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 2015 production estimates for Argentina, Brazil, Canada, and the United States.

3.1 Overview

Section 1.1 of this bulletin stressed that the global patterns of the CropWatch agroclimatic indicators (CWAIs: RAIN, TEMP and RADPAR) anomalies identify well-delimited zones but that the zones mostly do not coincide with, or only imperfectly overlap for, different indicators. This is apparent in figures 3.1 to 3.4.

Figure 3.1. Global map of rainfall (RAIN) by country and sub-national areas, departure from 14YA (percentage), July-October 2015

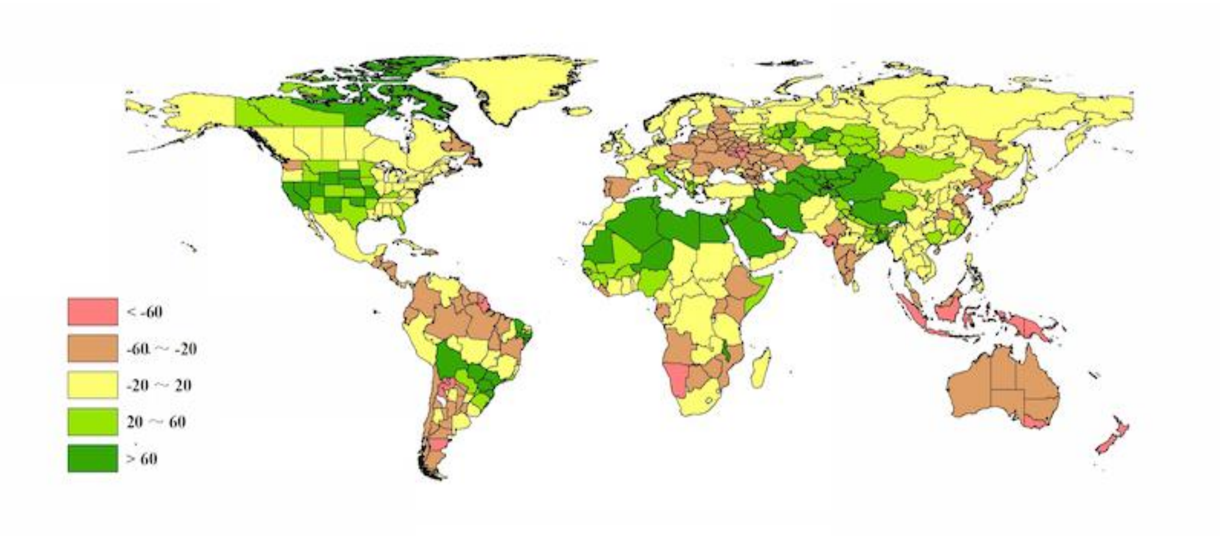


Figure 3.2. Global map of temperature (TEMP) by country and sub-national areas, departure from 14YA (degrees), July-October 2015

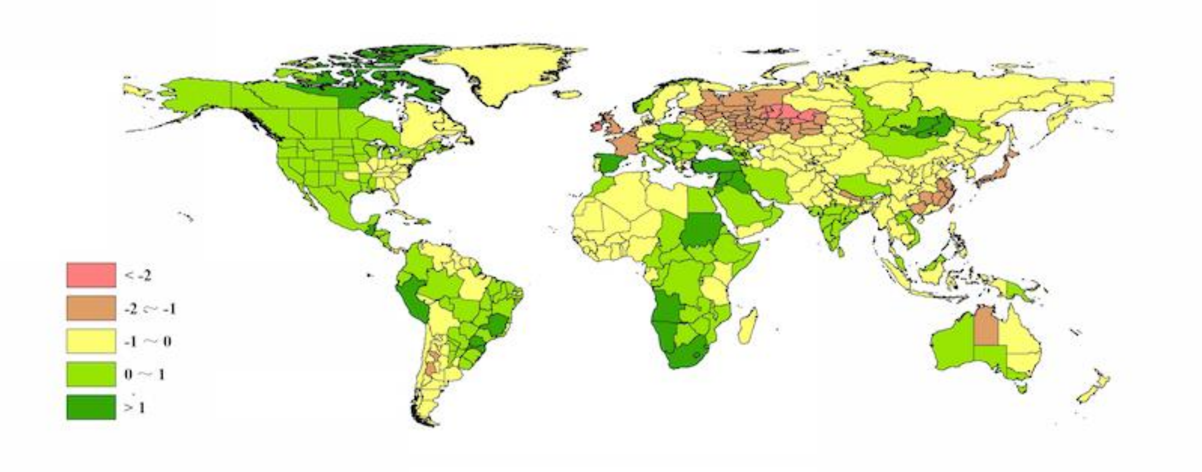


Figure 3.3. Global map of PAR (RADPAR) by country and sub-national areas, departure from 14YA (percentage), July-October 2015

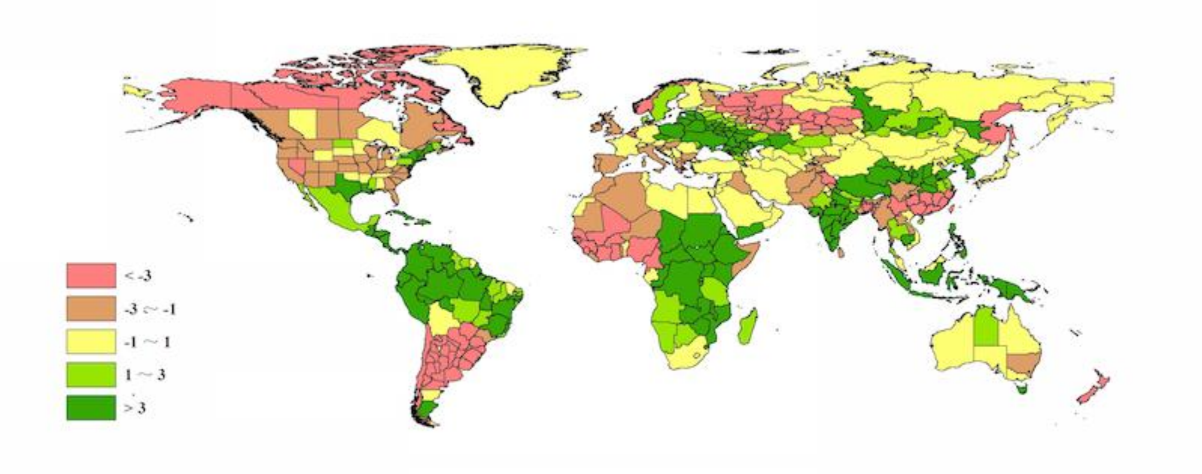
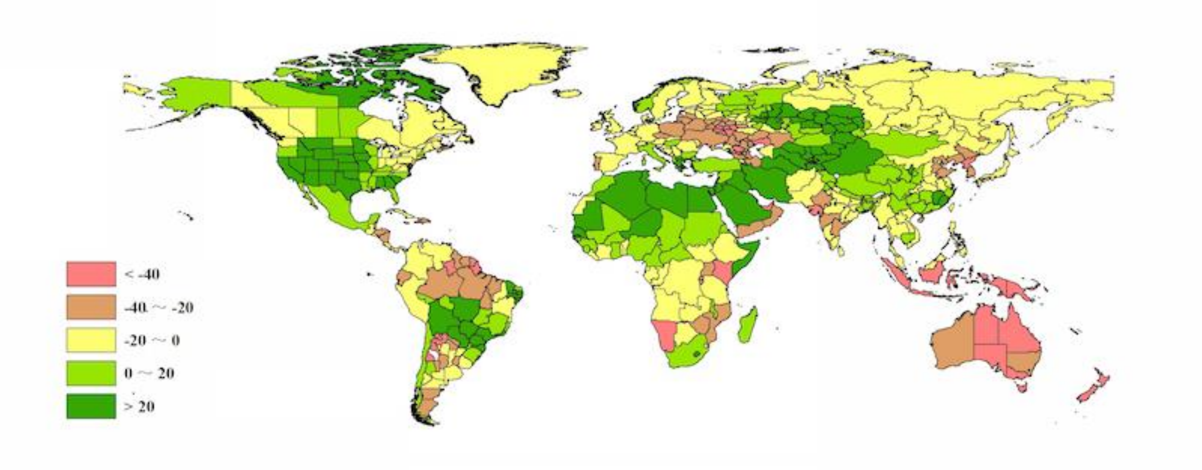


Figure 3.4. Global map of biomass (BIOMSS) by country and sub-national areas, departure from 14YA (percentage), July-October 2015



It has also been noted that the global variations of RAIN are largely compatible with well-known El Niño effects. Table 3.1 below parallels table 1.1 in section 1.1 and lists the twenty most extreme low and high national rainfall departures.

Table 3.1. CropWatch indicators and the anomalies in RAIN (%), TEMP (°C) and RADPAR (%) among some countries sorted by the largest rainfall anomalies

Country	RAIN (mm)	RAIN (%)	TEMP (°C)	RADPAR (%)
Sao Tome Principe (STP)	23	-82	-0.5	0
New Caledonia (NCL)	28	-81	-0.9	1
French Guiana (GUF)	70	-81	-0.5	0
Papua New Guinea (PNG)	118	-80	0.1	11
New Zealand (NZL)	86	-73	-0.4	-4
Samoa (WSM)	111	-71	0	0
Indonesia (IDN)	263	-67	-0.1	11
Korea DPR (PRK)	242	-64	-0.5	3
Portugal (PRT)	79	-59	-0.1	-2
Kenya (KEN)	130	-51	0.0	7
Ukraine (UKR)	116	-49	0.1	7
Ecuador (ECU)	195	-48	0.6	10
Jamaica (JAM)	471	-48	-0.2	7
Korea REP (KOR)	459	-48	-0.5	9
Mauritania (MRT)	706	78	-0.4	-2
Tunisia (TUN)	223	94	-0.8	0
Tajikistan (TJK)	104	146	-0.2	-2
Bolivia (BOL)	516	149	-0.1	-1
Uzbekistan (UZB)	77	156	-0.5	-1
Iraq (IRQ)	112	239	2.0	-1

Some extremely severe departures of rainfall occurred in East Asia, Southeast Asia and in Oceania (NCL, -81%; NZL, -73%, WSM, -71%; PRK, -64%), in Africa (STP, -82%; Kenya, -51%), in Europe (western Mediterranean: PRT, -59%; Ukraine -49%), Latin America and the Caribbean islands (GUF, -81%; ECU and JAM, -48%). The listed countries are part of broader clusters of varying sizes that are clearly visible in figure 3.1.

Some of these countries combine to cover limited areas (such as Portugal, Spain and adjacent Morocco) while others, centered around the south of western Russia and Ukraine, encompass large areas stretching from Switzerland to Karelia (north-west Russia) to the north of the Caspian (Kazakhstan), including the Caucasus, the northern Black Sea and Romania.

Deficit areas also include (1) much of the Southern Cone (Cono Sul) of Latin America (but fortunately avoids many important production areas and includes mostly rangelands and mountainous areas where little is produced) and (2) north-east India (Gujarat, -75%; Rajastan, -27%) and much of peninsular India, south of and including the states Maharashtra (-38%) and Andhra Pradesh (-20%).

Very favourable rainfall conditions (sometimes leading to floods, as in Burkina Faso as mentioned in section 2.2 on the West Africa MPZ and section 5.2 on disasters) occurred over much of north Africa and especially an immense area west and north of the Sahara (MRT, +78%, TUN, +94%), stretching into central Asia (TJK, +146%; UZB, +156%) via the Middle East (IRQ, +139%). This data is represented in figure 3.1. Countries in the area are very different stages of their crop calendar: in western Africa, from July to September (rarely October) the cereals (millet, sorghum) and ground nuts are in late vegetative to harvesting stages; north Africa, the Middle East and Central Asia approach winter cereal planting time at this time. In both cases, the abundant rainfall, beyond the beneficial and sometimes unexpected (surprisingly favourable considering the season) effect on rangelands and crops, has also created favourable conditions for winter crops by replenishing soil moisture reserves. Also part of the large area is north-east India (Bihar, West Bengal, Assam), Bangladesh and Nepal where excessive (abundant and intense) rainfall associated with Indian Ocean cyclones (for more information on cyclone Komen refer to section 5.2) has led to a lot of suffering and crop loss.

Among the thirty major producers listed by CropWatch in the current chapter, the countries with the most favourable rainfall conditions between July and October 2015 include the United States (+22%), Brazil (+24%), Kazakhstan (+47%), Iran (+73%) and Uzbekistan (+156%), as mentioned above. Particularly the semi-arid countries will benefit from abundant soil moisture for their winter crops. Table 3.2 shows the CropWatch agroclimatic and agronomic indicators for July to October 2015, including their departures from the five-year average and the average for countries monitored by CropWatch.

Table 3.2. CropWatch agroclimatic and agronomic indicators for July-October 2015, departure from 5YA and 14YA

Country	Agroclimatic Indicators			Agronomic Indicators			
	Departure from 14YA (2001-2014)			Departure from 5YA (2010-2014)			Current
	RAIN (%)	TEMP (°C)	RADPAR (%)	BIOMSS (%)	CALF (%)	Cropping Intensity (%)	Maximum VCI
Argentina	-13	-0.3	-9	-19	11	-4	0.65
Australia	-45	0.1	-1	-40	8	-4	0.80
Bangladesh	72	-0.7	-8	8	0	1	0.85
Brazil	24	0.6	2	14	10	4	0.77
Cambodia	0	-0.1	3	2	1	3	0.83
Canada	-6	0.4	-1	1	-4	1	0.88
China	1	-0.7	-3	0	0	0	0.87
Egypt	159	0.2	0	62	0	0	0.85
Ethiopia	-20	0.9	6	-17	-4	-4	0.86
France	-18	-1.2	1	-16	0	-4	0.76
Germany	-17	-0.1	1	-15	0	0	0.81
India	-2	0.0	5	-19	-5	4	0.83
Indonesia	-67	-0.1	11	-59	0	-2	0.86
Iran	73	0.2	-1	66	-8	3	0.57
Kazakhstan	47	-0.9	0	34	36	0	0.73
Mexico	-17	0.1	3	0	4	7	0.84
Myanmar	-8	-0.3	-1	-4	-1	3	0.88
Nigeria	21	-0.2	-3	7	-5	0	0.82
Pakistan	10	-1.0	-1	-8	-3	-5	0.76
Philippines	2	-0.1	4	-11	0	0	0.89
Poland	-39	0.3	7	-34	0	1	0.78
Romania	-27	0.8	0	-9	-2	-1	0.72
Russia	-5	-0.8	0	1	1	-1	0.82
S. Africa	-15	1.1	0	7	-16	0	0.64
Thailand	-10	-0.2	2	-9	0	-5	0.91
Turkey	13	1.2	0	4	8	1	0.83
United Kingdom	-5	-1.7	-3	-7	0	5	0.88
Ukraine	-49	0.1	7	-38	0	-1	0.78
United States	22	0.1	-1	20	1	-3	0.84
Uzbekistan	156	-0.5	-1	105	9	0	0.81
Vietnam	-10	0.1	0	-3	0	4	0.88

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 fourteen-year average (14YA) for the same period (July-October).

Altogether the rainfall during the reporting period was unfavourable: the (unweighed) average of RAIN departures over the countries and sub-countries monitored by CropWatch is -20%. It is important to remind readers that CWAIs are computed only for agricultural areas, even if their spatial representation in all the figures of this bulletin follow MRUs (Chapter 1) and political boundaries (Chapter 3). As already noted in Chapter 1, there is a weak negative correlation between RADPAR and RAIN departures from the average, which results in the generally below average RAIN being paralleled by generally above average RADPAR (+3%). This is, somehow, visible in table 3.2 where positive RADPAR departures tend to associate with negative RAIN and vice versa.

The lowest RADPAR departures (figure 3.3) are those of the Southern Cone, the countries in the Gulf of Guinea, Mali, central to north-western Russia (between and including the oblasts of Arkhangelsk and Vologda in the west and Tomsk and Novosibirsk in the east) and south and east China (Yunnan to Zhejiang).

In terms of TEMP, the average departure is just 0.1°C. As very clearly shown in figure 3.2, very large areas of the globe recorded average or above average temperatures, well in line with global warming projections scenarios. During the reporting period, areas with below average temperatures were mostly concentrated in north-western Europe (Benelux, France, Great Britain and especially Ireland with a -2.0°C departure), western Russia (Oblasts of Kurgan, Perm, Sverdlovsk and Tyumen, the Udmurt Republic and the Komi-Permyak Okrug, with departures between -2.1°C and -2.3°C) and eastern Asia (Japan, -1.0°C and Guangxi to Anhui in eastern China, -1.1°C to -1.6°C).

Finally, being based on Lieth's Miami model, the biomass production potential (figure 3.4) is affected by both precipitation and temperature. High positive departures affect the semi-arid regions around the Sahara to Central Asia (Tajikistan, +83% and Uzbekistan, +105%), as mentioned, much of North America and the major agricultural areas in southern Brazil. The most negative departures occur in Southeast Asia (Timor Leste, -94% and Indonesia, -59%), Oceania (New Zealand, -59%), Korea DPR (-43%) and the area from Kazakhstan to Poland (Oblasts of Belgorod, -69%; Voronezh, -63%; Kursk, -60% and Atyrau in Kazakhstan, -44%). In Africa, the least favourable areas include mostly pastoral Namibia (-58%) and Kenya (-43%).

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 2015 period to the previous season and the five-year average (5YA) and maximum. (b) Maximum VCI (over arable land mask) for July 1 – October 31 2015 by pixel; (c) Spatial NDVI patterns up to July 2015 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.10, and Annex B, tables B.1-B.4, for additional information about indicator values and production estimates by country. Country agricultural profiles are posted on www.cropwatch.com.cn.

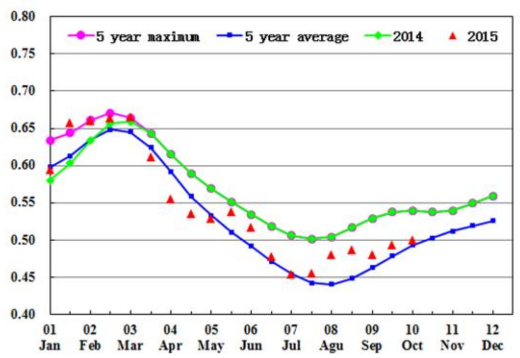
Figures 3.5-3.34. Crop condition for individual countries ([ARG] Argentina- [ZAF] South Africa) for April-July 2015

[ARG] Argentina

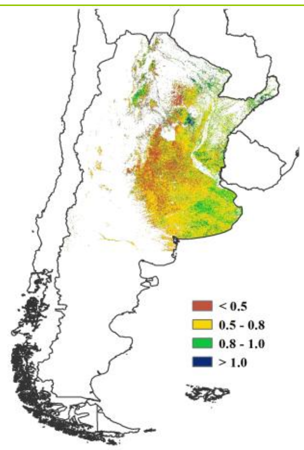
In general conditions for crops from July to October were average in Argentina. Maize and soybean are currently off-season, while wheat was heading to the grain-filling stage at the end of October. Agroclimatic conditions were unfavourable, confirmed by insufficient rainfall and low radiation (RAIN, 13% below average, RADPAR -9%, 19% below average BIOMSS). Similar patterns were found in most provinces except Misiones which saw almost one third above normal rainfall (See Annex A, table A.3). Lack of rainfall is problematic for the planting and emergence of maize and soybean in the coming months. Fortunately key winter wheat producing Buenos Aires did not suffer from water deficit. Agronomic indicators also showed average conditions.

According to the NDVI-based crop development profile, crop condition was slightly above average but well below the same period last year. As shown in NDVI departure from 5-YA clustering and the corresponding profiles, crop condition was above average in southern and eastern Buenos Aires. In contrast, NDVI was well below average in regions between Bahia Blanca and Santa Rosa (see section 2.4 and figure 2.3). VCIx was high in central Buenos Aires where wheat was at the peak of the growing season when other regions' had just ended. In spite of unfavorable meteorological conditions, CALF was 11% above average. Cropping intensity was 4% below average due to persistently high temperature from March to April (May and August bulletins).

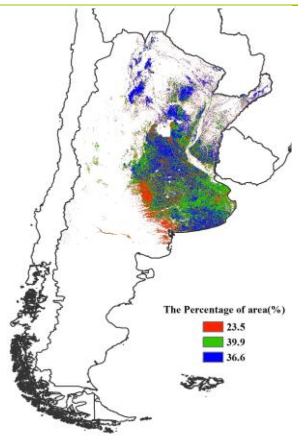
Figure 3.5. Argentina crop condition, July-October 2015



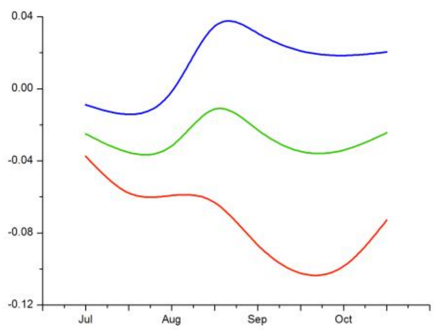
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA



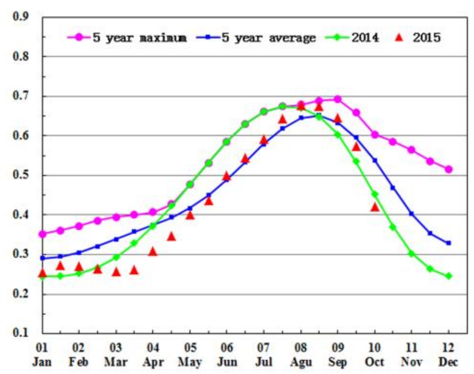
(d) NDVI profiles

[AUS] Australia

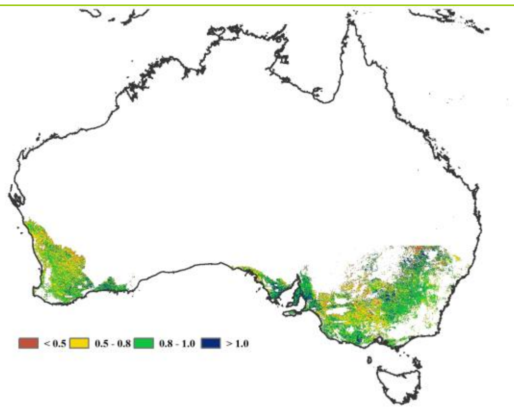
Compared to the last five-year average, the crop condition in Australia shows an overall average level during this monitoring period, which was the main growing season for winter wheat and barley. The spatial NDVI patterns shows that in south-eastern New South Wales, southern south Australia and part of south-western western Australia (32.7% of the arable land), winter wheat and barley conditions were above average from the middle of July to October, while in northern Victoria and part of south-western western Australia (25.9% of the arable land), conditions were well below average throughout the reporting period. The crop condition remained close to average in the southeast of south Australia, south-western Victoria, east of the border area between New South Wales and Victoria and part of south-western western Australia (41.4% of the arable land),

The analysis result is consistent with the situation of the crop condition development graph based on the NDVI, which show that winter wheat and barley, on the whole, grew well in July, attaining the five-year maximum at the end of July and staying close to average in August and September, but deteriorated below average in the harvest season of October. This is possibly due to the negative impact of El Niño that resulted in a 45% decrease of precipitation in the country. Although CALF has increased by 8%, compared to the five-year average, CropWatch estimates that the production of winter wheat and barley in Australia increased by 1% only. (Also see table B.2 in Chapter 5.2.)

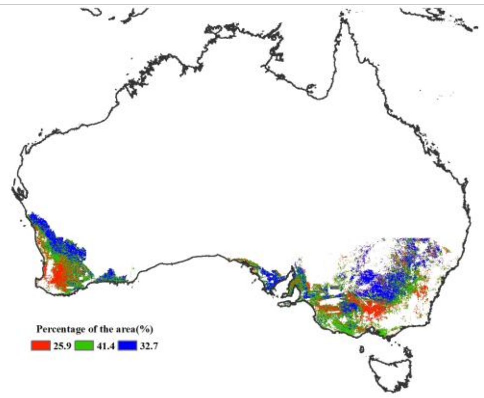
Figure 3.6. Australia crop condition, July-October 2015



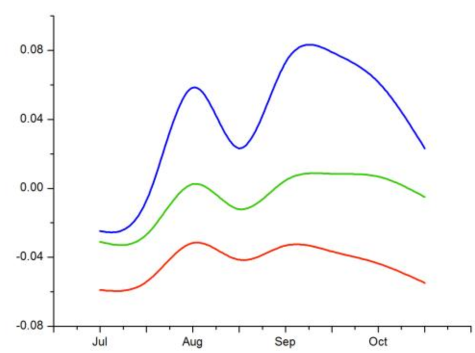
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA



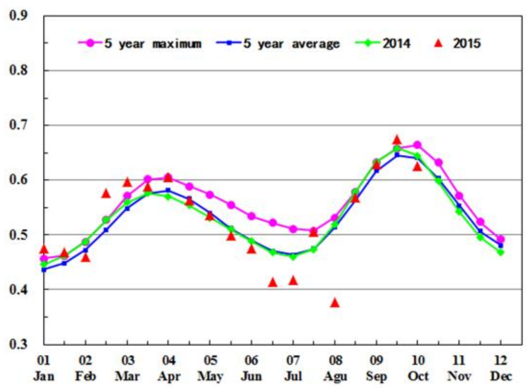
(d) NDVI profiles

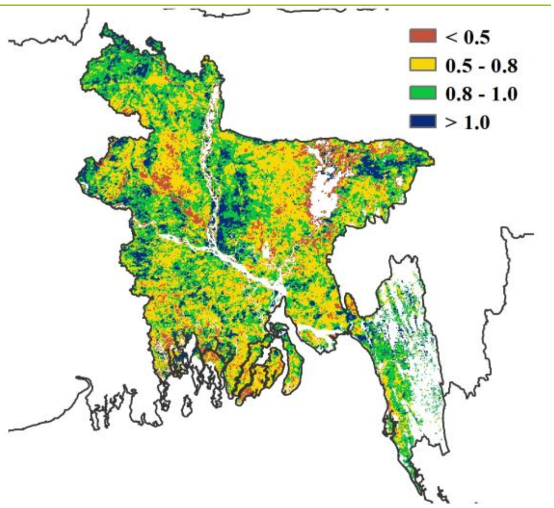
ARG AUS **BGD** BRA CAN DEU EGY ETH FRA GBR IDN IND IRN KAZ KHM MEX MMR NGA PAK PHL POL ROU RUS THA TUR UKR USA UZB VNM ZAF

[BGD] Bangladesh

Bangladesh experienced good crop conditions during this monitoring period as a result of excess rainfall (RAIN, +72%) during the growing season, even if floods harmed the standing crops in selected localized areas. Even though the temperature (TEMP) was average and photosynthetically active radiation (RADPAR) was low (-8%) the biomass accumulation potential (BIOMSS) rose to 8% over the recent 5-year average. The cropped arable land fraction (CALF) remained unchanged. The crop condition development graphs (national NDVI curves) show a situation comparable to the previous five-year average. The NDVI values increased from early August to October for the whole country. The maximum VCI ranged from 0.5 to 1, indicating average crop condition except some scattered areas in Sylhet, Dhaka and Rajshahi where the maximum VCI recorded was below 0.5, indicating poor crop condition. Altogether, CropWatch assesses the overall crop condition is average.

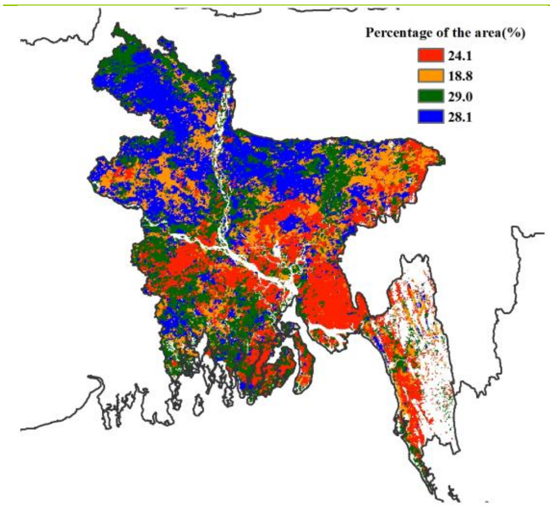
Figure 3.7. Bangladesh crop condition, July-October 2015

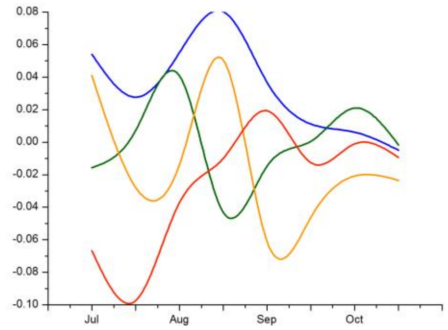




(a) Crop condition development graph based on NDVI

(b) Maximum VCI





(c) Spatial NDVI patterns compared to 5YA

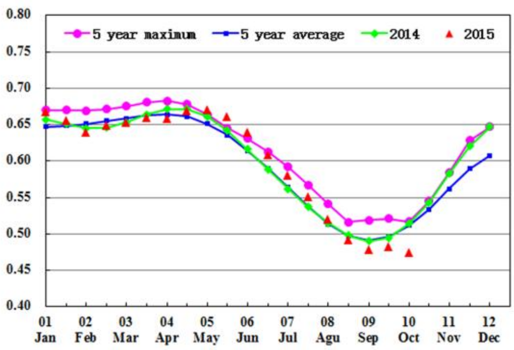
(d) NDVI profiles

[BRA] Brazil

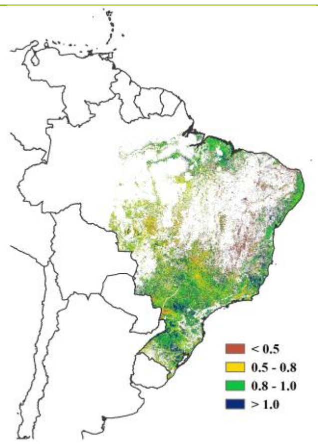
Crop condition was, in general, above average in Brazil during the reporting period. Winter wheat has reached maturity and harvesting will be concluded by the end of the year. The sowing of soybean started at the end of October. In most of central-south Brazil, rice and maize are also at planting stage. In southern Brazil winter wheat benefited from favorable agroclimatic conditions from heading to maturity stage. Rainfall was 325 mm from July to October (24% above average), providing sufficient rainfall for wheat grain-filling and good soil moisture for soybean and maize. Warms temperature and average radiation was also beneficial for winter wheat. However, the continuous rainfall was unfavorable for the harvesting and drying of wheat after maturity especially in Mato Grosso do Sul, Parana, and Sao Paulo where rainfall was double the average. Heavy rainfall also hampered the sowing of maize and soybean. According to Safras and Mercado, soybean planting progress reached 56% by November 13 against the historical average of 68%.

Spatial patterns and NDVI departure profiles compared to the five-year average indicate the above average conditions in southern Brazil except for north-western Rio Grande do Sul. Comparing the peak NDVI to the recent five years, the crop condition in central Parana and eastern Rio Grande do Sul exceeded five year's maximum. Cropped arable land fraction at national scale is estimated at 92%, 10 percentage point above average. Cropping intensity for 2015 is 183% (or 4% above the previous five years average). Winter wheat production is revised at 6.9 million tons using the most updated data, about 3% above previous forecast. Table B.3 in Annex B presents the estimated production outputs for 2015.

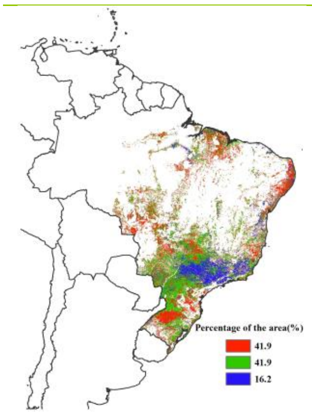
Figure 3.8. Brazil crop condition, July-October 2015



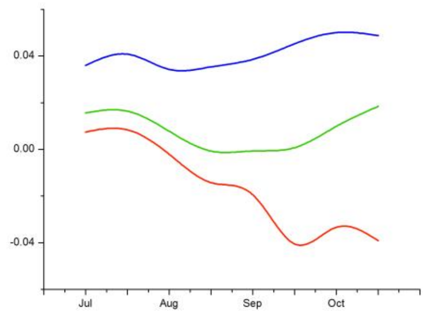
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA



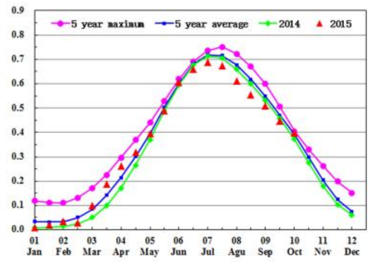
(d) NDVI profiles

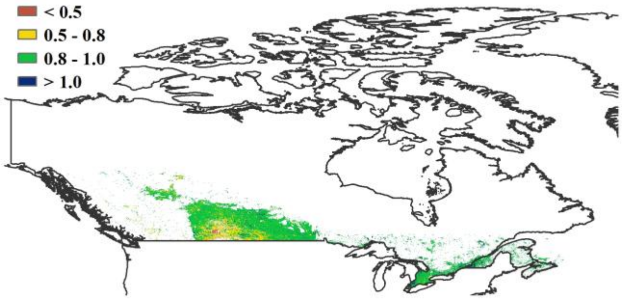
[CAN] Canada

According to CropWatch indicators the condition of crops was below average during this monitoring period. The drought in Canada, especially in Alberta and Manitoba during the previous quarter did not improve much, with the current period recording a negative rainfall departure (6% below average) with temperature slightly higher than normal (+0.4°C), and a 1% increase in radiation.

For the major crop agricultural provinces in Canada, water deficit continued in Alberta with a negative rainfall departure (-9%) that resulted in a -8% drop in biomass production potential. In Manitoba, rainfall was above average (+14%) but still insufficient to compensate the water deficit of the last monitoring period. In other major provinces of Canada, rainfall was average with a 1% positive departure. The three provinces that produce 80% of Canada's output suffered poor weather and as a result lower crop production is forecast. The unfavorable conditions are confirmed by the NDVI development profile that remained below average after June as well as the NDVI clusters and profile which show that crop condition gradually worsened after mid-July. Due to continuous water deficit, the fraction of cropped arable land decreased by 4% compared to last 5 years average. Overall, CropWatch forecasts below average output in Canada this season.

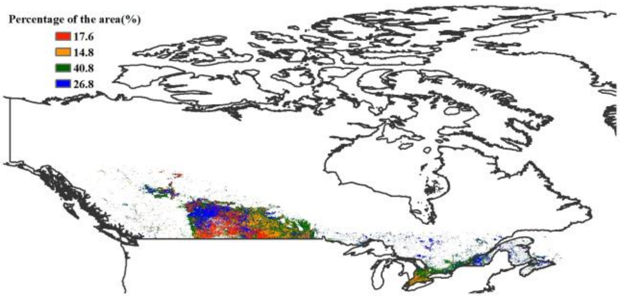
Figure 3.9. Canada crop condition, July-October 2015

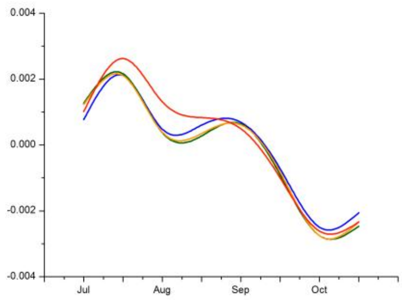




(a) Crop condition development graph based on NDVI

(b) Maximum VCI





(c) Spatial NDVI patterns compared to 5YA

(d) NDVI profiles

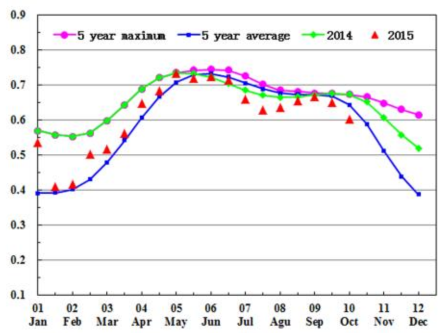
[DEU] Germany

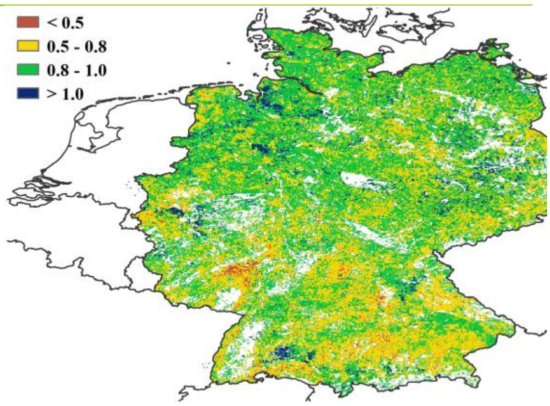
The crops in Germany showed below average condition during the reporting period from July to October. The country's spatial NDVI patterns indicate a situation that on the whole is less favourable than the five-year average, except for limited patches in the central-east and northern Germany (Saxony, Lower Saxony, Sachsen-Anhalt and Mecklenburg-Vorpommern).

This spatial pattern is also reflected by the maximum VCI in Lower Saxony and Sachsen-Anhalt, with a VCIx over 0.8. According to the crop condition map based on NDVI, Germany suffered dry conditions compared with the five-year average throughout the reporting period.

The CropWatch RAIN indicator decreased by 17%, with TEMP around average (-0.1°C). Although RADPAR increased by 12% compared with the previous average, BIOMSS decreased by 15%. Due to normal temperatures but less rainfall, the agronomic indicators show poor condition for most summer crop areas of Germany except the north-east.

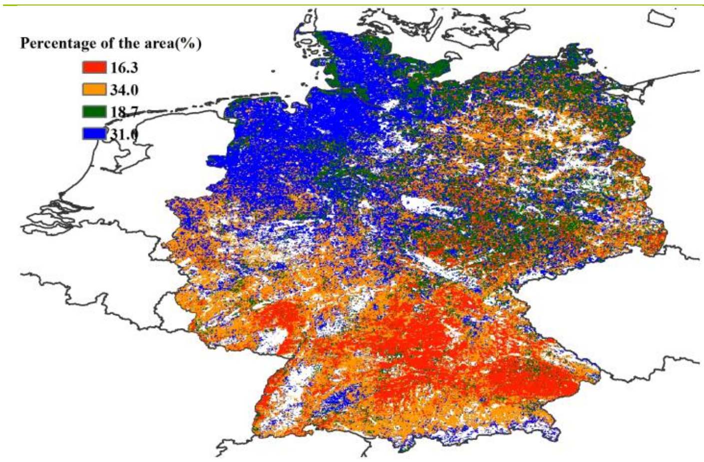
Figure 3.10. Germany crop condition, July-October 2015

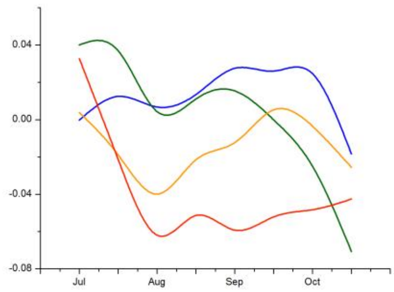




(a) Crop condition development graph based on NDVI

(b) Maximum VCI





(c) Spatial NDVI patterns compared to 5YA

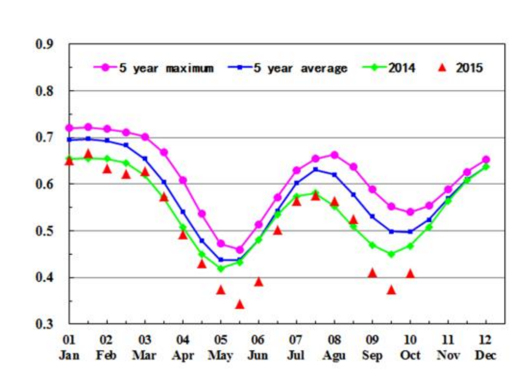
(d) NDVI profiles

[EGY] Egypt

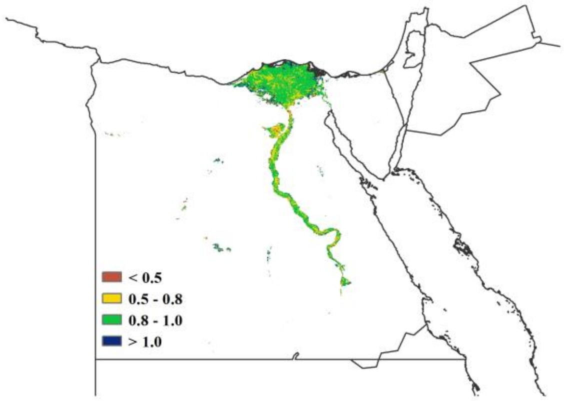
During August and through to early October, poor crop condition occurred in Egypt, particularly towards the end of September according to the crop condition development graph.

The CropWatch Agroclimatic Indicators showed that rainfall (+159%) was far above average but temperature (+0.2°C) and RADPAR were near average. The cropped arable land fraction (CALF) and the cropping intensity were stable during the reporting period. Considering the above analyses, we infer that lower-than-average summer crop condition may be related to non-climatic factors, such as disease and insect attacks. According to NDVI profiles and spatial NDVI patterns, 67% of croplands were continuously below the average level in the Nile valley, north-western Egypt and the central and southern Delta. Crop yields in Egypt are just fair and below the recent five-year average.

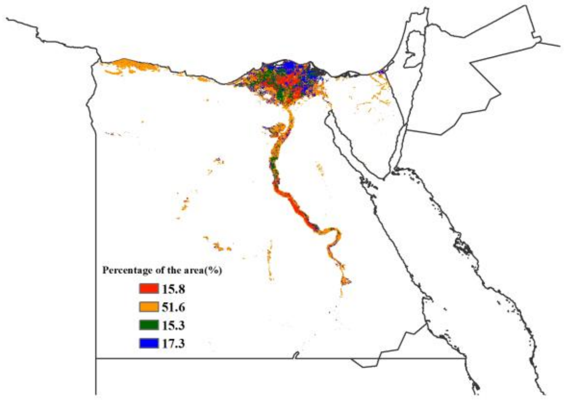
Figure 3.11. Egypt crop condition, July-October 2015



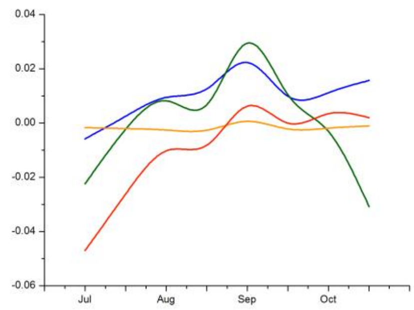
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA



(d) NDVI profiles

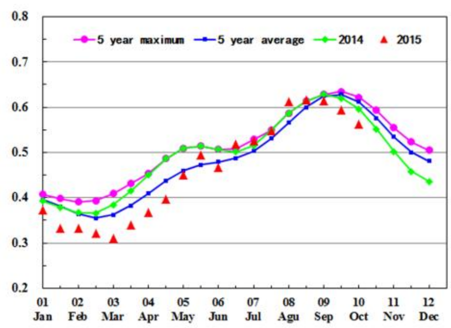
ARG AUS BGD BRA CAN DEU EGY **ETH** FRA GBR IDN IND IRN KAZ KHM MEX MMR NGA PAK PHL POL ROU RUS THA TUR UKR USA UZB VNM ZAF

[ETH] Ethiopia

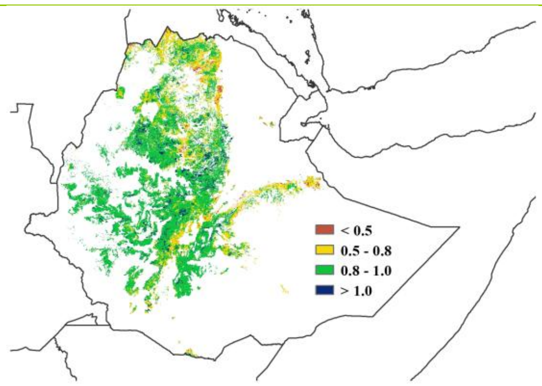
As already mentioned in the previous CropWatch bulletin, conditions were largely unfavorable during the Belg season before August when the early crops are harvested. The current reporting period mostly covers the early main season Meher crops that will be harvested until December. Overall, NDVI was well below the recent 5-year average until June, above average until August but then it dropped below average again until October. At the national level, July to August rainfall was 20% below average. A positive sunshine anomaly (+6%) combined with above average temperature (+0.9°C) has resulted in increased crop water requirements, which has further exacerbated crop water requirements and stress. This resulted in an estimated drop in biomass production potential of 17%. In spite of a fair VCIx value of 0.86, the agronomic indicators include a decrease of 4% for both cropped arable land and cropping intensity, two negative signs.

NDVI clusters and the maximum VCI map provide additional detail about regional spatial differences. Altogether, conditions are favourable in about 35% of agricultural areas and average in 39% of the croplands. Crop condition has been deteriorating constantly since July in the remaining areas (22% of cropped areas) corresponding essentially to (1) most of Tigray, where the growing season is normally short and ending in September; (2) scattered areas in East Amhara especially in the eastern parts of North Wollo and East Gojam and (3) north-east SNPP and adjacent areas in Oromia (east Shewa) as well as other areas in Oromia such as the east of Arsi and the northern parts of East and West Hararghe. The region described in (2), Amhara, includes some of the major wheat and teff producing areas whose first season starts in February (the Belg season, which mostly failed this year) and a main season from June to October. In the east of the region described in (3), Hararghe, the season is long but reliable rainfall occurs only in July to August. While large areas of the country were able to grow fair crops, about 25% suffered from dry conditions, resulting in below average output expectations and poor rangeland conditions.

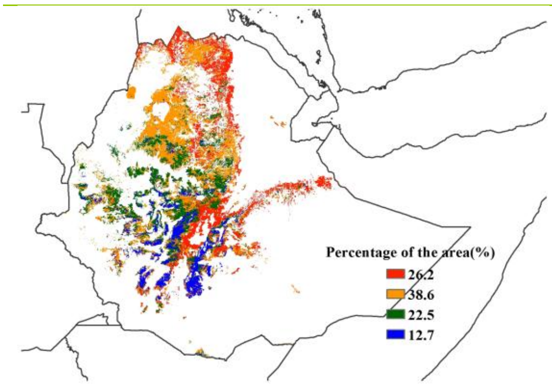
Figure 3.12. Ethiopia crop condition, July-October 2015



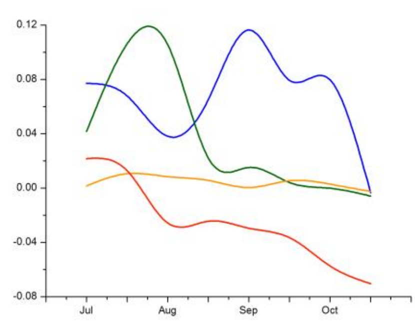
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA



(d) NDVI profiles

ARG AUS BGD BRA CAN DEU EGY ETH **FRA** GBR IDN IND IRN KAZ KHM MEX MMR NGA PAK PHL POL ROU RUS THA TUR UKR USA UZB VNM ZAF

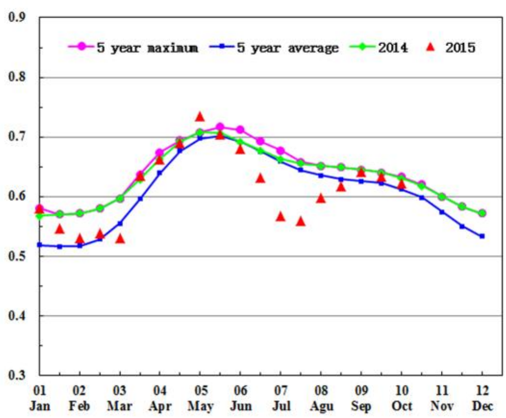
[FRA] France

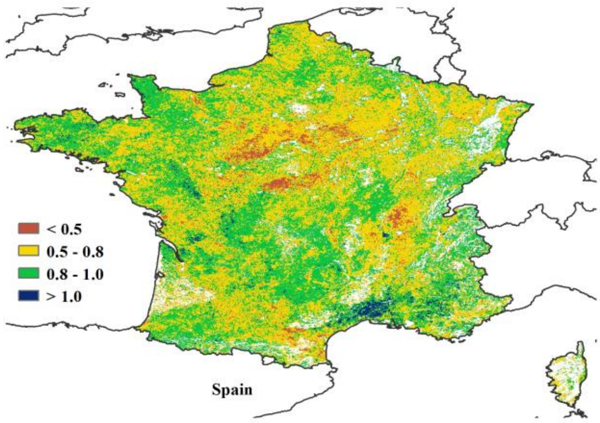
Crops in France showed generally unfavorable conditions during the reporting period from July to October. At this point in time, summer crops have already been harvested. As shown by the NDVI profiles, national NDVI values were well below average and even 30% lower than average in July and August, after which they were close to the 5-year average from September to October.

According to the spatial NDVI patterns, about 70% of the country suffered from poor crop and vegetation conditions in comparison to the recent five-year average. The same patterns are reflected in the maximum VCI map, with a VCIx below 0.5 in some areas. The CropWatch RADPAR indicator exceeded average by 1%, however, TEMP and rainfall decreased by 1.2°C and 18%, respectively, compared with average, resulting in a BIOMSS drop of 16% below the recent five-year average.

Generally, due to the deficit of rain, the agronomic indicators mentioned above indicate unfavorable condition for most summer crop areas of France, with average or below average yields.

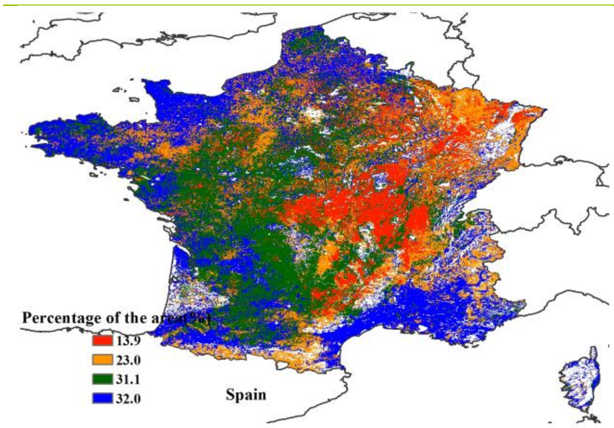
Figure 3.13. France crop condition, July-October 2015

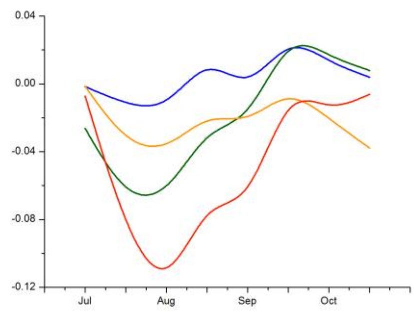




(a) Crop condition development graph based on NDVI

(b) Maximum VCI





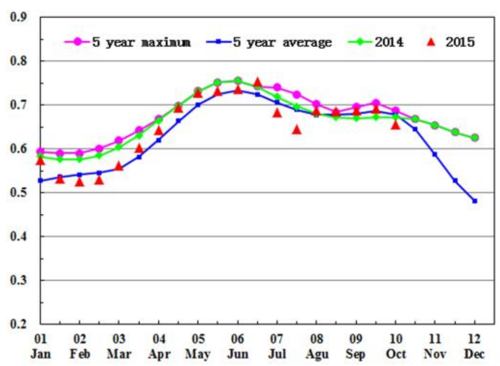
(c) Spatial NDVI patterns compared to 5YA

(d) NDVI profiles

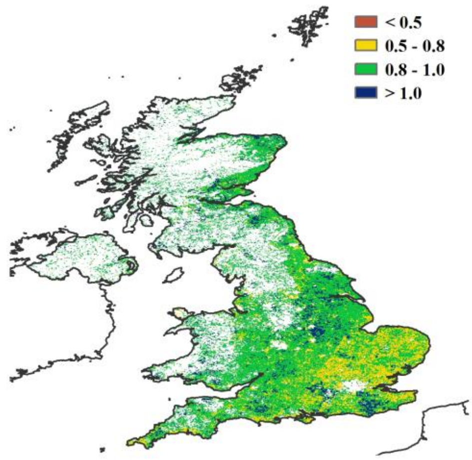
[GBR] United Kingdom

Crops in the United Kingdom showed average conditions during this reporting period. Currently, summer crops have been harvested, and winter crops (wheat and barley) are at the planting stage. Compared to averages, the CropWatch agroclimatic indicators show that rainfall over the reporting period was below average (RAIN, -5%), with slightly below average radiation (RADPAR, -3%) and temperature (TEMP, -1.7°C). With water stress and low temperatures, BIOMSS decreased by 7% compared to the five-year average at the national scale. As a result of adequate rainfall from late July to late august, the national NDVI values were average and above the five-year average from late July to early September according to the crop condition development graph. For early July and late September, due to reduced rainfall and colder weather, the national NDVI values dropped to below average. Spatial NDVI patterns compared to the five-year average show low values from late September (1) along the eastern and southern coast, including south of Dorset and Hampshire, east of Lincolnshire, Yorkshire and Grampian, southeast of Tayside and Lothian and low values from July in (2) Worcestershire, Warwickshire, Staffordshire, Northamptonshire, Leicestershire and Gloucestershire. Corresponding NDVI departure cluster profiles and appropriate rainfall from late July to October indicate above average NDVI values over the country for over 76% of arable land (Oxford, Cambridge, York, Birmingham, Edinburgh). The spatial pattern is also reflected by the maximum VCI in the different areas, with a VCIx of 0.8 for the country overall.

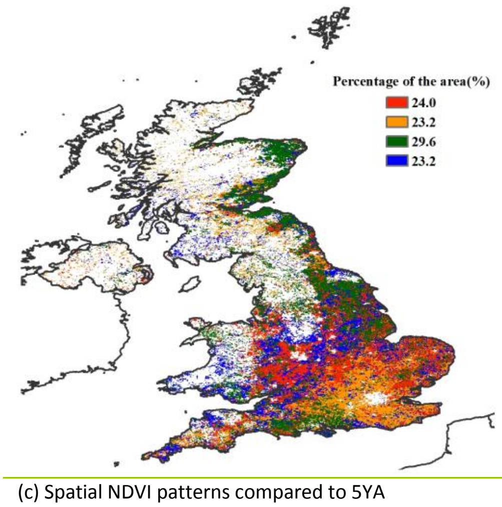
Figure 3.14. United Kingdom crop condition, July-October 2015



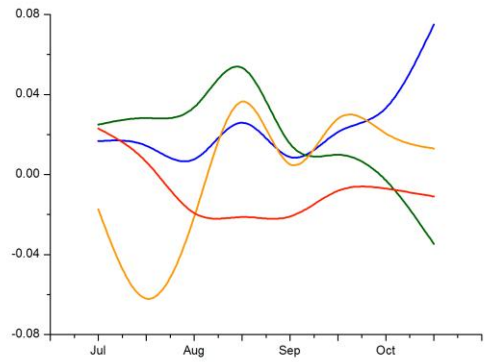
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA



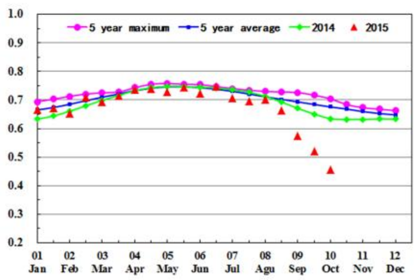
(d) NDVI profiles

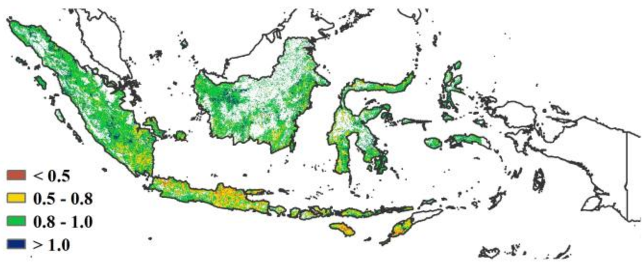
ARG AUS BGD BRA CAN DEU EGY ETH FRA GBR **IDN** IND IRN KAZ KHM MEX MMR NGA PAK PHL POL ROU RUS THA TUR UKR USA UZB VNM ZAF

[IDN] Indonesia

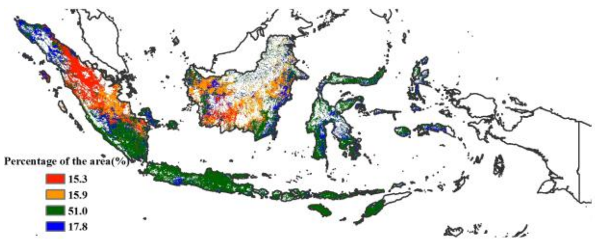
Indonesia suffered from unfavorable crop conditions from August to October, while the dry season maize and rice were entering reproductive or early ripening stage. Compared with the recent average, precipitation was very significantly below average (-67%) as a result of the on-going El Niño. Corresponding with the sharp drop in rainfall, PAR displays an increase of 11%. As a result of the lack of rain, the rain-fed biomass accumulation potential dropped (-59%). Dry weather delayed the planting of the main seasonal crops in 2016. This information is consistent with the NDVI profile, which shows that the average NDVI was below the five-year average during this monitoring period. Contrasting NDVI clusters are observed with mostly below average conditions in central Sumatra (including Riau and Jambi) in September and October. In conclusion, rice and maize production of Indonesia are well below average in 2015.

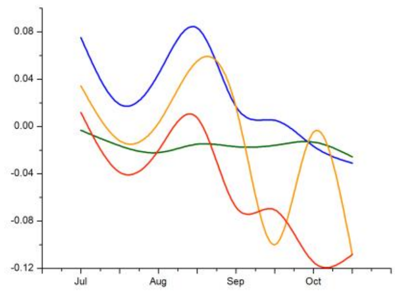
Figure 3.15. Indonesia crop condition, July-October 2015





(a) Crop condition development graph based on NDVI (b) Maximum VCI



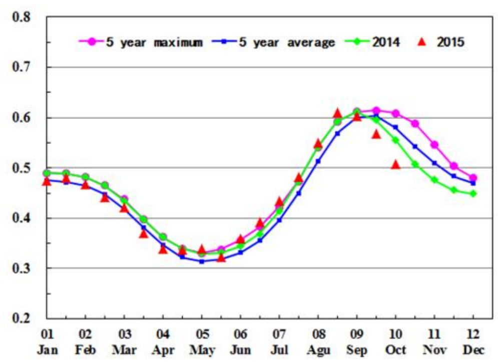


(c) Spatial NDVI patterns compared to 5YA (d) NDVI profiles

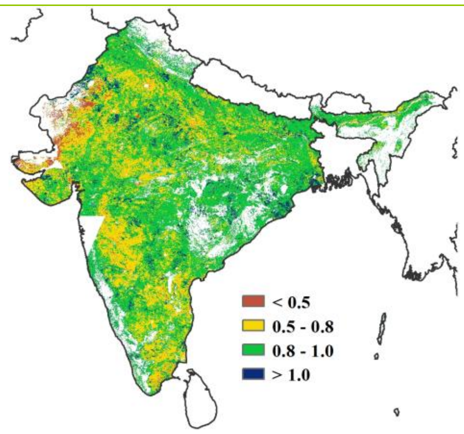
[IND] India

The current monitoring period corresponds to the rain-fed Kharif season: crop condition was poor for India. The cropped arable land fraction (CALF) and biomass accumulation potential (BIOMSS) dropped below average by 5% and 19% respectively. Over the country a slight RAIN deficit of 2% was recorded. The close to average national rainfall hides the large disparity of sub-national values: Andhra Pradesh (-20%), Gujarat (-78%), Goa (-67), Kerala (-40%), Karnataka (-36%), Maharashtra (-38%), Madhya Pradesh (-10%), Puducherry (-40%), Rajasthan (-27%) and Tamil Nadu (-21%). The states that recorded above average RAIN include Assam (+23%), Bihar (+40%), Chhattisgarh (+16%), Himachal Pradesh (+55%), Haryana (+11%), Jharkhand (+21%), West Bengal (+59%), Tripura (+112%), Punjab (+20%), Mizoram (+54), Meghalaya (+35%) and Sikkim (+27%). The temperature (TEMP) was unchanged compared with average while photosynthetically active radiation (RADPAR) increased by 5%. Below average rainfall in the key growing stages of Kharif crop triggered the poor crop condition for the country. The national NDVI profile indicates that crop development was below the average of the previous five years during September and October. In Rajasthan, Haryana and Uttar Pradesh the NDVI started decreasing from early September and reached the minimum value in early October; however it gained again later this month. The NDVI value remained below average throughout the monitoring period in the states of Bihar, Karnataka, Gujarat and west Bengal as evidenced by NDVI clusters and profiles. The maximum VCI indicates that the least favorable crop condition occurred in Gujarat and Rajasthan. Overall, according to Crop Watch indicators, the crop condition was below average and reduced output for Kharif crops is expected.

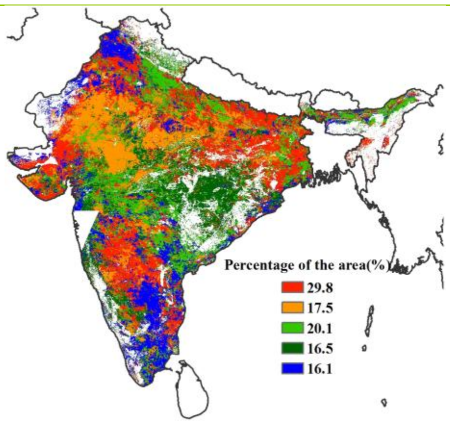
Figure 3.16. India crop condition, July-October 2015



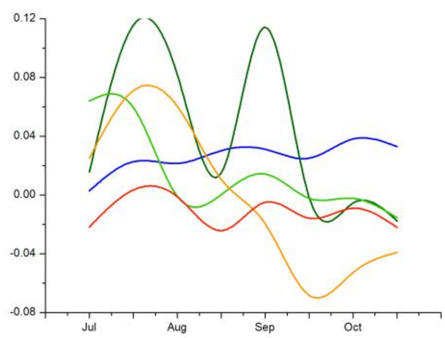
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA



(d) NDVI profiles

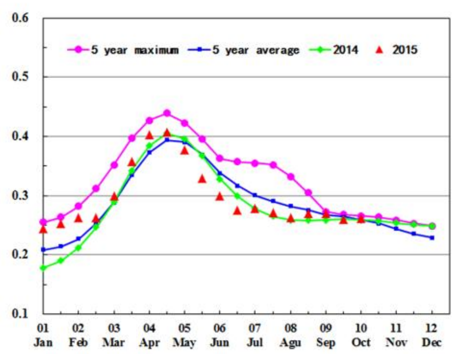
ARG AUS BGD BRA CAN DEU EGY ETH FRA GBR IDN IND **IRN** KAZ KHM MEX MMR NGA PAK PHL POL ROU RUS THA TUR UKR USA UZB VNM ZAF

[IRN] Iran

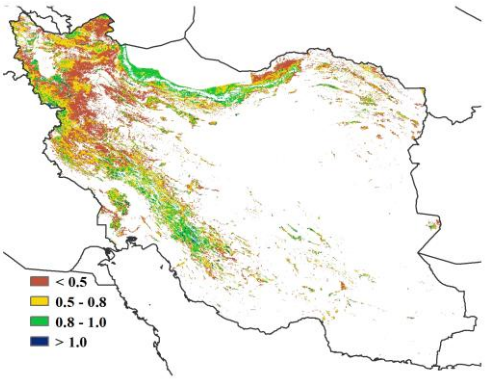
The crop condition in Iran was below average in July, and recovered to average during this monitoring period starting from August. The summer crops (potatoes and rice) were harvested in September, while winter wheat and barley were sown. Accumulated rainfall (+73%) was very abundant and temperature was close to average throughout the monitoring period, while the accumulated RADPAR was less (-2%). CropWatch agroclimatic indices for the current season show rather favorable conditions for crop growth, which is confirmed by the increase of the BIOMSS by 66%.

Crop condition in most of the north-western region was close to the five-year average during the whole monitoring period. The major rice producing areas (Mazandaran and Gilan provinces in the central north region) experienced favorable conditions. Crop condition was below the recent five-year average in the Khuzestan and Fars provinces of the south-western region. Overall, the outcome of summer crops was fair, and rice output is expected to be above average.

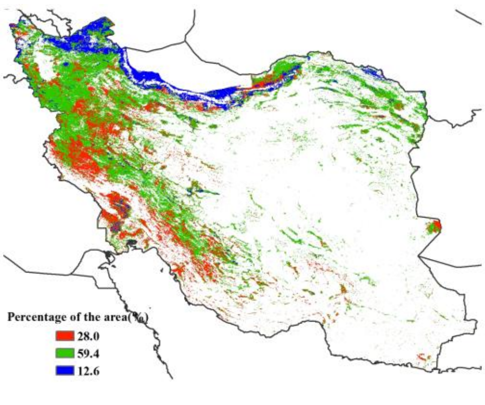
Figure 3.17. Iran crop condition, July-October 2015



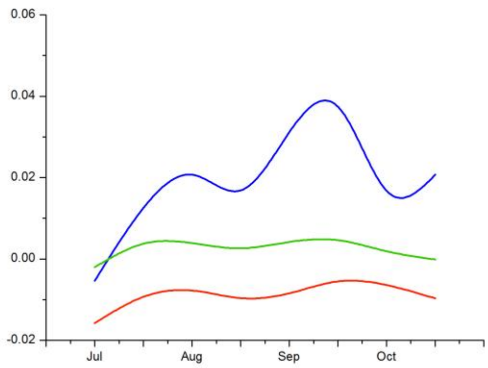
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA



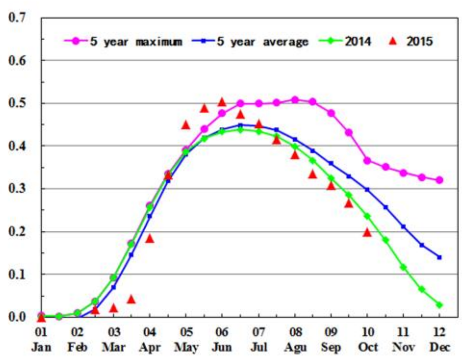
(d) NDVI profiles

[KAZ] Kazakhstan

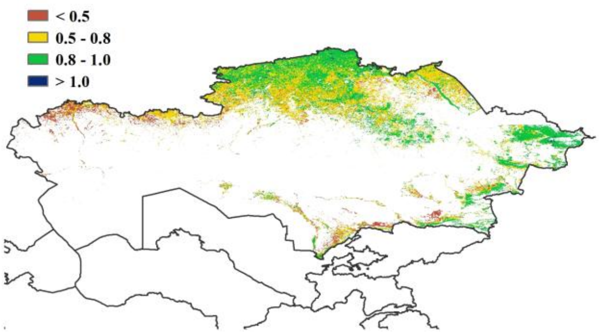
For this monitoring period, crop condition was generally unfavorable during the growing and harvesting stage of spring barley and wheat. Among the CropWatch agroclimatic indicators, RAIN was above average (47%), TEMP below (-0.9%) and RADPAR was average. The combination of the factors resulted in an increase of the biomass production potential above over the average of the recent five years. The maximum VCI indicates that crop condition was below average (pixel value below 0.5) in the north-west and in the south of the country.

Spatial NDVI patterns and profiles show that crop condition in 21% of the agricultural areas was below average in August and September, and then again at the end of October, mainly in the north (especially in Severo-kazachstanskaya, Akmolinskaya, Kustanayskaya and Karagandinskya). 21% of the agricultural areas were below average in late of October in parts of Severokazachstanskaya, Kustanayskaya, Akmolinskaya, Pavlodarskaya, Aktyubinskya, Karagandinskya and Voskochno-Kazachstanskaya. The poor crop condition in these areas resulted from uneven rainfall distribution in time and space. In 19.6% of the agricultural areas, including some of the major agricultural areas, crop condition was persistently above average thanks to satisfactory rainfall in the east of Severo-kazachstanskaya, north Pavlodarskaya as well as in scattered eastern areas bordering China. According to the crop condition development graph, overall crop condition was below both last year's and the five-year average from August. However, thanks to a spectacular increase in cropped arable land (+36%) the output of summer crops is bound to increase.

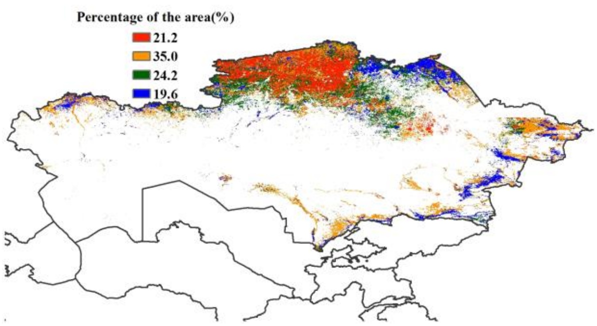
Figure 3.18. Kazakhstan crop condition, July-October 2015



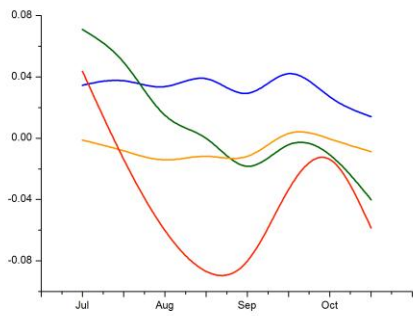
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA

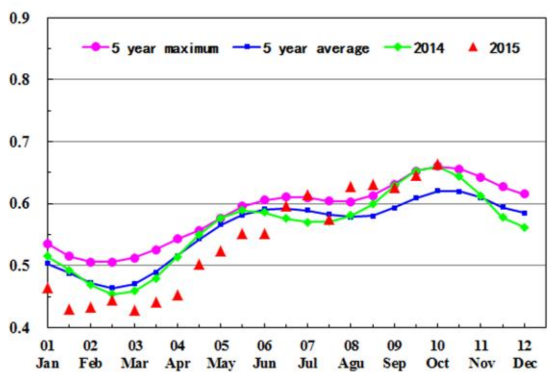


(d) NDVI profiles

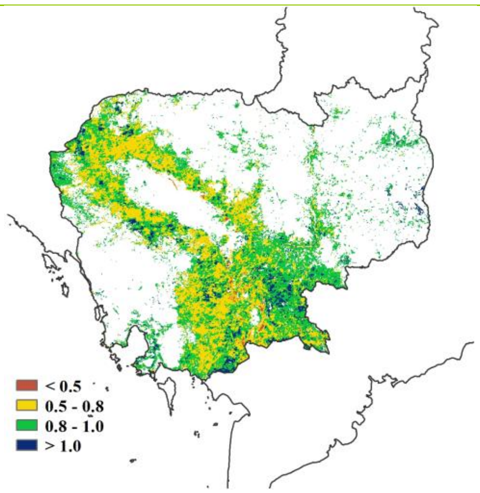
[KHM] Cambodia

Crops in Cambodia displayed around average conditions over the reporting period, which coincides with the planting of the main paddy crop. Overall, rainfall over the period has been average (0% departure) over much of the country. Climatic indicators and biomass monitoring by CropWatch indicate that the country enjoyed favorable PAR with values about 3% higher than the five-year average, as well as a 2% increase of biomass accumulation. Crop condition, which was below average during mid-July, soon recovered in the following two months. The maximum VCI was between 0.5 and 1, showing average crop conditions. NDVI profiles show that crop condition was slightly above average in 12.6% of the cropped areas, and average in 55.3% of croplands. Overall crop prospects for the country are optimistic.

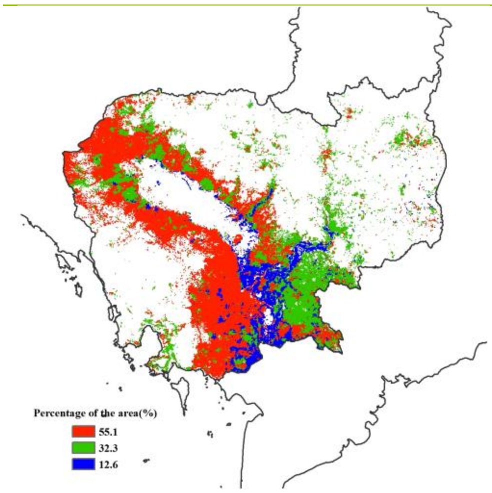
Figure 3.19. Cambodia crop condition, July-October 2015



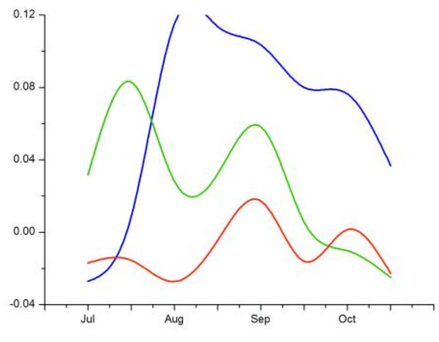
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA



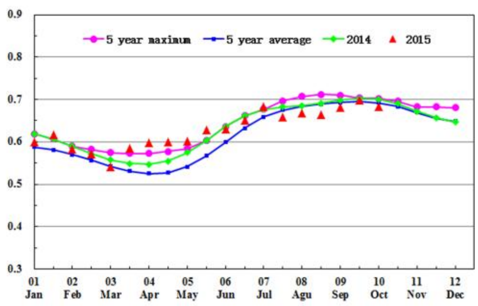
(d) NDVI profiles

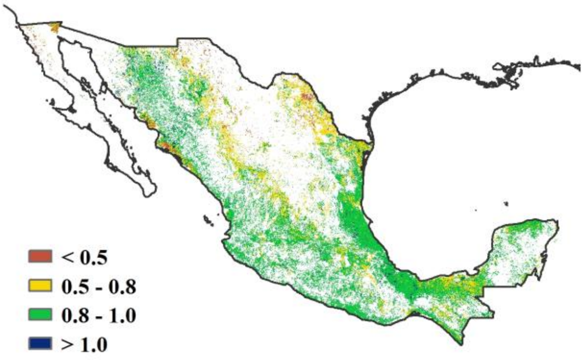
[MEX] Mexico

During August through to early October, maize and sorghum were being harvested while planting of wheat was on-going in Mexico. Overall, crop condition was close to the recent 5-year average.

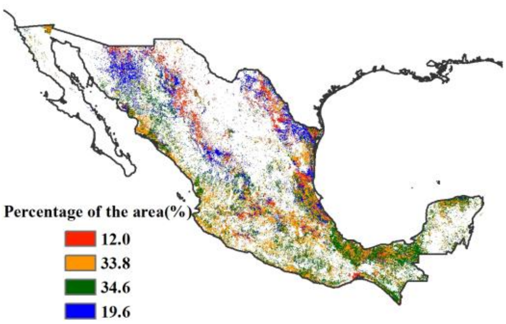
The CropWatch Agroclimatic Indices show that rainfall (-14%) was below average while temperature (+0.1°C) and RADPAR (+3%) were slightly above. Compared to the average level for the same time of the recent five years, the cropped arable land fraction (CALF) and the cropping intensity in 2015 increased by 4% and 7%, respectively. The NDVI profiles and spatial NDVI patterns indicate that crop condition for about 65% of arable land was below average after early September, mainly in northern and central Mexico. On the other hand, 34.6% of crops were continuously above the average level, in south-eastern and western regions. CropWatch estimates that crop production will be close to the five-year average.

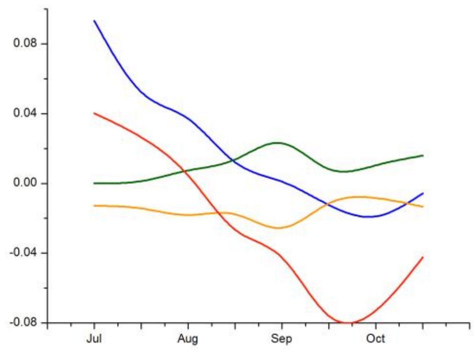
Figure 3.20. Mexico crop condition, July-October 2015





(a) Crop condition development graph based on NDVI (b) Maximum VCI





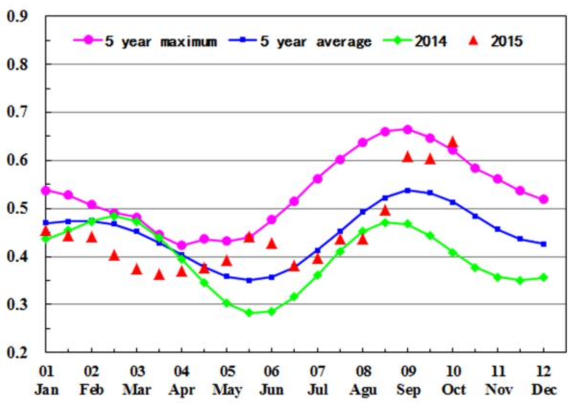
(c) Spatial NDVI patterns compared to 5YA (d) NDVI profiles

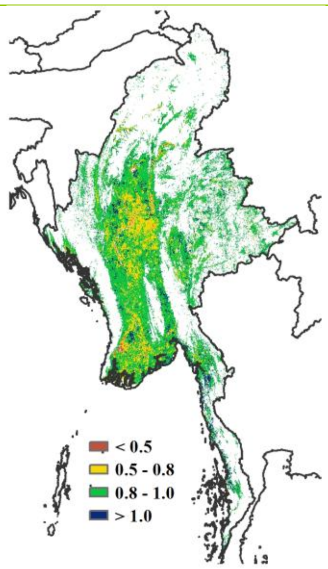
[MMR] Myanmar

Even though the rainfall (RAIN, -8%), temperature (TEMP, -0.3°C) and photosynthetically active radiation (RADPAR, -1%) were below average, the crop condition in Myanmar throughout this monitoring period remained average. The fraction of cropped arable land (CALF) decreased by 1% while biomass accumulation potential (BIOMSS) decreased by 4% compared to the previous five-year average.

The national NDVI profile was above average and even close to previous five-year maximum in September and October. Following the severe floods in July, the assessed crop condition is average, and the national NDVI profiles were generally average. National NDVI profiles dropped sharply in the coastal area of Yangon and Mon in the middle of August but recovered in early September. The NDVI profile in the low-lying area of Bago and Ayeyarwaddy decreased in mid September and then sharply increased from early October onwards. The maximum VCI ranged from 0.5 to 1 over the country indicating good crop condition. Overall, CropWatch assesses the crop condition and production outlook as average.

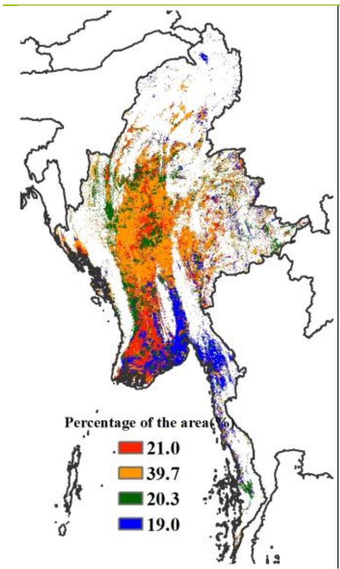
Figure 3.21. Myanmar crop condition, July-October 2015

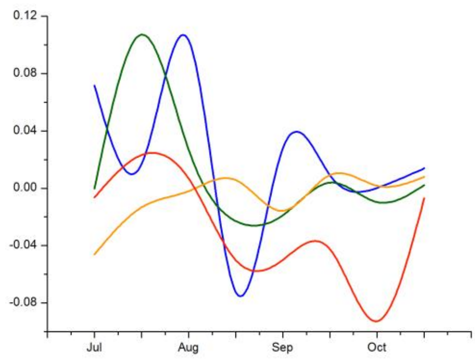




(a) Crop condition development graph based on NDVI

(b) Maximum VCI





(c) Spatial NDVI patterns compared to 5YA

(d) NDVI profiles

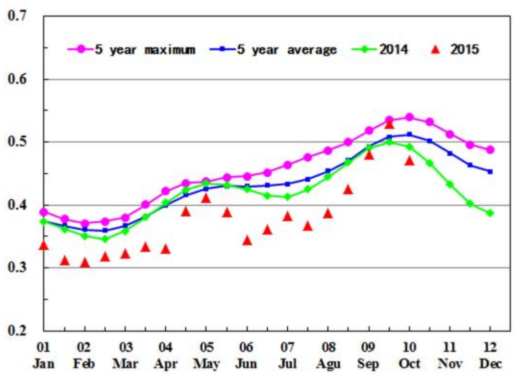
[NGA] Nigeria

The CropWatch rainfall indicator for Nigeria from July to October exceeded the recent average by 21%, accompanied by a drop in RADPAR of 3%, resulting in an estimated biomass potential increase of 7% compared with the last five years. From July to August, however, national NDVI was below the recent 5-year reference values, reaching values closer to average at the time of the cereal harvest in the northern, Sahelian regions, also the time of the harvest of the first maize crop in central and southern regions. CALF decreased 5% while the cropping intensity remained stable at a favourable average VCIx of 0.82

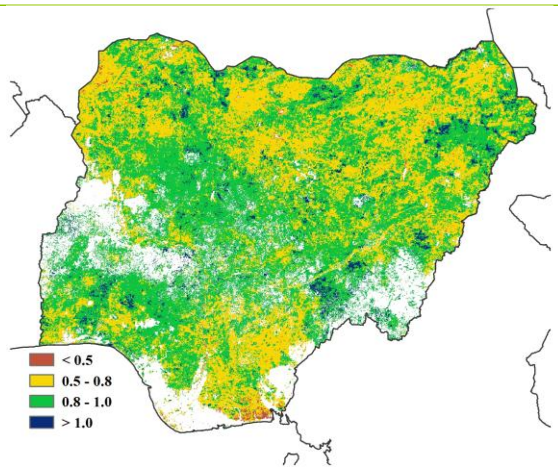
NDVI clusters show above average and average conditions in the central Guinean maize belt and the northern Sahelian regions where sorghum and millets replace maize due to the drier climate. The two mentioned areas approximately coincide with the northern half of the country: in 34% of the country crops were average or above average, 48% was slightly below average in July and August at the time of harvest. In the south, conditions were approximately average at the time of the harvest of the first crops but generally less favourable at the time of planting of the second crop that will be harvested in December and January 2016.

Agroclimatic indices, NDVI and VCIx describe a situation of mixed cereal crop condition, mostly favourable in the north and mixed in the south where, however, cassava and yams are the main staples.

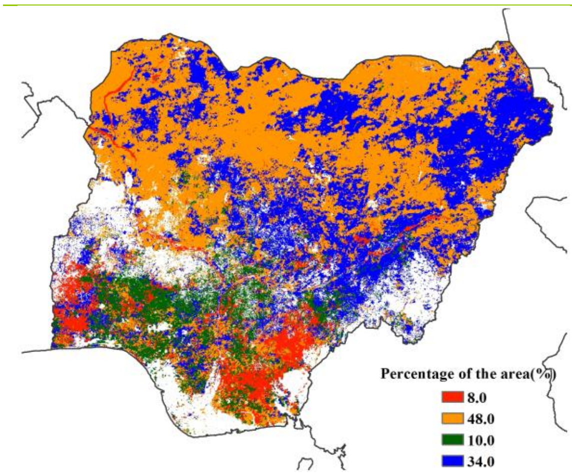
Figure 3.22. Nigeria crop condition, July-October 2015



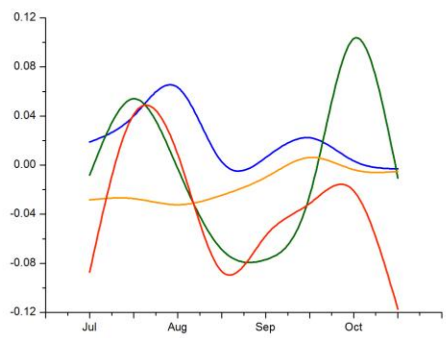
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA



(d) NDVI profiles

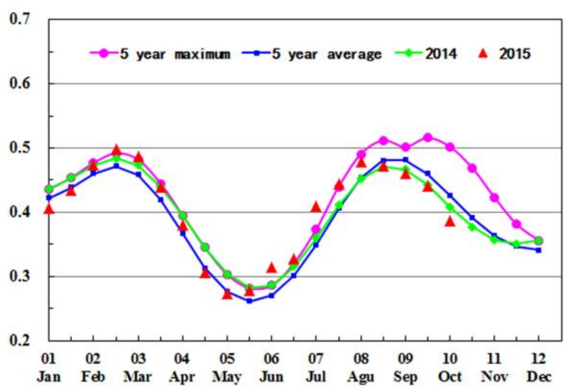
ARG AUS BGD BRA CAN DEU EGY ETH FRA GBR IDN IND IRN KAZ KHM MEX MMR NGA **PAK** PHL POL ROU RUS THA TUR UKR USA UZB VNM ZAF

[PAK] Pakistan

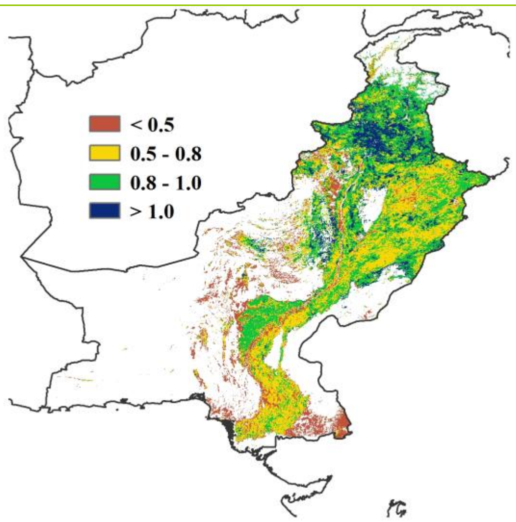
This monitoring period from July to October covers the growing and harvesting stages of summer crops (sugarcane, cotton, rice and maize), as well as the sowing of barley and winter wheat. Compared with average conditions, agroclimatic indicators show an increase of rainfall (+10%), a drop in temperature (-1°C) and radiation (-1%), resulting in a biomass production potential is below the five-year average (-8%). The fraction of cropped arable land (CALF) and cropping intensity decreased (-3% and -5% respectively).

The average NDVI development profiles indicate that crop condition was better than during the five-year average in the beginning of July but from the beginning of August a decline started that continued until October. The lowest maximum VCI values (<0.5) occur in the north of Balochistan, the south of Khyber Pakhtunkhwa and south of Sindh. According to the spatial NDVI patterns and profiles, 41.3% of the cropped area displayed above average conditions throughout the monitoring period from July to October (north Punjab and central Khyber Pakhtunkhwa). 43.6% of cropped areas show average conditions throughout. The remaining 15.1%, mostly in the Sindh area, show poor conditions. Altogether, crop condition is estimated to be fair.

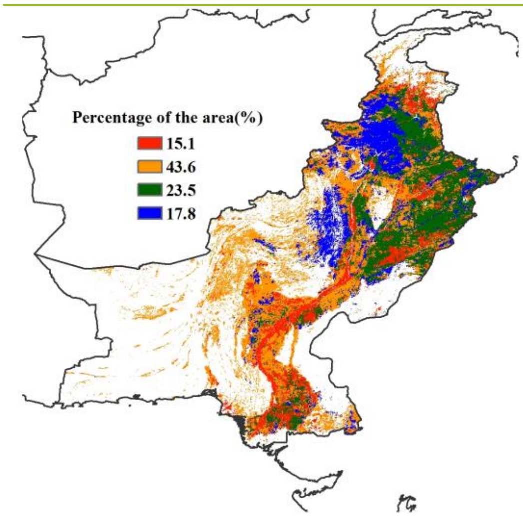
Figure 3.23. Pakistan crop condition, July-October 2015



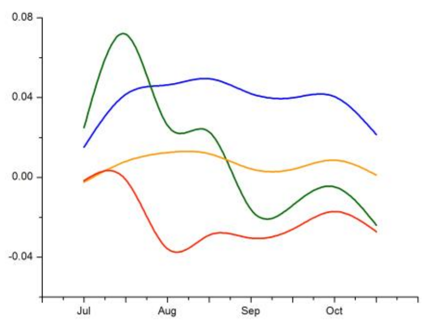
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA

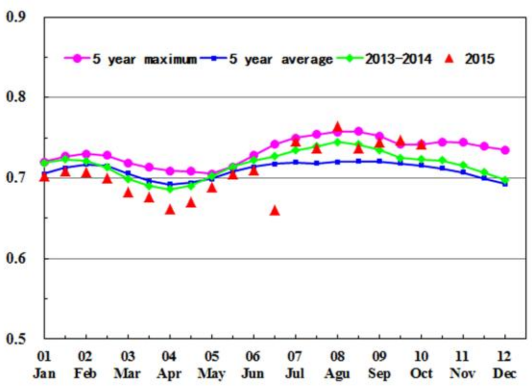


(d) NDVI profiles

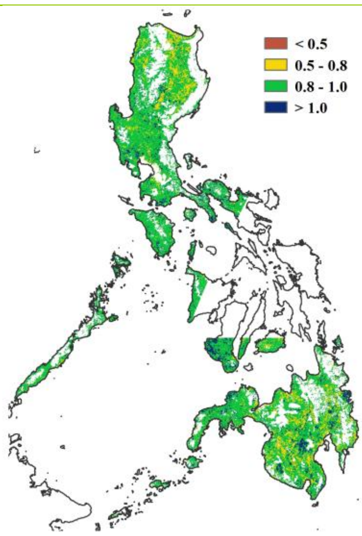
[PHL] The Philippines

The crops in the Philippines generally showed average conditions between August and October (VCIx is 0.89) although the biomass decreased by 11% compared to the most recent five years. Harvesting of the main season paddy crop is currently underway. Soil moisture is plenty, and conducive to the sowing of the secondary season crop. As illustrated by above average indices for rainfall (+2%) and PAR (+4%), the secondary season maize and rice planted from October enjoyed good initial conditions. In mid-October, Typhoon Koppu affected the Philippines and caused torrential rainfall mainly in Aurora province, flooding some arable land. However, the impact on crop growth was limited according to the NDVI profiles: crop condition reached the recent five-year maximum level in October. According to NDVI clusters, crop condition decreased from north to south in August, with favorable conditions in Luzon and poor conditions in Mindanao. From September, however, the difference between north and south narrowed and NDVI values were average throughout the country. Average production can be expected for this year.

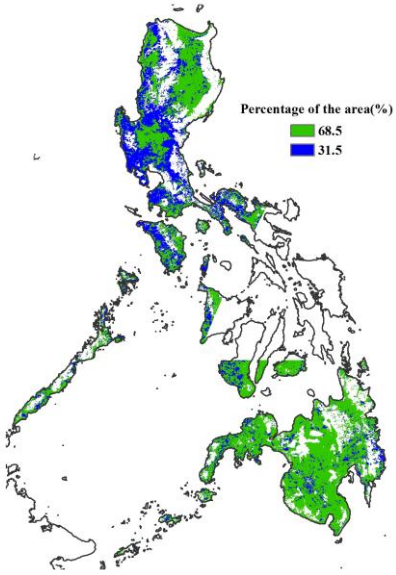
Figure 3.24. Philippines crop condition, July-October 2015



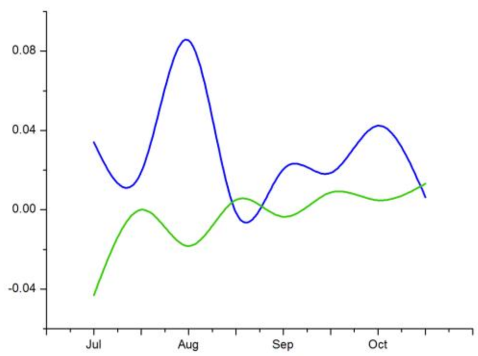
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA



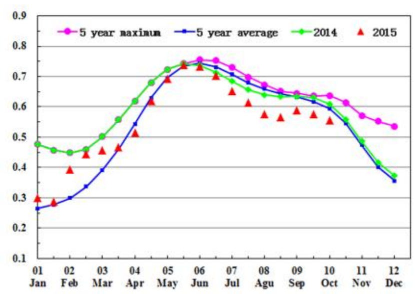
(d) NDVI profiles

[POL] Poland

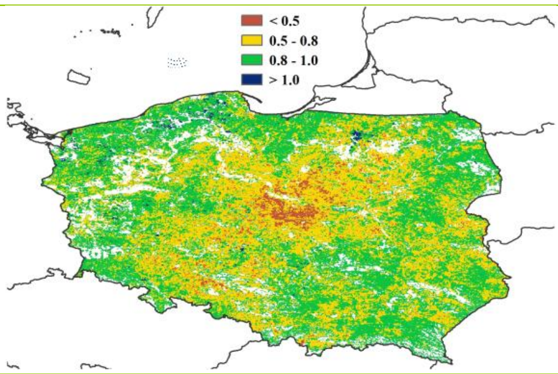
In Poland the winter wheat and maize harvests start from July, and winter wheat is sown from the second half of September. The cropped arable land fraction (CALF) during this monitoring period is same as the average from the last five years. From July to October, the rainfall departure was -39% and the temperature increased 0.3°C above average. RADPAR was above the recent average (+7%) and the potential biomass dropped significantly due to insufficient rainfall.

As shown in the NDVI crop condition development graph, the NDVI in Poland markedly decreased compared with the last five-year average during this monitoring period. Poland suffered drought due to the exceptionally hot weather and record low rainfall. In the center, south and east of Poland, including Dolnoslaskie, Opolskie, Lodzki, Slaskie, Mazowieckie, Swietokrzyskie, Malopolske, Lubeiskie and Podkarpackie, the NDVI dropped sharply from August. The grain filling of winter wheat and the flowering of maize were seriously affected by the water stress. The sowing and germination of winter wheat suffered as a result of this too. The VCIx in Poland during this monitoring period is 0.78, and the final assessment and outlook for Poland are poor.

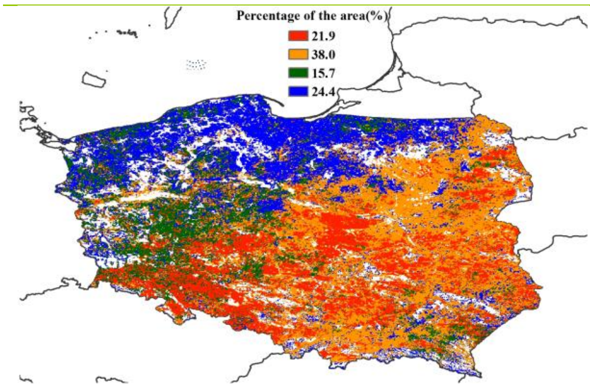
Figure 3.25. Poland crop condition, July-October 2015



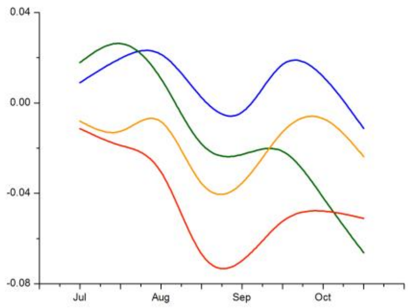
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA



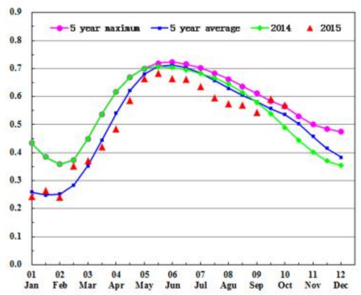
(d) NDVI profiles

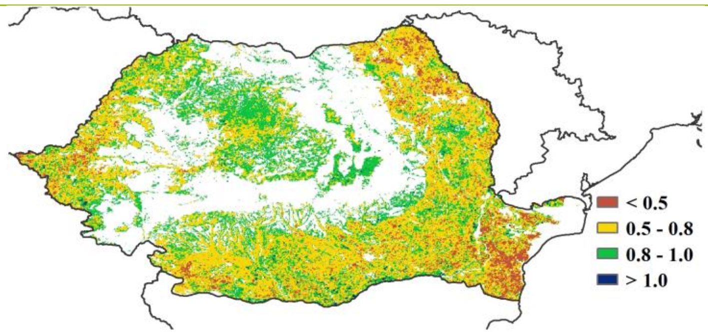
[ROU] Romania

The monitoring period covers the harvest of winter wheat from July, and the subsequent sowing of the 2015-16 crop. The maize harvest begins from September. During this monitoring period, cropped arable land dropped 2% compared with the last five-year average. Overall, the temperature increased over average (+0.8°C) while rainfall dropped 27%. Due to the dry weather, the potential biomass accumulation decreased 9% compared with the average of the last five years.

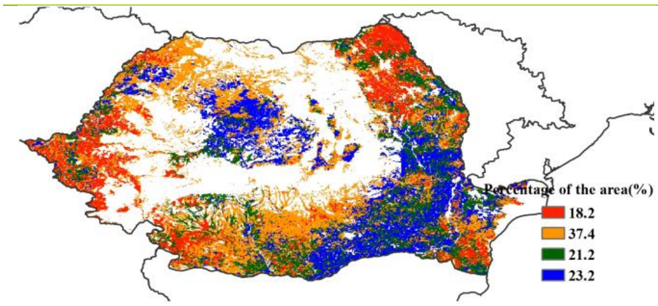
During this monitoring period, as shown in the NDVI development graph, the condition of crops was below the last five years' average from July and close to the average from the end of September. In the west, south and northeast of Romania including Timis, Hunedoara, Mehedinti, Botosani and Neamt, NDVI values seriously departed from average, which will negatively affect the winter wheat and maize yield there. In the center and south-east of Romania, including Alba, Cluj, Giurgui, and Calarasi, crop penology was advanced due to warm weather. The VCIx in Romania during this monitoring period was 0.72 due to the dry and hot weather; the final assessment for Romania's output is below expectations.

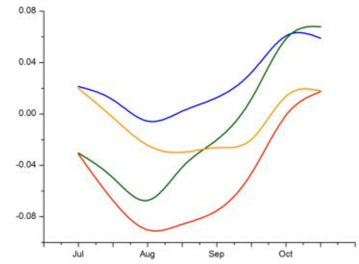
Figure 3.26. Romania crop condition, July-October 2015





(a) Crop condition development graph based on NDVI (b) Maximum VCI





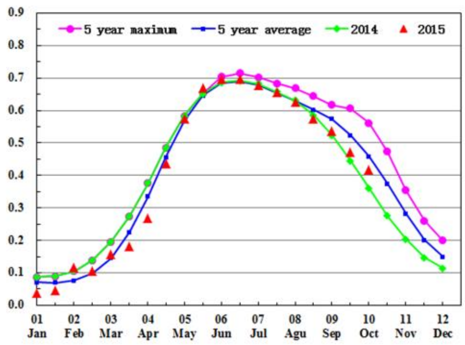
(c) Spatial NDVI patterns compared to 5YA (d) NDVI profiles

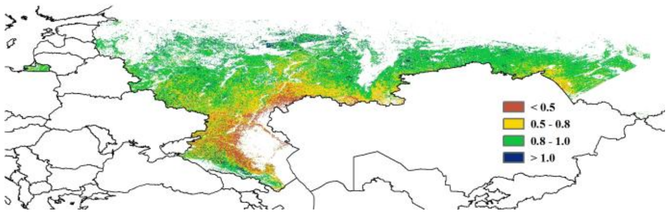
[RUS] Russia

Russia experienced average climate conditions between July and October. The spring wheat and maize harvest begins from August and the winter wheat planting starts in August. Cropped arable land increased 1% compared to the last five-year average. Russia experienced slightly dry and cold conditions during the reporting period. Precipitation below the recent average (-5%) and the temperature was significantly lower than average (-0.8°C) The BIOMSS index rose 1% over the last five-year average.

As shown in the NDVI development graph, crop condition was close to last year's and slightly below the last five-years average. In the Caucasus and south of Siberian Federal District including Krasnodarskiy Kray, Stavropolskiy Oblast, Bashkortostan Republic, Chelyabinskaya and Kurganskaya Oblasts, due to the cold weather (temperature departure below -1°C), the NDVI sharply decreased before October compared with the last five years. In middle of Central Federal District and Volga Federal District, including the Oblasts of Rostov and Voronezh, the NDVI was higher than the last five-years average from July and returned to normal after August. The VCIx in Russia during this monitoring period was 0.82 and the final assessment for Russian crops is average.

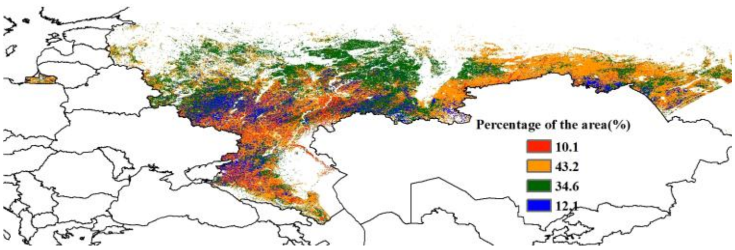
Figure 3.27. Russia crop condition, July-October 2015

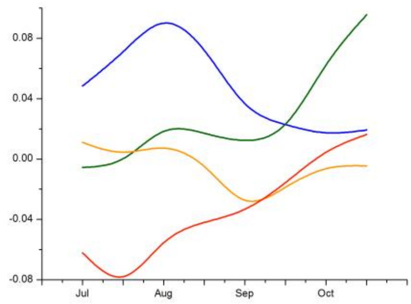




(a) Crop condition development graph based on NDVI

(b) Maximum VCI





(c) Spatial NDVI patterns compared to 5YA

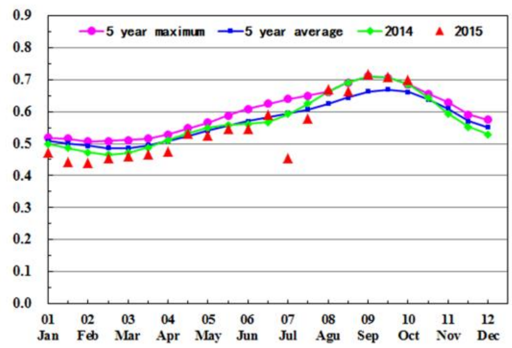
(d) NDVI profiles

[THA] Thailand

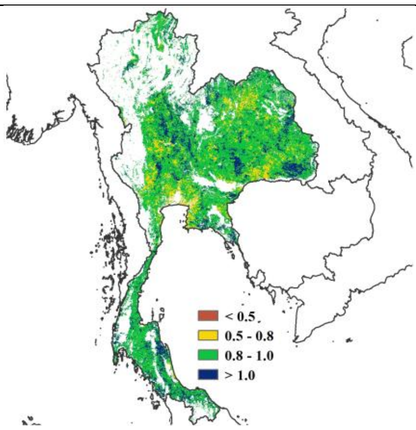
Rice is Thailand's main crop; the harvest of the first crop started in September and will go into December. The second rice matures from April to June. In addition, the first crop of maize normally starts in May and matures in August and September. The second maize is a short-cycled crop grown in the same regions (September to December). According to agroclimatic and agronomic indicators, RAIN and BIOMSS decreased by 10% and 9%, respectively. RADPAR was slightly above the average value. There was little change in temperature and CALF.

As shown in figure (a), the national NDVI curve was below the five-year average from January to July, reaching its minimum in July (about 0.45), then increasing and reaching the average in August. Below-average rain in May is the major reason for the NDVI fluctuation, which delayed sowing of the main season rice. However, favorable rains in early July stimulated growth, which may offset the effect of late planting: there was an obvious improvement of crop condition after July. High VCIs are widely seen by central Thailand's rivers; they indicate favourable crop condition with maximum values occurring over the Chao Phraya river system (VCIx>1). Altogether, the production prospects of rice and maize are favorable.

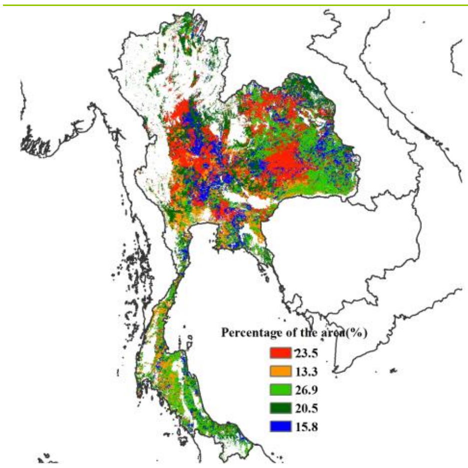
Figure 3.28. Thailand crop condition, July-October 2015



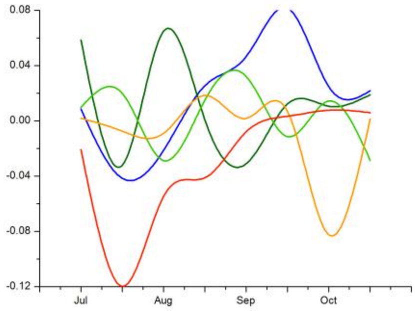
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA



(d) NDVI profiles

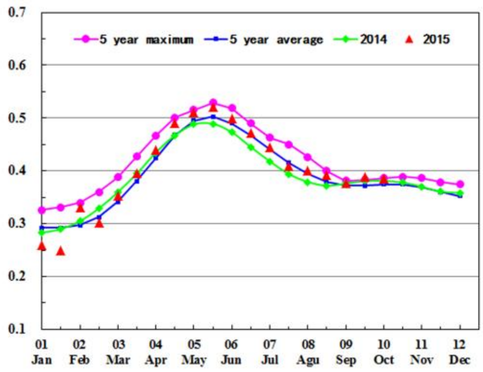
ARG AUS BGD BRA CAN DEU EGY ETH FRA GBR IDN IND IRN KAZ KHM MEX MMR NGA PAK PHL POL ROU RUS THA **TUR** UKR USA UZB VNM ZAF

[TUR] Turkey

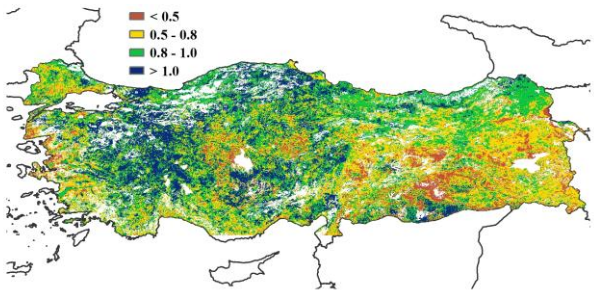
The crop condition from July to October 2015 was generally close to average in Turkey. Summer crops' harvest was completed during the monitoring period, and winter wheat and barley were sown from September onwards. Accumulated rainfall (+13%) and temperature (+1.2°C) were above average, while the accumulated RADPAR was close to average. The agro-climatic conditions resulted in a BIOMSS increase of 4% above the average of the previous five years. The maximum VCI (0.83) was above average, and CALF significantly increased by 8% compared to the recent five-year average. The indicators imply production levels for summer crops comparable with the recent five-year average.

Crop condition in most of the Aegean, Mediterranean and the south-eastern Anatolia regions was above the recent five-year average, but crop condition was below average in the most of northern and southern Anatolia. Poor growing conditions concentrated in the Ardahan and Kars provinces in Eastern Anatolia and most of Marmara regions during the whole monitoring period. Overall, the outcome for the summer crops is expected to be favorable.

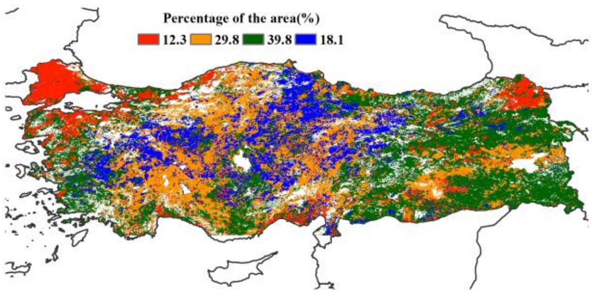
Figure 3.29. Turkey crop condition, July-October 2015



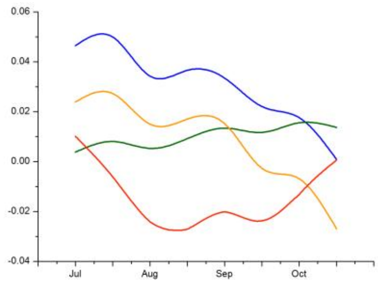
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA



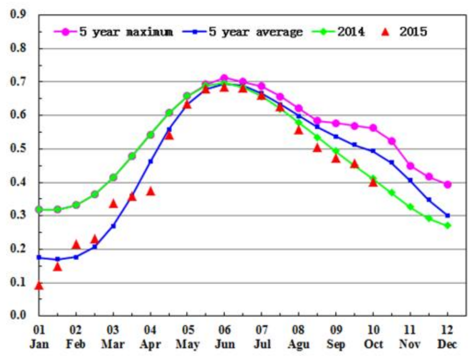
(d) NDVI profiles

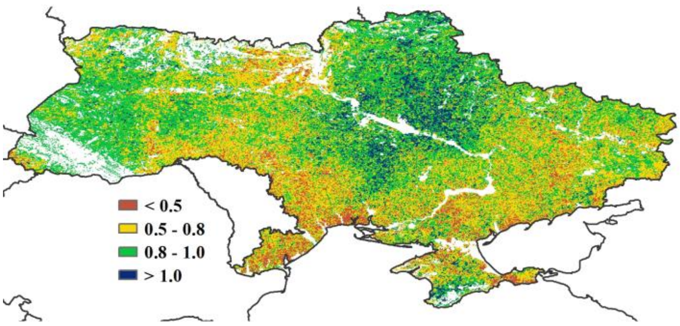
[UKR] Ukraine

Ukraine's crop condition was unfavourable during this monitoring period. The winter wheat's harvest was completed before August and seeding began in September, while the maize harvest started in August. Weather conditions were characterized by poor rainfall from July to October (down 49% compared with average), while PAR was above average (+7%). The resulting potential biomass drop is 38%. According to the spatial NDVI patterns compared to the recent five years, most pixels' VCIx value in Chernihivs'ka, Sums'ka, Poltavs'ka and Cherkas'ka in central Ukraine is larger than 1, which indicates rather good crop condition in this area.

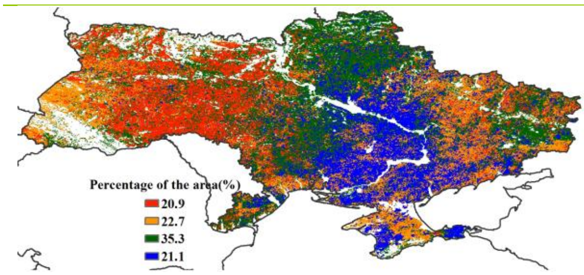
Western Ukraine, however, underwent unfavorable conditions from July to September, including Vinnyts'ka, Khmel'nyts'ka, Ternopil's'ka and Zhytomyrs'ka, then recovered to average in October. As shown in the crop condition development graph, the July-October NDVI was lower than the recent five years due to the continuous drought. As most of the winter wheat has been harvested before August, the yield of wheat wouldn't be affected. The maize yield of 2015 is expected to drop in Ukraine.

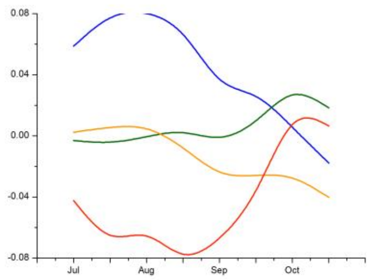
Figure 3.30. Ukraine crop condition, July-October 2015





(a) Crop condition development graph based on NDVI (b) Maximum VCI





(c) Spatial NDVI patterns compared to 5YA (d) NDVI profiles

ARG AUS BGD BRA CAN DEU EGY ETH FRA GBR IDN IND IRN KAZ KHM MEX MMR NGA PAK PHL POL ROU RUS THA TUR UKR **USA** UZB VNM ZAF

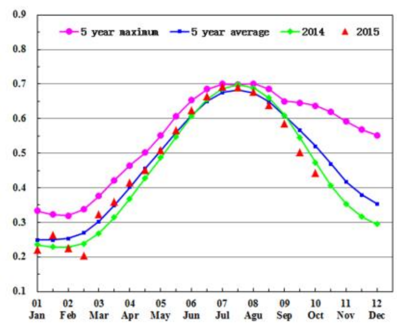
[USA] United States

In general, CropWatch indicators show that crop condition was below last year's during the reporting period, which covers heading, filling and the harvest of summer crops. Overall, weather conditions were favorable with rainfalls 22% above average, a slight temperature anomaly (-0.1°C) and a 1% drop in radiation compared to the average.

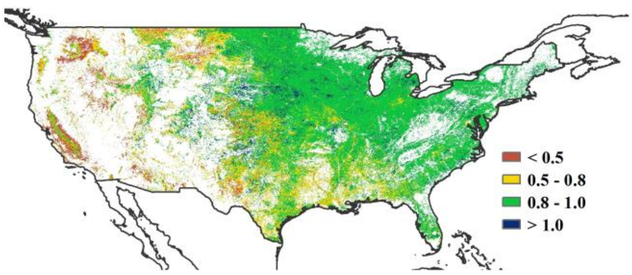
Maize and soybean are the major crops in the United States during the reporting period. Except for Indiana (-18 %) and Ohio (-15%), other major maize producing states received average or above average rainfall, including Illinois (+5%), Iowa (+43%), Kansas (+42%), Minnesota (+43%), Missouri (+77%), Nebraska (+88%) and Wisconsin (+18%). Since most maize is rain-fed in the United States, the potential biomass accumulation responds directly to rainfall, increasing by 34%, 11%, 43%, 34% and 51% over the average of the previous five years, respectively, in Iowa, Illinois, Missouri, Minnesota and Nebraska. In spite of favourable weather conditions, NDVI showed a negative departure in spring wheat production states, especially in North Dakota and Montana, which may have been caused by early drought. NDVI was below average in the main rice production in areas in the south-eastern United States, probably resulting in lower rice production this year.

Indicators are difficult to reconcile in the US this year: although biomass potential shows a 20% positive departure from the average of the last five years, CALF increased 1% and VCIx was 0.84, the NDVI development profiles show crop conditions below those last year. Low to average crop production can be expected in the United States this year.

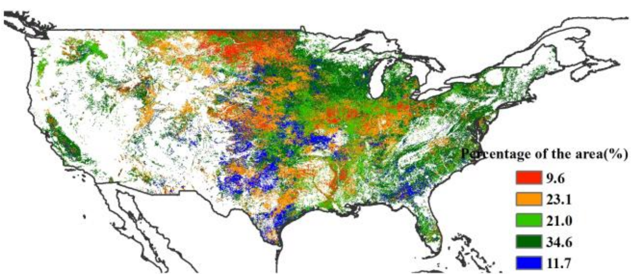
Figure 3.31. United States crop condition, July-October 2015



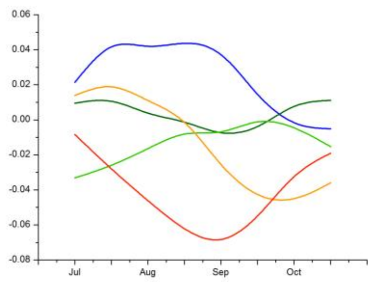
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA



(d) NDVI profiles

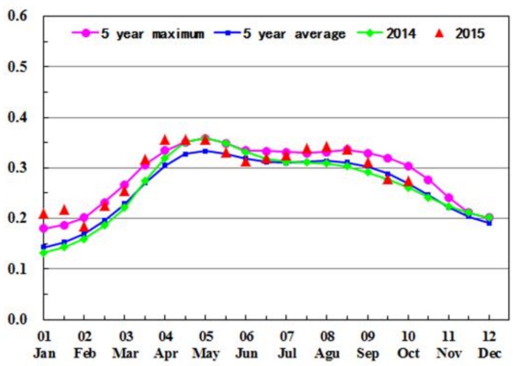
ARG AUS BGD BRA CAN DEU EGY ETH FRA GBR IDN IND IRN KAZ KHM MEX MMR NGA PAK PHL POL ROU RUS THA TUR UKR USA **UZB** VNM ZAF

[UZB] Uzbekistan

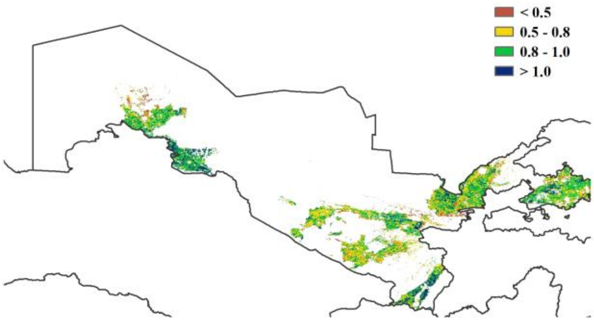
This monitoring period covers the harvesting and sowing stages of winter wheat, as well as the growing and harvesting stages of maize. Winter wheat, which is the most important crop in Uzbekistan, was harvested in June and the next season crop is currently being planted.

Crop condition was generally favorable. Among the CropWatch agroclimatic indicators, RAIN was well above average (156%), and TEMP and RADPAR below average by 0.5% and 1%, respectively. The combination of the factors resulted in high BIOMSS (+105%) compared to the five-year average. From July to late September, judging by the spatial NDVI patterns and profiles, the whole country experienced good conditions. Crop condition in the whole country was at least average throughout the entire monitoring period. CropWatch estimates that the wheat production increased 7% compared with the previous season, mainly due to an increase in CALF that reached 9%.

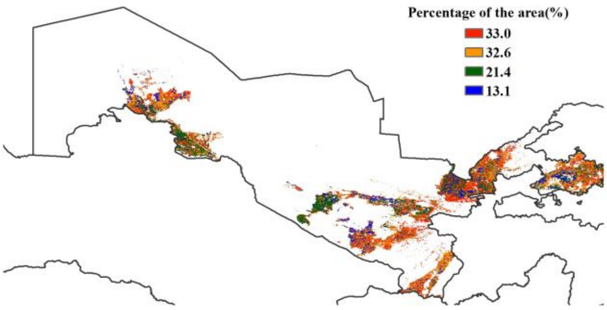
Figure 3.32. Uzbekistan crop condition, July-October 2015



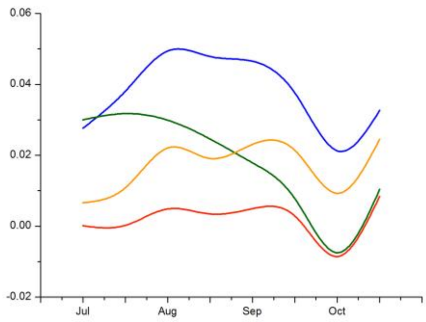
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA



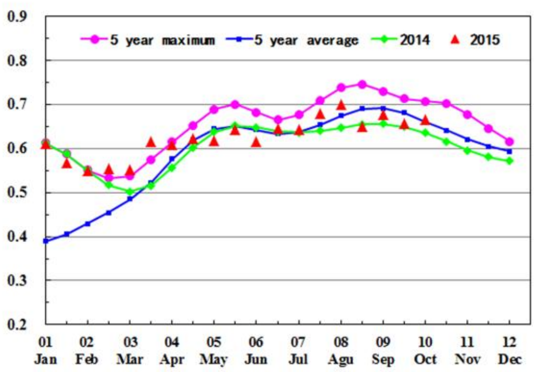
(d) NDVI profiles

[VNM] Vietnam

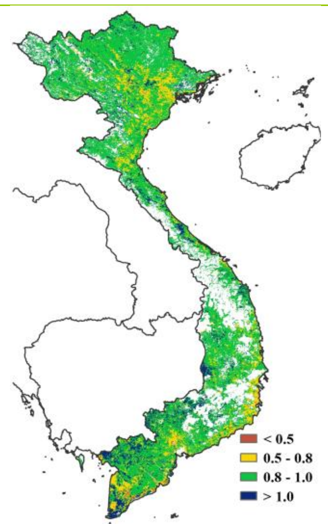
The harvesting period of summer and autumn rice has been completed, while the 10th month rice was still growing at mid-October. The crop condition from July to October was slightly lower than the recent five-years average. For the period under consideration, most CropWatch agroclimatic and agronomic indicators show average conditions or a slight drop below the average: RADPAR (0%), TEMP (+0.1°C), BIOMSS (-3%), and RAIN -10%).

Spatial NDVI profiles show that the crop condition was mostly above average in the Red River delta (including Lang Son and Cao Bang). Other areas recorded about average NDVI, especially in the middle mountain area and the south. NDVI profiles show that crop condition was above average in 21.7% of the major rice plantation area, mainly the Mekong River delta from September to October, with VCIx ranging between 0.8 and 1. Based on CropWatch indicators, the crop situation in Vietnam is considered to be satisfactory and close to average.

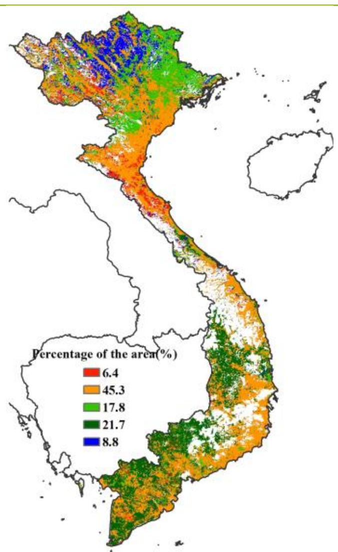
Figure 3.33. Vietnam crop condition, July-October 2015



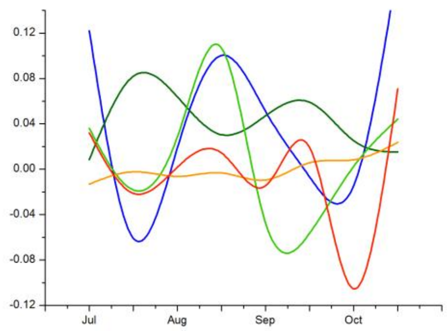
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA

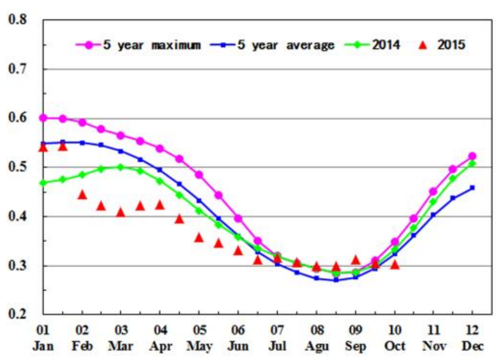


(d) NDVI profiles

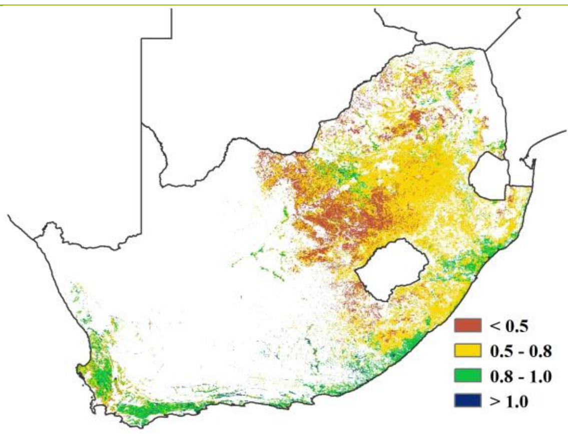
[ZAF] South Africa

In South Africa, the major summer crops, including maize, millet, sorghum and soybean, and winter cereals (such as barley and wheat) are harvested roughly during the period from May to June and the period from October to November, respectively. Therefore, maize, millet, sorghum, and soybean have already been harvested at the end of this reporting period, while barley and wheat are in their growing stage. Compared with the averages, rainfall, biomass accumulation and CALF have decreased significantly: 15% for rainfall, 7% for the biomass accumulation and 16% for CALF. Temperature was 1.1°C higher than average, and RADPAR remained close to the reference value. The NDVI values were lower than the five-year average in the first half of the year, after which it was close to the average; it exceeded the average value during this monitoring period, which can be explained by growing barley and wheat crops. Low VCIs mostly occurred in the Northern areas but the minimum VCI occurred in the Free State and North West province. In contrast, the southern coastal areas showed relative high VCIs values (0.8-1.0) in the main winter crop zones. According to figures (c) and (d), low NDVI occurred in South Africa, it shows production of winter cereals in the southern Mediterranean region (the major wheat zone), is expected to poor to fair. However, the main sugarcane zones in the Eastern Cape and the KwaZulu-Natal presented relative high NDVI values as well as the major citrus growing areas along the coast from the KwaZulu-Natal to the Eastern Cape and the Southern West Cape. Overall crop prospects are optimistic.

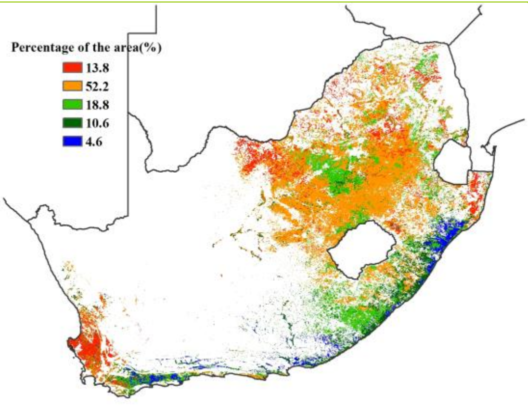
Figure 3.34. South Africa crop condition, July-October 2015



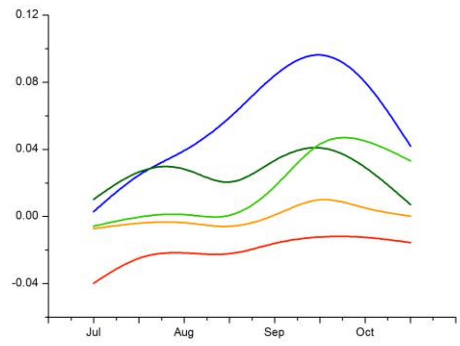
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA



(d) NDVI profiles