

Department of Land Reform and Rural Development

National Drone Programme, **Sharing our journey**

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WHY?



SPATIAL
PLANNING



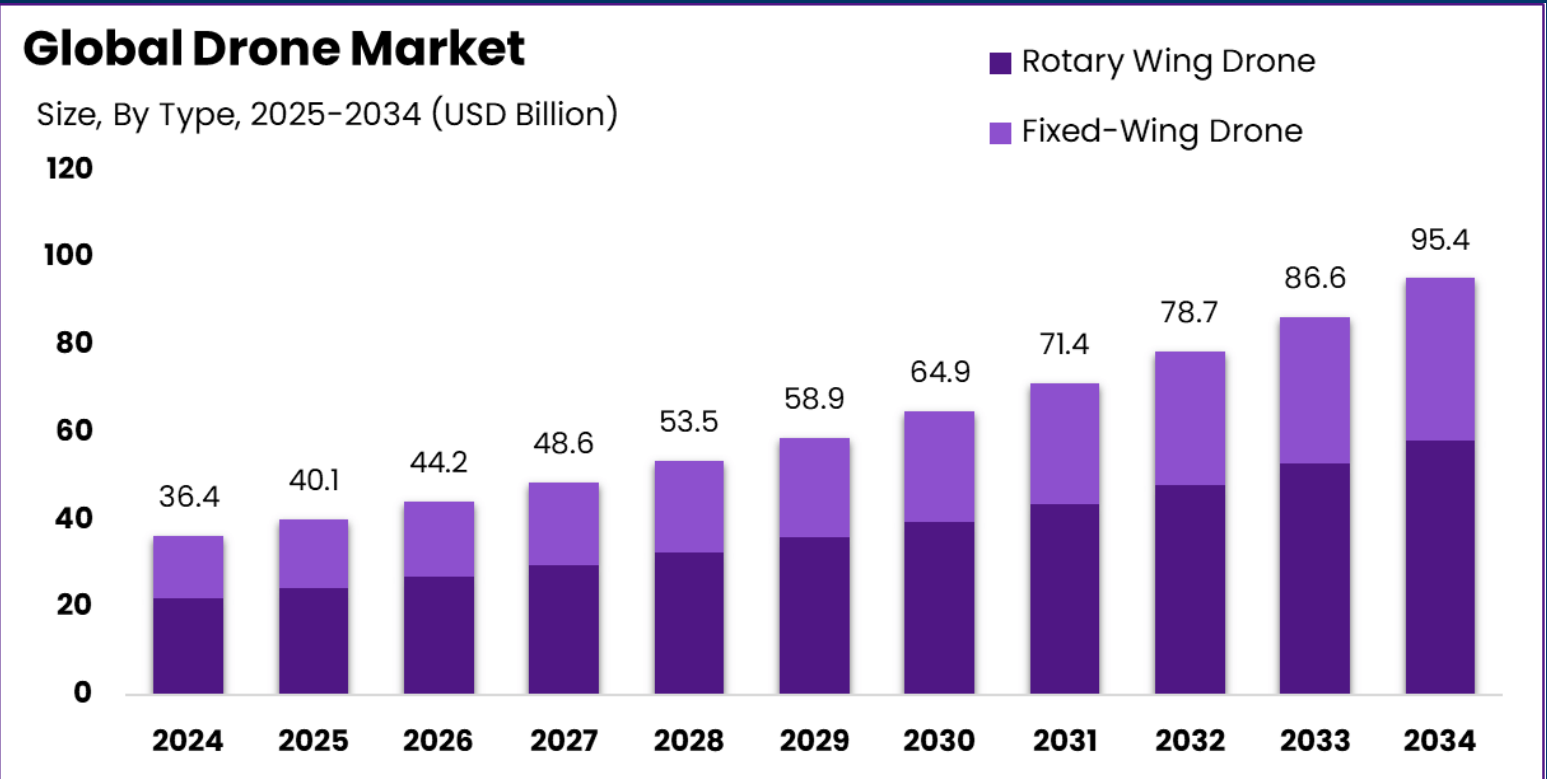
DISASTER
MANAGEMENT



SERVICE
DELIVERY

FOCUS?

Drones are Pushing the Boundaries of Technology

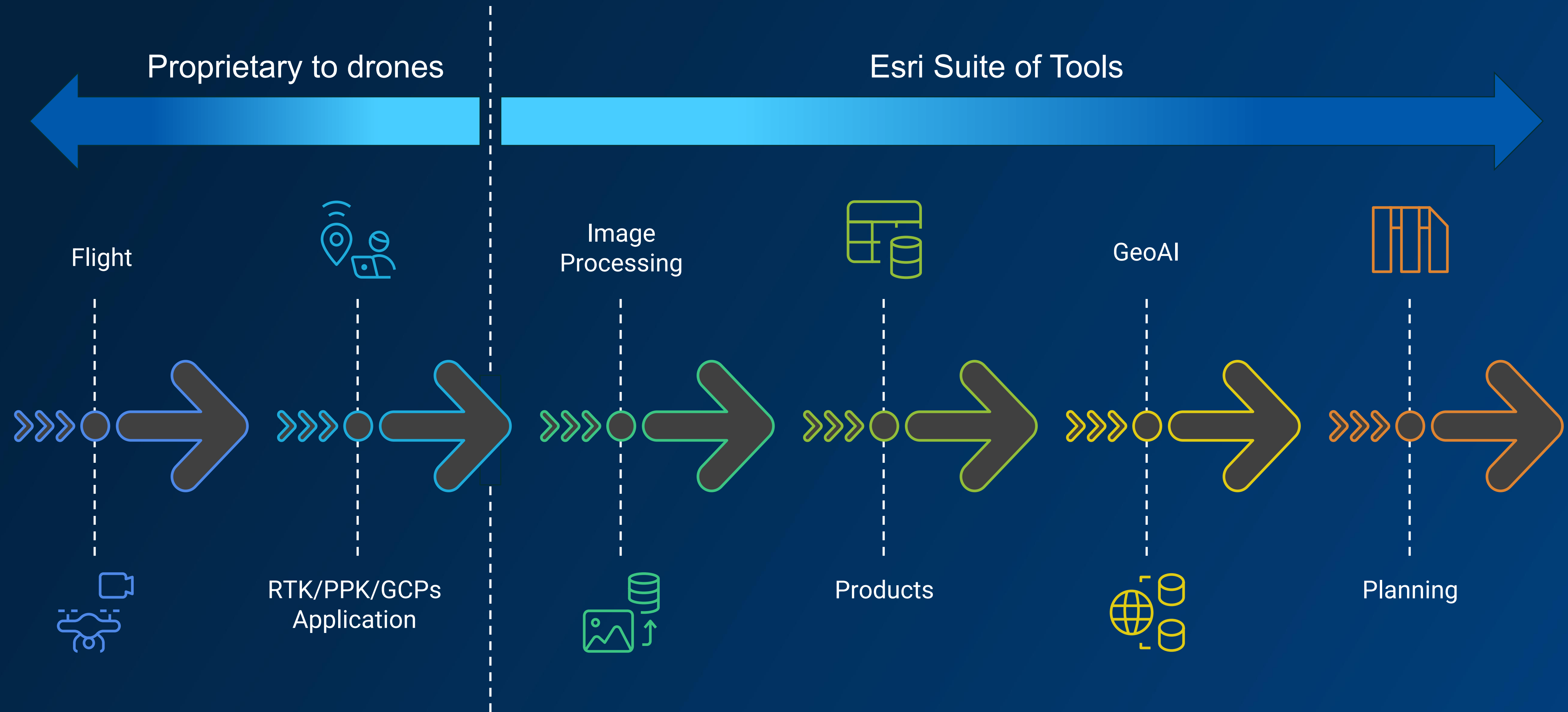


The Market will Grow At the CAGR of: **10.1%** The Forecasted Market Size for 2034 in USD: **\$95.4B** [market.us](https://www.market.us)



Who moved my data source...

From Drones to Decisions



Building Blocks of a Legal Drone Flight



All can be a PILOT

Rural Agricultural Advisor

GISc Practitioner

Land Surveyor

Rural Infrastructure Professional

Spatial Planning Professional

Property Valuer

Updated: 2025/10/14

Province	Number of Pilots	Number of Multirotor drones	Number of Fix-wing Drones
Eastern Cape	2	2	
Free State	10	10	3
Gauteng + National Office	10	10	2
KwaZulu-Natal	2	2	2
Limpopo	2	2	2
Mpumalanga	2	2	1
North West	2	2	1
Northern Cape	2	2	1
Western Cape	10	2	2

Female Pilot

Male Pilot

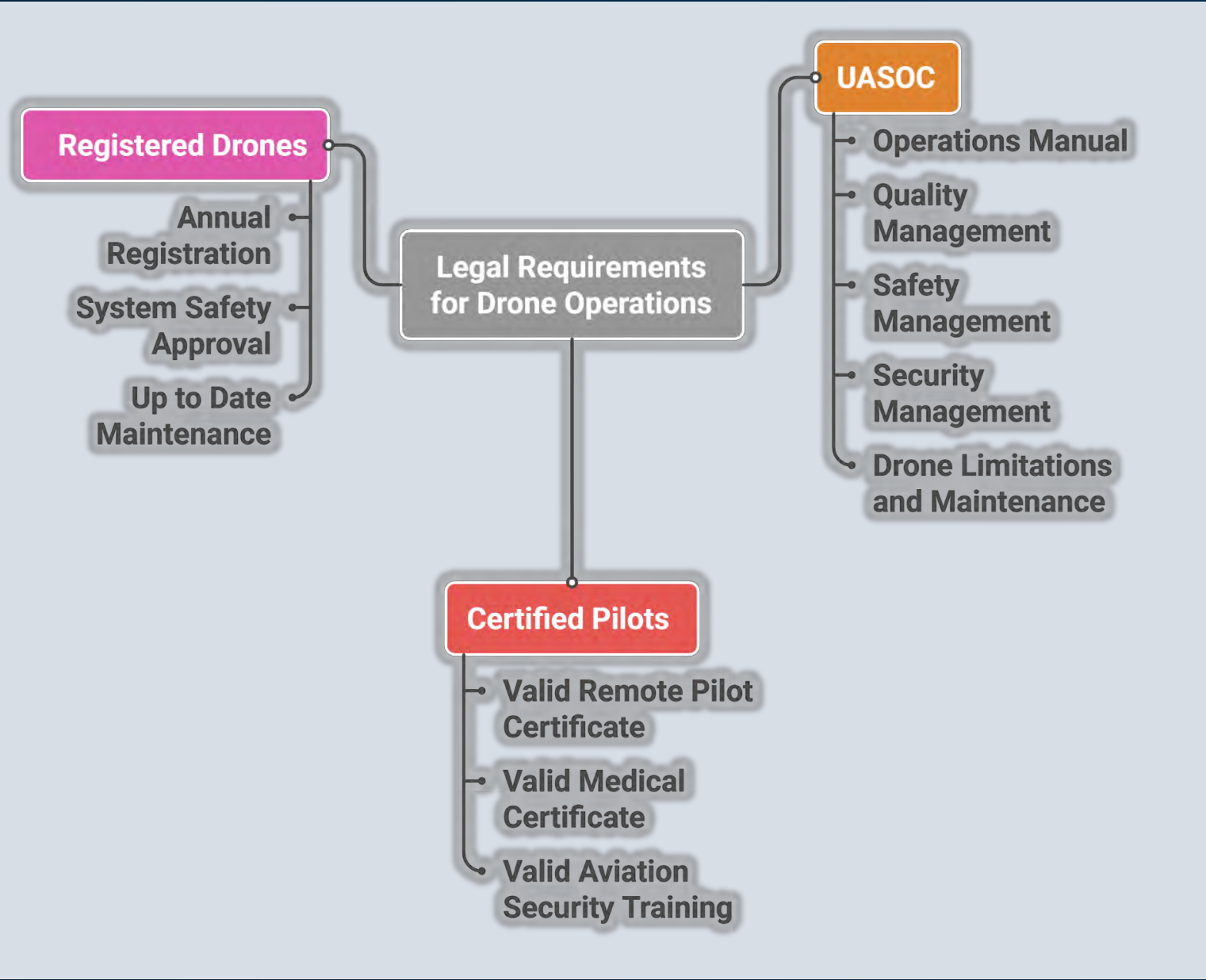
Multicopter drone (M3M x10, M3E x1, M2E x1)

Multicopter drone (utilised under DLRD UASOC)

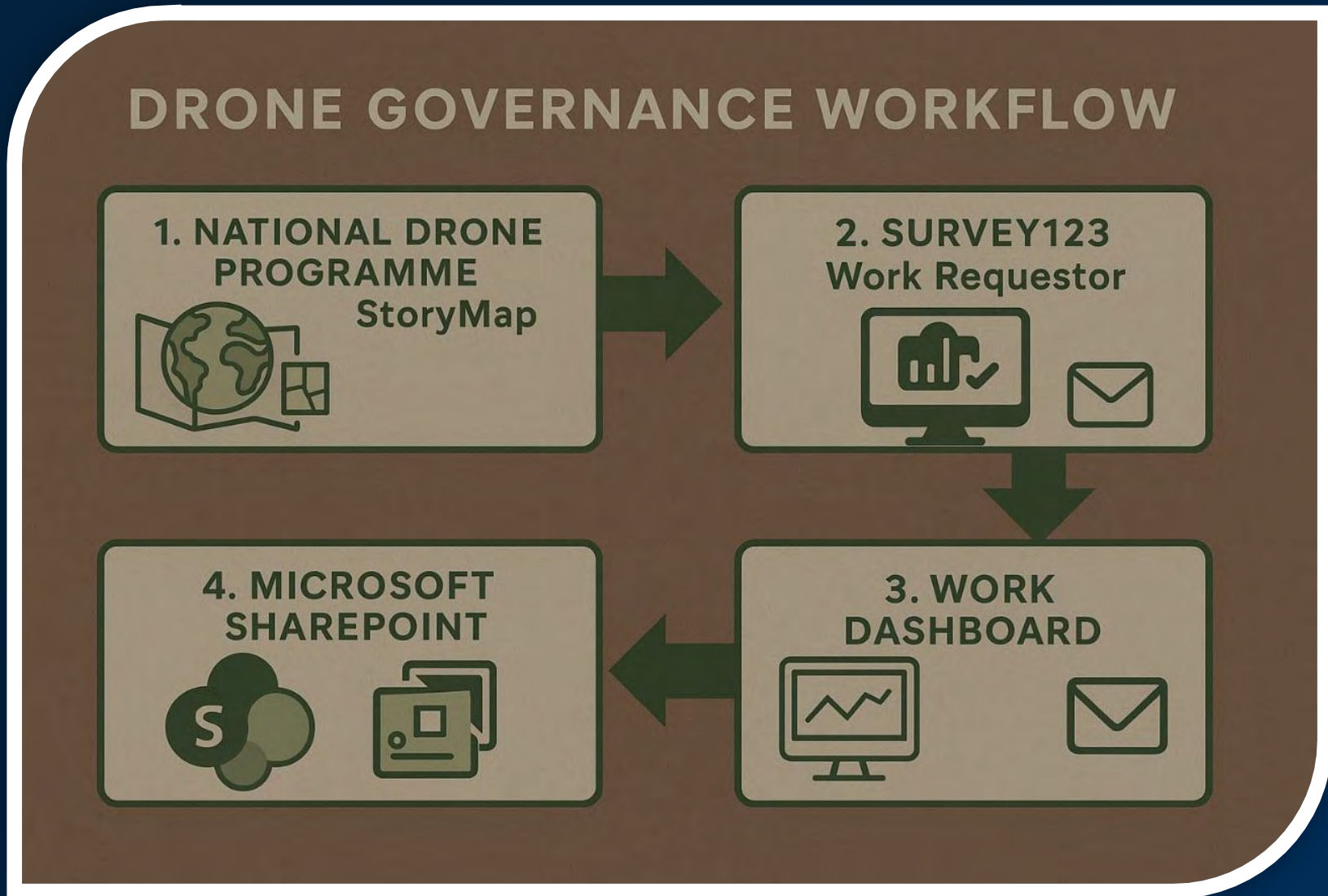
Multicopter drone (future 2025/2026)


Fixed-Wing Drone

In registration



Systems to run the National Drone Programme





Collection

DLRRD National Drone Programme


DLRRD is strategically implementing drone technology within the agriculture and land administration sectors.

UASOC Team


This site and all related pages are intended for DLRRD use only.

The Department of Land Reform, and Rural Development (DLRRD) is strategically implementing drone technology within the land administration sectors. This initiative aligns with the Constitution and the National Development Plan, fulfilling mandates established by the Spatial Planning and Land Use Management Act (SPLUMA), Spatial Data Infrastructure Act (SDI Act), and the Surveying Act.


The DLRRD's strategic deployment of this technology ensures adherence to national legislation and




1 Drone Programme Video




2 Drone Work Requests




3 Drone work request Dashboards (Not all work is shown here for security...)




4 Training Application and documents




5 Vision and details of the Drone Program




6 Flight Planning (Log flight request)



7 Empty Land Owners Permission form Ver3



8 WGS84 Global Ellipsoid Data for Drone Pilots



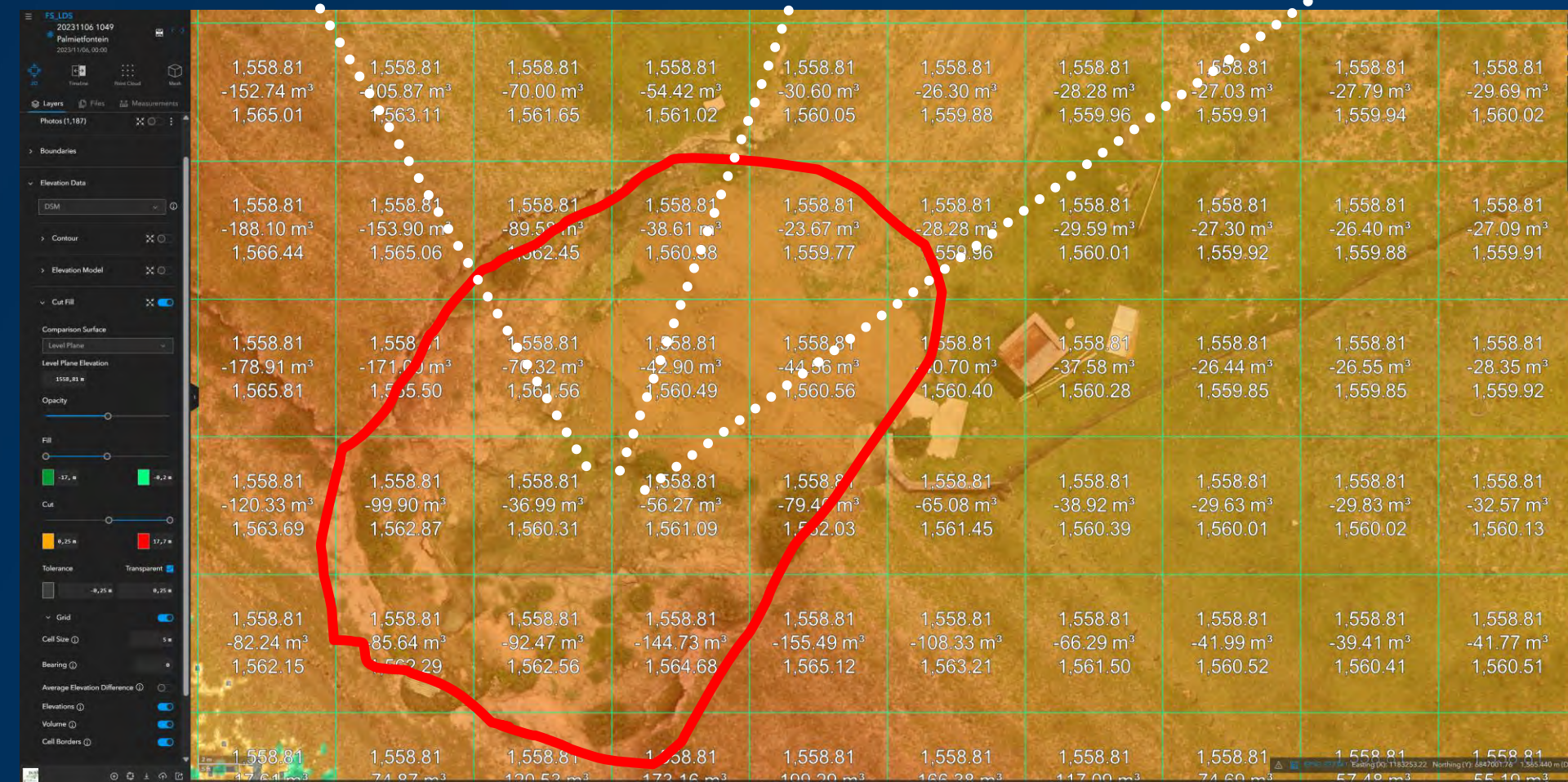
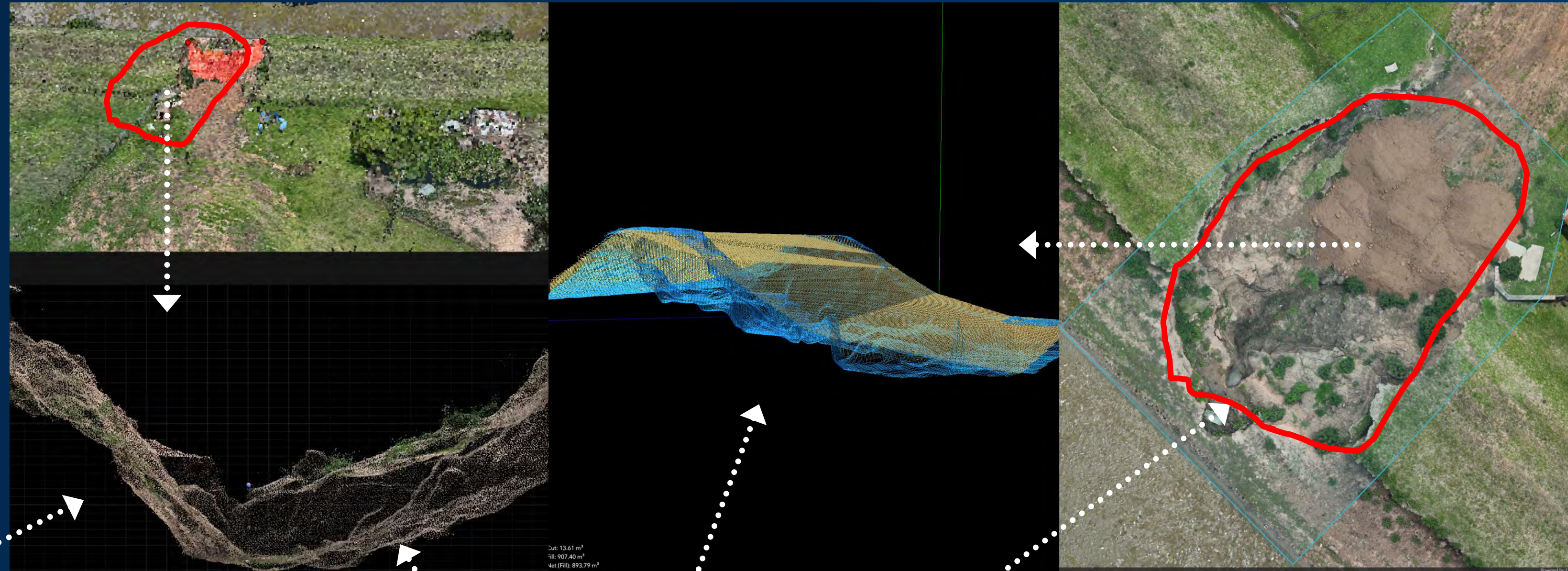
9 Nelson Mandela Bay Disaster

Palmietfontein - Dam Wall Break

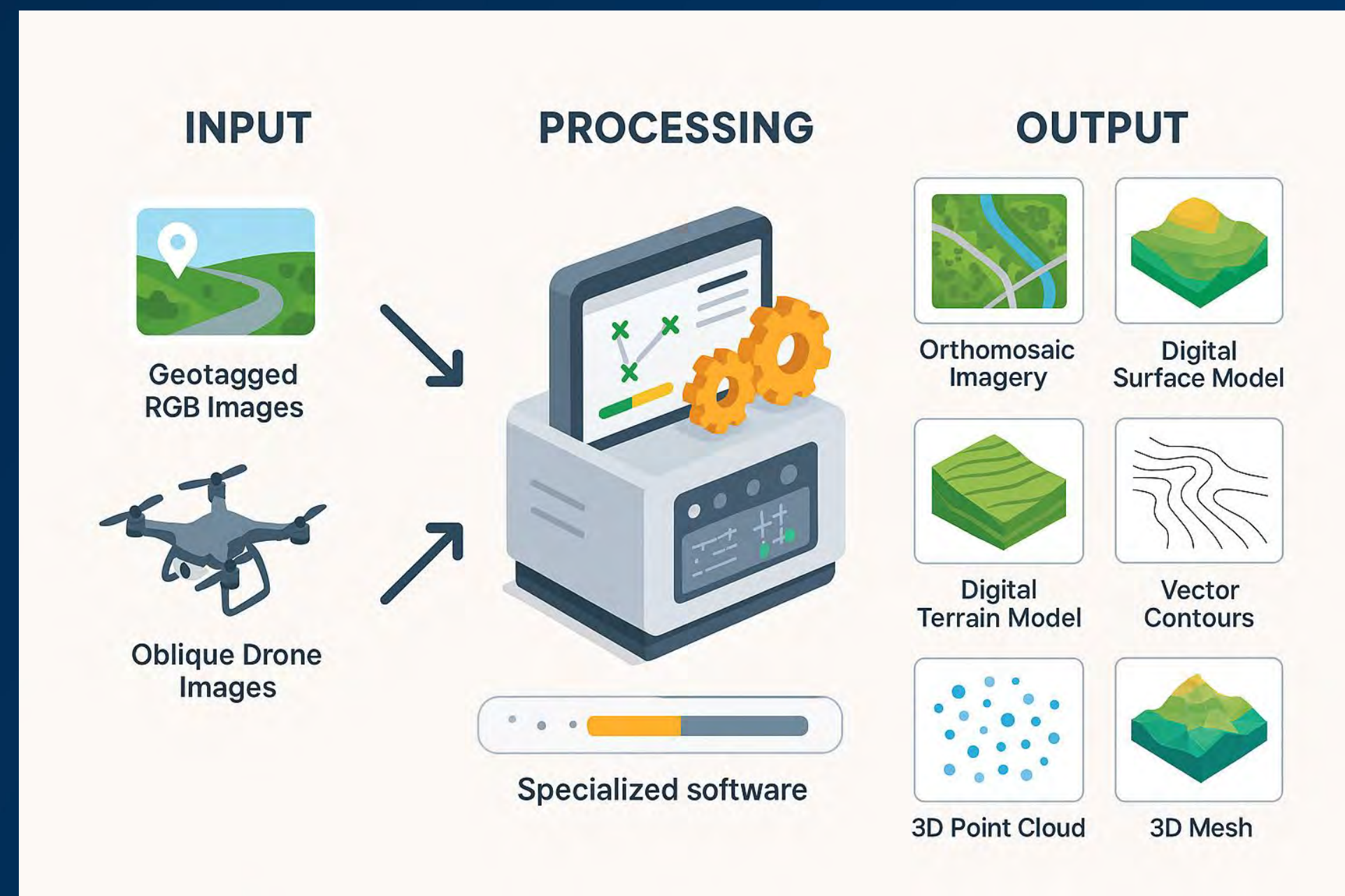
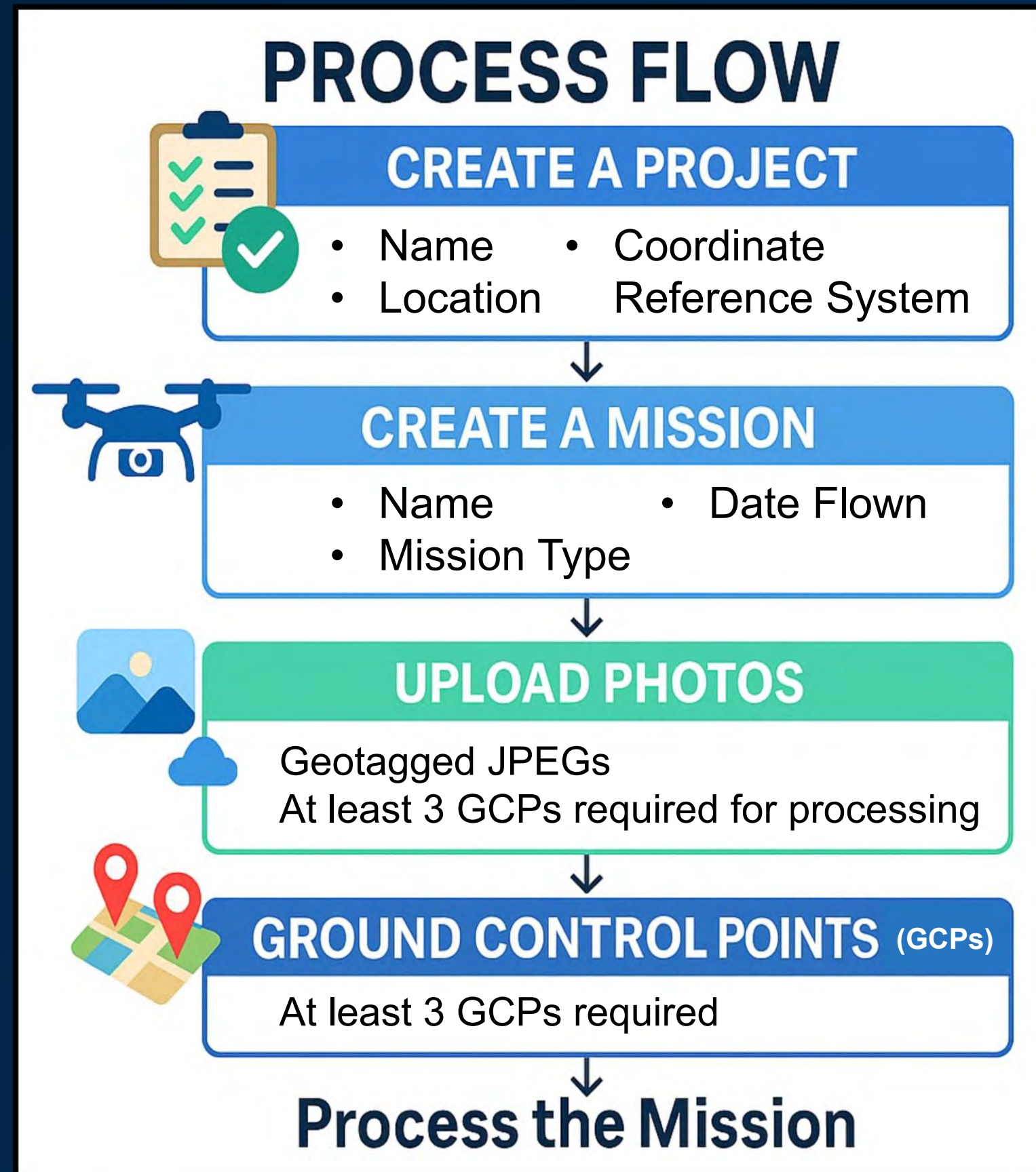
Solutions for all

Standard Operating Procedures assist with the creation of products from drone data.

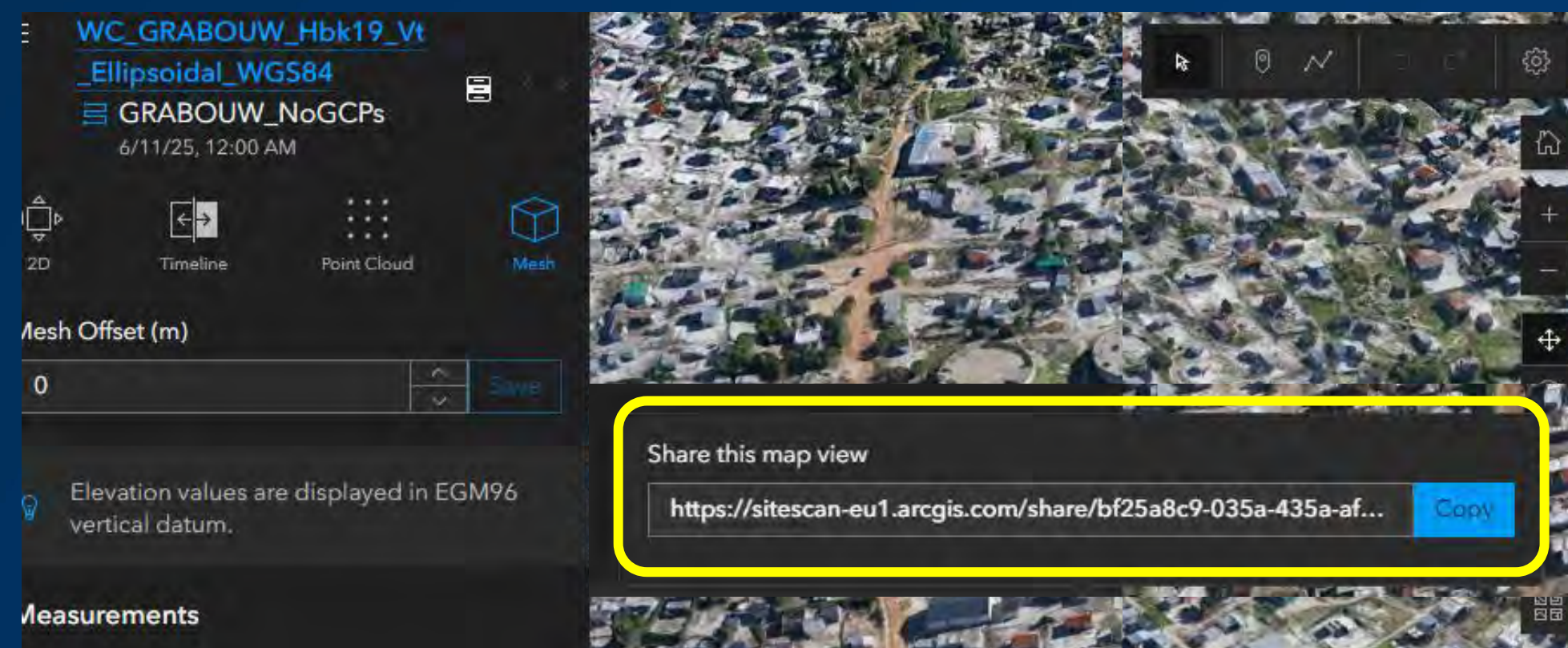
- Anyone can do it (professionals)
- Palmietfontein Dam
- 12-minute flight
- 328m x 226m



Processing Data – ArcGIS SiteScan



Fly once,
Create multiple products

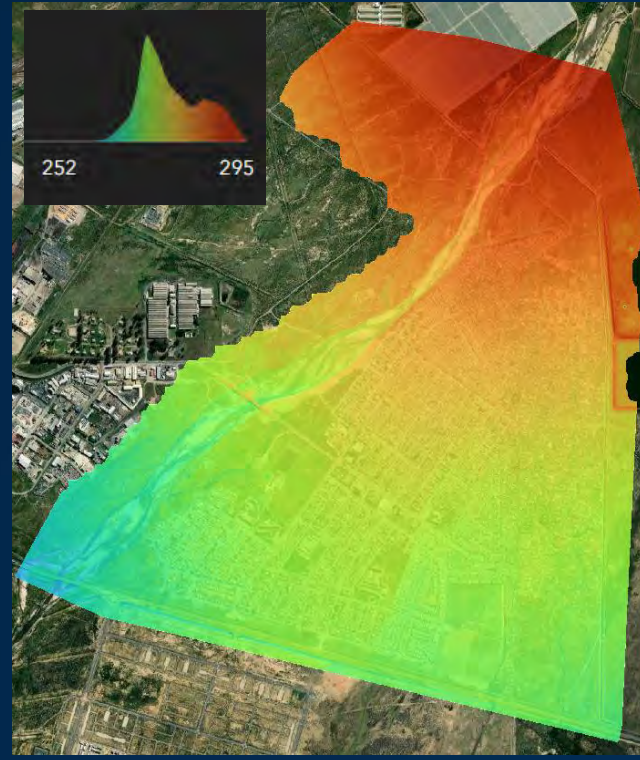


Processing Data – ArcGIS SiteScan / Drone2Map

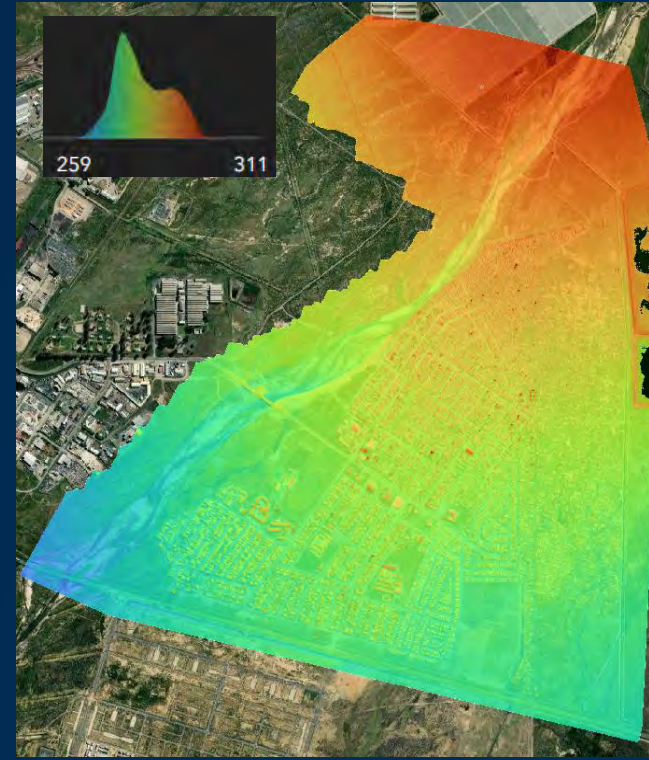
A simple RGB flight with 80% overlap will produce:



Orthomosaic (RGB)



DTM



DSM



DTM



DSM



Point Cloud (RGB Sensor)



3D Mesh (RGB Sensor)

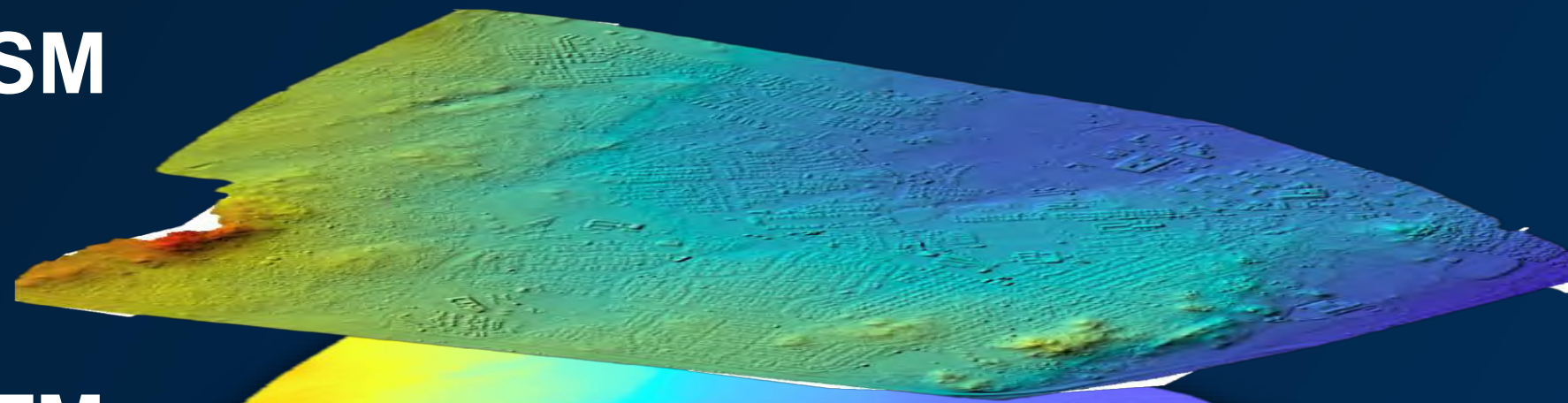


3D Mesh (Oblique Sensor)

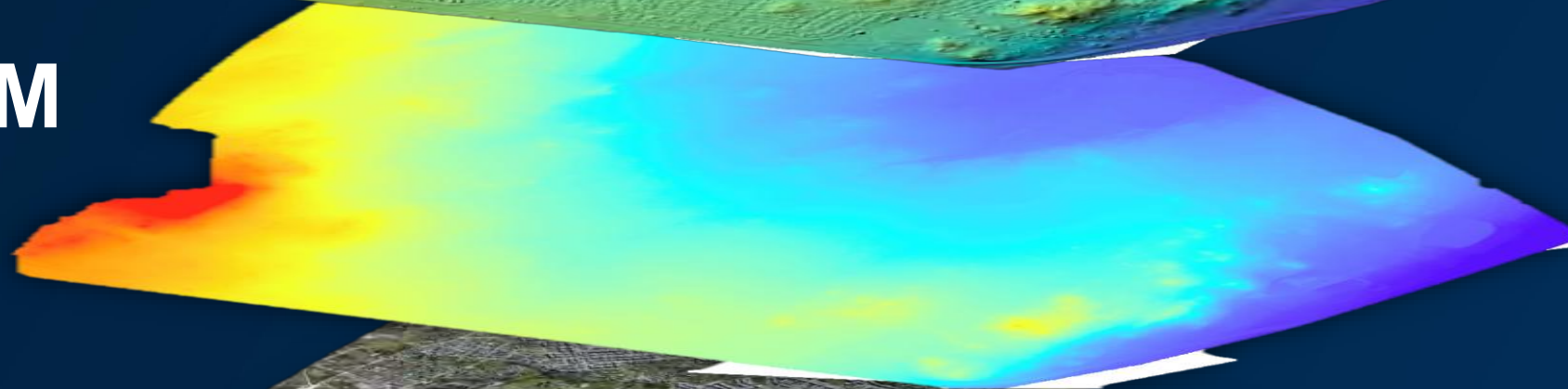
The Challenge of Urban Resilience

Human Settlement Management

DSM



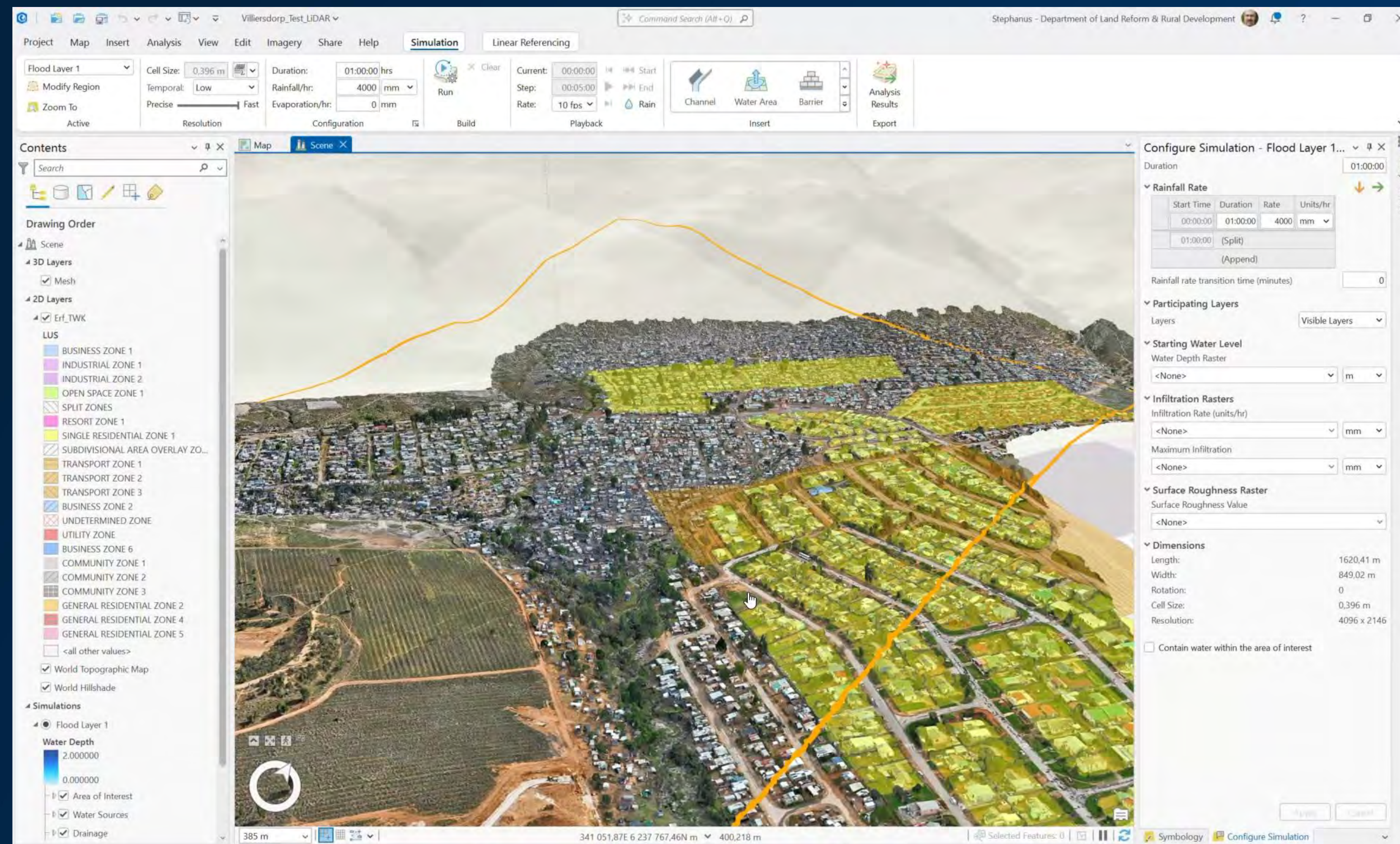
DTM



RGB



The Challenge of Urban Resilience



If you can simulate
it, people will
believe in it.

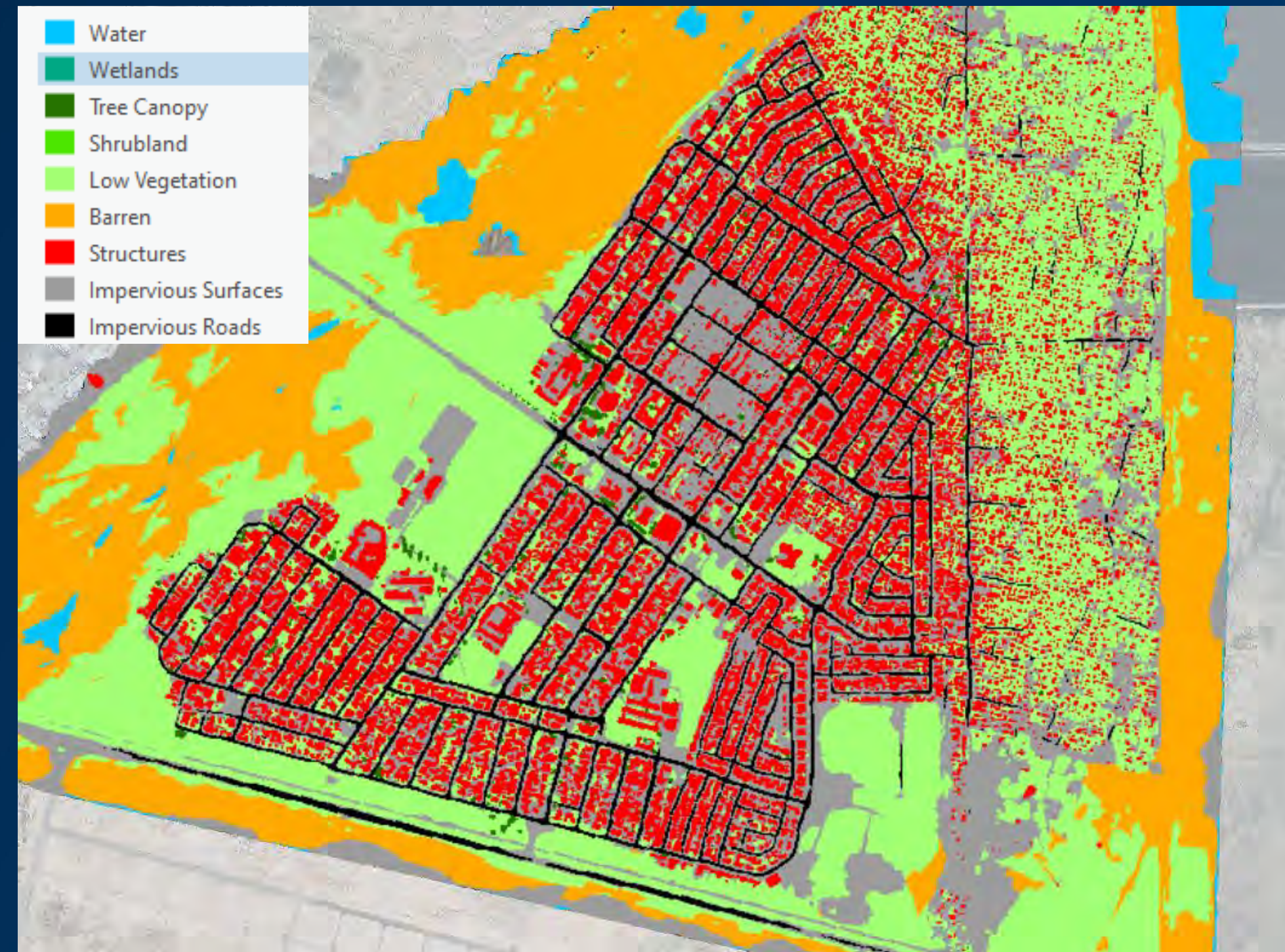
*Geoscience
in action...*

The Challenge of Urban Resilience

GeoAI Extracting Zweletemba Town Sprawl From Drone Footage



Tool: "Classify Pixels using Deep Learning"



Model Definition: HighResolutionLandCoverClassification_USA.dlpk

Unlocking insight in under 20 minutes

Orthomosaic and Land Cover generated using GeoAI

The Challenge of Urban Resilience

GeoAI extracting Zweletemba town sprawl from drone footage

50 cm Resolution



25 cm Resolution



15 cm Resolution



3 cm Resolution

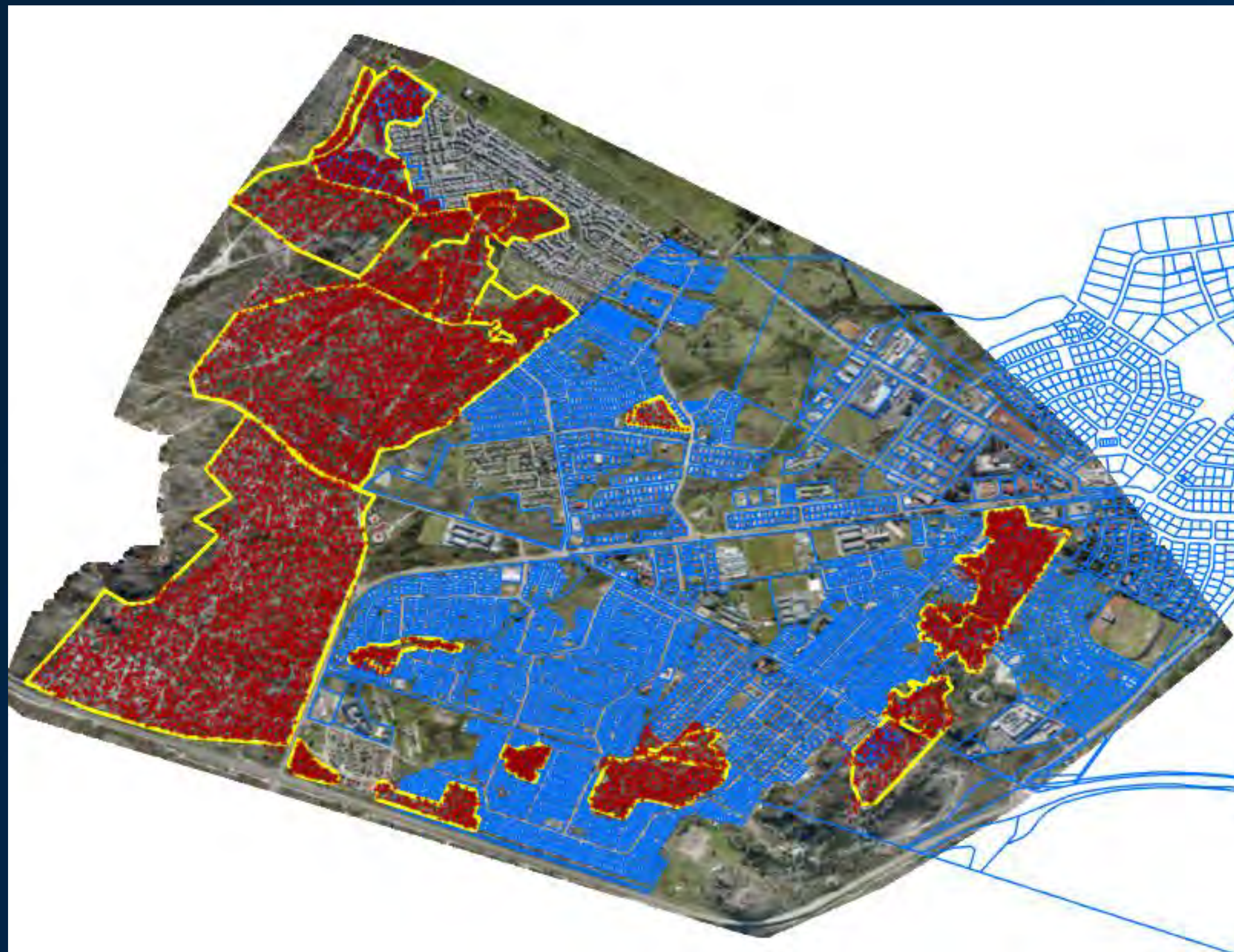


Vehicle

Outdoor Toilet with shadow

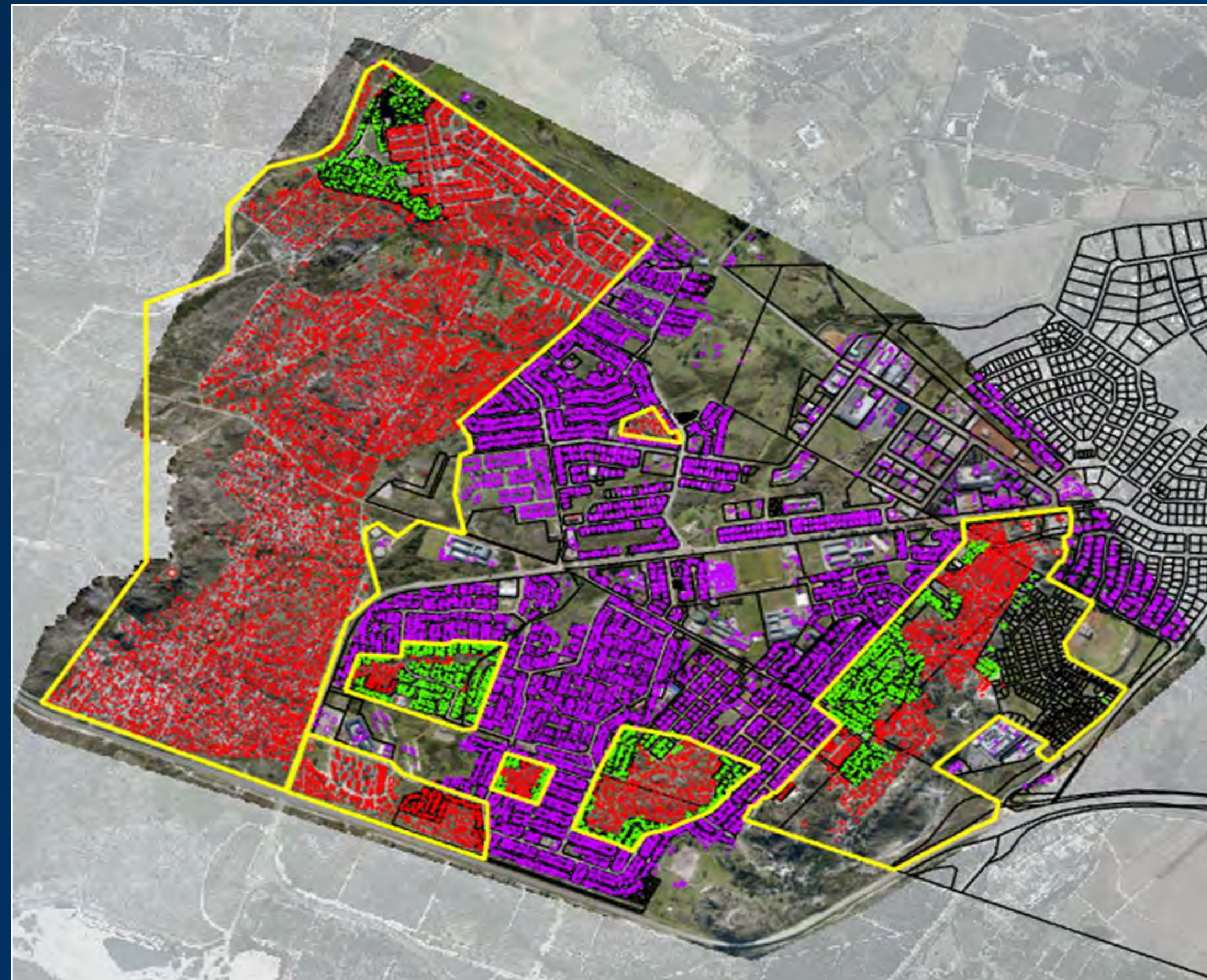
The Challenge of Urban Resilience

GeoAI extracting Grabouw town sprawl from drone footage



Count using Manual Digitising

± 12 400 structures (red)



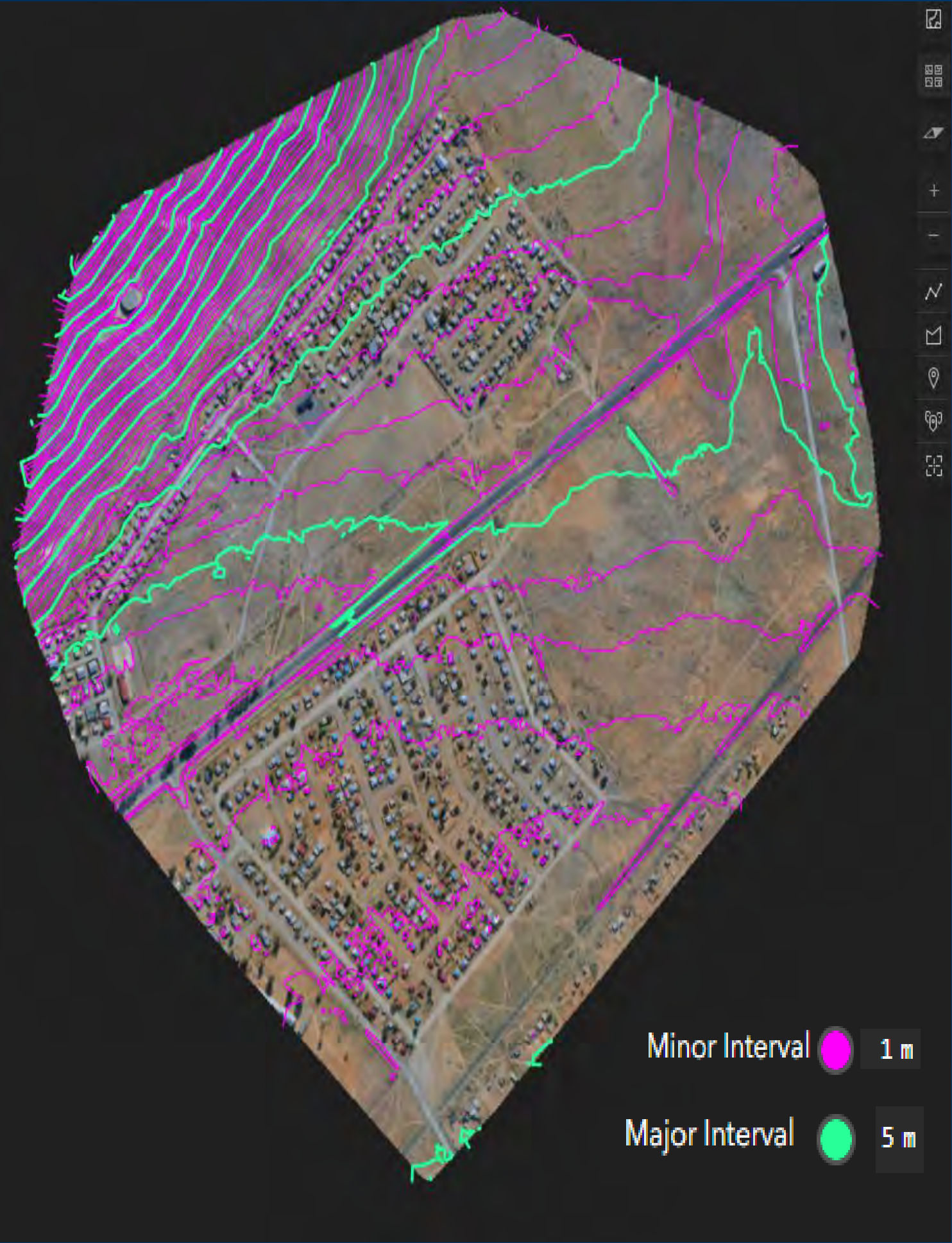
Count using GeoAI + Refinement

± 15 800 structures (red+green)

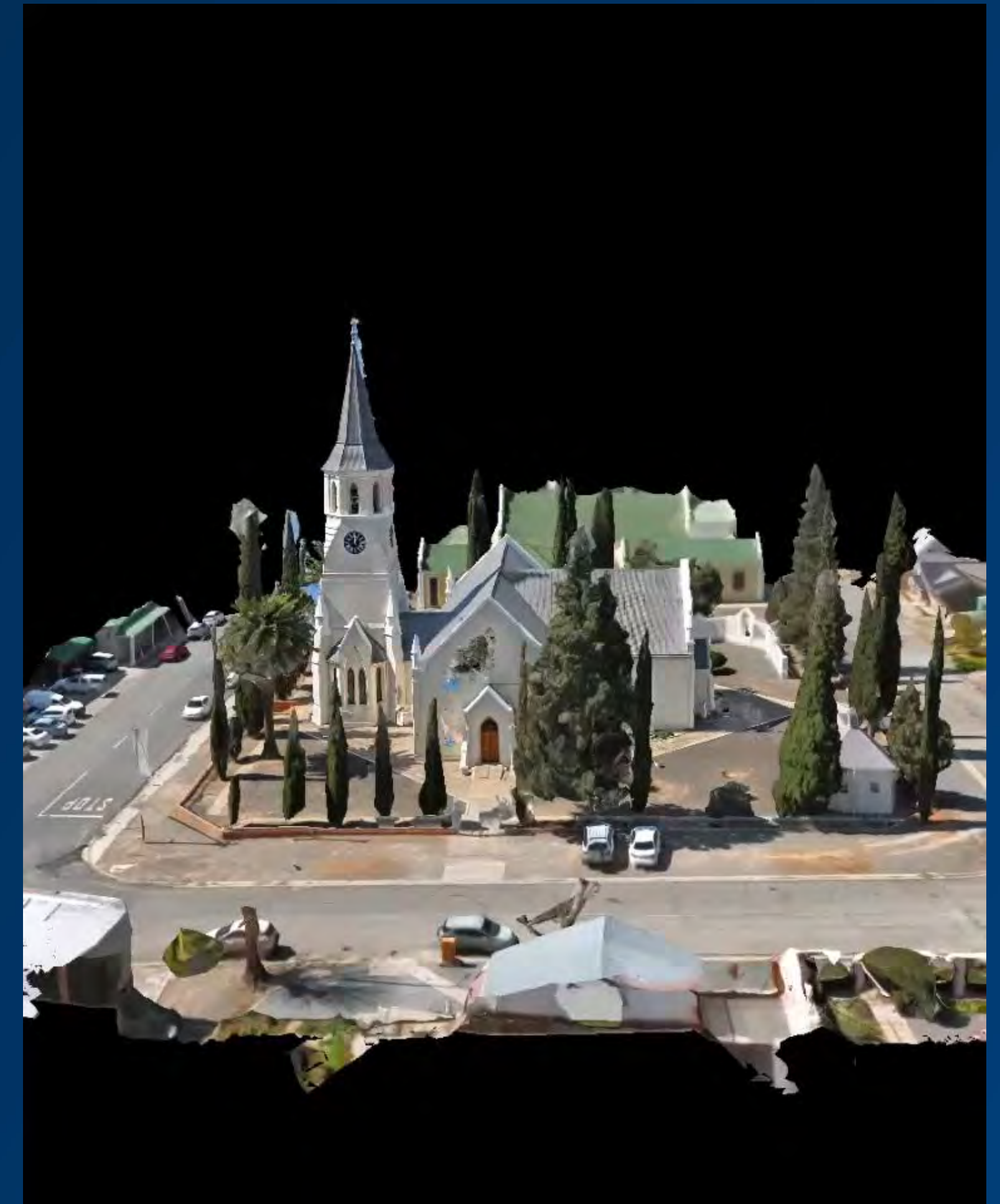
Correlation vs Causation - Grabouw



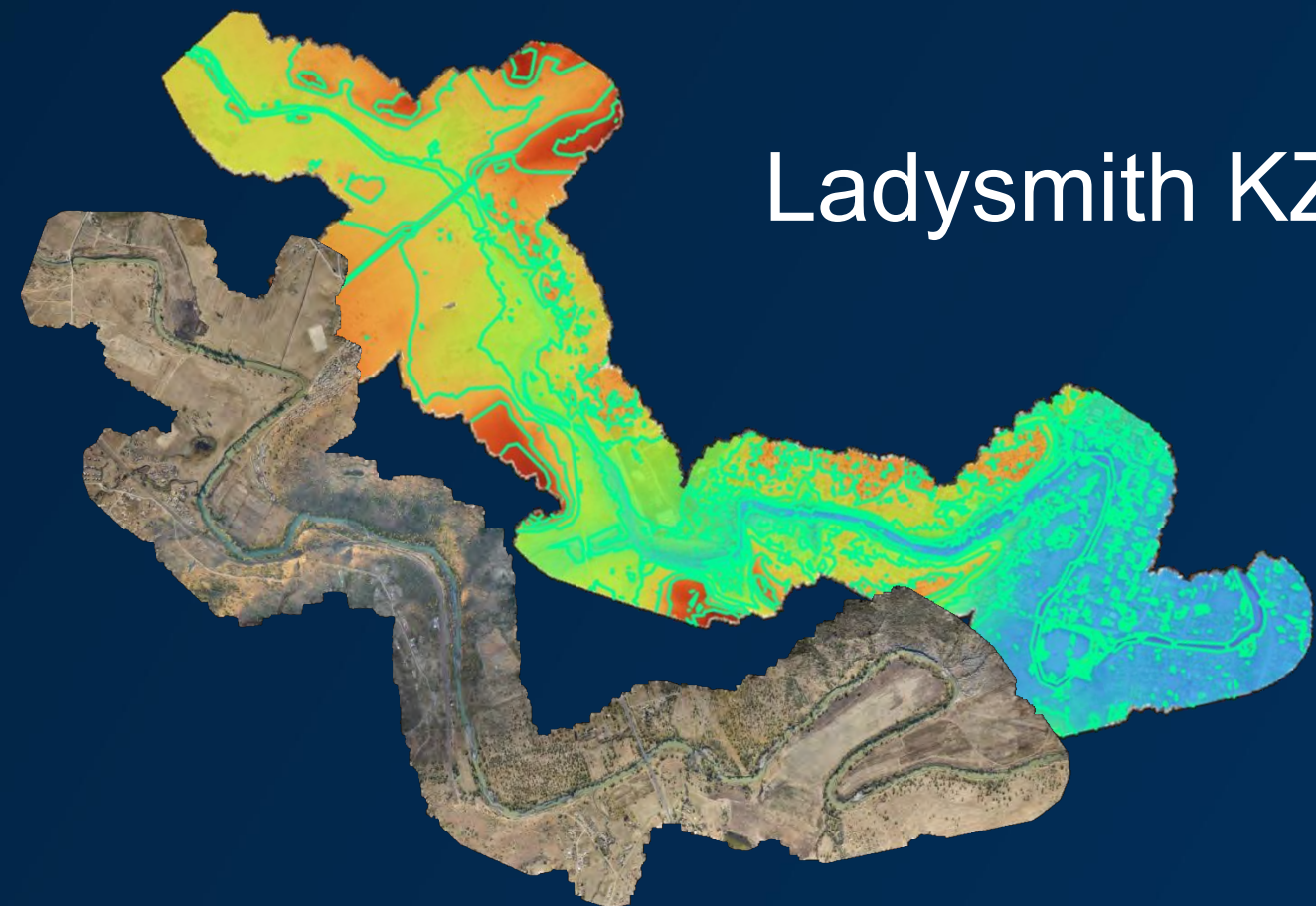
From Dust to Data: Victoria West



Pathway to Possible Resilience



Geospatial Pathways to Resilience



Ladysmith KZN Flood Mitigation



Evidence-led local interventions & re-imagination of space

Intergovernmental Engagement



government
communications

Department:
Government Communication and Information System
REPUBLIC OF SOUTH AFRICA



agriculture

Department:
Agriculture
REPUBLIC OF SOUTH AFRICA



human settlements

Department:
Human Settlements
REPUBLIC OF SOUTH AFRICA



stats sa

Department:
Statistics South Africa
REPUBLIC OF SOUTH AFRICA



sa air force

Department:
Defence
REPUBLIC OF SOUTH AFRICA



*Including numerous municipalities
and research institutions*

The objective is clear, **fly once, use multiple times.**

The need for ultra-high-definition, near-real-time remote sensing products is overwhelming.

Conclusion

UAVs are and will continue to transform decision-making and policy formulation.

- Evidence-based spatial planning

National Drone Programme

- Taking the lead on processing methodologies and standards

Open Invitation for Collaboration

- UASOC procedures and best practices as an enabler
- Robust workflows from acquisition to shared products
- Building a national knowledge base in Government

THANK YOU!

