

SAVING LIVES

CHANGING
LIVES



South Sudan – Seasonal Monitor

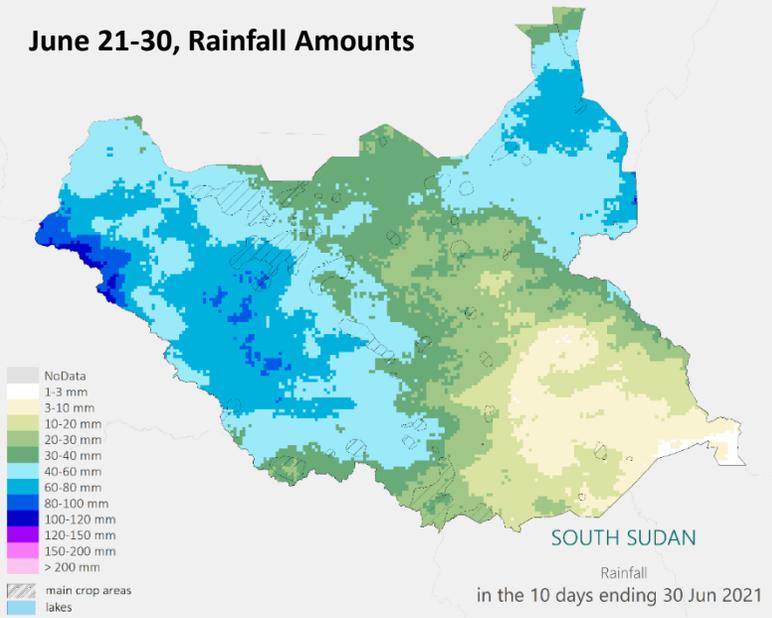
July 2021

Highlights

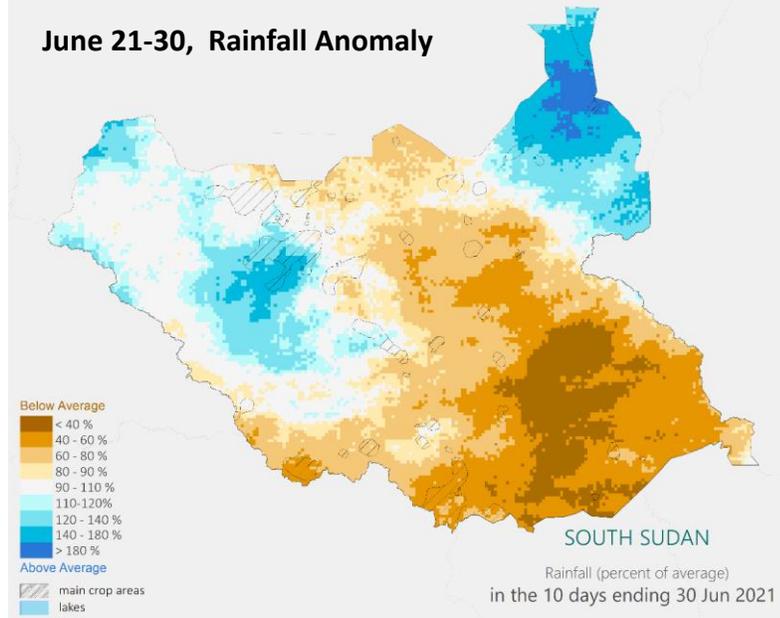
- The rainfall season in South Sudan is in its early stages. Until end of June, drier than average conditions had prevailed in the SE regions of the country, particularly southern Jonglei, Eastern Equatoria and Central Equatoria, a tendency intensified in late June. In some areas, it rained half of the usual amount. In contrast, rainfall along the Sudan border from North Bahr-el-Ghazal to most of Upper Nile has been above average.
- Early July brought abundant rainfall across most of the country, significantly decreasing rainfall deficits in the SE but adding to the persistently wetter than average conditions in Upper Nile. Short range forecasts point to the continuation of wetter than average conditions through mid July. This reduced the likelihood of significant negative impacts on crop performance in East Equatoria
- Persistent wetter than average conditions in northern Upper Nile have lasted since May – the landscape may be nearing saturation and continuation of excess rainfall is expected to lead to floods, in particular considering the very high river levels of the White Nile.
- Vegetation cover remains well above average as a result of the high soil moisture levels resulting from the large scale floods of the previous season. Drier conditions in June led to noticeable drying of soils in East Equatoria revealed by high surface temperatures, but this should be reverted soon.
- Elevated water levels are the norm in the lakes of the higher reaches of the Nile river catchment. As a result river heights in the White Nile in South Sudan remain at record levels. Incipient flooding can be detected in Aweil, Turalei and in the river Baro along the Ethiopia border in Upper Nile.
- Seasonal forecasts indicate wetter than average conditions in the eastern half of South Sudan. Wetter than average July is aligned with the forecasts and may herald the start of a more consistently period of above average rainfall. Given saturated soils and elevated river levels, even normal rainfall amounts may lead to significant flooding.

South Sudan: June 2021 Rainfall

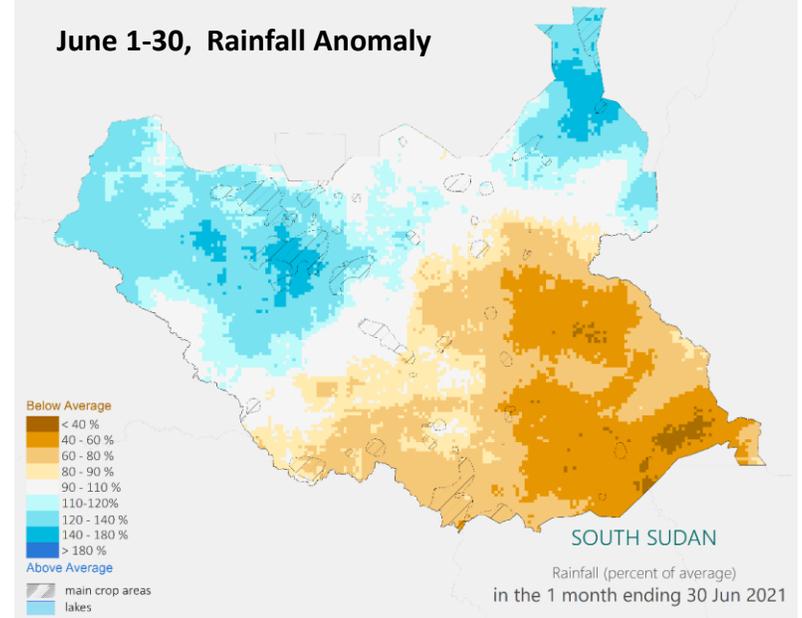
June 21-30, Rainfall Amounts



June 21-30, Rainfall Anomaly



June 1-30, Rainfall Anomaly



Rainfall amounts (left) and anomaly (middle) for 21-30 June 2021. Rainfall anomaly for the period June 1 to 30 (right). Wetter than average conditions in blues, drier than average conditions in orange shades

In late June, much drier than average conditions extended across most of Jonglei, Eastern and Central Equatoria, and reaching into Unity. In contrast, high rainfall amounts and wetter than average conditions prevailed in the Bahr-el-Ghazals and in Upper Nile.

These developments enhanced a pattern of strong rainfall deficits in Jonglei and East Equatoria and over the month of June, most of Eastern Equatoria had only received about half of the usual rainfall.

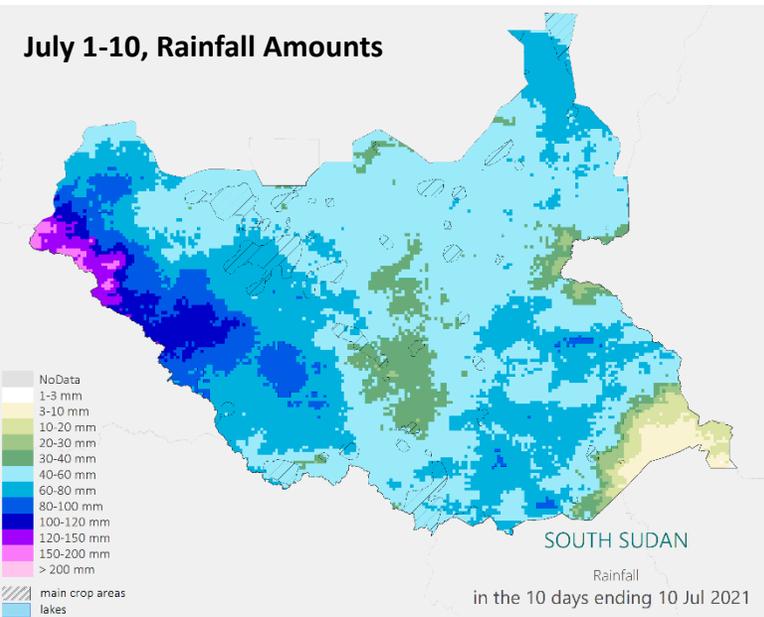
These rainfall deficits led to difficult early stages of the agricultural season, with delayed planting and poor crop development. In many areas, replanting may have been needed.

If rainfall during July does not improve significantly, considerable impacts on crops can be expected.

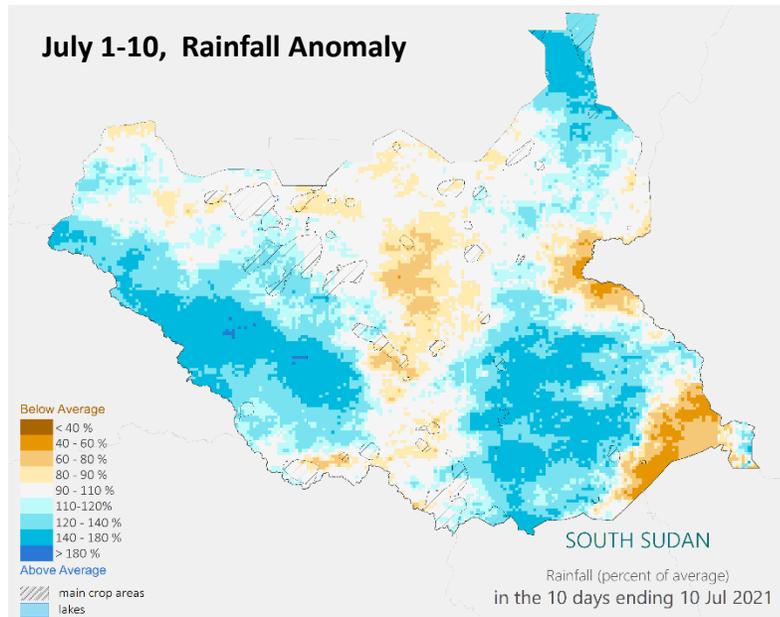
This is in contrast with the wetter than average conditions across the Bahr-el-Ghazals and most of Upper Nile, during June. Some areas registered 50% more rainfall than usual. Given the flood situation in the previous two seasons and enhanced soil moisture, these conditions may lead to localized flooding.

South Sudan: Early July 2021 Rainfall

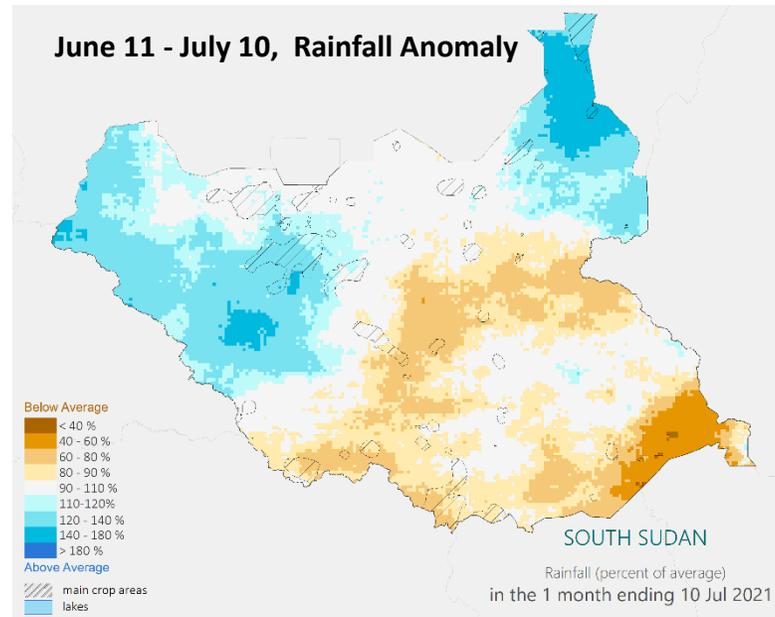
July 1-10, Rainfall Amounts



July 1-10, Rainfall Anomaly



June 11 - July 10, Rainfall Anomaly



Rainfall amounts (left) and anomaly (middle) for 1-10 July 2021. Rainfall anomaly for the period June 11 to July 10 (right). Wetter than average conditions in blues, drier than average conditions in orange shades

Rainfall in early July improved considerably relative to what had been the case in June. Steady, heavy rains fell over Jonglei and Central Equatoria and all along the western areas of the country. Wetter than average conditions continued to affect Upper Nile.

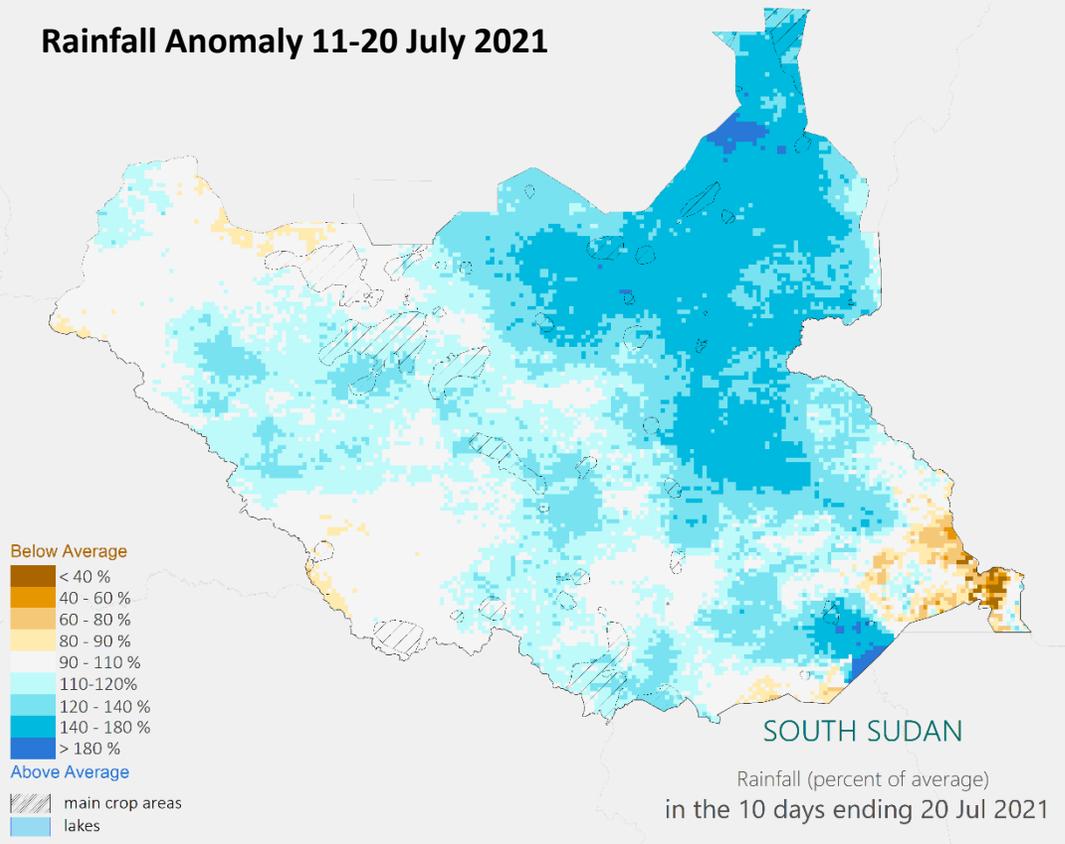
The effect of these rains was to decrease the severe rainfall deficits in the southeastern areas of the country. The most severe rainfall deficits are now concentrated in Kapoeta East county. Some areas of below average rainfall still remain in more northern areas of Jonglei and parts of Unity and Lakes.

The improved rainfall is expected to lead to a good recovery in crop development in East Equatoria, particularly if this is maintained throughout July, allowing crops to go through the more sensitive growth periods with enough available moisture.

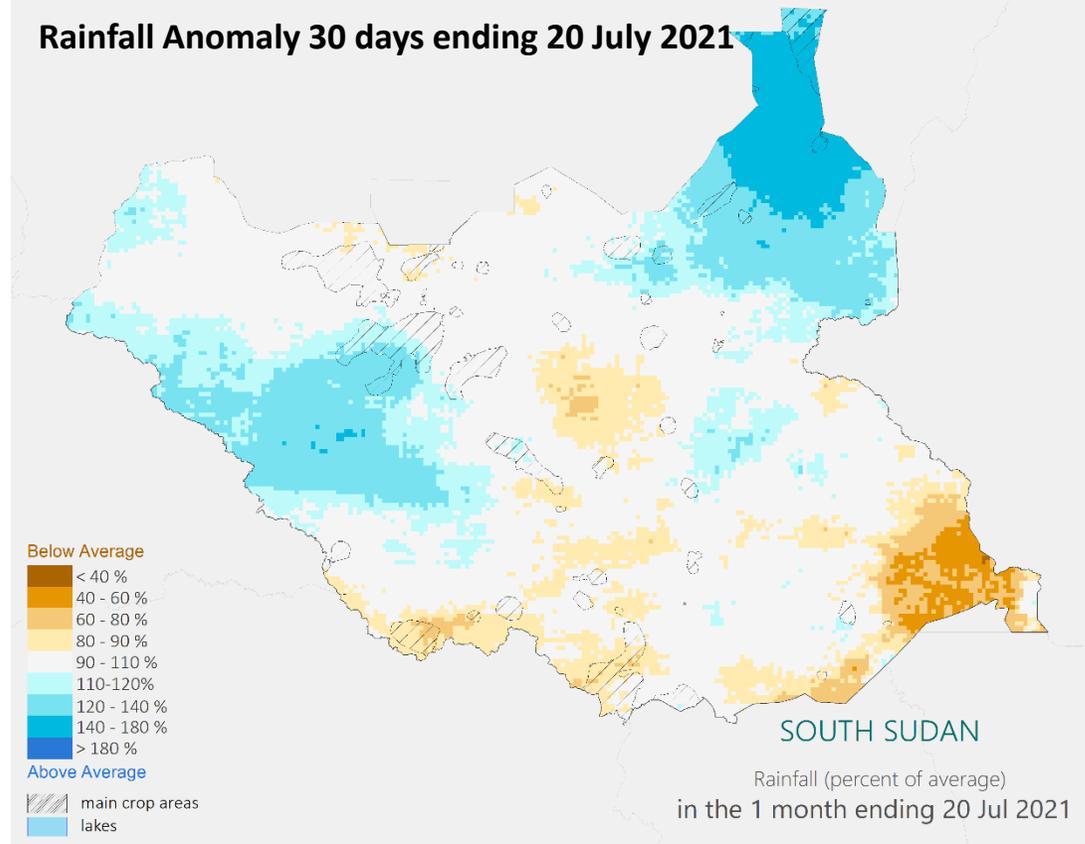
In northern areas of Upper Nile persistent heavy rains have increased soil moisture reserves, but also led to favourable conditions for flooding, particularly considering the elevated levels of the White Nile (see ahead).

South Sudan: Short Range Outlook

Rainfall Anomaly 11-20 July 2021



Rainfall Anomaly 30 days ending 20 July 2021



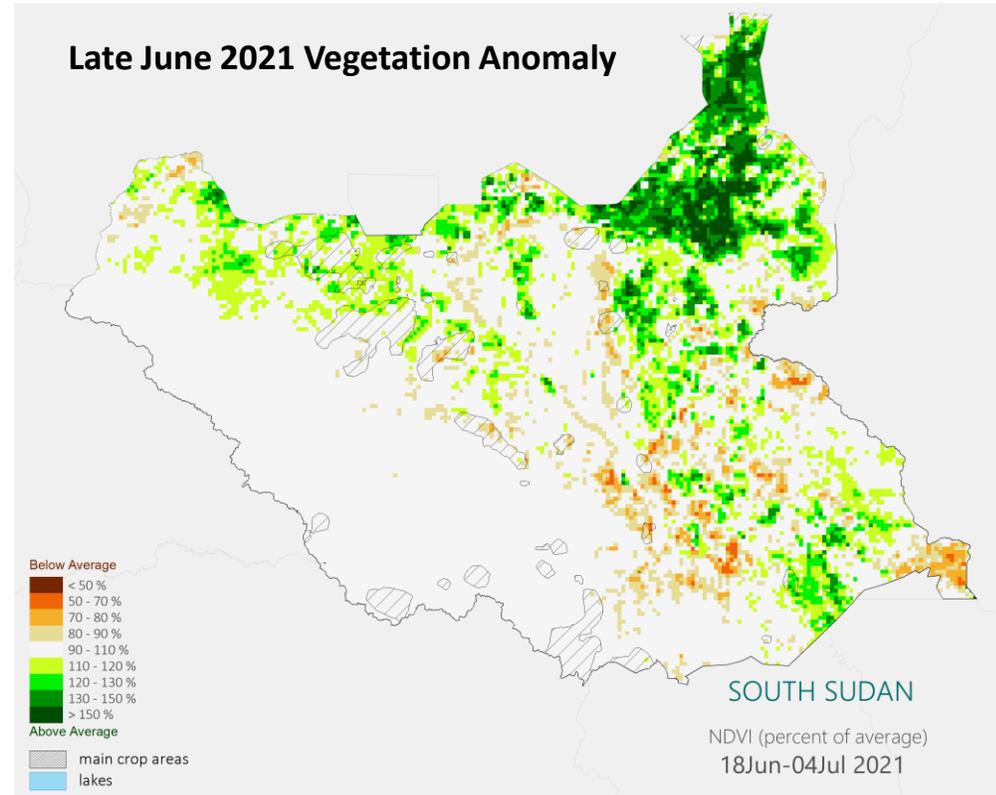
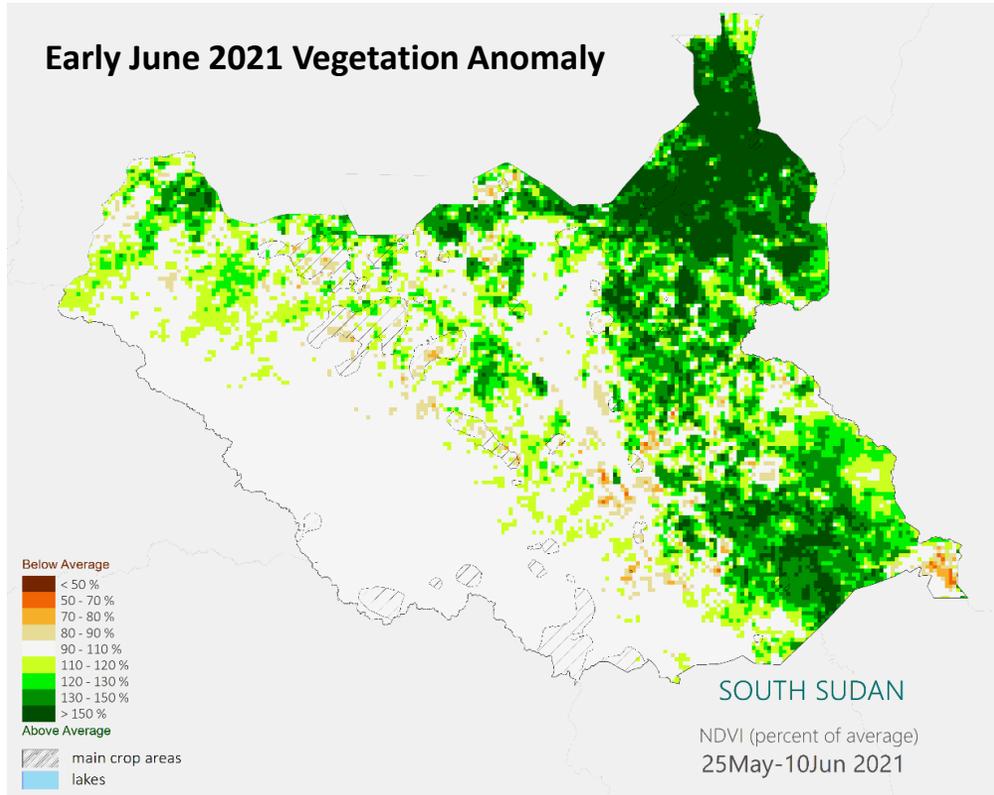
Rainfall Anomalies for 1-10 July and 11-20 July 2021 and for the month ending 20 July 2021.

Wetter than average conditions in blues, drier than average conditions in oranges

Short range forecasts until July 20, point to a continuation of wetter than average conditions across most of the country, particularly in northeast areas (Upper Nile and northern Jonglei). If these conditions indeed verify, most rainfall deficits in the country will be minimized, if not reverted, with the likely exception of Kapoeta East county.

Persistent higher than average rainfall is expected to continue in Upper Nile, a situation that has lasted from the very early stages of the season. This is now expected to lead to localised flooding in the more vulnerable areas, but may expand quickly given elevated river levels.

South Sudan: Vegetation Patterns



Vegetation in early June (left) and mid June 2021 (right) as a proportion of average.

Above average conditions in greens, lower than average conditions in oranges

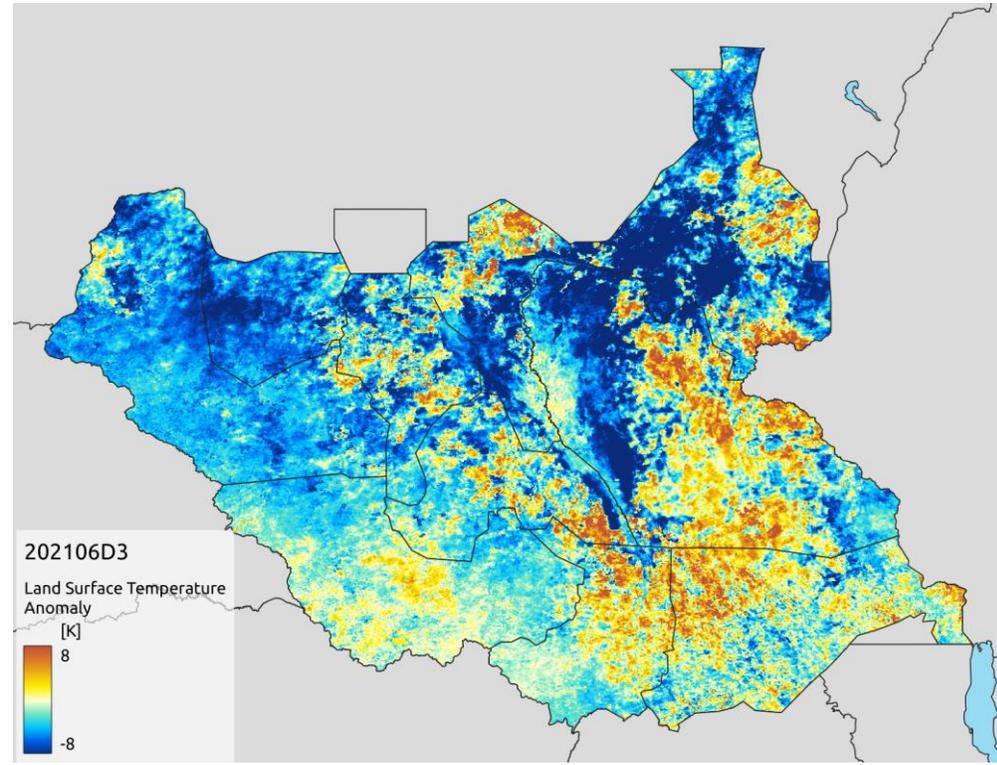
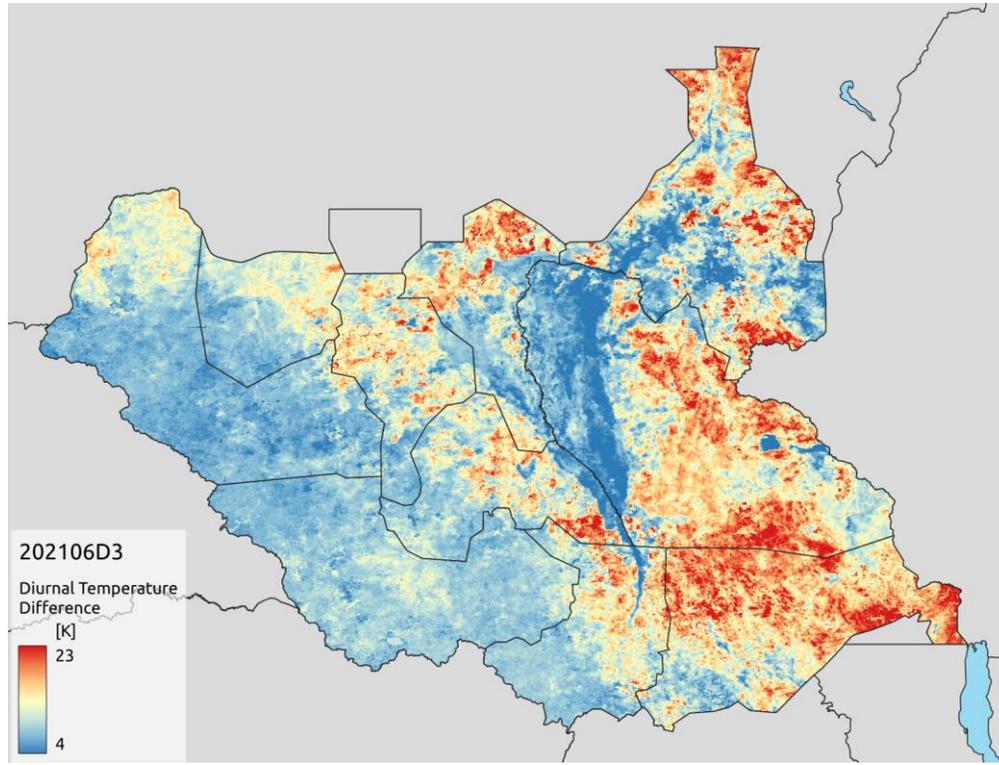
Vegetation development across the country is still largely tied to the high levels of soil moisture or standing water remaining from the large scale floods that affected the country.

Before the rains started (early March) vegetation was already well above average particularly along major drainage features. This is maintained by early and mid June.

While the strong June rainfall deficits in the SE of the country are not reflected on the vegetation levels, due to flood-related soil moisture, in some areas of Central Equatoria and Jonglei, vegetation is starting to go below average.

This may be in response to June deficits, but improved July rainfall should revert these back to normal conditions.

South Sudan: Land Surface Temperature



Thermal amplitude in late June 2021 (left). Warm shades for high amplitude (drier soil), blue for lower amplitude (wetter soil, dense vegetation).

Land Surface Temperature (difference from average) for late June 2021 (right). Warmer than average temperatures in yellow to red shades, cooler than average in blue shades.

Day-night temperature amplitudes (map left) reveal the extent of the wetland surfaces in the center of the country and along the Ethiopia border.

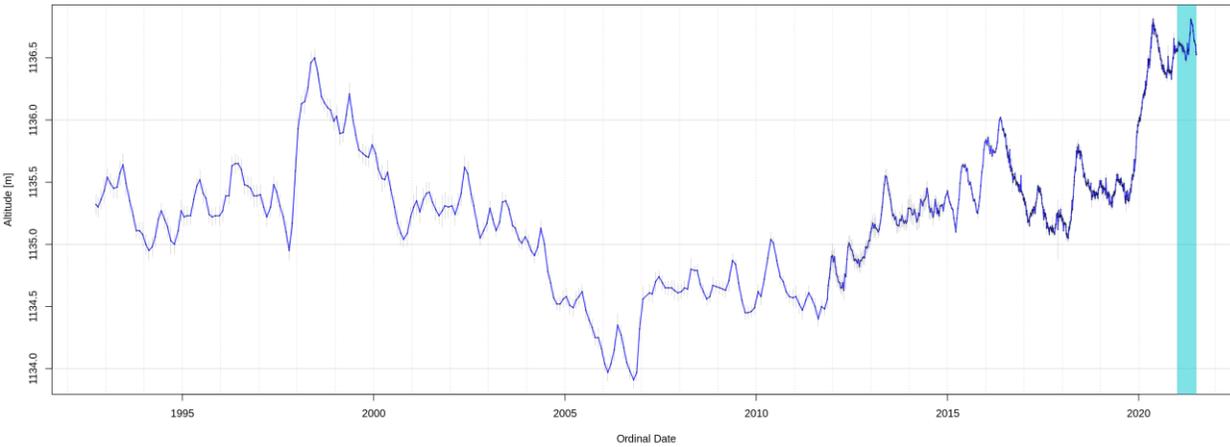
In East Equatoria day-night temperature amplitudes have increased (areas in red shades), an indication that the persistent drier than average conditions have led to a reduction in soil moisture. In July this is expected to decrease in response to increased soil moisture.

Higher than average surface temperatures are also becoming noticeable. These patterns will become less noticeable as rains have improved across the region.

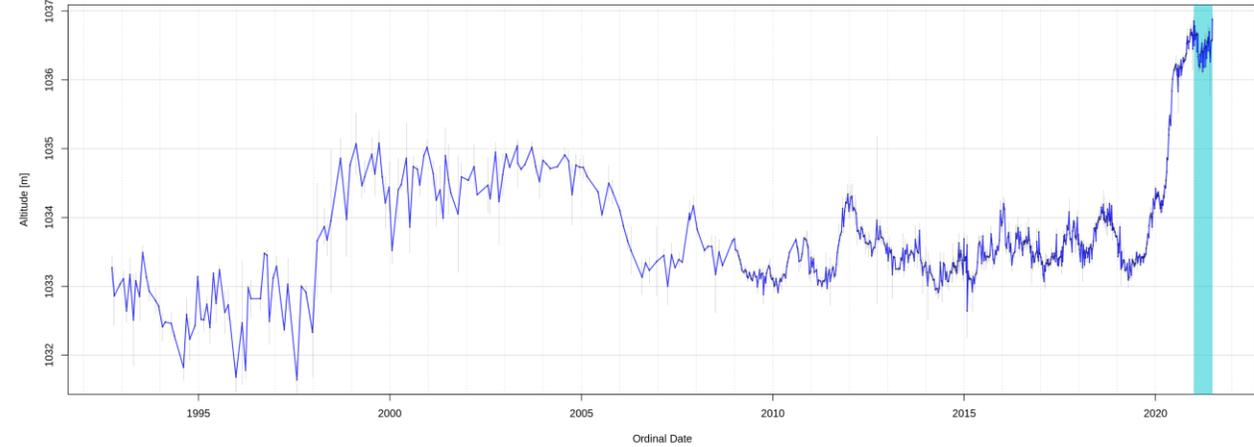
Lake Water Levels – Satellite Altimetry

Levels of Lake Victoria and Lake Kyoga continue to fluctuate around record levels. For these two lakes, the most recent measurements indicate further increases in their levels. Lake Albert levels are also rising again. Only in Lake Edward, water levels are stable following a spike earlier in the year.

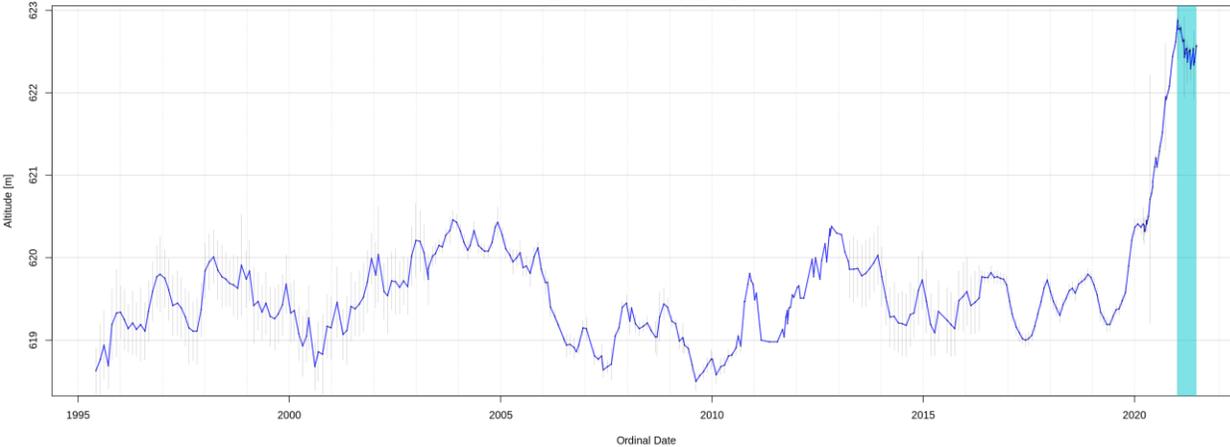
Water Level (THEIA Satellite Altimetry) - VICTORIA
Lon: 33 - Lat: -1 - Lake VICTORIA
Latest Measurement: 2021-07-04



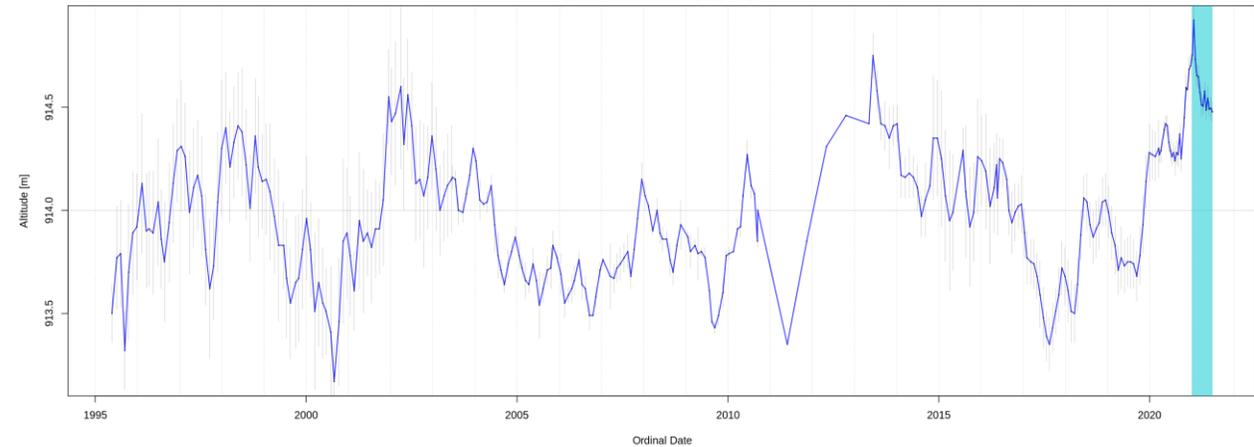
Water Level (THEIA Satellite Altimetry) - KYOGA
Lon: 33.01 - Lat: 1.48 - Lake KYOGA
Latest Measurement: 2021-06-28



Water Level (THEIA Satellite Altimetry) - ALBERT
Lon: 30.92 - Lat: 1.67 - Lake ALBERT
Latest Measurement: 2021-06-18



Water Level (THEIA Satellite Altimetry) - EDOUARD
Lon: 29.6 - Lat: -0.34 - Lake EDOUARD
Latest Measurement: 2021-06-27

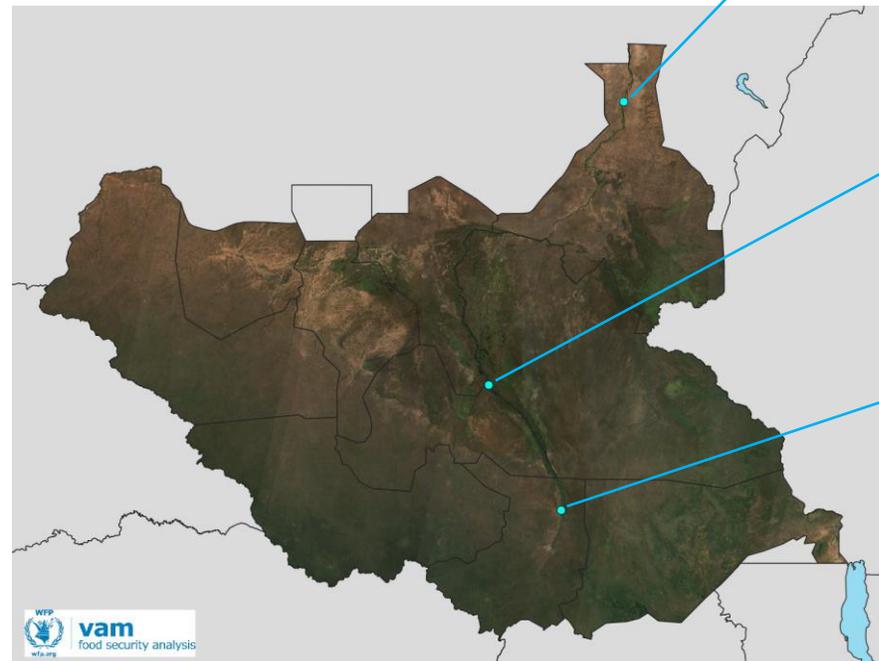
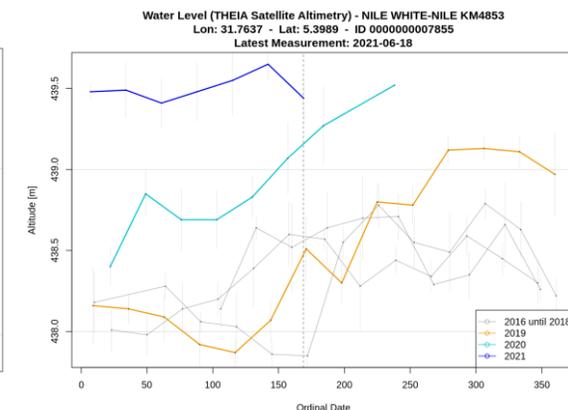
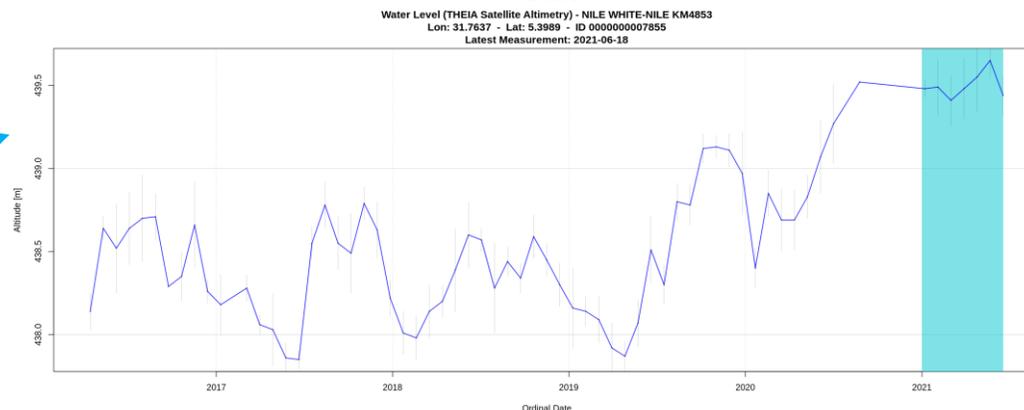
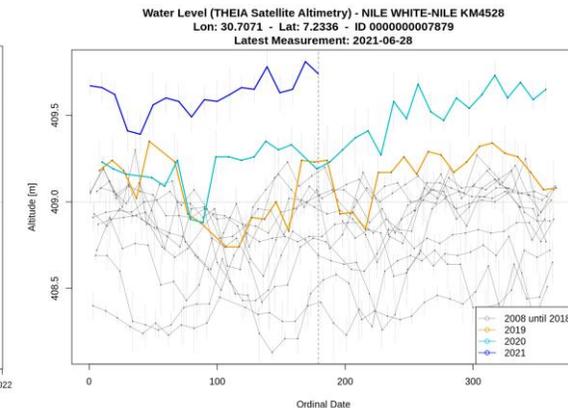
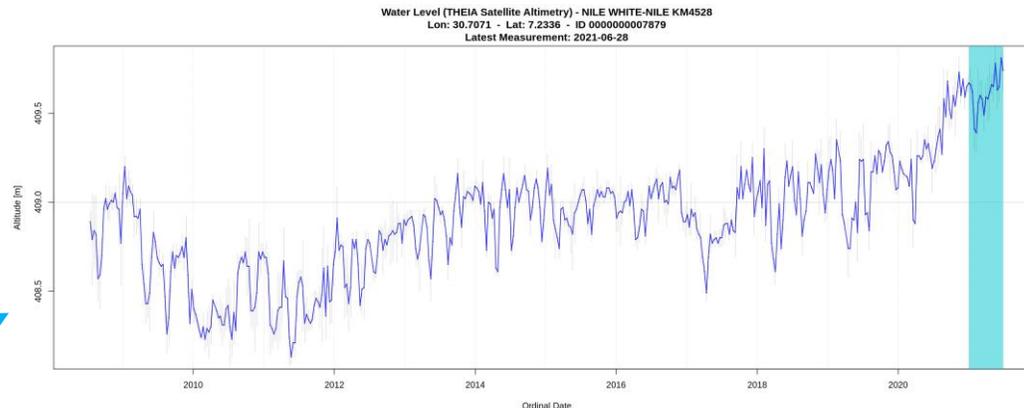
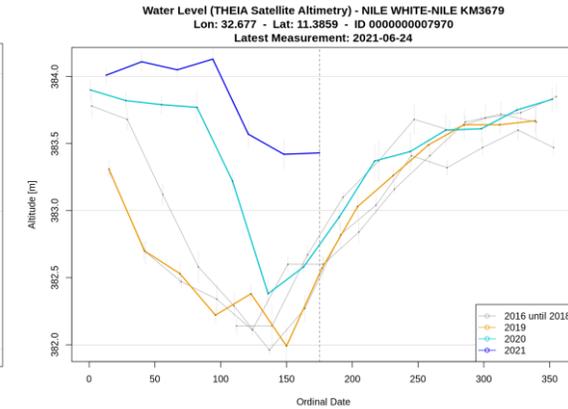
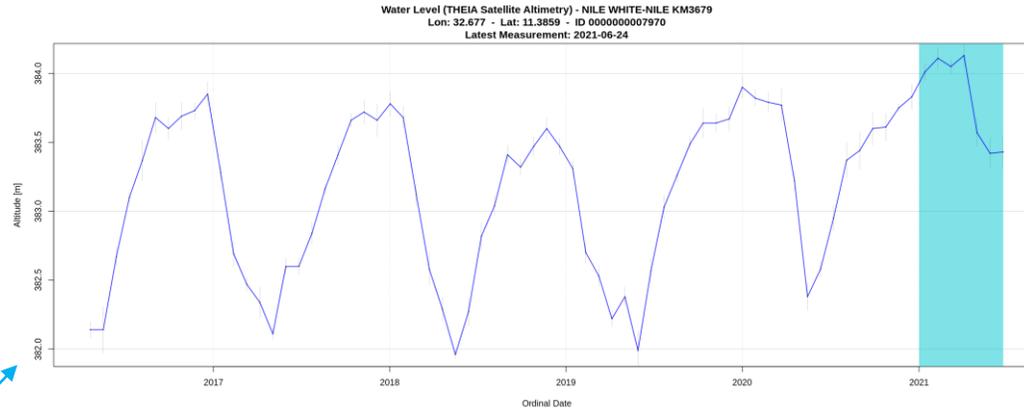


River Levels - Satellite Altimetry

High water levels are observed along the White Nile throughout South Sudan during June 2021.

White Nile water levels have remained at record levels at all times of the season since late 2019, following the first of the major flood events affecting the country. The usual seasonal minima have not even been observed.

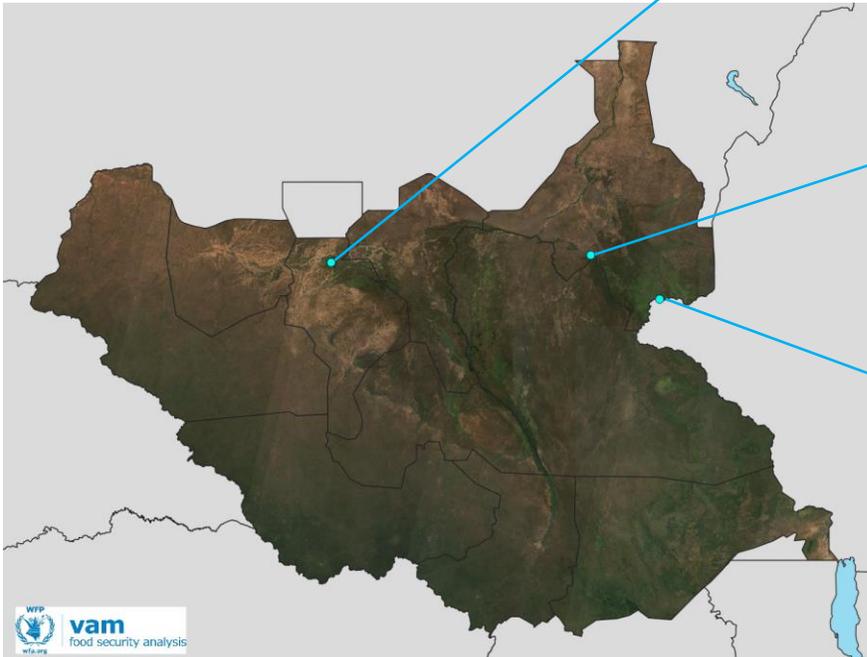
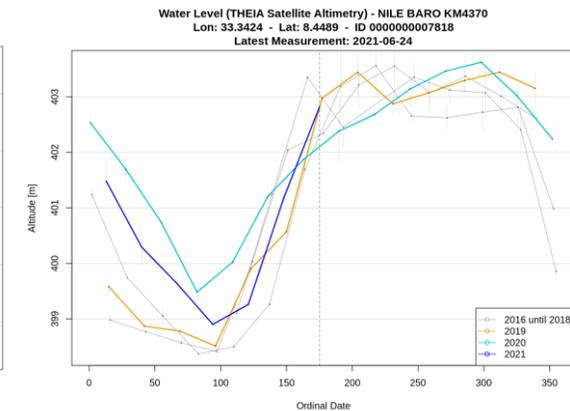
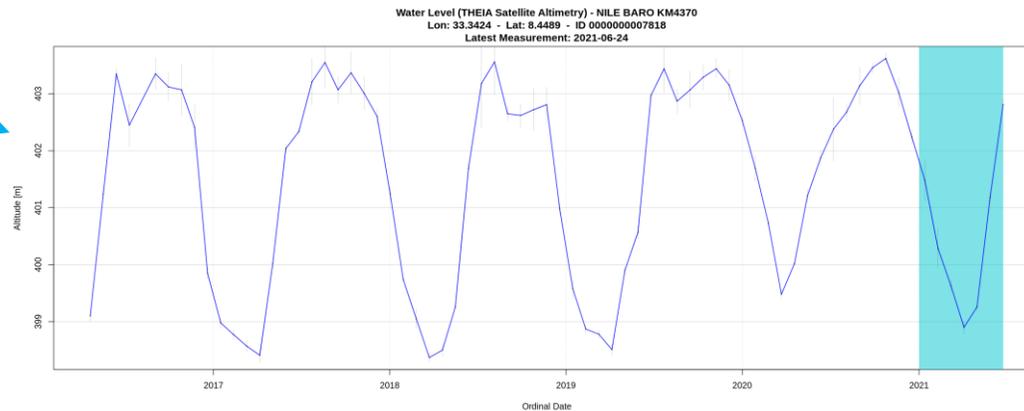
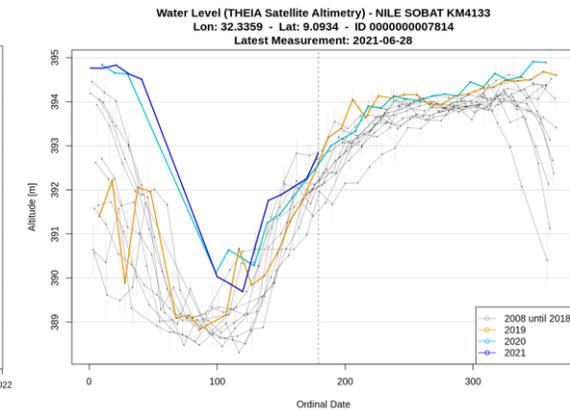
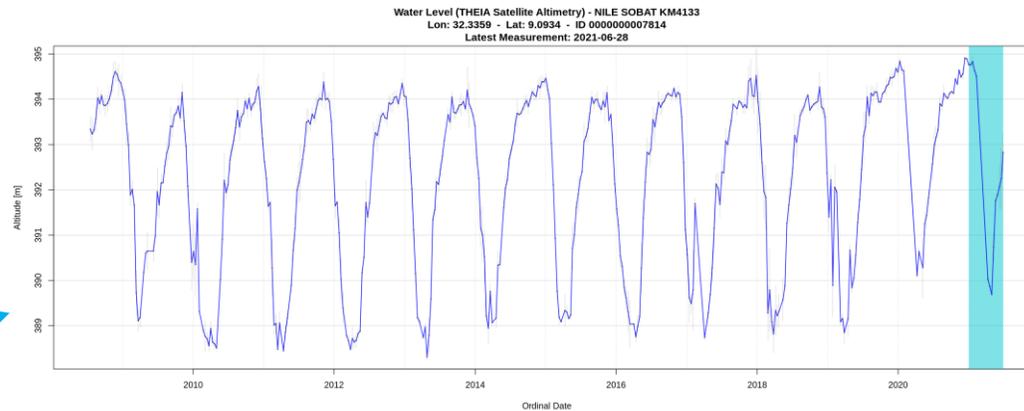
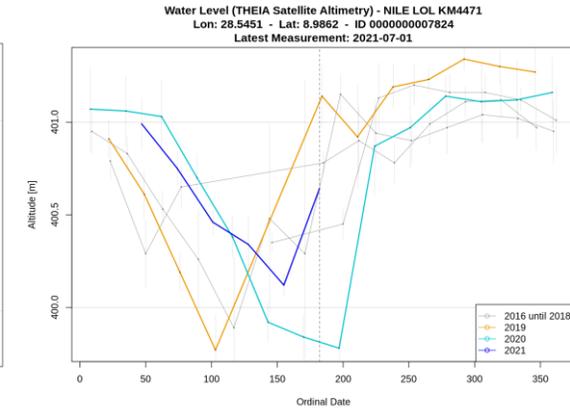
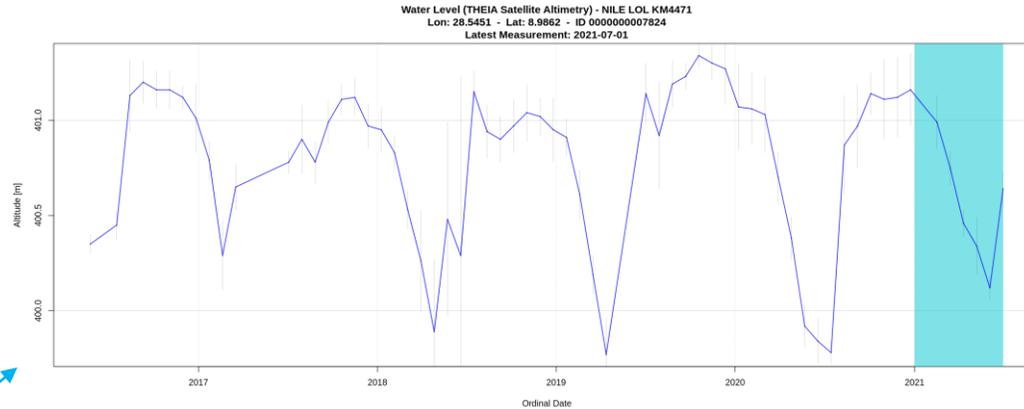
Levels are now increasing towards the seasonal maximum and record levels are expected to be maintained, considering the tendency exhibited by the Lake levels shown in the previous slide.



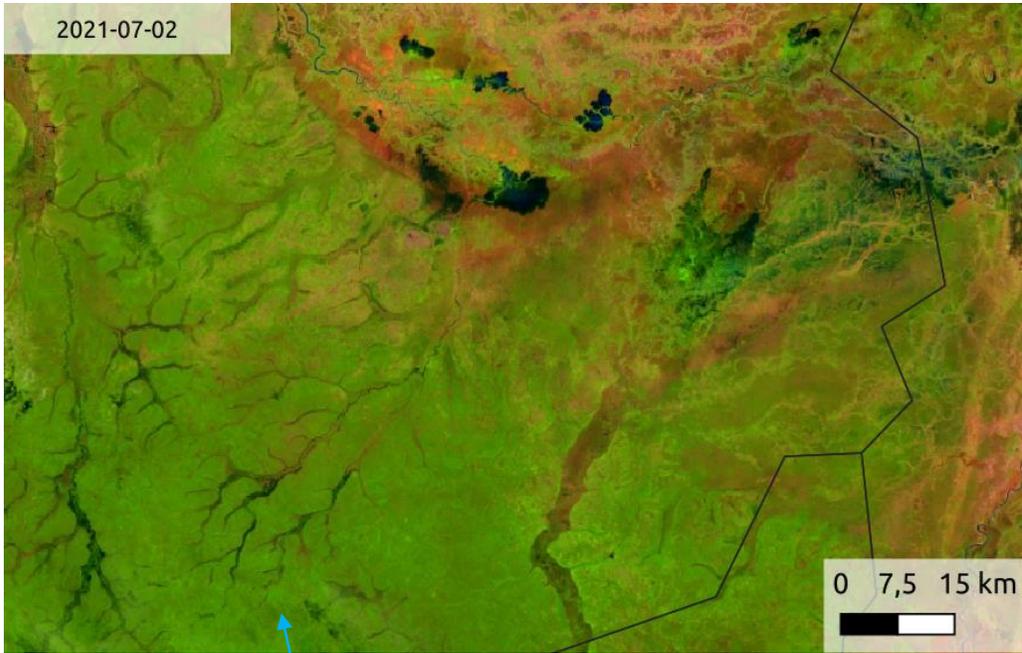
River Levels - Satellite Altimetry

Levels of rivers Sobat and Baro continue to rise during June in agreement with the usual seasonal cycle.

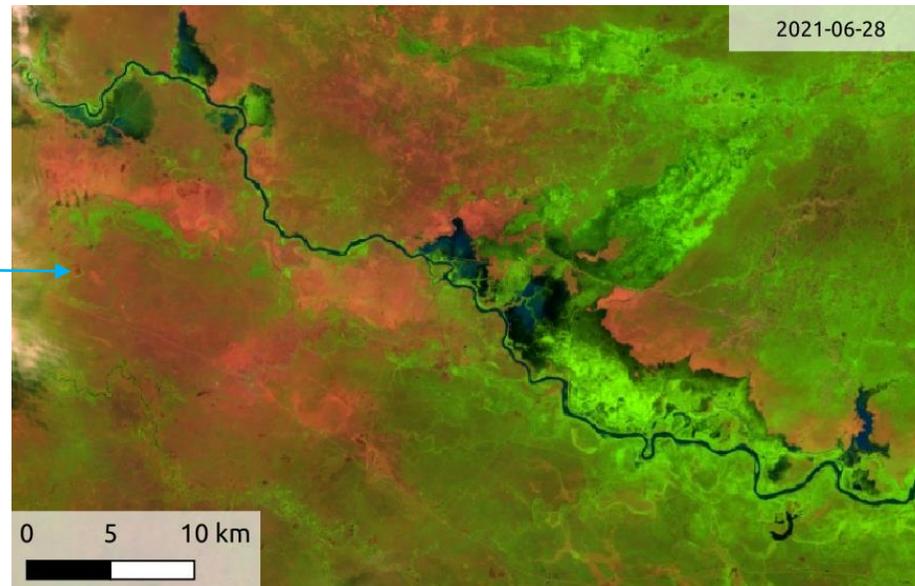
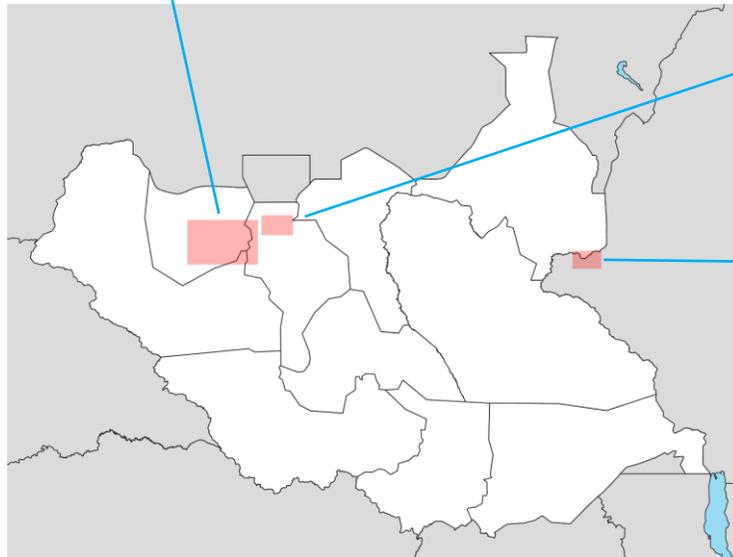
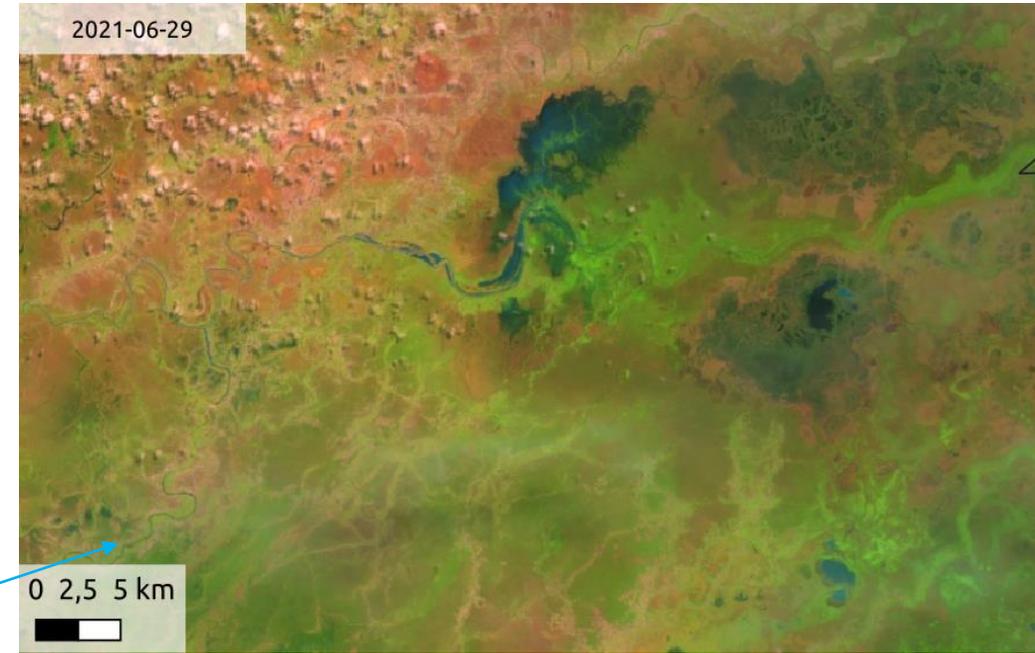
Levels of these rivers, are not exceptional within the historical record, but are around the highest observed so far.



Satellite detected flooding / surface water



Onset of flooding is observed in areas of the river Lol basin in late June 2021 / early July, around Aweil (Northern Bahr el Ghazal, left) and Turalei (Warrap state, right)



Riverine flooding intensified along river Baro around Gambela (Ethiopia) in late June 2021

South Sudan: Seasonal Forecasts

C3S multi-system seasonal forecast

ECMWF/Met Office/Météo-France/CMCC/DWD/NCEP/JMA/ECCC

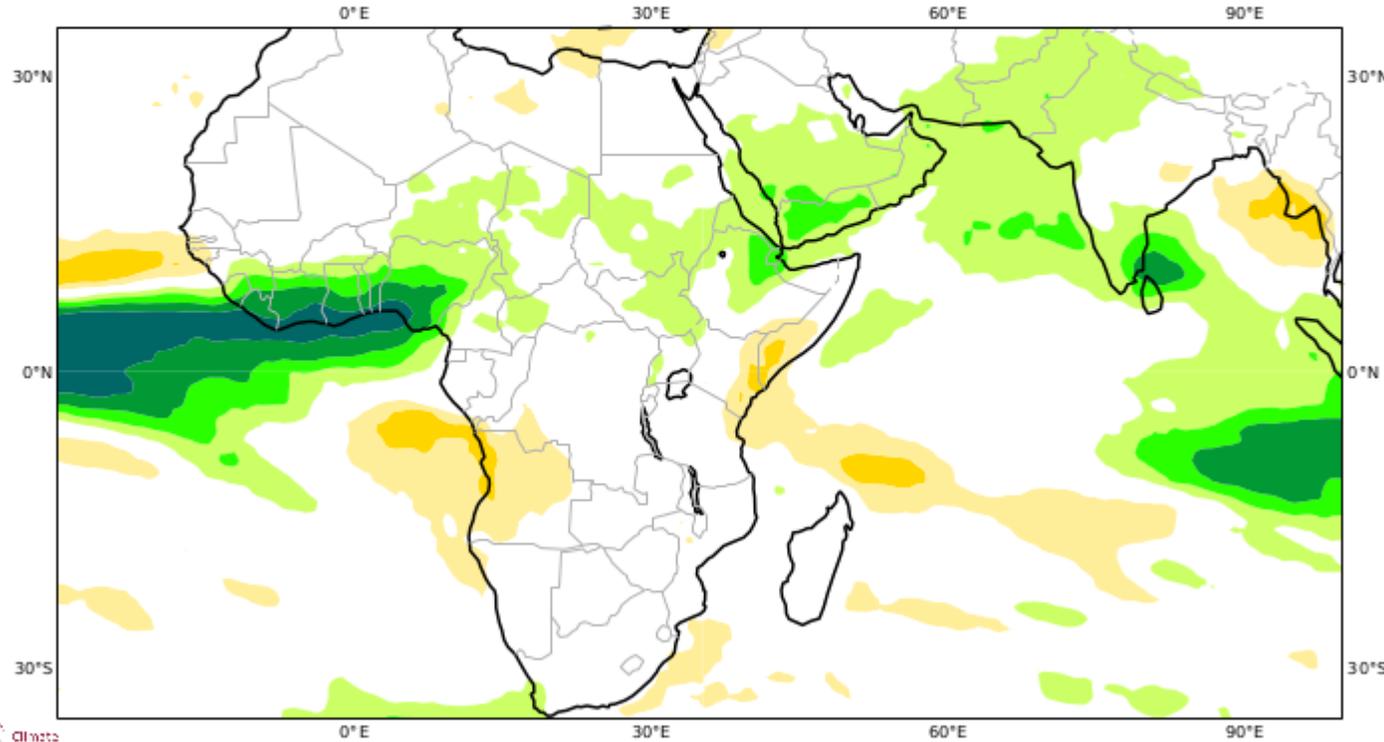
Prob(precipitation > median)

JAS 2021

Nominal forecast start: 01/06/21

Unweighted mean

0..10% 10..20% 20..30% 30..40% 40..60% 60..70% 70..80% 80..90% 90..100%



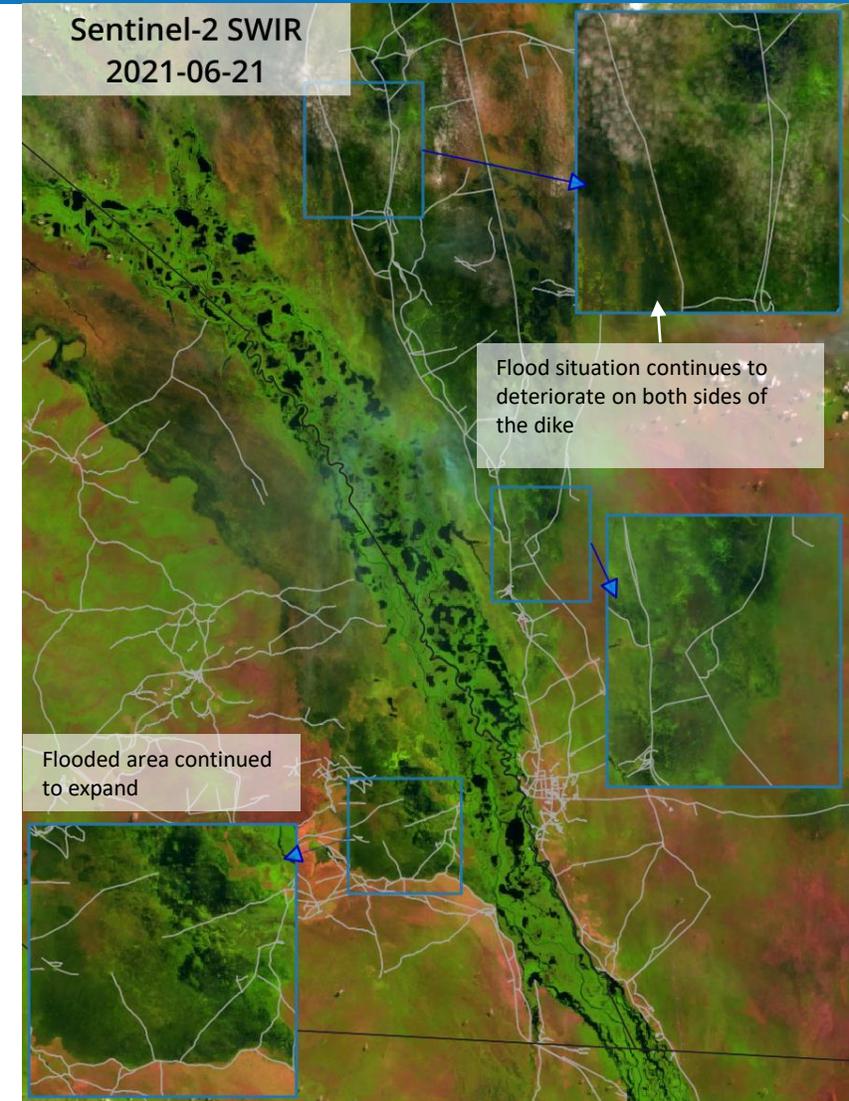
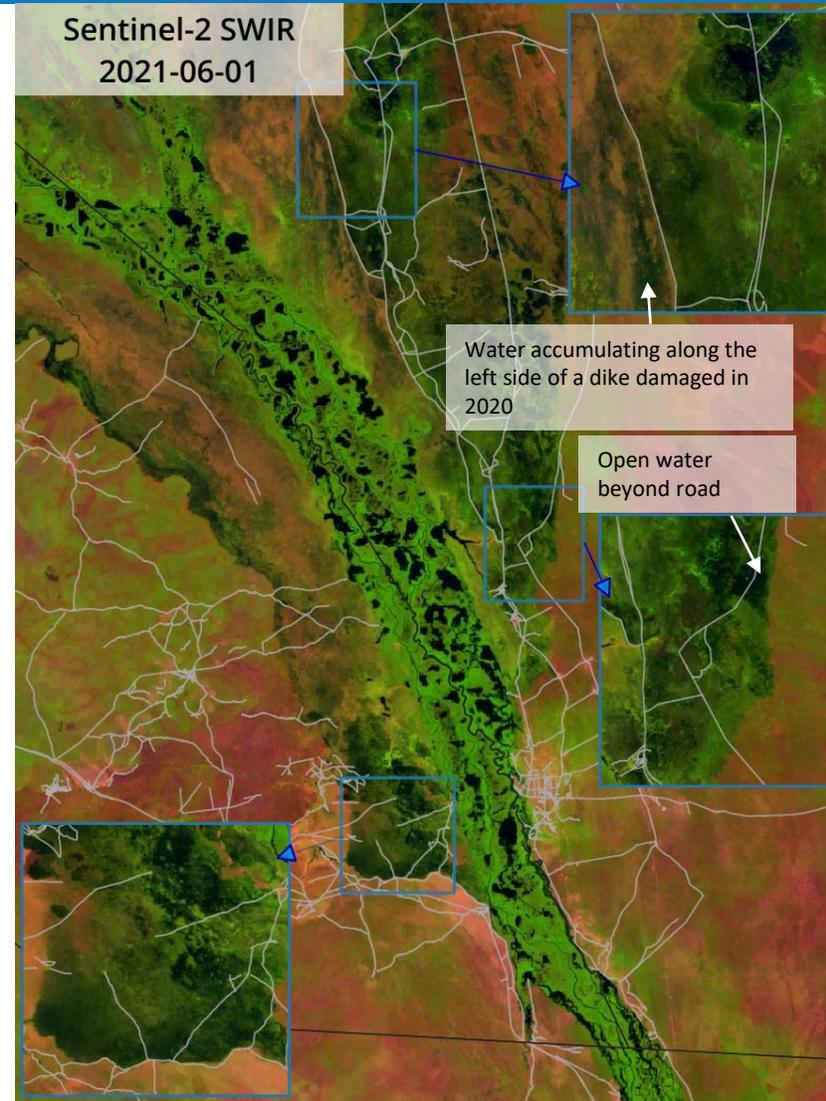
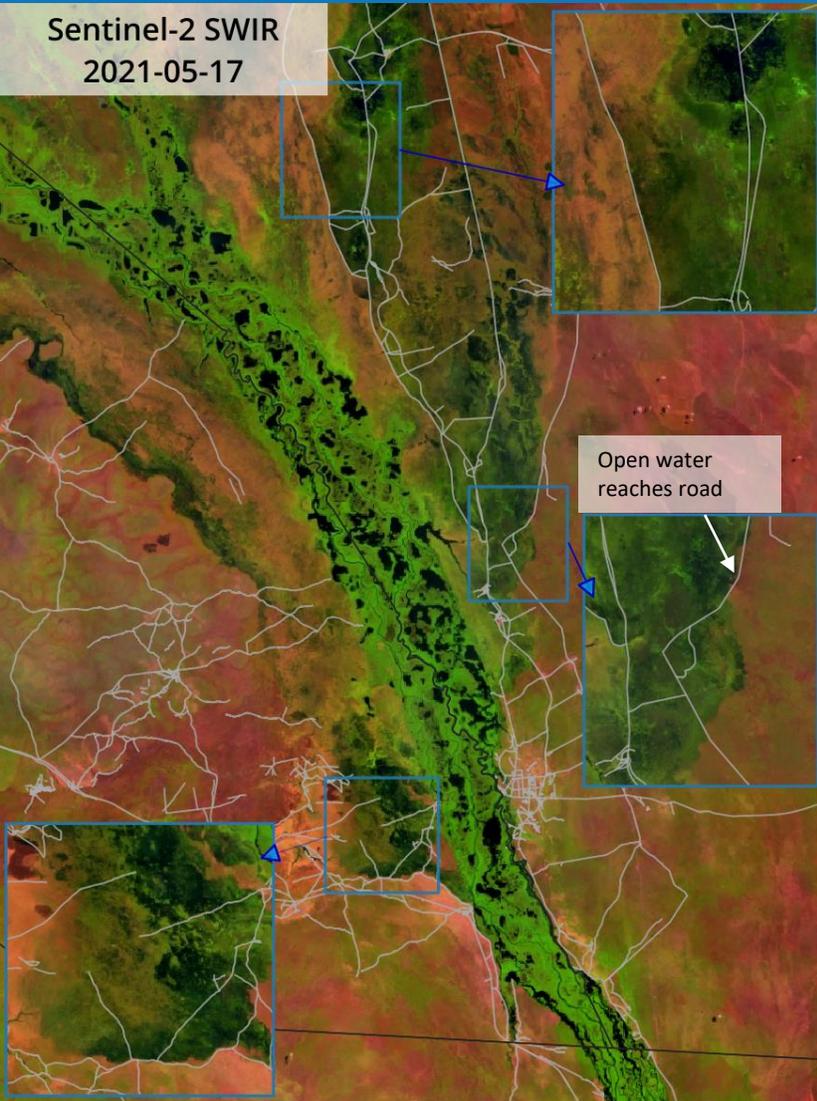
Seasonal forecasts for July to September 2021 continue to point to above average rainfall across most of South Sudan (in particular eastern areas) during this period.

These predictions have been in place since earlier in 2021 but until end of June have not been well matched with actual conditions on the ground .

This may change as the season evolves and indeed July has been more aligned with the seasonal forecast. This may indeed bring about a more sustained period of enhanced rainfall.

Considering exceptionally high lake and river levels and very high soil moisture, even moderately wetter than average conditions may lead to significant flooding events.

Sentinel-2 SWIR – Development May 17 to June 21



After a decrease in extent of the Sudd wetlands around Bor has been observed during the first months of 2021, the trend has reversed in late April. Sentinel-2 acquisitions on May 17, June 1 and June 21 show an increase in open water areas on both sides of the White Nile, likely related to the recent increase in water levels observed from satellite altimetry data.