WORLD METEOROLOGICAL ORGANIZATION

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COMMISSION FOR BASIC SYSTEMS
OPEN PROGRAMMME AREA GROUP ON
INTEGRATED OBSERVING SYSTEMS

INTER PROGRAMME EXPERT TEAM ON OBSERVING SYSTEM DESIGN AND EVOLUTION (IPET-OSDE)
First Session

GENEVA, SWITZERLAND, 31 MARCH – 3 APRIL 2014

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POST-AMMA ACTIVITIES

(Submitted by John Eyre and Doug Parker (United Kingdom))

SUMMARY AND PURPOSE OF DOCUMENT

The document provides a summary of experiences during AMMA to enhance the observational network in West Africa, particularly for upper air observations. It presents some lessons learnt from these experiences, which are relevant both to actions that might be taken to support and improve observations in the West African regional and also to address similar issues elsewhere within WIGOS.

ACTION PROPOSED

The Meeting is invited to note the information contained in this document when discussing how it organises its work and formulates its recommendations.

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References: Parker, D J, A Fink, S Janicot, J-B Ngamini, M Douglas, E Afiesimama, A Agusti-Panadera, A Beljaars, F Dide A Diedhiou, T Lebel, J Polcher, J-L Redelsperger, C Thorncroft and G A Wilson. The AMMA radiosonde program and its implications for the future of atmospheric monitoring over Africa. Bull. Amer. Meteorol. Soc., **89**, 1015-1027 (2008).
http://www.wmo.int/pages/prog/www/OSY/Meetings/IPET-OSDE1/documents/parker_etal_2008_amma_sondes.pdf

7th GCOS Steering Committee Session (2009) preparatory document on the AMMA observing network contribution to GCOS:
http://www.wmo.int/pages/prog/www/OSY/Meetings/IPET-OSDE1/documents/07_5_AMMA_Contribution_to_GCOS.pdf

Appendix: **A.** Recommendation from AMMA radiosonde group for international coordination and implementation of support for the West African upper air network

DISCUSSION

1. The African Monsoon research programme (AMMA) had goals:

- to improve our understanding of the West African Monsoon and its influence on the physical, chemical and biological environment, regionally and globally,
- to provide the underpinning science that relates variability of the WAM to issues of health, water resources, food security and demography for West African nations and defining and implementing relevant monitoring and prediction strategies,
- to ensure that the multidisciplinary research carried out in AMMA is effectively integrated with prediction and decision making activity.

2. AMMA was also successful in establishing a much enhanced observational network over West Africa. This included the reactivation and expansion of the radiosonde network in the region. Lessons learnt during AMMA have significance for the upper-air network in WMO Region I, and probably more general for sustaining and improving observation networks in the context of WIGOS.

3. The AMMA radiosonde programme and its implications for future observations have been documented by Parker et al. (2008) (available as background document no.2 on the IPET-OSDE1 webpage[1]).

4. The AMMA observing network contribution to GCOS was documented in a paper for the GCOS Steering Group in 2009 (available as background document no.3 on the IPET-OSDE1 webpage[2]).

5. The AMMA radiosonde programme formally closed in December 2009, and since that time there has been no coordinated monitoring of the "AMMA" network. However, some general conclusions can be made:

a. Stations which were operational before AMMA, and received assistance from AMMA in upgrades to hardware and communications, seem to have generally had a better reliability in the period immediately following AMMA funding (which ended in 2008).

b. Three of the four new stations in the Gulf of Guinea zone (Tamale, Parakou, Cotonou) did not continue operations immediately after the end of AMMA funding. However, more recently, Benin has made 336 soundings from Cotonou since September 2012. Some of these reached the GTS, but none have been received since March 2013. More than 150 soundings, funded by the Benin weather service (DMN) have been lost to the GTS since this date, due to communications problems.

The new "AMMA" station at Abuja, Nigeria, continued to get data to the GTS intermittently after the end of AMMA funding, in 2009. Since then, Nigeria has made significant numbers of soundings from other stations, including Enugu, Kano, Lagos, and Maiduguri. Some of these have been seen on the GTS, but

1 http://www.wmo.int/pages/prog/www/OSY/Meetings/IPET-OSDE1/documents/parker_etal_2008_amma_sondes.pdf
2 http://www.wmo.int/pages/prog/www/OSY/Meetings/IPET-OSDE1/documents/07_5_AMMA_Contribution_to_GCOS.pdf

we believe a significant number to have been lost. We are not aware of a systematic audit of the numbers of soundings and their reception on the GTS.

6. Former members of the AMMA TT1 Radiosonde Coordination Group met at the International AMMA Conference in 2012 and produced a Recommendation for international coordination and implementation of support for the West African upper air network – see Appendix A.

7. In the context of the work of IPET-OSDE and of WIGOS, the experiences of the AMMA observation network are interesting in several respects:

- They show how it is possible to make substantial improvements to an observational network in a group of developing countries with an input of resources which (at least by the standards of developed countries) is comparatively modest.
- They show the importance of providing support and coordination, and of the effectiveness of appropriate support.
- They show the dangers of withdrawing coordination and support, in terms of the subsequent degradation of the network.
- They provide a very good illustration of the type of problems that WIGOS is attempting to solve.

8. Doc.9.4.2 for this meeting makes a proposal for improving support for EGOS-IP implementation activities (mainly in developing countries) though a new structure whereby those responsible for maintaining and implementing observing systems can be linked with centres of expertise for advice and support. The evidence from AMMA shows how such a mechanism might work in practice to address the specific problems that arise in West Africa.

9. IPET-OSDE is invited to consider and make recommendations concerning:

- specific action that might be taken to improve the upper air network in West Africa, building on the experiences of AMMA,
- more general lessons that could be learnt within WIGOS concerning effective actions to improve observational networks and support capacity building in developing countries.

APPENDIX A

Recommendation from AMMA radiosonde group for international coordination and implementation of support for the West African upper air network

Notes from meeting of former members of AMMA TT1 Radiosonde Coordination Group, AMMA International Conference, Toulouse, 3 July 2012.

Doug Parker (Leeds; AMMA Co-Chair); Andreas Fink (Cologne); Jean-Blaise Ngamini (ASECNA-Dakar); Chris Thorncroft (Albany; AMMA Co-Chair); Peter Lamb (CIMMS, Oklahoma)

We propose that the international community should establish a small unit to take action in support of the upper-air network in West Africa. This would involve

- Monitoring of reception of data from the network
- Identification of the cause of problems when they occur
- Rapid response, in the form of solutions to problems identified.

WMO has coherent strategies in terms of upper air measurements worldwide, and in the form of regional priorities, coordinated through GCOS/GUAN for example. However, these groups are strategic and are not in a position to take action to remedy problems when they occur.

During the AMMA Extended Observing Period of 2005-2007, a "Task Team" was established to support the AMMA radiosonde programme. This group consisted of representatives of academic research, African operational centres and US/EU operational centres. The Task Team undertook operational support to the network both strategically, for instance in renovation of hardware, and operationally, responding quickly to problems as they occurred. This latter way of working was very effective, and rectified numerous problems, generally at very low cost.

Typical problems encountered at stations, and solutions needed at short notice, are as follows:

Problem	Solution	Cost
Damage to hardware e.g. antenna damage due to lightning.	Replacement parts located and sent to the station.	Cables/antennas $100's
Consumables run out (e.g. balloons).	Move consumables from another station, or from supplier.	$100's
Communications problem in GTS.	Route message through GTS, testing connections at hubs.	Staff time.
Communications problem in GTS.	Install backup communication route.	e.g. SMS/GSM $100's.
Staff issues, e.g. retirement or illness.	Redeploy staff from other stations. Train replacement staff.	