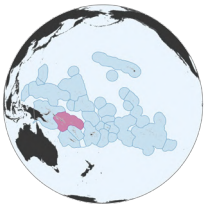
# SOLOMON ISLANDS



**Co-authors**[1]

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## Introduction

| | |
|---|---|
| Maritime area | 1,602,781 km² |
| Land area | 28,095 km² |
| Mean land elevation | 239 m |
| Coral reef extent | 6,743 km² |

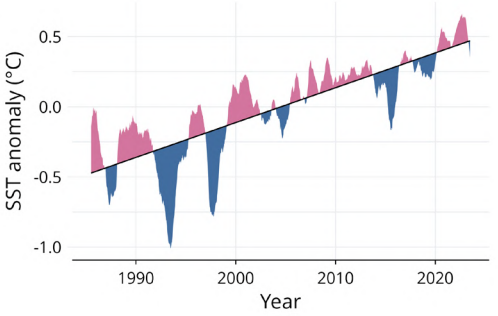
Coral reefs of Solomon Islands cover approximately 6,743 km², which represent 10.33 % of the total coral reef extent of the GCRMN Pacific region, and 2.700 % of the world coral reef extent.

We estimated the human population of Solomon Islands living within 5 km from coral reefs to be 494,831 inhabitants, in 2020. This represents 73.59 % of the total human population of Solomon Islands living within 5 km from coral reefs. We estimated that the human population living within 5 km from coral reefs has increased by 52.44 % between 2000 and 2020.

## Threats

### Thermal regime

The long-term average of SST on coral reefs of Solomon Islands between 1985 and 2023 was 29.20°C (Supplementary Figure 1). SST over coral reefs of Solomon Islands have increased by 0.92°C between 1985 and 2023, which corresponds to a warming rate of 0.024°C per year (Supplementary Figure 1).

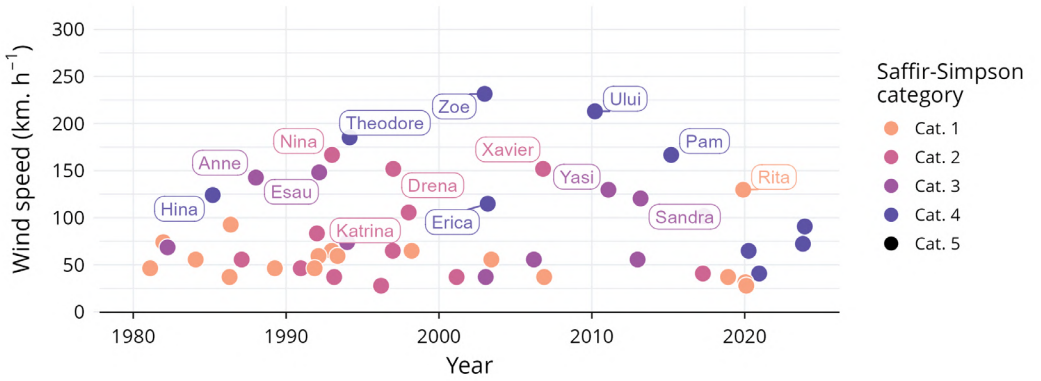



▲ **Figure 2.19.1.** Average Sea Surface Temperature (SST) anomaly from 1985 to 2023 over coral reefs of Solomon Islands. The black line is the long-term trend in SST anomaly, values below this line are negative SST anomalies (*i.e.* cooler than long-term trend), and values above this line are positive SST anomalies (*i.e.* warmer than long-term trend). Average Sea Surface Temperature (SST) anomaly with null-SST anomaly (*i.e.* 0) as a reference line, instead of the long-term trend in SST anomaly, are provided in Supplementary Figure 3.

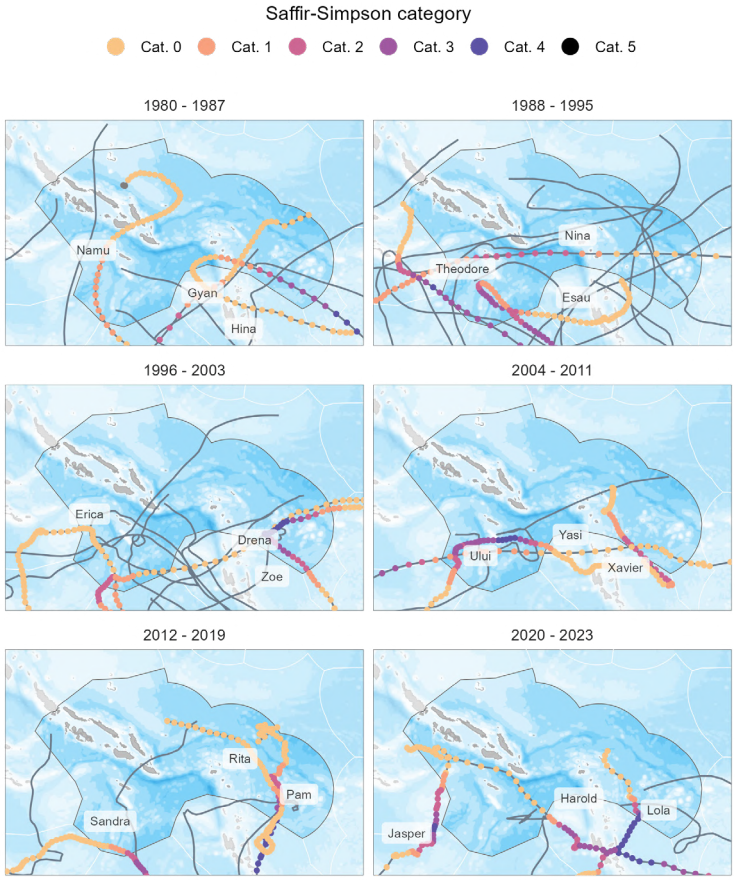
### Cyclones

Between 1980 and 2023, a total of 111 tropical storms passed within 100 km distance from a coral reef of Solomon Islands, and of these 16 were characterized by sustained wind speed greater than 100 km.h$^{-1}$ (Figure 2.19.2). The cyclone with the highest sustained wind speed over the studied period was the cyclone Zoe, in 2002, which passed 0 km from a coral reef with sustained wind speed of 232 km.h$^{-1}$.

[1] The term co-authors encompasses both individuals who contributed to writing the chapter and those who provided data. Therefore, inclusion in this list does not necessarily imply endorsement of the chapter's content. Specific contributions are detailed in the Author Contributions section.



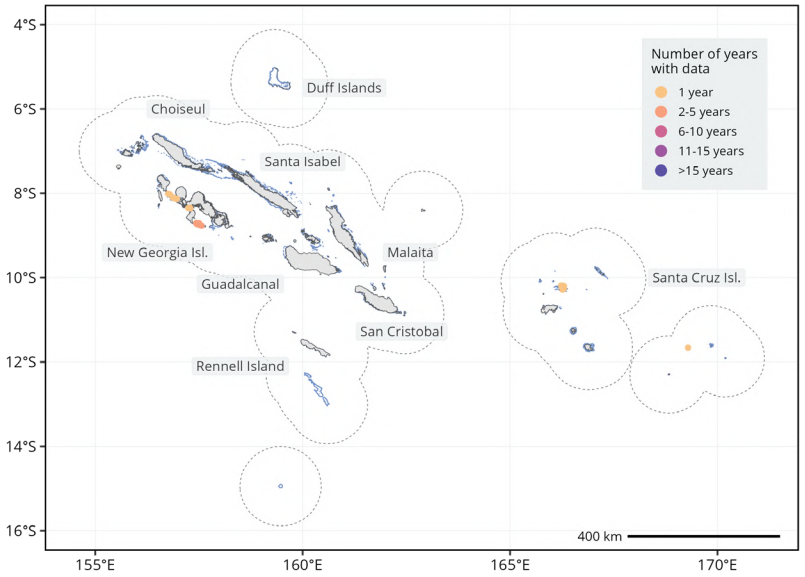

▲ **Figure 2.19.2.** Maximum sustained wind speed of tropical storms passing within 100 km of a coral reef between 1980 and 2023 in Solomon Islands. Colors correspond to the cyclone's Saffir-Simpson category along its entire track. However, the values of sustained wind speed are extracted from the nearest tropical storm position from a coral reef. For this reason, some sustained wind speed values are below the lower threshold of category 1 Saffir-Simpson scale (*i.e.* 119 km.h$^{-1}$). Note that cyclones passing more than 100 km away from coral reefs of Solomon Islands are not represented, although they may have had an impact.



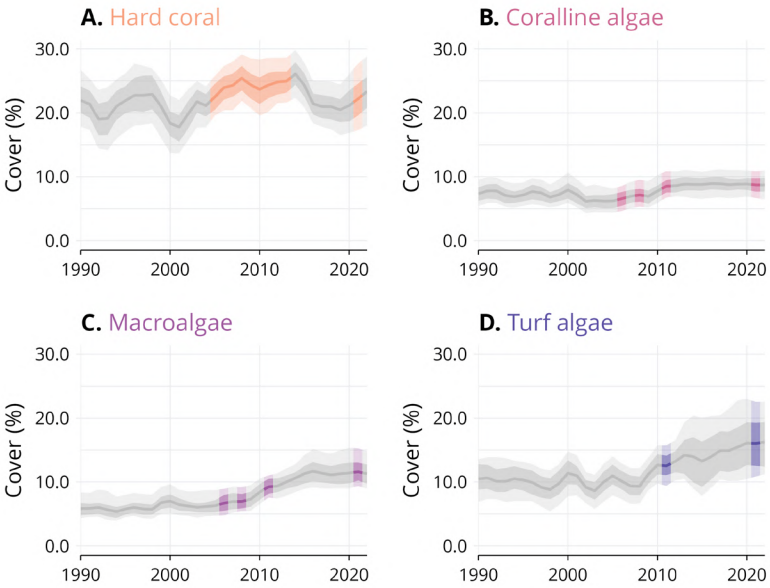

▲ **Figure 2.19.3.** Trajectories of cyclones passing within 100 km of a coral reef between 1980 and 2023 in Solomon Islands. Points correspond to cyclone positions every 3 hours and are colored depending on the Saffir Simpson scale of the sustained wind speed. Grey points correspond to cyclone positions on which wind speed was not available. For readability, only the three most powerful cyclones are labeled and colored per time range (*i.e.* subplot). The trajectories of other cyclones are represented by gray lines only.

## Temporal trends in benthic cover

The estimation of trends in the benthic cover of hard coral, coralline algae, macroalgae, and turf algae in Solomon Islands was achieved through the integration of 4 datasets (Supplementary Table 1). These datasets represent a total of 78 monitoring sites, on which 176 surveys were conducted between 2005 and 2021.




▲ **Figure 2.19.4.** Spatio-temporal distribution of benthic cover monitoring sites across Solomon Islands. Sites that were monitored for the longest period of time are represented on top of the sites monitored for fewer years. The scale bar provides distance at the equator and may not accurately represent distance over the entire latitudinal range of the economic exclusive zone. Dashed polygons represent a 100 km buffer around coral reefs. Note that only land and coral reef buffers of the country or territory are represented, not those of adjacent countries and territories. The distribution of coral reefs is shown in light blue.




▲ **Figure 2.19.5.** Modeled temporal trends for hard coral (A), coralline algae (B), macroalgae (C), and turf algae (D) cover from 1990 to 2022 in Solomon Islands. The bold line represents the estimated average cover, lighter and darker ribbons represent 95% and 80% confidence intervals, respectively. Gray areas represent periods where no observed data were available. The raw data used to estimate these temporal trends are shown in Supplementary Figure 4.