Overview of Climate Predictions at Various Timescales

Dr. Scott Weaver, Research Meteorologist
Climate Prediction Center / NCEP

CPASW

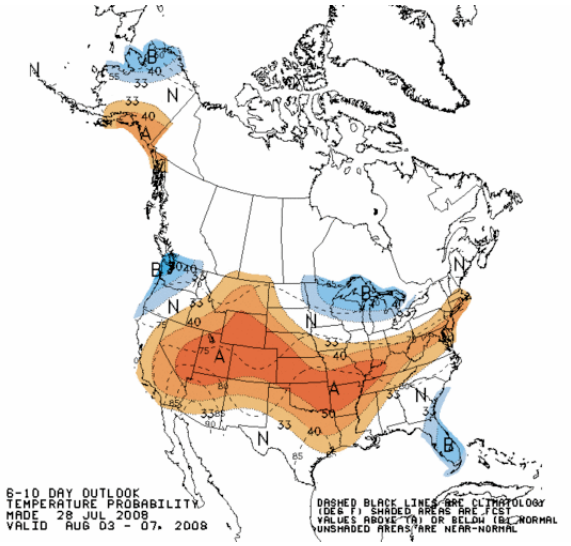
March, 2010

CPC Mission

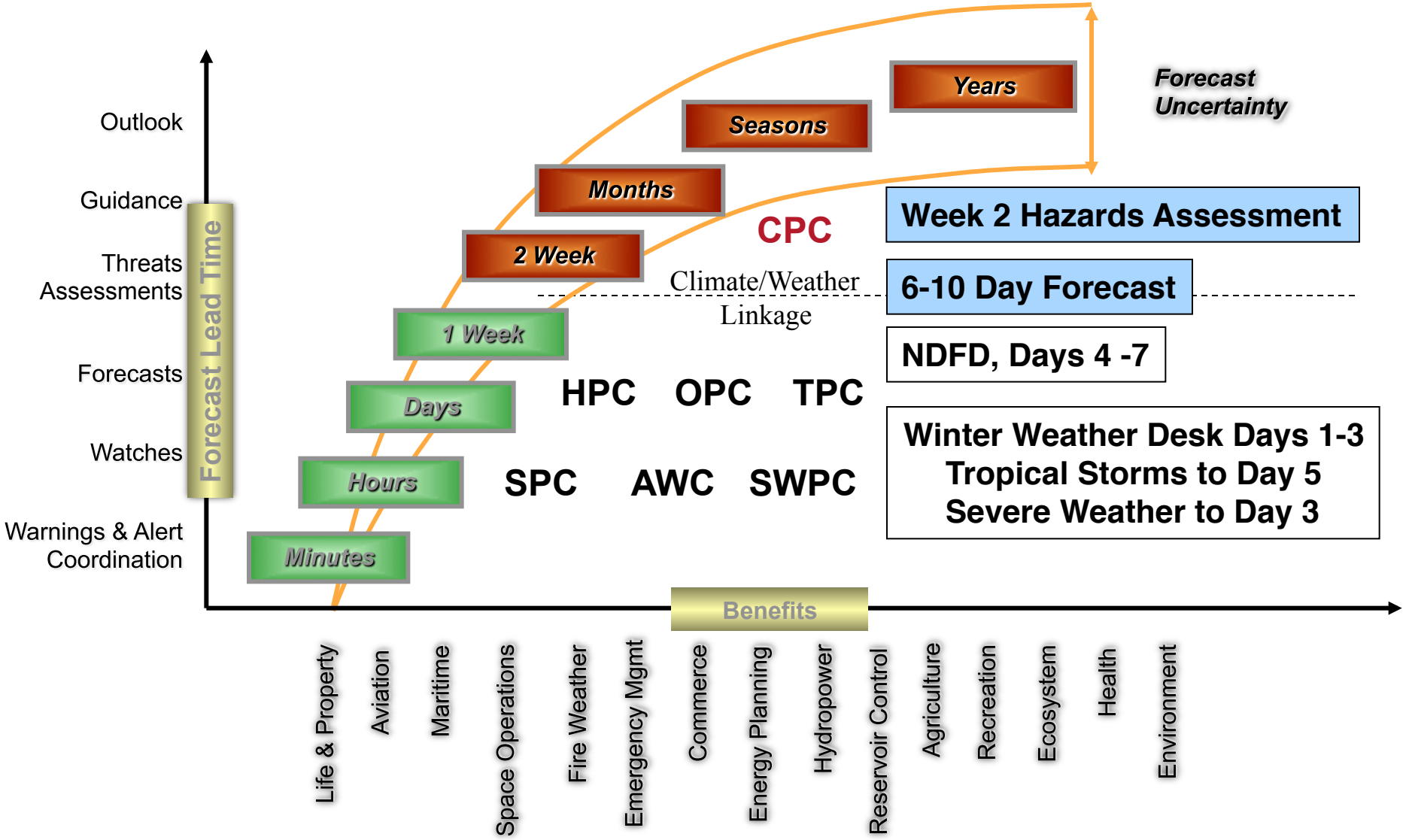
We deliver climate prediction, monitoring, and assessment products for timescales from weeks to years to the Nation and the global community for the protection of life and property and the enhancement of the economy.

- 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

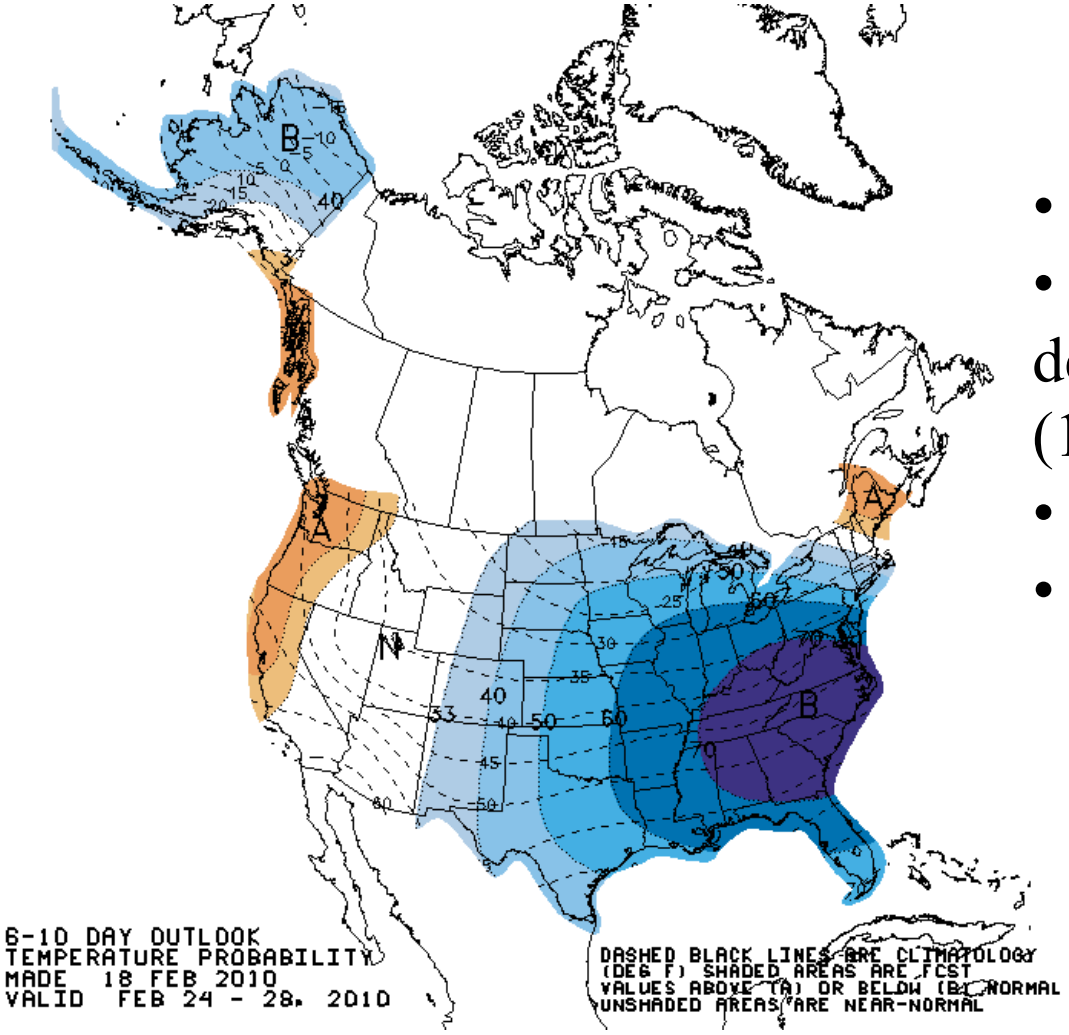
Temperature Outlook



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



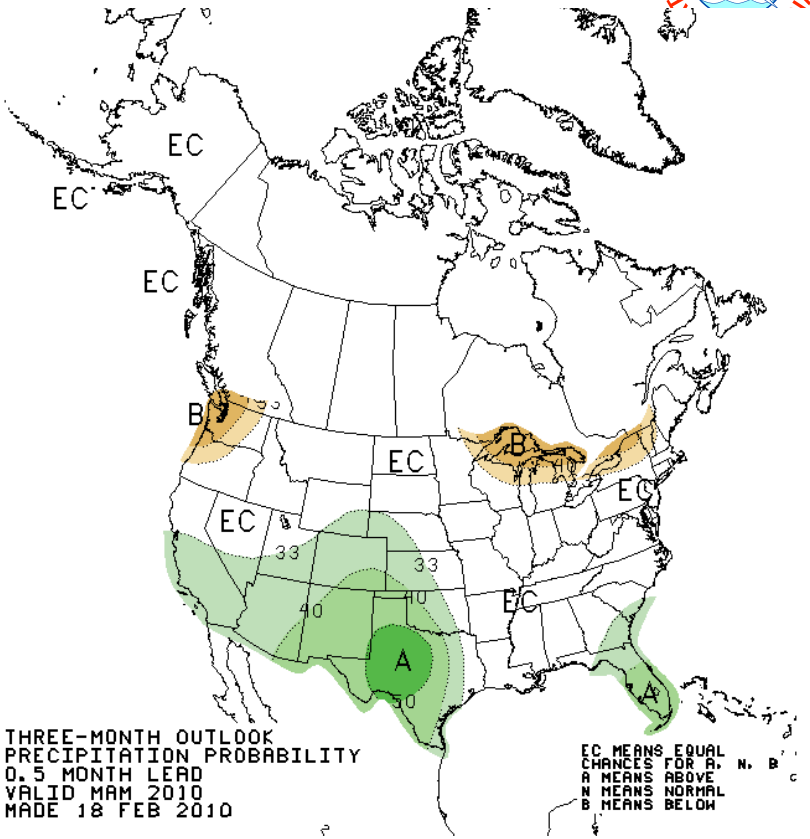
Extended Range Forecast
6-10 & 8-14 day outlook

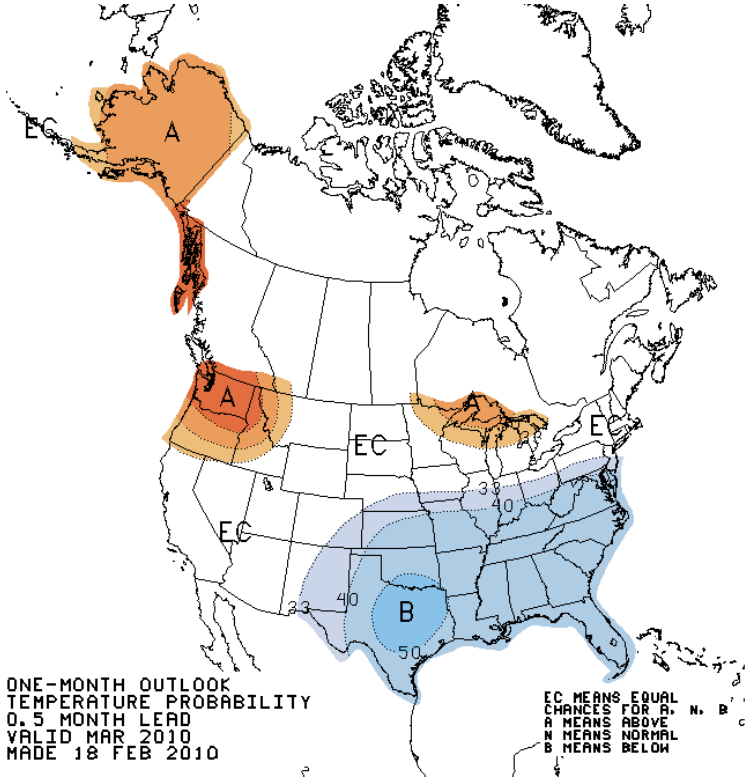


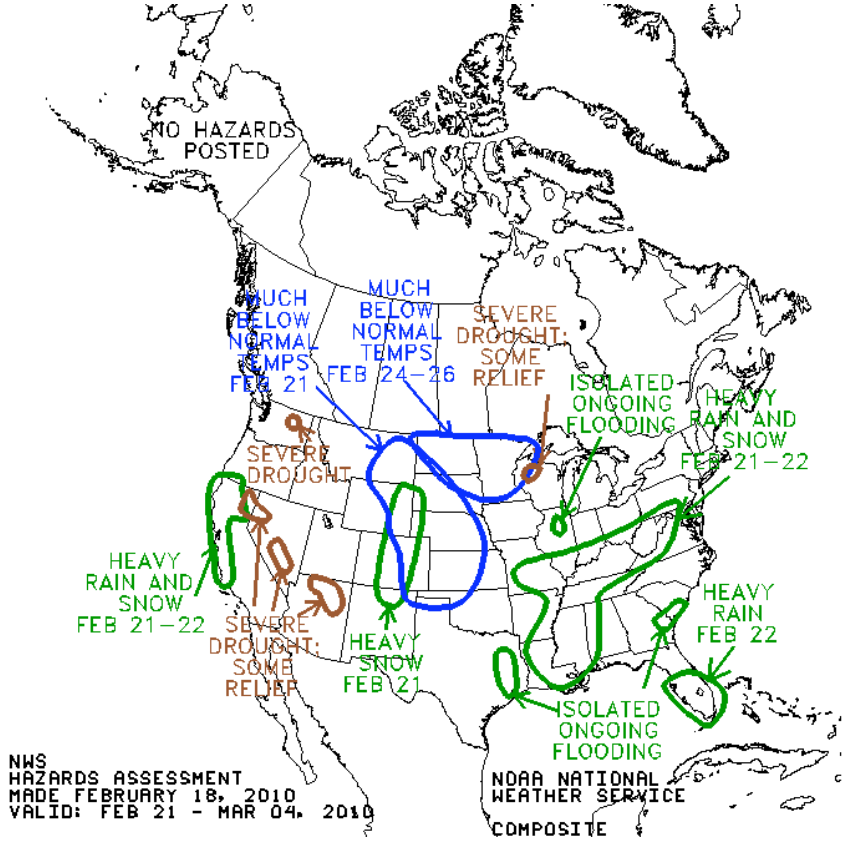
- 3-tier system.
- Forecaster confidence in departure from 30-yr normal (1971-2000).
- Represents PDF shifts.
- Middle category has no shift.

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

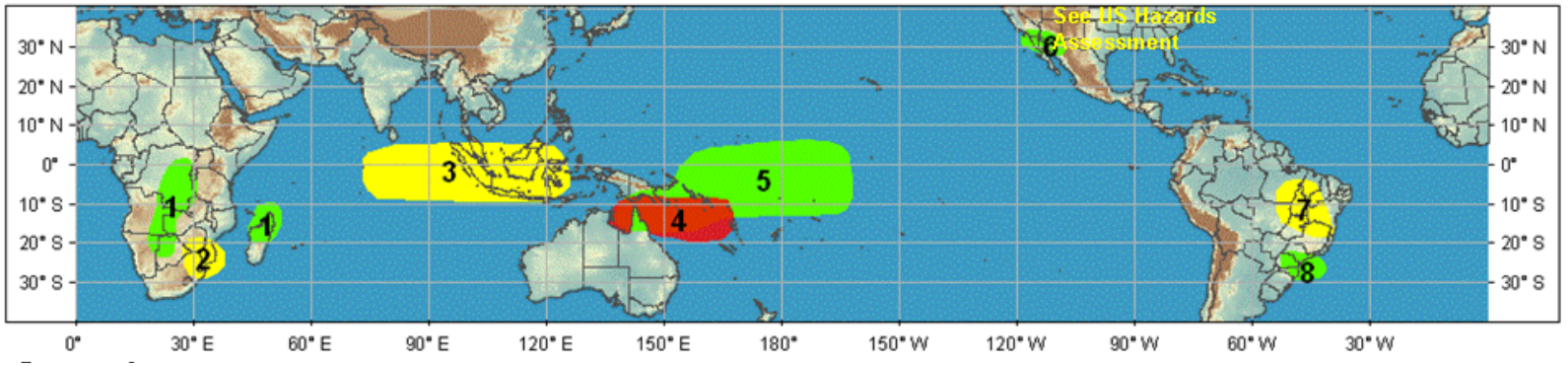
Advanced notice of potential Wx & Cx hazards

- 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

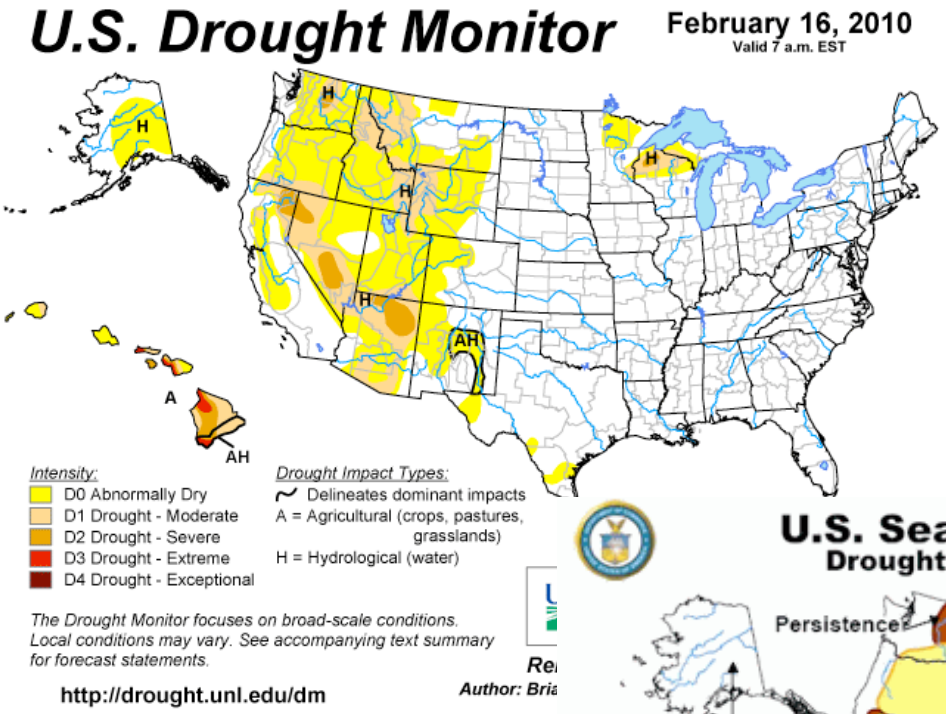
Product issued once per week with no updates. Conditions are subject to change after issuance time and before next outlook.
Product targets broad scale conditions integrated over a 7 day period for US interests only. Please also consult your local responsible forecast agency.

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



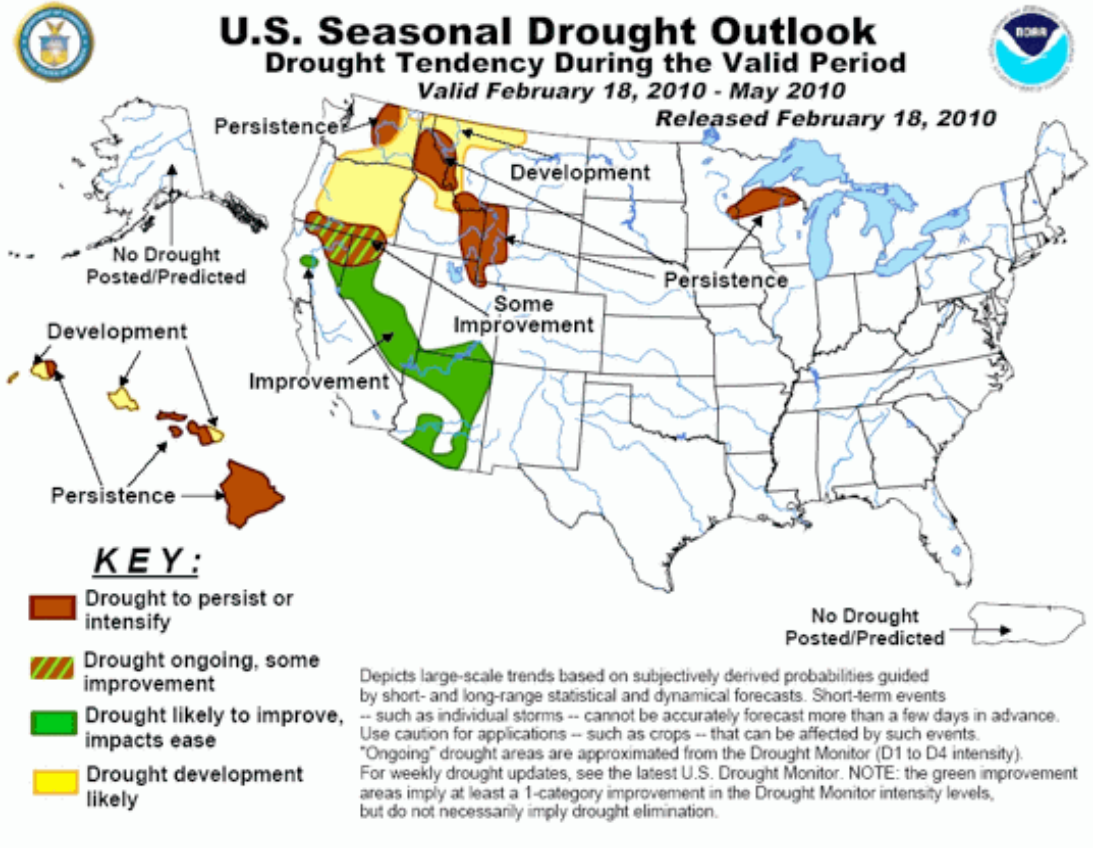
Drought Monitor

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



Drought Outlook

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



Seasonal Hurricane Outlook

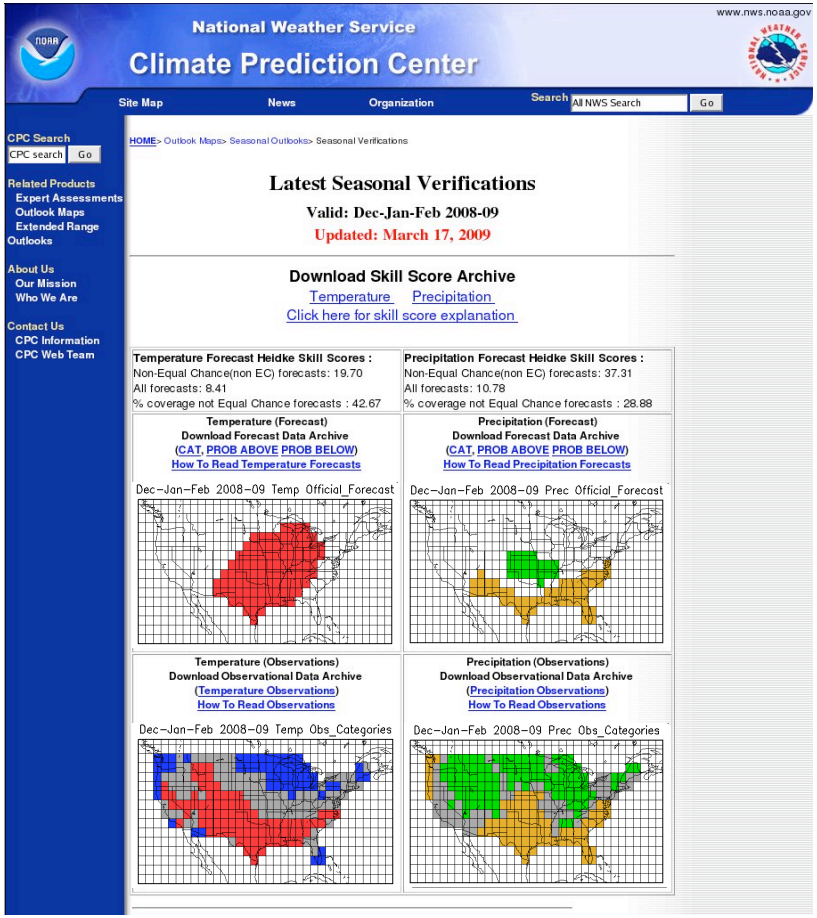
- Issued in May Revised in August.
- Provides outlook of seasonal TC activity.
- Latest Science & Technology.

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

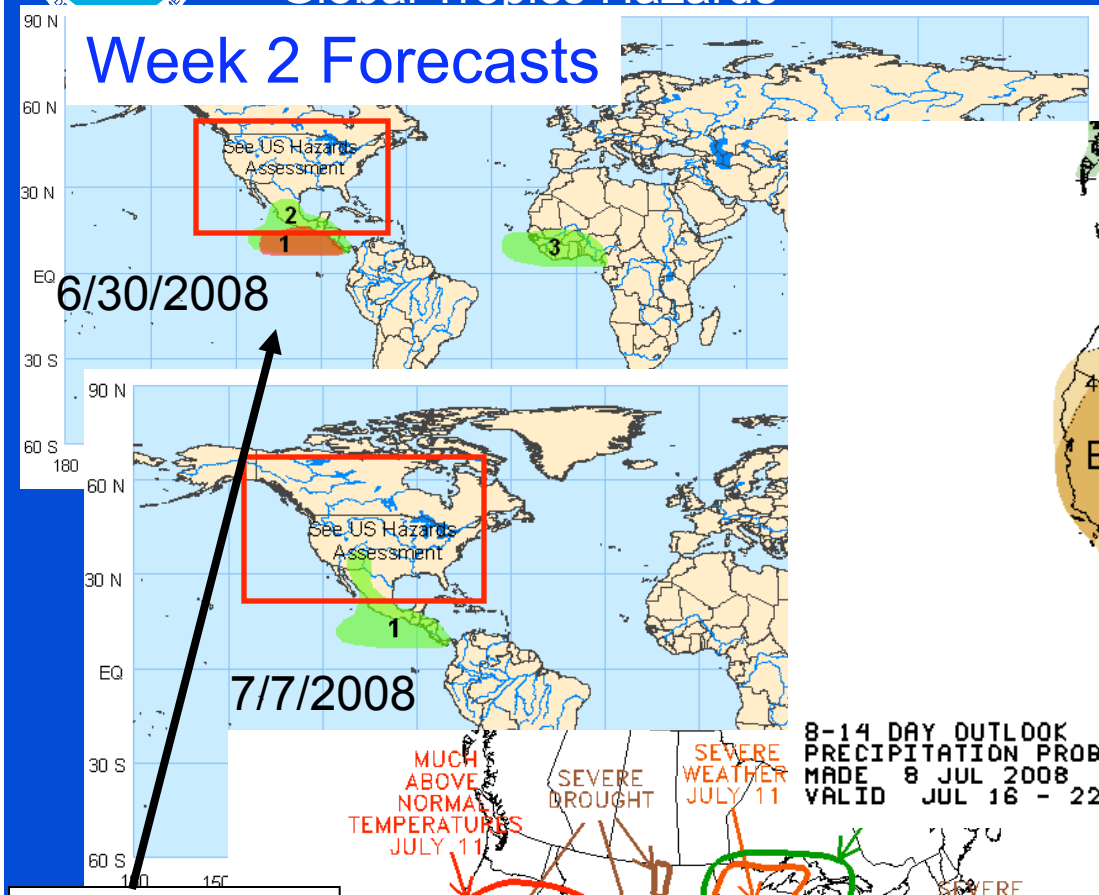


- **CPC provides real-time gridded verification of its seasonal outlooks**
  - **downloadable archive**
  - **observations**
  - **performance metrics**
- **Current/planned extension:**
  - **monthly outlooks**
  - **regional extended range**
  - **performance metrics**

Climate-Weather Linkage

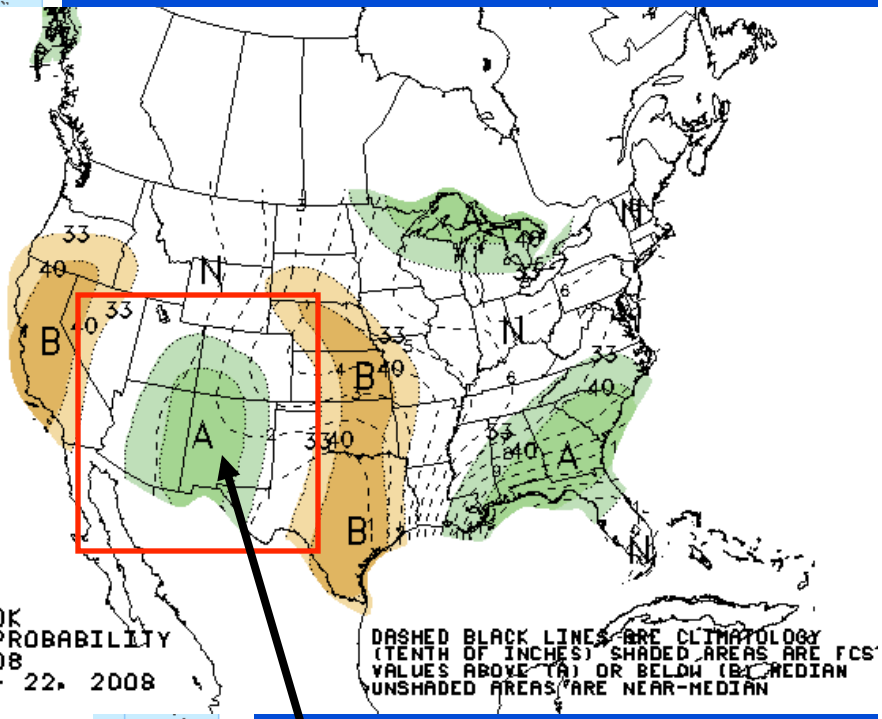
Global Tropics Hazards

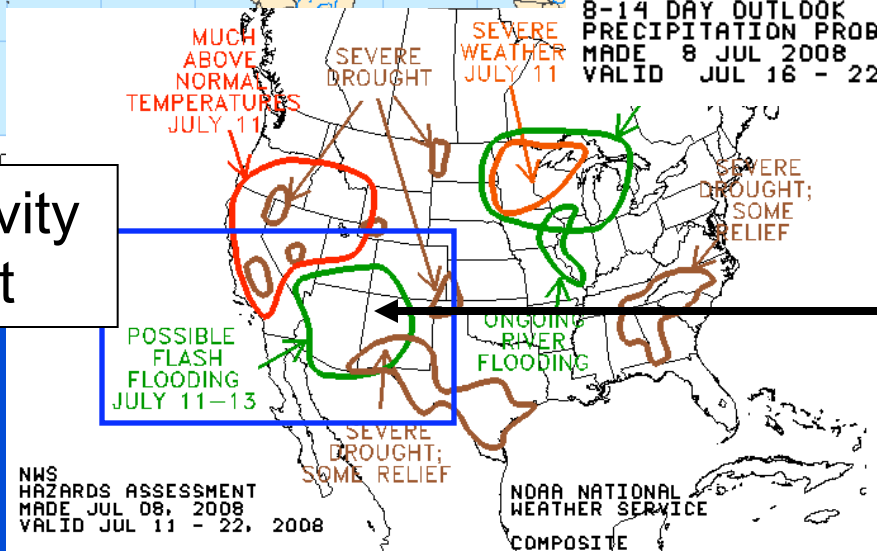
Week 2 Forecasts



TC activity forecast

8-14 Day Forecast





Lengthy period of heavy monsoon rainfall and flash flooding events

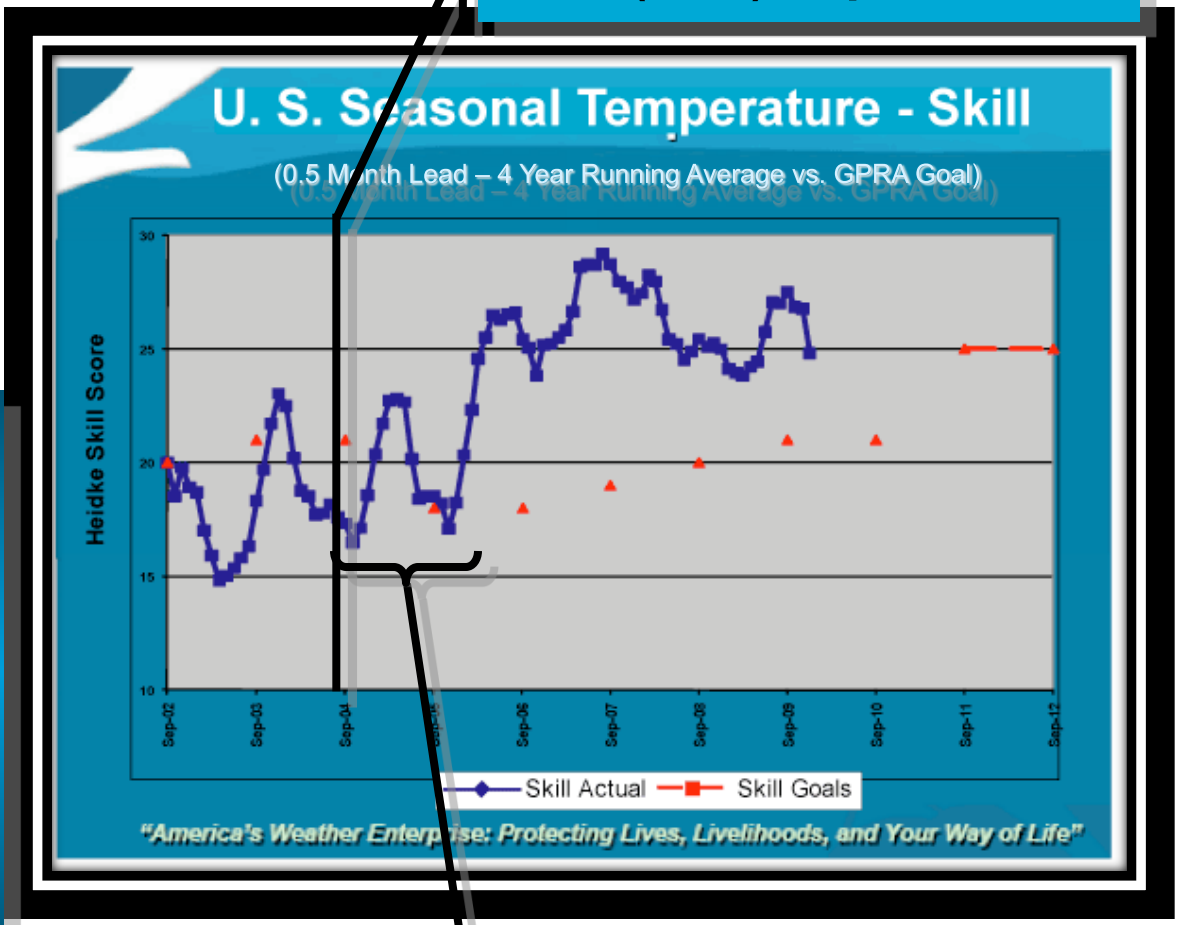
US Hazards Assessment

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

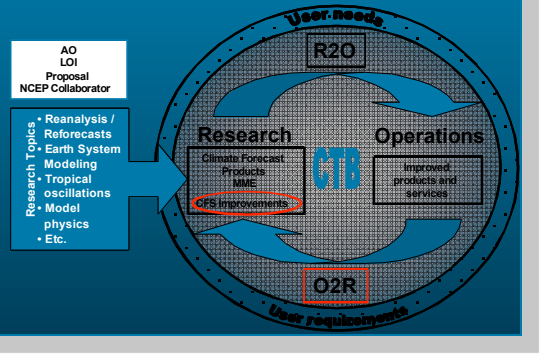
Climate Prediction Advances at NCEP

Climate Test Bed Mission

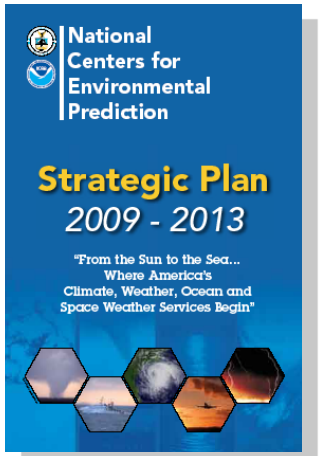
- *To accelerate the transition of scientific advances from the climate research community to improved NOAA climate forecast products and services*

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*

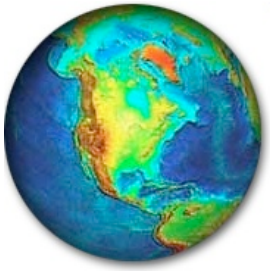


Looking Ahead: Next 5 Years

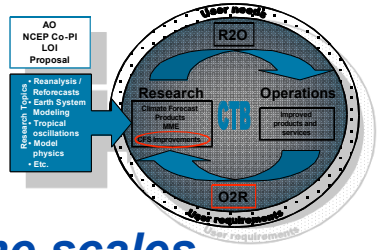


- **NCEP (FY09-13), NWS (2010-2025) & NOAA (FY10-14) Strategic Plans**
  - *CPC 5-Year Implementation and Operations Plan (FY09-13)*

- **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

scott.weaver@noaa.gov