

**SEVERE WEATHER FORECASTING AND DISASTER RISK
REDUCTION FULL DEMONSTRATION PROJECT
(SWFDDP)**

REGIONAL SUBPROJECT RA V

PROGRESS REPORT N°3

For the period 1 July 2011 – 31 Oct 2011

(01 Dec 2011)



Part of SWFDDP website banner

1 Overview:

1.1 Introduction:

The meeting of the Regional Subproject Management Team (RSMT) of the RA V Severe Weather Forecasting and Disaster Risk Reduction Demonstration Project (SWFDDP) for the planning of the expansion of the Regional Subproject to include nine South Pacific Islands was held from 1 to 4 November 2010, in Wellington, New Zealand. The meeting report can be found at:

[Meeting of the Regional Subproject Management Team \(RSMT\) of the SWFDDP - South Pacific Islands](#), Wellington, New-Zealand, 1-4 November 2010

Based on the success of the Pilot phase of the SWFDDP (1 November 2009 to 31 October 2010), it was concluded that the RSMT will implement a full Demonstration Phase with expanded participation, from 1 November 2010 to 31 October 2012.

The Regional Subproject Implementation Plan (RSIP) can be found at:
[Regional Subproject Implementation Plan \(RSIP\) for the full phase of the SWFDDP - South Pacific Islands](#) (pdf)

The principles and the goals of the Project were well outlined in section 1.1 of the plan. The Cascading Forecasting Process of global centres providing products through a lead RSMC to NMHSs is described in section 1.2. The overall framework of the Project in RA V is presented in section 1.3.

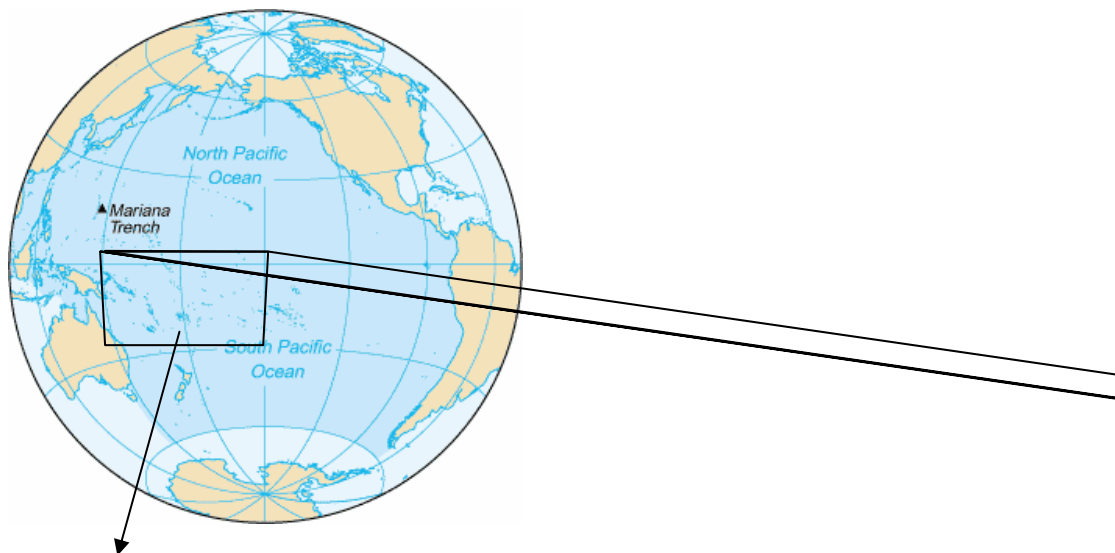
Full demonstration phase participants:

A Pilot phase involving a group of 4 participating countries in 2009/10 (Samoa, Vanuatu, Solomon Islands, and Fiji) was completed on 31 October 2010. It is followed by a full Demonstration phase in 2010/12 which includes the 4 Pilot phase NMHSs plus the following five NMHSs: Cook Islands, Niue, Kiribati, Tonga and Tuvalu.

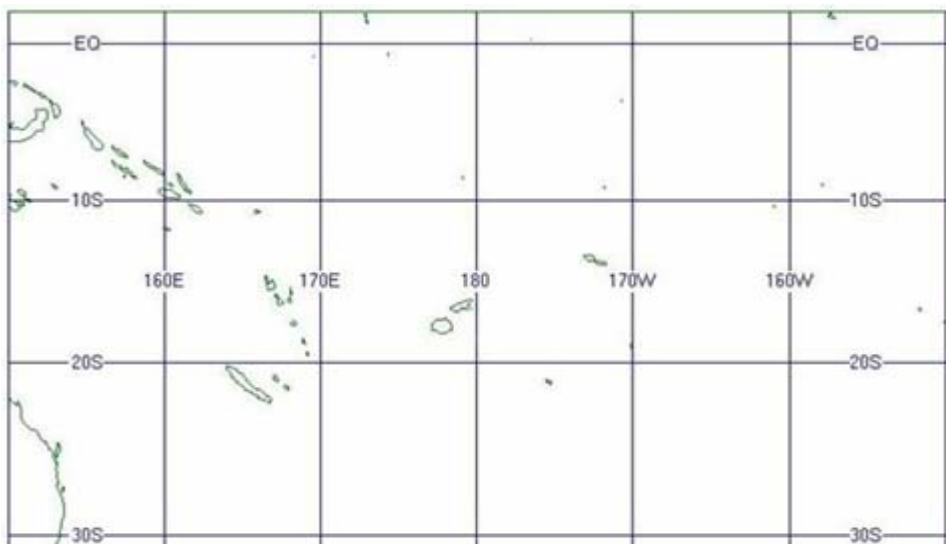
The Regional centres include: RSMC Wellington as lead RSMC for this Subproject (having responsibility for the development and management of a dedicated project Portal), RSMC Darwin (Geographic), and RSMC Nadi (Activity – Tropical Cyclone Centre (TCC)). Fiji also participates in the project as a NMHS.

The Global centres (ECMWF and the Met Office UK) will continue to participate actively. The Met Office has tailor made products for the area 150E – 120W, 10N – 40S, which is larger than the 'South Pacific window' - 150E - 150W, 2N -30S of the RSMC Wellington Guidance product (see below).

In section 2.4, the current or pending contributions of Japan (JMA), USA (NCEP and Honolulu) and France (Météo-France in French Polynesia and New Caledonia) to the Project is outlined.

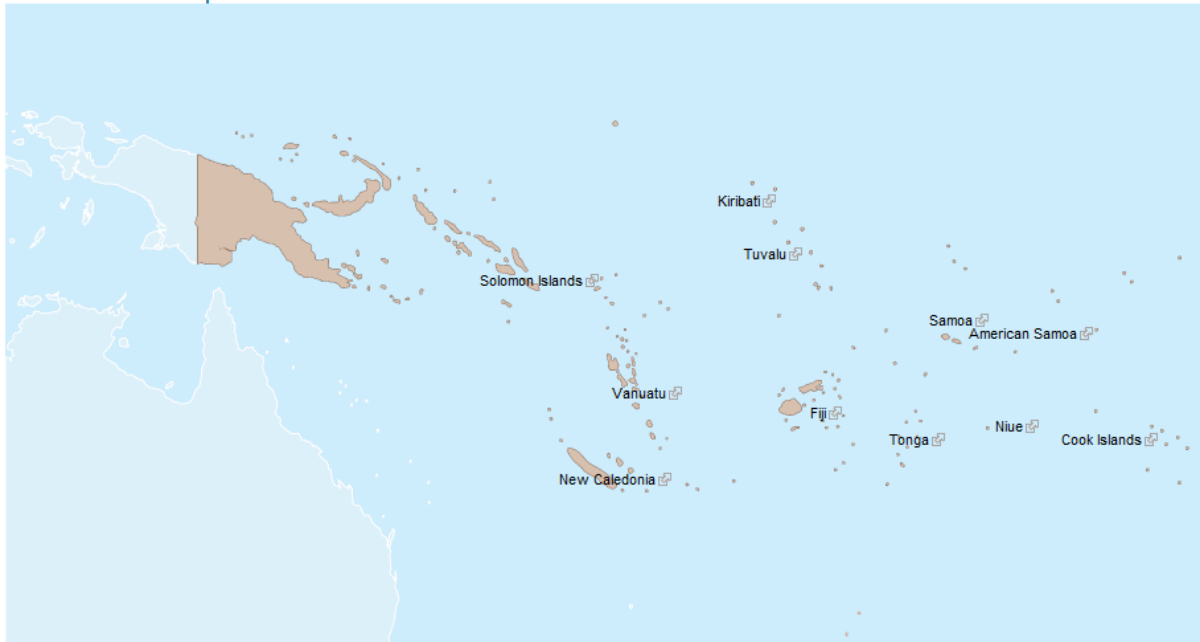


SWFDDP 'South Pacific Window' (subset of the above map)



South Pacific Ocean Map (showing location of participating NMHS)

South Pacific Ocean Map



This third Progress Report of the full Demonstration Project spans the period 1 July 2011 to 31 October 2011. This progress report compiles and assesses the feedback received from the RSMCs and the NMHSs in order to determine the quality of the guidance provided by RSMC Wellington as well as the quality and applicability of the global and regional products available. The feedback will also be used in order to ascertain the relevance and the quality of the warnings issued and improvement of the warning services the NMHSs delivered to the Disaster Management and Civil Protection Authorities – “DMCPA” and to the media.

The five newest additions to the list of participating countries viz Kiribati, Tuvalu, Tonga, Niue and Cook Islands depend on RSMC Nadi for some or all of their forecasts and warnings. This poses a challenge in how such forecasts and/or warnings should be evaluated when they are issued by somebody else. Each country should accept some degree of responsibility for what goes out to their public and if they aren't happy with any of the contents, they should send feedback back to RSMC Nadi. This way it makes sense for each of them to evaluate the forecasts and warnings just as if they had produced them.

SWFDDP News:

There are still plans to undertake SWFDDP in-country training, probably including a Public Weather Services component, in 2012, between cyclone seasons but no details are able to be given at this stage.

Reports and feedback received from participating NMHSs¹ for the period 1 July 2011 – 31 October 2011 (**Boldface**: Pilot phase participants)

Centre/Country	Event report (Appendix H)	Evaluation table(Appendix I)	Verification of warnings	Case studies ³
NMHS Samoa	x	x	2	
NMHS Solomon Is.	x	x	2	
NMHS Vanuatu	x	x	2	
NMHS Fiji/Nadi	x	x	2	
NMHS Cook Is.	x	x	2	
NMHS Kiribati	x	x	2	
NMHS Niue	x	x	2	
NMHS Tonga	x	x	2	
NMHS Tuvalu	x	x	2	

¹ RSMC Wellington submitted a report which described its activities, major events over the period and has begun verification of the South Pacific Guidance as outlined in this report. RSMC Darwin submitted a report describing its activities. RSMC Nadi did not submit a report.

²No NMHS has presented formal verifications of their warnings yet

³ No NMHS has presented a case study for the period

2. Input from RSMCs and Global centres:

2.1 RSMC Wellington:

As the lead RSMC for this project, Wellington continued to provide a platform (MetConnect Pacific at www.swfddp.metservice.com) for the SWFDDP products. This web site also provides helpful background material and links to global centres, other RSMCs and the NMHSs. Twice daily the RSMC staff produces the RSMC Daily Severe Weather Forecasting Guidance Products, referred to as the “South Pacific Guidance (SPG)” charts.

As agreed in the Implementation Plan, as of 1 December 2010 the threshold criteria used to generate the SPGs were changed. The new criteria provide more realistic thresholds in terms of what ranks as a severe weather event and taking into account the vulnerabilities of low-lying islands. The criteria thresholds for rain, wind and waves were raised to: rain \geq 100mm/24hrs, winds \geq 30 knots and waves \geq 2.5m north of 15S, and \geq 3.5m

From 1 July 2011 to 31 October 2011, a total of 1225 South Pacific Guidance charts were produced by RSMC Wellington Lead meteorologists and posted on MetConnect Pacific. 1071 (about 87%) of these charts contained guidance. Of the charts containing guidance 928 were for large waves (nearly 87%), followed by heavy rain 428 (about 43%), and 62 charts displayed high winds (6%). 154 charts (about 13%) displayed NIL SIG.

Large waves figured as the dominant phenomenon in the guidance for all participating countries, with rain dominant for the Solomon Islands. The principal cause of the latter was the semi-permanent position of the South Pacific Convergence Zone (SPCZ) in the vicinity of the Solomon Islands. Kiribati’s guidance was exclusively for ‘Large waves’.

In addition to the routine South Pacific Guidance, RSMC Wellington endeavours to follow up with a separate email and/or telephone call in the lead up to a significant event to check that the relevant forecasts/warnings are being or will be issued e.g. Fiji, Niue and the Cook Islands for the large wave event at the end of September.

The third WMO/Japanese International Cooperation Agency (JICA) course was held at RSMC Nadi from 1 to 12 August 2011 and Rochelle Fleming, RSMC Wellington attended as a SWFDP Expert. This is just one of several training initiatives that have been carried out since the implementation of SWFDDP.

MetConnect Pacific: The website operated continuously with no outages throughout this reporting period (1 July to 31 October 2011). The South Pacific Guidance charts weren't updated at 0300 UTC on 8 September due to a technical reason.

2.2 RSMC Darwin:

RSMC Darwin continued to contribute regional NWP guidance and tropical climate monitoring products during the full demonstration phase of the SWFDDP-RAV demonstration phase from 1 July to 31 October 2011. These products are available on MetConnect Pacific page and on the RSMC Darwin web site.

Additional Bureau of Meteorology support for the SWFDDP-RAV was provided by hosting the 9th WMO Southern Hemisphere Tropical Cyclone and Public Weather Course at the Bureau's National Training Centre in Melbourne, 5-23 September 2011.

Operational testing of ACCESS-TC, the moveable-domain high-resolution tropical cyclone model and the associated vortex tracker has been completed. These NWP systems are ready for operational implementation during November 2012, ready for the 2011/12 tropical cyclone season.

Parallel trials of an upgraded version of the ACCESS NWP model suite (the Australian Parallel Suite 1 - APS1) have commenced, in preparation for implementation early in 2012. Upgrades include the replacement of the tropical model ACCESS-T with a 12 km resolution regional model, ACCESS-R12.

2.3 RSMC Nadi

RSMC Nadi (TCC) continued to provide access to its web site through MetConnect Pacific.

RSMC Nadi produces tropical cyclone alerts, warnings, advisory bulletins, tropical cyclone Outlook and track and threat maps for the Southwest Pacific and Southeast Indian Ocean and Tropical Disturbance Summaries.

In addition RSMC Nadi produces Special Weather Bulletins and forecasts & warnings for damaging swell for Fiji, Tonga, Cook Islands, Niue, Tuvalu, Kiribati, Tokelau, Nauru.

2.4 Products from global centres:

ECMWF: The ECMWF products continued without interruption through this time period and were well received by the forecasters. There is a new Tropical cyclone activity (including genesis) map available on the ECMWF site: Click

[Home](#) > [Products](#) > [Forecasts](#) > [Medium range forecast](#) > [Ensemble Prediction System](#) > Tropical cyclone activity (including genesis)>.

Note: it is *not* accessible from the Project link for the “Severe Weather Forecast Demonstration Project for Pacific (SWFDP)” and under “Special”.

ECMWF also have available a “Global Extreme Forecast index (EFI) all parameters” interactive chart but not through the SWFDDP login. **WMO members have access to the chart via the country login by clicking [Home](#) > [Products](#) > [Forecasts](#) > [Medium range forecast](#) > [Ensemble Prediction System](#) > Global EFI all parameters (interactive chart).**

Met Office UK: The Met Office’s products continued without interruption throughout this time period.

JMA:JMA has continued to provide products throughout the period.

Other centres:

Steve Ready has continued to liaise with Ray Tanabe, the Director of the Central Pacific Hurricane Center about USA progress in getting the WRF model to run over the South Pacific area. At this stage, the USA is likely to provide images from WRF12km run over the entire SWFDDP domain as well as a WRF 4km run over a smaller domain, including Samoa and Niue. When more is known about these projects the participants will be informed.

There has not been any further development with Météo-France (French Polynesia, New Caledonia) in obtaining model data.

3. Summary of the severe weather events 1 March to 30 June 2011

3.1 Severe Weather Events reported by RSMC Wellington⁺:

Tropical cyclones

No named tropical cyclones in this period.

Other weather systems

There were NO wind events.

July

HEAVY RAINFALL: 3rd July - Fiji.

LARGE WAVES: 10-15 July – Tuvalu and Fiji.

August

HEAVY RAINFALL: 9thAugust – Fiji

LARGE WAVES: 24-30 August – Kiribati, Tuvalu, Niue and Cook Islands.

September

HEAVY RAINFALL: 19 September- Vanuatu.

LARGE WAVES: 4-7 September – Niue

October

HEAVY RAINFALL: 4 & 13 October- Vanuatu. 10-11 October – Solomon Islands.
25-27 Oct – Samoa. 15-16 October – Ha'apai.

+ This list may be incomplete. The onus is on participating countries to advise RSMC Wellington of all severe weather events.

3.2 Vanuatu:

A trough of low pressure near Vanuatu from 18 to 19 September 2011 caused heavy precipitation of 95.5mm in 24 hours at Torba Province, Northern Vanuatu. A heavy rainfall warning was issued. A trough of low pressure near Vanuatu from 3 to 5 of September 2011 caused heavy precipitation of 160mm rainfall in 24 hours at Tafea province, southern Vanuatu. A heavy rainfall warning was issued. A trough of low pressure near Vanuatu from 12 to 14 September 2011 caused 111mm in 24 hours at Torba. No rainfall warnings were issued. A trough of low pressure near Vanuatu from 28 to 31 of October 2011 caused 132mm in 24 hours and 126mm in 6hours in Central/Southern Vanuatu. No warnings were issued.

3.3 Solomon Islands

Heavy rainfall of 110mm/24hr was observed at Honiara at 0000UTC on 12 October, 2011 and 111.6mm/24hours at Henderson at 0000UTC on 12 Oct, 2011. No warnings were issued. This is the usual practice especially when the showers are local in nature. Heavy rain showers were mentioned in the 5pm public forecast.

3.4 Fiji:

Highlights over the period were:

Trough over the Fiji group on 01 July 2011. Rainfall – 155.6mm/24hours was recorded at Eastern Viti-Levu and 159mm at Vanuabalavu at 0000UTC on 01 July, 2011.

Heavy Swell Event on 11 July – warnings for up to 4m southwest swells were issued 14 hours before the onset. No damages were observed.

Trough over the group on the 9August caused heavy rains of 129.3mm/24hours at Yasawa-i-ra at 10 August. Heavy rainfall warnings were issued 14 hours before the start.

Active trough affected Fiji on 3 September and 132.3mm/24 hours were observed at Suva on 2100UTC on 03 September 2011. Heavy rainfall warnings were issued more than 24 hours in advance.

A trough over Fiji on the 29 October; 129.3mm/24 hours were observed at Ono-i-lau 2100UTC on 29 October, 2011. A heavy rainfall warning was issued with more than 24 hours lead time.

3.5 Samoa

It was relatively dry over Samoa until the return of the wet weather in the 3rd week of October. Heavy precipitation was recorded on 25 October from a deep convective cloud associated with an active trough of low pressure over Samoa. 158.2 mm/10hours were recorded at Mulinu'u at 0900UTC on 26 October and 135mm at Faleolo Airport in the same period. No warnings were issued – there was no indication of these events on the SPG charts.

In addition a few high swell advisories were issued for Samoa coastal areas mainly for fisherman through-out the progress report period – 10 July 2011, 24 August 2011 and 5 September 2011. There were no reports of damages.

3.6 Cook Islands:

High swells were observed at Titikaveka, Rarotonga on 26 August 2011- water flooded the coastal road. Damaging Swell Warnings were issued by RSMC Nadi more than 24 hours in advance.

3.6 Tuvalu:

Large southerly swells 2-4m were observed 10-17 July 2011. 4m swells were observed at Funafuti on 15 July 2011. Warnings were issued several days before the event.

South-easterly swells were observed 23–28 August 2011. Local fishermen were affected. Warnings were issued. A strong wind warning of winds greater 35knots was issued for marine areas 23–28 August. Movements in and out of the port were delayed.

3.7 Kiribati:

Damaging wave warnings were issued on the 27 August 2011; they were observed at Teraina on 29 August 2011.

3.8 Niue:

Heavy rainfall of 77.0mm/2hours at 0000UTC was observed on 19 July 2011 at Hanan Airport, Alofi. Heavy rainfall warnings were issued by Nadi. Damaging heavy swell from 0000UTC on 24 July to 1500 UTC on 28 July. Swells of 4m were observed at Avatele, Tapaon 26 and 27 July. Warnings were issued at least 24 hours in advance. Damaging heavy swell was observed from 5 to 7 September 2011. 4m waves were observed at Tapa, Avatele. Warnings were issued 24 hours in advance. Heavy rainfall of 88mm/24hours was observed at 2000UTC on 14 October at Hanan Airport. Heavy rainfall was issued by Nadi 6 hours before the event.

3.9 Tonga

Heavy rainfall at Ha'apai: 149mm fell in the 8 hours ending 0400UTC on 15 October. There was local flooding. A warning was issued at 1400 UTC on 14 October.

4. Comments about the SPG and the NWP products.

RSMC Wellington:

The UKMO and ECMWF precipitation probability charts continue to give a weak signal at 100mm over 24 hours and a good signal for 50mm. Wellington forecasters rely on both these products, together with the help of pattern recognition, to estimate rainfall totals \geq 100mm in 24 hours.

The change in the wind criteria now better matches the guidance produced by UKMO and ECMWF; hence the number of over-forecast strong wind areas remains small. Forecasters continue to rely on local observations to help determine the areal extent of 30kt winds on days one and two.

Wave guidance continues to appear on the charts in high frequency. The change in criteria has made a significant difference to the amount of wave guidance south of 15S. Forecasters continue to access ECMWF wave data specifying each half metre, allowing easier determination of waves \geq 2.5m, north of 15S and \geq 3.5m, south of 15S. The model guidance has proven to be very reliable with forecasters picking large wave events from 4 days out.

Fiji:

South Pacific Guidance charts were very useful. Deterministic and ensemble forecasts from the GFS and the ECMWF were also generally useful.

Samoa: In general, the SPG charts were very useful especially for the swell events. Both the SPG charts and model data were not useful for the more localised convective activity.

Vanuatu:

The SPG products were very useful. They gave the Vanuatu forecasters confidence in issuing the warnings with good lead time. Vanuatu mentioned there is a downside to this: Forecasters, mostly inexperienced ones, tend to rely heavily on the guidance and in the process; there is a danger of overlooking important observations and failing to analyse the initial conditions. The Australian Model Access T (RSMC Darwin) has proved to be very popular.

SIMS:

The SPG charts provided by RSMC Wellington for the swell and precipitation forecasts were very useful. The deterministic and ensemble models from the UKMO sometimes lacked accuracy in the SE trades.

Niue:

Niue has found both the SPG and the model products very useful. Niue would like in-country training.

Tuvalu:

Tuvalu found both the SPG and the model products very useful. Strong wind warnings are issued based on the UKMO and ARL EPS Meteogram. UKMO EPS

Meteogram, wind and precipitation probability charts are frequently used for rainfall and windspeed information in the 3 day outlooks and in special requests.

Kiribati:

The SPG is useful and user friendly. Poor connectivity issues have plagued KMS – sometimes they could not access the SPG. Ensemble products are also useful. Kiribati relies on Nadi for its forecasts.

Cook Islands:

The SPG is useful. The model data was not accessed. The Cook Islands rely on Nadi for its forecasts.

Tonga: The SPG is very useful and gives confidence to forecasters.

5. Project evaluation against SWFDDP goals:

5.1 To improve the ability of NMHSs to forecast severe weather events

All NMHSs agreed that the SWFDDP products and, in particular, the SPG charts have increased the NMHSs' ability to issue warnings and strengthen the forecasters' confidence in doing so.

5.2 To improve the lead time of alerting these events

All NMHSs agreed that the SWFDDP products allowed them to improve the lead time. Fiji was able to issue Damaging Swell Warnings up to 2 *days* in advance of wave events. Most countries who issued their own warnings were able to issue damaging wave guidance with a 24-48 hour lead time. Precipitation warnings were issued with a 6-24 hour lead time. In Samoa's case, no warning was issued due to the sudden development of deep convective cloud over the islands.

5.3 To improve the interaction of NMHSs with Disaster Management and Civil Protection Authorities (DMCPA) before, during and after severe weather events

Several (Fiji, Samoa, SIMS, Niue, Tonga and Cook Islands) reported no interactions with their DMCPA's. Vanuatu cites as evidence that warnings include an advisory from the National Disaster Office. Kiribati did get a call from the Disaster Management office – they asked to be on an email distribution list for future warnings.

5.4 To identify gaps and areas for improvements

Niue and Tonga cited lack of experience and require in-county training. Fiji mentioned that it was difficult to verify warnings and forecasts. Vanuatu would like to see improvements in forecasting localized events. Kiribati has a poor internet connection and has trouble accessing the MetConnect Pacific site.

5.5 To improve the skill of products from Global Centres and RSMCs through feedback from NMHSs

Samoa's intense local convection event was not forecast by any model. Vanuatu would like to have improvements in forecasting localized events.

6. Evaluation of the weather warnings:

6.1 Feedback from the public

Niue received thanks for the timely warning from fishermen. Tuvalu had immediate response from groups looking for more information when the warnings were issued. Otherwise there was no feedback.

6.2 Feedback from the DMCPA's

Warnings for Tuvalu were warmly received and thanked by their Disaster management organization. Kiribati will put the Disaster Management office on their email distribution list for warnings. Vanuatu cites a close working relationship. Otherwise there was no feedback.

6.3 Feedback from the Media

Tuvalu had requests for updates from the media after warnings had been issued. Otherwise, there was no feedback.

6.4 Objective verification by the NMHSs

The following is an objective verification by RSMC Wellington.

The rain and wave events have been displayed in the following tables. Refer to the legends for how to interpret the data. The yellow highlighted cells are confirmed events. The criteria used by participating countries may match or be slightly above the SPG criteria.

HEAVY RAIN

Target days	1 03-Jul	2 20-Jul	3 03-Aug	4 09-Aug	5 03-Sep	6 19-Sep	7 23-Sep	8 04-Oct	9 11-16 Oct	10 25-26 Oct	11 27-29 Oct
Solomon Islands			2,1,0 (E150-200)				NIS (116)		NIS (95) Small		
Vanuatu						NIS (96) Small		4,3,2,1,0 (160) Wide	NIS (111) Small		NIS (154) Small
Kiribati											
Tuvalu											
Fiji	NIS (161) Small			3 (129) Small	NIS (132) Small						3,1 (116) Small
Samoa										1 (158) Wide	
Tonga									NIS (149) Small		
Niue		NIS (77)							NIS (88)		
Cook Islands											

Legend:

NIS (100) = No guidance on SPG charts. Maximum observed total rainfall = 100mm
 2,1,0 (E150-200) = on SPG charts from 2 days out to actual day (= 0) with estimated 24hour rainfalls of 150 to 200mm.

Small = localised area

Wide = spread over largish area

LARGE WAVES

	1	2	3
Target days	10-17 Jul	24-30 Aug	4-7 Sept
Solomon Islands			
Vanuatu			
Kiribati		4,3,2,1,0 (E4)	
Tuvalu	4,3,2,1,0 (4)	4,3,2,1,0 (E3.5)	
Fiji	4,3,2,1,0 (E4)		
Samoa			
Tonga			
Niue		4,3,2,1,0 (E4)	4,3,2,1,0 (4+)
Cook Islands		4,3,2,1,0 (E5) Small	

Legend:

NIS = Not in SPG charts on any day

4,3,2,1,0 (E5) = in all charts from 4 days out to the actual day (= 0) with estimated significant wave height = 4m.

4,3,2,1,0 (4) = in all charts from 4 days out to the actual day (= 0) with observed significant wave height = 4m.

Occurrences on the SPG of different phenomena: Threshold Criteria: Rain \geq 100mm per day and/or Winds \geq 30 knots and/or Large waves \geq 2.5m north of 15S and \geq 3.5m at & south of 15S.

Jul/Aug/Sep/Oct	SWFDDP area	Solomon Islands	Vanuatu	Kiribati	Tuvalu	Fiji	Samoa	Tonga	Niue	Cook Islands
Heavy rain	458	148	73	2	2	61	13	66	23	5
Strong wind	62	0	18	0	0	4	0	13	1	0
Large waves	928	178	158	172	158	189	284	78	99	477
TC references	0	0	0	0	0	0	0	0	0	0
Combination of one or more of above	1071	262	226	174	160	255	295	133	122	482
NIL SIG	154	963	999	1051	1065	970	930	1092	1103	743
Total	1225	1225	1225	1225	1225	1225	1225	1225	1225	1225

7. Case studies:

Kiribati submitted a case study using the case study template for the damaging wave event of the 27-29 August 2011. They cited lack of direct observations however there was evidence from damages and anecdotal evidence of the high waves. Fiji provided a file with some email exchanges on swell events during the period.

8. Conclusions:

On a positive note, most NMHS's submitted reports at or near the deadline. The only one, Tonga, was a few days late. The reports also followed the format prescribed.

Few mentioned interactions with the DMCPA's, media or the public. With the exception of Vanuatu and Tuvalu who mentioned interactions with the DMCPA none of the other NMHS's mentioned interactions with their DMCPA's. Very few of the NMHS cited interactions with the media. A few mentioned interactions with target groups such as fishermen (Niue and Vanuatu).

Niue and Tonga mentioned a requirement for in-country training. Kiribati mentioned that they now use MetConnect Pacific products when the bandwidth permits them.

The two-tier criteria for large waves might have caused some confusion amongst users for a while when southwest swells appeared on the South Pacific Guidance charts

north of 15° South but not further south because the criteria doesn't cut in until the

swells/waves reach 3m. **That's why a dashed line has been drawn across the SPG chart to remind viewers of the discontinuity in the wave criteria.**

Since the start of the Full Demonstration phase, RSMC Wellington has been providing additional information on rain/wind/waves when a TC Outlook has been force on day 1 and day 2 but no tropical cyclone has existed or been named. This is designed to help fill the shortfall in specifics about heavy rain/strong winds/large waves when a TC Outlook area is introduced. **During the 2011/2012 cyclone season, RSMC Wellington forecasters will be able to put the extra information in a single area instead of 2.**

RSMC Wellington has found it challenging to provide heavy rainfall guidance at the new 100mm threshold especially when the NWP guidance has often been inconclusive for this and higher amounts. There is also the battle with localised heavy downpours which the Project doesn't cope with at this stage. Some of the events observed over the past 4 months have been localised and come as a surprise to participating countries because there was nothing in the SPG guidance. **This is likely to happen again given the difficulties in picking up mesoscale systems with horizontal scales of a few 10s of kilometres.**

The wind guidance from both the ECMWF and UKMO has proved very reliable now that the SPG wind threshold has been raised to 30knots.

RSMC Wellington will continue to provide useful guidance on potentially heavy rain and/or strong winds and/or large waves, possibly hinting at tropical cyclone formation beyond RSMC Nadi's TC Outlook period of 3 days **However, RSMC Nadi may be ready to introduce a TC 5 day Outlook before the end of 2011-2012 cyclone season.**

The big challenge ahead is for NMHSs to find a way to introduce new or revised products (using values especially for rainfall and waves) based on the guidance information available on MetConnect Pacific

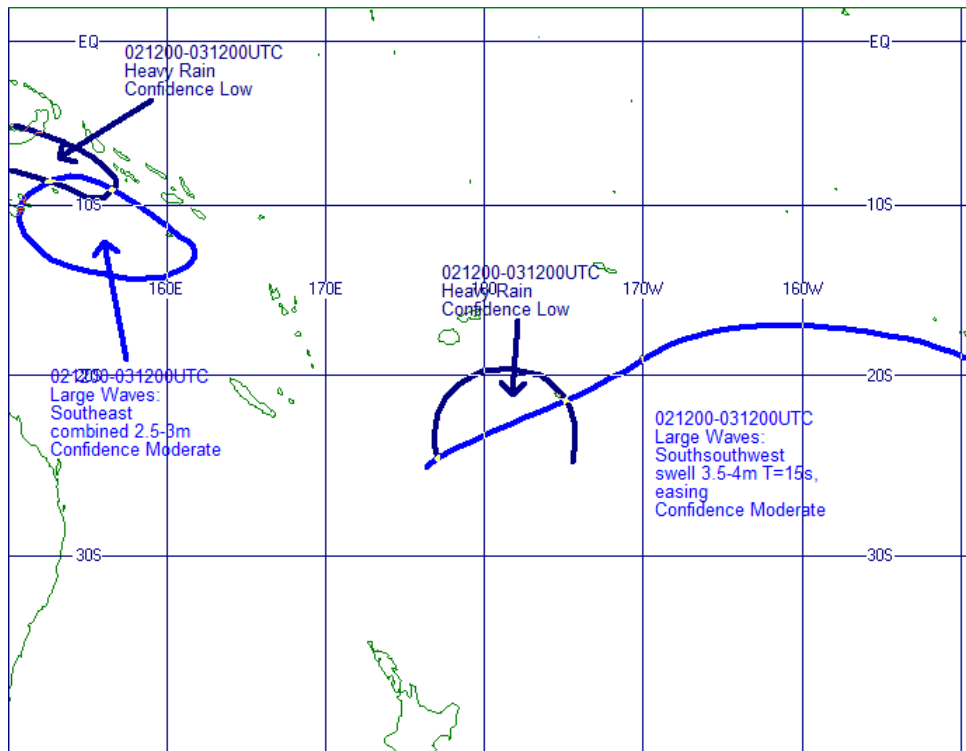
1. APPENDICES

Non-tropical cyclone events (4 have been referenced below)

1. **JULY**: Heavy Rain over Fiji – Nausori (161mm/24hr) on 3rd

(EVENT ONLY PICKED UP ONCE OBSERVATIONS CAME IN – EVENT NOT FORECAST IN ADVANCE (HOWEVER AN AREA OF RAIN WAS FORECAST 4 DAYS JUST TO THE SOUTHEAST OF FIJI))

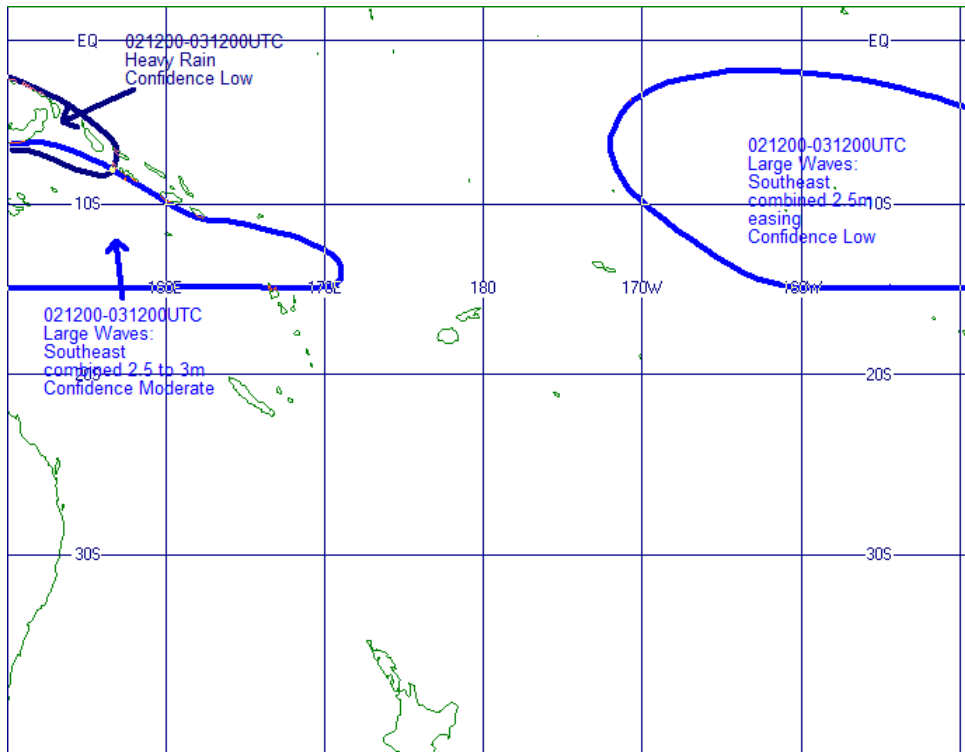
SPG chart issued 4 days before heavy rain event on 29 June



2. **AUGUST**: Heavy Rain over Solomon Islands - NRL accumulated rainfall image (150-200mm), 76mm/24hr, Munda on 3rd UTC

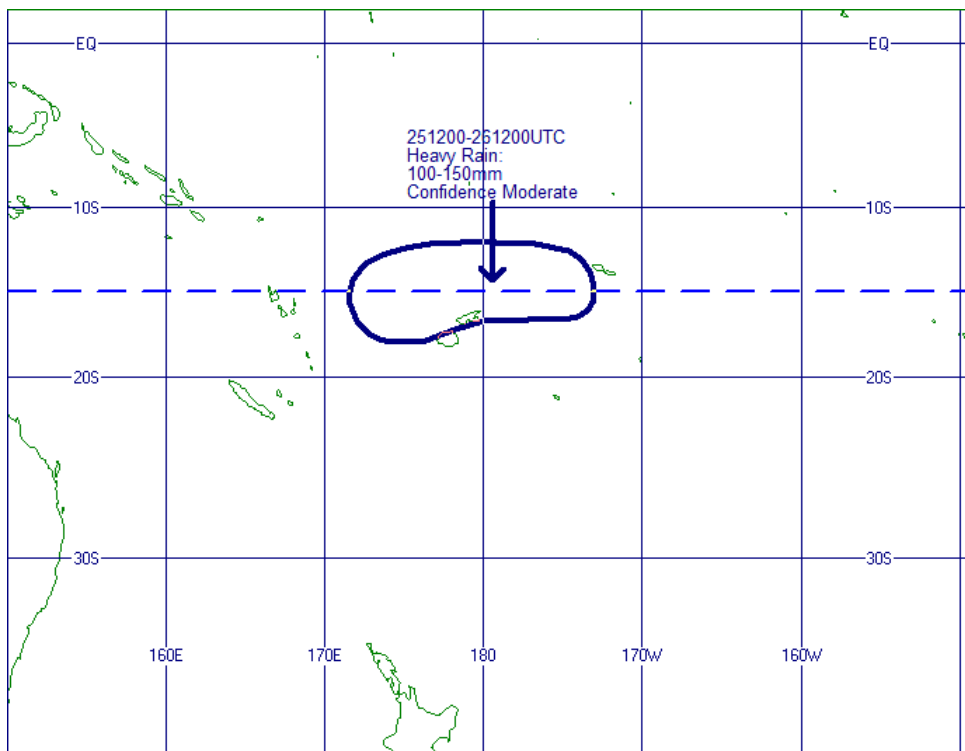
(EVENT FORECAST 2 DAYS IN ADVANCE)

SPG chart issued 2 days before heavy rain event on 1 August



3. OCTOBER: Heavy rain for Samoa - Mulinu'u (158.2mm/10hr), Faleolo (135mm/10hr), Mt Fiamoe (102.5mm/10hr) on 26th Oct UTC (EVENT FORECAST < ½ DAY IN ADVANCE)

SPG chart issued about 10 hours before heavy rain event at 13:15 UTC on 25-October



4. AUGUST: Large wave event affecting Kiribati, Tuvalu, Samoa, Niue and Cook Islands sometime during period 24th to 30th.

(EVENT FORECAST 4 DAYS IN ADVANCE FOR ALL AREAS)

SPG chart issued 4 days out on 23-August

