Introduction to Agisoft Metashape

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Data collected by J Ramón Arrowsmith

Tutorial notes
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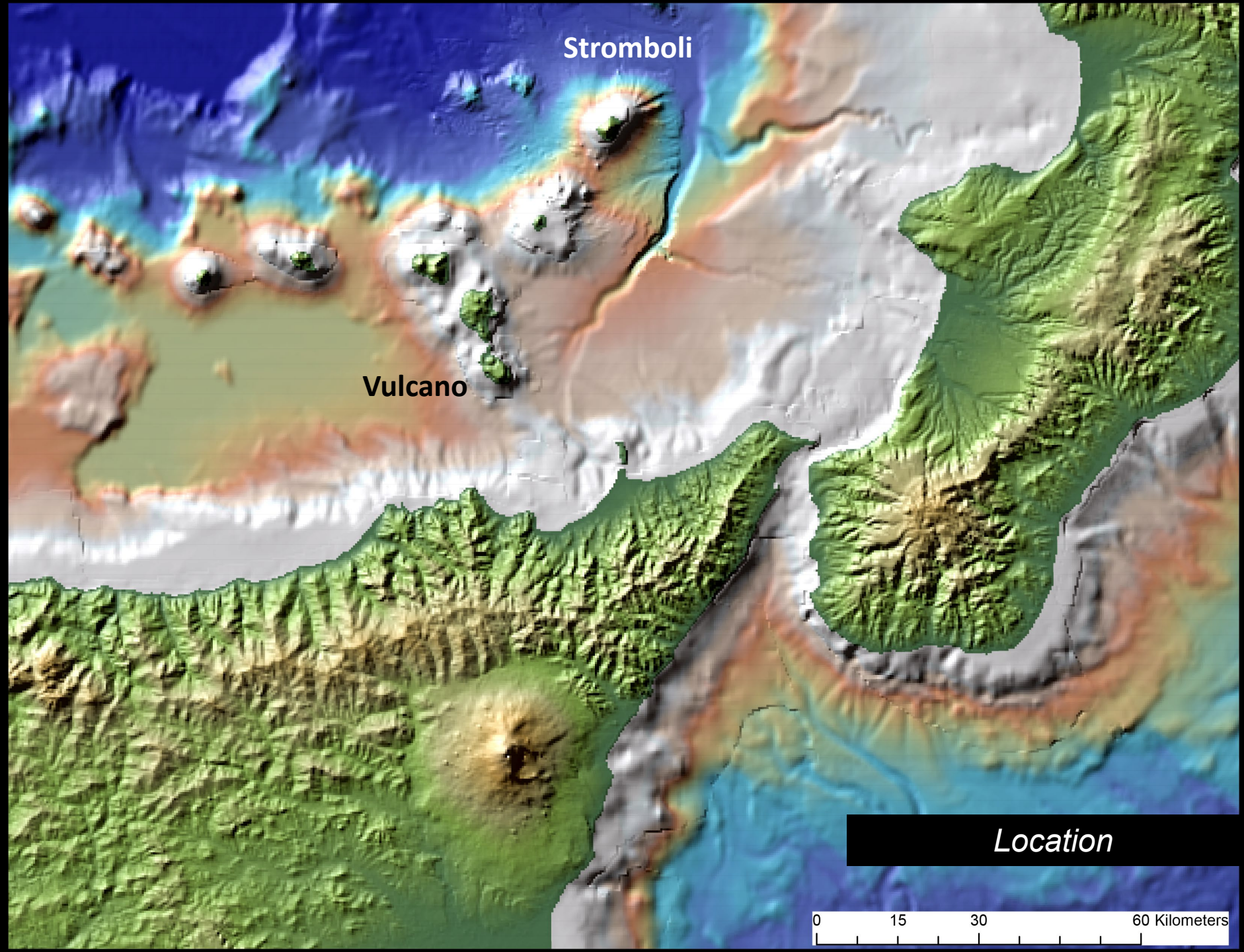
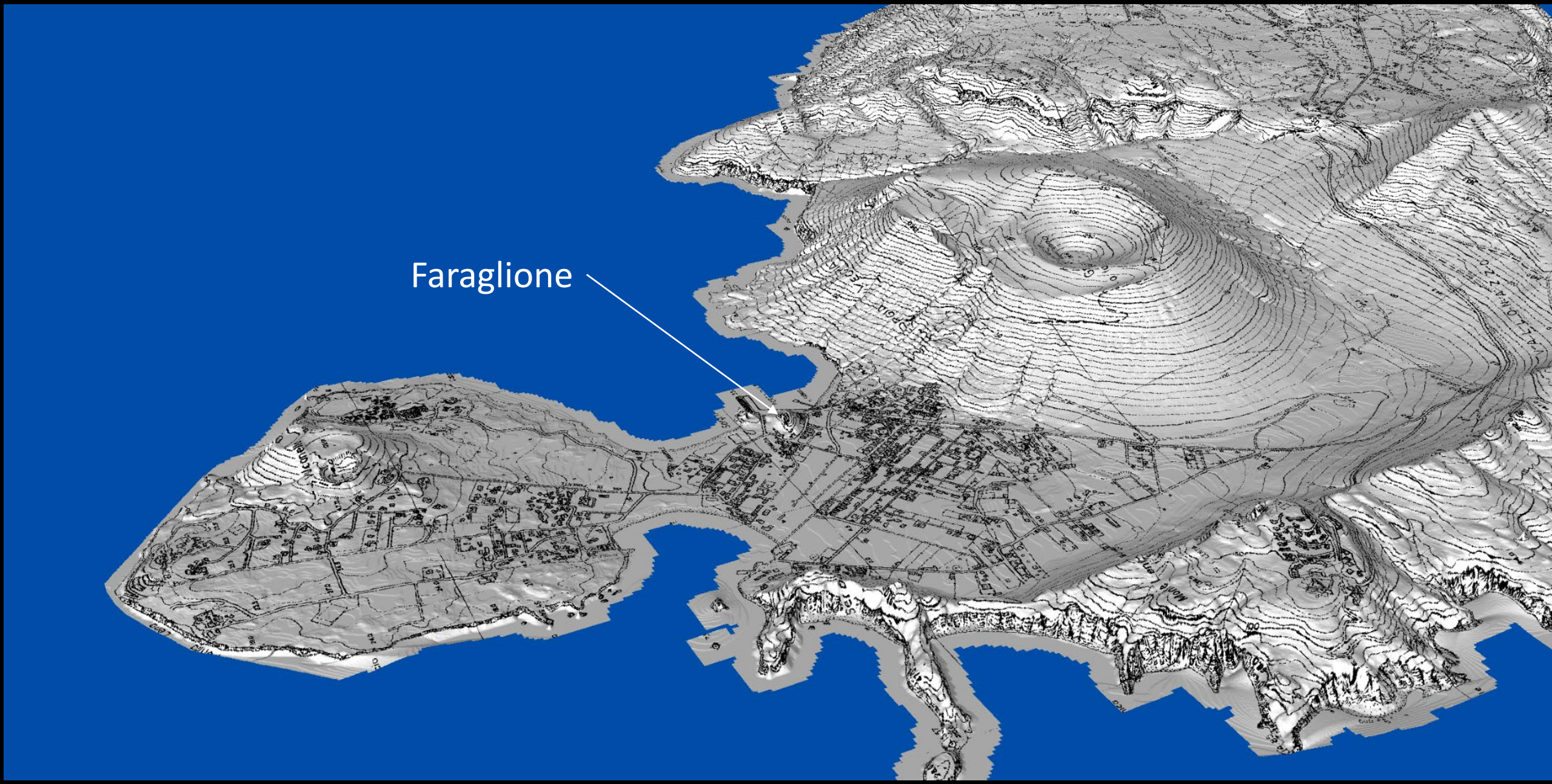
OpenTopography
High-Resolution Topography Data and Tools

Example for the demo is from the Eolian Islands north of Sicily: Vulcano Island




Faraglione

Step 1: Check OT for images/data (image folder provided)

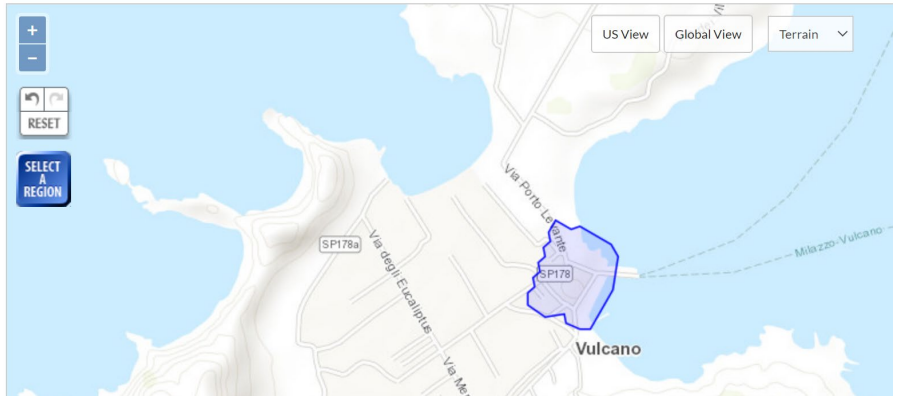
OpenTopography
High-Resolution Topography Data and Tools

HOME

OT Community data space

Find Topography Data

Information and Instructions



RESULTS:

Total 7 datasets found for all data sources.

OT High Resolution Topography [0] | USGS 3DEP Point Cloud [0] | Community Contributed [2] | Global & Regional DEM [5]

Datasets listed below were contributed to OpenTopography by members of our community dataspace. These datasets are not hosted by OpenTopography, but are shown here as a service to our users. For each dataset basic metadata are shown. Click the button to the right of the dataset to access these data. OpenTopography is not responsible for the accessibility of these data.

1 Geomorpho90m - Global High-Resolution Geomorphometric Layers — Get Data

2 2018 Faraglione, Vulcano Island, Sicily, Italy (simple demo) — Get Data

OpenTopography H

Show Data Files

Point Cloud Data

	File Name	Size	Points	Area (m^2)	Density
1	20181029_Faraglione_for_OT.laz	171.30 MB	17,314,196	68,688	252.07

Raster Data

	File Name	Size	Resolution	Dimensions	Layer Type
1	20181029_Faraglione_for_OT_DEM.tif	80.93 MB	0.06 meter	4848 x 5458	

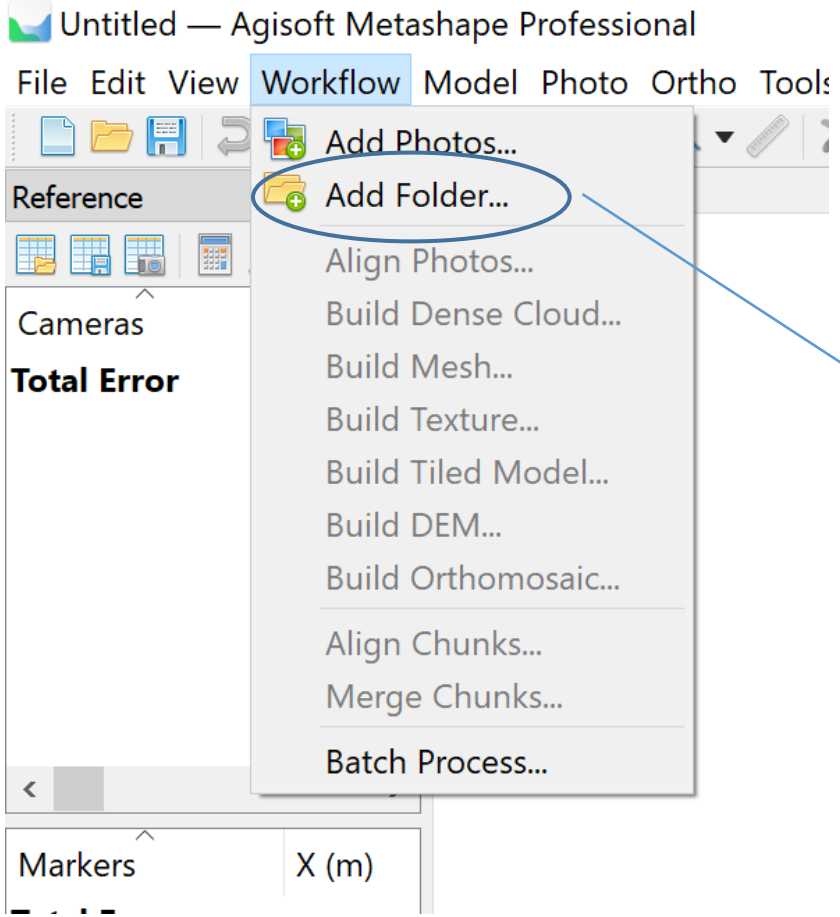
Images Files

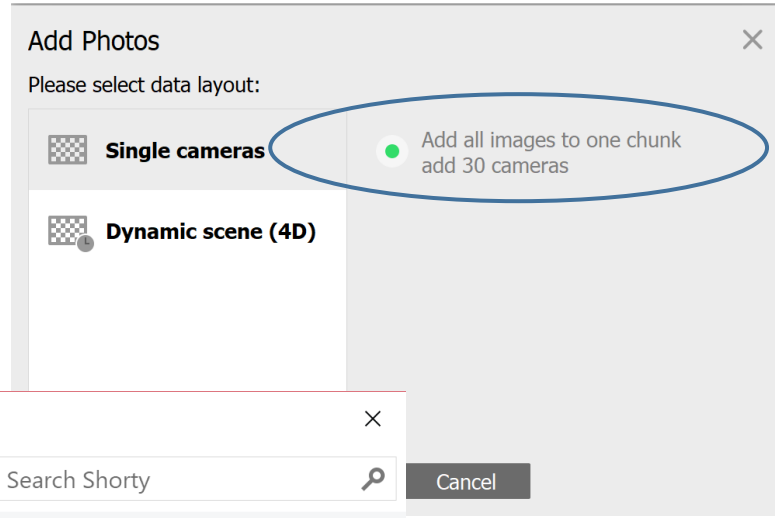
	File Name	Size	Dimensions
1	DJI_0917.JPG	8.29 MB	5472 x 3648
2	DJI_0921.JPG	7.98 MB	5472 x 3648
3	DJI_0925.JPG	8.33 MB	5472 x 3648
4	DJI_0929.JPG	7.92 MB	5472 x 3648

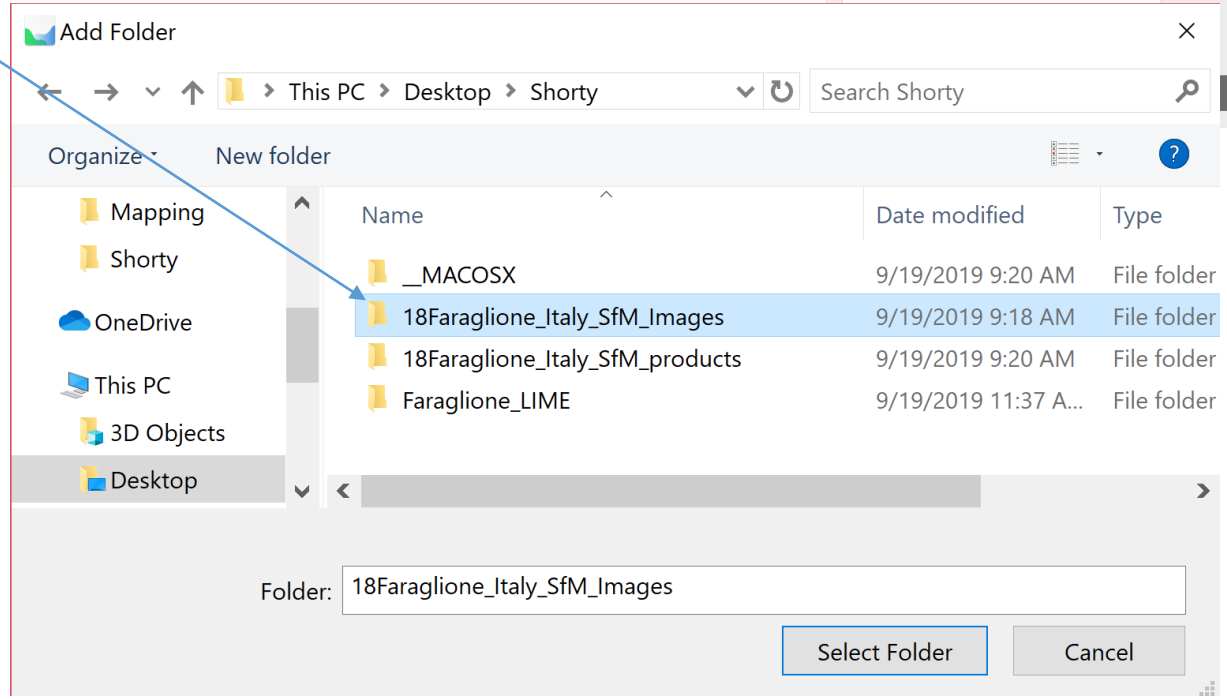
Photos are here

For the demo, we zipped the photos: see link on course page

Step 1: Add Folder of photos

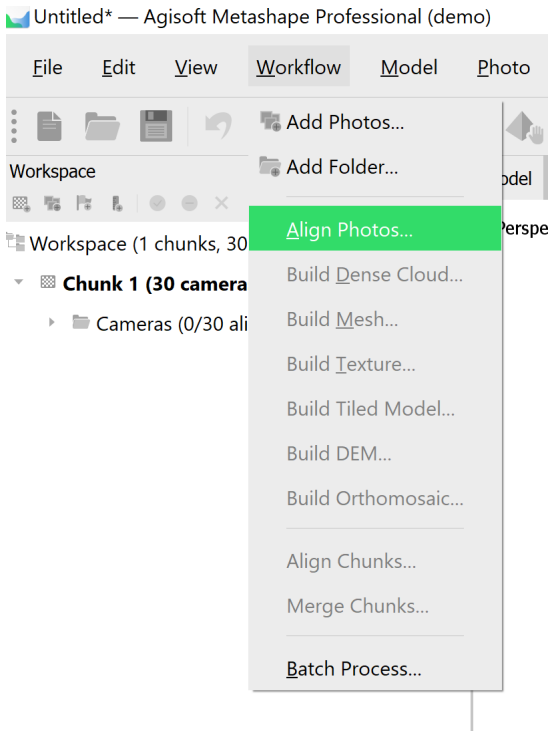






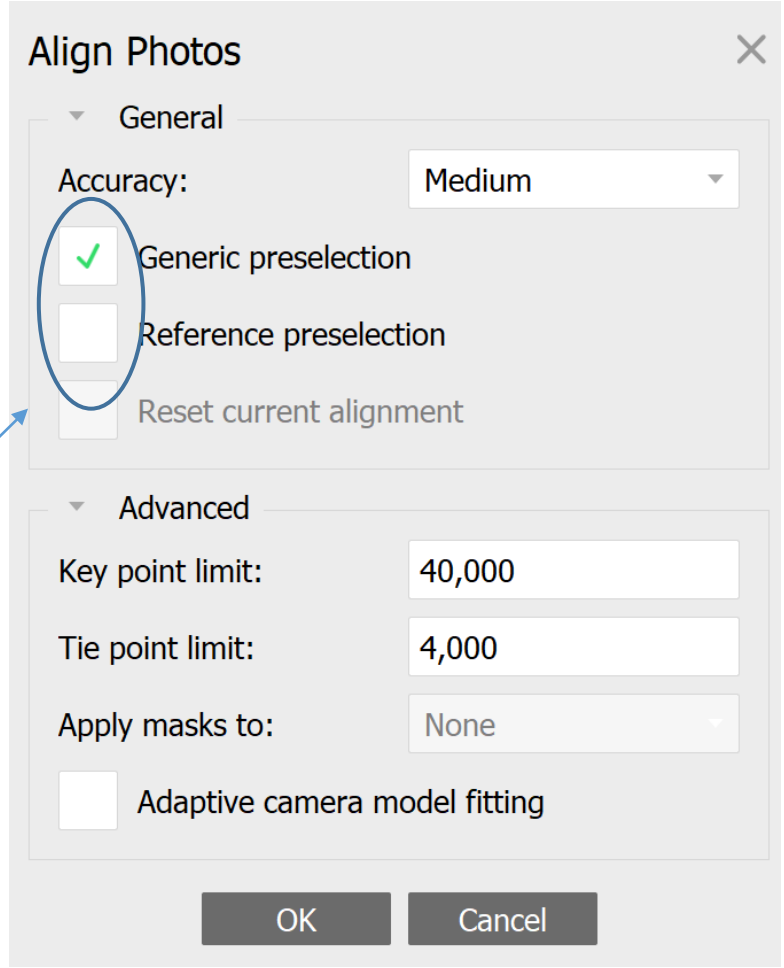
Step 2: Align photos (=SIFT plus Structure from Motion)

Most processing steps are located in the “Workflow” tab. A job can be batched or each step processed individually



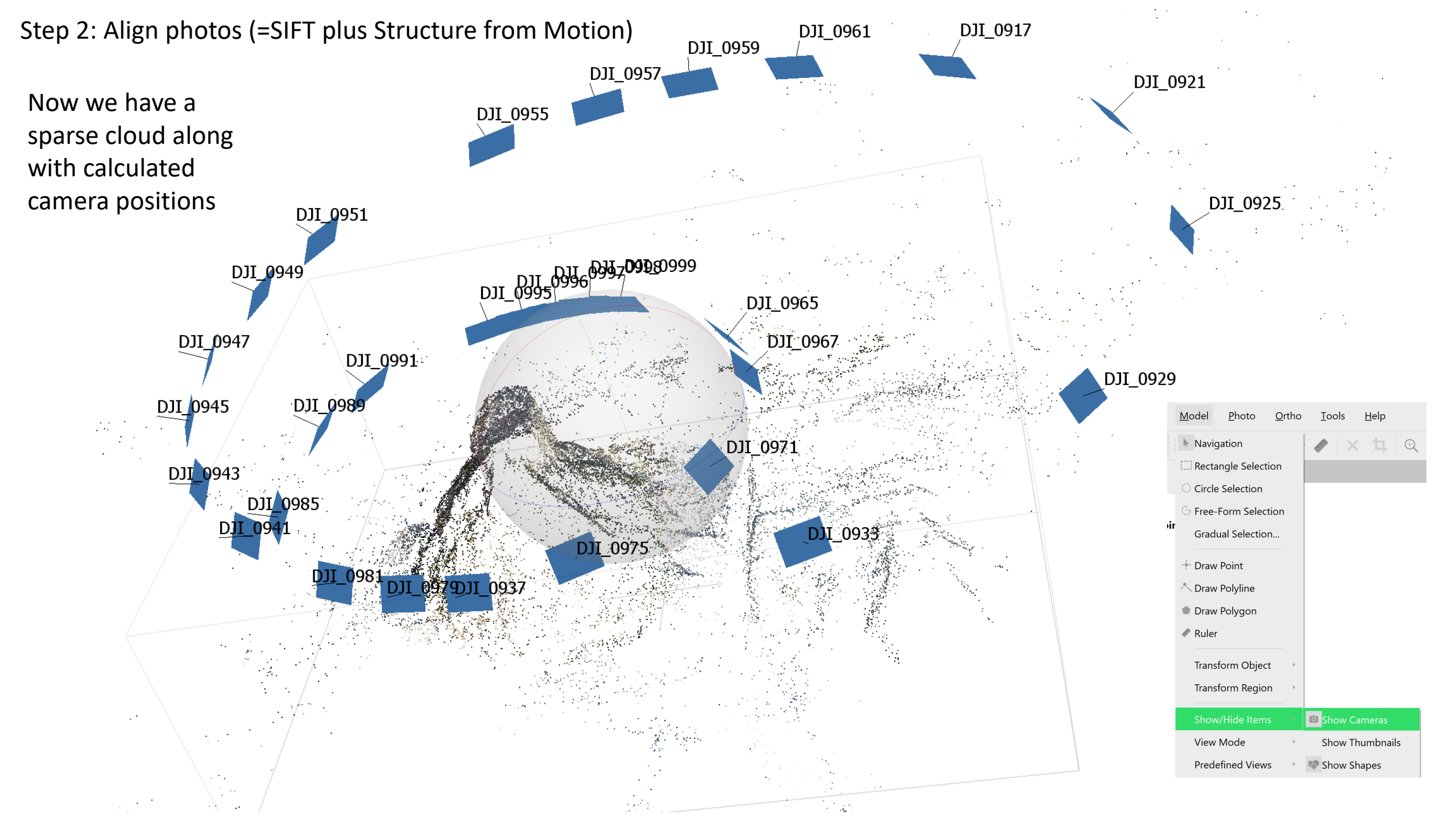
Alignment parameters set the foundation for following workflow steps. High accuracy may take substantial time. We use medium alignment here to save time and still acquire a desirable model. Medium means the photos are downscaled by a factor of 4 leading to possible errors in camera position calculations.

Generic preselection pairs photos on first pass and speeds up alignment. Reference is most useful with quality GPS tagged photos or georeferenced model.

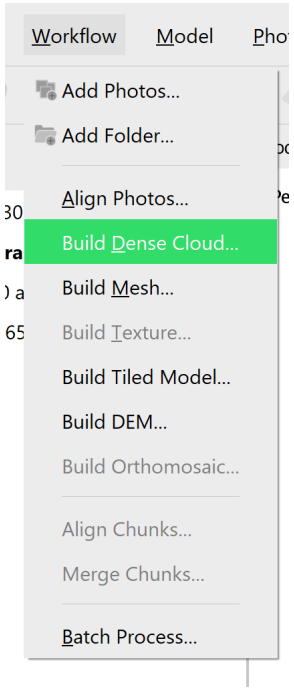


Step 2: Align photos (=SIFT plus Structure from Motion)

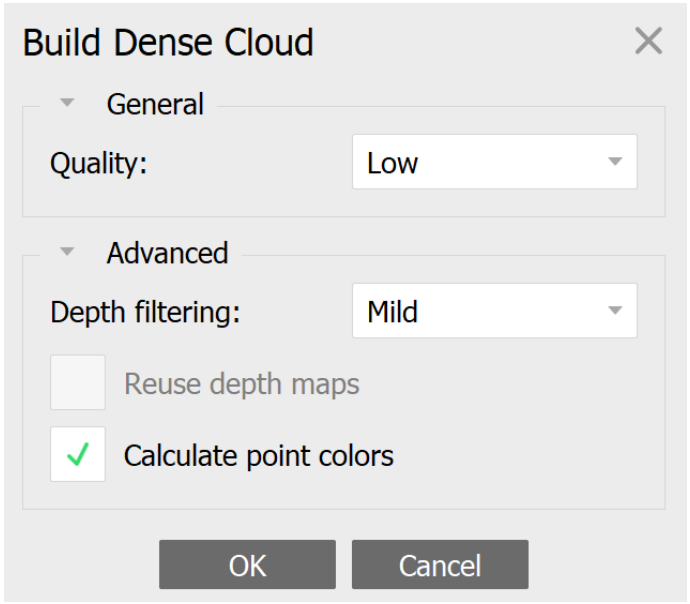
Now we have a sparse cloud along with calculated camera positions

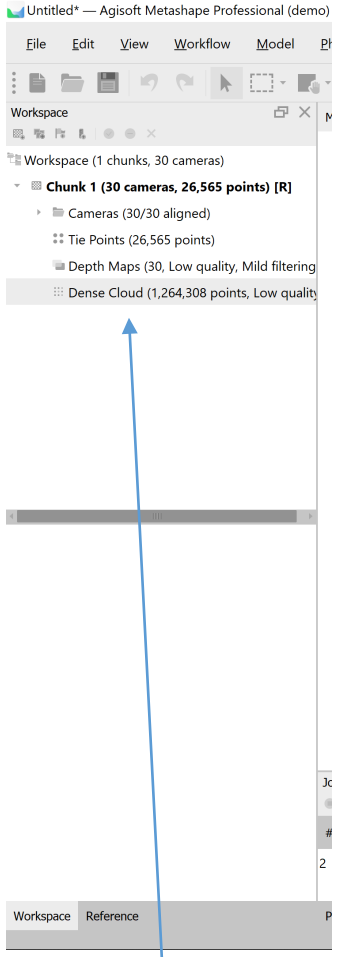


Step 2: Build Dense Cloud



High quality dense cloud is recommended but again is time consuming. A first pass with low quality is good for visualization and helps determine errors within alignment settings

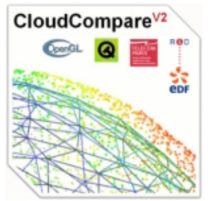




Use the workspace on left side to navigate or see symbols in toolbar

Take some time to explore.

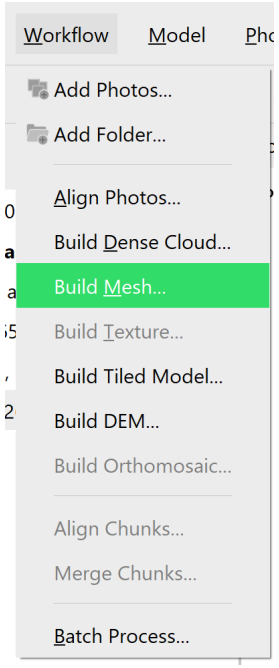
This may be the last step for some purposes. Dense point cloud can now be exported and analyzed in software such as CloudCompare



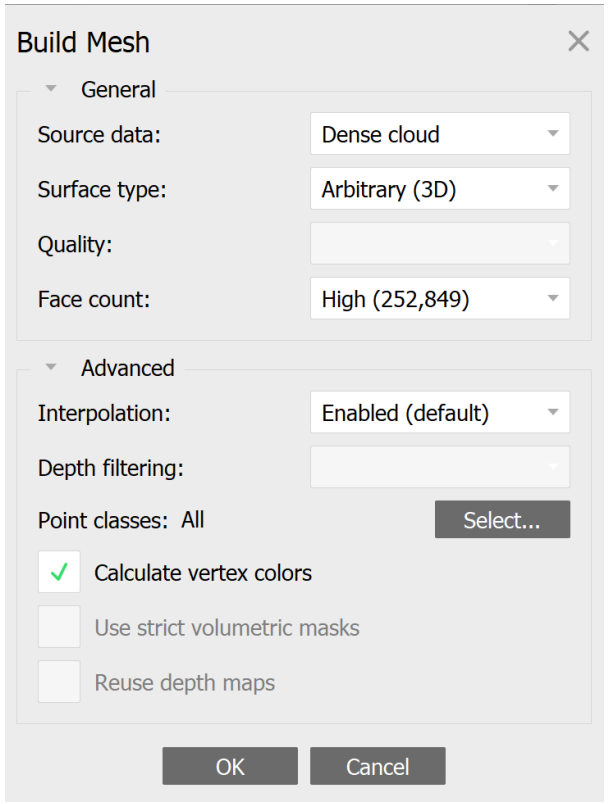
CloudCompare

3D point cloud and mesh processing software
Open Source Project

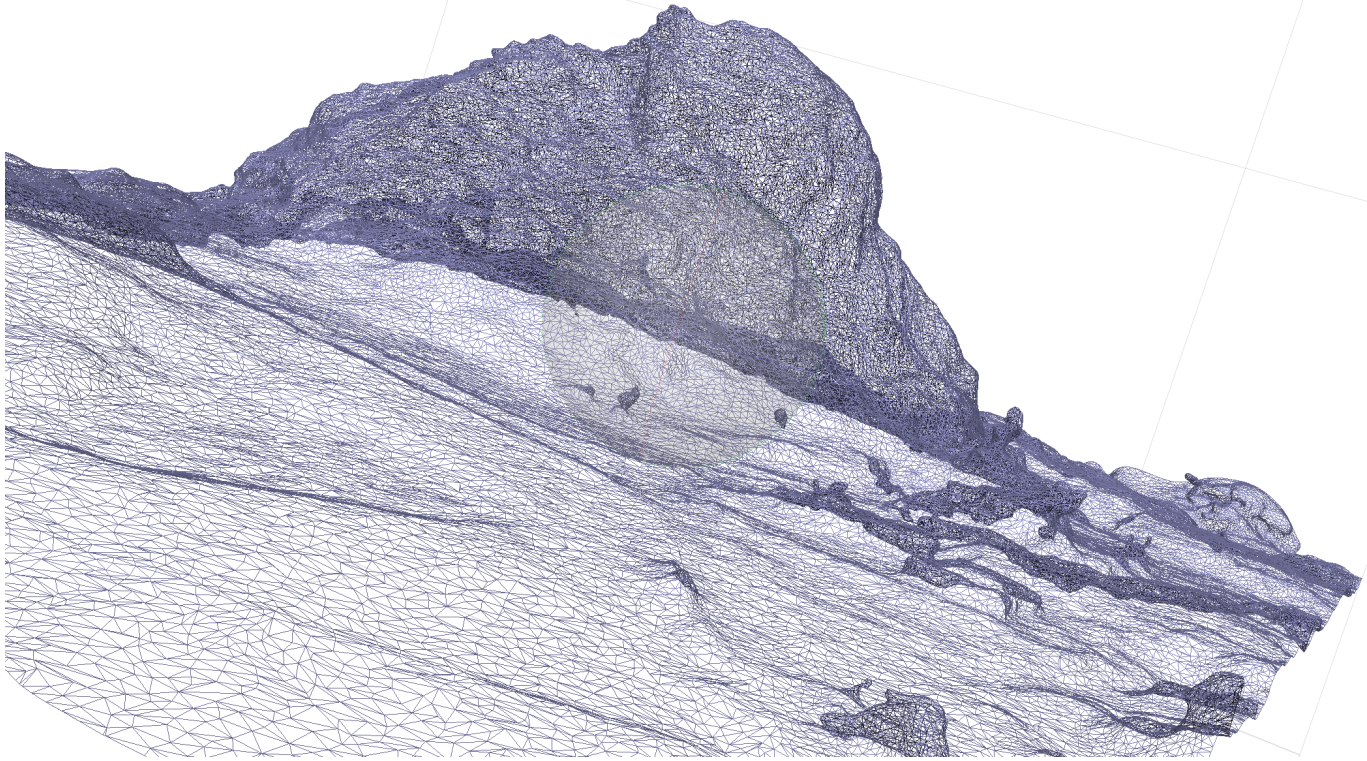
Step 3: Build Mesh



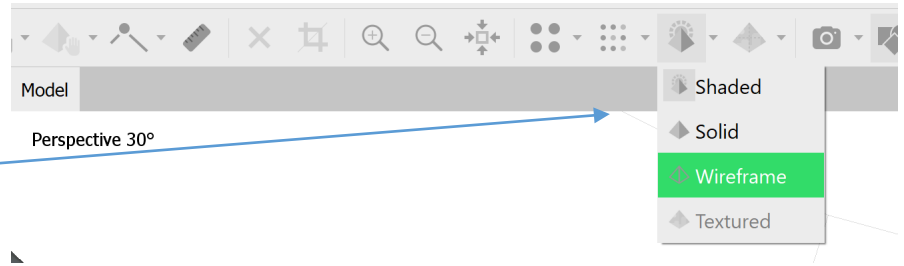
Using Dense Cloud as source data gives best results. Arbitrary surface type is recommended although height field can be useful with flat topography.



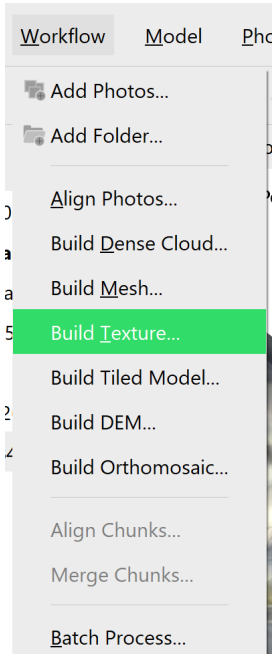
Triangle calculated from dense point cloud



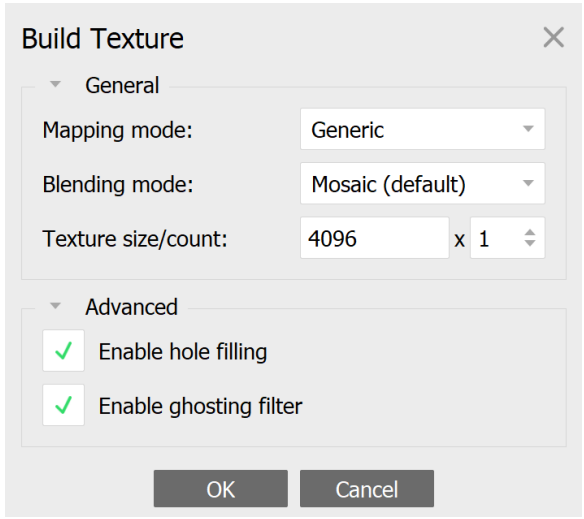
Use the workspace on left side to navigate or see symbols in toolbar



Step 4: Build Texture

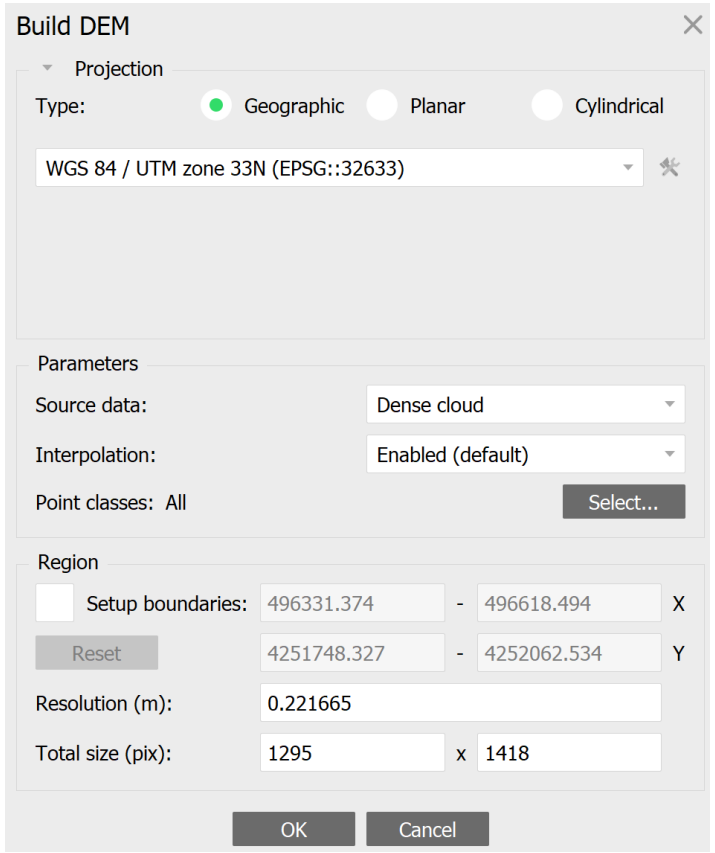


Default settings work here. Detailed explanations for all settings are provided in Agisoft [Metashape User Manual]

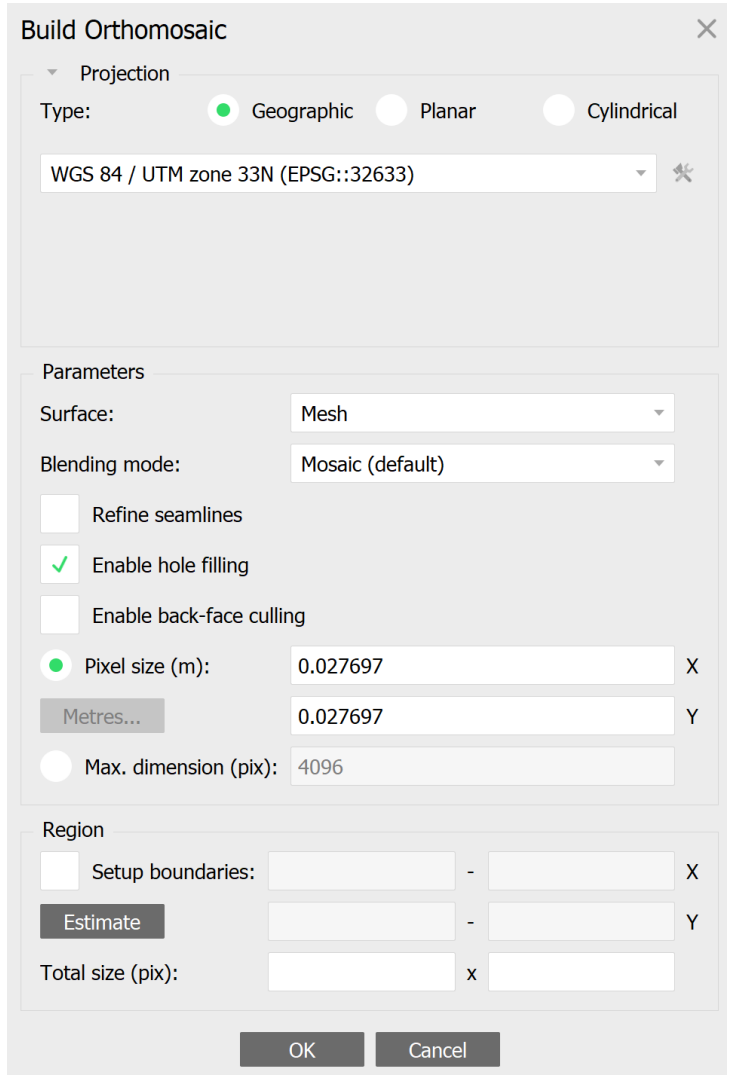


Not bad. Have a look around.

Step 5-6: Build DEM and Orthomosaic



Note the product resolution quality and that they are derived from previous workflow options.



Need paid version to complete these steps

Finished. We can now export all models and generate a processing report

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