2022 ANNUAL CLIMATE SUMMARY

FIJI METEOROLOGICAL SERVICE

MPWTMS
MINISTRY OF
PUBLIC WORKS , TRANSPORT
& METEOROLOGICAL SERVICES

Highlights

From 2015 to 2022, Fiji experienced a total 11 major natural hazards. These natural hazards resulted in over 70 fatalities, of which all were associated with storms.

Severe tropical cyclone Cody was the only TC that had a significant impact on Fiji during 2022. Cody brought torrential heavy rain, which led to severe flooding of Fiji's major rivers and low-lying areas. There was one reported causality of TC Cody in Mataniwai, Tavua.

The national average mean air temperature for Fiji in 2022 was the warmest on record since 1959. The national average mean, maximum and minimum air temperatures between 1959 and 2022 have increased by 1.0^{o}C, 1.1^{o}C and 0.9^{o}C, respectively.

Fiji's national average rainfall for 2022 was 2759mm, which was 122% of the long-term average. Fiji's rainfall continue to display large year-to-year variability associated with the El Niño and La Niña events. Extreme rainfall events were recorded, including rainfall associated with TC Cody, with active troughs of low pressure in other months.

Sea-level rise near Fiji measured by satellite altimeters from 1992 to 2022 was between 3-4mm/yr. A state of the art sea level monitoring station at the Lautoka Wharf had a relative sea level trend of 4.3mm/yr. The mean annual sea surface temperatures in Fiji's EEZ were warmest on record in 2022.

Large Scale Climate Drivers

El Niño Southern Oscillation (ENSO)

The year-to-year variability in Fiji's climate is strongly influenced by the ENSO phenomena. The two extremes of this phenomena are El Niño and La Niña. While no two El Niño and La Niña events are exactly the same, they tend to have some general impacts on Fiji's climate. El Niño events often lead to drier than usual conditions over Fiji, which can result in drought events. On the other hand, La Niña events usually bring more rainfall than usual, which can lead to floods, especially during the Wet Season from November to April.

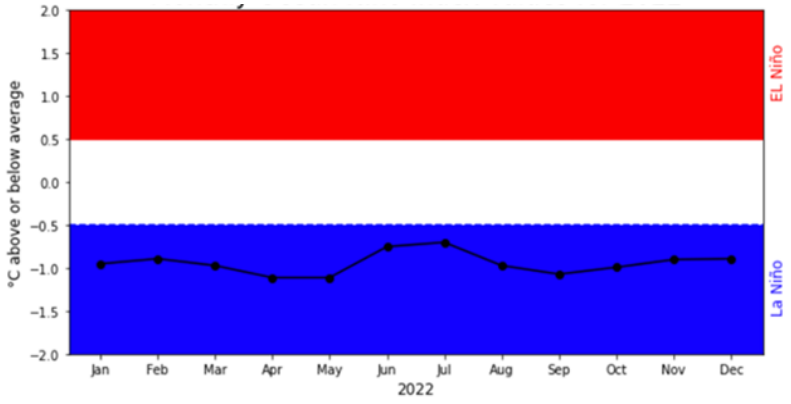


Figure 1: Monthly NINO3.4 anomalies indicate that the Pacific Ocean was leaning towards La Niña during the first half of 2022 and although ENSO-neutral phase commenced during July, sea surface temperatures continued cooling, which led to the establishment of a La Niña in September. Data source: NOAA.

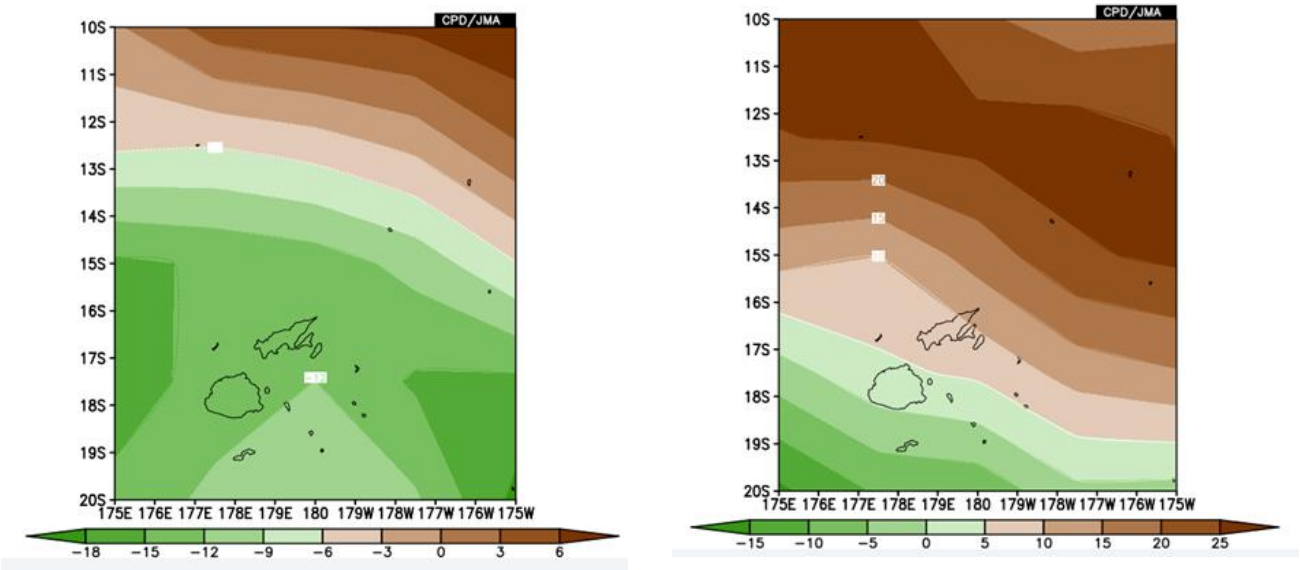
The tropical Pacific was in a La Niña state during the first half of 2022, followed by ENSO-neutral state from July to August, with Ocean Nino Index (ONI) values leaning towards a weak La Niña. However, due to lack of coupling between the oceanic and atmospheric indicators, a fully established La Niña event was declared in September.

Warmer than usual sea surface temperatures were concentrated in the western Pacific, while cooler than average sea surface temperatures continued to persist in the eastern Pacific during January to June. The cool anomalies in the eastern equatorial Pacific started weakening in July, however a number of atmospheric indicators, including cloudiness near the Date Line and the Southern Oscillation Index (SOI) continued

Large Scale Climate Drivers (Cont.)

showing La Niña-like signal. A transition to ENSO-neutral state was made in July as most of the atmospheric and oceanic indicators were in agreement with neutral conditions. ENSO-neutral conditions prevailed till August, but some of the oceanic and atmospheric indicators were approaching La Niña levels.

During September, the warm ocean waters continued to persist in the western half of the equatorial Pacific Ocean, especially around the Maritime Continent, while cool anomalies started strengthening in the eastern equatorial Pacific Ocean. The cooling continued and there was a clear coupling response from the atmosphere, which indicated establishment of a La-Niña event in the tropical Pacific. The 2021-2022 La Niña, followed by a transition through ENSO neutral conditions and the reestablishment of a La Niña event at the end of 2022 prompted scientists to call it a triple-dip La Niña. This became the first triple-dip La Niña of this century since 1950.



(a) **(b)**

Figure 2: Outgoing longwave (OLR) radiation anomalies for (a) January to March; and (b) November to December 2022. Enhanced cloud cover (negative OLR anomalies) persisted over the Fiji Group during January to March 2022, while suppressed cloud cover (positive OLR anomalies) was present in the northern parts of Fiji during November to December 2022. Image source: Japan Meteorological Agency.

Large Scale Climate Drivers (Cont.)

Fiji's weather at the beginning of the year displayed La Niña pattern, with the South Pacific Convergence Zone displaced south of its normal position closer to the Fiji Group. Consequently, most parts of the country were wetter than usual in the first three months. As the year progressed, Fiji's climate varied with some months experiencing wetter than usual condition and others with drier than normal. Fiji's climate was typical of La Niña during the last three months of the year with wetter than normal condition experienced at most of the places.

Madden Julian Oscillation (MJO)

The Madden Julian Oscillation is an eastward moving pulse of rainfall and cloudiness in the tropical Pacific, which usually begins in the Indian Ocean and then makes its way around the globe with a periodicity of 20-90 days. When the active phase of MJO is in the western Pacific then there is usually a surge in the convective activity in the southwest Pacific. The South Pacific Convergence Zone becomes more active, with formation of a number of low pressure systems, tropical disturbances, tropical depressions and tropical cyclones within a period of two to three weeks in the region around Fiji.

During 2022, five active MJO pulses passed through the western Pacific. The strongest of these pulses were in January, May and November (Figure 3). Two strong MJO pulse were in the western Pacific from January 1st to 9th and from 12th to 17th May. During 1st-9th January, tropical cyclone Cody formed in the region. Severe tropical cyclone Cody resulted in gale force winds and torrential rainfall over many parts of Fiji. From 12th-17th May, an active MJO pulse emerged in the western Pacific. During this time, TC Gina formed in the region but did not have any significant influence on Fiji's climate.

Towards the end of the year, three active MJO pulses were present in the western Pacific. The first MJO pulse was present from 9th-31st October in the western Pacific, followed by the second pulse from 1st-4th November, which moved out of the western Pacific, became weak and again propagated into the western Pacific on 22nd November

Large Scale Climate Drivers (Cont.)

and remained there for the rest of the month before becoming weak. The third MJO pulse was active in the western Pacific from 29th-31st December. These MJO pulses did not have any significant impact on Fiji.

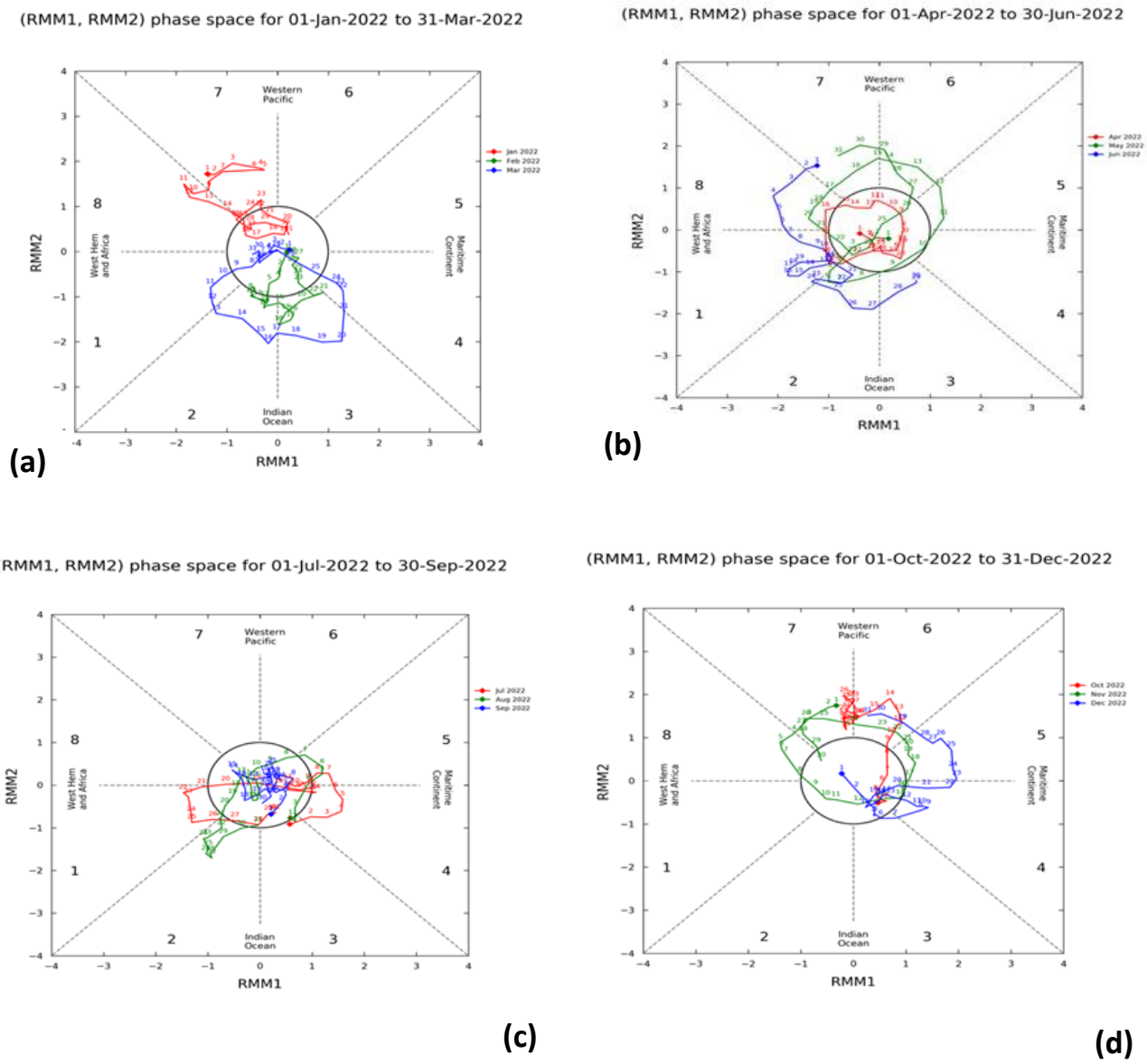


Figure 3: The MJO phase diagram illustrates the progression of the MJO through locations along the equator around the globe. When the index is within the centre circle, the MJO is considered weak. Outside of this circle the index is stronger and will usually move in an anti-clockwise direction as the MJO moves from west to east. Phases 6 and 7 are western Pacific. Data source: BoM.

Rainfall

Fiji's national average rainfall for 2022 was 2759 mm, which was 122% of the long-term average. This ranks 2022 as the 14th wettest year in 65 years of record (Figure 4).

Fiji's national annual average rainfall is not showing any significant increasing or decreasing trend between 1958 to 2022, with a large year-to-year variability associated with the El Niño and La Niña events (Figure 5). Similarly, the national average Wet (November to April) and Dry (May to October) Seasons also have no significant trends.

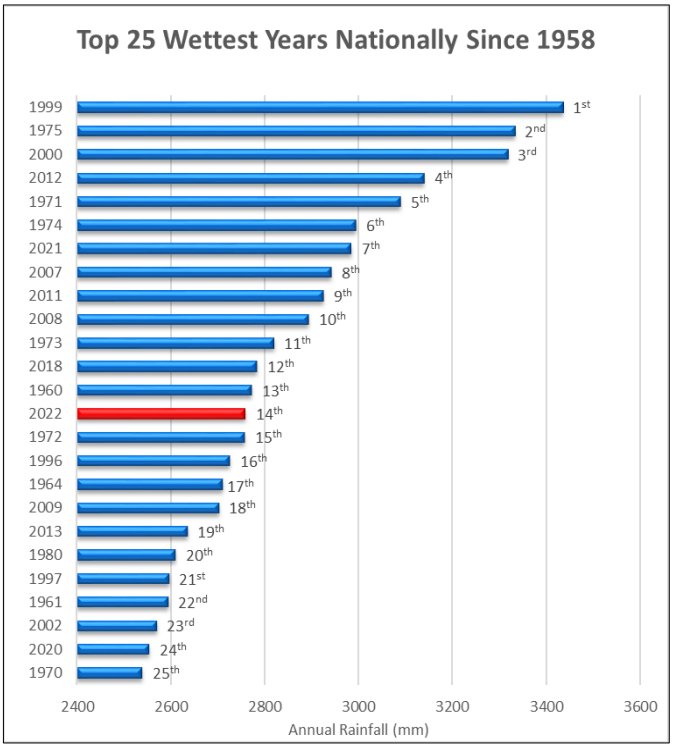


Figure 4: National average annual rainfall

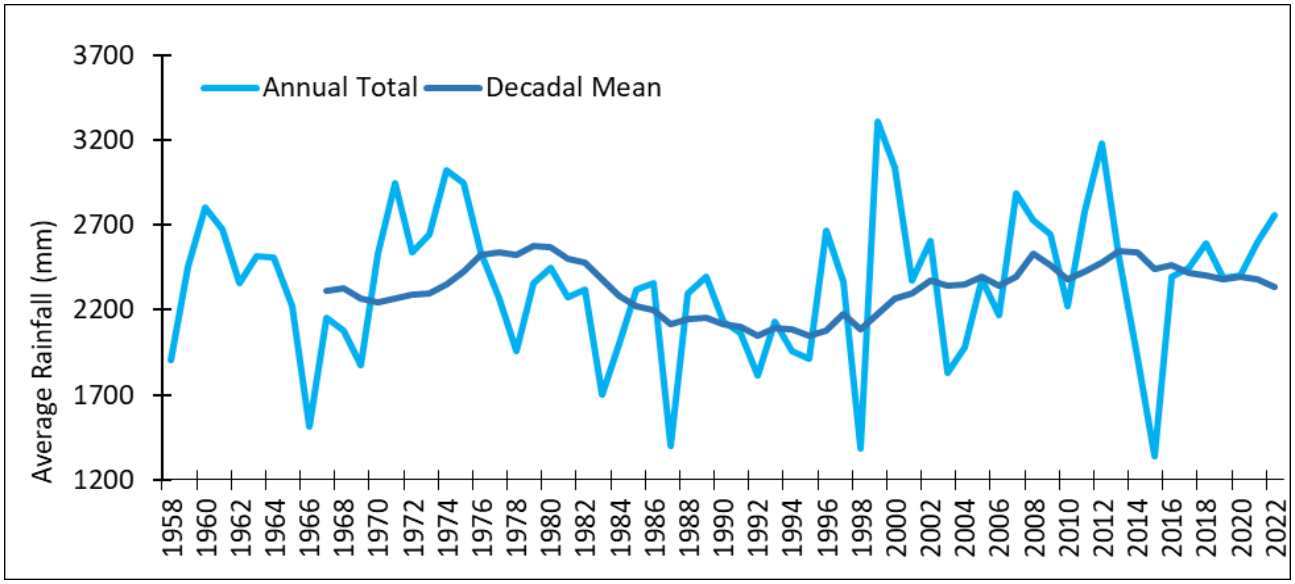


Figure 5: Time series of national average annual and decadal running mean rainfall from 1958 to 2022.

Rainfall (Cont.)

The annual total rainfall in 2022 at individual rainfall monitoring stations was near normal or above normal at majority of the stations. Out of the 21 rainfall monitoring sites, 12 registered above normal rainfall, 7 normal, while Navua and Rotuma recorded below normal rainfall (Figure 6).

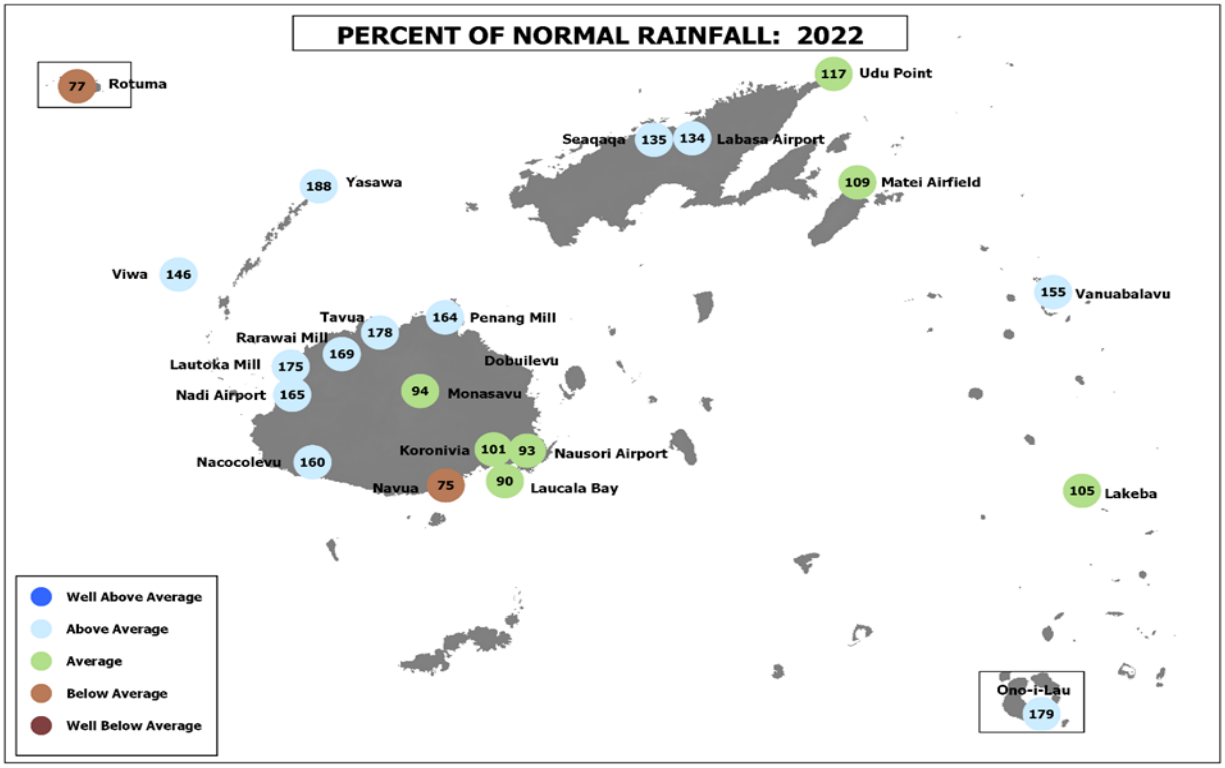


Figure 6: Percent of normal (1981 to 2010 mean) rainfall in 2022 at various rainfall monitoring stations across the country.

The rainfall was significantly wetter than usual in January, February and October. Tropical Cyclone Cody and its predecessor tropical depression, TD03F, had a substantial contribution to the rainfall in January (Figure 7), with Nadarivatu recording 525.4mm of rainfall on January 9th. This rainfall was followed by RKS Lodoni with 388.0mm on January 9th, Nadarivatu with 335.5mm on January 8th and Yasawa-i-Rara with 332.1mm on the January 9th.

Rainfall (Cont.)

On the other hand, April, June and November were significantly drier than normal (Figure 7). During June, extended period of dry days were recorded across all the divisions. The Momi to Tavua corridor, Yasawa-i-Rara and Mamanuca Groups and Vunisea recorded less than five rain days during June.

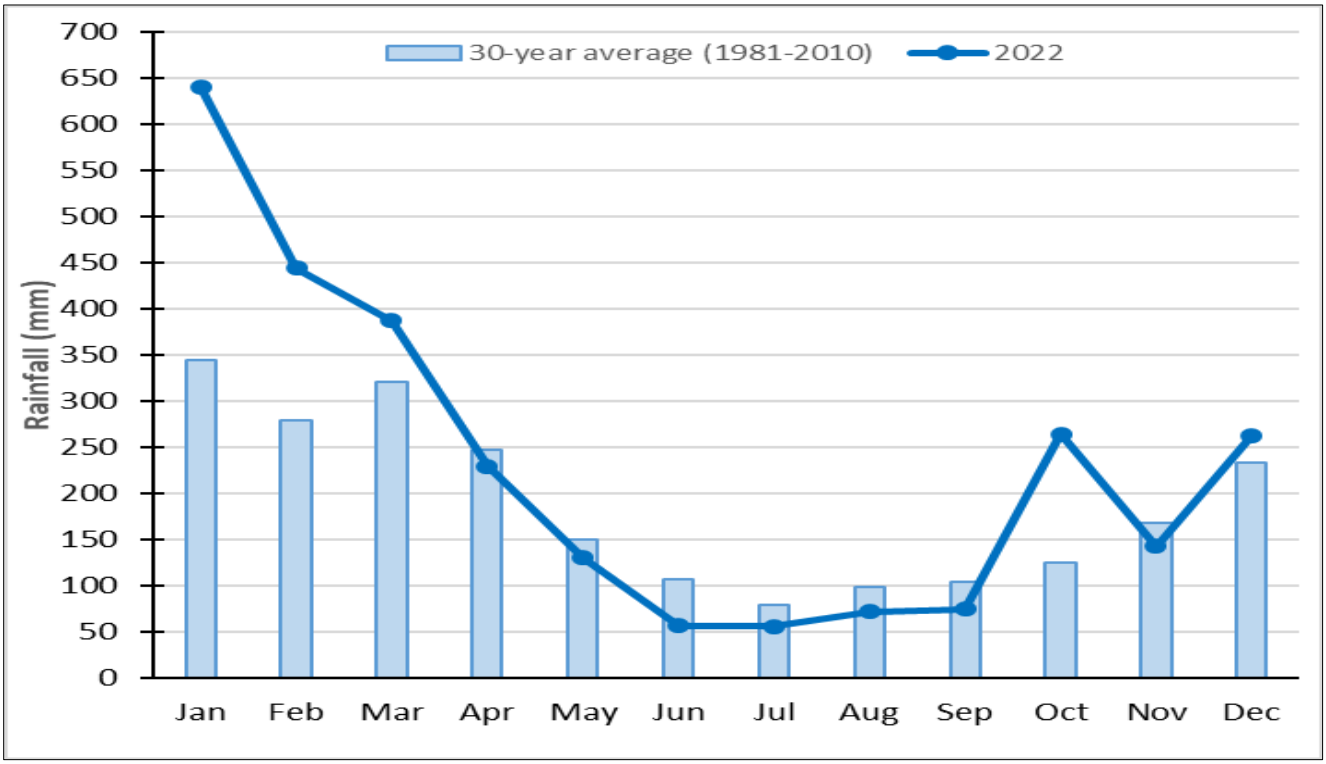


Figure 7: National average monthly rainfall during 2022 compared with the long-term average (1981-2010).

Overall, the wettest location during 2022 was Nadarivatu with 6626mm of the annual total rainfall, followed by Monasavu with 4615mm, Penang Mill with 3785mm and Rarawai Mill (Ba) with 3686mm. On the other hand, Wainikoro was the driest site with 1361mm of rainfall, followed by Lakeba with 1987mm, Korolevu with 2314mm and Viwa with 2403mm.

Air Temperatures

Mean Air Temperature

The year 2022 was the warmest year on record in Fiji with the national average mean air temperature of 26.5°C, which was 0.9°C warmer than the normal (Figure 8).

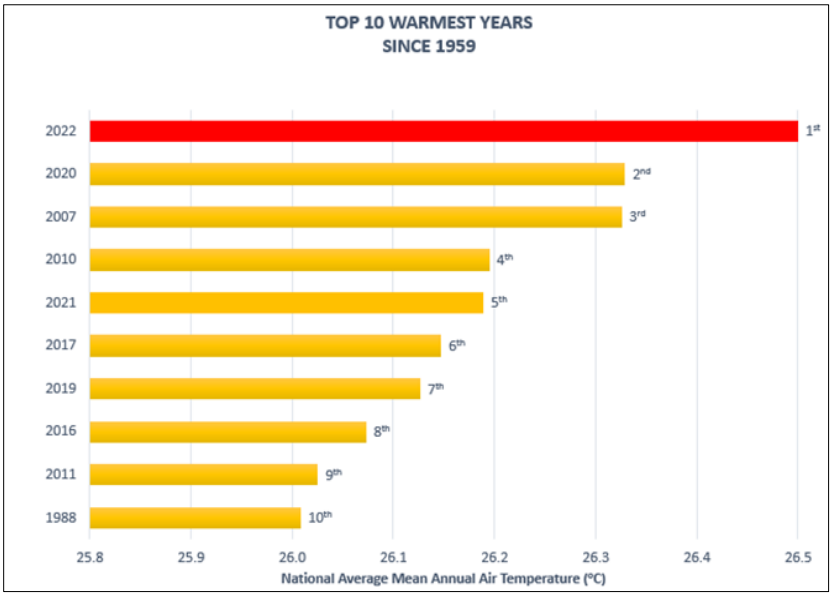


Figure 8: Top 10 warmest national average mean air temperatures for Fiji.

The most recent decade ending in 2020 was also warmest on record in Fiji. This pattern has continued with every new decade being warmer than all previous decades since 1960s (Figure 9).

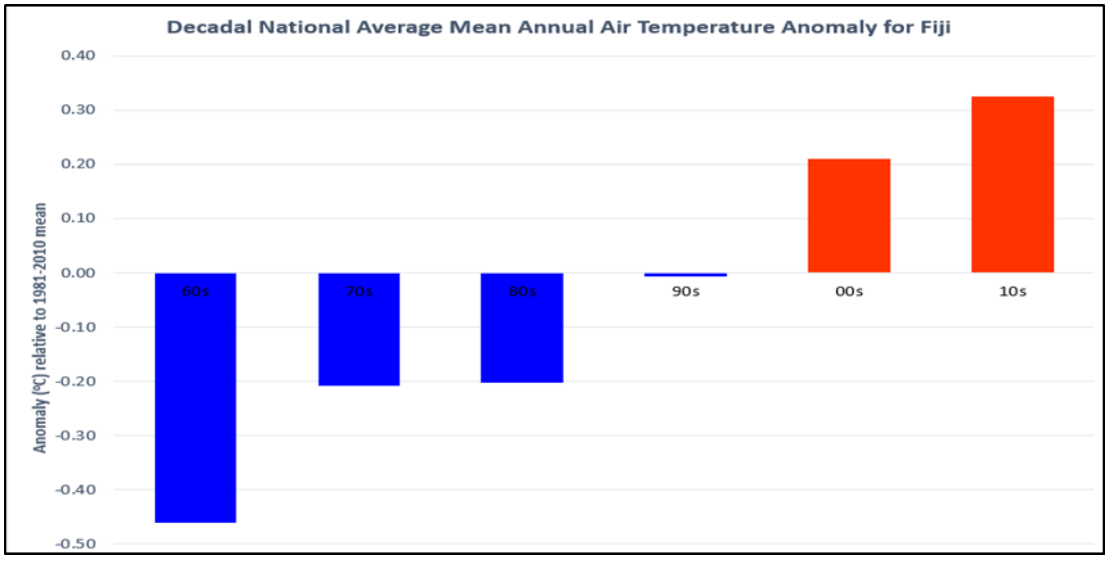


Figure 9: Decadal national average mean annual air temperature anomalies for Fiji.

Air Temperatures
(Cont.)

The national mean annual air temperature has increased by 1.0°C between 1959 and 2022 (statistically significant rise at 95% confidence level) (Figure 10). This trend is consistent with the global pattern of rising air temperatures as greenhouse gas concentration increases in the atmosphere.

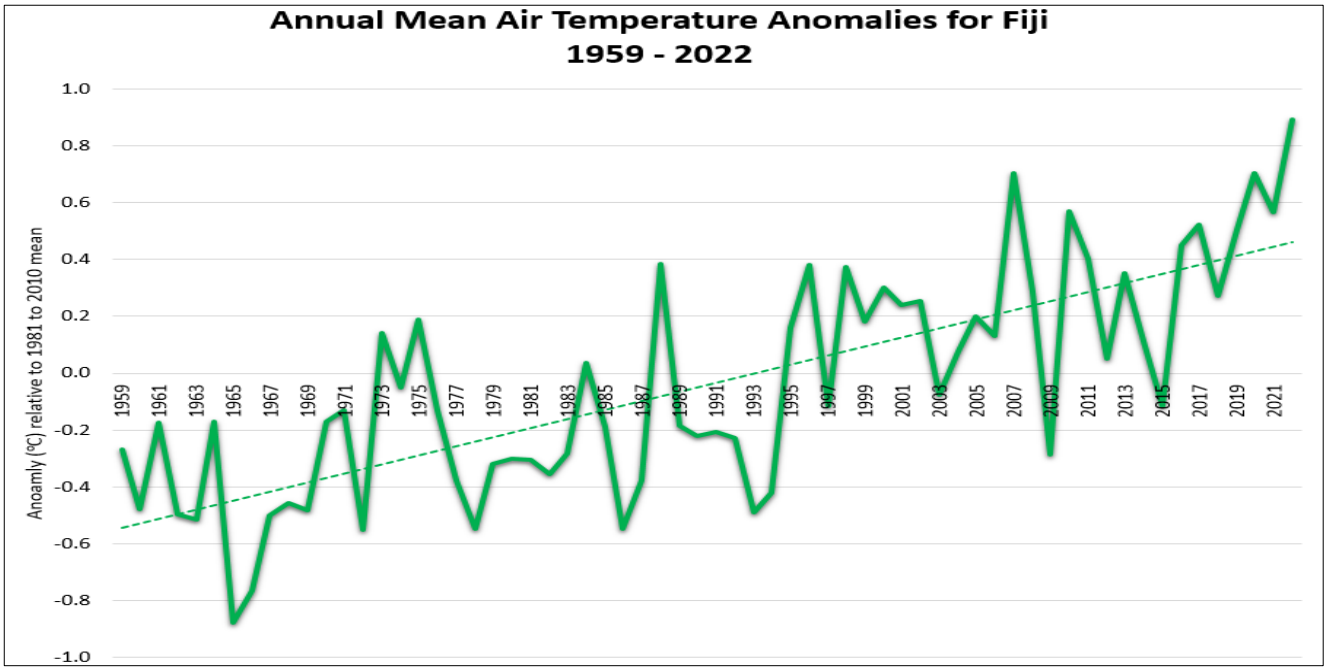


Figure 10: Time series of national average mean annual air temperature anomaly relative to 1981-2010 mean together with the associated trend.

Maximum and Minimum Air Temperatures

The country's national average annual maximum air temperature during 2022 was 30.4°C, which was 1.2°C warmer than the normal. This categorizes it as the warmest national annual maximum air temperature since 1959. The year 2021 is second warmest on record, followed by 1998 and 2020.

The national average annual minimum air temperature during 2022 was 22.6°C, which was 0.6°C warmer than the normal. This ranks as the 4th warmest annual minimum air temperature on record since 1959.

Air Temperatures
(Cont.)

The national average maximum air temperature has increased by 1.1°C between 1959 and 2022 (statistically significant rise at 95% confidence level). Similarly, the national average minimum air temperature has increased by 0.9°C between 1959 and 2022 (statistically significant rise at 95% confidence level) (Figure 11).

On average, the warmest days location during 2022 was RKS Lodoni with an annual mean maximum air temperature of 31.6°C, followed by Lautoka Mill, Rarawai Mill (Ba) and Labasa Airport all with 31.4°C and Viwa with 31.2°C. On the other hand, the coolest annual mean maximum air temperature was registered at Monasavu and Nadarivatu both with 24.9°C, followed by Ono-i-Lau with 29.3°C, and Vaturekuka (Labasa), Udu Point and Vunisea all with 29.8°C.

The highest daily maximum air temperature during the year was recorded at Yasawa-i-Rara with 37.2°C and 36.1°C on December 6th and December 5th, respectively, RKS Lodoni with 36.0°C on December 2nd, and Levuku and Yasawa-i-Rara both with 35.9°C on March 8th and December 8th, respectively.

The coolest nights on average during 2022 was recorded at Nadarivatu with the annual minimum air temperature of 17.6°C, followed by Monasavu with 18.3°C, Rarawai Mill (Ba) with 20.5°C and Lomaivuna with 20.8°C. In contrast, the warmest nights on average were recorded at Rotuma with annual minimum air temperature of 24.4°C, followed by Levuka with 24.1°C, Viwa with 23.9°C, Saqani with 23.8°C and Laucala Bay (Suva) with 23.5°C.

Air Temperatures
(Cont.)

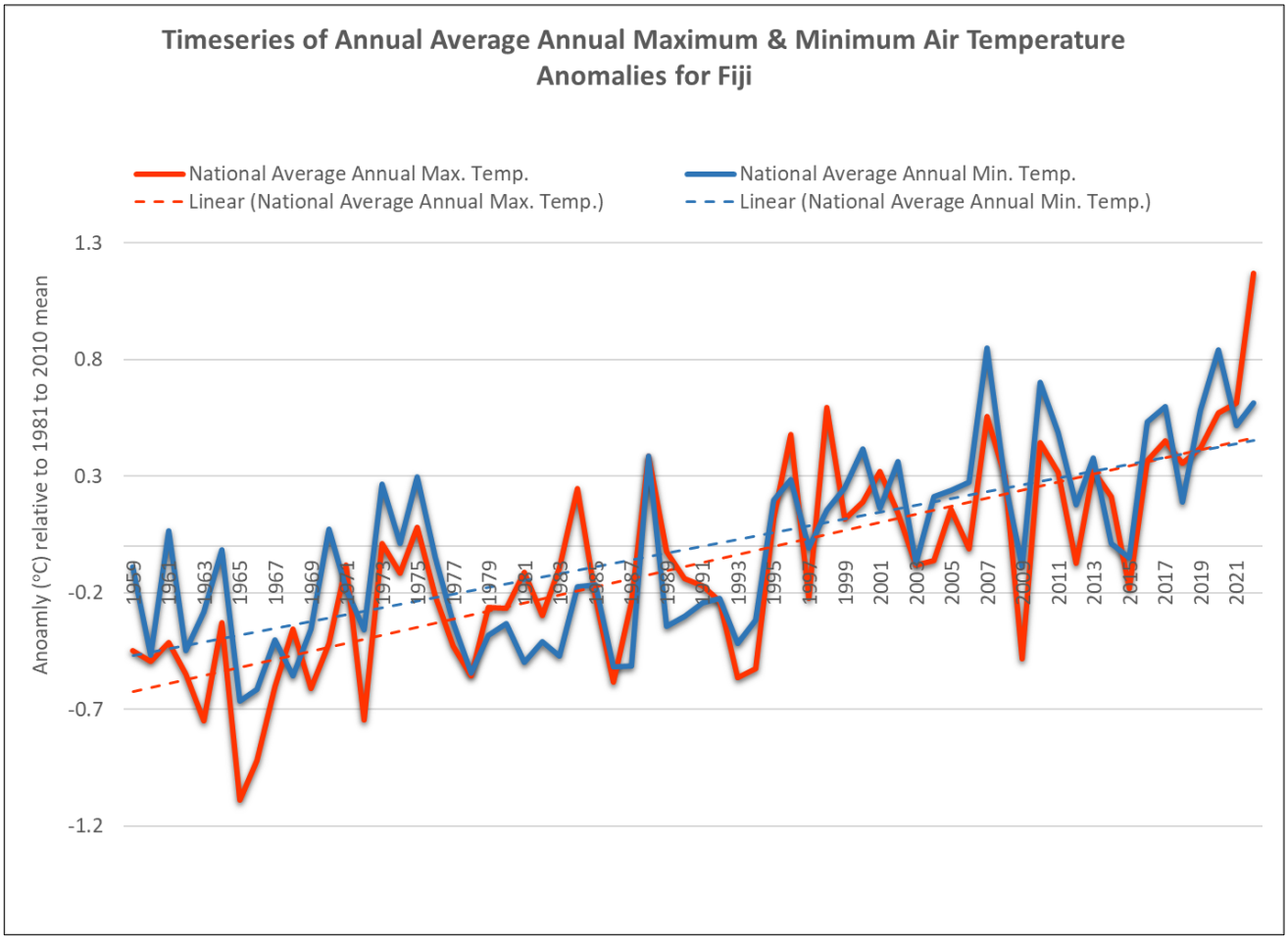


Figure 11: Time series of national average annual maximum and minimum air temperature anomalies of Fiji relative to 1981-2010 mean, together with the associated trends. The minimum air temperature is showing a slightly stronger warming trend than the maximum air temperature.

The lowest daily minimum air temperature for the year was experienced at Nadarivatu with 11.2°C on June 7th, Monasavu with 11.2°C on June 7th, Monasavu with 14.0°C on May 13th and September 5th, Monasavu with 14.4°C on October 11th and 12th, and Monasavu with 15.5°C on June 10th and 11th.

Note: The national average mean, maximum and minimum air temperatures have been calculated based on in-situ observations at 5 high quality meteorological stations, namely, Nadi Airport, Rarawai Mill, Laucala Bay, Nausori Airport and Vunisea.

Sunshine

The annual sunshine hours were near normal at Nadi Airport, Laucala Bay (Suva), Dobuilevu, Koronivia and Monasavu. The total annual bright sunshine hours at Nadi Airport, Laucala Bay, Dobuilevu, Koronivia and Monasavu was 2530 hours, 2040 hours, 1910 hours, 2001 hours and 1506 hours, respectively (Table 1).

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Nadi	174	160	150	185	232	228	277	223	252	195	234	222	2530
Suva	152	169	133	145	156	192	177	153	211	157	243	153	2040
Dobuilevu	133	130	98	126	194	161	202	162	210	158	207	128	1910
Koronivia	151	167	142	114	164	187	164	163	202	120	224	204	2001
Monasavu	86	123	102	126	144	143	116	106	155	90	170	146	1506

Table 1: Total monthly and annual bright sunshine hours for 2022.

Nadi Airport recorded 100% of normal annual bright sunshine hours during the year. The station's highest total monthly bright sunshine of 277 hours was registered in July, while the lowest of 150 hours was in March (Table 1).

Dobuilevu recorded 109% of normal bright sunshine hours during 2022. The station's highest total monthly bright sunshine of 210 hours was registered in September, while the lowest of 98 hours was in March (Table 1).

The annual total bright sunshine at Laucala Bay (Suva) was 106% of the normal. November was the sunniest month at Laucala Bay (Suva), with 243 hours of total bright sunshine, while March recorded the least with 133 hours (Table 1).

Koronivia experienced 117% of the normal sunshine hours during 2022. The sunniest month at Koronivia was November with 224 hours of bright sunshine, while the minimum was recorded in April with 114 hours (Table 1).

The annual total bright sunshine at Monasavu was 119% of the normal. The sunniest month at Monasavu was November with 170 hours of total bright sunshine, while January recorded the least with 86 hours (Table 1).

Winds

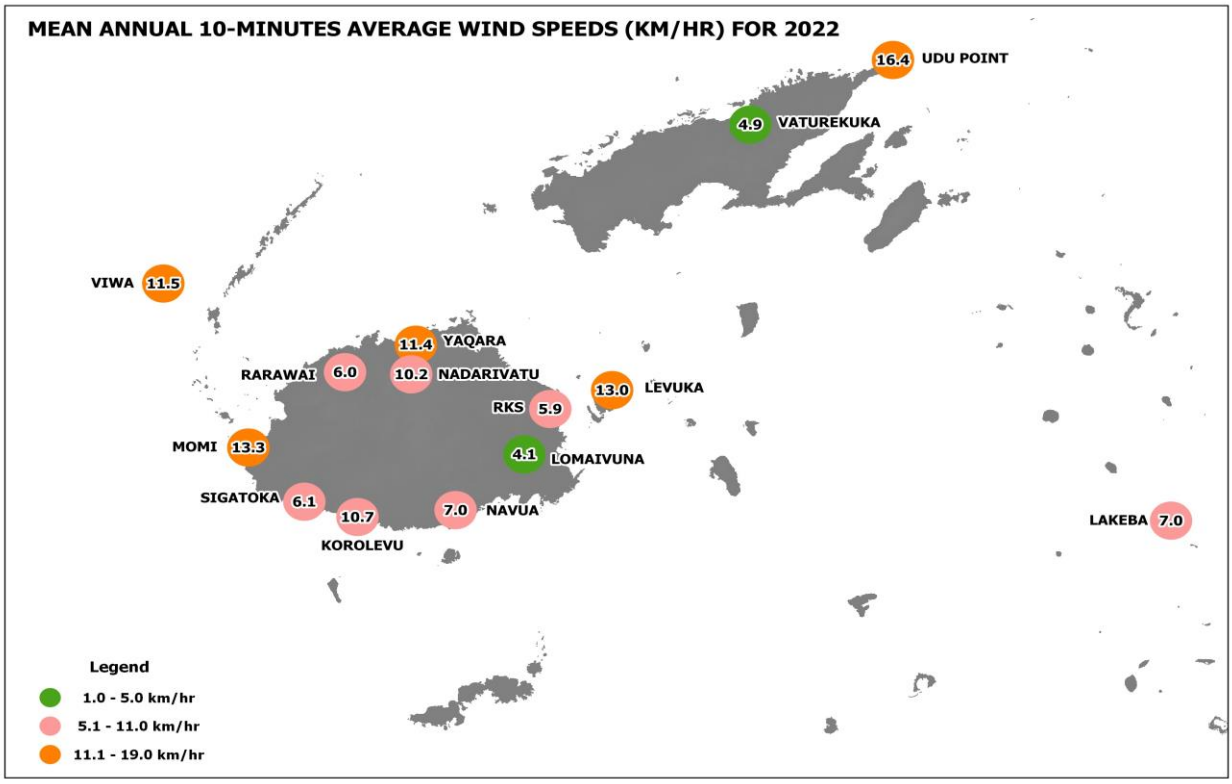


Figure 12: Mean annual 10-minute average wind speeds (km/hr) in 2022.

The highest 2022 mean annual 10-minutes wind speed was recorded at Udu Point with 16.4km/hr, followed by Momi with 13.3km/hr and 13.0km/hr at Levuka. On the other hand, Lomaivuna AWS recorded the lowest average winds of 4.1km/hr.

Tropical cyclone Cody was the only system that originated within Fiji's Exclusive Economic Zone (EEZ) during the year, resulting in some stations recording winds at 50 to 60km/hr, especially for the North and Western Division. Part of the Eastern Division also recorded The highest recorded sustained wind of 67km/hr was recorded at Levuka, followed by 61.6km/hr at Udu Point, 60.8km/hr at Momi and 55.1km/hr at Ndarivatu. However, with reference to during TC Cody's development, around 40 to 60km/hr winds were recorded at Udu Point, within 1300hours to 1900hours in the evening. The rest of the wind reporting stations recorded winds of less intensity.

Note: Not all wind reporting stations have been used for analysis due to missing data.

Tropical Cyclones (TCs)

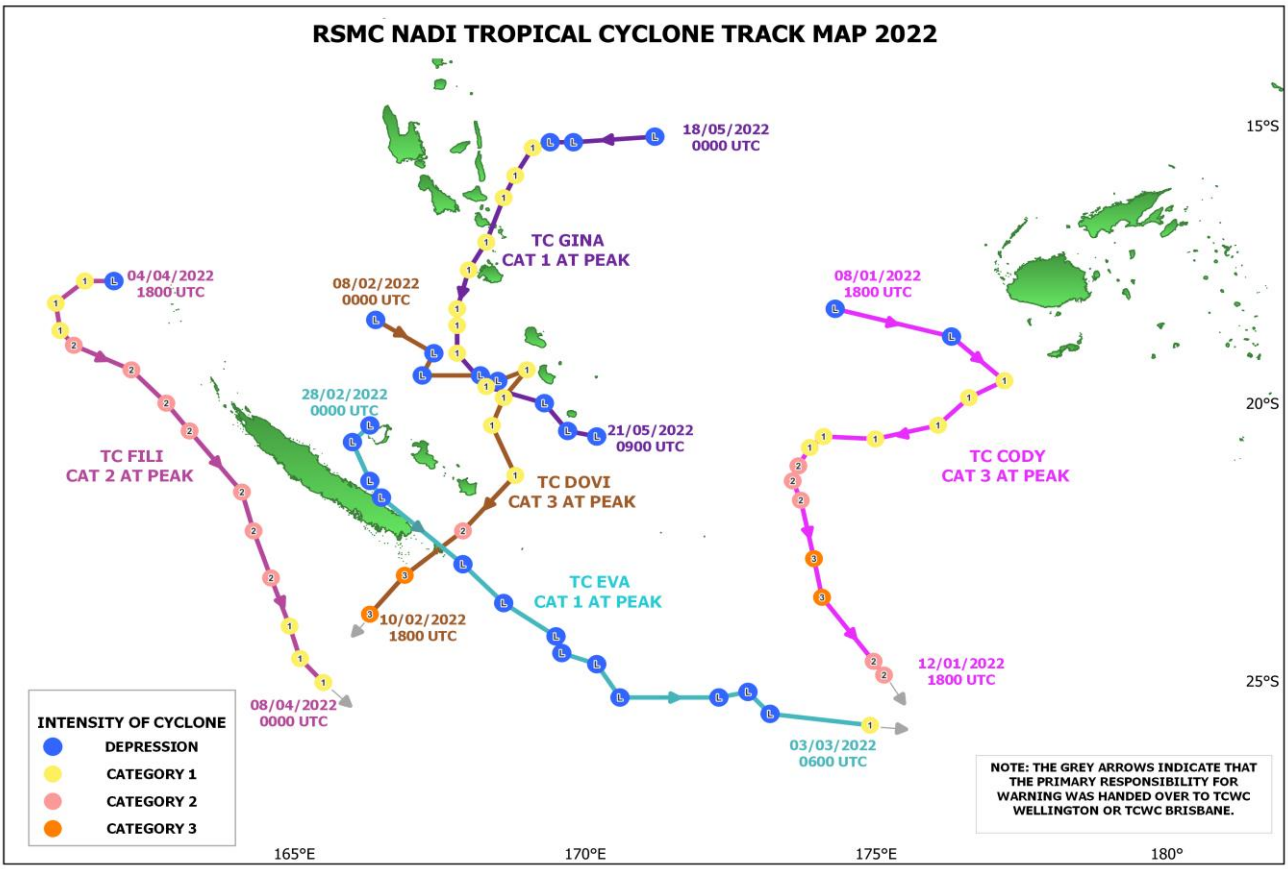


Figure 13: Track maps of TCs, which occurred in the RSMC Nadi-TCC area of responsibility during 2022.

Cyclones, with their destructive force, have severely affected Fiji's economy by damaging critical infrastructure, disrupting key industries, and incurring substantial costs in recovery and reconstruction efforts. The repeated occurrence of these events highlights the vulnerability of Fiji's economy to climate-related hazards and emphasizes the urgent need to enhance resilience and adaptation measures to mitigate future economic losses.

In 2022, five TCs occurred in the Regional Specialized Meteorological Centre Nadi – Tropical Cyclone Centre (RSMC Nadi-TCC) area of responsibility (AoR) (Figure 13). Two Category 3 cyclones TC Dovi and TC Cody occurred while in the RSMC Nadi-TCC AoR, one Category 2 (Fili), while TC Eva and Gina both were Category 1. Only TC Cody had significant impact on Fiji as the associated gale force winds and torrential heavy rain

Tropical Cyclones (Cont.)

brought about damages of severe flooding and flash flooding of Fiji's major rivers and low-lying areas.

Severe TC Cody originated from a low-pressure system that was analyzed near Rotuma, to the north of Fiji on January 4th. TC Cody was named on January 9th while it was located south-southwest of Fiji. Moving into more favourable conditions, TC Cody intensified into a Category 2 system on January 11th, the cyclone further intensified into a Category 3 system on January 12th, while it was still in open waters, far southwest of Fiji. TC Cody moved out of the RSMC Nadi AoR on January 13th. TC Cody did not make landfall on any Southwest Pacific Island country but the associated gale force winds and torrential heavy rain brought about damages of severe flooding and flash flooding of Fiji's major rivers and low-lying areas affecting many densely populated areas, major roads and public utilities. Transportation was disrupted as the number of roads in the country were closed due to flooding. There was one causality, whereby a man died while crossing flooded waters in Mataniwai, Tavua.

Severe TC Dovi moved south-southwest and made landfall on Isle of Pines in New Caledonia, where it became slow moving and intensified into a Category 2 system and on February 11th, Dovi moved out of RSMC AoR. Dovi attained maximum Category 3 intensity while it was in RSMC AoR. Dovi caused widespread flooding in Vanuatu and New Caledonia.

TC Eva was named on March 3rd and was a short-lived cyclone. Eva dissipated on March 5th and only intensified the rainfall during the 2022 eastern Australia floods.

TC Fili was named on April 4th and attained maximum Category 2 intensity while it was located west of New Caledonia. Fili dissipated on April 9th.

TC Gina became the first cyclone to form outside the 2021/2022 cyclone season and was named in the early hours of May 19th. Gina struggled to overcome the effects of the vertical wind shear and maintain deep persistent atmospheric convection, as it moved south-westwards along the subtropical ridge of high pressure. Gina caused flooding in various parts of Vanuatu.

Sea Surface Temperatures (SSTs)

Note: All date in this report is in Fiji Standard Time.

The presence of El Nino Southern Oscillation (ENSO) plays a significant role on the sea surface temperature in the tropical Pacific Ocean.

The year 2022 was characterized by generally warmer than normal sea surface temperatures within Fiji's Exclusive Economic Zone (EEZ). Warm anomalies between +1.0°C to +1.5°C were present across most of the Western, Central and Eastern Divisions, while anomalies around +0.5°C to +1.0°C were present around the northern parts of the Lomaiviti Group, southern Vanua Levu and northwestern Taveuni areas. Anomalies of more than +1.5°C to +2.0°C were observed around Nadi, Momi and some parts of the Coral Coast areas (Figure 14a). The annual mean sea surface temperatures around the Fiji Group ranged from 27°C to 29°C (Figure 14(b)).

In 2022, whole of Fiji waters registered record high mean annual sea surface temperatures since 1982 (Figure 15)

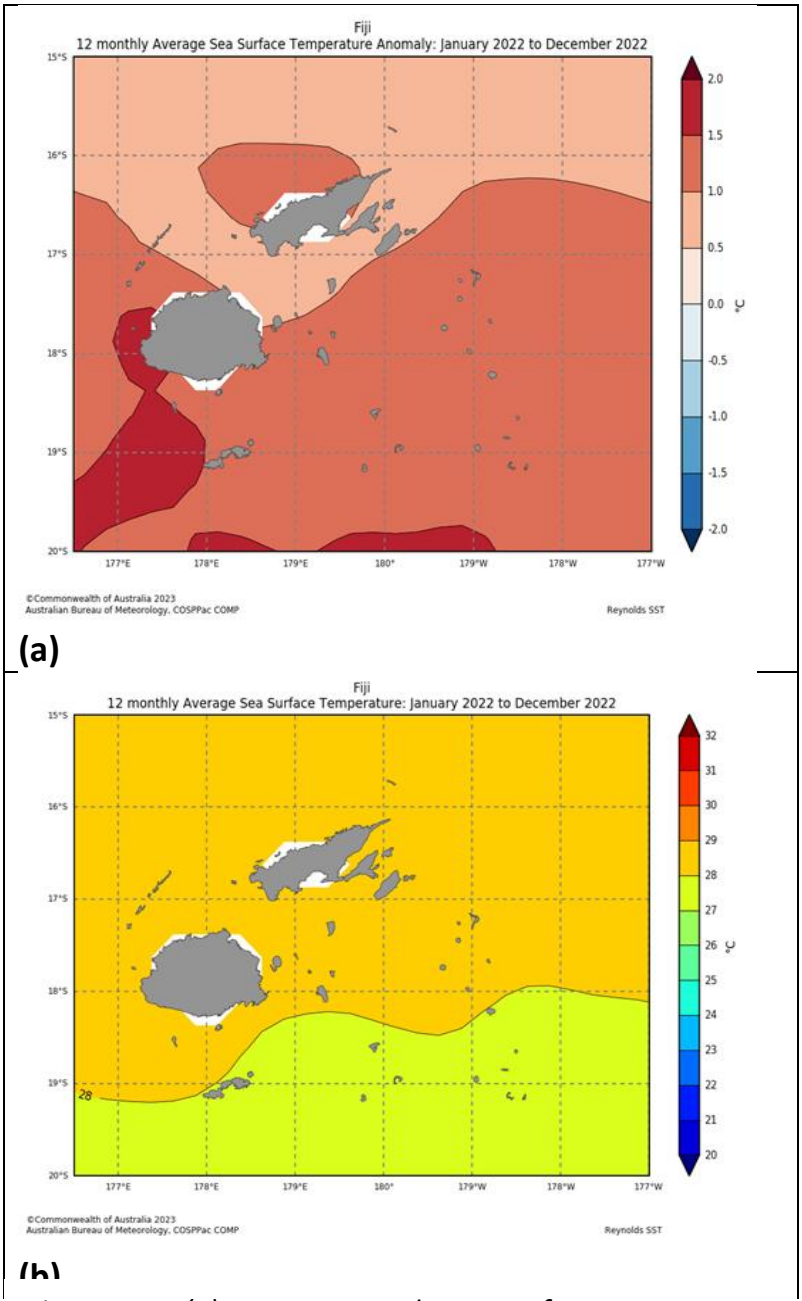


Figure 14: (a) Mean annual sea surface temperature difference from the normal (1971 to 2000 average); and (b) Mean annual sea surface temperature for 2022. Source: Pacific Community.

SSTs (Cont.)

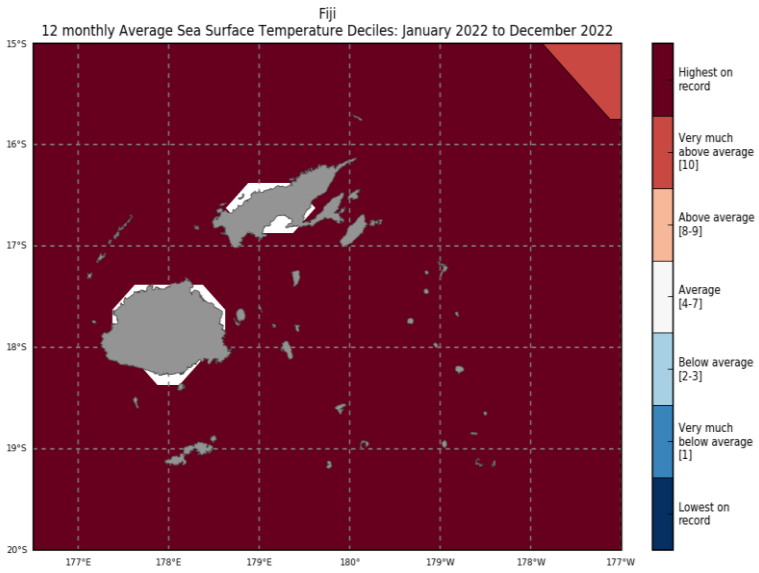


Figure 15: Ocean surface temperature ranking for 2022 since 1982. Source: Pacific Community

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The sea surface temperatures across the Fiji region showed a positive trend since 1950, with rise of 0.0 to 0.1°C/decade in the most of Fiji's EEZ and increase of 0.1°C to 0.2°C/decade to the far north (Figure 16).

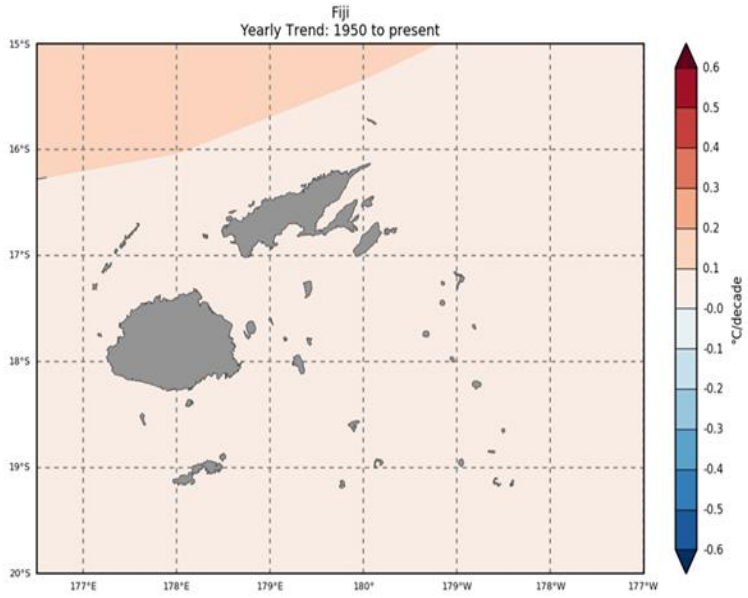

Figure 16: Average ocean surface temperature change since 1950. Source: Pacific Community.

Sea Level

There are currently three (3) tide gauge stations available within the country. The first is available at Lautoka Wharf (Western Division), second is located at the Suva Wharf (Central Division), while the final one was installed at Vatia Wharf (Rakiraki). The first two stations belongs to the Pacific Sea Level and Geodetic Monitoring Project (PSLGMP), while the third station belongs to Fiji Met Service.

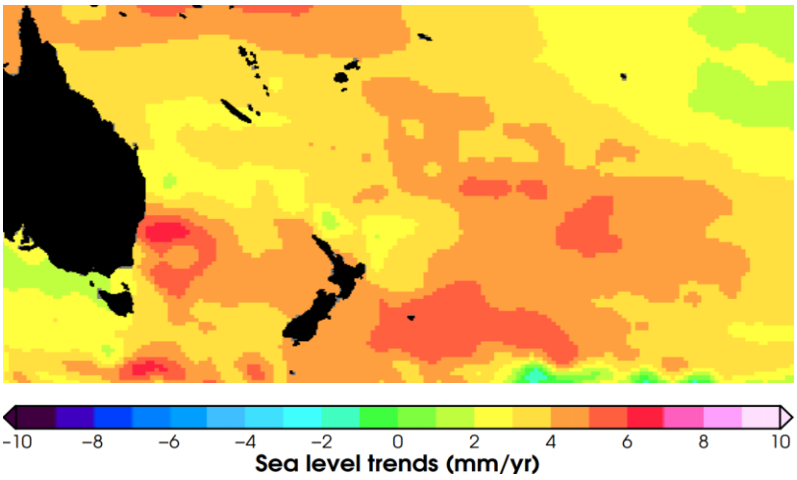

Figure 17: Sea level trend in the Pacific Island region between 1992 to 2022 as per the satellite measurement. Source: NOAA/Laboratory for Satellite Altimetry.

The sea-level rise near Fiji measured by satellite altimeters (Figure 17) from 1992 to 2022 was between 3-4mm/year. A state of the art sea level monitoring station at the Lautoka Wharf had a relative sea level trend of 4.3mm/year between 1993 to 2022, which is a statistically significant increasing trend at 95% confidence level (Figure 18). The global mean sea level rise is of 3.4mm/year since 1993.

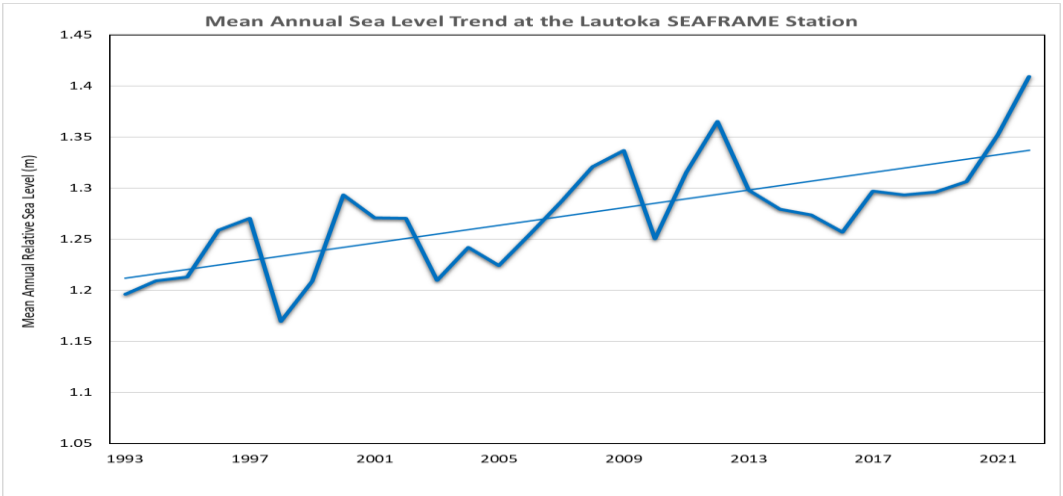

Figure 18: Mean annual relative sea level trend at the Lautoka SEAFRAME station. Data source: Pacific Community.

Note: Sea level at Vatia Wharf could not be analysed due to missing data.

Notable Weather Events

Floods, storms, landslides, and high heat events were among the key climate-related disasters that have damaged Fiji's economy. These events result in destruction of infrastructure, damage to properties, loss of livelihoods, and reduced productivity in key sectors.

According to the Global Risk Report, Fiji is among the top 20 countries with the highest risk and exposure. TC 'Winston' in 2016, 'Josie' in 2018, 'Ana' in 2021 caused the greatest number of fatalities, highlighting the continuing high levels of vulnerability of Fiji.

Flooding, Landslides and Swells due to Severe Tropical Cyclone (TC) Cody – January

Severe Tropical Cyclone Cody affected Fiji at the beginning of January. The intensification of Cody happened in open waters to the far southwest of Fiji. The center of TC Cody did not make landfall on any Southwest Pacific Island country but the associated gale force winds and torrential heavy rain brought about damages of severe flooding and flash flooding of Fiji's major rivers and low-lying areas. From 8th to 10th, TC Cody resulted in significant rainfall being recorded across the country. The highest 24-hour rainfall of 525mm was registered at Nadarivatu, 388mm at RKS Lodoni, 332mm at Yasawa-I-Rara, 248mm at Dobuilevu, all on the 9th, 202mm at Nadi Airport on the 8th, 187mm at Monasavu on the 9th, 179mm at Lautoka Mill on the 8th and 169mm at Nacocolevu on the 9th. The heavy downpour led to widespread flooding across Viti Levu, with Ba, Nadi, Tavua, Rakiraki and Sigatoka towns being inundated with floodwaters.

A 35 year old man was reported to have drowned while crossing flooded waters in Mataniwai, Tavua.

There were reports of landslide in Nananu-i-Ra that damaged five houses on the 11th. There was also report of landslide in Vunika, Labasa as well on the 11th.

TC Cody affected villages in Yasawa as huge swells battered the coastline on the 10th , resulting in people moving to higher grounds.

Notable Weather Events
(Cont.)

Figure 19: (a) Flooding in Wainibuka village on January 10th (Picture Credit: NDMO); (b) Flooded Naqali Road in Naitasiri on January 10th (Picture Credit: Fiji Sun); (c) Ba town inundated with floodwaters on January 10th (Picture Credit: Fiji Sun); (d) Flooding in Nadi town on January 9th (Picture Credit: Fiji Roads Authority); (e) Flooding in Tavua town on January 8th (Picture Credit: Fiji Roads Authority); (f) Flash flooding in Sigatoka town on January 10th (Picture Credit: FBC News); (g) Bulileka Road in Labasa inundated with floodwaters on January 10th (Picture Credit: Fiji Sun); (h) Lanslide along Kings Road, at Saivou District School, Ra in January (Picture Credit: RNZ Pacific Newsfijivillage).

Notable Weather Events
(Cont.)

Figure 20: (a) Pile of vegetation, debris and soil materials brought by the landslide at Vunika, Labasa on January 11th (Picture Credit: Fiji Sun); (b) Damaged house at Nananu-i-Ra due to landslide on January 11th (Picture Credit: The Fiji Times).

Tidal Wave generated by Volcanic eruption in Hunga Tonga-Hunga Ha'apai, Tonga – January

Following the eruption of an underwater volcano in Hunga Tonga-Hunga Ha'apai, Tonga, tidal waves inundated the coastal communities in Fiji at the beginning of January.

Twenty-seven (27) families of Nukui village in Rewa were relocated due to tidal waves entering their village. Some houses sustained damage to their floors. Nukuni village in Ono-i-Lau Island, Lau experienced high tidal waves on the 16th, which damaged five houses. The seawater entered the village and damaged some homes and outdoor kitchen for people living along the coast in Lau. Villagers had to evacuate and move to higher grounds as a precautionary measure. Narikoso, Kadavu and Taveuni also reported of tidal waves on the 15th.

Figure 21: (a) Village of Narikoso in Kadavu inundated with tidal waves on January 15th (Picture Credit: Fiji Times); (b) Village of Nukuni in Ono-i-Lau Island hit by tidal waves on January 16th (Picture Credit: fijivillage); (c) Nukui village in Rewa inundated with tidal waves on January 17th (Picture Credit: fijivillage).

Notable Weather Events
(Cont.)

Flash Flooding in the Western Division – February

A trough of low pressure affected the country from 1st to 8th. This resulted in flash flooding around low-lying areas of Ba, Rakiraki, Tavua, Nadi and Sigatoka on the 5th. Significant 24-hour rainfall recorded during this period was 292mm at Nadarivatu, 169mm at Tavua, 153mm at Nadi Airport, all on the 5th, and 352mm at Rarawai Mill and 149mm at Lautoka Mill, both on the 6th. On the 5th, parts of Ba town was flooded, Nabuna road, Mataniwai, Yaladro and Dramasi areas in Tavua were flooded, Naqoro flats, Qalau road and Nakauvadra river were flooded in Rakiraki.

Figure 22: (a) Flooding in Tavua town on February 5th (Picture Credit: fijivillage); (b) Rakiraki town inundated with floodwaters on February 5th (Picture Credit: FBC News); (c) Ba town flooded on February 5th (Picture Credit: fijivillage); (d) Ba market inundated with floodwaters on February 5th (Picture Credit: fijivillage).

The King tide, coupled with the low pressure system to the far south of Fiji, resulted in unprecedented high tides between 14th to 16th and caused coastal inundation along Fiji's coastal areas. On 14th, at 6.15pm the high tide was at 1.99m, and the following day (15th), at 6.18am, the highest recorded tide was 2.28m, the evening high tide was 2.0m, and on 16th, at 7.13am the high tide was at 2.26m with 1.99m in the evening. Several villages along the Coral Coast in Sigatoka were affected due to seawater entering their villages and houses on the 15th. At the Shangri-La Fijian Resort and Spa, inundated seawater entered the resorts mainland on the 15th. The seawater crossed the resorts bridge at a height of 1.3m because of debris being stuck through the channels of the bridge, which led to the overflow on the mainland.

Notable Weather Events
(Cont.)

Villages in the Lau Group were also affected by the King Tide, resulting in coastal flooding, with students in Lakeba not being able to attend school on the 15th. There were reports of coastal inundation in Navuevu village in Nadroga, Kadavu, as well as seawalls and onto the pathway along the Nasese (Suva) seawall. There were also reports of boats being washed ashore during the same period.

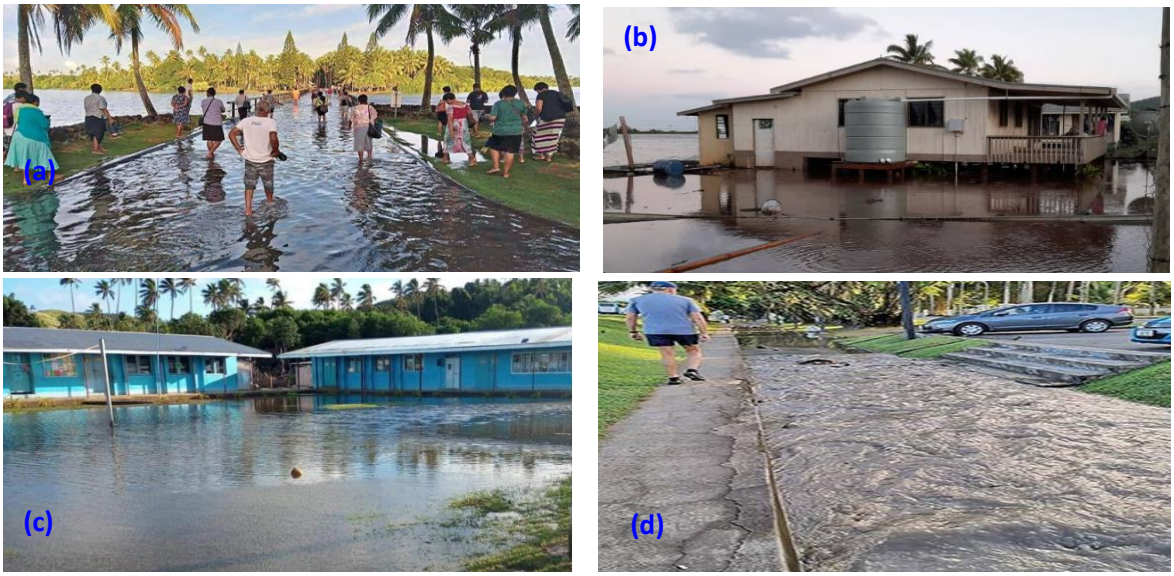

Figure 23: (a) Flooded bridge leading to Shangri-La Fijian Resort due to coastal inundation on June 15th (Picture Credit: The Fiji Times); (b) Coastal inundation at the government station on Lakeba Island on June 15th (Picture Credit: FBC News); (c) Schools in Lakeba surrounded with seawater on June 15th (Picture Credit: FBC News); (d) Walkway along the Suva seawall covered with seawater and debris on June 15th (Picture Credit: Fiji Sun).

Flash Flooding in the Central Division – October

A trough of low pressure from the west affected parts of the country from 5th to 10th and dissipated to the east of the Fiji Group. Localized heavy falls led to flash flooding in the some parts of the Central division. Ono-i-Lau and Levuka both recorded their highest 24-hour rainfall of 112.7mm and 138.5mm on the 8th, followed by Nasinu with rainfall of 119.5mm on the 9th. Low-lying areas in the interior of Namosi and Naitasiri were flooded on the 10th.

Notable Weather Events
(Cont.)

Figure 24: (a) Wainadoi back road flooded on October 4th; (b) Flooded waters in Naitasiri on October 10th (Picture Credit: Fiji Roads Authority).

Hailstorm in Ba – October

A hailstorm event hit residents of Vatuyaka and Varavu in Ba on 17th in the afternoon. The hailstorm event lasted for approximately 10 minutes. The hailstorm was a result of severe thunderstorms cell, which developed from pre-existing moisture content in the atmosphere. There were no significant damages sustained during the hailstorm.

Figure 25: Hailstones visible on the ground at Varavu in Ba on October 17th (Picture Credit: The Fiji Times).

Hailstorm in Labasa and Central Division – November

Hailstorm event was experienced in Labasa and some parts of the Central Division during the second and third week of November.

Hailstorm was observed over Waiqele in Vanua Levu on the 13th, parts of Nausori and near Kasavu in Naitasiri on the 15th. This was due to the presence of active or severe thunderstorms cell that developed from pre-existing moisture content in the

atmosphere, good surface heating resulting in warm air being forced to rise on mountains/hills and dry air entrainment from the environment lowering the freezing level.

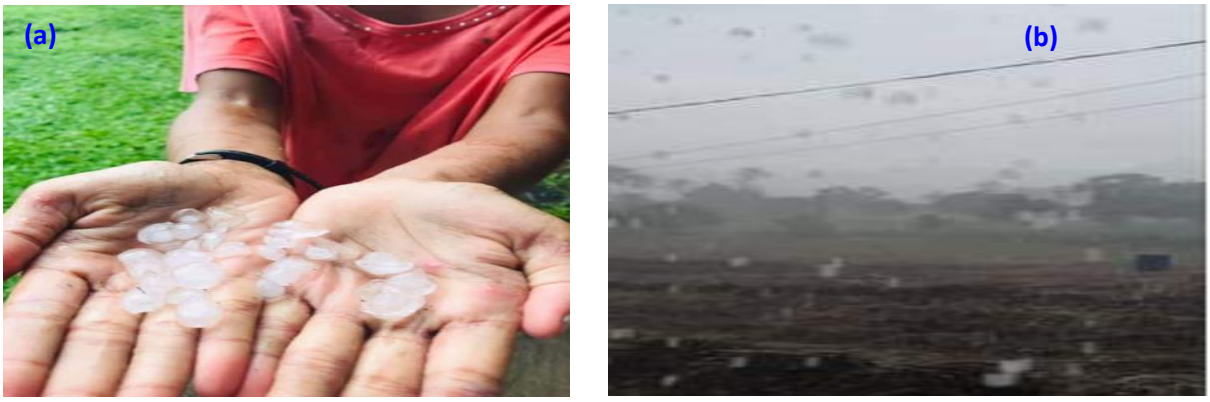

Figure 26: (a) Resident in Nausori holding the hailstones on November 15th (Picture Credit: fijivillage); (c) Hailstorm in Waiqele, Labasa on November 13th (Picture Credit: Fiji Khass News).

Flash Flooding – December

Flash flooding occurred when an associated trough of low pressure brought occasional rain over most places from 11th until the 13th. Major flash floods occurred around low-lying areas in the Western Division, that is, from Sigatoka to Rakiraki. Significant 24-hour rainfall of 131.9mm was recorded for Ono-i-Lau on the 11th and 130.5mm at Nadarivatu with 165.5mm at Toge, both on the 12th respectively.

The second episode of flash flooding occurred from 28th to 31st when active rain bands from a trough of low pressure to the west of Fiji, accompanied by moist northwesterly winds affected the country. Over a 72-hour period, from 9am on the 29th December 2022 until 9am on the 1st January 2023, Toge recorded 245mm of rainfall, followed by Nadarivatu with 223mm, Rarawai Mill with 199mm, Nadi Airport with 197mm, Tavua with 195mm, Lautoka Mill with 179mm and Yaqara with 169mm. Localized heavy falls led to flash flooding in the Western Division, especially Ba, Sigatoka, Lautoka and Nadi areas on the 30th and 31st.

Notable Weather Events
(Cont.)

Legalega, Nadi Town and parts of Korovuto were inundated with flash floods, while in Ba some of the Irish crossings and areas around Ba market were flooded on the 30th and 31st. There was a reported drowning victim when a 6 year old boy tried to cross a flooded culvert at Togomasi in Nadi on the 31st.

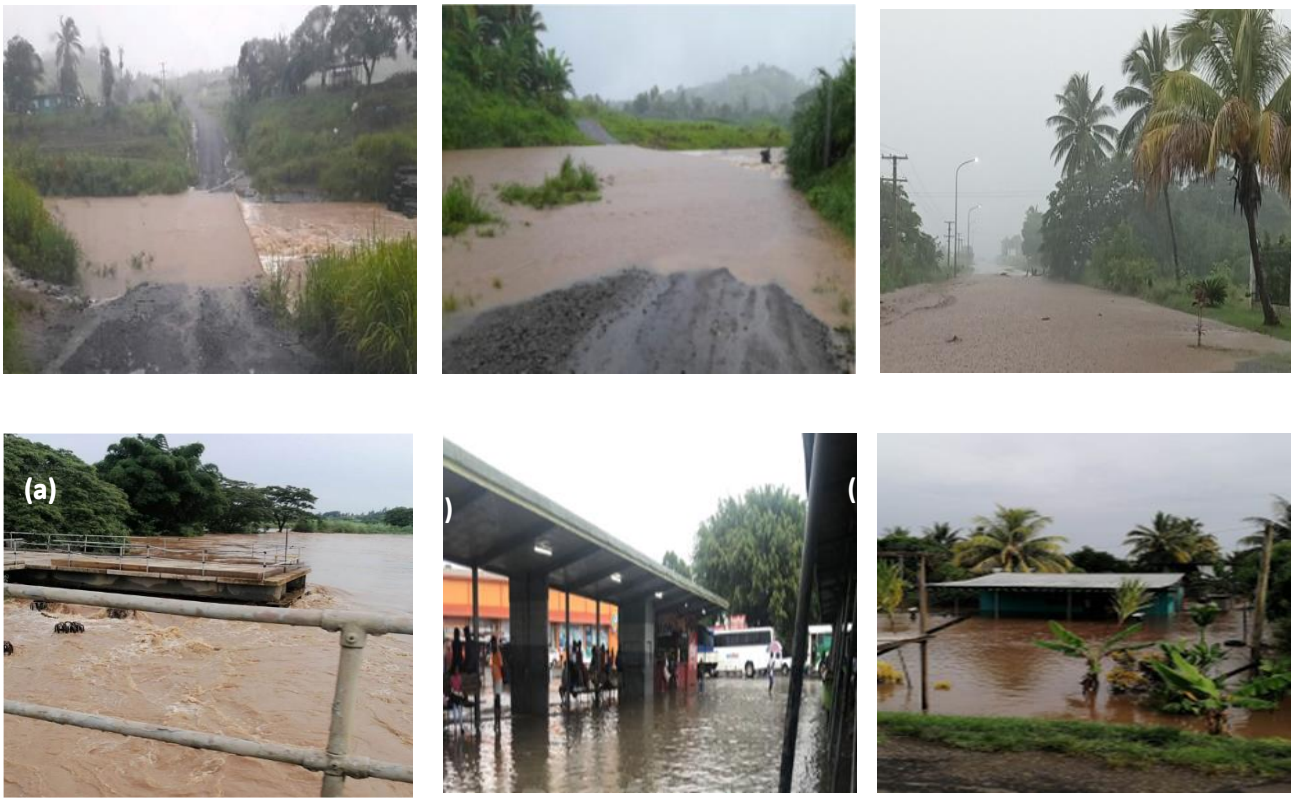

Figure 27: (a) Flooded road in Volivoli Ra on December 13th (Picture Credit: The Fiji Times); (b) Marinitawa Crossing in Ba on December 30th (Picture Credit: Fiji Roads Authority); (c) Vaivai road Lautoka crossing flooded on December 13th (Picture Credit: Fiji Roads Authority); (d) Rising flood waters at the Navo Bridge in Nadi on December 31st (Picture Credit: Fijivillage); (e) Flooded Nadi Bus Stand on December 31st (Picture Credit: FBC News); (f) Flooded houses in Korovuto settlement, Nadi on December 31st (Picture Credit: Fijivillage).

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