Disseminating Agroclimatic Information: Seminars, Bulletins, Web, and SMS

Robert Stefanski
Chief, Agricultural Meteorology Division
Climate and Water Department

Climate Services and Agrometeorology

- Historical Climate Data
- Crop Information
- Basic Soil Information

Simple Crop Model

Crop Advice for Rural Farmers

Example of Crop Planting Advice based on Rainfall

- **Crops:** Millet and Sorghum
- **Crop Cycle:** 90 – 120 days
- 1 – Avoid planting before 10 June, but proceed to make field preparations.
- 2 – From 11 to 30 June, plant long-cycle crops (120 days) as soon as the 10-day cumulative recorded rainfall which reaches or surpasses 20 mm.
- 3 – From 1 to 20 July, plant short-cycle crops (90 days) as soon as the 10-day cumulative recorded rainfall reaches or surpasses 10 mm.

Due to the high spatial variability of rainfall, each farmer or village can make planting decisions based on their own raingauge.

Distribution of Rainguages to Nigerian Farmers

Crop	Development zone	Field type	Area (ha)	Average yield (kg/ha)	Gross income (US$/ha)	Income gain in agromet fields (%)
Pearl millet	OHVN	Agromet	2,600	1,204	175	26
		Non-agromet	67,168	957	139	
	DRAMR	Agromet	750	757	110	10
		Non-agromet	45,790	690	100	
	ORS	Agromet	10,400	1,247	181	48
		Non-agromet	461,915	840	122	
Sorghum	OHVN	Agromet	5,375	1,427	193	42
		Non-agromet	470,996	1,005	136	
	DRAMR	Agromet	28,275	955	129	10
		Non-agromet	222,662	871	118	
	ORS	Agromet	2,850	1,562	212	56
		Non-agromet	179,853	1,002	136	
Maize	OHVN	Agromet	6,075	1,984	249	80
		Non-agromet	27,079	1,105	139	
Groundnut	DRAMR	Agromet	6,060	874	237	25
		Non-agromet	102,113	702	190	

Crop yields and farm incomes for farmers taking management decisions with and without agrometeorological information, in the 2003–2004 season.

"*Agriculture in Mali"* in Climate Risk Management in Africa: Learning from Practice. Hellmuth, M.E., Moorhead, A., Thomson, M.C., and Williams, J. (eds) 2007 IRI

Improving Agrometeorological Bulletins

Proceedings of the Inter-Regional Workshop

15-19 October 2001
Bridgetown, Barbados

AGM-5
WMO/TD No. 1108
World Meteorological Organization

World AgroMeteorological Information Service

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Locust Weather Tools & Resources

Related Web Sites
WMO AgMet
World Weather
Severe Weather
INSAM

Other Links

Mirror Servers
Italy
Republic of Korea

Products Available For:

ACMAD
Albania
Argentina
Australia (2)
Bangladesh
Belgium
Belize
Brazil (2)
Bulgaria
Burkina Faso
Canada
Chile
China
Colombia
Côte d'Ivoire
Cuba
Dominican Republic
DMCSEE
Ecuador
El Salvador
Ethiopia
EU-MARS
Fiji
Gambia
Germany
India
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Malawi
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Mexico
New Zealand (2)
Niger
Nigeria
Pakistan
Peru
Philippines
SADC
Sénégal
Sri Lanka
South Pacific
Swaziland
Tanzania
Turkey
USA (2)

www.wamis.org

Benefits of WAMIS to Members

- WAMIS helps members to disseminate and improve their agro meteorological products.
- As a dedicated web server, it allows countries to place their existing agrometeorological bulletins and advisories on a near real-time basis.
- Provides tools and resources to help members improve the quality and presentation of their agrometeorological bulletins.
- Provides a central location for agrometeorological information so that members can quickly and easily evaluate the various bulletins.

Tools and Resources

- 19 categories of Tools and Resources with over 77 links.
- Climate Forecasts
- Data Management
- Dissemination
- Drought
- Feedback
- Forestry/Fire GIS
- GRADS
- Irrigation/Drainage
- Natural Disasters
- Observations
- Online Training
- Phenology
- Plant/Animal Health
- Rainfall Monitoring
- Remote Sensing
- Soil Erosion
- Statistics
- Weather/Climate Data

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Locust Weather Tools & Resources

Related Web Sites
WMO AgMet
World Weather
Severe Weather

Other Links

Tools and Resources

The following tools and resources were compiled from different sources to aid WMO Members in improving their agrometeorological bulletins and increasing their knowledge of available agrometeorological-related resources.

Climate Forecasts | Data Management | Dissemination | Drought | Feedback | Forestry/Fire | GIS | GRADS | Irrigation/Drainage | Natural Disasters | Observations | Online Training | Phenology | Plant/Animal Health | Remote Sensing | Soil Erosion | Statistics | Weather/Climate Data |

Climate Forecasts and Agriculture

- **Applications of Climate Forecasts for Agriculture (PDF)** Proceedings of an Expert Group Meeting for Africa held 9-13 December 2002 in Banjul, Gambia
- **WMO's Climate Information and Prediction Service (CLIPS)**

Data Management

- An Expert Team Meeting on **Software for Agroclimatic Data Management** was held in Washington, D.C., USA in October 2000 to assess the current status of software for agroclimatic data management and determine the future needs for more efficient management of agroclimatic data to foster improved agroclimatic applications. Participants in the meeting discussed climatic data management, crop and soil data management, remotely sensed data management and integrated packages.
  - **Executive Summary from Expert Team Meeting (PDF)**
  - **Free Software for Agroclimatic Data Management** -- Over 35 links of free software

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Reminder – Keep in Mind

- Providing agrometeorological bulletins through the Internet is ONLY ONE DISSEMINATION METHOD for interacting with users.

- This does not replace direct interactions with users or using other media (newspaper, radio, TV, etc)

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INSAM

Other Links

Mirror Servers
Italy
Republic of Korea

North and Central America

- Belize
- Canada
- Cuba
- Dominican Republic
- El Salvador
- Mexico
- United States of America (2)

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USA-GMU

Caribbean

CAMI Monthly Agrometeorlogical Bulletin

Caribbean Institute for Meteorology and Hydrology (CIMH)
CAMI Monthly Bulletin Web Page

The Caribbean Institute for Meteorology and Hydrology assists with producing a monthly agrometeorological bulletin from the National Meteorological/Hydrometeorological Services of **Antigua and Barbuda, Barbados, Belize, Dominica, Grenada, Guyana, Jamaica, St. Lucia, St. Vincent, Trinidad and Tobago.** The web page provides the latest issue with an archive of previous issues. The bulletin includes information on the Regional Overview on Weather and Climate, National Overviews of ech country, and a Regional Overview on Seasonal Climate Forecast.

This regional bulletin is produced under the guidance of the Caribbean Agrometeorological Initaitve (CAMI) which is adminstered by CIMH with the Caribbean Agricultural Research and Development Institute (CARDI) and WMO as partners. CAMI is funded by the the European Union under the African, Caribbean and Pacific Group of States (ACP) Science and Technology Programme.

Monthly Agromet Bulletins

- **Sep 2012**
- **Aug 2012**
- **Jul 2012**
- **Jun 2012**
- **May 2012**
- **Apr 2012**
- **Mar 2012**
- **Feb 2012**
- **Jan 2012**
- **Jan 2012 - Special**

- **Dec 2011**
- **Nov 2011**
- **Oct 2011**

CAMI MONTHLY BULLETIN

Caribbean Agro-Meteorological Initiative

Enhancing Farming through Weather and Climate Information

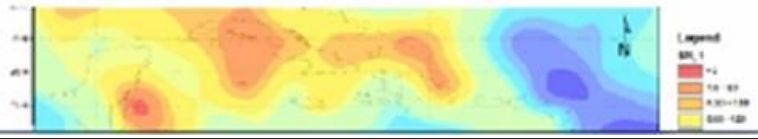
Volume 3 Issue 1 November 2011

ANNOUNCEMENTS

The first phase of farmers' forums is now complete. A second round of forums will take place during 2012. The second round of forums will include crop simulation modeling, crop water use and soil water management, and more on the modeling outcomes in pests and diseases, with information on these being included in 2012 bulletins. CAMI continues to urge the National Meteorological Services to maintain regular contact with their farmers and extension services. The formation of tripartite (meteorologists, farmers and extension officers) committees to take this activity forward at the national level have been recommended and are being pursued. A training workshop on crop simulation modeling takes place in January 2012 at the Caribbean Institute for Meteorology and Hydrology in Barbados. CAMI will continue to encourage and assist its NMS in developing their own national bulletins. CAMI collaborators continue to encourage feedback from farmers and the wider agricultural community on this bulletin.

REGIONAL OVERVIEW ON WEATHER AND CLIMATE FOR NOVEMBER 2011

west to normal in the east. Jamaica was normal, but Belize was normal to abnormally dry.



22 Bulletin/Countries Examined

- Albania
- Bangladesh
- Benin
- Burkina Faso
- Cote D'Ivoire
- Cuba
- Dominican Republic
- Ecuador
- El Salvador
- Ethiopia
- Fiji
- Gambia
- Kenya
- Lesotho
- Mali
- Malawi
- Mauritania
- Niger
- Senegal
- South Pacific
- Swaziland
- Tanzania

Results

- Rainfall Summary (22)
- Temperature (15)
- Agromet Analysis (12)
- Weather Forecasts (9)
- Synoptic Situation (8)
- Highlights (8)
- Crop Status (8)
- Soil Moisture/ Water Balance (6)
- Pest/Disease (5)
- Vegetation (5)
- Hydrology (4)
- Relative Humidity (2)
- Evaporation (2)
- Wind (2)
- Sunshine (1)
- Fisheries (1)
- Prices (1)
- Food Situation (1)
- Maps (12)
- Tables (10)
- Graphs (10)

Next Phase WAMIS Meeting

South Korea May 2010

Meeting Objectives – May 2010

- To review the current status and capabilities of WAMIS
- To survey the current state-of-the-art information technologies and internet tools that have application to agrometeorology;
- To evaluate and identify technologies and tools on their usefulness to global or regional agrometeorological communities and their potential to be hosted on WAMIS;
- To make recommendations on potential new WAMIS applications including the development of draft project proposals

New Technologies

- Several information technologies and internet tools have potential to aid the agrometeorolgical community:
- Web-based GIS tools,
- remote-sensing information,
- Online crop model applications,
- XML standards for agrometeorological bulletins,
- Downscaled model information (gridded evapotransipiration and soil moisture estimates),

New Technologies

- Numerical Weather Prediction information into agrometeorological models (crop, irrigation, pest/diseases),
- Online training and educational modules.
- MODIS applications for Soil Moisture

Future Directions

- Improve access and operation of online bulletins
- Improve Agrometeorological bulletins for members
- Online Applications
- Training Modules
- Partnership with Regional Projects (CAMI, RANET)

Numerical Weather Prediction (NWP) Applications

- Irrigation – scheduling
- Crop Pest and disease forecasting
- Drought Prediction (up to two weeks)
- Statistical Downscaling of NWP
- Animal pest and disease forecasting
- Crop Production forecasting
- Forest Fire Danger Rating & Fire Behaviour

Supporting Agrometeorological Services

Satellite Remote Sensing Data

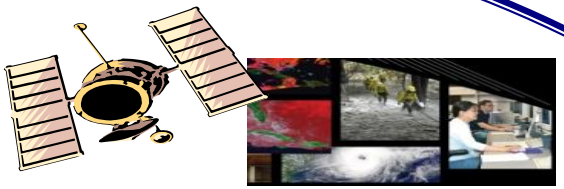
Integrated GIS Agrometeorological Data Products

Soil & Crop Moisture

Together, remotely sensed data and the ground station network will produce *Integrated GIS* agrometeorological data products for the *National Early Warning System*

Next Generation WAMIS System Infrastructure

Ground Measurements



Satellite Remote Sensing and GIS

Soil/Vegetation Moisture Estimation

Modeling and Impact Assessment tools

Decision Support

Agromet Bulletins

Preparation, modernization and distribution of agromet

- Input requirements
- Analytical tools
- Information delivery

Content of Agromet Bulletins

- Significant features of the past and present weather and climatic conditions at the national/regional/local level
- Presented in the form of graphs, tables, drawings, maps, satellite imagery and text. Average and extreme values of meteorological, agrometeorological and hydrometeorological elements are also presented.

Content of Agromet Bulletins

- **Existing agrometeorological conditions.**
- **Written text describes the state and the phases of development of agricultural crops, forest plantations and farm animals. In addition, comments are made on the soil-water regime, the state of agricultural drought, flooding, dangerous conditions of forest management, etc. All this information is complemented with maps, graphs, drawings and tables.**

Content of Agromet Bulletins

- **Forecasted meteorological conditions**
- **Weather and climate is analysed for the next time period that the bulletin will cover. This could be for the next twenty-four (24) hours, for the next forty-eight (48) to seventy-two (72) hours, for the next five (5) days, ten (10) days, month or for the entire cropping season.**

Basic Recommendations 1

- Don’t promise too much to quickly.
- Relate the weather data to meaningful agricultural information.
- Don’t oversell the information.
- Establish credibility slowly but surely.

Basic Recommendations 2

- Be proactive in demonstrating the usefulness of your products.
- Training and education is an essential component.
- Look to pool resources.

WMO OMM

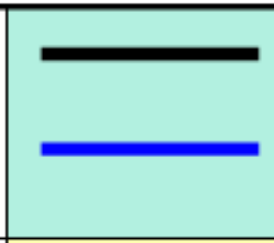
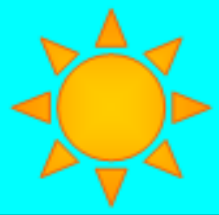
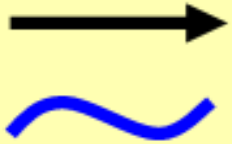
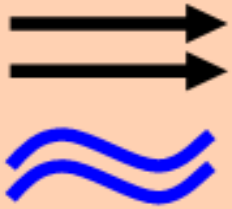
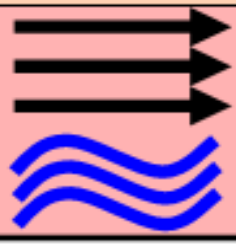
SMS project

Project overview

Every year, around 5’000 fishermen die on Lake Victoria as they face sudden winds and high waves that cause the boat to capsize

KYENVU Kulabula
Atusa Uganda Met Kalangala
02:19 AM 17:02:12
Ekisera: 6am – 6pm
Okulabula: BEERA NGOMANYI
Omuyaga: GW’AMAANYI ENNYO
Embera y?obudde
ENKUBA N’OKUBWATUKA
KW’EGULU WANO
N’AWALI
Wokoma kulaba: WAKIGERO

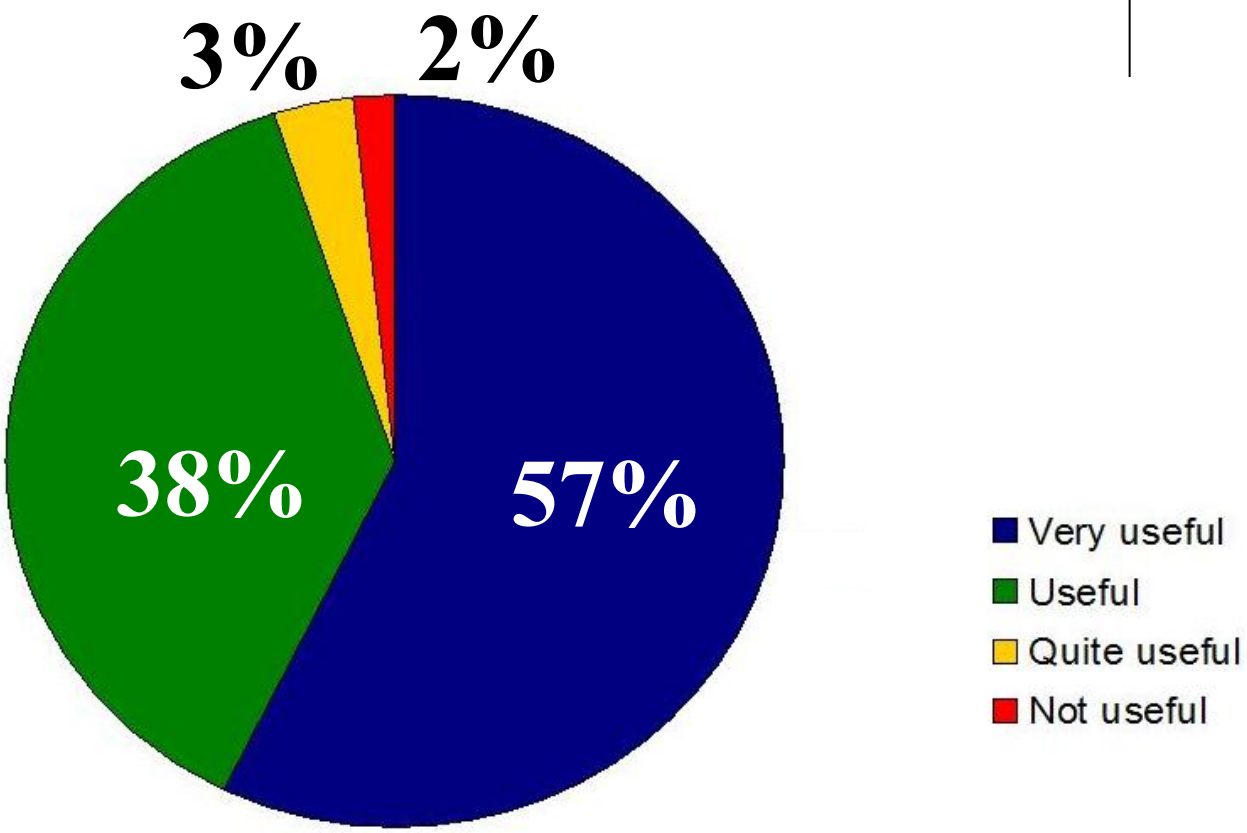
Alert table

Green alert	**No alert:** No hazardous weather expected. Take normal precautions.		
Yellow alert	**Be aware:** There might be changes in the weather. Be watchful and look out for signs of storm such as clouds, wind gusts, higher waves.		
Orange alert	**Be prepared:** The weather is likely to change. Consider moving to safer areas and be prepared to take necessary actions.		
Red alert	**Take action:** The weather will change soon. Take the necessary actions to get to a safe area.		

Namisoke landing site, Bubeke, Kalangala district, February 2012

The usefulness of the service

How would you rate the usefulness of the forecasts that you received?

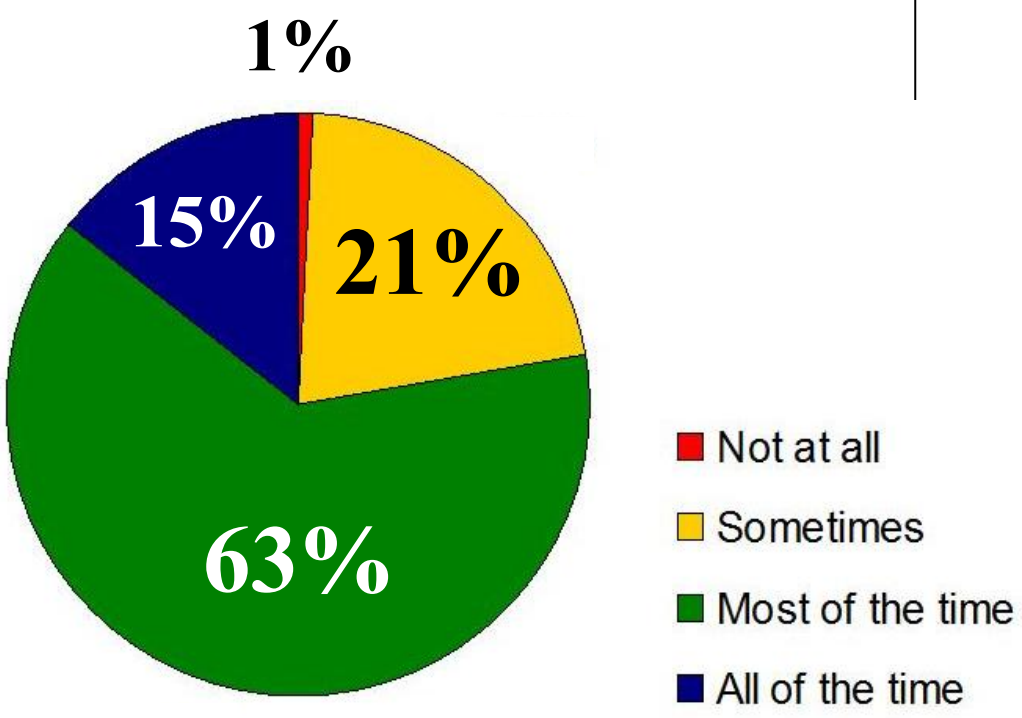


Do you think that the service has improved your safety on the lake?

	N	%
Yes	112	95.73%
No	5	4.27%

Forecast accuracy

The extent to which the responders trust the weather information



Were the forecasts accurate and did the actual weather correspond to the forecast?

	N	%
Yes, everyday	76	65%
A few times a week	9	8%
Occasionally	32	27%
Never	0	0%

What did the responders think about the service?

WHAT DID THE RESPONDERS LIKE ABOUT THE SERVICE?	WHAT DID THE RESPONDERS NOT LIKE ABOUT THE SERVICE?
- It is free of charge - It's in Luganda - It's easy to use - It's understandable and easy to read - SMSs come in time - They value the information	- The alerts are only send out in the morning - some fishermen go fishing during the night - MTN network is a problem - Spelling mistakes - Technical problems: too many SMSs a day meaning the same - SMSs are received too late sometimes

Final Thoughts

- What information does the user need?
- When does the user need this information?
- To answer these questions, there must be an established mechanism ….

…. between information providers (NHMS) & users.

Thank You

World Meteorological Organization

Geneva

Switzerland