Monthly Diagnostics of Climate Events for the RCC-Washington Region

(i) Temperature

During the month of March, mean maximum temperatures (Tmax) were warmer than average over Cuba, Jamaica, southern Hispaniola, and the Lesser Antilles (**Fig. 1**). Most of the Bahamas and Greater Antilles observed near-average Tmax. Mean minimum temperatures (Tmin) were also warmer than average across the Lesser Antilles, Cuba, and Jamaica by 1 – 2°C. Hispaniola and most of the Bahamas were the exception, registering near-average temperatures (**Fig. 2**).

In Mexico, Tmax were warmer than average by 1 – 4°C across southern portions of the country and the Yucatan Peninsula. Central and eastern states were warmer than average by 2 – 6°C (**Fig. 1**). Conversely, northwestern Mexico, including much of the Baja California Peninsula, registered negative Tmax anomalies of 1 – 4°C. In Central America, positive Tmax anomalies (1 – 4°C) were observed in northern Guatemala, Belize, and eastern Nicaragua. Tmax was near average elsewhere. Tmin were warmer than average (1 – 4°C anomalies) in southern and parts of eastern Mexico, along with the Yucatan Peninsula (**Fig. 2**). Conversely, Tmin were 1 – 2°C cooler than average in parts of central and western Mexico. The remainder of Mexico observed near-average Tmin. In Central America, Tmin were slightly above average by 1 – 2°C over the region, with the exception of eastern Panama.

(ii) Precipitation

During March, the heaviest rains were observed in Cuba and the Bahamas. Monthly totals of more than 100 mm up to 200 mm were observed (**Fig. 3**). These amounts were well-above normal by as much as 100 mm or more (**Fig. 4**). Light to moderate rainfall totals occurred in Jamaica and Hispaniola with as much as 25 mm in coastal Dominican Republic and as little as 0 mm in the center of the Island. The Windward Antilles received 10 – 25 mm of rainfall. While the observed rainfall in Hispaniola resulted in negative anomalies between 10 mm and 50 mm, little in the way of anomalies resulted in the Lesser Antilles.

Little rain was received across most of Mexico. However, localized heavy rainfall was received locally in the Yucatan Peninsula (more than 100 mm) and northwestern Baha California (50 – 100 mm) (**Fig. 3**). Some moderate rains were observed along Mexico's Gulf of Mexico coast. Due to the lack of March rain, negative anomalies (10 - 50 mm) were widespread throughout eastern and southern Mexico (**Fig. 4**). In Central America, some localized heavy rains were received while many other areas did not receive any rain. Localized parts of northern and central Honduras, north-central Nicaragua, Costa Rica, and western Panama, received the highest amounts of 75 – 150 mm. Some other portions of Honduras, as well as central Guatemala, received moderate rain. Dry portions of the area included northern and southern Guatemala, El Salvador, Belize, southern Nicaragua, and northern Costa Rica. The pattern resulted in some substantial negative anomalies (25 – 100 mm) in Guatemala, Belize, and eastern Panama. The heaviest localized rainfall amounts were more than 100mm above average in central Honduras, southern Costa Rica, and north-central Panama

(iii) Notable Events

Maximum temperatures have risen consistently above average during the month for large swaths of Central America. These temperatures combined with winds and dry conditions led to elevated fire danger in many areas. 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 56%) was classified under moderate to extreme drought according to the North American Drought Monitor as of the end of February (**Fig. 5**). 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 March, sea surface temperatures (SST) remained above average in the equatorial East and Central Pacific. However, the magnitude of the anomalies continued to decrease during the month. Positive SST anomalies of 0.5-1.5°C stretched from 90W longitude westward past 140E longitude. The Niño3.4 index only decreased slightly during March from 1.3°C to 1.2°C. These values are indicative of a 'moderate' but weakening El Niño. The Niño 1+2 index dipped slightly negative with the emergence of a small area of below average SST in near Ecuador. Based upon the observed SST patterns and Pacific atmospheric anomalies, NOAA's Climate Prediction Center has an 'El Niño advisory'. El Niño is expected to transition to ENSO-neutral during April-June 2024 with an 85% chance. The forecast also tilts the odds towards the development of a La Niña by June-August, 2024 (~60% chance). Consequently, a 'La Niña Watch' is also issued.

Narrowing the focus to the RCC region, SST was above average in the Gulf of Mexico, with anomalies ranging from 0.5°C to around 2°C (**Fig. 6**). Southern and eastern portions of the Caribbean exhibited positive SST anomalies of 1-1.5°C while northern and western portions exhibited positive anomalies of 0.5-1.0°C. The sub-tropical and tropical Atlantic was much warmer than average with 1.0-2.0°C anomalies. The tropical East Pacific basin widely had warmer than normal SST. The waters west of Nicaragua and Costa Rica exhibited SST anomalies of 1.5 – 3.0°C. Positive anomalies of 0.5 – 1.5°C were observed in the Gulf of California.

The 850mb circulation pattern featured westerly wind anomalies over the tropical eastern Pacific as well as most of the Caribbean islands. Southwesterly anomalies were present over Central America and southern Mexico (**Fig. 7**). Meanwhile, a cyclonic anomaly was present in the Gulf of Mexico. At the 200mb level, strongly anomalous westerly flow was present over Mexico and the Gulf of Mexico. Westerly anomalies also dominated over the eastern Caribbean as part of a larger cyclonic circulation anomaly. Northerly anomalies were observed over Central America (**Fig. 8**).

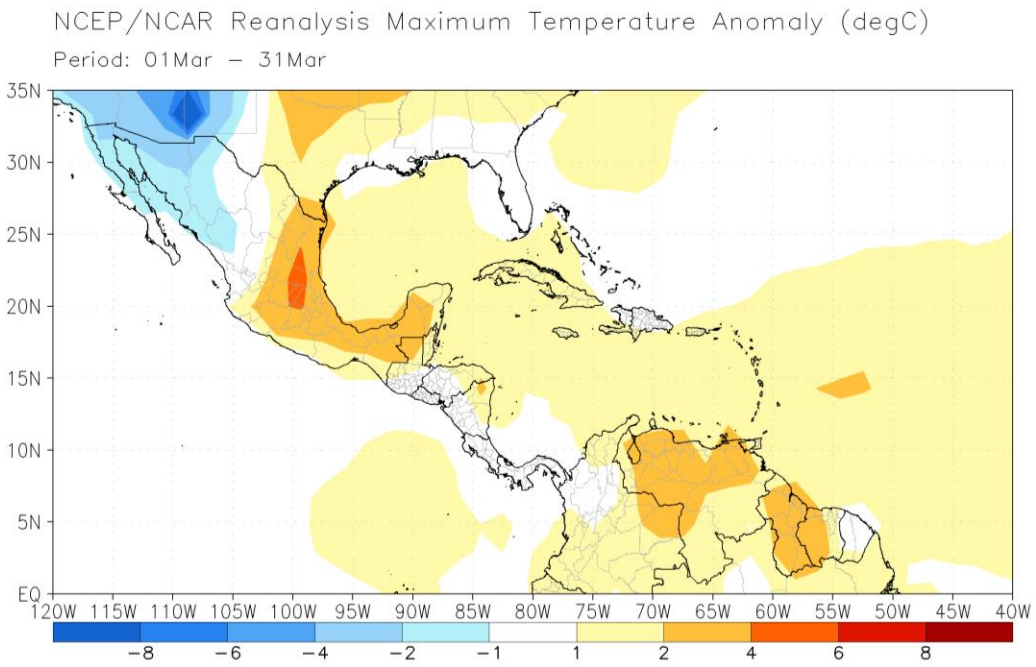

Figure 1. NCEP/NCAR Reanalysis mean maximum temperature anomaly (°C) during the month of March 2024. Anomalies are computed with respect to the 1991-2020 base period.

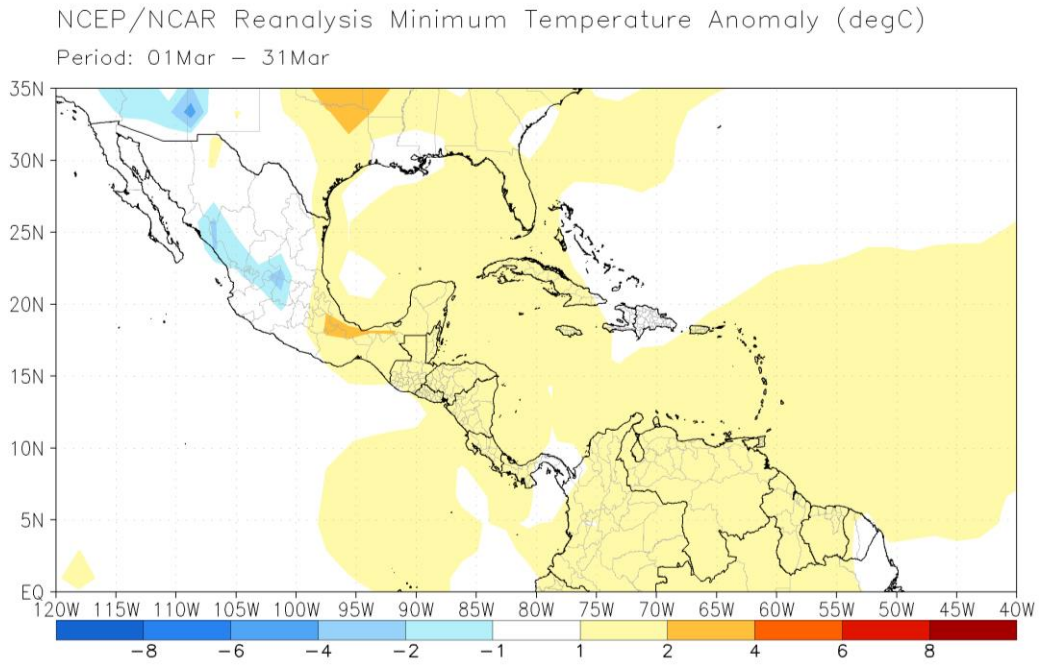

Figure 2. NCEP/NCAR Reanalysis mean minimum temperature anomaly (°C) during the month of March 2024. Anomalies are computed with respect to the 1991-2020 base period.

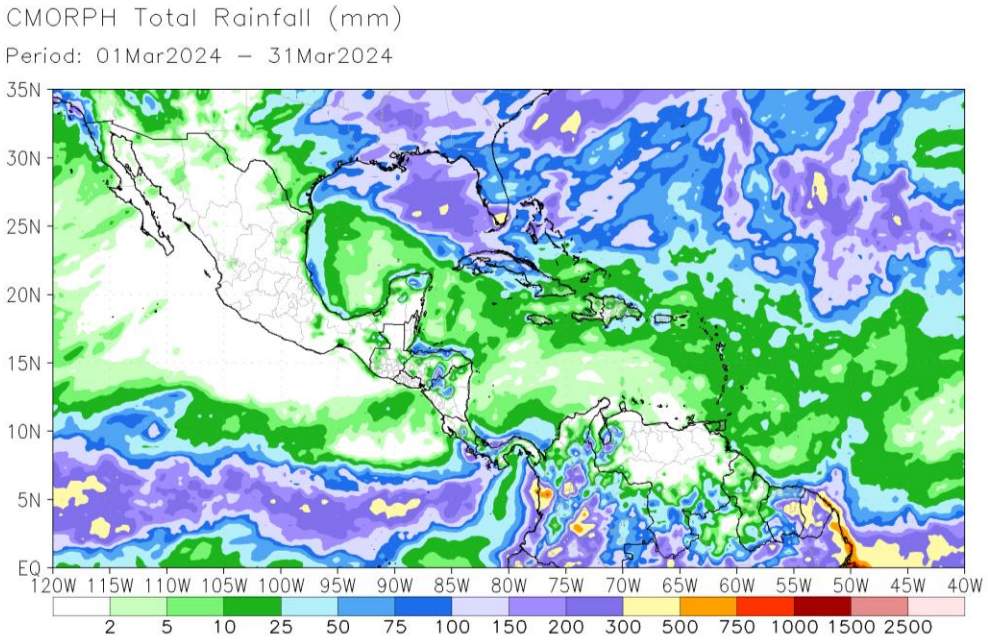

Figure 3. Satellite-estimated rainfall total (mm) during the month of March 2024.

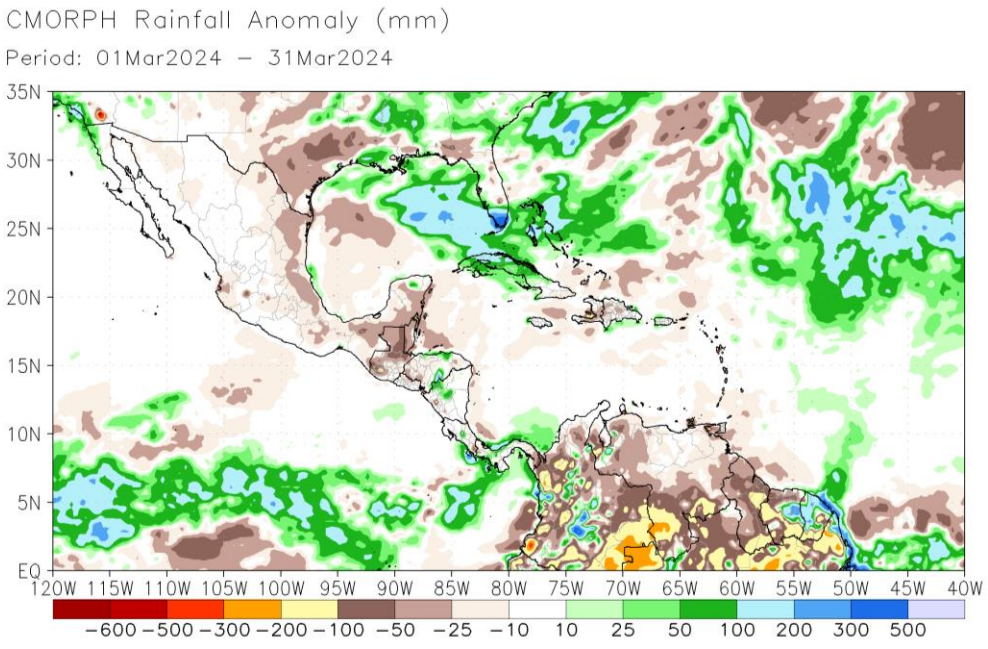

Figure 4. Satellite-estimated rainfall anomaly (mm) during the month of March 2024. Anomalies are computed with respect to the 1998-2012 base period.

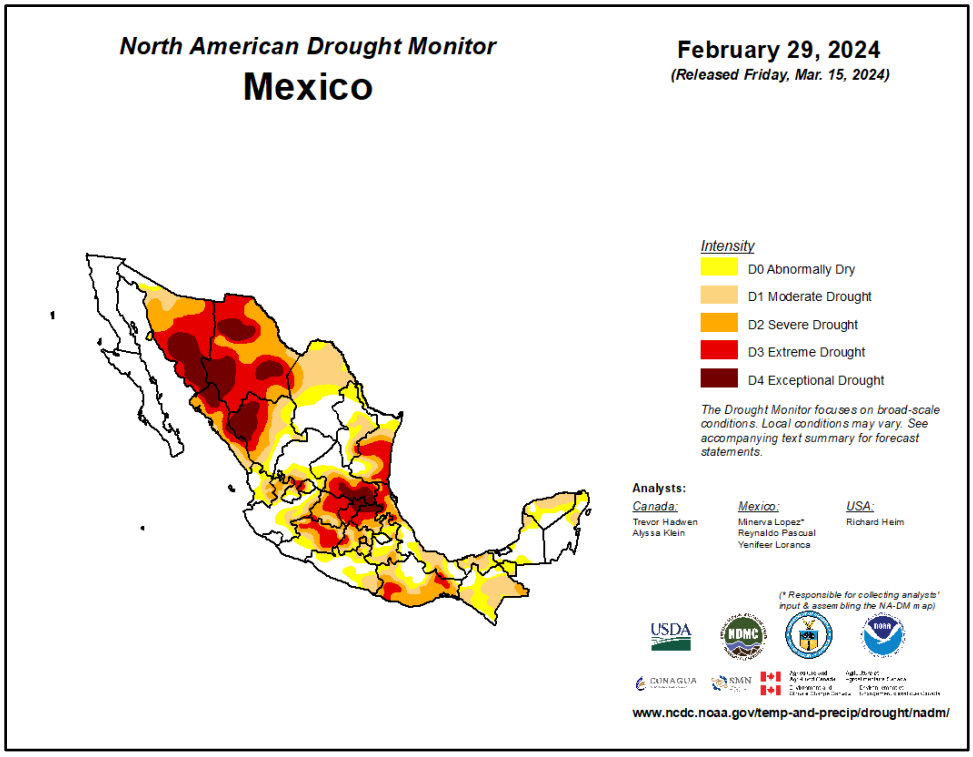

Figure 5. Standardized precipitation index (SPI) utilizing CMORPH data for the 1-month period from 1 February, 2024 to 29 February, 2024 indicating the number of standard deviations by which the observed anomaly deviates from the long-term mean.

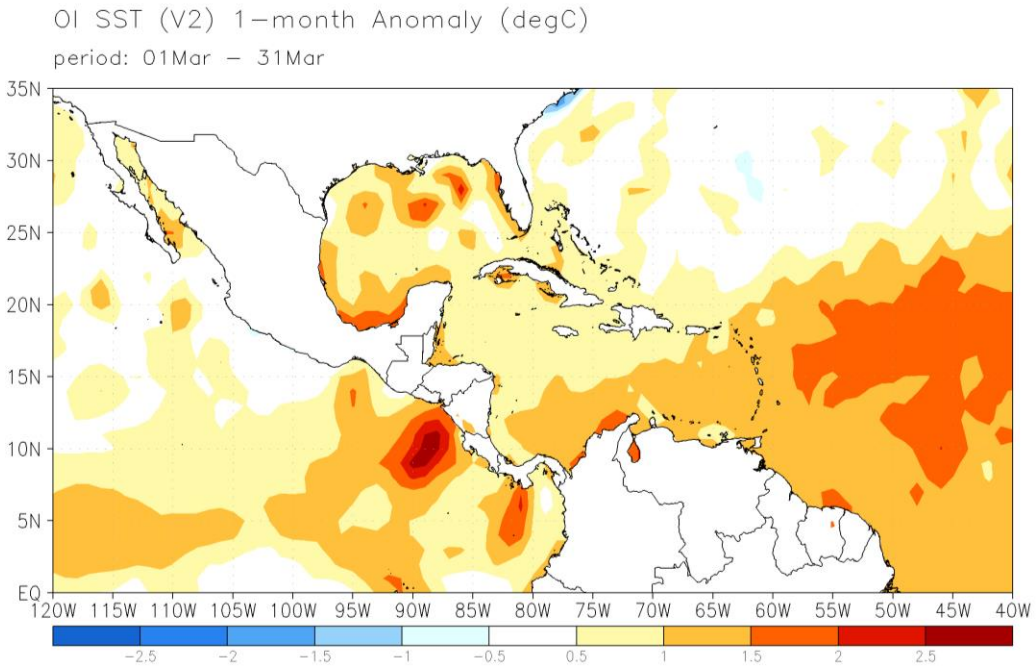

Figure 6. Average sea surface temperature (SST) anomalies (°C) for the month of March 2024. Anomalies are computed with respect to the 1991-2020 base period.

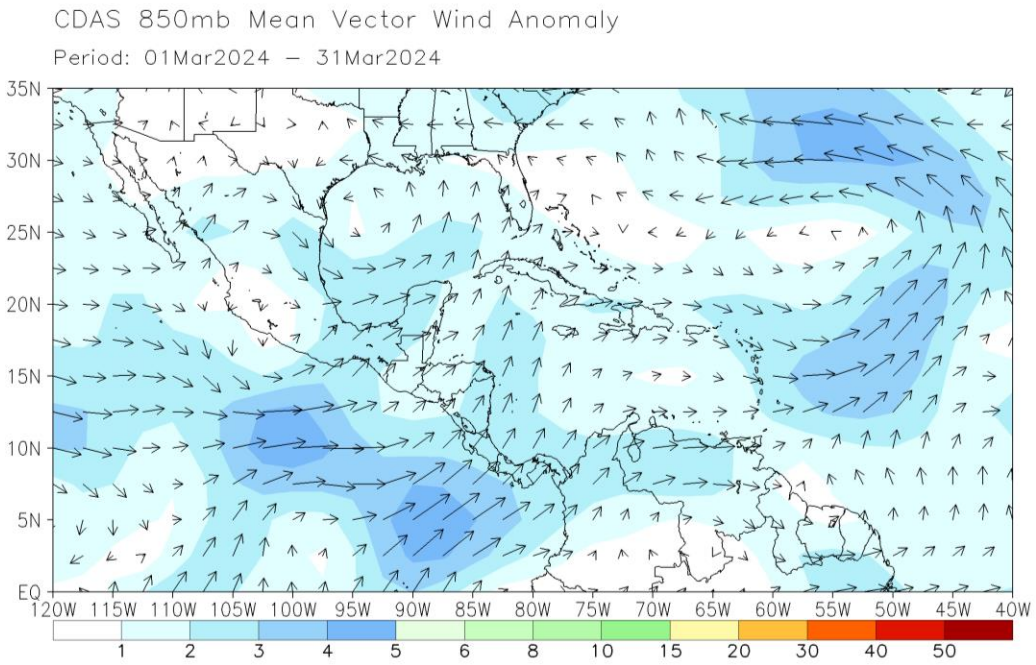

Figure 7. 850mb mean vector wind anomalies for the month of March 2024. Anomalies are computed with respect to the 1991-2020.

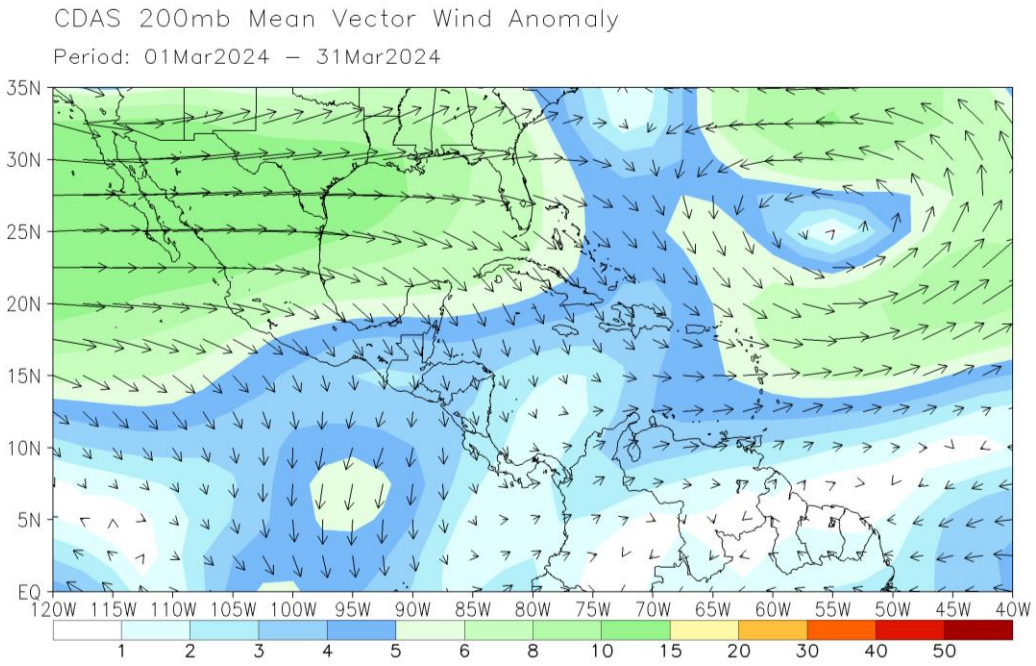

Figure 8. 200mb wind vector anomaly for the month of March 2024. Anomalies are computed with respect to the 1991-2020.

18 April 2024

Update prepared by Climate Prediction Center / NCEP