

2022-23 Southwest Pacific Tropical Cyclone Season Review

Presented by: Ben Noll, NIWA with
thanks to NOAA, University of Hawaii,
BoM, SPC & SPREP

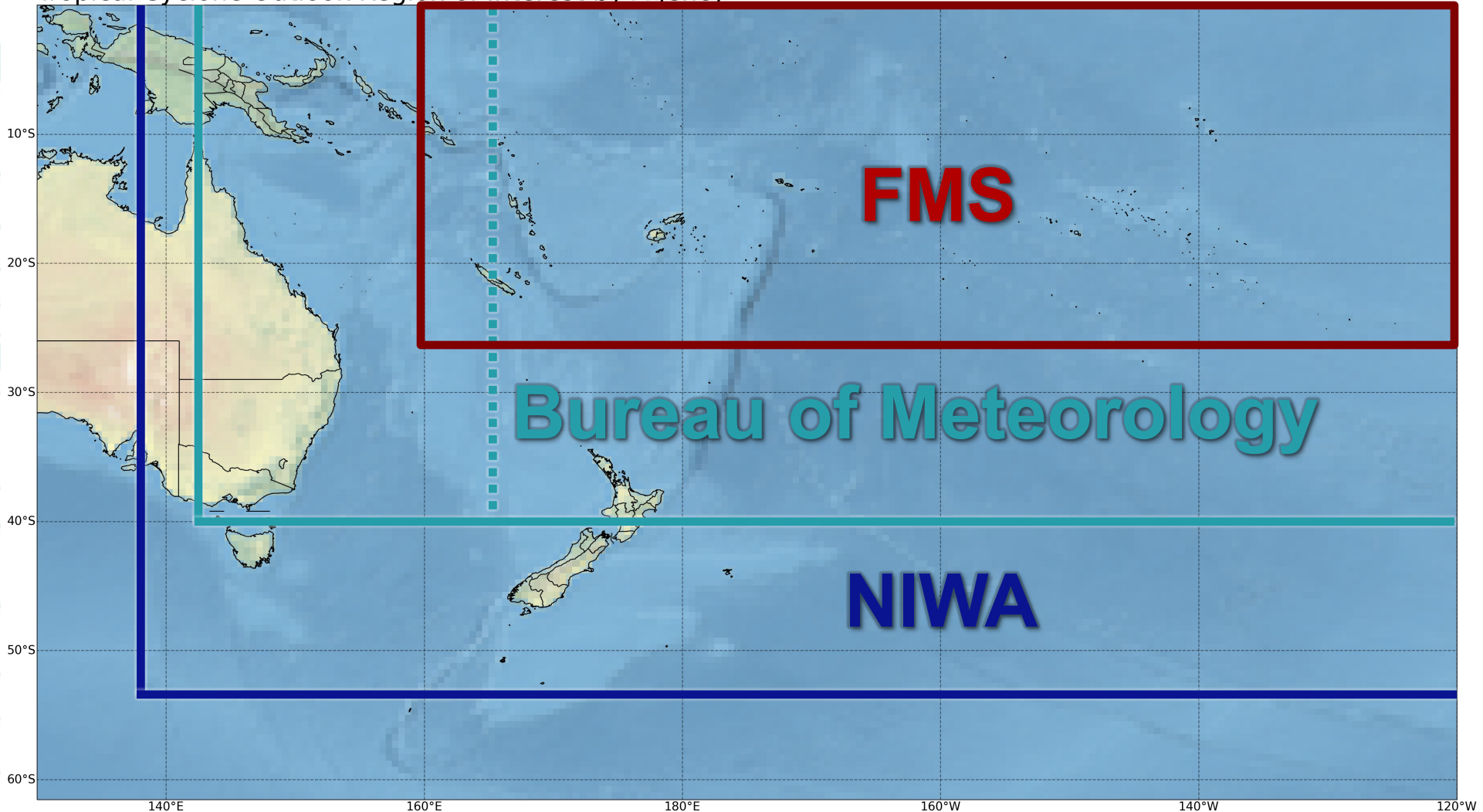
20 April 2023

Outline of Presentation

- Review of PICO-11 Statement & SW Pacific tropical cyclone activity
- Review of pre-season tropical cyclone outlooks
- Take home messages

Friendly reminder: cyclone outlook areas differ

Tropical Cyclone Outlook Region of Interest by Agency



Revisiting the PICOF-11 statement

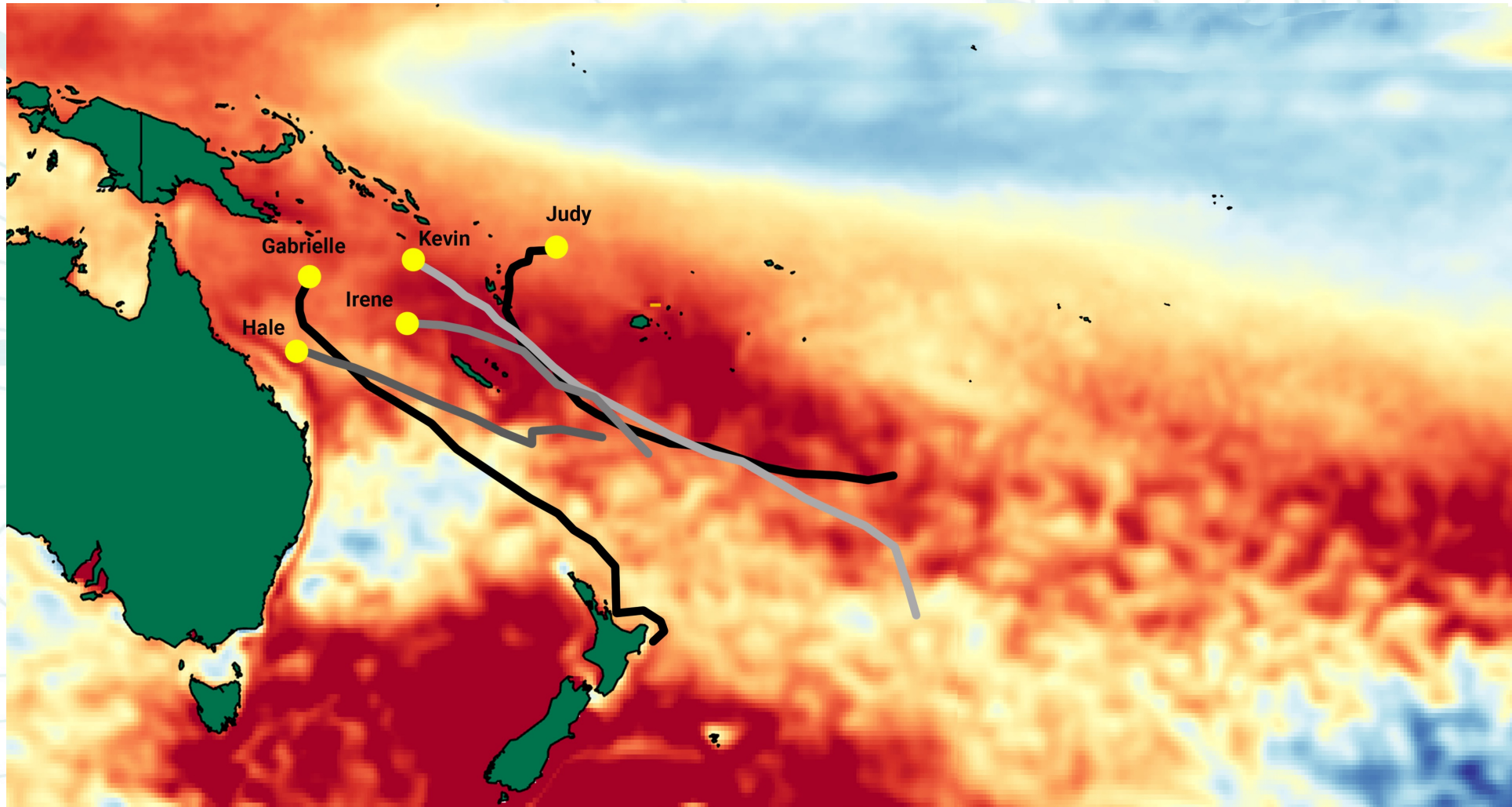


11th Pacific Islands Climate Outlook Forum Statement




Tropical cyclones

- Compared to this time last year, SSTs are warmer across the Southwest Pacific, particularly in the Coral Sea region.
- The South Pacific Convergence Zone (SPCZ) tends to be displaced to the southwest during La Niña events and this behaviour has already been observed during October.
- With this mind, The Australian Bureau of Meteorology (BoM) and New Zealand National Institute of Water and Atmospheric Research (NIWA) agree on an enhanced risk for tropical cyclone (TC) activity in the western Pacific.
- In the central and eastern part of the region, TC risks are near normal to below normal.
- NIWA expects at least three severe TCs reaching Category 3 or higher might occur anywhere across the region, so all communities should remain prepared.
- Both outlooks consider relationships between ENSO indicators and TCs numbers. BoM reports a high level of accuracy in the western part of the region.
- TC activity across the western North Pacific is closely related to the current ENSO pattern. While TC numbers show little fluctuation from year-to-year, the genesis location and track of TCs show a dramatic relationship with the ENSO cycle. TC activity shifts eastward during an El Niño; and shifts westward during a La Niña.
- As of mid-October, seasonal activity has been below normal, with 18 named storms, in the western North Pacific. Five of those storms have reached major hurricane status.
- La Niña conditions will likely result in a westward shift of tropical cyclone activity for the remainder of 2022.
- It does not take a severe TC to produce severe impacts. Flooding rainfall can occur with a weaker or former TC especially when high river flows are already present. All communities should remain vigilant, monitor tide predictions and follow forecast information provided by their National Meteorological and Hydrological Service (NMHS).

2022-23 Southwest Pacific tropical cyclones & SSTs



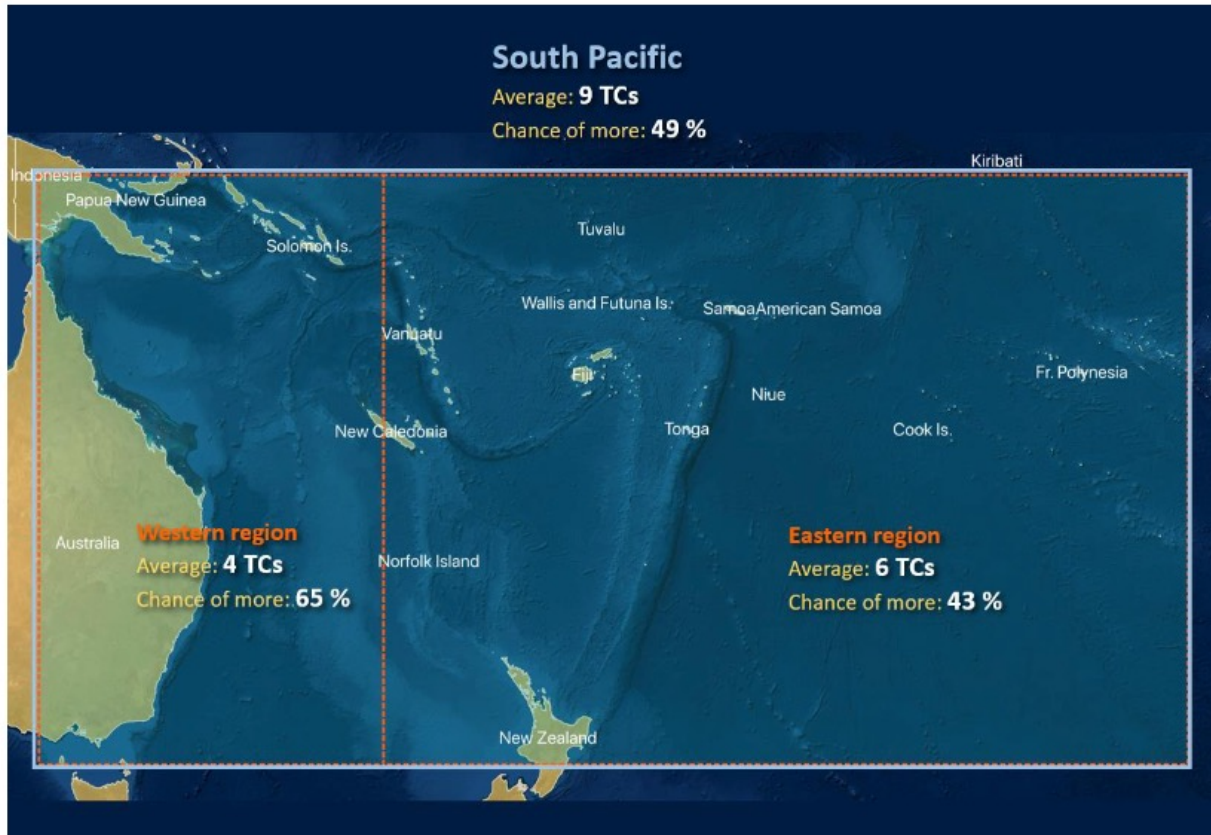
Review of 2022/23 season & predictions

Agency	Prediction		Observed	
	Total TCs	Severe TCs	Total TCs	Severe TCs
 BoM (142.5°E - 120°W)	49% chance of above average (9)		5	3
 NIWA (135°E - 120°W)	6-10	3+	5	3
 FMS (160°E-120°W)	5-7	1-4	5	3

- Below normal number of named tropical cyclones (fewest since 2016-17)
- Activity was favoured the western part of the region, consistent with La Niña
- Good guidance on the number of severe tropical cyclones

Quick review of tropical cyclone outlook – BoM

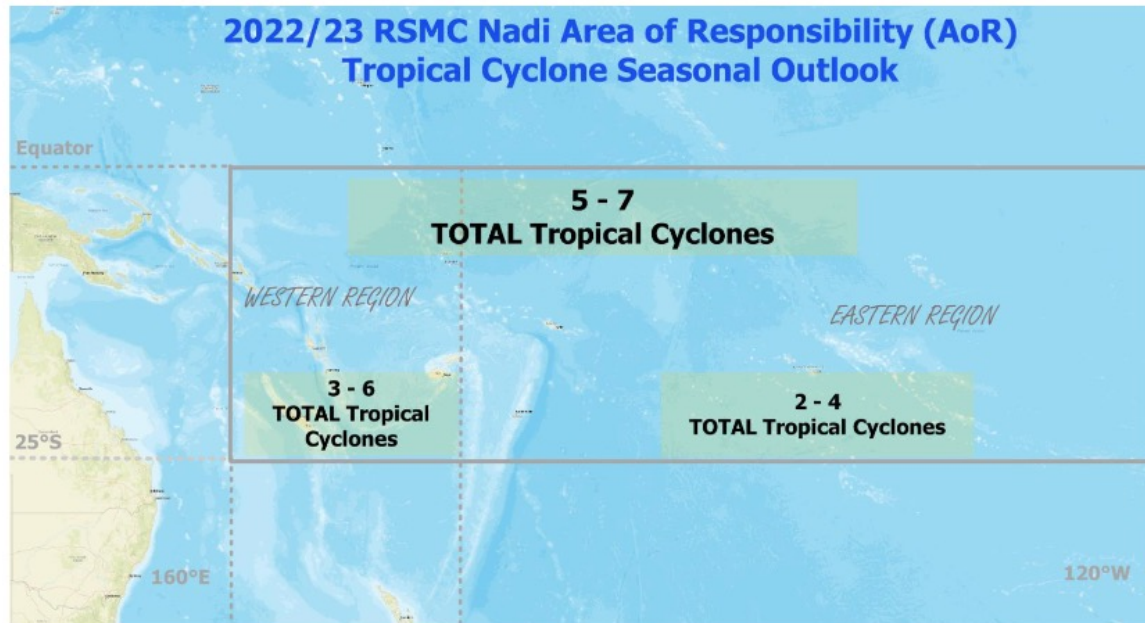
The Bureau – South Pacific TC outlook Nov-Apr 2022-23



- Established La Niña in the tropical Pacific Ocean influenced tropical cyclone outlook.
- An above-average number of tropical cyclones is likely (65% likelihood) in the western South Pacific region this season, with model accuracy historically being moderate.
- A close-to-average to below-average number of tropical cyclones is expected for the eastern South Pacific, but model accuracy is historically very low for this region.

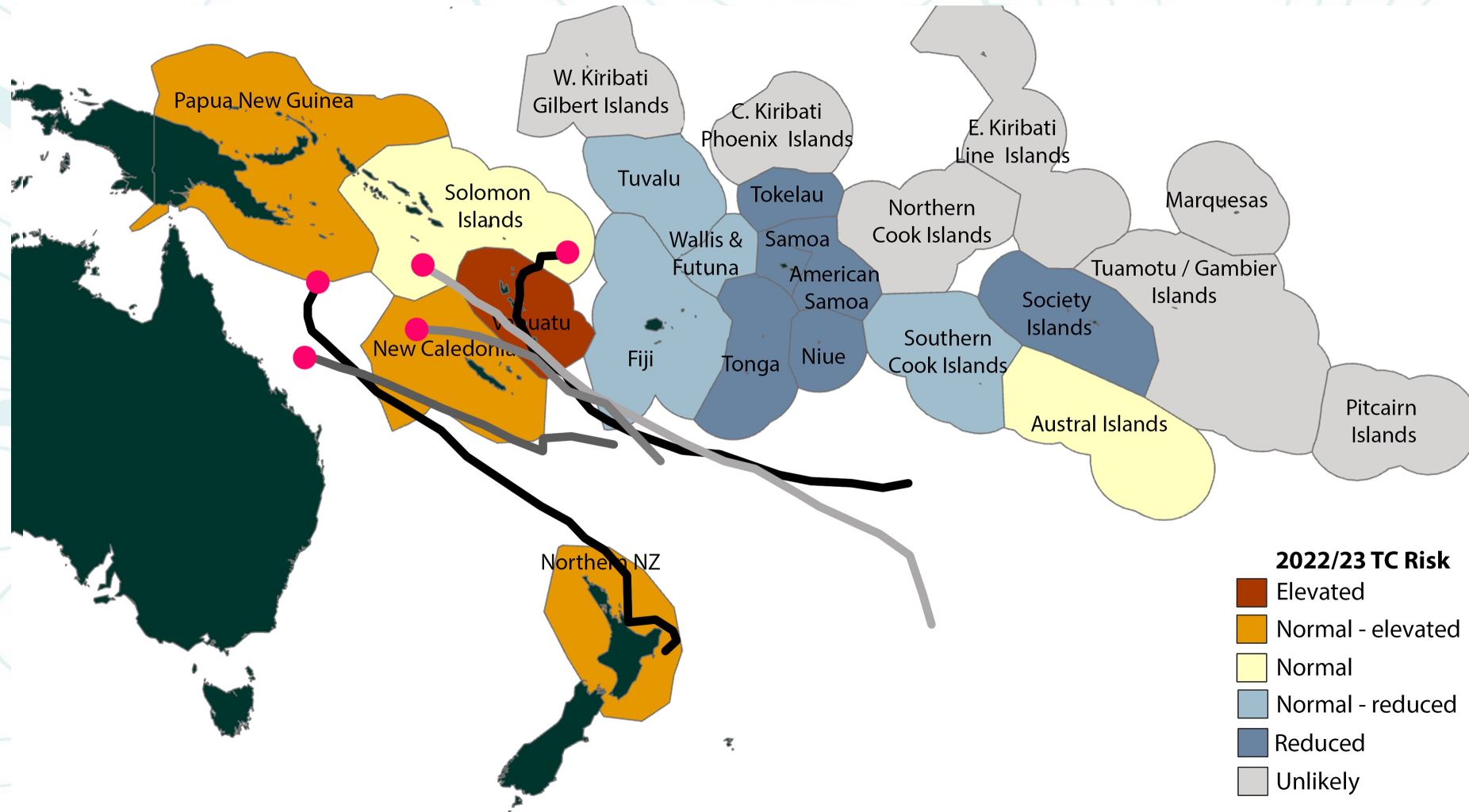
Quick review of tropical cyclone outlook - FMS

RSMC Nadi TC outlook Nov-Apr 2022-23



- Five to seven TCs are expected. On average, around seven TCs affect the RSMC Nadi-TCC AoR per season. Thus, average or below average number of TCs.
- On average, around four TCs affect west of Dateline and around three affect east of Dateline per season. Tropical cyclone numbers to the west of Dateline in the RSMC-Nadi TCC AoR is likely to be three to six or average to above average TC activities, while numbers to the east is likely to be two to four TCs or average this season.
- For severe TCs (Category 3 or above), average or below average severe TCs are anticipated this season, with one to four severe TCs expected. On average, around three severe TCs affect the RSMC Nadi-TCC AoR per season.
- TC outlook is greatly driven by the return of....La Nina event...persist until end of the 2022.

Quick review of tropical cyclone outlook - NIWA



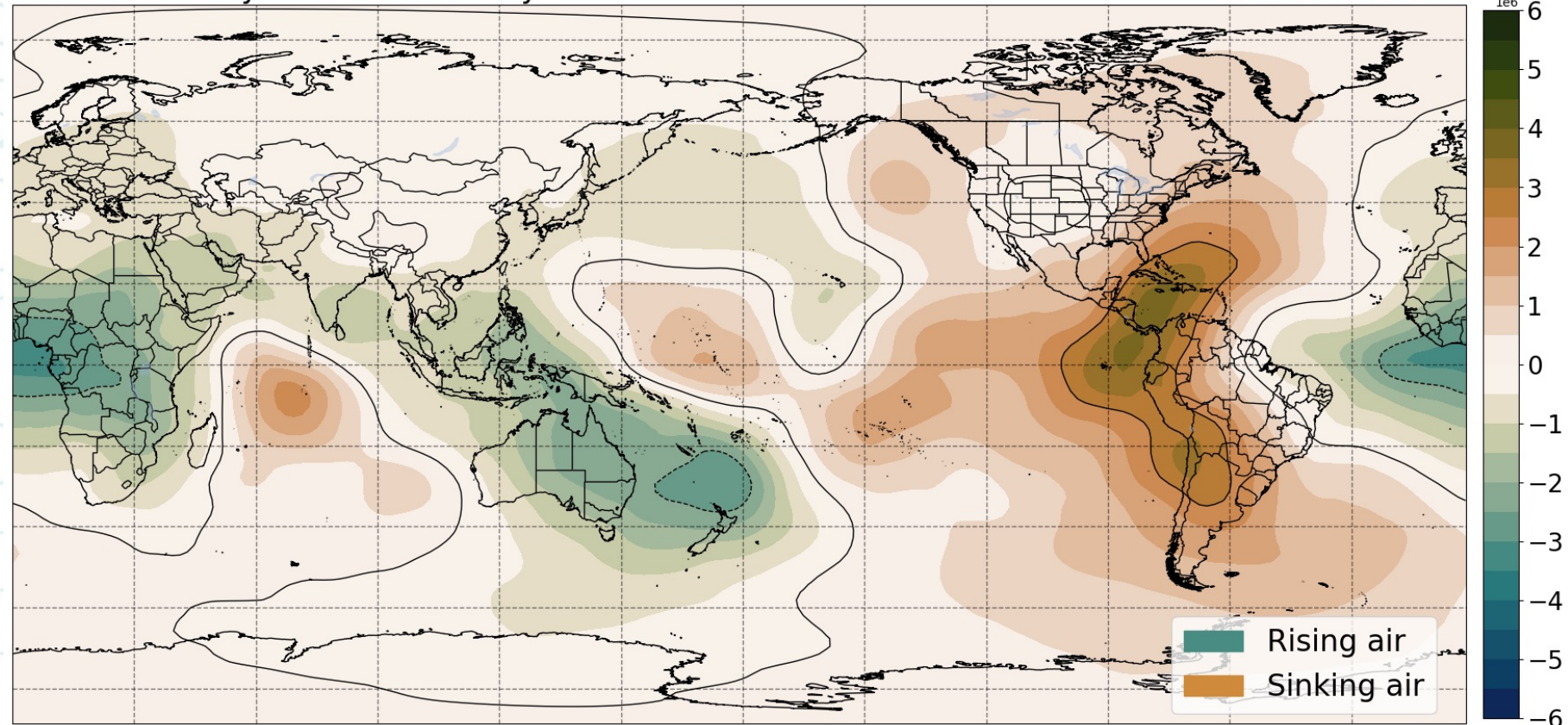
- 6 to 10 named storms predicted 135°E to 120°W; 5 occurred
- Good guidance for Vanuatu (elevated risk; 3 tropical cyclones occurred)

Why the lower number of tropical cyclones?

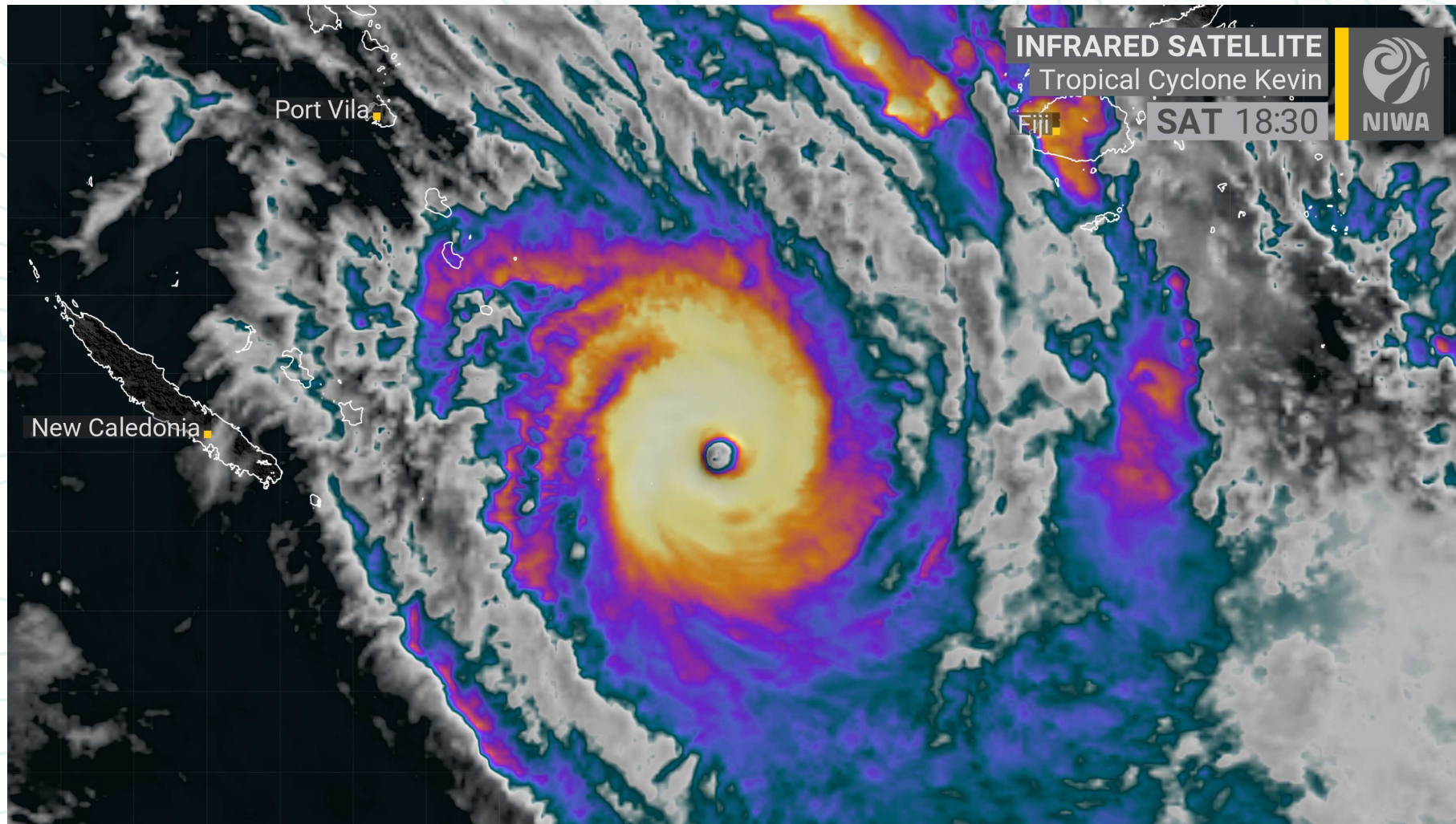
- Very unusually warm seas toward the sub-tropics could have displaced convection farther to the south than normal, shifting the tropical cyclone genesis risk zone

200 hPa Velocity Potential Anomaly

Nov 2022-Mar 2023



Even in a less active year, strong cyclones strike...



Key messages / summary

- **PICOF-11 Statement was generally consistent with what occurred (more activity west, less activity east), predictability likely linked to La Niña**
- **Good guidance on the number of severe tropical cyclones, despite a lower overall number of tropical cyclones (5 total – fewest since 2016-17)**
- **Vanuatu especially hard-hit with Judy & Kevin in the same week; 3 total tropical cyclones**
- **The very unusually warm seas toward the sub-tropics may affected stability profiles across the region, leading to fewer tropical cyclones**

Thank you!

Questions?