



# Tonga Ocean Outlook

## December 2022—February 2023

Issue: 10

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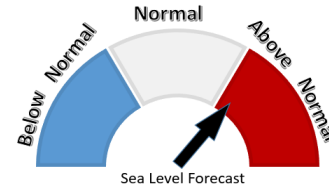
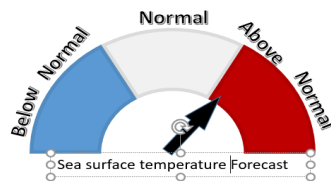
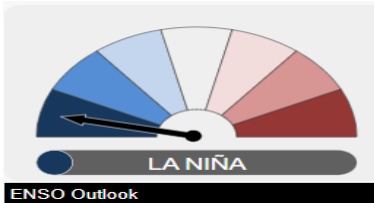
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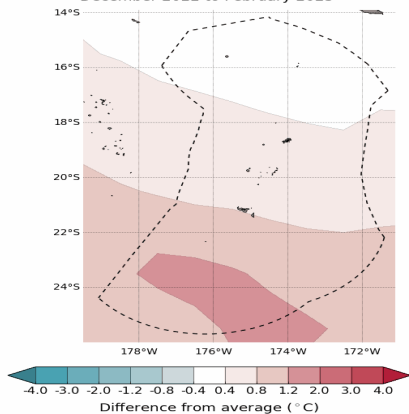
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- Above normal sea surface temperatures (SSTs) forecast to be more than 0.4 -0.8°C for Tonga.
- Notably higher than normal sea level (>100 mm) is forecast for southern Tonga during the forecast period.
- The fisheries convergence zone is predicted to be north of Tonga in the next few months.
- Next extreme highest and lowest tides will be on 26<sup>th</sup> November at height of 1.79m, lowest tide will be 0.28m on the 26<sup>th</sup>.



### Sea Surface Temperature Forecast

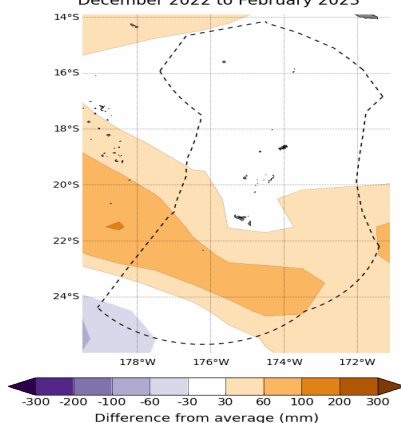
Difference from average sea surface temperature forecast for December 2022 to February 2023



Sea surface temperature forecast for December to February 2023 shows above average from south of Tongatapu to Vava'u and average north of Vava'u waters to the Niuaus. Presence of warmer or cooler waters than usual is useful because it indicates whether El Nino or La Nina like pattern is likely during the forecast period or monitoring warm patches of warm waters which gives insight into the potential for cyclone formation.

### Sea-level Forecast

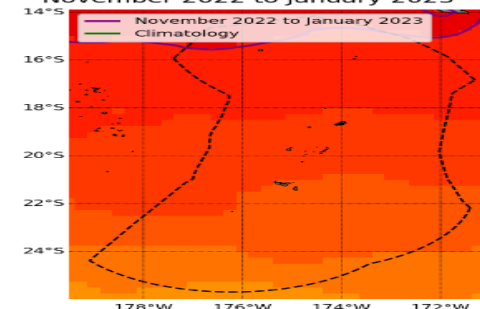
Difference from average sea surface height forecast for December 2022 to February 2023



Sea level anomaly 3 month forecast shows above average sea level height from south of Tonga waters and average across to central and northern Tonga. Stakeholders can use this forecasts to make decisions about the protection of communities and infrastructure against coastal inundation.

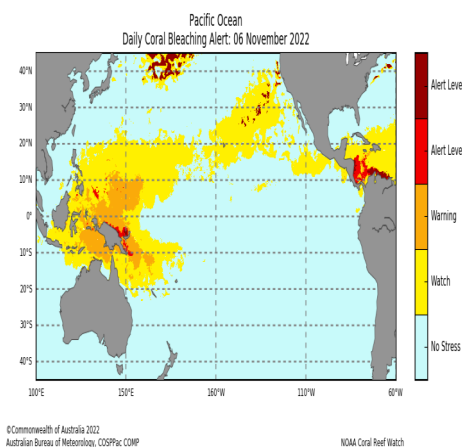
### Nutrient Zone Forecast

Sea surface temperature forecast for November 2022 to January 2023



The boundary between warm and cold ocean water is rich in nutrients and attracts Tuna. This convergence zone is normally located north of Tonga during this time of year. This information can be used by stakeholders to know where tuna can be found during this time period.

### Coral Bleaching



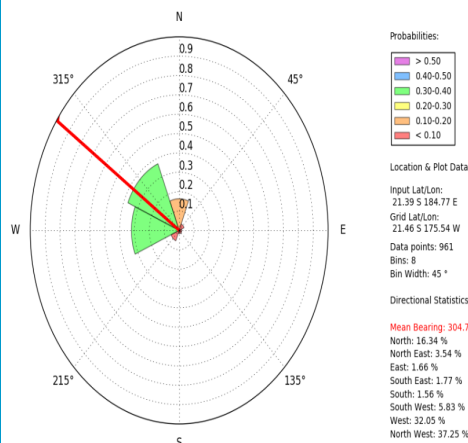
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NOAA Coral Reef Watch

Coral bleaching status for Tonga is under no thermal stress during this time period. Bleaching is a common stress response of corals, caused by warmer sea temperatures. During periods of unusually high sea temperatures, corals can bleach and may eventually die if the heat stress is intense and sustained over several weeks. This information is very useful for tourists and related stakeholders.

### Monthly Wave Direction

December mean daily wave direction (1979-2009)



Nuku'alofa wave climate for the month of December shows majority of the waves to come from the southeast going toward the northwest direction. This has been the average direction for the past 30 years. The average wave height for this location in December is 2.3 m with the possibility of waves reaching as high as 5.4m.

### The highest tide predicted for 2022

#### 10 highest tides for 2022

Date	Time	Height (m)	Date	Time	Height (m)
3-Jan	19:48	1.88	15-Jul	14:45	0.17
4-Jan	20:45	1.88	16-Jul	15:37	0.19
2-Jan	18:52	1.86	14-Jul	13:51	0.19
1-Feb	19:34	1.86	16-Jun	15:00	0.19
25-Dec	20:59	1.86	17-Jun	15:56	0.2
2-Feb	20:30	1.86	13-Aug	14:26	0.2
24-Dec	20:03	1.85	12-Aug	13:34	0.21
5-Jan	21:41	1.85	15-Jun	14:07	0.22
26-Dec	21:55	1.84	14-Aug	15:16	0.23
31-Jan	18:37	1.84	17-Jul	16:30	0.24

2022 Tidal predictions show the highest tides of the year for Nuku'alofa. The next highest and lowest tide coming up on the 26<sup>th</sup> November with a height of 1.79m. and 0.28m on the 27<sup>th</sup>. This information is very useful to everyone who wants to know these events especially to those stakeholders and people who are interested in tide predictions for guidance.