

SEPTEMBER 2025



MONTHLY STATE OF WATER BULLETIN

WATER IS LIFE - SANITATION IS DIGNITY



water & sanitation

Department:
Water and Sanitation
REPUBLIC OF SOUTH AFRICA



Overview

South Africa experiences significant weather variations between winter and summer owing to its diverse geography and subtropical location. The country has a combination of summer and winter rainfall zones, with the Western Cape predominantly receiving rainfall during winter, while the remainder of the country experiences summer rainfall. Temperatures also vary significantly, with the interior experiencing cold, arid winters and hot, humid summers, whereas coastal areas exhibit more temperate conditions.

The SAWS September 2025 report indicates that the El Niño-Southern Oscillation (ENSO) is still in a neutral state, with rapid cooling observed in September. The SAWS predictions indicate a move towards a weak La Niña event during the coming summer season. The La Niña State is more likely and gaining confidence as we near the summer season. The usual effect of La Niña on South Africa is an increased likelihood of receiving above-normal rainfall over the northeastern parts of the country during summer.

At the end of September 2025, the national dam levels were at 93.4% of FSC, reflecting a 14.5% increase compared to the same period last year, when overall storage was at 79.5% of FSC. At least 47 of the 222 national dams were above 100%, and only one dam was below 10% of FSC. The IVRS was at 97.6% of FSC, reflecting a substantial recovery of +21.8% compared to 75.8% at the same time last year. The storage level of the Orange system was at 95.9% of FSC, marking a 14.6% increase from the previous year. These significant improvements in dam levels are largely attributed to the above-average rainfall received earlier this year.

The SPI drought indicator analysed at the end of August 2025 shows that some parts of the Eastern Cape (Sarah Baartman DM) and Mpumalanga (Ehlanzeni DM) provinces experienced severe drought in the last 24 months. Moreover, a few District Municipalities (DMs) indicated a moderate drought status.

The national borehole distribution map, based on over 282,000 records from the National Groundwater Archive (June 2025), mainly features state-drilled boreholes. While it doesn't show all boreholes or local groundwater potential, it highlights Limpopo as the area with the highest borehole density, reflecting its significant dependence on groundwater.

Alien aquatic plants threaten South African water systems; glyphosate and other methods control them. The Vaal River project cut infestations from 400 to under 1 hectare by 2025 using monitoring, chemicals, physical removal, and biocontrol.

Rainfall

During spring and early summer, the eastern parts of the country normally receive significant rainfall. During early and mid-spring, the eastern and southeastern areas of the country usually receive above-normal rainfall, while the rest of the country receives below-normal rainfall. The weekly rainfall for September 2025 is presented in Figure 1. The first week of September was relatively dry. Notably, the fourth week of September 2025 experienced relatively higher rainfall across the country, with some areas in KwaZulu-Natal and Mpumalanga receiving 50-100 mm.

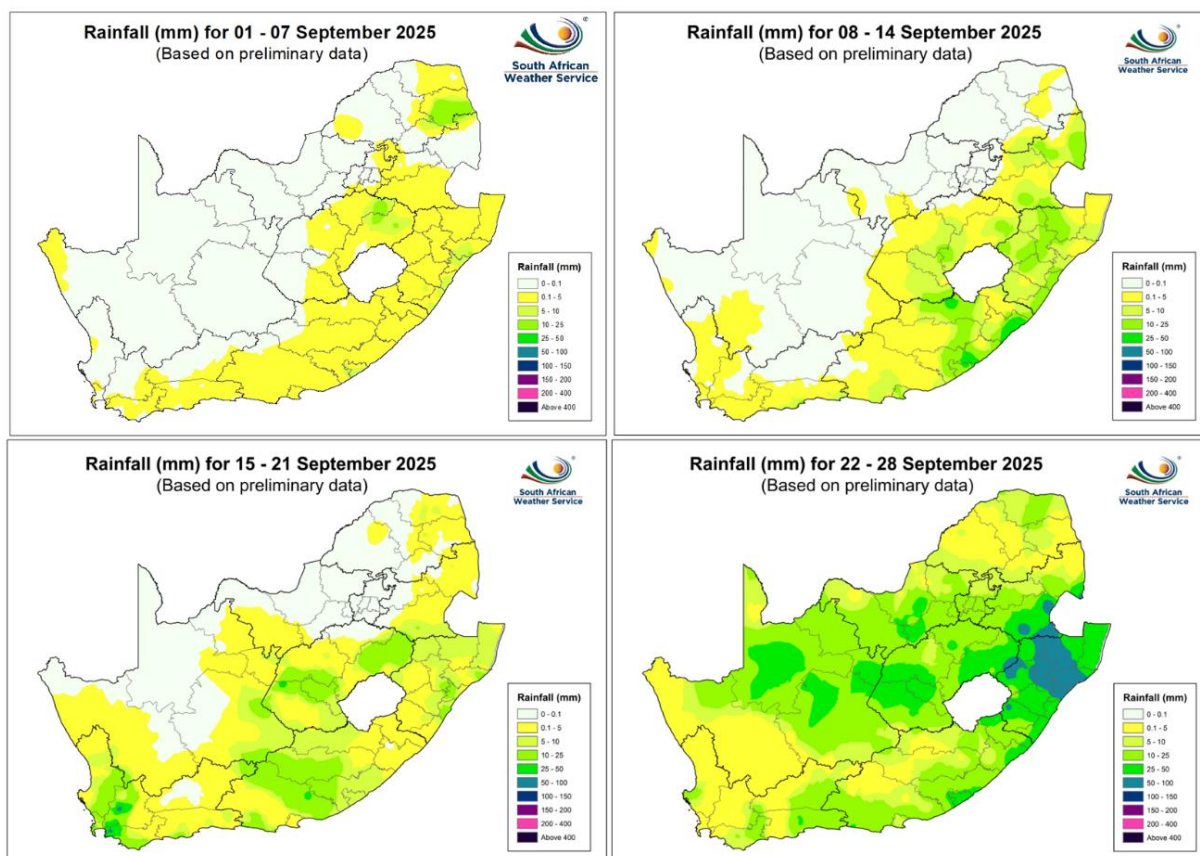


Figure 1: Weekly rainfall distribution for September 2025.

Weather Forecast and Early Warning

The weather has a significant impact on water resources. Rising temperatures increase evaporation and reduce water availability, while extreme weather events, such as droughts and floods, exacerbate water scarcity and pollution, respectively. Changes in precipitation patterns also affect water availability.

The South African Weather Services (SAWS) September 2025 report indicates that the El Niño-Southern Oscillation (ENSO) is still in a neutral state, with rapid cooling observed in September (SAWS, 2025). The SAWS predictions indicate a move towards a weak La Niña event during the coming summer season. The La Niña State is more likely and gaining confidence as we near the summer season. The usual effect of La Niña on South Africa is an increased likelihood of receiving above-normal rainfall over the northeastern parts of the country during summer.

Most areas that typically receive significant rainfall in late spring and summer are located in the northeastern part of the country. These regions are forecasted to experience above-normal rainfall until mid-summer. However, some parts of Mpumalanga and Limpopo may receive below-normal rainfall during this time (Figure 2).

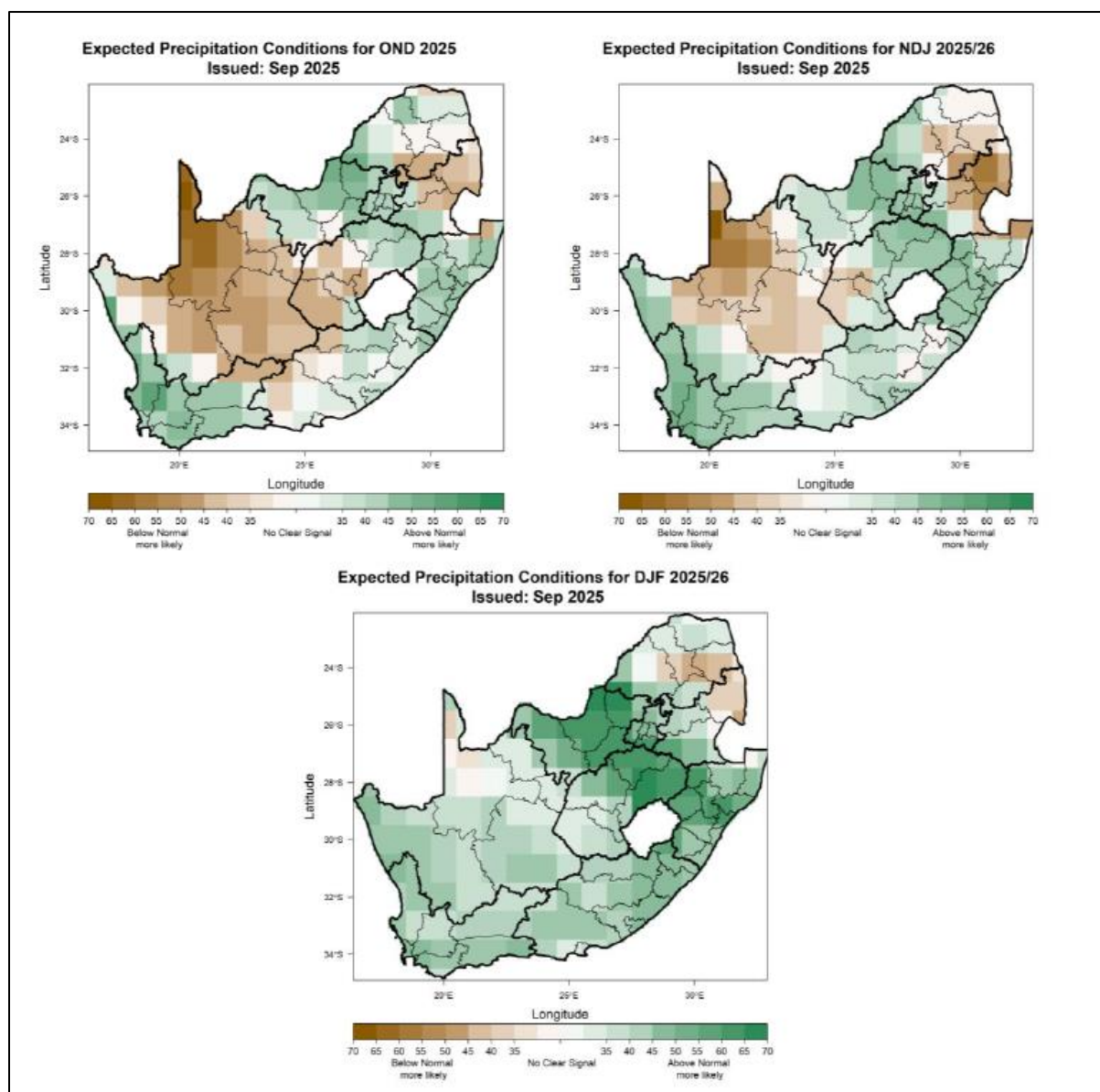


Figure 2: October-November-December 2025 (OND; left), November-December-January 2025/26 (NDJ; right), December-January-February 2025/26 (DJF; bottom) seasonal precipitation prediction. (Source: SAWS, 2025).

The latest climate report (SAWS,2025) also stated that the minimum and maximum temperatures are generally expected to be above normal throughout the late spring and summer seasons, with the exception of the southwestern coastal areas, where maximum temperatures are anticipated to be below normal. (Figure 3).

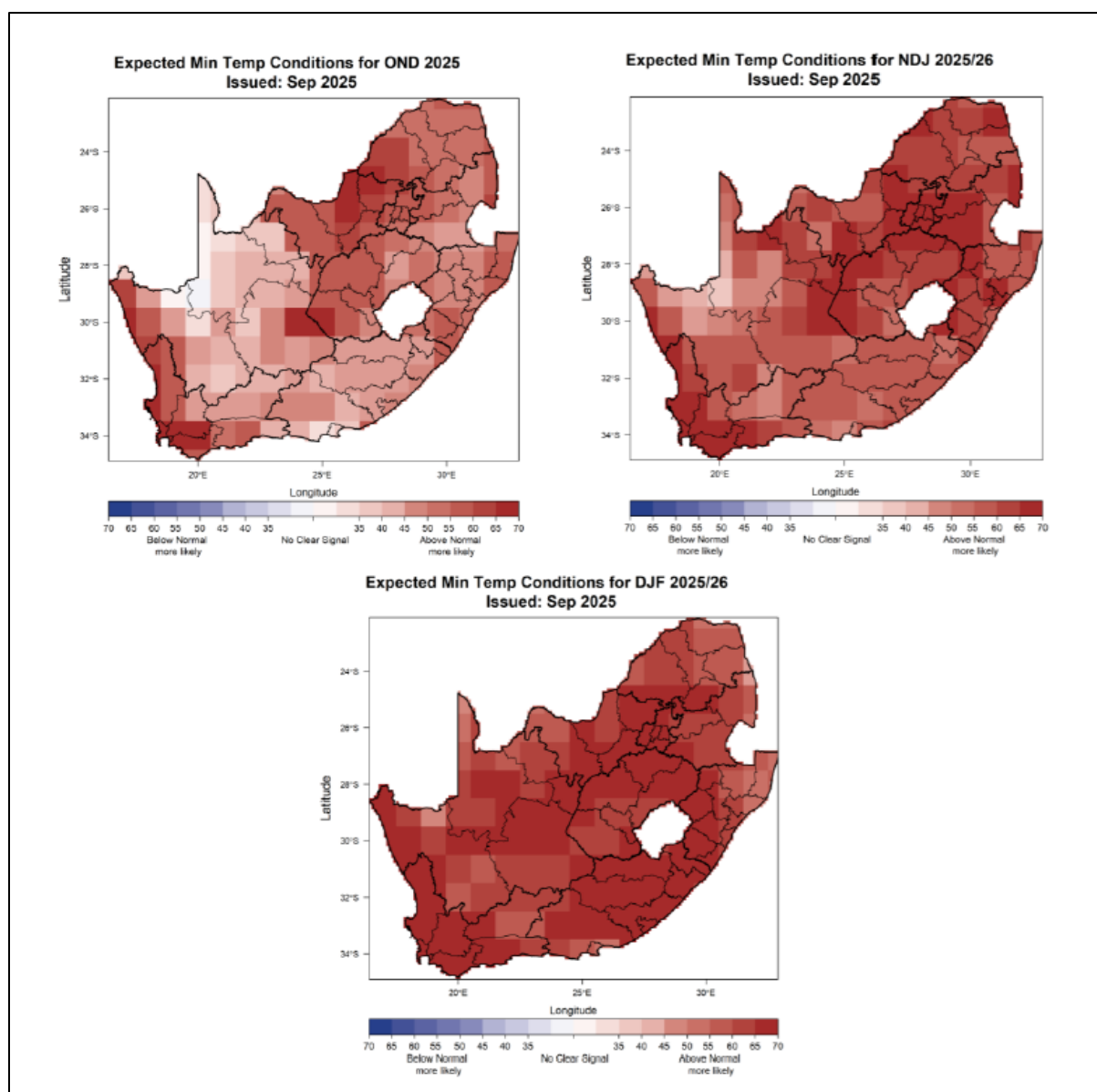


Figure 3: October-November-December 2025 (OND; left), November-December-January 2025/26 (NDJ; right), December-January-February 2025/26 (DJF; bottom) seasonal minimum temperature prediction (Source: SAWS, 2025).

“Minimum and maximum temperatures are largely expected to be above-normal for the most parts during the late spring and summer seasons, with a notable exception of maximum temperatures over the southwestern coastal areas to be below-normal” (SAWS, 2025).

National Dam Storage

The national surface water storage trends for the current hydrological year (2024/25) against the past three hydrological years are graphically presented in Figure 4. The graph shows that at the end of September 2025, the national dam levels were 93.4% of Full Supply Capacity (FSC). The current levels have been stable over the last four months. Moreover, this level is 14.5% higher than at the same time last year, when the overall storage level was at 79.5% of FSC (Table 1).

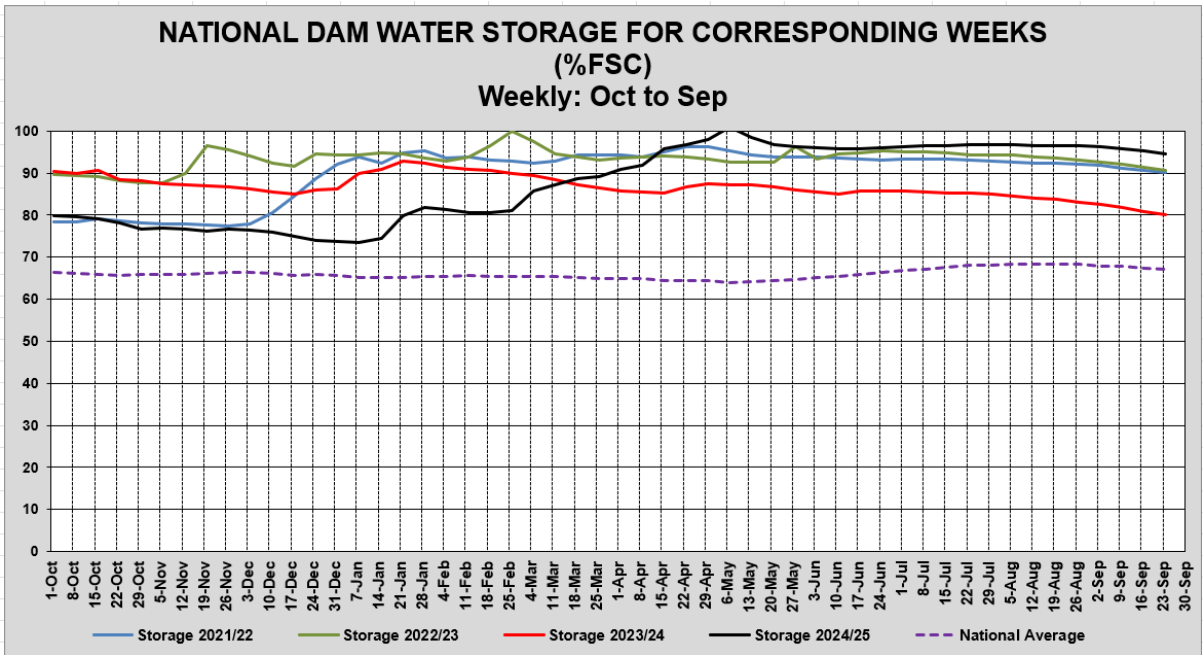


Figure 4: Weekly National Dam Storage at the end of September 2025, for four hydrological years.

Table 1 and Figure 5 show a summary of the status of 219 South African dams plus three dams from the Kingdoms of Eswatini and Lesotho. Based on 29 September 2025 dam data, the combined storage in the Western Cape province reached 84.1% of FSC, compared to the previous month, when it was the only province with an overall surface water storage below 80%. Notably, at least 47 of 222 national dams were above 100% of FSC, only one (<1%) dam was below 10% of FSC (critically low).

Table 1: National Surface Water Storage – 29 September 2025.

Provinces/ Countries sharing Water Resources with RSA	FSC million m ³	Total No. of Dams	Number of Dams per Province/Country				% of Full capacity		
			<10 (% of FSC)	10 - <50 (% of FSC)	50 - <100 (% of FSC)	≥100 (% of FSC)	Last Year	Last Week	This Week
							29/09/2024	22/09/2025	29/09/2025
Kingdom of Eswatini	333,75	1			1		82,1	88,8	88.2 ↓
Eastern Cape	1727,66	46		5	35	6	77,3	79,2	79.0 ↓
Free State	15656,9	21		1	17	3	77,5	98,1	97.5 ↓
Gauteng	128,08	5			1	4	86,7	100,1	100.2 ↑
Kwazulu-Natal	4909,66	19			16	3	84,3	94,3	94.0 ↓
Kingdom of Lesotho	2362,63	2			2		77,6	90,4	90.6 ↑
Limpopo	1484,64	29	1	3	18	7	73,4	83,4	82.5 ↓
Mpumalanga	2538,2	22			20	2	84,1	94,6	94.1 ↓
Northern Cape	146,33	5			4	1	78,1	88,6	88.9 ↑
North West	866,23	28			16	12	63,6	94,4	92.7 ↓
Western Cape - Other Rainfall	269,61	22		6	16		92,2	60,1	58.3 ↓
Western Cape - Winter Rainfall	1596,8	22			13	9	94,7	88,8	88.5 ↓
Western Cape - Total	1866,41	44	0	6	29	9	94,3	84,6	84.1 ↓
Grand Total:	32020,5	222	1	15	159	47	79,5	94	93.4 ↓

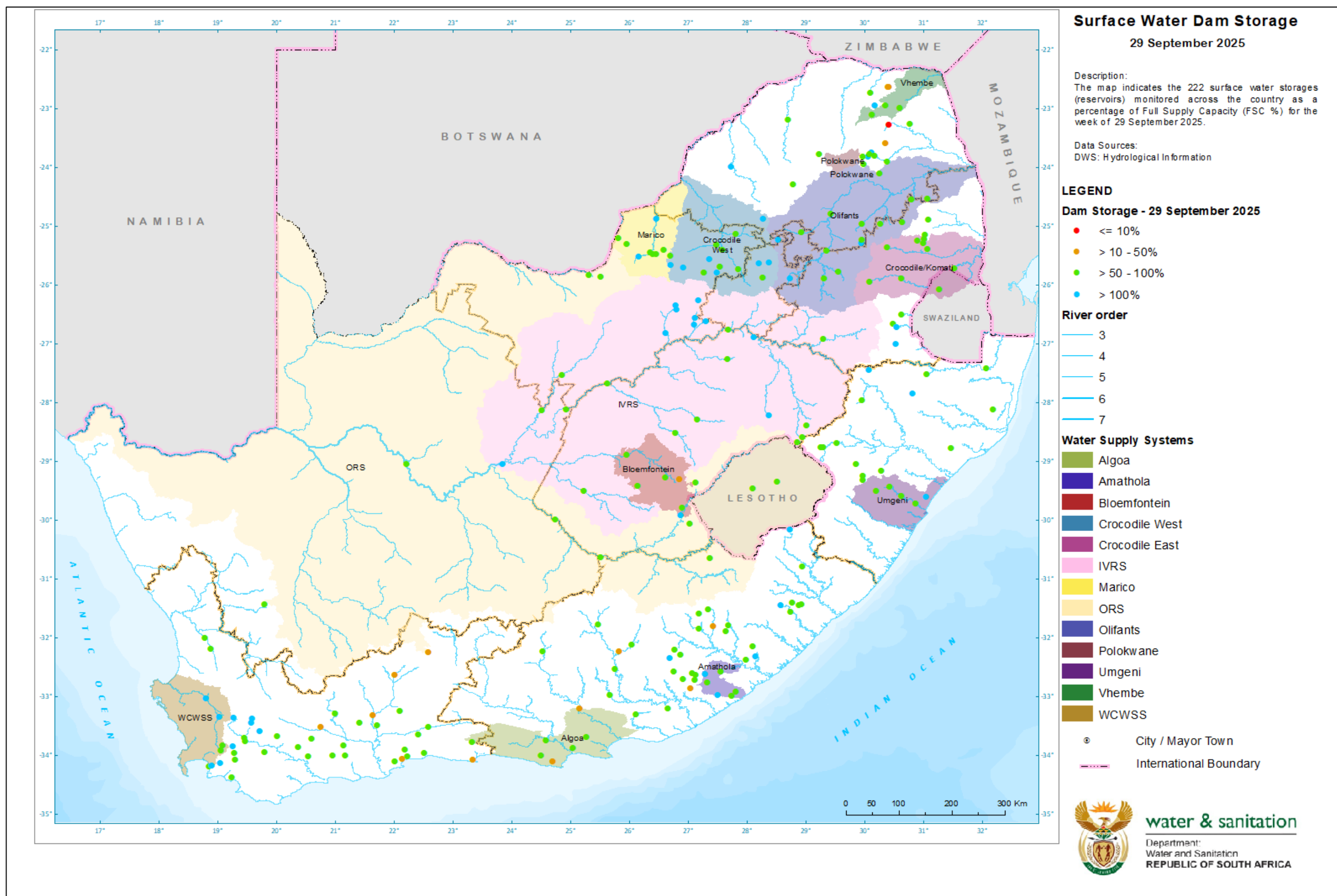


Figure 5: Surface Water Storage Levels – September 2025

The comparison of the storage levels per province (plus the Kingdoms of Eswatini and Lesotho) for September 2024 and September 2025 is graphically presented in Figure 6. Western Cape showed a decline in dam storage by 10% of FSC, while the North West is showing the most significant increase at +29.1%, year-on-year. The increase in the overall dam storage indicates higher-than-normal stream flows, as a result of above-normal rainfall received during the past months. The other notable increases were observed in Free State (+20%), Gauteng (+13.5%), and Northern Cape (+10.8%). The Kingdoms of Eswatini and Lesotho experienced increases of 6.1% and 13%, respectively, compared to the previous year.

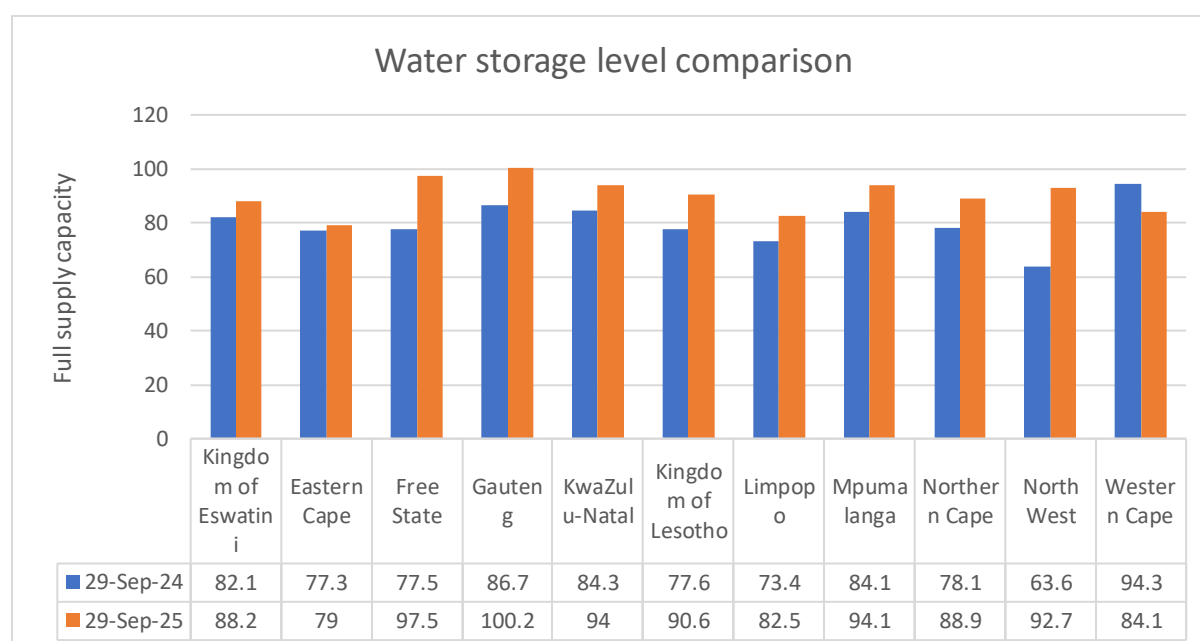


Figure 6: Water Storage Levels September 2024 vs. September 2025.

The comparison between September 2024 and September 2025 of the country's five largest dam storage is presented in Table 2.

Table 2: Storage Levels comparison for the Five Largest storage dams (by volume).

Reservoir	River	Province	Full Supply Capacity (Mm ³)	29 September 2024 (% FSC)	29 September 2025 (% FSC)	Difference (%)
Gariep Dam	Orange River	Free State	4 903.45	70.9	94	+23.4
Vanderkloof Dam	Orange River	Free State & Northern Cape	3 136.93	97.6	98.3	+0.7
Sterkfontein Dam	Nuwejaarspruit River	Free State	2 616.90	97.8	98.8	+1
Vaal Dam	Vaal River	Free State	2 560.97	40.9	102.3	+61.4
Pongolapoort Dam	Phongolo River	KwaZulu-Natal	2 395.24	82.6	93.4	+10.8

The surface water storage levels at the five major dams in the country exceed 90%, with Gariep and Vaal Dam showing increases of 23.4% and 61.4%, respectively, compared to the previous year. Earlier this year, the Vaal Dam's storage levels dropped to 24.1% of FSC. However, by the end of September 2025, the dam's capacity reached 102.3% of FSC, exceeding last year's levels by more than 50%.

Another year-on-year improvement was observed in the critical level category at the Middle-Letaba Dam in Limpopo, which rose from below zero to 5.5% of FSC at the end of September 2025 (Table 3).

Table 3: Dam below 10% of FSC compared to last year

Reservoir	River	Province	Full Supply Capacity (Mm ³)	29 September 2024 % FSC)	29 September 2025 (% FSC)	Difference (%)
Middel-Letaba Dam	Middel-Letaba River	Limpopo	171.93	0.8	5.5	+4.7

Figure 7 presents the 24-month Standardised Precipitation Index (SPI) analysed at the end of August 2025. The map shows a small part of the Northern Cape, located in the ZF Mgcawu DM, which experienced extreme drought in the last 24 months. While small parts of a few District Municipalities (DMs) indicated severe drought status. These include parts of Namaqua and ZF Mgcawu in the Northern Cape, Sarah Baartman DM in the Eastern Cape, Thabo Mofutsanyana DM in North West, and Capricorn DM in Limpopo.

District Municipalities

The year-on-year comparison of water storage levels per district municipality is presented in Figure 8. Capricorn DM, Ngaka Modiri Molema DM, and Sedibeng DM experienced the largest increase (>60%) in dam storage levels in September 2025 compared to the same time last year. Namakwa DM indicated a significant increase (>40%) in the dam storage level over the past year. The Central Karoo district municipality experienced significant declines (>-40%) in dam levels.

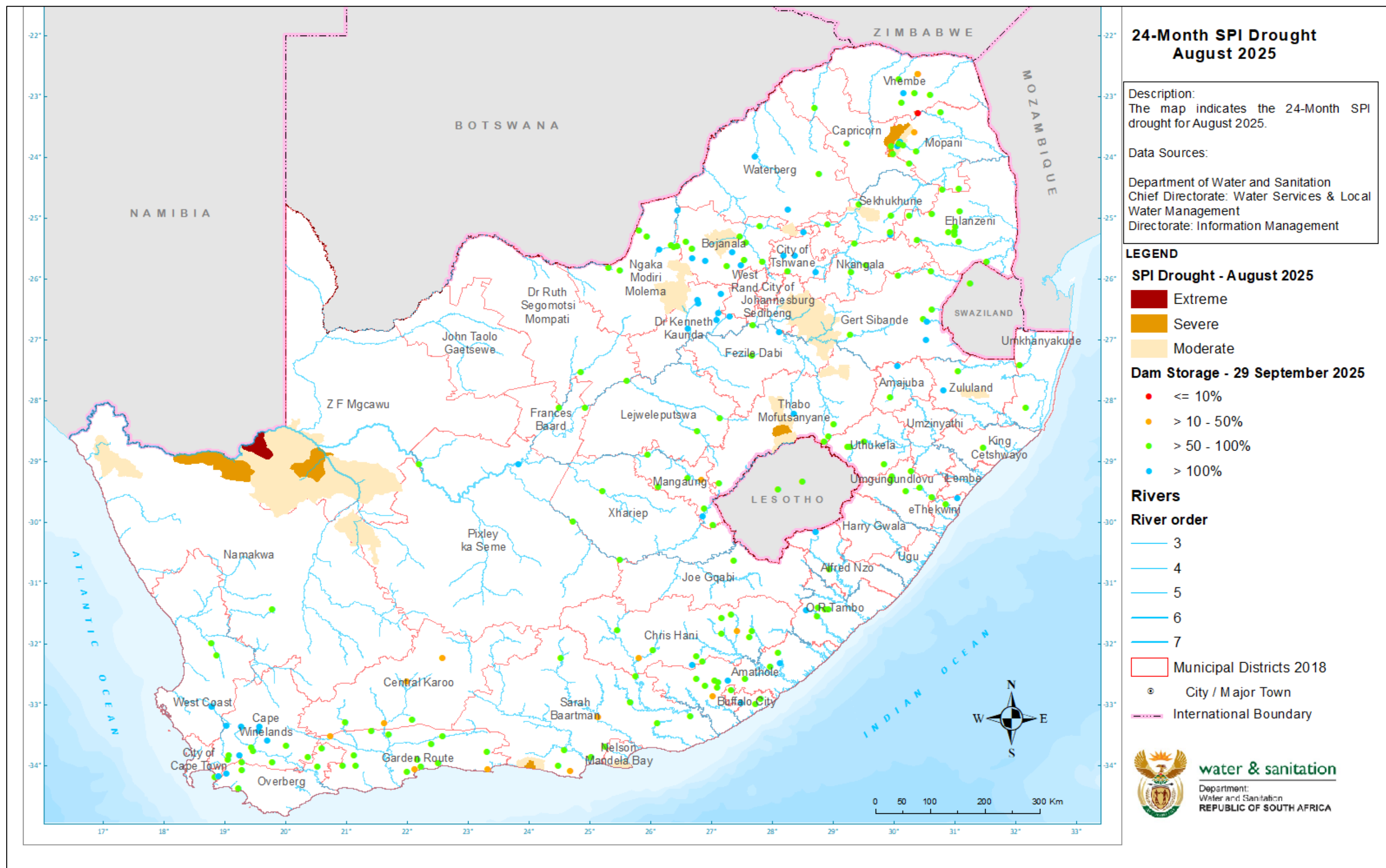


Figure 7: 24-Month Standardised Precipitation Index (SPI) – August 2025, including dam levels - September 2025.

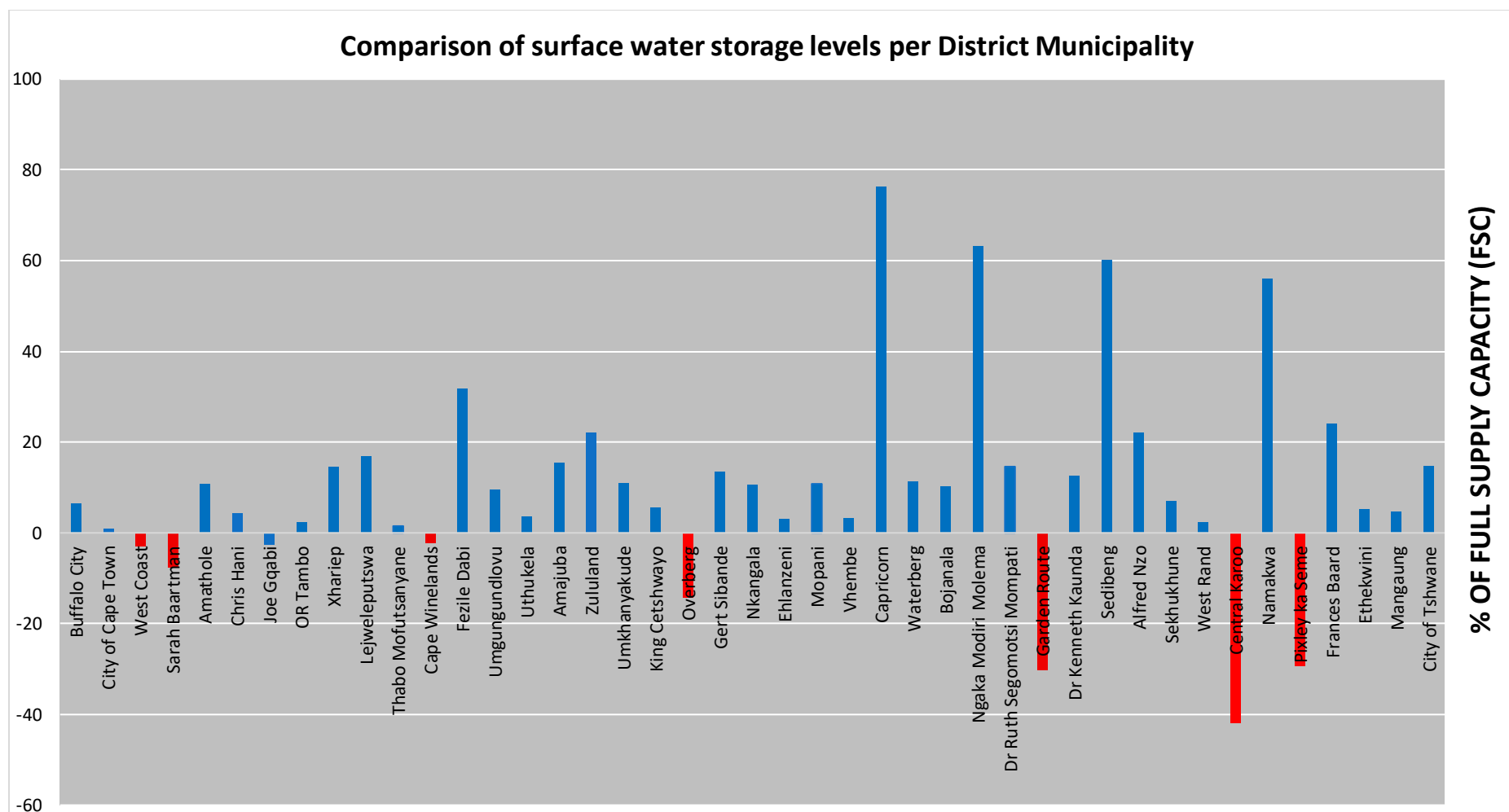


Figure 8: Comparison of water storage levels per District Municipality, September 2024 vs September 2025.

Water Supply Restrictions

The water supply systems and their respective restrictions are given in Table 4. Due to infrastructure limitations, permanent restrictions are applicable for the Polokwane and Bloemfontein Water Supply Systems.

Table 4: Water Supply Systems with Restrictions

System Name	Areas	Water Users	% Restrictions	Gazette Information	Next Review
Algoa WSS	Kromme subsystem	NMBM & Kouga LM Irrigation	23% domestic & industrial 43% irrigation	Recommended but not gazetted	Nov' 2025
Mangaung WSS	Caledon-Modder	Mangaung Metro	25% domestic & industrial when below 95%	13 Sep' 2024 Gazette no.5200	May 2025
Liebensbergvlei River	Run-off River abstractions Free State towns and irrigation	Towns of Bethlehem, Reitz, Tweeling within Dihlabeng, Mafube and Nketoana Local Municipalities	Irrigation users to abstract water on an alternative day basis Municipalities to use water sparingly	20 Sep' 2024 Gazette no. 5223	Once off until the end of the LHWP tunnel shutdown for the planned maintenance
Middle Letaba/ Nsami	Middle Letaba/ Nsami	Irrigation Mopani Municipality	100% irrigation 25% domestic	28 Jun' 2024	May 2025
Mutshedzi Dam	Mutshedzi Dam	Makhado Municipality	35% domestic		May 2025
Nzhelele	Nzhelele	Nzhelele Government Irrigation Scheme Nzhelele Regional Scheme	20% domestic 20% irrigation	28 Jun' 2024	May 2025
Nwanedi/ Luphephe	Nwanedi/ Luphephe	Mutale Local Municipality Irrigation	20% D&I 45% irrigation	28 Jun' 2024	May 2025
Polokwane Water Supply System Letaba System	Seshego, Mashashane, Houtrivier and Chuniespoort Dams Ebenezer and Groot Letaba System	Capricorn District, Polokwane Local Municipality Groot Letaba Water Users Association, Mopani Municipality	30% domestic & industrial water uses 27% agricultural use	28 Jun' 2024	May 2025

Table 5 presents the dam storage levels of South Africa's National Water Supply Systems. The Integrated Vaal River System (IVRS) is the largest and most economically vital system in the country, consisting of 14 dams with a combined capacity exceeding 10,620 Mm³. At the end of September 2025, the IVRS was at 97.6% of FSC, reflecting a substantial recovery of +21.8% compared to 75.8% at the same time last year. The Orange Water Supply System, the second-largest, comprises only two dams yet holds over 7,996 Mm³. At the end of September, the storage level of the Orange System was at 95.9% of FSC, marking a 14.6% increase from the previous year. These significant improvements in dam levels are largely attributed to the above-average rainfall received earlier this year.

Table 5: Water Supply Systems storage levels September comparisons.

Water Supply Systems/ Clusters	Capacity in 10 ⁶ m ³	29 Sept 2024 (% FSC)	22 Sept 2025 (% FSC)	29 Sept 2025 (% FSC)	System Description
Algoa System	192	76.4	63.8	63.1	<u>5 dams serve the Nelson Mandela Bay Metro, Sarah Baartman (SB) DM, Kouga LM and Gamtoos Irrigation:</u> 1. Kromrivier Dam 2. Impofu Dam 3. Kouga Dam 4. Loerie Dam 5. Groendal Dam
Amathole System	241	91.4	97	96.4	<u>6 dams serve Bisho & Buffalo City, East London:</u> 1. Laing Dam 2. Rooikrans Dam 3. Bridle Drift Dam 4. Nahoon Dam 5. Gubu Dam 6. Wriggleswade Dam
Klipplaat System	57	94.3	99.6	99.3	<u>3 dams serve Queenstown (Chris Hani DM, Enoch Ngijima LM):</u> 1. Boesmanskrantz Dam 2. Waterdown Dam 3. Ockraal Dam
Butterworth System	14	77.9	99	98.7	<u>Xilinxha Dam and Gcuwa weirs serve Butterworth</u>
Integrated Vaal River System	10 620	75.8	98	97.6	<u>14 dams serve Gauteng, Sasol, and ESKOM:</u> 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	215	92.4	90.8	90.1	<u>3 dams serve Thohoyandou:</u> 1. Albasini Dam 2. Vondo Dam 3. Nandoni Dam
Bloemfontein	184	81	81.1	81	<u>4 dams serve Bloemfontein, Botshabelo and Thaba Nchu:</u> 1. Rustfontein Dam 2. Groothoek Dam 3. Welbedacht Dam 4. Knellpoort Dam

Water Supply Systems/ Clusters	Capacity in 10 ⁶ m ³	29 Sept 2024 (% FSC)	22 Sept 2025 (% FSC)	29 Sept 2025 (% FSC)	System Description
Polokwane	257	84.4	98.8	96.6	<u>2 dams serve Polokwane</u> 1. Flag Boshielo Dam 2. Ebenezer Dam
Crocodile West	438	82.9	89.7	87.5	<u>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	905	85.3	93.7	93.2	<u>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	742	100.1	92.1	91.6	<u>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	77.9	87.5	84.8	<u>Kwena Dam supplies Nelspruit, Kanyamazane, Matsulu, Malelane and Komatipoort areas & Surroundings</u>
Orange	7 988	81.3	96.6	95.9	<u>2 dams service parts of the Free State, Northern and Eastern Cape Provinces:</u> 1. Gariep Dam 2. Vanderkloof Dam
uMhlathuze	297	89.5	95.1	95.1	<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>

Groundwater

Figure 9 presents the national borehole distribution map, compiled by the Directorate: National Hydrological Services. The map is based on 282,820 borehole records stored in the National Groundwater Archive (NGA) as of June 2025, with the majority of data coming from state-drilled boreholes. It is important to note that the map does not capture all existing boreholes, nor does it indicate the groundwater potential of any specific area. Nevertheless, it highlights Limpopo as having the highest borehole density, with some 10'x10' grid cells containing over 400 boreholes. This pattern aligns with the province's relatively high reliance on groundwater resources.

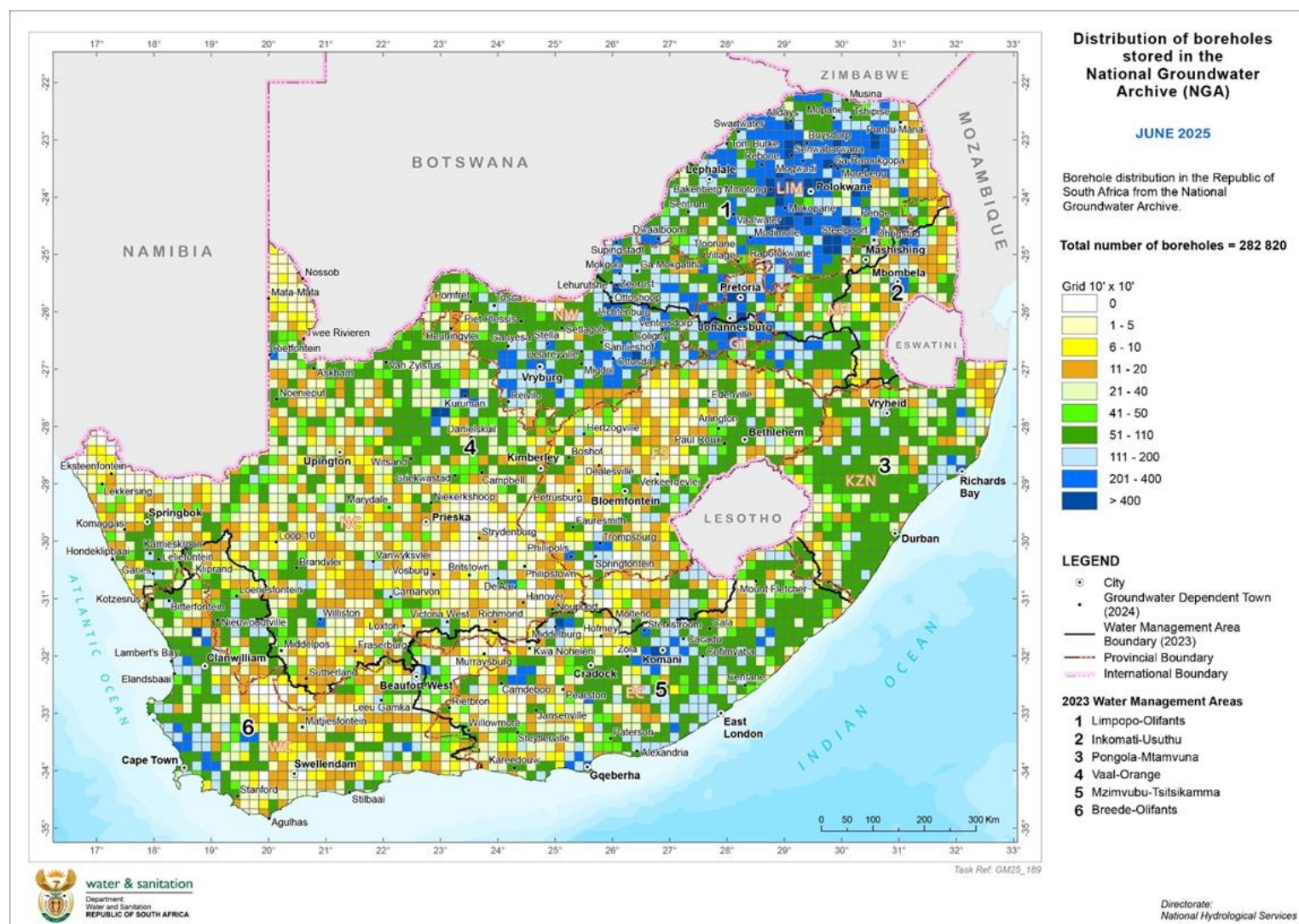


Figure 9: National borehole distribution data from the National Groundwater Archive.

Chemical Control of Alien Invasive Aquatic Species

Background

Aquatic ecosystems are highly susceptible to invasion by alien plant species. Floating and submerged invaders such as *Eichhornia crassipes* (water hyacinth), *Pistia stratiotes* (water lettuce), *Salvinia molesta* (Kariba weed), and *Azolla filiculoides* (Red water fern) can form dense mats that choke rivers, dams, and wetlands across South Africa. These species block sunlight, deplete oxygen, reduce water quality and quantity, and disrupt water flow and recreational activities (Hill, 2003).

To manage these threats, a range of control methods is employed, including physical, biological, and chemical methods. Among these, chemical control is often applied when infestations are extensive or difficult to access. Chemical control in aquatic environments involves the application of herbicides to kill or suppress alien invasive plants. These herbicides are specially formulated to minimise harm to fish and aquatic invertebrates and are registered for aquatic use through the Department of Forestry, Fisheries and the Environment (DFFE). Registered aquatic herbicides in South Africa include:

- **Glyphosate**, for emergent and floating weeds such as water hyacinth, water lettuce and red water fern. It is a systemic herbicide, which means it is absorbed and travels throughout the entire plant. Glyphosate-based herbicides are among the leading products used in South Africa for controlling alien invasive plant species (Mensah et al., 2013).
- **Imazapyr** (2-[(RS)-4-isopropyl-4-methyl-5-oxo-2-imidazolin-2-yl]nicotinic acid and 2,4-D (2,4-Dichlorophenoxyacetic acid) for floating plants such as water lettuce and Kariba weed.

Herbicides can be applied in several ways:

- **Foliar spraying:** Applying herbicide directly to leaves above the water surface.
- **Subsurface application:** Introducing the chemical into the water column to target submerged plants.
- **Cut-stem or stem injection:** Used for woody aquatic invaders along riverbanks.

Chemistry of Glyphosate and its Biochemical Pathway

Glyphosate, with the chemical name and formula N-(phosphonomethyl) glycine and $C_3H_8NO_5P$, respectively, is a broad-spectrum herbicide. It is a small, polar molecule composed of a glycine backbone (an amino acid) attached to a phosphonomethyl group ($-CH_2-PO_3H_2$). The structure can be represented as: $HOOC-CH_2-NH-CH_2-PO(OH)_2$

The herbicidal mechanism of glyphosate involves the inhibition of the shikimate pathway by targeting the key enzyme 5-enolpyruvylshikimate-3-phosphate synthase. This inhibition prevents the production of essential aromatic amino acids, such as phenylalanine, tyrosine, and tryptophan, which are crucial for plant growth. As glyphosate blocks this pathway, plants are unable to synthesise the proteins necessary for growth and metabolism, leading to symptoms such as chlorosis (yellowing of leaves due to a lack of chlorophyll), wilting, and ultimately death within a period of 1 to 3 weeks after herbicide treatment (Gomes et al., 2017; Kanissery et al., 2019).

Case Study on the Use of Glyphosate: DWS Vaal River System Remediation Project Report

The DWS Chief Directorate: Water Use Compliance, Monitoring, and Enforcement is currently managing the Vaal River Remediation Project, with Rand Water as the implementing agent and Rhodes University's Centre for Biological Control as Rand Water's research partner. This 3-year project commenced in April 2024 and aims to restore and maintain water quality in the Vaal River Barrage Reservoir by controlling alien invasive species, specifically water hyacinth and water lettuce. The active work areas include the Vaal Barrage, Loch Vaal, the main Vaal River, and Taaibospruit, while monitoring efforts focus on the Lower Vaal (from the Vaal River Barrage wall to the Vaal-Orange confluence) and the Upper Vaal (from Vaal Dam to Grootdraai Dam). The project employs a multi-method control strategy that combines the following approaches:

- **Monitoring and Mapping:** Utilising satellite imagery to track infestations of invasive plants and assess their density. Key water quality parameters monitored to understand and manage the conditions that promote the growth of alien invasive aquatic species include: phosphates and nitrates (nutrients/eutrophication indicators), E-coli (high counts indicate poor water quality and nutrient-rich conditions favourable to invasives), Cyanobacteria and chlorophyll-a (monitored due to frequent blooms linked to nutrient loading), and general physical and chemical parameters such as temperature, dissolved oxygen, pH, electrical conductivity and turbidity.
- **Chemical Control:** Applying herbicide formulations such as *Kilo Max* and *Seismic* (both containing Glyphosate as the active ingredient). Spraying operations are conducted via boat and drone.
- **Physical Removal:** Manually or mechanically removing both the invasive plants and biomass (decomposing plant material left after herbicide spraying).
- **Biological Control:** Introducing biocontrol agents - insects that specifically target water hyacinth and water lettuce.

The project has made significant progress, reducing the area covered by invasive plants from 400 hectares in 2024 to less than 1 hectare in March 2025 (Hoy, 2025). The Vaal River Remediation Project represents a nationally significant initiative in aquatic invasive species management.

Note: The chemical control of alien aquatic plants on the Vaal River Barrage was suspended in March 2025 due to seasonal, environmental, and regulatory considerations. Late summer rains caused high river flows that made glyphosate spraying ineffective and environmentally risky, while cooler autumn conditions naturally slowed plant growth, resulting in a period of low infestation. DWS and Rand Water have prioritised biological and physical control over herbicide use and therefore chemical control is currently on hold to minimise ecological impacts and remain compliant with regulatory requirements.

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

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Glossary

Term	Definition
DM	District Municipality
DWS	Department of Water and Sanitation
ENSO	El Niño-Southern Oscillation
FSC	Full Storage Capacity
IVRS	Integrated Vaal River System
NGA	National Groundwater Archive
SAWS	South African Weather Services
SPI	Standardized Precipitation Index. 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
WSS	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 a needed water treatment system

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