

SEA LEVEL IN THE SOUTHWEST PACIFIC IS STABLE

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Abstract: Graphs of sea level for twelve locations in the southwest Pacific show stable sea level for about ten years over the region. The data are compared with results from elsewhere, all of which suggest that any rise of global sea level is negligible. The Darwin theory of coral formation, and subsidence ideas for guyots would suggest that we should see more land subsidence, and apparent sea level rise, than is actually occurring. Sea level studies have not been carried out for very long, but they can indicate major tectonic components such as isostatic rebound in Scandinavia. Attempts to manipulate the data by modelling to show alarming rates of sea level rise (associated with alleged global warming) are not supported by primary regional or global data. Even those places frequently said to be in grave danger of drowning, such as the Maldives, Tuvalu and Holland, appear to be safe.

Keywords: *sea level, islands, Pacific, modelling, climate alarm, tectonics*

If you ask Google for information on sea level you get pages of claims that the Pacific islands are sinking in the sea. If you Google “Tuvalu” you will get messages of impending doom. And yet the best factual data available show that the islands, including Tuvalu, are not sinking. Of course the Climate Alarmists will keep this true information out of the literature as long as they can.

A tide gauge to measure sea level was in existence at Tuvalu since 1977, run by the University of Hawaii. It showed a negligible increase of only 0.07 mm per year over two decades. Between 1995 and 1999 it fell 3 mm. The gauge was closed in 1999. A new installation was set up by the Australian Bureau of Meteorology’s National Tidal Centre in 1991, and was run by Flinders University of Adelaide. Gauges are located on many islands, as shown in Figure 1. They used modern sophisticated equipment called SEAFRAME (Sea Level Fine Resolution Acoustic Measuring Equipment) shown diagrammatically in Figure 2. The sea enters a vertical cylinder whose position is kept constant by Global Positioning, and the sea level is obtained by bouncing sound waves off the surface and calculating how long it takes. It is all recorded automatically and transmitted to Australia.

The results are shown in Figure 3. The level was disturbed near the beginning because of the effects of ENSO (El niño-Southern Oscillation, often simplified to El niño), but since about 2001 there has been no significant change in sea level for any of the islands studied, including Tuvalu.

Since all the stations shown in Figure 1 show no change in sea level, it also shows no differential tectonic movement between the stations. Of course the time involved is trivial compared with geological time, but the results suggest that the technique might have many more significant uses, especially in tectonically active coasts such as parts of Indonesia or California. If we had global cover we might be able to distinguish regions of differential tectonic movement. It would also be valuable to have such stations in other controversial ‘hot spots’ of climate alarm, such as the Maldives. One might have hoped that the number of stations would rapidly increase. Unfortunately, the stations were set up to demonstrate *rising* sea levels. When they so clearly failed to do so, the operation was apparently closed down.

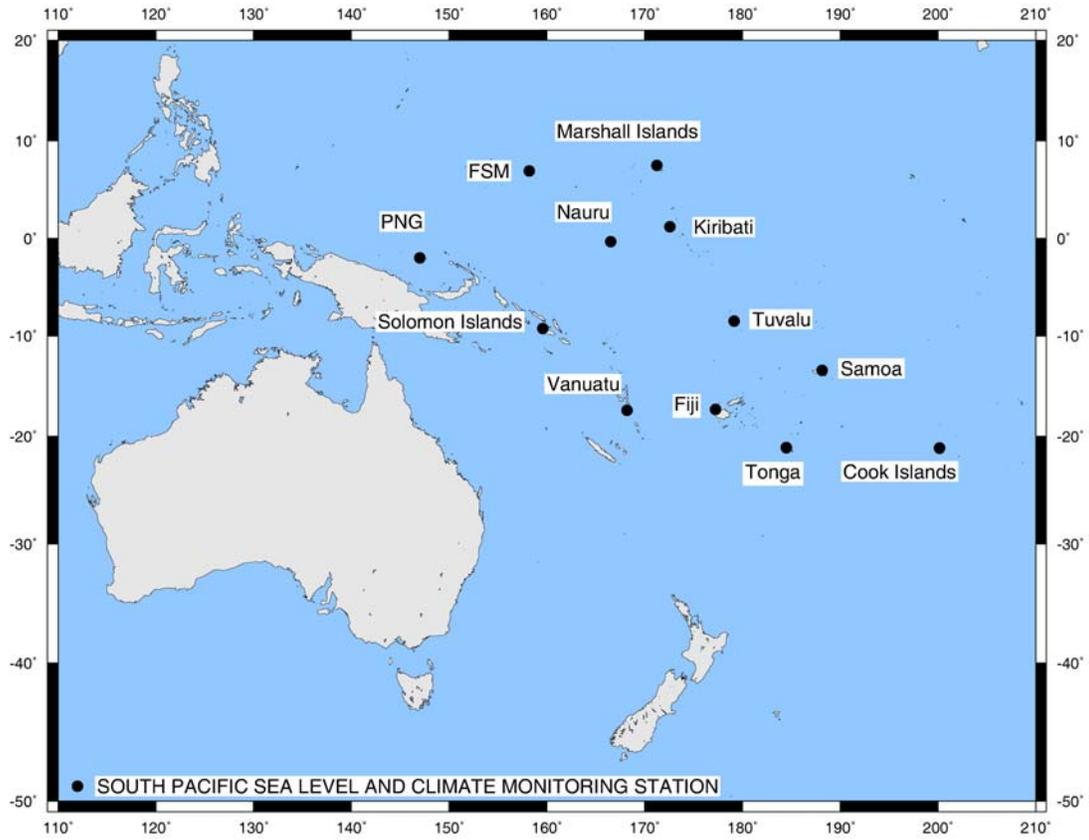


Figure 1. The sites of sea level monitoring stations.

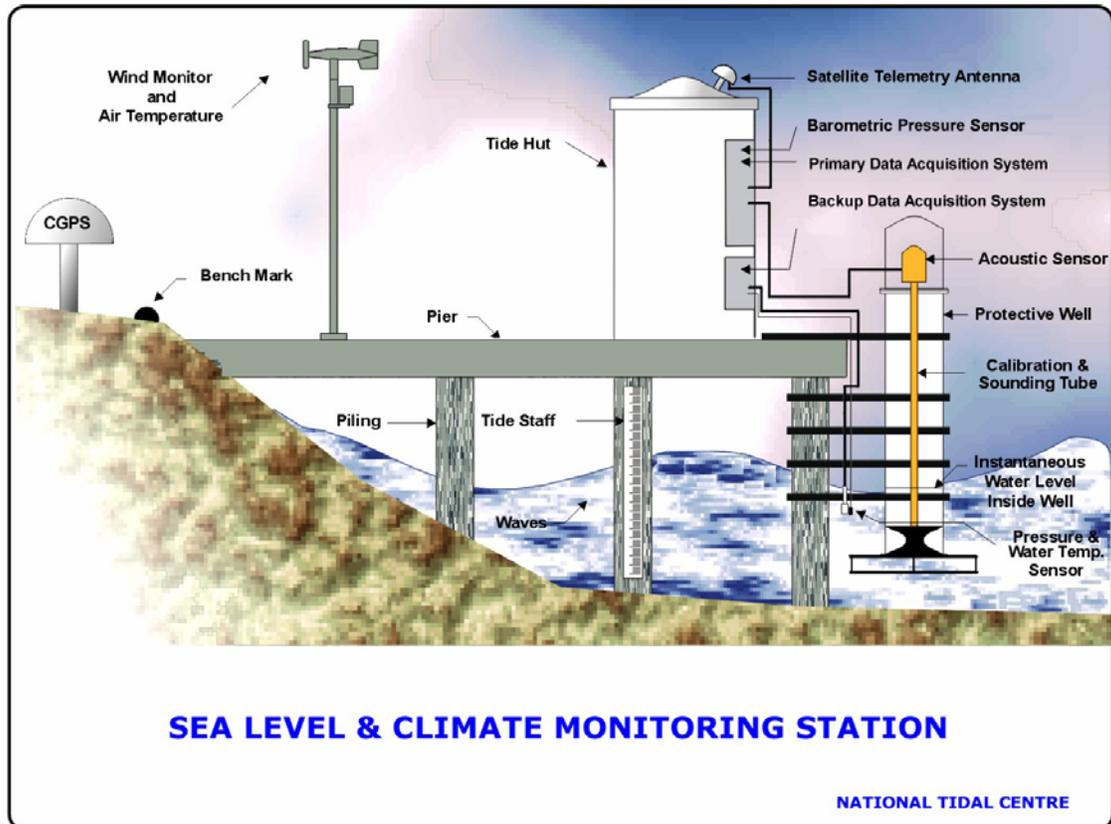


Figure 2. The main features of SEAFRAME sea level measuring equipment

Explaining it away

The results shown in Figure 3 have never been published in a "peer reviewed" journal. They are only available on the Australian Bureau of Meteorology website in a series of Monthly Reports that are "Untitled". See the latest at: <http://www.bom.gov.au/ntc/IDO60101/IDO60101.200809.pdf>

Vincent Gray explained in his newsletter, NZCLIMATE AND ENVIRO TRUTH NO 181 13th August 2008, that something had to be done to maintain rising sea level alarm, and it was done by in a paper by John R Hunter at: <http://staff.acecrc.org.au/~johunter/tuvalu.pdf>

Hunter first applies a linear regression to the chart for Tuvalu. He gets -1.0 ± 13.7 mm/yr so Tuvalu is actually rising! The inaccuracy is entirely due to the ENSO rubbish at the beginning. He then tries to incorporate old measurements made with inferior equipment and attempts to correct for positioning errors. He gets a "cautious" estimate for Tuvalu of 0.8 ± 1.9 mm/yr. He then tries to remove ENSO to his own satisfaction, and now his "less cautious" estimate is 1.2 ± 0.8 mm/yr.

Does this show the island is rising? Just look at the inaccuracy. The commonsense interpretation of Figure 3 is surely that Tuvalu, and 11 other Pacific Islands, are *not sinking* over the time span concerned. The sea level is virtually constant.

SEA LEVEL TRENDS THROUGH SEPTEMBER 2008 (mm/year)

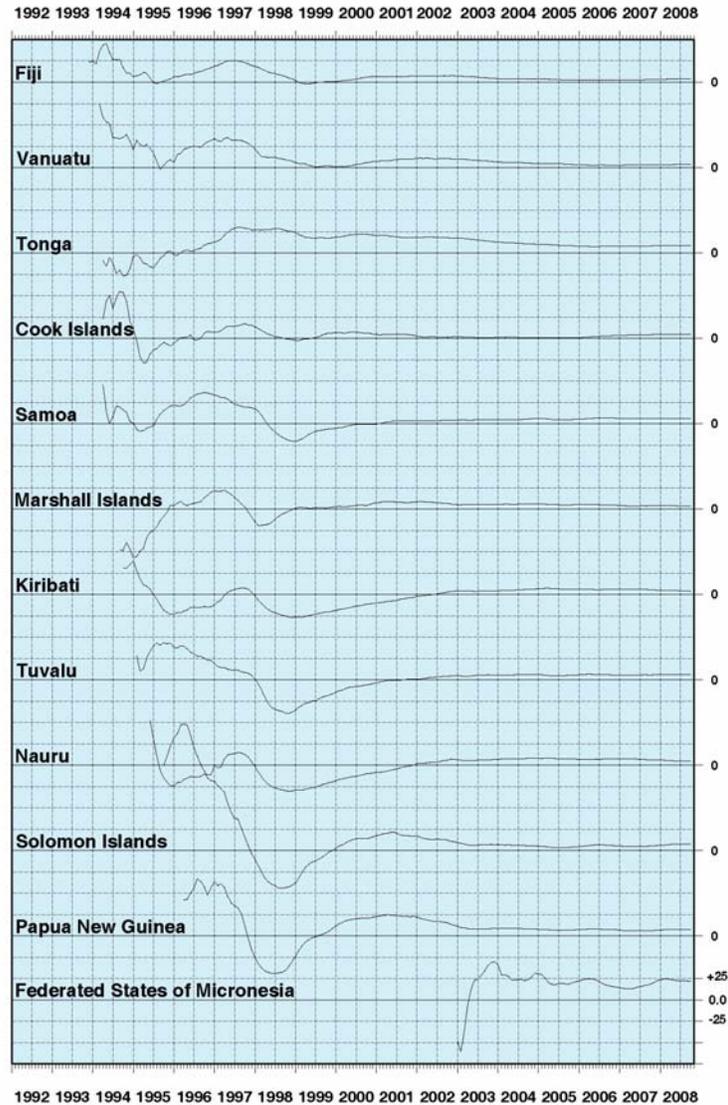


Figure 3. Sea level records for the stations of Figure 1 to September 2006

Similar manipulation of sea level data is reported in Church et al. (2006) who consider the tropical Pacific and Indian Ocean islands. Their best estimate for sea level rise at Tuvalu is 2 ± 1 mm/yr from 1950-2001. They wrote “The analysis clearly indicates that sea-level in this region is rising.” Does this square with simple observation of the data in Figure 3? They further comment: “We expect that the continued and increasing rate of sea-level rise and any resulting increase in the frequency or intensity of extreme-sea-level events will cause serious problems for the inhabitants of some of these islands during the 21st century.” *The data of Figure 3 simply do not support this excessive alarmism.*

Sea level in other places

A near stability or very small rise seems to be the common finding of researchers who are not in the IPCC/CSIRO network. Mörner, for example, has shown in many papers (see references) that sea level is stable in many parts of the world. He produced a summary in the booklet *The Greatest Lie Ever Told* (see review in NCGT 44, 2007). Church et al. (2006) are very critical of Mörner, claiming he has not presented evidence, but he certainly provided it in detail in his paper of 2007. The new sea level curve of the Maldives for the past 2,600 years is depicted in Figure 4. It is based on morphology, stratigraphy, biology and archaeology supported by extensive C14 dating. Over 5,000 years there have been a number of rapid ‘spikes’ of 60 – 100 cm that are of local or regional dimensions. Mörner, Tooley and Possnert (2004) noted that: “All over the Maldives there is evidence of a sub-recent sea level some 20 cm higher than the present one. In the 1970s, sea level *fell* to its present position.” (my italics).

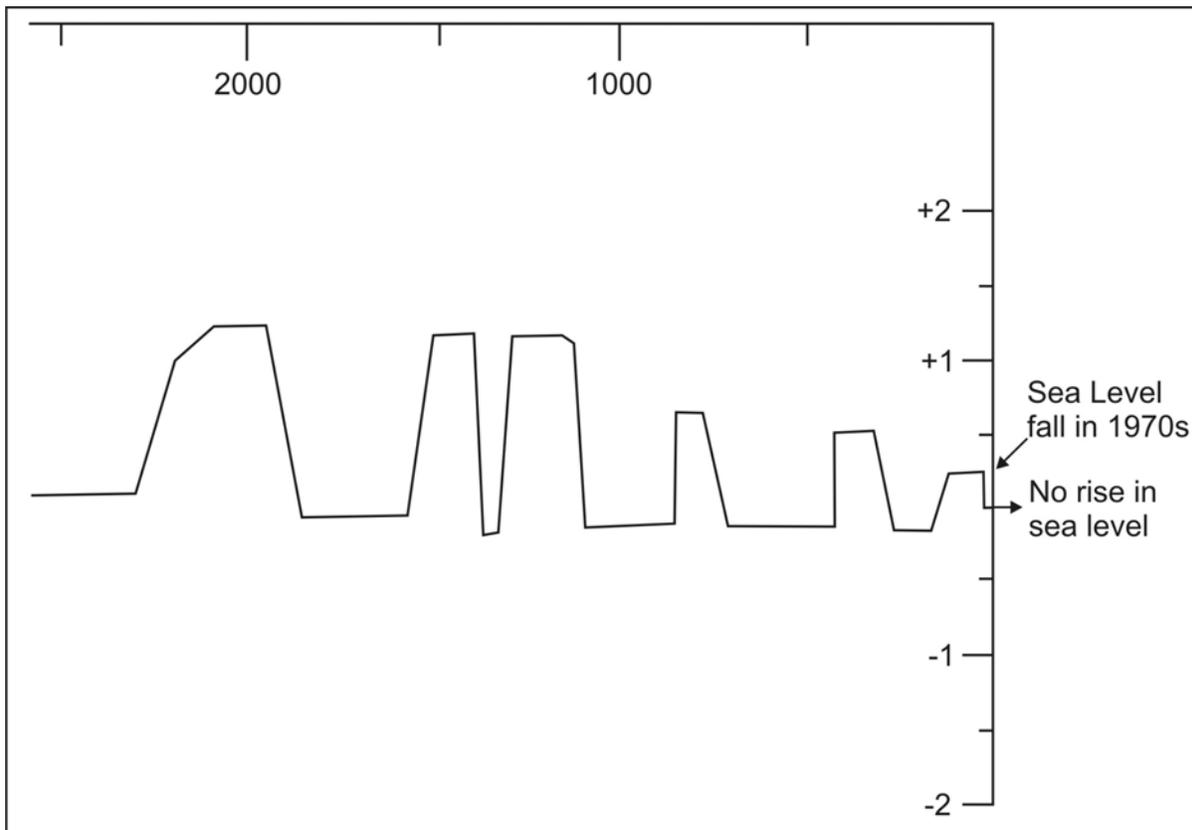


Figure 4. The new sea level curve of the Maldives (simplified after Mörner, 2007). Horizontal axis in years: vertical axis in metres.

You can get sea level data for the United States and a limited number of other countries, from satellite imagery, on: www.tidesandcurrents.noaa.gov/sltrends.html

The following table shows results I selected from several States:

State	rise (mm)		
Oregon	2.72	±	1.03
California	2.06	±	0.20
Maine	1.62	±	0.17
New York	2.77	±	0.09
Pennsylvania	2.79	±	0.2
Georgia	2.98	±	0.33
Florida	2.39	±	0.43
Hawaii	1.5	±	0.25

There is considerable variation even within each state, which shows that the figures need to be treated with caution. This is illustrated by figures from different sites in Virginia.

Kiptopeke	3.48	±	0.42
Colonial Beach	4.78	±	1.21
Lewisetta	4.97	±	1.03
Gloucester Point	3.81	±	0.47
Sewells Point	4.44	±	0.27
Portsmouth	3.76	±	0.45
Chesapeake Bay	6.05	±	1.14

It is notable that even the highest figure is not extreme by the standards of alarmists who claim a sea level rise of many metres is imminent. Those in the metric system do not need translation to calculate the rise in a hundred years, but for Americans the highest number provided for sea level rise, Chesapeake Bay, translates into 1.98 feet in 100 years.

Elsewhere in the world similar figures are reported, such as:

Reykjavik, Iceland	2.34	±	0.71 mm
Bermuda	2.04	±	0.47 mm
Murmansk, Russia	3.92	±	1.00 mm

But note that in Scandinavia we have negative numbers:

Goteborg, Sweden	-1.3	±	0.36 mm
Oslo, Norway	-4.53	±	0.34 mm

This presumably is a result of a non-climatic cause of sea level change, isostatic uplift in response to the loss of the old ice sheet.

Other international papers present similar findings. For example, a very recent paper on the sea level of the Aegean Sea shows the sea level is almost constant, but has been rising at 0.9 mm/yr for 5,000 years (Serafim et al., 2009).

Holland, also known as the Netherlands or lowlands, is particularly vulnerable to an alarming rise of sea level. Yet in a piece in the December 11 issue of *NRC/Handelsblad*, Rotterdam's counterpart to the *New York Times*,

Wilco Hazeleger, a senior scientist in the global climate research group at KNMI (the Royal Netherlands Meteorological Institute) wrote:

“In the past century the sea level has risen twenty centimetres. There is no evidence for accelerated sea-level rise. It is my opinion that there is no need for drastic measures. ... Fortunately, the time rate of climate change is slow compared to the life span of the defence structures along our coast. There is enough time for adaptation.”

All this information suggests that the data from the SW Pacific are, if anything, even less alarming than figures from elsewhere in the world, which suggest a harmless and slow sea level rise. There is every reason to conclude that sea level changes are regional and local but the short time range does not permit isolation of a single cause, such as anthropogenic global warming.

From a tectonic viewpoint it is surprising that more islands are not sinking (and thus causing an apparent rise in sea level). The Darwin theory of coral reef evolution, from fringing reef to barrier reef and eventually to atoll, depends on slow sinking of the volcanic foundation of the coral island. The flat-topped sea mounts, guyots, that are widespread in the Pacific indicate that non-coral islands in oceanic areas also sink. Presumably the time scale is too short to record any detectable sinking in these stations in the southwest Pacific.

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