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METEOROLOGICAL SERVICE FIJI

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TROPICAL CYCLONE REPORT 90/4

TROPICAL CYCLONE OFA

31 JANUARY TO 7 FEBRUARY 1990

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Tropical Cyclone Reports are intended to be quickly <u>Note</u>: available, preliminary, descriptive reports for public use. Their early issue means that details may be subject to subsequent correction.

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FIJI METEOROLOGICAL SERVICE

TROPICAL CYCLONE REPORT 90/4

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Introduction

Tropical cyclone Ofa was one of the most destructive cyclones to have occurred in the Southwest Pacific in the 1989/1990 cyclone season. It was also the first major tropical cyclone to have affected Western Samoa in more than twenty years.

Ofa formed on the 1st of February, 1990 from a depression that originated in the Tuvalu Group two days prior to this. The cyclone initially moved eastsoutheast at about 05 knots as it intensified rapidly. The system turned southsoutheast as it neared Samoa, then southeast and accelerated to about 12 knots. As it passed close to Niue, Ofa began curving southwards and slowed down again. It attained hurricane force winds on the 2nd of February and reached peak intensity around 1200UTC* on the 4th, with maximum average winds estimated at 100 knots and gusts to 140 knots close to the centre. At this time the radius of storm force winds was estimated to be about 90 miles and the radius of gales would be no more than 250 miles from the centre.

The centre of cyclone Ofa passed about 60 miles west of Savai'i island in Western Samoa between 1000UTC and 1600UTC on the 3rd of February and about 30 miles west of Niue around 0300 UTC on the 5th of February. The cyclone had major impact over several countries, namely, American Samoa, Niue, Tokelaus, Tonga, Tuvalu and Western Samoa. Of these, Western Samoa and Niue suffered most devastation. According to reports the fury of Ofa over Western Samoa has been unprecedented in 100 years.

Eight lives were lost in the wake of cyclone Ofa of which seven occurred in Western Samoa and one in Tonga. Preliminary estimates of the extent of damage were about US\$130 million in Western Samoa, US\$32 million in American Samoa, US\$2.5 million in Niue and US\$3.2 million in Tonga. Estimates from Tuvalu, Tokelau and Wallis were not available at the time of writing this report.

*UTC - Universal Corordinated Time (same as Greenwich Meridian Time)

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History

A shallow depression formed within the South Pacific Convergence Zone (SPCZ) over Tuvalu on the 27th of January, 1990. In the following two days the system remained slow-moving close to Funafuti with little development taking place. Then. by early on the 30th of January pressures near the depression centre began to fall rapidly and the whole system started to show a slow increase in organization. At 0600UTC on the 30th the central pressure of the system was estimated to be around 395 hPa with average winds of about 30 knots close to the centre. From then on, the system continued to deepen with subsequent increase in organization. As this occurred the depression moved very slowly towards northeast at first, and then curved towards the southeast, away from Tuvalu. By late on the 31st of January the system had acquired tropical cyclone characteristics and was named "Ofa" by the Nadi Tropical Cyclone Warning Centre (TCWC) at 1922UTC on the same day. At this time Ofa was located about 180 miles east of Funafuti and was moving southeast at about 05 knots. Winds close to the centre were estimated at about 40 knots.

From the time the system was named it developed steadily, reaching storm intensity in less than 12 hours and hurricane intensity within 36 hours. Soon after 0000UTC on the 2nd of February Ofa curved towards the southsoutheast and moved on this new path at about 05 knots for the next 48 hours. It passed about 60 miles west of Savai'i island in Western Samoa between 1000 UTCand 1800UTC on the 3rd. Thereafter it took a more southeastward track and accelerated to about 15 knots. The system reached peak intensity around 1200UTC on the 4th with maximum average winds estimated at 100 knots (175 km/hr) close to the centre. Storm force winds extended to about 90 miles and gales to about 250 miles from the cyclone centre. It maintained this intensity for about 24 hours as it continued moving toward the southeast." By now Ofa was fast approaching Niue. It passed within 30 miles west of Niue around 0300UTC on the 5th of February. The minimum pressure recorded at Niue was 962.4hPa* at 0300UTC on the same day.

As Ofa passed Niue it began to show a slight weakening trend. Subsequently, it curved slowly towards the south and slowed down to about 10 knots. It crossed the 25 degree south latitude, into Wellington's area of responsibility for issuing maritime warnings, just before 1800UTC on the 6th of February. At this time Ofa was still very intense with maximum average winds estimated at 75 to 80 knots close to its centre. Thereafter, the system weakened rather fast as a result of encountering shear from strong upper-level winds and also due to its entrance into cooler waters.

*hPa - hecto Pascals (equivalent to milibars)

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Warnings and Advisories

a) International Marine Warnings

The first International Marine warning on the system was issued from Nadi at 0735UTC on the 31st of January, when it was still a depression and lying just east of Funafuti. At that time average winds were estimated at 30 knots close to the centre and were expected to increase to 35 to 40 knots within the next 12 hours. Approximately 12 hours later the warning was upgraded to that of a tropical cyclone upon naming of the system as "Ofa". At 0115UTC on the 1st of February the first storm warning was issued on Ofa and six hours later the warning was upgraded to that of a hurricane as Ofa showed rapid intensification. At that time maximum average winds were estimated at 55 knots and were expected to reach hurricane force within the next 18 hours. The system acquired hurricane intensity around 0600UTC on the 2nd. Subsequent warnings were adjusted accordingly as Ofa developed to peak intensity around 1200UTC on the 4th of February, maintained this intensity for about 24 hours, and began a slow weakening trend afterwards. Nadi issued its final marine warning on Ofa at 1920UTC on the 6th as the cyclone moved out of its area of international responsibility. Thereafter, Wellington accepted the responsibility for issuing further warnings on the system.

<u>Tropical Disturbance Advisories</u>

The Nadi TCWC started to issue tropical disturbance advisories on the system from about the same time as its first international marine warning on the depression. The advisories were issued at approximately 12 hourly intervals, at around 0800 and 2000UTC. The advisories were tailored for the requirements of the various meteorological offices in the region and contained information additional to the contents of the warnings. Altogether, sixteen tropical disturbance advisories were issued by the Nadi TCWC on Ofa.

Bulletins on tropical cyclone Ofa were also issued by various other warning and advisory centres like the Joint Typhoon Warning Centre (JTWC) in Guam, the Offutt Air Base in Omaha and the Satellite Centre in Honolulu. They provided useful information on the cyclone's location, intensity, movement and other characteristics. The frequency of issue of these varied from centre to centre and ranged from about every 3 hours to 12 hours.

Special Weather Bulletins

<u>Tuvalu</u>

The first Special Weather Bulletin (SWB) for Tuvalu was issued at 0330UTC on the 30th of January when the system was in

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its early stages of development and located about 120 miles northeast of Funafuti'. The bulletin carried a tropical cyclone alert for Tuvalu. It mentioned that an existing depression in the area may develop into a tropical cyclone in the next 24 to 36 hours and cause gales over parts of the group. In SWB numbers two to seven, the alert was maintained as the system remained slow-moving in the area with very gradual development. Then in SWB number eight, issued at 1945UTC on 31st January, a gale warning was issued for Funafuti, Nukulaelae and Niulakita, and a strong wind warning was issued for the rest of Tuvalu. This followed immediately after naming of the system. Gales. with average winds up to 45 knots and gusts to 70 knots were expected over these islands in anticipation of intensification of the cyclone and possible drift towards the south. At that time Ofa was located about 160 miles east of Funafuti. Subsequently, the cyclone moved southeast, away from Tuvalu, and the gale warning was cancelled in SWB number twelve issued at 2000UTC on the 1st of March.

Altogether, twelve SWBs were issued for Tuvalu on the system. Except for SWB numbers two and four, bulletins were issued at 6 hourly intervals.

Wallis and Futuna

SWBs were started for these two islands on the 1st of February when Ofa was located about 240 miles north of Wallis and intensifying rapidly. In SWB numbers one, two and three issued at 0800, 1530 and 2200UTC respectively, a tropical cyclone alert was issued for both the islands. Then in SWB number four issued at 0200UTC on the 2nd, Wallis was placed under a gale warning while the alert was maintained for Futuna. By then Ofa had moved to about 200 miles north of Wallis and had begun curving southsoutheast, a path that would bring it closer to Wallis. As a result, gales were expected to develop over Wallis during that night. In the bulletins that followed at 6 hourly intervals, the warning for gales was maintained for Wallis as Ofa moved southsoutheast and passed about 130 miles east of the island at its closest point. The warning was finally cancelled in SWB number eleven issued at 1930UTC on the 3rd of February. For Futuna, the alert was replaced with a strong wind warning in SWB number eight issued at 0145UTC on the 3rd. The warning for strong winds over Futuna was maintained in the remaining SWBs issued for the two islands.

<u>Samoa</u>

A tropical cyclone alert was given for Samoa (both Western Samoa and American Samoa) in the first SWB for the group of islands issued at 2030UTC on the 1st of February. At that time Ofa was located about 300 miles northwest of Savaii island and was moving towards the eastsoutheast at about 05 knots. Based on that track Ofa was expected to cause gales or stronger winds over Samoa within the next 24 to 36 hours. In SWB number two issued at 0130UTC on the 2nd, the first gale warning was

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issued for Samoa. Following rapid development of the cyclone and its curvature towards southsoutheast, and slight acceleration, the warning was upgraded to a storm warning for Western Samoa in SWB number four issued at 1415UTC on the 2nd. For American Samoa, a gale warning was maintained. By then Ofa had reduced its distance to about 180 miles northwest of Savaii and had attained hurricane intensity with average winds estimated at 70 knots close to the centre. In the next nine SWBs issued at 3 hourly intervals, a storm warning was maintained for Western Samoa and a gale warning for American Samoa. During this period Ofa developed to peak intensity and maintained a steady southsoutheast movement at about 05 knots. Western Samoa was warned that as Ofa passed to the west of Savaii, the group could experience very destructive storm force winds with average speeds up to 60 knots and gusts to 90 knots. Over American Samoa gales were expected to average up to 45 knots with gusts to 70 knots. Rain was forecast to be very heavy over the whole of Samoa with high seas and damaging sea swell. Flooding of low lying areas was expected. In the early stages it appeared that the cyclone would follow a more southerly track and pass about 70 to 80 miles west of Savaii. However, a slight drift towards southsoutheast was always accounted for in the warnings and the public was kept advised of this. As the system drew closer to Samoa it became quite clear that Ofa would pass about 60 miles west of Savaii on the night of the 2nd (Samoa time) at its closest point. The public was again advised accordingly in SWB numbers ten and eleven issued at 1100 and 1400UTC respectively on the 3rd of February.

From the morning of 3rd February (Samoa time) Ofa began moving away from Samoa and the warning for Western Samoa was downgraded to a gale warning in SWB number fourteen issued at 2230UTC on the 3rd. Thereafter, a gale warning was maintained for the whole of Samoa, with SWBs issued at 6 hourly intervals, until 0145UTC on the 5th when the final SWB was issued for Samoa, cancelling the gale warning. Because of strong winds still affecting the Group, a strong wind warning was maintained for quite a while longer.

Altogether ninteen SWBs were issued to Samoa on tropical cyclone Ofa by the TCWC at Nadi. However, due to communication and other problems, only the first few (four or five) of these bulletins were received at the Apia Meteorological Observatory in Western Samoa. Even these were somehow distorted and it is not sure what was actually broadcast to the public. Copies of the warnings as available at the Apia Observatory, and provided to TCWC Nadi for, cross checking purposes, show that in instances where storm warnigs were issued by Nadi, the bulletins available at Apia instead contain strong-wind warnings. This major error is anticipated to have occurred within Samoa as a result of mis-interpretation when the bulletins were being relayed to Apia from Faleolo by voice after the normal communication link had failed. The public was therefore broadcast to expect only strong winds from the cyclone when it should have been warned of destructive storm force winds. It is no doubt then that the correct precautionary measures may not have been taken.

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Tokelaus

The alert and warning requirements for Tokelau were catered for in the same series of SWBs that were issued for Samoa.

In SWB number one for Samoa and Tokelau issued at 2030 UTC on the 1st of February, a tropical cyclone alert was given for Swains Island. Five hours later, in SWB number two, the whole of Tokelaus was placed under a gale warning. At that time Ofa was located about 260 miles westnorthwest of Swains Island and was intensifying rapidly as it moved towards the southeast at about 05 knots. In the next two SWBs, issued at 0745 and 1415UTC on the 2nd, the gale warning was maintained for whole of Tokelau. Islands in the group were forecast to experience damaging gale force winds with average speeds up to 45 knots and gusts to 70 knots-as the cyclone passed south of Swains Island. Rain was expected to be heavy with high seas and damaging swell. Some flooding of low-lying coastal areas was also expected. By 1800 UTC on the 2nd Ofa was located about 180 miles westsouthwest of Swains Island and no longer "posed any threat to any part of Tokelau. Subsequently, the gale warning was dropped for the group in SWB number five issued at 2015UTC on the same day. However, a strong wind warning was maintained for quite a while longer as rain squalls from the cyclone continued to affect the islands.

<u>Niue</u>

The first SWB for Niue was issued at 2030UTC on the 3rd of February when Ofa was quite far away, about 370 miles northwest of the island. The bulletin carried a tropical cyclone alert for Niue. In SWB number two issued at 0200UTC on the 4th, Niue was placed under a gale warning. Winds over Niue were forecast to increase to gale force from the afternoon of the following day and possibily become even stronger if the cyclone took a more southeasterly course. Rain was expected to be heavy with flooding, including flooding from the sea. By 1200UTC Of ahad moved to about 190 miles northwest of Niue and had accelerated to about 12 knots. At the same time, it had curved more towards the southeast and appeared to be heading almost directly for Niue. In anticipation of this, a storm warning was brought into effect for Niue in SWB number four issued at 1400UTC, and upgraded three hours later to a hurricane warning in SWB number five. In the next five SWBs that followed at approximately three hourly intervals, the hurricane warning was maintained as Ofa drew closer and closer to Niue, curved gradually towards southsoutheast, and its centre finally passed about 30 miles west of the island. Following this the warning was downgraded to a storm warning in SWB number twelve issued at 1030UTC on the 5th of February and to a gale warning in SWB number thirteen issued 3 hours later. By then Ofa was located about 90 miles south of Niue and was moving away to the south at about 12 knots. It had also started to lose its

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central organisation and intensity. In the final SWB for Niue on Ofa, issued at 1930UTC on the 5th, the gale warning was replaced with a strong wind warning and a damaging swell warning. Subsequently, the strong wind warning was maintained for a while longer as the system moved more slowly towards the south.

In total, fourteen SWBs were issued for Niue on tropical cyclone Ofa. The island began to experience gales from around midday on the 4th of February (Niue time), about 28 hours after the alert and 24 hours after the first warning was given by TCWC Nadi. This allowed enough lead time for preparatory measures to be taken.

<u>Tonga</u>

A tropical cyclone alert was first issued for Tonga at 0830UTC on the 2nd of February when Ofa was located about 300 miles north of Niuafoou island and appeared to be curving south, towards Tonga. In SWB number two issued at 1530UTC on the same day, a gale warning was brought into effect for the islands of Niuafoou and Keppel (Niuatoputapu), and the rest of Tonga was placed under a strong wind warning. In the following three SWBs, issued at six hourly intervals, the gale warning was maintained for the two islands as Ofa went through a rapid intensification phase and moved southsoutheast slowly. By 1500 UTC on the 3rd Ofa was located about 150 miles north of Keppel and it became apparent that the cyclone centre would pass quite close to Keppel. A storm warning was then issued for Keppel in SWB number six issued at 1530UTC on that day. SWB number seven issued three hours later maintained the storm warning for Keppel but in SWB number eight, the warning was upgraded to that of a hurricane for Keppel. At the same time, the gale warning was extended to include all the remaining islands in Tonga. By then Ofa had moved to about 85 miles north of Keppel and was estimated to have average winds of about 90 knots close to its centre. On its current path it was expected to pass about 30 miles east of Keppel around midnight of the 4th (Tongan time). Luckily, however, the cyclone gradually took a more southeasterly curve and accelerated from 05 knots to about 12 knots over the next 12 hours. Its centre passed about 60 miles east of Keppel on the evening of the 4th (Tongan time) thus causing only storm force winds over the island. The curvature of the cyclone towards southeast also spared islands in the Haapai and Tongatapu Groups from damaging gales.

As Ofa moved away from Keppel the warning for the island was downgraded to storm in SWB number thirteen and to a gale warning in SWB number fourteen issued at 1030 and 1330UTC respectively on the 4th. By 0000UTC on the 5th, Ofa was located well away from any islands in Tonga and no longer posed threat to the Group. Subsequently, in the final SWB issued at 0200UTC on the 5th the gale warning was cancelled. A strong wind warning was, however, maintained for the Vavau, Haapai and Tongatapu Groups for a while longer.

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<u>Effects</u>

Tropical cyclone Ofa caused gales or much stronger winds and very heavy rainfall to six different countries, resulting in damage ranging from moderate to very severe. Storm tide (combined effect of storm surge and high tide) from the cyclone caused havoc in several countries and was the major cause of destruction.

The total extent of the damage in the individual countries is not clearly known yet but the combined estimate is likely to reach almost US\$180 million. Reports of damage received at the Nadi TCWC show the impact of the cyclone to be most severe over Western Samoa which experienced a major cyclone for the first time in more than 20 years. Elderly people from Western Samoa, and also from Niue, described the fury of Ofa as something which they had never experienced in their lifetime.

Some meteorological data reported from various stations during the passage of Ofa is given below in Table 1.

Station Name	Maximu Wind (and ti	m Average kts) me (UTC)	Maximum Gust (kts)	Lowest Pressure (hPa)			
<u>Niue</u> Alofi	60 a	at 050600	88	962.4			
<u>Samoa</u> Apla Pagopago	60 -		97 93	986.1 989.2			
<u>Tonga</u> Keppel Niuafoou Vavau	90* a 44 a 35 a	at 040600 at 040000 at 050000	- -	974.1 990.1 991.0			
<u>Tuvalu</u> Funafuti Niulakita Nui Nanumea	36 a 47 a 40 a 35 a	at 010200 at 312137 at 010900 at 010600	46 68 50 40	997.6 998.6 1002.3 1002.6			
Wallis	38 a	at 022330	56	989.9			

<u>Table 1 - Wind And Pressure Reports From Various Meteorological</u> Stations During The Passage Of Cyclone Ofa

* Over estimated

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<u>Western Samoa</u>

Cyclone Ofa affected Western Samoa from the 2nd to the 4th of February UTC (from 1st to 3rd Samoan time). The meteorological stations at the Apia Observatory and at Faleolo Airport on Upolu began to report average winds of gale force from the night of the 1st (Samoa time). Rain became widespread and heavy at the same time. As the winds increased further during the next day, communication between Western Samoa and the outside world was lost almost completely. The Apia meteorological office was hit by high sea waves at 10.45 am on 2nd February (Samoa time) and had to be abondoned due to rising floods. A few hours later, the office was destroyed completely. The station at Faleolo also suffered damage and lost communication with Nadi for about 24 hours from 0500UTC on the 3rd. During the height of the cyclone the only means of communication left with Western Samoa was through a Polynesian Airline Boeing 727 aircraft standing on the tarmac at Faleolo Airport. Due to communication problems quite a number of very vital meteorological observations could not reach Nadi. Likewise, most of the warnings that were issued on the cyclone from Nadi did not reach the Apia Observatory and, therefore, were not broadcast.

Winds over Western Samoa became very destructive, with average speeds reaching 60 knots with gusts over 80 knots from the evening of the 2nd (Samoan time). Rain became continuous and very heavy. Huge waves and sea spray resulting from storm tide (combined effect of storm surge and high tides) flooded low-lying coastal areas, reaching 10 to 15 kilometres inland in places and adding to the already extensive flooding caused by the heavy rain. Destructive winds lasted for almost 24 hours and the heavy rain for several hours longer.

The combined effect of very high winds, heavy rainfall and storm tide created an impact never encountered before in Western Samoa in more than 100 years, and left the whole population in a state of terrible shock and distress. Reports reaching Nadi indicate that all of some 330 villages in the islands received at least some damage with the northern coasts of Upolu and Savaii being the worst hit. Roofs of houses were peeled away, walls knocked down, trees felled, and roads, bridges and power lines were badly damaged. Storm tide caused even more damage, washing off about 80 percent of the northwestern coastlines of the two main islands, reshaping them and creating several islands of coral debris near the reef line. Meteorological records and equipment at the Apia Observatory were ruined when huge sea waves struck the beachfront facility.

Altogether seven lives were lost, most of them washed away by waves or killed by flying debris. According to a preliminary estimate of the damage, the cyclone cost the country about WS\$306 million (roughly US\$130 million).

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<u>American Samoa</u>

Of a affected American Samoa about the same time and for almost the same duration as it affected Western Samoa. However, because the cyclone centre passed quite some distance away from American Samoa, only marginal storm force winds affected this group of islands. As a consquence, the impact of Ofa and resulting damage over American Samoa was less compared to that over Western Samoa. Nonetheless, the extent of damage the country suffered was also severe.

The eye of the cyclone is estimated to have passed about 140 miles southwest of Tutuila island in American Samoa on the 4th of February (evening of the 3rd Samoan time). Pago Pago started to report strong winds from about 0200 UTC on the 2nd. The winds became very gusty and average speeds reached gale force by 1200 UTC on the 3rd. Around 0500 UTC on the 4th the winds peaked at Pago Pago with maximum average speeds reported at 53 knots. The maximum gust reported was 93 knots which occurred at 0119 UTC on the 3rd. The auxillary power at the station failed around 2100 UTC on the 3rd and contact with Nadi was lost completely between 0800 and 2000 UTC on the 4th.

Preliminary estimate of the damage from cyclone Ofa to American Samoa was about US\$32 million. The principal destruction was to houses, the electrical system and to agriculture. According to information received, a total of 5618 homes were affected, of which about 20 percent were completely ruined and another 40 percent sustained major damage. Once again, the coastal areas and villages in the northern part of the islands were most severely affected. Heavy rain and huge sea waves washed away sections of roads and damaged bridges, buildings and other structures. However, no loss of human life was reported from American Samoa.

Niue

Of all the islands, the centre of cyclone Ofa passed closest to Niue (about 30 miles to the west) during late afternoon of the 4th of February (Niue time). Luckily however, the cyclone had started to weaken by then. Officials in Niue had taken heed of the advance warnings from Nadi and seemed well prepared to face the fury of Ofa. Soon after 1800 UTC on the 4th winds became strong and gusty over the island and reached gale force by 2300 UTC on the same day. As this happened the Niue Telecommunications Centre shut down its operations and no reports were received at Nadi from then until the next morning. At this point the Nadi TCWC sought the help of its counterpart in Wellington to request Radio New Zealand to broadcast Special Weather Bulletins for Niue. This was kindly accepted and subsequent warnings for Niue were broadcast from New Zealand.

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As the eye of Ofa passed close to Niue destructive hurricane force winds lashed the island for several hours. Gigantic sea waves resulting from storm surge swept over the northern and western coastal areas of the island and were reported to have reached several metres high. Virtually all landings to the sea were washed away or damaged badly by huge sea waves. There was considerable damage to hospital buildings, the island's hotel, roads, houses, churches, community halls and other facilities for the public. Due to the damage to power lines, electricity was out for about 24 hours. Most of the islands private water supply tanks were contaminated by salt water and declared unsuitable for drinking. Luckily, there was no loss of life or serious injury. The total

loss from the cyclone was estimated at around US\$2.5 million.

<u>Tonga</u>

In Tonga, the worst hit were the islands of Niuatoputapu (Keppel) and Tafahi which fell closest to the path of cyclone Ofa. The meteorological station at Keppel estimated a maximum wind gust of 90 knots around 0600 UTC on the 4th. At the same time Niuafoou, some distance away, estimated winds of 44 knots.

Niuatoputapu and Tafahi suffered severe damage to houses, church buildings, coconut plantations, food crops and other vegetation. Over 70 percent of the families in Niuatoputapu lost their houses completely with the remaining 30 percent losing their roofs either partly or completely. Over Niuafoou, damage was only moderate, and occurred mostly to crops and vegetation.

Only one death was reported from Ofa which occurred on the island of Niuafo'ou. Preliminary estimate of the damage from the cyclone stood at about US\$3.2 million.

<u>Tokelau</u>

Ofa passed about 180 miles west of Swains island around 1800 UTC on the 2nd of February. The islands in the Tokelau Group experienced strong to gale force winds and heavy rain from the cyclone.

According to reports, sea walls around the three atolls of Nukunonu, Atafu and Fakaofo were washed away by high seas, and up to half the number of houses on the atolls were wrecked. Furthermore, up to 80 percent of the breadfruit and coconut plantations were torn down by winds. There was no report of death or serious injury in Tokelau.

Over Swains island, all of its 15 people were made homeless in the wake of cyclone Ofa when their homes suffered extensive damage. The island's quarters which housed the

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government workers, its dispensary, school building, cooking houses and sheds were demolished with a complete loss of agricultural crops like bananas, pawpaws, breadfruits and taro. In addition, at least 85 percent of the island's livestock, mostly poultry, was destroyed.

<u>Tuyalu</u>

Tropical cyclone Ofa evolved from a depression which originated in Tuvalu on the 30th of January. As the system developed into a cyclone, winds over the Group became strong first, and then reached gale force on the 1st of February. On the 2nd, there were still reports of marginal gales from some of the stations but the winds decreased from late in the day.

Most of the islands reported damage to vegetation and crops especially bananas, coconuts and breadfruit, with the extent of damage ranging from 10 to 40 percent. There was minor loss of landscape from sea flooding in Nui and Niulakita. In Funafuti itself, sea waves flattened the Hurricane Bebe bank at the southern end of the airstrip causing sea flooding and evacuation of several families from their homes. Again, no loss of life was reported.

<u>Wallis</u>

Wallis Island reported gale force winds from the cyclone for a brief period around 2300 UTC on the 2nd of February. There were no casualties. Sea flooding occurred on the east coast of the island on the 2nd and 3rd causing minor damage in villages and to roads. Minor loss of crops and vegetation also occurred.

Conclusion

The number of countries tropical cyclone Ofa affected and the extent of destruction it caused in these places make it one of the most prominant cyclones to have occurred in these last few decades, if not the whole century. Its fury has left an unpleasant experience in the minds of hundreds of thousands of people, which will no doubt be remembered in many years to come.

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