Week-2 U.S. Hazards Outlook Description

Updated Aug 9, 2024

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 which are denoted in categorical (deterministic) format without associated probabilities. Probabilistic hazards maps indicate the forecast level of risk or likelihood of a hazardous event occurring. A composite map is released in addition to the separate probabilistic maps, showing any deterministic variables in addition to any highlighted moderate risk areas on any of the probabilistic maps (high risk hazards are not shown on this composite map). Hazards forecasters routinely coordinate, communicate, and consult with other NOAA centers as part of the forecast process (e.g. the Weather Prediction Center (WPC), National Weather Service local forecast offices, NWS regional climate contacts, National Water Center, etc.).

The Week-2 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 forecaster workflow has both objective and subjective components. Objectively, forecasters primarily base issued chances of risks on statistically post-processed (bias corrected and calibrated) ensemble model tools that estimate the likelihood of various thresholds occurring. One of the primary probabilistic tools used is the Probabilistic Extremes Tool (PET), found at http://www.cpc.ncep.noaa.gov/products/predictions/threats/extremesTool.php. Subjectively, forecasters take into consideration many factors when deciding whether conditions may be deemed hazardous including a) seasonal fluctuation of what would be considered hazardous (e.g. the first event of the season, or expectation to occur exceptionally early in the season) b) conditions deemed hazardous locationally c) impacts to other hazard types (e.g. areas currently experiencing wildfires may be easily exacerbated by even slightly enhanced wind speeds).

Forecast confidence is categorized as slight, moderate, or high risk with the listed labels corresponding to chances 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 at higher forecast probabilities, based on forecast tool evaluation.

Variables represented as categorical or deterministic do not have supporting probabilistic guidance yet, due to the complex nature of them. These include risks of rapid onset drought (ROD) and flooding.

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 reference below 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 90 deg F or greater, or night time lows above 80 deg F. This is usually issued during the cool season, October through April, with the exception of Alaska which may be issued for the state during the warm season (May-Sep).
- Excessive heat - Daily maximum heat index values greater than the 90th percentile and 100F or greater, or night time temperatures above 80 deg F. This is usually issued during the warm season, May - Sep.
- Heavy precipitation - 3-day total precipitation exceeding the 85th percentile and >1”.
- Heavy snow - 3-day snow water equivalent exceeding the 85th percentile and >0.5”.
- 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 antecedent and expected atmospheric, soil moisture, ice, etc. conditions. Specifics regarding the type of flooding would be identified in the text discussion.
- Rapid onset drought - Identifies where there is increased likelihood of 2-category degradation, from non-drought to drought conditions (D-nada to D1 or D0 to D2) at any time over the next 2 to 4 weeks, according to the United States Drought Monitor (USDM).