

Agisoft Metashape

Processing Report

24 June 2024



Survey Data

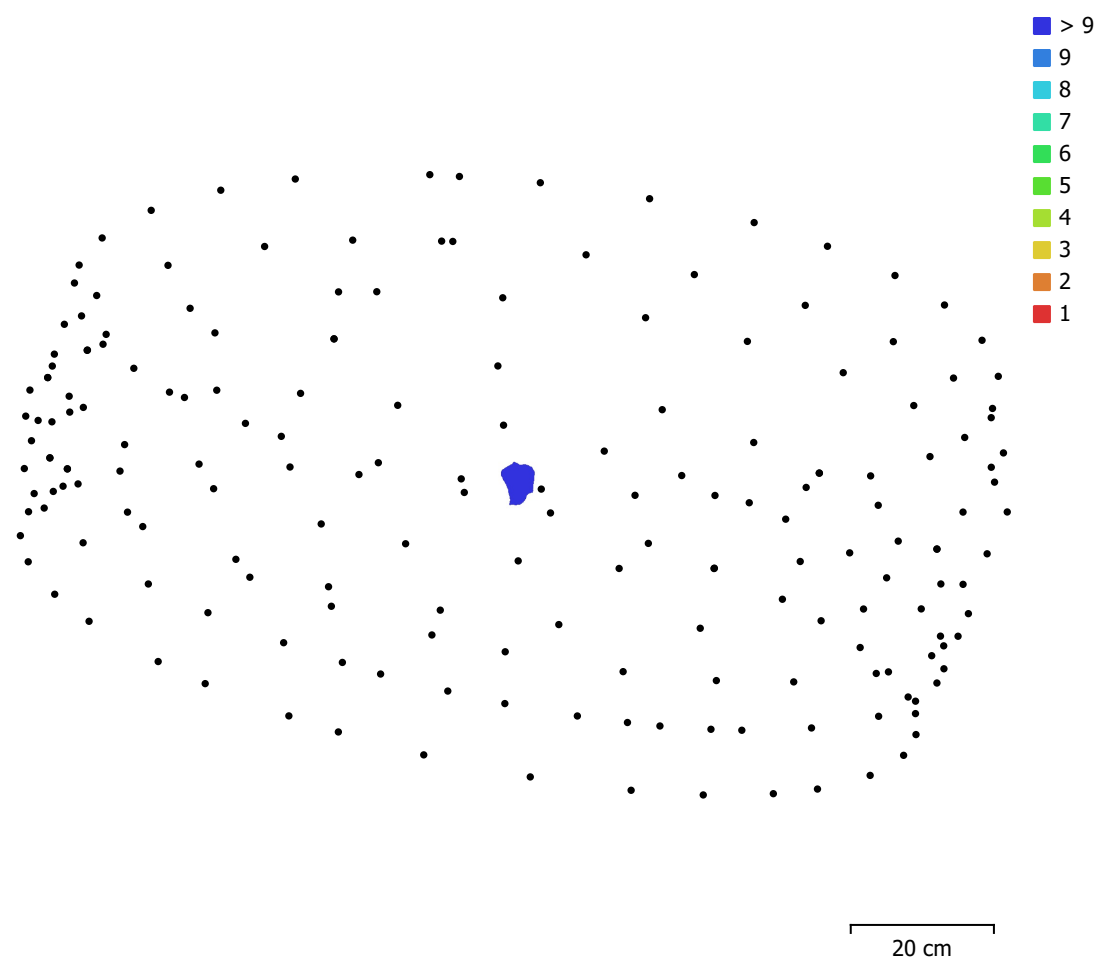


Fig. 1. Camera locations and image overlap.

| | | | |
|--------------------|----------------------|---------------------|-----------|
| Number of images: | 189 | Camera stations: | 189 |
| Flying altitude: | 65.4 cm | Tie points: | 805,026 |
| Ground resolution: | 0.0423 mm/pix | Projections: | 3,579,741 |
| Coverage area: | 19.8 cm ² | Reprojection error: | 0.552 pix |

| Camera Model | Resolution | Focal Length | Pixel Size | Precalibrated |
|---------------|-------------|--------------|----------------|---------------|
| DMC-G7 (60mm) | 4592 x 2584 | 60 mm | 3.79 x 3.79 μm | No |
| DMC-G7 (60mm) | 4592 x 2584 | 60 mm | 3.79 x 3.79 μm | No |

Table 1. Cameras.

Camera Calibration

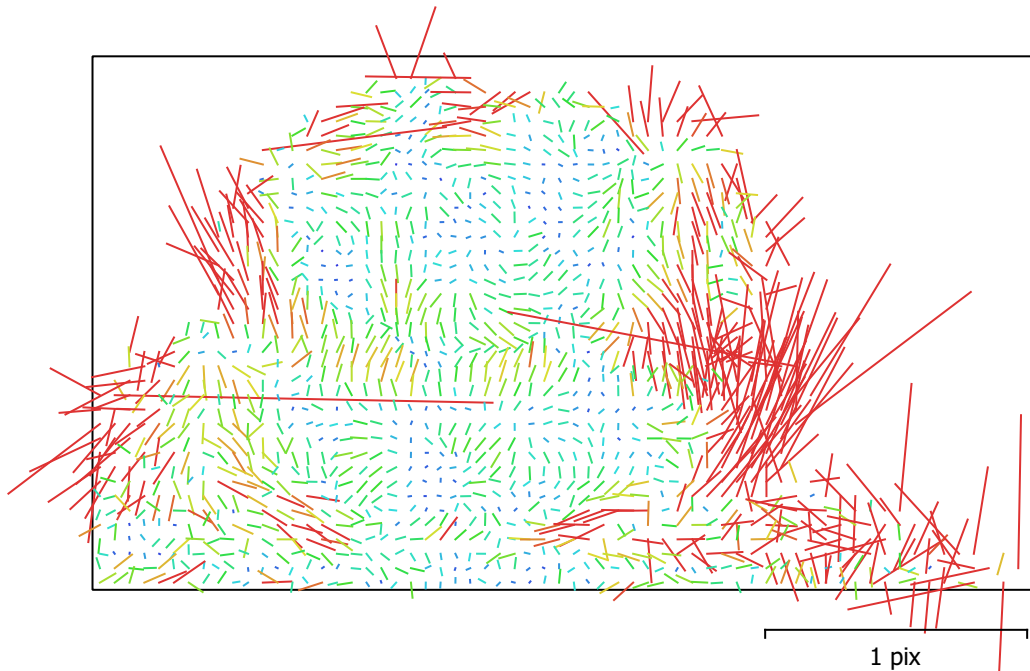


Fig. 2. Image residuals for DMC-G7 (60mm).

DMC-G7 (60mm)

105 images

| | | | |
|--------------|--------------------|--------------|---|
| Type | Resolution | Focal Length | Pixel Size |
| Frame | 4592 x 2584 | 60 mm | 3.79 x 3.79 μm |

| | Value | Error | F | Cx | Cy | B1 | B2 | K1 | K2 | K3 | P1 | P2 |
|-----------|---------------------|---------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| F | 15343.4 | 2 | 1.00 | -0.21 | -0.40 | -0.28 | -0.20 | -0.16 | 0.04 | -0.01 | -0.24 | -0.35 |
| Cx | -28.2653 | 4 | | 1.00 | 0.11 | 0.23 | 0.74 | -0.08 | 0.38 | -0.43 | 0.95 | 0.16 |
| Cy | 476.018 | 5 | | | 1.00 | 0.05 | -0.15 | 0.10 | 0.01 | -0.02 | 0.13 | 0.94 |
| B1 | 41.4197 | 0.68 | | | | 1.00 | 0.32 | 0.13 | -0.12 | 0.09 | 0.39 | -0.16 |
| B2 | -6.34591 | 0.21 | | | | | 1.00 | -0.03 | 0.27 | -0.31 | 0.74 | -0.06 |
| K1 | 0.101187 | 0.0012 | | | | | | 1.00 | -0.85 | 0.73 | 0.04 | 0.09 |
| K2 | -7.23385 | 0.14 | | | | | | | 1.00 | -0.97 | 0.30 | 0.09 |
| K3 | 181.907 | 4.7 | | | | | | | | 1.00 | -0.36 | -0.10 |
| P1 | -0.00295411 | 0.0001 | | | | | | | | | 1.00 | 0.15 |
| P2 | -0.000613437 | 9.5e-05 | | | | | | | | | | 1.00 |

Table 2. Calibration coefficients and correlation matrix.

Camera Calibration

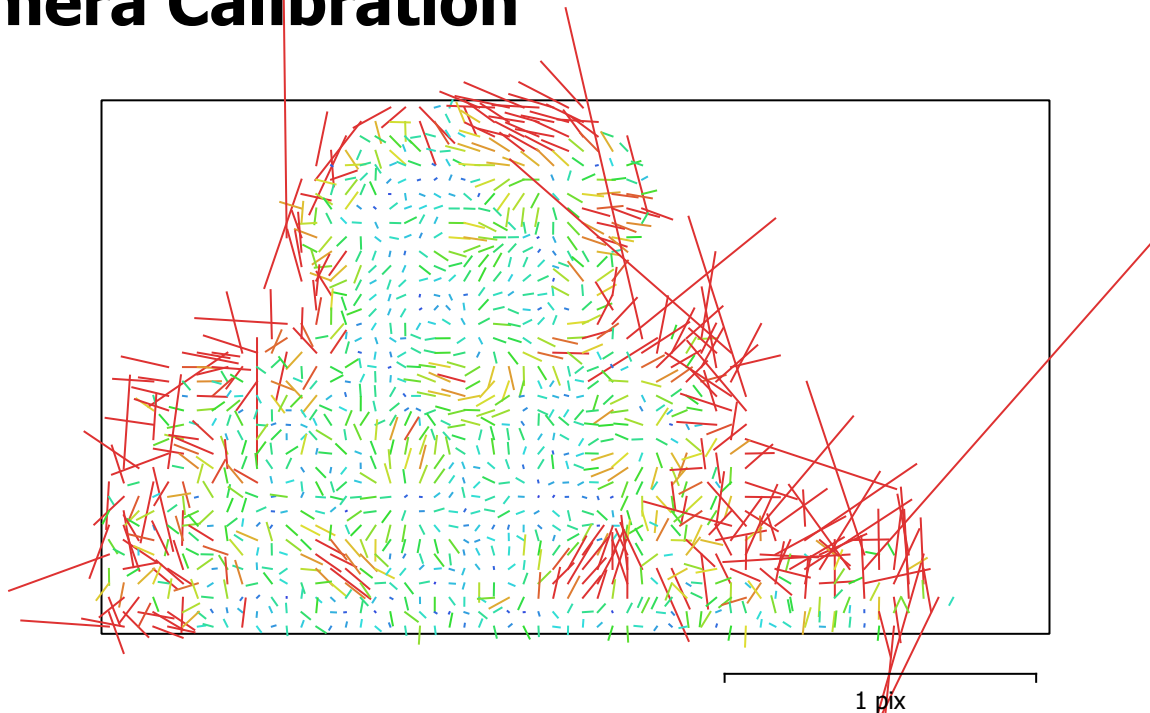


Fig. 3. Image residuals for DMC-G7 (60mm).

DMC-G7 (60mm)

84 images

| | | | |
|-------|-------------|--------------|----------------|
| Type | Resolution | Focal Length | Pixel Size |
| Frame | 4592 x 2584 | 60 mm | 3.79 x 3.79 μm |

| | Value | Error | F | B1 | B2 | K1 | K2 | K3 | P1 | P2 |
|----|--------------|---------|------|-------|-------|-------|-------|-------|-------|-------|
| F | 15574.3 | 1.9 | 1.00 | -0.16 | -0.03 | -0.18 | -0.02 | 0.03 | -0.32 | 0.02 |
| B1 | 9.23245 | 0.41 | | 1.00 | -0.38 | 0.25 | -0.19 | 0.17 | 0.66 | -0.42 |
| B2 | 1.52644 | 0.21 | | | 1.00 | -0.14 | 0.15 | -0.11 | -0.29 | 0.76 |
| K1 | 0.130122 | 0.0016 | | | | 1.00 | -0.88 | 0.77 | 0.48 | -0.05 |
| K2 | -9.06786 | 0.17 | | | | | 1.00 | -0.95 | -0.20 | 0.05 |
| K3 | 242.935 | 5.1 | | | | | | 1.00 | 0.16 | -0.02 |
| P1 | -3.11263e-05 | 4.7e-05 | | | | | | | 1.00 | -0.23 |
| P2 | -0.00710075 | 4.2e-05 | | | | | | | | 1.00 |

Table 3. Calibration coefficients and correlation matrix.

Ground Control Points

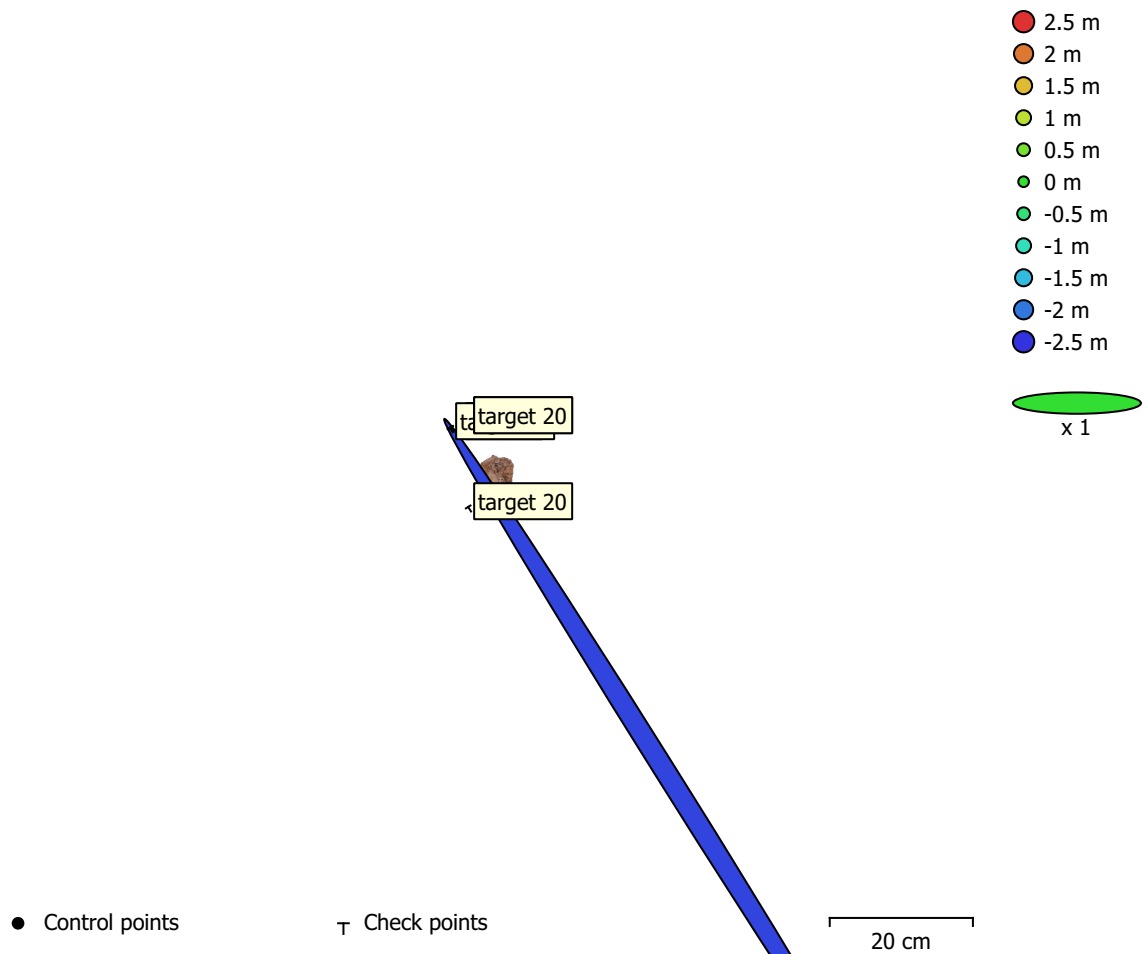


Fig. 4. GCP locations and error estimates.

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 (m) | Y error (m) | Z error (m) | XY error (m) | Total (m) |
|-------|-------------|-------------|-------------|--------------|-----------|
| 1 | 0.595298 | 0.949153 | 2.37047 | 1.12039 | 2.6219 |

Table 4. Check points RMSE.

| Label | X error (m) | Y error (m) | Z error (m) | Total (m) | Image (pix) |
|--------------|--------------------|--------------------|--------------------|------------------|--------------------|
| point 1 | -0.595298 | 0.949153 | -2.37047 | 2.6219 | 1.246 (15) |
| target 19 | | | | | 0.309 (3) |
| target 20 | | | | | 0.400 (3) |
| target 20 | | | | | 0.667 (9) |
| target 20 | | | | | 0.353 (3) |
| Total | 0.595298 | 0.949153 | 2.37047 | 2.6219 | 1.246 |

Table 5. Check points.

Scale Bars

| Label | Distance (m) | Error (m) |
|---------------------|--------------|--------------------|
| target 19_target 20 | 0.05 | 8.25728e-16 |
| Total | | 8.25728e-16 |

Table 6. Control scale bars.

Digital Elevation Model

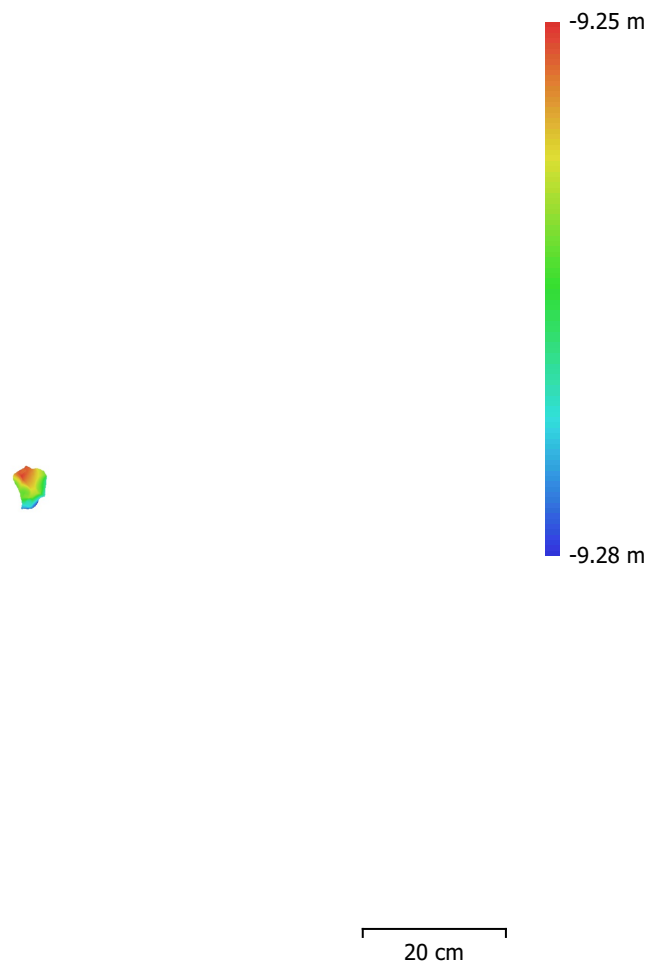


Fig. 5. Reconstructed digital elevation model.

Resolution: 0.156 mm/pix
Point density: 40.9 points/mm²

Processing Parameters

General

| | |
|-------------------|-----------------------|
| Cameras | 189 |
| Aligned cameras | 189 |
| Markers | 5 |
| Scale bars | 1 |
| Coordinate system | Local Coordinates (m) |
| Rotation angles | Yaw, Pitch, Roll |

Point Cloud

| | |
|--------------------------------|------------------------|
| Points | 805,026 of 910,416 |
| RMS reprojection error | 0.26627 (0.551764 pix) |
| Max reprojection error | 1.23982 (34.8497 pix) |
| Mean key point size | 1.95179 pix |
| Point colors | 3 bands, uint8 |
| Key points | No |
| Average tie point multiplicity | 5.04227 |
| File size | 91.10 MB |

Depth Maps

| | |
|---|----------------------|
| Count | 189 |
| Depth maps generation parameters | |
| Quality | Ultra High |
| Filtering mode | Mild |
| Max neighbors | 16 |
| Processing time | 12 minutes 1 seconds |
| Memory usage | 8.30 GB |
| Date created | 2024:06:12 16:19:57 |
| Software version | 1.8.4.14671 |
| File size | 163.78 MB |

Model

| | |
|---------------|-------------------------------------|
| Faces | 164,020 |
| Vertices | 82,012 |
| Vertex colors | 3 bands, uint8 |
| Texture | 16,000 x 16,000 x 2, 4 bands, uint8 |

Depth maps generation parameters

| | |
|-----------------|----------------------|
| Quality | Ultra High |
| Filtering mode | Mild |
| Max neighbors | 16 |
| Processing time | 12 minutes 1 seconds |
| Memory usage | 8.30 GB |

Reconstruction parameters

| | |
|-------------------------|----------------------|
| Surface type | Arbitrary |
| Source data | Depth maps |
| Interpolation | Enabled |
| Strict volumetric masks | No |
| Processing time | 1 minutes 51 seconds |
| Memory usage | 8.47 GB |

Texturing parameters

| | |
|---------------------|---------|
| Mapping mode | Generic |
| Blending mode | Mosaic |
| Texture size | 16,000 |
| Enable hole filling | Yes |

| | |
|---------------------------|----------------------|
| Enable ghosting filter | Yes |
| UV mapping time | 17 seconds |
| UV mapping memory usage | 686.12 MB |
| Blending time | 1 minutes 25 seconds |
| Blending memory usage | 12.75 GB |
| Blending GPU memory usage | 11.90 GB |
| Date created | 2024:06:12 16:21:48 |
| Software version | 1.8.4.14671 |
| File size | 190.83 MB |

System

| | |
|------------------|---|
| Software name | Agisoft Metashape Professional |
| Software version | 1.8.4 build 14671 |
| OS | Windows 64 bit |
| RAM | 127.71 GB |
| CPU | Intel(R) Core(TM) i9-10940X CPU @ 3.30GHz |
| GPU(s) | Quadro RTX 5000 |