

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

Table 5.1 presents the second revision of global maize, rice, wheat and soybeans production estimates prepared for 2018 by the CropWatch team. It is issued at a time when all 2017-2018 winter crops and 2018 summer crops in the temperate northern hemisphere have been harvested; in the southern hemisphere winter crops are growing and the planting of the summer season/monsoon season is underway or about to start. The planting of the second crop is ongoing or about to start in equatorial areas.

The production estimate below is based on a combination of remote-sensing models (for major commodities at the national level, in the 42 “core countries”) and statistical projections based on recent trends for 140 minor producers [1]. In table 5.1 below, modelled outputs are red bolded. The percentage of the global production which is modelled (as opposed to projected using trends) now mostly exceeds 89% for all crops (from 89% for wheat to 94% for soybean).

CropWatch production estimates differ from most other global estimates by the use of geophysical data in addition to other reference information such as detailed crop distribution maps. The reader is also reminded that a specific section (chapter 4) provides additional detail about China, of which only national aggregates are mentioned in this section. Sub-national statistics (including actual 2017 data) are used for the main commodities in the core countries. 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.

Of the two groups of countries which were already referred to above, “core countries” cover all the major producers in addition to some countries deemed important according to various criteria, alphabetically from Afghanistan to Zambia. The core producers represent at least 89% of estimated 2018 production (94% for soybeans) and 88% of average 2014-2016 exports of wheat, 92% for rice [2] and 93% for soybean and maize.

Production estimates (Table 5.1)

CropWatch estimates the global 2018 production of the major commodities at 999 million tons of maize [3], down 1.1% from 2017, 721 millions for rice (down 1.8%), 723 million tons of wheat (with a 0.9% decrease below 2017 output) and 327 million tons of soybeans, just 0.1% over 2017. The major or “core” producers contribute 916 million tons of maize (-1.1%), 658 millions for rice (-1.9%), 648 million tons of wheat (a 0.9% drop) and 307 million tons of soybeans (up 0.3% above 2017 output). The contribution of the “minor producers” (shown as “Others” in the table) to the global production is 6% (soybean) to 12% (wheat), and about 9% for rice and maize. The group of the minor producers generally outperforms the bulk of the remaining nations for rice and wheat, while the drop below 2017 output is comparable for maize. For soybeans, the trend-based production change of -2.1% for minor producers stays below the modelled value for the core producers (+0.3%). In earlier bulletins, we noted a trend of many small (and not so small: Pakistan) 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 interesting to note the 2017-2018 population growth rate of the core countries (5902 million people) reaches 1.0% (growth rate weighted by 2017 population) while the “minor producers” grew somewhat faster (1.6%) and their population amounts to 1603 millions [4].

This means in substance that food supply of the major commodities considered here is not keeping pace with demand. This needs not rise concern, at least in the short term, since several important food categories such as roots and tubers (especially white potatoes and cassava) are not considered here and

because for many crops, especially maize and soybeans, only a fraction is used for human consumption. It is also stressed that the trend-based projection of 2017-2018 global food supply variation amounts to 0.0% for maize (0.1% for the core producers), -0.1% for rice (both global production and core producers), +1.2% for wheat (+1.4% for core producers) and 4.7% (5.1%). For the current 2018 season, actual output thus remained below trend values, which is clearly the result of unfavorable conditions in several major producers, as stressed below and in other sections of the bulletin (Chapter 1, Section 3.1) for individual countries and commodities.

Maize

For maize and the other crops below, this presentation limits itself to modelled productions because they address major countries (major in terms of their output for domestic consumption and in terms of their exports.)

China, the second largest producer, did well as production increased 1.4%, equivalent to 2649 thousand tons. The major global producer, the United States experienced a production drop of 2.1%, or about 8 million tons. Among the other major producers, very few did well; they include Brazil (+1.8%), Nigeria (+5.3%) and Romania (+7.5%). Canada displays a slight increase (+0.8%) while Russia and Mexico are down by less than 1% (-0.4%, -0.9%, respectively). All other significant producers, among which several grow the crop mostly for domestic consumption, underwent a drop in production, starting with Ukraine (-7.8%), South Africa (-6.9%), Argentina (-6.2%), India (-5.8%), Indonesia (-4.9%) and France (-1.5%).

It is worth noting that some minor producers (including some exporters) did well this season, including Ethiopia and Hungary (+3.3% for both), Italy (+5.6%) and especially Kenya (+16.1%). One of the largest drops at the national level affected Egypt (-6.8%).

The production of the top exporters (table 5.2), which contribute about 50% of world production (48% for the top 3 exporters; 57% for the top 10) is down about 2%, which corresponds to about 20 million tons. The production of the importers is up about 10% (11.4% for the top 10) or approximately 5 million tons. This compares with a total traded volume of about 140 million tons and should not lead to any tension on maize markets.

Rice

With few exceptions, all major Asian rice producers recorded drops in production in 2018 compared with the previous season. This includes essentially China (-1.6% or 3.2 million tons), India (-2.1% or 1.1 million tons) and Indonesia (-4.7%, slightly below 1 million tons). As in other countries in the region, anomalous environmental conditions are the main factor behind the drops, which also affected Pakistan (-11.7%), the Philippines (-2.4%), Myanmar (-1.4%), Vietnam (-1, 3%) and Bangladesh (-0.9%). In Thailand, the second largest exporter on par with India suffered relatively little with a drop of 0.5%. This drop is comparable with Bangladesh (-0.9%) which is not, however, a significant exporter. Among the non-Asian exporters, both the United States and Brazil did well (+1.0% and +2.2%, respectively; no data are available for Uruguay).

As was noted for maize, CropWatch estimates the production drop for rice in Egypt at 6.9%.

The top 10 rice exporters contribute about 40% of global production (Table 5.2). Their output is down 1.7% (equivalent to about 5 million tons), which is comparable with the production deficit of importers (2.3%) and represents roughly 13% of traded amounts. The combined effect of increased demand and reduced offer may affect international markets.

Wheat

As already mentioned in the previous CropWatch bulletin, 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%). The overall wheat production drop was contributed to by almost all major wheat producing countries including, in addition to those already mentioned Poland (-7.4%), the United Kingdom (-5.3%), France (-4.5%), Germany and Argentina (both at -4.4%), United States (-3.9%), Brazil (-3.8%) and Romania (-2.1%). In comparison, the large Asian countries did relatively well with India at -2.3%, Kazakhstan at -1.9%, Pakistan at -1.2% and especially China at just -0.1%.

Few countries did well; they include Italy (+1.3%), Turkey (+3.4%), Iran (+8.8%) after a run of bad years, Mexico (+9.3%) and South-Africa (+22.5%).

The output of exporters is down about 6%, which represents between 15 and 20 million tons of tradeable wheat. This compares with the significant increase in production of the major importers (+41.8% for the top 10) importers, a volume at least equivalent to the production deficit of exporters, which is thus unlikely to affect markets.

Soybean

Soybean is the crop for which the difference between the trend-based projection for 2018 (+4.7%) and the value simulated by CropWatch (0.1%) is the largest. Soybean is also the crop for which importers did particularly well in 2018, increasing output by about 3%, which results from the reversal of the negative production trend in China (now at +2.1%). Other countries with 2018 production increases include Canada (+0.4%), Brazil (+1.2%), United States (+2.8%) and Russia (+3.9%). The combined production deficit in 2018 compared with 2017 of India (-6.5%) and Argentina (-7.6%) amounts to 4.7 million tons, while the increase in the other modelled countries reaches almost exactly the same amount (4.6 million tons).

Particularly when considering that no actual data are available in table 5.1 for Uruguay and Ukraine, two major soybean exporters, the data in table 5.2 show that soybean importers did generally well this year and that no particular stress should affect international soybean supplies.

Table 5.1. CropWatch productions estimates, thousands tons

Country	Maize		Rice		Wheat		Soybean	
	kTons	Δ%	kTons	Δ%	kTons	Δ%	kTons	Δ%
Afghanistan	315	0	279	-19.4	3353	-21.7		
Angola	2791	4.1	75	10.3	4	0	20	5.3
Argentina	28084	-6.2	1692	-5.5	17704	-4.4	47214	-7.6
Australia	389	-6.3			33104	-12.8	42	-22.2
Bangladesh	2186	-2.6	44871	-0.9	1503	0.9	118	7.3
Belarus	171	-48.2			2768	0.1		
Brazil	85495	1.8	11597	2.2	4103	-3.8	97883	1.2
Cambodia		8807	0.2			178	-0.6	
Canada	11980	0.8			31029	1.1	7744	0.4
China	196384	1.4	197325	-1.6	121528	-0.1	14036	2.1
Egypt	5513	-6.8	6091	-6.9	10790	-1.6	47	2.2
Ethiopia	7391	3.3	163	10.9	4021	-3.8	101	8.6
France	14364	-1.5	67	4.7	36333	-4.5	516	19.4
Germany	4738	-0.4			26885	-4.4	58	23.4
Hungary	5664	3.3	10	11.1	5022	-4.1	202	13.5
India	17936	-5.8	159713	-2.1	91374	-2.3	11368	-6.5
Indonesia	16911	-4.9	65228	-4.7			1095	6.1
Iran	359	-50.8	2474	8.9	13851	8.8	131	-0.8
Italy	6142	5.6	1603	5.3	7295	1.3	1524	10.5
Kazakhstan	910	7.7	509	8.3	16287	-1.9	257	2.8
Kenya	3483	16.1	107	0	53	-56.2	2	0
Mexico	23643	-0.9	301	8.3	3589	9.3	614	15.4
Mongolia					253	9.4		
Morocco	124	1.6	60	22.4	7043	-0.8	1	0
Mozambique	2085	2.2	376	-6.5	18	-5.3		
Myanmar	1705	0.2	25058	-1.4	91	-23.5	143	-2.7
Nigeria	11759	5.3	4692	0.2	38	-13.6	605	4.7

Pakistan	4513	-8.0	8749	-11.7	24004	-1.2		
Philippines	7419	-2.7	19713	-2.4			1	0
Poland	3895	-1.2			10117	-7.4	16	45.5
Romania	12890	7.5	40	-7	7512	-2.1	365	12
Russia	12765	-0.4	1176	5.5	52815	-10.3	3582	3.9
South Africa	13188	-6.9	3	0	1930	22.5	960	-2
Sri Lanka	324	8	2424	-3.0			5	-37.5
Thailand	4802	-3.9	38314	-0.5	1	0	37	-9.8
Turkey	6550	4.1	937	1.8	19829	3.4	170	-4.5
Ukraine	28943	-7.8	6	-140	21043	-7.1	5364	9
United Kingdom					13751	-5.3		
USA	362504	-2.1	11042	1	52657	-3.9	112674	2.8
Uzbekistan	552	7.2	251	-13.1	5945	-7.7		
Vietnam	5145	0.6	44832	-1.3			144	-2
Zambia	2367	-1.1	12	-42.9	110	-24.7		
Sub-total	916377	-1.1	658496	-1.9	647753	-0.9	307217	0.3
Others	82553	-1.0	62587	-0.6	74937	-0.4	19812	-2.1
Global	998930	-1.1	721083	-1.8	722690	-0.9	327029	0.1

Table 5.2: 2017-2018 statistics regarding the top 3, 5 and 10 exporters and importers. Rice is expressed as paddy. kT is total production in thousand tons, Δ% is the change in production between 2017 and 2018 and S% is the ratio (in %) between kT and total production (core countries and minor producers).

Top		Maize			Rice			Wheat			Soybeans		
		kT	Δ%	S%	kT	Δ%	S%	kT	Δ%	S%	kT	Δ%	Share%
3	Exp.	476083	-1.7	48	242859	-1.7	34	136501	-5.5	19	257770	0.1	26
	Imp.	23718	-0.6	2	197235	-1.6	27	12630	15.2	2	14650	2.6	4
5	Exp.	519390	-2.0	52	262651	-2.0	36	194291	-6.2	27	276121	-0.1	27
	Imp.	34376	15.2	3	199923	-1.5	28	27740	37.1	4	14712	2.7	4
10	Exp.	565018	-1.6	57	288830	-1.7	40	277347	-5.7	39	299004	-0.2	30
	Imp.	46350	11.4	5	268314	-2.3	37	62625	41.8	9	19856	3	6

[Footnote 1] "Minor producers" include the 142 countries from Albania and Algeria to Yemen and Zimbabwe that are not included in the table of 44 "major producers"

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

5.2 Disaster events

1. Introduction

The current reporting period was characterized mainly by Central American droughts, south-Asian floods, and Indonesian earthquakes and tsunamis. Tropical cyclone activity was relatively calm except for typhoon Mangkut in the Philippines and two North American hurricanes (Florence and Michael), which received broad media coverage.

2. Disasters by categories

2.1 Earthquakes

Relatively minor earthquakes were reported from Trinidad and Tobago (21 and 22 August, most considerable magnitude 6.9), causing little damage and no casualties. On 6 September, a 6.7 magnitude earthquake struck the island of Hokkaido in Japan, and two days later the province of Davao Oriental on Mindanao Island in the Philippines experienced several tremors up to a magnitude of 6.4. Around 6 October, several shocks (magnitude 5.9) killed 17 people in Haiti, with several hundreds requiring medical assistance.

Indonesia was, however, the country most dramatically affected by earthquakes in two separate events between August and October 2018. Several earthquakes hit Lombok – one of the Lesser Sunda Islands - between 29 July and 9 August (reaching magnitude 7.0 on 5 August). Several thousand people were injured, and about 300 died. Close to 70 thousand houses were damaged or destroyed, and 300 thousand islanders were displaced and needed food, water, shelter, and health assistance. Humanitarian access was made difficult by the damage to the transportation infrastructure. About a month later, several strong earthquakes destroyed Central Sulawesi Province, the strongest at magnitude 7.4 on 28 September.

The resulting tsunami along the coast of Palu (capital of Sulawesi) destroyed buildings up to 400 m from the shore. On 1 November, up to 1.2 million people had been affected: 210,000 people lost their homes, and half of them suffered food shortages. Just under 2,100 are confirmed dead, and more than 1,000 went missing. 70,000 houses were damaged, and 15,000 were destroyed. Due to the destruction of roads, power lines and communications infrastructure the island was cut off from the outside world and assistance was slow to set in and difficult to coordinate. Ten thousand hectares of agricultural land (mostly rice and maize) have been affected, together with irrigation infrastructure, but Sulawesi is also one of the major producers of coffee in Indonesia, and the leading exporter of cocoa (75% of national output). Although plantations did not suffer directly, disrupted transportation, lost farming tools, and seeds damaged and lost fishing vessels, and displaced labor will presumably impact the agricultural sector for several years.

2.2 Floods

Floods are reported from several areas in Africa, affecting about 50 thousand people in Sudan at the end of July, and leading to cattle loss [8]. The most severe floods in Africa during the reporting period occurred in Nigeria [9] at the end of September. They concerned the two major rivers in the country, the Benue and Niger (Figure D1).

Figure D1: States most affected by floods in Nigeria during September 2018. Source: https://ichef.bbci.co.uk/news/624/cpsprodpb/43E0/production/_103467371_nigeria_floods_640-nc-2.png.



In South America [10], early September flash floods caused havoc for 70 thousand people in Mexico, mostly in northern-central states. In October, 26,000 Colombians suffered floods in the departments of Vichada and Guainía due to heavy rainfall over the previous two months. Heavy rains also caused widespread flooding affecting close to 65 thousand people in the department of La Guajira. The most severely hit area was Uribia municipality. Urgent food, shelter, and water, sanitation and hygiene (WASH) had to be provided. October also witnessed floods in Costa Rica (about 200 thousand people impacted) and El Salvador but mainly in Guatemala, Honduras, and Nicaragua where early estimates of losses in the agricultural sector reached the US \$100 million. The abundant precipitation also touched the Caribbean where 150 thousand people suffered in Trinidad and Tobago.

Floods are reported in Western Europe at the end of October. In Asia, they occurred mainly as two separate events in Myanmar [11], in Laos [12] and India, especially in Kerala State [13].

Figure D2: Kerala floods. Left, Kerala has been dealing with unprecedented floods following torrential rains that also triggered landslides, claiming over 300 lives. Source: <https://cdn.dnaindia.com/sites/default/files/styles/full/public/2018/08/19/720123-kerala-flood.jpg>. Right, the number of those displaced in the torrential rains in Kerala was [...] put at [724 thousand]. Source: https://c.ndtvimg.com/q7hqhni_kerala-floods_625x300_19_August_18.jpg



Based on data from both the Department of Disaster Management (DDM) and the Myanmar Red Cross, a total of 9 provinces were hit by floods at the end of July and early August, especially the southern-central region of Bago, Tanintharyi, Kayin and Mon. 150 thousand people were affected and 17 died. At the end of August, dam damage in Bago flooded 85 villages, to the extent that 80 thousand people had to be evacuated and 30 thousand hectares of crops were lost. On 7 August, the Minister of Foreign Affairs of the Lao PDR briefed the international community and media on the flash floods in Sanamxay District of Attapu province. The Minister described the situation as a national tragedy with 35 deaths, 99 missing, and 6000 evacuated people.

Parts of India experienced exceptional monsoon conditions in July and August, reported being the most intense in 100 years (Figure D2). Massive floods ensued in Kerala, where 39 thousand people had to be evacuated in July and 60 thousand by mid-August. About half the population in Kerala depends on agriculture. According to ACAPS "crop damage has been significant and many agricultural workers will likely be in need of long-term livelihoods assistance." About 40% of plantations (including coffee) are affected with an expected loss that may reach US\$ 100 millions. Tea, rubber, cardamom (50% loss), and black pepper are also affected. According to the Indian Ministry of Home Affairs, by 30 July, the floods affected 2232 villages, causing 131 deaths and the loss of 22 thousand Ha of cash crops and countless plantain trees, which are a major local staple. In other States, the same source lists 1304 villages impacted in Assam, with 35 deaths and 16000 Ha of crops lost while West Bengal lost 48 thousand Ha of crops in 1378 villages (124 dead). Crop losses were more limited in Gujarat (213 villages, 53 dead), Maharashtra (170 dead) and Uttar Pradesh (1 village, 94 dead).

In Kerala, intense precipitation continued into October to the extent that 280 thousand people had eventually to be evacuated in Kerala, while more than 500 lives were lost and 60000 Ha of crops were damaged. The total damage is estimated to exceed 3 billion US\$. Other areas that were affected during the late monsoon include Himachal Pradesh, Karnataka, Nagaland, Odisha, and Punjab but especially Assam (41000 people evacuated) and Odisha (58000 people evacuated). According to the National Emergency Response Centre (NERC) in the Ministry of Home Affairs, about 575 thousand hectares of crops were affected by floods, of which the majority (about 300 thousand) occurs in Karnataka.

2.3 Drought and heat waves

While drought, forest, and bushfires continue along the Pacific coast in Canada and the USA [14], California suffered its largest fire in history with the destruction of 1858 km² of vegetation in the Mendocino forest complex. Heatwave and drought are also reported from south and south-west Europe and Korea DPR [15] in July-August. In the south and south-east of Madagascar 1.3 million people and five regions affected by rain shortfalls and failed harvests at the beginning of October. Around 400 thousand are in IPC emergency phase and close to 900 thousand are in the crisis phase. The situation is expected to last well into 2019.

Possibly, the most severe drought situation developed in Central America [16] starting in June and lasting into October. It affected southern Mexico (Chiapas), eastern Guatemala, eastern and north-western Nicaragua, southern Honduras, the east of El Salvador and north-western Costa Rica. Precipitation did not reach 50% of average and locally not even 25%. About 300 thousand Ha of beans and maize were lost in Guatemala, Honduras, and El-Salvador. In El Salvador, this corresponds to a loss estimated between 270 and 410 thousand tons of maize production. In Honduras, nationwide production drops were estimated at early August at 69% for maize and 73% for beans with losses more extensive than 80% in the Departments of Francisco Morazán, Choluteca, south of El Paraíso, Lempira and Intibucá. Much of the area subsequently suffered floods.

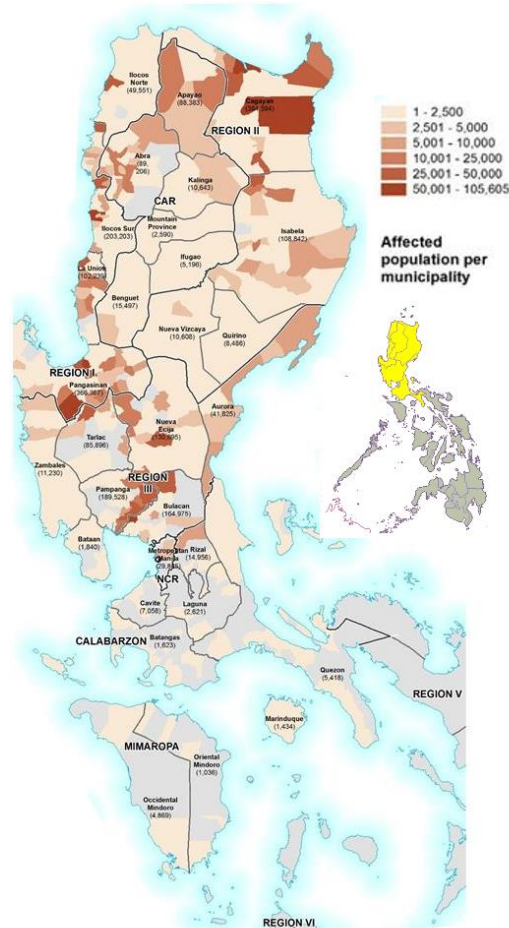
2.4 Cyclones

Of the eight cyclones and storms listed below [17], only Mangkut severely impacted agricultural production. The others include:

- Soulik, 15-24 August, 81 MUS\$ damage in Japan, the two Korea, and China;
- Florence, 31 August- 17 September, about 17 billion US\$ in the Caribbean and the USA;
- Michael, 7-12 October, about 12 billion US\$ in Central America, the Caribbean, and the eastern USA;

- Trami (also referred to as Paeng), 20 September - 1 October, 65 million US\$ in Japan;
- Titli, 8-12 October, 905 million US\$ damage mostly in India (Odisha and Andhra Pradesh);
- Willa, 20-24 October, 63 million US\$ damage in Central America, Mexico, and USA (Texas);
- Yutu (or Rosita), 21 October - 3 November, 7.5 million US\$ damage in the Northern Mariana Islands and the Philippines.

Figure D3: population affected by typhoon Mangkut in Luzon island. Modified from https://ahacentre.org/wp-content/uploads/2018/09/AHA-Situation_Update-no9-Typhoon-Mangkhut.pdf



Mangkut (also known as Omphong, Figure D3) developed between 7-17 September and caused damage over 2.5 billion US\$ in Vietnam, Laos, China and mostly in the Philippines (Luzon island). Mangkut was one of the strongest cyclones in the documented history of the Philippines. 2,150,000 people were affected, including 250 thousand displaced and 65 dead. Wind-speed reached 270km/h. According to OCHA, damage to rice, maize and vegetable crops in central and northern Luzon reaches USD 267 million, leading to some shortages of food and high prices. Damage to infrastructure was estimated to reach 131 million US\$. 170 thousand farmers were impacted mostly in the Cordillera Administrative Region (CAR), National Capital Region (NCR), Calabarzon and Mimaropa.

Main weblink sources:

- [1] https://www.acaps.org/sites/acaps/files/products/files/acaps_humanitarian_access_overview_august_2018_0.pdf
- [2] https://www.humanitarianresponse.info/sites/www.humanitarianresponse.info/files/documents/files/20181005_monthly_humanitarian_snapshot_eng.pdf
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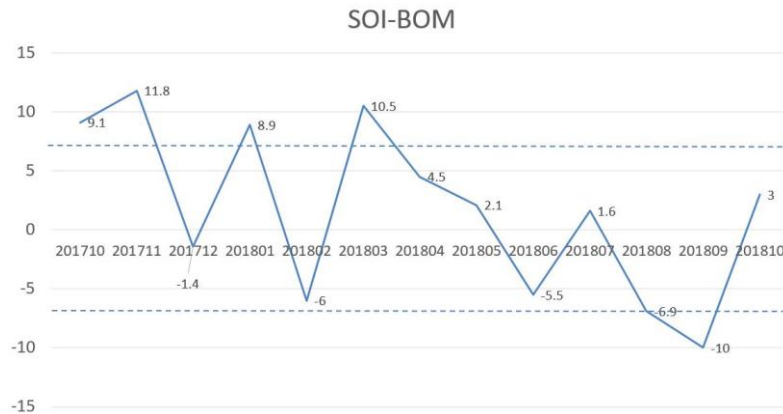
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- [13] https://www.acaps.org/sites/acaps/files/products/files/20180814_acaps_start_briefing_note_india_kerala_floods.pdf; <https://reliefweb.int/sites/reliefweb.int/files/resources/Situation-report-on-30-07-2018.pdf>; https://reliefweb.int/sites/reliefweb.int/files/resources/Situationreport_08102018.pdf; <https://www.theguardian.com/world/2018/aug/21/kerala-india-more-than-1m-people-flee-to-relief-camps-to-escape-floods>
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- [17] https://en.wikipedia.org/wiki/2018_Pacific_typhoon_season; https://en.wikipedia.org/wiki/2018_Pacific_hurricane_season; https://en.wikipedia.org/wiki/2018_Atlantic_hurricane_season; https://reliefweb.int/sites/reliefweb.int/files/resources/AHA-Situation_Update-no9-Typhoon-Mangkhut.pdf

5.3 Update on El Niño

Weak El Niño condition has appeared across the Pacific Ocean during the third quarter of 2018. Figure 5.1. illustrates the behavior of the standard Southern Oscillation Index (SOI) of the Australian Bureau of Meteorology (BOM) from October 2017 to October 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 suddenly from +1.6 in July to -6.9 in August, further to -10 in September indicating a weak El Niño trend. However, it increased to +3 in October again.

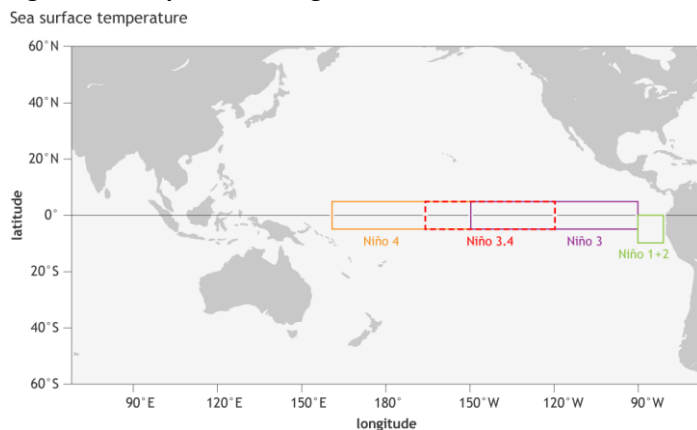
Figure 5.1. Monthly SOI-BOM time series from October 2017 to October 2018



Source: <http://www.bom.gov.au/climate/current/soi2.shtml>

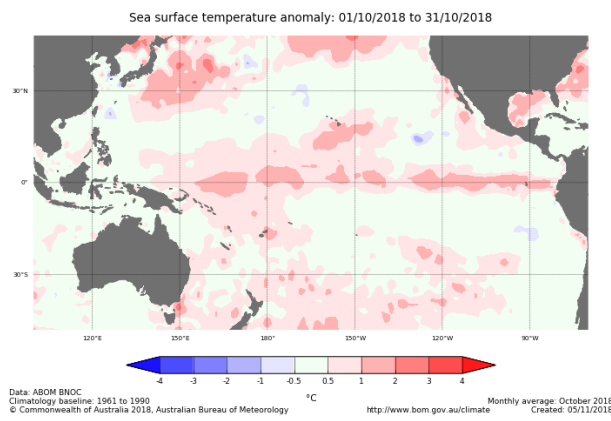
The sea surface temperature anomalies in October, 2018 for NINO3, NINO3.4 and NINO4 regions are +0.8°C, +0.8°C, and +0.9°C in sequence, warmer than 1961-1990 average according to BOM monitored (see Figure 5.3). Both of BOM and NOAA think that the warmer condition indicates a weak El Niño trend and their ENSO’s outlook lies at El Niño ALERT in the following winter of Northern Hemisphere. CropWatch will keep on monitoring its condition.

Figure 5.2. Map of NINO Region



Source: https://www.climate.gov/sites/default/files/fig3_ENSOindices_SST_large.png

Figure 5.3. October 2018 sea surface temperature departure from the 1961-1990 average



Source: http://www.bom.gov.au/climate/enso/wrap-up/archive/20181107.ssta_pacific_monthly.png