

Technical Memorandum

Date: Friday, July 09, 2021

Project: Jimmy Camp Creek DBPS

To: Christina Furchak, El Paso County

From: Jeff Christopherson, Liz Staten, HDR

Subject: El Paso County rainfall distribution

Introduction

As part of the Jimmy Camp Creek Drainage Basin Planning Study (DBPS), El Paso County (County) requested a new rainfall temporal distribution be developed based on depth-duration-frequency (DDF) data from the National Oceanic and Atmospheric Administration (NOAA) Atlas 14 (Perica et al., 2013) and guidance provided in Chapter Four of the National Engineering Handbook (NEH) Part 630 Hydrology (NRCS, 2019).

The County currently uses the National Resources Conservation Service (NRCS) (formally Soil Conservation Service) dimensionless Type IIA rainfall distribution for which there is little documentation. However, similar to the NRCS Type II distribution (which also has little documentation (NRCS, 2019, p. 4-27)), it is based on Technical Paper (TP) 40 (Weather Bureau 1961a) rainfall frequency maps and is applied to a large geographic area. TP 40 has since been superseded by NOAA Atlas 14 and the NRCS has concluded in subsequent studies that the rainfall ratios contained in the legacy Type IIA and Type II storms are not consistent with the rainfall ratios developed from NOAA Atlas 14 rainfall data. It is therefore the NRCS's recommendation to not use the Type II or other legacy rainfall distributions with NOAA Atlas 14 data due to the errors that could be introduced due to inaccurate rainfall intensities during the storm (NRCS, 2019, p. 4-27)). As a result, new rainfall distributions are developed for the Jimmy Camp Creek DBPS, the development of which are described in this technical memorandum.

Discussion of Frequency

Rainfall frequency, or rainfall recurrence interval, is the annual chance a rainfall depth has of occurring each year. A 100-year storm has a $1/100 = 0.01$ or 1 percent chance of being exceeded in any given year. NOAA Atlas 14 provides a range of rainfall frequencies from 1- to 1000-year events for intervals from 5-minutes to 60-days. A 100-year, 2-hour rainfall depth is just as likely to occur as a 100-year, 24-hour rainfall depth.

Flow frequency is the annual chance that a flow rate at a given point has of occurring each year. Similar to rainfall frequency, a 100-year flow rate has a 1 percent chance of exceeding in any given year. However, unlike rainfall frequency, a flow frequency is not associated with a duration.

Discussion of Design Storms

Rainfall distributions used for design of engineering projects (Design Storms) are not intended to reflect the patterns of actual storm events and are different from actual storms in several ways. Actual storms have variable rainfall during its event and could even have increments of very high intensity rainfall, very low intensity rainfall, or both. Typically, actual rainfall events or patterns are only reproduced for purposes of model validation or analysis of flows at a specific location. Ideally, a Design Storm will produce a runoff flow response that is consistent with the frequency of the respective rainfall depth (a statistical 100-year rainfall event will roughly produce a 100-year runoff response). Typically, the duration of the most intense rainfall frequency contributing to the peak runoff and subsequent peak flow rate is related to a watershed's time of concentration¹. Essentially, the duration of rainfall that causes a corresponding peak runoff response for a given frequency is related to a watershed's size and other surface conditions such as soil type, imperviousness, and topography. The rainfall duration for a given frequency that produces a runoff peak flow for that same frequency is often referred to as a critical duration. The NRCS has noted that when using NRCS procedures, the critical duration is about 170 percent of the time of concentration (NRCS, 1986).

The Jimmy Camp Creek DBPS has a large range in watershed sizes that vary from the sub-basin level (~ 200 acres) to the basin wide level (66 square miles). To avoid the use of different sets of rainfall intensities and durations for each drainage area size that are developed through critical duration analyses, a set of synthetic rainfall distributions having "nested" rainfall intensities were developed based on procedures described by the NRCS (NRCS, 2019). Nested storms maximize rainfall intensities by incorporating selected short duration intensities within those needed for longer durations at the same probability level. A single storm duration of 24-hours and the associated synthetic rainfall distribution, while longer than that needed to determine peaks for the Jimmy Camp Creek DBPS, can be used to represent not only the peak discharges but also the runoff volumes for a range of drainage area sizes and design points.

Per page 4-24 of the NEH Part 630 Hydrology (NRCS, 2019), "An important characteristic of NRCS synthetic rainfall distributions is that the maximum rainfalls for all durations from 5 minutes to 24 hours are represented accurately. The primary assumption made in the development of the rainfall distribution is that the rainfall values for all durations for a single return period occur within one 24-hour period. For example, the 25-year 5-minute, 25-year 10-minute, 25-year 15-minute, and up to the 25-year 24-hour rainfall occurs within the same design storm and are centrally nested within each greater storm duration listed."

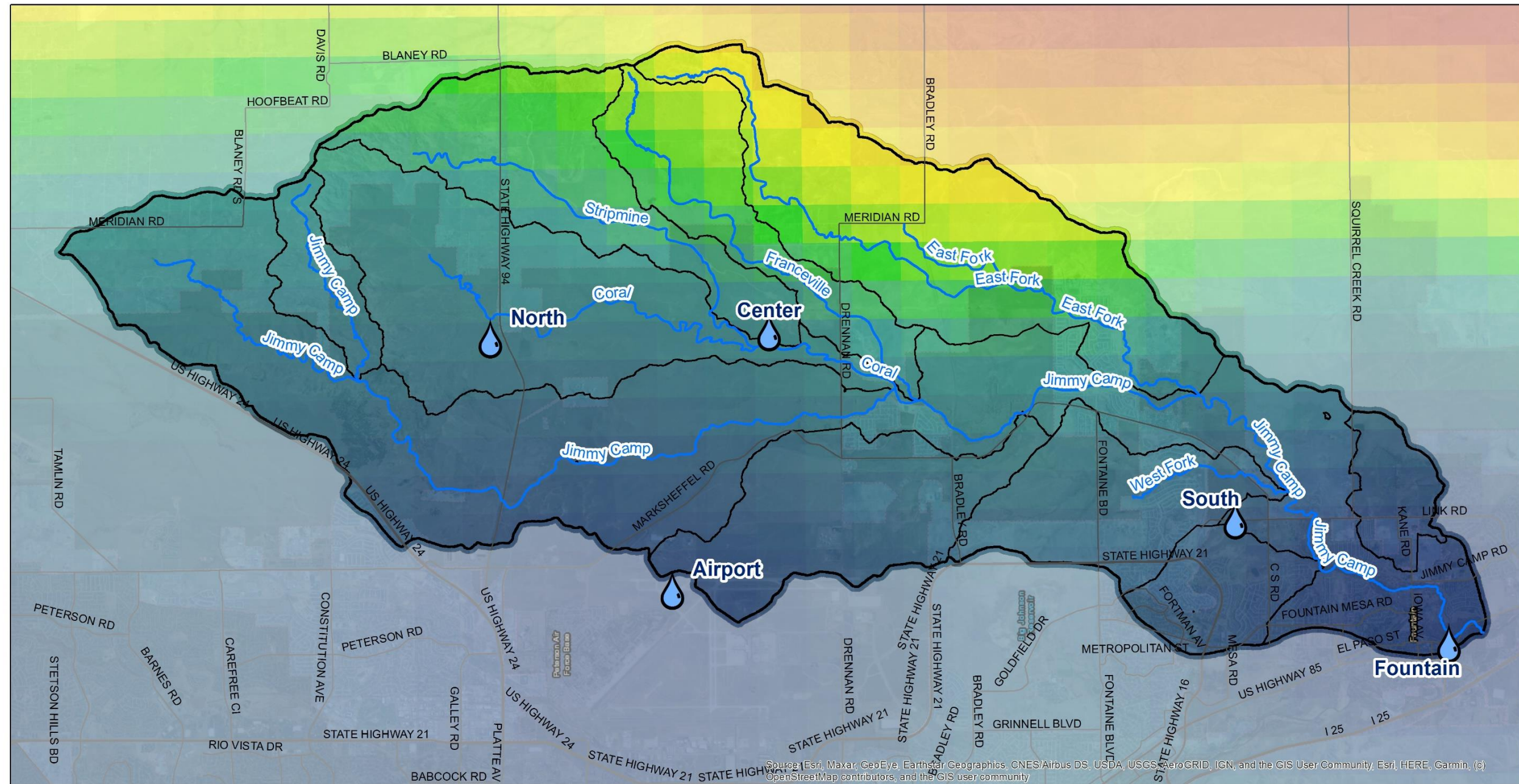
¹ Time of concentration is defined as the length of time runoff takes to travel from the most hydraulically distant point in watershed to that watershed's outlet.

Rainfall Depths

Data relating to NOAA Atlas 14 is published through the Precipitation Data Server (PDS) and is correlated to specific rain gage stations throughout the country. The County has two rain gage stations located in or near the Jimmy Camp Creek Basin, located in the City of Fountain (Station ID: 05-3063), and at the Colorado Springs Airport (Station ID: 05-1778). The City of Fountain gage is located near the outlet of the Jimmy Camp Creek Basin and the airport gage is located outside of the Jimmy Camp Creek Basin. Therefore, NOAA Atlas 14 depths were extracted from three locations within the Jimmy Camp Creek Basin, with one being in the northern location of the basin, one being near the basin center, and one being in a southern location of the basin (Figure 1). Table 1 summarizes the rainfall depths used in this analysis. As illustrated in Table 1 and Figure 1, there is little variability in the rainfall depths through the Jimmy Camp Creek Basin. The maximum percent change between rainfall depths across the basin is below 3 percent and is within the 90 percent confidence intervals of the datasets. Confidence limits provide a measure of uncertainty within the data and represent values that can be expected with a certain confidence that the true value of the rainfall depths will lie. The upper and lower confidence limits provide a confidence interval. In the case of Atlas 14 data, the 90 percent confidence intervals are provided. What this means is that the probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper limit or less than the lower limit is 5 percent and there is 90 percent confidence that the value will fall within those limits. Given that the average 90 percent confidence interval limits represent a rainfall depth change of about 20 percent, a 4 percent variation of the depths are considered within the 90 percent confidence interval representing the certainty of the data. The full Atlas 14 tables are provided in Appendix A.

Table 1. NOAA Atlas 14 Precipitation Frequency Data* Server Point Based Precipitation Frequency Estimates for 24-Hour Rainfall Depths for the Jimmy Camp Creek Basin. Total Rainfall Depths are in Inches with 90 Percent Confidence Limits.

Storm Duration	Airport (Station ID: 05-1778)	Fountain (Station ID: 05-3063)	South Location within the Jimmy Camp Creek Basin	Middle Location within the Jimmy Camp Creek Basin	North Location within the Jimmy Camp Creek Basin
Latitude	38.81°	38.6778°	38.714°	38.7931°	38.8406°
Longitude	-104.6883°	-104.7014°	-104.6741°	-104.6322°	-104.6332°
Elevation (ft)	6181 ft	5560 ft	5677.11 ft	5925.41 ft	6148.29 ft
2-Year Rainfall Depth (90% Confidence Interval)	1.96 (1.71-2.27)	1.94 (1.60-2.38)	1.91 (1.61-2.31)	1.89 (1.63-2.24)	1.92 (1.65-2.26)
5-Year Rainfall Depth (90% Confidence Interval)	2.48 (2.17-2.89)	2.46 (2.02-3.03)	2.43 (2.04-2.95)	2.40 (2.06-2.85)	2.44 (2.09-2.88)
10-Year Rainfall Depth (90% Confidence Interval)	2.99 (2.59-3.50)	2.98 (2.43-3.68)	2.94 (2.44-3.57)	2.89 (2.46-3.44)	2.93 (2.50-3.48)
25-Year Rainfall Depth (90% Confidence Interval)	3.79 (3.21-4.70)	3.79 (3.04-5.00)	3.73 (3.04-4.83)	3.66 (3.05-4.62)	3.71 (3.09-4.65)
50-Year Rainfall Depth (90% Confidence Interval)	4.48 (3.67-5.62)	4.50 (3.51-6.00)	4.42 (3.50-5.78)	4.33 (3.49-5.51)	4.38 (3.54-5.54)
100-Year Rainfall Depth (90% Confidence Interval)	5.25 (4.13-6.74)	5.30 (3.97-7.25)	5.19 (3.95-6.96)	5.06 (3.93-6.60)	5.11 (3.97-6.63)
* http://hdsc.nws.noaa.gov/hdsc/pfds					



Legend

- Atlas 14 Points
 - Creeks
 - Major Roads
 - Jimmy Camp Creek Major Basins
 - Jimmy Camp Creek Drainage Basin
- NOAA Atlas 14 100-yr 24-hr Value**
- High : 5295
- Low : 4805
- Data Sources: NOAA Atlas 14 (https://hdsc.nws.noaa.gov/hdsc/pfds/pfds_gis.html); CDOT

0 0.5 1 2 3 4 Miles



El Paso County: Jimmy Camp Creek DBPS
 Coordinate System: NAD 1983 StatePlane Colorado Central FIPS 0502 Feet

Figure 1. Atlas 14 Rainfall Depth Extraction Points for the Jimmy Camp Creek DBPS

Design Storm Development

Temporal distributions for the Jimmy Camp Creek Basin were developed based on guidance within Chapter Four of the NEH Part 630 Hydrology (NRCS, 2019). A NRCS design rainfall distribution starts with a low intensity and increases to a maximum value at 12-hours. After 12-hours the intensity gradually reduces until the end of the storm. The NRCS design rainfall distribution is developed to have the 100-year 24-hour rainfall, the 100-year 12-hour rainfall, the 100-year 6-hour rainfall, the 100-year 2-hour rainfall, etc., down to the 100-year 5-minute rainfall imbedded in a single storm.

Using methods in NEH Part 630 Hydrology (NRCS, 2019) in conjunction with the NOAA Atlas 14 rainfall depths presented in Table 1, 24-hours distributions were developed for north, center, and south locations in the watershed for the 2-, 5-, 10-, 25-, 50-, and 100-year rainfall depths. These distributions are normalized, meaning that they represent a single unit of rainfall depth and total 1 inch. This allows for any applicable rainfall depth in the Jimmy Camp Creek Basin to be placed under these distributions.

Graphical representations of these normalized rainfall distributions are presented in Figure 2 as a cumulative rainfall fraction. The cumulative rainfall data was also converted to rainfall intensity at each data step (increased rainfall depth divided by the time interval) and is presented in Figure 3. For graphical simplification, only the 5- and 100-year graphs are shown. As can be seen from these figures, the higher frequency rainfall depths (represented in these figures by the 5-year depths) produce more volume on the rising and falling limbs of the distribution when compared to the lower frequency rainfall depths (represented in these figures by the 100-year depths). These figures also illustrate that there is little variation between the north, center, and south data points.

The volume differences presented in Figures Figure 2 and Figure 3 are minor and are not anticipated to have a large impact on model results. The differences are also within the confidence intervals of the Atlas 14 rainfall depths. It is therefore recommended that a singular distribution be used for the Jimmy Camp DBPS developed from the 100-year Atlas 14 data extracted from the North data point. This distribution is presented in Table 2. The full set of distributions is provided in Appendix B.

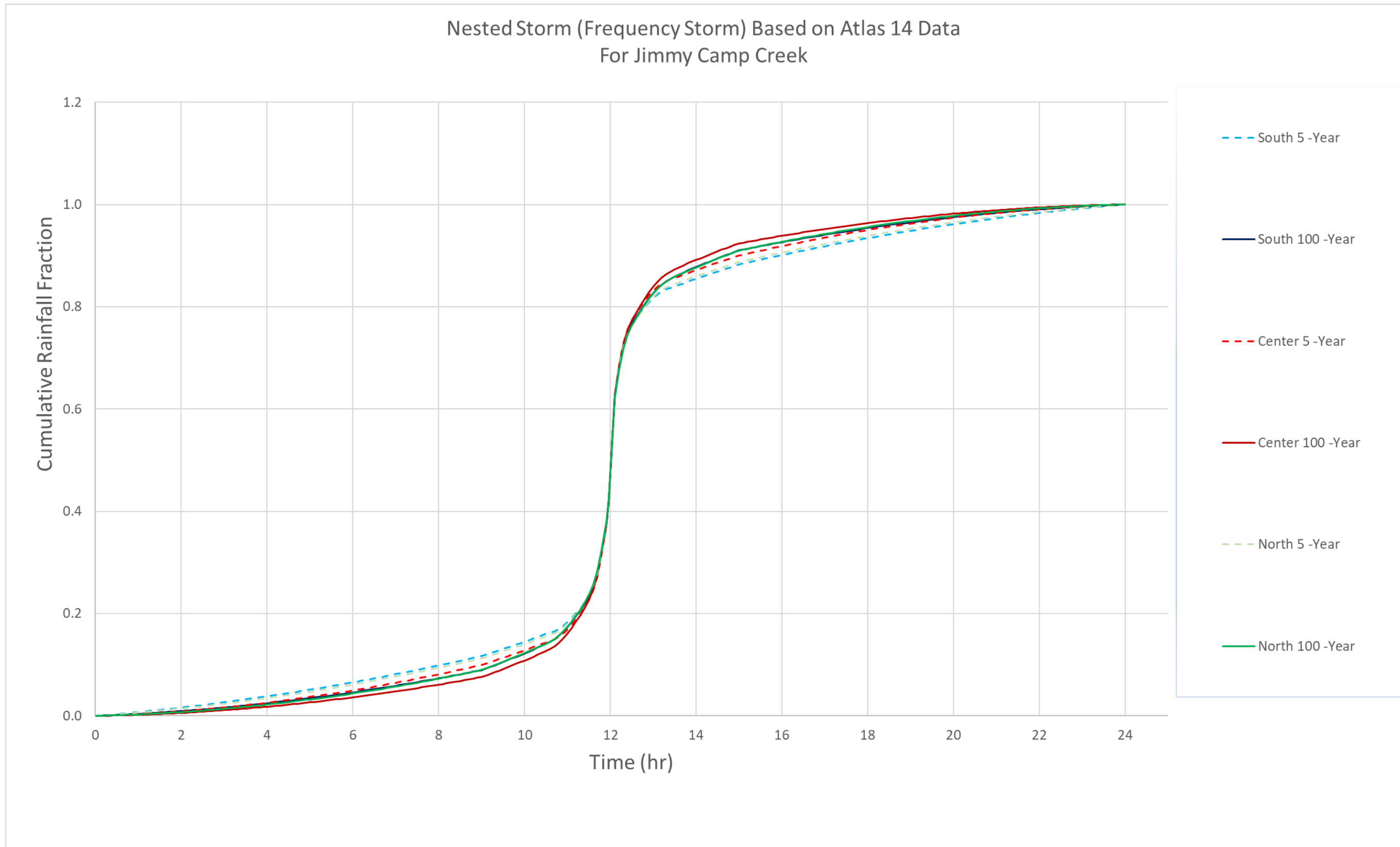


Figure 2. Normalized Temporal Distribution Based on NRCS NEH Part 630 Hydrology Chapter 4- Cumulative Rainfall Depth for 5- and 10-Year Frequencies

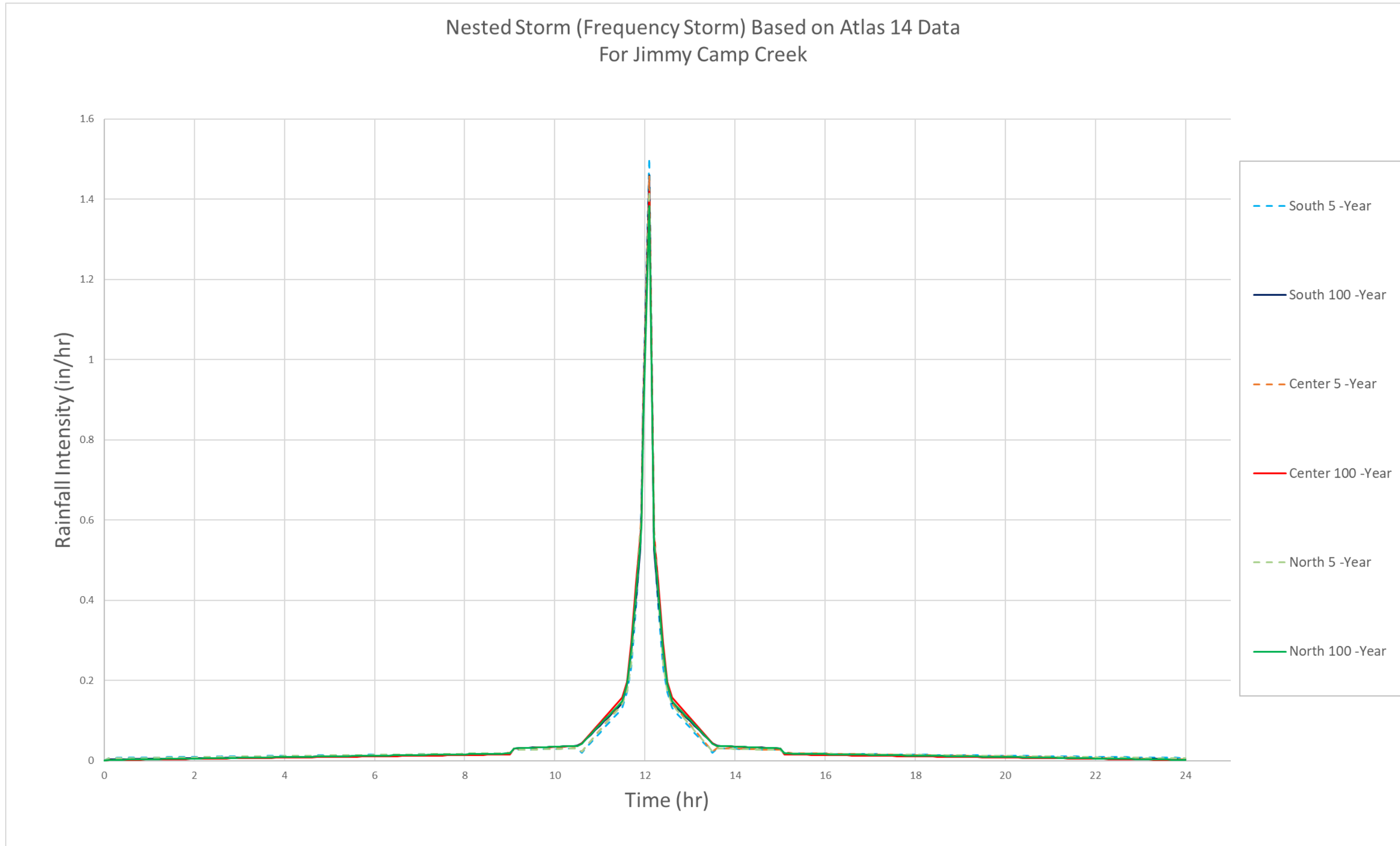


Figure 3. Normalized Temporal Distribution Based on NRCS NEH Part 630 Hydrology Chapter 4- Rainfall Intensity for 5- and 10-Year Frequencies

Table 2. NRCS Temporal Distribution based on 100-year Atlas 14 Data Extracted from the North Data Point

Time (hours)	Cumulative Rainfall Fraction	Normalized Incremental Rainfall Depth
0	0	0
0.1	0.00021	0.00021
0.2	0.000438	0.000228
0.3	0.000683	0.000246
0.4	0.000947	0.000263
0.5	0.001228	0.000281
0.6	0.001526	0.000299
0.7	0.001843	0.000317
0.8	0.002177	0.000334
0.9	0.002529	0.000352
1	0.002899	0.00037
1.1	0.003287	0.000388
1.2	0.003692	0.000405
1.3	0.004115	0.000423
1.4	0.004556	0.000441
1.5	0.005015	0.000459
1.6	0.005491	0.000476
1.7	0.005985	0.000494
1.8	0.006497	0.000512
1.9	0.007027	0.00053
2	0.007574	0.000547
2.1	0.008139	0.000565
2.2	0.008722	0.000583
2.3	0.009323	0.000601
2.4	0.009941	0.000618
2.5	0.010577	0.000636
2.6	0.011231	0.000654
2.7	0.011903	0.000672
2.8	0.012593	0.000689
2.9	0.0133	0.000707
3	0.014025	0.000725
3.1	0.014768	0.000743
3.2	0.015528	0.00076
3.3	0.016306	0.000778
3.4	0.017102	0.000796
3.5	0.017916	0.000814
3.6	0.018748	0.000832

Time (hours)	Cumulative Rainfall Fraction	Normalized Incremental Rainfall Depth
3.7	0.019597	0.000849
3.8	0.020464	0.000867
3.9	0.021349	0.000885
4	0.022251	0.000903
4.1	0.023172	0.00092
4.2	0.02411	0.000938
4.3	0.025065	0.000956
4.4	0.026039	0.000974
4.5	0.02703	0.000991
4.6	0.028039	0.001009
4.7	0.029066	0.001027
4.8	0.030111	0.001045
4.9	0.031173	0.001062
5	0.032253	0.00108
5.1	0.033351	0.001098
5.2	0.034467	0.001116
5.3	0.0356	0.001133
5.4	0.036751	0.001151
5.5	0.03792	0.001169
5.6	0.039107	0.001187
5.7	0.040311	0.001204
5.8	0.041534	0.001222
5.9	0.042774	0.00124
6	0.044031	0.001258
6.1	0.045307	0.001275
6.2	0.0466	0.001293
6.3	0.047911	0.001311
6.4	0.04924	0.001329
6.5	0.050586	0.001346
6.6	0.05195	0.001364
6.7	0.053332	0.001382
6.8	0.054732	0.0014
6.9	0.05615	0.001418
7	0.057585	0.001435
7.1	0.059038	0.001453
7.2	0.060509	0.001471
7.3	0.061997	0.001489

Time (hours)	Cumulative Rainfall Fraction	Normalized Incremental Rainfall Depth
7.4	0.063504	0.001506
7.5	0.065028	0.001524
7.6	0.06657	0.001542
7.7	0.068129	0.00156
7.8	0.069706	0.001577
7.9	0.071302	0.001595
8	0.072914	0.001613
8.1	0.074545	0.001631
8.2	0.076193	0.001648
8.3	0.077859	0.001666
8.4	0.079543	0.001684
8.5	0.081245	0.001702
8.6	0.082964	0.001719
8.7	0.084702	0.001737
8.8	0.086456	0.001755
8.9	0.088229	0.001773
9	0.09002	0.00179
9.1	0.093093	0.003073
9.2	0.096211	0.003119
9.3	0.099376	0.003164
9.4	0.102585	0.00321
9.5	0.105841	0.003255
9.6	0.109142	0.003301
9.7	0.112488	0.003346
9.8	0.11588	0.003392
9.9	0.119318	0.003438
10	0.122801	0.003483
10.1	0.12633	0.003529
10.2	0.129904	0.003574
10.3	0.133524	0.00362
10.4	0.137189	0.003665
10.5	0.1409	0.003711
10.6	0.145205	0.004305
10.7	0.150685	0.005479
10.8	0.157339	0.006654
10.9	0.165166	0.007828
11	0.174168	0.009002
11.1	0.184344	0.010176

Time (hours)	Cumulative Rainfall Fraction	Normalized Incremental Rainfall Depth
11.2	0.195695	0.011135
11.3	0.208219	0.012524
11.4	0.221918	0.013699
11.5	0.236791	0.014873
11.6	0.255875	0.019084
11.7	0.283449	0.027574
11.8	0.325636	0.042187
11.9	0.379636	0.054
11.9167	0.389432	0.009796
11.95833	0.424364	0.034932
12.1	0.620364	0.196
12.2	0.674364	0.054
12.3	0.716551	0.042187
12.4	0.744125	0.027574
12.5	0.763209	0.019084
12.6	0.778082	0.014873
12.7	0.791781	0.013699
12.8	0.804305	0.012524
12.9	0.815656	0.011135
13	0.825832	0.010176
13.1	0.834834	0.009002
13.2	0.842661	0.007828
13.3	0.849315	0.006654
13.4	0.854795	0.005479
13.5	0.8591	0.004305
13.6	0.862811	0.003711
13.7	0.866476	0.003665
13.8	0.870096	0.00362
13.9	0.87367	0.003574
14	0.877199	0.003529
14.1	0.880682	0.003483
14.2	0.88412	0.003438
14.3	0.887512	0.003392
14.4	0.890858	0.003346
14.5	0.894159	0.003301
14.6	0.897415	0.003255
14.7	0.900624	0.00321
14.8	0.903789	0.003164

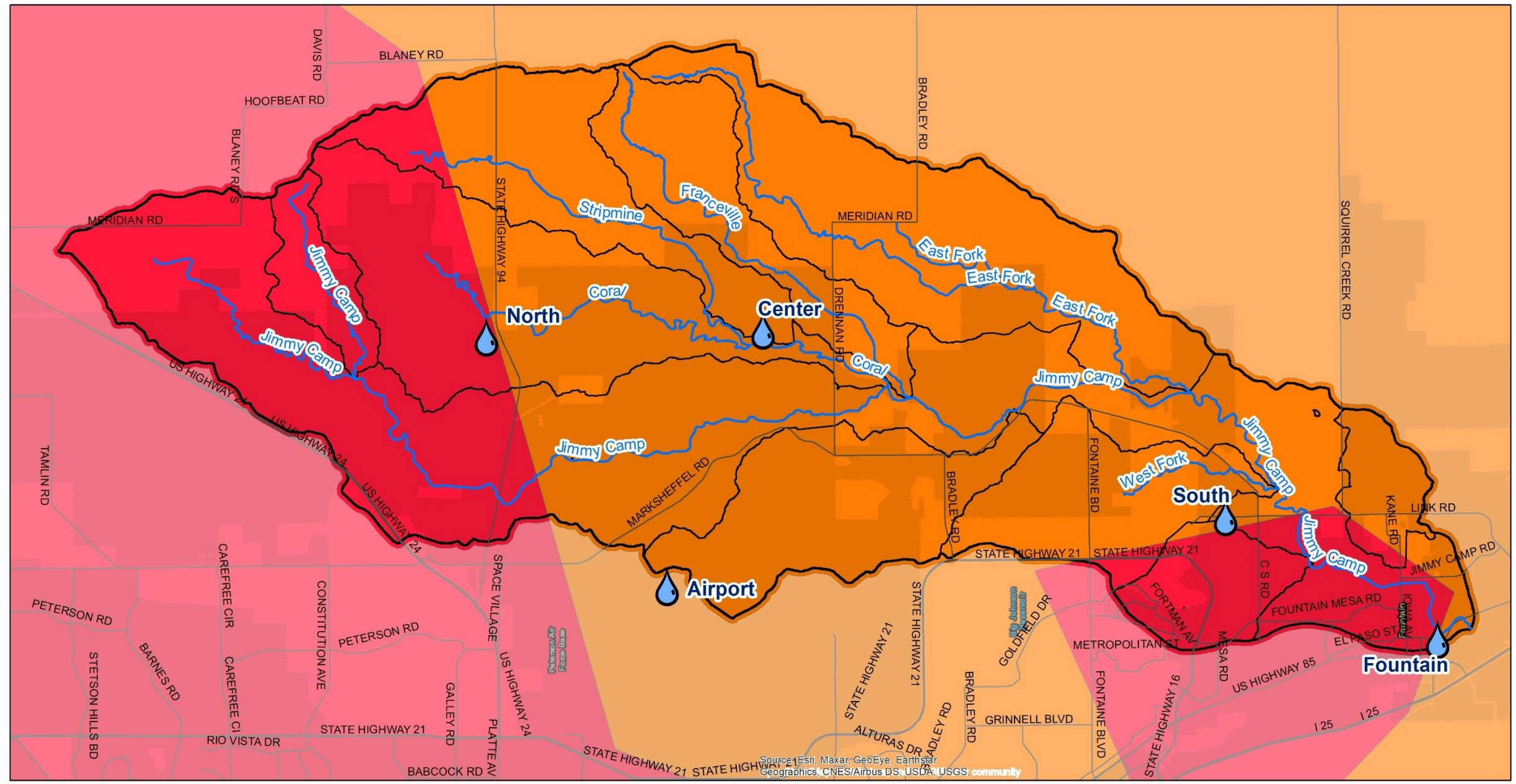
Time (hours)	Cumulative Rainfall Fraction	Normalized Incremental Rainfall Depth
14.9	0.906907	0.003119
15	0.90998	0.003073
15.1	0.911771	0.00179
15.2	0.913544	0.001773
15.3	0.915298	0.001755
15.4	0.917036	0.001737
15.5	0.918755	0.001719
15.6	0.920457	0.001702
15.7	0.922141	0.001684
15.8	0.923807	0.001666
15.9	0.925455	0.001648
16	0.927086	0.001631
16.1	0.928698	0.001613
16.2	0.930294	0.001595
16.3	0.931871	0.001577
16.4	0.93343	0.00156
16.5	0.934972	0.001542
16.6	0.936496	0.001524
16.7	0.938003	0.001506
16.8	0.939491	0.001489
16.9	0.940962	0.001471
17	0.942415	0.001453
17.1	0.94385	0.001435
17.2	0.945268	0.001418
17.3	0.946668	0.0014
17.4	0.94805	0.001382
17.5	0.949414	0.001364
17.6	0.95076	0.001346
17.7	0.952089	0.001329
17.8	0.9534	0.001311
17.9	0.954693	0.001293
18	0.955969	0.001275
18.1	0.957226	0.001258
18.2	0.958466	0.00124
18.3	0.959689	0.001222
18.4	0.960893	0.001204
18.5	0.96208	0.001187
18.6	0.963249	0.001169

Time (hours)	Cumulative Rainfall Fraction	Normalized Incremental Rainfall Depth
18.7	0.9644	0.001151
18.8	0.965533	0.001133
18.9	0.966649	0.001116
19	0.967747	0.001098
19.1	0.968827	0.00108
19.2	0.969889	0.001062
19.3	0.970934	0.001045
19.4	0.971961	0.001027
19.5	0.97297	0.001009
19.6	0.973961	0.000991
19.7	0.974935	0.000974
19.8	0.97589	0.000956
19.9	0.976828	0.000938
20	0.977749	0.00092
20.1	0.978651	0.000903
20.2	0.979536	0.000885
20.3	0.980403	0.000867
20.4	0.981252	0.000849
20.5	0.982084	0.000832
20.6	0.982898	0.000814
20.7	0.983694	0.000796
20.8	0.984472	0.000778
20.9	0.985232	0.00076
21	0.985975	0.000743
21.1	0.9867	0.000725
21.2	0.987407	0.000707
21.3	0.988097	0.000689
21.4	0.988769	0.000672
21.5	0.989423	0.000654
21.6	0.990059	0.000636
21.7	0.990677	0.000618
21.8	0.991278	0.000601
21.9	0.991861	0.000583
22	0.992426	0.000565
22.1	0.992973	0.000547
22.2	0.993503	0.00053
22.3	0.994015	0.000512
22.4	0.994509	0.000494

Time (hours)	Cumulative Rainfall Fraction	Normalized Incremental Rainfall Depth
22.5	0.994985	0.000476
22.6	0.995444	0.000459
22.7	0.995885	0.000441
22.8	0.996308	0.000423
22.9	0.996713	0.000405
23	0.997101	0.000388
23.1	0.997471	0.00037
23.2	0.997823	0.000352
23.3	0.998157	0.000334
23.4	0.998474	0.000317
23.5	0.998772	0.000299
23.6	0.999053	0.000281
23.7	0.999317	0.000263
23.8	0.999562	0.000246
23.9	0.99979	0.000228
24	1	0.00021

Comparison to the NRCS MSE Distributions

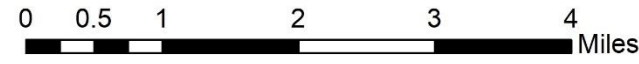
The NRCS has developed a series of rainfall distributions across the Midwest and Southeast states based on the Part 630 procedures (Merkel et al., 2015). These distributions are named MSE 1 through MSE 6 (MSE is abbreviated from Midwest/Southeast states) and are based on 25-year rainfall depths. Several states have adopted these distributions for use in design. El Paso County is covered by all six of these distributions, with the Jimmy Camp Creek basin being within MSE 2 and MSE 3 (Figure 4). Comparisons of these MSE distributions to the north distributions described in the previous section is provided in Appendix B and Appendix C. For reference, the legacy NRCS Type II distribution is also graphed. To summarize, the distributions developed in the previous section compare closely to the MSE distributions for higher frequency events.



Legend

- NRCS MSE Region 2
- NRCS MSE Region 3
- Atlas 14 Points
- Creeks
- Major Roads
- Jimmy Camp Creek Major Basins
- Jimmy Camp Creek Drainage Basin

Data Sources: NRCS (<https://www.nrcs.usda.gov/wps/portal/nrcs/detail/full/national/water/?cid=stelpdrb1044959>); CDOT

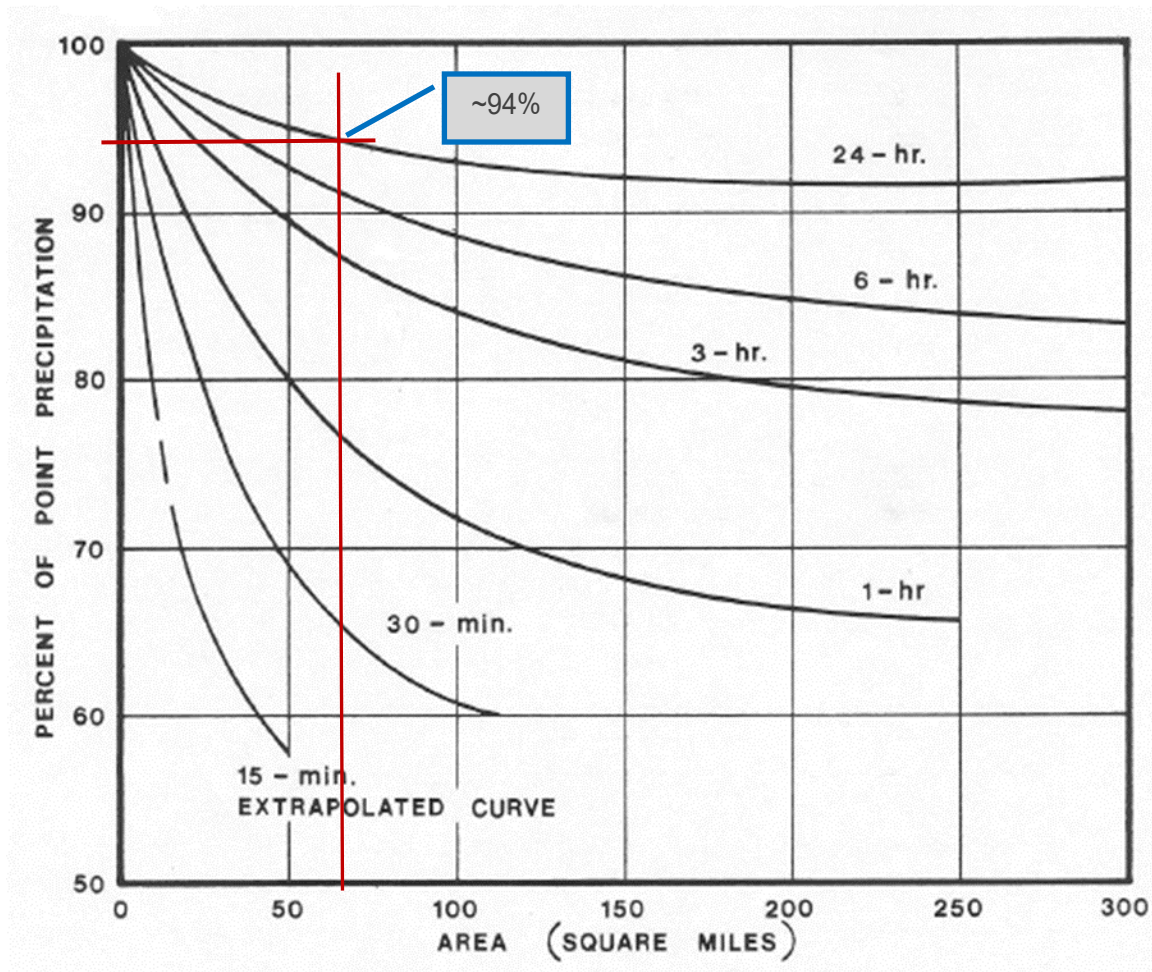


El Paso County: Jimmy Camp Creek DBPS
 Coordinate System: NAD 1983 StatePlane Colorado Central FIPS 0502 Feet

Figure 4. NRCS MSE Distributions in the Jimmy Camp Creek Basin

Depth-Area Reduction Factors

Depth-area reduction factors (DARFs) will be used to adjust the point-precipitation values from the NOAA Atlas 14 dataset to represent average precipitation over larger areas in the Jimmy Camp Creek Basin. As drainage area increases, the basin-average precipitation for a storm event decreases. NOAA has not produced updated DARFs in conjunction with Atlas 14. This is due to the uncertainties in rainfall data. DARFs were developed in TP-40 (Weather Bureau, 1961) and it still used by the Mile High Flood District (MHFD, 2016). These DARF curves are presented in Figure 5. For a 24-hour storm event and a 66 square mile watershed, the maximum DARF for Jimmy Camp Creek is about 6 percent, or 94 percent of the point rainfall depth. The general 90 percent confidence intervals associated with the Atlas 14 rainfall depth data presented in Table 1 varies the rainfall depth by about 20 percent, which is greater than 6 percent DARF reduction. Therefore, the use of a DARFs is not recommended for the Jimmy Camp Creek DBPS because the 6 percent DARF reduction is within the 90 percent confidence interval associated with the uncertainty of the data (90 percent confidence interval limits represent a rainfall depth change of about 20 percent within the Jimmy Camp Creek Basin).



*Source: Technical Paper No. 40 ((Weather Bureau, 1961))

Figure 5. Depth-Area Reduction Factor (DARF) Curves for Infrequent Storm Events

Summary and Recommendations

It is recommended that the Jimmy Camp Creek DBPS use a rainfall distribution developed directly from Atlas 14 data. It is also recommended that the distributions be consistent with procedures described in Chapter Four of the National Engineering Handbook (NEH) Part 630 Hydrology (NRCS, 2019) for a nested storm temporal distribution. This allows for a singular temporal distribution that is applicable for various watershed sizes within the Jimmy Camp Basin using procedures that are widely understood and well documented. It is also recommended that a singular distribution developed from 100-year Atlas 14 rainfall depths extracted from the north area of the watershed be used. Finally, it is recommended that DARFs not be used given the generally uncertainty associated with rainfall frequency depths.

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Appendix A

Atlas 14 Rainfall Data

Precipitation Frequency Data Server

NOAA Atlas 14, Volume 8, Version 2 COLORADO

SPGS MUNI AP

Station ID: 05-1778

Location name: Colorado Springs, Colorado, USA*

Latitude: 38.81°, Longitude: -104.6883°

Elevation:

Elevation (station metadata): 6181 ft**

*source: ESRI Maps

**source: USGS



POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Deborah Martin, Sandra Pavlovic, Ishani Roy, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Michael Yekta, Geoffrey Bonnin

NOAA, National Weather Service, Silver Spring, Maryland

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PF tabular

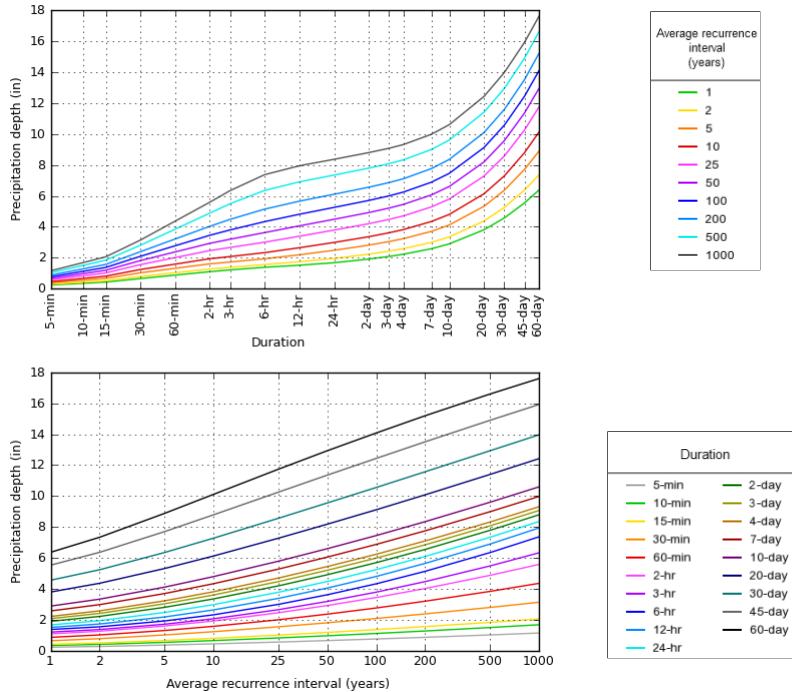
Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.239 (0.202-0.286)	0.289 (0.244-0.346)	0.377 (0.317-0.453)	0.456 (0.380-0.549)	0.572 (0.462-0.723)	0.668 (0.525-0.854)	0.770 (0.581-1.01)	0.879 (0.633-1.19)	1.03 (0.711-1.43)	1.16 (0.770-1.62)
10-min	0.350 (0.295-0.419)	0.424 (0.357-0.507)	0.552 (0.464-0.663)	0.667 (0.557-0.804)	0.837 (0.677-1.06)	0.978 (0.768-1.25)	1.13 (0.851-1.48)	1.29 (0.927-1.74)	1.51 (1.04-2.10)	1.69 (1.13-2.37)
15-min	0.427 (0.360-0.510)	0.516 (0.435-0.618)	0.673 (0.566-0.808)	0.814 (0.679-0.981)	1.02 (0.826-1.29)	1.19 (0.937-1.53)	1.38 (1.04-1.80)	1.57 (1.13-2.12)	1.84 (1.27-2.56)	2.06 (1.38-2.89)
30-min	0.656 (0.554-0.784)	0.791 (0.667-0.947)	1.03 (0.864-1.24)	1.24 (1.04-1.50)	1.56 (1.26-1.97)	1.82 (1.43-2.33)	2.09 (1.58-2.75)	2.39 (1.72-3.23)	2.81 (1.94-3.90)	3.14 (2.10-4.40)
60-min	0.878 (0.741-1.05)	1.03 (0.870-1.24)	1.32 (1.11-1.58)	1.59 (1.33-1.92)	2.01 (1.64-2.57)	2.38 (1.87-3.06)	2.77 (2.10-3.66)	3.21 (2.32-4.36)	3.85 (2.66-5.36)	4.37 (2.91-6.11)
2-hr	1.10 (0.937-1.31)	1.27 (1.08-1.51)	1.61 (1.36-1.92)	1.94 (1.63-2.32)	2.46 (2.03-3.15)	2.93 (2.34-3.77)	3.45 (2.64-4.55)	4.03 (2.94-5.45)	4.88 (3.40-6.78)	5.59 (3.75-7.78)
3-hr	1.22 (1.04-1.44)	1.38 (1.18-1.64)	1.72 (1.47-2.05)	2.08 (1.76-2.48)	2.66 (2.22-3.41)	3.20 (2.57-4.11)	3.80 (2.93-5.00)	4.48 (3.29-6.05)	5.49 (3.85-7.61)	6.34 (4.28-8.79)
6-hr	1.38 (1.19-1.63)	1.56 (1.34-1.83)	1.93 (1.66-2.28)	2.33 (1.99-2.76)	3.01 (2.53-3.84)	3.63 (2.94-4.65)	4.34 (3.37-5.69)	5.14 (3.81-6.92)	6.35 (4.49-8.76)	7.37 (5.01-10.2)
12-hr	1.52 (1.32-1.77)	1.74 (1.51-2.04)	2.19 (1.90-2.57)	2.65 (2.28-3.12)	3.39 (2.87-4.27)	4.06 (3.31-5.15)	4.81 (3.76-6.24)	5.66 (4.21-7.54)	6.90 (4.91-9.43)	7.94 (5.44-10.9)
24-hr	1.68 (1.47-1.95)	1.96 (1.71-2.27)	2.48 (2.17-2.89)	2.99 (2.59-3.50)	3.79 (3.21-4.70)	4.48 (3.67-5.62)	5.25 (4.13-6.74)	6.10 (4.57-8.05)	7.34 (5.25-9.94)	8.36 (5.77-11.4)
2-day	1.91 (1.69-2.20)	2.23 (1.97-2.57)	2.81 (2.48-3.26)	3.36 (2.94-3.90)	4.20 (3.57-5.15)	4.92 (4.06-6.10)	5.70 (4.51-7.24)	6.56 (4.94-8.56)	7.79 (5.61-10.4)	8.79 (6.11-11.9)
3-day	2.09 (1.85-2.39)	2.43 (2.15-2.79)	3.04 (2.69-3.51)	3.61 (3.17-4.18)	4.48 (3.82-5.45)	5.21 (4.31-6.41)	6.00 (4.76-7.57)	6.86 (5.18-8.90)	8.08 (5.84-10.8)	9.07 (6.33-12.2)
4-day	2.23 (1.99-2.55)	2.59 (2.31-2.97)	3.23 (2.87-3.72)	3.82 (3.37-4.41)	4.71 (4.02-5.70)	5.45 (4.52-6.68)	6.24 (4.97-7.85)	7.10 (5.39-9.19)	8.33 (6.03-11.1)	9.31 (6.52-12.5)
7-day	2.58 (2.32-2.94)	2.99 (2.68-3.41)	3.71 (3.31-4.23)	4.34 (3.86-4.99)	5.28 (4.54-6.34)	6.06 (5.05-7.36)	6.88 (5.51-8.58)	7.76 (5.91-9.95)	8.99 (6.55-11.9)	9.98 (7.03-13.3)
10-day	2.90 (2.61-3.29)	3.35 (3.02-3.80)	4.12 (3.70-4.69)	4.80 (4.28-5.49)	5.79 (4.99-6.91)	6.60 (5.53-7.98)	7.45 (5.99-9.24)	8.35 (6.39-10.7)	9.60 (7.02-12.6)	10.6 (7.49-14.1)
20-day	3.80 (3.46-4.29)	4.37 (3.98-4.93)	5.32 (4.82-6.02)	6.13 (5.52-6.97)	7.28 (6.30-8.57)	8.19 (6.89-9.78)	9.12 (7.37-11.2)	10.1 (7.76-12.7)	11.4 (8.38-14.8)	12.4 (8.85-16.4)
30-day	4.57 (4.18-5.13)	5.24 (4.79-5.89)	6.36 (5.79-7.16)	7.28 (6.59-8.24)	8.56 (7.44-10.0)	9.56 (8.08-11.3)	10.6 (8.57-12.9)	11.6 (8.94-14.5)	12.9 (9.54-16.7)	14.0 (9.99-18.4)
45-day	5.54 (5.10-6.19)	6.37 (5.85-7.13)	7.70 (7.05-8.64)	8.79 (7.99-9.91)	10.3 (8.92-11.9)	11.4 (9.63-13.4)	12.4 (10.1-15.0)	13.5 (10.5-16.8)	14.9 (11.0-19.1)	15.9 (11.4-20.9)
60-day	6.37 (5.89-7.10)	7.34 (6.77-8.19)	8.88 (8.16-9.94)	10.1 (9.23-11.4)	11.7 (10.2-13.5)	12.9 (11.0-15.2)	14.1 (11.5-16.9)	15.2 (11.8-18.8)	16.6 (12.3-21.2)	17.6 (12.7-23.0)

¹ Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS). Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values. Please refer to NOAA Atlas 14 document for more information.

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PF graphical

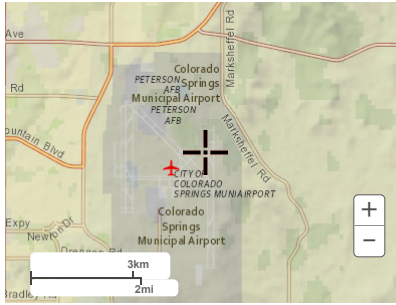
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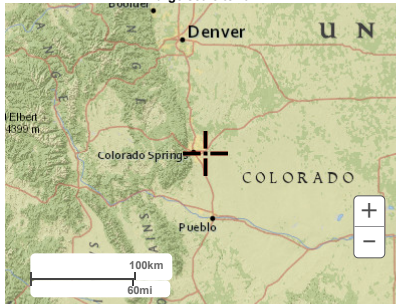
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Maps & aeriels

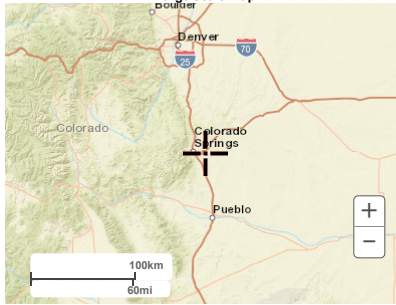
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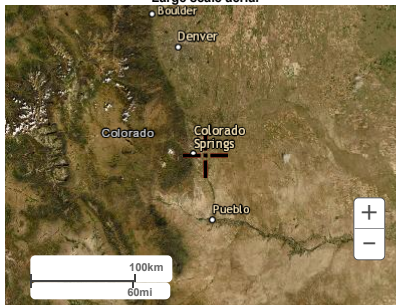
Large scale terrain



Large scale map



Large scale aerial



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Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov
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NOAA Atlas 14, Volume 8, Version 2
 Location name: Colorado Springs, Colorado, USA*
 Latitude: 38.8406°, Longitude: -104.6332°
 Elevation: 6148.29 ft**
*source: ESRI Maps
 **source: USGS



POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Deborah Martin, Sandra Pavlovic, Ishani Roy, Michael St. Laurent, Carl Trypaak, Dale Uhrich, Michael Yokta, Geoffrey Bonnin

NOAA, National Weather Service, Silver Spring, Maryland

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PF tabular

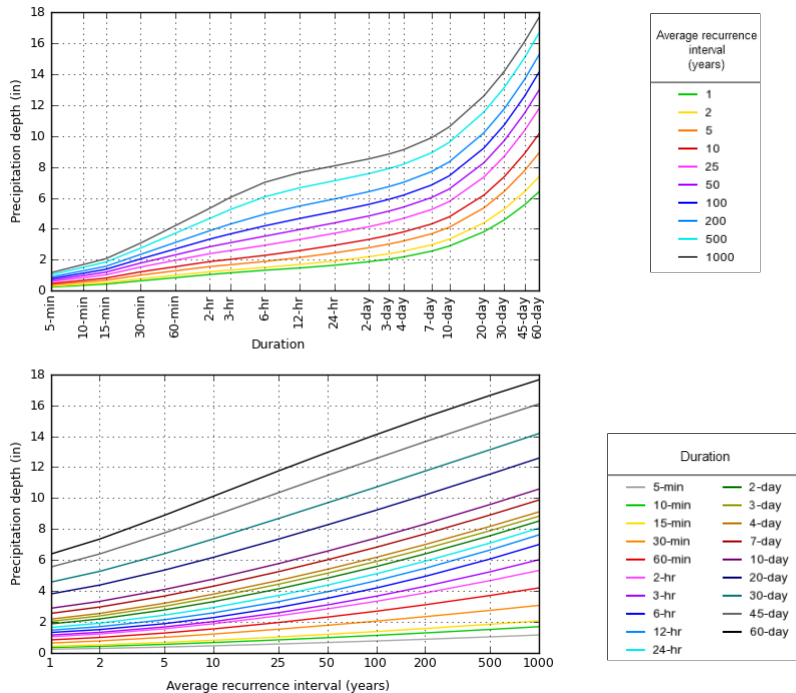
Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.239 (0.198-0.290)	0.290 (0.240-0.352)	0.379 (0.313-0.462)	0.458 (0.376-0.561)	0.575 (0.458-0.737)	0.671 (0.520-0.870)	0.773 (0.577-1.03)	0.882 (0.629-1.20)	1.03 (0.707-1.45)	1.16 (0.766-1.64)
10-min	0.349 (0.290-0.425)	0.424 (0.352-0.516)	0.554 (0.458-0.676)	0.670 (0.551-0.821)	0.842 (0.671-1.08)	0.983 (0.762-1.27)	1.13 (0.845-1.50)	1.29 (0.921-1.76)	1.52 (1.03-2.12)	1.69 (1.12-2.40)
15-min	0.426 (0.354-0.518)	0.517 (0.429-0.629)	0.676 (0.559-0.825)	0.817 (0.672-1.00)	1.03 (0.818-1.32)	1.20 (0.929-1.55)	1.38 (1.03-1.83)	1.58 (1.12-2.15)	1.85 (1.26-2.59)	2.07 (1.37-2.92)
30-min	0.638 (0.530-0.775)	0.773 (0.641-0.940)	1.01 (0.834-1.23)	1.22 (1.00-1.49)	1.53 (1.22-1.96)	1.78 (1.38-2.31)	2.05 (1.53-2.73)	2.34 (1.67-3.20)	2.75 (1.88-3.85)	3.07 (2.03-4.35)
60-min	0.842 (0.700-1.02)	0.998 (0.828-1.21)	1.28 (1.06-1.57)	1.55 (1.27-1.90)	1.96 (1.57-2.54)	2.31 (1.80-3.02)	2.69 (2.02-3.60)	3.11 (2.24-4.26)	3.71 (2.54-5.22)	4.20 (2.78-5.94)
2-hr	1.05 (0.877-1.26)	1.22 (1.02-1.48)	1.56 (1.30-1.89)	1.88 (1.56-2.29)	2.39 (1.94-3.09)	2.84 (2.23-3.69)	3.33 (2.52-4.44)	3.88 (2.80-5.30)	4.67 (3.23-6.55)	5.33 (3.55-7.49)
3-hr	1.16 (0.972-1.39)	1.33 (1.12-1.60)	1.68 (1.41-2.02)	2.03 (1.69-2.45)	2.59 (2.12-3.35)	3.10 (2.45-4.03)	3.67 (2.79-4.88)	4.30 (3.13-5.87)	5.24 (3.64-7.33)	6.02 (4.03-8.44)
6-hr	1.32 (1.12-1.58)	1.51 (1.28-1.80)	1.89 (1.60-2.26)	2.28 (1.91-2.75)	2.93 (2.43-3.78)	3.52 (2.82-4.57)	4.19 (3.22-5.55)	4.95 (3.63-6.72)	6.06 (4.25-8.44)	7.00 (4.73-9.75)
12-hr	1.47 (1.26-1.74)	1.70 (1.45-2.01)	2.14 (1.82-2.55)	2.59 (2.19-3.09)	3.31 (2.75-4.21)	3.95 (3.18-5.06)	4.66 (3.61-6.12)	5.47 (4.03-7.36)	6.65 (4.69-9.18)	7.63 (5.19-10.5)
24-hr	1.64 (1.42-1.93)	1.92 (1.65-2.26)	2.44 (2.09-2.88)	2.93 (2.50-3.48)	3.71 (3.09-4.65)	4.38 (3.54-5.54)	5.11 (3.97-6.63)	5.92 (4.39-7.89)	7.10 (5.04-9.70)	8.06 (5.53-11.1)
2-day	1.87 (1.63-2.19)	2.19 (1.91-2.57)	2.78 (2.40-3.26)	3.31 (2.85-3.90)	4.13 (3.46-5.12)	4.83 (3.92-6.05)	5.58 (4.36-7.16)	6.40 (4.77-8.44)	7.57 (5.40-10.3)	8.52 (5.88-11.6)
3-day	2.04 (1.78-2.37)	2.39 (2.09-2.78)	3.02 (2.62-3.52)	3.58 (3.09-4.20)	4.43 (3.72-5.45)	5.14 (4.20-6.40)	5.91 (4.63-7.53)	6.73 (5.04-8.82)	7.89 (5.66-10.6)	8.83 (6.13-12.0)
4-day	2.18 (1.91-2.53)	2.55 (2.24-2.96)	3.21 (2.80-3.74)	3.80 (3.29-4.44)	4.67 (3.93-5.72)	5.40 (4.42-6.69)	6.17 (4.86-7.84)	7.00 (5.26-9.14)	8.17 (5.88-11.0)	9.11 (6.34-12.4)
7-day	2.55 (2.26-2.95)	2.96 (2.61-3.42)	3.68 (3.23-4.25)	4.31 (3.76-5.01)	5.24 (4.43-6.37)	6.01 (4.95-7.39)	6.82 (5.40-8.61)	7.69 (5.81-9.98)	8.91 (6.44-11.9)	9.88 (6.92-13.3)
10-day	2.88 (2.56-3.31)	3.33 (2.95-3.83)	4.10 (3.61-4.72)	4.77 (4.18-5.53)	5.76 (4.89-6.96)	6.57 (5.43-8.04)	7.42 (5.90-9.32)	8.33 (6.31-10.7)	9.59 (6.96-12.7)	10.6 (7.45-14.2)
20-day	3.81 (3.40-4.34)	4.38 (3.92-5.01)	5.35 (4.76-6.13)	6.18 (5.46-7.10)	7.34 (6.26-8.75)	8.27 (6.87-10.0)	9.22 (7.37-11.4)	10.2 (7.79-13.0)	11.5 (8.43-15.2)	12.6 (8.93-16.8)
30-day	4.57 (4.11-5.19)	5.27 (4.73-5.99)	6.41 (5.73-7.31)	7.36 (6.54-8.43)	8.68 (7.42-10.3)	9.69 (8.08-11.6)	10.7 (8.59-13.2)	11.7 (8.99-14.9)	13.1 (9.62-17.1)	14.2 (10.1-18.8)
45-day	5.55 (5.01-6.27)	6.39 (5.77-7.24)	7.75 (6.97-8.80)	8.86 (7.91-10.1)	10.3 (8.86-12.1)	11.5 (9.58-13.7)	12.6 (10.1-15.4)	13.6 (10.5-17.2)	15.1 (11.1-19.5)	16.1 (11.5-21.3)
60-day	6.38 (5.79-7.20)	7.35 (6.66-8.30)	8.89 (8.02-10.1)	10.1 (9.07-11.5)	11.7 (10.1-13.7)	12.9 (10.9-15.3)	14.1 (11.4-17.2)	15.2 (11.7-19.1)	16.6 (12.3-21.5)	17.6 (12.7-23.3)

¹ Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS). Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values. Please refer to NOAA Atlas 14 document for more information.

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PF graphical

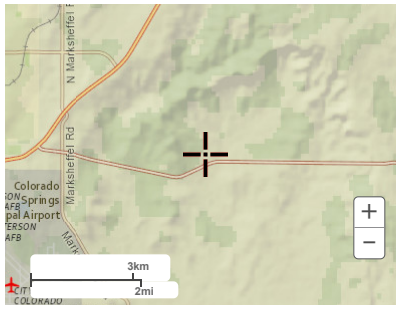
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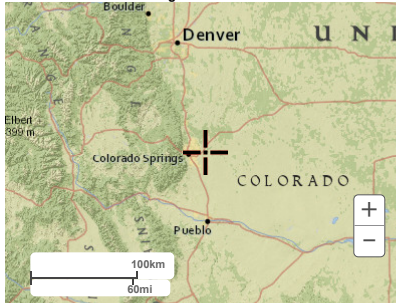
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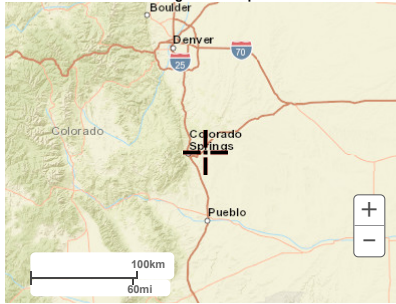
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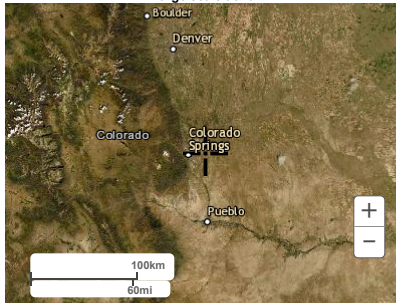
Large scale terrain



Large scale map



Large scale aerial



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Questions?: HDSC.Questions@noaa.gov

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NOAA Atlas 14, Volume 8, Version 2
 Location name: Colorado Springs, Colorado, USA*
 Latitude: 38.7931°, Longitude: -104.6322°
 Elevation: 5925.41 ft**
*source: ESRI Maps
 **source: USGS



POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Deborah Martin, Sandra Pavlovic, Ishani Roy, Michael St. Laurent, Carl Trypaak, Dale Uhrich, Michael Yorkta, Geoffrey Bonnin

NOAA, National Weather Service, Silver Spring, Maryland

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PF tabular

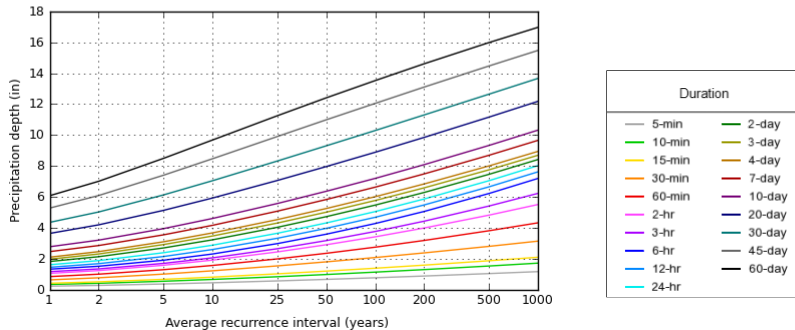
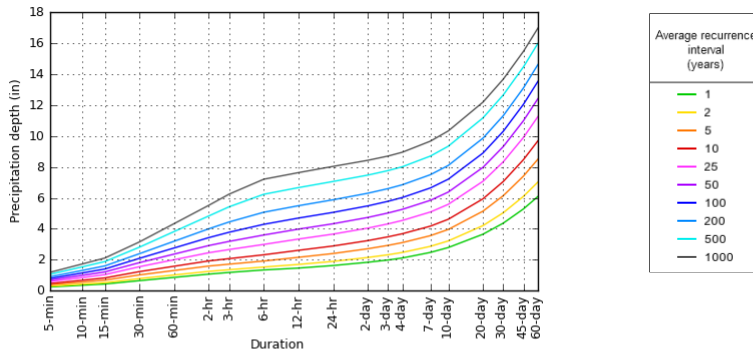
PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches) ¹										
Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.242 (0.201-0.295)	0.293 (0.243-0.357)	0.382 (0.316-0.467)	0.462 (0.380-0.568)	0.581 (0.463-0.748)	0.680 (0.527-0.885)	0.784 (0.585-1.05)	0.897 (0.638-1.23)	1.06 (0.719-1.49)	1.18 (0.780-1.68)
10-min	0.354 (0.294-0.432)	0.429 (0.356-0.523)	0.560 (0.463-0.684)	0.677 (0.556-0.831)	0.851 (0.679-1.10)	0.995 (0.771-1.30)	1.15 (0.856-1.53)	1.31 (0.934-1.80)	1.54 (1.05-2.18)	1.73 (1.14-2.46)
15-min	0.432 (0.359-0.526)	0.523 (0.434-0.637)	0.683 (0.564-0.834)	0.825 (0.678-1.01)	1.04 (0.828-1.34)	1.21 (0.940-1.58)	1.40 (1.04-1.87)	1.60 (1.14-2.20)	1.88 (1.28-2.65)	2.11 (1.39-3.00)
30-min	0.649 (0.540-0.791)	0.784 (0.651-0.956)	1.02 (0.845-1.25)	1.23 (1.01-1.52)	1.55 (1.24-2.00)	1.81 (1.41-2.36)	2.09 (1.56-2.79)	2.39 (1.70-3.28)	2.81 (1.92-3.97)	3.15 (2.08-4.48)
60-min	0.860 (0.715-1.05)	1.02 (0.844-1.24)	1.31 (1.08-1.60)	1.58 (1.30-1.94)	2.00 (1.61-2.60)	2.37 (1.84-3.10)	2.76 (2.07-3.71)	3.20 (2.28-4.40)	3.82 (2.61-5.41)	4.33 (2.86-6.17)
2-hr	1.07 (0.896-1.30)	1.25 (1.05-1.51)	1.59 (1.33-1.93)	1.93 (1.59-2.35)	2.45 (1.99-3.18)	2.92 (2.29-3.81)	3.43 (2.59-4.59)	4.00 (2.88-5.49)	4.83 (3.33-6.81)	5.52 (3.76-7.80)
3-hr	1.18 (0.992-1.42)	1.36 (1.14-1.64)	1.71 (1.43-2.07)	2.07 (1.72-2.52)	2.66 (2.18-3.45)	3.19 (2.52-4.16)	3.78 (2.87-5.05)	4.44 (3.22-6.09)	5.42 (3.76-7.62)	6.24 (4.17-8.78)
6-hr	1.34 (1.14-1.61)	1.53 (1.29-1.83)	1.92 (1.62-2.31)	2.32 (1.94-2.80)	2.99 (2.47-3.87)	3.60 (2.87-4.68)	4.29 (3.29-5.71)	5.07 (3.71-6.92)	6.23 (4.36-8.72)	7.20 (4.85-10.1)
12-hr	1.46 (1.25-1.74)	1.70 (1.45-2.02)	2.16 (1.83-2.58)	2.61 (2.20-3.13)	3.34 (2.77-4.26)	3.98 (3.19-5.12)	4.69 (3.62-6.18)	5.49 (4.04-7.42)	6.66 (4.69-9.23)	7.63 (5.18-10.6)
24-hr	1.63 (1.40-1.92)	1.89 (1.63-2.24)	2.40 (2.06-2.85)	2.89 (2.46-3.44)	3.66 (3.05-4.62)	4.33 (3.49-5.51)	5.06 (3.93-6.60)	5.87 (4.35-7.87)	7.06 (5.00-9.70)	8.03 (5.49-11.1)
2-day	1.84 (1.59-2.15)	2.15 (1.86-2.52)	2.71 (2.34-3.19)	3.24 (2.78-3.83)	4.04 (3.38-5.04)	4.73 (3.84-5.96)	5.48 (4.28-7.07)	6.30 (4.69-8.35)	7.47 (5.33-10.2)	8.42 (5.81-11.6)
3-day	1.98 (1.73-2.32)	2.32 (2.02-2.72)	2.93 (2.54-3.44)	3.48 (3.00-4.10)	4.32 (3.62-5.34)	5.02 (4.09-6.28)	5.78 (4.52-7.41)	6.60 (4.93-8.69)	7.76 (5.55-10.5)	8.70 (6.03-11.9)
4-day	2.12 (1.85-2.47)	2.47 (2.16-2.89)	3.11 (2.70-3.64)	3.68 (3.18-4.33)	4.54 (3.81-5.59)	5.26 (4.29-6.55)	6.02 (4.73-7.69)	6.85 (5.13-8.99)	8.01 (5.75-10.8)	8.95 (6.22-12.2)
7-day	2.47 (2.18-2.87)	2.87 (2.52-3.33)	3.56 (3.11-4.14)	4.17 (3.63-4.88)	5.09 (4.29-6.21)	5.84 (4.79-7.22)	6.64 (5.24-8.42)	7.50 (5.65-9.77)	8.70 (6.28-11.7)	9.66 (6.76-13.1)
10-day	2.79 (2.46-3.22)	3.22 (2.84-3.72)	3.96 (3.48-4.59)	4.62 (4.03-5.37)	5.58 (4.72-6.78)	6.37 (5.25-7.84)	7.21 (5.71-9.09)	8.09 (6.12-10.5)	9.33 (6.77-12.5)	10.3 (7.25-13.9)
20-day	3.65 (3.25-4.18)	4.20 (3.74-4.83)	5.14 (4.55-5.91)	5.94 (5.23-6.86)	7.07 (6.01-8.47)	7.97 (6.60-9.69)	8.89 (7.09-11.1)	9.85 (7.50-12.6)	11.2 (8.14-14.8)	12.2 (8.63-16.3)
30-day	4.36 (3.90-4.98)	5.04 (4.50-5.76)	6.14 (5.46-7.03)	7.05 (6.24-8.12)	8.32 (7.09-9.89)	9.31 (7.73-11.2)	10.3 (8.23-12.8)	11.3 (8.63-14.4)	12.6 (9.26-16.6)	13.7 (9.73-18.3)
45-day	5.29 (4.75-6.01)	6.10 (5.48-6.94)	7.41 (6.62-8.46)	8.47 (7.53-9.72)	9.91 (8.45-11.7)	11.0 (9.15-13.2)	12.1 (9.67-14.8)	13.1 (10.0-16.6)	14.5 (10.6-18.9)	15.5 (11.1-20.6)
60-day	6.09 (5.49-6.90)	7.02 (6.32-7.97)	8.50 (7.62-9.67)	9.68 (8.63-11.1)	11.2 (9.62-13.2)	12.4 (10.4-14.8)	13.5 (10.9-16.5)	14.6 (11.2-18.4)	16.0 (11.8-20.7)	17.0 (12.2-22.5)

¹ Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS). Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values. Please refer to NOAA Atlas 14 document for more information.

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PF graphical

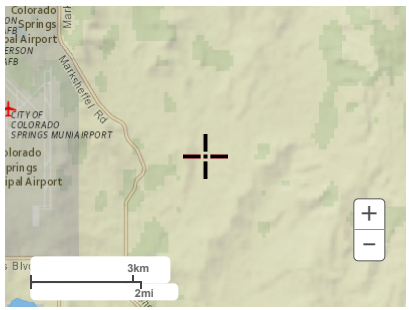
PDS-based depth-duration-frequency (DDF) curves
 Latitude: 38.7931°, Longitude: -104.6322°



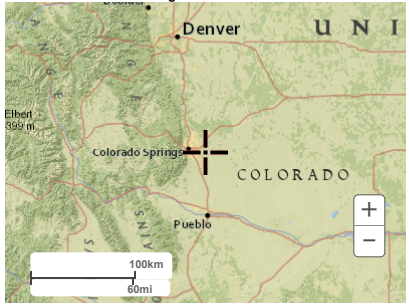
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Maps & aerials

Small scale terrain



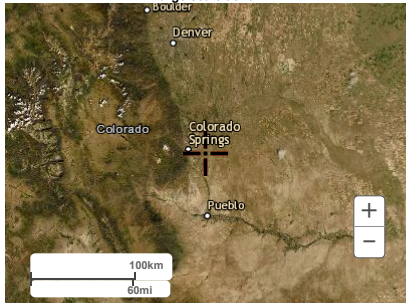
Large scale terrain



Large scale map



Large scale aerial



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NOAA Atlas 14, Volume 8, Version 2
 Location name: Fountain, Colorado, USA*
 Latitude: 38.714°, Longitude: -104.6741°
 Elevation: 5677.11 ft**
*source: ESRI Maps
 **source: USGS



POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Deborah Martin, Sandra Pavlovic, Ishani Roy, Michael St. Laurent, Carl Trypaak, Dale Urruh, Michael Yekta, Geoffrey Bonnin

NOAA, National Weather Service, Silver Spring, Maryland

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PF tabular

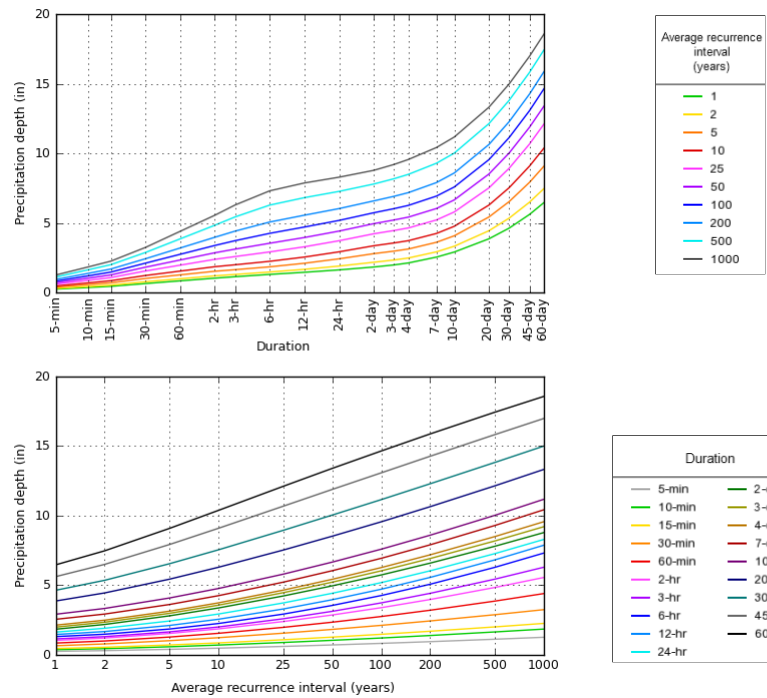
Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.256 (0.209-0.318)	0.307 (0.251-0.382)	0.399 (0.325-0.498)	0.483 (0.390-0.605)	0.609 (0.478-0.805)	0.715 (0.545-0.956)	0.828 (0.607-1.14)	0.951 (0.664-1.34)	1.13 (0.752-1.64)	1.27 (0.818-1.86)
10-min	0.374 (0.306-0.466)	0.450 (0.367-0.560)	0.584 (0.475-0.729)	0.707 (0.571-0.886)	0.892 (0.700-1.18)	1.05 (0.798-1.40)	1.21 (0.888-1.67)	1.39 (0.973-1.97)	1.65 (1.10-2.40)	1.86 (1.20-2.72)
15-min	0.457 (0.373-0.568)	0.548 (0.448-0.682)	0.713 (0.580-0.889)	0.862 (0.697-1.08)	1.09 (0.854-1.44)	1.28 (0.973-1.71)	1.48 (1.08-2.03)	1.70 (1.19-2.40)	2.01 (1.34-2.92)	2.26 (1.46-3.32)
30-min	0.657 (0.537-0.817)	0.788 (0.643-0.980)	1.02 (0.832-1.28)	1.24 (0.999-1.55)	1.56 (1.22-2.06)	1.83 (1.40-2.45)	2.12 (1.55-2.91)	2.44 (1.70-3.45)	2.89 (1.93-4.20)	3.25 (2.10-4.77)
60-min	0.851 (0.696-1.06)	0.999 (0.816-1.24)	1.28 (1.04-1.60)	1.55 (1.25-1.95)	1.98 (1.56-2.64)	2.35 (1.80-3.16)	2.76 (2.03-3.81)	3.21 (2.25-4.56)	3.86 (2.59-5.64)	4.41 (2.85-6.46)
2-hr	1.04 (0.859-1.29)	1.21 (0.995-1.50)	1.54 (1.26-1.91)	1.87 (1.52-2.33)	2.40 (1.91-3.19)	2.87 (2.21-3.85)	3.39 (2.52-4.67)	3.98 (2.82-5.63)	4.84 (3.28-7.04)	5.56 (3.62-8.11)
3-hr	1.15 (0.948-1.41)	1.31 (1.08-1.62)	1.65 (1.36-2.04)	2.01 (1.64-2.49)	2.59 (2.09-3.47)	3.13 (2.43-4.20)	3.73 (2.79-5.14)	4.42 (3.15-6.25)	5.44 (3.71-7.90)	6.30 (4.13-9.15)
6-hr	1.31 (1.09-1.61)	1.49 (1.23-1.82)	1.86 (1.54-2.28)	2.25 (1.85-2.78)	2.93 (2.38-3.90)	3.55 (2.79-4.75)	4.26 (3.21-5.85)	5.07 (3.65-7.15)	6.29 (4.33-9.09)	7.31 (4.84-10.6)
12-hr	1.47 (1.23-1.78)	1.68 (1.40-2.04)	2.11 (1.76-2.58)	2.56 (2.12-3.14)	3.30 (2.69-4.34)	3.96 (3.12-5.25)	4.71 (3.57-6.40)	5.56 (4.03-7.76)	6.82 (4.73-9.77)	7.88 (5.26-11.3)
24-hr	1.64 (1.38-1.98)	1.91 (1.61-2.31)	2.43 (2.04-2.95)	2.94 (2.44-3.57)	3.73 (3.04-4.83)	4.42 (3.50-5.78)	5.19 (3.95-6.96)	6.04 (4.39-8.32)	7.27 (5.07-10.3)	8.29 (5.59-11.8)
2-day	1.84 (1.56-2.21)	2.19 (1.85-2.62)	2.80 (2.36-3.37)	3.37 (2.82-4.08)	4.23 (3.46-5.40)	4.96 (3.94-6.40)	5.74 (4.39-7.60)	6.59 (4.82-8.98)	7.80 (5.48-10.9)	8.78 (5.97-12.4)
3-day	1.99 (1.69-2.38)	2.35 (1.99-2.81)	2.99 (2.52-3.58)	3.57 (3.00-4.30)	4.47 (3.66-5.67)	5.22 (4.16-6.71)	6.03 (4.64-7.96)	6.92 (5.09-9.39)	8.18 (5.78-11.4)	9.21 (6.30-13.0)
4-day	2.14 (1.82-2.55)	2.49 (2.12-2.97)	3.14 (2.66-3.75)	3.74 (3.15-4.49)	4.65 (3.83-5.89)	5.43 (4.34-6.96)	6.27 (4.84-8.25)	7.19 (5.31-9.73)	8.50 (6.02-11.8)	9.57 (6.57-13.4)
7-day	2.56 (2.19-3.03)	2.93 (2.51-3.48)	3.62 (3.08-4.30)	4.25 (3.60-5.08)	5.22 (4.32-6.57)	6.04 (4.86-7.70)	6.93 (5.38-9.07)	7.90 (5.88-10.6)	9.29 (6.64-12.9)	10.4 (7.21-14.6)
10-day	2.92 (2.51-3.44)	3.34 (2.86-3.94)	4.09 (3.49-4.84)	4.77 (4.05-5.68)	5.80 (4.81-7.25)	6.66 (5.38-8.43)	7.59 (5.91-9.87)	8.59 (6.42-11.5)	10.0 (7.19-13.8)	11.2 (7.77-15.6)
20-day	3.87 (3.34-4.54)	4.45 (3.84-5.22)	5.44 (4.68-6.40)	6.29 (5.38-7.44)	7.53 (6.25-9.27)	8.52 (6.90-10.6)	9.55 (7.48-12.3)	10.6 (7.99-14.1)	12.1 (8.76-16.6)	13.3 (9.35-18.4)
30-day	4.64 (4.02-5.42)	5.36 (4.64-6.26)	6.54 (5.65-7.67)	7.54 (6.48-8.89)	8.94 (7.43-10.9)	10.0 (8.15-12.4)	11.1 (8.75-14.2)	12.3 (9.25-16.1)	13.8 (10.0-18.7)	15.0 (10.6-20.7)
45-day	5.62 (4.89-6.53)	6.50 (5.65-7.56)	7.92 (6.87-9.25)	9.09 (7.84-10.7)	10.7 (8.88-12.9)	11.9 (9.67-14.6)	13.1 (10.3-16.5)	14.3 (10.8-18.6)	15.8 (11.5-21.3)	17.0 (12.1-23.3)
60-day	6.47 (5.64-7.50)	7.47 (6.52-8.67)	9.08 (7.89-10.6)	10.4 (8.97-12.1)	12.1 (10.1-14.6)	13.4 (10.9-16.4)	14.6 (11.5-18.4)	15.9 (12.0-20.6)	17.4 (12.7-23.3)	18.6 (13.2-25.4)

¹ Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS). Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values. Please refer to NOAA Atlas 14 document for more information.

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PF graphical

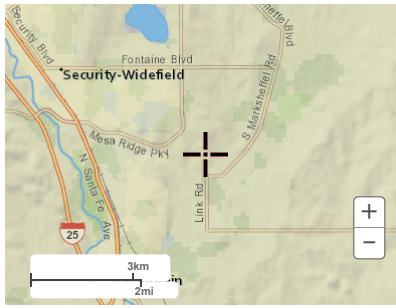
PDS-based depth-duration-frequency (DDF) curves
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Small scale terrain



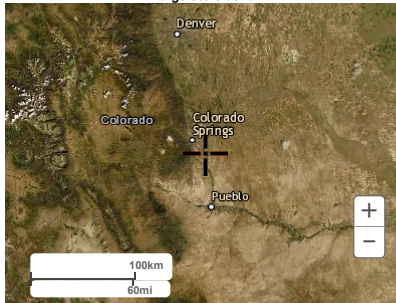
Large scale terrain



Large scale map



Large scale aerial



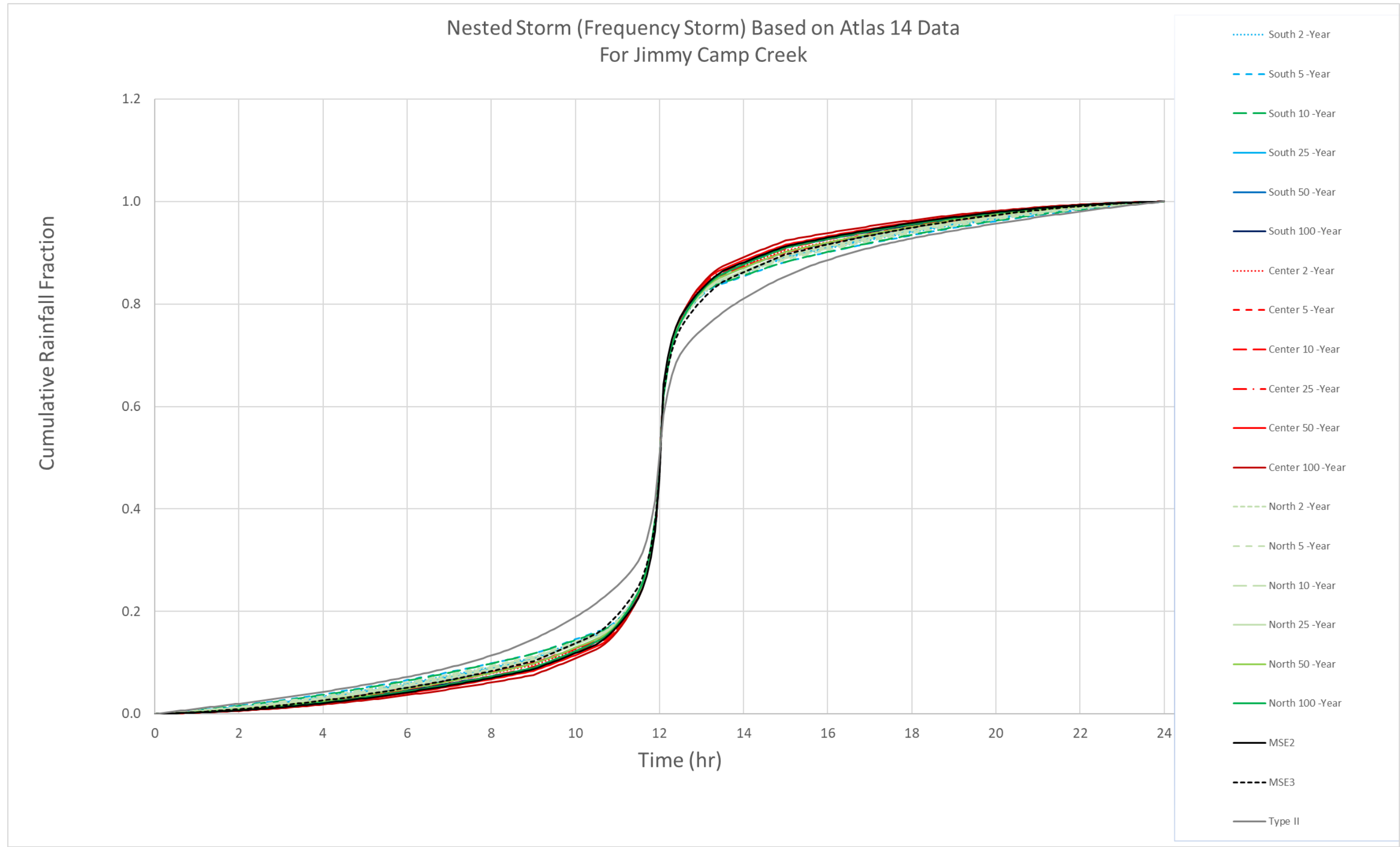
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Appendix B

Jimmy Camp Creek Temporal Distributions



Appendix Figure B-1. Normalized Temporal Distribution Based on NRCS NEH Part 630 Hydrology Chapter 4- Cumulative Rainfall Depths for All Data Sets

Appendix Table B-1. Normalized Temporal Distribution Based on NRCS NEH Part 630 Hydrology Chapter 4- Cumulative Rainfall Depths for All Data Sets

Time (hours)	Cumulative Rainfall Fraction																		
	South 2 - Year	South 5 - Year	South 10 -Year	South 25 - Year	South 50 - Year	South 100 - Year	Center 2 - Year	Center 5 - Year	Center 10 -Year	Center 25 - Year	Center 50 -Year	Center 100 - Year	North 2 -Year	North 5 - Year	North 10 - Year	North 25 - Year	North 50 - Year	North 100 - Year	
0	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
0.1	0.00057	0.00069	0.00063	0.00051	0.00042	0.00033	0.00040	0.00029	0.00024	0.00016	0.00016	0.00015	0.00050	0.00058	0.00044	0.00037	0.00028	0.00021	0.00021
0.2	0.00116	0.00140	0.00128	0.00103	0.00086	0.00067	0.00082	0.00059	0.00050	0.00034	0.00033	0.00031	0.00101	0.00117	0.00091	0.00075	0.00058	0.00044	0.00044
0.3	0.00177	0.00212	0.00194	0.00157	0.00131	0.00103	0.00126	0.00092	0.00078	0.00054	0.00052	0.00048	0.00155	0.00178	0.00139	0.00116	0.00090	0.00068	0.00068
0.4	0.00239	0.00285	0.00262	0.00212	0.00178	0.00140	0.00170	0.00126	0.00108	0.00076	0.00073	0.00067	0.00209	0.00240	0.00189	0.00158	0.00124	0.00095	0.00095
0.5	0.00302	0.00360	0.00331	0.00269	0.00226	0.00179	0.00217	0.00162	0.00139	0.00100	0.00096	0.00088	0.00265	0.00304	0.00240	0.00202	0.00159	0.00123	0.00123
0.6	0.00366	0.00436	0.00401	0.00327	0.00276	0.00220	0.00265	0.00200	0.00173	0.00126	0.00120	0.00111	0.00323	0.00369	0.00294	0.00248	0.00196	0.00153	0.00153
0.7	0.00433	0.00514	0.00474	0.00387	0.00327	0.00262	0.00314	0.00240	0.00209	0.00153	0.00146	0.00135	0.00382	0.00436	0.00349	0.00296	0.00235	0.00184	0.00184
0.8	0.00500	0.00593	0.00547	0.00448	0.00380	0.00305	0.00364	0.00281	0.00246	0.00183	0.00174	0.00160	0.00443	0.00504	0.00406	0.00345	0.00276	0.00218	0.00218
0.9	0.00569	0.00673	0.00622	0.00511	0.00434	0.00350	0.00417	0.00325	0.00285	0.00214	0.00204	0.00187	0.00505	0.00574	0.00464	0.00396	0.00319	0.00253	0.00253
1	0.00640	0.00754	0.00699	0.00576	0.00490	0.00396	0.00470	0.00370	0.00327	0.00248	0.00235	0.00216	0.00569	0.00645	0.00525	0.00449	0.00364	0.00290	0.00290
1.1	0.00712	0.00837	0.00777	0.00642	0.00548	0.00444	0.00525	0.00418	0.00370	0.00283	0.00268	0.00246	0.00634	0.00718	0.00587	0.00504	0.00410	0.00329	0.00329
1.2	0.00785	0.00922	0.00857	0.00710	0.00606	0.00493	0.00582	0.00467	0.00415	0.00321	0.00303	0.00278	0.00701	0.00792	0.00651	0.00561	0.00458	0.00369	0.00369
1.3	0.00860	0.01008	0.00938	0.00779	0.00667	0.00544	0.00640	0.00518	0.00462	0.00360	0.00340	0.00311	0.00770	0.00868	0.00716	0.00619	0.00508	0.00412	0.00412
1.4	0.00937	0.01095	0.01021	0.00849	0.00729	0.00596	0.00700	0.00570	0.00511	0.00401	0.00378	0.00346	0.00840	0.00946	0.00784	0.00679	0.00560	0.00456	0.00456
1.5	0.01014	0.01183	0.01105	0.00922	0.00792	0.00650	0.00761	0.00625	0.00562	0.00444	0.00419	0.00383	0.00911	0.01025	0.00853	0.00741	0.00614	0.00501	0.00501
1.6	0.01094	0.01273	0.01191	0.00995	0.00857	0.00706	0.00823	0.00681	0.00615	0.00489	0.00461	0.00421	0.00985	0.01105	0.00924	0.00805	0.00669	0.00549	0.00549
1.7	0.01174	0.01364	0.01279	0.01071	0.00923	0.00762	0.00887	0.00740	0.00670	0.00536	0.00504	0.00461	0.01059	0.01187	0.00997	0.00871	0.00726	0.00599	0.00599
1.8	0.01257	0.01457	0.01367	0.01147	0.00991	0.00821	0.00952	0.00800	0.00727	0.00585	0.00550	0.00502	0.01135	0.01270	0.01072	0.00938	0.00785	0.00650	0.00650
1.9	0.01340	0.01551	0.01458	0.01226	0.01060	0.00881	0.01019	0.00862	0.00785	0.00635	0.00597	0.00545	0.01213	0.01355	0.01148	0.01007	0.00846	0.00703	0.00703
2	0.01425	0.01646	0.01550	0.01306	0.01131	0.00942	0.01088	0.00926	0.00846	0.00688	0.00646	0.00589	0.01292	0.01442	0.01226	0.01078	0.00909	0.00757	0.00757
2.1	0.01512	0.01743	0.01643	0.01387	0.01204	0.01005	0.01157	0.00992	0.00908	0.00743	0.00696	0.00635	0.01373	0.01530	0.01306	0.01151	0.00974	0.00814	0.00814
2.2	0.01600	0.01841	0.01738	0.01470	0.01278	0.01069	0.01229	0.01059	0.00973	0.00799	0.00749	0.00683	0.01456	0.01620	0.01388	0.01226	0.01040	0.00872	0.00872
2.3	0.01689	0.01940	0.01834	0.01555	0.01353	0.01135	0.01301	0.01129	0.01039	0.00858	0.00803	0.00732	0.01540	0.01711	0.01471	0.01302	0.01108	0.00932	0.00932
2.4	0.01780	0.02041	0.01932	0.01641	0.01430	0.01202	0.01376	0.01200	0.01107	0.00918	0.00859	0.00783	0.01625	0.01803	0.01556	0.01380	0.01178	0.00994	0.00994
2.5	0.01872	0.02143	0.02031	0.01728	0.01508	0.01271	0.01451	0.01273	0.01177	0.00980	0.00917	0.00835	0.01712	0.01897	0.01643	0.01460	0.01250	0.01058	0.01058
2.6	0.01966	0.02247	0.02132	0.01817	0.01588	0.01341	0.01529	0.01348	0.01250	0.01045	0.00976	0.00889	0.01801	0.01993	0.01732	0.01542	0.01324	0.01123	0.01123
2.7	0.02062	0.02352	0.02235	0.01908	0.01670	0.01413	0.01607	0.01425	0.01324	0.01111	0.01038	0.00944	0.01891	0.02090	0.01823	0.01625	0.01399	0.01190	0.01190
2.8	0.02158	0.02458	0.02339	0.02000	0.01753	0.01487	0.01687	0.01504	0.01399	0.01179	0.01101	0.01001	0.01982	0.02189	0.01915	0.01711	0.01476	0.01259	0.01259
2.9	0.02256	0.02566	0.02444	0.02094	0.01837	0.01561	0.01769	0.01584	0.01477	0.01249	0.01165	0.01060	0.02075	0.02289	0.02009	0.01798	0.01555	0.01330	0.01330
3	0.02356	0.02675	0.02551	0.02189	0.01923	0.01638	0.01852	0.01667	0.01557	0.01321	0.01232	0.01120	0.02170	0.02391	0.02105	0.01887	0.01636	0.01402	0.01402
3.1	0.02457	0.02785	0.02659	0.02286	0.02011	0.01716	0.01936	0.01751	0.01639	0.01394	0.01300	0.01182	0.02266	0.02494	0.02202	0.01978	0.01719	0.01477	0.01477
3.2	0.02560	0.02897	0.02769	0.02385	0.02100	0.01795	0.02022	0.01837	0.01722	0.01470	0.01370	0.01245	0.02364	0.02599	0.02302	0.02070	0.01803	0.01553	0.01553
3.3	0.02664	0.03010	0.02881	0.02485	0.02190	0.01876	0.02110	0.01925	0.01808	0.01548	0.01442	0.01310	0.02464	0.02705	0.02403	0.02164	0.01890	0.01631	0.01631
3.4	0.02769	0.03125	0.02994	0.02586	0.02282	0.01958	0.02199	0.02015	0.01895	0.01627	0.01515	0.01376	0.02564	0.02813	0.02506	0.02261	0.01978	0.01710	0.01710
3.5	0.02876	0.03241	0.03108	0.02689	0.02376	0.02042	0.02289	0.02106	0.01985	0.01709	0.01590	0.01444	0.02667	0.02922	0.02610	0.02358	0.02068	0.01792	0.01792
3.6	0.02984	0.03358	0.03224	0.02794	0.02471	0.02127	0.02381	0.02200	0.02076	0.01792	0.01667	0.01514	0.02771	0.03033	0.02717	0.02458	0.02160	0.01875	0.01875

Time (hours)	Cumulative Rainfall Fraction																	
	South 2 - Year	South 5 - Year	South 10 -Year	South 25 - Year	South 50 - Year	South 100 - Year	Center 2 - Year	Center 5 - Year	Center 10 -Year	Center 25 - Year	Center 50 -Year	Center 100 - Year	North 2 -Year	North 5 - Year	North 10 - Year	North 25 - Year	North 50 - Year	North 100 - Year
3.7	0.03094	0.03477	0.03342	0.02900	0.02567	0.02214	0.02474	0.02295	0.02169	0.01878	0.01746	0.01585	0.02876	0.03145	0.02825	0.02560	0.02253	0.01960
3.8	0.03205	0.03597	0.03461	0.03007	0.02665	0.02302	0.02569	0.02393	0.02265	0.01965	0.01827	0.01658	0.02983	0.03259	0.02935	0.02663	0.02349	0.02046
3.9	0.03318	0.03718	0.03582	0.03116	0.02765	0.02392	0.02665	0.02492	0.02362	0.02054	0.01909	0.01732	0.03092	0.03374	0.03047	0.02768	0.02446	0.02135
4	0.03432	0.03841	0.03704	0.03227	0.02866	0.02483	0.02763	0.02593	0.02461	0.02145	0.01993	0.01808	0.03202	0.03491	0.03160	0.02875	0.02545	0.02225
4.1	0.03548	0.03965	0.03827	0.03339	0.02968	0.02576	0.02862	0.02695	0.02562	0.02238	0.02079	0.01885	0.03314	0.03610	0.03275	0.02984	0.02646	0.02317
4.2	0.03665	0.04091	0.03952	0.03453	0.03072	0.02671	0.02963	0.02800	0.02664	0.02333	0.02166	0.01964	0.03427	0.03730	0.03392	0.03094	0.02749	0.02411
4.3	0.03783	0.04217	0.04079	0.03568	0.03178	0.02766	0.03065	0.02906	0.02769	0.02430	0.02256	0.02045	0.03542	0.03851	0.03511	0.03207	0.02853	0.02507
4.4	0.03903	0.04346	0.04207	0.03685	0.03285	0.02864	0.03169	0.03015	0.02876	0.02529	0.02347	0.02127	0.03658	0.03974	0.03632	0.03321	0.02960	0.02604
4.5	0.04025	0.04475	0.04337	0.03804	0.03394	0.02962	0.03274	0.03125	0.02984	0.02630	0.02439	0.02211	0.03776	0.04098	0.03754	0.03437	0.03068	0.02703
4.6	0.04148	0.04606	0.04468	0.03924	0.03504	0.03063	0.03380	0.03237	0.03095	0.02732	0.02534	0.02296	0.03895	0.04224	0.03878	0.03554	0.03178	0.02804
4.7	0.04272	0.04739	0.04601	0.04045	0.03615	0.03165	0.03488	0.03351	0.03207	0.02837	0.02630	0.02383	0.04016	0.04352	0.04004	0.03674	0.03290	0.02907
4.8	0.04398	0.04872	0.04735	0.04168	0.03729	0.03268	0.03598	0.03467	0.03322	0.02944	0.02728	0.02472	0.04139	0.04481	0.04132	0.03795	0.03403	0.03011
4.9	0.04525	0.05008	0.04870	0.04293	0.03843	0.03373	0.03709	0.03584	0.03438	0.03052	0.02828	0.02562	0.04263	0.04611	0.04261	0.03918	0.03519	0.03117
5	0.04654	0.05144	0.05008	0.04419	0.03959	0.03479	0.03821	0.03704	0.03556	0.03162	0.02930	0.02653	0.04389	0.04743	0.04393	0.04043	0.03636	0.03225
5.1	0.04784	0.05282	0.05146	0.04546	0.04077	0.03587	0.03935	0.03825	0.03676	0.03275	0.03033	0.02747	0.04516	0.04877	0.04526	0.04170	0.03755	0.03335
5.2	0.04916	0.05421	0.05286	0.04675	0.04196	0.03696	0.04051	0.03948	0.03799	0.03389	0.03138	0.02841	0.04644	0.05012	0.04660	0.04298	0.03876	0.03447
5.3	0.05049	0.05562	0.05428	0.04806	0.04317	0.03807	0.04167	0.04073	0.03923	0.03505	0.03245	0.02938	0.04774	0.05149	0.04797	0.04429	0.03999	0.03560
5.4	0.05183	0.05704	0.05571	0.04938	0.04439	0.03919	0.04286	0.04200	0.04048	0.03623	0.03353	0.03036	0.04906	0.05287	0.04935	0.04561	0.04123	0.03675
5.5	0.05319	0.05847	0.05716	0.05072	0.04563	0.04033	0.04405	0.04329	0.04176	0.03743	0.03464	0.03135	0.05040	0.05427	0.05075	0.04695	0.04250	0.03792
5.6	0.05457	0.05992	0.05862	0.05207	0.04688	0.04148	0.04527	0.04459	0.04306	0.03865	0.03576	0.03236	0.05174	0.05568	0.05217	0.04830	0.04378	0.03911
5.7	0.05596	0.06138	0.06010	0.05344	0.04814	0.04265	0.04649	0.04592	0.04438	0.03989	0.03690	0.03339	0.05311	0.05710	0.05361	0.04968	0.04508	0.04031
5.8	0.05736	0.06285	0.06159	0.05483	0.04943	0.04383	0.04774	0.04726	0.04571	0.04114	0.03805	0.03443	0.05449	0.05855	0.05506	0.05107	0.04640	0.04153
5.9	0.05878	0.06434	0.06310	0.05623	0.05072	0.04503	0.04899	0.04862	0.04707	0.04242	0.03922	0.03549	0.05588	0.06000	0.05653	0.05248	0.04773	0.04277
6	0.06021	0.06584	0.06463	0.05764	0.05204	0.04624	0.05026	0.05000	0.04844	0.04372	0.04042	0.03656	0.05729	0.06148	0.05802	0.05391	0.04909	0.04403
6.1	0.06166	0.06736	0.06616	0.05907	0.05336	0.04747	0.05155	0.05140	0.04984	0.04503	0.04162	0.03765	0.05872	0.06296	0.05953	0.05535	0.05046	0.04531
6.2	0.06312	0.06889	0.06772	0.06052	0.05471	0.04871	0.05285	0.05281	0.05125	0.04637	0.04285	0.03876	0.06016	0.06447	0.06105	0.05682	0.05185	0.04660
6.3	0.06459	0.07043	0.06929	0.06198	0.05606	0.04997	0.05417	0.05425	0.05268	0.04772	0.04409	0.03988	0.06161	0.06598	0.06259	0.05830	0.05326	0.04791
6.4	0.06608	0.07199	0.07087	0.06345	0.05744	0.05124	0.05550	0.05570	0.05413	0.04909	0.04535	0.04101	0.06309	0.06752	0.06415	0.05980	0.05469	0.04924
6.5	0.06759	0.07356	0.07247	0.06495	0.05882	0.05253	0.05684	0.05718	0.05560	0.05048	0.04663	0.04217	0.06457	0.06906	0.06573	0.06132	0.05613	0.05059
6.6	0.06911	0.07514	0.07408	0.06645	0.06023	0.05383	0.05820	0.05867	0.05709	0.05189	0.04793	0.04333	0.06608	0.07063	0.06733	0.06286	0.05760	0.05195
6.7	0.07064	0.07674	0.07571	0.06797	0.06164	0.05515	0.05958	0.06018	0.05860	0.05332	0.04924	0.04452	0.06759	0.07221	0.06894	0.06441	0.05908	0.05333
6.8	0.07219	0.07835	0.07735	0.06951	0.06308	0.05648	0.06096	0.06170	0.06013	0.05477	0.05057	0.04572	0.06913	0.07380	0.07057	0.06598	0.06058	0.05473
6.9	0.07376	0.07998	0.07901	0.07107	0.06452	0.05783	0.06237	0.06325	0.06168	0.05624	0.05192	0.04693	0.07068	0.07541	0.07222	0.06757	0.06209	0.05615
7	0.07533	0.08162	0.08069	0.07263	0.06599	0.05920	0.06379	0.06481	0.06324	0.05773	0.05329	0.04816	0.07224	0.07703	0.07388	0.06918	0.06363	0.05758
7.1	0.07693	0.08327	0.08238	0.07422	0.06747	0.06057	0.06522	0.06640	0.06483	0.05924	0.05467	0.04941	0.07382	0.07867	0.07557	0.07081	0.06519	0.05904
7.2	0.07853	0.08494	0.08408	0.07582	0.06896	0.06197	0.06667	0.06800	0.06644	0.06077	0.05607	0.05067	0.07542	0.08033	0.07727	0.07245	0.06676	0.06051
7.3	0.08016	0.08662	0.08580	0.07743	0.07047	0.06337	0.06813	0.06962	0.06806	0.06231	0.05749	0.05195	0.07703	0.08200	0.07899	0.07412	0.06835	0.06200
7.4	0.08179	0.08831	0.08754	0.07906	0.07199	0.06480	0.06961	0.07126	0.06970	0.06388	0.05893	0.05324	0.07865	0.08368	0.08073	0.07580	0.06996	0.06350

Time (hours)	Cumulative Rainfall Fraction																	
	South 2 - Year	South 5 - Year	South 10 -Year	South 25 - Year	South 50 - Year	South 100 - Year	Center 2 - Year	Center 5 - Year	Center 10 -Year	Center 25 - Year	Center 50 -Year	Center 100 - Year	North 2 -Year	North 5 - Year	North 10 - Year	North 25 - Year	North 50 - Year	North 100 - Year
7.5	0.08344	0.09002	0.08929	0.08071	0.07353	0.06623	0.07110	0.07292	0.07137	0.06546	0.06038	0.05455	0.08030	0.08538	0.08248	0.07749	0.07158	0.06503
7.6	0.08511	0.09174	0.09105	0.08237	0.07508	0.06769	0.07260	0.07459	0.07305	0.06706	0.06185	0.05588	0.08195	0.08710	0.08425	0.07921	0.07323	0.06657
7.7	0.08679	0.09348	0.09283	0.08405	0.07665	0.06915	0.07413	0.07629	0.07475	0.06869	0.06334	0.05722	0.08362	0.08883	0.08604	0.08094	0.07489	0.06813
7.8	0.08848	0.09523	0.09463	0.08574	0.07824	0.07064	0.07566	0.07800	0.07647	0.07033	0.06485	0.05858	0.08531	0.09057	0.08785	0.08270	0.07658	0.06971
7.9	0.09019	0.09699	0.09644	0.08744	0.07983	0.07213	0.07721	0.07973	0.07821	0.07199	0.06637	0.05995	0.08702	0.09233	0.08968	0.08447	0.07828	0.07130
8	0.09191	0.09877	0.09826	0.08917	0.08145	0.07365	0.07878	0.08148	0.07997	0.07367	0.06792	0.06134	0.08873	0.09411	0.09152	0.08625	0.07999	0.07291
8.1	0.09365	0.10056	0.10010	0.09090	0.08308	0.07517	0.08036	0.08325	0.08175	0.07537	0.06947	0.06274	0.09047	0.09590	0.09338	0.08806	0.08173	0.07455
8.2	0.09540	0.10236	0.10196	0.09266	0.08472	0.07672	0.08195	0.08504	0.08354	0.07709	0.07105	0.06416	0.09222	0.09771	0.09526	0.08988	0.08348	0.07619
8.3	0.09717	0.10418	0.10383	0.09443	0.08638	0.07827	0.08356	0.08684	0.08536	0.07883	0.07265	0.06560	0.09398	0.09953	0.09715	0.09173	0.08526	0.07786
8.4	0.09895	0.10601	0.10571	0.09621	0.08805	0.07985	0.08519	0.08867	0.08720	0.08058	0.07426	0.06705	0.09576	0.10137	0.09907	0.09358	0.08705	0.07954
8.5	0.10075	0.10785	0.10762	0.09801	0.08974	0.08143	0.08682	0.09051	0.08905	0.08236	0.07589	0.06852	0.09756	0.10322	0.10100	0.09546	0.08886	0.08125
8.6	0.10256	0.10971	0.10953	0.09983	0.09145	0.08304	0.08848	0.09237	0.09093	0.08416	0.07753	0.07000	0.09937	0.10509	0.10295	0.09736	0.09068	0.08296
8.7	0.10438	0.11158	0.11146	0.10166	0.09317	0.08465	0.09015	0.09425	0.09282	0.08597	0.07920	0.07150	0.10120	0.10697	0.10491	0.09927	0.09253	0.08470
8.8	0.10622	0.11347	0.11341	0.10350	0.09490	0.08629	0.09183	0.09615	0.09473	0.08780	0.08088	0.07301	0.10304	0.10886	0.10690	0.10120	0.09439	0.08646
8.9	0.10808	0.11537	0.11537	0.10536	0.09665	0.08793	0.09353	0.09806	0.09666	0.08966	0.08258	0.07454	0.10490	0.11078	0.10890	0.10315	0.09627	0.08823
9	0.10995	0.11728	0.11735	0.10724	0.09842	0.08960	0.09524	0.10000	0.09862	0.09153	0.08430	0.07609	0.10677	0.11270	0.11092	0.10512	0.09817	0.09002
9.1	0.11283	0.11995	0.11988	0.11003	0.10131	0.09268	0.09798	0.10268	0.10126	0.09427	0.08716	0.07911	0.10964	0.11536	0.11355	0.10792	0.10109	0.09309
9.2	0.11576	0.12265	0.12244	0.11286	0.10424	0.09581	0.10075	0.10539	0.10394	0.09705	0.09006	0.08218	0.11254	0.11804	0.11621	0.11076	0.10404	0.09621
9.3	0.11871	0.12539	0.12502	0.11572	0.10721	0.09898	0.10357	0.10813	0.10665	0.09986	0.09300	0.08530	0.11548	0.12076	0.11890	0.11364	0.10704	0.09938
9.4	0.12171	0.12815	0.12764	0.11862	0.11022	0.10220	0.10642	0.11091	0.10940	0.10272	0.09599	0.08847	0.11846	0.12350	0.12162	0.11655	0.11008	0.10259
9.5	0.12474	0.13094	0.13028	0.12155	0.11327	0.10547	0.10931	0.11372	0.11218	0.10561	0.09902	0.09169	0.12147	0.12628	0.12437	0.11950	0.11315	0.10584
9.6	0.12781	0.13376	0.13294	0.12452	0.11635	0.10878	0.11223	0.11657	0.11500	0.10854	0.10209	0.09495	0.12452	0.12909	0.12716	0.12248	0.11627	0.10914
9.7	0.13091	0.13661	0.13564	0.12752	0.11948	0.11214	0.11519	0.11945	0.11785	0.11151	0.10521	0.09826	0.12761	0.13192	0.12997	0.12550	0.11942	0.11249
9.8	0.13405	0.13949	0.13836	0.13056	0.12265	0.11554	0.11819	0.12237	0.12073	0.11451	0.10836	0.10162	0.13074	0.13479	0.13282	0.12855	0.12262	0.11588
9.9	0.13723	0.14240	0.14111	0.13363	0.12586	0.11899	0.12122	0.12532	0.12365	0.11756	0.11156	0.10503	0.13390	0.13769	0.13569	0.13164	0.12586	0.11932
10	0.14045	0.14534	0.14388	0.13674	0.12910	0.12249	0.12430	0.12831	0.12660	0.12064	0.11480	0.10849	0.13710	0.14062	0.13860	0.13477	0.12913	0.12280
10.1	0.14370	0.14831	0.14669	0.13989	0.13239	0.12603	0.12741	0.13133	0.12959	0.12376	0.11808	0.11199	0.14033	0.14358	0.14153	0.13793	0.13245	0.12633
10.2	0.14699	0.15131	0.14951	0.14307	0.13571	0.12962	0.13055	0.13438	0.13261	0.12691	0.12141	0.11554	0.14361	0.14658	0.14450	0.14113	0.13581	0.12990
10.3	0.15031	0.15434	0.15237	0.14628	0.13908	0.13325	0.13373	0.13747	0.13566	0.13011	0.12478	0.11914	0.14692	0.14960	0.14750	0.14437	0.13920	0.13352
10.4	0.15367	0.15740	0.15525	0.14953	0.14248	0.13693	0.13695	0.14059	0.13875	0.13334	0.12819	0.12279	0.15026	0.15265	0.15052	0.14764	0.14264	0.13719
10.5	0.15707	0.16049	0.15816	0.15282	0.14593	0.14066	0.14021	0.14375	0.14187	0.13661	0.13164	0.12648	0.15365	0.15574	0.15358	0.15094	0.14612	0.14090
10.6	0.15998	0.16255	0.16048	0.15544	0.14946	0.14497	0.14349	0.14608	0.14381	0.13973	0.13529	0.13087	0.15704	0.15803	0.15625	0.15385	0.14959	0.14521
10.7	0.16405	0.16584	0.16401	0.15930	0.15416	0.15040	0.14804	0.14975	0.14720	0.14415	0.14023	0.13652	0.16160	0.16164	0.16014	0.15801	0.15429	0.15068
10.8	0.16929	0.17037	0.16878	0.16440	0.16005	0.15696	0.15386	0.15475	0.15204	0.14989	0.14647	0.14344	0.16733	0.16656	0.16526	0.16340	0.16023	0.15734
10.9	0.17569	0.17613	0.17476	0.17072	0.16710	0.16462	0.16095	0.16108	0.15834	0.15694	0.15400	0.15162	0.17423	0.17279	0.17160	0.17003	0.16740	0.16517
11	0.18325	0.18313	0.18197	0.17828	0.17534	0.17341	0.16931	0.16875	0.16609	0.16530	0.16282	0.16107	0.18229	0.18033	0.17918	0.17790	0.17580	0.17417
11.1	0.19197	0.19136	0.19041	0.18708	0.18475	0.18331	0.17894	0.17775	0.17529	0.17497	0.17293	0.17178	0.19152	0.18918	0.18799	0.18701	0.18543	0.18434
11.2	0.20185	0.20082	0.20007	0.19710	0.19534	0.19434	0.18984	0.18808	0.18595	0.18596	0.18434	0.18375	0.20192	0.19934	0.19802	0.19736	0.19630	0.19569

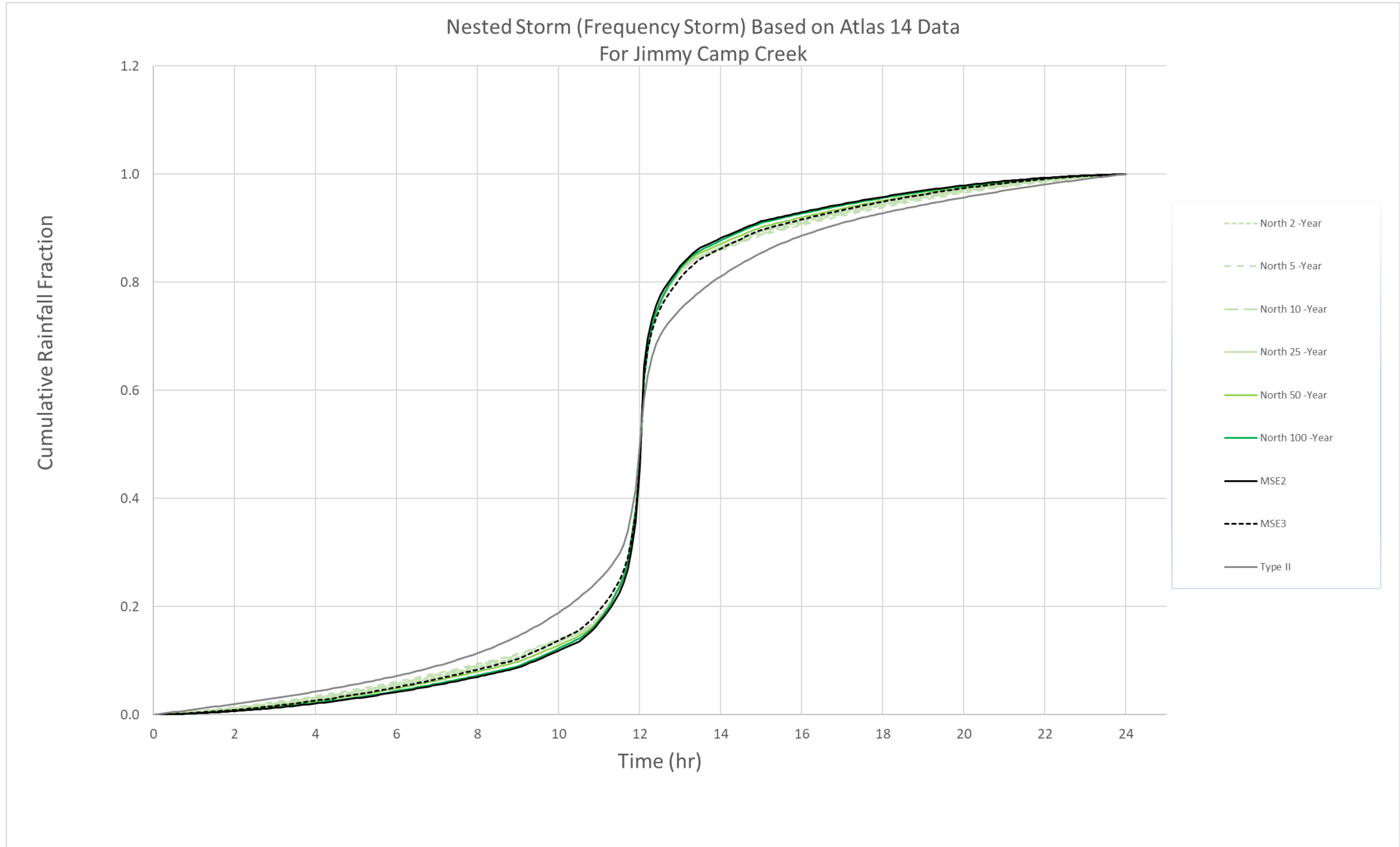
Time (hours)	Cumulative Rainfall Fraction																	
	South 2 - Year	South 5 - Year	South 10 -Year	South 25 - Year	South 50 - Year	South 100 - Year	Center 2 - Year	Center 5 - Year	Center 10 -Year	Center 25 - Year	Center 50 -Year	Center 100 - Year	North 2 -Year	North 5 - Year	North 10 - Year	North 25 - Year	North 50 - Year	North 100 - Year
11.3	0.21290	0.21152	0.21095	0.20836	0.20710	0.20647	0.20201	0.19975	0.19806	0.19825	0.19704	0.19700	0.21348	0.21082	0.20928	0.20895	0.20840	0.20822
11.4	0.22511	0.22346	0.22306	0.22086	0.22005	0.21973	0.21545	0.21275	0.21163	0.21186	0.21104	0.21150	0.22621	0.22361	0.22177	0.22178	0.22174	0.22192
11.5	0.23848	0.23663	0.23639	0.23458	0.23416	0.23410	0.23016	0.22708	0.22664	0.22678	0.22633	0.22727	0.24010	0.23770	0.23549	0.23585	0.23630	0.23679
11.6	0.25603	0.25372	0.25317	0.25230	0.25247	0.25316	0.24927	0.24578	0.24502	0.24549	0.24580	0.24693	0.25846	0.25494	0.25322	0.25391	0.25490	0.25587
11.7	0.28004	0.27693	0.27607	0.27685	0.27821	0.28019	0.27673	0.27226	0.27172	0.27257	0.27438	0.27631	0.28404	0.27914	0.27777	0.27926	0.28147	0.28345
11.8	0.31885	0.31539	0.31483	0.31609	0.31787	0.32042	0.32021	0.31558	0.31522	0.31612	0.31871	0.32075	0.32536	0.32041	0.31932	0.32075	0.32329	0.32564
11.9	0.37192	0.36921	0.36921	0.36980	0.37080	0.37301	0.37655	0.37307	0.37262	0.37340	0.37516	0.37647	0.37988	0.37646	0.37562	0.37638	0.37786	0.37964
11.9167	0.38220	0.37984	0.37976	0.38043	0.38122	0.38343	0.38651	0.38333	0.38287	0.38374	0.38510	0.38636	0.38958	0.38648	0.38567	0.38652	0.38779	0.38943
11.95833333	0.41963	0.41790	0.41786	0.41836	0.41912	0.42023	0.42249	0.42042	0.42007	0.42063	0.42148	0.42253	0.42448	0.42234	0.42184	0.42251	0.42340	0.42436
12.1	0.62808	0.63079	0.63079	0.63020	0.62920	0.62699	0.62345	0.62693	0.62738	0.62660	0.62484	0.62353	0.62012	0.62354	0.62438	0.62362	0.62214	0.62036
12.2	0.68115	0.68461	0.68517	0.68391	0.68213	0.67958	0.67979	0.68442	0.68478	0.68388	0.68129	0.67925	0.67464	0.67959	0.68068	0.67925	0.67671	0.67436
12.3	0.71996	0.72307	0.72393	0.72315	0.72179	0.71981	0.72327	0.72774	0.72828	0.72743	0.72562	0.72369	0.71596	0.72086	0.72223	0.72074	0.71853	0.71655
12.4	0.74397	0.74628	0.74683	0.74770	0.74753	0.74684	0.75073	0.75422	0.75498	0.75451	0.75420	0.75307	0.74154	0.74506	0.74678	0.74609	0.74510	0.74413
12.5	0.76152	0.76337	0.76361	0.76542	0.76584	0.76590	0.76984	0.77292	0.77336	0.77322	0.77367	0.77273	0.75990	0.76230	0.76451	0.76415	0.76370	0.76321
12.6	0.77489	0.77654	0.77694	0.77914	0.77995	0.78027	0.78455	0.78725	0.78837	0.78814	0.78896	0.78850	0.77379	0.77639	0.77823	0.77822	0.77826	0.77808
12.7	0.78710	0.78848	0.78905	0.79164	0.79290	0.79353	0.79799	0.80025	0.80194	0.80175	0.80296	0.80300	0.78652	0.78918	0.79072	0.79105	0.79160	0.79178
12.8	0.79815	0.79918	0.79993	0.80290	0.80466	0.80566	0.81016	0.81192	0.81405	0.81404	0.81566	0.81625	0.79808	0.80066	0.80198	0.80264	0.80370	0.80431
12.9	0.80803	0.80864	0.80959	0.81292	0.81525	0.81669	0.82106	0.82225	0.82471	0.82503	0.82707	0.82822	0.80848	0.81082	0.81201	0.81299	0.81457	0.81566
13	0.81675	0.81687	0.81803	0.82172	0.82466	0.82659	0.83069	0.83125	0.83391	0.83470	0.83718	0.83893	0.81771	0.81967	0.82082	0.82210	0.82420	0.82583
13.1	0.82431	0.82387	0.82524	0.82928	0.83290	0.83538	0.83905	0.83892	0.84166	0.84306	0.84600	0.84838	0.82577	0.82721	0.82840	0.82997	0.83260	0.83483
13.2	0.83071	0.82963	0.83122	0.83560	0.83995	0.84304	0.84614	0.84525	0.84796	0.85011	0.85353	0.85656	0.83267	0.83344	0.83474	0.83660	0.83977	0.84266
13.3	0.83595	0.83416	0.83599	0.84070	0.84584	0.84960	0.85196	0.85025	0.85280	0.85585	0.85977	0.86348	0.83840	0.83836	0.83986	0.84199	0.84571	0.84932
13.4	0.84002	0.83745	0.83952	0.84456	0.85054	0.85503	0.85651	0.85392	0.85619	0.86027	0.86471	0.86913	0.84296	0.84197	0.84375	0.84615	0.85041	0.85479
13.5	0.84293	0.83951	0.84184	0.84718	0.85407	0.85934	0.85979	0.85625	0.85813	0.86339	0.86836	0.87352	0.84635	0.84426	0.84642	0.84906	0.85388	0.85910
13.6	0.84633	0.84260	0.84475	0.85047	0.85752	0.86307	0.86305	0.85941	0.86125	0.86666	0.87181	0.87721	0.84974	0.84735	0.84948	0.85236	0.85736	0.86281
13.7	0.84969	0.84566	0.84763	0.85372	0.86092	0.86675	0.86627	0.86253	0.86434	0.86989	0.87522	0.88086	0.85308	0.85040	0.85250	0.85563	0.86080	0.86648
13.8	0.85301	0.84869	0.85049	0.85693	0.86429	0.87038	0.86945	0.86562	0.86739	0.87309	0.87859	0.88446	0.85639	0.85342	0.85550	0.85887	0.86419	0.87010
13.9	0.85630	0.85169	0.85331	0.86011	0.86761	0.87397	0.87259	0.86867	0.87041	0.87624	0.88192	0.88801	0.85967	0.85642	0.85847	0.86207	0.86755	0.87367
14	0.85955	0.85466	0.85612	0.86326	0.87090	0.87751	0.87570	0.87169	0.87340	0.87936	0.88520	0.89151	0.86290	0.85938	0.86140	0.86523	0.87087	0.87720
14.1	0.86277	0.85760	0.85889	0.86637	0.87414	0.88101	0.87878	0.87468	0.87635	0.88244	0.88844	0.89497	0.86610	0.86231	0.86431	0.86836	0.87414	0.88068
14.2	0.86595	0.86051	0.86164	0.86944	0.87735	0.88446	0.88181	0.87763	0.87927	0.88549	0.89164	0.89838	0.86926	0.86521	0.86718	0.87145	0.87738	0.88412
14.3	0.86909	0.86339	0.86436	0.87248	0.88052	0.88786	0.88481	0.88055	0.88215	0.88849	0.89479	0.90174	0.87239	0.86808	0.87003	0.87450	0.88058	0.88751
14.4	0.87219	0.86624	0.86706	0.87548	0.88365	0.89122	0.88777	0.88343	0.88500	0.89146	0.89791	0.90505	0.87548	0.87091	0.87284	0.87752	0.88373	0.89086
14.5	0.87526	0.86906	0.86972	0.87845	0.88673	0.89453	0.89069	0.88628	0.88782	0.89439	0.90098	0.90831	0.87853	0.87372	0.87563	0.88050	0.88685	0.89416
14.6	0.87829	0.87185	0.87236	0.88138	0.88978	0.89780	0.89358	0.88909	0.89060	0.89728	0.90401	0.91153	0.88154	0.87650	0.87838	0.88345	0.88992	0.89741
14.7	0.88129	0.87461	0.87498	0.88428	0.89279	0.90102	0.89643	0.89187	0.89335	0.90014	0.90700	0.91470	0.88452	0.87924	0.88110	0.88636	0.89296	0.90062
14.8	0.88424	0.87735	0.87756	0.88714	0.89576	0.90419	0.89925	0.89461	0.89606	0.90295	0.90994	0.91782	0.88746	0.88196	0.88379	0.88924	0.89596	0.90379
14.9	0.88717	0.88005	0.88012	0.88997	0.89869	0.90732	0.90202	0.89732	0.89874	0.90573	0.91284	0.92089	0.89036	0.88464	0.88645	0.89208	0.89891	0.90691

Time (hours)	Cumulative Rainfall Fraction																	
	South 2 - Year	South 5 - Year	South 10 -Year	South 25 - Year	South 50 - Year	South 100 - Year	Center 2 - Year	Center 5 - Year	Center 10 -Year	Center 25 - Year	Center 50 -Year	Center 100 - Year	North 2 -Year	North 5 - Year	North 10 - Year	North 25 - Year	North 50 - Year	North 100 - Year
15	0.89005	0.88272	0.88265	0.89276	0.90158	0.91040	0.90476	0.90000	0.90138	0.90847	0.91570	0.92391	0.89323	0.88730	0.88908	0.89488	0.90183	0.90998
15.1	0.89192	0.88463	0.88463	0.89464	0.90335	0.91207	0.90647	0.90194	0.90334	0.91034	0.91742	0.92546	0.89510	0.88922	0.89110	0.89685	0.90373	0.91177
15.2	0.89378	0.88653	0.88659	0.89650	0.90510	0.91371	0.90817	0.90385	0.90527	0.91220	0.91912	0.92699	0.89696	0.89114	0.89310	0.89880	0.90561	0.91354
15.3	0.89562	0.88842	0.88854	0.89834	0.90683	0.91535	0.90985	0.90575	0.90718	0.91403	0.92080	0.92850	0.89880	0.89303	0.89509	0.90073	0.90747	0.91530
15.4	0.89744	0.89029	0.89047	0.90017	0.90855	0.91696	0.91152	0.90763	0.90907	0.91584	0.92247	0.93000	0.90063	0.89491	0.89705	0.90264	0.90932	0.91704
15.5	0.89925	0.89215	0.89238	0.90199	0.91026	0.91857	0.91318	0.90949	0.91095	0.91764	0.92411	0.93148	0.90244	0.89678	0.89900	0.90454	0.91114	0.91875
15.6	0.90105	0.89399	0.89429	0.90379	0.91195	0.92015	0.91481	0.91133	0.91280	0.91942	0.92574	0.93295	0.90424	0.89863	0.90093	0.90642	0.91295	0.92046
15.7	0.90283	0.89582	0.89617	0.90557	0.91362	0.92173	0.91644	0.91316	0.91464	0.92117	0.92735	0.93440	0.90602	0.90047	0.90285	0.90827	0.91474	0.92214
15.8	0.90460	0.89764	0.89804	0.90734	0.91528	0.92328	0.91805	0.91496	0.91646	0.92291	0.92895	0.93584	0.90778	0.90229	0.90474	0.91012	0.91652	0.92381
15.9	0.90635	0.89944	0.89990	0.90910	0.91692	0.92483	0.91964	0.91675	0.91825	0.92463	0.93053	0.93726	0.90953	0.90410	0.90662	0.91194	0.91827	0.92545
16	0.90809	0.90123	0.90174	0.91083	0.91855	0.92635	0.92122	0.91852	0.92003	0.92633	0.93208	0.93866	0.91127	0.90589	0.90848	0.91375	0.92001	0.92709
16.1	0.90981	0.90301	0.90356	0.91256	0.92017	0.92787	0.92279	0.92027	0.92179	0.92801	0.93363	0.94005	0.91298	0.90767	0.91032	0.91553	0.92172	0.92870
16.2	0.91152	0.90477	0.90537	0.91426	0.92176	0.92936	0.92434	0.92200	0.92353	0.92967	0.93515	0.94142	0.91469	0.90943	0.91215	0.91730	0.92342	0.93029
16.3	0.91321	0.90652	0.90717	0.91595	0.92335	0.93085	0.92587	0.92371	0.92525	0.93131	0.93666	0.94278	0.91638	0.91117	0.91396	0.91906	0.92511	0.93187
16.4	0.91489	0.90826	0.90895	0.91763	0.92492	0.93231	0.92740	0.92541	0.92695	0.93294	0.93815	0.94412	0.91805	0.91290	0.91575	0.92079	0.92677	0.93343
16.5	0.91656	0.90998	0.91071	0.91929	0.92647	0.93377	0.92890	0.92708	0.92863	0.93454	0.93962	0.94545	0.91970	0.91462	0.91752	0.92251	0.92842	0.93497
16.6	0.91821	0.91169	0.91246	0.92094	0.92801	0.93520	0.93039	0.92874	0.93030	0.93612	0.94107	0.94676	0.92135	0.91632	0.91927	0.92420	0.93004	0.93650
16.7	0.91984	0.91338	0.91420	0.92257	0.92953	0.93663	0.93187	0.93038	0.93194	0.93769	0.94251	0.94805	0.92297	0.91800	0.92101	0.92588	0.93165	0.93800
16.8	0.92147	0.91506	0.91592	0.92418	0.93104	0.93803	0.93333	0.93200	0.93356	0.93923	0.94393	0.94933	0.92458	0.91967	0.92273	0.92755	0.93324	0.93949
16.9	0.92307	0.91673	0.91762	0.92578	0.93253	0.93943	0.93478	0.93360	0.93517	0.94076	0.94533	0.95059	0.92618	0.92133	0.92443	0.92919	0.93481	0.94096
17	0.92467	0.91838	0.91931	0.92737	0.93401	0.94080	0.93621	0.93519	0.93676	0.94227	0.94671	0.95184	0.92776	0.92297	0.92612	0.93082	0.93637	0.94242
17.1	0.92624	0.92002	0.92099	0.92893	0.93548	0.94217	0.93763	0.93675	0.93832	0.94376	0.94808	0.95307	0.92932	0.92459	0.92778	0.93243	0.93791	0.94385
17.2	0.92781	0.92165	0.92265	0.93049	0.93692	0.94352	0.93904	0.93830	0.93987	0.94523	0.94943	0.95428	0.93087	0.92620	0.92943	0.93402	0.93942	0.94527
17.3	0.92936	0.92326	0.92429	0.93203	0.93836	0.94485	0.94042	0.93982	0.94140	0.94668	0.95076	0.95548	0.93241	0.92779	0.93106	0.93559	0.94092	0.94667
17.4	0.93089	0.92486	0.92592	0.93355	0.93977	0.94617	0.94180	0.94133	0.94291	0.94811	0.95207	0.95667	0.93392	0.92937	0.93267	0.93714	0.94240	0.94805
17.5	0.93241	0.92644	0.92753	0.93505	0.94118	0.94747	0.94316	0.94282	0.94440	0.94952	0.95337	0.95783	0.93543	0.93094	0.93427	0.93868	0.94387	0.94941
17.6	0.93392	0.92801	0.92913	0.93655	0.94256	0.94876	0.94450	0.94430	0.94587	0.95091	0.95465	0.95899	0.93691	0.93248	0.93585	0.94020	0.94531	0.95076
17.7	0.93541	0.92957	0.93071	0.93802	0.94394	0.95003	0.94583	0.94575	0.94732	0.95228	0.95591	0.96012	0.93839	0.93402	0.93741	0.94170	0.94674	0.95209
17.8	0.93688	0.93111	0.93228	0.93948	0.94529	0.95129	0.94715	0.94719	0.94875	0.95363	0.95715	0.96124	0.93984	0.93553	0.93895	0.94318	0.94815	0.95340
17.9	0.93834	0.93264	0.93384	0.94093	0.94664	0.95253	0.94845	0.94860	0.95016	0.95497	0.95838	0.96235	0.94128	0.93704	0.94047	0.94465	0.94954	0.95469
18	0.93979	0.93416	0.93537	0.94236	0.94796	0.95376	0.94974	0.95000	0.95156	0.95628	0.95958	0.96344	0.94271	0.93852	0.94198	0.94609	0.95091	0.95597
18.1	0.94122	0.93566	0.93690	0.94377	0.94928	0.95497	0.95101	0.95138	0.95293	0.95758	0.96078	0.96451	0.94412	0.94000	0.94347	0.94752	0.95227	0.95723
18.2	0.94264	0.93715	0.93841	0.94517	0.95057	0.95617	0.95226	0.95274	0.95429	0.95886	0.96195	0.96557	0.94551	0.94145	0.94494	0.94893	0.95360	0.95847
18.3	0.94404	0.93862	0.93990	0.94656	0.95186	0.95735	0.95351	0.95408	0.95562	0.96011	0.96310	0.96661	0.94689	0.94290	0.94639	0.95032	0.95492	0.95969
18.4	0.94543	0.94008	0.94138	0.94793	0.95312	0.95852	0.95473	0.95541	0.95694	0.96135	0.96424	0.96764	0.94826	0.94432	0.94783	0.95170	0.95622	0.96089
18.5	0.94681	0.94153	0.94284	0.94928	0.95437	0.95967	0.95595	0.95671	0.95824	0.96257	0.96536	0.96865	0.94960	0.94573	0.94925	0.95305	0.95750	0.96208
18.6	0.94817	0.94296	0.94429	0.95062	0.95561	0.96081	0.95714	0.95800	0.95952	0.96377	0.96647	0.96964	0.95094	0.94713	0.95065	0.95439	0.95877	0.96325
18.7	0.94951	0.94438	0.94572	0.95194	0.95683	0.96193	0.95833	0.95927	0.96077	0.96495	0.96755	0.97062	0.95226	0.94851	0.95203	0.95571	0.96001	0.96440

Time (hours)	Cumulative Rainfall Fraction																	
	South 2 - Year	South 5 - Year	South 10 -Year	South 25 - Year	South 50 - Year	South 100 - Year	Center 2 - Year	Center 5 - Year	Center 10 -Year	Center 25 - Year	Center 50 -Year	Center 100 - Year	North 2 -Year	North 5 - Year	North 10 - Year	North 25 - Year	North 50 - Year	North 100 - Year
18.8	0.95084	0.94579	0.94714	0.95325	0.95804	0.96304	0.95949	0.96052	0.96201	0.96611	0.96862	0.97159	0.95356	0.94988	0.95340	0.95702	0.96124	0.96553
18.9	0.95216	0.94718	0.94854	0.95454	0.95923	0.96413	0.96065	0.96175	0.96324	0.96725	0.96967	0.97253	0.95484	0.95123	0.95474	0.95830	0.96245	0.96665
19	0.95346	0.94856	0.94992	0.95581	0.96041	0.96521	0.96179	0.96296	0.96444	0.96838	0.97070	0.97347	0.95611	0.95257	0.95607	0.95957	0.96364	0.96775
19.1	0.95475	0.94992	0.95130	0.95707	0.96157	0.96627	0.96291	0.96416	0.96562	0.96948	0.97172	0.97438	0.95737	0.95389	0.95739	0.96082	0.96481	0.96883
19.2	0.95602	0.95128	0.95265	0.95832	0.96271	0.96732	0.96402	0.96533	0.96678	0.97056	0.97272	0.97528	0.95861	0.95519	0.95868	0.96205	0.96597	0.96989
19.3	0.95728	0.95261	0.95399	0.95955	0.96385	0.96835	0.96512	0.96649	0.96793	0.97163	0.97370	0.97617	0.95984	0.95648	0.95996	0.96326	0.96710	0.97093
19.4	0.95852	0.95394	0.95532	0.96076	0.96496	0.96937	0.96620	0.96763	0.96905	0.97268	0.97466	0.97704	0.96105	0.95776	0.96122	0.96446	0.96822	0.97196
19.5	0.95975	0.95525	0.95663	0.96196	0.96606	0.97038	0.96726	0.96875	0.97016	0.97370	0.97561	0.97789	0.96224	0.95902	0.96246	0.96563	0.96932	0.97297
19.6	0.96097	0.95654	0.95793	0.96315	0.96715	0.97136	0.96831	0.96985	0.97124	0.97471	0.97653	0.97873	0.96342	0.96026	0.96368	0.96679	0.97040	0.97396
19.7	0.96217	0.95783	0.95921	0.96432	0.96822	0.97234	0.96935	0.97094	0.97231	0.97570	0.97744	0.97955	0.96458	0.96149	0.96489	0.96793	0.97147	0.97493
19.8	0.96335	0.95909	0.96048	0.96547	0.96928	0.97329	0.97037	0.97200	0.97336	0.97667	0.97834	0.98036	0.96573	0.96270	0.96608	0.96906	0.97251	0.97589
19.9	0.96452	0.96035	0.96173	0.96661	0.97032	0.97424	0.97138	0.97305	0.97438	0.97762	0.97921	0.98115	0.96686	0.96390	0.96725	0.97016	0.97354	0.97683
20	0.96568	0.96159	0.96296	0.96773	0.97134	0.97517	0.97237	0.97407	0.97539	0.97855	0.98007	0.98192	0.96798	0.96509	0.96840	0.97125	0.97455	0.97775
20.1	0.96682	0.96282	0.96418	0.96884	0.97235	0.97608	0.97335	0.97508	0.97638	0.97946	0.98091	0.98268	0.96908	0.96626	0.96953	0.97232	0.97554	0.97865
20.2	0.96795	0.96403	0.96539	0.96993	0.97335	0.97698	0.97431	0.97607	0.97735	0.98035	0.98173	0.98342	0.97017	0.96741	0.97065	0.97337	0.97651	0.97954
20.3	0.96906	0.96523	0.96658	0.97100	0.97433	0.97786	0.97526	0.97705	0.97831	0.98122	0.98254	0.98415	0.97124	0.96855	0.97175	0.97440	0.97747	0.98040
20.4	0.97016	0.96642	0.96776	0.97206	0.97529	0.97873	0.97619	0.97800	0.97924	0.98208	0.98333	0.98486	0.97229	0.96967	0.97283	0.97542	0.97840	0.98125
20.5	0.97124	0.96759	0.96892	0.97311	0.97624	0.97958	0.97711	0.97894	0.98015	0.98291	0.98410	0.98556	0.97333	0.97078	0.97390	0.97642	0.97932	0.98208
20.6	0.97231	0.96875	0.97006	0.97414	0.97718	0.98042	0.97801	0.97985	0.98105	0.98373	0.98485	0.98624	0.97436	0.97187	0.97494	0.97739	0.98022	0.98290
20.7	0.97336	0.96990	0.97119	0.97515	0.97810	0.98124	0.97890	0.98075	0.98192	0.98452	0.98558	0.98690	0.97536	0.97295	0.97597	0.97836	0.98110	0.98369
20.8	0.97440	0.97103	0.97231	0.97615	0.97900	0.98205	0.97978	0.98163	0.98278	0.98530	0.98630	0.98755	0.97636	0.97401	0.97698	0.97930	0.98197	0.98447
20.9	0.97543	0.97215	0.97341	0.97714	0.97989	0.98284	0.98064	0.98249	0.98361	0.98606	0.98700	0.98818	0.97734	0.97506	0.97798	0.98022	0.98281	0.98523
21	0.97644	0.97325	0.97449	0.97811	0.98077	0.98362	0.98148	0.98333	0.98443	0.98679	0.98768	0.98880	0.97830	0.97609	0.97895	0.98113	0.98364	0.98598
21.1	0.97744	0.97434	0.97556	0.97906	0.98163	0.98439	0.98231	0.98416	0.98523	0.98751	0.98835	0.98940	0.97925	0.97711	0.97991	0.98202	0.98445	0.98670
21.2	0.97842	0.97542	0.97661	0.98000	0.98247	0.98513	0.98313	0.98496	0.98601	0.98821	0.98899	0.98999	0.98018	0.97811	0.98085	0.98289	0.98524	0.98741
21.3	0.97938	0.97648	0.97765	0.98092	0.98330	0.98587	0.98393	0.98575	0.98676	0.98889	0.98962	0.99056	0.98109	0.97910	0.98177	0.98375	0.98601	0.98810
21.4	0.98034	0.97753	0.97868	0.98183	0.98412	0.98659	0.98471	0.98652	0.98750	0.98955	0.99024	0.99111	0.98199	0.98007	0.98268	0.98458	0.98676	0.98877
21.5	0.98128	0.97857	0.97969	0.98272	0.98492	0.98729	0.98549	0.98727	0.98823	0.99020	0.99083	0.99165	0.98288	0.98103	0.98357	0.98540	0.98750	0.98942
21.6	0.98220	0.97959	0.98068	0.98359	0.98570	0.98798	0.98624	0.98800	0.98893	0.99082	0.99141	0.99217	0.98375	0.98197	0.98444	0.98620	0.98822	0.99006
21.7	0.98311	0.98060	0.98166	0.98445	0.98647	0.98865	0.98699	0.98871	0.98961	0.99142	0.99197	0.99268	0.98460	0.98289	0.98529	0.98698	0.98892	0.99068
21.8	0.98400	0.98159	0.98262	0.98530	0.98722	0.98931	0.98771	0.98941	0.99027	0.99201	0.99251	0.99317	0.98544	0.98380	0.98612	0.98774	0.98960	0.99128
21.9	0.98488	0.98257	0.98357	0.98613	0.98796	0.98995	0.98843	0.99008	0.99092	0.99257	0.99304	0.99365	0.98627	0.98470	0.98694	0.98849	0.99026	0.99186
22	0.98575	0.98354	0.98450	0.98694	0.98869	0.99058	0.98912	0.99074	0.99154	0.99312	0.99354	0.99411	0.98708	0.98558	0.98774	0.98922	0.99091	0.99243
22.1	0.98660	0.98449	0.98542	0.98774	0.98940	0.99119	0.98981	0.99138	0.99215	0.99365	0.99403	0.99455	0.98787	0.98645	0.98852	0.98993	0.99154	0.99297
22.2	0.98743	0.98543	0.98633	0.98853	0.99009	0.99179	0.99048	0.99200	0.99273	0.99415	0.99450	0.99498	0.98865	0.98730	0.98928	0.99062	0.99215	0.99350
22.3	0.98826	0.98636	0.98721	0.98929	0.99077	0.99238	0.99113	0.99260	0.99330	0.99464	0.99496	0.99539	0.98941	0.98813	0.99003	0.99129	0.99274	0.99401
22.4	0.98906	0.98727	0.98809	0.99005	0.99143	0.99294	0.99177	0.99319	0.99385	0.99511	0.99539	0.99579	0.99015	0.98895	0.99076	0.99195	0.99331	0.99451
22.5	0.98986	0.98817	0.98895	0.99078	0.99208	0.99350	0.99239	0.99375	0.99438	0.99556	0.99581	0.99617	0.99089	0.98975	0.99147	0.99259	0.99386	0.99499

Time (hours)	Cumulative Rainfall Fraction																	
	South 2 - Year	South 5 - Year	South 10 -Year	South 25 - Year	South 50 - Year	South 100 - Year	Center 2 - Year	Center 5 - Year	Center 10 -Year	Center 25 - Year	Center 50 -Year	Center 100 - Year	North 2 -Year	North 5 - Year	North 10 - Year	North 25 - Year	North 50 - Year	North 100 - Year
22.6	0.99063	0.98905	0.98979	0.99151	0.99271	0.99404	0.99300	0.99430	0.99489	0.99599	0.99622	0.99654	0.99160	0.99054	0.99216	0.99321	0.99440	0.99544
22.7	0.99140	0.98992	0.99062	0.99221	0.99333	0.99456	0.99360	0.99482	0.99538	0.99640	0.99660	0.99689	0.99230	0.99132	0.99284	0.99381	0.99492	0.99588
22.8	0.99215	0.99078	0.99143	0.99290	0.99394	0.99507	0.99418	0.99533	0.99585	0.99679	0.99697	0.99722	0.99299	0.99208	0.99349	0.99439	0.99542	0.99631
22.9	0.99288	0.99163	0.99223	0.99358	0.99452	0.99556	0.99475	0.99582	0.99630	0.99717	0.99732	0.99754	0.99366	0.99282	0.99413	0.99496	0.99590	0.99671
23	0.99360	0.99246	0.99301	0.99424	0.99510	0.99604	0.99530	0.99630	0.99673	0.99752	0.99765	0.99784	0.99431	0.99355	0.99475	0.99551	0.99636	0.99710
23.1	0.99431	0.99327	0.99378	0.99489	0.99566	0.99650	0.99583	0.99675	0.99715	0.99786	0.99796	0.99813	0.99495	0.99426	0.99536	0.99604	0.99681	0.99747
23.2	0.99500	0.99407	0.99453	0.99552	0.99620	0.99695	0.99636	0.99719	0.99754	0.99817	0.99826	0.99840	0.99557	0.99496	0.99594	0.99655	0.99724	0.99782
23.3	0.99567	0.99486	0.99526	0.99613	0.99673	0.99738	0.99686	0.99760	0.99791	0.99847	0.99854	0.99865	0.99618	0.99564	0.99651	0.99704	0.99765	0.99816
23.4	0.99634	0.99564	0.99599	0.99673	0.99724	0.99780	0.99735	0.99800	0.99827	0.99874	0.99880	0.99889	0.99677	0.99631	0.99706	0.99752	0.99804	0.99847
23.5	0.99698	0.99640	0.99669	0.99731	0.99774	0.99821	0.99783	0.99838	0.99861	0.99900	0.99904	0.99912	0.99735	0.99696	0.99760	0.99798	0.99841	0.99877
23.6	0.99761	0.99715	0.99738	0.99788	0.99822	0.99860	0.99830	0.99874	0.99892	0.99924	0.99927	0.99933	0.99791	0.99760	0.99811	0.99842	0.99876	0.99905
23.7	0.99823	0.99788	0.99806	0.99843	0.99869	0.99897	0.99874	0.99908	0.99922	0.99946	0.99948	0.99952	0.99845	0.99822	0.99861	0.99884	0.99910	0.99932
23.8	0.99884	0.99860	0.99872	0.99897	0.99914	0.99933	0.99918	0.99941	0.99950	0.99966	0.99967	0.99969	0.99899	0.99883	0.99909	0.99925	0.99942	0.99956
23.9	0.99943	0.99931	0.99937	0.99949	0.99958	0.99967	0.99960	0.99971	0.99976	0.99984	0.99984	0.99985	0.99950	0.99942	0.99956	0.99963	0.99972	0.99979
24	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000

Appendix C
Jimmy Camp Creek North Distributions Compared
to NRCS Distributions



Time (hours)	Cumulative Rainfall Fraction								
	North 2 -Year	North 5 -Year	North 10 -Year	North 25 -Year	North 50 -Year	North 100 - Year	MSE2	MSE3	Type II
0	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0	0	0.00000
0.1	0.00050	0.00058	0.00044	0.00037	0.00028	0.00021	0.00017	0.000267	0.00100
0.2	0.00101	0.00117	0.00091	0.00075	0.00058	0.00044	0.000359	0.000555	0.00200
0.3	0.00155	0.00178	0.00139	0.00116	0.00090	0.00068	0.000565	0.000861	0.00300
0.4	0.00209	0.00240	0.00189	0.00158	0.00124	0.00095	0.00079	0.00119	0.00400
0.5	0.00265	0.00304	0.00240	0.00202	0.00159	0.00123	0.00103	0.00153	0.00500
0.6	0.00323	0.00369	0.00294	0.00248	0.00196	0.00153	0.00129	0.0019	0.00600
0.7	0.00382	0.00436	0.00349	0.00296	0.00235	0.00184	0.00157	0.00229	0.00700
0.8	0.00443	0.00504	0.00406	0.00345	0.00276	0.00218	0.00187	0.00269	0.00800
0.9	0.00505	0.00574	0.00464	0.00396	0.00319	0.00253	0.00218	0.00312	0.00900
1	0.00569	0.00645	0.00525	0.00449	0.00364	0.00290	0.00251	0.00356	0.01000
1.1	0.00634	0.00718	0.00587	0.00504	0.00410	0.00329	0.00286	0.00403	0.01100
1.2	0.00701	0.00792	0.00651	0.00561	0.00458	0.00369	0.00323	0.00451	0.01200
1.3	0.00770	0.00868	0.00716	0.00619	0.00508	0.00412	0.00362	0.00501	0.01300
1.4	0.00840	0.00946	0.00784	0.00679	0.00560	0.00456	0.00402	0.00554	0.01400
1.5	0.00911	0.01025	0.00853	0.00741	0.00614	0.00501	0.00444	0.00608	0.01500
1.6	0.00985	0.01105	0.00924	0.00805	0.00669	0.00549	0.00488	0.00665	0.01600
1.7	0.01059	0.01187	0.00997	0.00871	0.00726	0.00599	0.00534	0.00723	0.01700
1.8	0.01135	0.01270	0.01072	0.00938	0.00785	0.00650	0.00581	0.00783	0.01800
1.9	0.01213	0.01355	0.01148	0.01007	0.00846	0.00703	0.00631	0.00845	0.01900
2	0.01292	0.01442	0.01226	0.01078	0.00909	0.00757	0.00682	0.0091	0.02000
2.1	0.01373	0.01530	0.01306	0.01151	0.00974	0.00814	0.00735	0.00976	0.02101
2.2	0.01456	0.01620	0.01388	0.01226	0.01040	0.00872	0.00789	0.01044	0.02203
2.3	0.01540	0.01711	0.01471	0.01302	0.01108	0.00932	0.00846	0.01114	0.02307
2.4	0.01625	0.01803	0.01556	0.01380	0.01178	0.00994	0.00904	0.01186	0.02412
2.5	0.01712	0.01897	0.01643	0.01460	0.01250	0.01058	0.00964	0.0126	0.02519
2.6	0.01801	0.01993	0.01732	0.01542	0.01324	0.01123	0.01026	0.01336	0.02627
2.7	0.01891	0.02090	0.01823	0.01625	0.01399	0.01190	0.0109	0.01414	0.02737
2.8	0.01982	0.02189	0.01915	0.01711	0.01476	0.01259	0.01155	0.01494	0.02848
2.9	0.02075	0.02289	0.02009	0.01798	0.01555	0.01330	0.01223	0.01576	0.02961
3	0.02170	0.02391	0.02105	0.01887	0.01636	0.01402	0.01292	0.0166	0.03075
3.1	0.02266	0.02494	0.02202	0.01978	0.01719	0.01477	0.01363	0.01746	0.03191
3.2	0.02364	0.02599	0.02302	0.02070	0.01803	0.01553	0.01435	0.01834	0.03308
3.3	0.02464	0.02705	0.02403	0.02164	0.01890	0.01631	0.0151	0.01924	0.03427
3.4	0.02564	0.02813	0.02506	0.02261	0.01978	0.01710	0.01586	0.02016	0.03547
3.5	0.02667	0.02922	0.02610	0.02358	0.02068	0.01792	0.01664	0.02109	0.03669
3.6	0.02771	0.03033	0.02717	0.02458	0.02160	0.01875	0.01744	0.02205	0.03792
3.7	0.02876	0.03145	0.02825	0.02560	0.02253	0.01960	0.01825	0.02303	0.03917
3.8	0.02983	0.03259	0.02935	0.02663	0.02349	0.02046	0.01909	0.02403	0.04043
3.9	0.03092	0.03374	0.03047	0.02768	0.02446	0.02135	0.01994	0.02504	0.04171
4	0.03202	0.03491	0.03160	0.02875	0.02545	0.02225	0.02081	0.02608	0.04300
4.1	0.03314	0.03610	0.03275	0.02984	0.02646	0.02317	0.0217	0.02714	0.04431

Time (hours)	Cumulative Rainfall Fraction								
	North 2 -Year	North 5 -Year	North 10 -Year	North 25 -Year	North 50 -Year	North 100 - Year	MSE2	MSE3	Type II
4.2	0.03427	0.03730	0.03392	0.03094	0.02749	0.02411	0.0226	0.02821	0.04563
4.3	0.03542	0.03851	0.03511	0.03207	0.02853	0.02507	0.02353	0.02931	0.04697
4.4	0.03658	0.03974	0.03632	0.03321	0.02960	0.02604	0.02447	0.03042	0.04832
4.5	0.03776	0.04098	0.03754	0.03437	0.03068	0.02703	0.02543	0.03156	0.04969
4.6	0.03895	0.04224	0.03878	0.03554	0.03178	0.02804	0.02641	0.03271	0.05107
4.7	0.04016	0.04352	0.04004	0.03674	0.03290	0.02907	0.0274	0.03389	0.05247
4.8	0.04139	0.04481	0.04132	0.03795	0.03403	0.03011	0.02842	0.03508	0.05388
4.9	0.04263	0.04611	0.04261	0.03918	0.03519	0.03117	0.02945	0.0363	0.05531
5	0.04389	0.04743	0.04393	0.04043	0.03636	0.03225	0.0305	0.03753	0.05675
5.1	0.04516	0.04877	0.04526	0.04170	0.03755	0.03335	0.03156	0.03878	0.05821
5.2	0.04644	0.05012	0.04660	0.04298	0.03876	0.03447	0.03265	0.04006	0.05968
5.3	0.04774	0.05149	0.04797	0.04429	0.03999	0.03560	0.03375	0.04135	0.06117
5.4	0.04906	0.05287	0.04935	0.04561	0.04123	0.03675	0.03487	0.04266	0.06267
5.5	0.05040	0.05427	0.05075	0.04695	0.04250	0.03792	0.03601	0.04399	0.06419
5.6	0.05174	0.05568	0.05217	0.04830	0.04378	0.03911	0.03717	0.04535	0.06572
5.7	0.05311	0.05710	0.05361	0.04968	0.04508	0.04031	0.03835	0.04672	0.06727
5.8	0.05449	0.05855	0.05506	0.05107	0.04640	0.04153	0.03954	0.04811	0.06883
5.9	0.05588	0.06000	0.05653	0.05248	0.04773	0.04277	0.04075	0.04952	0.07041
6	0.05729	0.06148	0.05802	0.05391	0.04909	0.04403	0.04198	0.05095	0.07200
6.1	0.05872	0.06296	0.05953	0.05535	0.05046	0.04531	0.04322	0.0524	0.07363
6.2	0.06016	0.06447	0.06105	0.05682	0.05185	0.04660	0.04449	0.05387	0.07530
6.3	0.06161	0.06598	0.06259	0.05830	0.05326	0.04791	0.04577	0.05536	0.07703
6.4	0.06309	0.06752	0.06415	0.05980	0.05469	0.04924	0.04707	0.05687	0.07880
6.5	0.06457	0.06906	0.06573	0.06132	0.05613	0.05059	0.04839	0.0584	0.08063
6.6	0.06608	0.07063	0.06733	0.06286	0.05760	0.05195	0.04973	0.05995	0.08250
6.7	0.06759	0.07221	0.06894	0.06441	0.05908	0.05333	0.05108	0.06152	0.08443
6.8	0.06913	0.07380	0.07057	0.06598	0.06058	0.05473	0.05245	0.06311	0.08640
6.9	0.07068	0.07541	0.07222	0.06757	0.06209	0.05615	0.05384	0.06472	0.08843
7	0.07224	0.07703	0.07388	0.06918	0.06363	0.05758	0.05525	0.06635	0.09050
7.1	0.07382	0.07867	0.07557	0.07081	0.06519	0.05904	0.05668	0.06799	0.09263
7.2	0.07542	0.08033	0.07727	0.07245	0.06676	0.06051	0.05812	0.06966	0.09480
7.3	0.07703	0.08200	0.07899	0.07412	0.06835	0.06200	0.05958	0.07135	0.09703
7.4	0.07865	0.08368	0.08073	0.07580	0.06996	0.06350	0.06106	0.07306	0.09930
7.5	0.08030	0.08538	0.08248	0.07749	0.07158	0.06503	0.06256	0.07478	0.10163
7.6	0.08195	0.08710	0.08425	0.07921	0.07323	0.06657	0.06408	0.07653	0.10400
7.7	0.08362	0.08883	0.08604	0.08094	0.07489	0.06813	0.06561	0.0783	0.10643
7.8	0.08531	0.09057	0.08785	0.08270	0.07658	0.06971	0.06716	0.08008	0.10890
7.9	0.08702	0.09233	0.08968	0.08447	0.07828	0.07130	0.06873	0.08189	0.11143
8	0.08873	0.09411	0.09152	0.08625	0.07999	0.07291	0.07032	0.08371	0.11400
8.1	0.09047	0.09590	0.09338	0.08806	0.08173	0.07455	0.07193	0.08556	0.11666
8.2	0.09222	0.09771	0.09526	0.08988	0.08348	0.07619	0.07355	0.08742	0.11943
8.3	0.09398	0.09953	0.09715	0.09173	0.08526	0.07786	0.07519	0.08931	0.12232

Time (hours)	Cumulative Rainfall Fraction								
	North 2 -Year	North 5 -Year	North 10 -Year	North 25 -Year	North 50 -Year	North 100 - Year	MSE2	MSE3	Type II
8.4	0.09576	0.10137	0.09907	0.09358	0.08705	0.07954	0.07685	0.09121	0.12532
8.5	0.09756	0.10322	0.10100	0.09546	0.08886	0.08125	0.07853	0.09314	0.12844
8.6	0.09937	0.10509	0.10295	0.09736	0.09068	0.08296	0.08022	0.09508	0.13167
8.7	0.10120	0.10697	0.10491	0.09927	0.09253	0.08470	0.08194	0.09704	0.13502
8.8	0.10304	0.10886	0.10690	0.10120	0.09439	0.08646	0.08367	0.09903	0.13848
8.9	0.10490	0.11078	0.10890	0.10315	0.09627	0.08823	0.08542	0.10103	0.14206
9	0.10677	0.11270	0.11092	0.10512	0.09817	0.09002	0.08718	0.10305	0.14575
9.1	0.10964	0.11536	0.11355	0.10792	0.10109	0.09309	0.09012	0.10628	0.14956
9.2	0.11254	0.11804	0.11621	0.11076	0.10404	0.09621	0.0931	0.10956	0.15348
9.3	0.11548	0.12076	0.11890	0.11364	0.10704	0.09938	0.09612	0.11289	0.15752
9.4	0.11846	0.12350	0.12162	0.11655	0.11008	0.10259	0.09919	0.11626	0.16167
9.5	0.12147	0.12628	0.12437	0.11950	0.11315	0.10584	0.10229	0.11967	0.16594
9.6	0.12452	0.12909	0.12716	0.12248	0.11627	0.10914	0.10545	0.12314	0.17032
9.7	0.12761	0.13192	0.12997	0.12550	0.11942	0.11249	0.10864	0.12664	0.17482
9.8	0.13074	0.13479	0.13282	0.12855	0.12262	0.11588	0.11188	0.1302	0.17943
9.9	0.13390	0.13769	0.13569	0.13164	0.12586	0.11932	0.11516	0.1338	0.18416
10	0.13710	0.14062	0.13860	0.13477	0.12913	0.12280	0.11849	0.13744	0.18900
10.1	0.14033	0.14358	0.14153	0.13793	0.13245	0.12633	0.12185	0.14113	0.19402
10.2	0.14361	0.14658	0.14450	0.14113	0.13581	0.12990	0.12527	0.14487	0.19928
10.3	0.14692	0.14960	0.14750	0.14437	0.13920	0.13352	0.12872	0.14866	0.20478
10.4	0.15026	0.15265	0.15052	0.14764	0.14264	0.13719	0.13222	0.15248	0.21052
10.5	0.15365	0.15574	0.15358	0.15094	0.14612	0.14090	0.13576	0.15636	0.21650
10.6	0.15704	0.15803	0.15625	0.15385	0.14959	0.14521	0.14115	0.16212	0.22272
10.7	0.16160	0.16164	0.16014	0.15801	0.15429	0.15068	0.14732	0.16863	0.22918
10.8	0.16733	0.16656	0.16526	0.16340	0.16023	0.15734	0.15428	0.17591	0.23588
10.9	0.17423	0.17279	0.17160	0.17003	0.16740	0.16517	0.16203	0.18394	0.24282
11	0.18229	0.18033	0.17918	0.17790	0.17580	0.17417	0.17056	0.19272	0.25000
11.1	0.19152	0.18918	0.18799	0.18701	0.18543	0.18434	0.17988	0.20226	0.25776
11.2	0.20192	0.19934	0.19802	0.19736	0.19630	0.19569	0.18998	0.21256	0.26644
11.3	0.21348	0.21082	0.20928	0.20895	0.20840	0.20822	0.20087	0.22362	0.27604
11.4	0.22621	0.22361	0.22177	0.22178	0.22174	0.22192	0.21254	0.23543	0.28656
11.5	0.24010	0.23770	0.23549	0.23585	0.23630	0.23679	0.225	0.248	0.29800
11.6	0.25846	0.25494	0.25322	0.25391	0.25490	0.25587	0.24398	0.2663	0.31430
11.7	0.28404	0.27914	0.27777	0.27926	0.28147	0.28345	0.26912	0.29062	0.33940
11.8	0.32536	0.32041	0.31932	0.32075	0.32329	0.32564	0.30466	0.32445	0.37330
11.9	0.37988	0.37646	0.37562	0.37638	0.37786	0.37964	0.35622	0.37245	0.41600
11.9167	0.38958	0.38648	0.38567	0.38652	0.38779	0.38943	0.45627	0.46289	0.50000
11.95833333	0.42448	0.42234	0.42184	0.42251	0.42340	0.42436			
12.1	0.62012	0.62354	0.62438	0.62362	0.62214	0.62036	0.64378	0.62755	0.58400
12.2	0.67464	0.67959	0.68068	0.67925	0.67671	0.67436	0.69534	0.67555	0.62670
12.3	0.71596	0.72086	0.72223	0.72074	0.71853	0.71655	0.73088	0.70938	0.66060
12.4	0.74154	0.74506	0.74678	0.74609	0.74510	0.74413	0.75602	0.7337	0.68570

Time (hours)	Cumulative Rainfall Fraction								
	North 2 -Year	North 5 -Year	North 10 -Year	North 25 -Year	North 50 -Year	North 100 - Year	MSE2	MSE3	Type II
12.5	0.75990	0.76230	0.76451	0.76415	0.76370	0.76321	0.775	0.752	0.70200
12.6	0.77379	0.77639	0.77823	0.77822	0.77826	0.77808	0.78746	0.76457	0.71344
12.7	0.78652	0.78918	0.79072	0.79105	0.79160	0.79178	0.79913	0.77638	0.72396
12.8	0.79808	0.80066	0.80198	0.80264	0.80370	0.80431	0.81002	0.78744	0.73356
12.9	0.80848	0.81082	0.81201	0.81299	0.81457	0.81566	0.82012	0.79774	0.74224
13	0.81771	0.81967	0.82082	0.82210	0.82420	0.82583	0.82944	0.80728	0.75000
13.1	0.82577	0.82721	0.82840	0.82997	0.83260	0.83483	0.83797	0.81606	0.75718
13.2	0.83267	0.83344	0.83474	0.83660	0.83977	0.84266	0.84572	0.82409	0.76412
13.3	0.83840	0.83836	0.83986	0.84199	0.84571	0.84932	0.85268	0.83137	0.77082
13.4	0.84296	0.84197	0.84375	0.84615	0.85041	0.85479	0.85885	0.83788	0.77728
13.5	0.84635	0.84426	0.84642	0.84906	0.85388	0.85910	0.86424	0.84364	0.78350
13.6	0.84974	0.84735	0.84948	0.85236	0.85736	0.86281	0.86778	0.84752	0.78948
13.7	0.85308	0.85040	0.85250	0.85563	0.86080	0.86648	0.87128	0.85134	0.79522
13.8	0.85639	0.85342	0.85550	0.85887	0.86419	0.87010	0.87473	0.85513	0.80072
13.9	0.85967	0.85642	0.85847	0.86207	0.86755	0.87367	0.87815	0.85887	0.80598
14	0.86290	0.85938	0.86140	0.86523	0.87087	0.87720	0.88151	0.86256	0.81100
14.1	0.86610	0.86231	0.86431	0.86836	0.87414	0.88068	0.88484	0.8662	0.81584
14.2	0.86926	0.86521	0.86718	0.87145	0.87738	0.88412	0.88812	0.8698	0.82057
14.3	0.87239	0.86808	0.87003	0.87450	0.88058	0.88751	0.89136	0.87336	0.82518
14.4	0.87548	0.87091	0.87284	0.87752	0.88373	0.89086	0.89455	0.87686	0.82968
14.5	0.87853	0.87372	0.87563	0.88050	0.88685	0.89416	0.89771	0.88033	0.83406
14.6	0.88154	0.87650	0.87838	0.88345	0.88992	0.89741	0.90081	0.88374	0.83833
14.7	0.88452	0.87924	0.88110	0.88636	0.89296	0.90062	0.90388	0.88711	0.84248
14.8	0.88746	0.88196	0.88379	0.88924	0.89596	0.90379	0.9069	0.89044	0.84652
14.9	0.89036	0.88464	0.88645	0.89208	0.89891	0.90691	0.90988	0.89372	0.85044
15	0.89323	0.88730	0.88908	0.89488	0.90183	0.90998	0.91282	0.89695	0.85425
15.1	0.89510	0.88922	0.89110	0.89685	0.90373	0.91177	0.91458	0.89897	0.85794
15.2	0.89696	0.89114	0.89310	0.89880	0.90561	0.91354	0.91633	0.90097	0.86152
15.3	0.89880	0.89303	0.89509	0.90073	0.90747	0.91530	0.91806	0.90296	0.86498
15.4	0.90063	0.89491	0.89705	0.90264	0.90932	0.91704	0.91978	0.90492	0.86833
15.5	0.90244	0.89678	0.89900	0.90454	0.91114	0.91875	0.92147	0.90686	0.87156
15.6	0.90424	0.89863	0.90093	0.90642	0.91295	0.92046	0.92315	0.90879	0.87468
15.7	0.90602	0.90047	0.90285	0.90827	0.91474	0.92214	0.92481	0.91069	0.87768
15.8	0.90778	0.90229	0.90474	0.91012	0.91652	0.92381	0.92645	0.91258	0.88057
15.9	0.90953	0.90410	0.90662	0.91194	0.91827	0.92545	0.92807	0.91444	0.88334
16	0.91127	0.90589	0.90848	0.91375	0.92001	0.92709	0.92968	0.91629	0.88600
16.1	0.91298	0.90767	0.91032	0.91553	0.92172	0.92870	0.93127	0.91811	0.88858
16.2	0.91469	0.90943	0.91215	0.91730	0.92342	0.93029	0.93284	0.91992	0.89110
16.3	0.91638	0.91117	0.91396	0.91906	0.92511	0.93187	0.93439	0.9217	0.89358
16.4	0.91805	0.91290	0.91575	0.92079	0.92677	0.93343	0.93592	0.92347	0.89600
16.5	0.91970	0.91462	0.91752	0.92251	0.92842	0.93497	0.93744	0.92522	0.89838
16.6	0.92135	0.91632	0.91927	0.92420	0.93004	0.93650	0.93894	0.92694	0.90070

Time (hours)	Cumulative Rainfall Fraction								
	North 2 -Year	North 5 -Year	North 10 -Year	North 25 -Year	North 50 -Year	North 100 - Year	MSE2	MSE3	Type II
16.7	0.92297	0.91800	0.92101	0.92588	0.93165	0.93800	0.94042	0.92865	0.90298
16.8	0.92458	0.91967	0.92273	0.92755	0.93324	0.93949	0.94188	0.93034	0.90520
16.9	0.92618	0.92133	0.92443	0.92919	0.93481	0.94096	0.94332	0.93201	0.90738
17	0.92776	0.92297	0.92612	0.93082	0.93637	0.94242	0.94475	0.93365	0.90950
17.1	0.92932	0.92459	0.92778	0.93243	0.93791	0.94385	0.94616	0.93528	0.91158
17.2	0.93087	0.92620	0.92943	0.93402	0.93942	0.94527	0.94755	0.93689	0.91360
17.3	0.93241	0.92779	0.93106	0.93559	0.94092	0.94667	0.94892	0.93848	0.91558
17.4	0.93392	0.92937	0.93267	0.93714	0.94240	0.94805	0.95027	0.94005	0.91750
17.5	0.93543	0.93094	0.93427	0.93868	0.94387	0.94941	0.95161	0.9416	0.91938
17.6	0.93691	0.93248	0.93585	0.94020	0.94531	0.95076	0.95293	0.94313	0.92120
17.7	0.93839	0.93402	0.93741	0.94170	0.94674	0.95209	0.95423	0.94464	0.92298
17.8	0.93984	0.93553	0.93895	0.94318	0.94815	0.95340	0.95551	0.94613	0.92470
17.9	0.94128	0.93704	0.94047	0.94465	0.94954	0.95469	0.95678	0.9476	0.92638
18	0.94271	0.93852	0.94198	0.94609	0.95091	0.95597	0.95802	0.94905	0.92800
18.1	0.94412	0.94000	0.94347	0.94752	0.95227	0.95723	0.95925	0.95048	0.92959
18.2	0.94551	0.94145	0.94494	0.94893	0.95360	0.95847	0.96046	0.95189	0.93117
18.3	0.94689	0.94290	0.94639	0.95032	0.95492	0.95969	0.96165	0.95328	0.93273
18.4	0.94826	0.94432	0.94783	0.95170	0.95622	0.96089	0.96283	0.95465	0.93428
18.5	0.94960	0.94573	0.94925	0.95305	0.95750	0.96208	0.96399	0.95601	0.93581
18.6	0.95094	0.94713	0.95065	0.95439	0.95877	0.96325	0.96513	0.95734	0.93733
18.7	0.95226	0.94851	0.95203	0.95571	0.96001	0.96440	0.96625	0.95865	0.93883
18.8	0.95356	0.94988	0.95340	0.95702	0.96124	0.96553	0.96735	0.95994	0.94032
18.9	0.95484	0.95123	0.95474	0.95830	0.96245	0.96665	0.96844	0.96122	0.94179
19	0.95611	0.95257	0.95607	0.95957	0.96364	0.96775	0.9695	0.96247	0.94325
19.1	0.95737	0.95389	0.95739	0.96082	0.96481	0.96883	0.97055	0.9637	0.94469
19.2	0.95861	0.95519	0.95868	0.96205	0.96597	0.96989	0.97158	0.96492	0.94612
19.3	0.95984	0.95648	0.95996	0.96326	0.96710	0.97093	0.9726	0.96611	0.94753
19.4	0.96105	0.95776	0.96122	0.96446	0.96822	0.97196	0.97359	0.96729	0.94893
19.5	0.96224	0.95902	0.96246	0.96563	0.96932	0.97297	0.97457	0.96844	0.95031
19.6	0.96342	0.96026	0.96368	0.96679	0.97040	0.97396	0.97553	0.96958	0.95168
19.7	0.96458	0.96149	0.96489	0.96793	0.97147	0.97493	0.97647	0.97069	0.95303
19.8	0.96573	0.96270	0.96608	0.96906	0.97251	0.97589	0.9774	0.97179	0.95437
19.9	0.96686	0.96390	0.96725	0.97016	0.97354	0.97683	0.9783	0.97286	0.95569
20	0.96798	0.96509	0.96840	0.97125	0.97455	0.97775	0.97919	0.97392	0.95700
20.1	0.96908	0.96626	0.96953	0.97232	0.97554	0.97865	0.98006	0.97496	0.95829
20.2	0.97017	0.96741	0.97065	0.97337	0.97651	0.97954	0.98091	0.97597	0.95958
20.3	0.97124	0.96855	0.97175	0.97440	0.97747	0.98040	0.98175	0.97697	0.96085
20.4	0.97229	0.96967	0.97283	0.97542	0.97840	0.98125	0.98256	0.97795	0.96211
20.5	0.97333	0.97078	0.97390	0.97642	0.97932	0.98208	0.98336	0.97891	0.96336
20.6	0.97436	0.97187	0.97494	0.97739	0.98022	0.98290	0.98414	0.97984	0.96460
20.7	0.97536	0.97295	0.97597	0.97836	0.98110	0.98369	0.9849	0.98076	0.96582
20.8	0.97636	0.97401	0.97698	0.97930	0.98197	0.98447	0.98565	0.98166	0.96704

Time (hours)	Cumulative Rainfall Fraction								
	North 2 -Year	North 5 -Year	North 10 -Year	North 25 -Year	North 50 -Year	North 100 - Year	MSE2	MSE3	Type II
20.9	0.97734	0.97506	0.97798	0.98022	0.98281	0.98523	0.98637	0.98254	0.96824
21	0.97830	0.97609	0.97895	0.98113	0.98364	0.98598	0.98708	0.9834	0.96944
21.1	0.97925	0.97711	0.97991	0.98202	0.98445	0.98670	0.98777	0.98424	0.97062
21.2	0.98018	0.97811	0.98085	0.98289	0.98524	0.98741	0.98845	0.98506	0.97179
21.3	0.98109	0.97910	0.98177	0.98375	0.98601	0.98810	0.9891	0.98586	0.97295
21.4	0.98199	0.98007	0.98268	0.98458	0.98676	0.98877	0.98974	0.98664	0.97410
21.5	0.98288	0.98103	0.98357	0.98540	0.98750	0.98942	0.99036	0.9874	0.97523
21.6	0.98375	0.98197	0.98444	0.98620	0.98822	0.99006	0.99096	0.98814	0.97636
21.7	0.98460	0.98289	0.98529	0.98698	0.98892	0.99068	0.99154	0.98886	0.97747
21.8	0.98544	0.98380	0.98612	0.98774	0.98960	0.99128	0.99211	0.98956	0.97858
21.9	0.98627	0.98470	0.98694	0.98849	0.99026	0.99186	0.99265	0.99024	0.97967
22	0.98708	0.98558	0.98774	0.98922	0.99091	0.99243	0.99318	0.9909	0.98075
22.1	0.98787	0.98645	0.98852	0.98993	0.99154	0.99297	0.99369	0.99155	0.98182
22.2	0.98865	0.98730	0.98928	0.99062	0.99215	0.99350	0.99419	0.99217	0.98288
22.3	0.98941	0.98813	0.99003	0.99129	0.99274	0.99401	0.99466	0.99277	0.98392
22.4	0.99015	0.98895	0.99076	0.99195	0.99331	0.99451	0.99512	0.99335	0.98496
22.5	0.99089	0.98975	0.99147	0.99259	0.99386	0.99499	0.99556	0.99392	0.98598
22.6	0.99160	0.99054	0.99216	0.99321	0.99440	0.99544	0.99598	0.99446	0.98700
22.7	0.99230	0.99132	0.99284	0.99381	0.99492	0.99588	0.99638	0.99499	0.98800
22.8	0.99299	0.99208	0.99349	0.99439	0.99542	0.99631	0.99677	0.99549	0.98899
22.9	0.99366	0.99282	0.99413	0.99496	0.99590	0.99671	0.99714	0.99597	0.98997
23	0.99431	0.99355	0.99475	0.99551	0.99636	0.99710	0.99749	0.99644	0.99094
23.1	0.99495	0.99426	0.99536	0.99604	0.99681	0.99747	0.99782	0.99688	0.99189
23.2	0.99557	0.99496	0.99594	0.99655	0.99724	0.99782	0.99813	0.99731	0.99284
23.3	0.99618	0.99564	0.99651	0.99704	0.99765	0.99816	0.99843	0.99771	0.99377
23.4	0.99677	0.99631	0.99706	0.99752	0.99804	0.99847	0.99871	0.9981	0.99470
23.5	0.99735	0.99696	0.99760	0.99798	0.99841	0.99877	0.99897	0.99847	0.99561
23.6	0.99791	0.99760	0.99811	0.99842	0.99876	0.99905	0.99921	0.99881	0.99651
23.7	0.99845	0.99822	0.99861	0.99884	0.99910	0.99932	0.999435	0.999139	0.99740
23.8	0.99899	0.99883	0.99909	0.99925	0.99942	0.99956	0.999641	0.999445	0.99828
23.9	0.99950	0.99942	0.99956	0.99963	0.99972	0.99979	0.99983	0.999733	0.99914
24	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.0000	1.0000	1.0000