

Review of October 2020 – March 2021 climate and oceans

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PICOF-7 outlook

- Above average air and sea temperatures likely in the coming 6 months across most Pacific Islands with the exception of islands along and near the equatorial Pacific.
- Rainfall is favoured to be above normal for many Pacific Islands, with the exception of islands along and near the equatorial Pacific. There is good model agreement in forecasts over the coming three to six months in line with the strengthening La Nina.
- Elevated ocean heat stress is likely across a large part of the western equatorial Pacific.
- Sea level is likely to be above normal from PNG through to the Pitcairn Islands.

Model Rainfall Predictions

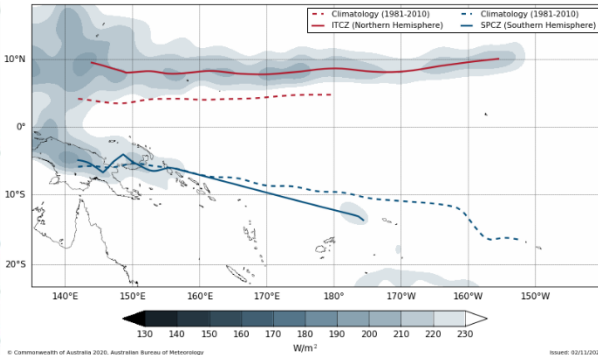
	Nov 2020-Jan 2021		
	ACCESS-S	C3S	PICASO
Cook Is Nth			
Cook Is Sth			
Fiji West			
Fiji Central			
Fiji East			
Fiji Nth			
Fiji Rotuma			
Kiribati West			
Kiribati Central			
Kiribati East			
Marshall Is			
Niue			
Palau			
PNG Momase			
PNG Is			
PNG Sth			
PNG Highlands			
Samoa			
Solomon Is West			
Solomon Is Central			
Solomon Is East			
Tonga Nth			
Tonga Central			
Tonga Sth			
Tuvalu Nth			
Tuvalu Central			
Tuvalu Sth			
Vanuatu Nth			
Vanuatu Sth			

	Feb-Apr 2021		
	ACCESS-S	C3S	CLIKP
Cook Is North			
Cook Is South			
Fiji West			
Fiji Central			
Fiji East			
Fiji North			
Fiji Rotuma			
FSM West			
FSM Central			
FSM East			
Kiribati West			
Kiribati Central			
Kiribati East			
Marshall Is			
Nauru			
Niue			
Palau			
PNG Momase			
PNG Is			
PNG South			
PNG Highlands			
Samoa			
Solomon Is West			
Solomon Is Central			
Solomon Is East			
Tonga North			
Tonga Central			
Tonga South			
Tuvalu North			
Tuvalu Central			
Tuvalu South			
Vanuatu North			
Vanuatu South			

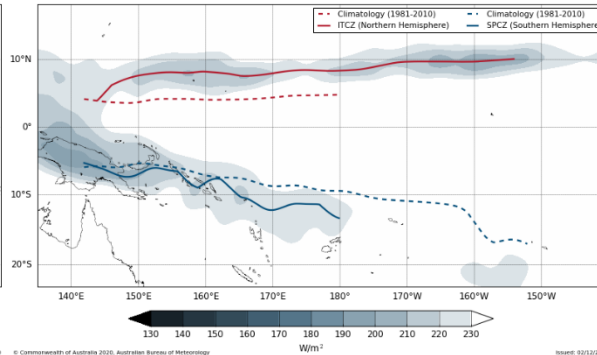
	41-50%	51-60%	61-70%	71-80%	81-90%	>90%
Below normal						
Near-normal						
Above normal						

Pacific outgoing longwave radiation (OLR)

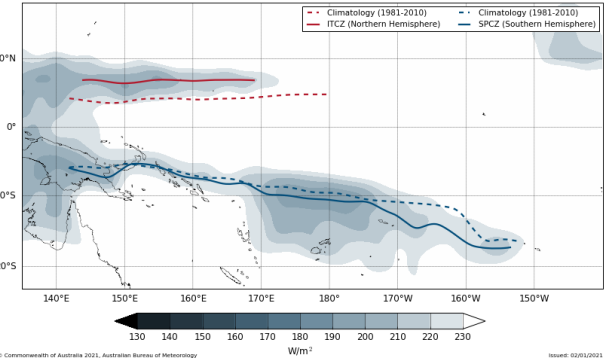
30 Day Average Outgoing Longwave Radiation (OLR) minimum to 2020-10-31



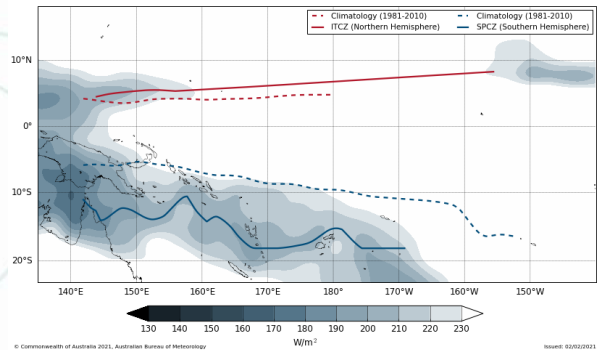
30 Day Average Outgoing Longwave Radiation (OLR) minimum to 2020-11-30



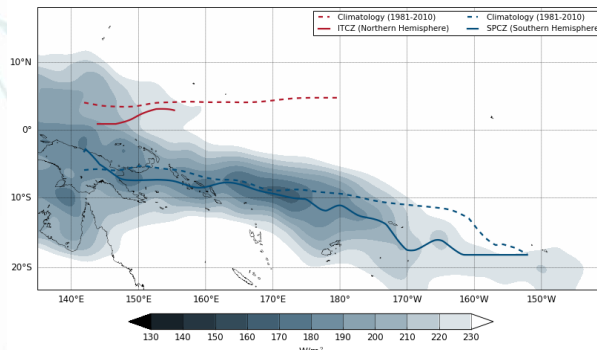
30 Day Average Outgoing Longwave Radiation (OLR) minimum to 2020-12-31



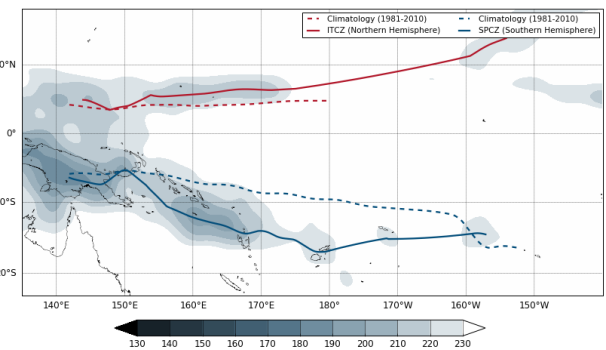
30 Day Average Outgoing Longwave Radiation (OLR) minimum to 2021-01-31



30 Day Average Outgoing Longwave Radiation (OLR) minimum to 2021-02-28

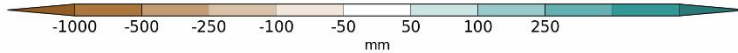
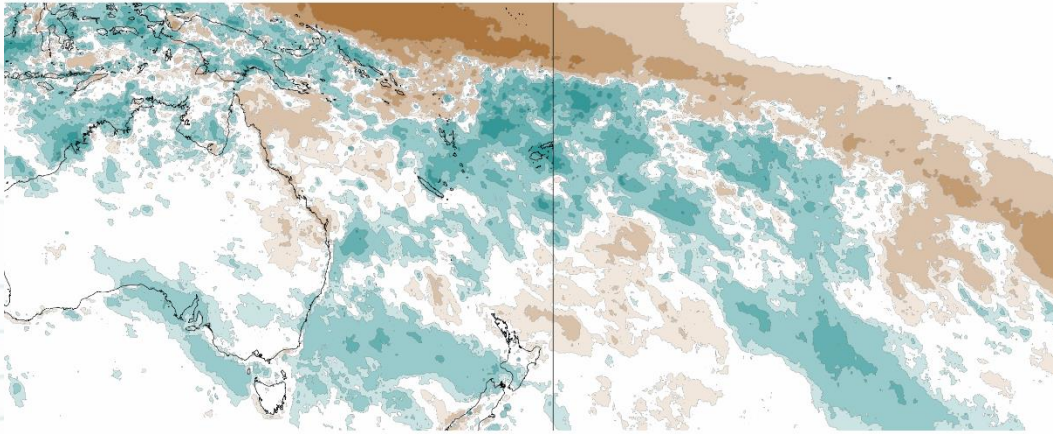


30 Day Average Outgoing Longwave Radiation (OLR) minimum to 2021-03-31



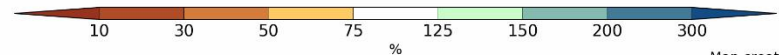
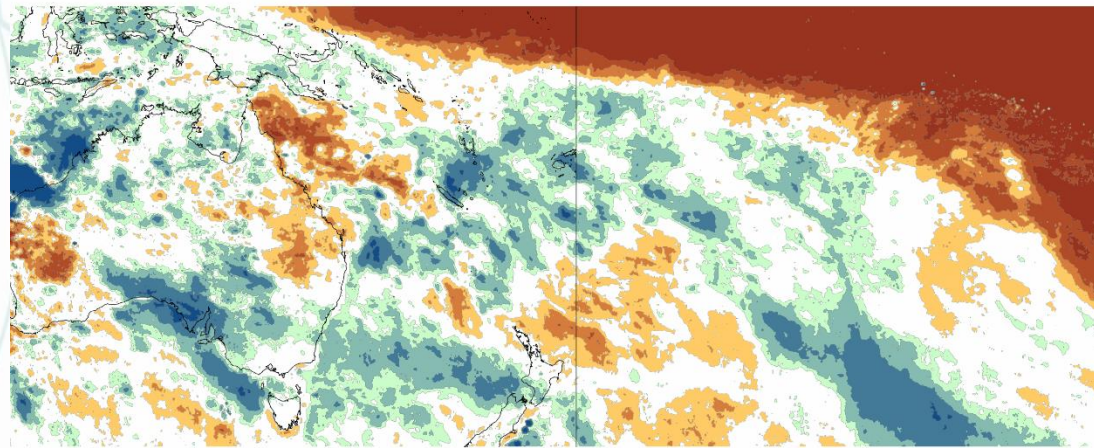
First 3-month rainfall (to December 2020)

3-month total rainfall anomaly ending December 2020



Source: GSMaP

3-month total rainfall % of normal ending December 2020

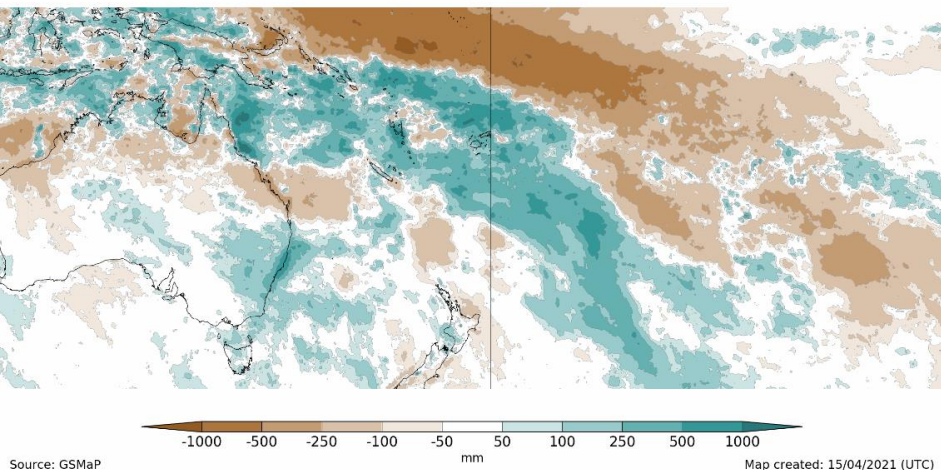


Source: GSMaP

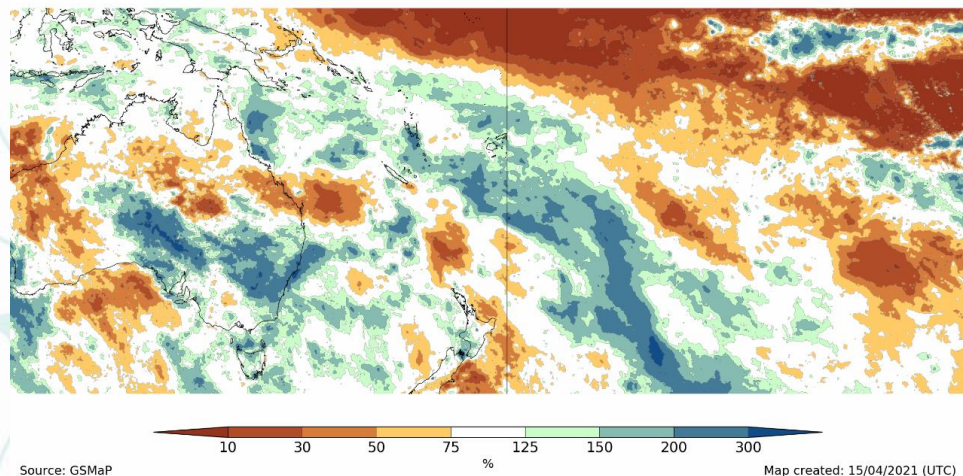
Map created: 15/04/2021 (UTC)

Second 3-month rainfall (to March 2021)

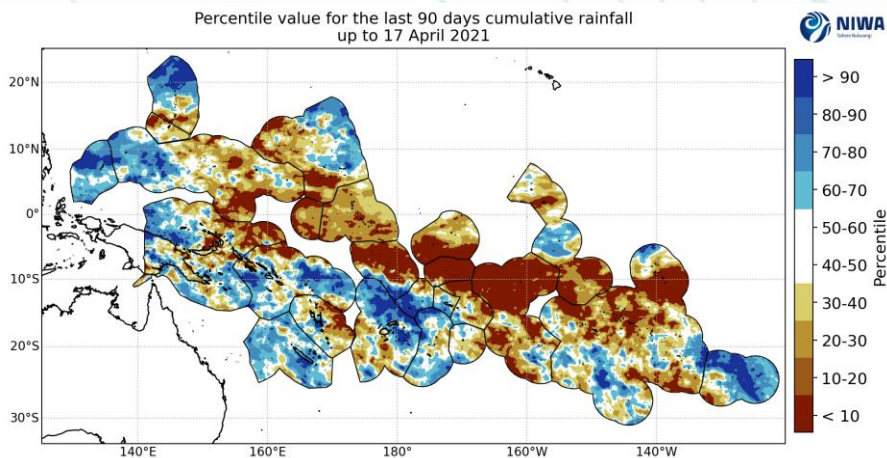
3-month total rainfall anomaly ending March 2021



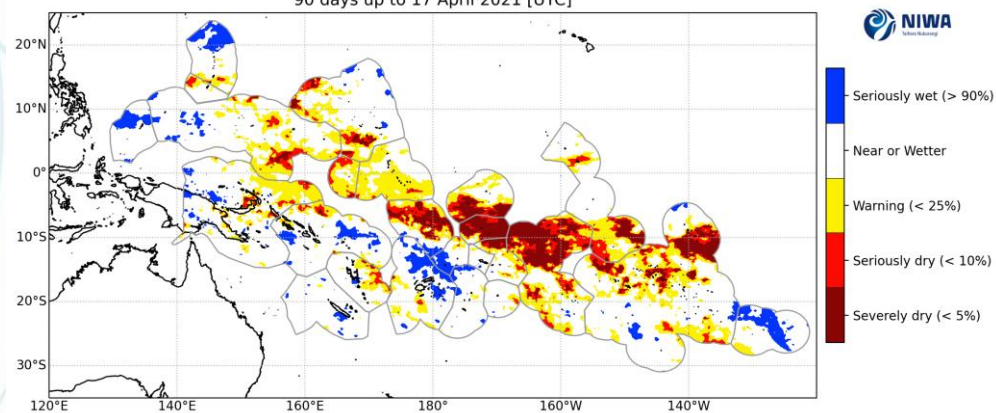
3-month total rainfall % of normal ending March 2021



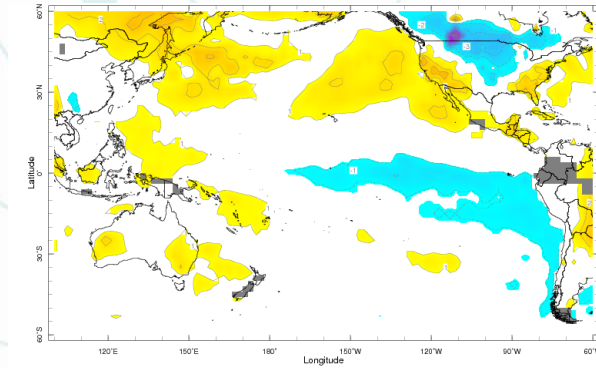
Percentile value for the last 90 days cumulative rainfall up to 17 April 2021



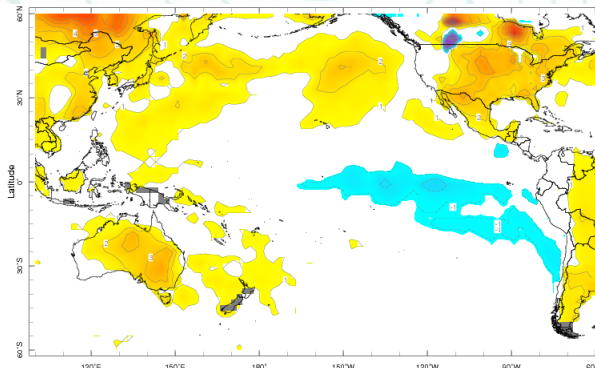
"EAR" Watch alert levels 90 days up to 17 April 2021 [UTC]



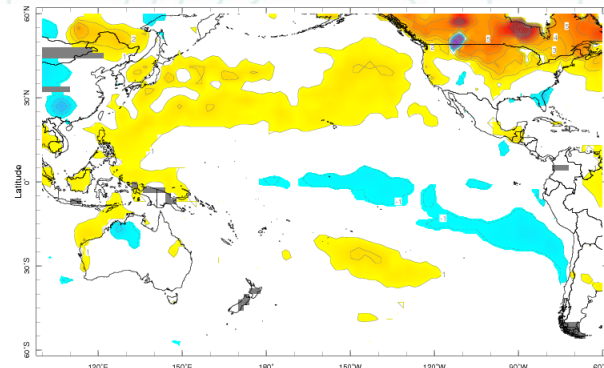
Air temperature anomalies



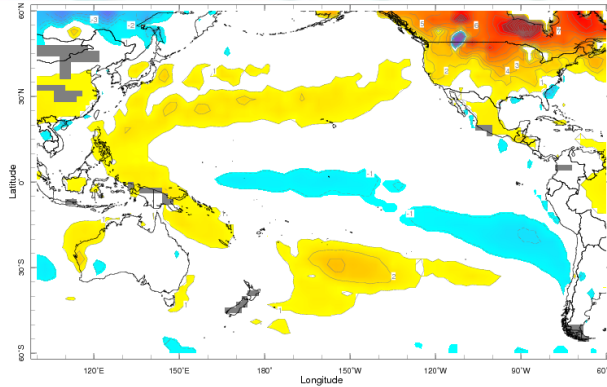
Oct 2020



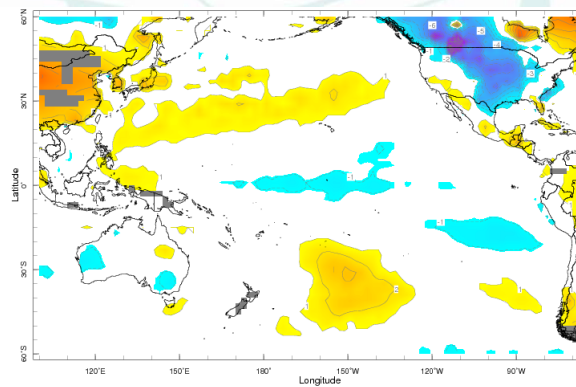
Nov 2020



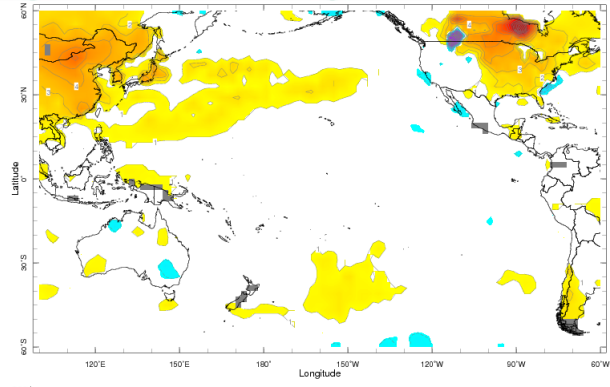
Dec 2020



Jan 2021



Feb 2021



Mar 2021



Station based rainfall monitoring

Online Climate Outlook Forum

Observations and Verification of October to December 2020 outlooks:

Station	Period	Rainfall Amount (mm)	Rainfall Rank	Years of record
Penrhyn, Cook Islands	December	13.0	2	83
Penrhyn, Cook Islands	Oct-Dec	126.8	3	82
Penang, Fiji	Oct-Dec	891.1	100	106
Rotuma, Fiji	Oct-Dec	1444.1	102	105
Tarawa, Kiribati	Dec	19.8	7	73
Beru, Kiribati	Oct-Dec	11.7	2	62
Kavieng, PNG	December	128.0	6	94
Vanimo, PNG	Oct-Dec	885.4	55	60
Apia, Samoa	December	778.8	127	130
Afiamalu, Samoa	December	1316.1	63	68
Nafanua, Samoa	December	870.0	45	46
Faleolo, Samoa	December	607.7	58	59
Apia, Samoa	Oct-Dec	1283.3	123	130
Afiamalu, Samoa	Oct-Dec	2244.5	62	67
Nafanua, Samoa	Oct-Dec	1491.2	42	45
Faleolo, Samoa	Oct-Dec	1135.1	56	58
Taro, Solomon Islands	December	351.7	41	43
Lata, Solomon Islands	Oct-Dec	751.7	5	46
Niuaotoputapu, Tonga	December	540.1	66	69
Niuaotoputapu, Tonga	Oct-Dec	1097.9	66	69
Vava'u, Tonga	Oct-Dec	994.0	71	74
Nanumea, Tuvalu	December	60.6	5	79
Nanumea, Tuvalu	Oct-Dec	170.4	5	79
Bauerfield, Vanuatu	December	396.7	48	48
Port Vila, Vanuatu	December	450.0	67	68

Observations and Verification of January to March 2021 outlooks:

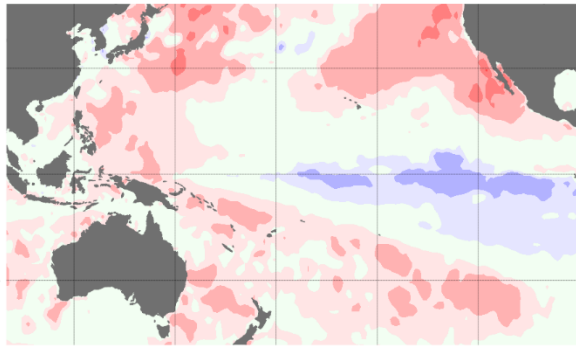
Station	Period		Rainfall Amount (mm)	Rainfall Rank	Years of record
Rotuma, Fiji	March		157.0	7	108
Penang Mill, Fiji	Jan-Mar		1872.0	106	122
Lakeba, Fiji	Jan-Mar		1079.1	63	70
Rotuma, Fiji	Jan-Mar		1388.5	98	108
Hanan Airport, Niue	March		121.0	12	116
Vanimo, PNG	March		141.6	6	69
Wewak, PNG	Jan-Mar		650	63	65
Port Moresby, PNG	Jan-Mar		838.6	126	133
Taro, Solomon Islands	March		439.6	42	46
Niuafo'ou, Tonga	March		76.6	3	50
Fua'amotu, Tonga	Jan-Mar		1045	38	42
Nanumea, Tuvalu	March		108.6	8	81
Niulakita, Tuvalu	March		148.3	6	69
Lamap, Vanuatu	March		458.5	56	61
Lamap, Vanuatu	Jan-Mar		1294.1	58	61
Whitegrass, Vanuatu	Jan-Mar		867.4	46	50

Climate Summary

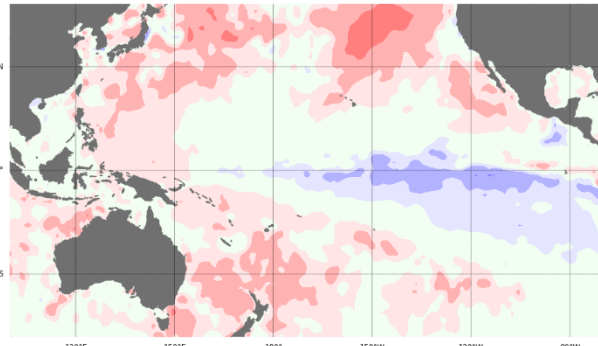
- SPCZ displaced southwest, ITCZ displaced north over the last few months. La Niña-like behaviour
- Significant rainfall suppression (<10th %ile) across equatorial Pacific, e.g. Kiribati, Tuvalu. Conversely significantly more rainfall than normal across much of the South Pacific Islands, e.g. Fiji, Samoa (Oct-Dec 2020), Tonga, and Vanuatu.
- Cooler than normal temperatures in the equatorial Pacific, warmer than normal in the western equatorial Pacific extending southeast to Vanuatu between October – January 2021. Cool anomalies in the eastern Pacific gradually weakening with only small regions remaining.

Sea Surface Temperature

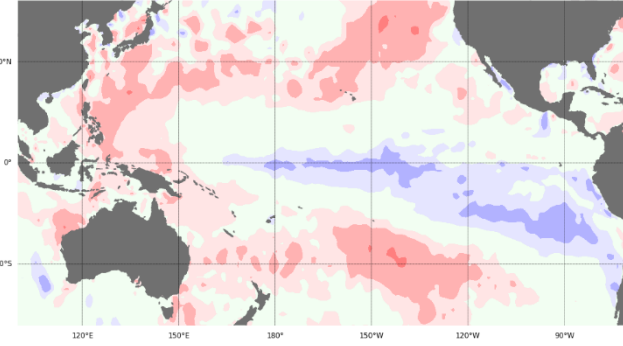
Sea surface temperature anomaly: 01/10/2020 to 31/10/2020



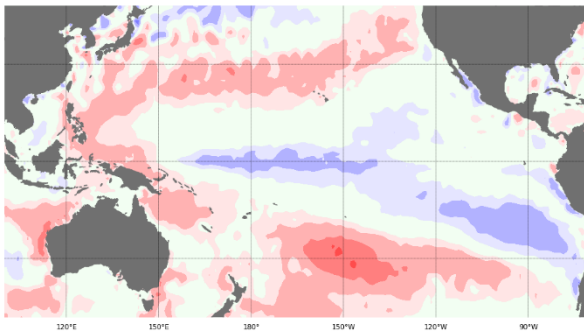
Sea surface temperature anomaly: 01/11/2020 to 30/11/2020



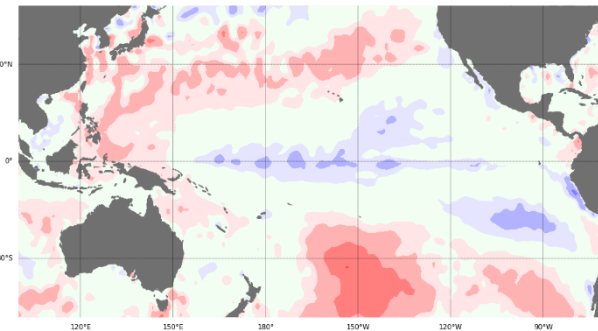
Sea surface temperature anomaly: 01/12/2020 to 31/12/2020



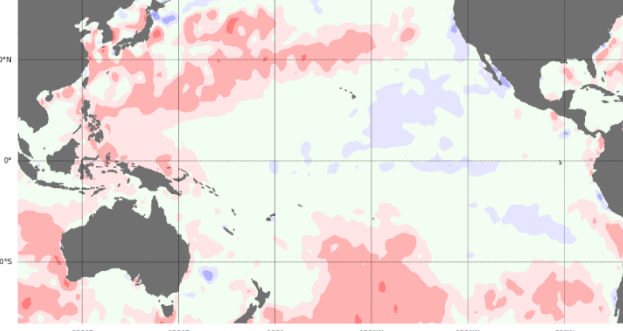
Sea surface temperature anomaly: 01/01/2021 to 31/01/2021



Sea surface temperature anomaly: 01/02/2021 to 28/02/2021



Sea surface temperature anomaly: 01/03/2021 to 31/03/2021



Data: ABOM BNOC
Climatology baseline: 1961 to 1990
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<http://www.bom.gov.au/climate>

Monthly average: January
Created: 06/02

Data: ABOM BNOC
Climatology baseline: 1961 to 1990
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<http://www.bom.gov.au/climate>

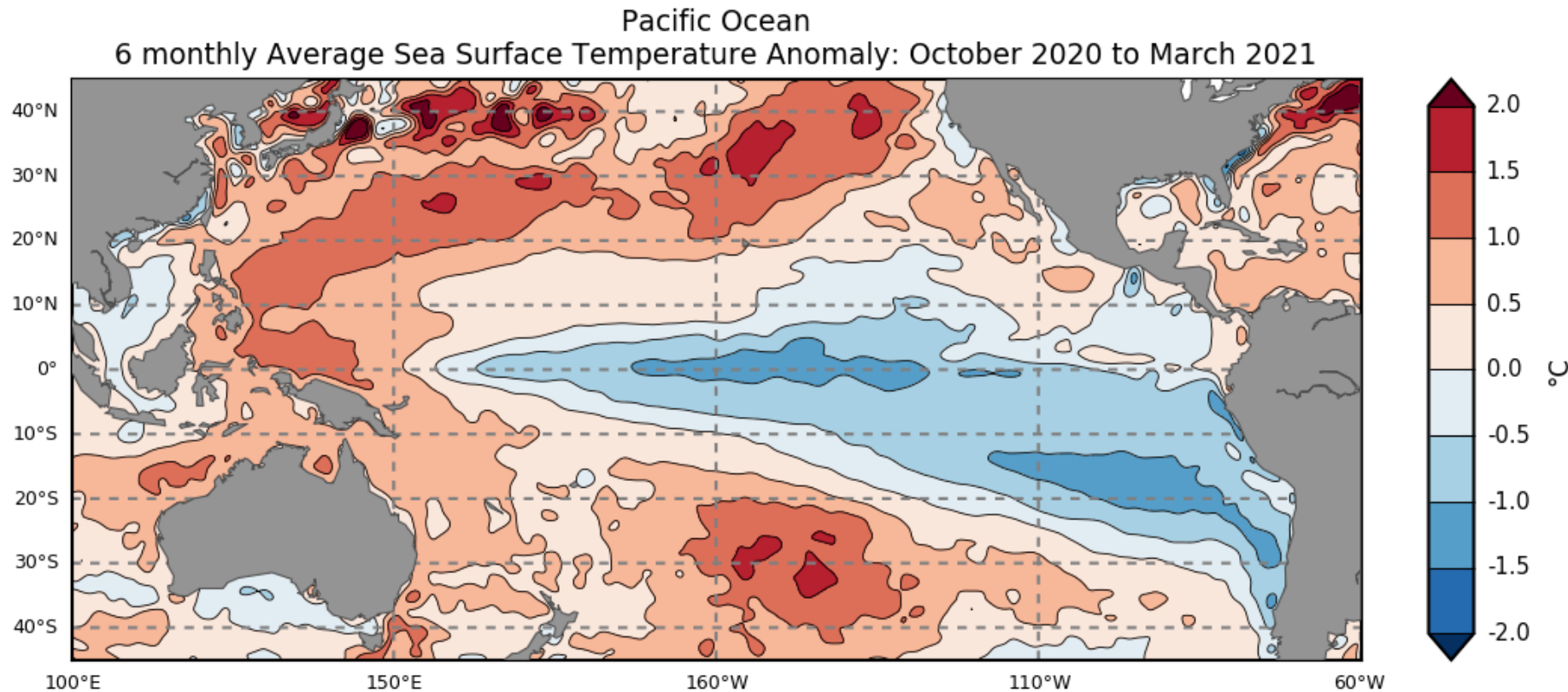
Monthly average: February
Created: 06/03/

Data: ABOM BNOC
Climatology baseline: 1961 to 1990
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<http://www.bom.gov.au/climate>

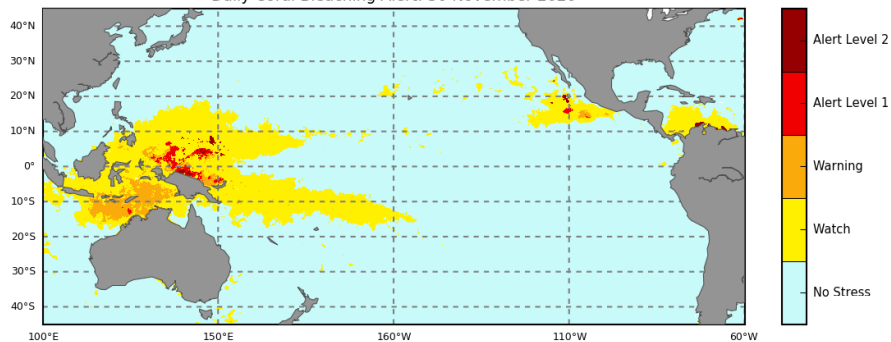
Monthly average: March 2021
Created: 05/04/2021

Sea Surface Temperature



Coral Bleaching

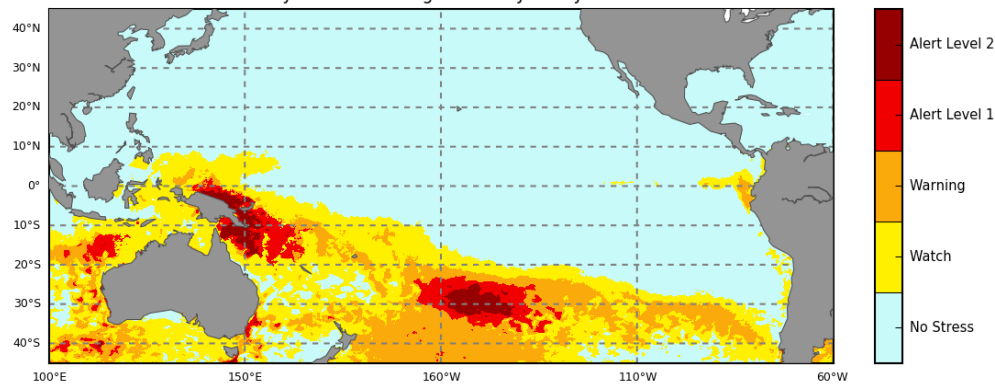
Pacific Ocean
Daily Coral Bleaching Alert: 30 November 2020



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Geoscience Energy and Maritime Division, COSPPac SPP

NOAA Coral Reef Watch

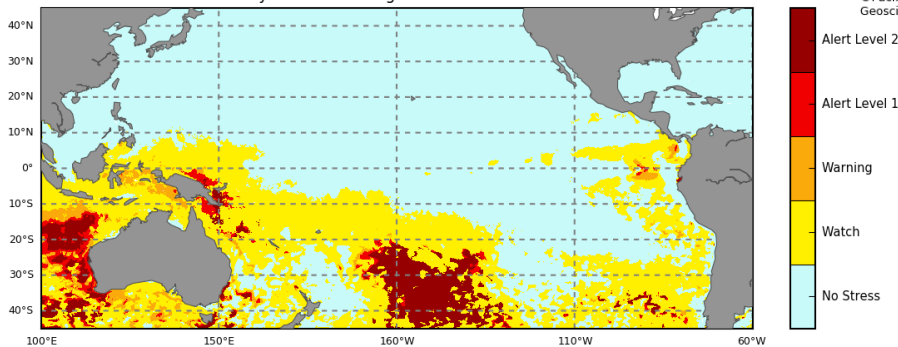
Pacific Ocean
Daily Coral Bleaching Alert: 31 January 2021



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NOAA Coral Reef Watch

Pacific Ocean
Daily Coral Bleaching Alert: 31 March 2021

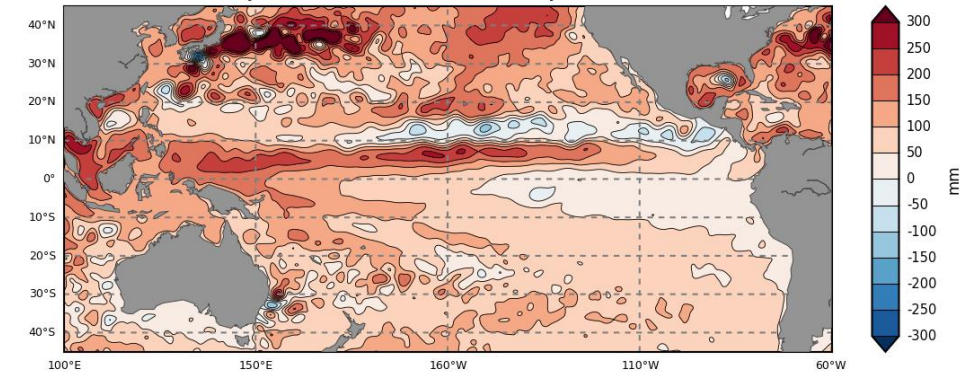


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NOAA Coral Reef Watch

Sea Level

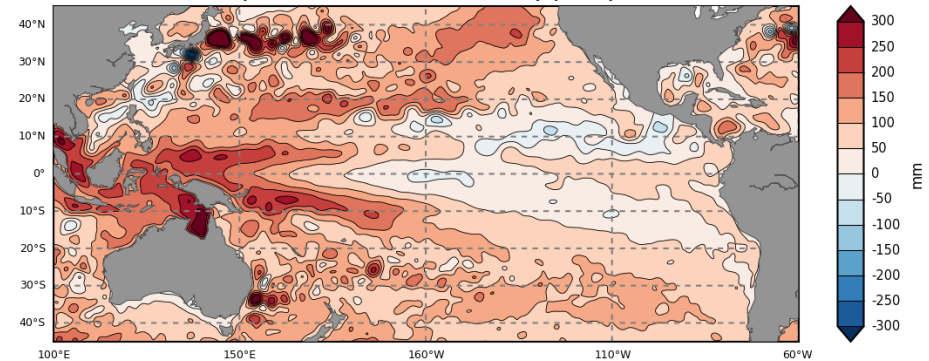
Pacific Ocean
Monthly Near Real Time Sea Level Anomaly: November 2020



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Geoscience Energy and Maritime Division, COSPPac SPP

AVISO Ssalto/Duacs SLA

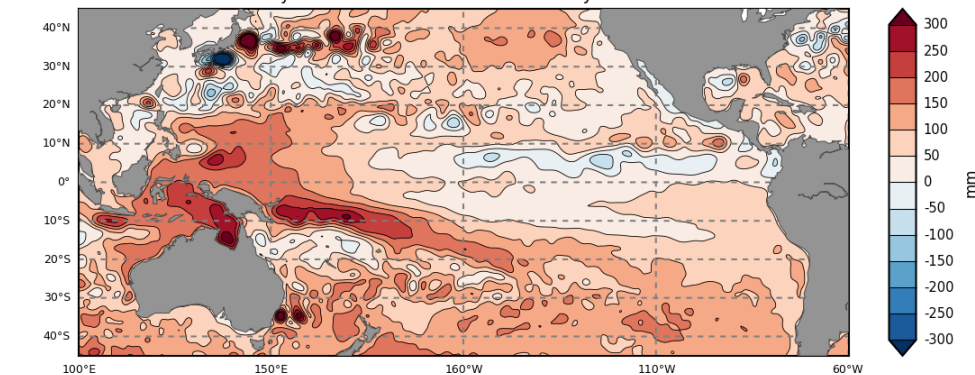
Pacific Ocean
Monthly Near Real Time Sea Level Anomaly: January 2021



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AVISO Ssalto/Duacs SLA

Pacific Ocean
Monthly Near Real Time Sea Level Anomaly: March 2021



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AVISO Ssalto/Duacs SLA

Ocean Summary

- Cooler than normal SSTs along the equatorial Pacific, weakening during 2021. Persistent warmer than normal SSTs in the western equatorial Pacific.
- Coral Bleaching alerts were at Alert Level 1 and 2 at PNG, Solomons, Vanuatu, extending to Palau & FSM. Another marine heatwave recently extended into Cook Islands EEZ.
- Positive sea level anomalies were most significant in the western warm pool region.
- Equatorial Pacific temperature and rainfall observations consistent with PICO-7 outlooks.