

New Generation Sensors for VTOL Drones



Pacific GIS and
Remote Sensing Council

Simon Morris
Regional Manager Asia Pacific

**QUANTUM
SYSTEMS**



Interchangeable Sensors for a wide range of applications



Oblique Capability

Oblique D2M 5 Lens Multi-oblique Sensor

- ▶ Designed for sharp terrain reconstruction
- ▶ Suitable for urban capture applications
- ▶ Combined 130 megapixel output
- ▶ Fewer passes for LOTS OF DATA!



Oblique D2M

Five-lens RGB Camera

The Oblique D2M is a powerful oblique imaging system consisting of five high-resolution multidirectional cameras, making it the ideal tool for large scale 3D photogrammetry.

①

A fast trigger interval along with custom high-speed storage provides class-leading time efficiency without compromising data quality. The payload combines four oblique and one NADIR camera to capture complex geometries with ease.

This ensures remarkable detail even on slanted surfaces and makes Oblique D2M destined for 3D mesh generation of high-rise areas, industrial environments, archaeological sites and alike.

Oblique D2M

Technical Specification



GSD	1.50 cm @100m AGL
Cameras	1 x NADIR, 4 x oblique
Sensor resolution	26 MP (6252 x 4168 px)
Total resolution	130 MP
Trigger interval	≥ 0.8 seconds
Sensor type	CMOS
Sensor format	APS-C
Sensor size	23.5 x 15.6 mm
Focal length	25 mm NADIR, 35 mm (oblique)
Payload weight RTF	833,7 g
Flight time	60 minutes
Storage	High speed data storage device (640 GB)



Oblique Capability

D2M 5 Lens Multi-oblique Sensor



LiDAR Capability



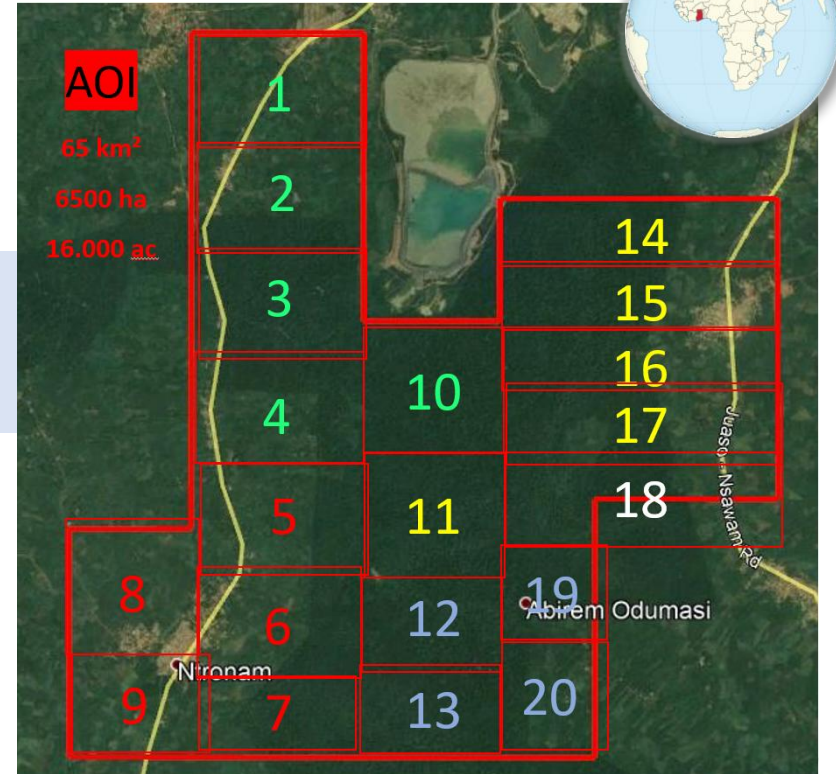
Case Study: Ghana Dam Lidar Survey for Flood Analysis

Risk Management Operation with 3 imperatives:

- Business
- Social
- Humanitarian

The surface model is needed to plan measures to protect the Tropical Rainforest and the nearby villages in the unlikely event of a dam collapse.

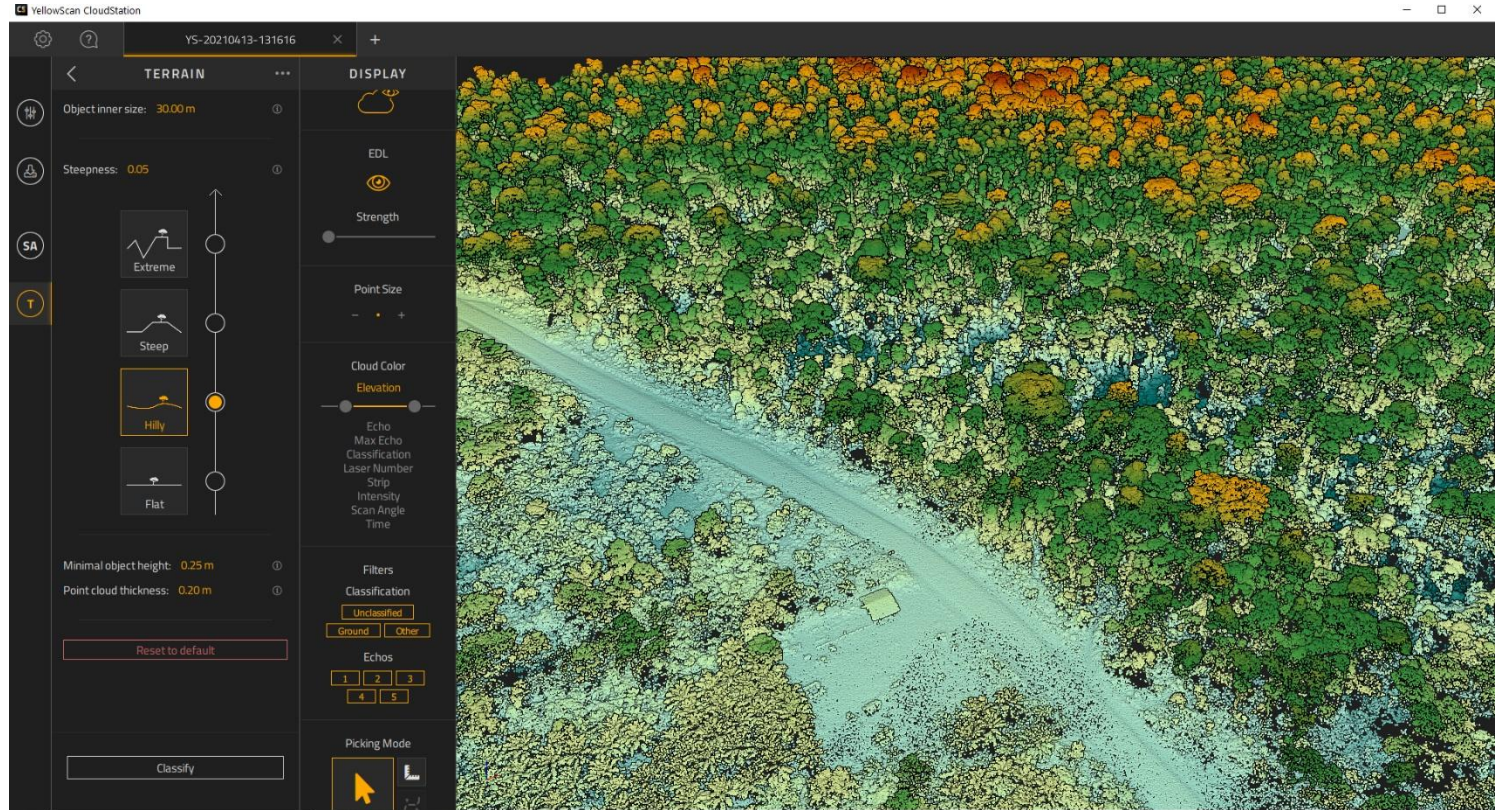
- 20 Flights of 55-60min (each 300-350ha)
- Altitude 100-120m above Ground
- 18 m/s airspeed (65km/h)
- 6 Takeoff Locations
- 5 Flights per day:
- **Total area: 6,500 ha (65km²)**



Case Study: Ghana Dam Lidar Survey for Flood Analysis

Results:

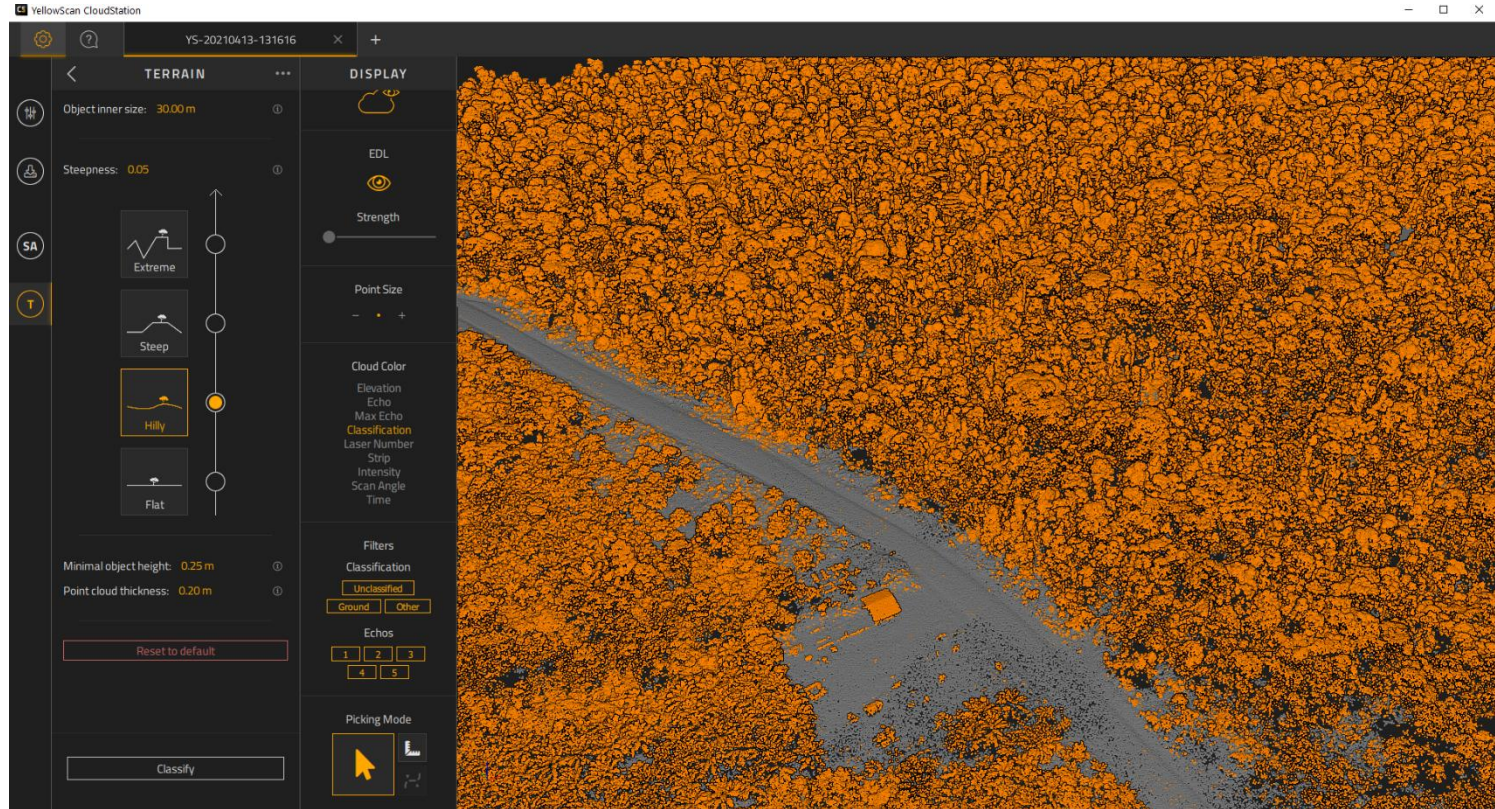
- Capture



Case Study: Ghana Dam Lidar Survey for Flood Analysis

Results:

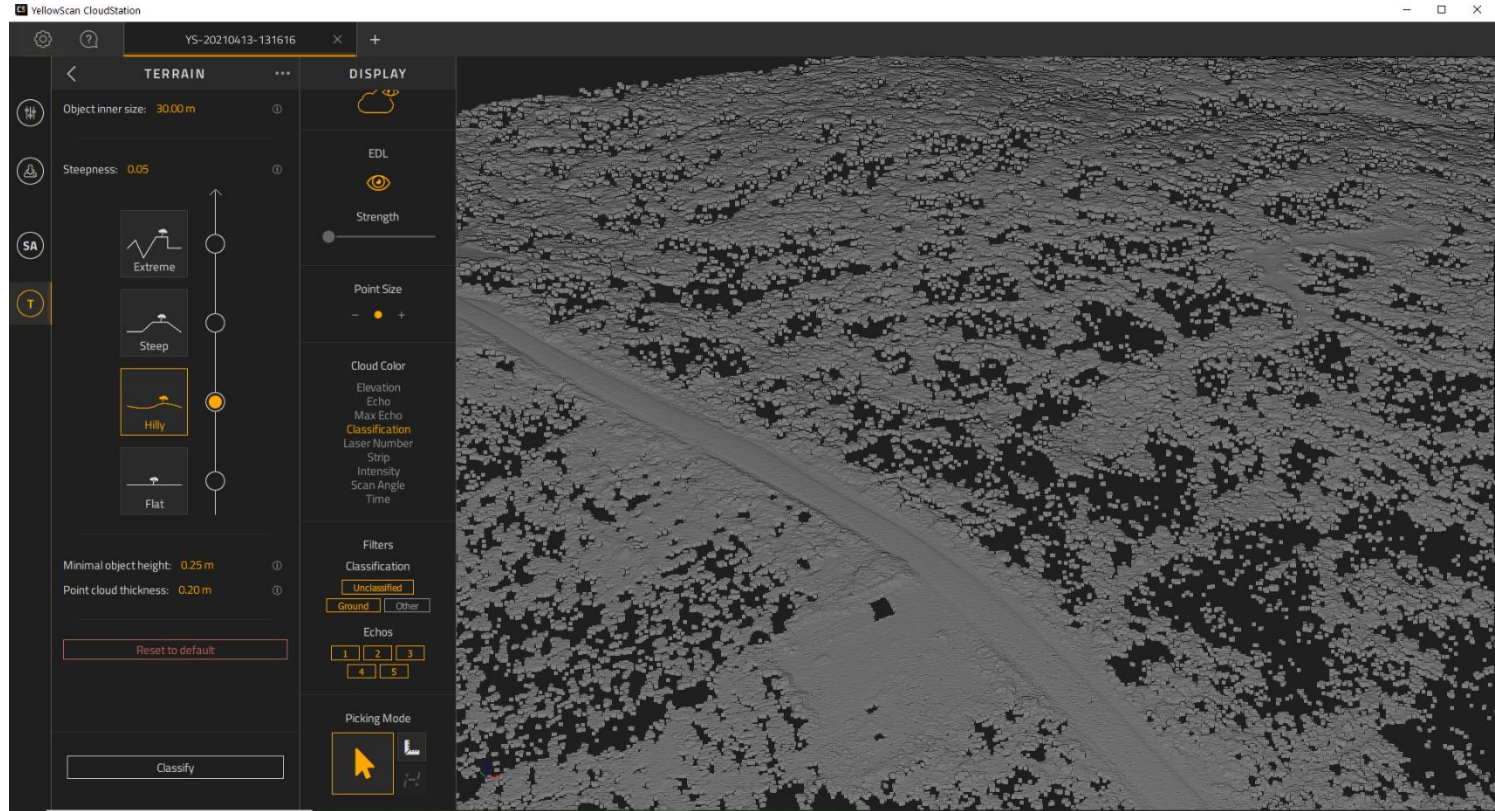
- Classified



Case Study: Ghana Dam Lidar Survey for Flood Analysis

Results:

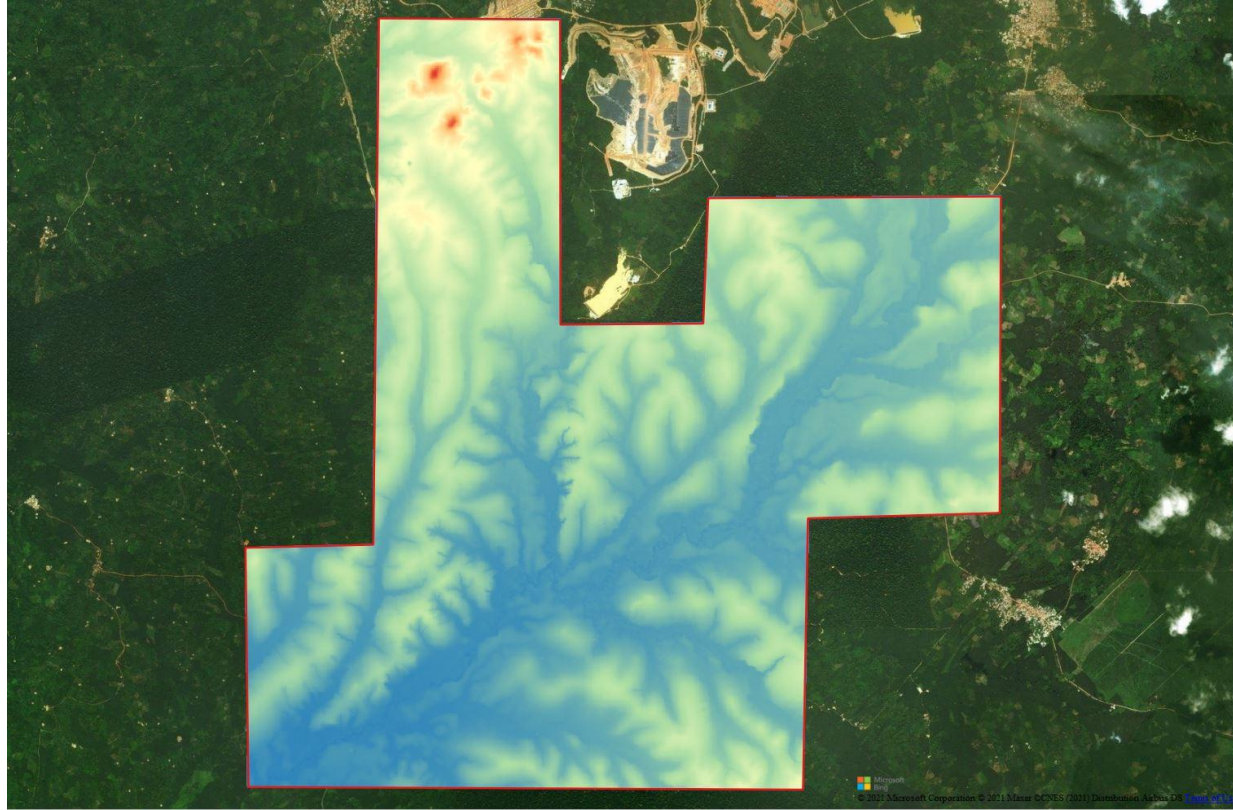
- Ground



Case Study: Ghana Dam Lidar Survey for Flood Analysis

Results:

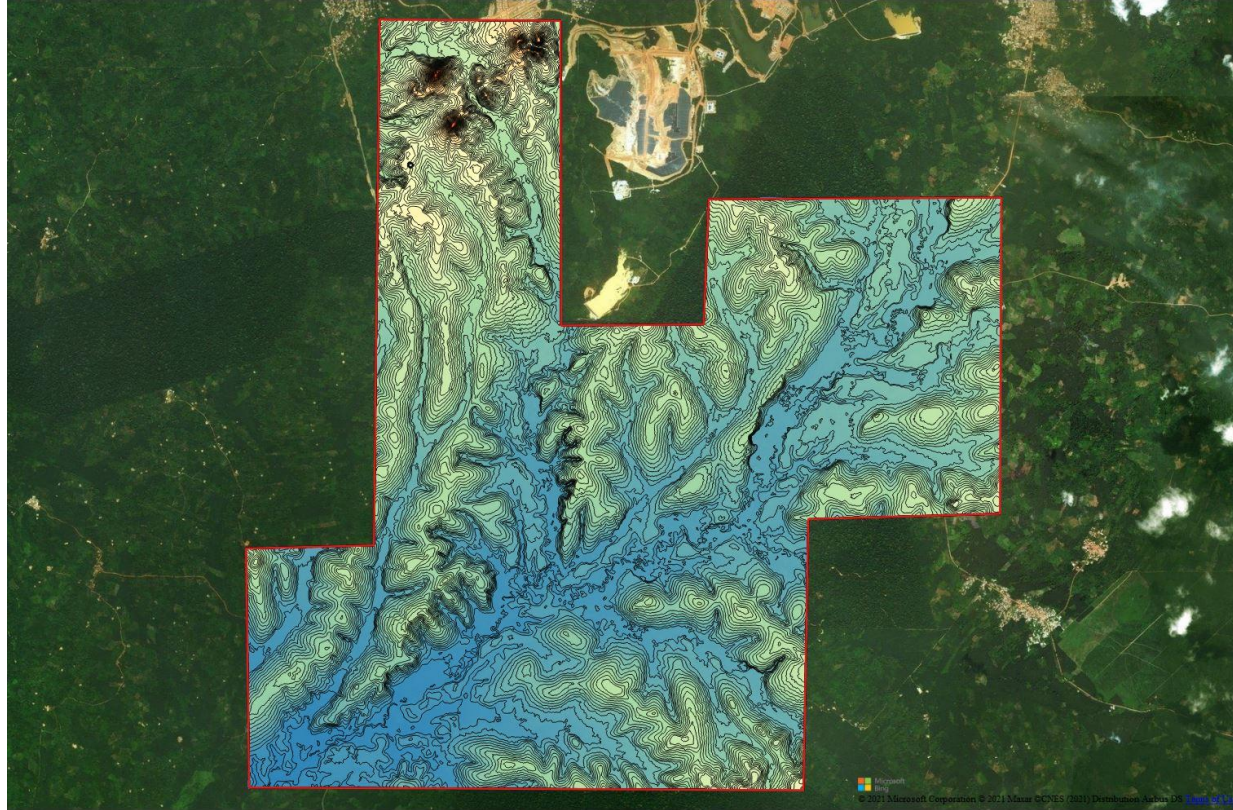
- Surface



Case Study: Ghana Dam Lidar Survey for Flood Analysis

Results:

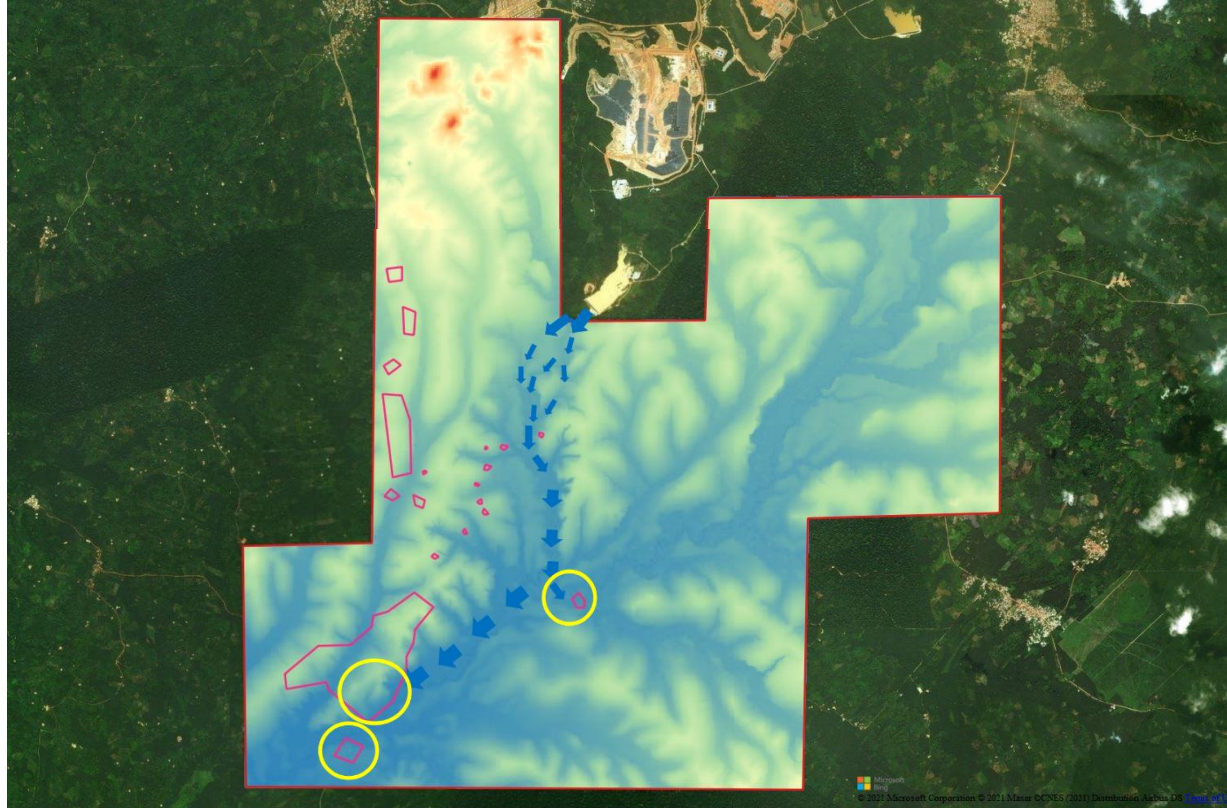
- Contours



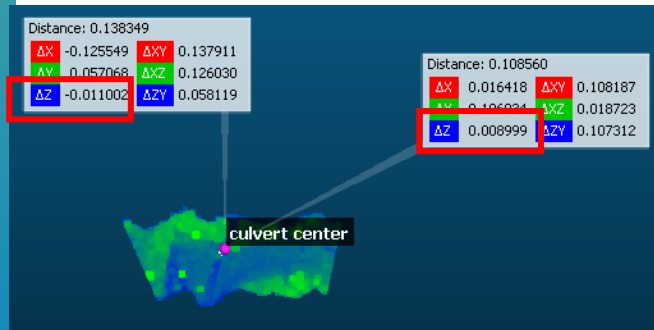
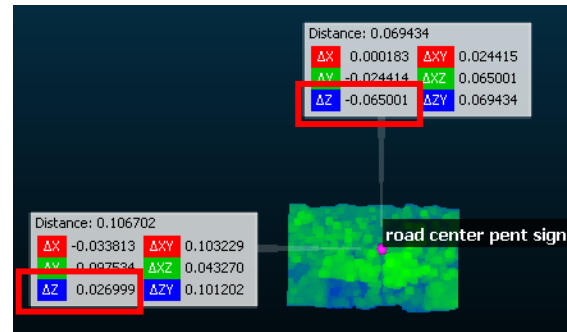
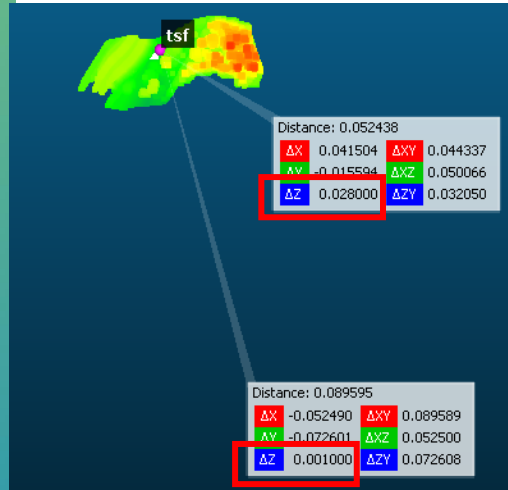
Case Study: Ghana Dam Lidar Survey for Flood Analysis

Results:

- Risk Map



Elevation Accuracy Check - with GCPs (RTK GNSS)



GCP	Delta z (m)
Point 1	0,028
Point 1	0,001
Point 2	0,026
Point 2	0,065
Point 3	0,011
Point 3	0,008
Mean:	0,023

2.32 cm

Case Study: Ghana Dam Lidar Survey for Flood Analysis

Results:

- Faster!
- Cheaper!
- More accurate!
- Successful!

3cm Spatial Accuracy
Rainforest Penetration
40+ degree heat
Low mobilisation cost
65km² in 4 days



One more thing ...

One more thing ...





Phase One P5

Technical Specifications



Sensor Resolution	128 MP
Sensor Type	CMOS
Sensor Size	Medium Format
Shutter Type	Electronic Global Shutter
Dynamic Range	80 dB
Max Frame Rate	4 fps
Storage	CF Express Card up to 2TB
Lens Options	80 mm (HFOV: 32° VFOV: 23°) 35 mm (HFOV: 66° VFOV: 49°)

80 mm Option

GSD @60m	0.26 cm/px
GSD @120m	0.52 cm/px
Coverage @60m AGL	67 ha (0.26cm/px GSD, 70% overlap)
Coverage @120m AGL	135 ha (0.51cm/px GSD, 70% overlap)

35 mm Option

GSD @60m	0.59 cm/px
GSD @120m	1.18 cm/px
Coverage @60m AGL	154 ha (0.59cm/px GSD, 70% overlap)
Coverage @120m AG	309 ha (1.18cm/px GSD, 70% overlap)