



Tonga Ocean Outlook

March–May 2023

Issue: 1

Issued 10th February 2023

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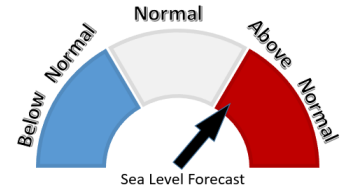
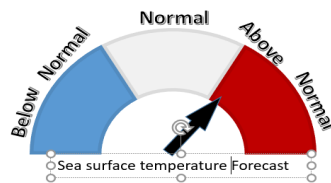
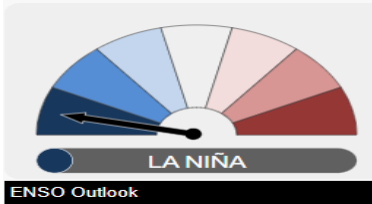
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- Above normal sea surface temperatures (SSTs) forecast to be more than 0.4 –1.2°C for Tonga.
- Notably higher than normal sea level (>100 mm) is forecast for southern Tonga during the forecast period.
- The fisheries convergence zone is predicted to be across Tonga waters in the next few months.
- Next extreme highest and lowest tides will be on 21st February at height of 1.88m and lowest tide will be 0.31m.



Sea Surface Temperature Forecast

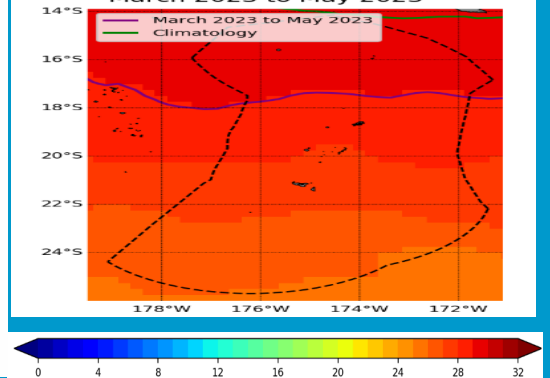
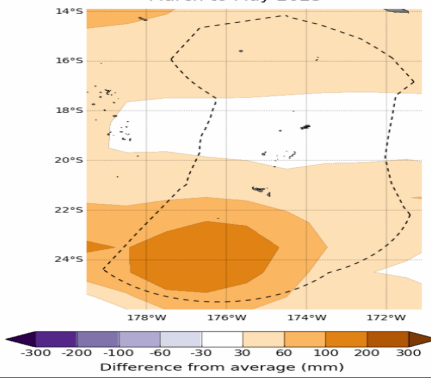
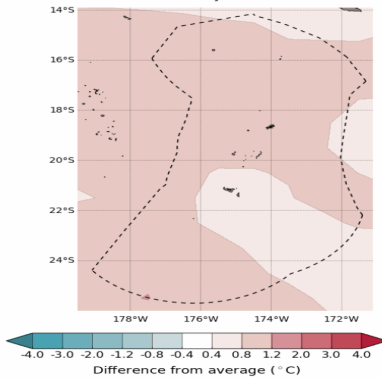
Sea-level Forecast

Nutrient Zone Forecast

Difference from average sea surface temperature forecast for March to May 2023

Difference from average sea surface height forecast for March to May 2023

Sea surface temperature forecast for March 2023 to May 2023



Sea surface temperature forecast for March to May 2023 shows above average from south of Tongatapu 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.

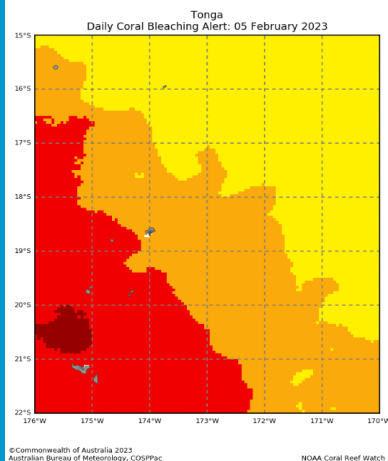
Sea level anomaly 3 month forecast shows above average sea level height from south of Tonga waters and average across central Tonga waters and above average over northern Tonga. Stakeholders can use this forecasts to make decisions about the protection of communities and infrastructure against coastal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

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.

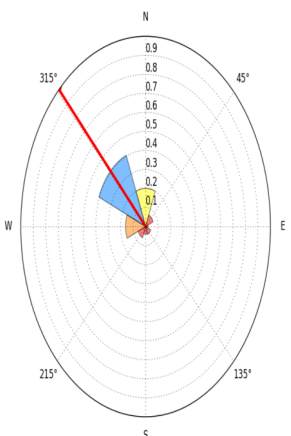
Coral Bleaching

Monthly Wave Direction

The highest tide predicted for 2022



February mean daily wave direction (1979-2009)



Distribution:
 Lower Quartile
 Interquartile Range
 Upper Quartile

Location & Plot Data:
 Input Lat/Lon: 21.31 S 184.91 E
 Grid Lat/Lon: 21.46 S 175.54 W
 Data points: 876
 Bins: 80
 Bin Width: 0.1 m

Statistical Information:
 Max: 7.1 m
 75th Percentile: 2.6 m
 Mean: 2.3 m
 25th Percentile: 1.9 m
 Min: 1.3 m

10 highest tides for 2023 10 lowest tides for 2023

Date	Time	Height (m)	Date	Time	Height (m)
23-Jan	20:44	1.9	03-Aug	14:40	0.2
22-Jan	19:47	1.89	04-Aug	15:31	0.21
21-Feb	20:27	1.88	02-Aug	13:49	0.22
24-Jan	21:39	1.88	01-Sep	14:18	0.22
20-Feb	19:31	1.88	05-Jul	15:00	0.22
22-Feb	21:21	1.86	06-Jul	15:51	0.23
21-Jan	18:50	1.85	31-Aug	13:28	0.24
19-Feb	18:34	1.84	02-Sep	15:09	0.25
25-Jan	22:34	1.83	05-Aug	16:23	0.25
23-Feb	9:55	1.83	04-Jul	14:08	0.25

Coral bleaching status for Tonga is under alert level 2 about north of Tongatapu waters as seen above. 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.

Nuku'alofoa wave climate for the month of February 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 February is 2.3 m with the possibility of waves reaching as high as 7.1m.

2023 Tidal predictions show the highest tides of the year for Nuku'alofoa. The highest and lowest tide coming up on the 21st February with a height of 1.88m. and 0.31m on the the same day. 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.