



INKOMATI-USUTHU

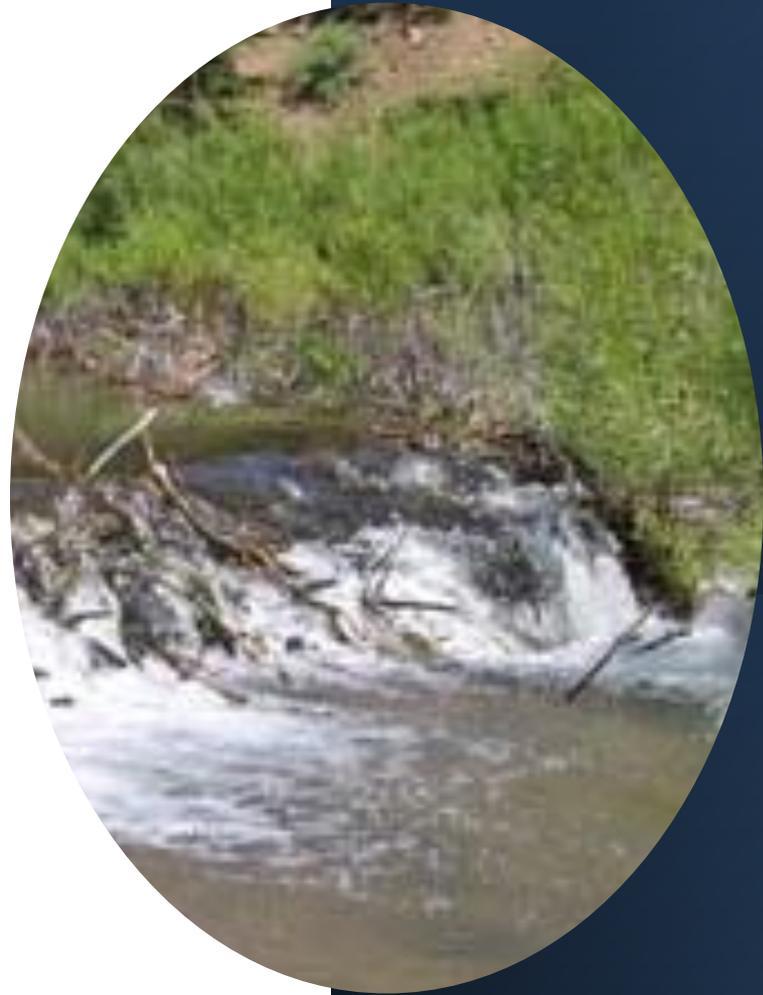
CATCHMENT MANAGEMENT AGENCY



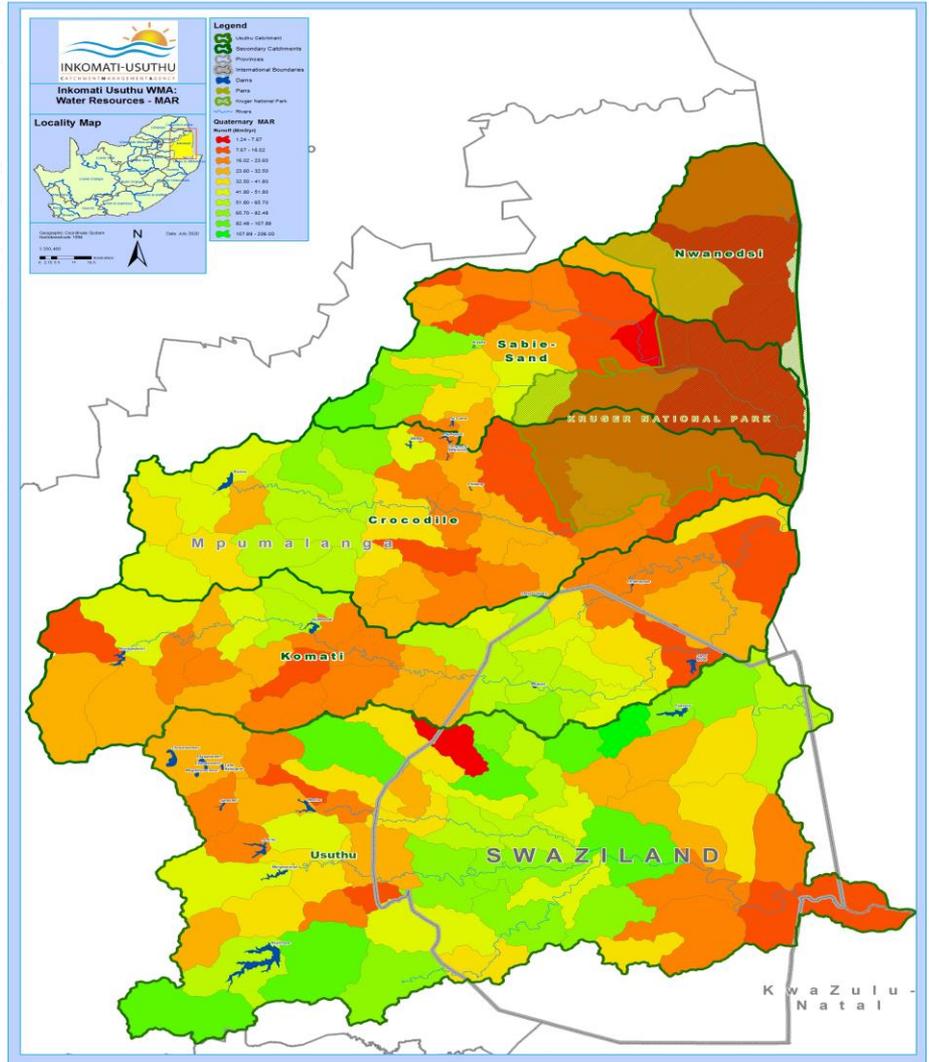
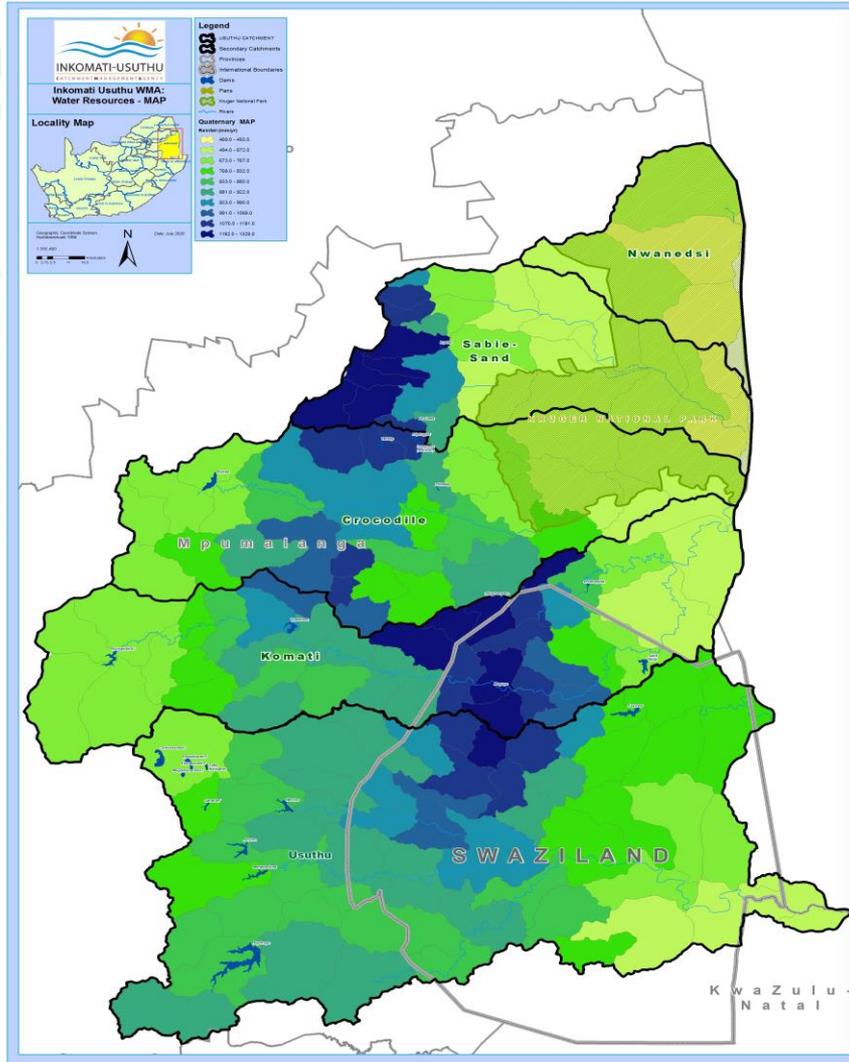
**Water Quality and Quantity Status
Within the Inkomati Usuthu WMA
(Crocodile and Lower Komati Catchment)**

14 July 2023

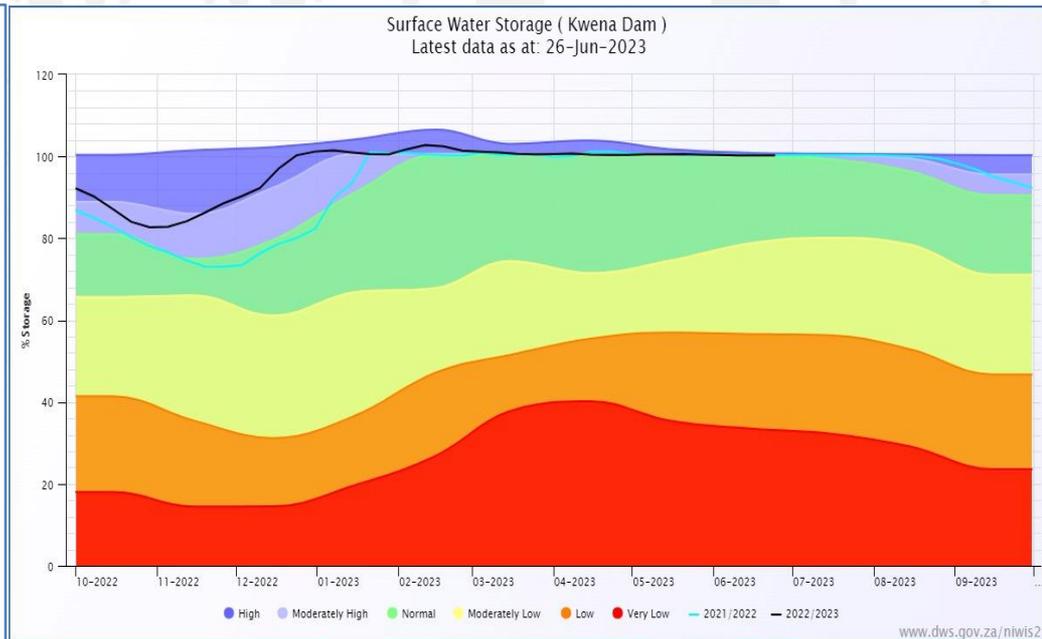
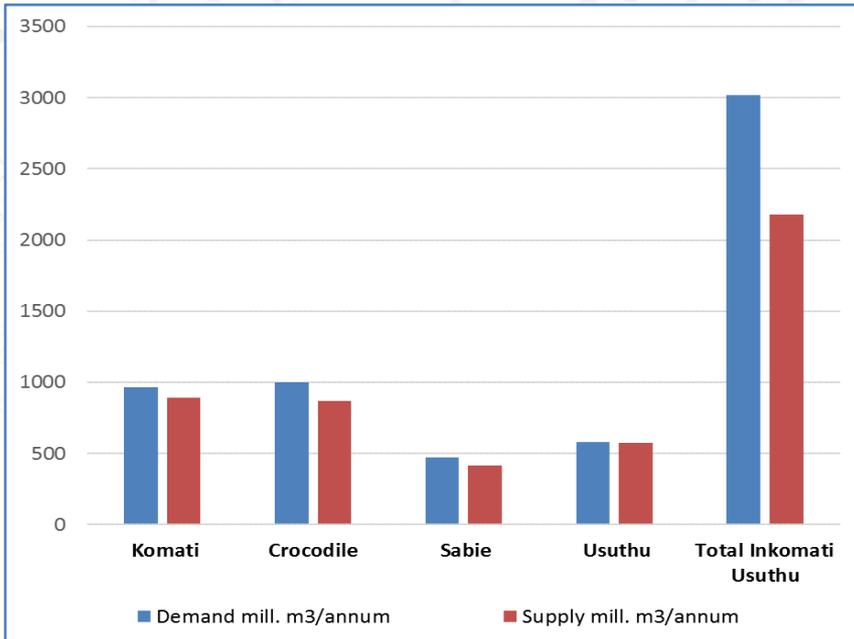
SURFACE AND GROUNDWATER QUANTITY STATUS



DISTRIBUTION OF MEAN ANNUAL RAINFALL AND MEAN ANNUAL RUNOFF IN THE WMA

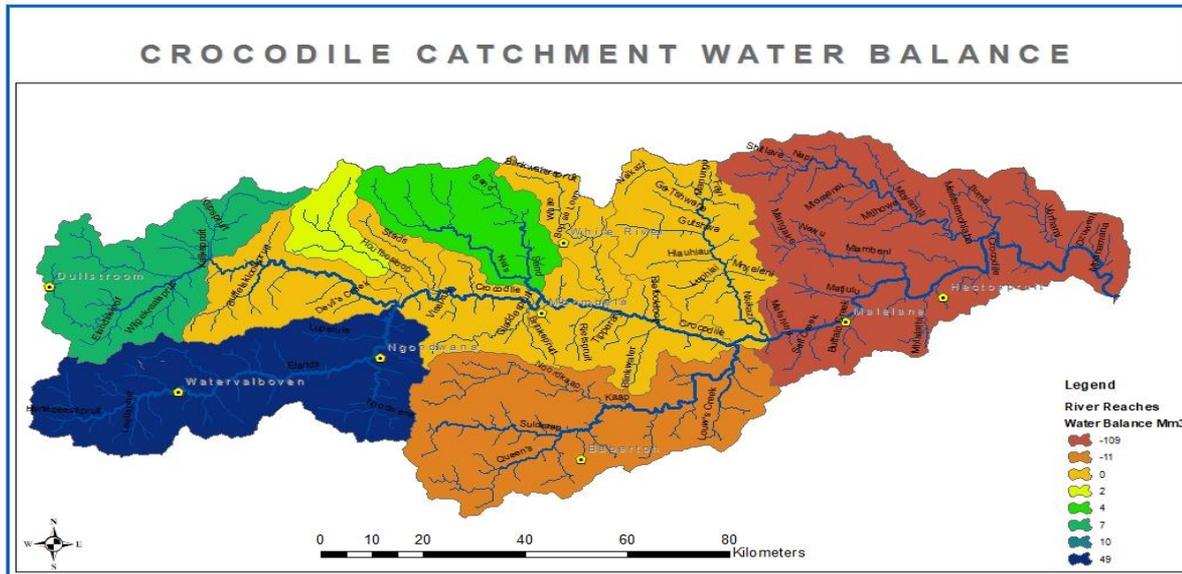


SURFACE WATER RESOURCES STATUS



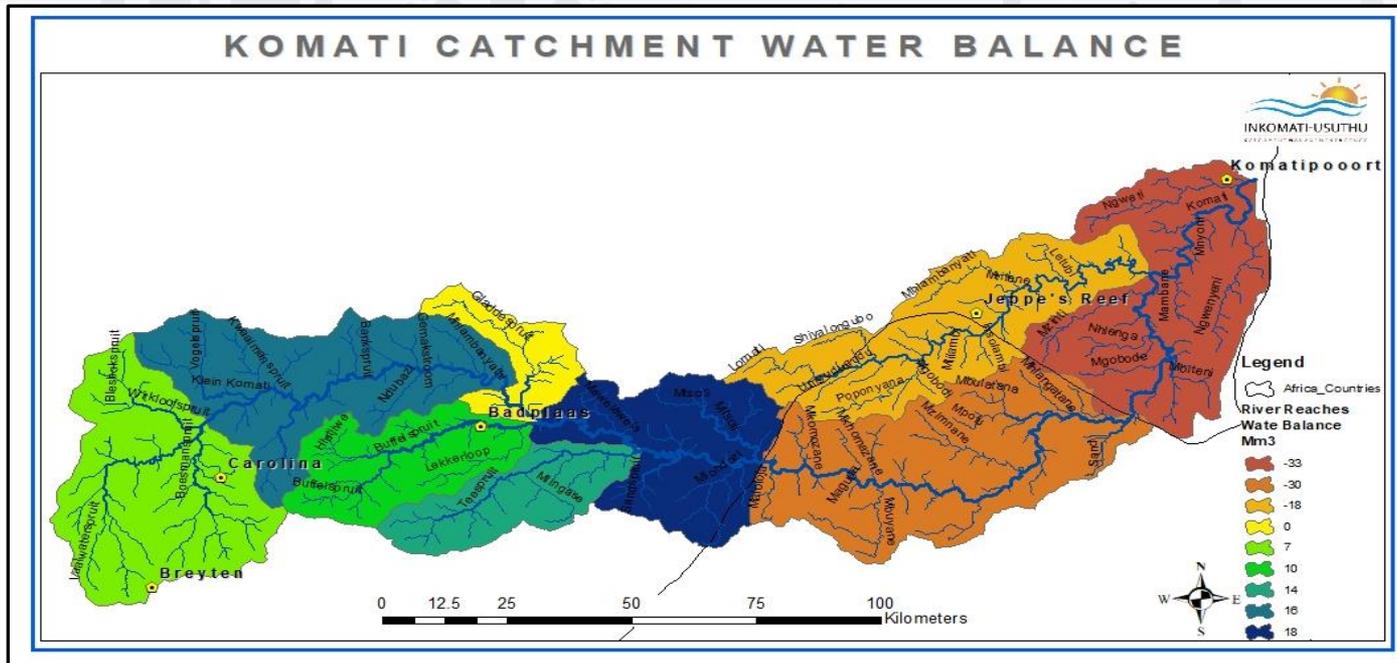
- All dams were above normal, an indication of excess water in the system for annual allocations to different sectors through to next rain season.
- However, those who rely on river flows will still be affected as the river levels are dropping until next rainy season.

CROCODILE SURFACE WATER BALANCE



River Reach/Tributary	Water available at mixed assurance	Water requirement	Balance
Elands River	76	28	48
Crocodile (u/s of Kwena Dam)	21	14.1	6.9
Crocodile (d/s of Kwena Dam to confluence with the Elands)	20	19.8	0.2
Houtbosloop	7	5.3	1.7
Stads River	5	39.3	-34.3
Crocodile (Montrose to Mataffin)	78	41.3	36.7
Nels River	25	10.5	14.5
White River	19	19	0
Crocodile (Mataffin to Crocodile Gorge)	57	63.6	-6.6
Kaap River	70	85.1	-15.1
Gutshwa River	10	9.2	0.8
Lower Crocodile	116	220.6	-104.6
Total	504	555.8	-51.8

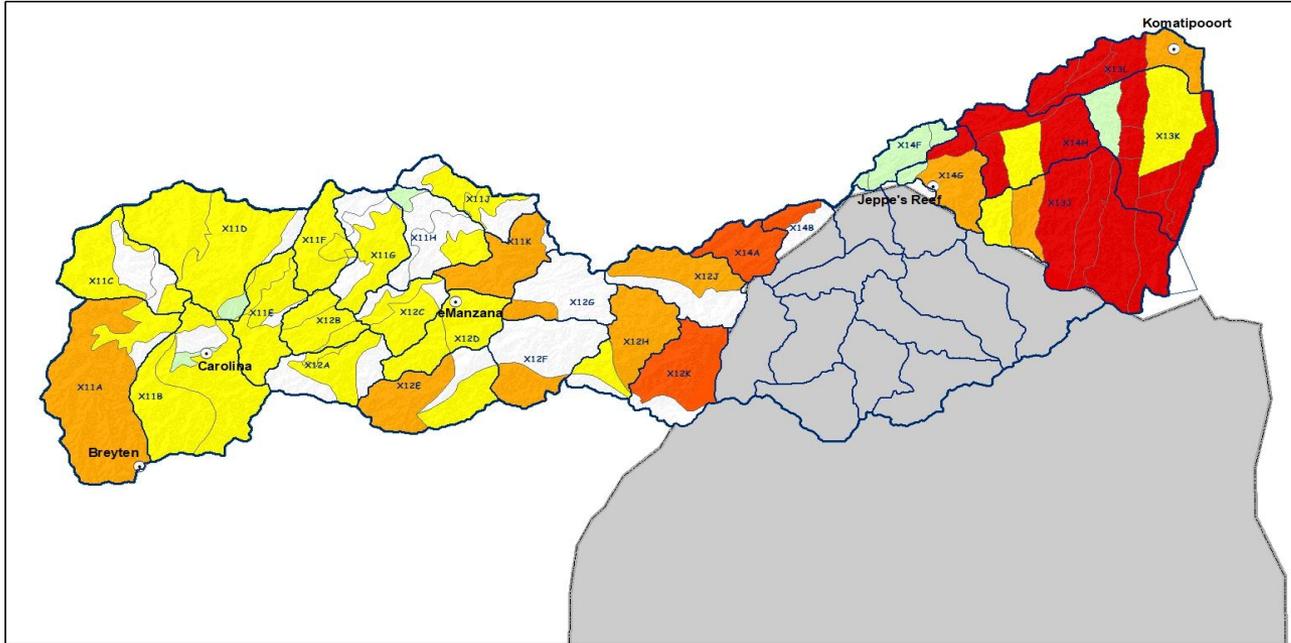
KOMATI SURFACE WATER BALANCE



River Reach/Tributary	Water available at mixed assurance	Water requirement	Balance
Nooitgedacht	47	40	7
Vygeboom	101	85	16
Buffelspruit	11	1	10
Gladdespruit	6	6	0
Theespruit	20	6	14
Upper Komati	25	7	18
Middle Komati	327	357	-30
Lomati	128	146	-18
Lower Komati	206	239	-33
Total	871	887	-16

GROUNDWATER STRESS INDEX MAPS PER CATCHMENT

KOMATI CATCHMENT : GROUND WATER STRESS LEVEL



Legend

- Komati Catchment
- Quaternaries
- Towns
- eSwatini

% OF GU STRESS LEVEL FOR KOMATI CATCHMENT

PRESENT STATUS CATEGORY	DESCRIPTION	STRESS INDEX (groundwater abstraction / recharge – baseflow)
A	Unstressed or low levels of stress	< 0.05
B		0.05-0.20
C	Moderate levels of stress	0.20-0.50
D		0.50-0.75
E	Stressed	0.75-0.95
F	Critically stressed	> 0.95

Date: 2023/07/06



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SURFACE WATER QUALITY STATUS

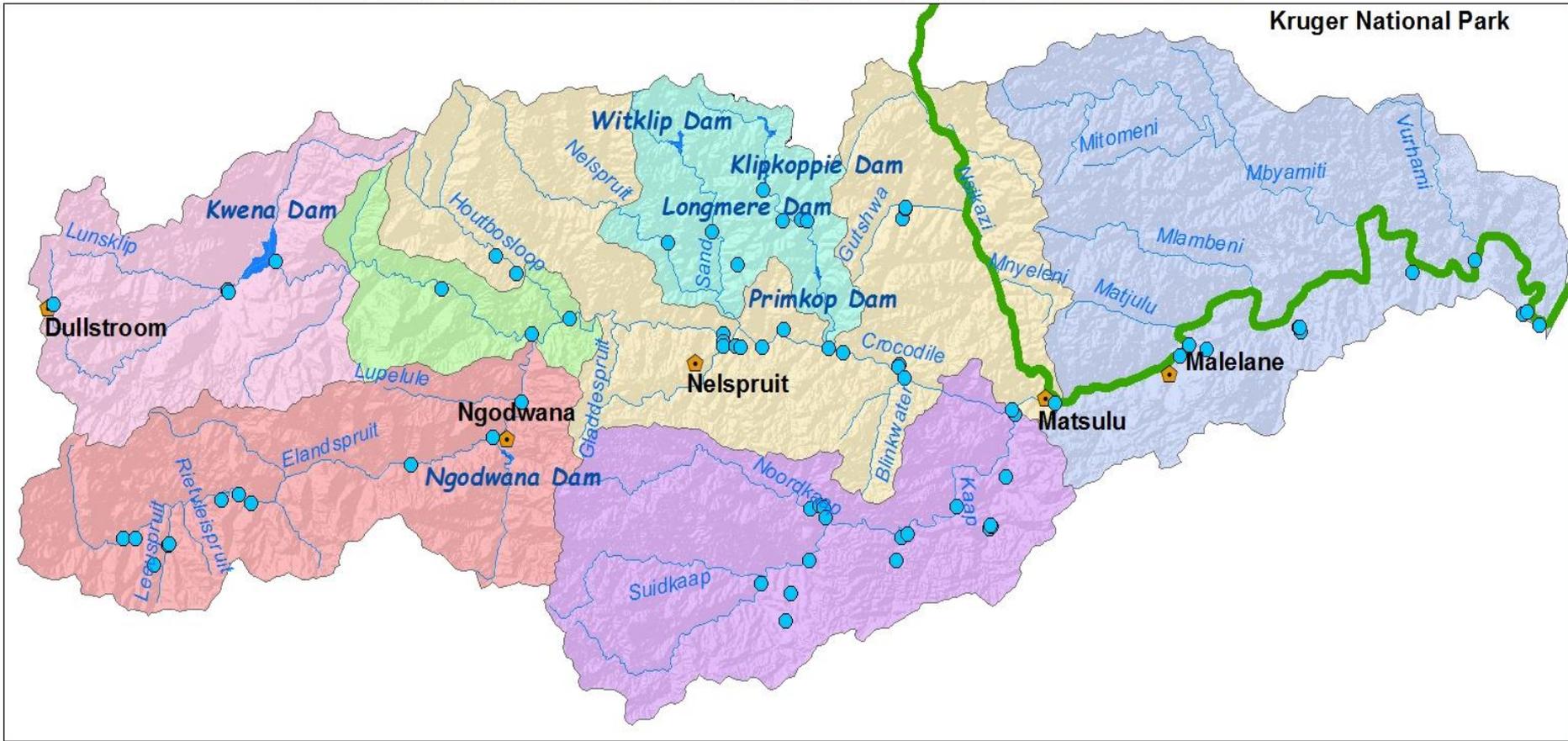


WATER QUALITY DATA REPORTED

- The data reported per Catchment ranges between April 2022–March 2023 Financial year within the WMA.
- The compliance of these indicator variables tabulated were compared with Resource Quality Objectives (RQOs) published in a Government Gazette dated 30 December 2016, where RQOs are not available TWQG will be used.
- The selected indicator variables are tabulated:

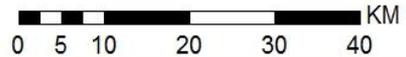
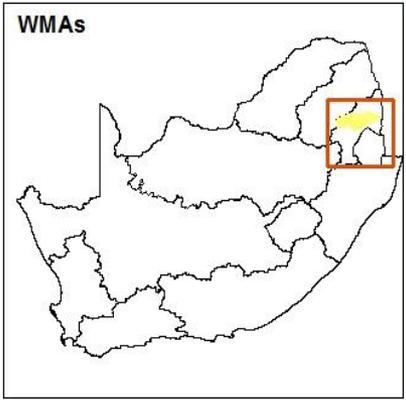
Classified Water quality variables	Indicator Variables	Statistical analysis of data
System variable	pH	Average
Salts	Electrical Conductivity	Average
Nutrients	Phosphate	Median
Microbial	<i>E coli</i>	Average
Eutrophication	<i>Chlorophyll-a</i> and Total Phosphorus	Median

CROCODILE CATCHMENT : WATER QUALITY MONITORING POINTS

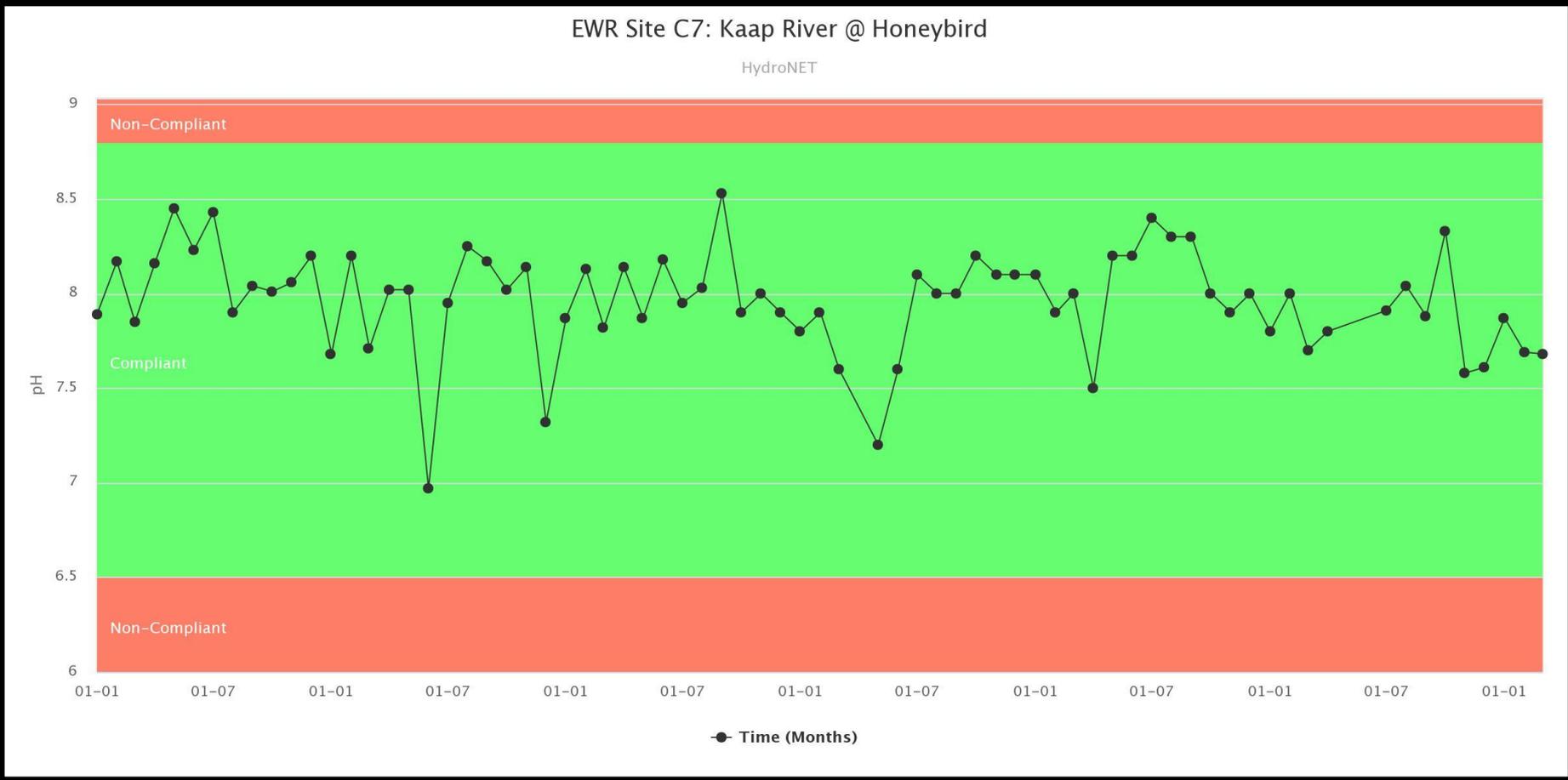


- Legend**
- WQMP
 - Crocodile Catchment
 - Dams
 - Rivers
 - Towns
 - Kruger National Park

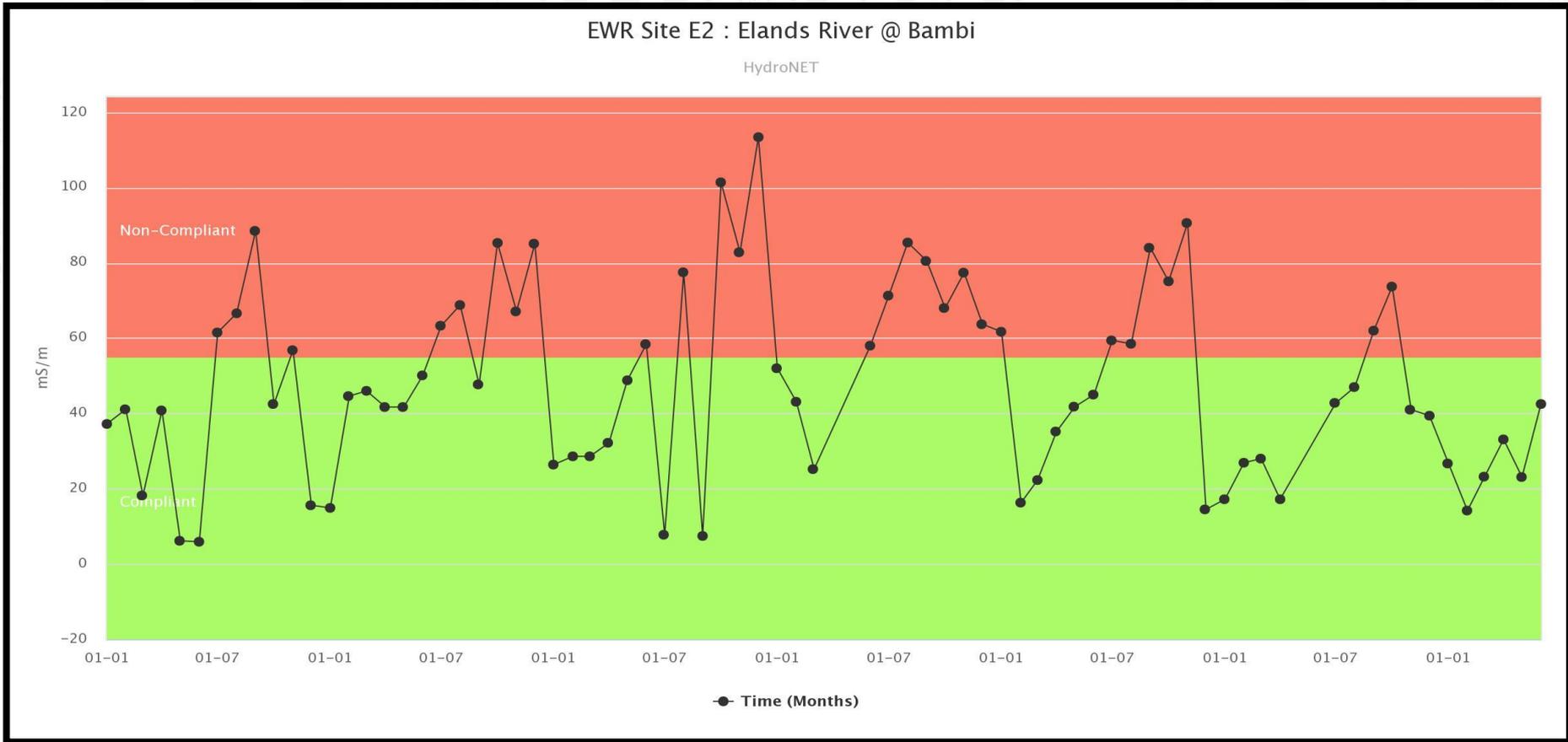
- Crocodile Sub Catchments**
- Elands Sub System
 - Kaap River Sub-System
 - Lower Crocodile Sub-System
 - Lower Kwena
 - Middle crocodile Sub-System
 - Upper Crocodile Sub-system
 - White River Sub-System



TRENDS: PH



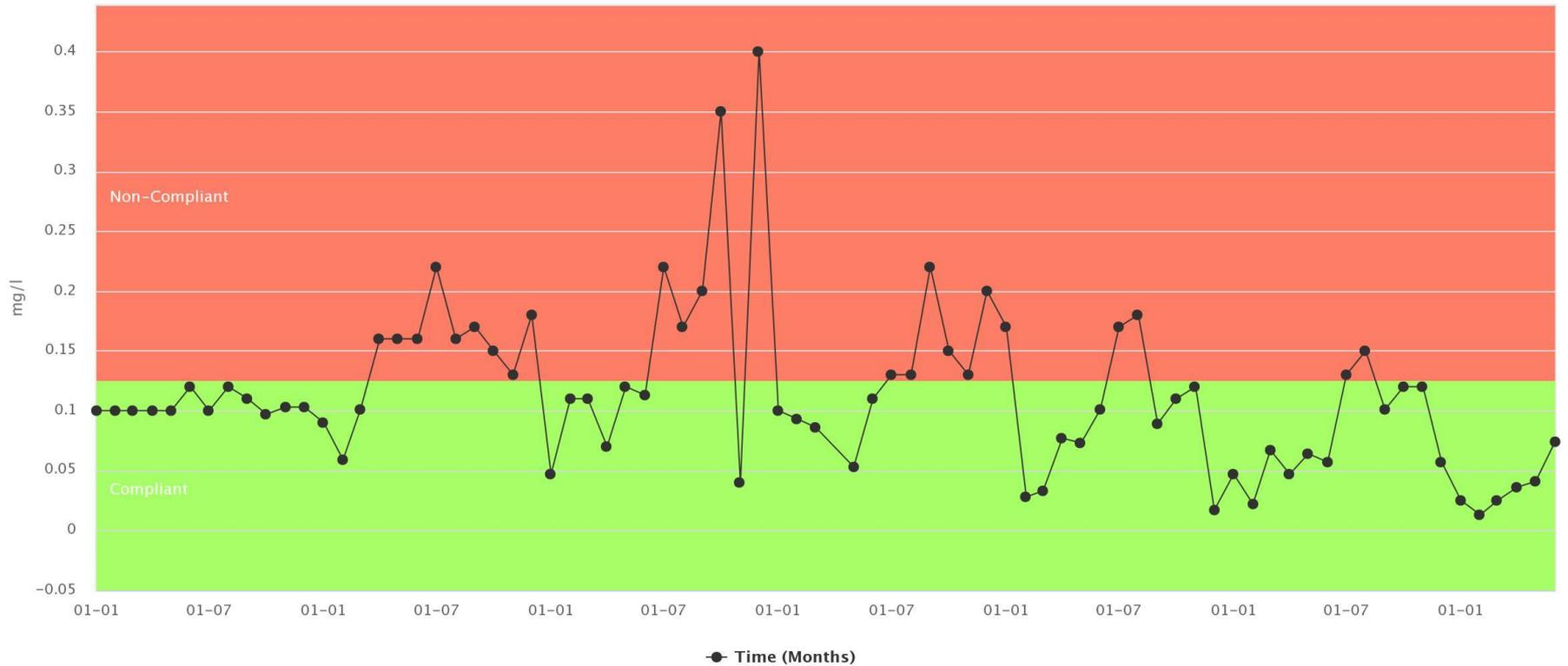
TRENDS: ELECTRICAL CONDUCTIVITY



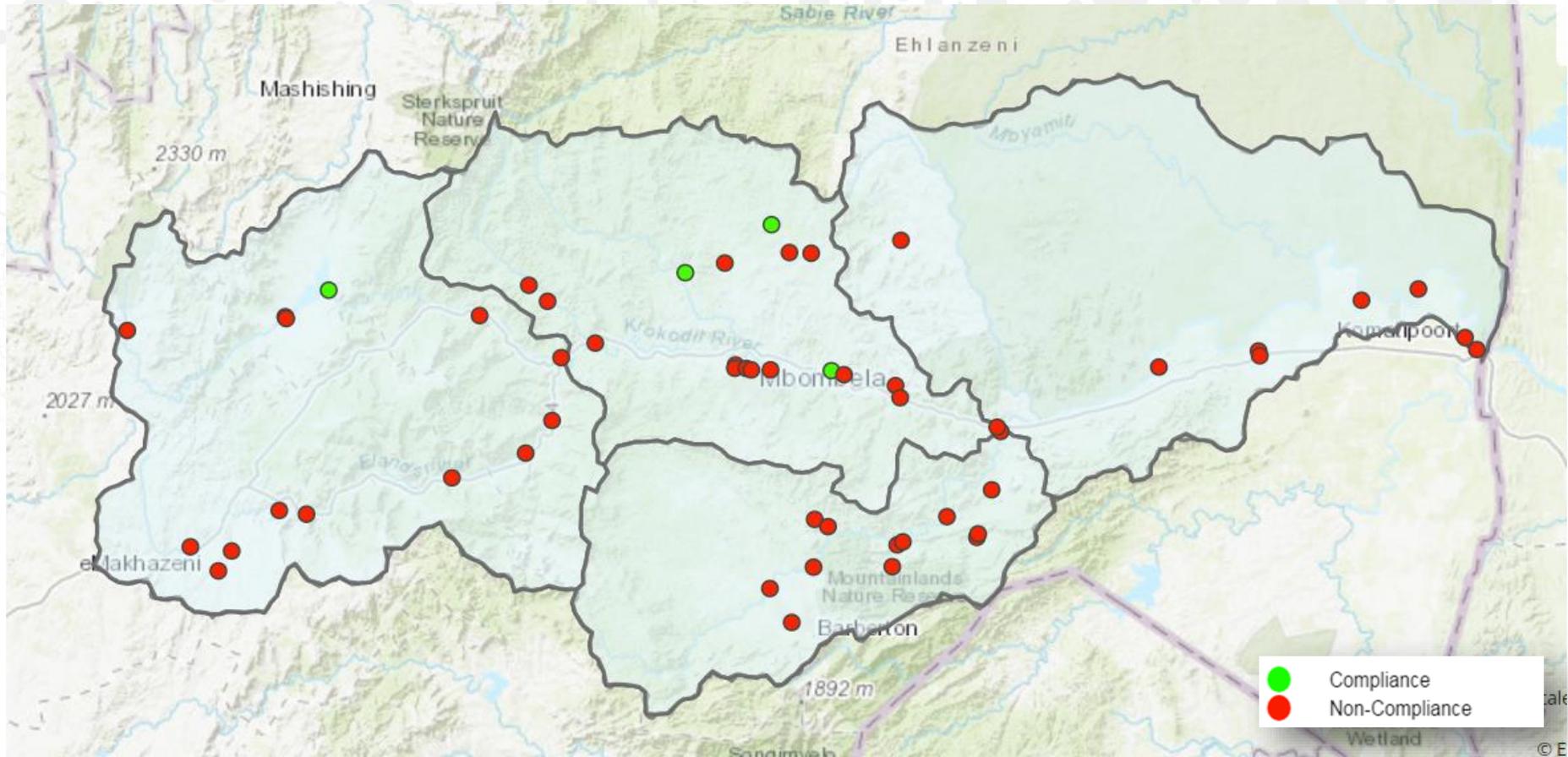
TRENDS: PHOSPHATE

EWR Site C4 : Crocodile River @ KaNyamazane N4 Bridge

HydroNET



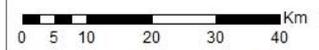
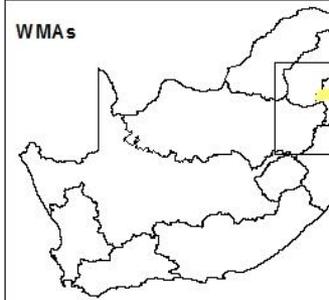
WATER QUALITY STATUS: E COLI



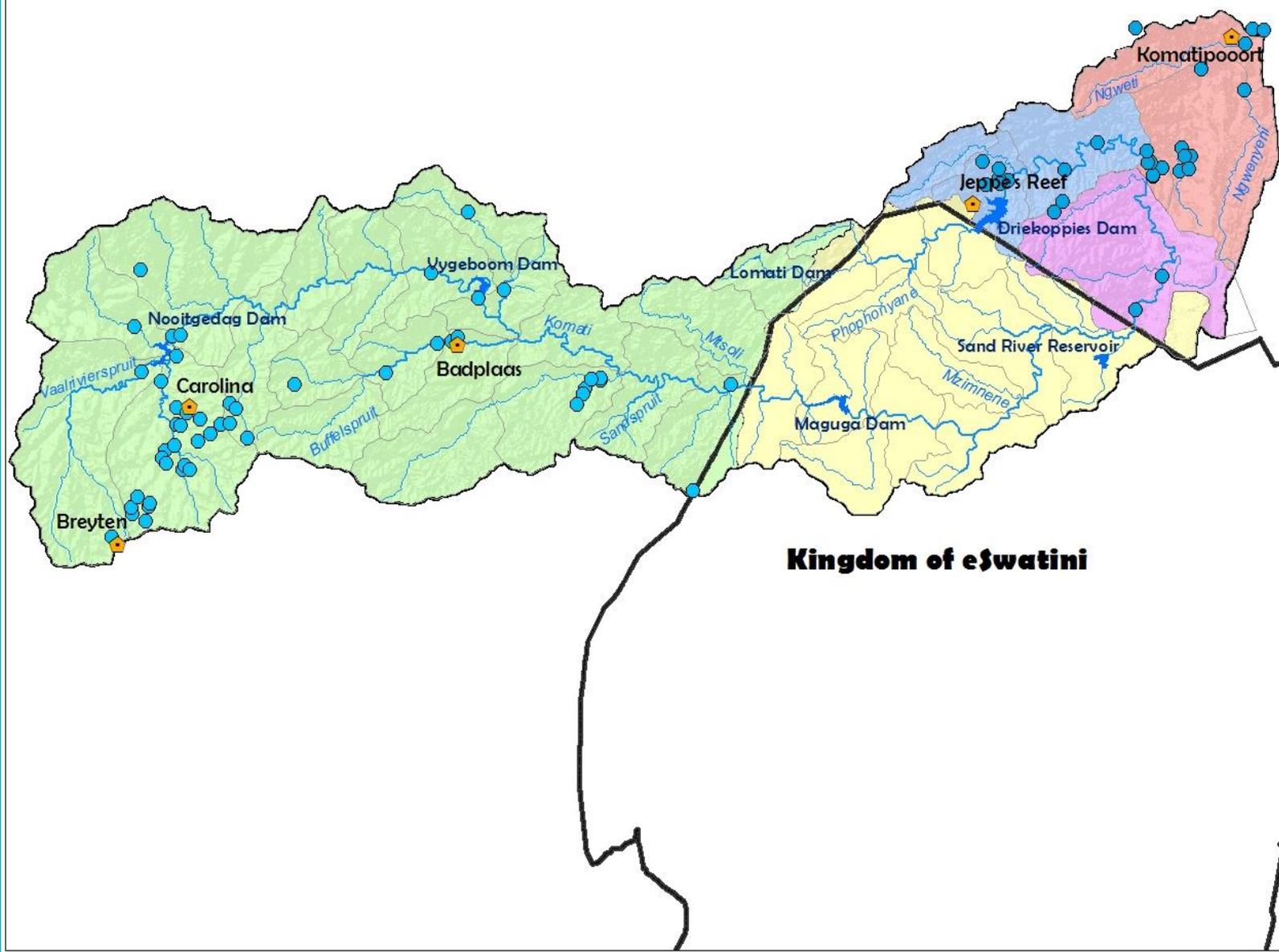
E. coli counts Catchment did not comply with the set RQOs for most of the monitoring sites, with high concentrations within residential areas, except for dams (Kwena & Longmere), Nels River and Crocodile River at Karino.

Legend

- WQMP
- Komati Catchment
- Komati_Sub Catchment**
- Komati Upstream Sub-system
- Komati West Sub-system
- Lomati Sub-System
- Lower Komati Sub-system
- Middle Komati Sub-system
- Quaternaries
- Dams
- Rivers**
- Rivers_Orders**
- 1
- 2
- 3
- Towns
- International_borders



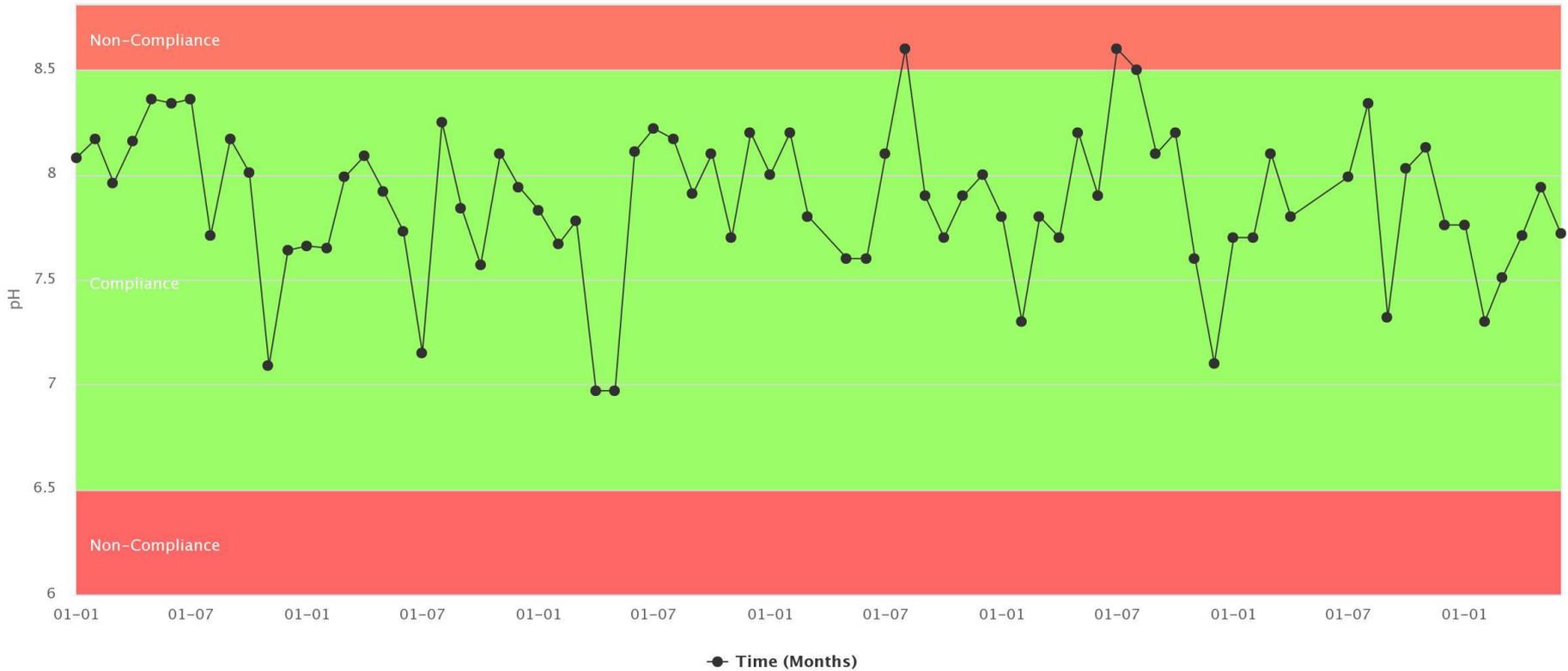
Date: 2019/03/14



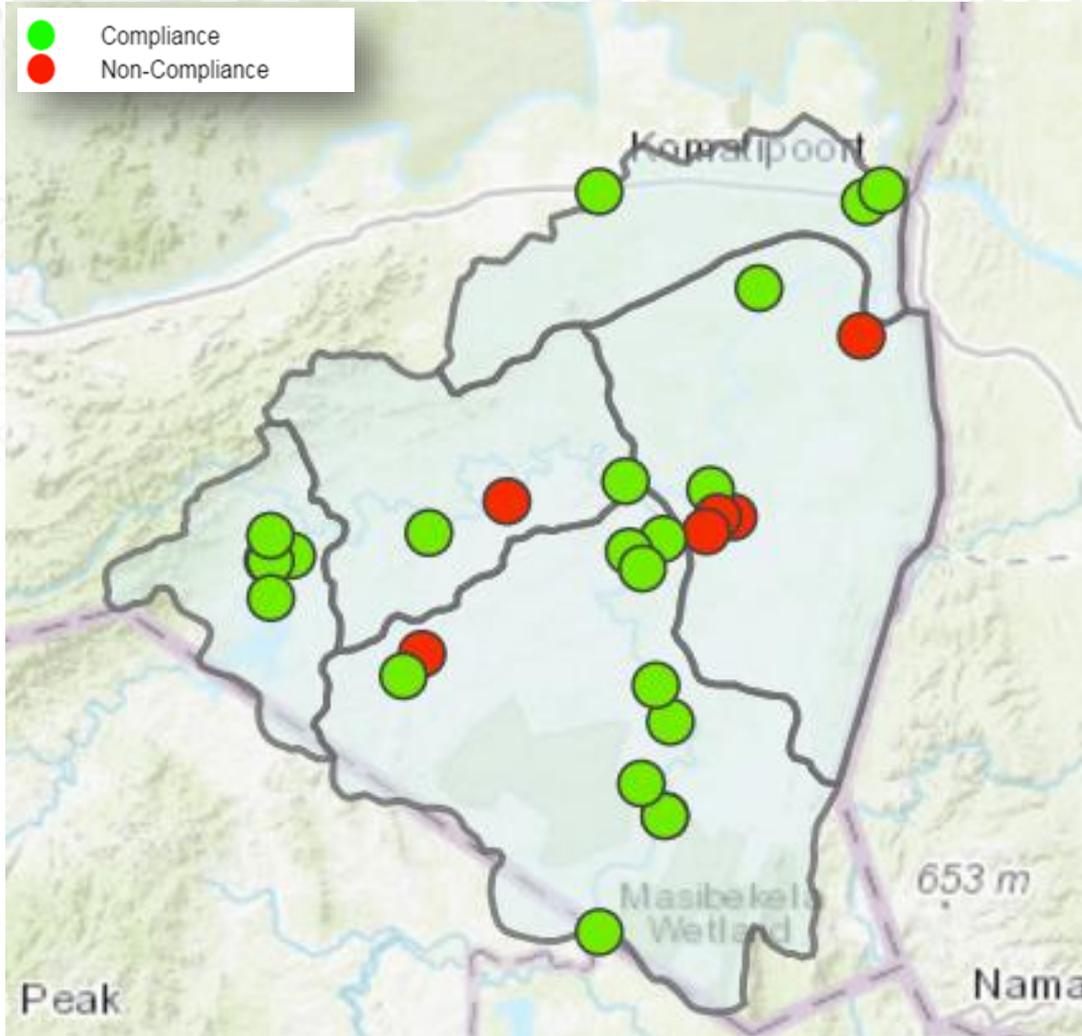
TRENDS: PH

EWR Site K3: Komati River @ Tonga bridge

HydroNET

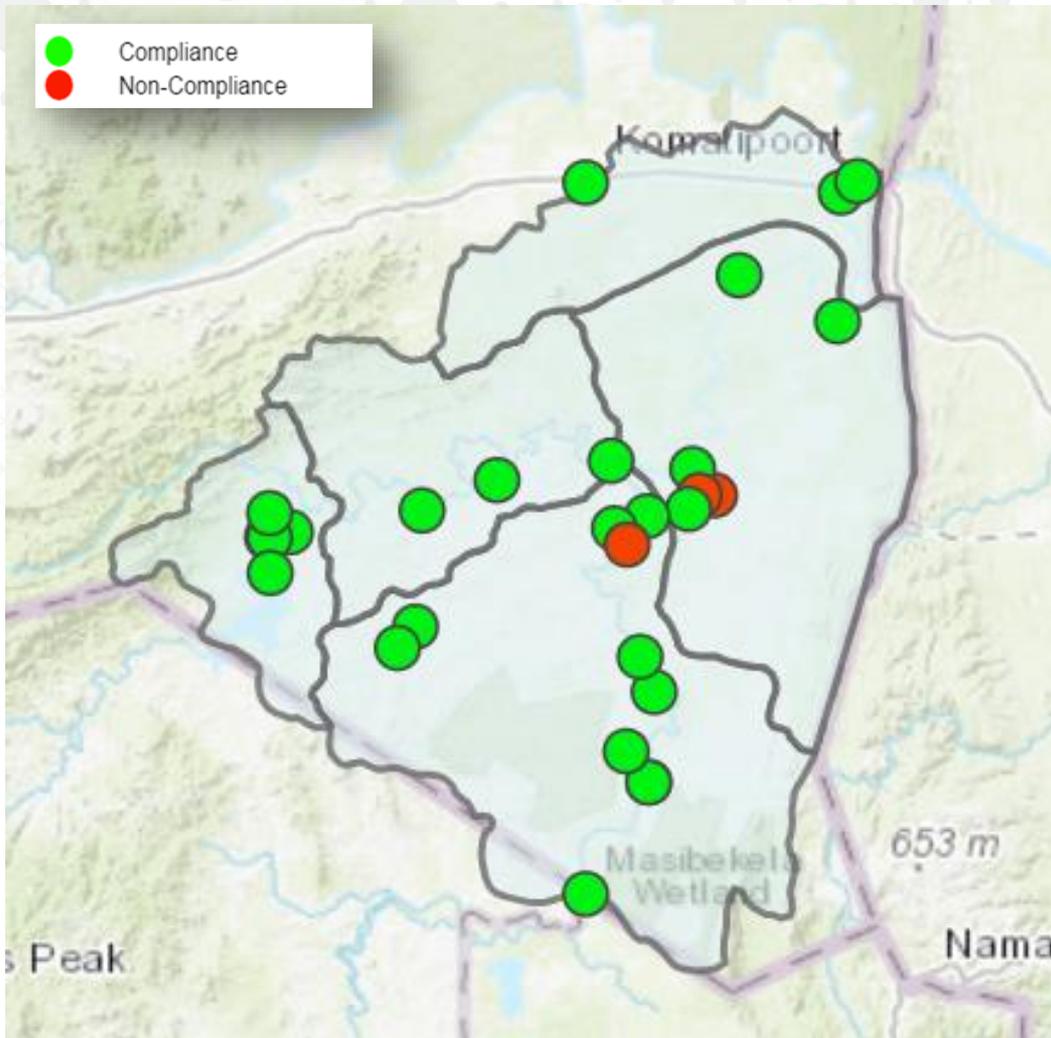


WATER QUALITY STATUS: ELECTRICAL CONDUCTIVITY



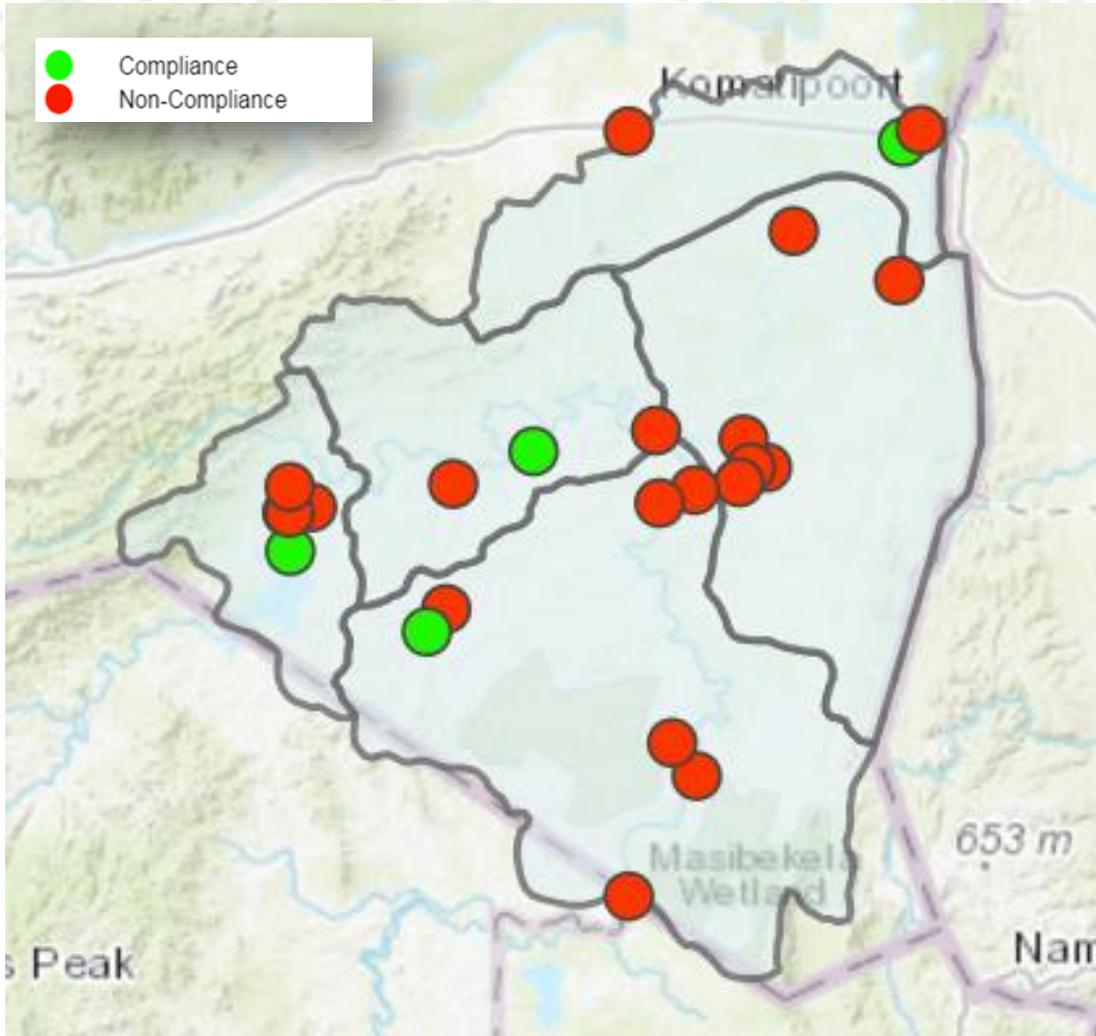
Electrical Conductivity complied with the RQOs except for Vlakbult Dam, Mtilane River(Boschfontein), Mahorwane Stream, Block B stream and Sikwaka River due to cane irrigation returns flow and settlement.

WATER QUALITY STATUS: PHOSPHATE



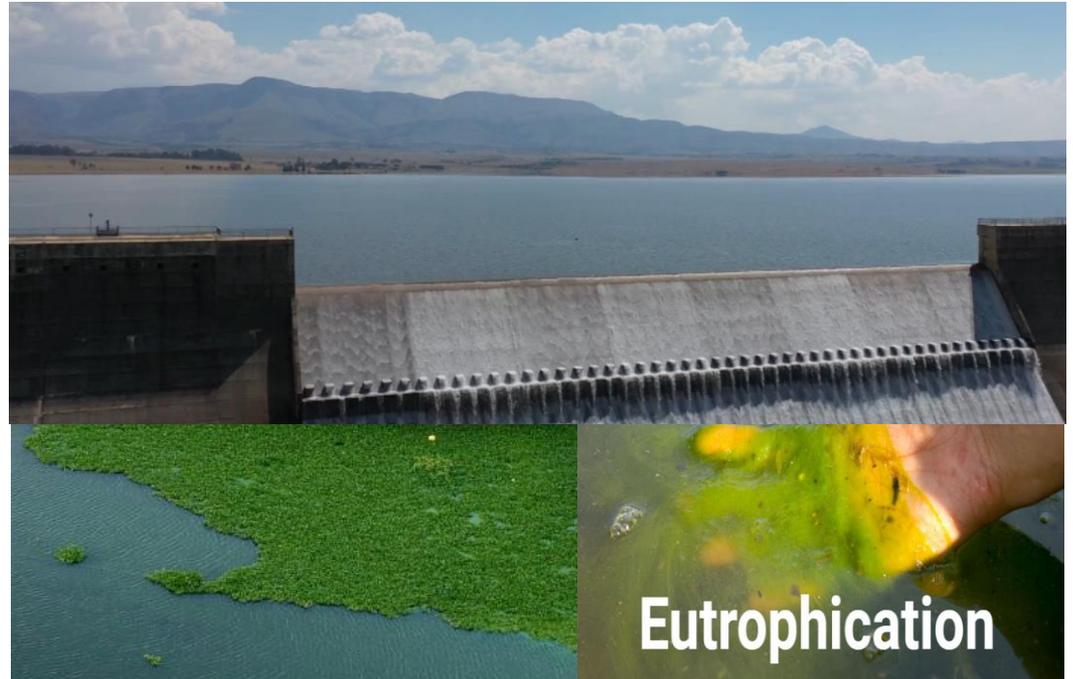
Phosphate most of the time complied with the set RQOs except for tributary of Komati River D/S of Tonga Hospital WWTWs and Mahorhwane stream as well as its tributary (Kamaqhekeza).

WATER QUALITY STATUS: E COLI



E. coli counts in the Lower Komati Sub-Catchment did not comply with the set RQOs for most of the monitoring sites, especially within residential areas. Whereas the Dams indicated compliance with the set RQO of 130 (cfu/100ml).

**EUTROPHICATION
STATUS OF THE
MAJOR DAMS
WITH THE WMA**



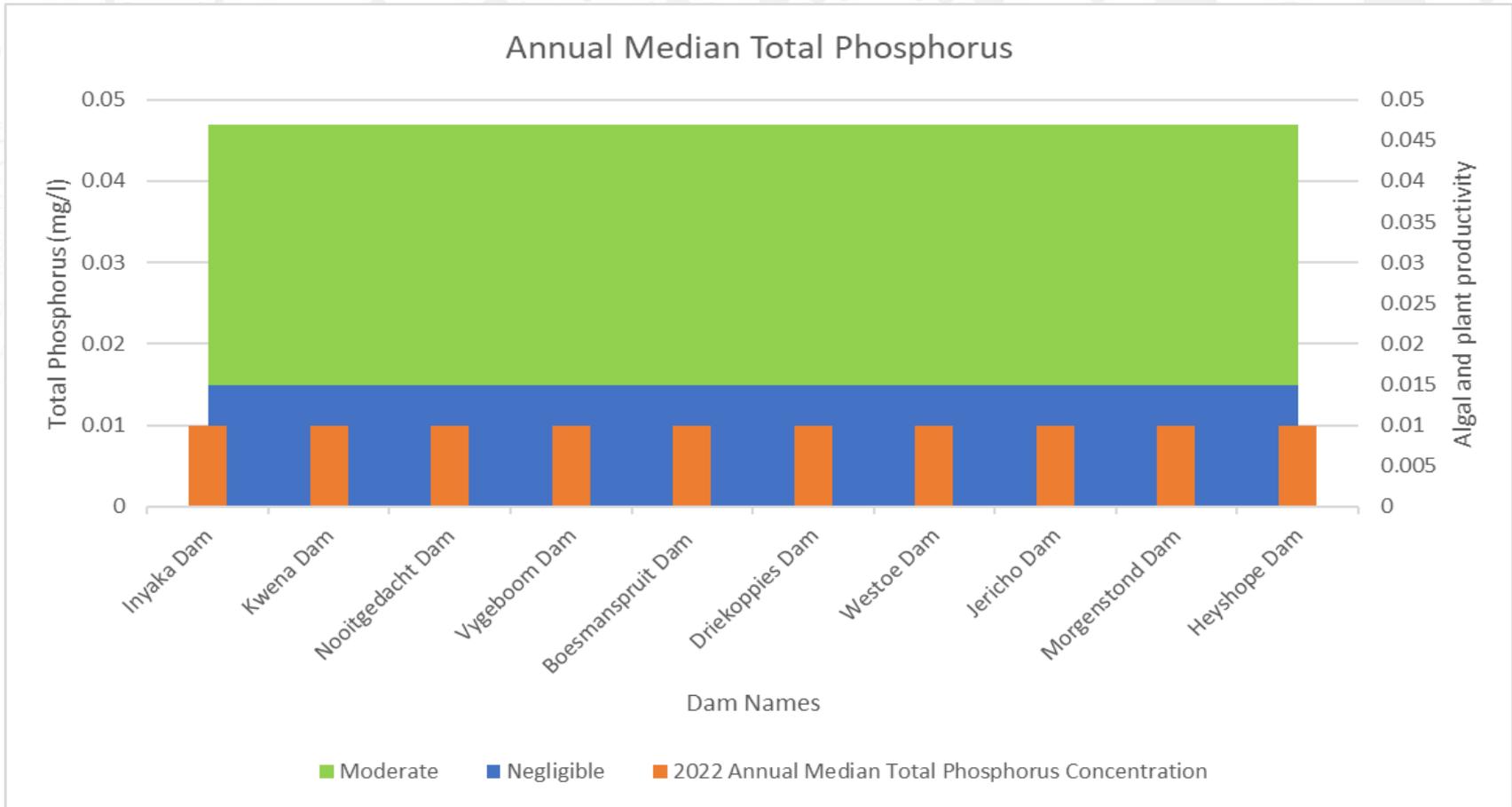
TROPHIC STATUS

- **Trophic Status** is the degree of nutrient enrichment and of the associated eutrophication problems of an aquatic ecosystem.
- Trophic status classes used for assessment of dams in South Africa.

1. Oligotrophic	low in nutrients and not productive in terms of aquatic and animal plant life;
2. Mesotrophic	intermediate levels of nutrients, fairly productive in terms of aquatic animal and plant life and showing emerging signs of water quality problems;
3. Eutrophic	rich in nutrients, very productive in terms of aquatic animal and plant life and showing increasing signs of water quality problems; and
4. Hypertrophic	Very high nutrient concentrations where plant growth is determined by physical factors. Water quality problems are serious and can be continuous.



EUTROPHICATION STATUS: TOTAL PHOSPHORUS



**ISSUES RAISED AT
CMF MEETINGS**

KEY ISSUES ON WATER RESOURCES MANAGEMENT FROM STAKEHOLDERS: 2022-2023- LOWER KOMATI

No.	Issue raised	Sub-catchment	Proposed Action	Progress and recommendations
	<p>Paying charges (billed) for Masibekela Dam yet considered not beneficial to farmers.</p> <p>The issue of invoices not being issued and no transparency on water use allocated to the farmers by the Irrigation boards were also raised</p>	Lower Komati CMF.	Proposed a strategic engagement at a higher level after the Minister approves the tariffs (Irrigation Board members, IUCMA's CEO, three members representing Malelane Mill Cane Committee (MMCC), three representing Komati Mill Area Committee (KMAC) and representatives for the land reform projects).	<p>The Revenue Division provided advice to the Lower Komati forum through their chairperson to write about their concern and address it to the CEO of the IUCMA.</p> <p>The IUCMA facilitated further engagements with the affected parties to provide clarity and further guidance on addressing the issues related to billing and tariffs.</p>
	Transformation of Irrigation Boards into Water User Associations (WUAs) seen to be moving at a very slow pace..	Lower Komati CMF.	The Department of Water and Sanitation and the IUCMA to fast track the establishment of Water User Associations	The IUCMA through the Institutions & Participation and Revenue divisions provided guidance to the process and had meetings with the affected parties to give updates on the Irrigation Boards Transformation process and to address the billing matters.
	The Anthracite Mine Bloc L Open Cast Area which was reported to be under assessment for water use authorization without a proper public participation being conducted.	Lower Komati CMF.	The matter was referred to the IUCMA Manager responsible for Water Use Authorization (WUA) for further investigation and advise.	<p>The investigation revealed that Public Participation process was conducted as per S41 (4) of the National Water Act (36 of 1998) (the Act), The water use licence was granted in March 2023.</p> <p>Stakeholders were advised that they have an option to lodge an appeal during 30 -days period after the issuance of the water use licence (WUL) to DWS Water Tribunal in terms of 148 (1)(f) of the Act.</p>

KEY ISSUES ON WATER RESOURCES MANAGEMENT FROM STAKEHOLDERS: 2022-2023-

LOWER KOMATI

No.	Issue raised	Sub-catchment	Proposed Action	Progress and recommendations
	Sibange weir was washed away by floods in the year 2000 remains a serious concern to the small scale sugar cane farmers.	Lower Komati CMF meeting	The IUCMA to coordinate a meeting between DARDLEA and the farmers to discuss the issue of reconstruction of Sibange weir	The matter has been brought to the attention of the Department through their Engineering Unit. A report from the Komati Mill Area Committee annual general meeting (AGM) indicated that there is an initiative by the RCL Foods to fund the project as assistance to the small scale growers.
	Ehlanzeni District Municipality (EDM) raised a concern about the development that was taking place at Tonga bridge.	Lower Komati CMF meeting	A joint inspection to be conducted by Ehlanzeni District Municipality and IUCMA to investigate if the new funeral service provider did not discharge at Tonga Bridge.	The first joint investigation was conducted by IUCMA and EDM, and the findings was that there is a septic tank constructed on the wetland area, the pipe of the final effluent was discharging direct to the wetland. The CME Division from the IUCMA issued a notice. This was followed by another joint investigation conducted by the IUCMA and EDM and it was discovered that the facility is no longer discharging any effluent to the water course but outsourcing services to collect and dispose their effluent offsite.
	Forestry SA Court Case impacting on the validation and verification of the forestry properties.	Crocodile CMF meeting	IUCMA to follow up on the developments regarding FSA Court Case.	The IUCMA has engaged the Department of Water and Sanitation and matter is still ongoing
	Assisting water users to access invoices and statements from IUCMA portal website.	Crocodile CMF meeting	The IUCMA through the Revenue Division to share the link, contact details, and a snapshot of the process of registration in the organization's website portal.	The Revenue Division is continually sharing the information on the website.

KEY ISSUES ON WATER RESOURCES MANAGEMENT FROM STAKEHOLDERS: 2022-2023- CROCODILE

No.	Issue raised	Sub-catchment	Proposed Action	Progress and recommendations
	A high impact application at Maggiesdal (Student accommodation) The Forum needed to understand the water issues on this development.	Crocodile CMF meeting	IUCMA (CME) to investigate the matter and report back to the forum	The IUCMA manager for the WUA Division investigated the matter and the findings were that there was no application lodged in the DWS EWULAAS. The feedback was given to the forum members.
	Issues raised by DARDLEA regarding Public Consultation on Climate Change Bill. Water sector is identified as a key and vulnerable sector.	Crocodile CMF meeting	IUCMA was urged to make comments on the Climate Change Bill. Closing date for comments was end of May 2023, and was urged to craft the Climate Change Adaptation Strategy in a way that all important issues are captured even the transboundary issues, water sector to add value to the document.	The matter is on going.
	A matter around the renewal of Water Use Licences.	Crocodile CMF meeting	It was agreed that this item should remain in the agenda of the next Forum of Forums meeting. IUCMA to bring on board a representative from DWS who can address certain functions that IUCMA is not mandated for. The forum was advised to write a detailed letter with their concerns to DWS through the IUCMA's CEO.	The WUA Manager from IUCMA tasked to facilitate the engagement of DWS. This is an ongoing matter as the IUCMA has written to the DWS and the matter is receiving attention.

KEY ISSUES ON WATER RESOURCES MANAGEMENT FROM STAKEHOLDERS: 2022-2023-

CROCODILE

No.	Issue raised	Sub-catchment	Proposed Action	Progress and recommendations
	Access to information: Requirement of the Act.	Crocodile CMF meeting	IUCMA to have a manual for the public to access information and that should be published on the IUCMA website	The IUCMA has engaged its IT unit to work on the issue. This is being addressed by the IT division as the ICT Strategy is currently under development
	Suidkaap gauging station was reported to be offline for two months in August 2022.	Crocodile CMF meeting	IUCMA to Fastrack the process of the contract renewal with the service provider	Contract renewed
	Application to abstract groundwater by City of Mbombela.	Crocodile CMF meeting	Reports indicate that ground water is over allocated, the CME Division was tasked to make a follow up on unlawful water use by the City of Mbombela especially on underground schemes.	The IUCMA is working on the matter and has embarked on the registration of all boreholes utilised for commercial purpose.
	Illegal Sand mining at the confluence of Crocodile and Malelane bridge.	Crocodile CMF meeting	CME to investigate and report back to the forum	The Mpumalanga Joint Operations Committee with the participation of the SAPS, DARDLEA, EDM, IUCMA and other entities was set up to look at the matter.



CONCLUSIONS AND RECOMMENDATIONS

Surface water:

- ❑ The surface water resources status is high in Crocodile and Lower Komati (all dams are full and above normal) and no formal planned restrictions on water use allocations
- ❑ Crocodile system is over-allocated, and experiences significant water shortages during dry years, with similar challenges in Lower Komati.

Groundwater:

- ❑ Groundwater development in the Crocodile and Lower Komati catchment should be controlled.



CONCLUSIONS AND RECOMMENDATIONS

Water Quality:

- ❑ Water Quality in the Crocodile and Lower Komati is generally good but punctuated by microbial (*E. coli*) pollution and salts (electrical conductivity) non-compliance at various sites due to WWTWs and its associated infrastructure, urban/rural settlement and irrigation (return flows).
- ❑ 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 NWA.

THANK YOU

