



Overview of Climate Predictions at Various Timescales

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CPASW

March, 2010





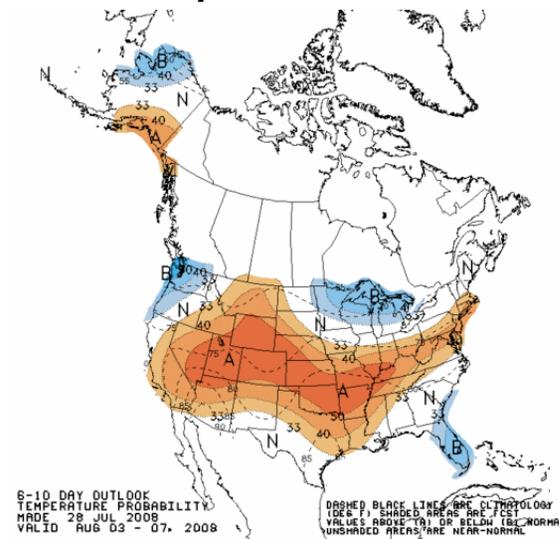
CPC Mission



We deliver climate prediction, monitoring, and assessment 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.

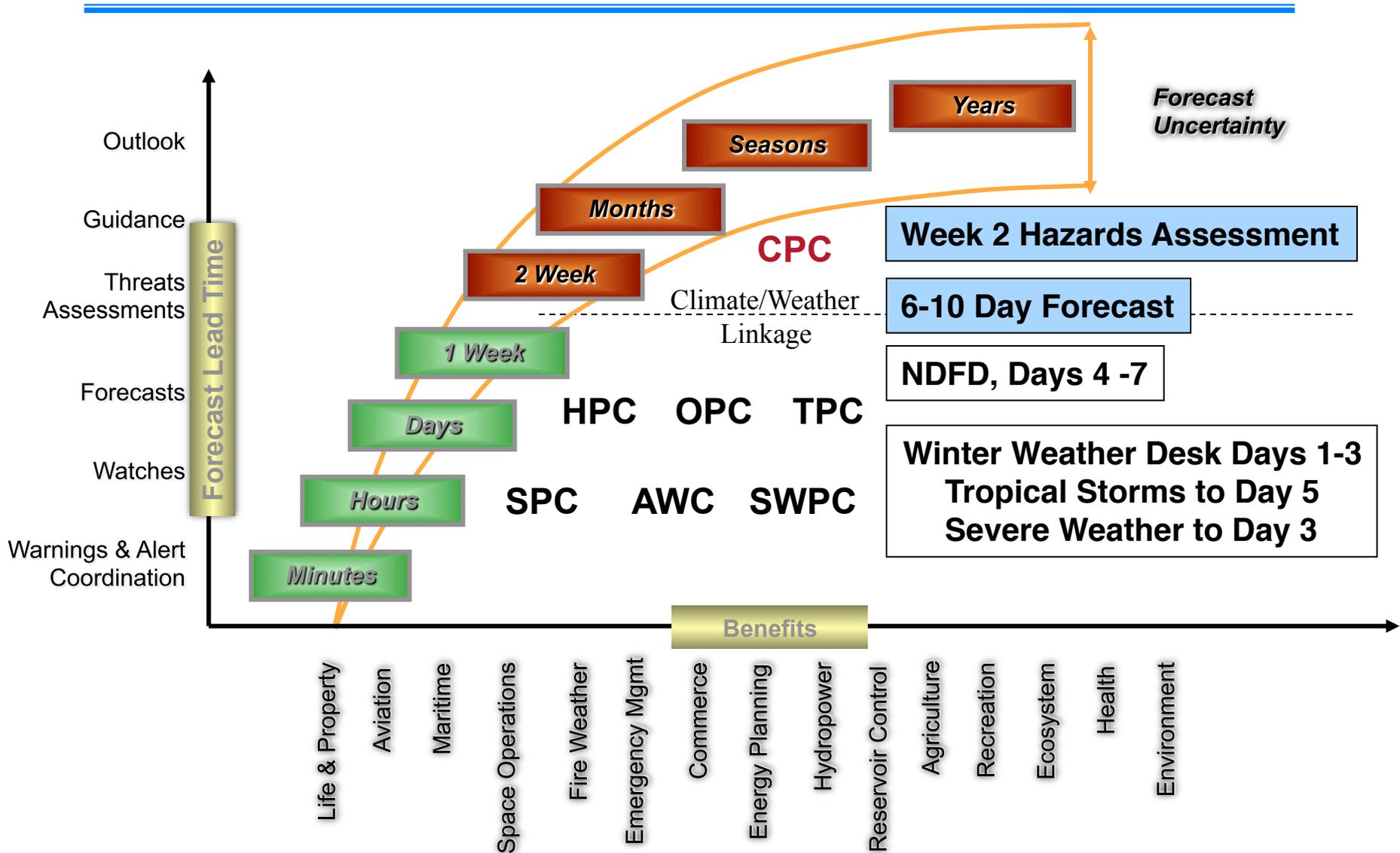
- National temperature and precipitation outlooks, but not monthly / seasonal rankings
- Focus: weeks, months, seasons, years (i.e. **short term climate**)
- Forecasts in collaboration with other NCEP Centers, NOAA line offices, other agencies and labs
- Integral to NWS Seamless Suite of Products

Temperature Outlook



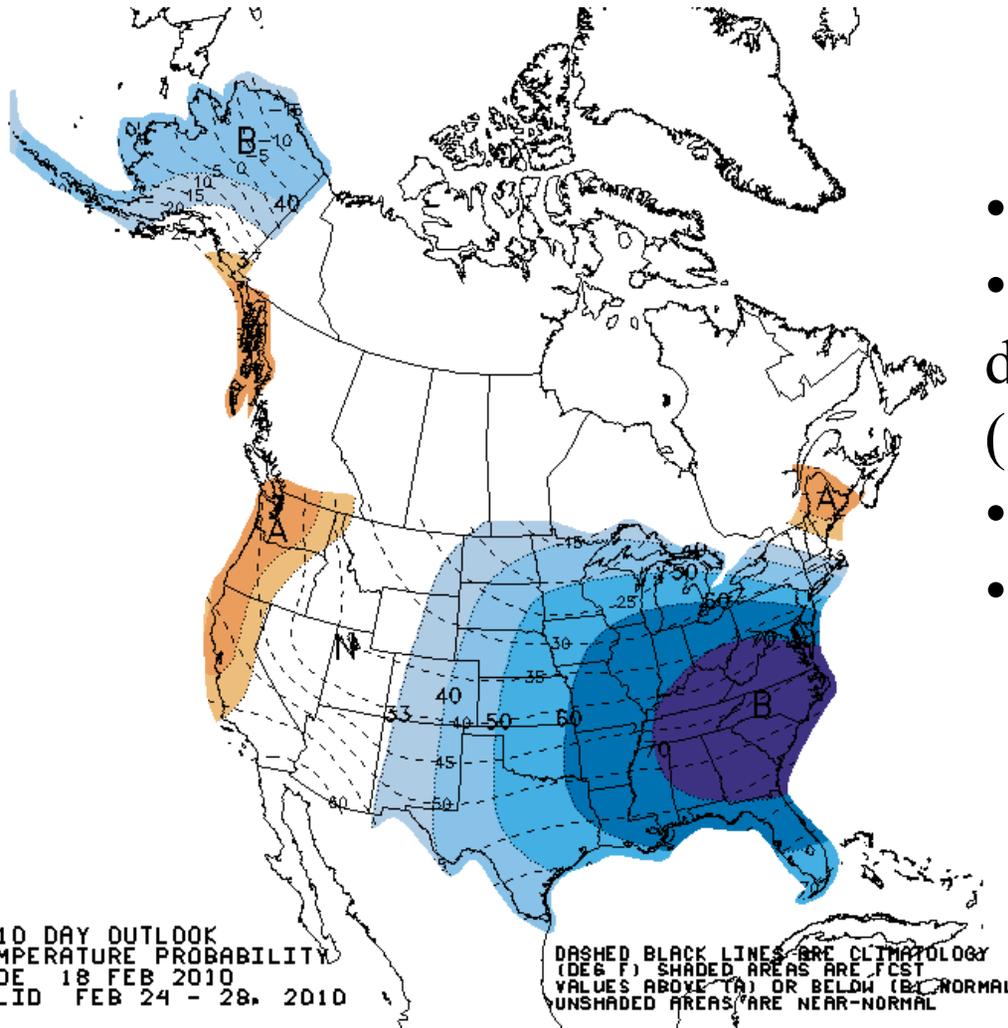


CPC Supports the NOAA Seamless Suite of Forecast Products Spanning Climate and Weather





Extended Range Forecast 6-10 & 8-14 day outlook



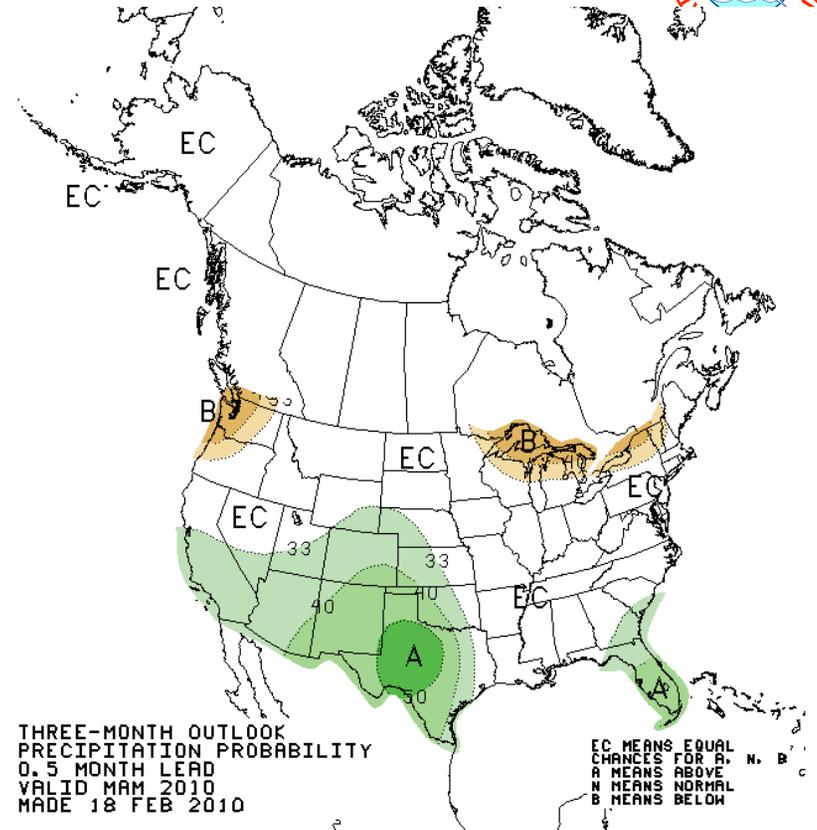
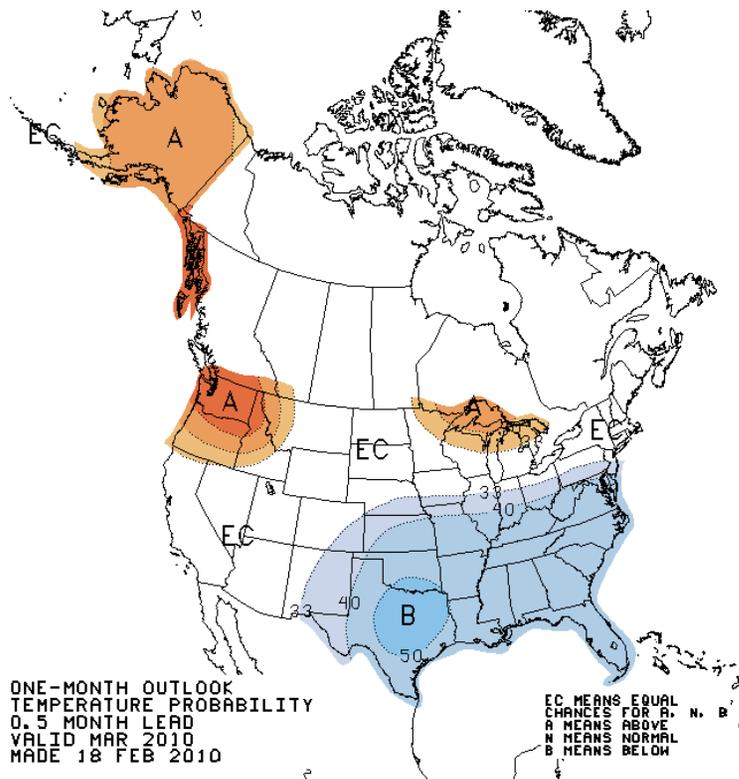
- 3-tier system.
- Forecaster confidence in departure from 30-yr normal (1971-2000).
- Represents PDF shifts.
- Middle category has no shift.



Long Lead Forecast Monthly & Seasonal Outlook



- Similar to ERF but for 1-Month and seasonal timescale.
- 0.5 month lead for month and season 1. Rolling seasons thereafter.
- Issued on 3rd Thursday of month.

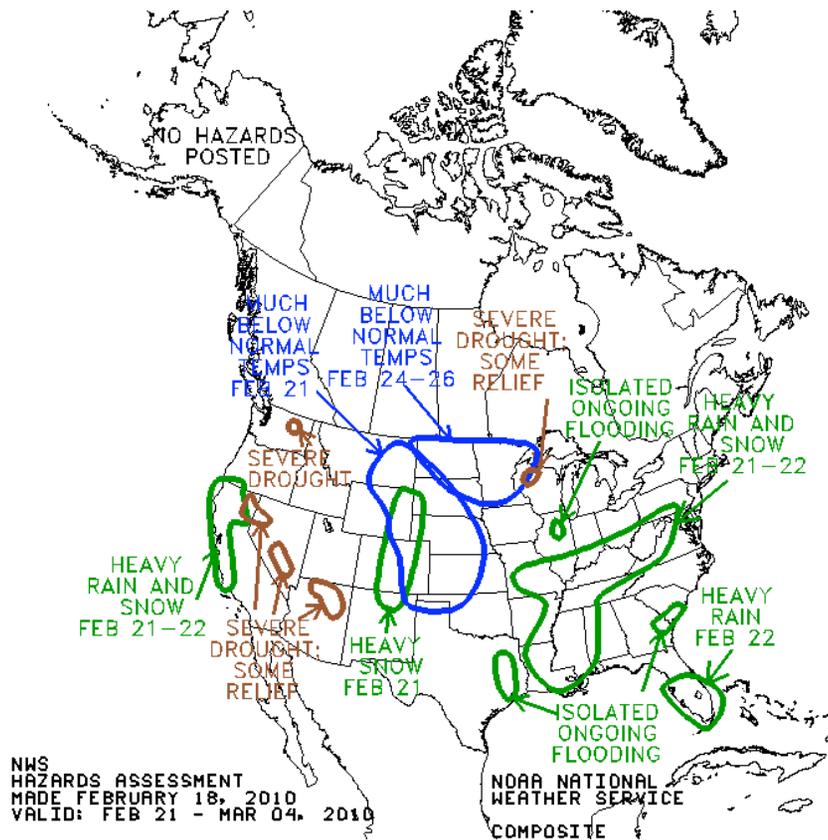




Hazards Assessments

Advanced notice of potential Wx & Cx hazards

- US – short & Med range NWP; hydrologic analyses.
- GTH – MJO, NWP, statistical tools etc.
- Not mutually exclusive.

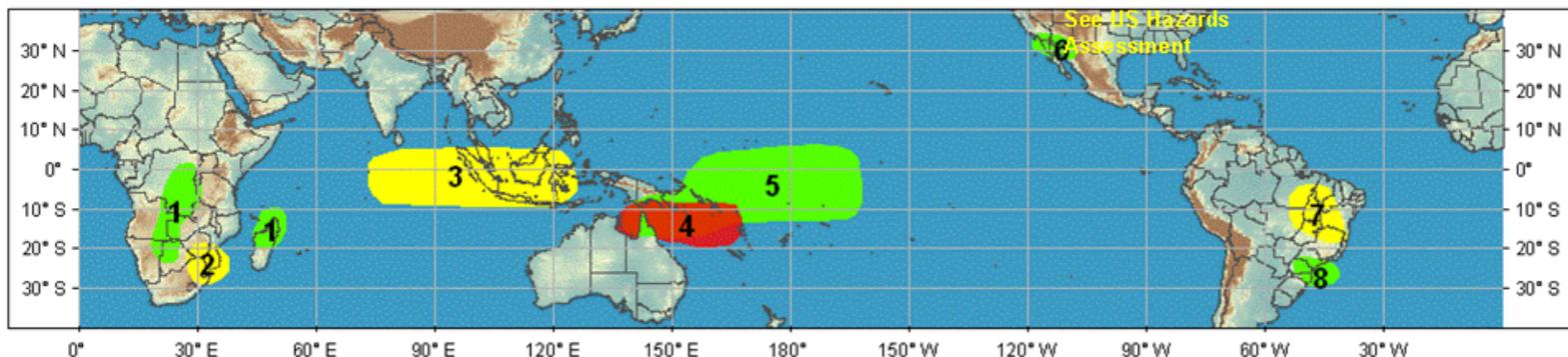


Global Tropics Hazards/Benefits Assessment - Climate Prediction Center - Issued: 1/19/2010



Product issued once per week with no updates. Conditions are subject to change after issuance time and before next outlook.
 Product targets broad scale conditions integrated over a 7 day period for US interests only. Please also consult your local responsible forecast agency.

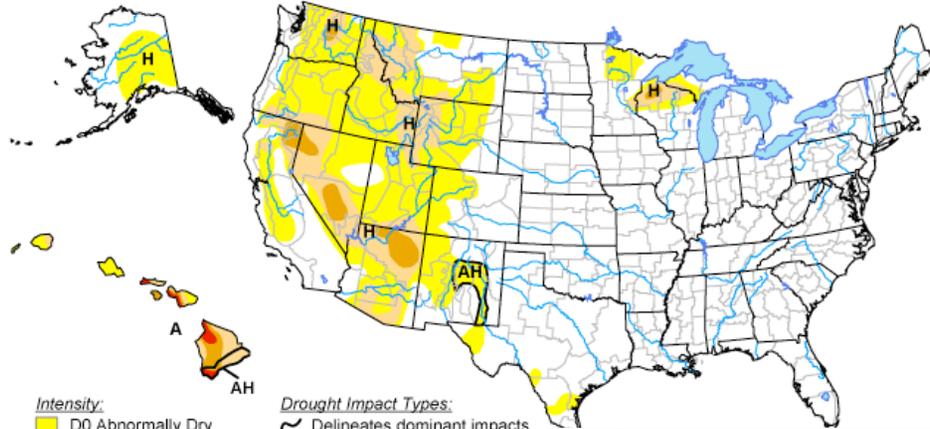
Week 1 Outlook – Valid: January 20 - 25, 2010





U.S. Drought Monitor

February 16, 2010
Valid 7 a.m. EST



Intensity:
 D0 Abnormally Dry
 D1 Drought - Moderate
 D2 Drought - Severe
 D3 Drought - Extreme
 D4 Drought - Exceptional

Drought Impact Types:
 ~ Delineates dominant impacts
 A = Agricultural (crops, pastures, grasslands)
 H = Hydrological (water)

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

<http://drought.unl.edu/dm>

Re: 
 Author: Bri



Drought Monitor

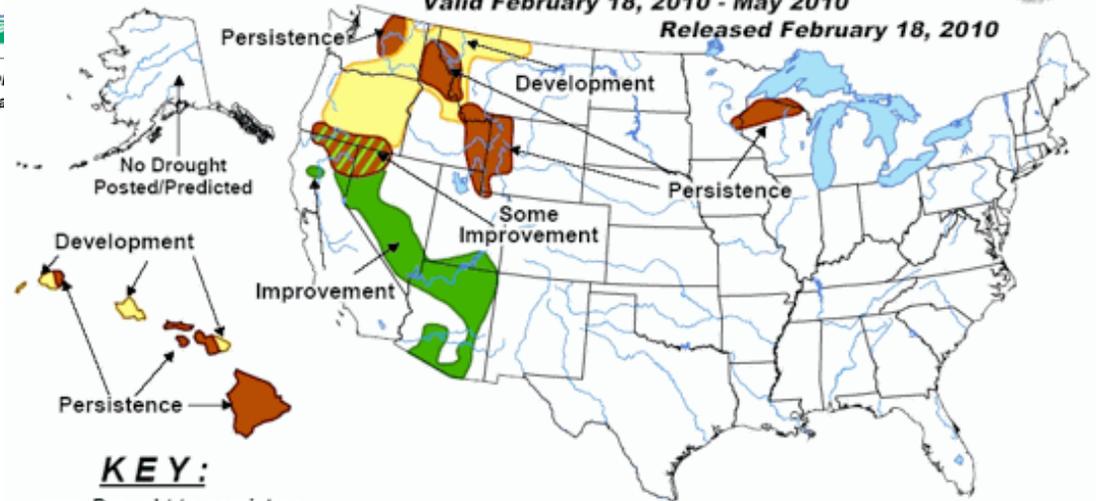
- Issued each Thursday.
- Consolidation based on drought indicators.

U.S. Seasonal Drought Outlook

Drought Tendency During the Valid Period

Valid February 18, 2010 - May 2010

Released February 18, 2010



KEY:

- Drought to persist or intensify
- Drought ongoing, some improvement
- Drought likely to improve, impacts ease
- Drought development likely

No Drought Posted/Predicted

Depicts large-scale trends based on subjectively derived probabilities guided by short- and long-range statistical and dynamical forecasts. Short-term events -- such as individual storms -- cannot be accurately forecast more than a few days in advance. Use caution for applications -- such as crops -- that can be affected by such events. "Ongoing" drought areas are approximated from the Drought Monitor (D1 to D4 intensity). For weekly drought updates, see the latest U.S. Drought Monitor. NOTE: the green improvement areas imply at least a 1-category improvement in the Drought Monitor intensity levels, but do not necessarily imply drought elimination.

Drought Outlook

- Issued each month with LLF.
- Inputs: DM, ERF, 2-wk soil moisture, LLF.



Seasonal Hurricane Outlook

- Issued in May Revised in August.
- Provides outlook of seasonal TC activity.
- Latest Science & Technology.



Climate Prediction Center

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EL NIÑO/SOUTHERN OSCILLATION (ENSO) DIAGNOSTIC DISCUSSION

issued by
CLIMATE PREDICTION CENTER/NCEP
4 February 2010

ENSO Alert System Status: **El Niño Advisory**

[Spanish Version](#)

Synopsis: El Niño is expected to continue at least into the Northern Hemisphere spring 2010.

A significant El Niño persisted throughout the equatorial Pacific Ocean during January 2010 (Fig. 1). Although sea surface temperature (SST) departures in the Niño-3.4 region decreased to +1.2°C in late January, SSTs continued to be sufficiently warm to support deep tropical convection (Fig. 2 and Fig. 3). Over the last several months, a series of oceanic Kelvin waves contributed to the build-up of heat content anomalies in the central and eastern Pacific (Fig. 4). The latest Kelvin wave was associated with temperature departures exceeding +2°C down to 150m depth across the eastern half of the equatorial Pacific (Fig. 5). Equatorial convection over the central Pacific remained enhanced during the month, while convection over Indonesia exhibited considerable week-to-week variability. While the low-level winds have been variable, low-level westerly and upper-level easterly wind anomalies generally prevailed during January. Collectively, these oceanic and atmospheric anomalies reflect a strong and mature El Niño episode.

Nearly all models predict decreasing SST anomalies in the Niño-3.4 region through 2010, and model spread increases at longer lead times (Fig. 6). Nearly half of the models indicate the 3-month Niño-3.4 SST anomaly will drop below +0.5°C around April-May-June 2010, indicating a transition to ENSO-neutral conditions during Northern Hemisphere spring. However, predicting the timing of this transition is highly uncertain.

ENSO Discussion

- Issued each month.
- Assessment of current ENSO status predictions.
- Includes ENSO alert system.



Outlook Verification Tools



http://www.cpc.ncep.noaa.gov/products/predictions/long_range/tools/briefing/seas_veri.grid.php

The screenshot displays the National Weather Service Climate Prediction Center website. The header includes the NOAA logo, the text "National Weather Service Climate Prediction Center", and the URL "www.nws.noaa.gov". A navigation bar contains "Site Map", "News", "Organization", and a search box. The main content area is titled "Latest Seasonal Verifications" and includes the following information:

- Valid: Dec-Jan-Feb 2008-09
- Updated: March 17, 2009
- Download Skill Score Archive
 - [Temperature](#)
 - [Precipitation](#)
 - [Click here for skill score explanation](#)

Below this, there are four data tables and maps:

Temperature Forecast Heidke Skill Scores :	Precipitation Forecast Heidke Skill Scores :
Non-Equal Chance(non EC) forecasts : 19.70	Non-Equal Chance(non EC) forecasts : 37.31
All forecasts : 8.41	All forecasts : 10.79
% coverage not Equal Chance forecasts : 42.67	% coverage not Equal Chance forecasts : 28.88

Temperature (Forecast) Download Forecast Data Archive (CAT, PROB ABOVE PROB BELOW) How To Read Temperature Forecasts

Precipitation (Forecast) Download Forecast Data Archive (CAT, PROB ABOVE PROB BELOW) How To Read Precipitation Forecasts

Dec-Jan-Feb 2008-09 Temp Official Forecast

Dec-Jan-Feb 2008-09 Prec Official Forecast

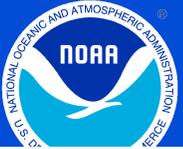
Temperature (Observations) Download Observational Data Archive (Temperature Observations) How To Read Observations

Precipitation (Observations) Download Observational Data Archive (Precipitation Observations) How To Read Observations

Dec-Jan-Feb 2008-09 Temp Obs_Categories

Dec-Jan-Feb 2008-09 Prec Obs_Categories

- **CPC provides real-time gridded verification of its seasonal outlooks**
 - downloadable archive
 - observations
 - performance metrics
- **Current/planned extension:**
 - monthly outlooks
 - regional extended range
 - performance metrics

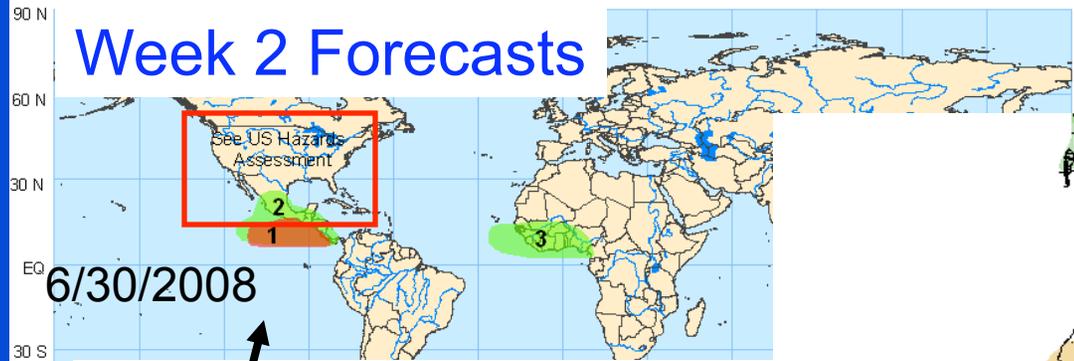


Climate-Weather Linkage

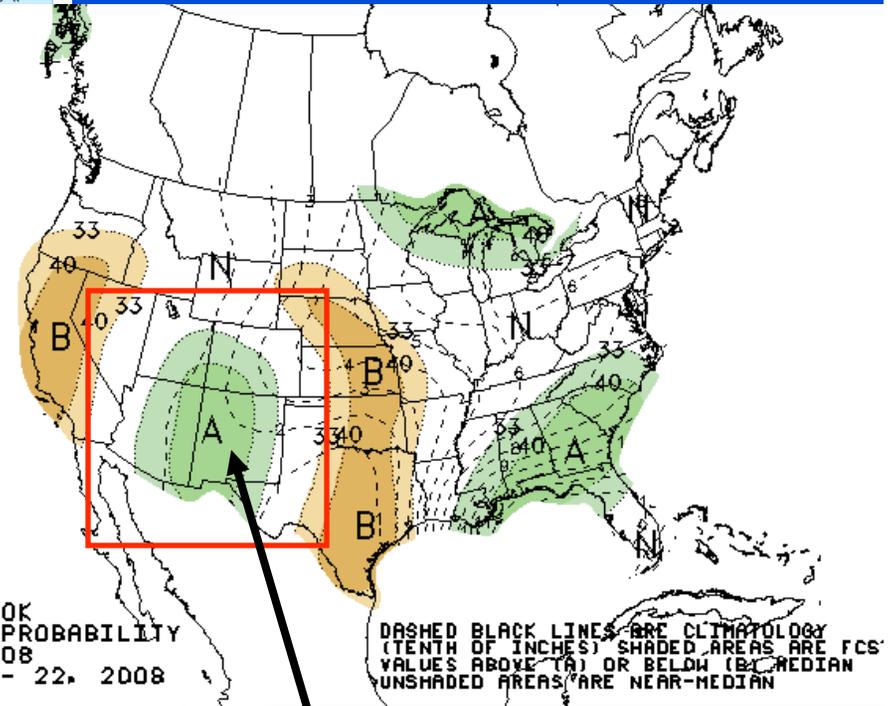


Global Tropics Hazards

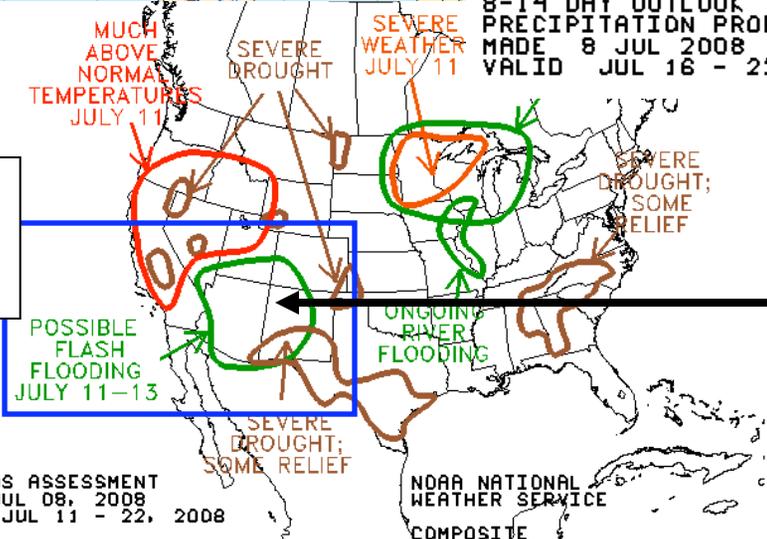
Week 2 Forecasts



8-14 Day Forecast



TC activity forecast



Lengthy period of heavy monsoon rainfall and flash flooding events

US Hazards Assessment



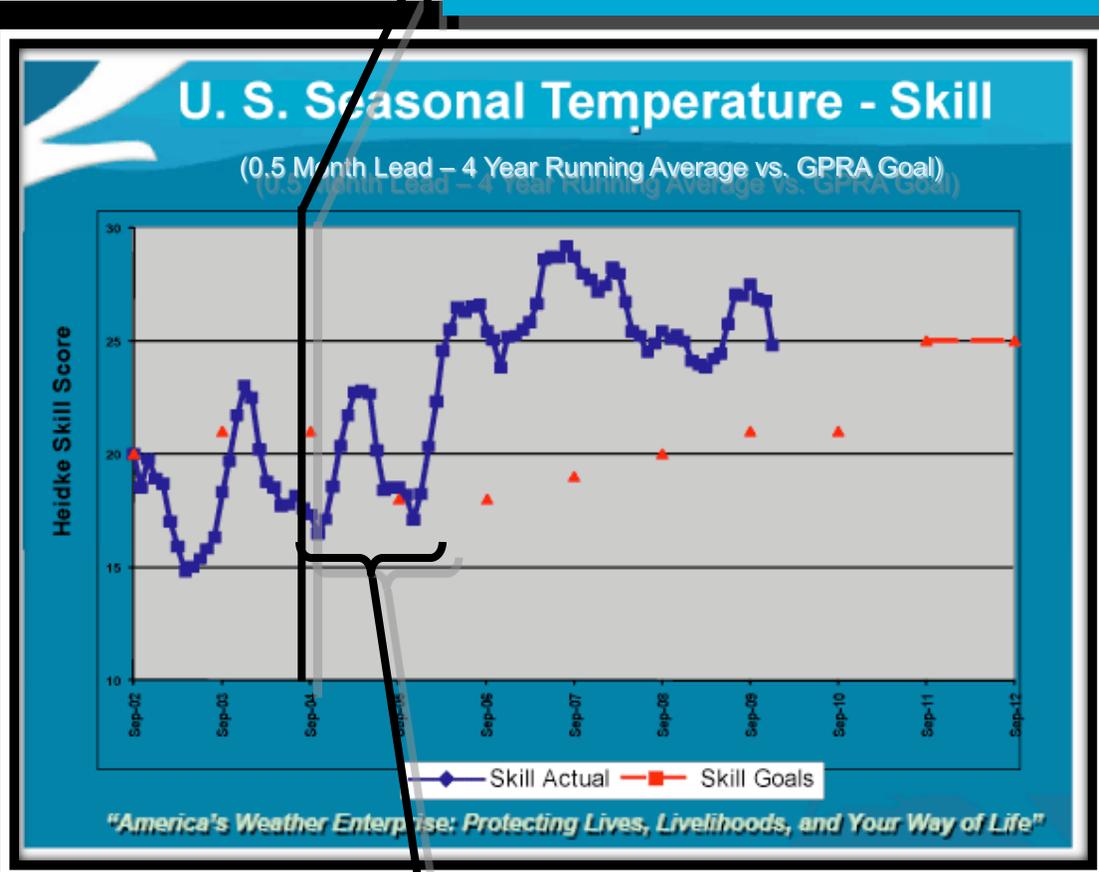
Climate Prediction Advances at NCEP



Climate Forecast System (CFS)
Dynamic, fully-coupled operational model

CFS & improvements to CFS through CTB contributed to improved skill of CPC official outlooks by 20% or more (O'Lenic et al 07)

CFS (v1.0) implemented



CTB Spun up



Climate Prediction Advances at NCEP



Climate Test Bed Mission

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

Research to Operations (R2O)

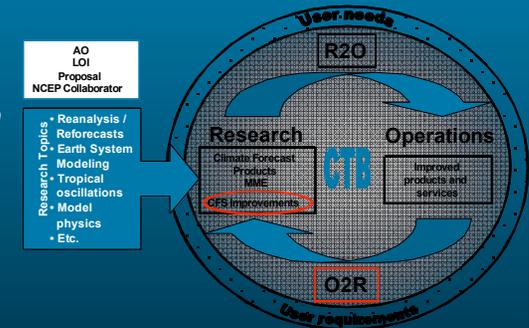
Operations to Research (O2R)

• Focus Areas

- *CFS Improvements – transition of research advances from external community*
- *Multi Model Ensemble (MME) Prediction Systems*
 - *National / International*
 - *GFDL / NCEP Postdocs*
- *Climate Forecast Products*
 - *Establishing user needs*
 - *Develop and improve products and services in coordination with external community*

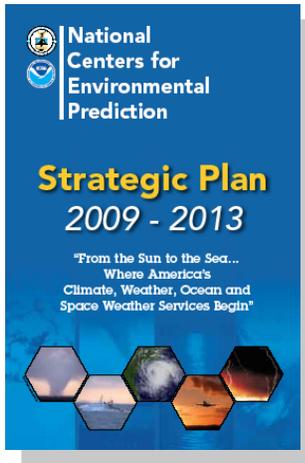
• Model Test Facility

- *Provide CFS and related datasets to community*





Looking Ahead: Next 5 Years



- NCEP (FY09-13), NWS (2010-2025) & NOAA (FY10-14)
 - *CPC 5-Year Implementation and Operations Plan (FY09-13)*

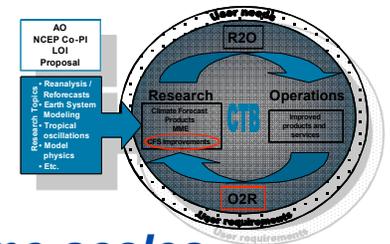
Strategic Plans

- Move to NOAA Center for Weather and Climate Prediction
 - *Opportunities for collaboration*



- Emergence of NOAA Climate Service
 - *Informing decisions and managing risks*

- Climate Prediction
 - *Enhance Intraseasonal-to-Interannual climate forecasts*
 - *Increasing emphasis on multi-model ensembles across time scales*
 - *Enhance transition activities (Climate Test Bed; Model Test Facility)*



- Improve Interactions with Broader Science and Service Community



Thank You

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