

### Ocean Summary:

- Both sea surface and sub-surface temperatures across the central tropical Pacific Ocean have cooled over the past two months. The ENSO outlook remains INACTIVE or Neutral. If further cooling is observed in coming weeks with additional models suggesting a La Niña development, the ENSO Outlook will be raised to La Niña WATCH.
- Key indicators of ENSO, such as the Southern Oscillation Index (SOI), trade winds, cloudiness near the Date Line, and sea surface temperatures in the tropical Pacific Ocean, are generally at levels consistent with a neutral ENSO state.
- Luganville Harbour:** Lowest Tide: 0.11m on 6<sup>th</sup> June. at 11:24 am. Highest tide: 1.78m on 5<sup>th</sup> June at 03:55 am.
- Port Vila Harbour:** Lowest Tide of the year: 0.09m on 7<sup>th</sup> June. at 12:58 pm. Highest tide: 1.52m on 5<sup>th</sup> June at 04:38 am.

### Sea Surface Temperatures (SST)

SSTs have slightly cooled in June with temperatures ranging from 28°C up north to 24°C down south. 26°C—28°C are forecasted for the northern region (Torba, Sanma, Penama and Malampa) in July 2020, while the southern region (Shefa & Tafea) is likely to experience cooler temperatures of 24°C—26°C.

**Application:** Different species of fish are sometimes known to be found at certain temperatures.

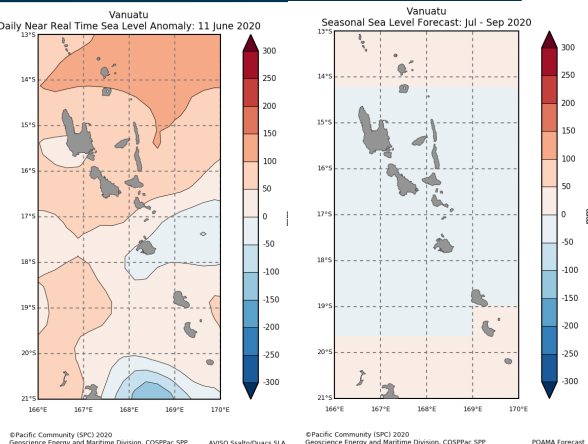
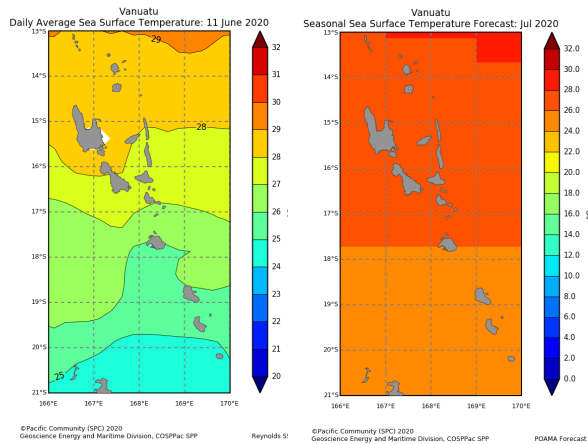
Common name	Species	All occurrences (°C)	Abundant occurrences (°C)
Skipjack	Katsuwonus pelamis	17-30	20-29
Yellowfin	Thunnus albacares	18-31	20-30
Bigeeye	T.obesus	11-29	13-27
Albacore	T. alalunga	13-25	15-21
Southern	Bluefin T.maccoyii	10.5-21	17-20

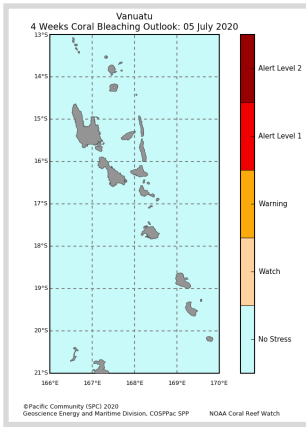
### Sea Level (SL) Outlook: June to August 2020

Sea Level has been above normal in the northern region in June, while the southern region experiences normal to below normal sea level. Forecast for the next three months (Jul—Sep 2020) shows below normal sea level (-50mm) over Sanma, Penama, Malampa and Shefa.

### Application

- High tides at higher sea level could cause inundation of waves overland (seas-flooding) during bad weather / windy conditions causing rough seas.
- Low tides at lower sea level could reduce sea level over wharfs and docks, and could also expose coral reefs further during low tides.



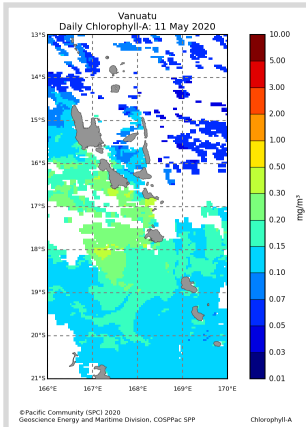


### Coral Reef Outlook: June 2020

No stress on Corals is observed over Vanuatu waters in June, and forecast show corals will continue to experience no stress during the next 4 weeks. This means there is no potential threat of coral bleaching until 5<sup>th</sup> July.

#### Application

- Coral reef provide food for fishes and shells. When there is coral bleaching, the coral can die and the whole food chain is affected.
- Limiting fishing in the region can increase fish populations, which in turn maximizes the consumption of plant growth and limits their impact on the corals. (Marshall and Schuttenberg, 2006).

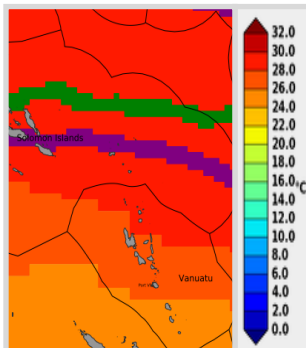


### Monthly Chlorophyll

Chlorophyll concentration has been increasing over the Central Waters in recent months. Up to 0.50 mg/m<sup>3</sup> of chlorophyll (green colour) were evident over Malekula, Epi, Efate and the Shepherds group as of May 11<sup>th</sup>.

#### Application

- Fishermen targeting smaller pelagic (open sea) fish may be interested in the chlorophyll concentration.
- Filter feeders (i.e. oysters, mussels, clams, scallops) thrive in high chlorophyll concentrations.
- Crown of thorns spawning is likely to be more successful under high chlorophyll concentrations.



### The Convergence Zone Outlook: June 2020

The green line is the average position of the Warm pool –cold tongue Convergence zone. The purple line is the edge of the Warm pool –cold tongue Convergence zone. Forecast shows the Convergence Zone will remain over Solomon islands in the next three months (July–September 2020).

#### Application:

Along the eastern edge of Warm pool-cold tongue Convergence zone is rich with nutrient which support high abundance of tuna.

### Top Highest and Lowest Tides for July 2020 to September 2020 Luganville & Port Vila Harbour

Luganville Harbour						Port Vila Harbour					
Lowest Tide	Date	Time (VUT)	Highest Tide	Date	Time (VUT)	Lowest Tide	Date	Time (VUT)	Highest Tide	Date	Time (VUT)
0.14m	5 July	11:15 am	1.74m	4 July	03:41 am	0.11m	5 July	11:59am	1.47m	4 July	04:16 am
0.15m	19 Aug	11:11 am	1.81m	20 Aug	05:08 am	0.15m	20 Aug	12:41pm	1.49m	20 Aug	05:57 am
0.17m	17 Sep	10:41 am	1.82m	18 Sep	04:15 am	0.21m	17 Sep	11:30am	1.57m	19 Sep	19:10 pm

### Moon Phases for July 2020 to September 2020

New Moon ●	First Quarter ◐	Full Moon ○	Last Quarter ◑
		5th July	13 July
21 July	27 July	4th August	12th August
19th August	26th August	2nd September	10th September
17th September	24th September		