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Sea Level Rise in Tuvalu

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Most people, especially for Pacific Islanders, are aware of the sea level change which may caused by many factors, but no of them has deeper sensation of flooding than Tuvaluan. Tuvalu, a coral country, consists of nine low-lying islands in the central Pacific between the latitudes of 5 and 10 degrees south, has the average elevation of 2 meters (South Pacific Sea Level and Climate Monitoring Project, SPSLCMP report, 2006) up to sea level. Meanwhile, the maximum sea level recorded was 3.44m on February 28th 2006 that damaged Tuvaluan's property badly. Local people called the flooding water oozes up out of the ground "King Tide", that happened almost once or twice a year, which destroyed the plant, polluted their fresh water, and forced them to colonize to some other countries. The predictable but uncontrollable king tide had been observed for a long time by SPSLCMP, but some of the uncertainties which intensify the sea level rise need to be analyzed furthermore.

In this study, a span of 18 years of tide gauge data accessed from Sea Level Fine Resolution Acoustic Measuring Equipment (SEAFRAME) are compared with the satellite altimeter data accessed from Archiving Validation and Interpretation of Satellite Data in Oceanography (AVISO). All above are processed under the limitation of same time and spatial range. The outcome revealed a 9.26cm difference between both. After the tide gauge data shifted to the same base as altimeter data, the results showed the unknown residuals are always positive under the circumstances of the sea level rise above 3.2m. Apart from uncertainties in observing, the residual reflected unknown contributions. Among the total case number of sea level rise above 3.2m is 23 times, 22 of which were recorded with oceanic warm eddy happened simultaneously. The unknown residual seems precisely matched with oceanic warm eddies and illustrates a clear future approach for Tuvaluan to care for.