

# Pacific Islands - Ocean and Climate Outlook Forum (OCOF) No. 177

Country: Tonga

## Part 1: Recent climate

**TABLE 1: Monthly Rainfall**

Station (include data period)	Mar-2022	Apr-2022	May-2022				
			Total (mm)	33%tile	67%tile	Median	Rank
	Total (mm)	Total (mm)	Rainfall (mm)				
Northern Division							
Niuafo'ou (1971-2022)	161.1	142.4	102.7	136.3	214.0	163.0	11/51
Niutoputapu (1947-2022)	138.5	69.0	120.0	127.0	185.0	152.0	23/72
Central Division							
Vava'u (1947-2022)	285.5	346.9	79.1	101.1	195.7	142.0	21/76
Ha'apai (1947-2022)	420.5	206.4	72.8	68.0	136.0	94.0	30/75
Southern Division							
Fua'amotu (1979-2022)	594.0	276.1	22.3	73.8	174.1	125.0	1/42
Nuku'alofa (1944-2022)	384.0	300.5	29.0	68.4	139.3	95.5	8/78

**TABLE 2: Three-month Total Rainfall for March to May 2022**

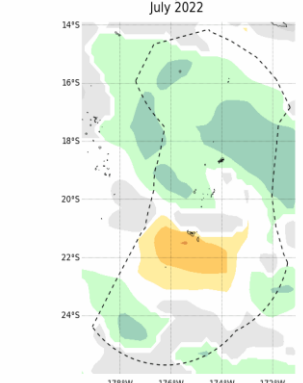
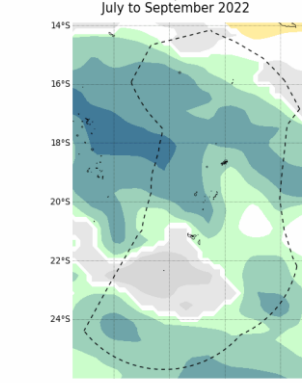
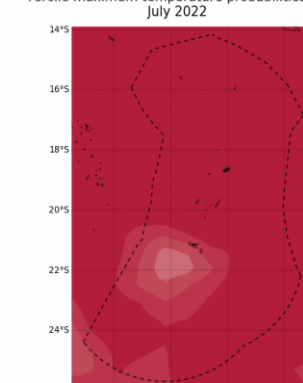
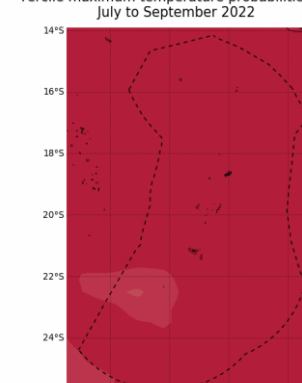
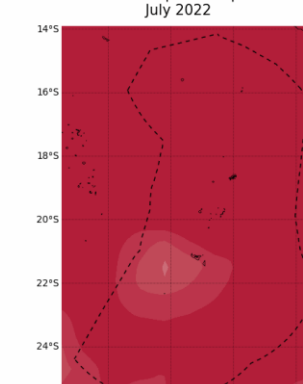
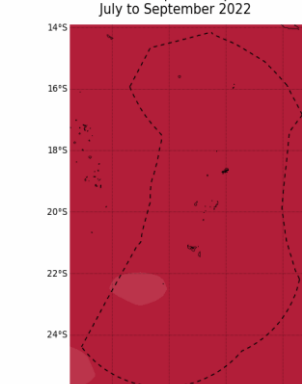
Station	Three-month Total		33%tile	67%tile	Median	Rank
	Rainfall (mm)					
Northern Division						
Niuafo'ou (1971-2022)	406.2	Below normal	642.2	801.1	758.0	4/49
Niutoputapu (1947-2022)	327.5	Below normal	568.7	743.2	630.0	4/67
Vava'u (1947-2022)	711.5	Normal	591.3	790.0	707.0	40/76
Ha'apai (1947-2022)	699.7	Above normal	444.4	647.7	559.0	60/75
Southern Division						
Fua'amotu (1979-2022)	892.4	Above normal	435.0	618.3	536.6	38/42
Nuku'alofa (1944-2022)	713.5	Above normal	453.2	599.0	516.0	68/77

**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:  $X \geq 35$

## Part 1i. Monthly and Seasonal Outlooks for July and July to September 2022

Monthly: July	Seasonal: July to September
Rainfall (Image 1)	Rainfall (Image 2)
<p>Tercile rainfall probabilities for July 2022</p>  <p>Base period: 1981-2018 Model: ACCESS-S2 © Commonwealth of Australia 2022, Australian Bureau of Meteorology Shapefile data extracted from Randers-Nielsen Institute (2013), Maritime Boundaries Geodatabase: Maritime Boundaries and Exclusive Economic Zones (EEXZs), version 11. Available online at <a href="http://www.maritimesg.org">http://www.maritimesg.org</a></p> <p>Model run: 30/05/2022 Issued: 02/06/2022</p>	<p>Tercile rainfall probabilities for July to September 2022</p>  <p>Base period: 1981-2018 Model: ACCESS-S2 © Commonwealth of Australia 2022, Australian Bureau of Meteorology Shapefile data extracted from Randers-Nielsen Institute (2013), Maritime Boundaries Geodatabase: Maritime Boundaries and Exclusive Economic Zones (EEXZs), version 11. Available online at <a href="http://www.maritimesg.org">http://www.maritimesg.org</a></p> <p>Model run: 30/05/2022 Issued: 02/06/2022</p>
Monthly Maximum temperature (Image 3):	Seasonal maximum temperature (Image 4):
<p>Tercile maximum temperature probabilities for July 2022</p>  <p>Base period: 1981-2018 Model: ACCESS-S2 © Commonwealth of Australia 2022, Australian Bureau of Meteorology Shapefile data extracted from Randers-Nielsen Institute (2013), Maritime Boundaries Geodatabase: Maritime Boundaries and Exclusive Economic Zones (EEXZs), version 11. Available online at <a href="http://www.maritimesg.org">http://www.maritimesg.org</a></p> <p>Model run: 30/05/2022 Issued: 02/06/2022</p>	<p>Tercile maximum temperature probabilities for July to September 2022</p>  <p>Base period: 1981-2018 Model: ACCESS-S2 © Commonwealth of Australia 2022, Australian Bureau of Meteorology Shapefile data extracted from Randers-Nielsen Institute (2013), Maritime Boundaries Geodatabase: Maritime Boundaries and Exclusive Economic Zones (EEXZs), version 11. Available online at <a href="http://www.maritimesg.org">http://www.maritimesg.org</a></p> <p>Model run: 30/05/2022 Issued: 02/06/2022</p>
Monthly minimum temperature (Image 5):	Seasonal minimum temperature (Image 6):
<p>Tercile minimum temperature probabilities for July 2022</p>  <p>Base period: 1981-2018 Model: ACCESS-S2 © Commonwealth of Australia 2022, Australian Bureau of Meteorology Shapefile data extracted from Randers-Nielsen Institute (2013), Maritime Boundaries Geodatabase: Maritime Boundaries and Exclusive Economic Zones (EEXZs), version 11. Available online at <a href="http://www.maritimesg.org">http://www.maritimesg.org</a></p> <p>Model run: 30/05/2022 Issued: 02/06/2022</p>	<p>Tercile minimum temperature probabilities for July to September 2022</p>  <p>Base period: 1981-2018 Model: ACCESS-S2 © Commonwealth of Australia 2022, Australian Bureau of Meteorology Shapefile data extracted from Randers-Nielsen Institute (2013), Maritime Boundaries Geodatabase: Maritime Boundaries and Exclusive Economic Zones (EEXZs), version 11. Available online at <a href="http://www.maritimesg.org">http://www.maritimesg.org</a></p> <p>Model run: 30/05/2022 Issued: 02/06/2022</p>

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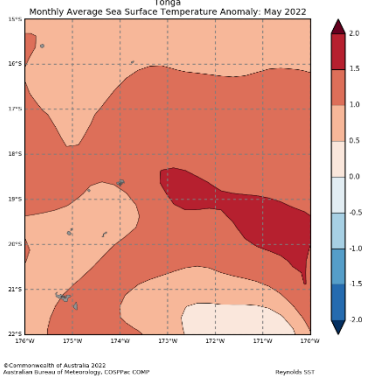
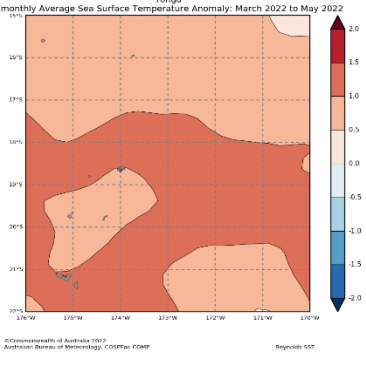
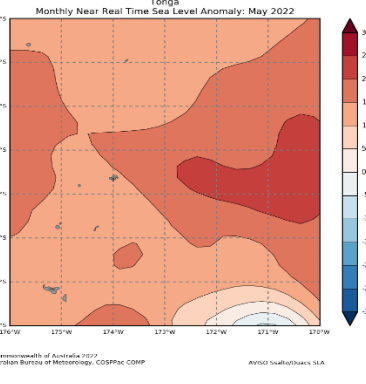
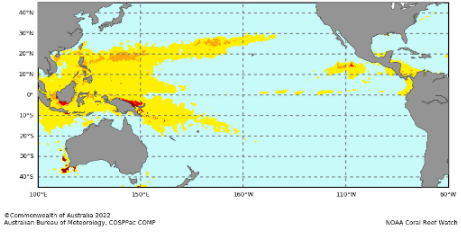
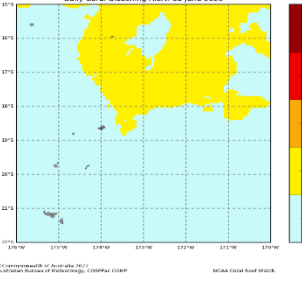
Good:  $10 \leq X < 15$

High:  $15 \leq X < 25$

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

Part 2: Recent Ocean summary statement

Monthly: May 2022

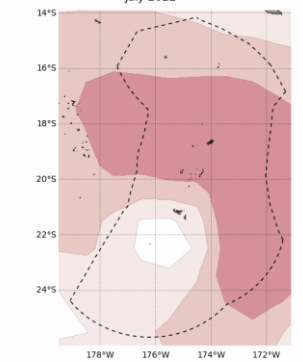
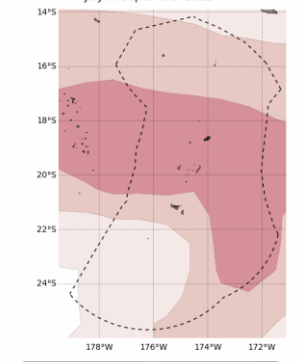
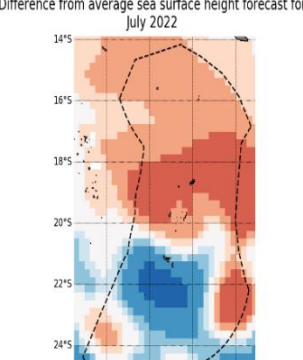
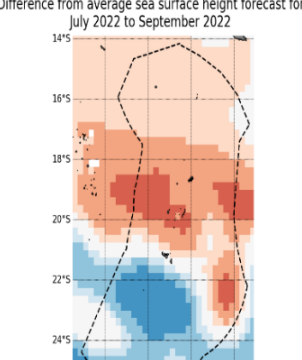
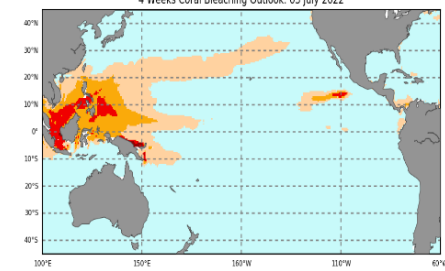
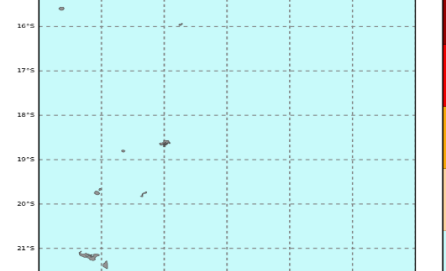
Monthly: May	Last three months: March to May 2022:
Sea Surface Temperature (Image 1): <div></div>	Sea Surface Temperature (Image 4): <div></div>
Sea level (Image 2): <div></div>	
Daily coral bleaching alert (Image 3): <div></div>	<div></div>

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## Part 2i. Monthly and Seasonal Outlooks for July and July to September 2022

Monthly: July	Seasonal: July to September
Monthly sea surface temperature (Image 5):	Seasonal sea surface temperature (Image 6):
<p>Difference from average sea surface temperature forecast for July 2022</p>  <p>Base period: 1981-2018 Model: ACCESS-S2 © Commonwealth of Australia 2022, Australian Bureau of Meteorology Geographic data extracted from Standard Marine Elevation (SME) (2019). Maritime Boundary Geodatabase: Maritime Boundaries and Exclusive Economic Zones (2008), version 11. Available online at <a href="http://www.maritime.gov.au">http://www.maritime.gov.au</a></p> <p>Model run: 11/06/2022 Issued: 13/06/2022</p>	<p>Difference from average sea surface temperature forecast for July to September 2022</p>  <p>Base period: 1981-2018 Model: ACCESS-S2 © Commonwealth of Australia 2022, Australian Bureau of Meteorology Geographic data extracted from Standard Marine Elevation (SME) (2019). Maritime Boundary Geodatabase: Maritime Boundaries and Exclusive Economic Zones (2008), version 11. Available online at <a href="http://www.maritime.gov.au">http://www.maritime.gov.au</a></p> <p>Model run: 11/06/2022 Issued: 13/06/2022</p>
Monthly sea level (Image 7):	Seasonal sea level (Image 8):
<p>Difference from average sea surface height forecast for July 2022</p>  <p>© Commonwealth of Australia 2022 Bureau of Meteorology</p> <p>Model: ACCESS-S2 Base Period: 1981-2018</p> <p>Model Run: 28/05/2022 Issued: 07/06/2022</p>	<p>Difference from average sea surface height forecast for July 2022 to September 2022</p>  <p>© Commonwealth of Australia 2022 Bureau of Meteorology</p> <p>Model: ACCESS-S2 Base Period: 1981-2018</p> <p>Model Run: 28/05/2022 Issued: 07/06/2022</p>
4-week Coral Bleaching (Image 9):	
<p>Pacific Ocean 4 Weeks Coral Bleaching Outlook: 03 July 2022</p>  <p>© Commonwealth of Australia 2022 Australian Bureau of Meteorology, COSPac COMP</p> <p>NOAA Coral Reef Watch</p>	<p>Tonga 4 Weeks Coral Bleaching Outlook: 03 July 2022</p>  <p>© Commonwealth of Australia 2022 Australian Bureau of Meteorology, COSPac COMP</p> <p>NOAA Coral Reef Watch</p>

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## Summary Statement

### **Monthly and last three months: May 2022/March to May 2022 statement (Highly significant changes)**

*For May, normal Rainfall was recorded in Ha'apai, below Normal Rainfall was recorded for the rest of the country. Fua'amotu recorded the lowest May rainfall on record.*

*For March to May, above normal rainfall was recorded in Ha'apai, Fua'amotu and Nuku'alofa. Near normal rainfall at Vava'u while below normal rainfall was recorded in Niuafo'ou and Niuatoputapu. Niuafo'ou and Niuatoputapu recorded its fourth lowest rainfall while Fua'amotu recorded its fifth wettest March to May on record.*

## Part 1i. Monthly and Seasonal Outlooks for July and July to September 2022

### **Monthly /Seasonal rainfall and temperature Outlook statements (Highly significant changes)**

*The rainfall outlook for Tonga for July and July to September period is likely to be above normal except for Fua'amotu and Nuku'alofa with likely below normal rainfall in July. The outlook for Fua'amotu and Nuku'alofa in the southern division for the period of July to September likely to be near normal. The temperature outlook for Tonga is very likely to be above normal for both July and July to September.*

## Part 2: Recent Ocean summary statement

### **Monthly and last three months: May/March to May 2022 (Highly significant changes)**

Tonga experienced above average SSTs in May and March to May of 0.5-1.5 degrees Celsius.

The sea level anomaly for May revealed above average sea surface heights of 100-150 mm for Tonga.

Coral bleaching alert status is 'Watch' for northern Tonga with rest of Tonga waters experiencing no thermal stress.

## Part 2i. Monthly and Seasonal Outlooks for July and July to September 2022

The monthly SST outlook for Tonga is forecasted to likely be above normal with SST differences of 0.8-2.0 degrees Celsius for Ha'apai and Vava'u group with normal SST for Tongatapu. The seasonal SST outlook for July to September is forecasted for all of Tonga to be above average with SST differences of 0.8-2.0 degrees Celsius.

The monthly sea surface height outlook for July is forecasted to have below average sea surface height differences of -60 to -100 mm at Tongatapu, with Ha'apai and Vava'u group forecasted to be above average with 60 – 200 mm. The seasonal sea surface height outlook for July to September is forecasted to be normal for Tongatapu and northern Tonga, with above average sea surface height differences for Ha'apai and Vava'u ranging from 60 – 200 mm.

Coral bleaching outlook for Tonga is "No Stress" status.

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

Product	Date: May 2022	Stakeholder	Total Number of Participants	Number of male	Number of female
Climate Bulletin	3 May	Government ministries, NGOs,Media, Private sectors	155	118	37
EAR Watch					
Monthly Climate Briefing					
Ocean Outlook	3 May	Government ministries, NGOs,Media, Private sectors	155	118	37
Climate data request					
<b>Total</b>			<b>156</b>	<b>236</b>	<b>74</b>

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