Tonga Meteorological and Coastal Services

Outline

- Brief about Tonga
- Ministry Structure
- Department Structure
- Stations
- Tropical Cyclone Flow Chart
- TC Gita
- Conclusion

By
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Sitamipa Paea
Gary Vite
Kingdom of Tonga

King George Tupou VI and Queen Nanasi Pau'u Tuku’aho

Population: 106,326 people
Location: 15-23° S, 173-177° W
Local Area: 717km²

171 Islands of which 36 are in habitat, Land/sea area ...720,000 km2
Tonga Meteorological & Coast Radio Services

Ministry of Environment, Energy, Climate Change, Disaster Management, Meteorology, Information and Communications

KINGDOM OF TONGA

Official Government Website: Providing meteorological and maritime radio services in support economic development, safety and security and general well-being of citizens of and visitors to the Kingdom of Tonga

Website: http://met.gov.to/
Stations in Tonga

<table>
<thead>
<tr>
<th>WMO No.</th>
<th>Name</th>
<th>Lat. (S)</th>
<th>Lon. (W)</th>
<th>Elev. (m)</th>
<th>Type of Station*</th>
</tr>
</thead>
<tbody>
<tr>
<td>9177200</td>
<td>Niuafo’ou Aerodrome</td>
<td>15.57°</td>
<td>175.62°</td>
<td>37</td>
<td>Climate/Synoptic/Aeronautical</td>
</tr>
<tr>
<td>9177600</td>
<td>Niuatoputapu</td>
<td>15.95°</td>
<td>173.77°</td>
<td>2</td>
<td>Climate/Synoptic/Aeronautical</td>
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<tr>
<td>9177900</td>
<td>Lupepau’u Aerodrome</td>
<td>18.60°</td>
<td>173.98°</td>
<td>71</td>
<td>Climate/Synoptic/Aeronautical</td>
</tr>
<tr>
<td>9178806</td>
<td>Nuku’alofa</td>
<td>21.13°</td>
<td>175.18°</td>
<td>2</td>
<td>Climate</td>
</tr>
<tr>
<td>9178900</td>
<td>Tide Gauge (TBU)</td>
<td>21.13°</td>
<td>175.17°</td>
<td>2</td>
<td>AWS</td>
</tr>
<tr>
<td>9178400</td>
<td>Pilolevu Aerodrome</td>
<td>19.78°</td>
<td>174.35°</td>
<td>2</td>
<td>Climate/Synoptic/Aeronautical</td>
</tr>
<tr>
<td>9179200</td>
<td>Fua’amotu Aerodrome</td>
<td>21.25°</td>
<td>175.15</td>
<td>38</td>
<td>Climate/Synoptic/Aeronautical</td>
</tr>
<tr>
<td>9179203</td>
<td>Kaufana Aerodrome</td>
<td>21.38°</td>
<td>174.95°</td>
<td>105</td>
<td>Climate</td>
</tr>
<tr>
<td>A3A</td>
<td>Nuku’alofa Radio</td>
<td>21.25°</td>
<td>175.15</td>
<td>38</td>
<td>Coastal Radio</td>
</tr>
</tbody>
</table>

- Tongatapu area have 8 AWS
- Fua’amotu Met Station – Aerodrome report, Climate and Synoptic 24/7
- Nuku’alofa Station – Climate (observe at 10am everyday 1 hour)
- Ha’apai Met Station – Aerodrome report, Climate and Synoptic (observe at (1am) 6am -7pm 14 hours and 4 AWS for Ha’apai)
- Vava’u Met Station – Aerodrome report, Climate, Synoptic (observe 1am – 7pm 19 hours and 5 AWS/1 Sea Level for Vava’u)
- Niuatoputapu Met Station – Synoptic (observe at 1am, 7am, 1pm, 7pm 4 hours and 1 AWS/1 Sea Level)
- Niuafo’ou Met Station – Synoptic (observe at 1am,7am,1pm,7pm 4 hours and 1 AWS)
- ‘Eua Met Station – Climate – (observe at 10am everyday 1 hours and 2 AWS)
Meteorological brief on Severe Tropical Cyclone “Gita” (Cat4)

Total Cost $TOP356Million
($TOP208Million in Damages and $TOP147Million in Losses)
Warnings

• Fua’amotu TCWC was activated at 11:45am Saturday 10th February 2018
• TC Gita arrive evening in Tonga on 12th of February, 2018.
• A total of 22 Tropical Cyclone Advisories were issued on TC Gita (17 from Fua’amotu Tropical Cyclone Warning Centre until Roof damage around 10:30pm and the last 5 tropical cyclone warnings for Tonga were issued from RSMC Nadi until cancellation at 3pm Tuesday 13th February 2018.)
• Met Office remained on air and was able to continue to provide advice on the cyclone until it passed Tongatapu but could only do so to the local FM/AM Radio station.
Satellite Image

Visible Image

IR Imagery
Effects

Eye cross over Fua’amotu station around 10:45pm (12/02/2018) and lasted for an hour

Observations recorded at Fua’amotu Meteorological Station and the Nuku’alofa tide gauge (Automatic Weather Station) were

<table>
<thead>
<tr>
<th>Station</th>
<th>Winds</th>
<th>Lowest Pressure</th>
<th>Rain 24</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fua’amotu</td>
<td>25066G100 knots (1015pm)</td>
<td>947hpa (1115pm)</td>
<td>146mm</td>
</tr>
<tr>
<td>Nuku’alofa</td>
<td>30073G105 knots (1115pm)</td>
<td>956hpa (1115pm)</td>
<td>200mm</td>
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</tbody>
</table>

The largest wave recorded was 2.4m above normal tide about 4am Tuesday 13 February.
Fua’amotu Tropical Cyclone Warning Center
Lessons learnt

- Social media dissemination
- Radio interviews
- Impact information
- State of Emergency 12hrs before impact
- Regular NEMC meetings during warning phase
- Strong leadership from the Executive
Conclusion

• Tonga Met Office is building its capacity to extend our products and services to help the public for their decision making in management of their future works for their life and property.

• TMS still in process of implementing a new SOP for Severe Weather Forecast to operate during a Non-TC related events

• TMS still in process to implement of a SOP for Impact Forecast