

January 2024



MONTHLY STATE OF WATER BULLETIN

WATER IS LIFE - SANITATION IS DIGNITY



water & sanitation

Department:
Water and Sanitation
REPUBLIC OF SOUTH AFRICA



Overview

Most parts of South Africa receive rainfall from October to April during the warm summer, except for the southwestern parts, which receive most rain from March to October. Above-normal rainfall was experienced for most parts of the country in December. Much-below-normal rainfall was received in isolated parts of the Western Cape, Northern Cape, Eastern Cape, Mpumalanga, Freestate, and North West Provinces. The South African Weather Service (SAWS) multi-model rainfall forecast indicates mostly below-normal rainfall over most of the country during Jan-Feb-Mar (JFM), Feb-Mar-Apr (FMA), and Mar-Apr-May (MAM), except for the central and eastern coastal areas indicating higher likelihood of above-normal rainfall.

At the end of January, 38% of the 221 dams monitored nationally were either full or spilling, while 1%, which consisting of the Middle Letaba Dam in Limpopo and Leeugamka Dam in Western Cape Provinces, remained at critically low levels (<10% of Full Supply Capacity). The comparison of dam storage levels in January 2023 and December 2024 indicates that dam storage levels in seven provinces declined in the current reporting period. The two provinces with improved dam storage levels were the Eastern Cape (+9.1%) and Western Cape (+19.4%).

The wet conditions that led to flooding in KZN in December persisted through to January 2024. Most provinces received more than 100 mm of rainfall in January, with the southern parts exceeding 200 mm. The heavy storms that occurred in January affected various districts in KwaZulu Natal, particularly uThukela (Ladysmith), uMzinyathi, and Amajuba District Municipalities, where fatalities were reported due to drowning, displacement, and other people who are still missing.

The 2023 Blue Drop progress report demonstrated a negative national trend in risk movement during the previous five assessment cycles (2009-2023), with the average risk rating rising from 70.1% to 76.5%, putting the country in the high-risk category. The Department is concerned about the increase in WWTWs in the high-risk and critical-risk categories, which indicates poor wastewater management.

Rainfall

The distribution of total monthly rainfall across the country for October to January 2024 is presented in Figure 1. The La Niña weather conditions continued to cause above-normal rainfall over the country. Widespread rainfalls, primarily concentrated in the country's eastern half, were received during January. High rainfalls (>200 mm) were observed over parts of Limpopo, Eastern Cape, and KwaZulu-Natal Provinces.

The monthly rainfall anomalies expressed as a percentage of normal rainfall are presented in Figure 2. Above-normal rainfall was experienced for most parts of the country in January 2024. Much-below-normal rainfall was received in isolated parts of the Western Cape, Northern Cape, Eastern Cape, Mpumalanga, Free State, and North West Provinces.

The South African Weather Service (SAWS) multi-model rainfall forecast indicates mostly below-normal rainfall over most of the country during Jan-Feb-Mar (JFM), Feb-Mar-Apr (FMA), and Mar-Apr-May (MAM) except the central and eastern coastal areas indicating higher likelihood of above-normal rainfall. Minimum and maximum temperatures are expected to be mostly above-normal countrywide for the forecast period.

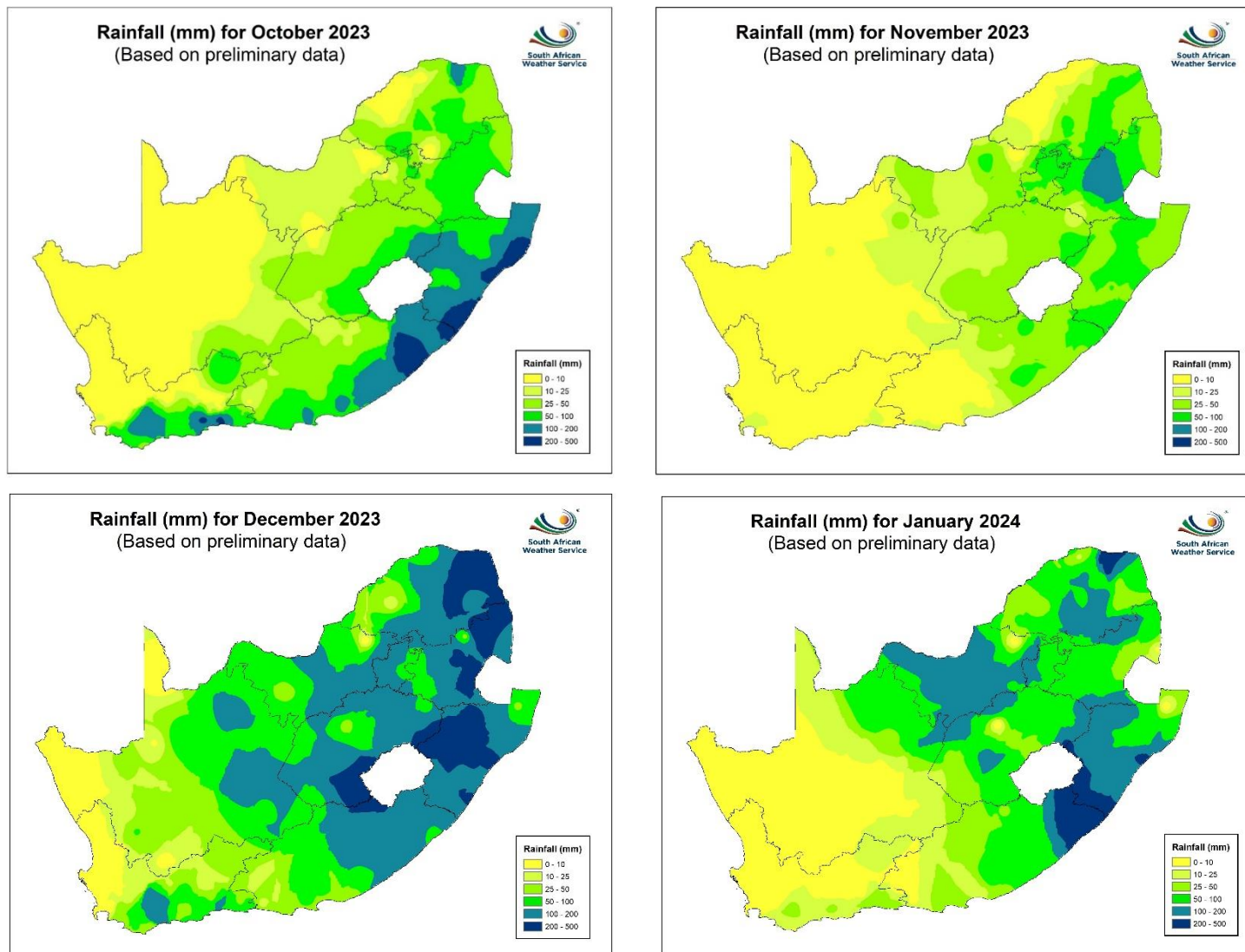


Figure 1: Summer season monthly rainfall distribution for October to January 2024 (Source: SAWS <https://www.weathersa.co.za/home/historicalrain>)

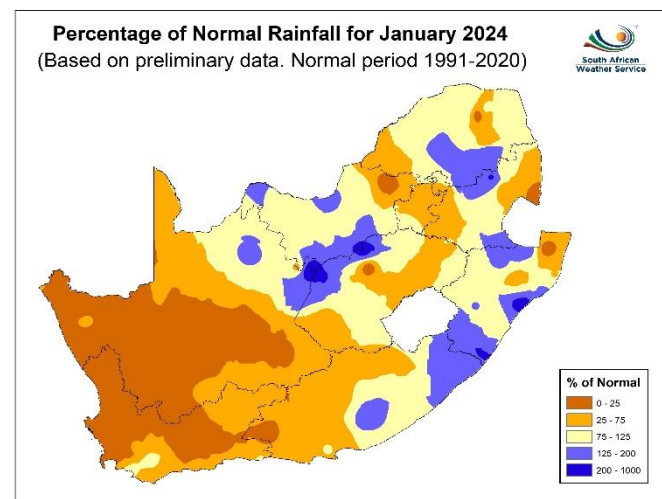
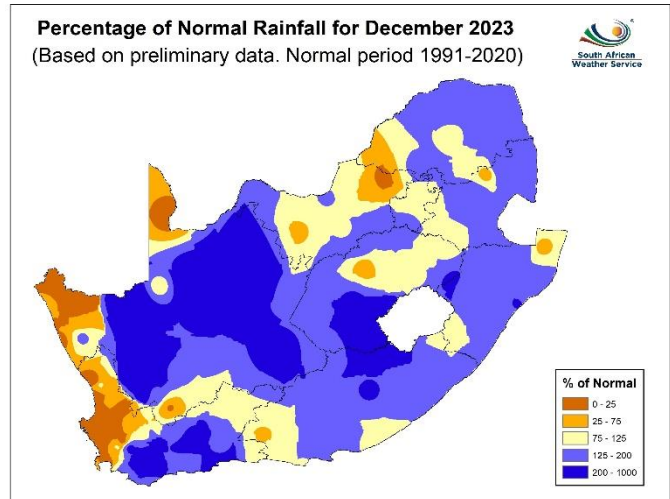
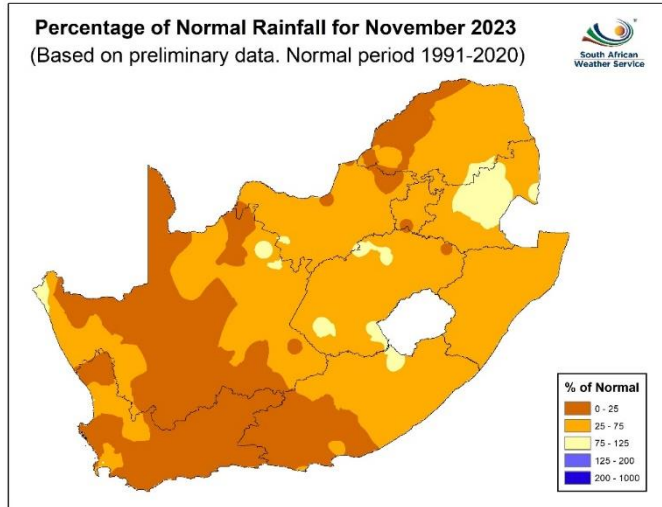
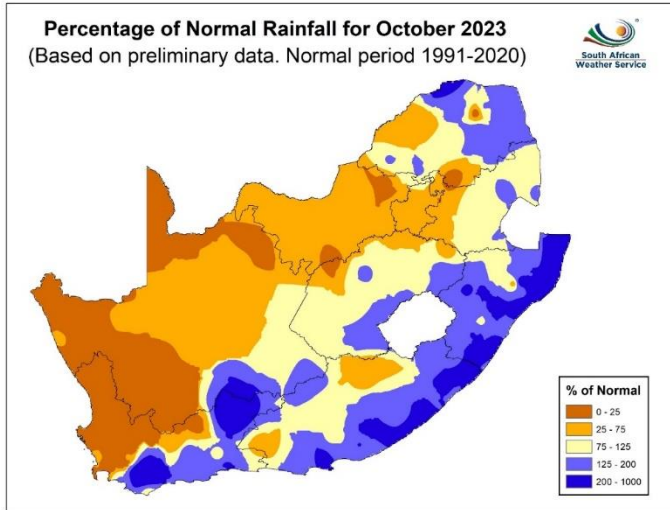


Figure 2: Summer season Percentage of normal rainfall for October to January 2024. Blue shades are indicative of above-normal rain, and the darker yellow shades of below-normal rainfall (Source: SAWS <https://www.weathersa.co.za/home/historicalrain>)

National Dam Storage

Approximately **38%** of the national dams are **above 100% of FSC** (either full or spilling), **56%** are between 50 and 100% of FSC, and at least **1%** are at <10% of FSC (critically low). The country's five largest dam storage ranges between 71 and 100.1% of FSC (Table 1). There are two dams with critically low storage levels (<10% of FSC) (Table 2). The spatial distribution of the dams and a classified range of their storage levels on 29 January 2024 is presented in Figure 3.

Table 1: Storage Levels for Five Largest Dams (by volume)

Reservoir	River	Province	29 January 2024 (% FSC)
Bloemhof Dam	Vaal	Free State	94.7
Vaal Dam	Vaal	Free State	71
Gariiep Dam	Orange	Free State	99.3
Vanderkloof Dam	Orange	Free State	100.1
Pongolapoort Dam	Pongola-Mtamvuna	KwaZulu Natal	80.9

Table 2: Dams below 10% of Full Storage Capacity

Reservoir	River	Province	29 January 2024 (% FSC)
Middle-Letaba Dam	Middle-Letaba River	Limpopo	3.1
Leeugamka Dam	Leeu River	Western Cape	8.8

Figure 4 depicts the 24-month Standardised Precipitation Index (SPI) for December 2023, indicating that several District Municipalities experienced drought over the previous 24 months. Some settlements in the Namaqua District (Northern Cape) and Sarah Baartman District (Eastern Cape) were affected by moderate to severe drought, while two municipalities in the Western Cape (Garden Route District and the City of Cape Town) experienced moderate drought in the previous 24 months. The map also shows that parts of the City of Ekurhuleni in Gauteng experienced a mild drought.

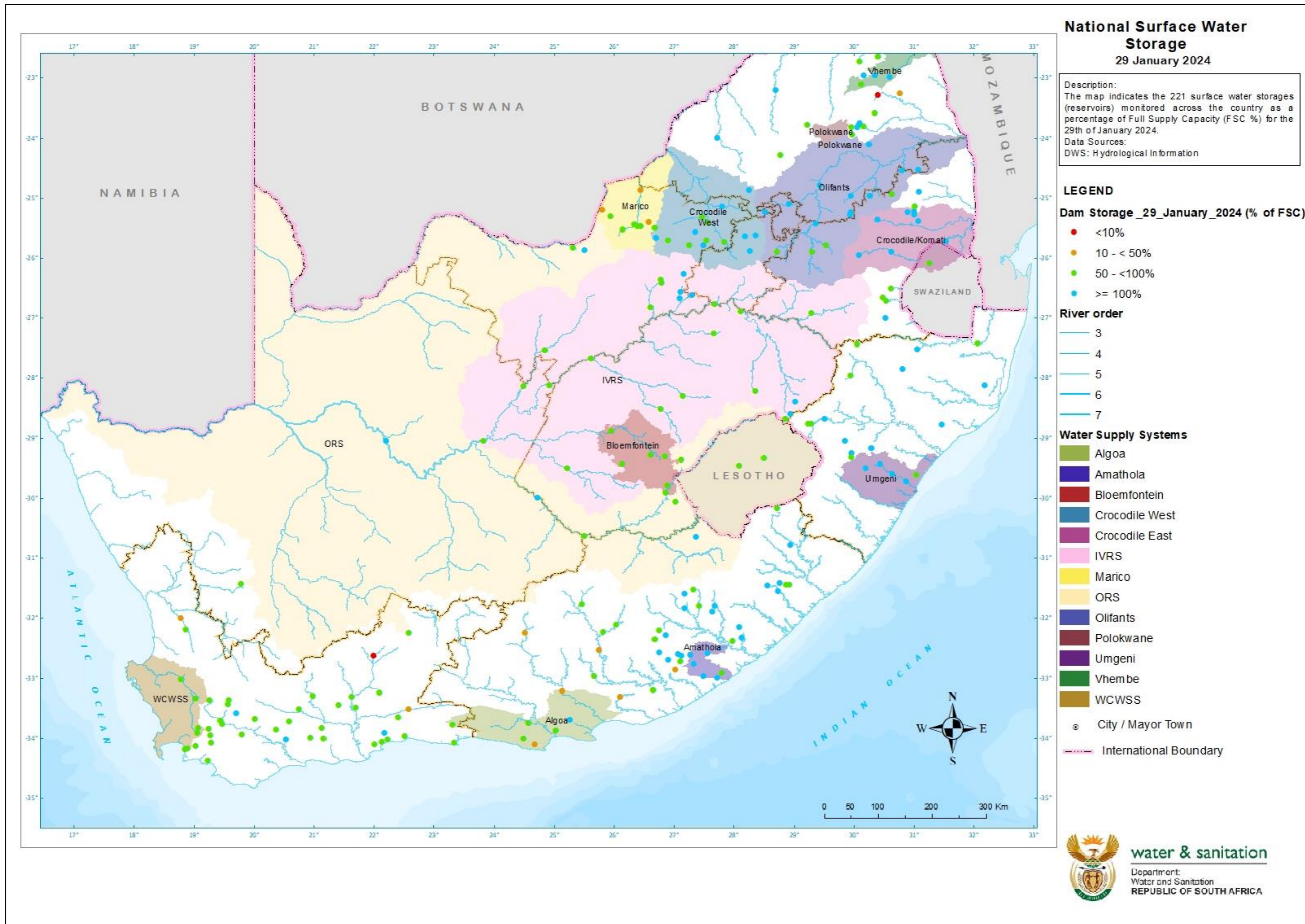


Figure 3: Surface Water Storage Levels - January 2024.

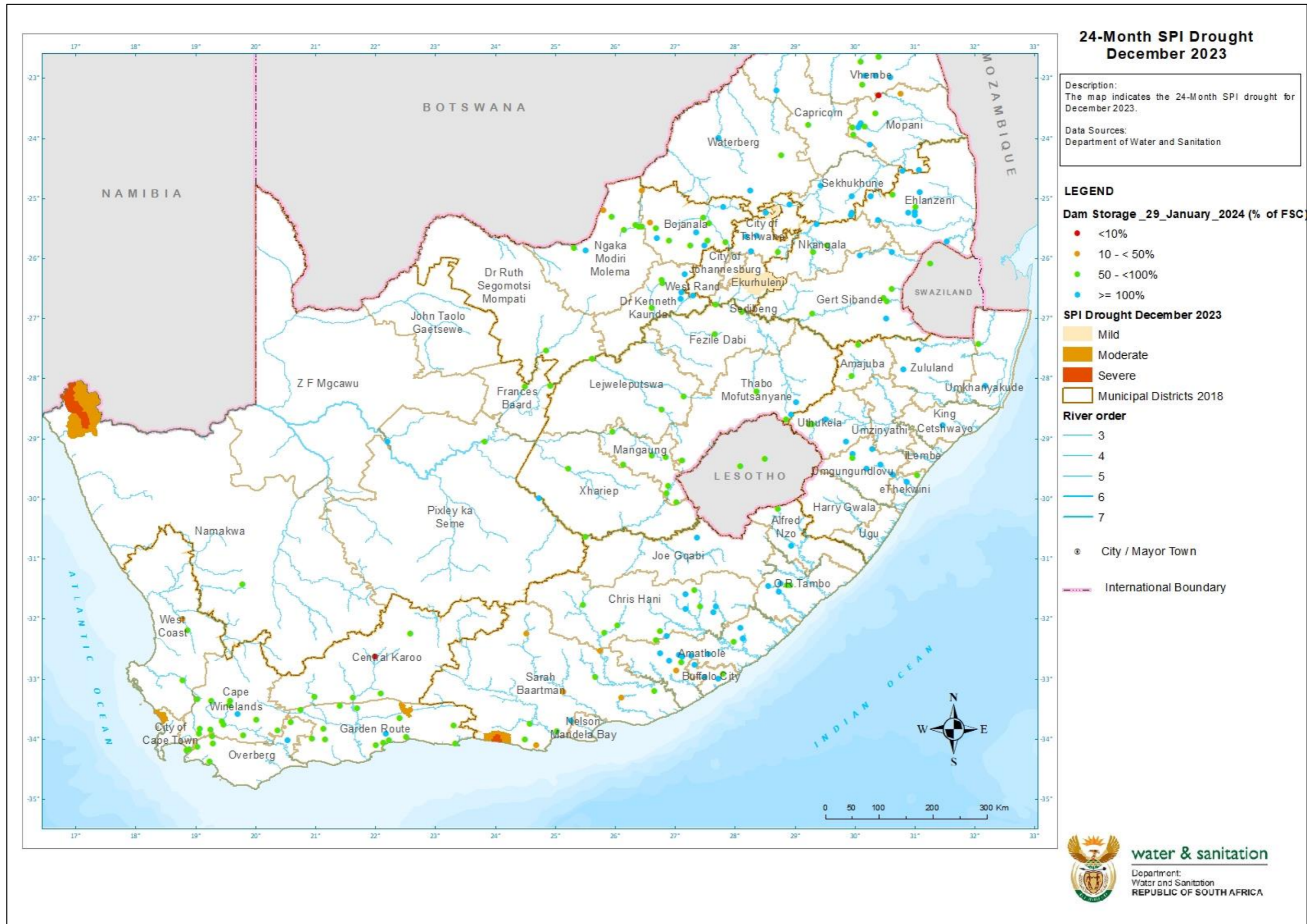


Figure 4: 24-month Spatial Precipitation Index – December 2023

Figure 5 compares the storage levels per Province and International areas for January 2024 to the same time of reporting last year. Seven of the nine Provinces presented a decline in dam storage levels compared to the previous year. The two Provinces with increased dam storage levels were Eastern Cape (+9.1%) and Western Cape (+19.4%).

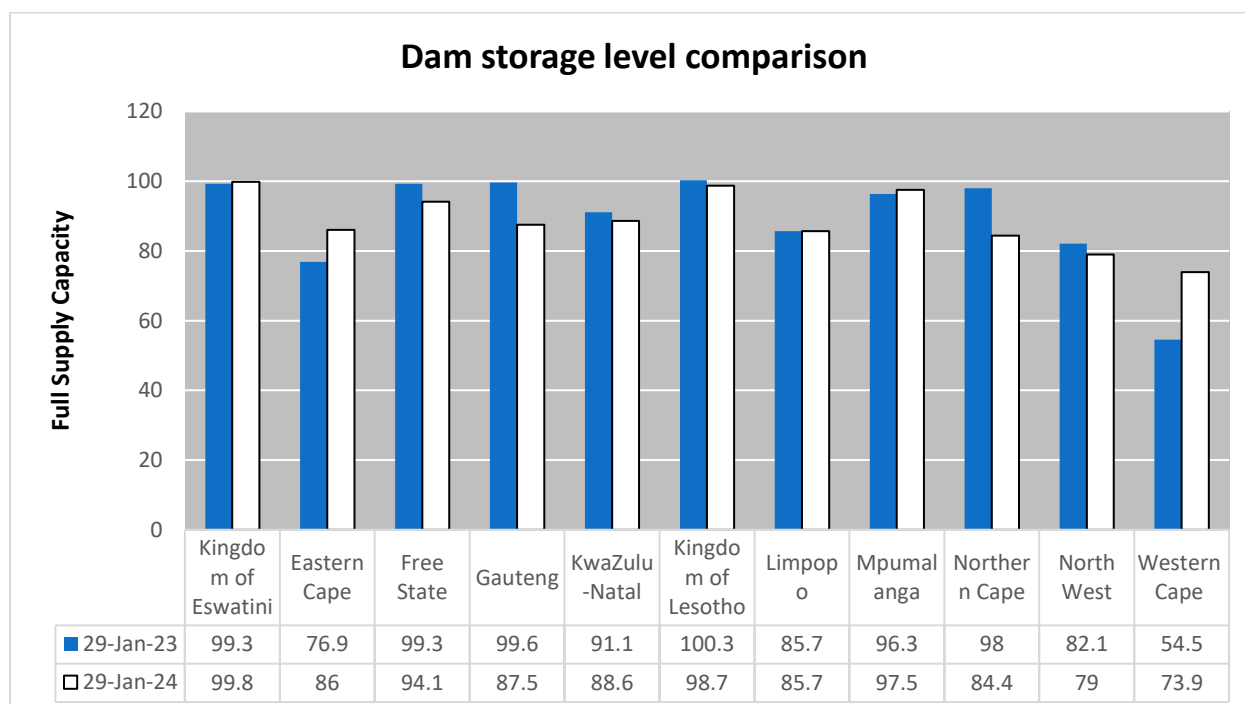


Figure 5: Water Storage Levels January 2023 vs. January 2024.

District Municipalities

The year-on-year comparison of water storage levels per District Municipality (DM) is presented in Figure 6. Sarah Baartman DM, Cape Winelands DM, Overberg DM, Garden Route DM, and Namakwa DM experienced a significant increase (>20%) in dam storage levels compared to last year. In contrast, Sedibeng DM, Francis Baard DM, and the City of Tshwane MM experienced significant declines (>-10%) in dam levels compared to last year.

The dam storage levels in water supply systems (WSSs) and applicable restrictions are in Table 3. The Algoa WSS decision date was changed from 1 June to 1 November, and a new annual operating analysis for the decision date was performed, resulting in an update of water restrictions that will be in effect from 1 November 2023 to 31 October 2024. These restrictions are yet to be gazetted.

Notably, restrictions have been lifted for the Amatole WSS as it recovered well after the rainfall events in February/March 2023.

Due to infrastructure limitations, permanent restrictions are applicable for the Polokwane and Bloemfontein WSSs.

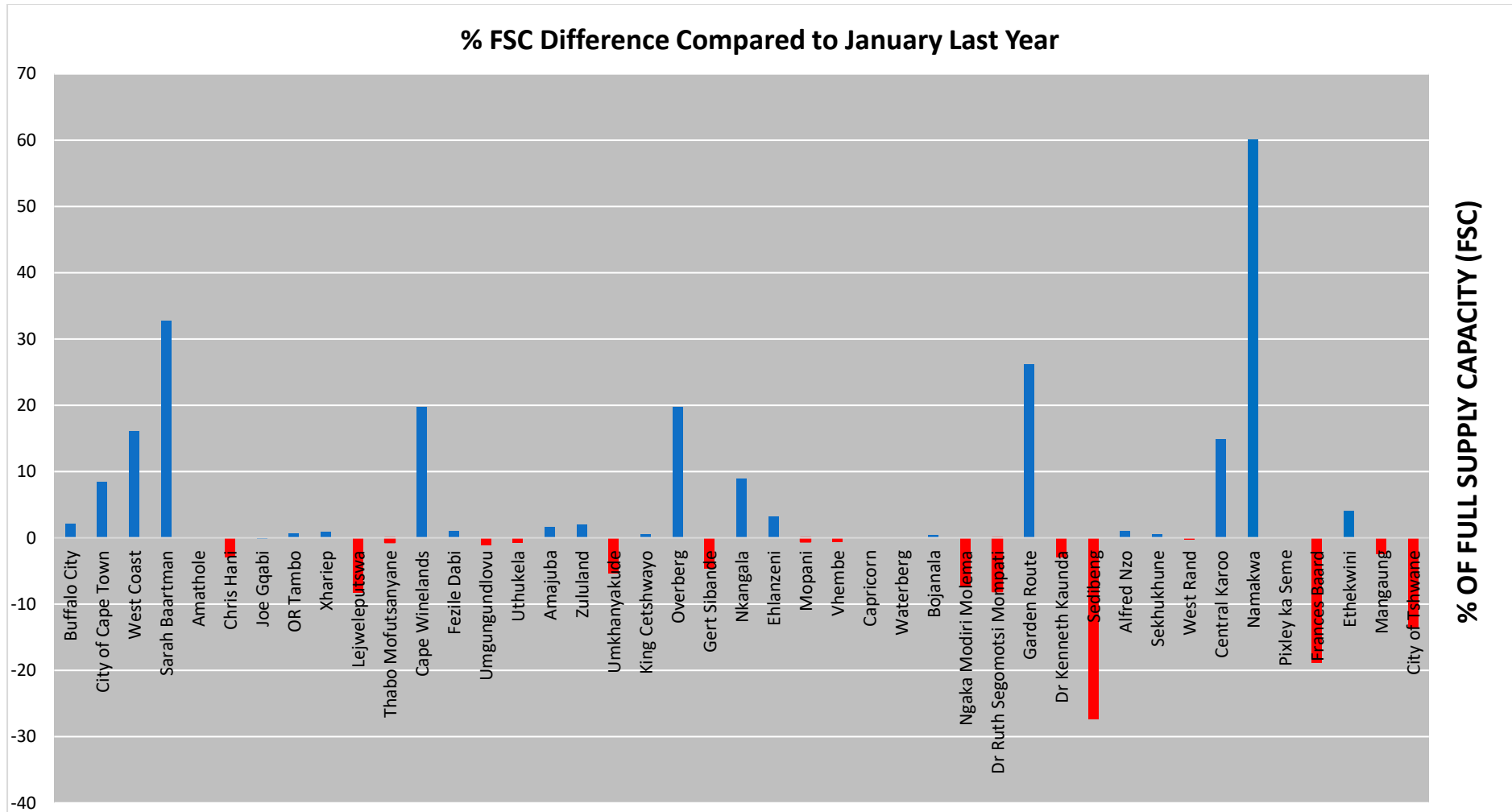


Figure 6: Difference in Water Storage Levels per District Municipality January 2023 vs January 2024

Table 3: Water Supply Systems storage levels

Water Supply Systems/clusters	Cap in 10 ⁶ m ³	29 January 2023 (% FSC)	22 January 2024 (% FSC)	29 January 2024 (% FSC)	System Description
Algoa System	282	13.7	77.6	77	<p><u>The following 5 dams serve the Nelson Mandela Bay Metro, Sarah Baartman (SB) DM, Kouga LM and Gamtoos Irrigation:</u></p> <ol style="list-style-type: none"> 1. Kromrivier Dam 2. Impofu Dam 3. Kouga Dam 4. Loerie Dam 5. Groendal Dam
Amatole System	241	100.8	103.5	102	<p><u>The following 6 dams serve Bisho & Buffalo City, East London:</u></p> <ol style="list-style-type: none"> 1. Laing Dam 2. Rooikrans Dam 3. Bridle Drift Dam 4. Nahoon Dam 5. Gubu Dam 6. Wriggleswade Dam
Klipplaat System	57	100.4	99.7	99.5	<p><u>The following 3 dams serve Queenstown (Chris Hani DM, Enoch Ngijima LM):</u></p> <ol style="list-style-type: none"> 1. Boesmanskrantz Dam 2. Waterdown Dam 3. Oxkraal Dam
Butterworth System	14	100.2	100.1	100.7	<p><u>Xilinxha Dam and Gcuwa weirs serve Butterworth</u></p>

Water Supply Systems/clusters	Cap in 10 ⁶ m ³	29 January 2023 (% FSC)	22 January 2024 (% FSC)	29 January 2024 (% FSC)	System Description
Integrated Vaal River System	10 546	99.9	90.8	90.8	<p><u>The following 14 dams serve Gauteng, Sasol, and ESKOM:</u></p> <ol style="list-style-type: none"> 1. Vaal Dam 2. Grootdraai Dam 3. Sterkfontein Dam 4. Bloemhof Dam 5. Katse Dam 6. Mohale Dam 7. Woodstock Dam 8. Zaaihoek Dam 9. Jericho Dam 10. Westoe Dam 11. Morgenstond Dam 12. Heyshope Dam 13. Nooitgedacht Dam 14. Vygeboom Dam
Luvuvhu	225	100.6	101.4	100.8	<p><u>The following 3 dams serve Thohoyandou etc:</u></p> <ol style="list-style-type: none"> 1. Albasini Dam 2. Vondo Dam 3. Nandoni Dam
Bloemfontein	219	99.4	98.5	97.4	<p><u>The following 4 dams serve Bloemfontein, Botshabelo and Thaba Nchu:</u></p> <ol style="list-style-type: none"> 1. Rustfontein Dam 2. Groothoek Dam 3. Welbedacht Dam 4. Knellpoort Dam

Polokwane	254.27	100	101.2	100.5	<u>The following 2 dams serve Polokwane</u> 1. Flag Boshielo Dam 2. Ebenezer Dam
Crocodile West	444	91.3	95.9	93.9	<u>The Following 7 dams serve Tshwane up to Rustenburg:</u> 1. Hartbeespoort Dam 2. Rietvlei Dam 3. Bospoort Dam 4. Roodeplaat Dam 5. Klipvoor Dam 6. Vaalkop Dam 7. Roodekopjes Dam
uMgeni System	923	101.2	101	100.5	<u>The following 5 dams serve Ethekwini, iLembe & Msunduzi:</u> 1. Midmar Dam 2. Nagle Dam 3. Albert Falls Dam 4. Inanda Dam 5. Spring Grove Dam
Cape Town System	889	61.9	82.4	80.5	<u>The following 6 dams serve the City of Cape Town:</u> 1. Voelvlei Dam 2. Wemmershoek Dam 3. Berg River Dam 4. Steenbras-Lower Dam 5. Steenbras-Upper Dam 6. Theewaterskloof Dam

Crocodile East	159	100.3	100.7	100.5	<u>Kwena Dam supplies Nelspruit, Kanyamazane, Matsulu, Malelane and Komatipoort areas & Surroundings</u>
Orange	7 996	98.4	102.3	99.6	<u>The Following two dams servie parts of the Freestate, Northern and Eastern Cape Provinces:</u> <u>1. Gariep Dam</u> <u>2. Vanderkloof Dam</u>
uMhlathuze	301	99.7	100.3	100.2	<u>Goedertrouw Dam supplies Richards Bay, Empangeni Towns, small towns, surrounding rural areas, industries and irrigators, supported by lakes and transfer from Thukela River</u>

Water Supply Systems - Restrictions

Water Supply Systems with Restrictions	
Water Supply Systems/clusters	Restrictions
Algoa	Decision date was changed from 1 June to 1 November, therefore new AOA were conducted and water restrictions imposed as from 1 November 2023, Urban (Domestic and Industrial) = 5%, Irrigation = 15% for Kouga Subsystem and Urban (Domestic and Industrial) = 40%, Irrigation = 50% for the Kromme Subsystem, these are yet to be gazetted.
Klipplaat	10% for domestic and 50% for irrigation use. Restrictions were gazetted on 17 December 2021
Polokwane	20% restrictions on Domestic and Industries
Bloemfontein	A 15% restriction has been recommended on Domestic and Industrial water supply when the system drops below 95%, notice yet to be gazetted.
Butterworth	Domestic restrictions of 20% still in place (Covid and community frustration occurring, further interventions like augmenting river flows from upstream Dams)

KwaZulu-Natal Floods - January 2024

In December 2023, some parts of KwaZulu Natal experienced heavy rainfall, resulting in flooding in several areas, including uThukela District Municipality. The wet conditions in the province persisted through to January 2024. The January national rainfall map (Figure 7) shows that most parts of the province received more than 100 mm of rainfall, with the southwestern parts exceeding 200 mm. The heavy storms that occurred in January affected various districts in KwaZulu Natal, particularly uThukela (Ladysmith), uMzinyathi, and Amajuba District Municipalities, where fatalities were reported due to drowning, displacement, and other people who remain missing.

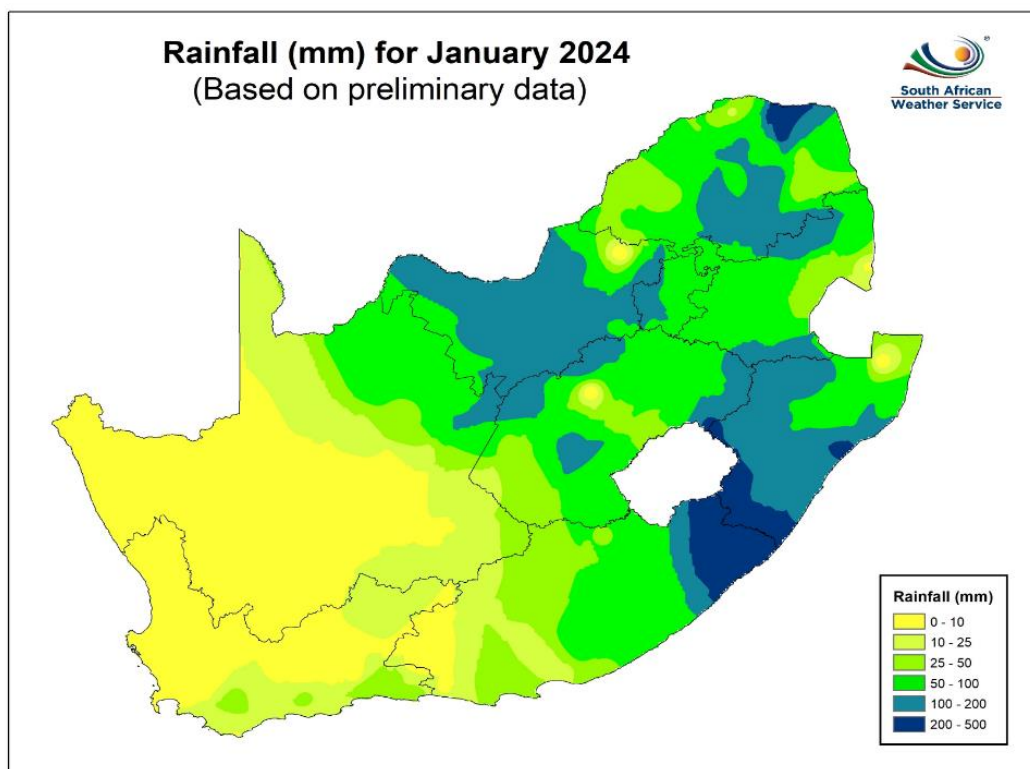


Figure 7: Rainfall map for January 2024 (Source: SAWS).

Floods in the Alfred Duma Local Municipality (ADLM)

On 7 January 2024, SAWS issued a Yellow Level 2 Warning of an upper-air system that was expected to cause disruptive rain in the province's western and southern areas on 8 January 2024 (Figure 8). SAWS numerical weather models had predicted a 24-hour rainfall accumulation of 50mm. The Alfred Duma Local Municipality was severely affected by the heavy rainfall, resulting in flash floods in some of its municipal areas. The floods caused damage to several roads, business properties in the Central Business District (CBD), and homes in its thirteen municipal wards. According to the municipality's assessment, thirty-nine (39) households were affected, with five (5) structures destroyed and eleven (11) partially damaged, affecting one hundred and ninety-nine (199) people. [Figure 9](#) depicts a few flooded low-water bridges within the ADLM.

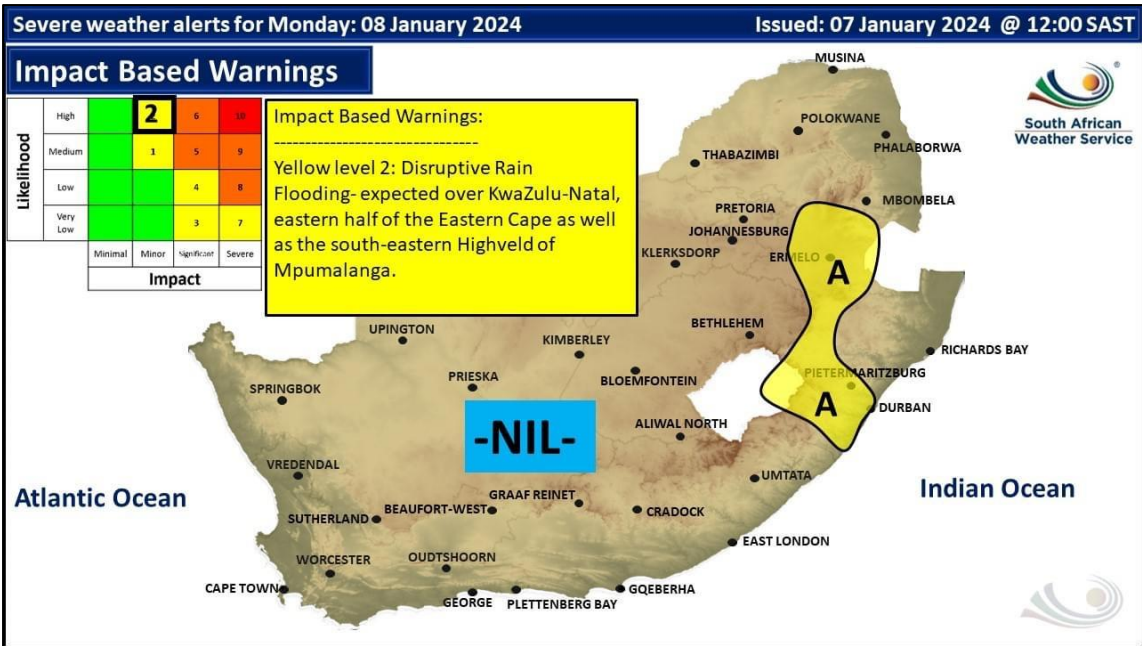


Figure 8: Severe weather warning for 08 January 2024 in KZN (Source:SAWS)



Figure 9: Damages on road infrastructure in the Alfred Duma Local Municipality (Source: Alfred Duma Local Municipality).

Floods in the eThekweni Metropolitan Municipality

On 12 January 2024, SAWS issued a Yellow Level 2 Warning for Disruptive Rain, which was expected to cause flooding and isolated structural damage in central KwaZulu Natal (Figure 10). On 13 January 2024, heavy rainfall, severe thunderstorms, and strong winds wreaked havoc across KwaZulu-Natal, leaving a trail of destruction. The most severe damage and fatalities were reported in parts of the eThekweni Metropolitan Municipality (EMM) and the north coast of KZN. Hundreds of homes, roads, and bridges were damaged, six people died, and two people were reported missing.

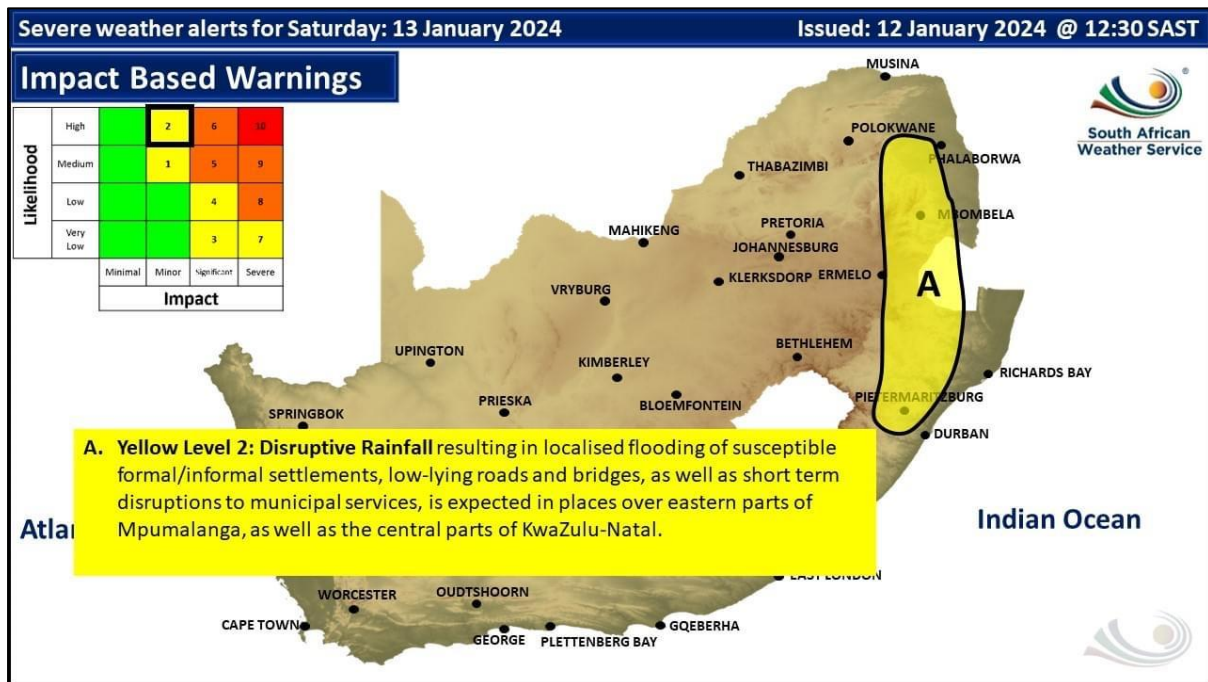


Figure 10: Severe weather warning for 13 January 2024 in KZN (Source: SAWS)

Floods also damaged water and electricity infrastructure, leaving some communities in eThekweni and Stanger without access to water and electricity (EMM, 2024a). The Verulam area, located North of Durban, experienced widespread road closures, mudslides, and power outages. According to eThekweni Disaster Management, 250 households and 1,000 people were directly affected in the eThekweni Metro area. **Furthermore, on 14 January 2024, the eThekweni Metro issued a statement informing the public of the beach closures due to heavy rains that impacted water quality at some of its beaches** (EMM, 2024b).

2023 Green-Drop Assessment Overview

The Green Drop Programme, introduced by the Department in 2008, is an incentive-based risk management approach that aims to address the design and operational capacity of WWTWs, effluent compliance with agreed-upon standards, local regulation (by-laws implementation), and infrastructure management and condition. Since its inception, this programme has sought to identify and develop core competencies that, if strengthened, would gradually and sustainably improve South Africa's wastewater management standards.

The Green Drop certification process recognizes and rewards progressive improvement and excellent performance. The process measures and compares the results of the performance of water services institutions and subsequently rewards or reprimands the institution upon evidence of their excellence or failures according to the minimum standards or requirements that have been defined.

The 2023 Green Drop Assessment

The Green Drop Progress Assessment was conducted for approximately 867 WWTWs, operated by 144 Water Services Authorities (WSAs), the Department of Public Works, and some private institutions nationwide.

The progress report revealed a negative national trend in risk movement over the past five (5) assessment cycles (2009-2023), **with an increase in average risk rating from 70.1% to 76.5%, placing the country in a high-risk category** (DWS, 2023). [Figure 11](#) shows the movement in the number of WWTWs in each risk category at a national level, as summarised below:

- ❖ The overall national risk profile 2023 leans towards works dominating the medium, high, and critical risk areas, with prominence in the high-risk category.
- ❖ The number of WWTWs in the low-risk category has reduced from 199 in 2013 to 168 in 2022, with a further reduction to 74 in 2023, indicating a negative movement with deterioration in wastewater management.
- ❖ The number of WWTWs in the medium-risk category has decreased since 2013 from 272 to 217 in 2023, noting a small decrease between 2022 and 2023.
- ❖ The number of WWTWs in the high- and critical-risk categories has both increased since 2013.
- ❖ The number of WWTWs in the high-risk category has increased from 232 in 2013 and 252 in 2022 to 298 in 2023. This indicates a negative movement of WWTWs from the low and medium category into the high-risk category.
- ❖ The same pattern is apparent for the number of WWTWs in the critical-risk category, with a notable increase from 2013, with 278 WWTWs now residing in the critical-risk category.

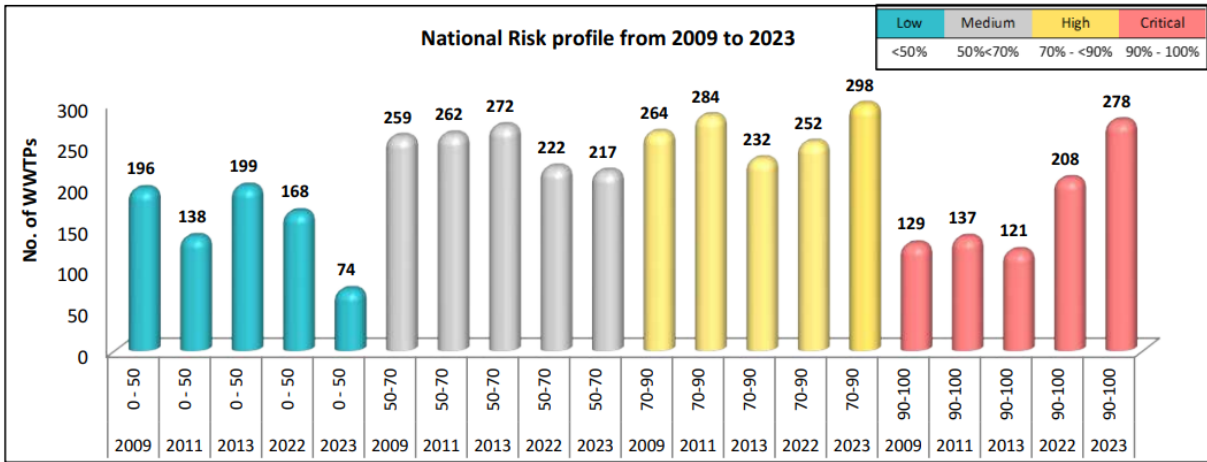


Figure 11: National Risk Profile Trend from 2009 to 2023 (Source: DWS, 2023).

The Department is concerned about the increase in the number of WWTWs in the **high and critical-risk** categories, as this represents poor wastewater management at these WWTWs. The 2023 national risk profile and the results from DWS (2023) are summarised as follows:

- ❖ The average Cumulative Risk Rating (%CRR) deviation score is 76.5%, placing the country in the high-risk category;
- ❖ 9% of WWTWs are in the low-risk category;
- ❖ 25% of WWTWs are in the medium-risk category;
- ❖ 34% of WWTWs are in the high-risk category, and
- ❖ 32% of WWTWs are in the critical-risk category.

Compiled by: Hulisani Mafenya, Nokulunga Biyase, Judy Reddy, Mirrander Ndhlovu and Joshua Rasifudi

For technical inputs and enquiries:

Sub-Directorate: Integrated Water Resource Studies:

Tel: 012 336 6856

Email: IntegratedWaterStudies@dws.gov.za

National State of Water Reporting Web page:

<https://www.dws.gov.za/Projects/National%20State%20of%20Water%20Report/default.aspx>

Department of Water and Sanitation

Private Bag X313

Pretoria

0001

Glossary

Term	Definition
FSC	Full Storage Capacity
Flood Alert/Flood Warning	Three levels of warnings may be issued by the South African Weather Service and the Department of Water and Sanitation. Flood Alerts indicate flooding is possible. Flood Warnings indicate flooding is expected. Severe Flood Warnings indicate severe flooding.
SPI	Standardized Precipitation Index (SPI) is a widely used index to characterise meteorological drought on a range of timescales. On short timescales, the SPI is closely related to soil moisture, while at longer timescales, the SPI can be related to groundwater and reservoir storage
Water Supply System	A typical town/city water supply system consists of a gravity or pumping-based transmission and distribution system from a local or distant water source with needed water treatment system

References

Department of Water and Sanitation (DWS), 2023. Blue Drop National Report 2023. Pretoria. Department of Water and Sanitation (DWS), Pretoria, South Africa.

eThekweni Metropolitan Municipality (EMM), 2024a. Media Statement: Severe thunderstorms cause devastation in coastal areas; eThekweni Metro, iLembe, and uGu Districts with five confirmed fatalities (14 January 2024)

(<https://www.durban.gov.za/presstatement/Severe+thunderstorms+cause+devastation+in+coastal+areas%3B+eThekweni+Metro%2C+iLembe%2C+and+uGu+Districts+with+five+confirmed+fatalities>,

Accessed 31 January 2024)

eThekweni Metropolitan Municipality (EMM), 2024b. Media Statement: City Closes Some Beaches Following Recent Heavy Rains (14 January 2024). (<https://www.durban.gov.za/pressstatement/City+closes+some+beaches+following+recent+heavy+rains>, Accessed 31 January 2024)