

Looking back – review & evaluation of November 2021 – April 2022 climate outlook

Presented by: Ben Noll, NIWA with
thanks to BoM, NOAA, SPC, and
SPREP

Outline of Presentation

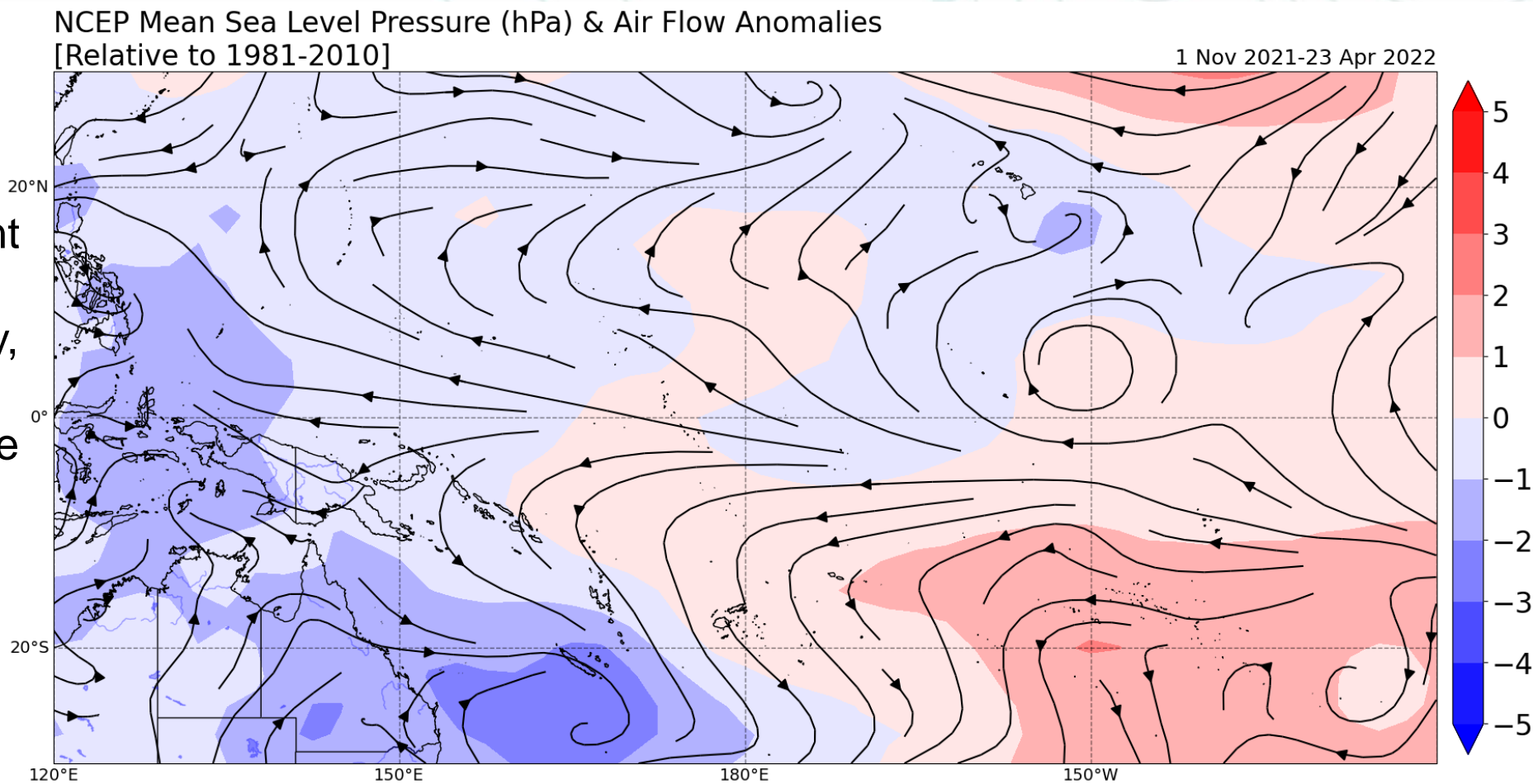
- Review of PICO-9 outlook
- Air pressure & wind flow patterns
- South Pacific Convergence Zone
- Rainfall and temperature forecasts vs observations
- Velocity potential / Madden-Julian Oscillation

October 2021 PICO-9 predictions – consistent with La Niña

- ☀️ **Rainfall forecast:** drier than normal conditions for island groups near/west of the Date Line & near equator | ***this was a good forecast*** ✓
- ☀️ **Rainfall forecast:** drier than normal conditions extending southeastward toward the subtropics in the Southern Hemisphere | ***this was a good forecast*** ✓
- 💧 **Rainfall:** wetter than normal conditions between Palau & central Marshall Islands & from southeast Papua New Guinea to southern French Polynesia | ***this was a good forecast*** ✓
- 🌡️ **Temperature:** warmer than normal air temperatures for many island groups except near the equator and east of the Date Line | ***this was a good forecast*** ✓
- 🌀 **Wind:** stronger than normal easterly air flow along the equator; more northerlies extending into the western Pacific in the Southern Hemisphere | ***this was a good forecast*** ✓

Air pressure and wind anomalies

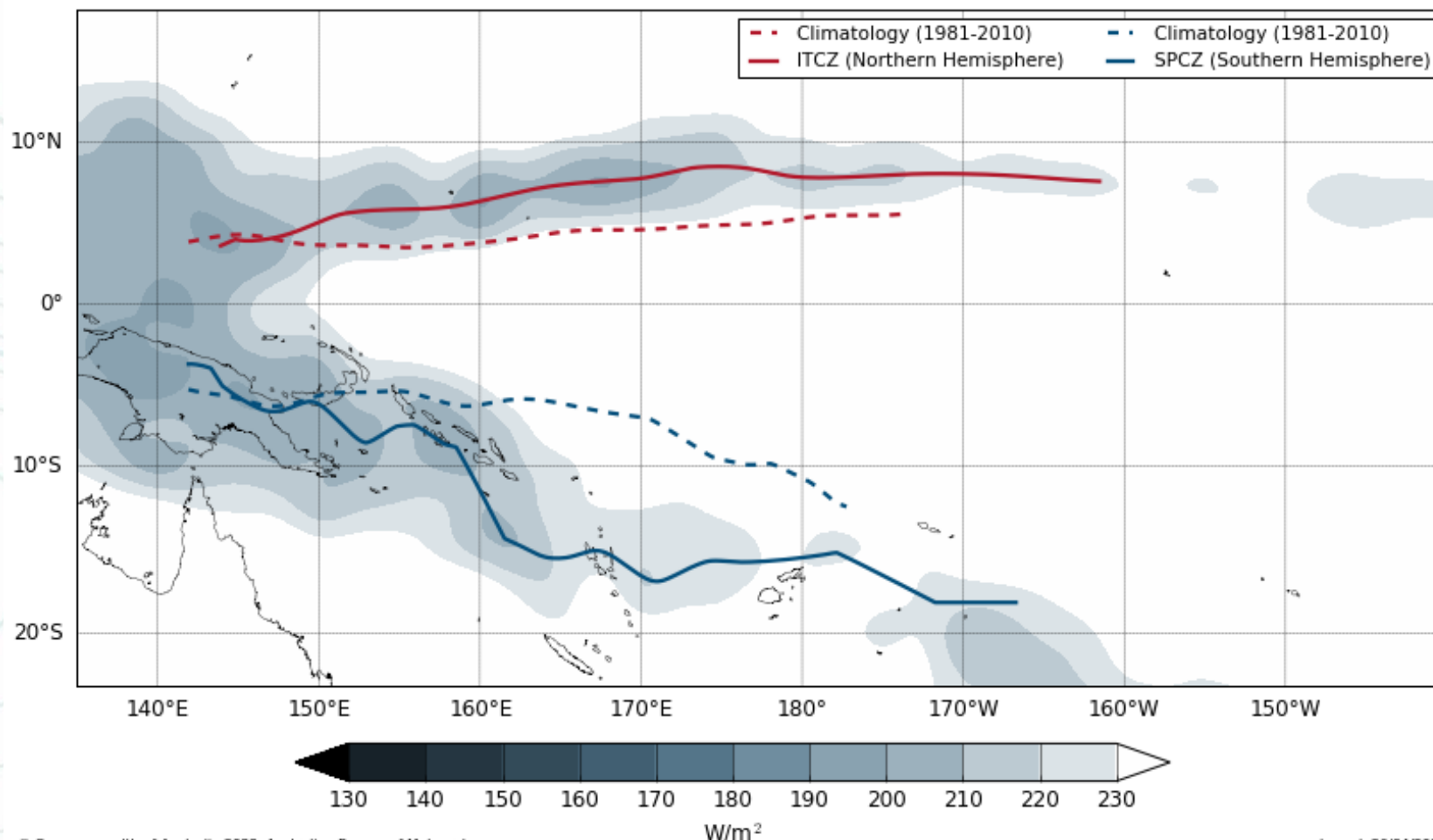
- Lower than normal air pressure in the west, consistent with more cyclonic activity, and higher pressures in the east
- More northerly quarter winds south of the equator; advecting warmth, moisture



South Pacific Convergence Zone

30 Day Average Outgoing Longwave Radiation (OLR) minimum to 2022-04-23

http://access-s.clide.cloud/files/climate_drivers/spcz.png



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- SPCZ was displaced south of its climatological position for much of the last two seasons - consistent with La Niña and heavy rainfall observed from PNG southeastward

Rainfall outlook vs observations

Nov-Jan forecast (left) vs Oct-Apr estimates (right)

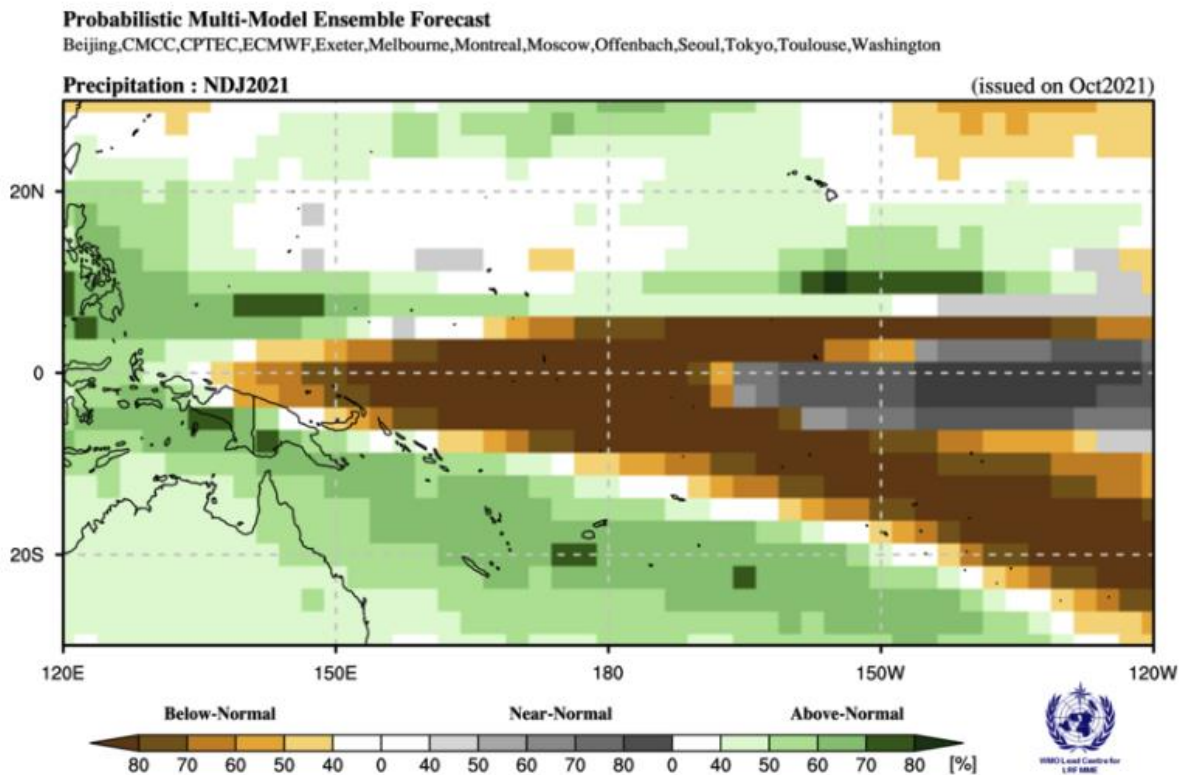
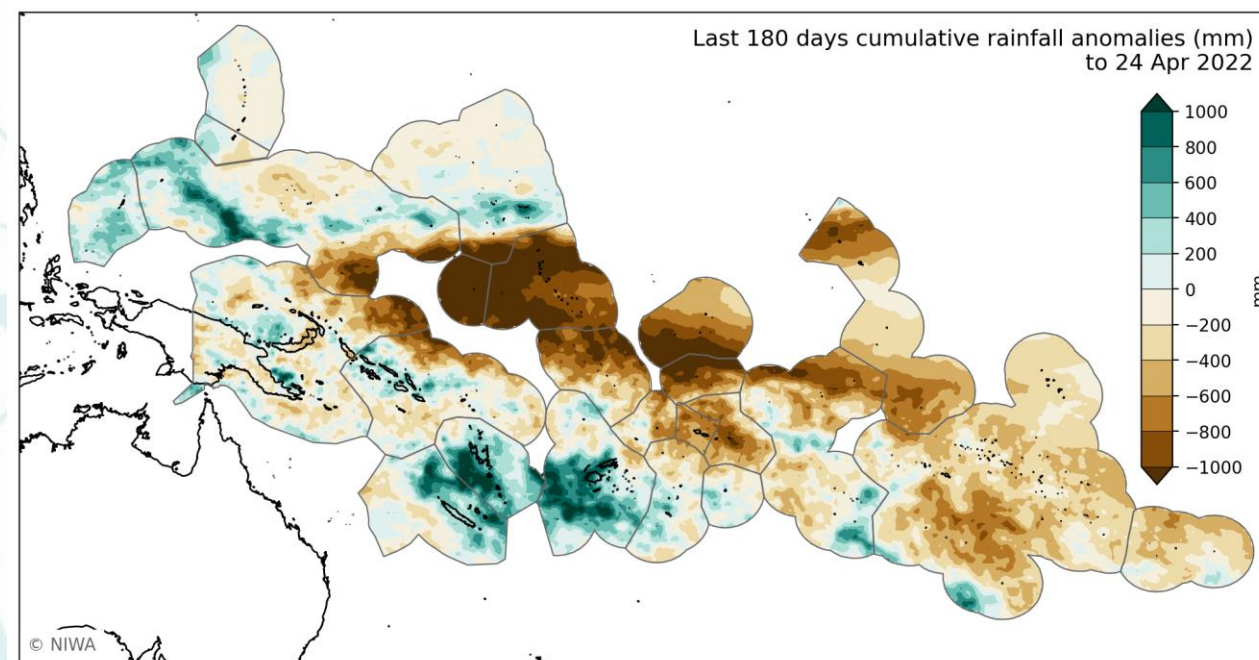


Fig. 1: Rainfall forecast for November 2021 to January 2022 for the western Pacific region.

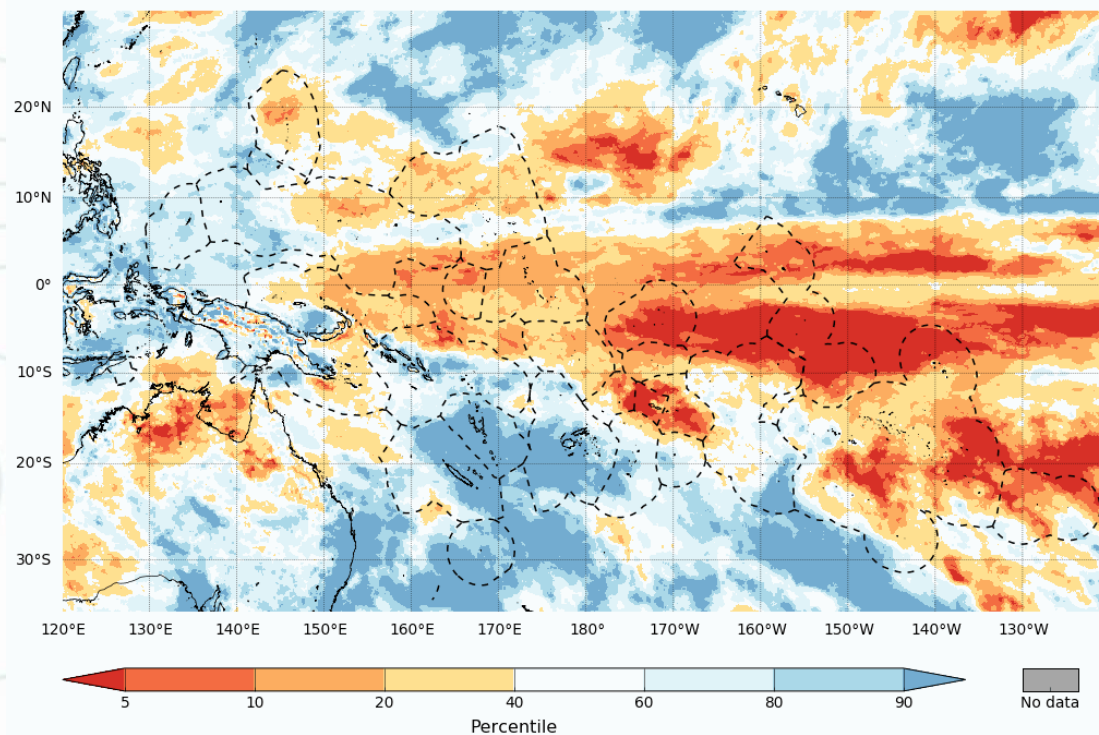


- Categorical rainfall forecasts over the last 3-6 months were **good**, with skill likely enhanced by La Niña
- Too wet: Samoa/American Samoa, central FSM, Line Islands

Rainfall percentiles

Oct-Mar (left) | Oct-Apr (right)

6-month percentile to end of March 2022



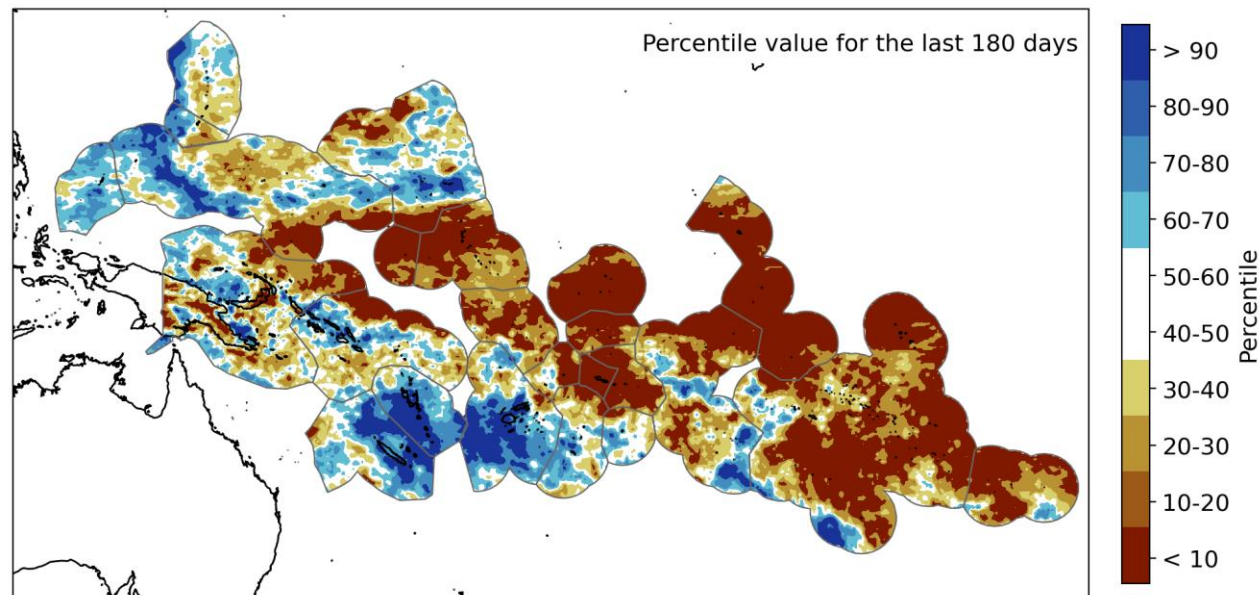
Data source: MSWEP

Base period: 1980-2021

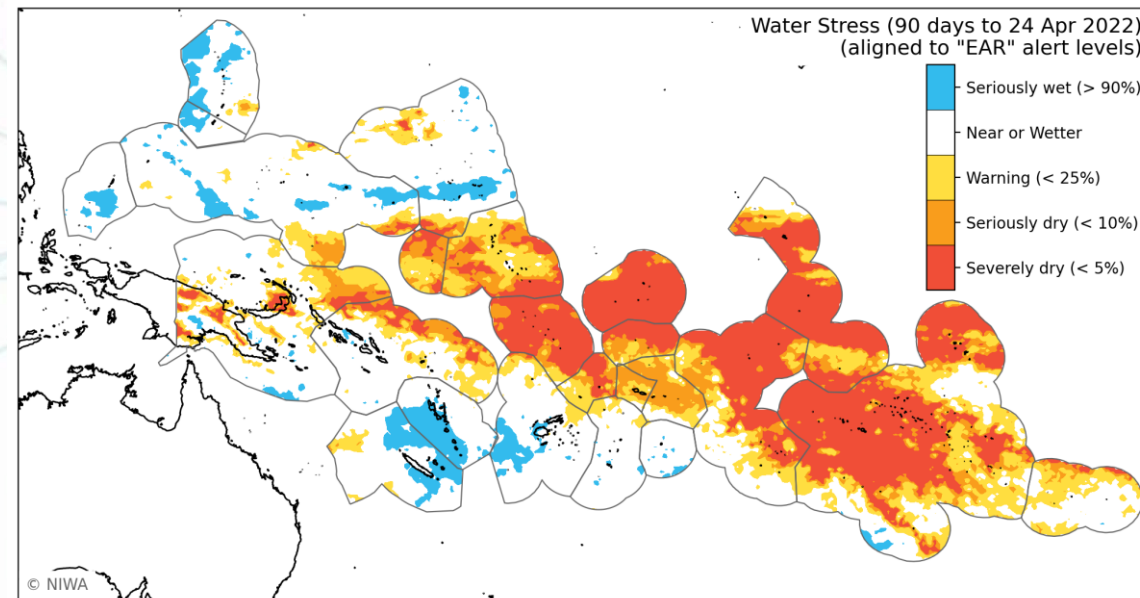
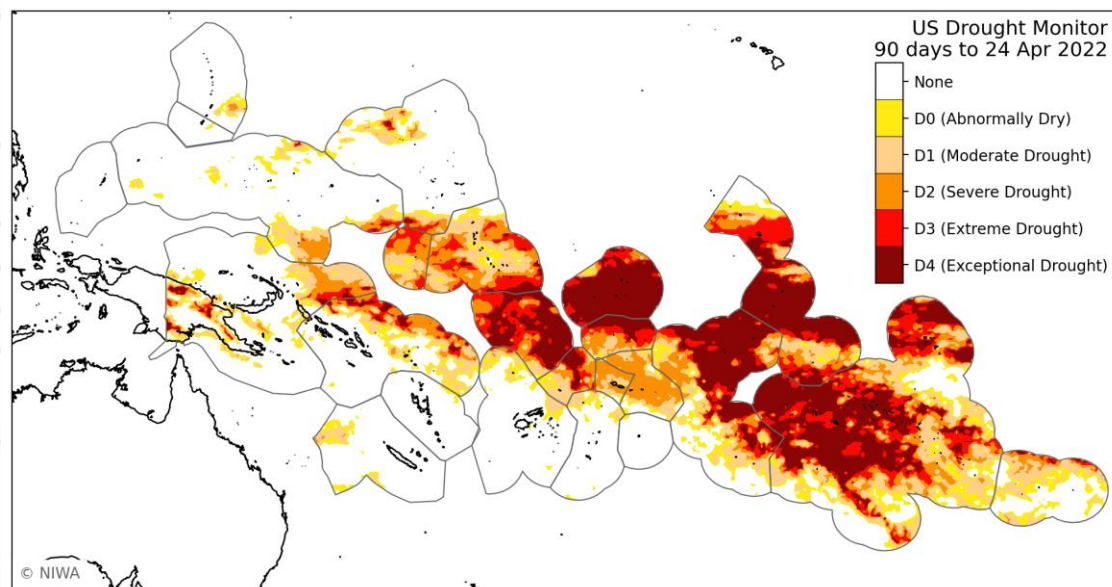
Run: 01/03/2022

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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.marinerregions.org/>.

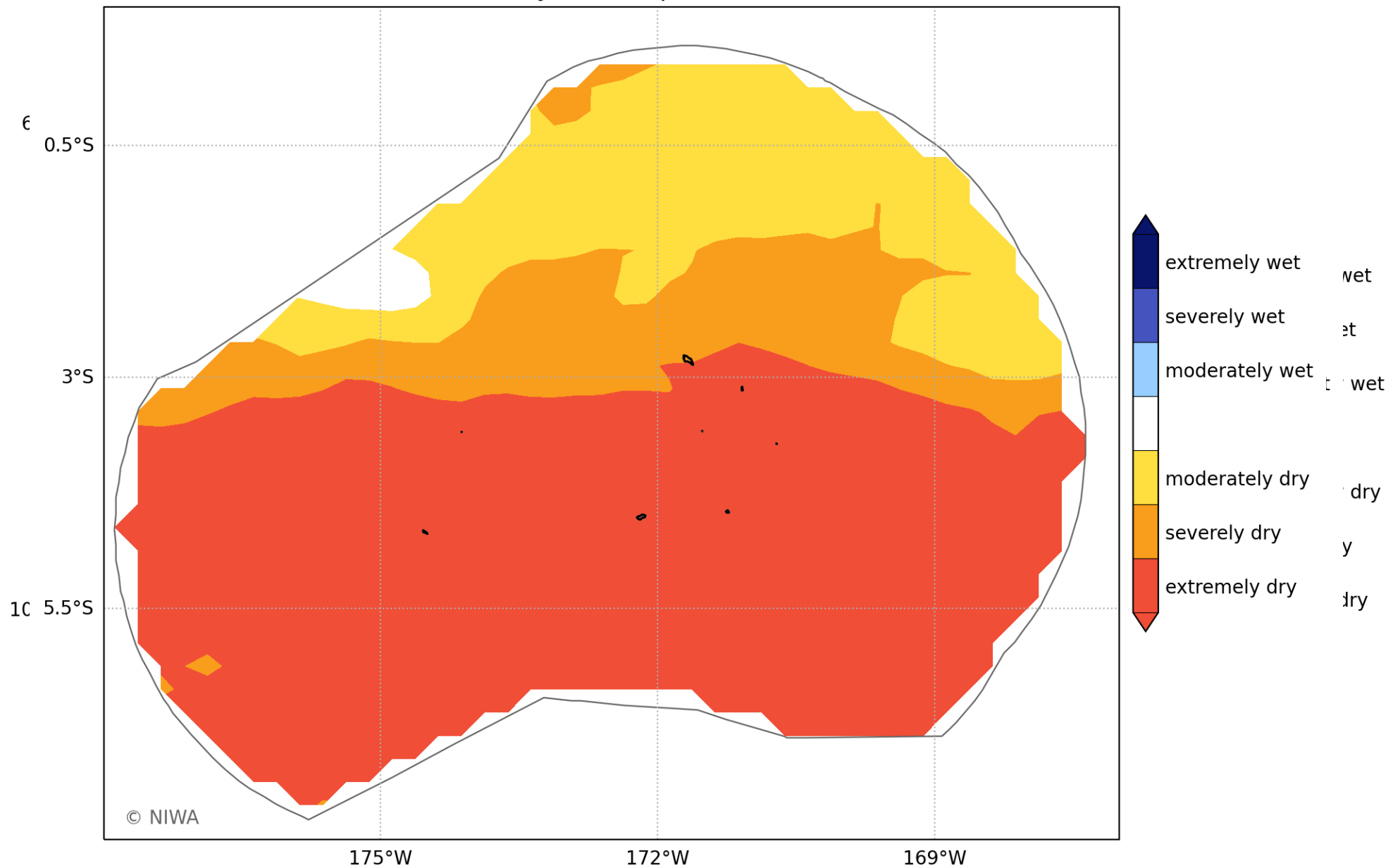


Regional hotspots – last 90 days



- Parts of PNG, Nauru, Kiribati, Tuvalu, Tokelau, Wallis & Futuna, Samoa, American Samoa, Cook Islands, French Polynesia

Kiribati: Phoenix Islands: Standardized Precipitation Index (SPI)
90 days to 24 Apr 2022



Temperature outlook vs observations

Nov-Jan forecast (left) vs Oct-Apr estimate (right)

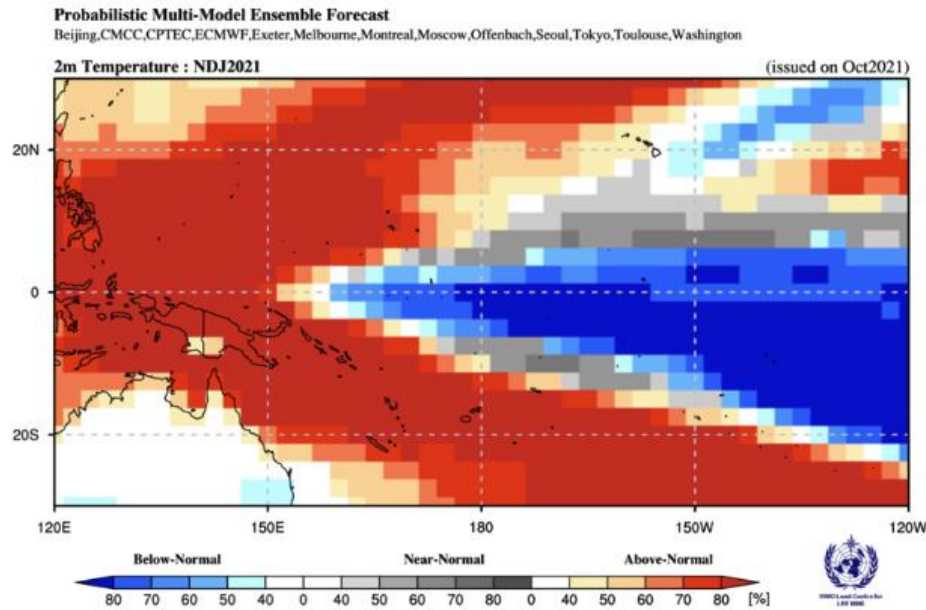
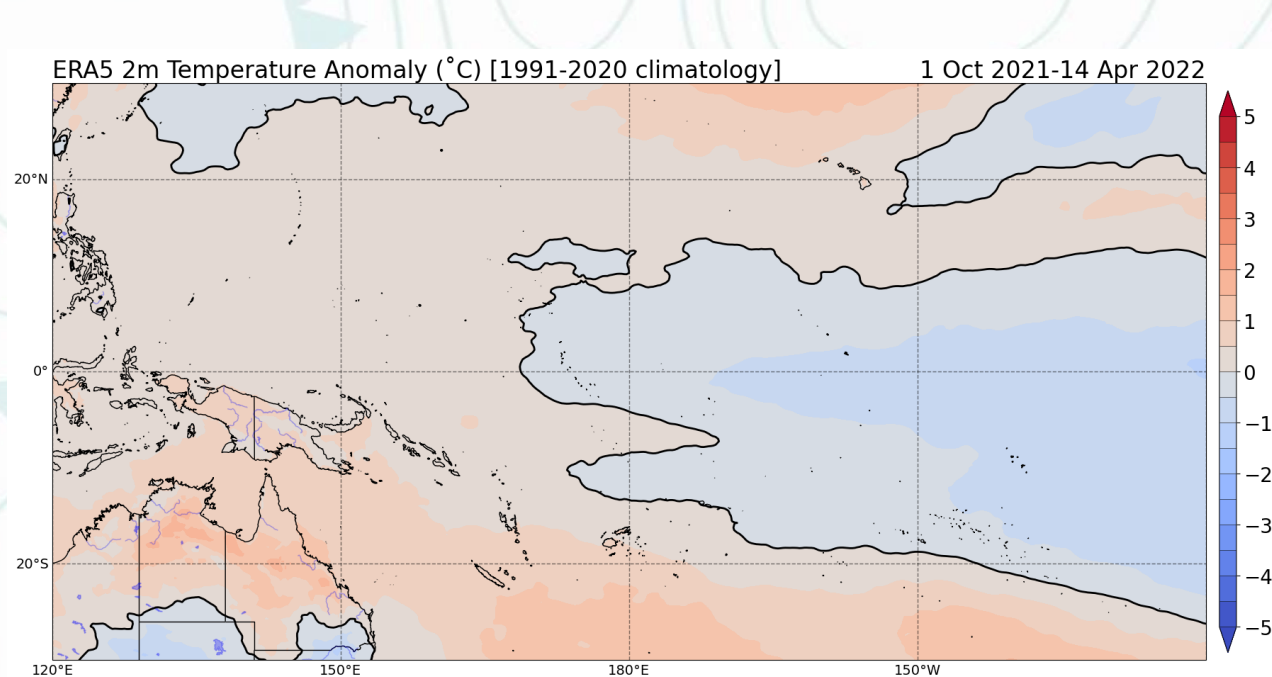


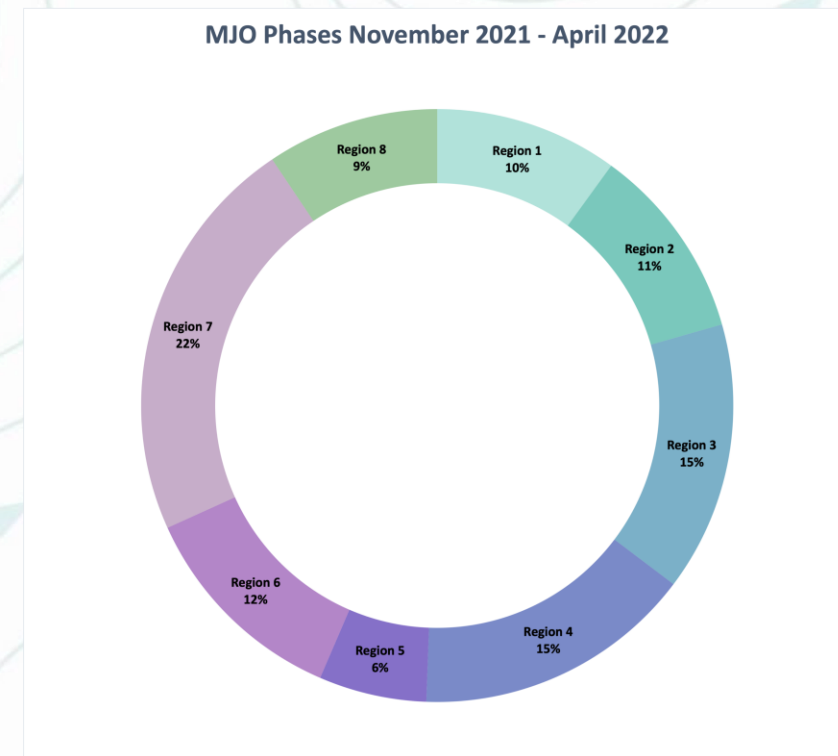
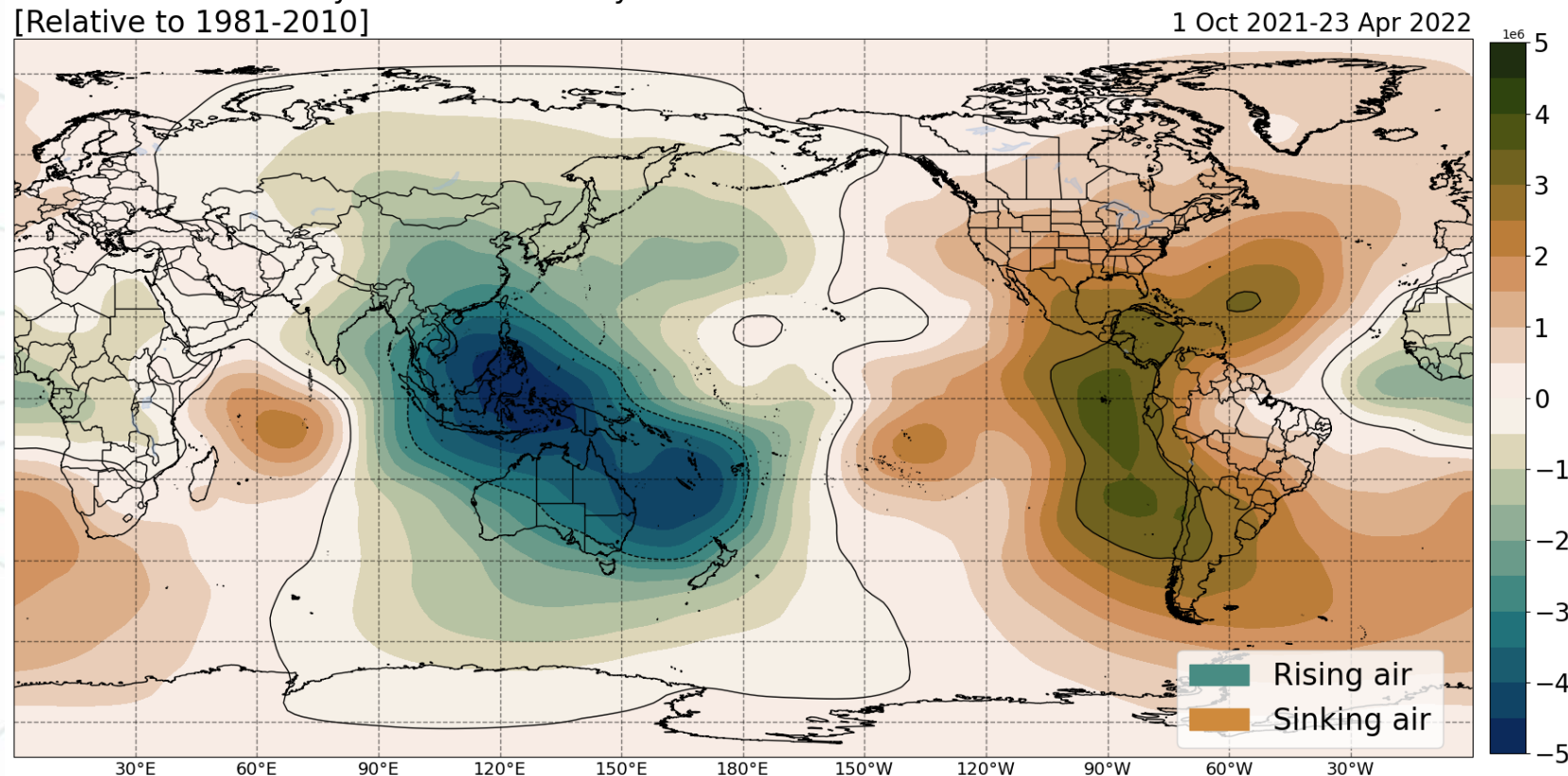
Fig. 3: Air temperature forecast for November 2021 to January 2022 for the western Pacific region.



- Temperature forecasts were very good; cooler conditions occurred toward the equator
- Air temperatures consistent with La Niña signal

Velocity potential / Madden-Julian Oscillation

NCEP 200 hPa Velocity Potential Anomaly
[Relative to 1981-2010]



- Walker Circulation uplift enhanced over Maritime Continent, reduced over eastern Pacific
- MJO reluctant to cross into the Pacific; more time in eastern Indian Ocean, Maritime Continent