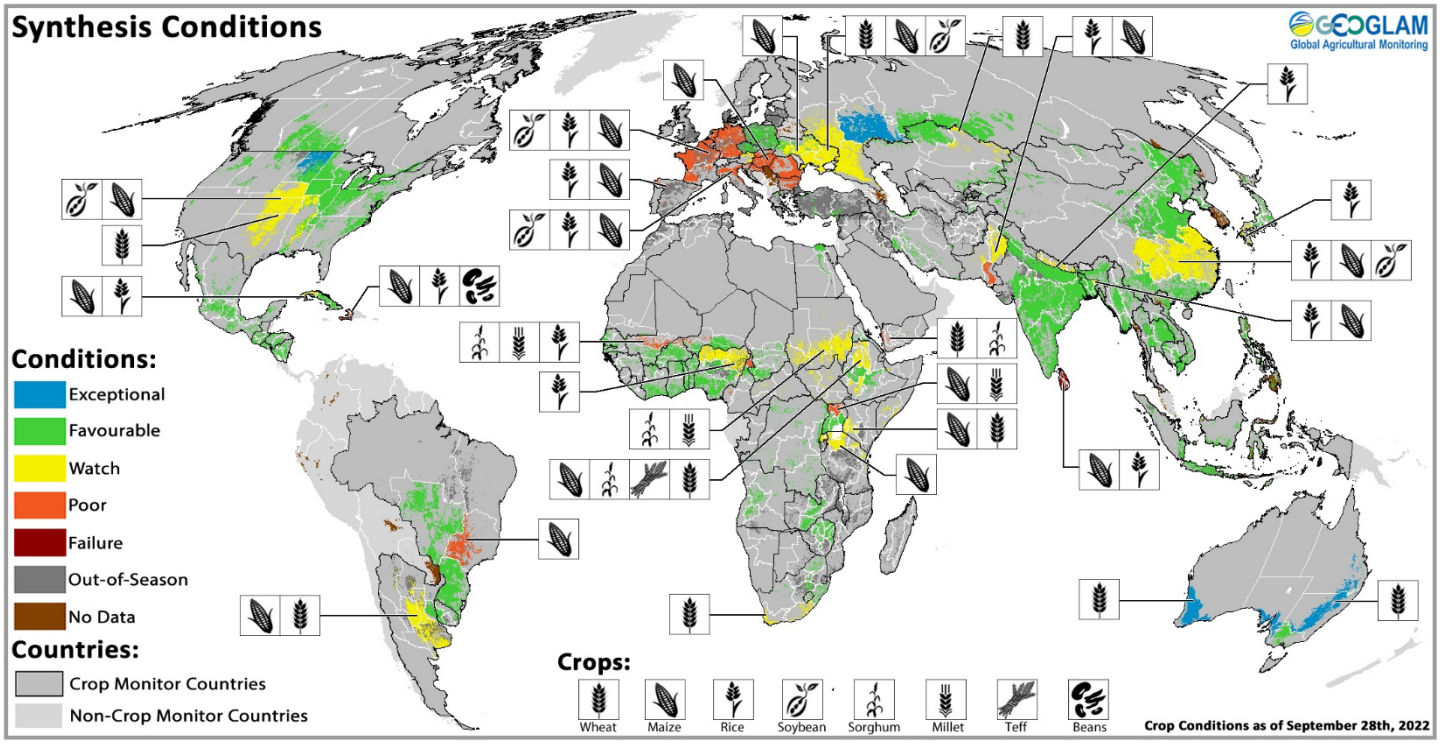
GEOGLAM Global Crop Monitor

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



Crop condition map synthesizing information for all Crop Monitor crops as of September 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
Current Conditions				
Compared to last month	↓	↓	–	–
Compared to last year	↓	↓	↓	–

Legend:
Positive ↑ Better
Mixed – Similar
Negative ↓ Worse

See Appendix I for detailed methodology description

Global Crop Overview

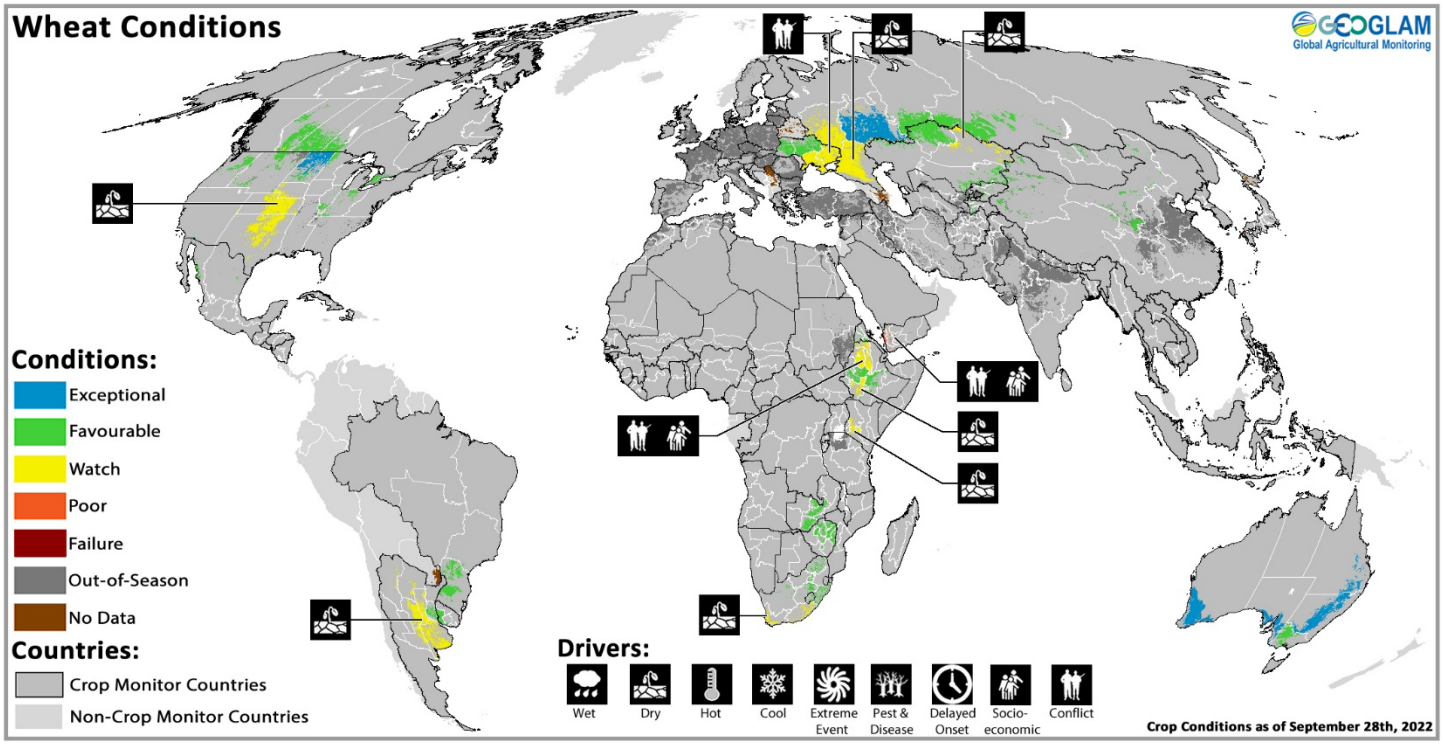
Global crop conditions at the end of September are overall positive for soybeans while mixed for wheat, maize, and rice. For **wheat**, Argentina, South Africa, the US, Ukraine, and the Russian Federation are areas of concern. For **maize**, there are persistent issues in North America, South America, Europe, East Africa, and Asia. For **rice**, concern remains in parts of China, Pakistan, Japan, Nepal, and Sri Lanka. For **soybeans**, conditions are generally favourable with harvesting beginning in the Northern Hemisphere while sowing begins in the Southern Hemisphere. The remaining crops are covered in the CM4EW publication.

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 (89% chance for October to December and 65% chance for December to February), according to the IRI/CPC. Negative Indian Ocean Dipole (IOD) conditions are present and are expected to continue through at least November (78% chance), according to the Australia Bureau of Meteorology. For further details see page 6.

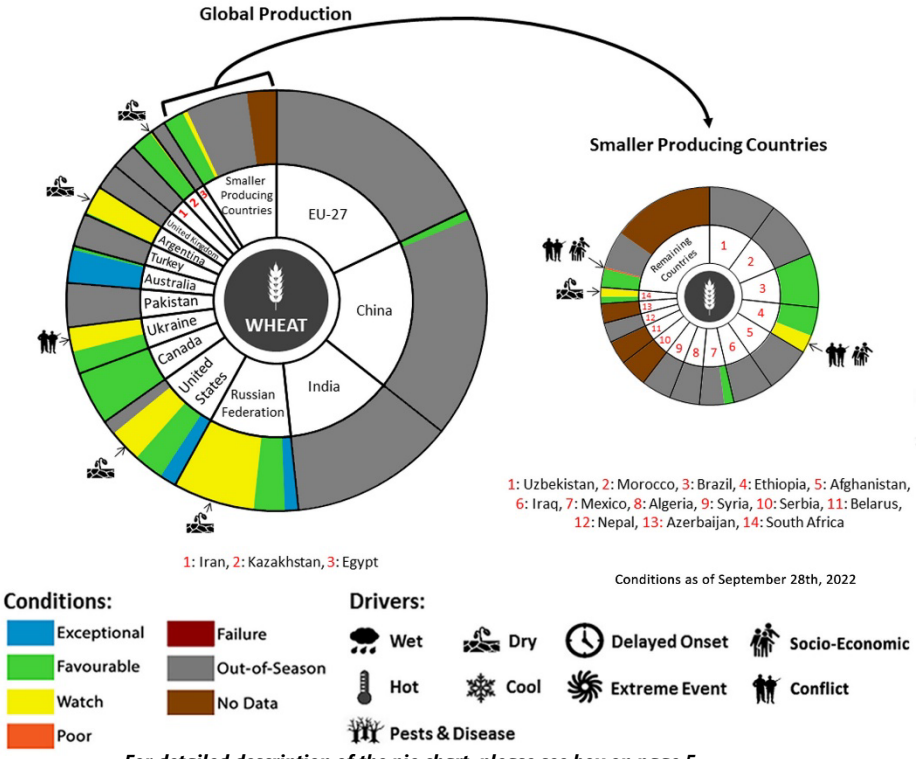
Source: UCSB Climate Hazards Center

WHEAT



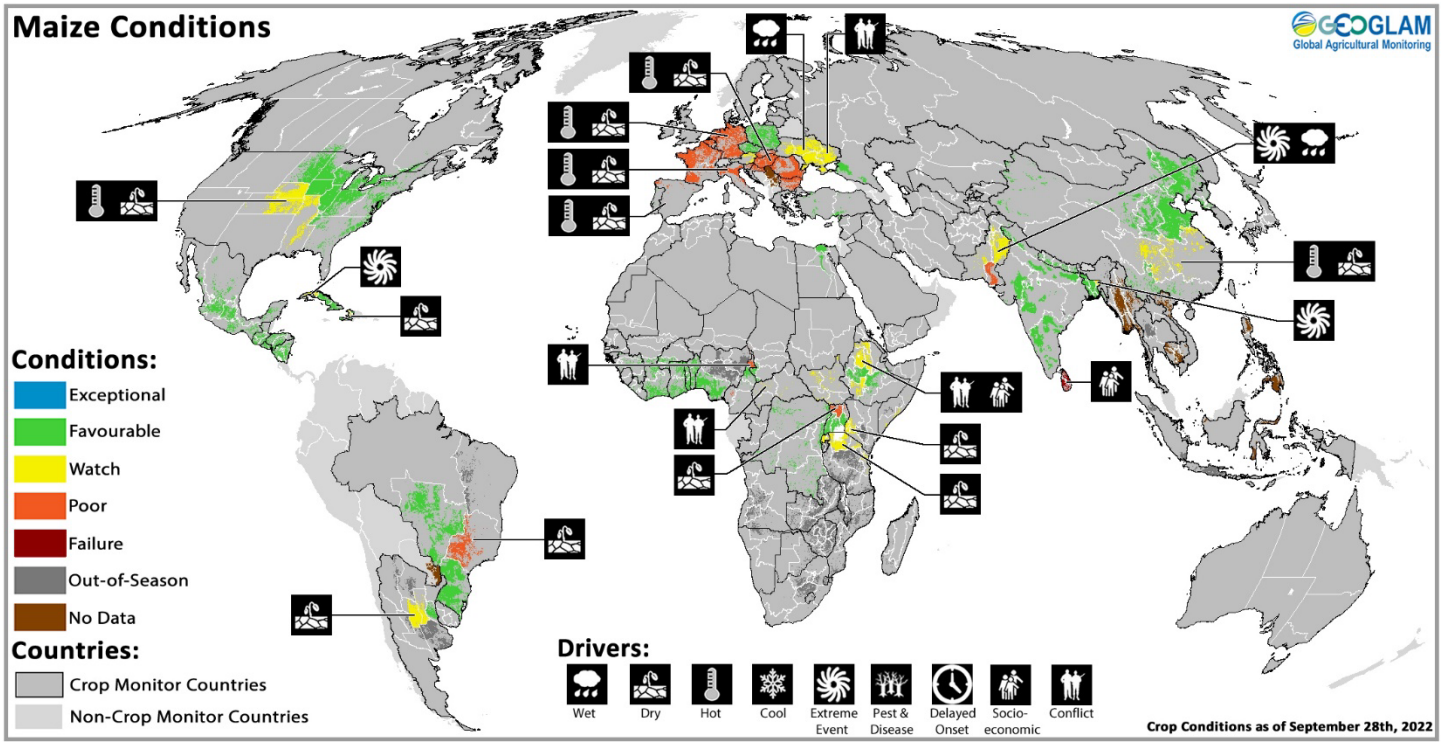
Wheat crop conditions over main growing areas are based upon a combination of national and regional crop analyst inputs along with earth observation data. Conditions are based upon information as of September 28th.

In **North America,** after a delayed start to the season, harvesting of spring wheat is wrapping up in the US under exceptional conditions. However, sowing of winter wheat is ongoing under dry conditions in the southern and central Great Plains. In Canada, spring wheat harvesting is wrapping up under favourable conditions, while winter wheat sowing begins. In **South America**, dry conditions continue to persist in Argentina across most of the central and northern growing areas, however, some recent rainfall has helped to stabilize the crops in the south. In Brazil, most crops are in the reproductive stage and under favourable conditions. An increase in the total sown area is estimated. Conditions are favourable in Uruguay. In **Europe**, sowing has begun in Ukraine under mixed conditions in the southern and eastern regions due to the ongoing war and some dryness in the south. In the Russian Federation, harvesting of spring wheat is wrapping up under favourable to exceptional conditions. Sowing of winter wheat has begun under dry conditions and will require additional rainfall to support crop establishment. In **Central Asia**, harvesting of spring wheat is wrapping up in Kazakhstan, Kyrgyzstan, and Tajikistan under generally favourable conditions. However, there is concern in northeastern Kazakhstan due to previous dry conditions. In **East Asia**, harvesting of spring wheat is wrapping up in China under favourable conditions. In **Oceania**, conditions are exceptional in Australia where above-average yields are expected across the country due to timely and ample rainfall over the winter supporting crop development. In **MENA**, harvesting is wrapping up in Yemen under poor conditions. In **Sub-Saharan Africa**, harvesting of crops is underway in Zimbabwe. Conditions are generally favourable in South Africa, except in Western Cape, where dry conditions persist. Crops continue to develop in Lesotho and Zambia for harvest starting in October. Conflict impacts continue to persist in northern Ethiopia, while dry conditions remain in western Kenya and southwest Ethiopia.



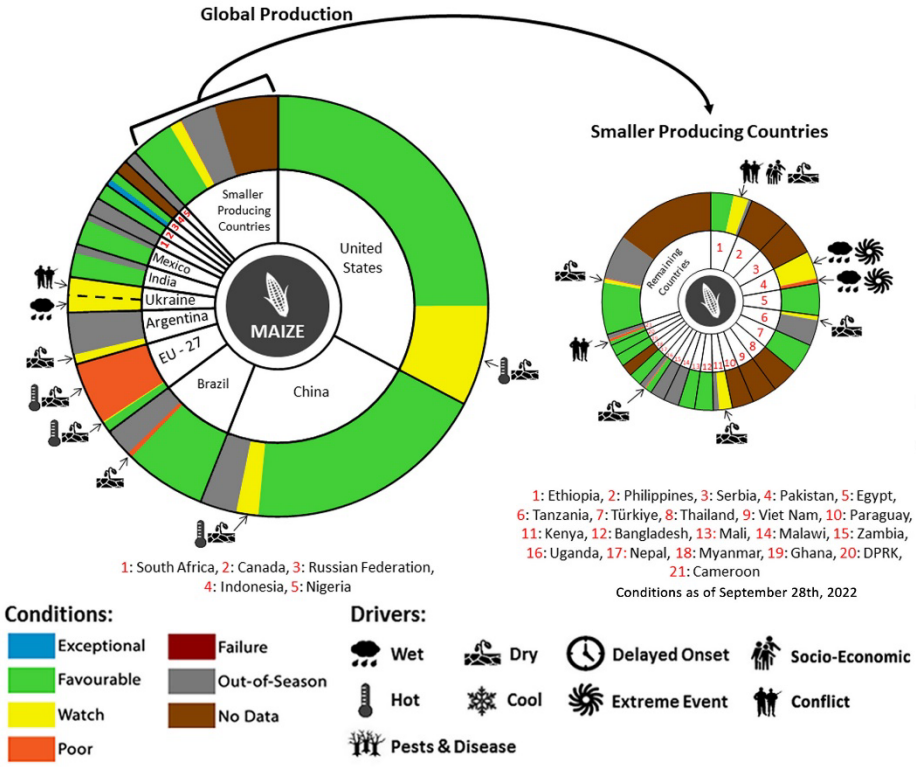
For detailed description of the pie chart, please see box on page 5.

MAIZE



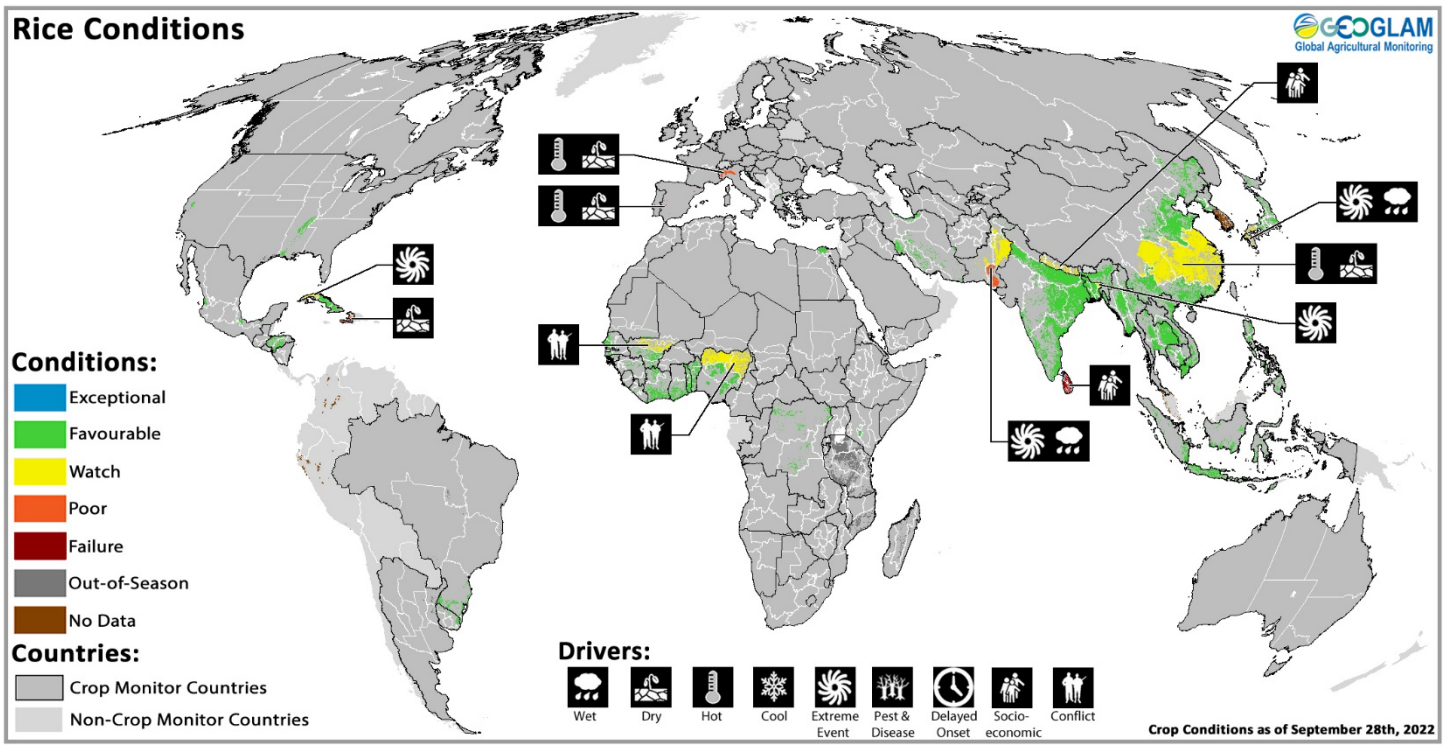
Maize crop conditions over main growing areas are based upon a combination of national and regional crop analyst inputs along with earth observation data. Conditions are based upon information as of September 28th.

In **North America**, conditions in the western and southern Corn Belt of the US remain a concern as harvesting begins. In Canada, harvest is ongoing under favourable conditions. In **Central America & the Caribbean**, sowing is wrapping up in Mexico for the spring-summer season (larger season). Harvesting of *Primera* season crops is nearing completion in El Salvador, Guatemala, Honduras, and Nicaragua while sowing of *Segunda/Postrera* season crops is underway. In Cuba, harvesting of main season crops is underway. In Haiti, second-season crops are generally favourable. In **South America**, the summer-planted crop (larger season) harvest is wrapping up in Brazil under favourable conditions in the Central-West and South regions, while poor in the Southeast region. Sowing of the spring-planted crop (smaller) has begun in the south. In Argentina, sowing of the early-planted crop (larger season) continues, albeit delayed due to a lack of soil moisture in many areas. In **Europe**, the summer drought in the EU has brought the yield outlook for crops to a rather uniform poor status. In Ukraine, heavy September rainfall in the northern and western regions combined with cooler temperatures has slowed ripening and delayed harvesting. In the Russian Federation, harvesting is ongoing. In Türkiye, conditions are favourable for harvesting. In **South Asia**, conditions are favourable in India for *Kharif* crops. In Pakistan, harvesting of *Kharif* crops has just begun under mixed conditions due to the severe monsoon rainfall and unprecedented flooding. In Bangladesh, main-season crops are favourable. In Nepal and Sri Lanka, harvesting of the main season and *Yala* season crops respectively is wrapping up with decreases due to input shortages. In **East Asia**, conditions are favourable in China for the main producing areas of the northeast, offsetting impacts from the earlier hot and dry conditions in the Yangtze River basin. In **West Africa**, harvesting activities are nearing completion in the south and are just beginning along the Sahel. In **East Africa,** harvesting of main-season crops is underway in the north under mixed conditions due to persistent dryness in parts of South Sudan and Ethiopia as well as flooding in some areas.



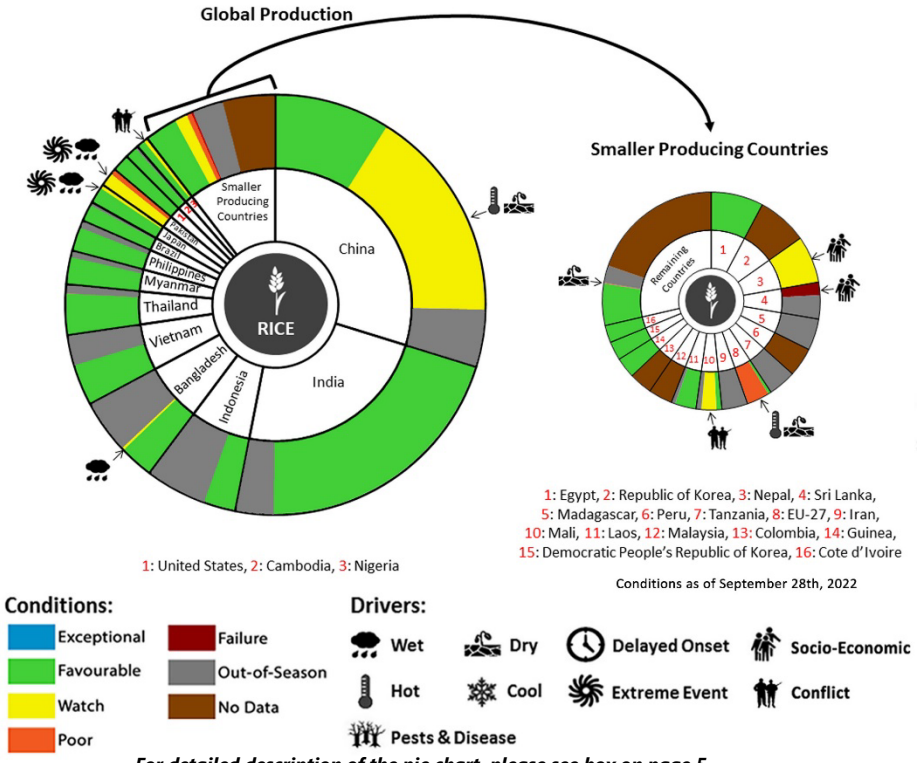
For detailed description of the pie chart, please see box on page 5.

RICE



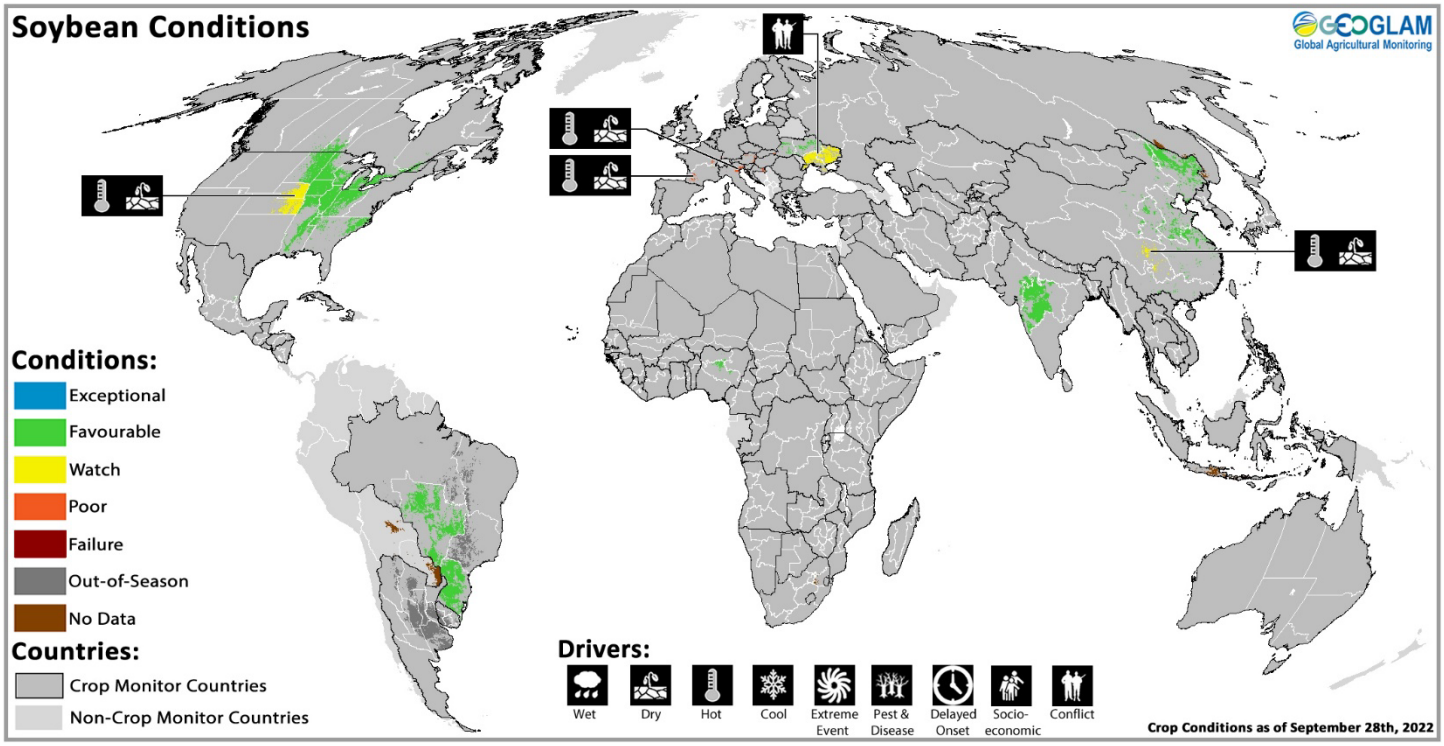
Rice crop conditions over main growing areas are based upon a combination of national and regional crop analyst inputs along with earth observation data. Conditions are based upon information as of September 28th.

In **East Asia**, harvesting is ongoing for single-season rice in China, however, hot and dry conditions during the summer months impacted the yield potentials of both single-season and late-season crops in the Yangtze River basin. In Japan, typhoon Nanmadol impacted the south, bringing heavy rainfall and flooding. In the Democratic People's Republic of Korea, harvesting of crops is nearing completion. In **South Asia**, conditions are favourable in India as harvesting approaches in the northern states for *Kharif* season crops. There is a slight reduction in the total sown area compared to the average and last year, primarily in the eastern states. In Pakistan, harvesting of *Kharif* season crops has just begun, and overall conditions are mixed as the country continues to be affected by severe monsoon rainfall and unprecedented flooding. In Bangladesh, *Aman* season rice crops are in the vegetative to reproductive stage for harvest starting in October. In Nepal, yields are expected to decrease due to the high price of fuel and fertilizer. In Sri Lanka, harvesting of the *Yala* season crop is wrapping up with significant yield declines expected due to the severe economic crisis. In **Southeast Asia**, wet-season rice is developing under favourable conditions in Viet Nam, Thailand, Myanmar, the Philippines, Cambodia, and Laos. In Indonesia, sowing of dry-season rice enters the late stages as harvesting of earlier sown crops continues. In the **Americas**, harvesting is ongoing in the US. In Mexico, harvesting of the spring-summer crop has begun. Harvesting is ongoing for second-season rice in Cuba and main-season rice in Haiti. Sowing is beginning in southern Brazil and Uruguay. In **Europe**, conditions are poor going into the harvest due to a hot and dry summer. In **MENA**, conditions are favourable in Iran and Egypt. In **Sub-Saharan Africa**, conditions are generally favourable except for in Mali and northern Nigeria due to continuing conflicts.



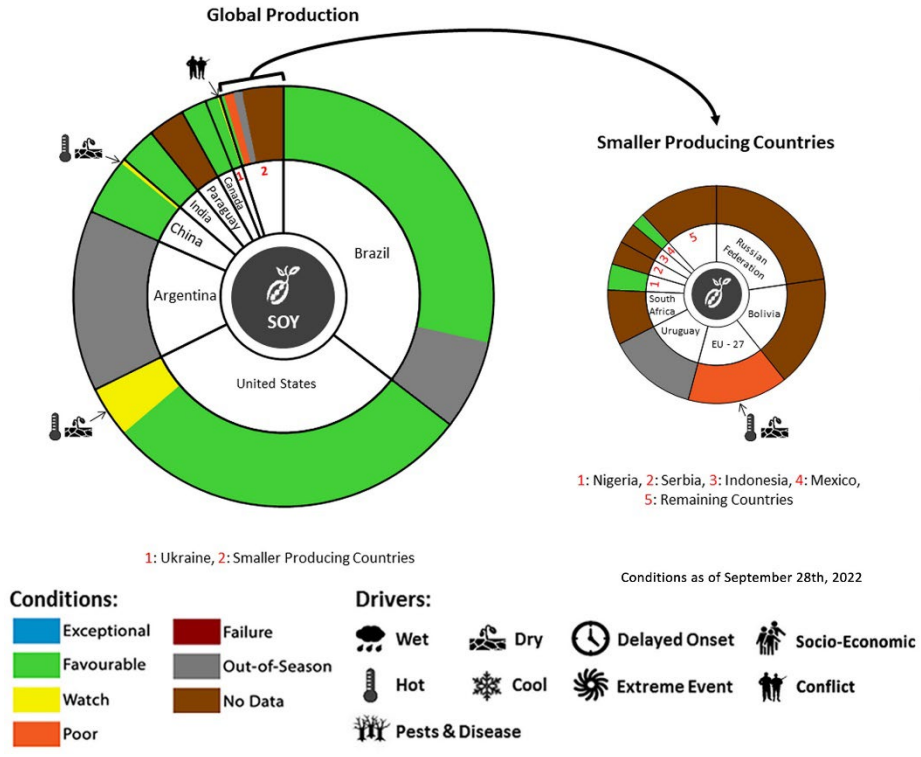
For detailed description of the pie chart, please see box on page 5.

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 September 28th.

In **North America**, conditions remain generally favourable in the US as harvesting begins, albeit with earlier hot and dry conditions likely impacting yields in Kansas and Nebraska. In Canada, harvesting is ongoing under favourable conditions. In **Central America**, harvesting is beginning under favourable conditions in Mexico. In **South America**, sowing is beginning in Brazil under favourable conditions in the South region and some areas with enough soil moisture in the Central-West region. In **Asia**, conditions are generally favourable in China as harvest begins with some minor areas of concern in the southwest due to earlier summer hot and dry conditions. In India, crops are in the maturity stage under favourable conditions with a total sown area similar to last year, but higher than the average. In **Europe**, hot and dry summer weather has reduced yields in the EU, most notably across southern Europe. In Ukraine, conditions are favourable as harvest begins, however, conditions remain mixed in the southern and eastern regions due to the ongoing war. In **Sub-Saharan Africa**, a timely start to the 2022 rainy season in Nigeria followed by average to above-average rainfall between July and September has supported sowing activities and crop establishment.



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.

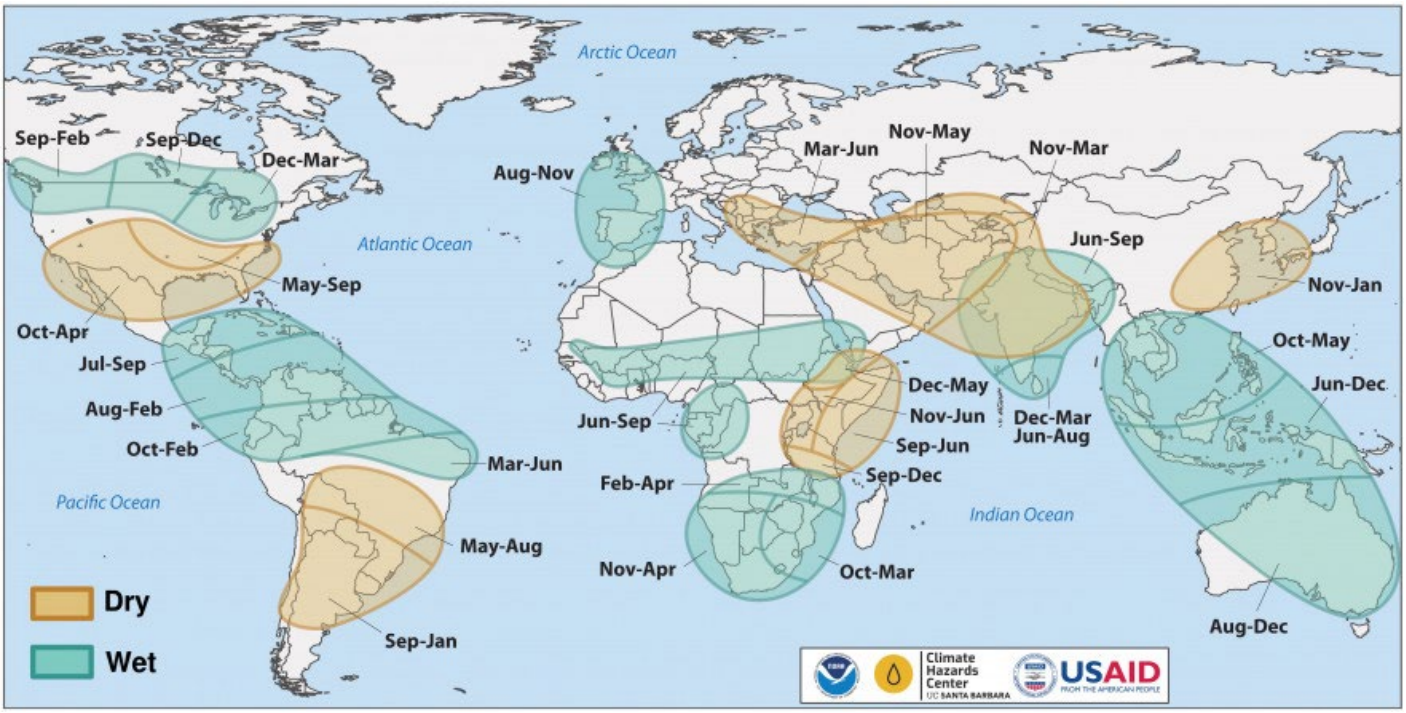
Global Climate Influences

The El Niño-Southern Oscillation (ENSO) is currently in the La Niña phase. La Niña conditions will likely continue into early 2023 (89% chance for October to December and 65% chance for December to February), according to the IRI/CPC.

Negative Indian Ocean Dipole (IOD) conditions are present and are expected to continue through at least November (78% chance), according to the Australia Bureau of Meteorology.

Associated with the co-occurring La Niña and negative IOD conditions there are very high risks of severe drought impacts across the Horn of Africa, and heavy rainfall and flooding in Australia and Southeast Asia. Additionally, La Niña conditions for a third year in a row raises concerns about repeat dry conditions in eastern East Africa, southern South America, Central and Southern Asia, and southern North America, where multiple rainfall seasons have been below-average since late 2020. Historically, co-occurring La Niña and IOD events have led to very dry conditions in East Africa during boreal fall, and fall La Niñas are very often followed by poor spring rains as well, even if La Niña strength wanes.

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 October-November-December 2022 forecast (Figures 3 & 4) are influenced by the co-occurring La Niña phase, and a Negative Indian Ocean Dipole (IOD).

In **North America**, the two-week forecast (Figures 1 & 2) indicates likely below-average precipitation in the US across the northern Great Plains and the northern Corn belt, along with the Southeast. Canada is likely to also see below-average rainfall across the majority of the Prairies. There is likely above-average precipitation in the US over Alaska and the central Pacific coast. During the same time, temperatures are likely to be above-average across the US Great Plains and Pacific Northwest, while above-average temperatures are likely across the Canadian Prairies and the Rockies. The long-term October-November-December 2022 forecast (Figures 3 & 4) shows possible below-average precipitation across the majority of the central and southern US, while above-average precipitation in the western Canadian Prairies and Rockies. During the same time, temperatures are likely to be above-average across all of North America, especially in the US and 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 below-average precipitation over western and southern Mexico, southern Guatemala, El Salvador, southern Honduras, western Cuba, and Haiti. During this time, temperatures are likely to be above-average in western and northeast Mexico and Costa Rica. The long-term October-November-December 2022 forecast (Figures 3 & 4) suggests likely below-average precipitation across northern Mexico, while above-average precipitation across Honduras, Nicaragua, Costa Rica, and Panama. During this time, temperatures are likely to be above-average in northern Mexico, and Cuba, while below-average in Panama. For further details, see the CM4EW seasonal forecast alert for Central America and the Caribbean.

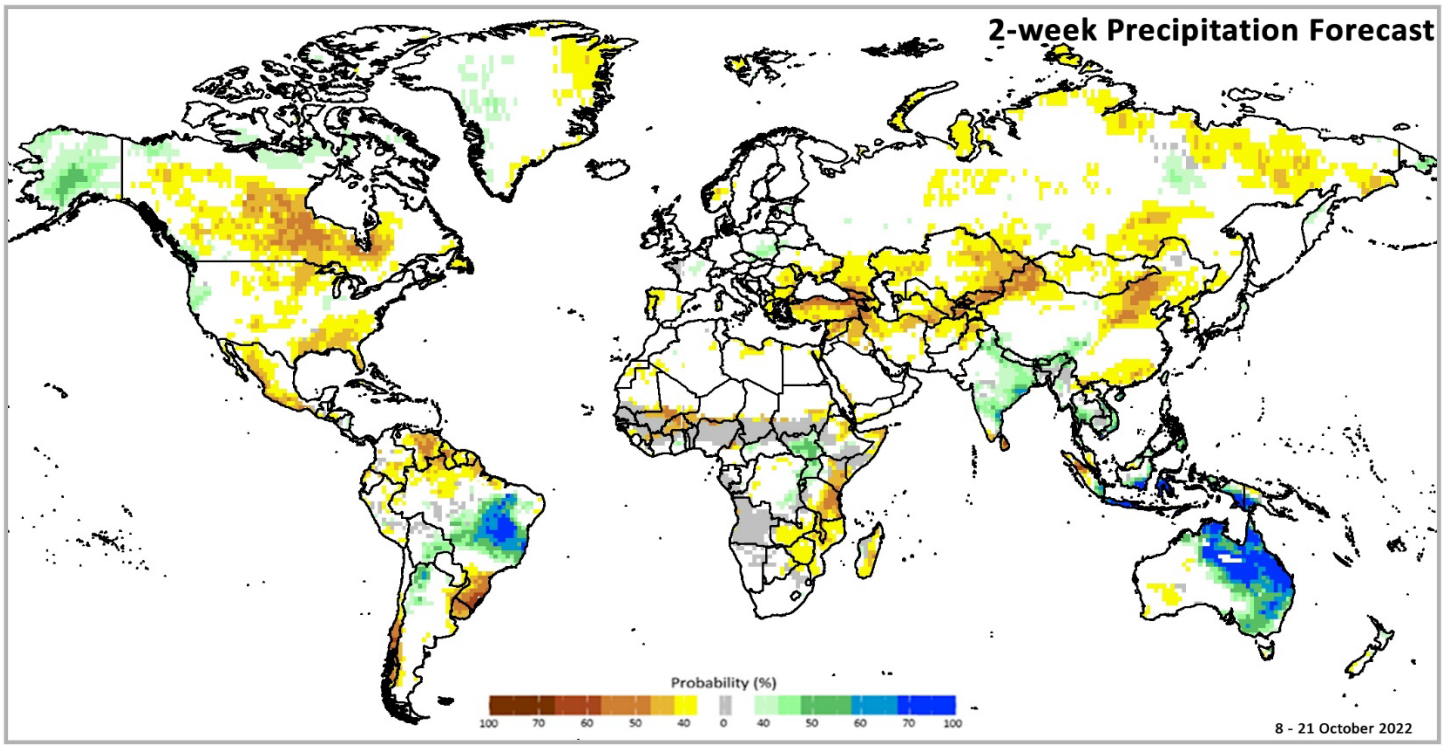


Figure 1: IRI SubX Precipitation Biweekly Probability Forecast for 8 – 21 October 2022, issued on September 30th, 2022. The forecast is based on statistically calibrated tercile category forecasts from three SubX models. Source: IRI Subseasonal Forecasts Maproom

In **South America**, the two-week forecast (Figures 1 & 2) indicates likely above-average precipitation in central and eastern Brazil, southeast Bolivia, and northeast Argentina. Below-average precipitation is likely over southeast Colombia, Venezuela, Guyana, Suriname, French Guiana, northern and southern Brazil, Uruguay, and southern Chile. During this time, temperatures are likely to be above-average in eastern Colombia, southern Venezuela, Guyana, Suriname, French Guiana, northern Brazil, northern and southern Peru, southwest Bolivia, southern Chile, and central and southern Argentina. The long-term October-November-December 2022 forecast (Figures 3 & 4) suggests likely above-average precipitation across northwest Colombia, Venezuela,

Guyana, Suriname, French Guiana, and northern and central Brazil. Below-average precipitation is likely across southern Brazil, eastern Paraguay, Uruguay, Argentina, and southern Chile. During that time, temperatures will likely be above-average across Argentina and below-average across southeast Brazil. For further details, see the CM4AMIS Regional Outlooks for Argentina and Brazil.

In **Europe**, the two-week forecast (Figures 1 & 2) indicates likely above-average rainfall over southern Poland with below-average precipitation over northwest Spain, northern Portugal, southern and eastern Ukraine, eastern Romania, Bulgaria, North Macedonia, Greece, Turkey, southern Russian Federation, Georgia, Armenia, and Azerbaijan. During this time temperatures are likely to be near average. The long-term October-November-December 2022 forecast (Figures 3 & 4) predicts likely below-average precipitation in Portugal, Spain, western France, Ireland, southern Ukraine, Moldovia, Romania, Bulgaria, North Macedonia, Greece, Turkey, southern Russian Federation, Georgia, Armenia, and Azerbaijan. During the long-term forecast, temperatures are forecast to be likely above-average across all of Europe.

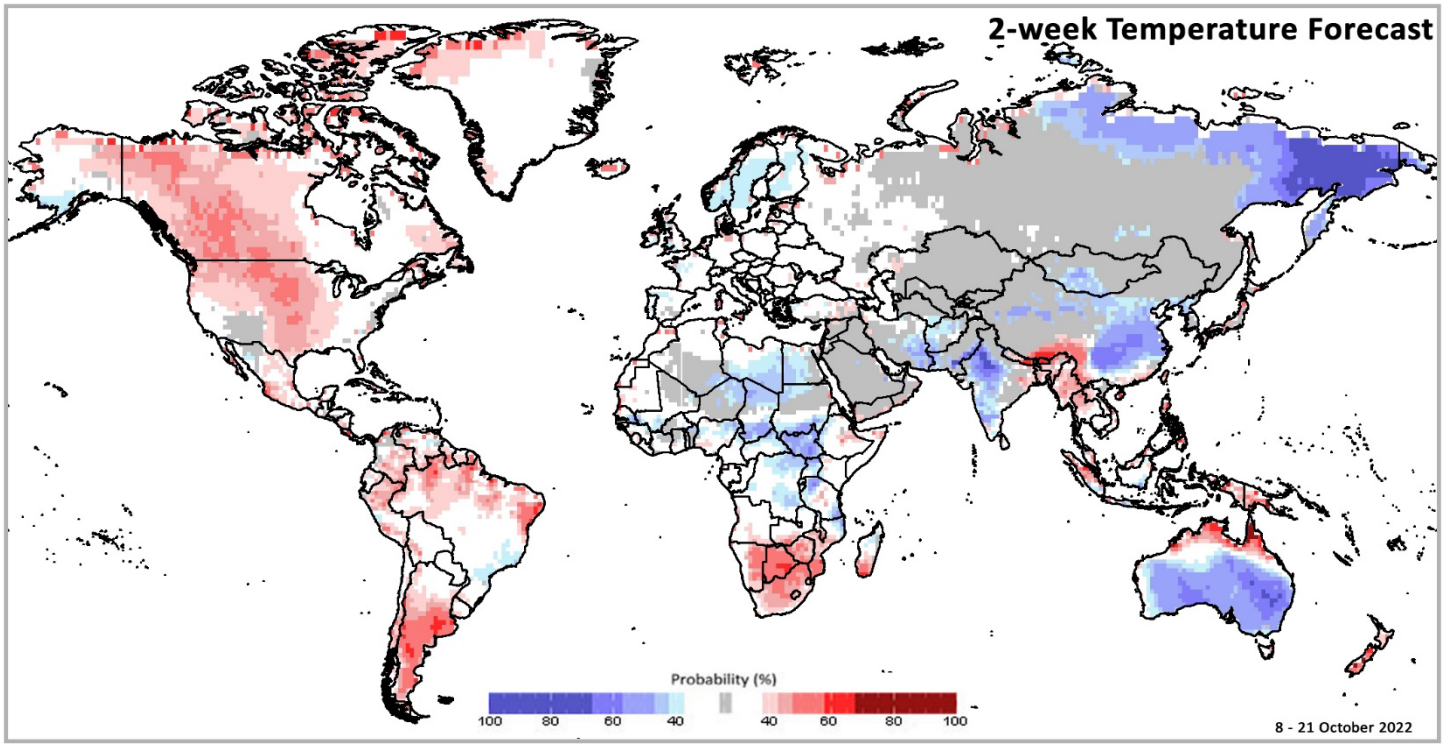


Figure 2: IRI SubX Temperature Biweekly Probability Forecast for 8 – 21 October 2022, issued on September 30th, 2022. The forecast is based on statistically calibrated tercile category forecasts from three SubX models. Source: IRI Subseasonal Forecasts Maproom

In **MENA**, the two-week forecast (Figures 1 & 2) indicates likely average precipitation and temperature across most of the region. The long-term October-November-December 2022 forecast (Figures 3 & 4) predicts likely below-average precipitation in northern Morocco, northeast Libya, northern Egypt, Jordan, Lebanon, Syria, Iraq, northern Saudi Arabia, and Iran. During this time temperatures are likely to be above-average across most of the region, most notably in Tunisia and southern Iran.

In **Sub-Saharan Africa**, the two-week forecast (Figures 1 & 2) indicates likely below-average precipitation over central Mali, Burkina Faso, northeast Ethiopia, northeast Somalia, southeast Kenya, eastern Tanzania, Zambia, Malawi, Mozambique, Zimbabwe, and eastern Madagascar. Above-average precipitation is likely over South Sudan, Uganda, and Rwanda. During this time, temperatures are likely to be below-average across southern Chad, southern Sudan, South Sudan, northern Uganda, northeast DRC, and northwest and southeast Tanzania, while above-average over Namibia, Botswana, southern Zambia, Zimbabwe, central and southern Mozambique, South Africa, and southern Madagascar. For the long-term October-November-December 2022 forecast (Figures 3 & 4), precipitation is likely to be above-average over South Sudan, Botswana, and central South Africa, while below-average in eastern Ethiopia, Somalia, Kenya, Tanzania, southern DRC, northern Zambia, Malawi, and northern Mozambique. During this time, temperatures are likely to be above-average in the northern and central countries. For further details, see the CM4EW seasonal forecast alert for East Africa.

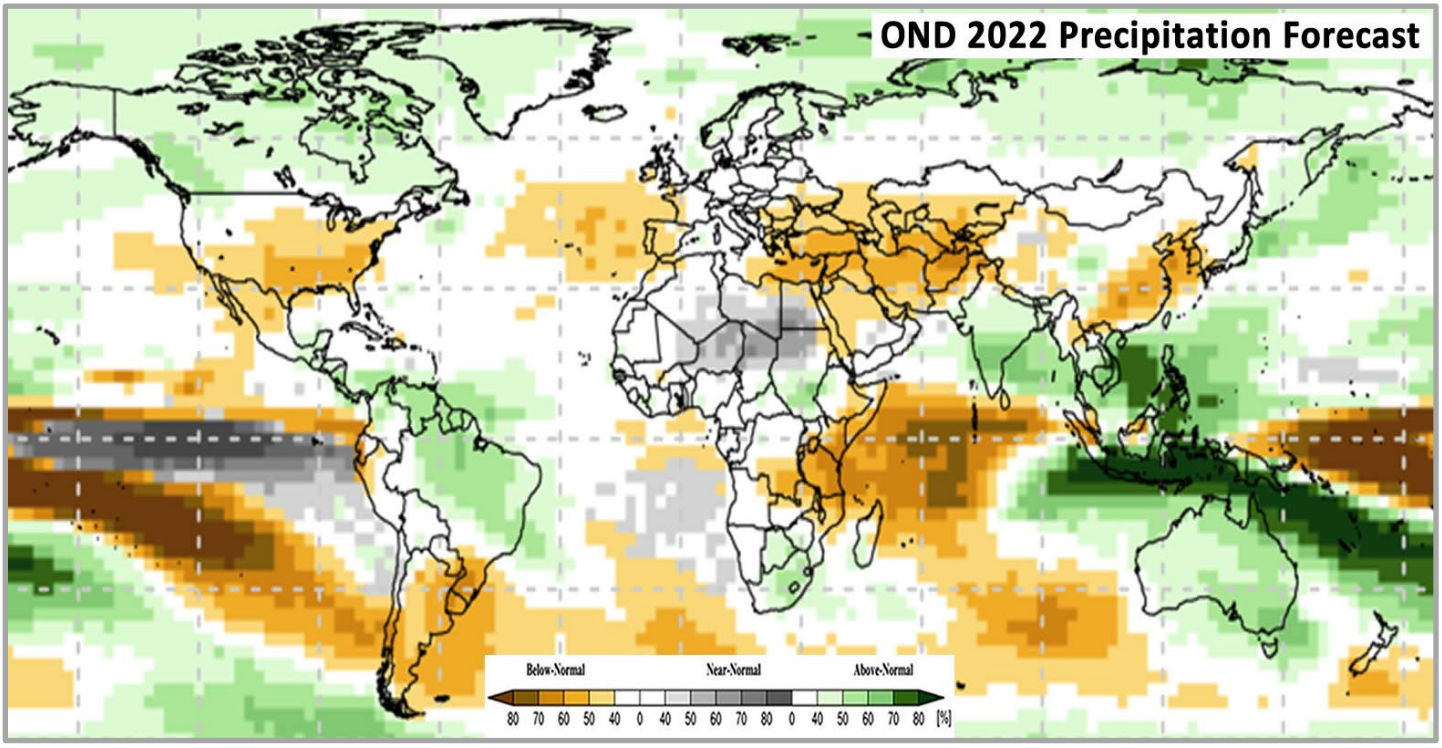


Figure 3: Probabilistic forecast for most-likely October-November-December (OND) 2022 rainfall tercile, based on September conditions. The white colour indicates that there is no dominant category across the model forecasts. Source: WMO Lead Centre for Long-Range Forecast Multi-Model Ensemble

In **Central Asia**, the two-week forecast (Figures 1 & 2) indicates likely below-average precipitation in eastern and western Kazakhstan, Kyrgyzstan, eastern Uzbekistan, Tajikistan, eastern Turkmenistan, and northern Afghanistan. During this time, temperatures are likely to be below-average in central and western Afghanistan. The long-term October-November-December 2022 forecast (Figures 3 & 4) predicts likely below-average precipitation across the entire region except for northern Kazakhstan. At the same time, temperatures are likely to be above-average across most of the region, particularly in Afghanistan. For further details see the CM4EW seasonal forecast alert.

In **South Asia**, the two-week forecast (Figures 1 & 2) indicates likely below-average precipitation in northern Pakistan and Sri Lanka, while above-average across much of Indi and Bhutan. During this time, temperatures are likely to be above-average in Bhutan, eastern Nepal, Bangladesh, and eastern India, while below average in western and southern India, and eastern Pakistan. The long-term October-November-December 2022 forecast (Figures 3 & 4) indicates likely above-average precipitation across much of India, while below-average in Pakistan, northwest India, and Sri Lanka. During this time, temperatures are likely to be above-average in northern Pakistan, northern and eastern India, Nepal, Bhutan, and Bangladesh.

In **East Asia**, the two-week forecast (Figures 1 & 2) indicates likely below-average precipitation in parts of western and eastern Mongolia and over northern and southern China. During this time, temperatures are likely to be below-average over southcentral Mongolia, eastern China, and the Democratic People's Republic of Korea, while above-average in southwest China. The long-term October-November-December 2022 forecast (Figures 3 & 4) suggests likely below-average precipitation over central China, the Democratic People's Republic of Korea, the 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 northern Indonesia and Malaysia. Above-average precipitation is likely in central Thailand, central and southern Viet Nam, southern Philippines, most of Indonesia, southern Papua New Guinea, and eastern and southern Australia. During this time, temperatures are likely to be above average across Myanmar, Northern Thailand, western Laos, northern Indonesia, the Philippines, Papua New Guinea, northern Australia, and New Zealand, while below-average across most of Australia. The long-term October-November-December 2022 forecast (Figures 3 & 4) precipitation is predicted to be above-average across most of the region except for northern Indonesia, western Malaysia, and southern New Zealand, which are likely to have below-average precipitation.

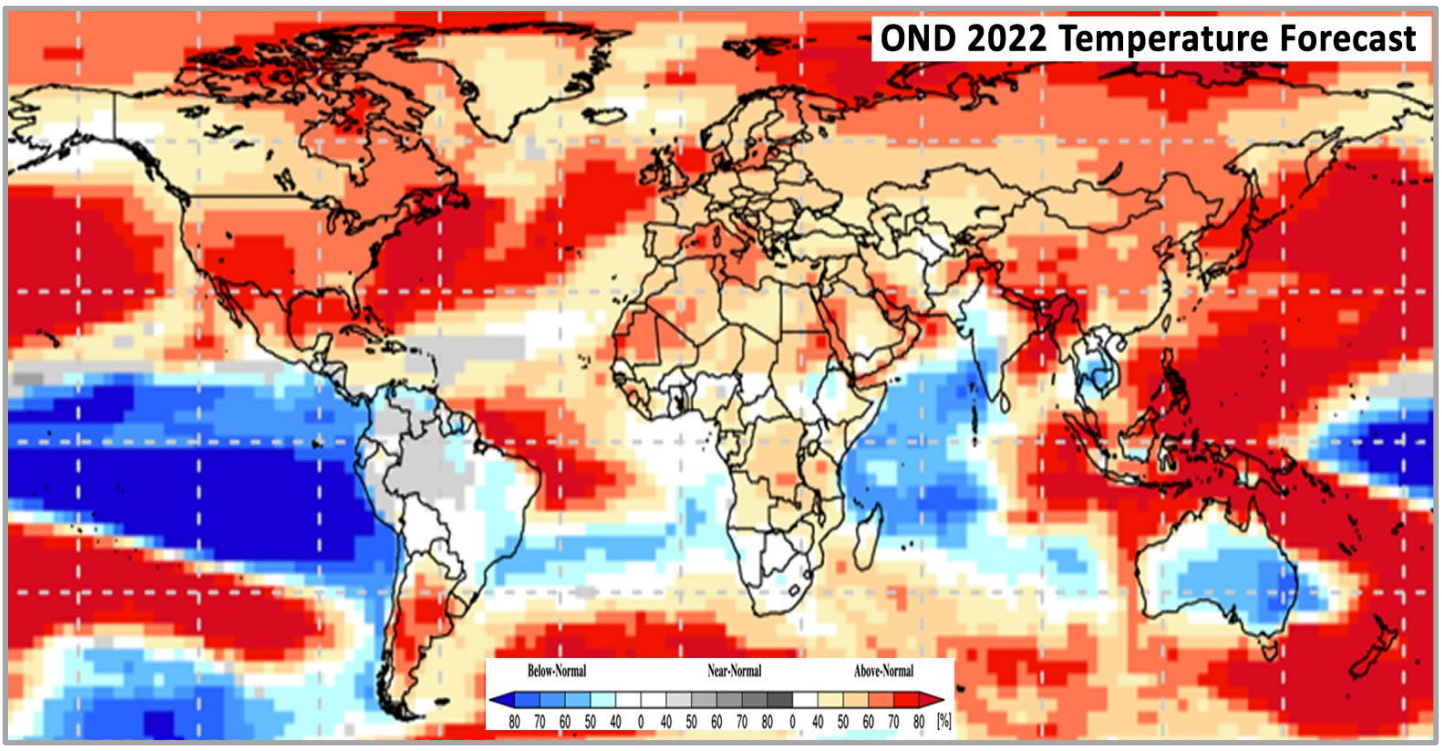


Figure 4: Probabilistic forecast for most-likely October-November-December (OND) 2022 temperature tercile, based on September conditions. The white colour indicates that there is no dominant category across the model forecasts. Source: WMO Lead Centre for Long-Range Forecast Multi-Model Ensemble

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).