# Chapter 5. Focus and perspectives

*Building on the CropWatch analyses presented in chapters 1 through 4, this chapter presents first early outlook of crop production for 2018-2019 for countries in Southern Hemisphere and some isolated northern hemisphere countries (section 5.1), as well as sections on recent disaster events (section 5.2) and an update on El Niño (5.3).*

## 5.1 Production outlook

The production outlook for the current bulletin includes only the major producers in the southern hemisphere and some isolated northern hemisphere countries where crop development is sufficiently advanced to ensure that estimates are reliable. Detailed production estimates for Brazilian States and Argentinian Provinces are listed in Annex B.

CropWatch production estimates differ from most other global estimates by the use of geophysical data in addition to statistical and other reference information such as detailed crop distribution maps. Recent sub-national statistics are used for the calibration of remote-sensing-based models. It is also stressed that the assessments and underlying data are crop-specific, i.e. based on different crop masks for each crop and that, for each crop listed in Table 5.1, both yield variation and cultivated area variation are taken into account when deriving the production estimates.

*Maize*

Table 5.1 includes the second and third exporters of Maize (Brazil and Argentina) which both export about 20 million tonnes of the commodity annually. Other exporters include South Africa and Mexico which commercialize about 1 million tonnes each, as well as Zambia with less than 500 thousand tonnes. Argentina did well (production up 9%) while the CropWatch estimate for Brazil is 1% down. Brazil exports about 25% of its maize production while the percentage is much higher in Argentina at more than 60%. Maize available for export should thus not be affected by the current situation in Argentina and Brazil. Mexico is net maize importer; it usually exports a very low percentage of its production (around 3%), so that the rather favorable production will merely reduce imports - which are in the range of 12 million tonnes - by about 25%. In South Africa, where exports and imports balance each other out, the production shortfall is likely to increase imports from outside the region as most countries suffered from a poor rainfall season which has reduced their maize output, as shown in the table for Angola and Zambia.

*Rice*

The rice production of Brazil and Argentina is up by 4% and 16%. Both countries rank about 10th among the rice exporters, more or less at the level of countries such as Uruguay, Paraguay, Italy and Cambodia. Both countries are minor net exporters - they are far behind the major Asian exporters which market about 10 times more - and their output will be neutral as far as international markets are concerned.  The same applies to Mozambique which has a net import of rice that varies between 100 thousand tonnes and 150 thousand tonnes.

*Wheat*

Australia has been one of the top 5 wheat exporters, although the position of the country among exporters varies from year to year because of the inherent variability of wheat output. If the production variability is defined as the ratio between the largest output and the smallest one over the last 10 years, production variability reaches 2.3 in Australia, Argentina and Kazakhstan but only values between 1.2 and 1.5 in India, the United States and France. Similar results are obtained with more complex measures of variability, for instance coefficients of detrended variability, which are close to 1.3 in Australia, Argentina and Kazakhstan, but only 0.5 in India, the United States and France. In short, the wheat production drop in Australia (-13%) may be spectacular, but it is nevertheless in line with the recent history of wheat production in the country.

The other negative value in Argentina (-3%) is also rather consistent with the recent behavior of wheat in the country. Not only: among the top ten wheat exporters, Argentina is the only one where the average production of the last five years (12.2 million tonnes on average between 2013 and 2017, based on FAOSTAT data) is below the production of 2001-2005 (15.0 million tonnes). This is due to a variety of factors but weather variability has played and continues to play a dominant role.

Australia is the major wheat exporter among those listed in Table 5.1. Exports, which have recently been in the range of 17 million tonnes are likely to fall by several million tonnes. Exports of Argentina, the second largest exporter among those listed in the table (5 million tonnes exports) are unlikely to be affected. Nor are those of Brazil as the country exports virtually no wheat.

All the other countries in Table 5.1 produce wheat essentially for domestic consumption. India and Pakistan are basically self-sufficient, with minor imports and exports only. Others, such as Mexico, Morocco and especially Egypt are among the world's top wheat importer. Egypt is actually the world's first wheat importer with a volume in excess of 10 million tonnes annually, less so (around 5 million tonnes) for Mexico and Morocco. The improved production will allow the countries to reduce imports.

The same applies to South Africa. The country used is an exporter of the same importance as Australia, but over the recent two decades South-African farmers have reduced production to grow other, more profitable crops, to the extent that South Africa is now a net importer of about 1.5 million tonnes. The estimated production increase will allow the country to compensate, albeit in a limited way, the reduced output of maize.

*Soybean*

Brazil and Argentina, which both increased their soybean production, are the second and third exporters for the commodity (about 50 million tonnes and 9 million tonnes, respectively). While first exports about 60% of its production, the second exports about one third. In Argentina, the extra production in 2019 (about 4.7 million tonnes) represents about 50% of average soybean exports of the country. As such, the volume of exportable soybean will increase significantly (by about 50%) in Argentina. This is larger than the increase in Brazil, which exceeds to 2018 output by about 2 million tonnes.

When taking into account the recent reversal of the negative trend of Chinese soybean production, and correlated reduced imports, the data in table 5.1 suggest that the current soybean glut will worsen.

**Table 5.1: Preliminary 2019 production estimates in thousands tonnes for selected southern hemisphere countries and early crops in the Northern hemisphere. Δ% stands for the change in % compared with the corresponding season in 2018.**

| | Maize | | Rice | | Wheat | | Soybean | |
|---|---|---|---|---|---|---|---|---|
| | 2019 | Δ % | 2019 | Δ % | 2019 | Δ % | 2019 | Δ % |
| **Africa** | | | | | | | | |
| Morocco | | | | | 11216 | 59 | | |
| Egypt | | | | | 11660 | 8 | | |
| Angola | 2722 | -2 | | | | | | |
| Mozambique | 2125 | 2 | 36.7 | -2 | | | | |
| Zambia | 2151 | -9 | | | | | | |
| South Africa | 11368 | -14 | | | 1792 | 14 | | |
| **Asia** | | | | | | | | |
| India | | | | | 92165 | 1 | | |
| Pakistan | | | | | 26039 | 8 | | |
| **Americas** | | | | | | | | |
| Mexico | 28495 | 21 | | | 4442 | 24 | | |
| Brazil | 84325 | -1 | 12173 | 4 | 4572 | 7 | 98577 | 2 |
| Argentina | 30485 | 9 | 1962 | 16 | 18009 | -3 | 51220 | 8 |
| **Oceania** | | | | | | | | |
| Australia | | | | | 33104 | -13 | | |

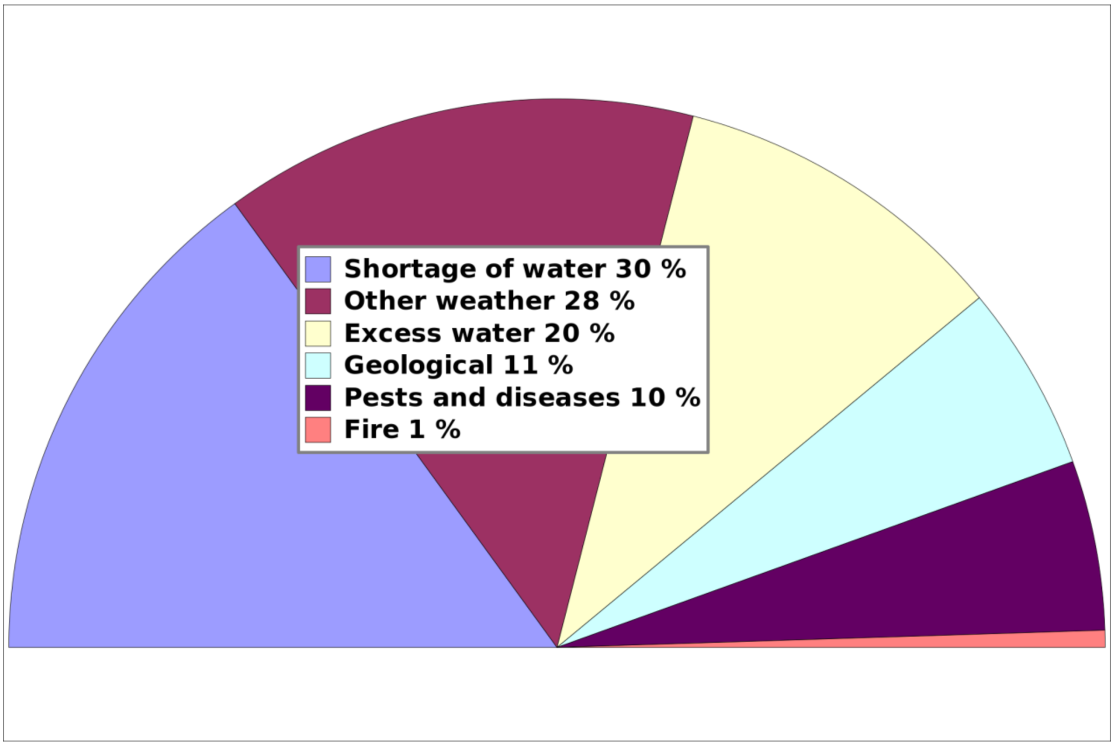
## 5.2 Disaster events

*Introduction*

The current section focuses on disasters that are most relevant for agriculture, food production and food security. This generally excludes health emergencies and geological disasters linked with volcanic eruptions.

According to the recent FAO report 2017: The Impact of Disasters and Crises on Agriculture and Food Security (FAO, 2018),the value of crop and livestock losses between 2005 and 2015 due to natural disasters has amounted to US$ 96 billion, of which 29 billion (or 30%) were due to drought (figure 5.1).

**Figure 5.1: relative importance of various disasters in agricultural production losses between 2005 and 2015. (Based on data in FAO, 2018)**




As we have repeatedly mentioned in previous CropWatch bulletins, the most dramatic humanitarian situations currently include a man-made component. Civil unrest, conflict and war result in large scale population movements and compound negative climatic impacts. The FAO report estimates that the economic loss associated with man-made disasters to be between US$ 250 billion and US$ 300 billion every year, i.e. about thirty times larger than disasters associated with climate.

For more than 20 years, The World Meteorological Organization (WMO) has published official statements about the state of the global climate. The latest report puts 2018 on course to be the 4th warmest year on record. This means that the past four years – 2015, 2016, 2017 and 2018 – are also the four warmest years in the series, with 2018 being the "coolest" of the four. Not only: the 20 warmest years have occurred in the past 22 years! According to Wikipedia, 2018 was also the third in a consecutive series of above-average and damaging Atlantic hurricane seasons, featuring 15 named storms, 8 hurricanes and 2 major hurricanes and a total of US$ just under 34 billion in damages.

Average temperatures around the world in 2018 were nearly 1°C above pre-industrial levels. Extreme weather has affected all continents in early 2019: several weather records broken in January, for instance cold in North America, fires in Tasmania and floods in Queensland, record temperatures and rainfall in parts of South America, and heavy snowfall in the Alps and Himalayas.

The extremes frequently trigger inadequate responses because our societies are ill prepared to handle excessive variability of water supply and temperature. Worldwide, too many financial resources are spent on recovery rather than prevention. According to a study released in December 2018 by the US National Institute of Building Sciences every $1 spent on hazard mitigation in the construction industry saves the about 6$ in future disaster costs, saves lives, reduces physical and psychic trauma and creates jobs. The benefits are largest in the case of water-related disasters and cyclones.

*List of main disasters by categories*

*Tsunamis*

At the end of December a tsunami associated with the eruption of Anak Krakatau on Indonesia killed 450 people in Indonesia. Rescue operations were made difficult due to debris and torrential rain. The tsunami was only of a series of disasters that affected Indonesia in 2018, including the Lombok earthquake in August and the earthquake and tsunami that together killed about 5000 people on Sulawesi Island in September. According to FAO, many families in the area of Palu (Sulawesi) are entirely dependent on agriculture and/or fisheries, and they lost considerable assets, including equipment and inputs. The period from August to October corresponds to the "dry" season (a relative concept in equatorial areas!) and the harvesting time. Agricultural land was marginally affected and assistance focused basically on non-food related needs and seeds for the growing season that is currently underway.

**Figure 5.2: Stranded boat and destroyed buildings in Palu.**

Source: http://www.fao.org/news/story/en/item/1162194/icode/

*Cyclones*

The section addresses cyclones and related disturbances such as storms of various intensities, basically characterised by the combination of strong wind and abundant precipitation. In all basins, the reporting period covers the end of the season cyclone season in October or November.

In the Atlantic Ocean, several hurricanes were already reported on in the previous bulletin (Michael 7-16 October, the third-most intense Atlantic hurricane to make landfall in the United States). Damage exceeded $15.1 billion over Central and North America, the Caribbean and even the Iberian Peninsula. The last hurricane of the season was Oscar (27-31 October), off the US coast. It neither affected weather as far as Europe but did nor creates major damage.

The eastern Pacific basin (season from June to October) recorded three category 5 cyclones in 2018, of which two occurred in October: Walaka (29 Sep – 9 Oct) with insignificant damage, and Willa (20-24 October) along the western central American coast, Mexico and the USA, killing 6 people and causing losses amounting to 537 million US$ damage.

In the Indian Ocean cyclone Gaja (10-20 Nov) made landfall in southern India on November 26, impacting about 100000 hectares mostly in Tamil Nadu and Kerala States and causing about 50 deaths and damage to about 120000 houses of which about 60000 were destroyed. Perennial fruit crops and shrimp farms suffered most. Many thousands of trees were uprooted, which significantly hindered relief operations. The nationwide damage is estimated at US$ 775 million. According to the Indian Express, 70000 coconut farmers were hit and about 10 million coconut palms were damaged in Tamil Nadu. It is estimated that four to ten years will be needed for the local coconut industry to recover. The Economic Times reported that the impact of Gaja will depress shrimp production in India by 15% this fiscal year. Tamil Nadu is the largest shrimp producer in the country.

**Figure 5.3: A family checks the remains of their coconut farm.**

Source: http://www.newindianexpress.com/states/tamil-nadu/2018/dec/13/learning-from-gaja-agriculture-department-asks-farmers-to-take-precautionary-measures-to-face-cyclo-1911030.html.

Although it was initially feared that tropical storm Phethai (13-18 December) would make landfall in Tamil Nadu, the event instead affected the states of Andhra Pradesh and Odisha from December 17 to 19. Eight people were reported dead and the agricultural damage in Andhra Pradesh was estimated at US$ 41.1 million. Generally,however,the abundant water supply provided by Phetai is assessed as positive and The Hindu reported on 20 December that "Phethai lifts Prakasam farmers' spirits" because the weather system has brought much-needed rains to the coastal areas which had been reeling under drought for the fifth year in succession".

Five events are listed below for the western Pacific cyclone basin although the last (Pabuk) also affected parts of the Indian Ocean. Some of them occurred after the normal end of the Typhoon season in the region, which may be linked with global warming, according to findings by the NOAA Geophysical Fluid Dynamics Laboratory.

Typhoon Yutu (known in the Philippines as Rosita) was the most powerful tropical cyclone worldwide in 2018. It developed between October 21 and November 2, affecting mostly Northern Mariana Islands, but also impacting the Philippines and just grazing southern China. 1-minute sustained winds reached 285 km/h and the damage amounts to US$ 198 million. The damage to agriculture in the Philippines reached US$ 35 million according to Department of Agriculture data reported by ReliefWeb and the Philippines Star, with 150000 tons of crops lost in about 110000 Ha in Northern Luzon. The bulk of the damage (80%) corresponds to rice on

Isabela and Cagayan, and some maize on Isabela and Nueva Vizcaya. Just fewer than 30000 farmers were affected in Apayao, Benguet, Ifugao, Kalinga, Mountain Province, Ilocos Sur, Pangasinan, Isabela, Quirino, Aurora and Pampanga.

Two depressions made landfall in Vietnam, tropical storm Toraji (16-21 Nov) which was followed a week later by Usagi. Each of the events caused about US$ 15 million in total damage. Toraji affected Vietnam and the Malay Peninsula. It caused flooding in Nha Trang, 22 dead and more than US$ 40 million damage.

Usagi (also known as Samuel; 13 Nov- 26 Nov) made landfall in southern Vietnam (Mekong Delta) after crossing the northern Philippines on 20 November. One person died and the damage in the agricultural sector was just under US% 1 million. In Vietnam, Toraji left 19 people dead and flooded Ho Chi Minh City.

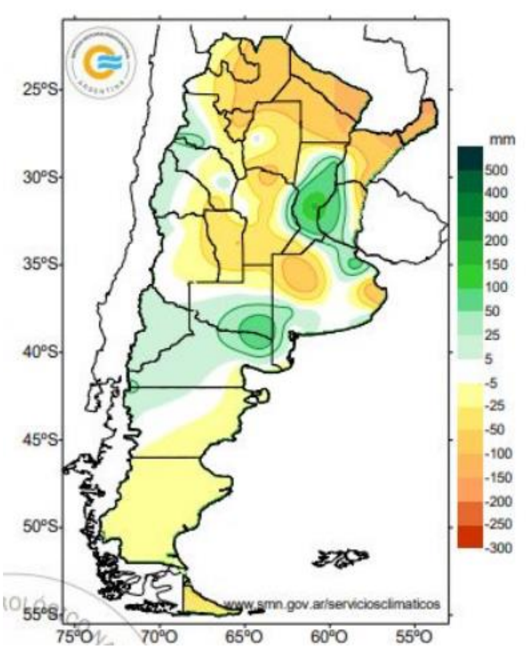
Storm Usman (Dec 25-29) struck the Philippines just before the end of December, killing about 160 people mostly in Regions IV-A (Calabarzon), IV-B (Mimaropa), V (Bicol), and VIII (Eastern Visayas). The mountainous Bicol region, south-east of Manila and in the central island of Samar suffered the largest number of casualties due to landslides and drownings. Damage reached over US$ 100 million, of which 80% in agriculture and infrastructure. About 650000 people were affected. According to CNN Phillippines and the Philippines Star the damage in the agricultural sector (including fisheries) amounts to US$ 15 to 20 million in the Visayas and Bicol regions and US$ 700000 in northern Samar. The total damage to infrastructure exceeds US$ 50 million.

Tropical storm Pabuk developed between 31 December and 4 January over the South China Sea and crossed the Maly Peninsula into the Indian Ocean. Most damage occurred in Thailand where eight people were killed and economic losses reached US$100 million. Minor impacts are also reported from Malaysia, Vietnam and Myanmar.

*Floods, landslides and heavy rain, tsunamis*

Abundant rainfall throughout October and November caused numerous episodes of flooding throughout the Middle-East. On 22 and 23 November, Iraq suffered from severe floods that have led to several deaths and displaced thousands of people, mostly in the Governorates of Ninewa and Salah-al-Din. 112 people lost their lives due to flash floods in Jordan in early November. While bridges, roads and villages were inundated, more than 30000 people were in need of assistance in Iraq. According to ACAPS, many houses and crops were destroyed, which will have lasting impacts on food security and livelihoods as floods have reduced crop planting that takes normally place at the time. Many germinating crops have been destroyed due to water logging.

**Figure 5.4: rainfall anomaly in Argentina during November 2018(mm)**




The same period was also exceptionally wet in parts of Italy and Spain Nov according to the AON Global catastrophe recaps. In Italy and Spain, more than 10 people died. The economic damage exceeds US$ 3.4 billion in Italy in Spain; the loss due to destroyed infrastructure and crops in the region of Valencian is put between US$ 100 and 140 million.

Huge agricultural damage close to US$ 200 million was brought about by intense thunderstorms and hailstorms in Central Chile in November, especially in the O'Higgins and Maule regions. In January, floods occurred in north-east Argentina (Chaco, Corrientes, Santiago del Estero, Tucumán, Santa Fe and Entre Ríos), and neighbouring parts of Uruguay and Brazil.

According to the national Disaster Management Center (DMC) of Sri Lanka, floods occurred in five districts of the Northern Province on 22 December, bringing great suffering to nearly 14,000 families. By 25 December, over 75,000 people had been affected.

ReliefWeb reported floods for different parts of Indonesia throughout the reporting period: mid-October in Sumatra; late October in Sulawesi in the midst of the emergency response (including 200000 displaced persons) to the earthquake, tsunami and soil liquefaction; early November in east Java; mid-November in West and North Sumatera provinces. On 13 December landslides due to heavy rain created havoc in Pintu Pohan District, North Sumatera Province. Early January witnessed excess water in several parts of Java and, at the end of the month, in Sulawesi. As of 27 January, still according to ReliefWeb, South Sulawesi Province recorded floods and landslides that affected 188 villages in 13 districts, with 68 people dead and significant damage to transport infrastructure and buildings.

*Heat waves*

Heat waves occurred in December and January in several areas in the southern hemisphere.

At the end of December, Australian mainland and Tasmanian temperatures exceeded seasonal normals by 10°C to 14°C, accompanied by poor air quality. Australia had its warmest January on record, according to its Bureau of Meteorology.

Several temperature records were exceeded as well in Chile and Argentina, most severely in the southern part of the continent.

*Cold wave/ extreme winter conditions*

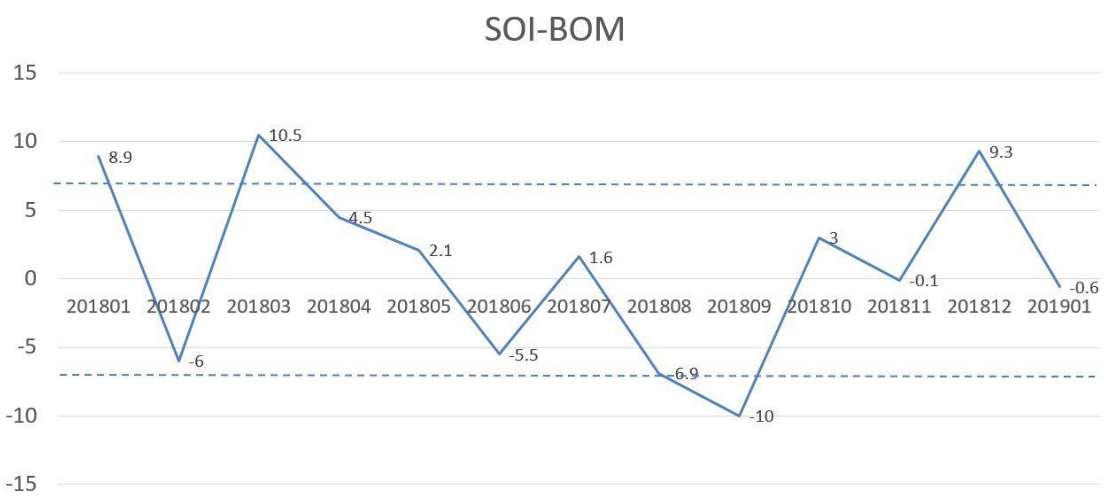
According to the Red Cross, Moldova recorded abundant snow and low temperatures in Moldova, especially on 11 and 12 January. The level of snow throughout the country reached 30 – 190 mm. More than 5000 people were unable to afford the costs of heating, including mainly older people and people with disabilities.

## 5.3 Update on El Niño

A likely El Nino condition has appeared across the Pacific Ocean during the first month of 2019. Figure 1 illustrates the behavior of the standard Southern Oscillation Index (SOI) of the Australian Bureau of Meteorology (BOM) from January 2018 to January 2019. 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 +3 in October to -0.1 in November, then increased to +9.3 in December, but dropped to -0.6 again in January 2019, indicating a likely El Nino condition.

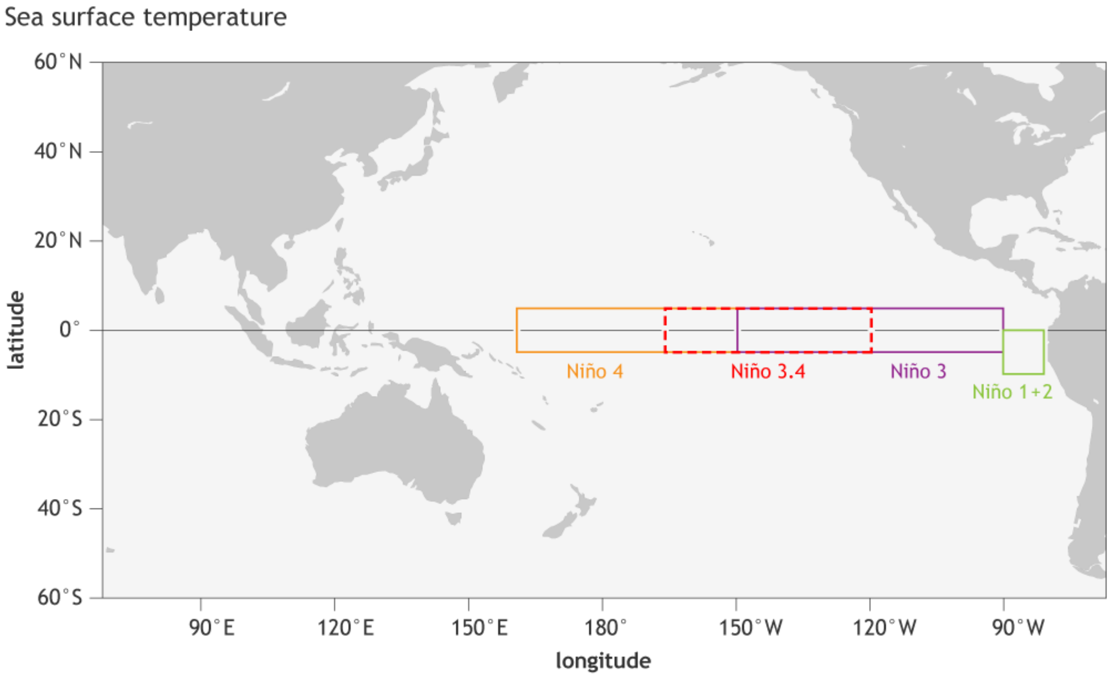
**Figure 5.5: Monthly SOI-BOM time series from January 2018 to January 2019**




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

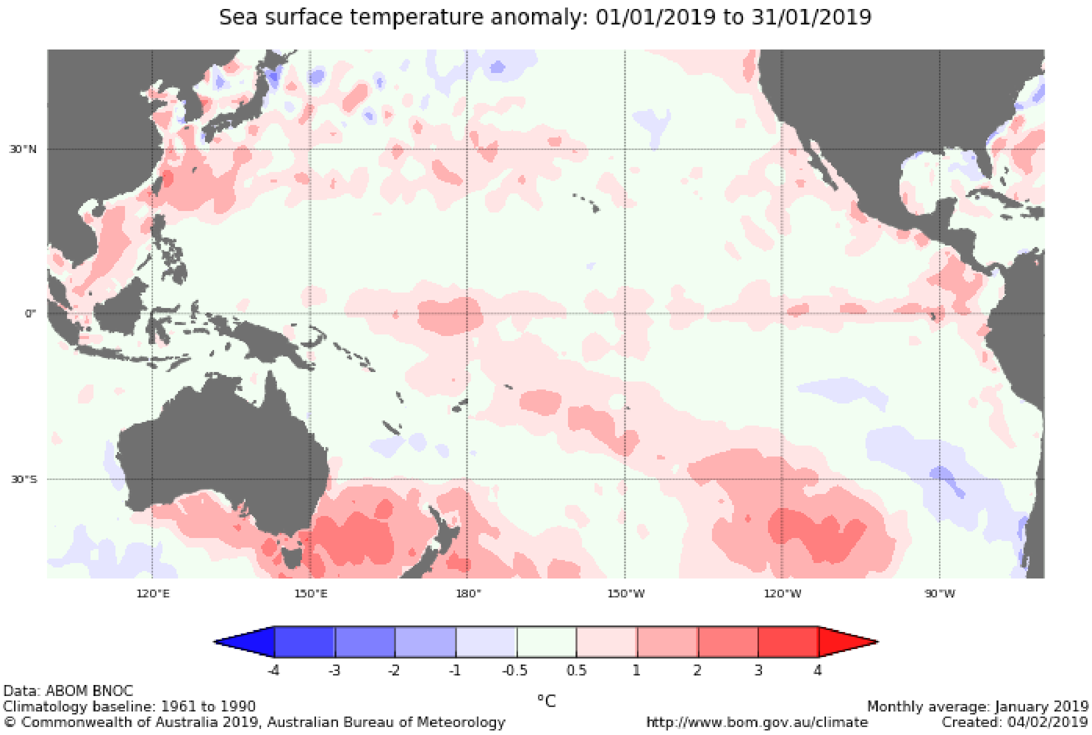
The sea surface temperature anomalies in January 2019 for NINO3, NINO3.4, and NINO4 regions are +0.5°C, +0.5°C, and +0.7°C in sequence, a litter warmer than 1961-1990 average according to BOM monitored (see Figure 5.7). Both of BOM and Japan Meteorological Agency (https://ds.data.jma.go.jp/tcc/tcc/products/elnino/elmonout.html) think that the warmer condition indicates a weak El Niño trend and their ENSO's outlook lies at El Niño Watch in the following spring of Northern Hemisphere. CropWatch will keep on monitoring its condition.

**Figure 5.6: Map of NINO Region**




Source: https://www.climate.gov/sites/default/files/Fig3_ENSOindices_SST_large.png.

**Figure 5.7: January 2019 of sea surface temperature departure from the 1961-1990 average**

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