

# BUILDING RESILIENT COMMUNITIES THROUGH EARTH OBSERVATION



Flood in Tshwane, South Africa, February 2022. Photo: City of Tshwane



science, technology  
& innovation

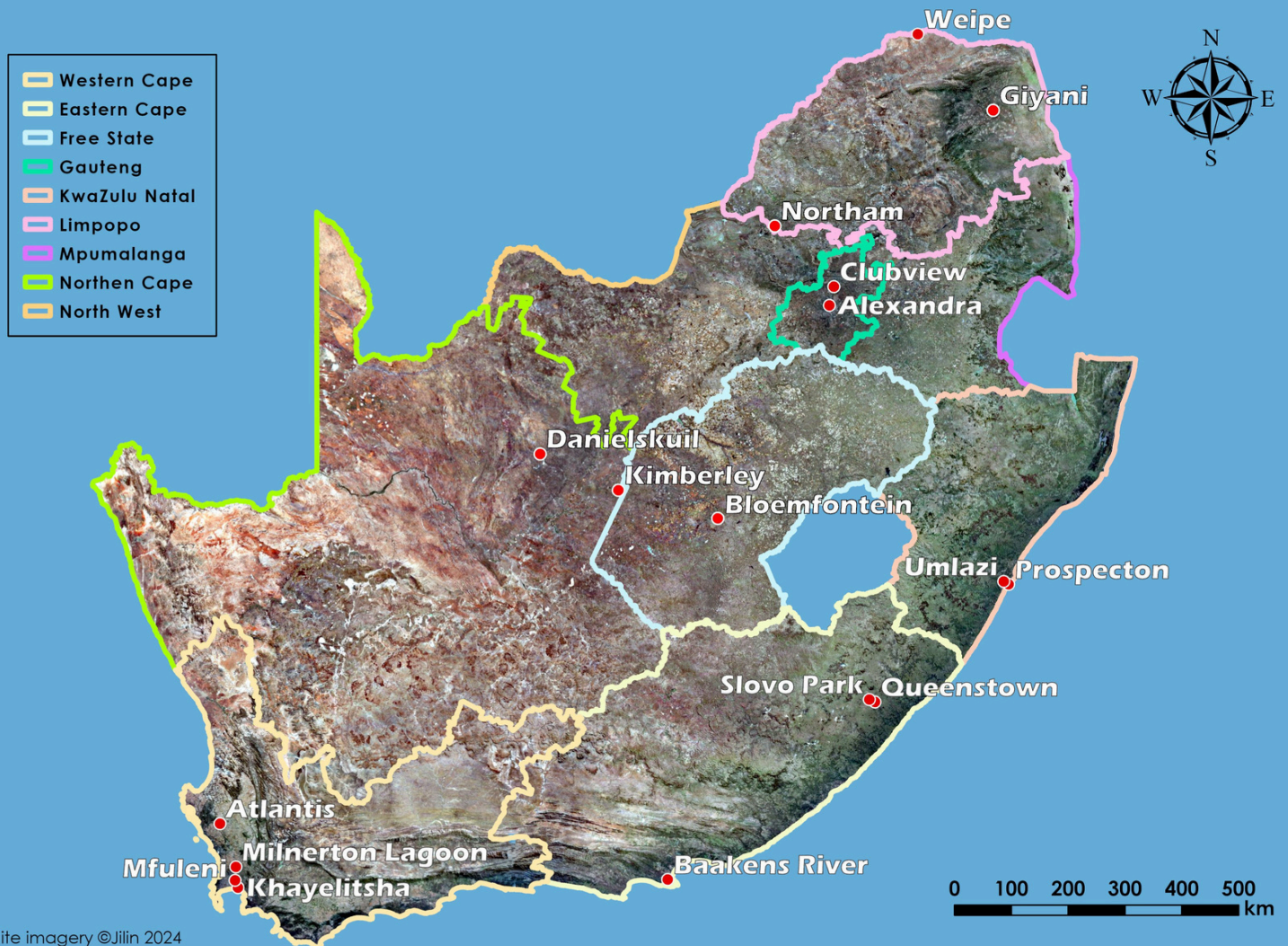
Department:  
Science, Technology and Innovation  
REPUBLIC OF SOUTH AFRICA

**A Legacy of Impact**



**SANSA**  
SOUTH AFRICAN NATIONAL  
SPACE AGENCY

# SANSA FLOOD RISK MAPPING ACROSS SOUTH AFRICA



As climate-related extreme rainfall events become more frequent, Earth Observation (EO) is increasingly vital for identifying risk areas, informing planning, and supporting early response. The South African National Space Agency (SANSA) continues to play a pivotal role in strengthening the National System of Innovation's (NSI's) Disaster Management Strategy through the positioning of flood monitoring and disaster support as an important national capability.

This feature showcases flood-prone areas across major South African cities, using SANSA's satellite-derived analytics and geospatial mapping products. These insights form part of SANSA's expanding suite of disaster support tools currently under development for national, provincial, and local authorities.

# Cape Town – Urban Expansion Meets a High Water Table



Flood prone roads and residential areas within a 5m simulated flood risk. Satellite imagery ©Jilin 2024.

 **Flood Risk (5m)**

0 250 500  
m

## Key Flood-Prone Areas:

Philippi, Khayelitsha, Gugulethu, Mfuleni, Atlantis, Milnerton Lagoon surroundings

Cape Town's flood risk is driven by a combination of high water tables, low-lying wetlands, rapid urban expansion and stormwater constraints. EO data helps track seasonal saturation, land-cover changes and areas repeatedly affected during winter rainfall cycles, supporting the City's flood mitigation strategies



science, technology  
& innovation

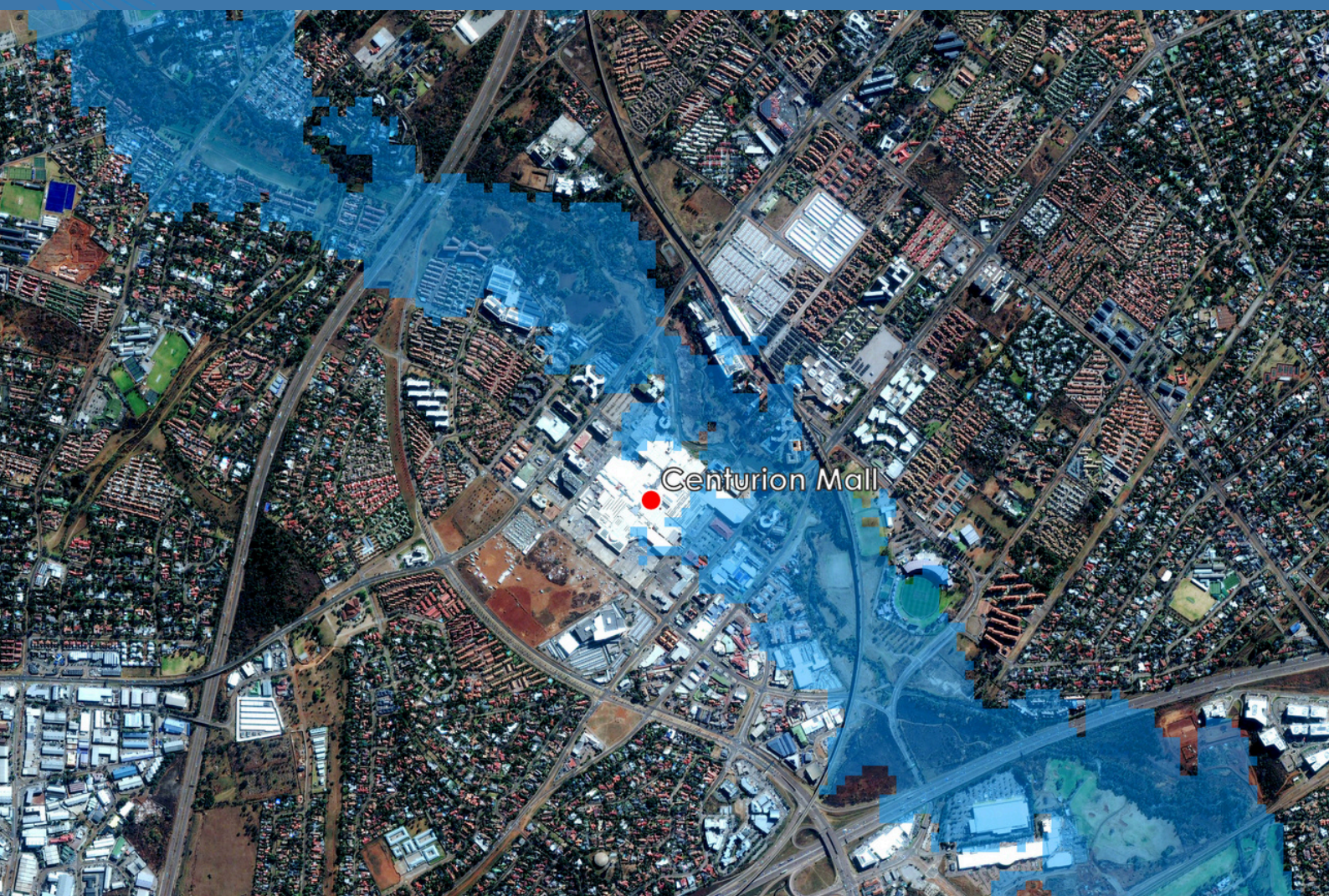
Department:  
Science, Technology and Innovation  
REPUBLIC OF SOUTH AFRICA

**A Legacy of Impact**



**SANSA**  
SOUTH AFRICAN NATIONAL  
SPACE AGENCY

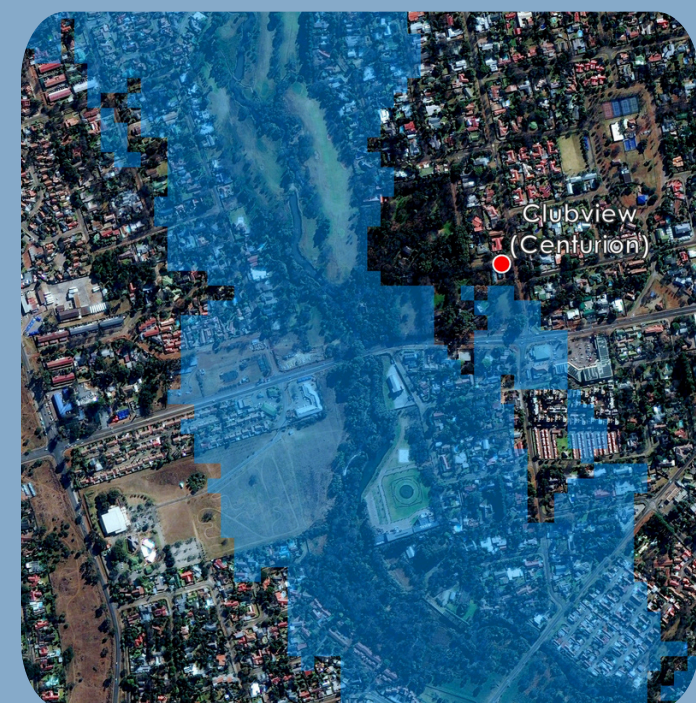
# Pretoria - Centurion, Riverine Flooding Along the Hennops



Flood prone roads, commercial and residential areas along the Hennops River within a 5m simulated flood risk. Satellite imagery ©Jilin 2024.

 **Flood Risk (5m)**

0 200 400  
 m

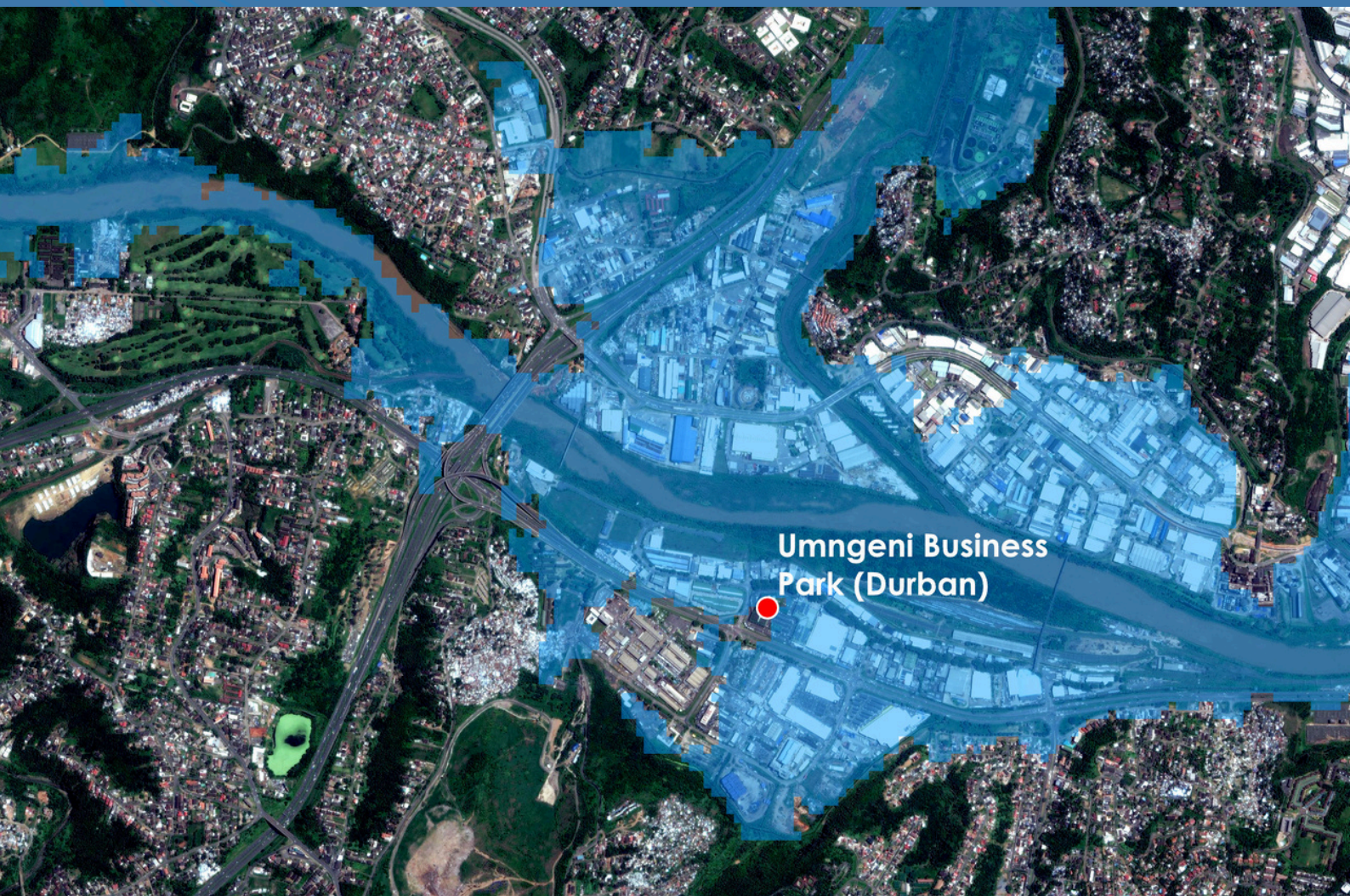


## Key Flood-Prone Areas:

Centurion CBD, Lyttleton, Clubview, Die Hoewes, Hennops River corridor

These areas experience periodic flooding due to their position on the Hennops River floodplain, coupled with increasing surface runoff from urban hardening. SANSA's EO monitoring provides early insights on upstream rainfall and river response, helping risk authorities prepare for potential overflow events.

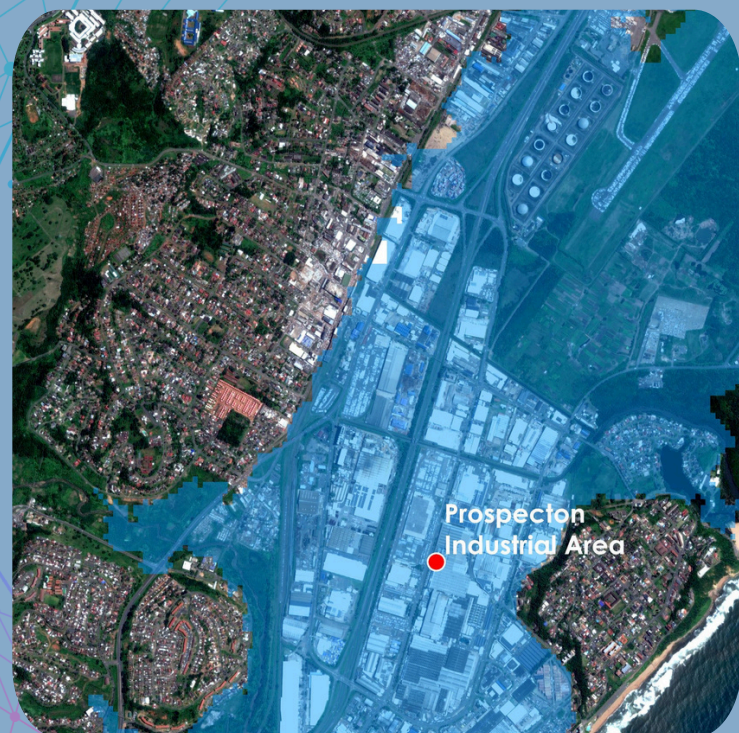
# Durban (eThekweni) – The Epicentre of Climate-Intensified Flood Events



Buildings along the Umngeni River within a 5m simulated flood risk. Satellite imagery ©Jilin 2024.

 **Flood Risk (5m)**

0 500 1 000  
m

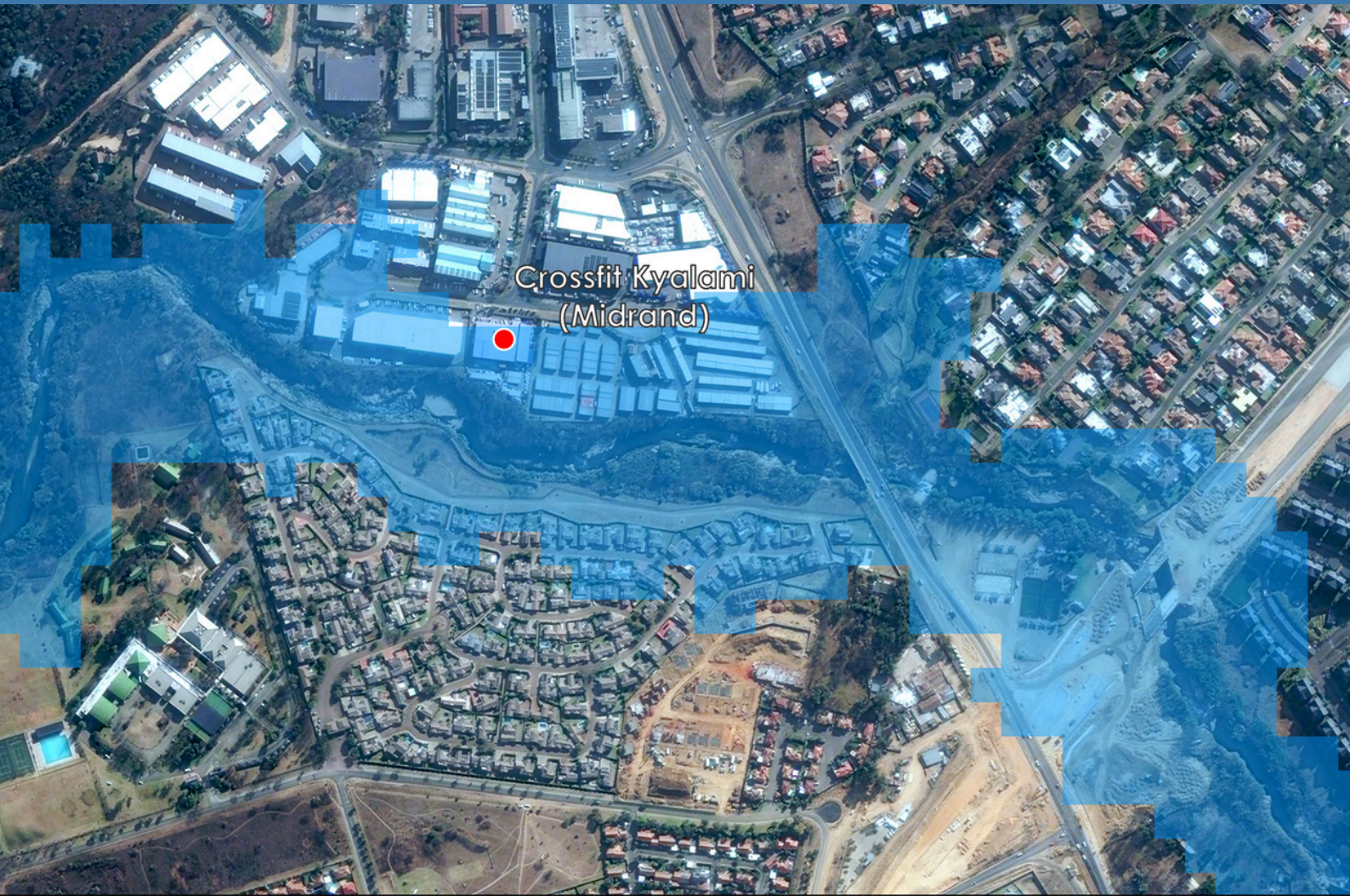


## Key Flood-Prone Areas:

Umdloti, Isipingo, Quarry Road (uMngeni), Umlazi, lower coastal zones

Durban continues to face severe flood incidents, most notably the April 2022 disaster. Using radar and optical satellite data, SANSA identifies slope instabilities, saturated catchments, and high-risk settlements. These datasets support municipal disaster managers in prioritising vulnerable communities and infrastructure.

# Johannesburg – Flash Flooding Along the Jukskei



Flood prone roads, commercial and residential areas along the Jukskei River within a 5m simulated flood risk. Satellite imagery ©Jilin 2024.

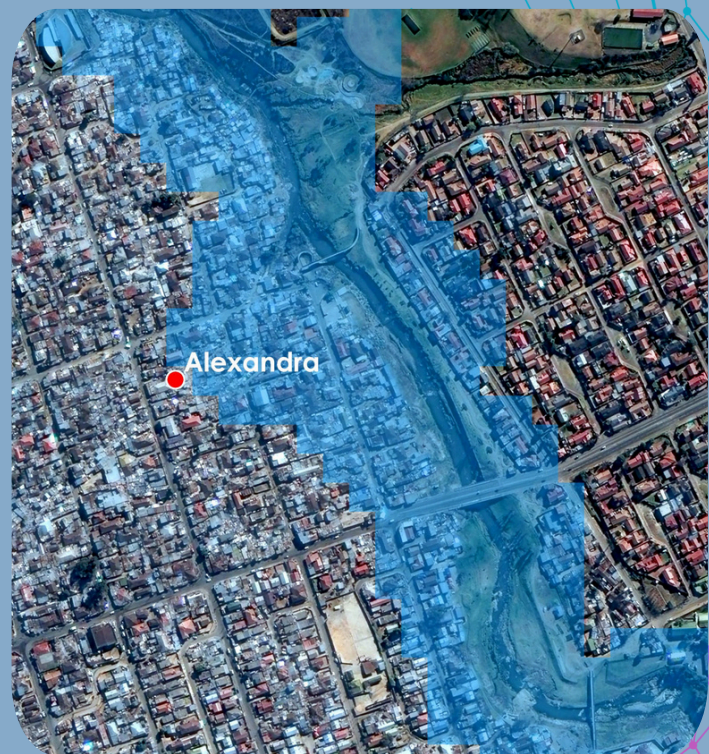
 Flood Risk (5m)

0 200 400  
m

## Key Flood-Prone Areas:

Alexandra, Kyalami, parts of Midrand, Jukskei River corridor

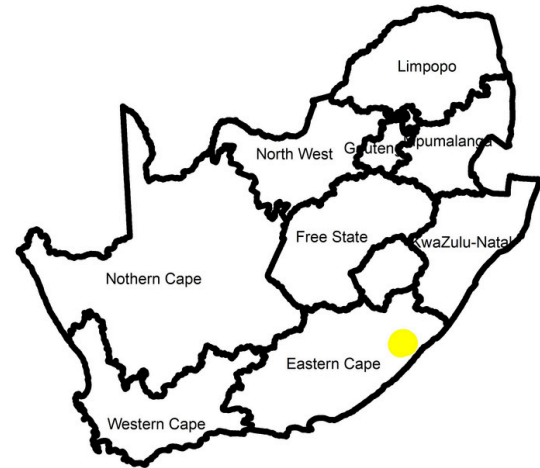
Johannesburg's risk profile is dominated by flash flooding triggered by high-intensity storms and insufficient drainage in densely built areas. EO-based monitoring assists in identifying runoff pathways, impervious surface growth and recurring hotspots affecting households and transport networks.



# Eastern Cape Province Hotspots Areas identified by SANSA



Mthatha, King Sabata Dalindyebo  
Local Municipality, Eastern Cape



## Narrative

The map shows simulated flooding from SANSA's flood risk layer and actual flood extent of Mtata river mapped during the June 2025 Mthatha floods.

Satellite imagery supplied by SANSA,  
copyrights of Jilini

## Legend

 Mtata river flood extent June 2025

Flood risk area

 Simulated flooding

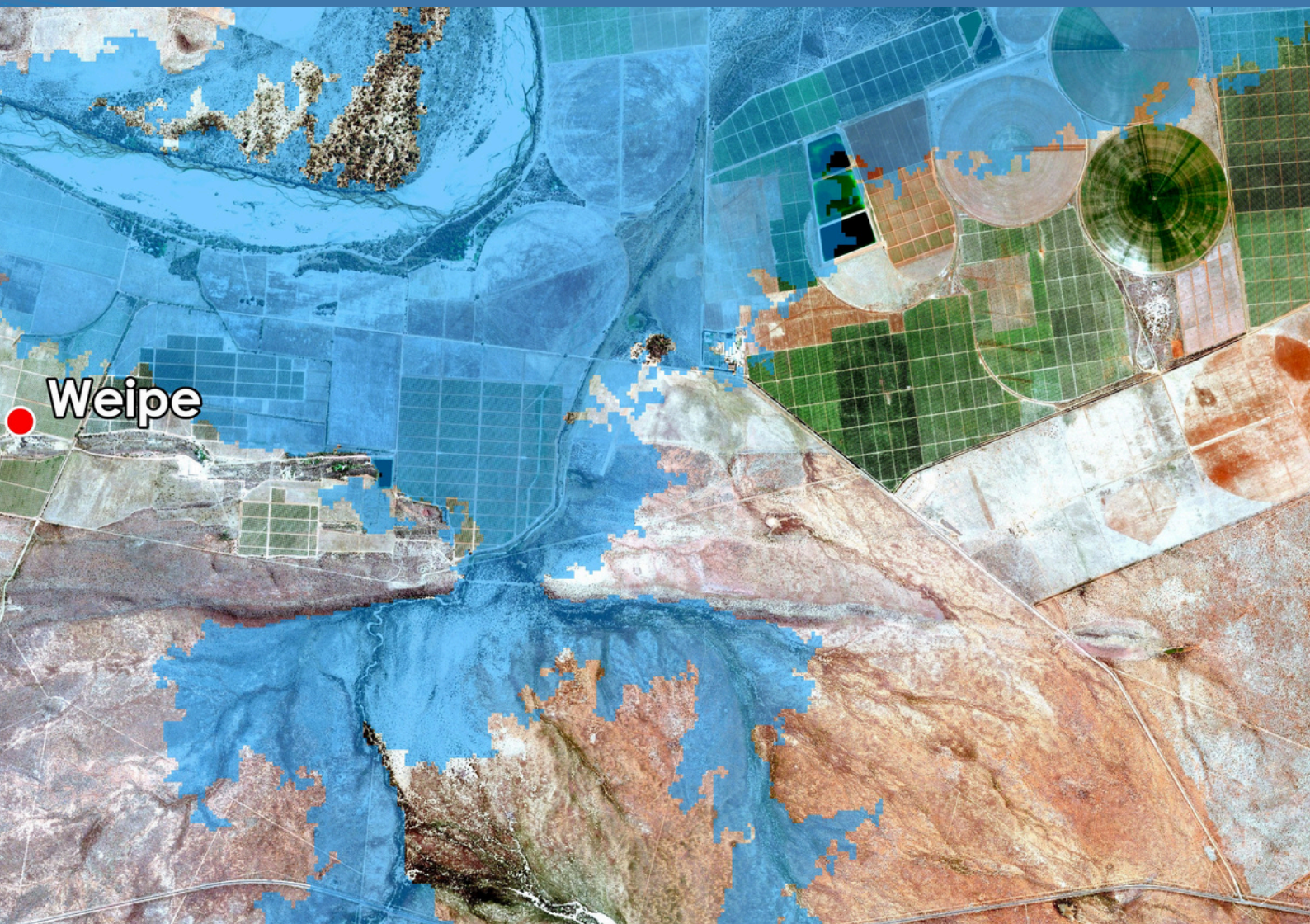


0 0.25 0.5 km

## Other hotspots identified by SANSA in Eastern Cape

- Nelson Mandela Bay: Baakens River and low-lying floodplains are prone to repeated flood events

# Vhembe District: Limpopo River floodplain impacts on agriculture and settlements



Agricultural lands and farm dwellings along the Limpopo River within a 5m simulated flood risk. Satellite imagery ©Jilin 2024.



**Flood Risk (5m)**

0 500 1 000  
m

## Hotspots areas identified by SANSA in Mpumalanga and Free State

- Mbombela: Nels River flood zones associated with rapid seasonal runoff
- Free State (Bloemfontein): Urban flash floods linked to stormwater system limitations

# SANSA'S FLOOD MONITORING & DECISION-SUPPORT CAPABILITIES

SANSA continues to improve national resilience through:

- Flood Disaster Decision Support Tool focusing on flood risk mapping
- Flood hotspot mapping using multi-sensor satellite imagery
- Future Decision Support Systems for Water, Air Quality, Agriculture and Biodiversity

These tools support national and provincial planning, emergency response and post-disaster recovery.

## WAY FORWARD: STRENGTHENING NATIONAL FLOOD RESILIENCE

SANSA remains committed to supporting the Minister, DG, and the broader NSI through actionable geospatial intelligence. By integrating space-based insights with national planning efforts, we aim to enhance preparedness, safeguard vulnerable communities, and strengthen South Africa's long-term climate resilience.

To access SANSA's Earth Observation data portfolio, decision support tools, flood maps, and other products and services, please contact Customer Services at:  
**customers-eo@sansa.org.za.**



[www.sansa.org.za](http://www.sansa.org.za)



science, technology  
& innovation

Department:  
Science, Technology and Innovation  
REPUBLIC OF SOUTH AFRICA

**A Legacy of Impact**



**SANSA**  
SOUTH AFRICAN NATIONAL  
SPACE AGENCY