

## Week-2 U.S. Hazards Outlook Description

**Updated information for 2021:** Severe weather is not a hazard type that CPC includes in the Week 2 U.S. Hazards Outlook map or accompanying forecast text discussion. This is a change from 2020 as the Storm Prediction Center (SPC) and some management within NCEP and the NWS does not support CPC placing this hazard type forecast in the Week 2 period. Please see the SPC forecasts for advance notice of potential hazardous severe weather. The SPC Day 4-8 severe weather outlook is available at the link below:

<https://www.spc.noaa.gov/products/exper/day4-8/>

The Climate Prediction Center (CPC) U.S. Hazards Outlook is released every weekday and targets the Day 8-14 forecast period for potential hazardous conditions related to temperature, precipitation, and wind. The forecast is mainly represented in probabilistic format, with the exclusion of a few variables (e.g. frozen precipitation and flooding), which are denoted in categorical format without associated probabilities. A composite map is released in addition to the separate probabilistic maps, showing any categorical variables (i.e., noted above) as well as highlighted regions drawn as a moderate risk on any of the temperature, precipitation and wind probabilistic maps.

The U.S. hazards outlook contains human drawn delineations of where various variables are expected to have the potential of posing a hazard to life or property. The forecasters do apply a subjective decision factor when delineating a hazard area. A cold snap in the winter or a heat wave in the summer are likely threats to life and property, while a cool period in July is not. Another example can be forecasters using less restrictive hazards criteria than normal (e.g. antecedent conditions or time in the seasonal cycle, etc.).

Forecasters use statistically post-processed (bias corrected and calibrated) ensemble model forecasts to estimate the likelihood of that event occurring, and indicate a confidence or “risk of occurrence”. The GEFS extremes reforecast tool (see link below) is one of the primary guidances for the outlook and utilizes historical forecast information to statistically adjust (calibrate) ensemble model output to produce more reliable forecast probabilities. Additional model guidance is also used to inform the forecaster’s decisions.

<http://www.cpc.ncep.noaa.gov/products/predictions/threats/extremesTool.php>

Forecast confidence is categorized as slight, moderate, or high risk with the listed labels corresponding to GEFS bias corrected and calibrated reliable probabilities of 20-40%, 40-60%, or >60% of occurrence respectively. At the current time, only slight and moderate risk labels are

indicated for high winds due to unreliable probabilities and lower forecast skill based on reforecast analysis at higher forecast probabilities.

A list of the variables currently included as probabilistic week-2 hazard forecasts are listed below, as well as the typical hazardous criteria used. These criteria can be adjusted by the forecaster when deemed necessary as a function of region, season, and specific situation. Percentiles are based on 30-year historical observations from 1991-2020.

- Much below normal minimum temperatures - Daily minimum temperatures less than the 15th percentile and near freezing or sub-freezing (or other temperature deemed hazardous) temperatures.
- Much above normal maximum temperatures - Daily maximum temperatures greater than the 85th percentile and temperatures reaching 90F or greater, or night time lows above 80F.
- Heavy precipitation - 3-day total precipitation exceeding the 85th percentile and >1”.
- Heavy snow - 3-day accumulated precipitation exceeding the 85th percentile and >0.5” and temperatures falling to values conducive to snow. It should be noted that at the current time, the hazards forecasters do not base the risk levels on a probabilistic model guidance tool of snowfall amounts since there is not one available yet. The forecaster uses the probabilities from the heavy precipitation (liquid equivalent) and temperature tools to determine a risk level. The CPC is planning to develop a probabilistic snowfall tool in the near future.
- High winds - Sustained wind speeds reaching the 85th percentile as well as reaching 25 to 50 miles per hour, at any time over a 3-day period.

Additionally, there are some variables that are highlighted on the composite hazards map.

These are variables that currently do not have an associated probabilistic model guidance tool available for forecasters to utilize for the outlook. Below is a list of non-probabilistic variables included at this time and a description about them:

- Flooding - Highlights possible flooding based on various current and expected atmospheric, soil moisture, ice, etc. conditions. Specifics regarding the type of flooding would be identified in the text discussion.
- Frozen precipitation - Identifies any potential risk of frozen precipitation that is not necessarily classified as heavy snow. This may include, e.g. icing, wintry mix, sleet, etc. There may or may not be an associated highlighted possibility of heavy precipitation for an overlapping frozen precipitation area.