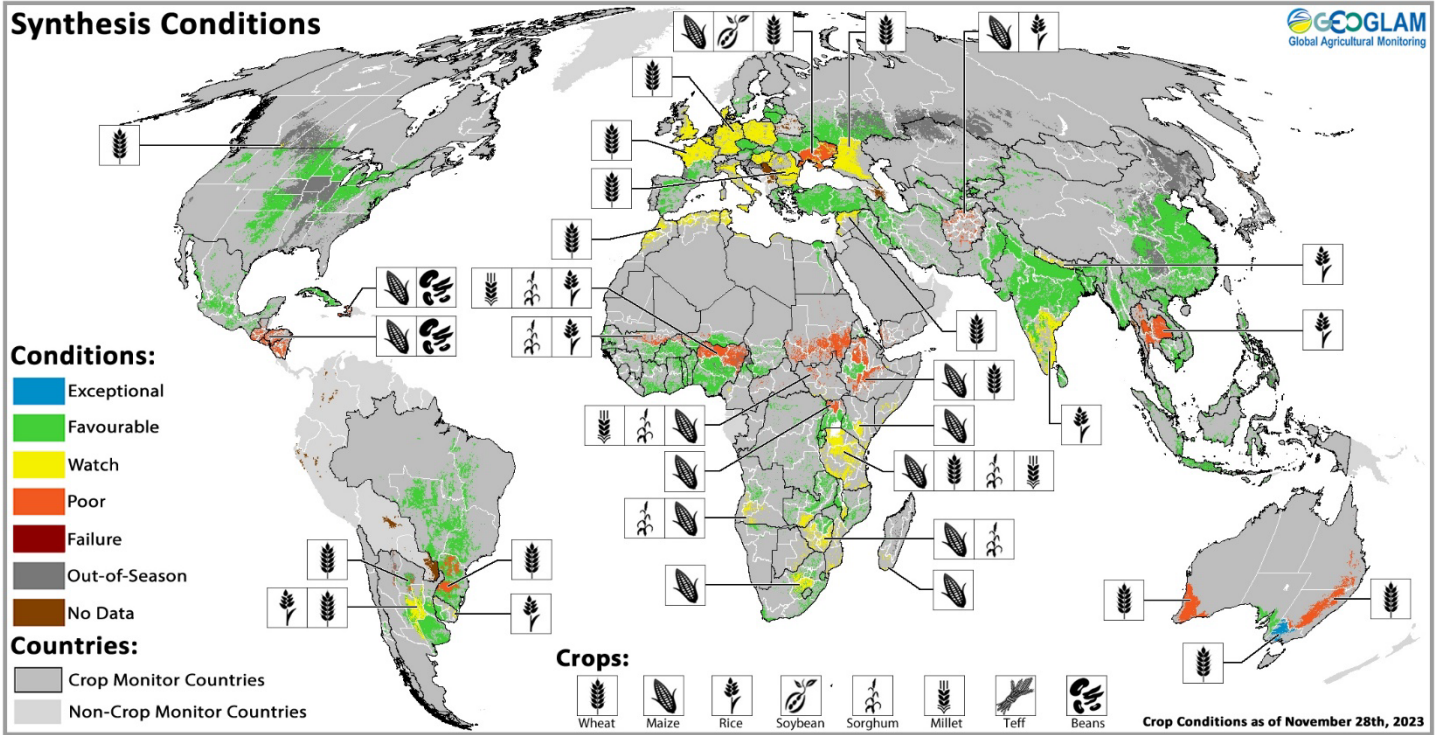


GEOGLAM Global Crop Monitor

Synthesized from the Crop Monitor for AMIS, the Crop Monitor for Early Warning, and direct submissions from individual countries.



Crop condition map synthesizing information for all Crop Monitor crops as of November 28th. Crop conditions over the main growing areas are based on a combination of inputs including remotely sensed data, ground observations, field reports, and national and regional experts. Regions that are in other than favourable conditions are labeled on the map with a symbol representing the crop(s) affected.

	Wheat	Maize	Rice	Soybean	Legend:
Current Conditions					Positive
Compared to last month					Better
Compared to last year					Mixed
					Negative
					Similar
					Worse

See Appendix I for detailed methodology description

Global Crop Overview

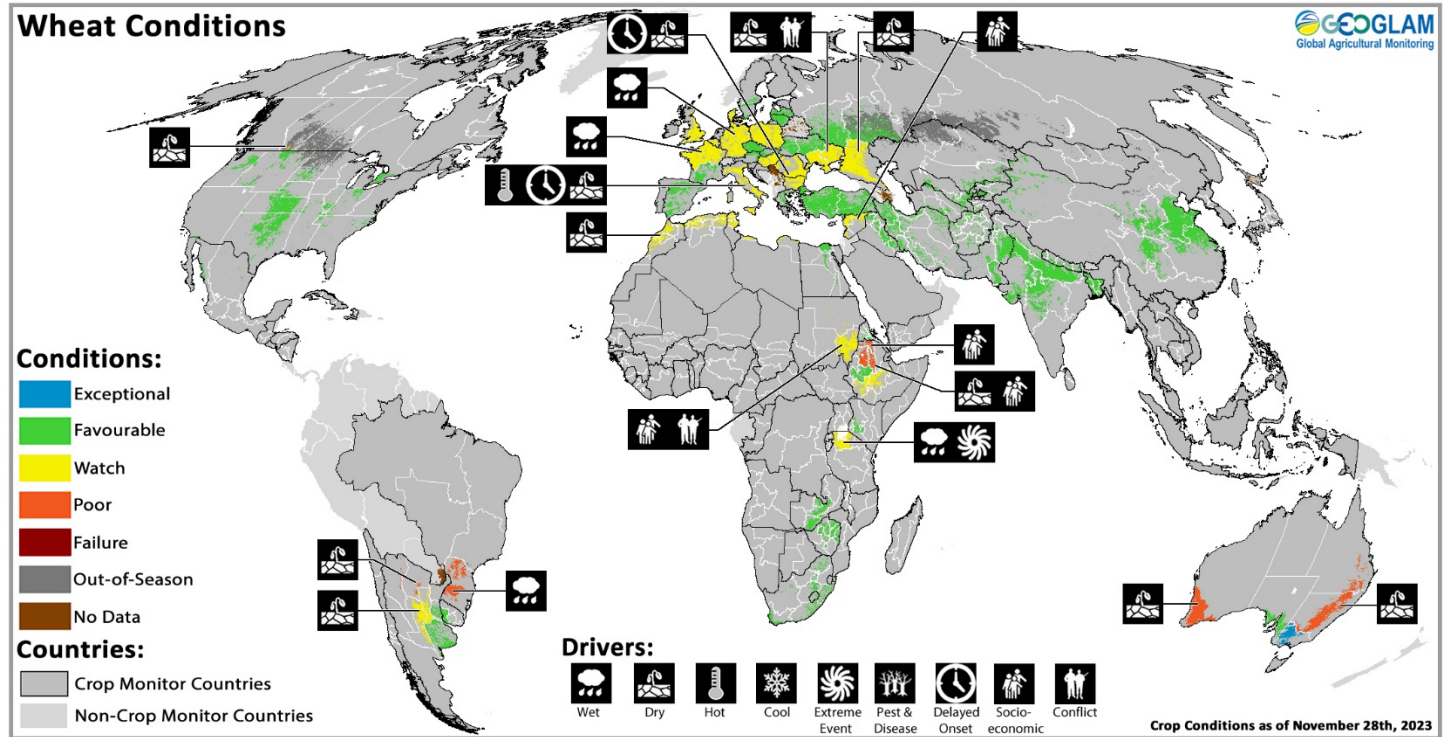
Global crop conditions at the end of November are mixed for wheat, while positive for maize, rice, and soybeans. For **wheat**, areas of concern are in Europe, Ukraine, the Russian Federation, Australia, Argentina, Brazil, North Africa, and East Africa. For **maize**, harvesting wraps up in the Northern Hemisphere as sowing picks up pace in the Southern Hemisphere. For **rice**, conditions are generally favourable except in southern India and Thailand. For **soybeans**, conditions are favourable as sowing begins in the Southern Hemisphere. The remaining crops are covered in the [CM4EW](#) publication.

Global Climate Influences

The ongoing El Niño is developing into a strong event and is likely to maintain strength into early 2024, possibly even becoming a historically strong event (35 percent chance). El Niño conditions will likely continue into March to May 2024 (88 percent chance) and transition to ENSO-neutral by May to July (55 percent chance), according to the IRI/CPC forecast. The ongoing strong positive Indian Ocean Dipole (IOD) event will likely weaken in December but last into January, according to the Australian Bureau of Meteorology. For further details see page 6.

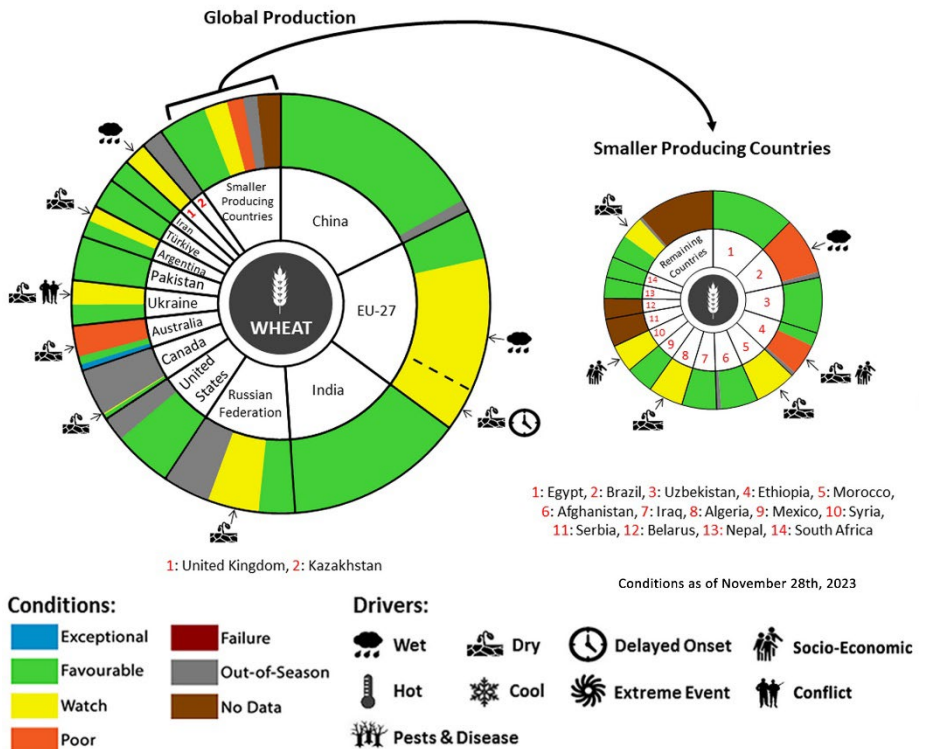
Source: UCSB Climate Hazards Center

WHEAT



Wheat crop conditions over main growing areas are based upon a combination of national and regional crop analyst inputs along with earth observation data. Conditions are based upon information as of November 28th.

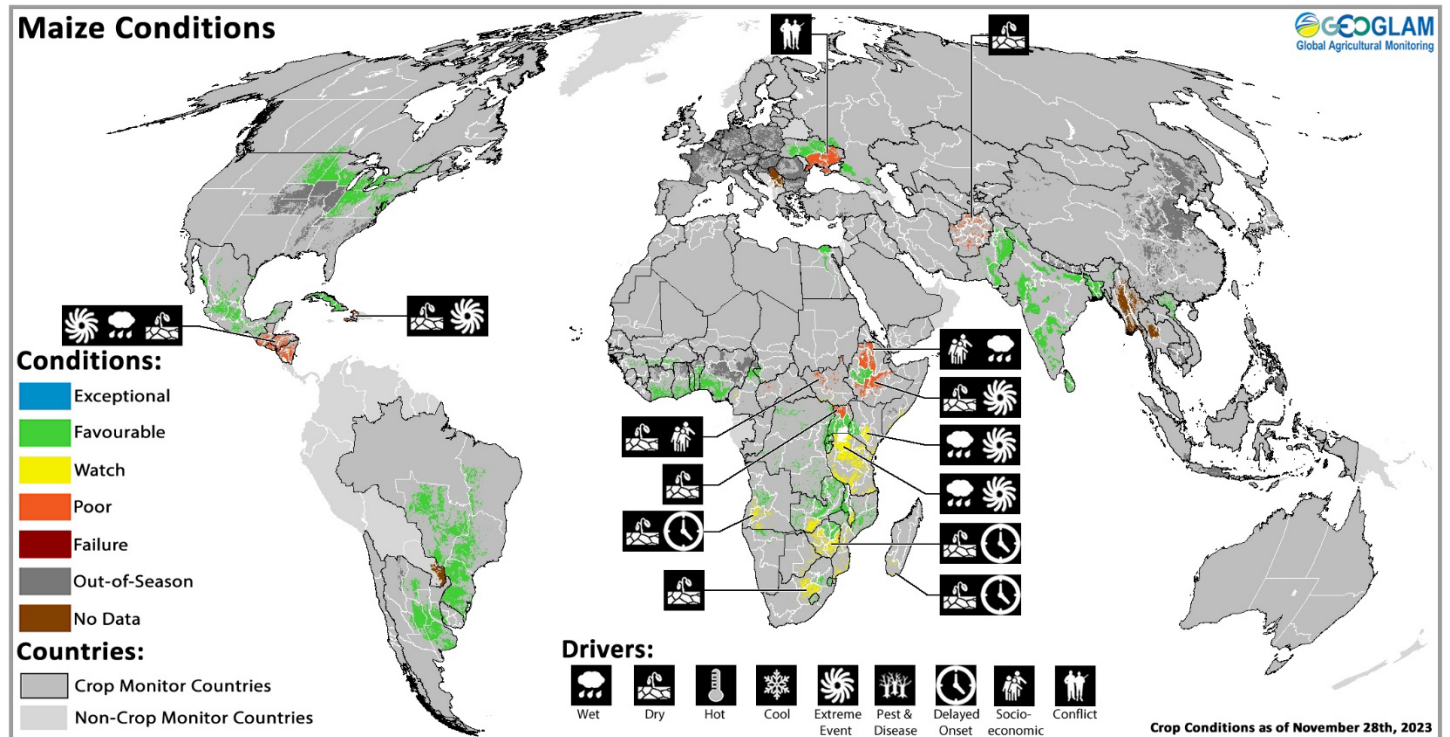
In **North America**, dry weather in the US has continued to support winter wheat sowing. In Canada, winter wheat conditions are favourable in the main producing provinces of Ontario and Manitoba. In Mexico, sowing is beginning for winter wheat. In **South America**, harvesting is beginning in Argentina in the north as recent rains have arrived too late for most of the crops, however, conditions have improved in Buenos Aires. In Brazil, harvest is wrapping up in the South region under poor conditions due to excessive rains during the end of the season. In Uruguay and Chile, conditions are favourable. In **Europe**, wetter than average conditions in western and northern EU have delayed sowing and crop establishment, while dryness in south-east countries has led to poor development. In the UK, abundant rainfall has resulted in late sowing and may affect early crop development. In Türkiye, sowing is wrapping up under favourable conditions. In Ukraine, sowing is wrapping up under favourable conditions away from the conflict zones owing to warmer and wetter-than-average weather during November, while drought persists in Odessa. In the Russian Federation, November rains have improved conditions across most regions except for in the Caucasus. In **Central Asia**, winter wheat sowing continues under favourable conditions despite below-average fall precipitation received in some areas which is delaying sowing activities. In **South Asia**, sowing is progressing in India's northern and central states under favourable conditions. In Pakistan, sowing is ongoing under favourable conditions. In Nepal, sowing is continuing. In **East Asia**, winter wheat in China is entering dormancy under favourable conditions. In **Oceania**, harvesting is ongoing in Australia under mixed conditions as hot and dry weather eroded yields across much of the country, however, timely October rains supported grain filling in Victoria and South Australia. In **MENA**, dry conditions for the start of the season have resulted in moisture deficits in Morocco, Algeria, Tunisia, and western Libya despite abundant rainfall received in mid-November in parts of Algeria and Tunisia. In Syria and Libya, socio-economic challenges continue to impact agricultural activities. In Egypt, Iraq, and Iran, sowing is ongoing under favourable conditions. In **Southern Africa**, harvesting is wrapping up in Zimbabwe, Zambia, South Africa, and Lesotho under favourable conditions. In **East Africa**, harvesting in Ethiopia continues under mixed conditions due to combined impacts of prior seasonal rainfall deficits, a switch to above-average rains and flooding in October that disrupted harvest activities in most areas, and ongoing socio-economic issues.



For detailed description of the pie chart, please see box on page 5.

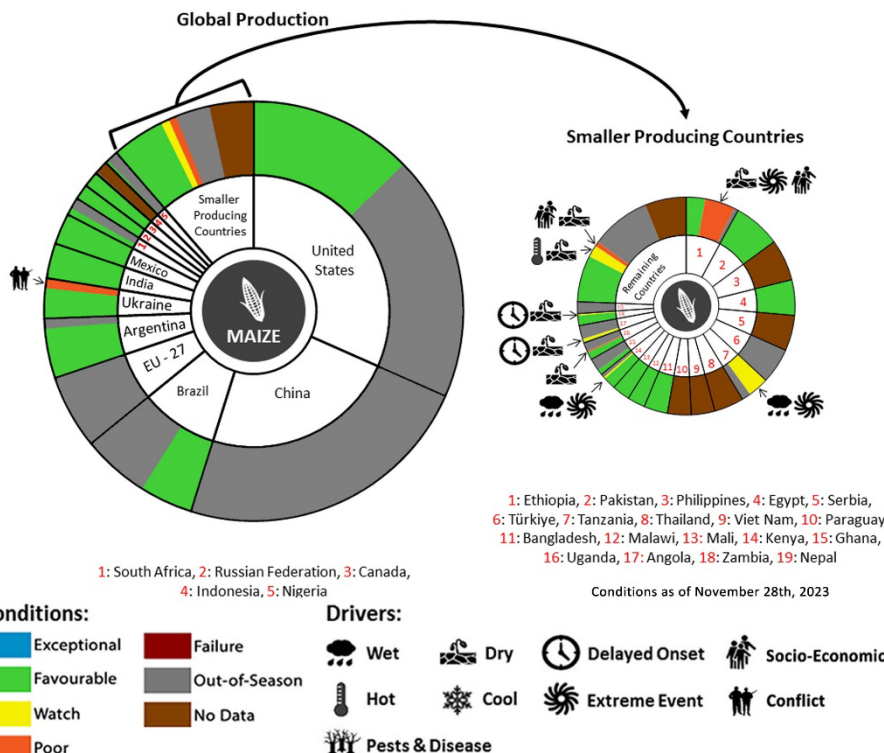
* Assessment based on information as of November 28th, 2023

MAIZE



Maize crop conditions over main growing areas are based upon a combination of national and regional crop analyst inputs along with earth observation data. Conditions are based upon information as of November 28th.

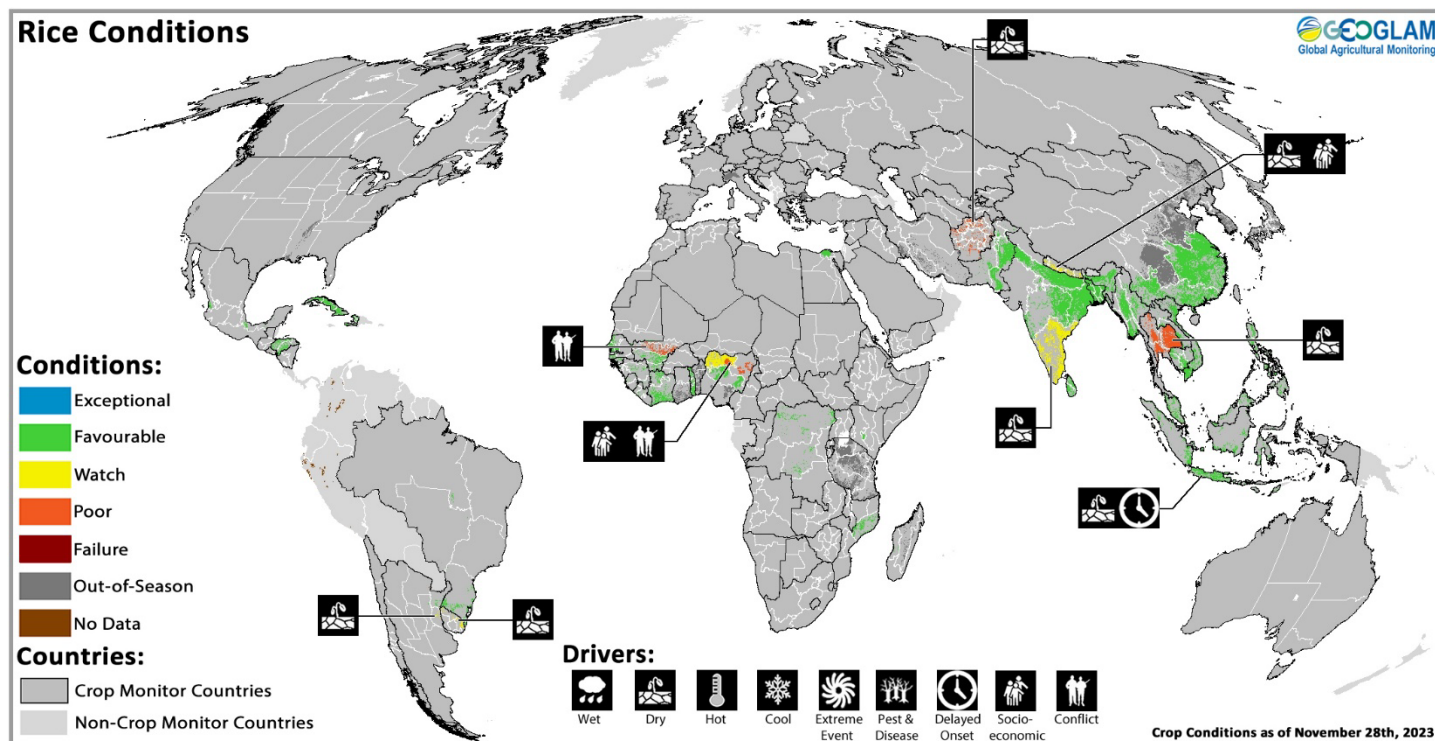
In **North America**, harvesting in the US is wrapping up in the northern states under favourable conditions. In Canada, harvesting is wrapping up under favourable conditions. In **Central America & the Caribbean**, harvesting in Mexico is ongoing for the Spring-Summer season (larger season) with a reduction in total sown area compared to last year. The sowing of the Autumn-winter season (smaller season) is beginning. *Segunda* season maize crops in El Salvador, Guatemala, Honduras, and Nicaragua have been downgraded to poor conditions as they are unlikely to recover from antecedent dry and hot conditions. In Haiti, *Été* season crop harvesting is wrapping up under poor conditions. In Cuba, harvesting of the main season crop is wrapping up under favourable conditions. In **South America**, sowing in Brazil of the spring-planted crop (smaller season) has slowed down due to adverse weather and the prioritization of soybean management. A reduction in the total sown area is expected for the spring-planted crop compared to last year. In Argentina, recent rains have improved conditions for the early-planted crop (larger season) in Buenos Aires, Entre Ríos, Santa Fe and, to a lesser extent, Córdoba. Additionally, the rains have also generated favourable conditions for the sowing of the late-planted crop (smaller season). In Uruguay, sowing is continuing under favourable conditions. In **Europe**, harvesting in Ukraine is wrapping up under favourable conditions away from the conflict zones. In the Russian Federation, harvesting is wrapping up. In **South Asia**, harvesting in India of the *Kharif* (larger season) crop is wrapping up as the sowing of the *Rabi* (smaller season) crop begins. In Pakistan, harvesting is wrapping up under favourable conditions. In Sri Lanka, sowing of the Maha season crop is underway. In **East Africa**, harvesting of the main season crops is wrapping up under generally poor conditions due to earlier dry conditions followed by flooding. Furthermore, a combination of conflict and related socio-economic challenges influenced poor conditions in Sudan, South Sudan, and northern Ethiopia. Sowing of second-season crops continues in Uganda, Rwanda, Burundi, the United Republic of Tanzania, Kenya, and Somalia. In **West Africa**, harvesting of the main season crops is wrapping up in all countries as the harvesting of the second season crops is nearing completion in the Sahel countries. In **Southern Africa**, sowing is ramping up across the region, however, lingering dry conditions from the previous season and a delayed rainfall onset for the current season is impacting conditions in southern Angola, southern Zambia, most of Zimbabwe, eastern Botswana, north-central South Africa, central and southern Mozambique, southern Malawi, and southern Madagascar.



For detailed description of the pie chart, please see box on page 5.

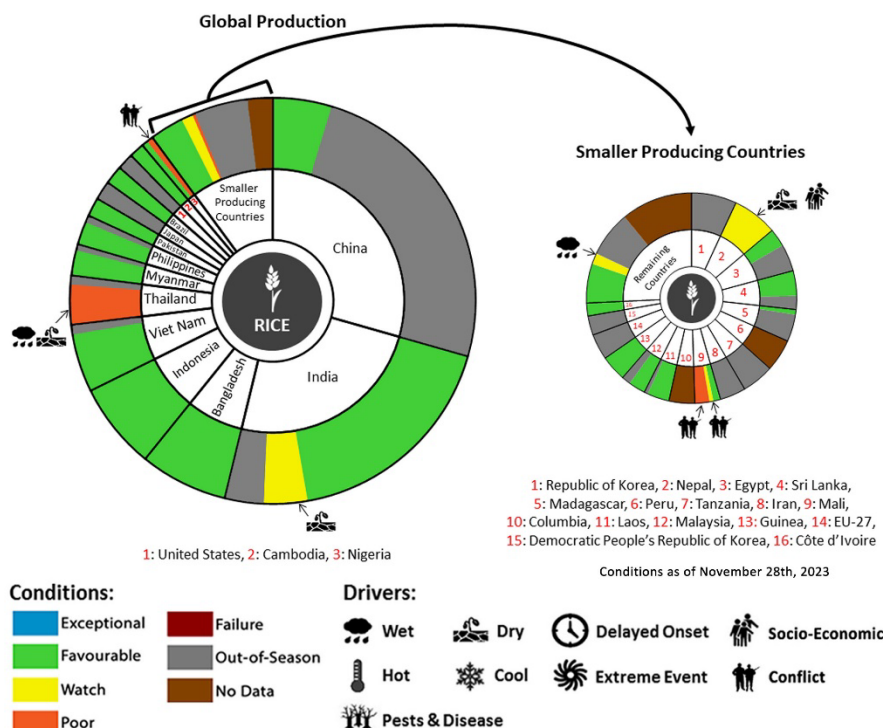
* Assessment based on information as of November 28th, 2023

RICE



Rice crop conditions over main growing areas are based upon a combination of national and regional crop analyst inputs along with earth observation data. Conditions are based upon information as of November 28th.

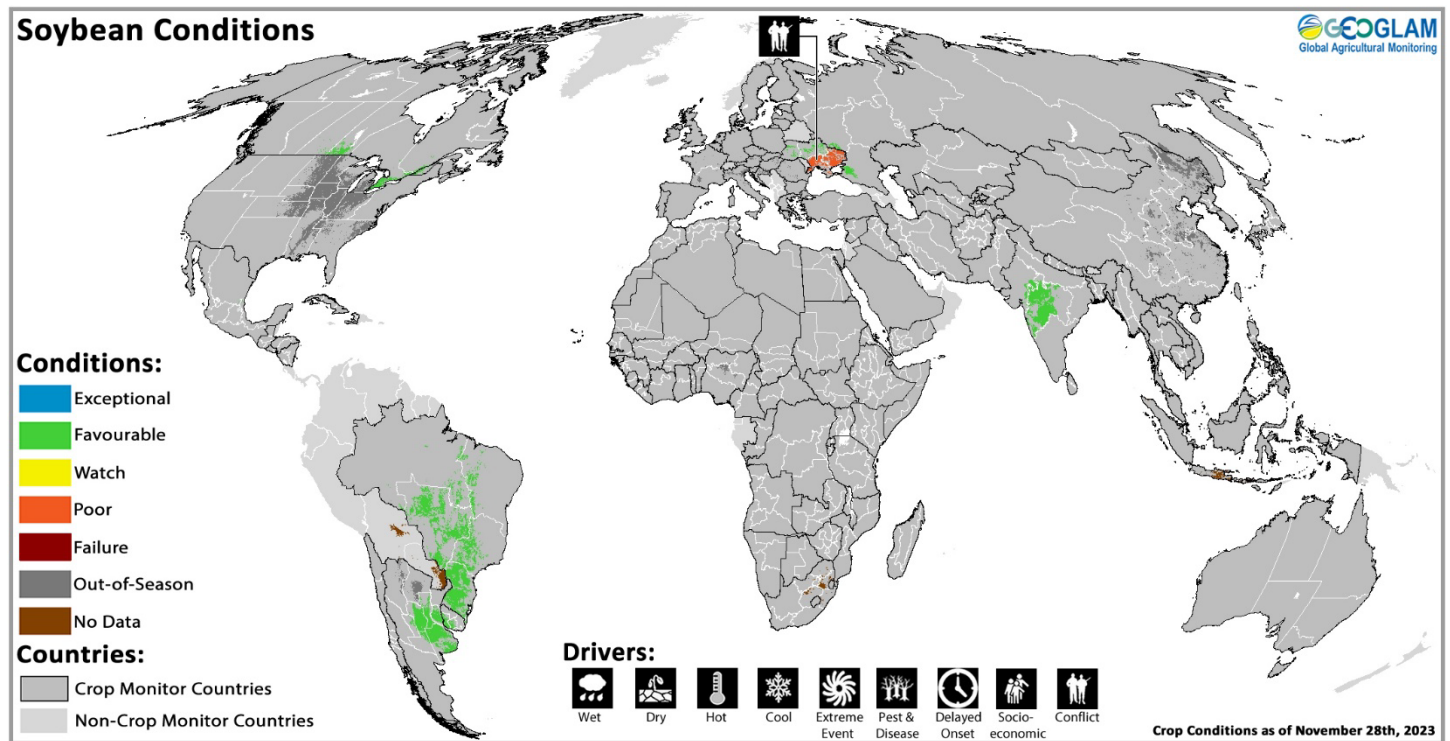
In **East Asia**, harvesting is wrapping up in China for the late-season crop under favourable conditions. In **South Asia**, harvesting in India of the *Kharif* season crop is wrapping up in the northern and central states, while ongoing in the southern and eastern states. In Pakistan, harvesting of *Kharif* season rice continues, and conditions are favourable. In Bangladesh, harvesting of *Aman* season crops, which account for 35 percent of rice production, is currently underway. Production is expected at an above-average level due to expected high yields and despite localized crop losses due to flooding in the Chattogram Division in late August. Sowing of *Boro* season rice, which accounts for 55 percent of rice production, is just beginning under favourable conditions. In Nepal, harvesting is now underway, and dry concerns and high input costs may impact final yields. In Sri Lanka, planting of *Maha* season rice, which is mostly irrigated and accounts for about 70 percent of annual rice production, is underway, and conditions are favourable. In **Southeast Asia**, harvesting of dry-season rice is wrapping up in Indonesia with good yields, but with a reduction of total harvested area. Wet-season rice sowing is continuing into its second month under favourable conditions. In northern Viet Nam, harvesting of the main wet-season rice is wrapping up under favourable conditions. In the south, harvesting of the other wet-season (autumn-winter and seasonal) rice is ongoing under favourable conditions as the sowing of dry-season rice begins. In Thailand, harvesting of wet-season rice is ongoing with poor yields due to early in-season drought followed by damages from floods. In the Philippines, wet-season rice sown in July to August is beginning to be harvested under favourable conditions. In Myanmar, harvesting of wet-season rice is beginning. In Cambodia, harvesting of wet-season rice is wrapping up as the sowing of dry-season is ongoing. In Laos, harvesting of wet-season rice is ongoing. In Malaysia and Brunei, harvesting of dry-season rice is nearing completion while the sowing of wet-season rice continues. In the **Americas**, harvesting in Mexico of the Spring-Summer crop is continuing. In Cuba, harvesting of second-season rice wrapped up under favourable conditions. In Brazil, sowing is continuing under favourable conditions with an increase in total sown area expected. In Uruguay, excess rainfall has delayed the sowing of the crop. In Argentina, sowing is continuing under mixed conditions due to dryness in the main producing eastern provinces. In **Sub-Saharan Africa**, conflict continues to be an issue in northern Nigeria and Mali.



For detailed description of the pie chart, please see box on page 5.

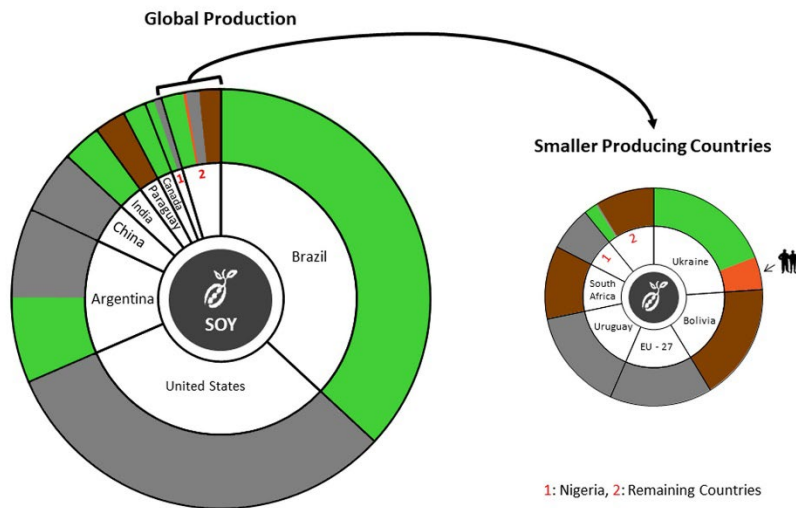
* Assessment based on information as of November 28th, 2023

SOYBEAN

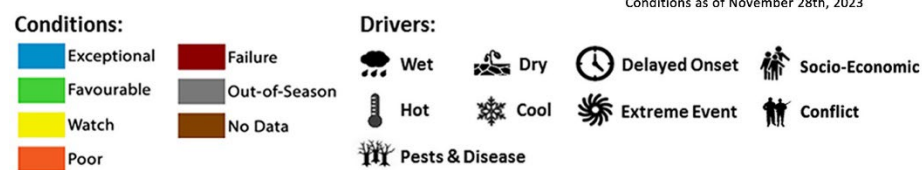


Soybean crop conditions over main growing areas are based upon a combination of national and regional crop analyst inputs along with earth observation data. Conditions are based upon information as of November 28th.

In **North America** harvesting is wrapping up under favourable conditions in Canada with an anticipated increase in harvested area compared to last year. In Mexico, harvesting is beginning under favourable conditions. In **South America**, sowing is continuing in Brazil under generally favourable conditions despite excess rainfall in the South region and a lack of rain in other producing regions. An increase in the total sown area is expected compared to last year. In Argentina, after receiving some rainfall in recent weeks, sowing is accelerating across most growing areas. However, due to the earlier dry conditions and remaining drought in some places, a significant proportion of the early-planted crop (typically larger season) is being shifted to late-planted crop (typically smaller season). In Uruguay, sowing is ongoing under favourable conditions. In **Europe**, harvesting is wrapping up in Ukraine under favourable conditions away from the conflict zones. In the Russian Federation, harvesting continues under favourable conditions. In **Asia**, harvesting is wrapping up in India under favourable conditions.



Pie Chart Description: Each slice represents a country's share of total Global production (5-year average). Main producing countries (representing 90-95 percent of production) are shown individually, with the remaining 5-10 percent grouped into the "Smaller Producing Countries" category. The proportion within each national slice is coloured according to the crop conditions within a specific growing area; grey indicates that the respective area is out of season. Sections within each slide are weighted by the sub-national production statistics (5-year average) of the respective country. The section within each national slice also accounts for multiple cropping seasons (e.g., spring and winter wheat). When conditions are other than 'favourable', icons are added that provide information on the key climatic drivers affecting conditions.



Global Climate Influences

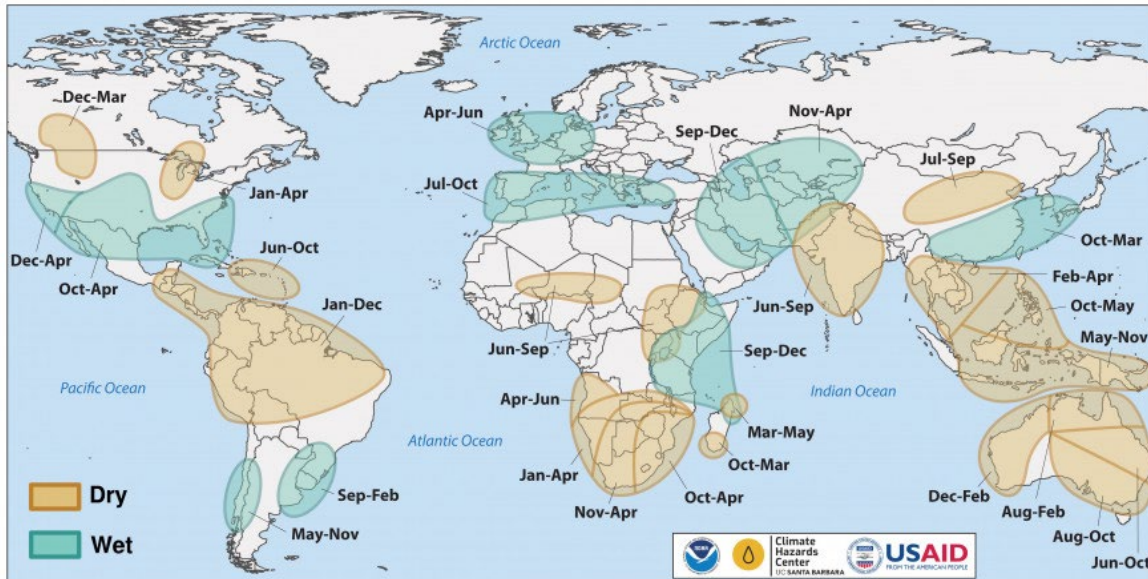
The ongoing El Niño is developing into a strong event and will likely maintain its strength into early 2024, possibly even becoming a historically strong event (35 percent chance). El Niño conditions will likely continue into March to May 2024 (88 percent chance) and transition to ENSO-neutral by May to July (55 percent chance), according to the North America forecast.

El Niño events tend to enhance precipitation in Central Asia, southern North America, south-eastern South America, east and southern East Africa, and south-eastern China. Drier-than-average conditions tend to occur in Central America, northern South America, parts of the northern U.S. and Canada, Southern Africa, Northern China, the Maritime Continent, and Australia.

The ongoing strong positive Indian Ocean Dipole (IOD) event will likely weaken in December but last into January, according to the Australian Bureau of Meteorology. The combination of positive IOD and El Niño conditions has led to intense rain and severe flooding in East Africa and dry conditions in Australia and the Maritime Continent.

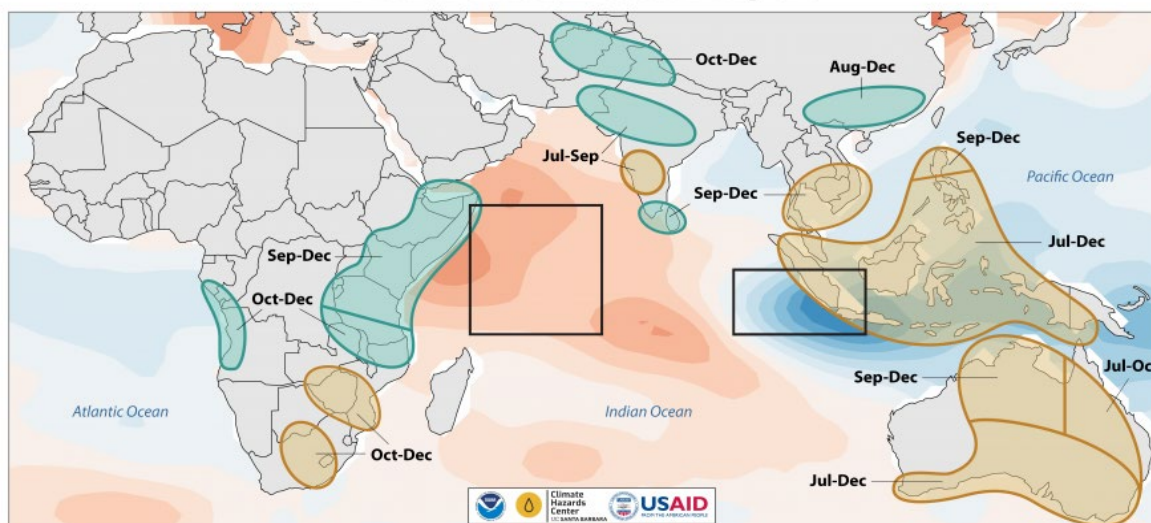
Globally, temperatures during 2023 have been the warmest on record, and the warming influence of El Niño will likely continue this upward trend. Warmer temperatures will exacerbate rainfall deficits.

Source: UCSB Climate Hazards Center



Location and timing of likely above- and below-average precipitation related to El Niño events. Based upon observed precipitation during 22 El Niño events since 1950. Source: FEWS NET & NOAA & CHC

Positive Indian Ocean Dipole



Precipitation Tendency
■ Wet ■ Dry

Sea Surface Temperature Departure From Average
■ Below Average ■ Above Average

Location and timing of likely above- and below-average precipitation based on precipitation during positive IOD events during 1960-2020. The IOD-related sea surface temperatures are based on a linear regression between the Dipole Mode Index and sea surface temperature for July to September. Source: FEWS NET & NOAA & CHC

Regional Outlooks

Both the short-term (two-week) and the long-term December–January–February 2023–2024 forecast (Figures 3 & 4) are influenced by the currently ongoing El Niño and positive Indian Ocean Dipole (IOD) events and a warming global climate.

In **North America**, the two-week forecast (Figures 1 & 2) indicates potential areas of below-average precipitation in northern Canada and the US Rockies, while potential areas of above-average precipitation over eastern Canada and Florida in the US. During the same time, temperatures are likely to be above-average over most of the US. The long-term December–January–February 2023–2024 forecast (Figures 3 & 4) shows no dominant tercile for precipitation over most of North America. During the same time, temperatures are slightly leaning toward being above-average across most of North America, with the highest probability over eastern Canada. For further details, see the [CM4AMIS](#) Regional Outlook for the United States.

In **Central America & the Caribbean**, the two-week forecast (Figures 1 & 2) indicates likely above-average precipitation over eastern Mexico and Cuba. During the same period, temperatures are likely to be above-average across the entire region, with the highest probability over Nicaragua and Costa Rica. The long-term December–January–February 2023–2024 forecast (Figures 3 & 4) suggests below-average precipitation over southern Guatemala and Nicaragua. During this time, temperatures are highly likely to be above-average across the entire region.

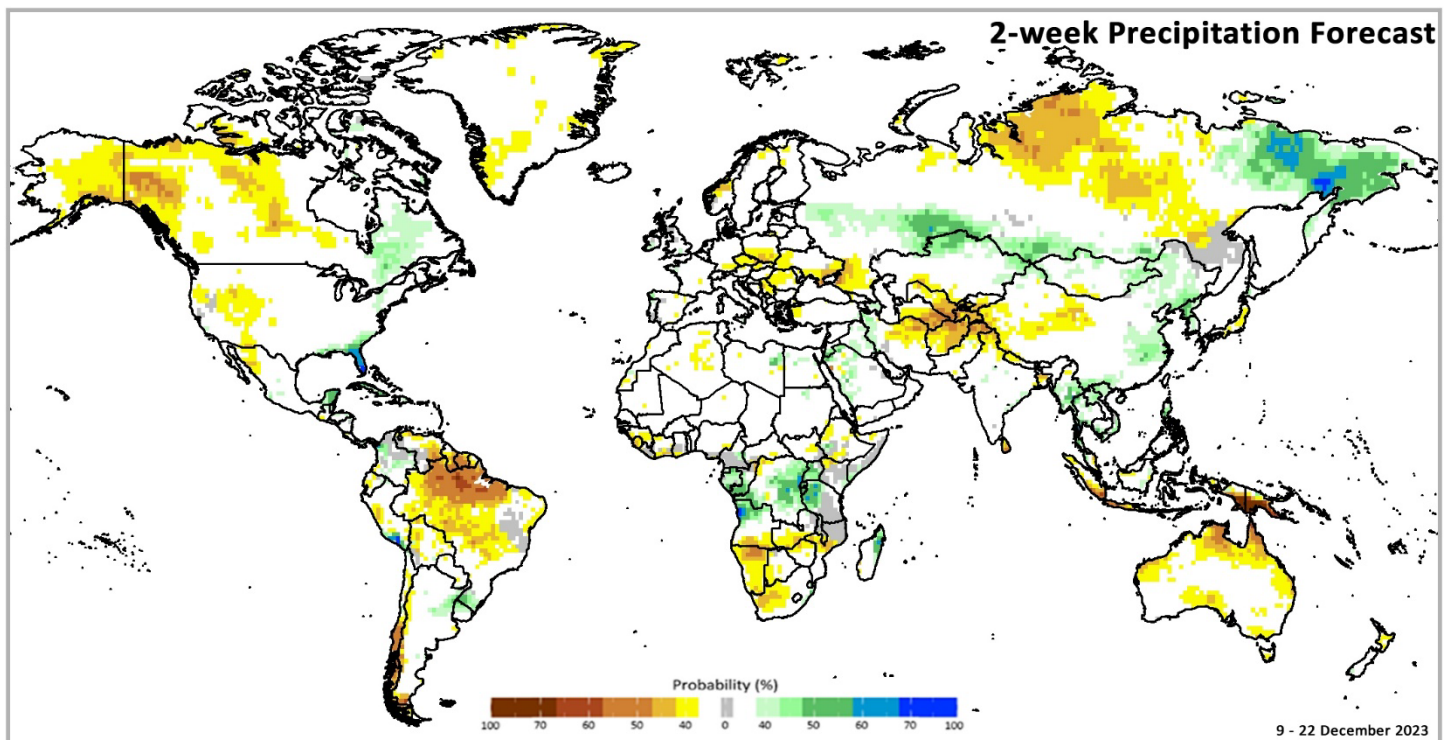


Figure 1: IRI SubX Precipitation Biweekly Probability Forecast for 9 – 22 December 2023, issued on 1 December 2023. The forecast is based on statistically calibrated tercile category forecasts from three SubX models. Source: [IRI Subseasonal Forecasts Maproom](#)

In **South America**, the two-week forecast (Figures 1 & 2) indicates likely below-average precipitation over southeastern Columbia, eastern Venezuela, Guyana, Suriname, French Guiana, northern and northwest Brazil, western Bolivia, and southern Chile, while above-average over southern Peru, southern Brazil, northern Uruguay, and central east Argentina. During this time, temperatures are likely to be above-average across most of the continent except for in southern Brazil, Uruguay, Argentina, and southern Chile. The long-term December–January–February 2023–2024 forecast (Figures 3 & 4) suggests likely below-average precipitation across eastern Venezuela, Guyana, Suriname, French Guiana, central and northeastern Brazil, and Chile, while above-average over eastern Columbia, western Ecuador, southern Brazil, Uruguay, and central Argentina. During that time, temperatures will highly likely be above-average over the majority of the continent except for southern Chile, Argentina, and Uruguay. For further details, see the [CM4AMIS](#) Regional Outlook for Argentina and Brazil.

In **Europe**, the two-week forecast (Figures 1 & 2) indicates likely below-average precipitation over Czechia, southern Poland, Serbia, western Romania, western and southern Ukraine, and the southern regions of the Russian Federation, while above-average over the central regions of the Russian Federation. During this time, temperatures are leaning to be above-average over Portugal, Spain, France, the United Kingdom, Switzerland, Italy, Hungary, Romania, Serbia, Bulgaria, Albania, North Macedonia, Greece, Türkiye, and the southern Russian Federation, while below-average over Norway, Sweden, Finland, Latvia, and the northern Russian Federation. The long-term December-January-February 2023-2024 forecast (Figures 3 & 4) indicates a slight leaning towards above-average precipitation across all of Europe except for Spain, Portugal, and Italy. During the same period, temperatures are leaning above-average across most of Europe, with a higher likelihood over the countries bordering the Mediterranean Sea.

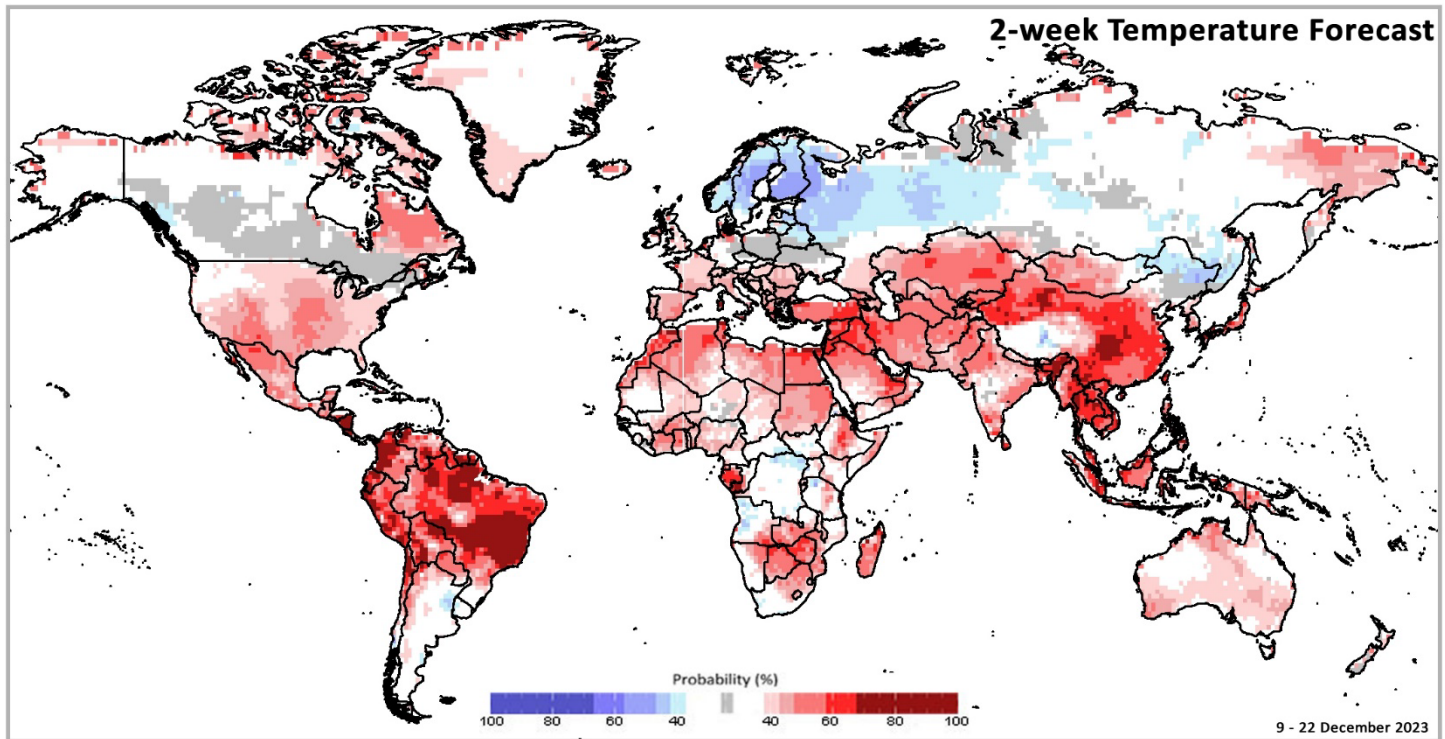


Figure 2: IRI SubX Temperature Biweekly Probability Forecast for 9 – 22 December 2023, issued on 1 December 2023. The forecast is based on statistically calibrated tercile category forecasts from three SubX models. Source: [IRI Subseasonal Forecasts Maproom](#)

In **MENA**, the two-week forecast (Figures 1 & 2) indicates a likelihood of below-average precipitation over northeastern Iran. During this time, temperatures are likely to be above-average over the entire region. The long-term December-January-February 2023-2024 forecast (Figures 3 & 4) indicates slightly leaning above-average precipitation over Syria, Iraq, and Iran, while below-average over Morocco, Algeria, Tunisia, and western Libya. During this time, temperatures are highly likely to be above-average across the entire region. For further details, see the [CM4EW](#) regional outlook for MENA.

In **Sub-Saharan Africa**, the two-week forecast (Figures 1 & 2) indicates likely below-average precipitation over Sierra Leone, southern Angola, Namibia, southern Zambia, western South Africa, northern Zimbabwe, and central Mozambique, while above-average over Gabon, southern Republic of the Congo, central Democratic Republic of the Congo, northern Angola, Uganda, Rwanda, Burundi, western Tanzania, and northeastern Madagascar. At the same time, temperatures are likely to be above-average over Mali, Burkina Faso, Côte d'Ivoire, Ghana, Togo, Benin, Nigeria, Chad, Sudan, central Ethiopia, eastern Somalia, Gabon, southern Republic of the Congo, Zambia, southeast Angola, northeast Namibia, Botswana, Zimbabwe, western Mozambique, northern South Africa, and Madagascar. For the long-term December-January-February 2023-2024 forecast (Figures 3 & 4), precipitation is likely to be above-average across southern South Sudan, Ethiopia, Somalia, eastern Democratic Republic of the Congo, Uganda, Kenya, Rwanda, Burundi, and Tanzania, while below-average over Namibia, Botswana, Zimbabwe, South Africa, and southern Mozambique. During this time, temperatures are highly likely to be above-average across all of Sub-Saharan Africa except for southern Kenya, Uganda, and northeast Tanzania. For further details, see the [CM4EW](#) regional outlooks for East Africa and Southern Africa.

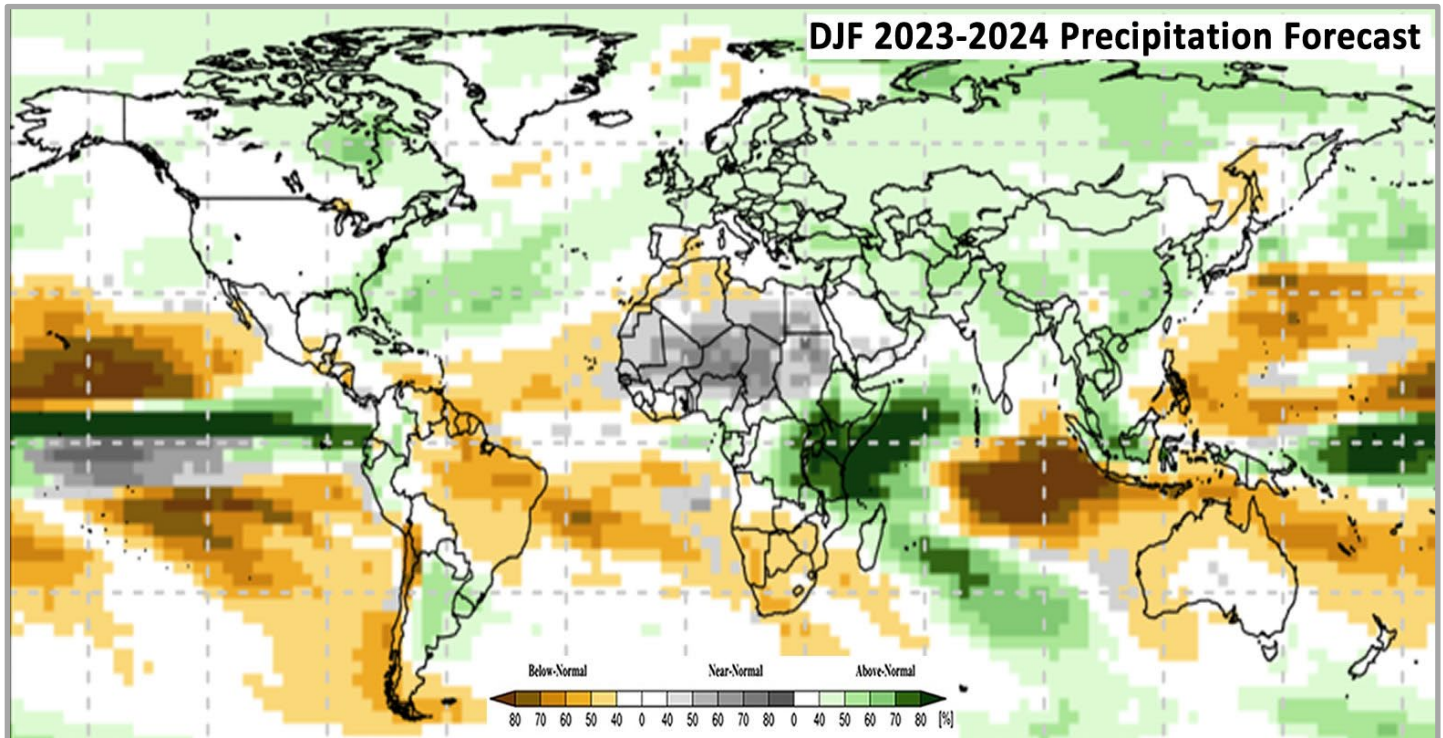


Figure 3: Probabilistic forecast for most likely December-January-February (DJF) 2023-2024 rainfall tercile, based on November conditions. The white colour indicates that there is no dominant category across the model forecasts. Source: [WMO Lead Centre for Long-Range Forecast Multi-Model Ensemble](#)

In **Central Asia**, the two-week forecast (Figures 1 & 2) indicates likely below-average precipitation over Kyrgyzstan, Tajikistan, Uzbekistan, eastern Turkmenistan, and Afghanistan while above-average over northern Kazakhstan. During this time, temperatures are likely to be above-average across the entire region. The long-term December-January-February 2023-2024 forecast (Figures 3 & 4) indicates a leaning to above-average precipitation over the entire region. At the same time, temperatures are leaning above-average across the entire region. For further details, see the [CM4EW](#) regional outlook for Central and Southern Asia.

In **South Asia**, the two-week forecast (Figures 1 & 2) indicates likely below-average precipitation over northern Pakistan, northeastern India, Sri Lanka, and Bangladesh. During this time, temperatures are likely to be above-average over most of the region except for central India. The long-term December-January-February 2023-2024 forecast indicates a leaning to above-average precipitation across the entire region except for southern India and Sri Lanka. At the same time, temperatures are highly likely to be above-average across the entire region. For further details, see the [CM4EW](#) regional outlook for Central and Southern Asia.

In **East Asia**, the two-week forecast (Figures 1 & 2) indicates likely below-average precipitation over parts of central and western China and Japan, while above-average over eastern and northeast China, the Democratic People's Republic of Korea, and northern Republic of Korea. During this time, temperatures are likely to be above-average across the majority of China, Mongolia, the Republic of Korea, and Japan, while below-average over northeastern China. The long-term December-January-February 2023-2024 forecast (Figures 3 & 4) indicates a leaning to above-average precipitation over most of China, Mongolia, the Republic of Korea, and the Democratic Republic of Korea. During that time, temperatures are highly likely to be above-average across the entire region.

In **Southeast Asia & Oceania**, the two-week forecast (Figures 1 & 2) indicates potential above-average precipitation over Myanmar, Laos, Viet Nam, southern Cambodia, southern Thailand, and the central Philippines, while below-average over Indonesia, southern Papua New Guinea, and northern Australia. During this time, temperatures are likely to be above-average over Myanmar, Thailand, Laos, Cambodia, Vietnam, the Philippines, Malaysia, Indonesia, Papua New Guinea, and northern Australia. The long-term December-January-February 2023-2024 forecast (Figures 3 & 4) indicates leaning towards above-average precipitation over Myanmar, Thailand, Laos, Cambodia, Viet Nam, the Philippines, Malaysia, and western Indonesia, while below-average over southern Indonesia, and northern Australia. During the same time, temperatures are likely to be above-average across the entire region.

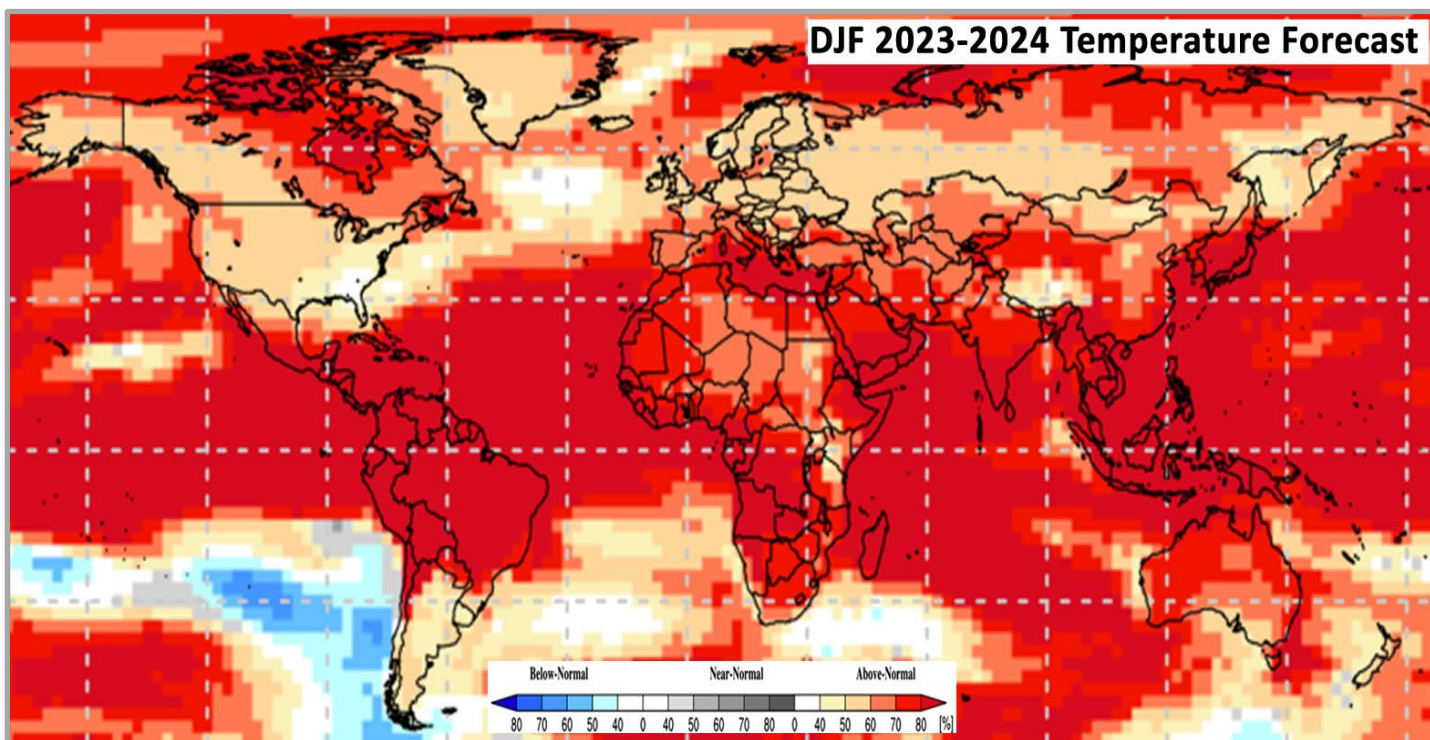


Figure 4: Probabilistic forecast for most likely December-January-February (DJF) 2023-2024 temperature tercile, based on November conditions. The white colour indicates that there is no dominant category across the model forecasts. Source: [WMO Lead Centre for Long-Range Forecast Multi-Model Ensemble](#)



The Crop Monitor is a part of GEOGLAM, a GEO global initiative.
 Prepared by members of the GEOGLAM Community of Practice.
 Coordinated by the University of Maryland with funding from NASA Harvest.
 Synthesized from the Crop Monitor for AMIS, the Crop Monitor for Early Warning, and direct submissions from individual countries.

<https://cropmonitor.org/>

@GEOCropMonitor

Appendix 1: Terminology & Definitions

Crop Conditions:

Exceptional: Conditions are much better than average* at the time of reporting. This label is only used during the grain-filling through harvest stages.

Favourable: Conditions range from slightly lower to slightly better than average* at reporting time.

Watch: Conditions are not far from average* but there is a potential risk to final production. The crop can still recover to average or near-average conditions if the ground situation improves. This label is only used during the planting-early vegetative and the vegetative-reproductive stages.

Poor: Crop conditions are well below-average*. Crop yields are likely to be more than 5-25% below-average. This is only used when conditions are not likely to be able to recover, and an impact on production is likely.

Failure: Crop conditions are extremely poor. Crop yields are likely to be 25% or more below-average.

Out of Season: Crops are not currently planted or in development during this time.

No Data: No reliable source of data is available at this time.

*"Average" refers to the average conditions over the past 5 years.



Drivers:

These represent the key climatic, environmental, and anthropomorphic drivers that are having an impact on crop condition status. They result in production impacts and can act as either positive or negative drivers of crop conditions.

Wet: Wetter than average (includes water logging and floods).

Dry: Drier than average.

Hot: Hotter than average.

Cool: Cooler than average or risk of frost damage.

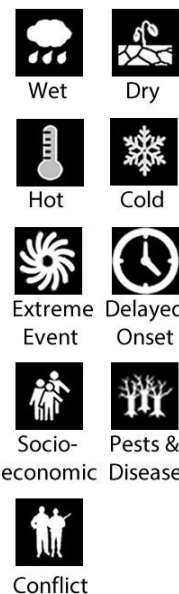
Extreme Events: Catch-all for all other climate risks (i.e., hurricane, typhoon, frost, hail, winter kill, wind damage, etc.). When this category is used the analyst will also specify the type of extreme event in the text.

Delayed-Onset: Late start of the season.

Pest & Disease: Destructive insects, birds, animals, or plant disease.

Socio-economic: Social or economic factors that impact crop conditions (i.e., policy changes, agricultural subsidies, government intervention, etc.)

Conflict: Armed conflict or civil unrest that is preventing the planting, working, or harvesting of the fields by the farmers.



Crop Condition Indicators:

Current Crop Conditions: The current crop condition indicators are based on only the crops that are currently in season. Crops with "No Data" are not counted. The crop condition is considered "Positive", with a green-coloured crop symbol, when 85-100% of active crops are currently under favourable to exceptional conditions. The crop conditions are considered "Mixed", with an orange-coloured crop symbol, when only 70-85% of active crops are under favourable to exceptional conditions. The crop conditions are considered "Negative", with a dark red-coloured crop symbol when only 0-70% of active crops are under favourable to exceptional conditions.

Crop Condition Comparisons: Crop condition changes are measured between the current month's conditions compared to the previous month and exactly one year ago. Only active crops are considered. If there is a -5% change in global crop conditions, then the crop conditions are considered "Deteriorating" (indicated by a down arrow). If there is a +5% change in global crop conditions, then the crop conditions are considered "Improving" (indicated by an up arrow). Otherwise, crop conditions are considered "Stable" (indicated by a dash).