WEATHER CLIMATE WATER

WORLD METEOROLOGICAL ORGANIZATION

# GLOBAL SEASONAL CLIMATE UPDATE

## TARGET SEASON: January-February-March 2024

**Prepared: 20 December 2023**

## Summary

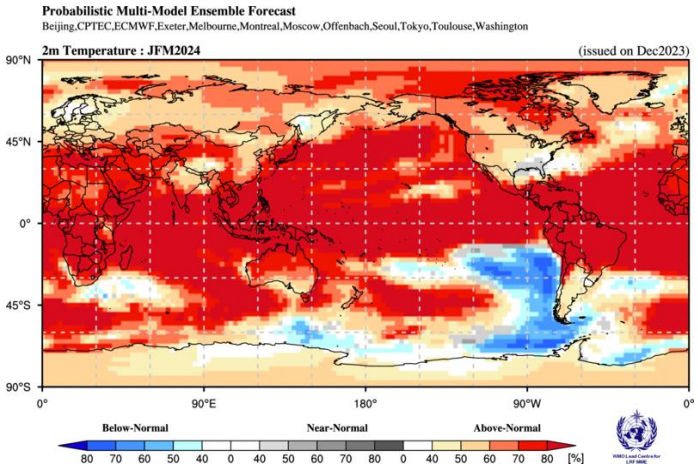
During September-November 2023, the Pacific Niño sea-surface temperature (SST) index in the eastern Pacific (Niño 1+2) was much above-normal and the other three indices in the central Pacific were also above-normal. The observed SST conditions in the equatorial Pacific were characterized by a strong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

Above-normal sea-surface temperature anomalies in the Niño 3.4 and Niño 3 regions, although are predicted to decline during the January-February (JFM) 2024, prediction indicates moderate El Niño conditions. Farther west in the Niño 4 region, the sea-surface temperature anomaly is also predicted to decline but remain above-normal. The strength of the Indian Ocean Dipole (IOD) index is predicted to also decline in JFM 2024. In the equatorial Atlantic, SSTs are predicted to be above-normal in both the northern (NTA) and the southern (STA) areas during the season.

Consistent with the anticipated continuation of 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 in the far south-eastern part of North America and over a small area of northeastern Indian subcontinent. The largest increases in probabilities for above-normal temperatures are generally south of about 40° N over Europe, Africa, and Asia, and south of about 30° N over Central America. Over much of North America, except for the south-east, and over Greenland probabilities for above-normal temperature are weakly enhanced, although the increase in probability is higher around the Hudson Bay. In the Caribbean and Central America, the probabilities of above-normal temperatures are strongly increased, and this area extends to about 30° S over South America. Extending further south, probabilities for above-normal temperatures are weakly increased. Over most of the rest of the Southern Hemisphere land areas, temperatures are predicted to experience above-normal temperature anomalies, as in the Northern Hemisphere. Thus, in Africa south of the equator, including Madagascar and the south-west Indian Ocean north of about 30° S, above-normal temperatures are predicted with high probabilities. Over Australia above-normal temperatures are predicted with moderate to high probability, but the probabilities are only weakly increased over New Zealand. Along about 20° S in the Pacific Ocean, east of the Dateline, there is a narrow band of predicted normal-to-below normal temperatures that expands southwards in the far south-eastern Pacific.

Predictions for rainfall are similar to some of the canonical rainfall impacts of El Niño, which is expected to continue in JFM 2024. Above-normal rainfall is predicted over a narrow band along and just north of the equator from 150° E extending to the west coast of South America and probabilities for above-normal rainfall are strongly enhanced. However, immediately on and south of the equator between about 165° W and 110° W, enhanced probability for normal rainfall is predicted. Across most of the Pacific Ocean immediately to the north of the wet band and to about 30° N, rainfall is predicted to be below-normal. The northern band of predicted below-normal rainfall extends from the Philippines to the north-west coast of Central America. In the Southern Hemisphere, the area of below-normal rainfall stretches across northern and western Australia, where it expands into the central Indian Ocean to about 60° E and is consistent with the prediction for the positive phase of the IOD. Probabilities in these below-normal areas are strongest in the eastern Indian Ocean and in the Pacific between about 120° E and 120° W. For the eastern Maritime continent, an area of above-normal rainfall extends northwards into southeast Asia. In the western Indian Ocean, above-normal rainfall is predicted in a C-shaped area that extends from immediately north of the equator at about 80° E into East Africa, and then south-eastwards across northern Madagascar into the central South Indian Ocean. Probabilities of above-normal rainfall are strongly enhanced over East Africa and the neighbouring ocean. To the south-west, over most of southern Africa, below-normal rainfall is predicted with low to moderately increased probabilities, while much of sub-Saharan Africa north of the equator has increased probabilities of normal precipitation. The below-normal area with moderate probabilities is predicted over southern Africa, and another in northwest Africa extending across the Atlantic to South America and the southern Caribbean. Below-normal rainfall is also predicted along the west coast of South America south of about 15° S. There are weak increases in probability for above-normal rainfall over south-eastern and eastern South America. Weak increases in probability for above-normal rainfall are also predicted over most of Asia and Europe, the northern Caribbean, south-east and north-east North America.

**Surface Air Temperature, JFM 2024**




**Precipitation, JFM 2024**

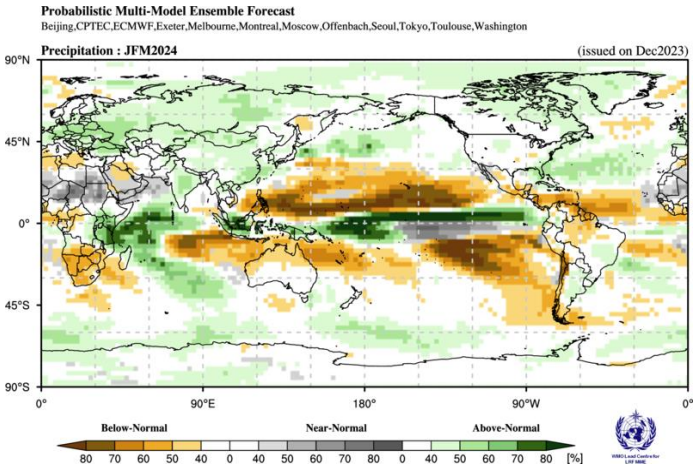
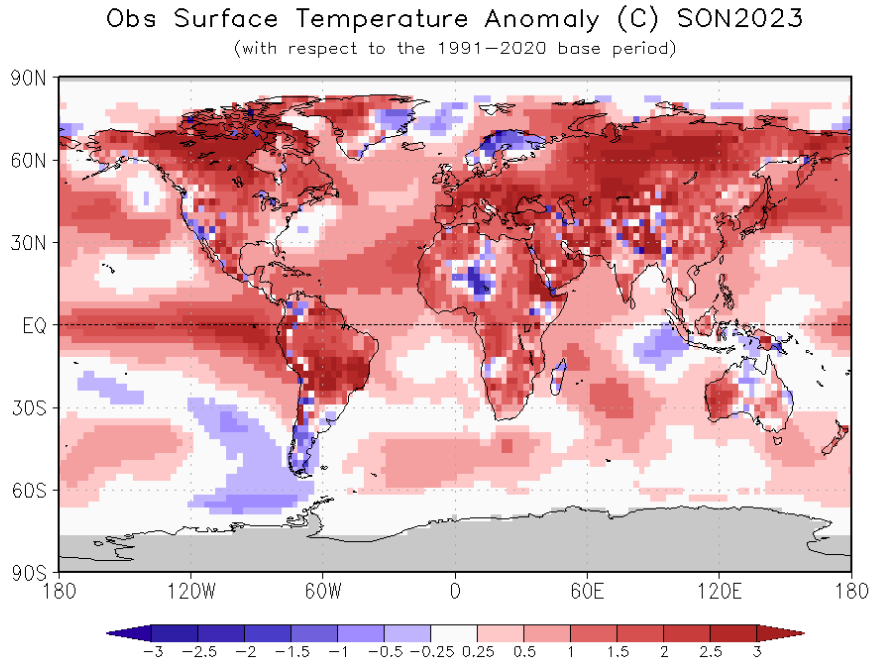



Figure 1. Probabilistic forecasts of surface air temperature and precipitation for the season January-February 2024. The tercile category with the highest forecast probability is indicated by shaded areas. The most likely category for below-normal, above-normal, and near-normal is depicted in blue, red, 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.



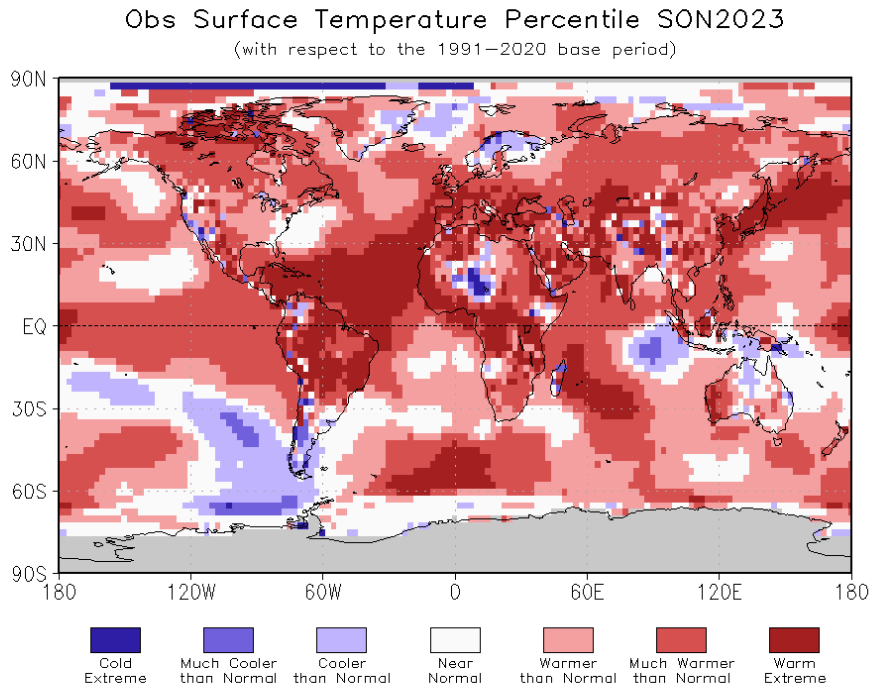
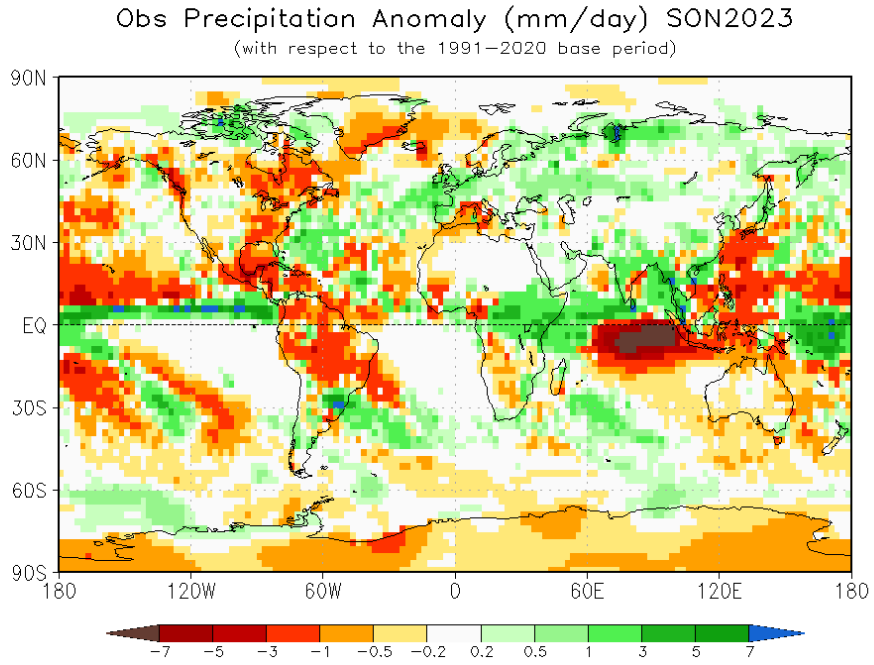




Figure 2. Observed September-November 2023 near-surface temperature anomalies relative to 1991–2020 (top). The Cooler than Normal, Near Normal, and Warmer than Normal shadings on the percentile map (bottom) indicate that seasonal mean anomalies were in the bottom, middle, and upper tercile of the 1991–2020 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).



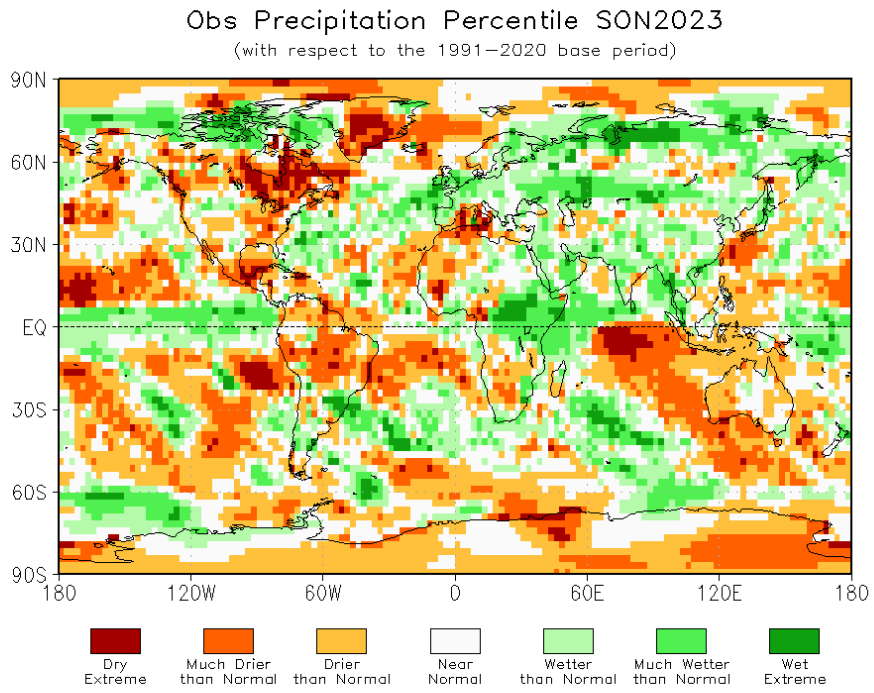




Figure 3. Observed precipitation anomalies for September-November 2023, relative to 1991–2020 base period (top). The Drier than Normal, Near Normal and Wetter than Normal shadings on the percentile map (bottom) indicate that seasonal mean anomalies were in the bottom, middle, and upper tercile of the 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).