

Summary: Climate Change in Samoa 2022

Historical and Recent Variability, Extremes and Change



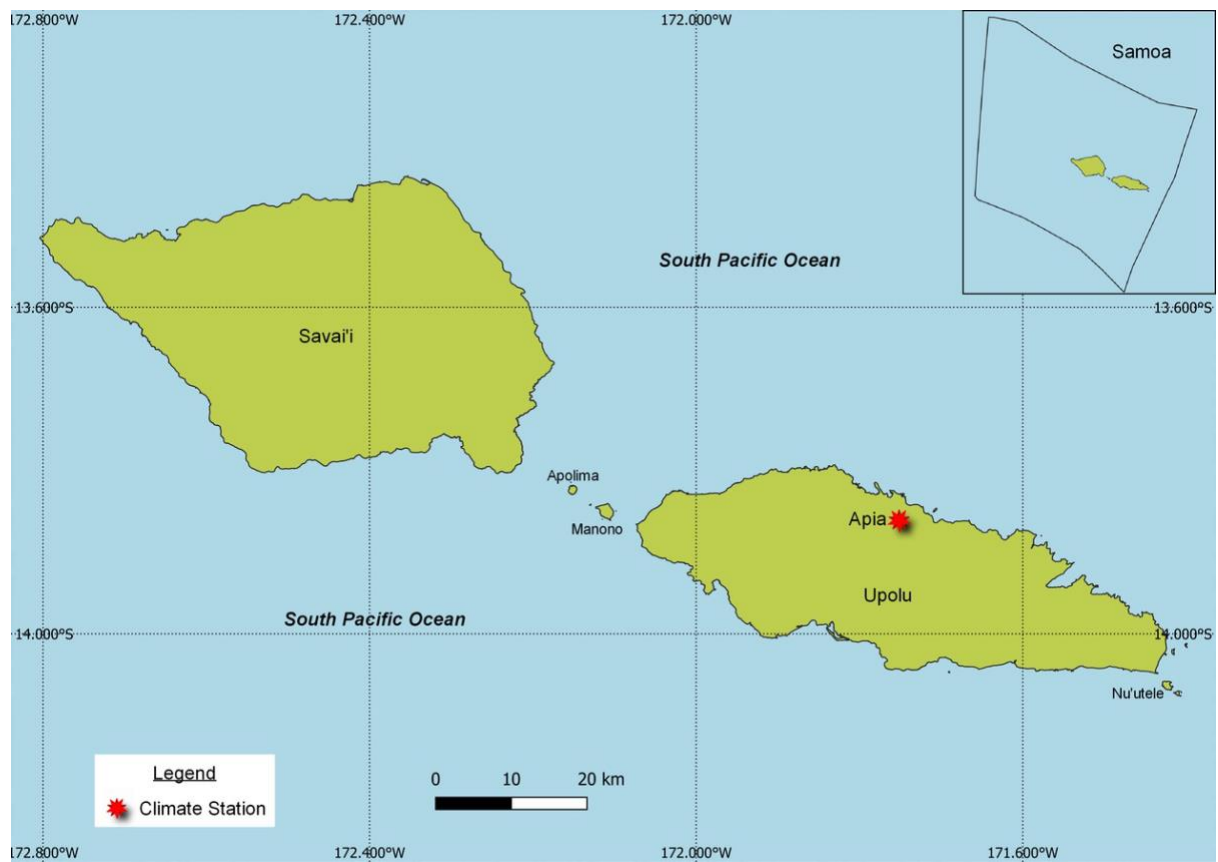
COSPPac
Climate and Oceans Support
Program in the Pacific

This brochure provides a snapshot of key long-term changes in climate and ocean variables in Samoa. Long-term changes were determined by analysing trends in historical climate and ocean data. Trends provide information about climate change in Samoa 'to date'.

Climate variability strongly influences extreme events in Samoa. The brochure also provides up-to-date scientific information on climate variability and its influence on extreme events.

Figure 1:

Samoa and the location of the Apia climate station used in Climate Change in the Pacific 2022 report.





Some extreme rainfall events have increased

The maximum amount of rainfall that falls on a single day has increased significantly since 1951 at Apia. Further, the proportion of total annual rainfall received from very wet days has increased by around 1.65 % per decade.

The El Niño Southern Oscillation (ENSO) – a natural mode of climate variability – influences rainfall variability from year to year in Samoa. Despite significant changes in the extremes mentioned above, there has been little change in the total amount of annual and seasonal rainfall since 1951 or in the number of wet days per decade.

There has been little long-term change in meteorological drought in the wet and dry seasons over time. Further, there has been little change over time in consecutive dry days per decade. El Niño years typically bring substantially longer dry spells than La Niña years.



Air Temperature has increased

Average annual temperatures at Apia have increased by 0.13 °C per decade since 1979. Average wet season (November–April) dry season (May–October) temperature trends were similar.

The number of hot days and warm nights has increased, and the number of cool days has decreased at Apia. Since 1979, hot days increased by about 17 days per decade. Hot days have a maximum temperature above 30.1–32 °C, depending on the time of year.

The number of days where air conditioning is required to cool a building down to 25 °C has increased by 45 days per decade, indicating that energy demand for cooling has increased significantly since 1979.

Long-term increases in both average temperature and temperature extremes in the Pacific are likely driven by human-associated climate change due to the rate of the observed changes and consistency with global trends that have been attributed to climate change (PCCM, 2021).

Tropical cyclone severity has decreased

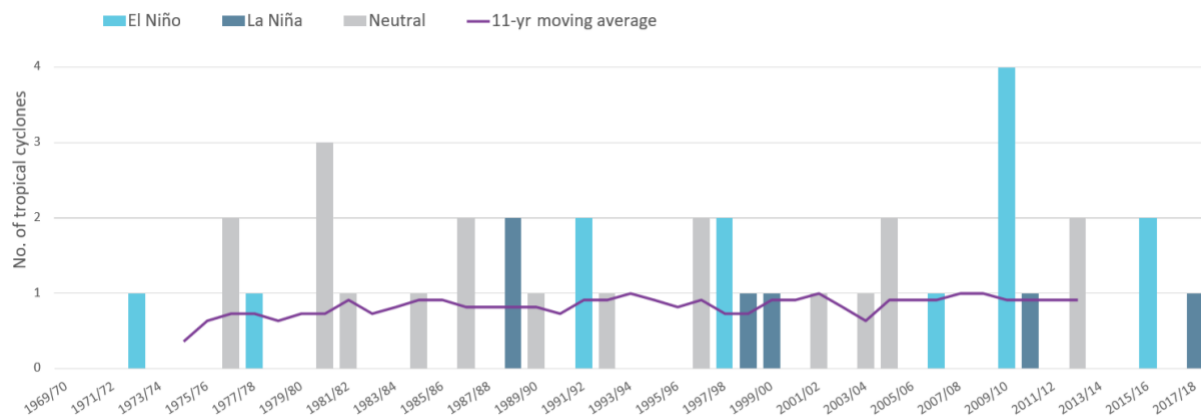
In the greater Southwest Pacific, the total number of **severe** tropical cyclones¹ has decreased over the last 40 seasons. There has been little change in the total number of tropical cyclones of any category in the southwest Pacific. The number of tropical cyclones that became severe has marginally declined.

Tropical cyclones usually affect Samoa during the southern hemisphere tropical cyclone season, which is from November to April, but also occasionally occur outside the tropical cyclone season.

The number of tropical cyclones occurring in Samoa's Exclusive Economic Zone (EEZ) varies considerably from one year to the next (Figure 2). Tropical cyclones were most frequent in El Niño years (10 cyclones per decade), followed by neutral years (9 cyclones per decade) and least frequent in La Niña years (4 cyclones per decade).

Figure 2:

Number of tropical cyclones passing within the Samoa EEZ per season. Each season is defined by the ENSO status, with light blue being an El Niño year, dark blue a La Niña year and grey showing a neutral ENSO year. The 11-year moving average is presented as a purple line and considers all years.



Due to this high interannual variability and the relatively small number of tropical cyclones passing through any country's EEZ since reliable records began, individual country analysis of long-term trends in frequency and intensity is not possible.

¹ A 'severe' tropical cyclone is defined as having a minimal central pressure of <970 hectopascals (hPa). Pressure is often used when comparing intensity of tropical cyclones.



Vini Isand seen off of Cape Tapaga, Lalomanu, Aleipata

The content of this brochure is an outcome of the high degree of cooperation and collaboration that exists between the implementing partners of the Australian Aid funded Climate and Oceans Support Program in the Pacific (COSPPac), specifically the Bureau of Meteorology (the Bureau), the Pacific Community (SPC) and Pacific Regional Environmental Programme (SPREP), together with the valuable ongoing support from the national meteorological services in the 15 partner countries and territories. Publication support has been provided through New Zealand Aid Programme.



For more detailed information on the climate of Samoa and the Pacific, see: *McGree, S., G. Smith, E. Chandler, N. Herold, Z. Begg, Y. Kuleshov, P. Malsale and M. Ritman. 2022. Climate Change in the Pacific 2022: Historical and Recent Variability, Extremes and Change. Climate and Oceans Support Program in the Pacific. Pacific Community, Suva, Fiji.*



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