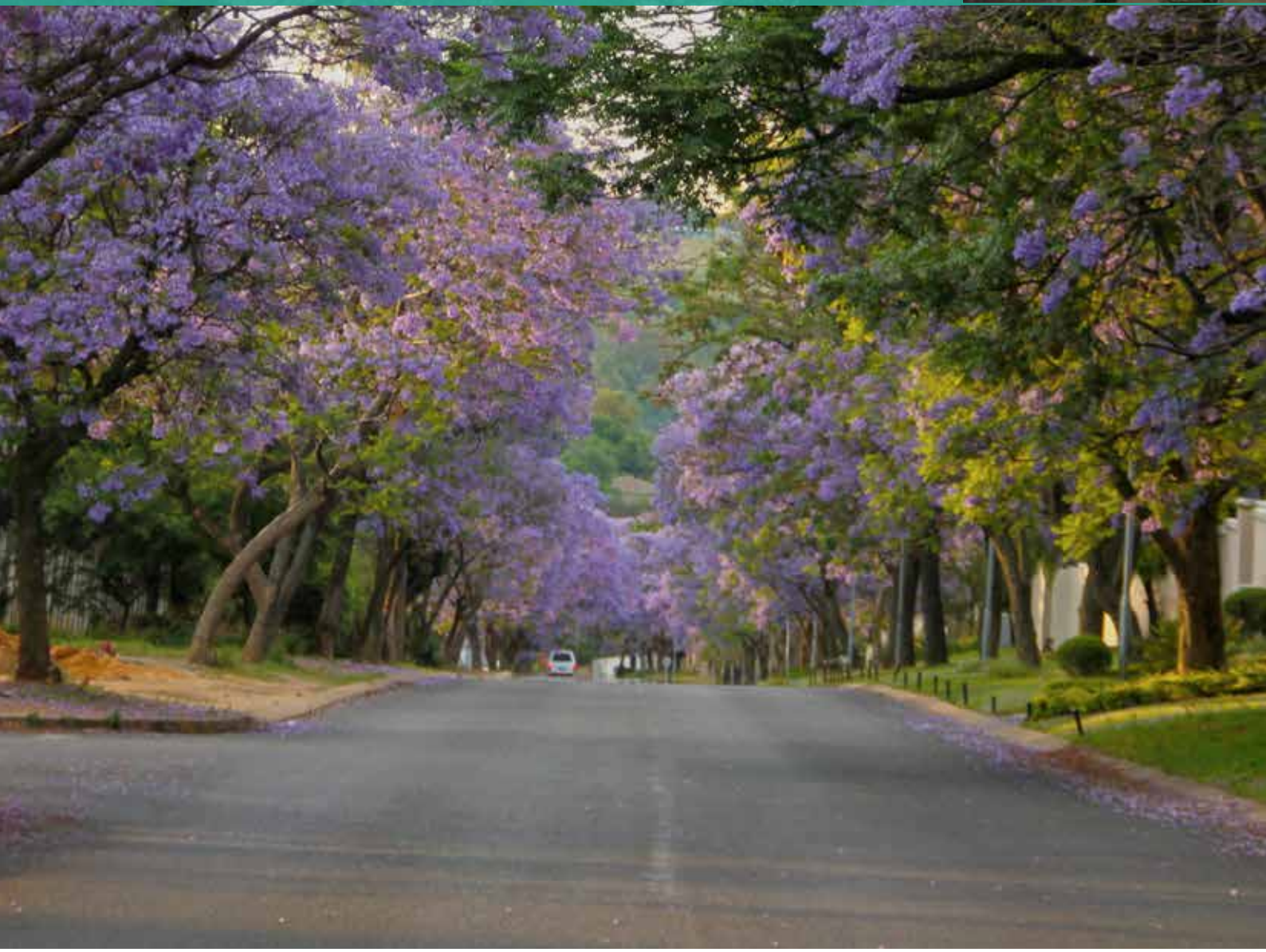
REPORT OF THE 11TH EUMETSAT USER FORUM IN AFRICA

SOUTH AFRICA, 8-12 SEPTEMBER 2014



11th ème
EUMETSAT User Forum in Africa
Forum des Usagers d'EUMETSAT en Afrique

South African Weather Service
ISO 9001 Certified Organisation

EUMETSAT

REPORT OF THE 11TH EUMETSAT USER FORUM IN AFRICA

Organised by EUMETSAT in collaboration with the
South African Weather Service (SAWS),
under the Ministry of Environmental Affairs
of the Republic of South Africa

Benoni, Johannesburg, Republic of South Africa
8 – 12 September 2014

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SUMMARY REPORT

Introduction

The 11th EUMETSAT User Forum in Africa was organised in Benoni (Johannesburg), South Africa, by EUMETSAT, in collaboration with the South Africa Weather Service (SAWS), under the Ministry of Environmental Affairs, Republic of South Africa.

The Forum was held from 8 to 12 September 2014 with some 150 participants representing 55 countries, of which 47 were African.

The Forum was attended by representatives of African National Meteorological and Hydrological Services (NMHSs) and specialised regional institutions for Meteorology, Climate and Environment, such as specialised regional and sub-regional technical institutions like the African Centre of Meteorological Application for Development (ACMAD), Centre Régional de Formation et d'Application en Agrométéorologie et Hydrologie Opérationnelle (AGRHYMET), Agence pour la Sécurité de la Navigation aérienne en Afrique et à Madagascar (ASECNA), International Commission for Congo-Ubangui-Sangha Basin (CICOS), IGAD Climate Prediction and Applications Centre (ICPAC); the SADC Climate Service Centre (SADC-CSC), the Mauritius Oceanographic Institute (MOI), the University of Ghana and the MESA Technical Assistance team.

The following African regional policy institutions were also represented at the Forum: Economic and Monetary Community of Central Africa (CEMAC), Economic Community of the Central Africa States (ECCAS), Economic Community Of Western African States (ECOWAS), Intergovernmental Authority on Development (IGAD), Indian Ocean Commission (IOC), and South African Development Community (SADC), together with representatives from the African Union Commission (AUC) and the Secretariat of the African, Caribbean and Pacific Group of States (ACP Secretariat), as well as the Bureau and Secretariat of the African Ministerial Conference on Meteorology (AMCOMET).

Several South African entities were also represented such as the South African National Space Agency (SANSA), Department of Environmental Affairs (DEA) Department of Science and Technology (DST), The Agricultural Research Council – Institute for Soil Climate and Water (ARC-ISCW), the Council for Scientific and Industrial Research (CSIR), the South African Maritime Safety Authority (SAMSA).

Representatives of the following European and international institutions also attended the Forum: the Joint Research Centre, the European Union Delegation to South Africa, the German Weather Service (DWD), the UK Meteorological Office (UK Met Office), Météofrance and the World Meteorological Organization (WMO), as well as other organisations such as the Vlaamse Instelling voor Technologisch Onderzoek (VITO), the International Institute for Geo-Information Science and Earth Observation (ITC), University of Reading, and the International

Research Institute for Climate and Society (IRI).

Opening Ceremony

The Opening Ceremony started at 09:00 on 8 September 2014 under the guidance of the Programme Director, Ms Judy Beaumont, Deputy Director General of the Department of Environmental Affairs of the Republic of South Africa.

Mr. Alain Ratier, EUMETSAT Director-General, recalls the important place that Africa has in the EUMETSAT strategy and its commitment for cooperation and partnership to facilitate access and use of EUMETSAT data across Africa and for various applications. He notably emphasised the need for Africa to start preparing for the Meteosat Third Generation (MTG). He also welcomed the strong political framework put in place thanks to the AMCOMET and wishes that it will allow the continuation and strengthening of the technical partnerships built since years. Finally, he appreciated the Benoni statement that highlighted the commitments of African political institutions to implement the GFCS in Africa and benefit from it.

Mr. Jery Lengoasa, Deputy Secretary-General of the WMO, thanked the Government of South Africa for hosting and EUMETSAT for organising this 11th EUMETSAT User Forum in Africa, which is a key venue for NMHS to exchange experience and express their needs. He underlined the long-standing and reliable support from EUMETSAT and the European Commission to ensure that Meteosat satellites serve user needs in Africa. He mentioned that the main WMO priorities are addressed in the Agenda of the Forum: disaster risk reduction, GFCS, data access, training and capacity building. He wished all participant good deliberations and a very successful meeting.

Ambassador Roeland van de Geer, Head of the Delegation of the European Union to the Republic of South Africa, explained the importance of the real and potential impacts of climate change, which is now at the centre of the debate on economic policy. After explaining the climate actions implemented in the EU, he emphasised that this topic was fully part of the strategic partnership between EU and South Africa, as well as between the EU and Africa. He highlighted the fact that the EU-Africa partnership includes activities to ensure provision of reliable and accurate environmental monitoring data, notably from Earth Observation, through various projects and initiatives. After mentioning the results obtained through past projects (PUMA, AMESD) and expectations from on-going initiatives (MESA, Disaster Resilience, ClimDev and GMES&Africa), he mentioned that he was proud of the partnerships, dialogue and cooperation in this area, and wished some of the lessons could be applied to other less fruitful areas of cooperation. He thanked EUMETSAT for the successful teamwork at the European and pan-African levels and wished all the best with the proceedings of the Forum.

H.E. Rhoda Peace Tumusiime, African Union Commissioner for Rural Economy and Agriculture, conveyed the warm greetings of H.E. Dr Nkosazana Dlamini Zuma, Chairperson of the Commission of the African Union and expressed her sincere appreciation to the Government and people of South Africa for the warm welcome and

generous hospitality. She mentioned that this Forum coincides with the finalisation of the Africa Agenda 2063. She wished that the Forum will solidify the joint action against phenomena that negatively impact the life-support system, as satellite technology is critical towards dealing with some of the challenges, as demonstrated in AMESD and MESA. She highlighted that integrating satellite technologies in current and future endeavours, with communities at the heart, should be part of the aspiration at this Forum. She underlined the need for Africa to possess the ability to exploit satellite technologies, and that cooperation was vital in this field, noting in this respect the MoU signed in 2013 between the AUC and EUMETSAT. She finally thanked the SAWS and EUMETSAT for working hard to organise and bring all participants to this Forum.

Mrs. Edwa Molewa, Minister for Environmental Affairs, Republic of South Africa, welcomed all the participants to the 11th EUMETSAT User Forum in Africa, which is an excellent platform for technological cooperation and partnership between Africa and Europe. She mentioned that satellite remote sensing became an integral part of operational environmental monitoring within the African continent and is critical for weather forecasting and climate research. She explained the importance of the GFCS, and the need to develop an efficient mechanism to deliver consistent climate information thereby underpinning national adaptation plans to climate change. She also emphasised the need to develop tailored products to enable reduction of climate-related disasters, improvement of food security, health and efficient water management. After thanking the European Union and EUMETSAT for the partnership and wishing that it continues to flourish, she drew the attention to the Integrated African Strategy on Meteorology that highlights the need for Africa to be more involved in the design of satellite derived products and NWP models. She therefore encouraged all participants to work hard and in a collaborative manner to this effect. She summarised her intervention by highlighting that international collaboration is critical, capacity building essential and technology transfer and knowledge sharing vital.

She concluded her speech by declaring the 11th EUMETSAT User Forum in Africa open.

Introductory session

The Forum was introduced with some remarks and presentations from key South African institution involved in the area of meteorology, space, as well as sciences and technologies: ***Dr Linda Makuleni,*** CEO of SAWS, highlighted the role of satellite data in improving meteorological and climate services. ***Dr Jane Olwoch***, Head of Earth Observation department of the South African National Space Agency (SANSA) presented the activities of the agency and the importance of regional and international partnerships. ***Dr. Mmboneni Muofthe*** highlighted the importance of investing in Sciences and technologies to ensure ownership and self capacities in the domain of space technologies and applications.

Dr Joseph Mukabana, as director of the AMCOMET Secretariat introduced the Integrated African Strategy for Meteorology as an overarching framework for the various activities,

projects and initiatives that will be discussed during the Forum. A message from the President of the WMO RA-I, ***Mr Lamine Bah*** was also read. In his message, Mr Lamine Bah who could not participate due to the Ebola outbreaks thanked EUMETSAT for the work accomplished over the past decades and wished all participants a successful Forum.

At the end of this introductory session, ***Mr Paul Counet***, EUMETSAT, presented the main objectives of the Forum, highlighting the session related to MTG, Disaster Risk Reduction and Climate Change. ***Mr. Vincent Gabaglio,*** EUMETSA, then presented the detailed programme of the Forum and provided logistics information.

Session 1 - Overview of EUMETSAT programmes

The first session of the Forum, chaired by ***Linda Makuleni,*** SAWS, was dedicated to the presentation of the updates of EUMETSAT programmes and activities relevant to Africa. On the EUMETSAT side, ***Mr Alain Ratier*** presented the latest status of EUMETSAT current and future services; ***Mr Mark Higgins*** presented in more details the status of the EUMETSAT Satellite Application Facilities (SAFs) and how to get additional information; and ***Mrs Sally Wannop*** indicated how African users can access EUMETSAT and third party data and products, and benefits from the various services to the users.

This session also benefited from a presentation of the WMO space programme by ***Mr Stephan Bojinski, WMO,*** which informed about the overall international context. ***Mrs Marianne Diop Kané, Senegal*** reported about the achievements of the RAIDEG during the last four years in including additional pertinent data in EUMETCast. The participants were also informed about the outcomes of the 5th meeting of the RAIDEG, which took place just before the Forum and its main recommendations.

The discussion focused on the complementarities of satellite data with upper air network and radar measurement, the access to Copernicus data and the nomination of RAIDEG points of contact in each country, This session contributed to recommendations #1 and #3.

Session 2 – RARS Africa for Disaster Risk Reduction

The second session was chaired by ***H.E. Rhoda Peace Tumusiime***. It was dedicated to the importance of the implementation of Disaster Risk Reduction (DRR) strategy in Africa and of the impact of extreme climatic events. In this context, earth observation data together with ground data and socio-economic information offer one of the most pertinent approaches to support Early Warning System in order to reduce natural hazard impacts. The Regional Advanced Retransmission Services (RARS) stations ensure real time access to daily Earth Observation at medium resolution. This availability of data allows improved Numerical Weather Prediction which outputs are very relevant to Disaster Risk Reduction, and in particular to Early Warning System.

During this session, ***Mr. Mathewos Hunde, AUC***, provided an overview of

Disaster Resilience in Africa. ***Ken Johm, AfDB*** presented the Result #3 of new EU-ACP programme on Disaster Resilience in Sub-Saharan Africa. ***Steve Manktelow, UK Met Office*** presented the added-value of satellite data for weather forecasting, in particular to the Numerical Weather Prediction. ***Benjamin Lamptey, ACMAD*** presented the implementation approach for the Result #3 of the EU-ACP Programme on Disaster Resilience in Africa.

During the discussion on this programme, the participants welcomed this new programme and the benefits it will bring to the NMHS to better serve the DRR community.

Finally, ***Mrs Sally Wannop, EUMETSAT*** presented the International Charter 'Space and Major Disasters' which aims at providing a unified system of space data acquisition and delivery to those affected by natural or man-made disasters. She indicated that in Africa today, only two countries (Nigeria and Algeria), are Authorized Users and can evoke the Charter in the case of a major disaster, and that NMHS are encouraged to promote the availability of the Disaster Charter service with their national disaster management authorities.

This session contributed to recommendations #6 to #12

Session 3 – Meteosat Third Generation (MTG)

This session, chaired by ***Dr Joseph Mukabana, WMO,*** was dedicated to the introduction of the new upcoming Meteosat satellite Third Generation. ***Mr Alain Ratier, EUMETSAT*** informed the participants that this session represents the start of a long process, to prepare African user community to the MTG. ***Mr. Jochen Kerkmann, EUMETSAT***, then presented the MTG capabilities in a very illustrative ways, showing concrete examples of its added-value for some applications in Africa. The RAIDEG will serve as EUMETSAT interface for conducting African user consultation on MTG in the coming years, notably on the access to high-volume data. The discussion that followed this presentation focused on the following aspects: identification of clear air turbulence, low level winds, assimilation of imagery and sounding into high resolution NWP models, calibration of sounding instruments, geometric resolution, lighting imager capabilities, availability of simulated data, and training programme. The upgrade of the user stations was also discussed and the meeting agreed that this should be planned in advance.

Session 4 – GFCS in Africa

This session was chaired by ***Mahama Ouedraogo, AUC*** and dedicated to presentations related to the implementation of the Global Framework on Climate Services (GFCS) in Africa.

The session started with a presentation by ***Mrs Linda Makuleni, SAWS***, of the Benoni Statement in support to GFCS in Africa, adopted during the High Level meeting on GFCS which took place on 7th September 2014 with participation from the Minister of Environmental Affairs of the Republic of South Africa, the Africa Union Commissioner on Rural Economy and Agriculture, as

well as representatives from the ACP Secretariat, the Regional Economic Communities, AMCOMET, the Regional Climate Centre, WMO and EUMETSAT. ***Dr Joseph Mukabana, WMO,*** presented the status of implementation of the GFCS, which provides a worldwide mechanism for coordinated actions to enhance the quality, quantity and application of climate services. He highlighted the activities in Africa, such as national consultation, the development of national action and Norway supported "Climate Services Adaptation Programme in Africa" for Malawi and Tanzania. ***Dr Jolly Wasambo, AUC,*** highlighted then the work accomplished by the GFCS ACP Task Team, and its main objective of establishing a fully-funded GFCS ACP project. ***Dr Benjamin Lamptey*** then presented the MESA Thema on Climate services, implemented by ACMAD and the RCCs, which will develop the two following services: (1) Climate Change Assessment Service to provide planning managers and decision makers with relevant climate information and projections and (2) Drought Service and Seasonal Climate Forecast to support strategic planning at continental and regional level ahead of season through assessing seasonal and intra-seasonal variability and to forecast the probability of drought.

The session continued with the presentation of the status of implementation of GFCS at national level. ***Dr. Themba Dube, SAWS***, presented the details of a roadmap towards the national implementation of the Global Framework for Climate Services in South Africa. ***Mr. Moussa Touré, Mali,*** explained that GFCS is a concept engaging West African countries to more coordination and that Mali serve as an example for the region. ***Mr Zachary Atheru, ICPAC,*** presented a Pilot Project in Kenya on application of climate information in Agriculture, which encourages a shift from traditional to climate based agriculture planning and management.

To conclude this session, ***Paul Counet, EUMETSAT***, introduced the Global Architecture for Climate Monitoring from Space aiming at describing how satellite programmes were actually contributing to the generation of the Essential Climate Variables (ECVs) in response to the requirements expressed by the Global Climate Observing System (GCOS).

During the discussion that followed these presentations, the need for strong regional institutions to support the implementation of National Framework for Climate Services (NFCS) was underlined, notably to help building national capacities. It pre-supposes the need for RECs to engage with their members to ensure appropriate communication and planning.

This session contributed to recommendations #4 and #5.

Session 5 – Climate research and applications

This session, chaired by ***Ali Jacques Garané, Burkina Faso***, was dedicated to climate research, notably the current and potential application of this research within the African continent to support climate monitoring activities. This session included five presentations.

Joerg Trentmann, DWD introduced the data sets and services from the Climate Monitoring Satellite Application Facility, which aims at the provision of satellite-derived geophysical parameter data sets

suitable for climate monitoring. Joerg Trentmann highlighted the support to users provided by the CM SAF and indicated that a training event will take place in June 2015 in Pretoria, South Africa.

Mxolisi Shongwe, SAWS, explored the precipitation characteristics and extremes using the Coordinated Regional Downscaling Experiment (CORDEX) regional climate model. The evaluation of this model embraces several rainfall characteristics including onset and length of the rainy season, wet-day frequencies, and consecutive dry and wet days.

Ross Maidment, University of Reading highlighted in his presentation the activities of the TAMSAT Group in the generation of rainfall datasets using Meteosat IR data. TAMSAT provides a new, temporally consistent and long-term (1983-present) satellite rainfall dataset for Africa which can be used to help assess rainfall variability.

Tufa Dinku, IRI, USA*,* talked about the work of IRI to Enhancing National Climate Services (ENACTS) in Africa by generating the best possible climate data, creating products and taking those information products to users. ENACTS has been implemented in Ethiopia, Tanzania, Madagascar, Rwanda and Gambia at national level and CILSS countries in West Africa at regional level. IRI looks to expand ENACTS to additional countries within the African continent.

Joerg Trentmann, DWD, addressed the activities Southern African Science Service on Climate Change (SASSCAL) to establish a multidisciplinary cooperation, building up capacity and providing support to decision makers. Through SASSCAL, DWD supports the enhancement of the network of weather stations to improve data gathering, performing the digitalization of historical paper records and generating from these records gridded precipitation products for the Global Precipitation Climatology Centre Centre (GPCC).

In the discussions which followed the presentations, the Forum asked to include a selection of CM SAF monitoring products on EUMETCast Africa and recognised the value of the TARCAT product. The Forum welcomed the opening up of rainfall data to inclusion in GPCC are encouraged other NMHS to follow suit.

This session contributed to recommendations #7, and #30

Session 6 – Marine applications

The focus of this session, chaired by ***Dominique Kuitsouc, ECCAS***, was the application of satellite and other data in research and in the provision of operational marine weather and oceanographic services across the region. Presentations came from the perspectives of academic, service providers and safety authority institutions.

Johann Stander, JCOMM, covered the data and capacity building needs of the continent from a JCOMM perspective. He indicated the critical need for more satellite data to be made available for Africa and much more capacity building is needed.

Christo Whittle, CSIR, introduced OceanSAfrica, which provides a platform to coordinate, transfer capability, develop capacity and infrastructure and develop scientific and operational programmes for the

sustainable governance and safe guarding of the marine exclusive economic zone. The remote sensing element is driven from CSIR and draws on many regional and global partners such as PML, NASA and EUMETSAT. EUMETCast has been part of the dissemination strategy, alongside using the web.

Meena Lysko, SAMSA, indicated that SAMSA's remit covers protection of life and property at sea and inland within MetArea-XII, combat pollution of the marine environment and promote national maritime interests. The South African Weather Services is the designated entity to implement the SOLAS requirement on provision of weather forecasts and warning to shipping. With the vast jurisdiction there is a considerable need for satellite data to support the maritime services notably the meteorological and environmental real time monitoring.

Beenesh Motah presented the IOC MESA Thema which focuses on marine resources management and monitoring of the coastal environment for all IOC member states and the neighbouring countries in the Mozambique canal. The project combines current SST and integrates other information to serve the fishing communities. The project also undertakes wave and surge monitoring. A new aspect is the coastal monitoring. The Thema will develop of a coastal vulnerability index (low, medium, high and extreme) to aid risk management.

George Wiafe, University of Ghana, presented the MESA Thema on Coastal and Marine Resources Management in the ECOWAS region. The project will produce potential fishing zone maps overlaid with vessel traffic and early warning information on ocean conditions, to help protect fishing grounds against IUU and ensure safety at sea to artisanal fishers. There is a strong element of cross-fertilisation from the MOI experiences of AMESD in the project, which also consolidates work from many previous projects.

The discussion that took place after these presentations noted the real value of the cross fertilisation and cross regional sharing, in particular in creating regional hubs or centres of excellence that are coordinated between them so that we do not duplicate each others' work. It also noted that the work presented in the session can contribute to developing the 2050 Africa's Integrated Maritime Strategy (AIMS).

This session contributed to recommendations #20 to #23.

Session 7 – Parallel Mini-Workshops

This seventh session, chaired by ***Amos Makarau, AMCOMET Secretariat***, included three parallel workshops, which had each their individual programmes and lasted about 3 hours:

- Regional Training Centre activities
- Numerical Weather Prediction for Disaster Risk management
- African Space Programme: EO data needs and access

A report of each parallel workshop was then presented in plenary session by the Chairperson or Rapporteur .

Session 7A – Regional Training Centre activities

Winifred Jordan, Chairperson of this session, explained that the main objectives of this session were:

1. to raise awareness of the activities of the training centres

2. to get feedback on the key regional training needs

Three of the WMO Vlab regional training centres gave short presentations on their work. The discussion that followed these presentations focused on the expression of needs. These addressed: research skills, training of trainers, application oriented training (marine, nowcasting, seasonal forecast, etc), cooperation between RIC and training centres.

This workshop contributed to recommendations #24 to #30.

Session 7B – Numerical Weather Prediction for Disaster Risk management

Dr. Benjamin Lamptey, chairperson, and ***Mrs.* Sally *Wannop***, rapporteur, presented the purpose and main outcomes of this workshop, which was a follow-on and deepening of the Session 2 dedicated to the Disaster Resilience and aimed at engaging discussions between RCC and NMHS on the implementation and priorities to be addressed through the EU-ACP funded disaster resilience project. Mr Lamptey explained that the project was to enhance the capabilities at the national level through the use of existing, and the development of emerging skills, at continental regional and national level. Each Regional Climate Centre then explained the foreseen activities in their region. Eugene ***Poolman***, SAWS, presented on behalf of the SADC region the main results and lessons learnt from the Severe Weather Forecast Demonstration Programme (SWFDP) in the region.

During the discussion, the workshop welcomed the planned introduction of the RARS-DRR Africa Project and stressed that the installation of direct readout stations in RARS Africa should be coordinated with the Global RARS group to ensure global exchange of data. The workshop finally discussed the usage of NWP and highlighted the importance of the following three aspects:

- the importance of “lead time” to ensure that national meteorological services get timely the right level of pre-processed information for their own usage

- the importance to engage with the DRM community to design and deliver services that are based on their needs

- the necessity to include capacity building notably through sharing of expertise among regions and ensuring sustainability for the future.

Session 7C – African Space Programme: EO data needs and access

The report of this session was presented by ***Mr. Marco Clerici*** from the JRC on behalf of the Chairperson, ***Dr. Jane Olwoch*** and the Rapporteur, ***Mr Emilio Barisano***.

The workshop was dedicated to Earth Observation data needs and data access in Africa. It was introduced by several presentations by Department of Sciences and Technology of South Africa, by AMCOMET and by AfriGEOSS (an initiative from the Group on Earth Observation – GEO), the European Commission (on

Copernicus) and the African Union Commission (on GMES&Africa).

These presentations were followed by an intensive and constructive discussion on the following aspects: African Space Strategy, physical access to the data and efforts in data format and exchange protocol, the use of existing data dissemination channels (e.g EUMETCast), users capacity building and watch of technology change and novelties related to data transfer.

This session contributed to recommendation #31 to #34.

Session 8 – MESA Project

This session, chaired by ***Olusola Ojo, ACP Secretariat***, focused entirely on the MESA programme, funding by the 10th European Development Fund, and implemented by the African Union Commission and seven Regional Implementation Centres.

Mr Jolly Wasambo, MESA Programme Coordinator at the African Union Commission, presented the status of implementation of the project. He highlighted that the seven regional Grants, to implement information services in the various regions were now in place, and that further activities on training and infrastructure were planned to start soon.

Mr Luc Verelst, from the MESA technical assistance team, explained to the participants the plan for the upgrade, maintenance and repair of the AMESD & PUMA reception stations. He mentioned that all PUMA2010 stations will be upgraded into PUMA2015 stations, and that all AMESD station will be upgraded toward MESA stations. The deployment will start six months after the award of a contract (tender on-going) planned at the beginning of 2015. Marco Clerici, from the EC's Joint Research Centres, provided then more information regarding the estation, which is installed in AMESD stations, and its evolution.

Robert Brown, MESA technical assistance team, presented then the training programme, with an emphasis to the training activities dedicated to the NMHS.

Finally, the status of four of the seven MESA regional thema were provided by ***Isaac Kusane*** from the BDMS (MESA in SADC region), ***Zachary Atheru*** (MESA in IGAD region), ***Kouamé Bouafou*** and ***Issifou Aflari*** (MESA in the ECOWAS region – land part), and ***Isidore Embola***, CEMAC, and ***Olivier Kambi*** (CICOS) for the MESA in the Central Africa region. The status of the three other regional thema were presented as part of the Marine session (IOC/Mauritius Oceanographic Institute) and ECOWAS/University of Ghana) and Climate session (ACMAD).

During the discussion, participants highlighted the importance for MESA to engage with national institutions in order to achieve its objectives.

This session contributed to recommendations #13 to #16.

Session 9 – Satellite Applications in Africa

The session 9, chaired by ***Humbulani Mudau***, DST South Africa, created the opportunity to present various Earth

Observation applications, projects and initiatives in Africa.

Mr Abdelwaheb Nmiri, NMHS Tunisia, informed the participants about the initiative in North Africa, notably to seek extension of MESA to this region.

Mr Gillie Cheelo, WMO, presented then the three tools developed by WMO, following a user survey, to facilitate access and use of satellite data: the Product Access Guide, the OSCAR tool and the Satellite User Readiness Navigator Portal (SATURN).

Mr Kassa Fekadu, Ethiopia National Meteorological Agency, and ***Mr Philip Frost***, CSIR, and ***Mrs Emily Black***, then presented the use of satellite data for agro-meteorology (including the installation of GEONETCast station in regional offices in Ethiopia), fire monitoring (with the AFIS system) and rainfall estimate (TAMSAT), respectively.

Mr Jean-Louis Roujeau presented the status of the Land Surface Analysis SAF, whose data are disseminated to Africa, and of the AERUS-GEO project that aims at tracking operationally aerosol related events. ***Mr Tim Jacobs,*** VITO, introduced the AGRICAB project, funded by the EU and aiming at enhancing African EO capacities for agriculture and forestry. Finally, ***Mr Marc Leroy***, from CNES, provided a presentation on the prospective use and exploitation of Sentinel-2 data in Africa.

During the discussion, the speakers could clarify various points, notably related to the validation of their products.

This session contributed to recommendation #33.

Session 10 – Recommendations

This session was firstly the opportunity for several NMHS to provide a more detailed status of implementation of some recommendations from the 10th EUMETAST User Forum in Africa, in their country.

Sudan, Burkina Faso and Zambia reported on the status of implementation of the recommendation #5 from the 10th EUMETSAT User Forum in Africa on the national network and coordination to access EO data.

Then South Africa and Ethiopia reported on the status of implementation of the recommendation #35 from the 10th EUMETSAT User Forum in Africa on the use of EO for renewable energy.

Following these reports, the participants reviewed and unanimously adopted the 34 recommendations raised during the 11th EUMETSAT User Forum in Africa, all included in this report. They were complemented by three recommendations related to the climate session, and six recommendations from the RAIDEG.

The recommendations addressed EUMETSAT, the African National Meteorological Services, the regional centre (RIC, Training centre) the sub-regional African Economic Groupings, the WMO, the AUC, AMCOMET and the MESA Programme. They are grouped into eight categories for ease of reference.

Before the conclusion of the Forum, the participants were invited to complete a Survey Form related to the

organisation of the 11th EUMETSAT User Forum in Africa, in order to help EUMETSAT make the necessary improvements for the organisation of the next Forum.

EUMETSAT then invited the participants to indicate their interest in hosting the 12th EUMETSAT User Forum in Africa, in 2016. Representatives from Tunisia, Ivory Coast and South Sudan expressed their interest in hosting the next forum.

Exhibition area

On the occasion of the 11th EUMETSAT User Forum in Africa, an exhibition area was jointly set up by EUMETSAT and the SAWS. The exhibition consisted of several display computers connected to a EUMETCast reception station, providing a live stream of data and products that could be displayed. The exhibition included a demonstration of EUMETSAT data and products, SAWS use of these products. The exhibition also included posters and flyers of various projects, notably MESA.

The exhibition area provided an opportunity for numerous interactions between users and data and SW providers.

Technical visit

In the middle of the Forum, SAWS organised a technical and cultural visit. This well-attended excursion consisted of a visit to SANSA receiving stations facilities in Hartebeesthoek, North of Johannesburg with its impressive antenna, equipment and staff to track satellites. The group also went to the Cradle of Humankind where participants crawled into the Sterkfontein cave to see the place where Mrs Ples was found, the most complete skull of an Australopithecus africanus specimen ever found in South Africa.

Closing remarks

During their closing remarks, ***Vincent Gabaglio from EUMETSAT, Amos Makarao from AMCOMET, Joseph Mukabana from WMO, Jolly Wasambo from AUC and Mark Majodina, on behalf of Linda Makuleni, from SAWS*** congratulated the Forum and in particular its participants for proactively owning the development in the appropriate usage of EO in order to support sustainable development.

The 11th EUMETSAT User Forum in Africa was officially closed at 12:00 on 12 September 2014.

LIST OF RECOMMENDATIONS OF THE 11th EUMETSAT USER FORUM IN AFRICA

The recommendations of the 11th EUMETSAT User Forum in Africa are sorted into the following categories:

1. EUMETSAT programme and RAIDEG
2. Climate and GFCS
3. RARS-DRR Africa project
4. MESA project
5. Marine applications
6. Training and Research activities
7. Space and Earth Observation
8. Data and products (access and dissemination)

They were generated in the various sessions and reviewed and approved during the last session.

1. EUMETSAT Programme and RAIDEG

Recommendation #1
IODC continuation

Taking note of the on-going international discussions in the World Metrological Organization (WMO) Coordination Group for Meteorological Satellites (CGMS) framework (in particular between EUMETSAT, China Meteorological Administration (CMA), Indian Space Research Organisation (ISRO), and ROSHYDROMET) to secure continuity of the Indian Ocean Data Coverage (IODC) beyond the end of Meteosat-7 decommissioning at end of 2016, the Forum recommended CGMS, via EUMETSAT:

- to come up with a timely solution in order to avoid any data gaps over the region;

- to ensure that the new satellite(s) covering the IODC will provide at least similar coverage as the current IODC, in terms of imagery and Data Collection Service;

- to inform the African user community about the solution and the corresponding calendar, so that users can prepare themselves for the transition;

- to ensure dissemination of the IODC data, from whatever satellite, through EUMETCast-Africa for a seamless transition;

Recommendation #2
MTG preparedness

The Forum took note of the capacities of the new Meteosat Third Generation (MTG) programme, whose first satellite is expected to be launched in 2019. The Forum recommended:

- EUMETSAT to initiate the MTG user preparedness activities, in particular through an initial study that would highlight the potential benefits of MTG for various applications in Africa;

- the African meteorological user community, through RA-I Dissemination Expert

Group (RAIDEG), to come-up with their priorities in terms of MTG applications on the basis of the study;

- EUMETSAT to take into account these African priorities when designing MTG preparatory activities on various topics (training, data dissemination, etc);

- the African meteorological user community and EUMETSAT to initiate discussions related to the upgrade of the user infrastructure to MTG (inc. meteorological data display system, MTG data processing and assimilation), engaging with the African Union Commission (AUC), the Regional Economic Communities (RECs) and potential donors in their discussions;

- EUMETSAT and RAIDEG to report on the outcomes of these activities at the next EUMETSAT User Forum in Africa.

Recommendation #3
RAIDEG within WIGOS

The Forum noted and supported the recommendations of the 5th RAIDEG meeting as presented during the Forum and call upon all relevant partners to respond to these recommendations before the next meeting of the RAIDEG planned in mid-2015.

In particular, the Forum recommended WMO RA-I to recognise RAIDEG in the Regional working structures of WMO Integrated Global Observing System (WIGOS), as further recommended by the Commission on Basic Systems (CBS), at its next conference, and to ask each country to nominate a focal point to interface with the representative of their region within the RAIDEG.

2. Climate and GFCS

Recommendation #4
Benoni statement on GFCS-ACP

The Forum welcomed the Benoni Statement on the Implementation of the Global Framework for Climate Services in Africa, and its call for initiating a GFCS-ACP project targeting the regional level of the GFCS in Africa, under the understanding that a strong regional component will facilitate national level GFCS activities. The Forum noted that AUC and the Republic of South Africa will bring the Statement to the attention of the African Ministerial Conference on Meteorology (AMCOMET) or relevant Specialised Technical Committees (STC), WMO, Intergovernmental Board Climate Services (IBCS), RECs, ACP Secretariat and the European Union.

The Forum recommended the GFCS-ACP Task Team:

- to ensure that the strengthening of regional and national institutions focuses on creating links with the global and with the national components and aims at supporting the national level which is central to a successful and sustainable implementation of the framework;

- to continuously engage with their member states during the project preparation process, i.e. to inform and consult in order to ensure that the national needs are conveyed and integrated into the

implementation of the framework, and in particular to ensure the integration of all the priority application areas such as health, agriculture, disaster risk management and water resources, etc.;

- to ensure that training and building capacity is an integral part of the implementation of the framework at regional and national levels;

The Forum also recommended all Forum participants to bring the Benoni statement to the attention of their authorities and to encourage them to initiate the implementation of GFCS at national level, following the example from various countries.

Recommendation #5
Climate data sets applications

The Forum recommended that the Regional and National climate institutions explore the application of gridded climate datasets derived from satellite sources in their product generation and further requests those with such data to support training in the Region.

3. RARS Africa for Disaster Risk Management (DRM)

Recognising the significant contribution satellite data is already playing in the generation of severe weather forecasts, the Forum welcomed the new EU funded intra-ACP Programme "*Building Disaster Resilience to Natural Hazards in Sub-Saharan African Regions, Countries and Communities"* and especially its Result #3 which will be implemented through the ClimDev Special Fund (CDSF), and will include the following activities:

- the implementation of Regional Advanced Retransmission Service (RARS) in Africa to access polar orbiting meteorological satellites;

- the enhancement of the regional Numerical Weather Prediction (NWP) capacities in Africa;

- the strengthening of national capacities on NWP for Disaster Reduction Management (DRM).

Recommendation #6
Preparation of RARS-DRR projects

The Forum recommended ACMAD, AGRHYMET, ICPAC, ECCAS and SADC-CSC to accelerate the preparation of their "Application for funding" under the CDSF that would lead to one continental project (ACMAD) and four regional projects (Western, Central, Eastern and Southern Africa);

Recommendation #7
Use of EUMETCast for model boundary conditions

Taking into account the existing infrastructure and capability of the network of EUMETCast stations within the African continent, the Forum recommended that EUMETSAT together with Regional centres explore the potential use of this network for the delivery of model boundary condition information (including data from ACMAD) to the wider NMHS community in Africa.

Recommendation #8
Building upon existing capabilities and exchanging knowledge and expertise

Recalling the success of the Severe Weather Forecasting Demonstration Project (SWFDP), the Forum recommended that these RARS-DRR projects leverage on existing SWFDP national and regional structures, which are seen as best practice.

Noting the importance of model forecast data in the generation of Severe Weather Forecasts (SWF) and Extreme Forecast Indices (FMI), the Forum recommended that regional centres and national NMHSs request training support through the WMO Centres of Excellence in the use and interpretation of NWP data.

Recommendation #9
Engaging with DRM community and contributing to Disaster Risk Reduction (DRR) strategies

Recognising the need for DRM authorities to understand the potential and limitations of the SWF they receive, the Forum recommended:

- to countries, with the support of AUC and RECs,to take into account these projects as a contribution to the implementation of the African regional strategy for disaster risk reduction and its programme of action (which is in line with the Hyogo Framework for Action), and support its alignment with other programmes and services.

- to the NMHS providers to recognise the critical role that the African Regional Strategy and its programme of action play in advancing DRR on the continent and support its implementation;

- to regional centres to develop a communication and awareness plan to promote the activities and benefits of the EU-AUC RARS-DRR projects for national government agencies and citizens alike;

- to regional centres and NMHSs to engage with DRMs to ensure cross-fertilisation of activities within and between regions, and to establish best practices.

Recommendation #10
Sustainability of the project activities

Noting that the intra-ACP programme on Building disaster resilience project is of limited duration, the Forum recognised the importance of building a sustainable future, and recommended that through this project, infrastructures, procedures and research expertise are developed and enhanced in such a way that allows for continuation beyond the boundaries of the project. Efforts should also be made to enhance synergy among institutions working within Africa, notably at continental level between ACMAD and AUC. Efforts should also be developed by the project to ensure the establishment of an appropriate framework at the national level.

The Forum called upon the countries concerned to devote adequate human and financial resources at national level to ensure sustainability after the project lifetime.

Recommendation #11
The International Charter

The Forum recognised the importance of the Charter data and products in the

event of a major disaster and welcomed EUMETSAT's plans to disseminate the Charter Products on a routine basis via GEONETCast (EUMETCast-Africa). NMHSs are encouraged to promote the availability of the Disaster Charter service, and the Forum recommended NMHSs to engage with their national disaster management authorities on this aspect. EUMETSAT is invited to report on the use of the Charter data through EUMETCast in the African countries or region at the next EUMETSAT User Forum in Africa.

Recommendation #12
CDSF fund for NMHS

Further noting that the AfDB intends to issue a call for proposal under the CDSF before the end of 2014, the Forum recommended NMHSs to already initiate the preparation of "application for funding" taking into account the objective of the ClimDev programme, the CDSF Operation Procedures Manual and the template for the "application for funding" available under the website http://www.climdev-africa.org, as already done by Mali, Senegal and Ethiopia NMHSs.

3 additional recommendations on use of climate data are included in the next section.

4. MESA project

Recommendation #13
Training Centres WMO and MESA RICs

The Forum recommended AUC (i) to engage with the WMO on the use of the Regional Training Centres by the MESA RICs and (ii) to establish agreement with the Training Centres as necessary.

Recommendation #14
Engaging the national level

As reaching national level is at the core of MESA, the Forum recommended MESA, and in particular its regional THEMAs, to ensure the appropriate engagement of national institutions, starting with appropriate communication.

The Forum also recommended MESA programme to facilitate cross-fertilisation of services from one region to another.

Recommendation #15
Sustainability at national level

The Forum also recommended national institutions (Focal points and NMHSs) to work in close collaborations, with MESA's initial support, in order to ensure long term sustainability at national level.

Recommendation #16
MEA and MESA to reach decision makers

Furthermore, the Forum recommended MESA to ensure that products and information are made available to and reach the decision makers in order to gain their commitment for long term sustainability. In this respect, the Forum further recommended the AU hub of the ACP programme on Capacity Building on Multilateral Environment Agreement (MEA) to coordinate with MESA, particularly for disseminating information, coordinating between focal points and raising awareness of parliamentarians on the MESA and MEAs activities.

Recommendation #17
RAIDEG involvement in PUMA upgrade

The Forum recommended MESA to invite RAIDEG experts for the evaluation of the offers for MESA infrastructure contract which will provide the new upgraded PUMA 2015 station, and of key implementation milestones such as the Factory Acceptance Test, to ensure that the new system will match current African meteorological user requirements for data processing and visualisation.

Recommendation #18
PUMA 2010 license keys

The Forum recommended MESA to speak with the contractor of the PUMA 2010 stations to seek replacement of broken licences keys at no cost, especially at the Training Centres, and to ensure that measures are taken for the PUMA 2015 to avoid such problems.

Recommendation #19
Activities in North Africa

Noting the status of discussion in North Africa for a MESA-like project, initiated following the 10th EUMETSAT User Forum in Africa, the Forum recommended the NMHS of Tunisia to pursue the discussion with the EU towards the inclusion of some MESA-like activities in the framework of the Regional environmental programme on water management.

The Forum also noted that a first project under the GMES&Africa initiative, which is currently being formulated by EU and AUC, covers the full continent (inc. North Africa) and recommended the EU and the AUC to take into account the activities formulated in the MESA-North Africa and Maghreb concepts for the formulation of this first GMES&Africa project.

5. Marines applications

Recommendation #20
Marine Data and Capacity Development needs

The Forum notes the critical satellite data/products and capacity development needs of the marine user community across several application areas. These needs are exacerbated by the lack of real time observation equipment in the region. The Forum recommended the WMO RAIDEG group to include a JCOMM representation or a Monitoring of Environment and Security in Africa (MESA) Marine RIC representation, so that dissemination and capacity development needs of the marine meteorological and oceanographic community are properly captured.

Recommendation #21
MESA Thema on marine (cross fertilisation between regional centres and beyond)

Noting the cooperation established between the two MESA Regional Implementation Centres for marine applications (University of Ghana and Mauritius Oceanographic Institute) within MESA, the Forum recommended that these MESA RICs engage with the CSIR South Africa and other African institutions to explore how knowledge sharing (cross-fertilisation) can be achieved and formalised in order to cover the entire African continent, possibly through the

first GMES&Africa project under formulation.

Recommendation #22
Maritime institution and NMHS coordination on real time data and products

The Forum noted the applicability of near real time meteorological data across maritime application areas and also the potential to develop real time maritime safety and surveillance products from these data. The Forum therefore recommended NMHSs of costal countries to engage with their national and regional maritime organisations to discuss this potential in order to meet the needs of the maritime community.

The Forum encouraged South Africa Marine Safety Agency (SAMSA) to support the other countries within the region and the continent, through capacity building activities possibly under on-going projects (such as MESA) and recommended JCOMM to report on this at the next Forum.

Recommendation #23
STCW training content review

The Forum noted the meteorological requirements of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW), and kindly requested EUMETSAT and the training centres to review the content of the STCW training courses, within the scope of the competencies described in the STCW Convention (1995) Chapter II, Section A-II/2, and propose additions to the STCW training providers based on satellite related systems, data and products available through national and regional institutions, EUMETSAT and other providers.

6. Training and research activities

Recommendation #24
Training needs

The Forum requested Training Centres (WMO RTC and the Centre of Excellence in Morocco) to address the training needs identified at the Forum, which includes training of trainers. The Forum requested centres to report progress at the next Forum. Furthermore, the Forum encouraged PRs and institutional directors to directly communicate their needs to the Training Centres.

Recommendation #25
Internet for training

The Forum recommended that NMHSs ensure adequate internet bandwidth and staff time to allow their staff to appropriately follow and complete online training courses.

This will enable the Service to make full use of the available capacity building initiatives.

Recommendation #26
Training Centre Cooperation and Coordination across regions

The Forum noted the cooperation established between the Training Centres and recommended WMO CGMS Vlab to further enhance cooperation across regional economic groupings in Africa.

Recommendation #27
Training in French

The Forum noted the very strong need for training provided in French in

certain countries to BIP-M and BIP-MT levels and recommended relevant PRs and francophone training centres, with guidance from the WMO secretariat, to explore ways forward.

Recommendation #28
Information on training opportunities

The Forum noted the range of available training opportunities. The Forum recommended Training Centres (WMO RTC and the Centre of excellence in Morocco), with the support of the MESA programme, to better make available information (e.g. on AUC website) on which training is offered by themt, RICs and other partners, in a coordinated manner, and to propagate this information to NMHSs and other potential participants.

Recommendation #29
Develop research capacities

The Forum, noting the research skills gaps in the region, invited AUC to make accessible information on the support available in order to develop the capacity of researchers in meteorology and wider environmental field.

Recommendation #30
Cooperation with research projects

Noting the presentations of the various projects from European institutions in Africa (e.g., TAMSAT, AGRICAB, SAFs, etc), the Forum encouraged them to strengthen collaboration and coordination among themselves and recommended NMHSs, RAIDEG and other relevant regional and national institutions to engage with these projects to establish partnerships and exploit the various data and information they provide.

The Forum recommended NMHSs and other users to respond to the next call for contributions that will be issued for the next EUMETSAT User Forum in Africa in order to present their collaborations with these projects.

7. Space and Earth observation

Recommendation #31
Coordination and collaboration

The Forum welcomed the coordination at AU level of policies and initiatives related to Space initiated by various African ministerial conferences (Conference for Ministers in charge of Communication and Information Technologies – CITMC, AMCOMET, African Ministerial Conference on Science and Technology – AMCOST). In particular, the Forum recommended AMCOMET Task Force on the African Regional Space Programme to continue collaborating with the AU Space Working Group in the development of the African Space Strategy, and to ensure consistency with the Integrated African Strategy on Meteorology (Weather and Climate Services).

Recommendation #32
User needs assessment

The Forum highlighted the importance of conducting regular user needs assessments and dialogues with data providers, and welcomed the process established under RAIDEG for meteorological applications, as a potential example for other user communities. In this respect, the

Forum recommended RAIDEG to continue to assess and evaluate requirements for meteorological satellite data sets and products, and to report these requirements to the AMCOMET Task Force on the African Regional Space Programme.

Recommendation #33
Data from EO initiatives in Africa

Welcoming the various on-going projects and initiatives (e.g., AfriGEOSS, MESA GMES&Africa) aiming at promoting the use of Earth Observation in Africa for several socio-economic sectors, the Forum recommended the main stakeholders of these initiatives, in particular the African GEO members and participating organisations, the GEO Secretariat and AUC departments (Rural Economy and Agriculture – REA and Human Resources Science and Technology – HRST):

- to promote, through these initiatives and projects, an open and free access to all relevant EO datasets;

- to coordinate data access and sharing at continental level, including harmonization of data format and protocol for data exchange, as well as exploring technical means for access and sharing;

- to focus capacity building efforts on datasets available openly and freely to Africa;

- to coordinate their efforts in order to come-up with a unique African EO portal, which would, at least, catalogue all EO data available from and to Africa, planning also interoperability with other existing EO portals available across the globe.

Recommendation #34
Near real time Copernicus data for Africa

The Forum noted that the issue of near-real time physical access to Copernicus data and products (core services and Sentinel satellite data) was often raised in the presentations (marine and land applications). The Forum recommended AUC to coordinate and federate (possibly through the MESA project and GMES&Africa intiatives) specific African users' requirements (by applications and with list of priorities), and to pursue its engagement with the EU to come up with concrete solutions for the near-real time access to some prioritised sets of Copernicus data and products.

RAIDEG and SESSION 5 RECOMMENDATIONS

RECOMMENDATIONS FROM THE 5th MEETING OF THE RAIDEG AT THE ATTENTION OF THE USER FORUM

RAIDEG Recommendation #1
Capturing user needs:

- Oceanography – to seek a representative from JCOMM or from the RIC oceanographic components (Mauritius & Ghana);

- Agrometeorology – to encourage those RICs and other organisations with agro-meteorology remit to feed into their regional reps;

- RAIDEG recommends to the forum to nominate competent national points of contact to ensure that user needs are properly captured in the RAIDEG meetings.

RAIDEG Recommendation #2
Maintaining display and visualisation systems:

- RAIDEG notes that it is essential to have good local ICT support in order to maintain data flows and operational use of data. PRs are strongly encouraged to ensure such people are in place and well trained, and noting that such training will be available under MESA;

- RAIDEG notes the cost issues with the license key replacement, particularly within training centres. This has a significant adverse impact on the availability of the PUMA2010 system. RAIDEG requests AUC to speak with MFI to seek a way forward;

- Graphical L2 product providers are requested to provide clear colour scales in their product guides;

- Providers of maritime products for West Africa are asked to extend their domains to 40°W;

- RAIDEG notes the range of WMO formats and WMO accepted formats. We also note gridded data are easier to manipulate in GRIB and netCDF and we encourage data and product providers to take note.

RAIDEG Recommendation #3
NWP training

RAIDEG notes a growing need for training in the use of NWP products, in particular ensemble and probabilistic products.

RAIDEG Recommendation #4
MESA Project

- RAIDEG is willing to assist AUC in the MESA Infrastructure contract evaluation with technical and operational experts.

- RAIDEG is also willing to assist in the Factory Acceptance Testing of the PUMA 2015 system.

RAIDEG Recommendation #5
Post-MESA Meteorological Display systems

- Noting the success of PUMA and AMESD in making data available for forecasters to interact with, RAIDEG further notes this continues in MESA, but with no follow on envisaged.
- PRs are strongly advised to develop a road map for preparing a solution for post MESA, this roadmap should extend to MTG.

RAIDEG Recommendation #6
Copernicus data

RAIDEG notes interest in the Sentinel data from operational users in RA1, and for Sentinel-3 requests EUMETSAT to speak with the relevant institutions to develop options for data dissemination to Africa.

ADDITIONAL RECOMMENDATIONS ON USE OF CLIMATE DATA

Recommendation ADD #1
Title CM SAF data via EUMETCast

The Forum recommends that CM SAF investigates with EUMETSAT the delivery of CM SAF monthly mean products on EUMETCast Africa.

Recommendation ADD #2
Title Use of CM SAF data in RCCs & NMHSs

The Forum recommends that RCCs and NMHSs incorporate the CM SAF data in their climate monitoring activities and seek appropriate training to support this.

Recommendation ADD #3
Title TAMSAT daily product available on EUMETCast

The Forum recommends that the daily TAMSAT estimates, which are currently generated at the end of each dekad (10 day period), be made available on EUMETCast from the start of 2015.

OPENING CEREMONY

Statement by Alain Ratier, EUMETSAT Director-General

[Protocol observed]

It is again an honour and a pleasure for me to take part in the EUMETSAT User Forum in Africa, two years after the 10th edition that took place in Addis Ababa in October 2012.

As you know, Africa is important for EUMETSAT and our commitment in cooperating with the African continent has never diminished during the last 20 years. It has also been re-affirmed in 2011 by the Strategy adopted by our 30 member states which defines the general framework of our action. And for an operational agency like EUMETSAT, it is action that counts and the support to the realisation of your projects, and more specifically those carried out together with the European Union.

In the framework of these projects, our objectives are clear. On one hand they are about facilitating access to EUMETSAT data, products and services for African users as well as to other environmental, climatic and meteorological information that we have, and on the other hand to help them make the best use of such information in order to allow each country of each region to develop meteorological and climatic services meeting their needs.

But these objectives are first of all yours, since they only make sense within the implementation of the strategic plan of the WMO Regional Association I and its new African Integrated Strategy for Meteorology adopted by AMCOMET and then by the African Union Summit in January 2013. Our contribution is quite modest compared to the sustainable development issues in Africa, but it is continuous and committed, based on the relationship of trust that we have managed to build over the years thanks to projects lead by users, with tangible and real results.

Our Forum is a remarkable dialogue tool to pursue our joint objectives, and I thank all of you to have accepted the invitation from EUMETSAT and SAWS.

In order to continue on the prepared track and to give you the best data to best manage the risks of climate change and natural disasters, EUMETSAT must first secure the continuity of satellite systems and relevant services in the coming decades. This requires us to exploit the best we can the current generation satellites (MSG and Metop) in order to best ensure the transition to new generation systems currently under development (MTG and Metop Second Generation) and that will be sent in orbit towards 2020. This is why, after the launch of Meteosaat-10 and Metop-B in 2012 we have been preparing the last launches of that generation, MSG-4 and Jason-3 in 201, and Metop-C in 2018.

At the same time, we are developing the new generation systems (MTG, Metop-SG and Jason-CS) which capacities much higher than current satellites will allow improving meteo-oceanic forecast at all time scales, while maintaining all the decades of climatic data sets already acquired. But these developments which are still at their early stages only make sense if user communities are prepared to the usage of the new data. And this is why, in order to engage this process of preparation of user communities in Africa, this Forum will open the dialogue on MTG and its potential applications in Africa. Those satellites, which will be presented in more details during the Forum, will not only produce images more precise, richer and more frequently, but also, for the first time since the geostationary orbit, vertical sounders for temperature and humidity at an hourly frequency. After PUMA, AMESD and MESA, which have seen the development in Africa of applications in meteorology, environment and then climate from our current satellites, future projects for capacity building will have to address new issues: ingest new data, much richer, but also much larger data sets, for all meteorological applications but also for other applications key for sustainable development such as agriculture, water and marine resources management, as well as the prevention and management of natural hazards and climatic risks. The Challenge is for Africa to manage to make best use of MTG satellites that will continue to observe Africa better than Europe.

This will require a strong and continuous partnership between EUMETSAT and its African users, within a political context of a larger cooperation between Africa and Europe. Saying this, I would like to acknowledge the new EU-ACP programme aimed at supporting African countries in the mitigation of disaster risks thanks to a specific contribution from the African ClimDev Special Fund managed by the African Development Bank and UNECA. This new programme, which will be presented during the Forum, should allow African meteorological services and their regional centres to produce improved forecast of extreme meteorological events, in particular thanks to the ingestion of data from polar meteorological satellites into prediction model at regional scale. These projects take place in the framework of the Joint EU-Africa Strategy which was reaffirmed during the recent EU-Africa summit of April 2014 in Brussels.

This political framework will allow the continuation of the technical partnerships built through the years between EUMETSAT, EU, AU, ACP secretariat and the African RECs and that will remain instrumental beyond projects PUMA, AMESD and now MESA. As does MESA, the continuation of such projects must maintain and strengthen infrastructure while strengthening capacity for data processing and usage of the regional centres and national meteorological services, in support to key applications for the sustainable development in Africa.

Ladies and gentlemen,

I would like, to conclude, to come back on the climate change and variability challenge. We all know it, and the GIEC reconfirmed it recently, Africa is the most vulnerable of the continents, and I don’t forget the island states of Caribbean and Pacific. It is therefore indispensable that Africa and ACP states build, at institutional, scientific and technical level, the capacity of services offering decision makers the possibility to build adaptation policies

based on undisputable science and climatic and socio-economic data.

In the Global Framework for Climate Services (GFCS), which calls for a coordination at global, regional and national levels, the Addis Ababa declaration stated the legitimate ambition and needs of Africa, and I am delighted that the high level meeting that preceded this Forum could both confirm the commitments of these political institutions and recognise the value of the work carried out during the last two years by the GFCS-ACP Task Team.

Here again EUMETSAT hopes, with modesty, to support your action. To do so we are taking part with other satellites operators to the implementation of an architecture for climate monitoring from space which will be our contribution to the Monitoring and Observation Pillar of GFCS, and which will allow to produce climatic data series of more than 30 years of observations acquired by meteorological satellites.

I thank you for your attention, I am looking forward to the exchange we will have during the coming days and I wish you an excellent Forum, thanking SAWS and EUMETSAT Teams for the excellent organisation.

Statement by Mr. Jery Lengoasa, Deputy Secretary General of the WMO

[Protocol observed]

It is a great pleasure to participate in the opening ceremony of the eleventh EUMETSAT User Forum in Africa. On behalf of WMO and its Secretary-General, Michel Jarraud, I wish to thank the Government of South Africa for hosting this session in Johannesburg, and express my appreciation to Ms Makuleni, Chief Executive Officer of the South African Weather Service and Permanent Representative of South Africa with WMO for the excellent arrangements made for this session.

I would like to extend my gratitude to Dr Ratier, Director-General of EUMETSAT, for organising the User Forum. Through the years, it has become a key venue for National Meteorological and Hydrological Services in Africa, which engage with WMO especially through its Regional Association I. Thanks to the User Forum, African NMHSs can exchange experience and express their needs in terms of meteorological satellite data, data reception and analysis systems, and applications and training.

I wish to underline that EUMETSAT and other partners such as the European Commission have been providing excellent, long-standing and reliable support on all these areas of work. To make just one example, the Meteosat Programme can be considered in many ways as the world's most advanced geostationary satellite programme. The current Meteosat-10 at its vantage point above 0° longitude serves very well satellite user needs in Africa.

Naturally, the User Forum also offers the opportunity for NMHSs in Africa to receive updates on programmes and plans of EUMETSAT as well as WMO. In this regard, I am pleased to see that the major priorities of WMO are addressed in the agenda of the Forum:

- Disaster risk reduction;

- The Global Framework for Climate Services (GFCS);

- Data access, which through EUMETCast and MESA is independent of internet connectivity;

- Early preparation of users to the Meteosat Third Generation satellite; and

- Training and capacity building.

My colleagues in WMO will address these priorities in specific presentations:

- Dr Mukabana will brief you on the status of AMCOMET activities and the implementation of the GFCS;

- Dr Bojinski and Mr Cheelo will update you on WMO Space Programme activities;

Ladies and Gentlemen,

WMO considers very important the dialogue that has been initiated between EUMETSAT and key satellite data users from WMO Regional Association I. The meeting organised through the WMO RA I Dissemination Expert Group (RA I DEG) on 6-7 September at this same venue provided an initial opportunity for such collaboration and I take this occasion to recommend that RA I formally endorse RA I DEG within the RA I working structure at the upcoming sixteenth session of RA I in October 2014.

I wish you good luck in your deliberations and a very successful meeting.

Thank you.

Statement by Roeland van de Geer EU Ambassador to South Africa

[Protocol observed]

In a recent student gathering on challenges facing global policy makers, the convener pointed out that everything boiled down to choices and noted that it was all about whether … "NO" interrupted one particularly sharp participant, "it is not about weather … it's all about climate!" … and I'm inclined to agree: it IS all about climate – for one our bio-diversity depends on it, directly linked, our food security depends on it, … and, you've guessed it: our weather depends on it. With food and weather inextricably linked to almost all human endeavours I think it is safe to say that we cannot overestimate the importance of the real and potential impacts of climate change.

Let me say at this point that I am very pleased that the European Union is associated with the opening of this, the 11th EUMETSAT event. It is fantastic to see so many African scientists here today and I must observe that South Africa is consolidating its reputation as a scientific hub.

I remember the recent COP 17 meeting in Durban – it really brought the importance and seriousness of climate change to the fore in South Africa, and I believe the region. Congratulations South Africa for not only hosting a great COP 17 but more importantly for your continued commitment to climate action locally, regionally and globally.

Climate change is now at the centre of the debate on economic policy. The World Bank President Jim Yong Kim, the IMF Managing Director Christine Lagarde, as well as the Head of the OECD Angel Gurria have all alluded to

fundamental threat that climate change presents to development.

In the European Union, we are already making the required paradigm shift. First, we are mainstreaming climate action in our national economy through ambitious emissions reduction, renewable energy and energy efficiency targets.

Secondly, climate action is key element of our external development policy. The European Commission will be aiming to spend around 20% of its development portfolio on climate-related projects and programmes. This would be in line with the overall target of making at least 20% of the entire European Union budget for 2014-2020 "climate relevant".

Finally, we elevate climate action in our dialogue and cooperation with third countries and regions. The 4th Summit of the Africa-EU Heads of State held in April 2014 adopted a roadmap, which identifies 'climate change and environment' as one of the key areas for cooperation.

Our strategic partnership with South Africa, which is in place since 2007, reflects our shared concern about the negative impacts of climate change and our shared commitment to 'greener' economy that offers opportunities for employment and overall sustainable growth.

Reliable and accurate environmental monitoring data is one of the key steps to initiate and pursue effective climate action. Reliable and accurate data allows for evidence-based policy-making.

This is why our Roadmap for cooperation with the African Union also makes strong references to space dialogue and continued development of Africa's Earth observation capacity, specifically in support of environmental monitoring.

As Head of the European Delegation to South Africa I would like to also emphasise that Earth observation is at the centre of our young but most productive bilateral Space dialogue with South Africa.

In the context of this political framework, the European Union has been supporting a number of concrete projects and programmes targeting Africa's access and use of reliable climate-related data through Earth observation technologies.

PUMA, AMESD, MESA – I am sure that you are much more familiar with these abbreviations than myself. These are abbreviations of the three consecutive programmes where the EU has teamed up with EUMETSAT to support Earth observation applications in Africa. The EU overall financial contribution to these programmes has been about €70 million.

PUMA was the first of the programmes and dates back to 2001. As you are well aware it ran under the formal title 'Preparation for the Use of MSG (Meteosat Second Generation) in support of Earth Observation technologies for meteorological purposes. It was then followed by AMESD - the African Monitoring of Environment for Sustainable Development (AMESD) programme in 2006. Today we are implementing 'Monitoring for Environment and Security in Africa' (MESA) with an EU contribution of 37 Mo€. The programme will run until 2018 and will consolidate and widen the operational environmental services developed in AMESD, and propose new services, such as African climate services.

MESA, building on AMESD and PUMA, is a unique experience of

implementing concrete activities at the continental level. It has a strong institutional network, which includes the African Union Commission, Regional Economic Communities as well as the Regional Information Centres. It is also underlined by strong partnerships with EUMETSAT and the European Commission's Joint Research Centre (JRC).

The joint work and team spirit demonstrated in the process of implementation of AMESD and MESA programmes is certainly an inspiration. It is equally a valuable contribution to the wider objectives of regional and continental integration in Africa.

In addition, we are funding an ongoing €80 million programme 'Building Disaster Resilience to Natural Hazards in Sub-Saharan African regions, countries and communities'. One of the programme's five results – Result No 3 – once again involves a welcome partnership with EUMETSAT and focuses on improved capacity of the national and regional climate centres. This implies access to additional Earth observation data primarily for more accurate weather forecasting. The achievement of this result will have benefits to the broader Disaster Risk Reduction and Disaster Risk Management sector.

You have all probably heard about the Global Monitoring for Environment and Security (GMES) and Africa initiative that was launched in 2007 to create an overarching framework in Africa for Earth Observation applications. This initiative was proposed on the basis of the EU Earth Observation Copernicus programme approach. The EU has supported the development of the GMES and Africa Action Plan, which was finalised in 2013 with the focus on three priority thematic areas – marine and coastal areas, water resources and natural resources management. And we are currently in discussions with the African Union about the best ways to support its implementation under the European Union's new financial instrument – the Pan-African Programme. EUMETSAT, as one of the key actors in our Copernicus programme infrastructure, will certainly have its role to play.

Let me finally mention that our support for various initiatives targeting better access and use of climate-related data in Africa and our own Copernicus programme are in line with our strong commitment to UN-led initiative the Global Framework for Climate Services. The European Union's contribution to this initiative has been also underlined by our so-called Framework Programmes for Research and Technological Development. Multiple climate-related research projects have been funded under the 7th Framework Programme by international research consortiums, which have included many African research institutions. We will further reinforce climate-related research under our new €80 billion programme Horizon 2020.

Dear ladies and gentlemen,

Let me once again reiterate that I am very pleased to be here today and demonstrate the European Union's most serious commitment to addressing the challenge of climate change, which as we all know requires access to most accurate data among other things.

Honourable Minister, Honourable Commissioner,

Let me say that I am proud of our partnerships, dialogue and cooperation in this area. It would be worthwhile to investigate if we can apply some of the lessons to other less fruitful areas of cooperation.

Finally, I would like to take this opportunity to thank EUMETSAT for our successful teamwork at the European as well as pan-African levels to facilitate access and use of the crucial climate-related data. Together we have achieved a lot and I believe there will be many more achievements to celebrate!

All the very best to you with the proceedings of this Forum!

Thank you.

Statement by H.E Rhoda Peace Tumusiime, African Union Commissioner for Rural Economy and Agriculture

[Protocol observed]

It is a great honour for me, on behalf of the Commission of the African Union, to convey the warm greetings of Her Excellency, Dr. Nkosazana Dlamini Zuma, Chairperson of the Commission of the African Union, and to express my sincere appreciation to the Government and people of the Republic of South Africa for the warm welcome and generous hospitality accorded to me and my delegation. I wish to, also, thank the South African Weather Service (SAWS), the European organization for the Exploitation of Meteorological Satellites (EUMETSAT) for all the efforts and hard work involved in organizing this Forum.

Excellences
Ladies and Gentlemen

Allow me, from the outset, to announce that the 11th EUMETSAT User Forum, that has gathered all of us here today, is an event happening at a critical point in time, especially for Africa, as it coincides with the period when we are finalising the elaboration of the Africa Agenda 2063 on the Africa We Want about fifty years from now. Among others, Africans envisions "a prosperous Africa based on inclusive growth and sustainable development". Aware of the myriad challenges, we are still determined to opt for every trusted path to move forward. With the positive collaboration we have with our international partners I am convinced that this Forum will allow us to comprehend the magnitude of the challenges and solidify our resolve for joint action against phenomena that alter, and in some cases negatively impact, our life-support systems.

Excellences,
Ladies and Gentlemen,

As Africa, we consider satellite technology as critical towards dealing with some of the challenges in near-real time. This has been demonstrated by the African Monitoring of Environment for Sustainable Development (AMESD) project and now transited to the Monitoring for Environment and Security in Africa (MESA) project – both funded by the European Union. The contribution of satellite technology and space science, is thus, vital for the implementation of national, regional and continental strategies such as the Integrated African Strategy of Meteorology (Weather and Climate Services), the African Strategy of Disaster Risk Reduction, and the implementation of the draft African Climate Change Strategy, among others.

Most of us are aware that the 2014 IPCC Report (i.e. Climate Change 2014: Impacts, Adaptation and Vulnerability) reports, with a very high degree of confidence, that (I quote),

"impacts from recent climate-related extremes, such as heat waves, droughts, floods, cyclones, and wildfires, reveal significant vulnerability and exposure of some ecosystems and many human systems to current climate variability" (end of quote). While it is clear that such extremes are altering our ecosystems, disrupting our food production and water supply, damaging our infrastructure and settlements, and increasing morbidity and mortality rates, literature reveals that countries at all levels of development are not prepared for current climate variability in some of the affected sectors. This cannot be taken lightly. As our scientists, practitioners, policy and decision makers, service users, etc. gather to deliberate in various sessions of this Forum, we expect nothing less than propositions that respond to our challenges and speak to our needs. Reflecting on our activities and integrating satellite technologies in our current and future endeavours, with the communities at heart, should be part of our aspirations at this Forum. We should not forget that our relevance lies on us addressing both current and future challenges that matter to the communities we serve.

Excellences
Ladies and Gentlemen

While we are aware of the existence of consistent satellite data for earth observations, climate monitoring as well as tracking environmental changes and others, we should also be mindful of the fact that possession of the ability to exploit satellite technologies is critical. That is why cooperation and collaboration, in this field, are vital. I am meant to understand that in order to exploit satellite data, including historical data, there is need for international collective efforts which ensure that processes such as data recalibration, reprocessing, as well as making them available for applications are successfully and timely executed. In this regard, I wish to thank EUMETSAT for playing a very critical role of contributing towards enabling Africa to access satellite data for use for socio-economic development. To consolidate this collaboration, the AUC and EUMETSAT, last year, signed the Memorandum of Understanding (MoU) and the Implementation Arrangement which define our working modalities, particularly with regards to the implementation of the MESA project.

Excellences
Ladies and Gentlemen

It is worth acknowledging the fact that Africa is able to access such a resource of satellite data through cooperation programmes and actions that are funded by the European Union. At this juncture, let me applaud the EU for funding our programmes such as the MESA programme I mentioned above, the Programme of Action for the Implementation of the Africa Regional Strategy for Disaster Risk Reduction, Capacity Building programme for the Multilateral Environmental Agreements (MEAs), the Great Green Wall for the Sahara and the Sahel Initiative (GGWSSI), the Climate Information for Development in Africa (ClimDev-Africa) Programme and many others. Allow me, therefore, to take this opportunity to request His Excellency Roeland van Geer, Head of the European Union Delegation to South Africa to convey our gratefulness to relevant authorities with the European Union structures.

Excellences,
Ladies and Gentlemen,

Taking stock of our seriousness in implementation of recommendations, I am glad to note that most of the recommendations of the 10th

EUMETSAT User Forum have been executed with very few under implementation. On our part as AUC, we have also implemented what we were supposed to implement particularly with regards to the MESA project. We will be highlighting some of these in some sessions.

Last but not least, I wish again to thank the organizers of this Forum for working very hard to bring such a huge cloud of people together. The Management and staff of the Kopanong Conference Centre also deserves our appreciation.

With these remarks, I wish you fruitful deliberations.

I thank you.

Opening address by Mrs Edna Molewa, Minister of Environmental Affairs, Republic of South Africa

[Protocol observed]

Ladies and Gentlemen,

Let me begin by extending a warm South African welcome to you all. It is a great pleasure and honour to be hosting the 11th EUMETSAT "Users Forum in Africa" right here on our soil. The Users Forum is an excellent platform for technological cooperation and partnership between the African satellite user community and EUMETSAT. We have seen this Forum grow and reach new milestones through the years. We have also seen how this information and technology have assisted our national weather services and weather forecasting in the region to protect life, property and contribute to economic development.

Programme Director,

Satellite remote sensing has become an integral part of operational environmental monitoring. Within the African continent, where there is an extremely low number of meteorological observations, satellite data has become critical for weather forecasting and climate research. With the advent of climate change, the latest high resolution satellite data is providing vital information for severe weather forecasting and nowcasting.

Our continent, ladies and gentlemen, is extremely vulnerable to climate change and variability. The changing rainfall patterns are already having an effect on agriculture, food and water security. Furthermore, the climate change projections for extreme weather events such as severe storms, droughts and floods are painting a gloomy picture of increasing frequency and severity.

This 11th Users Forum will more particularly focus on the implementation of the Global Framework for Climate Services (GFCS) in Africa, as supported by the Addis Ababa Declaration and the Integrated African Strategy on Meteorology, as endorsed by the African Ministerial Conference on Meteorology (AMCOMET). In this regard, South Africa recognizes the need for the development of an efficient mechanism to regularly deliver essential and consistent information on climate change projections - thereby underpinning our national adaptation to climate change. Additional efforts will be needed to establish robust information systems, guidance for appropriate interpretation, and delivery mechanisms to support the potentially wide range of specialized applications, especially at the national level. We are committed to working closely with partners such as EUMETSAT and the World Meteorological Organisation

(WMO) through programmes such as the GFCS to ensure that climate change projections are also included in our product portfolio.

Taking into account both climate change and variability, there is a need to sustain and enhance support for developing and promoting wide access to and the use of climate information, tailored products and services. South Africa takes note of the sound, overarching emphasis on a user-oriented approach within the Global Framework for Climate Services (GFCS) and that the provision of climate information for adaptation and risk management will continue to be a priority for our government. We recognize the need to evolve climate products more amenably for use by decision-makers in different sectors. In the perspective of climate services delivery, the products themselves should transform from basic products, such as rainfall or temperature information, to tailored products that satisfy the users' needs.

There is clearly a need to develop tailored products indicative of impacts such as forecasts of agriculture and crop production outlooks, hydrological outlooks, forecasts of energy production and consumption, and early warnings relevant to the health domain, among others. Building interfaces among stakeholders, including national weather services, will facilitate climate-smart decisions in critical sectors. This will enable the reduction of the impacts of climate-related disasters, improvement of food security, health outcomes and efficient water resource management.

Mainstreaming climate information, products and predictions for addressing climate change and variability in planning and decision making processes would significantly improve operations, adaptation and risk management. These emerging needs will become more prominent over time and the climate information delivery mechanisms will be increasingly called upon to support relevant interfaces for the impact models and relevant integrated climate indices in order to make the decision-making processes more beneficial to stakeholders and societies. These emerging opportunities call for us to work directly with partner agencies, at various levels, including EUMESAT at international level, to access sector specific expertise in furthering its work. Capacity development is a major cross-cutting pillar of the Global Framework for Climate Services (GFCS). It explicitly addresses institutional, infrastructural, procedural and human resource capacities. We recognize the fact that every capacity development activity should be inclusive, be sustainable, and dynamically evolve to meet emerging requirements. We further recognize the need to learn from those who are ahead of us with the overarching goal of strengthening capacity development in our region within the GFCS and achieving standardized methods and tools for climate services.

Ladies and Gentlemen,

The partnerships in satellite remote sensing are extremely important and we truly value the cooperation with EUMETSAT, which we can trace back to the 1970s with the operation of the first generation of satellites. Africa is currently making use of the higher resolution, 15-minute images from the Meteosat Second Generation satellite. The Third Generation satellite is expected in 2019, with an even higher resolution to resolve on greater detail and in response to the emerging user needs. The contribution of EUMETSAT to African meteorology is truly invaluable and we are truly grateful to EUMETSAT, Dr. Ratier. I have noted

with keen interest the immense contribution by EUMETSAT and the evolution in African satellite meteorology from the times of the Preparation for Use of MSG in Africa (PUMA) and later African Monitoring of the Environment for Sustainable Development (AMESD) moving on to Monitoring of the Environment and Security in Africa (MESA). The time has arrived now when the continent is developing its own Space Policy to use space science and technology to derive socio-economic benefits and to develop and maintain indigenous infrastructure and capabilities that service the African market. We trust that this partnership with EUMETSAT, the European Union and other partners will continue to flourish and we will complement each other's efforts.

Programme Director,

I would now like to draw the attention of the forum to the African Ministerial conference on Meteorology (AMCOMET) Integrated African Strategy on Meteorology (Weather and Climate Services) which pointed out the shortcoming that, although Africa utilizes numerical weather prediction and satellite derived products, there was limited involvement in the design of these products by the region itself. Ladies and Gentlemen, I cannot over-emphasize the importance of the local knowledge and experience when designing projects. Any scientific basis of developing products will need the local or regional knowledge to improve its accuracy and relevance. This Forum is an excellent opportunity to address this challenge. We have experts from all over the continent together with our partners gathered here today until the end of this week. I call upon you all to work together and address how the continent will actively participate not only as a consumer, but also as a designer of these satellite products. To do this, we will need to comprehend the bigger picture, respect one another and work extremely hard in a collaborative manner. In this regard, I also call upon you regional experts to actively participate in the African Global Earth Observations System of Systems (AfriGEOSS). AfriGEOSS was launched in 2012/13 to provide a platform for African countries to share knowledge and participate in global GEOSS collaborations and enhance the Africa-wide knowledge base through Earth Observations. Another similar initiative is the 10th International African Association of Remote Sensing of the Environment (AARSE) Conference which will be held here in Johannesburg from 27th to 31st October 2014. Returning back to the AMCOMET strategy, I will also call upon the WMO to ensure that this satellite data is channelled through the regional WMO Integrated Global Observing System and the WMO Space Programme to ensure its accessibility and international exchange.

In summary, distinguished guests, I would like to emphasize following three points:

- International collaboration is critical both amongst the States and also with EUMETSAT;

- Capacity building is essential for infrastructure development and expertise in satellite meteorology; and

- Technology transfer and knowledge sharing are of vital importance to deal with the enormous challenge of climate change.

The implementation of the GFCS will require continued cooperation amongst us all to address the user-needs, technology transfer, capacity

building and resource mobilization. The development of climate services is critical for our fight against poverty and efforts to combat the adverse effect of natural disasters that continue to oppose the development gains of our continent.

Finally, Ladies and Gentlemen, in line with South Africa's keen interest in meteorology, its impacts on almost every facet of life and the central role which WMO plays in this, the South African Cabinet has endorsed the candidature of Mr. Jerry Lengoasa for the WMO Secretary General position. Our National Department of International Relations and Cooperation has been circulating formal government notifications calling on your support during the 17th WMO Congress elections in 2015 for Mr. Lengoasa. We are convinced that, from his own vision of the WMO and his impeccable record from the time he served as the Chief Executive Officer of the South African Weather Service and within the WMO as both the Assistant Secretary General and the Deputy Secretary General, he will lead the WMO to greater heights to serve all its members with a particular focus on the unique development challenges facing our own region. I therefore call upon your support for this African Union-endorsed candidate, in the race for the new Secretary General position during the 17th WMO congress.

I thank you.

INTRODUCTORY REMARKS
(Introductory session)

Introductory remarks by Linda Makuleni, CEO of SAWS and Permanent Representative of South Africa with the WMO.

Ladies and gentlemen,

I wish to welcome you once more to this 11th Users Forum in Africa. This session was preceded this morning in the Opening Ceremony by excellent high level addresses. These have helped to set the broader context and captured the essence of making contributions to socio-economic development on our continent against the background of climate change and variability.
The EUMETSAT Users Fora in Africa have been held 10 times already since 1995 where the Forum was held in Niamey, Niger. The Forum meetings are held every two years to evaluate past progress and develop new programmes that take the emerging African Users needs into consideration. Through these years we have seen the expanding use of satellite data throughout the continent, particularly by national weather services to improve weather forecasting, climate monitoring and some socio-economic applications.

Programme Director,
There is no doubt that the use of the EUMETSAT satellite data has improved the services provided by national meteorological services. The services on the other hand have assisted with safeguarding of lives and property. It is today hard to imagine how effective the delivery of weather services would be without satellite information, especially in light of the alarmingly poor observations and meteorological equipment over our continent.

The advent of climate change with an evident increase in the frequency and intensity of severe weather, presents a new dimension. The climate change projections for the continent reveal a gloomy picture. In fact it reminds me of the difficult and sad moments in the popular Charles Dickens novel, A Tale of Two Cities such as:

“It was the worst of times”;
“It was the age of foolishness”,
“It was the epoch of incredulity”,
“It was the season of darkness”,
“It was the winter of despair”

We are in a fortunate position however as the scientific community. We know what the likely future scenario looks like. We have or can build the capacity and skills to exploit our knowledge of future weather and climate scenarios to benefit our communities and decision-making. This is what I view as a key potential outcome of this Forum and in our efforts to societal resilience to climate change. This 11th EUMETSAT Forum in Africa has a particular focus on the implementation of the Global Framework for Climate Services. It calls on each and everyone of us to think in a different and new way, with the perspective of the public and user community and with greater innovation.

Ladies and gentlemen,

The GFCS has identified 4 initial and key priority areas which are: Disaster Risk Reduction, Health, Water Resources Management and Agriculture & Food Security. These are key socio-economic sectors with specialist knowledge which does not reside with meteorologists. Any improvement with climate applications to these sectors will require an integrated approach and cooperation with the specialists in these areas. This is also the approach we are taking in South Africa as we develop our National Framework for Climate Services. We need programmes and resources to work in an inter-disciplinary manner to develop superior products and services that respond to the user's needs. We need to think differently about our training programmes in order to emerge with contemporary scientists who are familiar with other relevant disciplines and can work in an interdisciplinary framework. This is a challenge which our Regional Training Centres, Universities etc. will need to grapple with going forward.

Programme Director,

The forecasting capability in the national meteorological and hydrological services (NMHSs) relies increasingly on numerical weather prediction. We know that early warnings systems are becoming more critical with the advent of climate change. This means that we will need to put an effort to numerical weather prediction and particularly in improving data inputs. We cannot expect model outputs to improve if we do not improve the data inputs or observations. This calls for investment in meteorological infrastructure (observations equipment), data management and processing. The African Ministers Conference on Meteorology (AMCOMET) also emphasizes the need for governments to invest in their meteorological infrastructure in order to improve on the service delivery. This data is still of great importance for verification and in addition to the satellite data. I am emphasizing this to dispel the myth that satellite observations can replace ground data. Let me also hasten to say that we also need data from surrounding oceans. We have seen in recent years the linkages between sea-surface temperature and rainfall patterns. This is also an area that will need to receive greater attention as we develop our mitigation strategies to manage climate risk.

Ladies and gentlemen,

I will conclude by emphasizing the need to continue with the excellent work and partnership with EUMETSAT to improve our service delivery and tools to enhance our climate change adaptation strategies. Partnerships will need to be enhanced to promote technology transfer and capacity building. Infrastructure development particularly in weather observations and data communications will need to be enhanced in order to benefit weather and climate prediction and research. Partnerships are also essential for developing climate applications that respond to the needs of the users and also build societal resilience to climate change and variability.

With this cooperation, I am certain we can overturn this situation of gloom so that we can realize what Charles Dickens described for good seasons:

"It was the best of times"
"It was the age of wisdom"
"It was the epoch of belief"
"It was the season of life"
"It was the spring of hope".

With these few words, I thank you.

Address by Mr Lamine Bah, President of the WMO RA-I, read by Dr Loumouamou, Director of the NMHS of Congo-Brazzaville.

Ladies and Gentlemen,

I should like to take this opportunity to welcome you to the 11th EUMETSAT User Forum in Africa. As we know, EUMETSAT User fora in Africa are an outstanding example of North-South cooperation. For more than 20 years now, the fruitful and fertile cooperation established between the African Regional Communities and the European Organisation for the Exploitation of Meteorological Satellites has given the African meteorological services and other African institutions the benefit of new space technologies.

On behalf of the WMO Regional Association I for Africa and the African weather and climate organisations, I also wish to express our gratitude to EUMETSAT for its invaluable contribution in providing national weather services and partners with information and products designed to improve the protection of African populations and their property from hydrometerological disasters. Equally noteworthy is EUMETSAT's very positive participation in the implementation of a large number of WMO projects, including the Global Framework for Climate Services, the WMO Information System (WIS) and the WMO Integrated Global Observing System (WIGOS).

Ladies and Gentlemen, I regret that I will be unable to be with you during this week, for reasons related to the Ebola epidemic raging in our countries. I am confident that your work will produce excellent results.

I would also like to take this opportunity to express my concern about the information made available to participants at the recent sixty-sixth session of the WMO Executive Council held in Geneva in June of this year. During this session, it was brought to our attention that the Meteosat 7 satellite, which ensures coverage over the countries of East Africa, Southern Africa, the Middle East and the western Indian Ocean, is expected to cease operating in 2016. If this information is confirmed, this entire part of the world will no longer have access to satellite information and products, despite the high frequency of droughts and tropical storms. It is time to consider a replacement solution for the period after 2016.

I would therefore like to suggest that you add to your list a recommendation calling on EUMETSAT and the countries operating satellites in this area (Russia, China and India) to examine ways of ensuring continuity of the services provided to this part of the world after Meteosat 7 ceases to operate.

Let me also take this opportunity to recall the importance of the African Regional Space Programme to African institutional bodies such as the African Union Commission and the African Union Conference of Ministers Responsible for Meteorology (AMCOMET). A recommendation calling on EUMETSAT to contribute to the implementation of the African Regional Space Programme would therefore be most welcome.

I am certain that very important recommendations will be formulated following your five days of work.

Once again I wish the 11th session of the EUMETSAT User Forum in Africa every success.

Thank you.

SESSION REPORTS

All presentations and speeches delivered during the 11th EUMETSAT User Forum in Africa are included in the CD-ROM inserted in the present report. The following paragraphs provide a brief abstract of the presentations and report on the discussions.

Introductory Session

Introductory remarks (Linda Makuleni, Permanent representative of South Africa with WMO and CEO of SAWS)

Mrs Makuleni welcomed all participants to this Forum, highlighting the role that satellite data plays in improving the services provided by national meteorological services. She then focused on the topic of climate change, articulating her speech with some inspiring quotes from Charles Dickens novel, A Tale of Two Cities. Her full introductory remarks are available in the speech section.

Address from South African Department of Science and Technology - Mmboneni Muofhe, DST Deputy Director General

During its address, Dr Muofhe presented the South African policy in the area of Sciences and Technology, and the place that space technology and applications occupies in South Africa. He emphasised the need for Africa to invest in Sciences and Technology to ensure ownership and self-capacities in the domain of space, its technologies and its applications. He mentioned that in order to build the ground to achieve this objective, efforts shall target education and research. He also welcomed the initiatives at the continental level, which foster these aspects, notably the pan-african university on space and the African Spacer Working Group, chaired by South Africa, which is working on an African Space Policy.

AMCOMET – Status and way forward - J. R. Mukabana, WMO

Dr Mukabana, as director of the AMCOMET Secretariat, presented the current status of AMCOMET, which is a high-level mechanism for the development of meteorology and its applications in Africa. Its vision is to have a framework of cooperation (between WMO, AU, and relevant stakeholders) to support sustainable development through the sound governance of the science of meteorology and its applications. Its mission is to provide political leadership, policy direction and guidance in the provision of weather and climate services that meet societal needs.

He then presented more in details the aspects of the Integrated African Strategy on Meteorology,that directly relates to space and satellites, and its links with the WMO Space programme.

Presentation of the South African National Space Agency - J. Olwoch, SANSA

Mrs Olwoch, Head of the Earth Observation department at the South African National Space Agency (SANSA), presented the mandate and organisational structure of the agency, as well as the various programmes. She then emphasised SANSA activities in the area of Earth Observation: the ground station, the data archiving facilities and the various applications that are supported by these data in South Africa and the region. She then presented activities and opportunities for scientists, training and capacity building. She concluded by emphasising that SANSA partnership at both regional and international level is key in addressing key national challenges and making a positive contribution to efforts in using space technologies for societal benefits.

Objectives and programme of the 11th EUMETSAT User Forum in Africa - Paul Counet and Vincent Gabaglio, Strategy and International Relation Division, EUMETSAT

Mr. Paul Counet then presented the main objective of the Forum, which is to reinforce the dialogue between EUMETSAT and the African user communities in order to optimise the use of satellite data and products in Africa. He highlighted also the sessions related to MTG, Disaster Risk Reduction and Climate Change as the key for shaping the future of the cooperation between EUMETSAT and Africa. Vincent Gabaglio then presented the detailed programme of the Forum and provided logistics information for the participants.

Review of Recommendations from the 10th EUMETSAT User Forum in Africa - Vincent Gabaglio, EUMETSAT

Vincent Gabaglio provided a brief overview of the status of implementation of all the recommendations raised during the 10th EUMETSAT User Forum in Africa. The detailed status was distributed to all participants by email in advance to the Forum. Of the 36 recommendations raised, implementation was completed for 31 of them, and still on-going for 5. These 5 recommendations were discussed again during the pertinent session of this Forum and 2 of them were subject to report from NMHS during the last session of the Forum.

Session 1 – Overview of EUMETSAT programmes

Chairperson: Linda Makuleni, SAWS;
Rapporteurs: Vincent Gabaglio, EUMETSAT and Val Munsani (DST)

The first session of the Forum was dedicated to the presentation of the updates of EUMETSAT programmes and activities relevant to Africa.

Status of EUMETSAT programmes MSG, MTG, EPS, Jason and future programmes (Alain Ratier, EUMETSAT Director-General)

Alain Ratier presented the latest status of EUMETSAT current and future satellite programmes. The first high point of his presentation was about the status of discussion with international partners about the continuation of the Indian Ocean Data Coverage (IODC). He also explained that the current generation of geostationary and polar-

orbiting satellites will be sufficient to provide data for the next 5-6 years. He explained the status of the future satellites' programme.

WMO space programme (Stephan Bojinski, WMO)

Stephan Bojinski updated participants on recent developments in the WMO Space Programme, focusing on coordination of the space-based Global Observing System, the development of an Architecture for Climate Monitoring from Space, and measures to enhance utilisation of satellite data by users, particularly in Africa. These include support to an effective dialogue between satellite users and EUMETSAT through the RA-I Dissemination Expert Group, support to training through the VLab, and online tools. He emphasized the importance of user readiness to the next generation of meteorological satellites. To guide this preparation, he provided details of a 5-year Reference User Readiness project template.

Status of EUMETSAT Satellite Application Facilities (Mark Higgins, EUMETSAT)

Mark Higgins presented the Satellite Application Facilities (SAFs), which provide a range of useful products data and software. Information on each SAF is available at eumetsat.int and on each SAF webpage. This presentation highlighted the SAF outputs available for Africa. Help on accessing SAF products and data is available from ops@eumetsat.int.

Data access and user service (inc. DCP) (Sally Wannop, EUMETSAT)

Sally Wannop, User relations manager, explained how African users can access EUMETSAT either through EUMETCast or through the EUMETSAT data centre. She highlighted the role of the EO portal to search data and manage requests for access. She then explained the novelties of the Data Collection Platforms and associated services. She finally highlighted how African users can benefit from various services provided by EUMETSAT to its users, notably the new User Notification Service (UNS) and the tools put in place to interact on a daily basis with users (help desk, website pages, twitter, etc).

Report from RAIDEG (Mariane Diop Kané, NMHS Senegal)

Mariane Diop Kané presented the status of work of the RAIDEG, as well as the outcomes and main recommendations from the 5th meeting of the RAIDEG, which took place on the Saturday and Sunday just before the 11th EUMETSAT User Forum in Africa. These main recommendations are about:

- capturing of user needs,
- maintaining display and visualisation systems:
- training in use of NWP products
- involvement in MESA
- planning for post-MESA (meteorological display system)
- access to Copernicus data.

Detailed RAIDEG recommendations are provided in the previous section of this report. The official report of the 5th RAIDEG meeting is available on the WMO website (under space programme section).

Discussion

Following the presentations, a discussion took place on the following aspects:

Regarding access to Sentinel-3 data, it was advised that African users should be more specific about which products they would like to receive via EUMETCast-Africa. Due to the volume of the Level 1 data, it was advised to initially concentrate on Level 2 products.

It was also responded that MTG will replace neither the GCOS Upper-air Network (GUAN) nor radar measurement, but complement them. MTG sounding instrument will also measure wind although the quality of the measurement will decrease when closer to the ground.

Regarding the nomination of the RAIDEG point of contact in each country, Mrs Diop explained that this should be done at regional level (it was done in western Africa) and that integration of RAIDEG in WIGOS structure will help getting points of contact in each NMHS.

This session contributed to recommendations #1 and #3

Session 2 – RARS Africa for Disaster Risk Reduction

Chairperson: H.E. Rhoda Peace Tumusiime, AU Commissioner
Rapporteurs: Emilio Barisano, EUMETSAT consultant and Abdelwad Nmiri, NMHS Tunisia

The second session was dedicated to the importance of the implementation of Disaster Risk Reduction (DRR) strategy in Africa and of the impact of extreme climatic events. DRR is one of the most important actions to take into account in the framework of Disaster Risk management in order to save lives, reduce infrastructure destruction and limit negative economic impact. In this context, earth observation data together with ground data and socio-economic information offer one of the most pertinent approaches to support Early Warning System in order to reduce natural hazard impacts, such as reduce disasters resulting from flooding. The Regional Advanced Retransmission Services (RARS) stations ensure real time access to daily Earth Observation at medium resolution, such as data from EUMETSAT METOP satellites and other polar orbiting meteorological satellites. This availability of data allows improvements to Numerical Weather Prediction which outputs are very relevant to Disaster Risk Reduction, and in particular to Early Warning Systems in the cases of flooding.

This second session gave an overview of Disaster resilience in Africa, of the Result number 3 of the Disaster Resilience program in sub-saharian countries implementing a RARS System, of Numerical Weather Prediction approaches, and of an African example of regional implementation in ACMAD. Those presentations were completed by EUMETSAT contribution to the International Charter on “Space and major Disaster”.

Disaster Resilience in Africa and role of the meteorological services (Mathewos Hunde, AUC)

Mathewos Hunde provided an overview of Disaster Resilience in Africa and the role that meteorological services currently play and could play in the future to contribute to Disaster Risk Reduction.

Component #3 of EU-ACP programme on Disaster Resilience in Sub-Saharan Africa (Ken Johm, AfDB)

Ken Johm presented the Result #3 of new EU-ACP programme on Disaster Resilience in Sub-Saharan Africa, which aims at improving the core capacities of the specialised national and Regional Climate Centres (RCCs), for them to meet the needs of Disaster Risk Management agencies and socio-economic sectors for effective use of weather and climate services.

The role of satellite data in NWP (Steve Manktelow, UK Met Office)

Steve Manktelow presented the added-value of satellite data for weather forecasting, in particular for Numerical Weather Prediction. His presentation also provided an overview of the activities of the EUMETSAT's Satellite Application Facility for Numerical Weather prediction.

Project implementation and role of Regional Centres (Benjamin Lamptey, ACMAD)

Benjamin presented for the very first time the implementation approach for the Result #3 of the EU-ACP Programme on Disaster Resilience in Africa, presented by the African Development Bank and funded under the ClimDev Special Fund. He focused on the benefits of this programme for the African meteorological community.

The project is aimed at ultimately making impact on the frontline of disasters in the countries. For the NMHSs to make the desired impact in the countries a coordinated effort is required from continental and sub-regional meteorological institutions to effectively work in a seamless manner with them.

This project proposes a Numerical Weather Prediction System being established at ACMAD at 12 km horizontal resolution and generating initial and boundary conditions for the RCCs/NMHSs to run models at 4 km horizontal resolution over their respective regions and countries. ACMAD will at the same time generate products at a relatively coarse resolution for use by institutions at the continental level. In-situ and satellite data would both be assimilated into the models at continental, regional and national levels.

The relevant DRM products would be generated at the continental, regional and national level in collaboration with the DR managers at the appropriate scale. The project would leverage on existing DRM structures at the different levels to ensure the services achieve the desired target.

EUMETSAT contribution to the "International Charter: Space and Major Disaster" (Sally Wannop, EUMETSAT)

Sally Wannop presented the International Charter 'Space and Major Disasters', which aims at providing a unified system of space data acquisition and delivery to those affected by natural or man-made disasters through Authorized Users. Each of the current 15 member agencies has committed resources to support the provisions of the Charter and thus is helping to mitigate the effects of disasters on human life and property.

In the event of a disaster, an Authorized User can call a single number to request the mobilization of the space and associated ground

resources associated with Charter members in order to obtain data and information on a disaster occurrence. A 24-hour on-duty operator receives the call, checks the identity of the requestor and verifies that the User Request form, sent by the Authorized User, is correctly completed. The operator passes the information to an Emergency On-Call Officer who analyses the request and the scope of the disaster with the Authorized User, and prepares an archive and acquisition plan using available satellite resources. Data acquisition and delivery takes place on an emergency basis, and a Project Manager, who is qualified in data ordering, handling and application, assists the user throughout the process. Value-adding services are used to further process and interpret the data acquired over the affected area to generate images, maps and charts for use by the End User, the disaster management relief agencies.

In Africa today, only two countries Nigeria and Algeria, are Authorized Users and can evoke the Charter in the case of a major disaster.

In 2012 the Charter extended its offer of service to national management agencies world-wide through the Universal Access scheme. After a simple registration and training process, any national disaster management authority can submit requests for emergency support from the Charter.

NMHS are encouraged to promote the availability of the Disaster Charter service with their national disaster management authorities.

EUMETSAT as a member of the Charter provides satellite imagery to support activations related to tropical cyclones and other weather related disasters. In addition, EUMETSAT is making available its network of EUMETCast stations to deliver Charter Data to Project Managers and end-user Charter Products (charts and maps) to the disaster management agencies. NMHS in Africa could support their disaster management authorities by making available their EUMETCast reception stations for the reception of Charter data and products. EUMETSAT is planning to provide through EUMETCast on a routine basis Charter Products for the purpose of familiarisation and training.

The Forum recognised the importance of such data and products in the event of a major disaster and welcomed EUMETSAT plans to disseminate the Charter Products on a routine basis.

Discussion

Africa being confronted to many danger and natural hazards in particular, the discussion addressed the following topics:

- Earth Observation by satellite data and their importance on Early Warning Systems for efficient management of natural hazard risk and for Disaster resilience;

- The efforts to be deployed in Africa to achieve this, and the role of National Meteorological Services and Regional Centre in engaging with national and regional agencies and institutions in charge of DRR in order to ensure that the new programme provides concrete results;

- The support of EU to the ClimDev program and the related regional and national projects already identified as contribution to the Disaster Risk reduction;

- The contribution of meteorological satellites into the development of NWP (Numerical Weather Prediction), i.e. the impact of the Earth Observation into the reduction of errors of forecasting, and the importance of a collaboration between EUMETAST SAF and NWP;

- Concerning the International Chart, the discussion focused on EUMETSAT's support to the NMS by the dissemination of timely and useful product in case of Disaster. The condition to be part of the Charter was also highlighted. EUMETSAT International Chart web site was indicated as a mean to get more information.

This session contributed to recommendations #6 to #12

Session 3 – Meteosat Third Generation

Chairperson: Joseph Mukabana, WMO
Rapporteur: Paul Counet, EUMETSAT

The third session was dedicated to the introduction of the new upcoming Meteosat satellite Third Generation.

Alain Ratier, EUMETSAT Director-General, introduced the session by informing the participants that this session represents the start of a long process, to prepare the African user community to the MTG, and that there will be several challenges to be addressed together in order to ensure exploitation of MTG data in Africa.

Jochen Kerkmann, training officer at EUMETSAT, then presented the MTG capabilities in a very illustrative way, showing concrete examples of its added-value for some applications in Africa. He also highlighted some technical challenges, notably in terms of capacity to disseminate the high volume MTG data to Africa via EUMETCast Africa. At the end of the presentation, he proposed that EUMETSAT starts an African user consultation process on MTG, using the RAIDEG group as main interface. The results of this interaction would be presented at the next Forum.

Following this presentation, the chairperson opened the floor for questions.

An item addressed was the possible use of MTG for the identification of clear air turbulence. EUMETSAT indicated that clear air turbulences cannot be directly seen, but could be identified indirectly by looking, for example, at patterns of jet streams. This is currently done with MSG and it will continue to be the case with MTG.

In addition, by assimilating imagery and sounding into high resolution NWP models, the Very Short Range Forecasts will improve, and should provide better information on clear air turbulence.

In response to a question raised on the calibration of the IRS instrument on MTG, EUMETSAT indicated that it will be calibrated using other sources, such as other satellites (IASI, HIRS) or radio sounding data. EUMETSAT has the experience with instruments such as IASI, and also indicated that IRS are very stable instruments, actually used as reference for calibrating other instruments.

On training and availability of simulated data, EUMETSAT indicated that dedicated MTG sets of simulated data would only be available in a few

years from now. In the meantime, for training purposes, it is possible to look at similar channels on MODIS instrument or at VIIRS flown on the Suomi-NPP NOAA satellite. EUMETSAT has developed, together with the University of Wisconsin, simple data display software for these sensors, which could be obtained from EUMETSAT. However, MODIS and VIIRS do not have the frequency of observation that the FCI and IRS will have. Approaching the MTG timeframe, EUMETSAT will also start preparing dedicated training programmes.

The issue of use of the IRS instrument for improvement of Medium Range forecasting was discussed. It was noted that MR Forecasting models need to assimilate Global Data and that IRS will only be available over Africa. This might evolve in the future, as China also plans to fly an IRS instrument in geostationary orbit.

On the use of the IRS for the detection of low level winds, EUMETSAT responded that the main purpose of the instrument will be to provide winds and moisture at different levels, but that studies are on-going to determine how deep this information would be available. For the time being, it is doubtful that the signal will be deep enough to support the detection of low level winds, in particular on land surfaces, because of the ground emissivity.

A participant raised a question on the difference of geometric resolution which will exist between the VIS and IR channels of MTG. EUMETSAT indicated that it was related to technology and cost. It is easier to derive high resolution in the VIS, because the signal is stronger. In the IR, to improve resolution, it is necessary to cool the instruments, and this has a cost.

On the Lightening Imager (LI), the possible use in night time was raised. EUMETSAT indicated that users will not get “LI Images” but that the signal will be processed to identify flashes and users will be provided with a product. This product will be available for day and night observations.

On the upgrade of the receiving equipment, it is clear that receiving stations will need to be upgraded to cope with visualisation and processing of MTG data. This has to be planned in the 2020 timeframe. In the meantime, through the MESA project, the PUMA 2010 stations will be upgraded to PUMA 2015 stations, but still focusing on MSG. At the recent meeting of RAIDEG held in South Africa, a recommendation was taken to recommend to the PR of RA-I to start planning the transition from MSG to MTG, and the upgrade of their working stations. However, in doing so, the benefits of having similar configurations across the African continent, as it is the case since the PUMA, AMESD and MESA projects, should be kept. It is a factor of sustainability.

The session was concluded by a discussion on the complementarity between the MTG and the radar observations. EUMETSAT confirmed that the two types of observations will remain fully complementary; the satellites will observe from top and be limited at the top of the clouds and the radar will continue to observe all what is below, including winds and rainfall (precipitation). The combined data shall be used and assimilated in models.

This session contributed to recommendation #2.

Session 4 – GFCS in Africa

Chairperson: Mahama Ouedraogo, AUC
Rapporteurs: Stéphane Flasse, EUMETSAT consultant and Jacques Garané, NMHS Burkina Faso

Foreword and outcomes of the High level meeting on GFCS Africa (Linda Makuleni, SAWS)

Linda Makuleni provided a summary of the High Level meeting of 7th September 2014 which was attended by H. E. Mrs Edna Molewa, Minister of Environmental Affairs; H. E. Rhoda Peace Tumussime, African Union Commission and representatives from Economic Community of West African States (ECOWAS), Economic and Monetary Community of Central Africa (CEMAC), Economic Community of Central African States (ECCAS), Intergovernmental Authority on Development (IGAD), Indian Ocean Commission (IOC), Secretariat of the African, Caribbean and Pacific Group of States (ACP) and EUMETSAT. The participants expressed their commitment to the Addis Ababa Declaration of 2012 and took into consideration the following key developments: AMCOMET Integrated African Strategy on Meteorology (Weather and Climate services), the formation of the Intergovernmental Board on Climate Services, the IPCC 5th Assessment Report, the outcomes of the recent 3rd UN Conference on Small Island Developing States and the will of the European Union to tackle climate change and build capacity in developing countries. The participants reaffirmed their support to the GFCS and its implementation, and called upon the African Union Commission to engage the European Union on the prioritisation of a specific GFCS-ACP programme in the Joint EU-Africa Partnership. The meeting further called upon the ACP Secretariat to engage the EU on resource mobilisation for the GFCS-ACP programme within the 11th EDF framework to define and prepare the project. The meeting concluded with the signing of the Benoni Statement which expressed the sentiments of the meeting, by the AUC Commissioner and the South African Minister of Environmental Affairs. The Benoni Statement will now be drawn by the two dignitaries to the IBCS, the Third Session of AMCOMET, the EU and to all the African regional economic communities to promote the implementation of the GFCS and build resilience of the continent to climate risks.

GFCS, status of implementation (Joseph Mukabana, WMO)

Joseph Mukabana explained that the Global Framework for Climate Services (GFCS) was spearheaded by the WMO and provides a worldwide mechanism for coordinated actions to enhance the quality, quantity and application of climate services. The priority areas of the GFCS are agriculture and food security, disaster risk reduction, health and water. Its key components are the User Interface Platform; Climate Services Information Systems; Observations and Monitoring; Research, Modelling and Prediction; and Capacity Building. Its goal is to enable better management of risks of climate variability and change through the development and incorporation of science-based climate information and prediction into planning, policy and practice on the global, regional, and national scale.

National consultations have been held in Burkina Faso, Chad, Mali, Niger, Senegal, South Africa, Tanzania and Malawi, which aim to develop Frameworks for climate services at national level and the development of national action plans to address the gaps and needs identified that kick start pilot projects.

The "Climate Services Adaptation Programme in Africa", funded by the Government of Norway, is the first multi-agency initiative to be implemented under GFCS, and aims to develop user-driven climate services for food security, health, as well as disaster risk reduction in Malawi and Tanzania. It represents a unique partnership between WMO, the CGIAR Research Programme on Climate Change, Agriculture and Food Security (CCAFS); the Centre for International Climate and Environmental Research – Oslo (CICERO); the Chr. Michelsen Institute (CMI); the International Federation of Red Cross and Red Crescent Societies (IFRC) through the Tanzanian and Malawian Red Cross; the World Food Programme (WFP); and the World Health Organization (WHO).

GFCS-ACP Task Team (follow-on of the Addis Ababa declaration) (Jolly Wasambo, AUC)

Jolly Wasambo gave an account of the progress made since the representatives of the African Union Commission (AUC), the ACP Secretariat, and the participating African Regional Economic Communities (RECs) (i.e. CEMAC, ECOWAS, IGAD, IOC and SADC) agreed on the need to implement the Global Framework for Climate Services (GFCS) in Africa through the Addis Ababa Declaration in support of the implementation of the GFCS in Africa. Jolly presented the work of the GFCS Task Team in terms of what has been achieved so far and proposed next steps.

With the main objective of establishing a fully-funded GFCS ACP project, the following have been achieved:

- Development and adoption of the Team's Terms of Reference (ToRs);
- Adoption of a geographic extension of the Addis Ababa Declaration to cover the Caribbean and Pacific Regions, hence the Team name "GFCS-ACP Task Team";
- Analysis of the African context of climate change challenges;
- Commencement of a mapping exercise of existing capacities and needs for the implementation of GFCS in the regions; and
- Secured reaffirmation of commitment of high-level officials to the implementation of the GFCS by the signing of the Benoni Statement.

The Team's next steps are

- To further define the scope and area of intervention of a GFCS-ACP programme;
- Prepare ToRs for the feasibility study and mobilise funds for the study by end 2014;
- Recruit a consultant and commence the feasibility study in the first quarter of 2015;
- Submission and acceptance of the feasibility study report by mid 2015; and
- Commence project identification.

Regional implementation of GFCS: MESA Climate Services (Benjamin Lamptey, ACMAD)

Benjamin Lamptey presented the status of the MESA Thema on Climate Services. He indicated that ACMAD is the Continental Implementation Center for this THEMA and that the focus is on Disaster Risks Reduction (DRR). Together with its partners (ICPAC, AGRHYMET and SADC-CSC), two services will be developed:

(1) Climate Change Assessment Service with the objective to provide planning managers and decision makers with relevant climate information and projections to enable them to formulate appropriate policies and strategies on climate change adaptation to build climate resilient societies and economies on the African continent. The expected outputs include climate model outputs, climate indices maps, climate trend and variability diagrams and African Climate Outlook Reports.

(2) Drought Service and Seasonal Climate Forecast, with the objective to support strategic planning ahead of season through assessing seasonal and intra-seasonal variability and to forecast the probability of drought events. The expected outputs include: Drought Information System established as a dynamic and accessible decision support tool that provides users the ability to determine the potential impacts of drought and the decision support tools needed to better prepare for and mitigate the effects of the drought.

He indicated that the Grant is expected to be signed by 13 September 2014 and will last 3 years.

National implementation of GFCS, the case of South Africa (Themba Dube, SAWS)

Themba Dube presented the details of a roadmap towards the national implementation of the Global Framework for Climate Services. The Roadmap was documented following the workshop of 19 – 22 August 2013 in Pretoria, convened under the auspices of the Department of Environmental Affairs, the South African Weather Service as well as the World Meteorological Organisation. It was generated through the participation of key stakeholders in climate services in South Africa. The actions (preliminary and future) were outlined. These provide the basis for the development of the national implementation plan for the GFCS. The latter will be a consultative process involving all major stakeholders, addressing issues raised in this roadmap as well as those that will emerge from the consultative process. The GFCS will be implemented within the legislative framework provided by the National Climate Change Response Policy and other relevant pieces of legislation.

National implementation of GFCS, the case of Western Africa (Moussa Touré, NMHS Mali)

Moussa Touré explained that GFCS is a concept engaging West African countries to more coordination in order to support sectors such as health, agriculture, food security, water, DRR, etc. to better integrate climatic issues in their decision making.

Based on the well advanced Malian example, other countries have been invited to more policies, methods and engagement for a successful implementation. This will not be possible without the engagement and

support from political authorities, sub-regional centres and international institutions. The success of this ambitious project will allow tackling efficiently and surely the issues linked to climate change and sustainable development.

National implementation of GFCS, the case of Eastern Africa (Zachary Atheru, ICPAC)

Zachary Atheru presented a Pilot Project on application of climate information in Agriculture, which encourages a shift from traditional to climate based agriculture planning and management by providing quality, down-scaled, well interpreted climate information to highly vulnerable farming communities in Kenya. Climate information at the beginning of each cropping season is disseminated through community-based climate downscaling workshops, while subsequent climate information needed by farmers as the seasons progressed is disseminated through SMS using an Internet Based SMS Broadcasting System based at ICPAC. Over 200 farmers and pastoralists are participating in the pilot project. The project has clearly demonstrated that accurate climate prediction, followed by proper interpretation, packaging and timely dissemination, as well as proper utilisation advisories by farmers in planning and management of their farming activities undoubtedly increases farm/rangeland productivity, resulting in food security and improved livelihoods.

Satellite architecture in support to Climate services (Paul Counet, EUMETSAT)

Paul Counet introduced the Global Architecture for Climate Monitoring from Space, a joint effort started by all space agencies - members of the Committee of Earth Observation Satellites (CEOS) and of the Coordination Group for Meteorological Satellites (CGMS), together with WMO - aiming at describing how their satellite programmes were actually contributing to the generation of the Essential Climate Variables (ECVs) in response to the requirements expressed by the Global Climate Observing System (GCOS). This Global Architecture will be the space contribution to the Observation and Monitoring pillar of the Global Framework for Climate Services (GFCS). It will be a coordinated response from all space agencies and will identify which datasets are available to support the creation of ECVs. The work is currently on-going. The first phase was the development of an inventory listing all relevant Climate Data Records available as of today and characterising them. On that basis, space agencies will be able to identify activities needed to sustain these data records through gap analysis or inter-calibration, but would also identify which instruments / missions will be needed in the future to sustain the production of these data records on the long term. The work is currently under development and is planned to be finalised by 2016, creating a coherent set of information for the global climate scientific community.

Discussion

During the discussion that followed these presentations, the need for strong regional institutions to support the implementation of National Framework for Climate Services (NFCS) was underlined. Of particular importance, the need for capacity to provide appropriate training at national level was highlighted. With regards to the process of implementation of the

framework, the need for the participation of all stakeholders, at national, regional and continental level, was claimed as essential, in particular the need for RECs to engage with their members so that national level needs can be integrated in order to build on what exists and to reach a harmonised implementation. The importance of continuous appropriate communication between all stakeholders was also stressed. Finally, it was emphasised that Climate Services are transversal, i.e. they can benefit many areas such as agriculture, health, civil protection, etc., and that as many as possible should be integrated in the implementation of the framework.

This session contributed to recommendations #4 and #5.

Session 5 – Climate research and applications

Chairperson: Jacques Garané, Burkina Faso NMHS
Rapporteur: Sally Wannop, EUMETSAT.

The fifth session was dedicated to climate research, the current and potential applications of the research within the African continent to support climate monitoring activities.

Satellite-based Climate Information for Africa: Introducing the data sets and services from the CM SAF (Joerg Trentmann, Deutscher Wetterdienst)

Joerg Trentmann provided an overview of the Climate Monitoring Satellite Application Facility (CM SAF) and its activities. The CM SAF aims at the provision of satellite-derived geophysical parameter data sets suitable for climate monitoring. CM SAF provides climatologies for Essential Climate Variables (ECV), as required by the Global Climate Observing System implementation plan in support of the UNFCCC. Several cloud parameters, surface albedo, radiation fluxes at the top of the atmosphere and at the surface as well as atmospheric temperature and humidity products form a sound basis for climate monitoring of the atmosphere. The products are categorized in monitoring data sets obtained in near real time and data sets based on carefully inter-calibrated radiances. The CM SAF products are derived from several instruments on-board operational satellites in geostationary and polar orbit, i.e., the Meteosat and NOAA satellites, respectively.

In the second part of his presentation he focussed on the gridded data generated by the CM SAF and explored their application in Africa. Joerg Trentmann highlighted the support to users provided by the CM SAF which includes software tools and training events. The next training event will take place in June 2015 at the WMO Centre of Excellence in Pretoria, South Africa.

Precipitation Characteristics and Extremes Simulated by CORDEX Regional Climate Models: Model Evaluation and Future Projections (Mxolisi Shongwe, SAWS)

In his presentation Mxolisi Shongwe explored the precipitation characteristics and extremes using the Coordinated Regional Downscaling Experiment (CORDEX) regional climate model. The CORDEX Regional Climate Models are evaluated for their simulation of precipitation characteristics and extremes in their

control runs. The evaluation embraces several rainfall characteristics including onset and length of the rainy season, wet-day frequencies, and consecutive dry and wet days. In the twenty-first century, the three RCMs considered project an increase in consecutive dry days over the south-western parts where the severity of droughts is projected to increase. To the northeast, there are indications of an increase in the intensity of floods associated with an increase in the average precipitation per wet day.

Development and exploitation of a 30 year, temporally consistent satellite rainfall dataset for Africa (Ross Maidment, University of Reading, UK)

Ross Maidment highlighted in his presentation the activities of the TAMSAT Group in the generation of rainfall datasets using Meteosat IR data. Reliable knowledge of the recent rainfall climate across Africa is essential for many applications, however many existing long-term merged satellite-gauge products are created by using contemporaneous gauge information which can introduce significant time-varying biases into the rainfall record, especially where the gauge network is sparse and inconsistent over time. TAMSAT provides a new, temporally consistent and long-term (1983-present) satellite rainfall dataset for Africa which can be used to help assess rainfall variability, trends and climate risk over Africa. The 10-day product from TAMSAT is disseminated through EUMETCast.

Enhancing National Climate Services (Tufa Dinku, International Research Institute for Climate and Society, USA)

In his presentation Tufa Dinku talked about the work of IRI to Enhancing National Climate Services (ENATCS) in Africa by generating the best possible climate data, creating products and taking those information products to users. IRI works with NMHSs to organize data from the national weather station networks. He stressed the importance of a 3 pillar approach to ENACTS's work: firstly, improving the availability of climate data by building capacity of NMHS, enhancing the quality of climate data and combining station data with satellite and reanalysis products; secondly improving the availability of climate information by installing IRI Data Library at NMHS and using it to generate climate information products for users; and finally, promoting the use of climate information through raising awareness of users, training users, and involving users in product development. The ENACTS approach generates over 30 years of rainfall time series and over 50 years of temperature time series for every 5km grid. ENACTS has been implemented in Ethiopia, Tanzania, Madagascar, Rwanda and Gambia at national level and CILSS countries in West Africa at regional level. IRI looks to expand ENACTS to additional countries within the African continent.

Southern and Western African Science Service Centre for Climate Change and Adaptive Land Management (SASSCAL-WASCAL) activities and status of GPCC (Joerg Trentmann, Deutscher Wetterdienst)

In his presentation Joerg Trentmann addressed the activities Southern African Science Service on Climate Change (SASSCAL) to establish a multidisciplinary cooperation, building up capacity and providing support to decision makers. In particular he focused on the role of Deutscher Wetterdienst (DWD) in Climate Data Management. Through this activity DWD is supporting the enhancement

of the network of weather stations to improve data gathering, performing the digitalization of historical paper records and generating from these records gridded precipitation products for the Global Precipitation Climatology Centre Centre (GPCC). The GPCC generates and distributes gridded precipitation data sets that can be used for climate monitoring based on gauge measurements provided by the NMHS. The regional quality of the GPCC data sets critically depends on the availability of gauge data; the density of available stations in Africa is currently very inhomogeneous.

Discussion

In the discussions which followed the presentations, the Forum welcomed the information provided in the presentations and:

- recalled the request arising from the 5th WMO RAI Dissemination Expert Group to include a selection of CM SAF monitoring products on EUMETCast Africa;

- recognised the value of the current TAMSAT product TARCAT and the potential use of a daily product;

- noted that variations in rain gauge type and quality of data exist, but also recognised the important contribution of such data to climate research. Also noting that there remains limited access to many national archives of rain gauge data, the Forum welcomed the opening up of these data in the support of climate research activities;

- recognised that since the last forum Gambia, Libya and more recently Botswana have, or are in, the process of providing their national data to DWD for inclusion in GPCC and that other NMHS are encouraged to follow suit.

This session contributed to recommendations #7, and #30

Session 6 – Marine applications

Chairperson: Dominique Kuitsouc, ECCAS
Rapporteurs: Mark Higgins, EUMETSAT and George Wiafe, University of Ghana

The focus of this session was the application of satellite and other data in research and in the provision of operational marine weather and oceanographic services across the region. Presentations came from the perspectives of academic, service provider and safety authority institutions.

JCOMM perspectives for Africa – Overview (Johann Stander, SAWS)

Johann Stander covered the data and capacity building needs of the continent from a JCOMM perspective, including the JCOMM strategy (which links to both IOC and WMO strategic objectives). From the WMO side this links to Service Delivery, Climate WIGOS and Capacity Development themes. The presentation described:

- JCOMM's role and ways of working

- approaches to quality management

- the importance of the upcoming competency framework

- recent capacity building initiatives

- marine and ocean links to WIS / WICOS and GFCS

- (most importantly) the requirements from the region.

Africa is ready to contribute to observing systems and JCOMM urges members to contribute. There is a significant thread of recent capacity building but much more is needed. This requires African initiative. JCOMM urges more continental institutions to engage. There is a critical need for more satellite data to be made available for Africa, which includes capacity development.

OceanSAfrica: Integrated marine observation, monitoring and forecasting (Christo Whittle, Council for Scientific and Industrial Research, South Africa)

Christo Whittle introduced OceanSAfrica, which considers the sustainable governance and safe guarding of the marine exclusive economic zone. It is an example of an integrated observing, monitoring, and forecasting project. This task covers very strong physical and dynamic processes in the zone to be monitored which can be tricky, so there are significant under sampling issues. However, shifts have been observed in Kelp, Small pelagic, and west coast Rock Lobster. We need to understand what drives those changes. There is a considerable need for data across a range of parameters. This is the challenge addressed by the OceanSAfrica initiative. The initiative seeks to integrate across a network of private, academic and public organisations. It provides a platform to coordinate, transfer capability, develop capacity and infrastructure and develop scientific and operational programmes. The remote sensing element is driven from CSIR and concentrates on algorithm development and user training, this draws on many regional and global partners such as PML, NASA and EUMETSAT. EUMETCast has been part of the dissemination strategy, alongside using the web. The products develop focus on SST and ocean colour. OceanSAfrica has an observation pillar which works with in-situ observation – which requires more integration with the satellite data and then packages to be more useable by users. OceanSAfrica third pillar covers the ocean modelling component, assimilating AVISO altimetry products (in a hindcast mode). There is a large data system need to cover data archiving and dissemination, this should be resolved soon.

Maritime domain awareness and safety in support of the Marine Industry (Meena Lysko, South African Maritime Safety Authority)

In her presentation, Meena Lysko indicated that SAMSA's remit covers protection of life and property at sea and inland (with regional responsibilities, including within MetArea-XII), combats pollution of the marine environment and promotes national maritime interests. Meena Lysko also presented the SOLAS related services which include regional coverage, as well as the vessel monitoring technology and incident response approaches. SAMSA is a public body with many national (civil and national defence) and international stakeholders. The South African Weather Services is the designated entity to implement the SOLAS requirement on provision of weather forecasts and warning to shipping. It is noted that this coverage is for an area smaller than the designated search and rescue area. Autonomous and real-time knowledge on marine meteorological conditions will enhance

the Center for Sea Watch capability to manage vessel traffic flow and protect the environment. Further, a real-time display of weather data will make the Maritime Rescue Coordination Centre's search and rescue activities far more reactive. Cooperation and collaboration are vital for the work. There is the need to add meteorological and environmental real time information to the real time monitoring. With the vast jurisdiction there is a considerable need for satellite data to support the maritime services.

MESA Thema in the Indian Ocean (Beenesh Motah, Mauritius Oceanographic Institute)

Beenesh Motah outlined the IOC MESA Thema objectives, work and anticipated results. The Thema is focused on marine resources management and monitoring of the coastal environment. It covers IOC member states and the neighbouring countries in the Mozambique canal. It builds on the work completed in AMESD. Data used include SST, ocean colour and altimeter data. An example of the marine outputs combines current SST and information integrated to provide information for fishing communities. The project also undertakes wave and surge monitoring. There will be a small network of wave buoys in the IOC area, monitoring wave height, period and spectra, the current database goes back to 2012. The coastal monitoring approach was outlined, with stats from developing a historical database to be used to understand shoreline change. Untimely this will lead to the development of a coastal vulnerability index (low, medium, high and extreme) to aid risk management.

MESA ECOWAS Marine Thema (George Wiafe, University of Ghana)

George Wiafe started by explaining that the Coastal and Marine Resources Management in the ECOWAS region is one of seven thematic actions under the Monitoring for Environment and Security in Africa (MESA) programme and that the project will produce potential fishing zone maps overlaid with vessel traffic and early warning information on ocean conditions from EO data and disseminate them via the EUMETCast system and other multimedia platforms to decision makers and end users. Goerge Wiafe then emphasised how this will help protect fishing grounds against IUU and ensure safety at sea for artisanal fishers. The bedrock for success in the program is the work package for support to decision making – this is what makes the work valuable. This starts by gathering national and regional mandates from the regional and national structures to provide support to them and their user groups. Similar to the work in MOI, this project adds value to the data provided through the MESA station to provide useful services. There is a strong element of cross-fertilisation from the MOI experiences of AMESD. This project really consolidates work from so many previous projects so that we start efficiently. The project will assist decision making in solving some of the trans-boundary issues in the region.

Discussion

The discussion that took place after these presentations noted the real value of the cross fertilisation and cross regional sharing, in particular in creating regional hubs or centres of excellence that are coordinated between them so that we do not duplicate each others' work. During the discussion it was also clarified that

the AU is developing the 2050 Africa's Integrated Maritime Strategy (AIMS), and that the strategy refers to the need for African governments, the RECs/RMs and the AU to facilitate collaboration among research entities, provide funding, expertise and dissemination of innovative practices. It also refers to the pooling of knowledge into an African marine data centre. It also refers to the need for regular data updates and interpretation of information gathered to inform policy makers. MOI also clarified information on buoys data access and on PFZ maps usefulness. Finally Ghana explained data issues regarding a pollution service.

This session contributed to recommendations #20 to #23.

Session 7 – Parallel Mini-Workshops

Chairperson: Amos Makarau, AMCOMET. Rapporteur: Vincent Gabaglio, EUMETSAT

Three parallel mini-workshops were proposed on the following topics:

- Regional Training Centre activities
- Numerical Weather Prediction for Disaster Risk management
- African Space Programme: EO data needs and access

Each single workshop took place successfully and 3 specific reports were prepared (see below).

Session 7A – Regional Training Centre activities

Chairperson: Winifred Jordaan, SAWS
Rapporteurs: Lee-Ann Simpson, SAWS and Mark Higgins, EUMETSAT

Session purpose and content

The objectives of the mini-workshop were:

1. to raise awareness of the activities of the training centres
2. to get feedback on the key regional training needs

Short introductory presentations were made about current training activities followed by an open discussion covering the key training needs of the region.

Individual speakers

Three of the training centres in the region gave short presentations on their work. The following themes were raised in the presentation.

All of the training centres have existing mandates and audiences and deliver a range of trainings for national or regional needs. The revised learning outcomes of BIP-M and BIP-MT and the competencies are a driver for change. These also are a vehicle for standardisation. This affects both training and also competency assessment.

Training centres are also involved in a range of partnerships delivering course and materials including: Severe Weather Demonstration project, marine forecasting, monthly regional weather discussions, and learning modules through the ASMET project (which are available on http://meted.ucar.edu). ASECNA has recently published a new manual on the application of satellite data in forecasting. Alongside the training

output resulting from the partnerships the centres also collaborate with other training centres globally to facilitate knowledge exchange. This is facilitated through the WMO ETR and Space (VLab) programmes. While course evaluation is standard practice, there are now plans to start impact assessments of some of these initiatives.

The training centres generally offer shorter professional training / role specific courses. Degree length courses are offered through the university partners. Limited scholarship money is available through the WMO Fellowships programme.

With the centres' own work and the partners' work, the training centres are operating at or close to capacity.

Online and distance learning is a growing element of the work in the region. The ability to engage with online learning varies over the region – which can lead to marginalisation of some of the target audiences. Students are making significant efforts to overcome internet barriers to complete online courses. For students new to ODL there can be a steep learning curve in engaging with the training materials / instructional technologies. There are also a limited number of trainers with ODL skills. Some courses have a prior ODL element which is a pre-requisite for any classroom phase. This leads to much higher quality face to face courses, as the right people come to the classroom and they are prepared and oriented to the course.

Technology is a constraint to international cooperation and delivery. Many institutions have tightly controlled networks that do no facilitate the use of collaboration tools such as Google docs or drop box.

AUC presented the capacity building project on multilateral environmental agreements (MEAs). This has the objective to build the capacities of AU member states and RECs to implement MEAs. To date the project has successfully conducted training on negotiations, strategy, and law development and promotion of conventions and established systems for the dissemination of information.

Discussion

The training needs will be for operational and research/development staff in meteorological and wider EO disciplines.

Policy maker needs are being address in MESA project – the interface with policy is challenging as the gap between technologists and decision makers can be very large.

Impact assessment is hard but it needs to be addressed so that training interventions can be properly designed.

Focal points for training are an issue. Traditionally the PRs are the key nominating person. With the breadth of training these can lead to inefficiencies. Training centres feel that they often cannot reject the candidate nominated by the PR, even if they do not fit the intended profile of the course. PRs have themselves noted the importance of sending the right person to training and deploying them so that they can use their skills (UFA-10).

The training channel of EUMETCast has potential to assist in some of the bandwidth elements associated with online training.

Needs expressed:

- Data science, environmental remote sensing and GIS skills. IMTR are running a course for Rwanda that addresses GIS at this time.

- The research (meteorology and environment) skills gap and training capacity limitations (CPD and university level) were raised in the AMCOMET meeting in 2010. Some of this may be met through exchange programs. AUC is encouraged to consider funding for research scholarships.

- Online degree training: BSc, or MSc courses through ODL. The University of Pretoria offers an MSc and PhD dissertation course through distance, although this is not the easy way to study. University of Nairobi also offers distance MSc and PhD level training.

- Marine meteorology and forecasting at a practical level are a strong requirement.

- Seasonal forecast information training for users coming from many different sectors (there may also be a need to develop capacity on the provider's side on useful product creation).

- Training of trainers is required, including instructional design training for trainers with a focus on ODL materials.

- Instrument training, including AWS, is still needed together with calibration and maintenance. Also training in combining in situ and remotely sensed data is required.

- Some services are undergoing a large scale change in staffing as many retire and new people come in, this generates a large scale ab initio training needs. Many that come straight from the universities do not meet the competency requirements. This may be due to weak training skills in some training centres.

For MESA, RICs and training centres need to talk to coordinate the RIC level training.

This session contributed to recommendation #24 to #30.

Session 7B – Numerical Weather Prediction for Disaster Risk management

Chairperson: Benjamin Lamptey, ACMAD
Rapporteur: Sally Wannop, EUMETSAT

Session purpose and content

In his opening remarks to the workshop Almami Dampha from the African Union Commission (AUC) emphasised the importance of this meeting in bringing together the Numerical Weather Prediction (NWP) and the Disaster Risk Management communities to converge upon a common goal and to establish synergies for the overall benefit of lives and livelihoods of the citizens of Africa.

The chairperson, Benjamin Lamptey in his opening statement, recalled that NWP is not weather forecasting, but rather one input into the wider weather forecasting process. He emphasised that for the National Meteorological and Hydrological Services (NMHSs) to have the desired impact in their countries, it requires them working with the regional and continental meteorological institutions. The aim of the EU-ACP funded Disaster Resilience project was to enhance the capabilities at the national level through the utilisation of existing, and

the development of emerging skills, at continental, regional and national level. He emphasised that focus would be placed upon the whole value chain from data input, through to processing and the generation of the severe weather forecasts down to the issuing of the warnings to the local disaster management agencies. He added that the NWP products generated for DRR should be useful by engaging the DRR community right at the design stage, and sustainability should be ensured by engaging the research community for further research and development.

RCC Presentations

The Chairperson waived his opportunity to present the status of NWP at the national level, preferring that the workshop learn more of the excellent work being carried out at regional and national levels from they themselves.

On behalf of ICPAC, Zachary Atheru presented **"***IGAD Climate Prediction and Application Centre (ICPAC) Concept note on NWP in support of DRM in Eastern Africa***".**

In his presentation Zachary Atheru referred to the importance of regional knowledge in the interpretation and generation of a weather forecast. He recalled that Eastern Africa is an arid region and that changes in land use and increase in population have impacted the environment and that over 90% of disasters in the region were weather related. He expanded upon the work of ICPAC in the field of Extreme Forecast Index (EFI), the role of the centre to raise warnings of severe weather, the communication campaigns with Disaster Risk Managers (DRMs) and other regional forums.

In addition, he highlighted the work of the centre in building up its technical infrastructure, engaging with disaster monitoring agencies and the development of a website to support the work ahead.

Eugene Poolman from SAWS presented on behalf of SADC the *"NWP and Early Warning Service for Southern Africa Severe Weather Forecast Demonstration Programme (SWFDP)".* The SWFDP was established in 2006 by the World Meteorological Organization (WMO) with the aim of using existing technologies to improve the 3-5 day forecast and to close the technology gap between the global centres and those in developing countries. It also aims to improve the coordination between NMHS and their local disaster management agencies.

The backbone to SWFDP is the input from the global NWP centres of the European Centre of Medium Range Weather Forecast (ECMWF), UK Meteorological Office and National Oceanic and Atmospheric Administration (NOAA) who the South Africa Weather Service (SAWS) relies on to generate global model simulation of the Southern African region online. The resulting forecast is provided for the next 5 days to 16 countries within SADC via a closed Internet service. At the national level there are no requirements for complex equipment, only a need for a reliable and good quality Internet connection. The programme makes use of both probabilistic and ensemble forecasting techniques.

The regional centres provided guidance forecast to the countries who analysed and utilized them as they found appropriate.

Eugene Poolman emphasised that the success of the product lays in the relative simplicity of the resulting forecast, the improved links with the

national disaster management agencies and the importance of the inter-organisational support to ensure coordination of forecasting and warning activities. He added that the benefits of the SWFDP were demonstrated during the Tropical Cyclones Eline and Favio, when it was noted that SWFDP had significantly reduced the loss of lives.

Eugene Poolman concluded his presentation with an outlook to the future, and the advantage that will be gained by running models at a 4km resolution. He stated that the big centres are moving towards running global models at high resolution (e.g. 16 km resolution). He therefore advised that this EU-ACP project considers running the Limited Area models at very high resolution.

He did mention that the use of existing Ensemble Prediction Systems (EPS) could improve the lead time between the warning and the required action.

Discussion

The Workshop took note of the status of the various on-going activities within the different regions and at country level and noted that some regions were already performing well and were looking to build upon their success whilst others were developing competencies and require additional support to further exploit these capabilities.

During the resulting discussion the group considered the usage of NWP, including the importance of lead-time, the potential benefit of running high resolution NWP models at the regional and local levels, the additional contribution of data assimilation at regional level and local level, the importance of clear interpretation of the NWP output and the generation of the resulting forecast, the importance of engagement with the DRM community to ensure the end product meets with their needs and finally, the importance of training and general capacity building throughout the value chain.

Noting the importance of the input data, the Workshop recognised the ongoing and continued commitments of the global NWP centres in the provision of their ensemble and probabilistic forecast outputs and the support the NWP centres provide through their training and capacity building activities. The workshop welcomed the planned introduction of the RARS-DRR Africa Project as outlined by ACMAD earlier in the Forum and noted the contribution this would make in strengthening local NWP expertise which in turn would contribute to the wider DRR capabilities.

The WMO representative pointed out the important coordinating role of the global RARS Implementation Group (RARS-IG). He stressed that the installation of direct readout stations in RARS Africa should be coordinated with the Global RARS group to ensure global exchange of data acquired by the stations. A RARS Africa representative is encouraged to participate in the next meeting of the RARS Implementation Group planned for early 2015.

It was stated that a report on the third phase of the SWFDP in Eastern Africa has been submitted to WMO.

The following three areas of focus were highlighted by the Working Group:

LEAD TIME

- Contingency planning and enhanced preparedness could help improve lead time;

- The use of Ensemble Prediction Systems could help improve lead time;

- Delivering tools to support the generation of an accurate and timely forecast;

- Encourage NMHS to run high resolution (e.g. 4km horizontal resolution) models through the investment in their own resources;

- Ensure information sharing between the regional specialist centres and the NMHS with regards to the onset of severe weather;

- Strengthening the links with data providers and the centres running the models, including preparedness for future programmes to ensure the usefulness of the data received.

ENGAGING WITH THE DRM COMMUNITY

- Several examples of studies by NGOs could be considered;

- Look to the successes of other projects and build upon these successes, e.g. SWFDP used teleconferencing at times;

- There is the need to know who they are and what they want;

- In the SWFDP, the relationship between the communities is established during their training programs;

- Engage with national governments to promote the need and aims of the project.

CAPACITY BUILDING

- Sharing of expertise from other regions useful;

- Ensuring sustainability for the future.

This session contributed to recommendation #6 to #12.

Session 7C – African Space Programme: EO data needs and access

Chairperson: Jane Olwoch, SANSA
Rapporteur: Emilio Barisano, EUMETSAT

Session purpose and content

The session 7C was devoted to the Earth Observation data needs and data access in Africa. Jane Olwoch from SANSA introduced the mini-workshop, of which the main objectives were:

- Introduce the Police Context (namely African Space Policy and Strategy);

- Present long-term continental initiatives (GMES&Africa, AfriGEOSS);

- Clarify synergies and complementarities of these initiatives; and

- Discuss and make recommendations on the cross-cutting issues;

- Provide inputs for the definition of the first project under GMES&Africa.

Individual speakers

Five speakers highlighted the theme session into the following areas:

- *African Space Policy and Strategy, (Val Munsami, DST)*
- *AMCOMET and the African Regional Space Program (Joseph Mukabana, WMO)*

- *AfriGEOSS (Andiswa Mlisa, GEO Secretariat)*

- *Copernicus Program (Marco Clerici, JRC)*

- *GMES&Africa (Mahama Ouedraogo, HRST/AUC)*

The first three presentations gave a complete overview of the situation of Space framework at policy and needs levels:

- The African Space Policy Strategy presented by DST is underway with the output of the Africa Space Working Group representing all the African regions through the participation of specific countries representatives including the African nations already involved in Space Programs as Algeria, Nigeria, Kenya and South Africa. A first workshop was held in December 2013 in Brazzaville and another is planned for December 2014 in order to refine and consolidated the analysis and suggestions.

- AMCOMET described the interest and requirements in Earth Observation data for their own meteorological and climatic applications and welcomed the African Space Strategy presented by AUC, which includes all AMCOMET's requirements. He also strongly underlined the needs to solve the gap in data access and data sharing, and highlighted the great needs in capacity building in that area.

- The presented status of AfriGEOSS allowed the audience to appreciate the great effort of coordination already done in the EO domain, and also sketched the way-forward to reach a real data access and data sharing through innovative information systems. The importance of data exchange protocols was also highlighted.

- The COPERNICUS (known-as GMES until 2012) European Program presentation demonstrated the critical importance of EO in Europe to serve socio-economic issues. The huge level of investment in that program demonstrates Europe's ambition to reach a high level of operationalization of EO application through Core Applications and Downstream Services, and through satellite constellation with the Sentinel satellites. The speaker also presented the strong political and technical partnership of COPERINCUS Program and Africa through the GMES&Africa initiative.

- The status of GMES&Africa program was presented, and allowed to appreciate the new impulse given to the initiative with the Maputo Declaration in 2006 and regularly supported by African and European sides at high level in each EU-Africa Summit. A Project Definition Study is ongoing, which must analyse and propose operational solutions at management and technical level including the consolidation of the partnership with the African MESA project and the COPERNICUS program. The results of the Identification Study are expected for the first quarter of 2015.

Discussion

An intense and constructive discussion followed these presentations on the following main topics:

- The need to consolidate a full African Space Strategy with a strong request for Earth Observation;

- The provision of the physical access to data and the required effort into harmonization of data format and data exchange protocol, firstly by the national African Space Agencies;

- The importance to coordinate and harmonize the data access and data sharing;

- The importance to optimize the use and exploitation of the existing channels of data provision (e.g. EUMETCast, websites of data providers, as the COPERNICUS Global Land);

- The development of users assistance and users capacity building on the existing EO datasets;

- The importance for Africa to have a strong Technology Watch into data exchange in order to apply the newest technology of data transfer for the existing and coming extraordinary amount of data for the whole continent.

This session contributed to recommendation #31 to #34.

Session 8 – MESA Project

Chairperson: Olusola Ojo, ACP
Rapporteurs: Stéphane Flasse, EUMETSAT and Faka Nsadisa, SADC-CSC

The eighth session was dedicated to the presentation of the MESA project. MESA focuses on increasing the information management, decision-making and planning capacity of African continental, regional and national institutions mandated for environment, climate, food security and related responsibilities by enhancing access to and exploitation of relevant EO applications. The session presented MESA's objectives and activities, and provided information on services in each African region.

MESA status of implementation (Jolly Wasambo, AUC)

The Monitoring of Environment and Security in Africa (MESA) project, funded by the 10th European Development Fund of the European Union and implementation by the African Union Commission (AUC) and seven Regional Implementation Centres officially started in March 2012, with the signature of the Financing Agreement between the EU, the AUC and the ACP Secretariat.

After presenting the purpose and objectives of MESA, the current status of the project was explained.

A technical assistance team was hired in 2013. All seven regional Grants are in place with the aim to implement information services (THEMA) in various African regions. MESA will also put in place training activities at various levels (continental, regional and national). A contract for the continental training activities is about to be signed. Furthermore, MESA will put in place and maintain existing infrastructure to ensure access to earth observation data and processing of these data for various services. A MESA Forum is planned to take place in first half of 2015.

Upgrade of the PUMA 2010 stations (towards PUMA 2015) and AMESD stations (Luc Verelst, MESA)

Luc Verelst presented the MESA infrastructure support which includes upgrade, maintenance and repair of (AMESD & PUMA) receiving stations, supply of new stations for new MESA THEMAs, production of training materials, delivery of training in system administration and the use of the stations. The purpose of this support is to sustain the operational status of the existing PUMA2010 and AMESD stations and to deploy new stations at newly designated locations. Existing PUMA2010 stations will be upgraded to PUMA2015 stations (with meteorological forecasting and display software provided) and AMESD stations upgraded to MESA stations. In total, 50 PUMA 2010 stations will be upgraded and three new stations installed (as well as two reference stations at EUMETSAT). 57 AMESD stations will be upgraded to MESA stations, and 55 new stations will be installed (as well as three reference stations for JRC, EUMETSAT and TAT). Support and maintenance (hardware and software) will be provided to ensure that throughout the lifetime of the project the deployed infrastructure is running. In addition, software upgrades will be delivered to keep the software infrastructure up to date during the project's lifetime. Training material will also be provided to support the training activities delivered by the local actors.

Presentation of the eStation and its evolution (Marco Clerici, JRC)

Taking into account the experience of the AMESD project, Marco Clerici explained that JRC is implementing the eStation 2.0 system as core-component of MESA Stations to be delivered to all MESA beneficiaries in more than one hundred Institutions. The eStation is a processing server dedicated to the acquisition, processing, analysis and redistribution of EO products received through EUMETCast and additional sources (http, ftp), which automates and streamlines the recurrent activities and offers ad-hoc analysis features. A large range of remote sensing products on vegetation, precipitation, fires and oceanographic products (SST, Chlorophyll-a), from various instruments (including SPOT and PROBA Vegetation, MSG-SEVIRI, MODIS) are currently made available allowing for local and regional assessments of the state of marine and terrestrial ecosystems. Open Source, cross-platform, it supports OCG web-services and can feed more specific downstream GIS applications.

MESA training programme for NMHS (Robert Brown, MESA)

Robert Brown described the overall training programme of MESA, with the elements specific to training of the National Meteorological and Hydrological Services highlighted. This includes initial training during the installation of PUMA 2015 Stations, more in-depth training from the MESA training contractor, and training in weather forecasting by EUMETSAT using the new stations.

MESA in SADC region (Agricultural and Environmental Resources Management) (Isaac Kusane, BDMS)

Isaac Kusane presented the status of the services aimed to enhance the management of Agricultural and Environmental Resources in SADC Region. The implementation of these services is achieved by (i) establishing four operational geo-information monitoring services (agriculture, drought, fire and flood) at beneficiary institutions with respective mandates, within participating member states, with the view to facilitate better

informed decision making and strengthening policy development framework, (ii) improving infrastructure support to access EO data and information, and (iii) building technical (Thematic and ICT) capacity to ensure sustainability of projects output.

MESA in IGAD region (Land Degradation assessment, Natural Habitat Conservation, Forest management and climate change monitoring) (Zachary Atheru, ICPAC)

Zachary Atheru explained that the general objective of the THEMA in the IGAD region is to increase information management capacity of IGAD regional and national institutions in support of decision and policy makers and facilitate sustainable access to Africa-wide environmental information derived from earth observation technologies. The specific objective is to enhance the assessment and monitoring of land degradation, natural habitats and forest resources for sustainable land management. The expected results are: (i) Improved access by African stakeholders in IGAD region to Earth Observation (EO) and GIS data and information, (ii) operational information services on land degradation, natural habitats forests are established to better manage environmental resources and improve sustainable policy and decision-making processes, (iii) services developed by other RICs adopted in IGAD through cross-fertilization of services and products and cooperation among regions on the African continent, (iv) strengthened political and policy development frameworks, (v) increased knowledge of stakeholders in the IGAD region with regard to EO information.

Land degradation products developed during AMESD are being consolidated with improvements in (i) input data layers e.g. Rainfall, population (landscan vs afripop), (ii) additional factors: humus layer, (iii) dissemination (engagement of national focal points), and (iv) transferring of the service to national level. Natural habitat Products of AMESD are being consolidated with improvement in: (i) increasing the coverage for all Protected Areas in the participating countries, (ii) improving methods for LC/LCC in collaboration with JRC (validation tool), (iii) improving dissemination channels, (iv) more participation of national network e.g. validation of products (v) transferring of the service to national level.

MESA in the ECOWAS region (Water monitoring for Cropland and Rangeland management) (Kouamé Bouafou and Issifou Aflari, AGRHYMET)

In his presentation, Issifou Alfari explained how the Land THEMA ECOWAS focuses on water management for improved management of agricultural and grass land. The project is put in place by the Regional centre AGRHYMET and will allow capacity building regionally and nationally within the ECOWAS region, as well as Mauritania and Chad, for an improved use of EO data in the area of environment management and food security. In order to achieve these objectives, the project is putting in place three services for crop, grass land and fire monitoring. Thanks to this project, ECOWAS intends to play a key role in the GMES&Africa programme by facilitating and improving EO data access for an improved decision making et planning in the areas of environment, climate and food security.

MESA in the CEMAC region (Water Monitoring for fluvial transportation and environmental assessment) (Isidore

Embola, CEMAC and Olivier Kambi, CICOS)

Olivier Kambi presented the Central Africa THEMA focussing on improving information management capacity, decision making and political implementation for water management in countries from the Economic and Monetary Community of Central Africa (CEMAC), as well as in RDC and for regional institutions in charge of environment management, by improving access and adequate usage of EO data. This project will focus particularly on water level monitoring on the region's rivers and the monitoring of basin water balance in order to assess climate change impact on water resources and environment.

Discussion

During the discussion that followed these presentations, a number of delegates praised the importance of all the initiatives (and all corresponding institutions) that have allowed the community to be where it is today in terms of usage of EO in Africa. The importance of engagement of national institutions and in particular of national meteorological services was underlined, further stressing the responsibilities of both parties, i.e. the MESA project and the national institutions to communicate and take ownership of their engagement. The importance of national institutions management level was further highlighted as key to the long term sustainability of these initiatives. Clarifications were provided on a number of areas such as the involvement of Chad and Côte d'Ivoire, water transfer in the CEMAC region, MESA monitoring and evaluation, and finally JRC provided clarification with regards to the EMMA software.

This session contributed to recommendations #13 to #16

Session 9 – Satellite Applications in Africa

Chairperson: Humbulani Mudau, DST South Africa
Rapporteur: Jochen Kerkmann, EUMETSAT.

Session nine was dedicated to the use of satellite data and products in Africa, from the use of online resources, EUMETCast resources to the demonstration of products related to fire detection, atmospheric instability, vegetation monitoring, rainfall monitoring etc.

Initiative in North Africa (Abdelwaheb Nmiri, NMHS Tunisia)

Abdelwaheb Nmiri recalled two recommendations (#26 and #27) from the 10th User Forum, namely on the recommended association of North African countries to MESA and on training. Referring to recommendation #26, an initiative MESA North Africa started during a workshop in Tunis in February 2013 organised by EUM and Tunisia. This workshop concluded with some recommendations, including the proposal of 3 themes for MESA North Africa. A representative for the North African countries was selected (Tunisia is focal point, confirmed by letter exchange). Finally, it led to the transmission of a set of documents to the EU delegation in Tunisia in November 2013. The (positive) EU reply was presented in details to the Forum participants. Tunisia confirmed that it wants to continue to pursue the association with MESA.

Utilization of online resources to improve awareness and use of satellite products (Gillie Cheelo, WMO)

Gillie Cheelo, referring to a WMO survey carried out in 2012, presented a summary list of challenges in the use of satellite data. Top challenges are knowledge of data, access to satellite data in NRT, resources and preparation for future satellites. The outcome of the survey motivated WMO to identify training needs and to develop several online resources: a) a Product Access Guide (only for well documented products), b) OSCAR – an online data archive for information on satellites and instruments (payloads) and their applications and c) a Satellite User Readiness Navigator Portal (SATURN) for future satellite missions, developed by CGMS and WMO, with info about instrument performance, coverage, data access, software tools and operation plans.

Satellite tools for nowcasting in the African region (Estelle de Coning, SAWS)

In her presentation Estelle de Coning focussed on the demonstration of nowcasting applications from MSG SEVIRI. The importance of MSG satellite data for nowcasting in Africa was underlined (in lack of radar and ground data). The following Southern African examples were shown: 1) the satellite-based GII product (like the K Index), 2) the regional RII product (Regional Instability Index) for the area south of the equator, 3) the Combined Instability Index (CII), a probability map for convection in %, 4) the Hydro Estimator (satellite based precipitation product), and 5) the Nowcasting SAF RDT and CRR products. Estelle de Coning also demonstrated the website for Nowcasting products (related to the Severe Weather Forecast Demonstration Project).

Use of EUMETCast at regional meteorological branch offices in Ethiopia (Kassa Fekadu, EMA - Ethiopia, and Ben Maathuis, ITC)

Kassa Fekadu presented the history of Meteosat receiving stations in Ethiopia (which included PDUS and PUMA stations for the HQ of the Ethiopian NMS). He explained that satellite data reception is crucial also for the 11 branch offices in Ethiopia. Consequently, a free “toolbox” developed by ITC was installed successfully in all branch offices. This toolbox was presented to the audience in details, with many image and MPEF/SAF product examples.

AFIS fire detection system (Philip. Frost, CSIR South Africa)

In his presentation Philip Frost gave an overview of the Advanced Fire Information System (AFIS), developed by CSIR in 2003, originally designed to support governments and power agencies (ESKOM) etc. It consists of three components: fire prediction with model and satellite data, fire detection with SEVIRI/MODIS/VIIRS and assessment (burnt area mapping). Philip Frost showed the history of fire detection algorithms in AFIS pointing out that SEVIRI is often the first instrument to detect a fire (because of the frequent repeat cycle). CSIR with AFIS gives support to AMESD and MESA. An AFIS Mobile App is freely available (for iOS, Android). An important aim for the future is to get 3 stations in Africa running MSG and MODIS reception (South Africa, Kenya and Ghana) for continental-scale fire detection in NRT.

10m resolution Sentinel-2 satellite data: an opportunity for Africa (Marc Leroy, CNES – France)

Marc Leroy explained how Sentinel-2 / Copernicus presents a revolutionary concept in optical remote sensing (with free and open data policy), for many environmental applications over land. Sentinel-2 is a system of two satellites with 4 VIS/NIR bands at 10 m resolution and 290 km swath, to be launched in 2015 and 2016, respectively. Marc Leroy informed the participants that CNES is getting ready to process level 2 and level 3 products (atmospheric corrected and time composited), but that the product areas are not yet defined. Finally, the challenge of distributing the data was discussed.

Land Surface Analysis SAF products and activities (Jean-Louis Roujean, Météo France - Land SAF)

After presenting the Land SAF project, its development and its products, Jean-Louis Roujean showed several application examples, including broadband albedo, vegetation cycles in Africa, monthly evapotranspiration products over West Africa and fires and smoke products over Northern Africa. He concluded his talk by showing the training and outreach activities of the Land SAF, which include workshops in three languages (English, French and Portuguese), and the list of next steps (e.g. preparation for MTG). He encouraged all users to give feedback on the Land SAF web site, its services and products.

The TAMSAT Group: satellite rainfall products and activities within Africa (Emily Black, University of Reading, UK)

Emily Black gave an outline of the TAMSAT approach and range of TAMSAT products. She addressed TAMSAT's suitability for assessing climate-related risk and some new TAMSAT applications like the weather index-based insurance. TAMSAT partnered with MicroEnsure to provide supporting data and documentation for discussions with the financial regulators, and reinsurers and to design robust indices for droughts and floods for their African WII schemes.

Enhancing African EO capacities for agriculture and forestry management as a contribution to GEOSS: the AGRICAB project - AGRICAB partner (Tim Jacobs, VITO, Belgium)

Tim Jacobs presented AGRICAB, an EU project to enhance African EO capacities for agriculture and forestry management as contribution to GEOSS.

AERUS-GEO (Aerosol and surface albEdo Retrieval Using MSG SEVIRI) (Jean-Louis Roujean, Météo France, France)

Jean-Louis Roujean presented an advanced initiative for tracking operationally aerosol events over any surface targets based on MSG/SEVIRI observations. He explained that the AERUS-GEO method aims at separating aerosol from any surface (vegetation, desert, snow) for clear sky, performing efficiently at a low computation cost (suitable for operations). The method was qualified based on in situ validation (with AERONET data). The results are consistent or even better than MODIS. As an example, he showed global (full disk) products of a major dust outbreak that occurred in 2010.

Discussion

The Chairperson:

- Highlighted that a lot of progress in the use of satellite data has been made and that new satellite products have been developed in the last years;

- Appreciated the move to operational systems which ensures that product usage increases in Africa;

- Noted that data access has been improved and that many web-based tools assist African countries to have access to the products;

- Noted that all presented projects included capacity building activities;

- Stressed that even more can be achieved with strategic partnerships.

During the discussion, the critical issue of ground truth validation of new products was addressed and three speakers informed on their validation approach. In addition, Philip Frost clarified that, while for the moment VIIRS stations are only for fire purposes, other products are under development but not yet available. Finally, Emily Black indicated (i) that satellite based insurance indices need to be correlated to the experience of farmers in the field, and (ii) that TAMSAT methods have been tested on other areas and have been seen as doing surprisingly well also in North Africa (and would welcome countries collaborations in that matter).

This session contributed to recommendation #33.

Session 10 – Recommendation

Chairperson: Vincent Gabaglio, EUMETSAT
Rapporteurs: Stéphane Flasse, EUMETSAT and Nico Kroese, SAWS

In preamble to this last session, the participants were invited to fill-in a feedback form on their appreciation of the various aspects of the Forum (logistics and programme).

The chair then invited Sudan, Burkina Faso and Zambia to report on the status of implementation of the recommendation #5 from the 10th EUMETSAT User Forum in Africa on the national network and coordination to access EO data.

Hanan Magzoub Hag Ahmed Rabbah, NMHS Sudan.

Hanan Magzoub Hag Ahmed Rabbah explained that the AMESD station was installed in Sudan in October 2010 at the Meteorological Authority to feed the Ministry of Environment and other end users. The station is still working properly and the last update in 2013 was successful. The new release of the Processing Station software allows us to acquire and process 24 different Earth Observation products, thanks also to a pro-active collaboration between JRC and AMESD Regional Implementation Centres, achieved through daily contacts and specific common working sections (‘on-the-job’ training).

She further explained that the Puma 2010 was also installed in October 2010 and the system is still running very well. The primary objective was to

establish, maintain and exploit European systems of operational meteorological satellites and to contribute to the operational monitoring of the climate and the environment as well as the detection of global climatic changes. Images from the Meteosat satellites have been providing valuable information to weather forecasting, in particular on fast developing weather systems and therefore support the local short range forecast.

Finally, she gave a long list of the value of MSG for them in terms of Climate monitoring and Nowcasting.

Jacques Garané, NMHS Burkina Faso

Jacques Garané reported that PUMA data and products are open to all users. Products being generated by the Met Service are used to improve weather forecast. Daily and weekly bulletins are generated and provided to the ministries.

The AMESD station is housed at the Ministry of Environment. Products on fire and water from AGRHYMET are integrated in the decadal agro-meteorological bulletins. Amongst a number of other users, the Disaster risk centres receive the reports and products through a dedicated web-site. There is a very good collaboration between producers and users.

The PUMA 2010 station is of limited use (including some upgrade issues) and the Met. Service is looking forward to the Puma 2015 upgrade which will include new products and services.

Edward Falanga, NMHS Zambia

After 2012 Edward Falanga went back to address Recommendation #5 and soon realised a number of challenges. It was realized that there was already a centre in Zambia whose mandate was to disseminate remote sensing data. The Zambian Met Service had to move cautiously with disseminating satellite data and products in order not to infringe on other institutional mandates. Active users are Government Agencies involved in using fire products and drought monitoring. An atlas is produced using EO data to address land use change.
With the MESA project starting in Zambia more institutions are to be sensitized to utilize EO data in their routine operations which include fire, drought, hydro power. A first national network is in place and the remote sensing centre will play a key role in it. Zambia is actively involved in sharing this data received from EUMETCast.

Then the chair invited South Africa and Ethiopia to report on the status of implementation of the recommendation #35 from the 10th EUMETSAT User Forum in Africa on the use of EO for renewable energy.

Lucky Ntsangwane, SAWS, South Africa

The presentation of Lucky Ntsnagwane highlighted the work that the South African Weather Service is conducting in relation to renewable energy (wind and solar) and its collaboration with renewable energy institutions. Renewable energy is divided in 2 main sections (Wind & Solar). The renewable energy initiative is led by the CSIR in South Africa.

WIND power: South African Wind Atlas Project (WASA) is an initiative that deals with identifying “wind suitable” areas in South Africa, i.e. areas suitable for wind power generation. Extreme winds is also of interest to

wind power operators in order to avoid damages to equipment.

SOLAR Power: a solar power resource mapping initiative is currently in progress (Solar Radiation Atlas Project) SRMSA. The objective is to generate a solar radiation Atlas. An overview of the recent history in solar radiation measurements was given (1950's) up to recent times. The project is performed in phases with Phase 1 being completed with the deployment of 6 solar radiation stations. Phase 2 will include the further deployment of stations to make a total of 13 stations by the end of November 2014.

Dula Shanko, NMHS, Ethiopia

Target strategy of the Ethiopian government is to move towards a Green Economy. Government focussed on the deployment of solar network (solar stations). Wind Energy power generation in Ethiopia is more than 200 MW. A master plan was developed to increase the reliance of the country on solar and wind –energy. The Strategy is dependent on meteorological data to commission their implementation plan.

Closing remarks

The Forum was closed by a number of speakers addressing the delegates.

Vincent Gabaglio from EUMETSAT thanked the delegates for their proactiveness and contributions whether during or outside sessions, and encouraged them to widely share all the information back home with colleagues and relevant institutions at the national level. He was also noting and saluting the visible increased ownership by the Africans. Finally he thanked EUMETSAT and SAWS colleagues for the successful organisation of the Forum.

Amos Makarao from AMCOMET congratulated and thanked the event, allowing important sharing, engaging and networking, all essential as input to the definition of the new African Space Programme. He asked the Forum to articulate clearly all the recommendations so to be taken into account in the next ACMOMET, including the Benoni declaration. Finally he indicated looking forward to more collaboration with WMO and EUMETSAT.

Joseph Mukabana from WMO also thanked the event and all participants, in particular recognising the importance of the stated recommendations. He indicated the appreciation for the invaluable help coming from all the EO and meteorology communities and initiatives in alleviating Africa's vulnerability, and in particular the support to agriculture, water, health and disaster risk reduction towards sustainable development.

Jolly Wasambo from AUC also thanked the event and all parties involved. He stressed the particular importance of the Forum for Africa given that 2014 is the agriculture and food security year in Africa, the countries participation in the CILLS meeting, and Agenda 2063 on Africa. He also highlighted a number of important issues such as emphasis on collaboration, cooperation and synergies, using the opportunities of data availability, existing programmes for infrastructure development, AUC reaffirming their support to GFCS-Africa, and MESA focusing on bringing

EO to improve decision making in the field.

Finally, Mark Majodina, on behalf of Linda Makuleni, closed the Forum by recognising the importance of a number of elements such as EUEMTSAT data and involvement in Africa, MESA training to build capacity, NMHS and other institutions being at the cross road of technologies, the Forum recommendations. He stressed the need to pull resources together and to be proactive for the continent to successfully benefit from EO. The Benoni statement is an example of that. The final thanks went to the participants who made the success of this Forum possible.

Annexes

In the annex the following is provided:
- Programme of the Forum
- Benoni Statement
- List of participants
- Photos
- CD Rom

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LIST OF ABBREVIATIONS

AARSE	African Association of Remote Sensing of the Environment
ACMAD	African Centre for Meteorological Application for Development
ACP	African, Caribbean and Pacific Group of States
AERUS-GEO	Aerosol and surface albedo Retrieval Using MSG SEVIRI
AfDB	African Development Bank
AFIS	Advanced Fire Information System
AfriGEOSS	African Global Earth Observation System of Systems
AGRHYMET	Centre Régional de Formation et d'Application en Agrométéorologie et Hydrologie Opérationnelle
AIMS	Africa's Integrated Maritime Strategy
AMCOMET	African Ministerial Conference on Meteorology
AMCOST	African Ministerial Council on Science and Technology
AMESD	African Monitoring of the Environment for Sustainable Development
ARC-ISCW	The Agricultural Research Council – Institute for Soil Climate and Water
ASECNA	Agence pour la Sécurité de la Navigation Aérienne en Afrique et à Madagascar.
ASMET	African Satellite Meteorology for Education and Training
AUC	African Union Commission
BDMS	Botswana Department of Meteorological Services
CBS	Commission on Basic Systems
CCAFS	CGIAR Research Programme on Climate Change, Agriculture and Food Security
CDSF	ClimDev Special Fund
CEOS	Committee of Earth Observation Satellites
CEMAC	Central African Economic and Monetary Community
CGMS	Coordination Group for Meteorological Satellites
CICERO	Centre for International Climate and Environmental Research – Oslo
CICOS	Commission Internationale du bassin Congo-Oubangi-Sangha
CII	Combined Instability Index
CITMC	Conference for Ministers in charge of Communication and Information Technologies
ClimDev Africa	Climate Information for Development in Africa
CMA	Chinese Meteorological Administration
CNES	Centre national d'études spatiales
CORDEX	Coordinated Regional Climate Downscaling Experiment
COP17	The 17th Conference of the Parties (COP17) to the United Nations Framework Convention on Climate Change (UNFCCC)
CPD	Continuous Professional Development
CSIR	Council for Scientific and Industrial Research
DEA	Department of Environmental Affairs
DRM	Disaster Risk Management
DRR	Disaster Risk Reduction

DST	Department of Science and Technology
DWD	German Weather Service (Deutscher Wetterdienst)
EC	European Commission
ECCAS	Economic Community of the Central Africa States
ECVs	Essential Climate Variables
ECOWAS	Economic Community Of Western African States
EDF	European Development Fund
EFI	Extreme Forecast Index
EMA	Ethiopian Mapping Agency
EMMA	Environmental Monitoring and Mapping System
ENACTS	Enhancing National Climate Services
EO	Earth Observation
EPS	EUMETSAT Polar System
ESA	European Space Agency
EU	European Union
EUMETCast	EUMETSAT's Broadcast System for Environmental Data
FCI	Flexible Combined Imager
FMI	Extreme Forecast Indices
GCOS	Global Climate Observing System
GEO	Group on Earth Observation
GEOSS	Global Earth Observation System of Systems (GEOSS)
GFCS	Global Framework for Climate Services
GFCS-ACP	Global Framework for Climate Services – African, Caribbean and Pacific regions
GGWSSI	Great Green Wall for the Sahara and the Sahel Initiative
GMES	Global Monitoring of the Environment and Security
GPCC	Global Precipitation Climatology Centre
GUAN	GCOS Upper-air Network
HRST	Human Resources, Sciences and Technology
HIRS	High-resolution Infrared Radiation Sounder
IASI	Infrared Atmospheric Sounding Interferometer
IBCS	Intergovernmental Board Climate Services
ICPAC	IGAD Climate Prediction and Applications Centre
IFRC	International Federation of Red Cross and Red Crescent Societies
IGAD	Intergovernmental Authority on Development
IMF	International Monetary Fund
IMTR	Institute for Meteorological Training and Research
IOC	Indian Ocean Commission
IODC	Indian Ocean Data Coverage
IPCC	Intergovernmental Panel on Climate Change
IRI	International Research Institute for Climate and Society
IRS	Infra-red Sounder
ISRO	Indian Space Research Organisation
ITC	International Institute for Geo-Information Science and Earth Observation, Netherlands
IUU	Illegal, Unreported and Unregulated (IUU) Fishing
JCOMM	Joint Technical Commission for Oceanography and Marine Meteorology
JRC	Joint Research Centre, European Commission
LSA SAF	Land Surface Analysis SAF
LI	Lightning Imager
MEA	Multilateral Environment Agreement

MESA	Monitoring of Environment and Security in Africa programme
MODIS	Moderate-Resolution Imaging Spectroradiometer
MOI	Mauritius Oceanographic Institute
MSG	Meteosat Second Generation
MTG	Meteosat Third Generation
NASA	US National Aeronautics and Space Administration
NDVD	Normalised Difference Vegetation Index Decadal
NDVI	Normalized difference vegetation index
NFCS	National Framework for Climate Services
NMA	Ethiopian National Meteorological Agency
NMHS	National Meteorological and Hydrological Service
NOAA	National Oceanic and Atmospheric Administration
NWP	Numerical Weather Prediction
OECD	Organisation for Economic Cooperation and Development
OSCAR	Observing Systems Capability and Review
PML	Plymouth Marine Laboratory
PFZ	Potential Fishing Zone
PUMA	Preparation for the Utilisation of Meteosat Second Generation in Africa
RA-I	Regional Association One (WMO)
RAIDEG	RA-I Dissemination Expert Group
RARS	Regional Advanced Retransmission Services
RARS-DRR	Regional Advanced Retransmission Services – Disaster Risk Reduction
RCMRD	Regional Centre for Mapping of Resources for Development
REA	Rural Economy Agriculture
RECs	Regional Economic Communities
RIC	Regional Implementation Centre
RMs	Regional Mechanisms
Roshydromet	Federal Service for Hydrometeorology and Environmental Monitoring of Russia
SADC	Southern African Development Community
SADC-CSC	Southern African Development Community – Climate Services Centre
SAF	Satellite Application Facility
SAMSA	South African Maritime Safety Authority
SANSA	South African National Space Agency
SASSCAL	South African climate change and adaptive land use
SATURN	Satellite User Readiness Navigator Portal
SAWS	South African Weather Service
SOLAS	Safety Of Life At Sea
SRMSA	Solar Radiation Atlas Project
SST	Sea Surface Temperature
STC	Specialised Technical Committees
STCW	Certification and Watchkeeping for Seafarers
SWF	Severe Weather Forecasts
SWFDP	Severe Weather Forecast Demonstration Programme
TARCAT	TAMSAT African Rainfall Climatology And Time-series
UNECA	United Nations Economic Commission for Africa
UNFCCC	United Nations Framework Convention on Climate Change
UNS	User Notification Service
VIIRS	Visible Infrared Imaging Radiometer Suite
VITO	Vlaamse Instelling voor Technologisch Onderzoek, Belgium
VLab	Virtual Laboratory (WMO)
WASA	South African Wind Atlas Project

WASCAL	West African climate change and adaptive land use
WFP	World Food Programme
WHO	World Health Organisation
WIGOS	WMO Integrated Global Observing System
WIS	WMO Information System
WMO	World Meteorological Organization
WMO ETR	WMO Education and Training
WMO RTC	WMO Regional Training Centers

11th EUMETSAT User Forum in Africa

Detailed Programme

8 to 12 September 2014,
South Africa

ufa.eumetsat.int

September 2014

South African Weather Service
ISO 9001 Certified Organisation

EUMETSAT

Programme overview

The programme of the 11th EUMETSAT User Forum in Africa comprises the opening ceremony, a technical visit and ten sessions.

The first session is dedicated to the presentation of the various EUMETSAT programmes and activities: MSG, EPS, Jason, SAFs. It also includes presentations of the WMO Space programme, and some related to access to EUMETSAT data, EUMETCast and a report from RAIDEG.

The second session presents the Regional Advance Retransmission Service (RARS) Africa project, which aims at providing Africa with direct read-out access to meteorological polar orbiting satellites for Numerical Weather Prediction in support to Disaster Risk Reduction.

The third session focuses on the Meteosat Third Generation (MTG), presenting the satellites, the various instruments and the potential applications in Africa. This session will mark the start of the interaction between EUMETSAT and its user community in Africa about this new generation of geostationary satellites, planned to be operational from 2020 to 2040.

The fourth session will be dedicated to presentation related to the implementation of the Global Framework on Climate Services (GFCS) in Africa. Presentation will cover various aspects of the GFCS as well as projects contributing to the implementation of GFCS in Africa.

The fifth session of the Forum includes scientific contribution related to Climate monitoring (Climate change and variability), and the *the sixth session* concentrates on the use of satellite data for marine services (operational oceanography and other applications).

The seventh session consists in three workshops, focusing on: (i) training, (ii) Use of satellite data for Numerical Weather Prediction, and (iii) African Earth Observation initiative (AfriGEOSS and GMES&Africa). More details are available hereafter.

A technical visit will take place on Wednesday afternoon combining technical aspect and a cultural experience. More details are available hereafter.

The eighth session concentrates on the MESA project. This will include presentation of the various regional activities and of the MESA training programme. A special attention will be provided to the upgrade of the PUMA 2010 (and AMESD) stations that should occur in 2015.

The ninth session focuses on the use of satellite data in Africa in support to meteorology and sustainable development.

The tenth session will review and adopt the recommendations formulated during the Forum.
An overview of the preliminary programme is provided on the next page.

11th EUMETSAT User Forum in Africa
8-12 September 2014, South Africa
Programme Overview

	Monday 8 September	**Tuesday 9 September**	**Wednesday 10 September**	**Thursday 11 September**	**Friday 12 September**
8:30 – 10:30	Registration of participants **Opening Ceremony**	**Session 3:** **MTG and Africa**	**Session 7: Mini-Workshops** (a) Training centre activities (b) NWP for DRR (c) Africa EO initiatives: data needs and access	**Session 7 continued Report of Parallel Working Groups**	**Session 10** Review and adoption of Forum recommendations
11:00 – 12:30	**Introductory session**	**Session 4:** **GFCS in Africa**		**Session 8: MESA project**	**Closing Ceremony** *End of the Forum*
12:30 14:00	**Lunch time**	**Lunch time**	***Lunch time***	**Lunch time**	**Lunch time**
14:00 – 16:00	**Session 1: EUMETSAT Programmes Overview**	**Session 5: Climate services, scientific aspects**		**Session9: Use of meteorological satellites in Africa** *(call for papers)*	
16:30 – 18:00	**Session 2: RARS Africa for DRR**	**Session 6: Operational oceanography**	**Technical visit**		

SAWS Dinner	**Cocktail Dinner**	**EUMETSAT Dinner**		

South African Weather Service
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EUMETSAT

Detailed programme

Pre-meeting (upon invitation only)

Friday 5 September 2014

10:00 – 18:00 *Disaster Resilience Programme – Result #3 (upon invitation only)*

Saturday 6 September 2014

14:00 – 18:00 *5th RAIDEG meeting (upon invitation only)*
10:00 – 18:00 *GFCS ACP (Africa) Task Team meeting (upon invitation only)*

Sunday 7 September 2014

09:00 – 17:00 *5th RAIDEG meeting (upon invitation only)*
17:00 – 19:00 *High level event on Climate Services (upon invitation only)*

Programme of the User Forum

Monday 8 September 2014 (am)	
08:00	Chairpersons and rapporteurs briefing meeting
08:30	Registration
09:00	**Opening ceremony**
10:25	*Group Photo and coffee break*
10:40	*Media interviews (upon invitation)*
Introduction to the 11th EUMETSAT User Forum in Africa	
11:00	Introductory remarks - L. Makuleni, SAWS CEO and PR of South Africa with the WMO
11:10	Address from South African Department of Science and Technology - Mmboneni Muofhe, DST DDG
11:25	AMCOMET – Status and way forward - J. R. Mukabana, WMO
11:45	Presentation of the South African National Space Agency - J. Olwosh, SANSA
12:00	Objectives and programme of the 11th EUMETSAT User Forum in Africa - P. Counet and V. Gabaglio Strategy and International Relation Division, EUMETSAT
12:15	Review of Recommendations from the 10th EUMETSAT User Forum in Africa - V. Gabaglio, EUMETSAT
12:30	*Lunch break*

Monday 8 September 2014 (pm)	
Session 1 - Overview of EUMETSAT Programmes	
Chairperson: L. Makuleni, SAWS	
Rapporteurs: V. Gabaglio, EUMETSAT + V. Munsami, Department of Science and Technology	
14:00	Status of EUMETSAT programmes MSG, MTG, EPS, Jason and future programmes - A. Ratier, EUMETSAT
14:30	WMO space programme - S. Bojinski, WMO
14:50	Status of EUMETSAT Satellite Application Facilities - M. Higgins, EUMETSAT
15:10	Data access and user service (inc. DCP) - S. Wannop, EUMETSAT
15:30	Report from RAIDEG - M. Diop Kane, Senegal
15:50	Q&A, discussion
16:00	*Coffee break*
Session 2 - RARS Africa for Disaster Risk Reduction	
Chairperson: H.E. Rhoda Peace Tumusiime, AU Commissioner	
Rapporteurs: E. Barisano, EUMETSAT + A. Nmiri, NMS Tunisia	
16:30	Disaster Resillience in Africa and the role of the meteorological services - Mr. M. Hunde and Ms. L. Wanambwa, African Union Commission
16:45	Component #3 of EU-ACP programme on Disaster Resilience in Sub-Saharan Africa - K. Johm, African Development Bank
17:00	The role of satellite data in NWP - NWP SAF, S. Manktelow, UK Met Office
17:20	Implementation approach and role of Regional Centres - B. Lamptey, ACMAD
17:40	Open discussion
17:55	EUMETSAT: contribution to the "International Charter: Space and Major Disaster" - S. Wannop, EUMETSAT
18:10	Q&A, discussion
18:15	*End of Day 1*
18:30	*Gala dinner, hosted by SAWS - Kopanong Conference Centre*

Tuesday 9 September 2014 (am)	
Session 3 - Meteosat Third Generation	
Chairperson: J. Mukabana, WMO	
Rapporteurs: P. Counet, EUMETSAT + F. Uirab, Namibia	
09:00	Introductory remarks - A. Ratier, EUMETSAT
09:10	Meteosat Third Generation - J. Kerkmann, EUMETSAT
09:40	Q&A, discussion
Session 4 - GFCS and Africa	
Chairperson: J. Wasambo, AUC	
Rapporteurs: S. Flasse, EUMETSAT + J. Garané, Burkina Faso	
10:00	Foreword and outcomes of the High level meeting on GFCS Africa - L. Makuleni, Vice-Chair of the Intergovernmental Board on Climate Services
10:15	GFCS, status of implementation - J. R. Mukabana, WMO
10:35	GFCS Africa Task Team (follow-on of the Addis Ababa declaration) - J. Wasambo, African Union Commission
10:45	*Coffee break*
11:00	Regional implementation of GFCS: MESA Climate Services - B. Lamptey, ACMAD
11:15	National implementation of GFCS, the case of South Africa - T. Dube, SAWS
11:30	National implementation of GFCS, the case of Western Africa - M. Touré, Mali
11:45	National implementation of GFCS, the case of Eastern Africa - Z. Atheru, ICPAC
12:00	Q&A, discussion on regional and national implementation
12:10	Satellite architecture in support to Climate services - P. Counet, CGMS/EUMETSAT
12:30	*Lunch break*

Tuesday 9 September 2014 (pm)	
Session 5 - Climate research and applications	
Chairperson: J. Garané, Burkina Faso	
Rapporteurs: S. Wannop, EUMETSAT + T. Dubé, SAWS	
14:00	Satellite-based Climate Information for Africa: Introducing the data sets and services from the CM SAF - J. Trentmann, Deutscher Wetterdienst
14:20	Precipitation Characteristics and Extremes Simulated by CORDEX Regional Climate Models: Model Evaluation and Future Projections - M.Shongwe, SAWS
14:40	Development and exploitation of a 30 year, temporally consistent satellite rainfall dataset for Africa - R. Maidment, University of Reading
15:00	Enhancing National Climate Services - T. Dinku, International Research Institute for Climate and Society
15:20	Southern and Western African Science Service Centre for Climate Change and Adaptive Land Management (SASSCAL-WASCAL) activities and status of GPCC - J. Trentmann, Deutscher Wetterdienst
15:40	
16:00	Q&A, discussion
16:10	*Coffee break*
Session 6 - Marine and Operational Oceanography	
Chairperson: D. Kuitsouc, CEEAC	
Rapporteurs: M. Higgins, EUMETSAT + G. Wiafe, Univerity of Ghana	
16:30	JCOMM perspectives for Africa - Overview - J. Stander, SAWS
16:50	OceanSAfrica: Integrated marine observation, monitoring and forecasting - C. Whittle, Council for Scientific and Industrial Research
17:10	Maritime domain awareness and safety in support of the Marine Industry - M. Lysko, South African Maritime Safety Authority
17:30	MESA Thema in the Indian Ocean - B. Motah, Mauritius Oceanographic Institute
17:50	MESA ECOWAS Marine Thema - G. Wiafe, University of Ghana
18:10	Q&A, discussion
18:20	Introduction to the three parallel Mini Workshops:
	A: Training Centre activities in Africa
	B: Numerical Weather Prediction for Disaster Risk Management
	C: Africa Space Programme: EO data needs and access
18:40	Information on the Technical Visit - SANSA and Maropeng (N. Kroese, SAWS)
19:00	*Cocktail dinner, hosted by EUMETSAT - Kopanong Conference Centre*

Wednesday 10 September 2014			
Session 6 - Parallel Mini-Workshops			
Chairperson: A. Makarau, AMCOMET			
Rapporteur: V. Gabaglio, EUMETSAT			
08:30- 11:30	**Session 7A - Regional Training Centre activities**	**Session 7B - Numerical Weather Prediction for Disaster Risk Management**	**Session 7C - African Space Programme: EO data needs and access**
Chairperson:	W. Jordaan, SAWS	B. Lamptey, ACMAD	J. Olwosh, SANSA
Rapporteur:	M. Higgins, EUMETSAT	S. Wannop, EUMETSAT	E. Barisano, EUMETSAT
Coffee break for 10-15 minutes at approximately 10:00, to be decided by each Chairperson			
Technical visit			
11:30	*Collection of packed lunches*		
11:45	*Departure for the Technical Visit (from Kopanong Conference Centre)*		
13:30	Group I: Visit of SANSA Observation Station		
	Group II: Visit of Cradle of Humankind		
15:00	*Bus departure for second part of visit*		
15:30	Group I: Visit of Cradle of Humankind		
	Group II: Visit of SANSA Observation Station		
17:00	*Bus departure for dinner*		
18:00	*Dinner hosted by EUMETSAT - Lesedi Cultural village*		
20:30	*Bus departure from restaurant*		
22:00	*Arrival back at Kopanong Conference Centre*		

Thursday 11 September 2014 (am)	
Session 7 - Parallel Mini-Workshops continued	
Chairperson: A. Makarau, AMCOMET	
Rapporteur: V. Gabaglio, EUMETSAT	
09:00	Reports from the parallel Mini-Workshops (10 minutes each)
Session 8 - MESA project	
Chairperson: O. Ojo, ACP Secretariat	
Rapporteurs: S. Flasse, EUMETSAT + F. Nsadisa, SADC-CSC	
09:30	MESA status of implementation - J. Wasambo, AUC
09:50	Upgrade of the PUMA 2010 stations (towards PUMA 2015) and AMESD stations - L. Verelst, MESA
10:25	Presentation of the e-station and its evolution - M. Clerici, Joint Research Centre
10:45	*Coffee break*
11:00	MESA training programme for NMHS - R. Brown, MESA training
11:20	MESA in SADC region (Agricultural and Environmental Resources Management) - F. D. Nsadisa SADC CSC, I. Kusane, BDMS
11:35	MESA in IGAD region (Land Degradation assessment, Natural Habitat Conservation, Forest management and climate change monitoring) - Z. Atheru, ICPAC
11:50	MESA in the ECOWAS region (Water monitoring for Cropland and Rangeland management) - K. Bouafou, I. Aflari, AGRHYMET
12:05	MESA in the CEMAC region (Water Monitoring for fluvial transportation and environmental assessment) - G. Gulemvuga, CICOS
12:20	Q&A, discussion
12:30	*Lunch*

Thursday 11 September 2014 (pm)	
Session 9 - Satellite applications in Africa	
Chairperson: H. Mudau, South Africa Department of Science and Technology	
Rapporteurs: J. Kerkmann, EUMETSAT + J. Olwoch, SANSA	
14:00	Initiative in North Africa - A. Nmiri, NMS Tunisia
14:15	Utilization of WMO online resources to Improve Awareness and Use of Satellite Products - G. Cheelo, WMO
14:30	Satellite tools for nowcasting in the African region - E. de Coning , SAWS
14:50	Use of satellite derived data in monitoring thunderstorm clouds in Kenya - E. M. Chanzu, Kenya Meteorological Department
15:10	Use of EUMETCast at regional meteorological branch offices in Ethiopia - K. Fekadu, Ethiopian Meteorological Agency, B. Maathuis, ITC
15:30	AFIS fire detection system - P. Frost, Council for Scientific and Industrial Research
15:50	Analysis of forest fires impact in Semi-Arid zones and identification of desertification process in Algeria - A. Zegrar, Algerian Centre of Space Techniques
16:10	*Coffee break*
16:30	Land Surface Analysis SAF products and activities - J. L. Roujean LSA SAF
16:50	The TAMSAT Group; satellite rainfall products and activities within Africa - E. Black, University of Reading
17:10	Enhancing African EO capacities for agriculture and forestry management as contribution to GEOSS: the AGRICAB project - AGRICAB partner, T. Jacobs, VITO
17:30	AERUS-GEO (Aerosol and surface albEdo Retrieval Using MSG SEVIRI) - J. L. Roujean, Météo Fr.
17:50	Q&A, discussion
18:00	*End of day*
Friday 12 September 2014	
09:00	Feedback form - 11th User Forum in Africa
Session 10 - Review of the main recommendations	
Chairperson: V. Gabaglio, EUMETSAT	
Rapporteurs: S. Flasse, EUMETSAT + N. Kroese, SAWS	
09:15	Report by NMHS on 10th UFA recommendations #5 and #35 (South Africa and Ethiopia on Use of EO for Renewable Energy) (Zambia, Burkina Faso and Sudan on national use of EO)
11:00	Coffee break
11:20	Adoption of the 11th User Forum recommendations
11:30	**Closing remarks**
12:30	*Lunch break*
End of forum, departure of participants	

BENONI STATEMENT ON THE GLOBAL FRAMEWORK FOR CLIMATE SERVICES IN AFRICA

Benoni, South Africa, 7 September 2014

DÉCLARATION DE BENONI SUR LE CADRE MONDIAL POUR LES SERVICES CLIMATOLOGIQUES EN AFRIQUE

Benoni, Afrique du Sud, 7 septembre 2014

The Representatives of the African Union Commission (AUC), the Republic of South Africa, the Regional Economic Communities (Economic and Monetary Community of Central Africa – CEMAC, Economic Community of Central African States – ECCAS, Economic Community of West African States – ECOWAS, Intergovernmental Authority on Development – IGAD and Indian Ocean Commission – IOC) and the Secretariat of the African, Caribbean and Pacific (ACP Secretariat) Group of States (hereafter The Participants),

in the presence of the representatives of the World Meteorological Organization (WMO), the Intergovernmental Board on Climate Services (IBCS), the European Union (EU), the European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT), the African Regional Climate Centres (ACMAD, AGRHYMET and ICPAC);

Convening in Benoni, South Africa, at the invitation of the co-Chairs of the GFCS-ACP Task Team (the African Union Commission and the ACP Secretariat), on the basis of their respective mandates and responsibilities to address issues and impacts related to climate change and climate variability and to enhance regional integration;

Recalling the Addis Ababa Declaration of 30 September 2012, which called for the implementation of the Global Framework for Climate Services (GFCS) in Africa to enable better management of risks associated with climate variability and change, through the development and incorporation of science-based climate information and prediction into planning, policy and practice on continental, regional and national scale;

Les représentants de la Commission de l'Union africaine (CUA), de la République d'Afrique du Sud, des Communautés économiques régionales (Communauté économique et monétaire de l'Afrique centrale – CEMAC, Communauté Économique des États de l'Afrique Centrale – CEEAC, Communauté économique des États de l'Afrique de l'Ouest – CEDEAO, Autorité intergouvernementale pour le développement – IGAD et Commission de l'Océan indien – COI), du Secrétariat du Groupe des États de l'Afrique, des Caraïbes et du Pacifique (Secrétariat ACP) (dénommés ci-après les Participants),

en présence des représentants de l'Organisation météorologique mondiale (OMM), du Conseil intergouvernemental des services climatologiques (IBCS), de l'Union européenne (UE) en Afrique du Sud, de l'Organisation européenne pour l'exploitation de satellites météorologiques (EUMETSAT), des Centres régionaux africains sur le climat (ACMAD, AGRHYMET et ICPAC) ;

Réunis à Benoni, Afrique du Sud, sur l'invitation de la co-présidence de l'Équipe spéciale CMSC-ACP (Commission de l'Union africaine et Secrétariat ACP), sur la base de leurs mandats et responsabilités respectifs visant à répondre aux problèmes et aux incidences des changements et des variations climatiques et à renforcer l'intégration régionale ;

Rappelant la déclaration d'Addis-Abeba du 30 septembre 2012, qui appelait la mise en œuvre du Cadre mondial pour les services climatologiques (CMSC) en Afrique afin de permettre une meilleure gestion des risques liés aux changements et aux variations climatiques, à travers la production d'informations et de prévisions climatologiques scientifiquement fondées et leur prise en compte dans les processus de planification, d'élaboration des politiques et de mise en pratique aux échelles continentale, régionale et nationale ;

Noting that the Integrated African Strategy on Meteorology (Weather and Climate Services), which was approved during the Second Session of AMCOMET in October 2012, in Victoria Falls, Zimbabwe and subsequently endorsed by the African Union Assembly of Heads of State and Government, in Addis Ababa, Federal Democratic Republic of Ethiopia in January 2013 includes the Addis Ababa Declaration and recognized the role of weather and climate services as essential components in national and regional development frameworks for the sustainable development of Africa; **further noting** that the Strategy is a key mechanism for the implementation of GFCS in Africa;

Notant que la Stratégie africaine intégrée sur la météorologie (services météorologiques et climatologiques), approuvée lors de la deuxième session de l'AMCOMET à Victoria Falls, Zimbabwe, en octobre 2012, et adoptée ensuite par l'Assemblé des chefs d'État et de gouvernement de l'Union africaine à Addis-Abeba, la République démocratique fédérale d'Éthiopie, en janvier 2013, inclut la Déclaration d'Addis-Abeba et reconnaît le rôle des services météorologiques et climatologiques comme composantes essentielles des cadres de développement nationaux et régionaux pour le développement durable en Afrique ; **notant en outre** que cette Stratégie est un mécanisme clé pour la mise en œuvre du CMSC en Afrique ;

Acknowledging that the African Ministerial Conference on Meteorology (AMCOMET), a joint initiative of the World Meteorological Organization (WMO) and the African Union Commission (AUC), is the high-level body endorsed by the African Union Heads of State and Government and the WMO Congress, as the inter-governmental authority on meteorology, which advises and provides policy and political guidance to AU Heads of State and Government on all matters related to the development of weather and climate services and their application in Africa;

Prenant acte que la Conférence ministérielle africaine sur la météorologie (AMCOMET), initiative menée conjointement par l'Organisation météorologique mondiale (OMM) et la Commission de l'Union africaine (CUA), est un organe de haut niveau approuvé par les chefs d'État et de gouvernement des pays membres de l'Union africaine et par le Congrès de l'OMM comme étant l'autorité intergouvernementale en matière de météorologie, qui conseille les chefs d'État et de Gouvernement de l'UA et les oriente sur les stratégies et politiques à mener sur tous les aspects liés au développement de services météorologiques et climatologiques et à leur application en Afrique ;

Recognizing that the WMO Extraordinary Congress in October 2012 established the Intergovernmental Board on Climate Services (IBCS) and endorsed the adoption of the Global Framework for Climate Services (GFCS) Implementation Plan; and **further recognizing** that GFCS is the mechanism for coordinated actions to enhance the quality, quantity and application of climate services at global, regional and national levels;

Reconnaissant que le Congrès extraordinaire de l'OMM réuni en octobre 2012 a mis en place le Conseil intergouvernemental des services climatologiques (IBCS) et entériné l'adoption du Plan de mise en œuvre du Cadre mondial pour les services climatologiques (CMSC) ; et **reconnaissant en outre** que le CMSC est le mécanisme permettant de coordonner les actions entreprises pour améliorer la qualité, la quantité et les applications des services climatique aux échelles mondiale, régionale et nationale ;

Considering that the IPCC 5th Assessment Report: *Climate Change 2014: Impacts, Adaptation, and Vulnerability*, clearly states that "Africa as a whole is one of the most vulnerable continents due to its high exposure and low adaptive capacity" to climate change and, which enumerates impacts of climate change and variability in various socio-economic sectors;

Considérant que le 5e Rapport d'évaluation du GIEC : *Changements climatiques 2014 : conséquences, adaptation et vulnérabilité,* qui énonce clairement que « l'Afrique dans son ensemble est l'un des continents les plus vulnérables en raison de sa forte exposition et de ses faibles capacités d'adaptation » aux changements climatiques, et qui énumère les incidences des changements et des variations climatiques dans différents secteurs socio-économiques ;

Acknowledging the outcomes of the Third UN Conference on Small Islands Developing States (SIDS), held on 1-4 September 2014, in Samoa, in particular as it relates to SIDS in ACP regions, stating "sea-level rise and other adverse impacts of climate change continue to pose a significant risk to small island developing States and their efforts to achieve sustainable development and, for many, represent the gravest of threats to their survival and viability, including, for some, through the loss of territory.";

Prenant acte des conclusions de la troisième Conférence des Nations Unies sur les petits États insulaires en développement (PEID) qui s'est tenue du 1er au 4 septembre 2014 à Samoa, en particulier en ce qui concerne les PEID des régions ACP, indiquant que l'augmentation du niveau de la mer et les autres impacts adverses du changement climatique continuent à poser un risque significatif aux Etats insulaires en développement et à leurs efforts pour atteindre un développement durable et, pour bon nombres d'entre elles, représentent la pire des menaces à leur survie et viabilité, y compris, pour certaines, à travers la perte de territoire ;

Recalling the European Commission Communication on "Increasing the impact of EU Development Policy: an Agenda for Change" of 2011, that expressed the will of the EU to support developing countries in tackling climate change and building resilience capacities;

Rappelant la Communication de la Commission européenne intitulée « Accroître l'impact de la politique de développement de l'UE : un programme pour le changement » de 2011, exprimant la volonté de l'UE d'aider les pays en développement à faire face aux changements climatiques et à se doter de capacités de résilience ;

Taking into account the European Commission's stated intent to allocate at least 20% of its €960 billion overall Multiannual Financial Framework for the 2014-2020 period to climate change-related action[1];

Tenant compte de l'intention déclarée de la CE d'affecter au moins 20 % des 960 milliards d'euros de son cadre financier multi annuel pour la période 2014-2020 à des mesures liées aux changements climatiques[1];

[1] http://ec.europa.eu/clima/policies/finance/budget/index_en.htm

Appreciating the outcomes of the 3rd EU-Africa Summit of April 2014, in Brussels, Belgium, that complemented the Joint EU-Africa strategy with a roadmap to provide a framework for the EU-Africa relations and issued the EU-Africa Ministerial Statement on Climate change, which indicates the joint commitment to, "build upon existing cooperation such as implementation of the Integrated African Strategy on Meteorology (Weather and Climate Services)";

Se félicitant des conclusions du 3ème Sommet UE-Afrique d'avril 2014 à Bruxelles, Belgique, venant compléter la stratégie conjointe UE-Afrique avec une feuille de route fournissant un cadre pour les relations UE-Afrique, et aboutissant à la déclaration ministérielle de l'UE et de l'Afrique sur le changement climatique, laquelle indique l'engagement conjoint à « développer la coopération existante, comme la mise en œuvre de la Stratégie africaine intégrée sur la météorologie (services météorologiques et climatologiques) » ;

Referring to the creation of a GFCS-ACP Task Team to promote the implementation of the GFCS in Africa, Caribbean and Pacific regions, particularly to define and assist in the mobilisation of the necessary resources for a GFCS-Africa, Caribbean and Pacific (GFCS-ACP) programme;

Se référant à la création de l'Équipe spéciale CMSC-ACP pour promouvoir la mise en œuvre du CMSC dans les régions de l'Afrique, des Caraïbes et du Pacifique, en particulier pour définir et soutenir la mobilisation des ressources nécessaires à un programme CMSC-Afrique, Caraïbes, Pacifique (CMSC-ACP) ;

Acknowledging the interest demonstrated by Pacific and Caribbean Regions of the ACP in supporting the implementation of GFCS in their regions; **welcoming** the representation of those regions in the Task team;

Prenant acte de l'intérêt manifesté par les régions du Pacifique et des Caraïbes du Groupe ACP en faveur de la mise en œuvre du CMSC dans ces régions ; **saluant** la représentation de ces régions au sein de l'Équipe spéciale ;

Welcoming the work of the GFCS-ACP Task Team that identified gaps and needs to build or strengthen existing capacities for implementing GFCS in the African, Caribbean and Pacific regions, which will form the basis for the formulation of a GFCS-ACP programme;

Saluant le travail de l'Équipe spéciale CMSC-ACP, qui a recensé les lacunes et les besoins de renforcement des capacités existantes en vue de la mise en œuvre du CMSC dans les régions de l'Afrique, des Caraïbes et du Pacifique, formant la base de l'élaboration d'un programme CMSC-ACP ;

The participants,

Les Participants,

Mindful that climate change poses a major threat to sustainable growth and development in Africa, negatively affecting socio-economic activities such as food security and agriculture, fishing and aquaculture, water resource management, disaster resilience, human settlements, hydro-power and renewable energy, and health and public safety;

Conscients que les changements climatiques représentent une menace majeure pour la croissance et le développement durables en Afrique, ayant un effet néfaste sur les activités socio-économiques telles que la sécurité alimentaire et l'agriculture, la pêche et l'aquaculture, la gestion des ressources hydriques, la résilience face aux catastrophes, l'établissement humain, les énergies hydroélectrique et renouvelable, et la santé et la sécurité publique ;

Are Convinced that a GFCS-ACP programme will:

Sont convaincus qu'un programme CMSC-ACP :

- **Facilitate** the coherent development and provision of climate services at the continental, regional and national levels, and **allow** for the streamlining of climate information in various regional priority areas (food security and agriculture, natural resources management, fishing and aquaculture, water resource management, disaster risk management, building community resilience, human settlements, hydro-power and renewable energy, and health and public safety); and

- **facilitera** le développement et la prestation cohérents de services climatologiques aux niveaux continental, régional et national et **permettra** de rationaliser les informations sur le climat dans différents domaines prioritaires au niveau des régions (sécurité alimentaire et agriculture, gestion des ressources naturelles, pêche et aquaculture, gestion des ressources hydriques, gestion du risque des catastrophes, construire la résilience communautaire, établissement humain, énergies hydroélectrique et renouvelable, santé et sécurité publique ;

- **Support** decision-making processes in their region and countries related to climate risk management, mitigation and adaptation to build socio-economic resilience through environmental conservation.

- **soutiendra** les processus décisionnels dans la région et dans leurs pays en matière de gestion et d'atténuation des risques climatiques et d'adaptation à ces risques pour établir' une résilience socio-économique via la préservation de l'environnement ;

- **Support** the implementation of the Integrated African Strategy on Meteorology (Weather and Climate services) and Regional Meteorological and Hydrological Programs in Africa in building capacity of National Meteorological and Hydrological Services and Regional Climate Centres.

- **soutiendra** la mise en place de la Stratégie africaine intégrée pour la météorologie (services temps et climat) et les Programmes régionaux météorologiques et hydrologiques en Afrique pour le renforcement des capacités des Services météorologiques nationaux et les Centre régionaux climatiques.

On these grounds, the Participants:

- **Reaffirm** their support to the Global Framework for Climate Services, the Integrated African Strategy on Meteorology (Weather and Climate Services) and the Addis Ababa Declaration;
- **Commit** to continue providing support for the implementation of GFCS in their region;
- **Request** the African Union Commission to engage with the EU to highlight the relevance of a GFCS-ACP specific programme to the Joint EU-Africa Partnership;
- **Request** the ACP Secretariat to engage with the EU to secure financial support for a "GFCS-ACP programme" within the 11th EDF framework and initiate project definition and preparation.

The Participants also kindly request the South African Minister of Environment to:

- Draw the Benoni Statement to the attention of the Intergovernmental Board on Climate Services;
- Draw the Benoni Statement to the attention of the Third Session of AMCOMET.

The Participants also kindly request the African Union Commissioner to:

- Draw the Benoni Statement to the attention of the African Regional Economic Communities (SADC, ECOWAS, ECCAS, IGAD, CEMAC and IOC) and the ACP Secretariat;
- Draw the Benoni Statement to the attention of the international community and to the European Union in particular.

Done in Benoni, South Africa, on Sunday 7 September 2014.

Compte tenu de ce qui précède, les Participants :

- **réaffirment** leur soutien au Cadre mondial pour les services climatologiques, à la Stratégie africaine intégrée sur la météorologie (services météorologiques et climatologiques) et à la Déclaration d'Addis-Abeba ;
- **s'engagent** à continuer de soutenir la mise en œuvre du CMSC dans leur région ;
- **demandent** à la Commission de l'Union africaine de s'engager avec l'UE pour souligner la pertinence d'un programme spécifique CMSC-ACP pour la Partenariat commun UA-Afrique ;
- **demandent** au Secrétariat de l'ACP de s'engager avec l'UE à assurer un soutien financier à un « programme CMSC-ACP » dans le cadre du 11e FED et de lancer la définition et la préparation du projet.

Les Participants invitent également la Ministre sud-africaine de l'environnement à :

- **porter** la Déclaration de Benoni à l'attention du Conseil intergouvernemental des services climatologique ;
- **porter** la Déclaration de Benoni à l'attention de la troisième session de l'AMCOMET.

Les Participants invitent également la Commissionnaire de l'Union Africaine à :

- **porter** la Déclaration de Benoni à l'attention des Communautés économiques régionales (SADC, CEDEAO, CEEAC, IGAD, CEMAC et COI) et au Secrétariat ACP ;
- **porter** la Déclaration de Benoni à l'attention de la communauté internationale et, en particulier, de l'Union européenne.

Fait à Benoni, Afrique du Sud, le dimanche 7 septembre 2014.

For the African Union Commission,
Pour la Commission de l'Union Africaine,
H.E. Rhoda Peace Tumusiime, Commissioner for Rural Economy and Agriculture

For the Republic of South Africa
Pour la République d'Afrique du Sud,
H.E. Edna Molewa, Minister of Environmental Affairs

11th EUMETSAT User Forum in Africa
8-12 September 2014, South Africa

List of Participants

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11th EUMETSAT User Forum in Africa
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11th EUMETSAT User Forum in Africa
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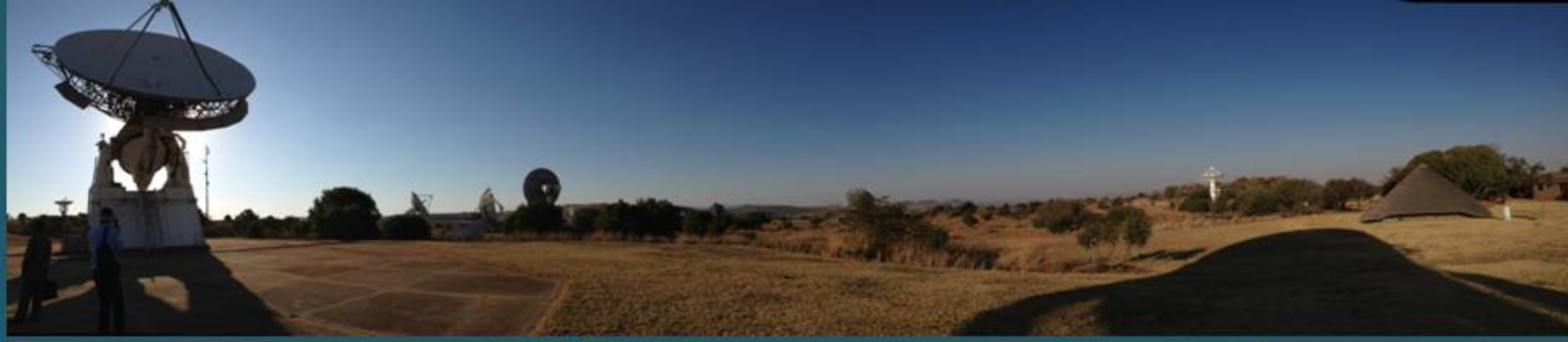


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