



#### **Overview:**

At the end of March, conditions are mixed for maize and soybeans, while favourable for wheat and rice. Winter wheat is breaking dormancy under generally favourable conditions except in parts of Europe. Hot and dry conditions continue to impact maize in Brazil, South Africa, and Mexico. Rice conditions are generally favourable, albeit with dry conditions impacting crops in Thailand, Vietnam, the Philippines, and southern India. Soybean conditions remain mixed due to the impacts of earlier hot and dry weather in Brazil and parts of northern Argentina.

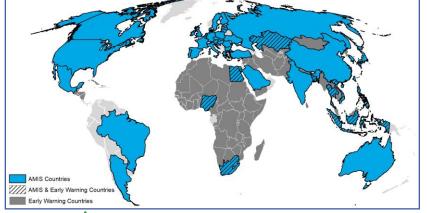












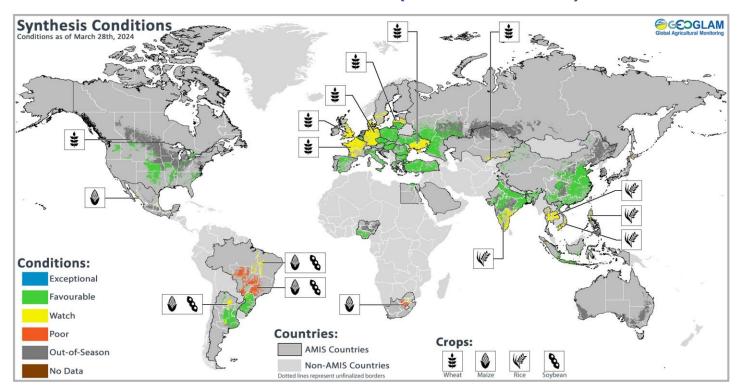
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Assessment based on information as of March 28 <sup>th</sup> , 2024.	





# **Conditions at a Glance (as of March 28th)**



Global crop condition map synthesizing information for all four AMIS crops as of March 28<sup>th</sup>. Crop conditions over the main growing areas for wheat, maize, rice, and soybean are based on a combination of national and regional crop analyst inputs and earth observation data. **Crops that are in other than favourable conditions are displayed on the map with their crop symbol.** 

# **Crop Conditions at a Glance**

**Wheat** – In the northern hemisphere, winter wheat is breaking dormancy under generally favourable conditions except in parts of Europe. Spring wheat sowing is beginning in China.

**Maize** – In the southern hemisphere, harvesting of the spring-planted crop in Brazil is progressing under mixed conditions as hot and dry conditions continue to negatively impact crops in South Africa.

#### Forecasts at a Glance

**Climate Influences** – The ongoing El Niño event is weakening, and neutral ENSO conditions are likely by April to June (83% chance). A quick shift to persistent La Niña conditions is anticipated. The CPC/IRI predicts a 75% chance of La Niña by July to September 2024, and chances remain high throughout the forecast period.

**Argentina** – Over the next few weeks below-average precipitation is likely over the main agricultural areas, which will be supportive of operations. Temperatures will remain near average.

**Rice** – Sowing of the early-planted crop in China and harvesting of the Rabi crop in India is beginning. In Southeast Asia, dry conditions continue to impact the northern countries at the start of the harvesting period.

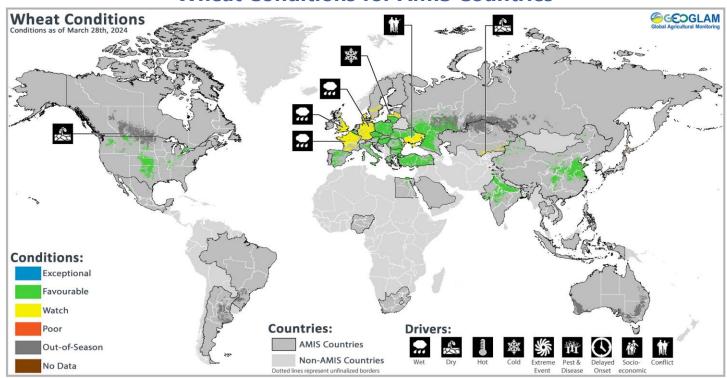
**Soybeans** – In the southern hemisphere, harvesting continues in Brazil under mixed conditions while slowly beginning in Argentina.

**Mexico** – In April, below-average precipitation is likely along the Gulf of Mexico, while in May precipitation is likely to be below-average along the southern Pacific Coast.

**United States** – During April, above-average precipitation is probable across large portions of the country, excluding the Pacific Northwest, while above-average temperatures are probable across the northern and central parts of the country.

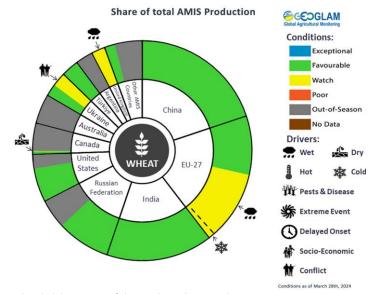
While the Crop Monitor for AMIS is primarily focused on documenting crop conditions based on environmental factors, the war in Ukraine and in other conflict areas will very likely negatively impact the ability of the crop to be harvested.

## Wheat Conditions for AMIS Countries



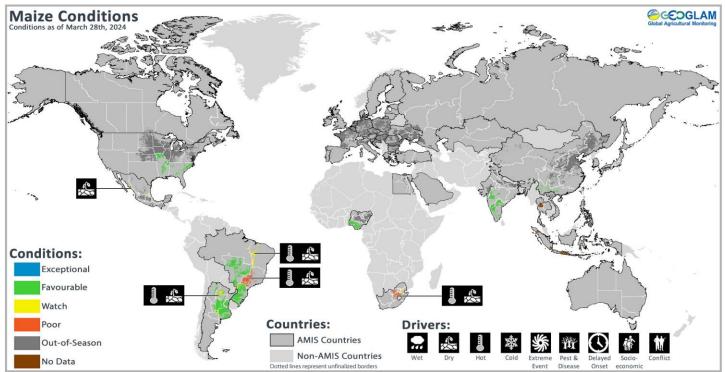
Wheat crop conditions over main growing areas are based upon a combination of national and regional crop analyst inputs and earth observation data. Crop condition information is based upon information as of March 28th. Where crops are in other than favourable conditions the climatic drivers responsible for those conditions are displayed. Crop Season Specific Maps can be found in Appendix 2.

**Wheat:** In the **EU**, adverse winter weather has negatively impacted crops, resulting in plans for resowing in the north and reduced yield potential in the south. However, since February, crop conditions have improved in some countries, supporting a nearaverage yield forecast for the EU as a whole. In the **UK**, continuing excessive rainfall is a concern. In **Türkiye**, crop development is ahead of average owing to a mild winter and ample rainfall. In Ukraine, a very warm February and March with supportive soil moisture conditions have resulted in the regrowth of winter wheat a month earlier than usual, however, the active warzone in the south and east remains a concern for agriculture. In the Russian Federation, winter wheat conditions remain stable with additional For detailed description of the pie chart please see box on page 6. precipitation forecast for the next two weeks. In



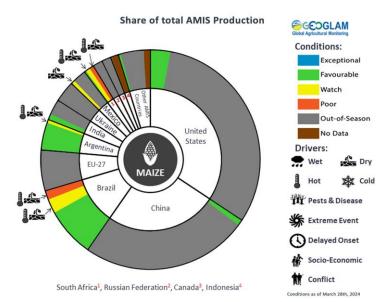
China, winter wheat conditions are favourable as spring wheat sowing begins. In India, harvesting has begun under favourable conditions. In the US, improving soil moisture across most of the country during the winter months is supporting winter wheat as it begins breaking dormancy. In Canada, winter wheat conditions are generally favourable, however, dry conditions remain across much of the Prairies.

# **Maize Conditions for AMIS Countries**



Maize crop conditions over main growing areas are based upon a combination of national and regional crop analyst inputs and earth observation data. Crop condition information is based upon information as of March 28<sup>th</sup>. Where crops are in other than favourable conditions the climatic drivers responsible for those conditions are displayed. Crop Season Specific Maps can be found in Appendix 2.

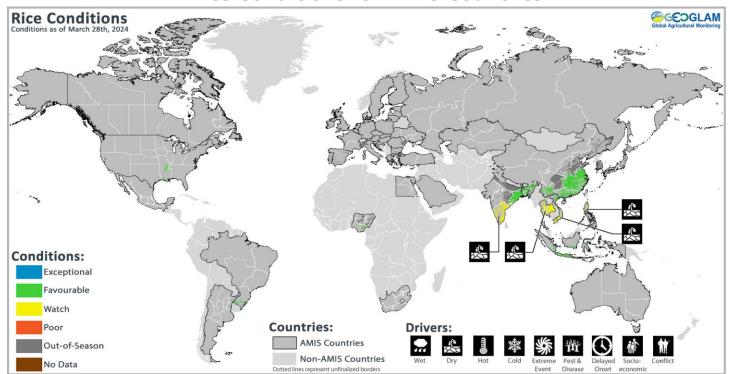
**Maize:** In **Brazil**, harvesting is progressing for the spring-planted crop (smaller season) under mixed conditions, particularly in the Southeast region, where yields are significantly reduced due to an earlier lack of rainfall and high temperatures. Sowing of the summer-planted crop (larger season) is wrapping up with developing concerns in the southeast and south regions due to irregular rainfall and temperatures. In Argentina, widespread rains are delaying the harvest of the early-planted crop (larger season), while conditions remain generally favourable for the late-planted crop (smaller season), albeit with growing concern due to incidences of pests and diseases (leafhopper and Spiroplasma). In South Africa, hot and dry conditions dominated since mid-January over a large part of the summer grain



For detailed description of the pie chart please see box on page 6.

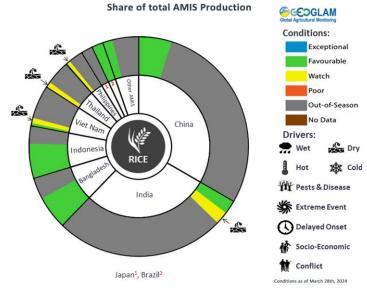
production region and have had a major negative impact on crops. In **Mexico**, dry conditions remain a concern for the Autumn-winter season (smaller season) due to reduced irrigation water reserves. In **India**, conditions are favourable for the Rabi crop. In the **US**, sowing begins in the southeast under favourable conditions. In **China**, the sowing of spring maize is beginning in the south.

## **Rice Conditions for AMIS Countries**



Rice crop conditions over main growing areas are based upon a combination of national and regional crop analyst inputs and earth observation data. Crop condition information is based upon information as of March 28<sup>th</sup>. Where crops are in other than favourable conditions the climatic drivers responsible for those conditions are displayed. Crop Season Specific Maps can be found in Appendix 2.

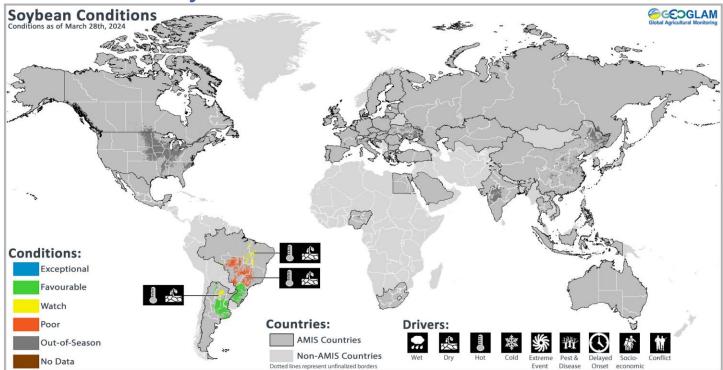
**Rice:** In **China**, conditions are favourable as the sowing of the early-planted crop begins. In India, harvesting for the Rabi crop is beginning under generally favourable conditions, except in the southern states due to reduced water availability during sowing and the season. In Bangladesh, conditions are favourable for the development of the Boro crop (largest season) and as sowing begins for the Aus crop (smallest season). In **Indonesia**, the total sown area for wet-season rice is below last season's, however, intensive rainfall in February and March may encourage further sowing past the traditional end. The harvesting of earlier sown crops continues under favourable conditions. In Viet Nam, dry-season rice (winter-spring rice) sowing is continuing in the north, while in the south, harvesting of dry-season rice



For detailed description of the pie chart please see box on page 6.

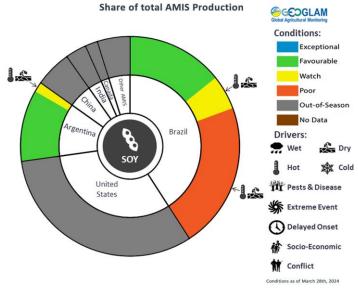
(winter-spring rice) is ongoing under mixed conditions due to saltwater intrusion in the Mekong Delta caused by dry weather. In **Thailand**, hot and dry conditions are negatively impacting crop development for dry-season rice. In the **Philippines**, below-average rainfall is affecting dry-season rice across most of the country except in Mindanao. In **Brazil**, harvesting continues under favourable conditions. In the **US**, sowing is beginning under favourable conditions.

# **Soybean Conditions for AMIS Countries**



Soybean crop conditions over main growing areas are based upon a combination of national and regional crop analyst inputs and earth observation data. Crop condition information is based upon information as of March 28<sup>th</sup>. Where crops are in other than favourable conditions the climatic drivers responsible for those conditions are displayed. Crop Season Specific Maps can be found in Appendix 2.

Soybeans: In Brazil, harvesting continues under mixed conditions with yields below-average in the Central-West, Southeast, Northeast, and North regions due to a lack of rain and high temperatures during crop development. In the Central-West and Southeast regions, harvesting is further advanced and with the lowest yields, while in the Northeast and North regions, harvesting is not as far advanced and the negative impact on yields is smaller so far. In Argentina, abundant rains since mid-February have supported crop development and recovery from earlier dry conditions. Harvest is slowly beginning for the early-planting crop (typically larger season) with good yields as the late-planted crop (typically smaller season) enters the reproductive stages.



For detailed description of the pie chart please see box below.

Information on crop conditions in non-AMIS countries can be found in the <u>GEOGLAM Crop</u>
<u>Monitor for Early Warning</u>, published April 4<sup>th</sup>

**Pie chart description:** Each slice represents a country's share of total AMIS production (5-year average). Main producing countries (representing 95 percent of production) are shown individually, with the remaining 5 percent grouped into the "Other AMIS 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 (i.e., spring and winter wheat). When conditions are other than' favourable', icons are added that provide information on the key climatic drivers affecting conditions.

\* Assessment based on information as of March 28th, 2024

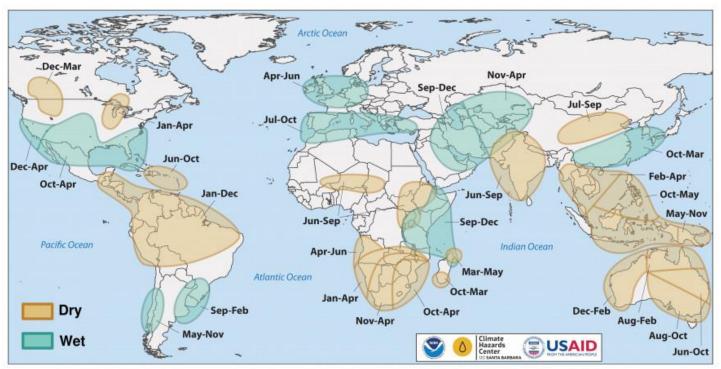
# Climate Influences: Weakening El Niño

The ongoing El Niño event is weakening, and neutral ENSO conditions are likely by April to June (83% chance). A quick shift to persistent La Niña conditions is anticipated. The CPC/IRI predicts a 75% chance of La Niña by July to September 2024, and chances remain high throughout the forecast period.

Globally, record-high temperatures in the latter half of 2023 and 2024 reflect the influences of the strong 2023-2024 El Niño and climate change. Heat extremes will very likely continue during 2024. Abnormally dry and hot conditions during mid-season development can particularly harm crops, as has been ongoing in parts of South America since July 2023 and most recently during February and March of Southern Africa's current main growing season.

Related to current El Niño conditions, drier-than-average conditions may continue in Southern Africa, Southeast Asia, the northern Maritime Continent, and parts of South America. La Niña conditions, if these develop, would continue a multi-year pattern of climate extremes. The strong and impactful 2023-2024 El Niño was preceded by three years of La Niña and associated multi-year droughts, especially in eastern East Africa, central-southern Asia, and southern South America.

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, 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

# Global Two-week Forecast of Areas with Above or Below-Average Precipitation

The two-week forecast (Figure 1) indicates a likelihood of above-average precipitation over parts of the central US, Nicaragua, Costa Rica, Panama, northeastern Brazil, Ireland, the United Kingdom, northwest Spain, northern Portugal, France, Belgium, the Netherlands, central Germany, Switzerland, northern Italy, southern Norway, northern Ghana, Togo, Benin, Nigeria, Cameroon, southern Chad, western Central African Republic, South Sudan, Eritrea, western Ethiopia, southeast Kenya, eastern Tanzania, northwest Angola, eastern Russian Federation, southeast China, Papua New Guinea, northern Australia, and northern New Zealand.

There is also a likelihood of below-average precipitation over the western Canadian Prairies, the west coast of the US, southern and western Mexico, northeastern Columbia, Venezuela, Guyana, Suriname, French Guiana, Ecuador, central Peru, northern and central-west Brazil, eastern Bolivia, northern Paraguay, central Chile, eastern Spain, northern Norway, central Russian Federation, northern Morocco, northern Algeria, Tunisia, southern Angola, Zambia, southern Malawi, Mozambique, Zimbabwe, Namibia, Botswana, northern South Africa, Madagascar, central and southern Kazakhstan, Uzbekistan, Turkmenistan, Kyrgyzstan, Tajikistan, Afghanistan, northern Pakistan, northern Iran, southern and northern India, Sri Lanka, Bangladesh, eastern Nepal, western northeast China, central Mongolia, the Democratic Republic of Korea, Republic of Korea, Japan, Myanmar, Thailand, Laos, Vietnam, the Philippines, western Malaysia, and central Australia.

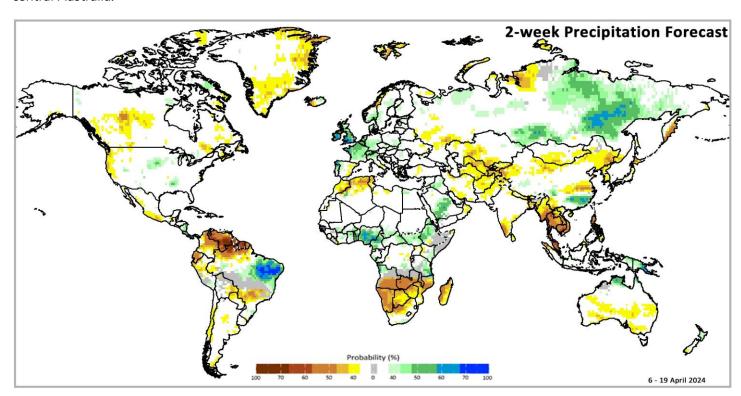


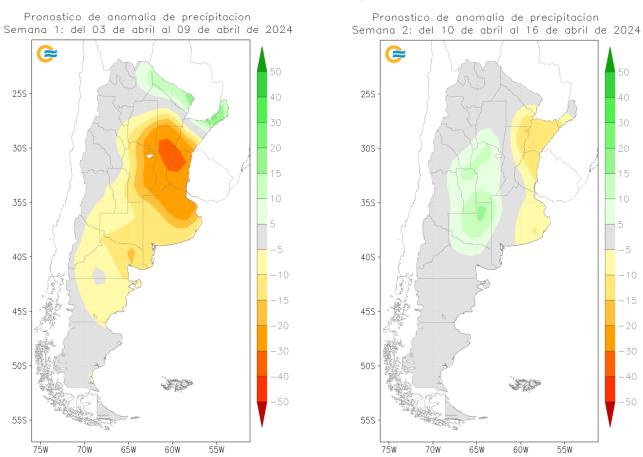
Figure 1: IRI SubX Precipitation Biweekly Probability Forecast for 6 – 19 April 2024, issued on 29 March 2024. The forecast is based on statistically calibrated tercile category forecasts from three SubX models. Source: IRI Subseasonal Forecasts Maproom

# **Argentina Outlook**

The 3 to 9 April precipitation anomaly forecast (left) indicates a likelihood of below-average rainfall over the main agricultural-producing regions, which will be beneficial for harvesting activities. During the same period, temperatures are likely to be near normal over most regions.

The 10 to 16 April precipitation anomaly forecast (right) shows above-average rainfall is expected over southern Santiago del Estero, Cordoba, San Luis, and La Pampa, while below-average precipitation is over Corrientes, eastern Santa Fe, Entre Rios, and eastern Buenos Aires. During the same period, temperatures are likely to be near average across main agricultural areas.

# **Precipitation Anomaly Forecasts**

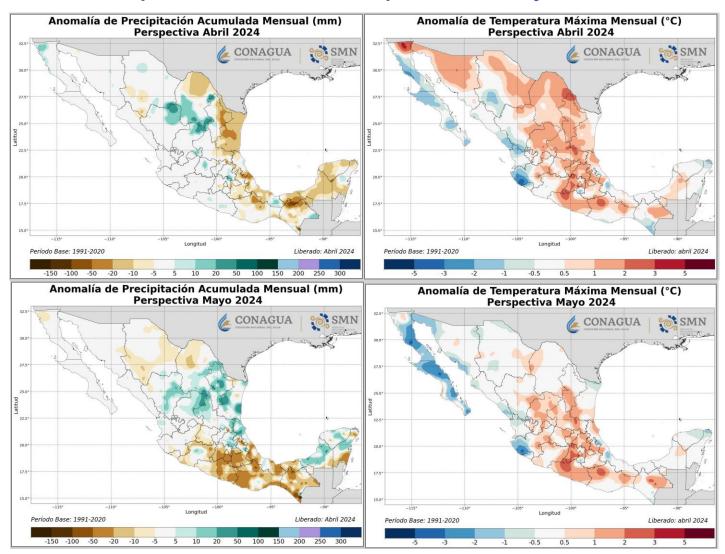


**Left:** 3 – 9 April 2024 forecast precipitation anomaly in mm. **Right:** 10 – 16 April forecast precipitation anomaly in mm. Images from the <u>National Meteorological Service of Argentina</u>.

#### **Mexico Outlook**

The April outlook indicates likely below-average precipitation across most of the eastern portion of the country over into the Yucatan Peninsula. During the same time, maximum temperatures are likely to be above-average across most of the country, except for the western areas. During May, the outlook indicates likely above-average precipitation in the northern and eastern regions of the country, while below-average precipitation across the southern portions of the country. During the same time, maximum temperatures are likely to continue to be above-average across the central and southern parts of the country, while below-average across the western parts of the country.

# **Precipitation and Maximum Temperature Anomaly Forecasts**



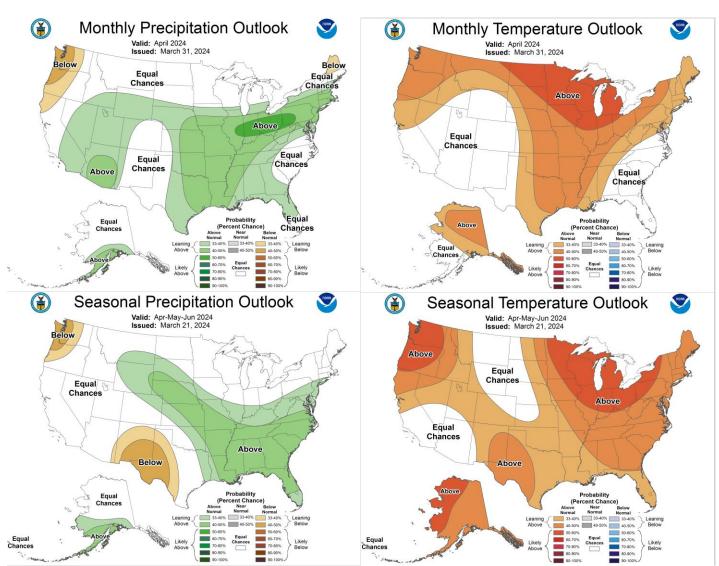
**Upper Left**: April precipitation anomaly issued April 2024. **Upper Right**: April maximum temperature anomaly issued April 2024. **Lower Left**: May precipitation anomaly issued April 2024. **Lower Right**: May maximum temperature anomaly issued April 2024. Maps from Mexico's <u>National Meteorological Service (SMN)</u>.

#### **United States Outlook**

The April outlook indicates probable above-average precipitation across the Southwest up into southeast Idaho and Wyoming, eastern sections of the southern and central Great Plains across into the Southeast from Florida to the lower Great Lakes, and into the mid-Atlantic and New England regions. Conversely, below-average precipitation is possible in northern Maine and along the coastal Pacific Northwest. During the same time, temperatures are likely to be above-average across the northern part of the country down into northern California and along the eastern portions of the Great Plains in the western Southeast.

For the long-term seasonal April-May-June (AMJ) 2024 outlook, below-average precipitation is probable in the Pacific Northwest and over western Texas and eastern New Mexico, while above-average precipitation is probable over the Southeast up into the Mid-Atlantic and across into the central and northern Great Plains. During the same period, temperatures are likely to be above-average across the Pacific Northwest, Mid-West, New England, Mid-Atlantic, Southeast, and western Texas.

# **Monthly and Seasonal Outlooks**



Upper Left: April 2024 precipitation outlook issued on 31 March 2024. Upper Right: April 2024 temperature outlook issued on 31 March 2024. Lower Right: Extended April-May-June precipitation outlook issued on 21 March 2024. Lower Right: Extended April-May-June temperature outlook issued on 21 March 2024. Maps from NOAA/National Weather Service, National Centers for Environmental Predictions, and Climate Prediction Center <a href="https://www.cpc.ncep.noaa.gov/products/forecasts/">https://www.cpc.ncep.noaa.gov/products/forecasts/</a>.

Source: NOAA Climate Prediction Center

**Conditions:** 

# **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 close to 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% below average. This is only used when conditions are not likely to be able to recover, and an impact on production is likely.

**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.

#### **Drivers:**

These represent the key climatic drivers that are having an impact on crop condition status. They result in production impacts and can function 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.

# Favourable Watch Poor Out-of-Season No Data

Exceptional

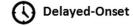












#### **Crop Season Nomenclature:**

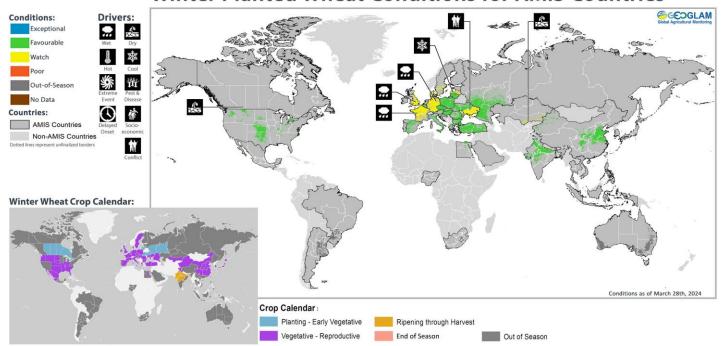
In countries that contain multiple cropping seasons for the same crop, the following chart identifies the national season name associated with each crop season within the Crop Monitor. Within the Crop Monitor for AMIS countries, the larger producing season (based upon the most recent 5-years of statistics) has been assigned to the first season.

Crop Season Nomenclature					
Country	Crop	Season 1 Name	Season 2 Name	Season 3 Name	
Argentina	Maize	Spring-planted	Summer-planted		
Argentina	Soybean	Spring-planted	Summer-planted		
Bangladesh	Maize	Winter	Summer		
Bangladesh	Rice	Boro	Aman	Aus	
Brazil	Maize	Summer-planted	Spring-planted		
Canada	Wheat	Spring Wheat	Winter Wheat		
China	Wheat	Winter Wheat	Spring Wheat		
China	Maize	Spring-planted	Summer-planted		
China	Rice	Intermediate Crop	Early Crop	Late Crop	
Egypt	Rice	Summer-planted	Nili season (Nile Flood)		
India	Maize	Kharif	Rabi		
India	Rice	Kharif	Rabi		
Indonesia	Maize	Dry-season	Rainy-Season		
Indonesia	Rice	Main-season	Second-season		
Kazakhstan	Wheat	Spring Wheat	Winter Wheat		
Mexico	Maize	Spring-planted	Autumn-planted		
Mexico	Wheat	Winter Wheat	Spring Wheat		
Nigeria	Maize	Main-season	Short-season		
Nigeria	Rice	Main-season	Off-season		
Philippines	Rice	Wet season	Dry season		
Russian Federation	Wheat	Winter Wheat	Spring Wheat		
Thailand	Rice	Wet season	Dry season		
United States	Wheat	Winter Wheat	Spring Wheat		
Viet Nam	Rice	Wet season	Dry season		

<sup>\*&</sup>quot; Average" refers to the average conditions over the past 5 years.

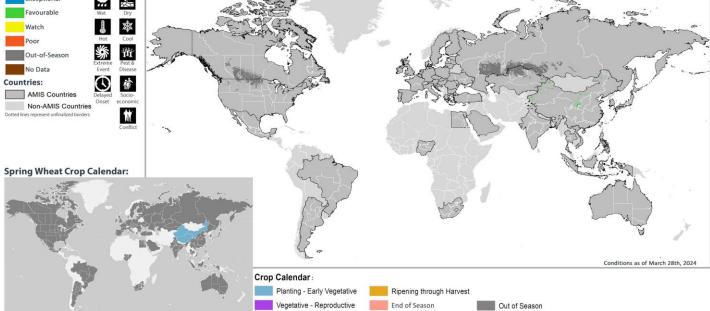
# **Appendix 2: Crop Season-Specific Maps**

#### Winter Planted Wheat Conditions for AMIS Countries



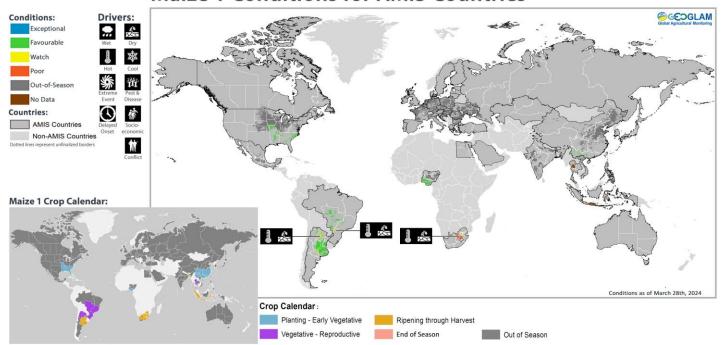
Winter wheat crop conditions over main growing areas are based upon a combination of national and regional crop analyst inputs and earth observation data. Crop condition information is based upon information as of March 28<sup>th</sup>. Where crops are in less than favourable conditions the climatic drivers responsible for those conditions are displayed. The crop calendar is provided as a point of reference to provide information on what part of the life cycle the crops are currently in for each area.

# Spring Planted Wheat Conditions for AMIS Countries Conditions: Exceptional Favourable Exceptional Wet Day Favourable



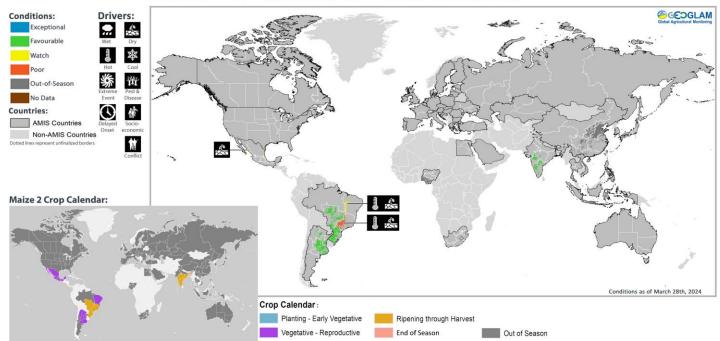
Spring wheat crop conditions over main growing areas are based upon a combination of national and regional crop analyst inputs and earth observation data. Crop condition information is based upon information as of March 28<sup>th</sup>. Where crops are in less than favourable conditions the climatic drivers responsible for those conditions are displayed. The crop calendar is provided as a point of reference to provide information on what part of the life cycle the crops are currently in for each area.

# **Maize 1 Conditions for AMIS Countries**



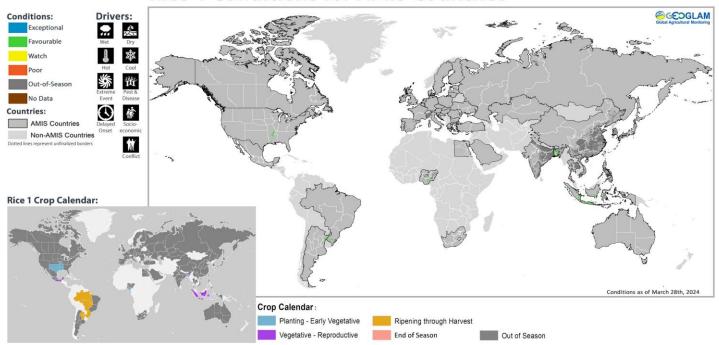
Maize 1 crop conditions over main growing areas are based upon a combination of national and regional crop analyst inputs and earth observation data. Crop condition information is based upon information as of March 28<sup>th</sup>. Where crops are in less than favourable conditions the climatic drivers responsible for those conditions are displayed. The crop calendar is provided as a point of reference to provide information on what part of the life cycle the crops are currently in for each area.

# **Maize 2 Conditions for AMIS Countries**

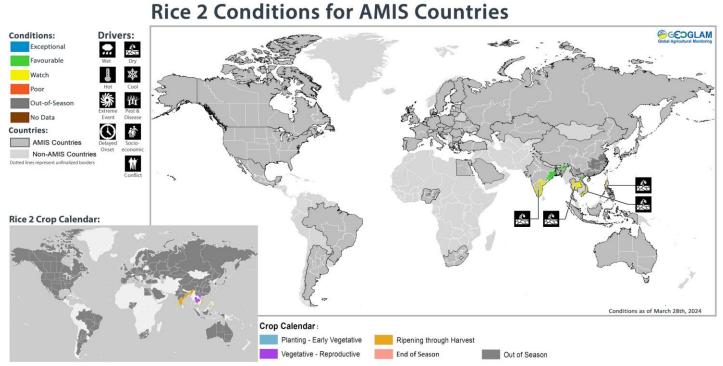


Maize 2 crop conditions over main growing areas are based upon a combination of national and regional crop analyst inputs and earth observation data. Crop condition information is based upon information as of March 28<sup>th</sup>. Where crops are in less than favourable conditions the climatic drivers responsible for those conditions are displayed. The crop calendar is provided as a point of reference to provide information on what part of the life cycle the crops are currently in for each area.

# **Rice 1 Conditions for AMIS Countries**

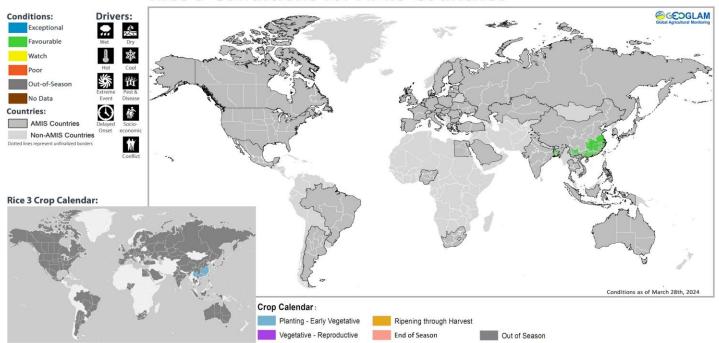


Rice 1 crop conditions over main growing areas are based upon a combination of national and regional crop analyst inputs and earth observation data. Crop condition information is based upon information as of March  $28^{th}$ . Where crops are in less than favourable conditions the climatic drivers responsible for those conditions are displayed. The crop calendar is provided as a point of reference to provide information on what part of the life cycle the crops are currently in for each area.

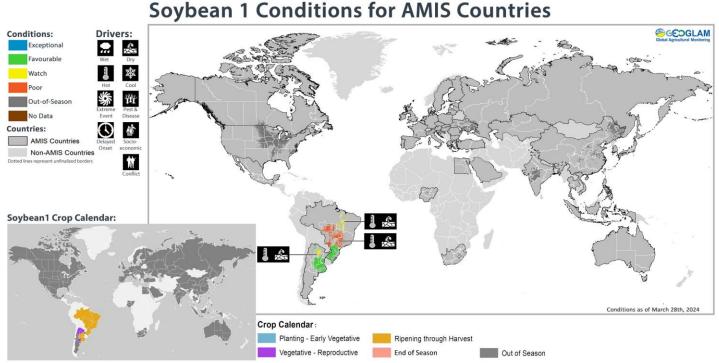


Rice 2 crop conditions over main growing areas are based upon a combination of national and regional crop analyst inputs and earth observation data. Crop condition information is based upon information as of March 28<sup>th</sup>. Where crops are in less than favourable conditions the climatic drivers responsible for those conditions are displayed. The crop calendar is provided as a point of reference to provide information on what part of the life cycle the crops are currently in for each area.

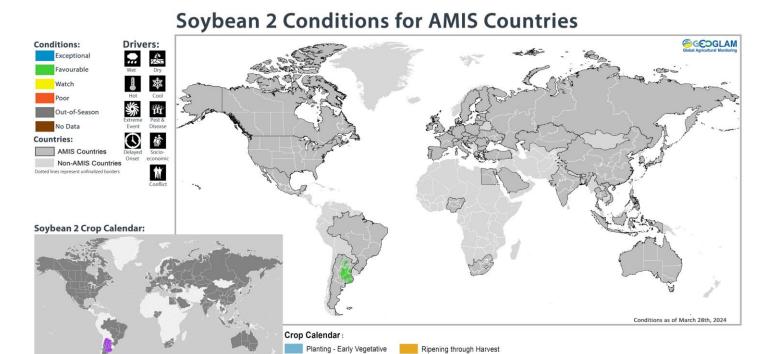
# **Rice 3 Conditions for AMIS Countries**



Rice 3 crop conditions over main growing areas are based upon a combination of national and regional crop analyst inputs and earth observation data. Crop condition information is based upon information as of March  $28^{th}$ . Where crops are in less than favourable conditions the climatic drivers responsible for those conditions are displayed. The crop calendar is provided as a point of reference to provide information on what part of the life cycle the crops are currently in for each area.



Soybean 1 crop conditions over main growing areas are based upon a combination of national and regional crop analyst inputs and earth observation data. Crop condition information is based upon information as of March 28<sup>th</sup>. Where crops are in less than favourable conditions the climatic drivers responsible for those conditions are displayed. The crop calendar is provided as a point of reference to provide information on what part of the life cycle the crops are currently in for each area.



Soybean 2 crop conditions over main growing areas are based upon a combination of national and regional crop analyst inputs and earth observation data. Crop condition information is based upon information as of March 28<sup>th</sup>. Where crops are in less than favourable conditions the climatic drivers responsible for those conditions are displayed. The crop calendar is provided as a point of reference to provide information on what part of the life cycle the crops are currently in for each area.

End of Season

Out of Season

Vegetative - Reproductive





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

Climatic Influences by Climate Hazards Center of UC Santa Barbara

#### 2024 Crop Monitor for AMIS release dates:

1 February, 7 March, 4 April, 2 May, 6 June, 4 July, 1 August, 5 September, 3 October, 7 November, 5 December

Cover photo courtesy of Brian Barker

https://cropmonitor.org/ @GEOCropMonitor

#### **Sources & Disclaimer**

Sources and Disclaimers: The Crop Monitor assessment is conducted by GEOGLAM with inputs from the following partners (in alphabetical order): Argentina (Buenos Aires Grains Exchange, MAGyP), Asia Rice Countries (AFSIS, ASEAN+3 & Asia RiCE), Australia (ABARES & CSIRO), Brazil (CONAB & INPE), Canada (AAFC), China (CAS), EU (EC JRC MARS), Gro Intelligence, India (NCFC), Indonesia (LAPAN & MOA), International (CIMMYT, FAO GIEWS, IFPRI & IRRI), Japan (JAXA, MAFF), Mexico (SIAP), Russian Federation (IKI), South Africa (ARC & CSIR & GeoTerralmage & SANSA), Thailand (GISTDA & OAE), Ukraine (NASU-NSAU & UHMC), USA (NASA, UMD, USGS – FEWS NET, USDA (FAS, NASS)), Viet Nam (VAST & VIMHE-MARD). The findings and conclusions in this joint multiagency report are consensual statements from the GEOGLAM experts, and do not necessarily reflect those of the individual agencies represented by these experts.

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