

Review of May 2021-October 2021 Climate

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Support from: BoM, Météo-France,
NOAA, SPC, SPREP, APCC

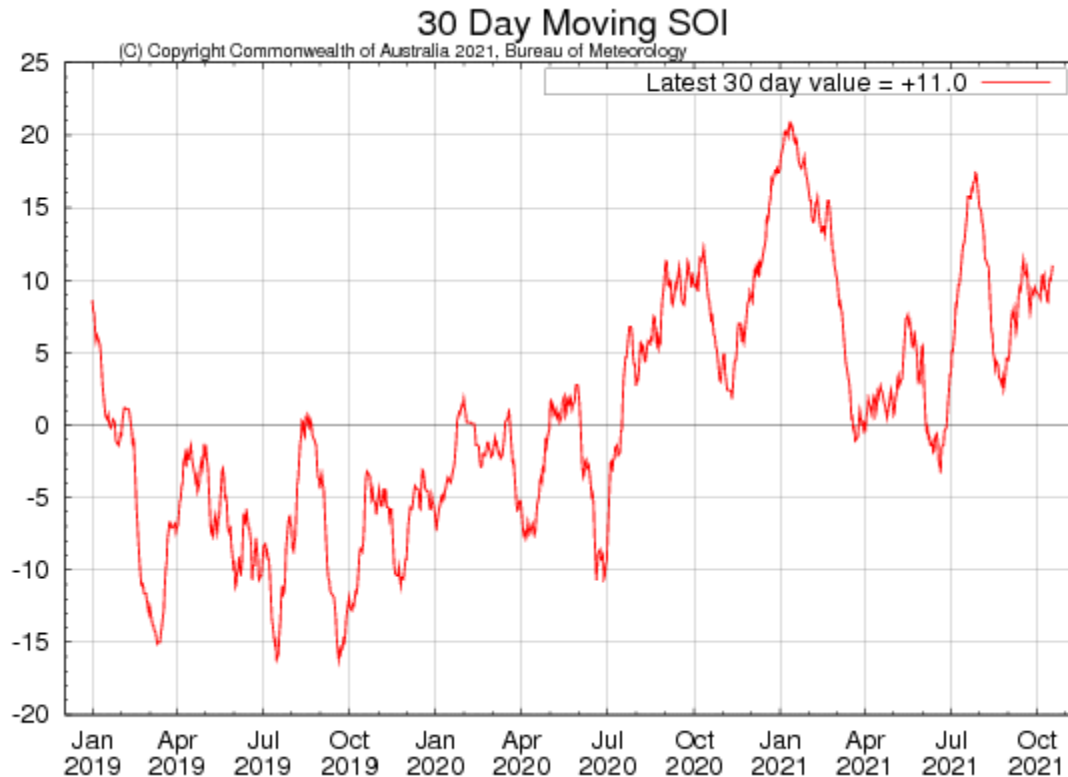
Presentation Outline

- PICO 8 Outlook
- Model predictions in past 6 months
- Rainfall and drought
- Indian Ocean Dipole status
- Air temperature anomaly
- Station based rainfall monitoring

PICOF 8 Outlook

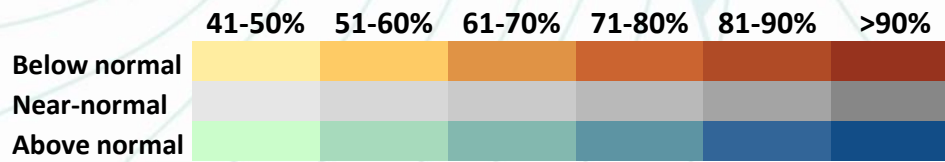
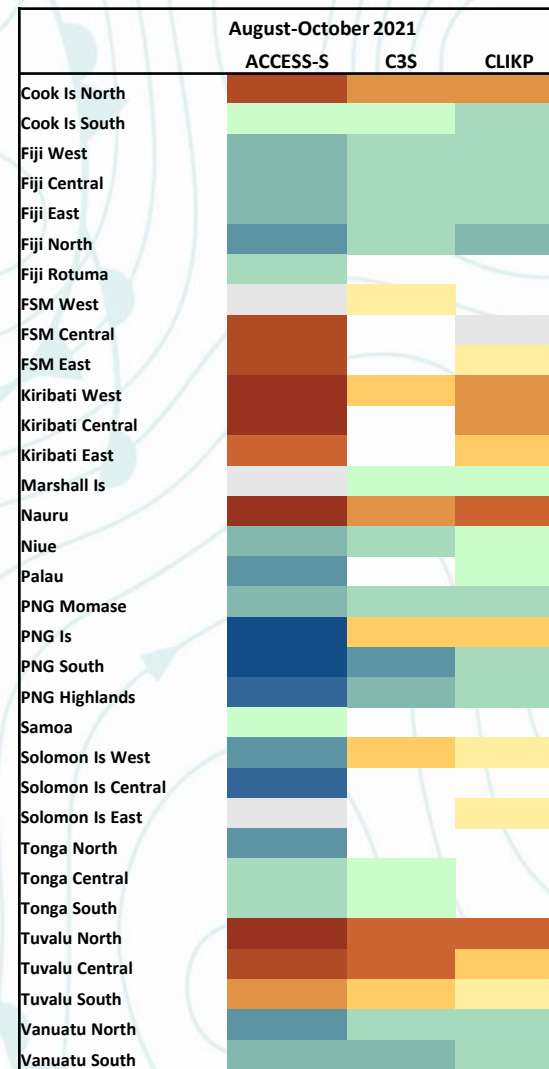
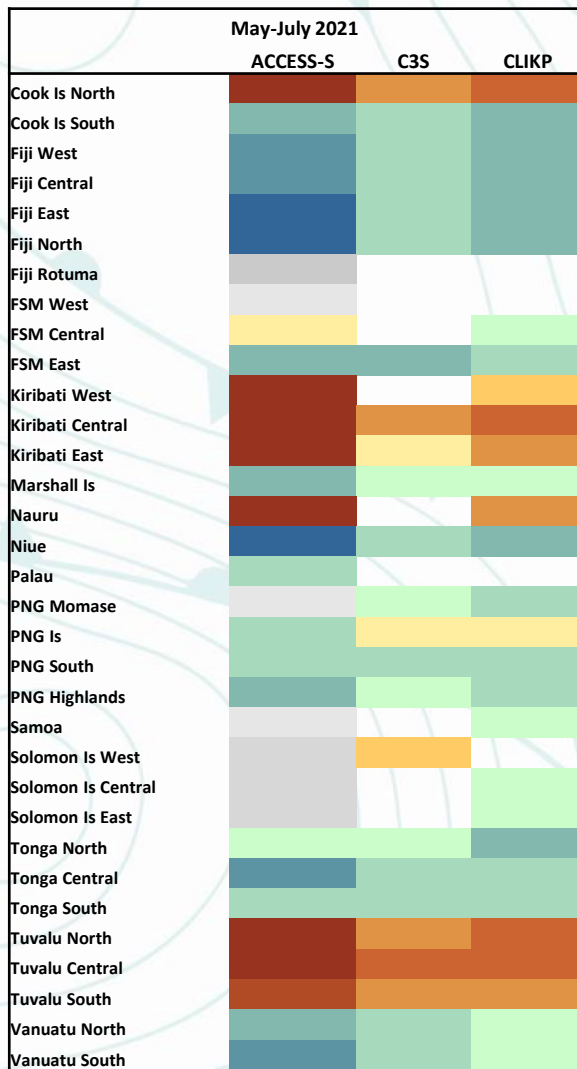
- Climate model outlooks favour the tropical Pacific Ocean being at **neutral El Niño-Southern Oscillation (ENSO) levels** for most of this period.
- The continuing **influence of La Niña is evident** in atmospheric and ocean seasonal forecasts especially for **May to July**.
- **Drier than normal conditions** are favoured for island groups close to the equator. Existing drought (including in Tarawa, western Kiribati and Penrhyn, northern Cook Islands) is likely to continue for a few more months.
- **Most countries in the southwest Pacific** are entering their dry season and this should be taken into account when considering the above rainfall outlooks. In countries where above normal rainfall is favoured, the dry season may be wetter than usual.
- **In countries where below normal rainfall** is favoured, **water stress** may be experienced.

Southern Oscillation Index (SOI)



The SOI values were neutral since March to July 2021 before showings signs of La Niña. Since September SOI have sit within the La Niña boundaries

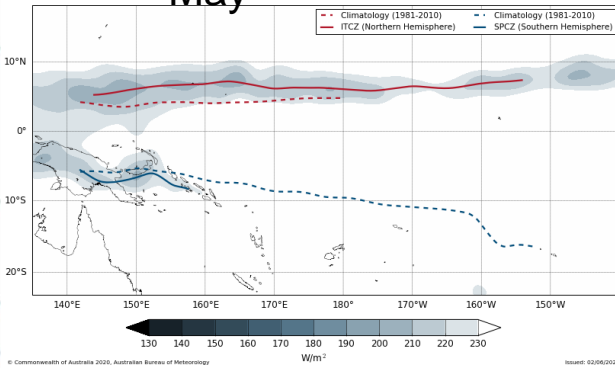
Model Rainfall Predictions



Pacific Outgoing longwave radiation (OLR)

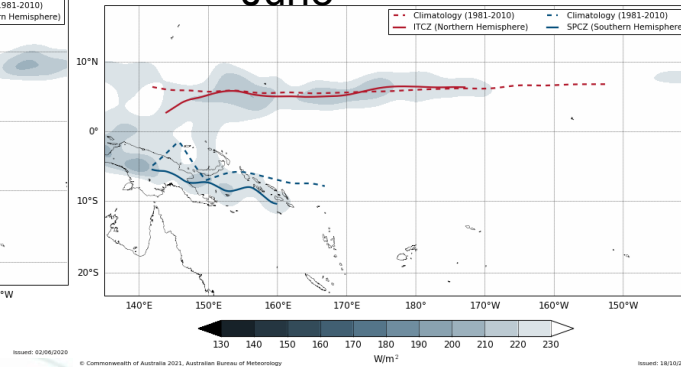
30 Day Average Outgoing Longwave Radiation (OLR) minimum to 2020-05-31

May



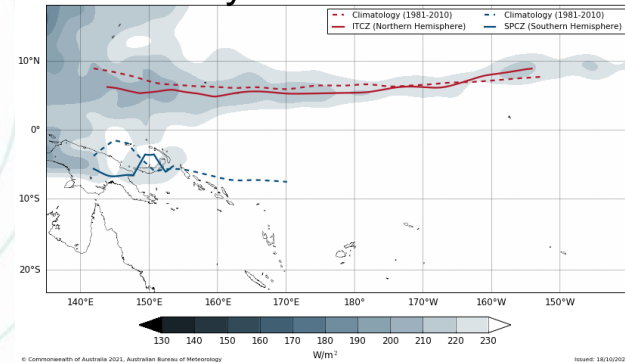
30 Day Average Outgoing Longwave Radiation (OLR) minimum to 2021-06-30

June



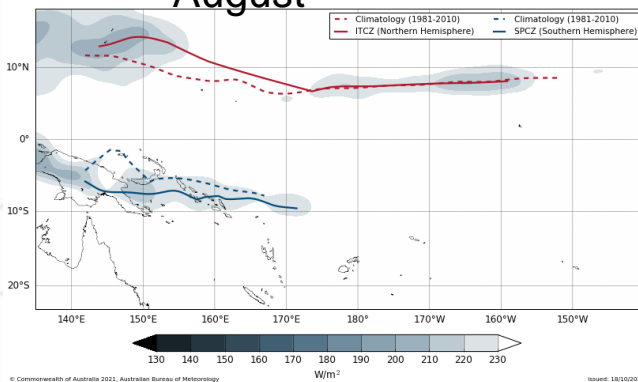
30 Day Average Outgoing Longwave Radiation (OLR) minimum to 2021-07-31

July



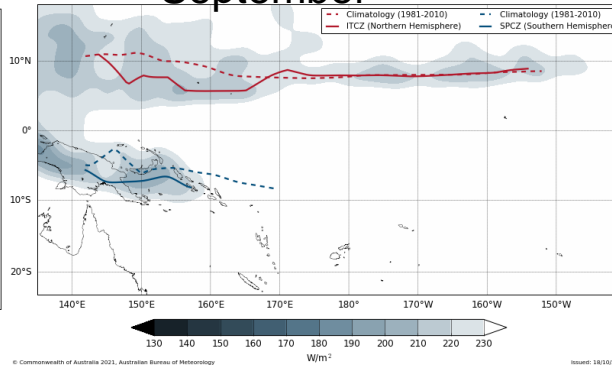
30 Day Average Outgoing Longwave Radiation (OLR) minimum to 2021-08-31

August



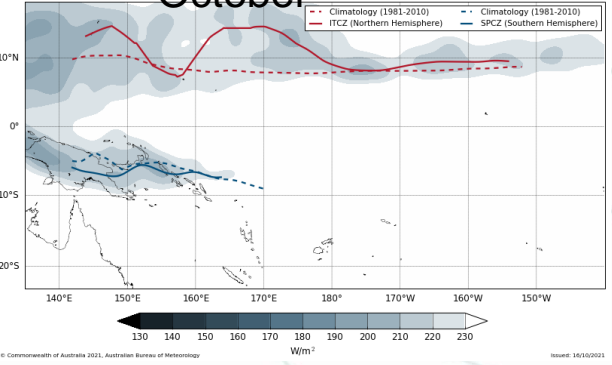
30 Day Average Outgoing Longwave Radiation (OLR) minimum to 2021-09-30

September



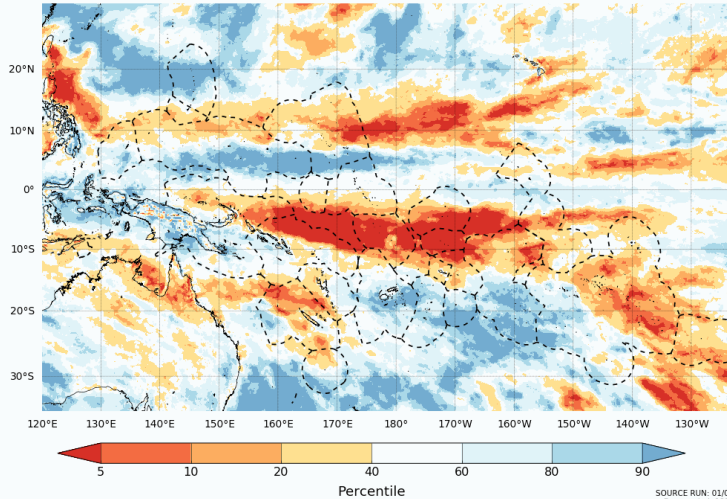
30 Day Average Outgoing Longwave Radiation (OLR) minimum to 2021-10-13

October



Rainfall and drought

3-month Percentile to end of July 2021



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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.maritimerregions.org/>

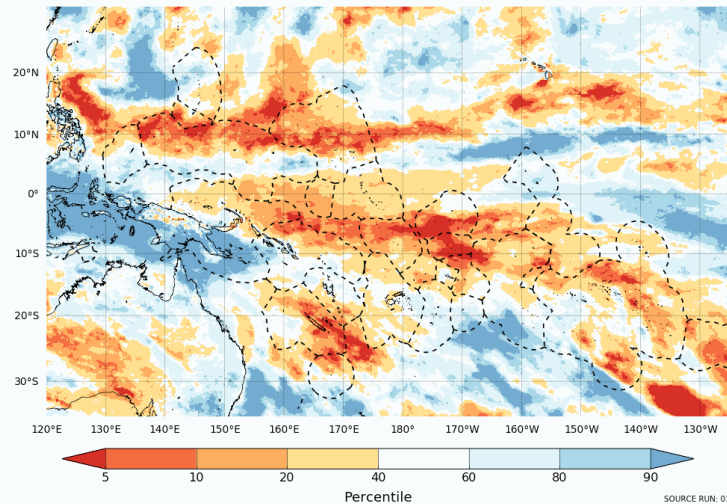
Over May to July,

- La Niña impact on rainfall continues in Tuvalu, Kiribati, Tokelau, northern Cook Islands and French Polynesia

Over July to September

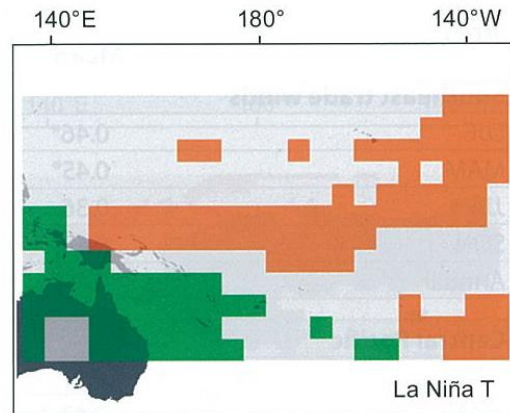
- Rainfall in the above countries gradually returns to normal
- Separately serious to severe rainfall deficiencies have developed in northern FSM, northern RMI and around New Caledonia and southern Vanuatu

3-month Percentile to end of September 2021



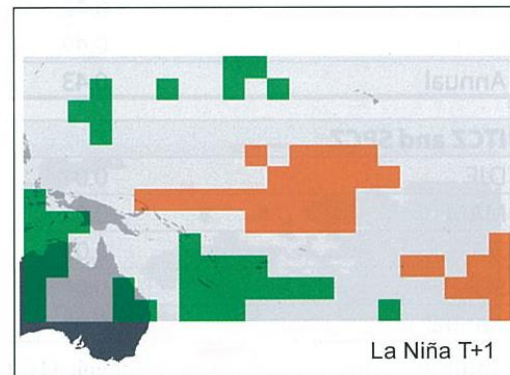
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ENSO association with Pacific rainfall



La Niña T
year the ENSO
event begins

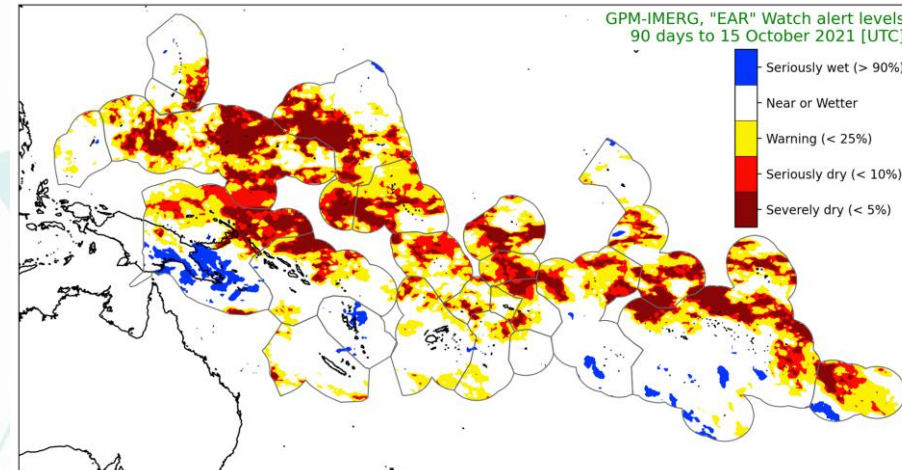
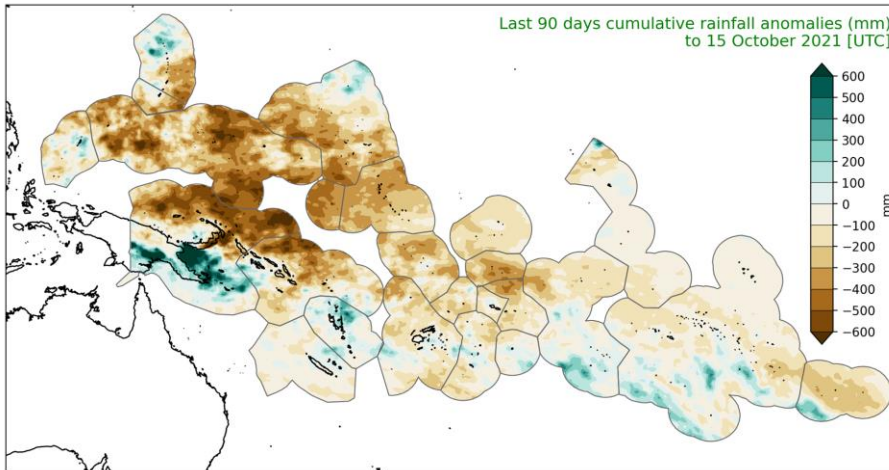
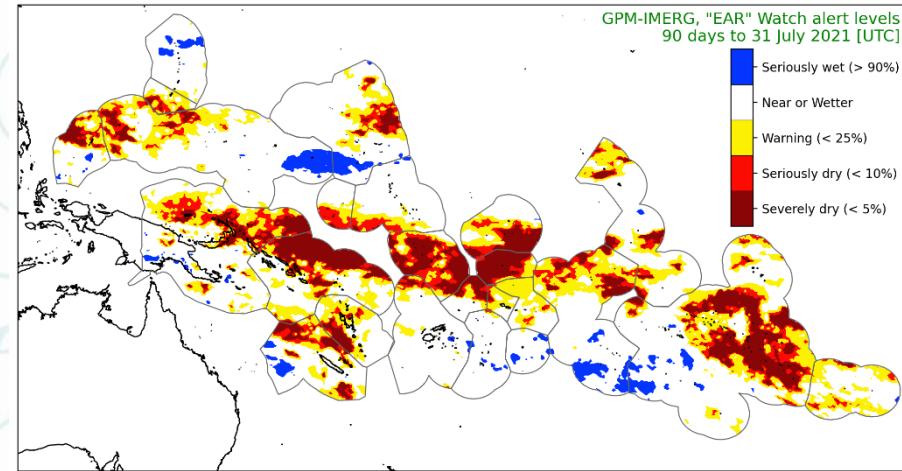
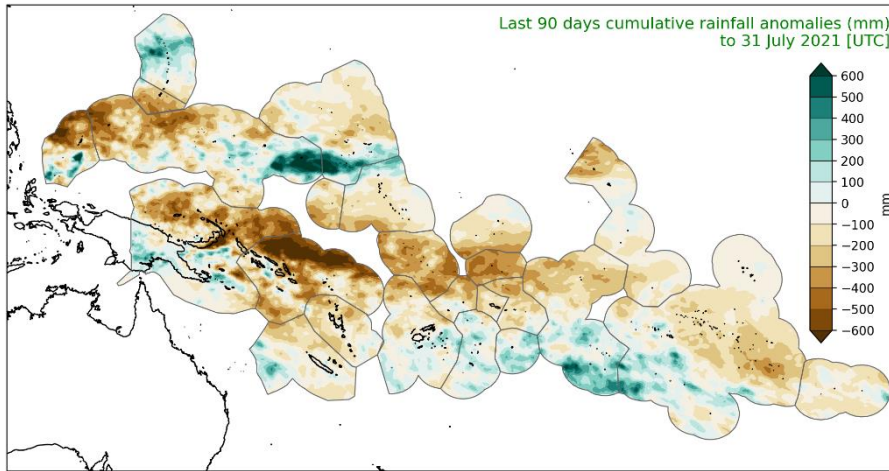
- Pattern consistent with past La Niña events, negative anomalies exist in year after La Niña event south of the equator, north of the SPCZ



La Niña T+1 year
after the ENSO
event begins

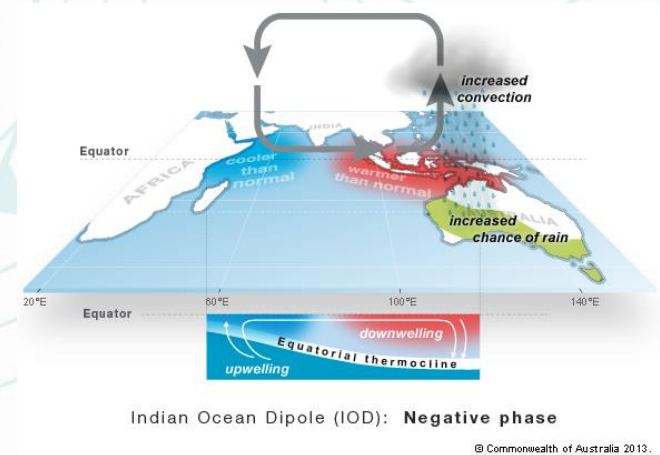
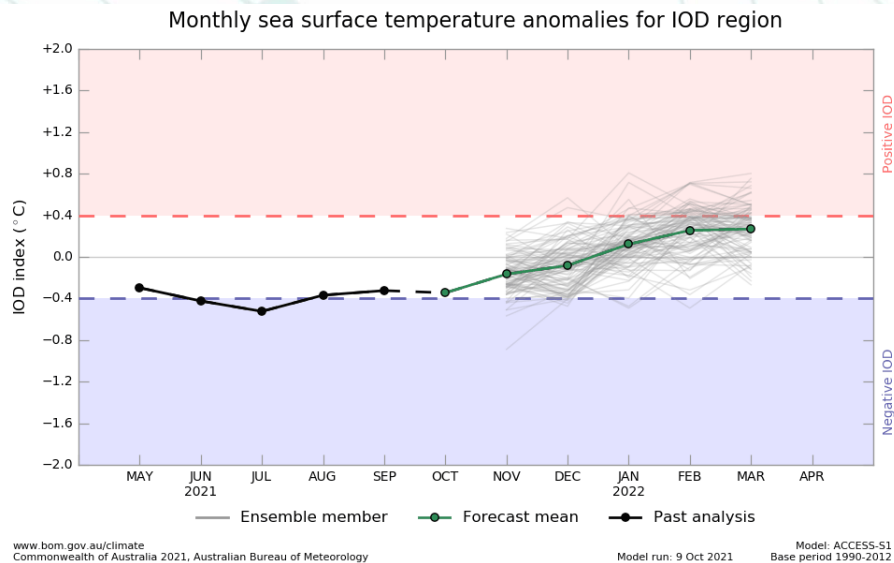
Areas with significantly wetter (green) or drier (orange) conditions during La Niña for year T (top) and year T+1 (lower) (Smith et al. 2008)

Second 3-month rainfall (to October 2021)



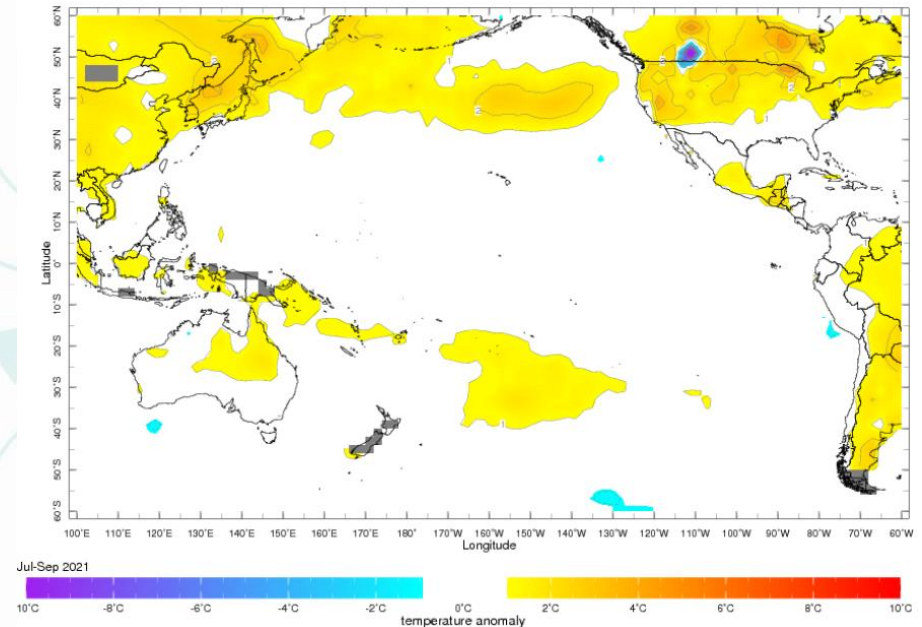
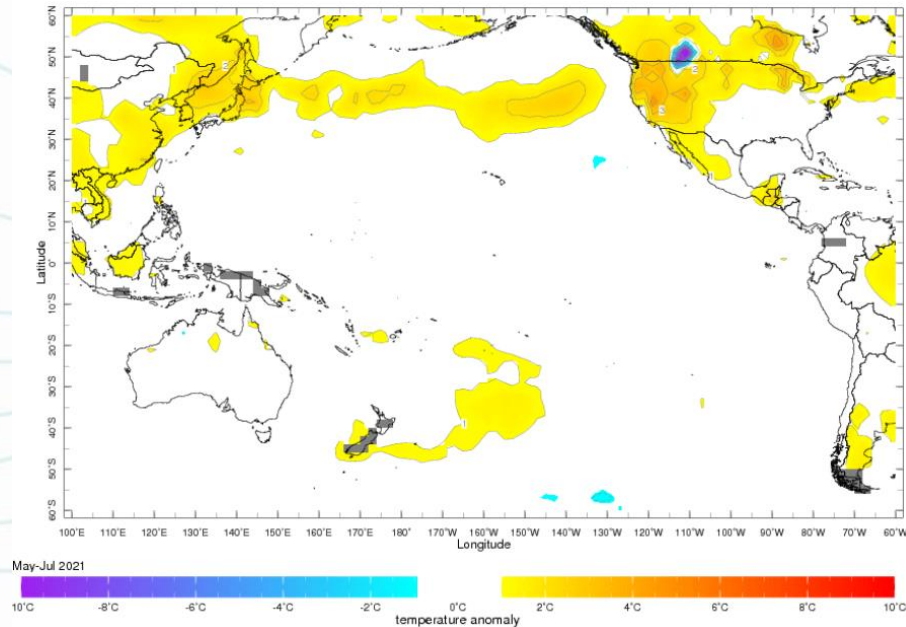
Similarly, a northward shift in the driest conditions in the last 3 months vs the previous 3 months.

Indian Ocean Dipole status



- IOD currently negative. May have contributed to enhanced rainfall over New Guinea.
- All five international climate models surveyed by the Bureau (including ACCESS-S, left) indicate the monthly IOD value for November will be within the neutral range, indicating a return to neutral weekly values in the coming weeks.

Air temperature anomalies



<https://iridl.ldeo.columbia.edu/> (base period 1971-2000)

Station based rainfall monitoring

Online Climate Outlook Forum

Observations and Verification of April to June 2021 outlooks:

Station	Period		Rainfall Amount (mm)	Rainfall Rank	Years of record
Rarotonga, Cook Islands	June		266.3	119	123
Rarotonga, Cook Islands	April-June		888.1	121	123
Rotuma, Fiji	April-June		1104.7	97	107
Kiritimati, Kiribati	April-June		86.9	7	96
Kwajalein, Marshall Islands	June		117.1	6	77
Majuro, Marshall Islands	April-June		1290.3	64	67
Koror, Palau	June		1360.2	67	70
Wewak, PNG	June		318.0	62	66
Wewak, PNG	April-June		874.6	60	64
Faleolo, Samoa	April-June		176.4	3	58
Honiara, Solomon Islands	June		26.1	6	67
Kirakira, Solomon Islands	June		591.0	55	55
Auki, Solomon Islands	April-June		472.3	6	59
Niuefo'ou, Tonga	April-June		861.5	44	47
Nuku'alofa, Tonga	April-June		533.2	69	76
Nanumea, Tuvalu	June		69.2	4	81
Pekoa, Vanuatu	June		26.5	3	51
Lamap, Vanuatu	June		26.5	3	60
Bauerfield, Vanuatu	June		33.0	2	49

Observations of June to August 2021:

Station	Period		Rainfall Amount (mm)	Rainfall Rank	Years of record
Rarotonga, Cook Islands	Jun-Aug		522.4	113	123
Ono-i-Lau, Fiji	June		25.8	8	74
Labasa Airport, Fiji	June		2.0	5	65
Nausori Airport, Fiji	Jun-Aug		55.5	7	80
Butaritari, Kiribati	Jun-Aug		1102.0	75	83
Kwajalein, Marshall Islands	August		87.1	1	77
Kwajalein, Marshall Islands	Jun-Aug		408.7	2	77
Misima, PNG	Jun-Aug		1162.4	86	93
Henderson, Solomon Islands	August		148.6	41	47
Honiara, Solomon Islands	August		178.2	62	66
Kirakira Solomon Islands	Jun-Aug		1398.8	51	54
Vava'u, Tonga	August		267.0	71	75
Niulakita, Tuvalu	August		423.2	63	69
Aneityum, Vanuatu	August		4.5	1	70
Whitegrass, Vanuatu	Jun-Aug		61.2	4	49
Aneityum, Vanuatu	Jun-Aug		142.1	2	70

Climate Summary

- SOI showed neutral ENSO phase until September SOI is in positive phase (La Nina)
- SPCZ displaced southwest, while in May the ITCZ was displaced to the north . Consistent with transition La Niña-like behaviour like state
- Significant rainfall suppression (<10th %ile) over parts of the Pacific in the past three months (Jun-Aug), e.g. RMI, Vanuatu, and part of Fiji while in the first 3 months (Apr-Jun), northern RMI, parts of Solomon Islands, Kiribati, Tuvalu and Vanuatu also experienced below normal rainfall. Conversely significantly more rainfall than over, e.g., Palau, RMI, parts of PNG, Rotuma, Samoa, Tonga and Southern Cooks (Apr-Jun 2021) and southern PNG, central Solomon Is., southern Tuvalu and southern Cook Is. Experience above normal rainfall (June -Aug)
- Near normal temperatures in the equatorial Pacific over May -June , warmer than normal west of Fiji, southern Cook Is., and southern French Polynesia between May – July 2021. Above normal air temperature over southern PNG, western Solomon Is., Vanuatu, Fiji, Niue, southern Cook Islands and southern French Polynesia over July-September