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**WORLD METEOROLOGICAL ORGANIZATION**

**COMMISSION FOR BASIC SYSTEMS**

**SEVERE WEATHER FORECASTING AND DISASTER RISK REDUCTION DEMONSTRATION PROJECT**

**SWFDDP – SOUTH PACIFIC PROJECT**

**MEETING OF THE REGIONAL SUBPROJECT**

**MANAGEMENT TEAM**

**Noumea, New Caledonia, 27-28 July 2018**

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**DRAFT REPORT**

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**Meeting attendees**

Back row (l to r): David GRANT, Yoshihiko TAHARA, Ueneta TOORUA, Tauala KATEA, Maccarios AUVAE, Ofa FA’ANUNU, Zulfikar BEGG, Mike BERGIN, Joe MALA, Fred JOCKLEY, Amit SINGH;

Front row (l to r): Arona NGARI, Chris NOBLE, Abdoulaye HAROU, Linda TONAWANE, James LUNNY, Patrice LECHANTEUR, Gerald FLEMMING, Dan BEARDSLEY, Jimmy GOMOGA, Tom EVANS.

1. **OPENING**
   1. Mr James Lunny (New Zealand), Chair of the Regional Sub-project Management Team (RSMT) for the Severe Weather Forecasting and Disaster risk reduction Demonstration Project (SWFDDP) opened the meeting by welcoming all participants and inviting them to introduce themselves. He indicated that the focus of this meeting will be on the assessment of progress made against the criteria established by the RSMT at the meeting of the RSMT in Nadi, Fiji, August 2013 and the recommendations made at the previous RSMT meeting to this one in Honiara, Solomon Islands, August 2016; achieving these are critical for determining whether to move the project to the continuing development phase. The meeting was also invited to reflect on the goals of the SWFDDP. Namely:

* To improve the ability of NMHSs to forecast severe weather events;
* To improve the lead time alerting of these events;
* To improve the interaction of NMHSs with Disaster Management and Civil Protection Authorities (DMPCA) before and during events; and
* To identify gaps and areas for improvements to improve the skill of products from Global Data-Processing and Forecasting System (GDPFS) Centres through feedback from NMHSs.

Mr Lunny noted that many of the participants had already spent the previous four days, at the same venue, participating in the seventeenth session of the RA V Tropical Cyclone Committee (RA V TCC-17) meeting.

Mr Lunny then offered the floor to Mr Hugues Ravenel, Director Meteo-France, New Caledonia and Wallis and Futuna, for his opening remarks.

* 1. Mr Ravenel welcomed the participants and underlined that the SWFDDP success is based on four “Cs” ie **Constructive** exchange amongst partners; strong and sustained **Collaboration**; **Creativity** to harness science progress for innovative products and services for increased efficiency and to realize positive impacts on users and; **Confidence** which is an absolute requirement to facilitate development and implementation of the three other “Cs”. He believed most of the “Cs” are characteristics of the SWFDP and will result in a successful meeting.
  2. Mr Lunny thanked: the Government of France, Mr Ravenel and Mr Patrice Lechanteur, Deputy Director Meteo-France, New Caledonia and Wallis and Futuna, for hosting the meeting in Noumea; for WMO for helping organize the meeting; and the Pacific Community (SPC) for providing the excellent venue on their Noumea campus.
  3. Mr Abdoulaye Harou (WMO), Chief Data-Processing and Forecasting System (DPFS) also welcomed the participants and thanked, on behalf of the Secretary General of WMO, Professor Petteri Taalas, the Government of France and Meteo-France for offering to host the meeting in Noumea, New Caledonia. He noted that SWFDDP is very useful to participating countries while it is still in demonstration phase. He also noted that funding has been an issue for quite some time but recently Climate Risk and early Warning System [(CREWS)](https://www.crews-initiative.org/en/about-us) funding has been secured. There are two components of CREWS funding: a) Canada CREWS focusing on South East Asia and SIDS for Building Resilience to High-Impact Hydrometeorological Events through Strengthening MHEWS in SIDS and SEA; b) [CREWS funding for Pacific SIDS](https://www.crews-initiative.org/en/projects/pacific-strengthening-hydro-meteorological-and-early-warning-services), focusing on Strengthening Hydro-Meteorological and Early Warning Services in the Pacific. He suggested that one of the focus of the meeting would be to determine a path forward to operational phase and concluded with his best wishes for a successful meeting.

1. **ORGANIZATION OF THE MEETING**
   1. **Adoption of the Agenda** 
      1. The proposed agenda was reviewed and adopted as per Annex 1.
   2. **Working arrangements** 
      1. The participants agreed to start the meeting at 9:00am and close at 5:30pm. Lunch break was scheduled for 12:30pm for 1.5 hours while coffee breaks were planned at 10:00am and 3pm.
      2. Mr Lunny informed the meeting that there will be a side event at 18:30 on 27 July 2018 at the Nouvata Hotel for a presentation by Mr Peter Fisher, Business Development Manager, Key Accounts (MetService) on the South Pacific Lightning Detection Network; a partnership between the Meteorological Service of New Zealand Ltd and TOA Systems Inc.
      3. The documents of the meeting are available at the following website:

http://www.wmo.int/pages/prog/www/DPFS/Meetings/RAV-SWFDDP-RSMT\_New%20Caledonia2018/DocPlan.html

* + 1. The list of participants is provided in Annex 2.

1. **EVALUATION AND REVIEW OF SWFDDP INCLUDING ACHIEVEMENTS AND GAPS**
   1. **Summary from the progress reports including verification of forecasts and warnings, service delivery aspects, case studies etc**.
      1. Mr Lunny reviewed the Progress Reports of the SWFDDP (Doc. 3.1), spanning the period from 1 June 2016 to 30 April 2018 (Progress Reports No. 13, 14, 15 and 16). This covers the reporting period between the fourth and fifth meetings of the RSMT. For comparison, the summaries for Progress Reports No. 8, 9, 10 and 11 were included, having been discussed at the fourth RSMT meeting in Honiara. The review focused on the strengths and weaknesses in the progress made by the participating NMHSs in relation to the criteria established by the RSMT at the third meeting in Nadi, Fiji, August 2013 (see Annex 3); deemed necessary for the transition of the Project from Demonstration to the subsequent Phase IV, known as the “operational” or “continuing development phase”.
      2. Overall, the member NMHSs have struggled to meet the criteria, with a general downward trend in provision of completed progress reports, provision of warnings verification, and the provision of feedback on the warnings systems (see [Doc 3.1](http://www.wmo.int/pages/prog/www/DPFS/Meetings/RAV-SWFDDP-RSMT_New%20Caledonia2018/DocPlan.html) of the meeting)
      3. The provision of case studies remains low. Commendation, however, was given to those that had most recently submitted a case study. Ie, Samoa and Tuvalu. The importance of undertaking case study writing was highlighted by the Chair because insight can be gathered on all aspects of the SWFDP goals. The uploading of case studies on MetConnect Pacific will continue to build a useful library of work, to be used by all stakeholders of the SWFDP cascading forecast process.
      4. In terms of relationships between NMHSs and Disaster Management and Civil Protection Agencies (DCMPA), Media and Public, it is known that good work in this area is ongoing in the participating countries but, unfortunately, not often being reported. Eg, the Director of Tonga Meteorological Service appeared in the New Zealand television news during the passing of Cyclone Gita (Feb 2018). This was also noted at the previous meeting of the RSMT (see para 3.1.11, final meeting report of the RSMT, Honiara, Solomon Islands, August 2016).
   2. **Global and Regional Centre reports** 
      1. **Met Office UK** – The Chair introduced the report from the Met Office UK. The meeting noted that Products from the Global component of the Met Office Global Regional Ensemble Prediction System (MOGREPS-G) system are currently supplied in .jpeg format via FTP: EPS meteograms, precipitation and wind probability charts, 500hPa spaghetti charts and EPS TC products which are only to be used in support of the aims of the project. The Met Office implemented an upgrade to the MOGREPS-G ensemble with the 12UTC run on the 11 July 2017. The resolution of the ensemble forecasts increased from 33km to 20km, and the number of ensemble members increased from 24 to 36.
      2. The meeting also noted that the Met Office is willing to respond to user requests for additional parameters from MOGREPS-G on a best endeavours basis and to contribute support (eg, staff and facilitated e-learning resources and expertise) to the sub-project’s training activities, when possible. The Met Office encourages feedback on the progress made regarding any recommendations and actions agreed at 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.
      3. The Met Office further encourages all participating members of the SWFDDP-RA V to proactively provide feedback on the performance of the participating centre’s models and encourages the writing and publication of case-studies for the purposes of model verification and future training activities. The 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.
      4. **JMA** – Mr Yoshihiko Tahara presented on the key activities performed by Japan Meteorological Agency (JMA) which contribute to SWFDDP: NWP provision through a dedicated web portal; and tailored Himawari satellite products, made available through the same web site.
      5. JMA provides the SWFDDP with NWP products of its three operational models: 1) the Global Spectral Model (GSM); 2) the Global Ensemble Prediction System (GEPS); and 3) the Wave Ensemble Systems (WENS). The GSM was upgraded in May 2017 with a revision of its parameterization schemes of land/sea surfaces, deep convection, cloud and radiation. These changes led to overall improvement in forecast skill of temperature in the low-troposphere. JMA’s super computer system was upgraded in June 2018 increasing the computing capability to be 10 times faster, extending forecasts from 84 to 132 hours at 00, 06 and 18 UTC initial runs. The corresponding products will be available soon via MetConnect Pacific.
      6. The Himawari suite of imagery is routinely made available at 10-minute intervals. The meeting was informed that JMA introduced HimawariRequest satellite service in January 2018, in collaboration with the Australian Bureau of Meteorology. HimawariRequest allows users of Himawari-8/9 satellite data to request Target Area observations covering a 1000 km x 1000 km area every 2.5 minutes. Target Area observations provide more accurate satellite-based tracking and thus better insight into severe events, for example, tropical cyclones or volcanic eruptions, and are expected to contribute to reducing the impact of natural hazards in RA II and RA V. Members of the SWFDDP are encouraged to register for this service, if their respective NMHS has not already done so.
      7. JMA, in collaboration with WMO and the Japan International Cooperation Agency (JICA), have coordinated to install HimawariCast receiving systems; totaling 20 to date. The systems can ensure reception of Himawari imagery data by NMHSs and use of their operational meteorological services even where Internet environment is poor. On-site training has also been provided, the latest being in Fiji during May 2018. Fourteen forecasters from Cook Islands, Kiribati, Fiji, Nauru, Niue, Samoa, Solomon Islands, Tonga, Tuvalu and Vanuatu attended the event.
      8. **NOAA** – Dan Beardsley: did an assessment of Chatty Beetle use. Major upgrade of all receiving stations in the pacific (good for 5 years). Emergency manager weather information network (EMWIN). If special needs or aware of station that needs fixing, request to inform him. (Text needed from Dan)
      9. **ECMWF**- The Chair introduced the report from ECMWF. The meeting was informed that ECMWF Council, at its 90th Session (June 2017), agreed that ECMWF support for SWFDPs could continue beyond the demonstration phase, ie in the continuing development phase and that ECMWF data available to WMO countries has been substantially increased; in particular, the amount of weather prediction data made available free of charge to Members of WMO. The provision of the data is part of the Centre’s obligations as a World Meteorological Centre (WMC), noting that ECMWF became a WMC in June 2017, as defined in the recently published Revised Manual on the GDPFS.
      10. The additional data enables a much more comprehensive view of atmospheric conditions as predicted by ECMWF than before, including near-surface weather conditions. This will help users to make better assessments of weather-related risks out to day 10. Registered NMHSs have been able to access the new data since 2 July 2018. Additional fields are available for both probabilistic and deterministic forecasts, and all forecasts of weather variables are now provided at 6- or 12-hour time steps instead of 24-hour time steps. The new products also include additional ocean wave forecast fields (peak wave period and mean zero-crossing wave period), with all wave forecast products provided at 3- or 6-hour time steps. The following link gives details on the data (GRIB edition 2 format on a 0.5x0.5 lat/long grid and BUFR format for Tropical Cyclones) and how to access them:

<https://www.ecmwf.int/en/forecasts/datasets/wmo-and-acmad-datasets>

* + 1. ECMWF has been developing eLearning modules on basic elements of Numerical Weather Prediction (NWP) including convection, parametrization, use of satellite data, data assimilation, ensemble forecasting, and on ECMWF specific products (Extreme Forecast Index). The modules are freely available and can be found at:

https://www.ecmwf.int/en/learning/education-material/elearning-online-resources

The SWFDDP members are strongly encouraged to check the page and take advantage of these modules to deepen their understanding of NWP models and ECMWF products.

* + 1. ECMWF has been working with the World Bank to build a training programme (funded by the World Bank) for countries in Central Asia who are part of the SWFDP-Central Asia. This is a new venture for ECMWF and it could be explored for other SWFDPs.
    2. **RSMC Wellington** - Mr Chris Noble focused on the challenges for the progression and the long-term sustainability of the SWFDDP. These include:
    3. RSMC Wellington Lead meteorologists will continue to produce the South Pacific Guidance but are 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. RSMC Wellington is considering issuing the SPG once a day with the usual five-day outlook. The representative from FMS had concerns with this.
    4. MetService is currently scoping an upgrade to the hosting of the website including a switch to server the site via SSL (https). While this change and ongoing BAU costs for running the site are expected to be funded internally by MetService, any significant enhancements/additions and future upgrades are likely to require funding assistance.
    5. 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. Mr Noble highlighted that there had been no SWFDDP related training since the in-country training carried out in 2015.
    6. To date there is no clear guidance or plan for the ongoing management of the project (be that SPREP as recommended by the RSMT in 2016 or another entity) including funding and reporting. Ongoing project evaluations and reports will be essential to ensure the project remains relevant for the Pacific Island participants, particularly as skills, knowledge and technology improve across the region.
    7. MetService is currently scoping the needs to make MetConnect Pacific more secure. Mr Noble noted that in April 2018 there was an outage of MetConnect Pacific and requested participants to inform RSMC Wellington of any issues with the web site, when noticed.
    8. **Meteo-France** – Mr Patrice Lechanteur described various models used by Meteo-France, New Caledonia, including deterministic, ensemble and swell models. The global model ARPEGE has a grid resolution of .50, runs 4 times a day and provides outputs every 3 hours up to 102 hours. Another deterministic forecast is the AROME-NC, a high-resolution limited area model (resolution 0.025° over New Caledonia and south of Vanuatu) running four times a day with outputs available every hour up to 42 hours. The AROME-NC is available for Vanuatu on the Synergie workstation. Swell models, based on Meteo-France Wave A Model, forced by IFS (or ARPEGE) has a resolution of 0.50, runs four times a day and offers outputs every three hours up to 120 hours. Finally, the Ensemble Prediction Model (PEARP) is based on the ARPEGE model and has a resolution of 0.50 and run four times a day and offers the following outputs: a) Cyclone data over New Caledonia with individual trajectories, strike probabilities; and b) MSLP iso-lines, heavy rainfall probabilities and quantiles, strong winds probabilities and quantiles.
    9. The meeting was informed that, if required, Meteo-France can make available data from the Météo-France models on the Metconnect Pacific website, through a FTP service. RSMC Wellington and Meteo-France New Caledonia are liaising on this matter.
    10. **BoM** – Mr David Grant reported that The Australian Bureau of Meteorology continues to support the SWFDDP through the provision of charts from the ACCESS-G global NWP model over two domains for the MetConnect Pacific web portal. High-resolution (12km) tropical cyclone products are also available on MetConnect Pacific from the tropical cyclone model, ACCESS-TC, when a tropical cyclone is active in the region. In September 2017, the Bureau of Meteorology supported the 12th session of the WMO southern hemisphere tropical cyclone and public weather workshop in Nadi, Fiji. Mr Joe Courtney (Western Australia) and Mr David Grant (Queensland) attended and organised the training that was provided at this workshop, which included use of the SWFDDP website for operational forecasting purposes.
    11. Following the WMO southern hemisphere tropical cyclone and public weather workshop a recommendation was made by the Bureau of Meteorology for the inclusion of the following links on Met Connect Pacific:

<http://www.bom.gov.au/pacific/index.shtml>

<http://cosppac.bom.gov.au/>

It was felt that the addition of these links would be beneficial for operational forecasters in the South Pacific as it would provide them with a platform to monitor sea level anomalies and assess future wave model guidance (from AUSWAVE-G).

* + 1. Climate Outlooks from the Bureau of Meteorology will soon begin to use a new, higher resolution coupled climate model, known as ACCESS-S. ACCESS-S will replace the current climate mode, POAMA. Some of the benefits of ACCESS-S include:
* A resolution of 60km, compared to the current POAMA resolution of 250km.
* Capability to produce a more accurate representation of atmospheric and oceanic processes, enabling it to better capture local climate features.
* Ability to account for changing greenhouse gases in the atmosphere, meaning climate change impacts are better simulated.

SWFDDP members will benefit from the output of the new ACCESS-S climate model through future issues of the South Pacific Tropical Cyclone Outlook that is available at  <http://www.bom.gov.au/climate/cyclones/south-pacific/>

* 1. **National Centre Reports**
     1. The Chair invited members to report on national involvement in the SWFDDP, and requested the focus to be on achievements, challenges and what can be done better.
     2. **Cook Island** – Mr Arona Ngari informed the meeting that information from Fiji Meteorological Service was useful and MetConnect Pacific continues to be a valuable tool. Staffing of CIMS is a major issue; a request was submitted to government for an increase in manpower but there has been little progress so far. He highlighted the issue of silent upper air sites and that he wrote to the WMO SG for help with respect to the resurrection of these sites but there has been no response, as yet. The main requirement is for securing financial resources for upper air consumables, as Rarotonga upper air station is capable of operations.
     3. The Chair confirmed that this upper air issue was highlighted as one of the major gaps in the Southwest Pacific observational network by the Joint GCOS-WIGOS Workshop for the Pacific Small Island Developing States (SIDS), 9-12 October 2017, Nadi, Fiji. The meeting was informed that the Meteorological Service of New Zealand is making the key messages from the Joint GCOS/WIGOS Workshop visible to potential donors.

***Action****: The Chair to further investigate the interest of the Government of New Zealand to support upper air sites maintenance and consumables, as well as other potential donors.*

* + 1. Considering the number of upper air stations across the SW Pacific that are currently not producing upper air data [Port Moresby, Honiara, Bauerfield and Rarotonga] due to either equipment failure or insufficient consumables and noting that the SWFDDP relies on high quality NWP guidance that would be enhanced with a fully operational upper-air program, **the meeting noted the ‘key messages’ from the Joint GCOS-WIGOS Workshop and encouraged WMO and other interested parties to seek funding sources to restore the full operation of the GUAN station(s)**.
    2. Mr Ngari noted the usefulness of the South Pacific Guidance (SPG) and suggested that the severe weather thresholds should be reconsidered to include small scale events with high impacts. Mr Lunny clarified that the SPG is made for larger scale events rather than small scale ones, as per the guide on SWFDP. Inclusion of these small-scale events in the SPG would require a significant amount of resources from the regional centres and cannot be envisaged at this time.
    3. **Fiji –** Mr Amit Singhpresented on behalf of FMS and RSMC Nadi. He thanked MetService for close liaison, particularly during cyclone seasons and for the production of the SPG which is routinely used. Mr Singh indicated that the Lightning Detection Network display (now available through a link on MetConnect Pacific) is an important tool for aerodromes and recommended that distance indication of the lightning from airport would be useful. The Chair clarified that the Lightning Detection Network is not directly related to the SWFDDP, and the request will be passed directly to TOA Systems and MetService. Mr Singh also reported that they were not able to provide verification and case studies for recent reporting periods but ensured that they will do so for the next report. FMS notified the meeting that the WRF model, available through the NOAA NWS WSO Pago Pago page has been unserviceable for a few months. Tom Evans, subsequently, confirmed that the WRF models for Fiji, Samoa, Niue and Tonga have been down for several months.

***Action:*** *Mr James Lunny and Mr Tom Evans to follow up on the situation related the WRF being U/S.*

* + 1. **Kiribati** – Mr Ueneta Toorua Thanked WMO and MetService for their continued support of the SWFDDP. The meeting noted that the Kiribati Meteorological Service (KMS) found SWFDDP useful and helpful in supporting their weather and marine forecasting services; MetConnect Pacific is seen as an excellent one-stop-shop for relevant information. MetConnect Pacific is also used in monitoring and quality control of weather observations by comparing reports from neighboring stations.
    2. He indicated that Public Weather forecast services are produced at the national level and SWFDDP helps with the visibility of KMS. MetConnect Pacific is very useful especially with those who have gone to the training desk in Honolulu. SPG was found to be very useful as well, as its provides forecasters with confidence when providing forecasts and warnings. Warning and advisories are appreciated by users, however, a challenge has been the request from the public to include impacts with the forecasts/warnings. KMS is therefore looking for support to assist with the provision of this additional information. It is recommended the SWFDDP continues and in-country training takes place with a focus on impact-based forecasting. Internet speed continues to be a challenge for KMS.
    3. **Niue** – The Chair presented on behalf of the Niue Meteorological Service:

The SWFDDP has helped Niue Meteorological Service warn the public ahead of time (at least 24 hours) for TC and non-TC related severe weather, through the provision of relevant products from RSMC Nadi. This has helped the public have ample time for preparations. The challenges have included: submitting the progress reports on time; completion of the warnings verification; and presenting evidence of strong interactions between the meteorological service with the media and disaster management.

* + 1. **Samoa** – Mr Maccarios Auvae thanked MetService for the provision of products on MetConnect Pacific and WMO for supporting the project. He indicated that SWFDDP somewhat provides useful information for Samoa Meteorology Office in terms of severe weather prediction which leads to minimizing disaster impacts and to inform Samoan people well in advance.
    2. The meeting was informed that a number of severe weather events have occurred during the past two years over the Samoa island chain. The major event was Tropical cyclone Gita (Feb 2018) with associated heavy rain, strong winds and damaging storm surge. A considerable number of Tropical Depressions have crossed near and further south of the island. Deep synoptic and local convective activities have occurred and significantly contributed to some of the severe flooding and gusty winds that took place at some part of both main islands (Savaii and Upolu)
    3. The meeting noted the following successes and Achievements:
* SWFDDP Products proved to be somewhat useful for Samoa marine weather forecast advisories in terms of high swells;
* Tropical cyclone and other extreme weather events were fairly detected by SWFDDP products which also facilitated the issuance of warnings and advisories;
* Case studies provide a learning platform for weather forecast teams to be able to improve their forecasting capability in view of similar weather events that may occur;
* Collaboration with Disaster Management organization and other stakeholders has significantly improved due to the successful implementation of early warning system for different hazards.
  + 1. The following challenges were also noted:
* Samoa weather forecast team still facing difficulty of predicting small scale systems (localized/mirco-scale);
* the lack of marine observations;
* absence of a radar to accurately observe heavy rainfall & thunderstorm events;
* Inactive synoptic systems and localized convection cannot be resolved in most models including the ones employed by SWFDDP.

* + 1. Mr Auvae concluded with the following recommendations in moving forward with the SWFDDP: To encourage all SWFDDP members to provide case studies for the benefits of neighboring members and to nurture collaboration with NZ MetService for the improvement of services. Recommend also the inclusion of wave/swell forecast combination in the suite of products. [Chair’s note: swell guidance exists already through the ECMWF login on MetConnect Pacific].
    2. The above recommendation led to a discussion on storm surge forecasting. The meeting noted that, since the previous RSMT meeting (Honiara, August 2016), there has been considerable progress towards implementing a storm surge model for the Region. Through JMA, a storm surge model has been installed in RSMC Nadi and is currently being evaluated. JMA has also provided training for Nadi tropical cyclone forecasters. Domains have been established over many countries in the Region. While there are issues around the resolution of the bathymetric data, the model will produce outputs that will provide information for disaster managers and the public. Attention will now turn to developing suitable services for users based on the model data.
    3. The Samoa Met service has expressed the need for EPSgramme products for Samoa’s main airport (Faleolo airport, -13.8S, 172.0 W) and Maota airport 13.7S, 172.2 W (Savaii Is).
    4. **Solomon Islands -** Ms Linda Tonawane thanked WMO and MetService for the implementation of the SWFDDP. She reported that the Project helps with timely issuance of accurate forecasts and warnings and that no complaint about the service has been recently registered. The collaboration with the Disaster Management team, Media, Police, Red Cross and other key stakeholders was nurtured through workshops, conferences, interviews and through 24/7 availability to respond to any queries and to provide weather briefings with key stakeholders before, during and after severe weather events. Communication with these stakeholders, including the national broadcaster, Solomon Islands Broadcasting Corporation (SIBC), is also facilitated by a dedicated HF radio, used also to communicate with other meteorological stations in the provinces.
    5. The meeting noted that the interest of the Solomon Islands public for weather information is high considering the many calls received by the weather office when weather conditions are deteriorating. It also noted that a Non-TC SOPs was developed and implemented. There are however a few challenges to face:
* When a single guidance is drawn, mistakes are possible if the guidance is not followed. If we do not respect the SPG (Guidance), we may make mistakes at times, especially when a single guidance is drawn.
* skills of models in MetConnect Pacific need to be worked on
* adequacy of resolution of the models on MetConnect Pacific considering the small sizes of the Solomon Islands.
  + 1. Ms Tonawane offered the following recommendations:
* Employing a few new forecasters has highlighted the need for on-going training with respect to the SWFDDP and MetConnect Pacific;
* Request to be made available higher resolution models on MetConnect Pacific.
  + 1. **Tuvalu –** Mr Tauala Katea expressed his thanks to NZ MetService and WMO and partners for the provision of information on MetConnect Pacific. He reported that the SPG is used regularly for daily weather briefings and forecasts for the next five days. It is regularly used for the wind probability exceeding 20 kt (using Met Office UK products) and wave model information from JMA for waves over 2m. The public is aware of wind-waves but their understanding of swell is limited. Mr Katea requested the following to be considered:
* that swell and wind-waves be separated with confidence levels in the SPG;
* that upper air soundings be included on MetConnect Pacific; and
* that capacity training in upper air data analysis and in verification of marine, swell, and daily weather forecasts be undertaken.
  + 1. **Tonga –** Mr Ofa FA’anunu commented that the biggest strength of the SWFFDP is MetConnect Pacific which offers a one window access to information. Wind and precipitation probability charts are very useful. Mr Fa’anunu reported that there was significant improvement in forecasting severe weather, including heavy rain warnings with positive feedback. He reported the following successes and achievements:
* Significant improvement in location and timing of severe weather events e.g. heavy rain through improved confidence and little chance of anything going undetected;
* Identification of gaps and areas for improvements;
* The wind and precipitation probability charts have been operationally very effective and for the new update of its color bars really helps distinguish low and high probability values. This is one of the successes of the SWFDDP that has been very helpful in the forecasting of severe wind and rain events.
  + 1. The meeting noted the following challenges reported by Tonga:
* Difficulty to tailor some products to NMHS’s needs e.g. expanding the Severe Weather Guidance further South or plotting together the dew point and temp in the WMO ensemble forecast meteogram products;
* Development of DRR products still a challenge;
* Boundaries of severe weather drawn seems to be very large at times and cannot be specific, therefore leaves the forecaster with uncertainties to downscale those severe weather areas to a more localized scale;
* The criteria for strong winds used (Not associated with a TC) is ≥30kt; that is a bit high for Tonga’s threshold and for other several pacific countries. Perhaps putting it down to 20 or 25kt is a more realistic strong wind criterium. (The criteria are under the RSMC tab and under user help guidelines).
* Can the lightning feature accessible through MetConnect Pacific be accessed without initial log in being requested? This is to save time and to overcome problems of forgetting log in details. It was explained that the South Pacific Lightning Detection Network (SPLDN) is independent of the SWFDDP and access to the relevant TOA website is password protected. This request will be passed on to relevant MetService staff dealing with the TOA website.
  + 1. Mr Fa’anunu offered the following recommendations**:**
* To focus future SWFDDP related work on impact-based forecasting (assistance is required for development, implementation and training);
* to include in guidance products swell height when expected to exceed 3.5m;
* To include shear lines in the streamline analysis chart;
* To create EPSgramme for Vava’u as it is an international aerodrome and low cloud is an issue there. If this cannot be done then remove Fua’amotu and replace with Vava’u;
* To Include Ha’apai and Vava’u in the satellite base maps that appear under the ‘Satellite’ tab on MetConnect Pacific (note: these island groups are included in the Himawari-8 options available through the JMA website);
* To Introduce DRR products/guidance, including impact-based forecasting;
* To add Temperature and Dew Point representation on EPSgrammes;
* To provide more training on how to analyze and use SWFDDP products and to create products for the DRR community.

* + 1. **Vanuatu –** Mr Fred Jockley thanked WMO for the meeting and recognized the good progress made with developing MetConnect Pacific. He indicated that products including the SPG and Himawari (e.g. volcanic ash product) are used operationally, mostly in marine forecasts including high seas forecasting. The Vanuatu Met service can issue Flash Flood and severe weather forecast uisng the tools and products available. The ECMWF EFI product has turned out to be very useful as well as products from other global centres. The meeting noted that young forecasters were hired and required training on the use of products, including EPSgrammes. One of the challenges faced by Vanuatu Meteorological Service has been the transfer of two forecasters and one observer to their climate division resulting in more pressure on the operational forecasting staff. The continuation of in-country training was strongly recommended noting that the last in-country training occurred in 2015. Assistance is needed to fully utilize the lightning data, especially for aviation and to restart the upper air site at Bauerfield Airport. The Chair supported the request for assistance at the upper air site, citing the Key Messages from the Report of the Joint GCOS-WIGOS Workshop for the Pacific Small Island Developing States (SIDS), 9-12 October 2017, Nadi, Fiji.
    2. **PNG** -Mr Jimmy Gomoga attended the RSMT meeting as an observer and reported on the status of two of PNG's upper air observation sites: Port Moresby has a problem with acquisition of consumables (radiosondes and balloons). Also, the Proton Hydrogen Gas Generator and Tank were moved and require maintenance and reinstallation; Momote also has a problem with the acquisition of consumables. In this regard, PNG requests support for the maintenance and re-installation of the Hydrogen Generator and the Tank and the consumables for both upper air sites (Port Moresby & Momote).
    3. **Pacific Community (SPC) –** Mr Zulfikar Begg attended the RSMT as an observer.Mr Begg indicated that there may be an opportunity for the SPC to collaborate with stakeholders of the SWFDDP as SPC has a DRR program which performs DRR activities in the region.

The meeting noted that SPC has the capacity to conduct communication training in the region and that it assisted some members in facilitating users mapping between Met services and their stakeholders under the ocean science trainings program. SPC is willing to assist other members if they are interested.

* 1. **Review PWS component of the SWFDDP** 
     1. Mr Gerald Fleming, Chair of the OPAG on Public Weather Service Delivery (PWSD) attended the meeting as an invited expert to brief those present on items relevant to the PWSD programme with particular emphasis on Impact-Based Forecast and Warnings Services (IBFWS).
     2. In his presentation, Mr Fleming reviewed the “WMO Strategy for Service Delivery and its Implementation Plan” (WMO No. 1129) and outlined how the Guide was based around six steps to improved Service Delivery. For each of these six steps the Guide defines five different stages of development, from “Undeveloped” to “Advanced” and gives practical advice on how an NMHS or other meteorological service organisation might progress through these stages. Mr Fleming emphasised that, for an NMHS to get full value from the publication, it needed to be entirely honest with itself about its current stage of development.
     3. The “WMO Guidelines on Multi-Hazard Impact-Based Forecast and Warning Services” (WMO No. 1150) was then introduced, along with a brief description of the paradigm shift which IBFWS represented for NMHSs. The linkages between the understanding and forecasting of geophysical hazards on the one hand and societal and economic impacts on the other were examined, and the need to account for the concepts of Vulnerability and Exposure was emphasised.
     4. Underlying this paradigm shift was an implication of significant changes to the role of the operational forecaster, and Mr. Fleming considered these along with the likely changes needed in forecaster training. WMO was in the process of agreeing an updated PWSD Forecaster Competency Framework and this framework emphasised the “soft skills” which the forecaster of the future would need, along with a rigorous training in the atmospheric sciences.
     5. Finally, Mr Fleming outlined some specific PWSD-related issues of relevance to the community involved in the SWFDDP, including:
* Developing the competence to issue warnings in the Common Alerting Protocol (CAP) format;
* Engaging fully and actively with the WMO Register of Alerting Authorities;
* Contributing fully to the Severe Weather Information Centre and the World Weather Information System.
  + 1. In the discussion that followed, Mr Dan Beardsley (U.S.A.) noted that it was increasingly easy to takes the first steps in IBFWS. The WMO publication was readable and short. Pilot projects were underway in Myanmar and there were already some papers published of relevance, including two by Kootval and Davies. The U.S.A. was facilitating pilot projects under the Weather Ready Nations project; six were now ongoing. Case studies will be written up and published.
    2. Mr Ofa Fa’anunu (Tonga) commented that they were making a start, and were looking at traditional knowledge as a complement to the science. Tonga was trying better to connect with the communications aspects, and traditional knowledge will be a route into this. A 5‑yr project was planned in conjunction with Samoa and with engagement from the Bureau of Meteorology of Australia. Dialogue with users was included.
    3. Mr Beardsley noted that a good start was to get together the top 3 or 4 persons from the NMHS and those from the Disaster and Crisis Management Personnel. This would facilitate the development of hazard charts using the combined knowledge, and lead to response planning where each agency could agree in advance the tasks they would address.
    4. Mr Tauala Katea (Tuvalu) commented on the need for further studies and work on coastal hazard maps. Tuvalu was engaged in the establishment of HF radio stations on all the islands to improve communications capability. Ms Linda Tonawane (Solomon Islands) noted that they had completed a traditional knowledge project.
    5. Mr Yoshi Tahara (Japan) gave an account of IBFWS-related activities in JMA. Looking back 20 years ago, JMA had just provided weather warnings. They have tried additional activities to better communicate with local government. It is difficult to save extra lives; better preparatory work was necessary and progress can be slow. JMA made some improvements in 2017 with the provision of supplementary information.
    6. Mr Mike Bergin (Australia) commented on the value of having good examples. He noted that the RA V sub-project had inserted an additional “D” into the title to reflect the focus on DRR. The question of what training should look like in the next phase of the sub-project required careful consideration. The RSMT might consider the value of inviting someone from the DRR community to these meetings. The Chair noted that the RSMT has included the DRR community from the beginning (including Filomena Nelson (Samoa) and Linda Anderson-Berry (Australia)), but representation has been missing from this meeting and the previous RSMT meeting.

1. **TRANSITION OF SWFDDP TO THE NEXT PHASE**
   1. **Follow up Actions from last RSMT Meeting 2016**
      1. The meeting discussed the conclusions and recommendations from the previous meeting of the RSMT in Honiara, August 2016 (see Annex 4).
      2. The meeting felt that paragraph 6.1 of Annex 4 still applies with universal agreement and support for the benefits the SWFDDP has had and is making for the region.
      3. Recommendation 6.2 of Annex 4: It was reported that no action was taken to implement a system for a frequent exchange between participating NMHSs, principally due to the lack of resources; Dan Beardsley (NOAA NWS) offered to cover the fees for utilizing a video-conference system, such as ZOOM (US$50/month). Participants were further reminded that securing engagement for monthly conferences from the Lead forecasters in Wellington would remain a resource issue. It was also noted that internet connectivity within the region remains a major challenge. Examples of social media use and their advantages were discussed. For example, Tonga has a Facebook group that has proven successful with communicating with personnel and the Chair highlighted the successful use of Whatsapp between VAAC Darwin and VAAC Wellington.
      4. Decision: The Chair to set up a closed Facebook group for interested parties with regards the SWFDDP. It was noted that as people are on shift then queries may not be answered immediately. For more pressing or urgent operational matters, members were reminded that phoning the Lead forecasters in Wellington remains the preferred method of communication [Secretariat note: The Chair has subsequently established the Facebook group at the following link and invited participants to join: <https://www.facebook.com/groups/2234985623196166>].
      5. Recommendation 6.3 of Annex 4: Mr Dan Beardsley noted that SPREP was interested in taking on the responsibility as the regional entity for coordinating the activities of the SWFDDP. He informed the meeting that NOAA NWS tried to find 50% of costs for the coordination role, but budget could not be secured and could not be committed to long-term. Funding was also an issue from a WMO perspective. Mr Beardsley appealed to others, including to JMA and the Bureau of Meteorology to join NOAA NWS in the quest for securing resources to support the coordination of activities by funding a position in SPREP. The meeting recommended that this issue be reported to RA V (via the TCC) for discussion.
      6. Part of the responsibility of a regional entity will be to coordinate relevant SWFDDP training activities. The meeting was informed that Russia is funding a feasibility study on whether a Regional Training Centre (RTC) can/should be established in Fiji. Further, Mr Arona Ngari (Cook Islands) informed the meeting that a report on the status of training needs in the Pacific, commissioned by UNDP will be released soon. Owing to the importance identified by members for ongoing SWFDDP training, it was highlighted that the RSMT should keep abreast of the afore-mentioned studies.
      7. Recommendation 6.4 of Annex 4: This recommendation was also made by the EC WG on DRR and action is being taken to proceed with the independent review of the SWFDP, CIFDP and FFGS.
      8. Recommendation 6.5 of Annex 4: The meeting discussed the phase of which the SWFDDP exists and decided the project is to remain in the Demonstration Phase (Phase 3).
      9. Recommendation 6.6 of Annex 4: The Chair has recently received input from members to update the Regional Subproject Implementation Plan (RSIP) and requests further input from all RSMT members.
      10. Recommendation 6.7 of Annex 4: The meeting discussed the advancements in storm-surge modelling, noting that similar discussions were made during the preceding Tropical Cyclone Committee meeting earlier in the week. The meeting was informed the Bureau of Meteorology storm surge model is available for a large number of locations in the Pacific and evaluation of the model is currently taking place.
      11. As per recommendation 6.8 of the RSMT meeting in Honiara (August 2016), this meeting has been run back-to-back with the TCC in Noumea, New Caledonia. Further meetings of the RSMT was discussed. It was recommended that if this was to happen again, then there is more benefit for the RSMT to precede the TCC, as the RSMT reports to regional association V through the TCC. It was also discussed whether the RSMT should have a standing agenda item on the TCC meeting, rather than a distinct meeting. No decision was reached.
   2. **Reporting through the SWFDP database** 
      1. Mr Harou demonstrated the use of the SWFDP database, which was constructed in line with the WMO Country Profile Database (CPDB), to facilitate the production of progress reports by participating Members. The meeting was informed that Members of the SWFDP in Southern Africa are producing their reports online and this is helping with identification of bugs and possible improvements to this online reporting process. Mr Harou asked that each Member identify a focal point for the use of the database so that access can be granted to them by Mr Ata Hussain, the WMO SWFDP Coordinator. The meeting agreed to trial the database for the next progress report. Instruction on how to populate the database is available in the meeting Doc 4.2.
   3. **Future of the RSMT and updating of the Implementation Plan**
      1. Agenda items 4.3 (Future of the RSMT) and 4.4 (Updating the Implementation Plan) were discussed simultaneously with the salient points already addressed in section 4.1 of this meeting report.
      2. The Chair invited the meeting to consider the make-up of the RSMT. Specifically, whether the number of members of the RSMT could be reduced to approximately seven or eight members with management oversight of the SWFDDP (this smaller group to consist of the Chair of the RSMT, representation from RSMC Wellington, RSMC Nadi, Bureau of Meteorology, DRR and global producing centre(s)). It was discussed whether this smaller team could be more effective. If necessary, additional experts would be invited to address specific issues. The majority of the meeting thought that although the idea had merit, it was important that SWFDDP stakeholders remain part of the RSMT, including representation from each of the nine Pacific Island Members, and it was decided the status quo would be maintained pending the result of the independent review of the SWFDP.
2. **ANY OTHER BUSINESS**
   1. The meeting further discussed and stressed the requirement for on-going training and noted the following additional suggestions:

* To consider an additional half-day workshop on SWFDDP matters when the RSMT meets; and
* To compare the Honolulu Pacific training desk activities with the list of training topics suggested in the SWFDDP RSIP.

**Action:** James Lunny to provide the list of training topics in the RSIP (Annex G) to Dan Beardsley.

1. **CONCLUSIONS AND RECOMMENDATIONS**
   1. **The following recommendations were made by the RSMT:**

|  |  |  |
| --- | --- | --- |
|  | Recommendation | Responsibility |
| 6.2.1 | The SWFDDP to remain in the Demonstration phase until: a regional entity is identified to undertake management responsibilities; completion of an independent review of the SWFDDP; and for the participating NMHSs to fulfil the criteria set at the RSMT meeting in Nadi, August 2013. | WMO; NMHSs |
| 6.2.2 | The TCC to include in its paper to the RA V Session (Oct 2018) consideration of the issue around identifying and funding a regional entity for coordinating activities of the SWFDDP. | Chair of the TCC |
| 6.2.3 | The TCC to consider disestablishing the regional TT SWFD/DPFS and maintaining the RSMT. | TCC |
| 6.2.4 | WMO to ensure that the SWFDDP management team structure, and roles and responsibilities of the management structure, are considered within the independent review of the SWFDP. | WMO |
| 6.2.5 | Set up a closed Facebook group to facilitate frequent exchange between NMHSs, RSMCs and GPCs. | Chair of the RSMT |
| 6.2.6 | Proactively provide feedback on the performance of the participating global and regional models and undertake the writing and publication of case-studies for the purposes of model verification and future training activities. | NMHS and RSMCs |
| 6.2.7 | On-going training should be planned and executed with focus on: impact-based forecasting and warnings; MetConnect Pacific; verification; and interaction with the DRR community. | All |
| 6.2.8 | Training topics listed in the RSIP (Annex G) to be compared with training undertaken by the Pacific Desk at NOAA NWS Honolulu, in order to identify gaps and maximise the curriculum offered by the Pacific Desk. | Chair of the RSMT and NOAA NWS |
| 6.2.9 | Identify national focal points for reporting through the online SWFDP database, and trial the database for the next progress report (due October 2018). | NMHSs and RSMCs |
| 6.2.10 | Silent upper air stations were highlighted as one of the major gaps in the Southwest Pacific observational network by the Joint GCOS-WIGOS Workshop for the Pacific Small Island Developing States (SIDS), 9-12 October 2017, Nadi, Fiji. The key messages from this Joint GCOS/WIGOS Workshop should be made visible to potential donors. | All |
| 6.2.11 | Requests for extra meteograms were made from a number of members of the SWFDDP. The Chair to liaise with relevant global centres to check on feasibility. Requests for such additions to MetConnect Pacific need to be collated and go to the project’s management entity, or MetService, for consideration and funding. | Chair of the RSMT |
| 6.2.12 | To investigate making upper air sounding data available on MetConnect Pacific. Again, requests for such additions to MetConnect Pacific need to be collated and go to the project’s management entity, or MetService, for consideration and funding. | Chair of the RSMT |
| 6.2.13 | Members of the SWFDDP are encouraged to register for the JMA HimawariRequest service, if their respective NMHS has not already done so. | NMHSs |
| 6.2.14 | NMHSs to continue close liaison with RSMC Wellington, particularly when issues have been identified with MetConnect Pacific. | NMHSs |
| 6.2.15 | US WRF links on MetConnect Pacific are currently not working; follow up on previous correspondence between MetService and NOAA NWS. | Chair of the RSMT and NOAA NWS |
| 6.2.16 | Ensure the recommendations from this meeting of the RSMT are reflected in the meeting report of the TCC that ran immediately before this meeting. | Chair of the TCC and Chair of the RSMT |

1. **REVIEW OF MEETING REPORT**
   1. The meeting reviewed the list of recommendations, with the understanding the meeting report will be completed by the Secretariat after the meeting had ended. Abdoulaye Harou will develop the first draft of the meeting report and will share it with the Chair before it is sent to participants for their review.
2. **CLOSING**
   1. Mr Hugues Ravenel expressed his thanks to Mr Patrice Lechanteur who worked hard to make this meeting a success for hosting the meeting. He wished everybody a safe trip home and hoped to meet some of the participants at the RA V Session in in Tonga (October 2018). He hoped that the good collaboration demonstrated during the meeting will continue.

* 1. Mr James Lunny thanked the French government and Meteo-France for hosting and SPC for the excellent venue and to WMO for organizing the meeting. He thanked everyone for their participation, particularly as many had attended the TCC prior to the RSMT, making this their sixth day of meetings in the same venue. Mr Lunny wished everyone a pleasant and safe journey home.
  2. Meeting adjourned at 15:46 min, 28 July 2018.

**Annex 1**

**PROVISIONAL AGENDA**

1. **OPENING**
2. **ORGANIZATION OF THE MEETING**
   1. Adoption of the Agenda
   2. Working arrangements
3. **EVALUATION AND REVIEW OF SWFDDP INCLUDING ACHIEVEMENTS AND GAPS**

3.1 Summary from the progress reports including verification of forecasts and warnings, service delivery aspects, case studies etc.

3.2 Global and Regional Centre reports

3.3 National Centre Reports

3.4 Review PWS component of the SWFDDP

1. **TRANSITION OF SWFDDP TO THE NEXT PHASE**

4.1 Follow up Actions from last RSMT Meeting 2016

4.2 Reporting through SWFDP database

4.4 Future of the RSMT

4.5 Updating of Implementation Plan

1. **ANY OTHER BUSINESS**
2. **CONCLUSIONS AND RECOMMENDATIONS**
3. **REVIEW OF MEETING REPORT**
4. **CLOSING**

**Annex 2**

**List of Participants**

|  |  |  |
| --- | --- | --- |
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**Annex 3**

**Criteria for the move to the Continuing Development phase**

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 [criteria maintained by the RSMT meeting in Honiara, Solomon Islands, August 2016]:

“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:

1. An appropriate non­TC warning system has been implemented in all participating countries and is operating smoothly.
2. All participating countries are verifying severe weather and wave forecasts & warnings using the tool provided during the in­country training or an equivalent tool.
3. 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).
4. 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.
5. All participating countries to complete all SWFDDP progress reports in full before the deadlines prescribed.”

**Annex 4**

**Conclusions and Recommendations of the RSMT meeting,**

**Honiara, Solomon Islands, 25 to 27 August 2016**

**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 (see Annex 3 above), 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.