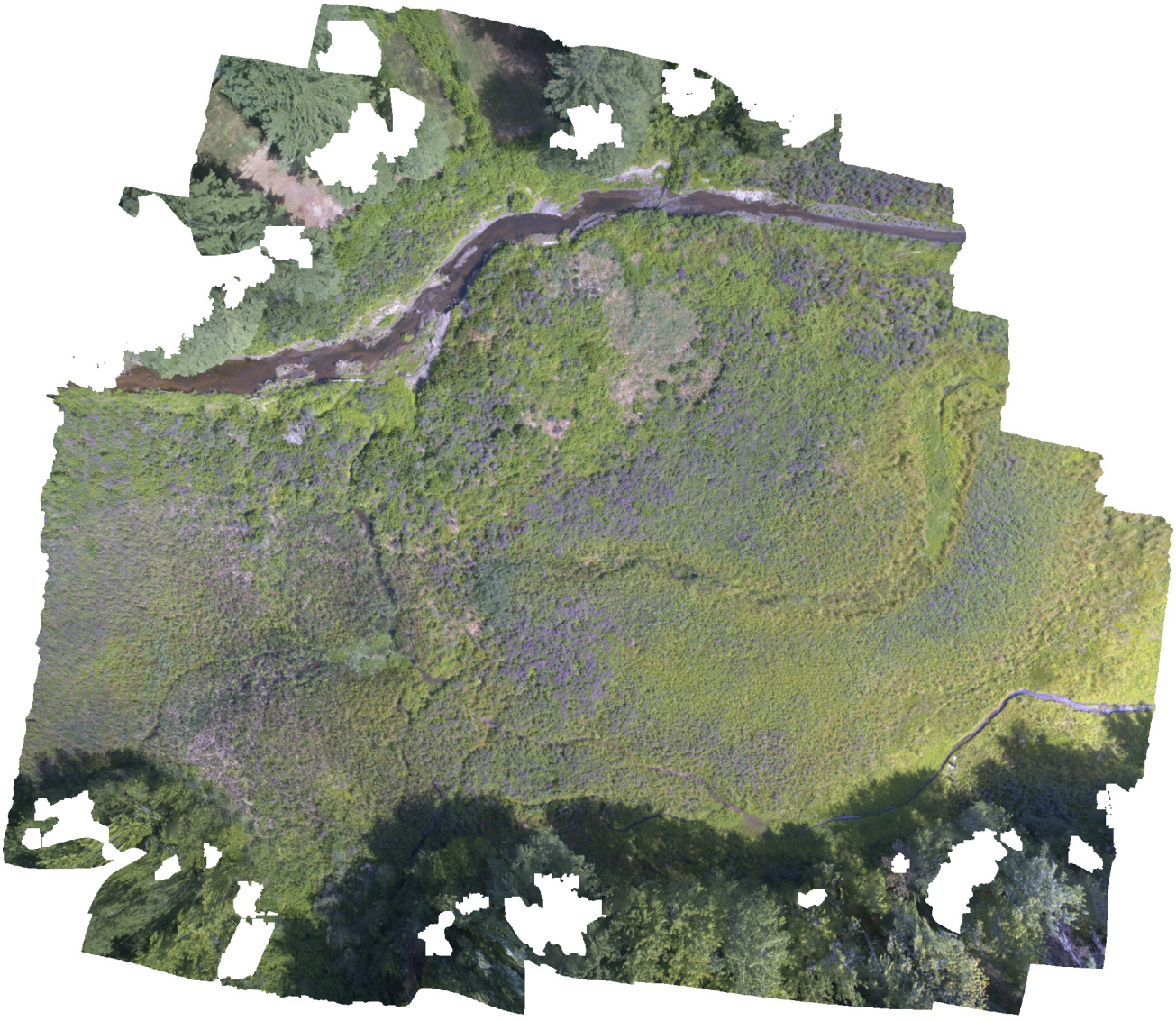
[2020-8-6]_vegArea_report

Processing Report

05 October 2020



Survey Data

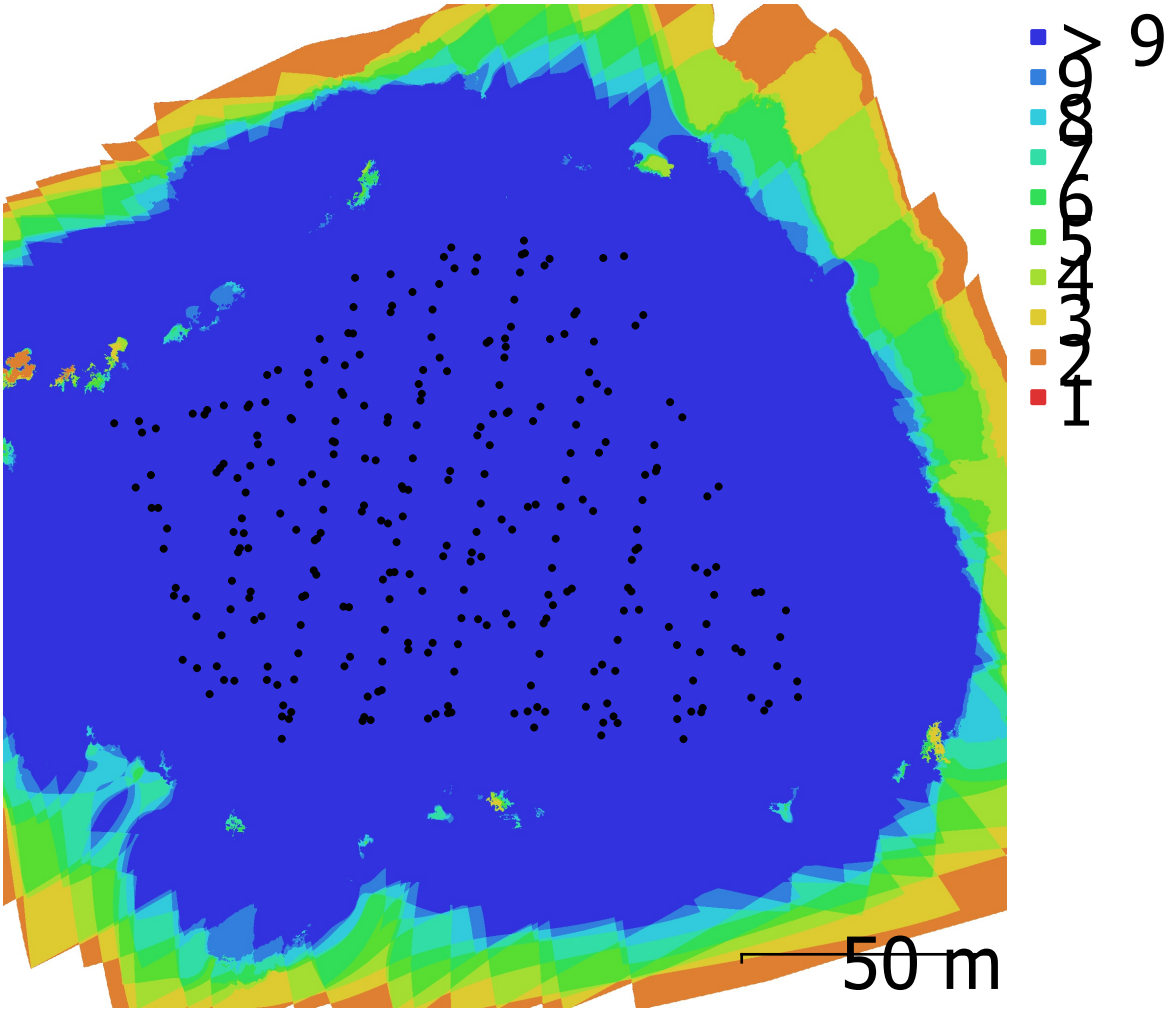


Fig. 1. Camera locations and image overlap.

Number of images:	288	Camera stations:	288
Flying altitude:	50.4 m	Tie points:	246,271
Ground resolution:	1.95 cm/pix	Projections:	793,537
Coverage area:	0.0361 km²	Reprojection error:	1.38 pix

Camera Model	Resolution	Focal Length	Pixel Size	Precalibrated
FC300X (3.61mm)	3992 x 2992	3.61 mm	1.57 x 1.57 µm	No

Table 1. Cameras.

Camera Calibration

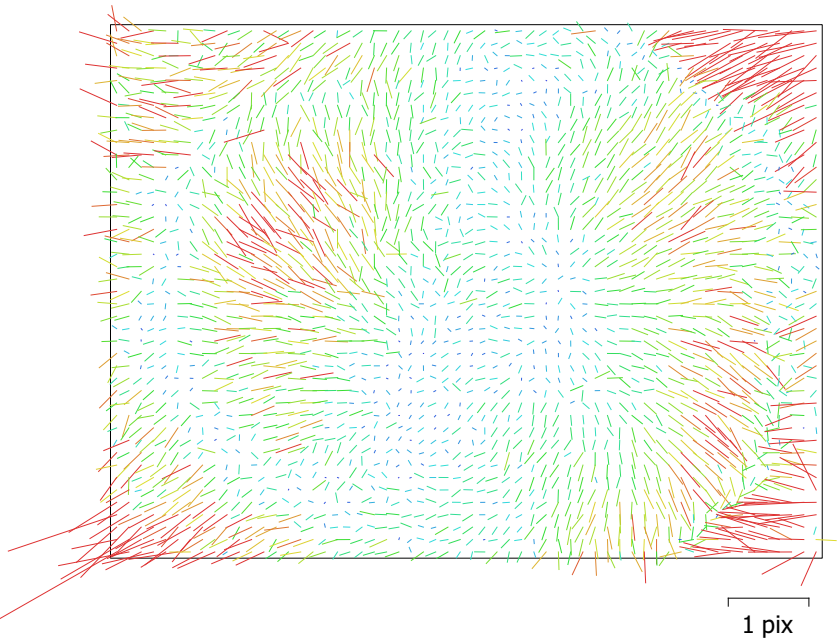


Fig. 2. Image residuals for FC300X (3.61mm).

FC300X (3.61mm)

288 images

Type	Resolution	Focal Length	Pixel Size
Frame	**3992 x 2992**	**3.61 mm**	**1.57 x 1.57 µm**

	Value	Error	F	Cx	Cy	B1	B2	K1	K2	K3	K4	P1	P2
F	**2347.82**	0.31	1.00	-0.27	-0.79	-0.17	-0.20	-0.29	0.20	-0.14	0.14	0.13	0.29
Cx	**-10.9554**	0.065		1.00	0.22	0.18	0.62	0.05	-0.03	0.02	-0.03	0.27	-0.06
Cy	**-19.9865**	0.11			1.00	-0.26	0.22	0.14	-0.08	0.04	-0.05	-0.09	-0.15
B1	**0.0406936**	0.019				1.00	0.06	0.02	-0.03	0.01	-0.01	-0.01	0.22
B2	**-2.88009**	0.019					1.00	0.07	-0.04	0.03	-0.03	-0.25	-0.09
K1	**-0.141285**	0.00017						1.00	-0.96	0.91	-0.86	-0.06	-0.17
K2	**0.153188**	0.00061							1.00	-0.98	0.95	0.02	0.05
K3	**-0.0794035**	0.00086								1.00	-0.99	-0.01	-0.03
K4	**0.0306432**	0.0004									1.00	-0.00	0.02
P1	**0.00315885**	6e-06										1.00	0.14
P2	**1.95611e-05**	7.1e-06											1.00

Table 2. Calibration coefficients and correlation matrix.

Ground Control Points

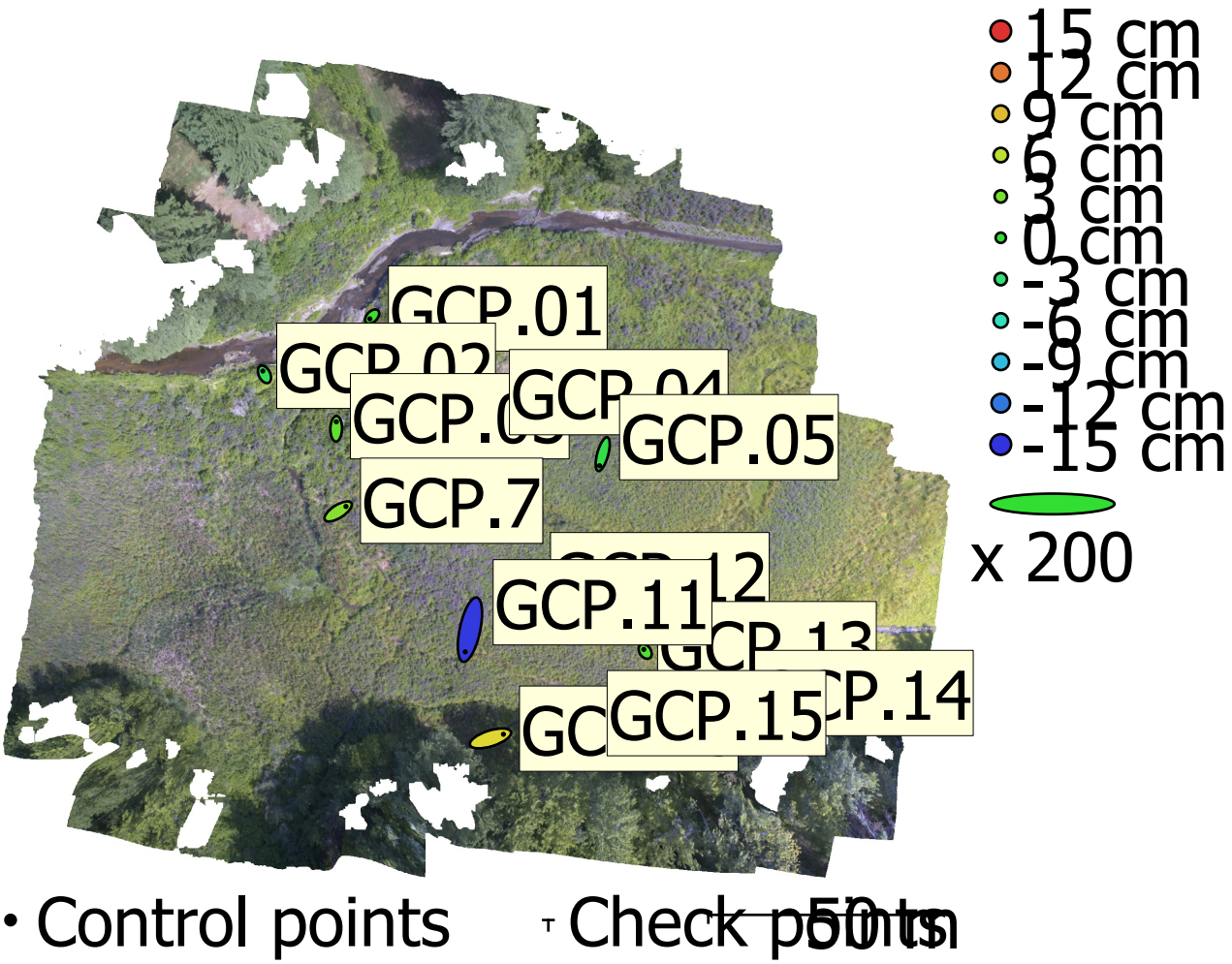


Fig. 3. GCP locations and error estimates.
Z error is represented by ellipse color. X,Y errors are represented by ellipse shape.
Estimated GCP locations are marked with a dot or crossing.

Count	X error (cm)	Y error (cm)	Z error (cm)	XY error (cm)	Total (cm)
12	1.07386	1.76204	5.0248	2.06348	5.43199

Table 3. Control points RMSE.
X - Longitude, Y - Latitude, Z - Altitude.

Label	X error (cm)	Y error (cm)	Z error (cm)	Total (cm)	Image (pix)
GCP.01	-0.468922	-0.474427	0.384787	0.770085	0.705 (91)
GCP.02	-0.340992	0.68258	-1.55145	1.72893	0.698 (97)
GCP.03	0.0310378	1.42854	1.99288	2.4522	0.691 (120)
GCP.04	0.329074	2.03015	0.691971	2.16993	0.691 (106)
GCP.10	2.66663	0.853163	7.82827	8.31388	2.059 (62)
GCP.12	-0.306236	-0.0982262	0.498573	0.593299	1.034 (115)
GCP.05	-0.656019	-2.37316	-0.923784	2.62976	0.675 (85)
GCP.13	-0.289197	0.410546	1.43467	1.52002	0.708 (66)
GCP.14	-1.46367	1.40507	-0.904285	2.22133	0.593 (47)
GCP.15	-0.126496	-0.345253	1.44501	1.49106	0.868 (63)
GCP.11	-0.971214	-4.55187	-14.6587	15.3799	9.488 (37)
GCP.7	1.60383	1.02623	3.70835	4.16861	0.686 (87)
Total	**1.07386**	**1.76204**	**5.0248**	**5.43199**	**2.048**

Table 4. Control points.

X - Longitude, Y - Latitude, Z - Altitude.

Digital Elevation Model

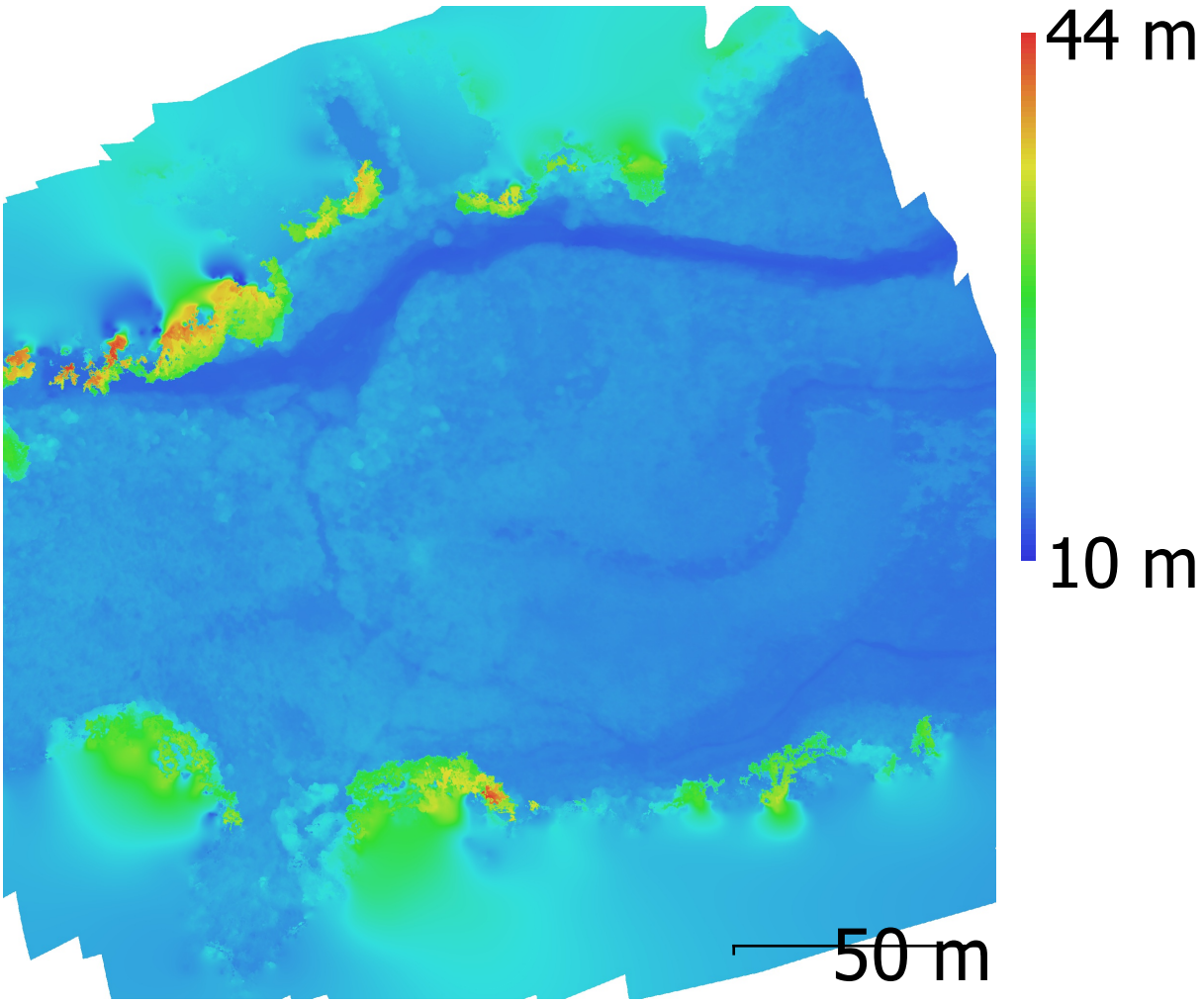


Fig. 4. Reconstructed digital elevation model.

Resolution:	3.9 cm/pix
Point density:	657 points/m²

Processing Parameters

General	
Cameras	288
Aligned cameras	288
Markers	12
Coordinate system	WGS 84 (EPSG::4326)
Rotation angles	Yaw, Pitch, Roll
Point Cloud	
Points	246,271 of 266,274
RMS reprojection error	0.412874 (1.37788 pix)
Max reprojection error	13.8116 (34.2704 pix)
Mean key point size	3.70664 pix
Point colors	3 bands, uint16
Key points	No
Average tie point multiplicity	3.85834
Alignment parameters	
Accuracy	Highest
Generic preselection	Yes
Reference preselection	Yes
Key point limit	40,000
Tie point limit	4,000
Adaptive camera model fitting	Yes
Matching time	35 minutes 52 seconds
Alignment time	2 minutes 54 seconds
Optimization parameters	
Parameters	f, b1, b2, cx, cy, k1-k4, p1, p2
Adaptive camera model fitting	No
Optimization time	14 seconds
Dense Point Cloud	
Points	26,511,029
Point colors	3 bands, uint16
Reconstruction parameters	
Quality	High
Depth filtering	Aggressive
Depth maps generation time	23 hours 18 minutes
Dense cloud generation time	1 days 0 hours
Model	
Faces	5,302,204
Vertices	2,659,048
Vertex colors	3 bands, uint16
Reconstruction parameters	
Surface type	Arbitrary
Source data	Dense
Interpolation	Enabled
Quality	High
Depth filtering	Aggressive
Face count	5,302,205
Processing time	14 minutes 55 seconds
DEM	
Size	11,000 x 8,951
Coordinate system	WGS 84 (EPSG::4326)
Reconstruction parameters	
Source data	Dense cloud
Interpolation	Enabled
Processing time	39 seconds
Orthomosaic	

Size	10,240 x 9,728
Coordinate system	WGS 84 (EPSG::4326)
Colors	3 bands, uint16
Reconstruction parameters	
Blending mode	Mosaic
Surface	DEM
Enable hole filling	Yes
Processing time	2 minutes 43 seconds
Software	
Version	1.4.4 build 6848
Platform	Windows 64