# FLOOD & DROUGHT BULLETIN

# MARCH 2026

GHANA METEOROLOGICAL AGENCY

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# INTRODUCTION

The Flood and Drought bulletin is a monthly analysis of rainfall in Ghana prepared and released by the Ghana Meteorological Agency (GMet). The bulletin provides an authoritative and scientific understanding of rainfall variability which is essential for accurate hydrological modeling, climate change assessments, and effective water resource planning to mitigate risks associated with extreme events like droughts and floods.

Among other services and products, the Flood and Drought bulletin complements the objectives of GMet in line with the National Framework for Climate Services (NFCS) to improve co-production, tailoring, delivery and use of science-based climate predictions and services focused on the five pillars of the Global Framework for Climate Services (GFCS) by the World Meteorological Organization (WMO): agriculture and food security, disaster risk reduction, energy, health and water.

The analysis in the Flood and Drought bulletin is based on the Standardized Precipitation Index (SPI) developed by McKee et al. (1993) for the purpose of defining and monitoring drought. Drought is an insidious natural hazard that results from lower levels of precipitation than what is considered normal. When this phenomenon extends over a season or a longer period of time, water becomes increasingly insufficient to meet the demands of human activities and the environment. Drought must be considered a relative, rather than absolute, condition. Drought means different things to different users such as water managers, agricultural producers, hydroelectric power plant operators and wildlife biologists. Even within sectors, there are many different perspectives of drought because impacts may differ markedly. Droughts are commonly classified by type as meteorological, agricultural and hydrological, and differ from one another in intensity, duration and spatial coverage (WMO, 2012).

# THE STANDARDIZED PRECIPITATION INDEX (SPI)

SPI indicator, which was developed by McKee et al. (1993), and described in detail by Edwards and McKee (1997), measures precipitation anomalies at a given location, based on a comparison of observed total precipitation amounts for an accumulation period of interest (e.g. 1, 3, 12, 48 months), with the long-term historic rainfall record for that period. This indicator measures anomalies of accumulated precipitation during a given period. In calculating SPI, precipitation is the only required input parameter (McKee and others, 1993, 1995). The SPI calculation for any location is based on the long-term precipitation record for a desired period. This long-term record is fitted to a probability distribution, which is then transformed into a normal distribution so that the mean SPI for the location and desired period is zero (Edwards and McKee, 1997).

The SPI is designed to quantify the precipitation deficit for multiple timescales and can be calculated from 1 month up to 72 months. Statistically, 1–24 months is the best practical range of

application (Guttman, 1994, 1999). The Flood and Drought bulletin of Ghana considers only the 1-month, 3-month, 6-month and 12-month SPI due to limited availability of data.

**1-month SPI:** The 1-month SPI compares the precipitation of a specific month with the precipitation totals from the same month for all the years included in the historical record.

**3-month SPI:** The 3-month SPI provides a comparison of the precipitation over a specific 3 consecutive month period with the precipitation totals from the same 3-month period for all the years included in the historical record.

**6-month SPI:** The 6-month SPI compares the precipitation for a specific 6 consecutive months with the same 6-month period over the historical record.

**12-month SPI:** The 12-month SPI is a comparison of the precipitation for 12 consecutive months with that recorded in the same 12 months in all previous years of available data.

These timescales reflect the impact of drought on the availability of the different water resources. Meteorological and soil moisture conditions (agriculture) respond to precipitation anomalies on relatively short timescales, for example 1 to 3 months (SPI-1 to SPI-3), whereas streamflow, reservoirs, and groundwater respond to longer-term precipitation anomalies, for example 3 months to 12 months (SPI-3 to SPI-12) or longer (EDO, 2020). A real strength of the SPI is its ability to be calculated for many timescales, which makes it possible to deal with many of the drought types described above. The ability to compute the SPI on multiple timescales allows for temporal flexibility in the evaluation of precipitation conditions in relation to water supply.

In the Flood and Drought bulletin, the SPI values for any given location and accumulation period, are classified into nine different precipitation regimes (from dry to wet), as shown in Table 1. As can be seen, increasingly severe rainfall deficits (i.e., meteorological droughts) are indicated as SPI decreases below -0.5, while increasingly severe excess rainfall is indicated as SPI increases above 0.5.

| *ANOMALY* | *RANGE OF SPI VALUES* | *PRECIPITATION REGIME* | *COLOUR* |
|---|---|---|---|
| Negative | Min <= SPI <= -2.0 | Extreme dry | |
| | -2.0 < SPI <= -1.5 | Severe dry | |
| | -1.5 < SPI <= -1.0 | Moderate dry | |
| | -1.0 < SPI <= -0.5 | Mild dry | |
| None | -0.5 < SPI <= 0.5 | Normal precipitation | |
| Positive | 0.5 < SPI <= 1.0 | Mild wet | |
| | 1.0 < SPI <= 1.5 | Moderate wet | |
| | 1.5 < SPI <= 2.0 | Severe wet | |
| | 2.0 < SPI <= Max | Extreme wet | |

**Table 1:** SPI classification scheme used in the Flood and Drought bulletin

## SPI ANALYSIS FOR MARCH 2026

The SPI analysis for rainfall in March 2026 has been generated in multiple timescales of 1-month (March 2026), 3-month (January 2026 – March 2026), 6-month (October 2025 - March 2026) and 12-month (April 2025 – March 2026). The maps generated depict the severity (positive or negative) of rainfall anomalies under review.

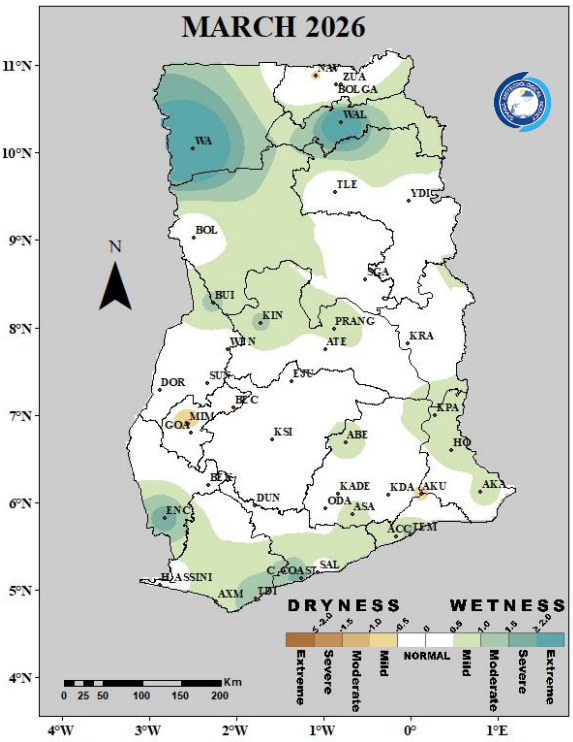


**Fig. 1(a):** 1-Month SPI *(for meteorological drought)*: March 2026

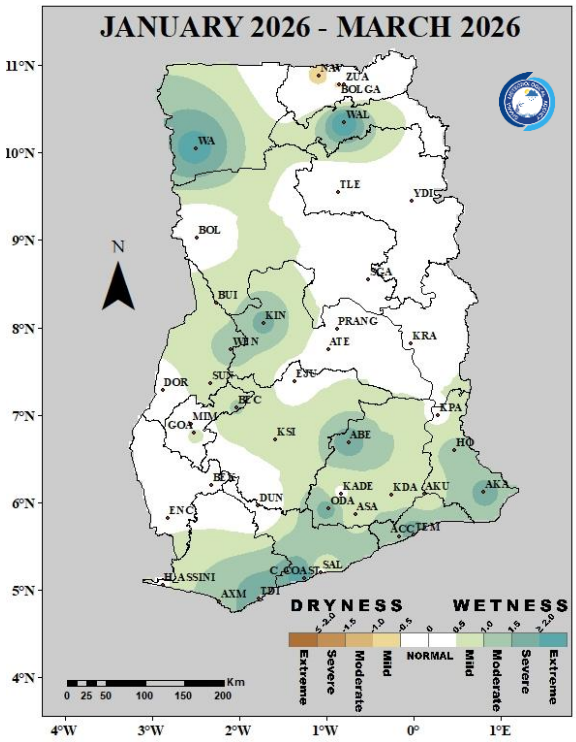


**Fig. 1(b):** 3-Month SPI *(for agricultural drought)*: January 2026 – March 2026

### 1-Month SPI (March 2026).

The 1-month SPI for March 2026, illustrated in Fig. 1(a), indicates mild to extreme wet conditions in most parts of the Savannah zone, particularly around Walewale and Wa. The Forest zone generally experienced normal conditions, although Enchi and Takoradi recorded moderate to severe wetness, while Mim exhibited mild dry conditions. In the Coastal zone, the western areas showed mild to severe wet conditions.

### 3-Month SPI (January 2026 - March 2026)

The 3-month SPI depicted in Fig. 1(b) indicates normal to mild wet conditions across most parts of the country. Severe to extreme wet conditions were observed in several locations, includingWa, Walewale, Kintampo, Abetifi, Akim Oda, Takoradi, Cape Coast, Accra and Akuse. In contrast, Navrongo in the Savannah zone experienced mild dryness.

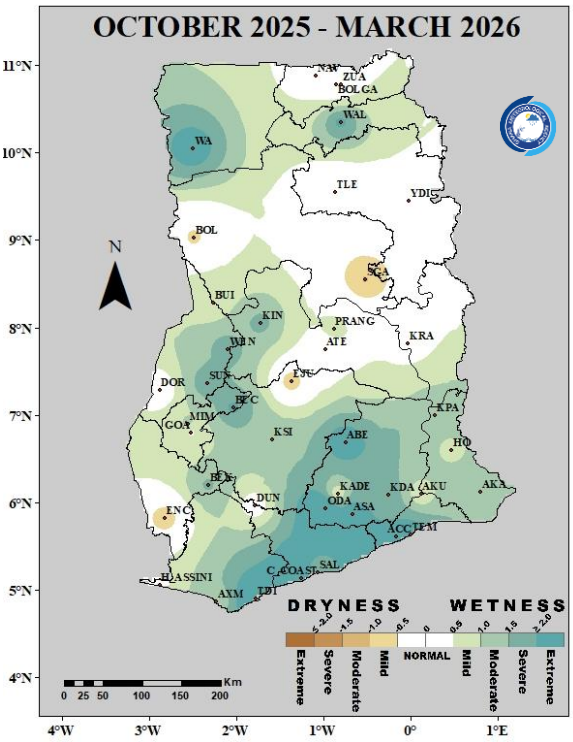


**Fig. 1(c):** 6-Month SPI *(for hydrological drought)*: October 2025 – March 2026

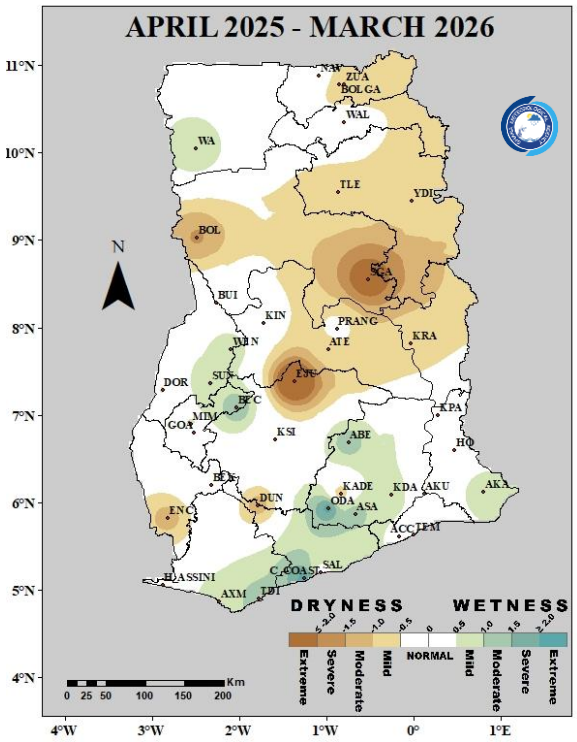


**Fig. 1(d):** 12-Month SPI *(for streamflow and lake storage drought)*: April 2025 – March 2026

**6-Month SPI (October 2025 - March 2026)**

The 6-month SPI presented in Fig. 1(c) shows moderate to severe wet conditions across much of the southern part of the country, particularly in Abetifi, Akim Oda, Asamankese, Takoradi, Cape Coast, Saltpond, Accra and Tema. In the Transition zone, Bechem, Sunyani, Wenchi, and Kintampo recorded severe wet conditions. Similarly, Wa and Walewale in the Savannah zone experienced severe to extreme wetness. However, some areas, including Bole, Salaga, Ejura, and Enchi, recorded mild dry conditions.

**12-Month SPI (April 2025 - March 2026)**

The 12-month SPI presented in Fig. 1(d) reflects normal to mild wet conditions across most parts of the southern, midwestern, and northwestern regions of the country. Nonetheless, extreme dry conditions were observed in Ejura and Salaga in the Transition zone. Additionally, moderate to severe dryness was recorded in Dunkwa, Enchi, and Bole.

## STATIONS

| Station | Abbreviation | Station | Abbreviation | Station | Abbreviation |
|---|---|---|---|---|---|
| Abetifi | ABE | Enchi | ENC | Sunyani | SUN |
| Accra | ACC | Goaso | GOA | Takoradi | TDI |
| Akatsi | AKA | Half Assini | H_ASSINI | Tamale | TLE |
| Akim Oda | ODA | Ho | HO | Tema | TEM |
| Akuse | AKU | Kade | KADE | Wa | WA |
| Asamankese | ASA | Kete Krachi | KRA | Walewale | WAL |
| Atebubu | ATE | Kintampo | KIN | Wenchi | WEN |
| Axim | AXM | Koforidua | KDA | Yendi | YDI |
| Bechem | BEC | Kpandu | KPA | Zuarungu | ZUA |
| Bole | BOL | Kumasi | KSI | | |
| Bolga | BOLGA | Mim | MIM | | |
| Bui | BUI | Navrongo | NAV | | |
| Cape Coast | C_COAST | Prang | PRANG | | |
| Dormaa | DOR | Salaga | SGA | | |
| Dunkwa | DUN | Saltpond | SAL | | |
| Ejura | EJU | Sefwi Bekwai | BEK | | |

## REFERENCE

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