SARCOF3: Post-Season Assessment - May 1998

In May 1998, a third meeting was held in Pilanesberg, South Africa, to assess the skill and usefulness of the forecasts from the first two meetings from the perspective of the scientific and user communities. This meeting included many of the forecast information producers from earlier meetings and representatives of the broader regional user community, including: agriculture and food security, water resources, health, and forestry. User participation stimulated user-producer dialogue by providing an opportunity for feed-back regarding forecast content, format, lead-time, delivery, and distribution. Activities at the Pilanesberg meeting included:

- User assessments of forecast performance and dissemination, including a preliminary assessment of the benefits of the Outlook for core group users;
- Assessment of the value of the predictions;
- Identification of relationships between elements of climate prediction and user activities, gaps in production and dissemination, and impediments to optimal use of forecasts; and
- Adjustment of the consensus methodology to better address user needs.

Successes of SARCOF and areas for improvement according to participants of the Post-Season Assessment Meeting are listed in the following table.

Due to the overall success of the 1997-98 process, SARCOF has continued into the 1998-99 season, with the goal of furthering previous accomplishments by addressing the needs and areas for improvement listed above. Of primary importance is the refinement of the consensus forecast process through statistical verification methods, and improved collection of climate data, for both the creation of empirically-based projections and for evaluation of the consensus forecasts. Long-term financing of SARCOF is necessary, and will be gained only through demonstrating the benefits of consensus climate forecasts to potential national, regional, or international sponsors. Increased involvement from regional and sub-regional institutions and NMHS will help 1) overall coordination and planning of forecast creation and dissemination, 2) increase regional capacity to utilize forecast information, and 3) create a sense of ownership critical to sustaining SARCOF.

Workshop participants at the SARCOF Meetings and other individuals interested in making use of early warning climate information have proposed several applications pilot projects. A list of pilot projects conducted during the 1997-98 rainfall season is included in the section on the Pilot Program for the Application of Climate Forecasts in Africa. Several other proposals are expected to be funded by members of an interagency group in time for the 1998-99 rainy season.

SARCOF SUCCESSES AND NEEDS -- POST-SEASON ASSESSMENT MEETING[25]

	Successes	Needs -- Areas for improvement
General Awareness	- Forecast consensus throughout region - Increased awareness of climate factors and forecasts amongst users - Use of media and increased publicity - Internet access to IRI, NOAA, UKMO, etc.	- El Niño often equated with drought conditions - Confusion between below-normal conditions and drought - Superstitions conflicted with forecast usage - Many users don't understand that seasonal forecasts are experimental - Outlook didn't get to small farmers - Formal forecast dissemination structures needed - NMHS not the first source of forecasts - Outlook results evaluated too hastily by users - Media overemphasized Outlook certainty - Bolder NMHS efforts needed to control misleading information from news media - Packaging of forecast information not user friendly - Need for uniform definitions for drought and other climate terms
Science	- Consensus process resulted in fewer conflicting forecasts - Users informed forecasters of requirements - Users educated about terciles and exposed to forecast limitations - Better public understanding of climate teleconnections - Forecast lead time generally adequate - Predictors and climate factors identified - Diagnosed peculiarities of El Niño signal at mid-season - Started process of understanding interactions of large scale atmospheric flow patterns with smaller scale climate anomalies	- Inadequate spatial and temporal forecast resolution - Some forecasters overconfident in their predictions - Forecast periods do not adequately address differences in seasonal timing across the region - Forecast lead-time not adequate for some users - No objective method to blend the forecasts - Difficult to maintain forecast standards - Individual forecast inputs to Outlook not equally weighted - Outlook consensus building still formative - Understanding of physical climate processes weak - Too much emphasis on El Niño for forecast creation at the expense of other factors (e.g., South Atlantic SSTs) - Increase monitoring & studies of Indian Ocean and its effect on southern Africa climate - Users lack full understanding of probabilities, terciles - Terciles inadequate - extreme events need coverage - Need for forecast in Geographic Information System format - No sectoral interpretation (e.g. food security) for forecast by SARCOF - Historical forecast information needed - Improve regional rainfall observation network

[25]This is a condensed version of the successes and needs list created at the Post-Season Assessment Meeting. For a complete list please contact NOAA-OGP.

	Successes	Needs -- Areas for improvement
Prepared-ness	- USAID complementary of SADC's role, led to increased preparedness - Facilitated long-term planning - Increased awareness of risks and feeling something can be done - Helped establishment of disaster management committees - Focused government response	- Difficult to manage user perceptions into useful mitigation strategies - Plans for response must be further developed - Governments generally did not have drought plans
Results	- Very accurate forecast for Namibia and Tanzania - User appreciation, particularly in Namibia, Zimbabwe, Tanzania, and Mozambique - Users able to provide value-added service for other end users - Forecast impact on markets - Namibia agriculture ministry adapted agronomic trials - Aided Namibia farmers decision-making - Reinforced crop diversification in Malawi & Zambia - Stock farmers stored feed in South Africa and bought animals during favorable grazing conditions	- Poor forecast in some countries - Increased market volatility - Users did not always have capacity to adjust decisions according to forecast - Users interpretation of information did not always lead to good management solutions - Small farmers who made poor decisions based on forecasts became skeptical - Some farmers regretted not using information - Suspension of water rights and loss of water distribution in some parts of Zambia
Institutional Issues and User-Science Interactions	- Enhanced communication with users - Highlighted critical value of NMHS - Collaborative efforts of international climate information community - Emphasized capacity building - Greater awareness & interaction between users, NMHS and governments - Users involved in SARCOF process	- Capacity building not addressed fully for users and NMHS - Lack of regional SARCOF contacts - Users still thinking in deterministic terms - No training program to enable NMHS to do forecasts - Users need further help to understand probabilistic forecasts - Inadequate definition of users - Incomplete understanding of when decisions based on forecast are made - Wider net of user sectors necessary - forestry, wildlife, fisheries, etc. - Clearly define user needs and profiles - Recommendations for mitigation strategies should be tied to existing methods for coping with climate variability - Continued monitoring of users' reaction - SARCOF process needs support from NMHS directors - Institutionalize SARCOF within existing SADC institutions for sustainability - Strengthen NMHS/stakeholder interface

SARCOF Survey Results

Echoing many of the suggestions from the Post-Season Assessment meeting, results from a survey of climate forecast users indicate that the SARCOF Climate Outlooks were of value, but require improvements. Survey results were complied and analyzed at the Natural Resources Institute, University of Greenwich, United Kingdom. Most respondents indicated that they used SARCOF climate forecast information in their decision-making during 1997-98. Decisions affected included:

- Timing and type of agricultural planting;
- Disaster (particularly drought) prevention and mitigation strategies;
- Epidemic forecasting and preparedness (e.g. malaria);
- Preparation for migratory pest outbreaks;
- Public water usage; and
- Electrical power generation strategies.

The majority of respondents indicated that in light of this experience, if similar forecast information were available during 1998-1999, it would again be incorporated into their decision-making processes. Responses to the SARCOF Survey also called for improvements in the Outlook product, including:

- Tailoring forecasts to predict dam levels, runoff, soil moisture, etc;
- Providing historical sets of forecasts for comparison;
- Detailing implications of tercile values for agricultural and hydrologic situations;
- Increasing forecast dissemination and explanation by National Meteorological Services;
- Including information on rainfall distribution within the season;
- Providing Outlook in additional formats (e.g. minimum-maximum temperatures); and
- Enhancing Outlook spatial resolution and presenting probabilities in greater detail than terciles (i.e. dividing the forecast into four or more categories).

These suggestions highlight the need for forecast producers to 1) learn more from the users about their forecast requirements, and 2) further educate user communities about the meaning and limitations of the forecasts. These issues can be addressed by continuing the cross-disciplinary dialogue initiated at the Outlook Fora, and through training and education for both forecast users and producers.

Greater Horn of Africa (February 1998) and Western Africa (May 1998) Regional Outlook Fora

As hoped for in the original design concept encouraging self-sufficiency of applications activities, the Outlook Fora held in West Africa and the Greater Horn of Africa were regionally generated without prompting by NOAA-OGP. These two Fora followed the methodology designed and modified by the Southern Africa Regional Outlook Forum. Unlike the SARCOF, however, these regions plan to hold two meetings each year. The Greater Horn of Africa (GHA) experiences two rainy seasons per year, the long rains (March to May) and the short rains (September to December). Hence, the first Outlook Forum was convened in February, 1998, to forecast for the long rains, while their second Outlook Forum in September, 1998 combined a post-season assessment of the long rains Forum with a pre-season meeting for the short rains. West Africa held its first Outlook Forum, Prevision Saisonniere en Afrique de l'Ouest (PRESAO-1), in Abidjan, Ivory Coast in May of 1998, and they plan to hold a post-season assessment meeting in December of 1998.

Both the PRESAO and the GHA Fora focused on building consensus precipitation Outlooks for the upcoming rainy seasons, but, like the regions in Latin America, they took the additional step of adding an applications focus to the Outlook Forum structure. PRESAO added a broad applications workshop which included agriculture, food security, water resources management, health, and environment, while the GHA Forum focused on regional food security and mitigation planning.[26]

The GHA Outlook Forum succeeded in bringing together more than 140 climate scientists and food security experts from all ten countries in the GHA region, along with international experts from other African countries, the IRI, the United States, and Europe. Together these experts dispelled rumors of an impending drought, indicating that risks of widespread dry conditions in the region were low. However, they cautioned that the food security situation in the region remained precarious due in part to poor harvests in early 1997 and excessive rains late in the year. In addition to arriving at a consensus forecast, participants at the Outlook Forum explored ways to use climate forecasts to improve food security in the coming months and in the longer-term. Both climatologists and food security specialists found the direct interaction from this multidisciplinary

[26]The full report of the PRESAO-1 meeting, including working group recommendations is available on the internet through the web pages of NOAA-OGP, ACMAD, and other major sponsors. The GHA Forum report is available from DMC, Nairobi, and from USAID's Famine Early Warning System (FEWS).

encounter valuable: climatologists learned more about tailoring their products to meet the needs of the food security community in the GHA, and food security specialists learned more about what climate forecasting has to offer and how this information might be integrated into disaster mitigation planning.

Outlook evaluation[27]

Rainfall observations indicate the Greater Horn of Africa was unusually dry from March through May, 1998, particularly in Sudan, where rainfall totals were generally less than 50% of normal, and in some regions less than 10% of normal. The Climate Outlook for most of Sudan (climatology), while including the possibility of dry conditions, was inconsistent with observations. Drier than normal conditions in northeast Ethiopia and Somalia were also inconsistent with the forecast of an increased chance of above normal precipitation in this region. The apparent discrepancy between the Outlook and observations is misleading, however, for two reasons: 1) the observation map in this region was based primarily on inaccurate satellite observations and is not representative of true rainfall observations (rain gauge data indicated wetter conditions that were more consistent with the Outlook), and 2) for much of this region, March through May is the dry season, and large departures from average rainfall in percent-normal terms translates to a very small departure in actual rainfall amount. Participants in the GHA Forum generally felt the Outlook was accurate over the forecast period, and a detailed verification similar to the process employed in southern Africa is scheduled to be incorporated into future GHA Fora.

Climate Outlook - Rainfall

Statement from the Greater Horn of Africa Regional Climate Outlook Forum
9-13 February 1998, Nairobi, Kenya

SUMMARY

Near- to above-normal rainfall conditions over the period March-May 1998 are expected over much of the eastern part of the Greater Horn of Africa and equatorial inland areas. The indications for above-normal rainfall are strongest over the coastal parts of northern Tanzania, Kenya, coastal southern Somalia and north-eastern Ethiopia. Near- to above-normal rains are expected over the western part of the area. Near- to below-normal conditions are expected further south and in the central inland areas.

[27]For a description of the qualitative method used to evaluate the Outlook, see Comparison of Climate Outlooks and Observations in the Methodology section.

THE CLIMATE OUTLOOK FORUM

From 9-13 February 1998, a Climate Outlook Forum was convened to formulate consensus guidance for the March-May 1998 season in the Greater Horn of Africa. The Forum reviewed the state of the global climate system and its implications for this region. Among the principal factors taken into account are the major El Niño event of 1997-98 which is now apparently just passing its peak, very warm sea-surface temperatures in the western Indian Ocean, and warmer than normal sea-surface temperatures in the tropical Atlantic The strong El Niño and warm sea-surface temperatures in the western Indian Ocean contributed significantly to the heavy rains over much of the region since October 1997. Although the relationship of sea-surface temperature variability in the Pacific and Indian oceans with the rainfall amounts during October-December over much of the region is relatively clear and well-established, its relationship with the rains from March-May is generally weaker (an exception is north-eastern Ethiopia). As a result, the March-May rains, in contrast to the October-December rains, are more difficult to predict.

METHODOLOGY

The regional climate assessment began with consensus agreement that the current El Niño and associated Indian Ocean sea-surface temperatures are expected to decay gradually over the forecast period (March-May 1998). This and other factors affecting the climate of the Greater Horn of Africa were assessed using coupled ocean-atmosphere models, physically-based statistical models and expert interpretation. The current status of seasonal- to interannual forecasting allows prediction of spatial and temporal averages, and may not fully account for all factors that influence regional and national climate variability. This Outlook is relevant only to seasonal time scales and relatively large areas; local and month-to-month variations may occur. Users are strongly advised to contact their National Meteorological and Hydrological Services for interpretation of this Outlook and for additional guidance.

The experts established probability distributions to indicate the likelihood of below-, near-, or above normal rainfall for each sub-region (see Map). Above-normal rainfall is defined as within the wettest third of recorded precipitation totals in each region; below-normal rainfall is defined as within the driest third of precipitation totals; near-normal is the third centered around the climatological median.

OUTLOOK

March to May constitutes an important rainfall season over the Greater Horn of Africa south of about 6°N, and in north-eastern Ethiopia and eastern Eritrea. An exception is southern Tanzania.

Over the coastal areas extending from northern Tanzania to southern Somalia, normal to above-normal rains are expected. Normal to above-normal rains are also expected over the eastern half of Ethiopia, Somalia, Djibouti and the highlands of Eritrea as well as over Uganda south of 2°N, Rwanda, Burundi, western Tanzania and western Kenya. Near- to below-normal rains are expected over northern Kenya and Uganda, extending northward into southern Sudan and the western half of Ethiopia and Eritrea. Over most of Sudan the rainy season does not start until after the forecast period Therefore climatology is indicated.

PARTICIPANTS

Participants at the Forum included representatives of Meteorological Services from nine countries (Institut Geographique du Burundi; Djibouti Meteorological Department; Meteorological and Hydrological Service of Eritrea; National Meteorological Service Agency, Ethiopia; Kenya Meteorological Department; Direction Nationale de la Meteorologie et de l'Hydrologie. Madagascar; Uganda Meteorological Department; Rwanda Meteorological Service; Directorate of Meteorology, Tanzania) and climate scientists and other experts from national, regional and international institutes (CLIPS WMO; Disaster Prevention and Preparedness Commission Ethiopia; DMC, Nairobi; DMC, Harare; Kenya Meteorological Society; USAID/FEWS, Ethopia, Water Department of Kenya; North Carolina State University; University of Nairobi, IRI; National Centers for Environmental Prediction/NOAA). Additional input was supplied by the UK Meteorological Office

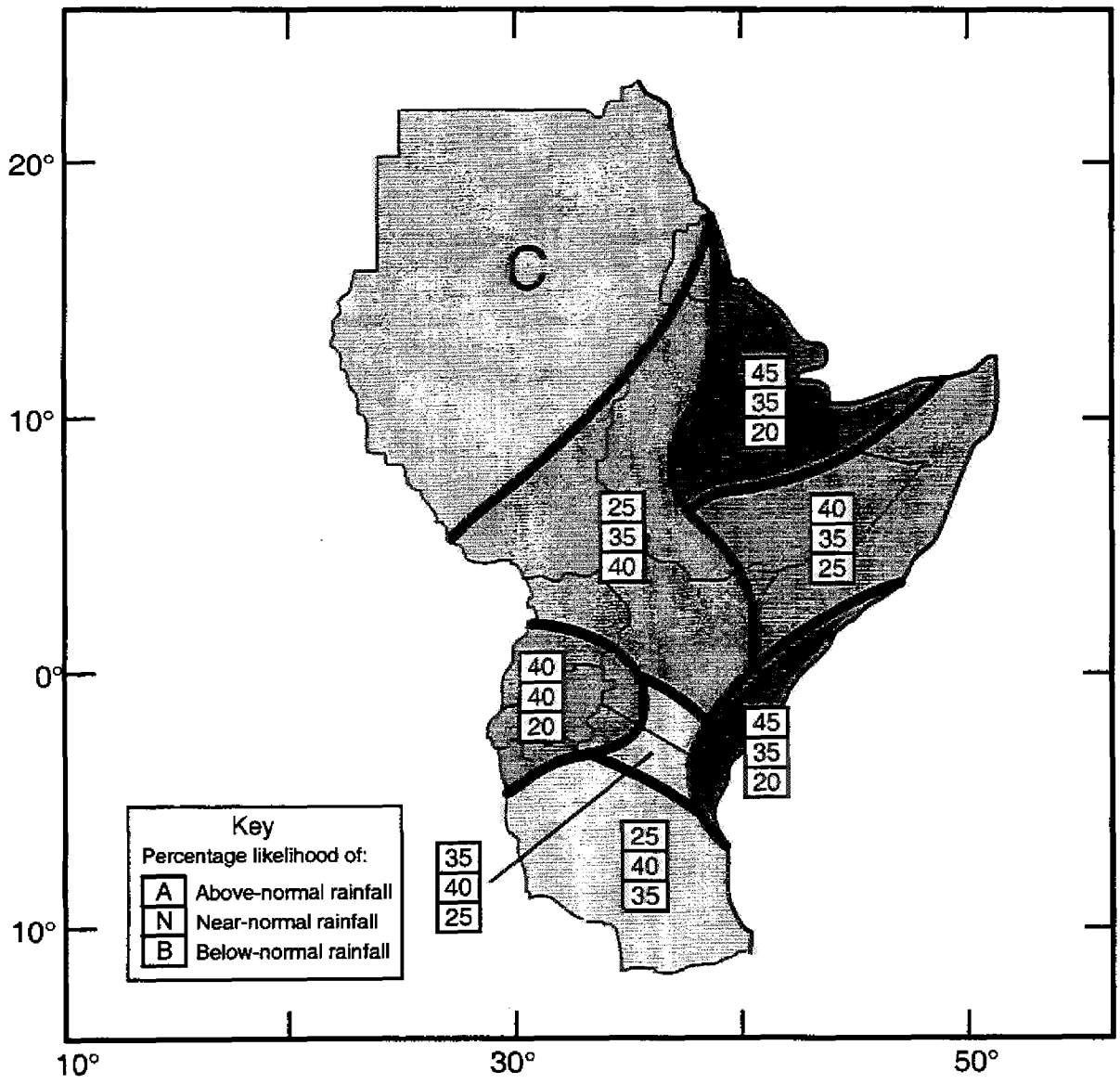
Consensus Climate Guidance

Greater Horn of Africa Regional Climate Outlook Forum

9-13 February, 1998 *Nairobi, Kenya*

(for list of participants and explanatory text see associated discussion)

March - May 1998



Feb. 9-13, 1998

IRI INTERNATIONAL RESEARCH INSTITUTE FOR CLIMATE PREDICTION
EXPERIMENTAL CLIMATE FORECAST DIVISION

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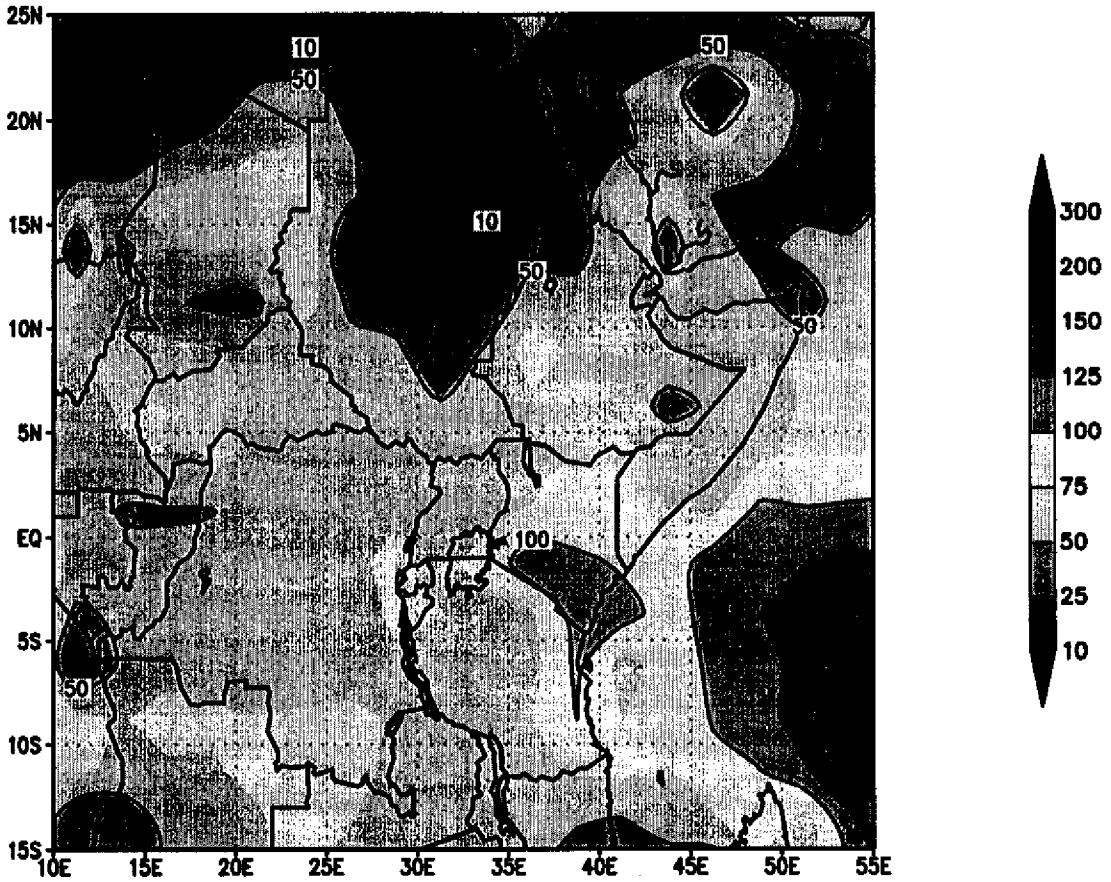

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