

# Agisoft Metashape

Processing Report  
18 January 2023



# Survey Data

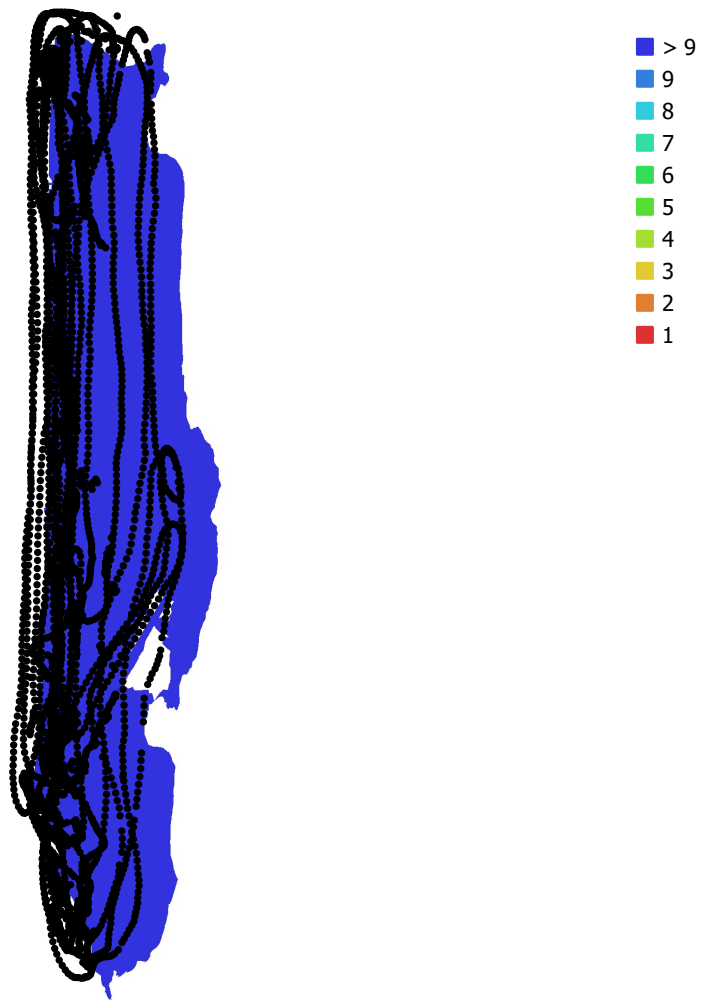


Fig. 1. Camera locations and image overlap.

Number of images: 4,604

Camera stations: 4,270

Tie points: 1,455,969

Projections: 3,861,558

Reprojection error: 2.12 pix

Camera Model	Resolution	Focal Length	Pixel Size	Precalibrated
Canon EOS 5D Mark IV, ...	6720 x 4480	15 mm	5.36 x 5.36 $\mu\text{m}$	Yes
ILCE-6500, .7x EF16-35...	6000 x 4000	12.7 mm	3.92 x 3.92 $\mu\text{m}$	Yes
ILCE-6500, .7x EF16-35...	6000 x 4000	13.4 mm	3.92 x 3.92 $\mu\text{m}$	Yes
ILCE-6500, .7x EF16-35...	4000 x 6000	13.4 mm	3.92 x 3.92 $\mu\text{m}$	Yes
ILCE-6500, .7x EF16-35...	4000 x 6000	12.7 mm	3.92 x 3.92 $\mu\text{m}$	Yes

<b>Camera Model</b>	<b>Resolution</b>	<b>Focal Length</b>	<b>Pixel Size</b>	<b>Precalibrated</b>
unknown	3840 x 2160	unknown	unknown	Yes

Table 1. Cameras.

# Camera Calibration

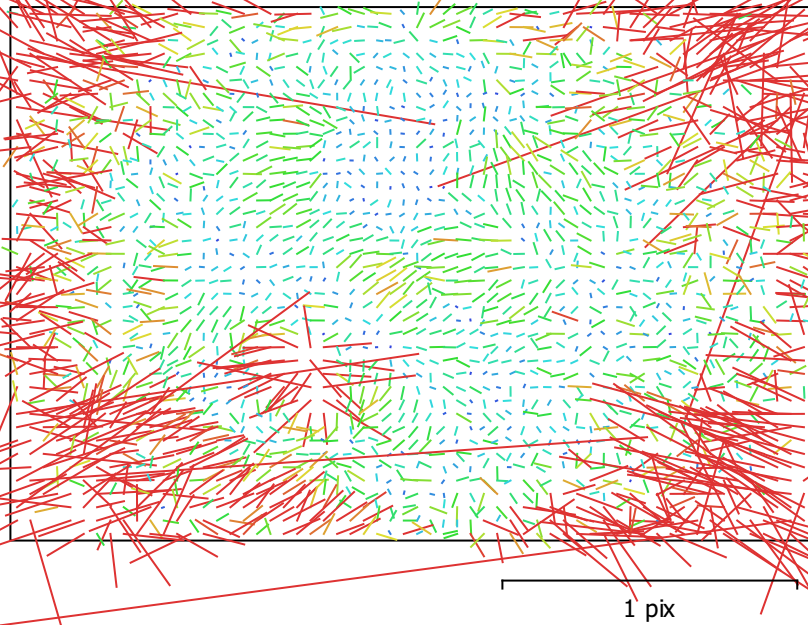


Fig. 2. Image residuals for Canon EOS 5D Mark IV, EF8-15mm f/4L FISHEYE USM (15mm).

## Canon EOS 5D Mark IV, EF8-15mm f/4L FISHEYE USM (15mm)

2460 images, precalibrated

Type	Resolution	Focal Length	Pixel Size
<b>Fisheye</b>	<b>6720 x 4480</b>	<b>15 mm</b>	<b>5.36 x 5.36 <math>\mu\text{m}</math></b>
F:	3091.61		
Cx:	-7.3338	B1:	0
Cy:	-28.6152	B2:	0
K1:	-0.049414	P1:	1.57659e-06
K2:	0.00876934	P2:	-0.000240198
K3:	-0.00231314	P3:	0
K4:	0	P4:	0

# Camera Calibration

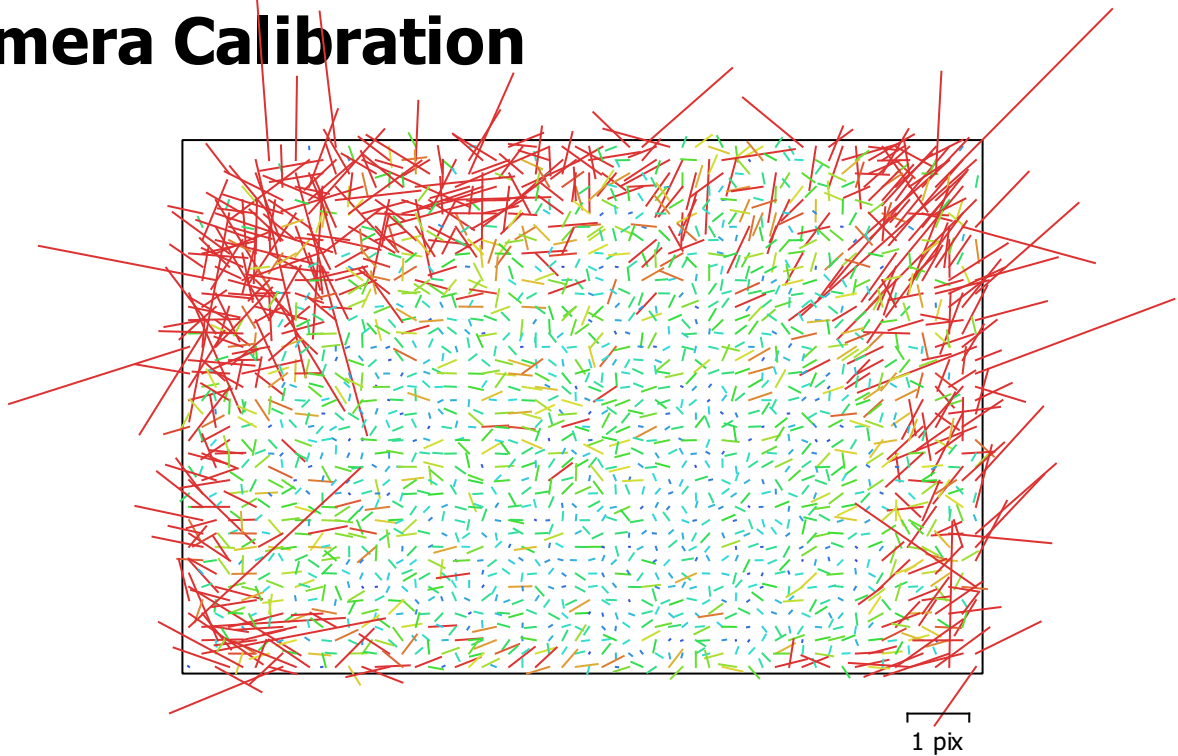


Fig. 3. Image residuals for ILCE-6500, .7x EF16-35mm f/2.8L II USM (12.7mm).

## ILCE-6500, .7x EF16-35mm f/2.8L II USM (12.7mm)

185 images, precalibrated

Type	Resolution	Focal Length	Pixel Size
<b>Frame</b>	<b>6000 x 4000</b>	<b>12.7 mm</b>	<b>3.92 x 3.92 <math>\mu\text{m}</math></b>
F:	3110.07		
Cx:	-6.75764	B1:	0
Cy:	32.4024	B2:	0
K1:	-0.110814	P1:	0.000875336
K2:	0.0635034	P2:	-0.00136523
K3:	-0.018543	P3:	0
K4:	0	P4:	0

# Camera Calibration

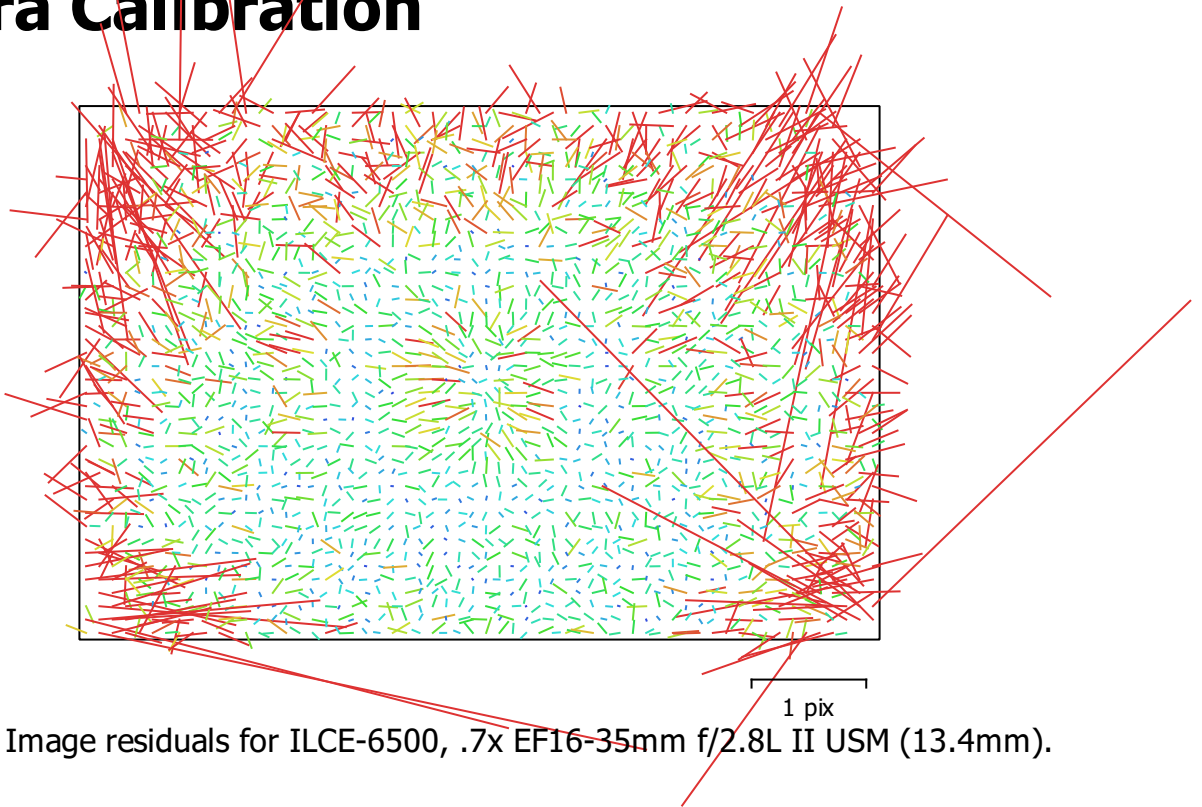


Fig. 4. Image residuals for ILCE-6500, .7x EF16-35mm f/2.8L II USM (13.4mm).

## ILCE-6500, .7x EF16-35mm f/2.8L II USM (13.4mm)

417 images, precalibrated

Type	Resolution	Focal Length	Pixel Size
<b>Frame</b>	<b>6000 x 4000</b>	<b>13.4 mm</b>	<b>3.92 x 3.92 μm</b>
F:	3147.76		
Cx:	-8.16749	B1:	0
Cy:	33.4894	B2:	0
K1:	-0.111887	P1:	0.000673984
K2:	0.0671739	P2:	-0.00102877
K3:	-0.0206867	P3:	0
K4:	0	P4:	0

# Camera Calibration

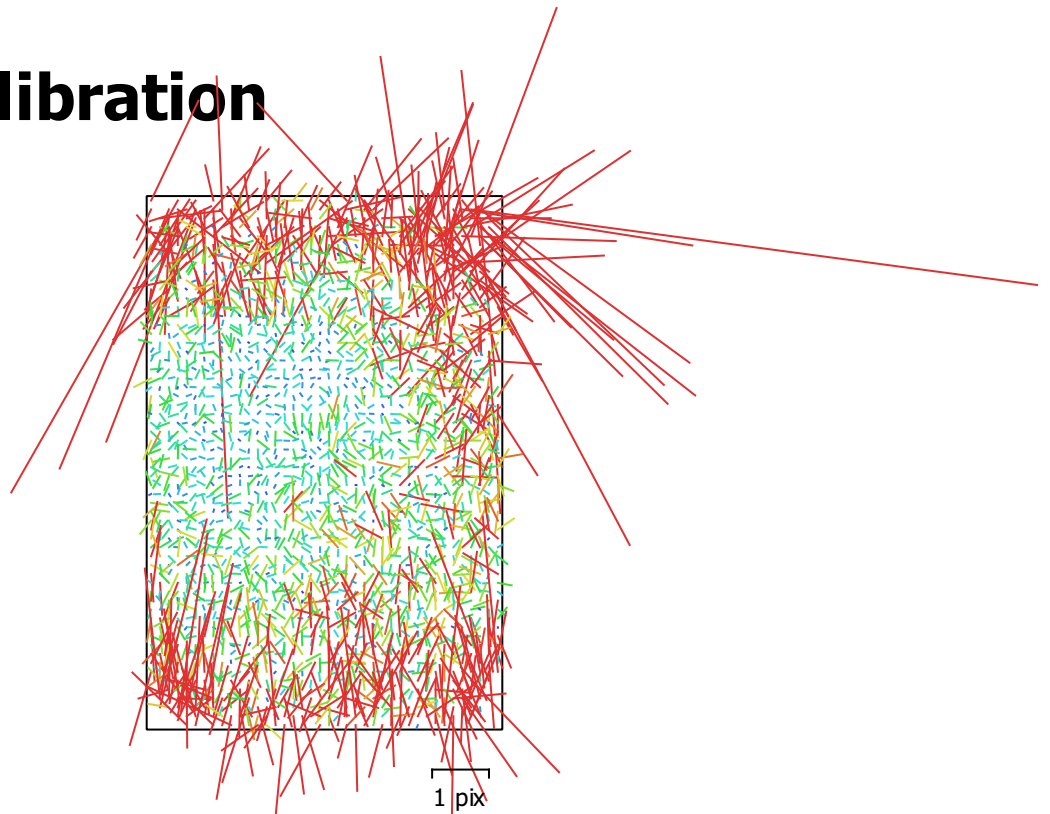


Fig. 5. Image residuals for ILCE-6500, .7x EF16-35mm f/2.8L II USM (13.4mm).

## **ILCE-6500, .7x EF16-35mm f/2.8L II USM (13.4mm)**

52 images, precalibrated

Type	Resolution	Focal Length	Pixel Size
<b>Frame</b>	<b>4000 x 6000</b>	<b>13.4 mm</b>	<b>3.92 x 3.92 <math>\mu\text{m}</math></b>
F:	3156.03		
Cx:	-36.3192	B1:	0
Cy:	-17.2142	B2:	0
K1:	-0.114649	P1:	0.000611654
K2:	0.0723685	P2:	-1.87846e-05
K3:	-0.0237562	P3:	0
K4:	0	P4:	0

# Camera Calibration



Fig. 6. Image residuals for ILCE-6500, .7x EF16-35mm f/2.8L II USM (12.7mm).  
7 pix

## **ILCE-6500, .7x EF16-35mm f/2.8L II USM (12.7mm)**

2 images, precalibrated

Type	Resolution	Focal Length	Pixel Size
<b>Frame</b>	<b>4000 x 6000</b>	<b>12.7 mm</b>	<b>3.92 x 3.92 μm</b>
F:	3093.53		
Cx:	-38.108	B1:	0
Cy:	-24.0438	B2:	0
K1:	-0.146525	P1:	0.000847179
K2:	0.15546	P2:	-0.000333586
K3:	-0.0799649	P3:	0
K4:	0	P4:	0



# Camera Calibration

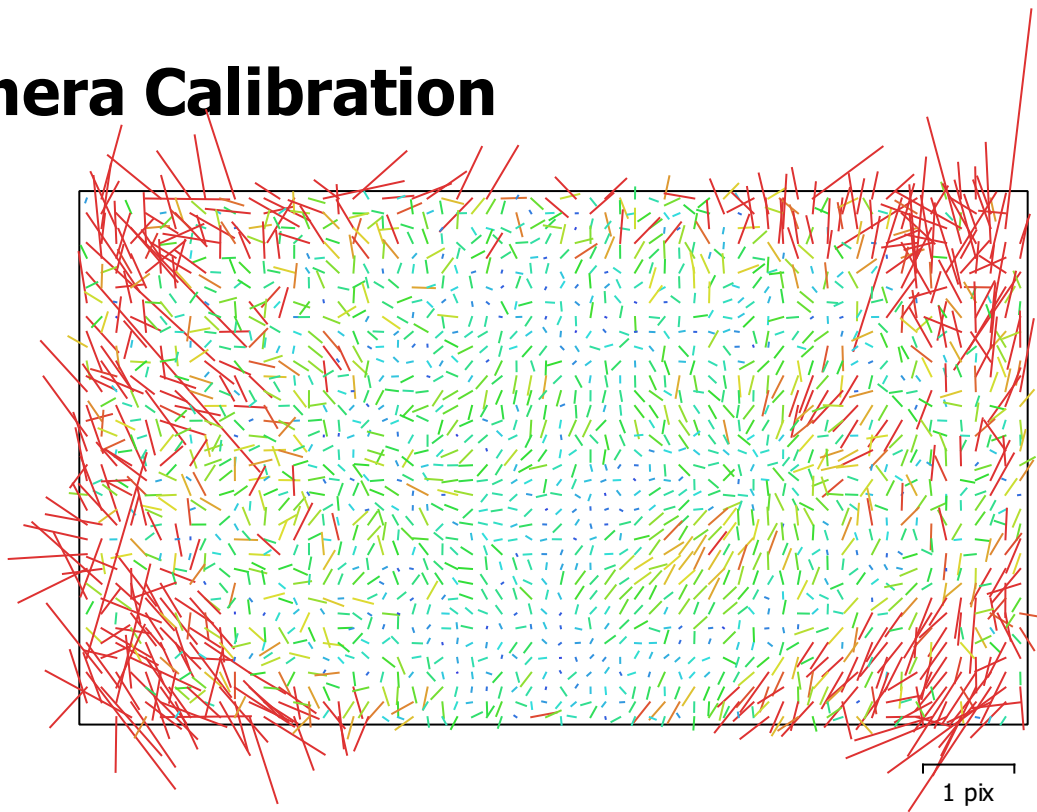


Fig. 7. Image residuals for unknown.

## unknown

1488 images, precalibrated

Type	Resolution	Focal Length	Pixel Size
<b>Frame</b>	<b>3840 x 2160</b>	<b>unknown</b>	<b>unknown</b>
F:	1922.55		
Cx:	-20.1215	B1:	0
Cy:	12.5101	B2:	0
K1:	-0.121391	P1:	0.00100182
K2:	0.394697	P2:	-0.0142233
K3:	-0.184056	P3:	0
K4:	0	P4:	0

# Digital Elevation Model

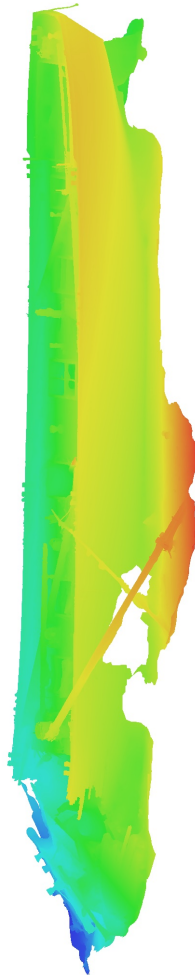


Fig. 8. Reconstructed digital elevation model.

# Processing Parameters

## General

Cameras	4604
Aligned cameras	4270
Markers	6
Coordinate system	Local Coordinates (m)
Rotation angles	Yaw, Pitch, Roll

## Point Cloud

Points	1,455,969 of 2,001,607
RMS reprojection error	0.191951 (2.12362 pix)
Max reprojection error	1.08355 (66.3423 pix)
Mean key point size	8.40498 pix
Point colors	3 bands, uint8
Key points	11.27 GB
Average tie point multiplicity	2.79183

## Alignment parameters

Accuracy	High
Generic preselection	Yes
Reference preselection	No
Key point limit	30,000
Key point limit per Mpx	1,000
Tie point limit	2,500
Exclude stationary tie points	Yes
Guided image matching	No
Adaptive camera model fitting	No
Matching time	22 seconds
Matching memory usage	87.28 MB
Alignment time	25 minutes 32 seconds
Alignment memory usage	1.21 GB

## Optimization parameters

Parameters	f, cx, cy, k1-k3, p1, p2
Adaptive camera model fitting	No
Optimization time	1 minutes 6 seconds
Date created	2022:08:31 05:25:09
Software version	1.8.0.13794
File size	147.37 MB

## Depth Maps

Count	49
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## Depth maps generation parameters

Quality	Medium
Filtering mode	Moderate
Max neighbors	16
Processing time	27 seconds
Memory usage	799.85 MB
Date created	2023:01:15 22:05:52
Software version	1.8.0.13794
File size	18.40 MB

## Dense Point Cloud

Points	307,656,795
Point colors	3 bands, uint8

## Depth maps generation parameters

Quality	Medium
Filtering mode	Moderate
Max neighbors	16
Processing time	1 hours 4 minutes
Memory usage	1.49 GB
<b>Dense cloud generation parameters</b>	
Processing time	3 hours 5 minutes
Memory usage	7.42 GB
Date created	2022:08:31 11:40:56
Software version	1.8.0.13794
File size	3.96 GB
<b>Model</b>	
Faces	8,000,000
Vertices	3,999,739
Vertex colors	3 bands, uint8
Texture	8,192 x 8,192, 4 bands, uint8
<b>Depth maps generation parameters</b>	
Quality	Medium
Filtering mode	Moderate
Max neighbors	16
Processing time	1 hours 4 minutes
Memory usage	1.49 GB
<b>Reconstruction parameters</b>	
Surface type	Arbitrary
Source data	Depth maps
Interpolation	Enabled
Strict volumetric masks	No
Processing time	21 minutes 31 seconds
Memory usage	8.09 GB
<b>Texturing parameters</b>	
Mapping mode	Generic
Blending mode	Mosaic
Texture size	8,192
Enable hole filling	Yes
Enable ghosting filter	No
UV mapping time	1 minutes 51 seconds
UV mapping memory usage	2.93 GB
Blending time	17 minutes 31 seconds
Blending memory usage	4.93 GB
Blending GPU memory usage	2.64 GB
Date created	2022:08:31 07:20:49
Software version	1.8.0.13794
File size	425.90 MB
<b>System</b>	
Software name	Agisoft Metashape Professional
Software version	1.8.0 build 13794
OS	Windows 64 bit
RAM	63.92 GB
CPU	Intel(R) Core(TM) i9-9900K CPU @ 3.60GHz
GPU(s)	NVIDIA GeForce RTX 2060 SUPER