

Seasonal Diagnostics of Climate Events for the RCC-Washington Region *January - March*

(i) Temperature

During the January - March (JFM) season, mean maximum temperatures were warmer than normal across Jamaica, southern Hispaniola, western Cuba and the Lesser Antilles. 1-2°C positive anomalies were recorded ([Fig. 1](#)). Mean minimum temperatures were warmer than average for the Lesser Antilles and were near average elsewhere ([Fig. 2](#)).

In Mexico, maximum temperatures were above average by 1-4°C in central and northwestern Mexico. Maximum temperatures were above average by 1-2°C in southern Mexico, while they were below average in northwestern parts of the country ([Fig. 1](#)). Maximum temperatures in Central America were 1-2°C above average through northern Guatemala, Belize, eastern Honduras, and eastern Nicaragua. The remainder of the region was near average.

Minimum temperatures were warmer than average by 1-2°C across many southern portions of Mexico. Parts of Sinaloa, Chihuahua, and Durango states observed below-average minimum temperatures ([Fig. 2](#)). The remainder of the country was near average. In Central America, 3-month mean minimum temperatures were warmer than average by 1-2°C across the region except for Guatemala and Belize.

(ii) Precipitation

For the JFM season, rainfall was above average over several portions of the Caribbean. The largest 3-month rainfall totals of 150-300 mm were observed in northern parts of The Bahamas, Turks and Caicos, northern Cuba, coastal portions of the Dominican Republic, and northern islands of the Lesser Antilles ([Fig. 3](#)). Seasonal rainfall totals across the rest of the Lesser Antilles ranged from 50-100 mm. Light rainfall (less than 25mm) was observed in southern Cuba, Jamaica, and portions of central Hispaniola. The greatest departures from average were registered in northern portions of The Bahamas, northern Cuba, and small northern parts of the Lesser Antilles where positive anomalies were 100 to 200 mm ([Fig. 4](#)). Rainfall was below average across parts of southern Cuba, central Dominican Republic, southern Haiti, and southern portions of the Windward Antilles by 10 mm to 50 mm.

Seasonal rainfall performance was above average in southern Mexico, and below average across much of the rest of Central America and Mexico. In Mexico, rainfall was greatest in the Northwest, South, and Yucatan Peninsula where rainfall totals of 100 mm to locally more than 300 mm were registered ([Fig. 3](#)). Moderate rains between 25 and 100mm were observed across the rest of northern Mexico and light rainfall between 10 and 25 mm was observed across much of central Mexico. The areas of heaviest rainfall in the South, Yucatan Peninsula and, northern Baja California exceeded averages by more than 100 mm ([Fig. 4](#)). Several other areas of central and northern Mexico recorded negative anomalies of 25-50 mm.

In Central America, seasonal rainfall totals ranged from 100 mm to 200 mm along the Caribbean coastline. Pockets of similar totals were present in central Honduras and in

central/southern Costa Rica, and southern Panama. Conversely, sections of southeastern Guatemala, southwestern Honduras, El Salvador, southern and western Nicaragua, and eastern Panama received no rain. Consequently, only areas along the northern coast of Honduras and a few small areas of Costa Rica and Panama exhibited positive anomalies (ranging from 10-200 mm). Large negative anomalies (100 – 200 mm) resulted from this pattern in northern and southern Guatemala, Belize, and southern Costa Rica. Lesser negative anomalies were observed through Honduras, eastern Nicaragua, eastern, eastern Costa Rica, and much of Panama.

(iii) Notable Events

Rainfall over the past season has been below average in many parts of Central America. 3-month standardized precipitation index values from January – March are less than -0.8 in northern Guatemala, and less than -1.2 in Belize, eastern Honduras and eastern Nicaragua indicating significantly dry conditions ([Fig. 5](#)).

Maximum temperatures have risen consistently above average during many portions of the season for large swaths of Central America. These temperatures combined with winds and dry conditions to cause an active fire season – most notably in Guatemala. Increased evaporation compounding already dry ground conditions has led to low stream flows across many areas, including El Salvador, Guatemala, Honduras, and Nicaragua that may adversely affect irrigation upon the start of the next growing season. In Guatemala, this is adversely affecting energy production where a declaration of emergency is valid through June.

Both short and long-term drought continue to affect Mexico throughout the dry season. More than half of the country (about 57%) was classified under moderate to extreme drought according to the North American Drought Monitor as of the end of March. The country's winter corn crop, notably around the Gulf of California, is negatively impacted by drought. This reduced yield will elevate the price of corn and tortillas in the country.

(iv) Sea Surface Temperature and Circulation

During the JFM season, sea surface temperature (SST) remained warmer than average, but cooled steadily across the Central and East Pacific. The largest anomalies (2.0 - 2.5°C) started the season in the East Pacific, and by March the largest anomalies were more centrally located in the Pacific and were only 1.0-1.5°C above average. The Niño3.4 index decreased from start of January through the end of March. The index started at 2.0°C and ended the period at around 1.0°C. The Niño 1+2 index held relatively steady at around 1.0°C during January and February before dropping into negative values by the end of March. Based upon these observed SST patterns and a coupled atmospheric response, NOAA's Climate Prediction Center has issued an El Niño advisory (meaning that an El Niño is ongoing). However, based upon cooling waters in the Pacific basin, a transition to ENSO-neutral is expected by the April-June season (85% chance). The forecast is favorable for La Nina Development during the Northern Hemisphere Summer. There is a 60% chance of La Nina by June-August 2024. As a result, a La Nina watch is also issued by the CPC.

Within the USRCC region, SST was above average throughout the much of the Gulf of Mexico and the Caribbean with anomalies of 0.5-1.5°C ([Fig. 6](#)). The larger positive anomalies (1.0 – 1.5°C) were found in the southern Caribbean, the bay of Campeche and a portion of central Gulf of Mexico. The tropical Atlantic also exhibited warmer than average SST (1.0-1.5°C anomalies). SST was warmer than average (by 1.0-2.0°C) across the tropical East Pacific basin and 0.5-1.0°C in most of the waters to the north. SST to the west of Costa Rica was 2.0-2.5°C above average. The waters in the Gulf of California exhibited 1.0-1.5°C positive anomalies.

The circulation pattern at 850mb during JFM featured westerly wind anomalies across southern Mexico and over Hispaniola, Puerto Rico, and the northern Lesser Antilles. Meanwhile, southerly or southwesterly anomalies were prominent over Central America, Cuba, and the southern Lesser Antilles ([Fig. 7](#)). Northwesterly anomalies were present over eastern Mexico and associated convergence over the Bay of Campeche likely helped to enhance rainfall there.

At 200mb, an enhanced sub-tropical Jet was observed across northern portions of the region. The westerly wind anomalies were observed over northern and central Mexico as well as the Gulf of Mexico, Florida, Cuba and the northern Bahamas ([Fig. 8](#)). Northerly wind anomalies were present over Central America and the Lesser Antilles. This upper level circulation pattern in the region is indicative of the presence of El Niño.

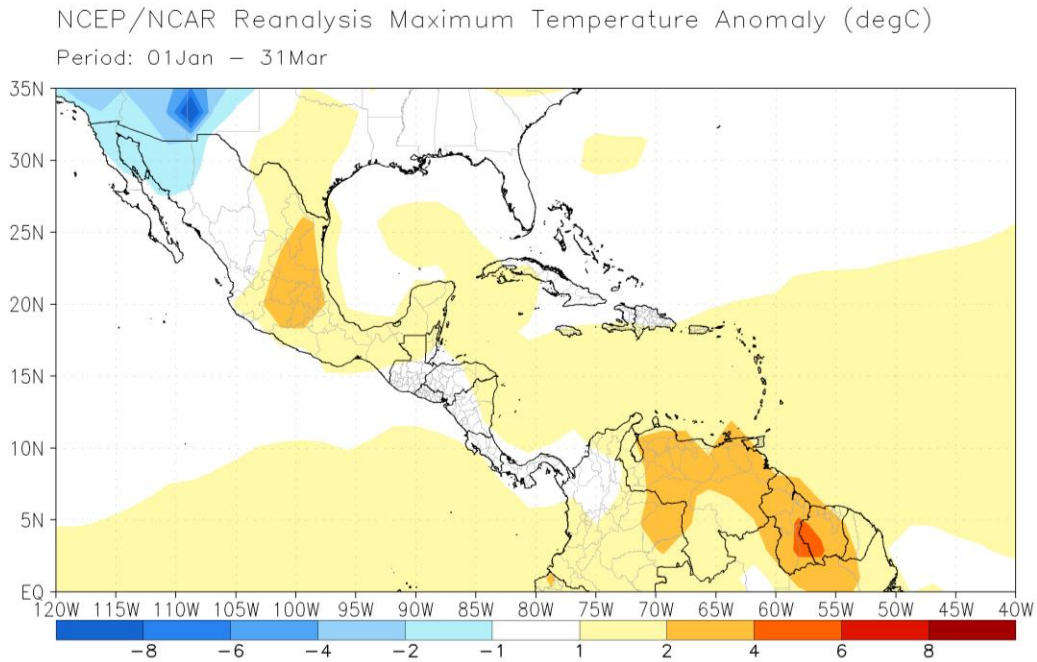


Figure 1. NCEP/NCAR Reanalysis mean maximum temperature anomaly (°C) during the 2024 JFM season. Anomalies are computed with respect to the 1991-2020 base period.

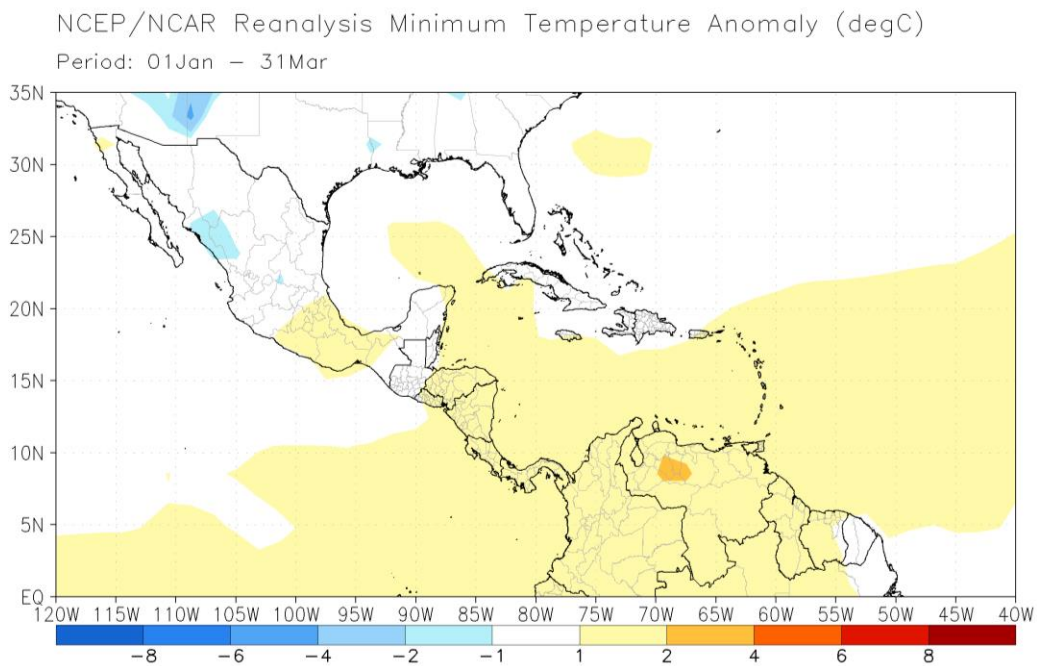


Figure 2. NCEP/NCAR Reanalysis mean maximum temperature anomaly (°C) during the 2024 JFM season. Anomalies are computed with respect to the 1991-2020 base period.

CMORPH Total Rainfall (mm)

Period: 01Jan2024 - 31Mar2024

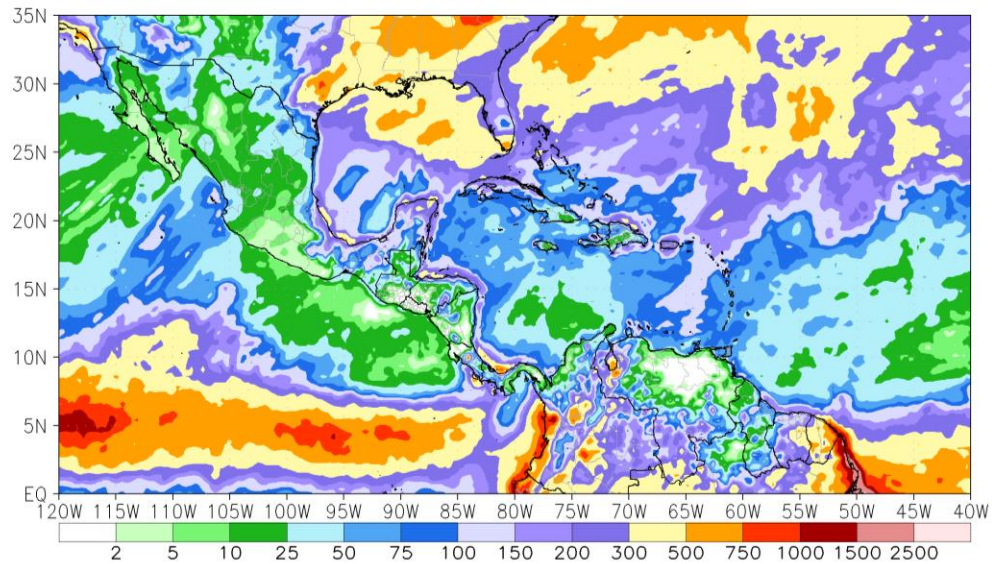


Figure 3. Satellite-estimated rainfall total (mm) during the 2024 JFM season.

CMORPH Rainfall Anomaly (mm)

Period: 01Jan2024 - 31Mar2024

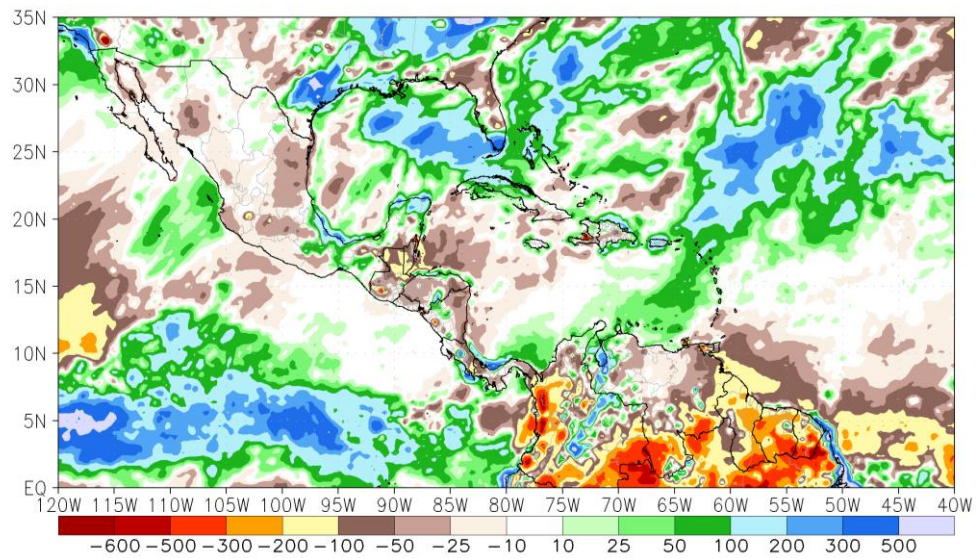


Figure 4. Satellite-estimated rainfall anomaly (mm) during the 2024 JFM season. Anomalies are computed with respect to the 1998-2012 base period.

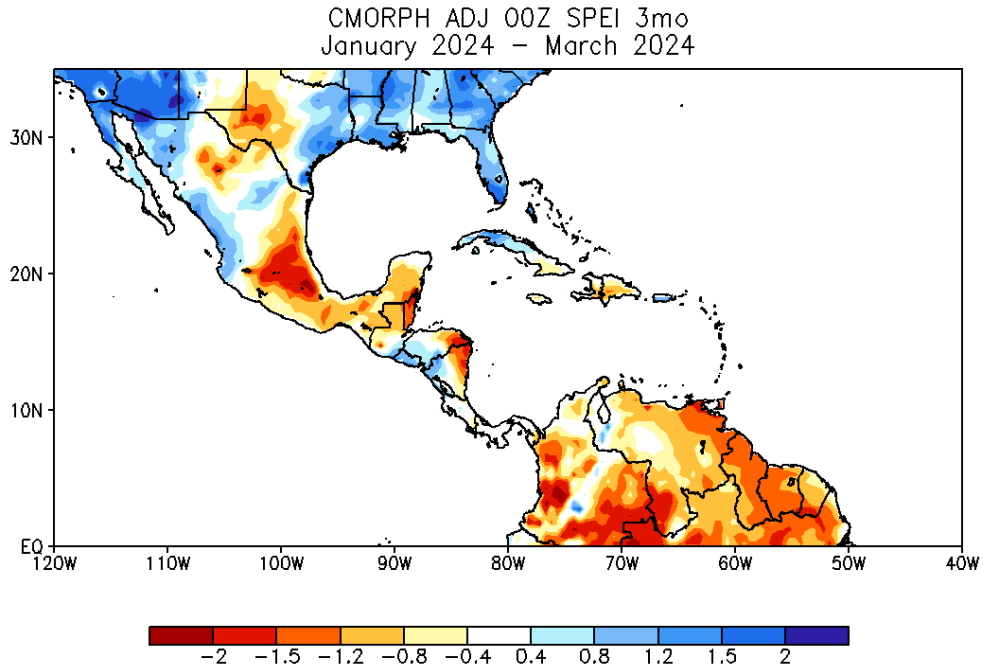


Figure 5. Standardized precipitation evapotranspiration index (SPEI) utilizing CMORPH data for the 3-month period from 1 January to 31 March, 2024 indicating the number of standard deviations by which the observed anomaly deviates from the long-term mean.

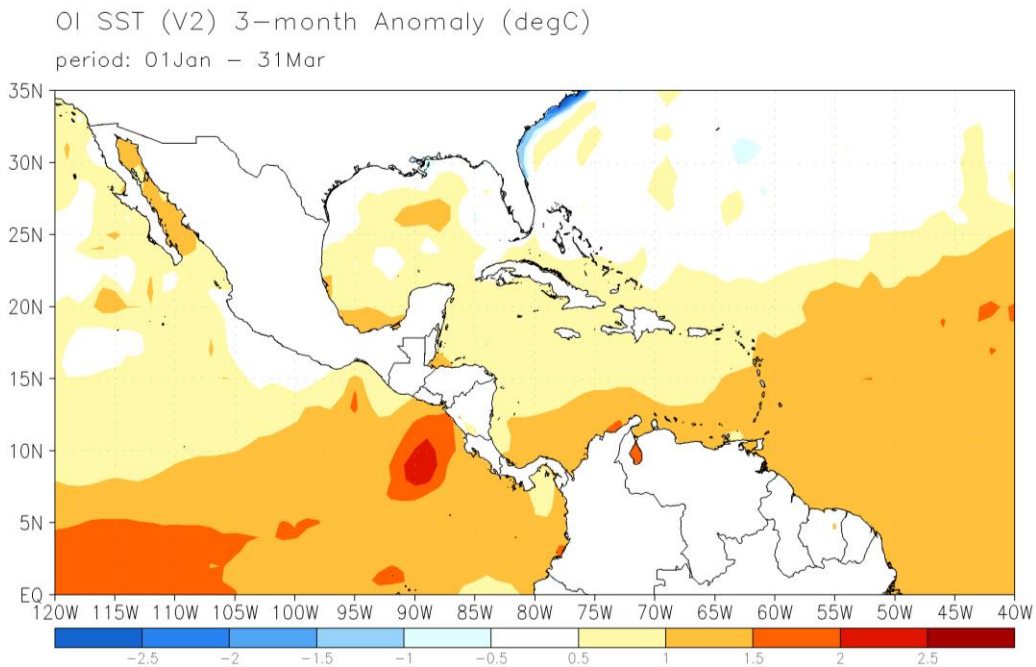


Figure 6. Average sea surface temperature (SST) anomalies (°C) for the 2024 JFM season. Anomalies are computed with respect to the 1991-2020.

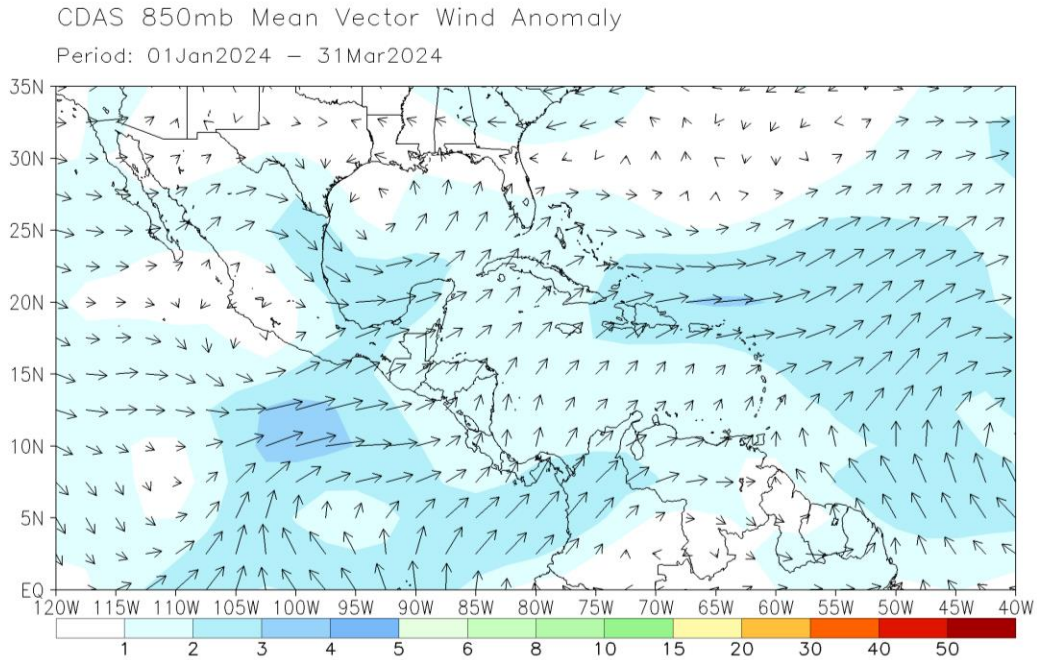


Figure 7. 850mb mean vector wind anomalies for the 2024 JFM season. Anomalies are computed with respect to the 1991-2020.

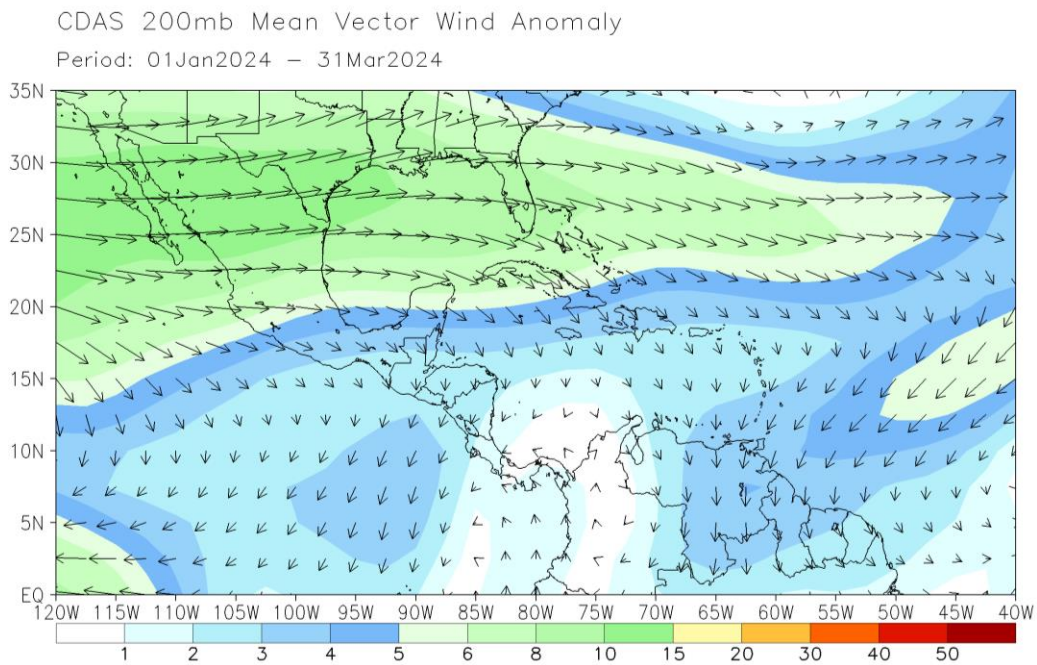


Figure 8. 200mb wind vector anomaly for the 2024 JFM season. Anomalies are computed with respect to the 1991-2020.

30 April 2024

Update prepared by Climate Prediction Center / NCEP