



Agrometeorology Division

# *Sudan Seasonal Monitor* *Issue (2) July 2011*

Prepared by:  
**SAMIS Team**

# Sudan Seasonal Monitor



Sudan Meteorological Authority  
Federal Ministry of Agriculture and Forestry

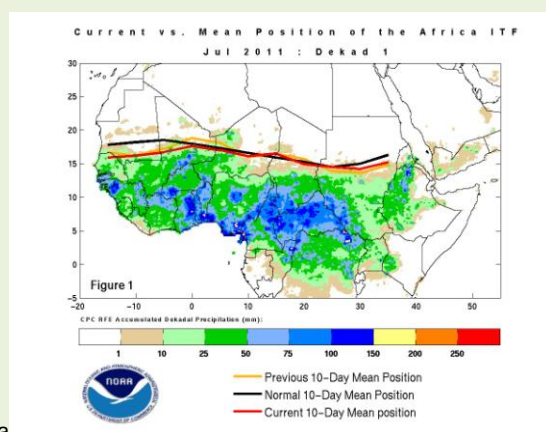


Issue 2

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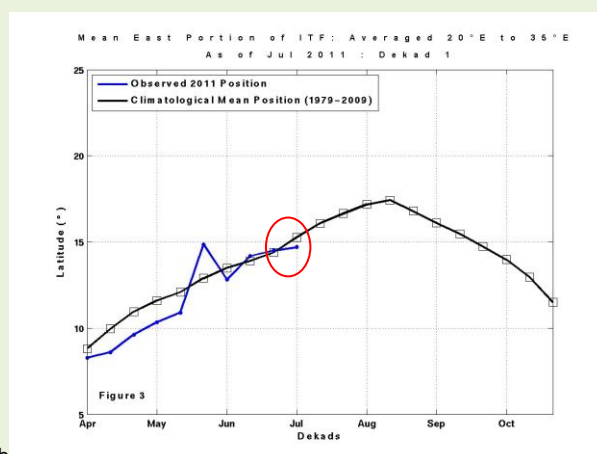
## Summary

- **The movement of ITF southward during early July associated with low rainfall amounts in the eastern, central and western parts of Sudan. See Page 1.**
- **Rainfall amounts in June below average across most of the country, apart from that some areas in the southern Darfur have above average rainfall. See Page 2-3**
- **Vegetation development situations still below average levels in the eastern parts, especially areas of Gedaref, Sennar, and Blue Nile after the June dryness. See Page 4.**
- **Forecasts for July-August-September rainfall from different sources have become more (IRI and ECMWF) consistent. On balance, considering forecasts from SMA and from other institutions, expectations for this key period of the rainy season are of on average to above average rainfall. See Pages 5-7.**



a

Fig 1a – Position of the ITF over Africa in July21-31-2011(red) compared to average position (black). (Source : CPC)



b

Fig 1b – Average position of the ITF over Sudan along the current season compared to a 20-year average. (Source: CPC).Note the retreat in the position in early July (circled)

## Seasonal Progress

Rainfall in Sudan mostly results from a northwards movement of humid air masses from March to August and their southwards retreat from September to November. At their northernmost reach, these humid air masses meet with drier and warmer air to form the Inter tropical convergence zone (ITCZ). Since the rain follow south of the ITCZ, tracking the ITCZ through the season provides a quick evaluation of the seasonal progress of the rainy season and of its quality.

Fig 1 shows a map with the latest ITCZ position. Current position of the ITCZ is south to its average position and north of the previous dekad. Fig 1b shows the Dekadal progress of ITCZ, where it is in the south of its average position in early July.

## June and early July Rainfall in Sudan

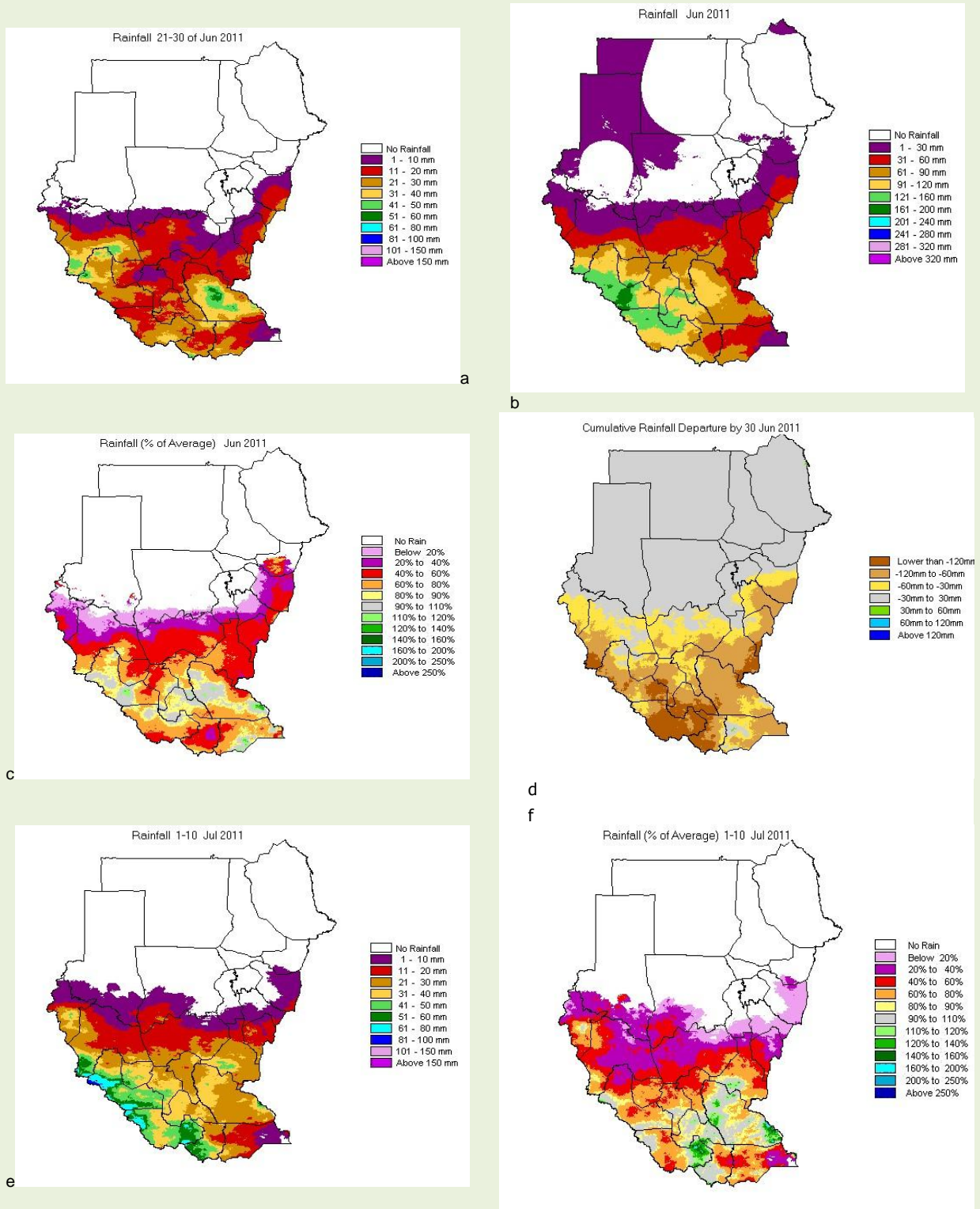


Fig 2: a – Rainfall in late June 2011. Fig b – Rainfall amounts in June 2011. Fig c – Total rainfall of June as a percentage of the average. Fig d – cumulative rainfall departure by late June, e – Total rainfall for early June and f – Rainfall as percentage of average in early July.

The above normal rainfall during late May was followed by dry conditions persisted during June. Mid and late June were characterized by the dryness as the ITCZ retreated to its normal and south normal positions, respectively. Late June, rainfall was moderately below average across the country, except some areas in the



southern Darfur and Jonglei have above average rainfall (see Fig 2a).

In term of total rainfall amounts, June shows below average rainfall amount in most parts of the country. In contrast, areas of south western borders showed above average rainfall amounts (western Bher El Gazal and western Equatoria and most thorn parts of southern Darfur (2d).

June shows below average amounts in all states of the country, See Fig (2c). The cumulative of rainfall till June was on average and below average in all states in the country see fig (2d).

During early July, rainfall amounts were registered in, the Southern Kordufan Southern and Western Darfur, Blue Nile, Gedarif, and Sennar state. Above average rainfall in south of southern Darfur and Western Darfur (Nyala), see Fig (2e).

In mid-June the rainfall was confined to the eastern part of Gedaref, Sennar state, and southern Kordufan, with below average amounts. Above average observed in south of southern Darfur.

## Start of Growing Season

A better evaluation of the effect of rainfall on crops can be made by comparing rainfall to a measure of the water demand imposed on crops by the environmental conditions (i.e. temperature, humidity, solar insulation and wind levels).

We can detect when rainfall is enough to meet the estimated water demands of planting and early crop development – the start of the growing season is taken as the date when these demands are met for at least two 10 day periods. Fig 3 displays the dates on which the growing season started across Sudan for this season.

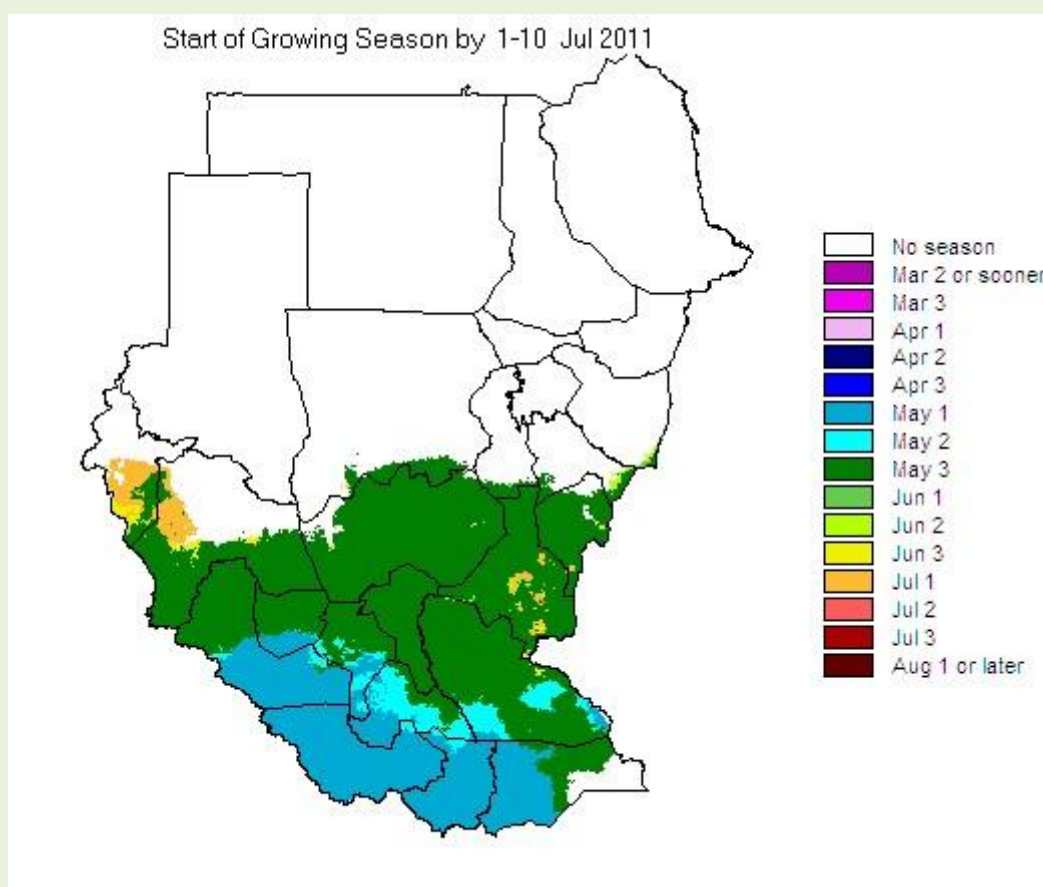


Fig 3 – Dates of Start of Growing Season till early June 2011. Each colour represents a different 10 day period of a given month (1 = 1 to 10, 2 = 11 to 20, 3 = 21 to 30 or 31).

The map (Fig3) of start of season dates shows that across most of northern Sudan, suitable conditions for

planting and early crop development took place in late May, reflecting the good rainfall in this period. There is no start of season detected in mid June in accordance with the very dry situation during this month; this means that areas where the season has started may have faced poor early moisture conditions. Small areas of Western and Southern Darfur states registered suitable conditions of planting in late June and early July. Elsewhere, no growing season registered.

## Vegetation Status

Vegetation condition and development are assessed by means of the NDVI (Normalized Difference Vegetation Index) – this is a satellite derived parameter which responds (almost) uniquely to vegetation and is available on a global scale every ten days.

Dryness conditions and lack of rainfall during June led to below average vegetation development. This led to delaying the crops sowing and early development in the mechanized areas in the eastern part; (Gedaref, Sennar and Damazine). The most western parts showed moderate vegetation development levels as a consequences of the late June and early July rains in the areas of; Kadogli, Babanusa, El Nhoud, Nyala and Rashad. Below average vegetation development situation is obvious during late June in the most central of Sudan (Fig 4b).

Vegetation development during July is moderately enhanced in the southern areas of southern and western Darfur states. Eastern areas of Sennar and Blue Nile state with the borders with Ethiopia showed some improvements (Fig 4a). This will support the early planting in these areas if the rain is continued during mid and late July.

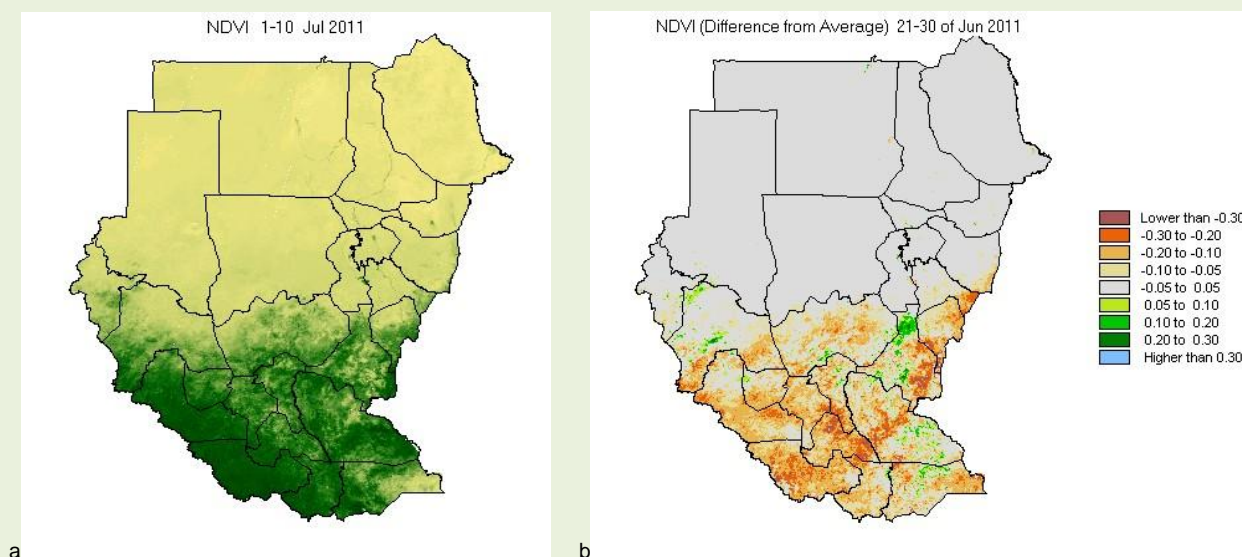


Fig 4a – NDVI progress for early July 2011, Fig 4b – NDVI difference from average in late June 2011. Yellows and reds represent below average vegetation development, greens and blues represent above average vegetation development.

## Seasonal Perspectives

El Niño (and La Niña) events are disruptions of the ocean-atmosphere system in the Intertropical Pacific which can cause large scale changes in wind circulation and sea surface temperature, and lead to a variety of impacts on rainfall and temperature distribution across the globe.

During the June - August season there is an approximately 71% probability of prevailing neutral conditions, and that is predicted to be the most likely situation through the second half of 2011 and into early 2012. The likelihood of returning to El Niño conditions is now very low (9%), while the chances of La Niña conditions are also low (15%).

## Rainfall Outlook

There are a variety of methodologies and models that use tropical east Pacific sea surface temperatures (SSTs) patterns as input to predict/forecast long term (1 to 6 month) changes to rainfall and temperature regimes over wide areas of the globe.

SMA uses seasonal forecast information produced by itself (based on IGAD Climate prediction and Application Centre) and information publicly available on the Web from three main sources: IRI, International Research Institute (USA), CPC, Climate Prediction Centre (NASA, USA), ECMWF, European Centre for Weather Forecasts (Europe).

## June - September 2011 Rainfall Forecasts

July-August-September (JJAS) is the crucial period for most crops in Sudan, in particular for the northern regions. Forecasts for JAS rainfall have been prepared in May and June by a variety of sources. Forecasts made at such long time ranges can provide only general guidance and it is possible to find conflicting information.

SMA updated its seasonal forecast for the rainfall for June-July-August-September (JJAS) 2011 (Fig 5) for the coming three months, July, August and September. According to this forecast, JJAS rainfall is expected to be on average to above average in eastern region, with probabilities of 50-35%, the western region is expected to be above average to average with probabilities of 40-35%. In contrast, in Southern Sudan rainfall expected to be on average to below average with probabilities of (45%-30%) with a somewhat higher chance of above average rainfall in the southwest regions.

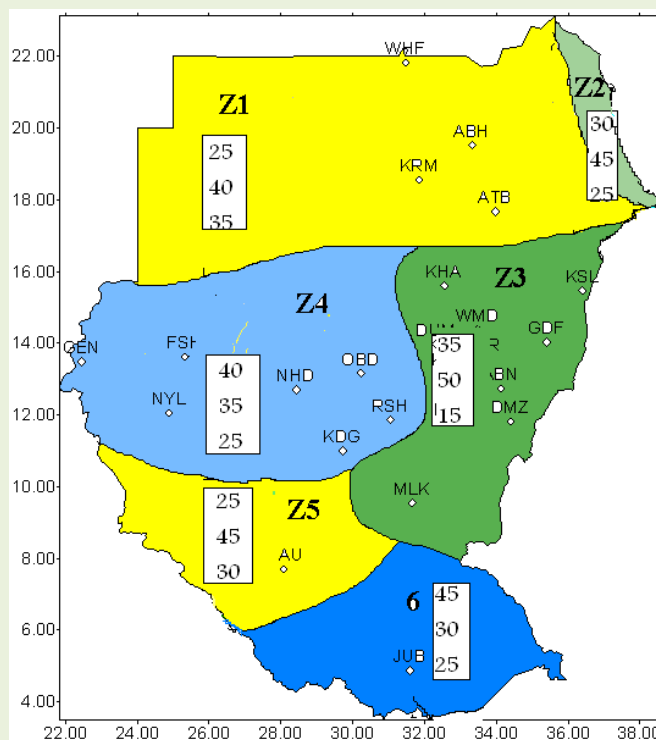


Fig5 – SMA forecasts of June - September rainfall (JJAS) 2011. Boxes indicate likelihood of above (top), on (middle) and below (bottom) average conditions. Zones represent homogeneous climatic rainfall

## July -August-September 2011 Rainfall Forecasts

This period is crucial one of most crops in the northern regions of Sudan. International centres produces seasonal forecast for July/August for this period from the sources above. However, forecasts made at such

long ranges have low skill and provide only general guidance. As a result, it is frequent to find conflicting information and this is case this season.

IRI and ECMWF forecast (Fig6a, c) outlook –normal to above normal rainfall, mainly in across the centre of Sudan and dry season in the north regions with probabilities of 45 -50% and 60 – 80%. CCA outlook and forecast below normal rainfall locally over central Sudan. Above average rainfall over the south western sectors of Sudan. See (Fig6b).

IRI and ECMWF are in consensus of forecasting normal to above normal condition a cross the central Sudan, CCA forecast of normal to below normal rainfall across the central Sudan. There is no sure way to decide which forecast is better. Inconsistencies like this may result in a middle way (average conditions).

In any case, actual crop-related quality of the rainfall season is influenced by a range of other factors such as the timing and distribution of rainfall amounts through the season, on which these forecasts do not provide information.

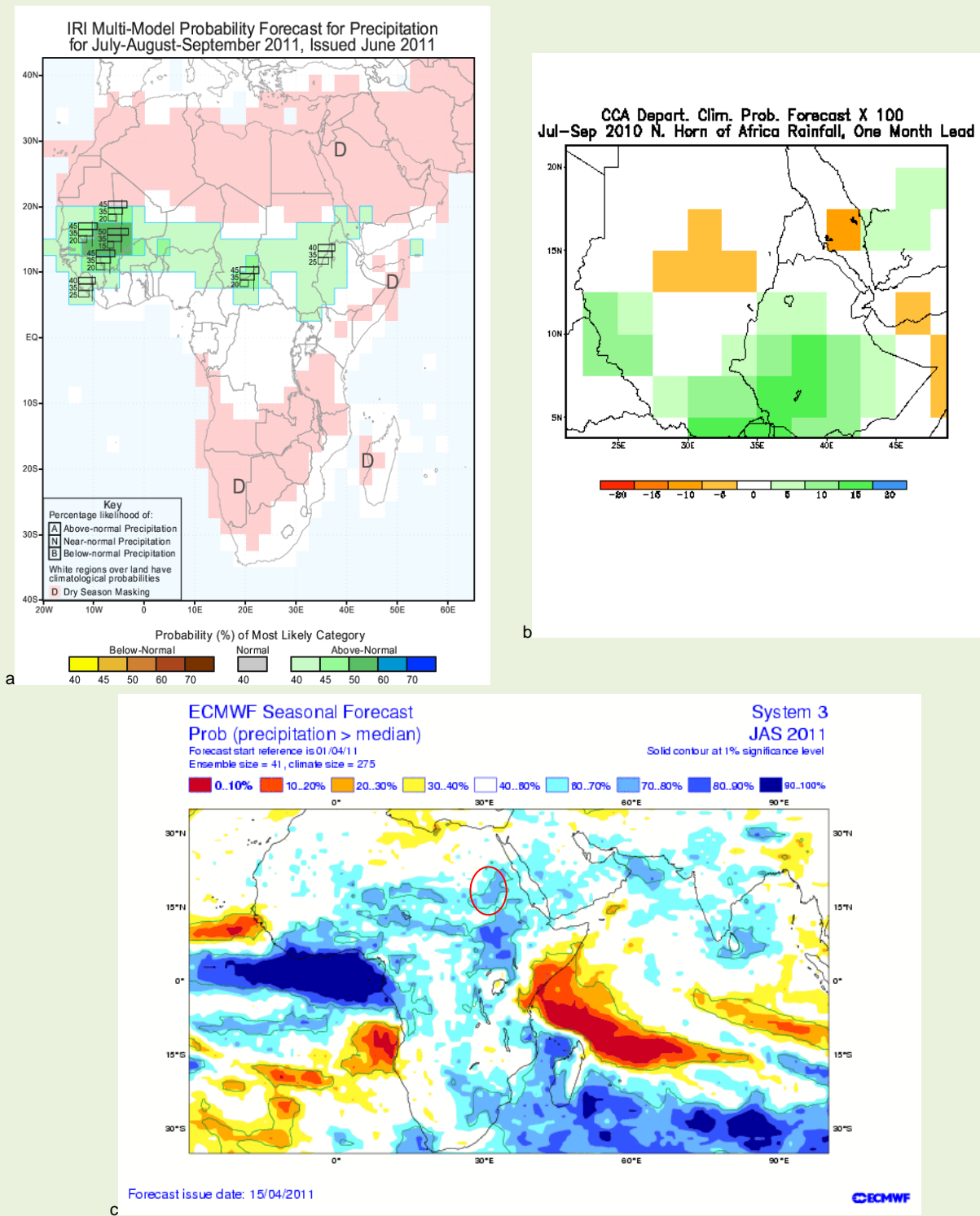


Fig 6a – Probabilistic forecast for July-August –September (JAS) 2011rainfall for Africa. Boxes indicate likelihood of above (top), on (middle) and below (bottom) average conditions. Green to blue indicate areas of increasingly more likely above average conditions (source: IRI).

Fig 6b – Forecast for July-August –September (JAS) 2011 rainfall for Africa. Colours indicate departure from climatology (usual scenario), oranges and yellows for below average conditions, blues and green for above average (source CPC).

Fig 6c – Forecast for July-August –September (JAs) 2011 rainfall for Africa. Probability of exceeding median rainfall (usual scenario). Yellow to red for less rainfall than usual, greens and blues for more rainfall than usual. (source : ECMWF)



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Note: Areas south of Southern Darfur, southern Kordofan, White Nile, Sennar and Blue Nile are no longer parts of Republic of Sudan.

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