METEOROLOGICAL SERVICES DEPARTMENT NEWSLETTER

VOLUME 4 | ISSUE 1

29-07-2024

Weather: Where Science Meets The Sky

PRODUCTS AND SERVICES

10 Day Weather Forecast and Advisory

BUHERA DISTRICT: ISSUE DATE AND TIME	TUESDAY 23 JUL 2024 @1600HRS	
VALID	TUESDAY 23 JUL 2024 - THURSDAY 1 AUG 2024	
Period	**Weather Conditions**	**Local Language**
TUE 23 JULY - THU 1 AUG	• Mostly sunny, cold in the morning and evening with hot afternoon conditions.	• *Kunotarisirwa kuti kuchange kuine zuva kuchitonhora mangwanani nemanheru asi kuchipisa munguva dzemasikati.*
ADVISORY: English		**ADVISORY: Local Language**
• Farmers are advised to ensure livestock have access to shade, water, and ventilation. • Farmers are advised to feed livestock during cooler hours to reduce heat stress. • Farmers are advised to Increase water supply to crops during hot conditions. • Farmers are advised to monitor soil moisture levels to prevent moisture stress.		• *Varimi vanokurudzirwa kutarisa kuti zvipfuyo zvawana mvura nepekuzorora panotonhorera,uye kuva nezvirugwi zvinotenderera mhepo.* • *Varimi vanokurudzirwa kupa zvipfuyo zvavo chikafu munguva dzinotonhorera* • *Vari vanokurudzirwa kuwedzera mvura muzvirimwa zvavo munguva dzekupisa.* • *Varimi vanokurudzirwa kuramba vachitarisa hunyoro mumbesa dzavo.*

HWANGE DISTRICT: ISSUE DATE AND TIME	TUESDAY 23 JUL 2024 @1600HRS	
VALID	TUESDAY 23 JUL 2024 - THURSDAY 1 AUG 2024	
Period	**Weather Conditions**	**Local Language**
TUE 23 JULY - THU 1 AUG	• Cool conditions in the morning and warm conditions by afternoon under cloudless skies.	• *Kunobetonholela zhingwanangwana kutikojiya mukunda konshaji kukanyeza izhuba lose.*
ADVISORY: English		**ADVISORY: Local Language**
• Farmers are encouraged to conserve moisture in vegetable beds by applying mulch.		• *Balimi bamukutayijwa kufukila zulimwa zwabo namazhani alokoma kana buhwa bulokoma.*

BIKITA DISTRICT: ISSUE DATE AND TIME	TUE 23 JULY 2024 @1600HRS	
VALID	TUE 23 JULY 2024 - 1 AUGUST 2024	
Period	**Weather Conditions**	**Local Language**
TUE 23 JUL - THU 1 AUG	• Mostly sunny, cool in the morning and evening with warm afternoon conditions.	• *Kuchange kuine zuva, kuchitonhora mangwanani nemanheru kwozodziya ave masikati.*
ADVISORY: English Language		**ADVISORY: Local language**
• Farmers are encouraged to wear warm clothes both in the morning and evening. • Farmers should house calves, chicks and kids in warm areas • Grain crops should be protected from weevils and other grain pests. • Digging of pfumvudza holes should be in progress since conditions are favorable for the program.		• *Varimi pfekayi zvinodziya mumangwanani nemumanheru.* • *Varimi chengetedzai mhuru, nhiyo, mbudzana mukutonhora kunyanya mangwanani nemanheru oga-oga.* • *Zvirimwa zvakakohewa ngazvidzivirirwe muzvifukuto sezvo zvipfukuto zvowanda nokudziya kwoita kunze.* • *Kucherwa kwemakomba epfumvudza ngakuenderere mberi iyezvino kunze kuchuri kushandika.*

Weather Summary For The Period 15 July - 28 July 2024

21 JULY 2024

It was cold in the morning over much of the country with slight ground frost in areas around Henderson and Nyanga. It was however, warm in the afternoon under clear skies countrywide.

22 JULY 2024

It was cold in the morning today especially over Harare, Hwedza, Henderson and Nyanga where ground minimum temperatures were below 3 degrees Celsius, Nyanga was the coldest with a ground minimum of zero degrees Celsius. The afternoon was warm countrywide.

23 JULY 2024

Henderson, Mount Darwin, Marondera and Nyanga were very cold in the morning. Chipinge, Plumtree and Binga were in the mild category while the rest of the country started off cold. As the day progressed it became warm and sunny across the country.

24 JULY 2024

There were cold morning conditions in most parts of the country, with Henderson, Nyanga and Masvingo having slight ground frost. However, by afternoon it became warm and sunny across the whole country.

25 JULY 2024

Brief clouds and cool conditions were experienced over Masvingo and the southern parts of Manicaland provinces in the morning. The rest of the country was cold under cloudless skies except for areas in Matabeleland North such as Binga, Kariba and Gokwe which had cool conditions. By the afternoon all areas became warm and sunny.

26 JULY 2024

It was cold in the morning across the country except for areas along the Zambezi and Save valleys which were cool. Nyanga, Henderson, Gweru and Lupane recorded slight ground frost. Briefly morning cloudy conditions were observed in southern districts of Manicaland and Matabeleland South Provinces. It became warm in the afternoon countrywide.

27 JULY 2024

It was cold in most parts of the country except for areas in the in the Save and Zambezi valleys that were cool. Brief cloud conditions were observed over southern districts of Masvingo. Warm conditions prevailed in the afternoon across the country.

28 JULY 2024

Cold and clear sky morning conditions were experienced over most parts of the country. Slight ground frost occurred at Henderson, and Nyanga. It became warm in the afternoon.

OUTLOOK FOR MONDAY 29 JULY

Morning: The southern districts of Matabeleland South, Manicaland and Masvingo should be briefly cloudy. In the rest of the country, expect cold conditions. Slight ground frost is probable in areas around Nyanga and Henderson. IMPACTS & ACTIONS TO TAKE • Avoid prolonged exposure to direct sunlight especially during midday.

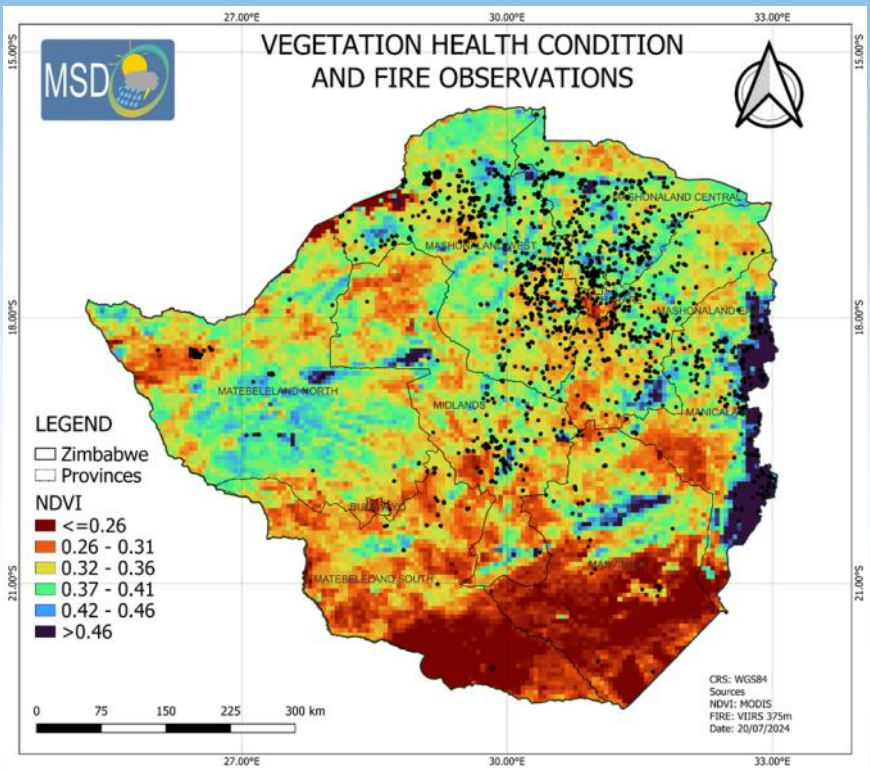
Afternoon: It should be sunny and warm.

Overnight: Cold and cloudless.

10 Day Agromet Bulletin: Summary of past Dekad 11 to 20 JULY 2024

Moderate ground frost was recorded in West Nicholson which had a ground minimum temperature of -04°C. Other places had slight ground frost with a ground temperature of -02°C being recorded over Henderson, Wedza, Chipinge, whereas Belvedere, Matopos and Nyanga had -01°C.

Vegetation condition, and fires observed in the past 10 days



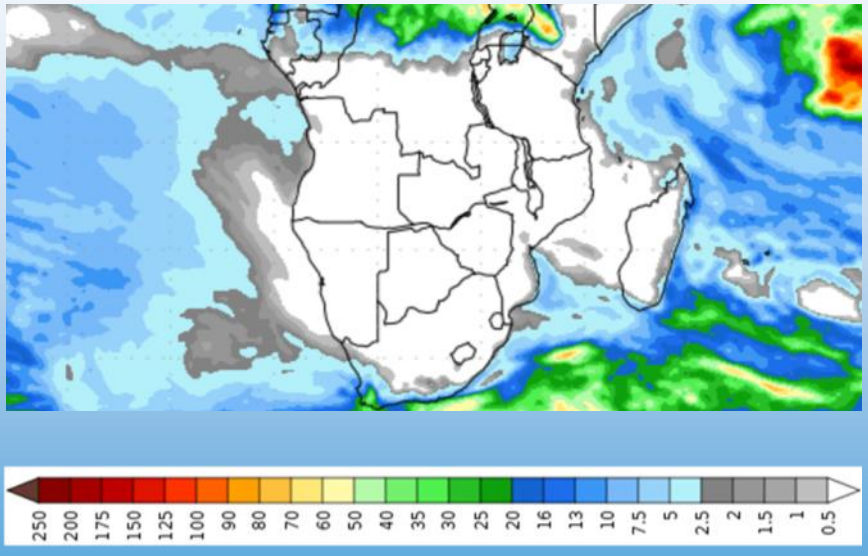
Vegetation health and fires observed all over Zimbabwe in the past 10 days (Disclaimer – some of the fires may have been of a controlled na-

The vegetation was slightly drier in the southern parts of Zimbabwe, while the rest of the country exhibited generally drier conditions indicated by the upper and lower limit of NDVI. The eastern parts of the country continue to have better vegetation condition probably due to some residual moisture.

The fire observations continue to exhibit the spatial distribution observed in the previous dekad. However, there were a total of 3237 spot fires observed, 1881 fewer than the 5118 in the previous dekad. On the map, low NDVI values represent poor vegetation health (dry vegetation), while higher values represent good vegetation health.

The greenish–yellowish shade represents a higher fire risk.

Weather Outlook For The Period 24/07/2024 to 01/08/2024



Accumulated precipitation for the period 24 July 2024 to 01 August 2024 (courtesy of National Center for Environmental Prediction) .

Agromet advisory

Anticipate a decrease in the general risk of ground frost occurrence for most regions in the country as the season transitions to summer. Risk of slight ground frost should be confined to Nyanga. However, it's important to note that the degree of the reduction in frost risk can vary considerably based on geographic location, local climate patterns, and other factors. Some regions may still experience occasional late-winter or early-summer frost events, especially in more elevated areas such as Nyanga. Stay informed with the MSD's daily weather updates, advisories and warnings. Farmers should consult their local Agritex officers for relevant advice on farming practice.

MSD and CAAZ Providing a Safe and Reliable Air Service To Stakeholders

Moven Manjowe - Training School Officer, MSD

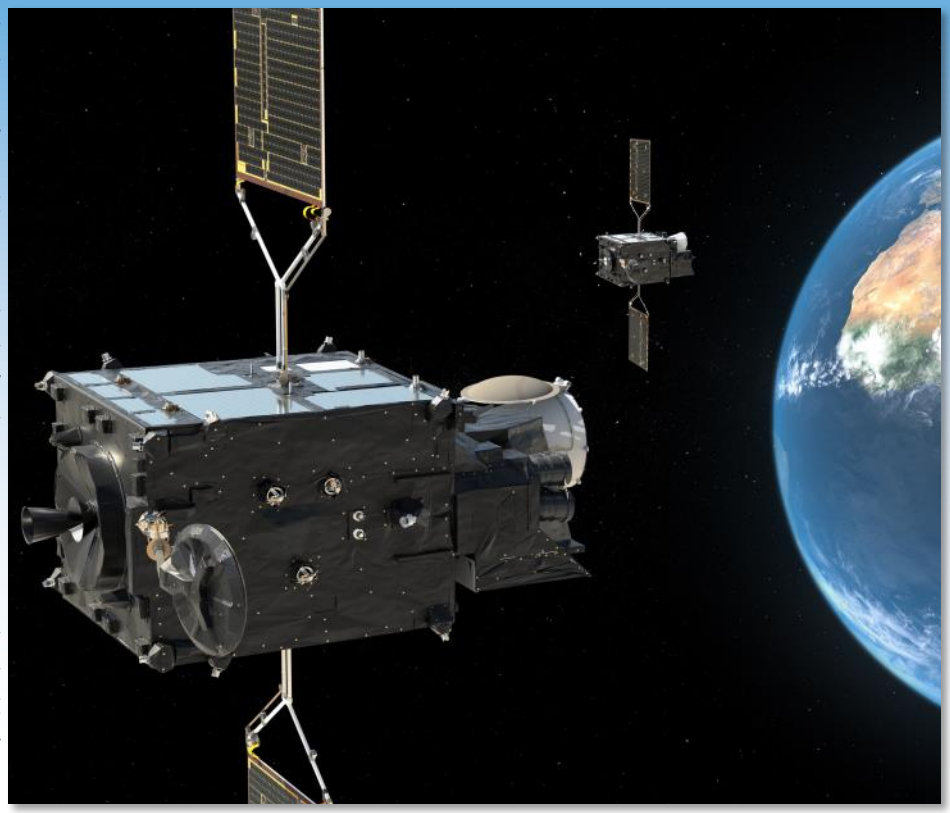
On the 17th of July a meting between MSD section heads including the DD for Aviation services, Ms. Vimbai Mamombe was held at the CAAZ offices at RGMIA . The represented sections included training Services, engineering, QMS and human resources sections. The agenda of the meeting was to align the operations of the service provider being the MSD to CAAZ expectations in line with the requirements of the Statutory Instrument 46 of 2019 termed Civil Aviation (Aeronautical Meteorology Services) Regulations of 2019. This S.I. gives legal status to the ICAO Annex 3 guidelines which guide the provision of Meteorological Services to the airline industry. The meeting touched on 7 agenda items the first one being the need for a robust communication system between the service provider (MSD) and Regulatory (CAAZ) to optimize service provision and iron out any outstanding issues which might hinder the provision of an efficient service by MSD. Next to be discussed was the need for MSD to be certified by CAAZ in line with the requirements of the S.I. 46.

The MSD agreed to pursue this requirement in order to fulfil government requirements. Also next to be discussed was the need for the MSD Training school to be certified by CAAZ as well. This ensures that the teaching materials adequately cover the expectations of the regulator for any MSD employee willing to work in the aviation industry. Critical provisions will be the carrying out of audits and inspection visits of MSD infrastructure and resources involved in the provision of met information to the aviation sector. It was strongly emphasized that Met employees at all airports must be further trained beyond the BIP Met and BIP M programs. Refresher courses and advanced training are part of the requirements if MSD is to get certification as a registered service provider.

Further issues to be discussed were QMS related with strong emphasis being on the need to timeously renew certifications as well as scheduled quality related issues as well as corrective actions raised by CAAZ. Competency assessments expiry and other related issues we also highlighted in the meeting. Aviation safety, and records management were also discussed in the meeting. One of the strong positives which came out of the meeting was the need for regular discussions with CAAZ so as to allow effective communication between CAAZ and MSD. The overall underlying aim of the whole interactions is the provision of a safe and efficient service to CAAZ and therefore promote the use of Zimbabwean airports and skies by users which can help boost tourism and investment in the country.

Harnessing Satellites In Meteorology

Praise Govere - GIS intern, MSD



Satellite in geostationary orbit | Source - Andrea Bettini on X

In the dynamic field of meteorology, satellites are indispensable tools, revolutionizing the way weather forecasts are generated and climate patterns monitored. These orbiting marvels operate on the principle of remote sensing, serving as vigilant sentinels high above the Earth's surface. Equipped with advanced sensors and cameras, satellites continuously capture an array of vital atmospheric and environmental data. They observe cloud formations, monitor precipitation levels, track wind patterns, and measure atmospheric pressure all in real -time.

This wealth of information forms the backbone of accurate weather predictions and enables meteorologists to issue timely warnings for impending storms, droughts, or other weather-related hazards. Moreover, satellites play a pivotal role in climate monitoring, providing invaluable insights into long-term climate trends and variations. By analyzing historical satellite data, meteorologists can discern shifts in temperature patterns, precipitation cycles, and sea levels, thereby contributing crucial data to inform climate change adaptation strategies and policy decisions. During natural disasters, such as floods or cyclones, satellites swiftly become indispensable assets in disaster management efforts. They facilitate rapid assessment of affected regions, aiding authorities in coordinating rescue operations and assessing damages. This capability not only enhances emergency response but also supports long-term planning for disaster resilience.

In tandem with remote sensing technologies, Geographic Information Systems (GIS) further augment the capabilities of satellite data. GIS integrates spatial information with satellite-derived data to create detailed maps and models of meteorological phenomena. These models allow meteorologists to conduct spatial analyses, identifying vulnerable areas to weather hazards and guiding proactive mitigation efforts. Furthermore, GIS enhances the accuracy of weather forecasting models by integrating satellite observations with ground-based meteorological data. This integration provides meteorologists with a comprehensive understanding of weather dynamics, essential for sectors such as agriculture, transportation, and urban planning. Looking forward, the future of satellite technology in Zimbabwean meteorology holds promise for further advancements.

Emerging satellite constellations and sensors offer potential improvements in spatial and temporal resolution, enabling even more precise monitoring of weather patterns and climate change impacts. For Zimbabwe's Meteorological Service Department, investment in satellite-based technologies and GIS capabilities is essential. By harnessing these technologies effectively, meteorologists can strengthen early warning systems, bolster resilience to climate-related risks, and ultimately safeguard lives and livelihoods nationwide. In conclusion, satellites represent not only a technological advancement but also a critical asset in the pursuit of accurate weather forecasting and climate resilience in Zimbabwe. By leveraging the capabilities of remote sensing and GIS, Zimbabwe's meteorological efforts are poised to thrive, ensuring a safer and more prepared future amidst the challenges of a changing climate.

Piles of Grotesque Rhodesian Era Tech and Tattered Furniture Invade MSD

Tinetariro Chikati - GIS Analyst

As the Meteorological Services Department intensifies its effort towards cultivating a cleaner environment in preparation for the SADC Summit, a lot of waste has piled up. Going through our premises reviewed more waste than we had imagined. Most of the waste now lies at a central place waiting for collection. With only a few days left before the 44th SADC Heads of State Summit, there is a need to expedite the collection of this waste as it now presents another very grotesque eye-sour, compared to when the waste was distributed around the compound.

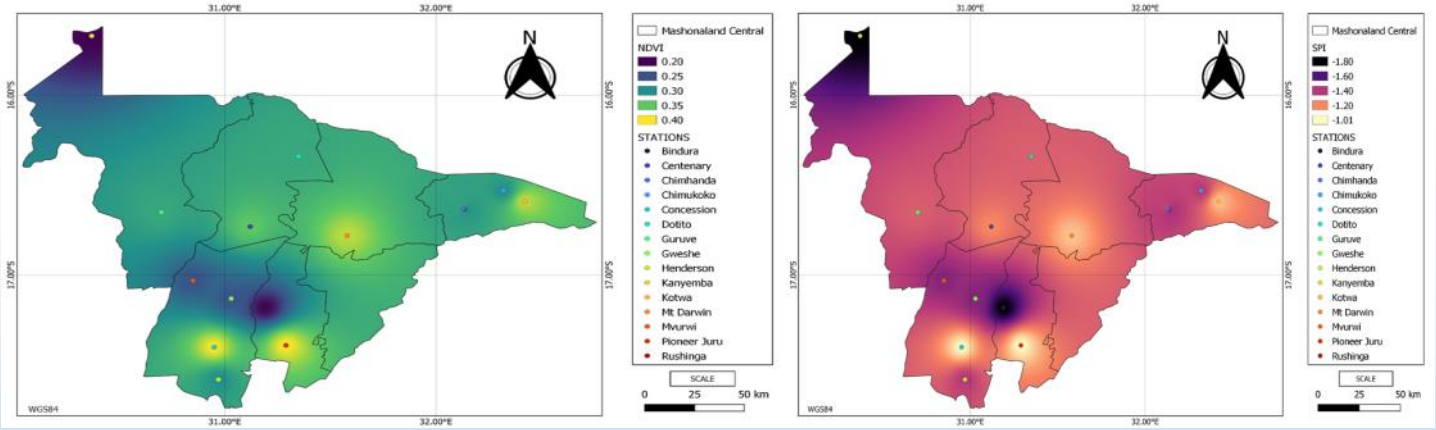
Complicating the disposal of the waste is the presence of pre-independence, Rhodesian-era electronic waste. Making up the waste are old monitors, tower computers, server racks, uninterruptible power supplies (UPS), keyboards, mice, air conditioners, and many other electronics we can no longer recognize today. In addition to the electronics are tables, desks, chairs, and old bed frames which are all predominantly metallic. This has been undercutting the Department's efforts towards gentrification. If the electronic waste is improperly disposed of, it can pose a risk to the environment which will be a conflict of interest since the Meteorological Services Department is all about the environment.

E-waste contains a mix of valuable materials and potentially harmful substances such as mercury, lead, and beryllium, which were mostly used in older electronics due to the limitations of technology at that time. Batteries in the old UPSs can explode at any time, which poses a risk to MSD employees. It is now The Meteorological Services Department's hope that Government processes are expedited so that the garbage is collected in time for our visitors to be presented with an immaculate environment.

Understanding the Spatiotemporal Patterns of Drought in Mashonaland Central

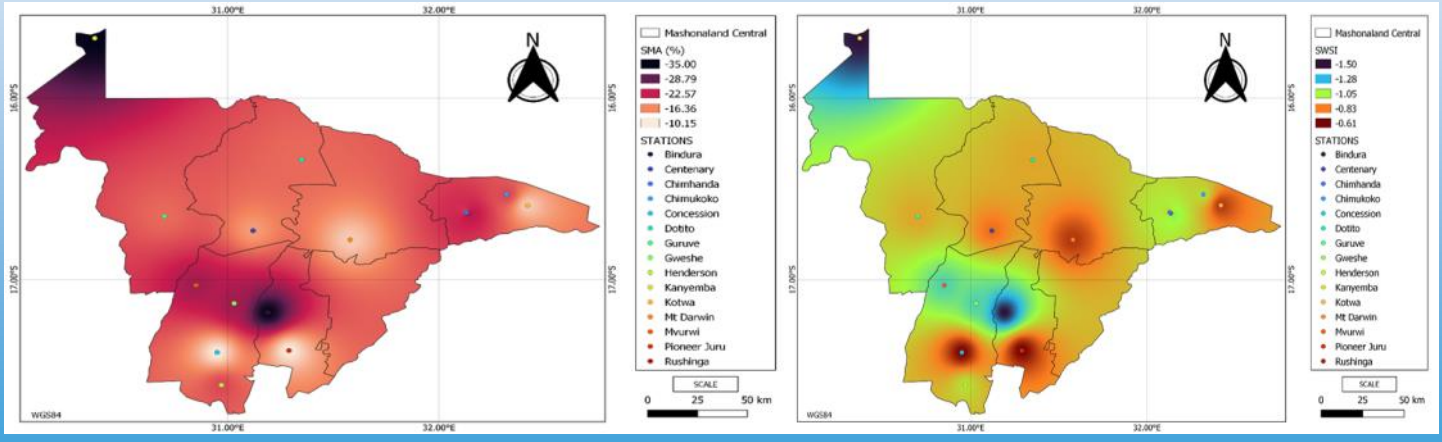
Blessed Sibanda - Meteorologist

Droughts are natural recurring hazards that can have significant socio-economic and environmental impacts. In Mashonaland Central, Zimbabwe, understanding the features and patterns of drought at various spatiotemporal scales is essential for effective drought management and mitigation strategies. A study was done to examine the spatiotemporal patterns of drought in Mashonaland Central, a region in Zimbabwe. By exploring drought characteristics at smaller scales, such as sub-regional or district levels, I was able to capture more localized patterns and identify areas that may experience distinct drought features. The study utilized a combination of remote sensing data, meteorological records, and statistical analysis methods to evaluate the intensity, duration, and frequency of droughts in the region. The Standardized Precipitation Index (SPI), Standardized Precipitation Evapotranspiration Index (SPEI), Normalized Difference in Vegetation Index (NDVI), Surface Water Storage Index (SWSI), and Soil Moisture Anomaly (SMA) were used to quantify drought conditions. The findings of the study revealed historical trends of drought in Mashonaland Central during the study period. I identified the frequency of moderate to extreme drought occurrences and their geographic range, providing valuable information about the most susceptible regions. The results showed that the Kanyemba and Bindura districts experienced extreme droughts, while the Pioneer Juru and Concession districts were the least likely to experience drought. These insights can help policymakers and stakeholders develop focused mitigation initiatives, such as agricultural planning, early warning systems, and water resource management plans, to reduce the negative impacts of drought in the region. By exploring the spatiotemporal patterns of drought at various scales, the study provides a comprehensive understanding of the drought characteristics in Mashonaland Central. The findings can inform the development of effective drought management strategies and contribute to the resilience of communities in the face of these natural hazards.



NDVI

SPI



SWSI

SMA

Flashback: September 2023 Seismic Activity Bulletin Summary

Ms Muponda, Mr Chibi and Mrs Mavazhe - Seismology Section, MSD

During the month of September 2023, a total of 53 events were recorded and analyzed, with 7 local, 41 regional events and 5 teleseismic (distant) event. Most regional events are from South Africa, Botswana, and Mozambique. All the local earthquakes are within the Zambezi basin and Deka fault. The biggest local earthquake was of magnitude 3.9 and the epicenter is in Binga. It occurred on the 20th of September 2023 at 0820hrs UTC and the coordinates are -17.233 27.969. The Binga area is part of the Zambezi Basin which is influenced by the Kariba Dam (reservoir induced seismicity) and the Deka fault (plate tectonics) which is also a seismically active part of Zimbabwe This area extends from the northern tip of the country, in a south-westerly direction through Lake Kariba, Devil's Gorge, the Deka Fault, to the westerly edge of the country. This region is the most active seismic region in Zimbabwe. Five events had epicenters in Mozambique. The eastern part of Zimbabwe is within the line of weakness of the East African Rift System. The Eastern Border area shows high earthquake activity. This area is the southern part of the Great East Africa rift system that is the dormant tectonic feature on the African continent. This system controls seismic activity in eastern and southern Africa and is considered by many to be the best example of continental rifting. Major seismic activity takes place on the eastern (Mozambique) side. Most of the earthquakes in South Africa and Botswana are mining induced events.

NO' OF EVENTS	DATE	TIME (UTC)	LOCATION OF EVENTS	LOCATION	MAGNITUDE
1	03/09/23	1550hrs	Hwange	-19.392 26.166	3.2
2	04/09/23	0419hrs	Kariba	-17.968 26.493	3.7
3	09/09/23	1522hrs	Hwange	-18.588 26.393	3.3
4	11/09/23	1442hrs	Hwange	-18.480 26.504	3.4
5	12/09/23	1554hrs	Hwange	-18.562 26.465	3.2
6	19/09/23	2309hrs	Kariba	-16.477 28.891	3.3
7	20/09/23	0820hrs	Binga	-17.233 27.969	3.9

The red dots indicate the epicentres of events recorded in September 2023

Current Network status for Zimbabwe

MATP and BLWY are working well. BLWY is not online and MATP only works when there's electricity because the battery is now dead. We no longer have KRI and CHIP stations therefore could not analyze a number of local events.

METEOROLOGICAL SERVICES DEPARTMENT

'Where Science Meets The Sky'

Vision

A world class provider of meteorological, climatological and seismological products and services by 2025.

Mission Statement

To provide customer and stakeholder driven quality seismological, weather and climate services for socio economic development.

Core Values

Team work: We value unity of purpose.

Equality: We offer equal status, rights and opportunities to all.

Customer focus: We prioritize and address customer needs.

Transparency: We are open to scrutiny.

Integrity: We have strong moral principles.

Creativity: We focus on innovation and continuous improvement.

Accountability: We take responsibility for one's own actions.