

DAFTAR ISI

- Bengen, D., 2002. Ekosistem dan Sumberdaya Alam Pesisir dan Laut serta Prinsip Pengelolaannya. Pusat Kajian Sumberdaya Pesisir dan Lautan, IPB, Bogor.
- Danoedoro, P., 2009. Penginderaan Jauh Untuk Inventarisasi Mangrove: Potensi, Keterbatasan Dan Kebutuhan Data. Pros. Workshop Sinergi Survei Dan Pemetaan Nas. Dalam Mendukung Pengelolaan Mangrove Berkelanjutan 98–113.
- Fathurrohmah, S., Hati, K.B., Marjuki, B., 2013. Aplikasi Penginderaan Jauh Untuk Pengelolaan Hutadan Mangrove Sebagai Salah Satu Sumberdaya Wilayah Pesisir (Studi Kasus Di Delta Sungai Wulan Kabupaten Demak). Semin. Nas. Pendayagunaan Inf. Geospasial Untuk Optim. Oton. Drh. 2013 85–89.
- Irawan, S., Malau, A.O., 2016. Analisis Persebaran Mangrove di Pulau Batam Menggunakan Teknologi Penginderaan Jauh. J. Integrasi 8, 80–87.
- Kementerian Kelautan dan Perikanan, 2017. Laporan Kegiatan Monitoring Mangrove Tongke-Tongke, Sinjai.
- Kementerian Kelautan dan Perikanan, 2016. Laporan Kegiatan Rehabilitasi Kawasan Pesisir Dengan Penanaman Mangrove di Pulau Lombok, NTB.
- Malik, A., Fensholt, R., Mertz, O., 2015. *Mangrove Exploitation Effects On Biodiversity And Ecosystem Services*. *Biodivers. Conserv.* 24, 3543–3557. <https://doi.org/10.1007/s10531-015-1015-4>
- Noor, Y.R., Khazali, M., Suryadiputra, I.N.N., 2006. Panduan pengenalan mangrove di Indonesia. Ditjen PHKA. Wetlands International, Indonesia Programme, Bogor.
- Panjaitan, A., Sudarsono, B., Bashit, N., 2019. Analisis Kesesuaian Penggunaan Lahan Terhadap Rencana Tata Ruang Wilayah (Rtrw) Di Kabupaten Cianjur Menggunakan Sistem Informasi Geografis. J. Geod. UNDIP 8, 10.
- Purwanti, F., Rudiyaniti, S., Suryanto, A., 2013. Kondisi Habitus Rhizophora sp Di Pantura Kota Semarang Berdasarkan Nilai Hue Daun. J. Saintek Perikan. 9, 75–79.
- Ramadhani, Y.H., Rokhmatulloh, Poniman K., A., Susanti, R., 2015. Pemetaan Pulau Kecil Dengan Pendekatan Berbasis Objek Menggunakan Data Unmanned Aerial Vehicle (UAV) Studi Kasus di Pulau Pramuka, Kepulauan Seribu. Maj. Ilm. Globe 17, 125–134.
- Salim, H.L., Afi Ati, R.N., Kepel, T.L., 2018. Pemetaan Dinamika Hutan Mangrove menggunakan drone dan Penginderaan Jauh di P. Rambut, Kepulauan Seribu. J. Kelaut. Nas. 13.
- Sampurno, R.M., Thoriq, A., 2016. Klasifikasi Tutupan Lahan Menggunakan Citra Landsat 8 *Operational Land Imager* (OLI) Di Kabupaten Sumedang (*Land Cover Classification Using Landsat 8 Operational Land Imager* (OLI) Datain Sumedang Regency). J. Teknotan 10, 61–70.
- Saparinto, C., 2007. Pendayagunaan Ekosistem Mangrove. Dahara Prize, Semarang.

- Silalahi, R.P., 2018. Penggunaan Citra Pesawat Tak Berawak Dalam Inventarisasi Dimensi Vegetasi Nipah. Sekol. Pascasarj. Inst. Pertan. Bogor 45.
- Suwargana, N., 2010. Analisis perubahan hutan mangrove menggunakan data penginderaan jauh di Pantai Bahagia, Muara Gembong, Bekasi. J. Penginderaan Jauh Dan Pengolah. Data Citra Digit. 5.
- Tahir, I., Paembonan, R.E., Harahap, Z.A., Akbar, N., Wibowo, E.S., 2017a. Sebaran Kondisi Ekosistem Hutan Mangrove Di Kawasan Teluk Jailolo, Kabupaten Halmahera Barat. Provinsi Maluku Utara. J. Enggano 2, 143– 155. <https://doi.org/10.31186/jenggano.2.2.143-155>
- Tulungen, J.J., Kasmidi, M., Rotinsulu, C., Dimpudus, M., Tangkilisan, N., 2003. Panduan Pengelolaan Sumberdaya Wilayah Pesisir Berbasis Masyarakat: Seri PSWPBM, Dalam Koleksi Dokumen Proyek Pesisir 1997-2003.
- Welly, M., Sanjaya, W., Sumerta, I.N., Anom, D.N., 2010. Identifikasi Flora Dan Fauna Mangrove Nusa Lembongan Dan Nusa Ceningan. Coral Triangle Center dan Balai Pengelolaan Hutan Mangrove Wilayah 1.
- Wicaksono, I., Farda, N.M., 2016. Pemetaan Famili Mangrove Menggunakan Metode *Object Based Image Analysis* (OBIA) Pada Citra Worldview-2 Di Balai Taman Nasional Karimunjawa. J. Bumi Indones. 5.
- Yuliani, S., Herminasari, N.S., 2017. Partisipasi Masyarakat Dalam Pengelolaan Hutan Mangrove Di Desa Segarajaya, Kecamatan Tarumajaya Kabupaten Bekasi. J. Green Growth Dan Manaj. Lingkung. 6, 42–53. <https://doi.org/10.21009/jgg.062.04>

LAMPIRAN

Lampiran 1. Data Kerapatan Rajuk

Titik Koordinat		Kode Titik Sampel	Jumlah Pohon (tegakan)	Pengolahan Data		Luas Transek (m)	Kategori
Latitude	Longitude			Ind/m	Ind/ha		
-5.151234	120.273141	Rh1	36	0.36	3600	10	Padat
-5.151016	120.273445	Rh2	36	0.36	3600		Padat
-5.150760	120.273783	Rh3	25	0.25	2500		Padat
-5.151127	120.272847	Rh4	9	0.09	900		Jarang
-5.151022	120.272671	Rh5	4	0.04	400		Jarang

Lampiran 2. Alat dan Bahan Penelitian

Lampiran 3. Dokumentasi Lapangan





Lampiran 4. Agisoft Metashape

Agisoft Metashape
Processing Report 27 May 2024



Survey Data

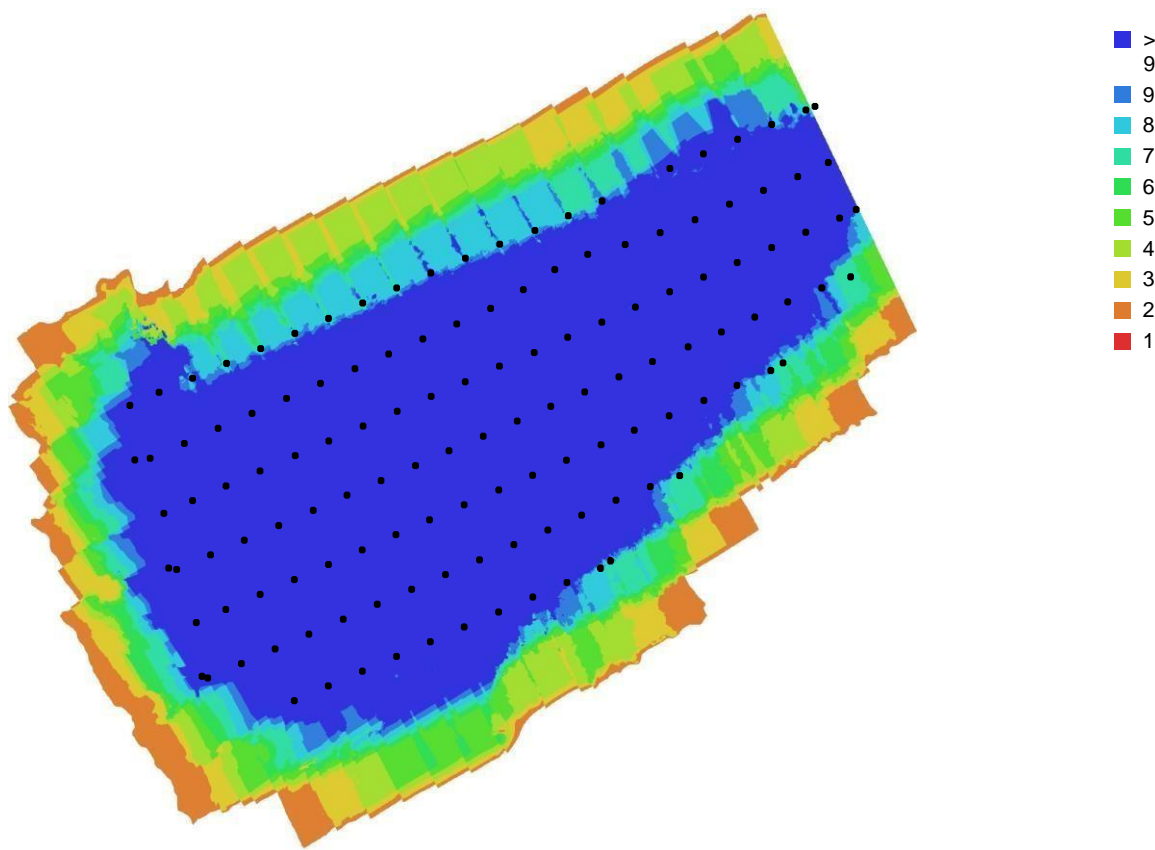


Fig. 1. Camera locations and image overlap.

Number of images:	134	Camera stations:	133
Flying altitude:	56.5 m	Tie points:	48,684
Ground resolution:	1.38 cm/pix	Projections:	164,928
Coverage area:	0.0334 km ²	Reprojection error:	1.05 pix

Camera Model	Resolution	Focal Length	Pixel Size	Precalibrated
FC6310S (8.8mm)	4864 x 3648	8.8 mm	2.61 x 2.61 μm	No

Table 1. Cameras.

Camera Calibration

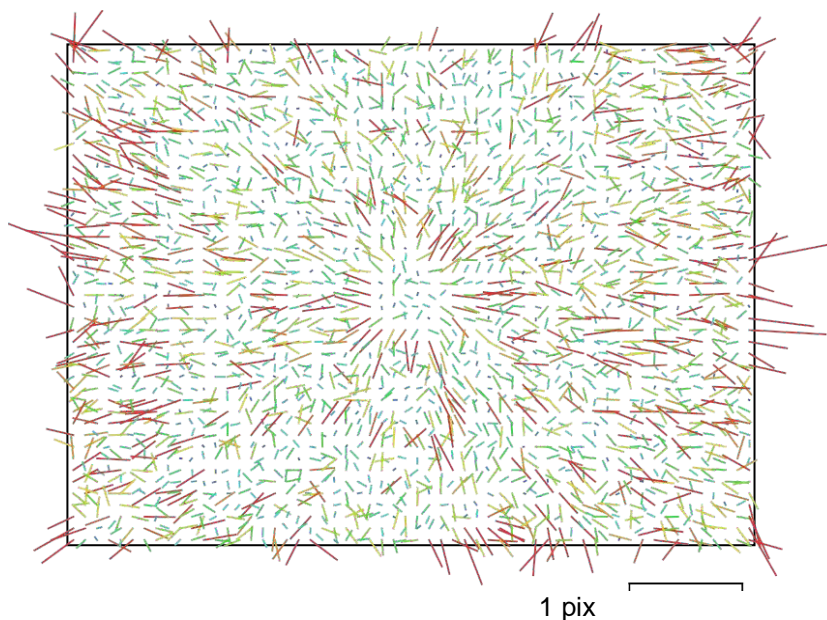


Fig. 2. Image residuals for FC6310S (8.8mm).

FC6310S (8.8mm)

134 images

Type	Resolution	Focal Length	Pixel Size
Frame	4864 x 3648	8.8 mm	2.61 x 2.61 μm

	Value	Error	F	Cx	Cy	K1	K2	K3	P1	P2
F	3692.97	14	1.00	0.85	-0.39	-0.03	-0.30	0.71	-0.39	-0.58
Cx	-6.834	0.2		1.00	-0.35	-0.04	-0.24	0.59	-0.06	-0.51
Cy	-10.463	0.097			1.00	0.04	0.13	-0.28	0.12	0.61
K1	-0.00922839	0.00033				1.00	-0.36	0.24	0.24	-0.10
K2	-0.00814879	0.00039					1.00	-0.87	0.12	0.19
K3	0.0173284	0.00055						1.00	-0.27	-0.42
P1	-0.000745683	7.7e-06							1.00	0.18
P2	-0.000966352	7.1e-06								1.00

Table 2. Calibration coefficients and correlation matrix.

Camera Locations



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)
22.9195	40.1272	21.5314	46.2114	50.9813

Table 3. Average camera location error. X –

Longitude, Y - Latitude, Z - Altitude.

Digital Elevation Model

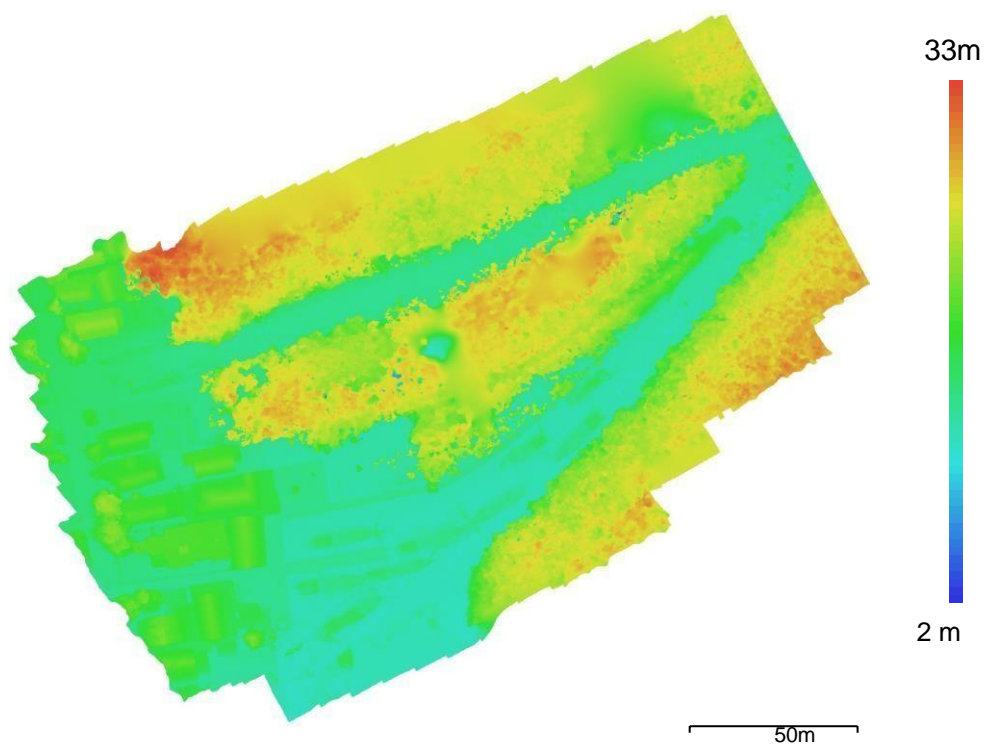


Fig. 4. Reconstructed digital elevation model.

Resolution: 5.5 cm/pix
Point density: 330 points/m²

Processing Parameters

General

Cameras	134
Aligned cameras	133
Coordinate system	WGS 84 (EPSG::4326)
Rotation angles	Yaw, Pitch, Roll

Point Cloud

Points	48,684 of 53,308
RMS reprojection error	0.114973 (1.05014 pix)
Max reprojection error	0.348268 (31.6025 pix)
Mean key point size	7.66323 pix
Point colors	3 bands, uint8
Key points	No
Average tie point multiplicity	3.54849

Alignment parameters

Accuracy	Medium
Generic preselection	Yes
Reference preselection	Source
Key point limit	40,000
Tie point limit	4,000
Guided image matching	No
Adaptive camera model fitting	No
Matching time	28 seconds
Matching memory usage	391.28 MB
Alignment time	1 minutes 3 seconds
Alignment memory usage	67.70 MB Software
version	1.6.0.9925

Depth Maps

Count	129
Depth maps generation parameters	
Quality	Medium
Filtering mode	Mild
Processing time	1 minutes 21 seconds

Dense Point Cloud

Points	19,488,439
Point colors	3 bands, uint8
Depth maps generation parameters	
Quality	Medium
Filtering mode	Mild
Processing time	1 minutes 21 seconds
Dense cloud generation parameters	
Processing time	1 minutes 32 seconds
Software version	1.6.0.9925

Model

Faces	1,285,816
Vertices	644,468
Vertex colors	3 bands, uint8
Texture	4,096 x 4,096, 4 bands, uint8

Depth maps generation parameters

Quality	Medium
Filtering mode	Mild

General

Processing time	1 minutes 21 seconds
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Reconstruction parameters

Surface type	Height field
Source data	Dense cloud
Interpolation	Enabled
Strict volumetric masks	No
Processing time	22 seconds

Texturing parameters

Mapping mode	Orthophoto
Blending mode	Mosaic
Texture size	4,096
Enable hole filling	Yes
Enable ghosting filter	No
UV mapping time	6 seconds
Blending time	13 seconds
Software version	1.6.0.9925

Tiled Model

Texture	3 bands, uint8
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Depth maps generation parameters

Quality	Medium
Filtering mode	Mild
Processing time	1 minutes 21 seconds

Reconstruction parameters

Source data	Dense cloud
Tile size	256
Face count	Medium
Enable ghosting filter	No
Processing time	16 minutes 52 seconds
Software version	1.6.0.9925

DEM

Size	6,037 x 5,141
Coordinate system	WGS 84 (EPSG::4326)

Reconstruction parameters

Source data	Dense cloud
Interpolation	Enabled
Processing time	8 seconds
Software version	1.6.0.9925

Orthomosaic

Size	18,616 x 16,392
Coordinate system	WGS 84 (EPSG::4326)
Colors	3 bands, uint8

Reconstruction parameters

Blending mode	Mosaic
Surface	DEM
Enable hole filling	Yes
Processing time	2 minutes 25 seconds
Software version	1.6.0.9925

System

Software name	Agisoft Metashape
Professional	
Software version	1 6.0 build 9925
OS	Windows 64 bit
RAM	31.71 GB
CPU	12th Gen Intel(R) Core(TM)
i7-12700H	
GPU(s)	NVIDIA GeForce RTX 3060
Laptop GP	