

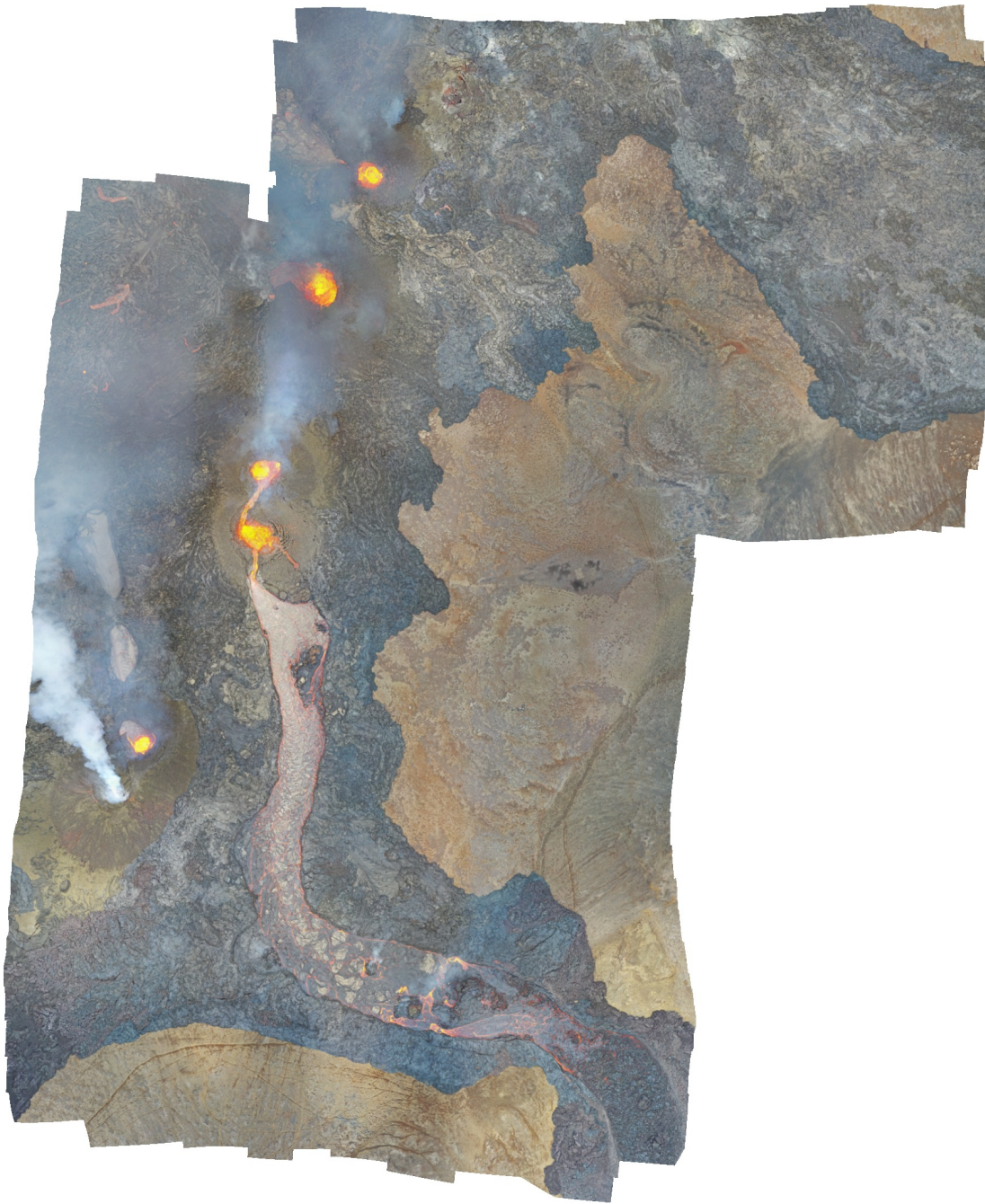
# 2021\_04\_21\_Vent\_All\_Report

Processing Report

April 21, 2021

Fagradalsfjall Vent Mergaed Model

03 June 2022



# Survey Data

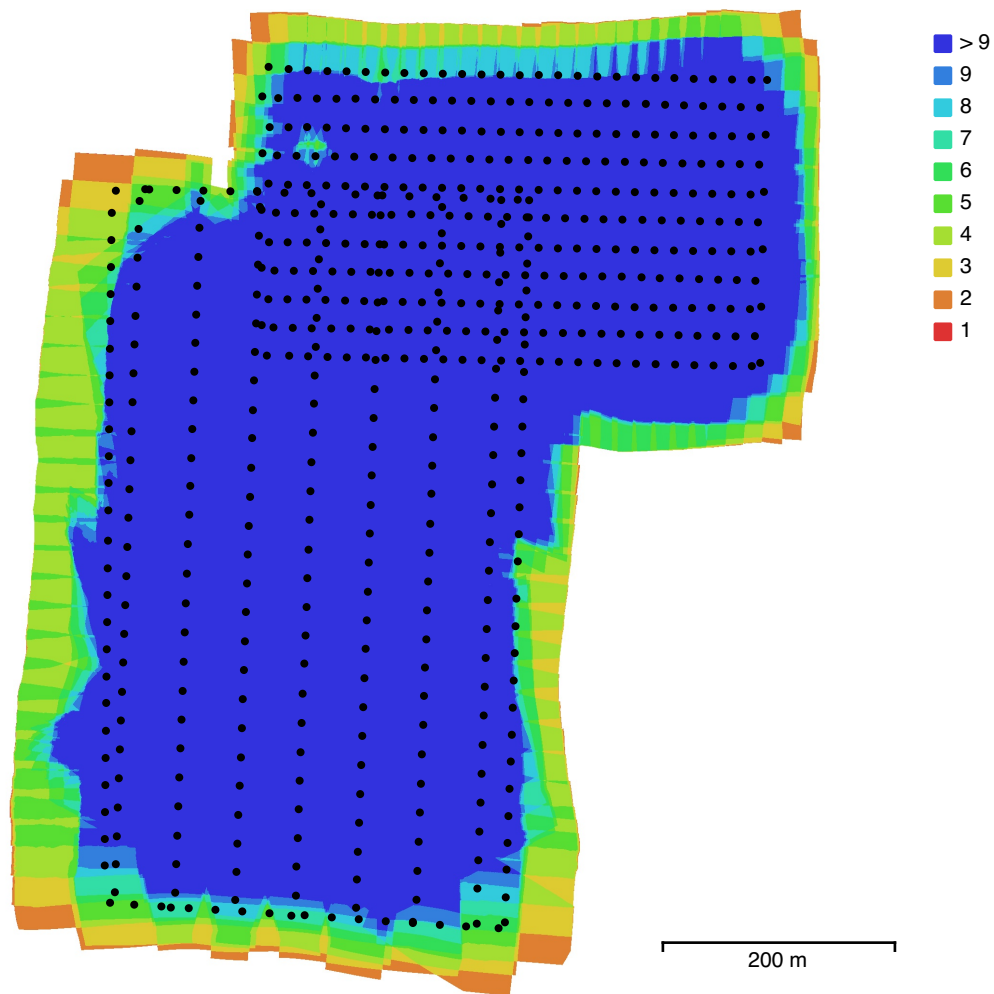


Fig. 1. Camera locations and image overlap.

Number of images:	562	Camera stations:	562
Flying altitude:	108 m	Tie points:	1,516,259
Ground resolution:	2.61 cm/pix	Projections:	5,680,966
Coverage area:	0.434 km <sup>2</sup>	Reprojection error:	0.335 pix

Camera Model	Resolution	Focal Length	Pixel Size	Precalibrated
Test_Pro (10.26mm)	5472 x 3648	10.26 mm	2.41 x 2.41 $\mu$ m	No
Test_Pro (10.26mm)	5472 x 3648	10.26 mm	2.41 x 2.41 $\mu$ m	No

Table 1. Cameras.

# Camera Calibration

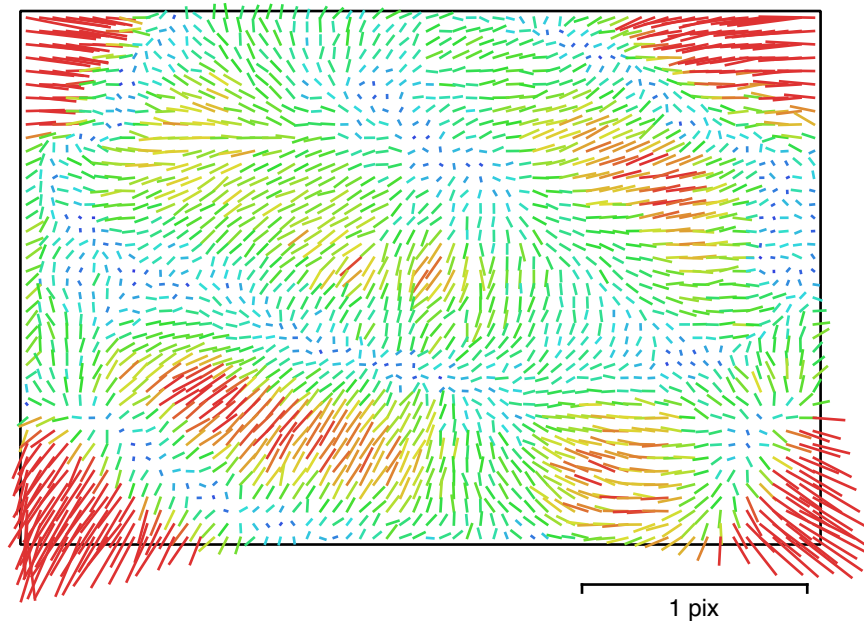


Fig. 2. Image residuals for Test\_Pro (10.26mm).

## Test\_Pro (10.26mm)

265 images

Type	Resolution	Focal Length	Pixel Size
Frame	5472 x 3648	10.26 mm	2.41 x 2.41 $\mu\text{m}$

	Value	Error	F	Cx	Cy	B1	B2	K1	K2	K3	K4	P1	P2
F	4348.74	0.06	1.00	-0.12	-0.17	-0.61	0.08	-0.08	0.08	-0.08	0.07	0.02	-0.12
Cx	2.27846	0.021		1.00	0.05	0.10	0.33	-0.00	-0.00	0.00	-0.00	0.55	0.01
Cy	-3.51645	0.018			1.00	-0.05	0.05	-0.01	-0.00	0.00	0.00	0.02	0.53
B1	-20.462	0.019				1.00	-0.10	-0.00	-0.01	0.00	-0.00	-0.03	0.04
B2	5.38082	0.013					1.00	-0.00	-0.00	0.00	-0.00	0.01	-0.02
K1	-0.00635217	3e-05						1.00	-0.97	0.92	-0.87	0.00	-0.02
K2	0.0166129	0.00021							1.00	-0.99	0.96	-0.00	-0.00
K3	-0.00464719	0.00056								1.00	-0.99	0.00	0.00
K4	-0.0255205	0.00051									1.00	-0.01	-0.00
P1	0.000749045	1.1e-06										1.00	-0.00
P2	-0.00172735	9.5e-07											1.00

Table 2. Calibration coefficients and correlation matrix.

# Camera Calibration

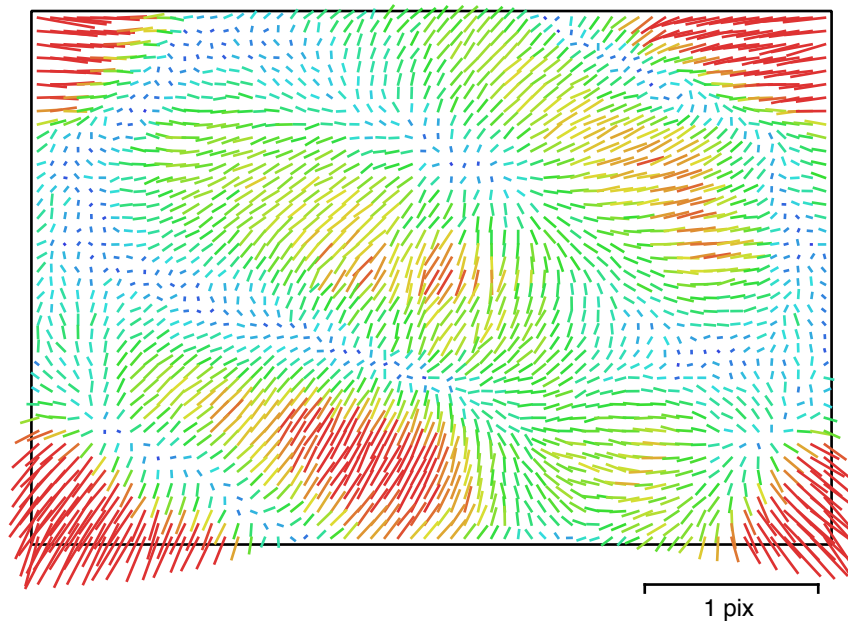


Fig. 3. Image residuals for Test\_Pro (10.26mm).

## Test\_Pro (10.26mm)

297 images

Type	Resolution	Focal Length	Pixel Size
<b>Frame</b>	<b>5472 x 3648</b>	<b>10.26 mm</b>	<b>2.41 x 2.41 <math>\mu\text{m}</math></b>

	Value	Error	F	Cx	Cy	B1	B2	K1	K2	K3	K4	P1	P2
<b>F</b>	<b>4291.97</b>	0.45	1.00	0.66	0.74	-0.02	-0.09	-0.02	0.05	-0.01	-0.05	0.17	-0.31
<b>Cx</b>	<b>3.59286</b>	0.017		1.00	0.46	-0.39	-0.38	0.00	0.03	-0.00	-0.04	0.47	-0.20
<b>Cy</b>	<b>-7.28931</b>	0.018			1.00	0.29	-0.36	-0.02	0.04	-0.01	-0.04	0.11	0.02
<b>B1</b>	<b>-10.8597</b>	0.022				1.00	0.05	-0.01	-0.01	0.01	-0.00	-0.01	0.01
<b>B2</b>	<b>-1.37701</b>	0.021					1.00	-0.00	-0.01	0.00	0.00	-0.05	-0.02
<b>K1</b>	<b>-0.00596785</b>	2.4e-05						1.00	-0.89	0.85	-0.80	0.08	0.10
<b>K2</b>	<b>0.0156262</b>	0.00015							1.00	-0.99	0.95	0.02	-0.01
<b>K3</b>	<b>-0.00219918</b>	0.00039								1.00	-0.99	-0.01	-0.00
<b>K4</b>	<b>-0.0250143</b>	0.00035									1.00	-0.00	0.02
<b>P1</b>	<b>0.000767658</b>	6.5e-07										1.00	-0.03
<b>P2</b>	<b>-0.00174821</b>	5.1e-07											1.00

Table 3. Calibration coefficients and correlation matrix.

# Ground Control Points

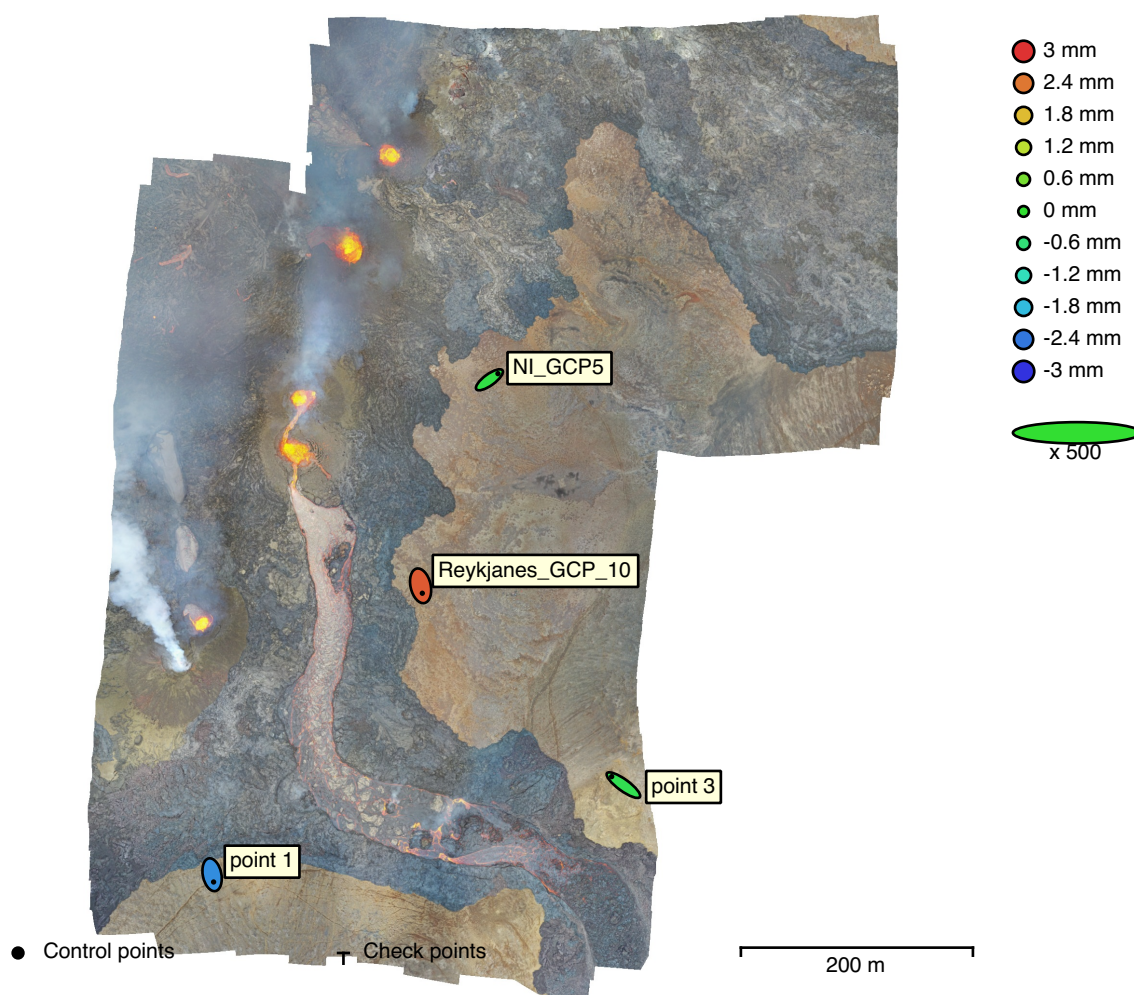


Fig. 4. GCP locations and error estimates.  
Z error is represented by ellipse color. X,Y errors are represented by ellipse shape.  
Estimated GCP locations are marked with a dot or crossing.

Count	X error (cm)	Y error (cm)	Z error (cm)	XY error (cm)	Total (cm)
4	2.52958	2.54371	0.17336	3.58737	3.59156

Table 4. Control points RMSE.  
X - Easting, Y - Northing, Z - Altitude.

<b>Label</b>	<b>X error (cm)</b>	<b>Y error (cm)</b>	<b>Z error (cm)</b>	<b>Total (cm)</b>	<b>Image (pix)</b>
NI_GCP5	2.93625	2.12415	-0.0174349	3.62407	0.768 (56)
Reykjanes_GCP_10	0.592758	-2.55503	0.265306	2.63628	1.183 (56)
point 1	0.51531	-2.50015	-0.220899	2.56225	1.262 (7)
point 3	-4.04432	2.93103	-0.0269722	4.99482	2.316 (8)
<b>Total</b>	<b>2.52958</b>	<b>2.54371</b>	<b>0.17336</b>	<b>3.59156</b>	<b>1.142</b>

Table 5. Control points.  
X - Easting, Y - Northing, Z - Altitude.

# Digital Elevation Model

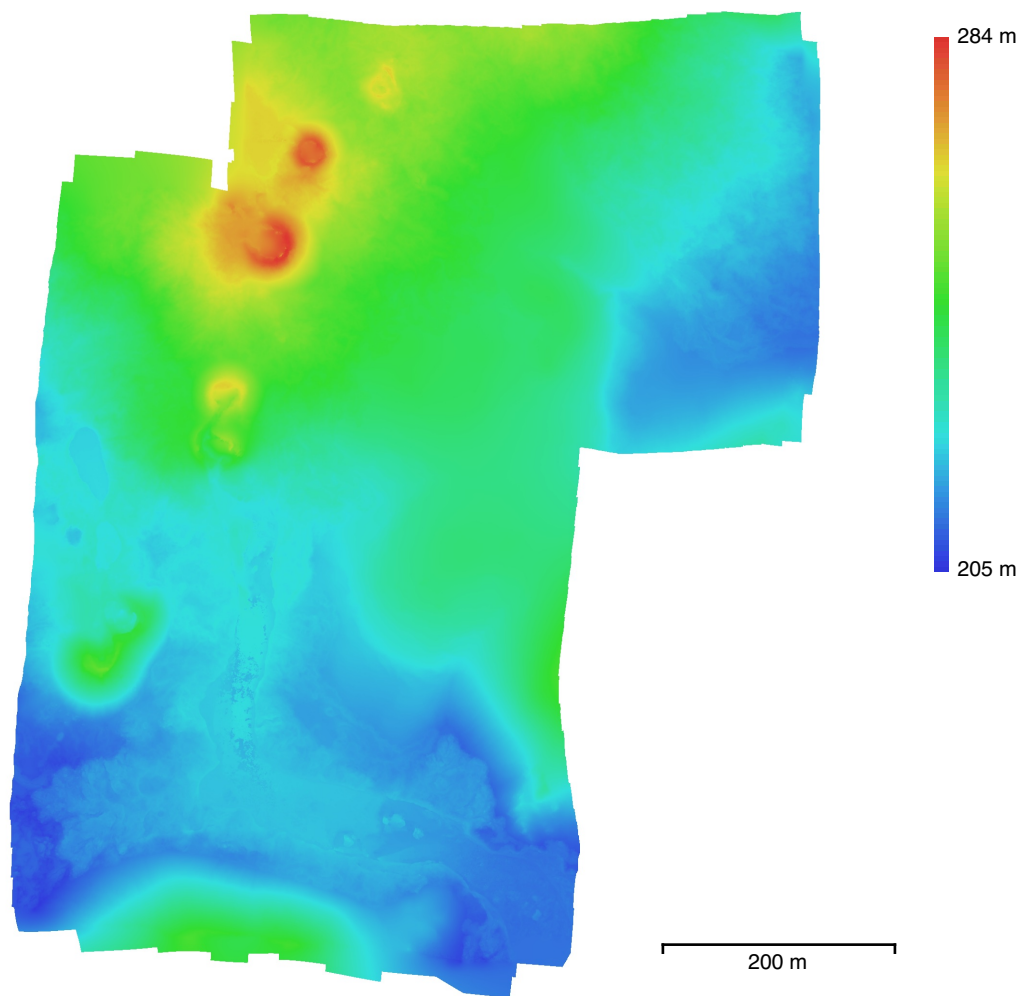


Fig. 5. Reconstructed digital elevation model.

Resolution: 5.22 cm/pix  
Point density: 366 points/m<sup>2</sup>

# Processing Parameters

## General

Cameras	562
Aligned cameras	562
Markers	110
Coordinate system	WGS 84 / UTM zone 27N (EPSG::32627)
Rotation angles	Yaw, Pitch, Roll

## Point Cloud

Points	1,516,259 of 3,936,988
RMS reprojection error	0.139855 (0.335075 pix)
Max reprojection error	0.524536 (2.13443 pix)
Mean key point size	2.38025 pix
Point colors	3 bands, uint8
Key points	No
Average tie point multiplicity	3.95763

## Alignment parameters

Accuracy	High
Generic preselection	Yes
Reference preselection	Source
Key point limit	60,000
Key point limit per Mpx	1,000
Tie point limit	0
Exclude stationary tie points	Yes
Guided image matching	No
Adaptive camera model fitting	No
Matching time	28 minutes 20 seconds
Matching memory usage	332.55 MB
Alignment time	36 minutes 14 seconds
Alignment memory usage	1.32 GB

## Optimization parameters

Parameters	f, b1, b2, cx, cy, k1-k4, p1, p2
Adaptive camera model fitting	No
Optimization time	25 seconds
Date created	2022:05:26 17:41:47
Software version	1.8.1.13915
File size	283.79 MB

## Depth Maps

Count	560
<b>Depth maps generation parameters</b>	
Quality	High
Filtering mode	Moderate
Max neighbors	16
Processing time	1 days 17 hours
Memory usage	1.83 GB
Date created	2022:06:01 13:53:33
Software version	1.8.1.13915
File size	4.17 GB

## Dense Point Cloud

Points	171,369,863
Point colors	3 bands, uint8

## Depth maps generation parameters

Quality	High
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Filtering mode	Moderate
Max neighbors	16
Processing time	1 days 17 hours
Memory usage	1.83 GB
<b>Dense cloud generation parameters</b>	
Processing time	2 hours 57 minutes
Memory usage	14.08 GB
Date created	2022:06:01 16:50:44
Software version	1.8.1.13915
File size	3.03 GB
<b>DEM</b>	
Size	29,676 x 32,450
Coordinate system	WGS 84 / UTM zone 27N (EPSG::32627)
<b>Reconstruction parameters</b>	
Source data	Dense cloud
Interpolation	Enabled
Processing time	3 minutes 10 seconds
Memory usage	303.27 MB
Date created	2022:06:02 16:54:13
Software version	1.8.1.13915
File size	618.56 MB
<b>Orthomosaic</b>	
Size	26,729 x 32,569
Coordinate system	WGS 84 / UTM zone 27N (EPSG::32627)
Colors	3 bands, uint8
<b>Reconstruction parameters</b>	
Blending mode	Mosaic
Surface	DEM
Enable hole filling	Yes
Enable ghosting filter	No
Processing time	19 minutes 27 seconds
Memory usage	3.04 GB
Date created	2022:06:02 17:14:14
Software version	1.8.1.13915
File size	14.07 GB
<b>System</b>	
Software name	Agisoft Metashape Professional
Software version	1.8.1 build 13915
OS	Mac OS 64 bit
RAM	64.00 GB
CPU	
GPU(s)	None