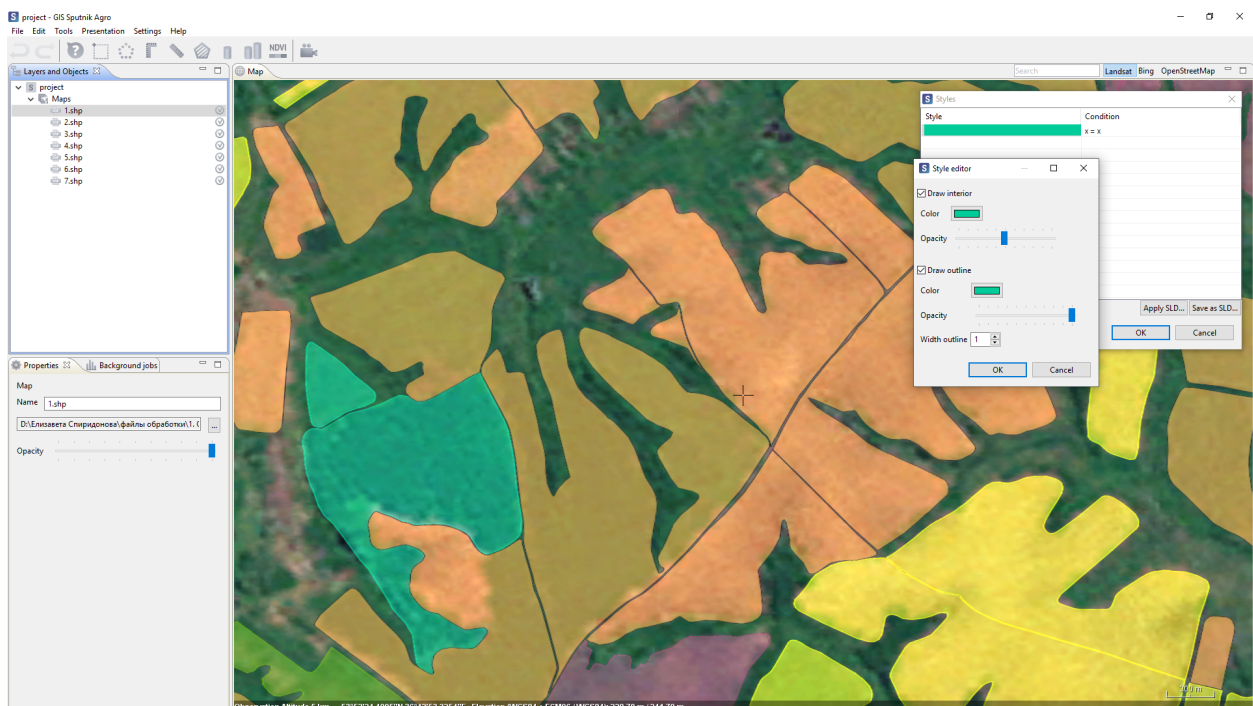
It is available to export *.kml file into *.dxf and *.shp formats for futher usage in GIS and CAD applications. To export *.kml file to *.dxf or *.shp choose **Save as** command from its context menu. In the **Save** dialog box select name, format, and directory for output file. You can use *.prj file to set custom CRS for the output *.dxf or *.shp file file.

When you export *.kml file containing more than one geometry type into *.shp fromat, select geometry types you would like to export. Each geometry type will be exported in separated *.shp file. You can create dictionary for attributes names. Click settings in the **Export Kml to ShapeFile** dialog box, set up names for output attributes in the Conformity column and click **Save** dictionary. To use the dictionary created earlier, click **Apply** dictionary.

CHAPTER 17

Shapefiles tools

Sputnik Agro support importing and visualisation of *.shp file and exporting *.kml files into *.shp format. Know more about exporting *.kml file into *.shp in *KML tools* chapter. To open *.shp select **File > Open > File....** In the dialog box, specify the file type - *.shp. The file appears in the **Map** window.



17.1 Viewing attributes

To view *.shp file table of attributes right-click it and choose **Show attributes**. To switch between pages of attributes table use **Previous** and **Next** buttons.

17.2 Setting styles

To set up styles for *.shp file, right-click it and choose **Shapes style...** command. In the **Shapes style...** window you may apply *.sld file to *.shp file. To apply *.sld file right-click on *.shp file in the **Layers and objects** window and choose **Shapes style...**, in the **Styles** window click **Apply SLD...** button and select proper *.sld.

To change style for condition, double-click on it in the **Styles** window and set up new style in the **Style editor** window. To save new *.sld file, use **Save as SLD** button in the **Styles** window.

Note that the format specification is *.shp implies strict typing of the file by geometry type, different styles are applied to different types of layers:

Layers	Available style	Available style	Available style
Points	Marker thickness	Marker color	•
Lines	Line thickness	Line color	•
Lines	Stroke thickness	Stroke color	Fill color

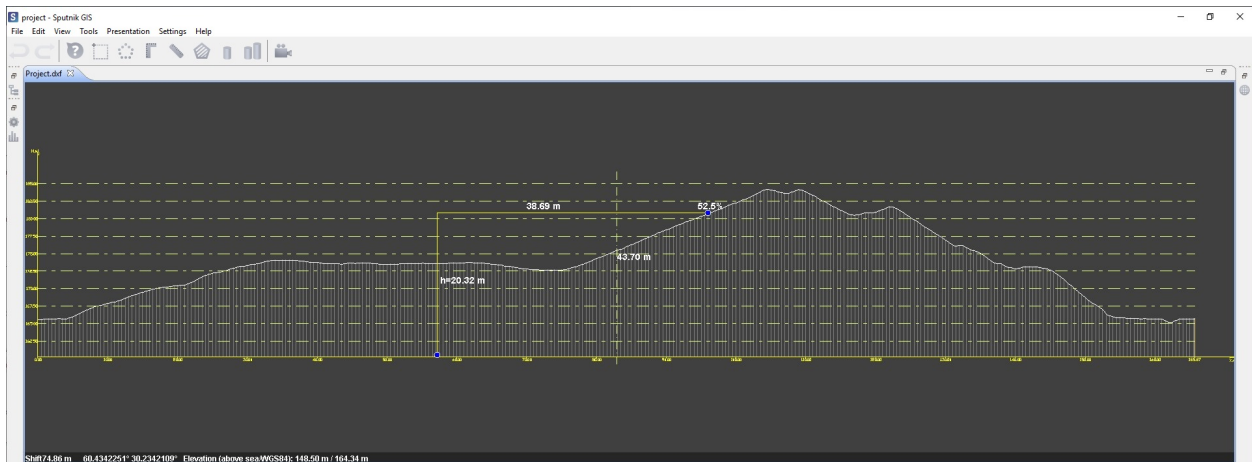
CHAPTER 18

Drawings tools

Spuntik Agro support generation of *.dxf files and it's visualisation in 2D **Drawing viewer**.

You can export to *.dxf format any *.kml file, also such tools as: sections, cross sections, compare sections, TIN model create output in *.dxf format. To import *.dxf into Spuntik Agro choose **File** command from **Open** submenu of **File** menu. To open drawing in **Drawing viewer** double left-click on it in the **Layers and objects** window.

You can perform measurements in **Drawing viewer** using corner ruller  .




CHAPTER 19

WMS/WMTS services

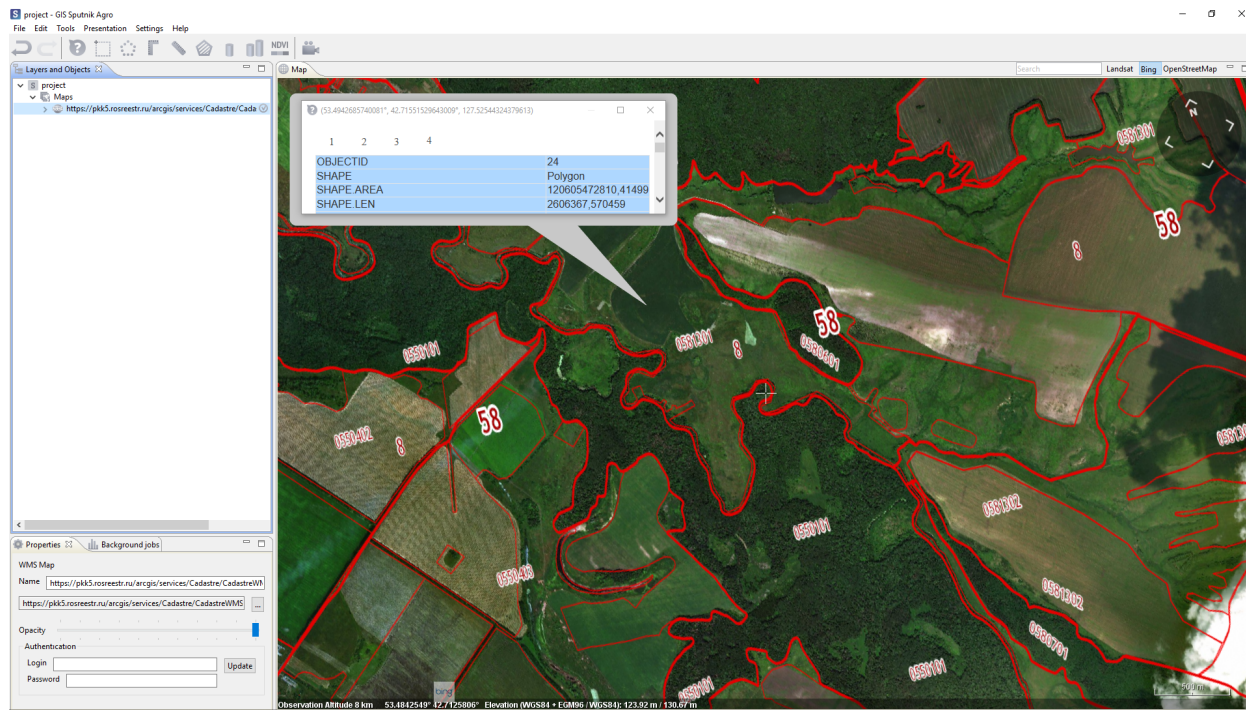
WMS - Web Map Service

WMTS - Web Map Tile Service

To import WMS or WMTS map choose **WMS/WMTS..** command from **Import** submenu of **File** menu. In the **Import Web Map** dialog box set up the *url* and *Authentication* parameters if needed and click **Next** button. Than select needed layers and click **Finish** button.

It is available to get feature info from WMS/WMTS maps imported. To do that use  tool on interested feature.

Due to WMTS support, you can use your own tile surfaces, created with Mapbox service. To sue your Mapbox tile surface, copy its link and paste it to URL-string in **Web map import** window.

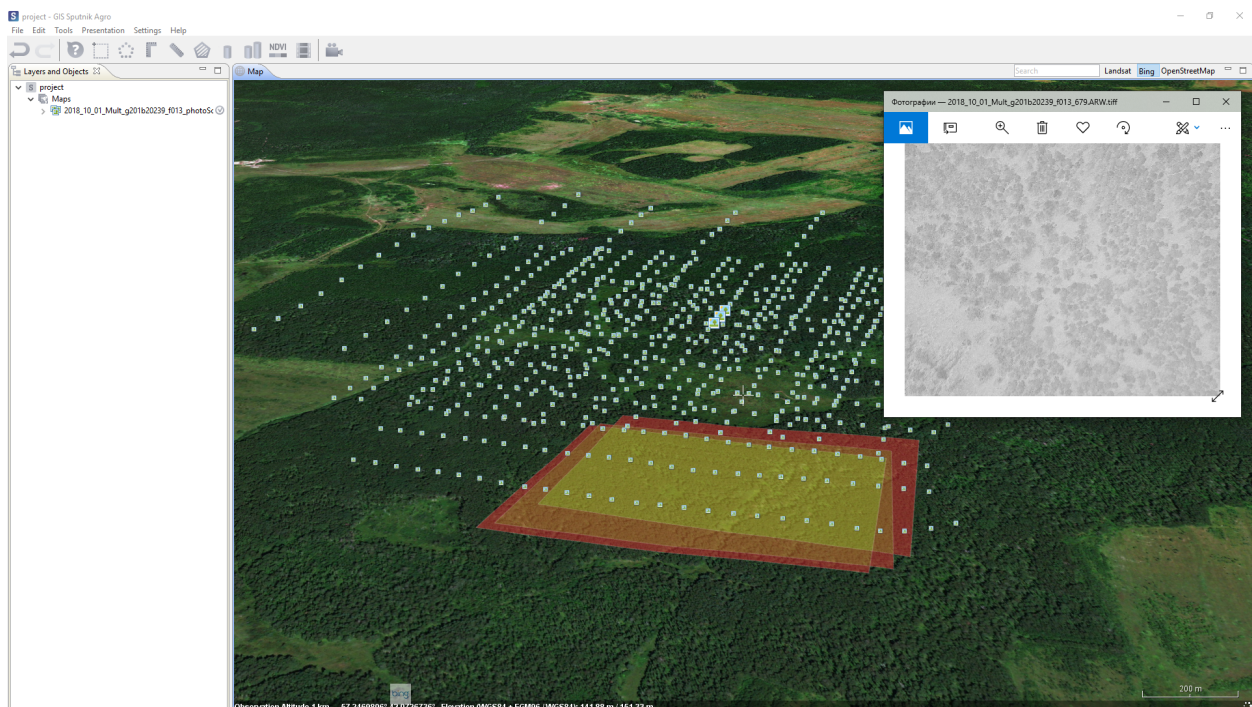


Working with UAV telemetry files

20.1 Aerial survey

Sputnik Agro provides number of tools for aerial survey raw data analysis. To work with raw aerial survey data you need to have images and *.txt file containing UAV telemetry in one folder. Image coordinates should be in WGS 84 CRS.

To start working with aerial survey choose **File** command from **Open** submenu of **File** menu and select telemetry file in *.txt, *.tel.



20.2 Agisoft Photoscan/Metashape project creation

To create Agisoft Metashape project from aerial survey raw data right-click telemetry file in the **Layers and objects** window and choose **Create Photoscan project**.

Coordinate reference systems

In Sputnik Agro it is available to set up coordinate reference system for current project. All data in the project transformes to project coordinate reference system on the fly.

To set up project coordinate reference system choose one from **Coordinate system** submenu of the **Settings** menu. To set up custom CRS, choose **Custom CRS** command from **Coordinate system** submenu of the **Settings** menu. In **Choose CRS** dialog box, choose one of available CRS and click **OK**. To add custom CRS to the list of available CRS, click **Load new PRG** button, in the **Load new PRJ file** dialog box select file and set CRS name, click **OK**.

Note: If you import raster map without CRS information in it's metadata, or in case CRS information in metadata is wrong you can set CRS for raster map manually in it's proprties window. In **Properties** window click **Additional properties** button, in dialog box switch to the **Coordinate system** tab and set up CRS for raster map.

CHAPTER 22

Preferences

Select **Settings > Preferences** in main menu. In this window, you can configure a number of user parameters to improve the interaction with the program.

Parameters	Descriptions
Cache	is a folder for temporary data in the file system
Coordinate Systems	
DXF	this page is for configuring DXF vector images (*.dxf)
Error Reporting	setting up error reporting
Interface	general interface settings. Setup single object dragging and location format
KML	setting up creation, viewing and working with *.kml files
NDVI	NDVI tools settings; set the default palette for viewing NDVI maps; Shapefile creation
Photo projections	setting the display of photo
Slope map	set the default palette for the draft Map tool
TLS performance	adjust the balance between performance and display quality *.tls models
Tables	tables settings
Tools	this page is for configuring tools
Usage reporting	enable/disable the usage reporting of the Software

23.1 Installation errors

The most probable cause of errors that appear during Sputnik Agro installation is a lack of administrator privileges.

In case the error appears:

1. Abort the installation
2. Check whether you have sufficient level of administrator privileges
3. Run installation again

23.2 Startup errors

Startup errors occur because of licencing issues.

Follow these steps:

1. Check whether hardware key (USB dongle) is installed properly on the local PC or on the Licence Server
2. In case software key is used, check if the HASP driver is installed properly

Read more about license driver issues in chapter Administration.

23.3 Runtime errors

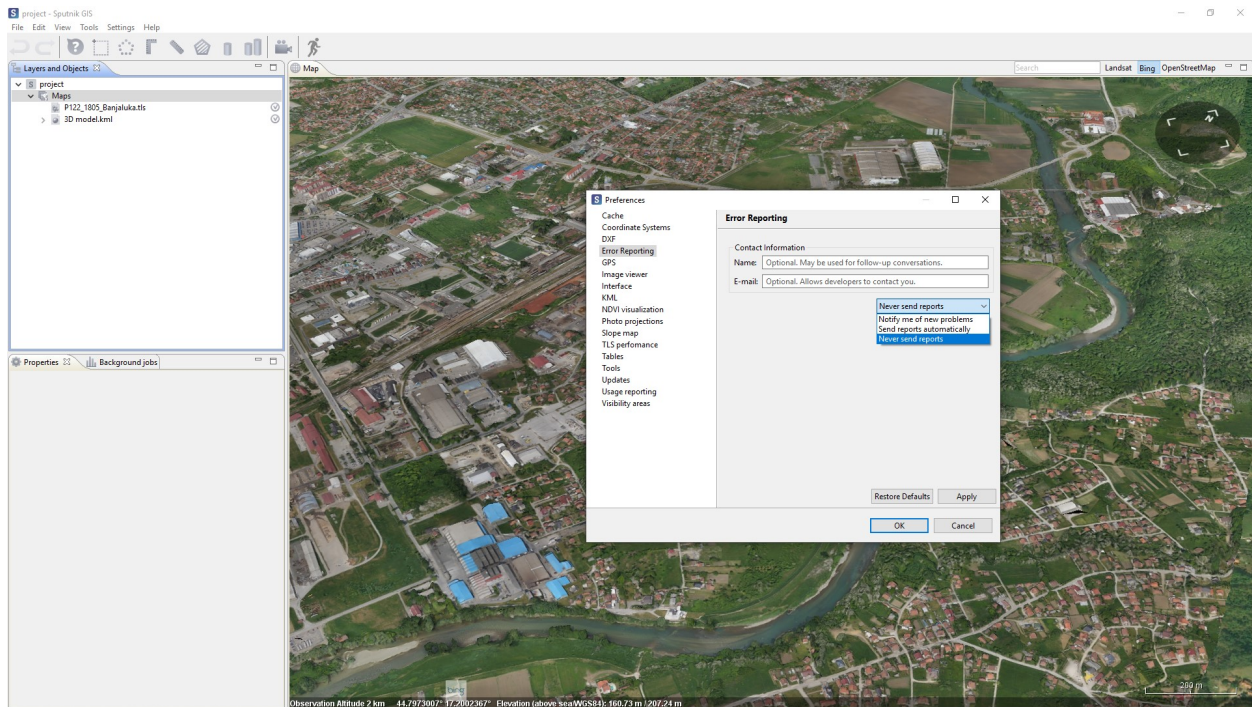
Two types of errors can occur during runtime:

1. Handled exceptions appear in the bottom right part of 3D Map window;
2. Unhandled exceptions appear in a separate window.

In case of handled exception occur the message box with instructions will appear in the bottom right part of **Map** window.

In this of unhandled exceptions, please click on Send report button and write a short message to describe a sequence of actions performed before the error has appeared. It will take some time to analyze your report and to update Sputnik Agro.

Important: You also can setup automated report sending or disable it. Go to **Settings > Preferences...** enter contact information and select one of available options for error reporting.



We appreciate your help. You are helping us to make **Sputnik Agro** perfect!

To configure advanced parameters of Sputnik Agro you need to configure Sputnik.ini file manually. The default path to Sputnik.ini file is: C:\Program Files\GeoScan\Sputnik.

Important: You need to have admin privileges to edit Sputnik.ini file

24.1 Language set up

To change Sputnik Agro GUI language from English to Russian you need to configure Sputnik.ini configuration file.

Open Sputnik.ini file using any text editor and change **-nl** key value from *en* to *ru*, save Sputnik.ini file and restart Sputnik Agro.

24.2 Setting up proxy server

To configure the proxy (for instance, proxy IP address - 127.0.0.1, port - 8080, login - someUserName, password - somePassword) add the following keys:

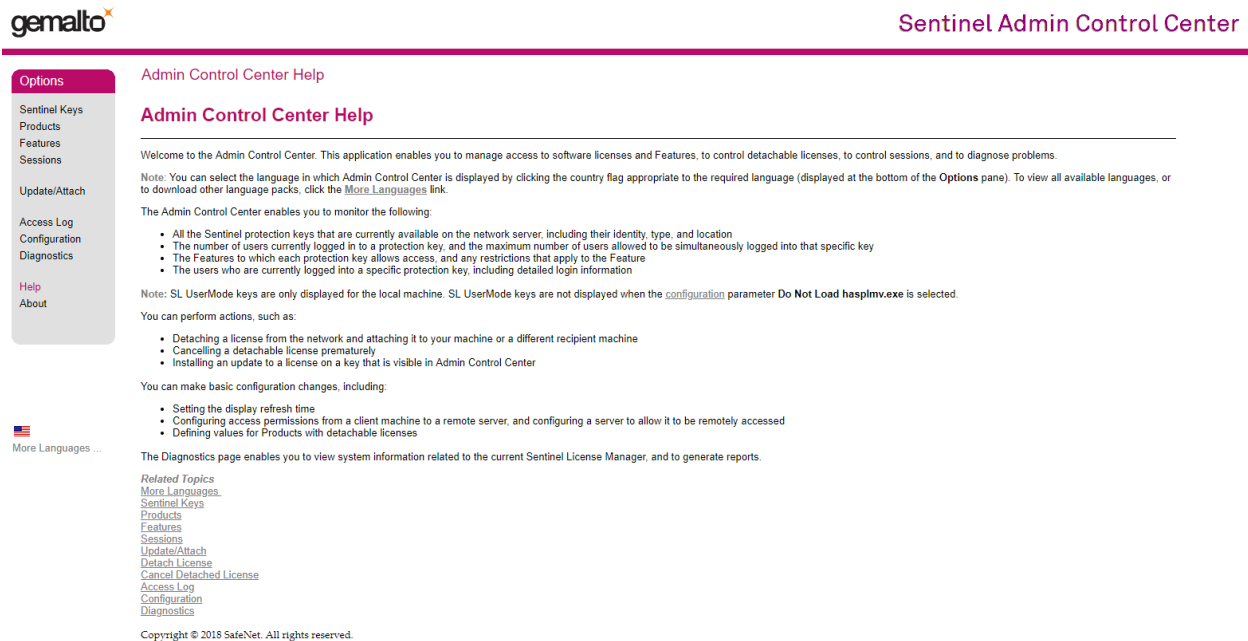
- Dhttp.proxyHost=127.0.0.1
- Dhttp.proxyPort=8080
- Dhttp.proxyUser=someUserName
- Dhttp.proxyPassword=somePassword

24.3 HASP driver check and maintenance

Sputnik Agro uses Sentinel driver as a license manager.

To check if the driver works properly open the browser and open the link: <http://localhost:1947>

If



gemalto Sentinel Admin Control Center

Options Admin Control Center Help

Sentinel Keys
Products
Features
Sessions
Update/Attach
Access Log
Configuration
Diagnostics
Help
About

Admin Control Center Help

Welcome to the Admin Control Center. This application enables you to manage access to software licenses and Features, to control detachable licenses, to control sessions, and to diagnose problems.

Note: You can select the language in which Admin Control Center is displayed by clicking the country flag appropriate to the required language (displayed at the bottom of the Options pane). To view all available languages, or to download other language packs, click the [More Languages](#) link.

The Admin Control Center enables you to monitor the following:

- All the Sentinel protection keys that are currently available on the network server, including their identity, type, and location
- The number of users currently logged in to a protection key, and the maximum number of users allowed to be simultaneously logged into that specific key
- The Features to which each protection key allows access, and any restrictions that apply to the Feature
- The users who are currently logged into a specific protection key, including detailed login information

Note: SL UserMode keys are only displayed for the local machine. SL UserMode keys are not displayed when the `configuration` parameter `Do Not Load hasplmv.exe` is selected.

You can perform actions, such as:

- Detaching a license from the network and attaching it to your machine or a different recipient machine
- Cancelling a detachable license prematurely
- Installing an update to a license on a key that is visible in Admin Control Center

You can make basic configuration changes, including:

- Setting the display refresh time
- Configuring access permissions from a client machine to a remote server, and configuring a server to allow it to be remotely accessed
- Defining values for Products with detachable licenses

The Diagnostics page enables you to view system information related to the current Sentinel License Manager, and to generate reports.

Related Topics
[More Languages](#)
[Sentinel Keys](#)
[Products](#)
[Features](#)
[Sessions](#)
[Update/Attach](#)
[Detach License](#)
[Cancel Detached License](#)
[Access Log](#)
[Configuration](#)
[Diagnostics](#)

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Products page contains the list of the installed Sputnik Agro versions, Features page contains the full list of available license keys and their restrictions (for trial keys).

If the link (<http://localhost:1947>) does not open, please install the driver again:

- Check whether you have an administrator privileges
- Open the installation folder, the default location is: C:\Program Files\GeoScan\Sputnik
- Find and open «hasp» folder
- Press Shift and click the right mouse button. Select «Open Command Window Here» in the context menu.
- Enter `haspdinst.exe -i -kp -fss` into the Command Window and press Enter

After installation is complete, check the link (<http://localhost:1947>) again.

25.1 Sputnik Agro version 1.4

25.1.1 New features

- EPSG CRS base
- User defined CRS support
- Relief editor
- Track animation
- *.shp files support
- Raster calculator
- Multiband raster support
- Band blending for multiband rasters
- Visualiation presets for Altum, Sequoia and RedEdge cameras

25.1.2 Improvements

- Ability to add intermediate edges to polygons/polylines
- GUI for animated tours
- New GUI for *.kml
- Imporved raster maps import master

25.1.3 Bugfixes

- No reloading while moving layers between folders
- Coordinate system parameters are read from file metadata
- The key combination CTRL + A (selection of all objects), works in all text boxes
- Fixed errors arising from the construction of isohyps
- All generated * dxf files are read in AutoCAD and other CAD systems.
- The sky is correctly displayed on the screenshots and rendered videos
- Files with an uppercase extension supported
- There is no error in the absence of access to the project layers
- The trajectory of the animated tour smoothes correctly