



NWS Regional and Local Climate – Informed Decision Support Services

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NOAA NWS AFSO

Climate Services Branch

Building a Weather Ready Nation

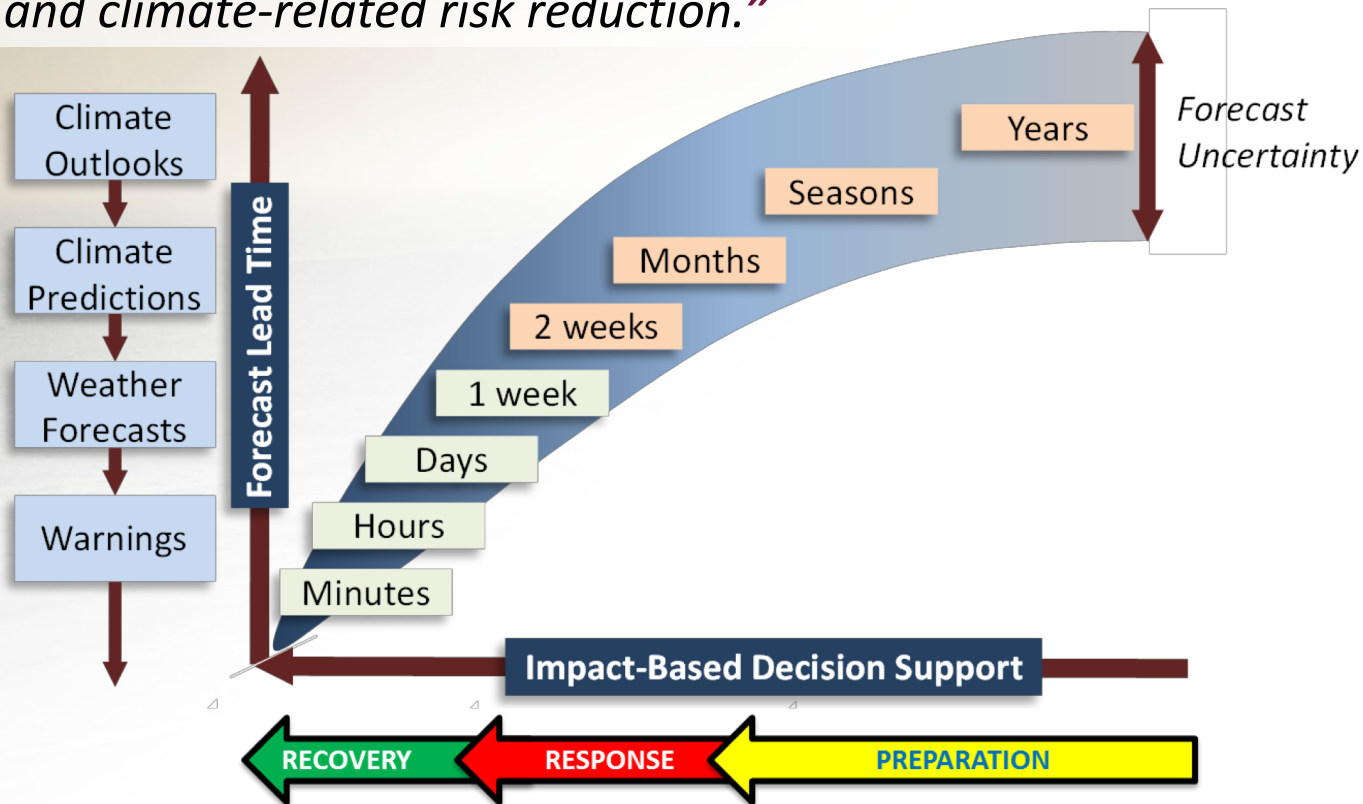
Legal Authorities

- Weather Research and Forecasting Innovation Act of 2017 - Public Law (No: 115-25)
 - Codifies NWS provision of IDSS
 - Recognizes NWS WCM position as a focus for IDSS
 - Focuses on ensuring public safety and supporting government disaster management efforts
- Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act)
 - DOC/NOAA has statutory requirement to support the Emergency Management community

Climate DSS

“Target on the Wall”:

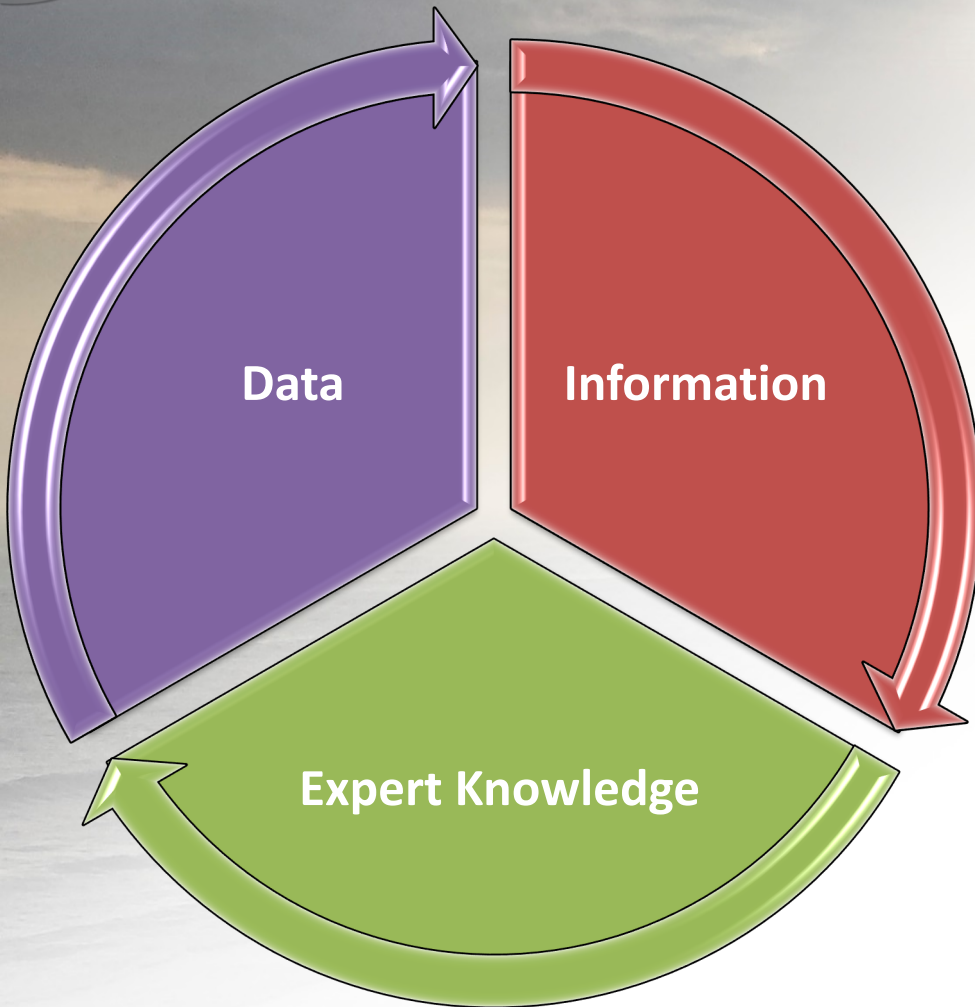
“A timely, accurate, and reliable NWS suite of subseasonal to seasonal monitoring and prediction products using trusted data, state-of-the-art models, and advances in physical and social sciences, to provide impact-based decision support services in easy-to-understand formats from highly-trained, professional staff for preparedness, response, and climate-related risk reduction.”



Impact-Based Decision Support Services

- Provision of observation/forecast information
- Preparedness education
- Impact-based Decision Support Services (IDSS)
 - interactive, interpretative services for NWS core partners
- IDSS may be characterized as either episodic or recurring

Decision-Relevant Data and Information



1. Data on past and present climate conditions
2. Analyses of past and present climate conditions
3. Forecasts and scenarios of future climate conditions
4. Assessments of the confidence associated with climate information
5. Analyses and forecasts of the impacts of climate conditions on people, the environment, and operations
6. Decision support for managing risks and opportunities associated with climate variations and climate impacts, including disruptive events

Climate Support Opportunities for Entire Enterprise

Agriculture

Drought Impacts
Indices (Drought Severity,
Crop and Soil Moisture,
Precip)

Health

Heat and Health joint CDC
NOAA messaging
Hospital Resilience

Energy

Degree Day Outlooks
Winds and solar insolation
for renewable energy

Disaster Risks

Climatological risks in prep
for disruptive and high
impact events
Past event assessment

Water Resources

Temp and Precip Outlooks
Stand. Runoff Index

Media

Event Outreach
Sound bite messages
Impacts and uncertainty
Social Media

Providing Long Range Outlook Summaries to the Climate Community for Decision Support Services

National Weather Service
Central Region Climate Outlook

June – August 2018
Tuesday, July 03, 2018 7:02 PM

Important Messages:

- ✓ Final La Niña Advisory, with ENSO-neutral favored through September-November 2018.
- ✓ Possibility of El Niño nearing 50% by boreal winter 2018-19.
- ✓ In general, dry and warm conditions are favored in June across much of Central Region.

June 2018 Temperature & Precipitation Outlooks

- Above-normal temperatures favored across most of Central Region.
- Equal chances of above, near or below normal temperatures over much of Michigan.
- Above normal precipitation favored in much of central and eastern Kentucky and extreme southeast Ohio.
- Equal chances of above, near, or below normal precipitation over most of Central Region.

Seasonal Drought Outlook

U.S. Seasonal Drought Outlook

- Drought is forecast to persist in parts of North Dakota and far northern Minnesota.
- Drought will remain but improve across much of Kansas.
- Drought removal is likely from extreme northern and eastern Kansas through northwest Missouri to southern Iowa.

June through August Temperature & Precipitation Outlooks

- Above-normal temperatures are favored across much of Wyoming, Colorado, and Kansas, as well as eastern Kentucky, eastern Lower Michigan, and much of Ohio.
- Above-normal precipitation is favored in Colorado generally west of the Continental Divide.
- Above-normal precipitation is also favored from eastern Iowa and eastern Missouri through points east, including the Ohio Valley and the lower Great Lakes.

Building a Weather-Ready Nation

For more info, contact: ray.wolf@noaa.gov [Click to evaluate this product](#)

PDF's sent to partners monthly via email



- Shawn Rossi (Hastings, NE & CR Climate Service Program Team Member)
- In January 2018, the CR Climate Service Program redesigned the regionally distributed climate outlooks to increase the visibility and usability of this product.
- The outlooks became more fluid, soliciting feedback from users and incorporating suggestions whenever possible.
- Increased reach was achieved through social media and partner sharing, with the reach of these outlooks growing each month.

Latest Climate Outlook
April – May – June

Three-Month Temperature Outlook

Analysis for south central Nebraska and north central Kansas

Above-normal temperatures are favored for all of south central Nebraska as well as North central Kansas: April through June.

There is a near equal chance for near, above or below normal precipitation across the local area from April through June.

Did you know?
On average, Hastings, NE receives 10.93" of precipitation over this time period – which is just over 40% of the annual precipitation!

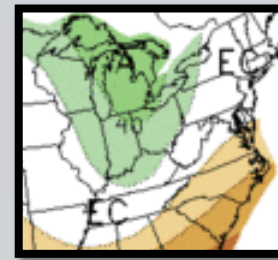
Published on: 03/15/2018 at 12:19PM

Increased reach via Social Media

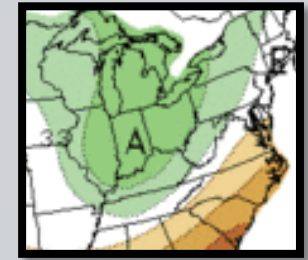



Sam Lashley - NWS Northern Indiana

- Interpretation, downscaling and localization of CPC Outlooks for Core Partners to aid in their seasonal decision making (Climate DSS)
- Core Partners gain a better understanding of CPC outlooks and associated uncertainty (certainty) as well as possible local impacts
- Online climate tools and data analysis help give the outlooks a historical perspective using analog years (La Nina)
- Partner engagement, input and discussion is critical for success. Understanding their needs helps us develop effective methods to communicate climate information for DSS



Winter 2016-17



Winter 2017-18

CPC Pcpn Outlooks



LCAT
Local Climate Analysis Tool

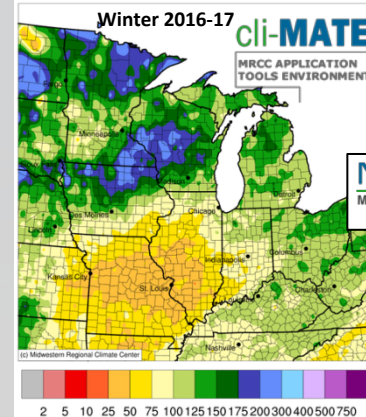
		Below Bin < 5.07		Middle Bin		Above Bin > 6.79	
		% Chance	Significance	% Chance	Significance	% Chance	Significance
South Central MI	19	5.30%	93.70%	36.80%	78.20%	57.90%	93.30%

Decreased Chance of Below Normal Precipitation

Increased Chance of Above Normal Precipitation

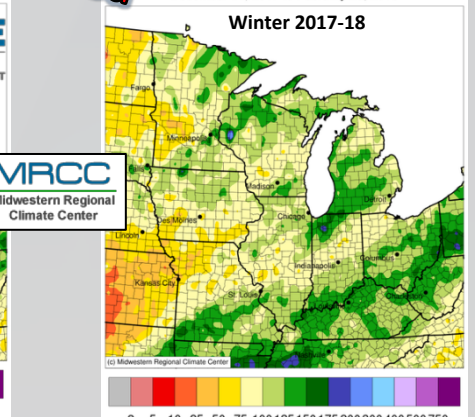


Accumulated Precipitation (in): Percent of 1981-2010 Normals
December 01, 2016 to February 28, 2017



Verified

Accumulated Precipitation (in): Percent of 1981-2010 Normals
December 01, 2017 to February 28, 2018



Name and Office - Ken Simosko/Bismarck Weather Forecast Office.

Purpose of work – Two case studies compared teleconnections and climate tools during extended range forecast periods in support of advanced IDSS, (Impact Based Decision Support Services (IDSS)).

What was done – Case #1: No signal in teleconnections, but there was using additional climate tools. As confidence grew, a partner e-mail and graphic was sent 10 days before the event. (see right graphic)

Case #2: Strong signal in teleconnections and climate tools. Contact was made well in advance with the appropriate Emergency Manager.

TO: Emergency Managers / Government Partners

FM: National Weather Service Bismarck North Dakota

RE: Significant Temperature Change Starting Thursday, December 21st

Case #1

What:

- Pattern change will bring much colder air into the Northern Plains.
- Below average highs and lows (Dangerous wind chills possible).

Where:

- All of western and central North Dakota.

When:

- Thursday, December 21st through the end of the year (Including the Christmas and New Year's Holidays)

Impacts:

- Increased threat for frostbite and hypothermia.

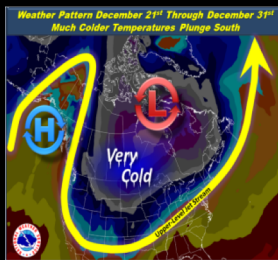
See attached graphic

Keep up to date through the weekend at www.weather.gov/bis

With questions or reports call us 24/7 at [701-250-4495](tel:701-250-4495)

Be Weather-Ready!

WFO Bismarck



Outcome – Case #1: Emergency Managers across western and central North Dakota were well prepared to handle the frigid air mass during the Christmas and New Year's Holiday of 2017.

Case #2: The Morton County Emergency Manager was contacted alerting protesters of the Dakota Access Pipeline that rapid snowmelt could lead to possible flooding, affecting thousands of activists.

Significant Tornadoes in the Northern Plains: An Environmental and Pattern-Based Climatological Risk Assessment

Chauncy J. Schultz (WFO Bismarck, ND)

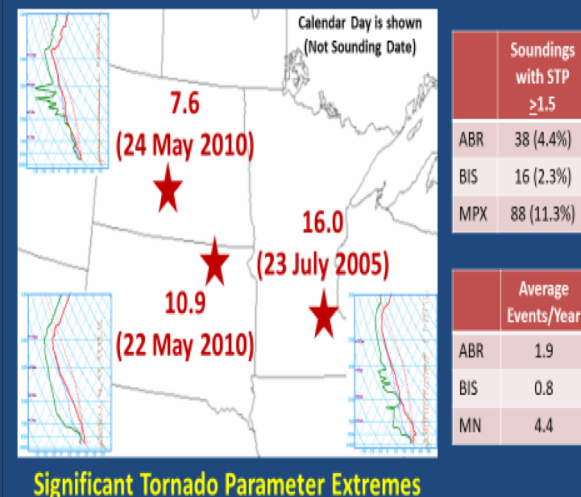
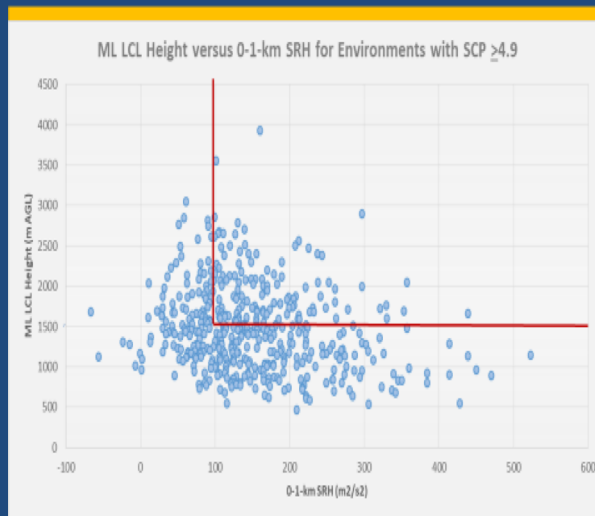
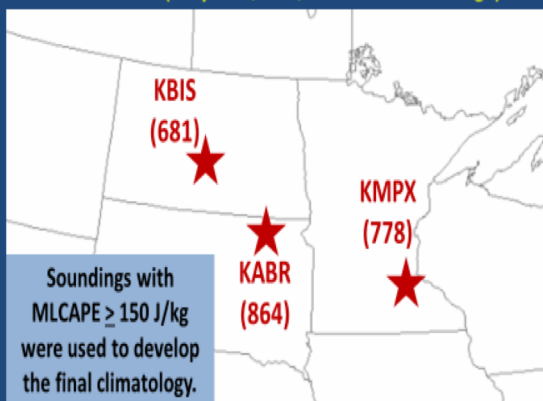
Purpose: Investigate the frequency of tornado-favorable environments and patterns to establish climatological risk assessment, independent of whether the environment was associated with a reported tornado.

An environment climatology was created using a vast sounding sample.

ML LCL heights are ≥ 1500 m AGL in 39% of favorable SRH and SCP environments.

STP values in a significant-tornado-favoring range occur infrequently.

March-November soundings were collected from 1998 to 2017 (20 years; ~16,500 total soundings)



Outcomes

- **NWS Operations:** Build confidence in what drives null events, and identification of extreme Significant Tornado Parameter (STP) value cases, which can be analyzed to develop deeper understanding for its usage
- **Partners:** County EM at the CPASW very interested in dates to help build simulations using “near misses”

NWS La Crosse Apple Orchard Network

Jeffrey Boyne, NWS La Crosse, WI

Purpose: Apple trees are one of the first fruit trees to blossom in spring. This network helps monitor the progress of spring apple tree bud development across the La Crosse, WI WFO service area.

What was done?: After the record warmth of March 2012 caused fruit trees to come out of dormancy well before the average last freeze date, a network of 13 apple orchards was formed to monitor bud development.

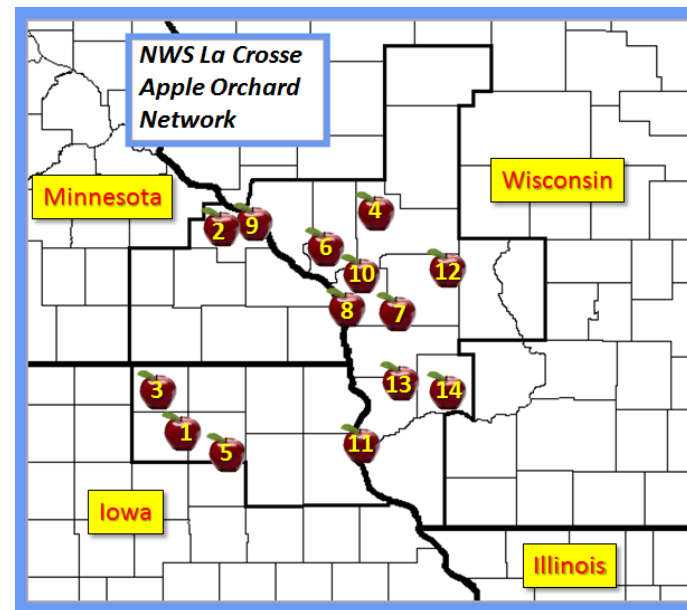
WFO also monitors 5 apple trees at their office.

Once trees come out of dormancy (silver tip), orchards will report at least once a week. This will then continue through petal fall (last stage).

Information shared through



Outcome: Apple growers are used to evaluate when frost/freeze services are needed for ALL users since they are the first to be cold susceptible.

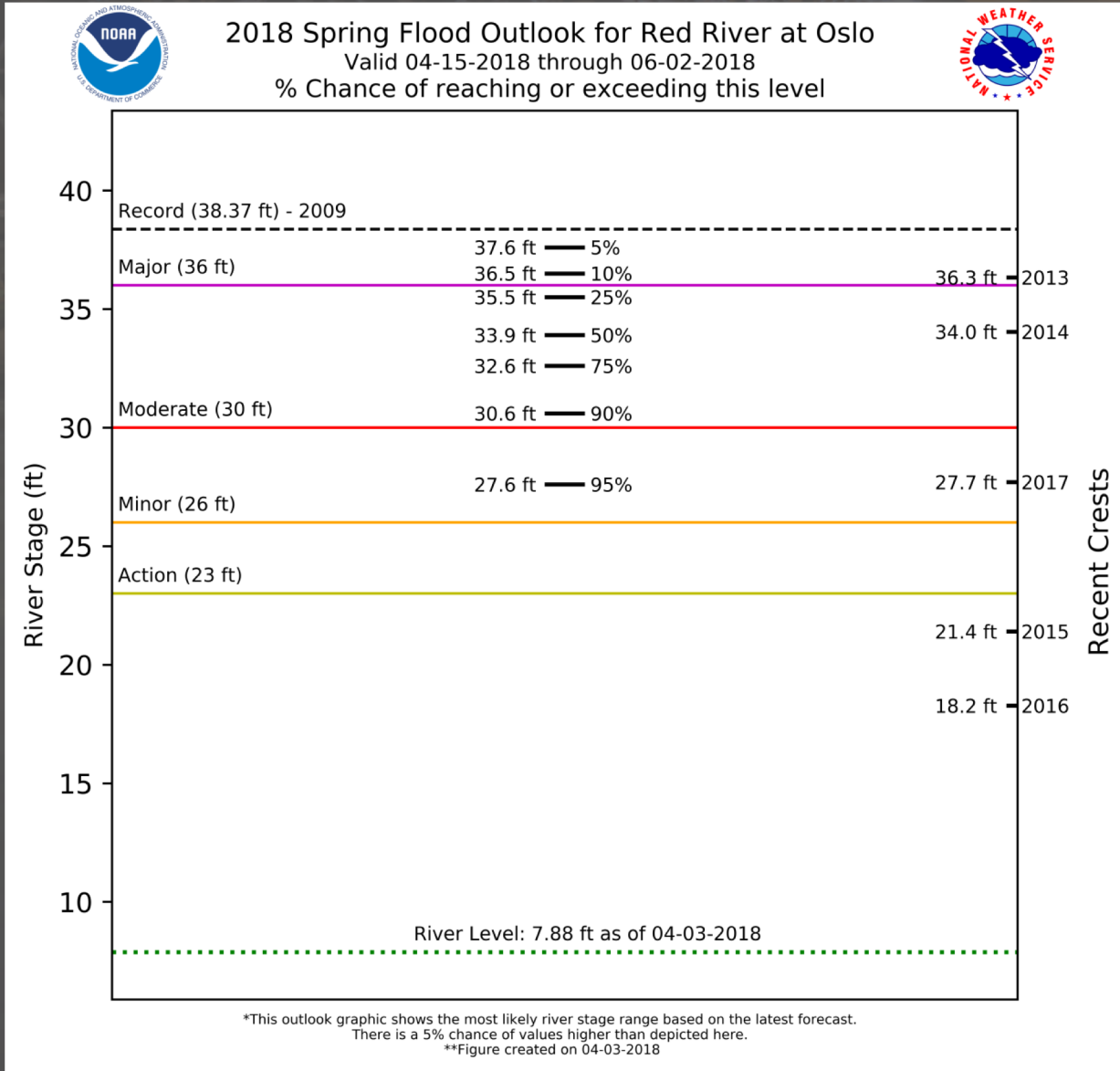


13 apple orchards participate in the network. There are even 5 trees monitored at the office (below).



Flood Outlook IDSS Case

Ryan Knutsvig, Andrew Moore, and Amanda Lee – WFO Grand Forks



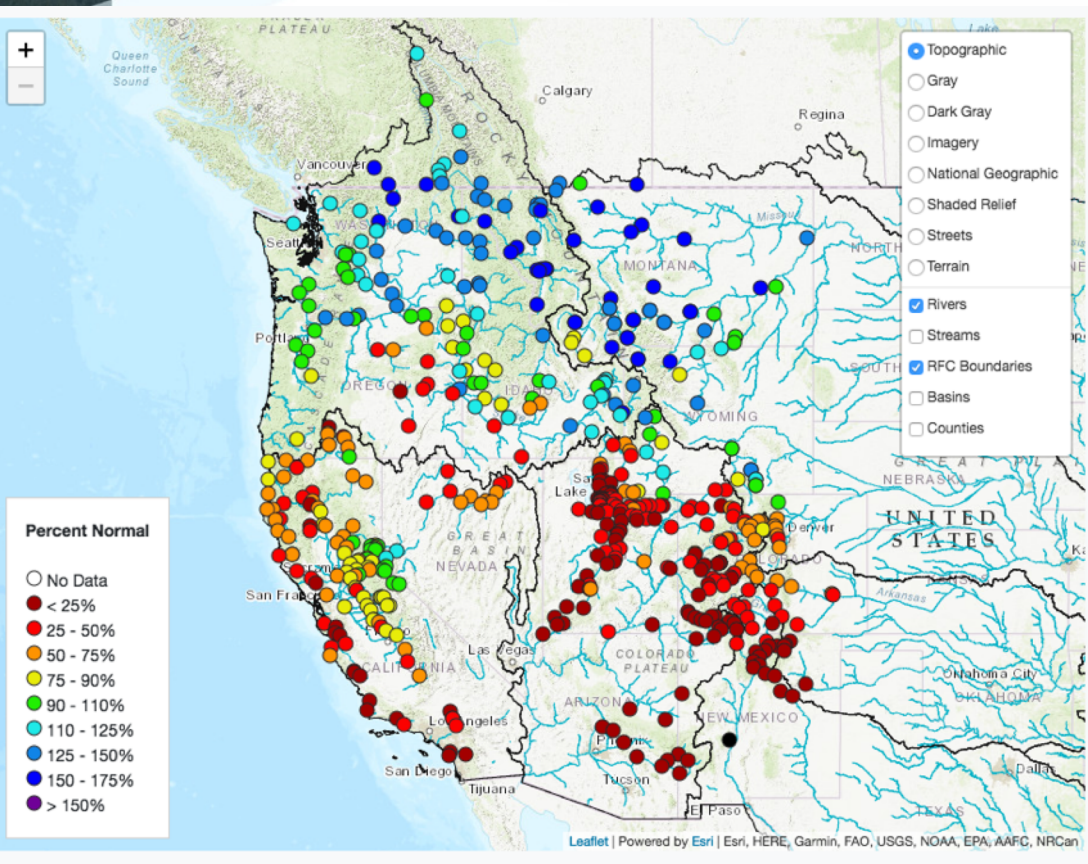
Purpose of work – Feedback from partners prompted us to improve the communication of our probabilistic flood outlook information.

What was done? – We created a graphic that displays the probabilistic flood outlook in a different format. This was done through an iterative process with a subset of partners where partners had an integral role in the development of the graphic.

Outcome – This new graphic is set to be tested publicly in the winter/spring of 2018-2019. We hope to gain more feedback during this period in order to enhance the product again.

Water Management in the West

13



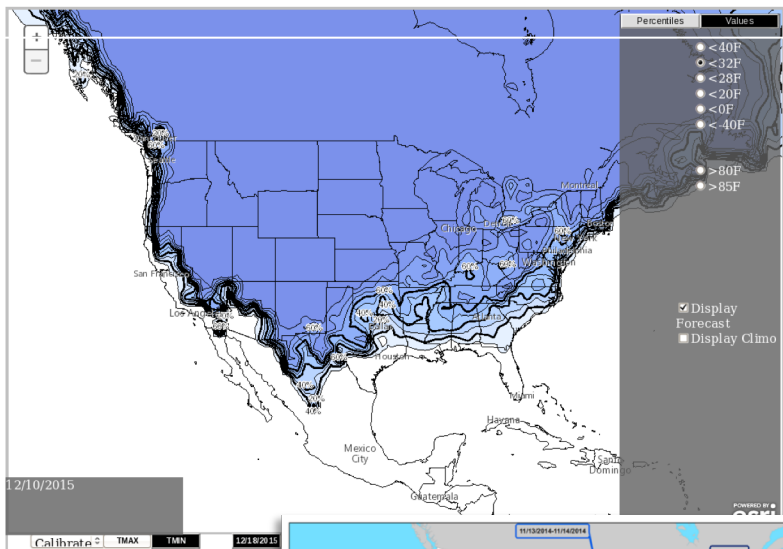
Water Resource Managers throughout the West often work across RFC boundaries. The Water Resources Monitoring and Outlook Page gathers seasonal forecasts into one spot for quick assessment by stakeholders

Hosted by the Colorado Basin River Forecast Center

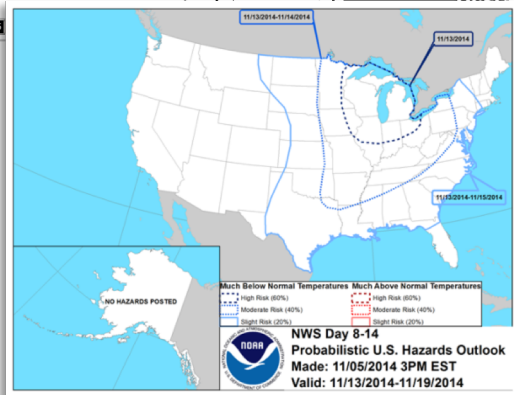




The current NCEP process uses reforecast-calibrated GEFS to derive a full probability distribution function (PDF), which allows one to determine probabilities of multiple element thresholds. But... It's for internal NCEP access only! (re: Dan Collins et al)



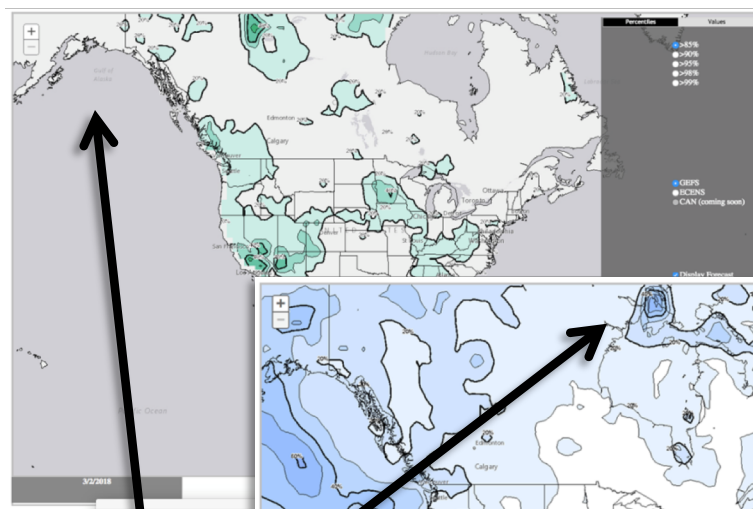
Used in NCEP Day 8-14 Prob Hazards →



UNDER CONSTRUCTION

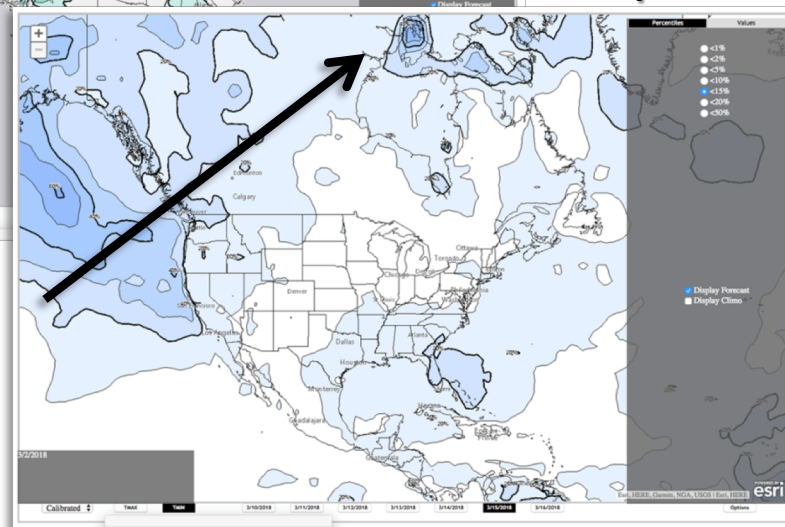
NEW → At our request, Melissa Ou and others at NCEP are working on expanded temp and precip options (maybe winds-n-dewpt too?)...

...for (eventual) Field Office Access and Use!



Expanded Forecast Options, for Public Health Emphasis!

Expanded Area: AK/HI and Canada



Improve Detection, Collaboration, and Communication of Heat Events

POC: Paul Iñiguez, SOO, NWS Phoenix

Secure | https://www.wrh.noaa.gov/wrh/heatrisk/

National Weather Service
National Oceanic and Atmospheric Administration

NWS Experimental HeatRisk: Identifying Potential Heat Risks in the Seven Day Forecast

Valid: Thu Jul 26

Click map for potential heat risks and NWS forecast for a location.

HeatRisk [More Information](#)

Heat affects everyone differently. In order to better address heat risk and allow you to prepare for upcoming heat events, the NWS has developed the experimental HeatRisk forecast. The NWS HeatRisk forecast provides a quick view of heat risk potential over the upcoming seven days. The heat risk is portrayed in a numeric (0-4) and color (green/yellow/orange/red/magenta) scale which is similar in approach to the Air Quality Index (AQI) or the UV Index. In a similar way, it provides one value each day that indicates the approximate level of heat risk concern for any location, along with identifying the groups who

Category	Level	Meaning
Green	0	No Elevated Risk
Yellow	1	Low Risk for those extremely sensitive to heat, especially those without effective cooling and/or adequate hydration
Orange	2	Moderate Risk for those who are sensitive to heat, especially those without effective cooling and/or adequate hydration
Red	3	High Risk for much of the population, especially those who are heat sensitive and those without effective cooling and/or adequate hydration
Magenta	4	Very High Risk for entire population due to long duration heat, with little to no relief overnight

Connecting Climate & Communities in western Alaska

Rick Thoman and Mary-Beth Schreck, NWS Alaska Region

- Partnership between NWS Alaska Region and State, Tribal and NGO
- Provides NWS AR with community contacts and learning to what matters to them
- Help communities get better information across the continuum of weather (e.g. individual storms) through climate (e.g. long term sea ice changes)



Community and partners meetings:
Chevak (top), Kwigillingok (bottom)

Climate Services Partnership

- **US Federal, State, and Local Government Agencies**
 - Agriculture (USDA, USAID)
 - Water Resources (USGS, NASA)
 - Health (CDC, NHI)
 - Emergency Management (FEMA, USCE)
 - Energy (DOE)
- **Key Climate Organizations (AASC, RCC, RISA)**
- **Private sector Climate service providers**
- **Academia (Universities, UCAR)**
- **Media (TV, broadcast, social)**
- **Public and Private Institutions, NGOs**
- **Engagement through Annual Meetings**
 - Climate Prediction Application Science Workshop
 - Climate Diagnostics and Prediction Workshop