Botswana National Meteorological Services

QUATERLY REPORT OF THE REGIONAL SUBPROJECT

PERIOD: March to May (MAM) 2007

1. HIGHLIGHTS OVER THE PERIOD (MAM)

- The second quarter continued be extremely drier than normal years
- Heavy down pours occured towards the end of march 2007 over the northwest,central and eastern parts of the country.
- April was slightly wet during the first week and then stayed dry thereafter
- May remain relatively dry

2. OVERVIEW OF PRODUCTS

a. Usefulness of RSMC-Pretoria guidance

RSMC – Pretoria guidance is very useful on large scale raifall baring systems. The guidence helps the forecasters in issue warning well in time. It also guide them to find areaas of possible severe activities. Howevere, the guidance has its shortcomings such as failing pick the areas of localized regions of strong winds. This is simply becase the models themselves are not able to pick such areas. Same observations as in the first quarter

b. Usefulness of SWFDP NWP/EPS Products received from each global centre and RSMC UM-SA12

Like the above the SWFDP NWP/EPS products received from the global centre are very useful because the products guides the forecasters to able to identify areas of severe storms well beyond the five days which has not been possible in the past. All near real time forecasts would not go beyond five days. With the new products it increases the confidence of the forecasters because the accuracy of the products has improved as well as the reliability of the products.

During this period NMC was not using RSMC UM-SA12 products that much. NMC is not in a position to comment whether the products are good or not. However, since March 2007 NMC started using products from Unified model from SAWS and the products have been good for the short period that have been in used.

2. PROJECT EVALUATION AGAINST SWFDP GOALS

SWFDP GOAL	PROGRESS AGAINST GOALS
To improve the ability of NMCs to forecast severe weather events	The Deterministic and EPS products have improved the visibility of the NMC. The Public has shown appreciations of the forecasts that are issued by the NMC. The viewers now take the warnings issued over the Television seriously. In the past, any warnings or advisory given over the television was largely met with some degree of skepticism or misplaced cynicism.
To improve the lead time of alerting these events	It is now possible to issue a forecast beyond five days with confidence, before it was close to impossible. The confidence of the NMC officers to issue warnings has improved as the lead-time has gradually improved due to the use of SWFDP products. There is no longer any hesitation on the part of the NMC officers to boldly issue a warning or advisory if the situation warrants it.

To improve the interaction of NMCs with Disaster Management and Civil Protection authorities before, during and after severe weather events	This project has help NMC to realized how it interacts with the DMCPA. The interaction is not that good. We have realized that the difficulties emanate from the fact that National Disaster Management does have action plan or legislation that will streamline their structure. However, NMC is dealing directly with National Disaster Management before, during and after severe weather events. It has proven to be difficult to get a feedback after the events. The warnings that are sent to the National Disaster management take time to reach the intended district because their communication lines are not defined. Recently NMC and stakeholders met to work on the Disaster Action Plan in which the Disaster Management Plan is expected to streamline its operational structure. The NMC has been working hard to involve other stakeholders such as water affairs and Disaster Management committees at both national and district level. This **tri-partite** arrangement would, in future, ensure smooth and efficient working relationship between the NMC and its partners in disaster issues. The absence of a legal instrument establishing the National Disaster Management Services remains the major stumbling block.

To identify gaps and areas for improvements	The models in general tend to reduce the intensity of the precipitation. Secondly, the models do not well predict localized strong winds due to convection. On the practical use of the models by the NMC, the forecasters have gradually mastered how best to make use of the sheer volume of SWFDP products at their disposal. At the beginning of the project, it wasn't easy to introduce so many products at once. The immediate challenge had to do with the evaluation of the Guidance and the products from the Global centers. But with the passage of time these tasks have become less daunting to many users and are now considered part and parcel of the everyday work.
To improve the skill of products from Global Centres through feedback from NMCs	Skill of the models is good. In case of localized regions strong wind from convection the skill is poor. This is due to the fact that the models are not able to predict small-localized regions of convection. The evaluation of the guidance and the products from Global Centre has made the users aware of the importance of giving feedback on the performance of the various models. The feedback would ultimately be employed to improve the skills of the models

3. EVALUATION OF WEATHER WARNINGS:

A) Feedback from the public

The public appreciates our warnings and the visibility of the NMC has tremendously improved. NMC is now capable of issuing advisories beyond five days and the public really appreciates that. However, the media like criticizing the NMC for failure to issue warning especially for localized strong winds that normally cause destruction to the communities.

B) Feedback from the DMCPA to include comments of the timeliness and usefulness of the warnings

The feedback from DMCPA is not all ways positive, the argument being that sometimes they area hit by storm without being warned prior to the storm. This is common during when a dry localized storm occurs. Warning is also provided in a lead-time of two days. Since the implementation of the SWFDP it was realized that National Disaster Management does not have a clear structure such that if you send a communiqué (issue warning) to the National Disaster Office it take times for that communiqué to reach the a specific district. However, the Meteorological Service is working on that with them. Several meetings at national and districts levels have been held to develop response plan to any disaster.

C) Feedback from the media

The media, like the general public appreciated warnings and the forecasts that are provided or issued. However, the media becomes skeptic when localized regions of strong winds hit towns and villages, which normally blow roofs of buildings away leaving households stranded without shelter. Despite the fact that Meteorological services meet with the media to explain how severe weather from the convection is difficult to forecast and that all models up to date are not well predicting the localized strong winds. The media criticize or the question the capability of the service in handling or dealing the issues of severe weather events (especially strong localized winds) in the country. However, when event is from large-scale weather systems warnings are issued well in time and the media report positively about the NMC. Since the implementation SWFDP the accuracy of the forecasts have improved which resulted in an improvement of the perception of the media about meteorological services.

D) Warning verification by the NMCs

The warning is verified once the event was either observed or forecasted. NMC looks at the impact of the warning from the District Disaster Management committees' reports whether the warning was useful to them or not. In most cases warnings for heavy precipitation are issued. Most models are able to well predict a heavy precipitation contrary to localized strong winds that normally causes catastrophic effects. Warnings for strong winds are rarely issued because it is difficult to forecast because their size and conditions that lead to their occurrence of such event develop very rapidly. Then finally, an evaluation report (assessment report) is compiled on impact of the weather phenomenon/event that occurred. In a case where by a warning was issued and a severe weather event did not occur, an evaluation is also carried out to see why the severe weather event did not occur.

5. SUMMARY (general comments, challenges, etc, details in Annex 1)

- . The use of these SWFDP products has also helped improve the accuracy of the general forecasts issued by the NMC
- The prolonged use of these products has made the forecasters aware or realizes that model products are there to provide guidance and not forecasts. They have also appreciated that for a good forecast deterministic and ensembles should be combined.
- It remains a challenge to issue warnings due to localized strong winds from convection, which causes natural calamity to the communities. A different approach is needed to try to reduce the impact of the problem unpredicted localized strong winds.

- More training is needed to forecasters in order to improve their skills and competences. At the start of the project, a lot of them had some misgivings about the usefulness of the Guidance and often complained that the sheer volume of the NWP products at their disposal overwhelmed them. Most of the time they couldn't make proper choices of what products to use for what event.
- NMC should assist the National Disaster Management to come with a disaster management plan not just a response plan.

Until such time that National Disaster Management Office is established by a legal instrument that would help streamline its functions, operational structure and activities, the NMC'S role in disaster issues would largely remain as that of "disaster information centre" and not a partner

6. CASE STUDY (PowerPoint Presentation to include guidance products (RSMC and NWP), satellite imagery, warnings issued, impact evidence etc)

7. ANNEX 1 – Quarterly Evaluation Table (to be fulfilled according to the Severe Weather Evaluation Form)

Starting date of the event	**SWFDP Evaluation Form Event Number**	**Type of event** **Heavy Precipitation or Strong Wind**	**Region affected**	**Highest observed value**	**RSMC Guidance**		**Which NWP/EPS forecast product(s) used by NMC**		**Local warnings issued?**	**Impact of the event**	Impact of the warning
dd/mm/yy		Indicate if extreme phenomena are the consequence of severe convection		(mm/period or kts, according to the phenomenon)	Amount predicted (same unit as in the preceding column)	Usefulness from 1 to 4 1- Misleading 2- Not useful 3 - Useful 4 - Very useful	(RSMC UM-SA12 ECMWF, Met-Office, NCEP)	Usefulness from 1 to 4 1- Misleading 2- Not useful 3 - Useful 4 - Very useful			

26-03-2007	12	Heavy precipitation	North west	Heavy precipitation 59mm/24hrs	>50mm.24hrs	2	Met-Office NCEP	2	No	No impact.	No impact
27-03-2007	13	Heavy precipitation	East	Heavy precipitation 91mm/24hrs	50mm.24hrs	3	Met-Office, NCEP	3	Yes	There was no impact of the event because it was dry prior to the severe storm.	Public was made alert and were ready to make informed decisions about the impending event
28-03-2007	14	/heavy precipitation	Central and East	Heavy precipitation 79mm/24hrs	50mm.24hrs	4	Met-Office, NCEP	3	Yes	There was no impact of the event because it was dry prior to the severe storm. .	No impact
04/04/2007	15	Heavy precipitation	Northeast	57mm/24hrs	>25mm/6hrs	2	RSMC UM-SA12 ECMWF, Met-Office, NCEP	3	No	No impact	None