Department of Land Reform and Rural Development

National Drone Programme, Sharing our journey

Presenters: Mr S Minnie, Mr MS Deal, Ms S Patel, Mr S Buthelezi, Ms S Mufamadi

WHY?

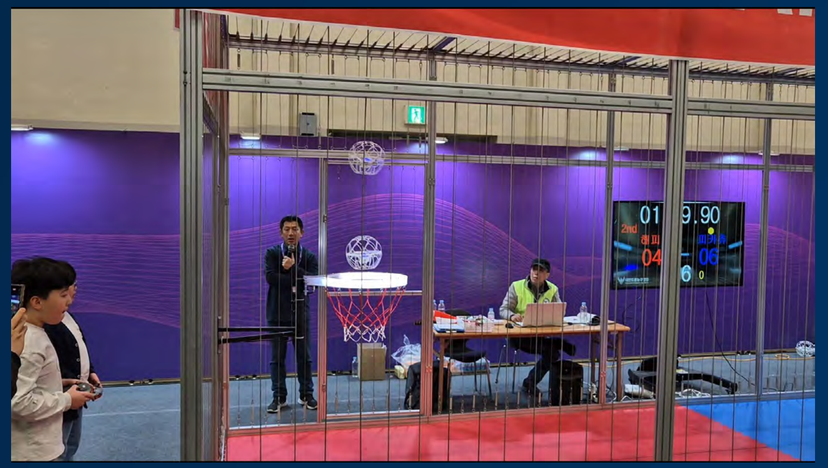
SPATIAL PLANNING

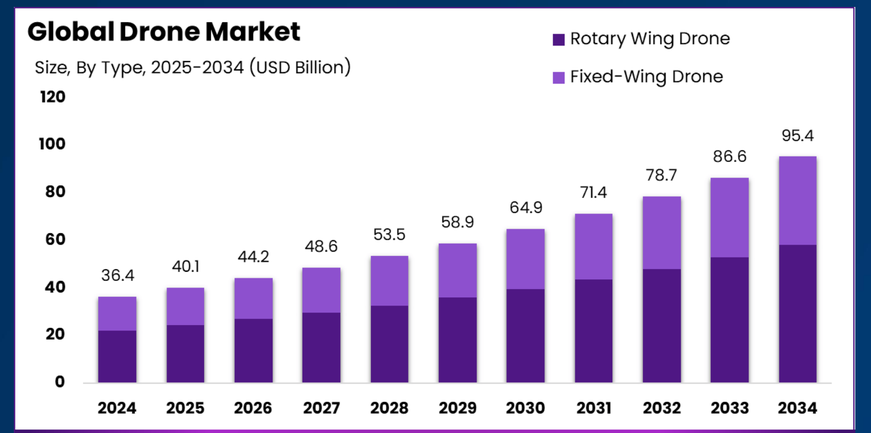
DISASTER MANAGEMENT

SERVICE DELIVERY

FOCUS?

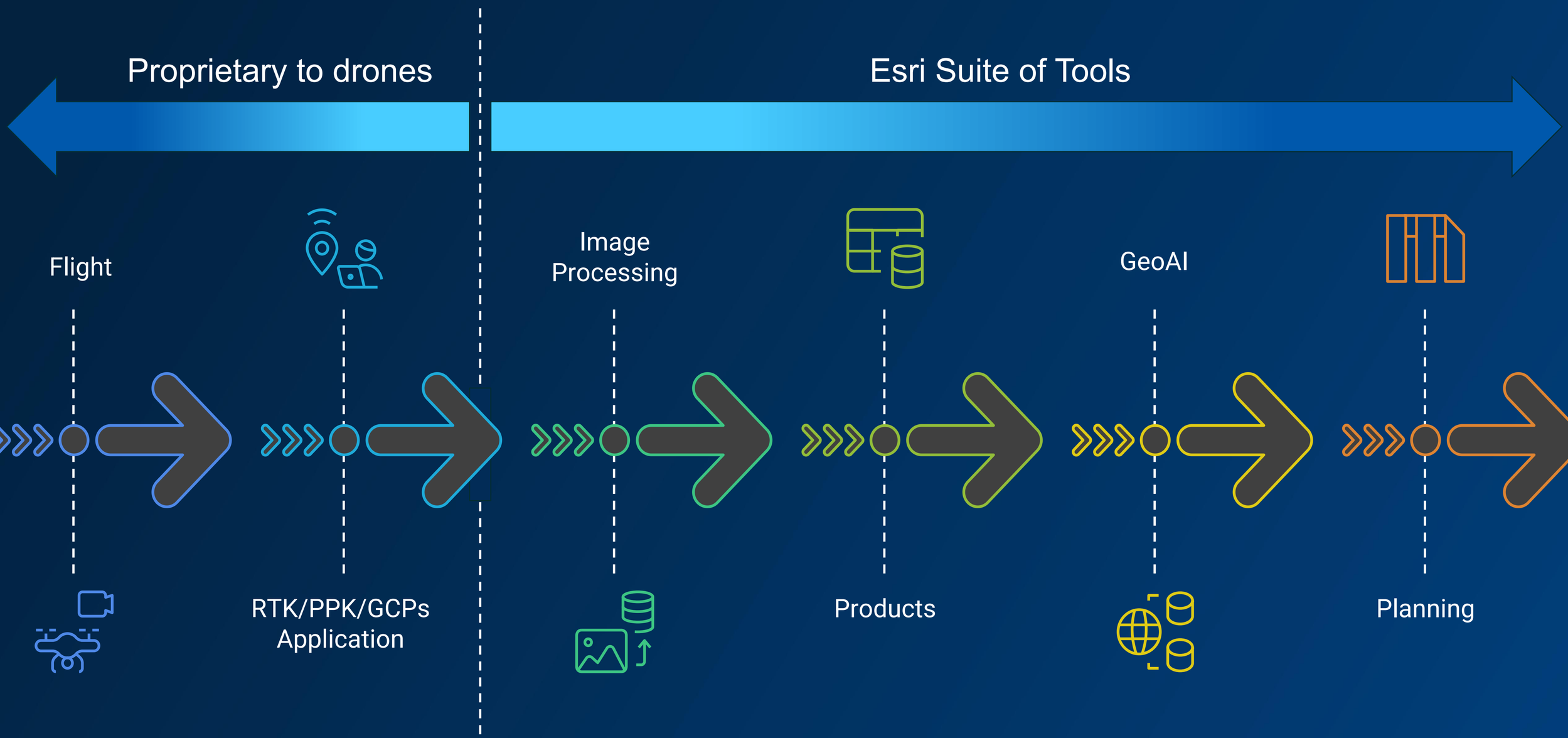
Drones are Pushing the Boundaries of Technology





Who moved my data source…

From Drones to Decisions

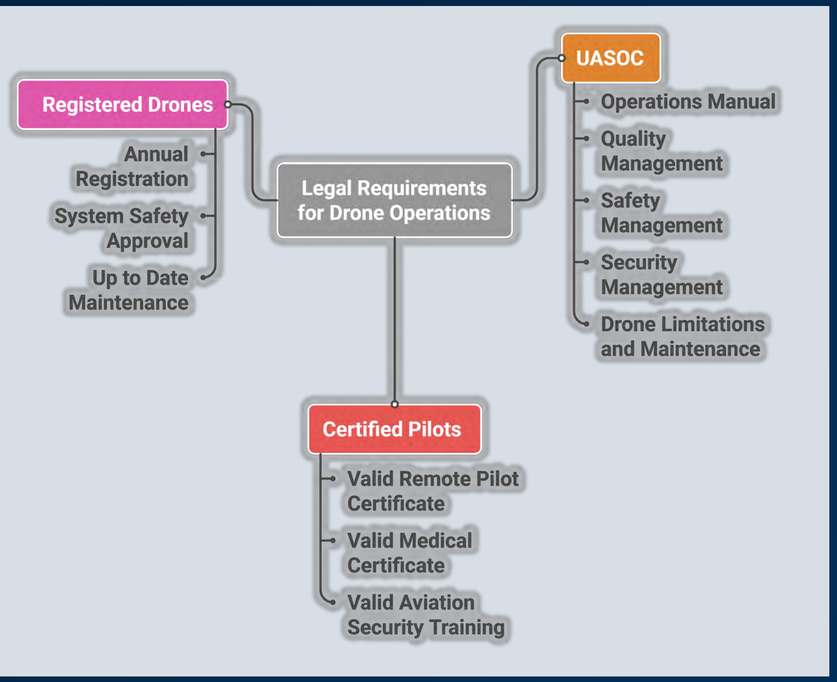


Building Blocks of a Legal Drone Flight

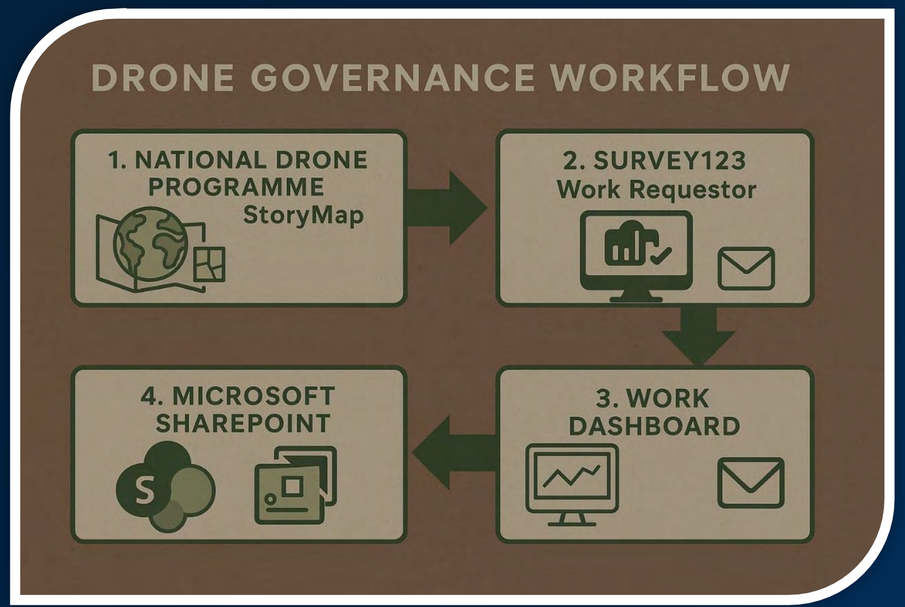
Updated: 2025/10/14

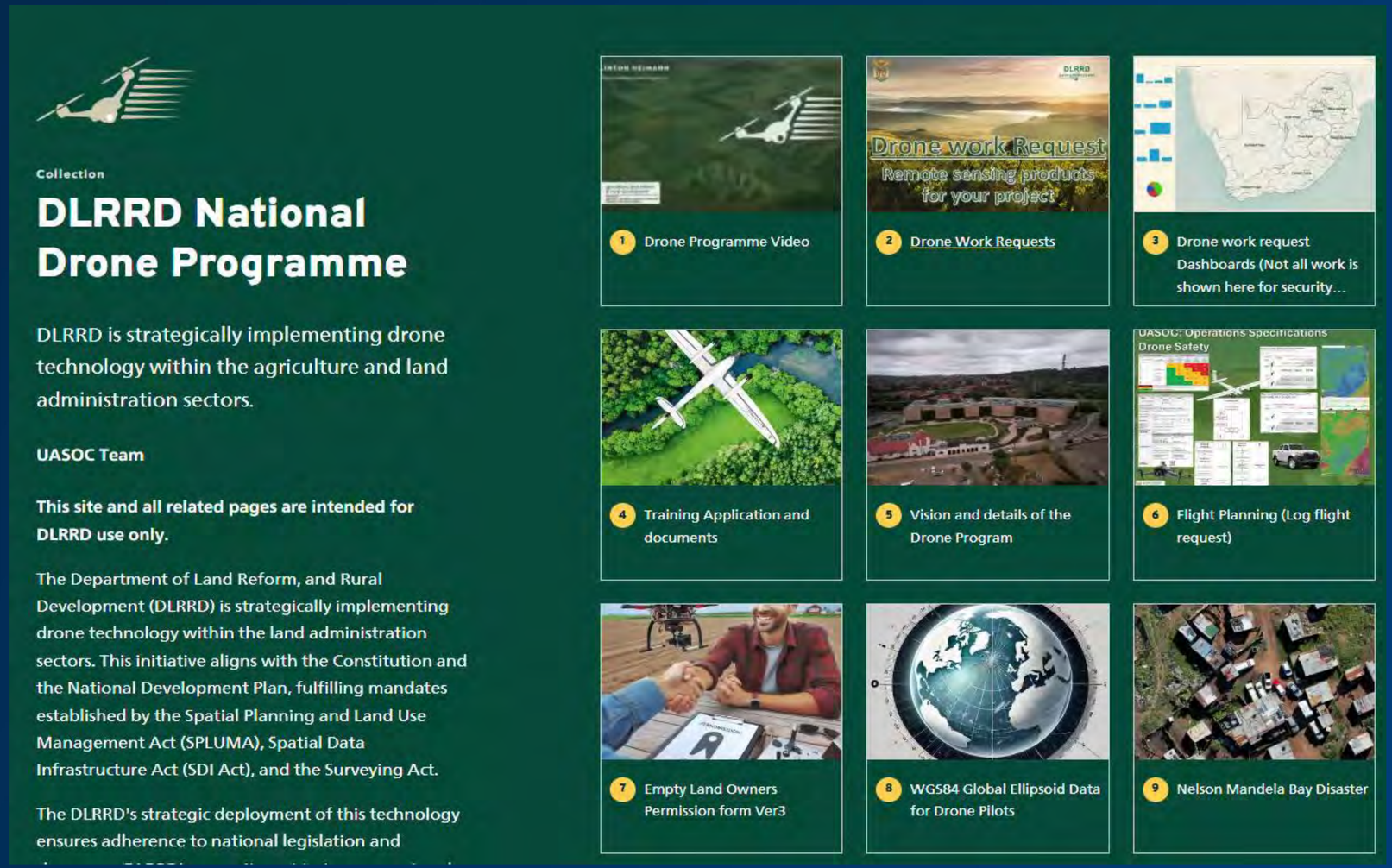
Province	Number of Pilots	Number of Multirotor drones	Number of Fix-wing Drones
Eastern Cape	1 male	2	
Free State	3 female, 4 male	5 (M3E, M2E)	3
Gauteng + National Office	3 female, 6 male	6	2
KwaZulu-Natal	1 female, 3 male	4	2
Limpopo	1 female, 2 male	3	2
Mpumalanga	3 male	3	1
North West	3 male	3	1
Northern Cape	2 female, 1 male	3	1
Western Cape	6 female, 2 male	3	2

- Female Pilot
- Male Pilot
- Multirotor drone (M3M x10, M3E x1, M2E x1)
- Multirotor drone (utilised under DLRRD UASOC)
- Multirotor drone (future 2025/2026)
- Fixed-Wing Drone
- In registration



Systems to run the National Drone Programme



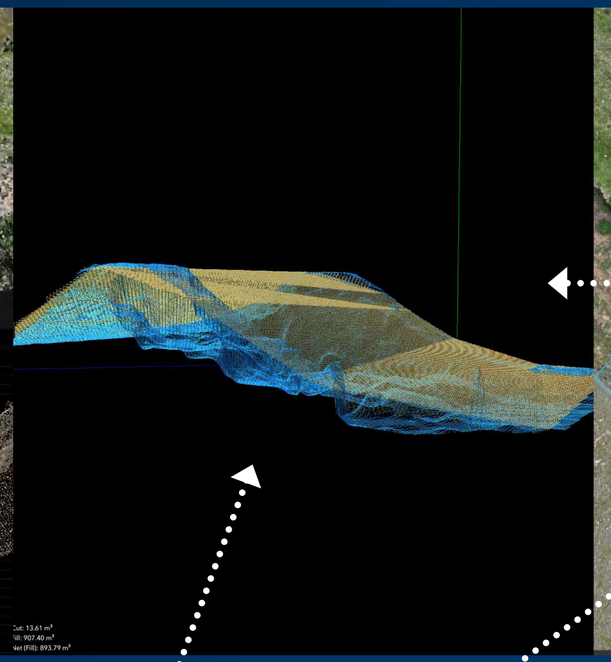


Palmietfontein - Dam Wall Break

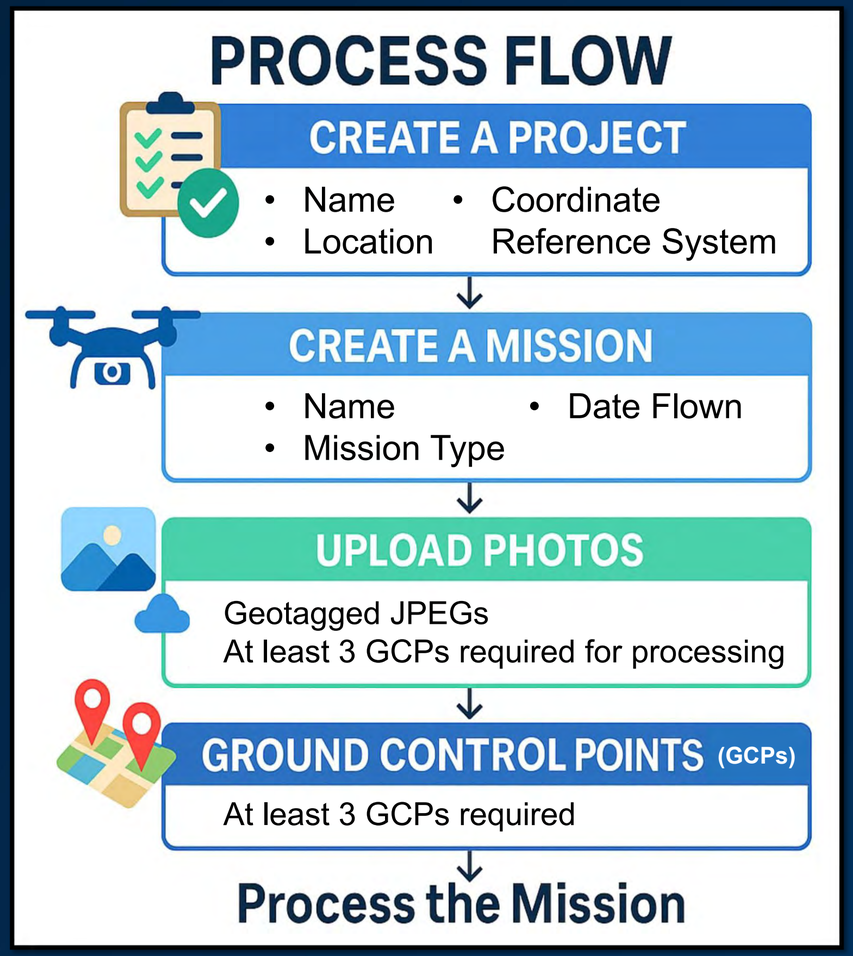
Solutions for all

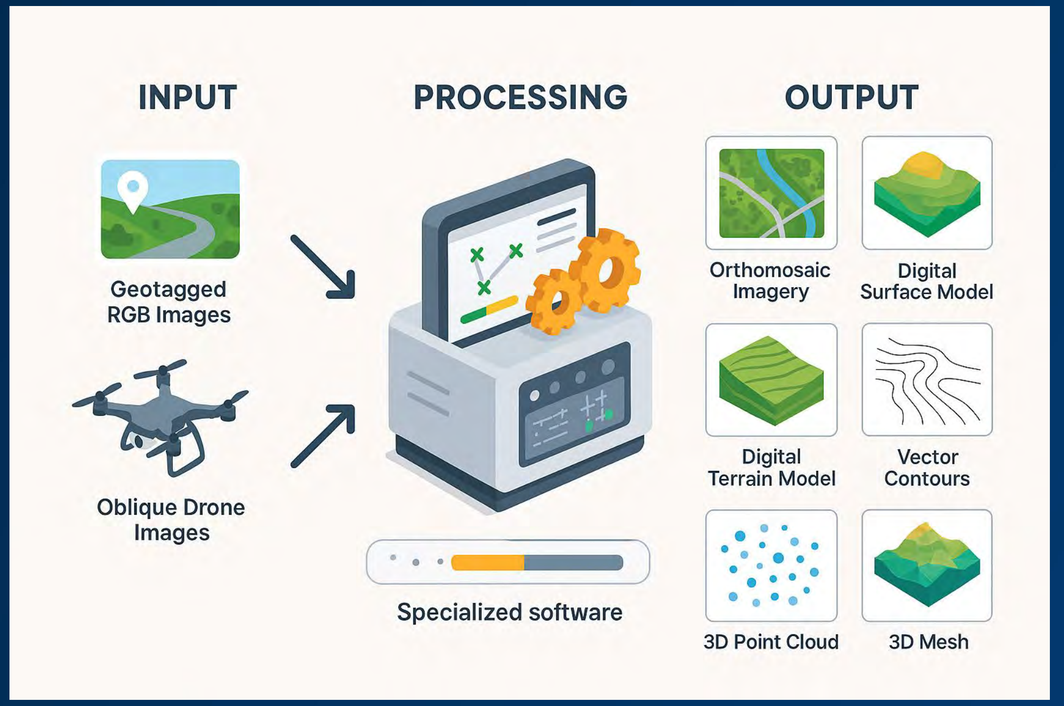
Standard Operating Procedures assist with the creation of products from drone data.

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

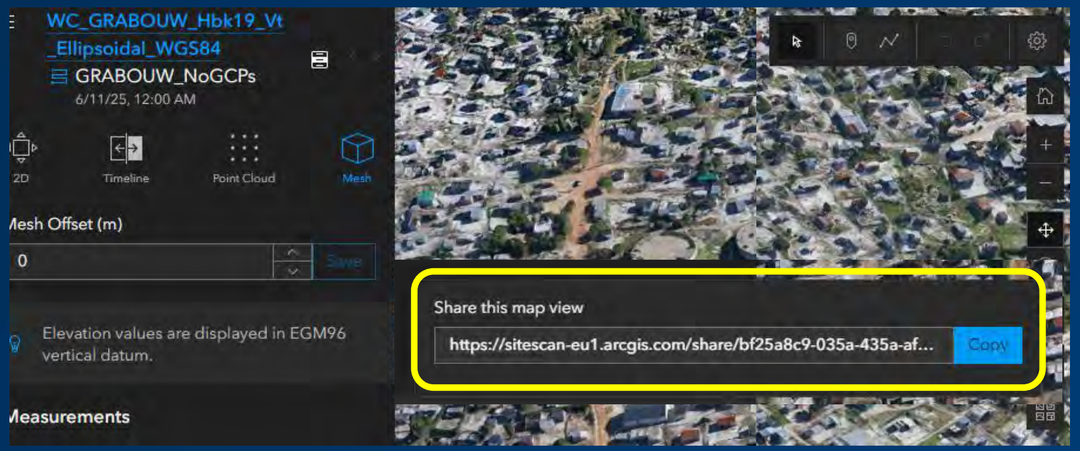


Processing Data – ArcGIS SiteScan





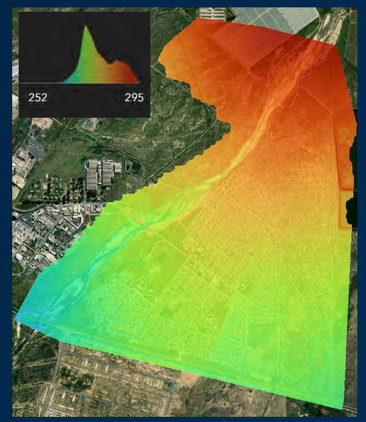
Fly once,
Create multiple products



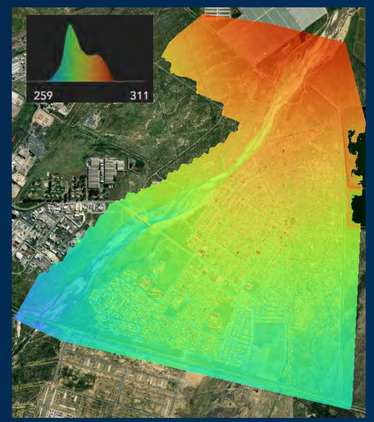
Processing Data – ArcGIS SiteScan / Drone2Map

A simple RGB flight with 80% overlap will produce:

Orthomosaic (RGB)



DTM



DSM

DTM

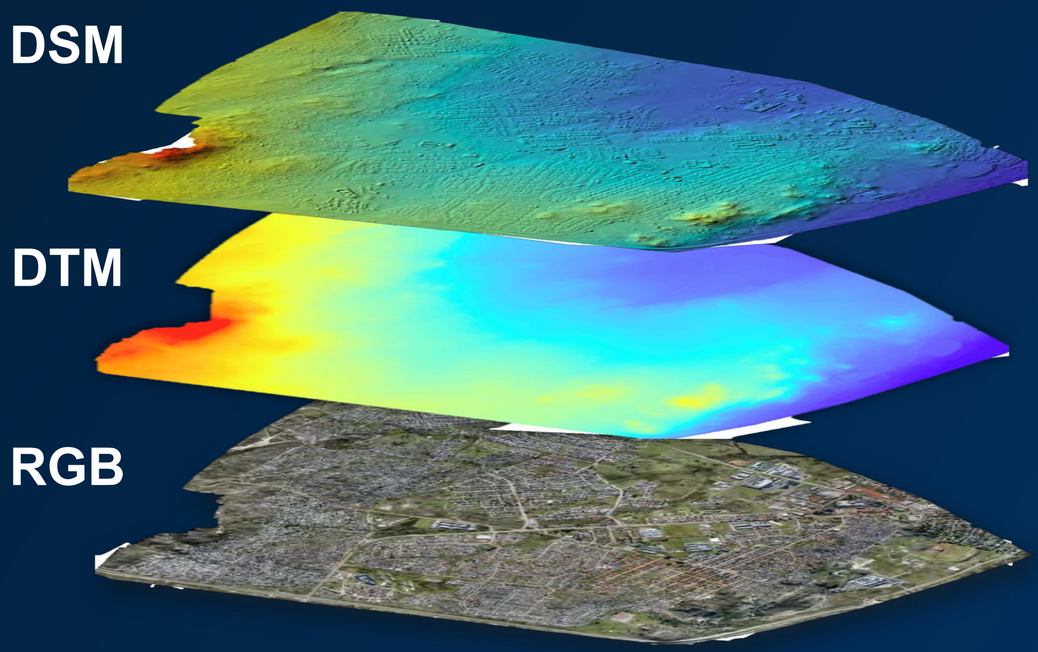
DSM

Point Cloud (RGB Sensor)

3D Mesh (RGB Sensor)

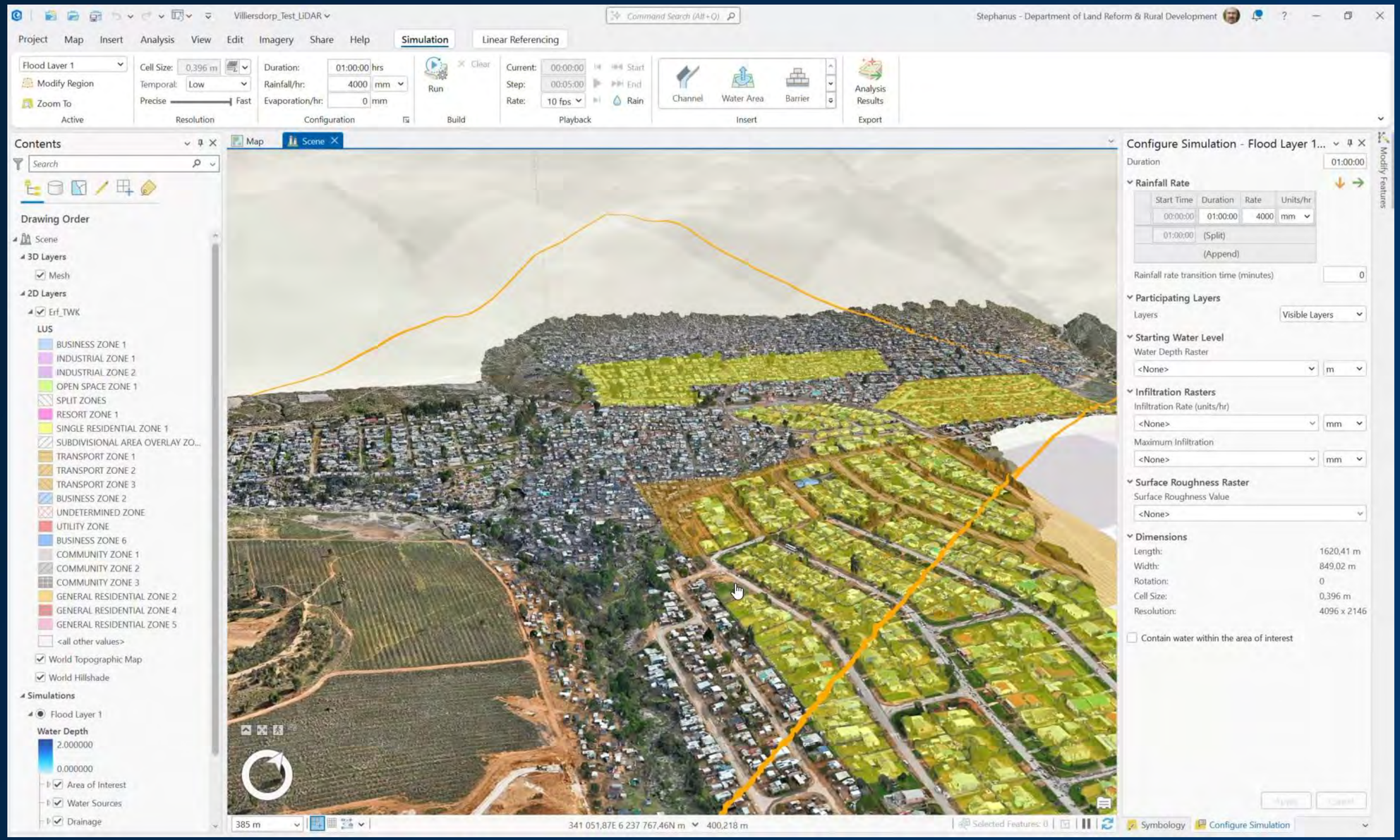
3D Mesh (Oblique Sensor)

The Challenge of Urban Resilience



Human Settlement Management

The Challenge of Urban Resilience



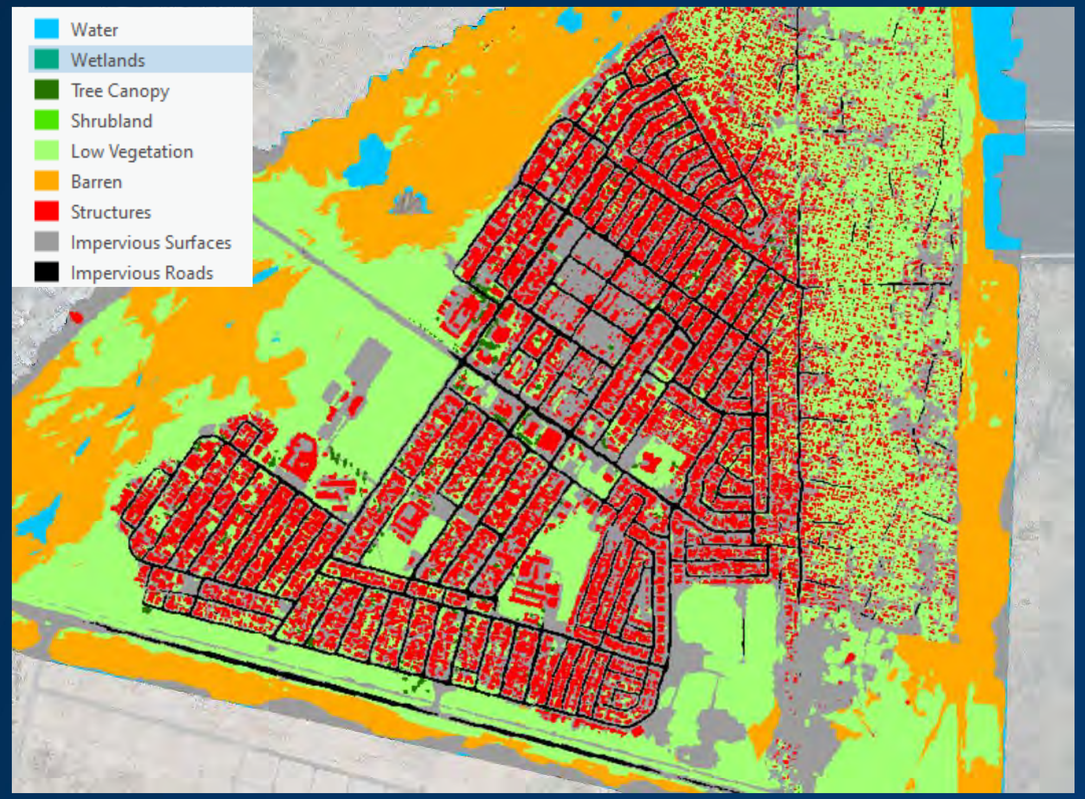
If you can simulate it, people will believe in it.

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

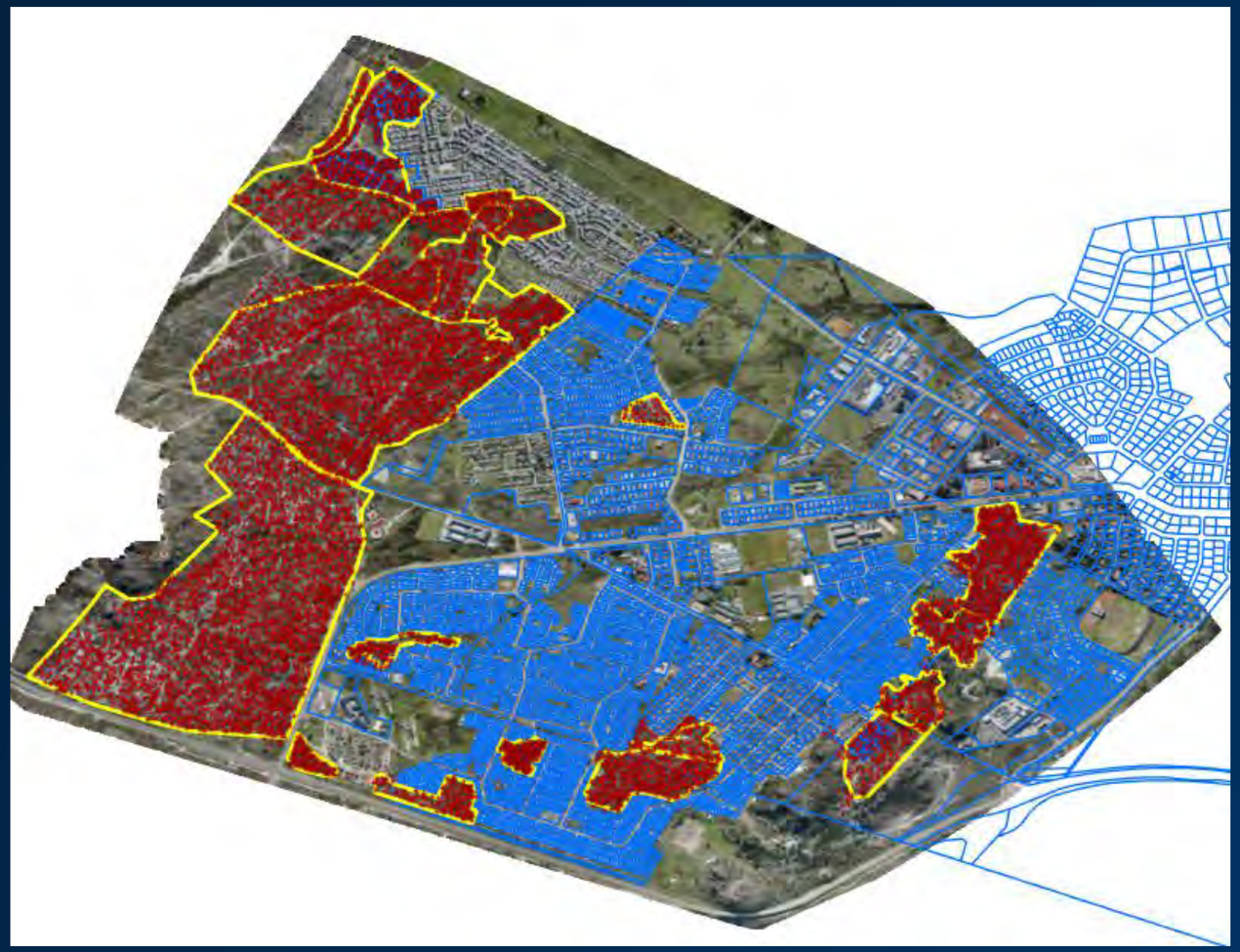
25 cm Resolution

15 cm Resolution

3 cm Resolution

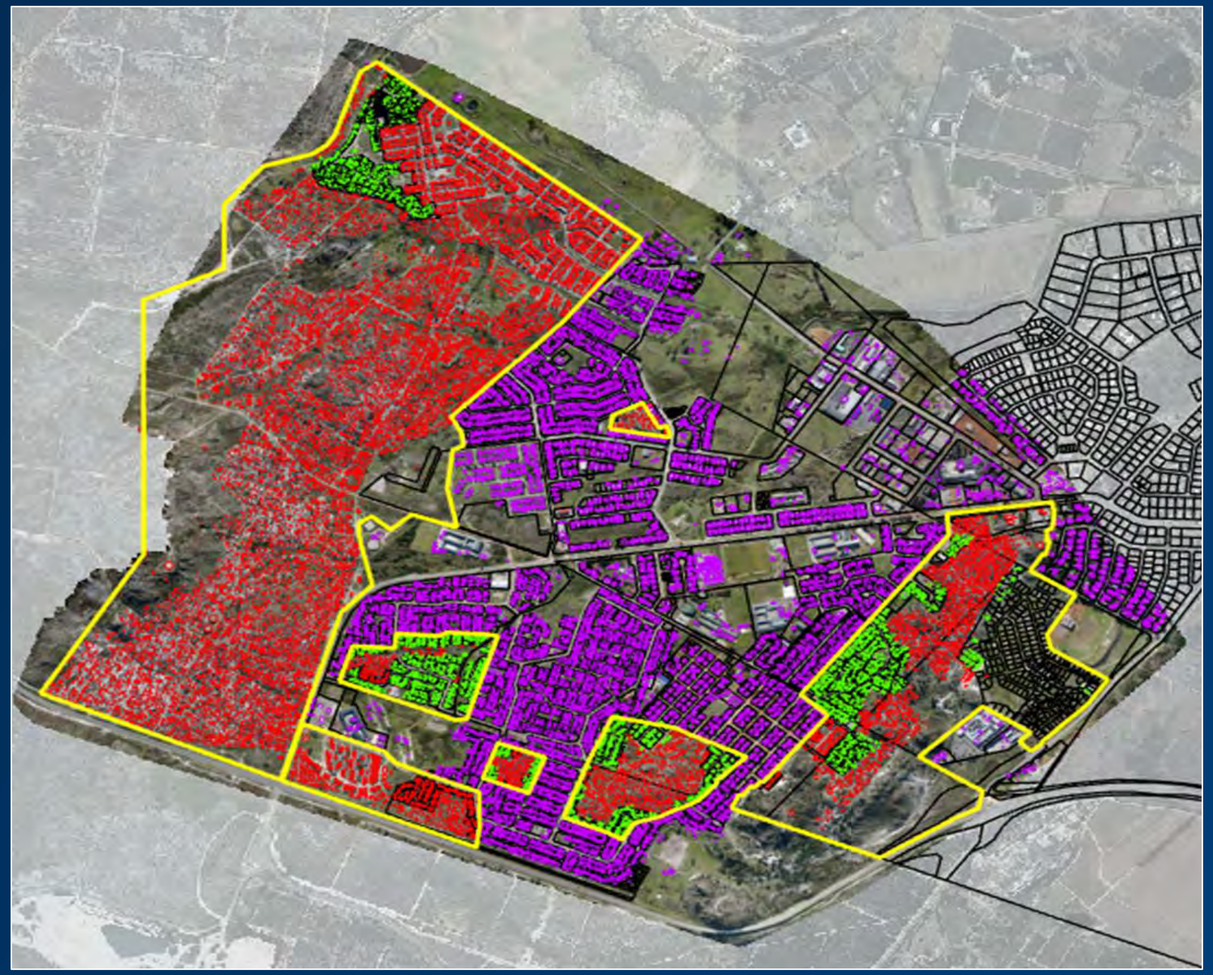
The Challenge of Urban Resilience

GeoAI extracting Grabouw town sprawl from drone footage



Count using Manual Digitising

± 12 400 structures (red)

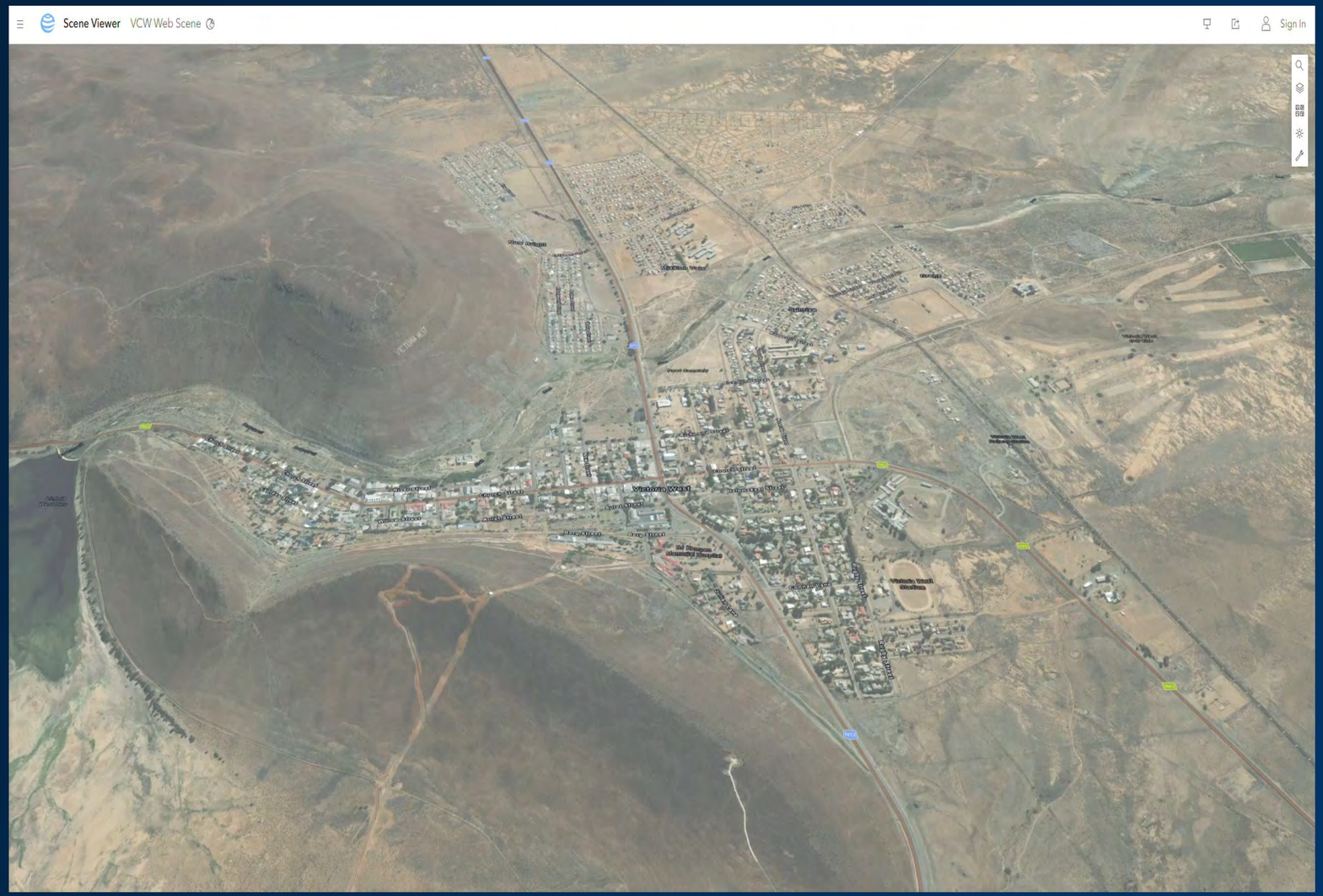


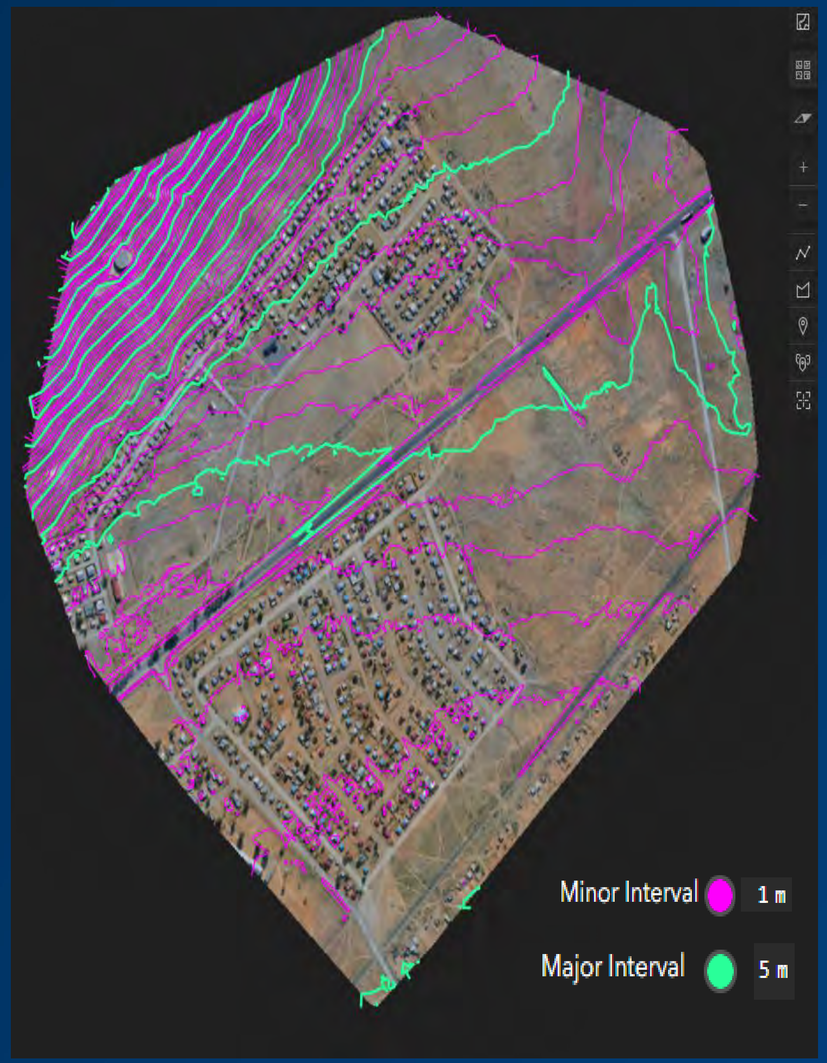
Count using GeoAI + Refinement

± 15 800 structures (red+green)

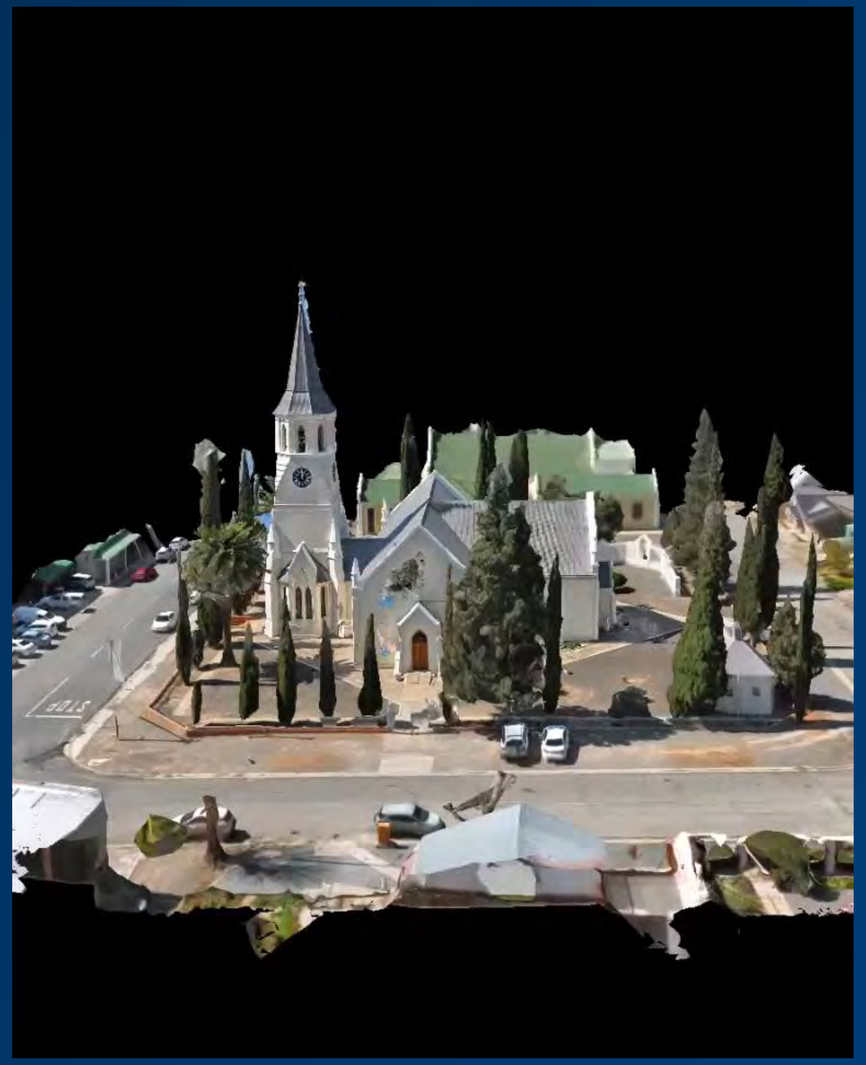
Correlation vs Causation - Grabouw

From Dust to Data: Victoria West

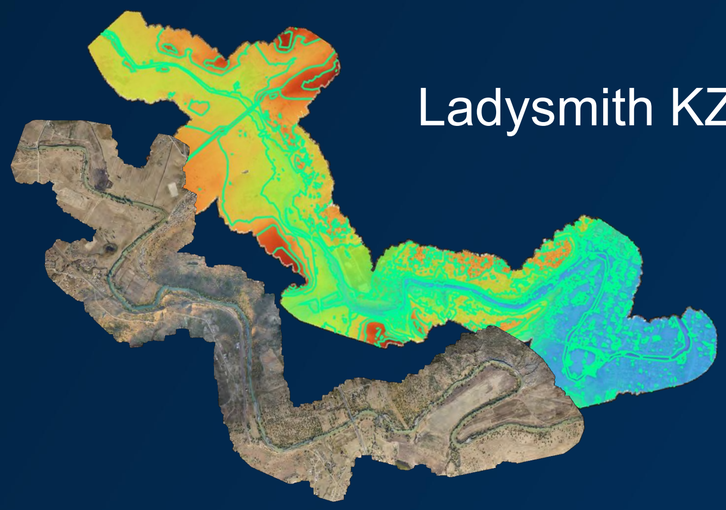




Pathway to Possible Resilience



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

HDA
HOUSING DEVELOPMENT AGENCY
an agency of the Department of Human Settlements

SOUTH AFRICAN POLICE SERVICE

BMA
BORDER • MANAGEMENT • AUTHORITY

sa air force
Department:
Defence
REPUBLIC OF SOUTH AFRICA

SOUTH AFRICAN LOCAL GOVERNMENT ASSOCIATION
SALGA
Inspiring service delivery

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!