

# Pacific Islands - Ocean and Climate Outlook Forum (OCOF) No. 180

Country: Tonga

## Part 1: Recent climate

**TABLE 1: Monthly Rainfall**

Station (include data period)	Jun-2022	Jul-2022	Aug-2022				Rank
			Total (mm)	33%tile	67%tile	Median	
	Total (mm)	Total (mm)	Rainfall (mm)				
<b>Northern Division</b>							
Niuafo'ou (1971-2022)	74.5	83.0	93.0	63.0	126.7	91.0	26/50
Niutoputapu (1947-2022)	62.5	92.0	104.0	53.2	104.3	77.0	50/75
<b>Central Division</b>							
Vava'u (1947-2022)	59.9	74.7	105.9	61.7	127.0	87.5	43/76
Ha'apai (1947-2022)	18.5	21.0	32.0	61.0	118.3	85.8	12/76
<b>Southern Division</b>							
Fua'amotu (1979-2022)	32.2	22.5	91.6	68.5	135.6	92.5	22/43
Nuku'alofa (1944-2022)	36.5	20.5	24.5	63.7	137.6	100.0	5/78

**TABLE 2: Three-month Total Rainfall for June to August 2022**

Station	Three-month Total		33%tile	67%tile	Median	Rank
	Rainfall (mm)					
<b>Northern Division</b>						
Niuafo'ou (1971-2022)	250.5	Below normal	276.0	421.0	372.6	13/47
Niutoputapu (1947-2022)	258.5	Normal	247.3	373.6	319.0	29/75
<b>Central Division</b>						
Vava'u (1947-2022)	240.5	Below normal	250.3	354.3	309.5	24/76
Ha'apai (1947-2022)	71.5	Below normal	202.3	316.0	278.4	8/76
<b>Southern Division</b>						
Fua'amotu (1979-2022)	146.3	Below normal	299.7	401.7	351.0	3/43
Nuku'alofa (1944-2022)	81.5	Below normal	240.0	374.9	298.1	3/78

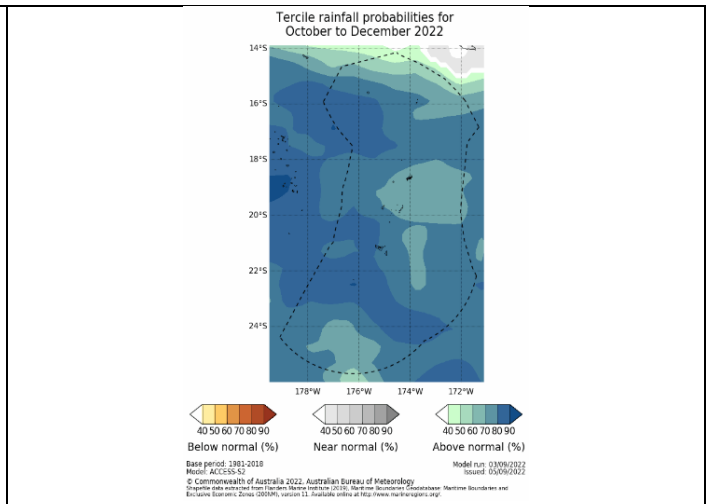
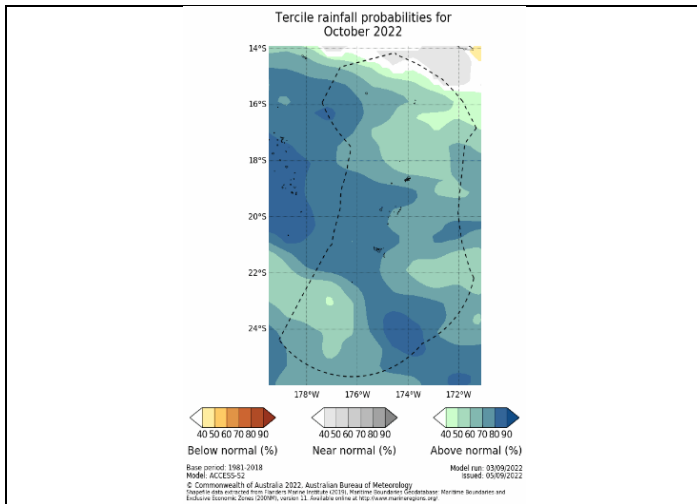
## Part 1i. Monthly and Seasonal Outlooks for October and October to December 2022

<b>Monthly: October</b>	<b>Seasonal: October to December</b>
Rainfall (Image 1)	Rainfall (Image 2)

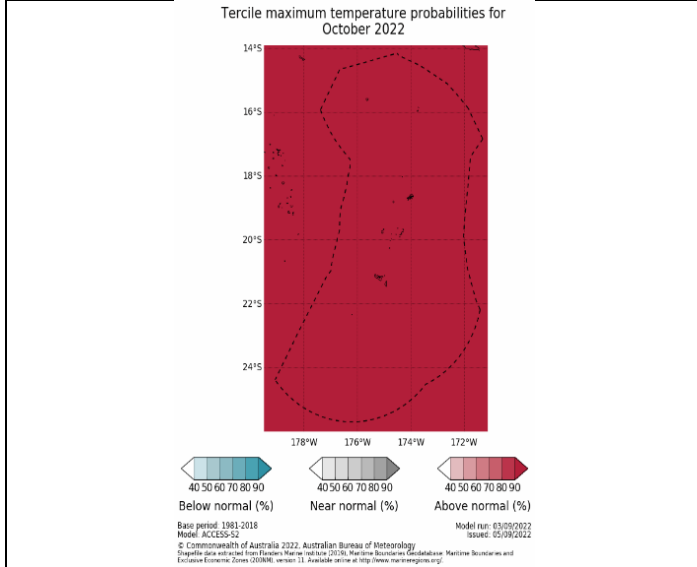
NB: The X LEPS % score has been categorised as follows:

Very Low:  $X < 0.0$       Low:  $0 \leq X < 5$       Moderate  $5 \leq X < 10$       Good:  $10 \leq X < 15$       High:  $15 \leq X < 25$

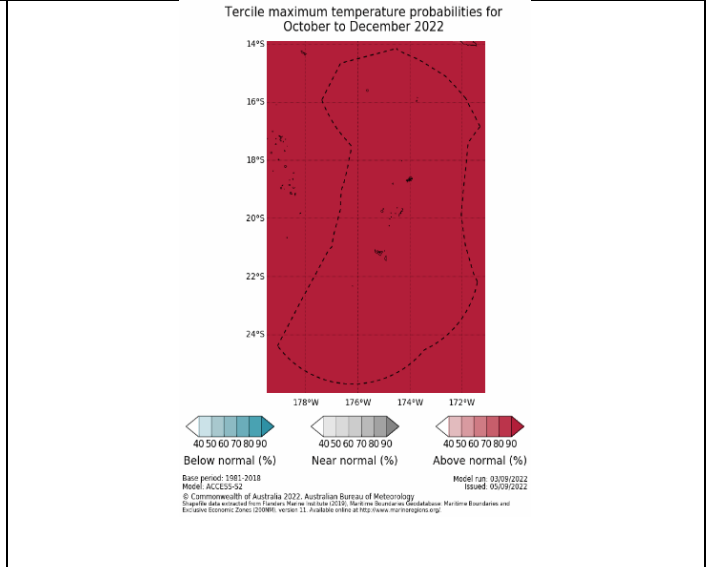
Very High:  $25 \leq X < 35$       Exceptional:  $X \geq 35$



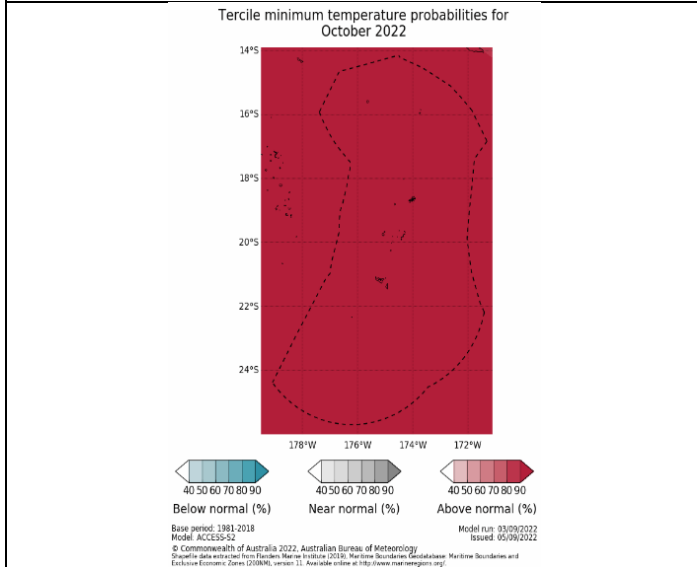
**Monthly Maximum temperature (Image 3):**



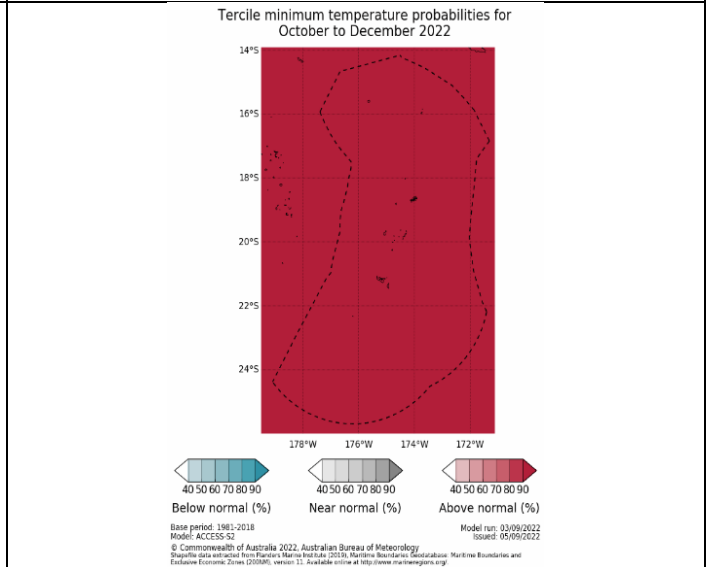
**Seasonal maximum temperature (Image 4):**



**Monthly minimum temperature (Image 5):**



**Seasonal minimum temperature (Image 6):**



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Moderate  $5 \leq X < 10$

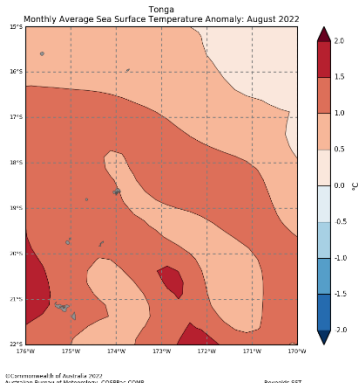
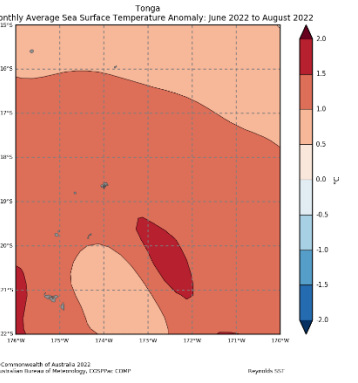
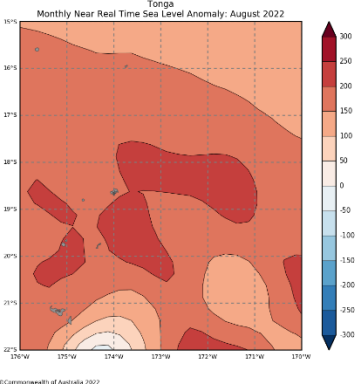
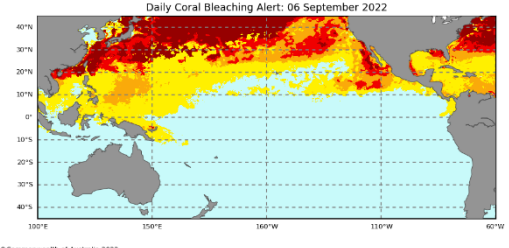
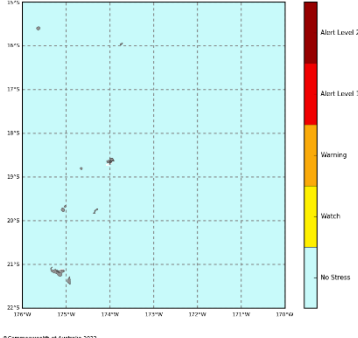
Good:  $10 \leq X < 15$

High:  $15 \leq X < 25$

Very High:  $25 \leq X < 35$  Exceptional:  $X \geq 35$

# Part 2: Recent Ocean Observation

## Monthly/Three months: August 2022 and June to August 2022

Monthly: August	Last three months: June to August 2022:
<p><b>Sea Surface Temperature (Image 1):</b></p>  <p>Tonga Monthly Average Sea Surface Temperature Anomaly: August 2022</p> <p>© Commonwealth of Australia 2022 Australian Bureau of Meteorology, COSPPac, COMF</p> <p>Reynolds SST</p>	<p><b>Sea Surface Temperature (Image 4):</b></p>  <p>Tonga 3 monthly Average Sea Surface Temperature Anomaly: June 2022 to August 2022</p> <p>© Commonwealth of Australia 2022 Australian Bureau of Meteorology, EXOOPac, COMF</p> <p>Reynolds SST</p>
<p><b>Sea level (Image 2):</b></p>  <p>Tonga Monthly Near Real Time Sea Level Anomaly: August 2022</p> <p>© Commonwealth of Australia 2022 Australian Bureau of Meteorology, COSPPac, COMF</p> <p>AVISO SeaLco Quasi SLA</p>	
<p><b>Daily coral bleaching alert (Image 3):</b></p>  <p>Pacific Ocean Daily Coral Bleaching Alert: 06 September 2022</p> <p>© Commonwealth of Australia 2022 Australian Bureau of Meteorology, COSPPac, COMF</p> <p>NOAA Coral Reef Watch</p>	 <p>Tonga Daily Coral Bleaching Alert: 06 September 2022</p> <p>© Commonwealth of Australia 2022 Australian Bureau of Meteorology, COSPPac, COMF</p> <p>NOAA Coral Reef Watch</p>

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Very High:  $25 \leq X < 35$  Exceptional:  $X \geq 35$

# Part 2i. Monthly and Seasonal Outlooks for October and October to December 2022

Monthly: October	Seasonal: October to December
<p><b>Monthly sea surface temperature (Image 5):</b></p> <p>Difference from average sea surface temperature forecast for October 2022</p> <p>Base period: 1981-2018 Model: ACCESS-S2 © Commonwealth of Australia 2022, Australian Bureau of Meteorology Shapfile data extracted from Flinders Marine Institute (2019), Maritime Boundaries Geodatabase, Maritime Boundaries and Exclusive Economic Zones (200NM), version 11. Available online at <a href="http://www.maritimerregions.org/">http://www.maritimerregions.org/</a></p> <p>Model run: 10/09/2022 Issued: 12/09/2022</p>	<p><b>Seasonal sea surface temperature (Image 6):</b></p> <p>Difference from average sea surface temperature forecast for October to December 2022</p> <p>Base period: 1981-2018 Model: ACCESS-S2 © Commonwealth of Australia 2022, Australian Bureau of Meteorology Shapfile data extracted from Flinders Marine Institute (2019), Maritime Boundaries Geodatabase, Maritime Boundaries and Exclusive Economic Zones (200NM), version 11. Available online at <a href="http://www.maritimerregions.org/">http://www.maritimerregions.org/</a></p> <p>Model run: 10/09/2022 Issued: 12/09/2022</p>
<p><b>Monthly sea level (Image 7):</b></p> <p>Difference from average sea surface height forecast for October 2022</p> <p>© Commonwealth of Australia 2022 Bureau of Meteorology</p> <p>Model: ACCESS-S2 Base Period: 1981-2018</p> <p>Model Run: 28/08/2022 Issued: 06/09/2022</p>	<p><b>Seasonal sea level (Image 8):</b></p> <p>Difference from average sea surface height forecast for October 2022 to December 2022</p> <p>© Commonwealth of Australia 2022 Bureau of Meteorology</p> <p>Model: ACCESS-S2 Base Period: 1981-2018</p> <p>Model Run: 28/08/2022 Issued: 06/09/2022</p>
<p><b>4-week Coral Bleaching (Image 9):</b></p> <p>Pacific Ocean 4 Weeks Coral Bleaching Outlook: 02 October 2022</p> <p>© Commonwealth of Australia 2022 Australian Bureau of Meteorology, COSPPac COMP</p> <p>NOAA Coral Reef Watch</p>	

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## Summary Statement

### Monthly and last three months: August 2022/June to August 2022 statement

For August, below normal rainfall was recorded in Ha'apai and Nuku'alofa, while at Fua'amotu, Vava'u and the Northern Division, rainfall was normal. Nuku'alofa recorded its fifth lowest August rainfall on record.

For June to August, normal rainfall was recorded in Niuatoputapu, but below normal rainfall was recorded for the rest of the country. Fua'amotu and Nuku'alofa recorded their third lowest June to August rainfall on record.

## Part 1i. Monthly and Seasonal Outlooks for October and October to December 2022

### Monthly /Seasonal rainfall and temperature Outlook statements

The monthly October outlook and the seasonal October to December outlook for Tonga show rainfall is very likely to be above normal across the whole country.

Maximum and minimum temperatures for Tonga for October and October to December are very likely to be above normal.

## Part 2: Recent Ocean summary statement

### Monthly and last three months: August/June to August 2022

Majority of Tonga experienced above average sea surface temperature anomalies ranging from 0.5° to 2.0°C for August and the last three months.

The sea level anomaly for August was above average from 100mm to 250mm.

Coral bleaching alert status reveals no thermal stress.

## Part 2i. Monthly and Seasonal Outlooks for October and October to December 2022

The monthly and seasonal SST outlooks for Tonga forecast SSTs of 0.8-2.0 degrees Celsius above average for October and October to December.

The monthly and seasonal sea surface height outlooks forecast near-normal sea surface heights in northern Tonga, and above normal sea surface heights of 100mm to 200mm over Tongatapu, Ha'apai and Vava'u. In addition, the southern EEZ of Tonga is forecast to have sea levels ranging from -60mm to -200mm below normal.

Coral bleaching outlook for Tonga reveals no thermal stress.

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**TABLE 3: Stakeholder Engagement- Evaluations of how effective NMS engage with stakeholders**

Product	Date: August 2022	Stakeholder	Total Number of Participants	Number of male	Number of female
Climate Bulletin	3 August	Government ministries, NGOs,Media. Private sectors	155	118	37
EAR Watch					
Monthly Climate Briefing					
Ocean Outlook	3 August	Government ministries, NGOs,Media. Private sectors	155	118	37
Climate data request					
<b>Total</b>			<b>310</b>	<b>236</b>	<b>74</b>

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