Chapter 5 China: Production and Crop Conditions

5.1 Summary of production estimates by province

The 2012-13 cropping season in China is best described as "globally average," with the following productions and differences with the previous season: maize 194,178 thousand tons (+ 3.1 percent), rice (as paddy) 200,145 thousand tons (+0.6 percent), soybean 13,245 thousand tons (-6.8 percent) and wheat 118,178 thousand tons (-1.3 percent) (table 5.1).

The largest single contribution of any province to the national production for a particular crop is 35 percent (soybean in Heilongjiang). For maize, the national production is dominated by Heilongjiang, Jilin, and Shandong (13, 12 and 10 percent, respectively). For rice, the largest contributors are Hunan (13 percent), Heilongjiang (10 percent), Jiangxi (9 percent), Anhui (8 percent) and Jiangsu (8 percent), a much more balanced situation than for other crops. For soybean, in addition to Heilongjiang, the major contributors are Anhui and Inner Mongolia with 8 percent and 6 percent, respectively. Finally, for wheat, more than half the production hails from the three provinces of Henan (22 percent), Shandong (19 percent), and Anhui (9 percent).

Considering the detail of changes over the previous season, the most dramatic difference occurs for wheat in Heilongjiang, with a decrease of 35.6 percent due essentially to very unfavorable temperature conditions during late winter and early spring in northeast China. In addition to yield loss, the phenomenon also accounts for changes in the cropping structure, in particular wheat to maize. Heilongjiang also underwent a dramatic drop in Soybean production (-5.2 percent), which was compensated for by a shift to maize (+5.5 percent). For rice, the extreme variations are those of Ningxia (-2.4 percent) and Anhui (+3.6 percent). The largest increase for any crop was achieved for maize in Shanxi (+11.7 percent).

Interestingly, for all crops, the yield variation compared with last year stays in the range from -2 percent to +3 percent, with few minor exceptions, for instance, approximately -3 to +3 percent for early rice, and -0.5 to + 1 percent for late rice (table E.3 in annex E).

For area, patterns are much less obvious. For maize, the variation ranges from -1.2 percent to +4.9 (in Heilongjiang); for soybean, from -5.1 percent (also Heilongjiang) to +0.6 percent. The most spectacular decrease is for wheat in Heilongjiang (-35.5 percent), followed by -4.5 percent in Ningxia, which stresses the abnormality of the conditions that affected Heilongjiang this year. The largest increase for wheat (+4.5 percent) occurred in Inner Mongolia. As to the three rice typologies in table 5.3, the area increases all are within a range of -3 percent to +2 percent. The difference between the (low) variability of yields and the (larger) variability of areas derives from the fact that a large volume of national Chinese production is irrigated.

Table 5.1 China, 2013 production and percent difference with 2012, by province (thousand tons)

	Maize		Rice (paddy)		Soybean		Wheat	
	2013	Δ%	2013	Δ%	2013	Δ%	2013	Δ%
Anhui	3799	-3.9	16746	3.6	1096	-4.1	11050	-2.3
Chongqing	2037	-1.5	4866	1.4			1137	-2.1
Fujian			2822	0.5				
Gansu	4942	0.7					2744	-0.6
Guangdong			11106	-1.7				
Guangxi			10953	1.2				
Guizhou	4722	-2.6	5126	-1.1				
Hebei	16635	6.2			174	3.7	10245	-1.6
Heilongjiang	25481	2.5	20044	1.7	4625	-10.9	482	-35.6
Henan	16697	-1.2	4102	1.8	776	-9.6	25486	-0.7
Hubei			15871	-1.0			4410	-2.8
Hunan			25547	-1.7				
Inner Mongolia	15172	4.7			845	-4.2	1904	2.5
Jiangsu	2170	0.5	16715	0.1	797	1.2	9052	0.4
Jiangxi			17221	-2.3				
Jilin	23947	4.0	5066	1.4	649	-3.9		
Liaoning	13270	0.3	4695	0.5	520	-3.5		
Ningxia	1687	-14.9	462	-2.4			741	-6.7
Shaanxi	3998	2.3	1052	2.4			3890	-8.3
Shandong	18587	5.5			697	-4.6	22242	0.7
Shanxi	9786	11.7			193	10.9	1970	-4.8
Sichuan	7060	1.4	14581	1.6			4567	1.6
Yunnan	5890	0.1	5074	-1.7				
Zhejiang			2815	3.2				
Sub-total	175879	2.7	184865	0.2	10372	-7.0	99919	-1.2
Remaining 12 provinces	18299	7.1	15280	6.6	2873	-6.3	18259	-2.0
National Total	194178	3.1	200145	0.6	13245	-6.8	118178	-1.3

5.2 Cropland use intensity and cropping structure

Most Chinese provinces practice cropping intensities in excess of 100 percent: the average reaches 168 percent, a slight decrease compared to last year. More than half the provinces have cropping intensity values in excess of 192, with values close to the maximum (235 percent in Guangxi) being observed in Zhejiang (234 percent) and in Jiangxi (226 percent). Interestingly, the next highest values are all about 20 percent below the top three. The largest decrease for cropping intensity this year occurred in Guangdong (-3.5 percent), while the largest increase was recorded in Zhejiang (+3.5 percent). Both cropping index and cropping index change show a marked difference between the average and the median, indicating a negative skew in the distribution of cropping intensities between provinces.

Uncropped arable land is less than 1 percent (0.85 percent), a notable increase over last year, no doubt due to the variety of adverse conditions that have affected the country this year. The highest value is that of Ningxia (3.8 percent). Regarding the potential biomass ratio (PBR), the difference between median (0.897) and average (0.879) is significantly less marked than for the other indicators in this table.

However, some spectacular changes are recorded when comparing this year's value with the previous one: from -5.8 percent (Anhui) to 25 percent in Ningxia.

As was also observed in chapter 3, the indicators are not mutually independent. A strong positive correlation (r=0.7) is noted between uncropped arable land and the change in potential biomass ratio, pointing at increasing efficiency, particularly in areas where uncropped arable land is high. Noteworthy and significant negative associations concern cropping intensity and both potential biomass ratio and its change since last year: the lower the cropping intensity, the higher the PBR and its growth. All these correlations could stem from specific development efforts being targeted at the technologically less advanced provinces.

Table 5.2 China, cropping intensity, uncropped arable land, and potential biomass ratio, 2013, by province

	Cropping Intensity		Uncropped arable land		Potential biomass ratio	
	2013	Δ%	2013 (%)	Δ%	2013	Δ%
Anhui	206	0.8	1.39	122	0.855	-5.8
Chongqing	193	0.7	0.08	-65	0.888	-2.8
Fujian	217	0.8	0.60	7	0.897	-0.3
Gansu	107	-1.5	1.60	-62	0.918	11.6
Guangdong	214	-3.5	0.59	-1	0.870	-1.6
Guangxi	235	0.5	0.09	109	0.912	0.2
Guizhou	206	1.4	0.03	216	0.897	-2.2
Hebei	154	-1.9	0.94	-16	0.885	-1
Heilongjiang	100	-0.6	1.39	115	0.935	-0.6
Henan	196	0.7	0.57	266	0.865	-4.4
Hubei	195	-2.8	0.63	122	0.872	-4.1
Hunan	209	-0.5	0.40	152	0.877	-3.3
Jiangsu	201	0.3	1.73	38	0.846	-4.1
Jiangxi	226	0.1	1.31	92	0.878	-2
Jilin	100	-1.6	0.67	41	0.935	1
Liaoning	100	-0.4	0.35	7	0.929	1.6
Inner Mongolia	100	-2	1.66	-77	0.919	8.7
Ningxia	100	0	3.84	-70	0.898	25
Shaanxi	133	1.6	0.39	-9	0.911	2
Shandong	182	1.1	0.65	-21	0.863	-1.6
Shanxi	134	-1.9	0.48	-47	0.923	5.7
Sichuan	186	-1.9	0.37	-70	0.908	0.3
Yunnan	191	0.8	0.25	116	0.912	0.5
Zhejiang	234	3.5	0.64	44	0.876	-2.1
Weighted average	**168**	**-0.3**	**0.85**	**65**	**0.892**	**-0.8**

Note: Δ% indicates percent difference with 2008-2012 average. The averages were obtained by weighting table values by the total provincial area under maize, rice, soybean and wheat.

Cropping structure, that is the distribution of land between different crops, is shown in table 5.3 for four major crops only. The table immediately shows the relative importance of summer crops in terms of cultivated land: maize: 59 percent; rice: 19 percent; soybeans: 6 percent. The provinces where maize occupied more than 70 percent of summer cultivated land include Guizhou, Hebei, Henan, Inner Mongolia, Jilin, Liaoning, Ningxia, Shaanxi, and Shanxi, while Guangxi, Hunan, and Jiangsu cultivates very little. It is a characteristic of the maize data in table 5.3 that the crop either plays a dominant part, or almost no part. There are no "intermediate" provinces.

For rice, the focus (>40 percent of land) is in Guangxi, Hunan, Jiangsu, and Sichuan, and many provinces do not cultivate rice at all. As for soybean, it remains a subordinate crop, except for in Anhui (30 percent) and the three provinces of Guizhou, Heilongjiang and Henan where it occupies between 10 and 15

percent. Henan and Shandong are the provinces which, by far, cultivate the largest proportion of wheat. Spring wheat is insignificant except for Gansu, Heilongjiang, Inner Mongolia and Ningxia. The bulk of the production, however, originates in Henan, Shandong, Hebei, Jiangsu, and Anhui.

Table 5.3 China 2013 cropping structure

	Maize	Rice	Soybean	Wheat**
Anhui	28.86	26.76	24.17	39.21
Chongqing	52.69	26.49	3.46	19.83
Fujian*				
Gansu	50.57	0.09	0.49	25.27
Guangdong*				
Guangxi	6.29	45.88	0.08	
Guizhou	82.12	2.36	15.49	
Hebei	76.58	0.02	0.34	36.79
Heilongjiang	60.68	21.69	15.03	1.32
Henan	74.27	0.01	11.42	68.80
Hubei	21.81	38.31	1.03	16.36
Hunan	9.37	71.61	0.29	
Inner Mongolia	77.49	0.05	0.29	5.10
Jiangsu	3.87	50.70	5.94	40.71
Jiangxi*				
Jilin	79.09	14.03	1.65	
Liaoning	80.85	7.56	0.42	
Ningxia	72.30	13.98	0.00	20.03
Shaanxi	71.54	7.65	0.37	18.57
Shandong	54.58	0.00	0.18	57.80
Shanxi	75.50	0.00	1.08	15.74
Sichuan	28.89	44.68	3.63	28.46
Yunnan	47.22	12.78	1.97	
Zhejiang*				
%weighted average	**52**	**19**	**6**	

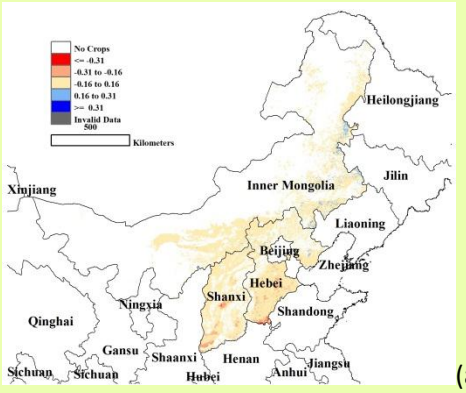
Note: The numbers indicate the percentage of the area cultivated under maize, rice, and soybean during early July and early October, and under wheat during mid-May in 2013. The difference between 100 percent and the sum of maize, rice, and soybean per province is "other summer crops."
*Fujian, Guangdong, Jiangxi, and Zhejiang were not sampled because rice is by far the dominant crop among the four major crops.
** Both spring wheat and winter wheat were included.

5.3 Province narratives and figures

For each of China's six regions, the figures 5.1 through 5.6 present crop condition information. Similar to what was provided for countries in chapter 3, the provided information is as follows: (a) General setting, provided by a NDVI background showing combined maize, rice, soybean, and wheat cultivation area, and areas where more than 50 percent of the land is irrigated; (b) Crop condition map compared with the average of the previous five years; (c) Crop condition development graph: a comparison of NDVI of the current year with the previous year and the average of the previous five years; (d) Spatial NDVI patterns of the latest or ongoing season; and (e) NDVI profiles associated with the spatial patterns. Additional information, including CropWatch estimates for yield and cropped areas by province, is presented in Annex E.

North China | HEBEI, INNER MONGOLIA, SHANXI

In Hebei province winter wheat growth was delayed due to low temperature, but the crop grew quickly after February due to improved conditions. Unfortunately, cold weather returned in several waves, inhibiting normal crop development. In Shanxi, during late February and April, high temperature and little rain led to the drought. Since then good weather condition promoted the crop growth until July. After the maize sowing in mid-June, Rainfall exceeded last year's negatively affected maize growth. From August, sufficient sunshine and suitable temperatures in the North China have accelerated the growth of the crops. In Inner Mongolia adequate rainfall and temperature from July to September led to crop condition comparable with the previous season. Overall, at the time of the NDVI peak in the region, crop condition (c) was comparable to the 2012 and slightly above the average of the last five years. Poor conditions (e) were observed in two locations: southeast Shanxi in May, which resulted in a decrease in wheat yield and production, and southeast Hebei during late summer, resulting in a drop in maize production.



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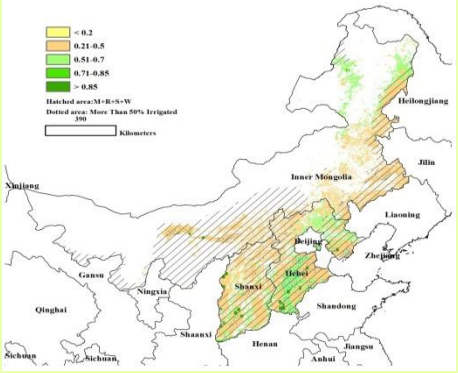

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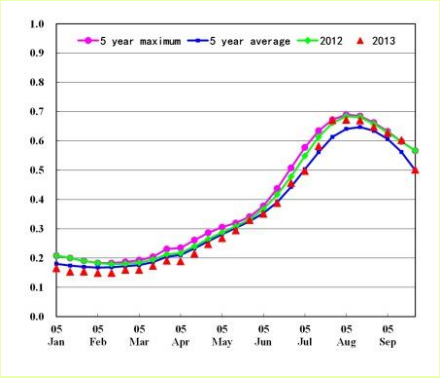

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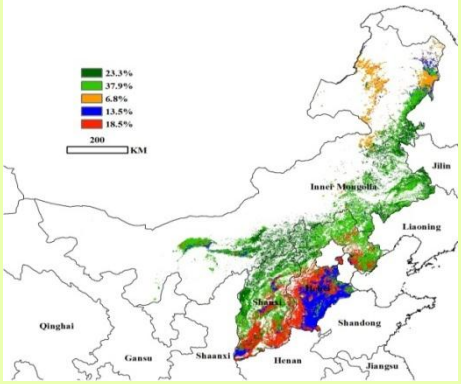

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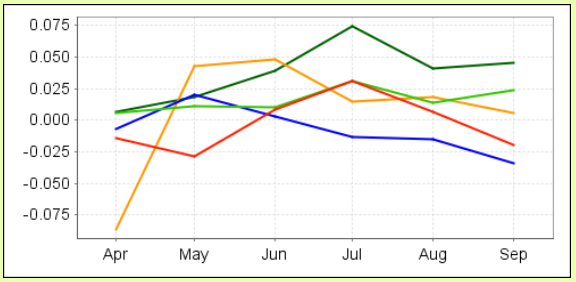
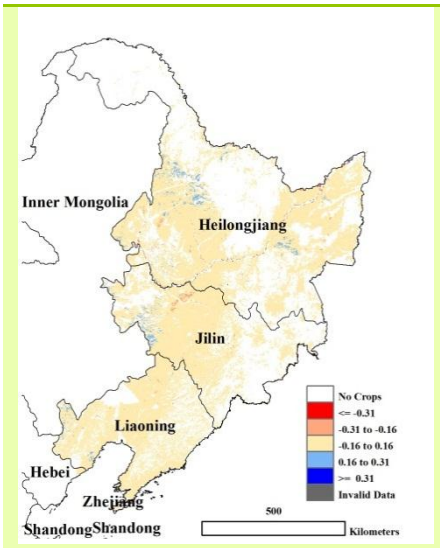


(e)

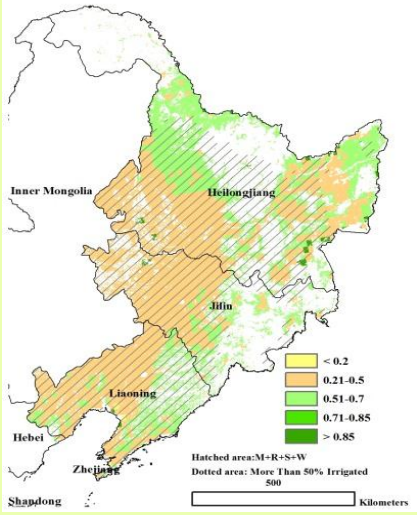
Figure 5.1 Crop condition for North China. (a) General setting: NDVI background; combined maize, rice, soybean and wheat cultivation area, and areas where more than 50 percent of the land is irrigated. (b) Crop condition map compared with the average of the previous five years. (c) Crop condition development graph: a comparison of NDVI of the current year with the previous year and the average of the previous five years. (d) Spatial NDVI patterns during the latest or ongoing season. (e) NDVI profiles associated with the spatial patterns.

Northeast China | HEILONGJIANG, JILIN, LIAONING



(a)

Except for Jilin province, northeast China exhibits unfavorable conditions compared with the previous season. In the beginning of the year, because of low temperature and snow, sowing was delayed until late April. From late May, rainfall was below and temperature was above last year's, which resulted in slow growth. In July, weather was favorable and crops developed fast. During August, rainstorms created unfavorable growing conditions in parts of east Heilongjiang (about 5 percent of the region) but the effect of which was offset by abundant sunshine and favorable temperature in September.



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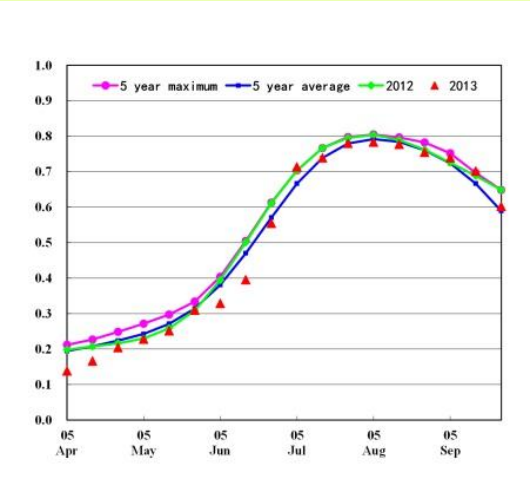

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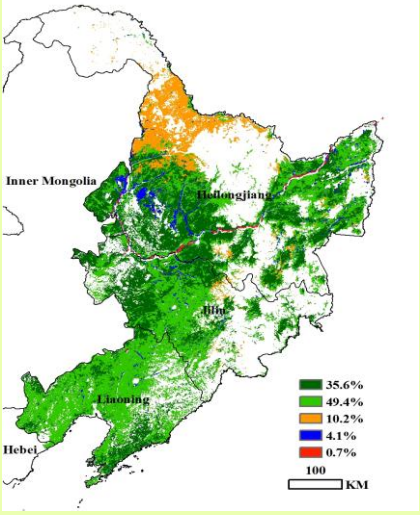

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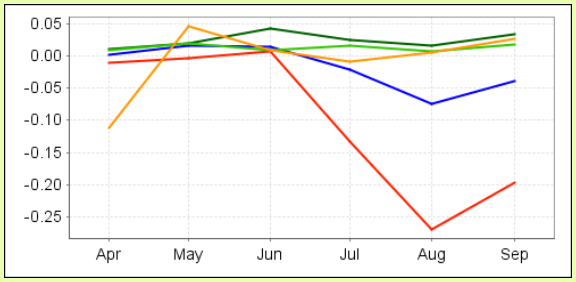
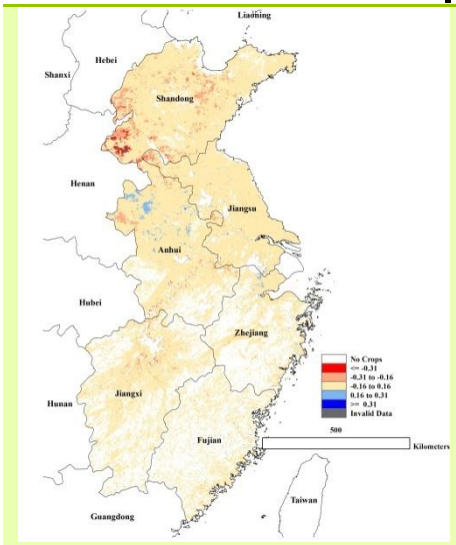


(e)

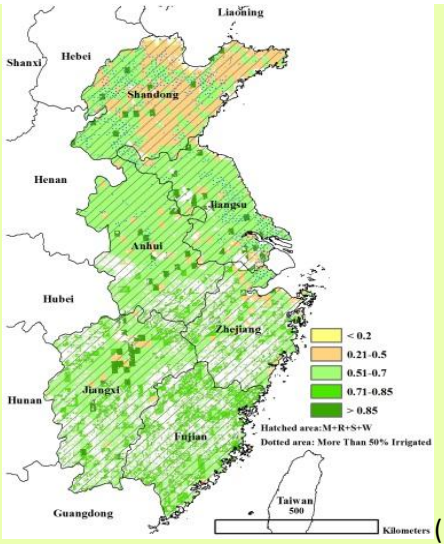
Figure 5.2 Crop condition for Northeast China. For descriptions of figures a-e, see figure 5.1.

East China | ANHUI, FUJIAN, JIANGSU, JIANGXI, SHANDONG, ZHEJIANG



(a)

Low temperatures affected East China at the beginning of the year, inducing slow crop growth, except in Fujian where normal weather favored crop growth. From early February, adequate temperature in Jiangsu and Anhui promoted the growth of crops which reached the same stage as in Zhejiang since early March. In May, heavy rainfall in East China (except Jiangsu) limited crop growth followed, around late April by low temperatures that inhibited crop growth in Jiangsu. After sowing in July, Shandong suffered slow crop development due to heavy rain. During August and September, weather and crop conditions improved in Fujian, Jiangxi and Shandong provinces. The high temperature and drought that negatively impacted crops in Jiangsu, Zhejiang and Anhui during August was succeeded by good rains in September. By Mid-September crop condition was comparable to last year's.



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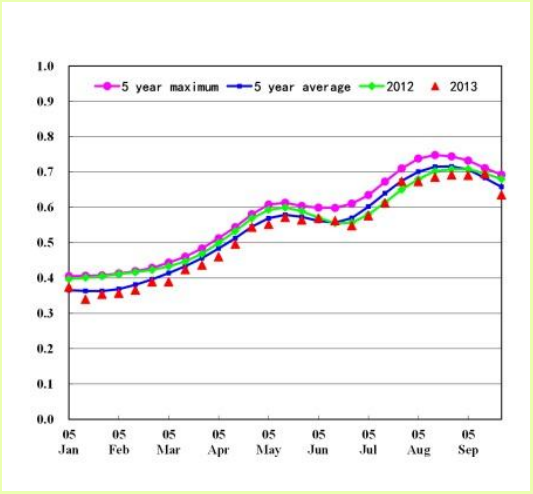

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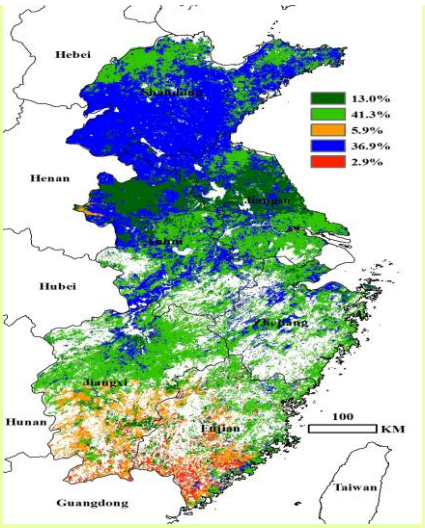

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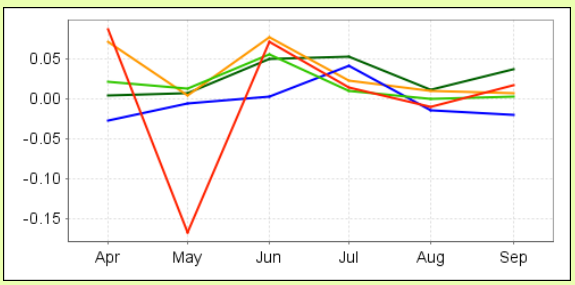
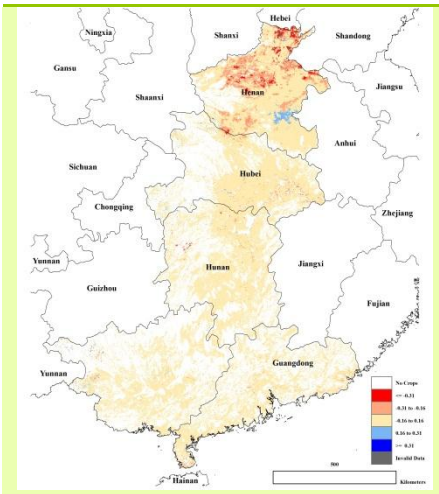


(e)

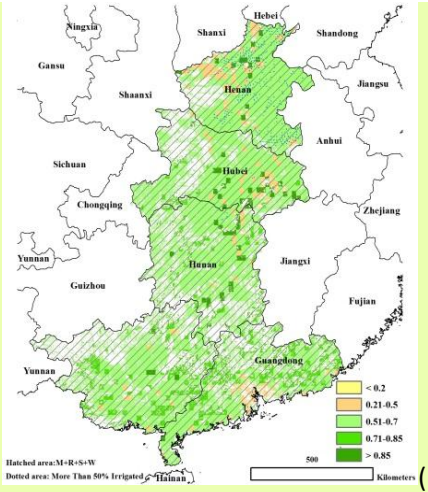
Figure 5.3 Crop condition for East China. For descriptions of figures a-e, see figure 5.1.

Central, South China | GUANGDONG, GUANGXI, HENAN, HUBEI, HUNAN



(a)

In January, in Guangdong and Guangxi province, crop condition was better than last year at the same period. Crop condition fluctuated because of rainstorms but from late March, weather was favorable and benefited crops. In early September, torrential rains brought about by cyclone Usagi, combined with low temperature significantly worsened crop condition, as clearly visible in figure 5.4e. In Henan province, during the winter wheat season, crop condition was worse than during the previous year due to drought. In August, high temperature and drought negatively impacted crops. In Hubei (starting in March) and in Hunan (from early February), high temperature and insufficient rainfall limited the growth of crop. Most provinces suffered from high temperature and drought during August.



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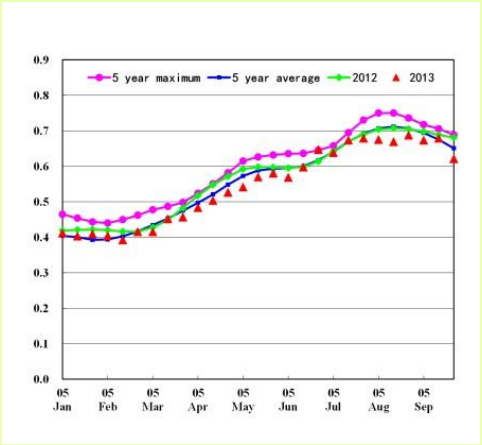

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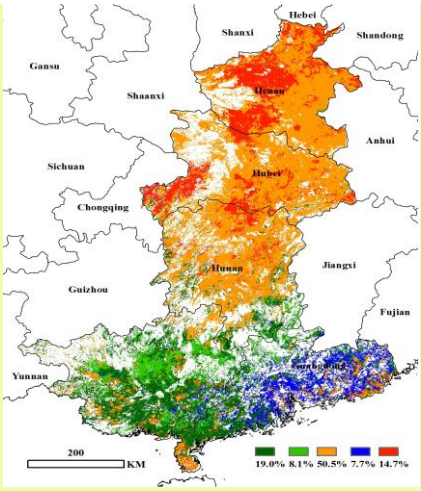

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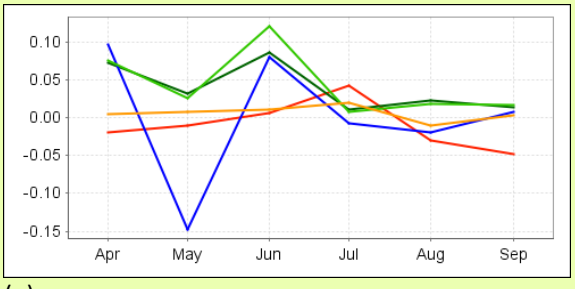

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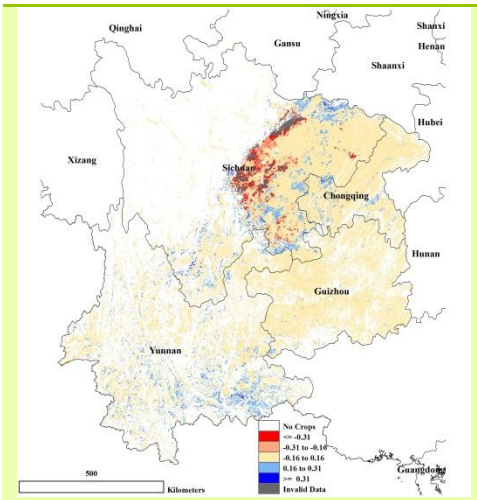
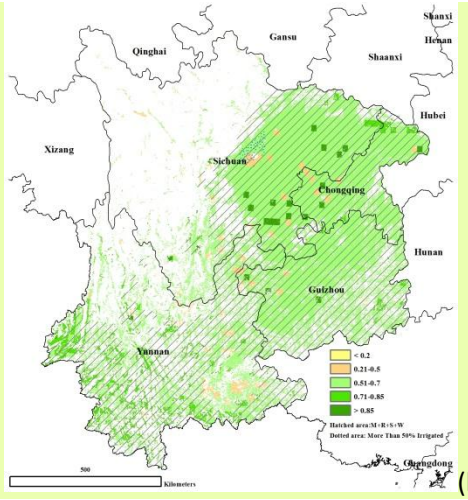
Figure 5.4 Crop condition for Central and South China. For descriptions of figures a-e, see figure 5.1.

Southwest China | CHONGQING, GUIZHOU, SICHUAN, YUNNAN



(a)

In Southwest China, high temperature and drought inhibited the growth of crop in February. The situation lasted into April in Guizhou and Yunnan, where favorable weather brought relief in May. Similar weather conditions prevailed in Chongqing and Sichuan province from March onwards. From August, insufficient rainfall limited crop development in Sichuan and Guizhou. In Chongqing, the crop growth was inhibited by continuous rain. Only Yunnan enjoyed satisfactory weather, which resulted in a good crop.



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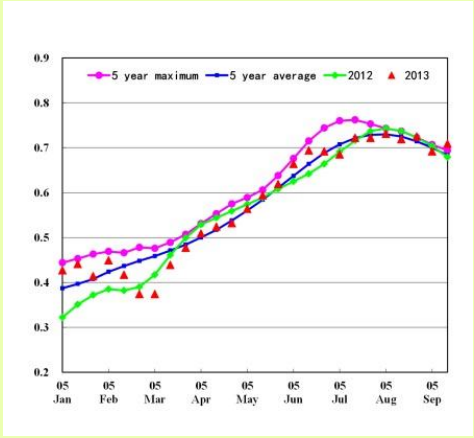

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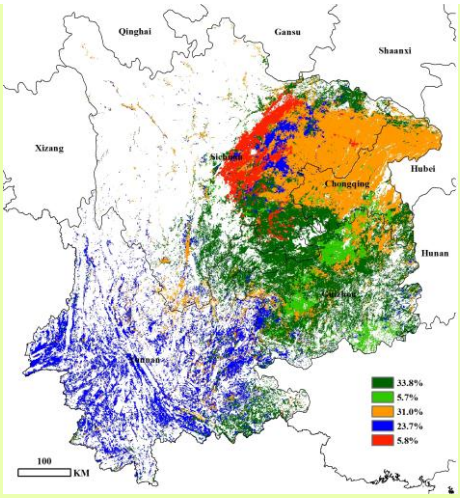
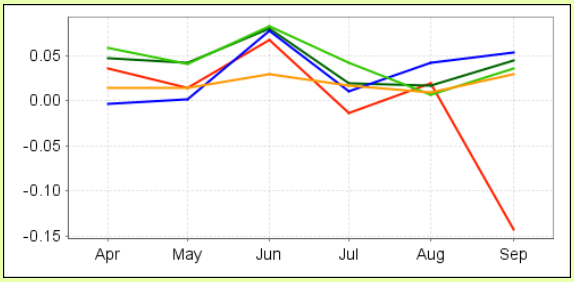


(d)



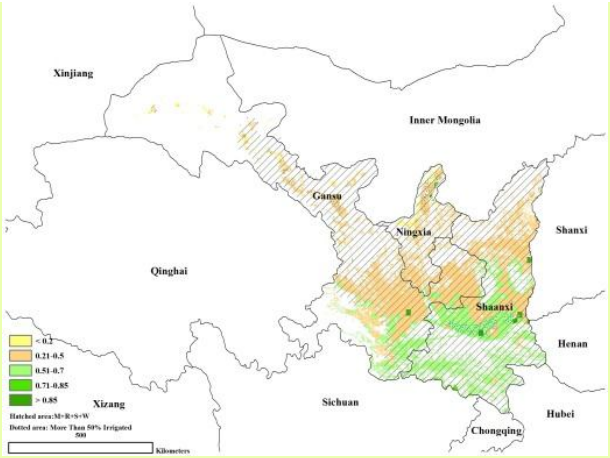
(e)

Figure 5.5 Crop condition for Southwest China. For descriptions of figures a-e, see figure 5.1.

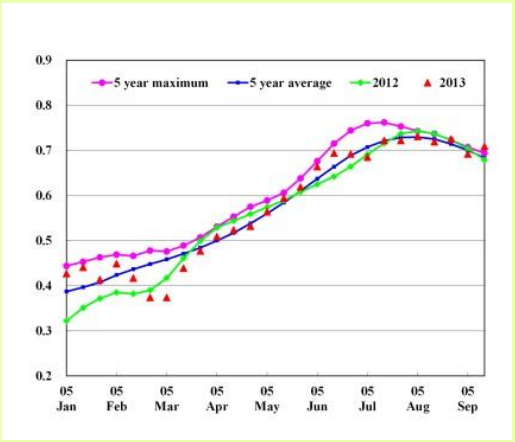
Northwest China | GANSU, NINGXIA, SHAANXI

(a)

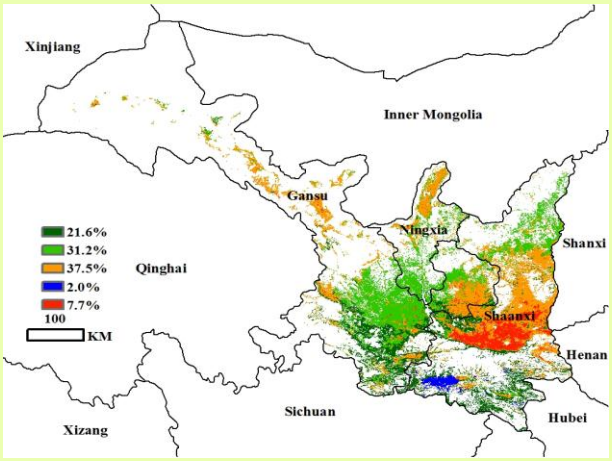
At the beginning of this year, both crop and weather conditions were average but, starting in March, high temperature inhibited crop growth, especially in Ningxia. During May, crop condition was worse than last year because of higher temperature. In Shaanxi, weather was satisfactory, especially September rainfall, leading to a good crop, except in the very south. In Gansu, continuous rain in August negatively impacted crops; in September, weather was normal.



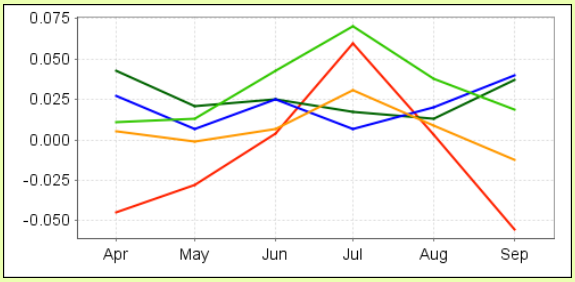
(b)



(c)



(d)



(e)

Figure 5.6 Crop condition for Northwest China. For descriptions of figures a-e, see figure 5.1.