



Monthly Hydro Meteorology Bulletin 2026

Forward

This Monthly Hydro Meteorological Bulletin is prepared and disseminated by the Ethiopia Meteorological institute (EMI). The ultimate objective of producing and disseminating this bulletin is to inform all level decision makers with the updated and relevant hydro meteorological information. This monthly Bulletin reviews the July 2026-month climate condition and its impacts over the river catchment across the country and highlights the September 2026 climate outlook along with the likely impact over the water dams and the rivers basins.

The information contained in this bulletin is believed to assist the water professionals for planning the capacity expansion of reservoirs, water supply, ecosystem restoration as well as rehabilitation of existing systems including dams, irrigation, canals, pumps, wetlands and the likes. In addition to the aforementioned benefit the bulletin also reveals the aridity levels of each basin, extremes heavy rainfall events and areas where significant amount of moistures loss through evapotranspiration. In the impact outlook section of the bulletin it provides the likelihood of the climate in the coming month and its potential impact over various aspect of the river basins including the hydraulic structures such as culverts, bridges, reservoir spillways, road embankments and dikes. It also indicates the measures need to be taken as the early actions so as to reduce the possible negative impact of the upcoming month climate condition. Meanwhile, your comments and constructive suggestions are highly appreciated to make the objectives of this bulletin a success.

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Introduction

The provision of hydro meteorological services can contribute a significant role toward water resource management and socio-economic development. Both surface water and groundwater management are essentially linked to climate variability. Therefore, the provided climate information and knowledge in this monthly hydro meteorological bulletin have a critical importance for efficient, equitable and sustainable development and management of the national water resources and for coping with any climate related risks. The information illustrates the impact of previous month climate on each and every water basins and the associated climate risks observed during the month under review. In addition to the previous month impact assessment, the bulletin also provided the expected climate condition for the coming months and its impact on the water resource. The design of water-use and flood-control facilities, mainly dams and reservoirs, is frequently based on these analyses. Estimating the likelihood of precipitation, the distribution of precipitation and the rate of evaporation in location and time, the heavy rainfall and the subsequent runoff, extreme temperature and wind are among issues that hydro meteorologists are concerned with.

1.1 Monthly Hydro Meteorological Assessments

1.1.1 September Monthly Climatology of the Ethiopian River Basin

As can be seen in figure 1, During September 2026, most parts of the Abay, Tekeze, Baro-Akobo, Omo-Gibe, Rift Valley, Genale-Dawa, Wabi-Shebelle, and Ogaden River Basins, together with some parts of the Middle and Upper Awash Basin, received substantial moisture, with rainfall exceeding the potential evapotranspiration (PET) in many areas. This resulted in a generally positive moisture balance, indicating that the moisture received through rainfall was sufficient to offset atmospheric water demand across much of the affected basins. The prevailing moisture surplus contributed to improved soil-moisture conditions, enhanced surface runoff, and the replenishment of rivers, reservoirs, wetlands, and other surface-water resources.

From a climatological perspective, September represents a transitional period in Ethiopia as the main Kiremt rainy season gradually weakens over the northern and central highlands, while rainfall activity increasingly shifts toward the southern and southeastern parts of the country. During September 2026, however, moisture conditions remained wet to very wet across substantial parts of the western, central, southern, southwestern, northern, and eastern river basins. The combination of continued seasonal rainfall and relatively favorable moisture

availability supported a positive water balance across many areas, contributing to sustained soil moisture and surface-water availability. The spatial variability in moisture conditions also reflects the seasonal transition and the differing rainfall regimes across Ethiopia's major river basins.

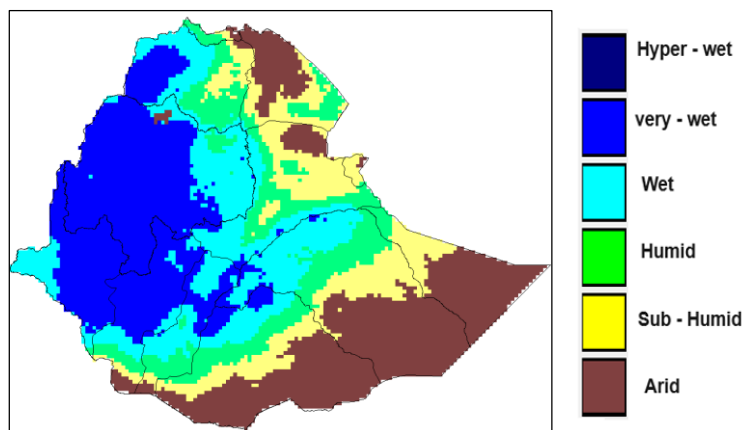


Figure 1 Monthly climatology of the Ethiopian river basin (September).

1.1.2 September 2026 Rainfall Assessment over the River Basins

During September 2026, rainfall distribution across the country's river basins exhibited marked spatial variability, as illustrated in Figure 2. Relatively higher monthly rainfall was mainly concentrated over the western, southwestern, and southern parts of the country. Most parts of the Abay, Tekeze, Baro-Akobo, Upper Omo-Gibe, Rift Valley, and Genale-Dawa basins, along with portions of the Upper Wabi-Shebelle Basin, received comparatively higher rainfall, with monthly totals ranging from approximately 68 mm to 450 mm. These relatively higher rainfall amounts contributed to improved moisture availability across the affected basins during the month.

In contrast, relatively dry conditions prevailed across the eastern, northeastern, and lower-elevation areas of the country. Most parts of the Ogaden and Afar-Danakil basins, together with the lower reaches of the Wabi-Shebelle, Genale-Dawa, and Awash basins, received relatively limited rainfall, with monthly totals generally below 67 mm throughout September. This pronounced spatial contrast in rainfall distribution highlights the substantial variation in moisture availability and hydrological conditions among the country's river basins during the month.

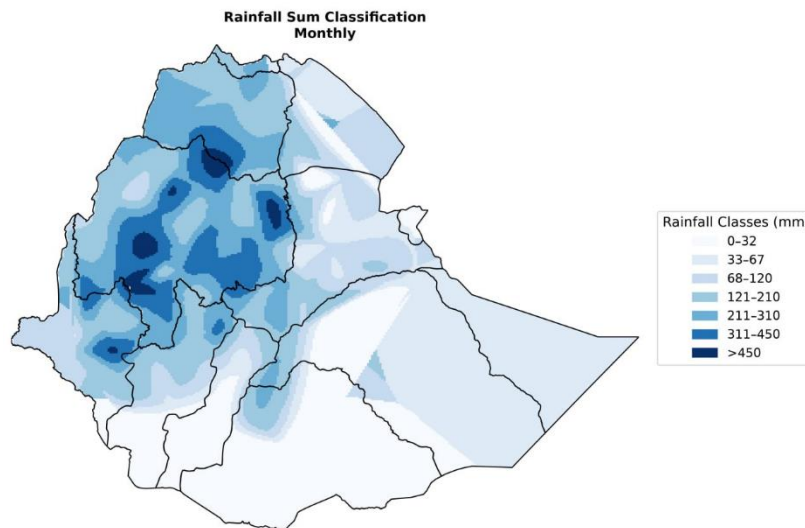


Figure 2 September monthly mean rainfall over Ethiopian River Basin

1.1.3 Monthly Mean Temperature over the River Basin

During September 2026, mean temperature patterns exhibited noticeable spatial variation across the region's major river basins, as illustrated in Figure 3. The majority of the central catchments specifically portions of the upper Abay, Baro, and Omo-Gibe, Rift Valley, Wabi Shebelle, Awash, and Genale Dawa basins recorded average monthly temperatures remaining below 25°C. These cooler thermal conditions effectively limited atmospheric demand, resulting in lower evapotranspiration rates across these areas.

In contrast, warmer thermal regimes prevailed across eastern, lowland, and peripheral basin areas. Monthly average temperatures surpassed 25°C in the Ogaden, Lower Wabi Shebelle, Baro-Akobo, Awash, Omo-Gibe, Rift Valley, and Afar-Danakil catchments, creating higher evaporative demand throughout these area.

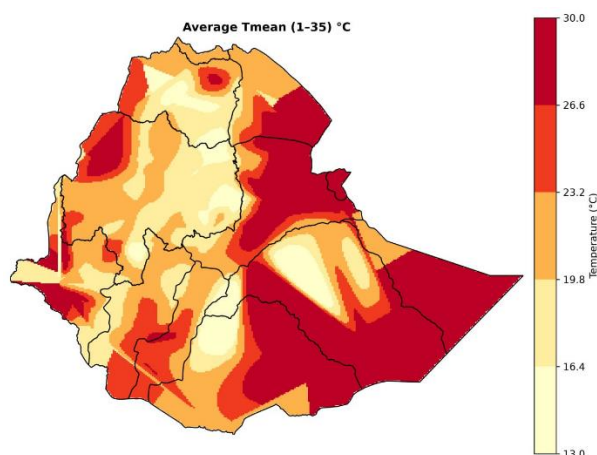
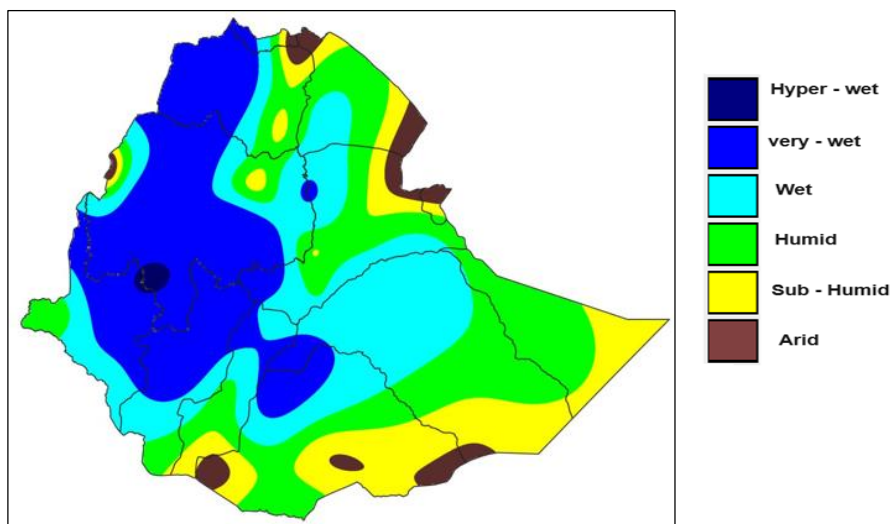


Figure 3 September monthly mean temperature over Ethiopian River Basin

1.1.4 Assessments of Aridity Index during the month of September

During September 2026, the observed Aridity Index distribution is presented in Figure 4. The analysis indicates generally favorable moisture conditions across the western, northern, southwestern, and northeastern parts of the river basins. Above-wet to hyper-wet Aridity Index conditions were observed across most parts of the Abay, Baro-Akobo, Tekeze, Mereb-Gashe, Upper Omo-Gibe, Rift Valley, and Genale-Dawa basins, as well as in some parts of the Upper Ogaden. These relatively wet conditions indicate adequate to surplus moisture availability across the affected areas during the month.

In contrast, sub-humid to arid conditions prevailed across most parts of the Ogaden and Wabi-Shebelle basins, as well as the Genale-Dawa, Lower Rift Valley, and Lower Omo-Gibe areas. These relatively dry conditions indicate lower moisture availability compared with the wetter western and northern parts of the country. The marked spatial variation in the Aridity Index during September reflects the differences in rainfall distribution and atmospheric moisture demand across the various river basins.



1.1.5 Distribution of Heavy fall

As illustrated in Figure 4, during the month, key hydrological basins, including most parts of the Abay, Baro-Akobo, Omo-Gibe, and Rift Valley basins, as well as the upper reaches of the Genale-Dawa and Wabi-Shebelle basins, experienced heavy rainfall events occurring for one to five days. The occurrence of these high-intensity rainfall events contributed significantly to increasing soil-moisture availability, replenishing major river channels, and enhancing surface runoff across the affected catchments. The resulting increase in runoff and river flow further supported the replenishment of water resources within the respective basins.

Consequently, the accumulated rainfall and associated runoff are expected to increase water storage and holding capacity in major natural and manmade reservoirs, hydropower dams, and river systems. The rise in reservoir levels can improve water availability and strengthen water security for agricultural, domestic, and industrial uses, while also supporting hydropower generation. In addition, increased water storage in major reservoirs and dams may enhance the potential for sustained energy production and contribute to the effective management and utilization of water resources across the interconnected basin systems.

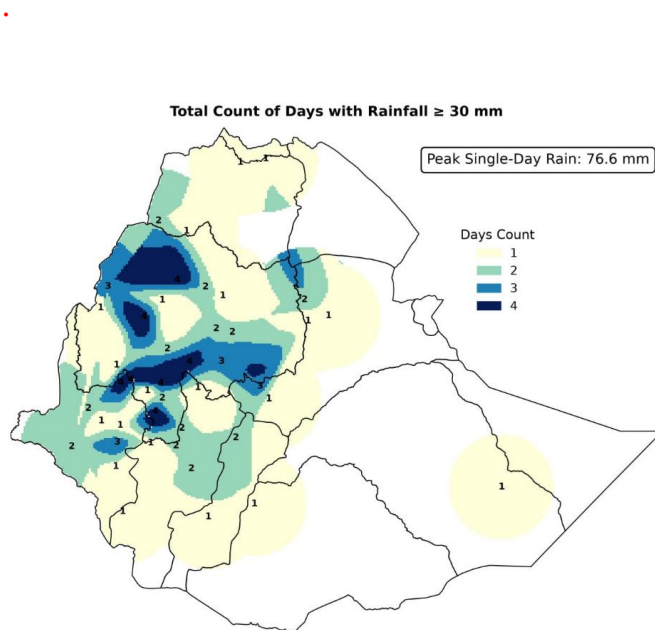


Figure 4(a, b) September monthly Aridity index and Heavy Fall Frequency over Ethiopian River Basis



2. Hydro Meteorological Impact Outlook for October 2026

2.1 Expected weather impact on water resource during the coming October, 2026

During October, most parts of the Tekeze, Abay, Mereb-Gashe, Awash, Baro-Akobo, Omo-Gibe, Upper and Middle Rift Valley, Upper Wabi-Shebelle, and Genale-Dawa basins are expected to experience wet to very wet moisture conditions. The anticipated rainfall is likely to enhance the replenishment of rivers, reservoirs, wetlands, and other surface-water resources. The resulting increase in runoff and reservoir inflows may improve water availability for hydropower generation, domestic and other water-supply services, and large- and small-scale irrigation activities. These favorable moisture conditions are also expected to support the continued availability and utilization of water resources across the affected basins.

On the other hand, the expected wet to very wet conditions may increase the potential for flash floods, riverine flooding, and landslides, particularly in flood-prone urban and rural areas and in hilly and steep terrain. Heavy or persistent rainfall may generate substantial surface runoff, saturate soils, and cause localized flooding, potentially affecting communities, roads, bridges, drainage systems, and other critical infrastructure. Accordingly, water-sector professionals, local authorities, and communities in vulnerable areas should strengthen preparedness and take appropriate precautionary measures, including clearing drainage channels, monitoring river and reservoir levels, and strengthening early-warning and response mechanisms. Residents are advised to remain vigilant for flooding, landslides, and reduced visibility and to strictly avoid walking or driving through flowing or flooded water.



