

Pacific Islands - Ocean and Climate Outlook Forum (OCOF) No. 197

Country: Tonga

Part 1: Recent climate

TABLE 1: Monthly Rainfall

Station (include data period)	Nov-2023	Dec-2023	Jan-2024				Rank
	Total (mm)	Total (mm)	Total (mm)	33%tile	67%tile	Median	
			Rainfall (mm)				
<i>Northern Division</i>							
Niuafo'ou (1971-2024)	89.5	211.5	138.0	210.0	362.0	245.0	12/50
Niuaatoputapu (1947-2024)	65.5	138.5	175.0	212.0	296.0	243.0	19/77
<i>Central Division</i>							
Vava'u (1947-2024)	83.9	136.0	277.5	173.0	314.9	241.5	47/78
Ha'apai (1947-2024)	74.5	63.1	195.4	123.7	255.9	202.5	38/78
<i>Southern Division</i>							
Fua'amotu (1979-2024)	165.8	75.3	625.1	132.3	293.4	199.7	45/45
Nuku'alofa (1944-2024)	135.5	44.0	464.5	128.3	256.7	197.5	74/80

TABLE 2: Three-month Total Rainfall for November 2023 to January 2024

Station	Three-month Total		33%tile	67%tile	Median	Rank
	Rainfall (mm)					
<i>Northern Division</i>						
Niuafo'ou (1971-2024)	439.0	Below normal	696.6	965.3	798.0	6/46
Niuaatoputapu (1947-2024)	379.0	Below normal	597.3	847.3	748.0	7/72
<i>Central Division</i>						
Vava'u (1947-2024)	497.4	Normal	465.8	816.0	650.0	28/77
Ha'apai (1947-2024)	333.0	Normal	323.7	571.2	459.0	27/77
<i>Southern Division</i>						
Fua'amotu (1979-2024)	866.2	Above normal	392.0	623.2	479.1	40/44
Nuku'alofa (1944-2024)	644.0	Above normal	317.0	572.0	435.7	61/80

Part 1i. Monthly and Seasonal Outlooks for March and March to May 2024

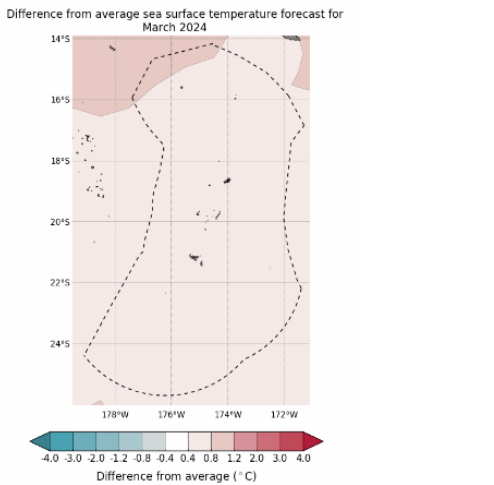
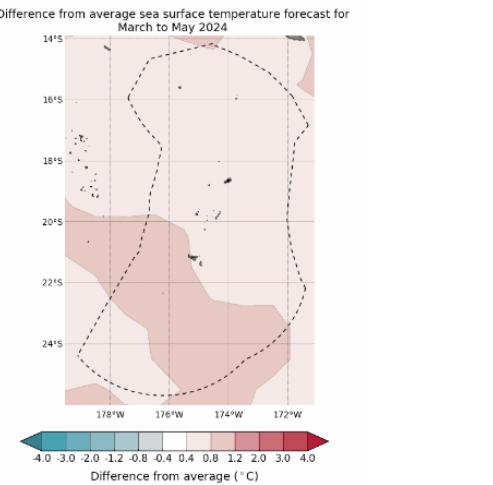
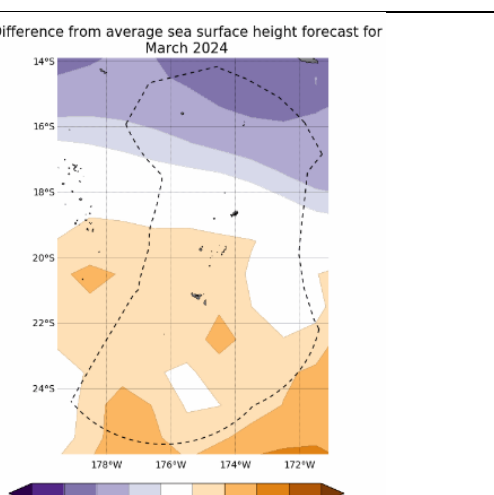
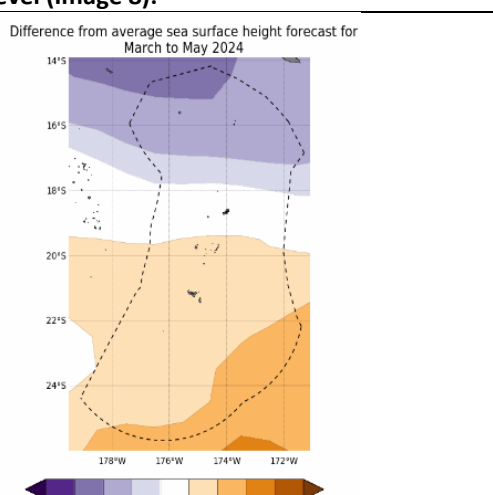
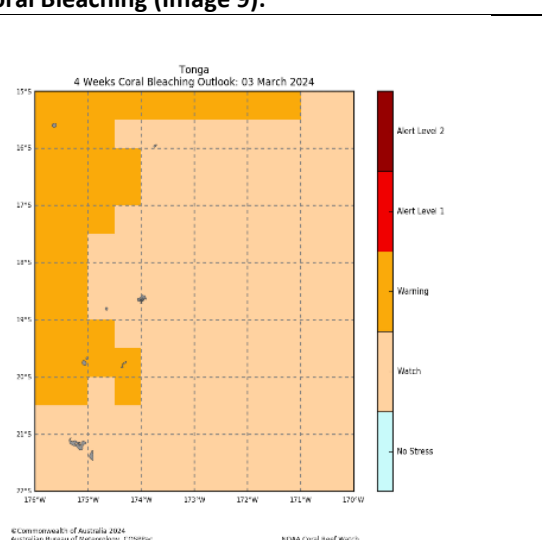
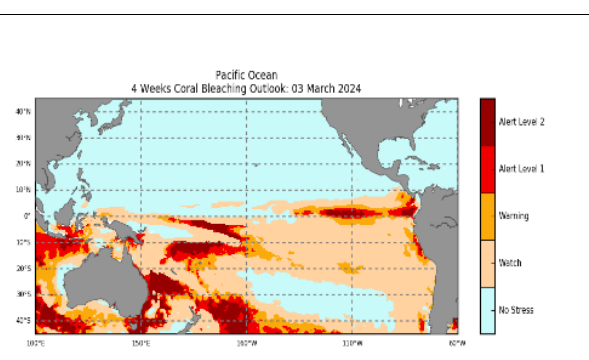
Monthly: March	Seasonal: March to May
<p>Rainfall (Image 1)</p> <p>Tercile rainfall probabilities for March 2024</p> <p>Below normal (%) Near normal (%) Above normal (%)</p> <p>Base period: 1981-2018 Model: ACCESS-S2 © Commonwealth of Australia 2024, Australian Bureau of Meteorology Shapefile data extracted from Flower's Marine (2019), Marine Boundaries Geodatabase, Maritime Boundaries and Exclusive Economic Zones (2004), version 11. Available online at http://www.met.gov.au/maritime</p> <p>Model run: 05/02/2024 Issued: 07/02/2024</p>	<p>Rainfall (Image 2)</p> <p>Tercile rainfall probabilities for March to May 2024</p> <p>Below normal (%) Near normal (%) Above normal (%)</p> <p>Base period: 1981-2018 Model: ACCESS-S2 © Commonwealth of Australia 2024, Australian Bureau of Meteorology Shapefile data extracted from Flower's Marine (2019), Marine Boundaries Geodatabase, Maritime Boundaries and Exclusive Economic Zones (2004), version 11. Available online at http://www.met.gov.au/maritime</p> <p>Model run: 05/02/2024 Issued: 07/02/2024</p>
<p>Monthly Maximum temperature (Image 3):</p>	<p>Seasonal maximum temperature (Image 4):</p>
<p>Tercile maximum temperature probabilities for March 2024</p> <p>Below normal (%) Near normal (%) Above normal (%)</p> <p>Base period: 1981-2018 Model: ACCESS-S2 © Commonwealth of Australia 2024, Australian Bureau of Meteorology Shapefile data extracted from Flower's Marine (2019), Marine Boundaries Geodatabase, Maritime Boundaries and Exclusive Economic Zones (2004), version 11. Available online at http://www.met.gov.au/maritime</p> <p>Model run: 05/02/2024 Issued: 07/02/2024</p>	<p>Tercile maximum temperature probabilities for March to May 2024</p> <p>Below normal (%) Near normal (%) Above normal (%)</p> <p>Base period: 1981-2018 Model: ACCESS-S2 © Commonwealth of Australia 2024, Australian Bureau of Meteorology Shapefile data extracted from Flower's Marine (2019), Marine Boundaries Geodatabase, Maritime Boundaries and Exclusive Economic Zones (2004), version 11. Available online at http://www.met.gov.au/maritime</p> <p>Model run: 05/02/2024 Issued: 07/02/2024</p>
<p>Monthly minimum temperature (Image 5):</p>	<p>Seasonal minimum temperature (Image 6):</p>
<p>Tercile minimum temperature probabilities for March 2024</p> <p>Below normal (%) Near normal (%) Above normal (%)</p> <p>Base period: 1981-2018 Model: ACCESS-S2 © Commonwealth of Australia 2024, Australian Bureau of Meteorology Shapefile data extracted from Flower's Marine (2019), Marine Boundaries Geodatabase, Maritime Boundaries and Exclusive Economic Zones (2004), version 11. Available online at http://www.met.gov.au/maritime</p> <p>Model run: 05/02/2024 Issued: 07/02/2024</p>	<p>Tercile minimum temperature probabilities for March to May 2024</p> <p>Below normal (%) Near normal (%) Above normal (%)</p> <p>Base period: 1981-2018 Model: ACCESS-S2 © Commonwealth of Australia 2024, Australian Bureau of Meteorology Shapefile data extracted from Flower's Marine (2019), Marine Boundaries Geodatabase, Maritime Boundaries and Exclusive Economic Zones (2004), version 11. Available online at http://www.met.gov.au/maritime</p> <p>Model run: 05/02/2024 Issued: 07/02/2024</p>

Part 2: Recent Ocean Observation

Monthly/Three months: January 2024 and November 2023 to January 2024

Monthly: January 2024	Last three months: November 2023 to January 2024:
<p>Sea Surface Temperature (Image 1):</p> <p>Tonga Monthly Average Sea Surface Temperature Anomaly: January 2024</p> <p>© Commonwealth of Australia 2024 Australian Bureau of Meteorology, CSIRO</p>	<p>Sea Surface Temperature (Image 4):</p> <p>Tonga 3 monthly Average Sea Surface Temperature Anomaly: November 2023 to January 2024</p> <p>© Commonwealth of Australia 2024 Australian Bureau of Meteorology, CSIRO</p>
<p>Sea level (Image 2):</p> <p>Tonga Monthly Near Real Time Sea Level Anomaly: January 2024</p> <p>© Commonwealth of Australia 2024 Australian Bureau of Meteorology, CSIRO</p> <p>NOAA Earth Observing System</p>	
<p>Daily coral bleaching alert (Image 3):</p> <p>Tonga Daily Coral Bleaching Alert: 07 February 2024</p> <p>© Commonwealth of Australia 2024 Australian Bureau of Meteorology, CSIRO</p> <p>NOAA Coral Reef Watch</p>	<p>Pacific Ocean Daily Coral Bleaching Alert: 07 February 2024</p> <p>© Commonwealth of Australia 2024 Australian Bureau of Meteorology, CSIRO</p> <p>NOAA Coral Reef Watch</p>

Part 2i. Monthly and Seasonal Outlooks for March and March to May 2024

Monthly: March	Seasonal: March to May
<p>Monthly sea surface temperature (Image 5):</p>  <p>Difference from average sea surface temperature forecast for March 2024</p> <p>Base period: 1981-2018 Model: ACCESS-S2 © Commonwealth of Australia 2024. Australian Bureau of Meteorology Specific data extracted from Fisheries Marine Hydrology (2023), Marine Boundaries, Geostatic, Marine Boundaries and Exclusive Economic Zone (2008), version 1. Available online at http://www.marine.gov.au</p> <p>Model run: 05/02/2024 Issued: 07/02/2024</p>	<p>Seasonal sea surface temperature (Image 6):</p>  <p>Difference from average sea surface temperature forecast for March to May 2024</p> <p>Base period: 1981-2018 Model: ACCESS-S2 © Commonwealth of Australia 2024. Australian Bureau of Meteorology Specific data extracted from Fisheries Marine Hydrology (2023), Marine Boundaries, Geostatic, Marine Boundaries and Exclusive Economic Zone (2008), version 1. Available online at http://www.marine.gov.au</p> <p>Model run: 05/02/2024 Issued: 07/02/2024</p>
<p>Monthly sea level (Image 7):</p>  <p>Difference from average sea surface height forecast for March 2024</p> <p>Base period: 1981-2018 Model: ACCESS-S2 © Commonwealth of Australia 2024. Australian Bureau of Meteorology Specific data extracted from Fisheries Marine Hydrology (2023), Marine Boundaries, Geostatic, Marine Boundaries and Exclusive Economic Zone (2008), version 1. Available online at http://www.marine.gov.au</p> <p>Model run: 05/02/2024 Issued: 07/02/2024</p>	<p>Seasonal sea level (Image 8):</p>  <p>Difference from average sea surface height forecast for March to May 2024</p> <p>Base period: 1981-2018 Model: ACCESS-S2 © Commonwealth of Australia 2024. Australian Bureau of Meteorology Specific data extracted from Fisheries Marine Hydrology (2023), Marine Boundaries, Geostatic, Marine Boundaries and Exclusive Economic Zone (2008), version 1. Available online at http://www.marine.gov.au</p> <p>Model run: 05/02/2024 Issued: 07/02/2024</p>
<p>4-week Coral Bleaching (Image 9):</p>  <p>Tonga 4 Weeks Coral Bleaching Outlook: 03 March 2024</p> <p>Alert Level 2 Alert Level 1 Warning Watch No Stress</p> <p>© Commonwealth of Australia 2024 Australian Bureau of Meteorology, CO2Pac NOAA Coral Reef Watch</p>	 <p>Pacific Ocean 4 Weeks Coral Bleaching Outlook: 03 March 2024</p> <p>Alert Level 2 Alert Level 1 Warning Watch No Stress</p> <p>© Commonwealth of Australia 2024 Australian Bureau of Meteorology, CO2Pac NOAA Coral Reef Watch</p>

Summary Statement

Monthly and last three months: January 2024/November 2023 to January 2024 statement

January 2024 rainfall was above normal recorded at Fua'amotu and Nuku'alofa, normal rainfall was recorded at Vava'u and Ha'apai, while below normal rainfall was recorded at Niuafou'ou and Niuatoputapu. Fua'amotu recorded its highest while Nuku'alofa recorded its seventh highest January rainfall.

November 2023 to January 2024 rainfall was above normal for Fua'amotu and Nuku'alofa, normal at Ha'apai and Vava'u, while below normal Niuatoputapu and Niuafou'ou. Fua'amotu had its fifth highest November to January rainfall on record.

Part 1i. Monthly and Seasonal Outlooks for March and March to May 2024

Monthly /Seasonal rainfall and temperature Outlook statements

The rainfall for Tonga in March offers little guidance as the chances of above-normal, normal and below-normal are similar. The outlook for parts of the northern, central and southern divisions is likely to be below -normal, while above-normal likely for parts of the central division.

The rainfall for March to May is likely to be below normal over Niuafou'ou and Vava'u while normal rainfall likely for Niuatoputapu. In Nuku'alofa and Fua'amotu the outlook offers little guidance for March to May's rainfall.

Maximum and minimum temperatures during March and are likely to be above normal over the Country.

Maximum and minimum temperatures averaged over March to May are very likely to be above normal over Tonga.

Part 2: Recent Ocean summary statement

Monthly and last three months: January 2024/November 2023 to January 2024

January ocean temperatures around Tonga were 0.5 to 1.5°C above normal.

Averaged over November to January, ocean temperatures around Tonga were 0.5 to 1.0°C above-normal.

January sea levels around Tonga were 50mm to 200mm above normal.

Coral bleaching alert reveals 'Warning' for Tonga.

Part 2i. Monthly and Seasonal Outlooks for March and March to May 2024

Ocean Variable statement

March ocean temperatures and average over March to May ocean temperatures around Tonga are predicted to be 0.4 to 1.2°C above normal.

March sea levels and averaged over March to May sea levels around Tonga are predicted to be 30mm to 100mm below normal for the Niuaus, and 30mm to 100mm above normal for Tongatapu and Ha'apai group.

The 4 week coral bleaching outlook to 3rd March 2024 shows 'Warning' for Niuatoputapu and Ha'apai and 'Watch' status for majority of Tonga.

IN BRIEF for Teleconference

- Rainfall for the past one and three months was below normal for northern division, normal for central division and above normal for southern division.
- The rainfall outlook for March and March to May generally indicates below normal likely for parts of the northern, central and southern divisions.
- SSTs were above normal for January and November to January. The outlook predicts above normal SSTs for the next one and three months.
Sea-surface heights (SSH) were above normal for January. The outlook predicts below normal for the Niuaus and above normal for Tongatapu and Ha'apai group.

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

Product	Date: January 2024	Stakeholder	Total Number of Participants	Number of Male	Number of Female	Comments (If there are comments from you Stakeholders)
Climate Bulletin	3 January	Government ministries, NGOs, Media, Private sector	155	118	37	
EAR Watch						
Monthly Climate Briefing						
Ocean Outlook	3 January	Government ministries, NGOs, Media, Private sectors	155	118	37	
Climate data request						
Total			310	236	74	