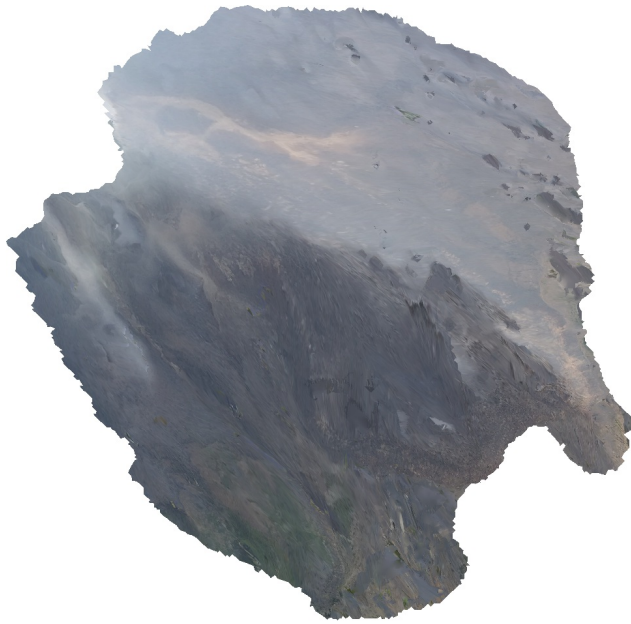


Sinabung_2014_Model_1_Report

Processing Report
21 February 2019



Survey Data

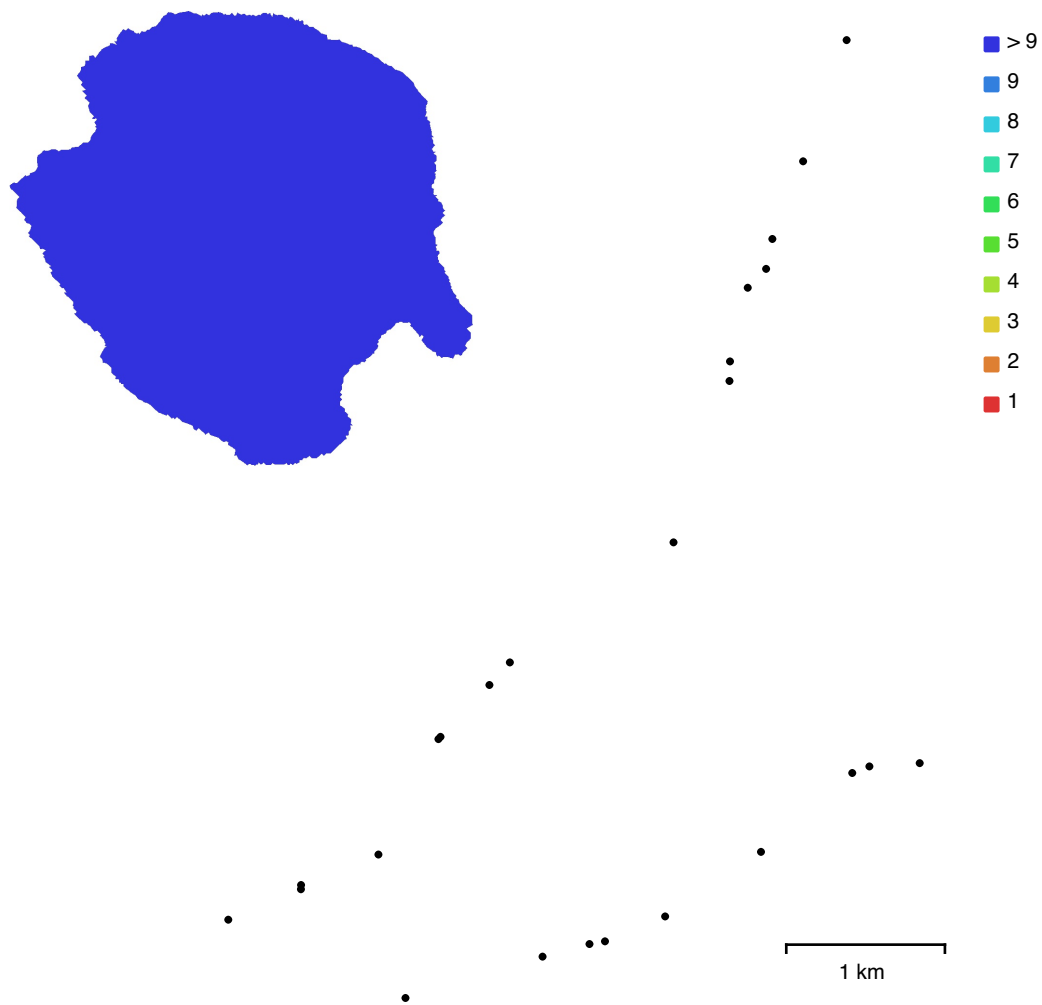


Fig. 1. Camera locations and image overlap.

Number of images:	27	Camera stations:	25
Flying altitude:	3.89 km	Tie points:	1,050
Ground resolution:	1.32 m/pix	Projections:	2,506
Coverage area:	5.51 km ²	Reprojection error:	0.754 pix

Camera Model	Resolution	Focal Length	Pixel Size	Precalibrated
iPhone 5s (4.12 mm)	3264 x 2448	4.12 mm	1.46 x 1.46 μ m	No
iPhone 5s (4.12 mm)	3264 x 2448	4.12 mm	1.46 x 1.46 μ m	No

Table 1. Cameras.

Camera Calibration

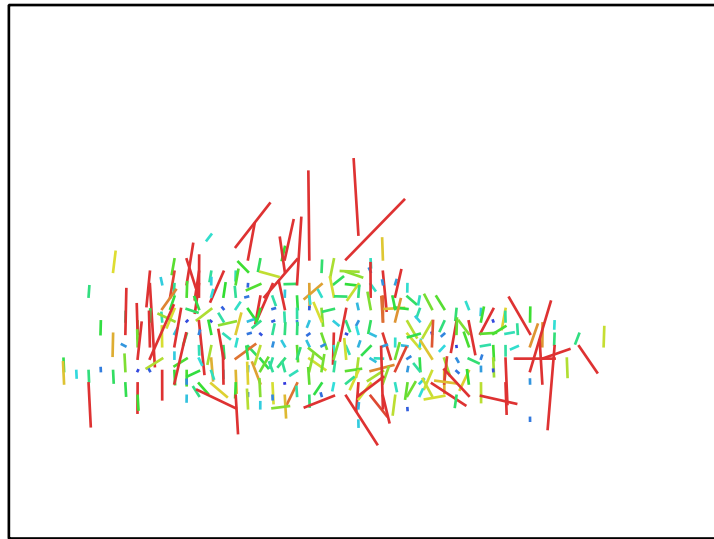


Fig. 2. Image residuals for iPhone 5s (4.12 mm). 1 pix

iPhone 5s (4.12 mm)
20 images

Type	Resolution	Focal Length	Pixel Size
Frame	3264 x 2448	4.12 mm	1.46 x 1.46 μm
F:	2690.7		
Cx:	-10.1294	B1:	0
Cy:	-105.392	B2:	0
K1:	0.00820701	P1:	0
K2:	0.276705	P2:	0
K3:	-0.60867	P3:	0
K4:	0	P4:	0

Camera Calibration

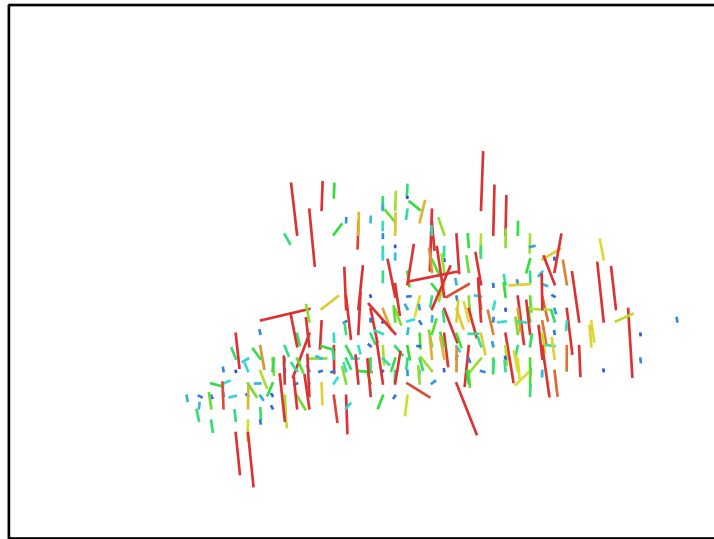


Fig. 3. Image residuals for iPhone 5s (4.12 mm). ┌
1 pix

iPhone 5s (4.12 mm)
7 images

Type	Resolution	Focal Length	Pixel Size
Frame	3264 x 2448	4.12 mm	1.46 x 1.46 μm
F:	2786.18		
Cx:	-34.7468	B1:	0
Cy:	-65.6326	B2:	0
K1:	0.0196436	P1:	0
K2:	0.22261	P2:	0
K3:	-0.42717	P3:	0
K4:	0	P4:	0

Camera Locations

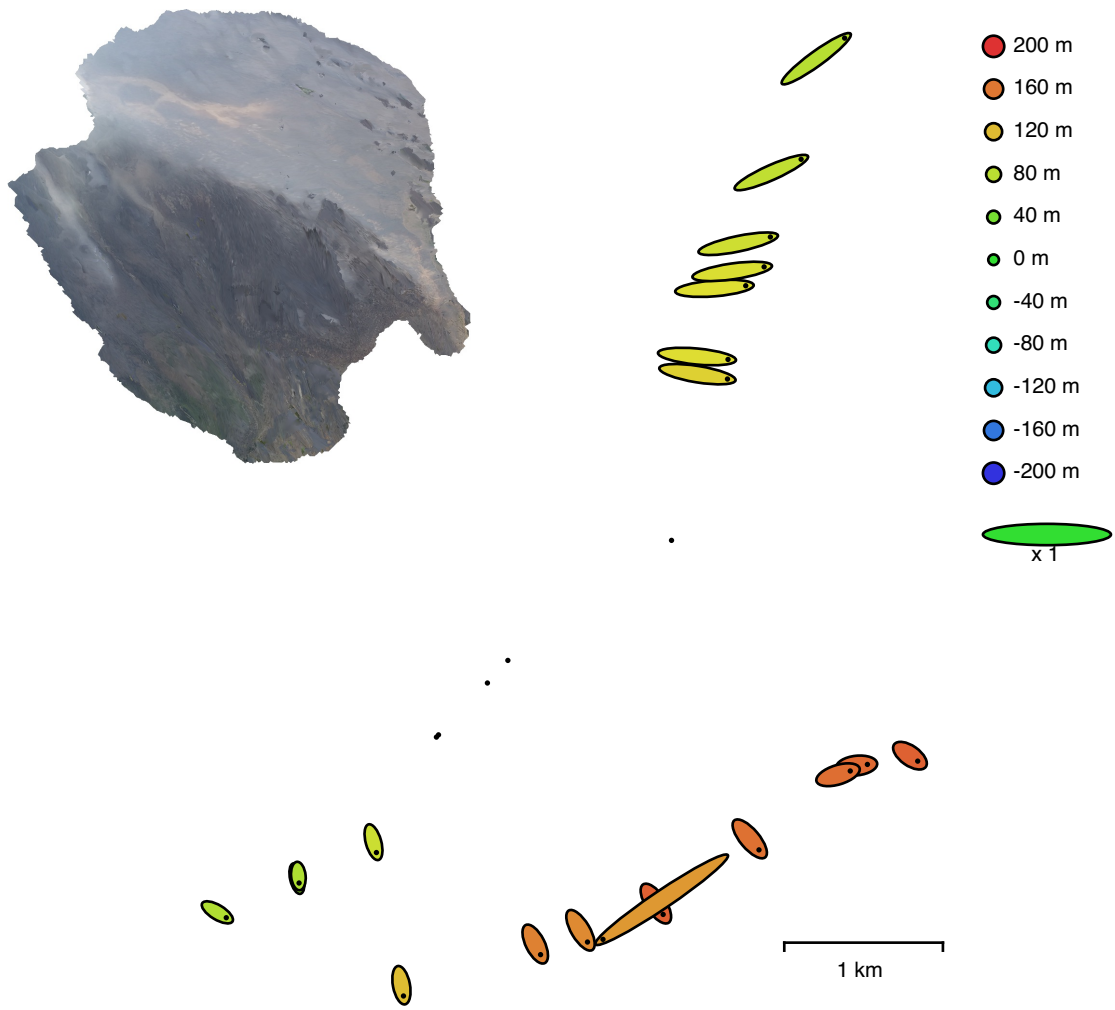
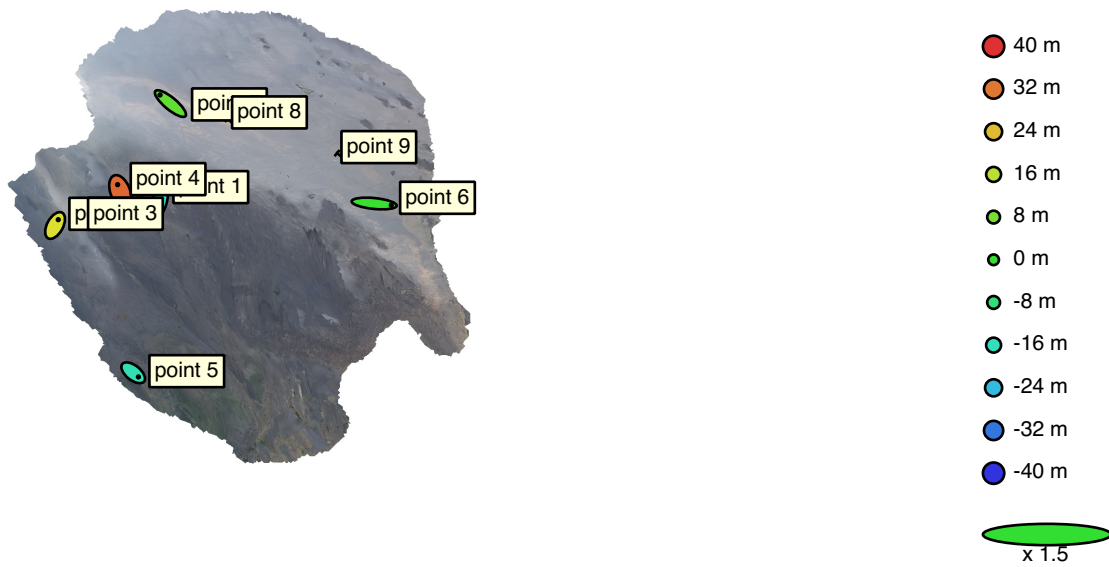


Fig. 4. Camera locations and error estimates.
 Z error is represented by ellipse color. X,Y errors are represented by ellipse shape.
 Estimated camera locations are marked with a black dot.

X error (m)	Y error (m)	Z error (m)	XY error (m)	Total error (m)
291.124	158.985	123.64	331.707	354

Table 2. Average camera location error.
 X - Longitude, Y - Latitude, Z - Altitude.

Ground Control Points



● Control points ✕ Check points 1 km

Fig. 5. 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)
6	73.4109	55.6985	18.747	92.1492	94.0369

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

Label	X error (m)	Y error (m)	Z error (m)	Total (m)	Image (pix)
point 1	-29.7084	-78.4847	-17.9268	85.8126	3.266 (24)
point 2	26.6896	48.7723	19.952	59.0691	5.393 (20)
point 4	-22.1365	58.5442	33.7002	71.0856	4.425 (14)
point 5	43.7154	-34.7612	-14.9377	57.8144	12.816 (15)
point 6	143.896	-14.1293	0.836612	144.59	2.324 (6)
point 7	-87.3667	72.3876	5.45081	113.59	8.009 (11)
Total	73.4109	55.6985	18.747	94.0369	6.923

Table 4. Control points.
X - Longitude, Y - Latitude, Z - Altitude.

Label	X error (m)	Y error (m)	Z error (m)	Total (m)	Image (pix)
point 3					7.909 (17)
point 8					12.873 (12)
point 9					5.803 (7)
Total					

Table 5. Check points.
X - Longitude, Y - Latitude, Z - Altitude.

Digital Elevation Model

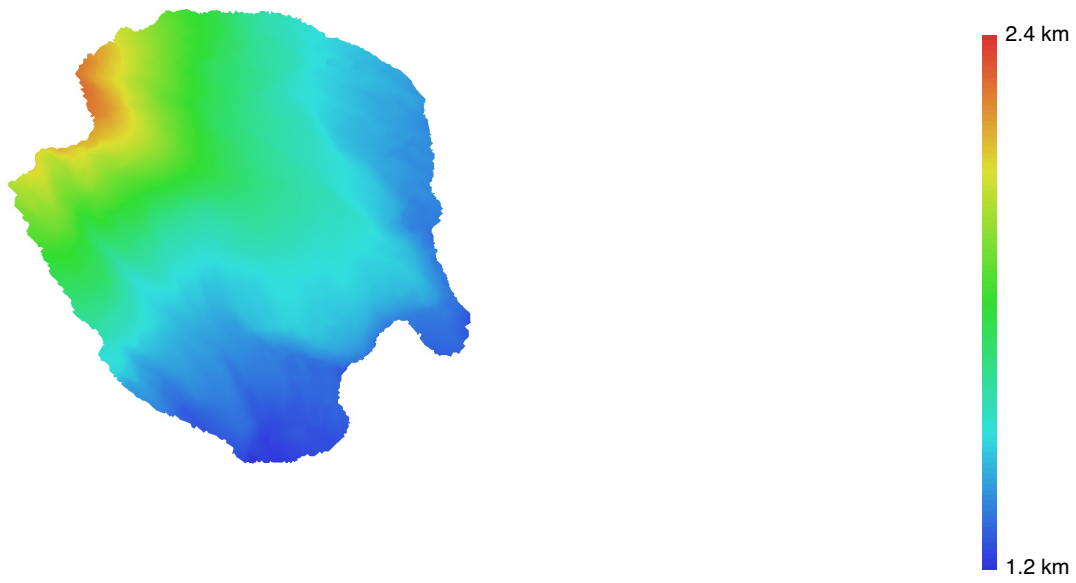


Fig. 6. Reconstructed digital elevation model.

Resolution: 5.27 m/pix
Point density: 0.036 points/m²

Processing Parameters

General

Cameras	27
Aligned cameras	25
Markers	9
Coordinate system	WGS 84 (EPSG::4326)
Rotation angles	Yaw, Pitch, Roll

Point Cloud

Points	1,050 of 1,687
Reprojection error	0.75438 (2.44812 max)
Point colors	3 bands, uint8
Key points	No
Average tie point multiplicity	2.64256

Dense Point Cloud

Points	134,060
Point colors	3 bands, uint8
Reconstruction parameters	
Quality	Medium
Depth filtering	Moderate

Model

Faces	50,642
Vertices	25,666
Vertex colors	3 bands, uint8
Texture	8,192 x 8,192, 4 bands, uint8
Reconstruction parameters	
Surface type	Arbitrary
Source data	Dense
Interpolation	Enabled
Quality	Medium
Depth filtering	Moderate
Face count	60,000
Processing time	28 seconds
Texturing parameters	
Mapping mode	Orthophoto
Blending mode	Mosaic
Texture size	8,192 x 8,192
Enable hole filling	Yes
Enable ghosting filter	No
UV mapping time	0 seconds
Blending time	48 seconds

Software

Version	1.5.1 build 7618
Platform	Mac OS 64