

Pacific Islands - Online Climate Outlook Forum (OCOF) No. 162

Country: Tonga

TABLE 1: Monthly Rainfall

Station (include data period)	Dec-2020	Jan-2021	Feb-2021				Rank
			Total (mm)	33%tile	67%tile	Median	
	Total (mm)	Total (mm)	Rainfall (mm)				
Northern Division							
Niufo'ou (1971-2021)	472.6	346.5	420.2	205.0	300.3	244.0	42/48
Niuatoputapu (1947-2021)	540.1	256.1	418.6	190.0	267.0	225.0	63/74
Central Division							
Vava'u (1947-2021)	347.5	527.4	336.8	195.7	297.7	221.0	54/75
Ha'apai (1947-2021)	247.9	417.1	279.2	136.0	238.0	187.0	57/75
Southern Division							
Fua'amotu (1979-2021)	132.0	598.3	272.9	145.1	236.7	185.0	30/42
Nuku'alofa (1944-2021)	118.7	559.2	240.5	154.7	276.1	218.0	46/77

TABLE 2: Three-month Rainfall for December 2020 to February 2021

Station	Three-month Total		33%tile	67%tile	Median	Rank	SCOPIC forecast probabilities based on NINO3.4 September-October 2020				Verification: Consistent, Near-consistent, Inconsistent?
	Rainfall (mm)						B-N	N	A-N	LEPS	
<i>Northern Division</i>											
Niuafu'ou (1971-2021)	1239.3	Above normal	722.0	951.0	845.0	38/44	15	46	39	3	Near-consistent
Niuatoputapu (1947-2021)	1214.8	Above normal	633.0	897.0	733.0	65/69	10	45	45	18	Near-consistent
<i>Central Division</i>											
Vava'u (1947-2021)	1211.7	Above normal	615.0	886.8	735.6	68/74	17	27	56	18	Consistent
Ha'apai (1947-2021)	944.2	Above normal	435.0	674.0	573.2	70/74	10	38	52	20	Consistent
<i>Southern Division</i>											
Fua'amotu (1979-2021)	1003.2	Above normal	426.0	806.5	612.4	37/41	12	21	67	22	Consistent
Nuku'alofa (1944-2021)	918.4	Above normal	445.0	725.0	553.0	69/77	12	29	59	27	Consistent

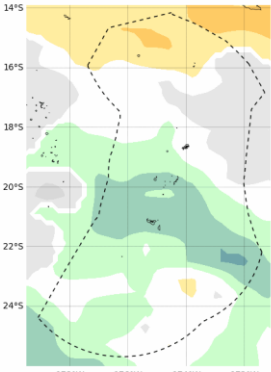
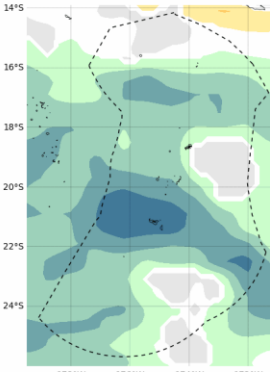
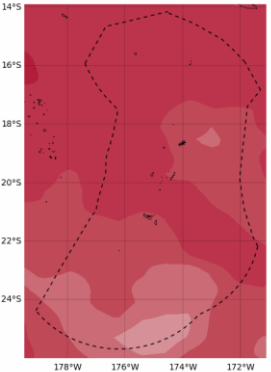
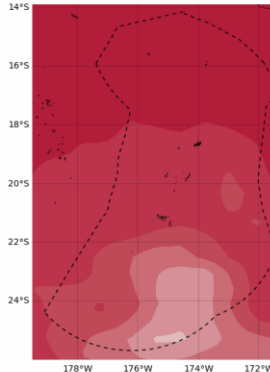
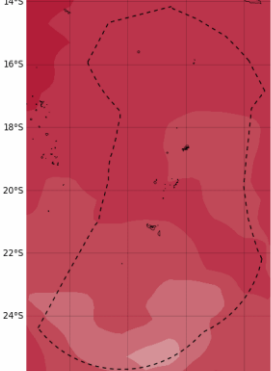
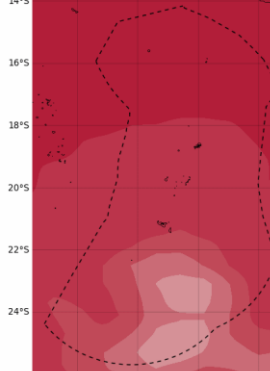
TABLE 3: Seasonal Climate Outlooks using SCOPIC for April to June 2021

Predictor and Period used: NINO3.4 for January to February 2021

Station	Below Median (prob)	Median Rainfall (mm)	Above Median (prob)		LEPS (%) [whole numbers]	Hit-rate (%) [whole numbers]
<i>Northern Division</i>						
Niuafo'ou (1971-2021)	53	582.0	47		-2	50
Niuaatoputapu (1947-2021)	51	537.5	49		-2	44
<i>Central Division</i>						
Vava'u (1947-2021)	39	493.0	61		3	54
Ha'apai (1947-2021)	44	355.0	56		0	51
<i>Southern Division</i>						
Fua'amotu (1979-2021)	35	452.4	65		6	61
Nuku'alofa (1944-2021)	42	348.2	58		2	56

Station	Below Normal (prob)	33%ile Rainfall (mm)	Normal (prob)	67%ile Rainfall (mm)	Above Normal (prob)	LEPS (%) [whole numbers]	Hit-rate (%) [whole numbers]
<i>Northern Division</i>							
Niuafo'ou (1971-2021)	35	496.5	31	646.0	34	-2	17
Niuaatoputapu (1947-2021)	35	437.0	35	617.0	30	-1	36
<i>Central Division</i>							
Vava'u (1947-2021)	25	411.3	33	587.7	42	3	38
Ha'apai (1947-2021)	27	294.3	33	432.4	40	1	34
<i>Southern Division</i>							
Fua'amotu (1979-2021)	15	305.3	48	511.4	37	6	51
Nuku'alofa (1944-2021)	18	290.8	48	438.0	34	3	43

TABLE 4: Monthly and Seasonal Climate Outlooks using ACCESS-S1 for April to June 2021

Monthly rainfall	Seasonal rainfall
<p><i>Insert map</i></p> <p>Tercile rainfall probabilities for April 2021</p>  <p>Below normal (%) Near normal (%) Above normal (%)</p> <p>Model: ACCESS-S1 Model run: 01/03/2021 Base period: 1990-2012 Issued: 04/03/2021</p> <p><small>© Commonwealth of Australia 2021, Australian Bureau of Meteorology Shapefile data extracted from Flinders Marine Institute (2019), Maritime Boundaries Geodatabase: Maritime Boundaries and Exclusive Economic Zones (2009M), version 11. Available online at http://www.marine.gov.au/</small></p>	<p><i>Insert map</i></p> <p>Tercile rainfall probabilities for April to June 2021</p>  <p>Below normal (%) Near normal (%) Above normal (%)</p> <p>Model: ACCESS-S1 Model run: 01/03/2021 Base period: 1990-2012 Issued: 04/03/2021</p> <p><small>© Commonwealth of Australia 2021, Australian Bureau of Meteorology Shapefile data extracted from Flinders Marine Institute (2019), Maritime Boundaries Geodatabase: Maritime Boundaries and Exclusive Economic Zones (2009M), version 11. Available online at http://www.marine.gov.au/</small></p>
Monthly Tmax	Seasonal Tmax
<p><i>Insert map</i></p> <p>Tercile maximum temperature probabilities for April 2021</p>  <p>Below normal (%) Near normal (%) Above normal (%)</p> <p>Model: ACCESS-S1 Model run: 01/03/2021 Base period: 1990-2012 Issued: 04/03/2021</p> <p><small>© Commonwealth of Australia 2021, Australian Bureau of Meteorology Shapefile data extracted from Flinders Marine Institute (2019), Maritime Boundaries Geodatabase: Maritime Boundaries and Exclusive Economic Zones (2009M), version 11. Available online at http://www.marine.gov.au/</small></p>	<p><i>Insert map</i></p> <p>Tercile maximum temperature probabilities for April to June 2021</p>  <p>Below normal (%) Near normal (%) Above normal (%)</p> <p>Model: ACCESS-S1 Model run: 01/03/2021 Base period: 1990-2012 Issued: 04/03/2021</p> <p><small>© Commonwealth of Australia 2021, Australian Bureau of Meteorology Shapefile data extracted from Flinders Marine Institute (2019), Maritime Boundaries Geodatabase: Maritime Boundaries and Exclusive Economic Zones (2009M), version 11. Available online at http://www.marine.gov.au/</small></p>
Monthly Tmin	Seasonal Tmin
<p><i>Insert map</i></p> <p>Tercile minimum temperature probabilities for April 2021</p>  <p>Below normal (%) Near normal (%) Above normal (%)</p> <p>Model: ACCESS-S1 Model run: 01/03/2021 Base period: 1990-2012 Issued: 04/03/2021</p> <p><small>© Commonwealth of Australia 2021, Australian Bureau of Meteorology Shapefile data extracted from Flinders Marine Institute (2019), Maritime Boundaries Geodatabase: Maritime Boundaries and Exclusive Economic Zones (2009M), version 11. Available online at http://www.marine.gov.au/</small></p>	<p><i>Insert map</i></p> <p>Tercile minimum temperature probabilities for April to June 2021</p>  <p>Below normal (%) Near normal (%) Above normal (%)</p> <p>Model: ACCESS-S1 Model run: 01/03/2021 Base period: 1990-2012 Issued: 04/03/2021</p> <p><small>© Commonwealth of Australia 2021, Australian Bureau of Meteorology Shapefile data extracted from Flinders Marine Institute (2019), Maritime Boundaries Geodatabase: Maritime Boundaries and Exclusive Economic Zones (2009M), version 11. Available online at http://www.marine.gov.au/</small></p>

Summary Statements

Rainfall for February 2021:

February rainfall was above normal across Tonga, apart from at Nuku'alofa where normal rainfall was recorded.

Accumulated rainfall for December 2020 to February 2021, including outlook verification:

Rainfall was above normal for all of Tonga. Niuatoputapu, Ha'apai and Fua'amotu recorded their fifth wettest December – February periods on record.

The outlook issued in November was verified as consistent at four sites in the Central and Southern Divisions, and near-consistent at Niuafou'ou and Niuatoputapu in the Northern Division.

Outlooks for April to June 2021:

1. SCOPIC:

Vava'u, Ha'apai: The outlook for season shows above normal as the most likely outcome, with normal the next most likely. Below normal is the least likely.

Fua'amotu, Nuku'alofa: The outlook for season shows normal as the most likely outcome, with above normal the next most likely. Below normal is the least likely.

Niuafou'ou, Niuatoputapu : The outlook offers little guidance as the chances of below normal, above normal and normal are similar.

2. ACCESS-S:

Monthly rainfall:

Above normal rainfall is the most likely outcome for April across most of the central one-third of the country, including Nuku'alofa, Fua'amotu, and Ha'apai. Vava'u is in a region where the outlook offers little guidance. Below normal rainfall is most likely across the far north, including Niuafou'ou and Niuatoputapu.

Monthly maximum and minimum temperatures:

Above normal temperatures are favoured across the country for April.

Seasonal rainfall:

Above normal rainfall is the favoured or most likely outcome for April to June rainfall for Tongatapu, Ha'apai, Vava'u and Niuatoputapu. There is little guidance for Niuafou'ou.

Seasonal maximum and minimum temperatures:

Above normal temperatures are favoured across the country for April to June 2021.

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: $X \geq 35$

TABLE 5: Stakeholder Engagement- Evaluations of how effective NMS engage with stakeholders

Product	Date: February 2021	Stakeholder	Total Number of Participants	Number of male	Number of female
Climate Bulletin	15 February	General public	132	68	34
EAR Watch					
Monthly Climate Briefing					
Ocean Bulletin		General public			
Total			132	68	34