Chapter 3. Main producing and exporting countries

Building on the global patterns presented in previous chapters, this chapter assesses the situation of crops in 30 key countries that represent the global major producers and exporters or otherwise are of global or CropWatch relevance. In addition, the overview section (3.1) pays attention to other countries worldwide, to provide some spatial and thematic detail to the overall features described in section 1.1. In section 3.2, the CropWatch monitored countries are presented, and for each country maps are included illustrating NDVI-based crop condition development graphs, maximum VCI, and spatial NDVI patterns with associated NDVI profiles. Additional detail on the agroclimatic and BIOMSS indicators, in particular for some of the larger countries, is included in Annex A, tables A.2-A.11. Annex B includes 2016 production estimates for Argentina, Australia, Brazil, Canada, and the United States.

3.1 Overview

Chapter 1 focused on large climate anomalies that sometimes reach the size of continents and beyond; in contrast, this section offers a closer look at all countries, including the 30 countries that together produce and commercialize 80 percent of maize, rice, wheat, and soybean. As evidenced by the data in this section, even countries of minor agricultural or geopolitical relevance are exposed to extreme conditions and deserve mentioning. Figures 3.1 to 3.4 respectively present global maps for the CropWatch indicators for RAIN, TEMP, RADPAR, and BIOMSS by country and subnational areas for large countries.

Wet areas

Sahel to Central Asia

The largest rainfall anomalies, at the national level, occur in a large area identified in chapter 1 as "Sahel to Central Asia." This includes Mauritania (RAIN, +156%, equivalent to 411 mm) and Niger (+73%, 379 mm) in the western Sahel, as well all other countries that are part of the West African Sahel from Senegal (+16%) to northern Sudan (+58%).

Figure 3.1. Global map of April-July 2016 rainfall (RAIN) by country and sub-national areas, departure from 15YA (percentage)

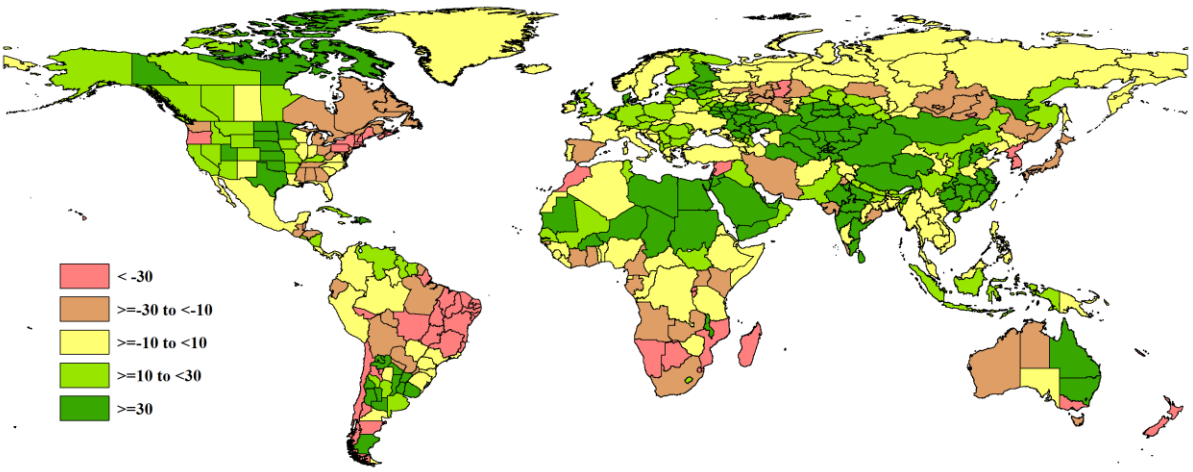


Figure 3.2. Global map of April-July 2016 temperature (TEMP) by country and sub-national areas, departure from 15YA (degrees)

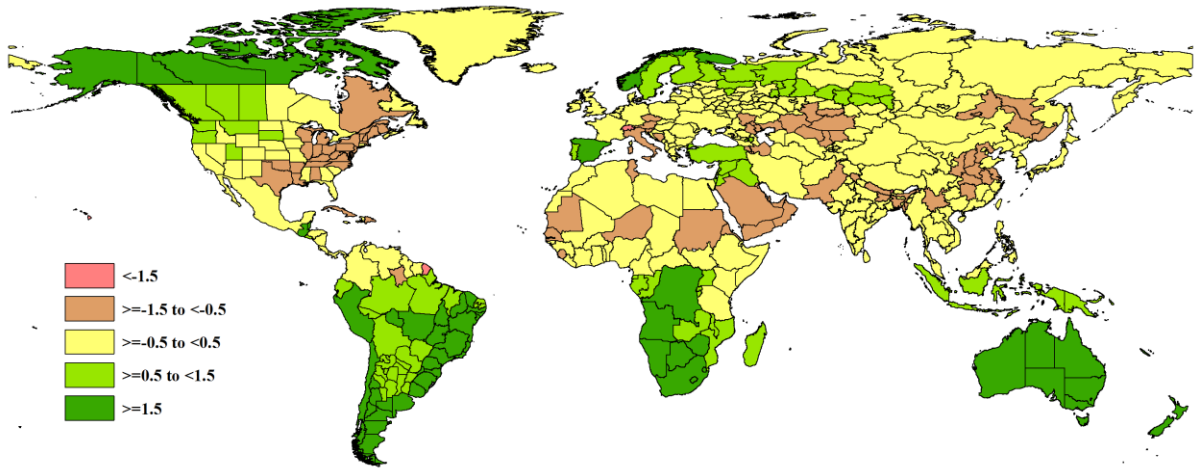


Figure 3.3. Global map of April-July 2016 PAR (RADPAR) by country and sub-national areas, departure from 15YA (percentage)

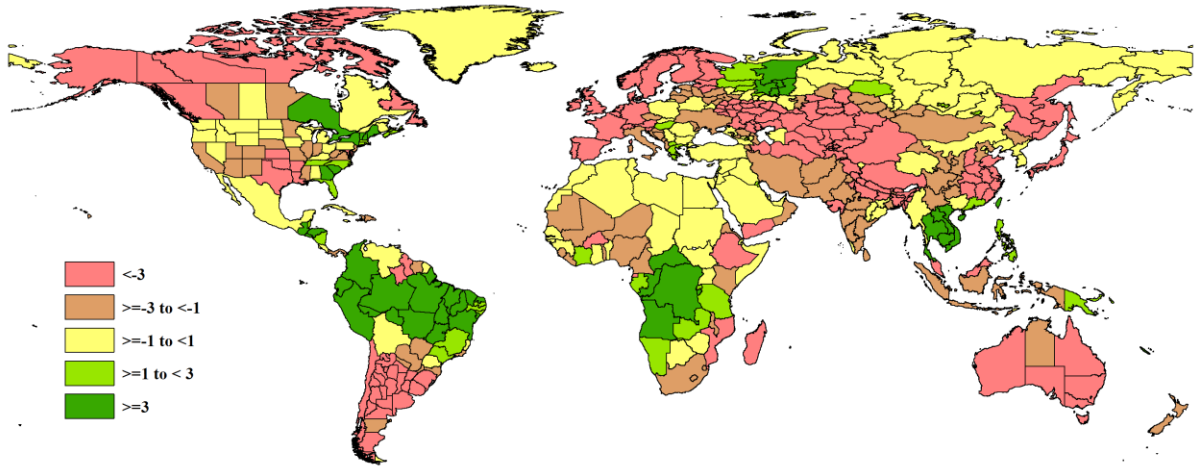
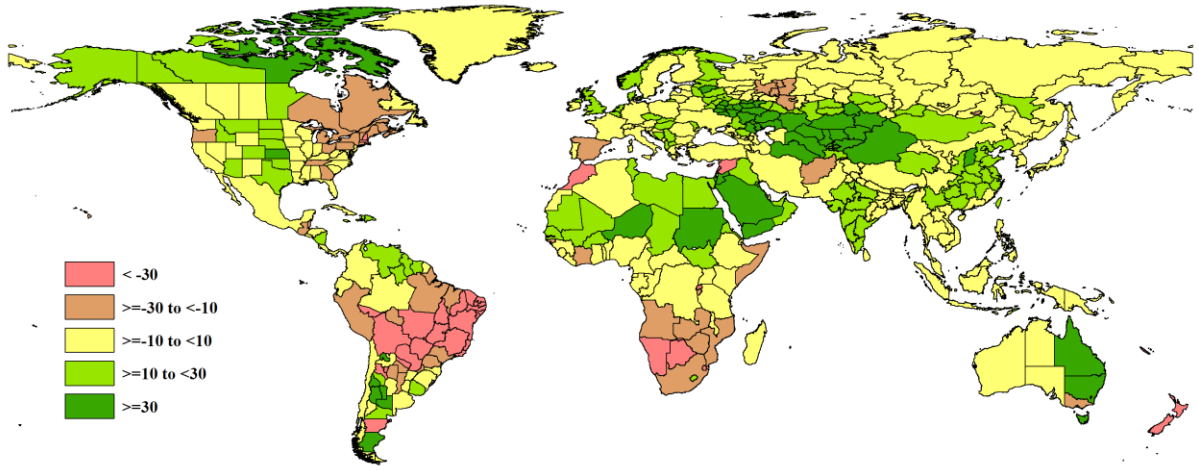


Figure 3.4. Global map of April-July 2016 biomass (BIOMSS) by country and sub-national areas, departure from 15YA (percentage)



For most countries, the rainfall supply marks an early and favorable start of the rainy season. In the very east of the "climatic Sahel," some slightly negative RAIN anomalies can be seen for Somalia (-3%) and Ethiopia (-5%). In Ethiopia, however, a positive CALF (+5%), an average BIOMSS index, and a favorable VCIx indicate that major production areas are recovering.

The Near East (Israel, RAIN, +75% and Jordan, +159%) and the Arabian Peninsula come next with precipitation excesses from 60% to 120% in Qatar, Yemen, Kuwait, and Saudi Arabia. In Egypt, although RAIN is at +71%, there is a marked drop in CALF (-9%) and a moderate VCIx value, no doubt associated with unfavorable irrigation conditions. For almost all listed countries, however, rainfed crop agriculture plays a minor role in their economy, and the rainfall is of relevance mainly for range-lands. The same also applies to Central Asia (less so for Kazakhstan) where the following RAIN anomalies are reported: Tajikistan +47%, Kazakhstan +71% (CALF +5%), Uzbekistan +82%, and Turkmenistan +115%. In Kyrgyzstan, RAIN of +119% over average was recorded, which corresponds to 539 mm of precipitation, an amount that is welcome in the late growth stages of winter crops and a useful supply of water for the Ferghana valley in Kyrgyzstan and neighboring countries. Much of the "Sahel to Central Asia" region had below average sunshine of -5% to -10%, with moderate temperature anomalies in the order of 0.5°C. The biomass production potential is mostly up by at least 40%.

Eastern West, South and East Asia, southeast South America, and parts of North America

Other wet areas were reported in various parts of Asia, southeast South America, and parts of North America. This includes, in particular, much of central eastern China (except Shandong and Henan). For China as a whole, CALF is close to average at -1% and VCIx is favorable at 0.94, while the RAIN departure is +36%. The largest excesses, however, occurred in the western areas bordering Central Asia. In the west, anomalies larger than 60% are reported from Beijing, Qinghai, Shanghai, Hebei, Jiangxi, Shanxi, and Zhejiang. Corresponding RADPAR and TEMP anomalies are modest and the associated BIOMASS increases mostly close to +10%.

In southern Asia, the RAIN index of 798 mm for India (+20%) hides a large disparity of sub-national conditions: Andhra Pradesh (+54%), Madhya Pradesh (+75%), and Rajasthan (+94%), but Gujarat at -18% and Goa at -30%. Bangladesh had above average RAIN of +7% with 1520 mm and Pakistan +15% with 248 mm. The Indian CALF value drops by a spectacular 12%, accompanied by a VCIx of 0.70, indicating the negative impact of excess rainfall. Bangladesh and Pakistan display rather large differences in CALF (0% and -8% respectively) associated, in the case of Pakistan, with large sub-national disparities in crop condition.

The largest RAIN anomalies in South America cover Argentina (311 mm or +46% above average nationwide for the RAIN indicator, with a 5% drop in CALF resulting from water logging) and Uruguay (797 mm or +89%). The area of interest is included in the contour from Uruguay to Salta and Jujuy in the west (+32% and +55%, for moderate rainfall amounts of 82 mm and 73 mm at the end of the summer season), to Mendoza (+158% with 159 mm) and Buenos Aires (+12% with 244 mm), providing good moisture supply for winter crops. One of the main agricultural provinces (Entre Rios) records 652 mm, equivalent to +111%. The other CropWatch agroclimatic indices follow an unusual pattern of high temperature departures associated with low sunshine; this points at high cloudiness, which is often characterized by limited evapotranspiration and water logging. However, altogether, conditions are conducive to winter crops, especially wheat.

In North America (RAIN, +8% in the United States), wet conditions prevailed mainly from Texas (RAIN, +45%) to North Dakota (+55%) and neighboring states, extending west all the way to the Pacific coast except for New Mexico (average with -9%), Washington (-24%), and Oregon (-30%).

Dry areas

Other areas in North America with dry conditions include parts of the eastern Corn Belt (Michigan, RAIN -27%; Ohio -22%), extending also east as far as Maine and Nova Scotia (both at -41%), and south to include Mississippi, Alabama, and Georgia with RAIN deficits between -10% and 20%. Altogether, CropWatch puts the CALF value for the United States at average (+1% with VCIx=0.88).

In South America, southern equatorial Brazil (including the Nordeste) recorded some severe water shortages (RAIN, -50% to -80%), especially in Alagoas, Bahia, Goias, Piaui, Rio Grande do Norte, Sergipe, Ceara, and Espirito Santo. States in the south with marked deficits include Minas Gerais (-42%) and Mato Grosso (-38%). Temperature in Brazil was mostly well above average (+2°C) and more, which was accompanied by a sunshine increase over average around 5%. The resulting CALF variation for the country is a 9% drop nationwide with a moderate VCIx of 0.79.

Among the Mediterranean countries, a strong west-east RAIN anomaly gradient varies from -47% (Morocco) to -1% (Algeria) to +24% (Tunisia), which is thus part of the "Sahel to Central Asia" block, making Morocco and Spain (-24%) stand out as an isolated group of drought affected areas.

Two larger drought affected areas also deserve mentioning:

- *Southern Africa.* In Southern Africa, all countries except Zimbabwe (RAIN, -1%) were dry and hot, in particularly Namibia (-41% and 26 mm) and Botswana (-63% with 17 mm), two countries where livestock plays a much larger role in agriculture than crops. The cropping sector is more relevant in Swaziland (RAIN, -61% with 34 mm) and Mozambique (RAIN -30%, 70mm) and especially Madagascar (RAIN down 30% to 133 mm).
- *Eastern Asia.* In eastern Asia, a region centered around the Korean Peninsula (a 40% or just under 40% RAIN deficit) and extending from the Primorsky Krai in Russia to Heilongjiang and Japan with deficits just short of 20% was affected by drought.

Finally, some isolated areas with unusual conditions include:

- Syria, with a -44% RAIN index and a BIOMSS indicator of 31% below average;
- Iran, a deficit "island" (-23% RAIN) in the rather favorable "Sahel to Central Asia" area. The water shortage is likely to have been compensated in terms of production by a large increase in CALF (+26%);
- Russia, with a dry pocket (recording -30% RAIN) centered around the region of Perm, with this dry area extending to adjacent areas in the south from Sverdlovsk (-11%) and Bashkiria (-26%) to the Kostroma Oblast (-11%);
- Malawi, in Southern Africa with 200 mm rainfall in the late season (RAIN, +45%);
- Continental south-east Asia and the Philippines, with a positive RADPAR anomaly. With the exception of Cambodia where CALF dropped 7 percentage points under just fair conditions, Thailand, Vietnam, Indonesia, and the Philippines all report CALF values identical with the previous five years;
- Much of Western Europe, with a negative RADPAR anomaly. CALF values are average in the region (France, German, and Great Britain) as well as in the eastern areas of the continent (Poland, Romania, and Ukraine), but dropping to -3% in Russia.

Table 3.1. CropWatch agroclimatic and agronomic indicators for April-July 2016, dept. from 5YA and 15YA

Country	Agroclimatic Indicators				Agronomic Indicators	
	Departure from 15YA (2001-2015)				Departure from 5YA (2011-2015)	Current
	RAIN (%)	TEMP (°C)	RADPAR (%)	BIOMSS (%)	CALF (%)	Maximum VCI
Argentina	46	1.3	-14	-3	-5	0.74
Australia	13	3.5	-5	15	4	0.92
Bangladesh	7	-0.6	-4	0	0	0.88
Brazil	-20	1.8	4	-26	-9	0.79
Cambodia	7	-0.1	4	-7	-7	0.75
Canada	-4	0.3	-1	2	1	0.97
China	36	-0.5	-3	13	-1	0.86
Egypt	71	0.5	1	26	-9	0.77
Ethiopia	-5	-0.3	-4	0	5	0.94
France	-9	-0.2	-8	-3	0	0.93
Germany	13	-0.4	-3	8	0	0.87
India	20	-0.2	-3	8	-12	0.70
Indonesia	15	0.7	-3	8	0	0.72
Iran	-23	-0.5	-1	-9	26	0.88
Kazakhstan	71	-0.3	-6	44	5	0.95
Mexico	4	-0.5	0	5	1	0.79
Myanmar	9	-0.4	0	1	-2	0.86
Nigeria	2	-0.5	-1	8	1	0.86
Pakistan	15	-0.7	-1	2	-8	0.74
Philippines	-6	0.0	2	-8	0	0.88
Poland	11	-0.1	0	5	0	0.89
Romania	13	-0.2	-1	8	0	0.98
Russia	12	0.2	-2	12	-3	0.96
S. Africa	-25	3.1	-2	-10	2	0.80
Thailand	6	0.2	7	-1	0	0.81
Turkey	1	0.7	0	-8	-4	0.80
Ukraine	3	0.0	-1	9	0	0.95
United Kingdom	16	0.1	-6	10	0	0.89
United States	8	-0.3	-1	4	1	0.88
Uzbekistan	82	-0.4	-5	93	12	0.92
Vietnam	7	0.1	5	0	0	0.87

Note: Departures are expressed in relative terms (percentage) for all variables, except for temperature, for which absolute departure in degrees Celsius is given. Zero means no change from the average value; Relative departures are calculated as (C-R)/R*100, with C=current value and R=reference value, which is the five-year (5YA) or fifteen-year average (15YA) for the same period (April-July).

3.2 Country analysis

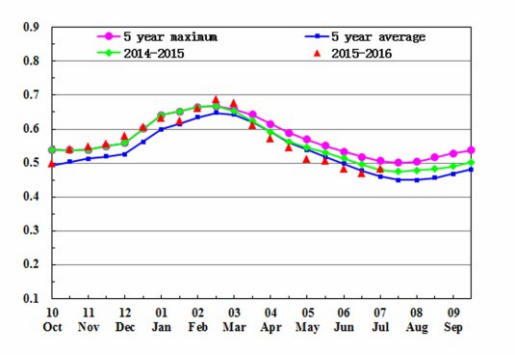
This section presents CropWatch results for each of thirty key countries (China is addressed in Chapter 4). The maps refer to crop growing areas only and include (a) Crop condition development graph based on NDVI average over crop areas, comparing the April-July 2016 period to the previous season and the five-year average (5YA) and maximum; (b) Maximum VCI (over arable land mask) for April-July 2016 by pixel; (c) Spatial NDVI patterns up to July 2016 according to local cropping patterns and compared to the 5YA; and (d) NDVI profiles associated with the spatial pattern under (c). See also Annex A, tables A.2-A.11, and Annex B, tables B.1-B.5, for additional information about indicator values and production estimates by country. Country agricultural profiles are posted on **www.cropwatch.com.cn**.

Figures 3.5-3.34. Crop condition individual countries ([ARG] Argentina- [ZAF] South Africa) for April-July 2016

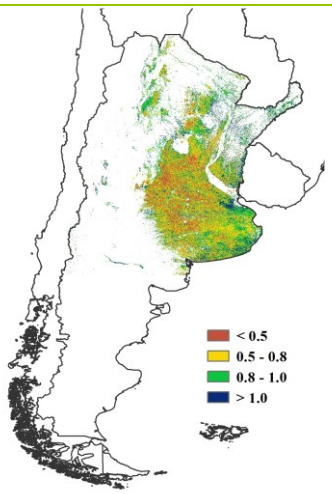
[ARG] Argentina

The harvesting of summer crops (soybean and maize) was completed in May, while June to August is the sowing period for winter wheat. From April to July, excessive rainfall in Argentina dominated agroclimatic conditions, with 46% above average rainfall observed nationally. However, rainfall was unevenly distributed with 20% or more below average RAIN in Missions and Tucuman and almost double of average rainfall in Corrientes, Entre Rios, and Santa Fe. Accordingly, RADPAR is 14% below average for Argentina and 1% to 26% below average for the major agricultural provinces. TEMP is about 1°C above average for the whole nation and each province. The harvesting of summer crops was delayed due to the abundant rainfall in southern Buenos Aires, especially for the late soybean. Outputs of summer crops was not significantly impacted, and yield for maize and soybean remains at the same level as the forecast in the previous bulletin. The excessive precipitation hampered the sowing of winter wheat. By the end of July, winter wheat planted area was 4 percentage points below that of the same time in 2015. The total planted area from April to July was also 5 percentage points below the 5YA. Nevertheless, soil moisture will be beneficial for winter wheat. In general, CropWatch is cautiously optimistic about the prospects of wheat production for the coming season. (See table B.1 in Annex B for production estimates.)

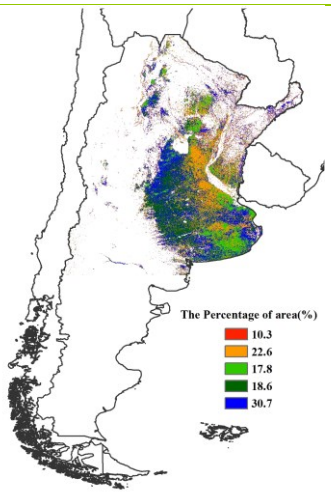
Figure 3.5. Argentina crop condition, April-July 2016



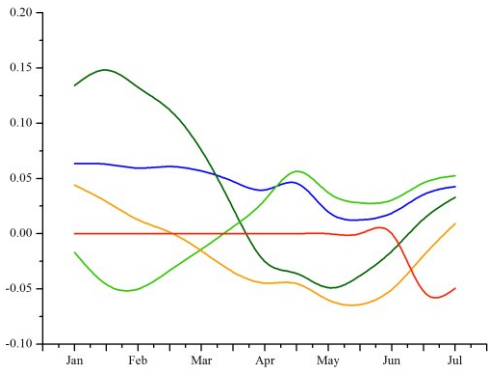
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA



(d) NDVI profiles

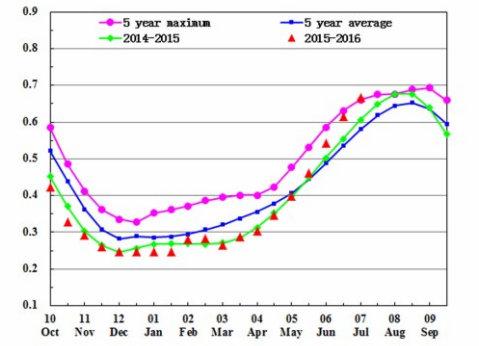
[AUS] Australia

Based on the nationwide NDVI development graph, crop condition was generally above average in Australia compared to the last 5 years, except in April, when it was below average. The maximum VCI attained 0.92 with an increased CALF (+4 percentage points), indicating a possible increased winter crop production.

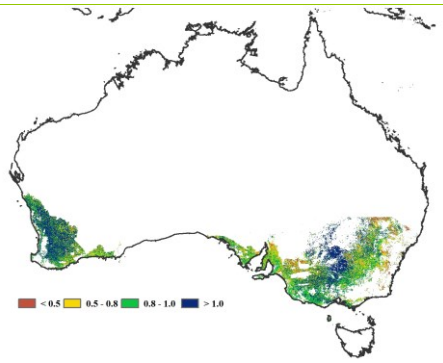
The VCIx in Western Australia shows favorable conditions with a value above 1.0. The Spatial NDVI patterns and profiles in Western Australia also display correspondingly above average conditions.

Although the precipitation in Western Australia shows a decrease of 26% compared to average (with temperature: +2.0°C and RADPAR: -7%) due to the influence of El Niño, the decrease in water has been supplemented by irrigation. The spatial NDVI patterns and profiles in the southern part of South Australia in June were below average, which should be paid attention to in the following months. Nevertheless, crop prospects for Australia are generally favorable. (See table B.2 in Annex B for production estimates.)

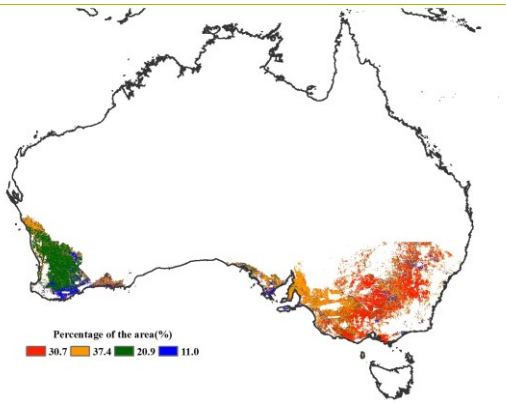
Figure 3.6. Australia crop condition, April-July 2016



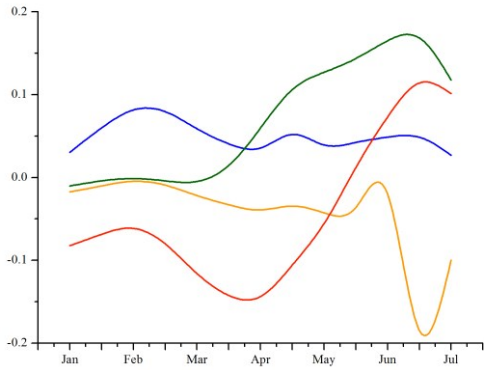
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA

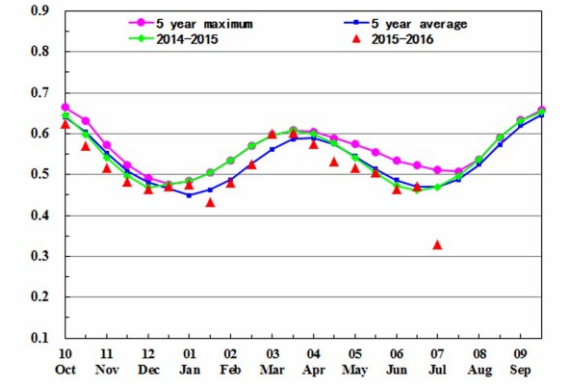


(d) NDVI profiles

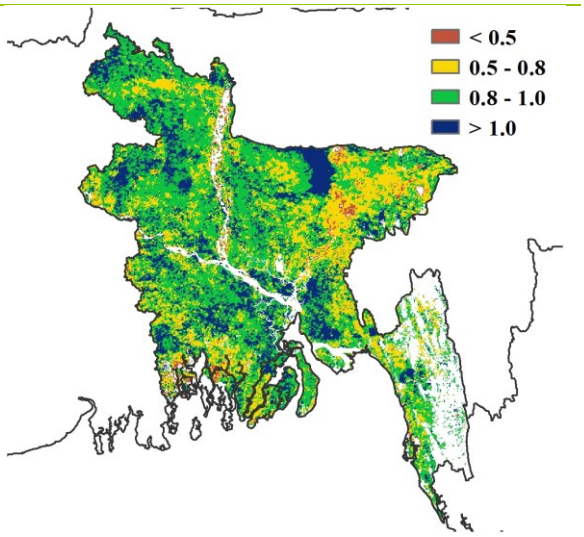
[BGD] Bangladesh

The reporting period corresponds to the growing of Aus rice and the planting of Aman. Overall, CropWatch indicators show below average crop condition for the country. Excess monsoon rainfall (RAIN, +7%) caused flooding and damaged the standing crop mainly in Rangpur, Sylhet, Dhaka, Barisal, and Khulna. The overall biomass accumulation potential (BIOMSS) and the cropped arable land fraction (CALF) remained at the level of the previous five-year average. Temperature (TEMP) remained average as well, while radiation was low (RADPAR, -4%), a very negative factor in a country where sunshine is a dominant limiting factor. The maximum VCI values over the country ranged from 0.5 to 0.8, pointing to average crop condition. In the coastal and the northern regions of the country the spatial NDVI profiles started dropping from early May and continued till the end of the reporting period. The NDVI profiles for the central regions of the country increased from early May to June and started dropping in early July. In Sylhet, the spatial NDVI profiles sharply dropped in early May, then gained for some time and again started dropping till July. Primarily due to flood damage, low photosynthetic activity, and the below average NDVI trend, CropWatch ranks the crop prospects as poor, especially in the northeast.

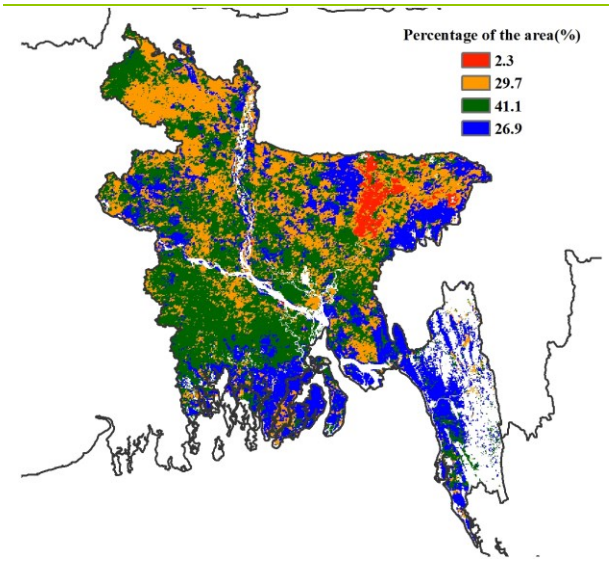
Figure 3.7. Bangladesh crop condition, April-July 2016



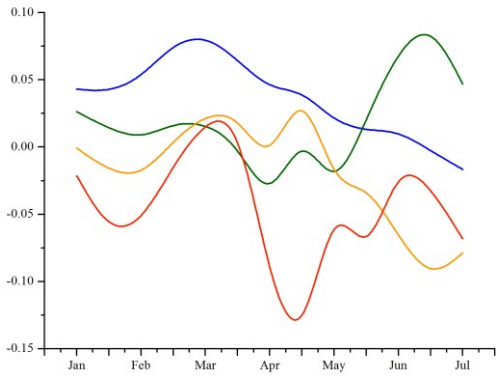
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA

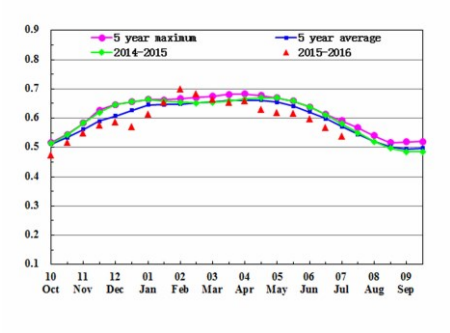


(d) NDVI profiles

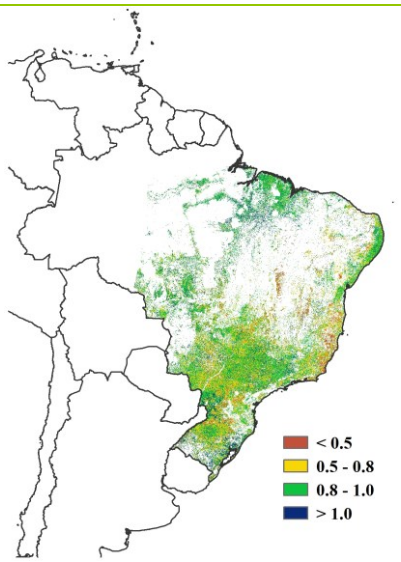
[BRA] Brazil

Overall unfavorable conditions were observed in Brazil from April to July. The harvest of the second maize is ongoing, and wheat is currently in the heading stage. Dry weather conditions were harmful for the second maize and other crops. In central and northern Brazil, 20% below average RAIN with 1.8°C above average temperature resulted in severe drought. Among the eight sub-national regions, the subtropical range-land region in the southernmost part of Brazil is the only region with above average rainfall. In Central Savanna, the Nordeste, East Coast region, and Mato Grosso, rainfall was 69%, 60%, 43%, and 32% below average, respectively, and crops suffered from water stress. In agreement with the unfavorable climatic conditions, BIOMSS was 26% below the five-year average and CALF for Brazil was 9 percentage points below. The crop condition development graph based on NDVI statistics also shows the overall poor crop condition with below average NDVI data since April. NDVI departure clusters present well below average NDVI in Mato Grosso, Goias, and Minas Gerais where rainfall was 38%, 64%, and 42% below average, respectively. Crops in those areas show below average condition with lower than 0.5 VCIx. Due to sufficient rainfall in the two major wheat producing states (Parana and Rio Grande do Sul) prospects are good for the crop if favorable climatic conditions persist. Table B.3 in Annex B presents 2016 production estimates for Brazil.

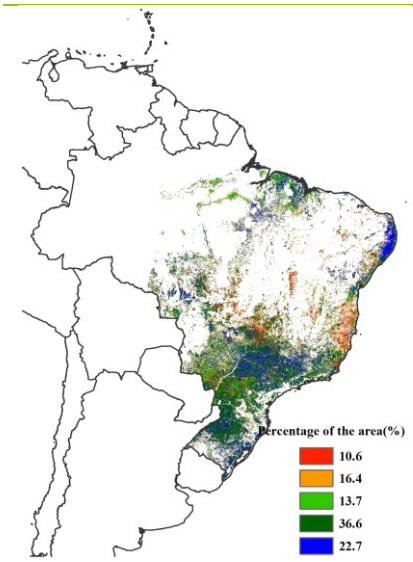
Figure 3.8. Brazil crop condition, April-July 2016



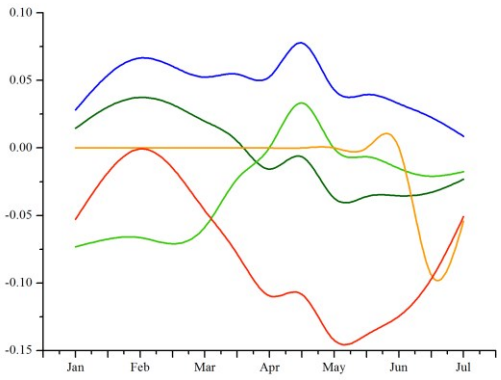
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA

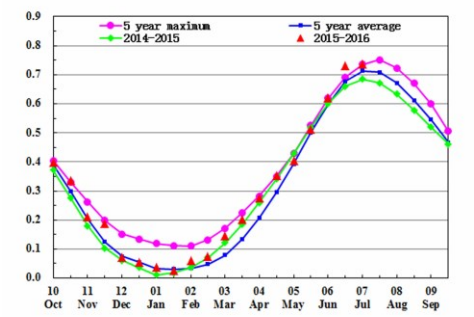


(d) NDVI profiles

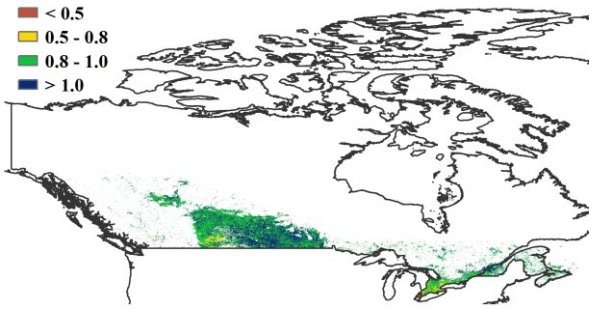
[CAN] Canada

Based on nationwide NDVI development graphs over this monitoring period, significantly above average crop condition prevails in Canada. The period covers the harvesting season of winter crops and early growing season of 2016 summer crops. Three major crop production provinces were dominated by good weather and abundant precipitation: Alberta (RAIN, +16%), Manitoba (RAIN, +23%), and Saskatchewan (RAIN, +16%). On the contrary, insufficient precipitation occurred in eastern provinces, such as Ontario (RAIN, -28%) and Quebec (RAIN, -22%). According to the NDVI profile clusters, favorable summer crop condition prevails in scattered locations in Quebec, southern Ontario, and Alberta, as well as in Southern Manitoba and Saskatchewan, with VCIx greater than one (indicating exceptionally good crop condition). Adequate soil moisture (compared to the five-year average), resulted in a cropped arable land fraction (CALF) increasing 1 percentage point at the expense of fallow land. Crop production is forecast to be above last year's if good weather continues. (See table B.4 in Annex B for Canada's production estimates.)

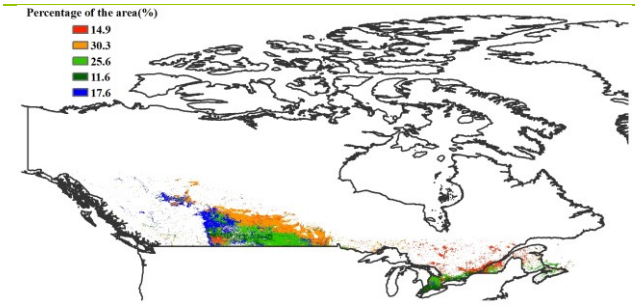
Figure 3.9. Canada crop condition, April-July 2016



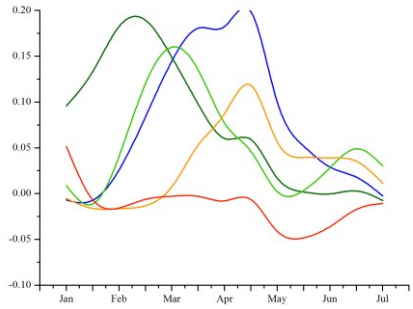
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA

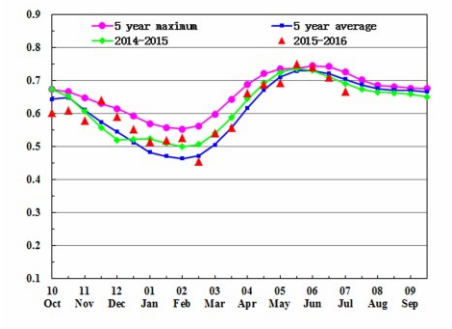


(d) NDVI profiles

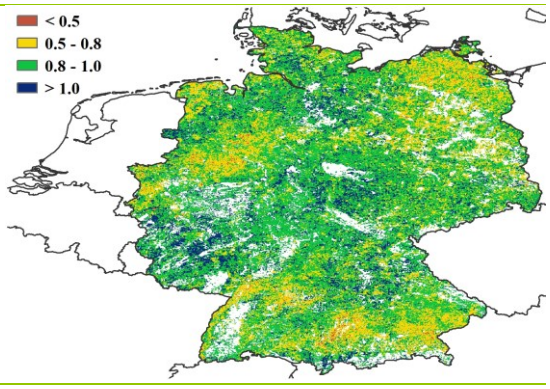
[DEU] Germany

Overall, mixed crop condition prevails in Germany over the monitoring period. Winter wheat, spring barley, and maize are the main grain crops of Germany; winter wheat has been harvested, while spring barley and maize are in the vegetative stage. The CropWatch agroclimatic indicators show above average rainfall (RAIN, +13%), close to average but cool temperature (TEMP, -0.4°C), and RADPAR at the national level significantly below average (-8%). Above average rainfall occurred throughout the country, with the largest positive departure occurring from late May to June. With favorable moisture and temperature, biomass (BIOMSS) is expected to increase by 8% nationwide compared to the five-year average. As shown by the crop condition development graph, national NDVI values were first above average from April to the middle of May, then below average in May due to floods and low temperature, next above-average in June due to good soil moisture and suitable temperature condition after floods, and finally below average after early July due to a lack of rainfall. National NDVI values started well above average, dropped below that average in early May, and came again close to the five-year maximum from the middle of June to late June, before going below average again. These observations are confirmed by the NDVI profiles. Winter crops had generally favorable or even very favorable condition, with the high VCIx areas and NDVI clusters showing this pattern for Saxony, Sachsen-Anhalt, Thüringen, and northern Bavaria, though with the exception of the northern wheat areas and northeast mixed wheat and sugarbeets areas. Summer crops are about average in most of Germany according to the NDVI profiles, with the exception of an area southwest of the southern highland areas. This spatial pattern is also reflected by the maximum VCI in the different areas, with a VCIx of 0.84 for Germany overall. Generally, the values of agronomic indicators mentioned above indicate favorable condition for most winter and summer crops in Germany.

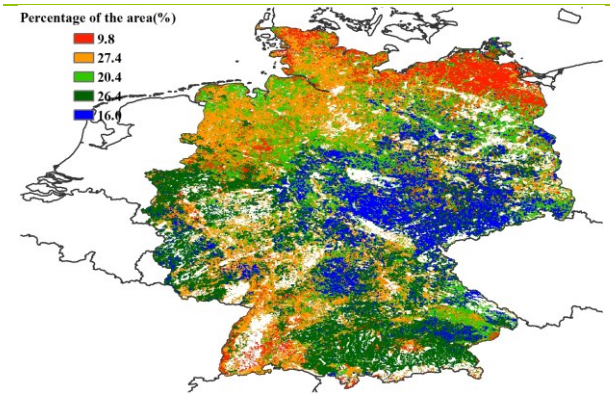
Figure 3.10. Germany crop condition, April-July 2016



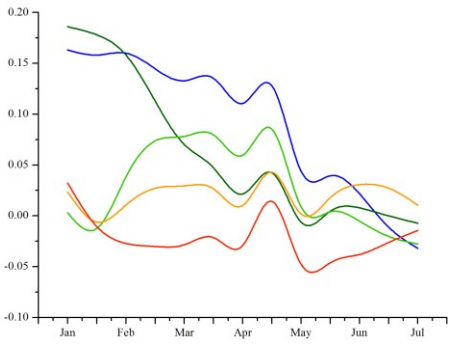
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA



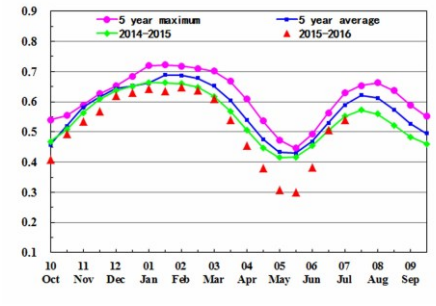
(d) NDVI profiles

[EGY] Egypt

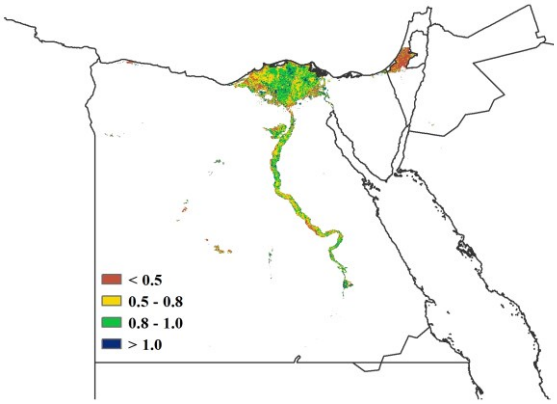
Over the monitoring period, wheat—as one of the major crops in Egypt—has been harvested in early June; the other two major crops, maize and rice, however, are still growing in field. Overall, crop condition in the country was significantly below average from April to early June, but close to average since late June.

The CropWatch agroclimatic indicators show that rainfall was well above average (RAIN, +71%), with about average temperature (TEMP, +0.5°C) and radiation (RADPAR, +1%). The rainfed BIOMSS, hence, increased by 26% compared to average. According to the spatial pattern map of maximum VCI, the values of this indicator were between 0.8 and 1.0 in most cropped areas of Egypt, with lower values below 0.5 only occurring in small regions along the river and in the western and south-eastern Delta. The spatial pattern and NDVI departure profiles show that crop condition was about average throughout the country except in 38% of the areas, mainly in the Delta, where the NDVI was below average by as much as 0.1 at the end of the cycle of wheat. Conditions improved in July when all crops were about average. As the cropped arable land fraction (CALF) decreased by 9 percentage points compared with average, the crop yields in Egypt are estimated to be below average.

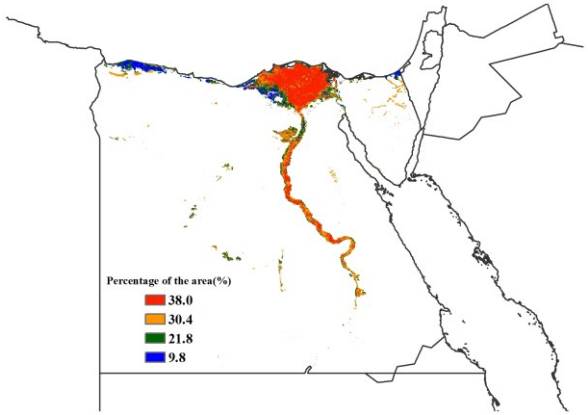
Figure 3.11. Egypt crop condition, April-July 2016



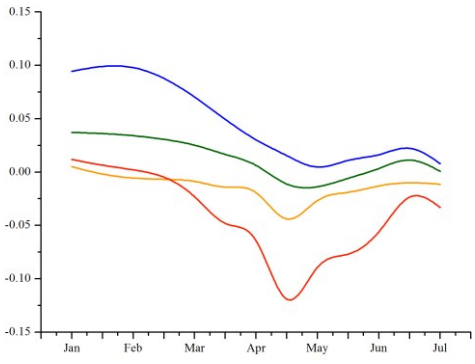
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA

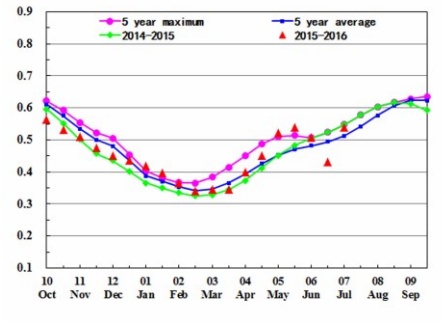


(d) NDVI profiles

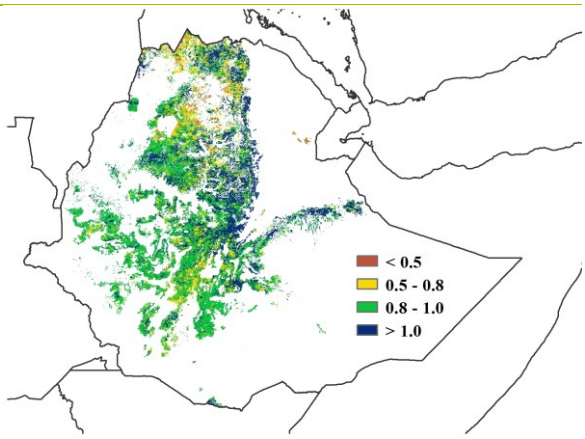
[ETH] Ethiopia

In the main agricultural regions in Ethiopia two rainy seasons exist—the Meher and the Belg, resulting in two crop seasons. Meher is the main crop season. It encompasses crops harvested between Meskerem (September) and Yeaktit (February). Crops harvested between Megabit (March) and Nehase (August) are considered part of the Belg season crop. The most important contribution of the Belg season to total production is maize. In western maize zones, rainfall was 766 mm (RAIN, +8% over average) and the biomass production potential increased 4%, in spite of rather cool temperature (-0.8°C). The southwestern coffee zones recorded decreased RAIN (-21%), BIOMSS (-11%), and TEMP (-0.6°C). Overall, the reporting period, which largely coincides with the planting of Meher and harvest of Belg crops, suffered below average rainfall (RAIN, -5%) and temperature (TEMP, -0.3°C) countrywide. The national average of the VCIx (0.94) was above average, and the cropped arable land fraction (CALF) increased by 5 percentage points compared to its five-year average. As shown in the NDVI crop condition development graph, NDVI was average or above average in this monitoring period. The spatial NDVI patterns show that in some parts of southern Ethiopia, including in Arba Minch and Hosaena and covering 16.2% of the total area, the NDVI is significantly below the five-year average before June and above average thereafter. Altogether, and with the possible exception of the northeastern SNPP, the outlook for Meher crops is favorable.

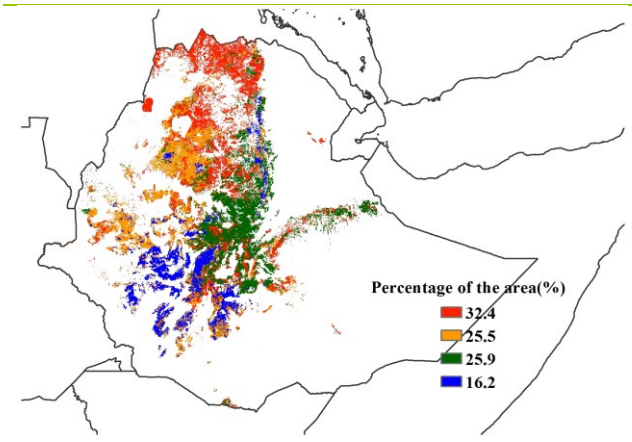
Figure 3.12. Ethiopia crop condition, April-July 2016



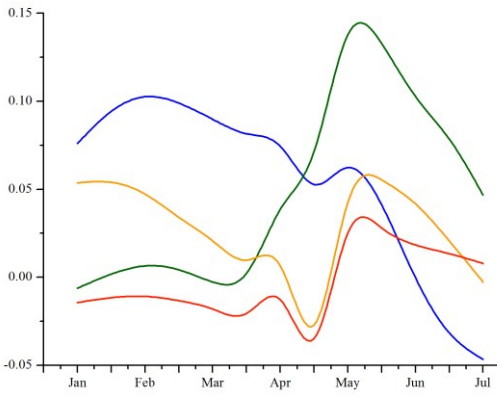
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA

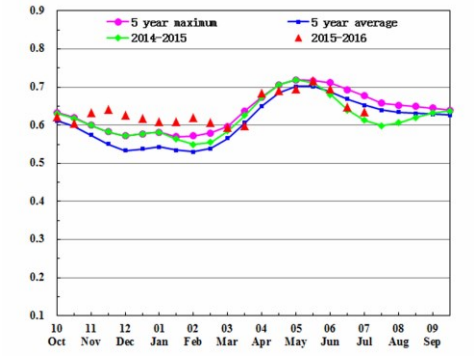


(d) NDVI profiles

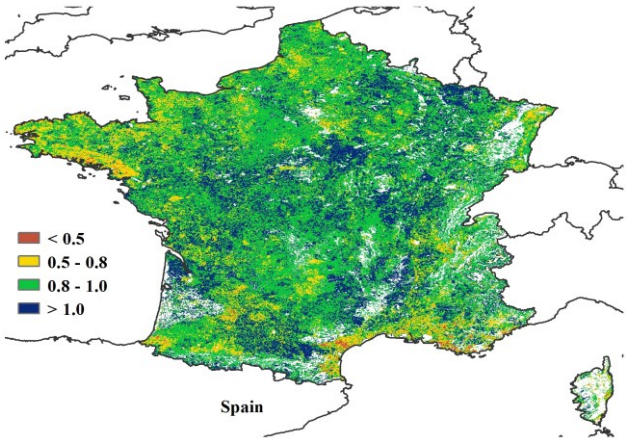
[FRA] France

Crops in France show mixed condition over the reporting period. Currently, winter wheat and spring barley have been harvested, while maize is in the vegetative stage. At the national level, compared with average, CropWatch agroclimatic indicators show that the reporting period recorded a 9% decrease in RAIN, a 0.2°C decrease in TEMP, and a significant 8% below average RADPAR. BIOMSS presents a 3% decrease compared to the five-year average. As shown by the crop condition development graph, national NDVI values were well above average and even above the five-year maximum from early April to late May due to sufficient rainfall and favorable temperature. National NDVI values began to drop below average from June—dropping even below last year's values, which is consistent with the occurrence of sudden flooding from late May to early June. Next to floods in the eastern half of the country (except its very south), drought and high temperature occurred in some areas over the reporting period, such as RAIN values of -23% from Pays de Loire to Poitou-Charentes (maize, barley, and rapeseed zone), -26% in Basse Bretagne to Haute Normandie (maize and barley), -19% from Limousin to the northwest of Rhone-Alpes, and -23% in both the southwestern maize zone (Aquitaine and Midi-Pyrénées) and the Mediterranean area. The spatial NDVI patterns compared to the five-year average and corresponding NDVI departure cluster profiles also indicate that NDVI is above average in winter crop areas and below average from June in summer crop areas. This spatial pattern is reflected by the maximum VCI in the different areas, with a VCIx of 0.93 for France overall. Generally, the agronomic indicators mentioned above show favorable condition for most winter crop areas but less favorable condition for some summer crop areas due to excess water.

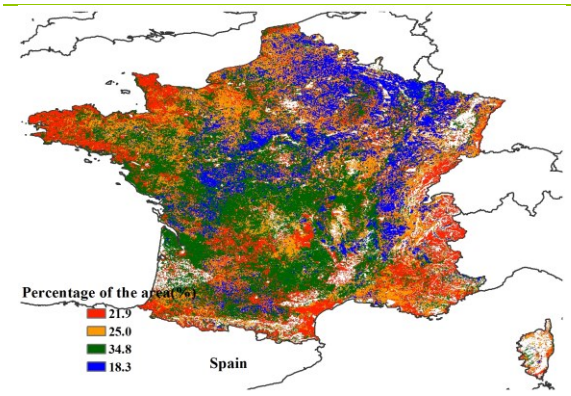
Figure 3.13. France crop condition, April-July 2016



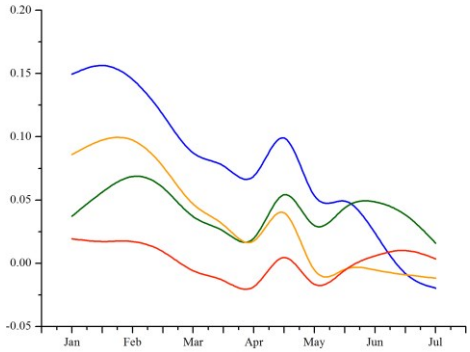
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA



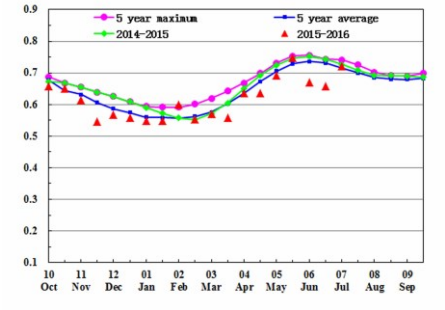
(d) NDVI profiles

[GBR] United Kingdom

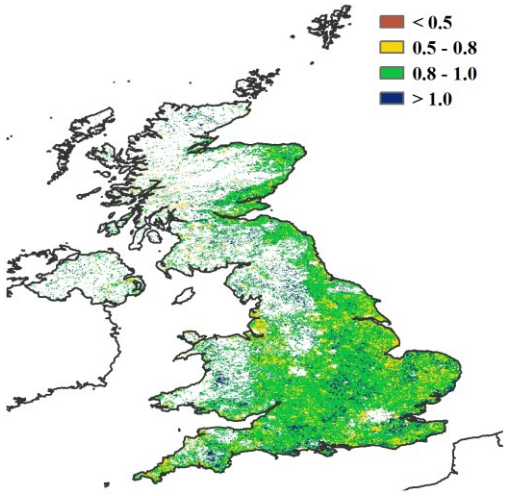
Crops in the United Kingdom showed mostly average conditions during the period from April to July 2016. During this period, most of the winter wheat, oats, and all the winter barley and winter rapeseed have been harvested, while spring barley is in the vegetative stage. Compared to average, the CropWatch agroclimatic indicators show that rainfall was in excess (RAIN, +16%) with average temperature (TEMP, +0.1°C) and well below average radiation (RADPAR, -6%). BIOMSS is expected to increase by 10% compared to the five-year average.

The national average of the VCIx (0.89) was above average, and the cropped arable land fraction remained unchanged compared to its five-year average. According to the crop condition map based on NDVI, close to 27.3% of the country recorded lower than average NDVI from May to July. Nonetheless, overall NDVI values for 72.7% of the region were average by July, with low NDVI values limited to 3.8% of agricultural areas, mostly in north Yorkshire and Humberside.

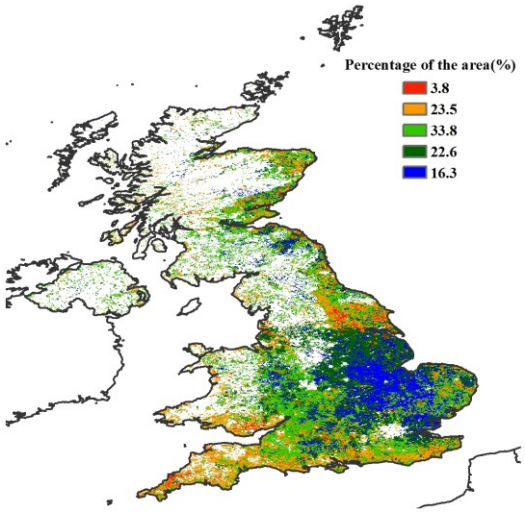
Figure 3.14. United Kingdom crop condition, April-July 2016



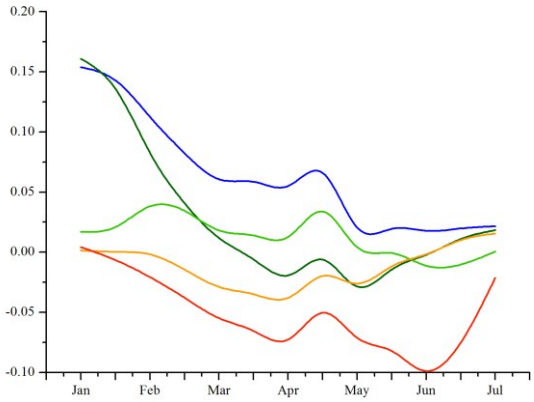
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA

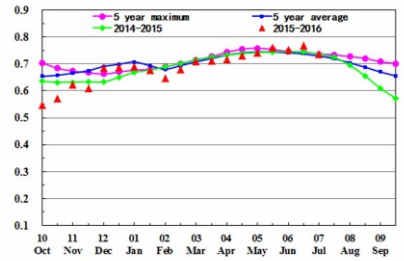


(d) NDVI profiles

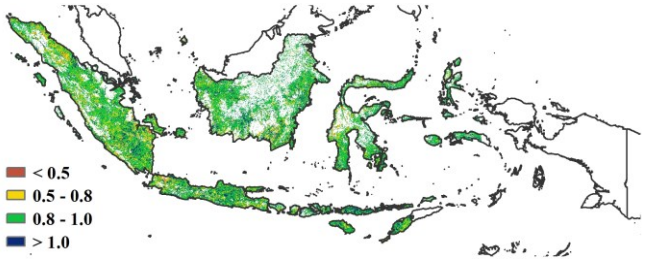
[IDN] Indonesia

Crops in Indonesia generally showed average condition between April and July. The monitoring period covers the harvest of the main rice and rainfed maize crop, as well as the growing of secondary rice. Compared with the recent average, rainfall and temperature were above average (RAIN, +15% and TEMP, +0.7°C), while the radiation values were about 3% below. The cropped arable land fraction (CALF) remained stable compared with previous years; and the average VCIx value is 0.72. Due to the favorable temperature and moisture conditions in this period, biomass increased 8% compared to the recent five-year average. According to the NDVI clusters, crop condition in most parts of the nation stayed average to slightly above average, except in Kalimantan Barat in the west of Kalimantan where NDVI was relatively low from late January to March. National NDVI profiles also present overall average NDVI from early July. Altogether, CropWatch estimates that normal yields can be expected for this season's crops.

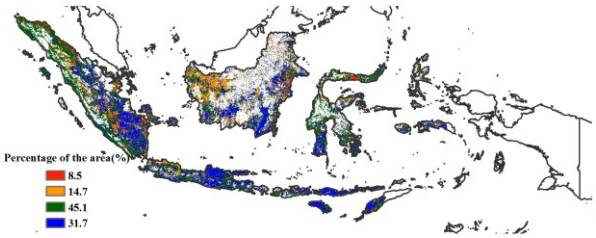
Figure 3.15. Indonesia crop condition, April-July 2016



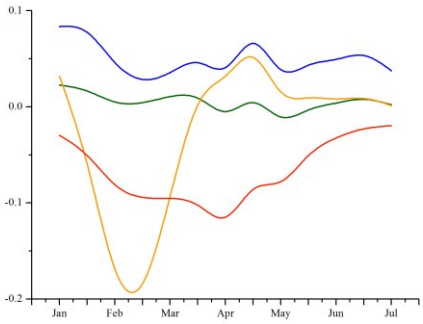
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA

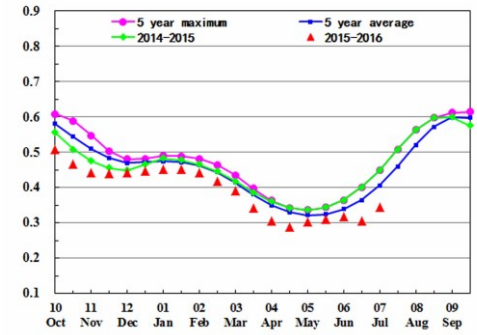


(d) NDVI profiles

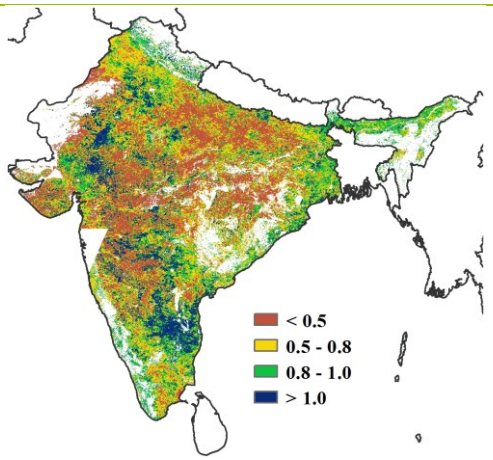
[IND] India

The monitoring period is the harvesting of Rabi and planting of Kharif crops. Severe floods damaged the crops in many states. Mostly affected regions were Assam, West Bengal, Bihar, Madhya Pradesh, Uttarakhand, and Arunachal Pradesh. The crop condition development was below average over the monitoring period. The maximum VCI values were below 0.5 for most of the states, confirming poor crop condition. The NDVI values remained favorable for the Northeast region, Tamil Nadu, Gujarat, Punjab, Haryana, Rajasthan, and West Bengal. Over central India, the NDVI profiles dropped sharply in the end of April and recovered in mid-May, dropping again from early June. In the rest of the regions, the NDVI fell in the end of April and somewhat recovered mid-May. The rainfed biomass accumulation potential was 8% above the five-year average and could be linked to the 20% excess rainfall over the country, mainly in the following states: Assam (RAIN, +20%), Bihar (+17%), Chhattisgarh (+36%), Haryana (+36%), Maharashtra (+31%), Madhya Pradesh (+75%), Manipur (+43%), Nagaland (+25%), Rajasthan (+94%), Arunachal Pradesh (+13%), Tamil Nadu (+36%), Andhra Pradesh (+54%), Tripura (+9%), Uttarakhand (+24%), Uttar Pradesh (+39%), and West Bengal (+5%). However, low rainfall was measured in some states like Gujarat (RAIN, -18%), Goa (-30%), Kerala (-26%), Orrisa (-18%), and Punjab (-20%). The crop arable land fraction (CALF) dropped by -12 percentage points compared to the five-year average. Temperature (TEMP) was average, while radiation (RADPAR) was -3% below. Overall, assessed crop condition is poor and the expected reduced output is mainly due to the excess rainfall, flooding, and decreased area of cultivated land.

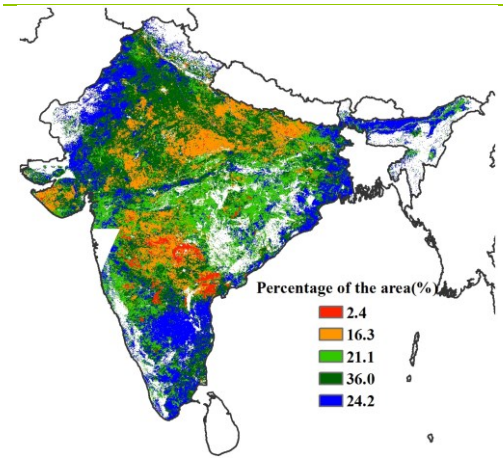
Figure 3.16. India crop condition, April-July 2016



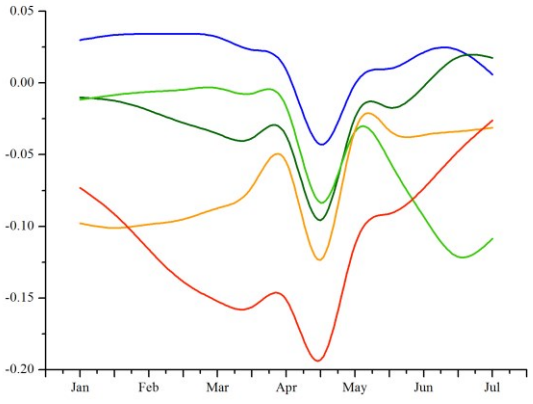
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA



(d) NDVI profiles

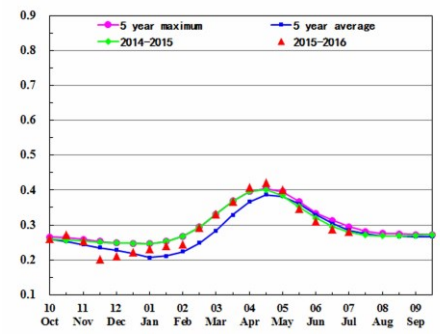
[IRN] Iran

The crop condition from April to July 2016 was generally below average in Iran. Winter wheat was harvested from June to July, and summer crops were planted starting in May. Accumulated rainfall (RAIN, -23%) was far below average during the monitoring period, while temperature (TEMP, -0.5°C) and radiation (RADPAR, -1%) were only slightly below average. The agroclimatic indices for the current season indicate unfavorable weather conditions for crop growth, which is confirmed by the decrease of the BIOMSS index by 9%. The national average of the VCIx (0.88) was above average, and the CALF increased by a spectacular 26 percentage points compared to the five-year average.

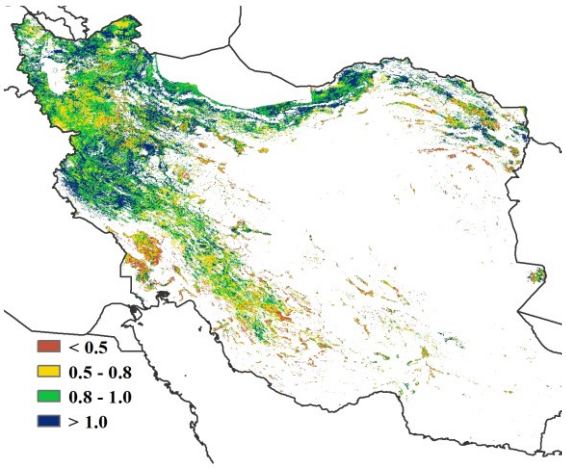
During the whole monitoring period, crop condition above the five-year average occurred in Kermanshah, Llam and surrounding provinces of the western region, and the Mazandaran and Gilan provinces of the central-north region. Khuzestan and Fars provinces in the southwest region, as well as most of the northwest and eastern regions, generally experienced unfavorable crop condition from May to July.

Overall, the total outcome of summer crops is expected to be favorable because of the significant increase of cropped arable land.

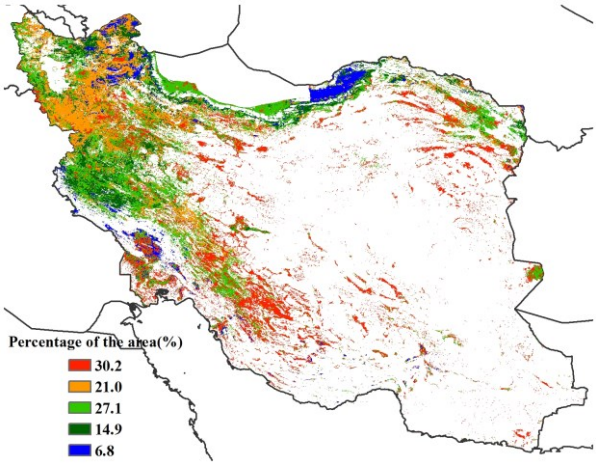
Figure 3.17. Iran crop condition, April-July 2016



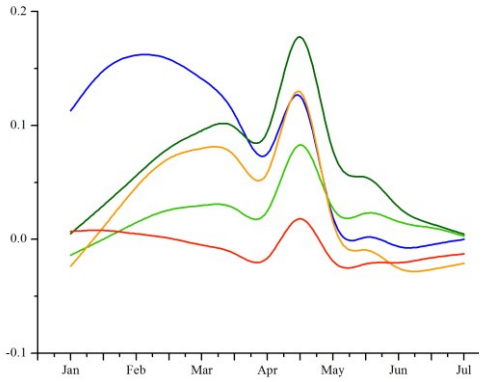
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA



(d) NDVI profiles

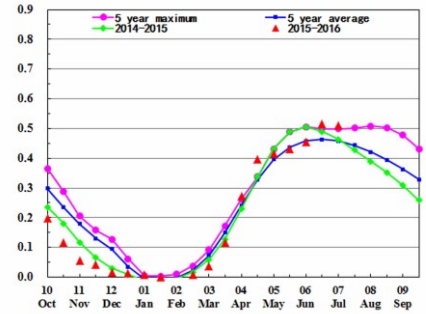
[KAZ] Kazakhstan

Spring wheat and barley were sowed before June and now are growing; other cereals in the country also entered into their vegetative stage. During the reporting period, crop condition in Kazakhstan was generally favorable.

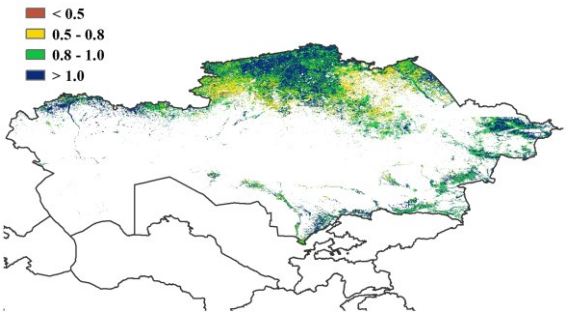
Among the CropWatch agroclimatic indicators, RAIN was very significantly above average (+71%), with close to average temperature (TEMP) and well above average radiation (RADPAR, +6%). This resulted in a marked BIOMSS increase over the five-year average (+44%). Crops developed well and crop condition was above the maximum of the past five years in April. Maximum VCI was above 0.8 in most areas. Considering the current NDVI profiles and spatial NDVI patterns compared to the past five years, most of the areas in Kazakhstan are above average this month. In about 72% of the cultivated areas (mainly in Kustanayskaya, Severo kazachstanskaya, Akmolinskaya, Pavlodarskaya, and Vostochno kazachstanskaya), the condition of crops was slightly below average from early May to early June. Later, the vegetation index gradually increased and reached the maximum of the past five years in late June and July.

During the reporting period, thanks to abundant precipitation, the country enjoyed favorable conditions that will benefit crops and grazing lands.

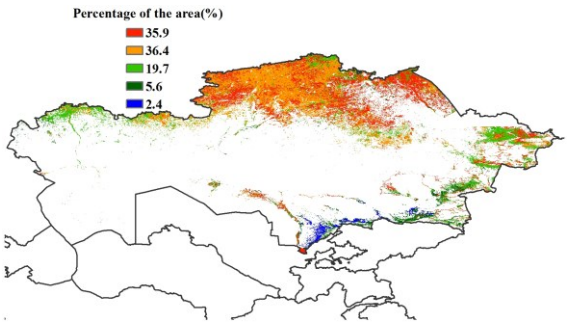
Figure 3.18. Kazakhstan crop condition, April-July 2016



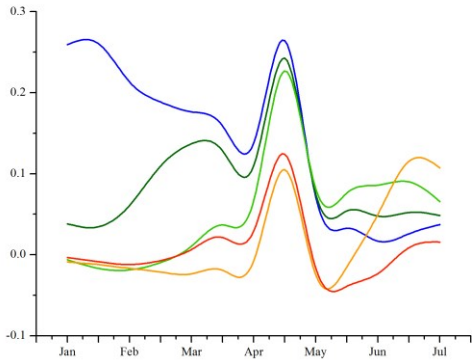
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA

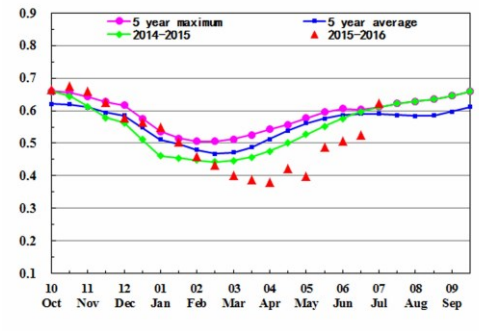


(d) NDVI profiles

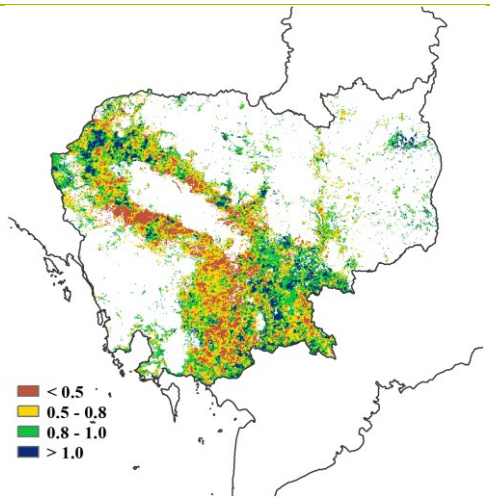
[KHM] Cambodia

The period from April to July 2016 covers the harvest of the second (dry season) rice, the early stage of the main (wet season) rice, and the growing period of maize. Compared to the five-year average, crop condition before July was well below average since April. The CropWatch agroclimatic and agronomic indicators show that Cambodia enjoyed a minor increase in precipitation compared to average (RAIN, +7%), with average temperature (TEMP, -0.1°C). This resulted in a biomass production potential (BIOMSS) drop of 7%. Low vegetation condition indices (VCIx<0.5) occur scattered around Tonle Sap. Average VCIx reaches just 0.75 and the cropped arable land fraction (CALF) dropped by a spectacular 7% compared with the previous five seasons. NDVI of most of the arable land (80%) presents continuous below average condition except for Kampong Chaam, Prey Veaeng, and some other, scattered areas. Overall crop prospects for the country are very poor.

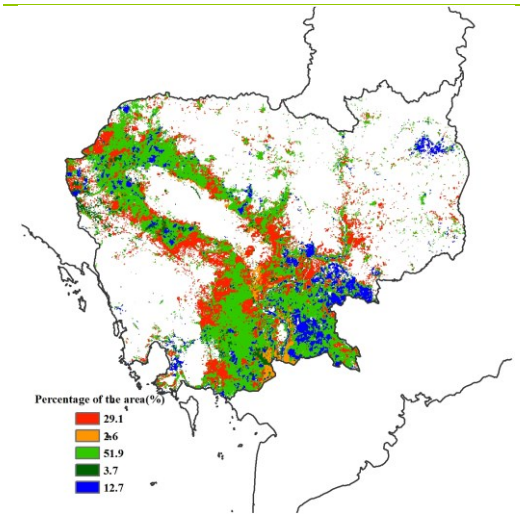
Figure 3.19. Cambodia crop condition, April-July 2016



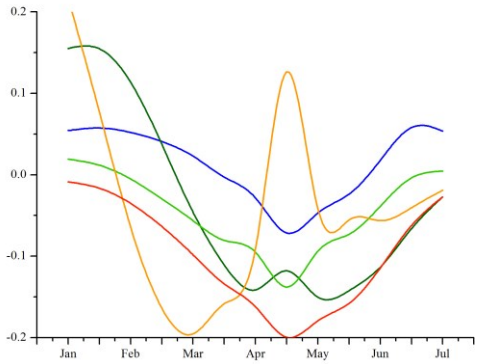
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA



(d) NDVI profiles

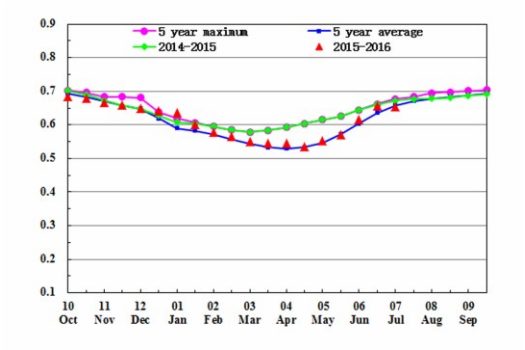
[MEX] Mexico

In Mexico over the reporting period, maize, sorghum (autumn-winter), and wheat have been harvested, while the sowing of maize, sorghum (spring-summer), and rice is underway. In general, crop condition was at the same level as the average of the recent five years.

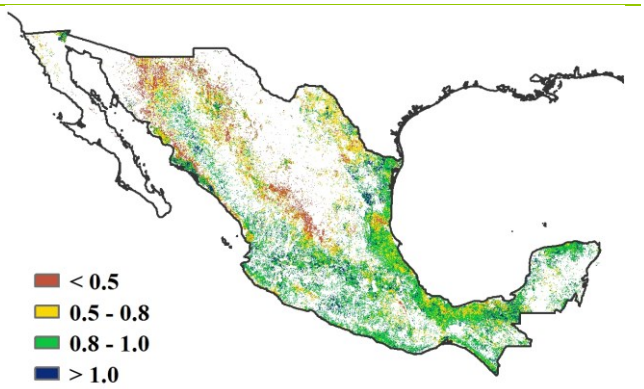
According to the CropWatch agroclimatic indicators, rainfall increased by 4%, whereas temperature dropped by 0.5°C, both compared to average. RADPAR was average. Agronomic indicators for the country show that BIOMSS (+5%) and the cropped arable land fraction (CALF, +1 percentage point) were above average. The average maximum VCI in Mexico was 0.79, with higher values (0.8-1.0) occurring in the south and southeast parts of the country and lower values (<0.5) in northwest and central parts. The spatial pattern and NDVI departure profiles show that crop condition for about 46% of planted areas was above average (mainly in southern and northeastern Mexico), while 40% of cropped areas, located in the northwest and eastern parts of the country, were below average.

Altogether, crop production in Mexico is likely to be average.

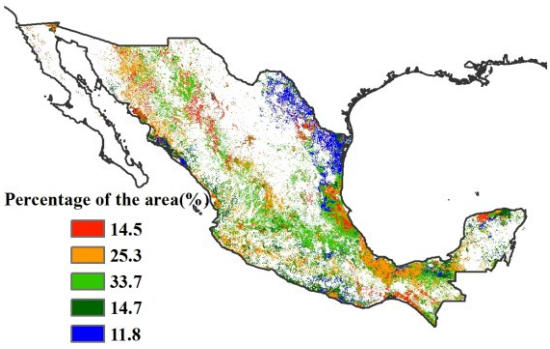
Figure 3.20. Mexico crop condition, April-July 2016



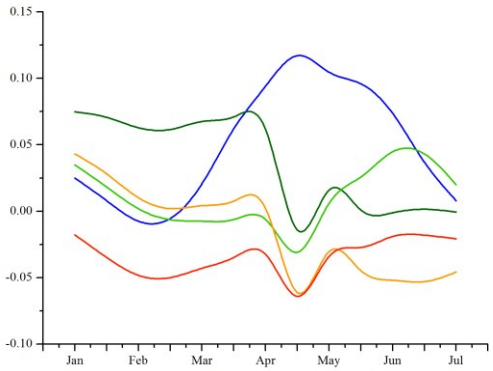
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA

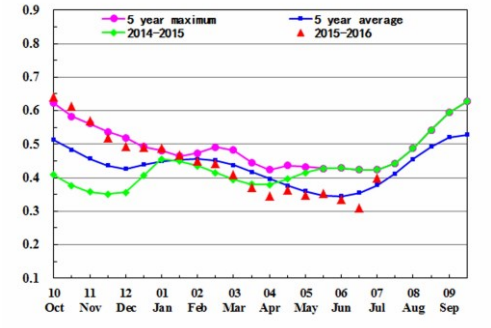


(d) NDVI profiles

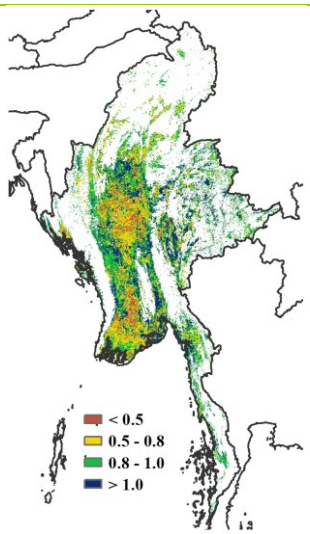
[MMR] Myanmar

The reporting period is the main rice season in Myanmar. The harvesting period of the maize, wheat, and second rice crop was completed in mid-April, mid-May, and mid-June respectively, with the main rice crop starting growth in early May. Based on CropWatch indicators, crop condition was average from April to July. The CropWatch agroclimatic and agronomic indicators showed an increases in rainfall (RAIN, +9%) but a slight decrease in temperature (TEMP, -0.4°C). The fraction of cropped arable land (CALF) decreased by 2 percentage points while biomass accumulation potential (BIOMSS) increased by 1% compared to the previous five-year average. Crop condition development was above the five-year average in July, while below average values prevailed from April to June. The spatial NDVI profile values were below average from April to June in the whole country, and recovered in mid-June only for Yangon and part of the center, which is consistent with the maximum VCI map. Overall, CropWatch assesses the crop condition and production outlook as average to below average.

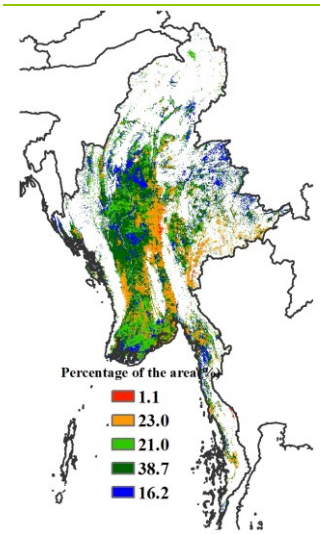
Figure 3.21. Myanmar crop condition, April-July 2016



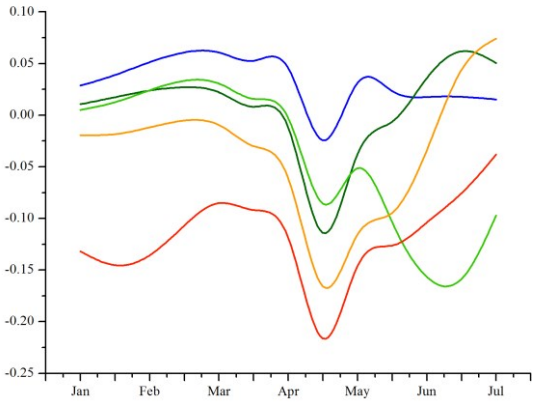
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA

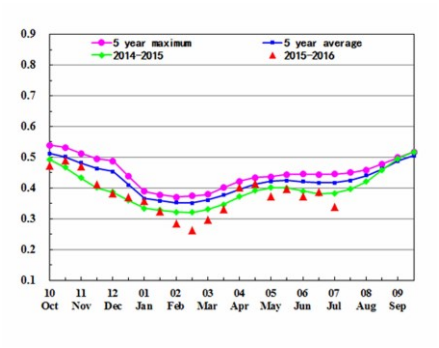


(d) NDVI profiles

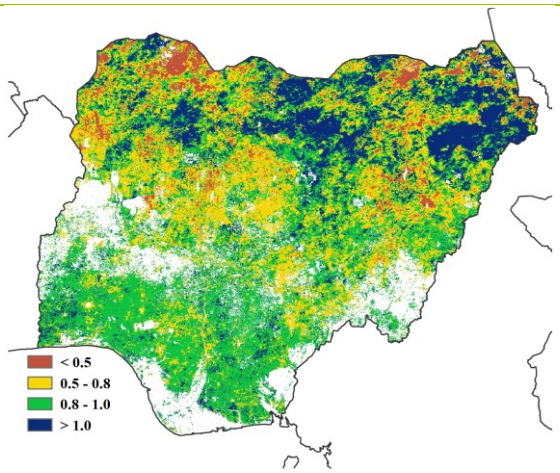
[NGA] Nigeria

Rain, temperature, and sunshine conditions in Nigeria were close to average during the monitoring period. Among all the four ecological zones, the Sudan-Sahelian area had the largest increase in potential biomass (BIOMSS, +24%), resulting from a large increase in rainfall (RAIN, +26%). Considering biomass, only a slight change in biomass production potential occurred in both the Derived Savanna zone and the Humid Forest zone (BIOMSS, +1% and +3% respectively), as these two regions also had only limited changes in rain (RAIN, -4% and -2% respectively), temperature (-0.6°C and 0.0°C), and sunshine (+1% and -3% respectively) in the past few months. A 9% increase in BIOMSS was found for the Guinean Savanna. According to the value for the Cropped Arable Land Fraction (CALF), Nigeria crop land expanded 2 percentage point compared with the five-year average. The NDVI profiles show that most parts of the north were close to average, in an area where VCIx reached record values above 1. The only current area of concern is in the south and especially southwest (Osun, Oyo, Ekiti, covering about 6.5% of arable lands) where NDVI departs from average by more than -0.2. Altogether, crop condition is favorable, especially in the north.

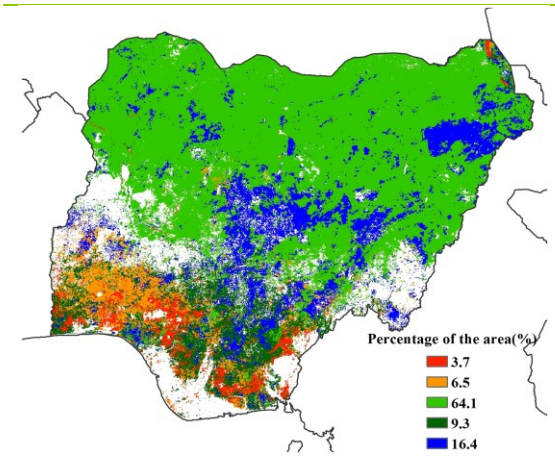
Figure 3.22. Nigeria crop condition, April-July 2016



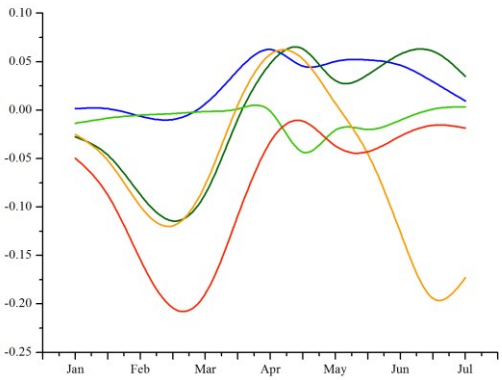
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA

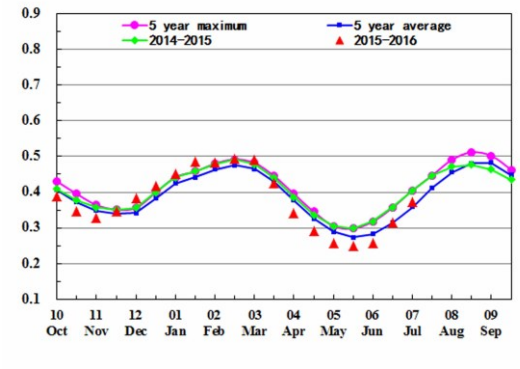


(d) NDVI profiles

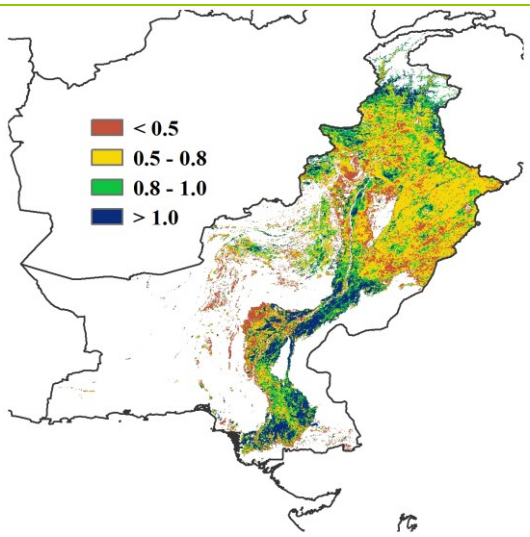
[PAK] Pakistan

The reporting period covers the harvest of winter wheat and barley, as well as the sowing and early growth of summer crops (cotton, rice, and maize). Agroclimatic indicators show an increase of rainfall over average (RAIN, +15%) and a decline of radiation (RADPAR, -1%). Temperature was below average (TEMP, -0.7°C), whereas the biomass production potential is close to average (BIOMASS, +2%). CALF diminished (-8 percentage point) below its five-year average. The national NDVI development graph illustrates that crop condition was below average from the start of April till the end of June, after which values turned average. The lowest maximum VCI values (<0.5) arise in Punjab and the Baluchistan provinces, upper Sindh, and southern Khyber Pakhtunkhwa. According to the NDVI profiles, 63.2% of the cropped areas exhibit below average conditions, much of it in Baluchistan province and central-east Punjab. On the other hand, 36.8% of the areas show above average NDVI, mostly in the regions along the lower Indus River or northern Khyber-Pashtun province. Altogether, crop condition is estimated to be average.

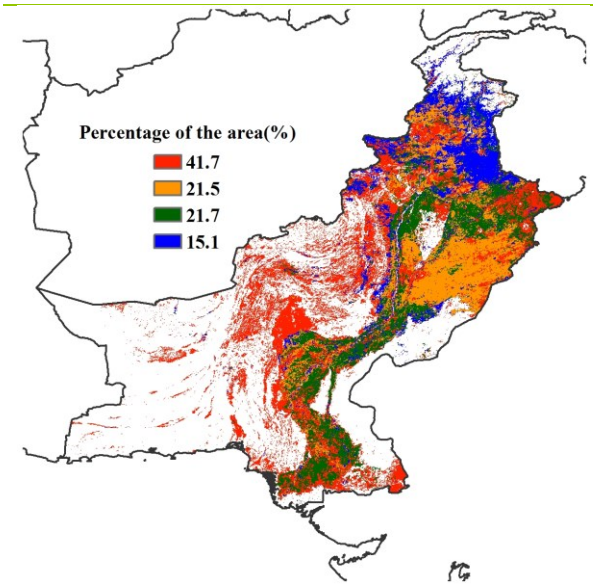
Figure 3.23. Pakistan crop condition, April-July 2016



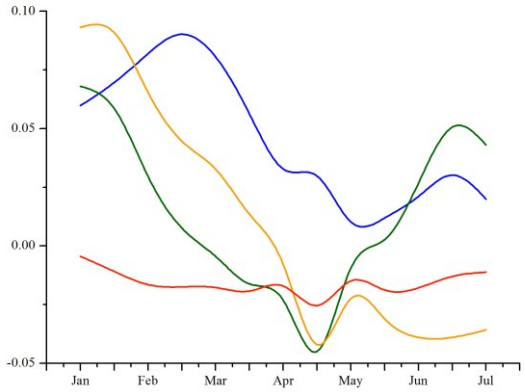
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA

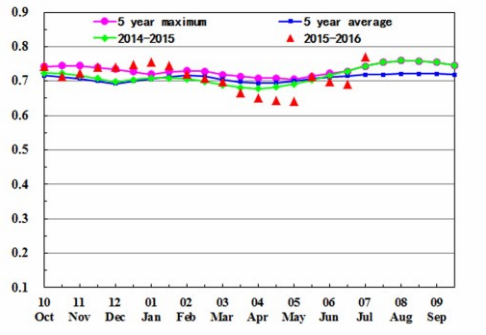


(d) NDVI profiles

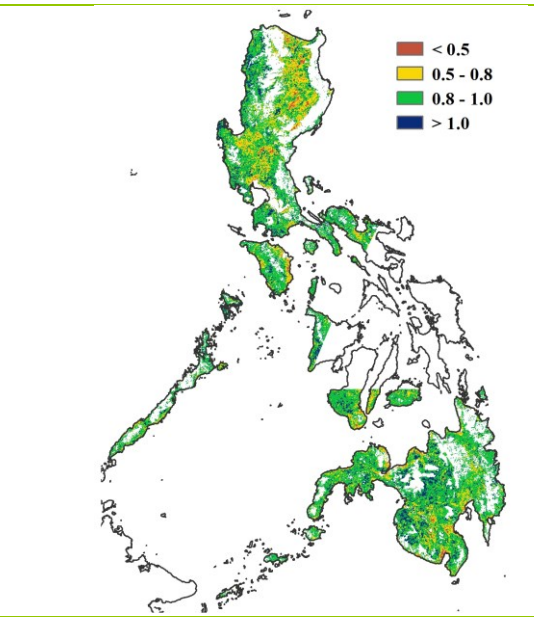
[PHL] The Philippines

In the Philippines, the main rice crop is currently growing, while maize has reached maturity and is about to be harvested. Nationwide, radiation was slightly above average (RADPAR, +2%), while rainfall (RAIN) was 6% below average, resulting from the recent El Niño impacts in the Asia-Pacific region; the biomass accumulation potential (BIOMSS) shows a significant decrease of 8%. The average national maximum VCI was 0.88 and the cropped arable land fraction (CALF) remained the same as during 2015. Considering the spatial patterns of NDVI profiles, crop condition in Caraga and Bicol region was above average during the whole monitoring period. In Soccsksargen and northern Mindanao, crop condition was much below average due to seasonal rainfall deficits from March to May, then recovered to average in June. NDVI in the beginning of May was significantly below average but returned to the maximum value in late-July. Altogether, the output of the main season rice is expected to be about average or just below.

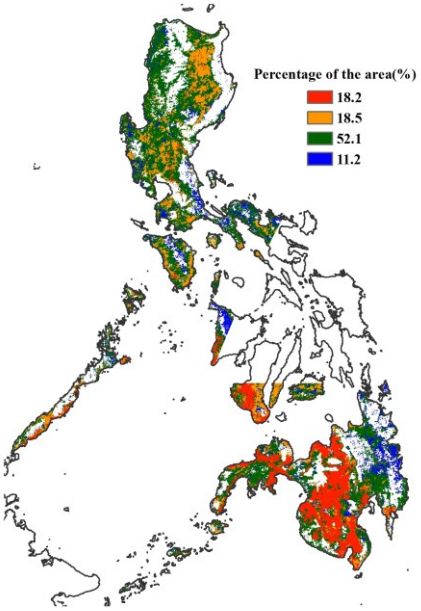
Figure 3.24. Philippines crop condition, April-July 2016



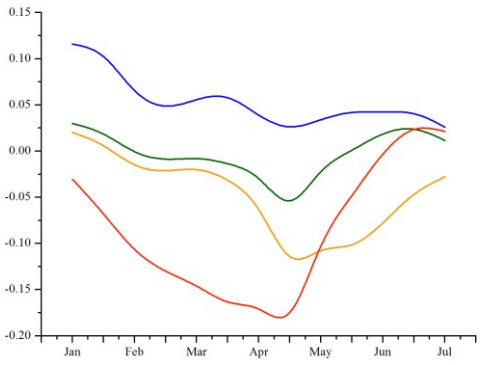
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA



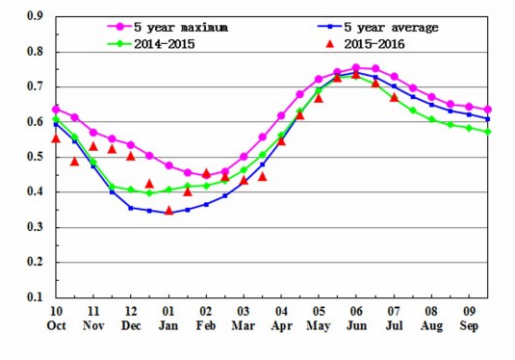
(d) NDVI profiles

[POL] Poland

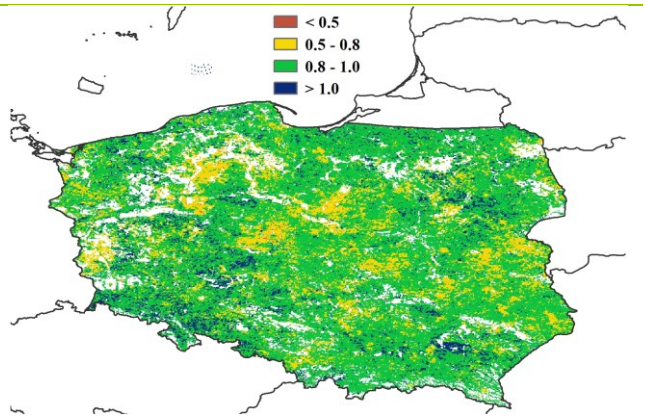
In Poland, maize planting begins in May, while winter wheat harvesting starts in July. Over the reporting period, the cropped arable land fraction (CALF) remained the same as the average of the last five years. During April to July, rainfall (RAIN) was up 11% compared to average. Both temperature (TEMP) and radiation (RADPAR) were near average, while the potential biomass (BIOMSS) increased 5% due to the sufficient rainfall.

As shown in the NDVI crop condition development graph, the NDVI in Poland is below average but comparable to the previous 2014-15 season. In most parts of the country with the exception of the southwest, NDVI was lower than usual until May due to the poor weather conditions early in the season; afterwards, however, NDVI recovered as a result of sufficient rainfall. In the southwest, including Dolnosalaskie and Wielkopolskie, crop development is slightly advanced. Considering the average VCIx of 0.87, the final assessment for Poland is that crop condition is mixed but fair.

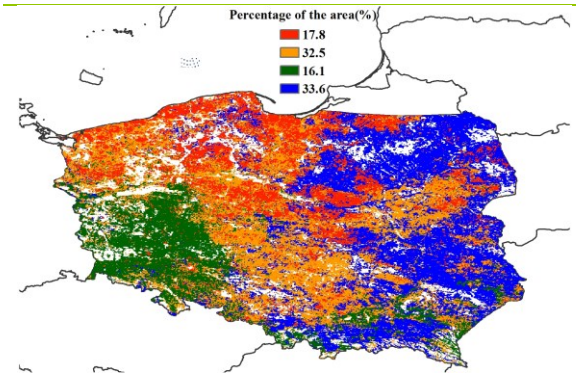
Figure 3.25. Poland crop condition, April-July 2016



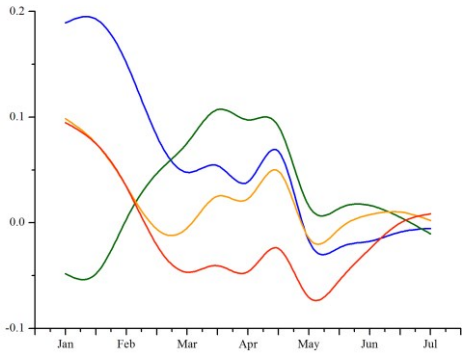
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA



(d) NDVI profiles

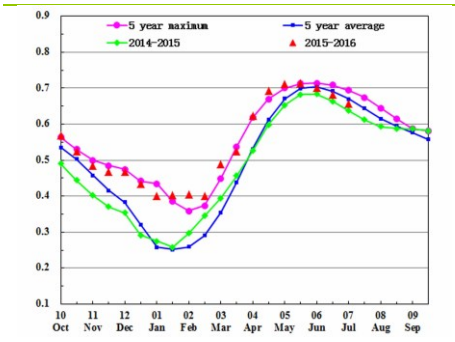
[ROU] Romania

In Romania, the winter wheat harvest starts in July, while summer crops are planted from May. These include maize, sunflower, some fruits and vegetables, fodder, soybeans, rapeseed, potatoes, and pulses; which in the south are mostly irrigated (with the exception of temporary fodder). Romania presented favorable crop condition from April to July (VCIx=0.98). Overall, temperature (TEMP) was average with a minor rainfall anomaly (RAIN, +13%), a positive biomass production potential (BIOMSS, +8%), and lower than average sunshine (RADPAR, -1%).

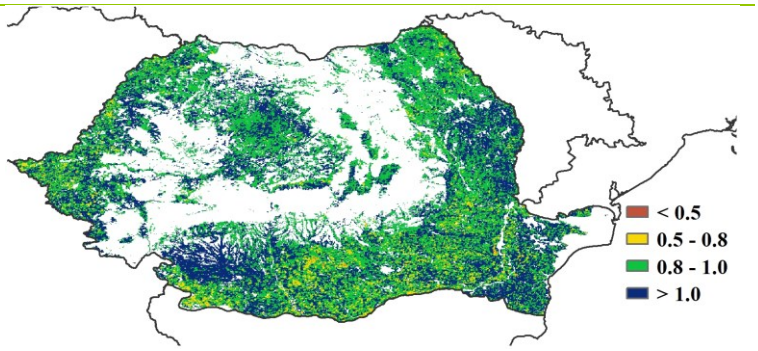
As shown in the national crop condition development graph, NDVI rather closely followed the maximum of the previous five years from April to May, while after May the NDVI suddenly declined compared to both the five-year maximum and five-year average, following the trend of 2014-2015 up to the end of the reporting period. In most parts of southern, southeast, central, and northwest Romania, crop condition is above average (VCIx 0.8-1.0 and >1.0), except for some small patches in southern and northwest Romania which had average condition (VCIx 0.5-0.8). In some parts of the country, for instance in the south and southeast (VCIx 0.8-1.0 and >1.0 range), the NDVI profile is consistently and significantly average (that is, 0.29 since April), while suddenly declining at the end of April up to the start of July, reaching low NDVI values (that is, <0.0) in 10.5% of the cropped area.

In the west and some patches in the south where VCIx is 0.8-1.0, about 32.8% of cropland had a marked drop of NDVI after the end of April, reaching a low but nevertheless positive NDVI departure. This is also the only area, along the Hungarian border, where the biomass production potential shows positive departures from the recent average. Located in parts of the northeast and in the center, about 33.3% of cropped areas had a marked drop of NDVI after the end of April reaching average NDVI until the start of July. Considering the summer conditions, and the fact that CALF remained average, summer crop prospects are average.

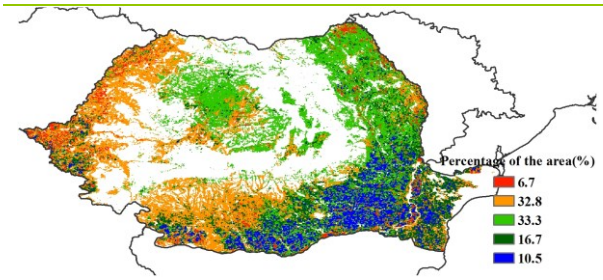
Figure 3.26. Romania crop condition, April-July 2016



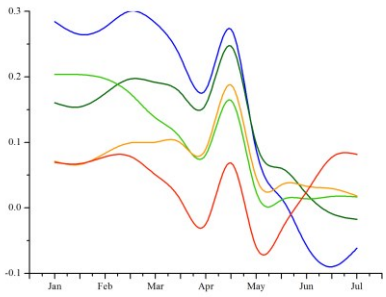
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA



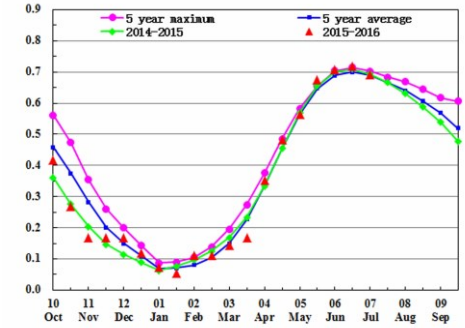
(d) NDVI profiles

[RUS] Russia

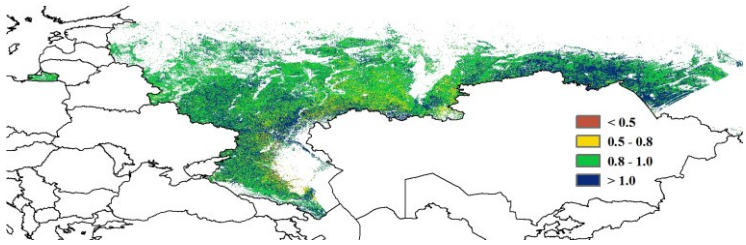
Russia experienced very favorable climate conditions from April to July (VCIx=0.92).The winter wheat harvest in the country began in mid-June, while the planting of maize and spring wheat started in April. The fraction of cropped arable land was 3 percentage points below the five-year average. In general, Russia experienced warm and wet conditions over the recent four months. Precipitation exceeds the recent average (RAIN, +12%) and the temperature was just slightly above average (+0.2°C). Mainly due to weather condition, the BIOMSS indicator rose 12% over the last five-year average.

As shown in the NDVI crop condition development graph, the NDVI is close to last year and last five years' average in this monitoring period, while crop condition is favorable in most parts of Russia's cropland (VCIx>0.8). The spatial NDVI patterns show that most parts of Russia (especially in the northwest, central area, Kalingrad, and Caucasus) benefit from abundant water supply—the RAIN indicator is 20% above average, and the harvest of winter wheat in these areas has been advanced. A dry pocket is centered around the region of Perm (RAIN, -30%), with dry conditions extending to adjacent areas to the south from Sverdlovsk (-11%) and Bashkiria (-26%) to the Kostroma Oblast (-11%). In general, however, the overall outlook of Russia's winter and summer crop is favorable.

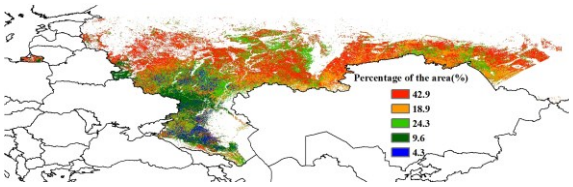
Figure 3.27. Russia crop condition, April-July 2016



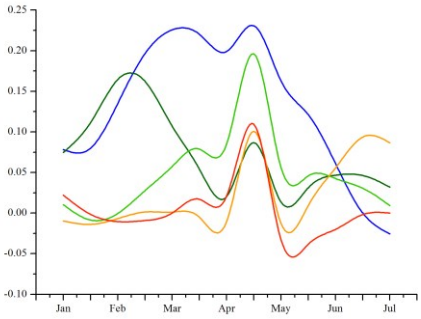
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA

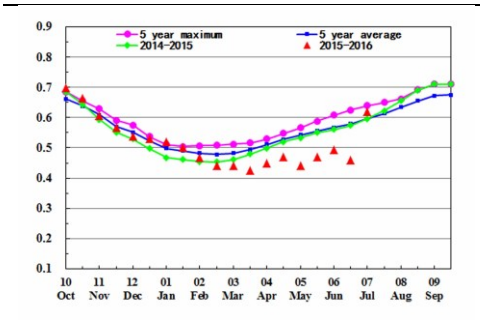


(d) NDVI profiles

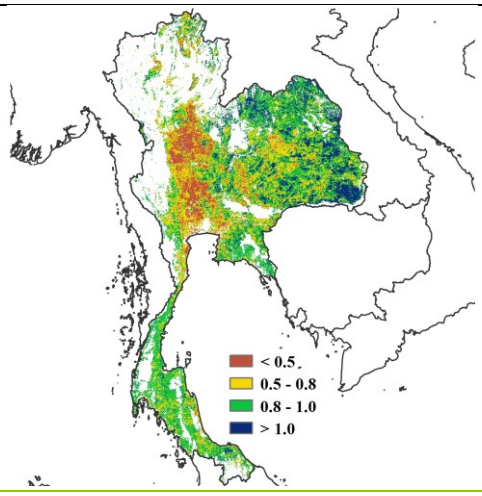
[THA] Thailand

Crop condition from April to July 2016 was below average in Thailand. During the monitoring period, the main rice is at the sowing stage, while the harvest of the country's second rice crop was completed in June. Accumulated rainfall, temperature, and radiation were slightly above the five-year average. Although the agroclimatic indices show good condition, BIOMSS decreased 1% in this period. As shown in the VCIx map, crop condition was poor in western Thailand (VCIx<0.5), which is confirmed by the NDVI. The NDVI profiles show that crop condition in Thailand improved in several areas though remained well below average, except for some areas in the northwest (roughly the single-cropped rice area west of Loei to Buriram) and the area south of Prachuap Khilikhan; these areas make up 42.1% of the arable land in the country. Overall, the condition of the main rice season is generally unfavorable.

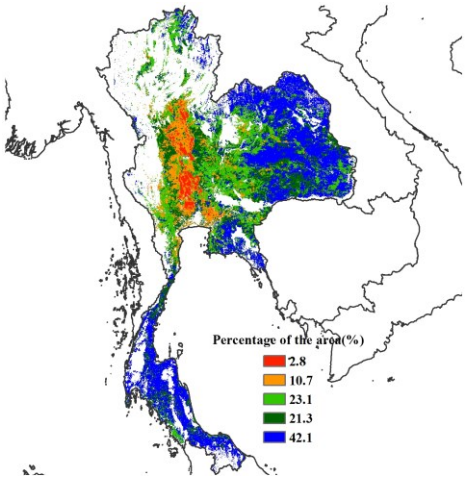
Figure 3.28. Thailand crop condition, April-July 2016



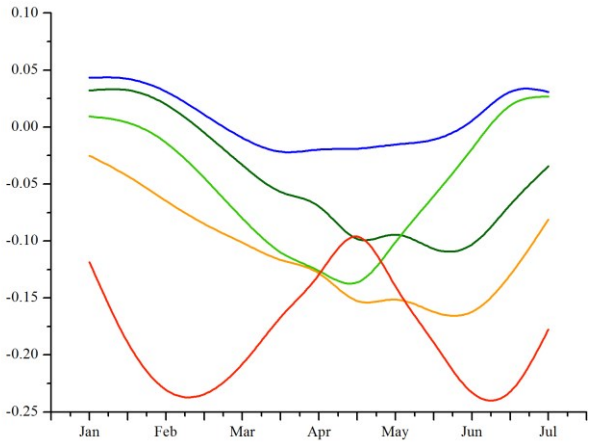
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA



(d) NDVI profiles

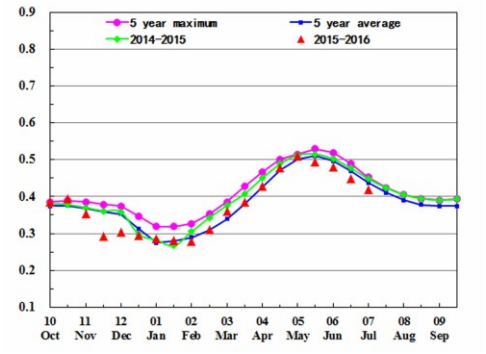
[TUR] Turkey

The crop condition from April to July 2016 was generally below average in Turkey. The winter wheat harvest was completed, and summer crops planted since April are still growing. Accumulated rainfall (RAIN, +1%) and radiation were close to average, while the accumulated temperature (TEMP, +0.7°C) was slightly above. The agroclimatic conditions resulted in a decrease of BIOMSS by 8%. The maximum VCI (VCIx=0.8) was above average, and CALF decreased by 4 percentage points compared to the recent five-year average.

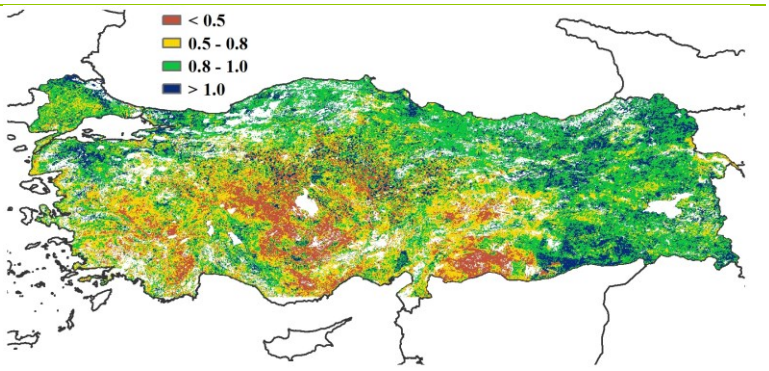
The map of maximum VCI presents a pattern consistent with the NDVI cluster map. Crop condition above the recent five-year average prevailed in the Marmara, Black Sea, and Eastern Anatolia regions. Crop condition in most of Aegean and Mediterranean regions was unfavorable over the monitoring period. Poor crop conditions have been continually distributed in most of the central and southeastern Anatolia region since the last monitoring period.

Overall, the outcome for the summer crop season is unfavorable.

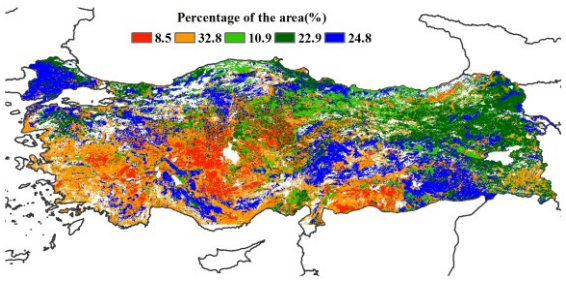
Figure 3.29. Turkey crop condition, April-July 2016



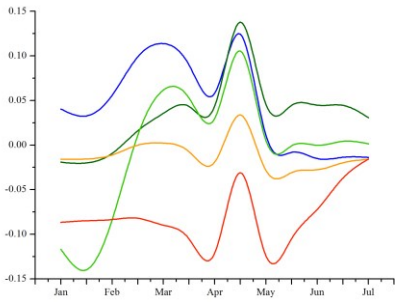
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA



(d) NDVI profiles

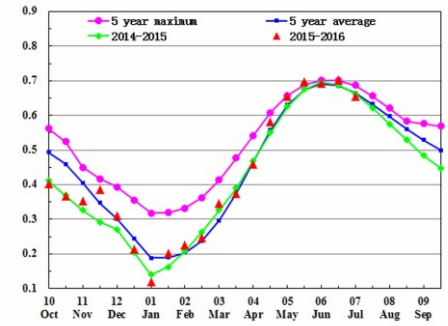
[UKR] Ukraine

The main crops present in the field during April–July in the Ukraine are barley and maize. Irrigated crops (paddy, vegetables, sunflower, potatoes, pulses, and sugar beet) occur mostly in the south, in the Oblasts of Kherson, Crimea, and Doentsk, as well as in Zaporizhia. While winter crops are harvested in July and August, the harvest of spring crops takes place after August and as late as October for maize.

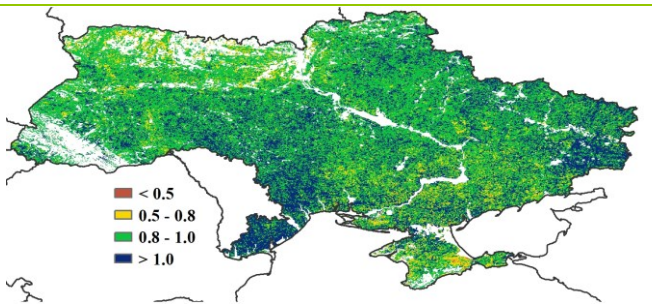
Agroclimatic conditions were average over the reporting period (RAIN, +3.0%; RADPAR, -1%; TEMP, +0.0°C). As illustrated in the section on the Central Europe to Western Russia MPZ (chapter 2.7), the increase in biomass potential (as described by BIOMSS) is large (>20%) in the northeast part of the country along the Russian border. Limited parts of west, north, central, and southeastern Ukraine have negative to low positive biomass anomalies (<-20% to +10%). Most parts of the country enjoyed favorable conditions: at the national level, a biomass increase (+9%) is expected. According to the national NDVI profile, crop condition in Ukraine is close to the reference five-year average with an average maximum VCI index of 0.95.

Altogether, the production of 2016 spring crops is expected to be slightly below that of last year (2015). With the cropped arable land fraction (CALF) remaining stable, an average season is expected.

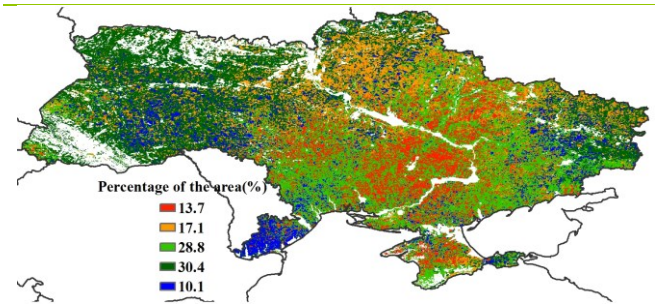
Figure 3.30. Ukraine crop condition, April-July 2016



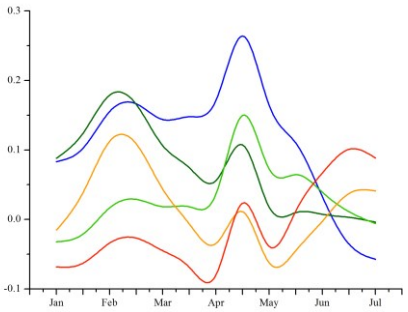
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA



(d) NDVI profiles

[USA] United States

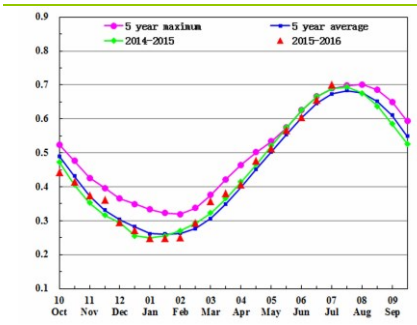
Based on the global NDVI profile, CropWatch conjectures above average crop condition for the United Stated This reporting period covered the harvesting season of winter crops and the core of the growing season of summer crops.

In general, weather was normal in the United States: CropWatch agroclimatic indicators recorded an 8% increase in precipitation, a 0.3°C drop in temperature, and a 1% drop in radiation at the national level. In the major production zones abundant rainfall was recorded. The main production zone for winter crops also received abundant rainfall, including in Kansas (RAIN, +56%), Oklahoma (+40%), and Texas (+45%) where serious floods occurred in June. Plentiful precipitation was also recorded in the northern Plains and western Great Lakes, including Nebraska (+38%), South Dakota (+37%), North Dakota (+55%), and Minnesota (+38%, resulting in floods in July). In the Corn Belt, normal or above average rainfall was recorded in Wisconsin (+7%), Indiana (+4%), Illinois (+10%), and Iowa (+13%), while Ohio (-22%) and Michigan (+27%) suffered a water deficit. As the most important rice producing state, Arkansas received above average rainfall (+11%), which benefited the growth of paddy.

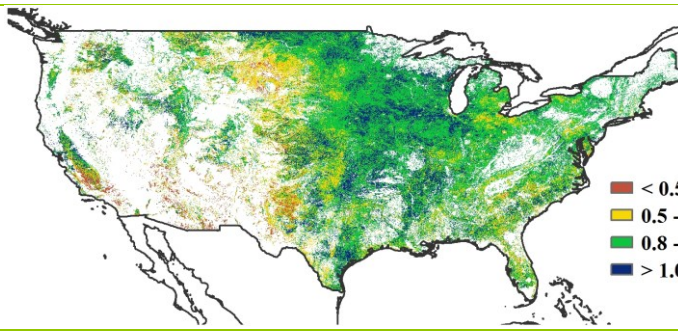
Without doubt, the predominantly humid weather provided enough soil moisture for crop growth. In major parts of the southeastern United Stated (including Arkansas, Louisiana, Alabama, Tennessee, and Florida), good crop condition is confirmed by NDVI cluster profiles and positive departure of crop condition development. Good production of paddy and cotton is to be expected this year. Although the states suffering from some floods, the good crop condition in winter crop states (Kansas, Texas, and Oklahoma) is also supported by positive NDVI departures. In the Corn Belt, crop condition in the south and east (including Illinois, Iowa, and Indiana) shows positive departures, while in the western and northern Corn Belt (Minnesota, Michigan, and Wisconsin) and northern Plains (North Dakota and South Dakota), crop condition was below average, resulting possibly from water deficit or excess.

In this monitoring period, the seeded area also increased 1% compared to the recent five-year average as a result of sufficient soil moisture. Altogether, crop prospect are favorable. (See table B.5 in Annex B for production estimates.)

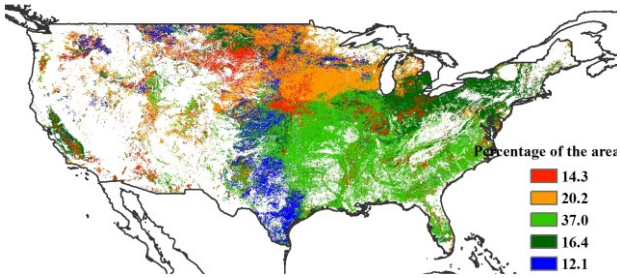
Figure 3.31. United States crop condition, April-July 2016



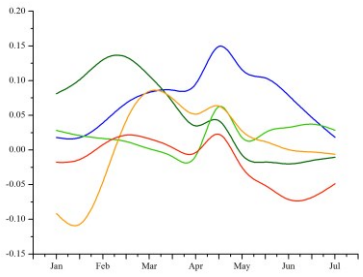
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA



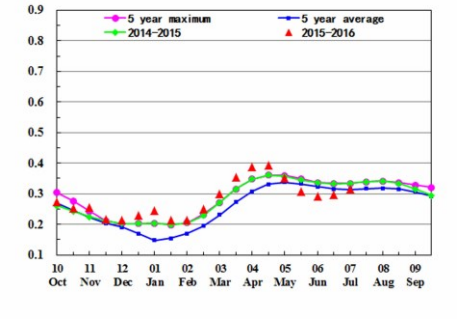
(d) NDVI profiles

[UZB] Uzbekistan

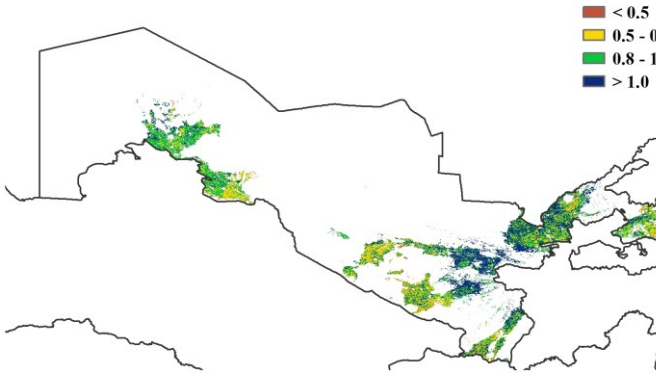
This analysis covers the growing and harvesting stage of winter cereals, along with the sowing and growth of maize and other coarse grains from April to July. The country as a whole showed a large increase of RAIN (+82%), while TEMP and RADPAR both dropped compared with average (-0.4°C and -5%). The combined effect of the precipitation and temperature was a sharp increase in BIOMSS in the order of +93% compared to the five-year average.

The national NDVI development graph showed that crop condition was above the maximum of the past five years in April, after which it dropped to below average. More precise spatial information is provided by the NDVI profiles and spatial NDVI patterns, which confirm the sudden fall of NDVI in May to average levels. In July, crop condition was a little below average, with about 33% crop lands in poor condition (cotton growing areas of Karakalpakstan, Andijon and Quqon, Navoiy, Kagan, Qarshi, Shakhriabz, Denow, Guliston, Tashkent, Termiz, Fergana, and Namangan). In short, winter crop condition was generally at least fair from April to July, while crop condition was less favorable though nevertheless close to average for summer crops.

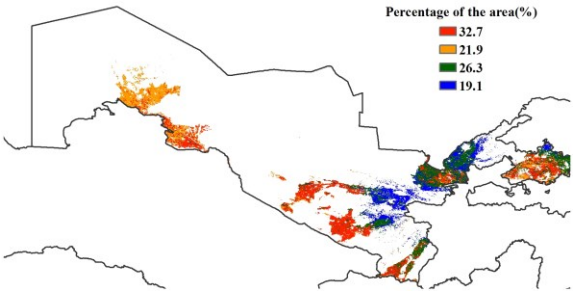
Figure 3.32. Uzbekistan crop condition, April-July 2016



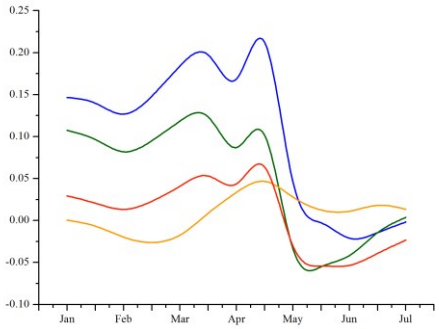
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA

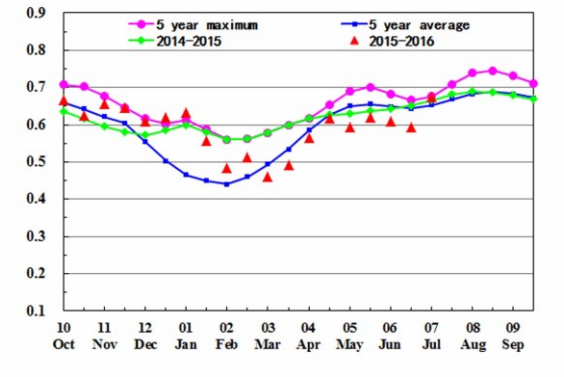


(d) NDVI profiles

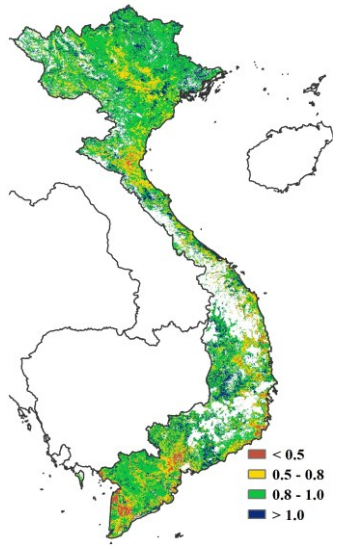
[VNM] Vietnam

The period from April to July mainly covers the harvesting period of winter/spring rice and the sowing of the 10th month or north rice in Vietnam. Crop condition was generally below the average of the previous five years. Crops over more than 27% of the arable land (mainly in the south of the country and including parts of the Mekong Delta) are not in favorable condition. NDVI over the south of the country was continuously below the five-year average during the monitoring period. The maximum VCI of the area is lower than 0.5, indicating less than fair conditions. The NDVI based crop development profile also confirms the overall below average crop condition. The CropWatch agroclimatic and agronomic indicators were above or close to average (RAIN, +7%; TEMP, +0.1°C; and RADPAR, +5%). BIOMSS is average in comparison to the recent five years. Overall crop condition in the country is unsatisfactory.

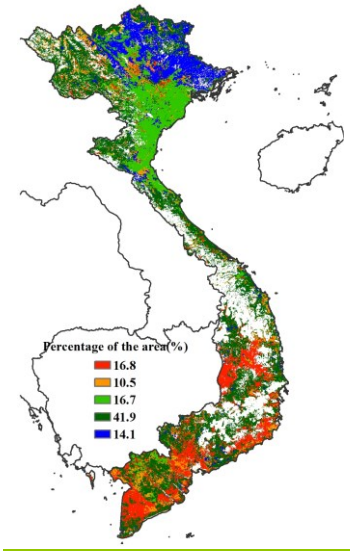
Figure 3.33. Vietnam crop condition, April-July 2016



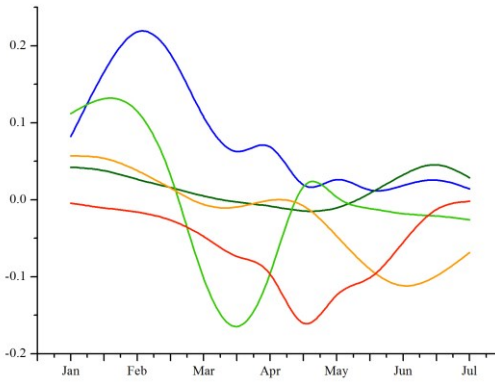
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA

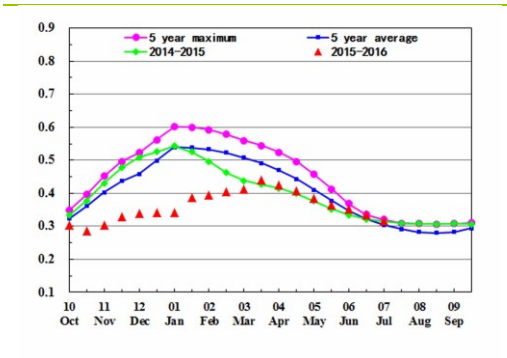


(d) NDVI profiles

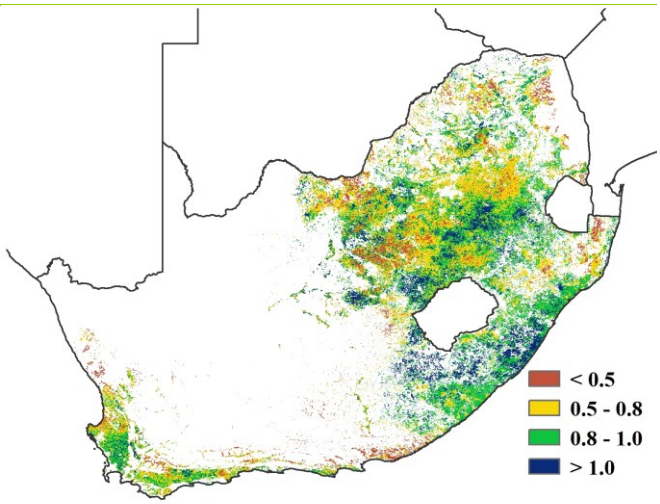
[ZAF] South Africa

The monitoring period coincides with the sowing of winter wheat in and around the western Cape, in addition to covering the end of the maize harvest throughout the country. Maize, extensively cultivated in the country's northwest and in Mpumalanga, Free State, and KwaZulu-Natal, is the most significant harvest for South Africa. Compared with average, RAIN was low (-25%), while RADPAR accumulation dropped by a smaller percentage (-2%); temperature was significantly above average at + 3.1°C. The fraction of cropped arable land (CALF) increased (+2 percentage points) while the biomass production potential decreased (BIOMSS, -10%). The national NDVI development graph indicates that NDVI values after May were comparable to the average of the last five years, but that the NDVI peak over the growing season was still well below average and spectacularly delayed. The lowest maximum VCI values (<0.5) occur in the central northern areas, especially in the Free State. According to the NDVI profiles, most areas display average (that is, seasonally dry conditions) at the end of the monitoring period.

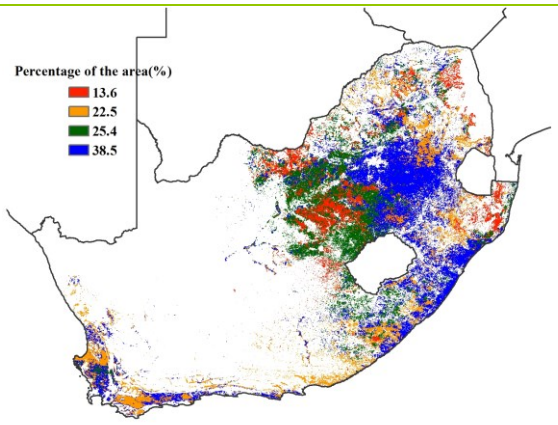
Figure 3.34. South Africa crop condition, April-July 2016



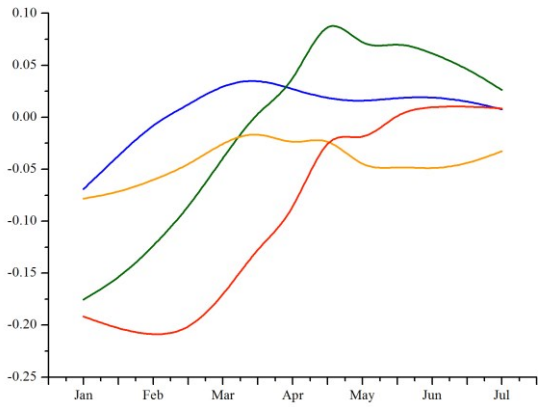
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA



(d) NDVI profiles