Chapter 4. China

After a brief overview of the agro-climatic and agronomic conditions in China over the reporting period (section 4.1), Chapter 4 presents an updated estimate of national winter crop production (4.2) and describes the situation by region, focusing on the seven most productive agro-ecological regions of the east and south: Northeast China, Inner Mongolia, Huanghuaihai, Loess region, Lower Yangtze, Southwest China, and Southern China (4.3). Section 4.4 presents the results of ongoing pests and diseases monitoring, while sections 4.5 and 4.6 describe trade prospects (import/export) of major crops (4.5) and an updated outlook for domestic prices of maize, rice, wheat and soybean (4.6). Additional information on the agro-climatic indicators for agriculturally important Chinese provinces are listed in table A.11 in Annex A.

4.1 Overview

During the current period from January to April, winter crops in China (i.e. winter wheat and rapeseed) were growing in the field. Overall, agro-climatic and agronomic conditions were unfavorable. Both rainfall and RADPAR at the national level dropped by 8% compared to average, while temperature was substantially average (+0.1°C). BIOMSS was 7% above average but CALF was 14% below. At 0.54, average national VCIx was rather low.

On the subnational scale, rainfall significantly exceeded average by more than 30% in Huanghuaihai, Inner Mongolia, the Loess region and North East China but decreased by 18% in the in Lower Yangtze region and by 17% in Southern China. Rainfall in South-West China was average (+2%). Temperature was close to average for all the regions, with the anomalies ranging between -0.4 °C and 0.5 °C. All the regions experienced below-average RADPAR, with significant departures between -14% and -6%. Moreover, CALF decreased everywhere, compared to average. The VCIx in Inner Mongolia was very low at 0.38. The values for other six regions were also rather low, ranging between 0.43 and 0.66.

As to the spatial pattern of agro-climatic and agronomic condition, rainfall was affected by large fluctuations in 8.9% of the cropped areas, mostly in southeastern China: from about 100mm above average in the first dekad of January to 60 mm below average during the last dekad of March in Fujian, Guangdong, southern Jiangxi and eastern Guangxi province, as indicated by figure 4.1. On the contrary, 79% of the planted areas continuously experienced average rainfall in Central, South-west and North-eastern. According to figure 4.2, temperature varied frequently everywhere during the reporting period with large departures from -5°C in late January to +6°C in late March in north-est China. Interestingly, areas which recorded variable precipitations over time are those that had stable temperatures, and vice versa. As shown in figure 4.3, cropped areas are mainly located in the southern and central parts of China whereas uncropped areas occur in the northeast, northern and northwest parts in accordance with the prevailing climates. The highest VCIx values (greater than 1) occur in the central part of China but lower values (below 0.5) are confined to the northeast (Figure 4.4). The VHIn pattern map (figure 4.5) shows that the values were varied between 51 and 100 in almost all the regions, indicating that water supply was generally sufficient for crops growth during this monitoring period.

Table 4.1. CropWatch agro-climatic and agronomic indicators for China, January - April 2018, departure from 5YA and 15YA

Region	Agroclimatic indicators	Agronomic indicators

	Departure from 15YA (2002-2016)			Departure from 5YA (2012-2016)		Current
	RAIN (%)	TEMP (°C)	RADPAR (%)	BIOMSS (%)	CALF (%)	Maximum VCI
Huanghuaihai	36	0.2	-14	31	-30	0.56
Inner Mongolia	35	0.4	-6	27	-93	0.38
Loess region	38	0.5	-9	28	-54	0.43
Lower Yangtze	-18	0.2	-9	-8	-12	0.60
Northeast China	31	-0.4	-6	31	-96	0.54
Southern China	-17	-0.2	-7	-4	-3	0.64
Southwest China	2	0.1	-6	8	-2	0.66

Figure 4.1. China spatial distribution of rainfall profiles, January - April 2018

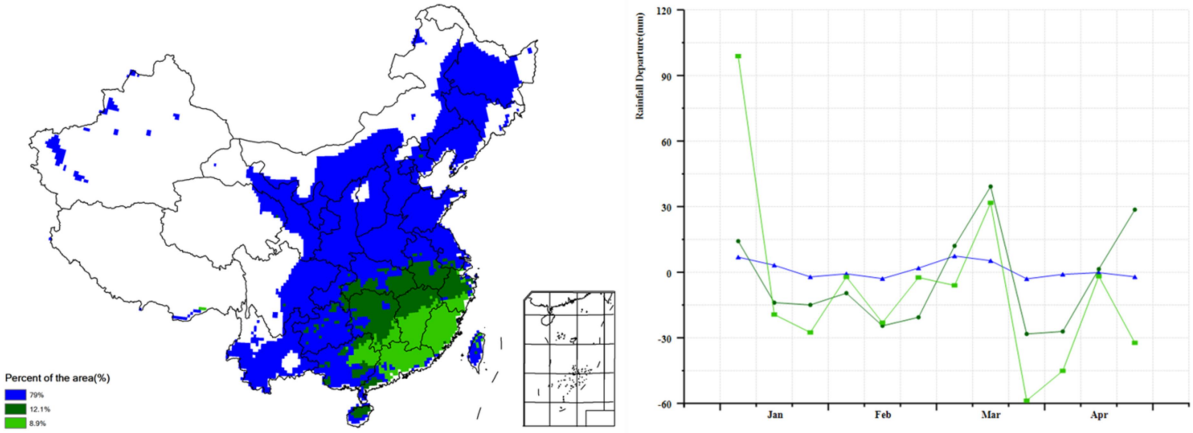


Figure 4.2. China spatial distribution of temperature profiles, January - April 2018

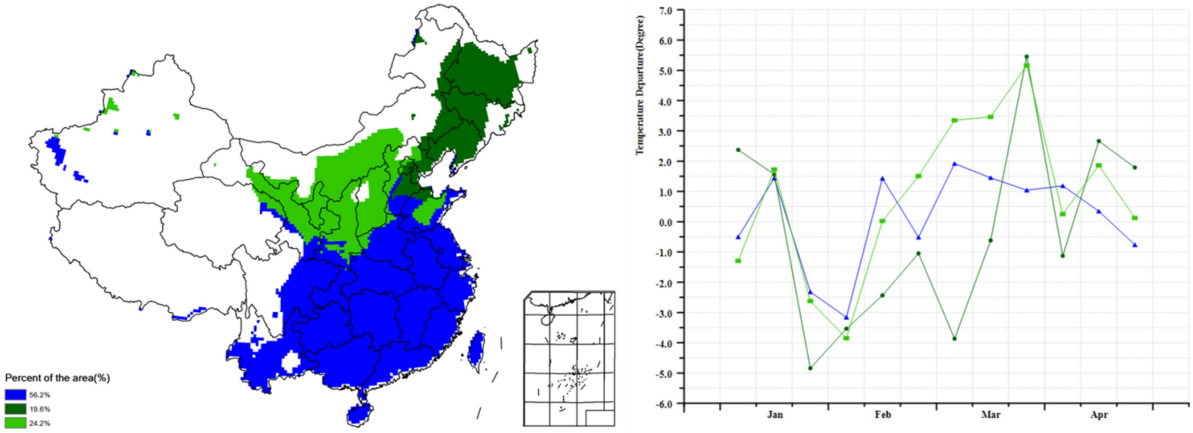


Figure 4.3. China cropped and uncropped arable land, by pixel, January - April 2018

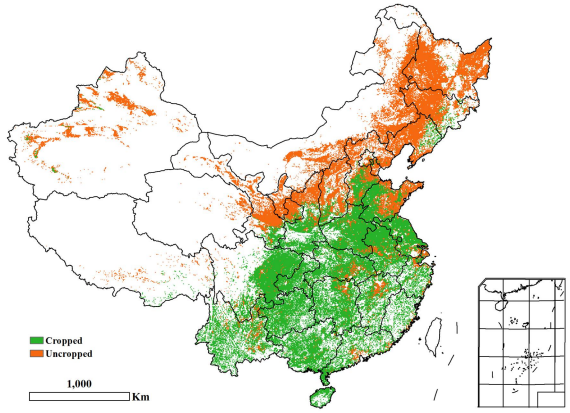


Figure 4.4. China maximum Vegetation Condition Index (VCIx), by pixel, January - April 2018

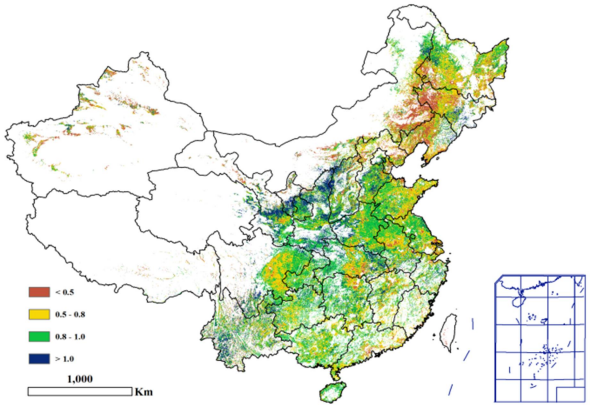
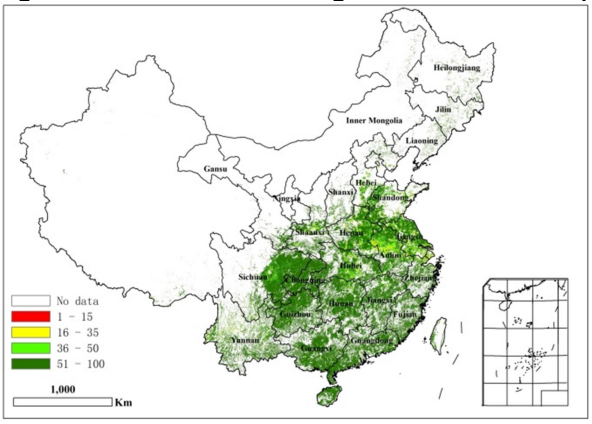


Figure 4.5. China minimum Vegetation Health Index (VHIn), by pixel, January - April 2018



4.2 China crop production

Overall agro-climatic conditions were unfavorable for winter wheat in major production zones, resulting in a 1.4% decrease of yield compared to the 2016-2017 season. Winter wheat production is forecast at 112.7 million tons, a decrease of 3.3 million tons or 2.8% below the 2016-2017 winter season (table 4.2). The total planted area is 23,218 thousand hectares, 1.4% down from 2016-2017. Among the major winter wheat producing provinces, the area decreased by 1% for Hebei, Jiangsu, Shandong and Henan and decreased by 2% in Sichuan. In Anhui, 2016-17 and 2017-18 hectarages were similar but they decreased 1% in Jiangsu. The largest increase of winter wheat hectarage was observed in the provinces of Shanxi (+3%) and Shaanxi (+5%). The previous Bulletin had already mentioned the delayed sowing of winter crops in Anhui and Henan provinces. The area, however, remained stable because farmers planted a late sowing wheat variety as a replacement. The largest drop of winter wheat yield (5%) was observed in Shandong province mainly due to the late breaking of dormancy. Winter wheat yield for Hebei, Henan, Hunan and Sichuan dropped slightly (1%) compared to 2016-2017. Shanxi, Jiangsu, Anhui, Shaanxi and Gansu enjoyed favourable conditions after over-wintering and yields are expected to be up between 2% and 6% from the previous year.

The largest winter wheat production inter-annual change (+11%) occurred in Shaanxi as a result of both increased planted area and yield. Other provinces with large production increases includes Shanxi (5%, due to both increased planted area and the yield), Anhui (5% because of increased yield), and Gansu (7%, due to both decreased planted area and the yield). Jiangsu (+4%) and Chongqing (+1%) mainly contributed by increased yield. The top three winter wheat producing provinces (Henan, Shandong and

Hebei) all suffered from unfavorable conditions and report large production drop of 2%, 6% and 2%, respectively. Hebei mainly suffered from drought while the decreased production for Shandong and Henan was mostly due to the delay of crop development.

Table 4.2. China, 2018 winter wheat area, yield, and production and percentage difference with 2017, by province.

	Area (kha)			Yield (kg/ha)			Production (thousand ton)		
	2017	**2018**	**Δ(%)**	**2017**	**2018**	**Δ(%)**	**2017**	**2018**	**Δ(%)**
Hebei	2048	2026	-1	5898	5827	-1	12080	11802	-2
Shanxi	517	533	3	4289	4374	2	2219	2332	5
Jiangsu	1962	1946	-1	4863	5045	4	9540	9816	3
Anhui	2420	2422	0	4441	4655	5	10747	11275	5
Shandong	4113	4091	-1	5963	5653	-5	24527	23124	-6
Henan	5115	5049	-1	5111	5058	-1	26142	25539	-2
Hubei	1040	1044	0	4117	4082	-1	4281	4263	0
Chongqing	350	349	0	3299	3343	1	1155	1167	1
Sichuan	1290	1268	-2	3627	3594	-1	4677	4559	-3
Shaanxi	1027	1076	5	3740	3957	6	3841	4257	11
Gansu	388	390	0	3858	4099	6	1499	1598	7
Sub total	20270	20193	-0.4	-	-	-	100709	99731	-1
Other provinces	3278	3025	-8	-	-	-	15273	12975	-15
National total*	23548	23218	-1.4	4925	4854	-1.4	115981	112707	-2.8

Note: National total production does not include Taiwan province.*

In China, winter wheat represents almost 92% of the total output for winter crops. For 2018, CropWatch puts the total winter crop production at 122.8 million tons, a 2.8 percent decrease from the 2017's bumper production (table 4.3). Due to the low return from winter wheat and rapeseed cultivation, farmers have reduced areas by 1.6% nationwide. Some farmers in lower Yangtze River region decide to keep the field fallow during winter and plant single rice after spring. The most significant drop of winter crop area occurred in Sichuan province (-2%). Favorable conditions in the Loess Region benefited the crops there and both planted area and yield were up from the previous year resulting in the largest production increase for Shanxi, Shaanxi and Gansu (Area up 3% in Shanxi, 5% inr Shaanxi and 1% in Gansu; Yield up 2% in Shanxi, +7% in Shaanxi and +6% in Gansu). Yield increased by 3% for both Jiangsu and Anhui thanks to favorable climatic condition which compensated the decreased hectarage. It is worth mentioning that the top two winter crop producing provinces suffered drops in winter wheat output (Henan 6%, Shandong 2%). As a result, the national winter crop production dropped from the previous years high output.

A caveat, however: depending on weather conditions during the grain-filling stage, production of winter wheat and total winter crop output could be revised up or down in the final CropWatch estimate, which will be published in the next bulletin.

Table 4.3. China, 2018 winter crops production (thousand tons) and percentage difference with 2017, by province

	2017	2018			
	(thousand ton)	Area change	Yield change	Production change	Production (thousand ton)

		(%)	(%)	(%)	
Hebei	12077	-1	-1	-2	11784
Shanxi	2251	3	2	5	2366
Jiangsu	9585	-1	3	2	9753
Anhui	11662	-1	3	2	11839
Shandong	24898	-1	-6	-6	23330
Henan	26293	-1	-2	-2	25636
Hubei	5756	-1	0	-1	5695
Chongqing	2289	0	2	2	2336
Sichuan	5513	-2	0	-1	5444
Shaanxi	3889	5	7	12	4373
Gansu	2999	1	6	7	3211
Sub total	107211	-	-	-1	105767
Other provinces	19064	-	-	-11	16986
National total*	126275	-2	-1	-3	122753

** Production for Taiwan province is not included.*

4.3 Regional analysis

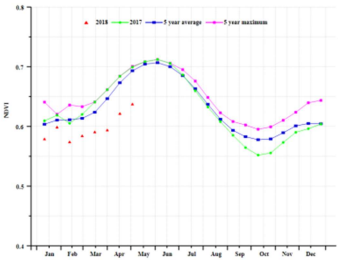
Figures 4.6 through 4.12 present crop condition information for each of China's seven agricultural regions. The provided information is as follows: (a) Phenology of major crops; (b) Crop condition development graph based on NDVI, comparing the current season up to April 2018 to the previous season, to the five-year average (5YA), and to the five-year maximum; (c) Spatial NDVI patterns for January - April 2018 (compared to the (5YA)); (d) NDVI profiles associated with the spatial patterns under (c); (e) maximum VCI (over arable land mask); and (f) biomass for January - April 2018. Additional information about agro-climatic indicators and BIOMSS for China is provided in Annex A.

Northeast region

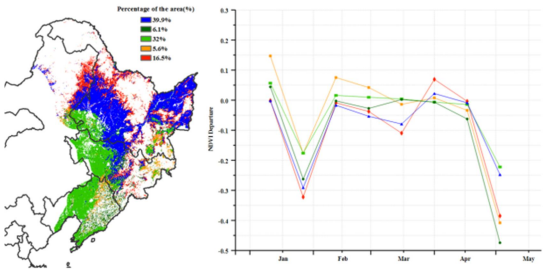
In northeast China, April is the month of sowing and germination for most crops, including maize and soybean. January to April weather was colder and more humid than average; rainfall was well above average (+31%) and RADPAR dropped by 6%. Temperature was slightly below average (-0.4°C). The agro-climatic conditions mentioned resulted in a 31% above average potential biomass in the region. It is still cold for crops before April in the region and NDVI variations depend on snow-melt more than crop condition.

In general, sufficient water supply in the region ensures good soil moisture, which will benefit crops in 2018.

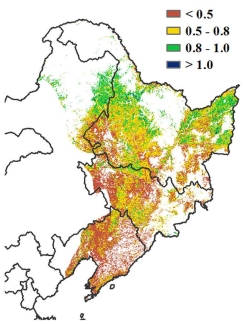
Figure 4.6. Crop condition China Northeast region, January - April 2018



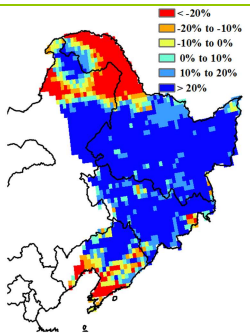
(a) Crop condition development graph based on NDVI



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



(d) Maximum VCI

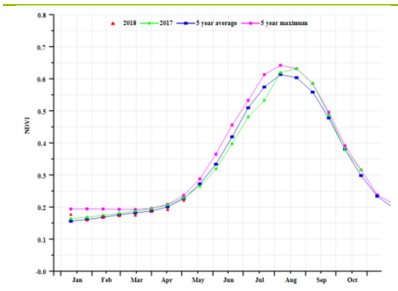


(e) Biomass

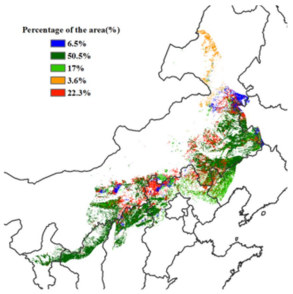
Inner Mongolia

No crops were cultivated in Inner Mongolia over the reporting period due to the seasonally low temperatures. Crops started to be sowed only from late April, along with gradually increasing temperatures. Considering agro-climatic indicators in the first four months of this year, rainfall indices were above average (RAIN +35 %), TEMP was slightly up and the PAR accumulation was above average (RADPAR, +6%), resulting in a potential biomass increase of 27%. VCIx was below 0.5 in most areas, which is of little agronomic significance at this time of the year. Stored soil moisture is abundant and will benefit the germination of crops and grazing lands alike. It is just very early stage of crop growing in April. If these conditions continue in the future, the outcome may be a good season.

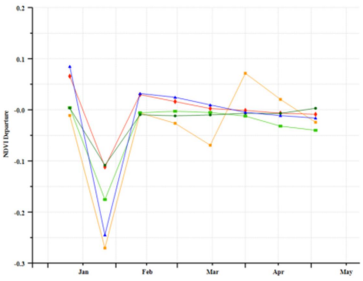
Figure 4.7. Crop condition China Inner Mongolia, January - April 2018



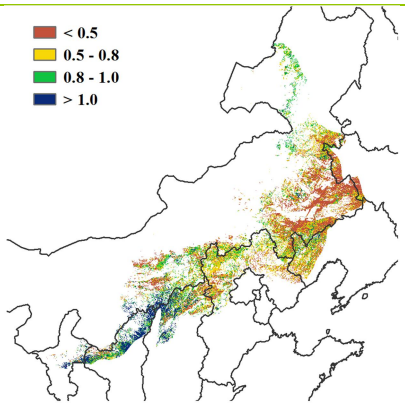
(a) Crop condition development graph based on NDVI



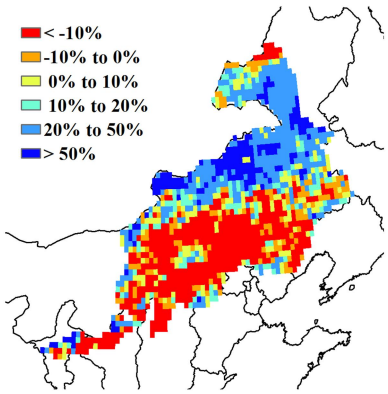
(b) Spatial NDVI patterns compared to 5YA



(c) NDVI profiles



(d) Maximum VCI



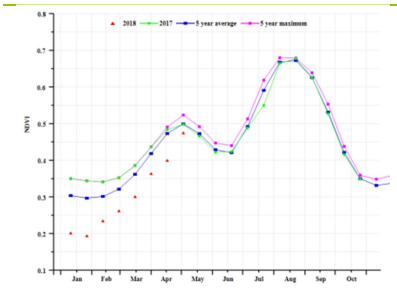
(e) Biomass

Huanghuaihai

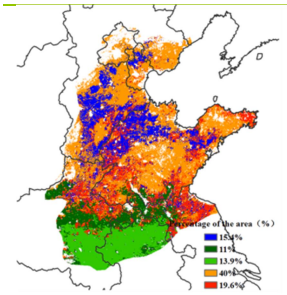
The main crop during the monitoring period is winter wheat, which was planted in early October will complete its cycle by mid -June. According to the crop condition development graph based on NDVI, crop condition was below 5YA during the entire period and slightly recovered in late April. According to the CropWatch agro-climatic indicators, temperature (TEMP) was generally average and precipitation (RAIN) was 36% above, while radiation (RADPAR) was 14% below. Sufficient precipitation provided good soil moisture and led to a 31% increase in biomass potential. The fraction of cropped arable land (CALF), however, decreased by 30%. Favorable yield conditions are shown by the biomass departure map: most areas exhibit more than 20% increase except for parts of southern Hebei and Shandong, which show negative departures.

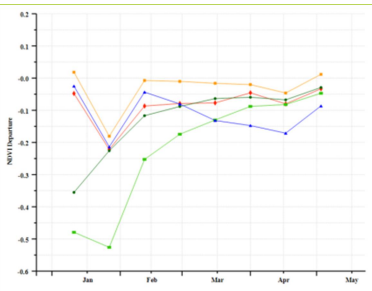
The whole region currently displays NDVI values that are below but close to average. This contrasts with the beginning of the monitoring period when NDVI showed large negative departures from average for almost the whole region, with very low values in the south. The improvement is confirmed by the VCIx distribution maps. Eastern Shandong and some isolated areas display low VCIx values. The current regional average was 0.56 at the end of April.

Figure 4.8. Crop condition China Huanghuaihai, January - April 2018



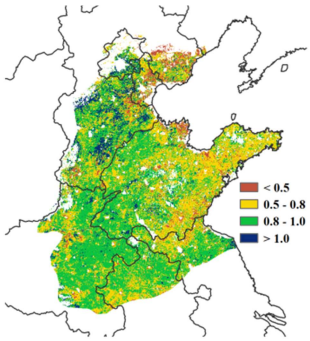
(a) Crop condition development graph based on NDVI

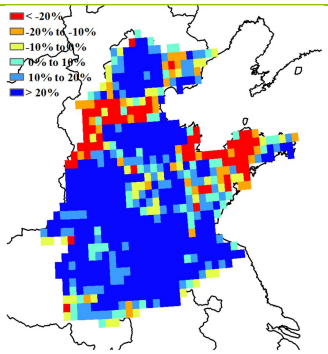




(b) Spatial NDVI patterns compared to 5YA

(c) NDVI profiles





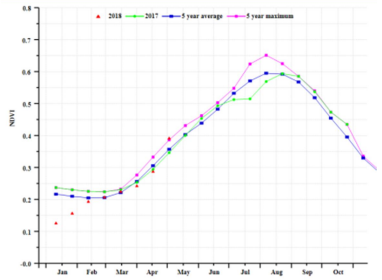
(d) Maximum VCI

(e) Biomass

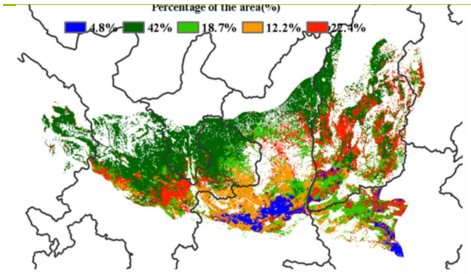
Loess region

According to the regional NDVI development graph, crop condition was generally fair in the Loess region. The main crops in the region are currently winter wheat, spring wheat, and spring Maize. Winter wheat was sowed during late September to middle October and will be harvested in middle June. Spring wheat and Maize were just sowed during late March to April. During the monitoring period, rainfall (RAIN) exceeded average by 38%, while temperature (TEMP) was 0.5°C above. Radiation (RADPAR) was 9% below average, which may adversely affect photosynthesis. NDVI clusters and profiles shows that crop condition was close to average in most parts of the region and even improved slightly in late April. The fraction of cropped arable land (CALF) for the region decreased 54 percentage points when compared with the five-year average, which indicates about half of the land is uncropped. The potential biomass indicator (BIOMASS) was 28% above average, with above average values in every province within the Loess region. According to the VCIx map, with the exception of central Shanxi and central Gansu, current crop condition in the region is quite favorable, especially in the north.

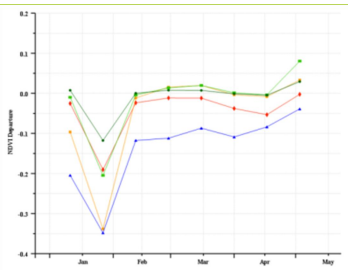
Figure 4.9. Crop condition China Loess region, January - April 2018



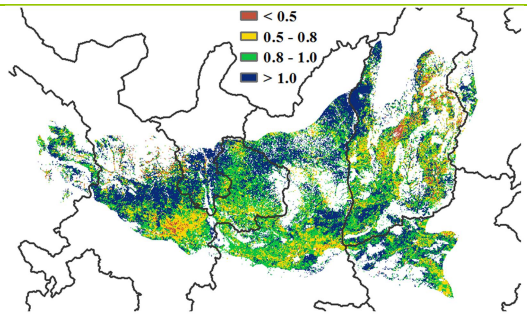
(a) Crop condition development graph based on NDVI



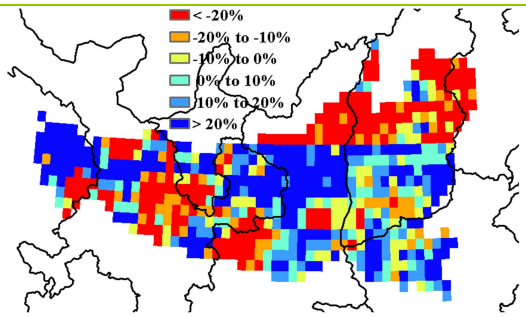
(b) Spatial NDVI patterns compared to 5YA



(c) NDVI profiles



(d) Maximum VCI



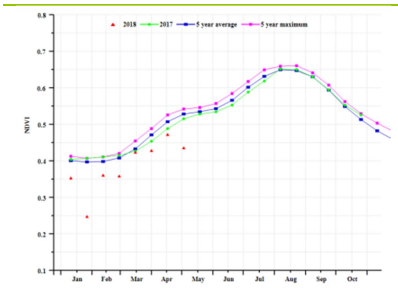
(e) Biomass

Lower Yangtze region

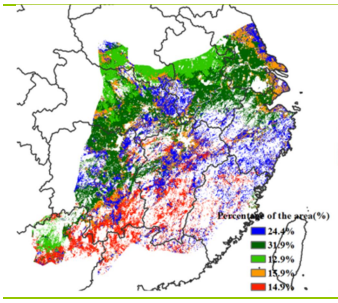
During this monitoring period from January to April, early rice was being transplanted while, in the north of the region, winter wheat had reached flowering and milky ripeness. Rapeseed has been harvested completely in early April.

The regional crop development graph based on NDVI shows below average conditions, due to mostly unfavourable rainfall (RAIN -18% compared to average) and sunshine (RADPAR, -9%). Although temperature was about average (+0.4°C), the potential BIOMSS dropped 8% compared to the average level and the regional VCIx was just 0.6. The BIOMSS map, however, has favourable conditions in the central-eastern Hubei (which is confirmed by VCIx), south Jiangsu, central Zhejiang and the north of Jiangxi and Guangdong provinces. According to NDVI profiles crop condition was below average in the whole region especially in the south, covering 14.9% of arable land. Considering that the fraction of cropped arable land (CALF) was 12 percentage points below the average of recent years, crop production is anticipated to be mostly unfavorable.

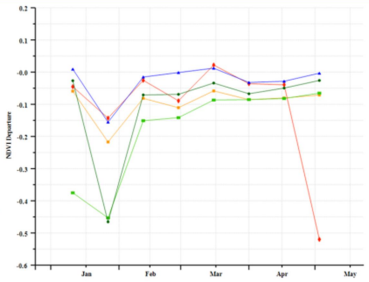
Figure 4.10. Crop condition Lower Yangtze region, January - April 2018



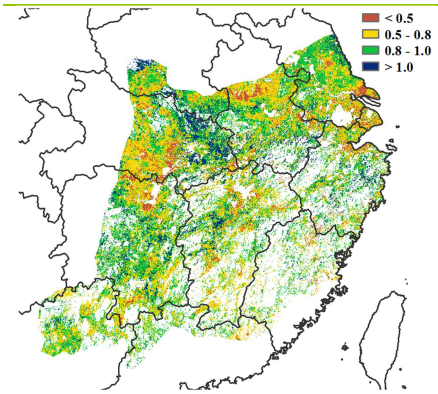
(a) Crop condition development graph based on NDVI



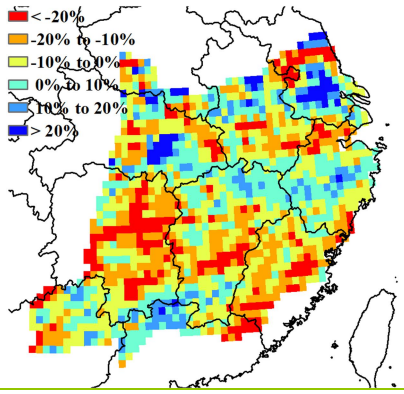
(b) Spatial NDVI patterns compared to 5YA



(c) NDVI profiles



(d) Maximum VCI



(e) Biomass

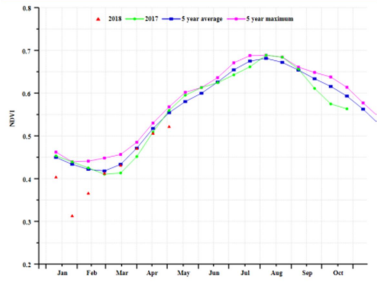
Southwest China

The reporting period covers the booting and heading of winter wheat in southwestern China.

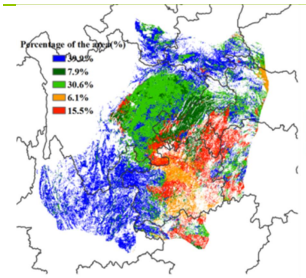
According to the regional NDVI profile, crop condition was partly below average. Rainfall exceed average (RAIN +2%), sunshine was low (RADPAR -6%) while temperature was average (TEMP +0.1℃). Compared to the average of the past 5 years, the cropped arable land fraction was slightly below (CALF -2%) and the potential biomass production index was high (BIOMSS +8%). The maximum VCI was 0.66 indicating mostly average crop conditions.

As shown by NDVI clusters and maps, NDVI in the region was close to average from early February to the end of April, except in central-east Guizhou and neigbouring areas in Chongqing; both had already experienced very low NDVI due to abundant precipitation (RAIN +10%, RADPAR -7%) early in the season. In Sichuan, rainfall and sunshine were low but close to average (RAIN and RADPAR -2%). The most favourable profile occurs in Yunnan in spite of low rainfall (RAIN -24%). Altogether, the situation is the region is as yet inconclusive and deserves close monitoring.

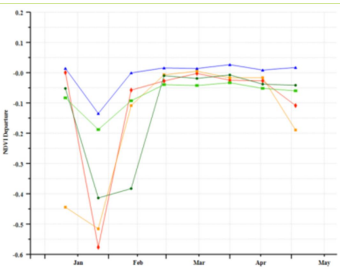
Figure 4.11. Crop condition Southwest China region, January - April 2018



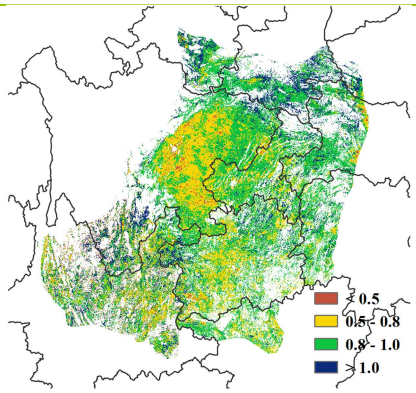
(a) Crop condition development graph based on NDVI



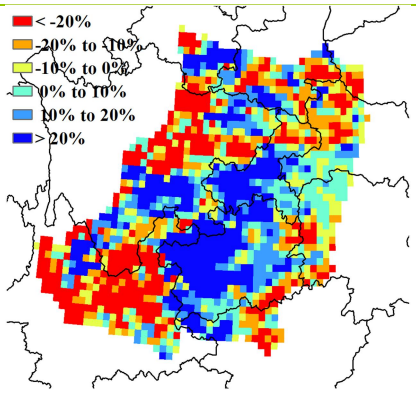
(b) Spatial NDVI patterns compared to 5YA



(c) NDVI profiles



(d) Maximum VCI



(e) Biomass

Southern China

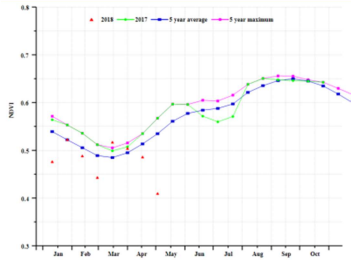
In southern China, the main crop was early rice during the reporting period; the crop was still in the vegetative stage.

Crop condition in Southern China was below average compared with the average of the previous five years. The region recorded average temperature (TEMP -0.2℃) but suffered a deficit of both rainfall and sunshine (RAIN -17%, RADPAR -7%). As a result, the biomass production potential fell as well (BIOMSS -4%), the cropped arable land fraction (CALF) was 3% below average and the maximum VCI (VCIx) was just average at 0.64.

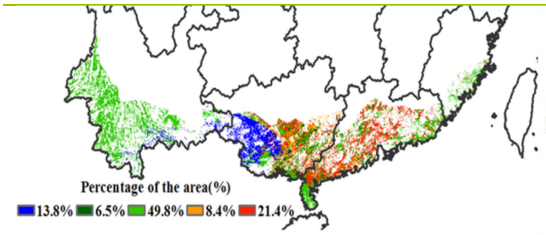
Southern China covers the four provinces of Fujian, Guangdong, Guangxi and parts of Yunnan. In Fujian, rainfall and radiation were below average (RAIN, -23%; RADPAR, -1%), and so was BIOMSS (-18%). Similar conditions prevailed in Guangdong (RAIN -13%, RADPAR -2%). VCIx was below 0.8 in more than half of this province. Guangxi as well had low RAIN and even lower RADPAR (-11% and -10%, respectively). In Yunnan, the rainfall, temperature and radiation were 24%, 0.6℃ and 8% below average, respectively.

At the time of reporting, crop condition is about average in 70.1% of the arable land in the region, corresponding to south Yunnan, west Guangxi and coastal Fujian. Crop condition is poor (with NDVI more than 0.4 units below average) or planting was delayed in most of Guangdong and south-east Guangxi. The next monitoring period will show if the low NDVI values indicate poor crops or some transient effect.

Figure 4.12. Crop condition Southern China region, January - April 2018

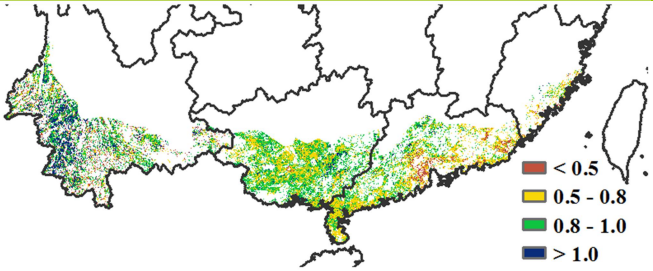


(a) Crop condition development graph based on NDVI

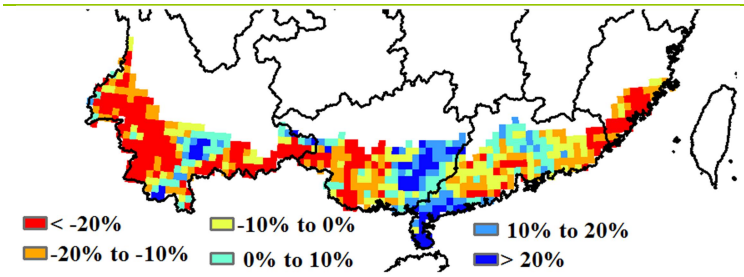


(b) Spatial NDVI patterns compared to 5YA

(c) NDVI profiles



(d) Maximum VCI



(e) Biomass

4.4 Pest and diseases monitoring

Up to mid-May 2018, the precipitation in northern China, eastern and central Huanghuaihai was higher than during 2017, while the temperature was lower. This resulted in moderate occurrence of wheat yellow rust, sheath blight and aphids; the total affected area reached 15.2 million hectares.

wheat yellow rust

The distribution of wheat yellow rust in 2018 is shown in Figure 4.13 (a) and Table 4.4. The total area affected by the yellow rust reached 1 million hectares, with the disease moderately occurring in southern Henan, southern Shaanxi, northern Anhui, and southern Hunan, and slightly in southern Shandong and central Jiangsu.

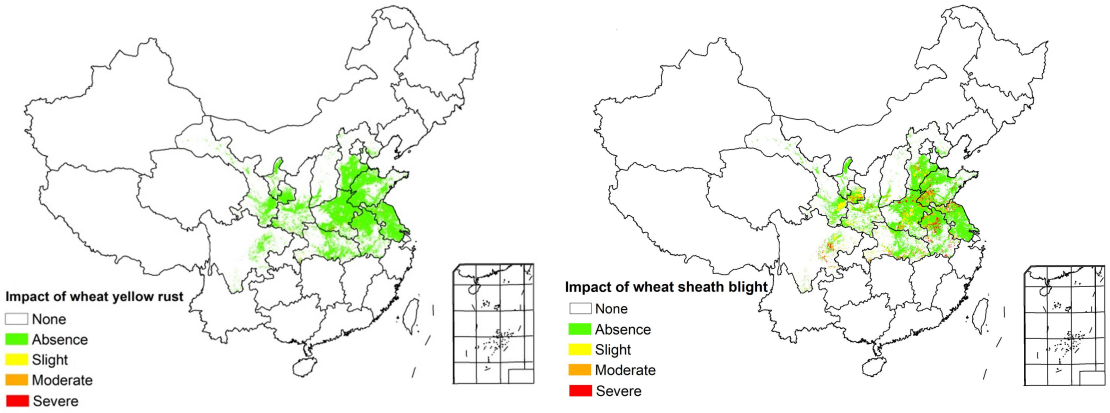
Wheat sheath blight

Wheat sheath blight (Figure 4.13 (b) and Table 4.5) damaged around 6.6 million hectares in mid May 2018, with the disease severely occurring in most of Anhui, northern Jiangsu, and western Shandong, and moderately in central Sichuan, central Shaanxi, and southern Hubei. Slight impact was observed in eastern Gansu, southern Hebei, and central Henan.

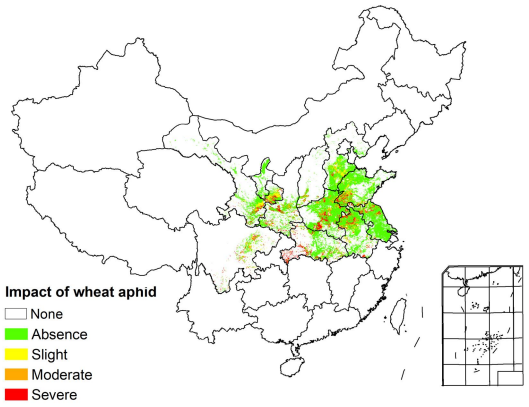
Wheat aphids

The total wheat area affected with aphids (Figure 4.13 (c) and Table 4.6) has reached 7.6 million hectares in mid May 2018, with severe impact in northern Jiangsu, northern Anhui, western Shandong, and most of Henan. Eastern Sichuan, and central Shaanxi had moderate infestation and only slight infestation occurred in southern Hebei, eastern Gansu.

Figure 4.13. Distribution of wheat yellow rust (a), sheath blight (b) and aphids (c) in China (mid May 2018)



(a) **(b)**



(c)

Table 4.4. Statistics of wheat yellow rust in China (mid May 2018)

Region	Occurrence ratio (%)			
	Absence	Slight	Moderate	Severe
Huanghuaihai	96	2	1	1
Loess region	95	3	1	1
Lower Yangtze	95	2	2	1
Southwest China	96	2	1	1

Table 4.5. Statistics of wheat sheath blight in China (mid May 2018)

Region	Occurrence ratio (%)			
	Absence	Slight	Moderate	Severe
Huanghuaihai	74	11	9	6
Loess region	71	18	7	4
Lower Yangtze	72	11	10	7
Southwest China	70	15	9	6

Table 4.6. Statistics of rice sheath blight in China, mid to late July 2017

Region	Occurrence ratio (%)			
	Absence	Slight	Moderate	Severe
Huanghuaihai	70	13	10	7
Loess region	67	14	11	8
Lower Yangtze	71	10	11	8
Southwest China	65	12	13	10

4.5 Major crops trade prospects

Imported and exported grains in the first quarter of 2018

Rice

The total imports of rice by China amounted to 0.7752 million tons, a decrease of 11.0% compared to the previous year. The rice mainly stems from Vietnam (46.9% of imports), Thailand (32.3%) and Pakistan

(12.3%). The expenditure for rice import was US$426 million. Total exports over the period were 337,100 tons, mainly to the Republic of Korea, Côte d'Ivoire, and Mozambique (24.3%, 14.2%, and 12.8%, respectively). The value of the export was US$182 million.

Wheat

Chinese wheat imports totaled 0.6417 million tons, down by 40.6% year-on-year. The main sources include Australia (28.1%) , Kazakhstan(19.0%), and the United States (11.5%). Imports amounted to US$186 million. Wheat exports (90,400 tons) went mainly to the Democratic People's Republic of Korea (76.4%) and Hong Kong (19.4%). The generated income for wheat export was US$38 million.

Maize

Maize imports reached 557,300 tons, an increase of 81.8% over 2017. The main suppliers were Ukraine and the United States, accounting for 95.4% and 3.2% of imports respectively. Imports amounted to US$116 million. The United States (42.9%), Canada (28.6%), and France (14.3%) were the main destinations of Chinese maize exports, which reached to 700 tons for a value of US$0.2343 million.

Soybean

In the first quarter of 2018, the total imports of soybean were up 0.2% to 19,566,800 tons. Brazil and the United States respectively contributed 58.7% and 35.4%, for a total value of US$8216 million. Soybean exports were 30,800 tons, down 5.2%.

Trade prospects for major grains in China for 2018

Based on the latest monitoring results, China grain imports are projected to increase. The projections are based on remote sensing data and the Major Agricultural Shocks and Policy Simulation Model, which is derived from the standard GTAP (Global Trade Analysis Project).

Rice

According to the model forecast, rice imports and exports will increase by 5.6% and 24.7% respectively in 2018. Due to the price differences at home and abroad, the low production cost of the main import sources (Vietnam , Cambodia, Pakistan and others), and the influence of the China-ASEAN Free Trade Area Agreement, rice imports in 2018 will maintain their growth momentum within the quota range.

Wheat

Wheat imports are projected to increase by 3.4%, while exports will decrease by 7.8%. As a result of the relaxed pattern of global supply and demand, global wheat price increased only slightly. However, due to the persistence of the wheat price difference at home and abroad wheat imports will increase slightly in 2018.

Maize

The model forecasts an increase of maize imports (+24.6%) in 2018, while exports decrease 9.4%. At present, global supply and demand of maize is relaxed, and prices are on a downward trend. Due to the strong demand by the livestock industry, maize imports are expected to increase in 2018.

Soybean

Soybean imports and exports will decrease by 0.8% and 3.0%, respectively. Under the influence of insufficient domestic production and other factors, imports will remain high. However, under in response to the structural adjustment policies for planting and the changing international context, soybean imports in China will decrease slightly in 2018.

Figure 4.14. Rate of change (%) of imports and exports for rice, wheat, maize, and soybean in China in 2018 compared to those for 2017.