

5

SURFACE WATER STORAGE



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5.1 National Storage

The surface water storage volume is expressed as a percentage of a combined volume: full supply capacity (FSC) of 221 dams being monitored nationally. The national dam levels for the past five hydrological years are presented in Figure 5.1 below.

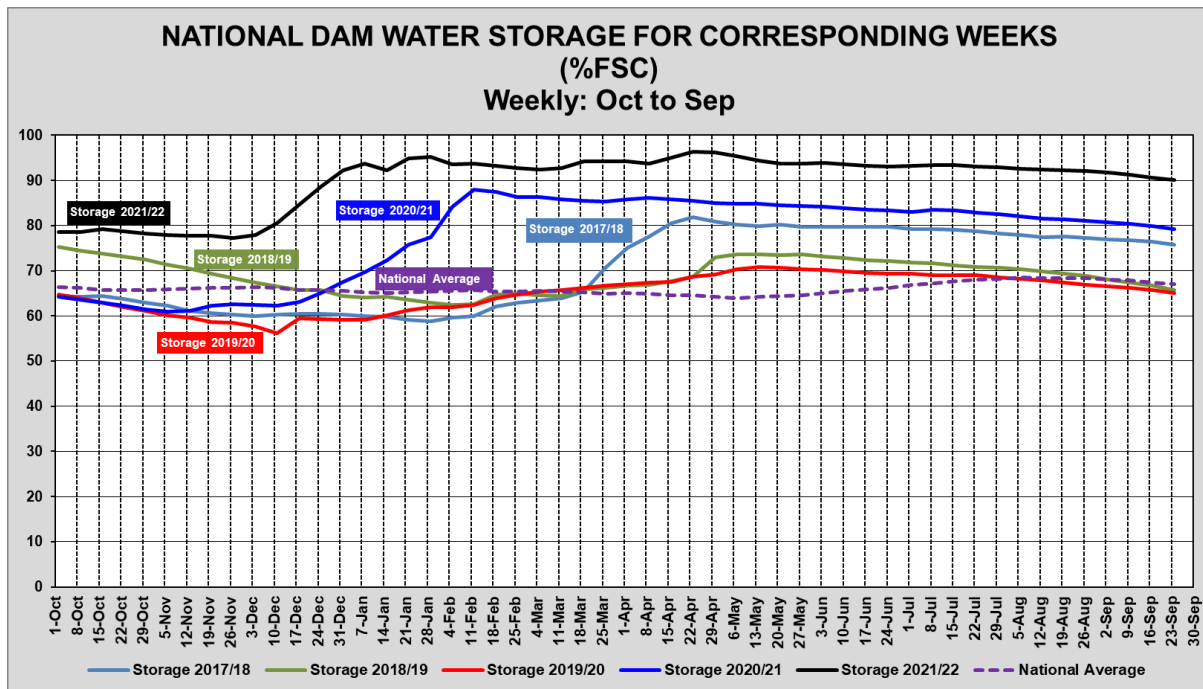


Figure 5.1 National Dam storage levels for the past five years compared to a national average

The national dam storage levels for the past two hydrological years - 2020/21 and 2021/22, have been the highest for most of the months in the past five hydrological years. This is true, especially after the beginning of summer rainfalls received between December and April 2022 for the eastern parts of the country.

Given in Table 5-1 is the classification of surface storage levels for Provinces ranging from critical storage levels, closer to dead storage of the dams (<10% of FSC); at risk of non-supply (>10% - <50% of FSC); optimal water levels for supply operations (>50% - <100%); and >100% of FSC (Full or spilling dams). At the end of the hydrological year (September 2022), approximately **4%** of the dams were at critical storage levels, **11%** were at risk, and over **85%** were either spilling or at optimal storage levels.

Table 5-1 Surface storage at the end of September 2022

PROVINCES/COUNTRIES SHARING WATER RESOURCES WITH RSA	FSC MILLION M ³	TOTAL	NUMBER OF DAMS PER PROVINCE/COUNTRY			
			<10%	>=10% <50%	>=50% <100%	>=100
Kingdom of Eswatini	334	1			1	
Eastern Cape	1729	46	2	7	21	16
Free State	15657	21		1	20	
Gauteng	128	5			2	3
KwaZulu-Natal	4910	19		1	15	3
Kingdom of Lesotho	2363	2			2	
Limpopo	1480	28	1	2	16	9
Mpumalanga	2539	22		2	20	
Northern Cape	146	5		1	2	2
North West	867	28		6	15	7
Western Cape - Other Rainfall	269	22	4	3	12	3
Western Cape - Winter Rainfall	1597	22	1	2	15	4
Western Cape - Total	1866	44	5	5	27	7
Grand Total:	32019	221	8	25	141	47

Most of the dams that were at critical storage conditions at the end of the reporting period were in the Eastern Cape, Limpopo, and Western Cape – all-year rainfall region/winter rainfall region. The list of Dams at critical low storage levels (<10% of FSC) is given in Table 5-2. Most dams still full or spilling at the end of the reporting period were in Eastern Cape, Limpopo, North West, and Western Cape.

Table 5-2 Dams below 10% of FSC September 2022

Reservoir	River	Province/Country	2022/09/26 (% FSC)
Middel-Letaba Dam	Middel-Letaba River	Limpopo	0.7
Nuwejaars Dam	Nuwejaarspruit River	Eastern Cape	3.6
Poortjieskloof Dam	Groot River	Western Cape - Winter Rainfall	9
Bellair Dam	Brak River	Western Cape - Other Rainfall	4.2
Oukloof Dam	Cordiers River	Western Cape - Other Rainfall	4.7
Nqweba Dam	Sondags River	Eastern Cape	5.5
Hartebeestkuil Dam	Hartenbos River	Western Cape - Other Rainfall	6
Kammanassie Dam	Kammanassie River	Western Cape - Other Rainfall	5

The spatial layout of dam storage levels in four storage level categories depicted with colour codes integrated with the SPI is presented in (Figure 5.2). In contrast, the presentation of dam storage levels in relation to the key water supply systems is presented in (Figure 5.3).

Areas experiencing moderate to severe drought are still prevalent in the Sekhukhune District in Limpopo, West Coast District, Sarah Baartman, Central Karoo, and the Garden Route District in the Western Cape. This is further confirmed by dams at critical dam levels (<10% of FSC) within these districts. An expectation is the Middle Letaba Dam which is on the boundary of Vhembe and Mopani District, although with no drought mapped out from the SPI, the land use changes, and water use activities within the catchment of the Middle-Letaba Dam are likely the cause of reduced streamflow and affecting the water resource yield at this dam over the years. The river catchment of the Middle-Letaba Dam requires further assessments.

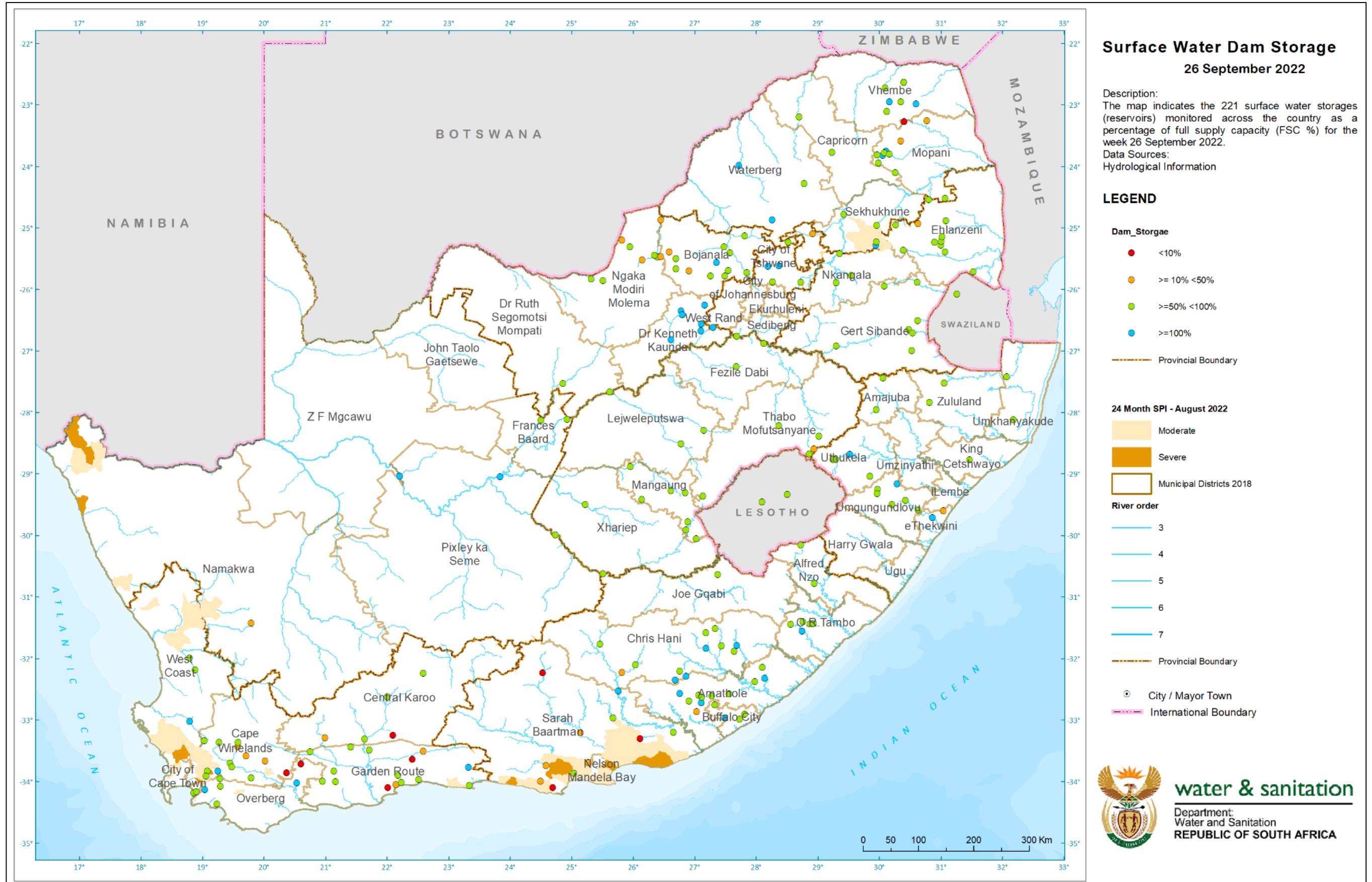


Figure 5.2 Dam Storage Levels at the end of September 2022

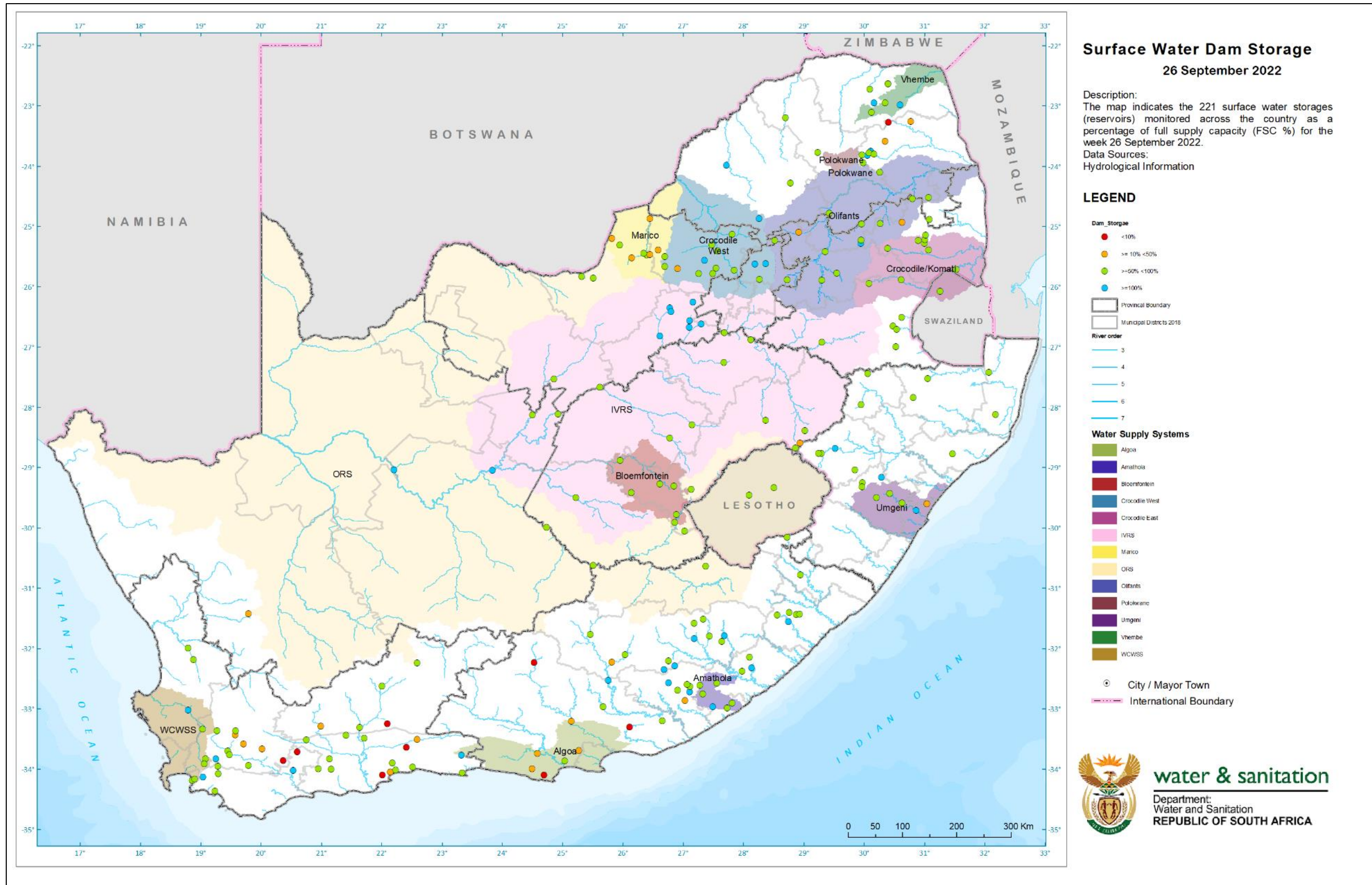


Figure 5.3 Water Supply System and dam storage – end September 2022

The Storage comparison for 2020/21 & 2021/22 of the ten largest dams, as of the end of September 2022, versus their full supply capacities is presented in Figure 5.4. Most of these large dams had storage levels higher than last year at the same time of reporting, apart from Sterkfontein Dam (Reservoir to augment water levels in the Vaal Dam), Bloemhof Dam, and Theewaterskloof Dam. The most significant improvement in storage levels from last year was for the Gariep, Pongolapoort, and Mohale Dams.

5.2 Provincial Storage

The long-term median storage (1978 – 2022) for each Province compared to the last two hydrological years is presented in Figure 5.5. For the hydrological year 2021/22, 50% of the time, the dam levels for all Provinces were above the long-term median storage levels. An increase or recovery to above the long-term median from last year is notable for the Eastern Cape and KwaZulu-Natal Provinces.

5.3 Water Management area storage

The comparison of the long-term historical median storage levels (2016-2022) of water management areas and the past two hydrological years' median storage is presented in Figure 5.6.

The 2021/22 storages have been above the historical median for all water management areas. A similar pattern is observed for the past year (2020/21) for all WMAs except for the Mzimvubu-Tsitsikamma WMA.

Notably, all median storages for the 2021/22 hydrological year are higher than the past year for all WMAs, apart from the Berg Olifants and Breede Gourits WMAs. However, the dam storage levels in these two WMAs remained higher than the long-term median dam levels.

5.4 District Municipality Storage

The water storage level comparison for the end of HY 2020/21 and 2021/22 for District Municipalities is presented in Figure 5.7. The central Karoo DM, Amathole DM, and Buffalo City DM have experienced a significant increase compared to last year. In contrast, the Cape Winelands DM, West Coast DM, Lejweleputswa DM, Overberg DM, OR Tambo DM, Mopani DM, and Ngaka Modiri Molema DM have experienced the worst decline in dam levels compared to last year.

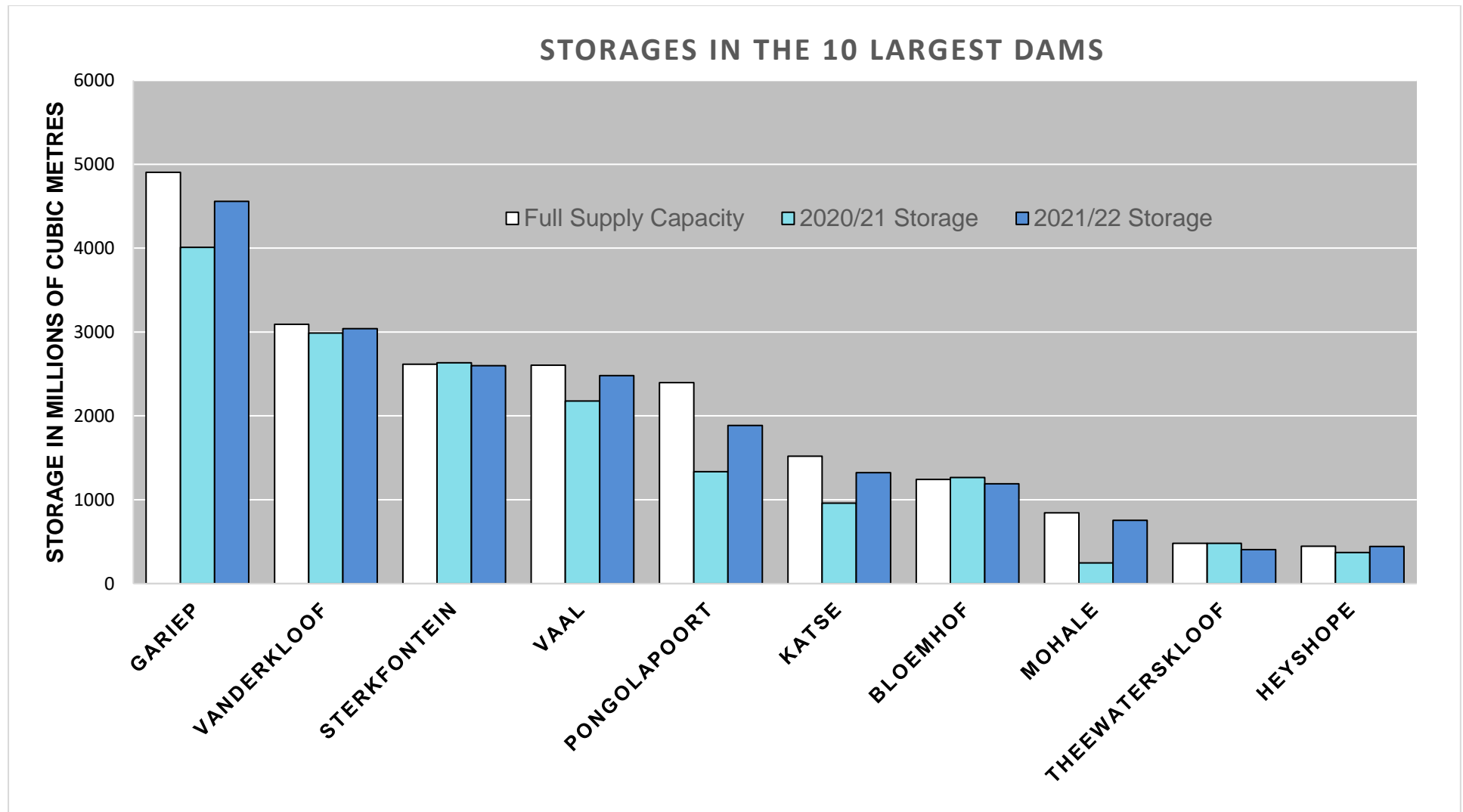


Figure 5.4 Storage volume comparison 2020/21 & 2021/22 of the ten largest dams, as at the end of September

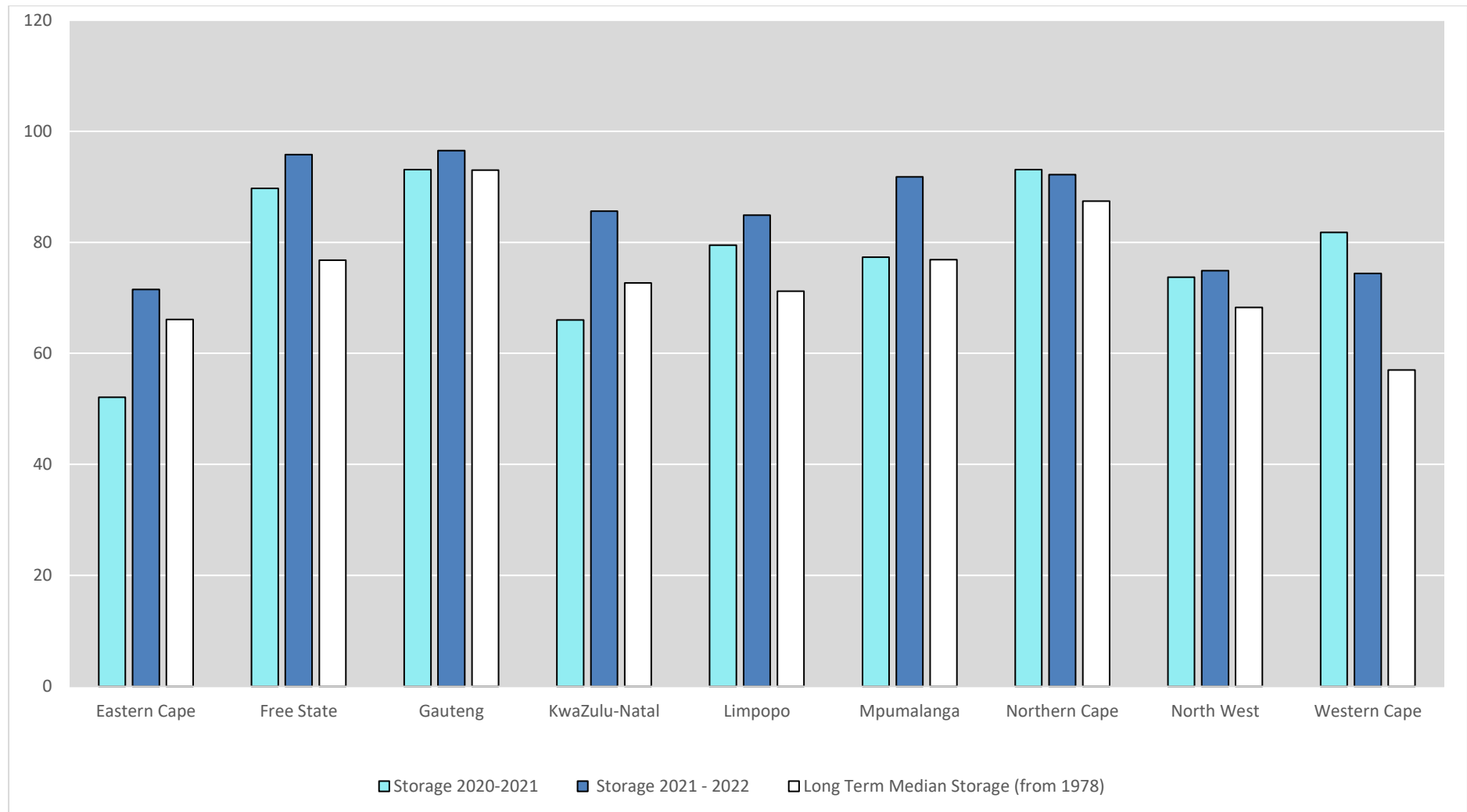


Figure 5.5 The storage situation in each Province during 2021-2022, compared with the previous hydrological year and the media

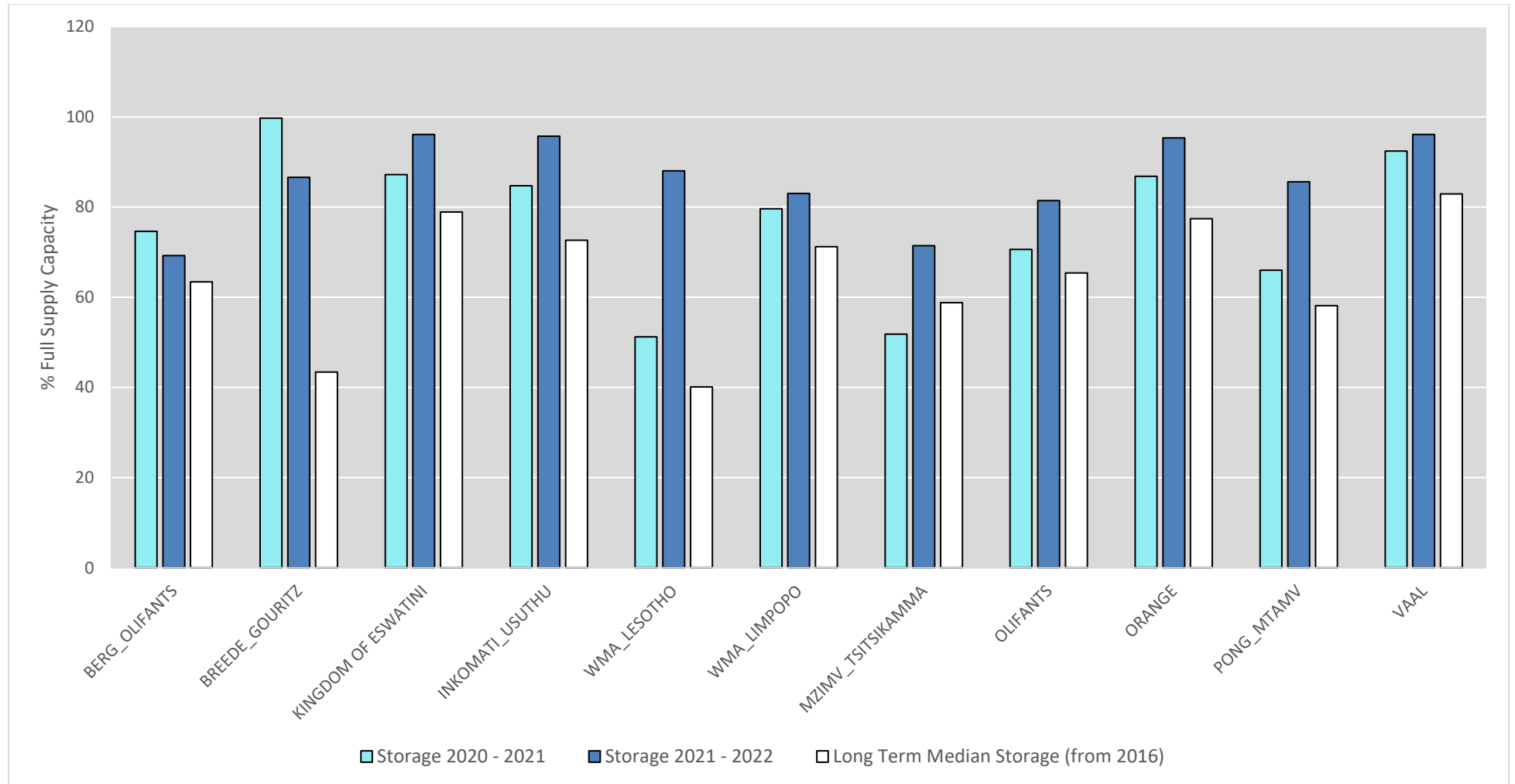


Figure 5.6 The storage situation in each WMA during 2021-2022, compared with the previous hydrological year and the median

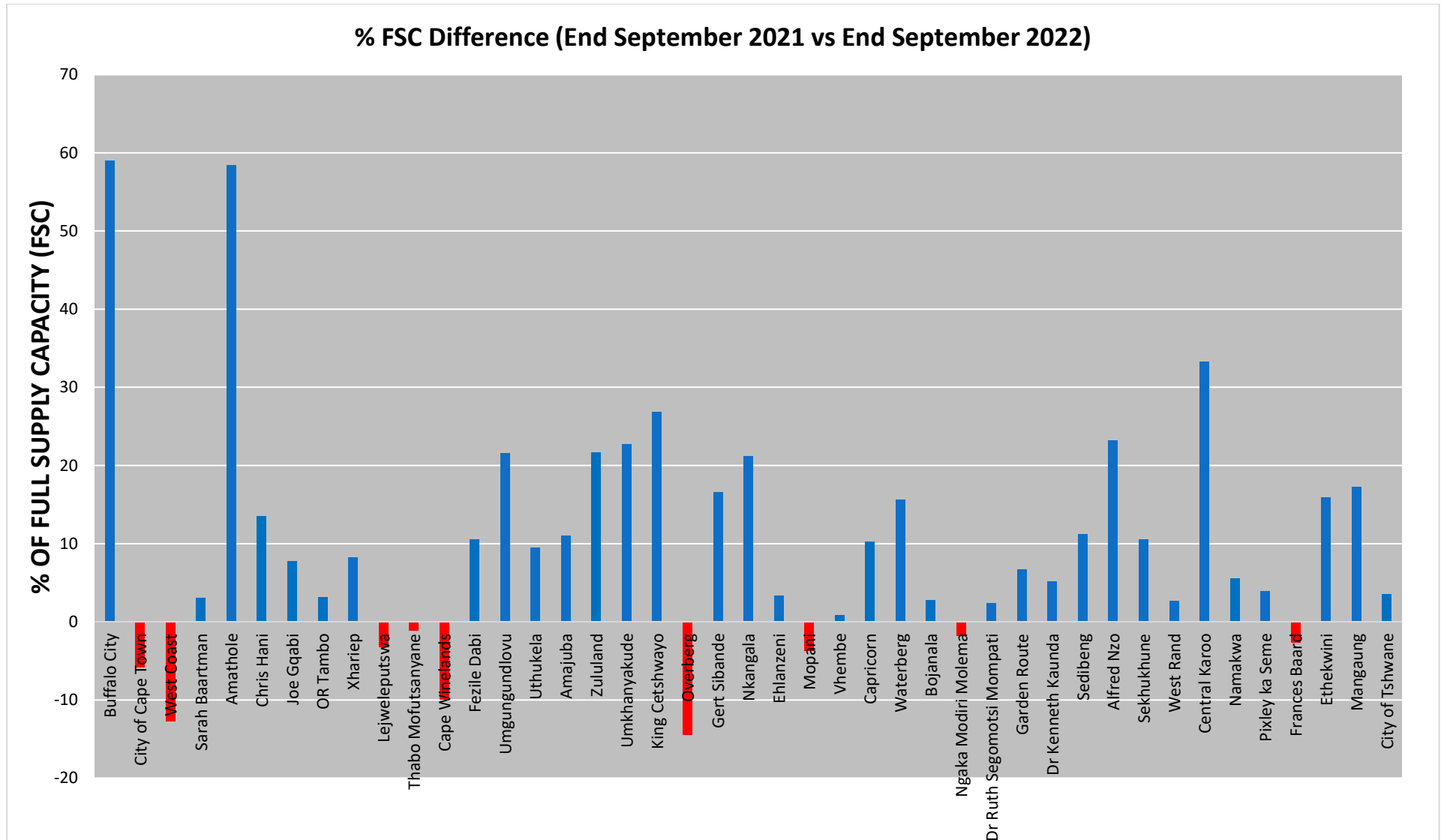


Figure 5.7 Difference in Water Storage Levels per District Municipality September 2021 vs September 2022

5.5 Water Supply Systems and restrictions

The Dam storage levels in water supply systems (WSSs) at the end of the HY 2020/21 and 2021/22 and the applicable restrictions are given in Table 5-3. A recovery or an increase in dam levels in water supply systems is observed for all water supply systems from last year at the same time of reporting. This is true except for the Cape Town WSS, which has experienced a decline from the previous year by **15%** of FSC.

Areas experiencing moderate to severe drought are still prevalent in the Sekhukhune District in Limpopo, West Coast District, Sarah Baartman, and Central Karoo, and the Garden Route District in the Western Cape.

Some parts of the country are still experiencing dry conditions, for example, the southern parts of the Eastern Cape, parts of the Northern Cape, and the southwestern parts of the Western Cape Province. The Department implements water use restrictions in these areas that are experiencing dry conditions, which affect dam storage levels in standalone dams or dams within a water supply system or cluster to avoid the risk of failure of water supply or non-supply to the various water use sectors, including users with a high assurance of water supply such as strategic users in the power generation industries.

The Algoa Water supply systems (WSS) remain with water restrictions in response to the low water storage levels. Notably, restrictions have been lifted for the Amathole WSS as the system recovered reasonably well since the February/March flooding events. Due to infrastructure limitations, permanent restrictions are still applicable for the Polokwane in Limpopo and Bloemfontein systems in the Free State Province.

Table 5-3 Water restrictions applicable at end of September 2021

Water Supply Systems/clusters	Cap in 10 ⁶ m ³ (% FSC)	27 September 2021 (% FSC)	26 September 2022 (% FSC)	Comments (systems below 50% in red)
Algoa System	282	12.1	19.1	<p><u>System of 5 dams for Nelson Mandela Bay Metro, Sarah Baartman (SB) DM, Kouga LM and Gamtoos Irrigation: 40% domestic & industrial restrictions (no compliance), 85% irrigation restrictions (Good compliance by Gamtoos IB); Varying levels of restrictions were also recommended for groundwater abstractions – restrictions are generally accepted by water users and gazetted in the Government Gazette Notice no. 1626 on December 17 2021</u></p>
Amatole System	241	26.2	84.2	<p><u>System of 6 dams for Bisho & Buffalo City, East London:</u></p> <p>No restrictions, the system recovered reasonably well since the February/March flooding event. Notice yet to be gazetted.</p>
Klipplaat System	57	22.4	100.4	<p><u>System of 3 dams for Queenstown (Chris Hani DM, Enoch Ngijima LM):</u></p> <p>10% for domestic and 50% for irrigation use. Restrictions were gazetted on December 17 2021</p>

Water Supply Systems/clusters	Cap in 10^6 m^3 (% FSC)	27 September 2021 (% FSC)	26 September 2022 (% FSC)	Comments (systems below 50% in red)
Butterworth System	14	6.9	100	<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	81.8	94.5	<u>System of 14 dams serving Gauteng, Sasol, and ESKOM:</u> No restrictions, and the system recovered reasonably well since the February/March flooding event
Polokwane	254	82.5	97.3	<u>System of 7 dams serving Polokwane and surroundings:</u> 20% restrictions on Domestic and Industries
Crocodile West	444	89.7	91.4	<u>6 dams for Tshwane up to Rustenburg:</u> No restrictions
Luvuvhu	225	98.7	100.3	<u>System of 3 dams for Thohoyandou etc:</u> No restrictions
Umgeni System	923	74.5	95.2	<u>System of 5 dams serving Ethekewini, iLembe & Msunduzi:</u> No restrictions
Cape Town System	889	100.1	85.4	<u>System of 6 dams for the City of Cape Town:</u>

Water Supply Systems/clusters	Cap in 10^6 m^3 (% FSC)	27 September 2021 (% FSC)	26 September 2022 (% FSC)	Comments (systems below 50% in red)
				No restrictions
Bloemfontein	219	74	95.6	<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	88.4	93.4	<u>Kwena Dam supplies Nelspruit, Kanyamazane, Matsulu, Malelane and Komatipoort areas & Surroundings:</u> No Restrictions
Orange	7 996	87.7	95	<u>Two dams serving parts of the Freestate, Northern and Eastern Cape Provinces:</u> No restrictions
uMhlathuze	301	71	97.8	<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