

## DAFTAR PUSTAKA

- Agisoft. 2014. *Agisoft PhotoScan User Manual Professional Edition*, Version 1.1, Copyright Agisoft LLC.
- Arba, H. N. 2017. *Identifikasi Logam Besi (Fe) pada Zonasi Radius 1-5 Km Daerah Tempat Pembuangan Akhir (TPA) Antang Makassar Terhadap Pengaruh Kualitas Air Sumur Gali* (Doctoral dissertation, Universitas Islam Negeri Alauddin Makassar).
- Arianto, B. B. 2015. *Studi Penentuan Jalur Aliran Lava Metode Steepest Slope Dari Data Dem Insar Dan Peta Rupa Bumi Indonesia (Studi Kasus: Gunung Semeru, Jawa Timur)* (Doctoral dissertation, Institut Teknologi Sepuluh Nopember).
- Arisandy, A. S., & Sukojo, B. M. 2016. *Studi Penentuan Aliran Hidrologi Metode Steepest Slope dan Lowest Height Dengan Aster GDEM V2 dan ALOS PALSAR (Studi Kasus: Gunung Kelud, Jawa Timur)*. *Jurnal Teknik ITS*, 5(2), A837-A841.
- Bhima Dhanardono, S. T., Utomo, A. B., & Juandra Hartono, S. T. 2022. *Pemodelan Tiga Dimensi Menggunakan Total Station, Terrestrial Laser Scanner Dan Unmanned Aerial Vehicle*. Deepublish.
- Galileo, R. 2013. Kebijakan pemerintah daerah dalam pengelolaan sampah pasca penetapan uu no. 18 tahun 2008. *Jurnal Demokrasi Dan Otonomi Daerah*, 10(1).
- Hariyanto, E. K. 2015. *Perbandingan Penggunaan Software Agisoft Photoscan Dan Pci Geomatica Untuk Pembuatan Orthophoto Dari Data Uav Kamera Non-Metrik (Studi Kasus Desa Gading Kulon–Kecamatan Dau–Kabupaten Malang)* (Doctoral dissertation, ITN MALANG).
- Hasan, Arfan, et al. 2018. *Analisis Spasial Aspek Topografi Menggunakan Citra DERSRM Sebagai Dasar Perencanaan Jalan (12-16)*. *PILAR* 13.2.
- Identifiedtech.com. 2022. *GCPs V. PPK/RTK: Which is Best to Receive Fast and Accurate Data?*. Diakses pada 20 Januari 2023, dari

<https://www.identifiedtech.com/blog/drone-technology/gcps-ppk-rtk-best-receive-fast-accurate-data/#industries>

- Juhaidah, S., Usman, F., & Subagiyo, A. 2019. Pengelolaan Sampah TPA Tamangapa Kota Makassar. *Planning for Urban Region and Environment Journal (PURE)*, 8(3), 133-142.
- Laili, F. 2021. *Analisa Kualitas Air Lindi Dan Potensi Penyebarannya Ke Lingkungan Sekitar Tpa Gunung Tugel Kabupaten Banyumas*.
- Laporan Pelaksanaan RKL RPL TPA Tamangapa. 2021
- Novianti, D. 2018. *Analisis Spasial Kualitas Air Tanah dan Air Permukaan Akibat Aktivitas di Sekitar TPA Sampah Terjun Kota Medan*.
- Kehutanan, D. 1986. Pedoman Penyusunan Pola Rehabilitasi Lahan dan Konservasi Tanah. *Direktorat Jendral Reboisasi dan Rehabilitasi Lahan. Jakarta*.
- Peraturan Menteri lingkungan hidup dan kehutanan no 59 tahun 2016 *Tentang Baku Mutu Lindi Bagi Usaha dan/atau Kegiatan Tempat Pemrosesan Akhir Sampah*
- Peraturan Menteri Negara Lingkungan Hidup Nomor 01 Tahun 2010 *Tentang Tata Laksana Pengendalian Pencemaran Air*
- Peraturan Pemerintah Nomor 82 Tahun 2001 *Tentang Pengelolaan Kualitas Air dan Pengendalian Pencemaran Air*.
- Perhubungan, M., Pm, N. O. M. O. R., & Berbendera, B. K. 2015. Peraturan Menteri Perhubungan. *Bandung. Pemerintah Kota Bandung*.
- Prayogo, I. Putu Harianja., Manoppo, F. J., & Lefrandt, L. I. 2020. *Pemanfaatan teknologi unmanned aerial vehicle (uav) quadcopter dalam pemetaan digital (fotogrametri) menggunakan kerangka ground control point (GCP)*. *Jurnal Ilmiah Media Engineering*, 10(1).
- Rachmanto, D. H., & Ihsan, M. 2020. *Pemanfaatan Metode Fotogrametri Untuk Pemetaan Skala 1: 1000 (Studi Kasus: Universitas Pendidikan Indonesia)*. *Jurnal ENMAP*, 1(2), 81-86.
- Rangga Sayyidina, 2022. *Pemodelan Penyebaran Kontaminan Lindi di Sekitar TPA Tamangapa Dengan Menggunakan Metode Numerik*
- Rompis, E. T., Sompie, S. R., & Sambul, A. M. 2022. *Pemodelan dan Implementasi Produk 3 Dimensi Gedung Fakultas Teknik Universitas Sam Ratulangi*.

- Salim, M. B., Nugraha, A. L., & Awaluddin, M. 2018. *Desain Aplikasi Peta Desa Katonsari, Kecamatan Demak, Kabupaten Demak Berbasis WebGIS. Jurnal Geodesi Undip*, 7(2), 42-52.
- Schenk, T. 2005. *Introduction to photogrammetry*. The Ohio State University, Columbus, 106.
- Setyoko, T. B. 2017. *Pemetaan Kemiringan Lereng Menggunakan Pengindraan Jauh Dengan Citra Dem Untuk Pembangunan Perumahan Di Kecamatan Pule Dalam Bentuk 3D*.
- Standar Nasional Indonesia 19-6724-2002
- Sulistyoningrum, D. R. 2018. *Studi Literatur Remediasi Tanah Tercemar Lindi di Tempat Pemrosesan Akhir (TPA) Sampah menggunakan Mixed Terrestrial Plants* (Doctoral dissertation, Institut Teknologi Sepuluh Nopember).
- Sutikno, Suprpto Dibyosaputro, dan Eko Haryono. 2018. *Geomorfologi Dasar*
- Syahputra, A., & Arifitama, B. 2018. *Pengembangan alat peraga edukasi proses siklus air (hidrologi) menggunakan teknologi Augmented Reality. Semnasteknomedia Online*, 6(1), 2-11.
- Tjahjadi, M. E., & Rifaan, M. 2019. *Foto Udara Menggunakan Unmanned Aerial Vehicle (UAV) Untuk Pemodelan 3D Jalan Raya*. Teknik Geodesi Institut Teknologi Nasional Malang.
- Van Zuidam, R. A, and van Zuidam – Cancelado, F.I. 1979. *Terrain Analysis and Classification Using Aerial Photographs, A Geomorphological Approach.*, International for Aerial Survey and Earth Science (ITC), Netherlands.
- wingtra.com. 2020. *What's the difference between PPK and RTK drones, and which one is better?*. Diakses pada 20 Januari 2023, dari <https://wingtra.com/ppk-drones-vs-rtk-drones/>

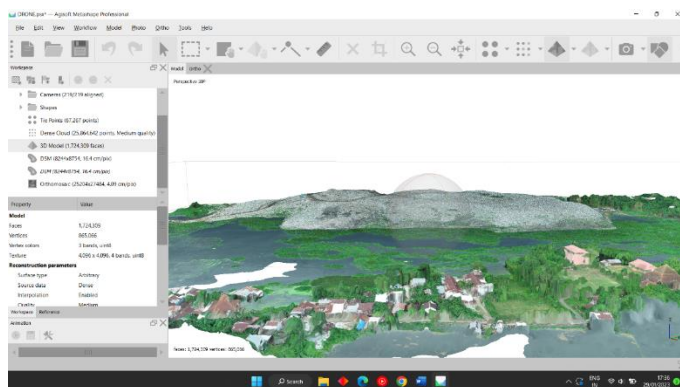
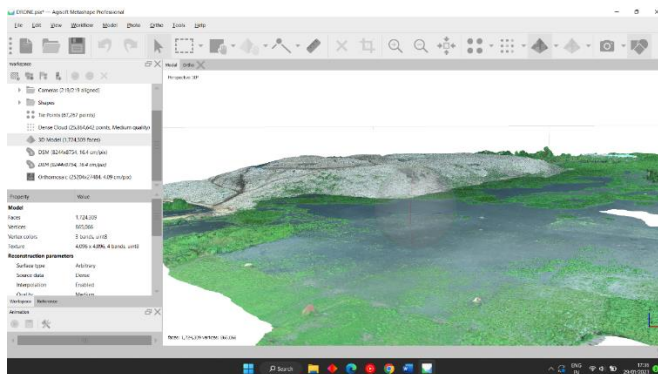
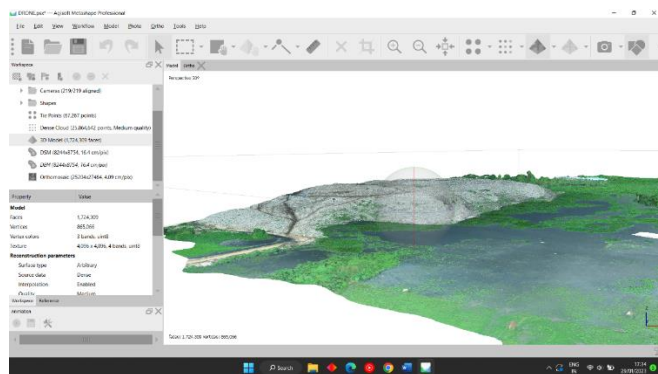
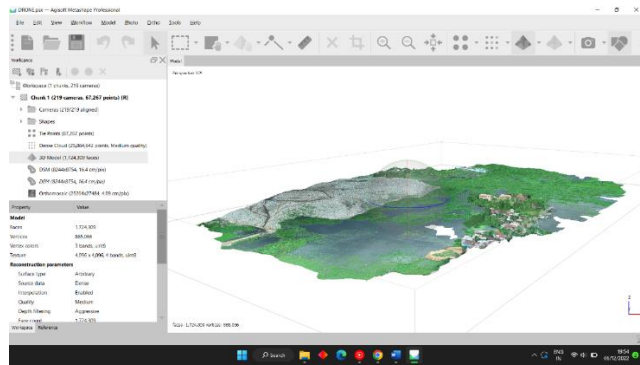
## LAMPIRAN

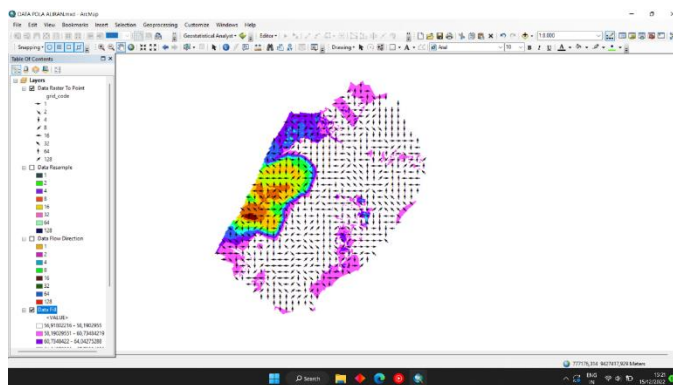
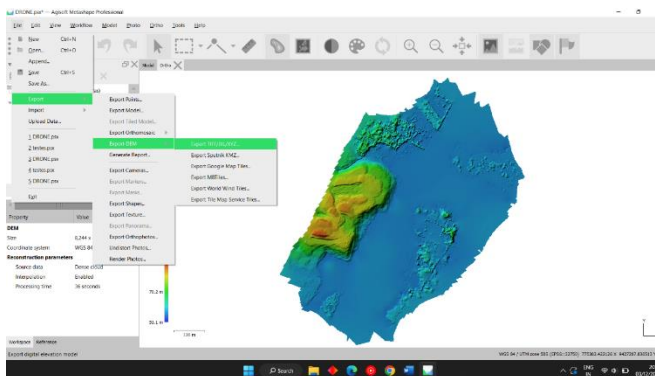
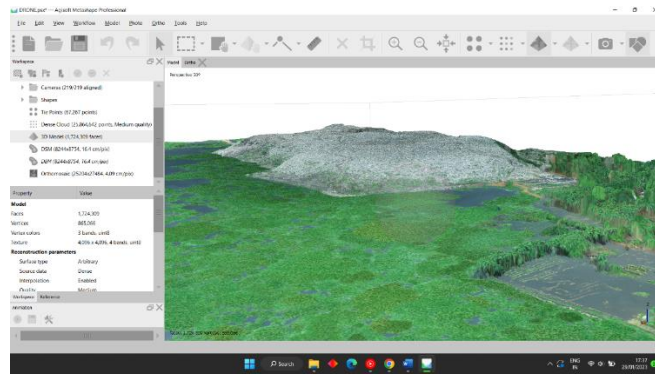
### Lampiran 1. Dokumentasi

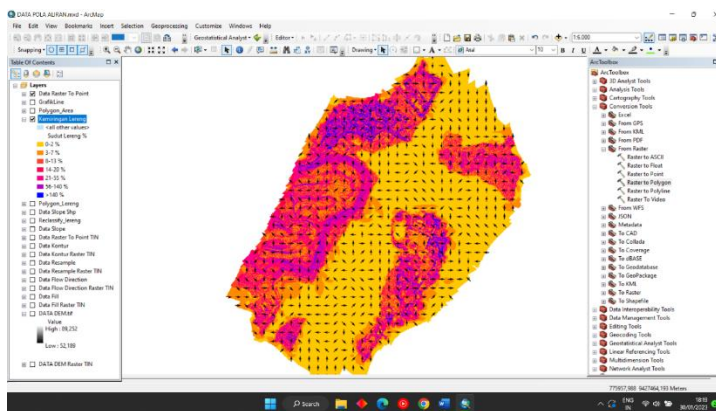
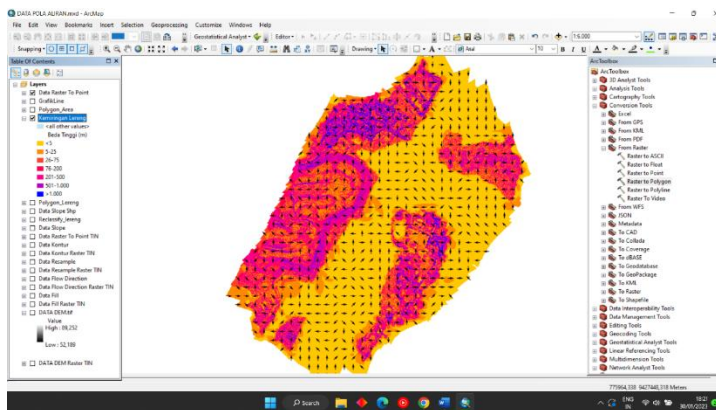
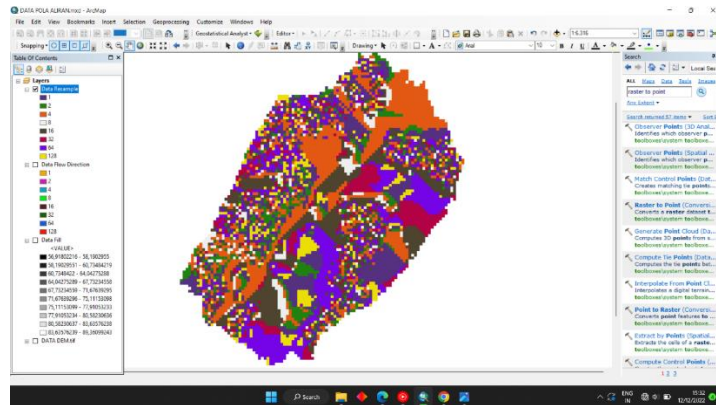




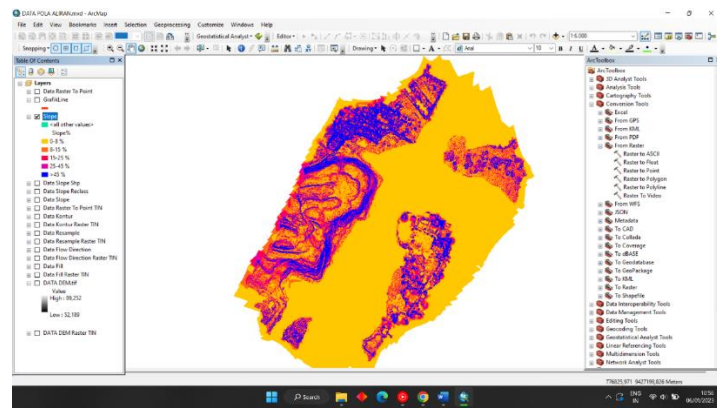
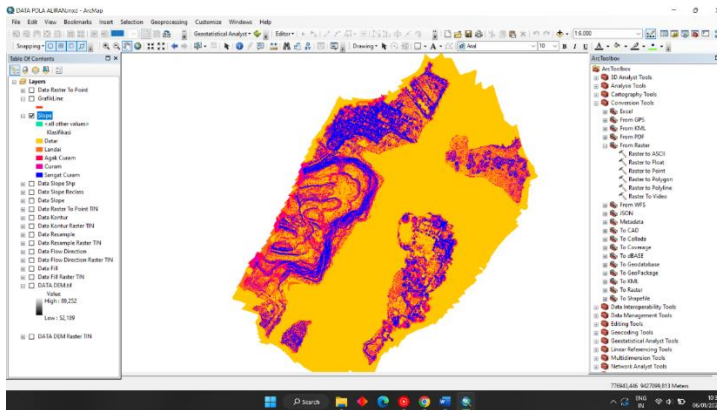
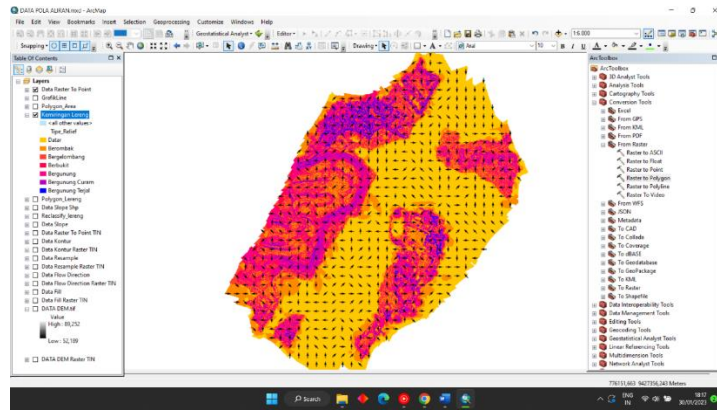


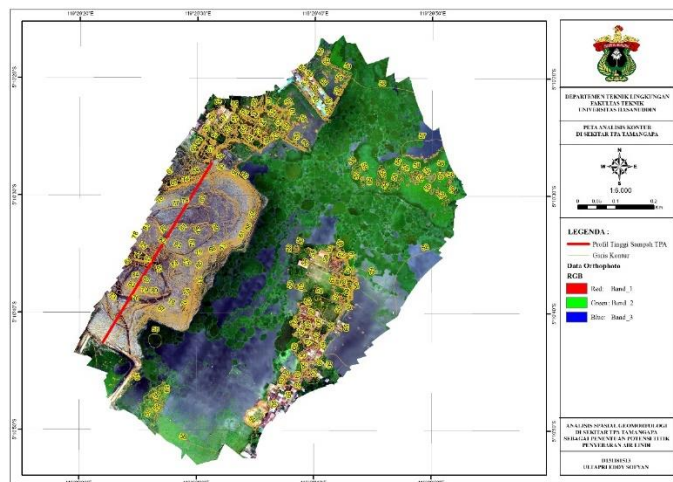
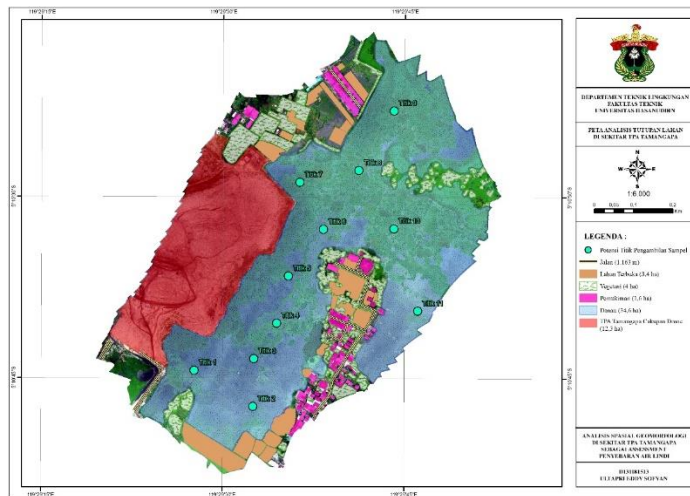
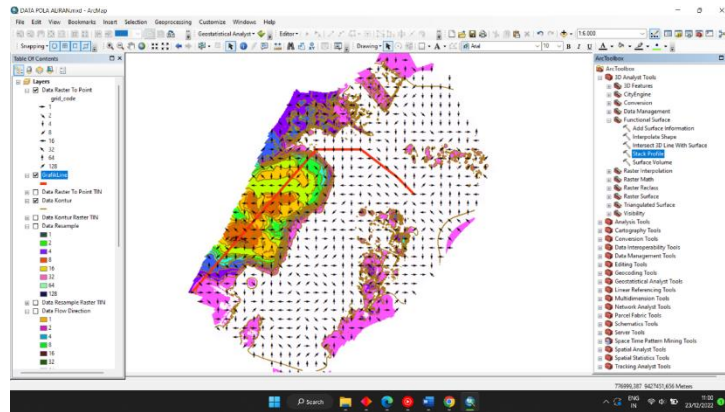


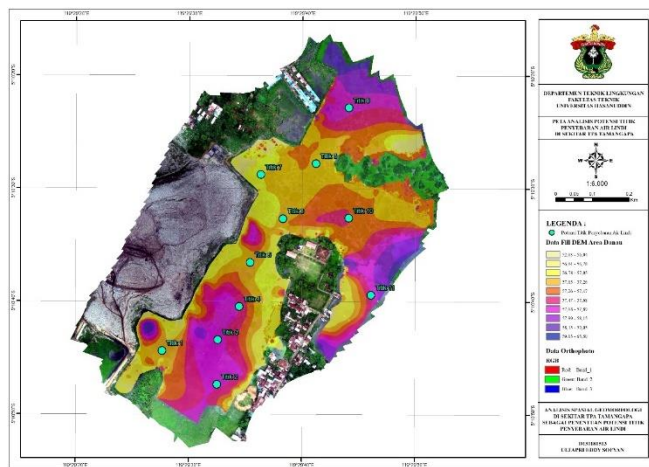
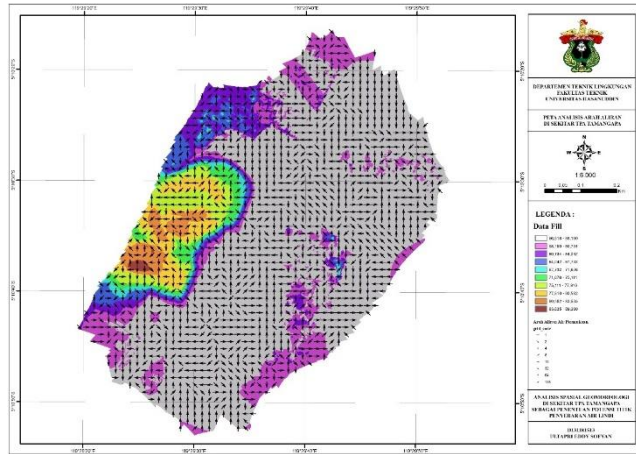






















Lampiran 2. Report

## **Agisoft Metashape**

**Processing Report  
02 December 2022**



## Survey Data

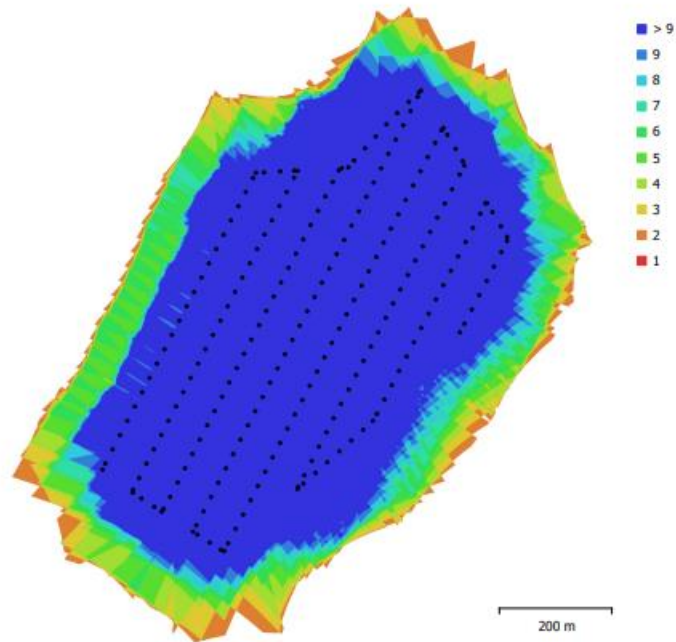


Fig. 1. Camera locations and image overlap.

Number of images:	219	Camera stations:	219
Flying altitude:	174 m	Tie points:	67,267
Ground resolution:	4.09 cm/pix	Projections:	156,594
Coverage area:	0.663 km <sup>2</sup>	Reprojection error:	0.457 pix

Camera Model	Resolution	Focal Length	Pixel Size	Precalibrated
FC6310R (8.8 mmmm)	5472 x 3648	8.8 mm	unknown	No

Table 1. Cameras.

## Camera Calibration

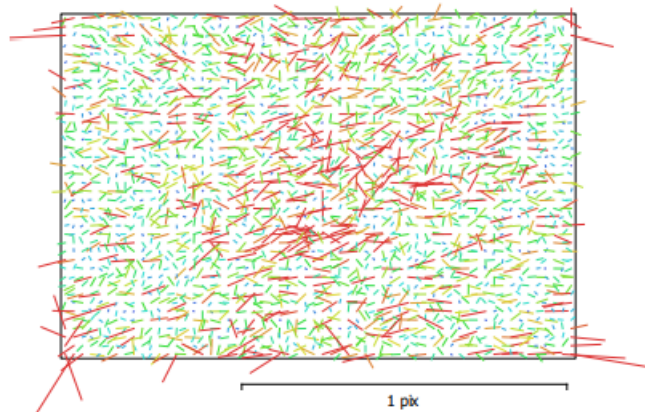


Fig. 2. Image residuals for FC6310R (8.8 mmm).

### FC6310R (8.8 mmm)

219 images

Type	Resolution	Focal Length	Pixel Size
Frame	<b>5472 x 3648</b>	<b>8.8 mm</b>	<b>unknown</b>

	Value	Error	F	Cx	Cy	B1	B2	K1	K2	K3	K4	P1	P2
<b>F</b>	<b>3700.91</b>	0.43	1.00	0.41	0.13	-0.02	-0.08	-0.72	0.34	-0.21	0.15	-0.42	-0.20
<b>Cx</b>	<b>5.3392</b>	0.048		1.00	0.07	-0.01	-0.09	-0.27	0.12	-0.07	0.05	-0.04	-0.08
<b>Cy</b>	<b>-11.7621</b>	0.041			1.00	-0.01	0.00	-0.08	0.03	-0.02	0.01	0.09	0.39
<b>B1</b>	<b>-0.153445</b>	0.017				1.00	-0.01	0.01	-0.02	0.02	-0.02	0.00	-0.01
<b>B2</b>	<b>-0.0425726</b>	0.015					1.00	0.05	-0.02	0.01	-0.00	0.04	0.02
<b>K1</b>	<b>-0.288079</b>	9.9e-005						1.00	-0.88	0.78	-0.71	0.30	0.14
<b>K2</b>	<b>0.143087</b>	0.00024							1.00	-0.98	0.94	-0.13	-0.07
<b>K3</b>	<b>-0.0615844</b>	0.00028								1.00	-0.99	0.07	0.04
<b>K4</b>	<b>0.0131029</b>	0.00012									1.00	-0.05	-0.04
<b>P1</b>	<b>-7.058e-005</b>	1.4e-006										1.00	0.10
<b>P2</b>	<b>-3.10001e-005</b>	1.4e-006											1.00

Table 2. Calibration coefficients and correlation matrix.

## Camera Locations

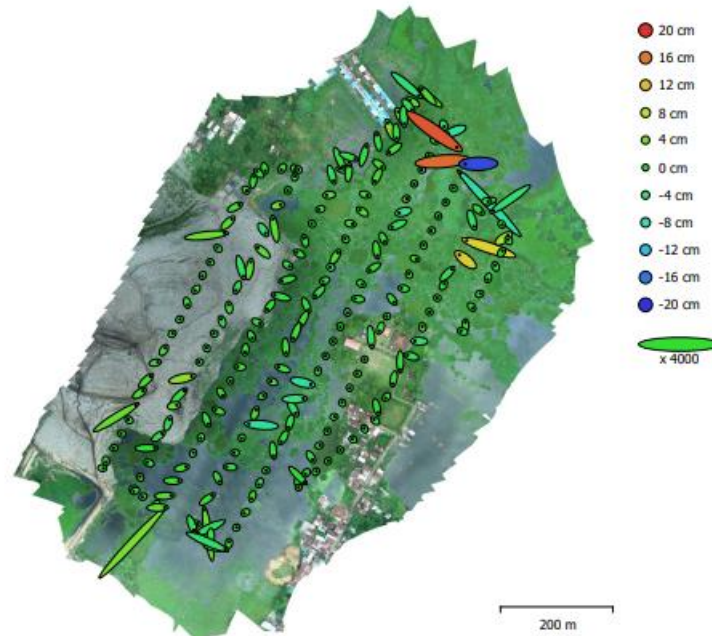


Fig. 3. Camera locations and error estimates.  
Z error is represented by ellipse color. X,Y errors are represented by ellipse shape.  
Estimated camera locations are marked with a black dot.

X error (cm)	Y error (cm)	Z error (cm)	XY error (cm)	Total error (cm)
0.487827	0.427873	2.86774	0.648884	2.94024

Table 3. Average camera location error.  
X - Longitude, Y - Latitude, Z - Altitude.



## Digital Elevation Model

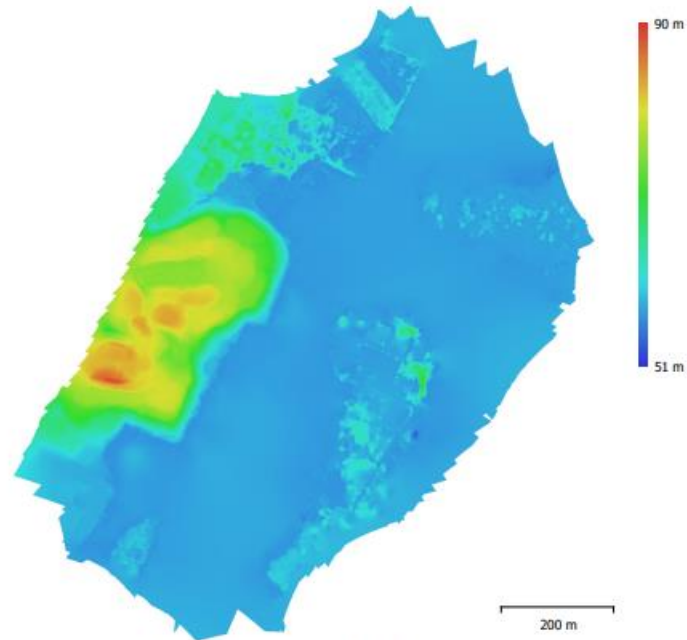


Fig. 4. Reconstructed digital elevation model.

Resolution: 16.4 cm/pix  
Point density: 37.3 points/m<sup>2</sup>

## Processing Parameters

<b>General</b>	
Cameras	219
Aligned cameras	219
Coordinate system	WGS 84 (EPSG::4326)
Rotation angles	Yaw, Pitch, Roll
<b>Point Cloud</b>	
Points	67,267 of 202,319
RMS reprojection error	0.0447386 (0.457031 pix)
Max reprojection error	0.383438 (9.45177 pix)
Mean key point size	7.84114 pix
Point colors	3 bands, uint8
Key points	No
Average tie point multiplicity	4.50898
<b>Alignment parameters</b>	
Accuracy	Medium
Generic preselection	No
Reference preselection	Yes
Key point limit	40,000
Tie point limit	4,000
Adaptive camera model fitting	No
Matching time	5 minutes 14 seconds
Alignment time	1 minutes 48 seconds
<b>Optimization parameters</b>	
Parameters	f, b1, b2, cx, cy, k1-k4, p1, p2
Adaptive camera model fitting	No
Optimization time	0 seconds
<b>Dense Point Cloud</b>	
Points	25,864,642
Point colors	3 bands, uint8
<b>Reconstruction parameters</b>	
Quality	Medium
Depth filtering	Aggressive
Depth maps generation time	5 minutes 12 seconds
Dense cloud generation time	5 minutes 38 seconds
<b>Model</b>	
Faces	1,724,309
Vertices	865,066
Vertex colors	3 bands, uint8
Texture	4,096 x 4,096, 4 bands, uint8
<b>Reconstruction parameters</b>	
Surface type	Arbitrary
Source data	Dense
Interpolation	Enabled
Quality	Medium
Depth filtering	Aggressive
Face count	1,724,309
Processing time	14 minutes 3 seconds
<b>Texturing parameters</b>	
Mapping mode	Orthophoto
Blending mode	Mosaic

<b>General</b>	
Texture size	4,096 x 4,096
Enable hole filling	Yes
Enable ghosting filter	Yes
UV mapping time	11 seconds
Blending time	9 minutes 15 seconds
<b>DEM</b>	
Size	8,244 x 8,754
Coordinate system	WGS 84 / UTM zone 50S (EPSG::32750)
<b>Reconstruction parameters</b>	
Source data	Dense cloud
Interpolation	Enabled
Processing time	36 seconds
<b>Orthomosaic</b>	
Size	25,204 x 27,484
Coordinate system	WGS 84 / UTM zone 50S (EPSG::32750)
Colors	3 bands, uint8
<b>Reconstruction parameters</b>	
Blending mode	Mosaic
Surface	DEM
Enable hole filling	Yes
Processing time	9 minutes 3 seconds
<b>Software</b>	
Version	1.5.0
Platform	Windows 64