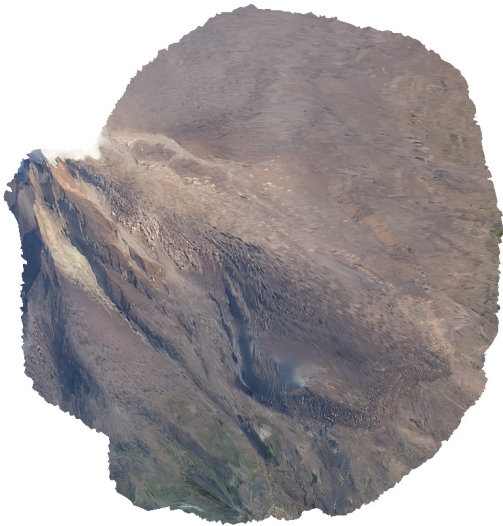


# Sinabung\_2014\_Model\_3\_Report

Processing Report  
21 February 2019



# Survey Data

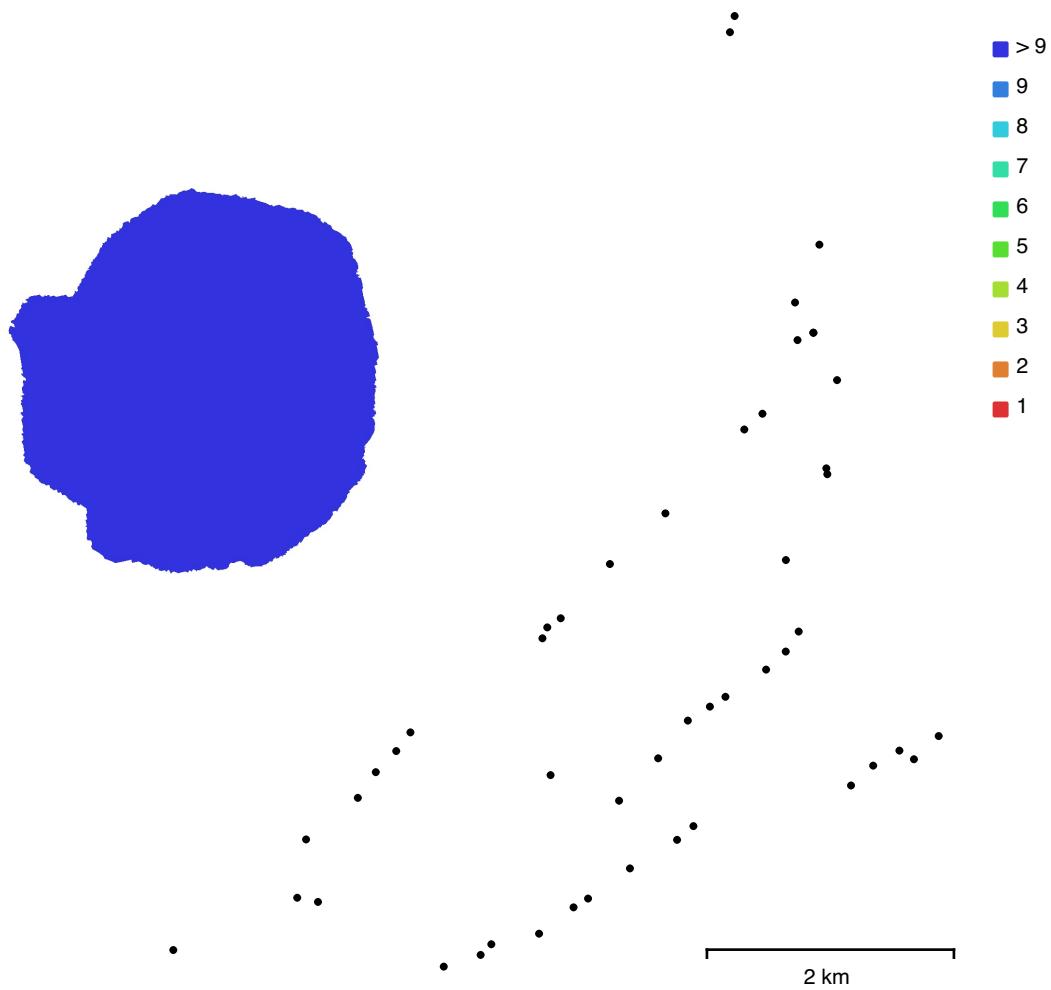


Fig. 1. Camera locations and image overlap.

Number of images:	54	Camera stations:	50
Flying altitude:	5.02 km	Tie points:	2,569
Ground resolution:	1.63 m/pix	Projections:	6,677
Coverage area:	7.06 km <sup>2</sup>	Reprojection error:	0.687 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 $\mu$ m	No

Table 1. Cameras.

# Camera Calibration

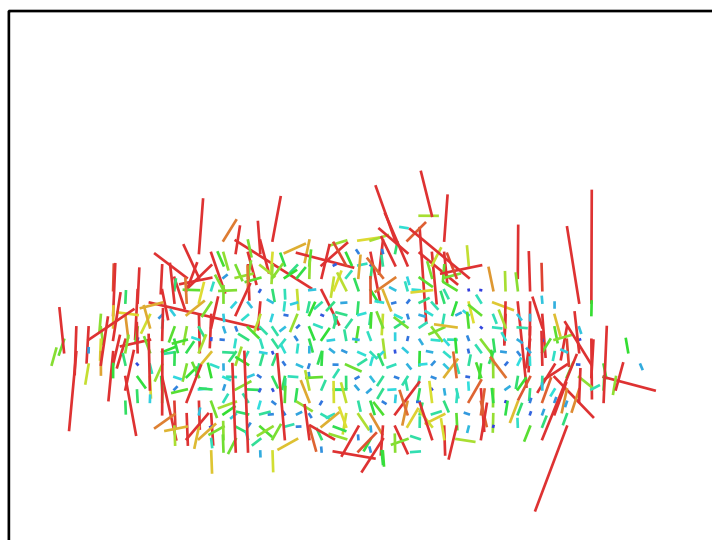


Fig. 2. Image residuals for iPhone 5s (4.12 mm).

iPhone 5s (4.12 mm)  
54 images

Type	Resolution	Focal Length	Pixel Size
Frame	3264 x 2448	4.12 mm	1.46 x 1.46 $\mu\text{m}$
F:	2809.27		
Cx:	-18.0587	B1:	0
Cy:	-7.13425	B2:	0
K1:	0.0223585	P1:	0
K2:	0.355118	P2:	0
K3:	-1.00302	P3:	0
K4:	0	P4:	0

# Camera Locations

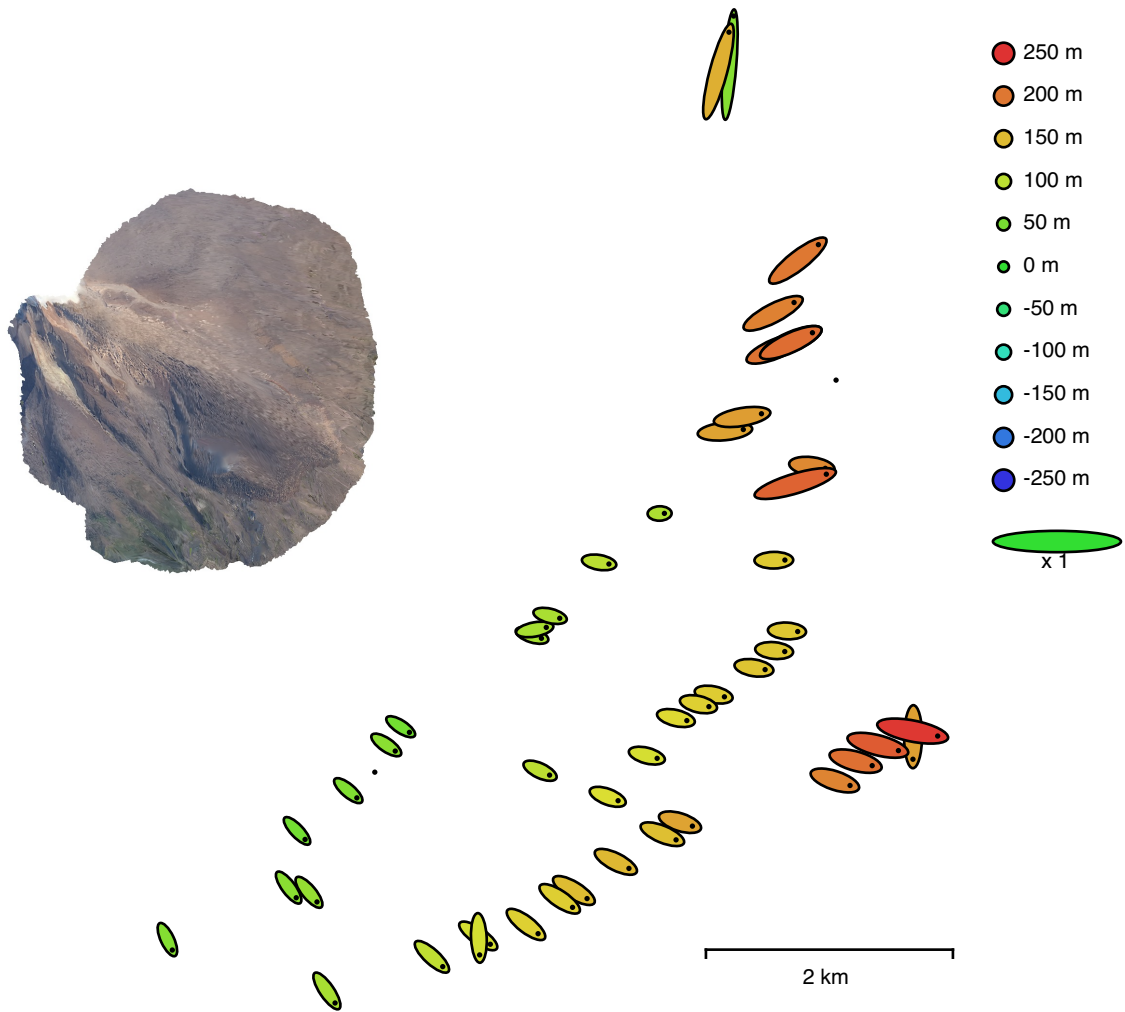


Fig. 3. Camera locations and error estimates.

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)
222.146	191.733	144.732	293.446	327.197

Table 2. Average camera location error.  
X - Easting, Y - Northing, Z - Altitude.

# Ground Control Points



● Control points

⊕ Check points

2 km

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)
7	54.9191	46.1978	16.334	71.7659	73.6013

Table 3. Control points RMSE.

X - Easting, Y - Northing, Z - Altitude.

Label	X error (m)	Y error (m)	Z error (m)	Total (m)	Image (pix)
point 1	-50.1766	-58.9234	-16.1249	79.0548	5.084 (47)
point 2	28.5925	62.7869	19.9535	71.8183	14.664 (48)
point 4	-27.4536	51.5082	23.2004	62.8096	7.674 (43)
point 5	36.57	-23.4663	-11.2811	44.8921	3.598 (29)
point 6	92.2442	-34.2121	-2.19684	98.4087	10.179 (24)
point 7	-84.6121	43.5869	15.3426	96.4076	4.605 (32)
point 10	-4.27929	-35.3755	-17.4268	39.6665	4.361 (43)
Total	54.9191	46.1978	16.334	73.6013	8.323

Table 4. Control points.  
X - Easting, Y - Northing, Z - Altitude.

# Digital Elevation Model

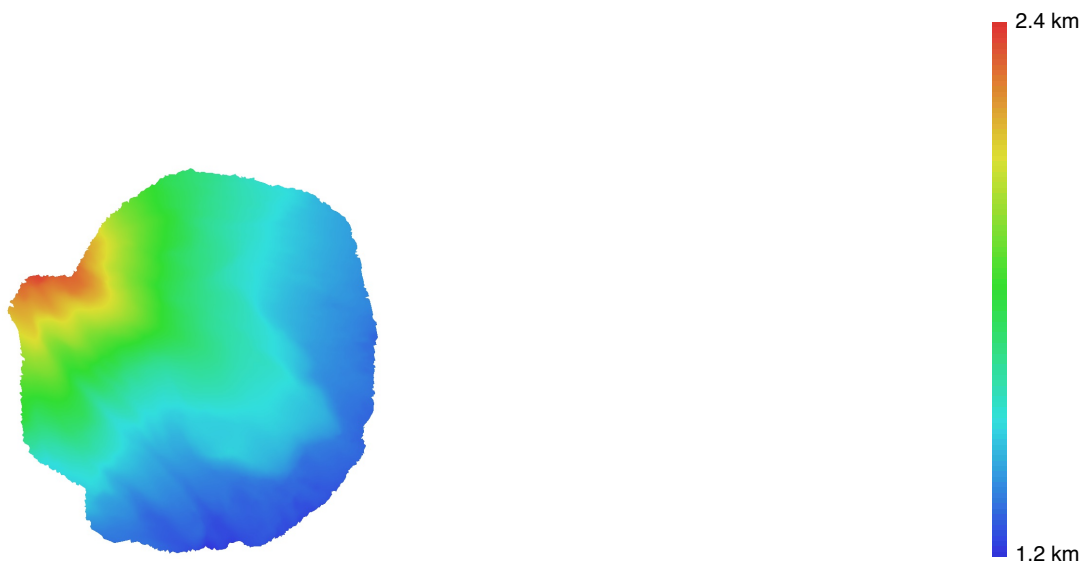


Fig. 5. Reconstructed digital elevation model.

Resolution: 6.51 m/pix  
Point density: 0.0236 points/m<sup>2</sup>

# Processing Parameters

## General

Cameras	54
Aligned cameras	50
Markers	7
Coordinate system	WGS 84 / UTM zone 47N (EPSG::32647)
Rotation angles	Yaw, Pitch, Roll

## Point Cloud

Points	2,569 of 4,386
Reprojection error	0.687042 (2.08702 max)
Point colors	3 bands, uint8
Key points	No
Average tie point multiplicity	3.16689
Alignment parameters	
Accuracy	Medium
Generic preselection	No
Reference preselection	No
Key point limit	40,000
Filter points by mask	Yes
Matching time	1 minutes 1 seconds
Alignment time	7 seconds

## Dense Point Cloud

Points	188,367
Point colors	3 bands, uint8
Reconstruction parameters	
Quality	Medium
Depth filtering	Moderate
Dense cloud generation time	49 seconds

## Model

Faces	53,695
Vertices	27,168
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	35 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	1 minutes 29 seconds

## Software

Version	1.5.1 build 7618
Platform	Mac OS 64