

## Report on SPRING TIDES 28<sup>th</sup> February – 02<sup>nd</sup> March, 2014

### What happen?

Readings from the Tide Gauge located at Betio port confirmed that sea levels during high tides in the last spring tide episode from 28<sup>th</sup> February to 02<sup>nd</sup> March, 2014 were higher than what was predicted (Figure 1). A tide calendar gives afternoon high tide predictions of 2.81 metres on the 28<sup>th</sup> of February, 2.88 metres on the 1<sup>st</sup> of March and 2.85 metres on the 2<sup>nd</sup> of March. The predicted sea levels for Thursday 27<sup>th</sup> of February and the 3<sup>rd</sup> March were expected to be lower than the 2.8 metres threshold of concern.

Heights of more than 2.90 metres were recorded from the 27<sup>th</sup> Feb to the 3<sup>rd</sup> of March. During this 5 day period of spring tides, from the 27<sup>th</sup> Feb to the 03<sup>rd</sup> of March, there was a lot of overtopping waves causing inundation and major damage to the Dai Nippon Causeway, and other low level sites around Tarawa, as well as other islands like Makin, Marakei and Onotoa which also reported over radio on the 05<sup>th</sup> March, 2014.

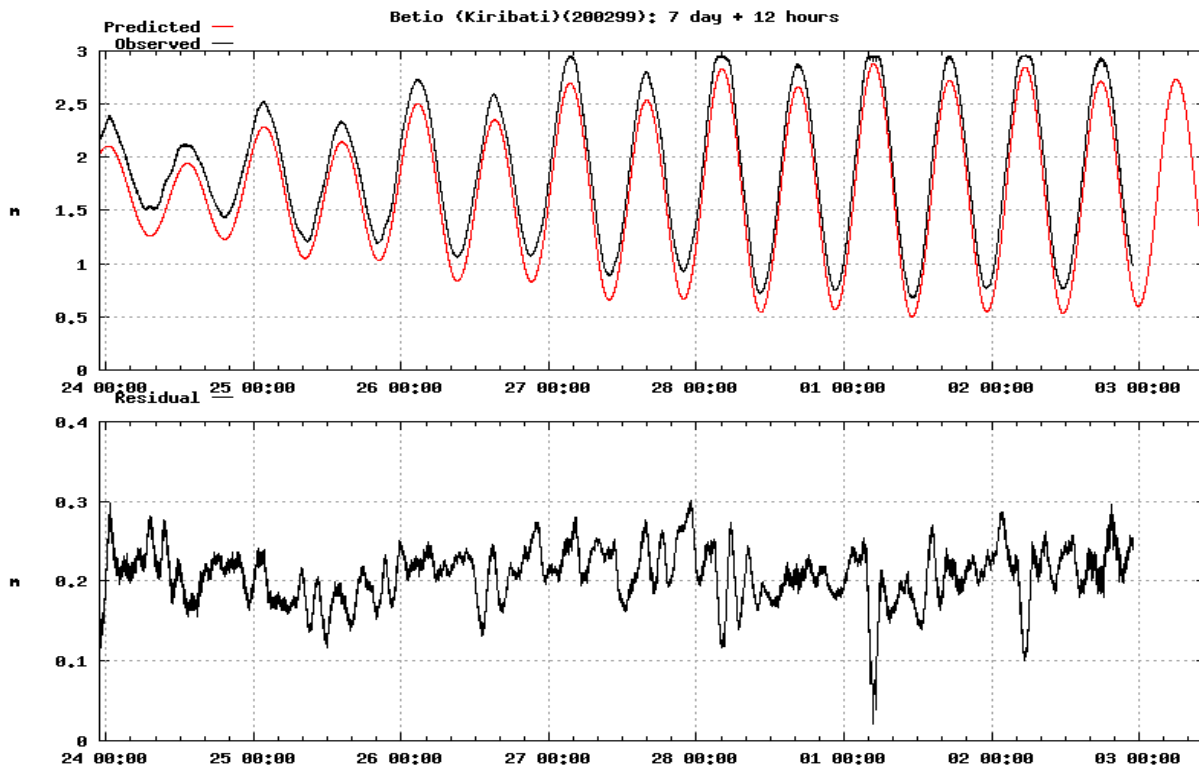


Figure 1 Top – Sea level Predicted vs Observed plot, Bottom – Residuals or difference between Observed and Predicted

## What cause the difference from the Predicted with the Actual sea level readings?

It been confirmed that there are low pressure systems sitting for days in the Northern Hemisphere while another system in the southern Hemisphere in the Pacific region (Figure 3 and 4). It also confirmed that another deep low pressure located in the north (Figure 4). Those systems generated swells which raised sea level and more visible when approaching land.

As a result, sea level became higher that what had been predicted during that particular spring tide. In simple terms, waves from low pressure system close to the Kiribati region running on top of the spring tides causing

## Forecast?

Usually sea levels in relation to a New Moon or Full Moon (Spring tides) decreasing after 2 or 3 days and therefore that the same concept for the last Spring tide on the 1<sup>st</sup> March, 2014.

In terms of low pressure systems, it been observed that the system situated near FSM had been moved northward (away from Kiribati) while the one in the southern hemisphere remains in the Solomon island region Figure 3, but their impacts expected to be lower as high tides level will be lower.

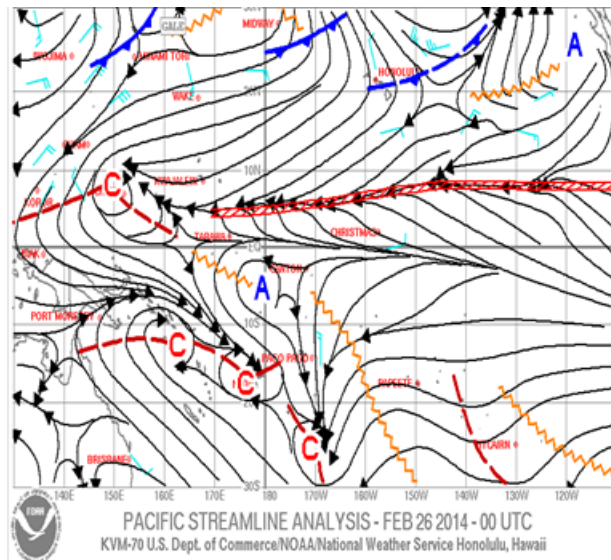


Figure 2. Streamline used as a weather map on the 26th Feb, 2014

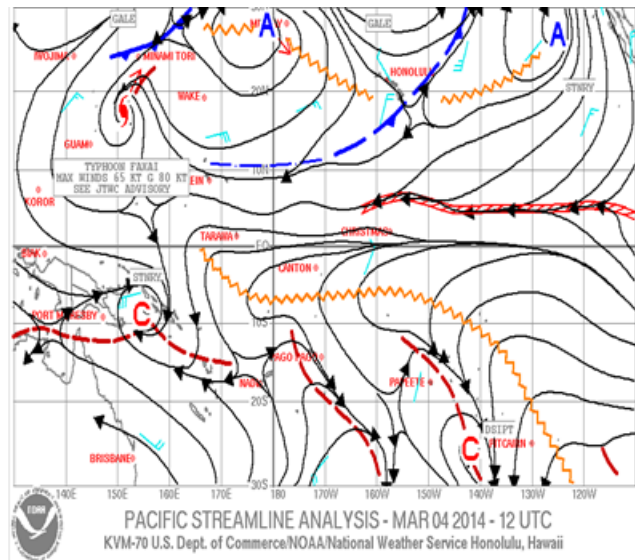


Figure 3. Streamline used as a weather map on the 4th of March, 2014

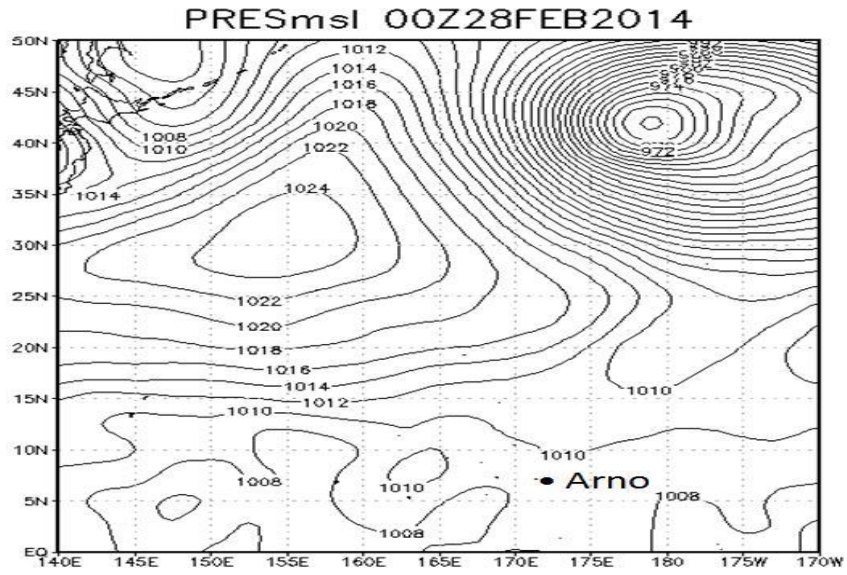


Figure 4 - Isobaric showing deep low pressure in the Northern Hemisphere