



The Climate Test Bed

**Fiona Horsfall
Director, Climate Test Bed
Climate Prediction Center
NOAA/NWS/NCEP**

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Outline



- **What is the Climate Test Bed?**
- **Ongoing Strategic Priorities**
- **Supported Projects**
- **Future**



Climate Test Bed



- **A joint NCEP-CPO facility within the Climate Prediction Center (CPC) @ NCEP**

NCEP – infrastructure support (human, computing)

CPO – annual Announcement of Opportunity

- **Established in 2005**

- **Mission**

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

- **Serves as conduit between the operational, academic and research communities**



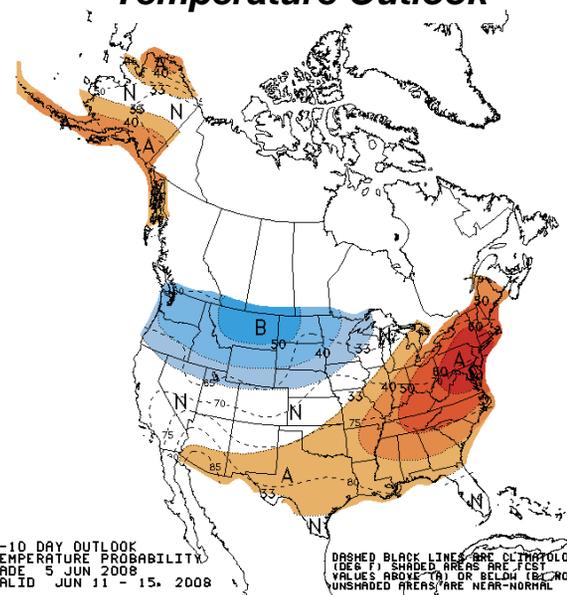
CPC Mission



CPC serves the public by assessing and forecasting the impacts of short-term climate variability, emphasizing enhanced risks of weather-related extreme events, for use in mitigating losses and maximizing economic gains.

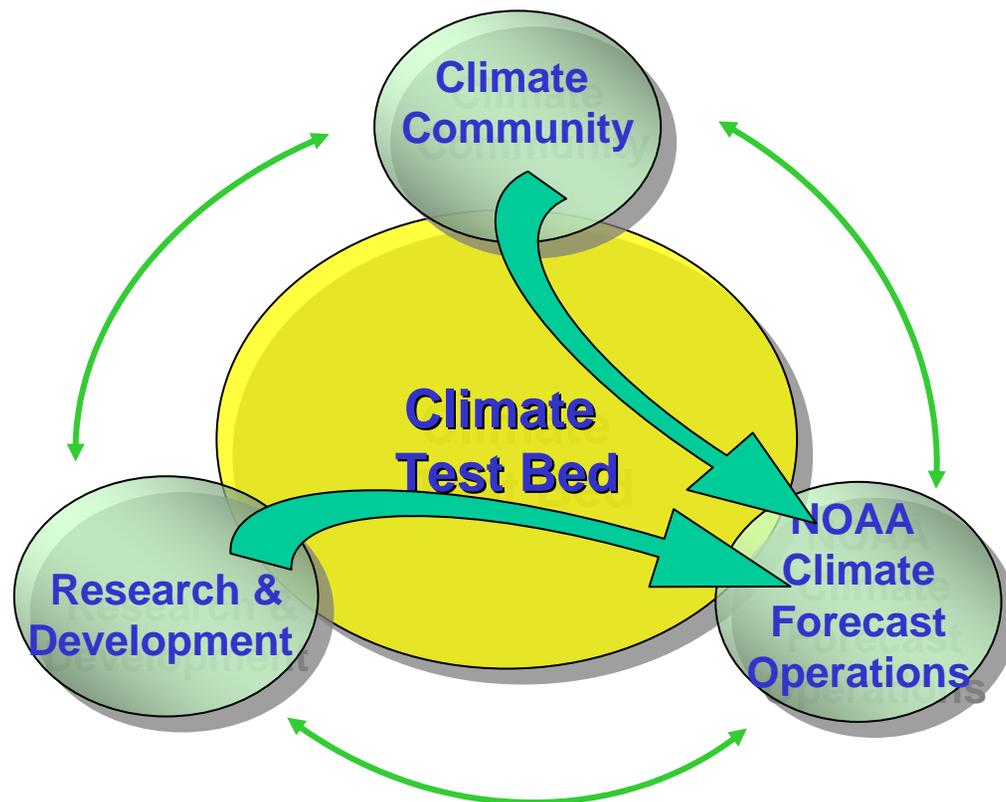
- Focus: weeks, months, seasons, years
- Official products for the U.S.
- Forecasts in collaboration with other NCEP Centers, NOAA line offices, other agencies and labs
- Integral to NWS Seamless Suite of Products

Temperature Outlook





Climate Test Bed



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



Structure/Resources (excluding grants)



- **CTB Management Team**
 - *Director*
 - Fiona Horsfall, CPC
 - *Deputies*
 - Hua-Lu Pan, EMC (for Science)
 - Mike Halpert, CPC (for Administration)
 - *Program Manager*
 - Chet Ropelewski, NOAA CPO
- **Support Staff**
 - *7.05 equivalent FTEs*
 - *5.5 equivalent Contractors*
- **Computing resources**
 - *1/3 NCEP research computer*



Boards



Oversight Board

- **NCEP CPC Director**
 - *Wayne Higgins, Chair*
- **NCEP EMC Director**
 - *Steve Lord*
- **ESRL Deputy Director**
 - *Randy Dole, Acting*
- **GFDL Director**
 - *Vacant*
- **IRI Director**
 - *Steve Zebiak*
- **NCPO Representative**
 - *Rick Rosen*
- **NASA Earth Sciences Director**
 - *Franco Einaudi*
- **Appropriate representatives of other stakeholders (e.g. NASA Earth Sciences Director)**

Science Advisory Board

- **T. Barnston (IRI)**
- **T. Busalacchi (ESSIC, University of Maryland) - Chair**
- **J. Kinter (COLA)**
- **M. Harrison (UKMO)**
- **E. Harrison (PMEL)**
- **Tony Rosati (GFDL)**
- **Joe Tribbia (NCAR)**
- **D. Lettenmaier (University of Washington)**
- **K. Redmond (DRI)**
- **M. Suarez (GMAO)**

4th Annual SAB
Sep 11-12, 2009



Ongoing Strategic Priorities



- ***Accelerate improvements in the CFS through the Research-to-Operations (R2O) & Operations-to-Research (O2R) paradigms***
- ***Enhance NCEP's role in the transition process***
- ***Be a partner within the multi model ensemble enterprise***
- ***Enhance the CPC operational product suite***



Functioning



- **In the beginning.....**
 - ***FTEs and contractors work on analysis of CFS updates; product development, CFS reanalysis***
 - ***Computer resources used by in house support staff***
 - ***AO issued, grants awarded for projects***
 - **First awards granted in FY06**
 - **External PI collaborates with NCEP PI**
 - **3 focus areas tied to strategic priorities**



CTB Focus Areas (FY06-08)



- **Climate Forecast System (CFS) Improvements**
- **Multi Model Ensemble Predictions**
 - *Consolidation techniques*
 - *Verification*
 - *International*
 - *National*
- **Climate Forecast Products**
 - *Drought*
 - *Other*



Funded Projects



- **FY06 (3)**

- ***Using Initial tendency errors to reduce systematic errors, identify model errors, and construct stochastic parameterizations (DelSol) (FY08)***
- ***Development of neural network emulations of model physics components for improving the computational performance of the NCEP seasonal climate forecasts (Fox-Rabinovitz) (FY08)***
- ***The Ocean Component of the NCEP ENSO CFS (McPhaden/Xue/Behringer) (FY08)***



Funded Projects



- **FY07 (1)**

- ***System-wide advancement of user-centric climate forecast products (Hartmann/O'Lenic) (FY09)***

- **FY08 (6)**

- ***Probabilistic forecasts of extreme events and weather hazards over the United States (Jones/Gottschalck) (FY09)***
- ***Enabling the Transition of CPC Products to GIS Format (Doty/Silva/Halpert) (FY09)***



Funded Projects



- **FY08 (cont)**

- **Generation and Evaluation of Long-Term Retrospective Forecasts with NCEP Climate Forecast System: Predictability of ENSO and Drought (Cane/Wang/Xue) (FY10)**
- **Multi-Model Ensemble Climate Prediction with CCSM and CFS (Kirtman/van den Dool) (FY10)**
- **Development of an Extended and Long-range Precipitation Prediction System over the Pacific Islands (Annamalai/Kumar) (FY10)**
- **New Tools for North American Drought Prediction (Lyon/Kumar) (FY10)**



CTB Focus Areas (FY09)



- **Climate Forecast System (CFS) Improvements**
- **Multi Model Ensemble Predictions**
 - *International*
 - *National*
 - *Evaluation*
- **Climate Forecast Products**

FY09: 10 proposals to be funded



CTB – Other Activities



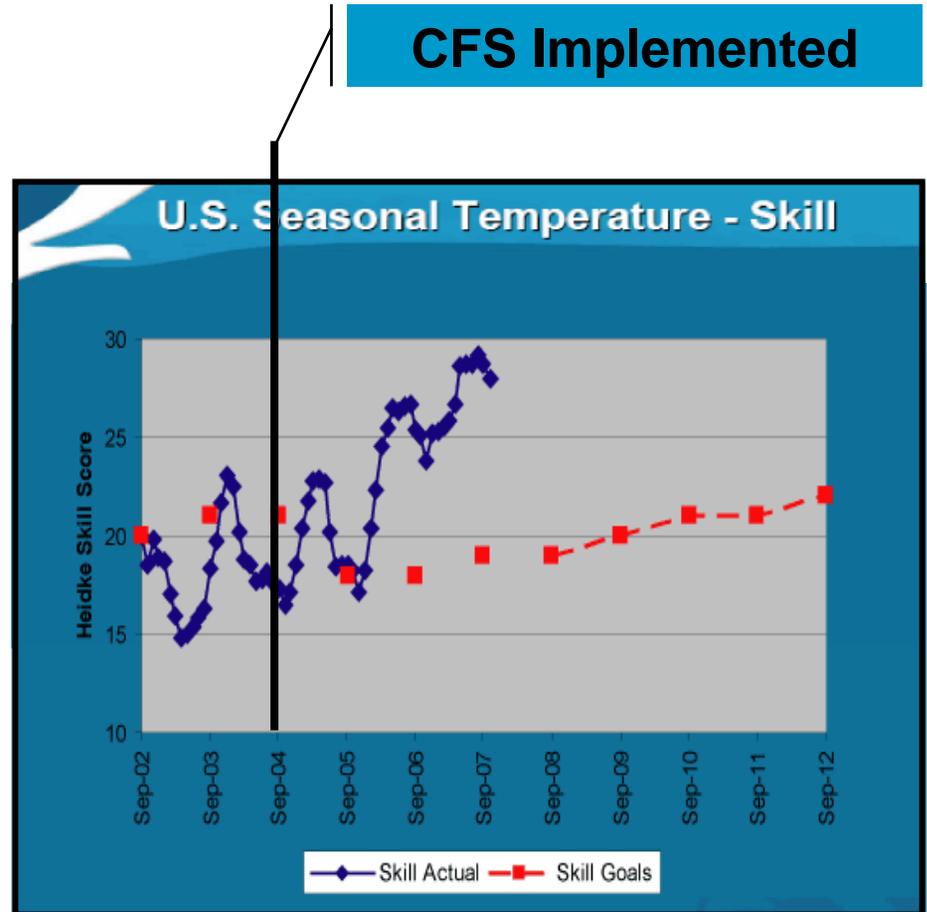
- **CTB-COLA Joint Seminar Series**
 - ***COLA – Center for Ocean-Land-Atmosphere Studies***
 - ***Theme for 2007-2008 series:***
CFS as a Prediction System and Research Tool
 - ***~17 seminars***
 - ***Extended summaries available at***
www.nws.noaa.gov/ost/climate/STIP/jsctb-cola.htm
 - ***2008-2009 series***
 - **3 focus areas**
 - **Jointly with COLA and ESSIC (Earth System Science Interdisciplinary Center) @ University of Maryland**



Benefits of CTB



- **CFS – first dynamic operational climate forecast model (implemented in August 2004)**
- **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)**
- **Improvements to CFS will result in improved forecast skill**





CTB: The Future



Performance Goals

- Exceeded GPRA goal for US Seasonal Temperature
- Sustained increases in the skill of CPC official seasonal outlooks

Challenges

- Accelerate CFS improvements (**R2O**)
- CFS as a National Model (**O2R**)
- MME Prediction System with CFS
 - National Strategy on MME including sufficient computing resources
 - Concept of Operations, including MOU's with partners



CTB: The Future



Accelerate R2O

- **Enhance opportunities available for transition of state-of-the-art research into operations**
- **Visiting Scientist Program**
 - *External scientists supported to transition their research to NCEP forecast operations*
 - *Provides infrastructure support (computer time and reallocated FTE's)*



CTB: The Future



To Accelerate R2O - Must Support O2R

- **Goal**
 - To accelerate improvements in CFS by providing it (and supporting data) to the broad research community
- **Deliverables**
 - CFS, data, and support services (e.g. helpdesk) to external research community
 - Annual users workshop on CFS
- **Mechanism**
 - **Model Test Facility** – combined NCEP, CPO and CTB
- **Benefits**
 - Provides support for research with CFS outside NCEP
 - Maximizes opportunities for community participation



CTB: The Future



Model Test Facility

- **NCEP will provide**
 - Operational models (CFS, GFS) and data (e.g. reanalysis, reforecasts)
 - Helpdesk facilities, training for O2R staff, web services
 - Points of contact for collaboration
 - Support for CTB Seminar Series
- **CPO will provide**
 - Support for helpdesk, training, points of contact, web services
 - Competitive Grants Program
- **CTB will provide**
 - Transition Infrastructure for pulling in the Research (R2O)
 - Links between Test Beds (e.g. CTB and Hydromet Test Bed)



Summary



- **CTB**
 - *Accelerates **R2O** for improved climate forecast models and products*
 - *Plans to accelerate **O2R** by providing CFS as a national model*