

SPECIAL FOCUS – February 2019

Persistent rainfall deficits lead to contracted sown area and impeded crop development across parts of Southern Africa

The delayed onset of the 2018/19 rainy season in many parts of the Southern Africa region, the erratic spatial and temporal rainfall distribution, coupled with above average temperatures, resulted in reductions in the planted area, poor germination and crop development. Affected crop areas are in the central South Africa, southern Angola, southeastern Botswana, northern Namibia, Lesotho and Zimbabwe (Figures 1a and 1b). Pastoral areas across the region are also facing large moisture deficits, conditions continue deteriorating and livestock deaths have been reported.

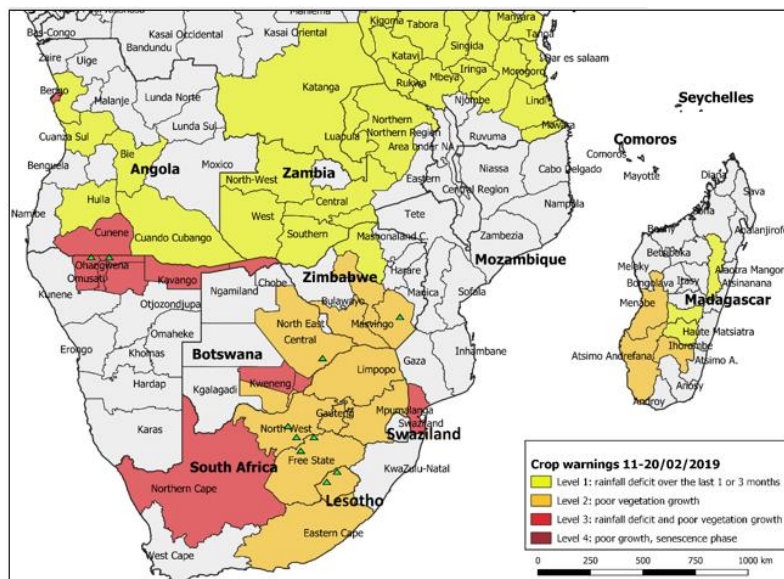


Figure 1a. Map of crop warnings according to ASAP between 11-20/02/2019 in Southern Africa region. The locations of high-resolution imagery examples facing drought conditions are shown with green triangles.

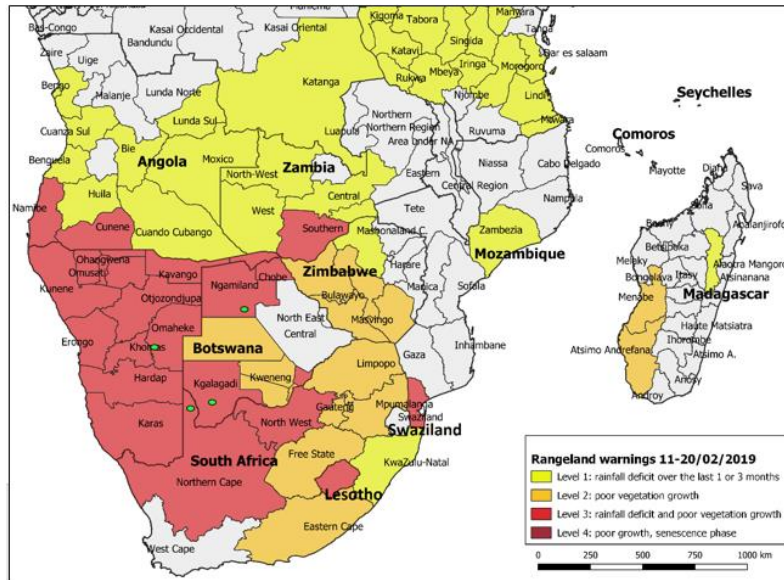


Figure 1b. Map of rangeland warnings according to ASAP between 11-20/02/2019 in Southern Africa region. The locations of high-resolution imagery examples facing drought conditions are shown with green circles.

In **South Africa**, the main cereal producing regions of Free State and North West, experience poor rainfall conditions since the start of the season in October. Above average rainfall in the first two dekads of February, might establish favourable soil moisture and help prevent large-scale permanent damage to the crops. However as mentioned by a report at the end of January by the Department of Agriculture, Forestry and Fisheries, *“Less favorable rainfall and warm temperatures in the western producing areas over the past few weeks prevented producers from planting their intended area with summer crops, especially in the Free State and North West provinces”*. According to the 1st production forecast released from the Department of Agriculture, Forestry and Fisheries (27/02/2019), the 2019 maize production is expected to be 16% below the production of 2018 (production for 2017/2018 was 30% above the 2012-2015 average) but still 9% above the 2012-2015 average.

The impact of reduced planted area is visible on the selection of Sentinel 2 high-resolution imagery in Figure 2 for crop areas in Free State (satellite imagery of 22/01-19/02) and Figure 3 for crop areas in North West (satellite imagery of 22/01-19/02). The images are false color composites with red showing active vegetation, with purple or blue water bodies and with light green bare soil or sparsely vegetate soil. Crop areas in 2019 show significantly less active vegetation than at the same time in 2018 and it can be assumed that most of the areas in bright green have not been planted in the 2018/2019 season.

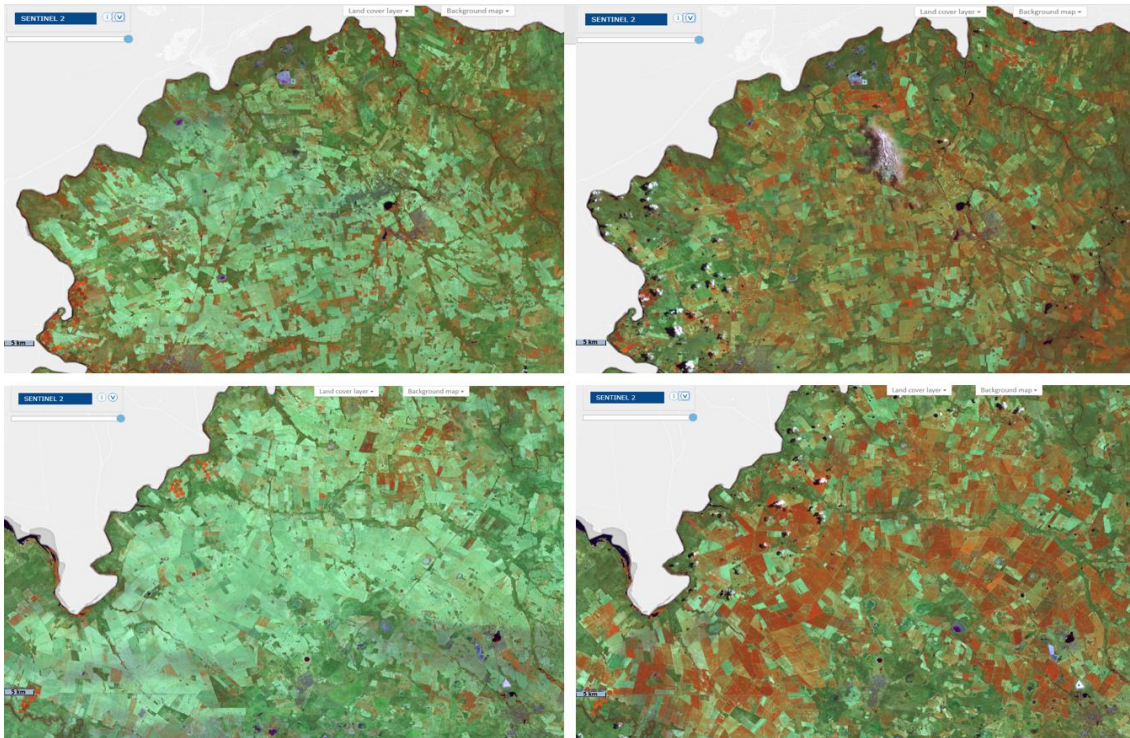


Figure 1. Top: Sentinel-2 Imagery showing crop areas in Free State, close to Viljoenskroon, in 2019 (left) and in 2018 (right). Bottom: Sentinel-2 Imagery showing crop areas in Free State, close to Wesselsbron, in 2019 (left) and in 2018 (right).

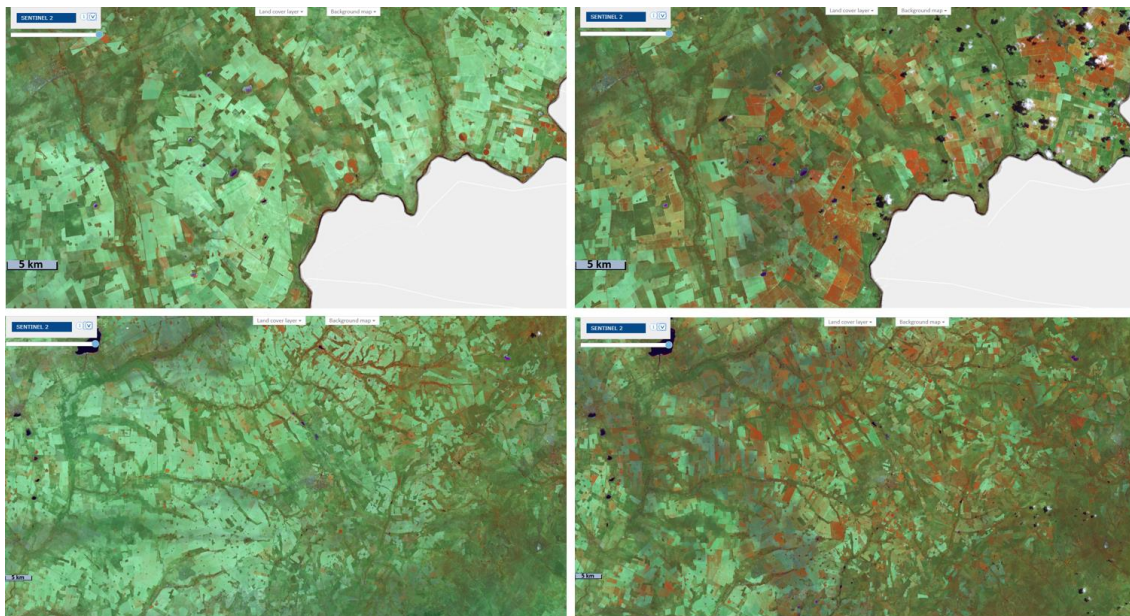


Figure 2. Top: Sentinel-2 Imagery showing crop areas in North West, close to the border with Free State, in 2019 (left) and in 2018 (right). Bottom: Sentinel-2 Imagery showing crop areas in North West, close to Ottosdal, in 2019 (left) and in 2018 (right).

Crop areas in northern **Namibia** have fared poorly from multiple droughts over the last few seasons, and national reports indicate potential water shortages (water levels in Namibia's main dams remain low - Hydrological Services Namibia) and reductions in planted area (SADC February bulletin). In Figure 4, the Sentinel 2 high-resolution imagery for the two northern regions of Omusati (satellite imagery of 23/01-22/02) and Ohangwena (satellite imagery of 22/01-15/02) are presented. For the 2019 images, light green color indicates bare or scarcely vegetated fields or rangelands, instead of active vegetation (red color in 2018 images). Moreover, the decreased surface water presence in 2019 images is evident compared to the images on the right (water indicated with purple color in 2018 images).

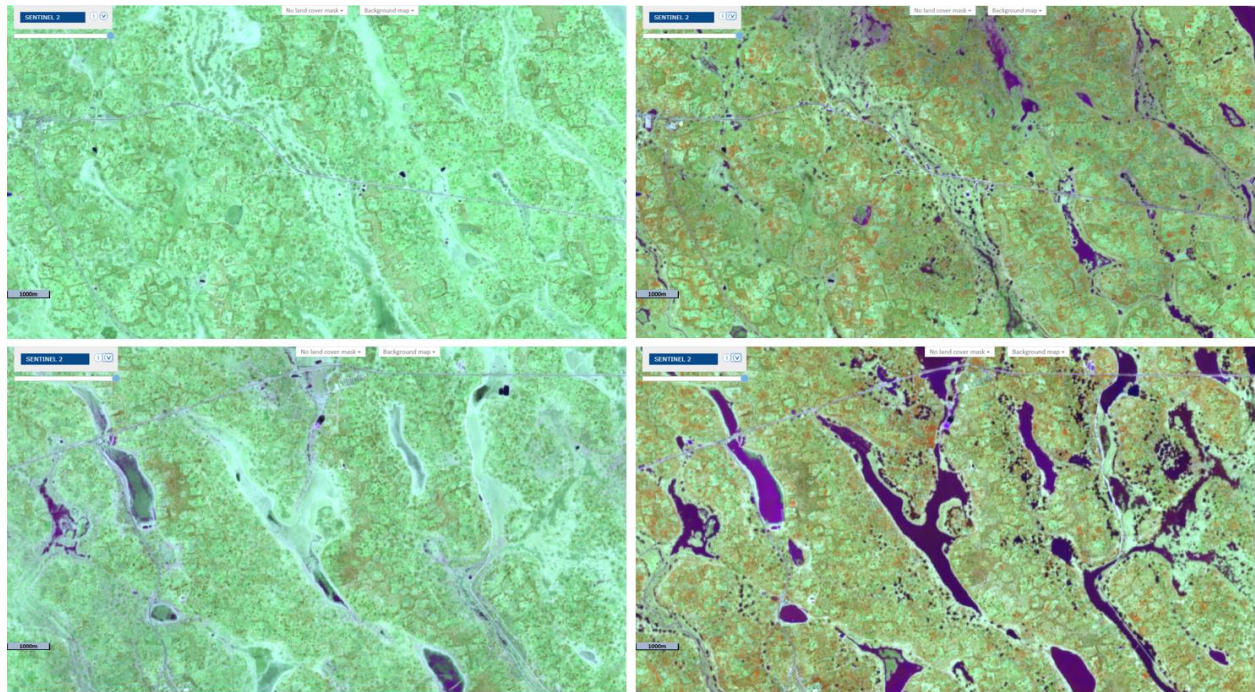


Figure 3. Top: Sentinel-2 Imagery showing crop areas in Omusati, close to Oneheke, in 2019 (left) and in 2018 (right). Bottom: Sentinel-2 Imagery showing crop areas in Ohangwena, close to Ongenga, in 2019 (left) and in 2018 (right).

The extended rainfall deficits have also delayed planting or caused severe moisture stress in crop growing areas in **Lesotho**, **Botswana** and **Zimbabwe**. According to the GIEWS special alert (FAO 15/02) for Zimbabwe, reports indicate significant contractions in the area sown to the cereal crop. An example of deteriorated crop conditions and diminished plantings in these countries is presented in Figure 5 for Lesotho and Figure 6 for Botswana and Zimbabwe. In these maps 2017 was chosen as comparison year since these areas experienced rainfall deficits and below-average vegetation conditions in 2018.

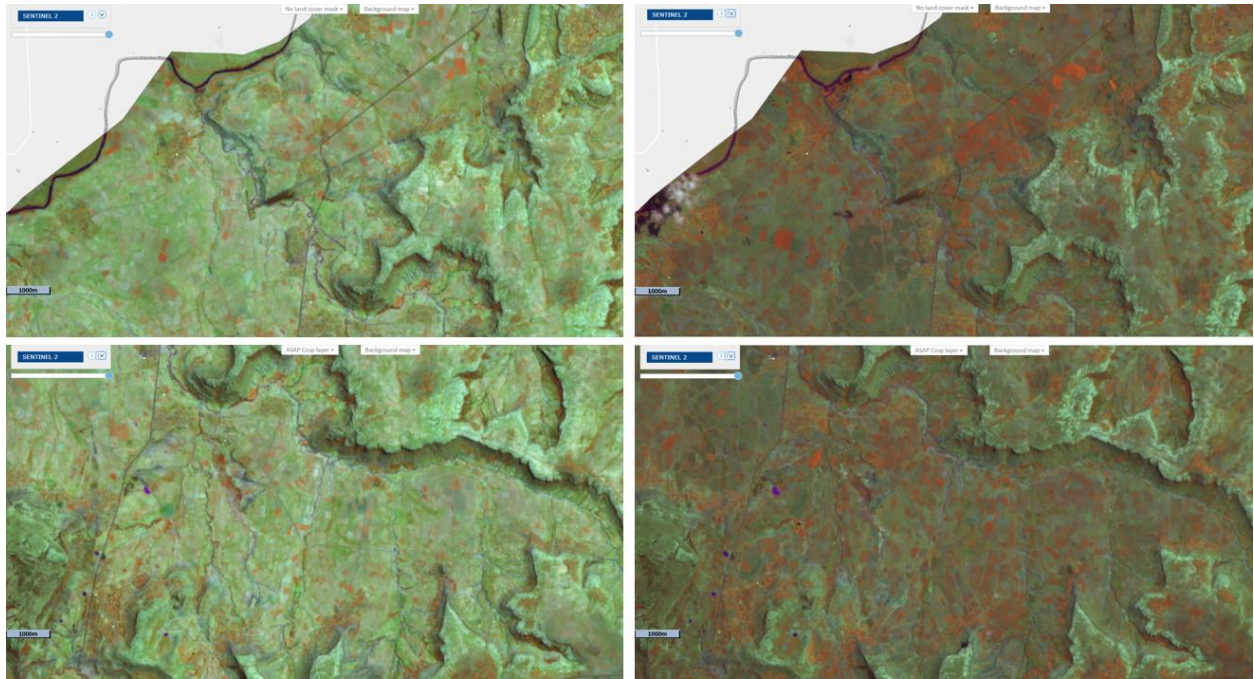


Figure 4. Sentinel-2 Imagery showing crop areas in Lesotho in 2019 (left panels) and in 2017 (right panels).

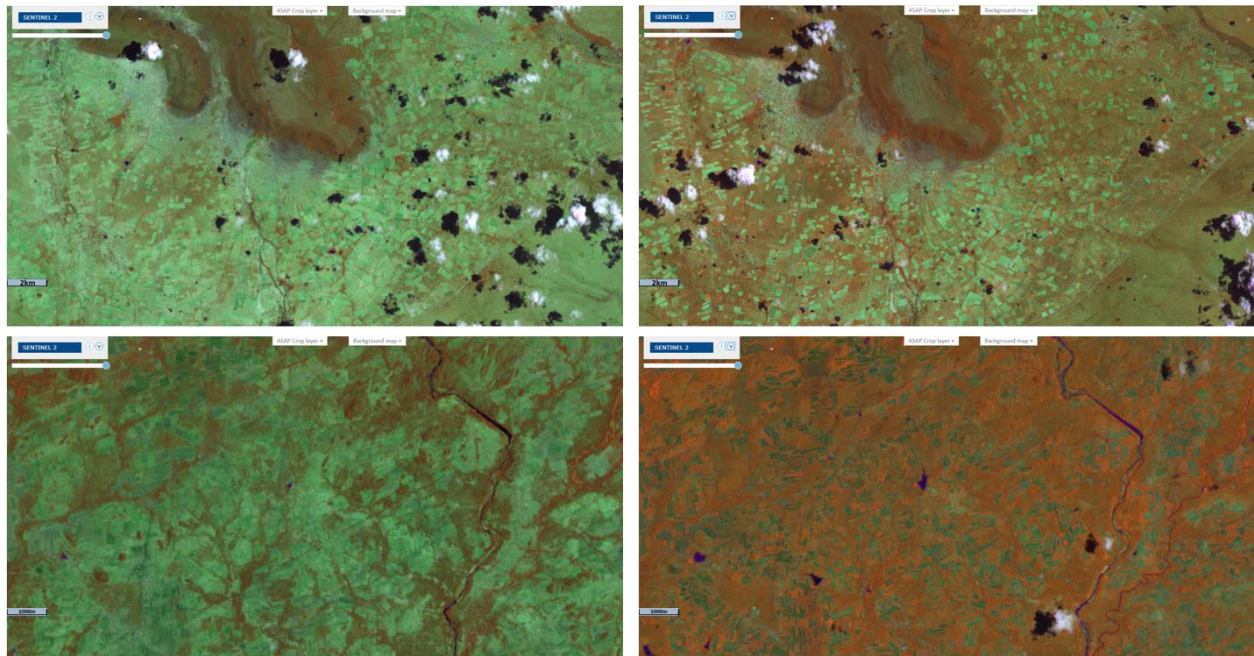


Figure 5. Top: Sentinel-2 Imagery showing crop areas in Central Region, in Botswana in 2019 (left) and in 2017 (right). Bottom: Sentinel-2 Imagery showing crop areas in Masvingo Region, in Zimbabwe in 2019 (left) and in 2017 (right).

In Figure 7, the MODIS NDVI 1km profiles are presented for a chosen crop field in each of the countries mentioned above. The impact of drought on biomass levels is visible for 2018 and 2019, compared to 2017, where crop conditions were favourable.

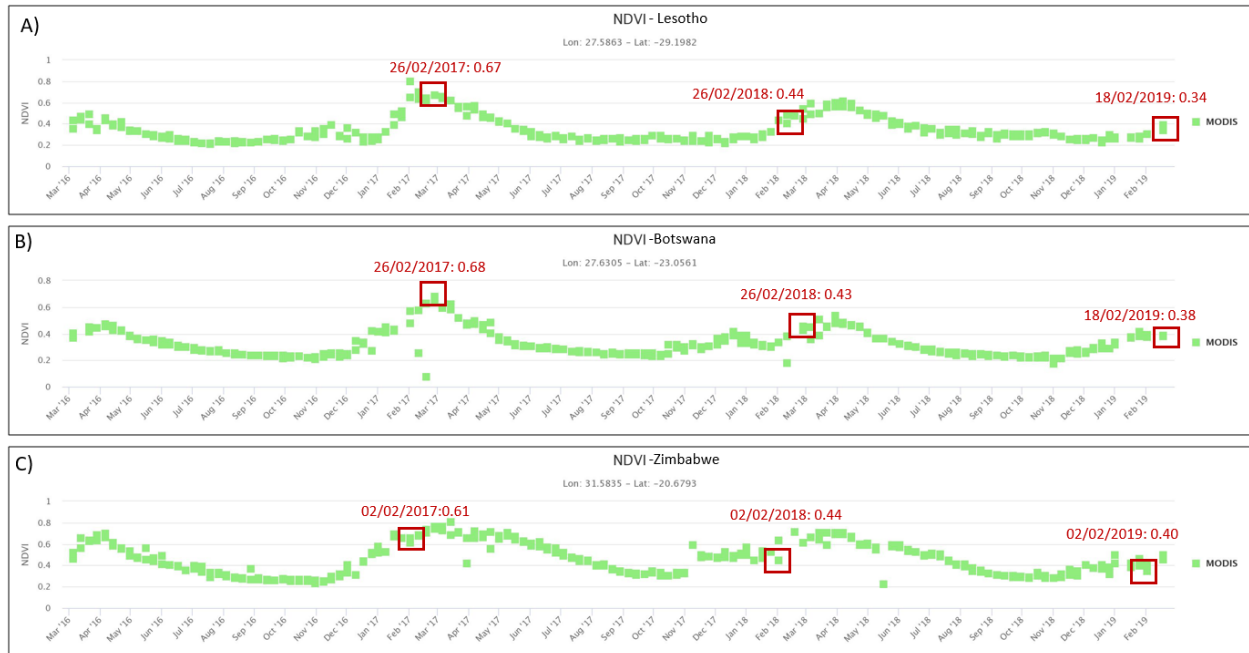


Figure 6. MODIS NDVI profiles for 28/02/2016 – 28/02/2019 for a chosen crop field in Lesotho (A), Botswana (B) and Zimbabwe (C). With red rectangles are highlighted particular dates, and the NDVI value for this date is presented.

According to FEWSNET (February analysis), “pasture conditions and water availability for livestock are below average in many areas, including in central South Africa and parts of Zimbabwe, Lesotho, and Botswana, where drought-related livestock deaths have been reported”. High-resolution satellite images of **affected rangelands** are presented in Figure 8 for South Africa (satellite imagery of 28/01-27/02), Namibia (satellite imagery of 28/01-27/02) and Botswana (satellite imagery of 28/01-27/02 for Kgalagadi and 28/01-20/02 for Ngamiland).

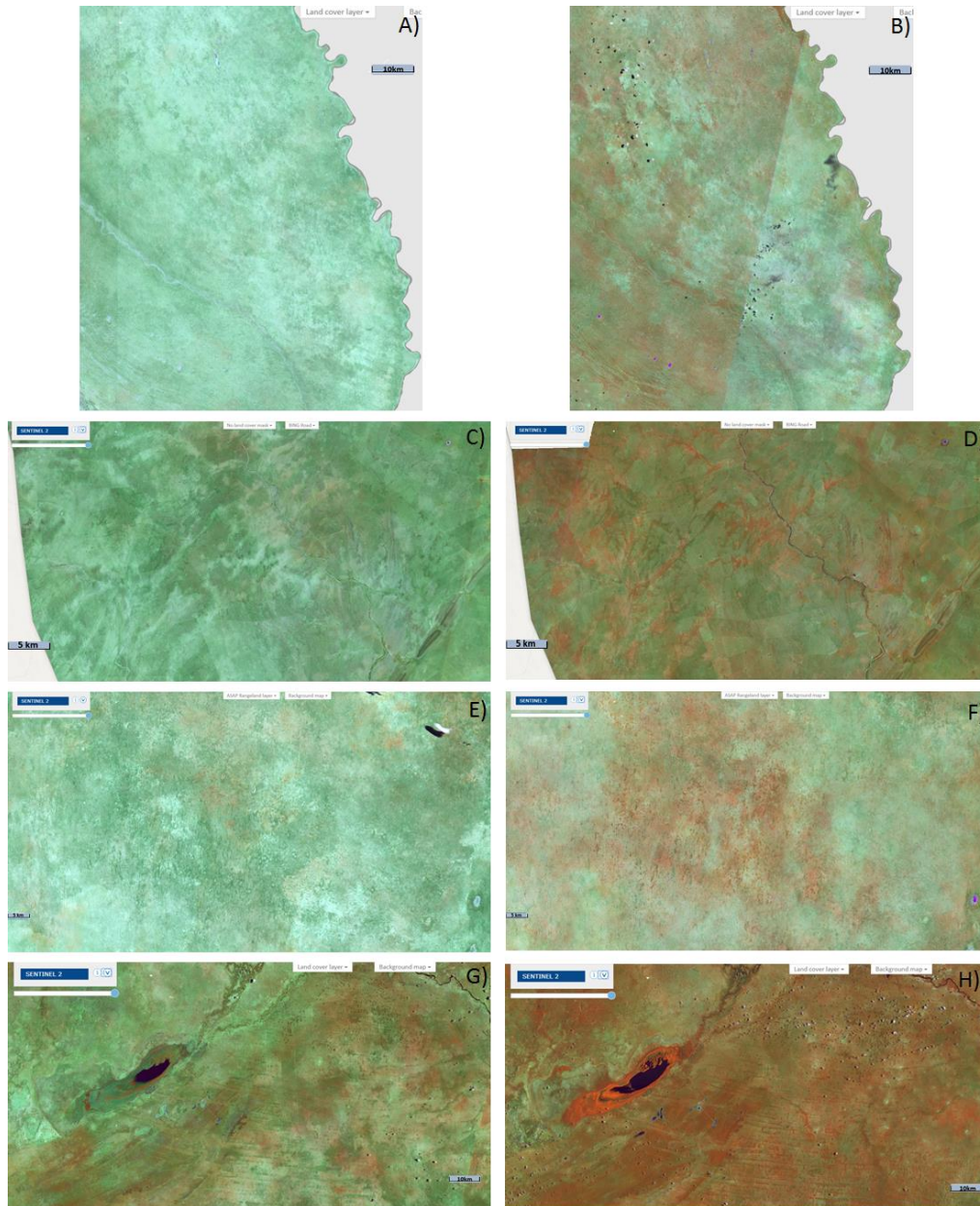


Figure 8. Rangelands in North West, South Africa (A, B), in Omaheke in Namibia (C,D), in Kgalagadi and Ngamiland in Botswana (E,F and G,H respectively). Left panels present images for the year 2019, whereas right panels for the year 2017.

For any feedback and questions please write to the address below.

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