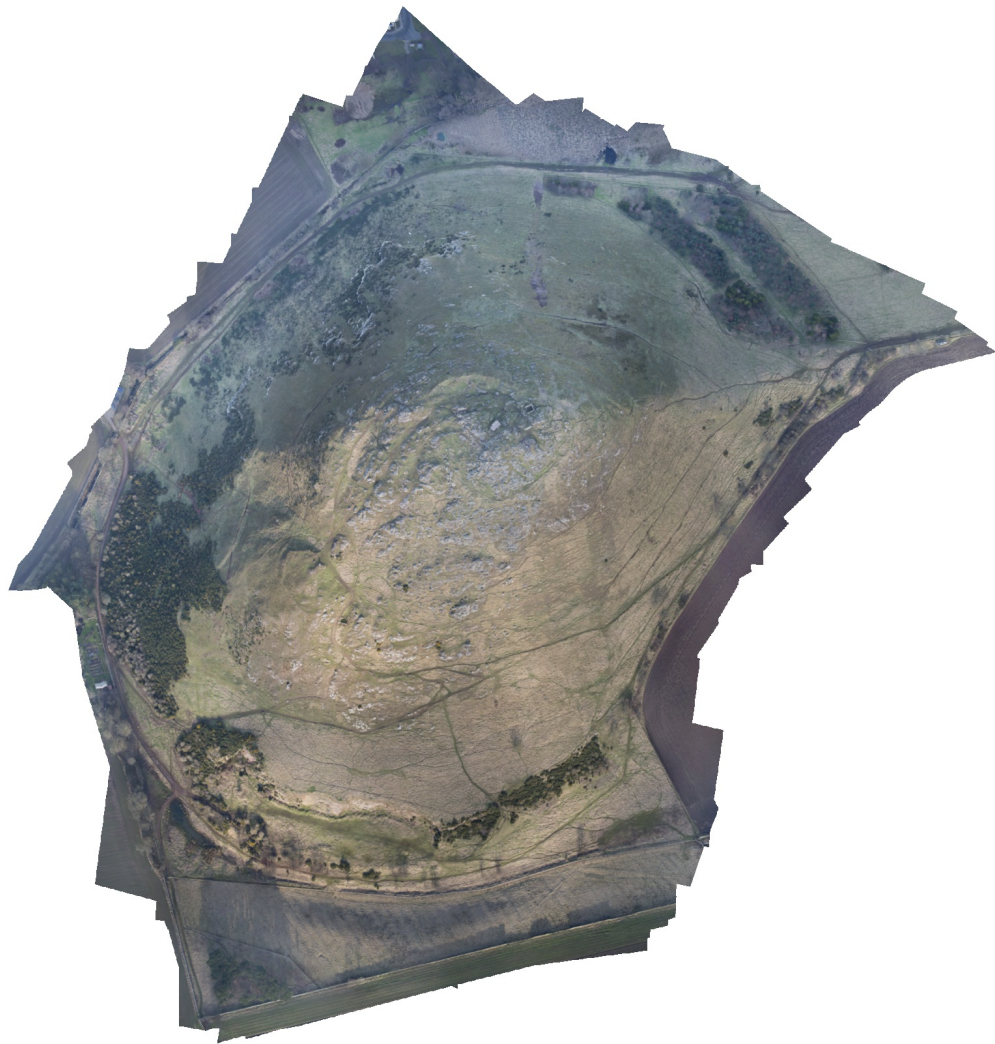


Agisoft PhotoScan

Processing Report
19 February 2019



Survey Data

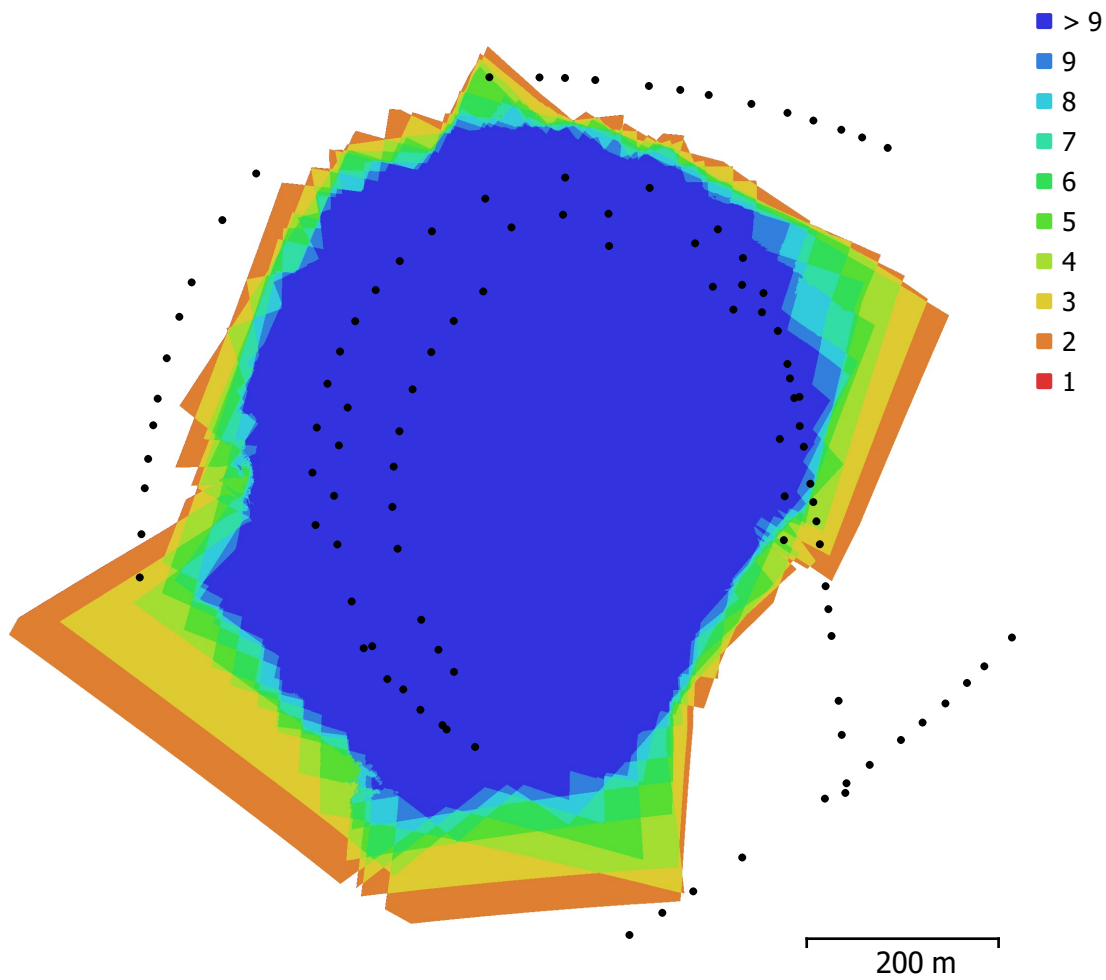


Fig. 1. Camera locations and image overlap.

Number of images:	105	Camera stations:	105
Flying altitude:	537 m	Tie points:	33,679
Ground resolution:	5 cm/pix	Projections:	451,257
Coverage area:	0.512 km ²	Reprojection error:	0.561 pix

Camera Model	Resolution	Focal Length	Pixel Size	Precalibrated
NIKON D800E (50 mm)	7360 x 4912	50 mm	4.88 x 4.88 μ m	No

Table 1. Cameras.

Camera Calibration

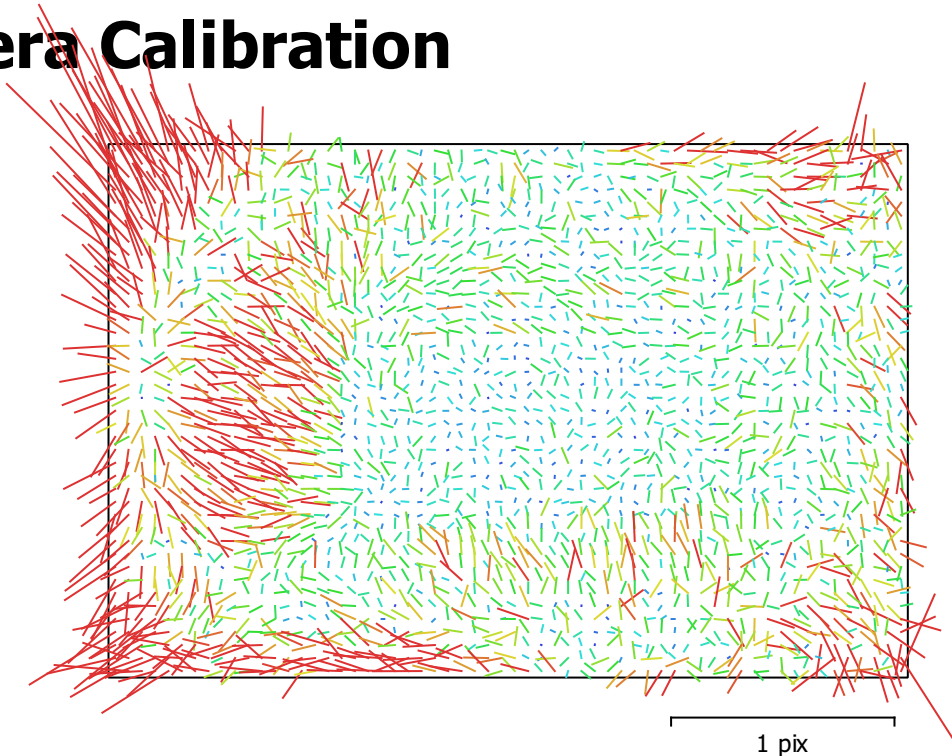


Fig. 2. Image residuals for NIKON D800E (50 mm).

NIKON D800E (50 mm)

105 images

Type Resolution Focal Length Pixel Size
Frame 7360 x 4912 50 mm 4.88 x 4.88 μ m

	Value	Error	F	Cx	Cy	B1	B2	K1	K2	K3	P1	P2
F	10544.3	0.14	1.00	-0.10	-0.62	-0.22	-0.17	-0.14	0.13	-0.10	-0.07	-0.19
Cx	11.2341	0.094		1.00	0.08	-0.10	0.29	-0.02	0.03	-0.03	0.86	0.01
Cy	20.3468	0.11			1.00	-0.28	0.10	-0.03	-0.00	-0.01	0.12	0.62
B1	-1.02052	0.017				1.00	0.05	0.04	-0.05	0.05	-0.12	-0.09
B2	2.89686	0.0094					1.00	-0.03	0.04	-0.05	0.20	0.01
K1	-0.141257	7.5e-05						1.00	-0.97	0.92	-0.02	-0.04
K2	0.122489	0.00095							1.00	-0.98	0.02	0.00
K3	0.124729	0.0036								1.00	-0.02	0.00
P1	0.000270671	2.2e-06									1.00	0.06
P2	5.46028e-05	2.3e-06										1.00

Table 2. Calibration coefficients and correlation matrix.

Ground Control Points

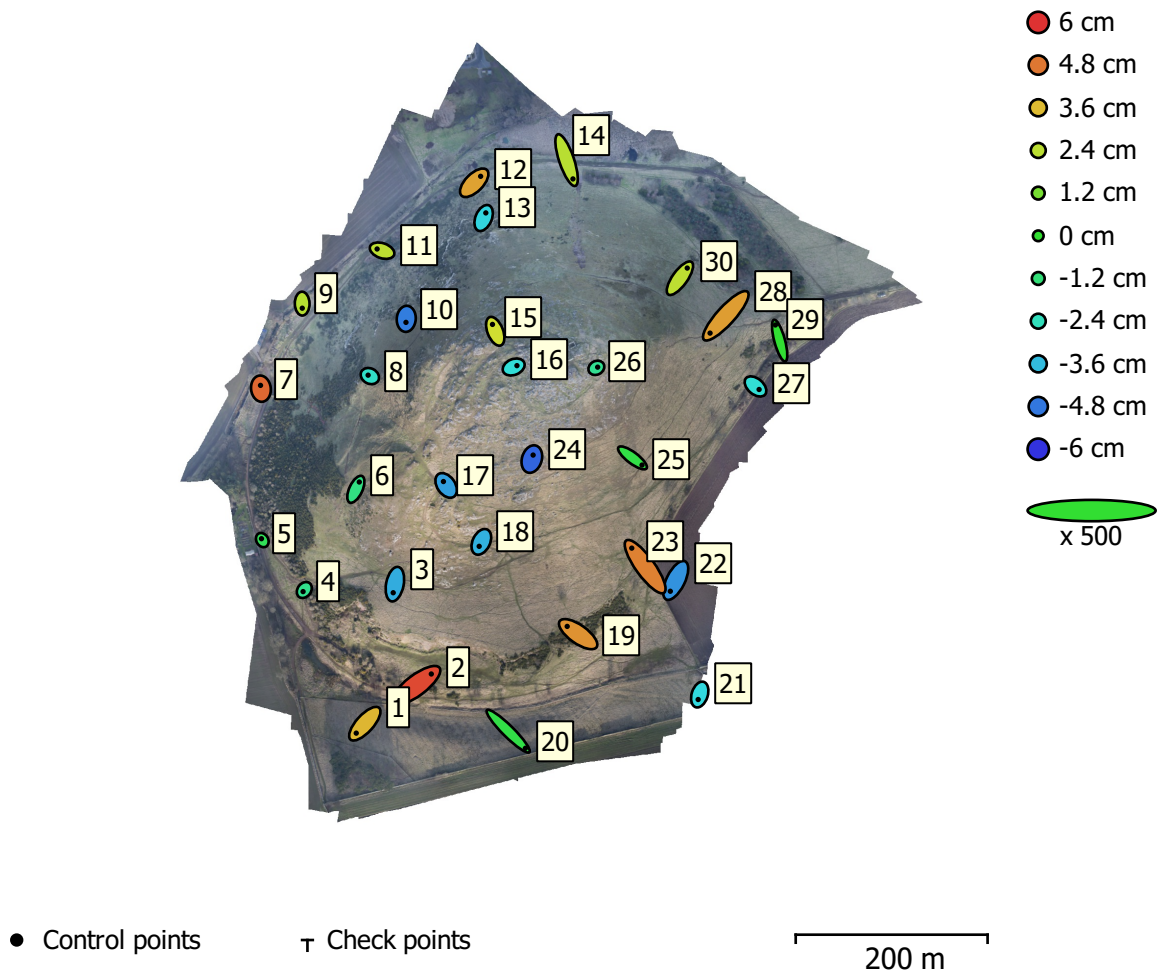


Fig. 3. GCP locations and error estimates.

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)
30	2.96513	3.77834	3.35362	4.8029	5.85787

Table 3. Control points RMSE.

X - Easting, Y - Northing, Z - Altitude.

Label	X error (cm)	Y error (cm)	Z error (cm)	Total (cm)	Image (pix)
1	-3.56753	-3.93903	3.69045	6.47013	0.756 (16)
2	6.31057	4.76932	5.5962	9.68953	0.591 (37)
3	-0.706123	-3.58336	-3.86709	5.31917	0.474 (47)
4	-0.507426	-0.655174	-1.56088	1.76723	0.463 (28)
5	-0.346614	0.573784	-0.660085	0.940788	0.437 (18)
6	1.4281	3.03643	-1.38587	3.63042	0.513 (38)
17	-1.12865	1.61418	-4.08937	4.53899	0.493 (59)
18	-0.907598	-1.86044	-3.77927	4.30904	0.472 (61)
20	7.17724	-7.10905	-0.35584	10.1083	0.492 (19)
19	-4.56577	3.23427	4.32125	7.06965	0.494 (39)
24	0.527957	1.6725	-5.1147	5.40704	0.551 (41)
22	-2.24426	-4.51444	-4.33282	6.64756	0.508 (24)
23	-5.58266	7.70982	4.62081	10.5811	0.532 (42)
25	3.9698	-2.98566	-0.347546	4.97938	0.455 (33)
26	0.53812	0.29677	-1.64339	1.75453	0.487 (37)
28	-6.56011	-7.21901	4.13226	10.5936	0.654 (23)
27	1.50713	-1.27227	-2.83479	3.45343	0.900 (16)
29	-1.77952	6.52552	-0.0130647	6.76382	0.487 (10)
30	3.05239	4.22769	2.43519	5.75505	0.541 (21)
14	2.65508	-7.83148	2.34615	8.5957	0.737 (27)
15	-1.14729	2.86807	2.75334	4.13799	0.492 (51)
12	2.68133	2.69506	4.04655	5.55225	0.492 (26)
11	-2.06749	0.706202	2.43574	3.27202	0.488 (38)
9	0.0376894	-1.90297	2.28471	2.97366	0.604 (20)
10	-0.116078	-1.47556	-4.68473	4.91298	0.522 (57)
13	0.910073	2.13155	-3.17478	3.93077	0.512 (37)
8	-0.722567	0.375885	-2.59457	2.71941	0.611 (41)
7	-0.166678	1.37749	5.06562	5.25221	0.583 (14)
16	1.3649	0.571886	-2.87484	3.23337	0.457 (44)
21	-0.656231	-2.07154	-3.07714	3.76706	0.000 (1)
Total	2.96513	3.77834	3.35362	5.85787	0.535

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

Digital Elevation Model

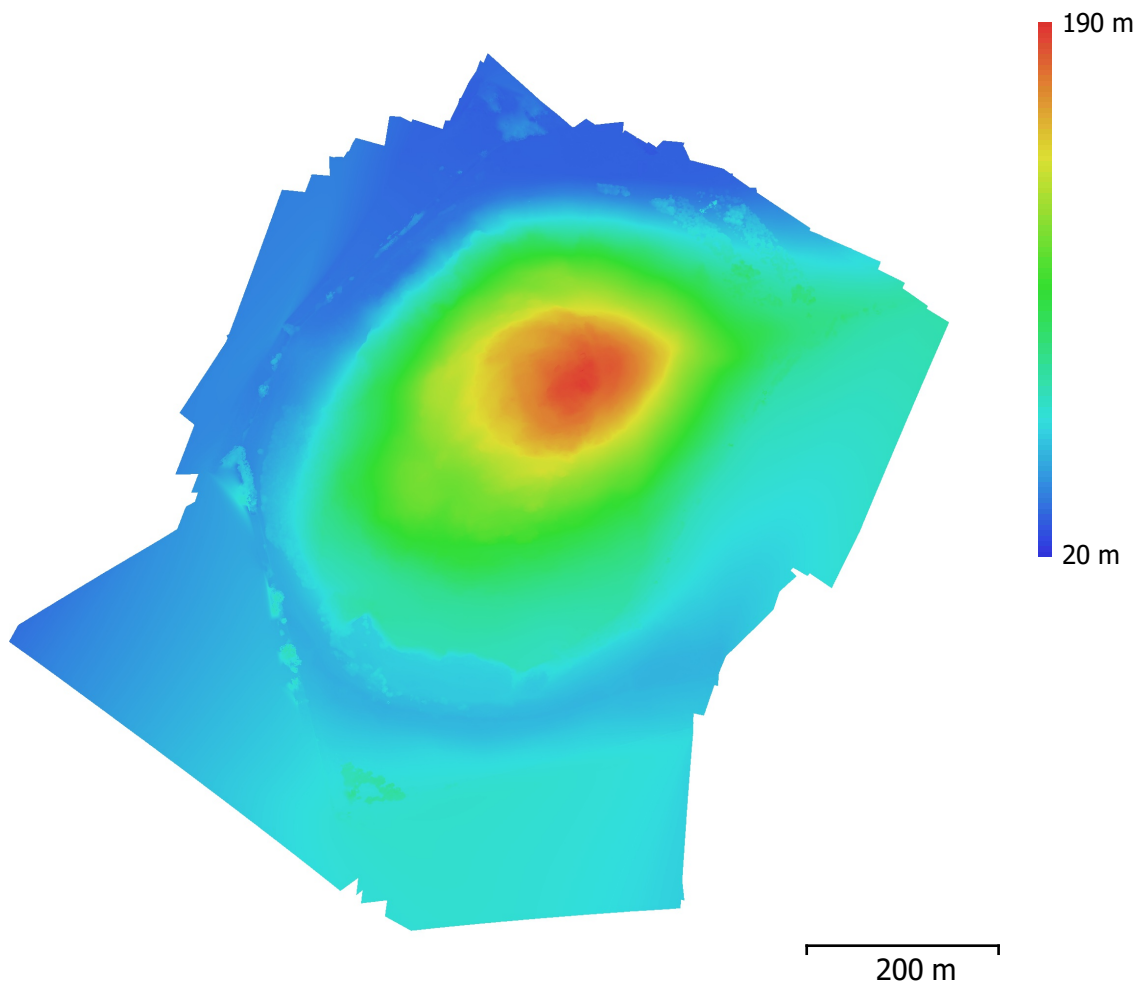


Fig. 4. Reconstructed digital elevation model.

Resolution: 10 cm/pix
Point density: 99.9 points/m²

Processing Parameters

General

Cameras	105
Aligned cameras	105
Markers	30
Coordinate system	OSGB 1936 / British National Grid (EPSG::27700)
Rotation angles	Yaw, Pitch, Roll

Point Cloud

Points	33,679 of 41,830
RMS reprojection error	0.24352 (0.561109 pix)
Max reprojection error	1.1998 (19.1779 pix)
Mean key point size	2.32177 pix
Point colors	3 bands, uint8
Key points	No
Average tie point multiplicity	15.0574

Alignment parameters

Accuracy	Highest
Generic preselection	Yes
Key point limit	40,000
Tie point limit	5,000
Filter points by mask	Yes
Adaptive camera model fitting	Yes
Matching time	30 minutes 56 seconds
Alignment time	22 seconds

Optimization parameters

Parameters	f, b1, b2, cx, cy, k1-k3, p1, p2
Optimization time	4 seconds

Dense Point Cloud

Points	50,530,912
Point colors	3 bands, uint8

Reconstruction parameters

Quality	High
Depth filtering	Mild
Depth maps generation time	1 days 13 hours
Dense cloud generation time	4 hours 7 minutes

Model

Faces	10,002,676
Vertices	5,006,513
Vertex colors	3 bands, uint8
Texture	4,096 x 4,096, 4 bands, uint8

Reconstruction parameters

Surface type	Height field
Source data	Dense
Interpolation	Enabled
Quality	High
Depth filtering	Mild
Face count	10,106,182
Processing time	3 minutes 47 seconds

Texturing parameters

Mapping mode	Orthophoto
Blending mode	Mosaic
Texture size	4,096 x 4,096
Enable color correction	No
Enable hole filling	Yes
UV mapping time	1 minutes 40 seconds
Blending time	7 minutes 13 seconds

Orthomosaic

Size 19,585 x 18,265
Coordinate system OSGB 1936 / British National Grid (EPSG::27700)
Colors 3 bands, uint8

Reconstruction parameters

Blending mode Mosaic
Surface Mesh
Enable color correction No
Enable hole filling Yes
Processing time 19 minutes 50 seconds

Software

Version 1.4.3 build 6529
Platform Windows 64