



Climate and Oceans Support
Program in the Pacific

ACCESS-S Workshop

MODULE: Sectoral tailored products





Climate and Oceans Support
Program in the Pacific

Topics in this module

- What is a tailored sectoral product
- Tailoring outlook maps
- EAR Watch examples
- Fiji sugarcane outlook bulletin
- Fiji energy sector outlook bulletin

Expected learning outcomes

- Understanding of the ACCESS-S outputs that can be used for different sectors, regional examples



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What is a tailored sectoral product

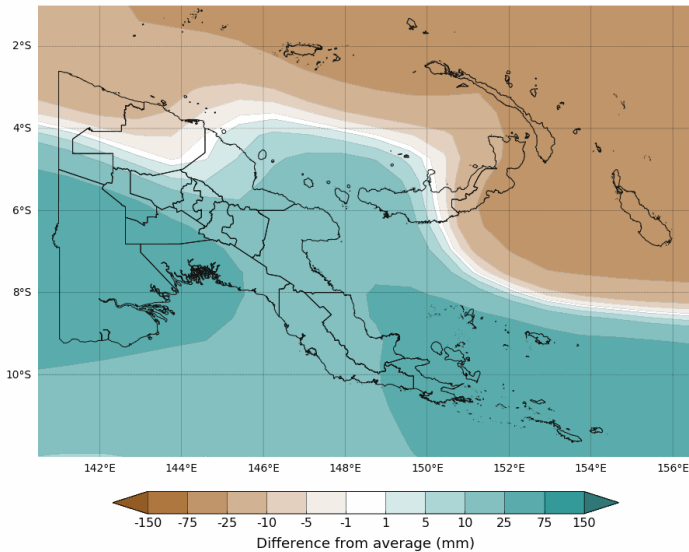
- Delivering climate outlooks directly to a specific group of users
- The bulletin may include interpreting climate information for the user, generally in collaboration with an expert body.
 - e.g. The Early Action Rainfall Watch is a good example of a tailored product for NDMO, providing past rainfall, outlook guidance, as well as potential impacts
- Tailored maps or data information focussed on the users region of interest



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Tailored climate outlook maps

Difference from average rainfall forecast for
1 to 7 October 2022

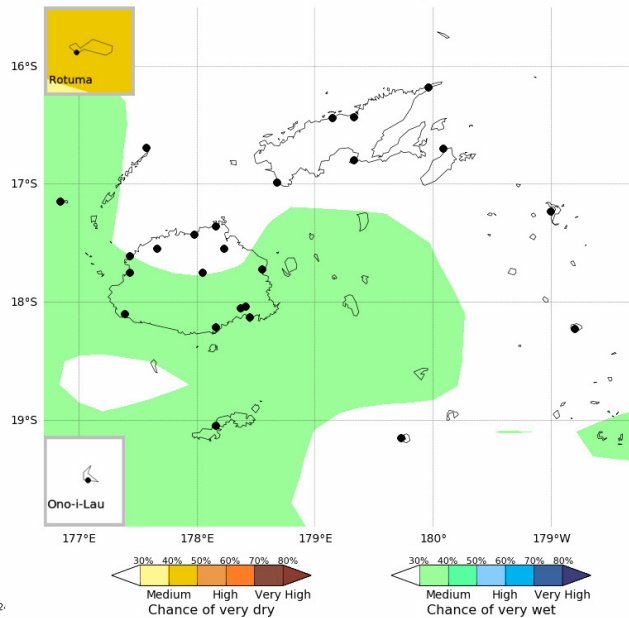


www.bom.gov.au/climate
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Model: ACCESS-S2
Base period: 1981-2018

Model run: 2-
Issued: 21

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.maritimerregions.org/>.

Model Run: 01/09/2022
Base period: 1981-2018

- Climate Outlook maps can be tailored and zoomed in upon request
- Can add information including Exclusive Economic Zones (EEZs) or provincial boundaries



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Early Action rainfall Watch



Cook Islands Meteorological Service Early Action Rainfall Watch

The Early Action Rainfall Watch provides sector managers with a brief summary of recent rainfall patterns, particularly drought and the rainfall outlook for the coming months.

Issued: 10/08/2022

Current El Niño-Southern Oscillation (ENSO) status: The ENSO Outlook continues at La Niña WATCH. La Niña WATCH means there is around a 50% chance of La Niña forming later in 2022. This is approximately double the normal likelihood.

Status summary: The Northern Cook Islands are largely in Meteorological Drought at the 12-month, 6-month, 3-month and at the 1-month timescale (Nassau and Suwarow move out of drought to No Alert at the 1-month timescale). In the Southern Cook Islands, Palmerston and Aitutaki is in Drought Watch and Mangaia is in a Very Wet status at 12-month timescale. At 6-month timescale, Mangaia joins Aitutaki and Palmerston in Drought Watch, while the rest of the Southern Cook Islands including Rarotonga is in a Drought Warning. At 3-month timescale only Rarotonga is in Drought Watch, and at the 1-month timescale all Southern Cooks is Very Dry except for Aitutaki and Palmerston with No Alerts.

Outlook summary: For August, all of Cook Islands is very likely to be Dry, there is a High Chance Dry Alert 3 for the Northern Cook Islands. Southern Cook Islands is mix between Dry Alert 1 and Alert 3.

For August to November 2022, follows a pattern similar to August where there is a High Chance Dry Alert 3 for the Northern Cook Islands (Penrhyn, Rakahanga, Manihiki, Pukapuka, Nassau and Suwarow). The outlook is for the long term drought to continue in the coming months. In the Southern Cook Islands, there is a Dry Alert for Rarotonga, Aitu, Mauke, Miliaro and Manuae, while there is No Alert for the rest of the Southern Cook Island stations (Aitutaki, Palmerston and Mangaia).

See table/maps below for additional information. See status table below for potential impacts.

Impacts

After the specified period of below or above average rainfall, the following primary agricultural and hydrological variables and secondary socio-economic and health variables may be impacted. Note the periods are estimates only. Allow for uncertainty associated with island size, topography, and geology and soil type. Contact the relevant sector offices for further information on impacts.

Southern Cook Islands				
Sector	1-month period most relevant for	3-month period most relevant for	6-month period most relevant for	12-month period most relevant for
Water	Sanitation issues, household water supply	Low water pressure, water rationing household water tanks, household water barrels, small streams, intakes, waterfalls	Medium to large streams, intakes, waterfalls, water transportation required	Wells, community tanks
Agriculture	Shallow rooted crops (e.g. tomato, watermelon and lettuce), crop pests and diseases,	Wet and dry taro, pawpaw, mango, oranges, banana, pineapple, raparapa		
Socio-economic and health	Shallow rooted plants (e.g. flowers)	Diarrhoea, increased reliance	Social conflict, water stealing	Livestock death



Palau National Weather Service Office (WSO Palau)



Early Action Rainfall Watch

The Early Action Rainfall Watch provides sector managers with a brief summary of recent rainfall patterns, particularly drought and the rainfall outlook for the coming months.

Issued: July 05, 2022

Current El Niño-Southern Oscillation(ENSO) status:

The ENSO Outlook continues at La Niña WATCH. This is due to the persistence of some La Niña-like signals as well as the model outlooks. La Niña WATCH means there is around a 50% chance of La Niña forming later in 2022. This is approximately double the normal likelihood. Most ENSO indicators are currently at neutral levels. Tropical Pacific sea surface temperatures are cooler than average but within ENSO-neutral levels with sub-surface conditions suggesting further warming will occur in the short-term. However, some indicators continue to show a La Niña-like signal. Four of seven models indicate La Niña could return in spring with the remainder maintaining ENSO-neutral until the end of 2022. WSO Palau will continue to closely monitor conditions in the tropical Pacific as well as model outlooks for signs of La Niña re-emergence.



Status summary:

Very Wet status is in place for the main islands of Palau at the 12-month, 6-month, and 3-month timescales.

Outlook summary:

For July there is a High Chance and Medium Chance of Drier than normal conditions across the main islands and the eastern region of Palau, and there is a High Chance of Wetter than normal conditions in the western region.

For July to September 2022 there is High Chance and Medium Chance of Wetter than normal conditions for the southwest and western regions of Palau and there is a High Chance of Drier than normal conditions for the southeast region.

Impacts

After the specified period of below or above average rainfall, the following primary agricultural and hydrological variables may be impacted. Note the periods are estimates only. Allow for uncertainty associated with island size, topography, geology and soil type. Contact the relevant sector offices for further information on impacts.

Palau (Wet Conditions)			
Sector	1-month period most relevant for	3-month period most relevant for	6-month period most relevant for
Water	Flooding, salt water intrusion, run off threatening coastal and coral communities, mud/landslides, threatened coastal and coral communities		
Agriculture	Damage to crops, flooded taro patches, soil erosion		
Socio-Economic	Damaged infrastructure (weak foundations, weak roads,		


Important for understanding how the outlook may affect countries through drought or a wet periods as well as the impacts on:

- Agriculture
- Hydrology
- Socio-economics
- Health



Fiji Sugarcane Outlook

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GOVERNMENT OF FIJI
MINISTRY OF INFRASTRUCTURE
& METEOROLOGICAL SERVICES

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Fiji Sugarcane Climate Outlook from August 2022 Harvesting & Crushing Season

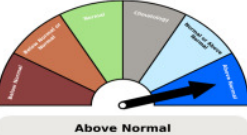


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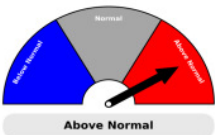
Volume 18
Issue: 3
Issued: July 29, 2022
Next issue: October 31, 2022

Key Messages



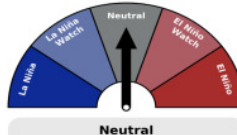
Above Normal

Rainfall Outlook



Above Normal

Air Temperature Outlook



Neutral

ENSO Outlook

English

- Most parts of the sugarcane growing areas have received less rainfall in the past 3 months and the forecast by the Fiji Meteorological Services indicates that rainfall is likely to be above normal during August to October 2022.
- The current dry weather conditions should be favourable for harvesting green cane and farmers should take full advantage of the prevailing conditions.
- Farmers are strongly recommended **NOT TO BURN** cane and trash as burning is detrimental to sugarcane. It affects the cane production and the quality of sugar. It kills all soil macro and microorganisms and degrades soil health. Burning emits large amounts of greenhouse gases, which are responsible for climate change.
- For cane already harvested, fertilizers should be ordered and applied to 2-4 weeks old ratoon cane.
- Those farmers that are planning to plant in September/October should start preparing the land.
- Soil sampling activity to be carried out accordingly and identify certified seedcane from FSC field staff.
- For further advice, please contact SRIF on 8921839.

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Hindi

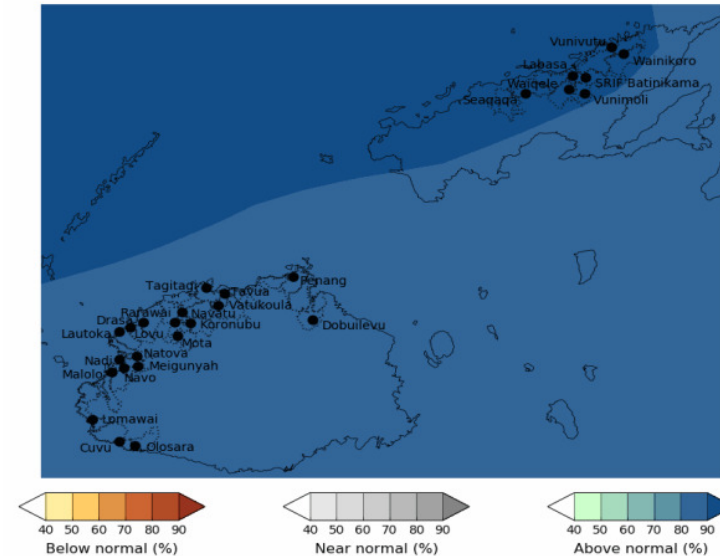
- गन्ना बोने वाले क्षेत्रों के अधिकांश हिस्सों में पिछले तीन महीनों में कम बारिश हुई है और नंदी मौसम विभाग के पूर्वानुमान से संकेत मिलता है कि अगस्त से अक्टूबर 2022 के दौरान बारिश सामान्य से अधिक रहने की संभावना है।

I -Taukei

- E laurai sara tiko ni lailai na uca e vakilai e na noda veivanua ni teidovu, e na tolu na vula sa oti. Ia, e ratou vakaraitaka tiko na Tabana ni Draki, ni na rawa ni namaki na draki suasua e na vula ko Okosita ki na Okotova.

Figure 1


Tercile rainfall probabilities for
August to October 2022





Fiji Energy Sector Outlook

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Fiji Meteorological Service
WMO 896128818
certified Climate Services

Volume: 18 Issue: 9
Issued: August 30, 2022

**Climate Outlook for Monasavu
from September to November 2022**

Current Conditions

Fiji's Climate

The 2021/22 La Niña event has finally ended in June and we are now currently in neutral state, which is neither El Niño nor La Niña. The weather during the month was dominated by moist easterly wind flow, with some troughs, over the eastern parts of the larger islands, while the rest of the country experienced fine weather.

Overall, out of the 19 rainfall stations analyzed until 29th July, 1 recorded *well above average*, 5 recorded *above average*, 2 *average*, 10 *below average* and 1 *well below average* rainfall.

When comparing the total rainfall recorded until 29th August against the World Meteorological Organization (WMO) standard 30years (1981-2010) normal, *above average* rainfall was recorded at Monasavu, with a highest daily rainfall of 41mm recorded on the 27th.

The total monthly rainfall for Monasavu until 29th August was 314mm, which was 123% of the *normal*. In the recent

3 months (June to 29th August), Monasavu recorded 916mm of rainfall, which was also *above normal*, while in the past 6 months (March to 29th August), 1791mm of rainfall was recorded (85% of the *normal*) (Figure 1).

El Niño Southern Oscillation (ENSO) Status

The tropical Pacific Ocean is in an ENSO-neutral state, that is, neither El Niño nor La Niña.

The Southern Oscillation Index (SOI) for July 2022 was +8.7, with the 5-month running mean of +16.7.

Cloudiness near the Date Line has been consistently below average since June 2021, and it continued to be below average through August 2022.

Overall, the oceanic and atmospheric indicators are indicative of ENSO neutral conditions. However, models are now favoring redevelopment of La Niña

El Niño-Southern Oscillation and Monasavu Climate Predictions

El-Niño Southern Oscillation Prediction

The global climate models suggest that there is 70% chance for La Niña to reform later in 2022, while the remainder of the models predict ENSO-neutral conditions to persist until the end of 2022.

Model predictions for this time of the year tend to have lower confidence. Thus, it is difficult to ascertain with accuracy the ENSO state for later half of the year.

Air Temperature Predictions - September to November 2022:

Both the maximum and minimum air temperatures are likely to be warmer than normal across Fiji during the September to November 2022 season (Figure 3).

Rainfall Predictions:

Fortnightly: 3rd - 9th September & 10th - 16th September

Rainfall is likely to be suppressed during the above mentioned fortnights.

Issued: August 30, 2022 *Climate Outlook for Monasavu* Volume : 18 Issue : 9

Monthly Rainfall Distribution at Monasavu until 29th August 2022




Table 1: Rainfall Outlook: September & September - November 2022


September Outlook	25% chance of at least (mm)	50% chance of at least (mm)	75% chance of at least (mm)	Forecast Confidence
Nadarivatu station	139	113	81	Low
Nadarivatu Dam	236	178	136	Low
Monasavu Dam	236	178	136	Low
Wailoa	236	178	136	Low

September to November Outlook	25% chance of at least (mm)	50% chance of at least (mm)	75% chance of at least (mm)	Forecast Confidence
Nadarivatu station	722	676	546	Moderate
Nadarivatu Dam	924	905	744	Moderate
Monasavu Dam	924	905	744	Moderate
Wailoa	924	905	744	Moderate


The table above provides 25%, 50% and 75% chances of each station receiving the amount of rainfall mentioned above.

Figure 1: Rainfall Outlook: Fortnightly; 3rd - 9th September & 10th - 16th September

Difference from average rainfall forecast for 3 to 9 September 2022



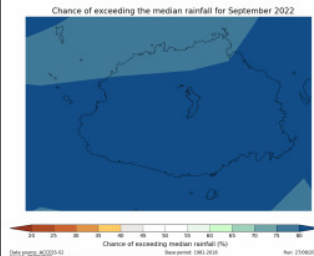
Difference from average rainfall forecast for 10 to 16 September 2022



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Figure 2: Rainfall Outlook: September & September - November 2022

Chance of exceeding the median rainfall for September 2022



Chance of exceeding the median rainfall for September to November 2022

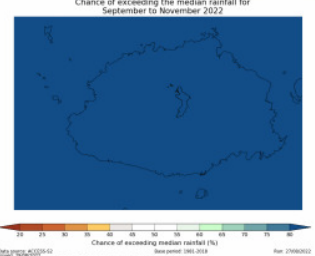
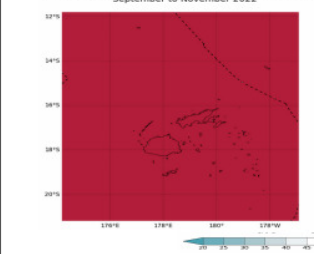
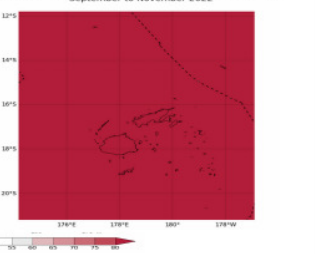


Figure 3: Air Temperature Predictions: September to November 2022

Chance of exceeding the median maximum temperature for September to November 2022



Chance of exceeding the median minimum temperature for September to November 2022



Both maximum and minimum air temperatures are expected to be *above median* across the country during the September to November 2022 period. *Source: ACCESS-S2 Model.*

Climate bulletins issued by the Climate Services Division of Fiji Meteorological Service include:

- 1) Fiji Climate Summary at <http://www.met.gov.fj/Summary1.pdf> (issued monthly)
- 2) Fiji Climate Outlook at <http://www.met.gov.fj/Outlook1.pdf> (issued monthly)
- 3) Climate Outlook for Monasavu at <http://www.met.gov.fj/Monasavu1.pdf> (issued monthly)
- 4) Fiji Sugarcane Climate Outlook at <http://www.met.gov.fj/Sugarcane1.pdf> (issued quarterly)
- 5) ENSO Update at http://www.met.gov.fj/ENSO_Update.pdf (issued every second month)
- 6) Fiji Annual Climate Summary at <http://www.met.gov.fj/Summary2.pdf> (issued annually)

This information is prepared as soon as ENSO, climate and oceanographic data is received from recording stations around Fiji and Meteorological Agencies around the world. Delays in data collection, communication and processing occasionally arise. While every effort is made to verify observational data, Fiji Meteorological Service does not guarantee the accuracy and reliability of the analyses presented, and accepts no liability for any losses incurred through the use of this information and its contents. The information may be freely disseminated provided the source is acknowledged. For further clarification and expert advice, please contact the Fiji Meteorological Service HQ, Nadi.

For further information, contact: The Director of Meteorology, Fiji Meteorological Service, Private Mail Bag NAP0351, Nadi Airport, Fiji. Phone: (679) 6724888, Fax: (679) 6720430, E-mail: fms@met.gov.fj or climate@met.gov.fj. URL: <http://www.met.gov.fj>

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Vanuatu climate outlook for Tourism

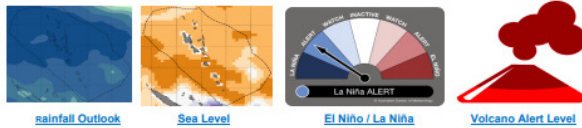
VANUATU CLIMATE OUTLOOK FOR TOURISM

A monthly bulletin issued by the Vanuatu Meteorology & Geo-hazards Department that provides concise one-month outlook on climatic conditions over Vanuatu that local tourism operators and tourists can use for better decision-making.

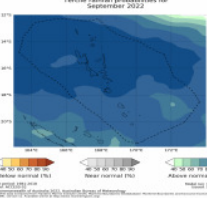
ISSUE 4

AUGUST 2022

Highlights in this bulletin



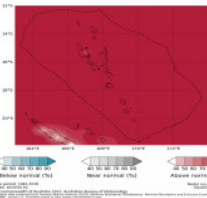
Rainfall Outlook for September 2022



Above normal rainfall is expected for all regions of Vanuatu extending from northern to southern provinces. There is a 80–90% chance for this forecast to happen.

Yumi ekspetem abav nomol renfol ova lo evri aelans blo Vanuatu stat long ol aelans lo north igo daon long ol aelans lo south. Igat bigfala janis blong fokas ya i save hapen.

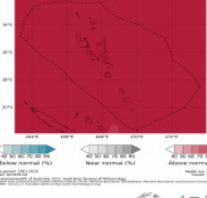
Day-time Temperature Outlook for September 2022



Warmer than average day-time temperatures are expected for the whole country. There is an 80–90% chance for this forecast to happen.

Yumi ekspetem tempreja blong day bae hemi wom lelebet bitim nomol ova long kaontri. Igat gudfala janis blong fokas ya i save hapen.

Night-time Temperature Outlook for September 2022



Warmer than average night-time temperatures are expected for the whole country. There is an 80–90% chance for this forecast to happen.

Yumi ekspetem tempreja blong day bae hemi wom lelebet bitim nomol ova long kaontri. Igat gudfala janis blong fokas ya i save hapen.

SUPPORTED BY: Australian Government Bureau of Meteorology, SPREP, GREEN CLIMATE FUND

VANUATU CLIMATE OUTLOOK FOR TOURISM

A monthly bulletin issued by the Vanuatu Meteorology & Geo-hazards Department that provides concise one-month outlook on climatic conditions over Vanuatu that local tourism operators and tourists can use for better decision-making.

ISSUE 4

AUGUST 2022

Climate Smart Recommendations for Tourism Sector

		Recommended Actions	
		Tourism Operators	Tourists
C l i m a t e V a r i a b l e	B e l o w n o r m a l	Use water wisely (e.g., watering lawns/gardens during cool morning/ evening hours)	Use water wisely (use water taps responsibly, reduce shower times)
		Provide tourists with resource on water saving behaviour	Travel with reusable water bottle and filter
		Heavily mulch flower beds to reduce evaporation	Support eco-tourism initiatives with a water conservation focus
		Desalination plants	Participate in activities with less reliance on water (e.g., go bush hiking instead of swimming)
		Avoid use of fire	
	A b o v e n o r m a l	Save enough water for consumption	Participate in indoor activities
		Increase water activities	Participate in water-based activities
		Increase shelter to accommodate rain day activities	
T e m p e r a t u r e	A b o v e n o r m a l	Build low huts near beaches to cool off	Apply SPF30+ sunscreen every 2 hours
		Encourage sun safe behaviour for tourists (sunscreen, staying in shade, etc.)	Adjust outdoor activities to avoid thermal stress
		Do not remove branches from trees nearby	Stay in the shade where possible
		Heavily mulch flower beds	Keep hydrated
		Provide shade tents and cooling stations	Reduce excess movement
		Use structural or mechanical aid (e.g., umbrellas or wind breaks)	Wear a shirt, hat, and sunglasses
		Avoid areas of unfavourable weather conditions (e.g., move from sun to shade)	
B e l o w n o r m a l	A b o v e n o r m a l	Reduce stormwater and fertilizer runoff	Do not litter in the marine environment
		Avoid using herbicides and pesticides	
		Work with government to move towards renewable energy	If participating in snorkelling or other water activities nearby coral reefs, take care to not damage coral reefs by stepping on, hitting, or touching corals
		For operators nearby coral, provide extensive education to tourists on how to avoid damaging coral reefs	Ensure sunscreen you use is safe for marine life
		When anchoring boats, avoid anchoring near places with coral reefs	
		Tour boats to avoid releasing grey-water discharge or other water pollutants that can be damaging to marine environment	

SUPPORTED BY: Australian Government Bureau of Meteorology, SPREP, GREEN CLIMATE FUND



Climate and Oceans Support
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Seasonal Marine Applications

- Coral Reef Management (bleaching, disease)
- Marine Heatwaves
- Fisheries (Tuna)
- Inundation risk & Reef exposure
- Ocean Outlooks



Conclusion

Climate and Oceans Support
Program in the Pacific

- There are great examples of tailored climate information being used in the Pacific.
- Consider what information is relevant to your stakeholders, if the information is regionally specific and which timescales are applicable.
- An important part of tailored information for sectors is consulting with them to see what climate information is most relevant and what actions could be taken