

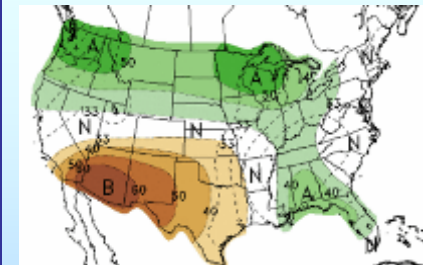
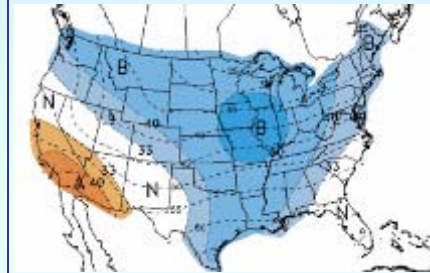
CPC – CI Collaboration

Question:

- How can CPC work more effectively with CI's on critical issues that address CPC mission requirements?

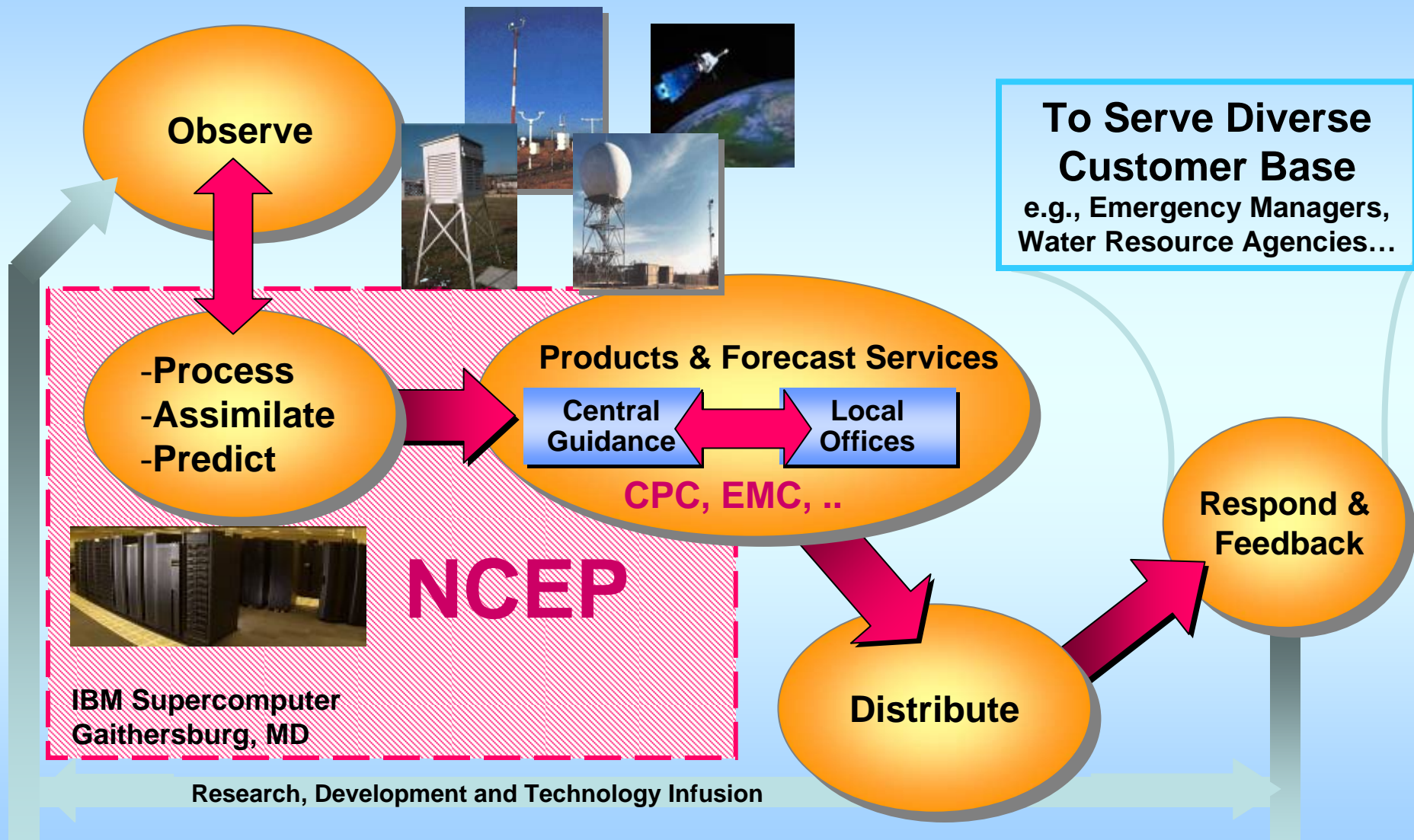
Outline:

- **CPC Role in NOAA Climate Services**
 - Operational activities
 - Applied research activities
- **CPC Future Strategy**
 - Climate Test Bed
 - National Climate Service*
- **Mechanisms to enhance collaboration between CPC and CI's**



Wayne Higgins
NOAA'S Climate Prediction Center
June 18, 2008

Path to NOAA's Seamless Suite of Products and Forecast Services...



NCEP provides operational support. CPC delivers operational climate forecast products and services. NOAA Climate Goal provides support for research and transition activities to accelerate improvements.



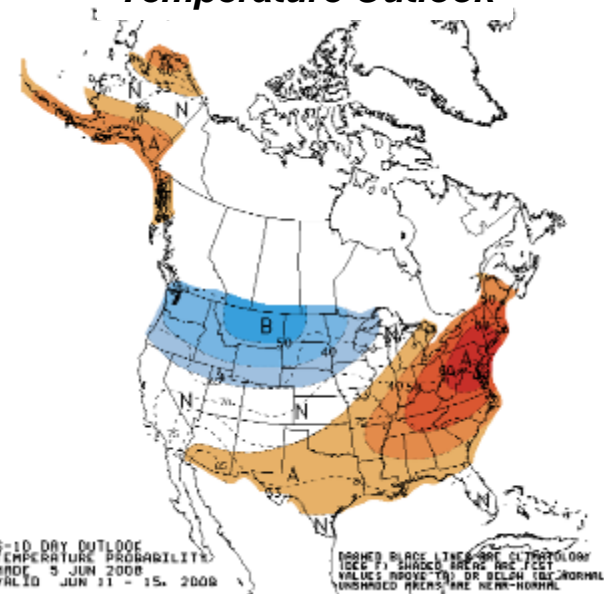
CPC Mission



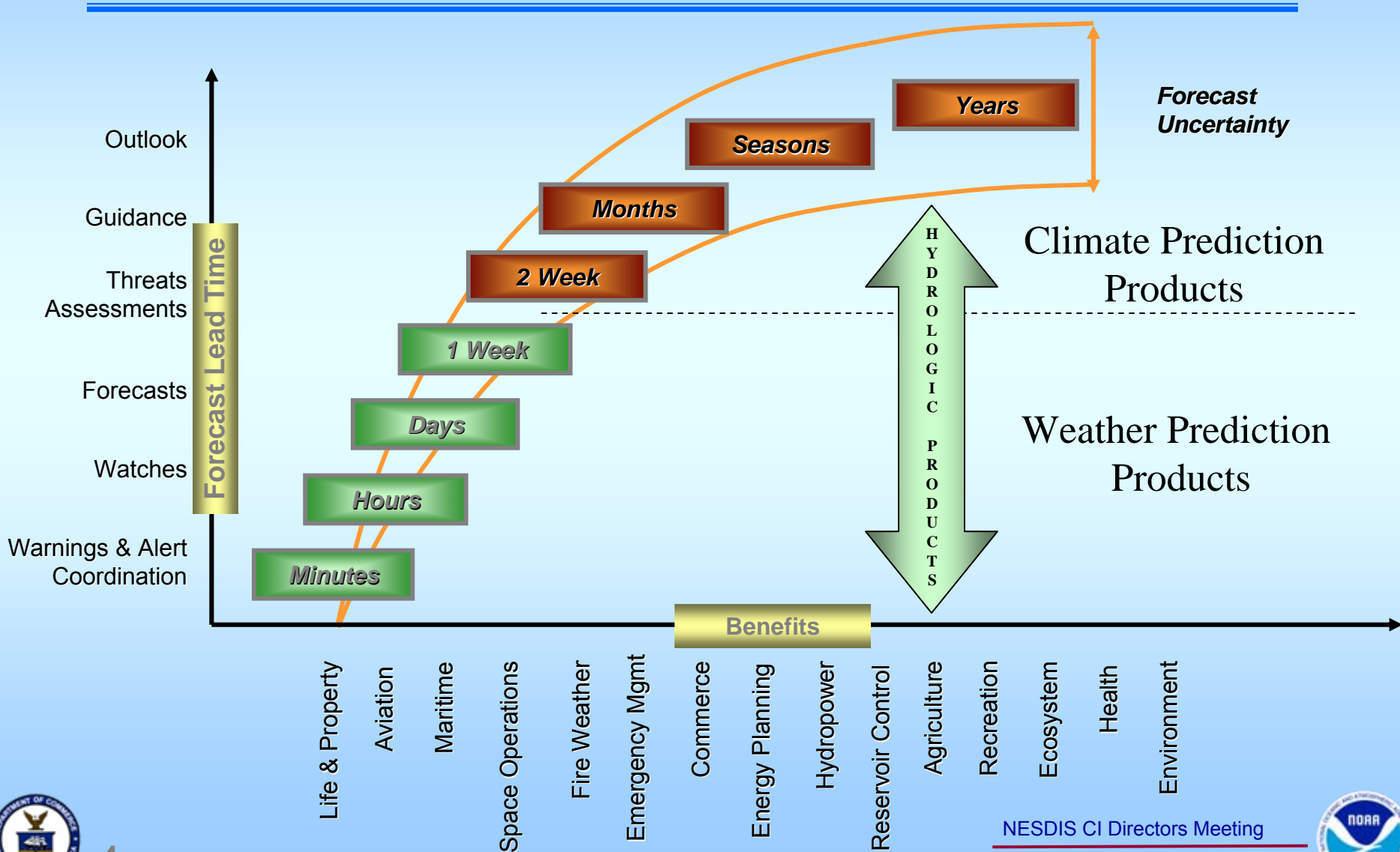
We deliver climate monitoring, assessment, and prediction products for timescales from weeks to years to the Nation and the global community for the protection of life and property and the enhancement of the economy.

- National temperature and precipitation outlooks, but not monthly / seasonal rankings
- Focus: weeks, months, seasons, years (i.e. **short term climate**)
- Forecasts in collaboration with other NCEP Centers, NOAA line offices, other agencies and labs
- Integral to NWS Seamless Suite of Products

Temperature Outlook



NOAA Seamless Suite of Forecast Products Spanning Climate/Weather/Water



CPC Operational Activities

- **Monitoring Products**
- **Outlooks (GPRA Measure - U.S. Seasonal Temp.)**
- **Assessment Products**

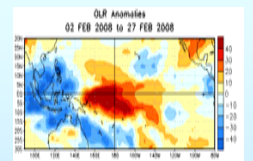
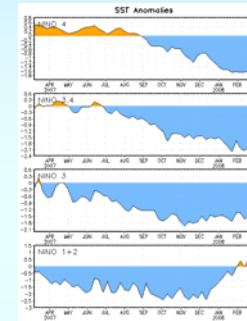
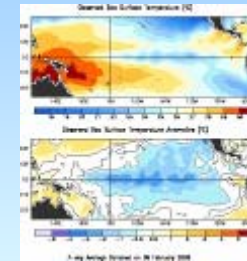
How do we accelerate improvements in the above?

- **Outreach and Feedback**
- **Partnerships**
- **Applied Research**
- **Transition Activities (R2O; O2R)**



Climate Monitoring Products

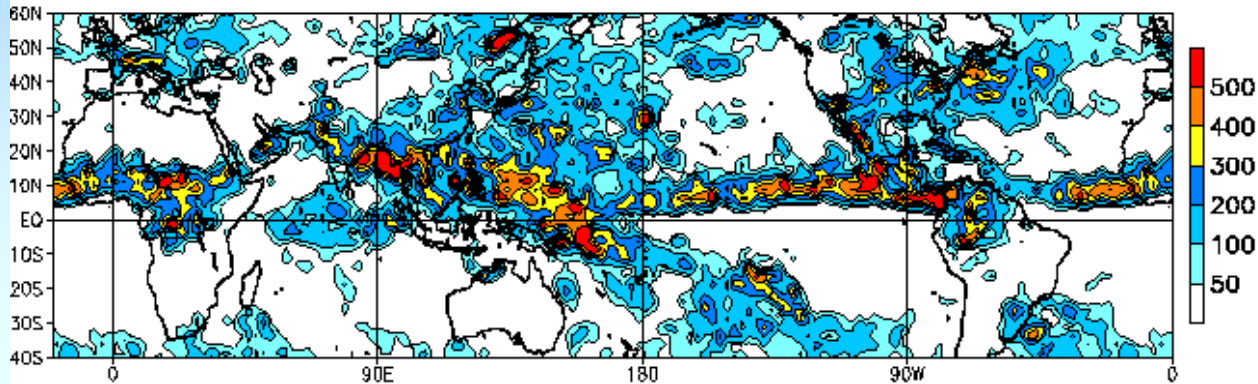
- Primary modes of climate variability (ENSO, MJO, NAO, PNA, AO,...)
- Atmospheric Circulation (global troposphere and stratosphere)
- Storm Tracks and Blocking
- Monsoons
- Oceanic Conditions (global)
- Precipitation and Surface Temperature (global and US)
- Drought (US, North America; NIDIS)



Note: *There has been a concerted effort to improve and expand the CPC monitoring product suite in response to user community requests.*

Conversion of CPC Monitoring and Forecast Products to GIS Format

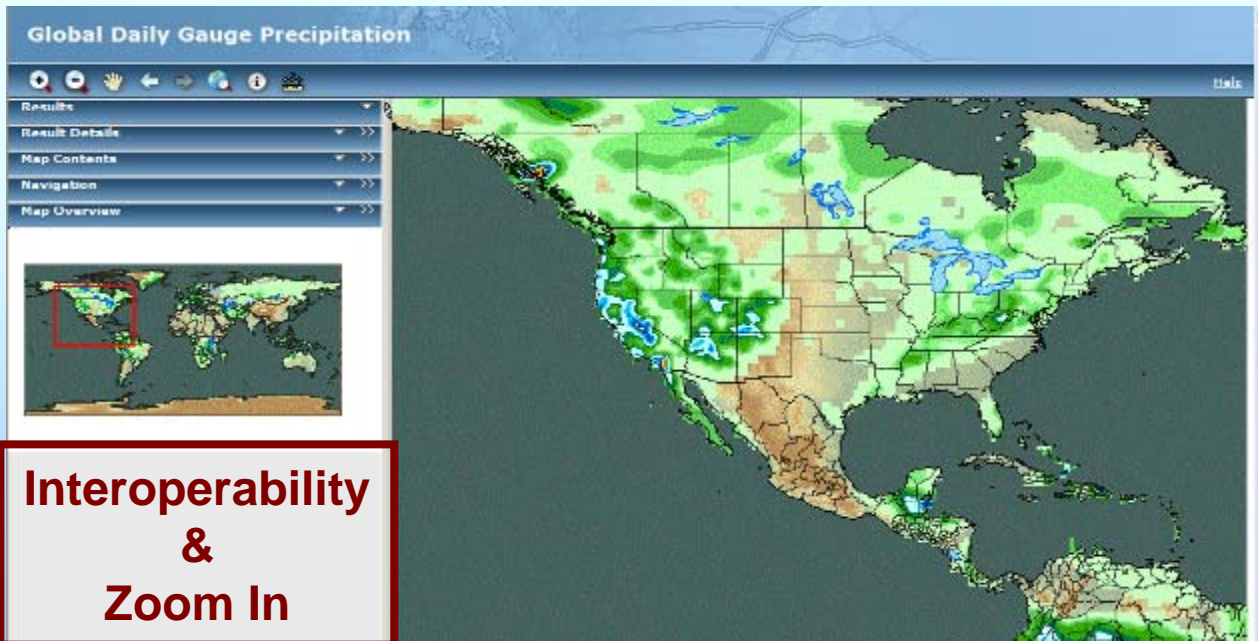
Viviane Silva Lloyd Thomas, Mike Halpert and Wayne Higgins



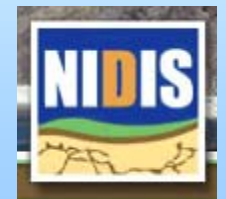
BEFORE



AFTER



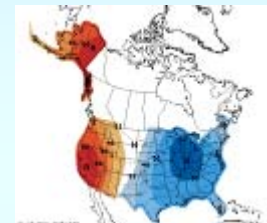
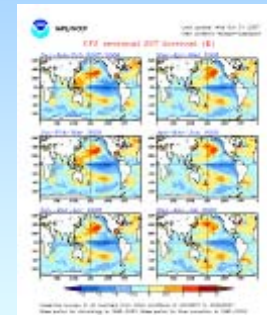
**Interoperability
&
Zoom In**



The CPC conversion to GIS started at CPAS 2 years ago!

Climate Outlook Products

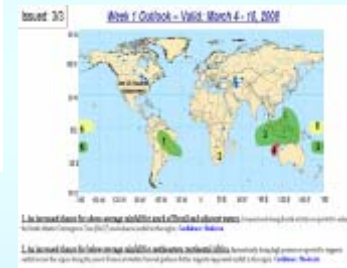
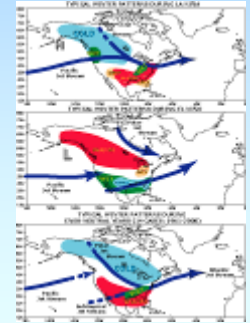
- Tropical Pacific SSTs
- Seasonal and Monthly Outlooks for Precipitation & Temperature
- Seasonal Drought Outlook
- Seasonal Hurricane Outlooks (Atlantic and Eastern Pacific)
- 6-10 Day (week-1) and 8-14 Day (week-2) Precipitation and Temperature Outlooks
- Day 3-14 Hazards Assessments (US, Global Tropics)



Note: *We recognize that we need to do more than T & P – and in particular – more climate-weather type products, more variables. What are your needs?*

Climate Assessment Products

- Climate Diagnostics Bulletin (monthly, web)
- ENSO Diagnostics Discussion (monthly, PDF and WORD)
- Weekly ENSO / MJO / Monsoon / Ocean updates (.ppt, PDF, web)
- Seasonal Climate Summaries (web)
- Special Climate Assessments (extreme events, web)
- Annual Climate Assessment (multi-agency; published in the AMS Bulletin)
- Hazards Assessments (US, Africa, & Global Tropics)
Day 3-14 – WX/CX Connection



Note: *These products should connect climate to people's lives. How should we expand and improve the current suite of products to do this?*

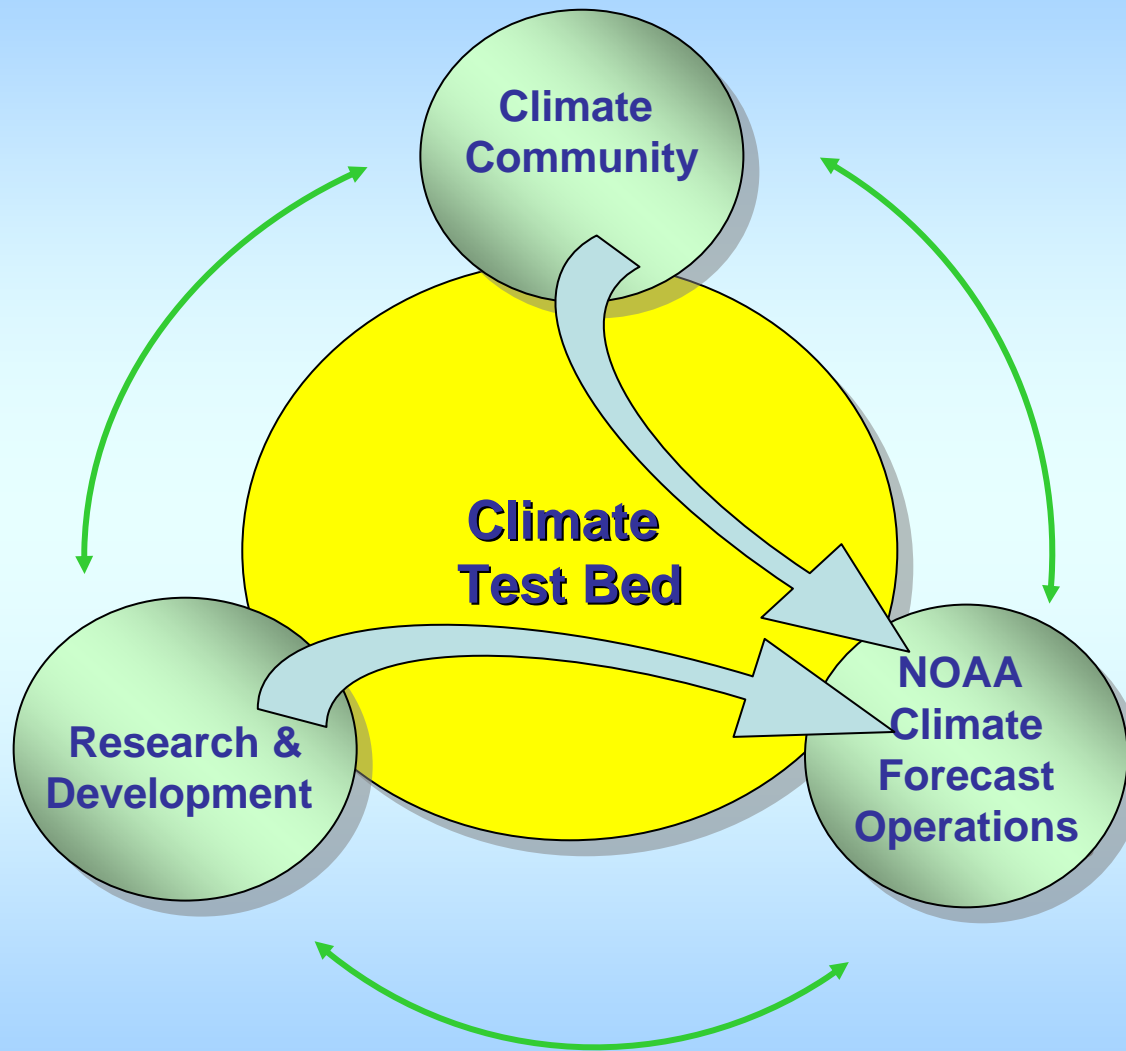
Applied Research Activities

- Climate diagnostics and attribution
- Prediction tool development/ improvement
- Climate monitoring tool development/ improvement
- Model diagnostics and evaluation
- Atmospheric and oceanic predictability
- Weather/ Climate links
- Teleconnections
- Drought/ floods and other extreme events

CPO and NCEP have partnered to accelerate the transition of research advances into operations (new and improved forecast products and services)



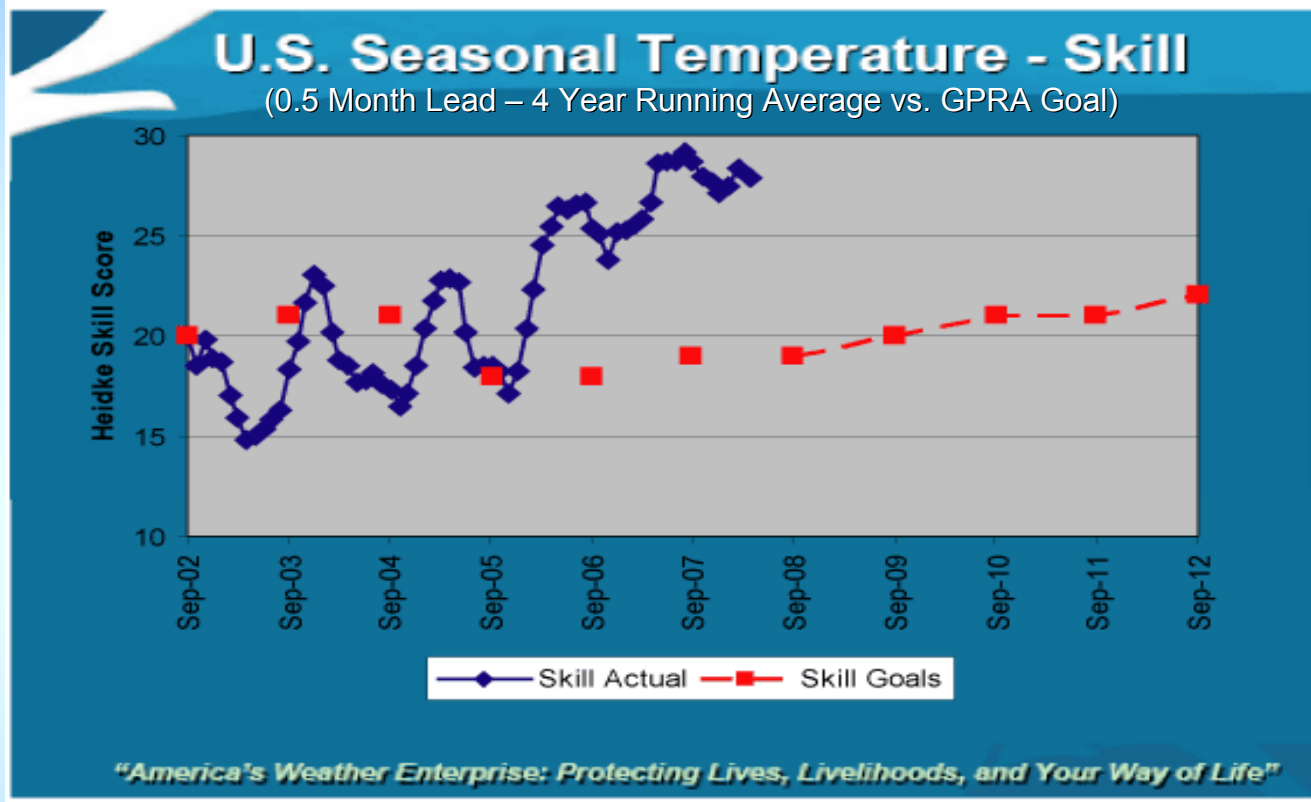
Climate Test Bed



Mission: To accelerate the transition of scientific advances from the climate research community to improved NOAA climate forecast products and services.



Climate Prediction Advances at NCEP



- **Climate Forecast System:** first dynamic operational coupled climate forecast model, implemented Aug 04
- **Climate Test Bed:** jointly established by CPO and NCEP in 2005 and focused on accelerating improvements in the Climate Forecast System and related seasonal forecast products
- **Increases in the skill of CPC official seasonal outlooks** (20% or more; O'Lenic et al. 2007) due in part to CFS and to CTB milestones (e.g. consolidation tool).

NCEP and CPO Climate Support: Climate Test Bed

- **The CTB is a resource to accelerate scientific advances to operations**
 - *Infrastructure: 1/3rd NCEP R&D computer & CPC/EMC contract/federal employees*
 - *New Director: Fiona Horsfall (Jan 08)*
- **The CTB emphasizes high profile science activities**
 - *CFS/GFS Improvements (CFSRR)*
 - *Multi-model ensembles (IMME, NMME)*
 - *Objective climate forecast products (drought / NIDIS)*
- **CTB Science Advisory Board Meetings**
 - *Written advice on CTB science activities*
- **Competitive Grants Program**
 - *Currently 10 external scientists funded by CTB*
- **CTB-COLA Seminar Series**
- **CPC-RISA Program**
- **Visiting Scientist Program (FY09)**





Summary



- CPC delivers a large suite of “operational” climate monitoring, assessment and prediction products
- CPC plays a unique and critical role in NOAA climate services
- CPC serves the nation by monitoring, assessing and predicting **short-term** climate variability
- CPC will play a central role in NOAA’s emerging strategy for a National Climate Service



Areas where CI's can help CPC



-
- Provide expertise in mission critical research areas
 - Collaborative applied research
 - Educate and train future CPC personnel
 - Personnel turnover

CPC-CICS-STAR Action Plan

Goal 1: Develop strategy to educate and train future CPC personnel.

Activities

- **Educate each other:**
 - **Exchange one page summaries of CPC & CICS Projects and Plans**
 - **Increase Seminars by CPC staff at CICS & STAR & vice-versa**
- **Collaborate on applied research relevant to CPC mission**
 - **Increase number of CPC proposals needing assistance via CI post-docs**
 - **Increase CPC - CICS joint proposals.**

Goal 2: Enhance On-going Collaboration between CPC and STAR

Activities

- **Joint Projects**
 - **STAR provides passive microwave precipitation inputs for CMORPH**
 - **STAR provides OLR data**
 - **STAR works jointly with CPC on national & international activities (GPCP, GOES-R Hydrology) and TRMM/GPM**
- **Satellite Component of CTB**
 - **PPBES**

CPC-CICS-STAR Action Plan

Goal 3: CTB-COLA Seminar Series

Activities

- 2007-2008
 - 17 seminars; *“CFS As a Prediction System and Research Tool”*
- Fall 2008:
 - Expand topics to include all CTB science priority areas
 - » CFS; Multi-model Ensembles; Climate Forecast Products
 - Rotate venue between CPC, COLA and (possibly) others
 - Add new sponsors (e.g. CICS, NCDC, etc.)

Goal 4: CTB Visiting Scientist Program

Activities

- Invite senior scientists to NCEP to transition their research advances to operations (e.g. NCEP climate model; MME; climate products)

Status

- Funded in FY09; Administered by a CI
- Alternative (FY11-15) to include senior scientists and students



NOAA CTB - COLA Joint Seminar Series

"CFS as a Prediction System and Research Tool"

Extended Summaries

COLA

- 14 May 2008 Circulation regimes in the CFS interactive ensemble: Bridging weather and climate predictability promises and challenges
by *David M. Straus* [[Print Version](#)]
- 12 Mar 2008 Sensitivity of CFS mean state and ENSO variability to changes in SST bias
by *Julia V. Manganello* [[Print Version](#)]
- 9 Jan 2008 Surface latent heat flux and relationships with SST in CFS
by *Renguang Wu* [[Print Version](#)]
- 10 Dec 2007 Mean, variability and the most predictable patterns in CFS over the tropical Atlantic ocean
by *Zeng-Zhen Hu* [[Print Version](#)]
- 14 Nov 2007 Sensitivity of the MJO to SST: A simulation and predictability study of the MJO using the CFS and GFS
by *Kathy Pegion* [[Print Version](#)]
- 10 Oct 2007 Multi-model ENSO prediction using CFS and CCSM3
by *Ben Kirtman* [[Print Version](#)]
- 10 Sep 2007 Estimation of the limit of predictability in the stratosphere versus troposphere using CFS
by *Cristiana Stan* [[Print Version](#)]

NOAA CTB

- 23 Apr 2008 MJO monitoring and assessment at the Climate Prediction Center and initial impressions of the CFS as an MJO forecast tool
by *Jon Gottschalck* [[Print Version](#)]
- 26 Mar 2008 Summer season forecast experiments with the NCEP Coupled Forecast System (CFS) using different land models and different initial land states
by *Ken Mitchell* [[Print Version](#)]
- 27 Feb 2008 Global ocean monitoring: A synthesis of atmospheric and oceanic analysis
by *Yan Xue* [[Print Version](#)]
- 31 Jan 2008 Assessment of the CFS on the predictability of the North American monsoon
by *Lindsey N. Long* [[Print Version](#)]
- 17 Oct 2007 Evaluation of the stratosphere in the operational CFS and CFS-Next
by *Craig S. Long* [[Print Version](#)]
- 19 Sep 2007 On the importance of horizontal resolution and initial conditions to forecasting tropical intraseasonal oscillations: the maritime continent prediction barrier
by *Augustin Vintzileos* [[Print Version](#)]

◀ Back ▲ Top

Climate Prediction Center, Environmental Modeling Center, Climate Service Division
Hydrology Laboratory, Hydrologic Service Division, Hydrologic Information Center
National Operational Hydrologic Remote Sensing Center
National Data Buoy Center

<http://www.weather.gov/ost/climate/STIP/jsctb-cola.htm>



Appendix



-
- NOAAs National Climate Service
 - National Climate Service Partnership

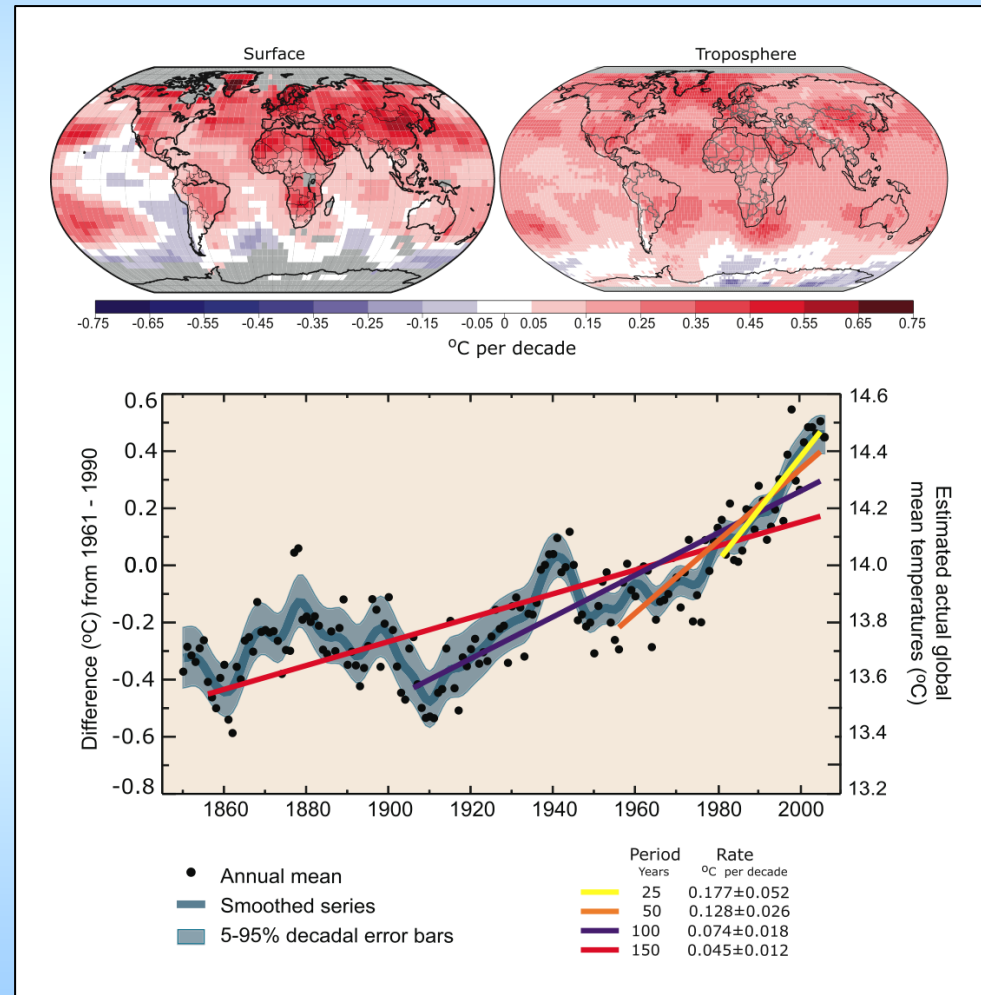
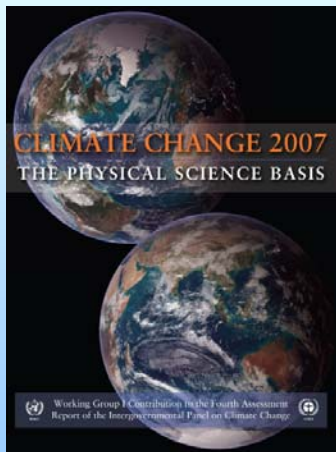
NATIONAL CLIMATE SERVICES: RESPONDING TO GROWING DEMANDS



May 29, 2008

IPCC FOURTH ASSESSMENT REPORT HAD A PROFOUND IMPACT

“There is now higher confidence in projected patterns of warming and other regional-scale features, including changes in wind patterns, precipitation and some aspects of extremes and of ice.” WG1 SPM

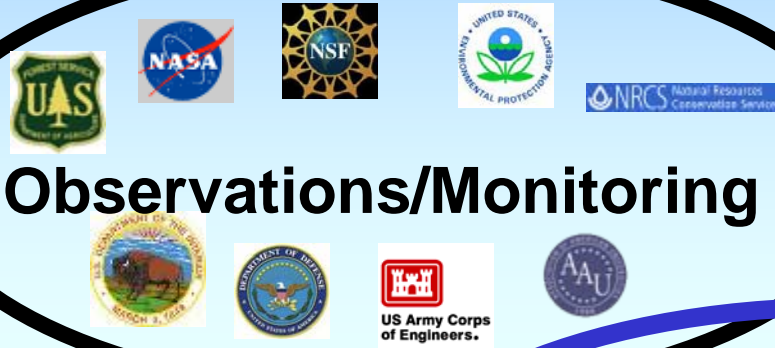


A STRATEGY FOR NATIONAL CLIMATE SERVICES

- **The proposed establishment, within NOAA, of a *National Climate Service*:**
 - To be the nation's centralized source of climate information
 - This includes historical and real-time data, monitoring and assessments, research and modeling, predictions and projections, decision support tools and early warning systems, and the development and delivery of valued climate services
- **The proposed establishment of a *national climate services partnership* across federal agencies:**
 - The focus of the partnership is on ensuring that highly usable, actionable, issue-focused information is produced and evaluated
 - The intention is that the activities of the Service and the distributed set of resources throughout the nation (including universities, federal, state and local science and management agencies, and non-governmental organizations) work in close collaboration.

The National Climate Service Partnership

Observations/Monitoring



Research, Modeling & Assessments



NOAA Climate Service



Resource Risk Management



Adaptation & Mitigation





Joint Agricultural Weather Facility (JAWF)



- Weekly Weather and Crop Bulletin
- Briefings & Weather Summaries
 - Morning (US) & afternoon (International) Wx summary
 - Weekly briefing on global weather and crop conditions
 - Daily Agricultural Weather Highlights
- Future plans include International JAWF Desk
 - World Food Crisis adds a sense of urgency to JAWF activities
- USDA – Commerce partnership on JAWF is a centerpiece of NOAA's emerging strategy for a National Climate Service

Volume 53, No. 16 <http://www.noaa.gov/oa/wcaweb/jawfweb.html> April 15, 2008

WEEKLY WEATHER AND CROP BULLETIN

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Weather Service

U.S. DEPARTMENT OF AGRICULTURE
National Agricultural Statistics Service
and World Agricultural Outlook Board

Observation and crop production reports were reported over a three-day period (April 9-11) as a strong low pressure system moved in the southern Plains and into the Midwest. High and low-level clouds were reported over the Midwest and southern Ohio on Wednesday, April 9, as rain and weather cleared. High and low-level clouds were reported through the day. The storm system moved east on Friday, April 11, bringing hot and severe winds to the Great Lakes as well as areas to the south, where 17 tornadoes were reported. Increases and warm fronts, along with numerous reports of severe drought, the winds and hot weather.

HIGHLIGHTS
April 6 - 12, 2008
INTERNATIONAL & GLOBAL

Higher rain totals in the east-central and southeastern Plains, the Midwest, and much of the Midwest, further delaying spring planting operations. At least a inch of rain fell from central Oklahoma into southern Missouri and western and central Arkansas, ending many areas nearly as high as they had climbed following the mid-March drought. In addition, the more-extended regions were equal to or as much as five dozen inches, most of which were spotted from April 3-11. At least an inch of precipitation fell across a much broader area stretching from the central and western Plains to the western slopes of the Appalachians. Moisture was beneficial, however, in several areas, including the High Plains region. (Continued on page 7)

Contents	
Crop Moisture Maps	2
Peter Drought Maps	3
April 8 Drought Monitor	4
April 15 Drought Monitor	5
Current Maximum 5-Minimum Temperature Maps	6
Temperature Change Maps	7
Soil Moisture Maps	8
Soil Moisture Maps by State	9
U.S. Crop Production Highlights	13
Crop Progress and Conditions	14
April 15 Drought Monitor	15
International Weather and Crop Summary	24
March Temperature/Precipitation Maps	25
Temperature/Precipitation	26

Good coverage will be observed for satellite temperature for 01Z on 15T 04Z.

International Weather Briefing - Wednesday - April 16, 2008

- In the West, some moderate rain to heavy rain, including a heavy rain to heavy rain, is expected through the period of crop planting, which begins in the Pacific Northwest, where some heavy rain to heavy rain is expected. In the Midwest, some moderate rain to heavy rain is expected. In the Southeast, some moderate rain to heavy rain is expected. In the South, some moderate rain to heavy rain is expected.
- In the Northeast, some moderate rain to heavy rain is expected. In the Midwest, some moderate rain to heavy rain is expected. In the Southeast, some moderate rain to heavy rain is expected. In the South, some moderate rain to heavy rain is expected.
- In the West, some moderate rain to heavy rain is expected. In the Midwest, some moderate rain to heavy rain is expected. In the Southeast, some moderate rain to heavy rain is expected. In the South, some moderate rain to heavy rain is expected.
- In the Northeast, some moderate rain to heavy rain is expected. In the Midwest, some moderate rain to heavy rain is expected. In the Southeast, some moderate rain to heavy rain is expected. In the South, some moderate rain to heavy rain is expected.

Outlook: The next few days will feature a moderate rain to heavy rain in the West, with a cold region to the north. In the Midwest, some moderate rain to heavy rain is expected. In the Southeast, some moderate rain to heavy rain is expected. In the South, some moderate rain to heavy rain is expected.

Copyright 2008 by the National Oceanic and Atmospheric Administration, Washington, D.C. (301-710-2397)
Web site: <http://www.noaa.gov/oa/wcaweb/jawfweb.html>



Activities for Africa/Asia



Current Activities

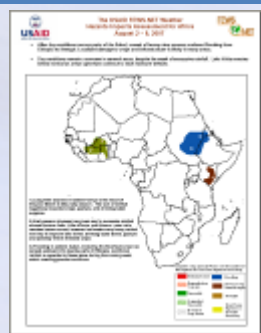
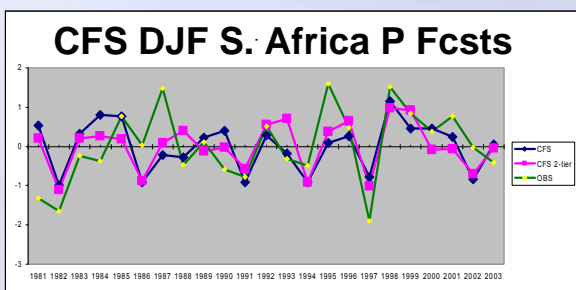
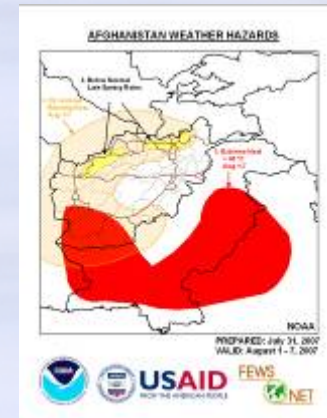
- Provide support to WMO Severe Weather Forecast Demonstration Project and to AMMA
- Work with WMO on improving seasonal to interannual climate forecasts and applications
- Support regional climate outlook forums
- Lead Famine Early Warning System Hazard/ Benefit Assessments: Africa, Central America, Afghanistan
- Indian Ocean tropical cyclone monitoring
- Contribute to USAID Asian Flood Network
- Provide professional development training to African Meteorologists

Severe Weather Forecast Demonstration Project
U.S. NOAA/NOCEP GFS FORECASTS
SOUTHERN AFRICA

GFS/NOCEP GFS FORECAST BLENDED	
Surface and Climate Parameters	
24 Hour Total Precipitation	Monthly Precipitation - 4 Days
Monthly Precipitation - 6 Month Total	NOAA and GFS Data Blend
Climate Prediction Status	USRAID/NOCEP Data Blend
NOCEP and GFS/NOCEP	USRAID/NOCEP Data Blend
Monthly 2m Temperature	Monthly 2m Temperature
24 Hour Total Precipitation	24 Hour Temperature
Climate	Total Total Data

GFS/NOCEP GFS/NOCEP Data Blend and Forecast

Forecast (GFS/NOCEP)	Forecast (GFS/NOCEP)	Forecast (GFS/NOCEP)
Forecast (GFS/NOCEP)	Forecast (GFS/NOCEP)	Forecast (GFS/NOCEP)
Forecast (GFS/NOCEP)	Forecast (GFS/NOCEP)	Forecast (GFS/NOCEP)
Forecast (GFS/NOCEP)	Forecast (GFS/NOCEP)	Forecast (GFS/NOCEP)



- ## Future Plans
- Assess global models over Africa
 - Climate training for SE Asia
 - Enhance outreach capability to ensure best possible use of forecast products and services