Experimental Extreme Precipitation Monitor
Product Description Document
October 2017

Part 1 – Mission Connection

a. Product Description – The Experimental Extreme Precipitation Monitor displays the climatological significance of the precipitation forecasted by the Weather Prediction Center (WPC). The climatological significance is represented by Average Recurrence Intervals (ARIs) and Annual Exceedance Probabilities of precipitation estimates from the NOAA Atlas-14, NOAA-40 and Atlas-2.

b. Purpose – This product allows the user to measure the climatological significance or "rarity" of the WPC precipitation forecast for all CONUS locations.

c. Audience - The target audience is very broad includes all of the weather enterprise, federal decision makers, and the general public.

d. Presentation Format – The forecasts are presented on an interactive WPC webpage at the following URL: http://www.wpc.ncep.noaa.gov/qpf/epm/extreme_precip_monitor.php

e. Feedback Method – Comments regarding the Experimental Extreme Precipitation Monitor are being collected via electronic survey: http://www.nws.noaa.gov/survey/nws-survey.php?code=EXPEXTPRECIPMON

Comments can also be sent to: http://www.wpc.ncep.noaa.gov/mail_webmaster/

or:

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Part II – Technical Description

a. Format and Science Basis –

ARIs describe the expected amount of time (e.g., years) between periods of rainfall exceedances (usually in inches) at a given location. ARIs are approximately inversely related to the Annual Exceedance Probability, which describes the probability of a

particular event occurring at any one location in any given year. For example, precipitation thresholds that have a 100-yr ARI have a 1-in-100 chance (i.e., 1% AEP) of occurring in any given year. The following table shows the equivalent AEP to ARIs ranging from 1-100 years.

ARI	AEP
100 year	1 %
50 year	2 %
25 year	4 %
10 year	10 %
5 year	20 %
2 year	50 %
1 year	100 %

This product is generated with WPC's Days 1-3 Quantitative Precipitation Forecasts (QPFs) for each 6- and 24-hour period. In the national mosaic, each contour level represents an ARI forecasted to be exceeded for the given time period. If the QPF for the given period is not expected to exceed the 1-yr ARI anywhere in the domain, the text at the center of the graphic will read "WPC-QPF NOT EXPECTED TO EXCEED THE 1-YR ARI". The value in recasting the QPF in the context of each ARI is that it allows the user to measure the climatological significance or "rarity" of a forecasted or observed rain event for any location. Furthermore, precipitation ARIs are used in the design of hydrologic and flood-control structures, so they are more relatable to emergency managers and key decision makers rather than absolute rain estimates alone.
Users should be aware that this product does not consider antecedent conditions and should not be used as a sole indicator for impacts from flooding. The severity of flooding is also dependent geographic location (urban vs. rural), antecedent conditions (e.g., soil characteristics and terrain), and total areal rainfall coverage.

The NOAA Atlas 14 data is available through the Precipitation Frequency Data Server, which provides point-based estimates of rainfall for ARIs between 1 and 1000 years for rainfall durations ranging from 5-mins up to 60 days based on a 90% confidence interval. Because the NOAA Atlas-14 update has not been completed for the Pacific NW or Texas, the DOC Tech Paper 40 (1961) was used for TX, and the NOAA Atlas-2 (1973) was used for the Pac NW. These data were "stitched" together with the Atlas-14 data (courtesy of Dr. Russ Schumacher and Greg Herman).

b. Product Availability – The product will update 4 times a day, commiserate with the WPC QPF issuances at 0600, 0830, 1800, and 2030 UTC.

c. Additional Information – None.