Eighth Pacific Islands Climate Outlook Forum (PICOF-8)

April 2021

Hosted virtually by the Secretariat of the Pacific Regional Environment Programme Pacific Met Desk Partnership and World Meteorological Organisation

21 April, 2021

Introduction

Regional Climate Outlook Forums have been held annually in the Pacific since 2015, and biannually since 2020, allowing dialogue and learning between the providers and users of climate information. Pacific Islands Climate Outlook Forums (PICOF) are organized by the Pacific Meteorological Council's (PMC) Pacific Islands Climate Services Panel (PICS Panel), its secretariat SPREP and the WMO and supported by various international and regional organisations.

The April PICOF 8, was held virtually and was organised around the following objective: *To produce consensus-based, user-relevant climate outlook guidance in real time to reduce climate-related risks and support sustainable development for the coming season for the Pacific Island region.*

A PICOF 8 Regional Statement summarising climate and ocean conditions over the past months and seasonal outlook May-October 2021 was produced as an output of PICOF 8.

This report offers a short summary of material presented during the virtual meeting, the key discussion points, and any Meeting recommendations and action points.

Agenda Item 1: Opening & setting the scene

The co-chair of the PICS Panel welcomed participants to the 8th PICOF and a representative of Samoa Meteorological Service opened the meeting with a prayer. SPREP PMDP covered meeting procedures. The PMC Chair, the CEO of Samoa MNRE gave opening remarks, acknowledging the range of participants present.

The Meeting:

- Noted that despite the challenges of COVID, fora such as PICOFs must continue and commended the virtual nature of the PICOFs
- Acknowledged the effects of La Niña and tropical cyclone season, noting that now is the time to step back and evaluate efforts to reduce risks.
- Noted the importance of the PICOF to making meteorological information accessible for decision makers and noted collaboration with the media to reach the last mile.
- Encouraged networking to collaboratively build resilience to climate variability and change

The PICS Panel co-chair overviewed the meeting objectives.

The Meeting:

- Noted the difficulties in comparing model guidance via a virtual PICOF
- Noted differences in methodology for producing the PICOF 8 statement to previous statements; in the past the PICOF used a subjective method for producing the consensus seasonal forecast presented in the statement, but WMO are now strongly encouraging the use of objective methods. The WMO RAV RCC node on Long Range Forecasting thus met and agreed to use the WMO Lead Centre for Long Range Forecast Multi-Model Ensemble (MME) https://www.wmolc.org/for rain, 2m temperature and SST, noting that MME has higher skill than individual models.

- Emphasised that the outlook presented in the PICOF is intended for NMHS guidance only and that text will be added to the statement clarifying that it is not an official outlook for any nation.

Agenda Item 2: ENSO update and outlook

The Meeting:

- Noted that La Niña peaked in November 2020 in the equatorial Pacific region and was a moderate La Nina compared to previous events. La Niña watches were issued by most institutions in mid winter.
- Noted that negative precipitation anomalies have been apparent in the central equatorial Pacific since November, typical of La Niña. Positive precipitation anomalies have been present in the south west and parts of the North Pacific, noting intense rainfall in New Caledonia.
- Compared the 2020/21 La Niña event to past events, acknowledging that La Niñas typically display less variability in terms of SST variation and impacts than El Niño events and noting that the 20/21 La Nina episode was similar to the episode experienced in the late 1980s.
- Recounted that during PICOF 6, the Meeting cautioned that any ENSO forecast issued beyond May 2020 should be used with caution due to the spring predictability barrier, although most models were favouring neutral conditions. La Niña typically has less predictability than El Niño and this was evident in some difficulties in forecasting the onset and strength of the 20/21 event.
- Noted that looking forward, most ensembles favour neutral conditions through to September 2021, although noting an area of warmer than average water in the western Pacific which, when occurring prior to austral autumn can be a precursor to El Niño. A westerly wind event can be a trigger for El Niño events and this is something to watch out for.

- Noted that most La Niña events slowly decay over a number of months and very rarely transition directly to an El Niño event.

Discussion:

- Fiji Met Service noted the importance of lagged impacts on rainfall for El Niño events but questioned whether the same applies for La Niña events. Meteo-France noted that the impacts across the Pacific appeared typical for a La Niña event with heavy rainfall and flooding events in New Caledonia and dry conditions across the central equatorial Pacific.
- Samoa Met Service asked how the PICOF measures the intensity of the previous La Niña event, noting that although the La Niña was a moderate event, the impacts in Samoa were severe. NIWA responded that the moderate La Niña may cause a weaker lag than if we were dealing with a very strong La Niña event.
- Palau NWS commented that the 2021 dry season has been wetter than normal with stronger trade winds.

Agenda Item 3: Climate monitoring section: review & evaluation of November 2020 to April 2021

i. Northern hemisphere rain, air temperature, sea surface temperature and sea level

The Meeting:

- Overviewed SST anomalies in different Niño regions since May 2020, noting that the difference in values between a moderate and strong La Niña are not that significant.
- Noted that sea levels in the tropical north-central and far western Pacific were above normal for much of the previous season. Conversely, along the equator (east of ~160 deg E) and the eastern Pacific, sea levels were below normal. Elevated

water levels combined with high wave events led to sea level impacts in some places with flooding observed in Palau.

- Noted that precipitation and clouds were pushed far west with a dry zone in the central equatorial Pacific.
- Noted that Kapingamarangi atoll in FSM experienced exceptional and extreme drought between September 2020 and February 2021 while in other areas of FSM, rainfall was well above normal. Moderate drought was experienced in RMI between December 2020 and February 2021, and American Samoa logged it's wettest year on record in 2020.

ii. Southern hemisphere rain, air temperature, sea surface temperature, sea level and coral bleaching

The Meeting:

- Reviewed the statements made in the PICOF 7 statement and compared model predictions from various centres for Nov 2020-Jan 2021 and Feb-Apr 2021
- Noted that as the end of 2020 approached the SPCZ began to shift to the south and was displaced to the southwest with precipitation implications for countries that sit in that region. The ITCZ has been displaced north over the last few months.
- Reviewed the JAXA satellite rainfall 3 month anomalies to Dec 2020 and March 2021 showing strong anomalies toward the end of last year with wet anomalies around the dateline and rainfall suppression around the equator. This pattern persisted to March 2021. With reference to the station-based rainfall monitoring (Online Climate Outlook Forum), spatial map observations indicated that Stations along the equator had low rainfall periods and areas along the date line had greater rainfall progressions.
- Emphasised the significant rainfall suppression experienced across the 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.

- Noted that air temperatures were cooler than normal across the equatorial pacific for the latter part of 2020, returning to largely normal through to March 2021, and were warmer than normal in the western equatorial Pacific extending southeast the Vanuatu between October-January 2021.
- Noted cooler than normal SSTs along the equatorial Pacific, weakening during 2021. Persistent warmer than normal SSTs in the western equatorial Pacific. Emphasised the presence of a marine heatwave south of the Cook Islands and Tahiti associated with the La Niña.
- Noted that tropical disturbances led to cooler SSTs than typical in some areas of the Pacific.
- Noted that 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 and thermal stress associated with the south Pacific marine heatwave is still present.
- Noted that highest sea level anomalies were around the west Pacific warm pool. Solomon islands and Samoa are still showing higher residual from La Niña.

Discussion:

- Fiji Met Service asked i) what the guidance is from the lead centres on the use of the most recent decade for calculation of anomalies and ii) whether there is any progress on developing a regional platform for coral bleaching. NOAA responded that they are on the verge of releasing the new climate normals including issuing 15 year normals. BoM responded that they are discussing shifting the normal period but that will be released later than NOAA's release. BoM responded that various community and civil society projects are reporting on coral bleaching events but this is difficult to do from a regional perspective. SPC responded that they are looking into developing a dashboard as part of ocean portal and something should be

available by mid or end next year. APCC responded that they changed their climatology period to 1991-2010 in 2020.

iii.Northern and Southern Hemisphere tropical cyclones

The Meeting:

- Reminded participants of the different regions used by different LRF institutions for SW Pacific seasonal TC outlooks.
- Emphasised that south west Pacific seasonal outlooks issued by Nadi RSMC, BoM and NIWA all performed well in terms of observed numbers of TC falling within the ranges predicted. A normal to below normal season was predicted and observed by all institutions.
- Emphasised that despite a normal season, it only takes one severe TC to cause significant impacts, thus having a plan going into the season is important. Despite a normal season, a severe TC such as TC Yasa can be experienced. TC Yasa was one of the most intense events recorded in the Pacific.
- Noted the western north Pacific 2020 outlook called for a near normal to above normal number of storms. There were 26 named storms in comparison to an average of 25.7. All major TCs occurred west or northwest of Micronesia. This geographic distribution is not normal, but is consistent with La Niña conditions.
- Noted that in 2021, two storms have been experienced and super Typhoon Surigae is breaking records.

iv. La Nina and TC impacts (SPREP), 9 Minutes - short review of La Niña and tropical cyclone impacts in both Hemispheres

The Meeting:

- Noted extreme high tides experienced in Palau as well as tropical cyclones.

- Noted flooding and landslides in PNG, associated with low pressure systems affecting infrastructure and food gardens and in northern PNG, drought affecting water security. Strong winds caused damages in Port Moresby.
- Noted tropical cyclone damage and associated flooding experienced in Solomon Islands.
- Noted Kiribati had been facing significantly dry conditions, particularly affecting Banaba, as well as damages associated with tropical cyclones.
- Noted landslides and flooding was experienced in Vanuatu associated with heavy rainfall particularly in Torba, Penama, Malampa and Shefa province.
- Noted that flooding was experienced in Fiji as well as three tropical cyclones and Samoa experienced flooding and heavy rainfall.

Discussion:

There were no questions

Agenda Item 4: Intra-seasonal to long-range forecasting section: outlooks for May to October 2021

i. Surface temperature, rainfall, MSLP

The Meeting:

- Noted that the WMO-LRF MME is now used for the PICOF outlook for SSTs, rainfall and temperature. An MME is a composite of multiple climate models used to generate a consensus forecast.
- Noted that for the coming three months dry conditions are expected in the equatorial Pacific region extending the La Niña like patterns. Out to August-October 2021 countries that are currently experiencing dry conditions can expect a continuation of these conditions over the coming months.

- Noted that normal to above normal rainfall is expected for off equatorial countries, generally for the coming six month period.
- Noted that for May -July, SSTs remain high in the west and cooler near the equator and east of 150 degrees west and air temperatures mirror this.
- Overviewed model outlooks (ACCESS-S, CLIK-P, PICASO, SCOPIC) to compare to the WMO LRF MME, noting that there is generally good agreement between the models for rainfall and temperature and high confidence in dry conditions continuing near the equator. This gives confidence in the WMO LRF MME based outlook.
- Noted that the skill of the models is reasonably good for most areas of the Pacific out to six months. Noted that the transition from La Niña to neutral can have a negative impact on model skill.
- Overviewed the NIWA ICU outputs showing regions with a high likelihood of experiencing rainfall below the 25th percentile and above the 75th percentile over the coming months and noting the water stress hotspots including PNG Islands, Nauru, Kiribati, Tuvalu, northern Cook Islands and French Polynesia.
- Noted that an MJO event is possible in late May/early June but could become infrequent mid-year, favouring east Pacific, Atlantic, and Africa.

ii. Ocean temperature, coral bleaching and sea level

- Noted that SSTs are likely to be warmer than normal for most countries in the west, including COSPPac partner countries in the south and cooler along the equator towards the east.
- Emphasised that sea level is forecasted to be up to 20cm higher (>20cm in Solomon Islands, northern Fiji and Tonga) than normal for most countries for the outlook period with some isolated patches of lower than normal sea level.
- Emphasised that countries in the subtropics will experience the highest tides of the year in the coming months and all NMHSs should check the tide calendars. In FSM and Palau, the predicted tidal values are breaching thresholds.

- Noted that northern PNG, Nauru and western Kiribati have coral bleaching alerts, noting that bleaching is also affected by freshwater inflows and salinity changes etc.
- Noted that the fisheries convergence zone is predicted to slightly contract westward and shift north.

iii. North Pacific typhoons

- Noted that the central and eastern north Pacific is moving into Typhoon season and the NOA 2021 hurricane outlooks for these regions will be released on May 19 and May 20 respectively.
- Noted that the western north Pacific experiences tropical cyclone activity year round and the NOAA 2021 tropical cyclone seasonal outlook will be issued around June 1.
- Noted that near normal to possibly below normal outlooks are expected in all north Pacific regions.
- Overviewed the multi-week ACCESS-S TC Outlooks, noting the heightened chance of TC activity shown in the north Pacific a couple of weeks ahead of TC Surigae's development.

Discussion:

- Fiji Met Service commented that many south Pacific countries are heading towards the dry season and given lower model skill at this time of the year it is important for communication in the PICOF statement that the uncertainties are made clear to help the NMHSs to communicate with their stakeholders. NIWA noted the comment. BoM noted that there was little concern about the skill levels for ACCESS-S over the coming three to six months. NIWA added that the copernicus MME has reasonably good skill over the coming six months and this could be due to the residual La Nina.
- The PICS Panel co-chair asked whether there is any kind of alerting system available for the multi-week TC outlooks. BoM responded that the multi-week outlooks are intended primarily for NMHSs although other agencies can use as they wish, noting some potential communication difficulties.

- BoM noted that the outlooks in the PICOF Statement may differ from national NMHS outlooks because it uses the WMO LRF MME and asked whether NMHSs were comfortable with this. Fiji Met Service did not note any significant difference in the outlook between the PICOF outlook and their nationally produced outlook but also noted that if there *was* inconsistency they would have an issue. New Caledonia noted that if there is no inconsistency between national and PICOF outlooks there is no problem.
- The PICS Panel co-chair recommended that where the outlooks are consistent, countries can be mentioned but where the outlooks are inconsistent countries are not mentioned.
- SPREP noted Samoa's preference to mention countries and suggests to develop the statement and mention countries, NMHS themselves can add or remove when the statement is circulated.

Agenda Item 6 Next Steps and Closure of PICOF-8

The PICS Panel chair:

- Thanked the participants and secretariat
- SPREP acknowledged the work of the PICS Panel in delivering the PICOF 8 and noted the link of the PICOF to the RCC in the future.

Annex 1: Agenda
Timeline

Monday 15 March 2021: Pacific NMSs notified of upcoming virtual PICOF April 2021

Friday 16 April 2021: Deadline for consortium members to send content to the node lead/co-leads to include in the PowerPoint presentations.

Monday 19 April 2021: Deadline for PowerPoint presentations to be send to the PICS panel secretariat to be circulated to PICS panel members and PICOF participants.

Wednesday 21 April 2021: Virtual PICOF April 2021 teleconference held (see proposed agenda below).

Friday 23 April 2021: Final draft of the PICOF statement sent to the PMC members for approval, deadline for responses Wednesday 28 April 2021.

Thursday 29 April 2021: Virtual PICOF April 2021 Statement released

Proposed agenda

Virtual PICOF April 2021 **Wednesday 21 April 2021, 13:30-16:30hrs Samoa time** **Summary of climate and oceans from November 2019 to April 2020, Seasonal outlook for May to July 2020 and May to October 2020 (where possible)**	
13:15-13:30	Registration and communications testing

13:30-14:00	**Agenda 1: Opening & setting the scene** ● Opening prayer ● Welcome and meeting procedures ● Opening remarks -PMC Chair (Samoa MRNE CEO) ● PICOF-8 meeting objectives and survey results ● Group Photo
14:00-14:20	**Agenda 2: ENSO Update and Outlook** ENSO Status and Outlook, Status of ENSO tracker NIWA/BOM/**Meteo-France**/NOAA-University of Hawaii/SPC/SPREP, 15 minutes Question & Answer (5 mins)
14:20-15:15	**Agenda 3: Climate Monitoring Section: review & evaluation of November 2020 to April 2021** **i. Northern hemisphere rain, air temperature, sea surface temperature and sea level** Review of the last six months, plus evaluation of the respective outlooks. NIWA/BOM/Meteo-France/**NOAA-University of Hawaii**/SPC/SPREP, 12 minutes **ii. Southern hemisphere rain, air temperature, sea surface temperature, sea level and coral bleaching** Review of the last six months, plus evaluation of the respective outlooks. NIWA/**BOM**/Meteo-France/NOAA-University of Hawaii/SPC/SPREP/RSMC Nadi, 12 minutes **iii. Northern and Southern hemisphere tropical cyclones** Review of the last six months, plus evaluation of the respective outlooks. **NIWA**/BOM/Meteo-France/**NOAA-University of Hawaii**/SPC/SPREP/RSMC Nadi, 12 minutes

	iv. **La Nina and TC impacts (SPREP), 9 Minutes -**Short review of La Niña and tropical cyclone impacts in both Hemisphere Questions & Answers (10 mins)
15:20-16:25	**Agenda 4: Intra-seasonal to Long-range Forecasting Section: outlooks for May to October 2021** i. **Surface Temperature, Rainfall, MSLP** **NIWA**/BOM/NOAA/University of Hawaii/APCC/SPREP/SPC, 20 minutes ii. **Ocean temperature, Coral Bleaching and Sea level** NIWA/BOM/NOAA/University of Hawaii/APCC/SPREP/**SPC**, 20 minutes iii. **North Pacific Typhoons** **NOAA**/University of Hawaii, 10 minutes Questions and Answers (15 mins)
16:25-16:30	**Agenda 5: Closing** Next steps, wrap up

Annex 2: Participants

List of Countries and Partners who have indicated to join the virtual APR-PICOF 8

Country	Participant	Gender	Partner	Participant	Gender
American Samoa	Elino Lutu McMoore	F	APCC	Soo-Jin Sohn	F
Fiji	Bipen Prakash	M		Daeun Jeong	F
	Arieta Baleisolomone	F		Bo Ra Kim	F
	Jasneel Chandra	M		Yun-Young Lee	F
	Anaseini Salavuki	F		WooMoo Kim	M
	Grace Voi	F	BOM	Simon McGree	M
	Shweta Shiwangni	F		Elise	F
French Polynesia	Victoire Laurent	F		Felicity	F

Kiribati	Kamaitia Rubetaake	F		Grant Smith	M
	Miriam Kataunati	F		Jessica Bhardwaj	F
New Caledonia	Thmoas Abinun	F		Stephanie Jacobs	F
	Christophe Dumont	F		Andrew Watkins	M
	Gabrielle Castella	F	JICA	Masako	F
	Alexandre Peltier	F		Yuri Ueno	M
New Zealand	Doug Ramsay	M	NIWA	Ben Noll	M
Niue	Raquel Tanaki	F	NOAA	John Marra	M
	Rossy Mitiepo	F	SPC	Ana Sereilagi	F
	Sean Tukutama	M			
Marshall Islands	Nover Juria	M		Judith Giblin	F
Palau	Kiku Mochimaru	F		Merana Kitione	F
	Rick Dizon	M			

	Joyleen Temengil	F			
PNG	Kisolel Posanau	F		Zulfikar Begg	M
	Nanao Bouauka	F	SPREP	Tagaloa Cooper	F
	Peter Warupi	M		Salesa Nimhei	M
Samoa	Frances Reupena	F		Philip Malsale	M
	Malaki Iakopo	M		Tile Tofaeono	M
	Emmanuel Etimani	M		Azarel Mariner	F
	Faapisa Aiono	F		Siosina Lui	F
	Kotoni Faasau	M		Teuila Fruean	F
	Silipa Mulitalo	M		Raymond Schuster	M
	Luteru Tauvale	M		Robert Duncan	M
Solomon Islands	Max Sitai	M		Vanda Faasoa	F

				Ella Strachan	F
Tonga	Gary Vite	M	USP	Awnesh Singh	M
	Seluvaia Finaulahi	F	WMO	Henry Taiki	M
Tuvalu	Niko Iona	M		Tessa Tafua	F
			PICS Panel	Olivia Warrick	F
Vanuatu	Glenda Pakoa	F			
	Daphne Nalawas	F			
	Albert Willy	M			
	John Mangau	M			