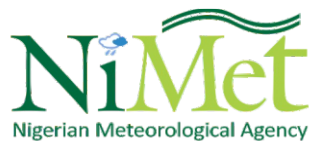


MARINE METEOROLOGICAL BULLETIN

A PUBLICATION OF THE NIGERIAN METEOROLOGICAL AGENCY

2ND QUARTER 2024





Marine Meteorological Bulletin

2nd Quarter 2024

A publication of Nigerian Meteorological Agency

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Our Mandate

Our core mandate is to observe, collate and analyze meteorological data to provide timely and accurate reporting of weather and climate information for socio-economic development and safety of lives and properties.

Our Vision

To be a World Class provider of Weather and Climate services for safety and sustainable national socio-economic development.

Our Mission

To observe Nigerian Weather and Climate and provide Meteorological, Hydrological, and Oceanographic Services in support of National needs and International Obligations

Who We Serve

Aviation, Agriculture, Building and Construction, Commerce, Health, Hydrology, Marine, Oil and Gas, Sports, Social Events, Power and Energy, Telecommunication and more...

Application of Marine Meteorological Information to relevant Sectors of the Economy

NiMet's Marinemet Bulletin provides useful information for operators and policymakers in the marine, maritime as well as oil and gas sectors of the Nigerian economy. Marine meteorology is geared toward the understanding and production of weather information in support of marine and coastal activities, including shipping, fishing, tourism, offshore oil drilling and mining operations, oil spill control, offshore wind and tidal energy harvesting, search and rescue at sea, and naval operations. Extreme values of temperature, wind speed, waves, and obstructions to visibility are hazards to infrastructure and personnel. This bulletin therefore serves as a risk-informed decision-support system to ensure improved productivity, safety of navigation, and protection of life and property at sea and along the coastlines of Nigeria.

1. Shipping: The Marinemet Bulletin provides necessary guidance to the shipping industry. Weather conditions such as high temperature and high humidity affect the quality of cargo shipped by sea-going vessels to distant destinations causing them to deteriorate. Also expected time of arrival of a vessel to a destination can be affected by weather conditions leading to delays which usually cause huge economic losses. The shipping industry can assist and also benefit from the JCOMM Voluntary Observing Ship (VOS) scheme. The VOS scheme is an International program by which ships plying the various oceans and seas of the world are recruited and trained to take records and transmit weather observations whilst at sea. These observations provide the basis for warnings and weather forecasts of benefit to shipping and other maritime activities and are also used in the

compilation of climatological atlases.

2. Fisheries Management: Several environmental factors affect fish and must be considered in the management and long-term planning of fishing operations. Factors such as behaviour, distribution, migration, and aggregation of fish yield and catch. Information on sea surface temperature is of utmost importance to the fishing industry as they are the major determinant of upwelling regions. Also, wind and wave information as well as ambient temperature data are necessary in the operational aspect of fisheries.

3. Coastal Community activities: Coastal areas are often heavily populated, with people being attracted by trade, industry, fisheries, recreation, and, in some countries, retirement to a place near the sea. These communities need protection from the hazards of the sea and its storms. Extreme values can affect the efficiency, effectiveness, or comfort of marine operators. For instance, warm temperatures accompanied by high humidity in the marine environment can produce considerable discomfort.

4. Oil Drilling and Exploration: The requirements for information and forecasts for the platform or drilling rig site may include wind direction and speed at 10 metres and the height of the helicopter deck, significant weather phenomena, visibility, air temperature, sea-surface temperature, and sea state. Given the complex nature of manoeuvring vessels in the open ocean and the high cost of dealing with an incident that can be avoided when accurate weather information is in hand, it makes sense

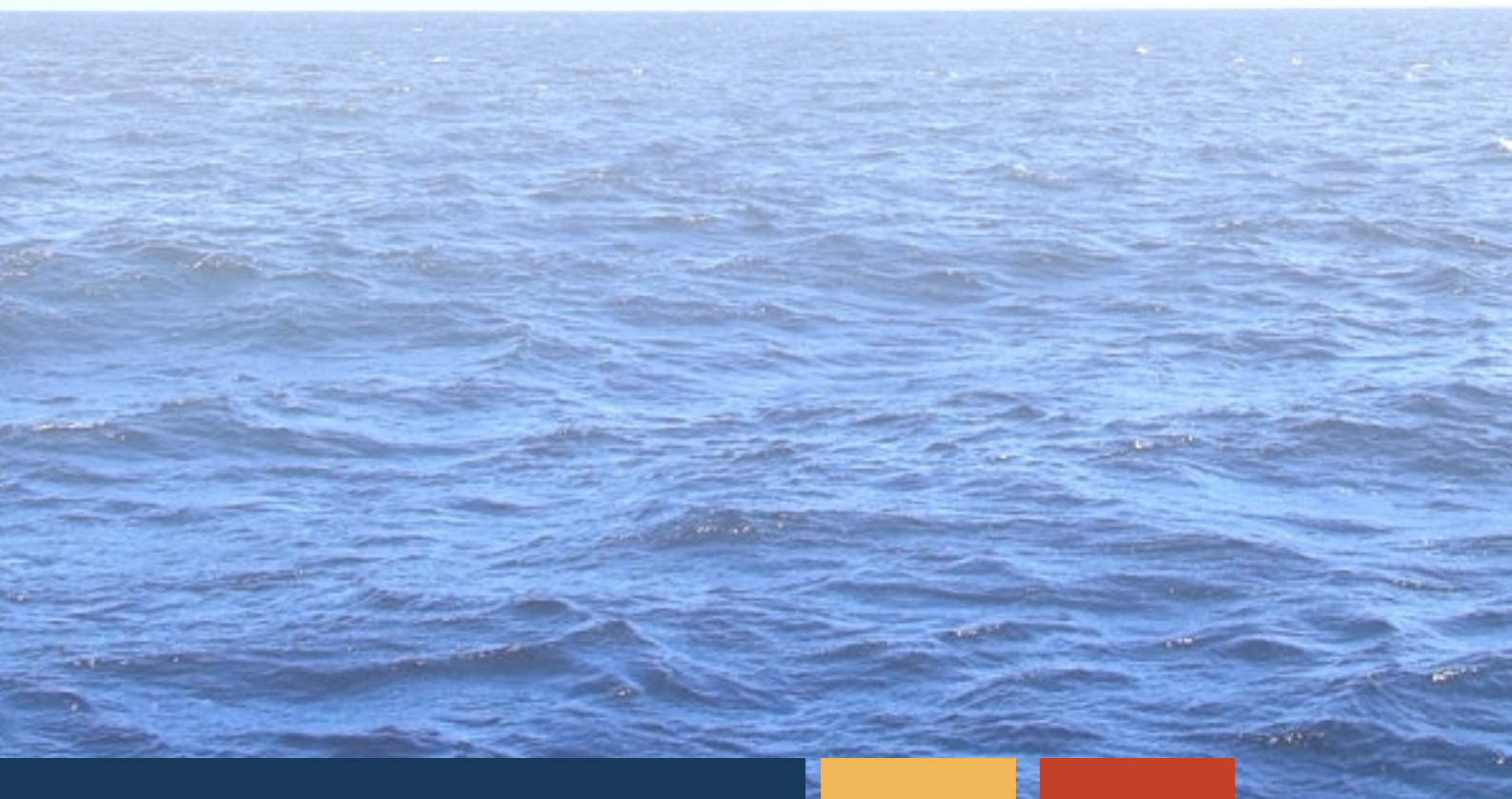
that offshore oil and gas operation concerns would utilize weather forecast services.

5. Recreational boating: Weather dependent small craft are usually used for recreational boating. Crews of such small craft are often inexperienced and frequently ignore the weather. Warnings need to be issued of strong winds, and advanced notice of sudden increases in wind gusts, particularly squalls from thunderstorms or fronts.

6. Marine pollution control: Agencies involved in marine pollution control may require information on existing and predicted wind, waves, and tidal or wind-generated currents to allow the prediction of the spread, movement, and concentration of the pollutant

7. Ports operations: The knowledge of expected winds, sea, and visibility helps in the planning of the movement of ships into, out of, or within the harbour. Weather conditions affect docking operations.

8. Maritime Search and Rescue operations: As small craft will drift with sea and tidal currents, an indication of drift is important in search and rescue operations along with forecasts of winds, waves and visibility. Sea-surface temperature may also be required, as small craft may capsize and this element is an important factor in determining survival time in the water.





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PREFACE



This Bulletin is a publication of the Nigerian Meteorological Agency (NiMet) produced for the purpose of providing marine meteorological information to the marine and blue economy sectors such as fishing and aquaculture, maritime, coastal tourism, shipping, offshore oil drilling, hydropower generation, water resources management, environment, construction, research institutes, universities and other end users.

The MarineMet Division of NiMet routinely monitors the Maximum Temperature, Minimum Temperature, Rainfall amount, Sea Surface Temperature (SST), Mean Sea Level Pressure, Wind Speed and Direction and Inter-tropical Discontinuity (ITD) in all the NiMet marinemet stations to produce accurate and timely

weather information in support of marine and coastal activities, including shipping, fishing, tourism, offshore oil drilling and mining operations, oil spill control, offshore wind and tidal energy harvesting, search and rescue at sea and naval operations.

In fulfilment of the NiMet's mandate, the Agency produces the **Quarterly Marine Meteorological Bulletin**. This edition reviews the weather in the months of April, May and June 2023 and present discussions on the general synoptic situation, temperature, rainfall, and sea surface temperature trends and position of Inter-tropical Discontinuity during the quarter.

It is our expectation that the information contained in this bulletin would optimally guide the management of blue economy, marine resources, fisheries and shipping sectors of the economy. We believe that this bulletin forms a very useful tool in the hands of our teeming stakeholders. While we assure the public of our resolve and readiness to continually upgrade this product, feedbacks from our stakeholders in the form of comments, suggestions and constructive criticisms would be highly appreciated.

Professor Charles Anosike

Director General/CEO NiMet &
Permanent Representative of Nigeria
with WMO

Introduction

Nigeria's coastal zone lies within Latitudes 4° 10' to 6° 2' N and Longitudes 2° 45' to 8° 35' along the Gulf of Guinea, spanning about 853km of low-lying coastline. The area is bordered by a narrow continental shelf off the Gulf of Guinea; shelf widths range from 15km in the west to about 67km in the Niger Delta and about 87km off the Cross-River estuary in the East. The Nigerian Coastal Zone comprises of Lagos, Ondo, Delta, Rivers, Bayelsa, Akwa Ibom, and Cross River states and parts of Edo state accounting for about 25% of the estimated population of the country. The coastal region has a high level of economic activity due to its ports, harbour, and industries.

The Nigerian Meteorological Agency (NiMet) was established in 2003 by an Act of the National Assembly and saddled with the responsibility of providing timely and accurate weather forecast for all sectors of the economy, including the marine blue economy sector. The Agency is willing to collaborate with more relevant organizations and institutions, which will eventually speed up the expansion of the maritime sector and oceanography.

The task of analyzing the observed weather pattern and changes to inform the general

public, marine users including ships and coastal dwellers is therefore given priority attention by the Agency. Regular daily weather forecasts are always made for the coastal territories based on 24hrs or 48hrs as the case may be for the safety of lives and properties. NiMet is determined to meet this expectation by putting in place adequate marine meteorological stations with state-of-the-art instruments and equipment in the MarineMet division.

At present the MarineMet division is made up of five operational coastal stations at; East-mole, Nigerian Institute for Oceanography and Marine Research (NIOMR) both in Lagos State, Eket in Akwa Ibom State, Calabar Marine in Cross-River State and Koko in Delta State.

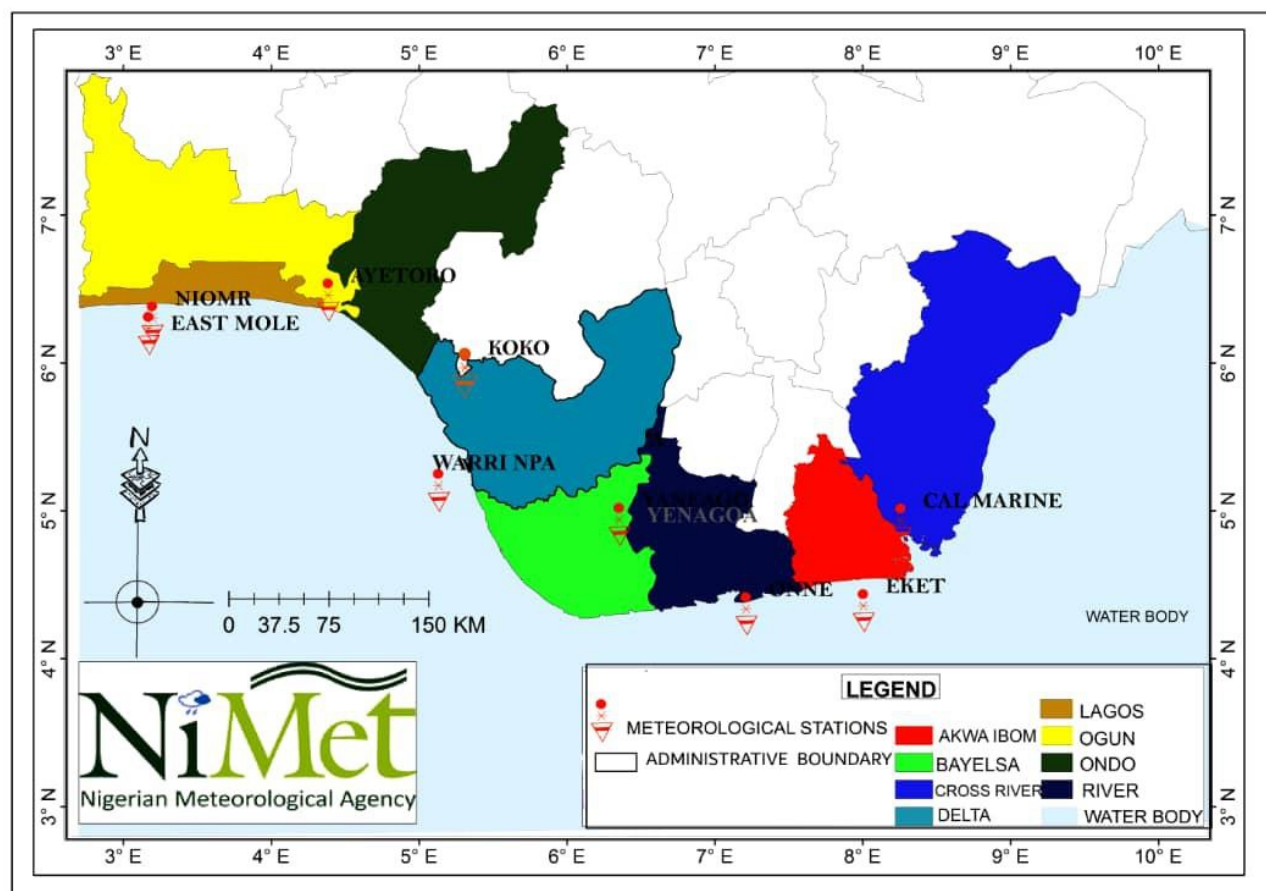


Figure 1 : Nigerian coastal region showing the locations of marine meteorological stations

SUMMARY OF FIRST QUARTER 2024 COASTAL WEATHER

In the first quarter of 2024 (January to March 2024), the weather in the Nigerian coastal region was characterized by significant changes as it transitioned from the dry season to the rainy season. The transition impacted

maritime activities as sea conditions became more unstable with rainfall activities across the coastal region.

Second Quarter 2024 Coastal Weather Review

Maximum temperature, minimum temperature, and SST increased in each month of the quarter. The consistent influx of moisture-laden winds from the Atlantic Ocean contributed to rainfall activities. These conditions had implications on maritime navigation, fisheries, and recreational activities

Review of April 2024 Weather in the Coastal Zone of Nigeria

In April 2024, the weather along Nigeria's coastlines was characterized by sunny days and occasional showers. While the overall trend was towards warmer temperatures, there were also some brief periods of cooler weather.

Key Weather Patterns:

- **Sunny Intervals:** Several days in April were characterized by sunny spells, especially during the mid-morning and afternoon hours.
- **Afternoon Showers:** Occasional brief showers were common, particularly in the late afternoon or early evening. These

showers often came with thunder and lightning.

- **Temperature Fluctuations:** While temperatures generally increased throughout the month, there were occasional dips in temperature, especially during the cooler mornings or after rainfall.
- **Humidity:** High humidity levels persisted throughout the month, contributing to the overall warm and humid conditions.

April 2024 was a distinctive month for Nigeria's coastal regions, with a balance of sunshine and occasional rainfall.

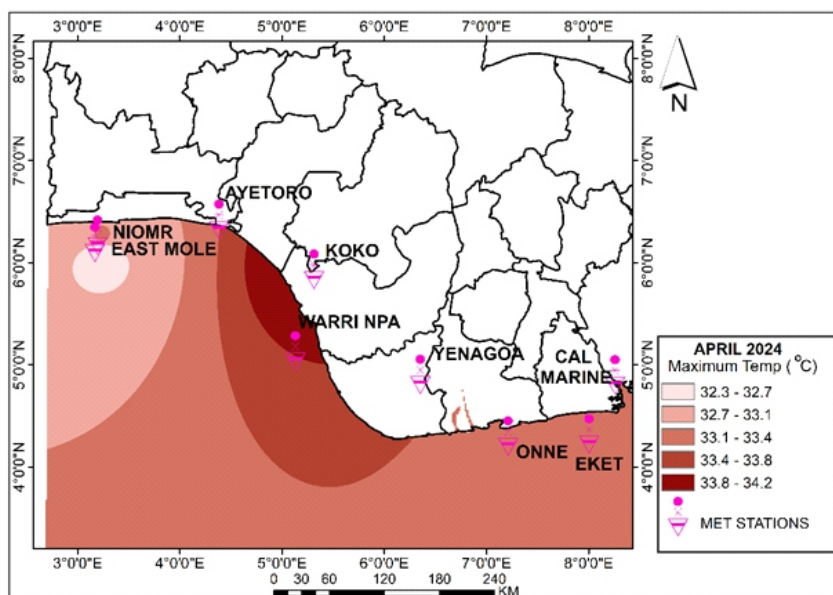


Figure 2: Observed maximum temperature in the Nigerian coastal region in April 2024

2.1.2 (a) April 2024 Maximum (Daytime)

Temperature: Mean maximum temperatures (day-time temperature) observed over the coastal region show that Eastmole and Koko coastal stations recorded the lowest and

highest values of 32.3°C and 34.3°C, while NIOMR, Eket, and Calabar marine weather stations reported mean maximum temperatures of 33.2°C, 33.1°C and 33.7°C respectively.

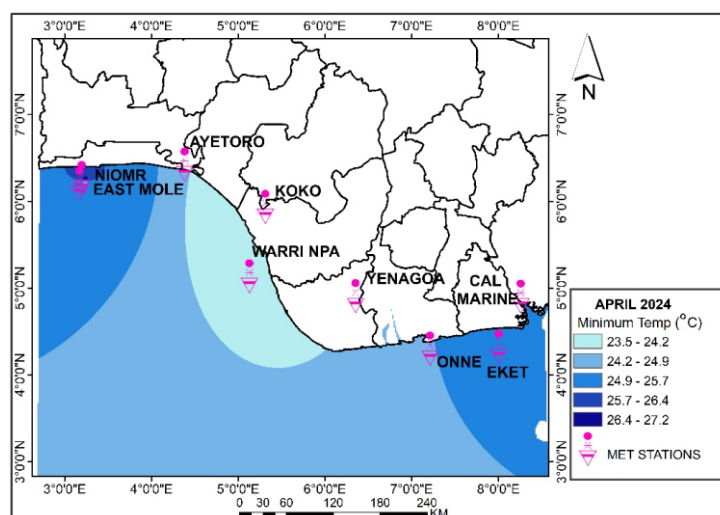


Figure 3: Observed minimum temperature in the Nigerian coastal region in April 2024

2.1.2 (b) April 2024 Minimum (Nighttime)

Temperature: Mean minimum temperature (night-time temperature) lowest and highest values of 23.5°C and 27.2°C were observed at

Koko and NIOMR stations, while Eastmole, Eket and Calabar stations recorded 24.1°C, 25.9°C and 24.9°C, respectively.

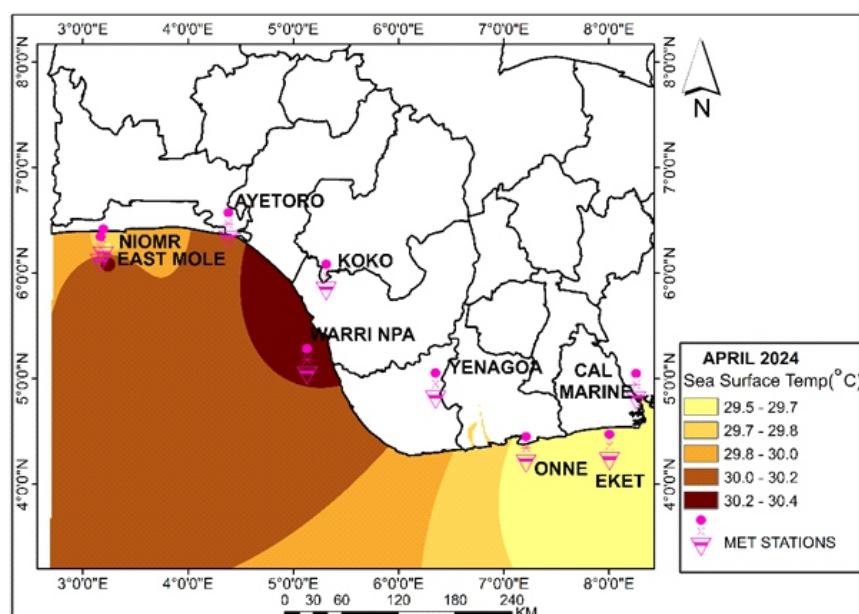


Figure 4: Observed Sea Surface Temperature (SST) in the Nigerian coastal region in April 2024

2.1.2 (c) April Sea Surface Temperature (SST): Sea Surface Temperatures (SST) of 29.5°C and 30.4°C observed at Eket and Koko stations were the lowest and highest, while Eastmole, NIOMR,

and Calabar stations reported 30.3°C, 29.7°C and 30.1°C, respectively during the period under review.

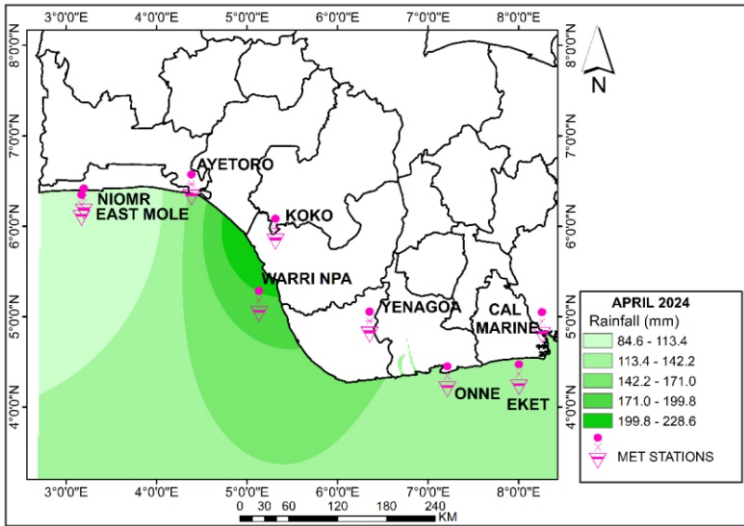


Figure 5: Observed rainfall in the Nigerian coastal region in April 2024

2.1.2 (d) April 2024 Total Rainfall Amount: Total rainfall amounts of 84.6mm and 228.6mm recorded at Eastmole and Koko stations were the lowest and highest values in the coastal region in

April 2024. However, 84.8mm, 113.4mm, and 140.4mm of rainfall were observed at NIOMR, Eket, and Calabar stations respectively.

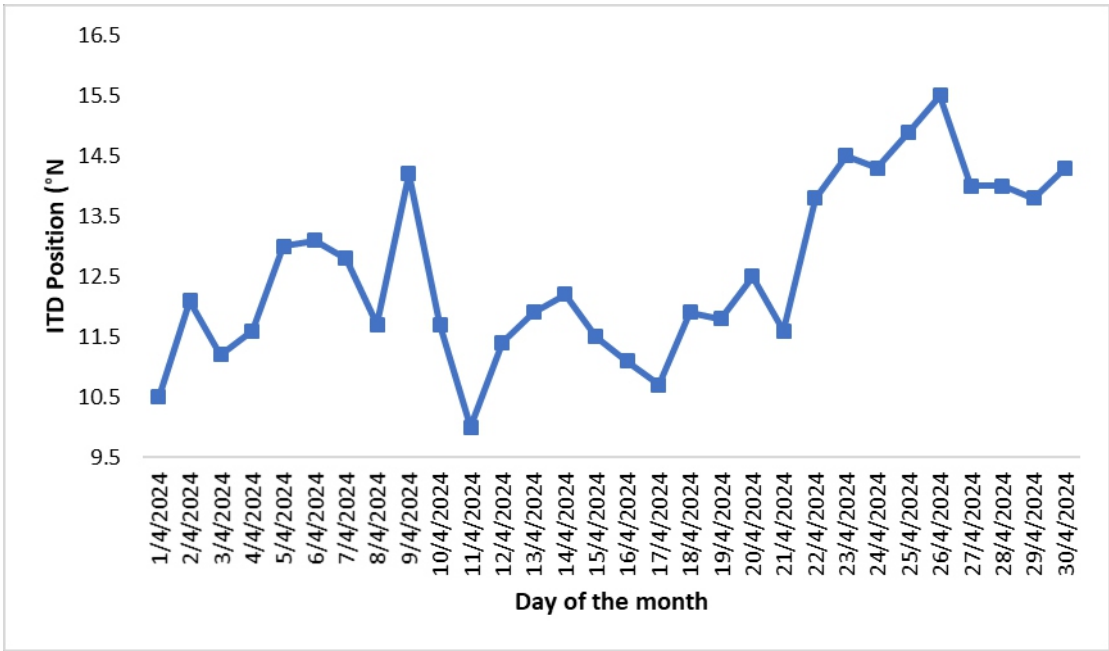


Figure 6: Time series of ITD position in April 2024

2.1.2 (e) Movement of the ITD in January: The ITD continued its southward oscillation from its position in the previous month fluctuating

between Latitude 10°N and 15.5°N with an average latitudinal position of 12°N during the period under review. (See Figure 6)

Table 1: April Significant Wave Height (meters)

	Lagos Eastmole	Lagos NIOMR	Koko	Eket	Calabar
Highest	1.7	1.56	1.49	1.37	1.4
Lowest	0.94	0.87	0.94	0.9	0.91

Impact of Weather on Activities in Nigerian Coastal Zone in April 2024.

In April 2024 the weather in the coastal zone of Nigeria was generally favorable for maritime activities in Nigeria's coastal zone. Here's a breakdown:

- **Shipping:** The combination of sunny days and occasional showers provided good conditions for shipping activities.
- **Fishing:** The weather was conducive to marine life and fishing, allowing for productive fishing trips.
- **Tourism:** Coastal tourism, including boat

tours and water sports, benefited from the generally pleasant weather.

However, there were also some challenges:

- **Strong Winds:** While uncommon, strong winds could have made navigation difficult and affected offshore operations.
- **Heavy Rainfall:** Heavy rainfall could have caused temporary disruptions to maritime activities, such as port operations or ferry services.

Review of May 2024 Nigerian Coastal Weather

General Conditions:

- **Rough Seas:** While the overall weather conditions were favorable, there were occasional rough seas.

Specific Activities:

- **Fishing:** May was a good month for fishing because the increased rainfall led to higher fish populations in coastal waters. Both

artisanal and commercial fishing activities thrived.

- **Offshore Operations:** It was essential to monitor weather conditions during May and take necessary precautions to ensure the safety of personnel and equipment in offshore oil and gas operations.

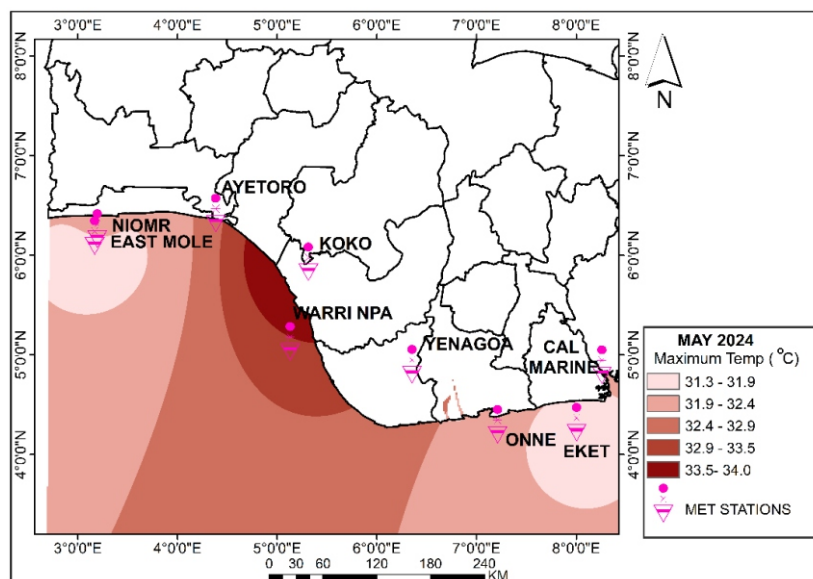


Figure 7: Observed maximum temperature in the Nigerian coastal region in May 2024

3.0.1 May 2024 Maximum (Daytime) Temperature:

In May 2024 Eket and Koko stations recorded the lowest and highest maximum temperatures of 31.3°C and 34.0°C,

respectively, while NIOMR, Eastmole, and Calabar stations recorded 32.2°C, 31.9°C and 33°C, respectively.

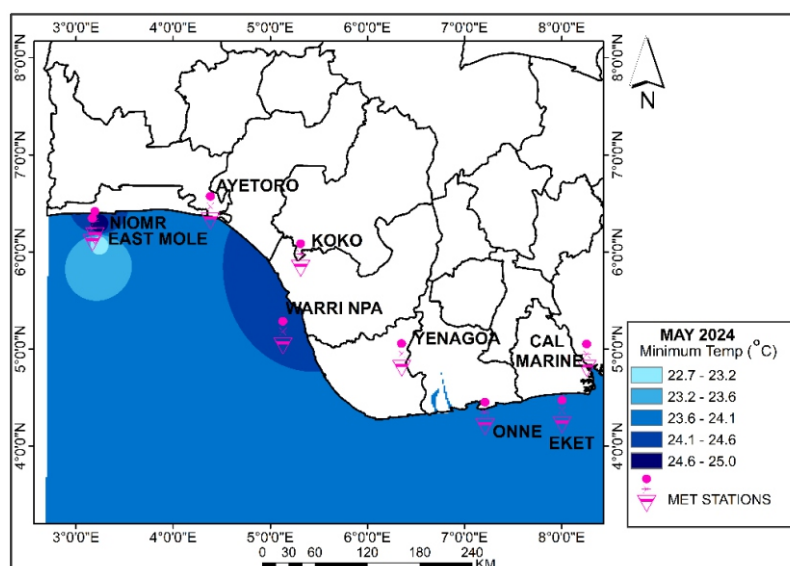


Figure 8: Observed minimum temperature in the Nigerian coastal region in May 2024.

3.0.2 May 2024 Minimum Temperature:

The lowest and highest mean minimum temperatures of 22.7°C and 25.0°C were

recorded at Eastmole and Koko stations, while NIOMR, Eket, and Calabar stations observed 24.6°C, 24.0°C and 24.1°C, respectively.

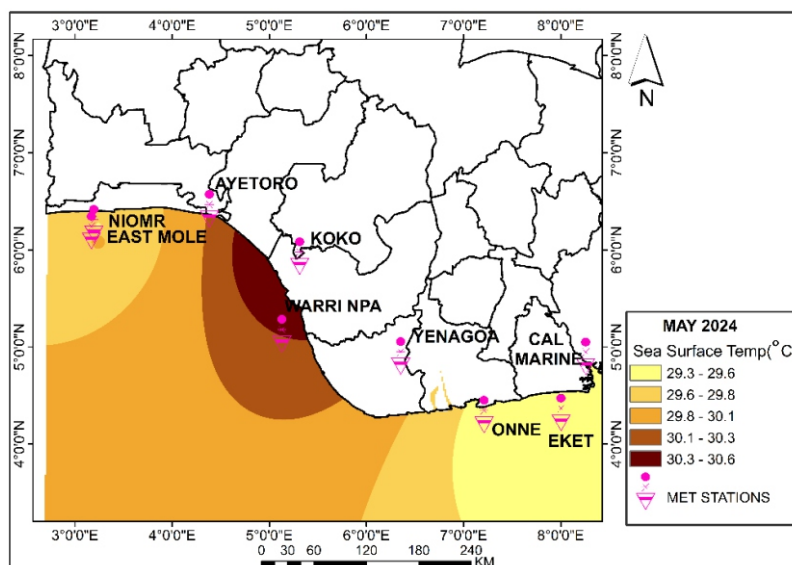


Figure 9: Observed Sea Surface Temperature (SST) in the Nigerian coastal region in May 2024

3.0.3 May Sea Surface temperature: The Sea Surface Temperature (SST) of 29.3°C and 30.6°C observed at Eket and Koko stations were the

lowest and highest, while NIOMR, Eastmole, and Calabar observed 29.6°C, 29.9°C, and 29.5°C, respectively.

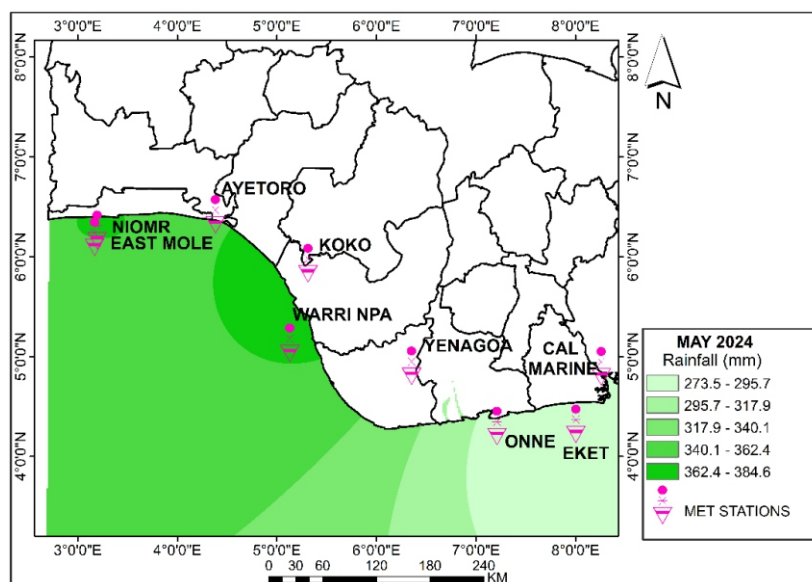


Figure 10: Observed rainfall in the Nigerian coastal region in May 2024

3.0.4 May 2024 Total Rainfall: Total rainfall amounts of 273.5mm and 384.6mm recorded by Eket and Koko stations were the lowest and highest in the coastal region for the month under

review. However, 368.7mm, 354.6mm, and 284.4mm of rainfall were observed at the NIOMR, Eastmole, and Calabar stations, respectively.

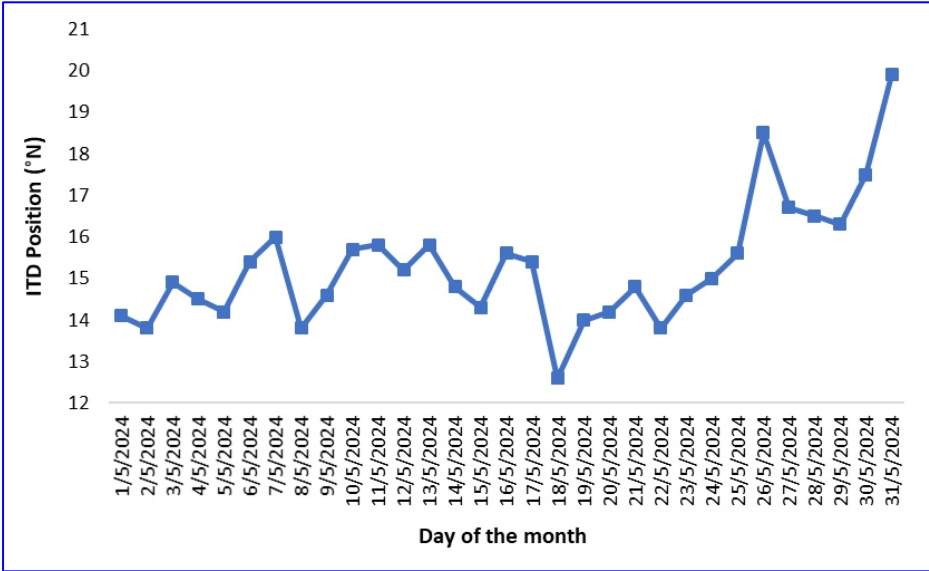


Figure 11: Time series of ITD position in May 2024

3.0.5 Position of the ITD: The ITD continued its southward oscillation from its position in the previous month fluctuating between Latitude 12.6°N and 19.9°N with an average latitudinal position of 15.28°N. (Figure11)

Table 2: May 2024 Significant Wave Height (meters)

	Lagos Eastmole	Lagos NIOMR	Koko	Eket	Calabar
Highest	2.35	2.47	2.12	2.48	2.25
Lowest	1.05	1.01	1.06	1.02	0.98

Impact Of Weather On Activities In Nigerian Coastal Zone In May 2024

- Increased Rainfall and Humidity:** The increased rainfall and higher humidity levels in May created challenging conditions for maritime activities. This often led to reduced visibility and slippery decks.
- Storms:** While the overall weather conditions were generally favorable, there were periods of occasional thunderstorms which brought about strong winds and heavy rain. These storms created hazardous conditions for marine operations.

Review of June 2024 Coastal Weather

SST: The SST values in the coastal stations depicted a slightly warmer sea surface when compared to May observations. 30.9°C observed in Koko (highest June SST) was 0.3 degrees higher than 30.6 °C also observed in Koko (highest May SST).

Rainfall: June was a very wet month there were frequent and heavy showers with thunderstorms especially in the afternoons and evenings. Rainfall patterns varied slightly between different coastal regions. 433.2mm (highest June rainfall value) observed in Calabar station was 43.3m higher than 388.9mm observed in Koko (highest May rainfall value).

Maximum Temperature:

High Temperatures: Maximum temperature

was high throughout the month, often exceeding 30°C in many coastal areas except Lagos axis.

Humidity: Thermal perception was warmer due to high humidity, especially during the afternoons.

Minimum Temperature:

- **Slight Cooling:** There was a slight decrease in minimum temperatures towards the end of the month which resulted in cool nights.

Overall, June 2024 was a very wet and warm month along the Nigerian coast, with high SSTs and frequent rainfall.

The weather variables observed in June 2024 are highlighted below.

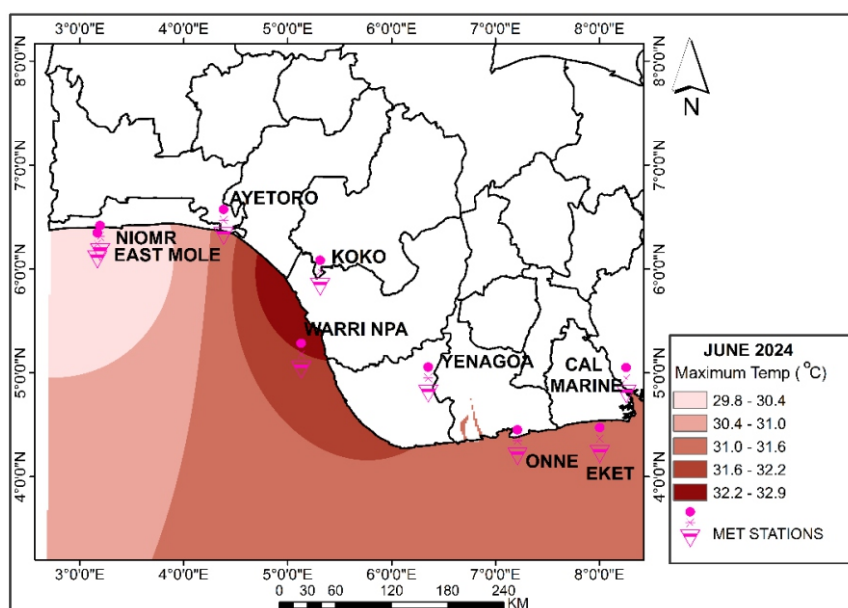


Figure 12: Observed maximum temperature in the Nigerian coastal region in June 2024

4.0.1 June 2024 Maximum (Daytime)

Temperature: In June 2024, Eastmole and Koko weather stations recorded the lowest and highest daytime temperatures of 29.8°C and

32.9°C respectively, while NIOMR, Eket, and Calabar stations observed 31°C, 31.3°C and 31.6°C respectively.

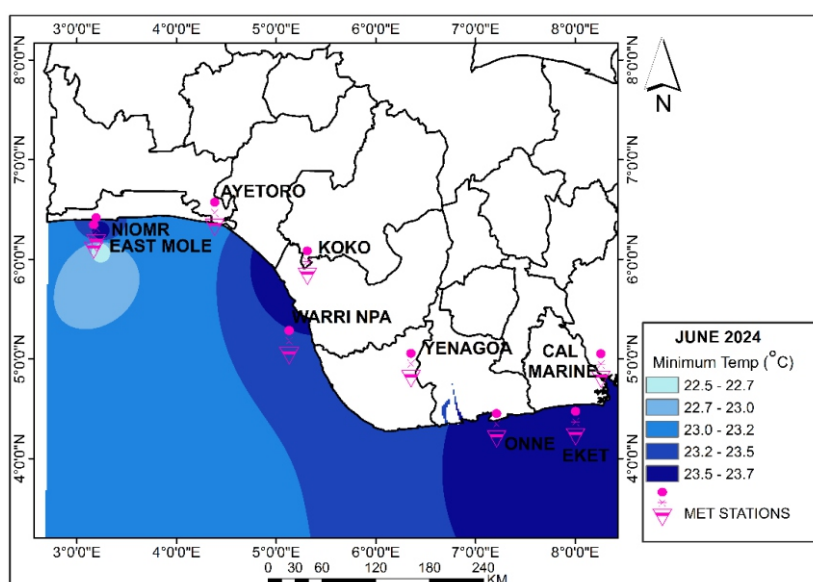


Figure 13: Observed minimum temperature in the Nigerian coastal region in June 2024

4.0.2 June 2024 Minimum Temperature: The lowest and highest mean minimum temperature values of 22.5°C and 23.7°C were observed in NIOMR and Eket stations, while

Eastmole, Koko, and Calabar stations recorded 22.7°C, 23.2°C and 23.6°C, respectively.

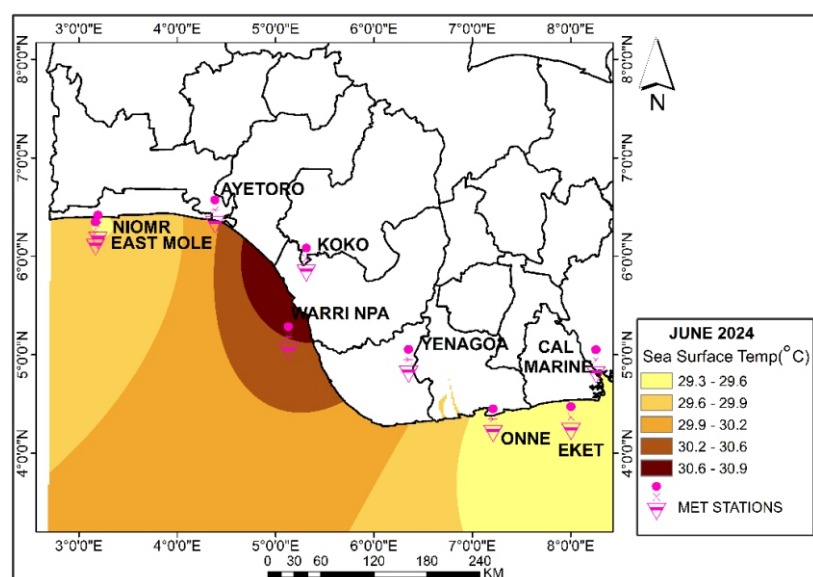


Figure 14: Observed Sea Surface Temperature (SST) in the Nigerian coastal region in June 2024

4.0.3 June 2024 Sea Surface Temperature: Sea Surface Temperatures (SST) of 29.3°C and 30.9°C recorded at Calabar and Koko stations

respectively were the lowest and highest, while Eastmole, NIOMR, and Eket observed 29.6°C, 29.9°C and 29.4°C respectively.

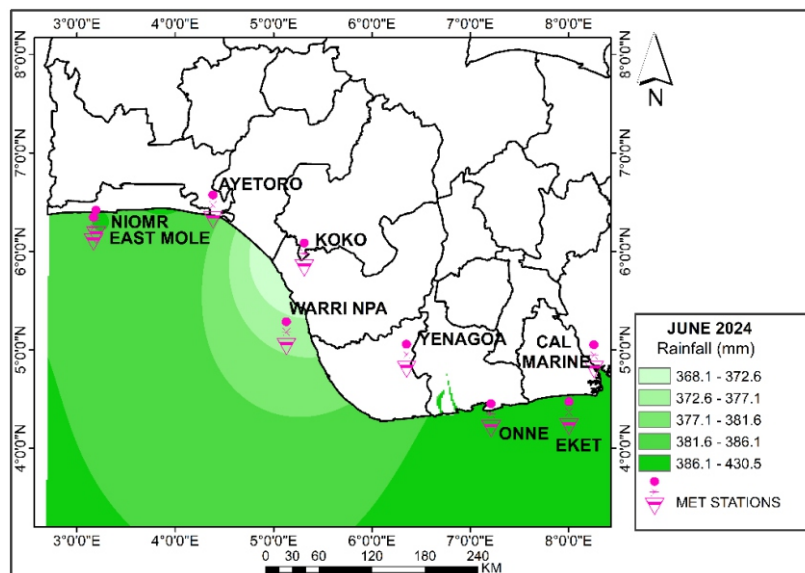


Figure 15: Observed rainfall in the Nigerian coastal region in June 2024

4.0.4 June 2024 rainfall: Total rainfall amounts of 368.1mm and 430.5mm recorded at Koko and Eket stations respectively were the lowest and highest values in the region for the period under

review, while 381.6mm, 388.1mm, and 400.6mm of rainfall were observed at Eastmole, NIOMR, and Calabar stations respectively.

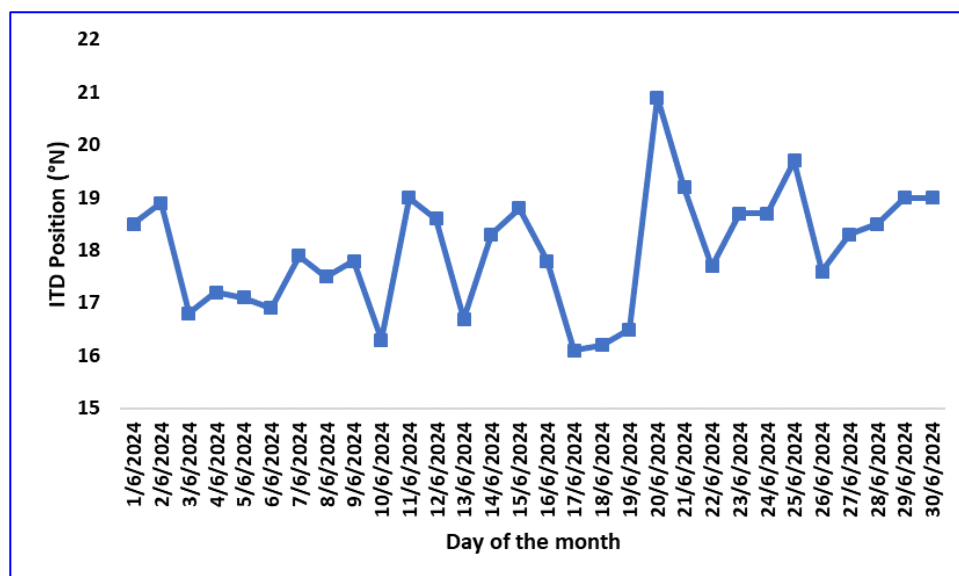


Figure 16: Time series of ITD position in June 2024

4.0.5 Movement of the ITD in June 2024: The ITD continued its northward oscillation from its position in the previous month, fluctuating between Latitude 16.1°N and 20.9°N with an average latitudinal position of 18°N. (See Figure 16)

Table 3: June Significant Wave Height (meters)

	Lagos Eastmole	Lagos NIOMR	Koko	Eket	Calabar
Highest	2.24	2.14	2.19	2.16	1.89
Lowest	1.17	1.19	1.18	1.01	1.1

4.1 Impact Of Weather On Activities In Nigerian Coastal Zone In June 2024

General Impacts:

Increased Rainfall and Humidity: The heavy rainfall and high humidity levels in June led to occasional rough seas, reduced visibility, slippery vessel decks, and increased corrosion of equipment.

Specific Impacts:

Shipping: While the increased rainfall improved navigation conditions for heavy vessels small vessels and fishing boats faced navigation challenges resulting from rough seas.



Summary of the Second Quarter 2024 Coastal Weather Review

The second quarter of 2024 in the Nigerian coastal region (April - June) witnessed weather patterns that significantly impacted maritime activities. Sea Surface Temperature, relative humidity, maximum temperature increased from April to June, while minimum temperature decreased in June

depicting the cooler nights experienced in June. The quarterly mean of maximum temperature, minimum temperature, Sea Surface Temperature, as well as cumulative rainfall amount, and ITD position are depicted in Figures 17 to 21.

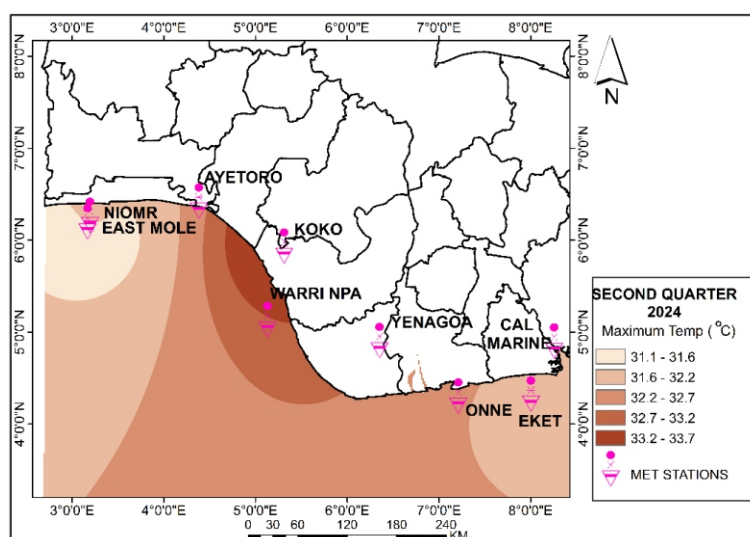


Figure 17: Maximum temperature for the second quarter of 2024 in the Nigerian coastal region

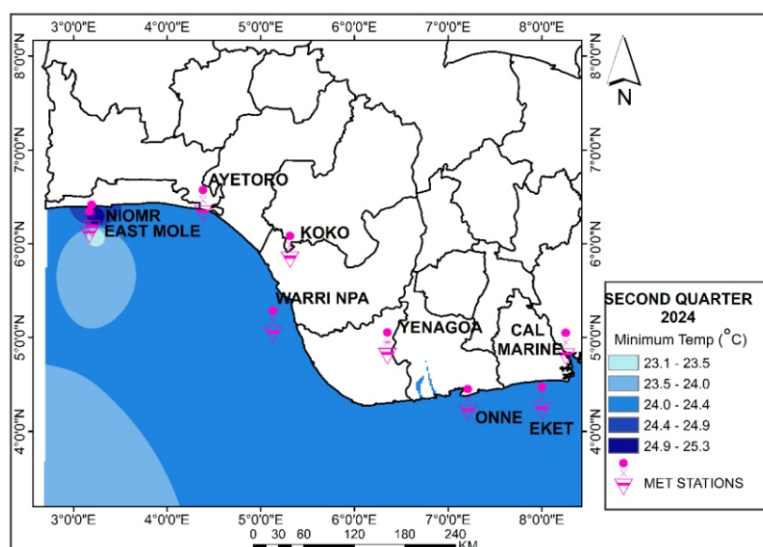


Figure 18: Minimum temperature for the second quarter of 2024 in the Nigerian coastal region

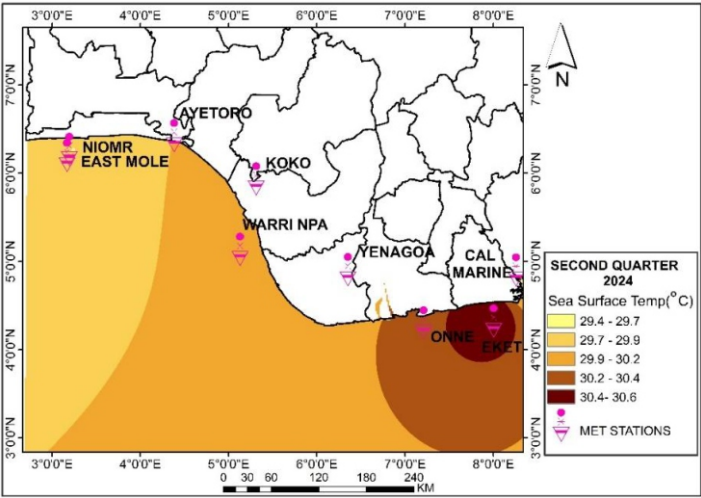


Figure 19: Sea Surface Temperature for the second quarter of 2024 in the Nigerian coastal region

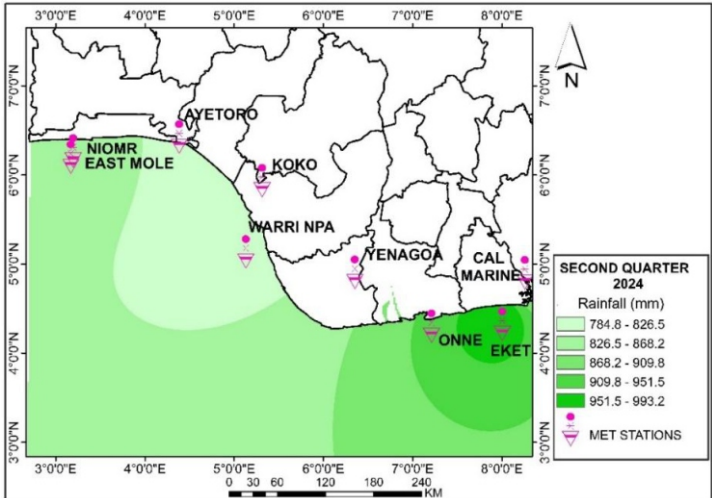


Figure 20: Rainfall for the second quarter of 2024 in the Nigerian coastal region

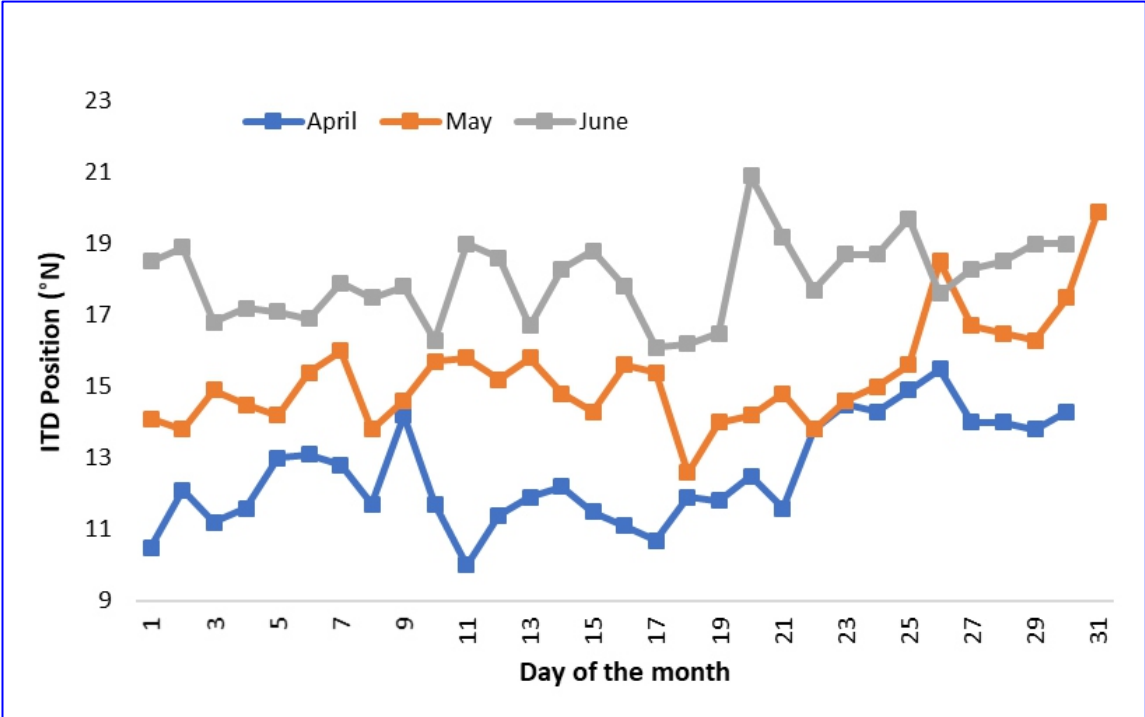


Figure 21: Time series of ITD position in the second quarter of 2024

Impact of the Second Quarter 2024 Coastal Weather on Maritime Activities

The coastal weather in Nigeria during the second quarter of 2024 (April-June) had a mixed impact on maritime activities, with some positive and negative effects:

Negative Impacts:

- **Reduced Visibility:** Heavy rainfall significantly reduced visibility, making navigation for small ships and fishing vessels more challenging. This led to delays, rerouting, and cancellations of some maritime activities.
- **Rough Seas:** In the last week of May and first week of June, maritime activities were hampered by rough seas. Strong winds and days of heavy rain made it dangerous for smaller vessels and disrupted fishing, recreational boating, and ferry services.

Positive Impacts:

- **Fishing Activities:** Some fish species are more in abundance during the peak of rainfall, local fishermen take advantage of May and June to optimize their yield.



**Inter-Tropical Discontinuity –**

The Inter-Tropical discontinuity is a convergence zone where the moist and cool southwesterly wind originating from the Atlantic Ocean and the dry and hot northeasterly wind blowing from the Sahara Desert meet.

Maximum Temperature: refers to the highest temperature reached during a specific period of daylight hours. Typically, maximum temperature represents the highest value recorded from sunrise to sunset.

Minimum Temperature: refers to the lowest temperature recorded during a specific period of darkness, typically measured from sunset to sunrise. This value represents the lowest point reached in the temperature cycle for a given night.

Significant Wave Height: is a term used in oceanography and meteorology to describe the average height of the highest one-third of waves in a given sea state. It is a statistical measure that

provides a representative value for the overall wave height in a particular area at a specific time.

Sea Surface Temperature: The temperature of the sea surface representing the condition in the surface mixed layer underlying the ocean skin.

Rainfall: refers to the amount of precipitation, typically in the form of water droplets, that falls from the atmosphere to the Earth's surface. It is a fundamental component of the Earth's water cycle and a key factor in shaping climate, ecosystems, and landscapes.

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