

Country: Cook Islands

Part 1: Recent climate

TABLE 1: Monthly Rainfall

Station (include data period)	Jul-2023	Aug-2023	Sep-2023				
			Total (mm)	33%tile	67%tile	Median	Rank
	Total (mm)	Total (mm)	Rainfall (mm)				
Penrhyn (1937-2023)	54.4	55.2	74.2	73.8	129.3	111.2	30/85
Rarotonga (1899-2023)	136.6	50.2	104.5	69.2	116.0	87.9	75/125

TABLE 2: Three-month Total Rainfall for July to September 2023

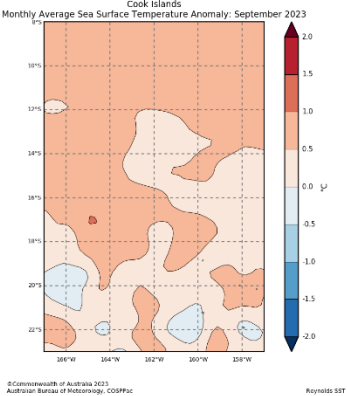
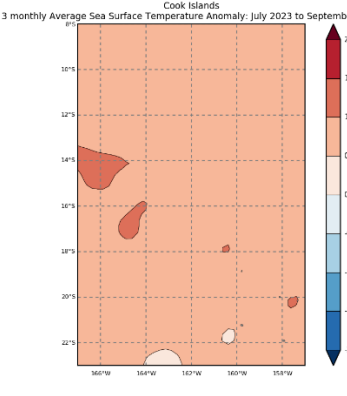
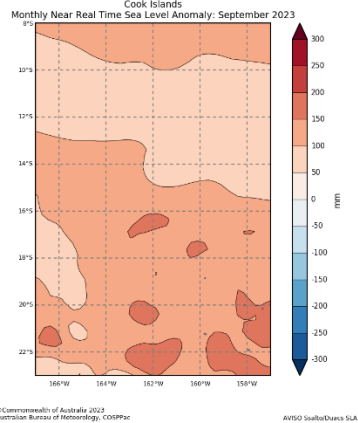
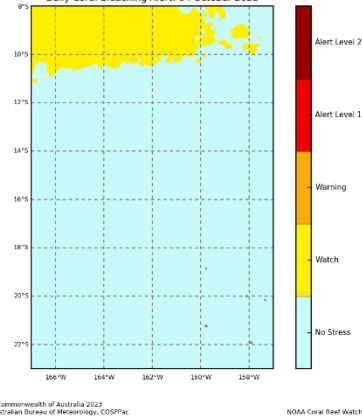
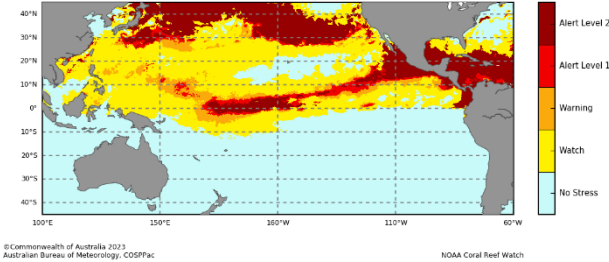
Station	Three-month Total		33%tile	67%tile	Median	Rank
	Rainfall (mm)					
Penrhyn (1937-2023)	183.8	Below normal	289.1	435.3	335.1	15/85
Rarotonga (1899-2023)	291.3	Normal	250.0	351.0	298.0	57/125

Part 1i. Monthly and Seasonal Outlooks for November and November 2023 to January 2024

Monthly: November	Seasonal: November to January
Rainfall (Image 1)	Rainfall (Image 2)
<p>Tercile rainfall probabilities for November 2023</p> <p>Base period: 1981-2018 Model: ACCESS-S2 © Commonwealth of Australia 2023, Australian Bureau of Meteorology Shapefile data extracted from Flinders Marine Institute (2019), Maritime Boundary Geodatabase: Maritime Boundaries and Exclusive Economic Zones (200NM), version 11. Available online at <a href="http://www.maritimeresources.gov.au/">http://www.maritimeresources.gov.au/</a></p>	<p>Tercile rainfall probabilities for November 2023 to January 2024</p> <p>Base period: 1981-2018 Model: ACCESS-S2 © Commonwealth of Australia 2023, Australian Bureau of Meteorology Shapefile data extracted from Flinders Marine Institute (2019), Maritime Boundary Geodatabase: Maritime Boundaries and Exclusive Economic Zones (200NM), version 11. Available online at <a href="http://www.maritimeresources.gov.au/">http://www.maritimeresources.gov.au/</a></p>
Monthly Maximum temperature (Image 3):	Seasonal maximum temperature (Image 4):
<p>Tercile maximum temperature probabilities for November 2023</p> <p>Base period: 1981-2018 Model: ACCESS-S2 © Commonwealth of Australia 2023, Australian Bureau of Meteorology Shapefile data extracted from Flinders Marine Institute (2019), Maritime Boundary Geodatabase: Maritime Boundaries and Exclusive Economic Zones (200NM), version 11. Available online at <a href="http://www.maritimeresources.gov.au/">http://www.maritimeresources.gov.au/</a></p>	<p>Tercile maximum temperature probabilities for November 2023 to January 2024</p> <p>Base period: 1981-2018 Model: ACCESS-S2 © Commonwealth of Australia 2023, Australian Bureau of Meteorology Shapefile data extracted from Flinders Marine Institute (2019), Maritime Boundary Geodatabase: Maritime Boundaries and Exclusive Economic Zones (200NM), version 11. Available online at <a href="http://www.maritimeresources.gov.au/">http://www.maritimeresources.gov.au/</a></p>
Monthly minimum temperature (Image 5):	Seasonal minimum temperature (Image 6):
<p>Tercile minimum temperature probabilities for November 2023</p> <p>Base period: 1981-2018 Model: ACCESS-S2 © Commonwealth of Australia 2023, Australian Bureau of Meteorology Shapefile data extracted from Flinders Marine Institute (2019), Maritime Boundary Geodatabase: Maritime Boundaries and Exclusive Economic Zones (200NM), version 11. Available online at <a href="http://www.maritimeresources.gov.au/">http://www.maritimeresources.gov.au/</a></p>	<p>Tercile minimum temperature probabilities for November 2023 to January 2024</p> <p>Base period: 1981-2018 Model: ACCESS-S2 © Commonwealth of Australia 2023, Australian Bureau of Meteorology Shapefile data extracted from Flinders Marine Institute (2019), Maritime Boundary Geodatabase: Maritime Boundaries and Exclusive Economic Zones (200NM), version 11. Available online at <a href="http://www.maritimeresources.gov.au/">http://www.maritimeresources.gov.au/</a></p>

Part 2: Recent Ocean Observation

Monthly/Three months: September and July to September 2023

Monthly: September		Last three months: July to September 2023:	
Sea Surface Temperature (Image 1):		Sea Surface Temperature (Image 4):	
<div><p>Cook Islands</p><p>Monthly Average Sea Surface Temperature Anomaly: September 2023</p><p>©Commonwealth of Australia 2023 Australian Bureau of Meteorology, COSPPac</p><p>Reynolds SST</p></div>		<div><p>Cook Islands</p><p>3 monthly Average Sea Surface Temperature Anomaly: July 2023 to September 2023</p><p>©Commonwealth of Australia 2023 Australian Bureau of Meteorology, COSPPac</p><p>Reynolds SST</p></div>	
Sea level (Image 2):			
<div><p>Cook Islands</p><p>Monthly Near Real Time Sea Level Anomaly: September 2023</p><p>©Commonwealth of Australia 2023 Australian Bureau of Meteorology, COSPPac</p><p>AVISO SwathBathy SLA</p></div>			
Daily coral bleaching alert (Image 3):			
<div><p>Cook Islands</p><p>Daily Coral Bleaching Alert: 04 October 2023</p><p>©Commonwealth of Australia 2023 Australian Bureau of Meteorology, COSPPac</p><p>NOAA Coral Reef Watch</p></div>		<div><p>Pacific Ocean</p><p>Daily Coral Bleaching Alert: 04 October 2023</p><p>©Commonwealth of Australia 2023 Australian Bureau of Meteorology, COSPPac</p><p>NOAA Coral Reef Watch</p></div>	

Part 2i. Monthly and Seasonal Outlooks for November and November 2023 to January 2024

Monthly: November	Seasonal: November to January
Monthly sea surface temperature (Image 5):	Seasonal sea surface temperature (Image 6):
<div><p>Difference from average sea surface temperature forecast for November 2023</p><p>Difference from average (°C)</p><p>Base period: 1981-2018 Model: ACCESS-S2 © Commonwealth of Australia 2023, Australian Bureau of Meteorology Shapefile data extracted from Flinders Marine Institute (2019). Maritime Boundaries Geodatabase: Maritime Boundaries and Exclusive Economic Zones (EZZs), version 11. Available online at <a href="http://www.maritime.gov.au">http://www.maritime.gov.au</a></p><p>Model run: 02/10/2023 Issued: 04/10/2023</p></div>	<div><p>Difference from average sea surface temperature forecast for November 2023 to January 2024</p><p>Difference from average (°C)</p><p>Base period: 1981-2018 Model: ACCESS-S2 © Commonwealth of Australia 2023, Australian Bureau of Meteorology Shapefile data extracted from Flinders Marine Institute (2019). Maritime Boundaries Geodatabase: Maritime Boundaries and Exclusive Economic Zones (EZZs), version 11. Available online at <a href="http://www.maritime.gov.au">http://www.maritime.gov.au</a></p><p>Model run: 02/10/2023 Issued: 04/10/2023</p></div>
Monthly sea level (Image 7):	Seasonal sea level (Image 8):
<div><p>Difference from average sea surface height forecast for November 2023</p><p>Difference from average (mm)</p><p>Base period: 1981-2018 Model: ACCESS-S2 © Commonwealth of Australia 2023, Australian Bureau of Meteorology Shapefile data extracted from Flinders Marine Institute (2019). Maritime Boundaries Geodatabase: Maritime Boundaries and Exclusive Economic Zones (EZZs), version 11. Available online at <a href="http://www.maritime.gov.au">http://www.maritime.gov.au</a></p><p>Model run: 02/10/2023 Issued: 04/10/2023</p></div>	<div><p>Difference from average sea surface height forecast for November 2023 to January 2024</p><p>Difference from average (mm)</p><p>Base period: 1981-2018 Model: ACCESS-S2 © Commonwealth of Australia 2023, Australian Bureau of Meteorology Shapefile data extracted from Flinders Marine Institute (2019). Maritime Boundaries Geodatabase: Maritime Boundaries and Exclusive Economic Zones (EZZs), version 11. Available online at <a href="http://www.maritime.gov.au">http://www.maritime.gov.au</a></p><p>Model run: 02/10/2023 Issued: 04/10/2023</p></div>
4-week Coral Bleaching (Image 9):	
<div><p>Cook Islands</p><p>4 Weeks Coral Bleaching Outlook: 29 October 2023</p><p>Alert Level 2</p><p>Alert Level 1</p><p>Warning</p><p>Watch</p><p>No Stress</p><p>©Commonwealth of Australia 2023 Australian Bureau of Meteorology, COSPPac</p><p>NOAA Coral Reef Watch</p></div>	<div><p>Pacific Ocean</p><p>4 Weeks Coral Bleaching Outlook: 29 October 2023</p><p>Alert Level 2</p><p>Alert Level 1</p><p>Warning</p><p>Watch</p><p>No Stress</p><p>©Commonwealth of Australia 2023 Australian Bureau of Meteorology, COSPPac</p><p>NOAA Coral Reef Watch</p></div>

## **Summary Statement**

### **Monthly and last three months: September 2023/July to September 2023 statement**

The rainfall for September was near-normal for both Rarotonga and Penrhyn. The July to September totals were below normal for Penrhyn and near-normal for Rarotonga.

## **Part 1i. Monthly and Seasonal Outlooks for November and November 2023 to January 2024**

### **Monthly /Seasonal rainfall and temperature Outlook statements**

The rainfall for November is likely to be near-normal at Penrhyn and below normal for Rarotonga. In between lies an area of the northern Cook Islands where above normal rainfall is likely, including Pukapuka.

Rainfall for November to January is likely or very likely to be above normal over the northern Cook Is, including Penrhyn, and below normal over the south, including at Rarotonga.

Maximum and minimum temperatures during November are very likely to be above normal over the northern two-thirds of the country, including Penrhyn, while they are likely to be near-normal in the south, including at Rarotonga.

Maximum and minimum temperatures averaged over November to January are likely or very likely to be above normal for most of the Cook Islands, including Penrhyn and Rarotonga.

## **Part 2: Recent Ocean summary statement**

### **Monthly and last three months: September 2023/July to September 2023**

September ocean temperatures around Penrhyn were 0.5 to 1.0°C above normal, and normal for Rarotonga.

Averaged over July to September, ocean temperatures around the Cook Islands were 0.5 to 1.0°C above normal.

September sea levels around the Cooks were 50mm to 150mm above normal.

Coral bleaching alert reveals 'Warning' status for northern Cook Islands, while the remaining parts reveal no thermal stress.

## **Part 2i. Monthly and Seasonal Outlooks for November and November to January 2024**

### **Ocean Variable statement**

November ocean temperatures around Penrhyn are predicted to be 0.8 to 1.2°C above normal, and near normal temperatures around Rarotonga.

Averaged over November to January, ocean temperatures around Penrhyn are predicted to be 1.2 to 2.0°C above normal, and near normal temperatures around Rarotonga.

November sea levels around both Penrhyn and Rarotonga station are predicted to be near normal.

Averaged over November to January, sea levels around both Penrhyn and Rarotonga station are predicted to be near normal.

Coral bleaching outlook predicts 'Watch' status for northwestern Cook Islands, the remaining parts of Cook Islands predicts no thermal stress.

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

Product	Date: September 2023	Stakeholder	Total Number of Participants	Number of Male	Number of Female	Comments (If there are comments from you Stakeholders)
Climate Bulletin						
EAR Watch						
Monthly Climate Briefing						
Ocean Outlook						
Climate data request						
Total						