



cooperative  
governance

Department:  
Cooperative Governance  
REPUBLIC OF SOUTH AFRICA



# **National Disaster Management Centre:**

## **NDMC Geohub:**

### **Empowering data-driven disaster management across South Africa**

# PRESENTATION OVERVIEW



1. Introduction
2. Background and Rationale
3. Leveraged Technologies
4. Data Integration
5. Demonstration
6. Benefits
7. Future developments
8. Conclusion

# INTRODUCTION

- “Disaster Management” – ‘a continuous and integrated multi-sectoral, multi-disciplinary process of planning and implementation of measures aimed at
  - **Preventing or reducing** the risk of disasters;
  - **Mitigating** the severity or consequences of disasters;
  - Emergency **preparedness**;
  - A rapid and effective **response** to disasters; and
  - Post-disaster **recovery and rehabilitation**’  
(Disaster Management Act 57 of 2002)
- **Strategic Goal** of the NDMC:
  - Strengthen coordination and support for effective integrated Disaster Management
- NDMC **Mandate** derived from
  - Disaster Management Act 57 of 2002
  - Disaster Management Framework 2005



STAATSKOERANT, 29 APRIL 2005

## GENERAL NOTICE

**NOTICE 654 OF 2005**

**MINISTER FOR PROVINCIAL AND LOCAL GOVERNMENT  
DISASTER MANAGEMENT ACT, 2002 (ACT NO. 57 OF 2002)**

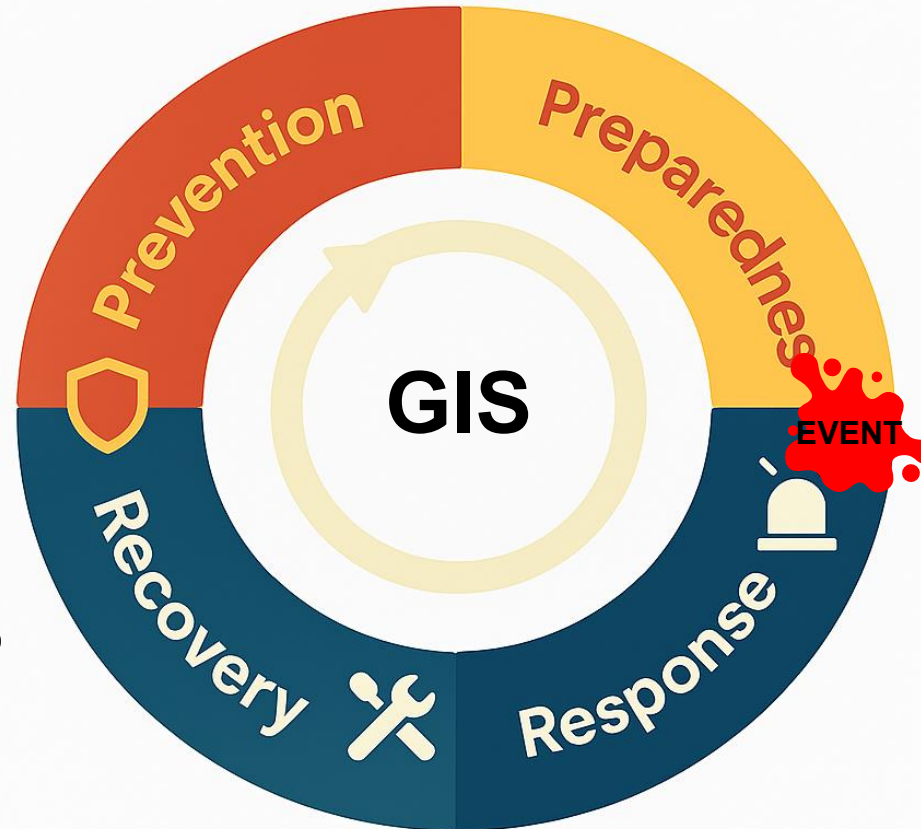
## Disaster Management Continuum

### Prevention & Mitigation

- Scientific Hazard Analysis
- Simulation & Modelling
- Vulnerability Analysis
- Risk Assessment Mapping
- Structural: Infrastructure Assessment
- Non Structural Measures
- Awareness Campaigns / Training and capacity building

### Recovery, Reconstruction, Rehab

- Spatial Planning
- Infrastructure
- Housing
- Livelihoods
- Transport
- Security
- Water
- Communication
- Agriculture



### Preparedness

- Resource Inventory
- Stockpiling
- Logistics Planning
- Evacuation Planning
- Needs Assessment
- Communication Planning

### Prediction & Warning

- Monitoring
- Forecasting
- Early Warnings
- Scenario Identification

### Response

- Situation Analysis
- Crises Mapping
- Decision Support
- Evacuation and shelters
- Dispatching and Resource Tracking
- Early Damage Assessment

### Relief

- Search and Rescue
- Rubble / debris removal
- Action Prioritization
- Logistics
- Relief Supply Tracking





## GIS Application in Disaster Management

The Disaster Management Act 57 of 2002 calls for a "significantly strengthened capacity to track, collate, monitor and disseminate information on phenomena and activities..." Furthermore, it states that "a key to having good information systems is to invest in mechanisms and capacity for surveillance, monitoring and evaluation".

The power of GIS lies within its ability to answer questions posed in analyzing trends and displaying geographical data for decision making purposes. GIS act as consolidator of various kinds of data, spatial and non spatial, and is the best equipped tool for visualization of an emergency situation.

GIS plays a central role in the development of the National Disaster Management Center's (NDMC) enhanced National Disaster Management Information System (NDMIS). The system relates to various aspects such as Risk Assessments, Hazard Analysis, Vulnerability Assessment, Situational Awareness, Contingency Planning, Reporting Systems as well as Early Warning Systems.



Wind



Fire



Floods



Drought

# BACKGROUND AND RATIONALE



South Africa faces increasing exposure to **climate-induced and human-made disasters**, including floods, wildfires, droughts, and severe storms.



These events are growing in **frequency, intensity, and complexity**, often affecting multiple provinces and sectors simultaneously.



Effective disaster management therefore requires **timely, accurate, and spatially informed decision-making** to protect lives, infrastructure, and the economy.



The **National Disaster Management Centre (NDMC)**, mandated by the **Disaster Management Act (Act 57 of 2002)**, is responsible for coordinating integrated disaster risk management across all spheres of government and external stakeholders.



However, disaster information and early warnings are often **dispersed across multiple agencies**, limiting the speed and efficiency of situational awareness and response.



To address this challenge, the NDMC established the **Disaster Management GeoHub** — a centralized spatial data and decision-support platform which provides data integration with DM actors and role players.

# BACKGROUND AND RATIONALE

By consolidating and visualizing hazard, exposure, and vulnerability information, the GeoHub enables:



**Data Integration** across government spheres and stakeholders



Real-time **monitoring and mapping** of hazard events.



**Impact-based early warning dissemination** to provincial and municipal centres.



Insights into spatial and temporal **Risk and Vulnerability assessments**



**Evidence-based decision-making** for disaster risk reduction and recovery.



**Collaboration** between government, science institutions, and local communities.

The GeoHub strengthens the NDMC's ability to **anticipate, prepare for, and respond to disasters** through **spatial intelligence**, supporting South Africa's commitments under the **Disaster of Management Act 57 of 2002**, **Sendai Framework for Disaster Risk Reduction (2015–2030)** and the **Early Warnings for All (EW4ALL)** initiative.

## LEVERAGED TECHNOLOGIES

The **Disaster Management GeoHub** integrates **ESRI's ArcGIS technology stack** to support spatial data management, analysis, visualization, and dissemination within the **Disaster Management fraternity**.

ESRI's tools enable a **scalable, secure, and interoperable geospatial platform** that connects real-time data sources with decision-makers at national, provincial, and municipal levels.

### ArcGIS Enterprise / Portal

Forms the backbone of the GeoHub — enabling secure multi-user data management, map services, and analytics. Supports integration with existing NDMC and partner systems.

### ArcGIS Online

Hosts interactive web maps, dashboards, and public-facing portals to share early warnings and hazard data. Useful for citizen engagement and awareness.

### ArcGIS Pro

Used by NDMC analysts for advanced spatial analysis, modelling, and data preparation (e.g., risk profiling, exposure mapping).

### ArcGIS Dashboards

Provides live operational dashboards showing hazard status, warnings, and response coordination metrics. Supports executive decision-making.

### ArcGIS StoryMaps

Communicates disaster events, success stories, and spatial narratives for reporting and public education.

### Survey123 / Field Maps

Supports mobile data collection during damage assessments, field verification, and monitoring of disaster impacts.

### ArcGIS Hub

Enables collaboration across NDMC, PDMCs, and partners through shared open data and community engagement platforms.

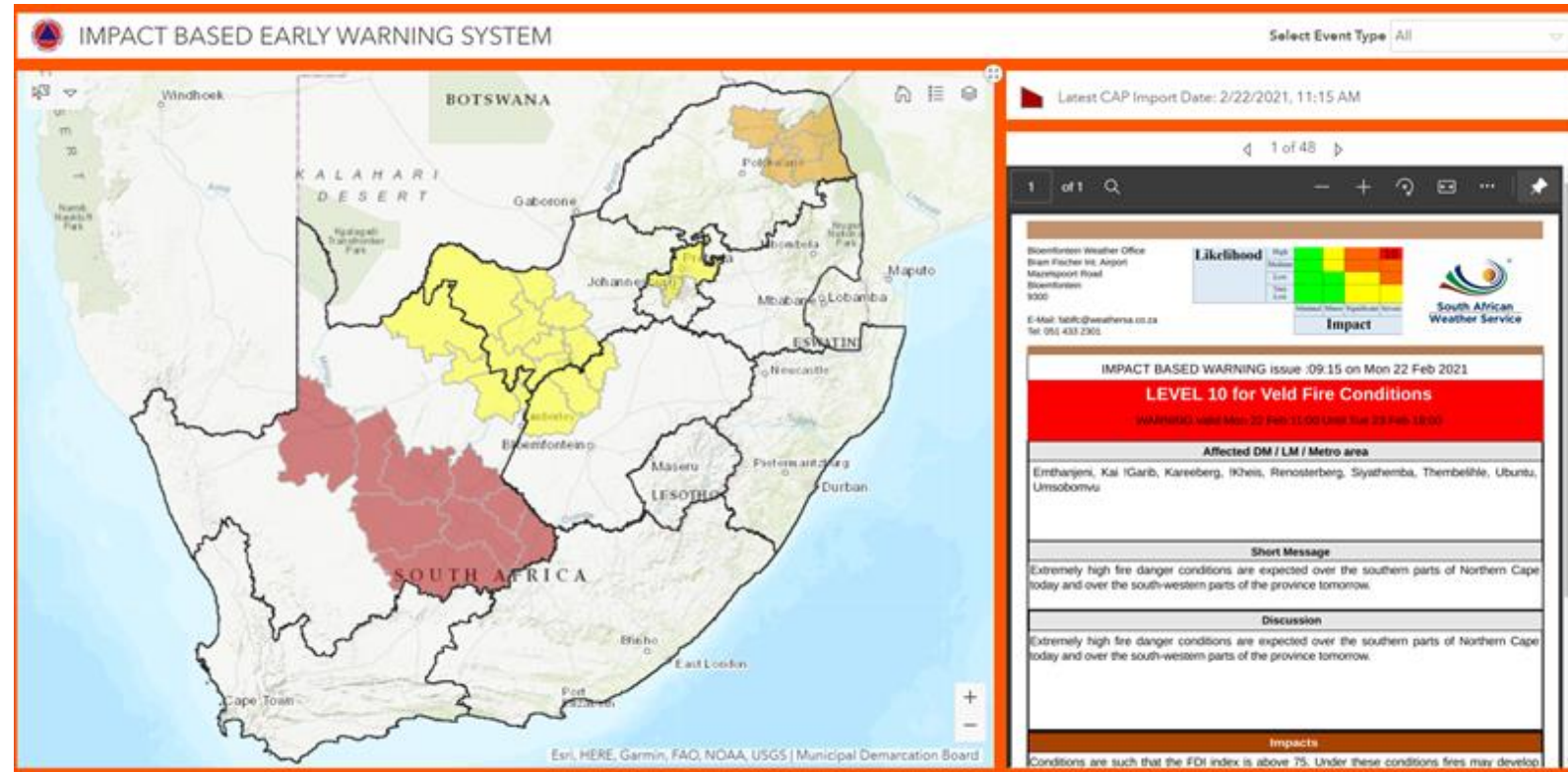
### ArcGIS Living Atlas

Provides access to global basemaps, demographic, and environmental datasets to supplement national data sources.



# DATA INTEGRATION

- **SAWS** (Impact-Based Forecasting and Early Warning data feeds, Met data, historical events)
- **ARC** (Drought monitoring and forecasting)
- **SANSA** (EO imagery and hazard mapping)
- **CSIR** (Green Book Climate Change datasets and vulnerability indices)
- **DWS** (Hydrological data and flood monitoring)
- **PDMC/MDMC systems** (local risk maps, disaster and legislative compliance reports)

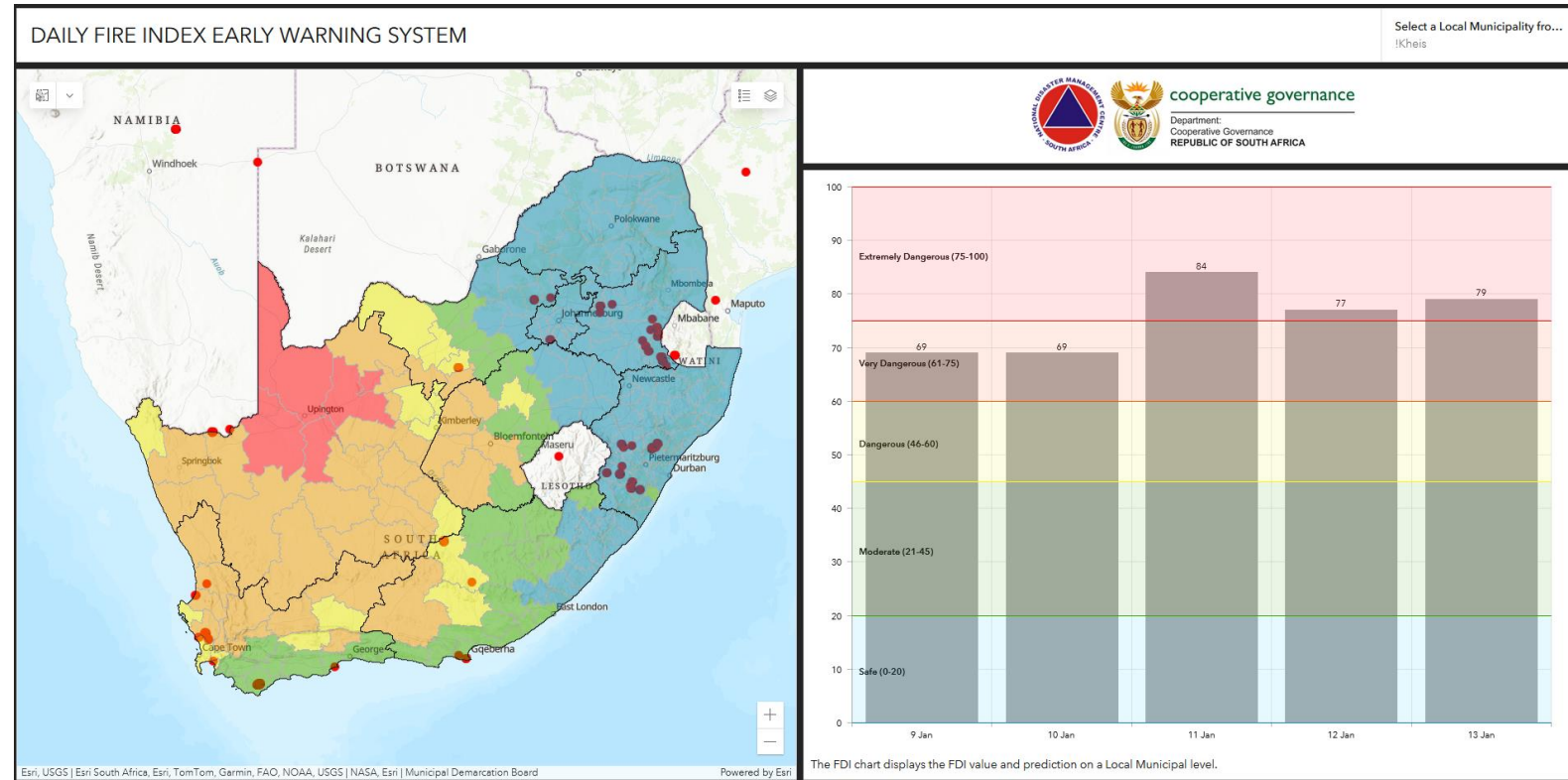


Integration is achieved using **REST APIs**, **OGC-compliant services (WMS/WFS)**, and **ArcGIS Data Interoperability tools**, ensuring data consistency and interoperability across platforms

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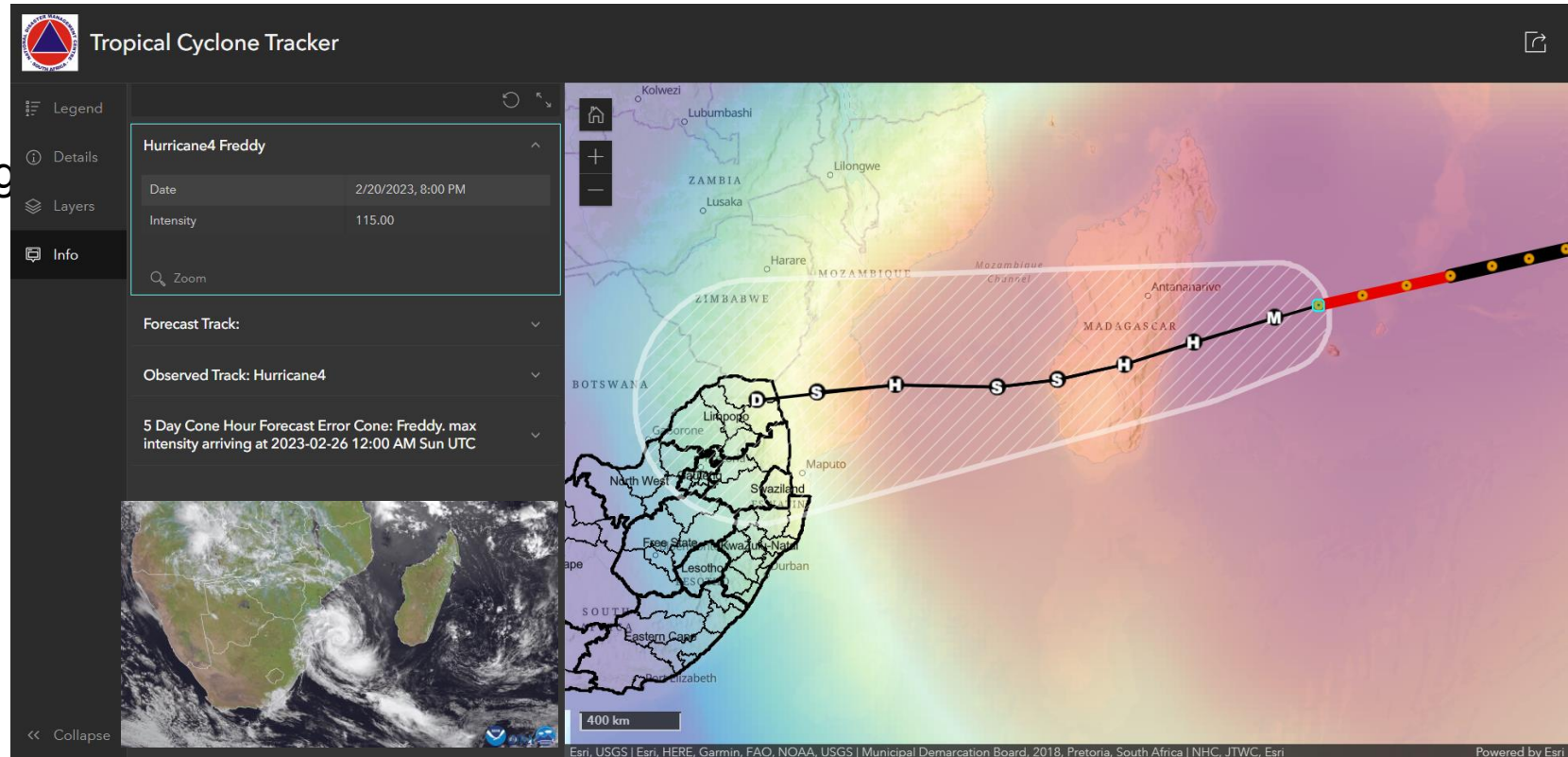
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# DEMONSTRATION





# BENEFITS



**Operational Efficiency**  
– Rapid, coordinated response through real-time data sharing



**Risk Reduction** – Improved identification of high risk areas and vulnerable populations and assets.



**Economic Value** – Reduced losses and optimized resource allocation.



**Governance and Accountability** – Transparent, data informed decision making and reporting



**Collaboration** - Providing a platform for strengthening partnerships



**Innovation** – Enhanced Resilience through integration of AI and EO technologies

# FUTURE DEVELOPMENTS



**Reimagined GeoHub for improved agility and user experience**

Social Media ingestion  
Team Based Access & Discussion spaces  
Community Access and Crowdsourcing



**Capacity building workshops: training of stakeholders**

Development of response procedures



**Sourcing of user requirements for product improvements**

Severe Weather Impact Based Early Warnings  
Fire Danger Index



**Increased synergy with legacy Survey Tools**

Executive Monitoring and Evaluation Dashboard



**Integration with NDMC Big Data Platform**



**Utilization of Business Intelligence for creation of Dashboards and Reports**



**StoryMaps offering monthly reports and analysis of events.**

The **Disaster Management GeoHub** represents a strategic investment in South Africa's resilience and innovation capacity.

By integrating spatial intelligence with disaster management operations, it will **transform reactive response into proactive risk governance** — ensuring that decision-makers at every level have the right information, at the right time, in the right place.

**Our Vision:** An efficient & effective cooperative governance system that enables resilient, safe, sustainable, prosperous, cohesive, connected and climate smart communities

**Our Mission:** To lead the Cooperative Governance System in support of integrated planning and implementation across all spheres of government

**THANK YOU**

Ngiyabonga | Re a leboga | Ndo livhuwa | Nndza nkhenisa | Ke a leboha haholo | Dankie | Enkosi



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# NDMC EARLY WARNING CONTACT REGISTRATION

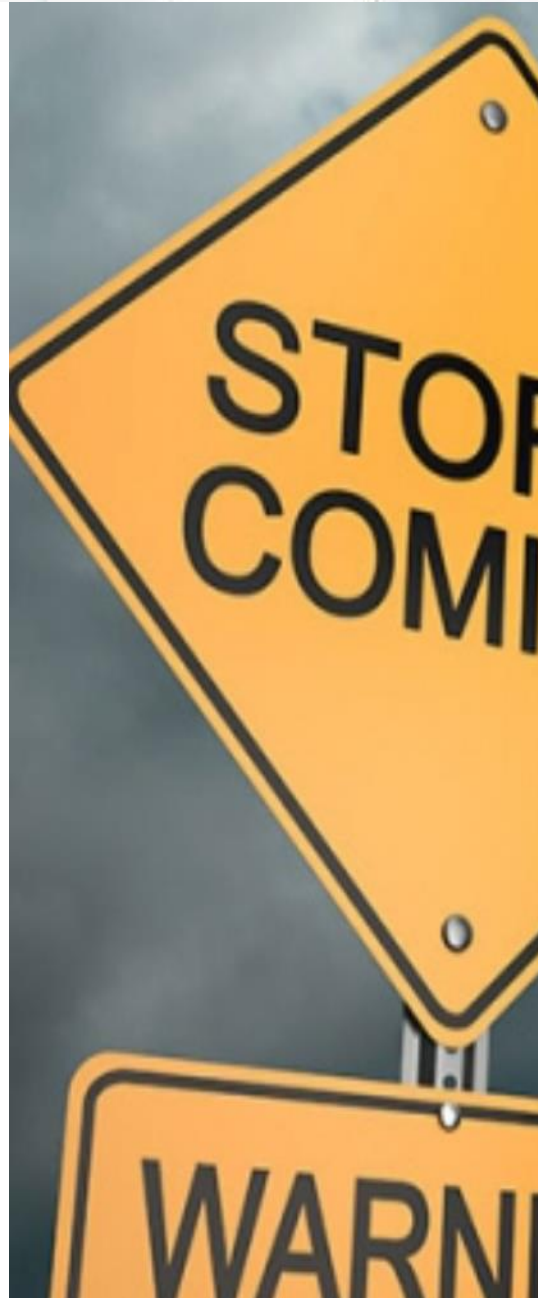
Registrations for Impact Based Early Warnings Contact List

- NDMC GIS Web Portal
  - <https://arcg.is/jy1G9>



- Mail

[markv@ndmc.gov.za](mailto:markv@ndmc.gov.za)



### Early Warnings Registrations

Use this tool to register for early warnings from the NDMC and SAWS

First Name\*

Surname\*

Organization  
Which organization do you represent?

Organization Designation  
Job Title / Position

E-mail address\*

Cellphone / Mobile Number

Warnings for provinces\*

Please select for which area you would like to receive warnings.

<input type="checkbox"/> Eastern Cape	<input type="checkbox"/> Free State	<input type="checkbox"/> Gauteng
<input type="checkbox"/> KwaZulu-Natal	<input type="checkbox"/> Limpopo	<input type="checkbox"/> Mpumalanga
<input type="checkbox"/> North West	<input type="checkbox"/> Northern Cape	<input type="checkbox"/> Western Cape

THE PROTECTION OF PERSONAL INFORMATION ACT (POPI):