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) also 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 2014 production estimates for Argentina, Brazil, and the United States.

3.1 Overview

Figures 3.1-3.4 illustrate the global distribution of CropWatch indicators for rainfall, temperature, radiation, and biomass—respectively the RAIN, TEMP, RADPAR, and BIOMSS indicators, showing their increase or decrease for this monitoring period compared to last year's January-April period. Details by country are presented in table 3.1.

Globally, as already mentioned in Chapter 1, over the reporting period droughts affected the Caribbean and northern Mediterranean. Within these two regions, the most seriously affected countries are Dominica (rainfall 84% below average) and Portugal[1] (-85%). In South America, the water deficit affects the Dominican Republic (-66%) and several countries in the north, especially Ecuador, Colombia, Venezuela (with departures from average between -20 and -30%), and Suriname where the deficit reached 63%. All those countries were at the stage of either harvesting their second crop or planting the main crop. Among the Mediterranean countries, the deficit during the reporting period (basically covering the dormancy period of winter crops) varies between -42% and -50% in Spain, Italy, and Greece. The rainfall deficit also extends to other countries to the north, including Hungary and in an area from the Czech Republic to France (-50%), but particularly including Albania, Bosnia, and Croatia where the rainfall deficit exceeds 60%. The crop stage in this area is comparable with the situation along the Mediterranean, and spring rainfall will be critical.

In Europe, the Baltic and Scandinavian countries recorded abundant precipitation in the range of 40 to 65% above average amounts. This above average precipitation was associated with temperature records (2.5 to 3.5°C above average, also affecting Belarus) and large radiation deficits. (The radiation deficits exceed -10% and reach a record -17% in Estonia.) Among the various weather variables, the large amount of rainfall is the most relevant as it contributes to soil moisture.

Excess precipitation was recorded for several countries in South America (see also section 5.1). This includes Peru and Bolivia, along with neighboring areas, but also Mexico, with one of the largest positive departures recorded at country level for the reporting period (+118%, with -8% sunshine). Excess precipitation also occurred in parts of western Africa (Guinea Bissau, Senegal, Gambia, Mauritania, as

[1] Strictly speaking, Portugal is not a Mediterranean country, but it's its climate is similar to that of Spain.

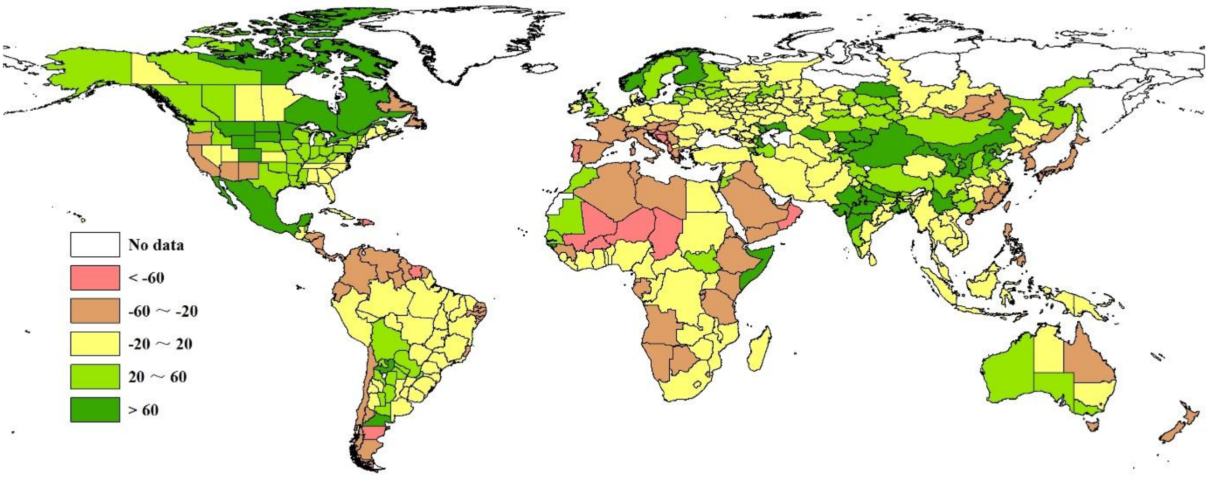
well as Morocco) where the excess precipitation of +20 or 30% and the early start of the season in some Sahelian countries could lead, if precipitation continues, to record biomass and crop production (the biomass potential reached +120% in Mauritania and +100% in Senegal). This is paralleled by a late onset of the season (decreased rainfall) in Guinea and some central Sahelian countries (Burkina Faso and the area from Mali to Chad). However, this rainfall deficit is still limited for the time being but nevertheless deserves close monitoring during this El Niño season.[2] The same applies to Kenya, Tanzania (20 to 30% deficit), and especially Eritrea (-56%). In Ethiopia, the early but "minor" Belg season suffered a water deficit (-25%).

Several central African countries (Cameroon, the Democratic Republic of Congo, and the Central African Republic) underwent favorable sunshine conditions, which occurred at the late phenological stages of cereals in the Democratic Republic of Congo (RADPAR, +11%) and early cycle or planting time in the other countries. Even if this was associated with a slight rainfall deficit (up to -10% for RAIN), shortage of sunshine (RADPAR) is usually a limiting factor in the region and the overall effect on crop production is positive.

Much of central and eastern Asia underwent wet conditions. Dry conditions however are reported from parts of Russia (the Chita Oblast and the Buryat Republic) as well as the Promorsky Kray and neighboring Japan, the Democratic People's Republic of Korea, and the Republic of Korea (below average rainfall of -30 to -40%). Further south, the rainfall deficit also affects the Philippines (-40%) and parts of east and south China from Jiangsu to Guangdong and Hainan. On the contrary, many central Asian regions (from Inner Mongolia to the Caspian and the eastern Black Sea, including Armenia where rainfall was 63% above average) enjoyed favorable rainfall. Above average rainfall also extended south into western India and southeast China (Yunnan), including earth-quake stricken Nepal (+101%).

Finally, drought conditions affected north-east Australia and New-Zealand (-51%).

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



[2] The El Niño signal is usually stronger in southern and eastern Africa than in West Africa.

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

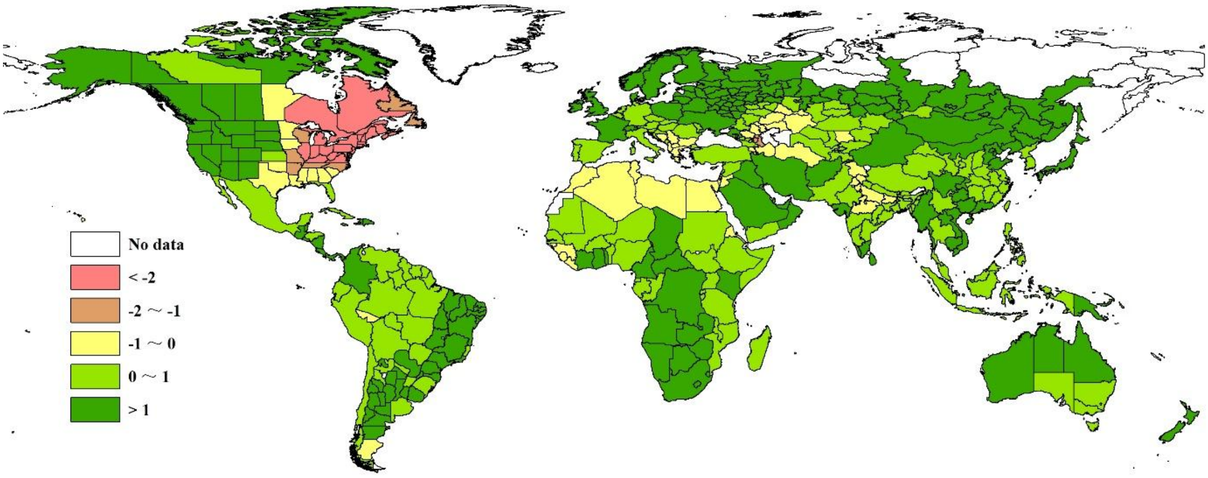


Figure 3.3. Global map of PAR (RADPAR) by country and sub-national areas, departure from 14YA (percentage), January-April 2015

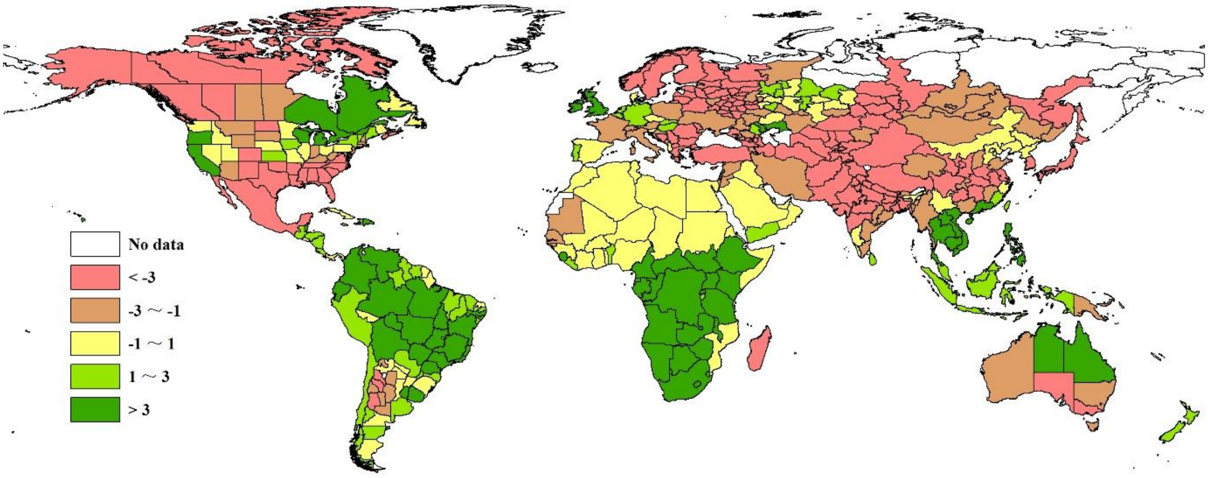


Figure 3.4. Global map of biomass (BIOMSS) by country and sub-national areas, departure from 14YA (percentage), January-April 2015

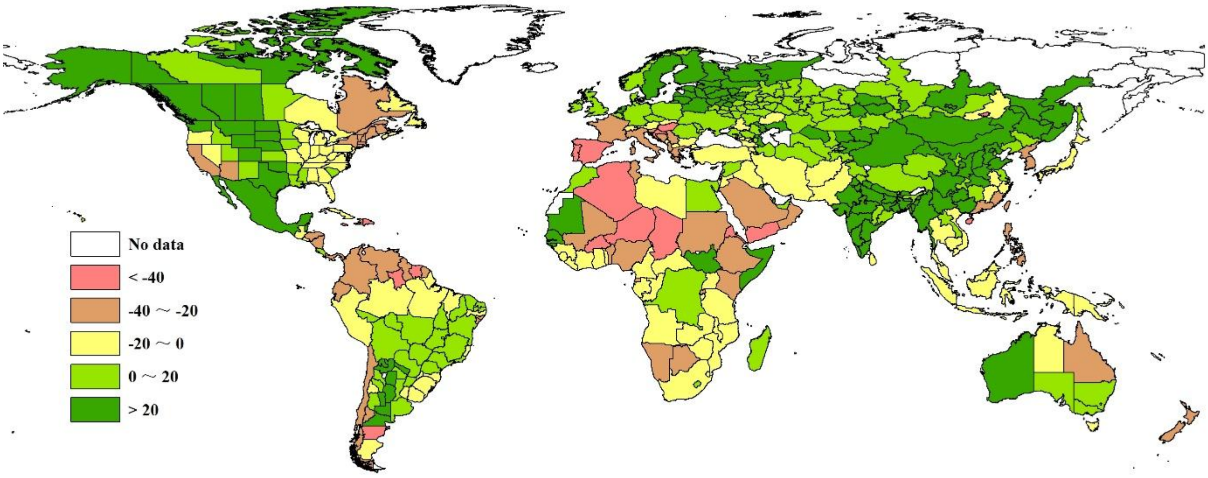


Table 3.1. CropWatch agroclimatic and agronomic indicators for January-April 2015, departure from 5YA and 14YA

Country	Agroclimatic indicators			Agronomic indicators		
	Departure from 14YA (2001-14)			Departure from 5YA (2010-14)		Current
	RAIN (%)	TEMP (°C)	RADPAR (%)	BIOMSS (%)	CALF (%)	Maximum VCI
Argentina	21	1.1	0	13	1	0.84
Australia	-2	0.8	-1	-1	-16	0.54
Bangladesh	36	0.6	-4	54	0	0.88
Brazil	-6	1.2	5	1	0	0.85
Cambodia	-18	1.2	6	-16	1	0.65
Canada	38	-0.5	0	8	/	0.71
China	5	1.2	-2	25	3	0.86
Egypt	-17	-0.6	-1	9	0	0.75
Ethiopia	-25	0.4	6	-22	-4	0.54
France	-46	1.8	-2	-27	1	0.88
Germany	-1	0.4	3	16	0	0.87
India	32	0.3	-4	52	3	0.83
Indonesia	-7	0.7	2	-2	0	0.89
Iran	-6	1	-2	-10	2	0.76
Kazakhstan	23	0.4	-2	17	/	0.60
Mexico	114	0.2	-8	101	16	0.95
Myanmar	8	1.1	-1	24	1	0.76
Nigeria	-12	0.7	1	-24	-14	0.53
Pakistan	16	0.3	-5	-5	3	0.81
Philippines	-41	0.6	6	-36	0	0.85
Poland	7	1.4	-1	14	0	0.83
Romania	-2	0.6	-3	5	-8	0.76
Russia	12	1.6	-3	15	-1	0.61
S. Africa	-6	1.3	5	-6	-10	0..68
Thailand	-11	0.7	5	-1	1	0.70
Turkey	10	0.1	-5	-6	3	0.84
United Kingdom	21	1	3	2	0	0.87
Ukraine	-3	1.4	-3	15	-1	0.69
United States	24	-0.4	-4	10	1	0.74
Uzbekistan	11	0.3	-5	18	/	0.66
Vietnam	-7	1.1	6	-6	0	0.83

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 (January-April). Some winter crops are grown in Canada, Kazakhstan, and Uzbekistan (marked with "/").

3.2 Country analysis

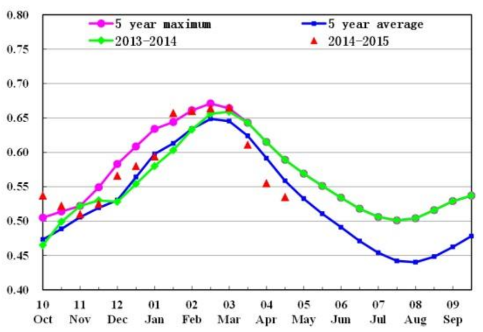
This section presents CropWatch results for each of thirty key countries (China is addressed in Chapter 4). The maps refer to crop growing areas only and include (a) Crop condition development graph based on NDVI average over crop areas, comparing the January-April 2015 period to the previous season and the five-year average (5YA) and maximum. (b) Maximum VCI (over arable land mask) for January 1 – April 30 2015 by pixel; (c) Spatial NDVI patterns up to April 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.3, 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 January-April 2015

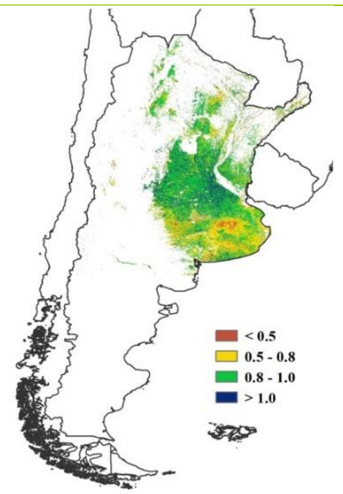
[ARG] Argentina

In general, crops in Argentina underwent favorable conditions from January to April. Currently, maize and soybean are at maturity stage and the harvest is ongoing. Nationally, abundant precipitation (RAIN, 21% above average) and favorable temperatures (TEMP, +1.1°C) accelerated the development and maturation of maize and soybean. Good agroclimatic conditions were also observed in major producing provinces, except for Entre Rios, with 8% below average rainfall. Overall, the NDVI development graph shows above average crop condition and advanced crop phenology. The NDVI peak exceeds the corresponding 2014 and five-year average values, which indicates above average yield prospects. As confirmed by spatial NDVI patterns compared to the five-year average and corresponding NDVI departure cluster profiles, NDVI has been above the five-year average since November 2014 in 90% of arable land in Argentina. The remaining 10% of land, where condition was below average, is located in scattered spots in northern Argentina, mostly in Mesopotamia and the Chaco Region. Compared with average, only Central Buenos Aires shows below average crop condition. For 2015, CropWatch puts maize and soybean production for the country at 25.3 million tons and 52.2 million tons, respectively, close to the 2014 production levels (see table B.1 in Annex B).

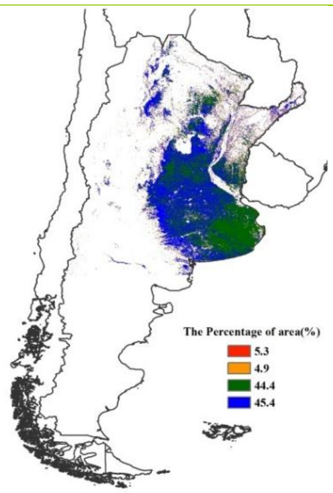
Figure 3.5. Argentina crop condition, January-April 2015



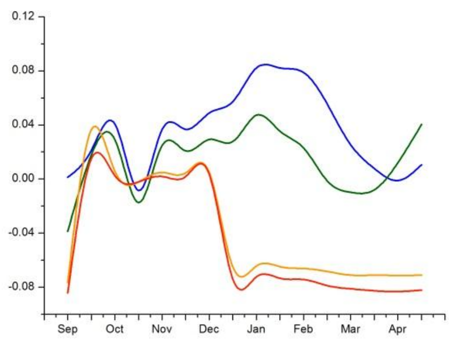
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA



(d) NDVI profiles

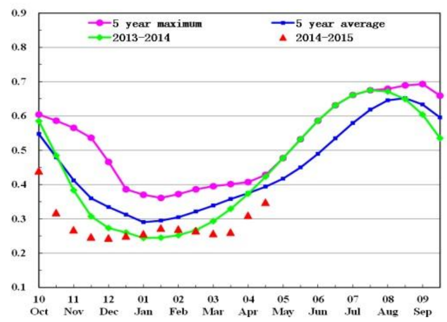
[AUS] Australia

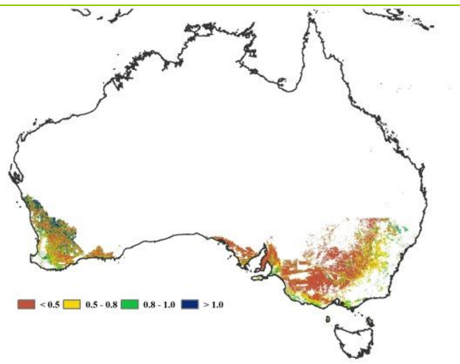
Indicators in Australia show generally below average condition for the period between January and April in 2015, but differences between indicators make it difficult to assess the intensity of the anomaly. The reporting period is out of season for wheat and barley, which are the main crops for Australia. As a result, it is not surprising that the maximum VCI is generally only 0.54. The maximum VCI is below 0.5 for most of the Eastern Australian regions, including Victoria (except for southeastern areas), the middle and south of New South Wales, and the southeast of South Australia, which is consistent with the monitored result of a 16% decrease of the fraction of cropped arable land (CALF) compared with the recent five-year average.

Also compared to the recent five years, the spatial NDVI patterns and the corresponding time profiles show the condition of crops as below average, especially for the western part of Western Australia, southeastern part of South Australia, all over Victoria except for its southeastern area, and the southwestern part of New South Wales, together accounting for about 76.4% of the monitored area.

Globally, agroclimatic indicators display average conditions (RAIN,-2%; TEMP, +0.8°C; and RADPAR, - 1%), resulting in an average potential accumulated biomass (BIOMSS) of -1% compared to average. The "average" RAIN results from a marked deficit in Queensland and Tasmania (below -30%), combined with positive departures in other areas (+19% in New South Wales, +33% in South Australia, +22% for Victoria, and +48% for Western Australia) where soil moisture conditions now are favorable for the planting of wheat and barley in the coming month.

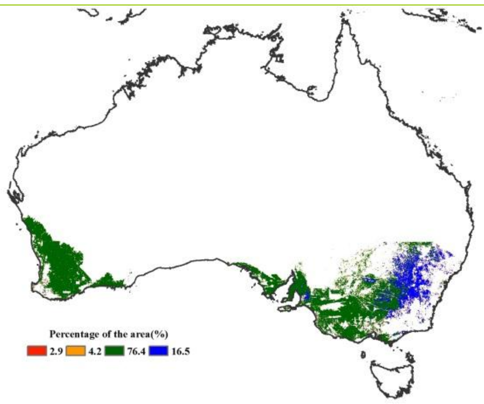
Figure 3.6. Australia crop condition, January-April 2015

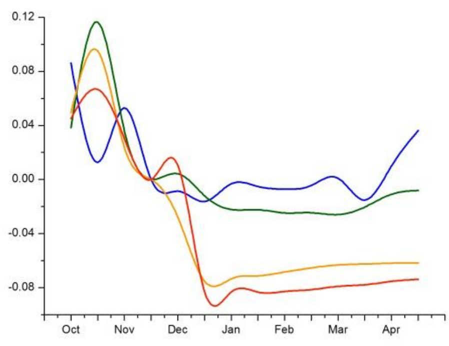




(a) Crop condition development graph based on NDVI

(b) Maximum VCI





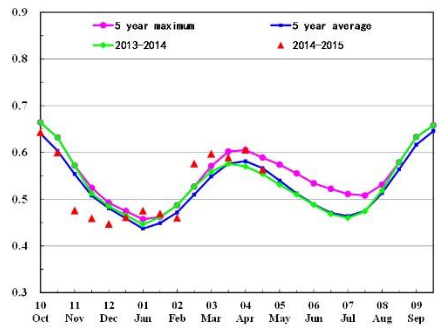
(c) Spatial NDVI patterns compared to 5YA

(d) NDVI profiles

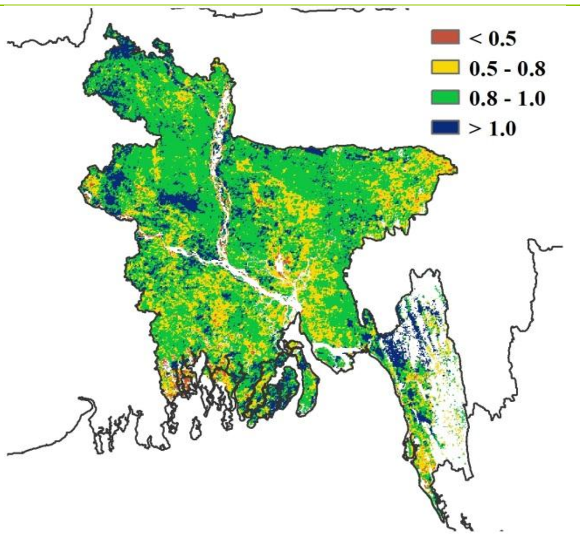
[BGD] Bangladesh

The monitoring period is the growing and harvesting season of irrigated boro rice. Overall, the CropWatch indicators indicate favorable crop condition for the reporting period. Rainfall was 36% above average, temperature was average, and PAR was low (-4%), nevertheless resulting in a biomass accumulation potential of 54% above the five-year average. The national NDVI profile was above the average of the previous five years from February to early April but dropped to average at the end of the month. The maximum VCI ranged from 0.5 to 1, indicating favorable crop condition for the entire country. Spatial NDVI profiles followed similar patterns for the whole country: after a marked drop at the end of 2014 and early 2015, values started increasing in early January and remained positive but close to average for the remainder of the monitoring period. Exceptions are in northeast Rajshahi and the north of Dhaka and Sylhet, where the recovery was much more gradual, affecting about 9.5% of the country.

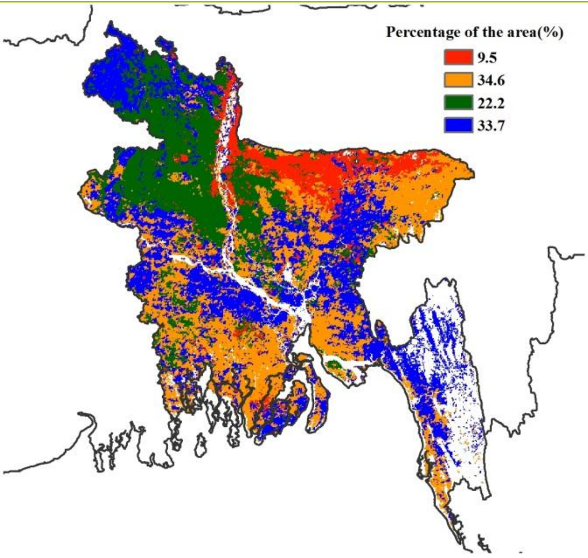
Figure 3.7. Bangladesh crop condition, January-April 2015



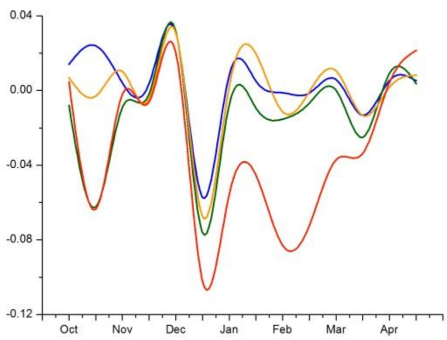
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA



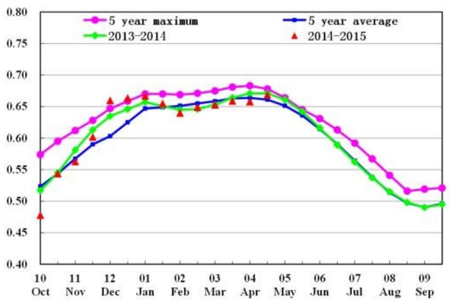
(d) NDVI profiles

ARGAUS 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

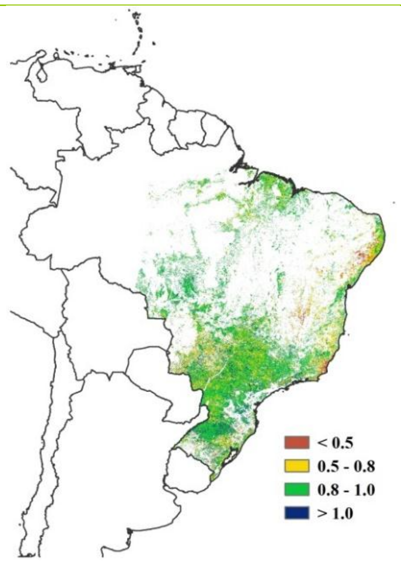
[BRA] Brazil

Overall crop condition was average in Brazil during the reporting period. The harvest of soybean, rice, and first season maize are almost completed and the second maize is reaching maturity stage. Rainfall was 803 mm from January to April, 6% below average, but still sufficient for crops. Air temperature was 1.2°C above average and radiation 5% higher. The NDVI development graph shows average condition at the national level. Spatial patterns and NDVI departure profiles compared to the five-year average clearly indicate above average conditions in Southern Brazil, including Mato Grosso Du Sol, Rio Grande Du Sol, Santa Catarina, and Parana, where crops benefited from above average rainfall. Below average crop condition is distributed in Goias, Minas Gerais, and Sao Paulo due to a water deficit. Significantly below average NDVI is scattered in northern Brazil as a result of drought. Regions with maximum VCI values below 0.5 confirm the below average condition. CropWatch puts maize, rice, and soybean production for Brazil at the same level as during 2014 (see also table B.2 in Annex B).

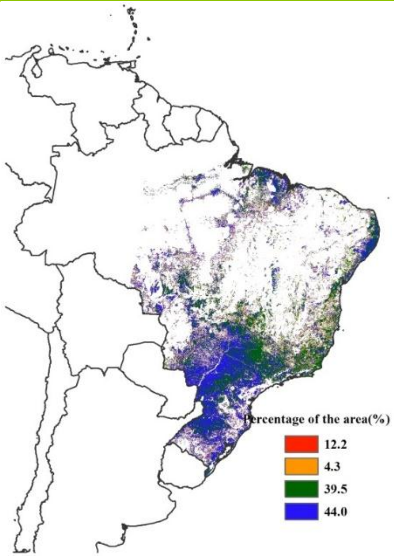
Figure 3.8. Brazil crop condition, January-April 2015



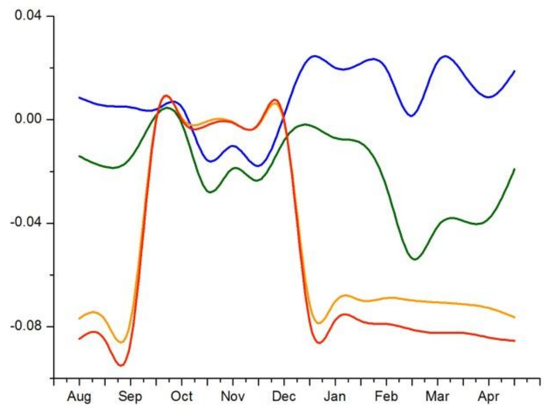
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA



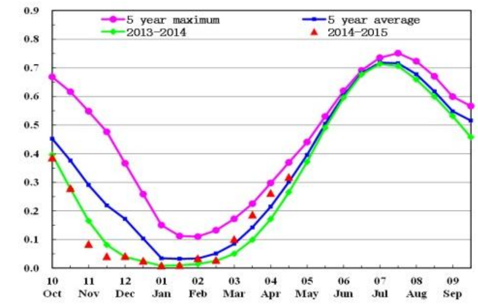
(d) NDVI profiles

[CAN] Canada

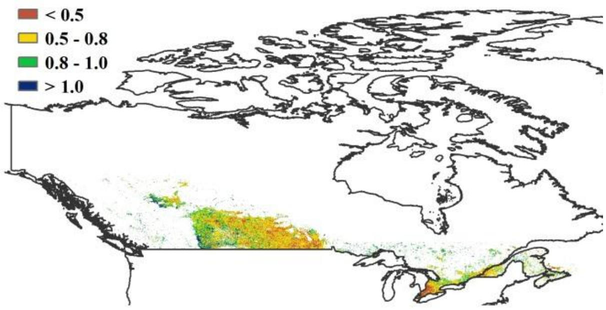
In general, crop condition as assessed by NDVI is above average in the current monitoring period. Except for limited winter crop areas, however, crops were not yet planted due to the cold weather conditions. In terms of the CropWatch agroclimatic indicators, RAIN was 38% above average, which will benefit the coming planting season of summer crops; TEMP was close to average(-0.5° C), and RADPAR was average. In the main agricultural province of Alberta, the following indicator values were recorded: RAIN, +23%; TEMP, 2.1°C; RADPAR -3%; and—the resulting biomass production potential—BIOMASS +29%.

The NDVI development profile is above average after March, which indicates the good performance of winter crops in Canada. At the same time, accumulated biomass showed a positive departure of 8%. The maximum VCI was 0.71.

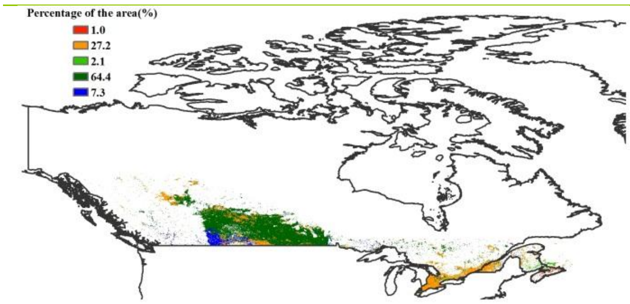
Figure 3.9. Canada crop condition, January-April 2015



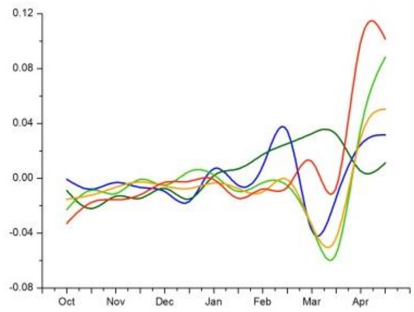
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA



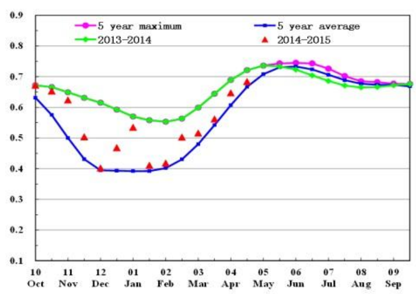
(d) NDVI profiles

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

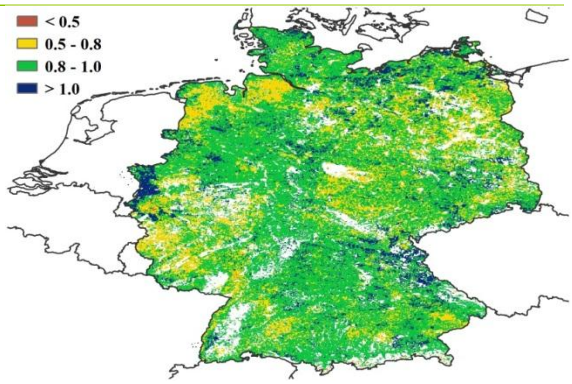
[DEU] Germany

Crop condition in Germany was generally above average but below last year's over the reporting period. Currently, winter wheat and winter barley are in the vegetative stages and maize is being planted. The CropWatch agroclimatic indicators show that the reporting period recorded a 1% drop in RAIN compared to average, a 0.4°C increase in TEMP, and 3% above average RADPAR at the national level, which promoted the development of crops. With the positive thermal anomalies, BIOMSS is expected to increase by 16% compared to the five-year average at the national scale. The overall crop condition based on NDVI development also shows above average condition. The spatial NDVI patterns compared to the five-year average and corresponding NDVI departure cluster profiles confirm that NDVI is above average for most arable land in Germany. In total, 27.5% of crop areas scattered across west, central, and eastern Germany showed apparently below average condition since March 2015, which is probably due to crops being early this year compared with average timing. The high maximum VCI values shown on the maximum VCI map also present overall good crop condition, with a VCIx of 0.87 for the country overall. Generally, the values of the agronomic indicators mentioned above result in above average condition for most winter crop areas in Germany, although still below last year's condition.

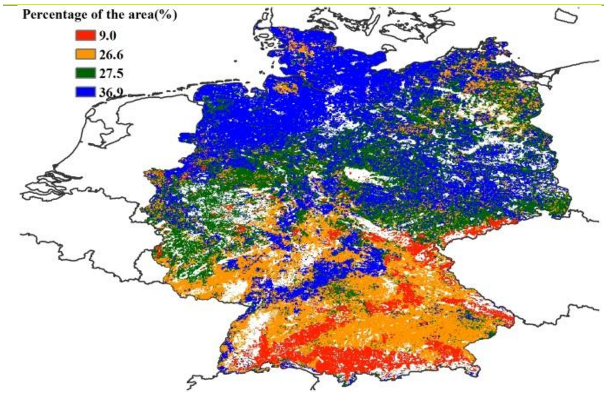
Figure 3.10. Germany crop condition, January-April 2015



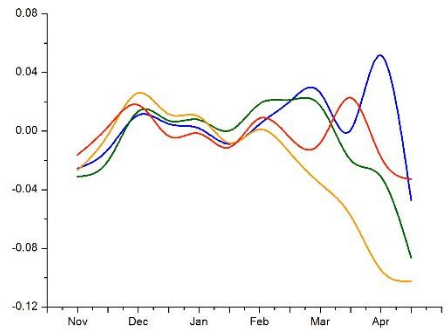
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA

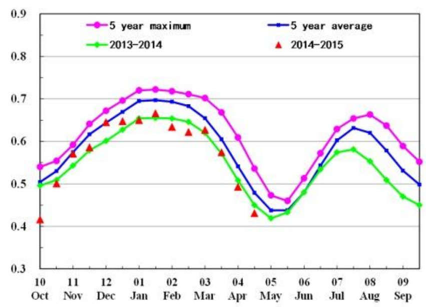


(d) NDVI profiles

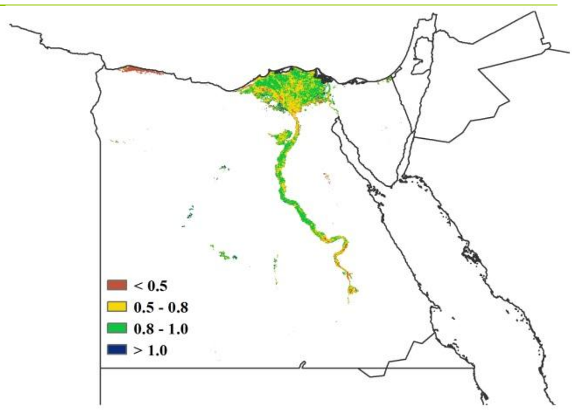
[EGY] Egypt

Harvest of winter crops (wheat and barley) is currently underway, while planting of summer crops (maize and rice) has started. As virtually all crops are irrigated, rainfall plays a very minor part in the outcome of Egyptian agricultural production. The RAIN indicator over agricultural areas dropped by a significant value of 17% compared to average, while RADPAR fell 1% and temperature was just slightly below average (-0.6°C). National NDVI values were below the recent five-year average throughout the season and generally comparable to their values in 2013-14, in agreement with a stable CALF value. Values for the maximum VCI (0.75) and BIOMSS (+9%) both indicate a season very comparable with the previous one (and thus a "good average year") with some differences, such as the somewhat less favorable conditions in the eastern Delta.

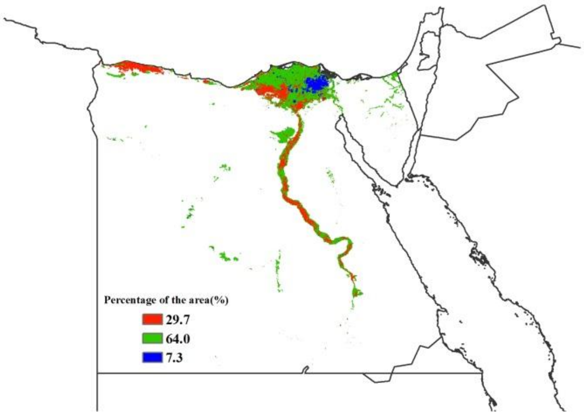
Figure 3.11. Egypt crop condition, January-April 2015



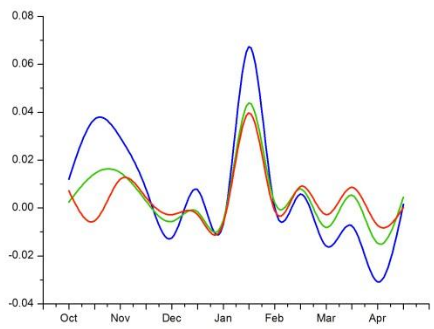
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA

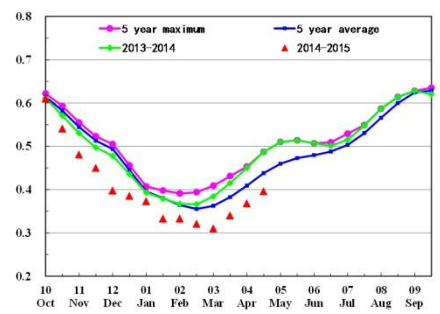


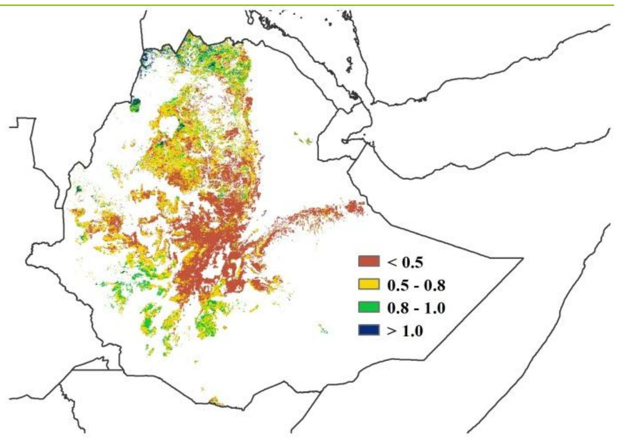
(d) NDVI profiles

[ETH] Ethiopia

Since the planting of Belg crops (in February) until now, overall conditions in the country were definitely less favorable than during the rather good previous season, possibly as a result of the “hesitant” El Niño conditions that have been prevailing for about a year now. Overall, the country suffered a rainfall deficit close to 25% in the early months of 2015, with a slight drop in sunshine (RADPAR, -1%) and resulting in a drop of biomass production potential of 22%. The period covered by this bulletin almost exactly corresponds to the Belg season, which is thus very unlikely to have performed normally, as also confirmed by a 4% drop in CALF and a VCIx that stayed below 0.5 in much of the country. According to the NDVI profiles for the period from February to April, above-average conditions prevailed in about 10% in the country; 60% of cropped areas can be described as comparable to the average of the previous five years, while about 25% show poor and deteriorating conditions, mostly in north and east Amhara and the north eastern fringe of Oromya. Although the Belg season plays a minor role compared to the main Meherseason (by definition, the crops harvested after August) in terms of cultivated area and production, a poor Belg season indicates that soil moisture conditions are not as good as during an average year even for MEHER crops. In addition, a poor Belg season means that grasslands and animals suffer, and that food prices increase. Even if the harvest of Meher crops takes place as late as December for some of the Meher crops, overall prospects are currently unfavorable in Ethiopia and deserve close monitoring.

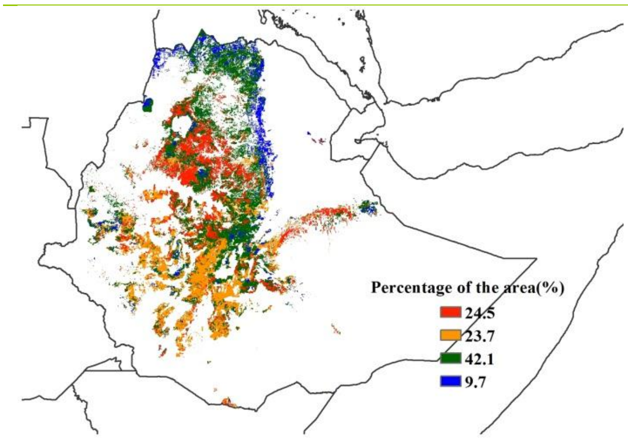
Figure 3.12. Ethiopia crop condition, January-April 2015

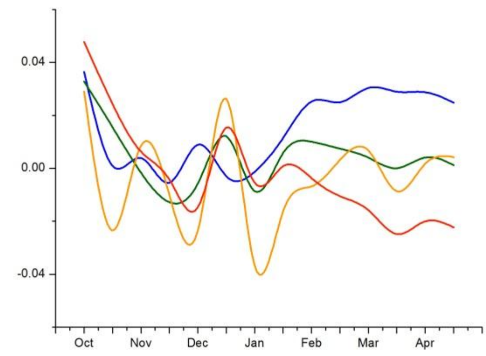




(a) Crop condition development graph based on NDVI

(b) Maximum VCI





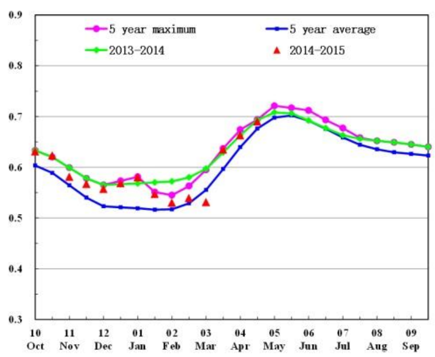
(c) Spatial NDVI patterns compared to 5YA

(d) NDVI profiles

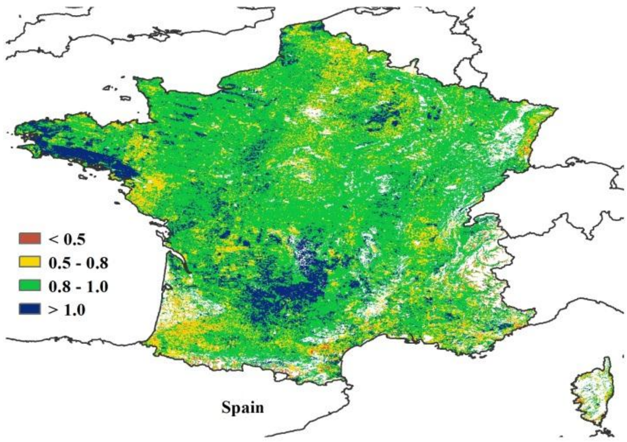
[FRA] France

Crop condition in France was generally favorable over the reporting period. Currently, winter wheat, winter barley, and spring barley are in the vegetative stages, and maize is being planted. Compared with the five-year average, CropWatch agroclimatic indicators show warmer than average weather at the national scale. BIOMSS presents a 27% decrease compared to average as a result of the scarcity of rainfall (-46%) and low radiation (-2%). As shown by the crop condition development graph, national NDVI values were well above average and even close to the five-year maximum, except for a noticeable drop at the beginning of March. The spatial NDVI patterns compared to the five-year average and corresponding NDVI departure cluster profiles also indicate that NDVI values over the country for most arable land in France are below average from early January to the end of March due to low rainfall. The maximum VCI map nevertheless presents overall good crop condition. Generally, due to suitable temperature, the agronomic indicators mentioned above indicate a favorable condition for most winter crop areas of France; however, more rain is needed in the next few months in France.

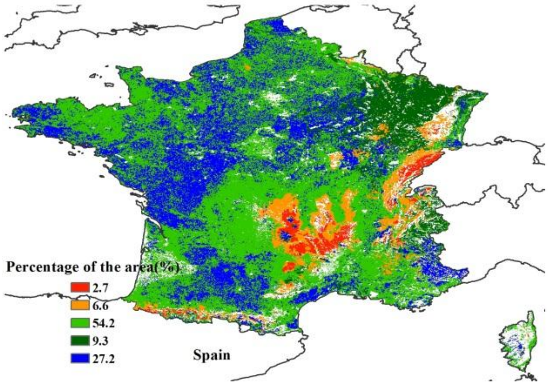
Figure 3.13. France crop condition, January-April 2015



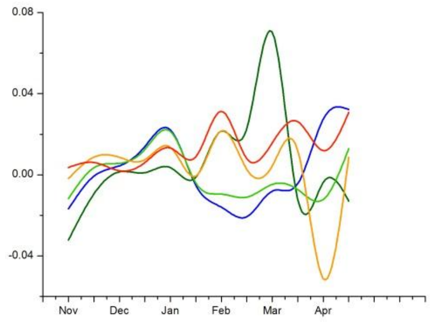
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA

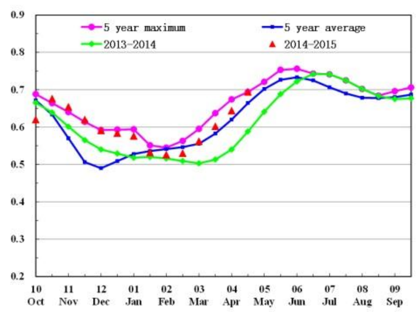


(d) NDVI profiles

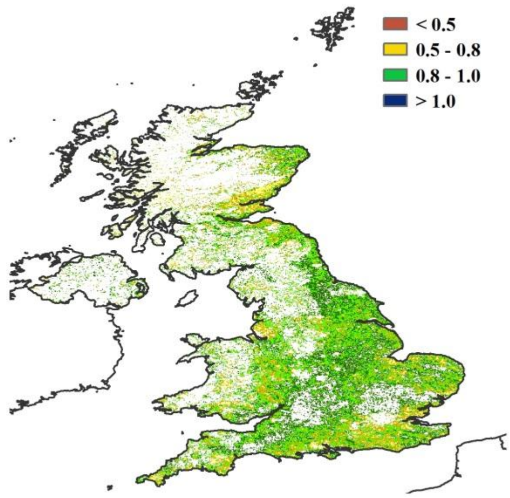
[GBR] United Kingdom

Crop in the United Kingdom showed generally favorable condition over the reporting period. Currently, wheat, winter barley, spring barley, and rapeseed are in the vegetative stages. The United Kingdom experienced sufficient rainfall and favorable temperature, which promoted the development of winter crops. Compared to the average, the country experienced an increase in the RAIN indicator of 21%, an increase in TEMP of 1°C, and 3% more RADPAR. With the positive moisture and thermal anomalies, BIOMSS is expected to increase by 2% compared to the five-year average at the national scale. As shown by the crop condition development graph, national NDVI values were below average from early January to early March, after which they rose above average and even close to the five-year maximum. The spatial NDVI patterns compared to the five-year average and corresponding NDVI departure cluster profiles also indicate above average NDVI values over the country for more than 42.3% of arable land after March. A recent deterioration occurred in the southeast (41.7% of the cropped areas). This spatial pattern is also reflected by the maximum VCI in the different areas, with a VCIx of 0.87 for the country overall. Generally, the agronomic indicators mentioned above indicate favorable condition for most winter crop areas of the United Kingdom at this point in the season.

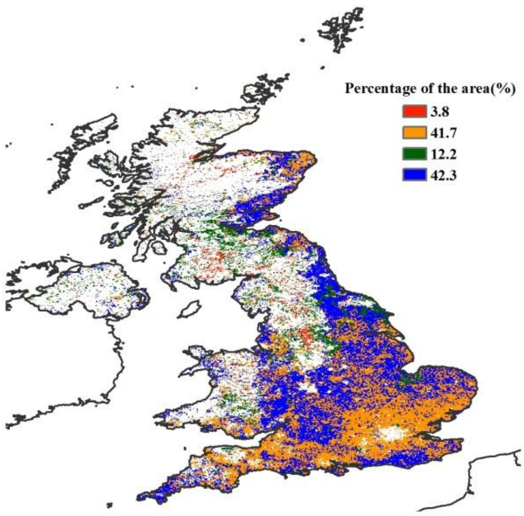
Figure 3.14. United Kingdom crop condition, January-April 2015



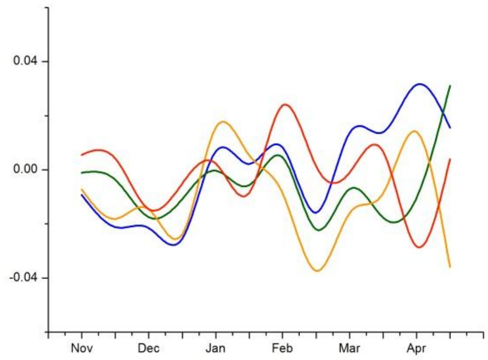
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA

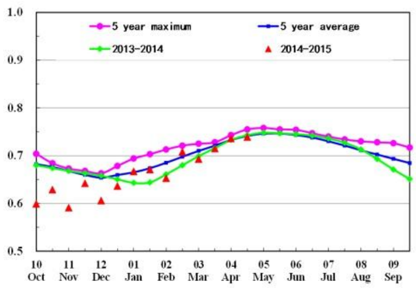


(d) NDVI profiles

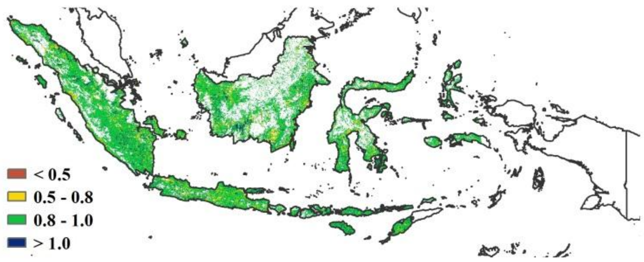
[IDN] Indonesia

This monitoring period covers the growing and harvesting stages of rainy season maize and rice in Indonesia. Crop condition was average from January to April, resulting from mostly average environmental conditions: RAIN, +7%; RADPAR, +2%; and TEMP, +0.7°C. In April, heavy rain caused flooding in South Sulawesi and West Java, which accounts for the below average crop condition in this region. The national NDVI profile was also below average until the end of March. Starting in April, NDVI values are between normal and above-normal. The biomass accumulation shows a slight 2% decrease compared to the average of the recent five years. CropWatch estimates that the production of rice and other crops in Indonesia will be average.

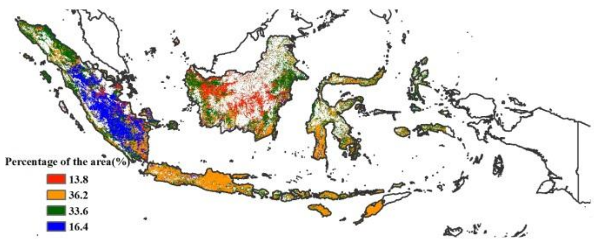
Figure 3.15. Indonesia crop condition, January-April 2015



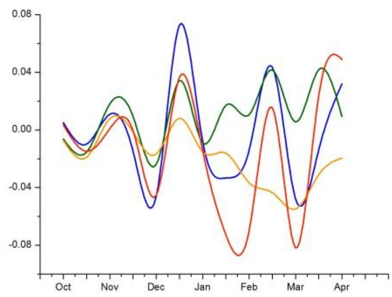
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA



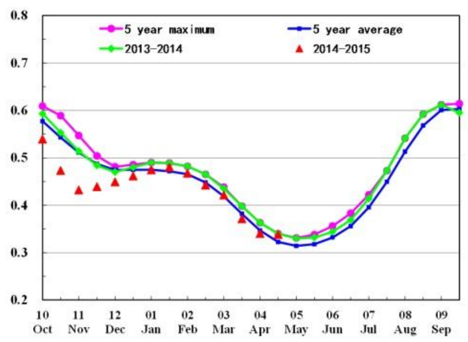
(d) NDVI profiles

[IND] India

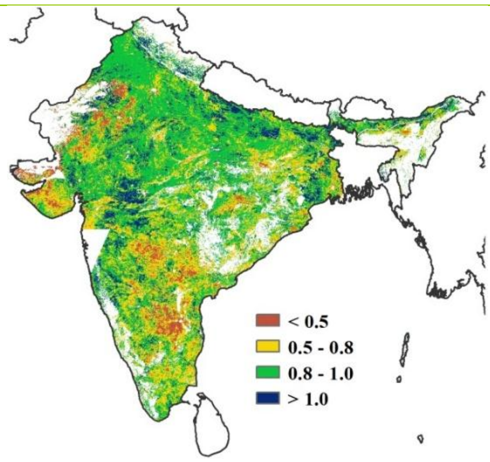
The reporting period corresponds to the growing and harvesting seasons of rabi crops. Overall, the CropWatch indicators suggest crop condition for India is average during the reporting period. All the major rabi crop producing states experienced above average rainfall, including Andhra Pradesh (RAIN, +15%), Bihar (+52%), Gujarat (+340%), Haryana (+48%), Kerala (+33%), Karnataka (+26%), Maharashtra (+100%), Madhya Pradesh (142%), Orissa(+14%), Punjab (+20%), Rajasthan (+92%), Tamil Nadu (+11%), Uttar Pradesh (+85%), and West Bengal (+68%). High rainfall lead to positive biomass accumulation in these regions. Temperatures (TEMP) were average over the region, while PAR was below average in several states including Bihar (RADPAR, -7%), Haryana (-6%), Himachal Pradesh (-9%), Jharkhand (-6%), Madhya Pradesh (-6%), Punjab (-7%), Uttar Pradesh (-8%), Uttarakhand (-9%), and West Bengal (-5%). Overall, however, weather conditions were favorable and resulted in average crop condition, except in some regions where high unseasonal rainfall destroyed some rabi crops.

Crop condition development was generally comparable with the previous five year's average and never reached the level of the previous five year’s maximum. Across the region, maximum VCI values ranged from below 0.5 to larger than 1.0. Low VCIx values of below 0.5 were recorded in Andhra Pradesh, Maharashtra, Gujarat, Rajasthan, and Haryana, indicating poor crop condition in these areas. The NDVI values for the entire country reached favorable values during early January and started dropping in early February. In northern and southern India, NDVI values increased gradually from early February to April, while in central India NDVI values decreased gradually from mid-January on forward. In Tamil Nadu, West Bengal, and Madhya Pradesh, NDVI underwent a marked drop in early March but recovered in early April.

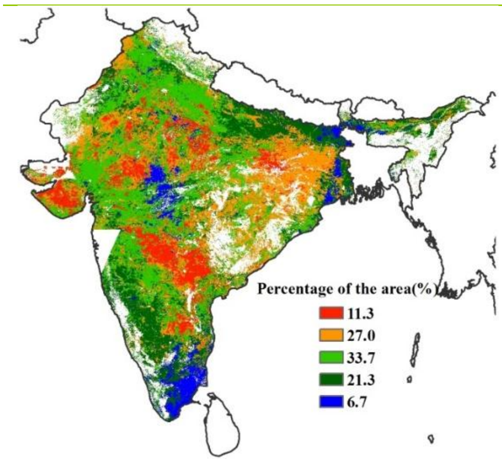
Figure 3.16. India crop condition, January-April 2015



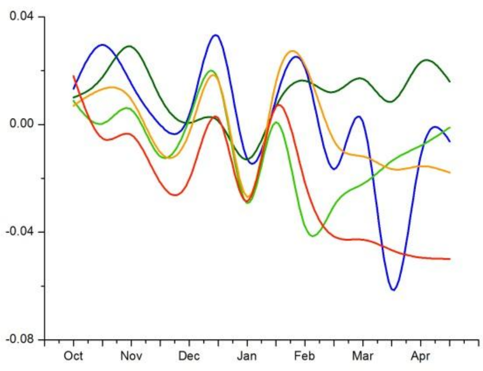
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA



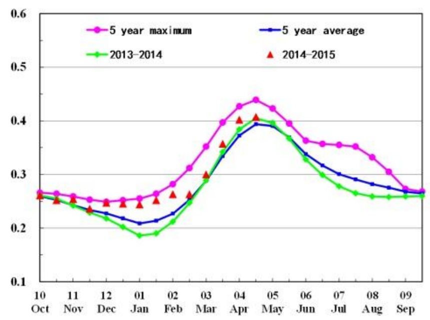
(d) NDVI profiles

[IRN] Iran

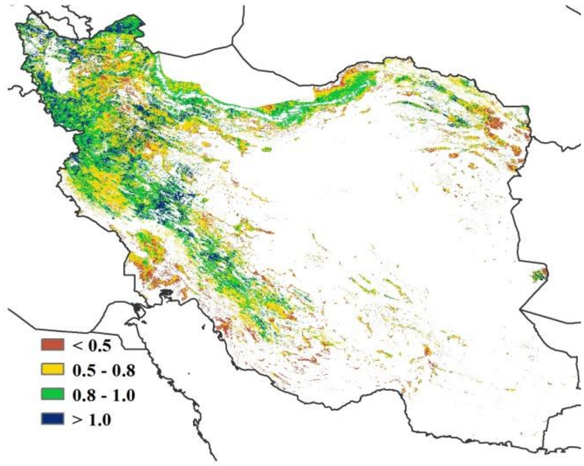
Crop condition from January to April 2015 was generally above average in Iran. During this period, winter wheat was grown and barley harvested. Accumulated rainfall (RAIN) and radiation (RADPAR) were below average in the monitoring period, while the temperature (TEMP) was above. CropWatch agroclimatic indices for the current season indicate unfavorable conditions for winter crop growth, which are confirmed by the decrease of the BIOMSS indicator by 10%. The national average of the maximum VCI (0.76) was just above average conditions, and the area of cropped arable land (CALF) increased by 2% compared to the five-year average.

Crop conditions close to or above the five-year average are mainly distributed in the northwest region. Other regions, such as the Khuzestan and Fars provinces in the southwest region, and Razavi Khorasan and North Khorasan province of the northeast region, generally experienced below average crop condition from February to April. Overall, Iran's latest 2014-15 winter crop outcome is estimated average, but more favorable in the northwest.

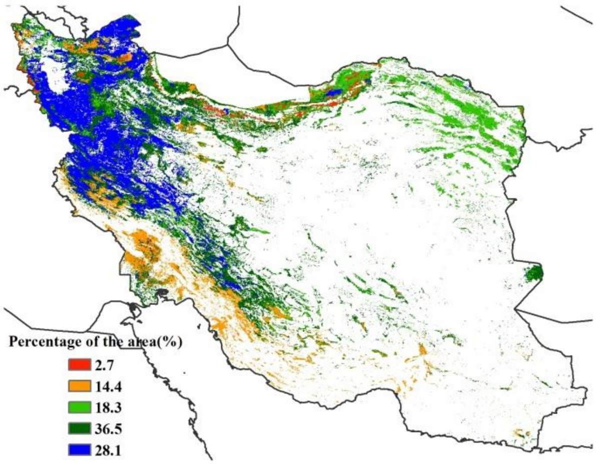
Figure 3.17. Iran crop condition, January-April 2015



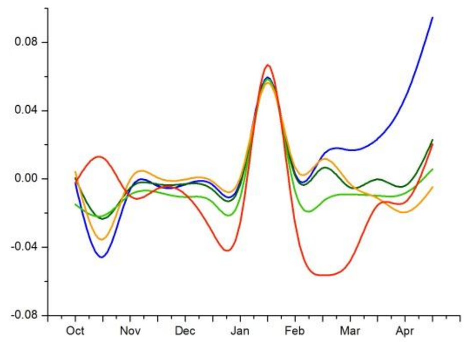
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA



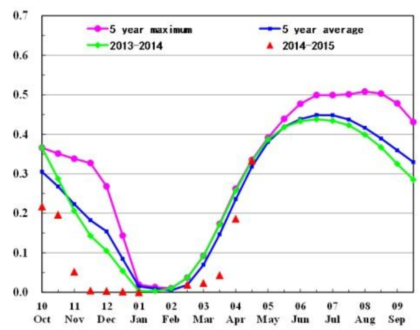
(d) NDVI profiles

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

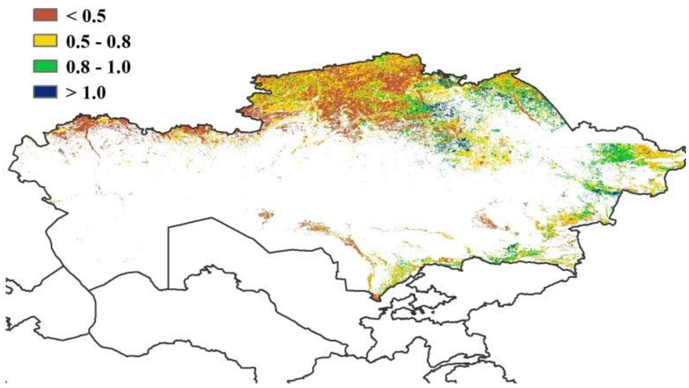
[KAZ] Kazakhstan

As shown by the national NDVI development graph, no winter crops are normally cultivated in Kazakhstan; spring crops are currently at the sowing and vegetative stages. As described in the section on disasters (section 5.2), Kazakhstan was—globally—one of the countries most severely affected by floods. In fact, during the reporting period, rainfall was above average by 23%, while temperature was average and PAR accumulation was 2% lower than average. The floods occurred from late March to mid-April and were due to the combined occurrence of rainfall and rapid snowmelt, affecting mostly four regions in central and eastern Kazakhstan (Akmola, Karaganda, Pavlodar and North Kazakhstan Oblasts). However, as a result of the high rainfall, the biomass production potential is also up 17% compared to the average of the recent five years. Current NDVI profiles and values of maximum VCI are about average, but more favorable in the east and south. Because of the stored soil moisture, crop prospects are good.

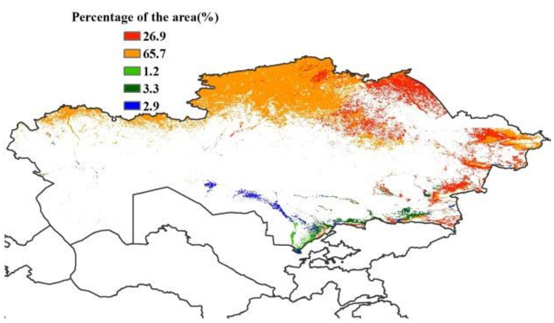
Figure 3.18. Kazakhstan crop condition, January-April 2015



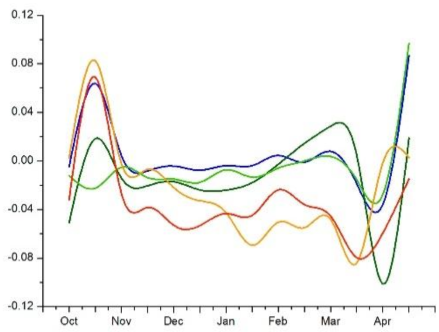
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA

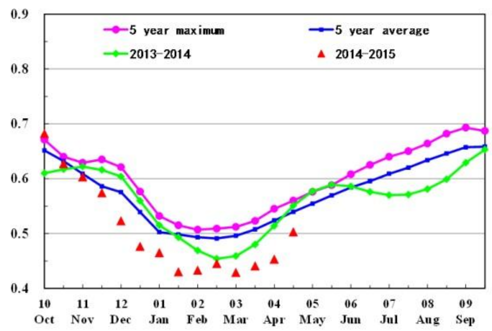


(d) NDVI profiles

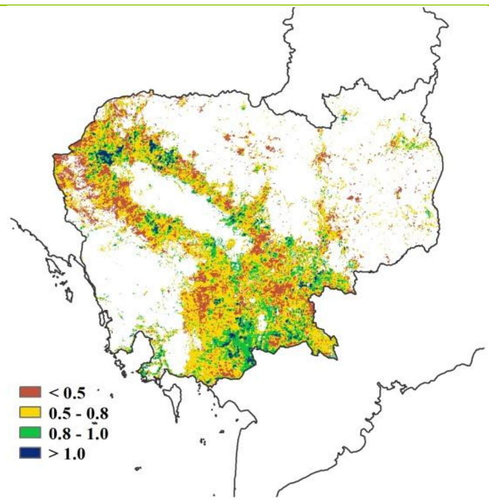
[KHM] Cambodia

The period from January to April 2015 covers the entire growing period of the second (dry season) rice crop and the harvest of the main (wet season) rice crop in Cambodia. The fraction of cropped arable land (CALF) was about the same as the recent five-year average. Low vegetation condition indices (VCIx) occur in a scattered way in most parts of the country. For the period under consideration, the CropWatch environmental indices show markedly below average rainfall (-18%), while temperature increased significantly by 1.2°C above average and PAR was 6% above average. Consequently, the extremely low rainfall decreased the biomass accumulation expectations (expressed by BIOMSS) by 16% compared to the recent five-year average. Crop condition of Cambodia assessed from nationwide NDVI was also below average during the entire reporting period. The profiles and NDVI clusters also show that crop condition in only 20% of the cropped area was above average from late January to the end of April (mainly concerning Phnom Penh, Kandal, Kampong Cham, and northwest Cambodia).

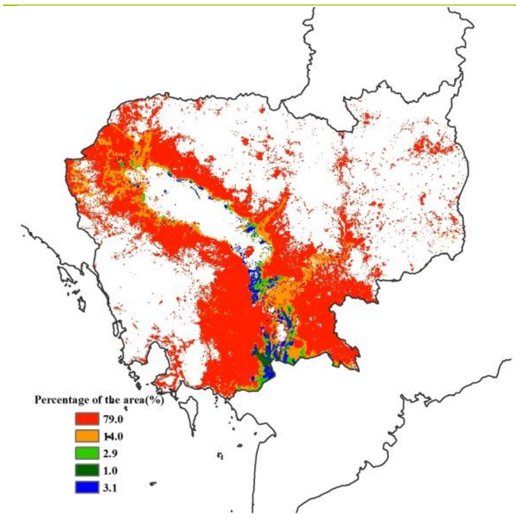
Figure 3.19. Cambodia crop condition, January-April 2015



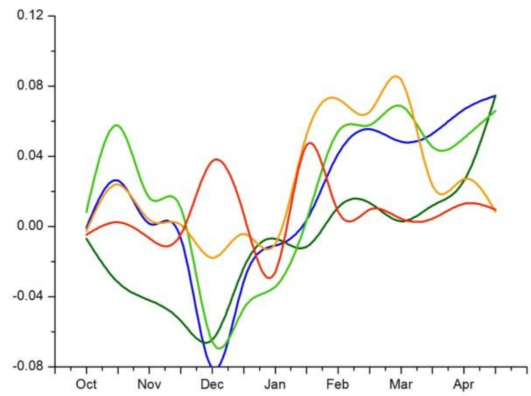
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA



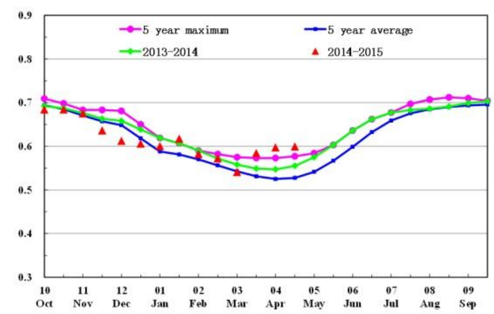
(d) NDVI profiles

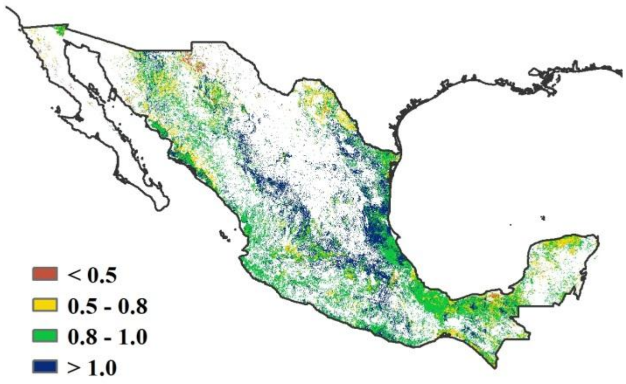
[MEX] Mexico

In general, crop condition was favorable in this monitoring period, which was the harvesting season of Mexico's secondary 2014 maize and winter wheat, as well as the planting season of the main 2015 maize crop. During the monitoring period, rainfall showed a significant positive departure (RAIN, +114%) compared to average; temperature was slightly above average (TEMP, +0.2°C), while radiation (RADPAR) underwent a marked drop of 8%.

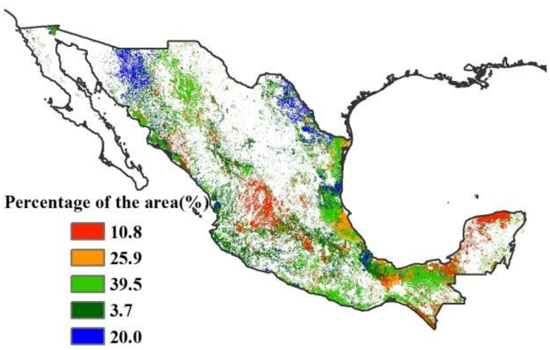
As a result of the abundant rainfall, NDVI development profiles after March indicated the favorable performance of crops, with close to 60% (59.5%) of crop areas showing conditions better than those during the last five years. The average maximum VCI reaches 0.95 and even exceeds 1.0 in some regions in the center and east. On average, the biomass accumulation potential (BIOMSS) about doubled compared with the recent five-year averages (+101%). At the same time, the cropped arable land fraction (CALF) showed a positive departure of 16%. Combining both the increase of yield and CALF, significantly above average crop production can be expected.

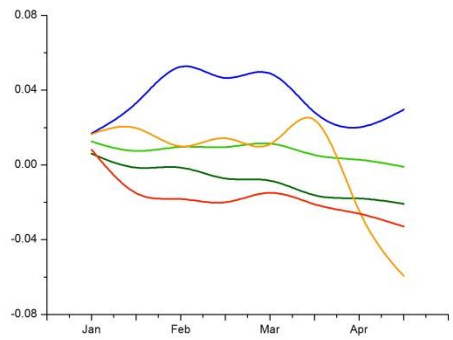
Figure 3.20. Mexico crop condition, January-April 2015





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



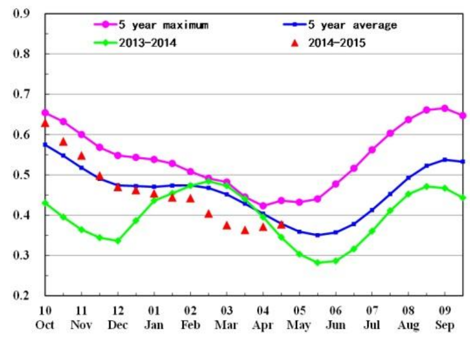


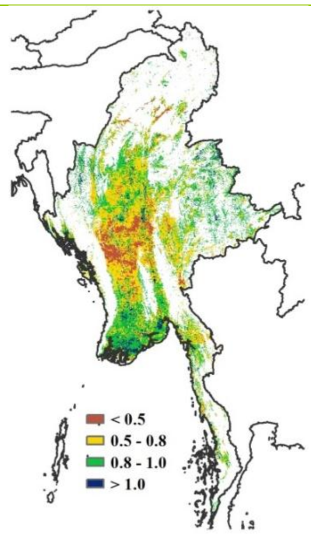
(c) Spatial NDVI patterns compared to 5YA (d) NDVI profiles

[MMR] Myanmar

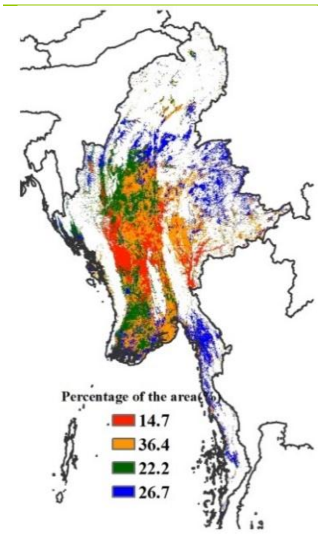
The reporting period corresponds to the growing and harvesting season of winter rice in Myanmar. Based on the CropWatch indicators, the overall crop condition in the country is assessed as poor. Although rainfall (RAIN) increased 8% over average and temperatures (TEMP) were 1.1°C higher than average, the crop condition was significantly below average in some areas. The overall biomass accumulation potential (BIOMSS) is estimated to be 24% above the five-year average, while PAR was somewhat low (RADPAR, -1%). Crop condition development was below the values for 2014 and the average of the previous five years. Based on maximum VCI values below 0.5 and unfavorable NDVI profile patterns, CropWatch assesses crop condition to be poor in the central divisions of Magway and Mandalay. Remaining regions display maximum VCI values between 0.5 and 0.8. Spatial NDVI profiles followed similar patterns for the entire country up to February, with very positive values from early January to early February. Conditions remained close to average in most of the country, but gradually deteriorated in the above-mentioned divisions.

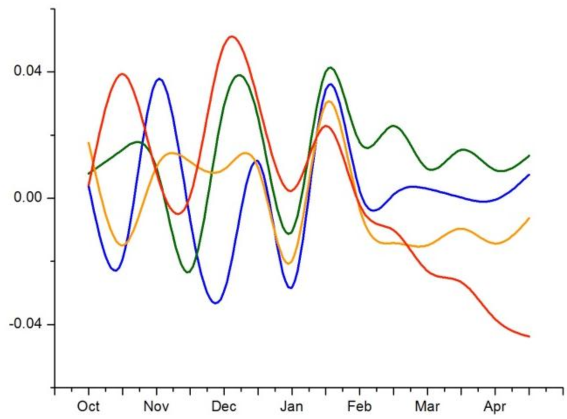
Figure 3.21. Myanmar crop condition, January-April 2015





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



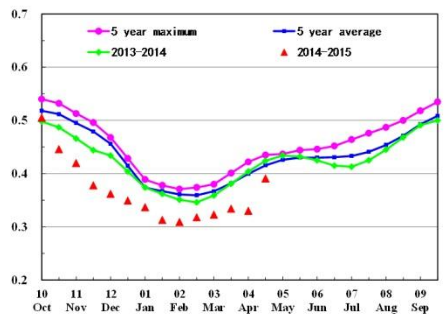


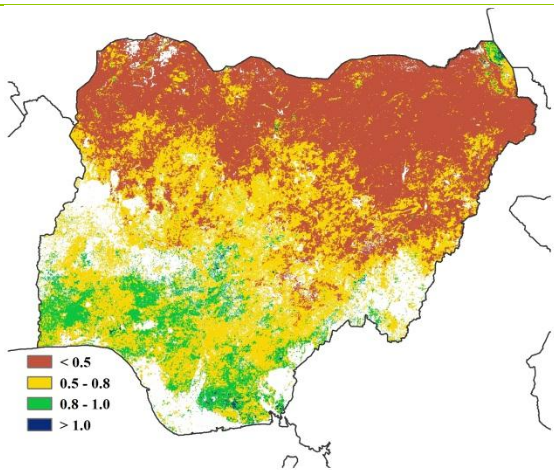
(c) Spatial NDVI patterns compared to 5YA (d) NDVI profiles

[NGA] Nigeria

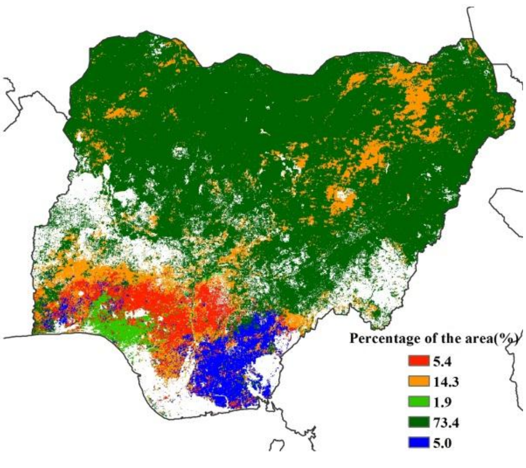
Cassava and yams are dominant crops in Nigeria, especially in the south. Cereals (maize and rainfed rice) play a major role in the southern-central part of the country where planting takes place from the middle of the current reporting period, from the end of March to April. Compared with the average, rainfall was generally low (-12%) with an increase in sunshine (RADPAR +1%), average VCIx, but a marked decrease of the fraction of cultivated arable land (CALF), the second highest drop of all the countries monitored by CropWatch. In the main maize producing areas, which correspond to the median belt of the country, conditions were generally average, according to the NDVI clusters. Below average conditions occurred mostly at the beginning of April, but the end of the month indicated some recovery as planting progressed. In line with the overall analysis of the west African region, the most plausible interpretation of the CropWatch indicators is that conditions were generally average so far, but that crop phenology is delayed in the Sahelian part of the country.

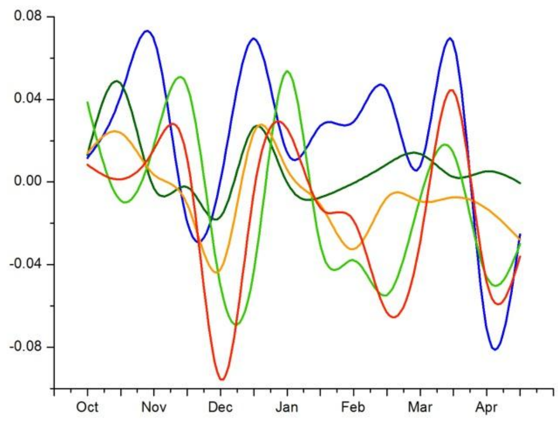
Figure 3.22. Nigeria crop condition, January-April 2015





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





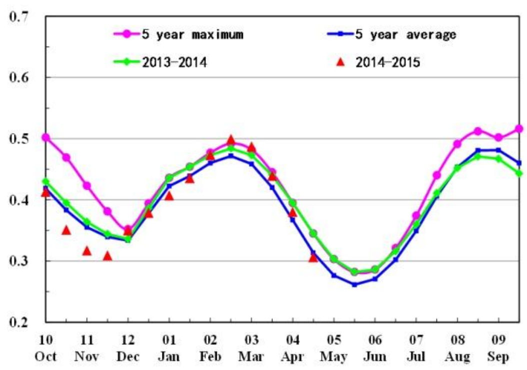
(c) Spatial NDVI patterns compared to 5YA (d) NDVI profiles

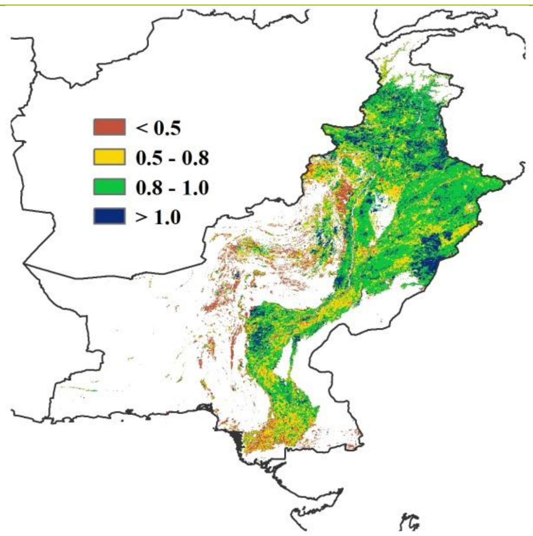
[PAK] Pakistan

This monitoring period covers the growing and harvesting stages of winter wheat and barley. Compared with average, RAIN was in excess (+16%) for the country, while RADPAR accumulation was decreased (-5%); meanwhile TEMP was average. Compared to the last five-years, BIOMSS was also below average (-5%).

The national NDVI development graph indicates that crop condition was unfavorable in early January, but later gradually improved and peaked in late February, reaching values comparable to the maximum of the past five years. It then deteriorated and was a little below the recent five-year average at the end of April, due to local excess precipitation and drought, as mentioned in section 5.2. The lowest maximum VCI values (below 0.5) occur in north Balochistan, south NWFP, and south Sindh. According to the NDVI profiles, about 10% (9.9%) of the cropped areas display consistently below average conditions from the beginning of December, much of it in Sindh, especially in the southeast but also the more central areas. On the other hand, about 70% of areas have shown close to average conditions. Altogether, crop condition is estimated to be just average and locally above average.

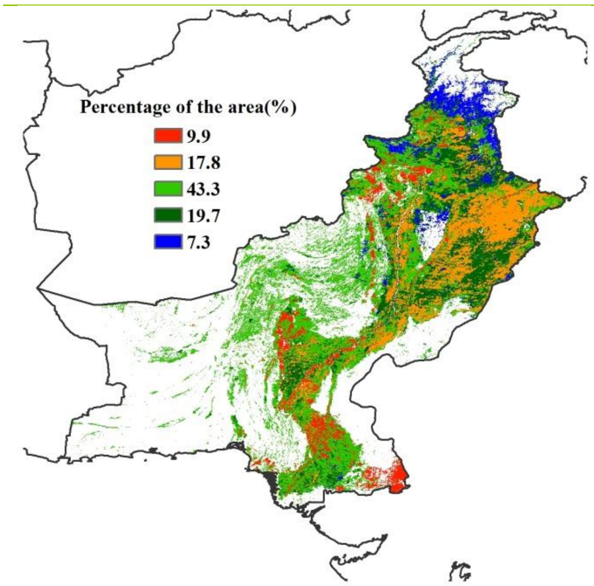
Figure 3.23. Pakistan crop condition, January-April 2015

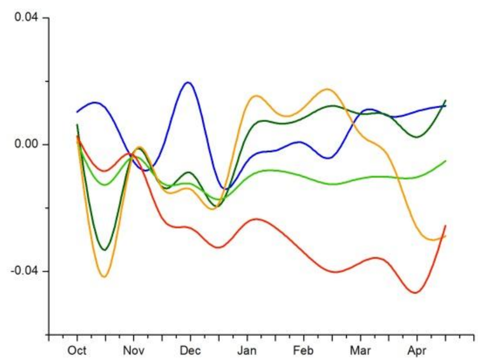




(a) Crop condition development graph based on NDVI

(b) Maximum VCI





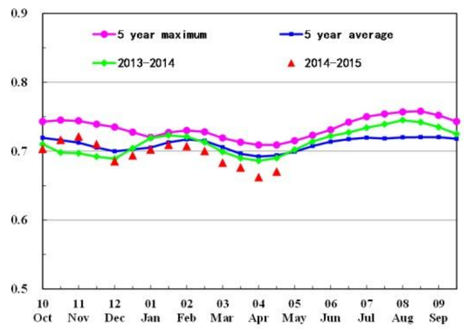
(c) Spatial NDVI patterns compared to 5YA

(d) NDVI profiles

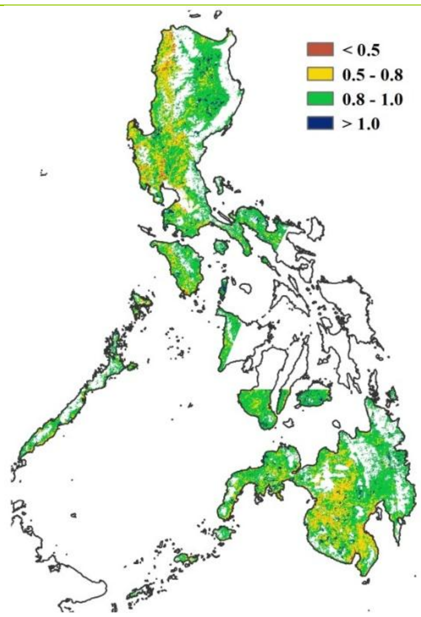
[PHL] The Philippines

The monitoring period covers the harvesting stage of secondary rice and maize, as well as the sowing stage of main rice and maize in the Philippines. Crop condition in the country was consistently below average from January to April. Overall, the Philippines experienced a dry and warm season with insufficient moisture supply: rainfall decreased by 41% compared with average, possibly resulting from El Niño conditions, accompanied with increased temperature (+0.6°C) and RADPAR (+6%). As a result of the rainfall deficit, the biomass production potential decreased by 36% compared to average, which is confirmed by the NDVI development graph. According to the NDVI clusters, crop condition in Luzon declined sharply from early-April, as a possible result of cyclone Maysak (see also section 5.2 on disasters). Altogether, the output of the main season is expected to be below or just average.

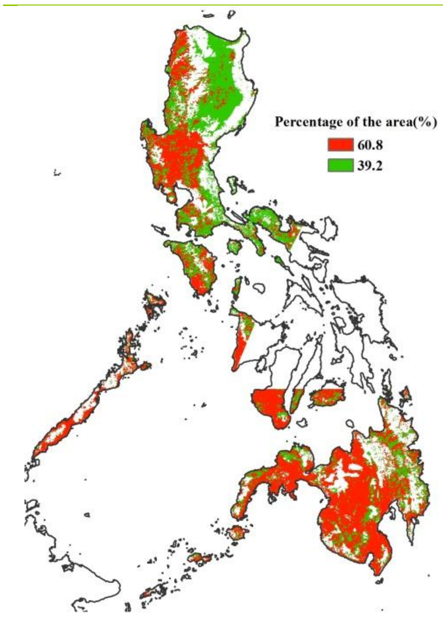
Figure 3.24. Philippines crop condition, January-April 2015



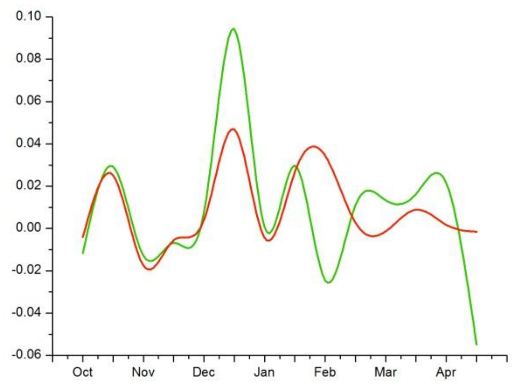
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA



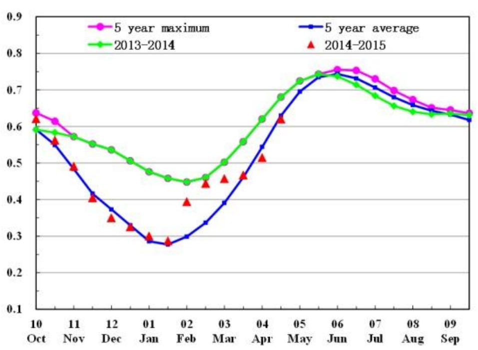
(d) NDVI profiles

[POL] Poland

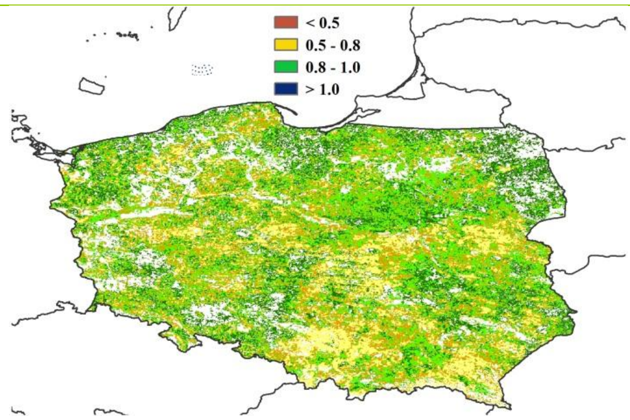
Poland enjoyed favorable conditions during this monitoring period (maximum VCI=0.83), which corresponds with the wintering stage of winter wheat; maize seeding starts in the beginning of April. The cropped arable land fraction (CALF) for the country is the same as the average of the last five years. Weather during January to April was wetter and warmer than average, with RAIN up 7% and TEMP 1.4°C, which is significant at the national scale over a four-month period. RADPAR dropped 1% below average and the potential biomass indicator BIOMSS was 14% above average due to the combination of abundant precipitation and mild weather.

Due to the favorable weather condition during the wintering stage, the crop condition in Poland is very good in most parts of the country (maximum VCI values over 0.8), and the phenology of winter crops must be much advanced. As shown by the spatial NDVI patterns, in about 81.5% of Poland, including Poznan, Warsaw, and Bialystok, the NDVI is close to average before February and significantly above average in the three months after. Because of this, the production of the country's winter crop is predicted to be very satisfactory.

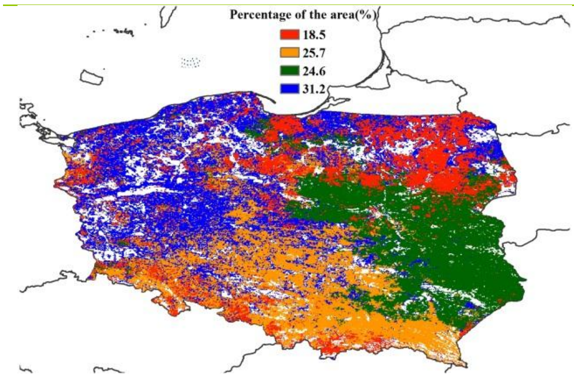
Figure 3.25. Poland crop condition, January-April 2015



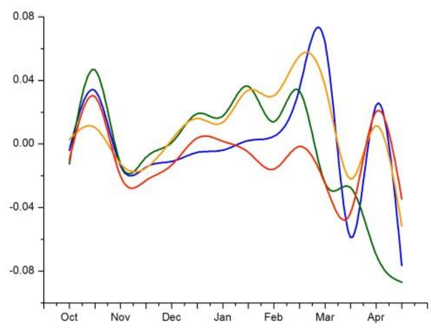
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA



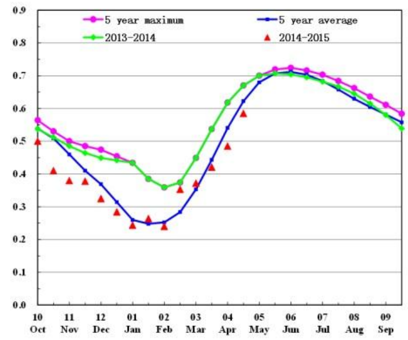
(d) NDVI profiles

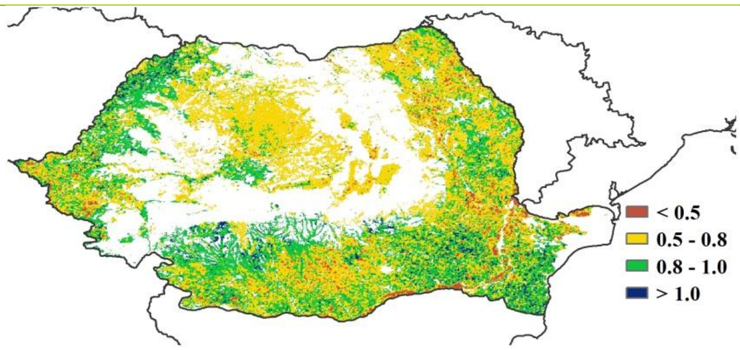
[ROU] Romania

Romania presented average crop conditions over the monitoring period (maximum VCI=0.76), a period corresponding with the wintering stage of winter wheat. The seeding of maize starts from the beginning of April. During this monitoring period, the fraction of cropped arable land (CALF) was 8% below its five-year average. Overall, weather was warm with temperature (TEMP) 0.6°C above average. Precipitation was lower than usual (RAIN, -2%), while the potential biomass was up (BIOMSS, +5% over average), due to the warm weather. The phenology of winter crops in Romania will be somewhat advanced due to the warm weather.

As shown by the spatial NDVI patterns, in most parts of the country the crop condition is below average starting in March. In the southeast, including Bucharest, Alexandria, and Craiova, crops were affected by water logging from January to March; all NDVI curves experienced a significant decline. Crop condition in other parts of Romania is fair. Overall, the expectation for national winter wheat production in Romania is average.

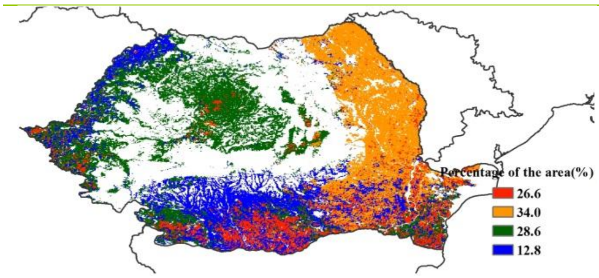
Figure 3.26. Romania crop condition, January-April 2015

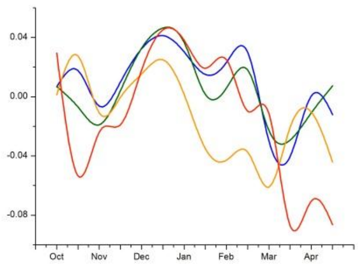




(a) Crop condition development graph based on NDVI

(b) Maximum VCI





(c) Spatial NDVI patterns compared to 5YA

(d) NDVI profiles

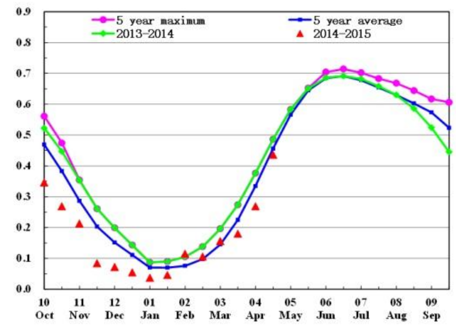
ARG AUS BGD BRA CAN DEU EGY ETH FRA GBR IDN IND IRN KAZ KHM MEX MMR NGA PAK PHL POL ROU **RUS** THA TUR UKR USA UZB VNM ZAF

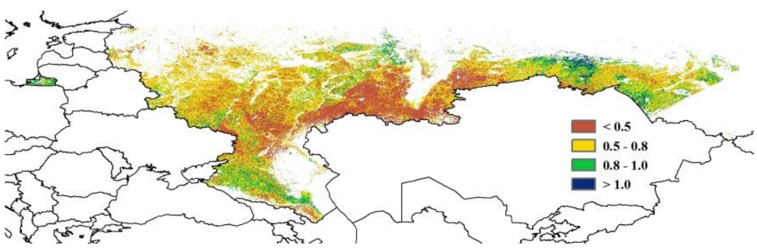
[RUS] Russia

Russia experienced poor crop condition from January to April (VCIx=0.61), which coincided with the wintering stage of winter wheat and early planting of spring wheat. The fraction of cropped arable land (CALF) dropped 1 percentage point when compared to the five-year average. Russia experienced warm and wet conditions in these four months. Precipitation exceeds the recent average (+12%), and the temperature anomaly is significant at +1.6°C. Mainly due to the weather conditions, the BIOMSS indicator rose 15% above the five-year average.

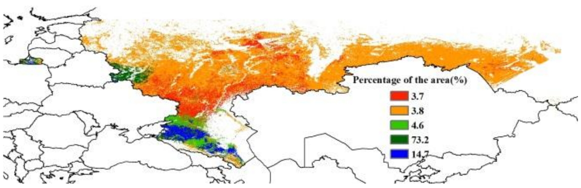
Significantly below average NDVI values occurred in more than 85% of Russia's agricultural area between December and the end of March. As a result of serious frost in autumn and early winter in southern Russia, crop condition is mostly poor, with VCIx values below 0.5 in the central-south of Russia including the Orenburg Oblast, Bashkortostan Republic, Samara Oblast, and Saratov Oblast. During this monitoring period, NDVI was below the average of the last five years in most of the country until the end of April, which may be partly due to phenology, but not during the winter months. Altogether, crop condition for Russia is estimated to be just fair.

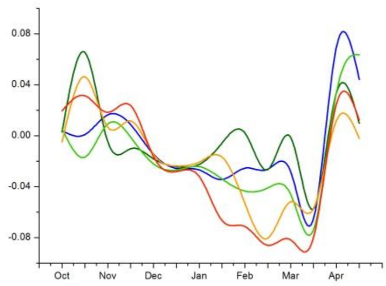
Figure 3.27. Russia crop condition, January-April 2015





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



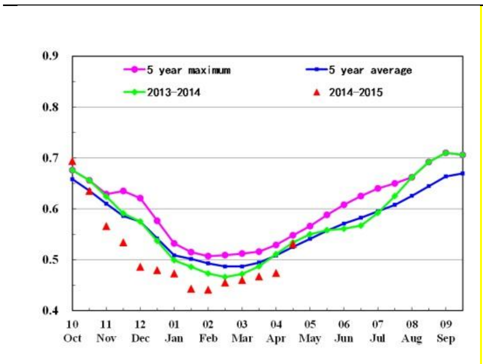


(c) Spatial NDVI patterns compared to 5YA (d) NDVI profiles

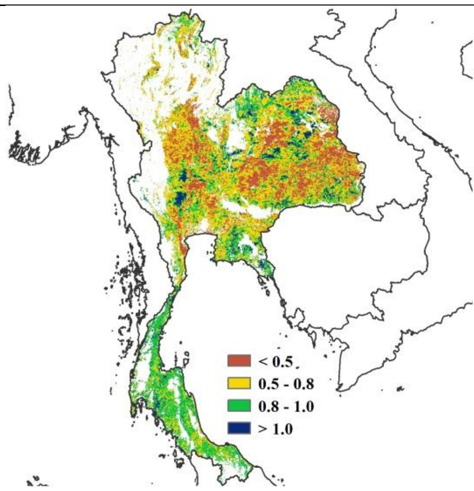
[THA] Thailand

The crop condition from January to April 2015 was below average in Thailand. The harvest of the 2014 main rice crop was completed in January, while the second season rice has reached maturity and was ready to be harvested in April. Accumulated rainfall was below the average in the monitoring period, while the temperature and radiation were above. The agroclimatic indices indicate poor growing conditions, which are confirmed by the slight decrease of the BIOMSS indicator by 1%. The VCIx map shows that crop condition was poor in most of the central and north-eastern regions. NDVI profiles confirm that crop condition was mostly below average from March to April, which is the growing period of second rice crop. The Chachoengsao province is the only area where crop condition was above average over the monitoring period.

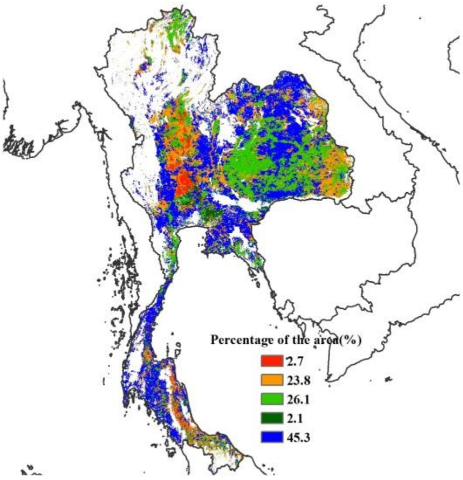
Figure 3.28. Thailand crop condition, January-April 2015



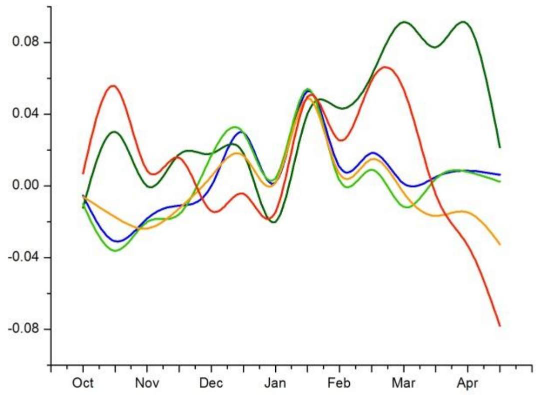
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA



(d) NDVI profiles

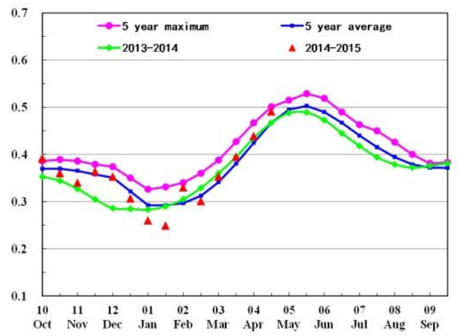
ARG AUS BGD BRA CAN DEU EGY ETH FRA GBR IDN IND IRN KAZ KHM MEX MMR NGA PAK PHL POL ROU RUS THA **TUR** UKR USA UZB VNM ZAF

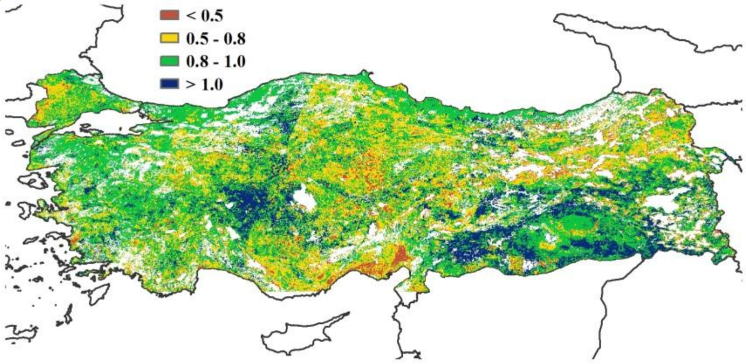
[TUR] Turkey

The crop condition from February to April 2015 was generally above average in Turkey. Winter grains are grown during this period, and planting of summer crops started in April. Accumulated rainfall (RAIN) and temperature (TEMP) from January to April were above average (although only slightly so for TEMP), while radiation (RADPAR) was below average. The agroclimatic conditions nevertheless resulted in a BIOMSS decrease of 6% below the average of the previous five years. The maximum VCI (0.84) was above average conditions, and the fraction of cropped arable land (CALF) increased by 3 percentage points compared to the recent five-year average. These changes indicate a comparable production of winter crops this year in comparison with last year.

Crop condition close to or above the five-year average for January to April was found in most areas across the country. Only the northern part of the Eastern Anatolia and the Thrace regions underwent unfavorable conditions from February to March, and recovered to the average level in April. The outcome for the winter crop season is expected to be favorable.

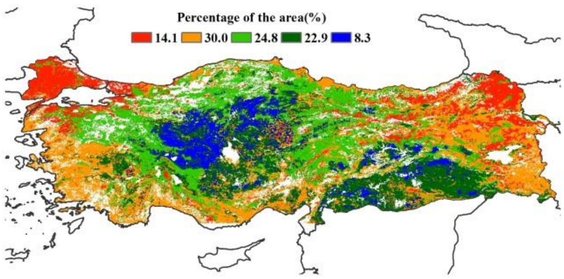
Figure 3.29. Turkey crop condition, January-April 2015

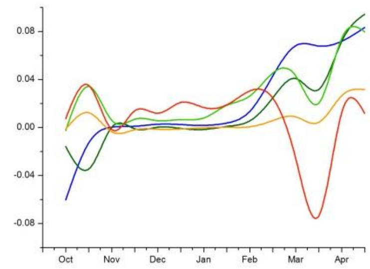




(a) Crop condition development graph based on NDVI

(b) Maximum VCI





(c) Spatial NDVI patterns compared to 5YA

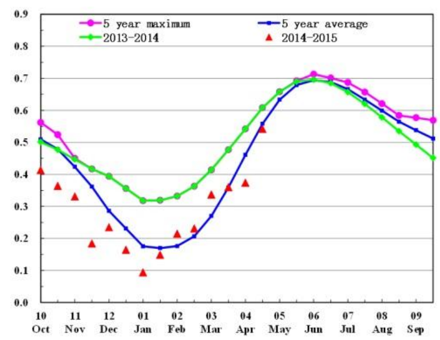
(d) NDVI profiles

Note: The sharply delineated line through Antalya and Ankara (figure (b)) stems from a methodological issue that is also affecting the maps for Russia and Ukraine.

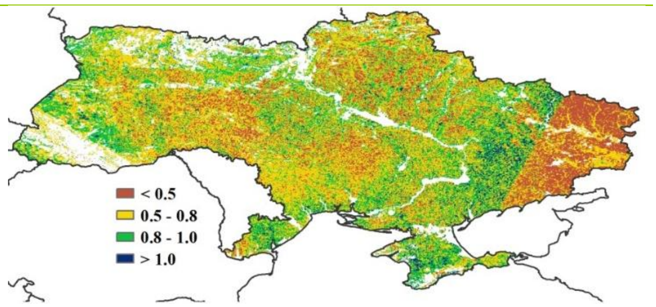
[UKR] Ukraine

Over this reporting period, winter crops in the Ukraine are growing while summer crops (mostly maize) are being planted. Nationwide, rainfall and PAR were slightly below average (-3%), while the warmer conditions (TEMP, +1.4°C) led to a 15% increase in potential biomass accumulation for winter crops. Meanwhile, NDVI was close to average, with marked fluctuations, but well below last year's values. According to the cluster map of NDVI, almost the entire country's crop condition has been constantly deteriorating since December (about 70% of the country), and particularly in the southern half (21.6% of agricultural areas). NDVI profiles show a sharp "recovery" in the northern half of the country (center and east areas only; Chernihivs'ka, Sums'ka, Poltavs'ka, and Kyyivs'ka), probably as a result of maize planting. The VCI map shows a patchwork of mixed low and high values.[3] The crop condition of winter crops seems to be below average in much of the country at the end of April, unless low values result from early harvest brought about by high temperature.

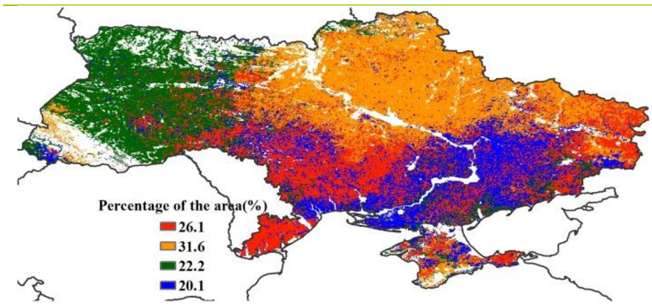
Figure 3.30. Ukraine crop condition, January-April 2015



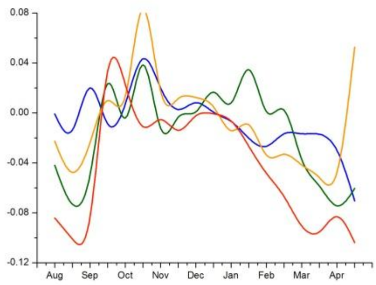
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA



(d) NDVI profiles

[3] The sharply delineated low values in the east result from a methodological issue (also, to a lesser extent, visible for Turkey and Russia) and are unrelated to the situation on the ground.

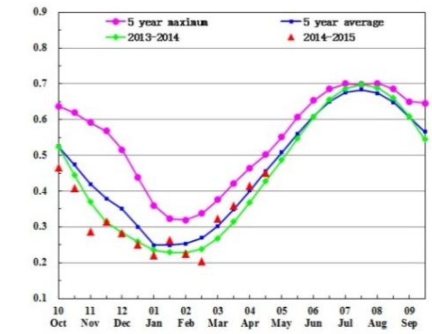
[USA] United States

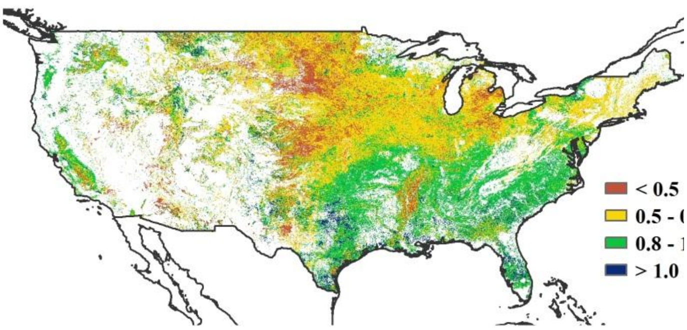
In general, CropWatch indicators concur to describe the condition of winter wheat as above average in the United States over the monitoring period, which covers the growing season of winter crops and planting season of summer crops. Overall, the rainfall indicator (RAIN) shows a 24% departure above average, with average temperature (TEMP, -0.4°C) and a 4% decrease in radiation (RADPAR). Thanks to the favorable weather, the main winter crops zone of the southern plains received abundant rainfall, including Texas (+35%), Oklahoma (+32%), Kansas (+16%), and in Nebraska (+48%). TEMP was close to below average in Texas (-0.8), Oklahoma (-0.7), Kansas (+0.2), and Nebraska (+1.0). RADPAR was below or close to average in Texas (-11%), Oklahoma (-6%), Kansas (+1%), and Nebraska (0%). As a result, the BIOMSS indicator shows a significant positive departure in Texas (+52%), Oklahoma (+35%), Kansas (+18%) and Nebraska (+41%). As mentioned in the description of the North American zone (section 2.3), the Corn Belt received abundant rainfall, which will benefit summer crops. However, at the same time, serious drought conditions occurred on the U.S. West Coast, including California (-48%) and Oregon (-35%).

Overall, the biomass accumulation potential (BIOMSS) shows a 10% positive departure compared to the recent five-year average; CALF increased by 1%; and VCIx was 0.74. The NDVI development profile showed average crop condition, but better than the condition for the same period last year. In the southern plains, winter crops showed good performance: in Texas; the maximum VCI (VCIx) was above 0.8 and even above 1 in some areas, which is consistent with BIOMSS. California is the largest vegetable and fruits producing state in the United States. As a result of advanced irrigation technologies, crops in this state showed a good condition with VCIx above 0.8, in spite of the drought but at the cost of increased groundwater consumption. Groundwater depletion in this region is a serious long-term risk.

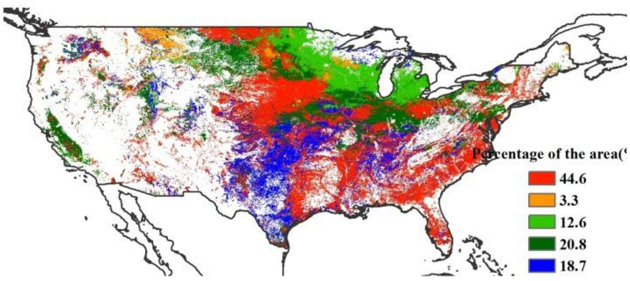
According to the NDVI profiles and patterns, crop condition was close to average from October 2014 to late February and March 2015. In March, the NDVI value dropped sharply due to drought in most western and northern states. This was followed by timely rainfall in northern states and the southern plains, so that crop condition rapidly recovered and locally exceeds the average. If the rainy weather condition continues, the combination of the increase in cropped arable land areas and good crop condition will lead to above average winter wheat production. Table B.3 in Annex B presents the 2015 wheat production outlook for the country.

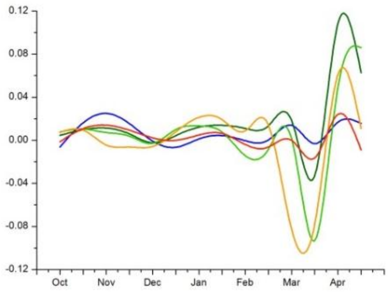
Figure 3.31. United States crop condition, January-April 2015





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



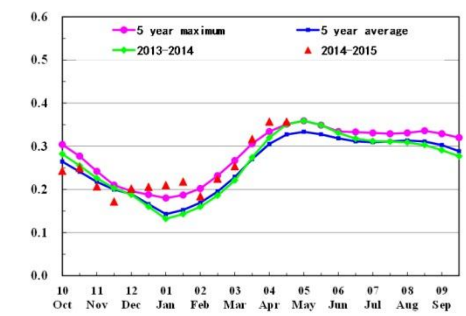


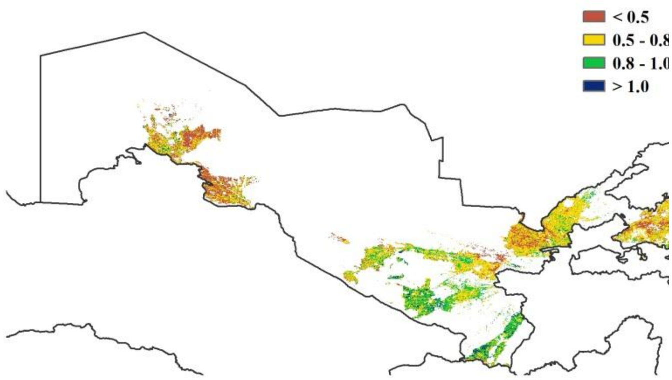
(c) Spatial NDVI patterns compared to 5YA (d) NDVI profiles

[UZB] Uzbekistan

This analysis covers the growing stage of winter cereals and the sowing stage of coarse grains, including maize, in Uzbekistan from January to April in 2015. The crop condition was generally favorable. The country as a whole showed a significant increase of rainfall (RAIN, +11%) but average temperature (TEMP). Radiation (RADPAR, -5%) was low, but the combined effect of RAIN and TEMP is an increase in BIOMSS of the order of 18% over the previous five-year average. This assessment is confirmed by the national NDVI development graph, which shows that crop condition was above last the five-year average and even exceeded the last five-year maximum in January and April. NDVI cluster graphs and profiles show a favorable picture in most parts of the country from February to March, while in the west (the cotton growing area of Karakalpakstan) and south (Kagan, Qarshi, and Surkhondaryo), crop condition showed a drop from early February. In late March, a sudden drop in NDVI also occurred in parts of the country's central and east areas (Samarkand, Jizzakh, Tashkent, Namangan, and Andijon). Current condition, however, is either average or above average. Altogether, prospects are favorable in Uzbekistan's food producing areas.

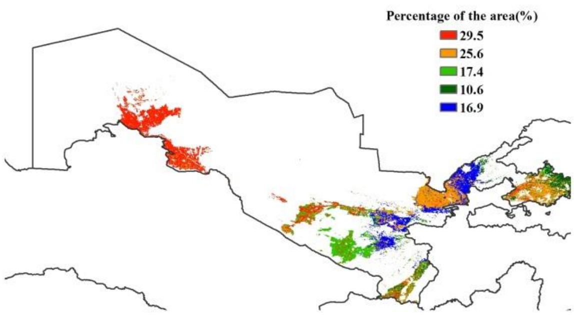
Figure 3.32. Uzbekistan crop condition, January-April 2015

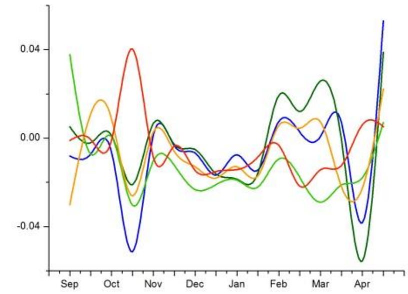




(a) Crop condition development graph based on NDVI

(b) Maximum VCI





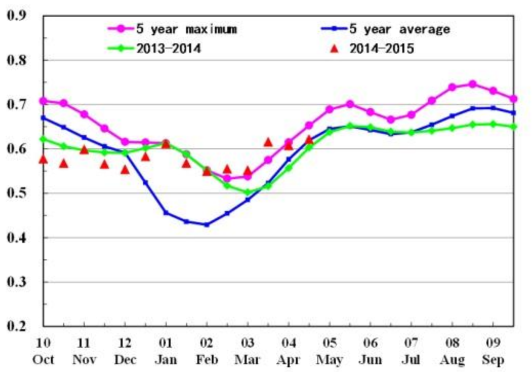
(c) Spatial NDVI patterns compared to 5YA

(d) NDVI profiles

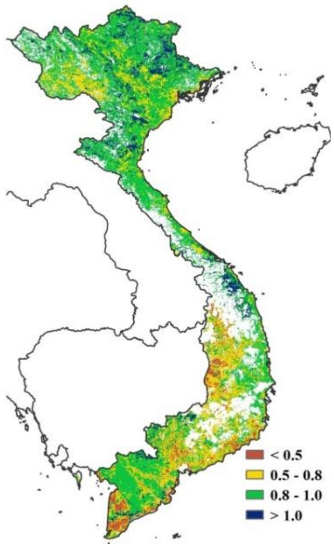
[VNM] Vietnam

The period covered by this bulletin is of relevance for winter/spring rice in Vietnam. The fraction of cropped arable land (CALF) in the country was close to the average of the previous five years. Most of the rice cultivation regions are distributed in the Red River delta in northern Vietnam and the Mekong River delta in southern Vietnam. Vegetation condition indices (maximum VCI) were above 0.8 in most of the two main rice producing areas, with the exception of the southern tip of Vietnam due to the salt water intrusion. For the period under consideration, the CropWatch environmental indices show markedly below average rainfall (RAIN, -14%) and a correlated slight increase in PAR (RADPAR, 6%) and temperature (TEMP, 1.1°C) in comparison with the previous fourteen years. The insufficient rainfall limited the biomass accumulation and resulted in a 6% decrease in the BIOMSS indicator compared with the average of the previous five years. Crop condition departed little from the five-year average during the entire monitoring period. The northern part of Vietnam (mainly in Lao Cai, Ha Giang, and Tuyen Quang, roughly 11.5% of the cropped area) suffered below average crop condition due to the dry weather and crop diseases from January to the end of April, as shown by the NDVI profiles and clusters.

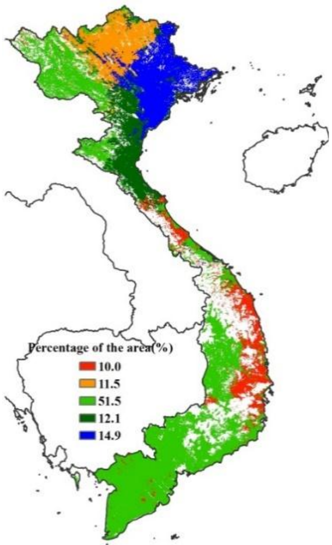
Figure 3.33. Vietnam crop condition, January-April 2015



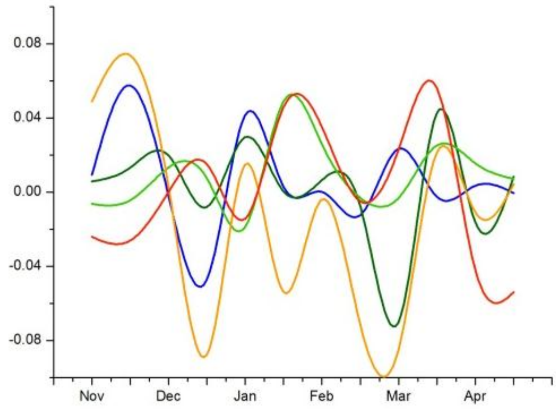
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA

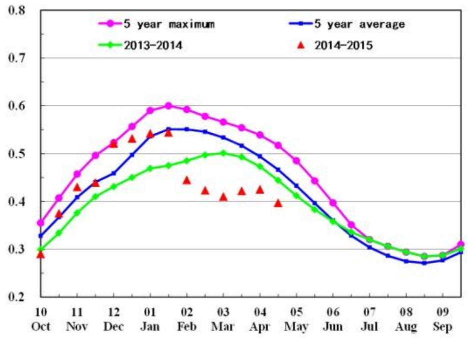


(d) NDVI profiles

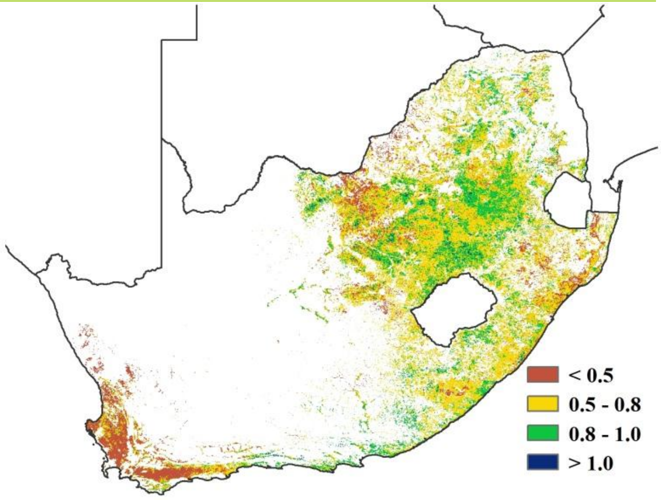
[ZAF] South Africa

Summer crops (maize and soybean) are currently being harvested in the east (up to June) and somewhat later in the west (June-July). The CropWatch agroclimatic indicators concur to describe the current season as generally poor. Overall rainfall was 6% below average, accompanied by relatively high temperature (+1.3°C) and abundant sunshine (RADPAR +5%), all resulting in a biomass production potential deficit (BIOMSS) of 6%. The cropped arable land fraction (CALF) decrease below the average of the last five years reaches 10%, one of the highest values among the countries monitored by CropWatch. Overall NDVI profiles are well below the average of the recent five years. NDVI clusters indicate average conditions (or even above average) in about 60% of agricultural areas, while poorer than expected crop condition prevails in the remaining areas, especially in Kwazulu-Natal (where coastal areas are more severely affected than the west), Mpumalanga, parts of the Free State, as well as the Northern province except its westernmost areas.

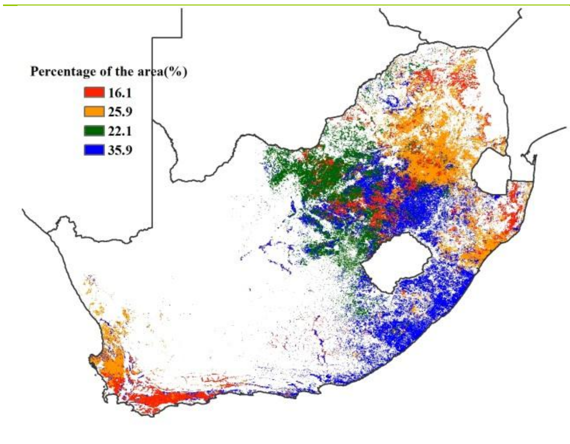
Figure 3.34. South Africa crop condition, January-April 2015



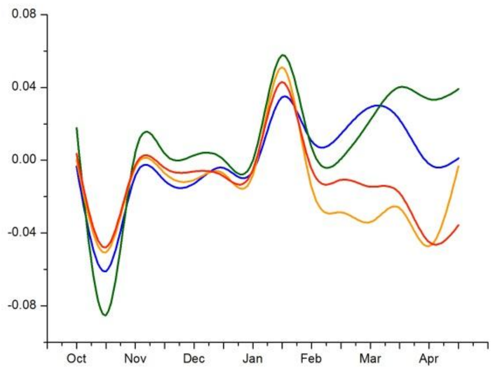
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA



(d) NDVI profiles