

SPECIAL ALERT – August 2018

Floods affecting main crop production areas in Sudan

Parts of the country including the main agricultural areas on the North East, but also parts of Kordofan and Darfur regions have experienced exceptional rainfall in July and August leading to localized floods. In particular, flash floods have been reported in the states bordering South Sudan and Ethiopia and including Kassala, Elgezira, Northern, West Kordofan and Sennar and are linked to particularly abundant rainfall over the Ethiopian highlands in July and early August. According to an assessment of the Sudan Red Crescent Society (SRCS) *“the flooding has affected over 45,000 people, led to 23 human deaths and 61 injuries. In addition, more than 8,900 families have been rendered homeless and are currently putting up in temporary sites in their neighbors and relative’s houses. These rains have caused significant damage to key infrastructure such as bridges and roads as well as to schools, latrines and local dispensaries. In addition, **livelihoods have been significantly affected as farms were submerged in water and livestock washed away.**”*

No estimates about the extent of farm and rangeland have been provided by local sources so far. However, satellite imagery of the Sentinel2 sensor shows large areas flooded in the period 25th of July to 20th of August. By analyzing S2 imagery of that period, areas with surface water during that period can be mapped. The algorithm, running in Google Earth Engine (GEE) produces a flood mask, by applying a threshold to the SWIR2 (Short Wave Infrared) band of the satellite image. Employing a crop mask, we mapped flooded cropland in purple and other flooded land use classes in blue, for important agricultural areas in the Al Jazeera, Blue Nile and Kassala states.

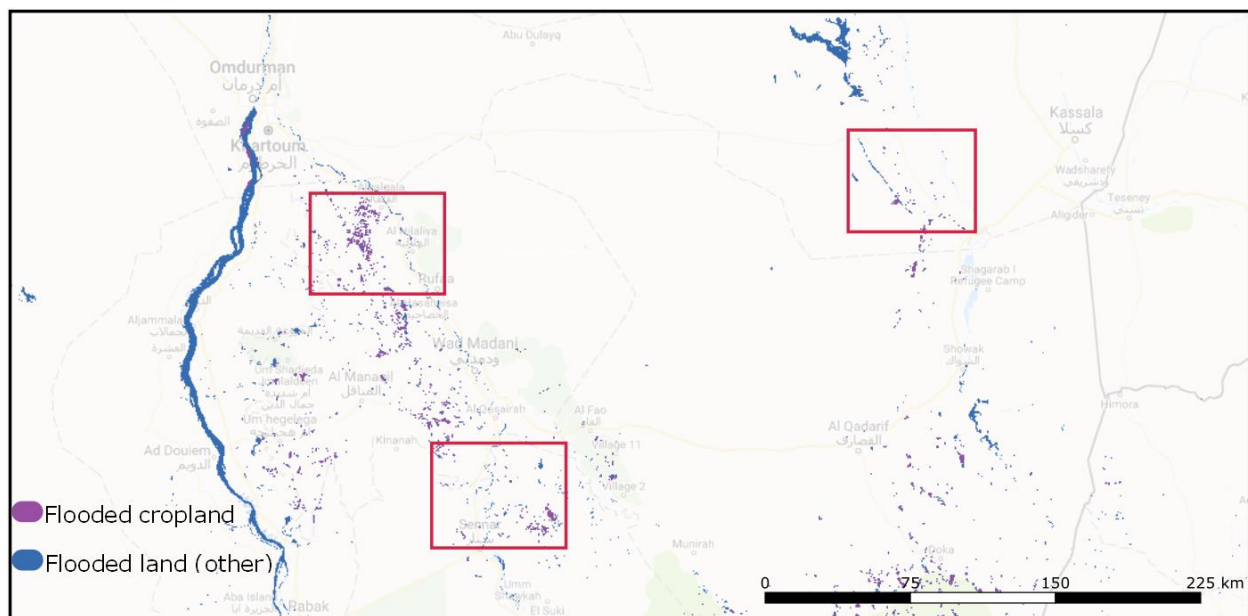


Figure 1. Overview map of Sudan with in blue and purple the area with surface water according to S2 imagery in the period 25th July to 20th August 2018. Purple corresponds to flooded cropland, while blue to flooded areas of other land use (including the rivers). Red rectangles indicate areas with zoomed maps included in this special alert.

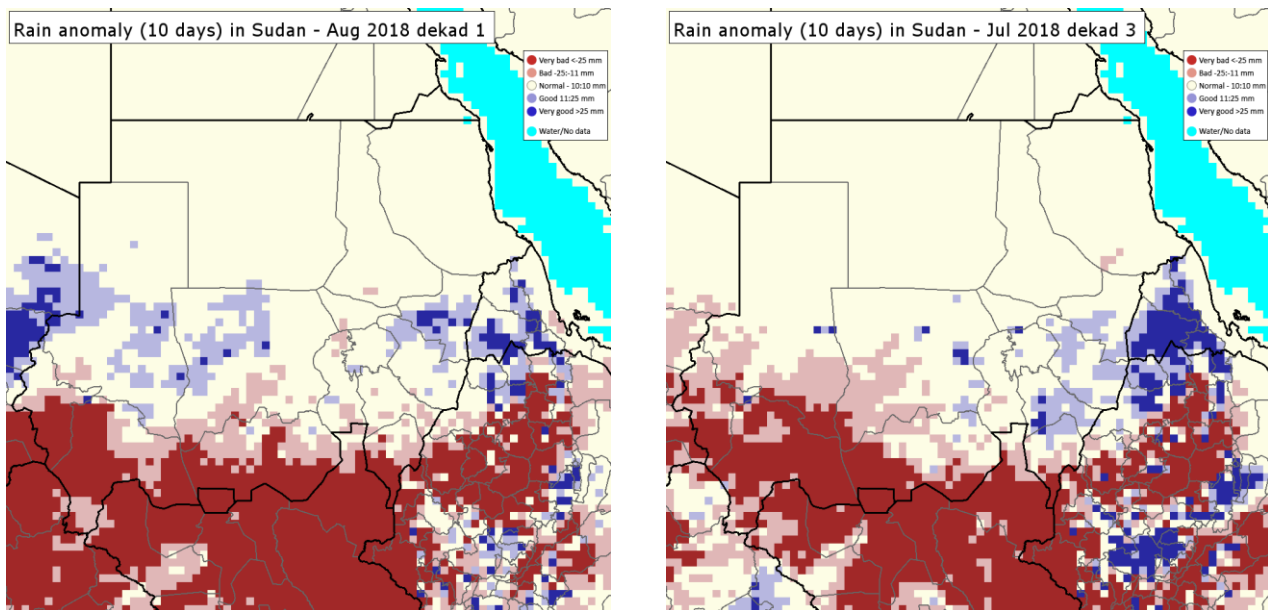


Figure 2. 10-day rainfall anomaly images (source: ECMWF data mapped by JRC) showing above normal rainfall on North Eastern Sudan and parts of the Ethiopian highlands during the period 20 July – 10 August 2018.

Although the satellite imagery used for this report shows clear evidence of large crop areas flooded in Sudan, the exact impact of the floods on crop production can only be established on the ground with observation of the damage to standing crops. In fact, while flash floods generally cause damage to agricultural infrastructure including to irrigation infrastructure and to standing crops, the soil moisture after flood recession can be beneficial for crops that have not been severely damaged or have been replanted. In general, and apart from direct damage to infrastructure and standing crops, the abundant rainfall is highly beneficial for crop and rangeland productivity during the 2018 season.

Figures 3-5 show zooms on some of the most concerned croplands in Al Jazeera, Kassala and Blue Nile. As visible, a significant portion of mechanized fields are submerged by water in the observation period, with possible damages to standing crops (mostly in vegetative stages at the time of flooding) and to irrigation infrastructure including dams, pumps and water reservoirs. In the maps, areas which are frequently flooded (including irrigated areas) are overlaid in red, based on information coming from JRC’s Global Surface Water Explorer.

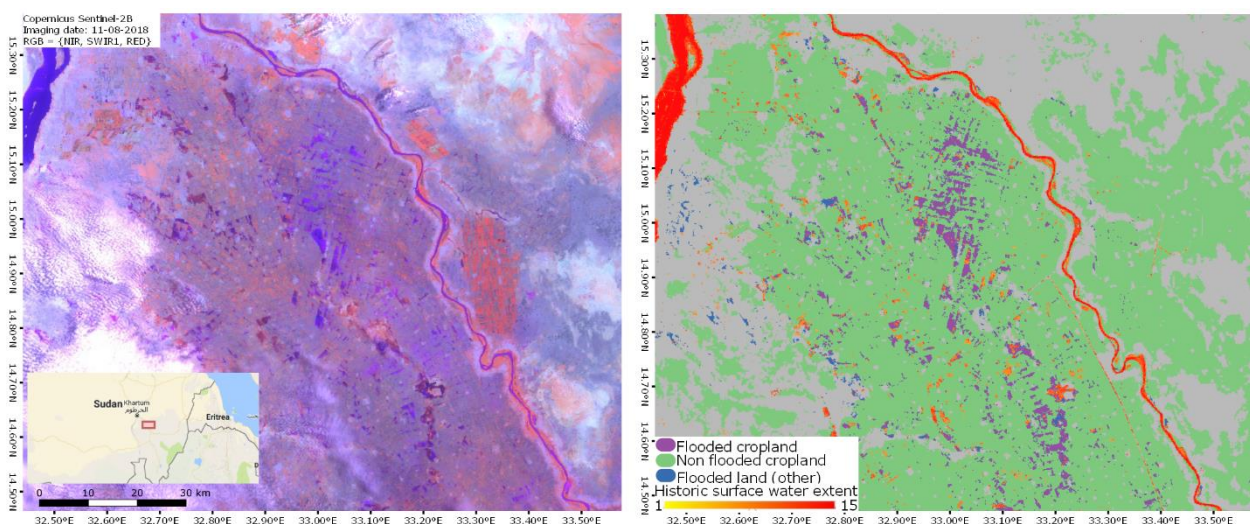


Figure 3. Crop areas along Blue Nile River, close to Tamboul, in Al Jazeera State. SENTINEL2 data show the flooded areas on August 11th (in purple in the image on the left) and the extent of flooded cropland (ca. 46.000 ha in the map) and other land use (on the right). For reference in orange/red (right) the areas which

have been flooded from a minimum of 1 to a maximum of 15 times in the previous 15 years according to the Global Surface Water Explorer (JRC).

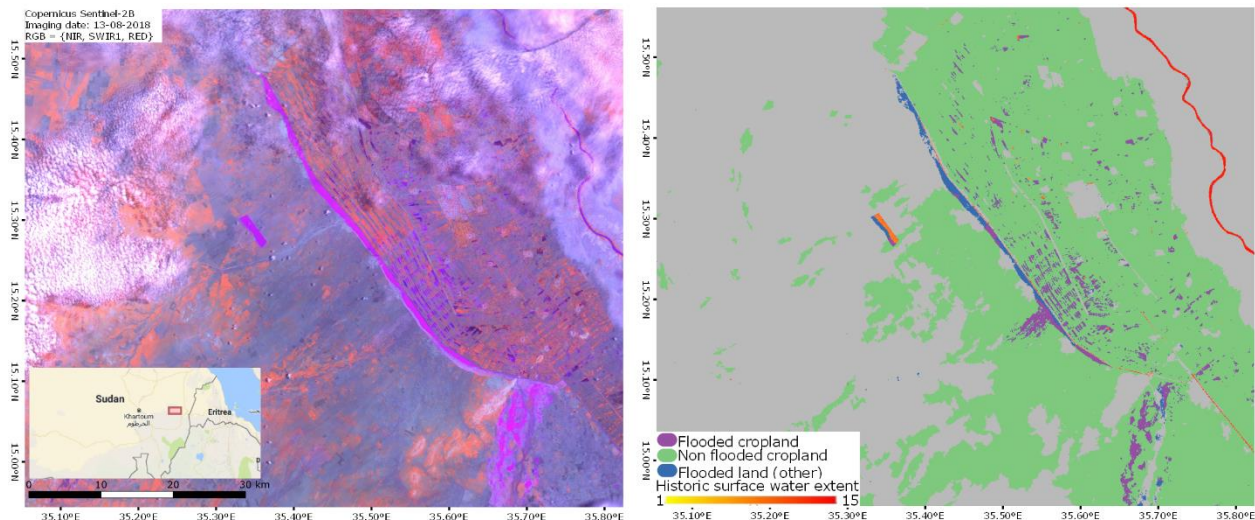


Figure 4. Crop areas close to Atbara River, in Kassala state. SENTINEL2 data show the flooded areas on August 13th (in blue and purple on the left) and the extent of flooded cropland (ca. 9,300 ha in the map) and other land use (on the right). For reference in orange/red (right) the areas which have been flooded from a minimum of 1 to a maximum of 15 times in the previous 15 years according to the Global Surface Water Explorer (JRC).

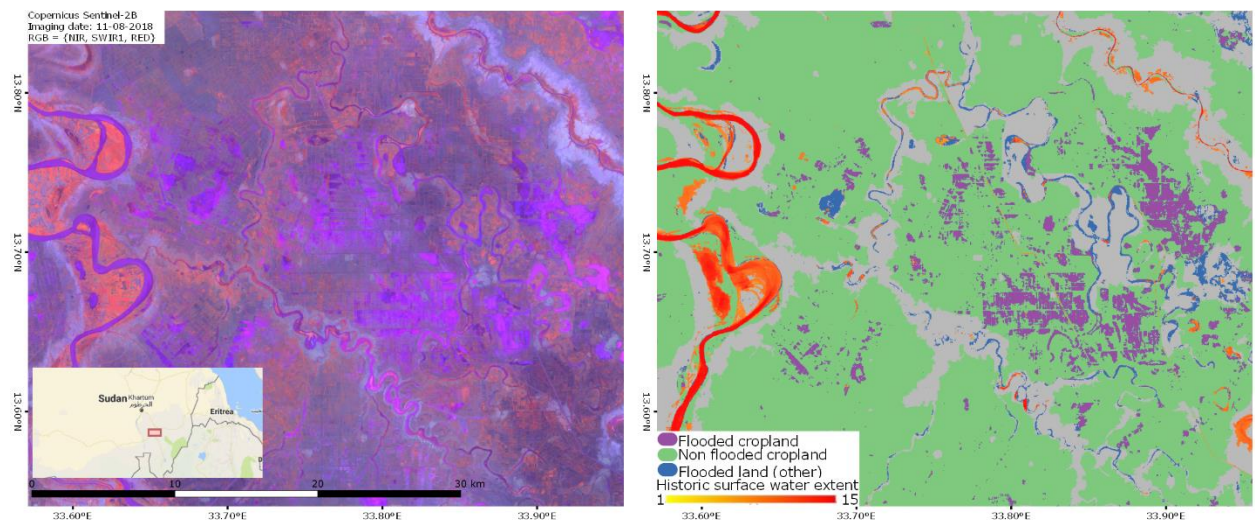


Figure 5. Crop area along Blue Nile River, close to Sennar, inundated by the recent floods. SENTINEL2 data show the flooded areas on August 11th (in purple on the left) and the extent of flooded cropland (ca. 7,700 ha in the map) and other land use (on the right). For reference in orange/red (right) the areas which have been flooded from a minimum of 1 to a maximum of 15 times in the previous 15 years according to the Global Surface Water Explorer (JRC).

More information about floods in Sudan can be found on the ERCC portal:

https://ercportal.jrc.ec.europa.eu/ercmaps/20180828_DailyMap_Sudan_Floods.pdf

and on the RELIEFWEB site:

<https://reliefweb.int/country/sdn>

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