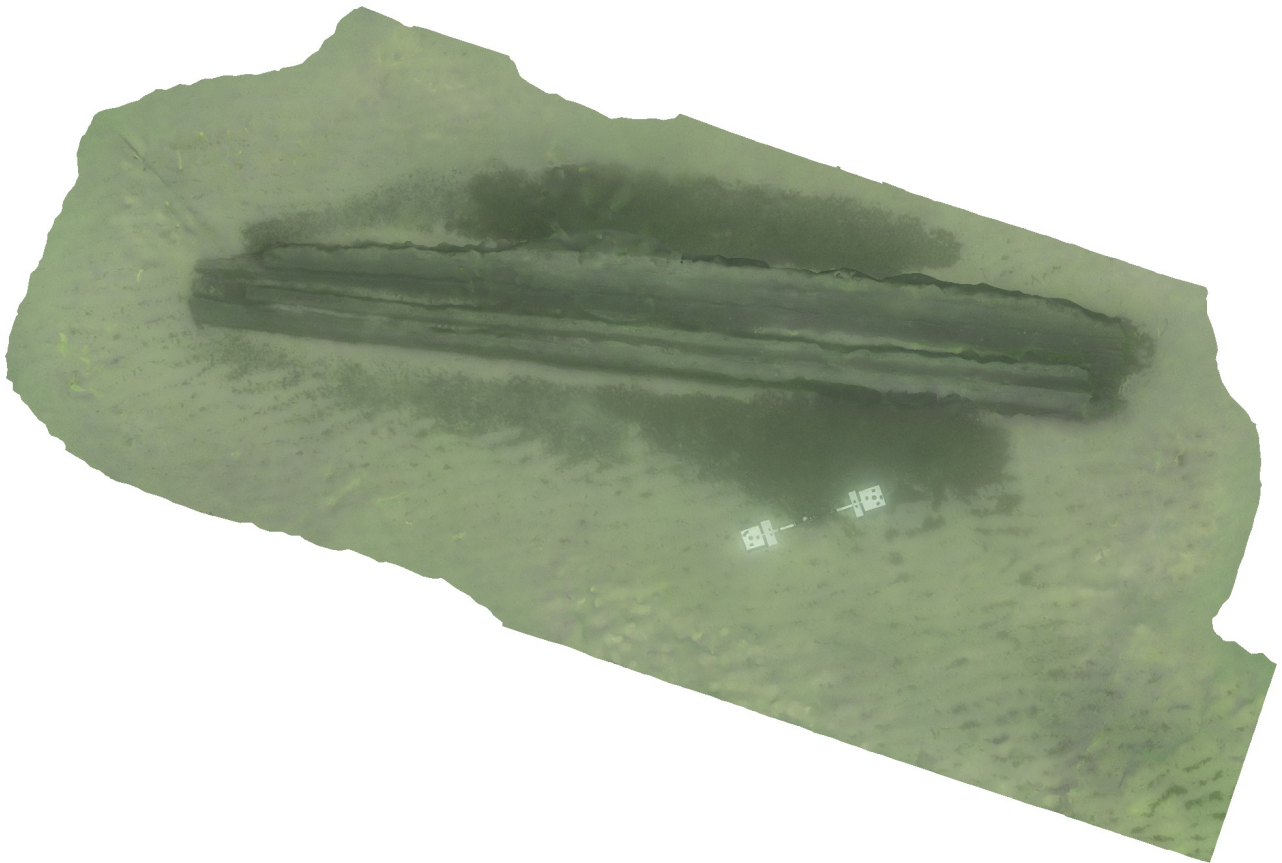


# Success Processing Report

Processing Report  
14 September 2019



# Survey Data

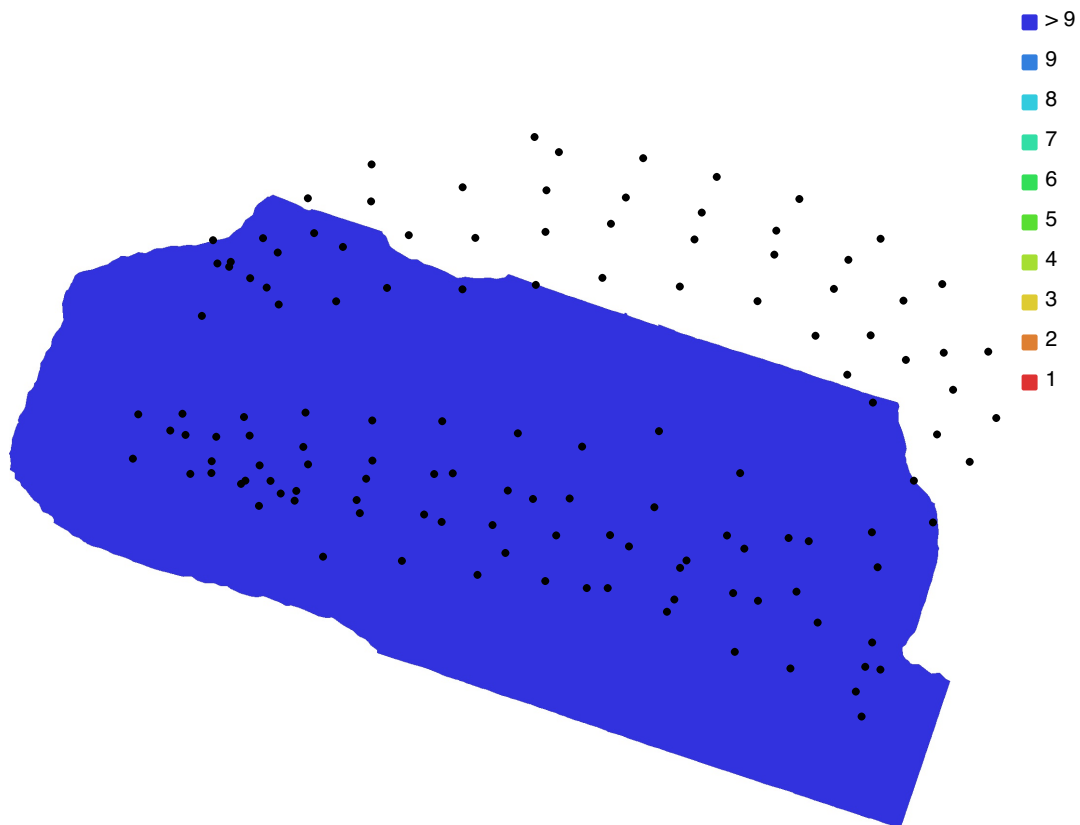


Fig. 1. Camera locations and image overlap.

Number of images: 133

Camera stations: 128

Tie points: 6,989

Projections: 18,616

Reprojection error: 1.51 pix

| Camera Model      | Resolution  | Focal Length | Pixel Size                | Precalibrated |
|-------------------|-------------|--------------|---------------------------|---------------|
| HERO5 Black (3mm) | 2048 x 1536 | 3 mm         | 3.38 x 3.38 $\mu\text{m}$ | No            |

Table 1. Cameras.

# Camera Calibration

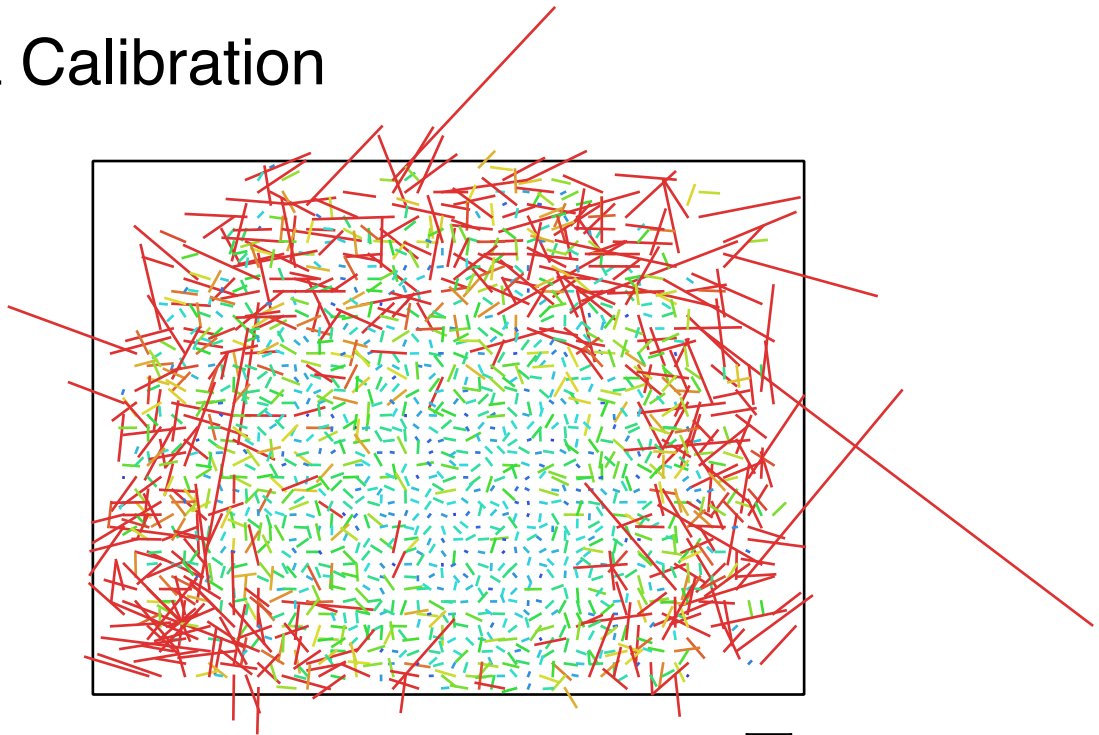


Fig. 2. Image residuals for HERO5 Black (3mm). 1 pix

HERO5 Black (3mm)  
133 images

|       |             |              |                           |
|-------|-------------|--------------|---------------------------|
| Type  | Resolution  | Focal Length | Pixel Size                |
| Frame | 2048 x 1536 | 3 mm         | 3.38 x 3.38 $\mu\text{m}$ |

|    | Value       | Error   | F    | Cx    | Cy    | K1    | K2    | K3    | P1    | P2    |
|----|-------------|---------|------|-------|-------|-------|-------|-------|-------|-------|
| F  | 1202.98     | 1.7     | 1.00 | -0.01 | -0.35 | -0.06 | 0.26  | -0.17 | -0.06 | -0.10 |
| Cx | 13.0781     | 0.79    |      | 1.00  | -0.09 | -0.05 | 0.02  | -0.02 | 0.64  | -0.03 |
| Cy | -4.1903     | 1.2     |      |       | 1.00  | -0.09 | -0.00 | 0.03  | -0.12 | 0.72  |
| K1 | -0.118471   | 0.0017  |      |       |       | 1.00  | -0.90 | 0.82  | -0.15 | -0.23 |
| K2 | 0.145787    | 0.005   |      |       |       |       | 1.00  | -0.96 | 0.08  | 0.07  |
| K3 | -0.0364995  | 0.0044  |      |       |       |       |       | 1.00  | -0.09 | -0.02 |
| P1 | 0.000679113 | 0.00015 |      |       |       |       |       |       | 1.00  | -0.06 |
| P2 | -0.00101169 | 0.00024 |      |       |       |       |       |       |       | 1.00  |

Table 2. Calibration coefficients and correlation matrix.

# Digital Elevation Model

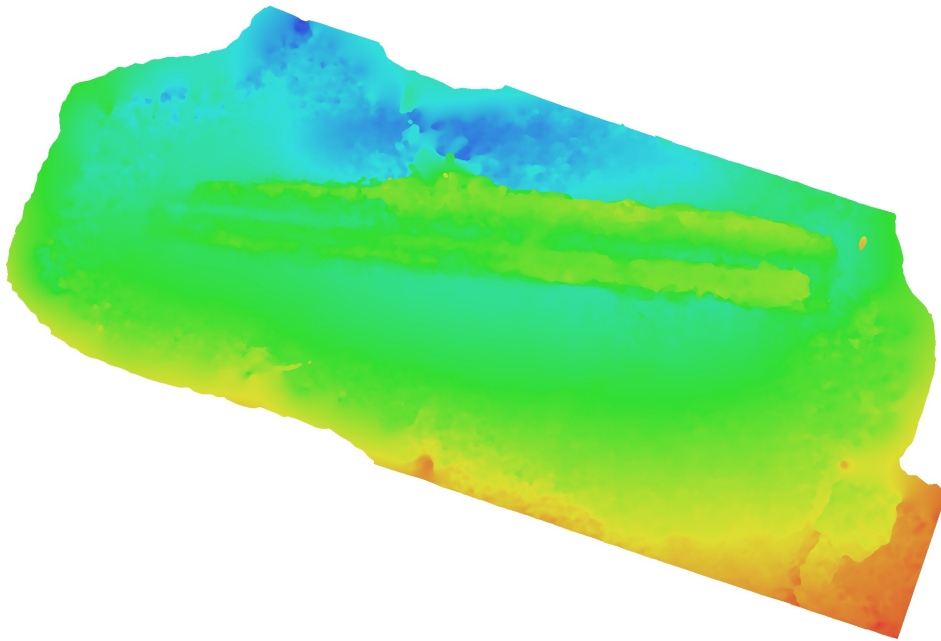


Fig. 3. Reconstructed digital elevation model.

# Processing Parameters

## General

|                   |                       |
|-------------------|-----------------------|
| Cameras           | 133                   |
| Aligned cameras   | 128                   |
| Coordinate system | Local Coordinates (m) |
| Rotation angles   | Yaw, Pitch, Roll      |

## Point Cloud

|                                |                        |
|--------------------------------|------------------------|
| Points                         | 6,989 of 8,045         |
| RMS reprojection error         | 0.2359 (1.51277 pix)   |
| Max reprojection error         | 0.715653 (34.3316 pix) |
| Mean key point size            | 5.86381 pix            |
| Point colors                   | 3 bands, uint8         |
| Key points                     | No                     |
| Average tie point multiplicity | 2.82759                |
| Alignment parameters           |                        |
| Accuracy                       | High                   |
| Generic preselection           | Yes                    |
| Key point limit                | 40,000                 |
| Tie point limit                | 4,000                  |
| Adaptive camera model fitting  | No                     |
| Matching time                  | 3 minutes 22 seconds   |
| Alignment time                 | 8 seconds              |
| Software version               | 1.5.5.9057             |

## Depth Maps

|                                  |            |
|----------------------------------|------------|
| Count                            | 79         |
| Depth maps generation parameters |            |
| Quality                          | Medium     |
| Filtering mode                   | Mild       |
| Processing time                  | 16 seconds |
| Software version                 | 1.5.5.9057 |

## Dense Point Cloud

|                                   |                |
|-----------------------------------|----------------|
| Points                            | 534,628        |
| Point colors                      | 3 bands, uint8 |
| Depth maps generation parameters  |                |
| Quality                           | Medium         |
| Filtering mode                    | Mild           |
| Processing time                   | 16 seconds     |
| Dense cloud generation parameters |                |
| Processing time                   | 18 seconds     |
| Software version                  | 1.5.5.9057     |

## Model

|                                  |                               |
|----------------------------------|-------------------------------|
| Faces                            | 179,999                       |
| Vertices                         | 90,662                        |
| Vertex colors                    | 3 bands, uint8                |
| Texture                          | 4,096 x 4,096, 4 bands, uint8 |
| Depth maps generation parameters |                               |
| Quality                          | Medium                        |
| Filtering mode                   | Mild                          |
| Processing time                  | 16 seconds                    |
| Reconstruction parameters        |                               |
| Surface type                     | Arbitrary                     |
| Source data                      | Dense cloud                   |

## General

|                         |            |
|-------------------------|------------|
| Interpolation           | Enabled    |
| Strict volumetric masks | No         |
| Processing time         | 36 seconds |

## Texturing parameters

|                        |                      |
|------------------------|----------------------|
| Mapping mode           | Generic              |
| Blending mode          | Mosaic               |
| Texture size           | 4,096                |
| Enable hole filling    | Yes                  |
| Enable ghosting filter | Yes                  |
| UV mapping time        | 23 seconds           |
| Blending time          | 1 minutes 14 seconds |
| Software version       | 1.5.5.9057           |

## Orthomosaic

|                           |                       |
|---------------------------|-----------------------|
| Size                      | 4,069 x 2,740         |
| Coordinate system         | Local Coordinates (m) |
| Colors                    | 3 bands, uint8        |
| Reconstruction parameters |                       |
| Blending mode             | Mosaic                |
| Surface                   | Mesh                  |
| Enable hole filling       | Yes                   |
| Processing time           | 24 seconds            |
| Software version          | 1.5.5.9057            |

## Software

|          |                  |
|----------|------------------|
| Version  | 1.5.5 build 9057 |
| Platform | Mac OS 64        |