Strategy and Description of Current Product

The Climate Prediction Center (CPC) U.S. Hazards Outlook is released daily and targets the Days 3-14 forecast period for potential hazardous conditions related to temperature, precipitation and winds. The operational outlook is currently categorical in nature, however, and potentially impactful events are often not highlighted in the Week-2 portion of the period as they sometimes do not meet forecaster confidence due to frequent high uncertainty in this time range. To address this issue, the product is systematically being converted to a probabilistic format so that improved lead time can be given for generally low probability but potentially very high impact events.

The strategy for this conversion is to do one variable at a time starting with much-above and much-below normal temperatures and this information is currently being experimentally released daily. Probabilistic heavy precipitation is now included in the suite of probabilistic hazards products. Additionally, frozen precipitation forecasts are included on the week-2 deterministic map. Excessive heat and high winds hazards forecasts is expected to be released during 2018.

The current experimental probabilistic U.S. hazards outlook for temperature hazards contains human drawn delineations of where temperatures are expected to be either much below normal or much above normal AND where those much below (above) normal temperatures pose a hazard to life or property. The typical hazard used is forecast temperatures below the 15th percentile for much below normal temperatures or above the 85th percentile for much above normal temperatures. Then additionally, forecasters assess if the forecast temperatures cross critical thresholds 32 deg F, 90 deg F, 100 deg F, night time lows above 80 deg F, etc.

Similar to the probabilistic U.S. hazards outlook for temperature hazards , the probabilistic U.S. hazards outlook for heavy precipitation hazards identifies where a forecaster expects the accumulated rainfall or liquid equivalent over 3 days to be greater than the 85th percentile. Then, forecasters evaluate whether the accumulation exceeds an amount that would typically be considered hazardous for a region. Where forecasters have reasonable confidence the precipitation will be frozen/freezing, frozen precipitation is indicated on the deterministic map for the 8-14 day time period, since the nature of the forecast is based on subjective regional thresholds. Therefore, the frozen precipitation forecast is most appropriate as a general highlight without specified probabilities.

In general, 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 across the Great Plains in July is likely perceived as a break in the heat.

Forecasters use bias corrected and calibrated ensemble model output to estimate the likelihood of an event occurring, and indicate a confidence/risk of occurrence. Forecast confidence risk is categorized as slight, moderate, or high, with the categories indicating a 20%, 40%, or 60% (20%, 30%, 40%) chance of maximum/minimum temperatures (heavy precipitation) occurrence, respectively. The probabilities of the heavy precipitation forecast are lower than those of the temperature forecasts because of the inherent lower confidence of precipitation forecasts.