

Dry conditions for 2019-2020 season expected to continue across portions of Southern Africa

Updated January 17, 2020

Highlights

- The 2019-20 main season in Southern Africa started with a timely onset of the rains followed by erratic and below-average rainfall from mid-October to mid-December in the central and southern parts of the region.
- Persistent drier than normal conditions across parts of southeastern Angola, northeastern Namibia, Lesotho, Botswana, southwest Zambia, eastern Zimbabwe, southern Mozambique, Namibia, southern Madagascar and parts of South Africa (Figure 1) have affected crop establishment and growth.
- In some areas, extended dry spells with high temperatures have resulted in permanent crop wilting and replanting will be necessary.
- Reservoir and water levels are low across the drought-affected areas causing further concern for crop production.
- Short term forecasts indicate that northern areas along with parts of central Zambia, northern Zimbabwe, and central Mozambique are likely to receive above-average rainfall in mid-January.
- However, following this, the longer-term outlook is for overall drier than average conditions to continue across the drought-affected central and south and forecasts show the increased chance of below-normal rainfall from February to March.

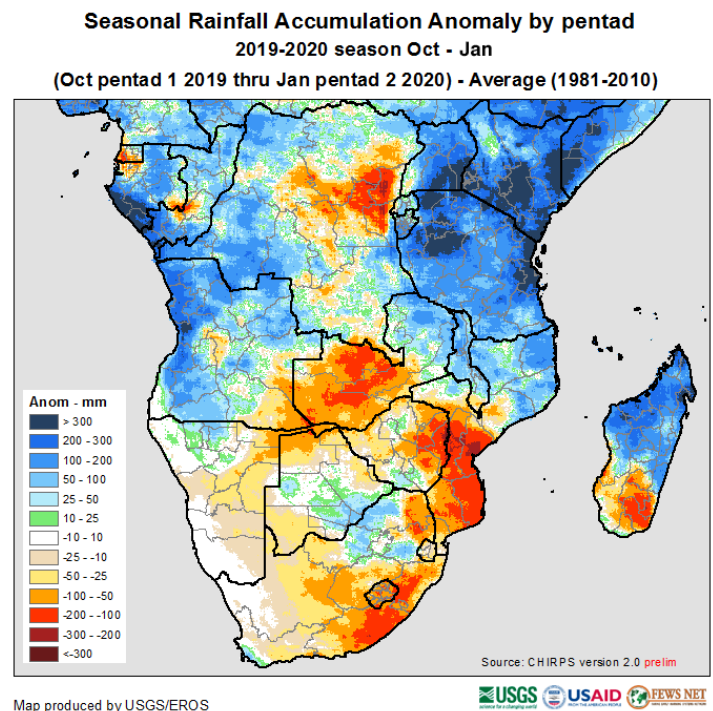


Figure 1. Seasonal rainfall accumulation anomaly from October 1 through January 10 compared to the long-term average from 1981-2010. Source: USGS/EROS

Overview

In Southern Africa, planting of the 2019-2020 main season cereals started in mid-October and November with a generally timely onset of the rains in most areas. However, from mid-October to mid-December, rainfall was erratic across central and southern parts of the region with periods of long dry spells and above-average temperatures, followed by short periods of rain. These conditions resulted in poor germination and establishment in areas where crops had already been sown and notably over southern Mozambique, Zimbabwe and southwestern Zambia. In the north of the region, rainfall has been generally favourable and in some areas above-average, supporting crop development and growth.

While much of the north of the region has received sufficient rains, parts of southern **Angola**, northern **Namibia**, **Lesotho**, **Botswana**, southwest **Zambia**, eastern **Zimbabwe**, southern **Mozambique**, **Namibia**, southern **Madagascar** and parts of **South Africa** have received below-average rainfall and in some areas, dry conditions have been exacerbated by above-average temperatures. This follows last year's severe main season drought, which impacted water levels and crop yields across many of the areas currently affected by drought.

Crop Condition Summary

In north and central **Angola**, rains have been generally favourable with some dryness in isolated areas of the north and northwest. In southern Angola, following dry conditions at the start of the season, heavy rainfall in December improved conditions, though some concern remains. In the **Democratic Republic of Congo**, heavy rains at the end of October caused major flooding across twelve provinces with the worst affected areas in the North and South Ubangi. An estimated 600,000 hectares have been affected by the flooding which, resulted in the loss of human life and significant damage to infrastructure and agricultural lands in the worst affected areas. Following this major event, rainfall through December has been above-average, benefiting vegetation conditions over those areas not directly affected by flooding. In **Namibia**, following carryover dry conditions from the previous season, which decreased the water supply in the north and central areas, rains have been near-normal since the start of the season except in the northeast where rains have been below-average. In **Zimbabwe**, following a timely start to the season, rainfall has been below-average across the country and notably over Matabeleland, Midlands, and Mashonaland West provinces (Figure 3), where poor vegetation conditions are present. Mashonaland Central province was affected by back to back dry spells, one of 18 days followed by a second dry spell of 23 days and from field reports, some farmers had crops that were written off (Figure 2-right). However, during the second week of January, good rains were received and better-off households that have the available resources are replanting and gap-filling. Other households that do not have available resources have been unable to replant due to a lack of adequate inputs.



Figure 2. Mixed conditions for maize crops in Mashonaland Central, Zimbabwe. Some fields show relative improvement (left) and in other areas maize crops have wilted (right).

Mashonaland West province provides around 24.8 percent of Zimbabwe's maize production ([Graph: Average production for cereals by ASAP unit for Zimbabwe](#)). Across this province, a reduction in active vegetation compared to average conditions can be seen from satellite imagery (Figure 4) and may indicate below-average planted area for this season. This same region was affected by last year's major drought and reduced planted area along with impacts from continuing drought may result in below-average yields for the second year in a row. From field reports, the dryness across Matabeleland South and North is severe in most areas and in some parts districts, more than half the number of households have not planted at all this season due to late timing of rains and input shortages. For those households that did plant, germination rates were very poor and the early planted crop is either completely written off or severely water-stressed. Some areas started receiving light showers from the second week of January, prompting farmers to start planting in the third week.

2020 Zimbabwe Maize Season

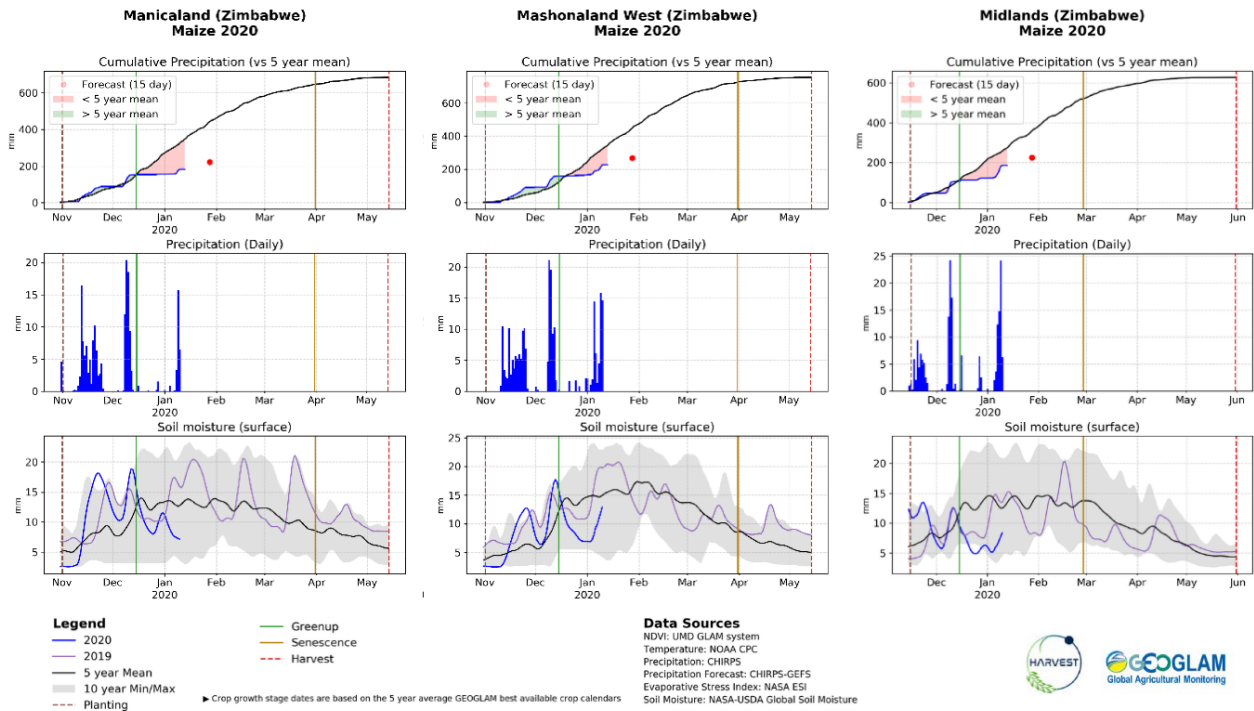
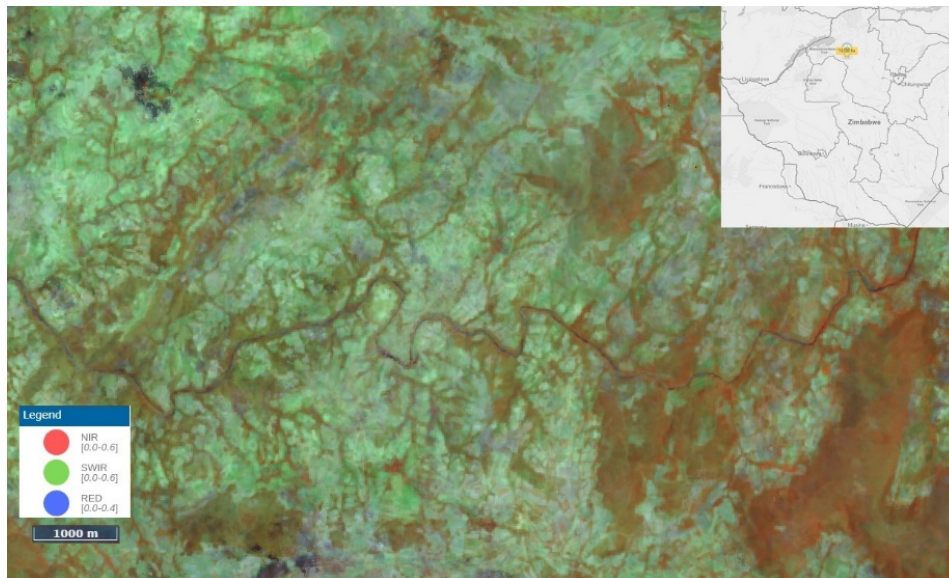


Figure 3. Agro-climatic indicators over the current 2020 main maize season in Manicaland, Mashonaland and Midlands Zimbabwe (source: NASA Harvest).



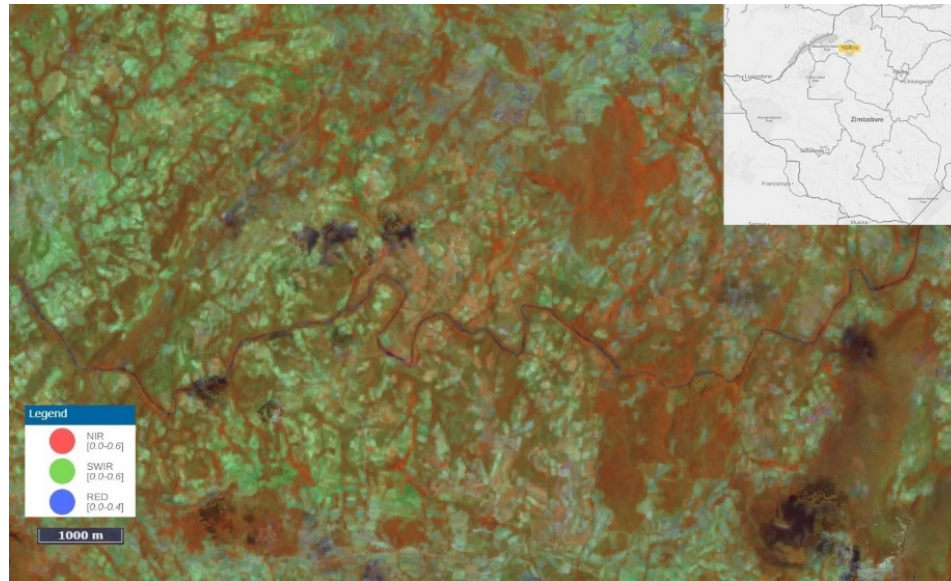


Figure 4. Sentinel-2 Imagery showing crop areas in Mashonaland West region, in Zimbabwe, for the period 09 December 2019 - 08 January 2020 (top) and for the selected reference period 09 December 2017 - 08 January 2018 (bottom) (source: [ASAP High-Resolution Viewer](#)). The reference period 2017-18 is representative of average conditions in this period of the year and as visible in the figure, many agricultural areas are bare (greenish color) in early 2020, while they are usually in an active vegetation state (red) in this period of the year.

In **Zambia**, while rains have been favourable across much of the North, East, Central and Copperbelt areas, rains have been below-average across the South, West, and Lusaka (Figure 5). This follows moisture deficits and poor water reserves from the previous drought-affected season. Zambia is a large maize producer for the Southern Africa region and the Southern province is one of the main producing provinces. Last year's production in southern Zambia failed and this year's drought is affecting this same main producing area. Across the southern region, which provides around 15.2 percent of Zambia's cereal production ([Average production for cereals by ASAP unit for Zambia](#)), a reduction in active vegetation along with reduced farm level reservoirs compared to the previous drought year is visible from satellite imagery (Figure 6). Reduced planted area along with the effects of the continuing dry conditions will likely impact 2020's cereal production.

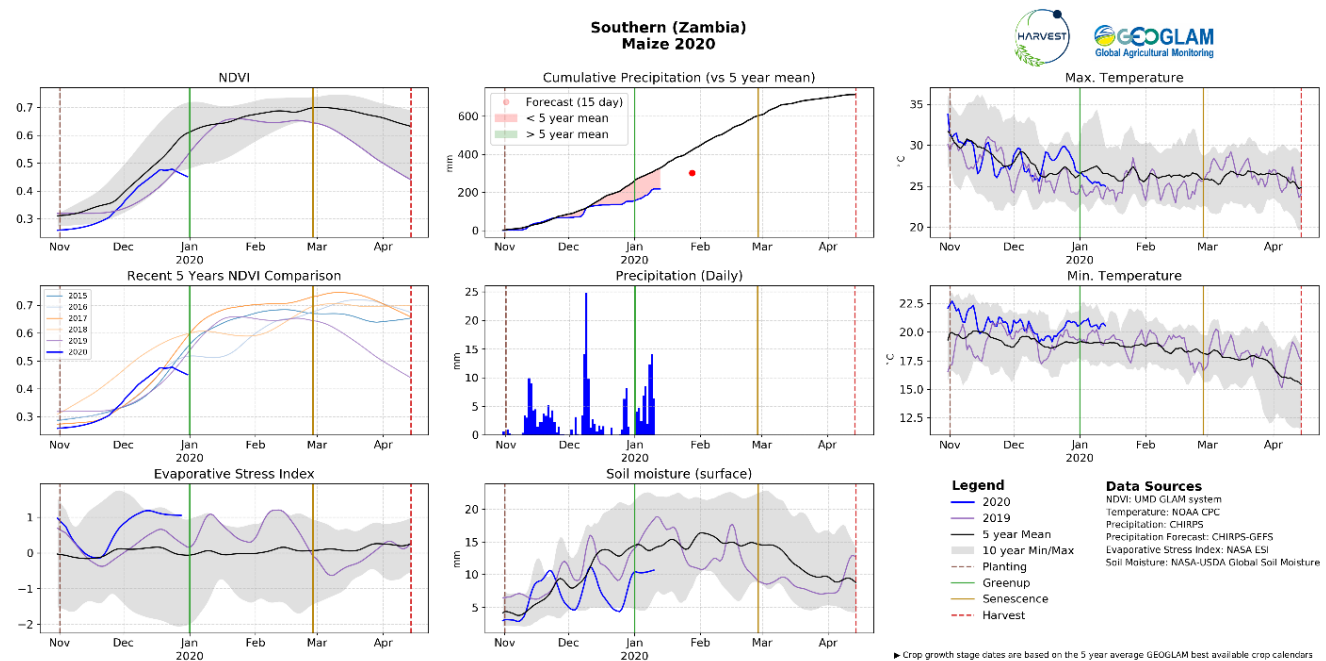


Figure 5. Agro-climatic indicators over the current 2020 main season in southern Zambia (source: NASA Harvest).

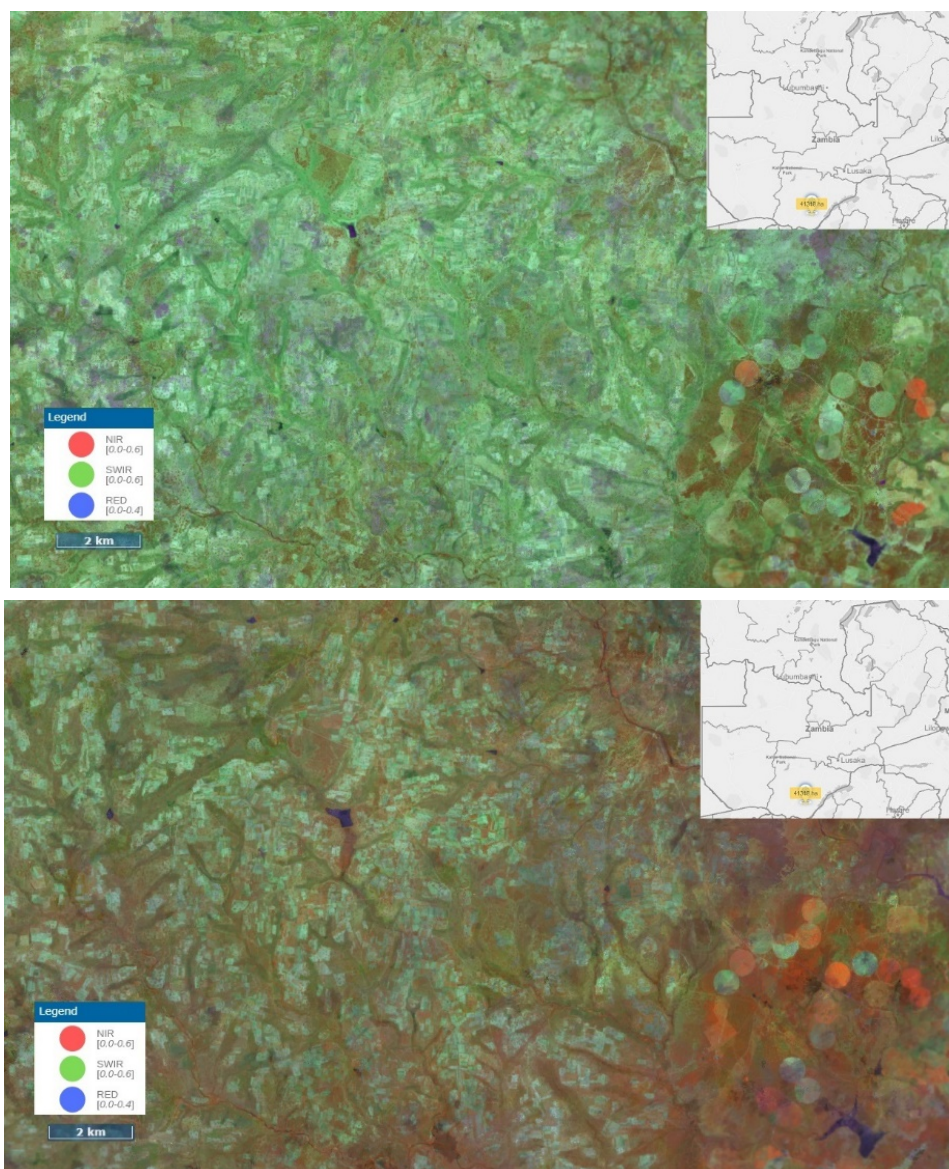


Figure 6. Sentinel-2 Imagery showing crop areas in Southern region, in Zambia, for the period 09 December 2019 - 08 January 2020 (top) and for the selected reference period 09 December 2017 - 08 January 2018 (bottom) (source: [ASAP High-Resolution Viewer](#)). The reference period 2017-18 is representative for average conditions in this period of the year and as visible in the figure, many agricultural areas and pivot-irrigated fields are bare (greenish color) in early 2020, while they are usually in an active vegetation state (red) in this period of the year. It is also evident that the water extent of farm-level reservoirs in early 2020 is significantly reduced compared to 2017/18.

In **Malawi**, conditions are favourable with a timely start of the season followed by average rains through December. In **Mozambique**, rainfall has been mostly average across the north with a timely onset of rains. However, in the southern areas, first planted crops have permanently wilted following a long dry spell from December through the first dekad of January, combined with abnormally high temperatures. While rains have been received in the last week, it is likely too late for improvement. In the central areas, conditions are mixed with the high plateau areas of northern Tete, western Manica and parts of Sofala doing well while across the southern parts of Manica and Sofala, drought conditions are present. In **Madagascar**, onset rains were timely with average to above-average rainfall in November and December except in the southeast where December rainfall was below-average. Cyclone Belna made landfall on the western coast of Madagascar on December 10th, causing flooding in the Soalala district and displacing 1,400 people. In **eSwatini**, onset rains were timely with average to above-average rainfall in November. However, temperatures have been high and have led to some moisture deficits. In **Botswana**, while rainfall in the east has been generally favourable, December rainfall was below-average in the lower producing north along with above-normal temperatures, which could lead to increased evapotranspiration and decrease soil moisture availability for crops. In **Lesotho**, onset rains were delayed by over 4 dekads in some areas and poor rainfall and above-average temperatures in November further aggravated moisture deficits. Rainfall improved in December, however, crops may not significantly improve given the poor start to the season.

In eastern **South Africa**, the onset of rains was delayed by 30 days in the most-affected areas, and up to 40 days in a few areas further east. Rainfall improved in December, however rainfall totals still remain below-average in Eastern Cape, while across the mostly irrigated Northern Cape, the ongoing drought has impacted irrigation water availability across many areas (Figure 7). In Free State, conditions have improved with recent rains in January (Figure 6), however, dry conditions still remain in the south. Due to the delay in onset rains, planting was delayed and January through March rainfall will be key to support late-planted crops.

2020 South Africa Maize Season

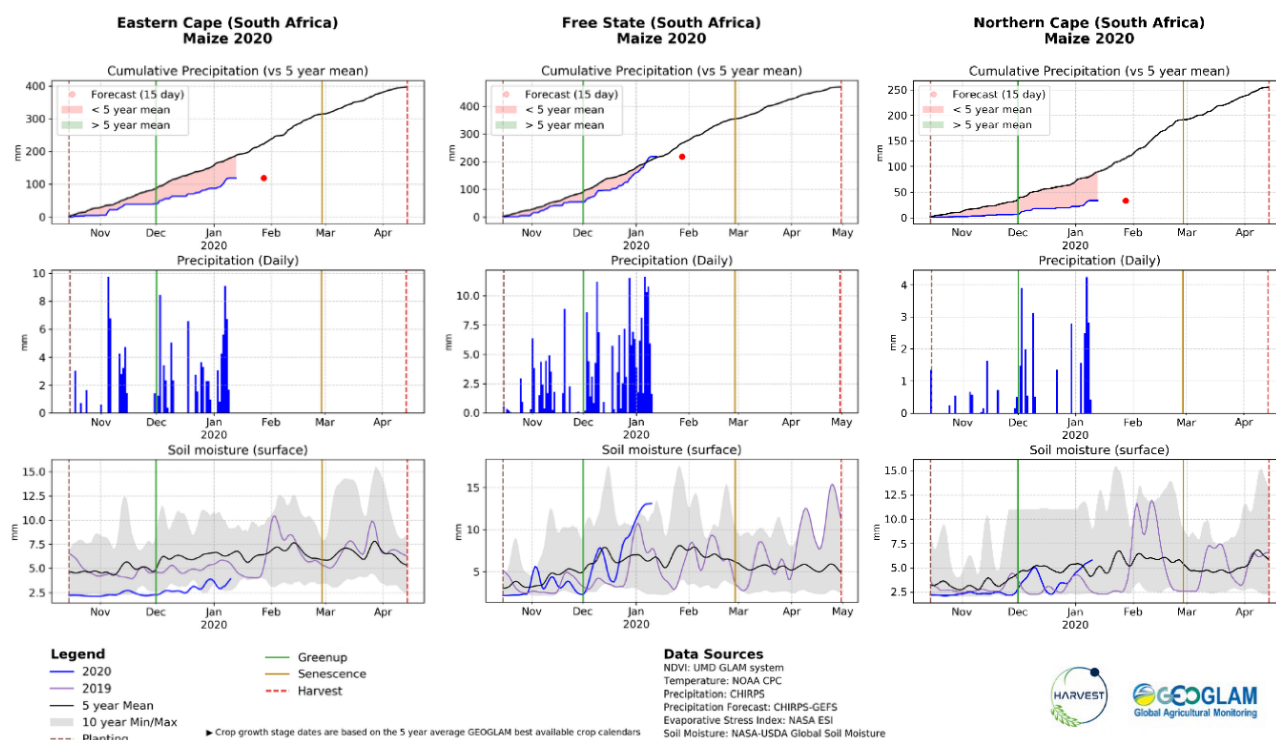


Figure 7. Agro-climatic indicators over the current 2020 main maize season in Eastern Cape, Free State, and Northern Cape regions of South Africa (source: NASA Harvest).

Reservoir and water levels are low across drought-affected areas of southern Africa. The Kariba Dam, a key water and energy resource for both **Zambia** and **Zimbabwe**, is at its lowest level since 1996. The decrease in water reserves from one year to the next can be seen from satellite imagery (Figure 8). According to the [Zambezi River Authority](#), the dam is at just under 8.5 percent of its full capacity. The low dam level caused power cuts and irrigation concerns during the winter season. The poor rains of the current main season have failed to replenish dam levels, indicating these concerns may worsen.

The Vaal dam in **South Africa** at the border of Free State, Gauteng, and Mpumalanga have been affected by the early-season drought and water levels dropped to as low as 39.2 percent of full capacity in the first week of December. Water levels showed some improvement with the rains in mid-December and as of December 18th, water levels were close to 46.1 percent of full capacity. In the same period last year, however, water levels were at 77.2 percent of full capacity. The year-on-year decrease in dam water levels can be seen from satellite images (Figure 9). According to the [South African government](#), national water storage in South Africa is low at 59.2 percent compared to 64.1 percent during the same period last year. Areas worst affected by the current drought are in the Eastern Cape where provincial water storage is at a low of 45.5 percent, compared to 58.6 percent during the same time last year.

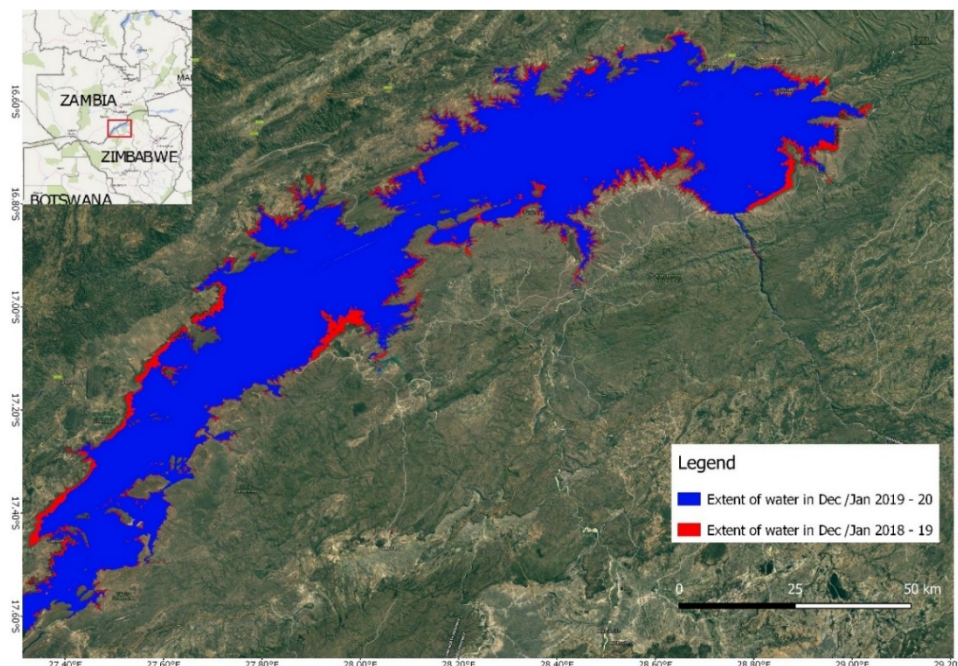


Figure 8. Extent of water in Lake Kariba in December/January 2019-20 and December/January 2018-19 (01/12-07/01), as estimated from Sentinel 2 images. The 2018-19 water extent is comparable to the permanent water extent layer as derived from the [JRC Yearly Water Classification History layer](#) for the years 2001-2018 (Background layer: Google Satellite).

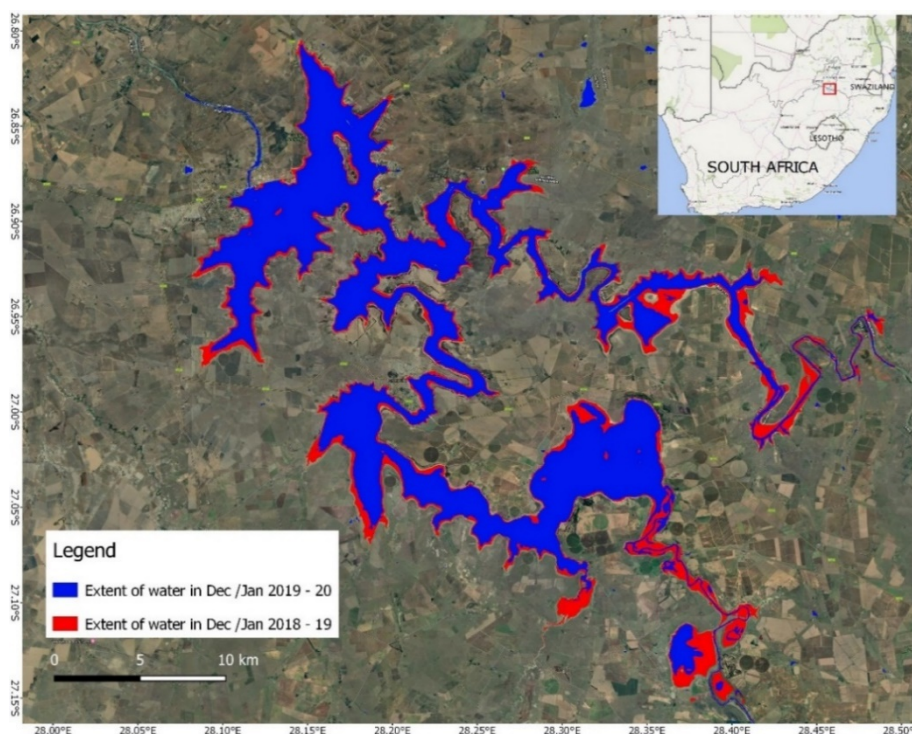


Figure 9. Extent of water in Vaal Dam in December/January 2019-20 and December/January 2018-19 (10/12-07/01) as estimated from Sentinel 2 images. The 2018-19 water extent is comparable to the permanent water extent layer as derived from the [JRC Yearly Water Classification History layer](#) for the years 2001-2018 (Background layer: Google Satellite).

Seasonal overview & January to March rainfall outlook

October to December 2019 featured very wet conditions in East Africa and suppressed rainfall in Southern Africa. This coincided with extreme Indian Ocean sea surface temperatures, a strong and long-lasting positive Indian Ocean dipole mode, and a delayed shift of the monsoon into the southern hemisphere. In the past couple of weeks, the positive Indian Ocean dipole relaxed toward a neutral state.

December to February (DJF) rainfall amounts and distribution have historically been an important factor for Southern Africa crop yields. Between December 1st and January 10th, cumulative rainfall was below average by 50 mm to more than 100 mm in central and southern Zambia, central and eastern Zimbabwe, central and southern Mozambique, and

northeastern and southeastern South Africa (Figure 10-left). This assessment is based on preliminary estimates, however, other monitoring data also show dry conditions in these areas. Figure 9-left shows rainfall deficits in southern Madagascar, and while there is less agreement across rainfall products, satellite vegetation data indicates the southeast recently experienced dry conditions. December 1st to January 10th rainfall was above average mainly in northern areas—in Tanzania, northeastern Zambia, Malawi, northern Mozambique, and northern Madagascar. Some of these areas saw flash flooding in early January. Western Angola, southeastern Namibia, and western parts of northeastern South Africa, southeastern and central Botswana and Lesotho also received above-average rainfall from December to January 10th. This improved seasonal totals in some of South Africa’s main maize growing areas where earlier deficits had prompted concern for crop production.

Short term forecasts show a relatively wet mid-January for northern areas. This would increase the rainfall surpluses seen thus far in Tanzania, Malawi, northern Mozambique, and northern Madagascar and continuous large rainfall surplus may also result in waterlogging and potential flooding in areas of low slope, depending on the topography of the area. Parts of central Zambia, northern Zimbabwe, and central Mozambique are also forecast to receive above-average rainfall during this period. This may bring some relief from ongoing dry conditions, though impacts may be localized. For southern areas of the region in general, drier than average conditions are likely to continue. Figure 9-right shows an outlook for December 1st to January 25th rainfall totals that includes a 15-day forecast from January 11th.

The longer-term outlook is for overall drier than average conditions in central and southern areas to continue. The January 2020 North American Multi-Model Ensemble (NMME) forecast shows increased chances for below-normal rainfall from February to April (Figure 11-left), with exception of in southeastern South Africa. Enhanced rainfall in northern areas, e.g. in Tanzania, is also forecast to continue.

NMME models collectively predict the largest deficits from February to April (Figure 11-right) in areas that received below-average December rainfall. This epicenter of dryness is similar to where the NMME previously forecast large DJF impacts (Nov. 2019 [Special Report](#)). Thus far, DJF deficits have been more regionally concentrated than extensive, and this is not surprising given the uncertainty associated with long term outlooks. Given the recent rainfall deficits, informal negative field reports, and the pessimistic forecast from NMME and other sources, the situation in southern Zambia, Zimbabwe, and central and southern Mozambique, in particular, requires close monitoring.

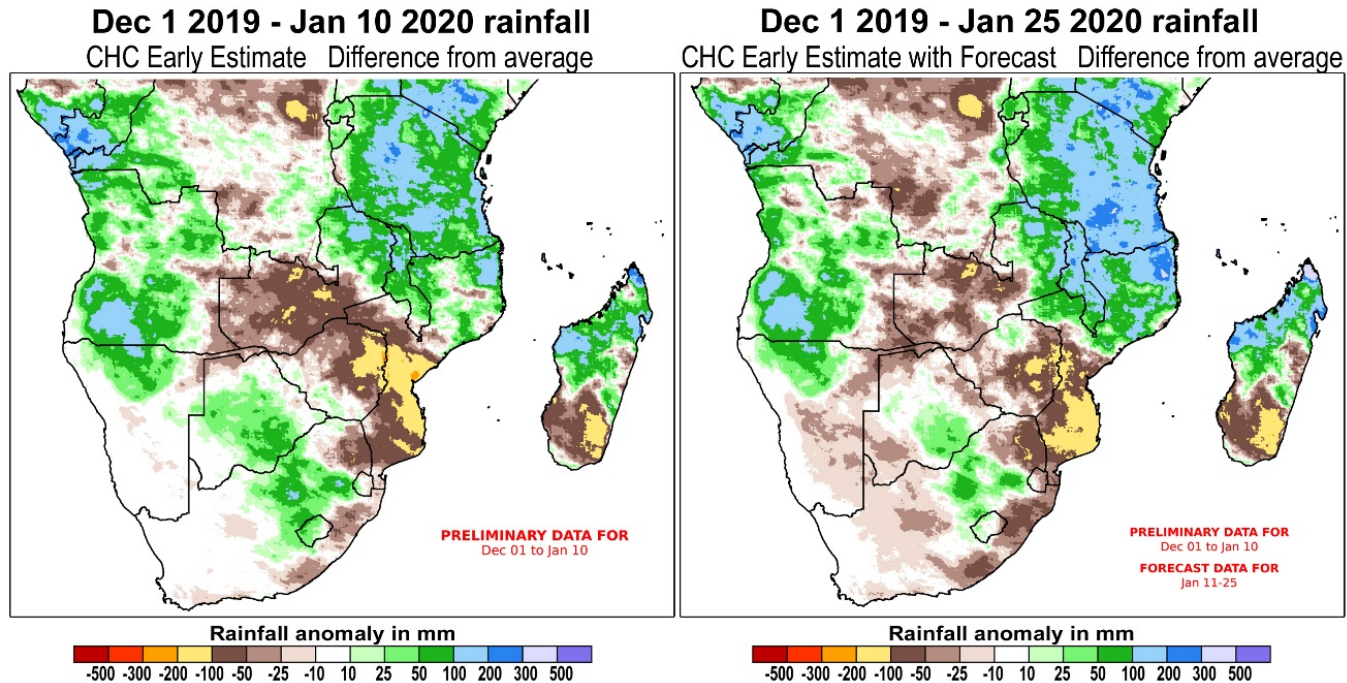


Figure 10. Estimated and forecast rainfall totals since December 1st, 2019, in terms of the difference from the 1981-2018 average. UCSB Climate Hazards Center Early Estimates from January 12th, 2020. On the left, the Dec. 1st to Jan. 10th anomaly based on CHIRPS preliminary data. On the right, the Dec. 1st to Jan. 25th anomaly based on CHIRPS preliminary and the CHIRPS-GEFS unbiased GEFS forecast for Jan. 11th-25th.

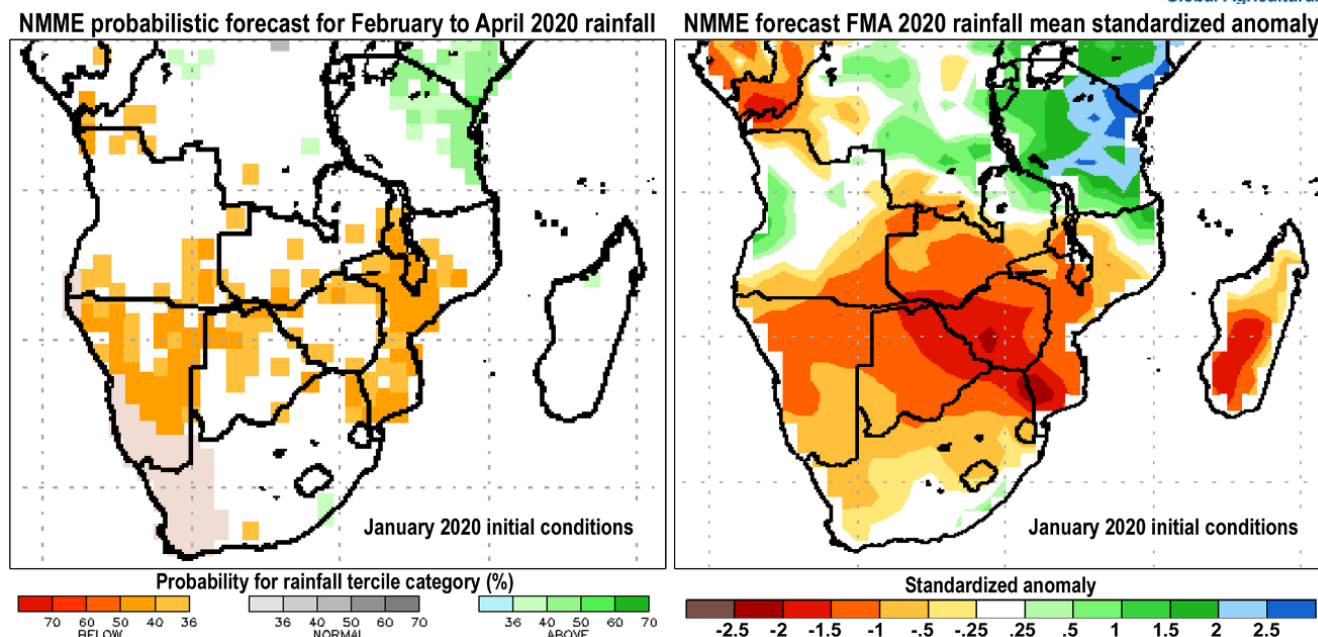


Figure 11. North American Multi Model Ensemble (NMME) rainfall forecast for February 2020 to April 2020, released in early January 2020. Left: The probabilistic forecast. Orange/red and green colors show the dominant tercile category (below-normal or above-normal) forecast by the ensemble, with the individual model forecasts judged according to their respective hindcasts. More intense colors correspond to higher probabilities. White color indicates where there is disagreement amongst models as to the most-likely tercile category. Right: Forecast standardized anomalies. Values less than -1 or greater than 1 are where the models depict substantial deviations from average. Original images are available at www.cpc.ncep.noaa.gov.

Potential Outcomes

The current drought comes after an already poor 2018-19 main season last year, which impacted much of the region and led to below-average and, in some cases, failed production across southern Angola, Namibia, Botswana, Zimbabwe, Lesotho, and southern parts of Zambia and Mozambique. This year's drought is affecting many of these same areas, further straining farmers and their resources. In areas where replanting is necessary, the decision of whether to replant will be determined based on farmer's resources and ability to purchase inputs. With drier than average conditions expected to continue across parts of the central and south in February and March there is a high possibility of poor production across Zimbabwe, Zambia, and southern Mozambique and further monitoring is needed.

According to the [United Nations](http://www.un.org), up to eight million people in Zimbabwe, nearly half of Zimbabwe's population, will require food aid this year following last year's drought and failed harvest, along with high levels of inflation. The poor start to the current 2020 maize season may result in the fourth consecutive year of drought and the potential for below-average production. Food security is of severe concern.

The GEOGLAM Crop Monitor team is monitoring the situation. Further information will be provided in the next *Crop Monitor for Early Warning* monthly bulletin, which will be released on February 6th.

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