

# Climate variability and change in the Solomon Islands

## Introduction

Solomon Islands lies approximately 6° to 14°S and 156° to 169°E. The Islands are zoned into nine political boundaries or Provinces basically comprising the nine big inhabited islands.

The climate is tropical with two marked seasons: the wet season from November to April; and the dry season from April to October. The local names for these seasons, *Komburu* and *Ara* are based on the prevailing direction of the trade winds.



Reef Islands- Abandoned well  
Source: Climate Change Office



Sikaiana flooding  
Source: Climate Change Office

## Climate Drivers

The main features of Solomons' climate are:

- Inter-Tropical Convergence Zone (ITCZ)
- South Pacific Convergence Zone (SPCZ)
- El Niño Southern Oscillation (ENSO)
- Monsoon
- Madden Julian Oscillation (MJO)

ENSO has a significant influence on the local climate, especially rainfall. One impact is a delayed onset of the wet season during El Niño years, often until late January and February, and the central region often experiences below-normal to normal rainfall. During La Niña years the wet season rainfall is usually above normal.

The South Pacific Convergence Zone (SPCZ) also has a significant influence on the local climate. The coupling of the SPCZ and the MJO usually relates to cyclogenesis activity in the eastern region.

The monsoon and the Inter-Tropical Convergence Zone (ITCZ) can also influence the local climate during the wet season, especially when the ITCZ is north of the country, and the influence is more significant in the western region.

## Seasonal Cycles

Rainfall shows significant variability in the central and northern regions with more rainfall observed during February and March. Rainfall in the southern region shows very small annual variability.

Temperature in the Solomon Islands shows very small seasonal variations and also very little change due to latitude. The most significant variation is from July to August when cooler air is advected from the south and a slight decrease in the maximum temperature is also evident in January, February and March due to increased cloud cover during the wet season.

The average annual cycle of temperatures in Honiara can be seen in Figure 2. The wet season can also clearly be seen with higher rainfall from November to April.

## Observed inter-annual variability and trends

Temperature shows warming trends for all locations, although southern locations show smaller warming trends compared to northern locations. In Honiara (see Fig. 3) maximum temperatures have been increasing since 1954 at 0.1°C/decade.

In contrast, for rainfall most stations show a drying trend, except Lata where there is a slight increase. Although year-to-year variability in Honiara is high due to the impact of ENSO (see Fig. 3), the linear trend from 1954 to 2009 in rainfall shows a decrease of 38.9 mm/decade.



Figure 1: Solomon Islands Meteorological Service Observation Network: Source: SCOPIC

## Data availability and homogeneity

There are six operational synoptic stations (see Figure 1): Auki, Henderson, Honiara, Taro, Munda, Kira Kira and Lata. Information about some of these stations are given in Table 1. Data is available from Honiara dating from 1953 for both temperature and rainfall and is used for the analysis in this poster.

Station Name	WMO Number	Longitude	Latitude	Start year	End Year
Auki	91507	08 47' S	160 03' E	1962	2010
Honiara	91517	9.42' S	159.97' E	1953	2010
Lata	91541	10 42' S	165 48' E	1970	2010
Munda	91503	08 20' S	157 16' E	1962	2010

Table 1: Long-term rainfall and temperature records in Solomons.

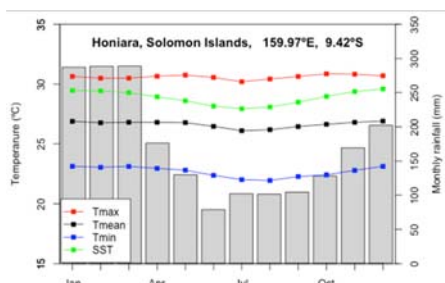


Figure 2: Average rainfall (grey bars) and temperatures at Honiara station for each month of the year. Period used is 1961-1990.

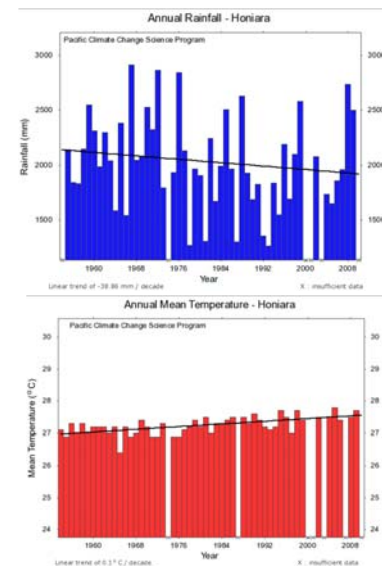


Figure 3: Annual average rainfall (top) and maximum temperatures (bottom) for each year from 1954 to 2009 at Honiara station. Linear trend lines are also shown.

## Impacts and extremes

Tropical cyclones usually pose major threats for the islands and the south eastern region is an area for cyclogenesis. Severe flooding associated with these systems is the most frequent extreme event, especially for the main islands of Guadalcanal, Malaita, Makira and Isabel. Recent flooding has caused huge damages to agriculture, infrastructure and even loss of lives.