

SWFDP - Southern Africa

QUARTERLY PROGRESS REPORT N° 1 for the period 24 November 2008 – 31 March 2009

Final version 24/07/09

1 – Overview

1.1 Introduction

This report summarizes the individual first quarter reports submitted by the participating NMHSs in the SWFDP Regional Subproject which has expanded to include the entire region of southern Africa, covering the period from the start, to the end of the first quarter of 2009 of the demonstration (i.e. November 2008 to March 2009). The first phase of this project took place during November 2006 to November 2007, and had included the participation of five NMHSs in southeast Africa, focused on heavy rain and strong winds.

The centres that participated in this period of the “SWFDP – Southern Africa” project include the following (see Fig. 1):

- NMHSs (14): Angola, Botswana, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Tanzania, Seychelles, South Africa, Swaziland, Zambia, Zimbabwe;
- Regional Centres (2): RSMC Pretoria, RSMC La Réunion;
- Global Products Centres (3): Exeter (Met Office UK), Washington (NCEP USA), and ECMWF.



Figure 1 - Map of the SWFDP - Southern Africa countries

(Note: Comoros, and Democratic Republic of Congo have not yet indicated their participation)

RSMC Pretoria officially expanded its services from the initial 5 countries to 16 countries during this period. This included guidance on additional hazards as finalized during the February 2009 Regional Technical Implementation Team (RTIT) meeting.

For this first Quarterly Progress Report, reports have not been received from two NMHSs, and among those submitted, some parts of the agreed feedback were not provided. Table 1 summarizes the information provided.

The information provided by the participating centres has been analysed with the aim to assess the utility and quality of the RSMC Daily Guidance, the relevance and the skill of the various NWP products, the pertinence of the severe weather warnings issued by the NMHSs and the improvement of the warning services they delivered to Disaster Management and Civil Protection Authorities, “DMCPA”. The quarterly evaluation table is used to identify all severe weather events of the reporting period, that occurred (forecast or not), and forecast (occurred or not).

FEEDBACK RECEIVED FROM THE NMHSs				
Country	Quarterly report	Quarterly evaluation table	Verification of warnings	Case studies
Angola				
Botswana	X	X	X	X
Comoros				
R.D. Congo				
Madagascar	X		X	
Lesotho	X	X	X	X
Malawi	X	X	X	
Mauritius	X	X	X	
Mozambique	X	X	X	X
Namibia	X			
Seychelles	X	X		
South Africa	X			
Swaziland	X			X
Tanzania				
Zambia	X			
Zimbabwe	X	X	X	X

Table 1 – Summary of the information received, noted by “X”, from the NMHSs for the 1st Quarterly Progress Report.

1.2 News

Rolling out the RSMC Daily Guidance Products to all 16 countries in the region posed additional challenges to RSMC Pretoria. This related particularly to the number of additional countries required on the risk (day-1 and day-2) and probability (day-3, day-4, day-5) tables, as well as the additional hazards that needs to be monitored. However, the forecasters of RSMC Pretoria have managed to adapt well to these changes. The risk and probability tables still need to be effectively adapted for all the different hazards, which vary seasonally. As well, it is evident that a Web interface needs to be developed to make effective exchange of national warnings among the participating NMHSs possible, and to display them on a map in a similar fashion as “Meteoalarm” in Europe. This possibility was already discussed with some funding agencies and needs to be pursued.

Progress is being made between RSMC Pretoria and RSMC La Réunion on displaying of outputs from the latter’s limited area model “Aladin-Reunion” (10-km resolution), covering the

South-west Indian Ocean basin on the RSMC Pretoria Web site for the use by the 16 NMHSs. RSMC La Réunion is currently working on packaging the information in a compatible format for RSMC Pretoria to easily display on its Web site.

Arrangements were also made with Eumetsat to use the Eumetcast system to transmit additional satellite nowcasting products developed at RSMC Pretoria to countries using the MSG satellite. The RSMC Pretoria Daily Guidance products will also be transmitted in this way to overcome any internet bandwidth problem that a country in the region may have to access these products. This system will be tested soon.

2 - Summary of the severe weather events reported by NMHSs, 24 November 2008 to 31 March 2009

This first quarter of the SWFDP – Southern Africa demonstration includes the period from the beginning (24 November 2009) to the end of the first calendar quarter of 2009 (31 March 2009), and corresponds approximately to the rainy season in the southern part of Africa. Normally, the tracks of the southern hemisphere mid-latitude perturbations shift northward, while the ITCZ remains very active and results in strong convective events. This is also the favourable period for the development of tropical storms and cyclones in the eastern part of the Indian Ocean, which could eventually impact on the southern African region. Indeed, in this region, 5 tropical cyclones or storms were identified and tracked by the RSMC La Réunion during this first quarter. The threatening periods for the SWFDP – Southern Africa region, identified with help of the definitive cyclone tracks established by the RSMC La Réunion (see Annex 1), are given below:

- moderate Tropical Storm ASMA: from 20/10/2008 to 24/10/2008;
- moderate Tropical Storm ERIC: from 18/01/2009 to 21/01/2009;
- intense Tropical Cyclone FANELE: from 19/01/2009 to 23/01/2009;
- intense Tropical Cyclone GAEL: from 04/02/2009 to 09/02/2009;
- strong Tropical Storm IZILDA: from 22/03/2009 to 29/03/2009.

The following list summarizes the highlights concerning severe weather events provided by the participating NMHSs in their respective quarterly reports. The order of the presentation below is by country, from west to east (see Figure 1 for reference).

Namibia

Since the beginning of 2009 the north-central and north-eastern regions of Namibia experienced torrential rains, and caused increased the water level of the rivers. The consecutive floods resulted in the death of many people and displacements of populations so that Namibia appealed for international assistance on the 17 March 2009.

Zambia

In Zambia, this period corresponds to the rainy season that can be considered this year as normal to above normal with regard to rainfall. Heavy rainfall occurred from 15 to 22 March 2009 over the northern and western parts of Zambia. Floods and flash floods also occurred over most parts of these regions especially during March 2009.

Malawi

During this period, heavy precipitation generally accompanied by strong winds, results from the interactions between moist, unstable north-westerly air masses and ITCZ. Localized heavy downpours occurred in some parts of the country during November 2008. From December 2008 to March 2009 heavy precipitation with daily amounts exceeding 100 mm/24h were reported in the southern part of the country (18 December 2008, 16 January 2009, 18 and 28 February 2009, 3 and 22 March 2009).

Zimbabwe

During this rainy season, severe weather was dominated by heavy precipitation resulting mainly from strong convective activity, although middle level stratiform clouds played a part for several cases. Zimbabwe experienced 3 important heavy rainfalls. The first event was from the 24 to the 25 December 2008, the second one occurred on the 8 January 2009, and the third one was on 12 January 2009. These last two events were announced by meteorological and flash flood warnings that involved DMCPA and Water Management Authority.

Botswana

The rainfall activity started in November 2008, intensified during December and January 2009 and reached a peak toward the end of January 2009 (26 - 30 January 2009). The bulk of the active weather was concentrated in the south-eastern quadrant of the country.

Mozambique

During the period unseasonable dry weather prevailed over much of Mozambique, and until middle of December only scattered, light to moderate rain fell over portions of southern and central Mozambique, hence represented a late onset of the rain season. From the 25 to 27 December, an upper trough enhanced a cold front over southern Mozambique coast that was connected to a coastal low and gave heavy rainfall and caused extensive flooding over these regions. Another heavy rainfall event caused flash flooding on the 3 February 2009 over Maputo City.

South Africa

An explosive cyclogenesis that occurred south of South Africa on the 22 and 23 December caused strong to gale force winds and very rough seas on the south coast of South Africa. This resulted in the sinking of a fishing boat near Port Elizabeth with the loss of several lives. From January to March 2009 a mixture of westerly cut-off lows and tropical lows caused outbreaks of heavy rain over parts of South Africa. Three notable damaging weather events took place during the quarter. A severe, slow-moving thunderstorm caused flash-flooding in Klerksdorp in the North-West Province on 21 January 2009. Another severe, slow-moving thunderstorm remained quasi-stationary over the Soweto area and generated significant flash flooding on 26 February 2009 that inflicted much damage. On 7 March 2009, a cut-off low situated to the east of the country generated strong south-easterly swell along the KwaZulu-Natal coast that resulted in damage along the coast. Taking into account the customary criteria, no warning was issued but this event forced the SAWS to revisit the heavy sea warning requirement for the east coast. It is important to mention that warnings were issued for wildfires in the Western Cape and for a heat wave due to persistent catabatic wind in the same region during the first week of March. Warnings were also issued for meteorological conditions where a combination of high temperatures and high humidity significantly increases the risk of heatstroke for people engaged in exercise or physical labour.

Swaziland

This season is normally characterized by the weather associated with the ITCZ and under the influence of Tropical Cyclones, and the most important meteorological events consist of heavy precipitation. The rainfall activity was considered as normal to above normal for the country for the review period.

Lesotho

In December 2008 and January 2009, Lesotho experienced very strong wind events; one of them was associated with heavy precipitation in the southern part of the country and led to major damages. Scattered heavy precipitation was also observed on the 28 January 2009 in the western part of the country.

Madagascar

This period corresponds to the rainy and cyclonic season in the south-western part of Indian Ocean. Madagascar Island experienced 4 tropical cyclone events during this period. The Tropical Storm Eric that affected the east coast and the Tropical Cyclone Fanele that landed over the south-western region produced heavy rains and strong winds that caused casualties and major damages. The effect of the Tropical Cyclone Gael and the Tropical Storm Izilda was less serious because their tracks were sufficiently far from the Island. In addition, 3 severe convective episodes occurred associated with the ITCZ; each of them caused continuous rains during 4 or 5 days over the northern part and produced local flooding.

Mauritius

This summer season can be considered as an average season. The weather was rather dry during November 2008 with the exception of heavy rainfalls during the period 27 - 29 November. The start of the rainfalls occurred in the last week of December when atmospheric conditions were favorable for afternoon sea breeze developments giving localized showers. During January to March 2009, the Island received normal monthly rainfall but experienced 4 heavy precipitation events associated with strong convective activity (2 in February and 2 in March). The tropical cyclone Gaël passed at a distance of about 200 km to the north of Mauritius on 5 February and did not cause severe impacts on the country.

Seychelles

This period corresponded with the rainy season over the Seychelles Islands with extremely wet weather from December 2008 to January 2009 during which the Island experienced 3 heavy precipitation events associated with severe convection.

3 – Performance of the RSMC Daily Guidance

An evaluation system for the RSMC Daily Guidance maps against satellite rainfall as measured using the Hydro-estimator system running at the RSMC is currently being tested. Once this proves to be a viable method, it will be used to attempt verification of the rainfall areas on the guidance maps since the beginning of this project.

4 – Comments about the RSMC Daily Guidance and NWP Products

4.1 – General assessment of the usefulness of SWFDP support

The RSMC website is still the main means of communicating the SWFDP products prepared by the global and regional centres to the 16 NMHSs. Some modifications were made to the Web site to accommodate changes requested at the RTIT meeting in February 2009.

The NMHSs participating in the SWFDP were asked to give their general comments about the usefulness of the “RSMC Daily Guidance for Severe Weather Forecasting” product issued by RSMC Pretoria, and the NWP guidance from various participating global and regional centres. In addition, for each event reported in their “Quarterly Evaluation Table”, they were also asked to give a rating (from 1 to 4) to quantify the usefulness of the SWFDP support. The synthesis of their assessment is given in the Table 2.

USEFULNESS OF SWFDP SUPPORT									
Country	Mark	Guidance usefulness				NWP/EPS usefulness			
		1	2	3	4	1	2	3	4
	Nb. events								
Angola									
Botswana	40	3	14	11	12		15	23	2
Comoros									
R.D. Congo									
Madagascar									
Lesotho	4		3	1			2		2
Malawi	27		7	20		-	-	-	-
Mauritius	2	-	-	-	-				
Mozambique	27	2	8	16	1		1	18	8
Namibia									
Seychelles	3		3			-	-	-	-
South Africa									
Swaziland									
Tanzania									
Zambia	1								
Zimbabwe	33		16	5	12		3	14	16
Total	137	5	51	53	25	0	21	55	28

Table 2 – Evaluation of the usefulness of SWFDP support during the severe weather events reported by the participating countries.

1 = misleading; 2 = not useful; 3 = useful; 4 = very useful;
- = absence of rating.

4.2 – Usefulness of RSMC Daily Guidance

According to the ratings given in the left part of Table 2, the NMHSs are rather satisfied with the RSMC Pretoria Daily Guidance (“useful” to “very useful” predominate), that it helped forecasters to issue warnings and reinforce their confidence in their own forecasts. It is important to note that this guidance is not only used in the context of severe weather forecasting but also for the day-to-day routine forecasting. It is incorporated into the routine by many NMHSs forecasting centres as a starting point for the discussions about the evolution of the large scale features of the atmosphere over their country.

4.3 – Usefulness of METEOSAT Next Generation Satellite (MSG) products

In 2008, following the outcome of the first phase of the SWFDP (southeast Africa), the RSMC Pretoria Web site has incorporated MGS products that estimated cumulative rainfall amounts, i.e., the “hydroestimator”. These products are helpful in assessing the possible rainfall amounts over the entire region, in near real-time. Nevertheless only NMHS Swaziland indicated in its report that the “hydroestimator” was very useful for short-range forecasting and NMHS Zimbabwe pointed out the importance of this product in its case studies.

4.4 - Usefulness of SWFDP NWP/EPS Products and RSMC UM-SA12

The ratings that appear in the right part of the Table 2 indicate the usefulness of NWP model products that are available through the SWFDP portal and show the high degree of satisfaction expressed by the NMHSs. Forecasters appreciate to be able to access large-scale medium-range deterministic and probabilistic forecasts given by the Global Centres, refinements in the model fields given by the limited area models and the chronological

evolution of the model parameters through the EPSgrams. Nevertheless many of them point out the weakness of the present model output to forecast severe convective events or to accurately forecast rainfall amounts. They also mention the difficulty to make the best use of this huge amount of model fields; there is no doubt that there is a need to pursue the training effort to show them how to make the best use of all the available SWFDP guidance products.

5 – Project evaluation against SWFDP goals

5.1 - To improve the ability of NMCs to forecast severe weather events

All the participating NMHSs reported a positive impact of daily use of SWFDP products (for both day to day and severe weather event forecasting). Generally RSMC guidance and model output help increase the skill of the forecasters and boost their confidence. Nevertheless some NMHSs noted that forecasting severe convection events accurately remains a challenge.

5.2 – To improve the lead-time of alerting these events

All the NMHSs that experienced severe weather events indicated that SWFDP products allowed them to improve the lead time of providing alerts to these events. Thanks to the medium-range deterministic and probabilistic forecasts, several events were detected and tracked 5 days in advance.

5.3 – To improve the interaction of NMHSs with DMCPAs before, during and after severe weather events

The present SWFDP Regional Subproject gives the opportunity to establish (for several NMHSs) or to strengthen (for most of them) links with their national DMCPA. Common meetings and training sessions organized by several NMHSs, as well as those organized by WMO, help DMCPAs staff better understand the significance and the limitations of the meteorological warnings. Even if it seems difficult to obtain a regular feedback, this increased cooperation contributes to improving the communication between NMHSs and DMCPAs.

5.4 – To identify gaps and areas for improvements

Two main problems have been identified during this first quarter of the SWFDP:

Difficulties to forecast strong winds and heavy precipitation associated with strong convection: the NWP continues to show difficulty to predict such severe convective events. Rather, the occurrence of such events can be anticipated by using nowcasting techniques based on real-time frequently updated satellite products, and on radar images where they are available. While MGS products well cover the region, ground receiving and processing systems are not available or not in working order in many of the NMHSs. As well most of the participating countries do not have operating radars to support timely warnings in the very short-range forecasting period.

Many NMHSs pointed out the deficiencies of their surface observational network especially for the evaluation of precipitation forecasts, even with the help of the MSG-hydroestimator.

5.5 – To improve the skill of products from Global Centres through feedback from NMCs

Many NMHSs are willing to provide feedback to the global centres about the performance of their products. Nevertheless, for the moment, the feedback consists mainly in the information given in the present report, and in the case studies prepared by the NMHSs. Lack of feedback from NMHSs remains a problem. A few countries made efforts to send emails to RSMC Pretoria commenting on the severe weather and the warnings they are issuing.

6 – Evaluation of weather warnings

6.1 - Feedback from the public

Many NMHSs noted the difficulty to assess the feedback from the public especially in the rural areas due to a general lack of a regular mechanism of evaluation. Nevertheless occasional surveys seem to indicate that the satisfaction of the public is rather good even if some misleading forecasts for severe convective events diminish their impression. Two actions are important to note: the co-operation engaged between NMC Pretoria and the University of Cape Town to perform evaluation of forecast products; and the user assessment survey launched by the NMHS Zimbabwe on the World Meteorological Day.

A comprehensive review of the information provided by the NMHSs and recommendations on important PWS aspects of SWFDP are given in the Annex 2 to this document.

6.2 – Feedback from DMCPAs

Although there exists no systematic feedback from the DMCPAs in all the countries, the participation in SWFDP encouraged the NMHSs to develop closer relationships with this category of users:

- In Lesotho, Mauritius, Zimbabwe and Seychelles Islands the relationships are rather good;
- In Swaziland, the process of establishing a DMA is going on;
- In Malawi, the meteorological service is in position to identify a regular feedback mechanism;
- In Madagascar, a questionnaire has been prepared to obtain feedback,
- In Namibia, a meeting with stakeholders was held recently,
- In Zambia, an officer from the NMHS joined the DMCPA to participate in the assessment of the heavy precipitation event that occurred in March 2009.
- In Botswana, the warnings are now directly sent by the Met Service to shorten the transmission time toward the users.
- In Mozambique, designation of focal points in the DMA helped to improve the understanding of the severe weather warnings.
- In South Africa, a working session was held between meteorologists and hydrologists to improve the way to issue consistent heavy precipitation and river flooding warnings.

Concerning the disaster risk reduction (DRR) aspect of SWFDP, a review is given in the Annex 2 to this document. This review also contains important recommendations to improve the collaboration of the NMHSs with their respective national DMCPAs.

6.3 – Feedback from the media

Most of the NMHS mentioned good relationships with the media but recognize that there is no formal feedback. With regard to transmitting the warnings several NMHSs (Botswana, Madagascar) reported communication problems with the media that are responsible for some delay in the dissemination of the information to the public. Meetings that gather meteorologists and journalists together are very useful, to agree on the formulation of the messages and the best way to transmit them without delay. The implementation of public relation desk, that is now effective at NMHS Zimbabwe, is a very efficient way to improve the relationships with this category of users. Nevertheless, although several NMHSs (Malawi, Mauritius, Seychelles, and Swaziland) expressed in their quarterly report their willingness to undertake actions to improve relationships with the media take, it clearly appears that NMHSs have to work actively to take up this challenge. The NMHSs should use the guidance documents (PWS) distributed at the 2008 Pretoria training workshop to assist them to obtain clear and precise feedback from the media in the next quarterly report.

6.4 – Objective Verification by the NMCs

A summary of the verification efforts reported for the first quarter of the extended SWFDP is shown in the Table 3. The results are so far very encouraging: Of the 12 countries for which reports have been received, all but 5 have made the effort to verify their warnings by means of a contingency table, following the recommended methods. And, in two countries there were too few severe weather occurrences (Seychelles and Swaziland), to require a contingency table. One NMHS (Zimbabwe) did a full analysis of the results, leading to specific recommendations on how to improve the forecasts.

There were significant differences among the countries concerning the definition of the severe weather event. Some countries defined each day as an event, so that the total sample size will equal the number of days in the verification period (e.g. 113 for Madagascar). For these countries, the contingency table will include all 4 boxes, since inactive days are counted as correct negatives. Other NMS's considered only the active days as events, so that their contingency table includes only 3 of the boxes, hits, misses and false alarms, and their sample size is equal to the number of active days. In those cases it is not always clear whether false alarm days (warning issued, but no event reported) are included or not. A third, intermediate interpretation of event was shown by Botswana, where inactive days were counted as one event, while active days resulted sometimes in more than one event. Since the Botswana NMS has included the original data in its report, it is a relatively simple matter to rescale the contingency table counts so that each day counts as one event. One country (Zambia) reported a single severe weather (flooding) event, but this extended over several days and over a relatively large area.

Aside from Zimbabwe, which has diligently divided the dataset up into 6 regions covering the country, and Botswana, where each event is treated separately, it is not always clear whether the location of the observed events vs the forecast is taken into account when compiling the table. In other words, if the forecast specifies a location for severe weather, and it occurs, but somewhere else, is that counted as a hit, or a false alarm and a missed event for the forecast and observed location respectively?

From the point of view of services to users, the contingency table verification is important in identifying objectively the number of missed events and false alarms, and to check the forecasting strategy. If too many false alarms occur, then the users will learn to ignore the warnings. On the other hand, if there are too many missed events, then the methods for identifying threatening situations need to be examined. As an example, the Zimbabwe NMHS has done this analysis of their contingency table results and discovered that the level of false alarms is too high, recommending that this be improved.

It would be advantageous also to take into account the spatial coverage of the forecast when the verification is carried out. A weather warning that covers an area much larger than the affected area is less useful than a warning that covers an area closer in size to the affected area. Provided there are enough observations to support it, countries could be divided into regions as for example in Zimbabwe, for the purpose of verification. This would be the best and easiest way to take into account differences in the area covered by forecast and observation.

Country	Event definition	N	Contingency Table			Data included?	Comment
			Included?	Scores	Analysis		
Botswana	Inactive day =1 case; otherwise separate events	142	yes	yes	no	yes	
Madagascar	Each day = 1 case	113	yes	yes	no	no	
Lesotho	Each active day = 1 case	5	yes	no	no	yes	
Malawi	Each active day= 1 case	27	yes	yes	no	yes	All stn reports listed; not clear how correct negatives determined
Mauritius	Each active obs and/or fcst day = 1 case	17	yes	yes	no	partly	
Mozambique	Each active day= 1 case	28	yes	yes	yes (some)	yes	
Namibia	Not defined		no	no	no	no	
Seychelles	Not defined	0	Not needed			no	
South Africa	1 case only*	1	no	no	Yes**	no	
Swaziland	1 case only	1	Not needed		Yes**		
Zambia	1 case only	1	Not needed ***	no	Report of the case	For the one case	One widespread and long duration flooding case
Zimbabwe	Each day = 1 case, 6 regions	588	yes	yes	yes	yes	Most complete report on verification
<p>*For Southwestern Cape area only; rest of country not reported. **Case study of the one case ***Given the larger scale definition of the event</p>							

Table 3 – Summary of the objective verification performed by the NMHSs during the first quarter of the SWFDP.

7 - List of the case studies prepared by the NMHSs

During this first quarter 5 case studies were prepared by 4 NMHSs :

- **Botswana:**

Strong instability associated with a surface low favoured the development of thunderstorms giving heavy rain and strong wind over Botswana on the 2 November 2008.

- **Lesotho:**

Severe convection that resulted in heavy precipitation and strong winds over Quthing on the 2 December 2008.

- **Mozambique:**

A mesoscale convective system gave heavy rain over Inhambane province and resulted in extensive flooding from the 25 to the 27 December 2008.

Strong convection enhanced by onshore flow associated with a coastal low gave heavy precipitation over Maputo City from the 3 to the 4 February 2009.

- **Swaziland:**

Heavy precipitation resulted from an intensifying tropical low that gave flash flood of the river Sitilo on the 3 February 2009.

- **Zimbabwe:**

Heavy rainfall that occurred throughout the country on the 24 and 25 December 2008 was rather well anticipated thanks to the SWFDP guidance and products and the expertise of the forecasters.

Heavy precipitation affected the southern and eastern districts of Mozambique from the 6 to the 12 January 2009. The study stressed the importance of the MSG imagery and the difficulties to prepare the forecasts when there is some divergence between the various model products.

This heavy rainfall event that occurred just after the preceding one, from the 14 to 18 January 2009 was correctly anticipated by the models. During the first warning period, the “hydroestimator” proved to be a valuable tool in estimating rainfall amounts and the identification of areas most affected by the heavy rains.

NMHSs Malawi, Mauritius and Zambia announced they will be able to produce case studies in the next quarterly report. South Africa provided a very comprehensive case study of severe weather events that occurred in 16 – 17 May 2009.

8 – Conclusions

All the countries that reported are globally satisfied by the support that the SWFDP provided, not only for severe weather forecasting but also useful for the day-to-day routine forecasting. In contrast to the feedback received from the earlier first phase of the SWFDP, there were no remarks concerning difficulties to access the products through the SWFDP Web site and portal via the Internet. During the Training Workshop (November 2008), and the SWFDP – Southern Africa planning meeting (February 2009), none of the sixteen NMHSs of southern Africa indicated Internet access problems, hence this first quarter reporting is consistent with the conclusion that most, if not all, of the NMHSs are able to satisfactorily access the various SWFDP guidance products.

All the participants also agreed on the usefulness of the RSMC Daily Guidance and NWP guidance products for severe weather forecasting. The shortcomings of the NWP model outputs that were reported in the context of severe convective situations are well known. This is the reason why there is a need use nowcasting tools in the very short-range, including improved access and better use of MSG-satellite products that are already available (e.g. via SUMO).

NMHS Mauritius would like to receive the short-range RSMC Daily Guidance earlier in the day for preparing their own forecasts and for anticipating their need to issue weather warnings. However substantial dedicated time is needed by the forecasters to prepare this RSMC Daily Guidance, to scrutinize NWP fields and to formulate a clear assessment about the expected weather for the entire region of half a continent. There were some complaints of the size of the NCEP graphical maps (Swaziland) and the difficulty of identifying their country in the RSMC Guidance (Malawi). Consequently it is important that RSMC Pretoria forecasters identify geographically the threatened areas by referring to the names of the countries.

Many NMHSs expressed a real need for training for forecasters about the performances and the possible shortcomings of the various NWP models that provide guidance to forecasting (e.g. medium-range global products, limited area predictions, how to interpret the probabilistic forecasts combined with the deterministic ones), and to propose to them a way of working to deal with the large amounts of information.

Most of the NMHSs mentioned some difficulties to obtain formal feedback from their DMCPA, and that developing close cooperation remains a challenge. To take it up, it is necessary to define and develop standing operational procedures for cooperation. This cooperation can be reinforced by designating focal points in charge of receiving the warnings in the DMCPAs and to take corresponding action. Joint training of forecasters and staff of DMCPAs will also benefit their mutual understanding to more effectively deal with severe weather events.

To obtain valuable information from the public and media about the usefulness and effectiveness of warnings, it is necessary to define clearly all the information required, and to prepare and send a questionnaire to be filled by the users after each severe weather event. The material provided by PWS, the examples of which were shown during the Pretoria 2008 training workshop, is quite suitable for this purpose and is freely available from WMO.

Finally, for the completeness of the next SWFDP Quarterly Progress Report, all NMHSs' quarterly reports should follow closely the agreed format proposed in the SWFDP - Southern Africa Regional Subproject Implementation Plan, including the Quarterly Evaluation Table. The second quarterly report covers the period from 1 April to 30 June 2009, and is due on 31 July 2009.

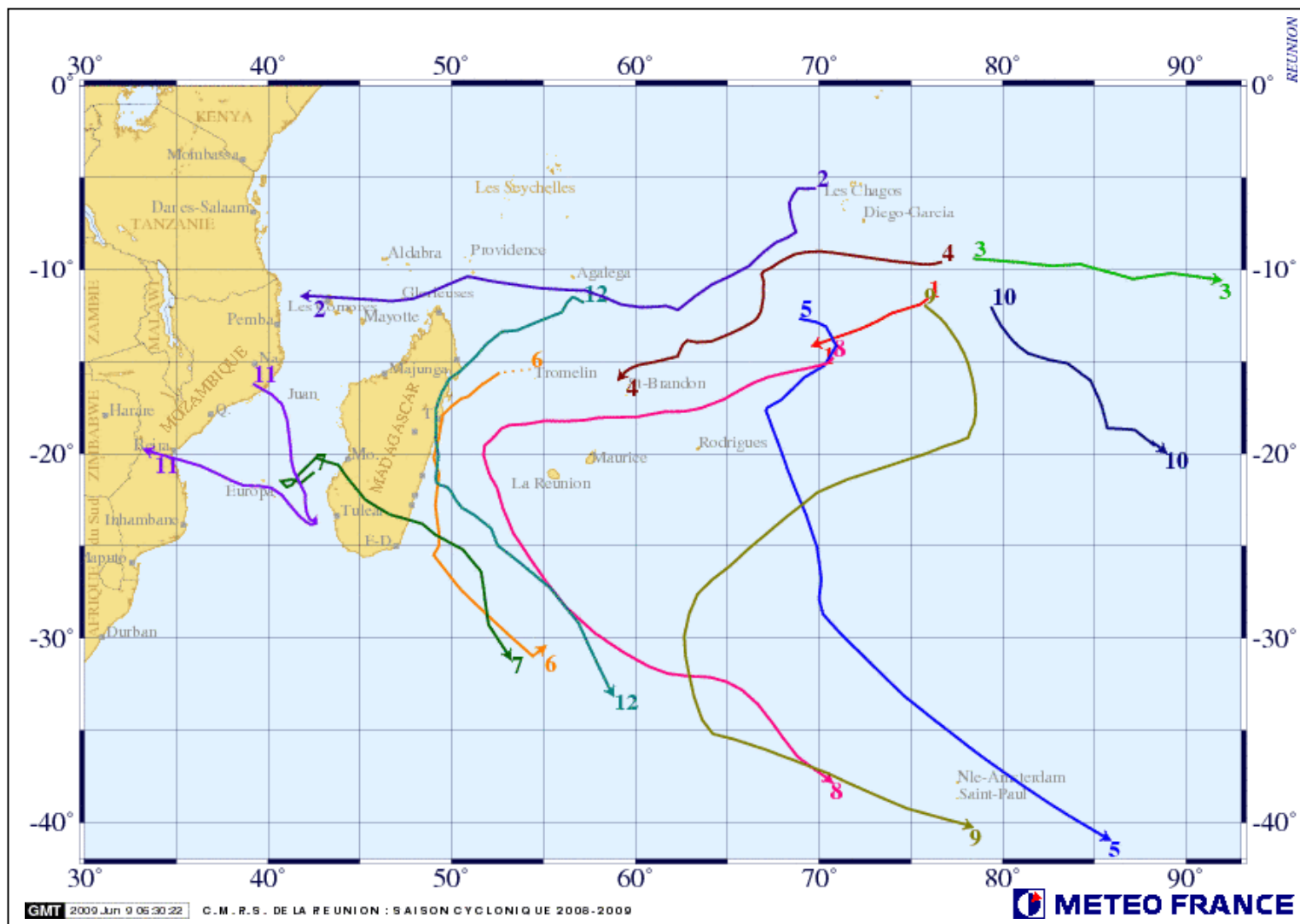
Annexes

Annex 1 – Tropical cyclones and storms in the eastern Indian Ocean – Season 2008-2009

Annex 2 – First Quarter Summary of the Public Weather Services (PWS) and Disaster Risk Reduction (DRR) assessments

ANNEX 1 - TROPICAL CYCLONES AND STORMS IN THE EASTERN INDIAN OCEAN – SEASON 2008-2009

N°	Name of the system
12	JADE
11	IZILDA
10	10-20082009
9	HINA
8	GAEL
7	FANELE
6	ERIC
5	DONGO
4	CINDA
3	BERNARD
2	ASMA
1	01-20082009



ANNEX 2 - First Quarter Summary of the PWS and DRR assessments

	Public Feedback	Media Feedback	Comments by C/PWS	Comments by DRR
Botswana	<p>During this period, feedback from the general public was largely positive. They appreciated the fact that warnings were now issued with increased regularity, consistency and increased level of confidence. On the other hand, a challenge DMS still faces is to continue working hard at improving the regularity and communication of these warnings to relevant users. Getting feedback on the impact of the warnings issued is a challenge facing DMS. However, no efforts will be spared in trying to put in place mechanisms for obtaining feedback from the end-users.</p>	<p>DMS enjoys good relations with the media especially radio and Television. Radio has proven to be the best and most accessible to both the forecasters and the general public to disseminate and receive warnings. Forecasts and warnings issued by DMS have now become part of the news content for most Radio and Television stations, especially commercial radios. In addition, during, weekdays, weather forecasts and warnings are issued live in the morning on the main national radio station, Radio Botswana. Forecasters also get to take part in live and /or recorded interviews by the newspaper, radio and television crews. DMS is organizing meetings with the media. The only major challenge is lack of reliable</p>	<p>Public Feedback: The positive reaction by the public to the warnings and forecasts is promising, as is the attitude of DMS to put in place mechanisms to get feedback. Recommendation: DMS should use survey forms similar to the one developed at the workshop to gather the feedback in a more objective manner. Media Feedback The positive and proactive attitude of DMS is very encouraging and should be considered as a model by the other project participants. Recommendation: Set up a mechanism to regularly update the contact details to overcome rapid turn over of media staff or the problem of changing contact information.</p>	<p>There are coordination challenges to be addressed between the NMC and the National Disaster Management Office (NDMO). Recommendations: - Development of standing operational procedures between the NMC and the NDMO; - Designation of a focal at the NDMO to receive and take action on the basis of warnings sent by NMC; - Joint training of forecasters and staff of NDMO on the use interpretation and use of forecasts and warnings.</p>

		<p>communication modes for the media houses. Email addresses and faxes numbers change often. This problem sometimes results in outdated forecasts being read over the radio. A radio room with a dedicated telephone line has been established to improve weather broadcasts over the radio.</p>		
Lesotho	<p>So far no formal feedback mechanisms are in place but public opinion is sought informally. The public response is positive but it remains a challenge for the office to get the feedback from the rural communities that are the most vulnerable. Efforts are being made together with the DMA to reach out and gather the rural community opinions. The early warning system has some challenging gaps in terms of communication, and strategies have to be put in place to overcome them.</p>	<p>No formal survey has been done but informal indications are that some radio stations appreciate the work of the Met service whereas others are still not yet convinced.</p>	<p>Public Feedback: It is encouraging that the challenges have been recognized and plans are being made to address them in a collaborative way. Recommendation: Strongly urge that every effort being made to reach the rural communities since they will benefit greatly from the warnings and forecasts. Media Feedback: The relationship is ad-hoc. Recommendation: Formal as well as informal relationship building with the media should be pursued.</p>	<p>Reportedly there is a good collaboration between NMC and the DMCPA. Lack of feedback from the DMCPA is however indicated. Recommendation: - A specific template for collecting feedback directly from the DMCPA should be developed.</p>
Madagascar	<p>Public is more interested in the warnings of cyclones, heavy rains and strong winds, but less so in heavy rain warning</p>	<p>The media is in general satisfied by the accuracy of warnings which are easy to understand. However most of</p>	<p>Public Feedback: Not much information has been given on any feedback mechanism or activity.</p>	

	related to local convection or ITCZ.	them mention that there is a delay of the warning to reach them.	<p>Recommendation: Establish a formal survey mechanism to gather information about public perception and satisfaction. This will help raise awareness and increase the interest of the public beyond tropical cyclones.</p> <p>Media Feedback: It is not very clear how the information about the media is gathered but it seems there is quite a bit of work to do in this area.</p> <p>Recommendation: Set up formal and informal channels of contact with the media and to investigate the serious question of delays in access to the warnings issued.</p>	
Malawi	The public generally appreciates the weather forecasts but is not satisfied with failure to capture the occurrence of localized strong winds and very heavy precipitation. The challenge is how to get feedbacks from the general public systematically.	The media appreciates the warnings but is critical of failure to forecast localised heavy storms. Some media houses have difficulties in interpreting the forecasts. There are plans to conduct education for media houses	<p>Public Feedback: Some information exists on public reaction but more work needs to be done.</p> <p>Recommendation: Conduct the formal surveys as discussed in the Pretoria Workshop.</p> <p>Media Feedback: It is clear that there are problems with the media understanding of the forecasts and it is encouraging that plans are being made to address them.</p>	There seem to be some degree of collaboration between the NMC and the DMCPA. However, the level of reporting does not allow an assessment of the level of collaboration. Furthermore, the reporting does not allow an understanding of usefulness and how were the forecasts used. Recommendation: - A specific template for collecting feedback directly

			<p>Recommendation: Help media by explaining the meaning of meteorological terms, give them list of such terms and try to improve the clarity of the forecasts.</p>	<p>from the DMCPA should developed</p>
<p>Mauritius</p>	<p>Weather warnings are communicated to the general public through the media and website. No formal feedback has been received from the public. Overall the public receives and reacts to the warnings. Need to establish the necessary protocol to receive formal feedback from the public at the end of a severe weather event and also at the end of the cyclone season. The feedback needs to be analysed and corrective actions taken.</p>	<p>Generally, the media received the warnings well, and the written press made positive comments. Private radios are competitive and want to have live intervention on their channels first. The Met. Service is investigating how to broadcast warnings on all radios simultaneously. The Met Service has not yet found the proper formula to satisfy all media.</p>	<p>Public Feedback: It is recognized that a formal mechanism needs to be set up. Recommendation: Organize for formal surveys to be conducted and analysed. Media Feedback: More work needs to be done to resolve some difficulties in relations with the media. Recommendation: Proper dialogue needs to be established with the media to openly discuss and overcome the issues indicated here.</p>	<p>Reference is made of extreme event occurred being handled correctly. This could either mean that there was no need for action or that the NMC and the DMCPA are well coordinated. This ambiguity could be addressed with more specific question about the coordination between the two institutions. Recommendation: - A specific template for collecting feedback directly from the DMCPA should developed</p>
<p>Mozambique</p>	<p>It has not been easy to get feedback from the public. This is mainly due to the absence of a regular mechanism to provide information on the accuracy and reliability as well as the lead-time of the warnings. Following the recommendations of Pretoria, workshop, surveys will be conducted to measure the users</p>	<p>Getting media feedback is a challenge.</p>	<p>Public Feedback: The problem is recognized and requires to be fixed. Recommendation: Set up a survey mechanism to gather feedback from the public. Media Feedback: Similar problem is recognized. Recommendation: Set up communication channels with the media before expecting any</p>	<p>Joint training between NMC and DMCPA staff seem to have improved interaction between the two institutions. Recommendations: - Systematic training between NMC and DMCPA staff; - Development of standing operational procedures between the two onstitutions</p>

	satisfaction in order to improve the way the weather is delivered to the users.		feedback.	
Namibia	The few weather warnings or advisories issued during the review period were well received by the public. So far, no survey has been done to receive the necessary feedback.	No real feedback from the media.	Public Feedback: Anecdotal but not formal feedback Recommendation: Set up the survey mechanism Media Feedback: Ditto. Recommendation: Set up communication channels with the media	The NMC seem to have realized the importance of collaboration with DMCPA. However, the details of the collaboration are not indicated. Recommendations: - Development of standing operational procedures between the NMC and the NDMO; - Designation of a focal at the NDMO to receive and take action on the basis of warnings sent by NMC; - Joint training of forecasters and staff of NDMO on the use interpretation and use of forecasts and warnings.
Seychelles	Most of the time it is one on one through telephone calls.	Not on a formal basis. In the process of identifying forecasters (among very few staff) who will be responsible for PWS and interaction with the media, DMA and the general public as well as for the verification process.	Public Feedback: No mechanism to collect mass samples Recommendation: To obtain objective feedback, need to establish formal survey mechanism. Media Feedback: Ditto, but encouraging that steps are being taken to address this Recommendation: Establish communication channels with	Collaboration between NMC and DMCPA seem to be lacking. Recommendations: - Development of standing operational procedures between the NMC and the NDMO; - Designation of a focal at the NDMO to receive and take action on the basis of warnings sent by NMC; - Joint training of forecasters

			the media.	and staff of NDMO on the use interpretation and use of forecasts and warnings.
South Africa	Evaluation of forecast products will be undertaken at Provincial level in Western Cape.		Public Feedback: The plans to start an evaluation process are encouraging. Media Feedback: None	There seem to a certain level of collaboration between the NMC and DMCPA. To streamline processes, it is recommended: - Development of standing operational procedures between the NMC and the NDMO; - Joint training of forecasters and staff of NDMO on the use interpretation and use of forecasts and warnings.
Swaziland	The general feeling from the forest companies that get their forecasts and warnings from the Met Service is that the NMSs weather forecast has improved significantly. Requests for tailored forecasts can be attributed to the accuracy of forecasts after the introduction of SWFDP.	The NMS has a good relationship with the media but does not very often get feedback from them. The NMS is working toward establishing good links with the media.	Public Feedback: The feedback is from the private clients rather than the public Recommendation: Set up proper survey mechanisms to gather feedback from the public. Media Feedback: It is encouraging that the Met Service is working towards establishing links with the media. Recommendation: Pursue the efforts to establish good links with the media.	Due to the absence of a structure for disaster management, collaboration between NMC and DMCPA seem to be lacking. Recommendations: - Development of standing operational procedures between the NMC and the NDMO; - Designation of a focal at the NDMO to receive and take action on the basis of warnings sent by NMC; - Joint training of forecasters and staff of NDMO on the use interpretation and use of forecasts and warnings.
Zambia	The public (urban areas) in general appreciated the	The media in general appreciated the forecasts	Public Feedback: The public response is encouraging. More	To be inserted

	<p>accuracy and timeliness of the forecasts issued. However, in the areas affected but the floods, most of these areas being in the rural set up, feedback could not be obtained</p>	<p>issued. This could be demonstrated by the interviews (live and recorded) broadcasted on both the national and community radio stations during the main news slots. The print media was not left out in this exercise. The Post newspaper dedicated a column on weather activities on weekly basis. A questionnaire will be send to all community radio station who access our forecasts</p>	<p>work is obviously needed in the rural areas. Recommendation: If Met offices exist in some rural regions, the staff should be encouraged to establish personal contacts with village chiefs to slowly introduce them to the use of warnings and forecast and then ask them (in person) how they found these products and services. Media Feedback: The response of the media is quite encouraging. Recommendation: Share the questionnaire itself and the result of the radio survey with the other SWFDP participating countries as a means of assisting those who need to see how the survey is done.</p>	
Zimbabwe	<p>The response from the public to warnings and advisories continues to be good and a user assessment survey dubbed <i>YOU AND THE WEATHER FORECAST – 2009 SURVEY</i> was launched on the World Meteorological Day. It is hoped that by the end of the year a good statistical sample</p>	<p>The media has been cooperative but the NMS has worked hard to attract the attention of both the print and electronic media during the last quarter of 2008 and first Quarter of 2009. This has seen the creation of a public relations desk within the NMS organisational structure,</p>	<p>Public Feedback: The Met service has taken this aspect seriously which is very encouraging. Recommendation: Publish the survey mechanism and the results as a good practice case. Media Feedback: very encouraging to see how the Met Service has taken up the cause</p>	<p>There is a degree of collaboration between the NMC and DMCPA. To improve this collaboration, the following is recommended: - Development of standing operational procedures between the NMC and the NDMO; - Designation of a focal at the NDMO to receive and take</p>

	will be in place for analysis.	formal and informal meetings with environmental journalists from different media houses and their involvement in the World Meteorological Day commemorations.	of establishing linkd wit the media. Recommendation: Publish the experience and the mechanism as a best practice case to share with others in the project.	action on the basis of warnings sent by NMC; - Joint training of forecasters and staff of NDMO on the use interpretation and use of forecasts and warnings.

Overall observations and recommendation

Apart from one or two countries, the rest have a lot of work to do in the area of working with users and responding to the major user groups, namely the public and media. In the quarterly reports, while much information on the analysis of the meteorological situation and on forecasting processes is provided, only brief information is given on the feedback from those who are the beneficiaries of improved forecasts and warnings, including the public, decision makers, and the media. We cannot give up or be discouraged. Through the SWFDP, the NMHSs will continue to be guided and assisted. The overall recommendation on PWS aspects is that the NMHSs should continue to pursue seriously real evaluation of their improved products and services in order to get the users' community engaged in a positive way.

Guidance materials provided by PWS are freely available and contain most of the materials needed by the participating NMHSs to assist and show them how to create channels of communication with these two large user groups. In addition, the WMO Joint GDPFS/PWS Training Workshop conducted in Pretoria in November 2008, where all NMHSs but one participated, provided rich sources of information and guidance on how to develop a dialogue with user communities and be responsive to their requirements as stakeholders.

It is recommended that all countries start using the materials distributed at the November 2008 training workshop and to include more comprehensive reports on public and media evaluation in the next quarterly report.