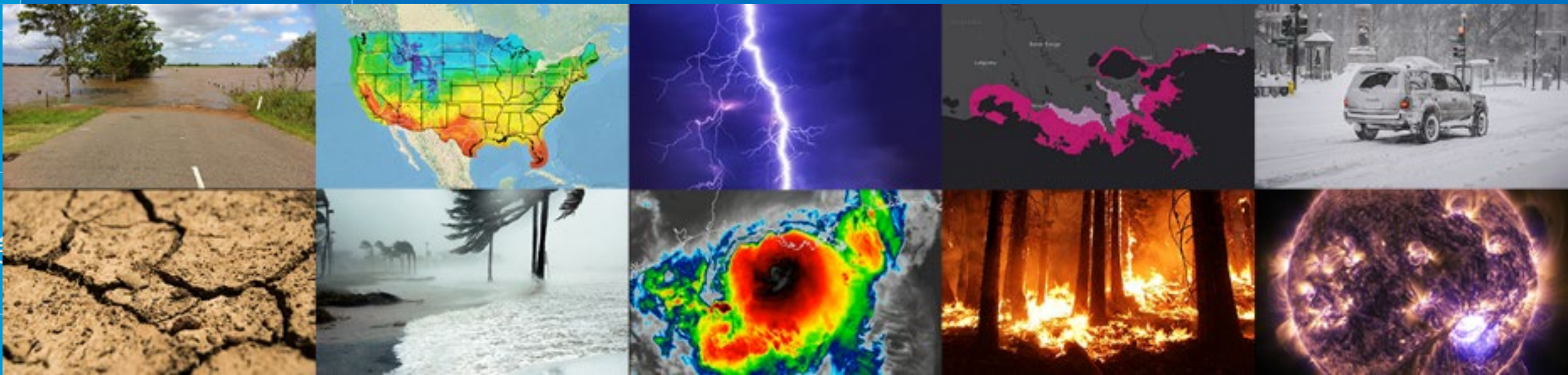




NOAA

CPC National and International Sub-Seasonal to Seasonal (S2S) Climate Decision Support Services

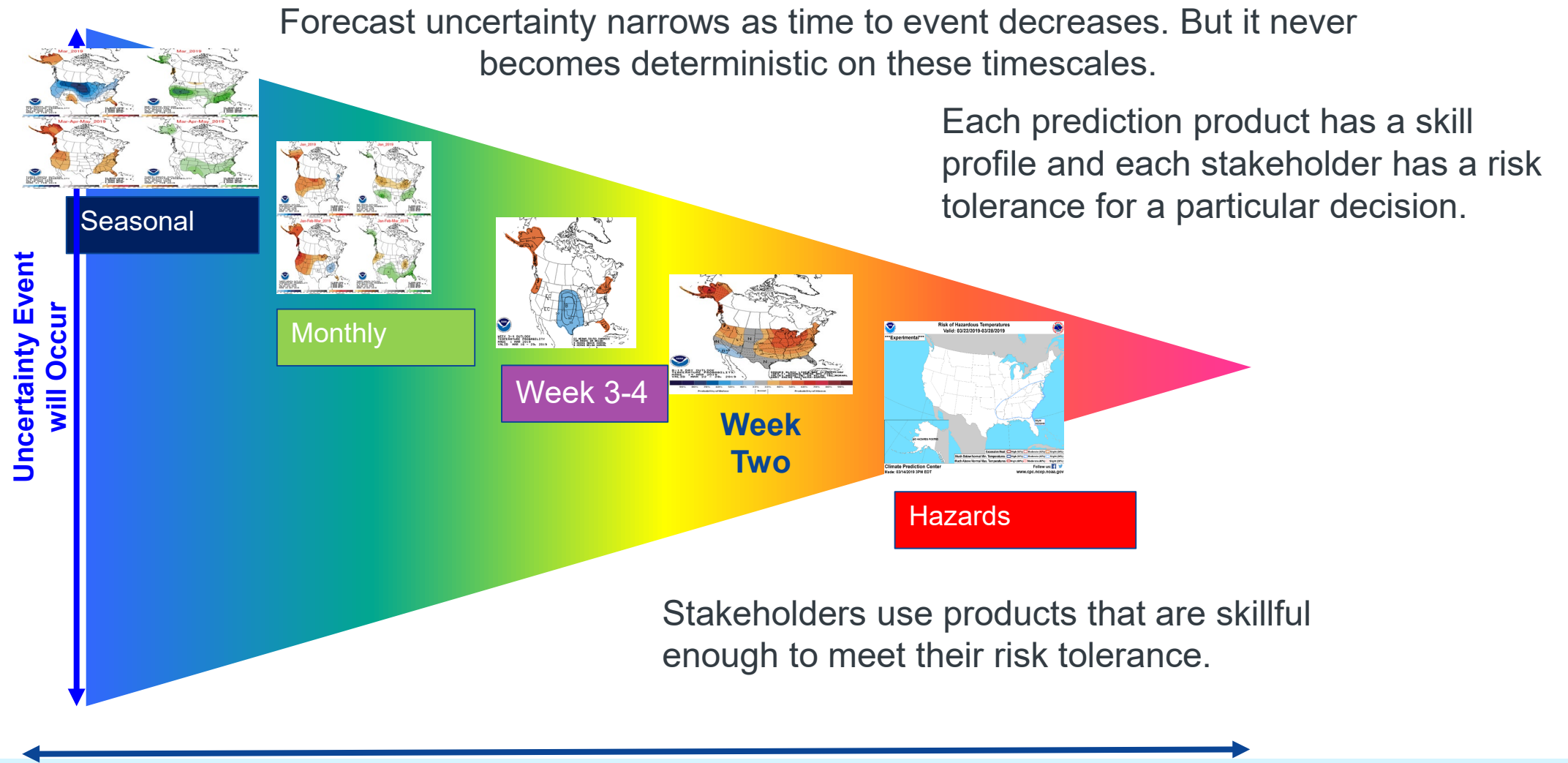
David G. DeWitt
Climate Prediction Center Director




Outline






- **Thanks for the opportunity to speak. It is good to see everyone.**
- **S2S Threat Vector**
- **NWS Decision Support Services (DSS) paradigm**
- **CPC DSS Core Partners (partial list)**
- **CPC Domestic DSS for Core Partners: USDA, NIDIS/USDM**
 - **Real-world examples (NOAA/USDA)**
- **CPC International DSS for Core Partners : (USAID OFDA and FEWSNET)**
 - **Capacity building**
- **Final Thoughts**

Sub-Seasonal to Seasonal Skill (Uncertainty) Profile

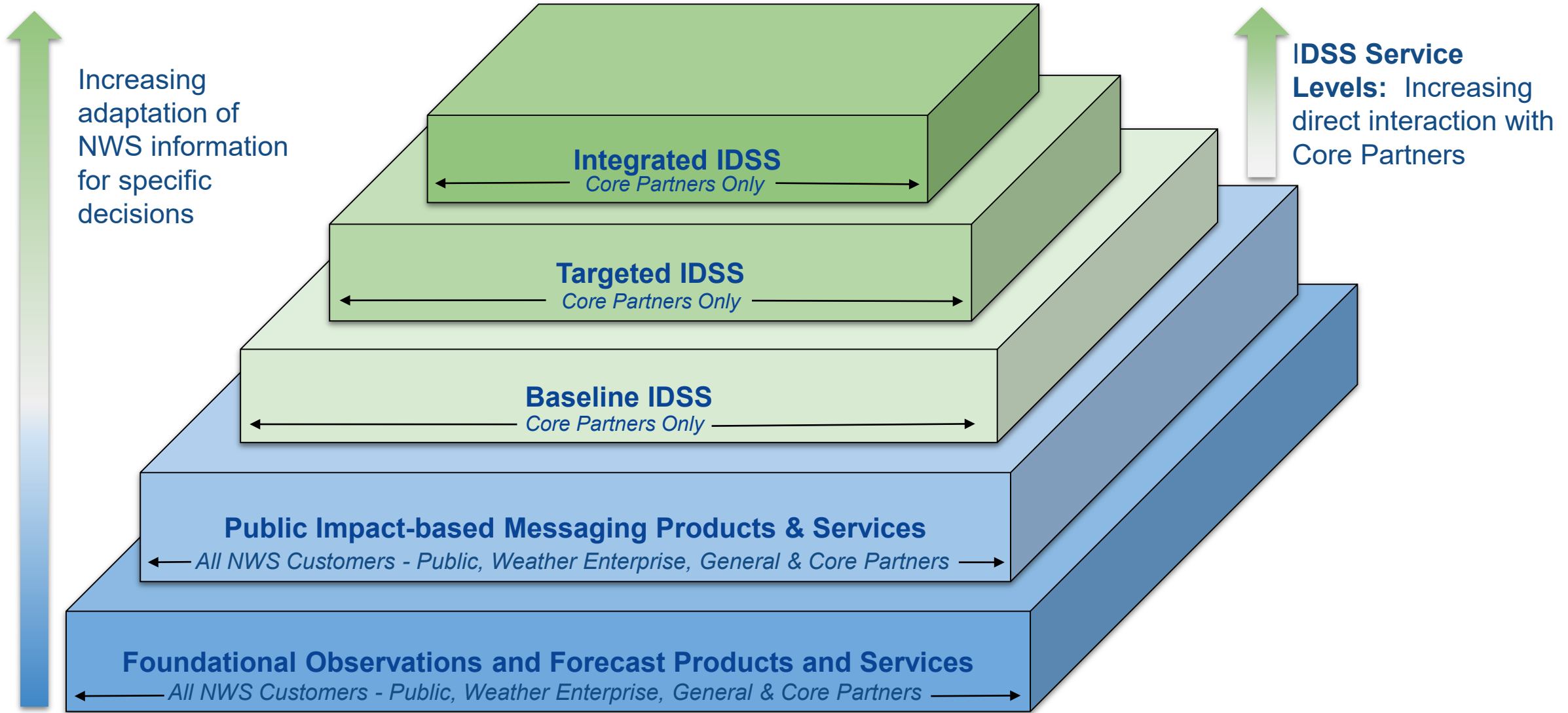




Sub-Seasonal to Seasonal Climate Services Through a National Weather Service Impact-Based Decision Support Services Lens

- 
- 
- 
- 
- 
- The National Weather Service (NWS) implemented a new user-focused service paradigm known as impact-based decision support service (IDSS) across its service areas.
 - The IDSS paradigm employs a tiered approach to services, with service level depending on the stakeholder community.
 - CPC collaborates extensively within NOAA, other federal agencies, the academic sector, and international partners to develop the foundational science capabilities for and to deliver S2S climate IDSS.
 - CPC's role in the IDSS service delivery value chain is situationally dependent, i.e. sometimes we lead and sometimes we follow. Whole of government approach.
 - The administration's climate services strategy is to focus climate services on the challenges that pose the greatest risks and opportunities to society.

Continuum of IDSS



Continuum of Impact-based Messaging Services

Messaging Foundation

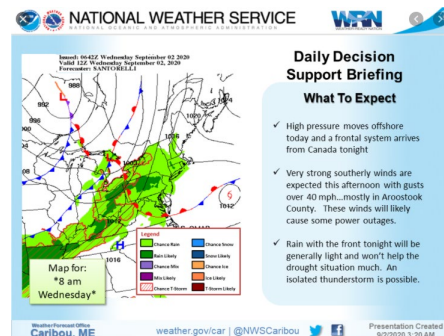
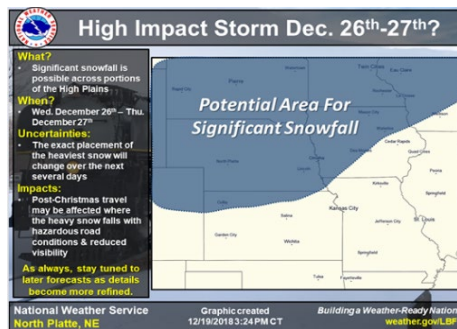
Increasing direct interaction with Core Partners

Public Services

Baseline IDSS

Targeted IDSS

Integrated IDSS



NDFD drives general forecast information, while forecaster generated Weather Graphics and Social Media posts convey **general impacts**.

Forecasters directly send IDSS Graphic Packages, and conduct Webinars to all Core Partners, focusing on **general impacts**. They respond to Core Partner questions in NWSChat.

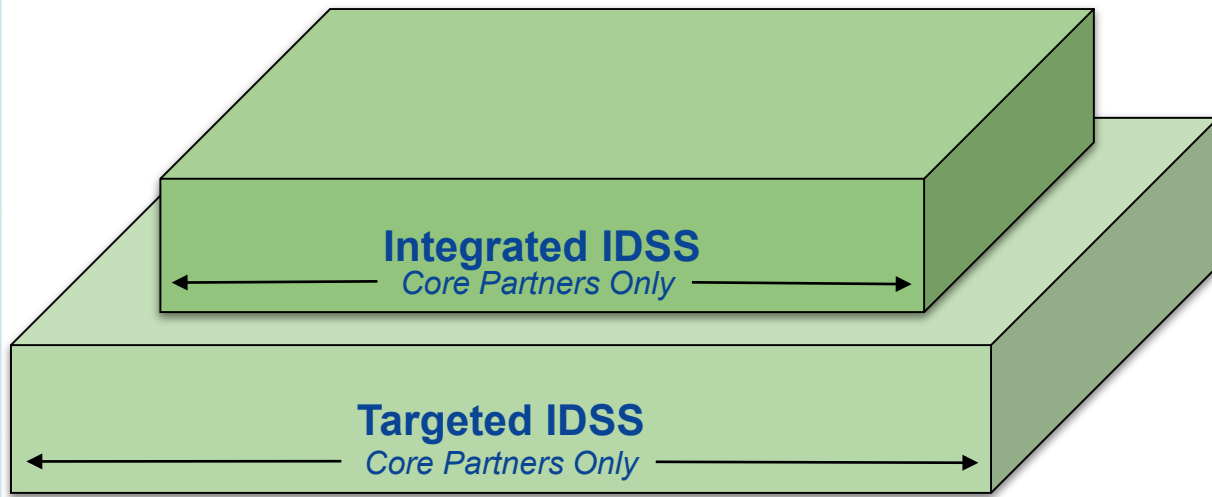
Targeted Webinars, Emails, Graphics Packages, etc. to subsets of Core Partners to convey **impacts based on their customized thresholds in a way tailored to their needs**

Integrated One on One Virtual or Onsite Support to an Individual Core Partner that requires **on-demand customized impact information**

Increasing adaptation of NWS information for specific decisions



Continuum of Impact-based Messaging Services

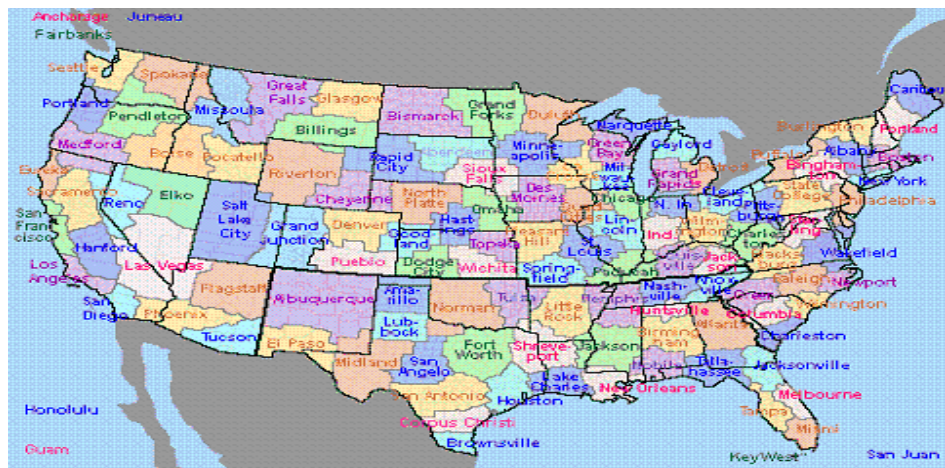


Considerations in Prioritizing the Provision of Higher Levels of IDSS Services*

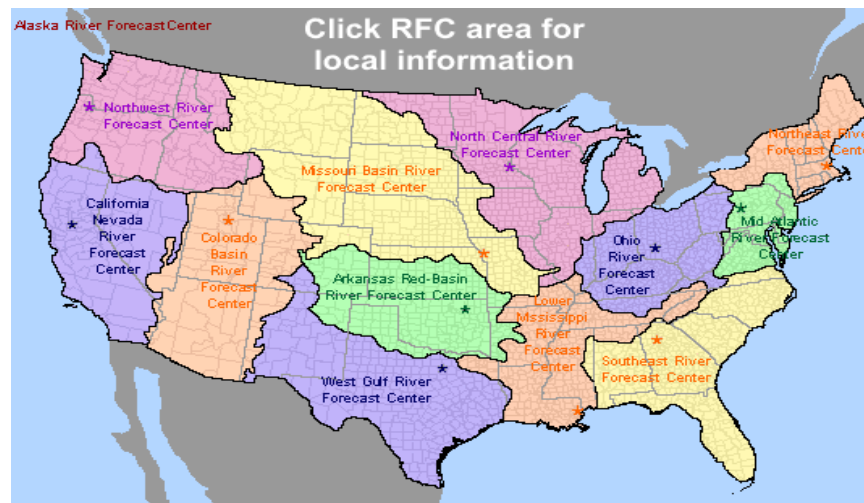
1. There is a legal mandate to support the Core Partner (e.g., Executive Order, statute) or support is a matter of national security;
- 2. The Core Partner exercises a large degree of authority or influence relative to other core partners, on public safety or management of the nation's water resources for the public good;**
3. The Core Partner serves a population or entity particularly vulnerable to impacts of weather, water, or climate hazards;
- 4. The Core Partner acts a force multiplier to help amplify NWS messages to other partners.**

*Consistent with Deep Core Partner Criteria from NWSD 10-24

Examples of CPC Core Partners (Partial List)



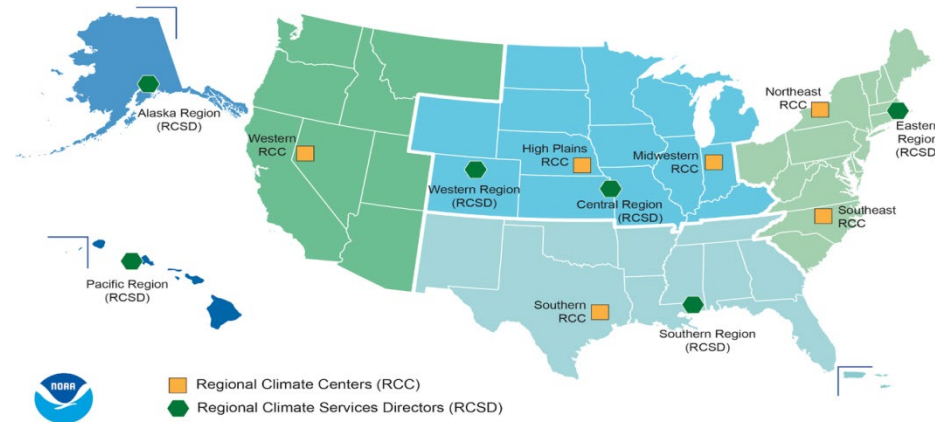
NWS Weather Forecast Offices/Regions



NWS River Forecast Centers



USDA Climate Hubs



NOAA Regional Climate Centers and Regional Climate Services Directors



Decision Support Services (DSS) for Core Partner: USDA

- **Joint Agricultural Weather Facility (JAWF) and World Agricultural Outlook Board (WAOB):**

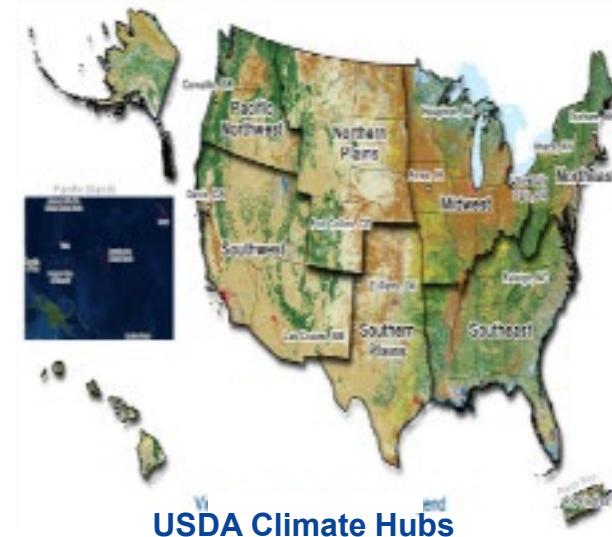
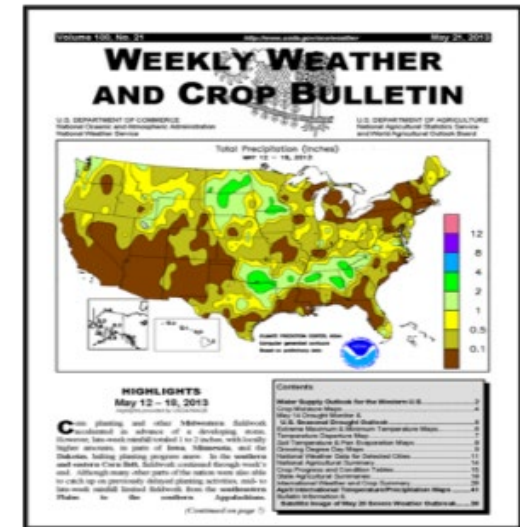
- Weekly Weather and Crop Bulletin:
 - Used by USDA to assess likely impacts on domestic and international crop production and commodity prices due to short-term climate variability.
- Customized tools and products.

- **Risk Management Agency (RMA) Rainfall Index- Based Crop Insurance:**

- RMA uses CPC precipitation monitoring data sets as the benchmark for determining whether or not to pay claims for the Pasture, Rangeland, and Forage Program.

- **Climate Hubs:**

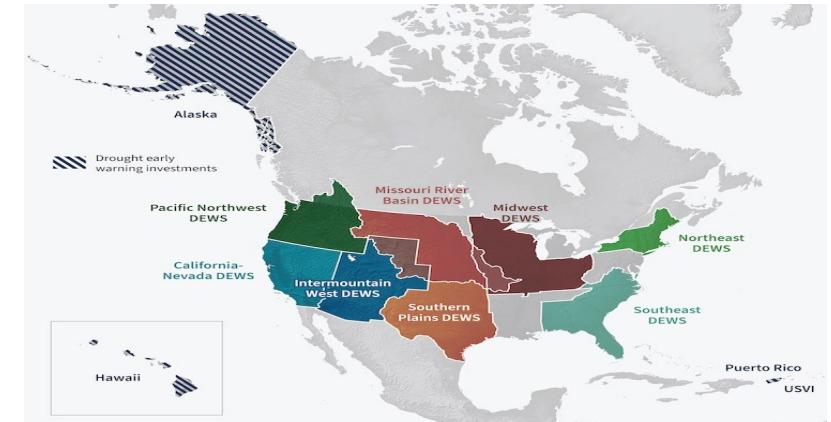
- Use CPC prediction and monitoring products to deliver science-based, region-specific information in agricultural contexts.



Decision Support Services (DSS) for Core Partners: NIDIS and USDM

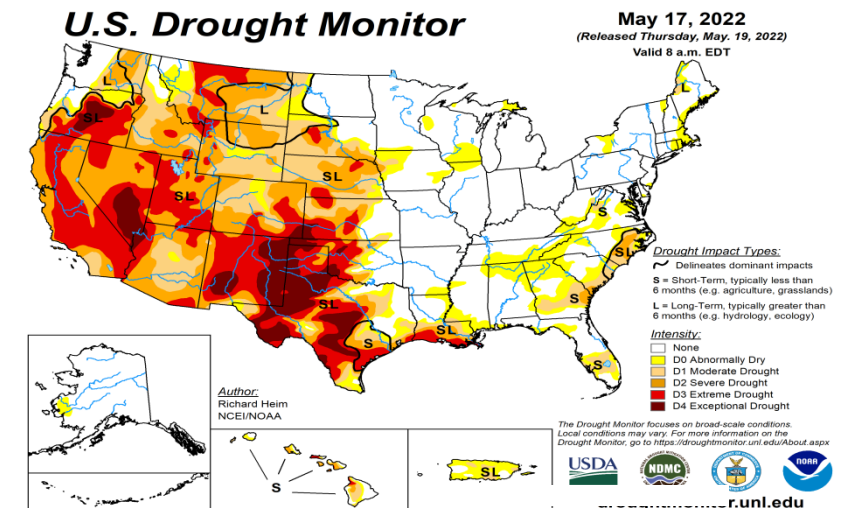
- **National Integrated Drought Information System (NIDIS):**

- CPC provides custom S2S prediction and science briefings to the NIDIS program and the NIDIS Regional Drought Early Warning Systems.
- CPC is collaborating with NIDIS to develop improved, objective drought prediction products.

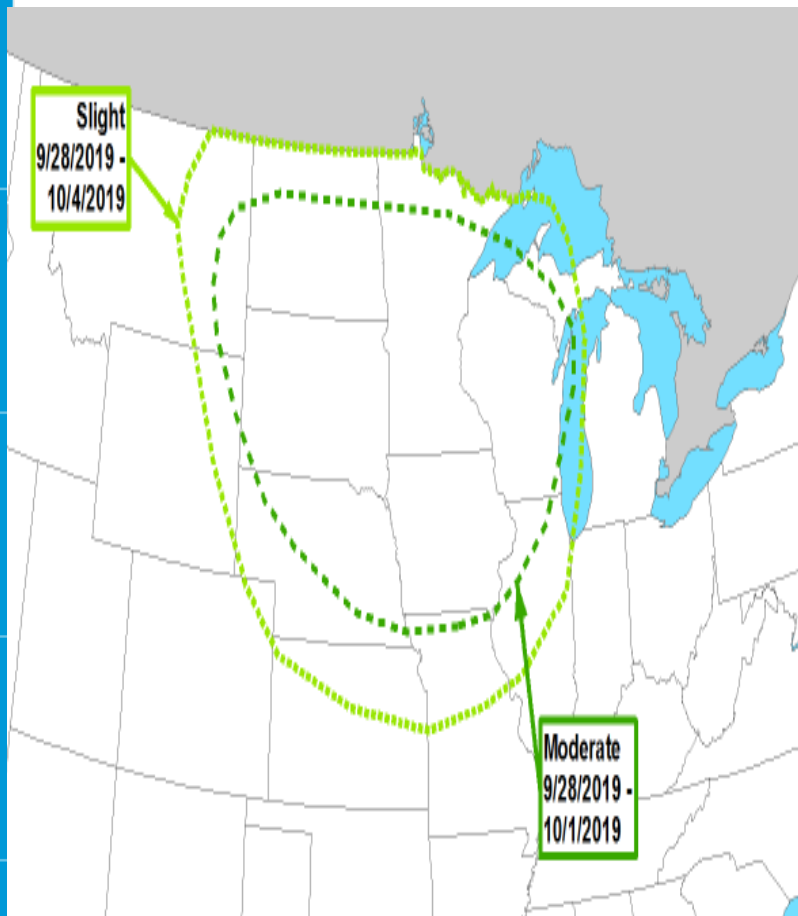


- **United States Drought Monitor (USDM):**

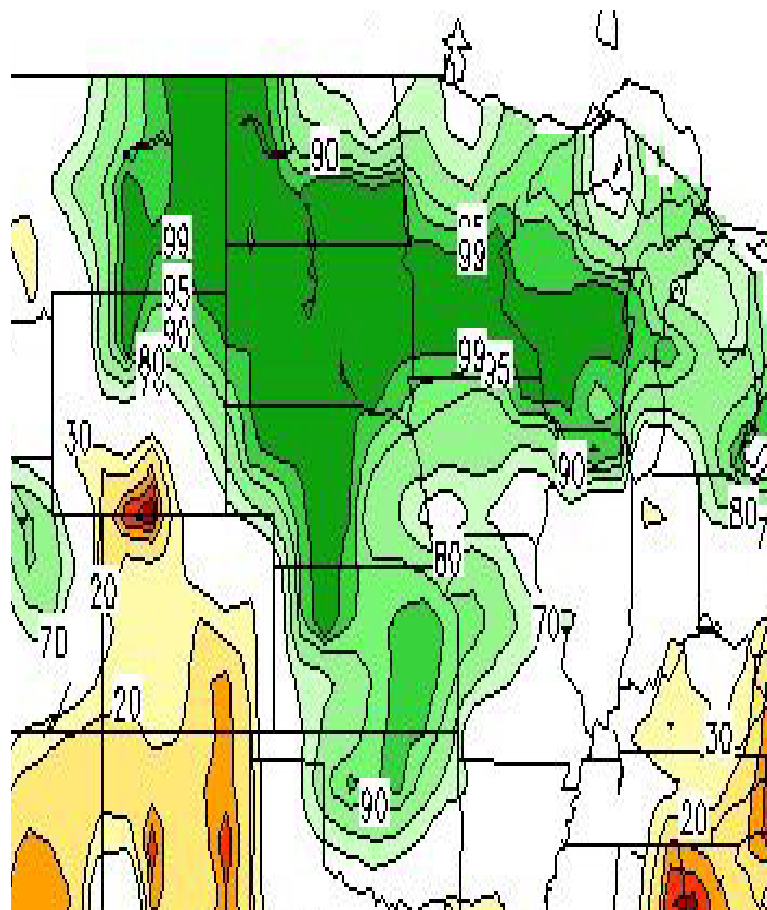
- CPC partners with the National Centers for Environmental Information (NCEI), United States Department of Agriculture (USDA), and the National Drought Mitigation Center (NDMC) to co-produce the USDM with and for a large number of stakeholders from across the states.



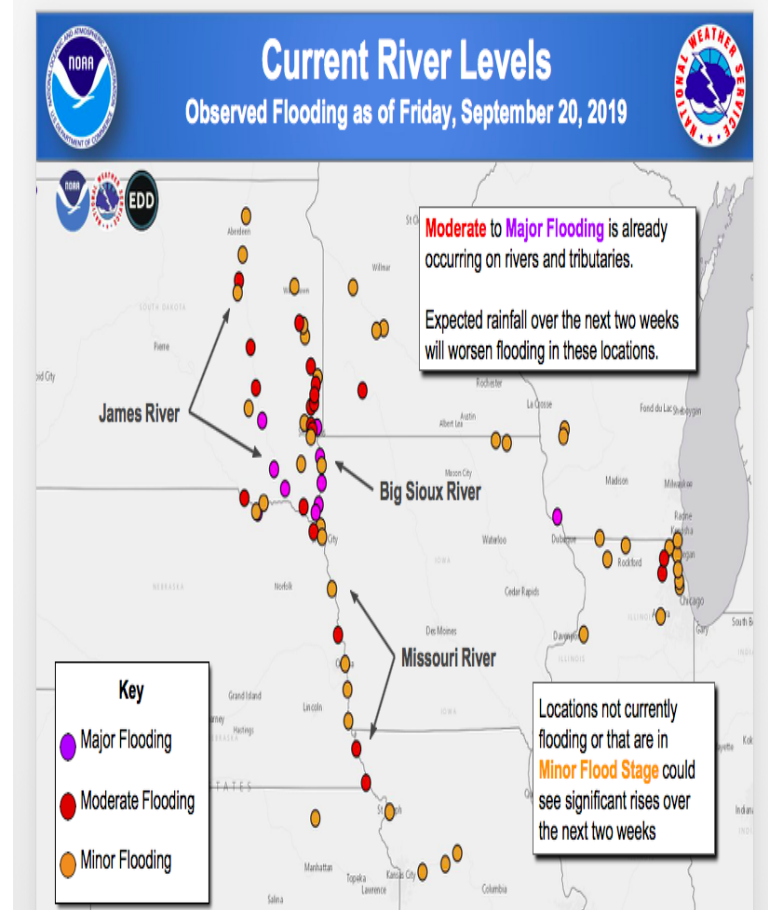
CPC Forecast: Continued/Worsened Flooding for Northern Plains Due to Heavy Rainfall: Late September into Early October 2019



CPC Prob. Hazards Outlook: 9/20/2019



Antecedent conditions:
Saturated soils over much of the
region



Antecedent conditions: Many
rivers near or above flood stage

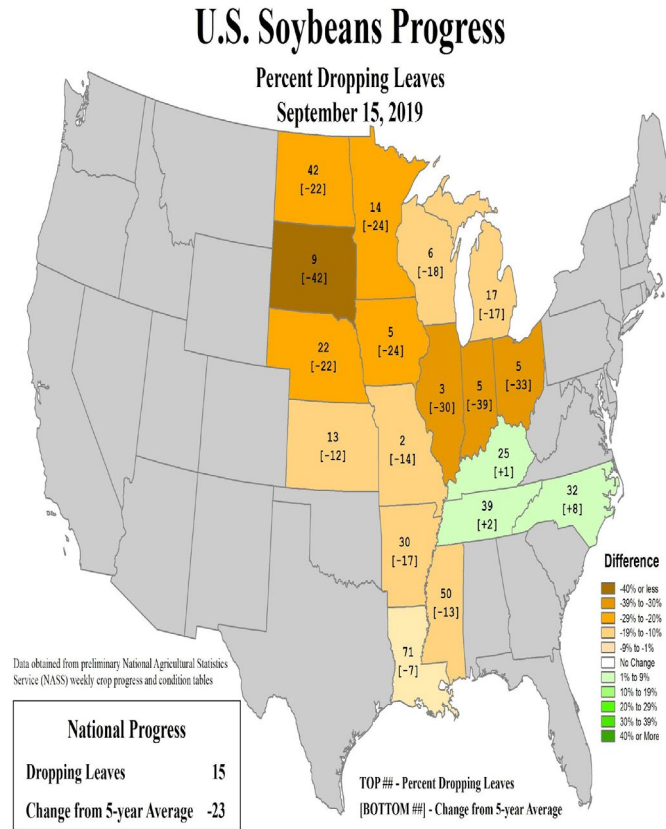
Decision Support Services (DSS) Briefings from Central Region and Partners about Heavy Rain Event

Heavy Rain Events
Forecast and Potential Impacts in the North Central U.S.
September 21 - October 4, 2019

Prepared By:
National Weather Service

In Partnership With:
Doug Kluck (NOAA/National Centers for Environmental Information), Dennis Today (USDA Midwest Climate Hub), Kevin Low (National Weather Service, River Forecast Center)

Building a Climate-Smart Nation



CPC Hazard Outlooks used as part of Decision Support Services (DSS) briefing from NWS Central Region and Partners including:

- NCEI
- Central Region Climate Services Director
- USDA Midwest Climate Hub
- High Plains Regional Climate Center
- Midwest Regional Climate Center

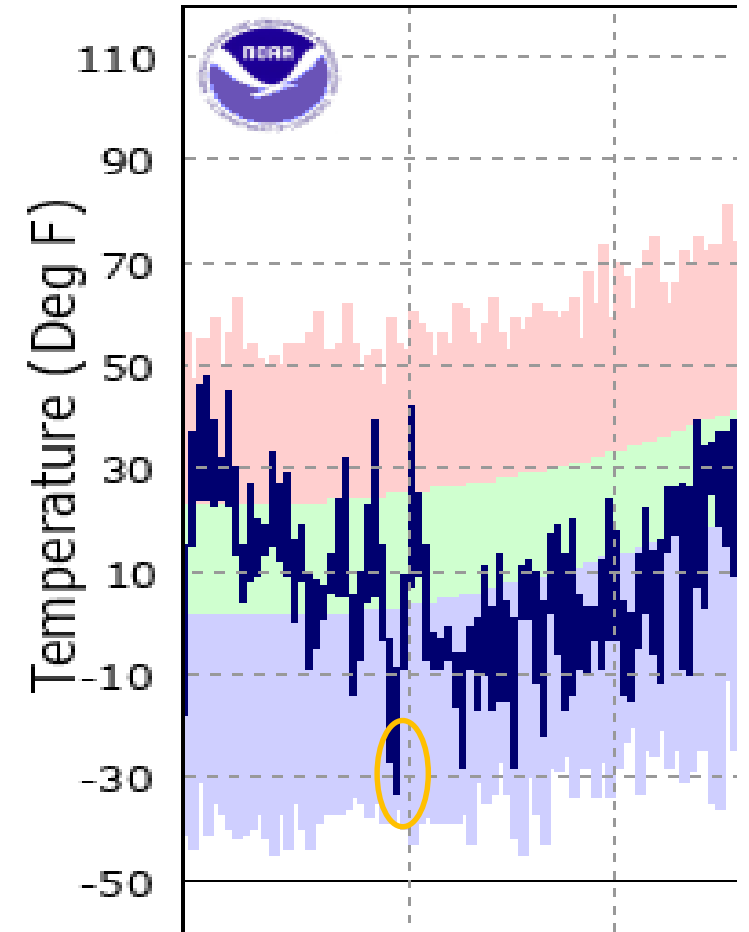
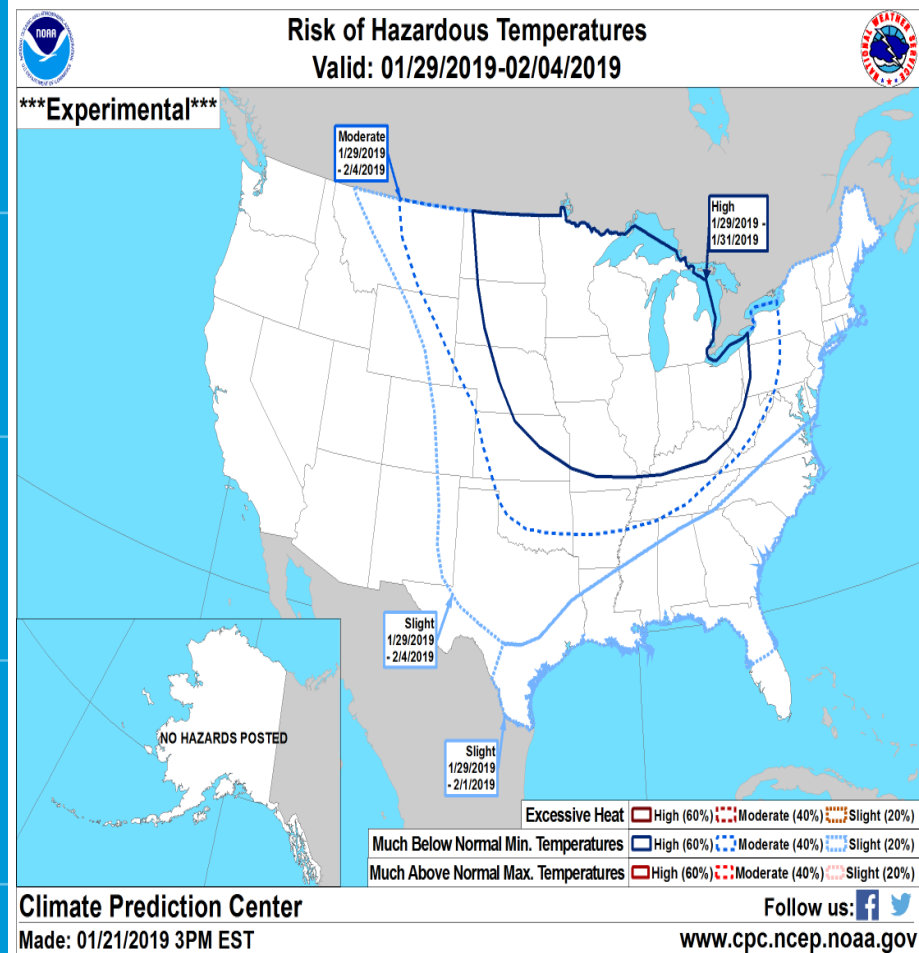
CPC Hazards Outlook Used in DSS Briefing from NWS CR and partners

Fall flooding exacerbated delays in crop harvesting due to previous Spring flooding





CPC Prediction: Exceptionally Cold Air Outbreak: End of January to Beginning of February 2019



Obs. Temp.: Sioux Falls, SD

Obs. Temp.: Bismarck, ND

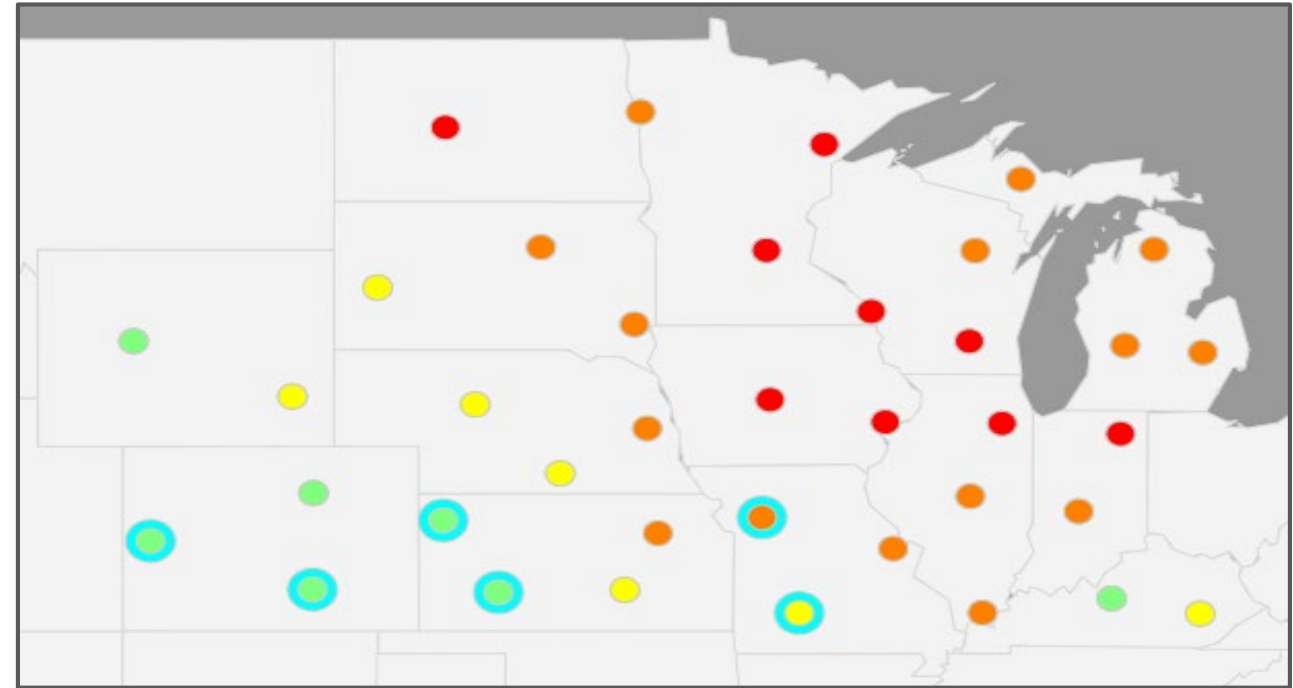
CPC Prob. Hazards Outlook from 1/21/2019



Regional DSS Associated with Extreme Cold Air Outbreak

Based on CPC guidance the Regional Operation Center collaborates the potential of an extreme cold wave with field offices during daily briefings well in advance of the event.

This sets in motion a consistent IDSS and operations tempo.



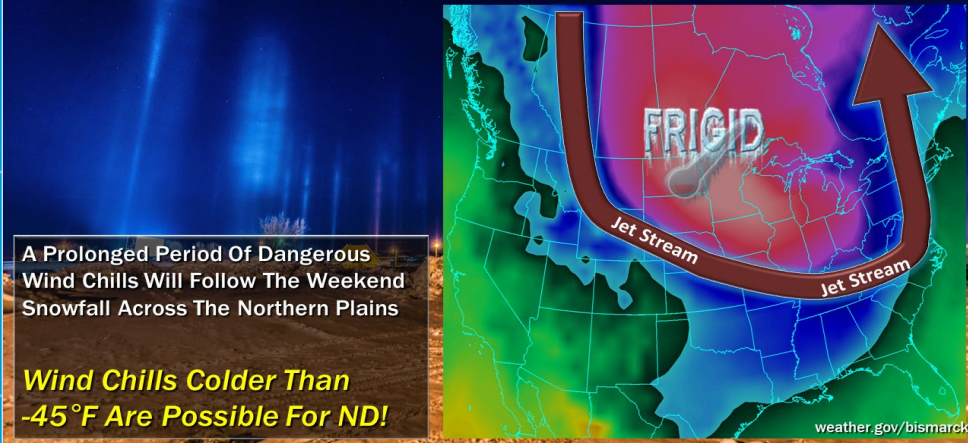
NWS Central Region Field Office Service Level Display

NWS Offices Message the Event

More Arctic Air Arrives Next Week

Monday Night Through Thursday

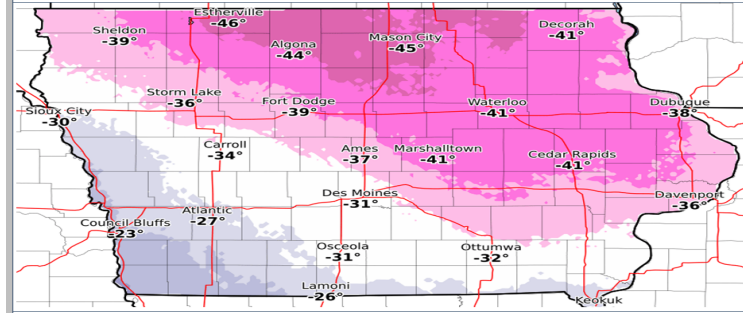
National Weather Service
Bismarck, ND



Published on: 01/25/2019 at 9:59AM

Exceptionally Cold Next Week

Tuesday • Wednesday • Thursday



Wind Chills (°F)

KEY POINTS

Lengthy period of dangerously cold temperatures and wind chills from Tuesday to Thursday.

IMPACTS

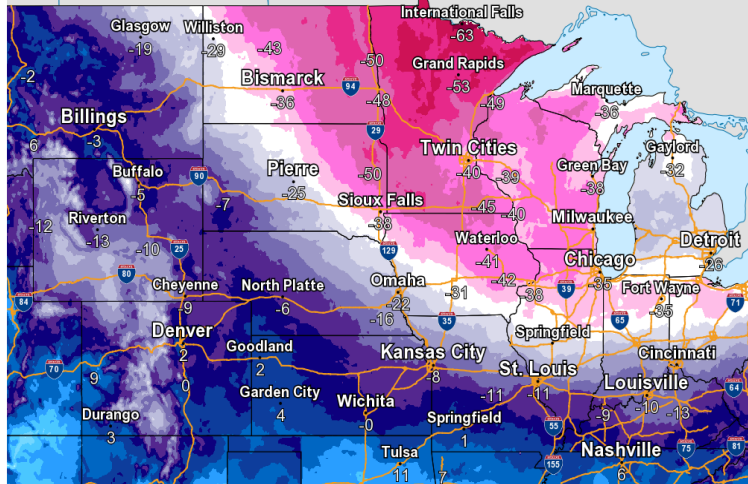
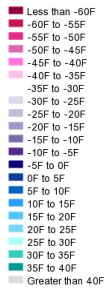
Bundle up or stay indoors! Exposure to the bitter cold can lead to frostbite and hypothermia within minutes. Please don't forget about outdoor pets!

NATIONAL WEATHER SERVICE
Des Moines · Iowa

Published on: 01/25/2019 at 6:04AM

Coldest Wind Chill

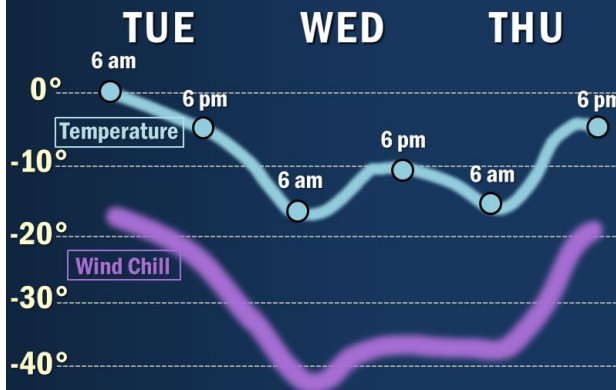
Valid Ending Thursday January 31st, 2019 at 12 PM CST



Graphic Created
January 25th, 2019
7:56 AM CST

Dangerous Cold Next Week

Preliminary Forecast for Northern IL and Northwest IN



What to Do Now?

CAR PREP:

- Check your battery
- Check your coolant
- Check your tires
- Have jumper cables
- Pack a blanket



HOME PREP:

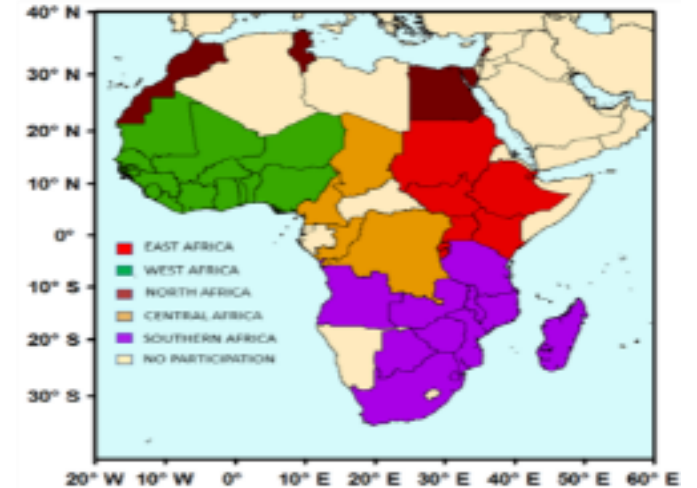
- Check your furnace
- Check chimneys
- Check your carbon-monoxide detector
- Insulate exposed pipes



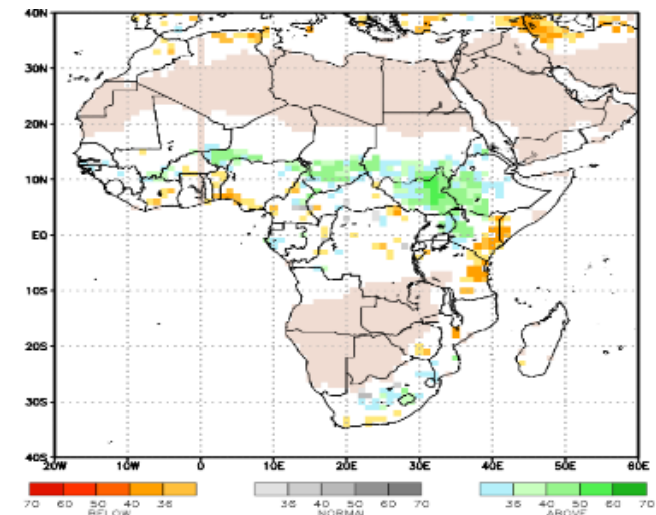
NWS Chicago | Saturday, January 26, 2019 6:09 AM

CPC International Desks

Home Country of International Desk Trainees



Probabilistic Precipitation Prediction



Training/Capacity Development:

- Use state of the art monitoring, modeling and forecasting capabilities at NCEP to train a cadre of meteorologists from around the world
- Started in March 1995
- Number of trainees: 300 from 46 countries

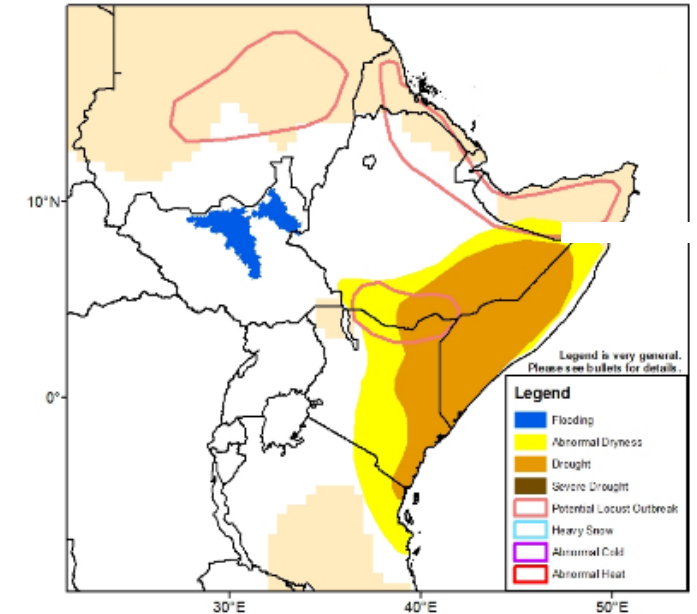
Monitoring and Prediction Products:

- Global and regional multi-model ensemble sub-seasonal to seasonal prediction tools
- Host of WMO-Regional Climate Center (RA-IV): Tailored multi-model ensemble sub-seasonal to seasonal prediction tools

Climate IDSS for Core Partner United States Agency for International Development (USAID)

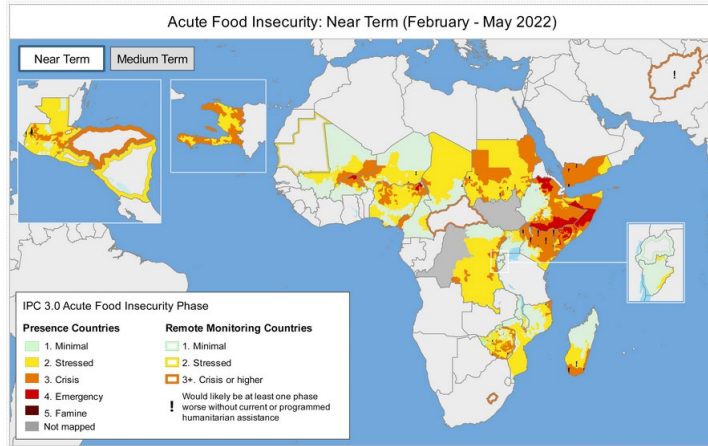
- **Famine Early Warning System (FEWS) Regional Hazards for Food Security:**
 - Used by USAID to assess weather impacts on agriculture and water
- **Office of Foreign Disaster Assistance (OFDA):**
 - Forecast of short-term climate extremes (drought, flood, cyclones)
 - Supports planning for humanitarian needs
- Sub-seasonal forecasts of excessive heat for Northern Africa (now being expanded to the global Tropics)

Enhanced Probability of Drought in East Africa



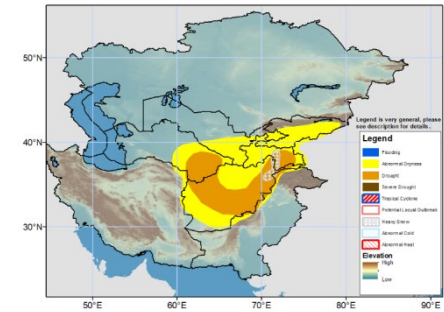
International Climate DSS for USAID FEWSNET

USAID Food Security Outlooks

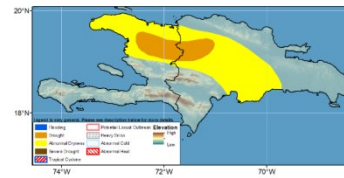


CPC Hazards outlooks are primary input to FEWS NET food security outlooks

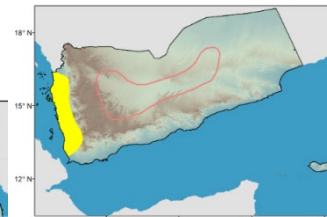
Central Asia



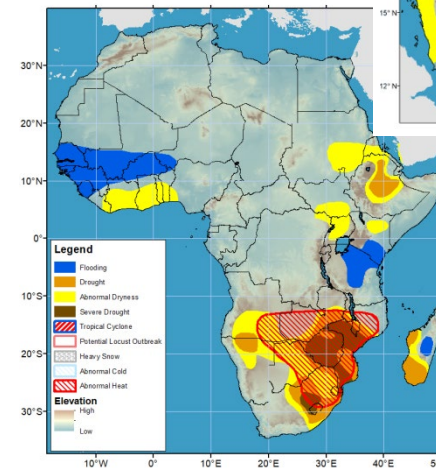
Hispaniola



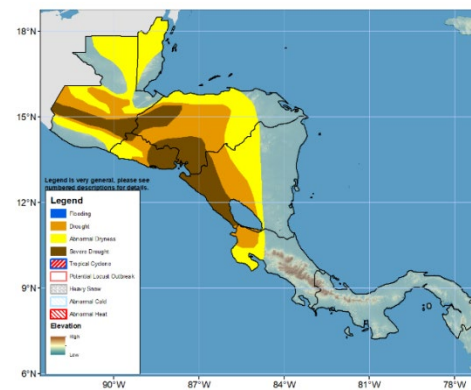
Yemen



Africa



Central America



USAID needs access to timely weather and climate information to mount a response to food insecurity.

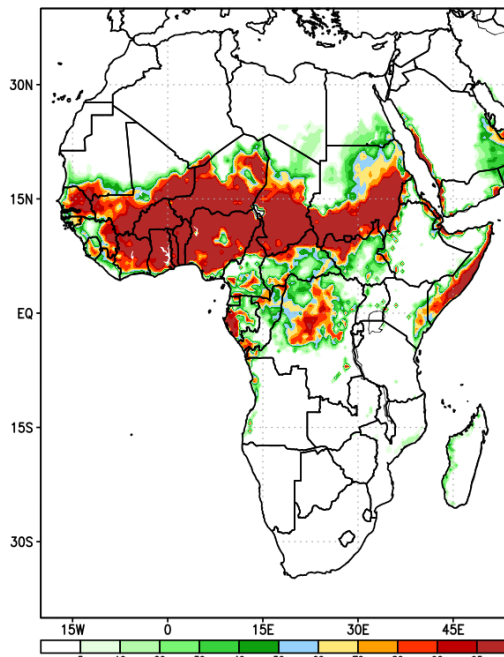
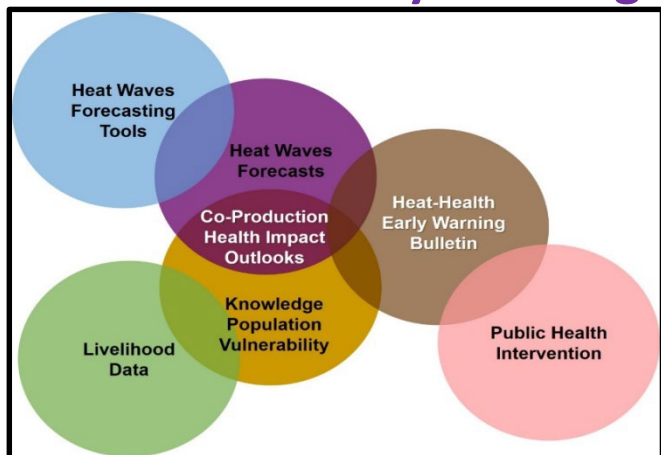
Integrating the evolution of the most recent climate with forecasts from one week to a season

International Climate DSS: Heat-Health Early Warning

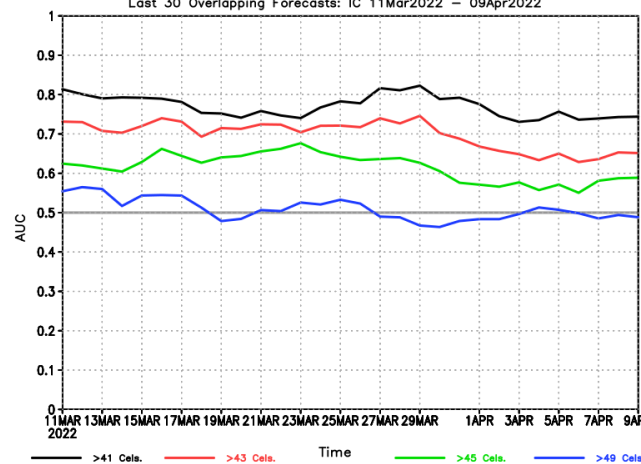
GEFS Week-2 HI exceedance Prob. > 41 deg C, > 3 consec. days, BC
Valid: 20220502 - 20220508

HHEWB

Heat Health Early Warning



GEFS Week-2 Area Under the ROC Curve (AUC), (Area: 19W-55E, 40S-40N)
Raw HI Persisting for at least 3 Consec days
Last 30 Overlapping Forecasts: IC 11Mar2022 - 09Apr2022



- Actionable heat hazards outlooks
- Integrate livelihood data with heat forecasts
- Co-production of heat-health early warning bulletin

- Health impact outlooks showing the degree of severity of the health risks.
- Advice to populations to reduce heat related illnesses.
- Heat wave forecasts as a background information



Final Thoughts

- **CPC collaborates across the weather, water, and climate enterprise to co-produce sub-seasonal to seasonal prediction and decision support services products.**
- **CPC partners with numerous organizations to deliver impactful sub-seasonal to seasonal climate decision support services in response to stakeholder needs.**
- **CPC's role in the decision support services value chain is situationally dependent and follows the NWS tiered paradigm from general services through custom products for core partners.**
- **CPC continually evaluates our decision support services portfolio both in terms of existing products/activities as well as possible expansion of this portfolio.**