

Climate and Oceans Support Program in the Pacific

ACCESS-S Workshop

MODULE: ACCESS-S specialized products and climate monitoring





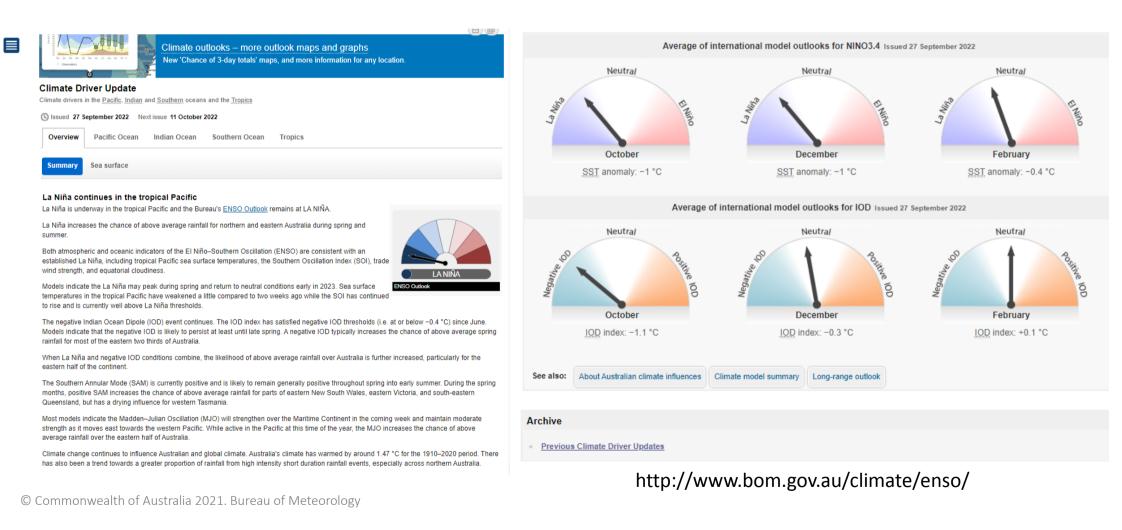
- Bureau of Meteorology analysis products
- Weekly ACCESS-S slide
- Specialised ACCESS-S products
- Climate monitoring products

Expected learning outcomes

• Understanding of the specialised ACCESS-S outputs and climate monitoring products that can be used for climate prediction



Program in the Pacific



Pacific, Indian Ocean and Tropics Monitoring

Climate and Oceans Support Program in the Pacific

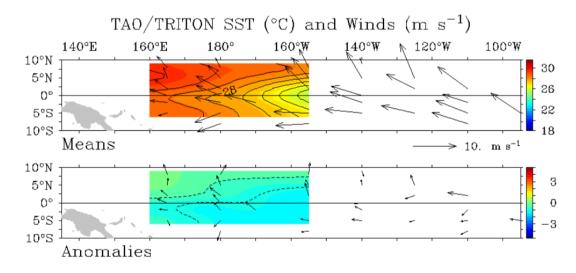
Overview	Pacific Ocear	Indian Ocean	Ocean Southern Ocean		Tropics			
Outlook	Sea surface	Sea sub-surface	SOI	Trade winds	Cloudiness	History	About	

Trade winds

Trade winds for the 5 days ending 25 September 2022 were slightly stronger than average across the western .

During La Niña there is a sustained strengthening of the trade winds across much of the tropical Pacific, while during El Niño there is a sustained weakening, or even reversal, of the trade winds.

5-day SST and wind anomaly from TAO/TRITON



Climate Driver Update presents information for the Pacific Ocean, Indian Ocean, Southern Ocean and the Tropics

Tabs at the top of the website are clickable to provide extra detail and analysis.

Updated fortnightly on Tuesdays.

http://www.bom.gov.au/climate/enso/



Climate and Oceans Support Program in the Pacific



Australian climate is influenced by temperature patterns in the Pacific and Indian Oceans. This page provides information on Pacific and Indian Ocean outlooks for the coming six months based on a survey of international climate models.

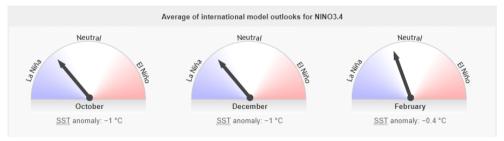
La Niña and negative IOD to influence climate for remainder of 2022

La Niña is under way in the tropical Pacific. The majority of models indicate this event will peak in the spring, with a return to ENSO-neutral in early 2023. This is earlier than normal as most ENSO events peak in late summer and decay in autumn. La Niña increases the chance of above normal spring and summer rainfall in eastern and northern Australia.

A negative Indian Ocean Dipole (IOD) event is also under way. All climate model outlooks indicate that negative IOD conditions are likely to continue until at least late spring. A negative IOD event typically enhances spring rainfall across much of Australia but has reduced influence in summer. A return to neutral weekly IOD values in late spring or early summer is consistent with the typical life cycle of an IOD event.

When a La Niña and a negative phase of the IOD coincide, it further increases the likelihood of above average rainfall over Australia, particularly in the eastern half of the continent.

Further details: Climate Driver Update | Climate Outlooks





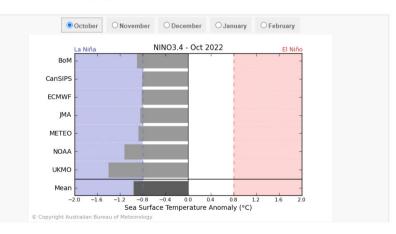
NINO3.4 outlook

A La Niña event is under way. The latest weekly NINO3.4 value to 25 September 2022 is -0.72 °C. This is the sixth consecutive week when values have been near the La Niña threshold (-0.8 °C).

All seven surveyed climate models show NINO indices are expected to remain at La Niña levels during October, with five persisting at these levels until at least the end of 2022. Most models indicate a return to ENSO-neutral conditions in early 2023, suggesting a relatively short-lived event; ENSOevents typically decay during the southern hemisphere autumn.

La Niña events increase the chance of above-average rainfall for northern and eastern Australia during spring and summer. The <u>Bureau's latest rainfall</u> outlooks indicate that the strongest influence on Australian rainfall is likely to be felt in the southern hemisphere spring, with reduced influence by summer as the event starts to weaken.

Persistent NINO3.4 values above +0.8 °C typically indicate El Niño, while values below -0.8 °C typically indicate La Niña.



http://www.bom.gov.au/climate/model-summary/#tabs=Overview

Weekly ACCESS-S Update

Climate and Oceans Support Program in the Pacific



Pacific Weekly ACCESS-S Update Climate and Oceans Support Program in the Pacific Tuesday 27 September 2022

Ocean Outlook, fortnight to 14 October:

- Sea surface temperatures (SSTs) are forecast to be more than 0.8 °C above normal for the following country EEZs: Palau, FSM (southern Yap State), PNG Islands and southwards, central and southern Solomon Is., Vanuatu, New Caledonia, Fiji (except Rotuma), most of both Tonga and Niue, far southern Cook Is., southern French Polynesia and the Pitcairn Is. Most of these countries EEZ's have significant regions with anomalies above +1.2 °C. Below normal SSTs (anomalies below -0.4 °C) are forecast over Nauru, Kiribati, northern Tuvalu, Tokelau, northern Cook Is. and northern French Polynesia. Elsewhere SSTs are predicted to be near-normal.
- Notably above normal sea level (>100 mm) is forecast in the following country EEZs in October: southern Palau, patches in FSM and RMI, eastern PNG, Solomon Is., southernmost Vanuatu, northern New Caledonia, southern Fiji, central and southern Tonga and southern Niue. Notably below normal sea level (<100 mm) is forecast to the east of New Caledonia. A patchy mix of above and below average sea levels are indicated for countries in the northern and southern subtropics (poleward of 20° latitude). Note that sea level anomalies from ACCESS-S2 do not include sea level trends.
- Tide calendars available via http://oceanportal.spc.int/portal/library/. Remember to review sea surface temperature and sea level skill information, which can be found in the accompanying presentation.

Climate Outlook, fortnight to 14 October:

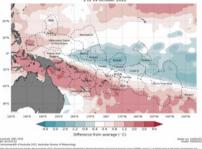
- The tropical cyclone (TC) occurrence risk is significantly increased over and to the northwest of the Mariana Is, for the weeks of 2 to 8 October and 9 to 15 October. The southwest Pacific statistical Tropical Cyclone outlook for November to April will be released on Wednesday 12 October.
- Above normal rainfall is favoured for the following country EEZs: central RMI, PNG (western New Britain, southern and eastern half of the mainland), central Solomon Is., New Caledonia, Vanuatu, Fiji (except Rotuma), central and southern Tonga, parts of Niue, and the far south of both Cook Is, and French Polynesia. The EEZs where below normal rainfall is favoured are; far southern FSM, PNG (Sepik, Madang, northern and eastern New Guinea Is.), northern and eastern Solomon Is., southern Nauru, the southern half of Kiribati, Tuvalu, Tokelau, Wallis, Samoa and American Samoa, plus the northern halves of both Cook Is. and French Polynesia.
- Maximum and minimum air temperatures are favoured to be above normal for Palau, Guam, CNMI, west and central FSM, northern RMI, PNG (except West Province), Solomon Is., Vanuatu, New Caledonia, Fiji, Tonga, southernmost Tuvalu, Wallis and Futuna, the southern halves of Samoa and American Samoa, Niue, southern Cook Is., southern French Polynesia, and Pitcairn Is. Elsewhere air temperatures are more likely to be near or below normal.
- Remember to review rainfall and air temperature outlook skill information, which can be found in the accompanying presentation. Climate Influences:

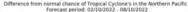
- . The ENSO Outlook is at La Niña, meaning a La Niña event is underway across the Pacific Basin. This will be the third successive La Niña since and including 2020. Models indicate this La Niña event may peak over September to November, with tropical Pacific temperatures returning to neutral early in 2023.
- Over the 30 days to 23 September, the Intertropical Convergence Zone was close to its normal position, and the South Pacific Convergence Zone was displaced slightly southward towards southern PNG and south of the Solomon Islands.
- The Madden-Julian Oscillation (MJO) is inactive and forecast to remain weak or inactive from now to the third week of October.
- A negative Indian Ocean Dipole (IOD) event is under way. Outlooks indicate it is likely to persist until the end of November. A negative IOD increases the chances of above . average rainfall for PNG in the coming months.
- Western Pacific climate warmed by 1.1°C over the period 1951-2020. With this warming there has been an increase in the frequency of extreme heat events and a general decrease in the frequency of extremely cold days and nights.

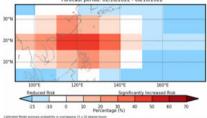


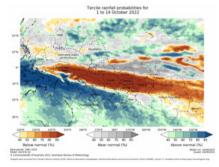


age sea surface tem to 14 October 2022











Program in the Pacific

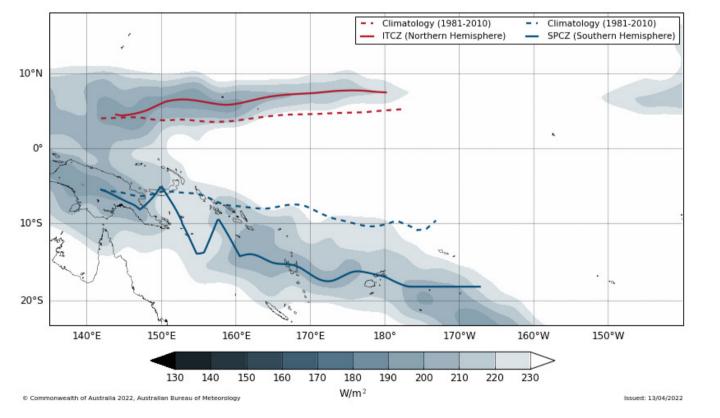
http://www.bom.gov.au/climate/pacific/outlooks/

HOME | ABOUT | MEDIA | CONTACTS Enter search terms Search Australian Government Bureau of Meteorology ANTARCTICA NSW VIC OLD WA SA TAS ACT NT AUSTRALIA Bureau home > Climate > Pacific > Outlooks World Meteorological Global and Pacific ACCESS-S outlooks and Pacific Organization (WMO) climate monitoring Global Producing Centre (GPC) for Long-Range Outlooks issued on Thursdays, one and two week outlooks also issued on Mondays Forecasts **RA-V** Pacific Regional About ACCESS-S | About GPCs | About RCCs Climate Centre (RCC) Network Co-lead for Node on Seasonal and inter-annual climate variability poses a major risk to many parts of our LRF and Consortium member global society, the economy and the environment. The risks are particularly significant for Node on Climate for Pacific Island Countries and are compounded by human caused climate change Monitoring which interacts with natural climate variability. This website provides dynamical Development supported by model-based seasonal and sub-seasonal outlooks and satellite-based climate DFAT-funded COSPPac and monitoring with an emphasis on the western Pacific region. WMO-funded CREWS Related links Category Domain Period Variable **1** SPC7 Climate drivers Download files

> Download global NetCDF data



30 Day Average Outgoing Longwave Radiation (OLR) minimum to 2022-04-10



- OLR as a proxy for rainfall
- Using OLR to locate the region which emits the least radiation, defining this region as the location of the SPCZ and ITCZ

Category

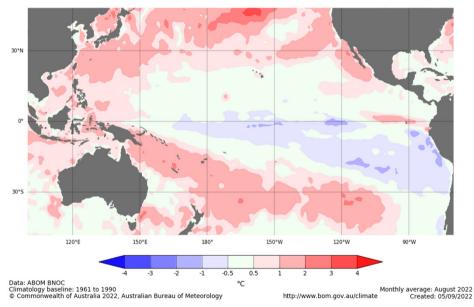
Climate drivers

http://www.bom.gov.au/climate/pacific/outlooks/



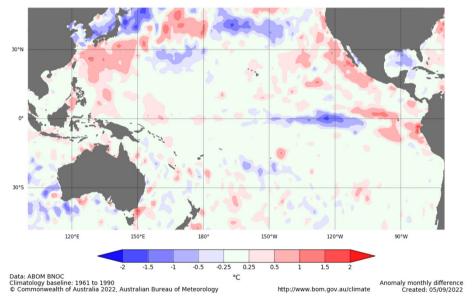
SST monthly anomaly

Sea surface temperature anomaly: 01/08/2022 to 31/08/2022



SST monthly anomaly difference

Change in the monthly SST anomaly: August-2022 - July-2022



Category

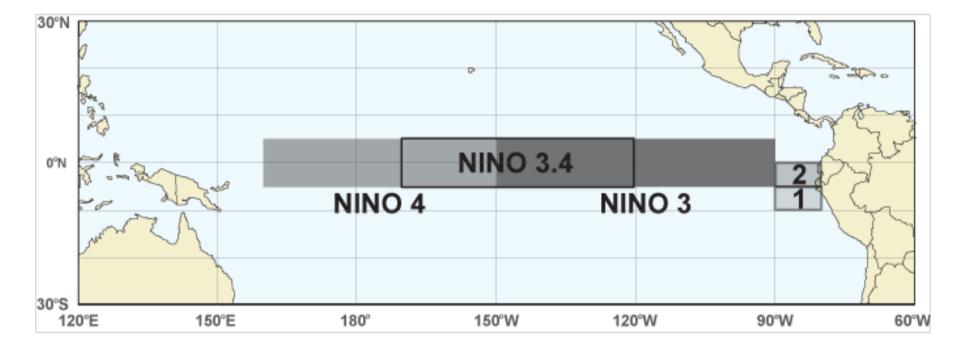
http://www.bom.gov.au/climate/pacific/outlooks/

Climate drivers

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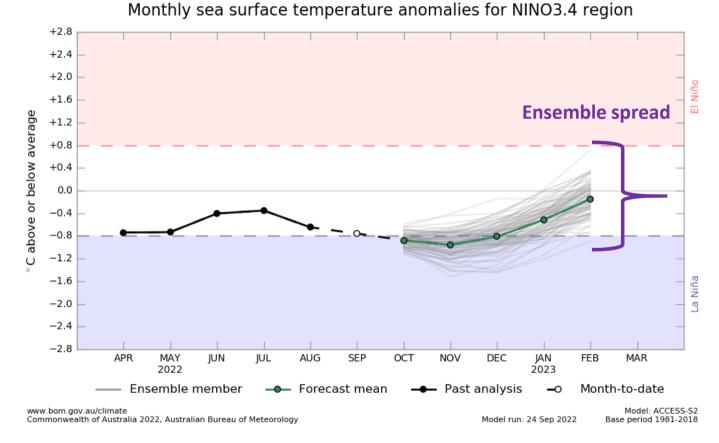




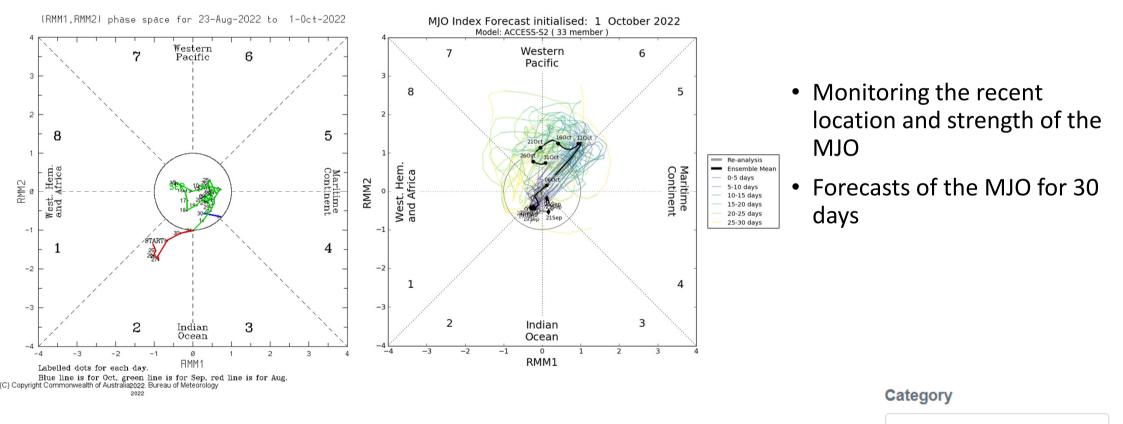
• Predictions for ENSO Indices



- Plumes of SST predictions for 6 months into the future
- NINO1
- NINO2
- NINO3
- NINO4
- NINO3.4
- Important for long-term prediction of ENSO







http://www.bom.gov.au/climate/pacific/outlooks/

Climate drivers

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Global and Pacific ACCESS-S outlooks and Pacific climate monitoring

Outlooks issued on Thursdays, one and two week outlooks also issued on Mondays

About ACCESS-S | About GPCs | About RCCs

Seasonal and inter-annual climate variability poses a major risk to many parts of our global society, the economy and the environment. The risks are particularly significant for Pacific Island Countries and compounded by human caused climate change which interacts with natural climate variability. The website provides dynamical model based seasonal and sub-seasonal outlooks and satellite-based climate monitoring with an emphasis on the western Pacific region.

Category	Domain		Variable	Period			
ACCESS-S outlooks	▼	Global	▼	Rain	▼	Week	▼
Regional	•	Forecast	-	Anomaly	-	2	▼



World Meteorological Organization (WMO)

Global Producing Centre (GPC) for Long-Range Forecasts

RA-V Pacific Regional Climate Centre (RCC) Network Co-lead for Node on LRF and Consortium member for Node on Climate Monitoring



Development supported by DFAT-funded COSPPac and WMO-funded CREWS

Related links

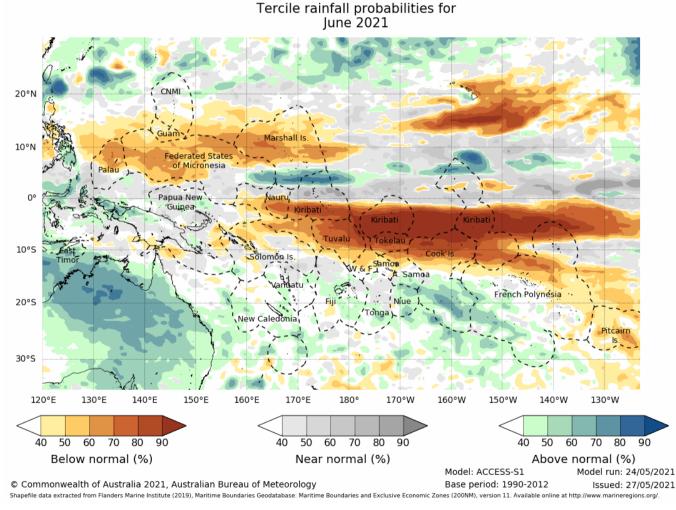
Download files

- Download global NetCDF data
- Download guidance documents

http://www.bom.gov.au/climate/pacific/outlooks/



- At a National scale Exclusive Economic Zones (EEZs) are presented as dashed lines
- At a Pacific regional scale Country names and EEZs are mapped
- Important for understanding climate outlooks in the coming months



Pacific Forecasts – atmospheric variables

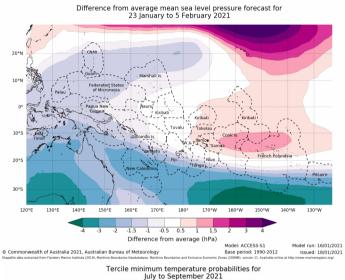
Forecasts are:

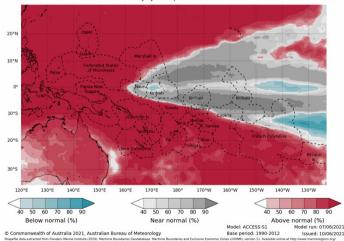
• Weekly

Climate and Oceans Support

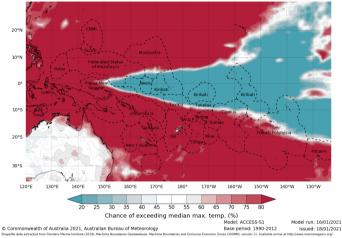
Program in the Pacific

- Fortnightly
- Monthly
- Seasonal





nce of exceeding the median maximum temperature for February 2021

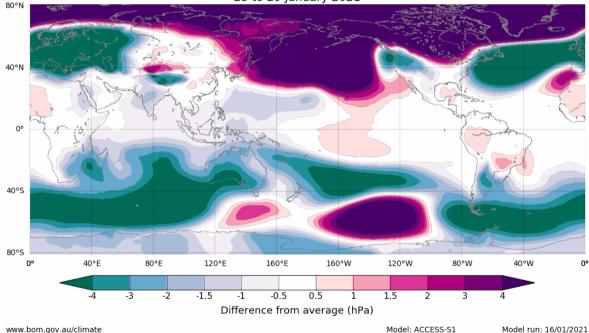


Outputs:

- Anomaly
- Tercile
- Chance of above median



Difference from average mean sea level pressure forecast for 23 to 29 January 2021



© Commonwealth of Australia 2021, Australian Bureau of Meteorology

Base period: 1990-2012 Issued: 18/01/2021

21°S 24°S 165°W 156°W 168°W 162°W 159°W 40 50 60 70 80 90 40 50 60 70 80 90 40 50 60 70 80 90 Below normal (%) Near normal (%) Above normal (%) Base period: 1981-2018 Model: ACCESS-S2 Model run: 26/09/2022 Issued: 29/09/2022 © Commonwealth of Australia 2022, Australian Bureau of Meteorology Shapefile data extracted from Flanders Marine Institute (2019), Maritime Boundaries Geodatabase: Maritime Boundaries and Exclusive Economic Zones (200M), version 11. Available online at http://www.marineregions.org/.

Tercile rainfall probabilities for

October 2022

6°S

9°S

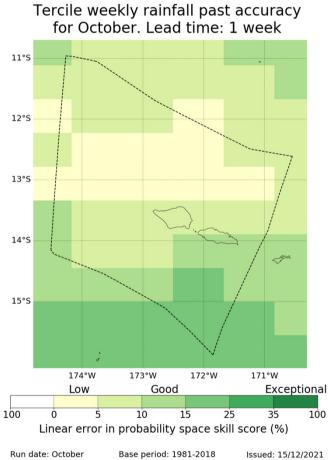
12°S

15°S

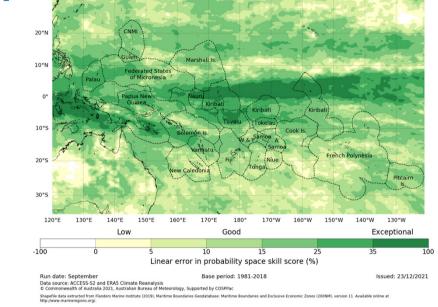
18°S



Climate and Oceans Support Program in the Pacific



Auto Gate: October Dase period: 1901-2010 ISSUed: 15/12/2021 Data source: ACCESS-S2 and ERAS Climate Reanalysis © Commonwealth of Australia 2021, Australian Bureau of Meteorology, Supported by COSPPac Shapefile data extracted from Flanders Marine Institute (2019), Maritime Boundaries and Exclusive Economic Zones (200NM), version 11. Available online at http://www.marineregions.org/. Median weekly rainfall past accuracy for September. Lead time: 1 week



	Seas	onal _{Feb}	Mar	Apr	May	lun	Tot	Aug	Son	Oct	Nov	Dec
	Jan	Lep	I*Ia1	Apr	May	Jun	Jui	Aug	Sep	UCL	NOV	Dec
lead 3	24	17	13	9	10	14	14	6	10	14	16	20
lead 2	25	19	16	10	15	16	18	8	11	13	18	21
lead 1	26	22	20	16	23	19	23	13	12	15	20	23
lead 0	29	23	22	23	29	22	27	16	13	18	20	25



Global and Pacific ACCESS-S outlooks and Pacific climate monitoring

Outlooks issued on Thursdays, one and two week outlooks also issued on Mondays

About ACCESS-S | About GPCs | About RCCs

Seasonal and inter-annual climate variability poses a major risk to many parts of our global society, the economy and the environment. The risks are particularly significant for Pacific Island Countries and compounded by human caused climate change which interacts with natural climate variability. The website provides dynamical model based seasonal and sub-seasonal outlooks and satellite-based climate monitoring with an emphasis on the western Pacific region.

			Period	Archive
Tropical cyclones	South Pacific 🔍	TC formation proba	Week	Operational 💌
			2	



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Related links

- Download files
- Download global NetCDF data
- Download guidance documents

http://www.bom.gov.au/climate/pacific/outlooks/



Multi-week Tropical Cyclone forecasts

Regions available:

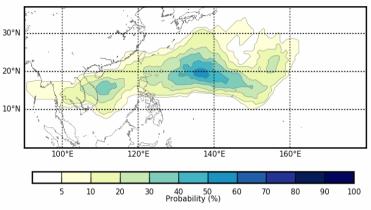
- NW Pacific
- South Pacific

Raw and calibrated model output

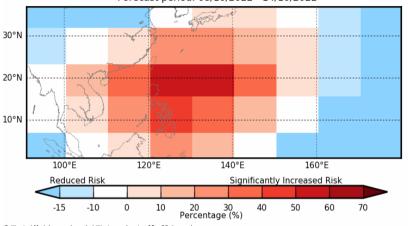
Raw gives spatially sharp forecasts

Calibrated forecasts are more reliable





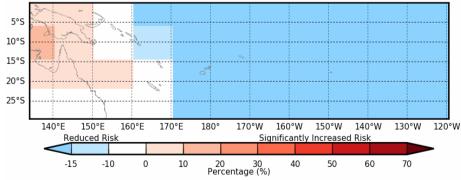
Difference from normal chance of Tropical Cyclone's in the Northern Pacific Forecast period: 08/10/2022 - 14/10/2022



Calibrated Model anomaly probability in overlapping 15 x 20 degree boxes © Commonwealth of Australia 2022. Australian Bureau of Meteorology

Model: ACCESS_S2 Model Run: 30/09/2022 Issued: 02/10/2022

Difference from normal chance of Tropical Cyclone's in the South Pacific Forecast period: 24/03/2022 - 30/03/2022

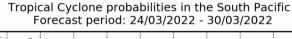


Model: ACCESS_S2 Model run: 16/03/2022 Issued: 18/03/2022

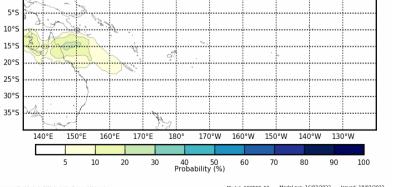
Model: ACCESS S2 Model run: 01/10/2022 Issued: 03/10/2022

Model: ACCESS_S2 Model Run: 16/03/2022 Issued: 18/03/2022

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Calibrated Model anomaly probability in overlapping 15 x 20 degree boxes © Commonwealth of Australia 2022, Australian Bureau of Meteorology



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World Meteorological Organization (WMO)

Forecasts



Global Producing Centre (GPC) for Long-Range

RA-V Pacific Regional Climate Centre (RCC) Network Co-lead for Node on LRF and Consortium member for Node on Climate Monitoring



Development supported by DFAT-funded COSPPac and WMO-funded CREWS

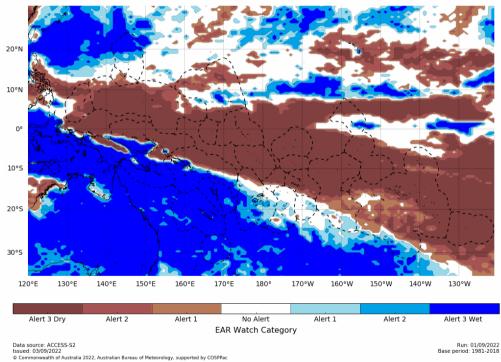
Category	Domain	Variable	Period	Related links		
Projects 💌	PNG 💌	Forecast 🔍	Fortnight 🔻	 Download files 		
EAR WATCH 🔻			2 💌	 Download global NetCDF data 		
				Download guidance documents		

http://www.bom.gov.au/climate/pacific/outlooks/

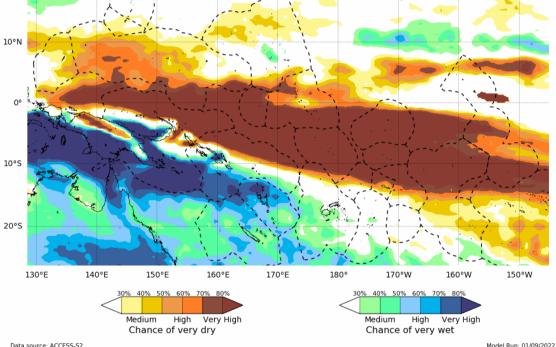


Climate and Oceans Support Program in the Pacific

EAR Watch Categorical forecast for September 2022



Shapefile data extracted from Flanders Marine Institute (2019), Maritime Boundaries Geodatabase: Maritime Boundaries and Exclusive Economic Zones (200NM), version 11. Available online at thttp://www.marineregions.org/



Chance of extreme rainfall for September 2022

Data source: ACCESS-S2 Issued: 08/09/2022

© Commonwealth of Australia 2022, Australian Bureau of Meteorology, supported by COSPPac 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.marineregions.org/.

Base period: 1981-2018



For Pacific ACCESS-S Pacific products: http://www.bom.gov.au/climate/pacific/outlooks/

For additional Bureau of Meteorology analysis: <u>http://www.bom.gov.au/climate/enso/</u> <u>http://www.bom.gov.au/climate/model-summary/#region=NINO34</u>