Chapter 5. Focus and perspectives

Building on the CropWatch analyses presented in chapters 1 through 4, this chapter presents initial CropWatch food production estimates for 2018 (section 5.1), as well as sections on recent disaster events (section 5.2), and an update on El Niño (5.3).

5.1 CropWatch food production estimates

Methodological introduction

Table 5.1 presents the first revision of global maize, rice, wheat and soybeans production estimates prepared for 2018 by the CropWatch team. It is issued at a time when almost all winter crops in the northern hemisphere have been harvested and summer crops are in their late stages; in the southern hemisphere winter crops are growing and the planting of the summer season/monsoon season will start in a month or so.

The estimate is based on a combination of remote-sensing models (for major commodities at the national level) and statistical projections based on recent trends for minor producers1 and for those countries which will harvest their crops later during 2018, for which no directly observed crop condition information is currently available. In the table below, modelled outputs are red bolded. The percentage of the production which is modelled (as opposed to projected using trends) now mostly exceeds 90% for all crops.

It is also important to remember that, for China and the 41 countries described in chapters 3 and 4 and listed by name (conventionally referred to as the "major producers"), the quantitative estimates in the present chapter are calibrated against national agricultural statistics (as opposed to FAOSTAT for the trends). This means that (1) sub-national statistics are used at least for the largest countries and (2) 2017 information in included in the calibration. It is also stressed that the calibration is crop-specific, i.e. based on different crop masks for each crop and that, for each crop, both yield variation and cultivated area variation are taken into account when deriving the production estimates. The major producers represent at least 80% or production and 80% of exports. "Others" or "Minor producers" [Footnote 1] and the countries shown in black in the production table were extrapolated to 2018 based on the linear trend from 2013 to 2017, with FAOSTAT data up to 2016 (the last year available).

CropWatch production estimates differ from other global estimates by the use of geophysical data in addition to statistical and other reference information such as detailed crop distribution maps. The reader is also reminded that a specific section (chapter 4) provides addition detail about China, of which only national data are mentioned in this section.

Production estimates

CropWatch estimates the global 2017 production of the major commodities at 1011 million tonnes of maize, down 0.1% from 2017, 727 million for rice (up 1.7%), 702 million tonnes of wheat (with a 2.4% decrease below 2017 output) and 320 million tonnes of soybeans, down 1.0%.The major producers contribute 924 million tonnes of maize (-0.2%), 684 million for rice (+1.8%), 640 million tonnes of wheat (a 2.9% drop) and 300 million tonnes of soybeans (-1,4% below 2017 output). The contribution of the

"minor producers" (shown as "others" in the table) to the global production is 6% (soybean) to 10% (wheat), and about 8% for rice and maize. The group of the major producers generally outperforms the bulk of the remaining nations, except for wheat where production drop is less than for the major producers. In August 2017 we noted a trend of many small (and not so small: PAK) producers of soybean to move away from the crop on all continents. The tendency is present in 2018 as well. For purpose of comparison, it is noted that the median nation-wide population-based increase in food demand is currently 1.3% and just under 3% for the upper decile. It is also stressed that the trend-based projection of 2018 for major producers amount to +0.1% for maize, -0.1 for rice, 1.4% for wheat and 5.1% for soybean. For all crops except rice, the actual variation remains below the projections. Adverse weather (or favorable in the case of rice) is directly responsible for the situation, as shown in other sections of this report. Detailed information for China is provided below.

Maize

For maize and the other crops below, this presentation limits itself to remote sensing productions. Large increases in maize production are listed for Hungary (+9.0%) and Romania (+15.8%), while neighboring Ukraine, where rainfall was less favorable, is foreseen to undergo a significant drop of 8.8%. Similarly, production estimates for Russia are at -18.3%. Low values are estimated as well for Pakistan (-10.1%), Argentina (-6.2%) and Canada (-4.2%). Countries with significant increases also include Kenya (+16.1%) and Thailand (+9.2%). Among the major exporters, the USA underwent a minor increase (+0.3%) while Brazil is put at +1.7%. Due to the poor expectations regarding Argentinian maize, the output of the three major exporters (according to table 5.2) is up just 0.1% while the expected output from other exporters (including Ukraine, Russia, but also India) results in a 0.3% drop of production of the top ten exporters. Major importers (Japan, Mexico, Korean Republic) did relatively well (+1.9% for the top 3) thanks to Mexico (+1.9%). It is stressed, however, that the volume of maize exported by the top 3 providers (about 85 million tonnes) is more than double the imports by the major importers and no dramatic changes should result from the relatively poor global maize output.

Rice

Because rice, as an irrigated crop, is relatively less weather dependent than maize, wheat or soybean, which are mostly rain-fed, the variations among producers are also less marked than for the other cereals. The largest production drop occurred in Argentina (-5.6%), which is a relatively minor rice producer and exporter. In terms of volume of production deficit, it is worth mentioning China (-2.1%, equivalent to 4.2 million tonnes) and Indonesia (-2.5%, equivalent to 1.7 million tonnes) while India increased production by 10.1 million tonnes (+6.2%), the fourth largest increase in the table after Bangladesh (+6.2% as well) and Thailand (+7.7%). In terms of output of major exporters (Table 5.2), the offer by the top 3 exporters increased significantly essentially because of the good performance of India and Thailand - which was just mentioned - while Vietnam increased output only marginally (+0.2%). Among the top importers, production fell 5.7% but, although the list includes China, imported volumes are small (less than 3 million tonnes).

Wheat

Australian and Argentinian wheat outputs are among the most variable in the group of major producers. This time, Australia's estimated production for 2018 is down by a very significant 12.8%, followed by Russia (-10.3%) and Ukraine (-7.1%), two countries already mentioned above for the poor projections of summer crop outputs (i.e. maize). For the United States, CropWatch estimates winter wheat output to be down 3.9% below 2017, while production deficits of France and Germany, two major European producers reach 4.5% and 4.4%, respectively. A positive note is the good performance of Iran (+8.8%)

after a series of unfavorable seasons. Although they trade only litlle, the major producers of wheat are China and India. Both underwent a drop in production that was only minor in China (-0.1%, equivalent to just 80 thousand tonnes) but more significant in India (-2.3%, equivalent to 2.1 million tonnes). This is more than compensated by rice in India and by maize in China.

The production drop among major exporters (Table 5.2; −5.7 % for the top 3 exporters and −7.1 for the top 5) is more significant than the global production drop in wheat (-2.6%). The top 10 importers did rather well as a group (+1.2%), among others due to the presence of Iran and Mexico.

Soybean

Soybean is the crop for which the difference between the trend-based projection for 2018 and the value simulated by CropWatch (table 5.1) is the largest, reaching 6.5% (forecast -1.4%; projected 5.1%), the second largest discrepancy occurring for wheat (4.0%, resulting from a forecast -2.6% and a projection of 1.4%). This underlines the fact that the current behavior of Soybean somehow departs from optimistic expectations. With the exception of China, all the major Soybean producers undergo a drop compared to 2017, most notably Canada and India (both at 5.3%) but especially Argentina (7.6) due to unfavourable weather. China reversed the decade long negative production trend by adopting a new agricultural policy.

Soybean is also the crop for which importers did particularly well in 2018, increasing output by 6.1% among the top ten importers. This results, again, from the production increase in China.

Table 5.1. CropWatch productions estimates, thousands tons

	Maize		Rice		Wheat		Soybean	
	Production 2018 (ktons)	% change from 2017	Production 2018 (ktons)	% change from 2017	Production 2018 (ktons)	% change from 2017	Production 2018 (ktons)	% change from 2017
Afghanistan	322	0.6	265	-16.7	3353	-21.7		
Angola	2791	4.1	72	13.1	4	1.9	20	12.0
Argentina	28084	-6.2	1689	-5.6	15674	-1.4	47214	-7.6
Australia	476	-0.7	490	-29.3	21456	-12.8	80	3.0
Bangladesh	2337	4.1	48063	6.2	1448	7.7	112	9.3
Belarus	280	-46.0			2768	0.1		
Brazil	85482	1.7	11666	2.8	8205	1.1	96311	-0.4
Cambodia	196	-42.0	9093	3.4			186	9.6
Canada	11387	-4.2			30741	0.2	5183	-5.3
China	195512	0.9	196406	-2.1	121528	-0.1	14203	3.3
Egypt	5774	-2.4	6358	-2.9	10790	-1.6	44	12.5
Ethiopia	6679	-6.6	160	6.8	4021	-3.8	111	6.3
France	14359	-1.5	51	-19.5	36333	-4.5	430	19.2
Germany	4621	-2.8			26885	-4.4	50	22.3
Hungary	5976	9.0	9	-5.8	5022	-4.1	171	12.3
India	18920	-0.6	173270	6.2	91374	-2.3	11514	-5.3
Indonesia	17769	-0.1	66675	-2.5			1017	4.9
Iran	728	-27.6	2338	2.9	13851	8.8	147	2.5
Italy	6072	4.4	2527	4.9	7295	1.3	1388	14.3
Kazakhstan	888	8.2	1522	0.6	16287	-1.9	283	6.3
Kenya	3483	16.1	467	6.8	156	-10.5	2	-7.0
Mexico	24315	1.9	121	-4.7	3589	9.3	565	12.0
Mongolia			278	10.5	258	11.6		

	Maize		Rice		Wheat		Soybean	
	Production 2018 (ktons)	% change from 2017	Production 2018 (ktons)	% change from 2017	Production 2018 (ktons)	% change from 2017	Production 2018 (ktons)	% change from 2017
Morocco	47	-0.6			7043	-0.8	1	0.0
Mozambique	2085	2.2	62	12.4	19	-2.5		
Myanmar	1661	-2.4	41	-40.4	126	-8.5	131	6.6
Nigeria	10736	-3.8	4532	-3.2	13	-66.0	656	-1.5
Pakistan	4410	-10.1	10119	2.2	24004	-1.2		
Philippines	7236	-5.1	20033	-0.8			1	-2.8
Poland	4877	2.1			10117	-7.4	11	29.6
Romania	13878	15.8	36	-9.3	7512	-2.1	320	14.9
Russia	10476	-18.3	1091	1.7	52815	-10.3	3609	10.7
South Africa	13827	-2.4	3	0.4	1546	-1.9	1036	3.4
Sri Lanka	333	9.8	2494	-0.2			9	13.3
Thailand	5461	9.2	41450	7.7	1	3.4	11	-4.8
Turkey	6469	2.8	914	0.2	18794	-2.0	203	5.2
Ukraine	28630	-8.8			21043	-7.1	5280	9.3
United Kingdom					14279	-1.7		
United States	371118	0.3	12653	15.7	52657	-3.9	108728	-0.8
Uzbekistan	568	8.1	391	7.1	6141	-4.7		
Vietnam	5002	-2.2	45678	0.6			89	-10.8
Zambia	2367	-1.1	19	-21.9	167	-15.2	137	-15.5
Major producers	**925634**	**-0.2**	**661035**	**1.9**	**637315**	**-3.2**	**299252**	**-1.4**
Others	**85766**	**1.4**	**66301**	**0.3**	**65123**	**0.5**	**20610**	**6.4**
Total	**1011400**	**-0.1**	**727336**	**1.7**	**702438**	**-2.4**	**319862**	**-1.0**

Rice

A major observation is the generalized drop in rice production in South-East Asia, starting with Cambodia (-2.2%), Indonesia (-1.1%), Thailand (-5.2%) and Vietnam (-1.4%). It is not evident what caused the drop, although reduced sunshine may have played a part. The countries also have in common a climate with equatorial tendencies ("all year round wet") and they experienced generally cooler than average temperature during the previous reporting period. Countries further to the north (Bangladesh, India, Myanmar, Philippines) have generally a more marked dry season during the northern hemisphere winter and dry-season irrigation is more common. In the four listed countries rice output increased by 3.2%, 2.6%, 1.5% and 3.8%, respectively.

Argentina produces about twenty times less rice than maize, but the crop is mentioned here because of the poor performance of rice (-15.3%). Argentina faces a historically poor agricultural season as next to rice, maize and soybean performed poorly and will affect the country's export capacity.

Wheat

Good actual satellite data are available for northern hemisphere wheat. Some of the southernmost countries (India, Pakistan, Bangladesh, and Nigeria) have reached or completed harvest, while the high latitudes will harvest from early to late summer, depending on location. Thus is also to say that unfavorable crops in the second group may improve if spring (May onwards) precipitation provides

moisture that was short during dormancy. Reductions in production exceeding 5% occurred on all continents, and include some of the major global producers such as Canada (-13.0%) and the United States (-13.5%) due to unfavorable weather including poor sunshine, drought and floods and cold waves. Other major producers such as India, Kazakhstan and Russia suffered a drop in production reaching 6.3%, 12.9% and 7.9%, respectively. It is mostly the poor performance of the large global producers of wheat that are responsible for the global drop of production mentioned above (-3.2%).

Countries with positive outcomes include Bangladesh (+7.7%, a relative new comer to wheat cultivation), Iran and Turkey (+6.2% and +7.9%, in both countries the first favorable crop after a run of bad or mixed seasons), Belarus, Poland and Romania (+9.7%, +11.9% and +6.5%, respectively), Egypt (+7.0%) where the good rice crop is to be added to increased maize and rice productions.

Soybean

In the northern hemisphere the crop is just past emergence or is still to be planted, so that only Argentina and Brazil can be meaningfully mentioned here. Similar to maize and rice, the Argentinian Soybean crop is down (-8.2%) while, in comparison, Brazil did well (+0.8%).

Major importers and exporters

Table 5.2 shows the performance of the major importers and exporters of maize, rice as paddy, wheat and soybeans according to the data in table 5.1. 14 additional countries are part of the top ten importers or exporters. They are listed in the note to Table 5.2.

Overall, the top 5 importers and the top 10 importers increased their production over 2018. For the top 10 importers, the increased volume of the output varies from 452 kTonnes (Wheat) to 3629 kTonnes for maize. The values are shown with a minus sign as they correspond to reduced demand on the international markets. As a group, their performance was slightly below that of the majority of countries (last line in table 5.1) for maize (+1.6% vs. +1.6% for the world) and for rice (+0.3% vs. +0.6%). For wheat and for Soybean (if the northern hemisphere output turns out to be “average”), they did significantly better for wheat (1.3% vs. -3.2% globally) and for soybean (3.8% vs. -0.1% globally). As a result, the demand will probably be comparable or slightly above last year’s by a couple of percent representing population growth.

Since the top exporters dominate the production landscape, the percentage change in their output closely follows table 5.1: +1.8% for maize in both the top 10 exporters and the total of all countries, 0.7% Vs 0.6% (top 10 exporters Vs global) for rice and -0.4% Vs. -0.1% for Soybean. Some difficulties may arise with wheat supply if the situation does not improve in the USA and Canada as the projected production deficit of the top 10 exporters reaches just above 17 million tonnes.

Table 5.2. 2017-2018 percent variation in production of the top 3, 5 and 10 exporters and importers.

	Maize		Rice		Wheat		Soybean	
	Exporters	Importers	Exporters	Importers	Exporters	Importers	Exporters	Importers
Top3	0.1	1.9	5.4	−2.1	−5.7	−3.1	−2.0	3.8
Top5	−0.5	0.3	5.7	−2.1	−7.1	−0.8	−2.2	3.8
Top10	−0.3	−0.7	5.5	−2.2	−4.9	1.2	3.9	6.1

Note: in addition to the countries listed in Table 5.2, the following countries belong to the group of major importers and exporters: Algeria, Bolivia, Colombia, Côte d'Ivoire, Iraq, Japan, Malaysia, Netherlands, Paraguay, Republic of Korea, Saudi Arabia, Spain, United Arab Emirates and Uruguay. Their 2017 and 2017 production of the reference crops are trend-based.

[Footnote 1] "Minor producers" include the 142 countries from Albania and Algeria to Yemen and Zimbabwe that are not included in the table of44 "major producers"

[Footnote 2] 2017 was first estimated based on 2012-16 data, then 2018 based on 2013-17 data.

5.2 Disaster events

The latest Crop Prospects and Food Situation Report issued by FAO on 7 June 2018, confirms that food production is mostly satisfactory. In Cabo Verde and Senegal, unfavorable weather is the main trigger of the poor food situation. According to the East African, the drought in Cabo Verde is the worst since 1977.

Volcanic eruptions

Volcanic eruptions in January on Kadovar Island (Papua New-Guinea) led people to Dandan in east Sepik province where they were still in need of assistance by late May. In Guatemala, the eruption of the Fuego Volcano at the beginning of June affected over 1.7 million people in Sacatepéquez, Escuintla, and Chimaltenango departments. 197 people went missing, 109 were killed and 58 injured, according to early reports. Some 12,407 people have been evacuated and over 4,000 are living in emergency shelters. The volcano produced pyroclastic flows and mud flows which also damaged and destroyed crops. This adds stress to farmer communities which suffered several years of drought: Some sources indicate that more than 100,000 families have lost their maize and bean crops this year.

Drought

Drought is reported from several areas across all continents. In Africa, Cabo Verde and Senegal were already mentioned above. Neighboring Sahelian areas in Burkina Faso, Chad, Mali, Mauritania, Niger are affected as well and have experienced losses of crops and livestock. Unrest and rising food prices contribute to a deteriorating food security situation, the worst since 2012.

In Asia, at the end of July, it was estimated that across Afghanistan, drought was affecting the health and nutrition situation of an estimated 4.2 million people, which was ranked as a severe humanitarian crisis resulting from the combination of insecurity and poor water supply. The Assessment Capacities Project (ACAPS), a major source of information on disasters, estimated that 3,300,000 people were in acute need of assistance with 1,900,000 in acute need of food security assistance.

In South America, the Uruguayan Ministry of Livestock, agriculture and fisheries declared an emergency at the end of June, especially in the Department of Tacuarembó. Altogether 14 Departments are affected by drought in the north of the country.

Floods

Floods in the Horn of Africa and surrounding regions started in April in Tanzania, Rwanda, Kenya, Ethiopia and especially Somalia. By mid-May, about a quarter million of people had been displaced but about 700,000 were affected. Settlements of Internally Displaced Persons (IDPs) were most badly affected through deteriorating sanitary situations.

During mid-July, damaging rainfall was also reported from parts of Niger and neighboring Nigeria. About 600 houses were damaged and about 50 people died. Close to 200000 people were affected.

In Asia, according to ACAPS, heavy rainfall was recorded in India (Tripura) and in north-eastern Bangladesh since 12 June; river water levels rose rapidly because of upstream flooding in India. The districts of Moulvibazar and Sylhet suffered most, where crops and infrastructure were destroyed. At least 700,000 people have been affected, and over 12,000 had to move to temporary shelters in Moulvibazar. In various areas of neighboring Myanmar, more than 120,000 people had been displaced due to flooding by late July. In Mongolia, floods occurred in the western part of the country from mid-July.

Floods were also reported for Sri Lanka around 20 May and in Tajikistan during the first days of June, but widest international coverage was received by the release of 5 billion cubic meters of water from a dam under construction by an international consortium in Champasak province in Laos. Most damage, however occurred downstream in Attapeu province. The collapse was contemporary with excess precipitation brought about by tropical storm Son-Tinh in the last days of July, although the causality links are not very clear. Hundreds of houses were damaged. More than thousand people are missing and 34 are confirmed dead. A United Nations report on the disaster mentions that about 12000 people in 357 villages are affected.

Figure 5.1. A Cambodian couple and their dog: News of Laos Dam Failure Didn't Reach Them, but the Water Did. Source: https://www.nytimes.com/2018/08/01/world/asia/laos-cambodia-dam-flooding.html

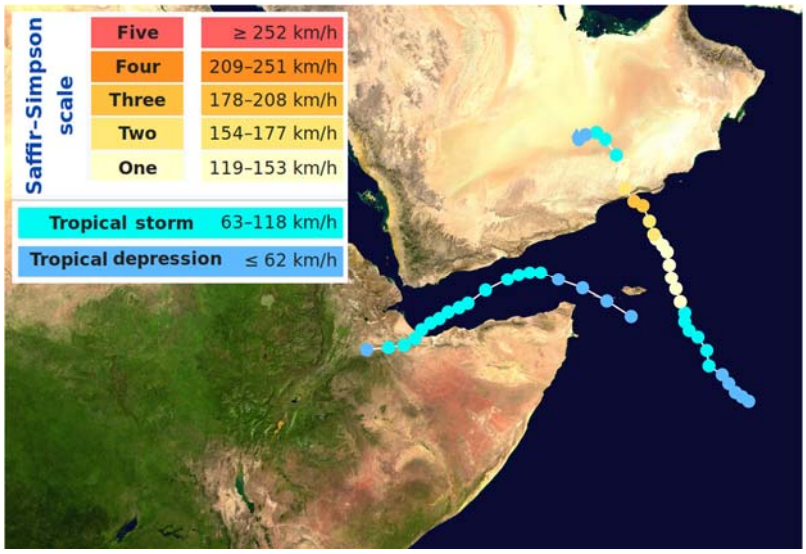
According to the Emergency Operations Centre of ASEAN, the flash-flood [that] occurred in Attapue Province [was] caused by water discharge from Xepien-Xenamnoyu Dam, due to heavy rainfall along Xe Pian River (these events took place while the monsoon season is ongoing.) Interestingly, the disaster provides an illustration of the failure of taking into account clear warning signals that became visible several days before the dam collapsed, but also the lack of warnings issued to the population due to poor cell-phone coverage in a mostly forested area (figure X1).

Cyclones

The situation of cyclones was relatively calm during the reporting period. It is in order to mention a tropical storm and a cyclone that developed in the north-western Indian Ocean, making landfall in the Horn of Africa (Somalia) and in the Arabian Peninsula in areas where their occurrence is rare.

Somalia is one of the countries that has been badly affected by political unrest and displaced persons for many years now. Between 16 and 20 May, the situation was made worse by the occurrence of a Tropical storm, Sagar, which affected N. Somalia and Djibouti. According to Wikipedia, Sagar caused deadly flash flooding that washed away roads (in particular two main roads connecting Gedo with Mogadishu and Kismayo), bridges, homes, and thousands of farm animals and crops (50,000 Ha inundated just before harvesting). Wells were contaminated by floodwater. This has led to a surge in water and vector borne diseases. The timing of flood recession crops [XXXX see note below for translators] is delayed due to high water levels and, as a result, replanting declined.

Figure 5.2. Tracks of tropical storm Sagar (16-20 May, western track) and cyclone Mekunu (21-27 May, eastern track) with the maximum wind speed. The Saffir-Simpson scale applies only to tropical cyclones. Figure based on Wikipedia.



Sagar was followed a week later by cyclone Mekunu which struck Socotra Island and the southern coast of Yemen, confirming the increasing frequency of cyclones in the north-western Indian Ocean. Stored food and fishing vessels were damaged or lost. Cyclonic Storm Sagar, which also hit Yemen, Djibouti and Ethiopia was the strongest tropical cyclone to ever make landfall in Somalia in recorded history.

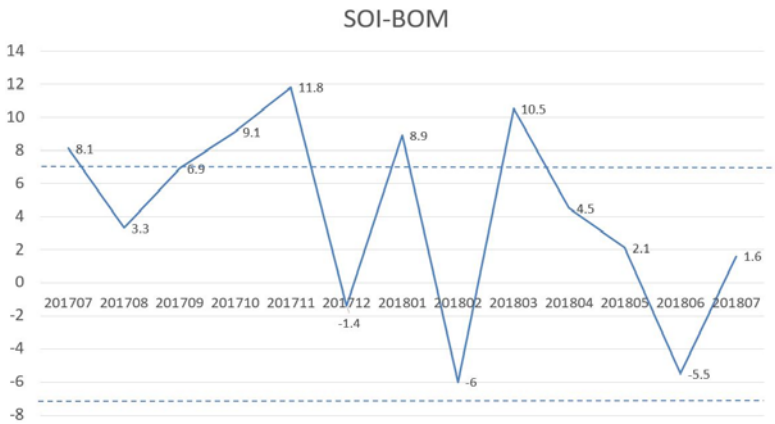
About 20 storms of various strengths developed in the Pacific Ocean during the reporting period. While many contributed rain to continental and maritime south-east Asia and to Eastern Asia, little damage is reported but for Son-Tinh (known as “Henry” in the Philippines). Between 15 and 24 July, this relatively weak tropical cyclone skimmed past the northern coast of Luzon, making landfall in Cagayan, then crossed Hainan, created a lot of havoc in Vietnam, remained over land again in Hainan and eventually died over the Himalayan foothills in China. In Vietnam the storm caused severe floods and mudslides leading to the death of about 30 people. Over 82,000 hectares (200,000 acres) of agricultural land was inundated and at least 17,000 farm animals were swept away by the floods. More than 100 houses have been destroyed and 4,000 have been flooded in the north and centre of the country. The Mekong River Commission has reported significant increase of water levels in the whole Mekong River area due to tropical storm Son-Tinh.

5.3 Update on El Niño

El Nino conditions have been neutral across the Pacific Ocean during the second quarter of 2018. Figure 5.3. Illustrates the behavior of the standard Southern Oscillation Index (SOI) of the Australian Bureau of Meteorology (BOM) from July 2017 to July 2018. Sustained positive values of the SOI above +7 typically indicate La Niña while sustained negative values below −7 typically indicate El Niño. Values between about +7 and −7 generally indicate neutral conditions.

During the current season, SOI decreased slightly from +4.5 in April to +2.1 in May, further to -5.5 in June, however, it increased to +1.6 in July again. The overall fluctuation of SOI between +7.0 and -7.0 indicates a neutral state of El Niño.

Figure 5.3. Monthly SOI-BOM time series from April 2017 to July 2018



The sea surface temperature anomalies in July 2018 for NINO3, NINO3.4 and NINO4 regions are +0.5°C, +0.4°C, and +0.4°C in sequence, slightly warmer than 1961-1990 average according to BOM (see Figure 5.4-5.5). Both BOM and NOAA think that the slight warmer condition is within the thresholds of El Niño–Southern Oscillation (ENSO) and their ENSO's outlook remains at El Niño WATCH. CropWatch will keep on monitoring the situation.

Figure 5.4. Map of NINO Region

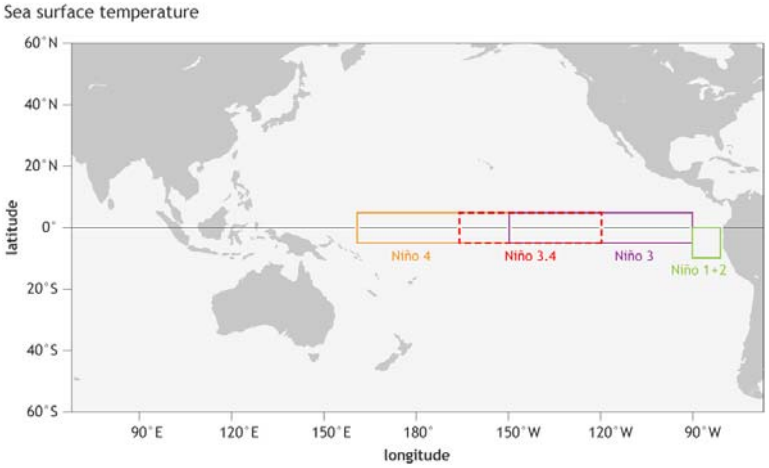
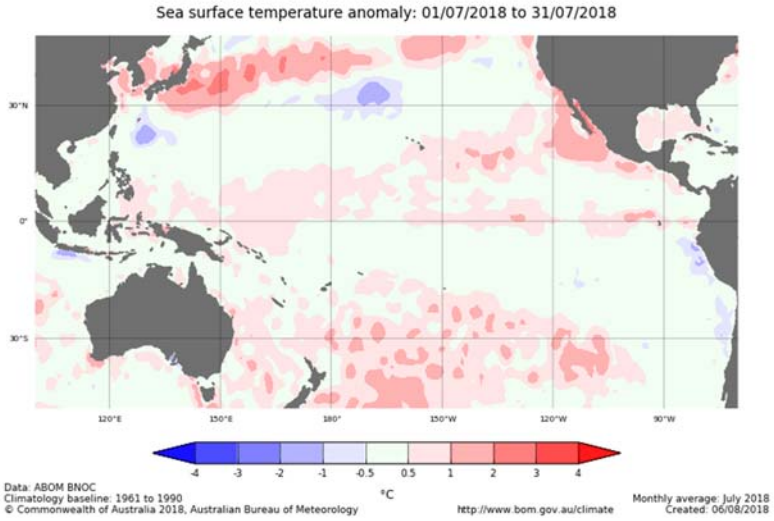


Figure 5.5. July 2018 sea surface temperature departure from the 1961-1990average



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