



Meteorological Data and Climatology Lead Executive

Climatology and Remote Sensing Desk

Ten Daily Satellite Rainfall Estimation and Vegetation Coverage Bulletin

3rd Dekad of August 2024

Date: Sep 3, 2025

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Forward

As an entity responsible for monitoring local and country wide climatic features and their day-to-day evolution, the National Meteorological Agency of Ethiopia strives hard to present useable information to different socio- economic activities. The production of satellite-based rainfall estimates and vegetation greenness bulletin is part of this effort.

The launch of meteorological satellites which happens as a result of technological advancement opens a new horizon in weather and climate monitoring. Unlike manned point observations, satellites collect data on cloud, vegetation and other parameters from part of the world that are not easily reachable or accessible. Satellite observation supplements ground manned observation and when it comes to vegetation cover, it is the only source of information.

The Ethiopian Meteorological institute uses products from TAMSATA group based in UK and Copernicus for producing dekadal rainfall estimate and vegetation greenness bulletin. We have a strong belief that various socio-economic activities related to planning disaster mitigation, water resources management, construction, environmental protection, transportation, recreation, tourism and others will be benefited most by the careful and continuous use of this bulletin. Meanwhile, your comments and constructive suggestions are highly appreciated to make the objectives of this bulletin a success

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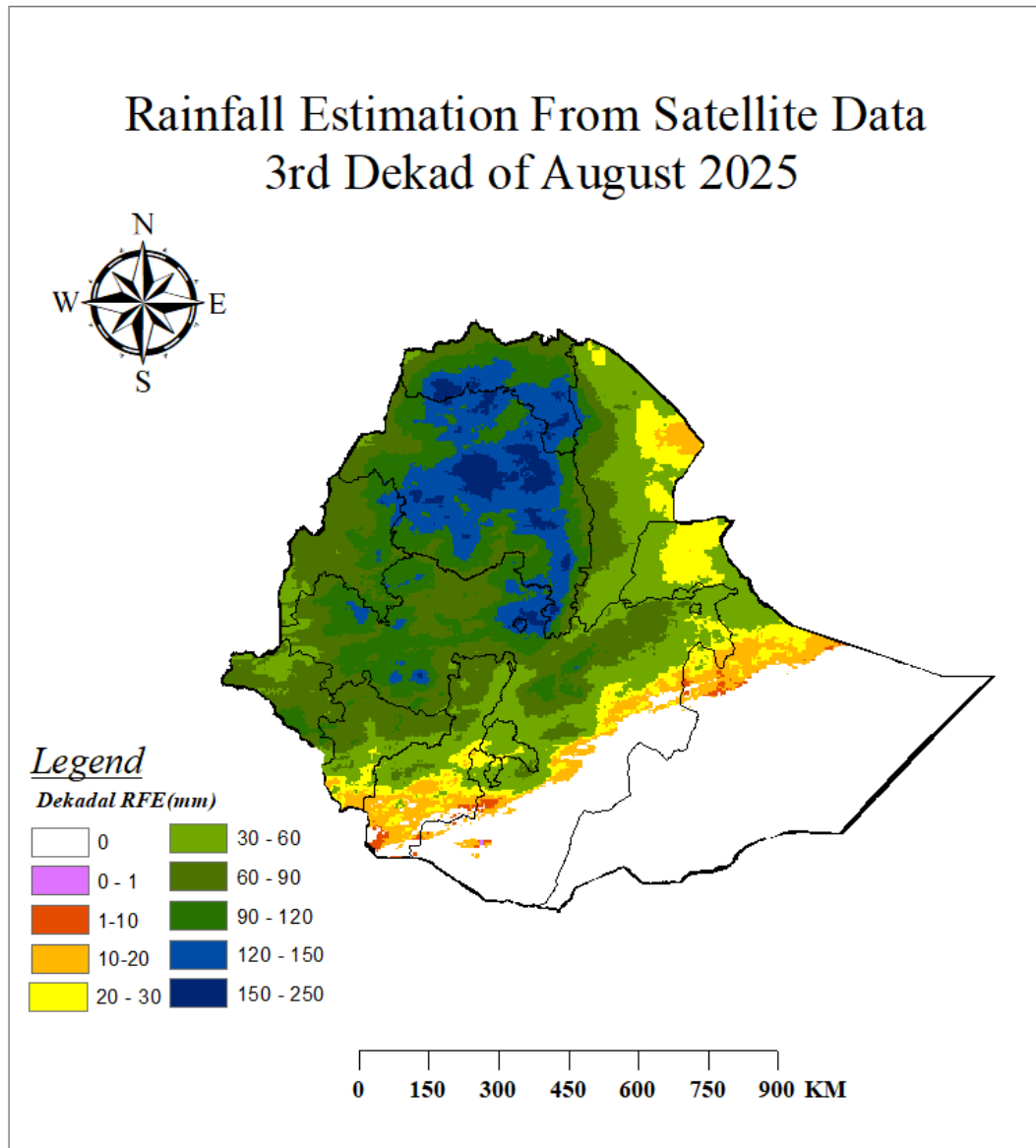
Introduction

Satellite remote sensing is often used to estimate vegetation distribution and productivity at large spatial scales. The normalized difference vegetation index (NDVI) is the most widely used surrogate for large-scale assessments of vegetation greenness and has been applied in a wide range of studies (Brandt et al. 2015, Chen et al. 1998; Santos and Negri, 1997; Zhang et al 2009). The spatial distribution of remotely sensed NDVI and consequently of terrestrial vegetation, is a function of prevalent climatic conditions such as rainfall and temperature. The relationship between NDVI and rainfall is well established at various spatial and temporal scales (Davenport et al. 1993; Grist et al. 1997; Nicholson et al. 1990; Potter and Brooks 1999; Wang et al. 2001). The results of these studies, although varying, indicate that rainfall is an important predictor of the geographical distribution of vegetation in many environments, particularly in transitional zones, such as from humid to arid and semi-arid environments (Zhao et al. 2015) as found in the Sahel of Africa.

Rainfall is a crucial resource in many socioeconomic activities, and particularly for those African countries relying predominantly on rain-fed agriculture. Many countries have been affected by rainfall variability and long-term changes in both rainfall amount and distribution over recent decades. However, the number of rain gauges throughout Africa is small and unevenly distributed, and the gauge network is deteriorating. Satellite rainfall estimates are being used widely in place of gauge observations or to supplement gauge observations. (Tufa dinku et al).

In this bulletin, the 3rd Dekad of August 2025 satellite rainfall estimation and vegetation greenness was produced with the help of TAMESAT and METOSAT vegetation product. During this dekad, some part of Kiremt rain benefiting areas receive moderate to heavy rainfall as result of strong relationship between rainfall and Normalized vegetation index (NDVI) some kiremt rain benefiting areas (Northern, Northwest and central) of the country was covered by Vegetation. On the other hand, southern, eastern and southeast part of the country receive minimum to no rainfall and the low to bare greens was observed in the country.

Rainfall Estimation from Satellite Data

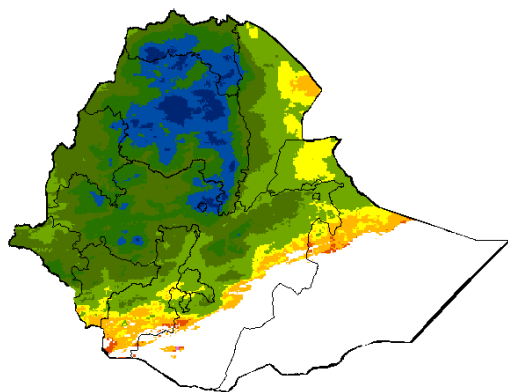
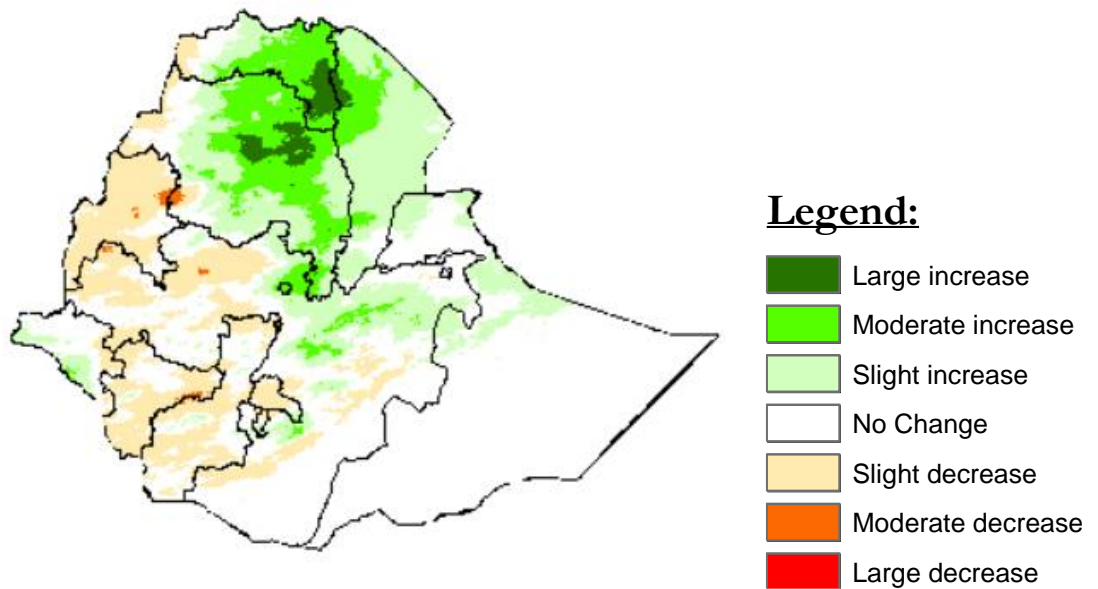


Rainfall distribution

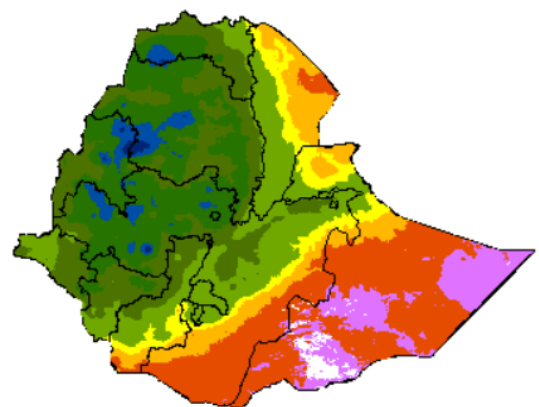
The Kiremt season, spanning from June to September, marks the main rainy period for most part of the country (northern, north western and central). By the 3rd decade of August, rainfall has been observed in various parts of the country. Specifically, in Amhara, Tigray, Benishangul Gumuz, Gambella, Central Ethiopia, South West Ethiopia, Sidama, Western and central Oromia, South Ethiopia and Afar regions received between 30 – 250mm. Conversely, no rainfall has been recorded in the other parts of the country.

Comparison with climatological normal

In this dekad the comparison of satellite rainfall estimation and climatological average shows that there was moderate to slight increase of rainfall was observed in most part of Amhara, Tigray and some part of Afar region. On the other hand, slight decrease of rainfall was observed in a Benishangul Gumuz, southwest Ethiopia, south Ethiopia, central Ethiopia, Sidama and western Oromia regions .



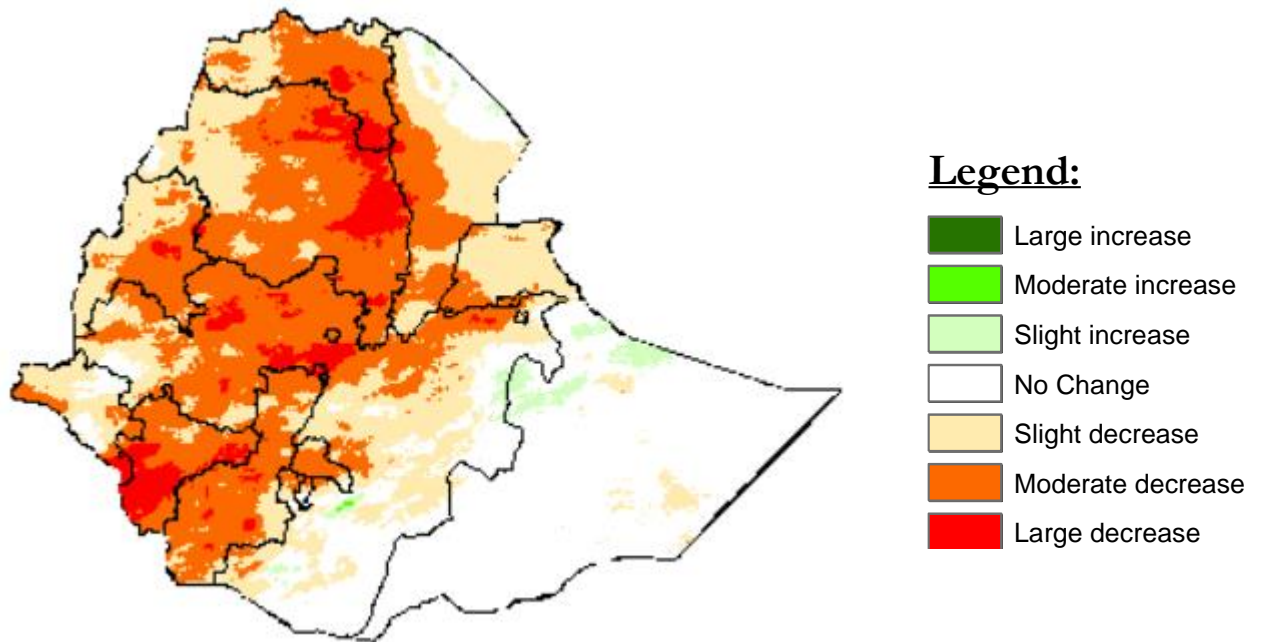
Current dekad



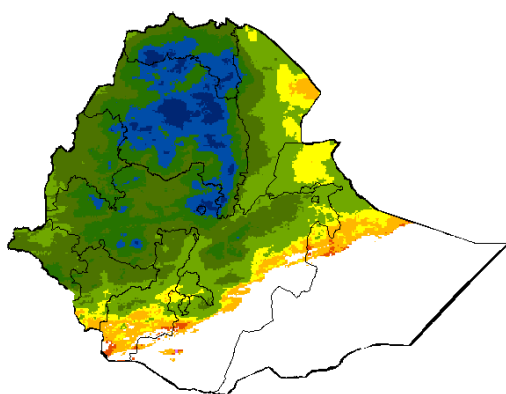
Climatological normal

Comparison with the previous Dekad

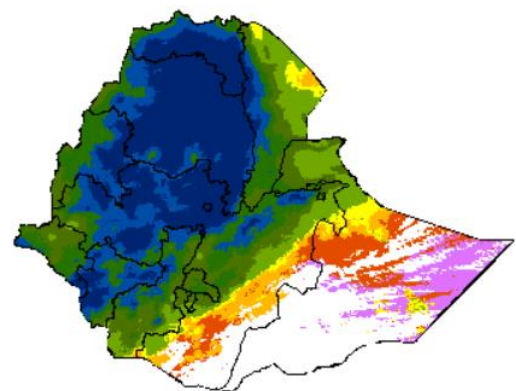
The comparison of the 3rd dekad of August 2025 and the 2nd dekad of August 2025 shows that slight increase of rainfall was observed in a few areas of the Somali region. On the other hand, a slight to large decrease of rainfall was observed over Amhara, Tigray, Benishangul Gumuz, central and west Oromia, southwest Ethiopia, south Ethiopia, and Sidama and Afar regions. No change in the rest of the country.



Difference of two Dekad



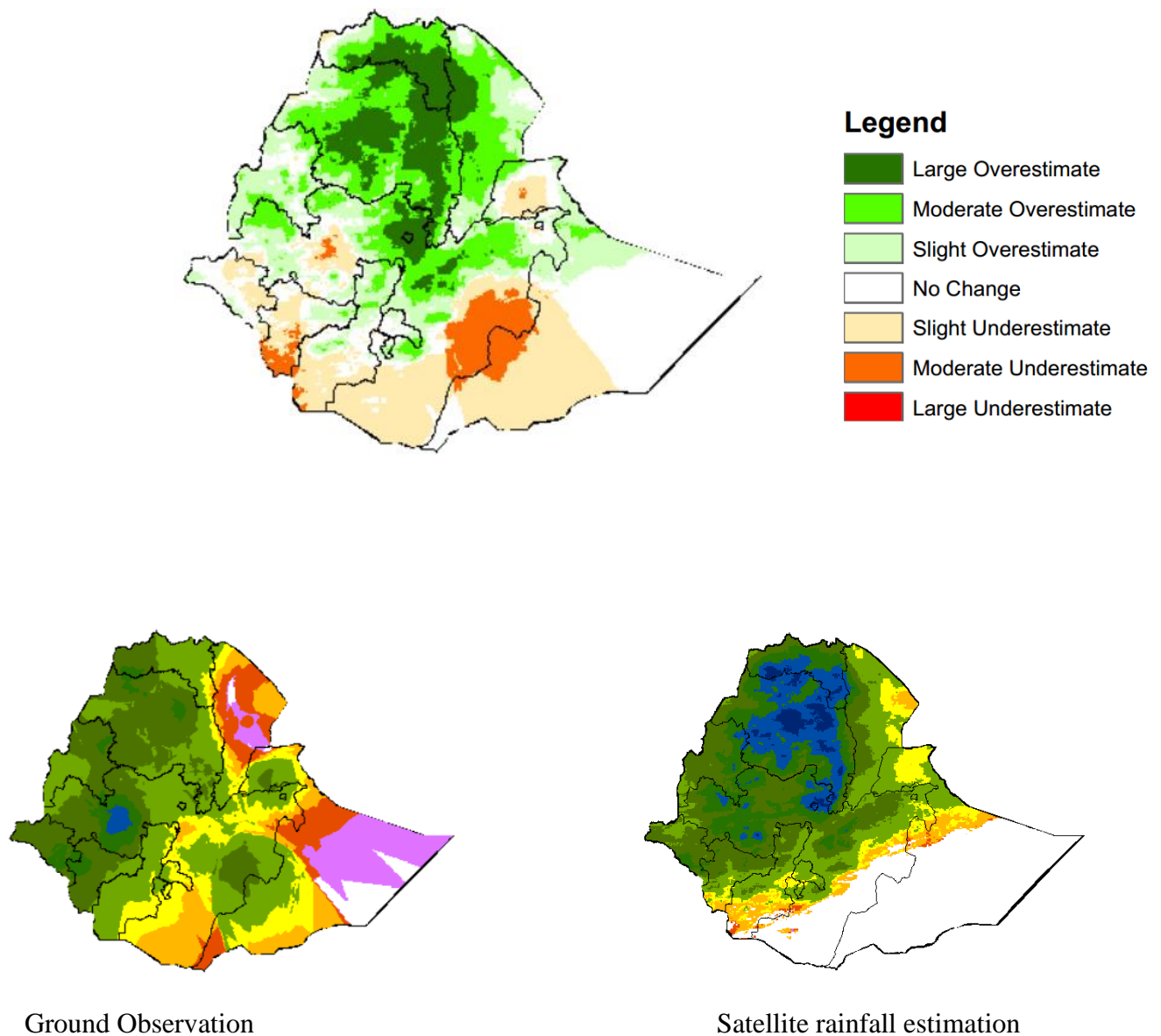
Current dekad



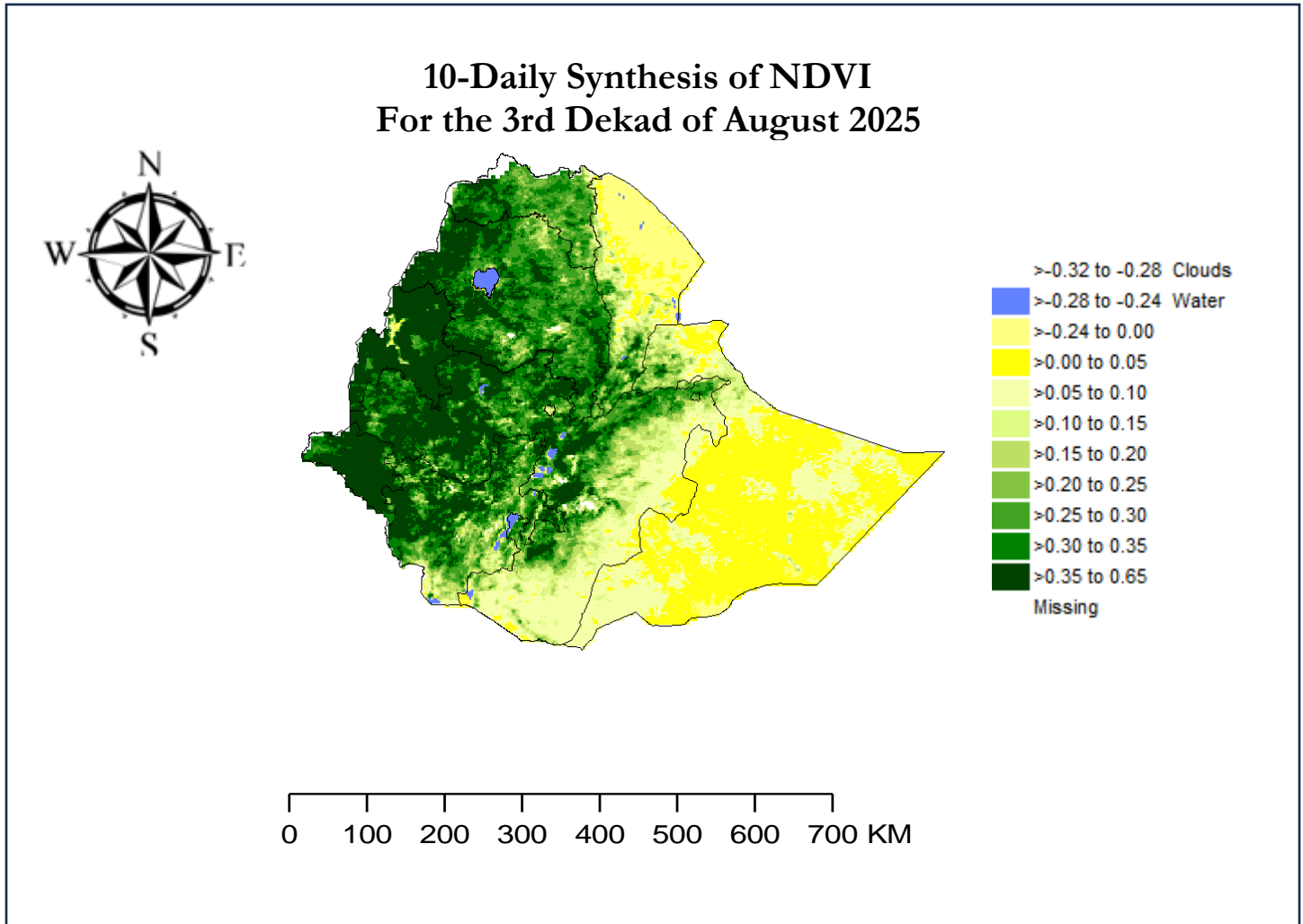
Previous dekad

Comparison with the ground observation

The satellite rainfall estimation shows that there was an Overestimate over Tigray, Amhara, Afar, and some part of Oromia regions. On the other hand, moderate to slight underestimate was observed over some part of Oromia, Somali, and south-west Ethiopia regions. There is no significant difference on the rest parts of the country; it shows the same pattern as compared with the Actual.



10-Daily Synthesis of NDVI



Assessment of synthesis NDVI for the 3rd dekad of August 2025

NDVI distribution for this dekad declared high greenness over some parts of the country. Whereas low NDVI value have been, observe over most parts of the country. Hence, Tigray, Amhara, Benishangul Gumuz, South-west Ethiopia, Sidama, South Ethiopia, western Oromia, Adjoin areas of Oromia and Sidama and Gambella regions covered by high to moderate greenness. Afar, Somali, Benishangul Gumuz and some part of Oromia regions covered by low to bare greenness. (Refer the *actual* figure above).

Comparison with the Climatological Normal

The comparison of current dekad with climatological normal shows that a large to small decreases of greens was observed in Benishangul Gumuz, Sidama, Central Ethiopia, Gambella, and most part of Oromia regions. On the other hand, small increase of greenness was observed in Afar, some part of Somali and few areas of Tigray regions.

