

October 2023



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 the country receive rainfall during the warm summer - October to April, except for the south-western parts, which receive most of its rain from March to October. Widespread rainfall occurred over the summer and winter rainfall region of South Africa during the reporting period. Most parts of the Eastern Cape and Kwazulu Natal received more than 200 mm of total rainfall in October 2023. The South African Weather Service (SAWS) multi-model rainfall forecast indicates above-normal rainfall for the north-east of the country during Nov-Dec-Jan (NDJ), Dec-Jan-Feb (DJF), and Jan-Feb-Mar (JFM) with below normal rainfall predicted for the central and south-western parts of the country.

As of 30 October 2023, 37% of the dams being monitored were either full or spilling (above 100% of FSC), while 1%, which included the Middle Letaba Dam in Limpopo, remained at critically low levels. The Algoa WSS storage level had been critically low in the previous months; winter rainfalls have significantly improved storage in the system, and as of 30 October 2023, storage in the system had progressively improved to 78.5% of FSC, up from 59.5% in the previous year. The comparison of dam storage levels for October 2022 and October 2023 demonstrates that all provinces have storage levels equal to or greater than the previous year's at the same reporting time.

The Department of Water and Sanitation is mandated to protect aquatic and associated ecosystems and their biological diversity. The Minister of Water and Sanitation is the custodian of the nation's water resources and must ensure that the nation's water resources are protected, used, developed, managed, and controlled in a sustainable manner for the benefit of all. The Water Quality Report for the 2022/23 hydrological year highlighted the variables of concern for the country. In KwaZulu Natal, coliforms, COD, Suspended Solids, Electrical Conductivity, and Nitrates were all found to be variables of concern.

Rainfall

The distribution of total monthly rainfall across the country for October 2023 is presented in [Figure 1](#). Widespread rainfall occurred over the summer and winter rainfall region of South Africa during the reporting period. Over the Eastern Cape and KwaZulu Natal, rainfall totals exceeded 200 mm in various locations, while rainfall in the Western Cape, Limpopo, Gauteng, and Limpopo ranged between 50 mm to about 100 mm.

The monthly rainfall anomalies expressed as a percentage of normal rainfall are presented in [Figure 2](#). Above-normal rainfall for October was experienced in the coastal areas of the country and some isolated parts of Limpopo and Free State Provinces. The South African Weather Service (SAWS) multi-model rainfall forecast indicates above-normal rainfall for the north-east of the country during Nov-Dec-Jan (NDJ), Dec-Jan-Feb (DJF), and Jan-Feb-Mar (JFM) with below normal rainfall predicted for the central and south-western parts of the country. Predictions still favor above-normal rainfall conditions over the northeastern parts of the country, even with an El Niño in place. Minimum and maximum temperatures are expected to be mostly above-normal countrywide for the forecast period

Rainfall (mm) for October 2023 (Based on preliminary data)

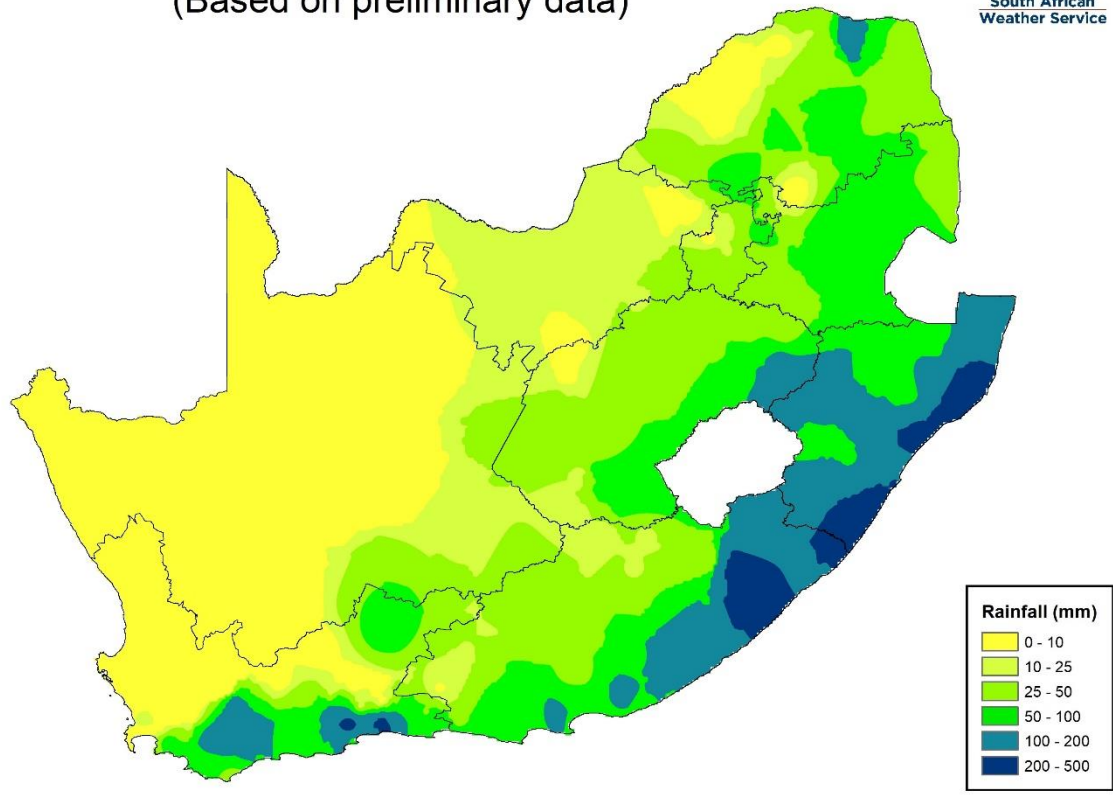


Figure 1: Summer season monthly rainfall distribution for October 2023 (Source: SAWS <https://www.weathersa.co.za/home/historicalrain>)

Percentage of Normal Rainfall for October 2023
(Based on preliminary data. Normal period 1991-2020)

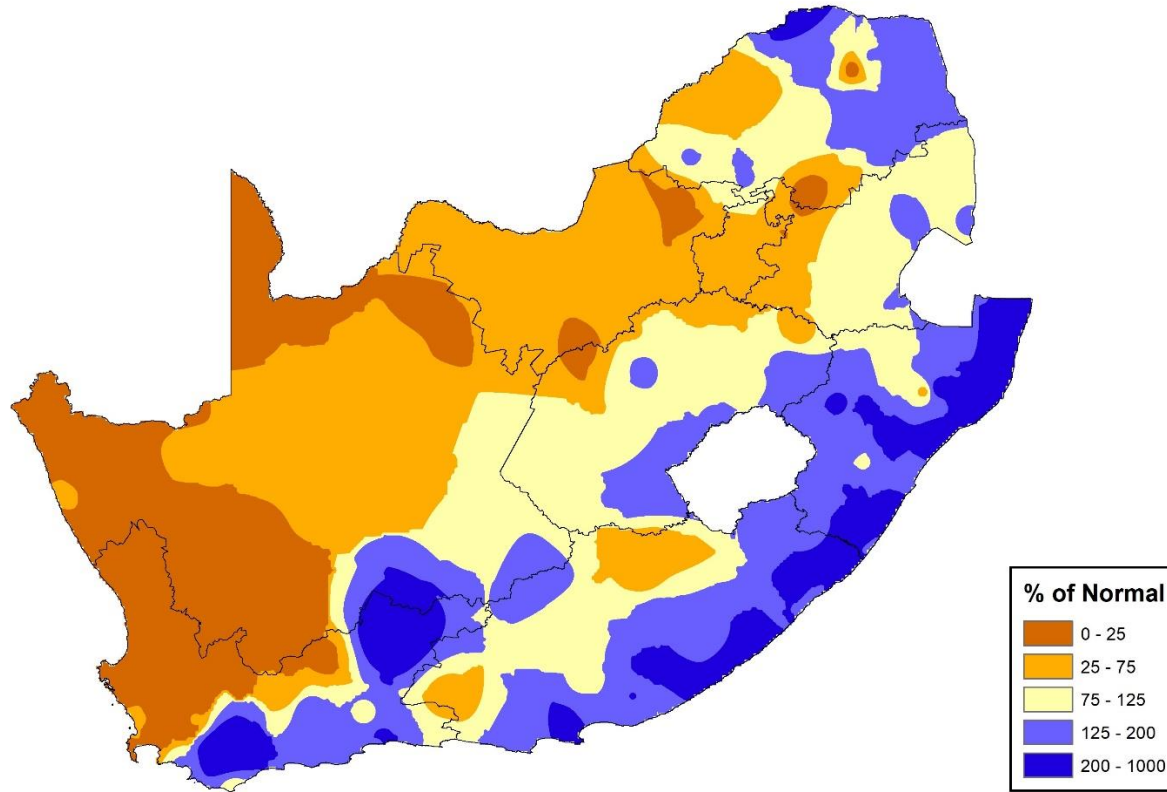


Figure 2: Summer season Percentage of normal rainfall for October 2023. Blue shades are indicative of above-normal rain, and the darker yellow shades of below-normal rainfall (Source: SAWS <https://www.weathersa.co.za/home/historicalrain>)

National Dam Water Storage

The 24-month (long-term) Standardised Precipitation Index (SPI) for September 2023 is presented in Figure 3. Based on the SPI, the two Cape Provinces (Eastern Cape and Northern Cape) have been affected by drought in the last 24 months. The Northern Cape Province is the only province with areas experiencing extreme drought, while the Eastern Cape Province is moderately impacted.

The dam storage's spatial distribution and status for 30 October 2023, displayed in Figure 4, shows that **37%** of the national dams are either full or spilling (**above 100% of FSC**), **59%** have storage between ($\geq 50\%$ and $< 100\%$) of FSC, while **1%** are at critically low storage volumes. The country's five largest dams storage were Bloemhof Dam (89.9 Full%), Vaal (74.8 Full%), Gariep (85.7 Full%), Vanderkloof Dam (94.8 Full%) and Pongolapoort Dam (74.4 Full%) for the last week of October 2023.

Dam at critically low storage levels ($< 10\%$ of FSC) are given in Table 1. The Middle-Letaba Dam in the Limpopo Province is the only dam at critical levels nationally.

Table 1: Dam below 10% Full Supply Capacity (October 2023)

Reservoir	River	Province	30 October 2023 (% FSC)
Middle-Letaba Dam	Middle-Letaba River	Limpopo	3.6

24 Month - SPI Drought - September 2023

Legend

- Major Towns
- ▭ Provincial
- ▭ Local Municipalities 2018
- ▭ Moderate
- ▭ Severe
- ▭ Extreme

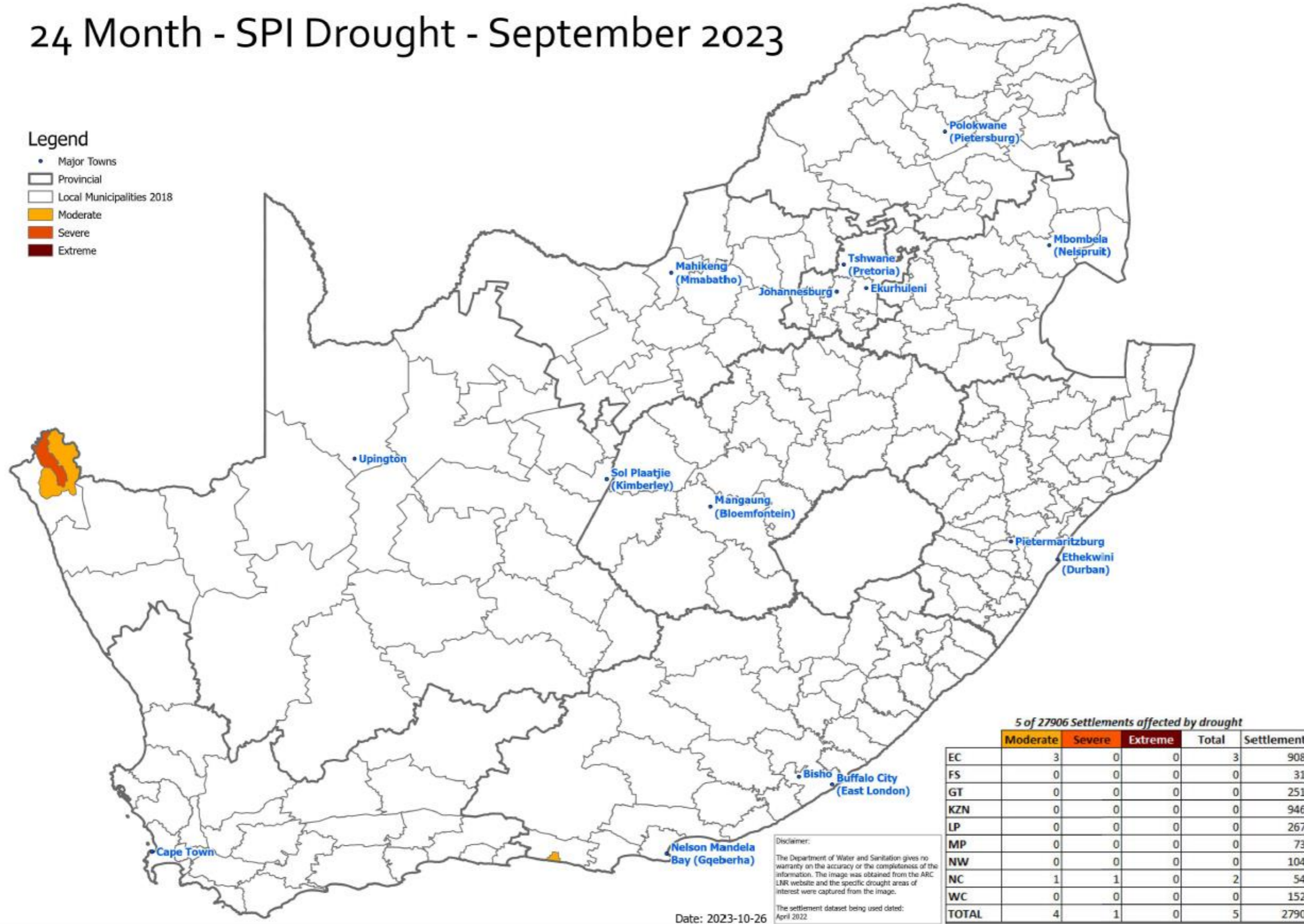


Figure 3: 24-months Spatial Precipitation Index – September 2023 (DWS - NIWIS - Disaster Management - (dwa.gov.za))

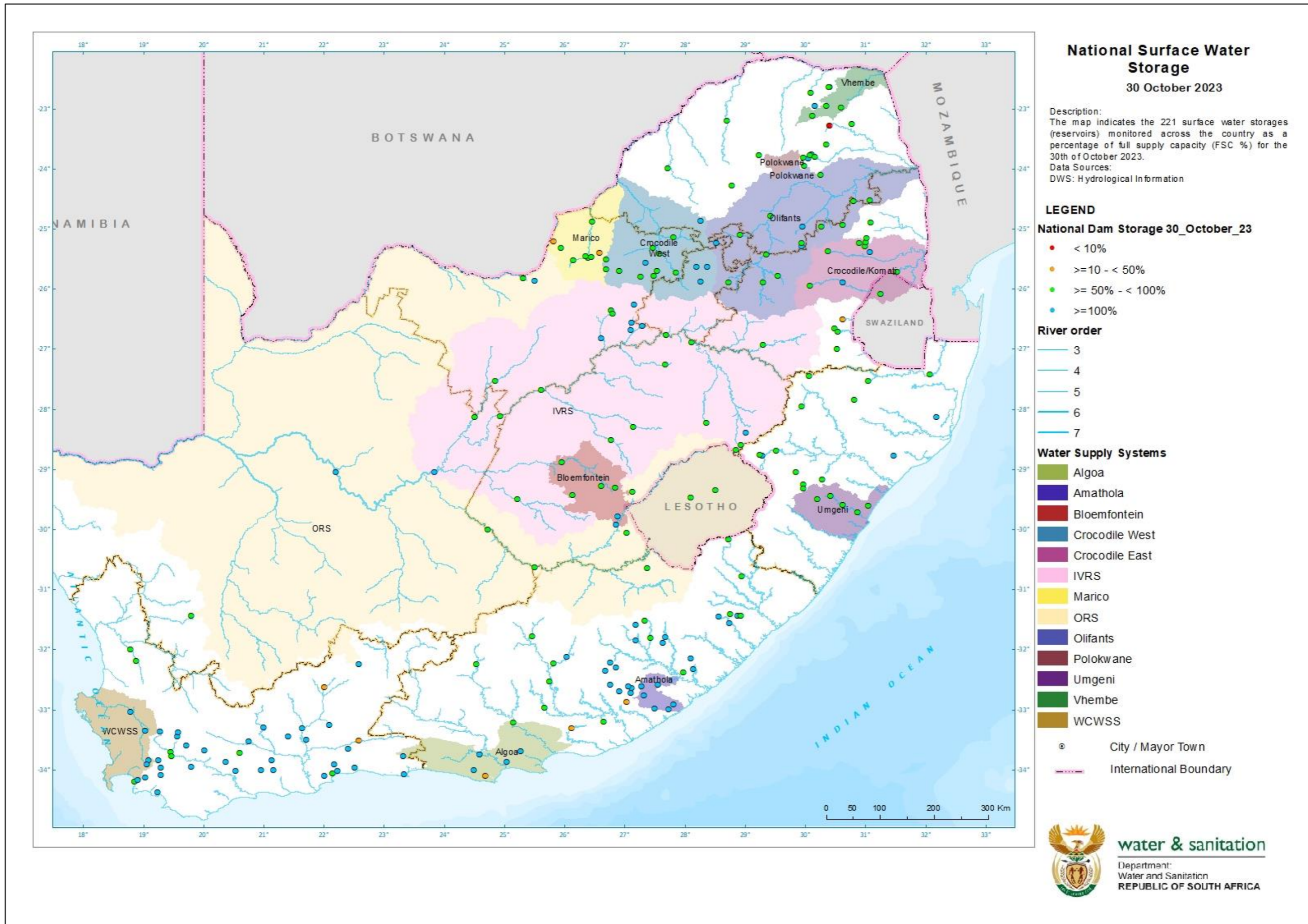


Figure 4: Water Supply System and dam storage – end of October 2023

The comparison of dam storage levels for October 2022 and October 2023 is presented in Figure 5 below. Most Provinces are experiencing storage levels equal to or greater than last year at the same time of the reporting period.

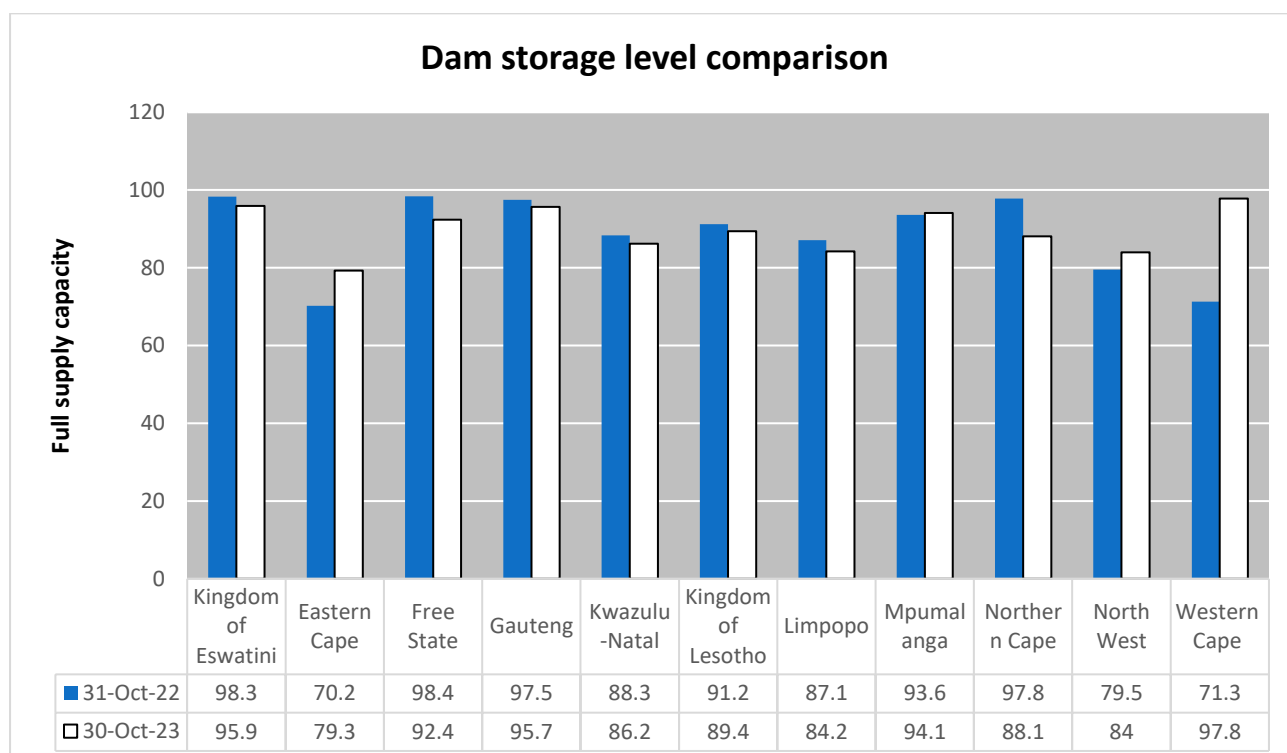


Figure 5: Water Storage Levels per Province/Country October 2022 vs. October 2023.

The water storage levels comparison per District Municipalities (DM) is presented in Figure 6. Namakwa DM, Sarah Baartman DM, Central Karoo DM, Garden Route DM, and Overberg DM have experienced a significant increase compared to last year. In contrast, the Umgundlovu DM, Zululand DM, Sedibeng DM, Alfred Nzo DM, Amajuba DM, Fezile Dabi DM, City of Tshwane DM, Vhembe DM, Pixley ka Seme DM and Francis Baard DM experienced the worst decline in Dam levels compared to last year.

The Dam storage levels in water supply systems and applicable restrictions are presented in Table 2. The Algoa Water Supply System remains with water restrictions in response to the low surface water storage levels. Notably, restrictions have been lifted for the Amatole Water Supply System as it had recovered well after the rainfall events in February/March 2023. **Due to infrastructure limitations, permanent restrictions are applicable for the Polokwane and Bloemfontein Water Supply Systems.**

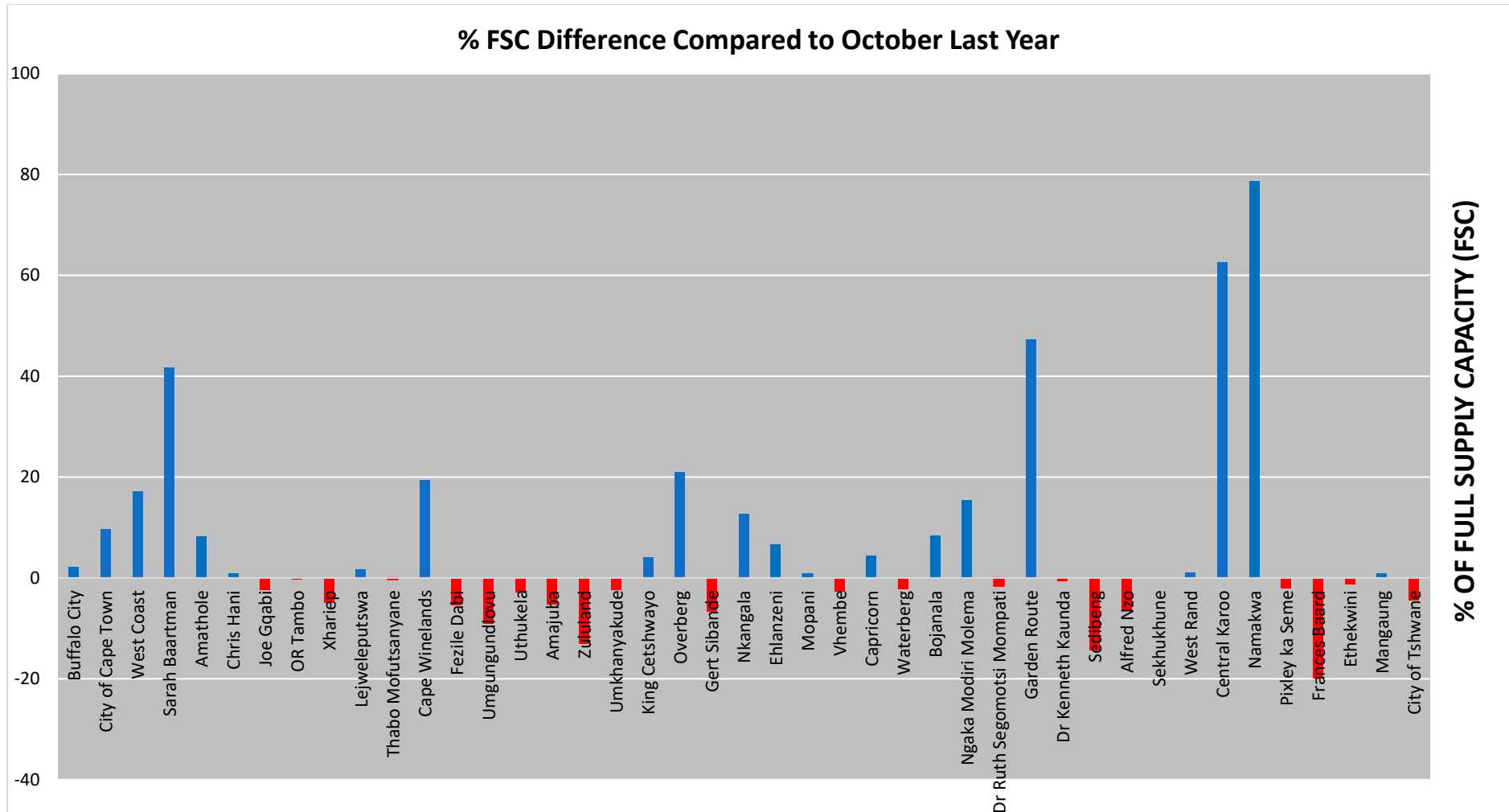


Figure 6: Difference in Water Storage Levels per District Municipality October 2022 vs October 2023

Table 2: Water Supply Systems storage levels and applicable restrictions

Water Supply Systems/clusters	Cap in 10 ⁶ m ³ (% FSC)	30 October 2022 (% FSC)	23 October 2023 (% FSC)	30 October 2023 (% FSC)	Comments (systems below 50% in red)
Algoa System	282	19	77.8	78.5	<u>System of 5 dams for Nelson Mandela Bay Metro, Sarah Baartman (SB) DM, Kouga LM and Gamtoos Irrigation:</u> Water restrictions imposed as from 1 June 2023, Urban (Domestic and Industrial) = 30%, Irrigation = 65%, these are yet to be gazetted.
Amatole System	241	92.8	104.8	102.1	<u>System of 6 dams for Bisho & Buffalo City, East London:</u> No restrictions for 2023/2024
Klipplaat System	57	100.5	101.2	101.3	<u>System of 3 dams for Queenstown (Chris Hani DM, Enoch Ngijima LM):</u> 10% for domestic and 50% for irrigation use. Restrictions were gazetted on 17 December 2021
Butterworth System	14	100.3	100.2	100.1	<u>Xilinx Dam and Gcuwa weirs for Butterworth:</u> Domestic restrictions of 20% still in place (Covid and community frustration occurring, further interventions like augmenting river flows from upstream Dams)
Integrated Vaal River System	10 546	91.7	88.7	87.9	<u>System of 14 dams serving Gauteng, Sasol, and ESKOM:</u> No restrictions, the system recovered reasonably well since the February/March flooding event

Water Supply Systems/clusters	Cap in 10 ⁶ m ³ (% FSC)	30 October 2022 (% FSC)	23 October 2023 (% FSC)	30 October 2023 (% FSC)	Comments (systems below 50% in red)
Polokwane	254	92.8	93.6	92.3	<u>System of 7 dams serving Polokwane and surroundings:</u> 20% restrictions on Domestic and Industries
Crocodile West	444	84.7	90.9	90.3	<u>6 dams for Tshwane up to Rustenburg:</u> No restrictions
Luvuvhu	225	98.7	96.8	96.4	<u>System of 3 dams for Thohoyandou etc:</u> No restrictions
Umgeni System	923	94.6	86.3	86.9	<u>System of 5 dams serving Ethekwini, iLembe & Msunduzi:</u> No restrictions
Cape Town System	889	81	100.6	100.5	<u>System of 6 dams for the City of Cape Town:</u> No restrictions
Bloemfontein	219	93.2	94.3	94	<u>System of 3 dams serving Bloemfontein, Botshabelo and Thaba Nchu:</u> A 15% restriction has been recommended on Domestic and Industrial water supply when the system drops below 95%, notice yet to be gazetted.
Crocodile East	159	82.4	86.8	84.7	<u>Kwena Dam supplies Nelspruit, Kanyamazane, Matsulu, Malelane and Komatipoort areas & Surroundings:</u> No Restrictions
Orange	7 996	94.1	89.3	89.1	<u>Two dams serving parts of the Freestate, Northern and Eastern Cape Provinces:</u> No restrictions
uMhlathuze	301	96	99.6	100.1	<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> No restrictions

An Overview of the National Water Quality Status

The Department of Water and Sanitation (DWS) is mandated to protect aquatic and associated ecosystems and their biological diversity. The Minister of Water and Sanitation is the custodian of the nation's water resources and must ensure that the nation's water resources are protected, used, developed, managed, and controlled in a sustainable manner for the benefit of all (DWS,2023). The quarterly water quality monitoring report is a tool used to assist the minister in achieving the mandate and identifying the trends in the water resource in advance. The Water Quality Report (DWS, 2023) for the 2022/23 hydrological year highlighted the variables of concern for the country, as illustrated in [Figure 7](#).

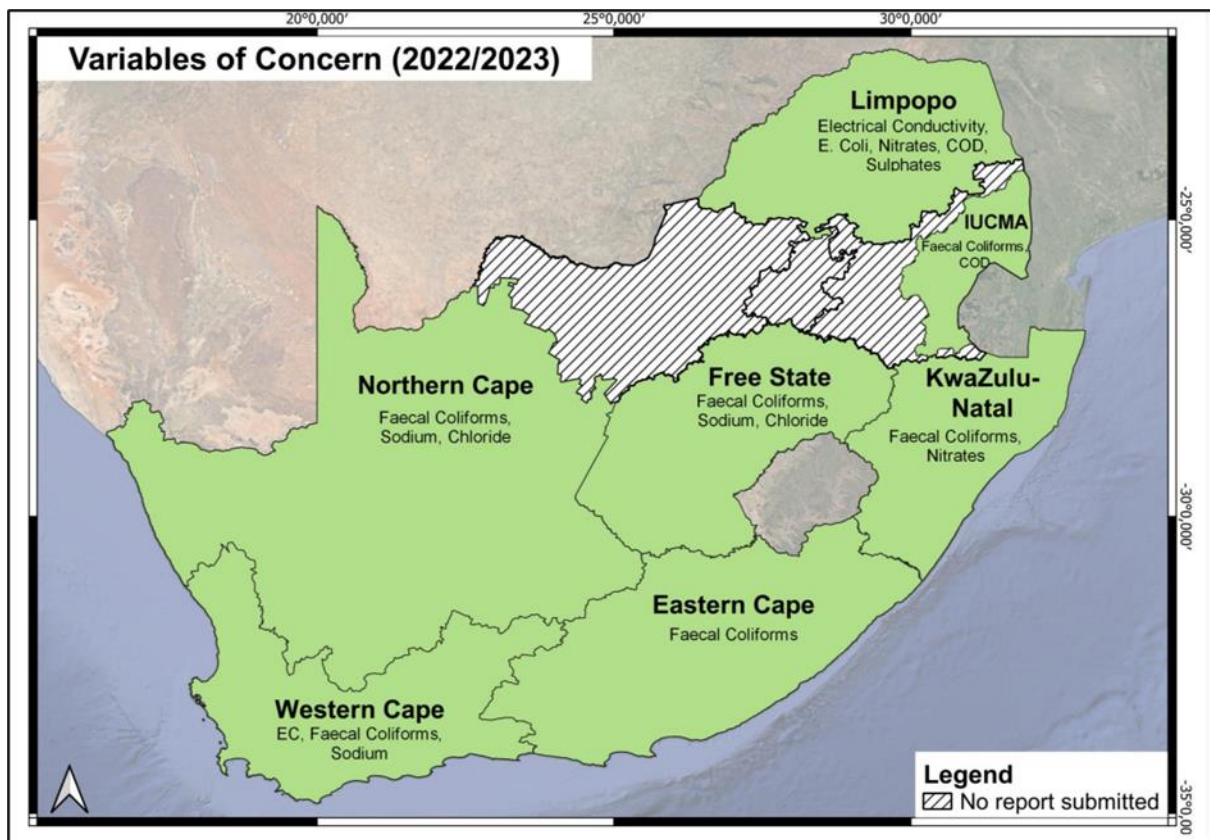


Figure 7: The country's water quality variables of concern (Source: DWS,2023).

Water Quality Status Synopsis for KwaZulu Natal Region

The KwaZulu Natal Regional Office of the Department is in charge of monitoring water quality in the **Usutu to Umhlatuze, Thukela, and Mvoti to Umzimkulu WMAs**. The Usuthu to Umhlathuze WMA is located in northern KwaZulu-Natal, extending to the south-eastern parts of Mpumalanga and west of The Kingdom of Eswatini (DWAf, 2004). The uMhlathuze River, Umfolozi River, Pongola River, and Mkhuzi River are the WMA's four primary rivers. The economic and water quality in the WMA is largely driven by heavy and medium-scale businesses, which include agriculture, industries, and mining (DWS, 2023).

Tugela River, which rises in the Drakensberg highlands near the border with Lesotho and meanders across central KwaZulu-Natal before discharging into the Indian Ocean, is the main river in the uThukela Water Management. The WMA has fourteen rivers, with larger rivers originating in the

Drakensberg, medium rivers in the KZN Midlands, and minor rivers along the coast. In the 2022/23 hydrological year, a total of 93 surface water quality points and 119 wastewater points were monitored by the region from all WMAs, and the results are displayed in [Figure 8](#).

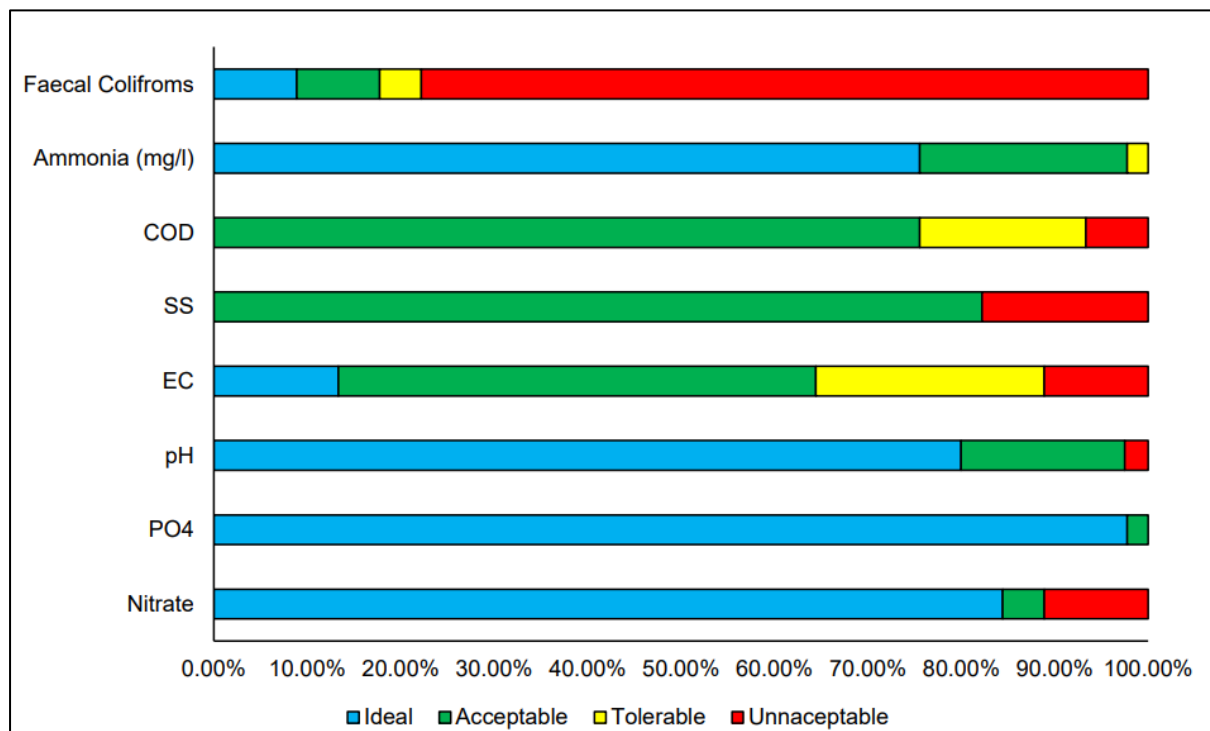


Figure 8: Quarter-1 Water Quality Results for DWS-KZN (Source: DWS, 2023).

The Faecal coliforms, COD, Suspended Solids, Electrical Conductivity, and Nitrates were all reported as variables of concern in the KwaZulu Natal Water Management Areas (DWS,2023). When the water quality status is unacceptable, its fitness for the intended purposes is compromised, posing a human health or ecological risk that necessitates the implementation of water quality management intervention measures

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

For technical inputs and enquiries:

Integrated Water Resource Studies: Tel: 012 336 6856 Email: IntegratedWaterStudies@dws.gov.za

National State of Water Report:

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
Areal average rainfall	The estimated average depth of rainfall over a defined area. Expressed in depth of water (mm)
Cumecs	Cubic metres per second (m ³ /s)
Climate Variability	A prominent aspect of our climate is its variability. This variability ranges over many time and space scales and includes phenomena such as El Niño/La Niña, droughts, multi-year, multi-decade, and even multi-century changes in temperature and precipitation patterns.
Effective rainfall	The rainfall available to percolate into the soil or produce river flow. Expressed in depth of water (mm)
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.
MAP	Mean Annual Precipitation
Reservoir gross capacity	The total capacity of a reservoir
Reservoir live capacity	The capacity of the reservoir that is normally usable for storage to meet established reservoir operating requirements. This excludes any capacity not available for use (e.g., storage held back for emergency services, operating agreements or physical restrictions). May also be referred to as 'net' or 'deployable' capacity
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
SDG	Sustainable Development Goals were established in 2015 by the United Nations. South Africa is a signatory to all 17 goals, including SDG 6 which is about ensuring access to clean water and sanitation for all.
Water Supply System	A typical town/city water supply system consists of a gravity/pumping-based transmission and distribution system from a local/distant water source with needed water treatment system

References

Department of Water and Sanitation (DWS), 2023. Annual Water Quality Report (2022/2023), Powerpoint presentation by James Berkland, 21 September 2023. Department of Water and Sanitation, Pretoria, South Africa.

Department of Water Affairs and Forestry (DWAF), 2004. DWAF Report No. PB WMA 06/000/00/0304: Internal Strategic Perspective: Usutu to Mhlathuze Water Management Area. (March 2004). Tlou & Matji (Pty) Ltd. Department of Water Affairs and Forestry, Pretoria, South Africa.