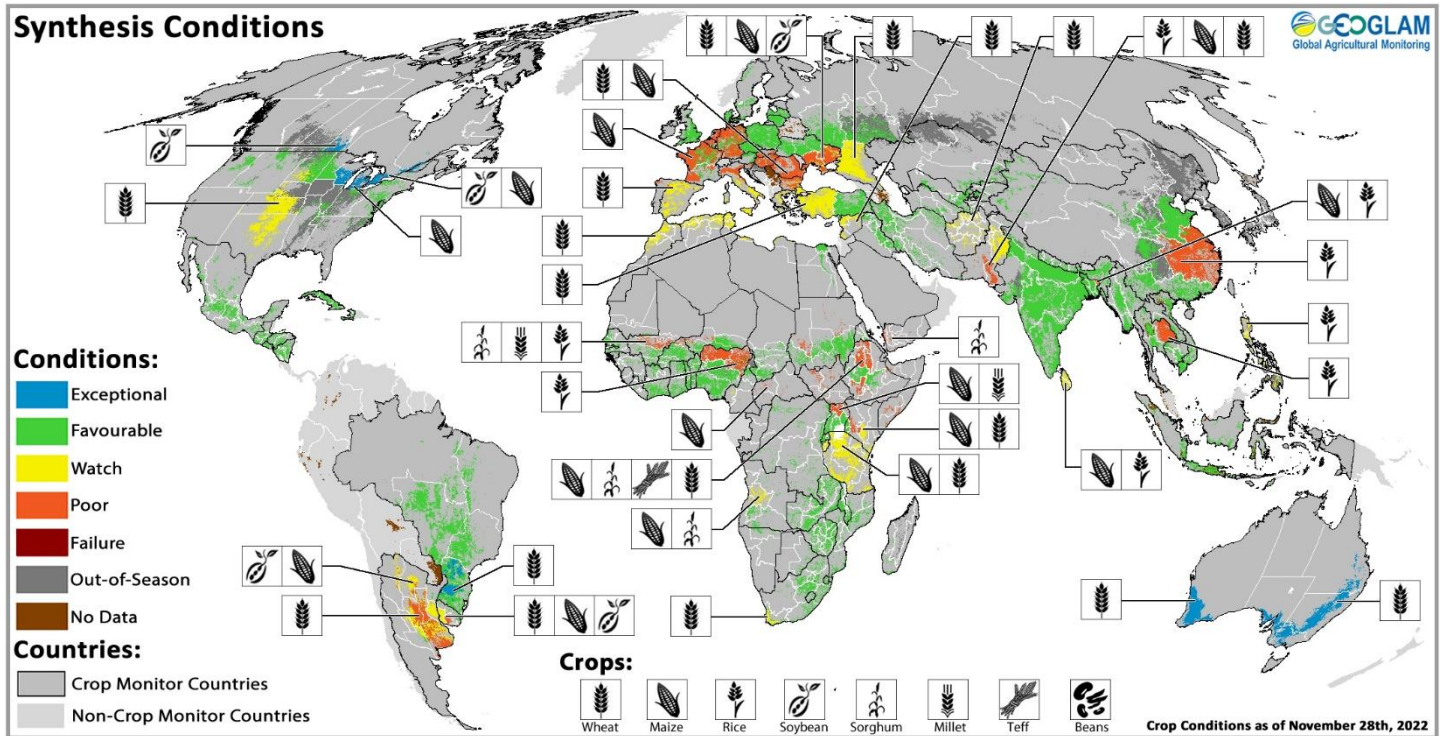


GEOGLAM Global Crop Monitor

Global Conditions at a Glance (as of November 28th)



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

See Appendix I for detailed methodology description

Global Crop Overview

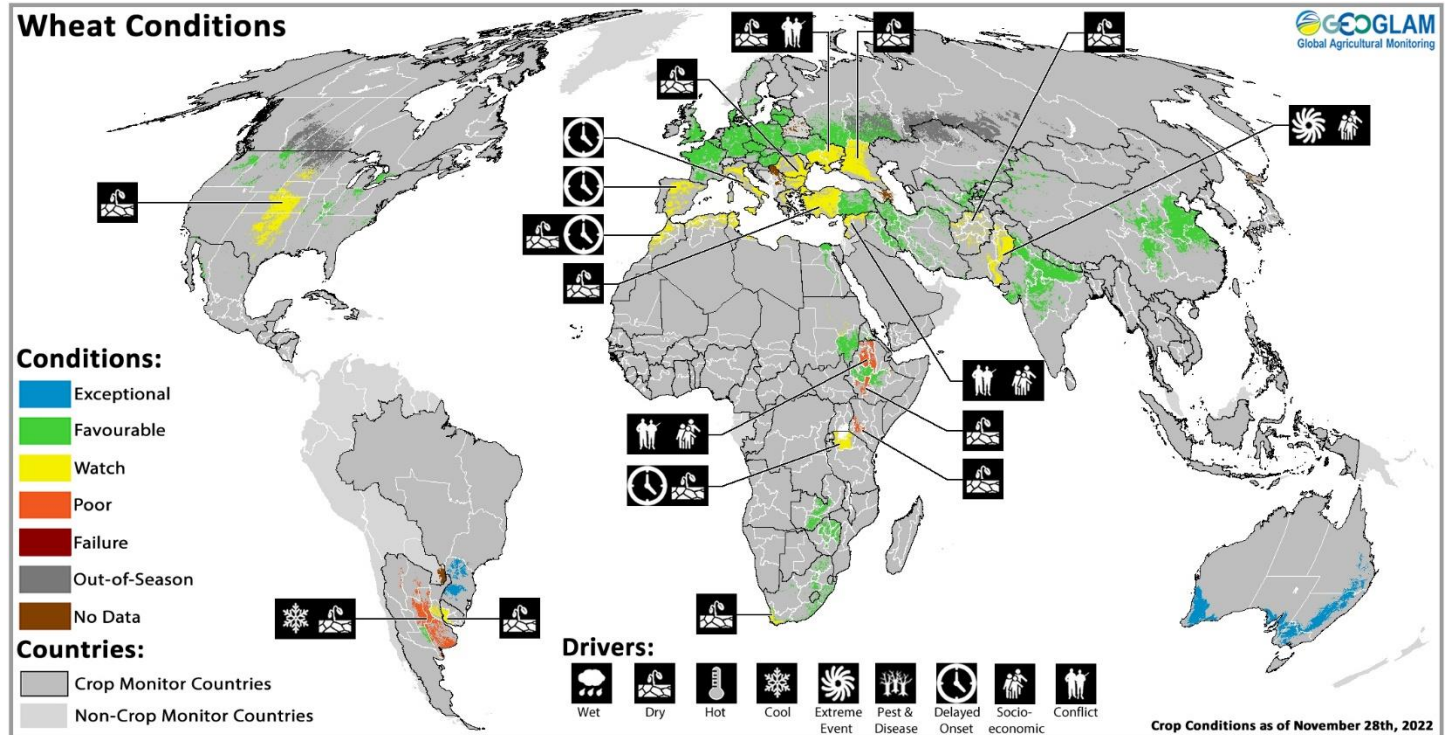
Global crop conditions at the end of November are overall mixed for wheat, maize, rice, and soybeans. For **wheat**, there are areas of concern in Argentina, the US, Ukraine, the Russian Federation, MENA, and Central Asia. For **maize**, Europe’s season wraps up in poor conditions while Argentina and East Africa deal with dry conditions. For **rice**, China, southern Pakistan, and parts of Southeast Asia wrap up their seasons under mixed conditions. For **soybeans**, harvesting is wrapping up in the Northern Hemisphere while sowing progresses in the Southern Hemisphere. The remaining crops are covered in the [CM4EW](#) publication.

Global Climate Influences

La Niña conditions are currently present and will likely continue into early 2023 (76% chance for December to February and 59% chance for January to March). Negative Indian Ocean Dipole (IOD) conditions weakened during November, and neutral IOD conditions are forecast for December. For further details see page 6.

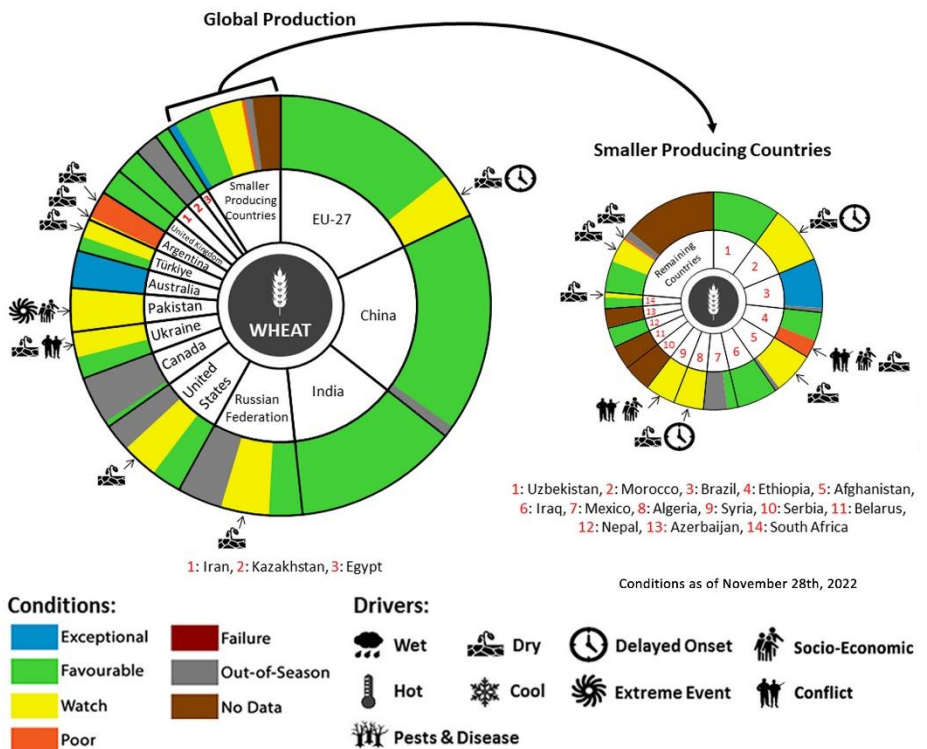
Source: UCSB Climate Hazards Center

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.

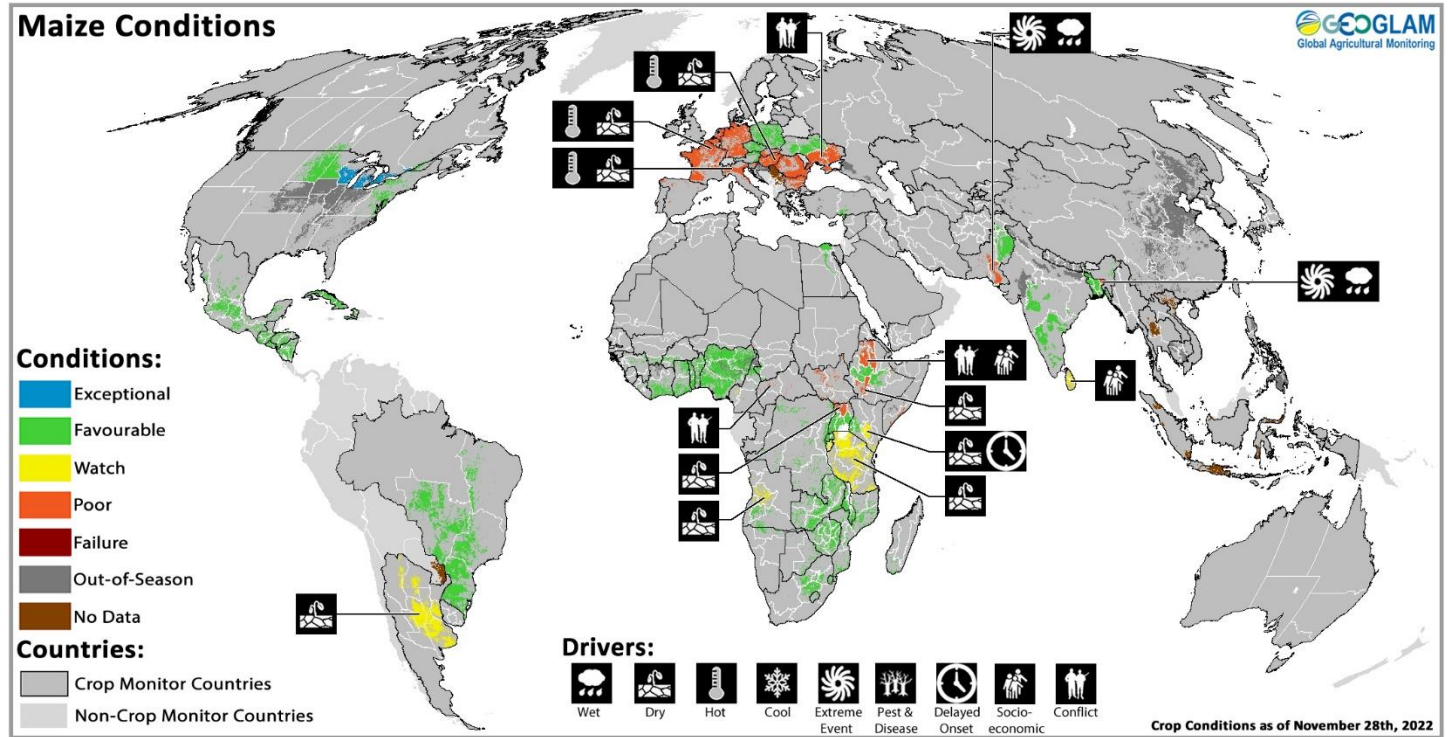
In **North America**, dry conditions across the US in the Great Plains from South Dakota to Texas continues to be a concern going into winter. In Canada, winter wheat sowing is complete and under favourable conditions going into winter dormancy. In Mexico, sowing has begun. In **South America**, yields are poor in Argentina in most areas due to drought as harvesting is wrapping up in the north and beginning in the main producing areas. In Brazil, harvesting is wrapping up under exceptional conditions, an area increase in the total sown area compared to last year. In Uruguay, harvest is beginning under mixed conditions due to prolonged dryness. In **Europe**, conditions are generally favourable in the EU, albeit with delayed sowing in the southern countries due to low soil moisture levels. In the UK, conditions are favourable. In Türkiye, sowing is wrapping up with dry conditions in the west. In Ukraine, conditions are generally favourable, albeit with persistent dryness in Odessa and disruptions/security concerns in the southern and eastern regions due to the ongoing war. In the Russian Federation, sowing is wrapping up under generally favourable conditions except for dryness in the southern Caucasus. In **Central Asia**, sowing and early development of winter wheat is underway in southern Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan. Dry conditions persist in Afghanistan, while the impact of earlier flooding remains in Pakistan. In **South Asia**, sowing is beginning in the northern and central states of India. In **East Asia**, winter wheat is under favourable conditions in China with ample soil moisture. In **Oceania**, harvesting is progressing under exceptional conditions in Australia, despite ongoing flooding in parts of eastern Australia. In **MENA**, low rainfall amounts have delayed sowing and early crop development in Morocco, Algeria, Tunisia, and Libya. Conditions are generally favourable in Iraq and Iran. In **Sub-Saharan Africa**, harvesting continues in southern Africa under generally favourable conditions. Dry conditions persist in Kenya, Tanzania, and southern Ethiopia while conflict impacts remain in northern Ethiopia.



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

* Assessment based on information as of November 28th

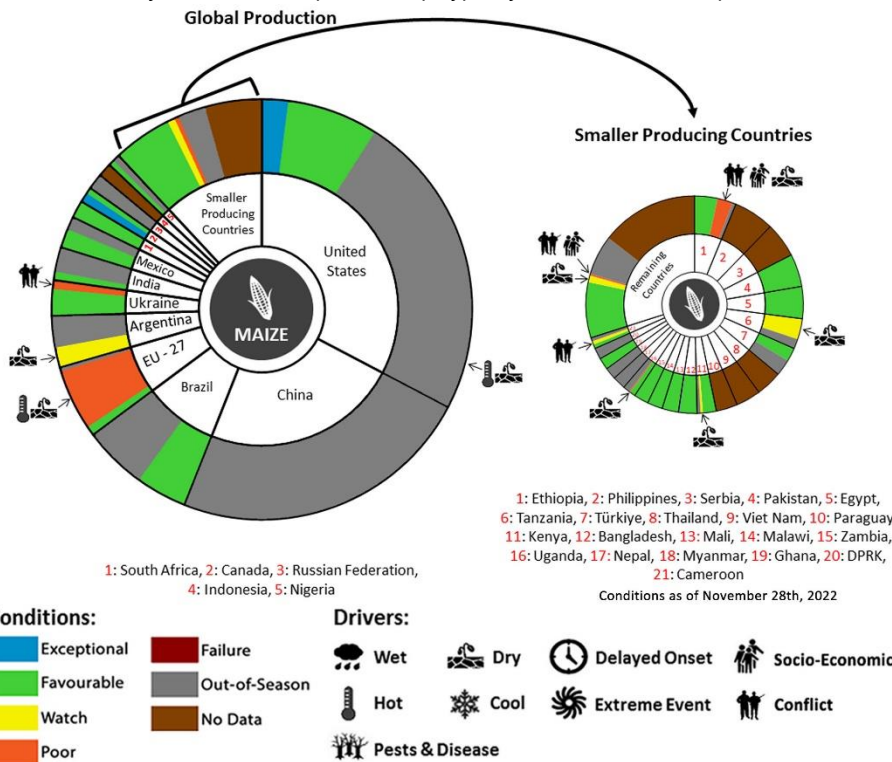
MAIZE



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 is wrapping up in the northern US under exceptional conditions in Michigan and Wisconsin. In Canada, harvesting is wrapping up under exceptional conditions in Ontario. In **Central America & the Caribbean**, harvesting is ongoing in Mexico for the spring-summer season (larger season) under favourable conditions. Harvesting of *Segunda/Postre* season cereals is now underway in Nicaragua while crops continue to develop in El Salvador, Guatemala, and Honduras. Harvesting of main-season crops is wrapping up in Cuba along with second-season crops in Haiti. In **South America**, sowing of the spring-planted crop (smaller) is continuing in Brazil under favourable conditions with a slight reduction in the total sown area expected compared to last year. In Argentina, sowing of the early-planted crop (typically larger season) continues at a slow pace due to dryness. Recent rains have improved conditions in some areas, but much of the intended sown area will likely shift to the later-planted crop (typically smaller season) in hopes of better soil moisture conditions. In Uruguay, conditions are favourable.

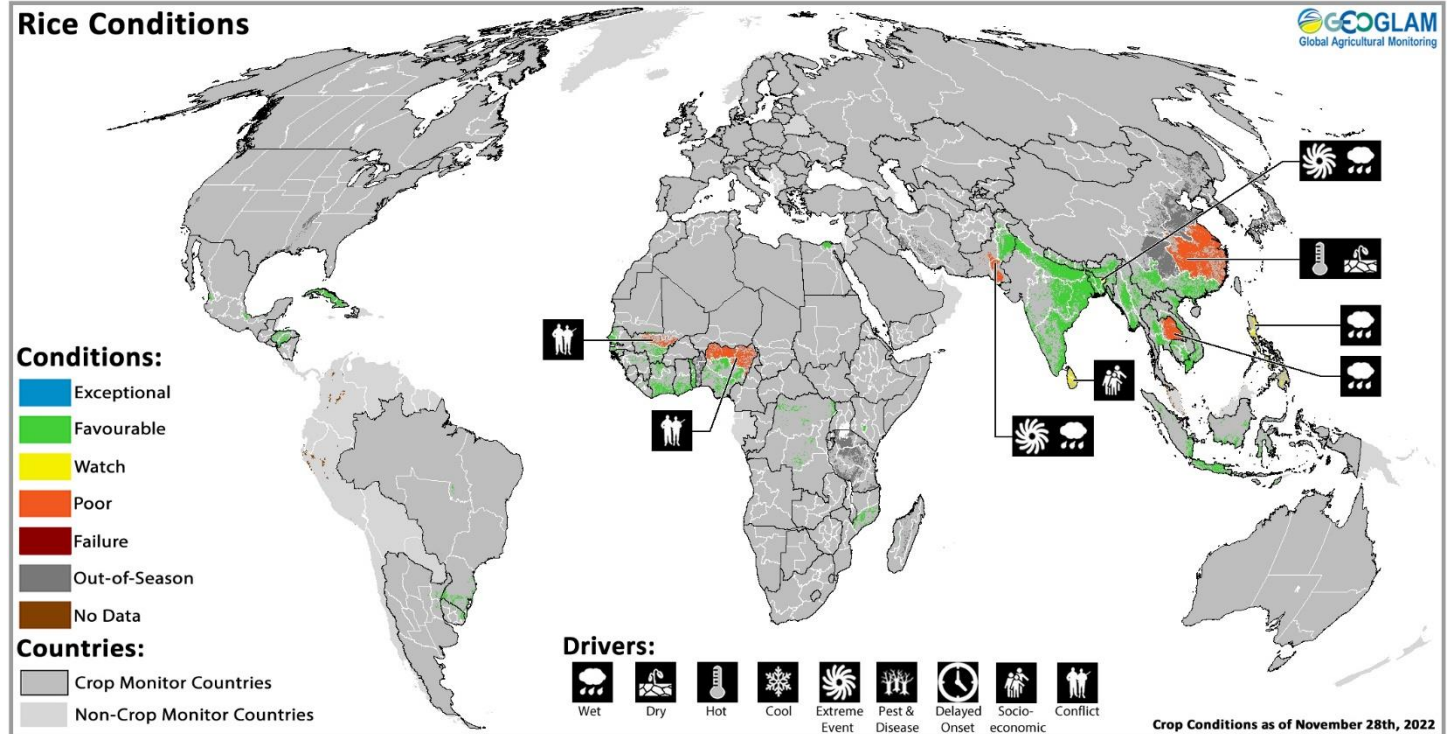
In **Europe**, harvesting is wrapping up in the EU with below-average yields across most of western and southern Europe due to droughts and heatwaves. In Ukraine, harvesting slowly continues with just over half the crop collected so far, so many crops will likely be harvested during the winter or early spring. In **South Asia**, sowing of the *Rabi* crop is beginning in India under favourable conditions. In Pakistan, harvesting of the *Kharif* crop is wrapping up under mixed conditions due to earlier flooding. In Bangladesh, harvesting is wrapping up for main-season crops. In Sri Lanka, sowing of *Maha* season crops is ongoing. In **West Africa**, harvesting of main season crops is wrapping up as sowing of the second season crops continues. In **East Africa**, harvesting of main-season crops is wrapping up in the north under mixed conditions, while sowing of the second-season crops continues in the south under mixed conditions due to drought. In **Southern Africa**, sowing is ongoing under generally favourable conditions. In South Africa, ample rainfall since mid-October has supported sowing and early development.



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

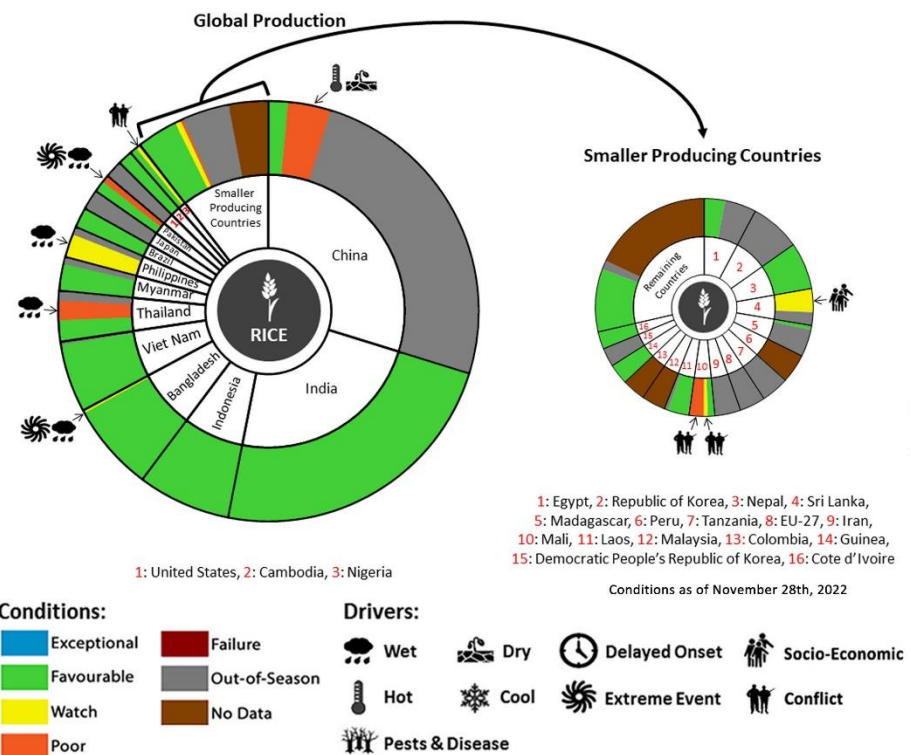
* Assessment based on information as of November 28th

RICE

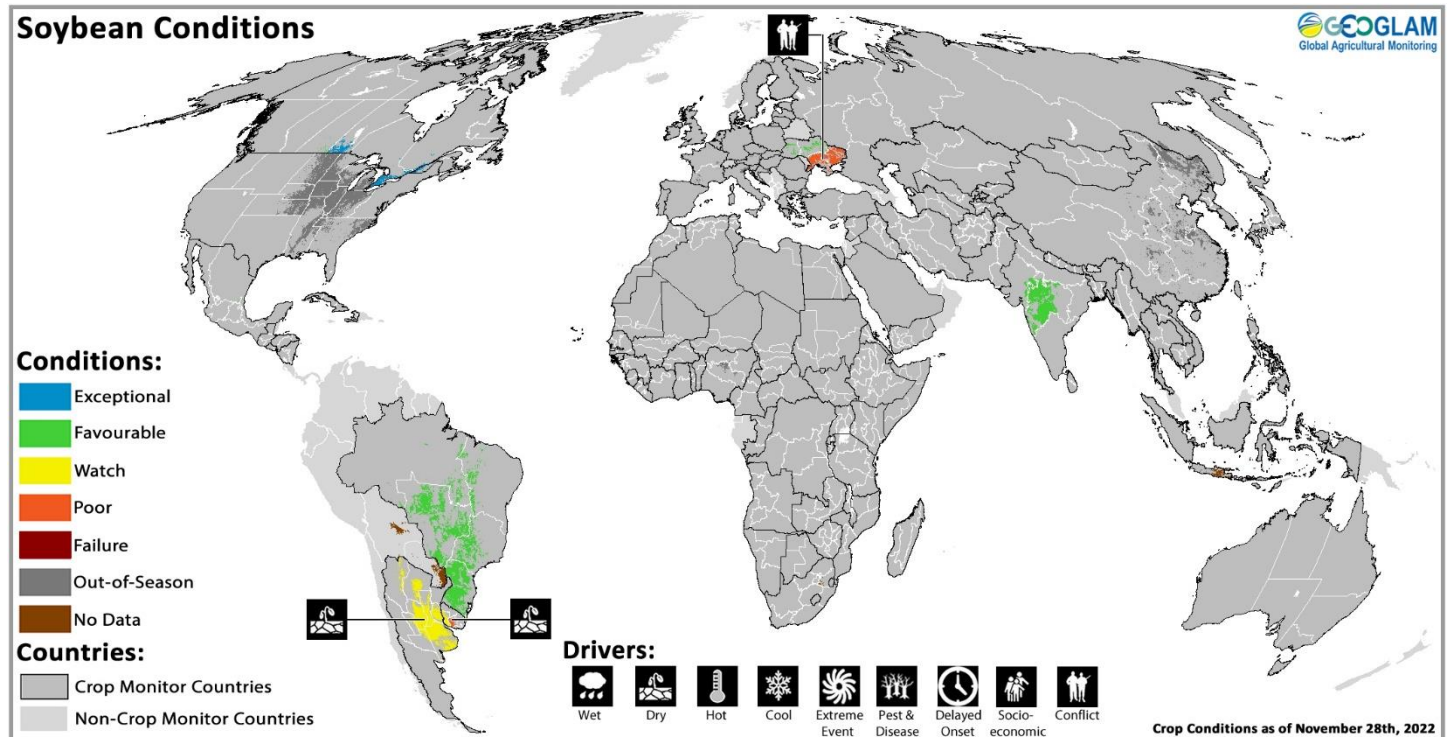


Rice crop conditions over main growing areas are based upon a combination of national and regional crop analyst inputs along with earth observation data. Conditions are based upon information as of November 28th.

In **East Asia**, harvesting is wrapping up for late rice in China under mixed conditions due to persistent extreme heat and dry weather during the fertility period in the Yangtze River Basin. In **South Asia**, harvesting of the *Kharif* crop is wrapping up in India in the southern and eastern states, while sowing is beginning for the *Rabi* crop. In Pakistan, harvesting of *Kharif* season crops is wrapping up under mixed as flood waters are still receding after unprecedented heavy rains and flooding between June and August. In Bangladesh, harvesting of rainfed *Aman* season crops is wrapping up under generally favourable conditions. In Nepal, harvesting is beginning. Sowing of the mostly irrigated *Boro* season crops is now underway. In Sri Lanka, sowing of *Maha* season crops is ongoing. In **Southeast Asia**, harvesting of wet-season crops has reached its peak month. Conditions are generally favourable in Viet Nam, Myanmar, Cambodia, and Laos, while under mixed conditions in northeast Thailand and the Philippines due to being impacted by October's typhoons and heavy rains. In Indonesia, harvesting of dry-season rice continues under favourable conditions while the sowing of wet-season rice begins. In the **Americas**, harvesting of the spring-summer crop is continuing in Mexico. Harvesting is wrapping up for second-season crops in Cuba as the sowing of main-season crops begins. In Brazil, sowing is wrapping up with a decrease in the total sown area compared to last year. In Uruguay, sowing is wrapping up under favourable conditions. In Argentina, sowing is progressing with crops expected to receive the water they need as the Parana River recovers its level. In **MENA**, harvesting of summer-planted crops is wrapping up in Egypt. In **Sub-Saharan Africa**, conditions are generally favourable except for in Mali and northern Nigeria due to the impacts of the continuing conflicts.

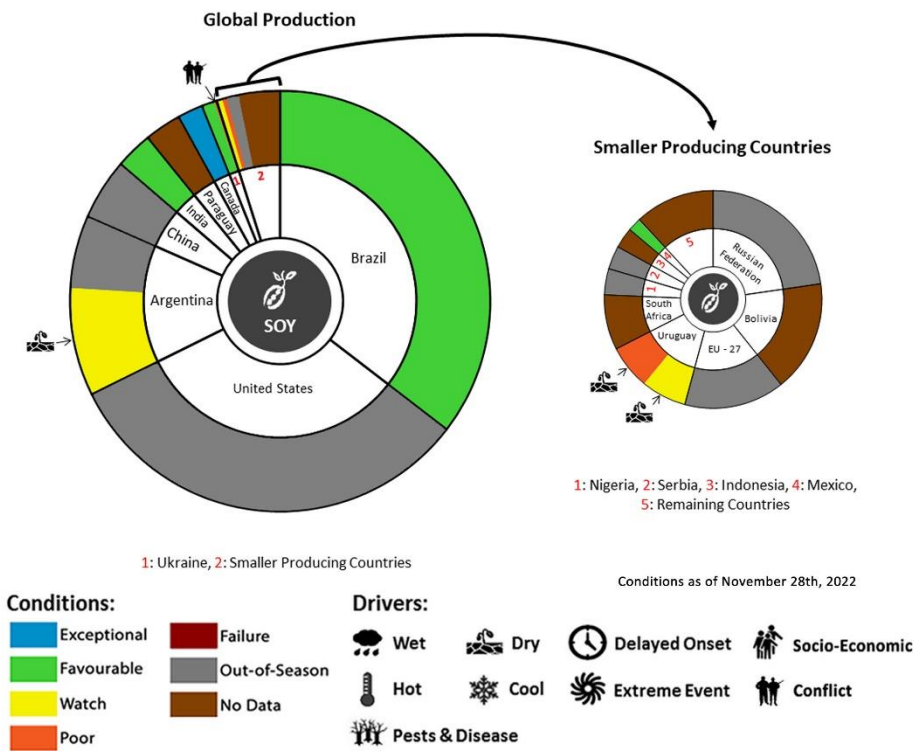


SOYBEAN



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 in Canada under exceptional conditions in Ontario, Manitoba, and Quebec. In **South America**, sowing is progressing in Brazil under favourable conditions despite earlier delays due to adverse weather. An increase in the total sown area is expected compared to last year. In Argentina, sowing is beginning in the main producing areas of Buenos Aires, Entre Rios, Santa Fe, and Córdoba, as recent rains improved soil moisture conditions. However, the lack of surface soil moisture might impact the sowing progress, with southern Santa Fe and northern Buenos Aires being the most affected regions. In Uruguay, sowing has begun with the recent rains and is expected to pick up pace as long as the rains continue. In **Asia**, harvesting is wrapping up in the major producing states of India under favourable conditions. In **Europe**, harvesting is wrapping up in Ukraine under generally favourable conditions outside of the occupied territories.



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.

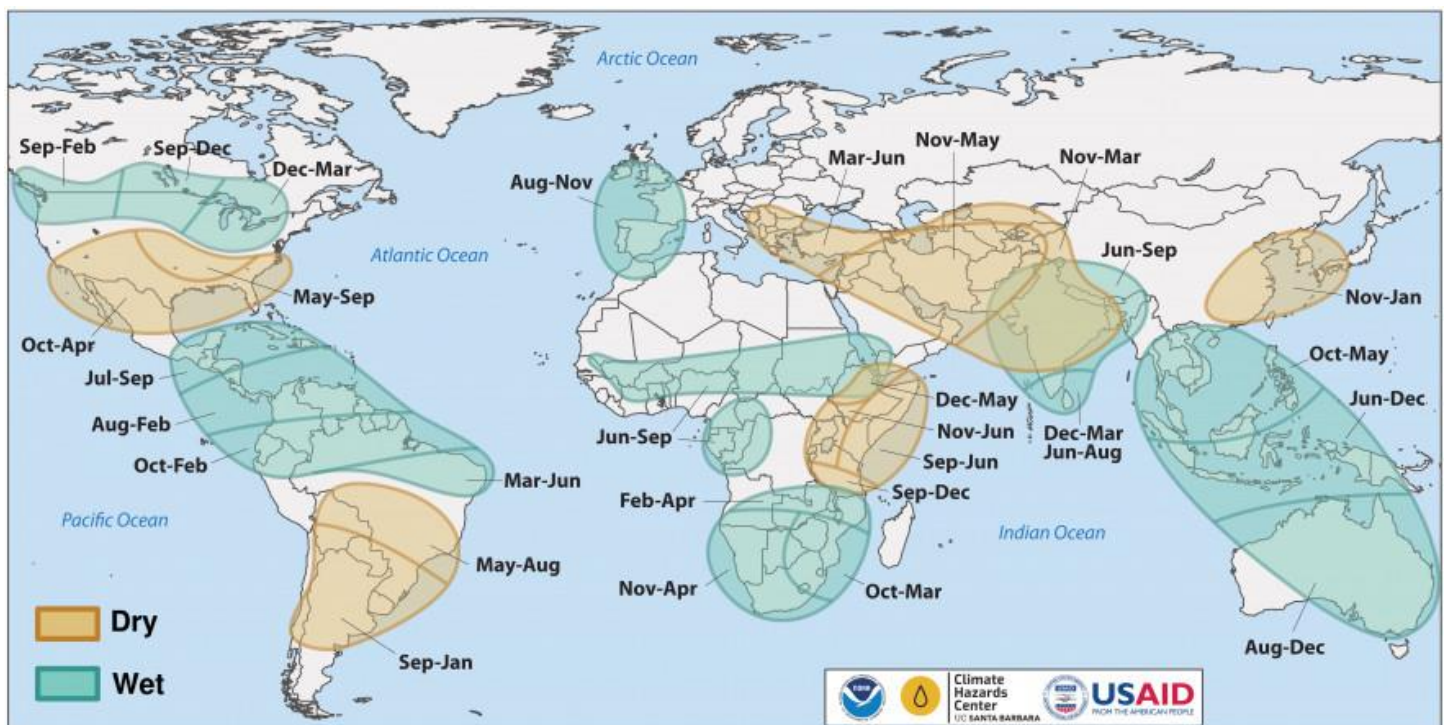
Global Climate Influences

The El Niño-Southern Oscillation (ENSO) is currently in the La Niña phase. La Niña conditions will likely continue into early 2023 (76% chance for December to February and 59% chance for January to March), according to the IRI/CPC. Neutral ENSO conditions are likely after that.

Negative Indian Ocean Dipole (IOD) conditions weakened during November, and neutral IOD conditions are forecast for December, signifying the end of the negative IOD event.

Persistent La Niña conditions since late 2020 have produced high-impact, multi-year droughts in eastern East Africa, southern South America, Central and Southern Asia, and southern North America. The forecast continuation of La Niña for several more months raises concerns about continued dry conditions in these areas. For [eastern East Africa](#), poor spring rains often follow fall La Niñas, as La Niña-like sea surface temperature gradients can linger after La Niña strength wanes. Recovery from severe drought can be a lengthy process, in which several seasons of improved precipitation may be needed to replenish reservoirs and groundwater, and negative socio-economic impacts can have long-lasting effects in food-insecure regions.

Source: UCSB Climate Hazards Center



Location and timing of likely above- and below-average precipitation related to La Niña events. Based upon observed precipitation during 21 La Niña events since 1950, wet and dry correspond to a statistically significant increase in the frequency of precipitation in the upper and lower thirds of historical values, respectively. Statistical significance at the 95% level is based on the resampling of precipitation during neutral El Niño-Southern Oscillation conditions. Source: [FEWS NET & NOAA & CHC](#)

Regional Outlooks

Both the two-week forecast (Figures 1 & 2) and the long-term December-January-February 2022/2023 forecast (Figures 3 & 4) are influenced by the current La Niña phase.

In **North America**, the two-week forecast (Figures 1 & 2) indicates potential areas of below-average precipitation in the US around the Great Lakes and the northern Great Plains. Canada also has the potential to have below-average precipitation in Ontario and Quebec. During the same time, temperatures are likely to be above-average across New Mexico and Texas. The long-term December-January-February 2022/2023 forecast (Figures 3 & 4) shows possible below-average precipitation across the majority of the central and southern US, while above-average precipitation in the US Pacific Northwest and across the Canadian Prairies. During the same time, temperatures are likely to be above-average across much of the US and eastern Canada, especially in the southern and central US. 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 in the eastern Yucatan Peninsula. During the same period, temperatures are potentially above-average in Mexico. The long-term December-January-February 2022/2023 forecast (Figures 3 & 4) suggests likely below-average precipitation across Mexico and western Cuba, while above-average precipitation across Nicaragua, Costa Rica, and Panama. During this time, temperatures are likely to be above-average in Mexico, Cuba, and Haiti, while below-average in Costa Rica and Panama.

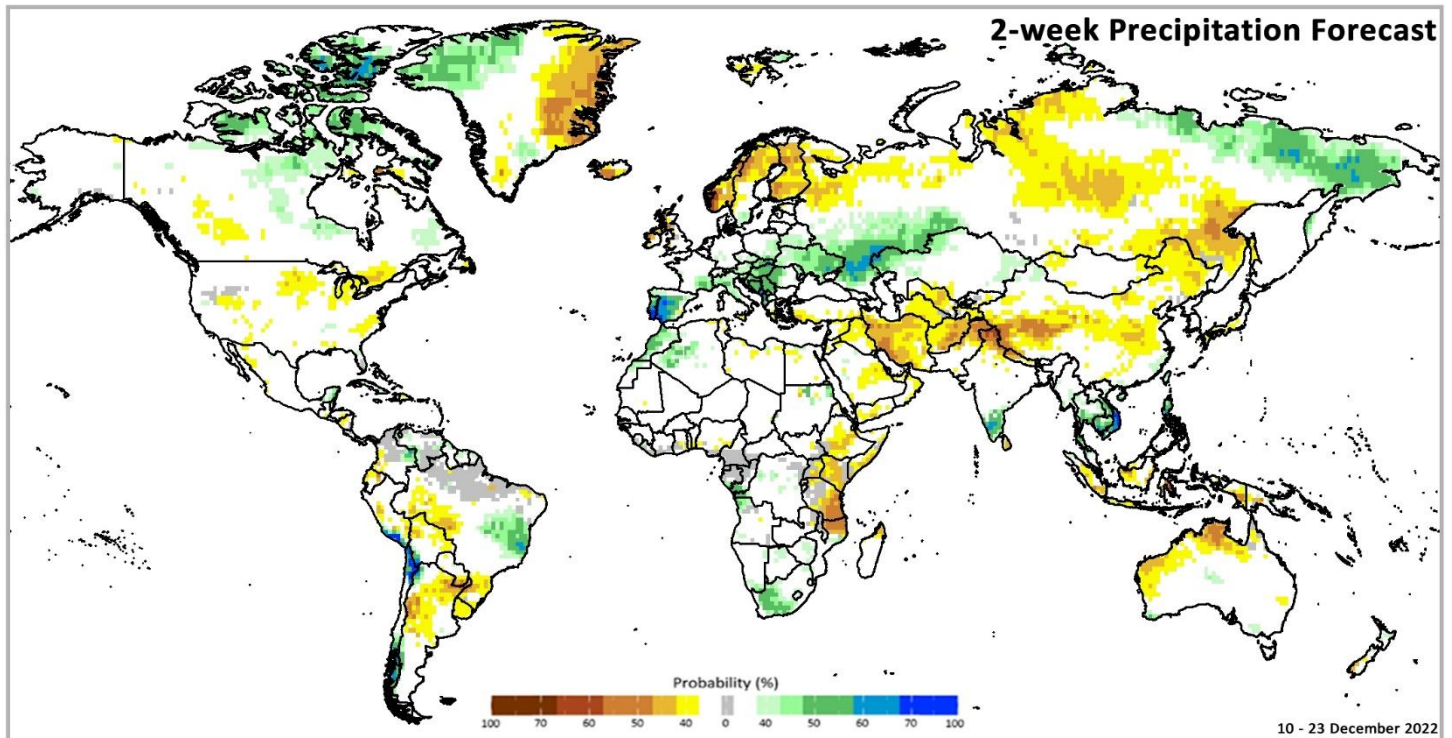


Figure 1: IRI SubX Precipitation Biweekly Probability Forecast for 10 - 23 December 2022, issued on December 2nd, 2022. The forecast is based on statistically calibrated tercile category forecasts from three SubX models. Source: [IRI Subseasonal Forecasts Maproom](#)

In **South America**, the two-week forecast (Figures 1 & 2) indicates likely above-average precipitation in eastern Colombia, eastern Brazil, southwest Peru, western Bolivia, and northern and southern Chile. Below-average precipitation is likely over northern Ecuador, northern Bolivia, western and southern Brazil, southern Paraguay, Uruguay, and northern and western Argentina. During this time, temperatures are likely to be above-average in Brazil, Bolivia, Chile, Paraguay, Uruguay, Argentina, and Chile. The long-term December-January-February 2022/2023 forecast (Figures 3 & 4) suggests likely above-average precipitation across northern South America, while below-average precipitation across southern Brazil, Argentina, Uruguay, southern Paraguay, southern Chile, coastal Ecuador, and coastal Peru. During that time, temperatures will likely be above-average across Argentina and Uruguay, while below-average across northern Brazil, Venezuela, Guyana, Suriname, French Guiana, and western Colombia. For further details, see the [CM4AMIS](#) Regional Outlooks for Argentina and Brazil.

In **Europe**, the two-week forecast (Figures 1 & 2) indicates likely below-average rainfall over Ireland, Scotland, Iceland, Norway, Sweden, Finland, southern Greece, southern Türkiye, and eastern and northern regions of the Russian Federation. Above-average precipitation is likely in Portugal, Spain, southern France, northern Italy, Austria, Slovakia, Hungary, western Romania, Serbia, Croatia, Slovenia, Bosnia and Herzegovina, Montenegro, Kosovo, Albania, Ukraine, and southern and central Russian Federation. During this time temperatures are likely to be above-average across most of southern Europe, while below-average across most of northern Europe. The long-term December-January-February 2022/2023 forecast (Figures 3 & 4) predicts possible below-average precipitation in northern Spain, France, southern United Kingdom, Belgium, the Netherlands, Germany, eastern Ukraine, southern Russian Federation, and Türkiye. During the long-term forecast, temperatures will potentially be above-average across all of Europe.

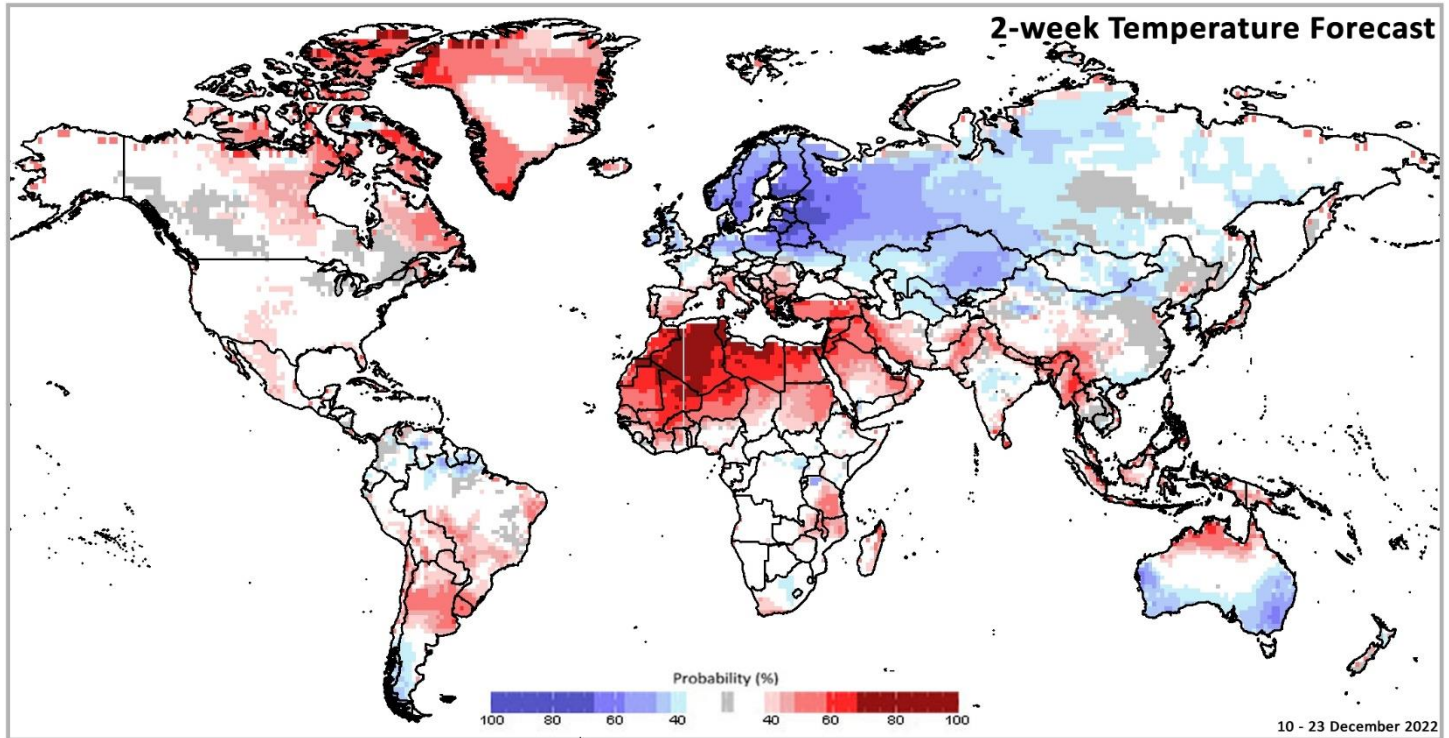


Figure 2: IRI SubX Temperature Biweekly Probability Forecast for 10 - 23 December 2022, issued on December 2nd, 2022. The forecast is based on statistically calibrated tercile category forecasts from three SubX models. Source: [IRI Subseasonal Forecasts Maproom](#)

In **MENA**, the two-week forecast (Figures 1 & 2) indicates likely above-average precipitation in Morocco, while likely below-average precipitation in Iraq, and central Iran. During this time, temperatures are likely to be above-average across the entire region, most notably along the southern Mediterranean. The long-term December-January-February 2022/2023 forecast (Figures 3 & 4) predicts likely near-average precipitation across the region except for possible below-average precipitation in Syria and Lebanon. During this time temperatures are possibly to be above-average across most of the region, most in southern Iran. 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 central Ethiopia, eastern Somalia, western Kenya, eastern Uganda, southeast Tanzania, northern Mozambique, and northern Madagascar. Above-average precipitation is likely over the southwestern Republic of Congo, western Democratic Republic of the Congo, northwest Angola, and western South Africa. For the long-term December-January-February 2022/2023 forecast (Figures 3 & 4), precipitation is likely to be below-average over Ethiopia, Kenya, Uganda, Tanzania, Rwanda, Burundi, southern DRC, northern Zambia, Malawi, northern Mozambique, and southwestern Angola. Above-average precipitation is likely over Cameroon, Zimbabwe, Botswana, South Africa, and southern Madagascar. During this time, temperatures are likely to be above-average across most countries except for likely below-average temperatures in Botswana, Zimbabwe, and South Africa. For further details, see the [CM4EW](#) regional outlooks for East and Southern Africa.

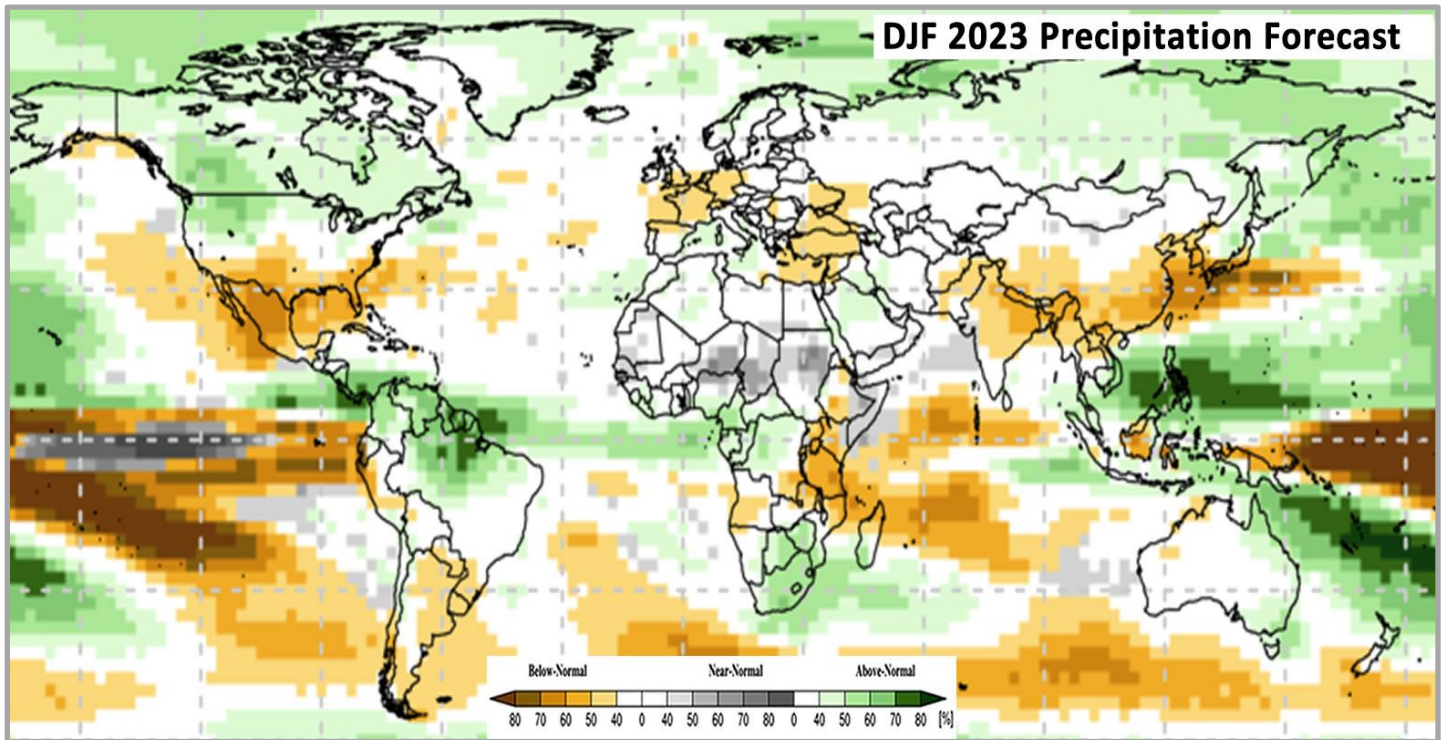


Figure 3: Probabilistic forecast for most-likely December-January-February (DJF) 2022/2023 rainfall tercile, based on November conditions. The white colour indicates that there is no dominant category across the model forecasts. Source: [WMO Lead Centre for Long-Range Forecast Multi-Model Ensemble](#)

In **Central Asia**, the two-week forecast (Figures 1 & 2) indicates likely below-average precipitation in central Uzbekistan, Turkmenistan, Tajikistan, and Afghanistan. Above-average precipitation is likely in northwestern Kazakhstan. During this time, temperatures are likely to be below-average in Kazakhstan, Kyrgyzstan, Uzbekistan, and Turkmenistan, while above-average in eastern Afghanistan. The long-term December-January-February 2022/2023 forecast (Figures 3 & 4) predicts likely below-average precipitation in eastern Afghanistan. At the same time, temperatures are likely to be above-average across the entire region, particularly in eastern Afghanistan. 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 in northern Pakistan, northern India, western Nepal, and Sri Lanka, while above-average in southern India. During this time, temperatures are likely to be above-average in Pakistan, northwestern and northeastern India, Nepal, Bhutan, Bangladesh, and Sri Lanka. The long-term December-January-February 2022/2023 forecast (Figures 3 & 4) indicates likely below-average precipitation in Pakistan, India, Nepal, and Bangladesh. During this time, temperatures are likely to be above-average in Pakistan, northwest and northeast India, Nepal, Bhutan, and Bangladesh. 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 in parts of China, southern Japan, and the eastern Russian Federation. During this time, temperatures are likely to be above-average in southwest China and parts of Japan, while below-average in northern China, the Republic of Korea, and the Democratic People's Republic of Korea. The long-term December-January-February 2022/2023 forecast (Figures 3 & 4) suggests likely below-average precipitation over central and southern China, the Republic of Korea, the Democratic People's Republic of Korea, and southern Japan. During that time, temperatures are likely to be above-average across the entire region.

In **Southeast Asia & Oceania**, the two-week forecast (Figures 1 & 2) indicates likely below-average precipitation in Indonesia, Papua New Guinea, and northern Australia, while above-average over the Philippines, southern Viet Nam, southern Laos, Cambodia, and southern Thailand. During this time, temperatures are likely to be above-average in Myanmar, northern Thailand, the Philippines, Indonesia, Malaysia, Papua New Guinea, and northern Australia, while below-average in eastern and western Australia. The long-term December-January-February 2022/2023 forecast (Figures 3 & 4) precipitation is predicted to be above-average across southern Viet Nam, the Philippines, and Eastern Australia, while below-average in northern Viet Nam, northern Laos, Myanmar, Indonesia, and Papua New Guinea. During the same time, temperatures are likely to be above-average in Myanmar, eastern Indonesia, Papua New Guinea, and New Zealand, while below-average in southern Thailand, Cambodia, southern Viet Nam, and eastern Australia.

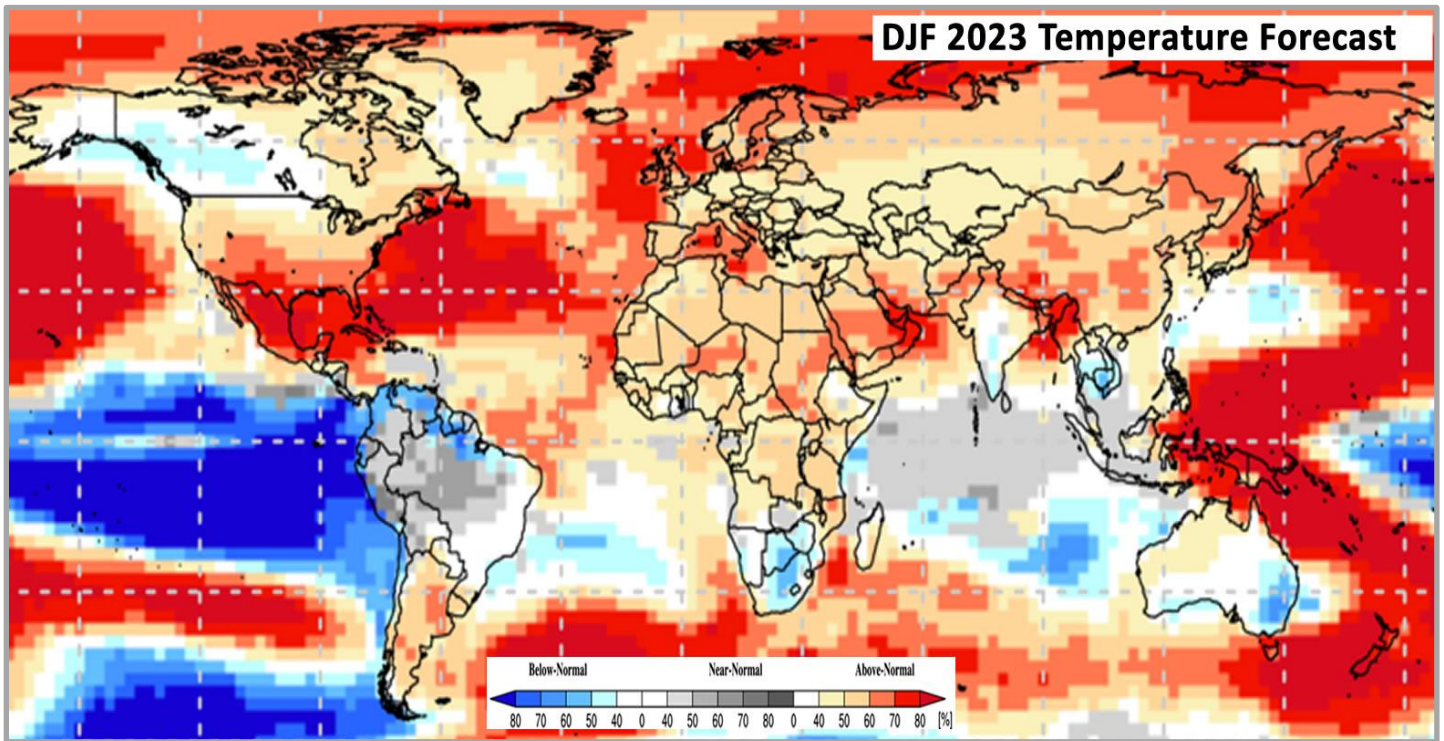


Figure 4: Probabilistic forecast for most-likely December-January-February (DJF) 2022/2023 temperature tercile, based on November conditions. The white colour indicates that there is no dominant category across the model forecasts. Source: [WMO Lead Centre for Long-Range Forecast Multi-Model Ensemble](#)

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 to 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).