



RIISING TIDES, RISING RISK SEA LEVEL ANOMALIES & POPULATION GROWTH IN THE PACIFIC PACIFIC DATAVIZ CHALLENGE 2026

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INTRODUCTION

Climate change poses an existential threat to Pacific Island Countries and Territories (PICTs). Among the most visible impacts is sea level rise, which endangers coastal communities, infrastructure, and livelihoods. However, the risk is not uniform across the region some countries face greater vulnerability due to rapid population growth in coastal areas.

This visualization examines sea level anomalies and population growth across 22 PICTs, using sea level data from 1993–2023 and population growth data from 1990–2025. By combining these two datasets, we aim to identify which countries face the greatest dual threat rising oceans and growing populations and where climate adaptation efforts should be prioritized.

OBJECTIVE

To identify Pacific Island countries facing the highest combined risk from:

1. Sea level anomalies (a direct indicator of climate change impact)
2. Population growth (which increases exposure to coastal hazards)

METHODOLOGY

Data Source: Pacific Data Hub (PDH.Stat)

Datasets:

- Sea Level Anomalies (1993-2023)
- Population Growth (1990-2025)

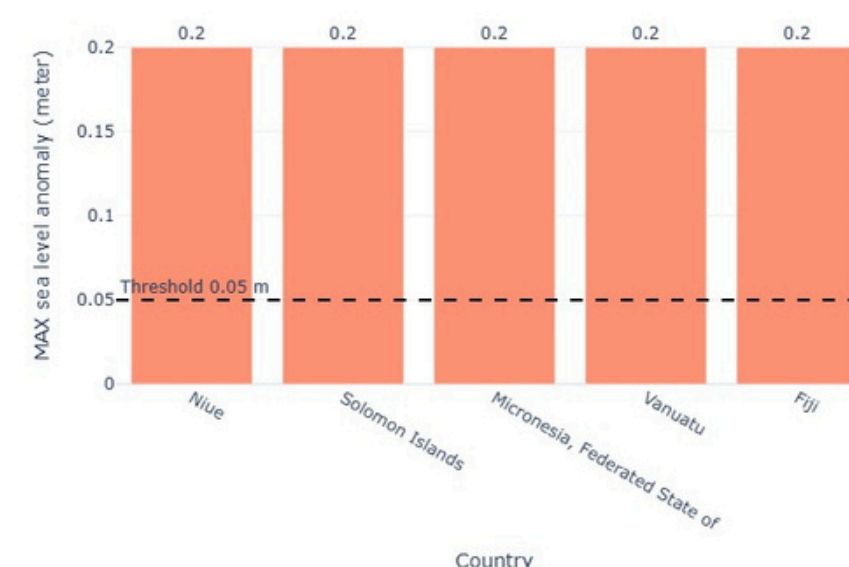
Tools: Python, Pandas, Plotly

Analysis: Average per country, linear trend, bivariate correlation

KEY FINDINGS

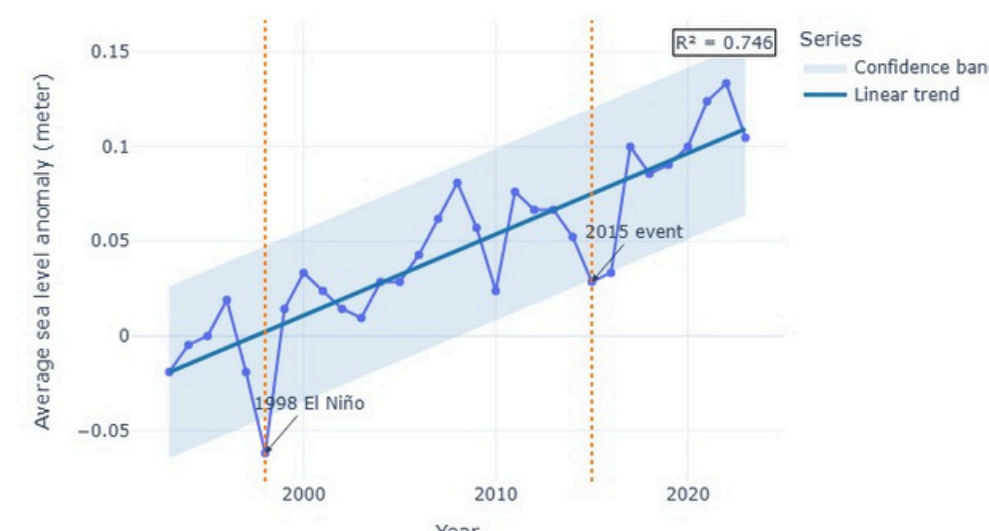
- Sea level anomalies increased from near-zero in 1993 to 0.06m in 2023
- $R^2 = 0.746$ indicates a strong long-term upward trend over 30 years.
- Niue, Solomon Islands, and Micronesia recorded the highest anomalies ($>0.1\text{m}$)
- Papua New Guinea, Solomon Islands, and Vanuatu have the fastest-growing populations ($>2.3\%$)
- Solomon Islands and Vanuatu face the greatest dual threat

TOP 5 SEA LEVEL ANOMALIES (MAX) — NIUE, SOLOMON, MICRONESIA, VANUATU, FIJI $>0.1\text{M}$



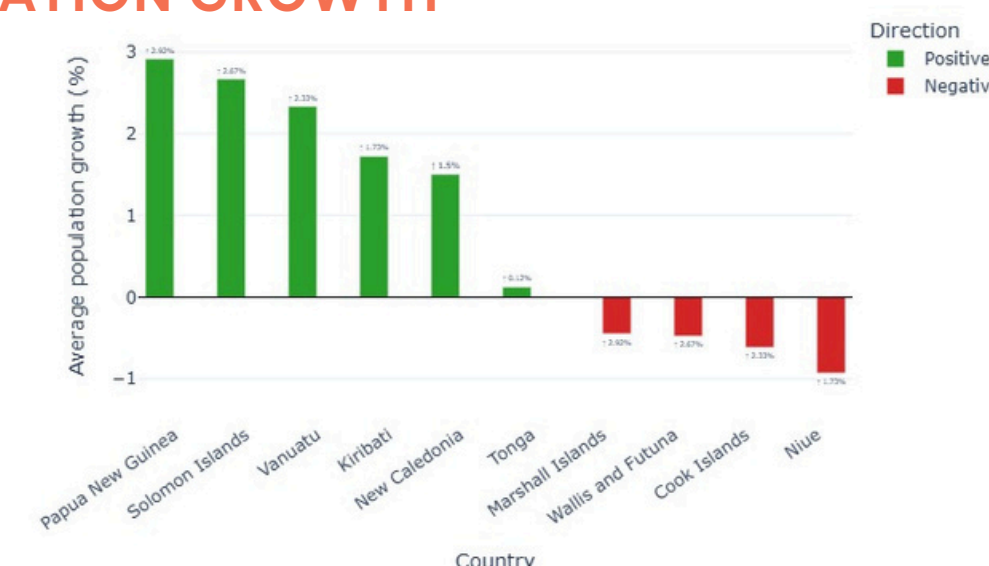
Niue, Solomon Islands, Micronesia, Vanuatu, and Fiji recorded maximum sea level anomalies above 0.1 meters.

SEA LEVEL ANOMALIES ARE RISING (1993-2023)



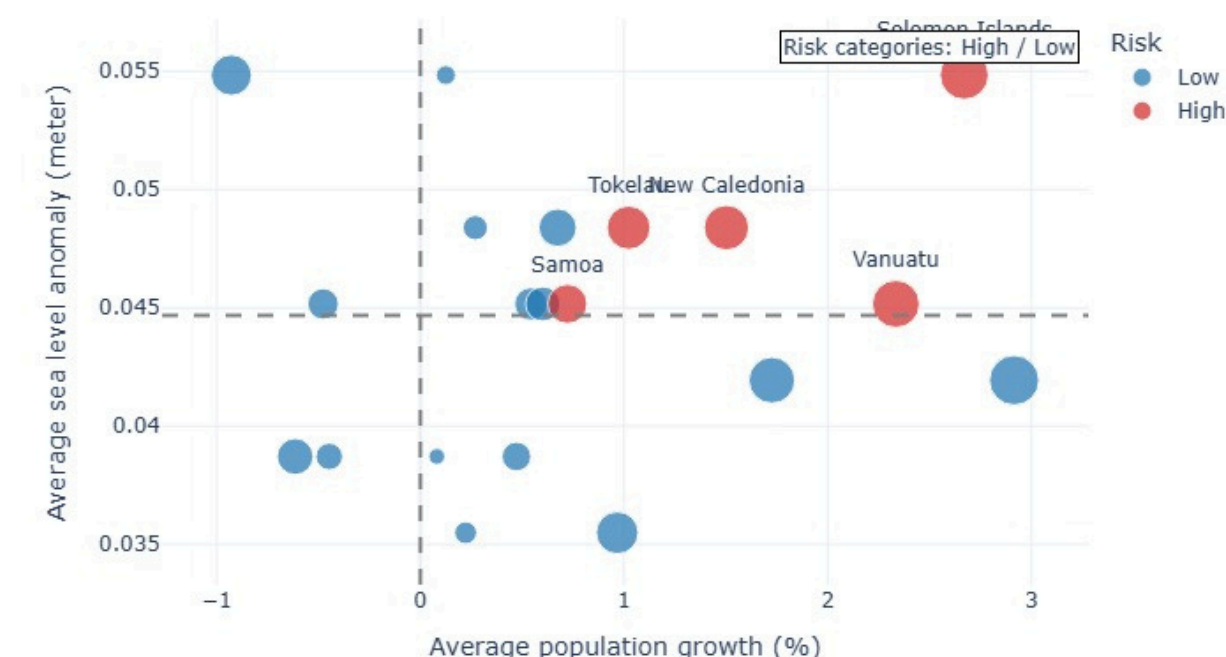
Sea level anomalies increased from near-zero in 1993 to 0.06 meters in 2023. The linear trend ($R^2 = 0.746$) indicates a strong long-term upward trend over 30 years. Notable spikes occurred during the 1998 El Niño and 2015 climate events.

POPULATION GROWTH



Papua New Guinea, Solomon Islands, and Vanuatu have the fastest-growing populations ($>2.3\%$ average). In contrast, Cook Islands and Niue are experiencing population decline ($<-2\%$).

SEA LEVEL VS POP GROWTH



Five countries fall into the high-risk quadrant: Solomon Islands, Tokelau, New Caledonia, Vanuatu, and Samoa. These face above-average sea level rise AND above-average population growth.

CONCLUSION

Sea level anomalies show a strong long-term upward trend across the Pacific ($R^2 = 0.746$). Solomon Islands and Vanuatu face the greatest combined threat: high sea level anomalies coupled with rapid population growth. These findings highlight the urgent need for targeted adaptation strategies in the most vulnerable nations. The Pacific is on the front line of climate change and the time to act is now.