



**INKOMATI-USUTHU**

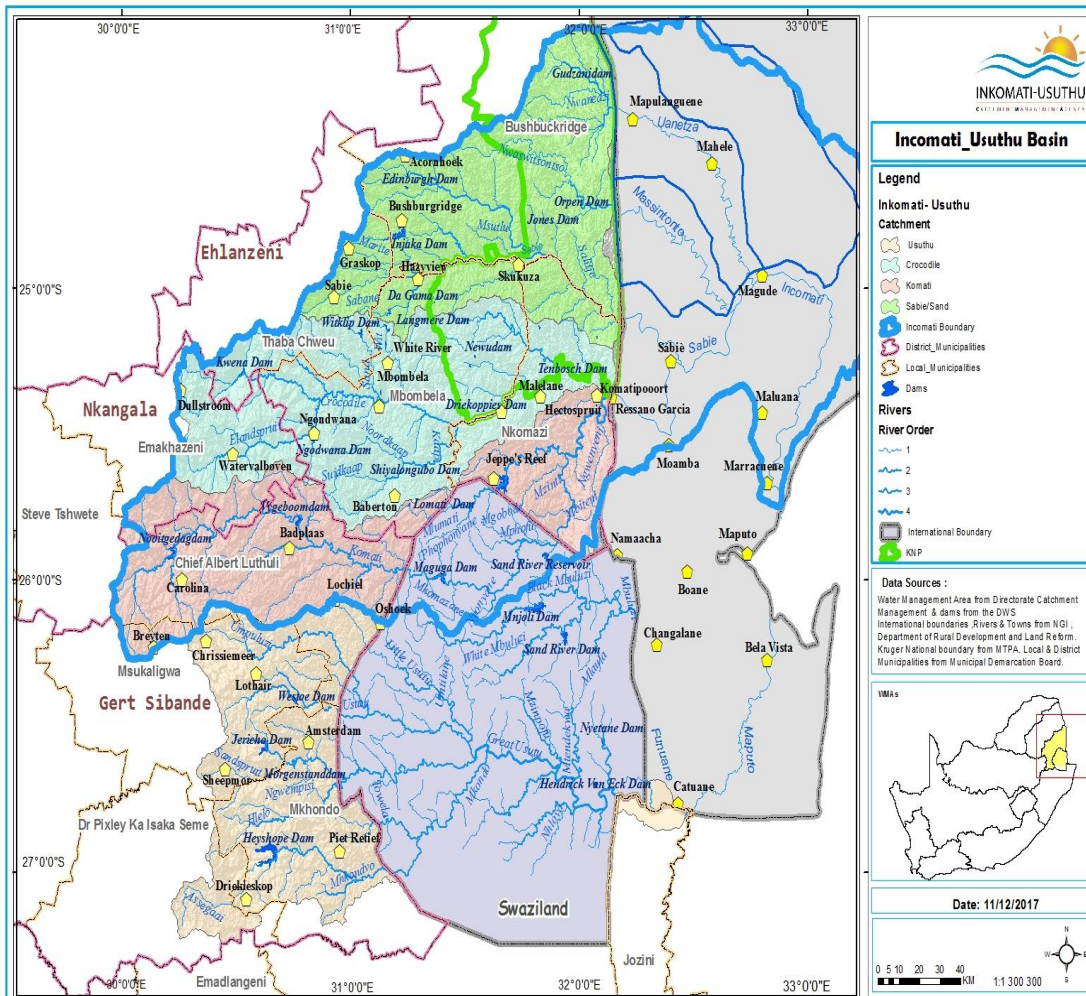
CATCHMENT MANAGEMENT AGENCY

# **Water Quality and Quantity Status:**

**Within Inkomati Usuthu WMA  
(Sabie- Sand Catchment)**

by: Dr T Sawunyama  
Tariff Consultation  
July 2022

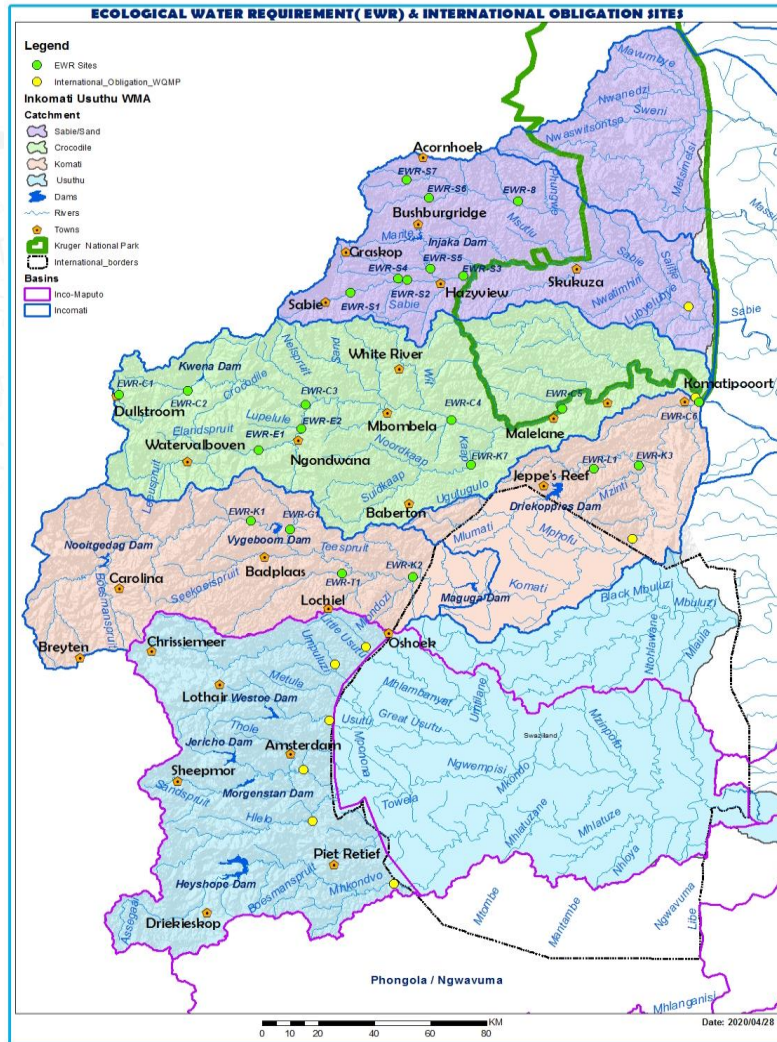
# INKOMATI-USUTHU WATER MANAGEMET AREA



- ❑ The WMA has four (4) main rivers which form the sub-division into 4-main catchments namely Crocodile, Sabie/Sand, Usuthu and Komati;
- ❑ The IUCMA is geographically wholly located within Mpumalanga Province: 3 Districts and 8 Local Municipalities;
- ❑ The IUCMA is transboundary nature and forms part of the Incomati International River Basin shared between the Republic of Mozambique, the Kingdom of Swaziland and the Republic of South Africa.



# INKOMATI- USUTHU WATER MANAGEMENT AREA



- ❑ The IUCMA currently monitors **269** water quality sites, **31** river flow sites, **25** rainfall sites and **12** groundwater sites within Inkomati-Usuthu Water Management Area (these excludes **45** DWS managed sites).
- ❑ Water Quantity monitoring is done through real time monitoring probes and rainfall gauges.
- ❑ Water Quality status is reported (April 2021-March 2022) on **32** Strategic monitoring sites :
  - Twenty-three (**23**) Ecological Water Requirement (EWR) sites
  - Ten (**10**) International Obligation (IO)
- ❑ Eutrophication monitoring is done through near-real time monitoring on the Cynlakes digital application and the National Eutrophication Monitoring Programme (NEMP) on 10 Major Dams within the WMA.

# Water Quality Status



# EWR SITE(S) COMPLIANCE STATUS: SABIE SAND CATCHMENT

EWR Site	pH		EC (mS/m)		PO <sub>4</sub> (mg/l)		E coli (cfu/100ml)	
	EcoSpec	Results	RQOs	Results	RQOs	Results	RQOs	Results
EWR S-1	6.5 - 8.0	7.3-7.9	30	12.78	0.015	0.015	130	1615
EWR S-2	6.5 - 8.0	7.0-8.0	30	59.78	0.015	<0.010	130	750
EWR S-3	6.5 - 8.8	7.3-8.1	30	11.11	0.015	<0.010	130	1258
EWR S-4	6.5 - 8.0	7.3-8.0	30	16.01	0.015	<0.010	130	197
EWR S-5	6.5 - 8.0	7.4-8.4	30	10.51	0.015	<0.010	130	666
EWR S-6	6.5 - 8.8	6.8-8.4	55	124.99	0.125	0.012	130	1167
EWR S-7	6.5 - 8.8	6.9-7.7	42	9.53	0.125	<0.010	130	682
EWR S-8	6.5 - 8.8	7.3-8.3	42	45.6	0.125	0.015	130	1047

Both EWR S2 and S6 showed elevated salts concentration in July and August due to irrigation return flows but complied throughout the reporting period. The high peaks for July and August resulted in the 95 %tile also being higher than the set RQOs. E. coli is an indication of faecal contamination of the water resources from municipal WWTWs.

# INTERNATIONAL OBLIGATION SITE(S) COMPLIANCE

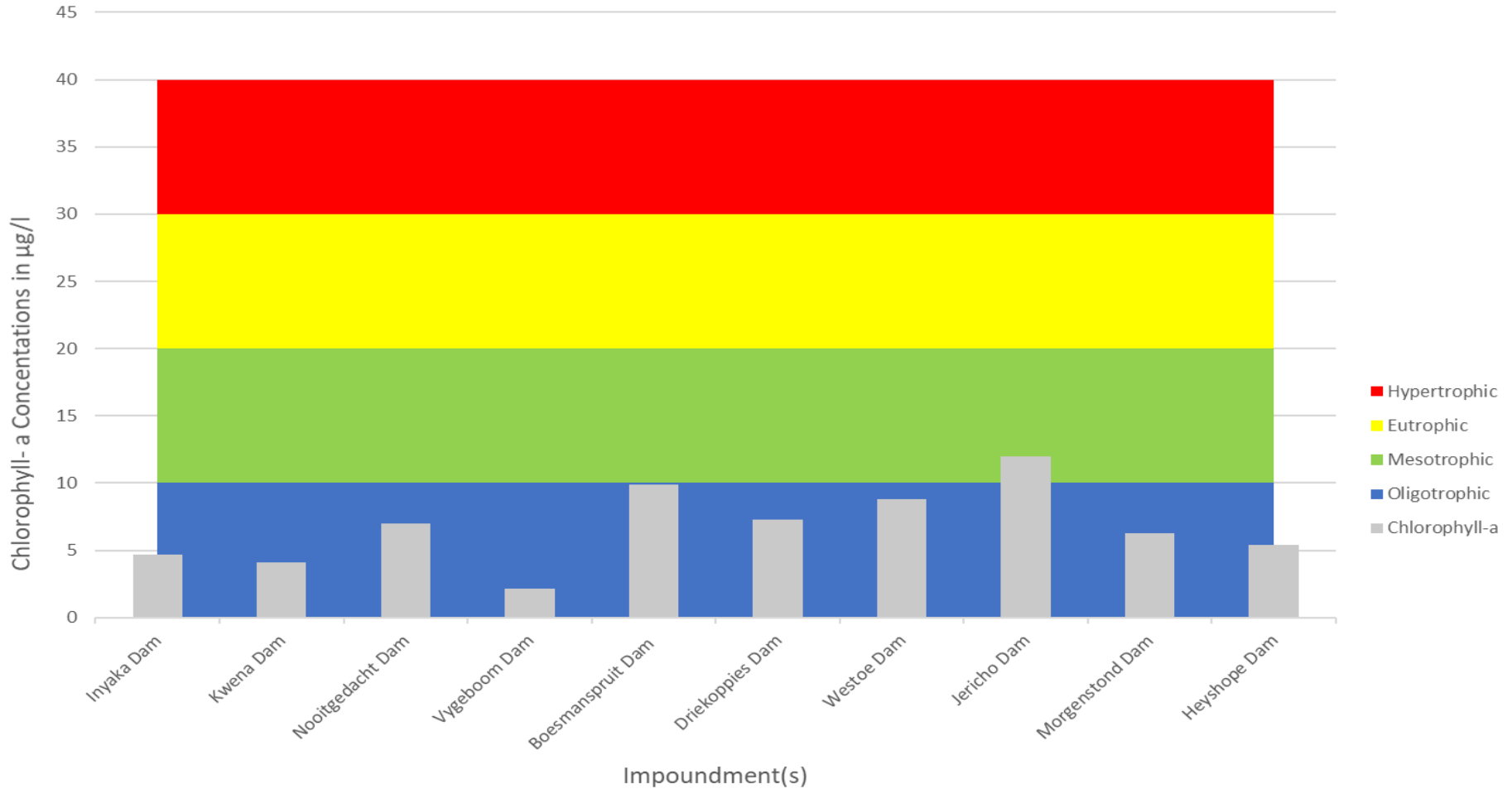
## STATUS: INKOMATI USUTHU WMA

ID code	pH		EC (mS/m)		PO <sub>4</sub> (mg/l)		<i>Faecal Coliforms</i> (cfu/100ml)	
	Limits	Results	Limits	Results	Limits	Results	Limits	Results
<b>SS-51</b>	6.5 – 8.5	<b>7.7-8.3</b>	150	<b>16.5</b>	2	<b>&lt;0.010</b>	2000	<b>828</b>
CRL-39	6.5 – 8.5	<b>7.8-8.2</b>	150	<b>20.5</b>	2	<b>&lt;0.010</b>	2000	<b>277</b>
K-13	6.5 – 8.5	<b>7.3-8.4</b>	150	<b>34.2</b>	2	<b>0.012</b>	2000	<b>1080</b>
K-2	6.5 – 8.5	<b>7.2-8.4</b>	150	<b>93.1</b>	2	<b>0.013</b>	2000	<b>352</b>
U-61	6.5 – 8.5	<b>6.8-7.7</b>	150	<b>7.3</b>	2	<b>&lt;0.010</b>	2000	<b>1155</b>
U-57	6.5 – 8.5	<b>6.9-7.6</b>	150	<b>8.8</b>	2	<b>0.91</b>	2000	<b>738</b>
U-53	6.5 – 8.5	<b>7.0-7.6</b>	150	<b>25.3</b>	2	<b>&lt;0.010</b>	2000	<b>196</b>
U-44	6.5 – 8.5	<b>7.0-8.2</b>	150	<b>11.3</b>	2	<b>&lt;0.010</b>	2000	<b>1417</b>
U-43	6.5 – 8.5	<b>7.1-7.9</b>	150	<b>14.2</b>	2	<b>&lt;0.010</b>	2000	<b>83</b>
U-26	6.5 – 8.5	<b>7.1-8.4</b>	150	<b>20.1</b>	2	<b>0.020</b>	2000	<b>530</b>

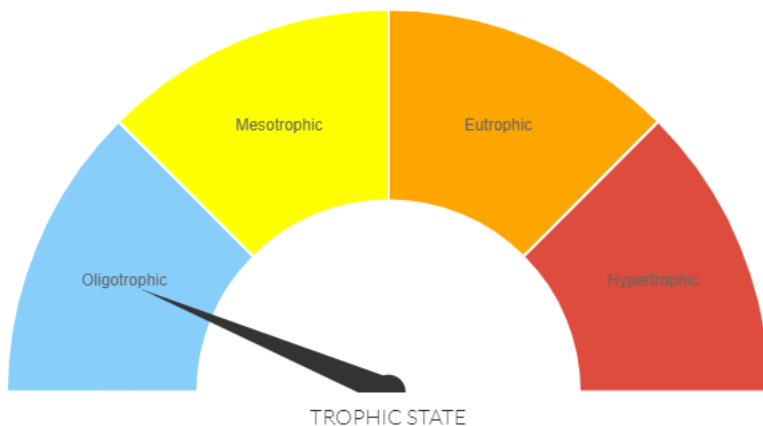
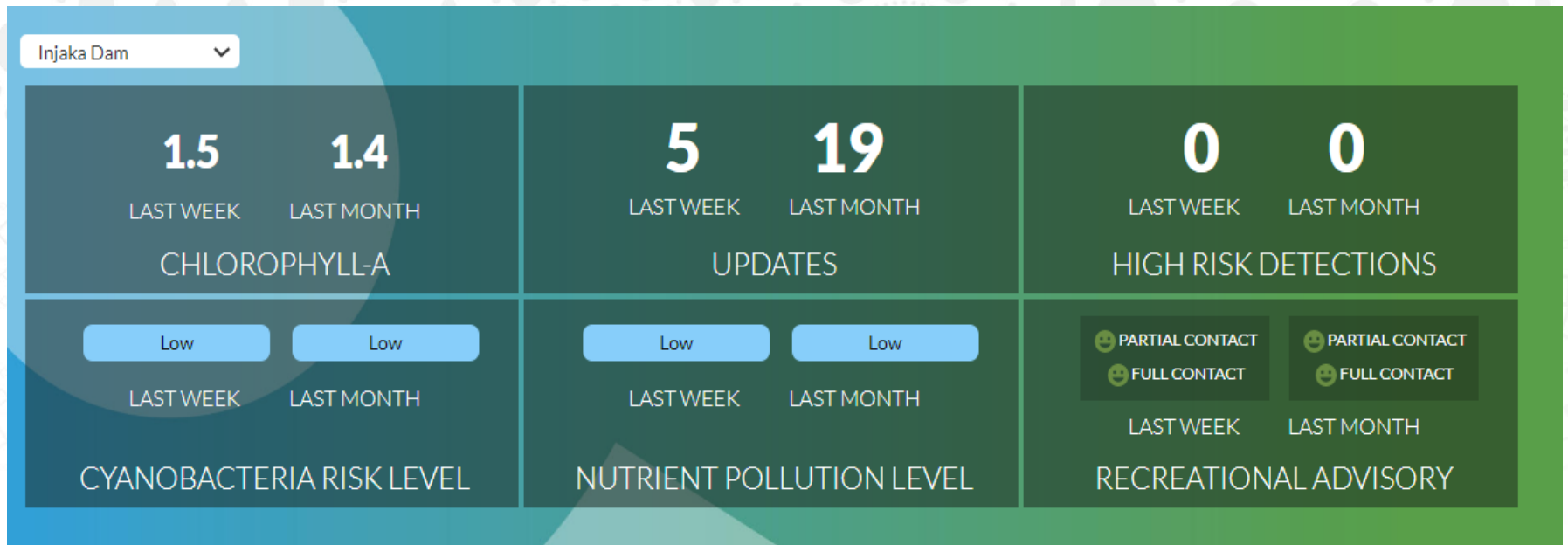


# NEMP: TROPHIC STATUS OF MAJOR DAMS

## Trophic Status for Dams in the WMA



# CYANOLAKES DIGITAL EUTROPHICATION MONITORING: INJAKA DAM



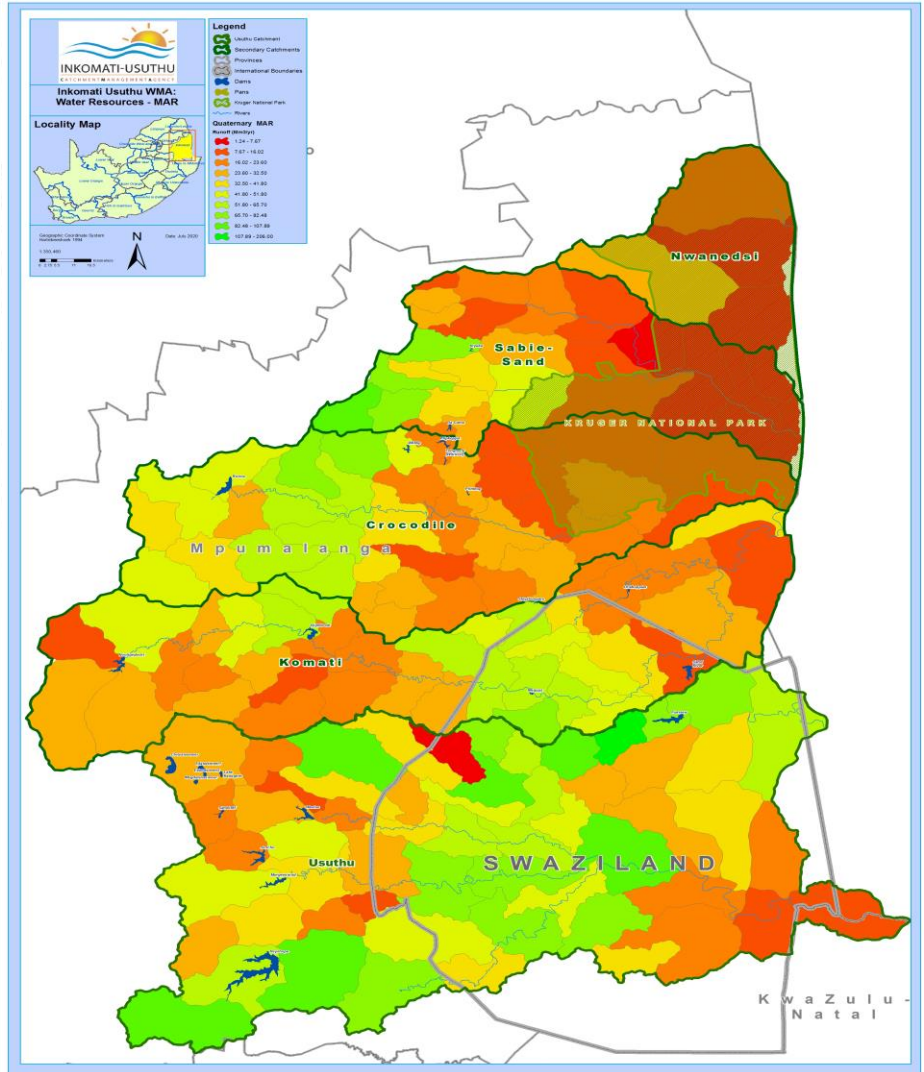
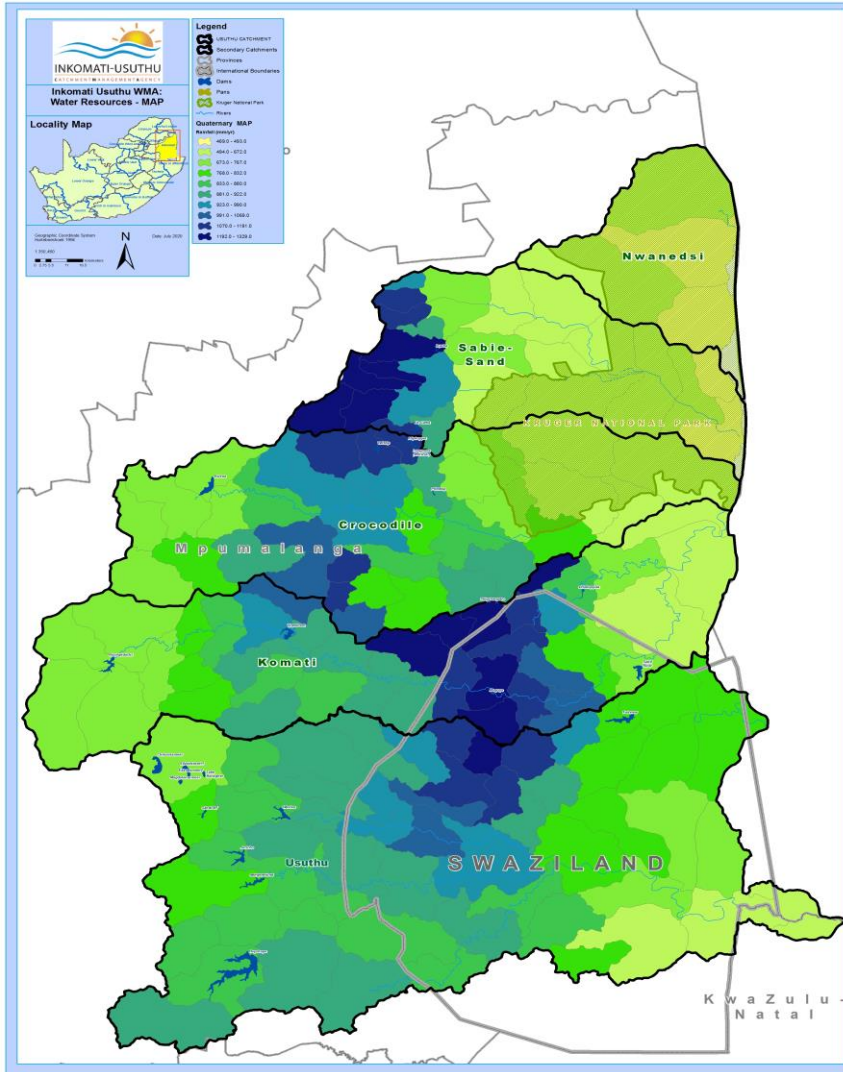
Injaka Dams' trophic status on the 21<sup>st</sup> of July 2022 stands at **Oligotrophic**, meaning it is low in nutrients and not productive in terms of aquatic and animal plant life.



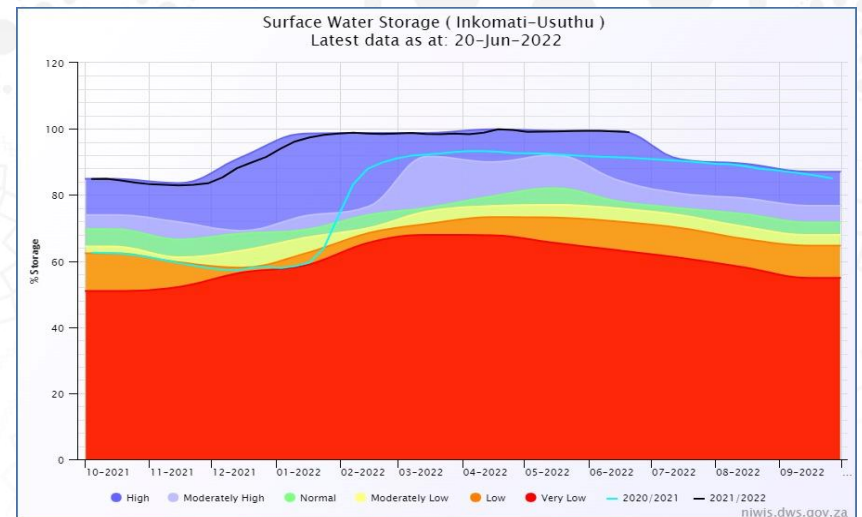
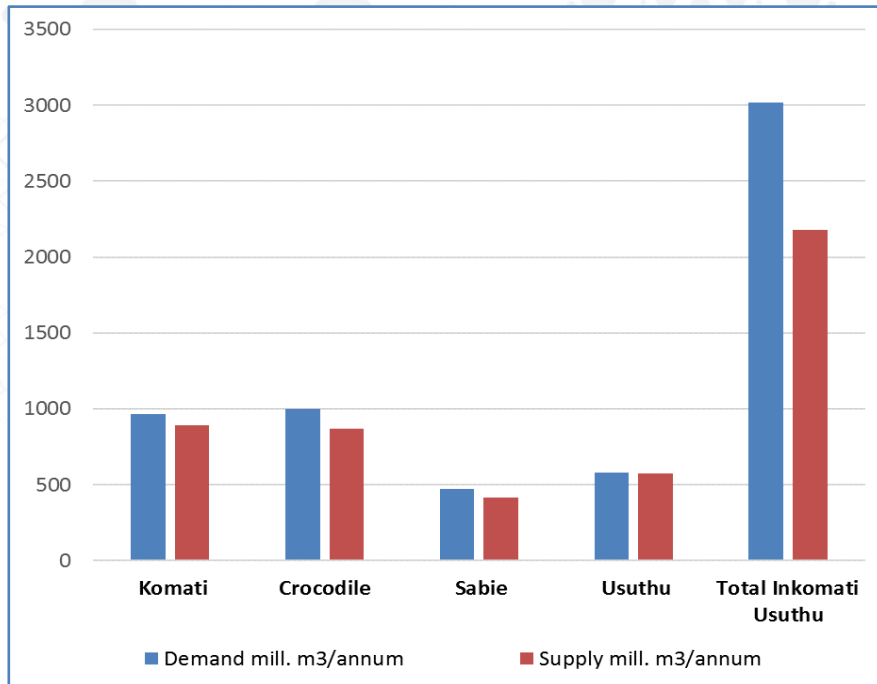
# Water Quantity Status



# DISTRIBUTUION OF MEAN ANNUAL RAINFALL AND MEAN ANNUAL RUNOFF IN THE WMA



# SURFACE WATER RESOURCES STATUS

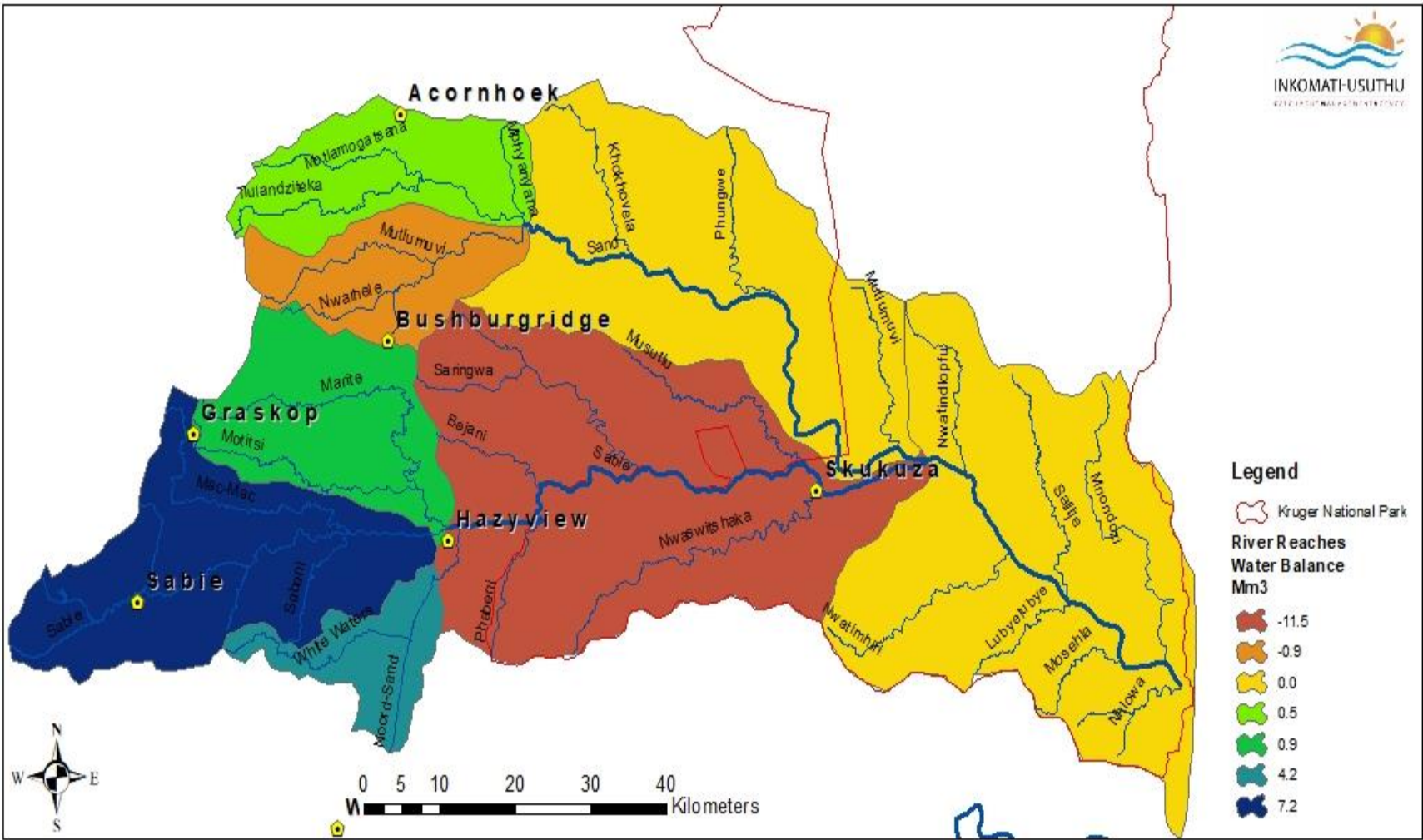


- The WMA water resource status is high (rivers and dams levels) compared to the three previous hydrological years and no water use restrictions were implemented to all sectors in the previous financial year as most dams reached 100.0 % full



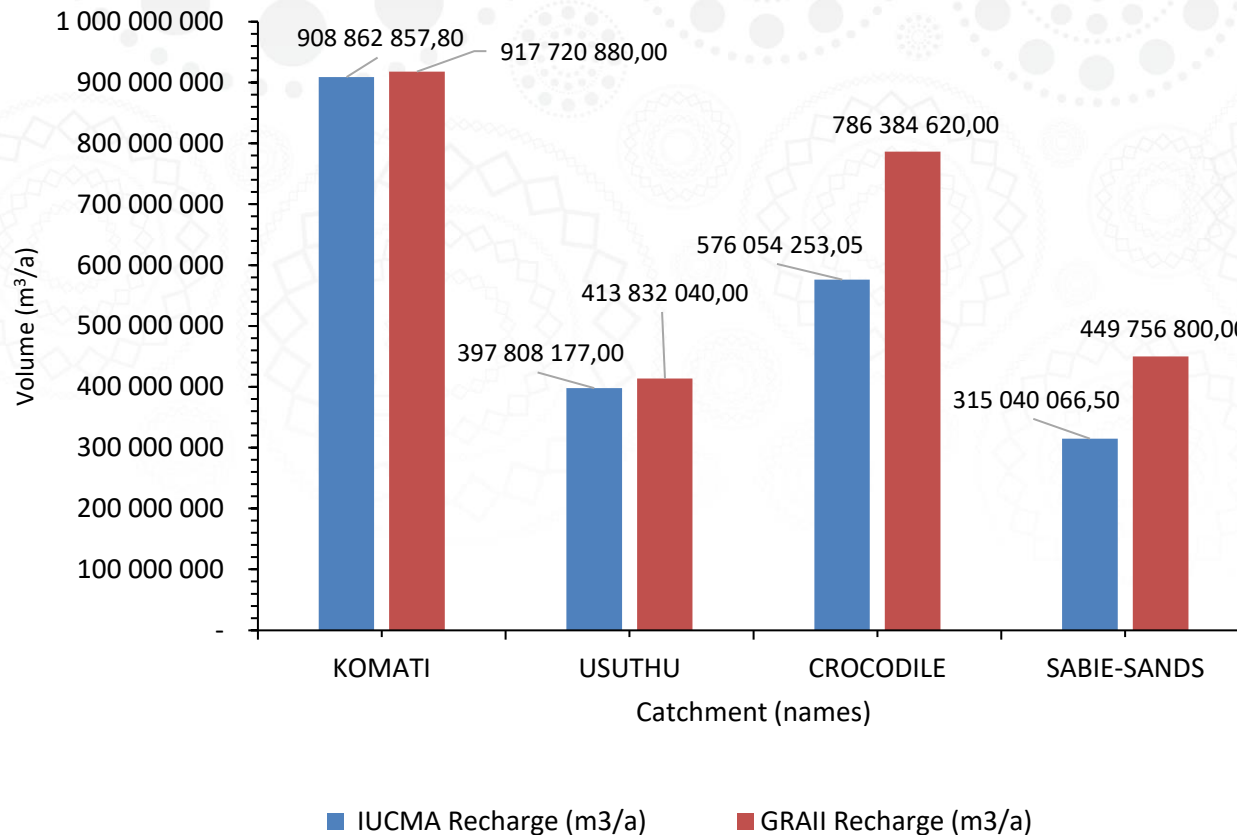
# SURFACE WATER RESOURCES STATUS

## SABIE-SAND CATCHMENT WATER BALANCE



# GROUNDWATER RESOURCES STATUS

Groundwater Recharge Inkomati-Usuthu WMA

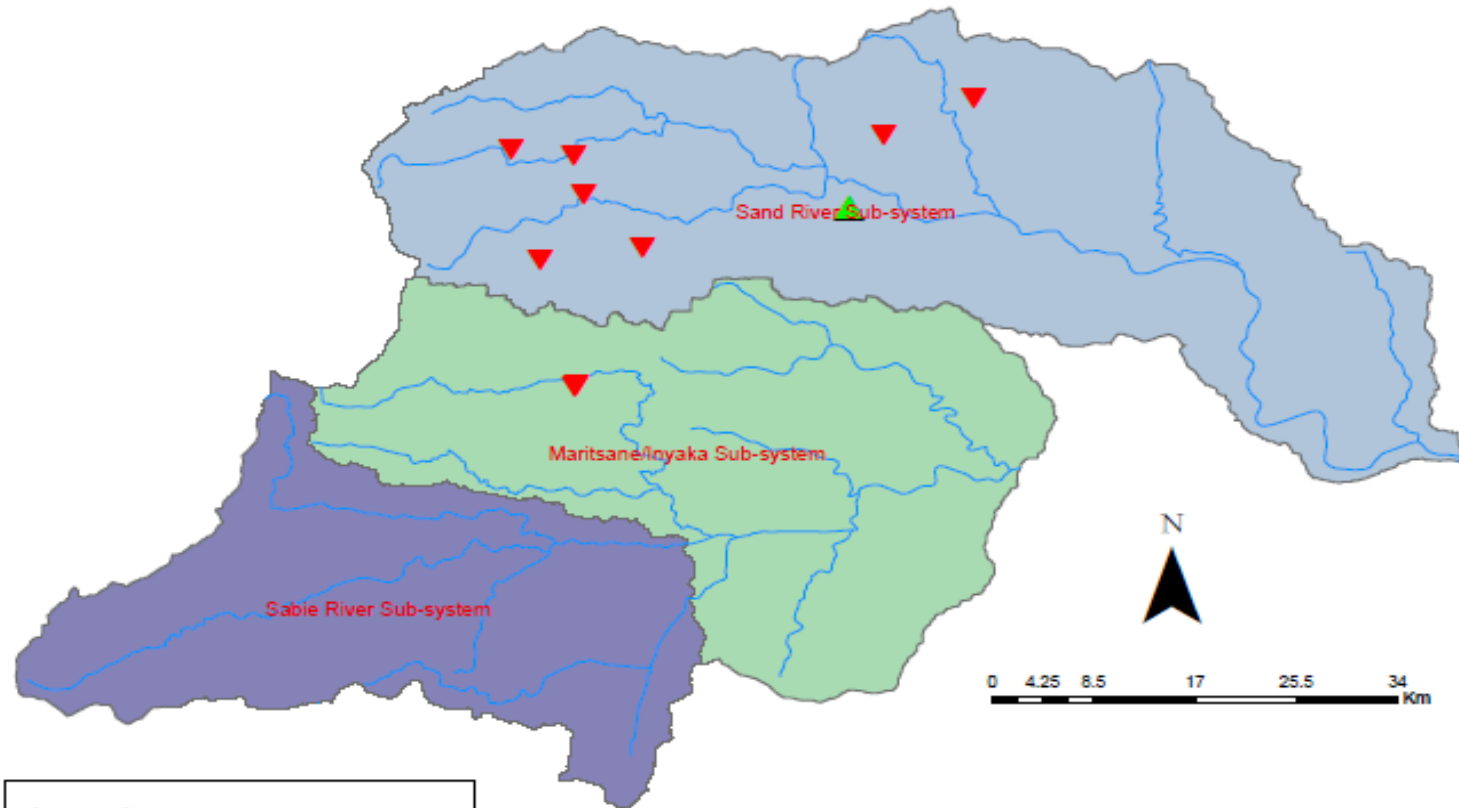


Since 2006 estimates (GRA II), groundwater recharge has dropped by approximately:

- **9 Mm³/a** for Komati,
- **16 Mm³/a** for Usuthu,
- **210 Mm³/a** for Crocodile,
- **135 Mm³/a** Sabie-Sand.

# GROUNDWATER RESOURCES STATUS

## Sabie-Sand GW Monitoring Boreholes: Long term water levels trend



**Legend**

- ▲ Up
- ▼ Down
- Rivers

**Sabie-sand Catchment Sub-systems**

- Maritsane/Inyaka Sub-system
- Sabie River Sub-system
- Sand River Sub-system

July 2022




# DISASTER MANAGEMENT FOR FLOODS, DROUGHTS AND POLLUTION INCIDENTS

IUCMA Water Early Warning - Data Analyses and Reporting Engine

**Dashboard**

- Info
- About



## IUCMA Water Early Warning

Data Analyses and Reporting Engine

version: 4.1.8122.6215

**Module :** PostgreSQL

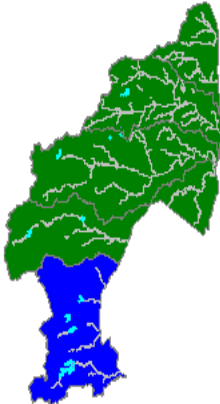
Web uploads enabled.

File based indicators enabled.

FloodWatch indicators disabled.


Latest Assessments

Floods



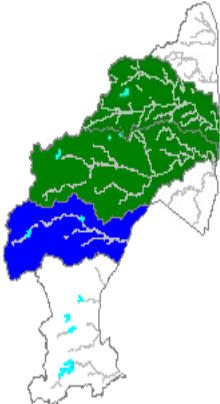
Latest Assessments

Drought



Latest Assessments

Water quality



Basin : IUCMA

Assessment approved : 4/19/2022 1:47:15 PM

Upper Komati	All Clear
Crocodile	All Clear
Sabie-Sand	All Clear
N'wanetsi	All Clear
Upper Usuthu	Flood Watch
Lower Komati	All Clear

Basin : IUCMA

Assessment approved : 4/19/2022 2:12:54 PM

Upper Komati	Normal Conditions
Crocodile	Normal Conditions
Sabie-Sand	Normal Conditions
N'wanetsi	Normal Conditions
Upper Usuthu	Normal Conditions
Lower Komati	Normal Conditions

Basin : IUCMA

Assessment approved : 4/4/2022 4:53:34 AM

Upper Komati	Water Quality Watch
Crocodile	All Clear
Sabie-Sand	All Clear
N'wanetsi	Not assessed
Upper Usuthu	Not assessed
Lower Komati	Not assessed

- [Dashboard](#)
- [Floods](#)
- [Droughts](#)
- [Water Quality](#)
- [Communication](#)
- [DARE configuration](#)
- [User administration](#)

# CONCLUSIONS & RECOMMENDATIONS

## Water Quality:

- ❑ Water Quality in the Sabie Sand catchment is generally good but punctuated by microbial (*E. coli*) pollution and salts (electrical conductivity) indicated non-compliance at various sites.
- ❑ Eutrophication status for all the dams within the WMA is good
- ❑ It is recommended that the land use activities impacting on water resources quality be efficiently controlled through Source Directed Controls (SDC) as per the provision(s) of the National Water Act No 36 of 1998.



# CONCLUSIONS & RECOMMENDATIONS

## Water Quality:

- It is also recommended that the water users:
  - ✓ Address poor operation and maintenance of WWTW's and its associated infrastructure i.e., Sewer pump stations, manhole.
  - ✓ Implement long term solution to resolve noncompliant i.e., Infrastructure Investment in Wastewater treatment and disposal facilities by water users.
  - ✓ Provide sustainable and adequate waste management and sanitation services to urban and rural settlement by Municipalities.



# CONCLUSIONS & RECOMMENDATIONS

## Surface water:

- ❑ Sabie catchment is in balance, but future water needs cannot be met with current surface water sources of water especially on the Sand catchment.

## Groundwater:

- ❑ Groundwater development in the Sabie-Sand should be controlled, with more challenges in the Sand catchment.



**THANK YOU**

