

# CUMULUS



## 5 October 2020 – by J Malherbe, R Kuschke



### Contents

- Summary.....2
- Seasonal overview .....4
  - ENSO and seasonal forecasts .....4
- Seasonal forecasts issues by various international institutions.....5
  - IRI, ECMWF, NCEP, UKMO .....5
- CUMULUS seasonal outlook, based on decadal variability .....8
- Rainfall (% of long-term mean): April – August 2020 .....9
- Rainfall (mm): 25 September – 4 October 2020.....10
- Percentage of Average Seasonal Greenness: 1 January – 20 September 2020 .....11
- Overview of expected conditions over South Africa during the next few days .....12
  - Conditions in main agricultural production regions (5 -11 October) ..... 12
  - Possible extreme conditions - relevant to agriculture..... 14
- Sources of information .....15

## Summary

### *Widespread rain expected over the northeastern half*

Scattered thundershowers occurred over especially the eastern parts of the maize-production region late last week. Thunderstorms were often associated with hail and strong winds – as is typical during this time of the year and the circulation patterns that included a strong wet/dry boundary and strong upper-air instability.

Continuing into early October, more rain is expected during the next few days over much of the summer rainfall region, including especially the northern and central to eastern parts of the maize-production region. This time around there will be larger amounts of moisture available and it can therefore be expected that rainfall totals will be higher. The upper-air system active will be a cut-off low over Botswana, and more towards the west there will probably be some severe storms while the weather over the eastern parts will probably be “softer and wetter”. While most of the rain will be confined to the northeastern half of the country, thunderstorms may also develop as far west as the central to eastern parts of the Northern Cape and western Free State earlier in the period. Given drier air present over these areas, isolated thundershowers may generate impressive dust storms with strong and gusty winds.

**The following is a summary of weather conditions during the next few days:**

- **General:**

- Rainfall will be above normal over the northeastern half of the country.
- It will be cloudy and mild (and wet) over the northeastern parts during much of the week.
- The central and northern to eastern parts of the maize-production region should receive rain with totals exceeding 25 mm during the next few days.
- 2-Day rainfall totals in excess of 50 mm are possible over isolated areas of North West, Gauteng and western Mpumalanga on Monday (5<sup>th</sup>) and Tuesday (6<sup>th</sup>).
- Some thunderstorms, especially on Monday (5<sup>th</sup>) and to a lesser extent on Tuesday (6<sup>th</sup>) over the central to eastern parts may become severe – with strong gusts and hail.
- Dust storms are possible over the Northern Cape interior and western parts of the adjacent provinces to the east on Monday (5<sup>th</sup>).
- Temperatures will on average be below normal for this time of the year in the east and north.
- Strong to gale-force Southeasterlies will occur over the southwestern Cape from Wednesday (7<sup>th</sup>) to Friday (9<sup>th</sup>).
- Current forecasts indicate possible colder and windy conditions over the southern parts of the country from Thursday onwards, with further thundershowers expected over the central to eastern parts of the country by the weekend and early next week.

- **Precipitation:**

- Monday (5<sup>th</sup>): Scattered to widespread thundershowers over the northeastern parts. Some storms may become severe over eastern North West, Gauteng and western Mpumalanga. Isolated thundershowers are possible over the central to eastern Northern Cape, with strong gusty winds.
- Tuesday (6<sup>th</sup>): Cloudy and cool to mild over the northeastern parts with rain and thundershowers. Significant falls possible over northern North West and Gauteng.
- Wednesday and Thursday (7<sup>th</sup> and 8<sup>th</sup>): Still cloudy in the northeast, with showers and thundershowers mostly over North West and adjacent parts of the surrounding provinces. It will become cloudy with rain and showers along the Garden Route and Eastern Cape during Thursday.
- Friday (9<sup>th</sup>): Cloudy with rain and showers along the eastern seaboard and adjacent interior, with isolated to scattered thundershowers over the Eastern Highveld.
- Saturday and Sunday (10<sup>th</sup>, 11<sup>th</sup>): Scattered thundershowers according to current forecasts mostly over the central parts of the country, including the western maize-production region.

- **Temperatures:**

- Temperatures will on average be below normal over the eastern parts of the country, including the maize-production region.
- Monday to Wednesday (5<sup>th</sup> – 7<sup>th</sup>): Cloudy conditions with an easterly flow will keep temperatures, especially maximum temperatures, on the low side over the northeastern half of the country.
- Thursday and Friday (8<sup>th</sup>, 9<sup>th</sup>): A strong southerly flow will result in low temperatures over the southern parts of the country, including the Garden Route, Karoo and the Eastern Cape. Accompanied by cloudy and windy conditions, minimum temperatures should be in the lower single digits in some areas while maximum temperatures will be in the lower teens.
- Saturday and Sunday (10<sup>th</sup>, 11<sup>th</sup>): Cooler, cloudy and windy conditions should shift to the eastern and northeastern parts of the country while an off-shore flow will result in warming over the western to southern parts of the country.
- Maximum temperatures over the western maize production areas will be in the order of 21 – 29°C (somewhat cooler during mid-week). Minimum temperatures will be in the order of 11 – 17°C.
- Maximum temperatures over the eastern maize-production region will range between 13 and 23°C, with lowest values during the weekend. Minimums will be in the order of 8 – 14°C – with lowest temperatures towards the weekend.

## Seasonal overview

### ENSO and seasonal forecasts

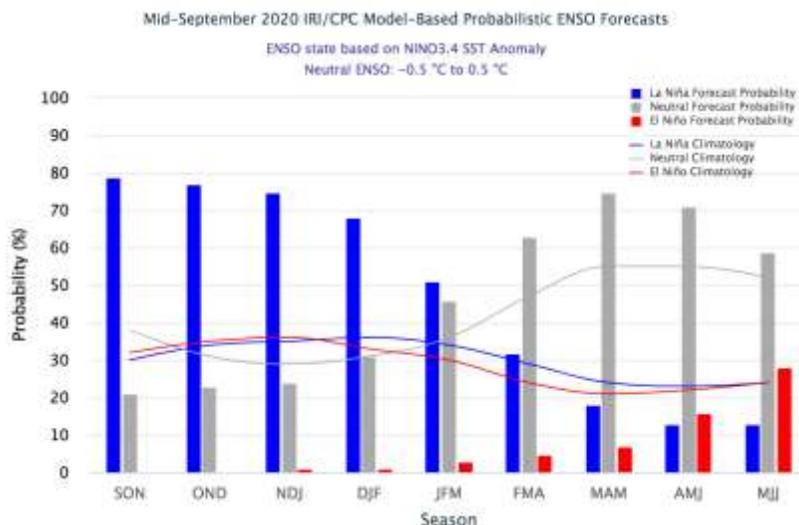
The Australian Bureau of Meteorology notices a neutral to weak negative Indian Ocean Dipole event, expected to become somewhat more negative. They also point out that La Niña conditions may strengthen.

(Updated 29 September) The Bureau's ENSO Outlook has moved to LA NIÑA, indicating La Niña is established in the tropical Pacific. All surveyed international climate models indicate this La Niña will persist until at least January 2021.

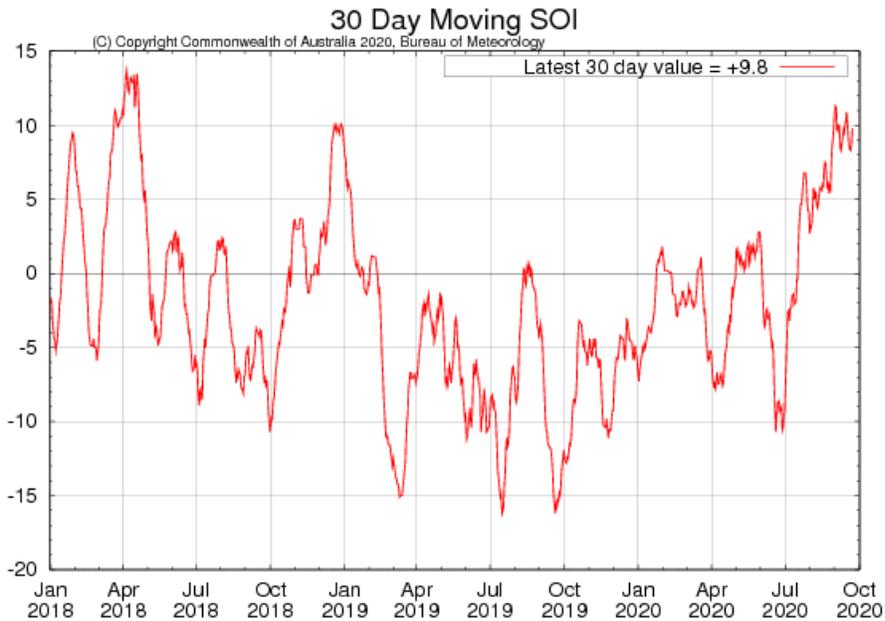
While models agree La Niña will continue well into summer 2020–21, around half the models predict a strong event, while 3 of 8 models suggest moderate strength. Overall, models do not currently anticipate this event will be as strong as the La Niña of 2010–12, which was one of the four strongest La Niñas on record.

Central and eastern tropical Pacific Ocean sea surface temperatures exceed La Niña thresholds (0.8 °C below average) and atmospheric indicators, including the Southern Oscillation Index (SOI), trade winds and cloud, are also at La Niña levels.....*Australian Bureau of Meteorology* - <http://www.bom.gov.au>

**According to the IRI** (Updated 18 September): In mid-September, SSTs in the east-central Pacific are below average, and most of the atmospheric variables are consistent with La Niña conditions. The majority of the model forecasts exceeds the threshold of La Niña SST conditions for fall and winter and implies about an 80% chance for La Niña for fall, 70% for winter. The official CPC/IRI outlook is similar to these model forecasts, calling for a 75% chance of La Niña for Southern Hemisphere spring and summer. A La Niña advisory is posted. *International Research Institute for Climate and Society*-  
<http://iri.columbia.edu/>



*International Research Institute for Climate and Society*- <http://iri.columbia.edu/>



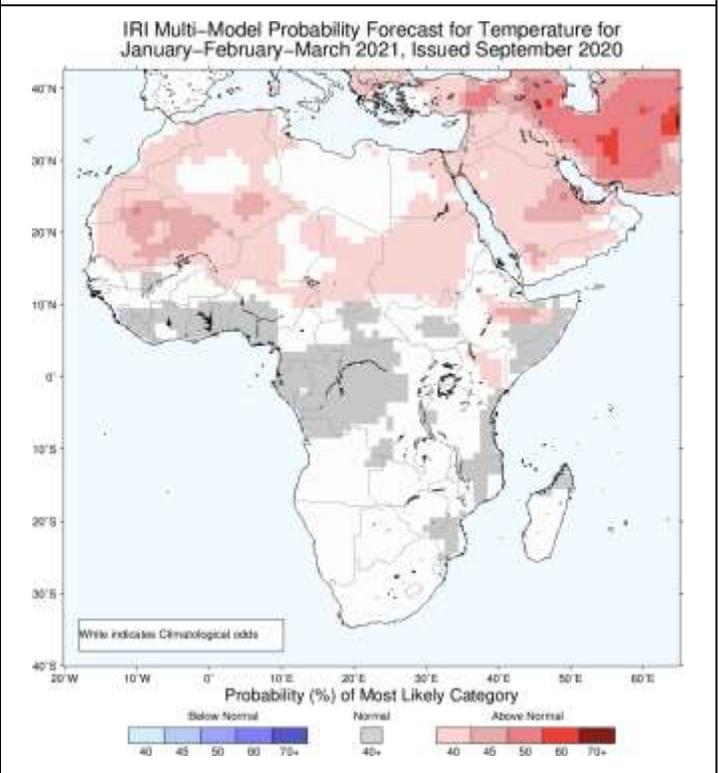
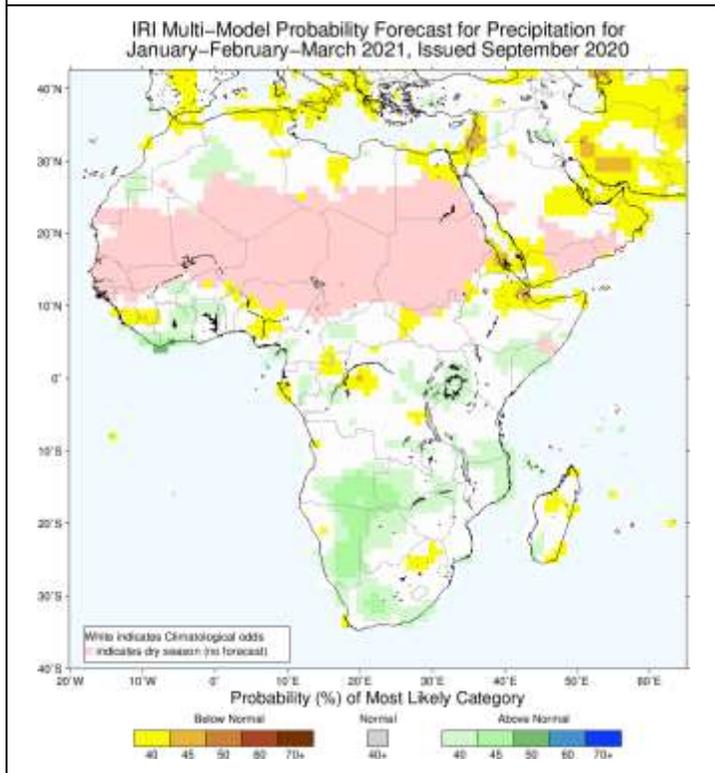
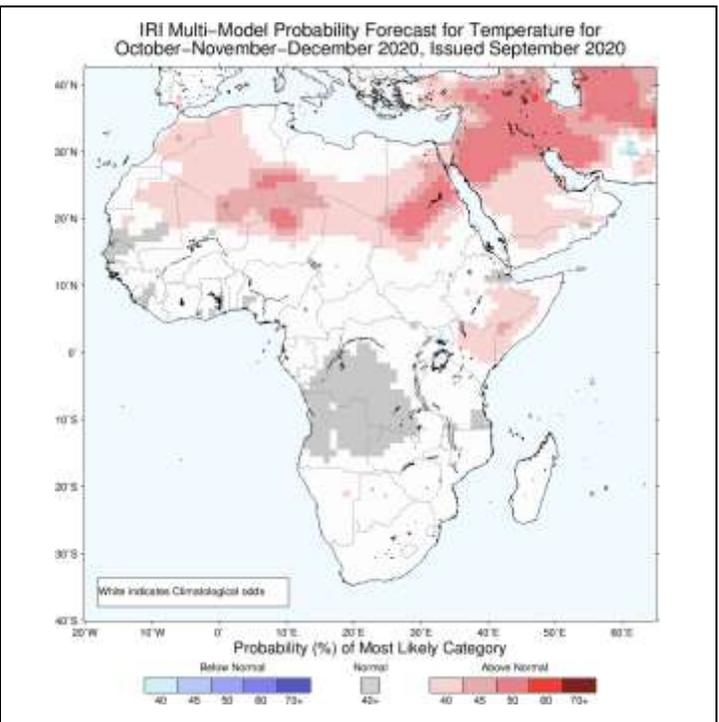
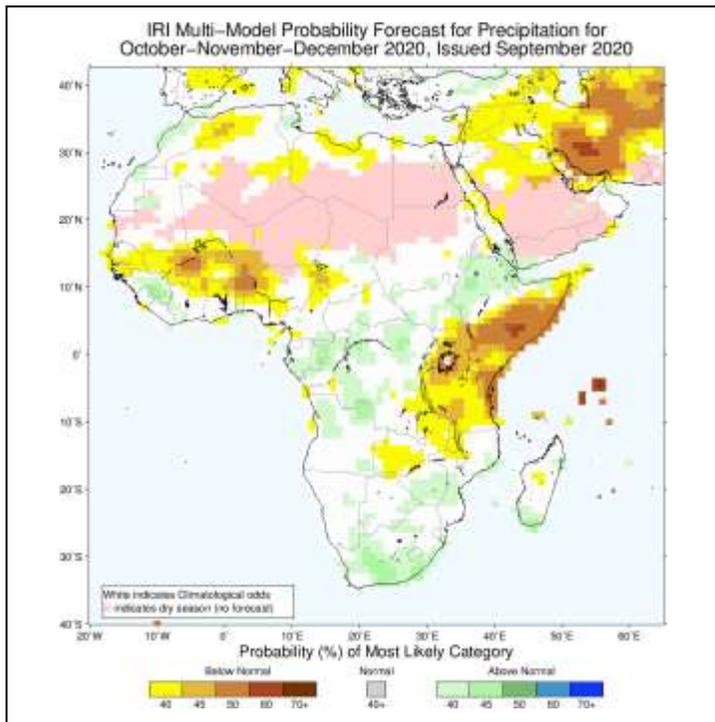
Australian Bureau of Meteorology - <http://www.bom.gov.au>

***The Southern Oscillation Index is positive and within the La Niña threshold (larger than +7), indicating atmospheric circulation patterns consistent with La Niña conditions.***

## Seasonal forecasts issues by various international institutions

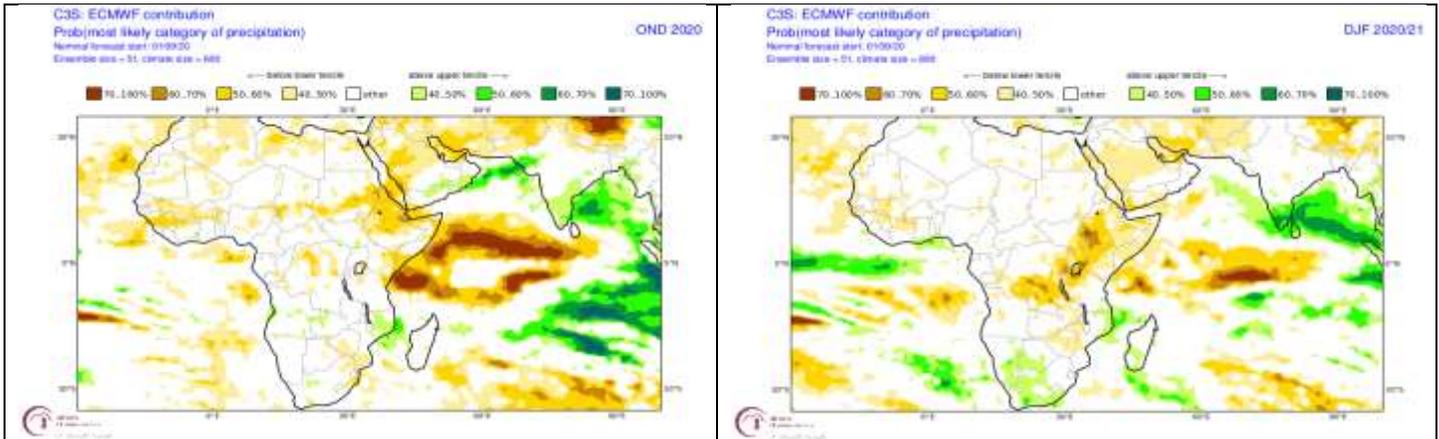
### IRI, ECMWF, NCEP, UKMO

The seasonal forecast by the IRI for Africa favours relatively wet conditions for both early and late summer 2020/21 over South Africa. Coupled with the relatively wet conditions expected over the interior, temperatures are expected to remain near normal.

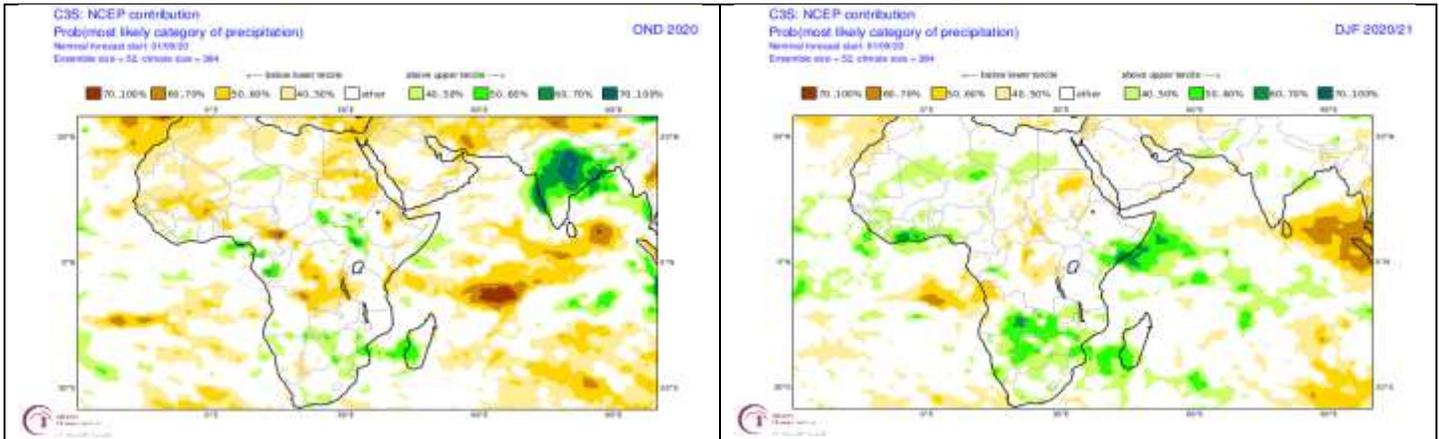


Probabilistic forecasts for rainfall (left) and temperatures (right) for mid-summer (October – December 2020/21; top) and mid-to-late summer (December – February 2020; bottom) (Forecast issued in 2020-09 by the IRI - <http://iri.columbia.edu/>).

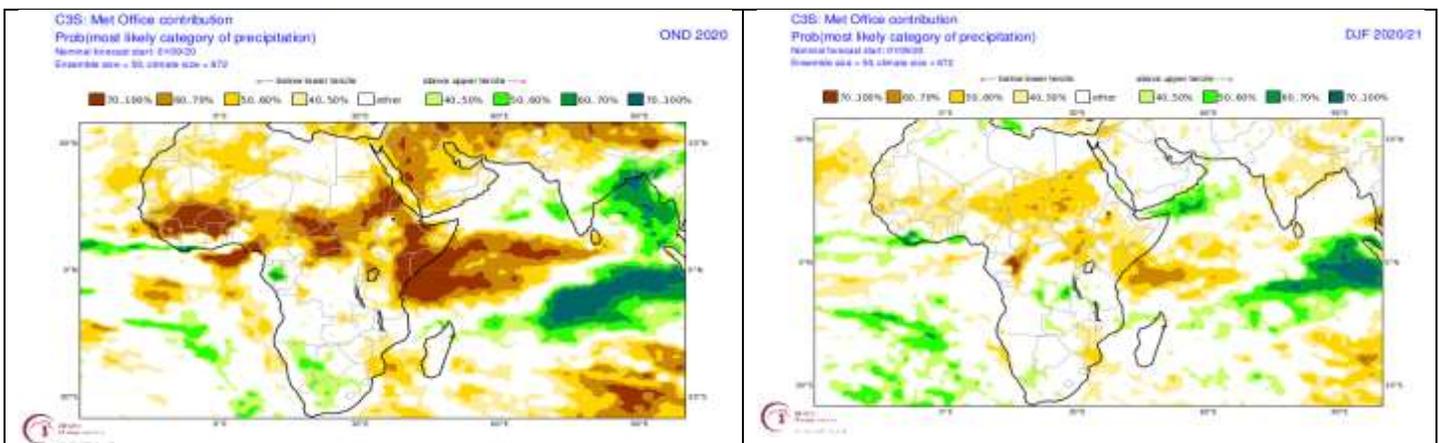
Seasonal forecasts by the ECMWF, NCEP, UKMO, as published by the COPERNICUS Programme (<https://climate.copernicus.eu/seasonal-forecasts>) for both early and mid-summer, reflect similar patterns with regards to rainfall for southern Africa as those by the IRI. The signal for relatively dry conditions over the summer rainfall region of South Africa is somewhat stronger for mid-summer to late summer (DJF) for most of these. This is probably associated with the weak negative Indian Ocean Dipole the developing and expected La-Niña-like conditions.



**Probabilistic forecasts by the European Centre for Medium-Range Weather Forecasts for rainfall for early-summer (October – December 2020; left) and mid-to late summer (December – February 2020; right) (Forecasts issued in 2020-09).**



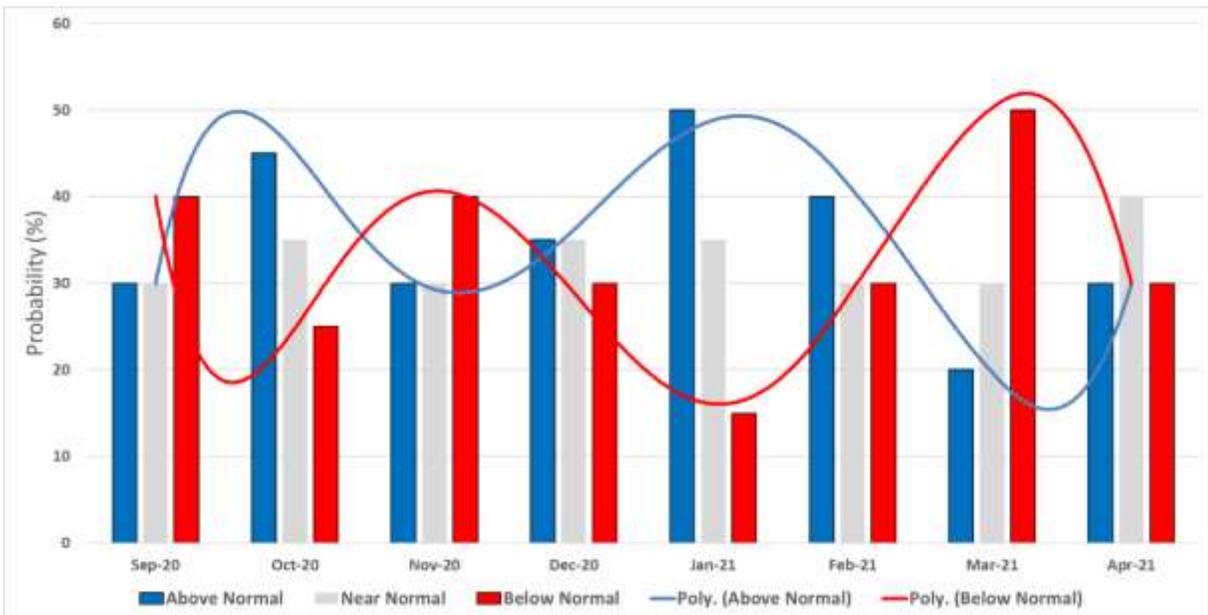
**Same as above, but forecasts issued by the National Centres for Environmental Prediction.**



**Same as above, but forecasts issued by the UK Met Office.**

## CUMULUS seasonal outlook, based on decadal variability

Based on the typical observed rainfall patterns over the northeastern half of the country (most of the summer rainfall region), as associated with the cyclic variability of the global climate system, similar summers as 2020/21 more often experience a seasonal rainfall curve that differs from normal conditions as indicated in the bar graph below:

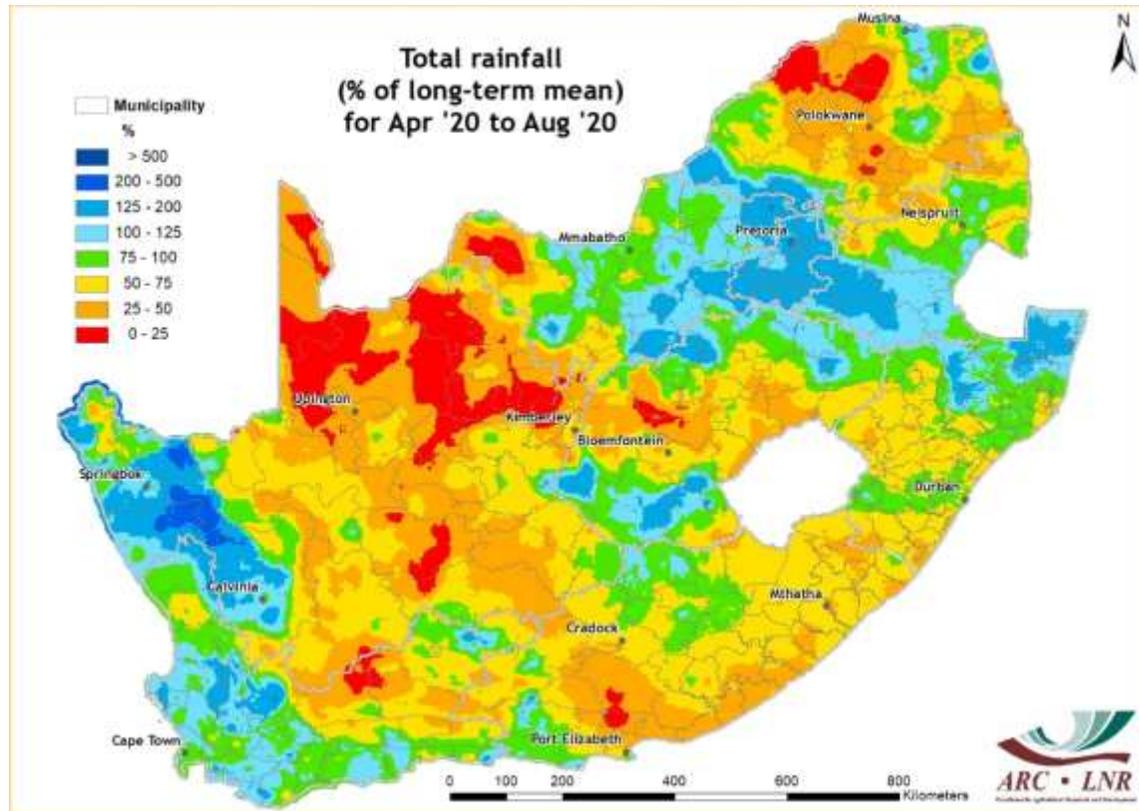


***Probabilistic forecast for rainfall over the summer rainfall region, based on the natural cyclic nature of the climate system as seen in decadal variability, per month for the period September 2020 – April 2021 (Forecast issued in 2020-09).***

Typical patterns during similar summers are:

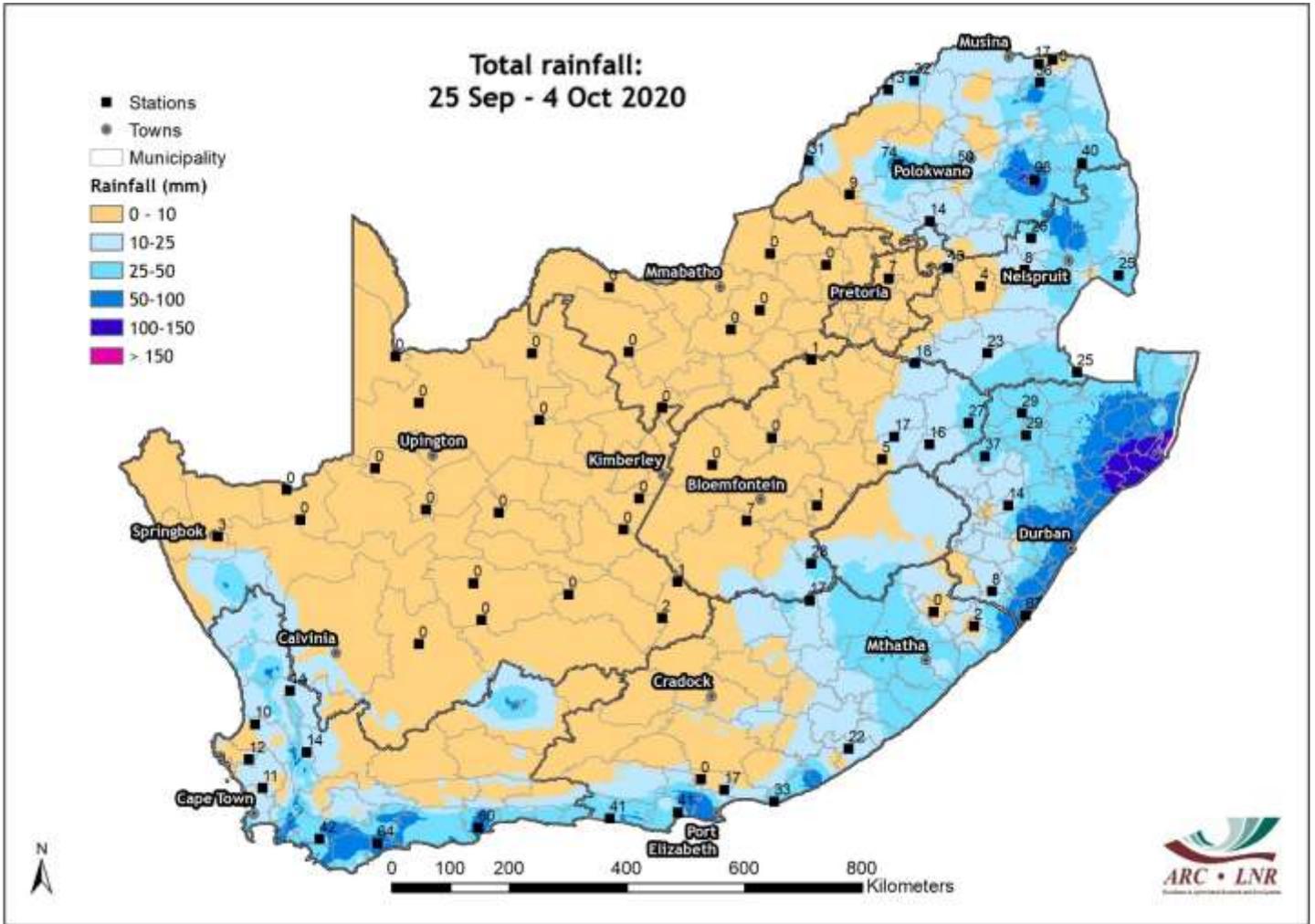
- Late September – 20 October: Relatively wet conditions over the summer rainfall region
- Late October – 20 November: Mostly drier than normal conditions
- Late November - December: Near-normal rainfall over the summer rainfall region
- January – late February: Normal to above-normal rainfall over the summer rainfall region
- Late February – March: Mostly drier than normal

## Rainfall (% of long-term mean): April – August 2020



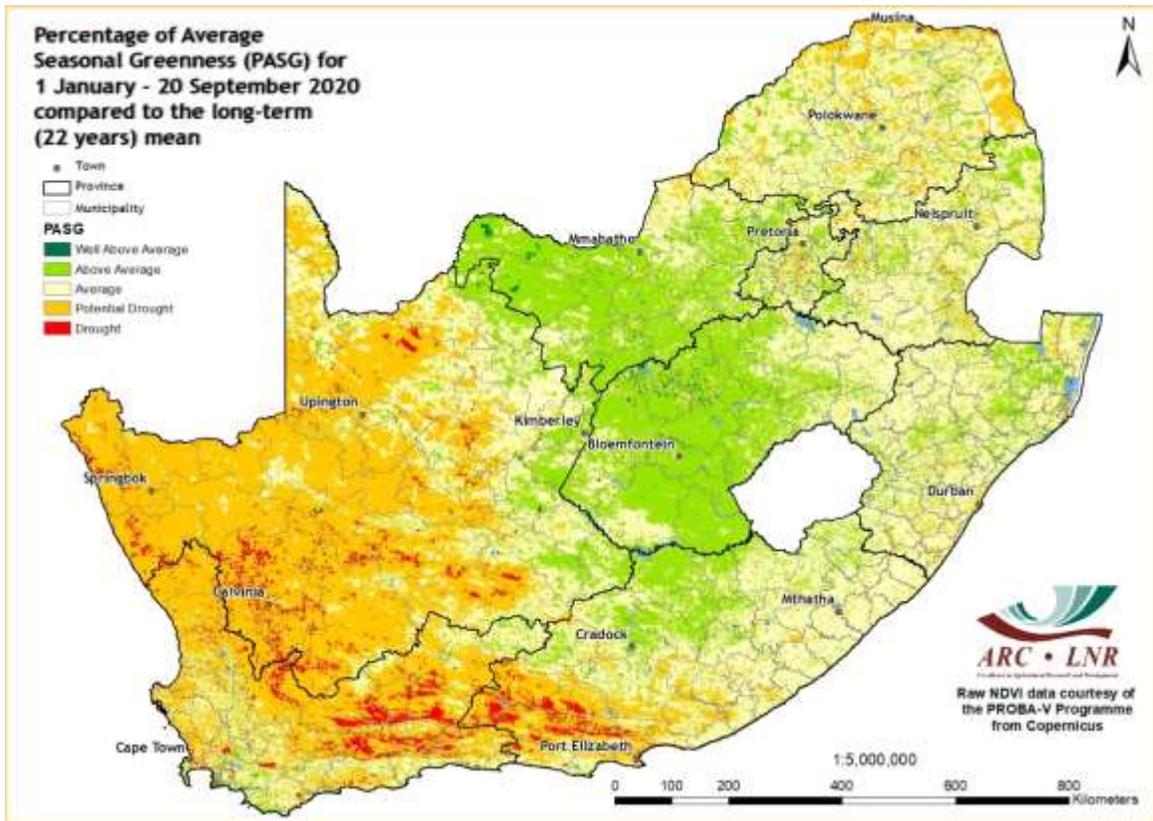
*Rainfall during April to August 2020 was above normal over the winter rainfall region and also the Highveld. Most of the rain over the Highveld occurred during April while rainfall over the winter rainfall region was spread over the period late May to August, continuing also into September (not shown).*

# Rainfall (mm): 25 September – 4 October 2020



*Early-summer thundershowers resulted in rain over the northeastern, eastern and southern parts of the country. The eastern maize-production region received between 5 and 30 mm of rain.*

## Percentage of Average Seasonal Greenness: 1 January – 20 September 2020



*Cumulative vegetation activity for 1 January – 20 September still shows the positive effect of above-normal rain during the 2019/20 summer over the central areas as well as the grain-production areas of the Western Cape with above-average cumulative vegetation activity over these areas.*

## Overview of expected conditions over South Africa during the next few days

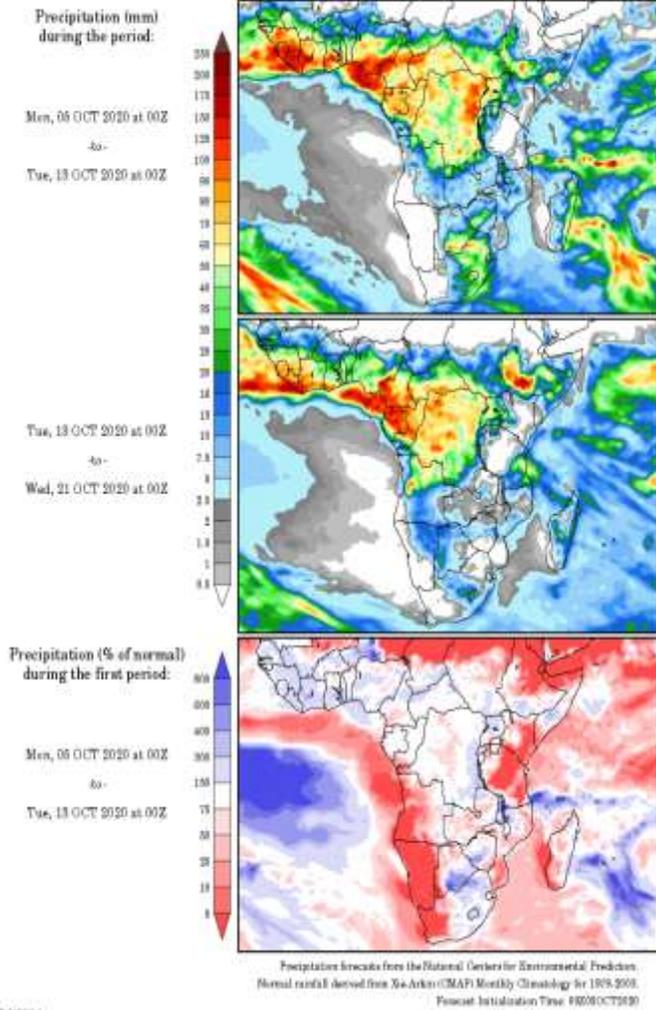
An upper-air cut-off low will develop over the Northern Cape today and is expected to move slowly northeastwards towards southeastern Botswana by Thursday. During this period, the Indian Ocean Anticyclone will feed moisture from the east into the interior. The low will support widespread rain and thundershowers over especially the northeastern half of the country, with some thundershowers also possible further west before the low moves east. Upper-air dynamics may result in some storms becoming severe, but this will be less prevalent than with the previous system last week as moisture will penetrate deep into the interior. It should clear by Friday (9<sup>th</sup>), but current forecasts are indicative of another upper-air system that may develop over the southwestern parts of the country during the weekend, bringing the chance of more thundershowers over the interior during the weekend and early next week. A strong ridging high associated with this system may also result in cool, cloudy conditions in the east.

### Conditions in main agricultural production regions (5 -11 October)

**Maize production region:** Partly cloudy and warm conditions will make way for cloudy and mild conditions from late Monday (5<sup>th</sup>) to Wednesday (7<sup>th</sup>). Widespread thundershowers may occur especially Monday evening (5<sup>th</sup>) over Mpumalanga, when some storms may become severe. The area of rain and thundershowers may concentrate somewhat more over North West and Gauteng as the week progresses. It should clear by Thursday (8<sup>th</sup>), with renewed thundershower activity possible, this time mostly over the central to western parts of the region, according to current forecasts, during the weekend and early next week while it should be cloudy, cool and windy in the east. Maximum temperatures over the western maize production areas will be in the order of 21 – 29°C (somewhat cooler during mid-week). Minimum temperatures will be in the order of 11 – 17°C. Maximum temperatures over the eastern maize-production region will range between 13 and 23°C, with lowest values during the weekend. Minimums will be in the order of 8 – 14°C – with lowest temperatures towards the weekend.

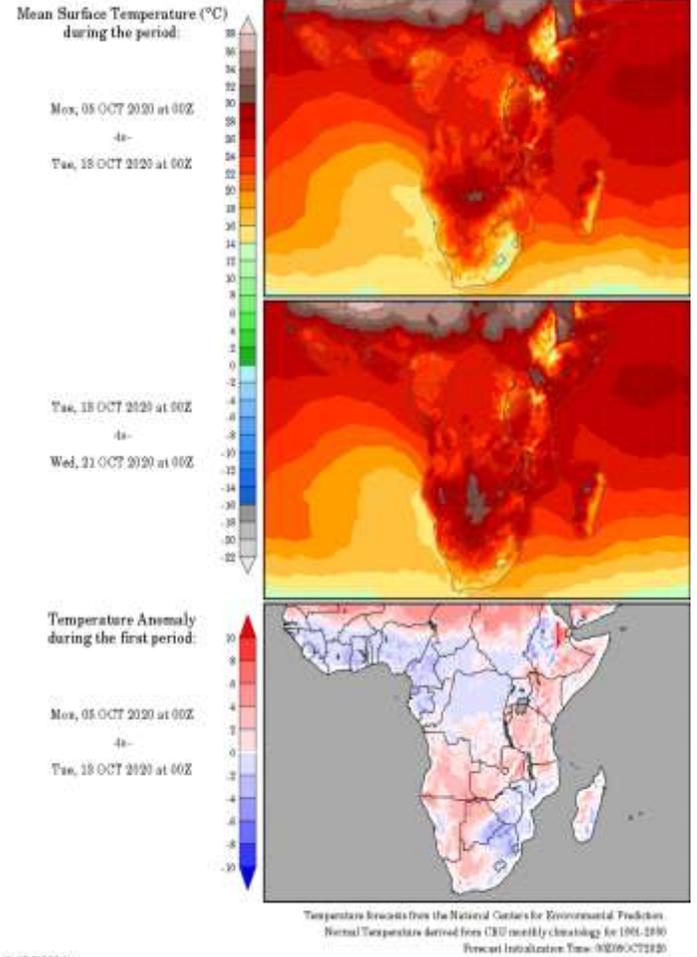
**Cape Wine Lands and Ruens:** It will be sunny and mild, becoming windy and cooler by Thursday when rain showers are possible along the Garden Route, lasting until Friday (9<sup>th</sup>). Strong southeasterlies will dominate in the southwest from Wednesday (7<sup>th</sup>) to Friday (9<sup>th</sup>), becoming easterly during the weekend when it will become warm along the West Coast.

### Precipitation Forecasts



GAD500LA

### Temperature Forecasts



GAD500LA

**Center for Ocean-Land-Atmosphere Studies (COLA) and Institute of Global Environment and Society (IGES) – <http://Wxmaps.org>**

## Possible extreme conditions - relevant to agriculture

The South African Weather Service issues warnings for any severe weather that may develop, based on much more information (and in near-real time) than the output of one single weather model (GFS atmospheric model - *Center for Ocean-Land-Atmosphere Studies (COLA) and Institute of Global Environment and Society (IGES)* – <http://Wxmaps.org>) considered here in the beginning of a week-long (starting 5 October) period. It is therefore advised to keep track of warnings that may be issued by the SAWS ([www.weathersa.co.za](http://www.weathersa.co.za)) as the week progresses.

According to current model projections (GFS model) of weather conditions during the coming week, the following may be deduced:

- Some thunderstorms may become severe over eastern North West, Gauteng, western Mpumalanga and southern Limpopo on Monday (5<sup>th</sup>).
- Thundershowers over the interior of the Northern Cape and adjacent parts of the neighbouring provinces to the east may lead to dust storms with strong gusty winds on Monday (5<sup>th</sup>).
- Cloudy, wet and cool conditions over parts of the eastern summer-grain production areas during the week and again during the weekend may favor the occurrence of fungal plant pathogens.
- Cold, wet and windy conditions over the Karoo, Garden Route and southern high-lying areas including the interior of the Eastern Cape on Thursday and Friday (8<sup>th</sup> and 9<sup>th</sup>) may adversely affect small stock in the region.
- Strong to gale-force southeasterlies will occur from Wednesday (7<sup>th</sup>) to Friday (9<sup>th</sup>) over the southwestern coastal areas.

## Sources of information

**Seasonal forecasts:** Published by the COPERNICUS Programme (<https://climate.copernicus.eu/seasonal-forecasts>)

**Rainfall, temperature and wind maps over South Africa for the past week:**

Agricultural Research Council - Institute for Soil, Climate and Water (ISCW) – Climate Data Bank. Data recorded by the automatic weather station network of the ARC-ISCW.

**Vegetation condition maps:** Copernicus Global Land service, distributed by VITO.

**Information related to: ENSO, IOD and SOI:**

Australian Bureau of Meteorology - <http://www.bom.gov.au>

Climate Prediction Center - <http://www.cpc.ncep.noaa.gov>

International Research Institute for Climate and Society- <http://iri.columbia.edu/>

**Information related to the SAM:**

The Annular Mode Website - <http://www.atmos.colostate.edu/ao/index.html>

**SST map:**

NOAA Climate Prediction Center - <http://www.cpc.ncep.noaa.gov>

**Daily conditions over South Africa:**

CSIR NRE (National Resources and the Environment)

“CSIR NRE produces forecasts on an experimental basis, doesn’t guarantee the accuracy of the daily forecasts and cannot be held accountable for the results of decisions taken based on the forecasts”

**Tropical cyclone/hurricane/typhoon information:**

Weather Underground - <http://www.wunderground.com>

Cooperative Institute for Meteorological Satellite Studies (CIMMS) - Tropical Cyclone Group -<http://tropic.ssec.wisc.edu/>

Tropical Cyclone Centre La Reunion -[http://www.meteo.fr/temps/domtom/La\\_Reunion/webcmrs9.0/anglais/index.html](http://www.meteo.fr/temps/domtom/La_Reunion/webcmrs9.0/anglais/index.html)

**Information on drought conditions over the USA:**

NOAA National Weather Service - <http://www.weather.gov>

United States Drought Monitor - <http://droughtmonitor.unl.edu>

**Precipitation and temperature outlooks for the coming week:**

Center for Ocean-Land-Atmosphere Studies (COLA) and Institute of Global Environment and Society (IGES) – <http://Wxmaps.org>

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