WEATHER CLIMATE WATER

WORLD METEOROLOGICAL ORGANIZATION

GLOBAL SEASONAL CLIMATE UPDATE

TARGET SEASON: October-November-December 2023

Prepared: 26 September 2023

Summary

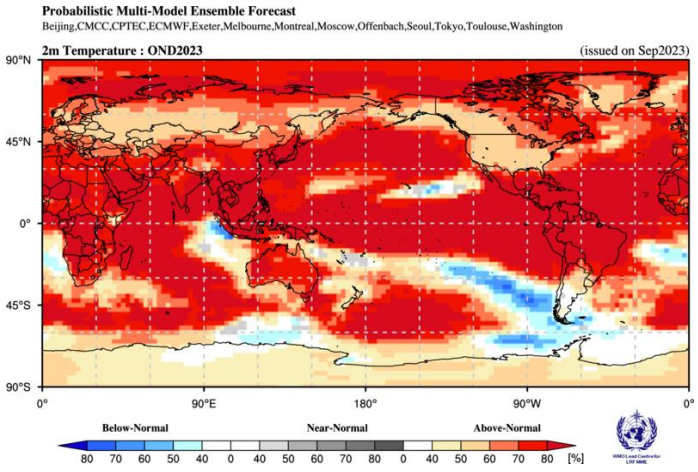
During June-August 2023, Pacific Niño sea-surface temperature (SST) index in the eastern Pacific (Niño 1+2) were much above-normal and the other three indices in the central Pacific were also above-normal. The observed SST conditions in the equatorial Pacific were characterized by an El Niño state. The observed Indian Ocean Dipole (IOD) was near normal. The North Tropical Atlantic (NTA) SST index was above-normal and the South Tropical Atlantic (STA) SST index was near-normal (but was positive) and reflected widespread warmth in the tropical Atlantic north of the equator.

Above-normal sea-surface temperature anomalies in the Niño 3.4 and Niño 3 regions are predicted to strengthen during the October-December (OND) 2023 season, indicating further amplification of El Niño conditions. Farther west in the Niño 4 region, above-normal sea-surface temperature anomalies are also predicted to strengthen. The Indian Ocean Dipole (IOD) index is predicted to be above-normal in OND 2023. In the equatorial Atlantic, SSTs are predicted to be above-normal in both the northern (NTA) and the southern (STA) regions during the season.

Consistent with the anticipated development of an El Niño in the equatorial central and eastern Pacific, together with the prediction of above-normal sea-surface temperatures over much of the global oceans, there is widespread prediction of above-normal temperatures over almost all land areas. Positive temperature anomalies are expected over almost the entire Northern Hemisphere except for a maritime area off the south-west coast of North America that extends into the central Pacific at about 20° N. The largest increase in probabilities for above-normal temperatures in the Northern Hemisphere is predicted generally south of about 45° N, and also over parts of Central and East Asia, north-eastern parts of North America, and in the regions north of 65° N. Elsewhere in the Northern Hemisphere, including Greenland, Europe and Asia between 45° and 65° N, and in North America north of about 30° N, the probabilities for above-normal temperature are moderately increased. There are also enhanced probabilities for above-normal temperatures over most of the Southern Hemisphere, except for the areas bordering the eastern tropical Indian Ocean, and southeast Pacific between 120 and 70° W where probabilities for below-normal temperature is enhanced. Over most other Southern Hemisphere land areas north of about 30° S, the probabilities for above-normal temperature are strongly increased. However, over New Zealand, and over the central and eastern Pacific Ocean islands south of about 20° S the probabilities for above-normal temperatures are only weakly increased. There is no clear signal over South America south of about 35° extending to the southern tip of the continent.

Predictions for rainfall are similar to some of the canonical rainfall impacts of El Niño, which is expected to strengthen in OND 2023. Probabilities for above-normal rainfall are enhanced over a narrow band along and just north of the equator from 150° E extending across the equator to the west coast of South America. Across most of the Pacific Ocean south of about 30° N, and immediately to the north of the wet band, rainfall is predicted to be below-normal. South of the equator and east of the Maritime continent, an area of strong enhancement in below-normal rainfall extends into the Indian Ocean to about 60° E and is consistent with the prediction for the positive phase of the IOD. This area of below-normal rainfall extends southeast towards the western coast of Australia, where it further extends eastward towards Tasmania. East of the Maritime continent, an area of below-normal rainfall extends towards the southeast to the Date Line where it curves south-westward towards the southeast coast of Australia. The probability for below-normal rainfall is also weakly enhanced over much of Australia. The probability for above-normal rainfall is enhanced in the Indian Ocean north of the equator and extends towards the eastern coast of Africa and into the Greater Horn of Africa, where along the equator it extends further towards western Africa. There is a weak enhancement in the probability of above-normal rainfall over the Arabian Peninsula, central and northern Asia, parts of eastern Asia, and northern Caribbean. Over North America, a weak enhancement in the probability of above-normal rainfall is predicted north of 55° N and merges with the expectations for above-normal rainfall in the Arctic latitudes. The probability for below-normal rainfall is enhanced across much of the northern part of South America north of about 25° S, southern parts of Central America and the southern Caribbean. The probability for above-normal rainfall is enhanced in South America below 30° S, however, over the extreme southern tip of the continent the probability for below-normal rainfall is enhanced and extends westward along 55° S to about 120° W.

Surface Air Temperature, OND 2023



Precipitation, OND 2023

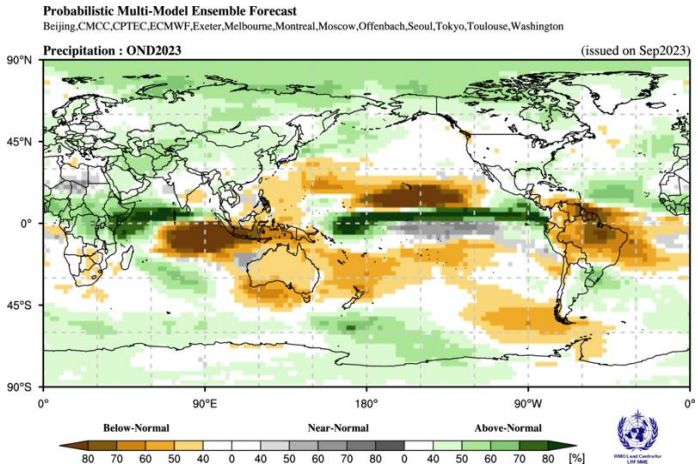


Figure 1. Probabilistic forecasts of surface air temperature and precipitation for the season October-December 2023. The tercile category with the highest forecast probability is indicated by shaded areas. The most likely category for below-normal, above-normal, and near-normal is depicted in blue, red, and grey shadings respectively for temperature, and orange, green and grey shadings respectively for precipitation. White areas indicate equal chances for all categories in both cases. The baseline period is 1993–2009.

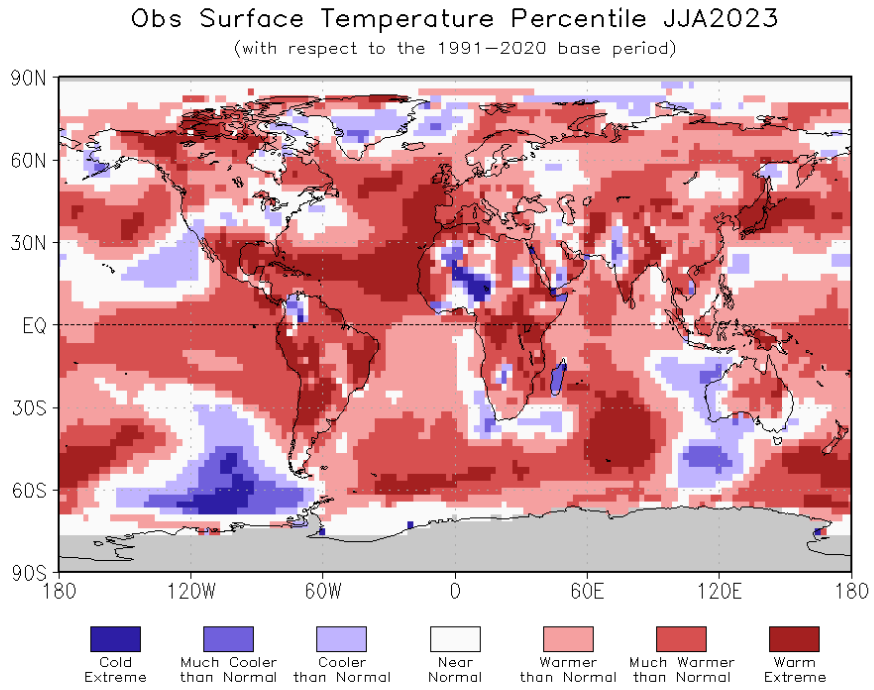
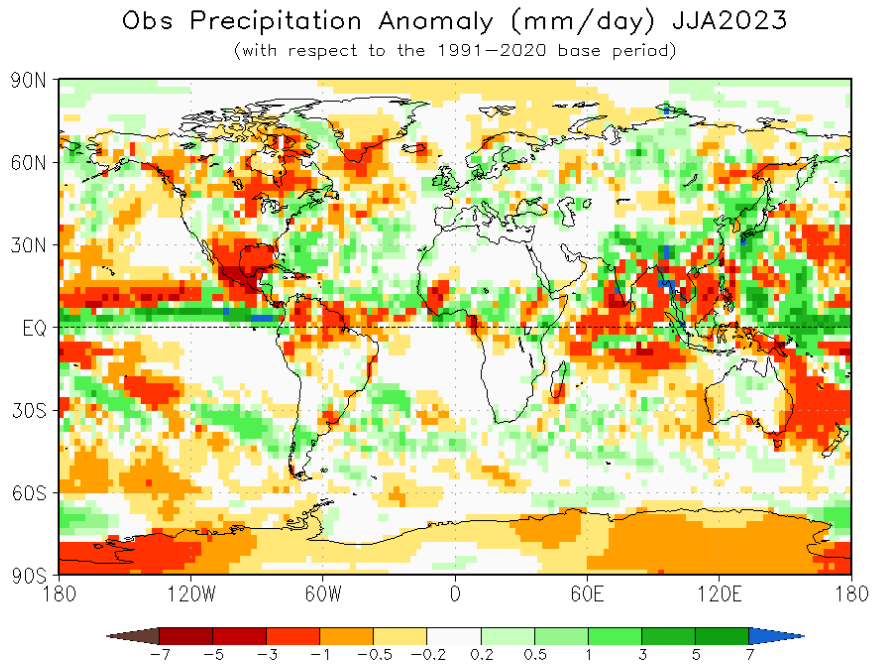


Figure 2. Observed June-August 2023 near-surface temperature anomalies relative to 1991-2020 (top). The Cooler than Normal, Near Normal, and Warmer than Normal shadings on the percentile map (bottom) indicate that seasonal mean anomalies were in the bottom, middle, and upper tercile of the 1991-2020 distribution, respectively. Regions with anomalies in the lowest and highest decile (or 10%) of the distribution are marked as Much Cooler than Normal and Much Warmer than Normal, respectively. The Cold Extreme and Warm Extreme shadings indicate that the anomalies exceeded the coldest and warmest temperature values of the 1991-2020 period for the season. Grey shading indicates areas where observational analysis was not available. (Source: U.S. Climate Prediction Center).



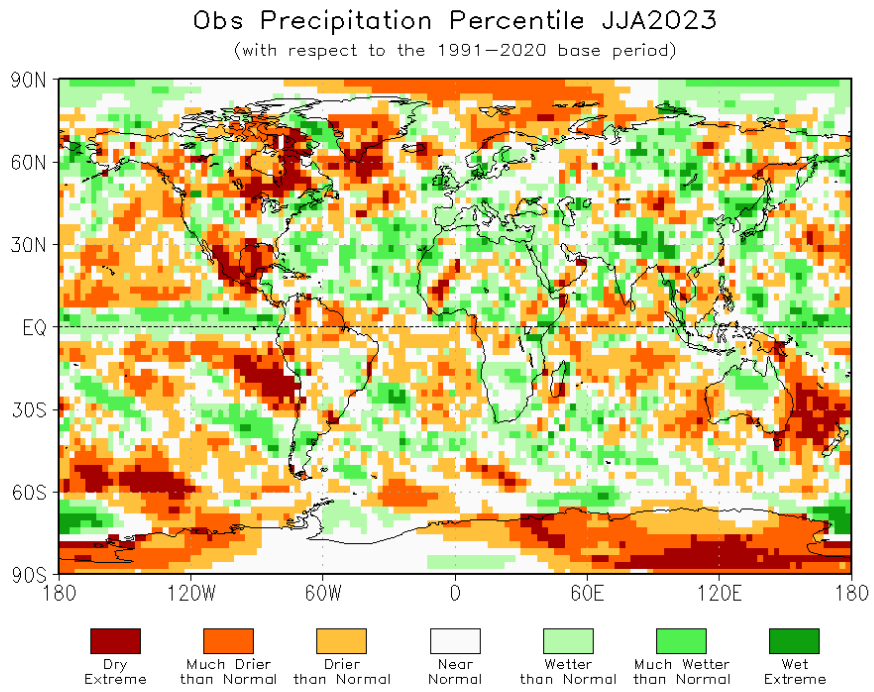


Figure 3. Observed precipitation anomalies for June-August 2023, relative to 1991-2020 base period (top). The Drier than Normal, Near Normal and Wetter than Normal shadings on the percentile map (bottom) indicate that seasonal mean anomalies were in the bottom, middle, and upper tercile of the 1991-2020 distribution, respectively. Regions with anomalies in the lowest and highest decile (or 10%) of the distribution are marked as Much Drier than Normal and Much Wetter than Normal, respectively. The Dry Extreme and Wet Extreme shadings indicate that the anomalies exceeded the driest and wettest values of the 1991-2020 period for the season. (Source: U.S. Climate Prediction Center).