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COMMISSION FOR BASIC SYSTEMS

REGIONAL SUBPROJECT MANAGEMENT TEAM (RSMT) FOR THE SEVERE WEATHER FORECASTING AND DISASTER RISK REDUCTION DEMONSTRATION PROJECT (SWFDDP) IN THE SOUTH PACIFIC ISLANDS

Honiara, Solomon Islands

25 to 27 August 2016

FINAL REPORT


World Meteorological Organization
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Regional Subproject Management Team (RSMT) of the Severe Weather Forecasting
and Disaster Risk Reduction Demonstration Project for the South Pacific Islands.
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Executive Summary

The fourth meeting of the Regional Subproject Management Team (RSMT) for the Severe Weather Forecasting and Disaster risk reduction Demonstration Project (SWFDDP) for the South Pacific Islands was held at in Honiara, Solomon Islands, 23-27 August 2016. Main objectives of the the meeting were to: a) Review compliance with criteria established by the RSMT in 2013 to inform a decision to move the Project to the "operational phase" (Phase 4). This review was based on the assessment of the six-monthly progress reports produced by the member countries since 2013 and; b) Address the issue of sustainability of the project; in particular, to identify a regional entity that will be responsible for the Management of the SWFDDP (coordination of: training; reporting; meetings; and resource mobilization).

The meeting agreed the SWFDDP is very valuable to the Region in the production of severe weather forecasts and warnings. It also expressed appreciations to RSMC Wellington for management of the Project website MetConnect Pacific and highlighted its use and importance.

As noted by the previous RSMT meeting (August 2013, Nadi, Fiji), presentations by the countries highlighted that good work has taken place that has not necessarily transpired through the six-monthly progress reports. As a result, the meeting recommended trialing a monthly exchange (this may be in the form of tele/video-conference) and requested WMO/US NOAA NWS to facilitate its implementation. This would be supplementary to the current six-monthly reporting. Review of the progress reports was deemed to be insufficient to decide on whether to move out of the demonstration phase, so it was recommended that WMO undertake a full and independent review of the SWFDDP in the South Pacific in order to truely evaluate the progress of the Project.

The meeting recommended that SPREP take on the role as the regional entity that will manage and coordinate activities of SWFDDP and that WMO/NOAA-NWS/SPREP consider funding a position within SPREP to assist with this role.

Through discussions, following the various presentations, the meeting came to a conclusion that Storm surge and sea inundation are major threats to the Region and need immediate attention. It recommended that actions be taken to enhance storm surge forecasting capability and to address sea inundation issues through research and enhanced modelling (including swell, wave period, storm surge, tide and bathymetry across the region).

The meeting decided to continue the demonstration phase pending: the commitment of SPREP to take on the responsibility of overall management and coordination of the SWFDDP; completion of a full and independent evaluation of the project; and the participating NMHSs meeting the criteria set by the RSMT in 2013..

1. **OPENING**

1.1. The Director of Meteorology of Solomon Islands, Mr David Hiriasa acted as the Master of Ceremony and invited Mr Arona Ngari, Permanent Representative of the Cook Islands to say a prayer for a successful meeting.

1.2. Mr Chanel Iroi, Permanent Representative of Solomon Islands with WMO opened the meeting: He apologized for the late start and welcomed the participants on behalf of the Minister of Environment, Climate Change, Disaster Risk Reduction and Meteorology. He indicated that the meeting was to look at the project achievement in the Pacific and to find the way to inform the partners and to improve the severe weather forecasting in the region. He wished a good meeting and ensured that the Ministry team was at the disposal of the meeting to assist in any way possible.

1.3. Ms Haleh Kootval, Chief Public Weather Services at WMO, thanked the government of Solomon Islands and conveyed the best wishes of Professor Peterri Taalas, Secretary General of WMO for a successful meeting. She introduced her WMO colleagues, Mr Abdoulaye Harou, Chief Data Processing and Forecasting Systems and Anne-Claire Fontan, Scientific Officer with Tropical Cyclone Programme (TCP) and highlighted the fact that this meeting was organized jointly with the Tropical Cyclone Committee (TCC) meeting. She recalled that the SWFDDP was initiated in 2009, with the objective to improve forecasts and services to the public and Disaster Management Agencies (DMAs) and that a number of training sessions were conducted to build the capacity of participating NMHSs.

1.4. Ms Kootval indicated that this meeting is a milestone in the project to assess the past activities and to pave the way to the future. She noted that the meeting program is quite condensed and that one of the important things from WMO and partners is to hear from the participants on the progress achieved since the previous RSMT, held in Nadi, Fiji in 2013. She also wished for a very successful meeting.

1.5. Mr James Lunny, the Chair of the Regional Sub-project Management Team (RSMT), thanked the Government of Solomon Islands for hosting the meeting and WMO for supporting it. He informed the meeting that he will highlight the progress made since the last meeting in 2013, will update on MetConnect Pacific website and thanked NOAA/NWS and the Canada Government for funding the upgrade of the website and 2015 in-country training, respectively. He underlined the necessity to concentrate on the hard criteria established by the RSMT for the move to Phase IV, the operational phase. In addition, he indicated the meeting needed to address the sustainability issue related to the move to operations. He encouraged the participants to speak up and to have fun and looked forward to discussions over the next three days.

1.6. Dr Melchior Mataki, Permanent Secretary of Ministry of Environment, Climate Change, Disaster Management and Meteorology started his opening remarks by apologizing for the delay to get to the meeting place due to construction work which caused significant traffic jams. He ensured that the situation would improve the next day. He welcomed the participants on behalf of the Minister. He recalled that the SWFDDP has been in operation for a few years now and that it is important to look at the future of the Project which gives priority to forecasting the severe weather and facilitates the test for the usefulness of Global models in forecasting severe weather.

1.7. Dr Mataki also indicated that the Project is ambitious in improving the lead time of warnings, the interaction of NMHSs with the Media and DMA and in determining gaps. The project objectives also include the development of new products and the assessment of the usefulness and robustness of these products. The inclusion of DRR in the project underlines the importance of making the link between the NMHSs and the Disaster Management Offices for efficient decision-making. He indicated that SWFDDP products are useful to Solomon Islands which experiences heavy flooding and damaging winds and waves. He highlighted the importance of MetConnect Pacific as a one-stop-shop for high quality products and that the project improved the capability of NMHSs to provide accurate forecasts and warnings. The project has driven some of the developments in Solomon Islands.

1.8. Dr Mataki expressed, on behalf of Pacific area countries, his gratitude to WMO, Met Office UK, USA NOAA NWS, JMA, ECMWF, RSMC Wellington and the Bureau of Meteorology for the support they provide to the SWFDDP. He noted that there is a lot to be covered and encouraged the participants to review the progress since 2013 and to evaluate, discuss the strengths and weaknesses of the Project and to provide guidance for the move from the demonstration to operational phase. He challenged the participants to look at these aspects of the Project. He also encouraged WMO to provide resources to facilitate the provision of better forecasts and warnings.

1.9. Dr Mataki recalled asking Professor Peterri Taalas, when he was running for the Secretary-General position, what he will do for the Islands if he gets elected? He suggested that perhaps the answer to his question would come from this meeting deliberation. In closing, he wished for a good meeting.

2. ORGANIZATION OF THE MEETING

2.1 Review of the Agenda

2.1.1 The proposed agenda was reviewed and adopted with the inclusion of an Item 3.3 ‘Global/Regional Centres reports’ and item 3.4 ‘Case Study (TC Winston)’. The revised Agenda is available in Annex 1.

2.2 Working Arrangement

2.2.1 The participants agreed to start the meeting at 8:30 am and close at 4 pm. They have also agreed to break for Lunch at 12:30 pm with coffee breaks at 10 am and 3 pm.

2.2.2 The documents of the meeting are available on the following website:

http://www.wmo.int/pages/prog/www/swfdp/Meetings/SWDDP-RAV-TC16/DocPlan2.html

2.2.3 The list of participants is provided in Annex 2

3. FULL EVALUATION OF THE SWFDP FOR SOUTH PACIFIC

3.1 Summary from the progress reports

3.1.1 Mr Lunny gave a brief overview of the SWFDP. He recalled the vision of SWFDP as established by Congress and the main goals of the SWFDP. The vision reads as follows: "NMHSs in developing countries are able to implement and maintain reliable and effective routine forecasting and severe weather warning programmes through enhanced use of NWP products and delivery of timely and authoritative forecasts and early warnings, thereby contributing to reducing the risk of disasters from natural hazards."(World Meteorological Congress, 2007 and 2011). He also highlighted the three key goals, namely: a) Improve Severe Weather Forecasting; b) Improve lead-time of Warnings and; c) Improve interaction of NMHSs with users (media; disaster management; and civil protection authorities)

3.1.2 Mr Lunny explained that the SWFDP uses the cascading forecasting process which allows Global Centres to feed information to Regional Centres which, in turn, provide guidance to NMHSs so that they can issue warnings. In the South Pacific, Met Connect Pacific, a password protected website, acts as a central location for global and regional NWP, guidance and observations relevant to the Project.

3.1.3 Mr Lunny recalled that some participants who attended the meeting in 2013 and were key figures in the SWFDDP have since retired, namely Peter Chen, Steve Ready and Alipate Waqaicelua. He briefed on various activities of SWFDDP and recalled a non-exhaustive list of severe weather events that occurred in the region between 2013 and 2016:

a) TC Ian – Tonga (10-11 Jan 2014) – 1 death;
b) TC Lusi – Vanuatu (9-11 Mar 2014) – 10 deaths;
c) Heavy rain (pre-TC Ita) – Solomon Islands (Apr 2014) – 22 deaths;
d) TC Pam – Vanuatu (Mar 2015) – 11 deaths;
e) Large waves in Kiribati & Tuvalu (inundation & erosion);
f) Large Waves – Kiribati (Jan 2016) – 4 deaths and; and
g) TC Winston – Fiji (Feb 2016) – 44 deaths

3.1.4 Mr Lunny also informed the participants that MCP was upgraded in 2014 through funding from US NOAA NWS and that there were in country trainings in Samoa Mar 2015, Fiji & Kiribati (April 2015), Tonga & Tuvalu (Sept 2015) and Solomon Islands and Vanuatu (Oct 2015). These trainings were made possible through funding from the government of Canada with in kind contribution from Met Office UK & MetService and the focus was on forecasting & PWS. Logistical constraints meant training in Niue and the Cook Islands were postponed, and are now being scheduled for late 2016.

3.1.5 Mr Lunny noted that other activities within the region, not directly connected to the SWFDDP, were in fact helping to achieve the goals of the Project. For example, media training organized by SPREP through the FINPAC Project during 2015 aimed at improving the communication of weather warnings from Pacific Island NMHSs to the public.

3.1.6 Mr Lunny highlighted the role and responsibilities of Global Centres and of the new Regional Severe Weather Forecasting Centres defined in the new Manual of GDPFS which will be tabled for endorsement at the 16th Session of the Commission for Basic System (CBS-16) to

be held in November 2016 in China. The features of these centres are provided in Annex 3. The meeting noted that, once endorsed by CBS-16, the Manual will be recommended to the next session of the WMO Executive Council (EC-69) for its approval for publication.

3.1.7 He also recalled the project evaluation criteria (see Annex 4a). He informed the meeting that he will provide an assessment of the previous reports (received since 2013 ie Progress reports 8,9,10 and 11) and will focus on the compliance of NMHSs with regard the identified criteria (see Annex 4b: RSMT Doc. 3.1(1) 'SUMMARY FROM THE PROGRESS REPORTS' for details).

3.1.8 The summary of compliance (ignoring partial compliance) shows that for reports 8, 9 and 10 things were improving or maintaining the status quo, but there is evidence of a significant drop in compliance in report 11. He noted that the completion of progress reports was not optimal in that they did not always include evidence of interaction with DMCPAs, public and the media (however, subsequent presentations made at the meeting did show that such interactions were taking place in most of the countries). Mr Lunny reported that eight case studies were received and recently posted on MCP. Over the four progress reports, only three countries provided case studies, although some may have done them but did not share them.

3.1.9 The presentation by the Chair generated discussion on the adequacy of the current method of reporting progress which did not capture a number of activities related to the criteria established by the RSMT in 2013. The meeting noted that a number of countries have established Facebook pages highlighting the importance of social media in sharing information. It also noted the desire for the NMHSs to have frequent exchange with the RSMC Wellington instead of the current method where exchange is made only close to the period of reporting progress. A suggestion for a monthly exchange using technology was put forth and it was agreed to have it as a recommendation. Mr Lunny informed the meeting that he, and a colleague from the SWFDP South Africa, were assigned a task to look at the SWFDP database, developed by WMO to facilitate the reporting, to see how it could be improved. He indicated that the solution may reside there.

3.1.10 Mr Lunny also clarified that the recent Lightning Detection Network initiated by New Zealand, was a separate project from the SWFDDP and its outputs were deemed to be useful information that can be accessed through the MCP via an externally protected website.

3.1.11 The SPREP representative thanked the Chair for recognizing the 2015 media training, contracted by SPREP through the FINPAC Project, as contributing to the objective of the SWFDDP and further provided a briefing on their initiatives working with NMHSs. SPREP has been working under different initiatives to assist the NMHSs communicate better with communities. Under the media training funded by FINPAC, the NMHSs are taken through sessions on how to effectively engage the different media outlets as well as work with the NMHSs to develop practical media plans. The workshops also provide technical training/awareness to the national media community on the different weather related hazards and allowed a dialogue between the two communities on how they can improve their working relationship to provide better information for the communities. One of the important activities in this training is working together to simplify technical meteorological terminology used in day-to-day forecasts or during warnings for severe weather events.

3.1.12 SPREPs other initiative consists of engaging NMHSs to work with the National Red Cross Societies in their countries to deliver important information to communities. Some NMHSs have indicated that they would like to formalize this relationship with MoUs to allow National

Red Cross Societies to be their voice in the communities and help explain the different warnings provided by the NMHSs.

3.1.13 Under the FINPAC Project and the Canada Project with WMO, SPREP is working with eight NMHSs and their national Red Cross Societies in the region to demonstrate with communities through small projects how weather and climate information can be used for decision making. SPREP cited as an example an initiative in the Solomon Islands to work in a community to build a low cost noticeboard (to pin up warnings) that will also have different coloured lights and powered by a Solar Panel to indicate to the community what type of warning is current.This project will however wrap up at the end of 2016.

3.1.14 Mr Harou summarized the key decions/directions from the meeting of the Steering Group of SWFDP (SG-SWFDP) (March 2016) and from EC-68 (June 2016). Mr Harou reported that the SG-SWFDP, noted that impact-based forecasting is better addressed at the national level and decided that it is important for the Strategy of SWFDP to support the development of impact-based forecasting and Risk-Based warnings. The Steering Group also recognized the challenge in the transfer of overall Management and coordination of SWFDP to a regional entity, noting that there may not be a Regional entity in all SWFDP regions and recommended to strengthen the relationship with the Regional Association and the WMO Regional Office.

3.1.15 Mr Harou also informed the meeting that the 68th Executive Council (EC-68) Session approved critical elements for consolidating the SWFDP into Global Sustainable Operational Services; these elements can be viewed in Annex 5.

3.2 SWFDDP achievements and gaps against the criteria for SWFDDP progressing to phase 4

3.2.1 The SWFDDP members presented their progress on their involvement within the SWFDDPwith focus on the criteria established by the RSMT in 2013 (see Annex 4).

Solomon Islands

3.2.2 The verification results were submitted to RSMC Wellington (New Zealand) and include the SPG charts, SWFDDP thresholds noting that although the wind threshold is over 25kts, only the threshold of wind over 30kts is verified. The meeting noted that two forecasters are assigned to the verification task and that warning thresholds were as follows:

a) Large swells for all Solomon Islands area water North of 12.5 South: ≥2.5m expected between 48 and 72 H will result in swell advisories (ie targeting atolls, low lying islands and flat coasts)
b) Heavy rain ≥100MM/48-72H for heavy rain alert and heavy rain ≥ 100MM/24H resulting in heavy rain warning
c) Strong to near gale force winds ≥25 kts within 48-72H resulting in strong winds or near gale advisory
d) Winds >33 kts with 24H will result in Gale warning

3.2.3 Solomon Islands Meteorological Service (SIMS) reported the relationship with the other agencies such as the media, police, NDMO, Red Cross and tourism was good: the SIMS

attended joint workshops such as the workshop on marine services, on Tsunami, on TC review and the Media (FINPAC/SPREP). All these workshops took place in 2015. In addition, the SIMS created a Committee on TC and Tsunami warning and established a dedicated HF radio (funded by Japan) for use during severe weather events and Tsunami. The Police, SIBC, NDMO and SIMS forecasters are therefore connected. Communication with the public is facilitated with a toll free phone, a website and the creation of facebook site. Communication with disaster management is excellent with positive feedback. NDMO issues a ."what to do information statement" along with SIMS warnings.

3.2.4 MetConnect Pacific is a key forecasting tool (David Grant's extra comments). Great benefits are drawn from the site. Efforts were made to install a manned station in areas prone to the genesis of severe weather as well as a number of automatic weather stations.

Vanuatu

3.2.5 The Vanuatu Meteorological and Geo-hazard department (VMGD) reported that they are a bit behind in term of reporting and that severe weather forecast. Three days Severe weather forecasts are made twice a day. Link with DMO is strong as they are in the same building. Verification of forecasts was not up to date and was made on an ad hoc basis depending on the workload. There is, however, room for improvement within this project. Under the FINPAC Project, the VMGD organized two workshops with stakeholders to explain what it does and how to interpret its information. Although progress reports were not submitted, VMGD confirmed that tools are adequate in helping forecasters to provide forecasts and Warnings. Metconnect Pacific is definitively a vital tool in assisting with the provision of forecasts and warnings.

Kiribati

3.2.6 The Kiribati Meteorological Service (KMS) was moved to the Office of "Te Beretitenti" (President) where Disaster Management Department and Climate Change Coordination office are located. The public weather forecast programme started in mid 2014 with 3 Forecasters covering 12 hrs shifts. Forecasts are available on KMS website (www.met.gov.ki), send to media (not including television) and all concerned sectors in the country. Only Advisories are issued to avoid impact of false alarms and to not scare people as KMS recently provides national Public Weather Forecasts and no longer depend on what Fiji Meteorological Service (FMS) prepared, except for TC warnings). One of the reasons of issuing only advisories is that, in the native language, both warning and advisory are the same. The service is appreciated by the public.

3.2.7 KMS shared a couple of examples of good performance related to two events of extreme spring tide which coincided with swell from 20 to 23rd January 2015 and on 9 January, 2016. The meeting noted that, for the first event, advisories were issued on 18th of January, two days before the event which resulted in damaging floods and evacuation from some areas including the Hospital in Betio in the Capital Island Tarawa. The second event, a situation of swell combined with tide and strong wind, was also well forecast with an advisory on strong wind issued as early as the January 1st 2016 with addition of swell advisories from January 6th 2016 until the onset of the event which resulted in 4 deaths. The Severe weather tools are very important for the forecasters but there is a need to incorporate suitable impacts forecasting. An assessment for users interest in the KMS information was done through email and workshops where Forecasters were being invited to explain products.

3.2.8 KMS requested that consideration be given to a work attachment or revolving Forecasters to be part of training program under SWFDDP. KMS also commented that some warning criteria under SPG are quite difficult to apply in Kiribati context. For example an information on the wave height in the order of 2.5-3 meters, may get people confused as their island is just 2 or 3 meters above mean sea level therefore this criteria need to be discussed with RSMC Nadi.. The meeting noted that KMS was also involved in SPREP and WMO Projects such as Enhancing community Early Warning System under FINPAC project and Conducting National Climate Outlook Forum (NCOF).

FIJI

3.2.9 The Fiji Meteorological Service (FMS) reported that Non TC products are used and warnings issued for events that will occur within 24hr. Heavy rain warning is for 100mm/48 -72 hr and wave of 4m or more implies warnings. Temperature less than 20 is cool and warning is issued. FMS uses models available in SWFDDP page and the ECMWF Extreme Forecast Index (EFI). Meteograms are also used heavily in the provision of forecasts in various locations based on EPSgrams of ECMWF. The meeting noted that there is a good relationship with DMO and the Public tunes in to FMS information and provided good feedback on their services.

3.2.10 The meeting noted the establishment of the Disaster Council where severe weather information is shared and discussed. The Council includes the Military, NGOs, Red Cross etc. The minister is briefed in case of emergencies. FMS attends every provincial meeting to educate users on the meaning of warnings they issue. Information is sent to news agencies and the local media. In terms of verification, there is room for improvement. As to Case Studies FMS is working on them and will provide a presentation on TC Winston. MetConnect Pacific does a marvelous job and information from the site is also used to provide briefings.

3.2.11 Mike Bergin (Chair of TCC) noted that presentations received so far, showed that there is a strong evidence of the value of the SWFDDP and that the progress made to date was remarkable. In addition he commented that perhaps the current way of reporting does not encapsulate well the benefits of the project.

Tuvalu

3.2.12 The meeting was informed that the Tuvalu Meteorological Service (TMS) received in country training in sept 2015 and that the JMA Himawari Satellite receiver was installed in December 2015, providing high resolution images every 10min with automatic refresh. Training on the use of the system was conducted in January 2016 and the staff received their training on the use of products in June 2016. They, however, have challenges which include new staff with limited experience and increasing demands for improved monitoring. The meeting noted the following Gaps & future needs: improved service delivery and quality, strengthening of capacity development, improved communication and early warning systems, maintaining high standard for observation data and securing a backup system. It was reported that dialogue with NDMO is good as TMS is involved in workshops, meetings and awareness projects. Internet connection remains a challenge although for the time being they were able to have a piece of GNSS VSAT system. The meeting also noted that warning of Swell use a threshold of 2.5 m and wind threshold is 30 kts. The SPG is used to guide the swell forecast.

Tonga

3.2.13 The meeting noted that warnings were sent to RSMC Wellington in terms of non TC related warnings for automatic switching to the GTS but not in the correct format set for the SWFDDP reporting. Progress reports were, however, sent in the required SWFDDP format. It was also noted that the collaboration with National Emergency Management Office (NEMO) in case of severe weather events was good and media briefings, release and of warnings are made in consultation with the National Emergency Management Council for decision making. There are plans to change headers of bulletins which contain non-TC severe weather warnings to ""Severe Weather Bulletin". Verification form to be completed on a daily basis by duty forecasters and quality checked/ controlled by the Chief before being sent to Wellington at the end of each of the verification month. Tonga supported the continuance of the project as it has helped improve capacity in responding to severe weather.

3.2.14 The meeting also noted that a VHF radio network has been established between the Tonga Meteorological Service, the Tonga Broadcasting commission, the NEMO, the Geological Survey Unit (GSU) and the local FM radio station which has greatly enhanced responding to severe weather events. Procedure for warning including criteria are formulated by Meteorological Service and approved by the National Emergency Management Committee (NEMC) which is responsible for establishing disaster management Policies. Any change in criteria must be approved by the NEMC.

3.2.15 The meeting was informed that there is a National Disaster Management Act enacted in 2007 and that a draft of Meteorology Bill 2016 is in preparation and will be submitted to the Government Law Committee by Sept 2016, and subsequently to Parliament for enactment. The Bill will give power to the Met Service to make procedures as well as advise actions to be taken during severe weather warnings events.

3.2.16 The Tonga Meteorological Service reported that the primary platform for forecasters is the MetConnect Pacific website for daily discussion and tools to assist with their work. The Meteorological Service supports the continuation of the project and informed the meeting that a new office is being built to house the Met Service and the Disaster Management Office and extended an invitation to possibly hold the next RSMT meeting in Tonga at the new facility. The new office is funded through a Resilience building partnership between Tonga and the World Bank which focus mostly on Early warning and disaster risk financing. It was reported that Impact-based forecasting is being developed in collaboration with various agencies under this project and an upgrade to the HF Radio capabilities within Tonga, among other upgrades. The meeting noted, that in terms of early warning, reaching the last mile in early warning is still a challenge and a grant aid project with Japan is under negotiations to establish a community alert FM radio (similar to NOAA weather Radio) in 2018.

3.2.17 Tonga acknowledged the support of JMA and JICA in building of capacity to respond to severe weather especially through the supply and installation of a Himawari-8 satellite receiver and training as well as the supply of SATAID which has been used operationally by the Tonga Met Service for tropical Cyclone forecasting.

3.2.18 Tonga highlighted as well the need for further research on storm surge and coastal inundation and for more support for operational staff to carryout research.

Niue

3.2.19 The meeting was informed that warnings, not related to TCs, for Niue, was issued by RSMC Nadi. Niue Meteorological Service (NMS) uses Met Connect South Pacific Guidance for Severe Weather Forecasting mainly for Heavy Swells, an information that can help fishermen with their planning before heading out to sea. Fishing is a source of subsistence living and generates income for families.

3.2.20 Severe Weather Warnings are incorporated into the daily weather forecast, using this platform to reach users. The dissemination is made via email as most people in Niue are connected to the internet via WiFi or ADSL. The email recipients are government staff and Officials, Chamber, Weather Group, Village Councils, Private Sector and Civil Society. Once the users receive the message it then becomes their responsibility to take action using their sector Disaster Plans. The Broadcasting Corporation of Niue (BCN) broadcast weather information via radio. There is no cost in announcing weather forecast that contains severe weather warning. There is no other body that needs to endorse the information before it goes out to the public. The only time the Niue Disaster Council is activated is when this body is advised by Director of Niue Met Service of a need to hold a meeting to discuss potential threat of any severe weather to lives and property.

3.2.21 The Niue Meteorological Service also provides severe weather information through a graphical presentation televised by BCN. This medium is highly commended because people can relate well to pictures and it reaches others who are not connected to the internet especially elders. The graphical presentation is only done from Mondays to Thursdays because Niue only works 4 days a week. There is a dedicated staff member who is responsible for recording and providing a progress report on the verification of the SWFDDP in Niue. He commented that a verification tool was given to all NMS to fill in on a daily basis. Niue Met was having problems at first filling the tables especially with correct negatives. Guidance was later received by Mr Lunny explaining in detail how to fill in the tables. Verification was sent to RSMC Wellington with the progress reports through endorsement of the Director.

3.2.22 In terms of training activities, the Niue Meteorological Service anticipated and looked forward for the In-country training that was supposed to take place in November 2015. The hope that this training will be available for Niue possibly in March 2017. This will help address some of our queries. [Secretariat note: a conversation between Mr Harou (WMO) and Ms Mitiepo (Niue) and Mr Ngari (Cook Island) resulted in an agreement to have in country training on 1-5 November 2016 in Niue and on 7-11 Nov in Cook Island]

3.2.23 In terms of case studies, Niue is yet to submit any case study. Report was compiled after each cyclone in the vicinity for the 2015/2016 cyclone season. The relationship with the Disaster management has been positive and cooperative as it was seen in the last cyclone seasons 2015 to 2016. Evidence of interaction is via email correspondence mainly between the Director and the Niue Disaster Council as Niue Met sits in the executive panel of the Council, phone conversations and Council meetings. The Meteorological service is also able to hook up to the Police radio channel and to hear ongoing communications e.g. Clearing fallen trees on public roads. The Service also had an opportunity to be escorted by Police to go around the island to assess the weather conditions. The council is guided by advice from Niue Met Service. The Disaster Council comprises of the NDMO, Secretary to Government, Police and Met Service.

3.2.24 The Meeting noted the participation of the Met Service in an in-country Media Training workshop conducted by SPREP via Finpac funding and the use of Niue Climate Outlook, which is the monthly newsletter to include some of the severe events that happened such as those from Tropical Cyclones. There is also a Climate Service Communication plan, but there is interest to to extend it to cover forecasting and other services.

Samoa

3.2.25 The Representative of Samoa thanked the Chair of RSMT for the opportunity to talk about the SWFDDP in relation to their daily routine forecasting service. The meeting learned that the relationship between Samoan forecasters and the SWFDDP project is very strong. SWFDDP products are used on a daily basis. It is very useful to them when the forecasters at Wellington provide information even if they indicate that the confidence is low. Great attention is paid to the products when the confidence is moderate to high noting that forecasters are aware that the high confidence doesn't mean necessarily that the event will occur.

3.2.26 The meeting was informed that a Non-TC warning system is in place. Heavy rain warning (>5.0 mm/Hrs OR > 50mm/Day) and wind advisory for sustained winds of more than 25 knots. Coastal flood advisories of coastal areas due to high surfs and waves (> 10 feet swells) are also issued. The main issue is the lack of ocean/wave observations to verify the forecasts. The meeting noted that the Met service is planning to introduce severe thunderstorms and lightning warnings not related to TC. This will depend on the availability of the technology (radar and lightning detectors).

3.2.27 Samoa continued to report forecasts and warnings in the recommended format and works closely with the Disaster Management Office to verify the forecast and warnings products. The meeting noted that the challenge is the delay in reporting from the NDMO in terms of damage assessments of severe events which caused delay in reporting over the past years. The Forecasters are responsible for providing at least one case study each year and a case of Heavy rain and Flood was submitted in January 2014. A Second case study is in progress for TC Tuni which occurred Nov 23 to Dec 2, 2015 and which forced the Samoa Met Service to issue 10 Special Weather Bulletins (SWBs).

3.2.28 The relationship and collaboration with NDMO was improved in terms of reporting and verification. The meeting noted that the relationship with the media and all responsible agencies during severe events was also improved. Awareness programme has been implemented in collaboration with media and NDMO. A Disaster Advisory Committee (DAC) composed of responsible government ministries and agencies was established. The meeting also noted that the Samoa Met Service will be part of the launching of a Regional Project, “Methodology for storm surge/wave hazard forecasting in SIDSs”, with funding from the Ministry of Environment of Japan. An inception workshop for this Project will be held in Fiji on September 16, 2016.

Cook Islands

3.2.29 The meeting was informed that the country is composed of 15 islands and its Met Service has 10 staff. In country training in SWFDDP and visits to rural areas were conducted. IOC conducted an SOP training to complement the PTWC Information Statement pertaining to tsunamis.

3.2.30 An in-country media training was conducted in close collaboration with SPREP to enhance the capability of CIMS to convey reliable information to communities. This process was tested in a rural area and promoted in other rural communities.

3.2.31 The Climate Information and Early Warning System (CLEWS) was ns approved recently where 10 automatic weather stations will be installed on 10 islands so as to report weather observations as part of the WMO Regional Basic Synoptic Network. It is envisaged that this will also provide aviation weather reports for domestic and international airlines.

3.2.32 CIMS provide a weather presentation on television both for routine and warning periods. This service reaches the outer islands as well as radio broadcasts via FM radio.

3.2.33 CIMS recently commissioned its website (www.met.gov.ck) and has added a facebook to this so as to convey weather information to communities as soon as possible. Recent monitoring of this service has proven the potential of this service to expand and promote the visibility of CIMS.

3.3 Global and Regional Centres Reports

3.3.1 The chair introduced the text in the new manual of GDPFS highlighting the responsibilities of the Global Centres. He informed the meeting that ECMWF will have a meeting of their council next year (2017) and will need to address its support to SWFDPs once the projects are deemed to have transferred from the demonstration to the operational phase. ECMWF's commitment has been for support through the demonstration phase and approval from the council is needed to continue the support in to operations.

RSMC Wellington

3.3.2 The meeting was informed, during 2015, MetService staff along with a PWS experts from the Met Office UK delivered in-country SWFDDP training for a number of Pacific Island nations as follows:

a) April 2015 - Fiji and Kiribati;
b) September 2015 - Tonga and Tuvalu; and
c) October 2015 - Solomon Islands and Vanuatu

3.3.3 The meeting acknowledged WMO for organization of the training, the Government of Canada for funding, and in-kind contributions by both MetService and Met Office staff to prepare for and deliver the training.

3.3.4 MetService has continued to maintain and upgrade the MetConnect Pacific website over the last three years. Upgrades and additions to the website have included:

a) Extension of the SWFDDP domain northwards to 5° North;
b) Launch of the upgraded MetConnect Pacific website in August 2014 including:
   ◦New graphics/branding and updated navigation;
c) Met Office UK ensemble and RSMC Darwin ACCESS-TC products; and
d) Availability of historic SPG, Met Office and RSMC Darwin charts via a date picker function

e) New MOGREPS-G products from Met Office UK including TC Tracks and forecast tropical storm activity for both existing and forming storms;
f) Updated satellite imagery from Himawari-8 (hourly, including; visible, infrared colour, infrared black & white, and water vapour imagery) covering the South Pacific;
g) Inclusion of extra links to useful external content including: ◦Bureau of Meteorology commentary/advice, specifically; Weekly Tropical Climate Note, ENSO Wrap-up and Madden-Julian Oscillation (MJO) info;
h) Himawari-8 imagery via the Meteorological Satellite Center (MSC) of JMA at 10min interval for the South Pacific; and
i) Surface analysis and streamline charts from the US NWS WFO in Honolulu

3.3.5 The meeting noted that, in addition to the upgrades highlighted above, MetService is currently working with TOA Systems Inc. to enhance their Global Lightning Detection Network by establishing a Southwest Pacific Lightning Detection Network. Initially, during phase one of the project, a subnetwork will be established with sensors installed in Niue, Samoa, Tokelau, Fiji, Tonga, Cook Islands and New Zealand. A second phase of the project is planned for sensor installation in a number of other island nations as far west as Papua New Guinea and as far east as Pitcairn Island. A lightning map will be made available on MetConnect Pacific for all participating countries, with phase one expected to be complete in Q4 2016.

3.3.6 The meeting and, in particular the MetService, acknowledged the support provided by the US NOAA NWS for funding the upgrades to the MetConnect Pacific website in 2014, and the generosity and support of TOA Systems Inc. to enable the establishment of phase one of the Southwest Pacific Lightning Detection Network.

3.3.7 RSMC Wellington reported that besides meeting the criteria for progression to the next phase of the project as agreed at the SWFDDP RSMT meeting in Nadi, 26-29 August 2013, there are a number of challenges for progression and for the long term sustainability of the SWFDDP. These include:

a) Operational Time: Wellington will continue to produce the South Pacific Guidance but is unable to absorb additional commitments such as expansion of the forecast domain, a.k.a. the “South Pacific Window”. Forecaster bench time is already at capacity and this is not expected to change.
b) MetConnect Pacific website: While Wellington will maintain the MetConnect Pacific website, any significant enhancements or upgrades are likely to require funding assistance.
c) Training: In-country training requires a significant investment of (operational) staff time, both for preparation and travel, placing pressure on other operational staff and domestic commitments. To date, staff time costs have been met by an in-kind contribution by MetService but budget and staffing constraints continue to make this increasingly difficult and future in-country training will require funding assistance.
d) Project Management: to date there is no clear guidance or plan for the ongoing management of the project, including funding and reporting. Ongoing project evaluations and reports will be essential to ensure the project remains relevant for the Pacific Island users, particularly as skills, knowledge and technology improve across the region.

Meteo-France

3.3.8 In November 2010 Météo-France decided to make a contribution to SWFDDP in the South Pacific, by developping a private website based on the one made for RSMC la Reunion. The development of this website encountered some technical difficulties (english translation, 180°...) and legal verifications (access rights, terms of use...) and remains under construction. The intention was to link it to www.swfddp.metservice.com and to provide data from deterministic model (Aladin), ensemble predictions (PEARP, IFS EPS) and swell forecast.

3.3.9 The meeting noted, however, some progress in the modelling area; a new high resolution deterministic model, Arome, developed by Météo-France is operationnal in New Caledonia and French Polynesia. Plans are to retire Aladin (replaced by Arome) in January 2017. The swell model MFWAM high resolution (0.1°) will, then, be forced by Arome-IFS instead of Aladin. Consequently, Météo-France will explore the possibility of providing data from Arome if the project finds an interest (small domains over New Caledonia and French Polynesia), if not Arpege could be used. The ensemble prediction would be based on Arpege (PEARP) and the swell model MFWAM. In conclusion, Météo-France will work in 2016 to develop an extranet website, which could be available early in 2017.

BOM

3.3.10 The meeting noted that, since the last RSMT Meeting in 2013, the Bureau of Meteorology (BoM) had contributed the following to the SWFDDP MetConnect Pacific website:

a) Added links on the Darwin RSMC Registered Users Page to the Weekly Tropical Climate Note, ENSO Wrap-up and the current status of the Madden-Julian Oscillation (MJO);
b) Provided ACCESS-TC guidance for tropical cyclones in the South Pacific, including central pressure and maximum wind prognosis out to 72 hours; and
c) Provided higher resolution ACCESS-G guidance (to 25km) for various parameters and levels in the South Pacific, including wind, precipitation and MSLP.

3.3.11 It was reported that the following upgrades to the ACCESS model should become available on the SWFDDP MetConnect Pacific website in the next 1-2 years, including:

a) Deterministic, global (ACCESS-G) resolution to potentially increase to 17km and provide 40km resolution ensemble guidance with 23 members in 2017; and
b) ACCESS-TC resolution to increase to 4km.

3.3.12 The upgrades to the ACCESS guidance will be taking place due to a new supercomputer purchased by the BoM, named Australis. It was noted that the WMO Southern Hemisphere Tropical Cyclone Training Workshops provided by the BoM (FMS, Nadi in 2013 and BoM, Melbourne in 2015), yielded the following for the SWFDDP:

a) Made attendees aware of the website and how to utilise some of the products and guidance, both before and during an event.
b) Attendees were trained on some of the ECMWF deterministic and ensemble products that are available.

JMA

3.3.13 Mr. Murata, of the Meteorological Satellite Center, Japan Meteorological Agency (JMA), presented JMA's contribution to the Project as a global center that provides meteorological satellite and numerical weather prediction (NWP) products.

3.3.14 Main updates on NWP since the last RSMT meeting in 2013 included the upgrade of JMA's Global Spectral Model (GSM) and the Ensemble Prediction System (EPS), which increased the EPS product update frequency from once a day to twice a day, and the enhancement of wave prediction systems. JMA started to operate the Wave Ensemble System (WENS) in June 2016, in addition to the existing Global Wave Model (GWM), whose products are planned to be made available for the Project in the second quarter of 2017. The new products are ensemble mean, 3rd quantile, maximum wave heights, probability of wave height over 2, 3, 4, 5, 6 m, ensemble spread and box plot and exceeding probability at stations (as map products), and windsea height, period, direction and swell height, period, direction (GRIB format model outputs).

3.3.15 Mr. Murata also presented updates on JMA's Himawari-8 satellite and its products, launched 7 October 2014 and started operation on 7 July 2015, having replaced MTSAT-2. Observation capabilities, especially the spatial and temporal resolutions were significantly enhanced, as well as spectral bands, which were increased from 5 to 16. Accordingly, data and products distribution/dissemination services were enhanced, now with four main channels: HimawariCloud, HimawariCast, GISC Tokyo WIS Portal and web-based quick look, to meet a wide range of user needs. JMA is also coordinating projects with WMO and JICA to install HimawariCast receiving systems in National Meteorological and Hydrological Services (NMHSs) followed by on-site training events, for the purpose of ensuring reception and the use of satellite imagery for the operational meteorological services even in an unstable internet environment. Mr. Murata introduced JMA's satellite-related activities, including the SATellite Animation and Interactive Diagnosis (SATAID) application service and new Himawari-8 products such as RGB imagery.

3.3.16 Mr. Koide presented JMA's training activities that are and would potentially be in the future, part of JMA's contribution to the Project. He showed examples of regular training events, including the Japan International Cooperation Agency's group training course, the Typhoon Committee's Regional Specialized Meteorological Centre (RSMC) attachment training and training events of the Asia Oceania Meteorological Satellite Users' Conference (AOMSUC). Mr. Koide also presented ongoing project-based training events in the pacific island region, focusing on meteorological instruments maintenance and calibration, and use of Himawari-8 products. Participation from the SWFDDP participating Members to JMA's training events are welcome, while coordination is necessary for some events.

Met Office UK

3.3.17 The Met Office reported that it has participated in the demonstration project as a global data provider ("global centre") of deterministic products already available via the GTS. Products from the Global component of the Met Office Global Regional Ensemble Prediction System (MOGREPS-G) are currently supplied in .jpeg format via FTP: EPS meteograms, precipitation and wind probability charts and 500hPa spaghetti charts. A data license stipulates that the products are only to be used in support of the aims of the project.

3.3.18 The meeting was informed that the Met Office is willing to respond to user request for additional parameters from MOGREPS-G on a best endeavours basis. It is also willing to contribute support (staff and facilitated e-learning resources and expertise) to the sub-project's training activities. The following SWFDDP-RAV training workshops were successfully conducted by UK Met Office Civil Contingencies Advisors:

a) April 2015: Fiji and Kiribati
b) August / September 2015:Tonga and Tuvalu
c) October 2015: Solomon Islands and Vanuatu

3.3.19 The Met Office encouraged feedback on the progress made regarding any recommendations and actions agreed at the training workshops, so that the value of these initiatives can be estimated and so that the successes and progress made can be demonstrated more widely to stakeholders. It further encouraged all participating members of the SWFDDP-RAV to proactively provide the following:

a) Feedback (particularly strengths and weaknesses) on the performance of the participating centre's models;
b) Weather case-studies for the purposes of model verification and future training activities;
c) Documented case-studies to include high-level testimonial evidence of the impact of the SWFDDP sub-project in terms of (i) increasing the forecast lead time of severe weather and; (ii) increasing the visibility/integration of the capabilities of the NMHS with government and the civil protection agencies. Such evidence is crucial if the project is to build sustainable capacity whilst also attracting future resource mobilisation opportunities.

3.4 Case Study (TC Winston (Fiji)

3.4.1 Fiji presented a case study on TC Winston that devastated parts of Fiji in February 2016. The cyclone produced serious inundation from waves and storm surge. The majority of the 44 deaths were from the resulting inundation.

3.4.2 The discussion, following the presentation, focussed on the ongoing dangerous threat posed by storm surge to countries in the Region and the participants expressed a strong desire for enhancement of storm surge forecasting capability and services. The meeting identified sea inundation as a major issue requiring urgent attention and effort, including research and enhanced modelling. The meeting noted the recent revitalisation of the CIFDP-F but called for more resources to be directed towards addressing the problem of coastal inundation and in particular storm surge from tropical cyclones across the Region. The meeting suggested that the upcoming project Japan is planning around storm surge for several countries in the Region including Samoa could, perhaps, be a vehicle for further effort.

4. TRANSITION OF SWFDDP TO THE NEXT PHASE

4.1 The meeting recalled that its objectives were to:

a) Review compliance with criteria established by the RSMT in August 2013 to inform a decision to move the Project to the "operational phase" (Phase 4).

This review was based on the assessment of the six-monthly progress reports produced by the member countries since August 2013; and

b) Address the issue of sustainability of the project; in particular, to identify a regional entity that will be responsible for the Management of the SWFDDP (coordination of: training; reporting; meetings; and resource mobilization).

The meeting agreed to form two sub-groups to address separately the issues of reporting and the issue of the transfer of SWFDDP responsibilities to an entity in the Region. The groups were asked to bring the results of their discussions to plenary. The following are the results of discussions in plenary; these recommendations will be passed to the RAV MG.

4.2 Options for reporting to improve achievement of the criteria set in 2013

4.2.1 The meeting found that, through the presentations of the participating countries, a lot of good work was done in relation to the criteria established by the RSMT in 2013 and this was not necessarily reflected in the countries regular progress reports. This triggered discussions around the adequacy of the current six-monthly progress reporting.

4.2.2 The small group to address the issue of progress reporting, reported the following from their discussion:

a) To implement an application/adoption of an interactive platform (eg, zoom meeting room software) to carryout monthly meetings/reporting/discussions through this medium platform.
b) The group was eager to give it a trial period and to provide further feedback to the project.
c) Most of the operational forecasters are involved in this group and the views is of vital importance for reporting and discussions.
d) Disseminate the monthly reports prior to the zoom forum taking place.
e) Proposed these discussions to be held on a monthly basis between NMHSs and RSMC Wellington, and responsibility for organizing etc rotates between participating NMHSs
f) A point was raised to adopt the COSPPAC teleconference platform as an alternative of which is in the planning process to be handed over to SPREP anytime soon. Merge with Climate Section on reporting. Climate reporting first and then forecasters' session.
g) The need to amend the existing reporting templates,
h) Simplified to a monthly
i) A more simplified tabulated checklist template for reporting.
j) Amend the existing templates used to reflect the one monthly reporting that we are proposing. 6 months is a bit longer and it's beneficial for us to report on a monthly basis.
k) Given the report is still being held on a 6 months we prefer to maintain this, but implement the monthly forum for discussions. This can reflect our relationship with our NDMOs through involving them as well.
l) Develop a shift communication log that we have in our Offices. NDMO can add to the reporting.
m) Consider a NMHSs severe weather reporting Award to each National Met Service who is competent and complying with reporting in their templates for

the one monthly progress. This promotes the Met Service and the capacity of the staff. Award, should be given to the best reporting Met Office in this project.

4.3 Proposal to the Management Group of RA V for transfer of SWFDDP to an entity in the Region

4.3.1 The group on the sustainability of the project recommended the following approach to address this issue:

SPREP to be the regional entity responsible for the management of the Project and that the Secretary-General of WMO and SPREP explore funding a position within SPREP to assist with this Management responsibility. The position would:

a) Be the regional focal point for the Project;
b) Be responsible for organizing SWFDDP meetings and training;
c) Collate and prepare the publication of national reports;
d) Perform resource mobilization;
e) Provide progress reports; and
f) Facilitate closer collaboration with other relevant panels/groups.

4.4 Requirement for a full and independent review of the SWFDDP

4.4.1 The discussions surrounding 4.2 and 4.3 above illustrated that a full and independent review is required of the SWFDDP in the South Pacific in order to truly evaluate the progress of the Project.

4.5 Regional Subproject Implementation Plan (RSIP)

4.5.1 This RSMT was shorter by one day than the previous meetings and as a result there was no discussion on updating the RSIP. It was decided the Chair would review the plan by the end of September 2016 and send out to the members for input.

5. ANY OTHER BUSINESS

5.1 No other business has been identified.

6. CONCLUSION AND RECOMMENDATIONS

6.1 The meeting unanimously agreed that the SWFDDP is making a difference in the region and that the website MetConnect Pacific is an excellent tool for the forecasters in providing severe weather forecasts and warnings. In terms of the project evaluation criteria (Annex 4), established by the RSMT in August 2013, the current progress reporting did not convey the true picture of countries activities.

6.2 Recognizing the need for a better way to capture the on-going work of participating NMHSs, it was recommended that there be a more frequent exchange between the participating NMHSs and RSMC Wellington. The RSMT recommended trialing a monthly exchange (this may be in the form of tele/video-conference) and requested WMO/US NOAA NWS to facilitate its implementation. This would be supplementary to the current six-monthly reporting. The chair reminded participants that Pacific Island forecasters are encouraged to phone the Lead

Forecaster at RSMC Wellington if he/she has a query. The chair stressed that RSMC Wellington's involvement in a monthly timetabled engagement would need to be agreed to by RSMC Wellington, bearing in mind that operational involvement is already at capacity.

6.3 Acknowledging the need to identify a regional entity to take on the responsibility to coordinate activities of the SWFDDP in Phase 4, the meeting recommended that:SPREP be the regional entity responsible for the Management of the project and that the Secretary-General of WMO and SPREP explore funding a position within SPREP to assist with this Management responsibility.

6.4 The meeting recommended that WMO undertake a full and independent review of the SWFDDP in the South Pacific in order to truly evaluate the progress of the Project.

6.5 The meeting decided that, pending the implementation of Recommendation 6.3 and 6.4 above, and for the participating NMHSs fulfilling the criteria set at the RSMT in Nadi, August 2013, the SWFDDP will maintain in the status quo and continue with the Demonstration Phase (Phase 3).

6.6 The Regional Subproject Implementation Plan (RSIP) will be reviewed by the chair (deadline suggested: 30 September 2016), with subsequent dissemination for further review thereafter.

6.7 Recognizing the threat posed by storm surge and sea inundation to countries in the Region, the meeting recommended actions be taken to enhance storm surge forecasting capability and to address sea inundation issues through research and enhanced modelling (including swell, wave period, storm surge, tide and bathymetry across the region).

6.8 The meeting agreed that the next RSMT meeting should be run back-to-back with the TCC at a location to be determined. Potentially the meeting could be held in Tonga in 2018. This has to be confirmed.

7. CLOSING

7.1 The Chairperson of the RSMT, Mr Lunny, expressed his appreciation to the participants for
their active contribution to the meeting as well as to the Solomon Islands Meteorological Service and staff for the excellent arrangements and hospitality they have put in place for a productive meeting. He also thanked the Government of Solomon Islands for hosting the meeting and US NOAA NWS for their significant financial contribution to the Project. He acknowledged the work of the WMO before and during the meeting. He wished a safe return home to all.

7.2 The meeting of the Regional Subproject Management Team (RSMT) for the SWFDDP South Pacific Islands closed at 15:30 on Saturday, 27 August 2016.

ANNEX 1

AGENDA

1. **OPENING**

2. ORGANIZATION OF THE MEETING

3. FULL EVALUATION OF THE SWFDP FOR SOUTH PACIFIC

3.1 Summary from the progress reports

3.2 SWFDDP achievements and gaps against the criteria for SWFDDP progressing to phase 4

- Cascading Forecasting Process: roles of participating countries
- Review non-TC warning system
- Verification of forecasts and warnings
- Case studies
- Review PWS component of the SWFDDP

3.3 Global and Regional Centres Reports

3.4 Case Study – TC Winston

4. TRANSITION OF SWFDDP TO THE NEXT PHASE

- Future of RSMT
- Progress reporting
- Synergy between SWFDDP and TCC in RA V
- Management and coordination
- Implementation Plan

5. ANY OTHER BUSINESS

6. CONCLUSION AND RECOMMENDATION

7. CLOSING

ANNEX 2

List of Participants

Name	City & Country	emails
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ANNEX 3

New Manual on GDPFS (WMO-No 485)

Role and Responsibilities of Global Centres

The Global Centre(s)

- to provide the other centres with medium-range NWP guidance and EPS output including probabilistic products specially adapted to the concerned severe weather event;
- to suggest suitable existing satellite imagery and satellite-based products that are helpful in assessing the current meteorological situation, and therefore also assess the quality of global NWP/EPS products;
- to evaluate the efficiency of products dedicated to medium-range severe weather forecasting through the feedback provided by the other centres.

Regional Severe Weather Forecasting Centres

- This activity includes networks of Regional Centre(s) and associated National Meteorological Centres (NMCs).
- Regional Centre(s) participating in activity of regional severe weather forecasting, shall:
  - Agree targeted severe events, phenomena, criteria for guidance and extent of regional domain with associated NMCs
  - Prepare, at least once per day, severe weather forecasting guidance products for associated NMCs containing an interpretation of deterministic NWP, EPS and remote sensing-based guidance products

ANNEX 4a

Project evaluation against SWFDDP criteria

The following is recommendation 6.7 made at the meeting of the RSMT for the SWFDDP for the South Pacific, Nadi, Fiji, 26-29 August 2013:

"6.7 The RSMT agreed on a set of criteria must be followed before the SWFDDP can be considered in Phase IV (refer to section 4). These criteria are:

- An appropriate non-TC warning system has been implemented in all participating countries and is operating smoothly.
- All participating countries are verifying severe weather and wave forecasts & warnings using the tool provided during the in-country training or an equivalent tool .
- All participating countries, in collaboration with their DMCPAs, produce at least one case study per year, using the SWFDDP template or an equivalent template (first one due by 30 June 2014).
- Demonstrate on a continual basis that the relationships between NMHSs and other Disaster Management and Civil Protection Authorities (DMCPAs), the media and the public are strong and healthy, with regular communications before, during and after severe weather events.
- All participating countries to complete all SWFDDP progress reports in full before the deadlines prescribed."

ANNEX 4b

SUMMARY FROM THE PROGRESS REPORTS (Doc 3.1(1))

1. OVERVIEW

The RSMT will review and discuss the Progress Reports of the SWFDDP, spanning the period from 1 October 2013 to 30 September 2015 (Progress Reports No. 8, 9, 10 and 11). Progress Report No. 12 (1 October 2015 to 31 March 2016) remains in a draft state and will not be included in the review.

The five main goals of the SWFDDP are:

- to improve the ability of NMHSs to forecast severe weather events;
- to improve the lead-time of alerting these events;
- to improve the interaction of NMHSs with Disaster Management and Civil Protection Authorities (DMCPAs) before, during and after severe weather events
- to identify gaps and areas for improvements; and
- to improve the skill of products from Global Centres and RSMCs through feedback from NMHSs.

The previous meeting of the RSMT (Nadi, Fiji, 26 – 29 August 2013) noted there were no hard criteria for the transition of the Project from Demonstration to the subsequent Phase IV, known as the “operational” or “continuing development phase”. The RSMT in Nadi (Aug 2013) agreed to the following set of criteria to be implemented by each participating NMHS:

- an appropriate non-TC warning system is implemented and operating smoothly;
- severe weather and wave forecasts & warnings are verified using the spreadsheet provided;
- all participating countries produce at least one case study per year;
- all participating countries to complete all SWFDDP progress reports in full before the deadlines prescribed (six monthly); and
- demonstrate on a continual basis that the relationships between NMHSs and Disaster
- Management and Civil Protection Authorities (DMCPAs), the media and the public are strong and healthy, with regular communications before, during and after severe weather events.

The RSMT will discuss and identify strengths and weaknesses in the progress made by the participating NMHSs in relation to the criteria, as well as the five main goals of the SWFDDP.

2. SWFDDP achievements and gaps against the criteria for SWFDDP progressing to phase 4

2.1 Appropriate non-TC warning system is implemented and operating smoothly

This first criterion requires NMHSs to demonstrate that their non-TC warning system is functioning smoothly. One aspect of quality management is to: 'say what you do and do what you say'. With this in mind, it was deemed beneficial if each NMHS described their non-TC warning system and a few of them did this. NMHSs should also provide evidence of their warning program by forwarding the alerts, warnings or advisories to RSMC Wellington. The second aspect of this criterion is to show that the system is working smoothly. What is required here is evidence of the interactions with their DMCPAs. In a smoothly functioning system the DMCPA should acknowledge receipt and respond to warnings. Evidence of that response is required.

In summary, the first aspect of this criterion is to inform RSMC Wellington of all non-TC warnings; the second aspect requires the NMHS to provide evidence of the interactions with the DMCPA. These aspects were achieved to varying degrees.

Fiji issues warnings for: Niue; Kiribati; Cook Islands; and Tuvalu, so all were considered compliant when NMHS Fiji forwarded warnings to RSMC Wellington (see Figures 1 and 2).

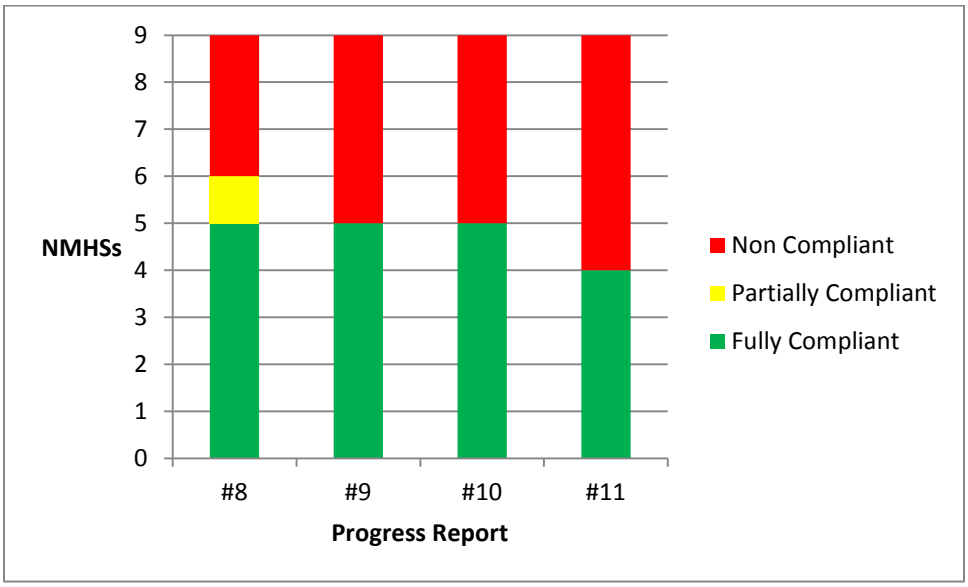

Figure 1: Summary of compliance from participating NMHSs with regard 'All NMHSs include RSMC Wellington on the distribution list for all alerts, warnings and advisories' for Progress Reports No. 8 to 11.

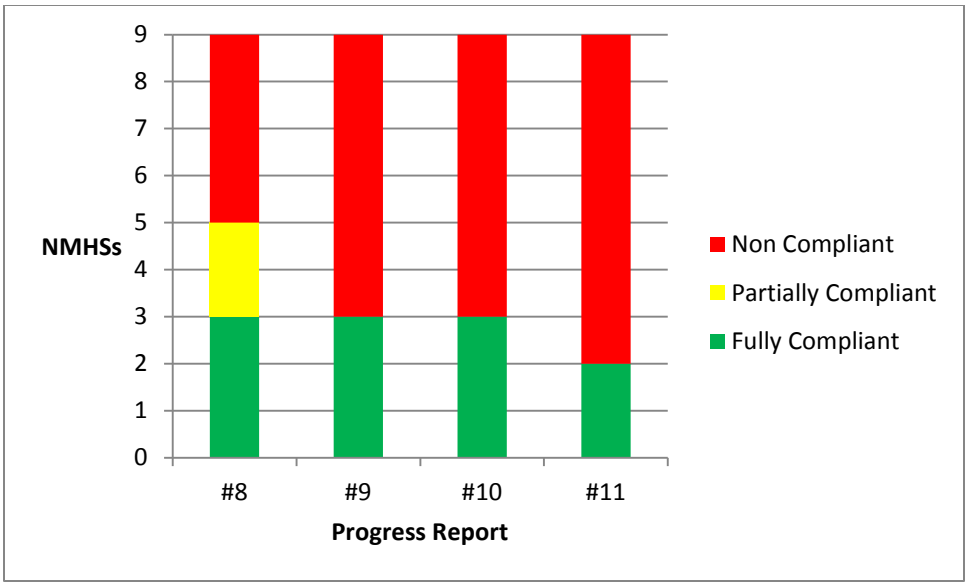

Figure 2: Summary of compliance from participating NMHSs with regard 'All NMHSs in collaboration with DMCPAs provide feedback on the performance of the warning system in the country's progress reports' for Progress Reports No. 8 to 11.

2.2 Severe weather and wave forecasts & warnings are verified

In reporting prior to Progress Report No. 8 the NMHSs were required to fill out an events table as part of Annex I. In the Regional Subproject Implementation Plan (RSIP), this was changed to a separate verification spreadsheet that allowed the NMHSs to verify their forecasts and confirm what South Pacific Guidance (SPG) charts were issued one to four days in advance.

The four partially compliant NMHSs for Progress Report No. 8 (Figure 3) was a result of omission of correct negatives in the verification spreadsheet. This was rectified somewhat for Progress Report No. 9, where Solomon Islands, Tonga and Niue were fully compliant, and all but one NMHS submitted their verifications.

At times the verification spreadsheet has been filled out on a monthly basis. For ease, this would be better done as one spreadsheet to cover the 6-monthly reporting timeframe.

Overall, each participating NMHS submitted at least one verification spreadsheet over the four Progress Reports.

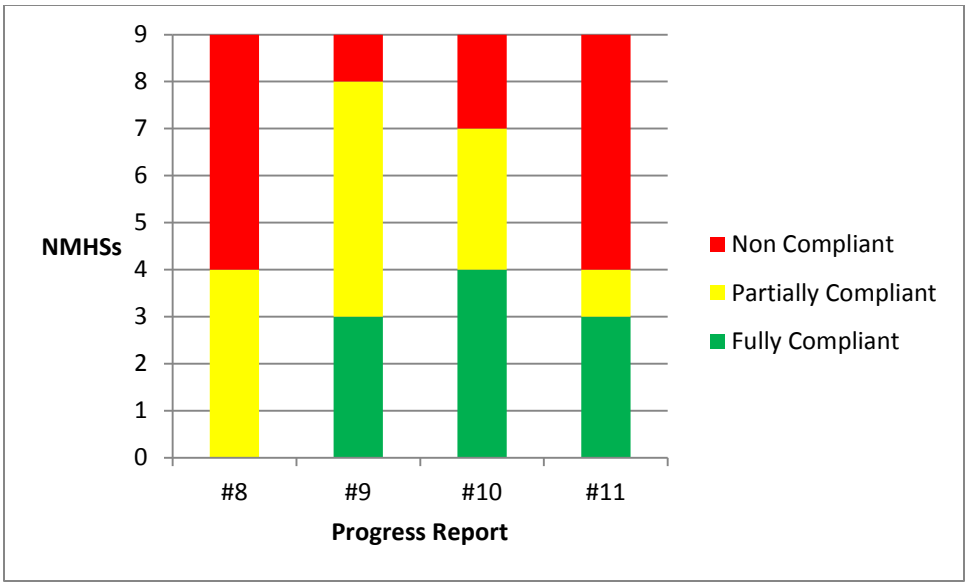

Figure 3: Summary of compliance from participating NMHSs with regard 'All NMHSs submit verifications to RSMC Wellington with each progress report' for Progress Reports No. 8 to 11.

2.3 All participating countries produce at least one case study per year

All participating countries are required to submit at least one case study per year. After the previous RSMT in Nadi, August 2013, a case study guide and template were distributed to the participants. Over this evaluation period, four countries have produced and submitted seven case studies (Kiribati x 4; Samoa x 1; Solomon Islands x 1; and Tonga x 1), and none have been submitted since April 2015 (see Figure 4). The case studies submitted were:

- Tonga – Cold Front (Oct 2013);
- Samoa – Heavy Rain (Jan 2014);
- Kiribati – Large Waves (Mar 2014);
- Solomon Islands – TC Ita (Mar/Apr 2014);
- Kiribati – Large Waves (Jan 2015);
- Kiribati – Strong Winds & Large Waves (Feb 2015); and
- Kiribati – TS Bavi and TC Pam (Mar 2015).

Samoa's case study was for heavy rain and flooding during January 2014; resulting from a slow moving tropical depression (TD07F) that was the pre-cursor to TC Ian. This was an excellent case study and is consistent with the case study format for the SWFDP. Along with the others, these are in the process of being put on MetConnect Pacific.

On one occasion there was confusion over whether case studies had replaced the Annex Hs; Annex Hs should be completed in addition to producing case studies.

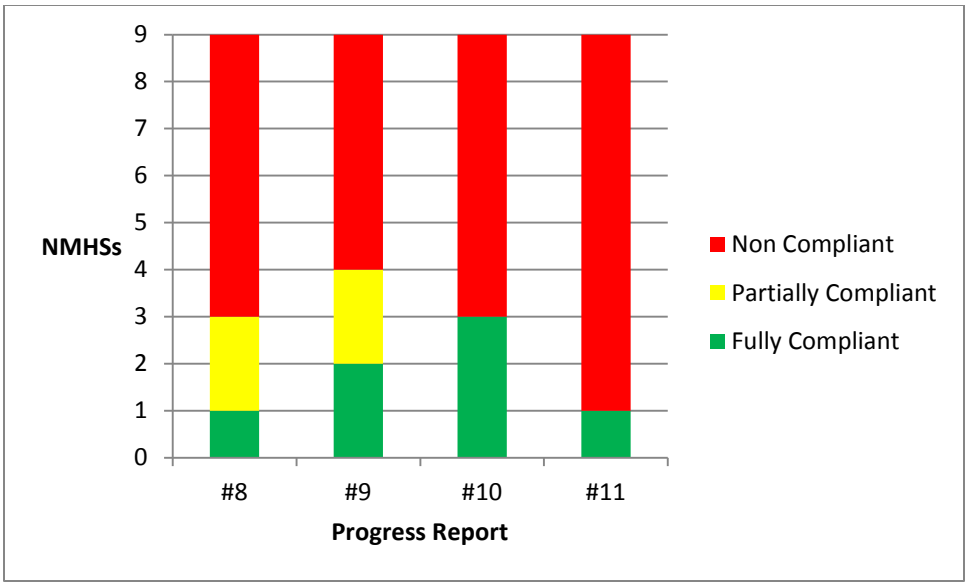

Figure 4: Summary of compliance from participating NMHSs with regard 'All participating countries produce at least one case study per year, using the SWFDDP template or an equivalent template' for Progress Reports No. 8 to 11.

2.4 All participating countries to complete all SWFDDP progress reports in full before the deadlines prescribed (six monthly; in April and October)

Strict deadlines have been assigned for the submitting of the 6-monthly progress reports. At times this has been difficult to achieve due to recent severe weather within a country. For example, Progress Report No. 8 was late from the Solomon Islands, but this was understandable giving the deadline (15 April 2014) was a few weeks after the heavy rain, land slips and flooding caused by the precursor depression to TC Ita.

Progress Report No. 11 only saw the Solomon Islands, Kiribati and Niue submitting their reports on time (see Figure 5) [further note: only Kiribati submitted their Progress Report No. 12 on time].

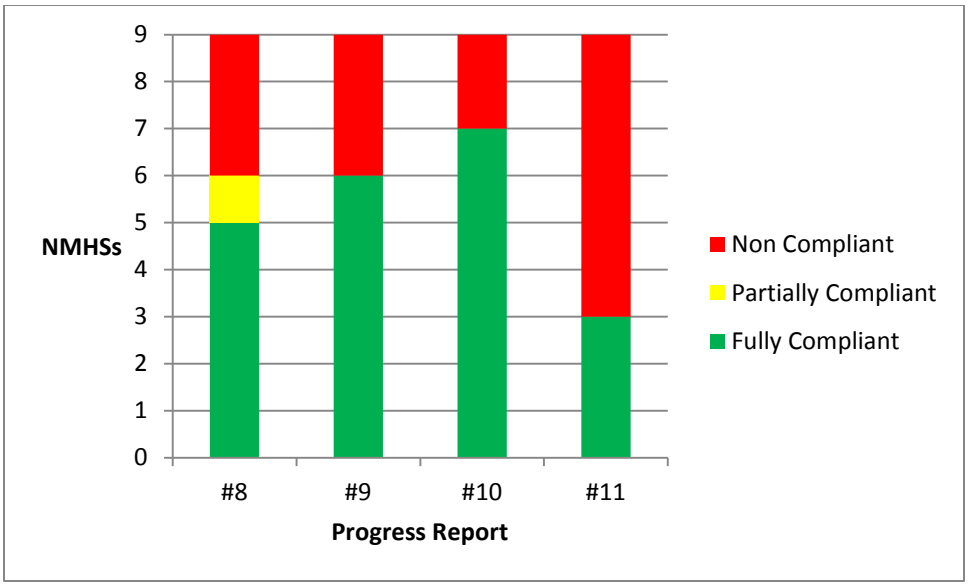

Figure 5: Summary of compliance from participating NMHSs with regard 'All participating NMHSs to complete all SWFDDP progress reports in full before the deadlines prescribed' for Progress Reports No. 8 to 11.

2.5 Demonstrate on a continual basis that the relationships between NMHSs and Disaster

Management and Civil Protection Authorities (DMCPAs), the media and the public are strong and healthy, with regular communications before, during and after severe weather events

NMHSs were encouraged to provide evidence of their interactions with DMCPAs, the media and the public. This may be emails, newspaper clippings, telephone conversations, relevant workshops, disaster reports or other evidence. If multiple events take place over the reporting period, then as much evidence as possible should be submitted; on occasion, one event would be covered, but not the other two, or three, or more.

Of note: Tonga provided a copy of the National Emergency Operations Management procedures which clearly indicates the relationship of the meteorological office with the DMCPA. Tonga also provided a screen shot of an email from the local Red Cross to a number of Tongan leaders regarding TD07F, the precursor to TC Ian; this was evidence of strong communication with the public.

On several occasions, strong interactions were claimed between meteorological offices and their respective disaster management offices, but no evidence was presented.

Lack of evidence was evident for Progress Report No. 11 (see Figures 6, 7 and 8).

Discussions at the previous RSMT in Nadi (August 2013) suggested the interactions between NMHSs with DMCPAs, the media and the public were strong, but, in general, Progress Reports No. 8 – 11 provided a lack of evidence to support these interactions.

Not part of the SWFDDP, but of note, was the FINPAC funded media in-country training provided to 14 different Pacific island countries during 2015 entitled, 'The Role of the National Meteorological Services and the Media in Providing Correct, Timely and Meaningful Weather and Climate Information to the Community and all Users'. The three day training brought together members of the community, NGOs, NMHSs and other government ministries, with members of the media to help forge a way forward to ensure the meteorological information shared is understood by all communities. (FINPAC is the Finland-Pacific project on 'reduced vulnerability of Pacific Island communities' livelihoods to the effects of climate change' that is being implemented by the Secretariat of the Pacific Regional Environment Programme (SPREP) and funded by the Government of Finland).

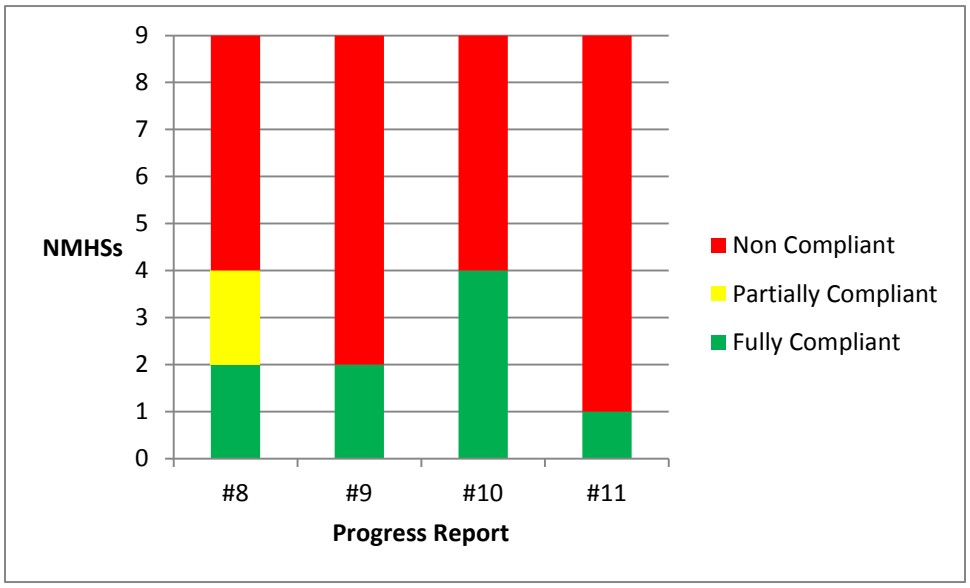

*Figure 6: Summary of compliance from participating NMHSs with regard 'Demonstrate on a continuing basis that the relationships between NMHSs and other **DMCPAs** are strong and healthy, with regular communications before, during and after severe weather events' for Progress Reports No. 8 to 11.*

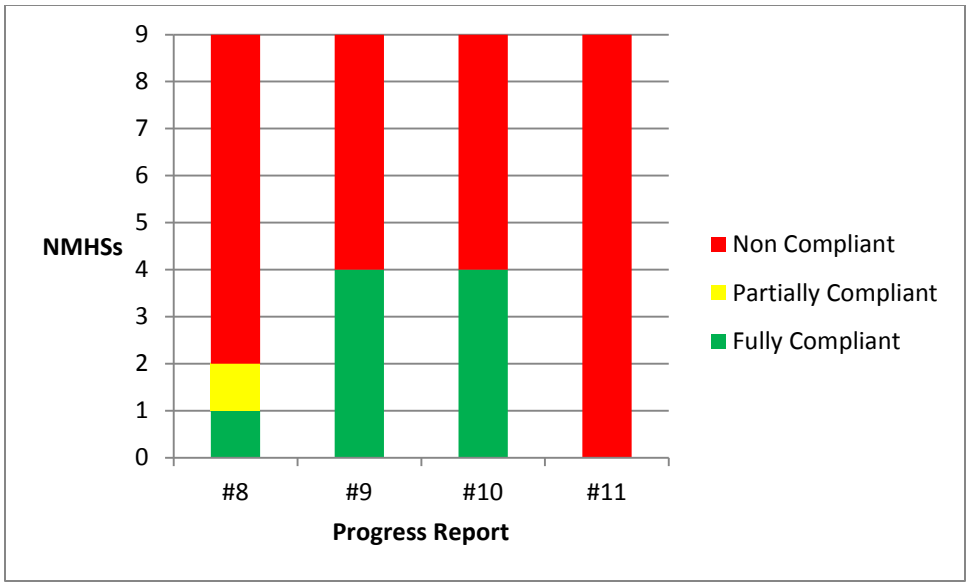

*Figure 7: Summary of compliance from participating NMHSs with regard 'Demonstrate on a continuing basis that the relationships between NMHSs and the **media** are strong and healthy, with regular communications before, during and after severe weather events' for Progress Reports No. 8 to 11.*

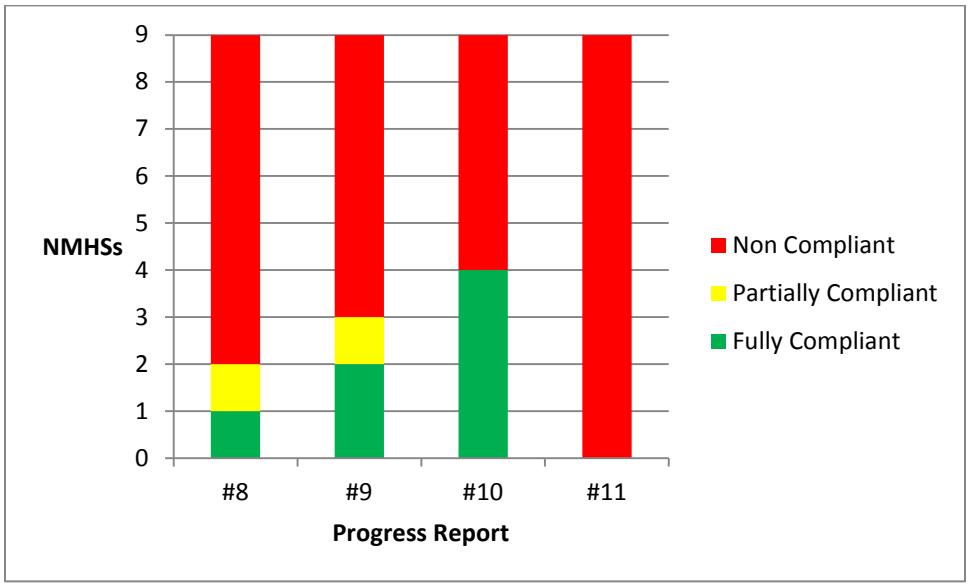

*Figure 8: Summary of compliance from participating NMHSs with regard 'Demonstrate on a continuing basis that the relationships between NMHSs and the **public** are strong and healthy, with regular communications before, during and after severe weather events' for Progress Reports No. 8 to 11.*

3. SUMMARY

Figure 9 illustrates the number of fully compliant NMHSs for each of the criteria set at the previous RSMT in August 2013, and for each Progress Report 8 – 11. This figure illustrates the decrease in compliance from Progress Report 10 to Progress Report 11.

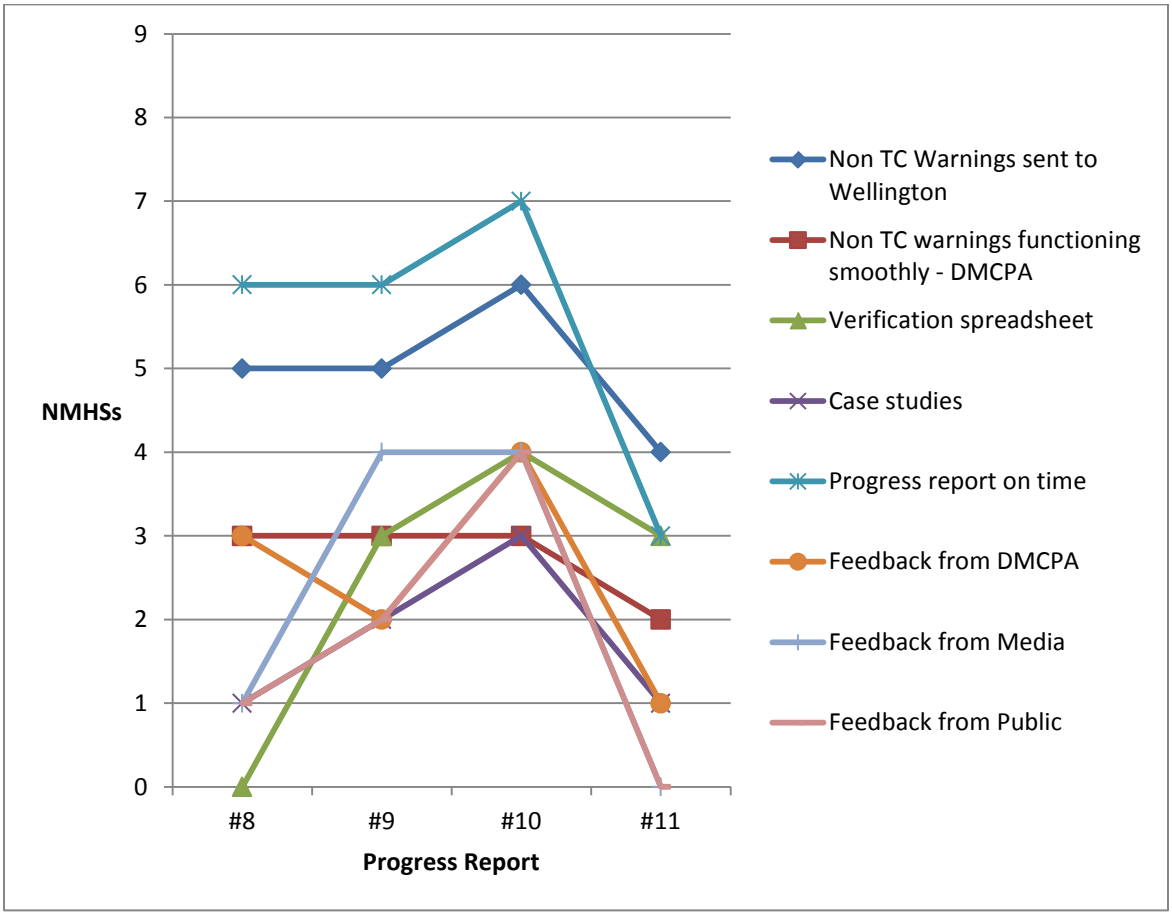

Figure 9: Summary of full compliance from participating NMHSs with regard all criteria set at the previous meeting of the RSMT (Nadi, August 2013), for Progress Reports 8 to 11.

ANNEX 5

CRITICAL ELEMENTS FOR CONSOLIDATING THE SWFDP INTO GLOBAL SUSTAINABLE SERVICES

The Council recognizes the following as critical elements for consolidating the SWFDP into global sustainable services, as a severe weather forecasting programme:

1. A fully operational regional component of the severe weather forecasting programme requires:

- A Regional Management Team (RMT) comprising the PRs of the participating countries or their representatives;
- A regional entity to oversee and coordinate the project activities, including support activities such as training, organising meetings and resource mobilisation (this regional entity requires to be identified before a new SWFDP is initiated);
- Global centres providing input data and products to the regional and national centres, as agreed.
- A regional centre providing forecast guidance to NMHSs in the region through the *Cascading Forecasting Process*, and operating and maintaining a dedicated website;
- National centres ensuring that appropriate warnings of severe weather are issued;

2. In addition to the activities listed above, the sustainability of operational regional components requires a number of non-operational activities to be supported and funded. These activities include:

2.1 The Regional Management Team being in charge of:

- Strategic leadership;
- Assess every opportunity to combine with existing activities related to severe weather, such as for flash flood forecasting, marine and aviation;

2.2 The regional entity being in charge of organizing:

- RMT meetings around every two years;
- Training for RSMC and NMHS staff on a regular basis, combining on-site training and making use of e-learning facilities;
- Resource mobilization;

2.3 The NMHSs being in charge of:

- Evaluating products and provide feedback to global and regional centre(s)
- Provide criteria for severe weather warnings to the relevant regional centre(s) and keep them up-to-date, according to the feedback provided by the end users;

2.4 The regional centre being in charge of:

- Routine website maintenance, including upgrades as required;
- Monitoring, evaluation and reporting;

2.5 The global centres which contributed to the demonstration phase being expected to continue to provide support, on the understanding that their data and products would be used only for the intended purpose by the participating regional bodies and NMHSs.