

Climate, climate variability and change in Nauru

Introduction

The Island of Nauru is situated approximately 50km south of the equator at 0°31'S; 166°56'E (Fig. 1). It is a raised atoll approximately 6km long (NE-SW) and 4km wide (NW-SE), with a maximum elevation of 71m.

The total land area of Nauru is only 22 km². Of this, 70% has been used for phosphate mining. The balance is used for domestic, commercial, industrial and government purposes. Problems associated with the lack of land for urban development and ground water supply are exacerbated by a rising population.



Data availability and homogeneity

Historical climate data is limited for Nauru, preventing the calculation of reliable long-term trends. Rainfall is the only element currently being recorded. Previously temperature data was collected by the British Phosphate Corporation; the old wireless radio station and the Nauru Airport.

The available rainfall data was found to be homogeneous but contains many missing data. The search for hardcopy and digitised climate data for Nauru remains ongoing.

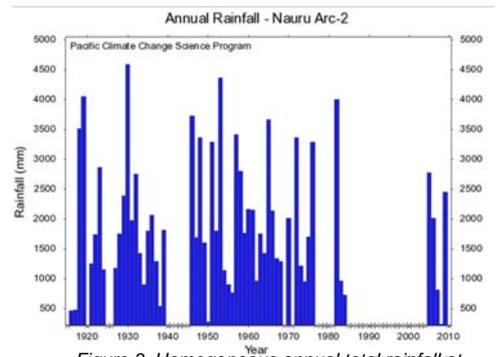


Figure 3. Homogeneous annual total rainfall at Nauru.

Observed inter-annual variability

The annual rainfall of Nauru has extremely high variability (standard deviation 1,280mm); a result of the strong ENSO influence. In some La Niña years Nauru only receives around 500 mm of rainfall, whereas in El Niño years rainfall can be as high 4,500mm.

Impacts and extremes

Being so close to the equator, Nauru does not experience tropical cyclones, although it is subject to strong winds and sea squalls. The main climate extreme experienced by Nauru is drought, which can last as long as 36 months. Droughts occur when La Niña events decrease the surrounding sea temperature, resulting in less cloud and rainfall. Prolonged droughts cause a lowering of the underground fresh-water lens, resulting in water supply problems and severe stress on natural systems.

Local perceptions of climate change

The people of Nauru have noticed changes in their climate. Elders sense that these changes are not normal. Consequently, some of the cultural and traditional practices that predate industrial activities have been modified to adapt to the impacts of climate change.

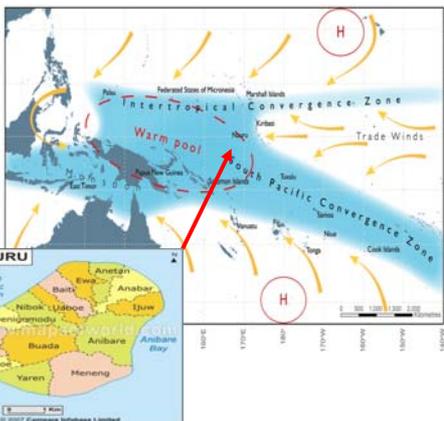


Figure 1. Climate drivers and features of the Pacific region with Nauru's location shown.

Climate Drivers

The main driver of climate variability in Nauru is the El Niño-Southern Oscillation (ENSO). La Niña events are associated with delayed onset of the wet season and drier than normal wet seasons, often resulting in an extended drought. During El Niño, temperatures on Nauru are warmer than normal due to warmer sea temperatures; and rainfall and cloud amount are increased.

Another key climate driver for Nauru is the Inter-tropical Convergence Zone (ITCZ) (Fig. 1). The ITCZ affects Nauru all year round. Its seasonal north/south movement drives the seasonal rainfall cycle, which peaks in Dec-Feb (Fig. 2).

The South Pacific Convergence Zone (SPCZ) affects Nauru during its maximum northward displacement in July and August.

Seasonal Cycles

Nauru has consistent monthly mean temperatures throughout the year (Fig. 2). Daytime temperatures range from 26 to 35°C, and night temperatures between 22 and 34°C.

The wet season usually starts in November and continues to April of the next year. During the wetter months, winds are generally from the west at 10-18 knots. During the drier months of May to November, the prevailing wind direction is generally easterly at 5-10 knots. There is a weak peak in rainfall during July-August associated with the northward displacement of the SPCZ.

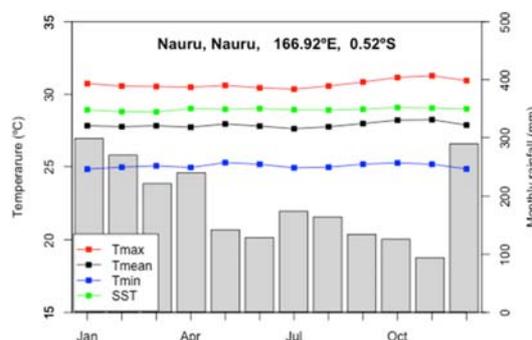


Figure 2. Mean seasonal cycles in temperature and rainfall at Nauru.

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