

# An Integrated Approach to Excellence

UCAR/NCAR/UOP as leaders in broadening participation in the geosciences





# Why emphasize diversity?

- Global problems require global solutions
- Broader perspectives improve science
- Scientific priorities should be set by all communities
- Our future workforce depends on it
  - A majority-minority USA by 2050
- Excellence demands the largest possible “brain pool”

# Demographics of NCAR Ladder Scientists

<b>Scientific Rank</b>	<b>Total</b>	<b>Women</b>	<b>URM</b>
Director	15	3 (20%)	0
Senior Scientist	63	6 (9.5%)	2
Scientist 3	37	9 (24%)	0
Scientist 2	21	9 (43%)	0
Scientist 1	18	4 (22%)	1
<b>TOTAL</b>	<b>154</b>	<b>31 (20%)</b>	<b>3 (2%)</b>

# Ethnicity of Atmospheric Science PhDs (1973 to 2004)

- 3,166 Total PhDs
- 2,140 Total earned by US Citizens
- 30 Hispanic American PhDs
- 21 African American PhDs

# Comparison to selected other departments

	<b>UCLA</b>	<b>Purdue</b>	<b>CSU</b>	<b>U Wash</b>	<b>UTEP (Geo)</b>	<b>Howard</b>	<b>NCAR</b>
<b>Number of Academic Faculty</b>	15	24	12	18	14	4	<b>154</b>
<b>Women</b>	2 (12%)	4 (17%)	1 (8%)	3 (17%)	4 (28%)	0	<b>31 (20%)</b>
<b>URM</b>	1 (6%)	1 (4%)	0	0	2 (14%)	3 (75%)	<b>3 (2%)</b>

# UCAR Strategic Plan, Diversity Page

- **Build and sustain national and international partnerships, including capacity building in developing countries.**
- Build strong interdisciplinary science partnerships with people and institutions representing varying perspectives.
- Create multiple opportunities and open pathways to those from nontraditional backgrounds to build an inclusive community of diverse and global perspectives.
- As a model institution, recruit and retain a diverse and interdisciplinary workforce to address scientific and societal problems of highest importance

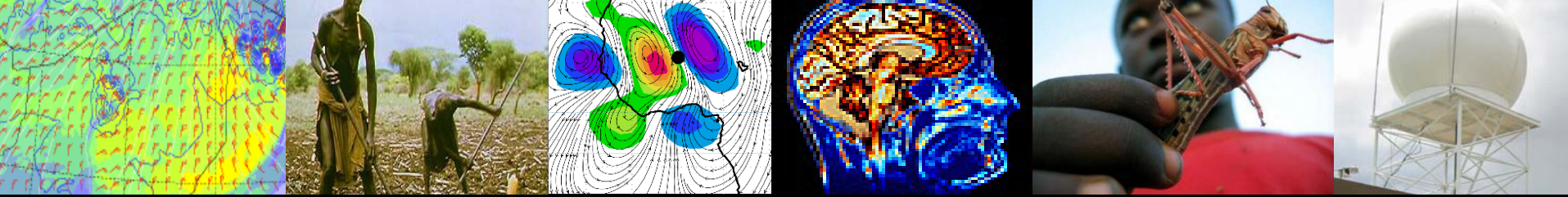
# NCAR Strategic Plan

- **GOAL: Increase societal resilience to weather, climate, and other atmospheric hazards**
  - **Priority: Establishing new connections with researchers from developing nations**
- **GOAL: Cultivate a scientifically literate and engaged citizenry and a diverse and creative workforce**
  - **Priority: Engaging a broader and more diverse community**

# UOP Strategic Plan

- **Goal 3: Develop and transfer technologies to meet critical societal and community needs**
  - *Goal 1, Objective 3: Provide international leadership through programs and initiatives that enhance education and research across national boundaries.*





# Africa Initiative Goals

An integrated end-to-end process, from research to impact

- Increase knowledge of the role of African weather, climate, and biogeochemical processes in the Earth system
- Develop research applications, operational systems, and dissemination strategies to improve lives in Africa
- **Enhance the capacity for atmospheric research in Africa by investing in sustainable infrastructure and education**

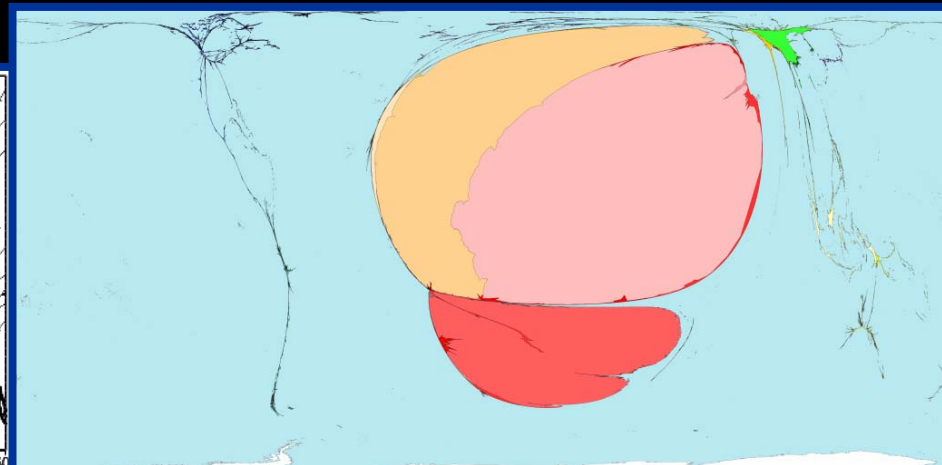
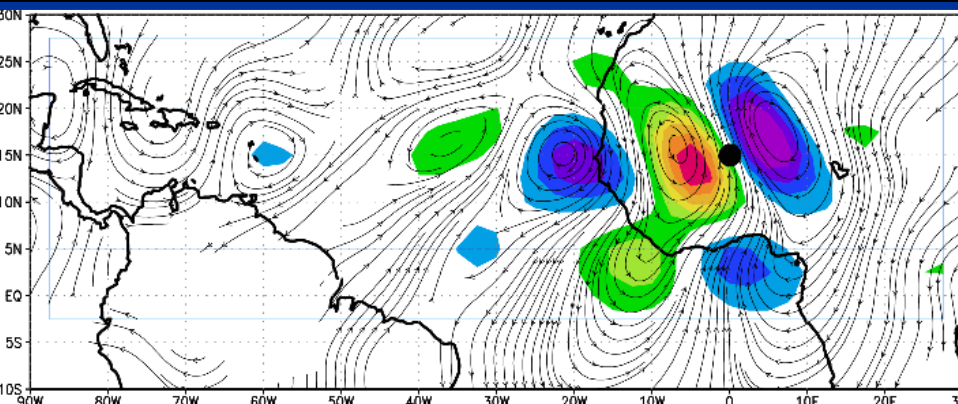
# The importance of integration: Algerian Flood November 2001 : 737 Dead



“No warning to the population was raised and no measure taken to reduce the impact of the disaster, even though the meteorological office in Algiers announced two days earlier that a strong storm will arrive in Algeria on Friday night ...”

# Global and Local Impact

- African easterly waves (AEW) create 90% of intense Atlantic hurricanes
- AEW's originate from traveling low-pressure systems that deliver essential precipitation in the Sahel
- The Sahel is subject to poorly understood variability in seasonal rains and frequent drought.



# A guiding strategy

“any solution proposed for Africa must be based on the continent's own perception of its needs, and on the dynamics of its own economic and political environment.”

David Dickson, Director  
SciDev.Net

# STEPS

- Identify and prioritize themes addressing local needs & global questions
- “Research for applications” around these priorities
- Develop communities of practice with partners specializing in collaborating with stakeholders

# Pilot and planned activities

- *Internal priority for capacity-building activities, aligned with identified priorities and partners*
- *Pilot projects that enhance existing activities while allowing program development*

## 0. AAAS-UCAR African Scholars Program

1. Educational Opportunities: April workshop in Ouagadougou, Burkina Faso
2. Enhanced Observational Capacity: Radar network in West Africa
3. Enhanced Modeling Capacity: WRF in Ghana

# 0. AAAS-UCAR African Scholars Program

Help to develop a network that can support and build capacity for climate & weather researchers in Africa

- Support for 20 African Post-docs a year to do research at UCAR and UCAR Universities
- \$100K per Post-doc in startup funds to support return to Africa
- Development of African Network of Scientist
- Sabbatical support for US scientists to work in Africa

# 1. April Workshop

- 2-6 April, in Ouagadougou, Burkina Faso
- Burkina Faso, Mali Met. Service, and UCAR are hosting
- Hands-on, Discussion-oriented format
- Opportunity to introduce UCAR activities and ground-truthing for AI activities



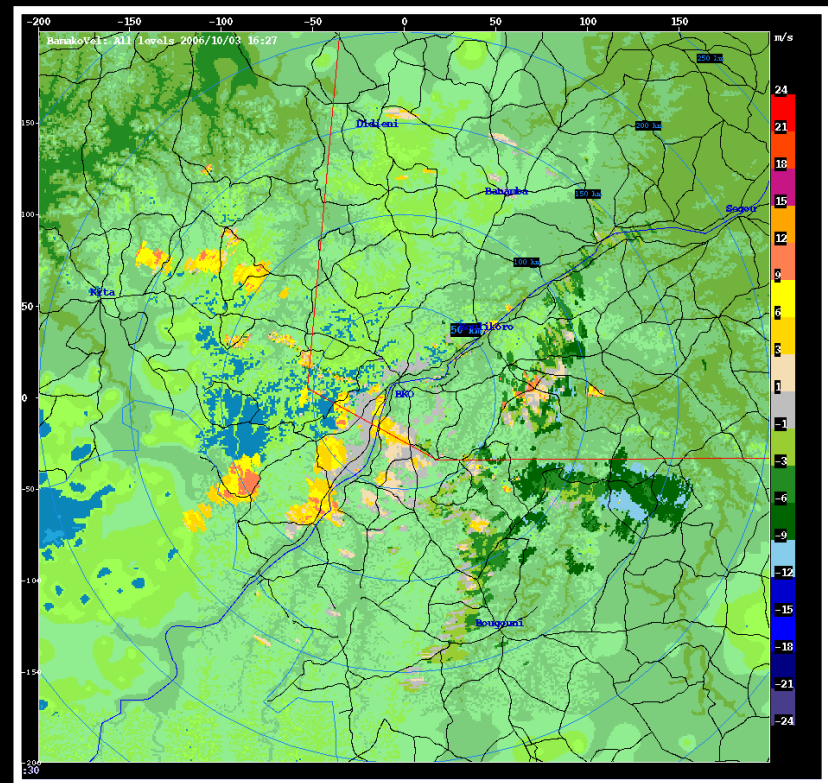
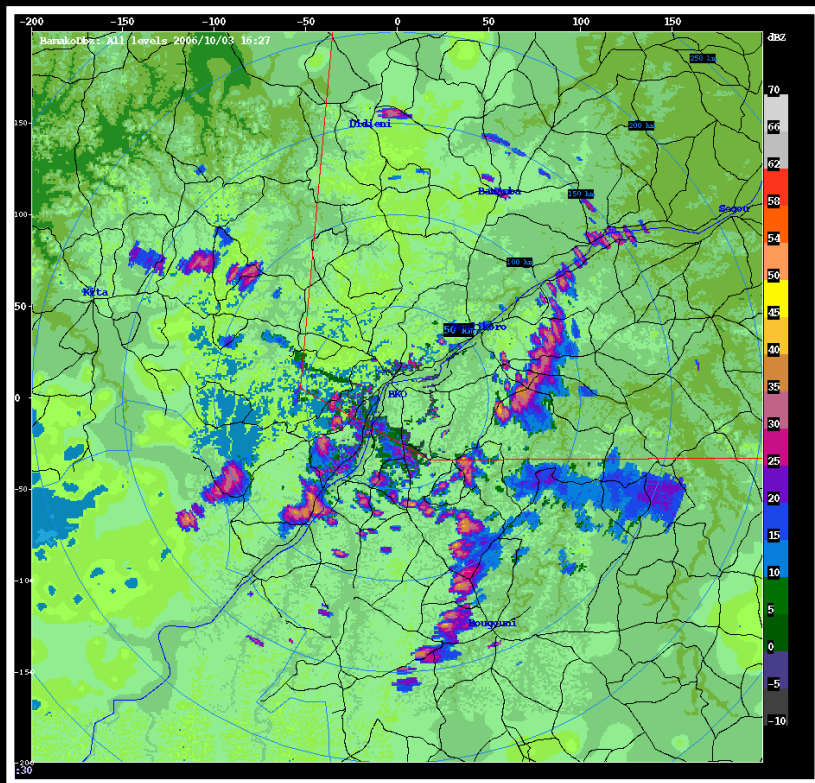
## 2. Radar Network

- Operationalize and network existing radars in West Africa
- Stream data for collaborative scientific analysis
- Train for maintenance and calibration



Project Lead: Roelof Brintjes

# Real-time data from Bamako, Mali

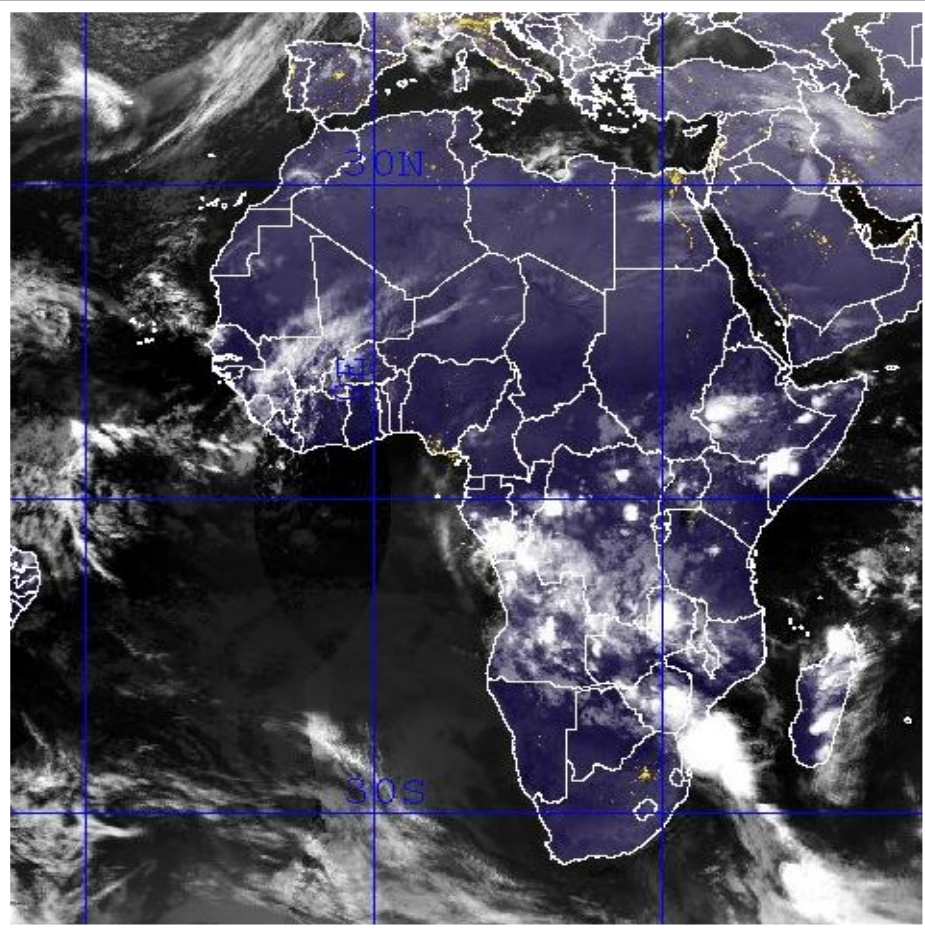


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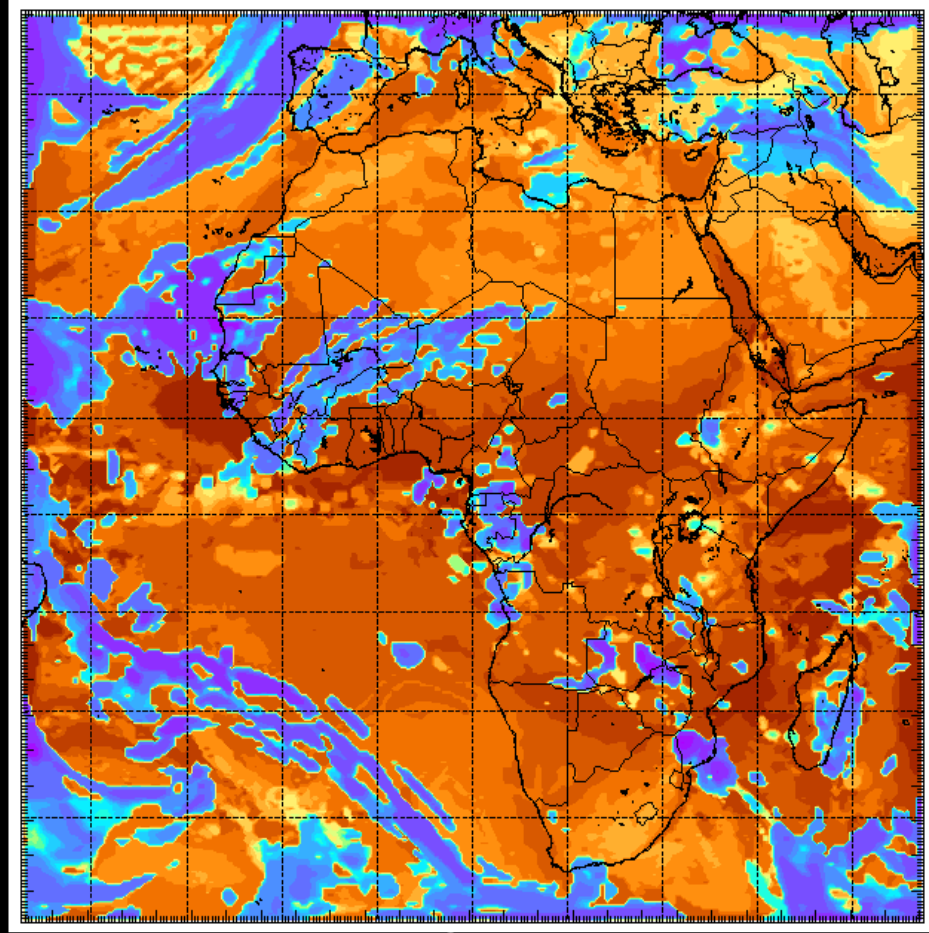
# 3. Numerical Weather Prediction

- Operational regional forecasting at NCAR; provide products to African weather services.
- Improve model and interface in collaboration with African forecasters
- Conduct a workshop for forecasters, in Accra, on effective use
- Move the model to Ghana

# A Sample Forecast



Satellite Image of Clouds



Model Forecast of Clouds

# AI Summary

- These capabilities integrate into a package that can help African Scientists and Meteorologists address weather-related societal and scientific challenges
- With AAAS we have a partner to develop resources and networks
- We seek a partner with an established presence in Africa, that could take immediate advantage of this enhanced capacity

Thank You

R. Pandya