

Appendix A.2. Seasonality

1. Introduction

Extreme precipitation over the semiarid southwestern United States project area can vary seasonally. In general, the western portion of the project area (western Nevada and into Southeastern California) receives maximum precipitation in the winter months of November through February. This climatology transitions to springtime dominated precipitation, March through May, across the northern portion of the project area, which includes much of Nevada and part of Utah. The southern portion of the project area, consisting of all of Arizona and New Mexico and parts of Southeastern California, Nevada, and Utah generally receives maximum precipitation in the summer months June through August which is associated with the monsoon.

To portray the seasonality of extreme precipitation throughout the project area, precipitation observations that exceeded given return frequencies were examined for each region used in the analysis (Figures 4.4.1 and 4.4.2). Exceedance graphs showing this information are provided as part of the PFDS.

2. Method

Exceedance graphs were prepared showing the percentage of events that exceeded selected annual exceedance probabilities (AEPs) in each month for each region. The quantiles were derived from annual maximum series at each station in the region as described in Section 4.2, Regional approach based on L-moments. Each graph shows the exceedances of the 1 in 2, 5, 10, 25, 50 and 100 AEPs.

Results for the 60-minute, 24-hour, 48-hour and 10-day durations are each provided in separate graphs. The results were compiled for each hourly region for the 60-minute (Figure 4.4.2) and each daily region for the 24-hour, 48-hour and 10-day (Figure 4.4.1).

To prepare the graphs, the number of events exceeding the precipitation frequency estimate at a station for a given AEP was tabulated for the selected durations. Events were extracted in the same manner as for the generation of the annual maximum series (Section 4.1.3). The output for all stations in a given region was then combined, sorted by month, normalized by the total number of data years in the region and plotted via the PFDS.

3. Results

Seasonal exceedance graphs are available via the PFDS (<http://hdsc.nws.noaa.gov/hdsc/pfds/>). When a point is selected, a user can view the seasonal exceedance graphs by clicking the “Seasonality” button. The exceedance graphs (see Figure A.2.1 for an example) indicate a measure of events exceeding the corresponding AEP for the specified duration. The percentages are based on regional statistics. The total number of stations and the total number of cumulative data years for a given region are provided in the graph title.

The AEPs represent the probability of an event occurring that exceeds the quantile in any given year (i.e., 1 in 100 or 0.01 probability). Theoretically, 50% of the total number of events could exceed the 1 in 2 AEP, 4% could exceed the 1 in 25 AEP, 2% could exceed the 1 in 50 AEP and only 1% could exceed the 1 in 100 AEP. In other words, the sum of the 1 in 2 AEP percentages for each month in the graph roughly equals 50%.

The graphs show how the seasonality of precipitation may differ between shorter duration and longer duration events in a region.

Seasonal precipitation frequency estimates can not be derived from the graphs.

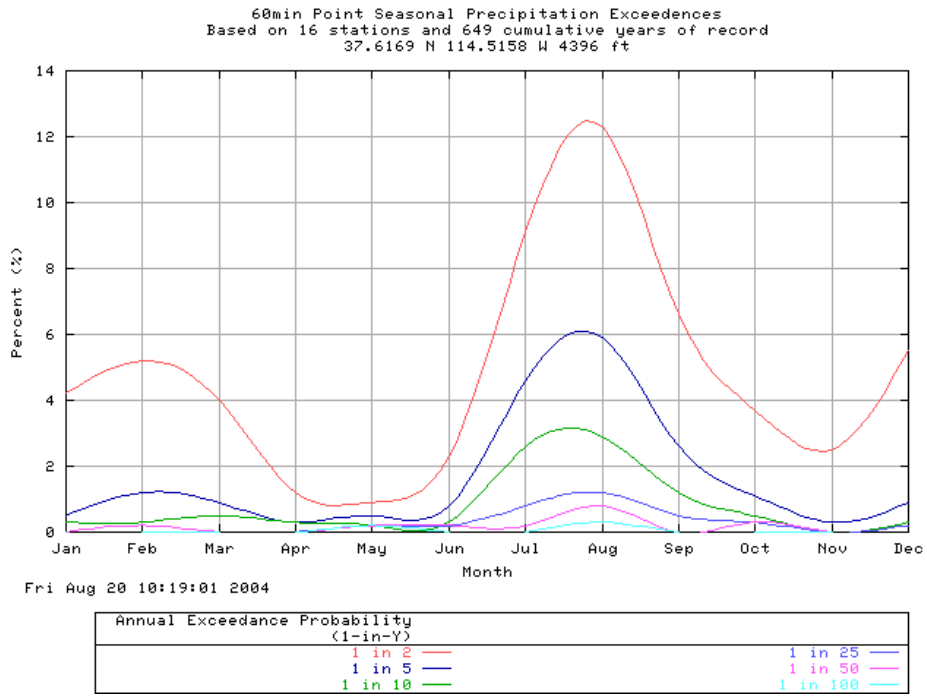


Figure A.2.1. Example of seasonal exceedance graph for the 60-minute duration.