



PLORAMINERÍA

Recursos y Reservas para la exploración Minera en Colombia

Outline

1. Introducción: Misión/Visión
2. Drones en la Minería :
 - Levantamiento topográfico de precisión
 - Ingeniería de Voladura
 - Inventario de Reservas y Cálculo de Volumen
 - Gestión de Activos e inspección de infraestructura
 - Monitoreo y Regeneración Ambiental
 - Nuevas Tecnologías de integración a través de GeoinGlobe S.A.S
3. Conclusiones

- We are a company that provides GIS applications consulting and advisory services for different industries and different areas of Geoscience for Engineering. We are a team of highly qualified professionals and specialists with a multidisciplinary academic background.
- We are a dynamic team of engineers, Geoscientists, US FAA certified aircraft pilots, US Certified drone pilots, Colombia Certified RPAS, GIS analysts, remote sensing specialists, aerospace engineers and so much more. Our employees are professional, passionate, hardworking and are motivated to make the world a safer place.
- We are committed to a culture of continuous improvement and empowering ingenuity.
- We are based on both Colombia and US markets.
- We offer opportunities to simplify the process of collecting, managing and utilizing information through on-site engineering, UAS technology and software solutions for the infrastructure and environmental markets.
- Through customized deliverables, we provide clients with the best insight and data to help manage their assets.

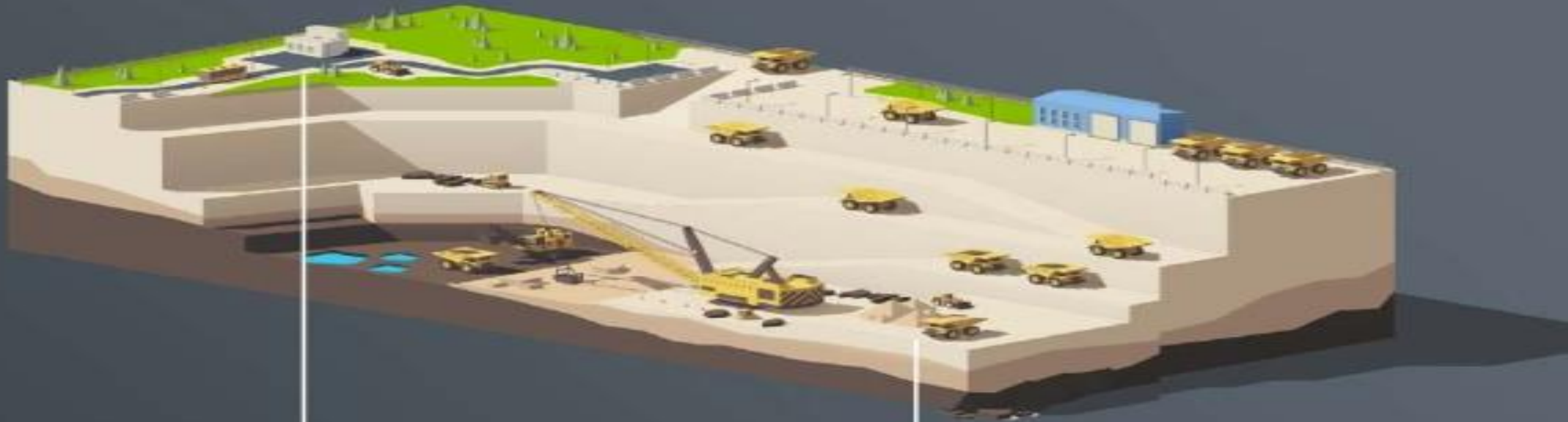


Our Vision

By 2025, GeoinGlobe will be the pioneer and leader in the integration of UAS (Drones) as a tool for rapid collection of GIS data to solve major problems that arise across different Industries. Our projects will also provide research findings to reduce technical barriers associated with integrating Unmanned Aircraft into the National Airspace System. These mechanisms will help to foster economic growth by reducing costs and improving survey methodologies.

Operational risk and compliance management

- Aerial surveying & 3D mapping
- Drill & blast planning & topography engineering
- Asset & infrastructure inspections
- Geotechnical inspection & structure characterization



Asset lifecycle management

- Base mapping for site designing
- Site surveys during construction
- As built versus as designed comparison

Supply chain management

- Stockpile management
- Production inventory
- Delivery forecasting

Why Unmanned Aerial Systems (UAS)?



**eBee + Con PPK y RTK
Incorporado**



Matrice 210 RTK





Los drones como equipo de minería



Reducción del riesgo operativo

Pronostique riesgos geotécnicos como derrumbes de rocas, entradas de agua y estabilidad de la pendiente.



Gestión de la cadena de suministro

Regule la cadena de suministro mediante un cálculo preciso y automático del volumen de existencias.



Gestión del ciclo de vida de los activos

Utilice un dron para ver todos los activos en cada etapa de su ciclo de vida.

Photogrammetry



Photogrammetry

“Photogrammetry is the science of obtaining reliable information about the properties of surfaces and objects without physical contact with the objects, and of measuring and interpreting this information”

is derived from the three Greek words:

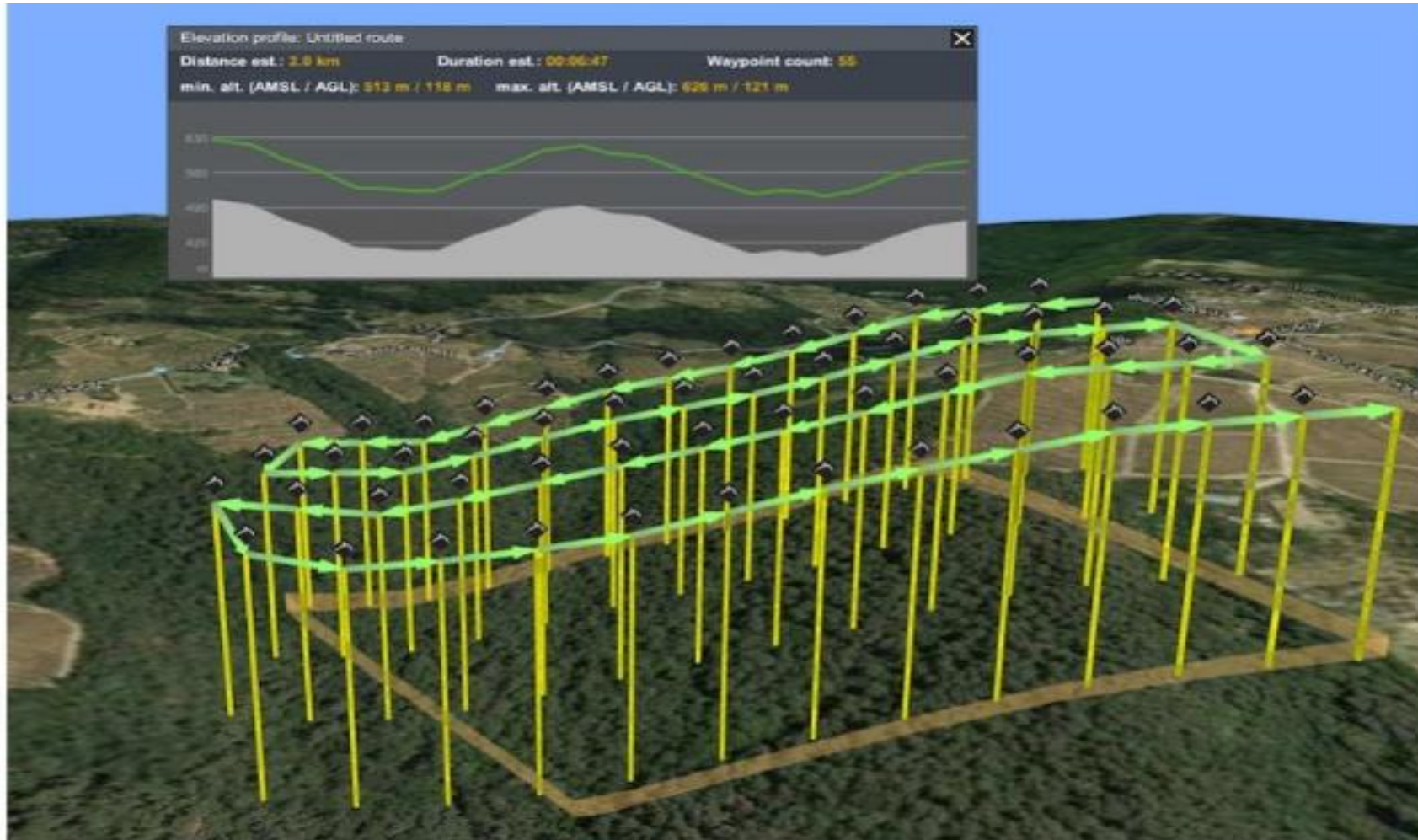
phos or phot → light

gramma → letter or something drawn

metrein → measure

Tomado de Schenk, 2005

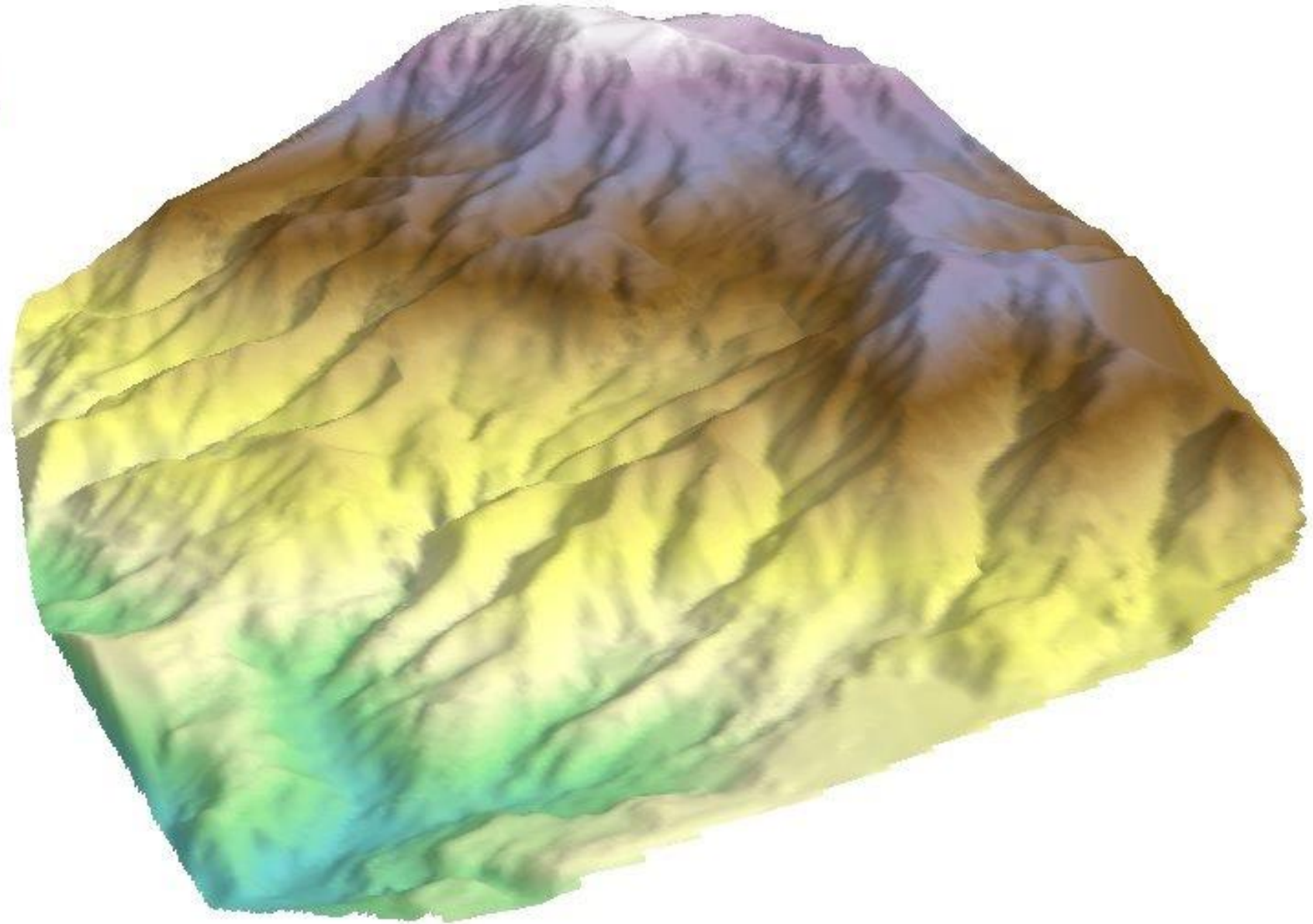
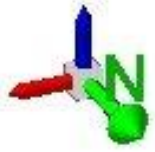
Survey Data with Topographic Profile



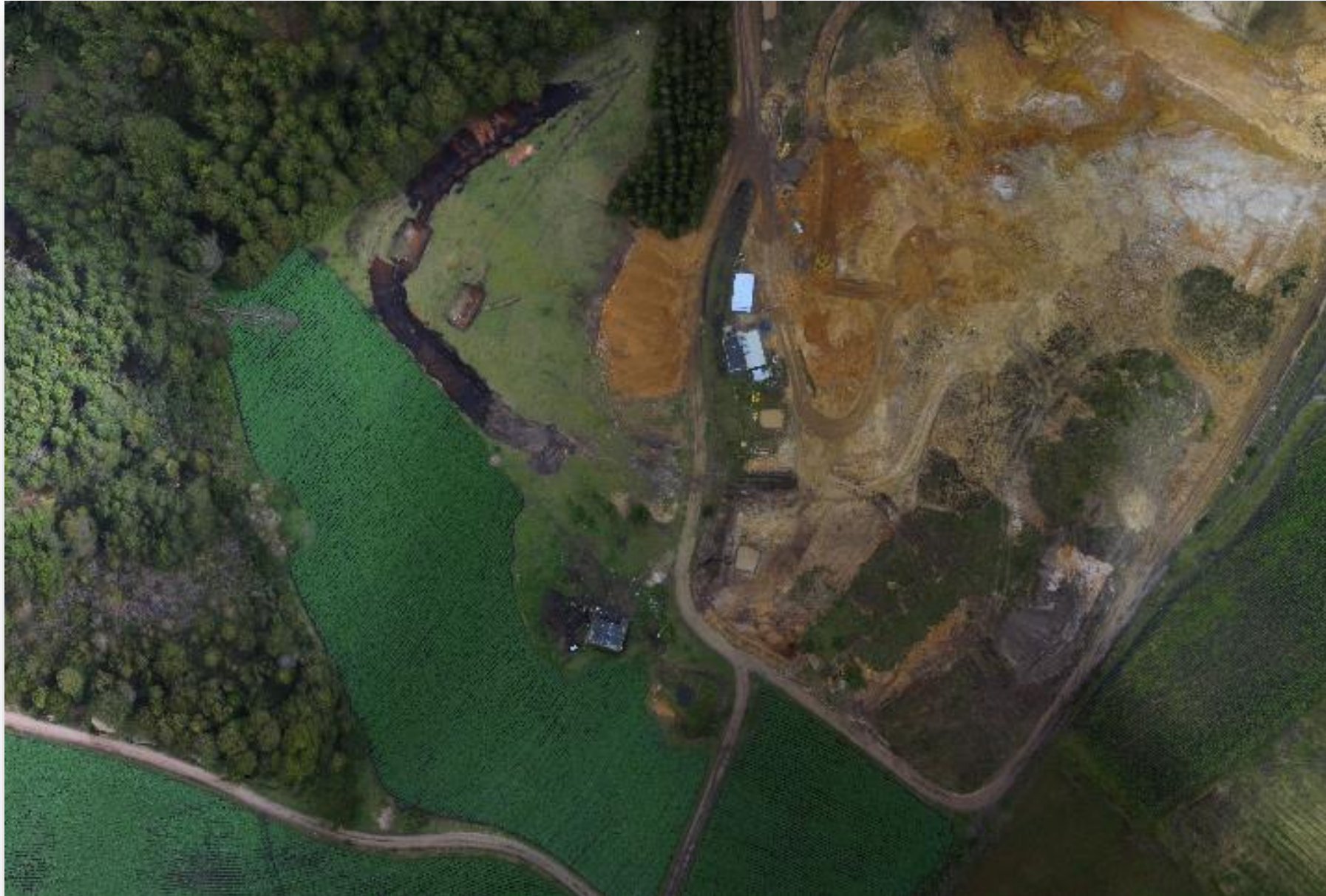
3D Point Cloud



Digital Terrain Model (DTM)



Orthomosaic



Global Navigation Satellite System (GNSS)



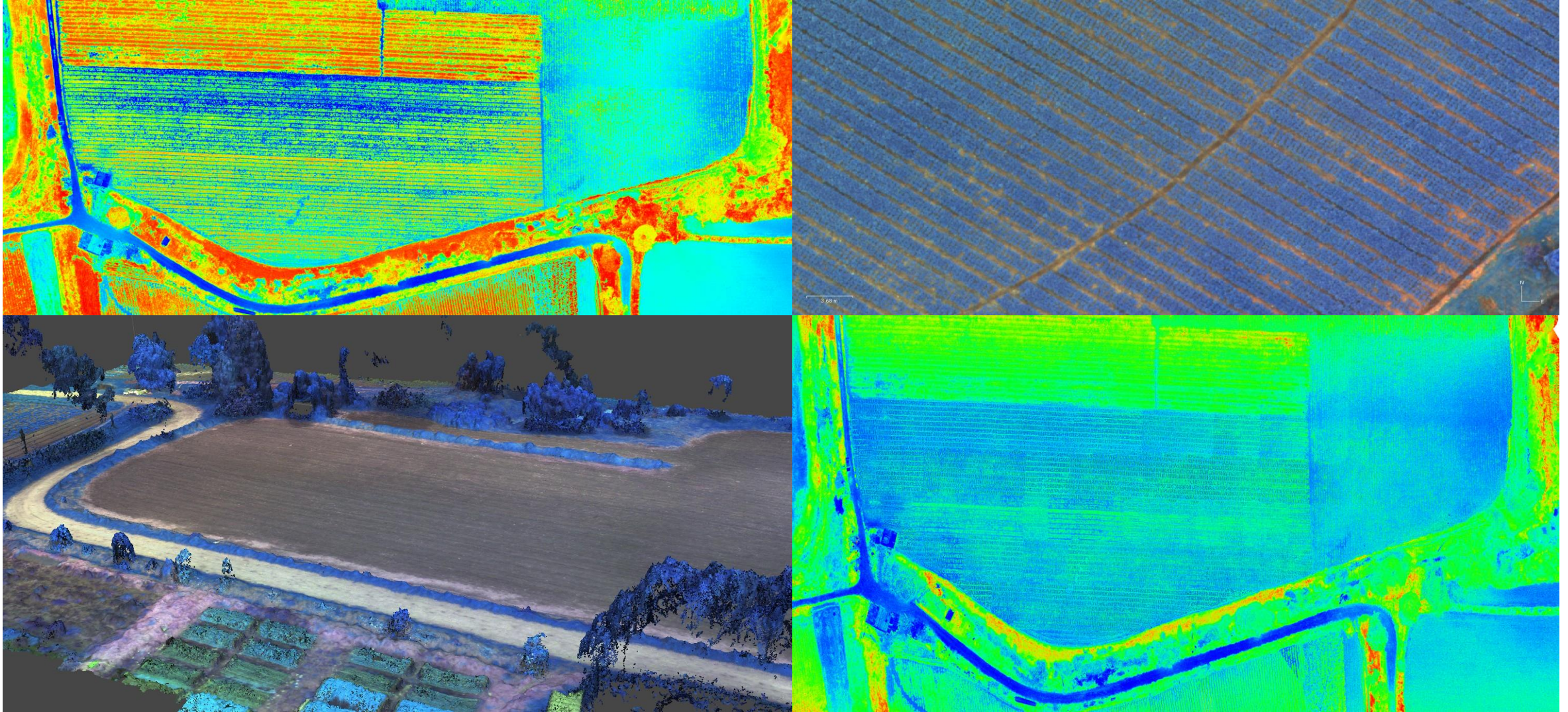
Ground Control Points (GCP)



Example: Tunja Project

AXIS	RMS (m)
x	0.022
y	0.019
z	0.032
Average GSD	3.77 Cm
Outputs	Orthomosaic, 3D Point Cloud, DTM, DSM, Contours
Processing Time	48 H

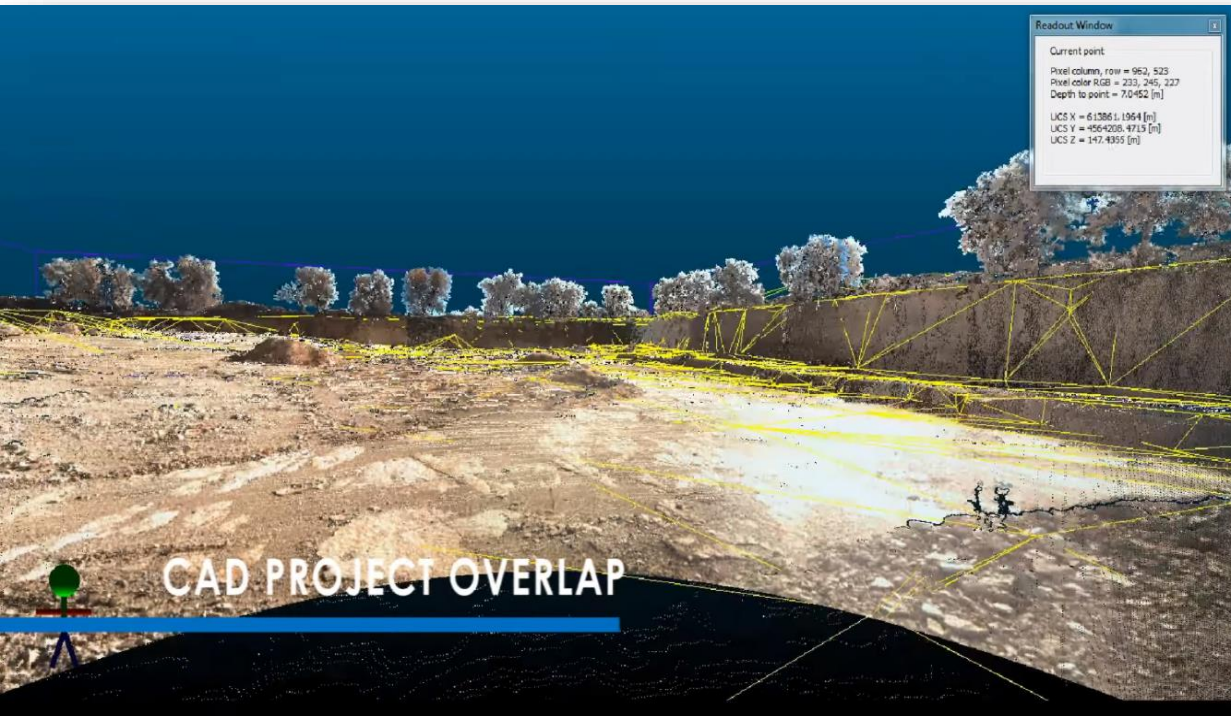
Multispectral Photogrammetry



Terrestrial Laser Scanning



Terrestrial Laser Scanning

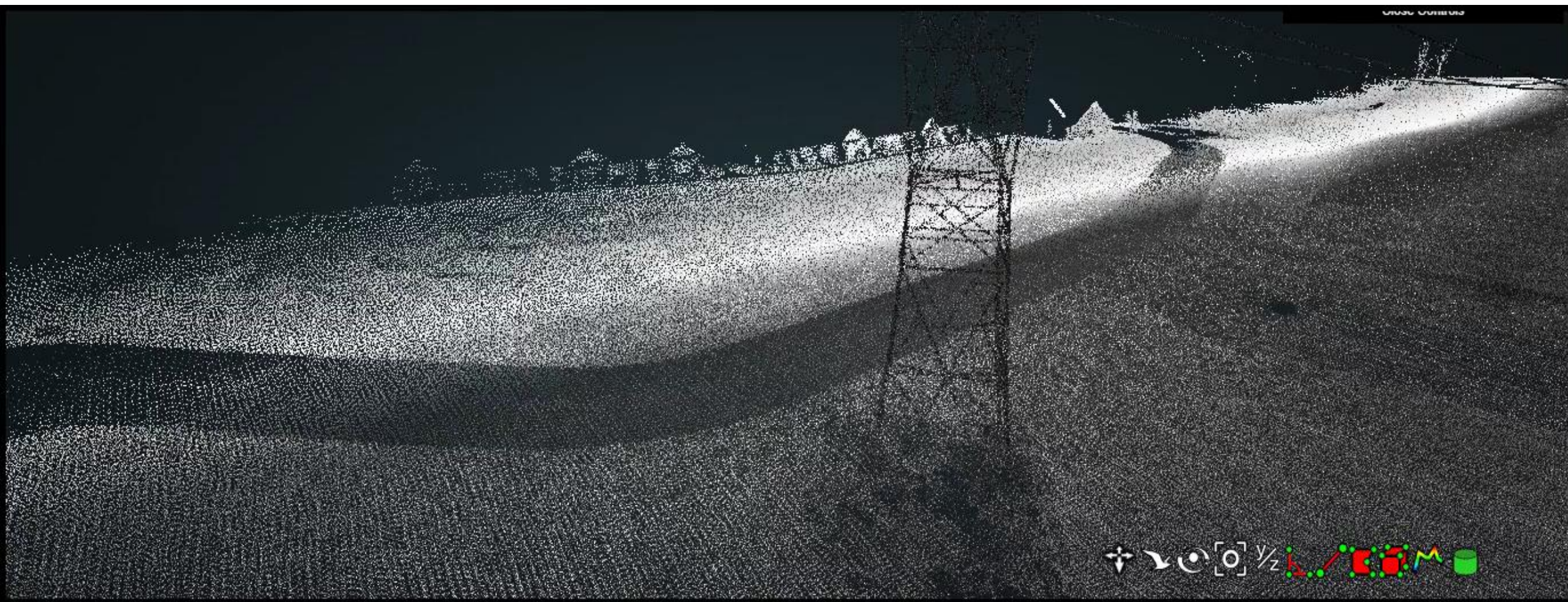


Tomado de STONEX

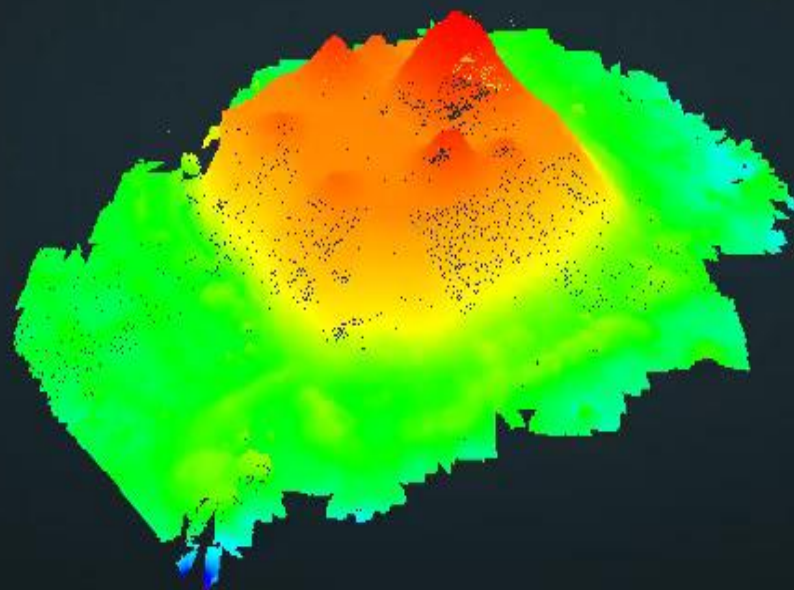


Lasergrammetry (LiDAR)





Tomado de LiDAR USA



Aerial Data with Land Data



Aerial Data with Land Data

Land Data:

Aerial Data

- | | | |
|---------------------|---|-------------|
| 1. Geochemical Data | + | Aerial Data |
| 2. Geophysical Data | + | Aerial Data |
| 3. Laboratory Data | + | Aerial Data |

Artificial Intelligence



Artificial Intelligence with Aerial Data

Start New Project

Project Name

Boston Post Road

Description

Description



Define your site location and boundaries

Don't have data collected? Get started by defining your site location



Upload .tiff and .las files

Get started by uploading your tiff and .las files

Tomado de Airworks

Artificial Intelligence with Aerial Data



Artificial Intelligence with Aerial Data



Artificial Intelligence with Aerial Data



Topography



Roads



Buildings



Sidewalks



Pavement
Markings



Vegetation



Water Surfaces



Manholes



Drains



Solar Panels

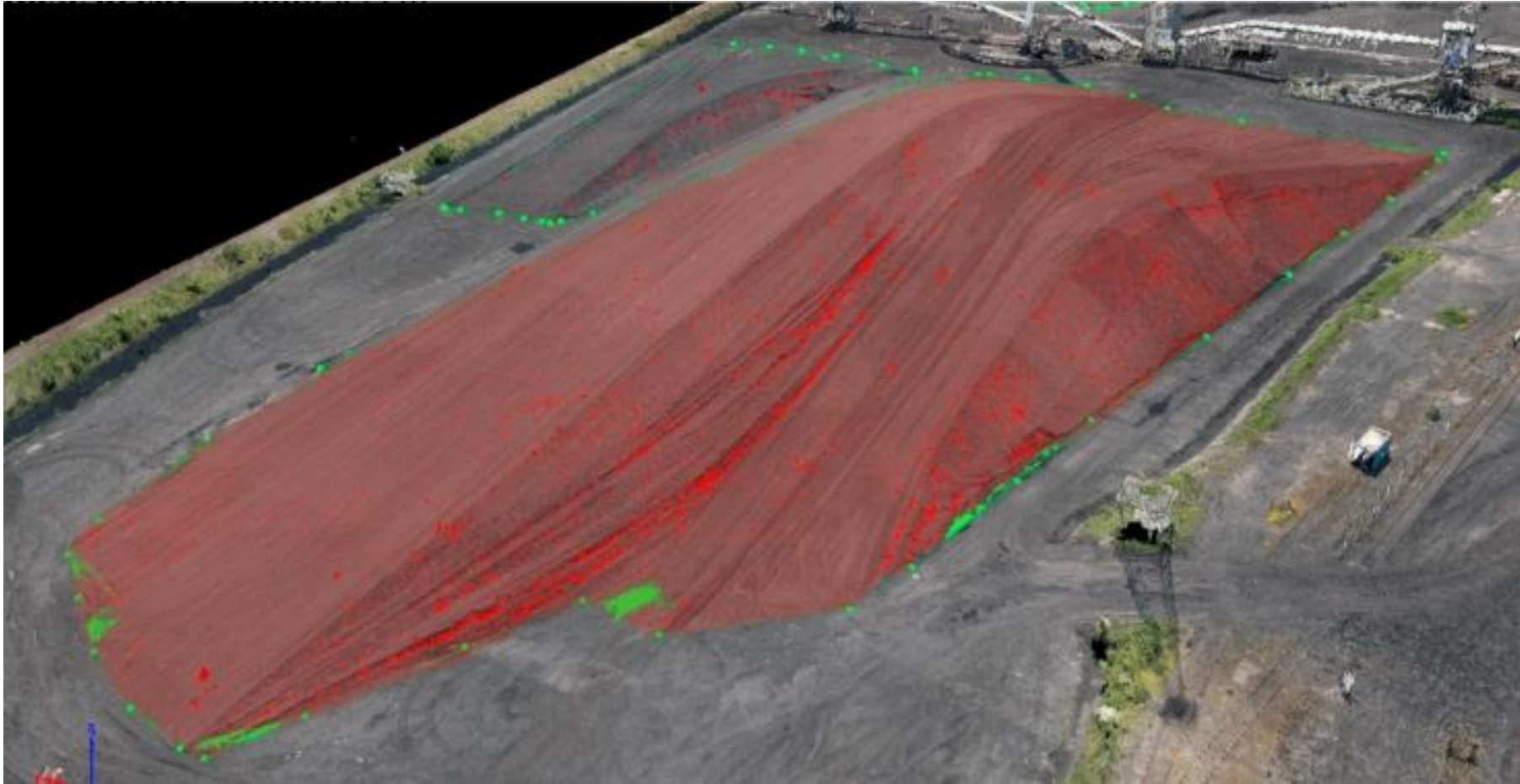
Case Studies



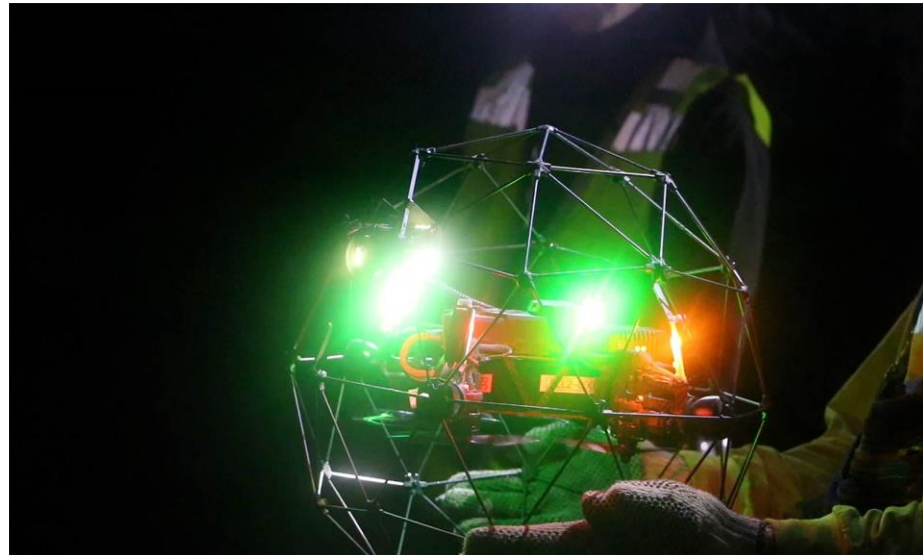
Inspección de infraestructura y activos



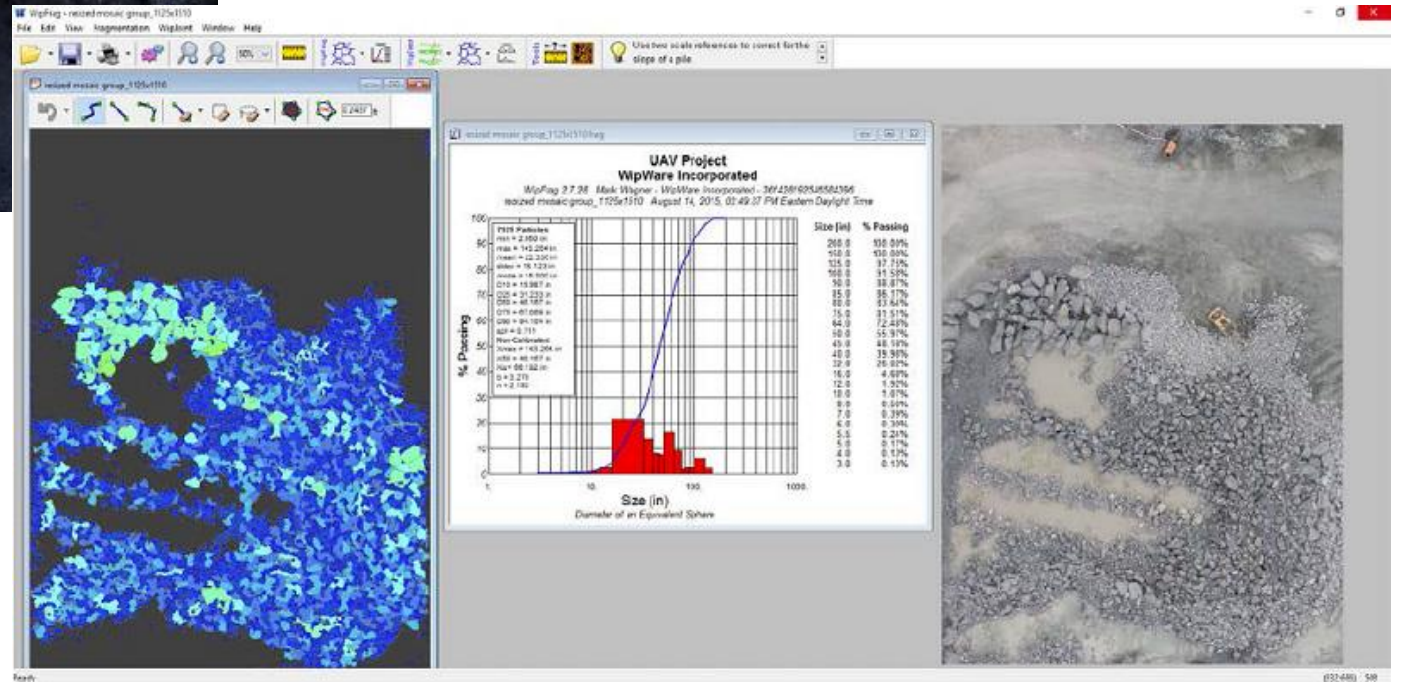
Medición de Volúmenes



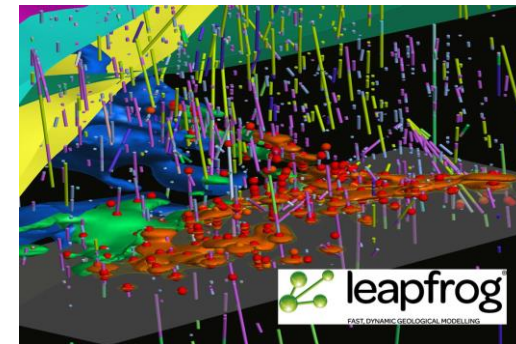
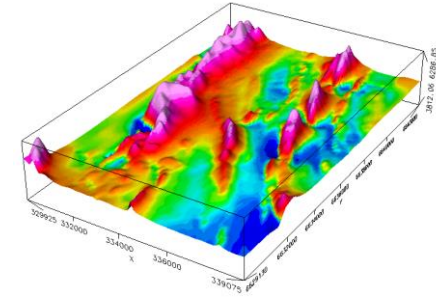
Minería Subterránea



Ingeniería de Voladura



Format Files		
Extensions	Outputs	Applications
.SHP	Contour Lines	Topography
.DWG	Contour Lines	Topography
.KML	Orthomosaic	Images visualization in common software like Google Earth
.PDF	Textured 3D Mesh	Interaction with a 3D model of an area using Adobe Acrobat Reader software
.TIF	Orthomosaic, Digital Terrain Model (DTM), Digital Surface Model (DSM), Index Maps	Territorial arrangement planning, risk studies, civil engineering projects, geomorphological & geological mapping
.ECW	Orthomosaic, Digital Terrain Model (DTM), Digital Surface Model (DSM), Index Maps	Territorial arrangement planning, risk studies, civil engineering projects
.JP2	Orthomosaic, Digital Terrain Model (DTM), Digital Surface Model (DSM), Index Maps	Territorial arrangement planning, risk studies, civil engineering projects
.LAS	Point Cloud produced with LiDAR or Photogrammetry	Realistic scenes, supplies to produce Digital Elevation Models (DTM or DSM), Classifications of surface objects
.LAZ	Point Cloud produced with LiDAR or Photogrammetry	Realistic scenes, supplies for produce Digital Elevation Models (DTM or DSM), Classifications of surface objects
.OBJ	3D Mesh	Model for 3D Printer, architectural design, urban planning, geological modeling.



Optimización Tiempo, Costos, Eficiencia

Área	Topografía Convencional	Fotogrametría	Fotogrametría Multiespectral	Lasergrametría
200 Ha	\$ 100,000,000	\$ 30,000,000	\$40,000,000	\$ 50,000,000

Ejemplo : Adquisición de datos para 200 Ha

Tiempo	Topografía Convencional	Fotogrametría	Fotogrametría Multiespectral	Lasergrametría
Tiempo Promedio	4 - 6 meses	1-2 días	1-2 días	1-3 días

