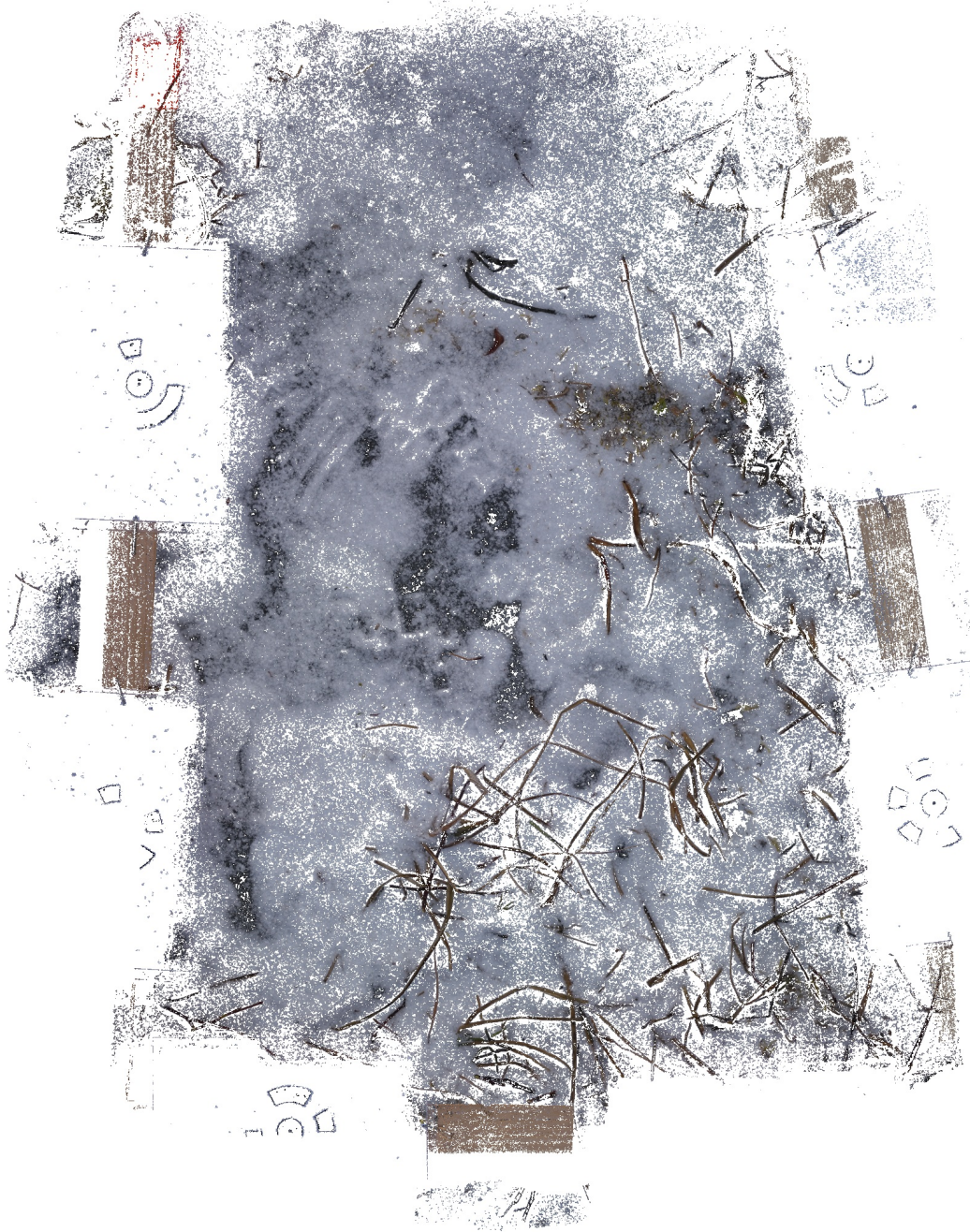


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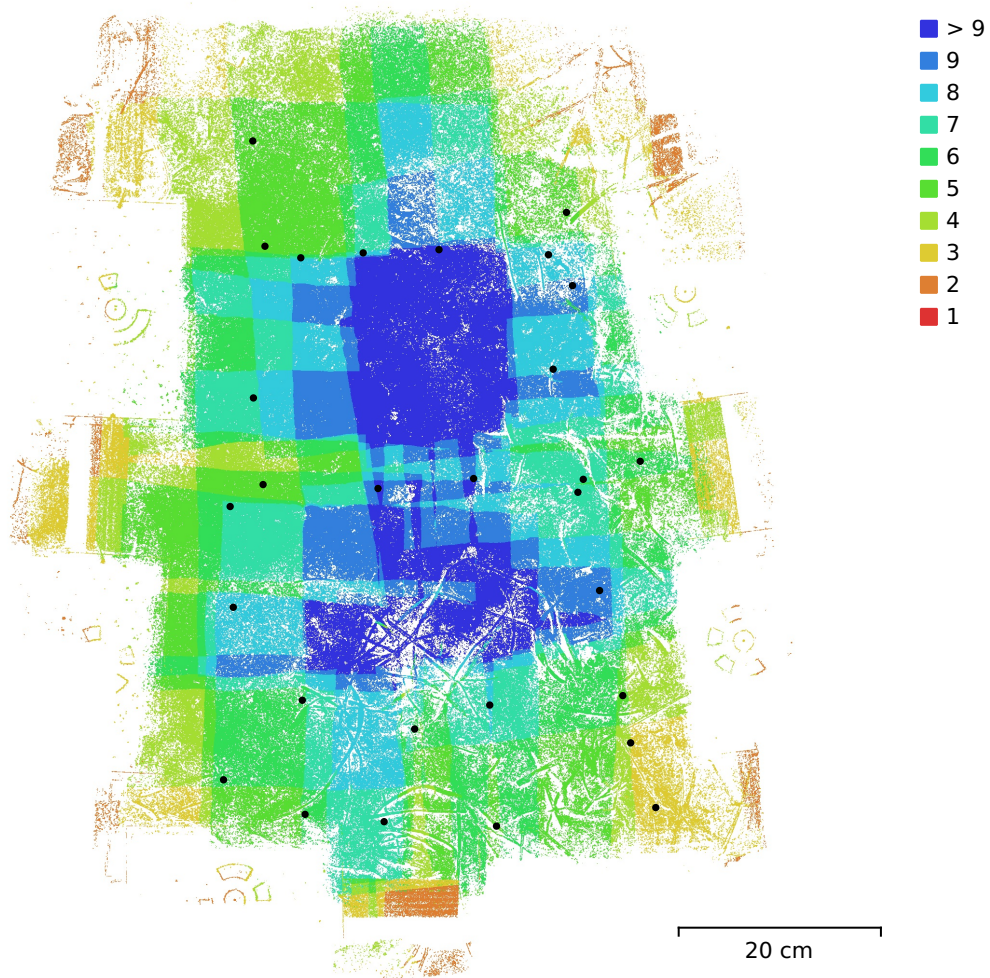


Fig. 1. Camera locations and image overlap.

Number of images:	29	Camera stations:	29
Flying altitude:	35.1 cm	Tie points:	16,749
Ground resolution:	0.0818 mm/pix	Projections:	42,089
Coverage area:	3.28e+03 cm ²	Reprojection error:	0.433 pix

Camera Model	Resolution	Focal Length	Pixel Size	Precalibrated
DC-TS7 (4.9mm)	5184 x 3888	4.9 mm	1.17 x 1.17 μ m	No

Table 1. Cameras.

Camera Calibration

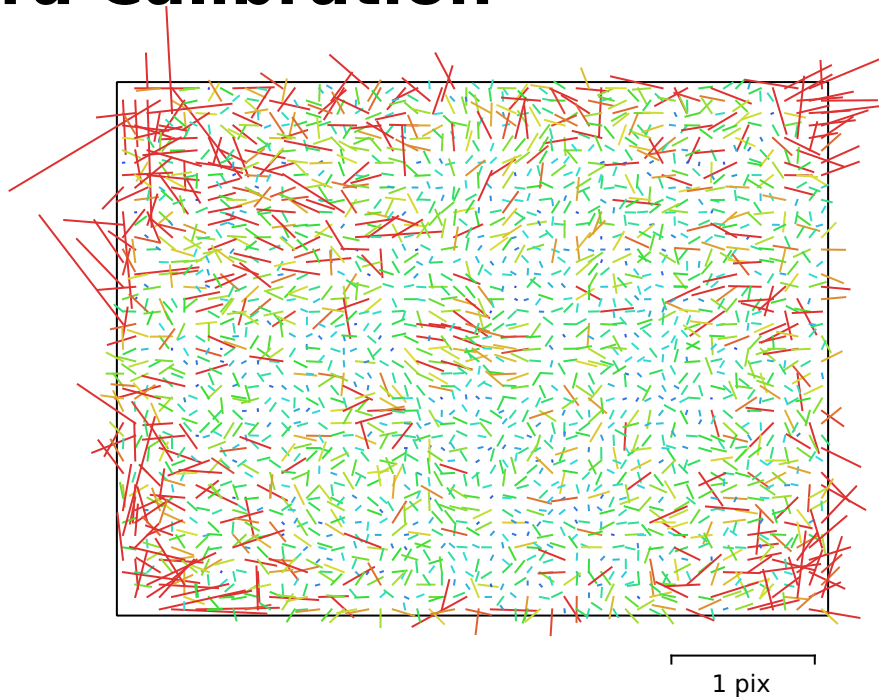


Fig. 2. Image residuals for DC-TS7 (4.9mm).

DC-TS7 (4.9mm)

29 images

Type	Resolution	Focal Length	Pixel Size
Frame	5184 x 3888	4.9 mm	1.17 x 1.17 μm

	Value	Error	F	Cx	Cy	K1	K2	K3	P1	P2
F	4286.89	2.7	1.00	-0.00	0.76	0.51	0.07	-0.13	0.24	0.31
Cx	65.3216	0.28		1.00	0.04	-0.08	0.00	-0.00	0.71	-0.20
Cy	-71.5043	0.42			1.00	0.47	0.02	-0.07	0.19	0.60
K1	-0.00977894	0.00033				1.00	-0.57	0.48	0.09	0.51
K2	0.0273707	0.00085					1.00	-0.98	0.02	-0.02
K3	-0.0393568	0.0011						1.00	-0.03	-0.01
P1	0.00417887	1.6e-05							1.00	-0.02
P2	-0.0045105	2e-05								1.00

Table 2. Calibration coefficients and correlation matrix.

Scale Bars

Label	Distance (m)	Error (m)
target 6_point 5	0.35	-2.498e-15
Total		2.498e-15

Table 3. Control scale bars.

Digital Elevation Model

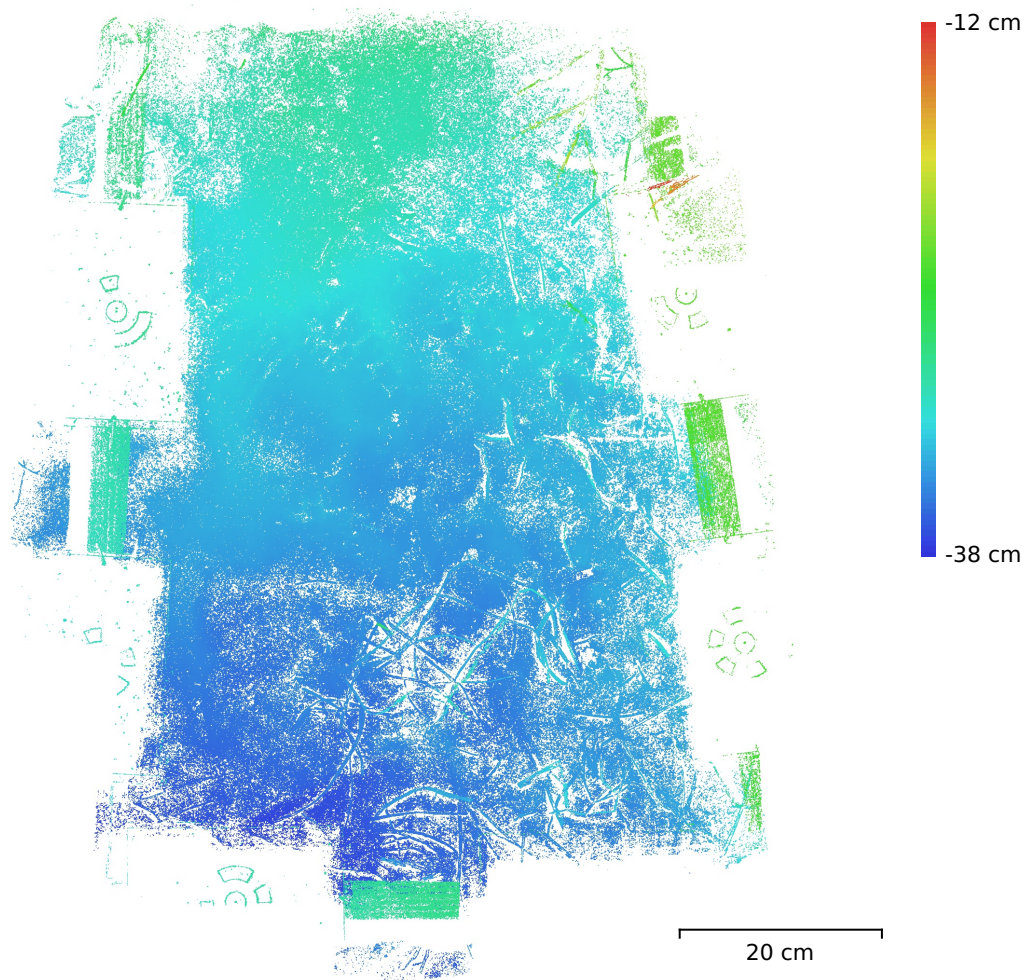


Fig. 3. Reconstructed digital elevation model.

Resolution: unknown
Point density: unknown

Processing Parameters

General

Cameras	29
Aligned cameras	29
Markers	5
Scale bars	3
Coordinate system	Local Coordinates (m)
Rotation angles	Yaw, Pitch, Roll

Tie Points

Points	16,749 of 65,746
RMS reprojection error	0.133627 (0.432982 pix)
Max reprojection error	0.368715 (1.77103 pix)
Mean key point size	3.14637 pix
Point colors	3 bands, uint8
Key points	No
Average tie point multiplicity	2.59514

Alignment parameters

Accuracy	Highest
Generic preselection	Yes
Reference preselection	Sequential
Key point limit	80,000
Key point limit per Mpx	1,000
Tie point limit	10,000
Exclude stationary tie points	Yes
Guided image matching	No
Adaptive camera model fitting	No
Matching time	17 seconds
Matching memory usage	931.27 MB
Alignment time	9 seconds
Alignment memory usage	191.21 MB

Optimization parameters

Parameters	f, cx, cy, k1-k3, p1, p2
Adaptive camera model fitting	No
Optimization time	0 seconds
Date created	2024:01:04 01:28:56
Software version	2.0.3.16960
File size	3.18 MB

Depth Maps

Count	29
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Depth maps generation parameters

Quality	Ultra High
Filtering mode	Mild
Max neighbors	16
Processing time	2 minutes 23 seconds
Memory usage	9.69 GB
Date created	2024:01:04 01:31:31
Software version	2.0.3.16960
File size	429.09 MB

Point Cloud

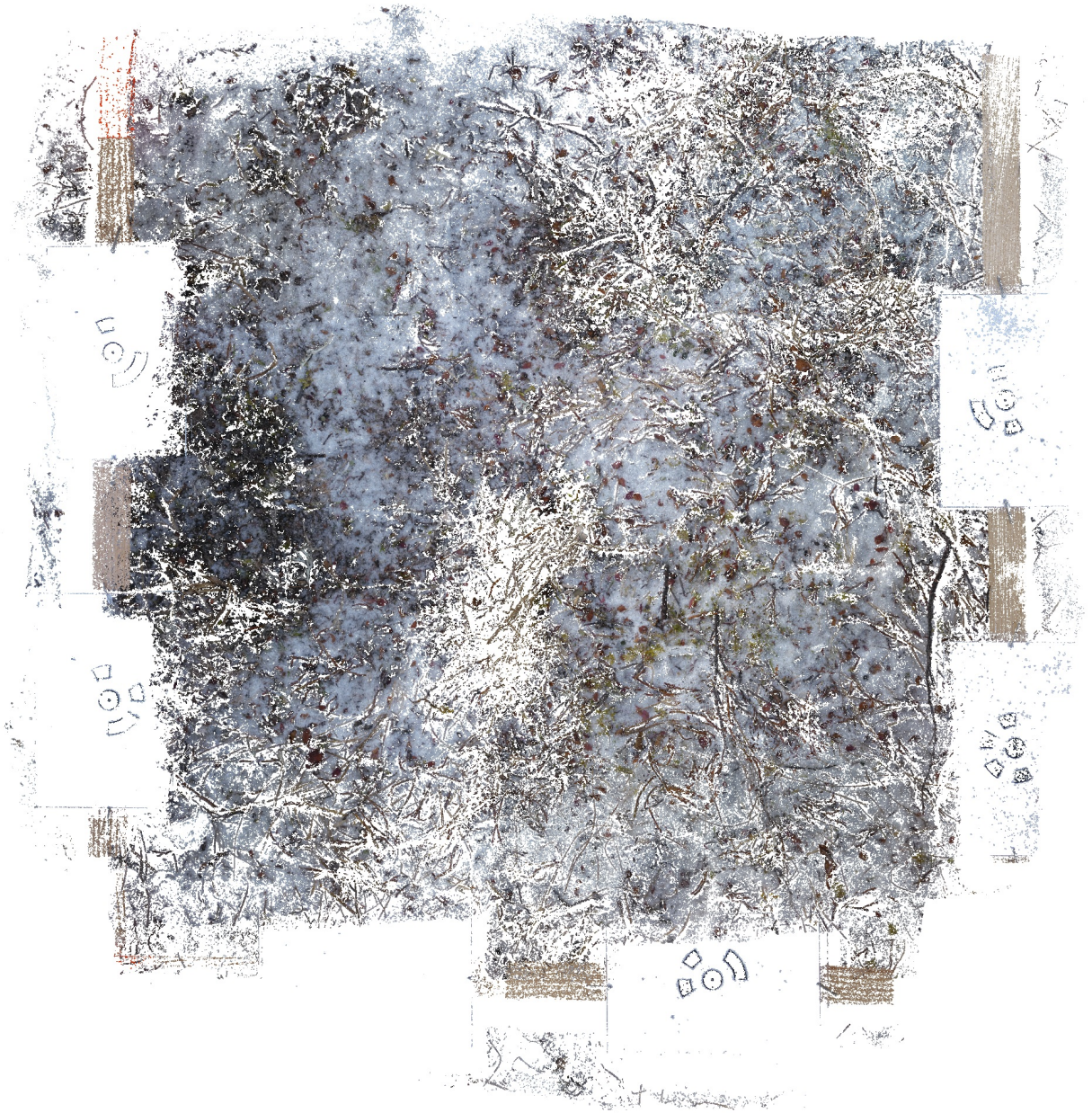
Points	8,267,397
Coordinate precision	0.0625 mm

Point attributes

Color	3 bands, uint8
Normal	
Confidence	2 - 13
Point classes	
Created (never classified)	8,267,397
Point cloud generation parameters	
Processing time	3 minutes 5 seconds
Memory usage	8.15 GB
Date created	2024:01:04 01:34:37
Software version	2.0.3.16960
File size	117.53 MB
System	
Software name	Agisoft Metashape Professional
Software version	2.0.3 build 16960
OS	Linux 64 bit
RAM	251.70 GB
CPU	Intel(R) Xeon(R) CPU E5-2680 v4 @ 2.40GHz
GPU(s)	Tesla P100-PCIE-12GB Tesla P100-PCIE-12GB

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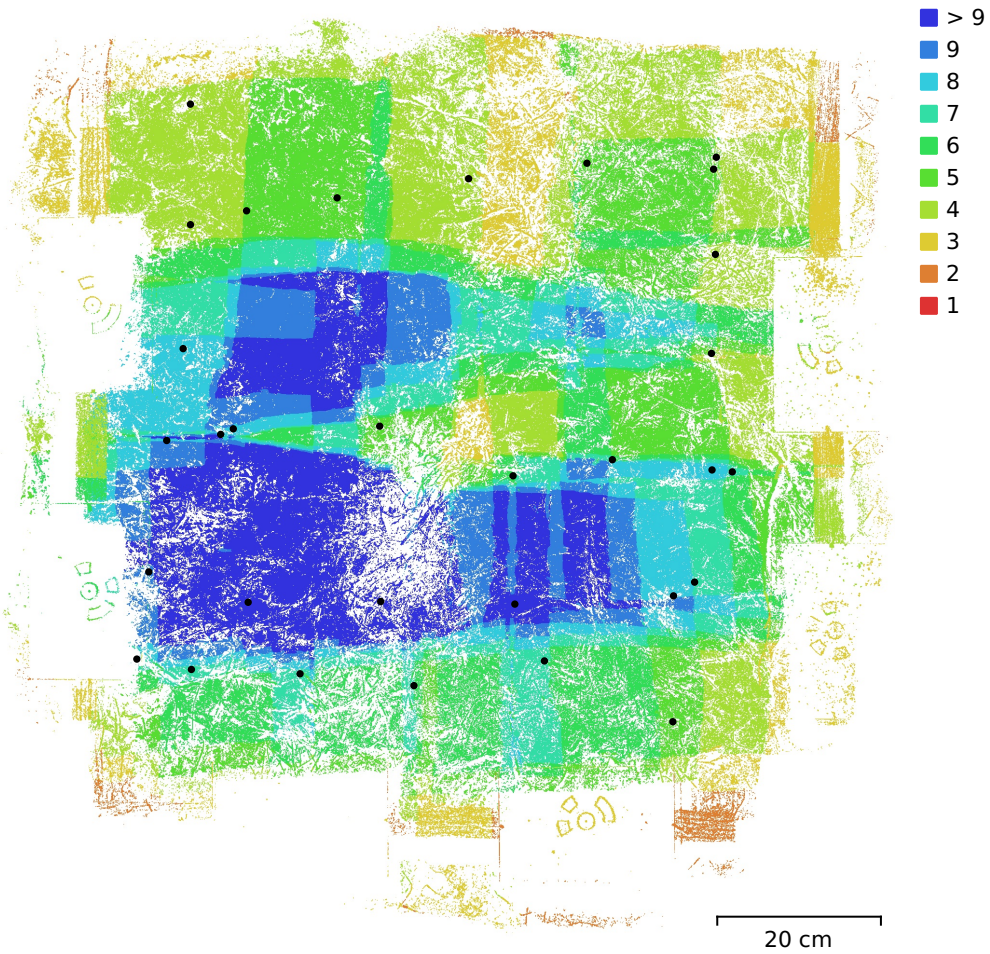


Fig. 1. Camera locations and image overlap.

Number of images:	31	Camera stations:	31
Flying altitude:	44.4 cm	Tie points:	18,427
Ground resolution:	0.103 mm/pix	Projections:	43,139
Coverage area:	5.67e+03 cm ²	Reprojection error:	0.406 pix

Camera Model	Resolution	Focal Length	Pixel Size	Precalibrated
DC-TS7 (4.9mm)	5184 x 3888	4.9 mm	1.17 x 1.17 μ m	No

Table 1. Cameras.

Camera Calibration

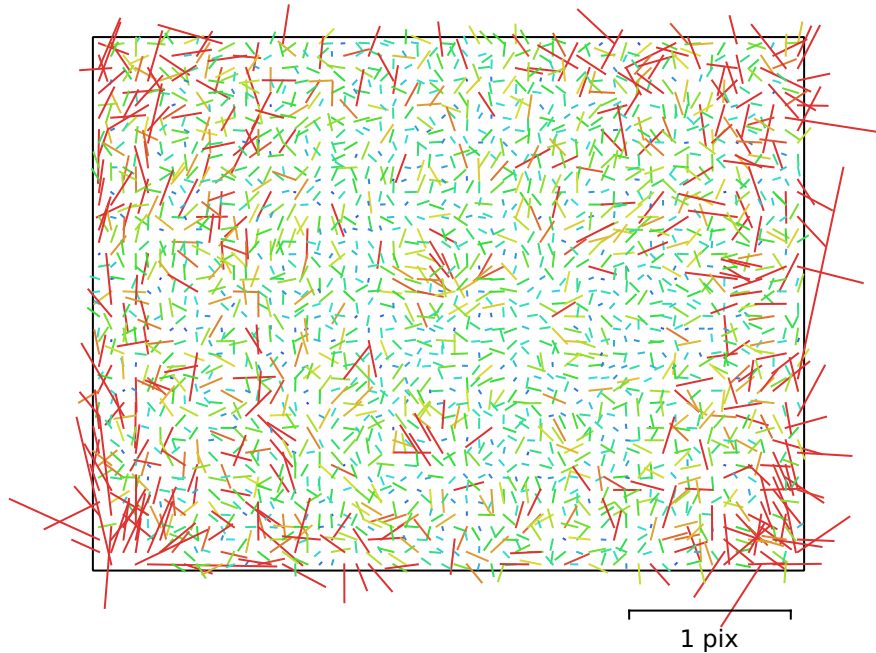


Fig. 2. Image residuals for DC-TS7 (4.9mm).

DC-TS7 (4.9mm)

31 images

Type	Resolution	Focal Length	Pixel Size
Frame	5184 x 3888	4.9 mm	1.17 x 1.17 μm

	Value	Error	F	Cx	Cy	K1	K2	K3	P1	P2
F	4319.04	1.5	1.00	-0.07	0.15	0.45	0.04	-0.07	0.01	0.09
Cx	72.2787	0.3		1.00	-0.17	-0.02	-0.02	0.03	0.72	-0.25
Cy	-57.0642	0.38			1.00	0.06	-0.02	0.01	-0.28	0.74
K1	-0.0115092	0.00025				1.00	-0.75	0.69	0.02	0.04
K2	0.0362928	0.00087					1.00	-0.98	-0.04	-0.01
K3	-0.0483326	0.0012						1.00	0.04	0.00
P1	0.00444235	1.7e-05							1.00	-0.37
P2	-0.00433824	2.5e-05								1.00

Table 2. Calibration coefficients and correlation matrix.

Scale Bars

Label	Distance (m)	Error (m)
target 1_target 2	0.349431	-0.000568892
target 3_point 4	0.349977	-2.31361e-05
point 5_point 6	0.35059	0.000590074
Total		0.000473413

Table 3. Control scale bars.

Digital Elevation Model

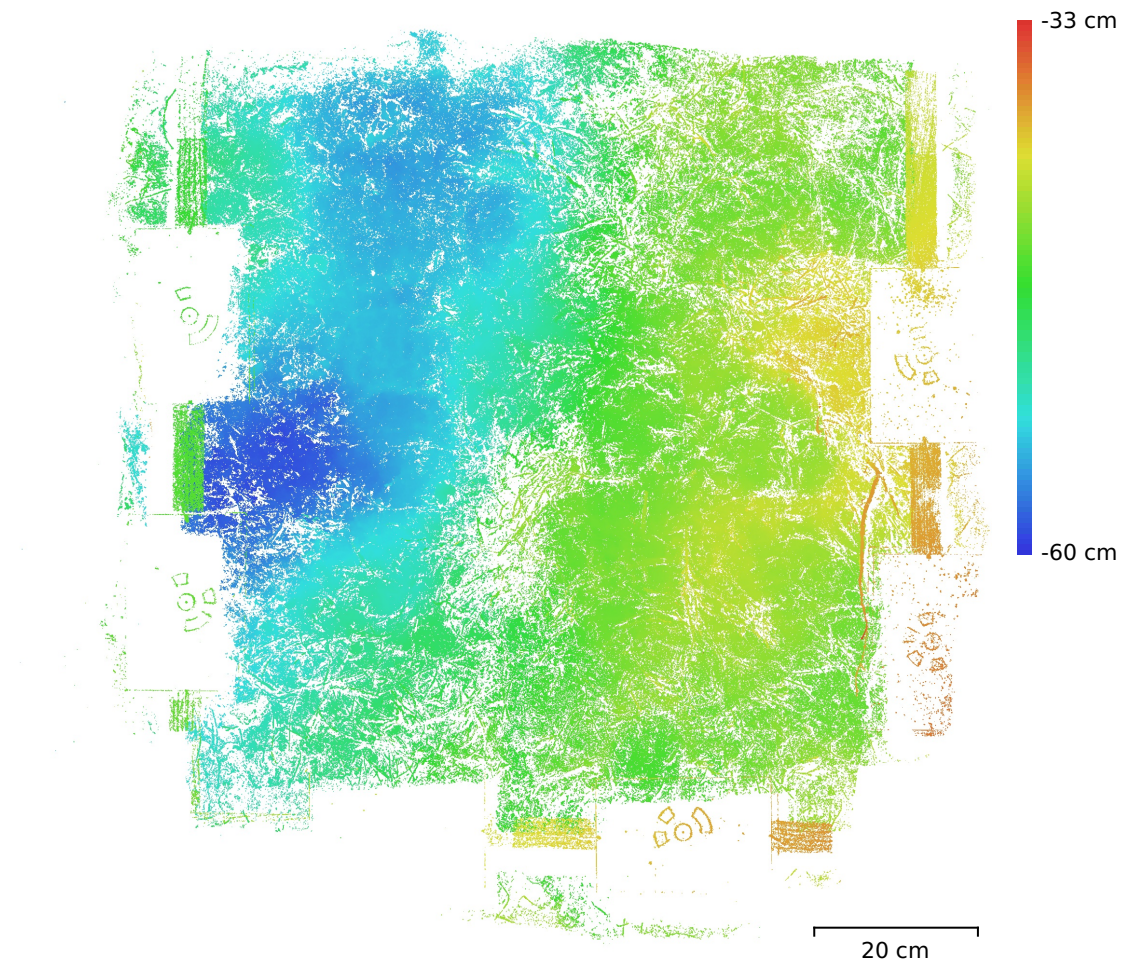


Fig. 3. Reconstructed digital elevation model.

Resolution: unknown
Point density: unknown

Processing Parameters

General

Cameras	31
Aligned cameras	31
Markers	9
Scale bars	5
Coordinate system	Local Coordinates (m)
Rotation angles	Yaw, Pitch, Roll

Tie Points

Points	18,427 of 65,501
RMS reprojection error	0.132847 (0.405558 pix)
Max reprojection error	0.359209 (1.82743 pix)
Mean key point size	2.9543 pix
Point colors	3 bands, uint8
Key points	No
Average tie point multiplicity	2.37677

Alignment parameters

Accuracy	Highest
Generic preselection	Yes
Reference preselection	Sequential
Key point limit	80,000
Key point limit per Mpx	1,000
Tie point limit	10,000
Exclude stationary tie points	Yes
Guided image matching	No
Adaptive camera model fitting	No
Matching time	20 seconds
Matching memory usage	901.30 MB
Alignment time	7 seconds
Alignment memory usage	178.48 MB

Optimization parameters

Parameters	f, cx, cy, k1-k3, p1, p2
Adaptive camera model fitting	No
Optimization time	0 seconds
Date created	2024:01:04 00:38:24
Software version	2.0.3.16960
File size	2.99 MB

Depth Maps

Count	31
Depth maps generation parameters	
Quality	Ultra High
Filtering mode	Mild
Max neighbors	16
Processing time	2 minutes 31 seconds
Memory usage	10.08 GB
Date created	2024:01:04 00:41:05
Software version	2.0.3.16960
File size	491.33 MB

Point Cloud

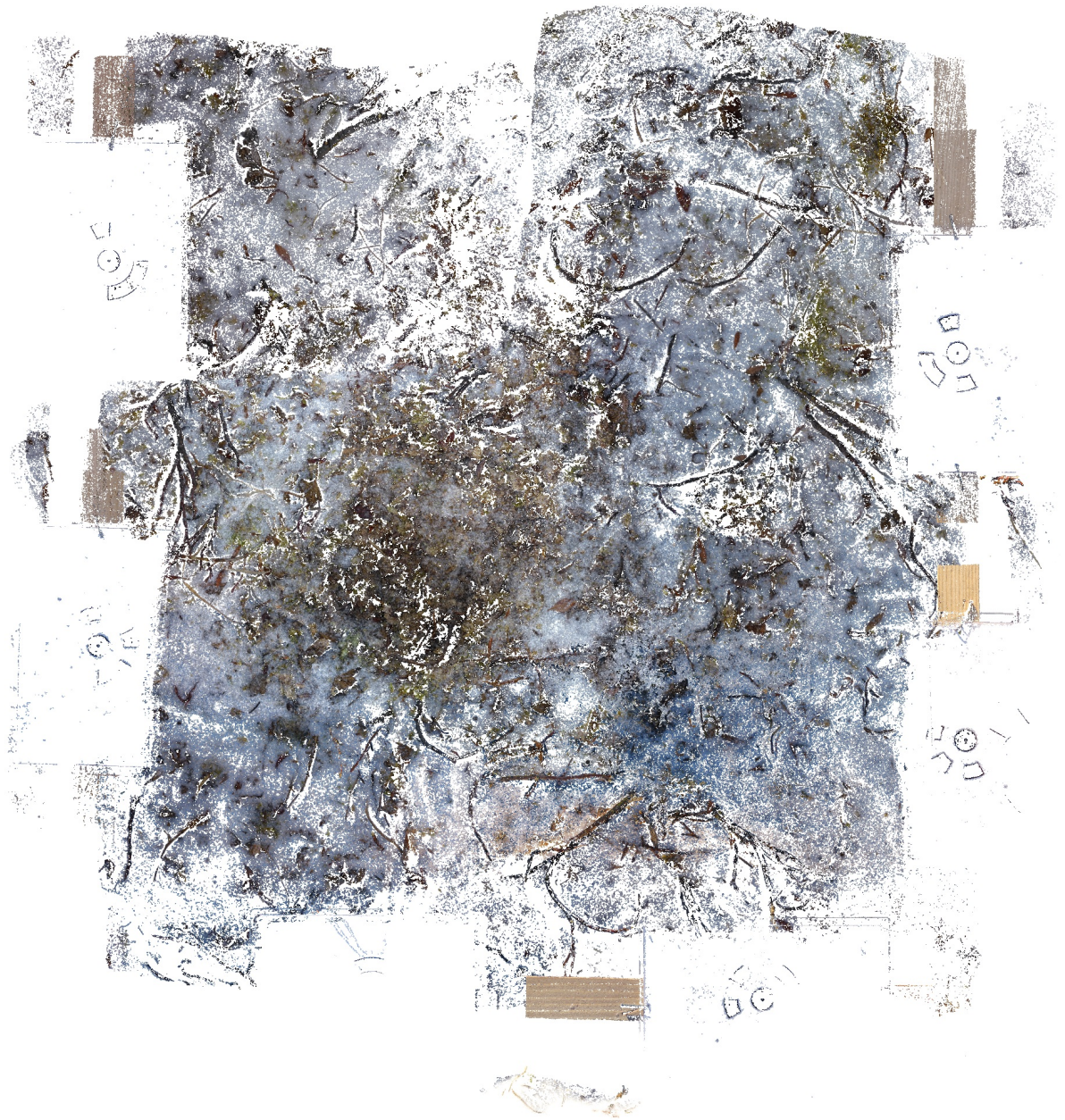
Points	15,443,339
Coordinate precision	0.0624 mm

Point attributes

Color	3 bands, uint8
Normal	
Confidence	2 - 10
Point classes	
Created (never classified)	15,443,339
Point cloud generation parameters	
Processing time	3 minutes 26 seconds
Memory usage	8.54 GB
Date created	2024:01:04 00:44:32
Software version	2.0.3.16960
File size	219.79 MB
System	
Software name	Agisoft Metashape Professional
Software version	2.0.3 build 16960
OS	Linux 64 bit
RAM	251.70 GB
CPU	Intel(R) Xeon(R) CPU E5-2680 v4 @ 2.40GHz
GPU(s)	Tesla P100-PCIE-12GB Tesla P100-PCIE-12GB

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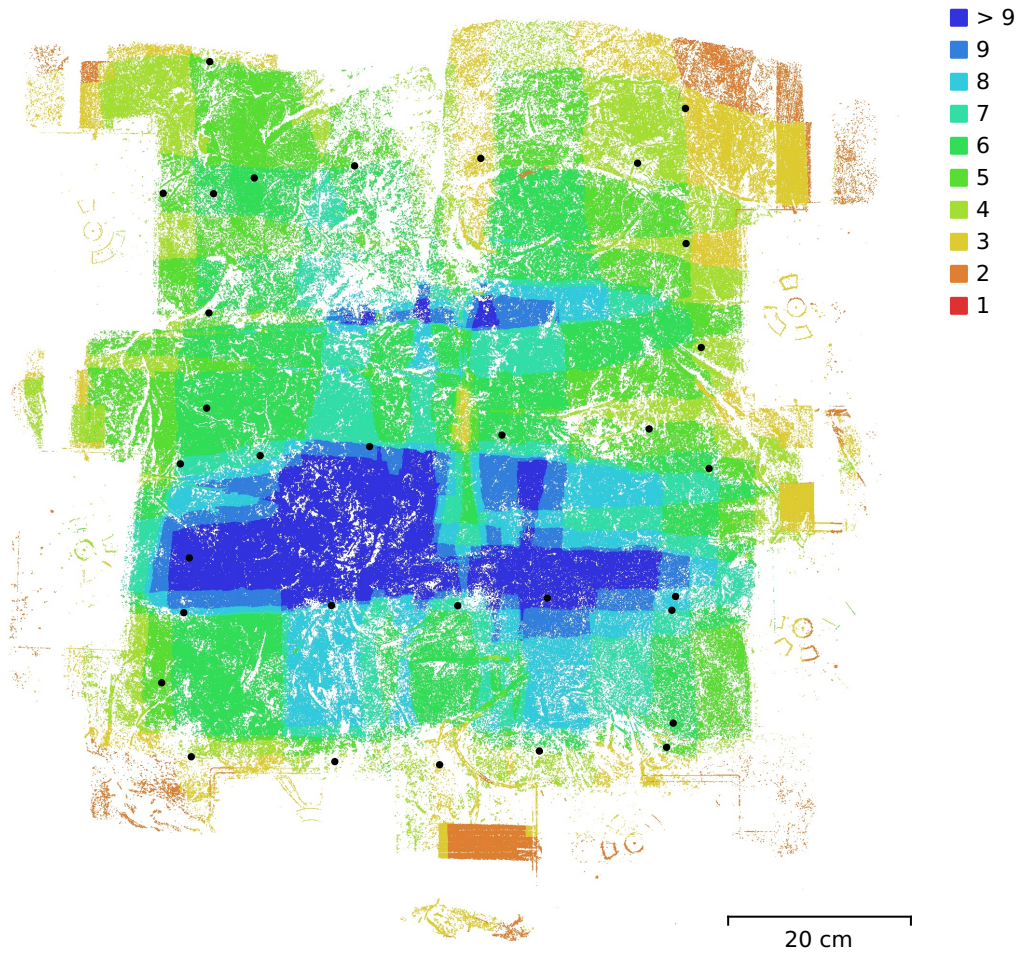


Fig. 1. Camera locations and image overlap.

Number of images:	32	Camera stations:	32
Flying altitude:	35.5 cm	Tie points:	17,092
Ground resolution:	0.0836 mm/pix	Projections:	39,807
Coverage area:	4.16e+03 cm ²	Reprojection error:	0.393 pix

Camera Model	Resolution	Focal Length	Pixel Size	Precalibrated
DC-TS7 (4.9mm)	5184 x 3888	4.9 mm	1.17 x 1.17 μ m	No

Table 1. Cameras.

Camera Calibration

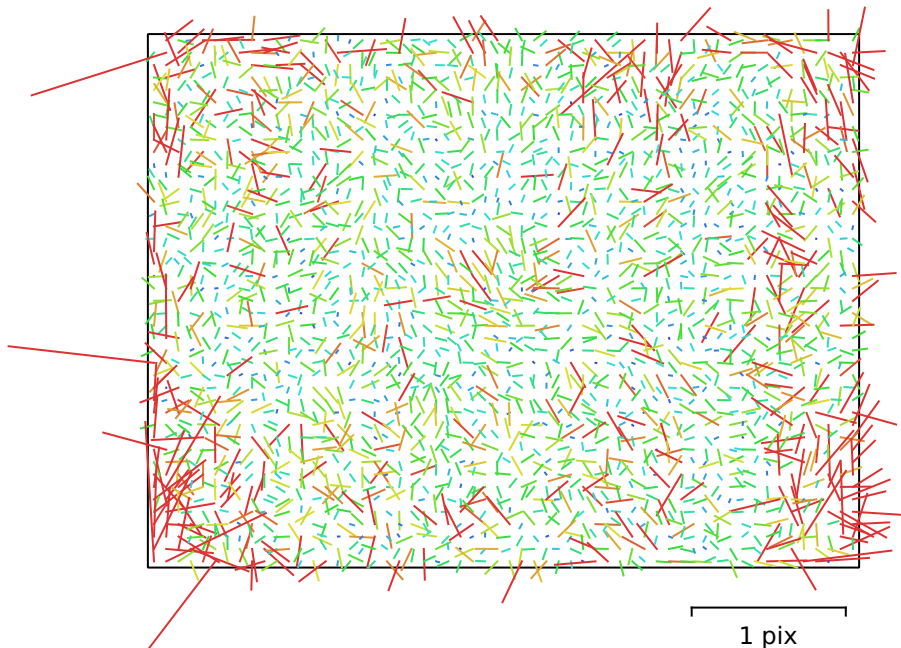


Fig. 2. Image residuals for DC-TS7 (4.9mm).

DC-TS7 (4.9mm)

32 images

Type	Resolution	Focal Length	Pixel Size
Frame	5184 x 3888	4.9 mm	1.17 x 1.17 μm

	Value	Error	F	Cx	Cy	K1	K2	K3	P1	P2
F	4248.35	2.1	1.00	0.01	-0.01	0.37	0.03	-0.06	0.21	-0.08
Cx	79.4608	0.65		1.00	-0.01	0.01	-0.06	0.07	0.90	0.03
Cy	-52.0276	0.71			1.00	0.14	-0.02	0.01	-0.03	0.70
K1	-0.0116863	0.00024				1.00	-0.74	0.68	0.10	-0.02
K2	0.0210769	0.00078					1.00	-0.98	-0.04	0.00
K3	-0.0260838	0.001						1.00	0.05	-0.00
P1	0.00501444	5e-05							1.00	-0.09
P2	-0.00380376	4.3e-05								1.00

Table 2. Calibration coefficients and correlation matrix.

Scale Bars

Label	Distance (m)	Error (m)
point 5_point 6	0.351203	0.00120311
target 1_point 2	0.348788	-0.0012116
Total		0.00120736

Table 3. Control scale bars.

Digital Elevation Model

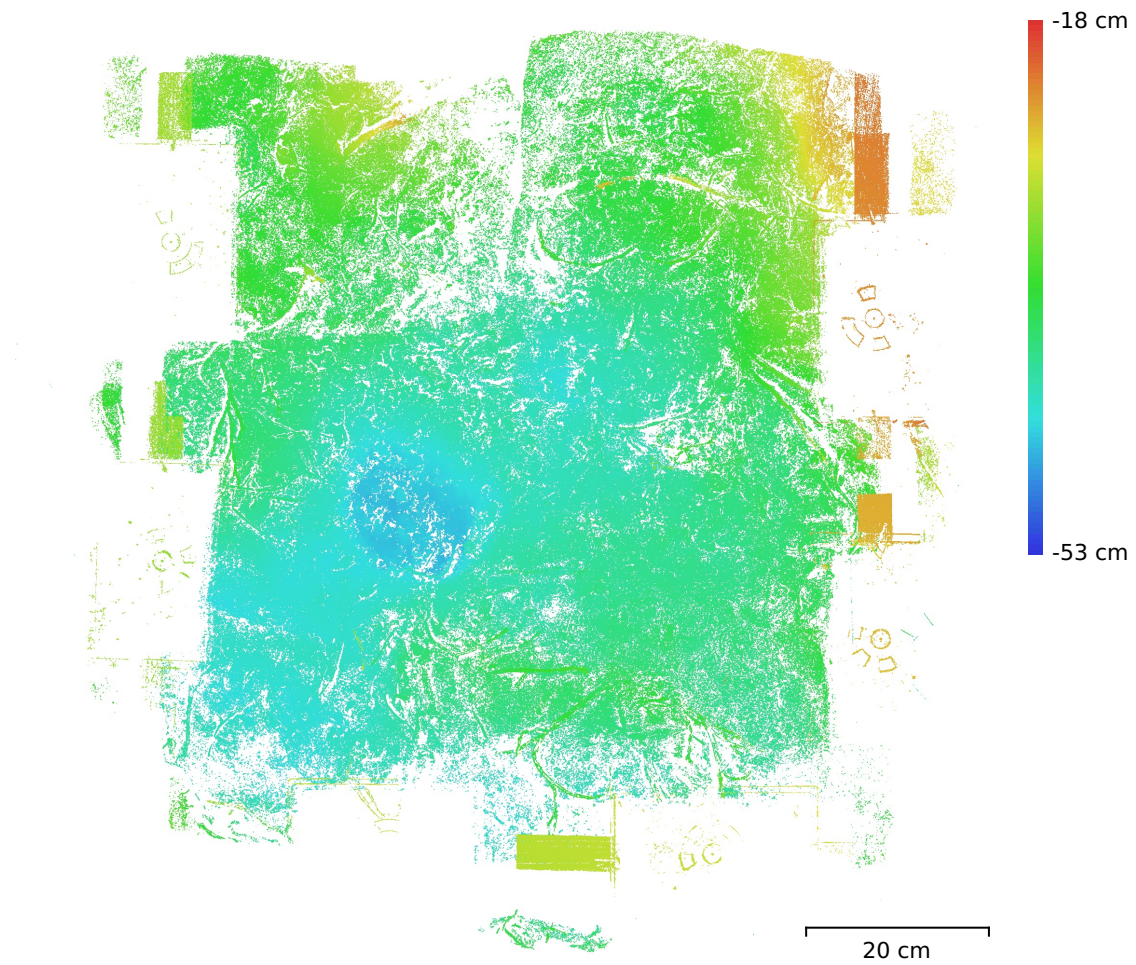


Fig. 3. Reconstructed digital elevation model.

Resolution: unknown
Point density: unknown

Processing Parameters

General

Cameras	32
Aligned cameras	32
Markers	7
Scale bars	3
Coordinate system	Local Coordinates (m)
Rotation angles	Yaw, Pitch, Roll

Tie Points

Points	17,092 of 57,347
RMS reprojection error	0.129022 (0.393232 pix)
Max reprojection error	0.378628 (1.91885 pix)
Mean key point size	2.94022 pix
Point colors	3 bands, uint8
Key points	No
Average tie point multiplicity	2.36279

Alignment parameters

Accuracy	Highest
Generic preselection	Yes
Reference preselection	Sequential
Key point limit	80,000
Key point limit per Mpx	1,000
Tie point limit	10,000
Exclude stationary tie points	Yes
Guided image matching	No
Adaptive camera model fitting	No
Matching time	18 seconds
Matching memory usage	992.46 MB
Alignment time	6 seconds
Alignment memory usage	136.62 MB

Optimization parameters

Parameters	f, cx, cy, k1-k3, p1, p2
Adaptive camera model fitting	No
Optimization time	0 seconds
Date created	2024:01:04 01:16:45
Software version	2.0.3.16960
File size	2.63 MB

Depth Maps

Count	29
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Depth maps generation parameters

Quality	Ultra High
Filtering mode	Mild
Max neighbors	16
Processing time	2 minutes 9 seconds
Memory usage	9.55 GB
Date created	2024:01:04 01:19:03
Software version	2.0.3.16960
File size	460.51 MB

Point Cloud

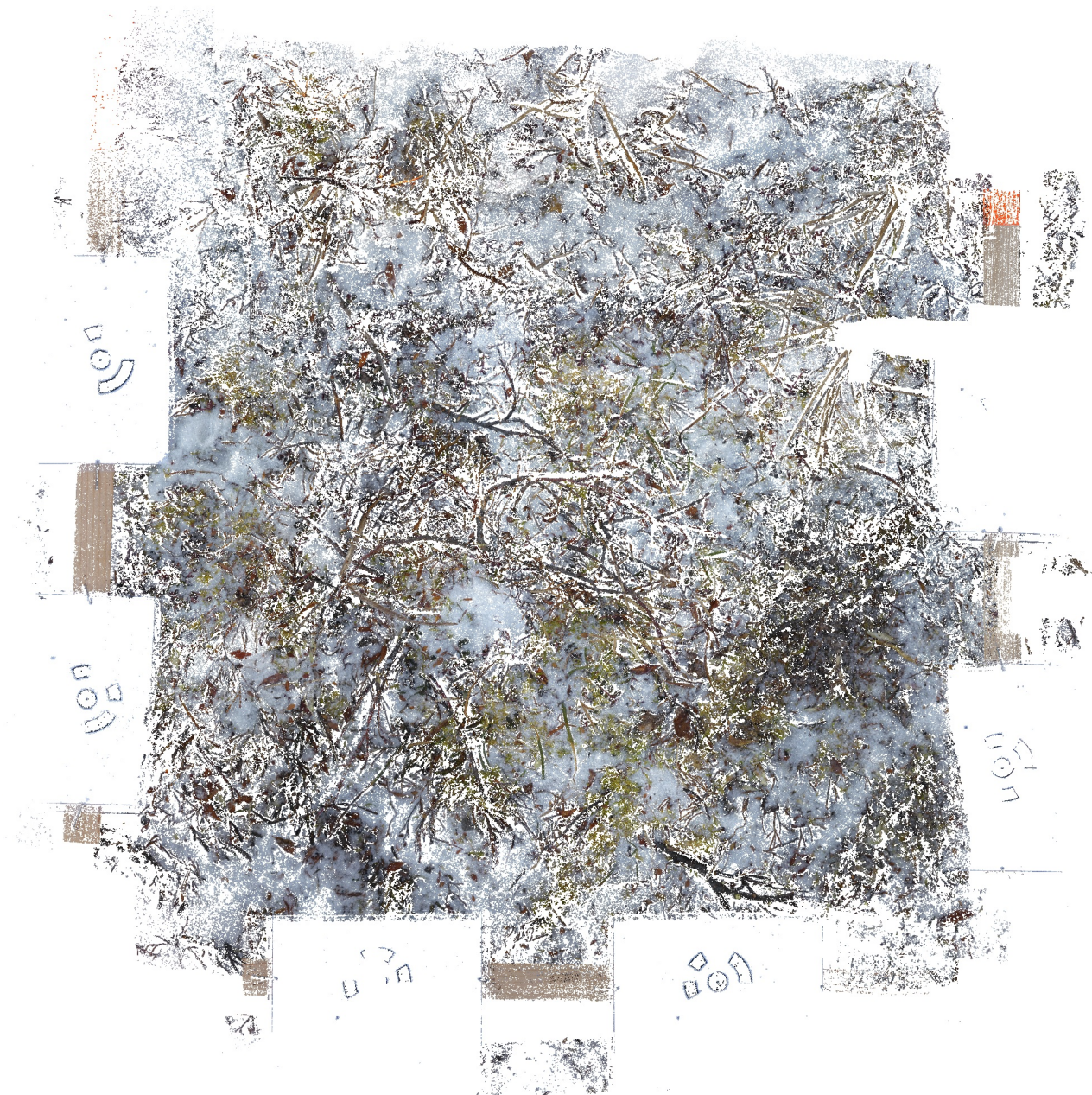
Points	11,786,573
Coordinate precision	0.0625 mm

Point attributes

Color	3 bands, uint8
Normal	
Confidence	2 - 10
Point classes	
Created (never classified)	11,786,573
Point cloud generation parameters	
Processing time	3 minutes 38 seconds
Memory usage	7.94 GB
Date created	2024:01:04 01:22:41
Software version	2.0.3.16960
File size	166.78 MB
System	
Software name	Agisoft Metashape Professional
Software version	2.0.3 build 16960
OS	Linux 64 bit
RAM	251.70 GB
CPU	Intel(R) Xeon(R) CPU E5-2680 v4 @ 2.40GHz
GPU(s)	Tesla P100-PCIE-12GB Tesla P100-PCIE-12GB

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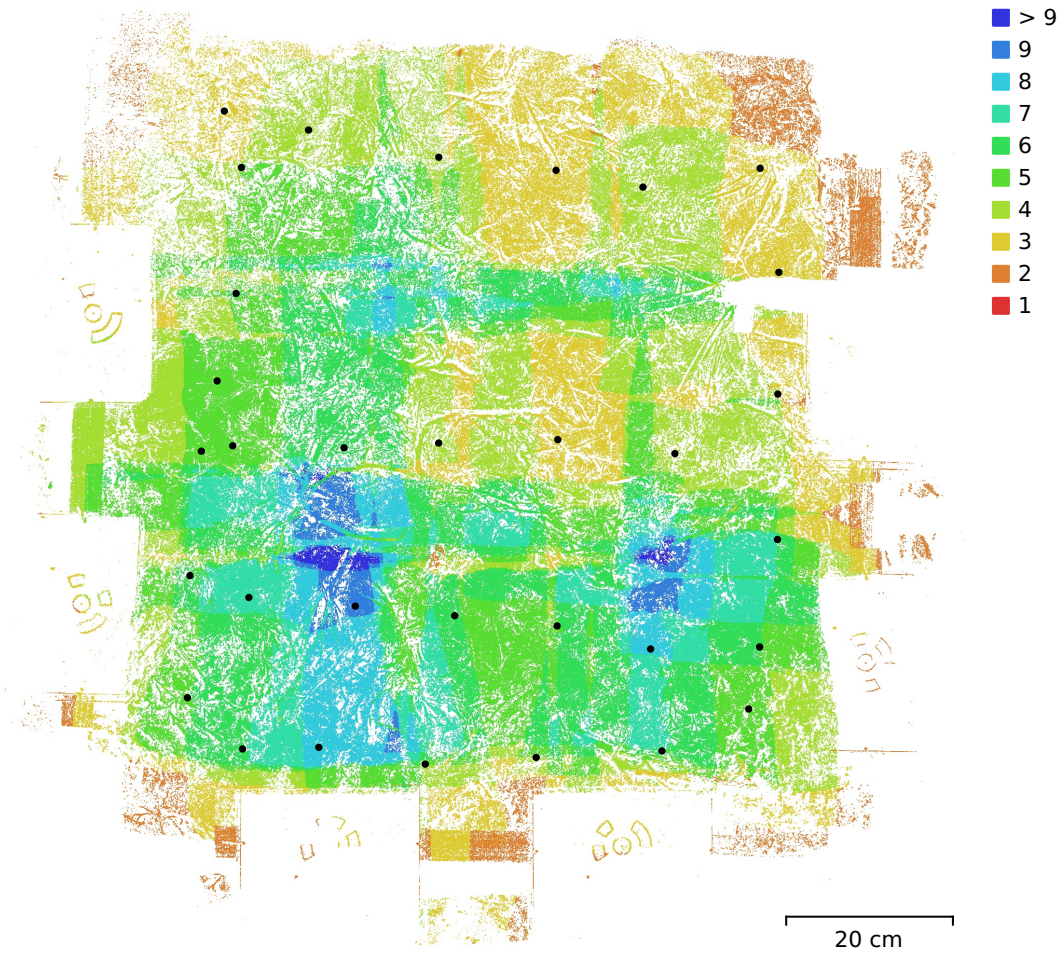


Fig. 1. Camera locations and image overlap.

Number of images:	32	Camera stations:	32
Flying altitude:	36.9 cm	Tie points:	14,216
Ground resolution:	0.0869 mm/pix	Projections:	30,697
Coverage area:	5.15e+03 cm ²	Reprojection error:	0.413 pix

Camera Model	Resolution	Focal Length	Pixel Size	Precalibrated
DC-TS7 (4.9mm)	5184 x 3888	4.9 mm	1.17 x 1.17 μm	No

Table 1. Cameras.

Camera Calibration

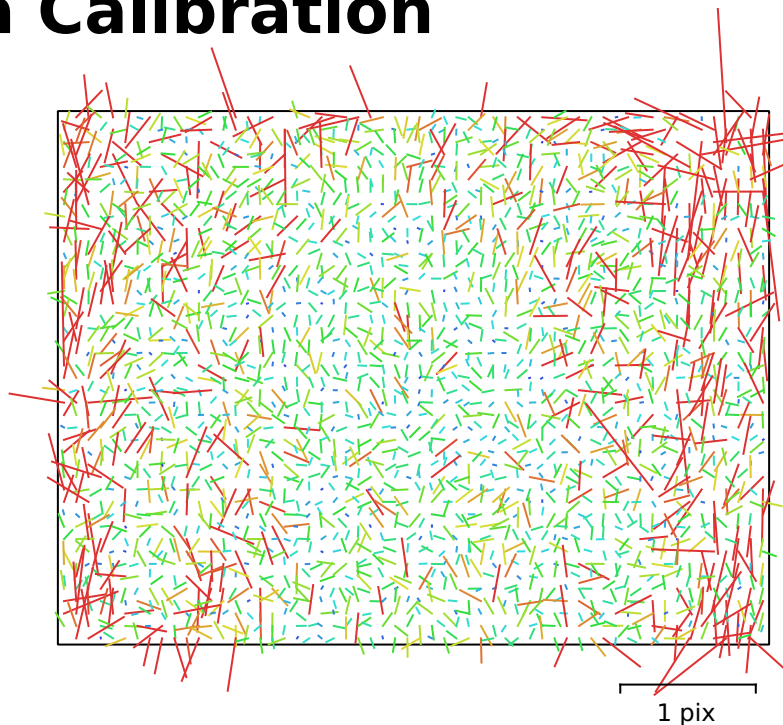


Fig. 2. Image residuals for DC-TS7 (4.9mm).

DC-TS7 (4.9mm)

32 images

Type	Resolution	Focal Length	Pixel Size
Frame	5184 x 3888	4.9 mm	1.17 x 1.17 μm

	Value	Error	F	Cx	Cy	K1	K2	K3	P1	P2
F	4242.62	1.8	1.00	0.05	-0.10	0.38	0.04	-0.07	0.05	-0.25
Cx	72.7261	0.52		1.00	0.06	0.03	0.03	-0.01	0.81	0.15
Cy	-71.8817	0.46			1.00	-0.04	0.03	-0.03	0.24	0.73
K1	-0.0117945	0.00031				1.00	-0.72	0.66	0.02	-0.07
K2	0.015744	0.001					1.00	-0.98	0.05	-0.03
K3	-0.0215582	0.0012						1.00	-0.04	0.02
P1	0.00448473	3e-05							1.00	0.24
P2	-0.00479768	2.8e-05								1.00

Table 2. Calibration coefficients and correlation matrix.

Scale Bars

Label	Distance (m)	Error (m)
point 1_point 2	0.35	-9.99201e-16
Total		9.99201e-16

Table 3. Control scale bars.

Digital Elevation Model

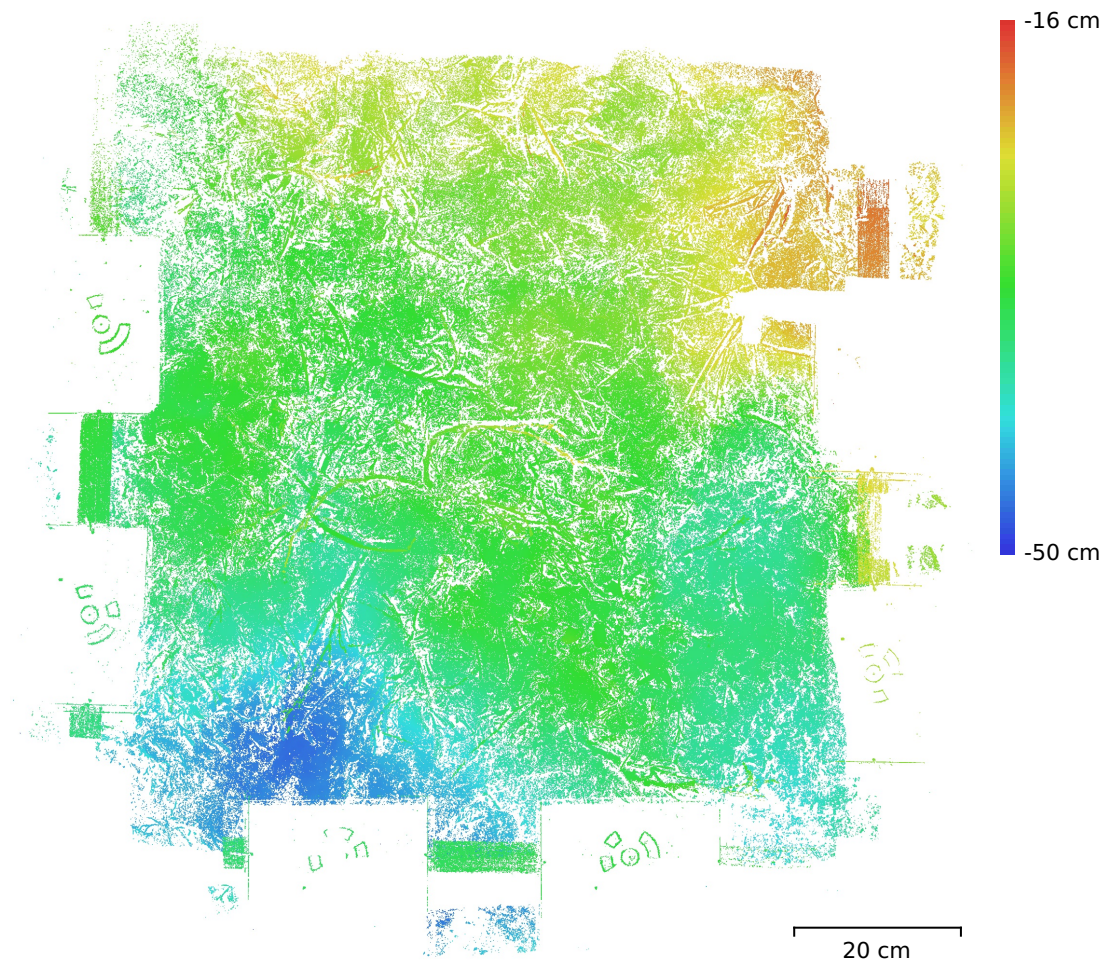


Fig. 3. Reconstructed digital elevation model.

Resolution: unknown
Point density: unknown

Processing Parameters

General

Cameras	32
Aligned cameras	32
Markers	8
Scale bars	4
Coordinate system	Local Coordinates (m)
Rotation angles	Yaw, Pitch, Roll

Tie Points

Points	14,216 of 44,081
RMS reprojection error	0.132136 (0.412926 pix)
Max reprojection error	0.366764 (1.61265 pix)
Mean key point size	3.02523 pix
Point colors	3 bands, uint8
Key points	No
Average tie point multiplicity	2.2744

Alignment parameters

Accuracy	Highest
Generic preselection	Yes
Reference preselection	Sequential
Key point limit	80,000
Key point limit per Mpx	1,000
Tie point limit	10,000
Exclude stationary tie points	Yes
Guided image matching	No
Adaptive camera model fitting	No
Matching time	18 seconds
Matching memory usage	982.72 MB
Alignment time	4 seconds
Alignment memory usage	124.23 MB

Optimization parameters

Parameters	f, cx, cy, k1-k3, p1, p2
Adaptive camera model fitting	No
Optimization time	0 seconds
Date created	2024:01:04 00:58:25
Software version	2.0.3.16960
File size	1.99 MB

Depth Maps

Count	32
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Depth maps generation parameters

Quality	Ultra High
Filtering mode	Mild
Max neighbors	16
Processing time	2 minutes 29 seconds
Memory usage	10.25 GB
Date created	2024:01:04 01:01:01
Software version	2.0.3.16960
File size	516.94 MB

Point Cloud

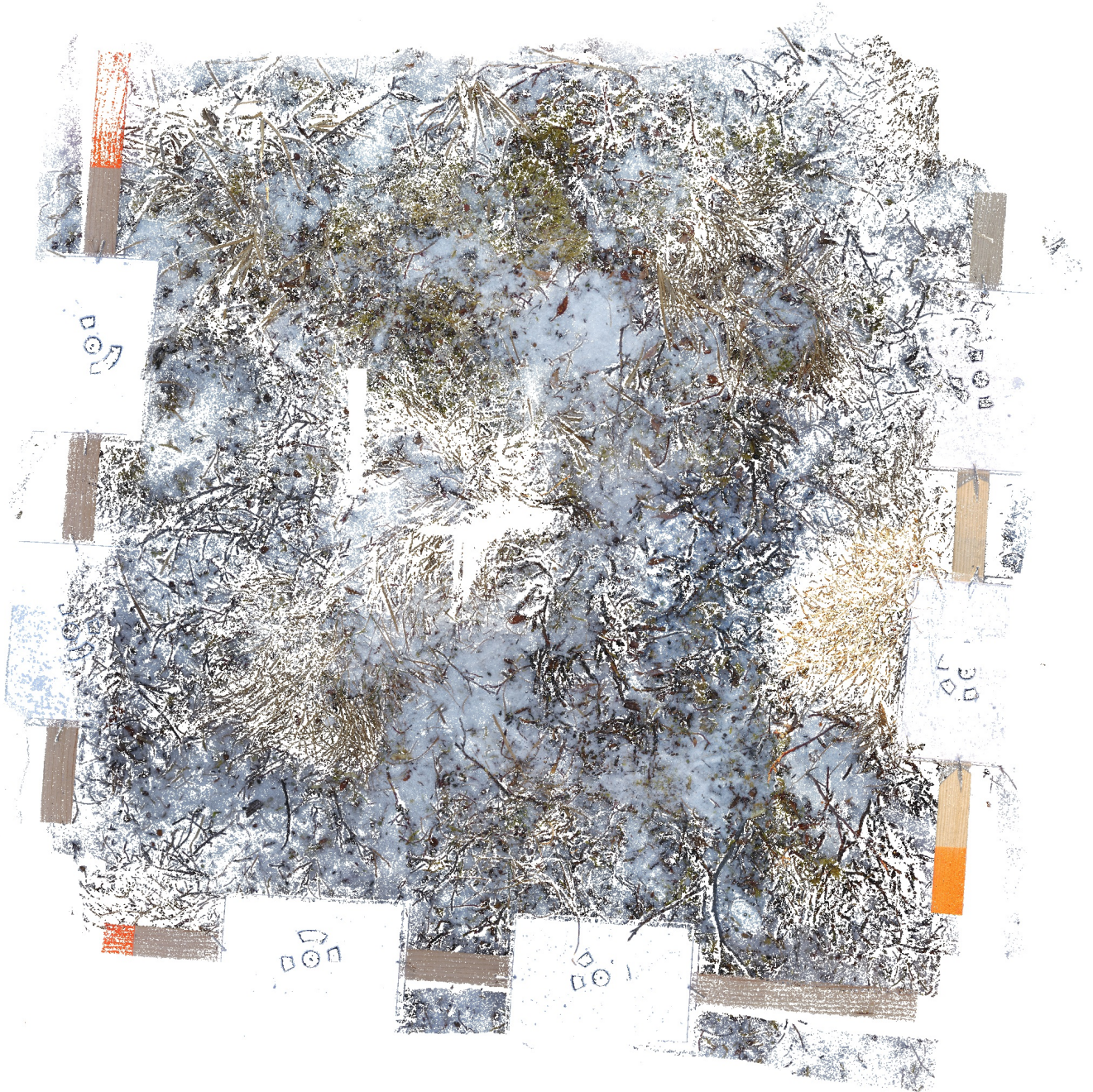
Points	14,493,119
Coordinate precision	0.0625 mm

Point attributes

Color	3 bands, uint8
Normal	
Confidence	2 - 9
Point classes	
Created (never classified)	14,493,119
Point cloud generation parameters	
Processing time	4 minutes 13 seconds
Memory usage	8.58 GB
Date created	2024:01:04 01:05:14
Software version	2.0.3.16960
File size	372.90 MB
System	
Software name	Agisoft Metashape Professional
Software version	2.0.3 build 16960
OS	Linux 64 bit
RAM	251.70 GB
CPU	Intel(R) Xeon(R) CPU E5-2680 v4 @ 2.40GHz
GPU(s)	Tesla P100-PCIE-12GB Tesla P100-PCIE-12GB

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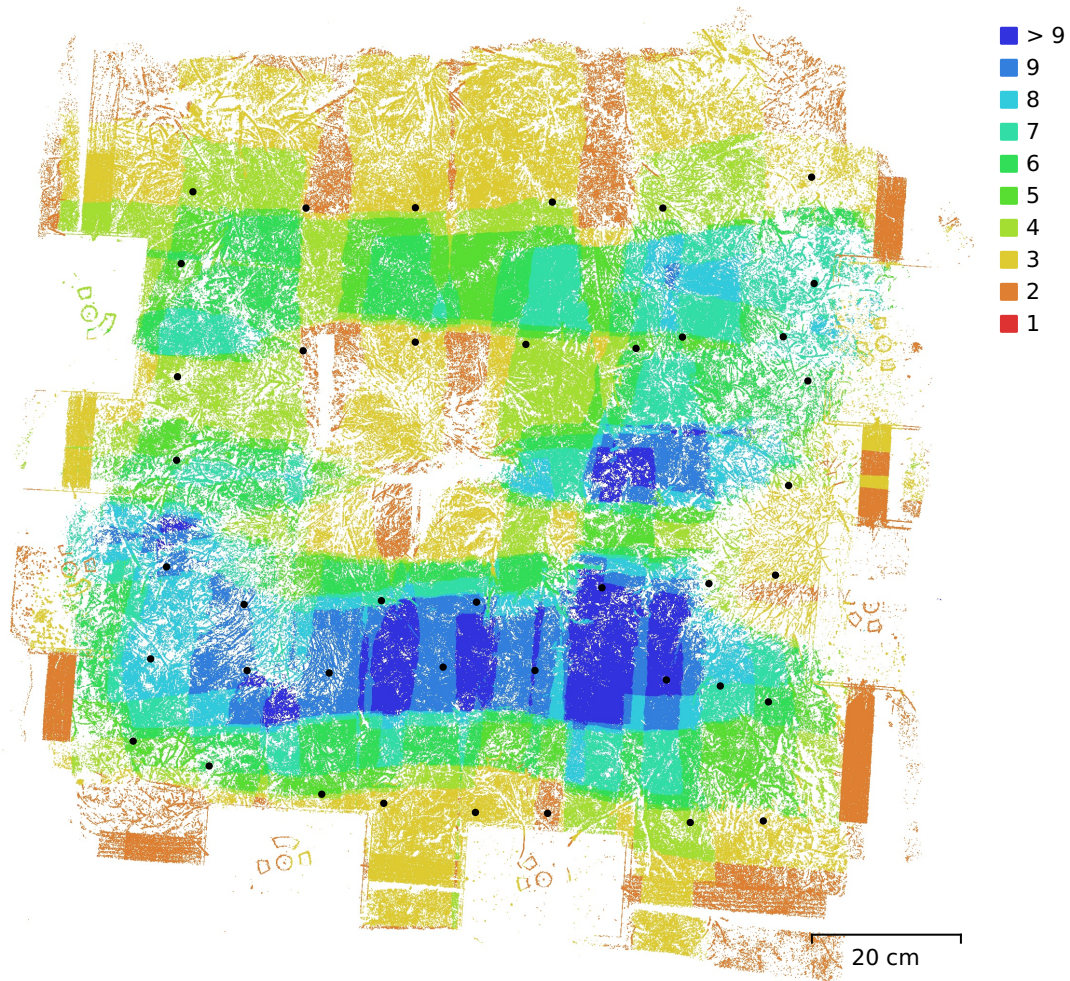


Fig. 1. Camera locations and image overlap.

Number of images:	41	Camera stations:	41
Flying altitude:	36.1 cm	Tie points:	19,587
Ground resolution:	0.0844 mm/pix	Projections:	42,249
Coverage area:	7.46e+03 cm ²	Reprojection error:	0.409 pix

Camera Model	Resolution	Focal Length	Pixel Size	Precalibrated
DC-TS7 (4.9mm)	5184 x 3888	4.9 mm	1.17 x 1.17 μm	No

Table 1. Cameras.

Camera Calibration

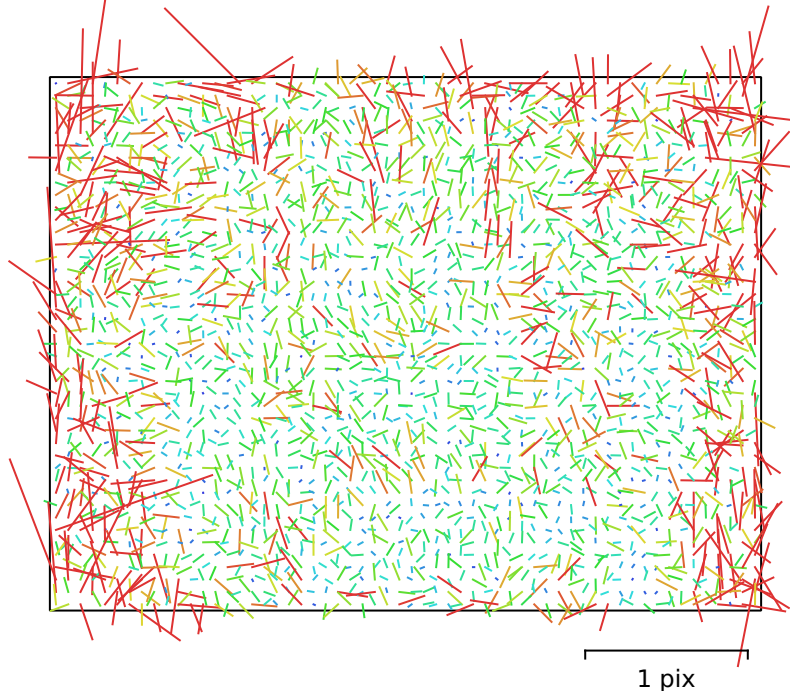


Fig. 2. Image residuals for DC-TS7 (4.9mm).

DC-TS7 (4.9mm)

41 images

Type	Resolution	Focal Length	Pixel Size
Frame	5184 x 3888	4.9 mm	1.17 x 1.17 μm

	Value	Error	F	Cx	Cy	K1	K2	K3	P1	P2
F	4274.92	1.9	1.00	0.31	0.40	0.35	0.05	-0.07	0.22	0.22
Cx	82.1419	0.48		1.00	0.39	0.16	0.04	-0.04	0.72	-0.06
Cy	-64.9427	0.61			1.00	0.15	0.04	-0.06	-0.12	0.59
K1	-0.00942167	0.00028				1.00	-0.76	0.70	0.14	0.14
K2	0.0178244	0.00094					1.00	-0.98	0.04	0.06
K3	-0.0214865	0.0012						1.00	-0.03	-0.07
P1	0.00472528	3.1e-05							1.00	-0.17
P2	-0.00450454	3e-05								1.00

Table 2. Calibration coefficients and correlation matrix.

Scale Bars

Label	Distance (m)	Error (m)
target 3_target 4	0.349089	-0.000910507
target 6_point 5	0.350906	0.000905725
Total		0.000908119

Table 3. Control scale bars.

Digital Elevation Model

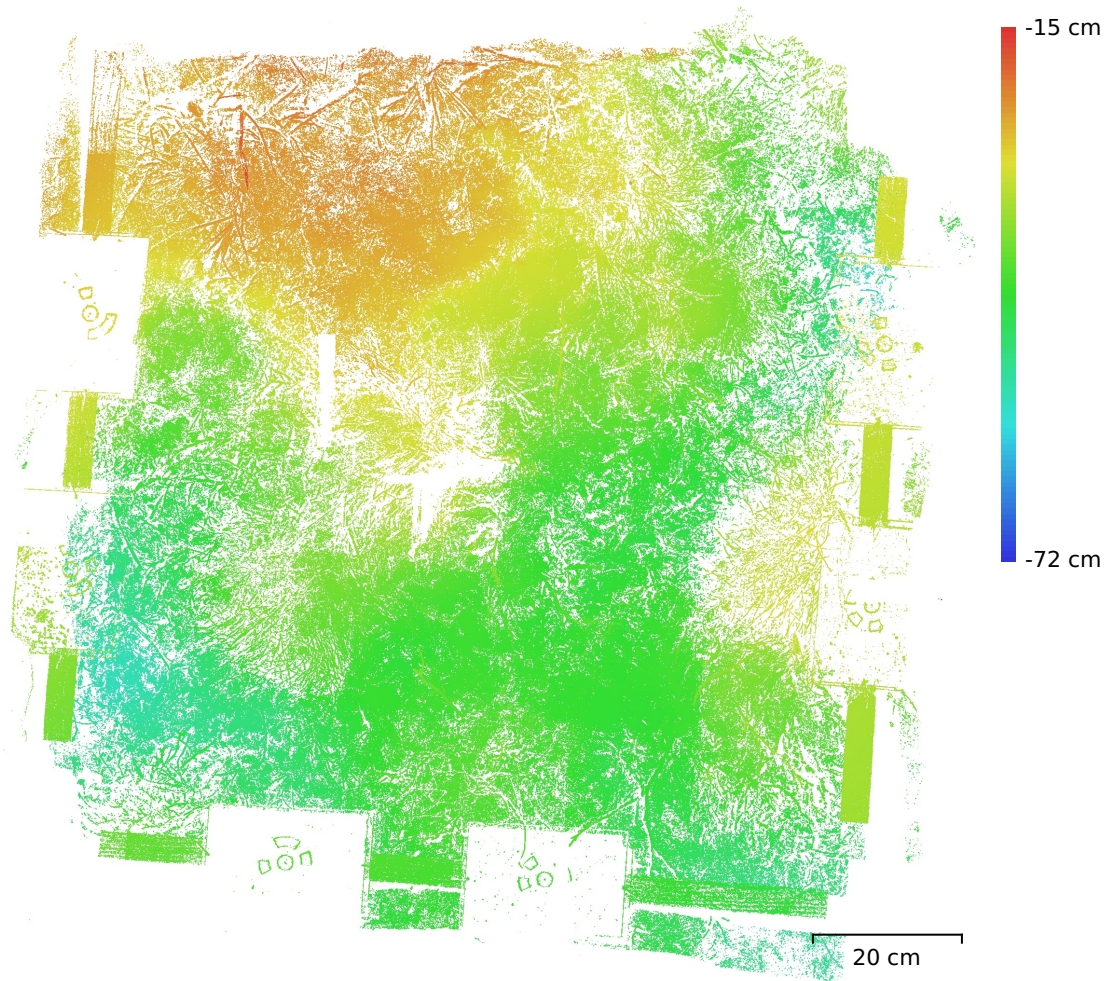


Fig. 3. Reconstructed digital elevation model.

Resolution: unknown
Point density: unknown

Processing Parameters

General

Cameras	41
Aligned cameras	41
Markers	6
Scale bars	3
Coordinate system	Local Coordinates (m)
Rotation angles	Yaw, Pitch, Roll

Tie Points

Points	19,587 of 58,014
RMS reprojection error	0.131452 (0.408893 pix)
Max reprojection error	0.361795 (1.8062 pix)
Mean key point size	2.97032 pix
Point colors	3 bands, uint8
Key points	No
Average tie point multiplicity	2.2945

Alignment parameters

Accuracy	Highest
Generic preselection	Yes
Reference preselection	Sequential
Key point limit	80,000
Key point limit per Mpx	1,000
Tie point limit	10,000
Exclude stationary tie points	Yes
Guided image matching	No
Adaptive camera model fitting	No
Matching time	25 seconds
Matching memory usage	957.50 MB
Alignment time	5 seconds
Alignment memory usage	143.05 MB

Optimization parameters

Parameters	f, cx, cy, k1-k3, p1, p2
Adaptive camera model fitting	No
Optimization time	0 seconds
Date created	2024:01:04 00:46:33
Software version	2.0.3.16960
File size	2.65 MB

Depth Maps

Count	41
Depth maps generation parameters	
Quality	Ultra High
Filtering mode	Mild
Max neighbors	16
Processing time	3 minutes 9 seconds
Memory usage	11.73 GB
Date created	2024:01:04 00:49:50
Software version	2.0.3.16960
File size	692.44 MB

Point Cloud

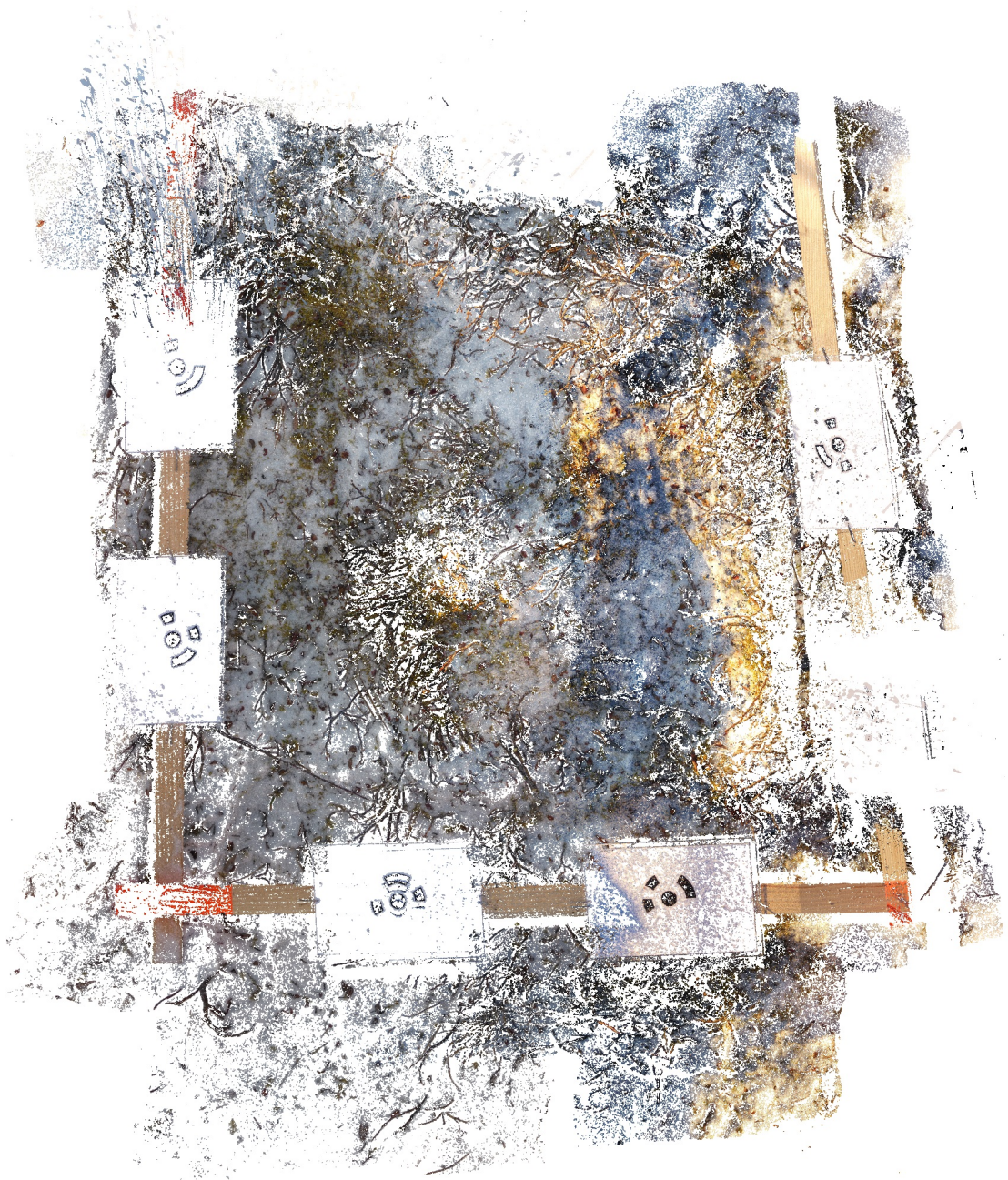
Points	19,598,561
Coordinate precision	0.0623 mm

Point attributes

Color	3 bands, uint8
Normal	
Confidence	2 - 11
Point classes	
Created (never classified)	19,598,561
Point cloud generation parameters	
Processing time	6 minutes 3 seconds
Memory usage	9.84 GB
Date created	2024:01:04 00:55:53
Software version	2.0.3.16960
File size	279.39 MB
System	
Software name	Agisoft Metashape Professional
Software version	2.0.3 build 16960
OS	Linux 64 bit
RAM	251.70 GB
CPU	Intel(R) Xeon(R) CPU E5-2680 v4 @ 2.40GHz
GPU(s)	Tesla P100-PCIE-12GB Tesla P100-PCIE-12GB

D768

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Survey Data

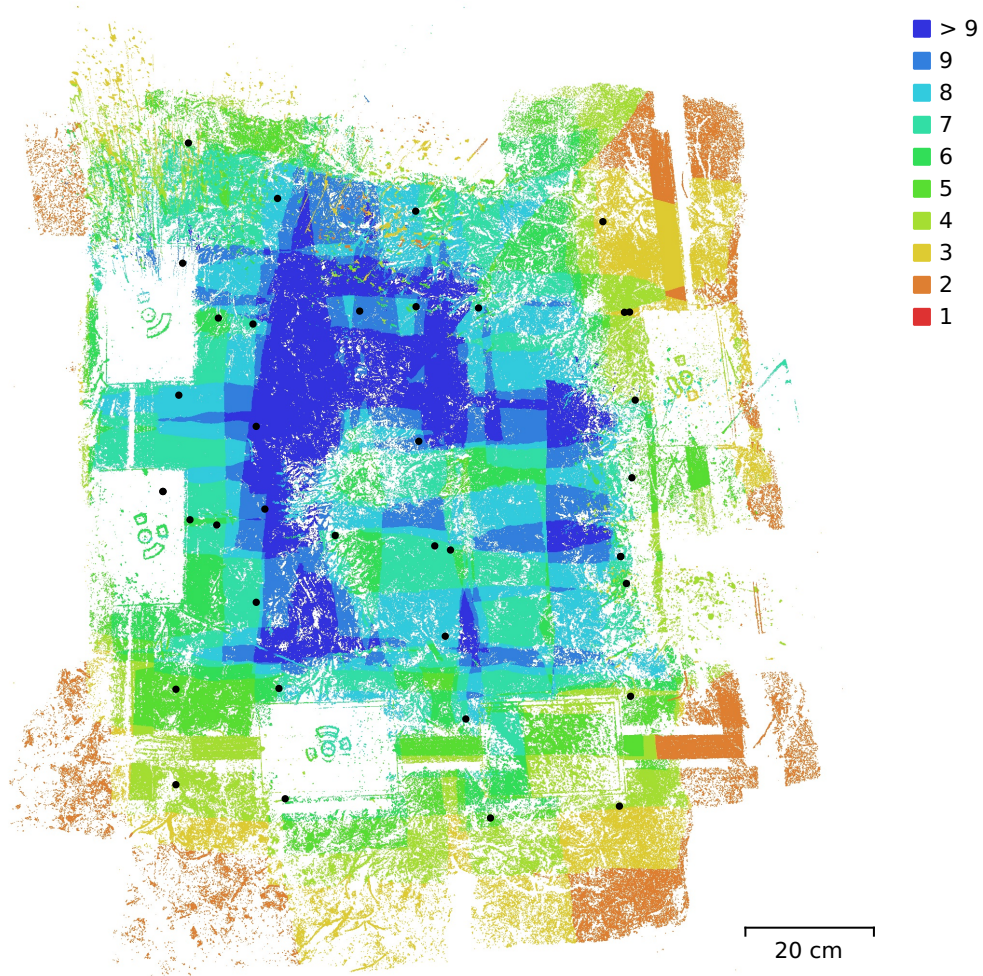


Fig. 1. Camera locations and image overlap.

Number of images:	38	Camera stations:	38
Flying altitude:	47.4 cm	Tie points:	22,861
Ground resolution:	0.11 mm/pix	Projections:	53,815
Coverage area:	8.02e+03 cm ²	Reprojection error:	0.373 pix

Camera Model	Resolution	Focal Length	Pixel Size	Precalibrated
DC-TS7 (4.9mm)	5184 x 3888	4.9 mm	1.17 x 1.17 μm	No

Table 1. Cameras.

Camera Calibration

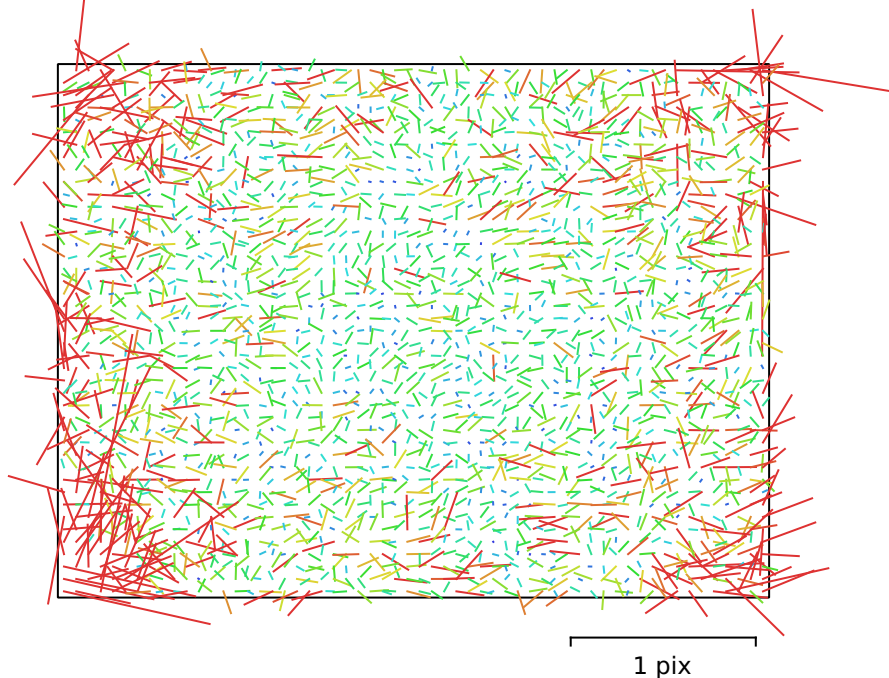


Fig. 2. Image residuals for DC-TS7 (4.9mm).

DC-TS7 (4.9mm)

38 images

Type	Resolution	Focal Length	Pixel Size
Frame	5184 x 3888	4.9 mm	1.17 x 1.17 μm

	Value	Error	F	Cx	Cy	K1	K2	K3	P1	P2
F	4299.98	0.88	1.00	-0.02	0.09	0.44	0.03	-0.06	0.02	0.00
Cx	35.4687	0.25		1.00	-0.17	-0.04	0.00	0.01	0.88	-0.14
Cy	-85.207	0.26			1.00	0.06	0.01	-0.02	-0.22	0.84
K1	-0.00749135	0.0002				1.00	-0.79	0.72	0.00	0.05
K2	0.0211659	0.00073					1.00	-0.98	-0.01	0.01
K3	-0.030053	0.00099						1.00	0.02	-0.01
P1	0.00354786	1.9e-05							1.00	-0.21
P2	-0.00459833	1.8e-05								1.00

Table 2. Calibration coefficients and correlation matrix.

Scale Bars

Label	Distance (m)	Error (m)
target 1_target 2	0.351147	0.00114689
target 3_target 4	0.348846	-0.00115447
Total		0.00115069

Table 3. Control scale bars.

Digital Elevation Model

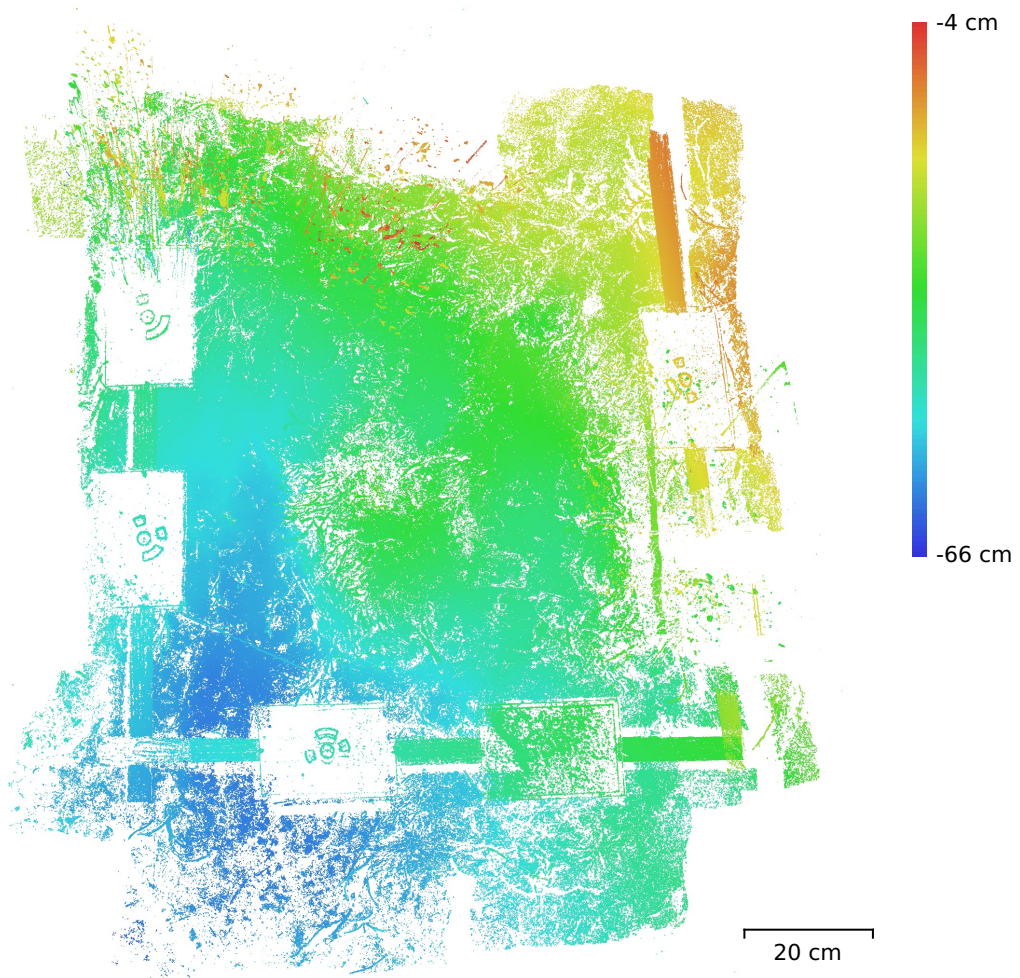


Fig. 3. Reconstructed digital elevation model.

Resolution: unknown
Point density: unknown

Processing Parameters

General

Cameras	38
Aligned cameras	38
Markers	5
Scale bars	2
Coordinate system	Local Coordinates (m)
Rotation angles	Yaw, Pitch, Roll

Tie Points

Points	22,861 of 78,357
RMS reprojection error	0.136883 (0.373305 pix)
Max reprojection error	0.409673 (1.84671 pix)
Mean key point size	2.63758 pix
Point colors	3 bands, uint8
Key points	No
Average tie point multiplicity	2.42369

Alignment parameters

Accuracy	Highest
Generic preselection	Yes
Reference preselection	Sequential
Key point limit	80,000
Key point limit per Mpx	1,000
Tie point limit	10,000
Exclude stationary tie points	Yes
Guided image matching	No
Adaptive camera model fitting	No
Matching time	24 seconds
Matching memory usage	916.30 MB
Alignment time	9 seconds
Alignment memory usage	207.50 MB

Optimization parameters

Parameters	f, cx, cy, k1-k3, p1, p2
Adaptive camera model fitting	No
Optimization time	0 seconds
Date created	2024:01:04 00:28:05
Software version	2.0.3.16960
File size	5.09 MB

Depth Maps

Count	38
Depth maps generation parameters	
Quality	Ultra High
Filtering mode	Mild
Max neighbors	16
Processing time	3 minutes 0 seconds
Memory usage	11.37 GB
Date created	2024:01:04 00:31:17
Software version	2.0.3.16960
File size	580.04 MB

Point Cloud

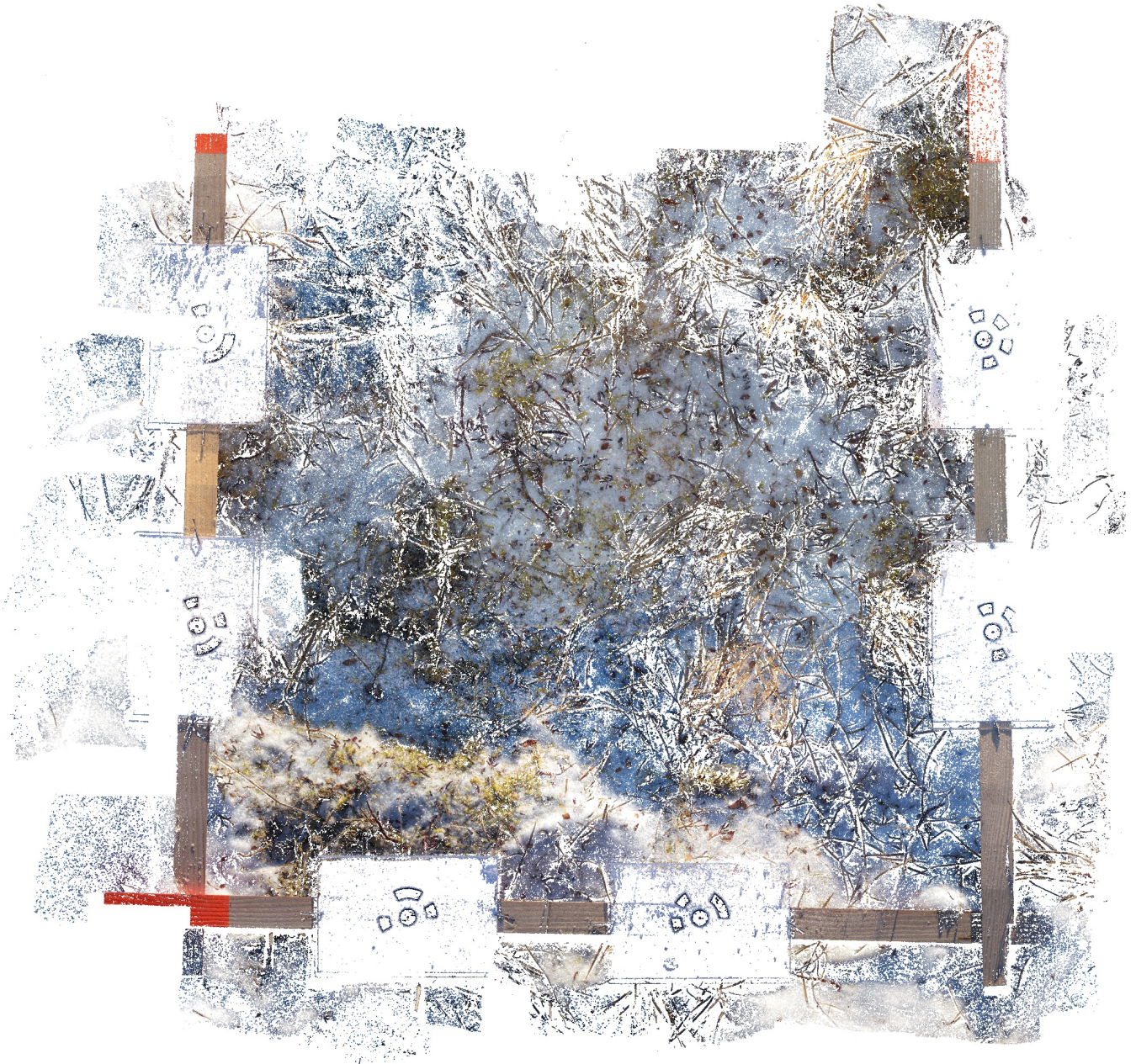
Points	20,576,013
Coordinate precision	0.0625 mm

Point attributes

Color	3 bands, uint8
Normal	
Confidence	2 - 12
Point classes	
Created (never classified)	20,576,013
Point cloud generation parameters	
Processing time	4 minutes 45 seconds
Memory usage	10.59 GB
Date created	2024:01:04 00:36:03
Software version	2.0.3.16960
File size	294.10 MB
System	
Software name	Agisoft Metashape Professional
Software version	2.0.3 build 16960
OS	Linux 64 bit
RAM	251.70 GB
CPU	Intel(R) Xeon(R) CPU E5-2680 v4 @ 2.40GHz
GPU(s)	Tesla P100-PCIE-12GB Tesla P100-PCIE-12GB

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Survey Data

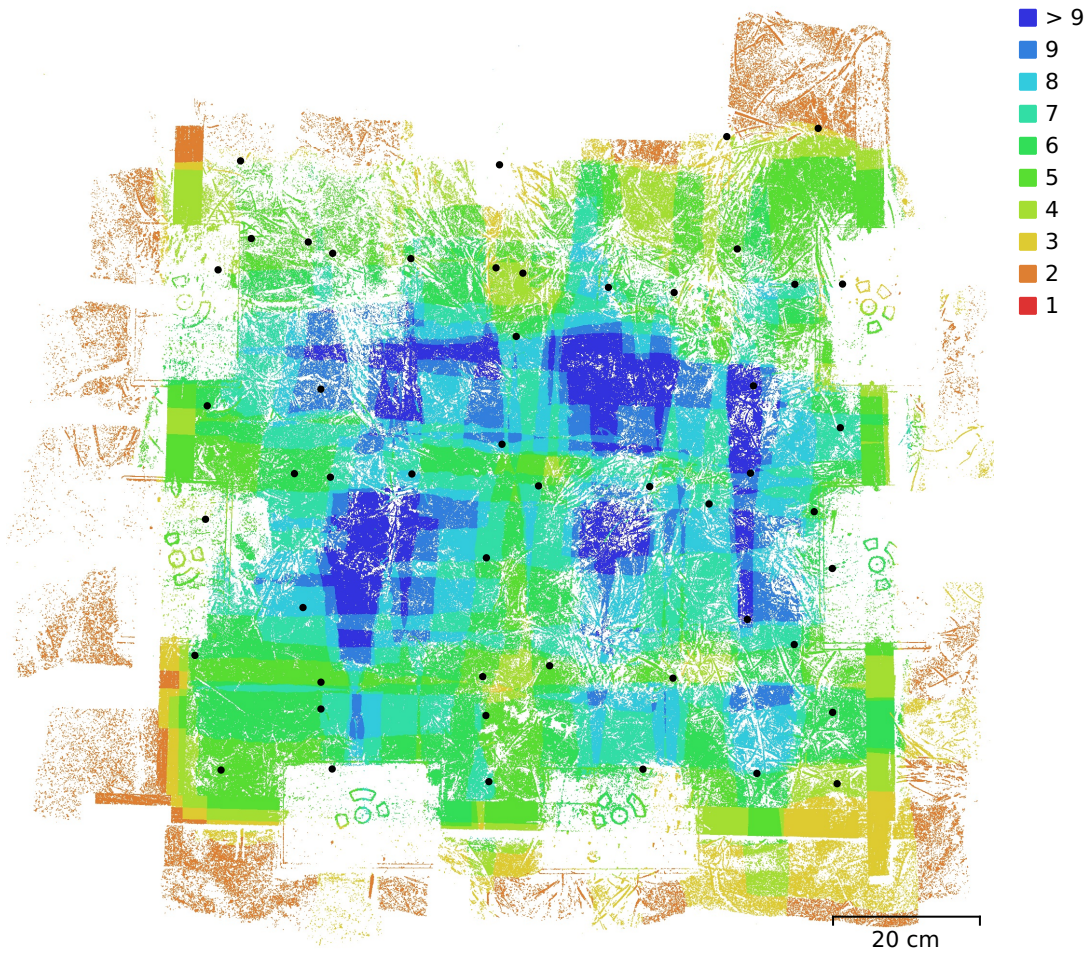


Fig. 1. Camera locations and image overlap.

Number of images:	51	Camera stations:	50
Flying altitude:	36.3 cm	Tie points:	26,912
Ground resolution:	0.0848 mm/pix	Projections:	61,622
Coverage area:	6.98e+03 cm ²	Reprojection error:	0.358 pix

Camera Model	Resolution	Focal Length	Pixel Size	Precalibrated
DC-TS7 (4.9mm)	5184 x 3888	4.9 mm	1.17 x 1.17 μ m	No

Table 1. Cameras.

Camera Calibration

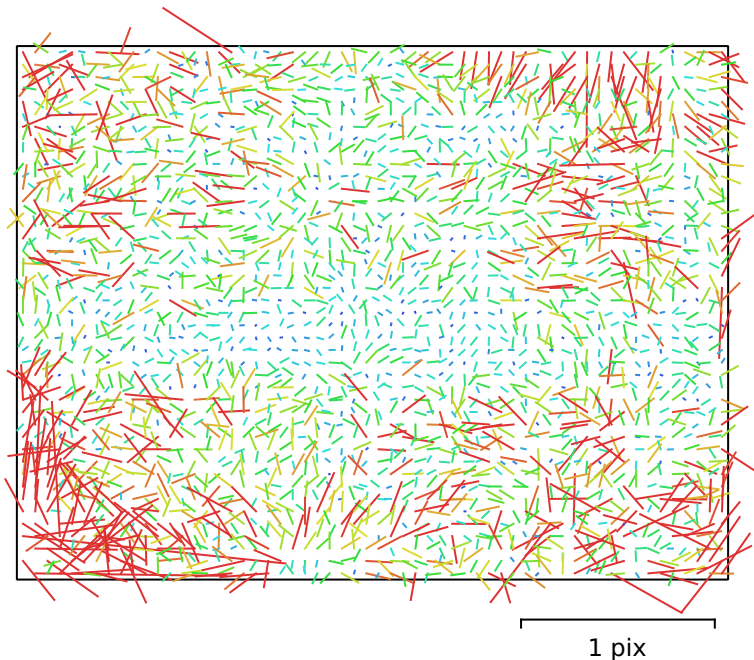


Fig. 2. Image residuals for DC-TS7 (4.9mm).

DC-TS7 (4.9mm)

51 images

Type	Resolution	Focal Length	Pixel Size
Frame	5184 x 3888	4.9 mm	1.17 x 1.17 μm

	Value	Error	F	Cx	Cy	K1	K2	K3	P1	P2
F	4281.76	1.6	1.00	-0.15	0.52	0.44	0.08	-0.13	0.08	0.17
Cx	53.4911	0.15		1.00	-0.03	-0.03	-0.02	0.00	0.80	0.06
Cy	-81.4863	0.17			1.00	0.32	0.05	-0.06	0.13	0.74
K1	-0.00796288	0.00022				1.00	-0.62	0.54	0.07	0.31
K2	0.0198398	0.00068					1.00	-0.98	-0.04	0.03
K3	-0.0273759	0.00091						1.00	0.02	-0.03
P1	0.00419712	1.1e-05							1.00	0.13
P2	-0.00422092	1.1e-05								1.00

Table 2. Calibration coefficients and correlation matrix.

Scale Bars

Label	Distance (m)	Error (m)
point 1_point 2	0.350081	8.10728e-05
point 3_point 4	0.349578	-0.000421796
point 5_point 6	0.35034	0.000339868
Total		0.000316225

Table 3. Control scale bars.

Digital Elevation Model

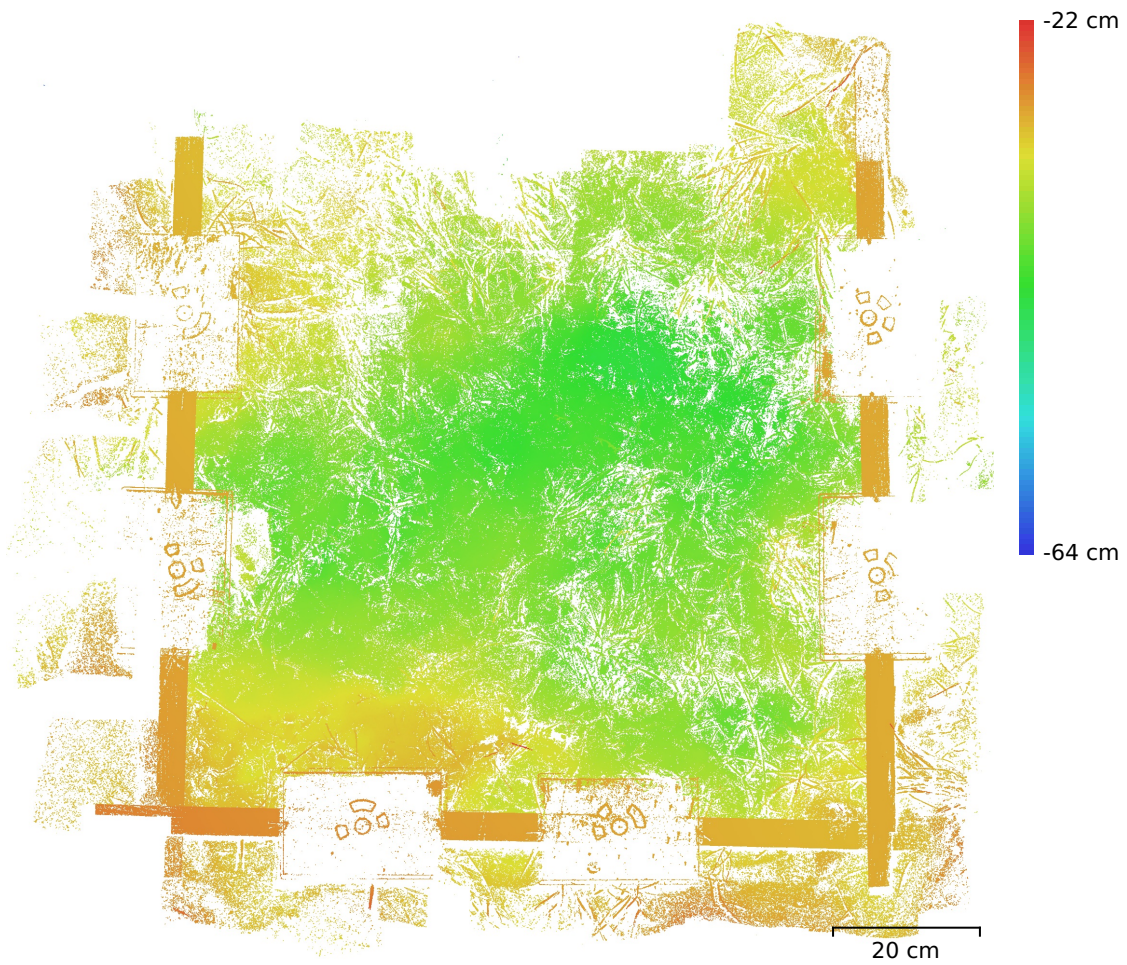


Fig. 3. Reconstructed digital elevation model.

Resolution: unknown
Point density: unknown

Processing Parameters

General

Cameras	51
Aligned cameras	50
Markers	11
Scale bars	5
Coordinate system	Local Coordinates (m)
Rotation angles	Yaw, Pitch, Roll

Tie Points

Points	26,912 of 81,211
RMS reprojection error	0.132337 (0.35785 pix)
Max reprojection error	0.537297 (2.04228 pix)
Mean key point size	2.51624 pix
Point colors	3 bands, uint8
Key points	No
Average tie point multiplicity	2.31554

Alignment parameters

Accuracy	Highest
Generic preselection	Yes
Reference preselection	Sequential
Key point limit	80,000
Key point limit per Mpx	1,000
Tie point limit	10,000
Exclude stationary tie points	Yes
Guided image matching	No
Adaptive camera model fitting	No
Matching time	48 seconds
Matching memory usage	1016.25 MB
Alignment time	17 seconds
Alignment memory usage	439.25 MB

Optimization parameters

Parameters	f, cx, cy, k1-k3, p1, p2
Adaptive camera model fitting	No
Optimization time	0 seconds
Date created	2024:01:04 00:07:49
Software version	2.0.3.16960
File size	3.72 MB

Depth Maps

Count	49
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Depth maps generation parameters

Quality	Ultra High
Filtering mode	Mild
Max neighbors	16
Processing time	3 minutes 50 seconds
Memory usage	13.29 GB
Date created	2024:01:04 00:11:59
Software version	2.0.3.16960
File size	718.55 MB

Point Cloud

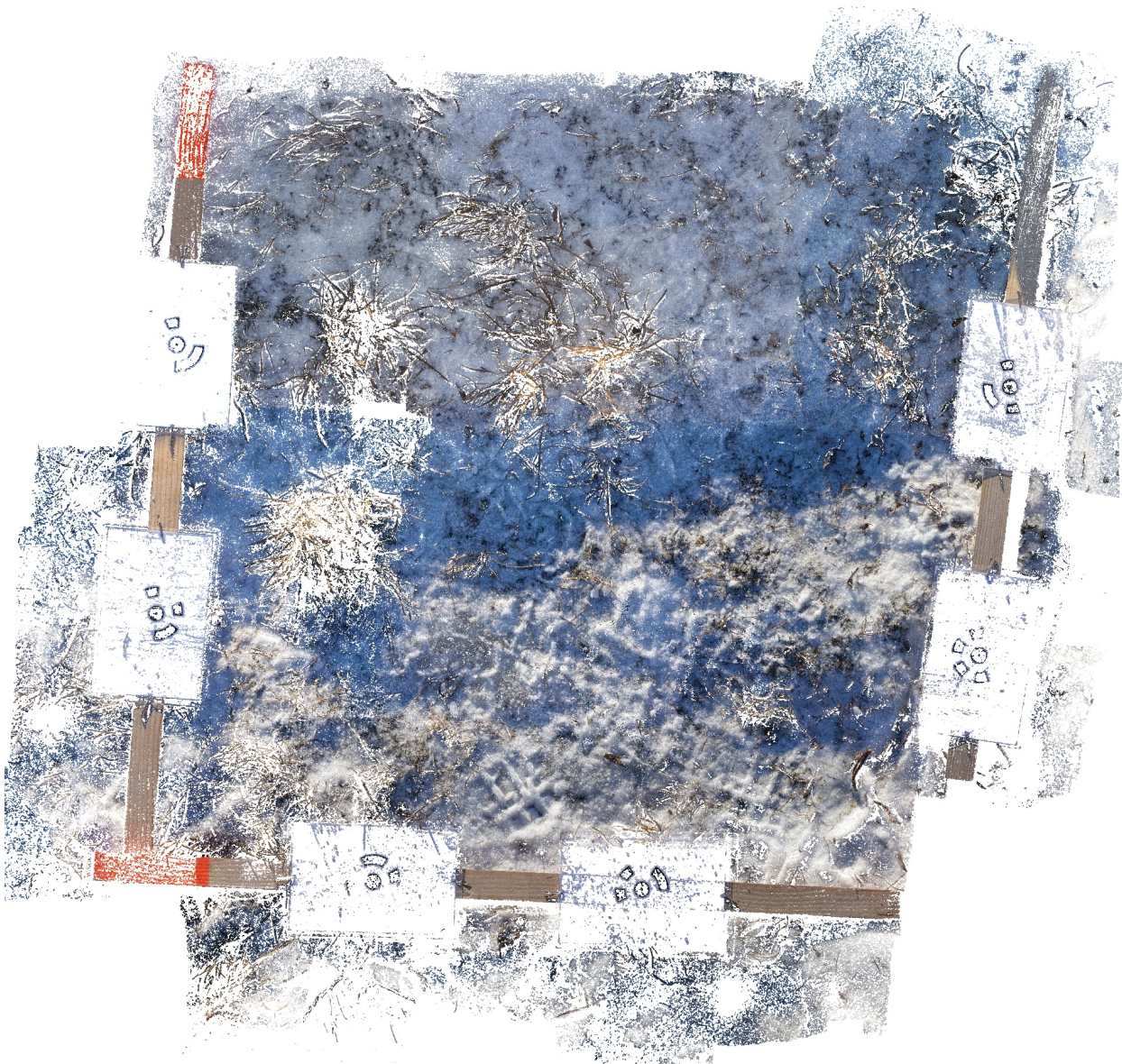
Points	17,808,496
Coordinate precision	0.0625 mm

Point attributes

Color	3 bands, uint8
Normal	
Confidence	2 - 10
Point classes	
Created (never classified)	17,808,496
Point cloud generation parameters	
Processing time	6 minutes 3 seconds
Memory usage	12.03 GB
Date created	2024:01:04 00:18:03
Software version	2.0.3.16960
File size	253.07 MB
System	
Software name	Agisoft Metashape Professional
Software version	2.0.3 build 16960
OS	Linux 64 bit
RAM	251.70 GB
CPU	Intel(R) Xeon(R) CPU E5-2680 v4 @ 2.40GHz
GPU(s)	Tesla P100-PCIE-12GB Tesla P100-PCIE-12GB

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Survey Data

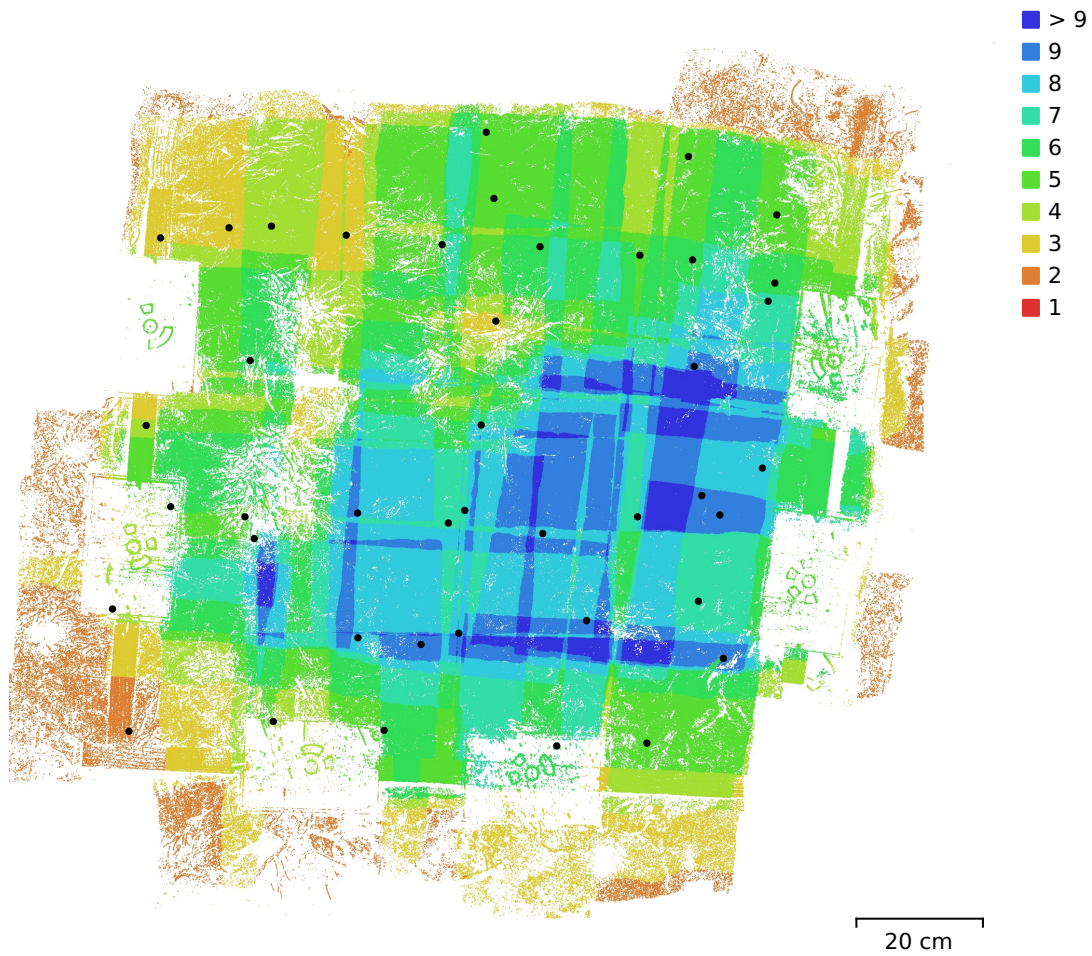


Fig. 1. Camera locations and image overlap.

Number of images:	42	Camera stations:	42
Flying altitude:	45.2 cm	Tie points:	40,716
Ground resolution:	0.105 mm/pix	Projections:	94,528
Coverage area:	1.06 m ²	Reprojection error:	0.383 pix

Camera Model	Resolution	Focal Length	Pixel Size	Precalibrated
DC-TS7 (4.9mm)	5184 x 3888	4.9 mm	1.17 x 1.17 μ m	No

Table 1. Cameras.

Camera Calibration

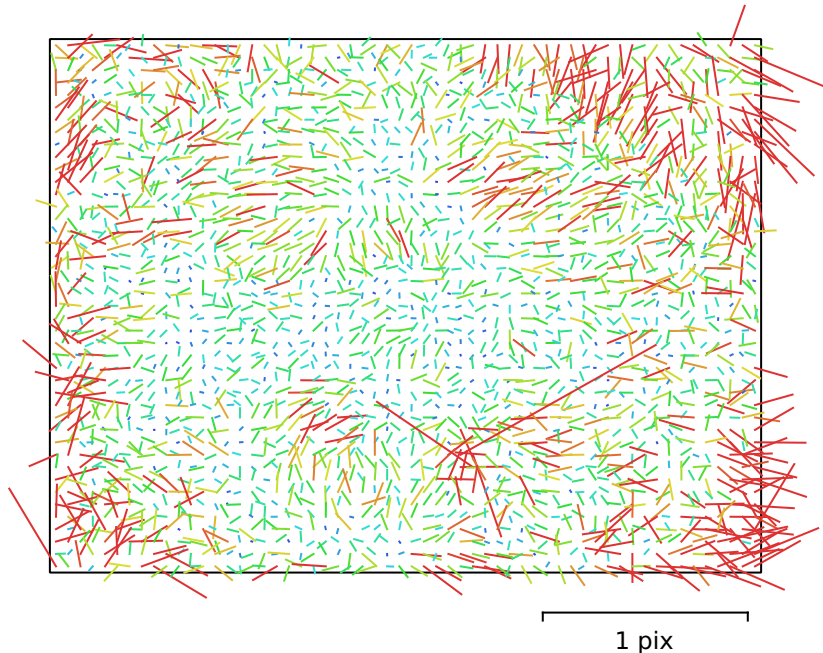


Fig. 2. Image residuals for DC-TS7 (4.9mm).

DC-TS7 (4.9mm)

42 images

Type	Resolution	Focal Length	Pixel Size
Frame	5184 x 3888	4.9 mm	1.17 x 1.17 μm

	Value	Error	F	Cx	Cy	K1	K2	K3	P1	P2
F	4316.26	1.7	1.00	-0.70	0.17	0.28	0.07	-0.12	0.02	-0.18
Cx	52.4089	0.2		1.00	-0.06	-0.21	-0.04	0.08	0.41	0.17
Cy	-79.1264	0.15			1.00	0.06	0.06	-0.06	0.18	0.60
K1	-0.00814104	0.00016				1.00	-0.69	0.62	-0.25	-0.02
K2	0.0265882	0.00056					1.00	-0.98	0.01	-0.01
K3	-0.0355652	0.00076						1.00	0.00	0.02
P1	0.00410261	1e-05							1.00	0.14
P2	-0.00430126	8.9e-06								1.00

Table 2. Calibration coefficients and correlation matrix.

Scale Bars

Label	Distance (m)	Error (m)
target 1_target 2	0.349647	-0.000353133
target 3_target 4	0.349836	-0.000163555
target 5_target 6	0.350515	0.000515476
Total		0.000372902

Table 3. Control scale bars.

Digital Elevation Model

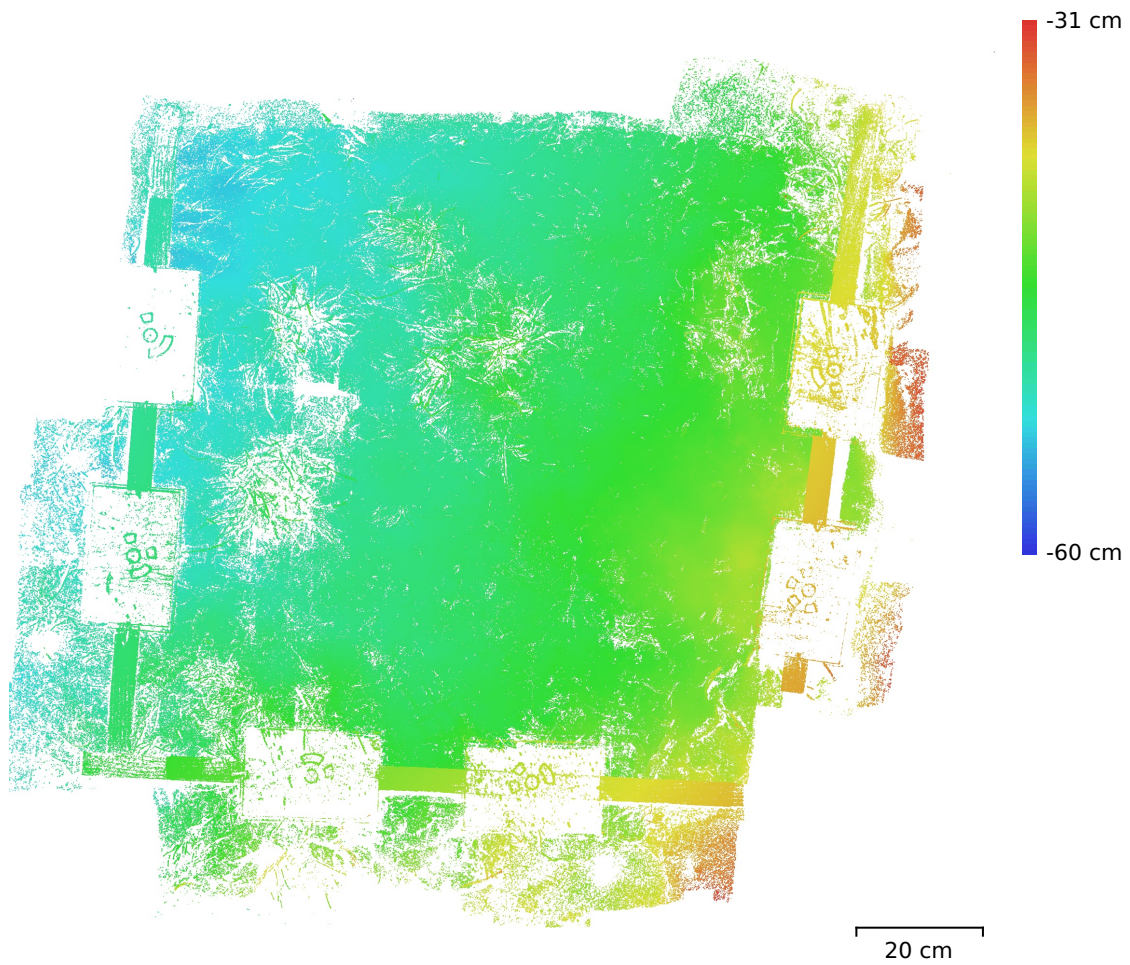


Fig. 3. Reconstructed digital elevation model.

Resolution: unknown
Point density: unknown

Processing Parameters

General

Cameras	42
Aligned cameras	42
Markers	6
Scale bars	3
Coordinate system	Local Coordinates (m)
Rotation angles	Yaw, Pitch, Roll

Tie Points

Points	40,716 of 95,210
RMS reprojection error	0.13324 (0.382581 pix)
Max reprojection error	0.343637 (1.83908 pix)
Mean key point size	2.75955 pix
Point colors	3 bands, uint8
Key points	No
Average tie point multiplicity	2.43985

Alignment parameters

Accuracy	Highest
Generic preselection	Yes
Reference preselection	Sequential
Key point limit	80,000
Key point limit per Mpx	1,000
Tie point limit	10,000
Exclude stationary tie points	Yes
Guided image matching	No
Adaptive camera model fitting	No
Matching time	27 seconds
Matching memory usage	1.04 GB
Alignment time	18 seconds
Alignment memory usage	498.64 MB

Optimization parameters

Parameters	f, cx, cy, k1-k3, p1, p2
Adaptive camera model fitting	No
Optimization time	0 seconds
Date created	2024:01:03 23:54:11
Software version	2.0.3.16960
File size	6.52 MB

Depth Maps

Count	42
Depth maps generation parameters	
Quality	Ultra High
Filtering mode	Mild
Max neighbors	16
Processing time	3 minutes 24 seconds
Memory usage	12.40 GB
Date created	2024:01:03 23:57:56
Software version	2.0.3.16960
File size	861.43 MB

Point Cloud

Points	24,441,033
Coordinate precision	0.0625 mm

Point attributes

Color	3 bands, uint8
Normal	
Confidence	2 - 10
Point classes	
Created (never classified)	24,441,033
Point cloud generation parameters	
Processing time	6 minutes 15 seconds
Memory usage	10.11 GB
Date created	2024:01:04 00:04:12
Software version	2.0.3.16960
File size	348.52 MB
System	
Software name	Agisoft Metashape Professional
Software version	2.0.3 build 16960
OS	Linux 64 bit
RAM	251.70 GB
CPU	Intel(R) Xeon(R) CPU E5-2680 v4 @ 2.40GHz
GPU(s)	Tesla P100-PCIE-12GB Tesla P100-PCIE-12GB

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Survey Data

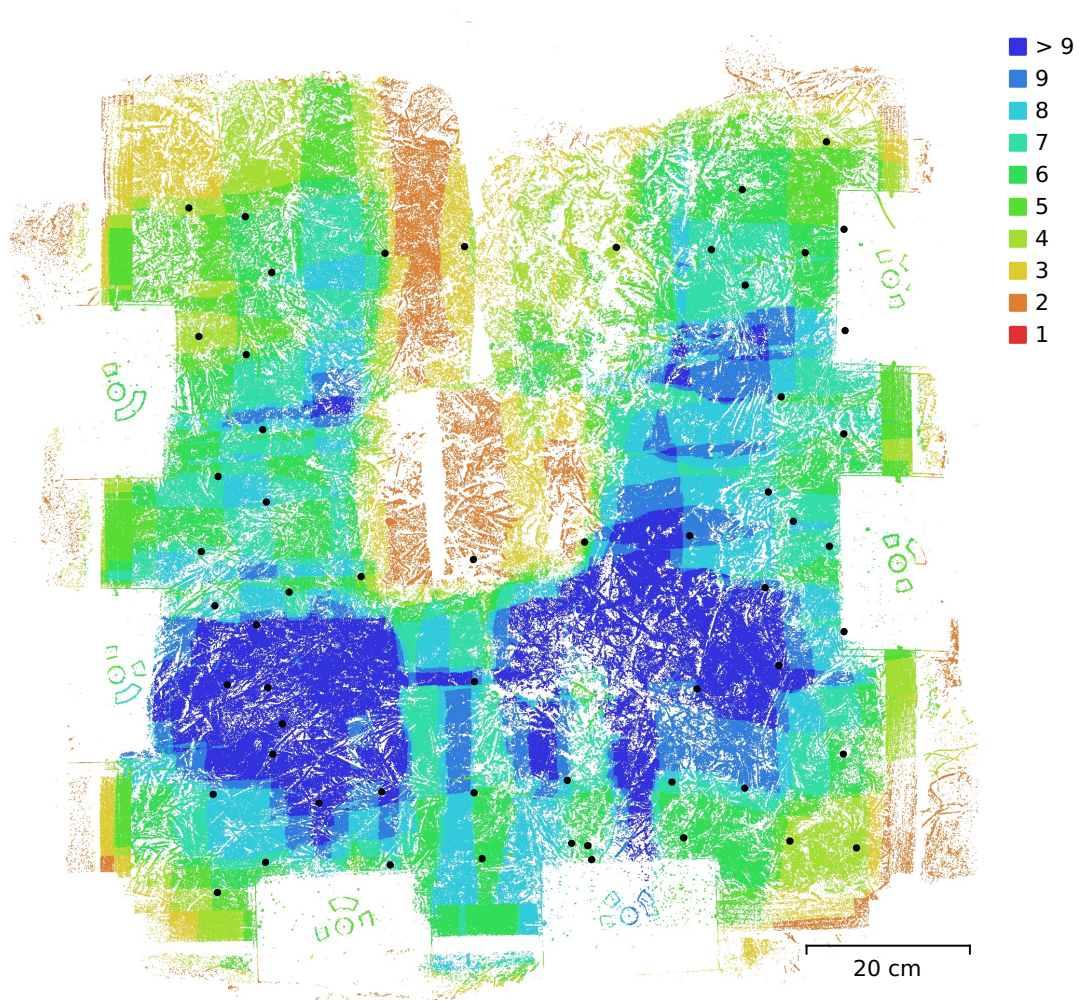


Fig. 1. Camera locations and image overlap.

Number of images:	58	Camera stations:	58
Flying altitude:	34.5 cm	Tie points:	21,128
Ground resolution:	0.0804 mm/pix	Projections:	47,942
Coverage area:	6.22e+03 cm ²	Reprojection error:	0.406 pix

Camera Model	Resolution	Focal Length	Pixel Size	Precalibrated
DC-TS7 (4.9mm)	5184 x 3888	4.9 mm	1.17 x 1.17 μ m	No

Table 1. Cameras.

Camera Calibration

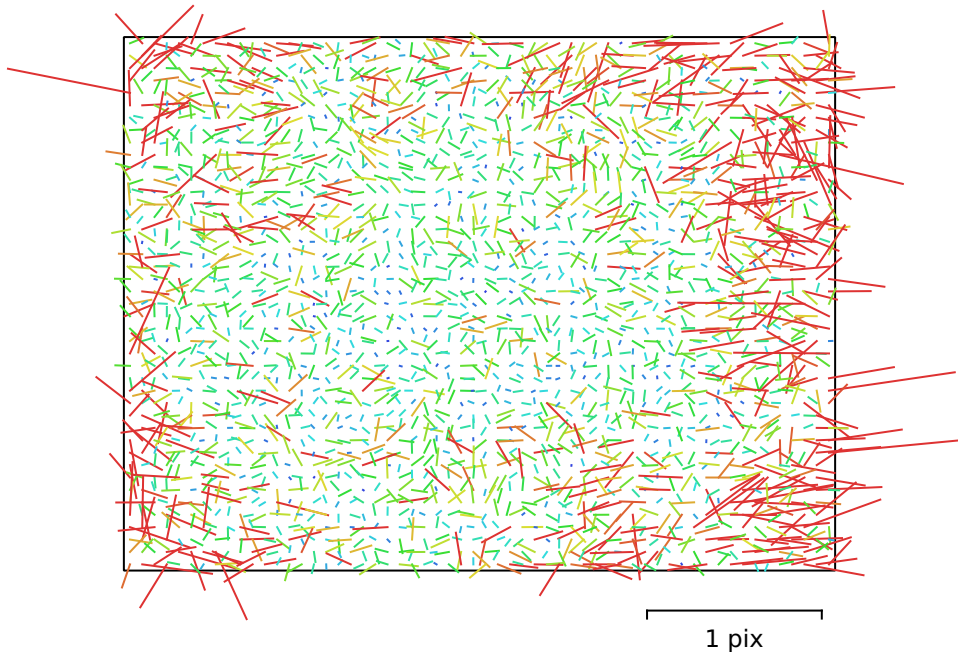


Fig. 2. Image residuals for DC-TS7 (4.9mm).

DC-TS7 (4.9mm)

58 images

Type	Resolution	Focal Length	Pixel Size
Frame	5184 x 3888	4.9 mm	1.17 x 1.17 μm

	Value	Error	F	Cx	Cy	K1	K2	K3	P1	P2
F	4295.53	1.4	1.00	-0.08	0.30	0.41	0.03	-0.06	0.01	0.07
Cx	48.6704	0.29		1.00	0.12	-0.05	-0.02	0.02	0.80	0.09
Cy	-88.1921	0.3			1.00	0.13	-0.01	-0.00	0.10	0.81
K1	-0.00582021	0.00024				1.00	-0.74	0.67	0.00	0.08
K2	0.0178582	0.00081					1.00	-0.98	0.01	0.02
K3	-0.0198792	0.0011						1.00	0.00	-0.02
P1	0.00405958	2e-05							1.00	0.08
P2	-0.00455952	2e-05								1.00

Table 2. Calibration coefficients and correlation matrix.

Scale Bars

Label	Distance (m)	Error (m)
target 5_target 6	0.35	-1.1402e-13
Total		1.1402e-13

Table 3. Control scale bars.

Digital Elevation Model

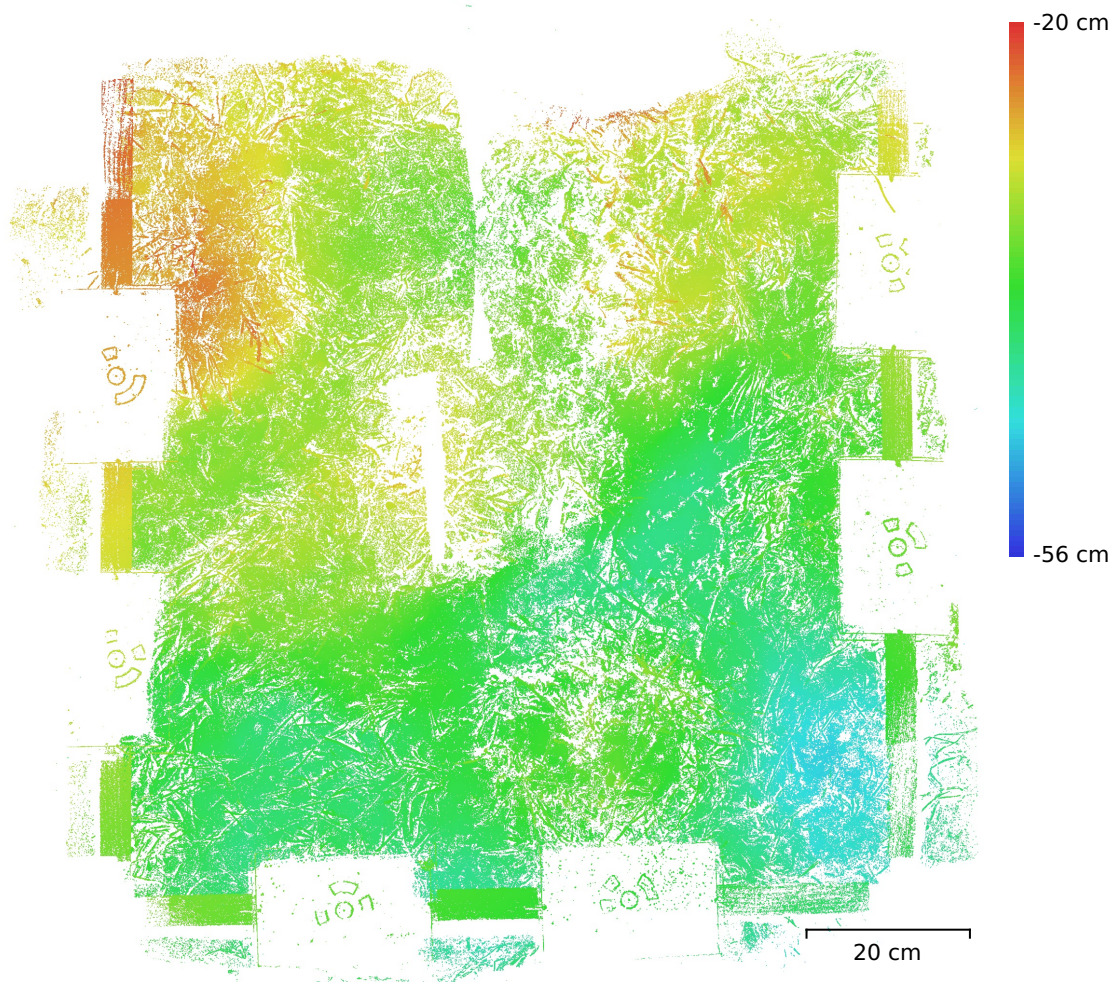


Fig. 3. Reconstructed digital elevation model.

Resolution: unknown
Point density: unknown

Processing Parameters

General

Cameras	58
Aligned cameras	58
Markers	6
Scale bars	3
Coordinate system	Local Coordinates (m)
Rotation angles	Yaw, Pitch, Roll

Tie Points

Points	21,128 of 81,979
RMS reprojection error	0.138372 (0.405689 pix)
Max reprojection error	0.427929 (1.87591 pix)
Mean key point size	2.81288 pix
Point colors	3 bands, uint8
Key points	No
Average tie point multiplicity	2.334

Alignment parameters

Accuracy	Highest
Generic preselection	Yes
Reference preselection	Sequential
Key point limit	80,000
Key point limit per Mpx	1,000
Tie point limit	10,000
Exclude stationary tie points	Yes
Guided image matching	No
Adaptive camera model fitting	No
Matching time	37 seconds
Matching memory usage	967.66 MB
Alignment time	11 seconds
Alignment memory usage	186.30 MB

Optimization parameters

Parameters	f, cx, cy, k1-k3, p1, p2
Adaptive camera model fitting	No
Optimization time	0 seconds
Date created	2024:01:03 23:33:07
Software version	2.0.3.16960
File size	5.10 MB

Depth Maps

Count	57
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Depth maps generation parameters

Quality	Ultra High
Filtering mode	Mild
Max neighbors	16
Processing time	4 minutes 31 seconds
Memory usage	11.23 GB
Date created	2024:01:03 23:37:52
Software version	2.0.3.16960
File size	828.70 MB

Point Cloud

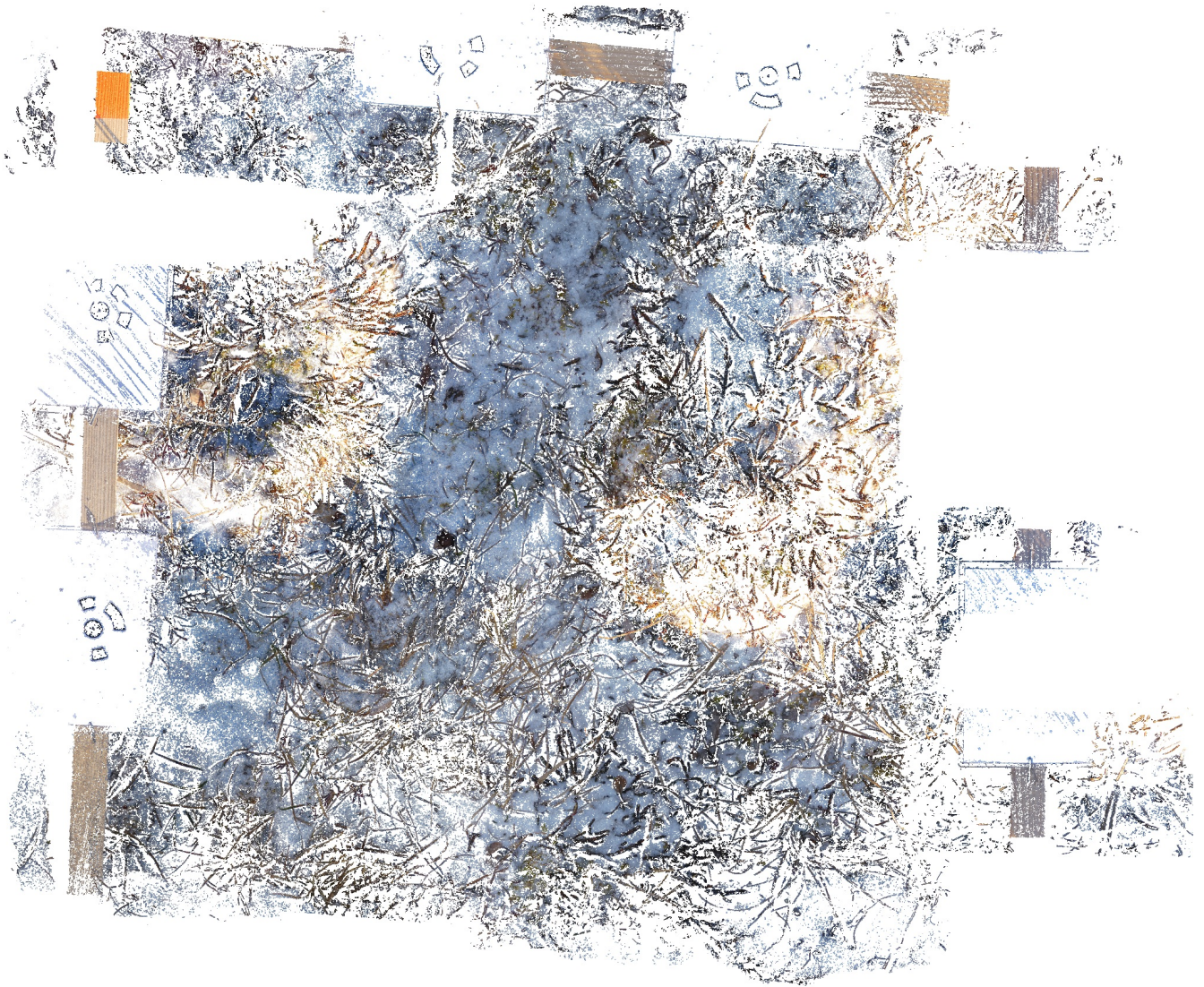
Points	17,395,740
Coordinate precision	0.0625 mm

Point attributes

Color	3 bands, uint8
Normal	
Confidence	2 - 11
Point classes	
Created (never classified)	17,395,740
Point cloud generation parameters	
Processing time	6 minutes 32 seconds
Memory usage	13.12 GB
Date created	2024:01:03 23:44:25
Software version	2.0.3.16960
File size	247.73 MB
System	
Software name	Agisoft Metashape Professional
Software version	2.0.3 build 16960
OS	Linux 64 bit
RAM	251.70 GB
CPU	Intel(R) Xeon(R) CPU E5-2680 v4 @ 2.40GHz
GPU(s)	Tesla P100-PCIE-12GB Tesla P100-PCIE-12GB

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Survey Data

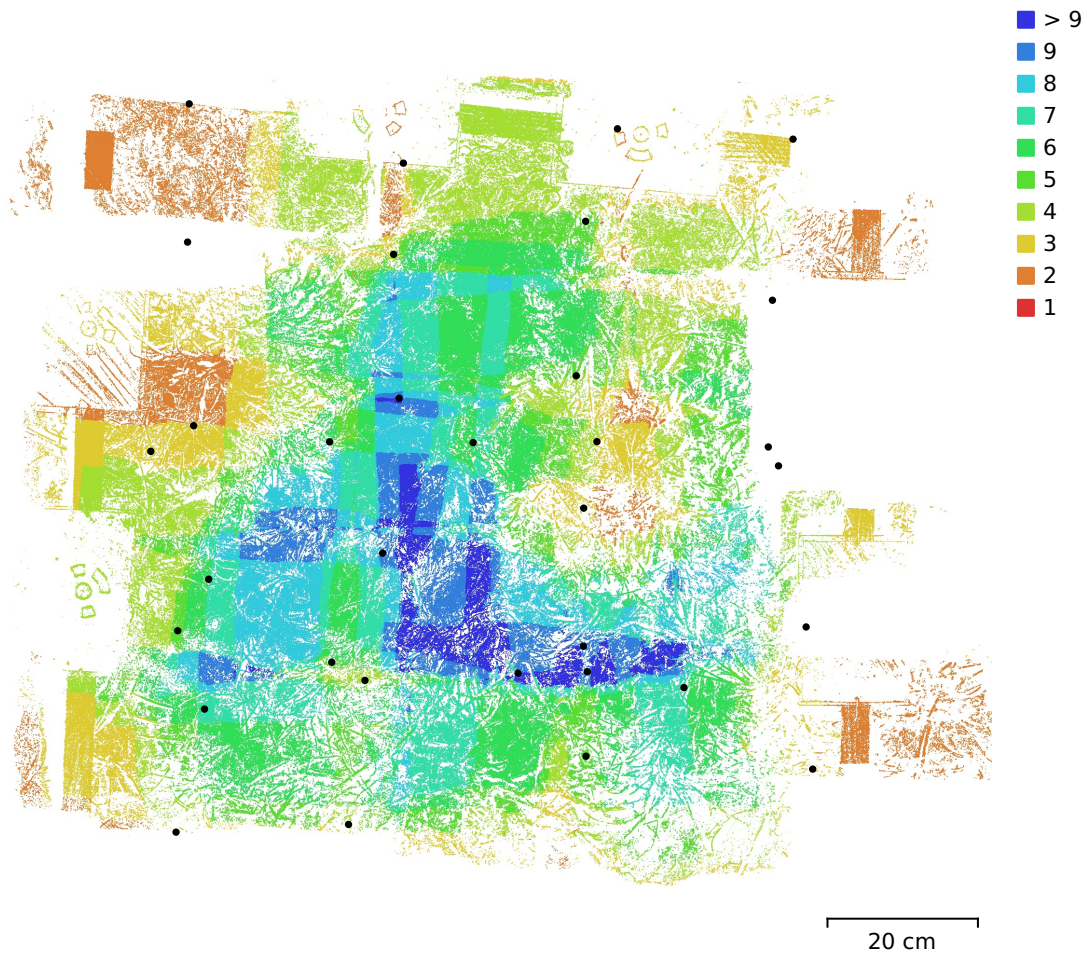


Fig. 1. Camera locations and image overlap.

Number of images:	33	Camera stations:	33
Flying altitude:	41.2 cm	Tie points:	10,585
Ground resolution:	0.097 mm/pix	Projections:	23,139
Coverage area:	5e+03 cm ²	Reprojection error:	0.36 pix

Camera Model	Resolution	Focal Length	Pixel Size	Precalibrated
DC-TS7 (4.9mm)	5184 x 3888	4.9 mm	1.17 x 1.17 μ m	No

Table 1. Cameras.

Camera Calibration

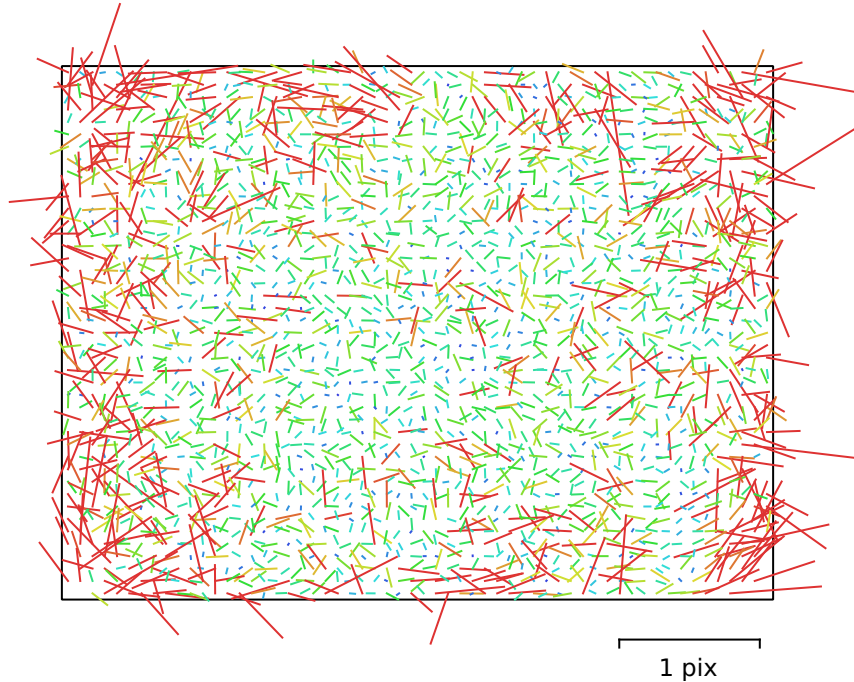


Fig. 2. Image residuals for DC-TS7 (4.9mm).

DC-TS7 (4.9mm)

33 images

Type	Resolution	Focal Length	Pixel Size
Frame	5184 x 3888	4.9 mm	1.17 x 1.17 μm

	Value	Error	F	Cx	Cy	K1	K2	K3	P1	P2
F	4242.02	2.7	1.00	-0.32	0.53	0.56	0.04	-0.07	-0.07	0.21
Cx	56.1163	0.31		1.00	-0.25	-0.15	-0.10	0.09	0.83	-0.15
Cy	-79.1997	0.34			1.00	0.30	0.02	-0.05	-0.07	0.79
K1	-0.00887163	0.00044				1.00	-0.61	0.55	-0.17	0.30
K2	0.00883579	0.0012					1.00	-0.98	-0.07	0.02
K3	-0.0117563	0.0015						1.00	0.06	-0.03
P1	0.00429657	2.3e-05							1.00	-0.18
P2	-0.0041361	2.4e-05								1.00

Table 2. Calibration coefficients and correlation matrix.

Scale Bars

Label	Distance (m)	Error (m)
target 5_target 6	0.35	1.66533e-14
Total		1.66533e-14

Table 3. Control scale bars.

Digital Elevation Model

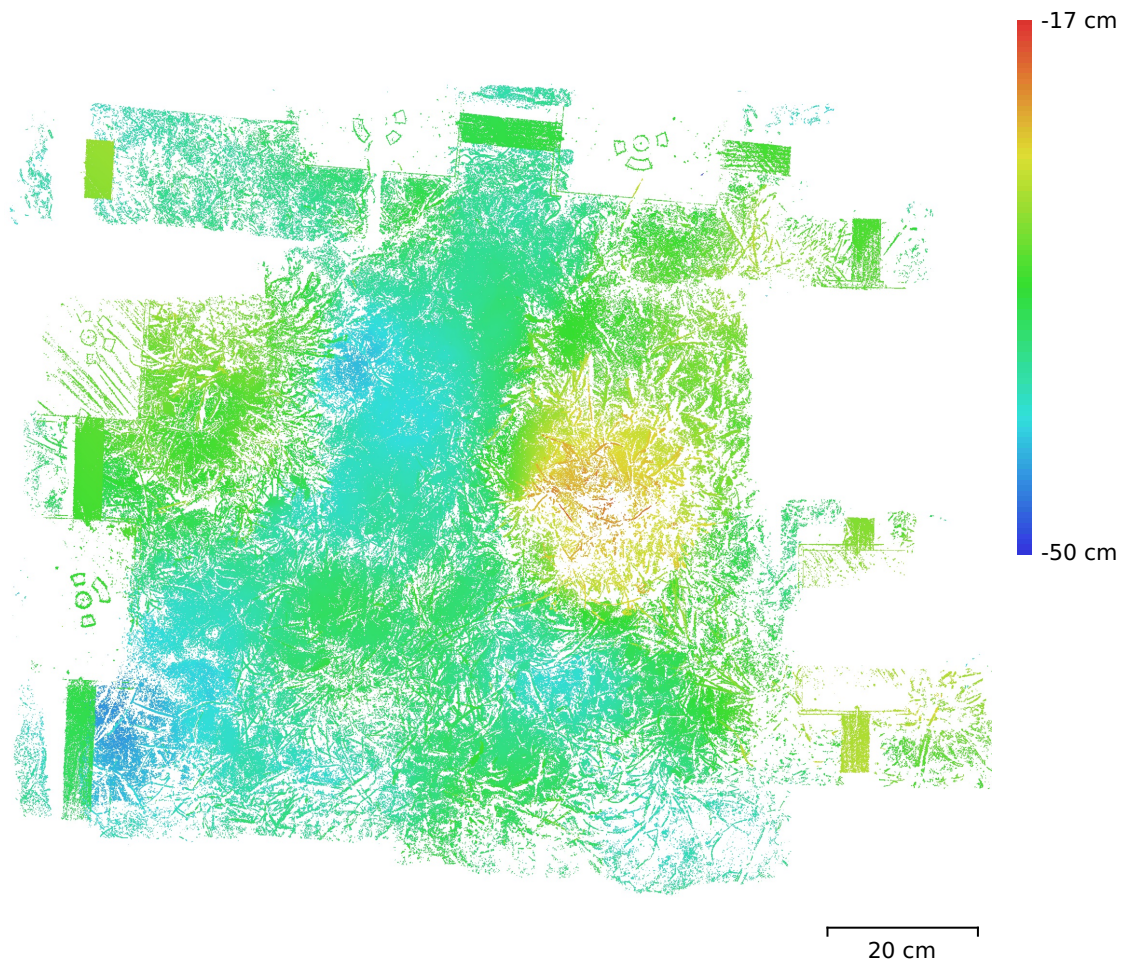


Fig. 3. Reconstructed digital elevation model.

Resolution: unknown
Point density: unknown

Processing Parameters

General

Cameras	33
Aligned cameras	33
Markers	5
Scale bars	2
Coordinate system	Local Coordinates (m)
Rotation angles	Yaw, Pitch, Roll

Tie Points

Points	10,585 of 39,446
RMS reprojection error	0.131021 (0.35962 pix)
Max reprojection error	0.359456 (1.68188 pix)
Mean key point size	2.65948 pix
Point colors	3 bands, uint8
Key points	No
Average tie point multiplicity	2.1892

Alignment parameters

Accuracy	Highest
Generic preselection	Yes
Reference preselection	Sequential
Key point limit	80,000
Key point limit per Mpx	1,000
Tie point limit	10,000
Exclude stationary tie points	Yes
Guided image matching	No
Adaptive camera model fitting	No
Matching time	20 seconds
Matching memory usage	890.17 MB
Alignment time	4 seconds
Alignment memory usage	122.97 MB

Optimization parameters

Parameters	f, cx, cy, k1-k3, p1, p2
Adaptive camera model fitting	No
Optimization time	0 seconds
Date created	2024:01:03 23:46:58
Software version	2.0.3.16960
File size	2.33 MB

Depth Maps

Count	31
Depth maps generation parameters	
Quality	Ultra High
Filtering mode	Mild
Max neighbors	16
Processing time	2 minutes 1 seconds
Memory usage	10.03 GB
Date created	2024:01:03 23:49:06
Software version	2.0.3.16960
File size	403.41 MB

Point Cloud

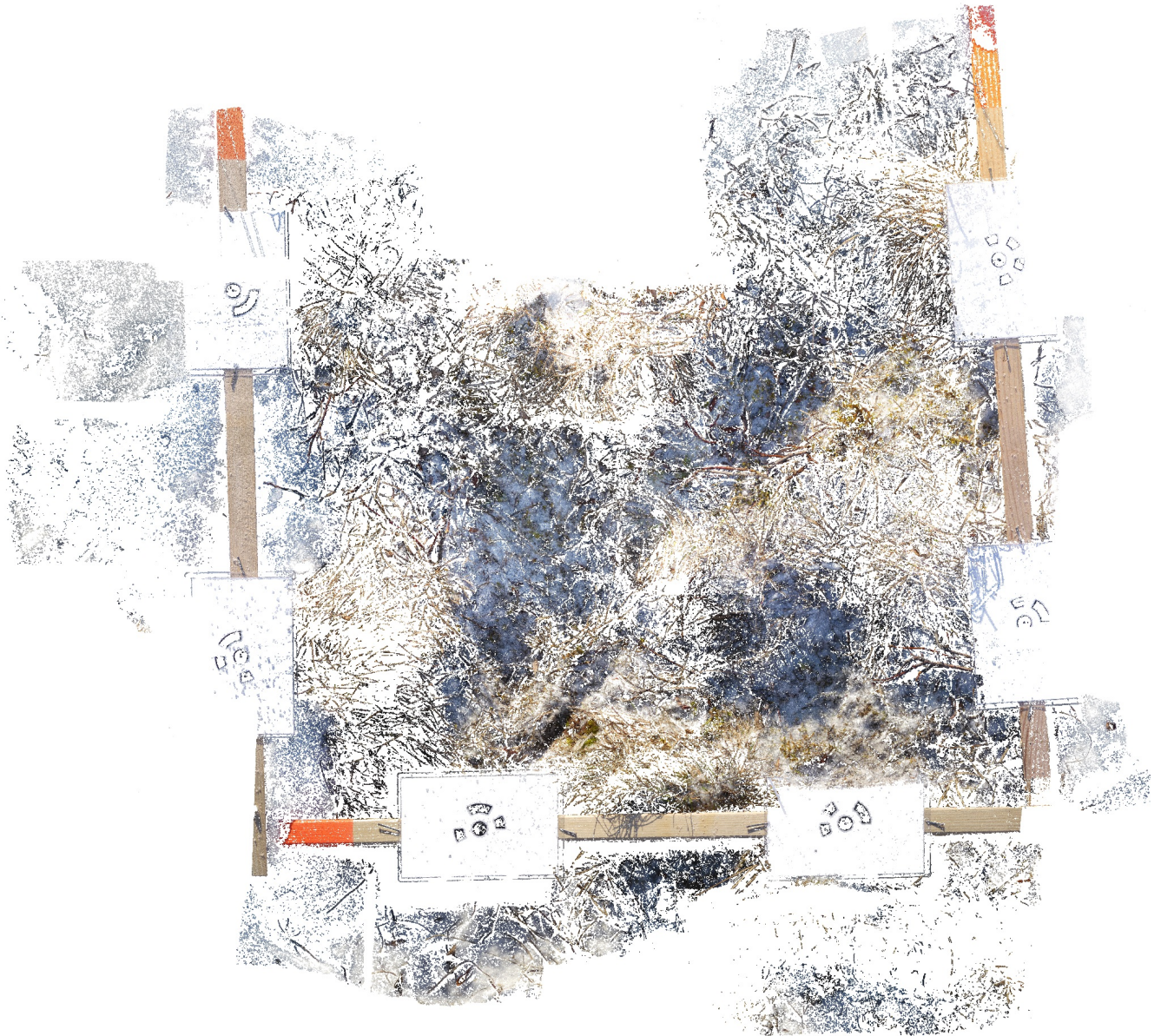
Points	12,990,027
Coordinate precision	0.0625 mm

Point attributes

Color	3 bands, uint8
Normal	
Confidence	2 - 8
Point classes	
Created (never classified)	12,990,027
Point cloud generation parameters	
Processing time	3 minutes 11 seconds
Memory usage	8.57 GB
Date created	2024:01:03 23:52:18
Software version	2.0.3.16960
File size	185.53 MB
System	
Software name	Agisoft Metashape Professional
Software version	2.0.3 build 16960
OS	Linux 64 bit
RAM	251.70 GB
CPU	Intel(R) Xeon(R) CPU E5-2680 v4 @ 2.40GHz
GPU(s)	Tesla P100-PCIE-12GB Tesla P100-PCIE-12GB

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Survey Data

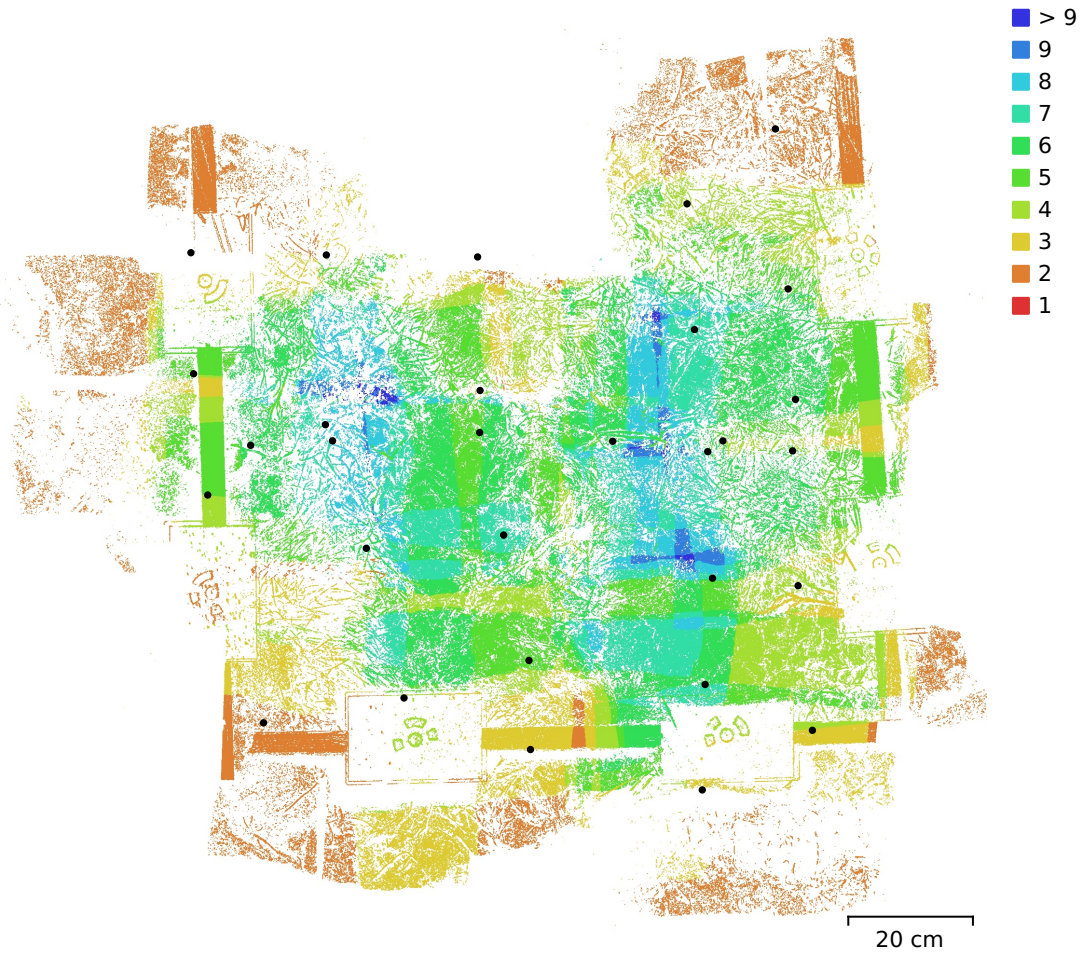


Fig. 1. Camera locations and image overlap.

Number of images:	30	Camera stations:	30
Flying altitude:	45.9 cm	Tie points:	10,170
Ground resolution:	0.106 mm/pix	Projections:	22,573
Coverage area:	5.9e+03 cm ²	Reprojection error:	0.36 pix

Camera Model	Resolution	Focal Length	Pixel Size	Precalibrated
DC-TS7 (4.9mm)	5184 x 3888	4.9 mm	1.17 x 1.17 μm	No

Table 1. Cameras.

Camera Calibration

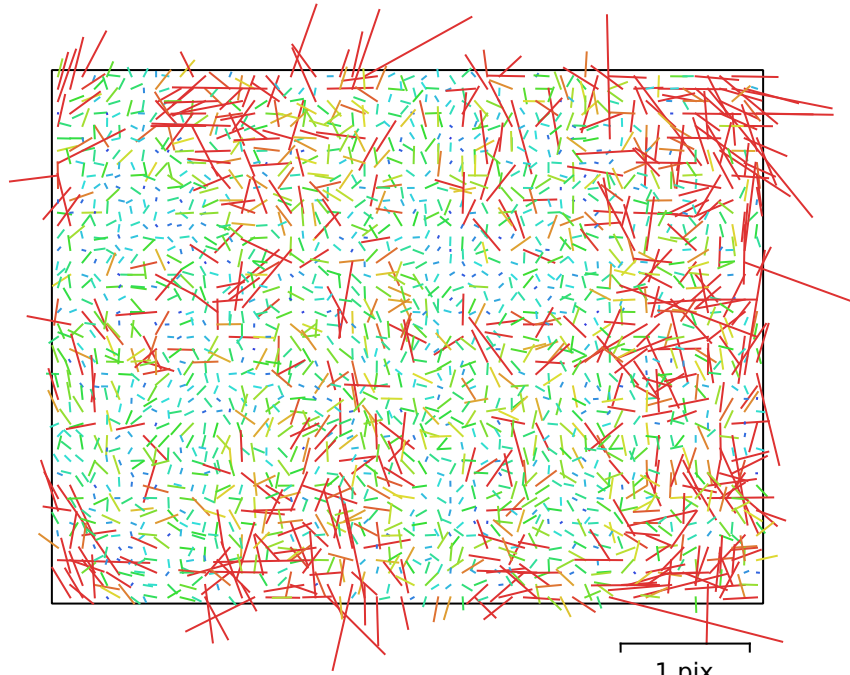


Fig. 2. Image residuals for DC-TS7 (4.9mm).

DC-TS7 (4.9mm)

30 images

Type	Resolution	Focal Length	Pixel Size
Frame	5184 x 3888	4.9 mm	1.17 x 1.17 μm

	Value	Error	F	Cx	Cy	K1	K2	K3	P1	P2
F	4343.32	3.1	1.00	-0.48	0.37	0.41	0.07	-0.12	-0.16	0.03
Cx	77.1279	0.42		1.00	-0.24	-0.24	-0.02	0.07	0.74	-0.16
Cy	-57.1429	0.29			1.00	0.10	0.08	-0.10	-0.16	0.76
K1	-0.0125547	0.00042				1.00	-0.65	0.57	-0.23	0.01
K2	0.0276687	0.0013					1.00	-0.98	0.01	0.09
K3	-0.0372111	0.0017						1.00	0.03	-0.09
P1	0.00480351	2.6e-05							1.00	-0.24
P2	-0.00425173	1.8e-05								1.00

Table 2. Calibration coefficients and correlation matrix.

Scale Bars

Label	Distance (m)	Error (m)
target 5 PC_target 6 PC	0.497191	-0.00280915
target 1_target 2 PC	0.501198	0.00119843
target 4_target 3 PC	0.501587	0.00158717
Total		0.00198718

Table 3. Control scale bars.

Digital Elevation Model

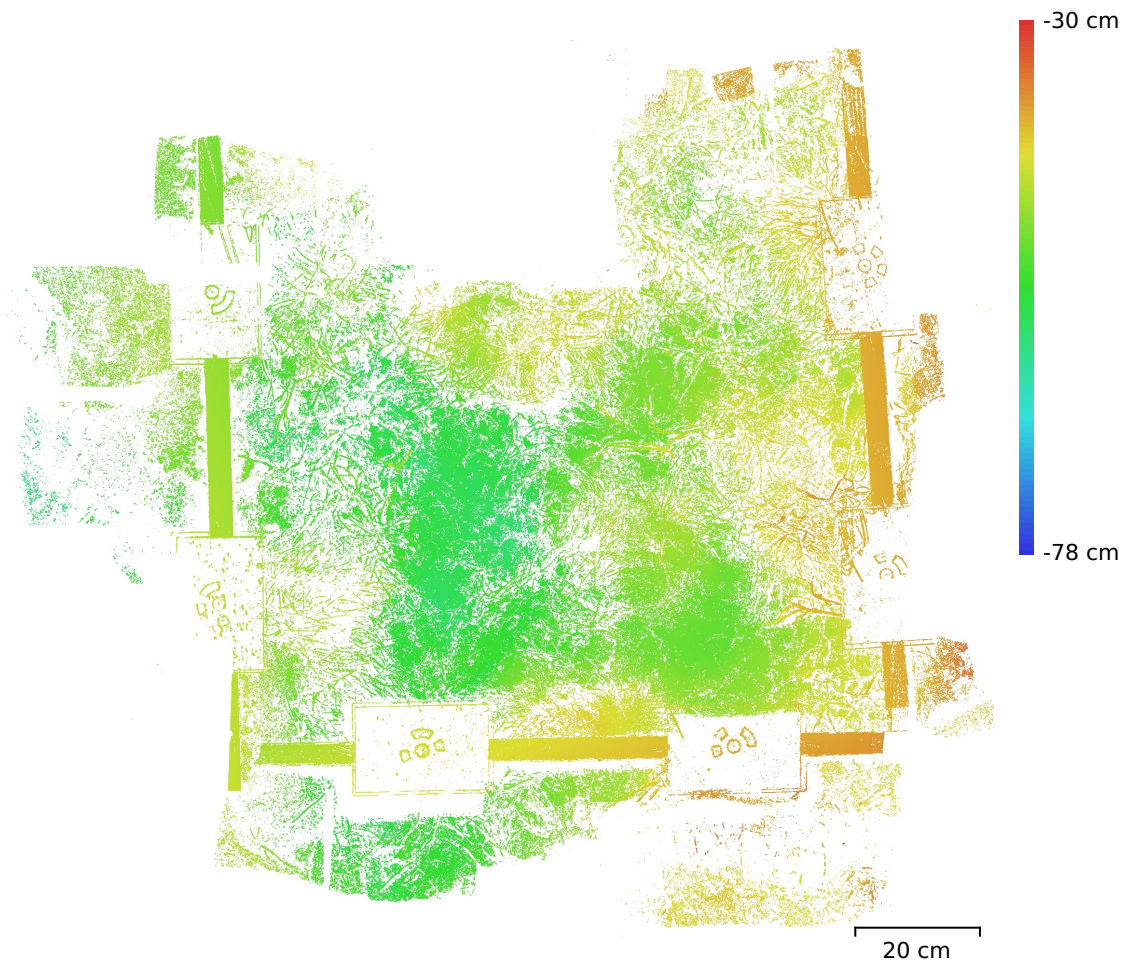


Fig. 3. Reconstructed digital elevation model.

Resolution: unknown
Point density: unknown

Processing Parameters

General

Cameras	30
Aligned cameras	30
Markers	10
Scale bars	6
Coordinate system	Local Coordinates (m)
Rotation angles	Yaw, Pitch, Roll

Tie Points

Points	10,170 of 36,027
RMS reprojection error	0.128172 (0.35977 pix)
Max reprojection error	0.436155 (1.92979 pix)
Mean key point size	2.68191 pix
Point colors	3 bands, uint8
Key points	No
Average tie point multiplicity	2.23691

Alignment parameters

Accuracy	Highest
Generic preselection	Yes
Reference preselection	Sequential
Key point limit	80,000
Key point limit per Mpx	1,000
Tie point limit	10,000
Exclude stationary tie points	Yes
Guided image matching	No
Adaptive camera model fitting	No
Matching time	18 seconds
Matching memory usage	965.39 MB
Alignment time	5 seconds
Alignment memory usage	165.27 MB

Optimization parameters

Parameters	f, cx, cy, k1-k3, p1, p2
Adaptive camera model fitting	No
Optimization time	0 seconds
Date created	2024:01:03 23:15:47
Software version	2.0.3.16960
File size	1.57 MB

Depth Maps

Count	30
Depth maps generation parameters	
Quality	Ultra High
Filtering mode	Mild
Max neighbors	16
Processing time	2 minutes 6 seconds
Memory usage	9.61 GB
Date created	2024:01:03 23:18:01
Software version	2.0.3.16960
File size	346.84 MB

Point Cloud

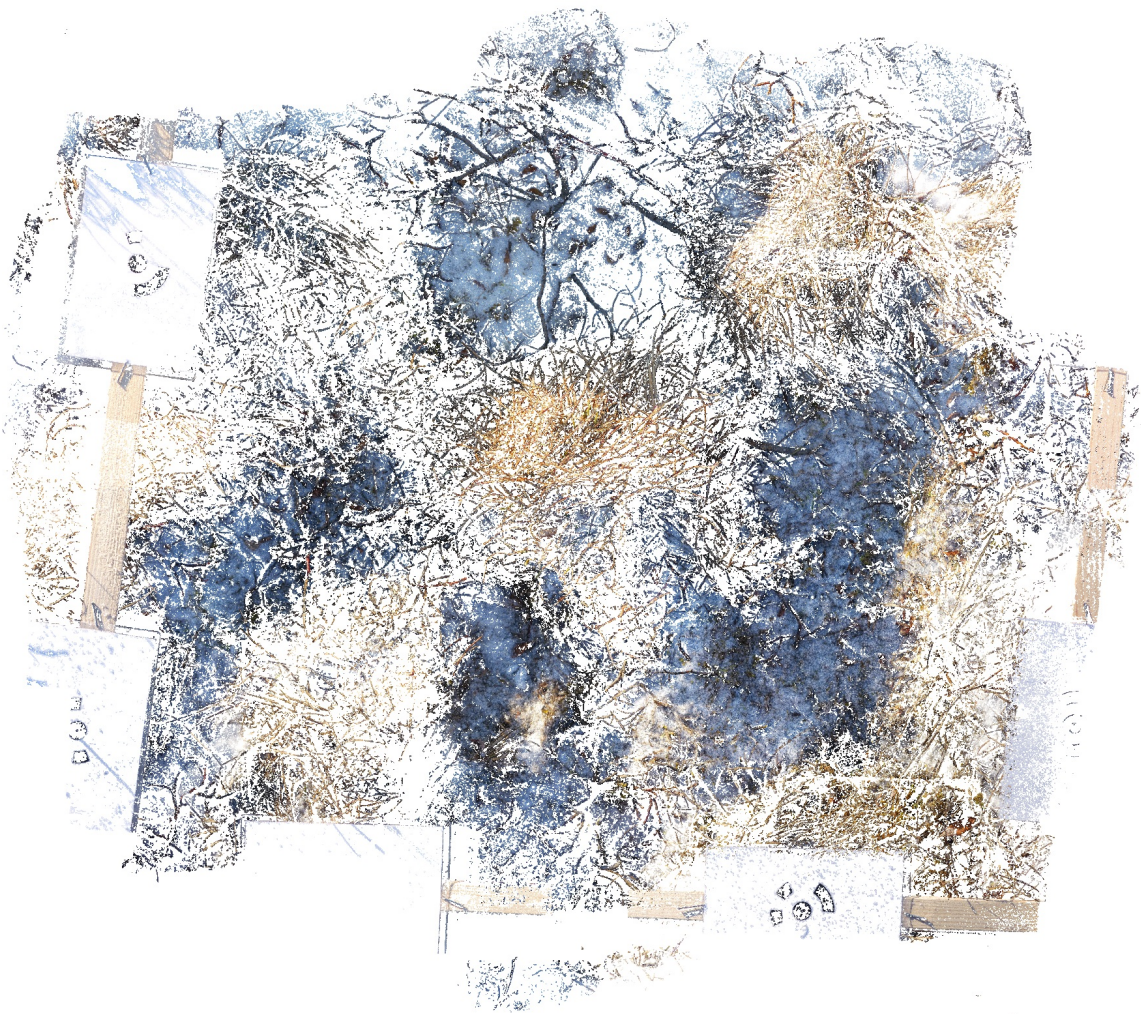
Points	13,490,677
Coordinate precision	0.0625 mm

Point attributes

Color	3 bands, uint8
Normal	
Confidence	2 - 8
Point classes	
Created (never classified)	13,490,677
Point cloud generation parameters	
Processing time	2 minutes 45 seconds
Memory usage	7.94 GB
Date created	2024:01:03 23:20:47
Software version	2.0.3.16960
File size	193.19 MB
System	
Software name	Agisoft Metashape Professional
Software version	2.0.3 build 16960
OS	Linux 64 bit
RAM	251.70 GB
CPU	Intel(R) Xeon(R) CPU E5-2680 v4 @ 2.40GHz
GPU(s)	Tesla P100-PCIE-12GB Tesla P100-PCIE-12GB

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Survey Data

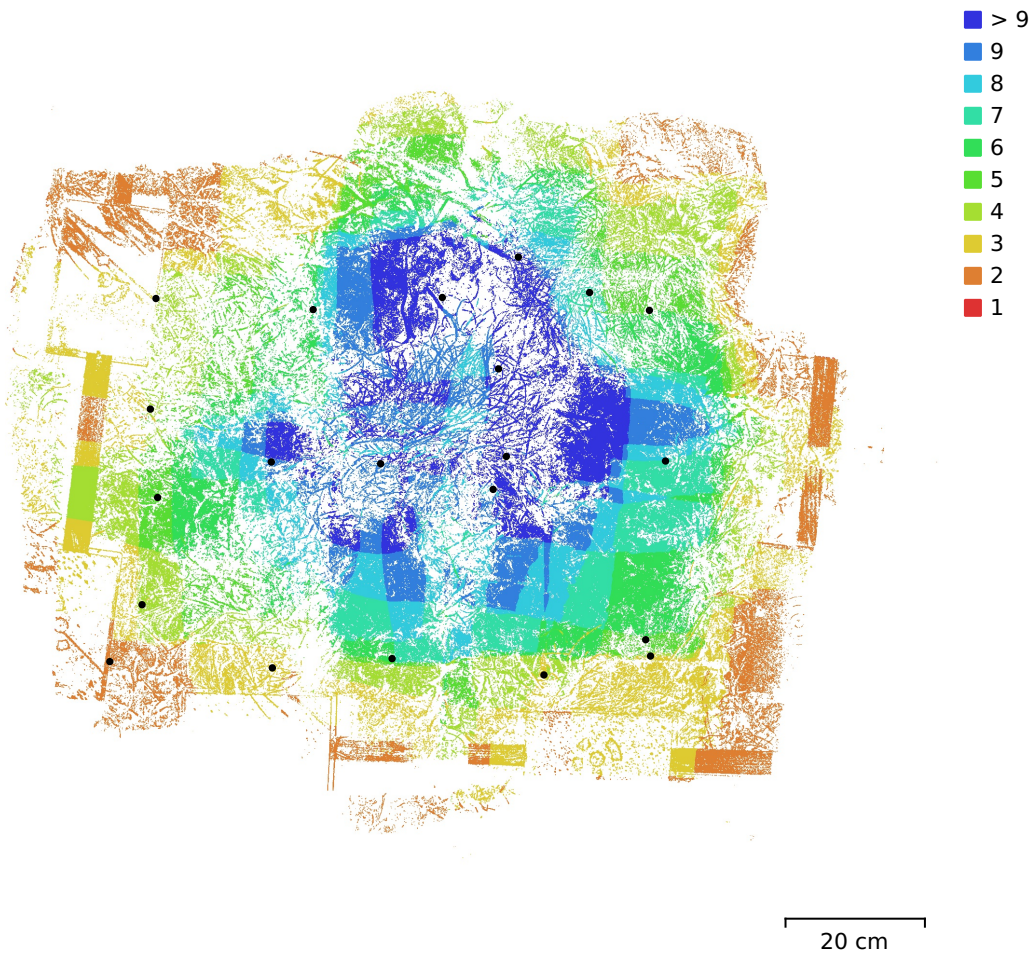


Fig. 1. Camera locations and image overlap.

Number of images:	21	Camera stations:	21
Flying altitude:	50.1 cm	Tie points:	7,243
Ground resolution:	0.117 mm/pix	Projections:	16,574
Coverage area:	4.4e+03 cm ²	Reprojection error:	0.438 pix

Camera Model	Resolution	Focal Length	Pixel Size	Precalibrated
DC-TS7 (4.9mm)	5184 x 3888	4.9 mm	1.17 x 1.17 μ m	No

Table 1. Cameras.

Camera Calibration

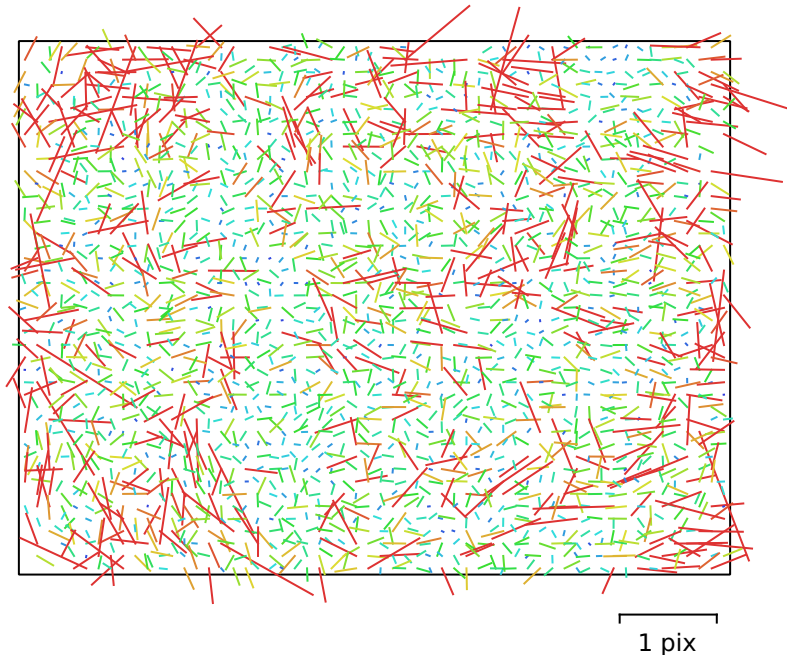


Fig. 2. Image residuals for DC-TS7 (4.9mm).

DC-TS7 (4.9mm)

21 images

Type	Resolution	Focal Length	Pixel Size
Frame	5184 x 3888	4.9 mm	1.17 x 1.17 μm

	Value	Error	F	Cx	Cy	K1	K2	K3	P1	P2
F	4273.38	3.1	1.00	-0.68	0.40	0.34	0.05	-0.10	-0.17	0.06
Cx	81.6806	0.54		1.00	-0.25	-0.27	-0.06	0.09	0.72	-0.05
Cy	-47.67	0.4			1.00	0.16	0.02	-0.05	0.02	0.82
K1	-0.0200225	0.0005				1.00	-0.78	0.70	-0.20	0.13
K2	0.033598	0.0017					1.00	-0.98	-0.08	0.04
K3	-0.0426957	0.0023						1.00	0.09	-0.05
P1	0.00490074	3.4e-05							1.00	-0.02
P2	-0.00377872	3e-05								1.00

Table 2. Calibration coefficients and correlation matrix.

Scale Bars

Label	Distance (m)	Error (m)
target 1_target 2	0.5	-5.55112e-17
Total		5.55112e-17

Table 3. Control scale bars.

Digital Elevation Model

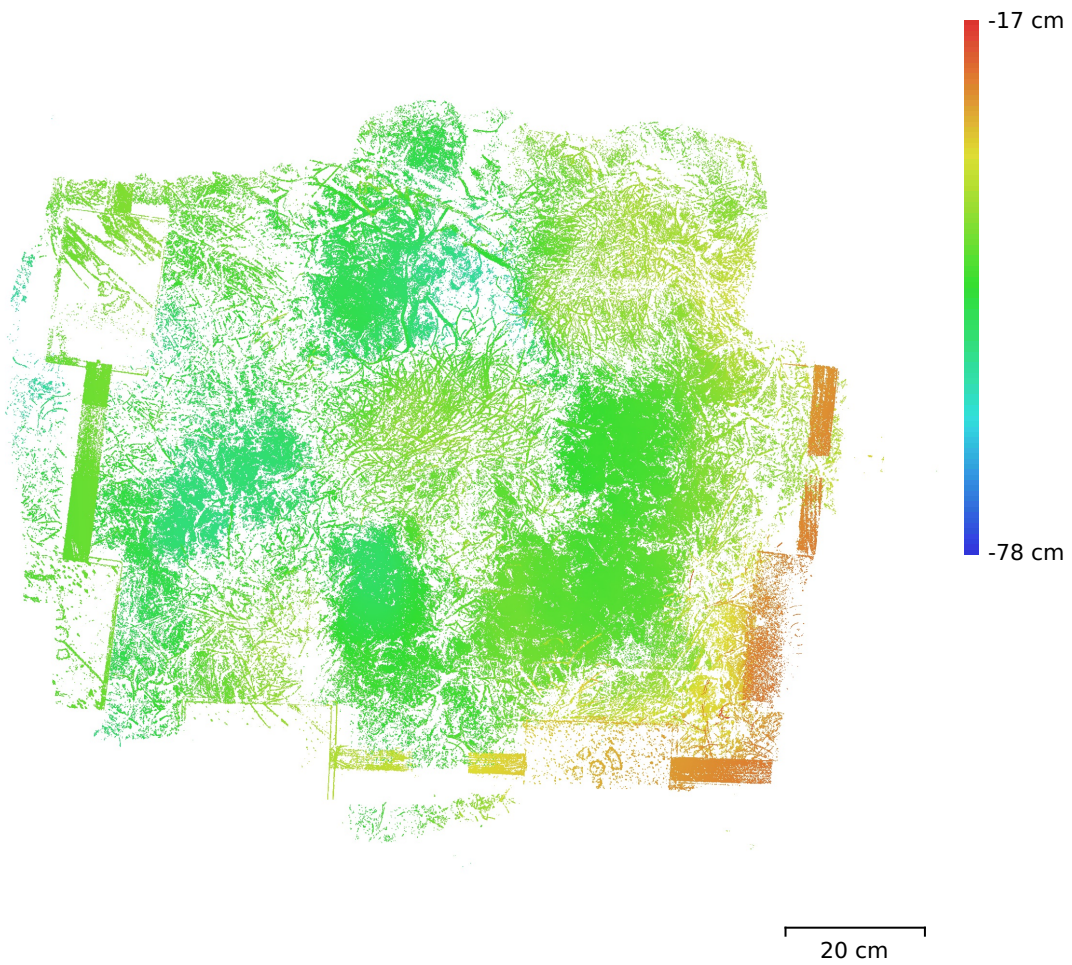


Fig. 3. Reconstructed digital elevation model.

Resolution: unknown
Point density: unknown

Processing Parameters

General

Cameras	21
Aligned cameras	21
Markers	3
Scale bars	1
Coordinate system	Local Coordinates (m)
Rotation angles	Yaw, Pitch, Roll

Tie Points

Points	7,243 of 33,817
RMS reprojection error	0.133422 (0.437796 pix)
Max reprojection error	0.419486 (1.79282 pix)
Mean key point size	3.17451 pix
Point colors	3 bands, uint8
Key points	No
Average tie point multiplicity	2.30233

Alignment parameters

Accuracy	Highest
Generic preselection	Yes
Reference preselection	Sequential
Key point limit	80,000
Key point limit per Mpx	1,000
Tie point limit	10,000
Exclude stationary tie points	Yes
Guided image matching	No
Adaptive camera model fitting	No
Matching time	13 seconds
Matching memory usage	816.91 MB
Alignment time	3 seconds
Alignment memory usage	110.19 MB

Optimization parameters

Parameters	f, cx, cy, k1-k3, p1, p2
Adaptive camera model fitting	No
Optimization time	0 seconds
Date created	2024:01:03 23:08:02
Software version	2.0.3.16960
File size	1.45 MB

Depth Maps

Count	21
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Depth maps generation parameters

Quality	Ultra High
Filtering mode	Mild
Max neighbors	16
Processing time	1 minutes 44 seconds
Memory usage	8.07 GB
Date created	2024:01:03 23:09:51
Software version	2.0.3.16960
File size	289.81 MB

Point Cloud

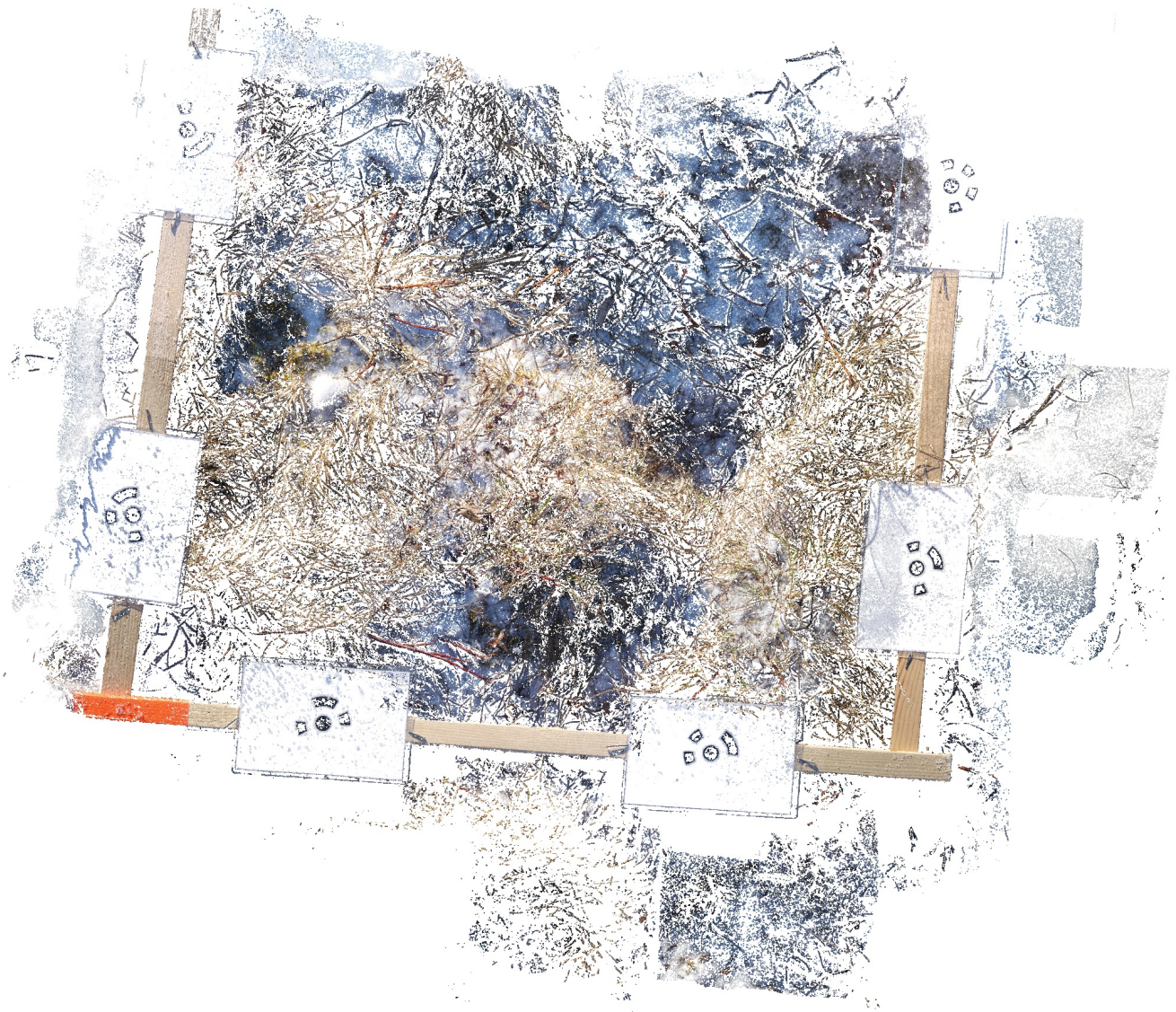
Points	11,351,677
Coordinate precision	0.0625 mm

Point attributes

Color	3 bands, uint8
Normal	
Confidence	2 - 10
Point classes	
Created (never classified)	11,351,677
Point cloud generation parameters	
Processing time	2 minutes 13 seconds
Memory usage	6.41 GB
Date created	2024:01:03 23:12:05
Software version	2.0.3.16960
File size	162.61 MB
System	
Software name	Agisoft Metashape Professional
Software version	2.0.3 build 16960
OS	Linux 64 bit
RAM	251.70 GB
CPU	Intel(R) Xeon(R) CPU E5-2680 v4 @ 2.40GHz
GPU(s)	Tesla P100-PCIE-12GB Tesla P100-PCIE-12GB

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Survey Data

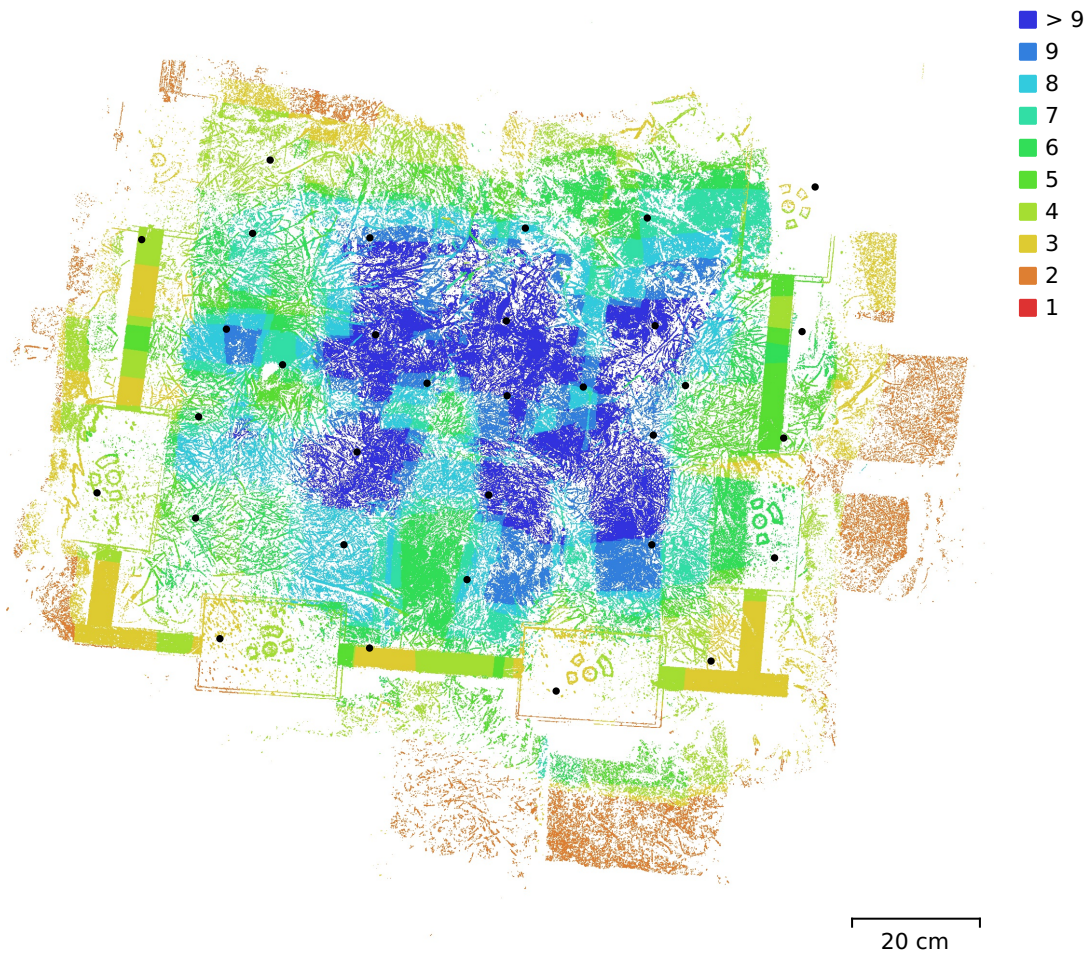


Fig. 1. Camera locations and image overlap.

Number of images:	32	Camera stations:	32
Flying altitude:	47.6 cm	Tie points:	8,633
Ground resolution:	0.106 mm/pix	Projections:	19,191
Coverage area:	5.96e+03 cm ²	Reprojection error:	0.368 pix

Camera Model	Resolution	Focal Length	Pixel Size	Precalibrated
DC-TS7 (5.2mm)	5184 x 3888	5.2 mm	1.2 x 1.2 μ m	No

Table 1. Cameras.

Camera Calibration

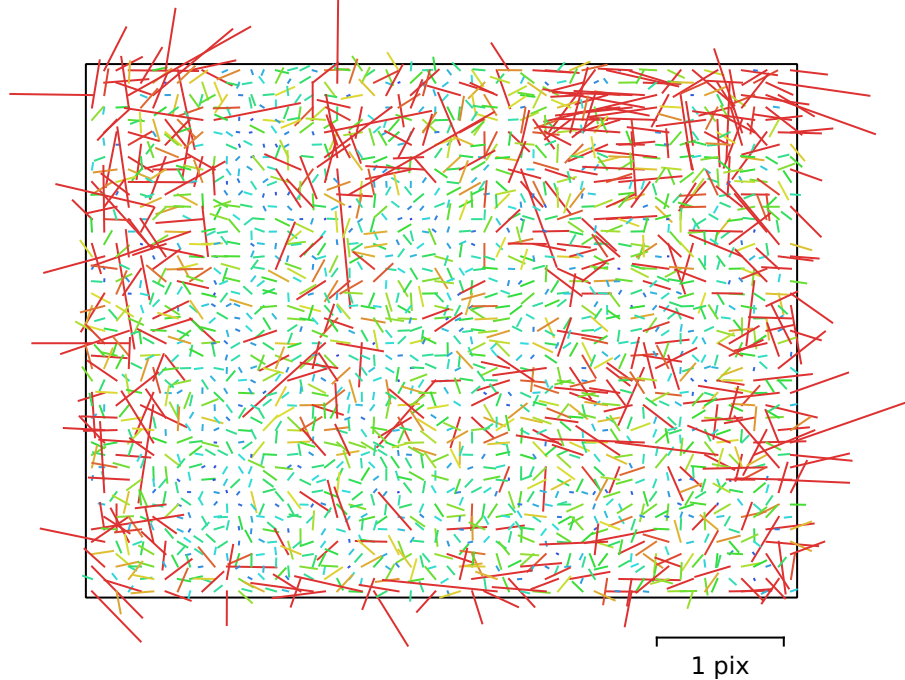


Fig. 2. Image residuals for DC-TS7 (5.2mm).

DC-TS7 (5.2mm)

32 images

Type	Resolution	Focal Length	Pixel Size
Frame	5184 x 3888	5.2 mm	1.2 x 1.2 μm

	Value	Error	F	Cx	Cy	K1	K2	K3	P1	P2
F	4501.59	2.3	1.00	-0.29	0.13	0.24	0.06	-0.07	-0.07	0.04
Cx	76.8669	0.42		1.00	-0.01	-0.08	0.00	-0.01	0.81	0.03
Cy	-63.919	0.37			1.00	-0.05	0.01	-0.00	-0.04	0.78
K1	-0.0173502	0.00039				1.00	-0.80	0.72	0.01	0.02
K2	0.0291386	0.0015					1.00	-0.98	-0.02	-0.02
K3	-0.0369562	0.0021						1.00	0.01	0.02
P1	0.00414901	3e-05							1.00	-0.04
P2	-0.00415662	2.8e-05								1.00

Table 2. Calibration coefficients and correlation matrix.

Scale Bars

Label	Distance (m)	Error (m)
target 1_target 2	0.502102	0.00210151
target 5_target 6	0.497881	-0.00211901
Total		0.00211028

Table 3. Control scale bars.

Digital Elevation Model

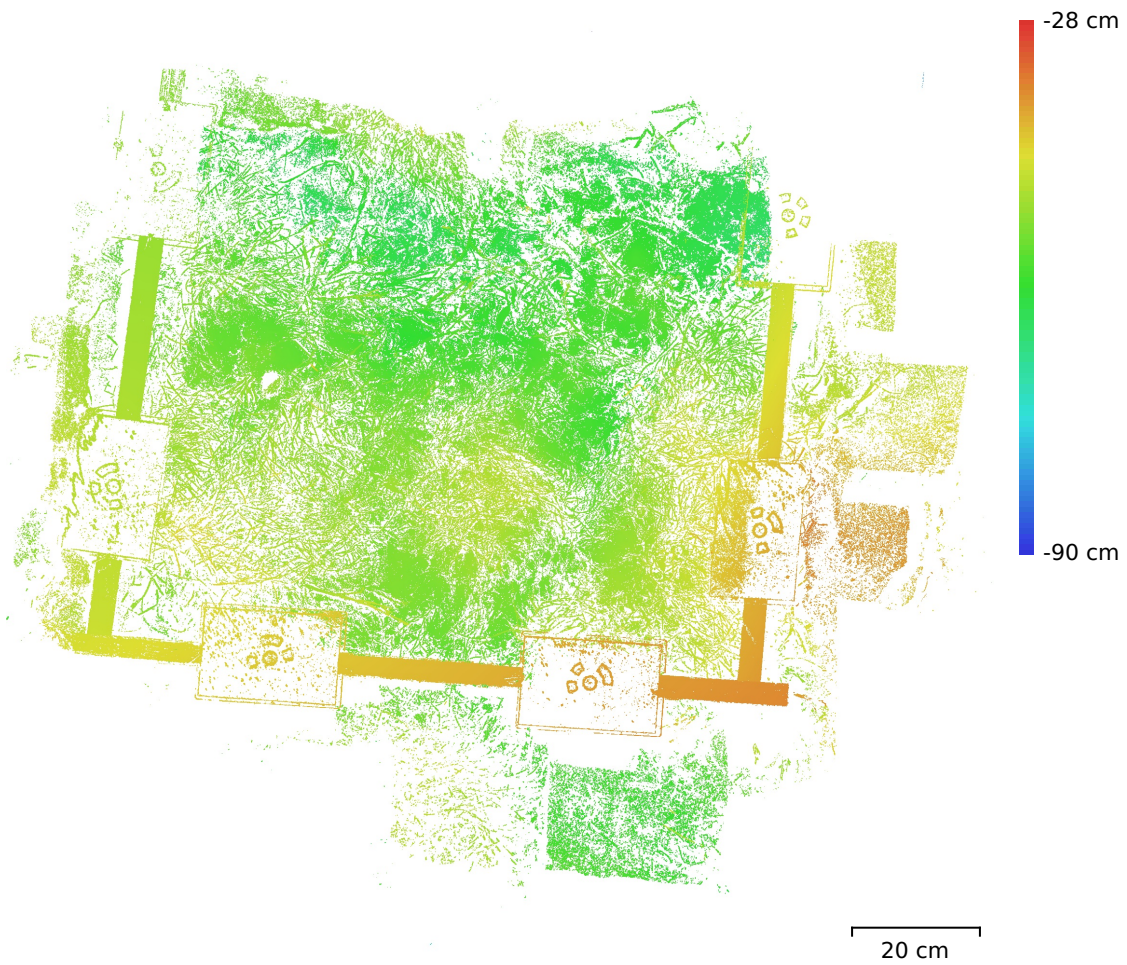


Fig. 3. Reconstructed digital elevation model.

Resolution: unknown
Point density: unknown

Processing Parameters

General

Cameras	32
Aligned cameras	32
Markers	6
Scale bars	3
Coordinate system	Local Coordinates (m)
Rotation angles	Yaw, Pitch, Roll

Tie Points

Points	8,633 of 22,047
RMS reprojection error	0.122988 (0.368143 pix)
Max reprojection error	0.334304 (1.62471 pix)
Mean key point size	2.85234 pix
Point colors	3 bands, uint8
Key points	No
Average tie point multiplicity	2.31088

Alignment parameters

Accuracy	Highest
Generic preselection	Yes
Reference preselection	Sequential
Key point limit	50,000
Key point limit per Mpx	1,000
Tie point limit	10,000
Exclude stationary tie points	Yes
Guided image matching	No
Adaptive camera model fitting	No
Matching time	14 seconds
Matching memory usage	800.52 MB
Alignment time	1 seconds
Alignment memory usage	83.69 MB

Optimization parameters

Parameters	f, cx, cy, k1-k3, p1, p2
Adaptive camera model fitting	No
Optimization time	0 seconds
Date created	2024:01:03 22:47:49
Software version	2.0.3.16960
File size	1.43 MB

Depth Maps

Count	31
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Depth maps generation parameters

Quality	Ultra High
Filtering mode	Mild
Max neighbors	16
Processing time	2 minutes 23 seconds
Memory usage	10.03 GB
Date created	2024:01:03 22:50:16
Software version	2.0.3.16960
File size	401.03 MB

Point Cloud

Points	14,275,013
Coordinate precision	0.0625 mm

Point attributes

Color	3 bands, uint8
Normal	
Confidence	2 - 12
Point classes	
Created (never classified)	14,275,013
Point cloud generation parameters	
Processing time	3 minutes 18 seconds
Memory usage	8.54 GB
Date created	2024:01:03 22:53:35
Software version	2.0.3.16960
File size	205.05 MB
System	
Software name	Agisoft Metashape Professional
Software version	2.0.3 build 16960
OS	Linux 64 bit
RAM	251.70 GB
CPU	Intel(R) Xeon(R) CPU E5-2680 v4 @ 2.40GHz
GPU(s)	Tesla P100-PCIE-12GB Tesla P100-PCIE-12GB