

Pacific Islands - Ocean and Climate Outlook Forum (OCOF) No. 171

Country: Cook Islands

Part 1: Recent climate

TABLE 1: Monthly Rainfall

| Station (include data period) | Sep-2021 | Oct-2021 | Nov-2021 | | | | Rank |
|-------------------------------|------------|------------|---------------|---------|---------|--------|--------|
| | | | Total (mm) | 33%tile | 67%tile | Median | |
| | Total (mm) | Total (mm) | Rainfall (mm) | | | | |
| Penrhyn (1937-2021) | 88.0 | 163.9 | 205.0 | 90.8 | 187.9 | 145.9 | 59/84 |
| Rarotonga (1899-2021) | 87.9 | 105.9 | 114.5 | 90.3 | 156.3 | 122.0 | 58/123 |

TABLE 2: Three-month Total Rainfall for September to November 2021

| Station | Three-month Total | | 33%tile | 67%tile | Median | Rank |
|-----------------------|-------------------|--------|---------|---------|--------|--------|
| | Rainfall (mm) | | | | | |
| Penrhyn (1937-2021) | 456.9 | Normal | 304.7 | 485.3 | 365.0 | 53/82 |
| Rarotonga (1899-2021) | 308.3 | Normal | 282.9 | 400.3 | 355.0 | 48/123 |

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

Very Low: $X < 0.0$

Low: $0 \leq X < 5$

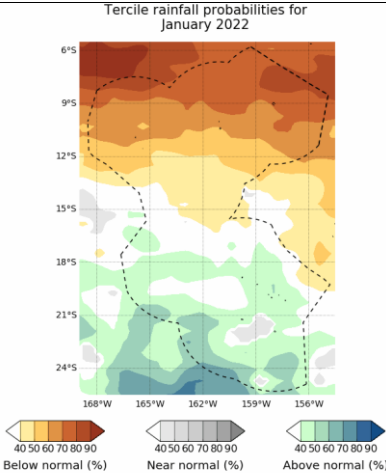
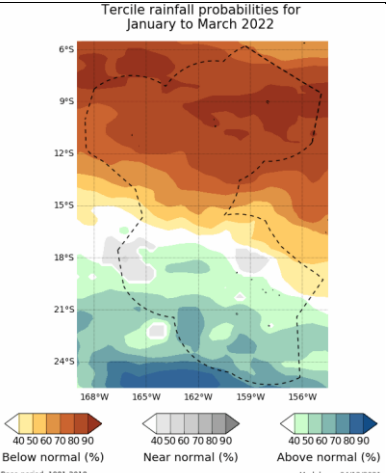
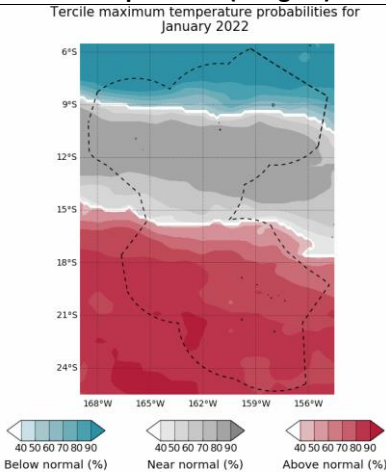
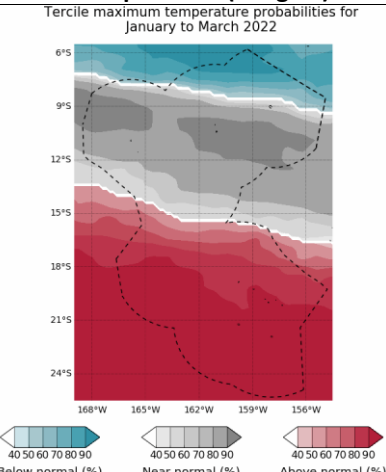
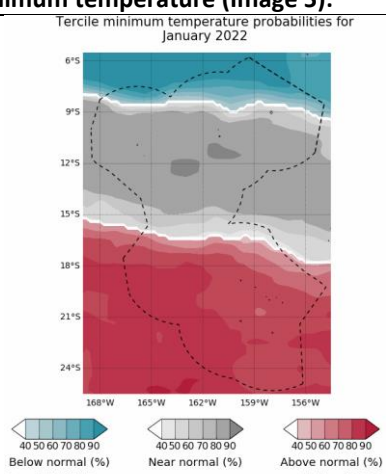
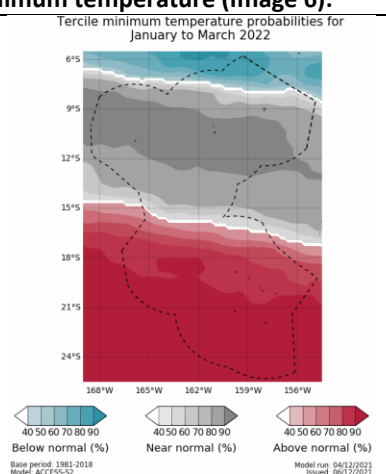
Moderate $5 \leq X < 10$

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 January and January to March 2022

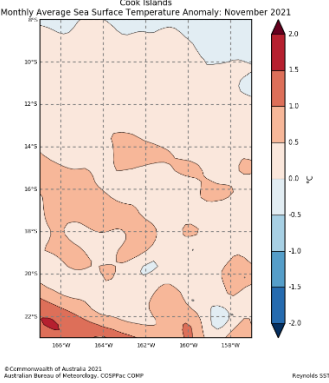
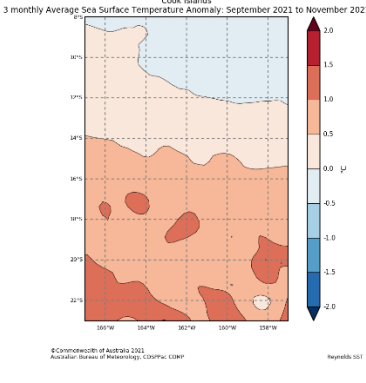
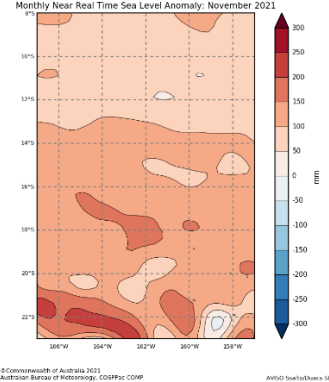
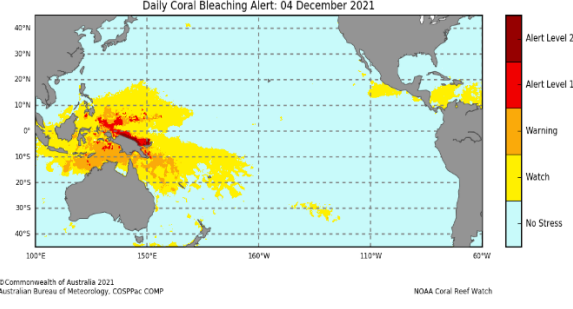
| Monthly | Seasonal |
|--|---|
| <p>Rainfall (Image 1)</p> <p>Tercile rainfall probabilities for January 2022</p>  <p>Base period: 1981-2018 Model: ACCESS-S2 © Commonwealth of Australia 2021, Australian Bureau of Meteorology Diagnostic data extracted from Forecast Marine Institute (2019), Maritime Boundaries Geodatabase, Maritime Boundaries and Exclusive Economic Zones (2009M), version 11. Available online at http://www.marine.gov.au</p> <p>Model run: 04/12/2021 Issued: 06/12/2021</p> | <p>Rainfall (Image 2)</p> <p>Tercile rainfall probabilities for January to March 2022</p>  <p>Base period: 1981-2018 Model: ACCESS-S2 © Commonwealth of Australia 2021, Australian Bureau of Meteorology Diagnostic data extracted from Forecast Marine Institute (2019), Maritime Boundaries Geodatabase, Maritime Boundaries and Exclusive Economic Zones (2009M), version 11. Available online at http://www.marine.gov.au</p> <p>Model run: 04/12/2021 Issued: 06/12/2021</p> |
| <p>Monthly Maximum temperature (Image 3):</p> <p>Tercile maximum temperature probabilities for January 2022</p>  <p>Base period: 1981-2018 Model: ACCESS-S2 © Commonwealth of Australia 2021, Australian Bureau of Meteorology Diagnostic data extracted from Forecast Marine Institute (2019), Maritime Boundaries Geodatabase, Maritime Boundaries and Exclusive Economic Zones (2009M), version 11. Available online at http://www.marine.gov.au</p> <p>Model run: 04/12/2021 Issued: 06/12/2021</p> | <p>Seasonal maximum temperature (Image 4):</p> <p>Tercile maximum temperature probabilities for January to March 2022</p>  <p>Base period: 1981-2018 Model: ACCESS-S2 © Commonwealth of Australia 2021, Australian Bureau of Meteorology Diagnostic data extracted from Forecast Marine Institute (2019), Maritime Boundaries Geodatabase, Maritime Boundaries and Exclusive Economic Zones (2009M), version 11. Available online at http://www.marine.gov.au</p> <p>Model run: 04/12/2021 Issued: 06/12/2021</p> |
| <p>Monthly minimum temperature (Image 5):</p> <p>Tercile minimum temperature probabilities for January 2022</p>  <p>Base period: 1981-2018 Model: ACCESS-S2 © Commonwealth of Australia 2021, Australian Bureau of Meteorology Diagnostic data extracted from Forecast Marine Institute (2019), Maritime Boundaries Geodatabase, Maritime Boundaries and Exclusive Economic Zones (2009M), version 11. Available online at http://www.marine.gov.au</p> <p>Model run: 04/12/2021 Issued: 06/12/2021</p> | <p>Seasonal minimum temperature (Image 6):</p> <p>Tercile minimum temperature probabilities for January to March 2022</p>  <p>Base period: 1981-2018 Model: ACCESS-S2 © Commonwealth of Australia 2021, Australian Bureau of Meteorology Diagnostic data extracted from Forecast Marine Institute (2019), Maritime Boundaries Geodatabase, Maritime Boundaries and Exclusive Economic Zones (2009M), version 11. Available online at http://www.marine.gov.au</p> <p>Model run: 04/12/2021 Issued: 06/12/2021</p> |

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 2: Recent Ocean summary statement

Monthly: November 2021

| Monthly: November | Last three months: September to November 2021: |
|---|--|
| <p>Sea Surface Temperature (Image 1):</p>  <p>Cook Islands Monthly Average Sea Surface Temperature Anomaly: November 2021</p> <p>© Commonwealth of Australia 2021 Australian Bureau of Meteorology, COSPPac COMP Reynolds SST</p> | <p>Sea Surface Temperature (Image 4):</p>  <p>Cook Islands 3 monthly Average Sea Surface Temperature Anomaly: September 2021 to November 2021</p> <p>© Commonwealth of Australia 2021 Australian Bureau of Meteorology, COSPPac COMP Reynolds SST</p> |
| <p>Sea level (Image 2):</p>  <p>Cook Islands Monthly Near Real Time Sea Level Anomaly: November 2021</p> <p>© Commonwealth of Australia 2021 Australian Bureau of Meteorology, COSPPac COMP AVISO SeaLevelBuys SLL</p> | |
| <p>Daily coral bleaching alert (Image 3):</p>  <p>Pacific Ocean Daily Coral Bleaching Alert: 04 December 2021</p> <p>© Commonwealth of Australia 2021 Australian Bureau of Meteorology, COSPPac COMP NOAA Coral Reef Watch</p> | |

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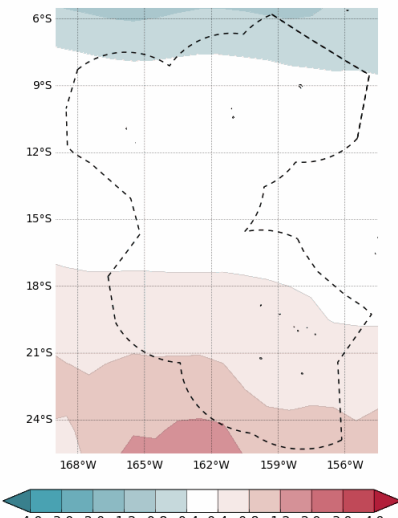
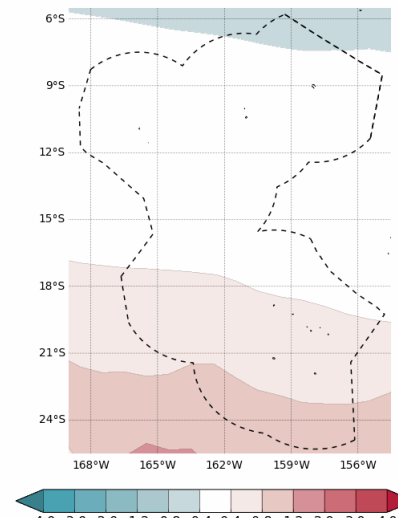
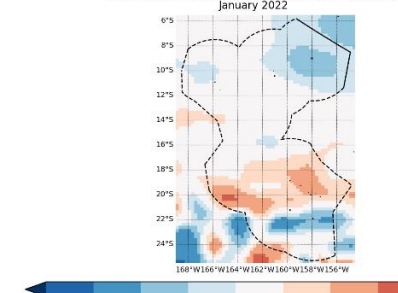
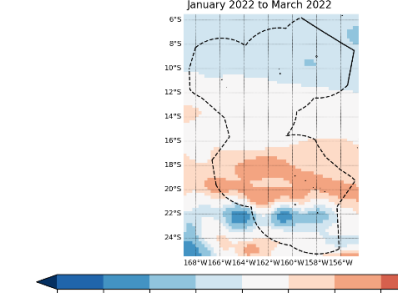
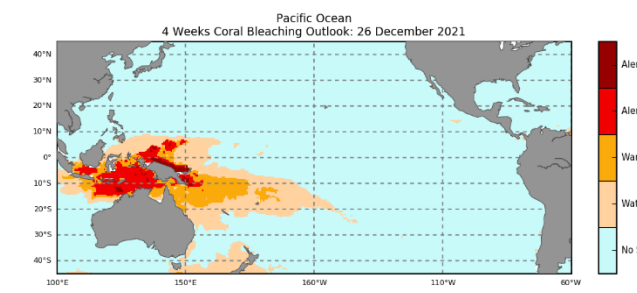
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Part 2i. Monthly and Seasonal Outlooks for January and January to March 2022

| | |
|---|--|
| <p>Monthly: January</p> <p>Monthly sea surface temperature (Image 5):</p> <p>Difference from average sea surface temperature forecast for January 2022</p>  <p>Base period: 1981-2018 Model: ACCESS-S2 © Commonwealth of Australia 2021. Australian Bureau of Meteorology Shapefile data extracted from Flanders Marine Institute (2019). Maritime Boundaries Geodatabase: Maritime Boundaries and Exclusive Economic Zones (200NM), version 11. Available online at http://www.maritimesregions.org</p> <p>Model run: 04/12/2021 Issued: 06/12/2021</p> | <p>Seasonal: January to March</p> <p>Seasonal sea surface temperature (Image 6):</p> <p>Difference from average sea surface temperature forecast for January to March 2022</p>  <p>Base period: 1981-2018 Model: ACCESS-S2 © Commonwealth of Australia 2021. Australian Bureau of Meteorology Shapefile data extracted from Flanders Marine Institute (2019). Maritime Boundaries Geodatabase: Maritime Boundaries and Exclusive Economic Zones (200NM), version 11. Available online at http://www.maritimesregions.org</p> <p>Model run: 04/12/2021 Issued: 06/12/2021</p> |
| <p>Monthly sea level (Image 7):</p> <p>Difference from average sea surface height forecast for January 2022</p>  <p>© Commonwealth of Australia 2021 Bureau of Meteorology</p> <p>Model: ACCESS-S2 Base Period: 1981-2018</p> <p>Model Run: 28/11/2021 Issued: 07/12/2021</p> | <p>Seasonal sea level (Image 8):</p> <p>Difference from average sea surface height forecast for January to March 2022</p>  <p>© Commonwealth of Australia 2021 Bureau of Meteorology</p> <p>Model: ACCESS-S2 Base Period: 1981-2018</p> <p>Model Run: 28/11/2021 Issued: 07/12/2021</p> |
| <p>4-week Coral Bleaching (Image 9):</p> <p>Pacific Ocean 4 Weeks Coral Bleaching Outlook: 26 December 2021</p>  <p>© Commonwealth of Australia 2021 Australian Bureau of Meteorology, COSPPac COMP</p> <p>NOAA Coral Reef Watch</p> | |

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Summary Statement

Monthly and last three months: November 2021/September to November statement (Highly significant changes)

Above normal rainfall was recorded at Penrhyn for November, with Rarotonga station having normal rainfall. For September to November 2021 both stations recorded normal rainfall.

Part 1i. Monthly and Seasonal Outlooks for January and January to March 2022

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

Rainfall outlook for next month and 3 months is very likely to be below normal for Penrhyn and above normal for Rarotonga.

Temperature pattern outlooks is the same for next month and next 3 months which is very likely to be near normal for central and majority of the northern Cooks, Penrhyn is expected to be below normal. Above normal is very likely for southern Cooks and Rarotonga.

Part 2: Recent Ocean summary statement

Monthly and last three months: November/September to November 2021 (Highly significant changes)

Sea Surface Temperature statement

Most of the Cooks archipelago experienced above average SST with exception of Penrhyn, for November 2021. Significant warm SSTs was experienced in the southern Cooks. Highest SSTs were 0.5 to 1.0 degrees above average.

Sea level statement

The sea level anomaly across the Cook Islands in November 2021 was significantly higher than normal, with majority of the archipelago in the range of 50 to 150 mm above average. This additional sea level anomaly should be taken into account when using the tide calendars by adding it onto the high/low tide levels.

Daily bleaching alert statement

Even with the warm SSTs experienced across the Cook Islands, 'no stress' coral bleaching alert status throughout the region.

Last three months Sea Surface Temperature statement

For the September to November 2021 period, similar to the monthly pattern of warmer than average SSTs were experienced in the Cook Islands, with the exception of Penrhyn.

Part 2i. Monthly and Seasonal Outlooks for January and January to March 2022

Ocean Variable statement (Highly significant changes)

Monthly sea surface temperature statement

Monthly outlook for the Cook Islands shows a significant temperature difference of -0.8 to 1.2°C for January 2022.

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Seasonal Sea Surface Temperature statement

Seasonal outlook similar to the monthly outlook. The outlook for the Cooks archipelago shows SSTs are likely to be close to average for the January to March 2022 period.

Monthly sea level statement

Outlook across the Cooks shows sea surface heights are likely to be below average for both Penrhyn and Rarotonga for January.

Seasonal sea level statement

Similar patterns to the monthly outlook, sea surface heights are likely to be below average for both Penrhyn and Rarotonga for January to March 2022 period.

4-weeks Coral Bleaching statement

The outlook for the Cook Islands shows a watch alert for central and southern Cooks, no stress for Penrhyn.

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

| Product | Date: November 2021 | Stakeholder | Total Number of Participants | Number of male | Number of female |
|-----------------------------|---------------------------|----------------------------------|------------------------------------|-------------------|---------------------|
| Climate Bulletin | | Ministry of Transport | 29 | 17 | 12 |
| EAR Watch | | C.I Govt. Stakeholders Public | ? | ? | ? |
| Monthly Climate Briefing | | Climate Change | 8 | 2 | 6 |
| Ocean Outlook | | | | | |
| Climate data request | | | | | |
| Total | | | 37 | 19 | 18 |

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