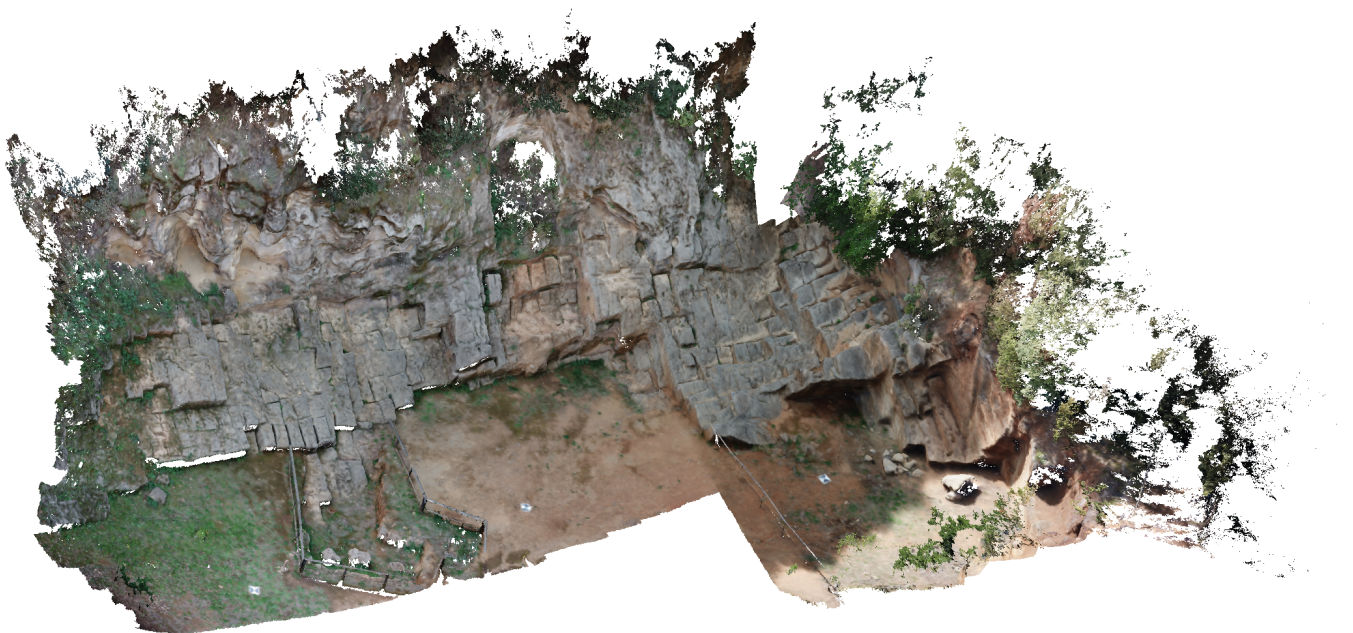


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Survey Data

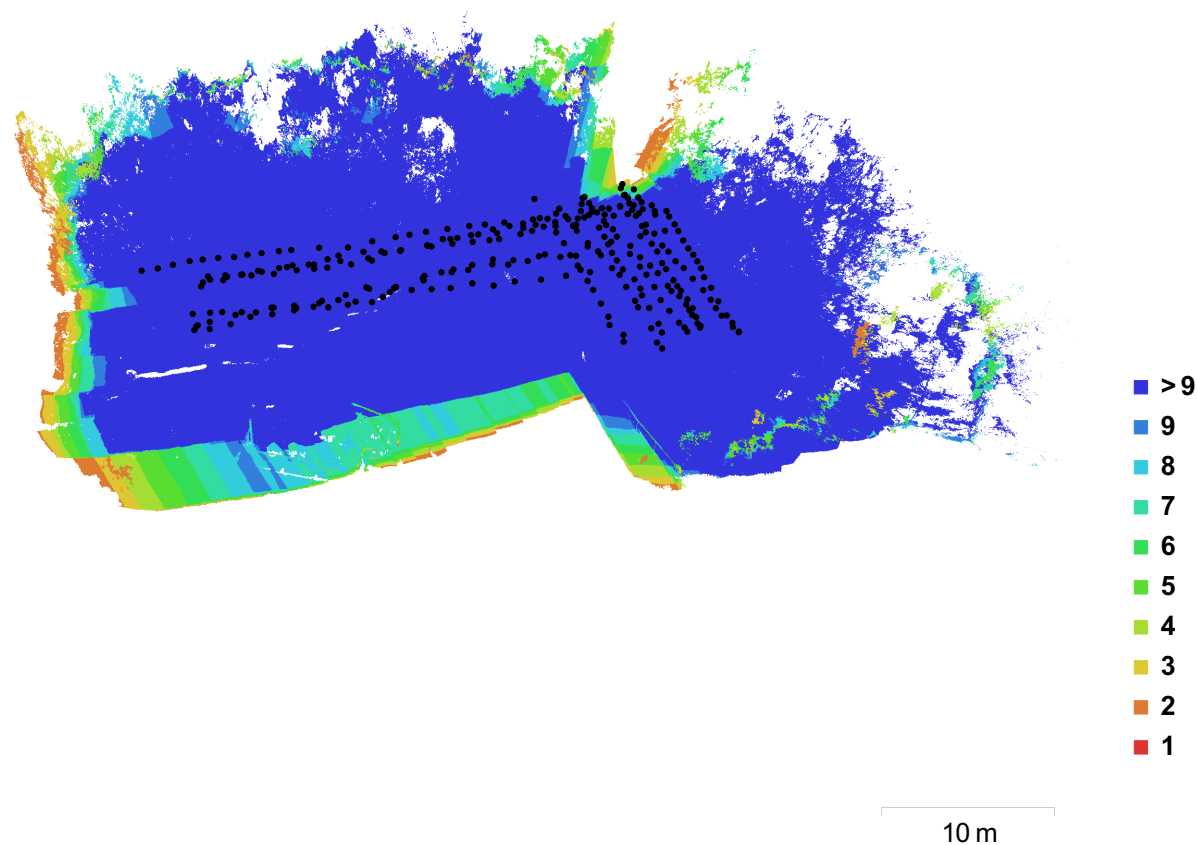


Fig. 1. Camera locations and image overlap.

Number of images:	290	Camera stations:	290
Flying altitude:	9.49 m	Tie points:	95,957
Ground resolution:	2.91 mm/pix	Projections:	480,362
Coverage area:	1.02e+03 sq m	Reprojection error:	1.31 pix

Camera Model	Resolution	Focal Length	Pixel Size	Precalibrated
FC220 (4.7 mm)	4000 x 3000	4.7 mm	1.56 x 1.56 um	No

Table 1. Cameras.

Camera Calibration

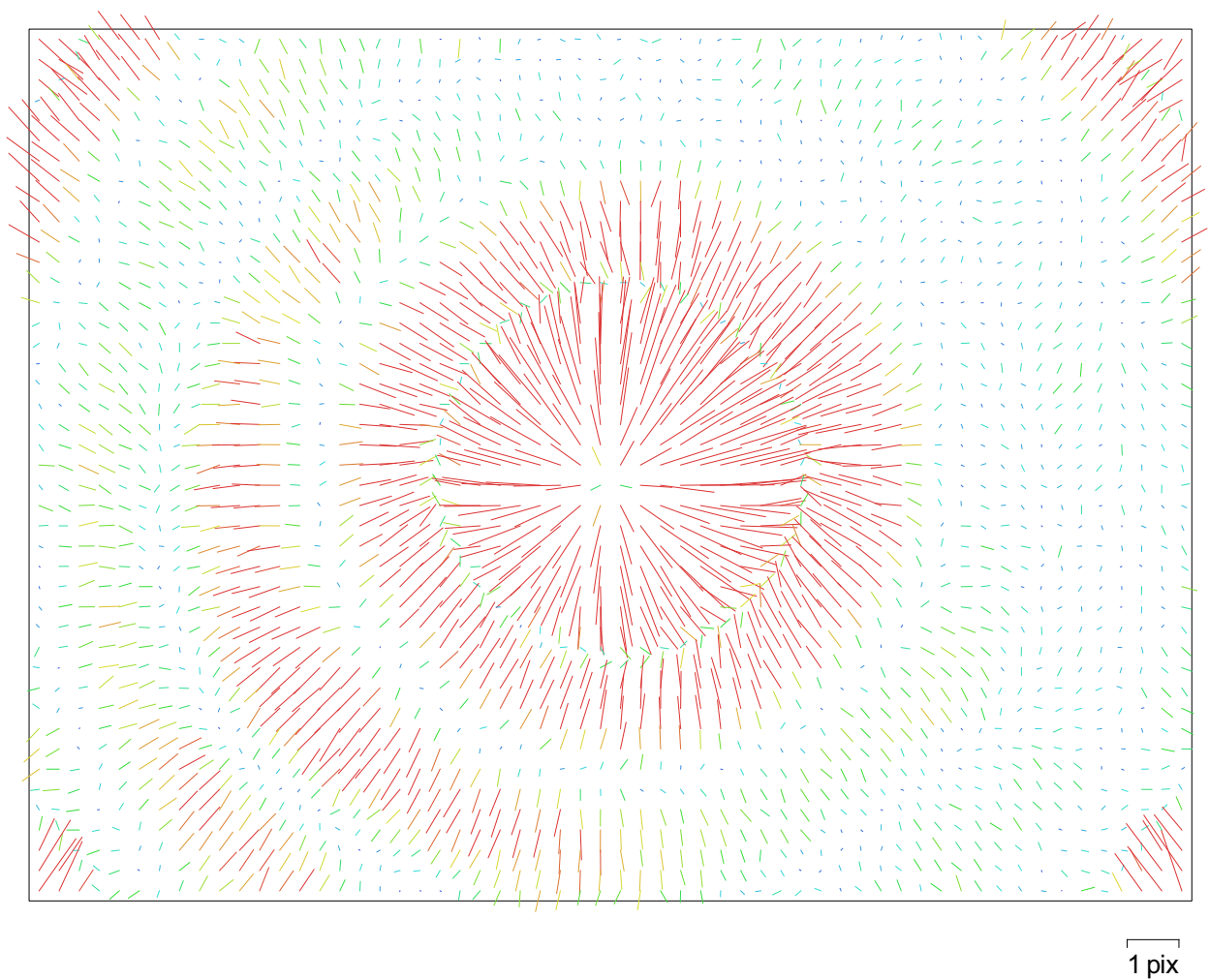


Fig. 2. Image residuals for FC220 (4.7 mm).

FC220 (4.7 mm)

290 images

Resolution	Focal Length	Pixel Size	Precalibrated
4000 x 3000	4.7 mm	1.56 x 1.56 um	No
Type:	Frame	F:	3062.25
Cx:	23.2043	B1:	-0.90703
Cy:	17.9342	B2:	-0.757598
K1:	0.110316	P1:	-0.000767555
K2:	-0.625087	P2:	0.000235829
K3:	1.41416	P3:	0
K4:	-1.09637	P4:	0

Ground Control Points

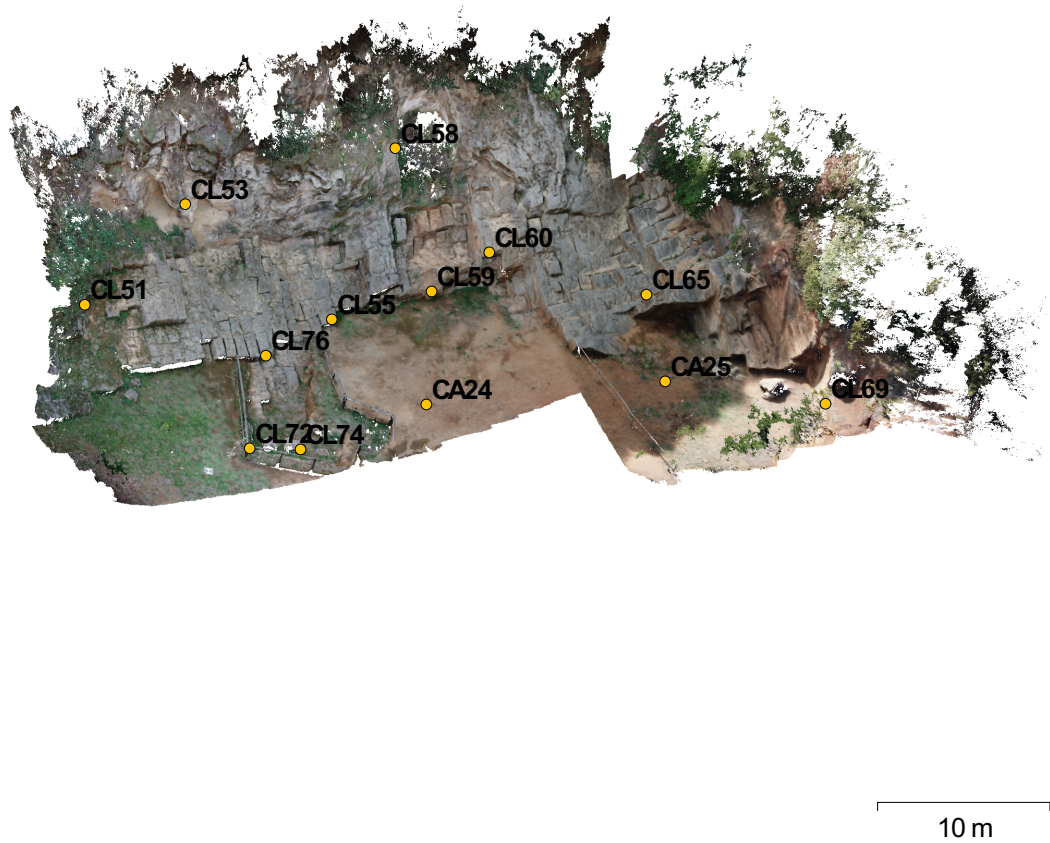


Fig. 3. GCP locations.

Label	XY error (m)	Z error (m)	Error (m)	Projections	Error (pix)
CA24	0.00417316	0.0231413	0.0235146	7	0.675
CL51	0.0177702	-0.00731237	0.0192159	7	2.442
CL53	0.0112199	-0.0142132	0.018108	26	0.991
CL55	0.0164563	0.00719771	0.0179615	15	0.804
CL58	0.00398402	-0.00863244	0.00950744	23	0.738
CL59	0.01215	0.0097183	0.0155585	22	0.728
CL60	0.00971933	-0.0010722	0.00977829	6	0.829
CL65	0.00632383	-0.00120933	0.00643842	17	1.086
CL69	0.012123	-0.0134985	0.0181433	21	0.490

Label	XY error (m)	Z error (m)	Error (m)	Projections	Error (pix)
CL72	0.00536089	-0.00356813	0.00643977	3	0.521
CL74					
CL76	0.00633719	0.0129994	0.0144618	4	0.405
Total	0.0106332	0.0111938	0.0154391		0.946

Table 2. Control points.

Label	XY error (m)	Z error (m)	Error (m)	Projections	Error (pix)
CA25	0.0262994	-0.000295593	0.0263011	45	0.916
Total	0.0262994	0.000295593	0.0263011		0.916

Table 3. Check points.

Digital Elevation Model

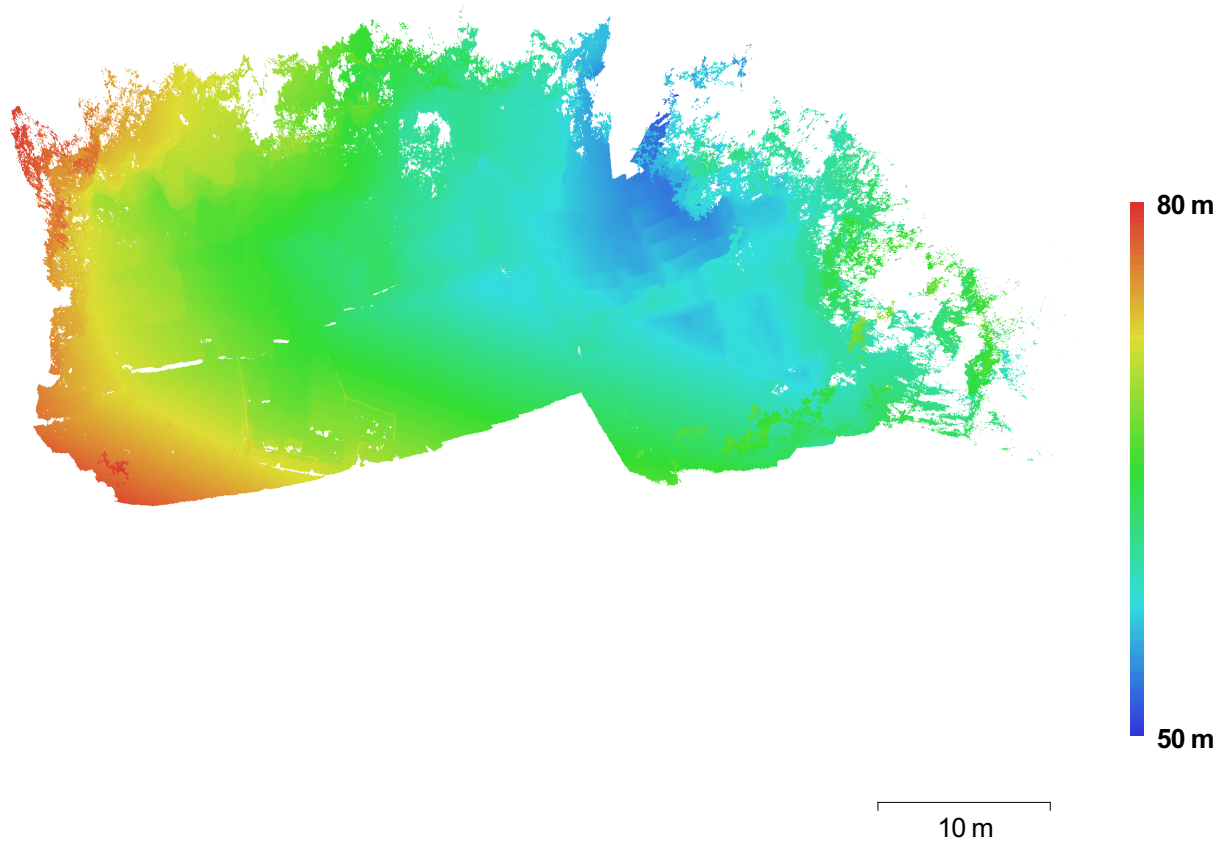


Fig. 4. Reconstructed digital elevation model.

Resolution:	1.16 cm/pix
Point density:	7402.47 points per sq m

Processing Parameters

General

Cameras	290
Aligned cameras	290
Markers	28
Coordinate system	WGS 84 / UTM zone 32N (EPSG::32632)

Point Cloud

Points	95,957 of 104,904
RMS reprojection error	0.189167 (1.30643 pix)
Max reprojection error	0.56911 (60.5356 pix)
Mean key point size	6.47757 pix
Effective overlap	5.74264

Alignment parameters

Accuracy	Medium
Pair preselection	Disabled
Key point limit	4,000
Tie point limit	40,000
Constrain features by mask	No
Matching time	10 minutes 28 seconds
Alignment time	4 minutes 58 seconds

Dense Point Cloud

Points	15,643,714
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Reconstruction parameters

Quality	Medium
Depth filtering	Mild
Processing time	9 minutes 28 seconds

Model

Faces	3,128,715
Vertices	2,513,884

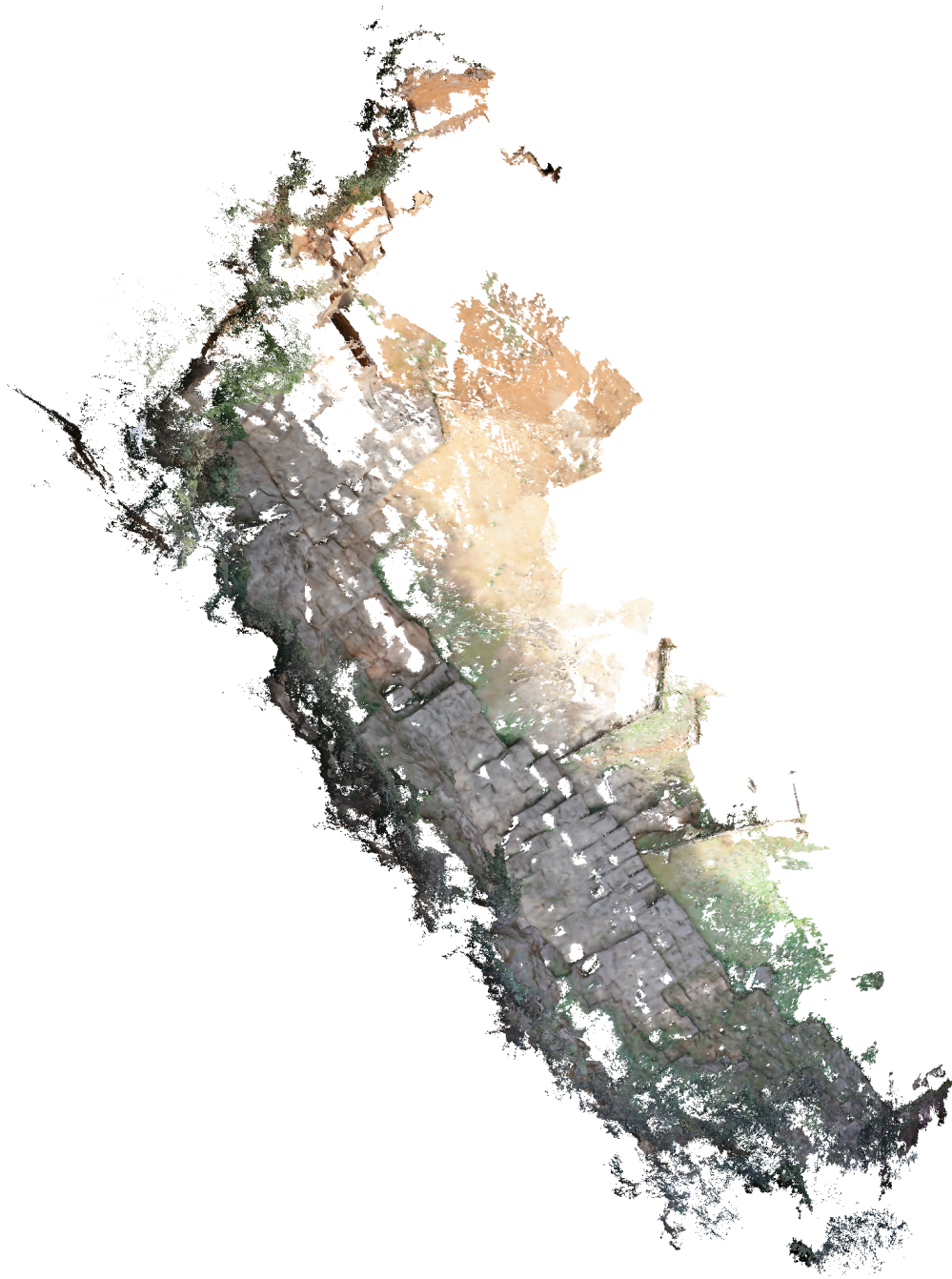
Reconstruction parameters

Surface type	Arbitrary
Source data	Dense
Interpolation	Disabled
Quality	Medium
Depth filtering	Mild
Face count	3,128,715
Processing time	12 minutes 33 seconds

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Survey Data

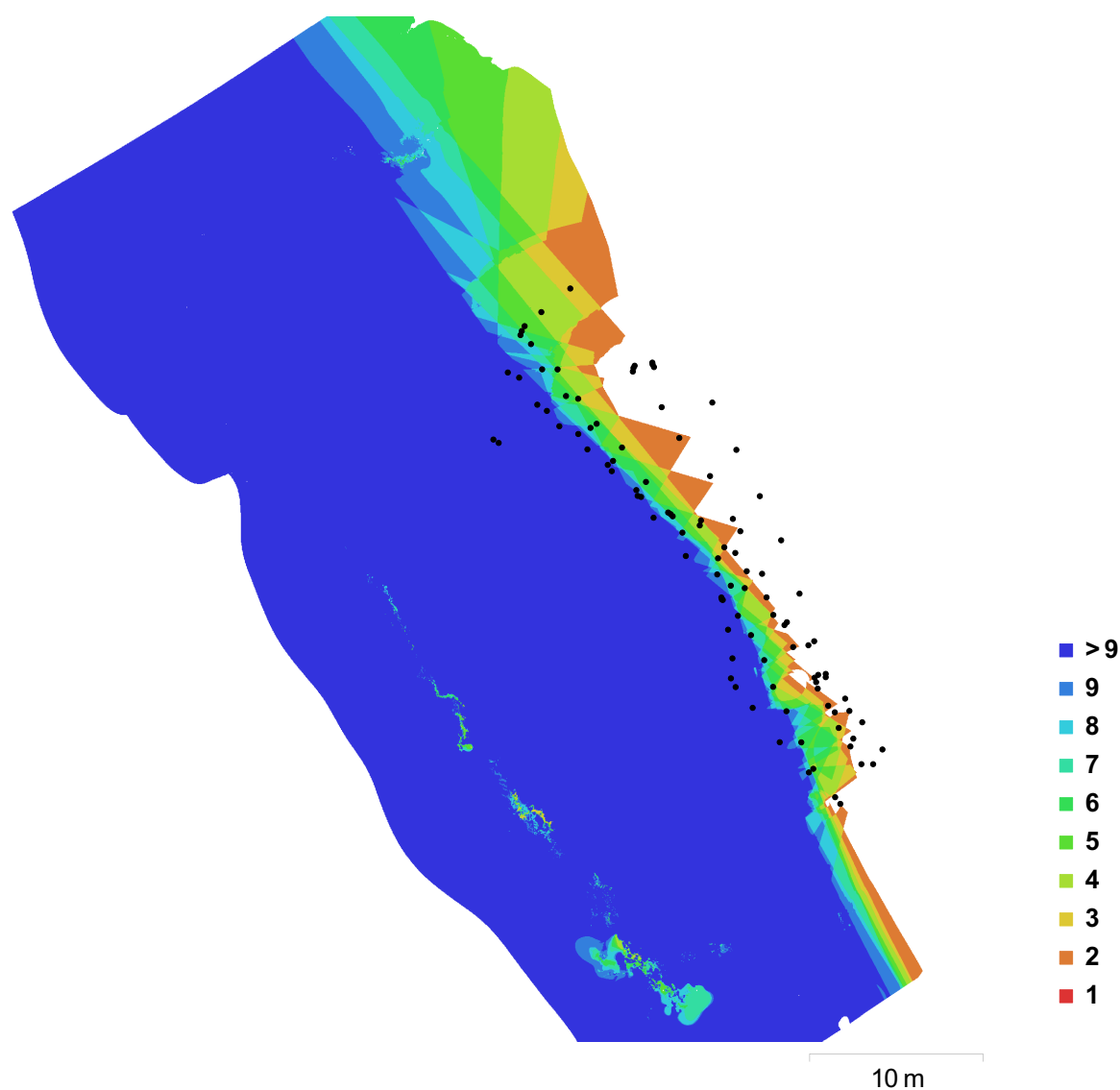


Fig. 1. Camera locations and image overlap.

Number of images:	104	Camera stations:	104
Flying altitude:	15.1 m	Tie points:	18,694
Ground resolution:	2.42 mm/pix	Projections:	70,309
Coverage area:	1.58e+03 sq m	Reprojection error:	2.74 pix

Camera Model	Resolution	Focal Length	Pixel Size	Precalibrated
Canon EOS 5DS R (24 mm)	8688 x 5792	24 mm	4.24 x 4.24 um	No

Table 1. Cameras.

Camera Calibration

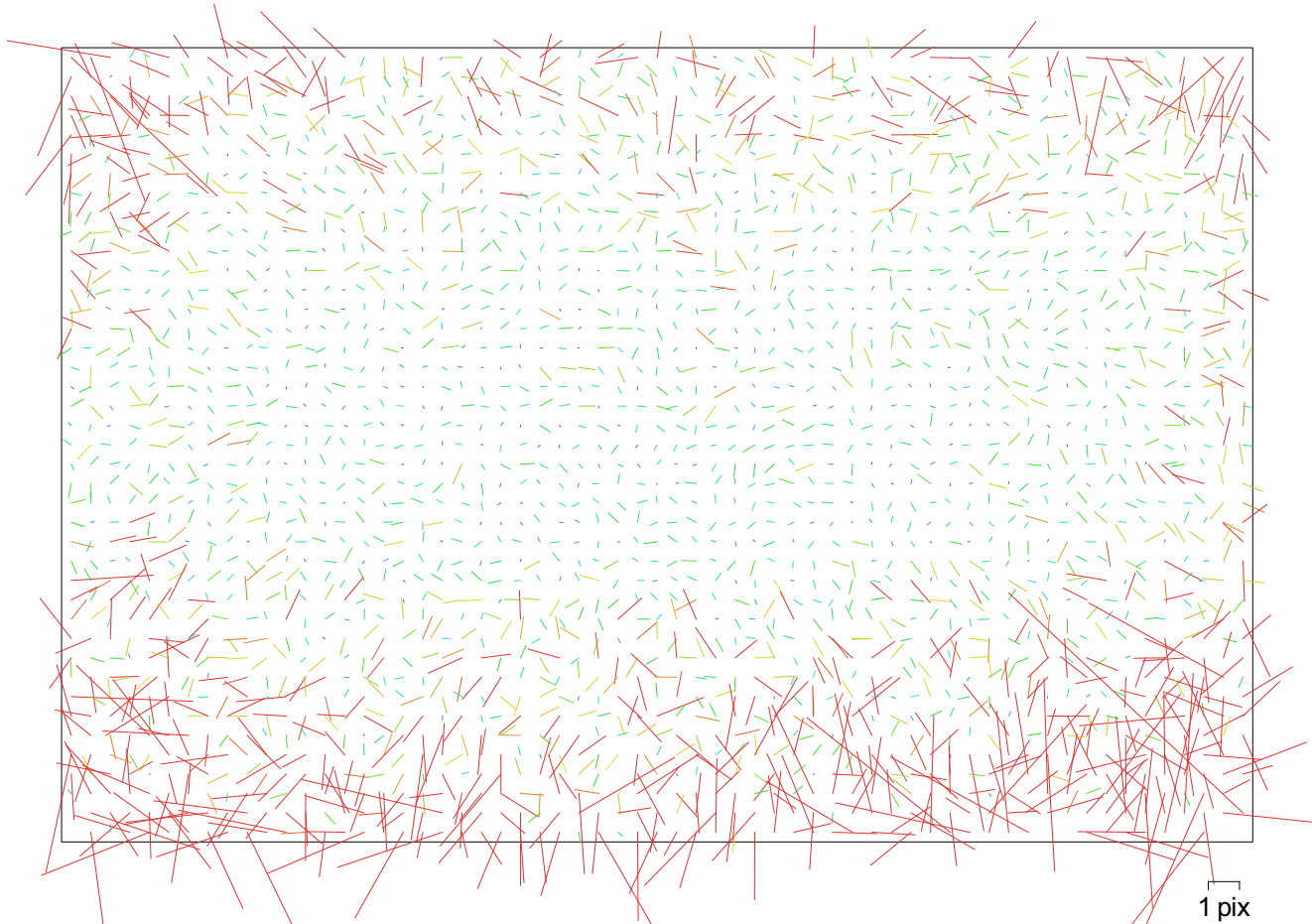


Fig. 2. Image residuals for Canon EOS 5DS R (24 mm).

Canon EOS 5DS R (24 mm)

104 images

Resolution	Focal Length	Pixel Size	Precalibrated
8688 x 5792	24 mm	4.24 x 4.24 um	No
Type:	Frame	F:	5971.67
Cx:	-1.49831	B1:	0
Cy:	-4.75023	B2:	0
K1:	-0.0771378	P1:	0.000159033
K2:	0.0644704	P2:	0.00166328
K3:	-0.0234989	P3:	0
K4:	0	P4:	0

Ground Control Points

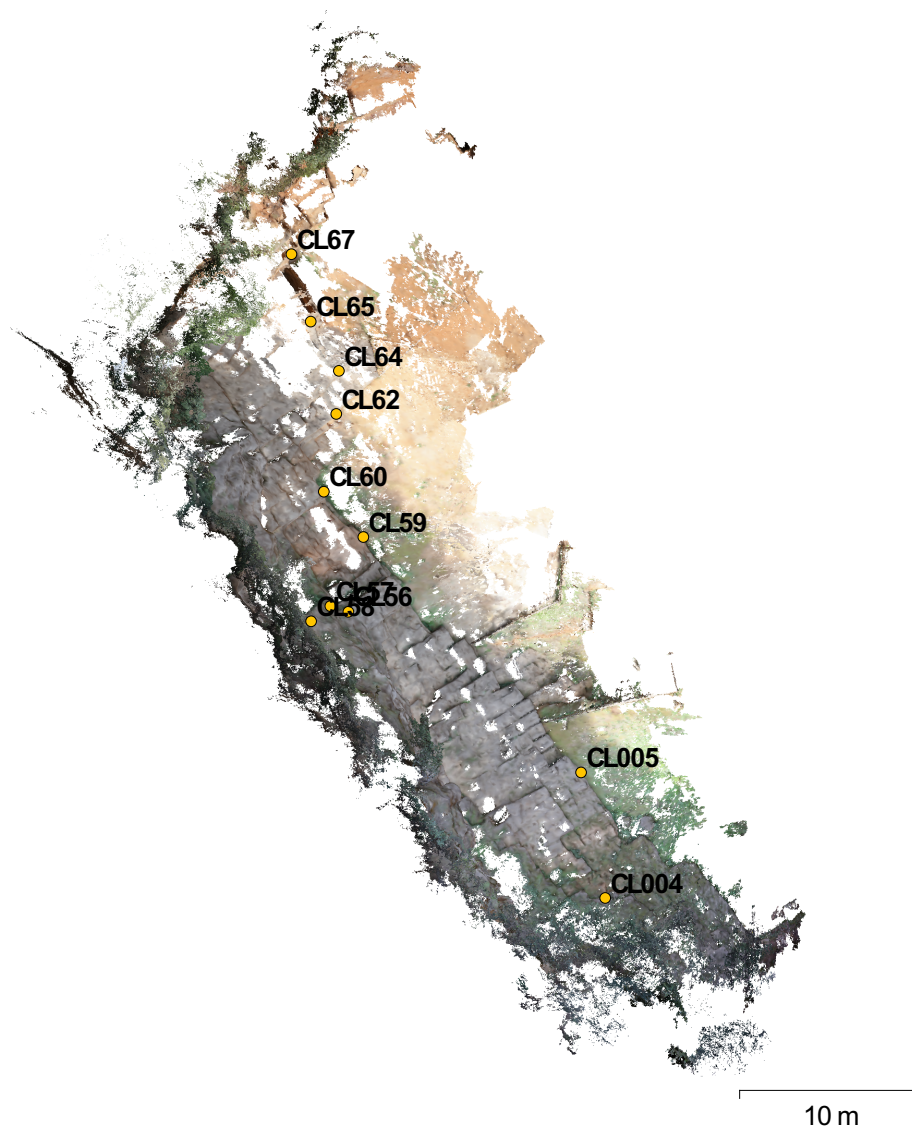


Fig. 3. GCP locations.

Label	XY error (m)	Z error (m)	Error (m)	Projections	Error (pix)
CL59	0.03431	-0.00382287	0.0345223	44	3.676
CL60	0.0517033	-0.00751386	0.0522465	46	3.245
CL62	0.00946168	0.0067433	0.0116188	40	8.685
CL64	0.0171775	0.00100337	0.0172068	35	8.785
CL65	0.0482706	0.00419114	0.0484523	31	5.290
CL004	0.00742911	0.0169051	0.0184655	31	15.215
CL005	0.0210576	-0.017505	0.0273833	32	14.585
Total	0.0317663	0.0101933	0.0333616		9.142

Table 2. Control points.

Label	XY error (m)	Z error (m)	Error (m)	Projections	Error (pix)
CL56	0.0843565	-0.00981297	0.0849253	54	2.656
CL57	0.107406	-0.0163726	0.108647	55	3.486
CL58	0.144029	-0.0340141	0.147991	40	4.092
CL67	0.105985	-0.00340216	0.10604	20	5.971
Total	0.112505	0.0195761	0.114195		3.794

Table 3. Check points.

Digital Elevation Model

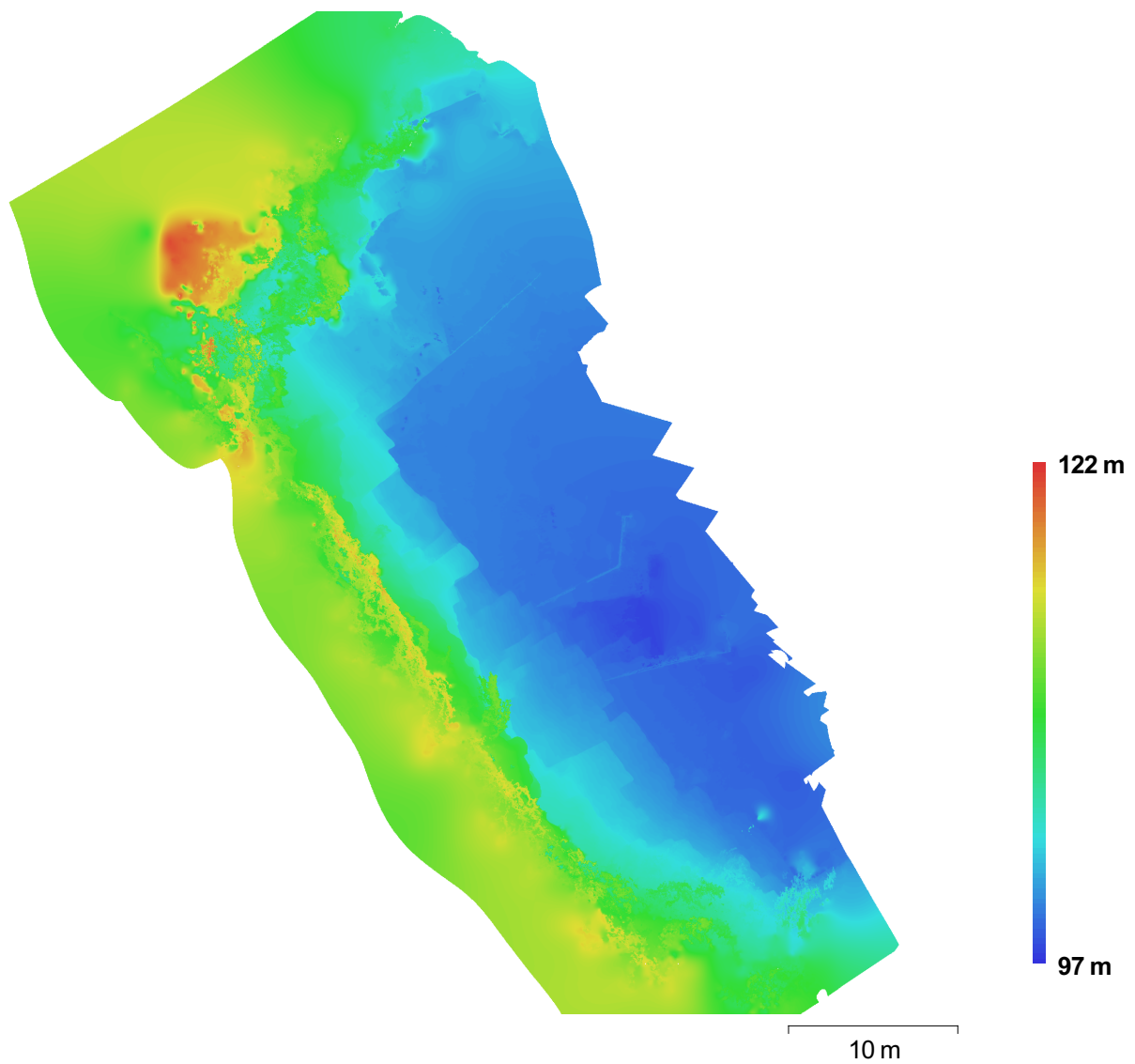


Fig. 4. Reconstructed digital elevation model.

Resolution:	9.66 mm/pix
Point density:	10705.3 points per sq m

Processing Parameters

General

Cameras	104
Aligned cameras	104
Markers	14
Coordinate system	WGS 84 / UTM zone 32N (EPSG::32632)

Point Cloud

Points	18,694 of 24,218
RMS reprojection error	0.768286 (2.74464 pix)
Max reprojection error	2.46204 (83.7086 pix)
Mean key point size	3.33835 pix
Effective overlap	4.78508

Alignment parameters

Accuracy	High
Pair preselection	Disabled
Key point limit	4,000
Tie point limit	40,000
Constrain features by mask	No
Matching time	8 minutes 48 seconds
Alignment time	55 seconds

Dense Point Cloud

Points	18,459,313
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Reconstruction parameters

Quality	Medium
Depth filtering	Aggressive
Processing time	1 hours 42 minutes

Model

Faces	3,691,851
Vertices	3,328,070

Reconstruction parameters

Surface type	Arbitrary
Source data	Dense
Interpolation	Disabled
Quality	Medium
Depth filtering	Aggressive
Face count	3,691,852
Processing time	18 minutes 47 seconds

DEM

Size	6,462 x 7,616
Coordinate system	WGS 84 / UTM zone 32N (EPSG::32632)

Reconstruction parameters

Source data	Mesh
Interpolation	Enabled