APPENDIX D
Rainfall Analysis

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A goal of the Kissimmee Basin Water Supply Plan (KB Plan) is to identify areas of potential water supply shortfalls and to identify sufficient supply sources to meet the 1 in 10 demand needs occurring over a 20-year planning horizon. Rainfall is responsible for nearly all surface water inflows and outflows in the KB Planning Area and is an important source of recharge to the Surficial Aquifer System and Floridan Aquifer System. As such, an understanding of the climatic conditions is an essential part of predicting water demands the availability of certain water resources. Rainfall is also the single most important variable controlling the occurrence of water shortages in the planning region.

RAINFALL DISTRIBUTION

Rainfall varies from county to county within the KB Planning Area. In order to address this issue, eleven rainfall stations distributed throughout the planning area were used to assess mean rainfall conditions (**Figure D-1**). These stations were chosen because they have a minimum of 30 years of reliable records. A summary of the data is presented in **Table D-1**. **Table D-1** also lists the period of record for each station, as well as the database keys (DBKEYs) used to retrieve the data from the District's DBHYDRO database. Abtew and Ali (1999) have done the most recent Districtwide analysis of rainfall distribution.

The mean annual rainfall for the KB Planning Area is 49.7 inches. **Figure D-2** presents the mean monthly distribution of rainfall at the rainfall stations. The wet period begins on June 1 and ends on October 31, with the heaviest rainfall usually occurring from June through August. The dry period begins on November 1 and ends on May 31. December is usually the month with the lowest rainfall.

RAINFALL DATA PREPARATION

The District has a network of rainfall stations that provides historical rainfall data. Long-term data were obtained from eleven rainfall stations with relatively long and reliable records. These data are maintained in the DBHYDRO database. **Table D-l** lists the DBKEY values for these stations**. Table D-l** also shows the period of record for each rainfall station. **Tables D-2** through **D-12** present the monthly rainfall for each rainfall station during the entire period of record. **Figure D-3** shows the statistical 1-in-10 year drought event plots for the rainfall stations in the Kissimmee Planning Area and **Table D-13** lists the values for 1-in-10 year drought events. In some instances not every daily values was available for each station location. In these occurrences, the inverse distance squared method was used to fill in daily missing values in each data set before calculating monthly averages.

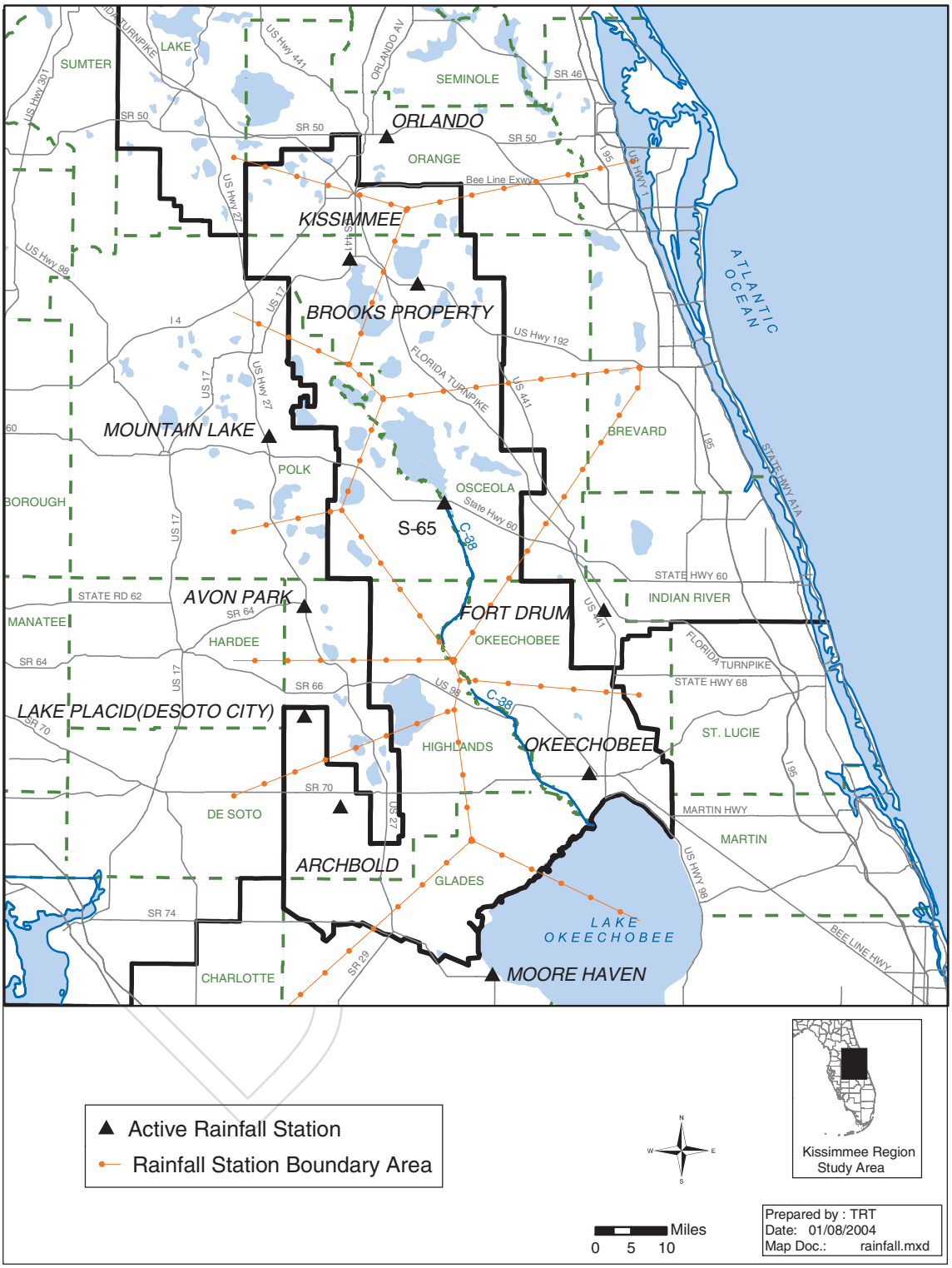

Figure D-1. Rainfall Stations in the KB Planning Area.

Table D-1. Average Rainfall Data for Rainfall Stations in the KB Planning Area.

County	Rainfall Station	Average Annual Rainfall	Period of Record[1]		Maximum Monthly Rainfall		Minimum Monthly Rainfall		% Rain Falling in Wet Season	Primary DBKEY[2]
			Number of Years	Years	inches	month	inches	month		
Glades	Moore Haven	47.59	36	1965-2000	7.77	Jun	1.60	Dec	65%	PT322, PT323
Highlands	Archbold	50.99	36	1965-2000	8.20	Jun	1.87	Dec	64%	PT143, PT144
	Avon Park	50.91	36	1965-2000	8.17	Jun	1.89	Dec	64%	PT145-PT148
	Lake Placid	48.52	36	1965-2000	8.35	Jun	1.59	Dec	64%	PT199, PT200
Okeechobee	Fort Drum	54.95	36	1965-2000	8.31	Jun	1.90	Dec	63%	PT218, PT219
	Okeechobee	48.03	36	1965-2000	6.92	Jun	1.71	Dec	62%	PT347-PT350, 06020
Orange	Orlando	49.32	36	1965-2000	7.45	Jul	2.22	Nov	61%	PT351, PT352
Osceola	Kissimmee	48.25	36	1965-2000	7.03	Aug	1.95	Apr	62%	PT283, PT284
	Brooks Property	49.11	33	1963-1995	7.25	Jul	1.87	Apr	61%	05813
	S-65	50.94	36	1965-2000	7.62	Jul	1.95	Dec	62%	05940
Polk	Mountain Lake	48.48	36	1965-2000	7.72	Jun	1.89	Apr	63%	PT326
Overall Average		49.73			7.71		1.86		63%	

1 Period of Record.
2 For those interested in accessing DBHYDRO. Missing daily data replaced by weighted averages of neighboring stations.

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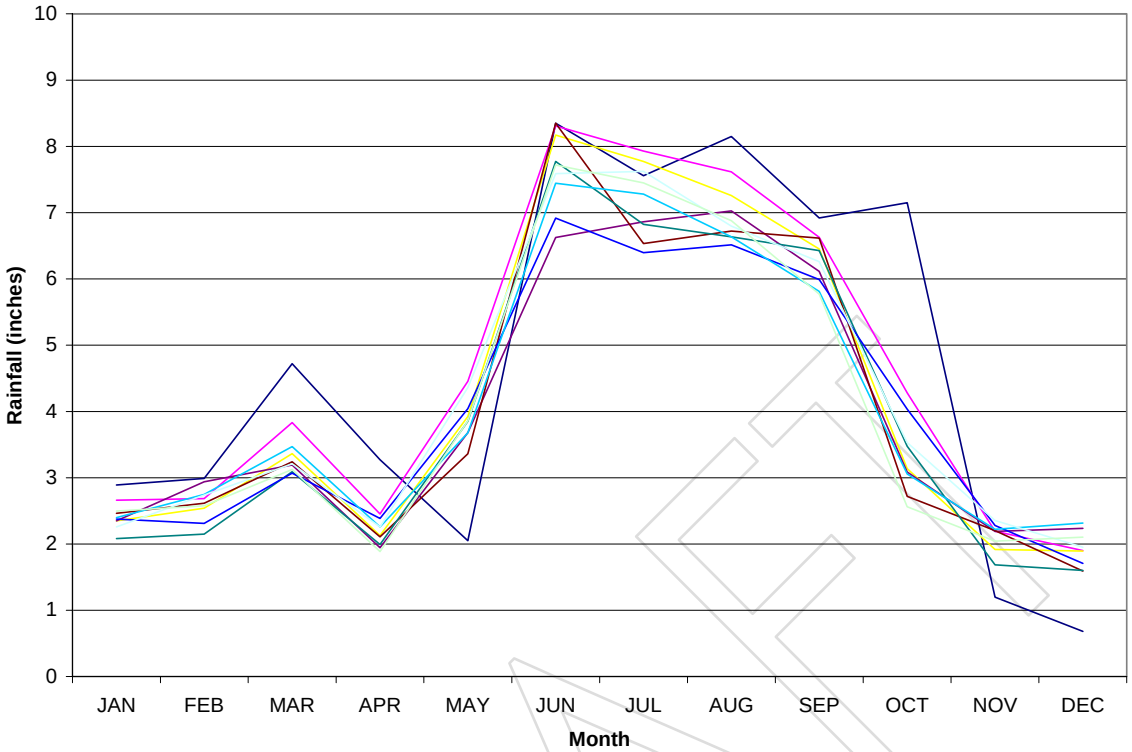

Figure D-2. Mean Monthly Distribution of Rainfall at Stations in the KB Planning Area.

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Table D-2. Monthly and Mean Rainfall (inches) at Archbold Rainfall Station.

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	SUM
1965	1.08	4.38	4.26	1.77	0.54	7.74	9.55	5.45	5.54	4.83	1.10	2.05	48.30
1966	5.32	5.05	1.47	2.66	4.83	9.94	6.78	7.10	6.88	3.25	0.47	1.09	54.84
1967	0.93	3.44	0.77	0.09	0.93	9.00	9.28	8.14	5.24	2.20	0.35	2.12	42.48
1968	0.59	2.09	1.08	0.65	6.50	15.47	8.38	5.49	5.45	4.97	2.52	0.38	53.56
1969	1.26	1.56	7.43	1.79	4.19	12.21	6.09	5.99	9.65	8.40	2.69	2.83	64.09
1970	4.78	3.57	8.85	0.19	4.97	8.62	8.94	4.24	4.93	3.16	0.12	0.31	52.68
1971	0.57	1.80	1.06	0.08	2.42	7.89	5.79	9.06	7.22	3.20	1.28	1.08	41.45
1972	0.25	2.99	0.78	5.90	2.25	10.53	3.90	5.35	4.27	3.35	3.52	1.97	45.06
1973	5.11	2.86	2.93	4.90	4.41	5.47	8.27	6.43	9.97	3.47	0.29	2.39	56.50
1974	0.33	1.09	0.05	1.41	5.39	14.12	16.89	10.23	4.87	0.56	0.53	2.93	58.40
1975	0.13	0.49	1.04	1.81	6.97	8.63	8.76	5.84	5.55	3.07	0.13	0.60	43.02
1976	0.08	0.76	2.45	1.88	4.98	9.75	6.50	7.65	6.61	3.42	1.75	1.19	47.02
1977	1.91	0.53	1.02	0.69	6.53	6.60	4.68	9.17	9.87	3.29	4.17	4.90	53.36
1978	1.81	2.38	3.16	0.43	7.00	9.04	10.00	7.71	4.24	3.63	1.76	4.16	55.32
1979	7.91	1.09	2.21	1.37	4.81	1.70	10.58	12.76	14.15	0.96	0.90	2.45	60.89
1980	3.72	1.65	1.47	3.90	3.90	2.40	6.64	4.71	4.05	0.40	3.21	1.34	37.39
1981	0.36	3.46	1.24	0.16	2.82	10.38	7.50	10.54	6.02	0.98	1.35	0.22	45.03
1982	1.16	2.06	6.52	4.15	6.96	11.14	7.79	5.97	10.65	2.59	1.57	0.51	61.07
1983	4.41	10.85	4.83	2.63	1.01	5.44	7.31	6.74	2.37	5.18	1.84	2.45	55.06
1984	0.45	2.93	6.42	2.75	5.09	7.39	13.09	2.71	3.70	0.13	3.13	0.61	48.40
1985	0.40	0.76	2.29	3.47	2.77	7.20	7.10	4.93	6.46	4.37	2.62	1.60	43.97
1986	1.33	0.78	6.03	0.21	1.56	15.85	7.75	8.14	5.06	4.05	0.08	3.35	54.19
1987	3.10	1.14	6.61	0.52	2.44	3.27	4.52	3.50	9.92	6.63	5.94	1.23	48.82
1988	2.39	2.37	6.21	1.47	2.90	3.01	9.29	10.20	2.41	1.81	3.80	1.73	47.59
1989	2.03	0.33	4.11	2.98	2.21	4.79	7.60	7.80	8.10	4.35	0.97	2.54	47.81
1990	2.21	3.27	1.79	1.34	1.72	9.20	10.89	9.40	3.88	0.53	0.45	1.01	45.69
1991	5.17	1.48	4.61	2.03	5.87	7.37	8.66	7.39	4.70	2.98	0.86	0.88	52.00
1992	0.36	4.73	2.26	4.91	3.84	15.77	4.67	12.12	6.71	1.91	4.37	0.58	62.23
1993	5.12	3.07	5.74	2.78	1.33	4.96	11.03	4.28	4.63	6.95	0.82	1.32	52.03
1994	3.82	1.84	3.49	2.00	4.30	11.35	3.64	9.03	8.31	2.57	4.16	3.83	58.34
1995	2.89	2.99	4.72	3.27	2.05	8.35	7.56	8.15	6.92	7.15	1.20	0.68	55.93
1996	2.42	1.71	4.76	1.16	7.61	8.32	5.57	6.03	0.70	3.72	0.20	1.64	43.84
1997	1.19	3.02	1.67	5.47	4.98	6.76	6.29	4.40	9.16	0.68	4.46	7.60	55.68
1998	5.65	8.28	5.39	0.95	3.94	0.90	7.08	6.22	8.73	2.90	5.16	0.94	56.14
1999	2.29	0.27	0.76	3.48	6.52	10.89	5.34	14.31	8.93	3.86	1.19	2.26	60.10
2000	1.15	0.37	2.00	1.92	1.17	3.76	5.06	1.94	7.95	1.37	0.24	0.38	27.31
Mean	2.32	2.54	3.37	2.14	3.94	8.20	7.74	7.20	6.49	3.25	1.92	1.87	50.99

Table D-3. Monthly and Mean Rainfall (inches) at Avon Park Rainfall Station.

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	SUM
1965	1.54	4.10	4.00	1.53	0.19	8.41	10.62	5.71	5.64	3.73	0.92	2.47	48.86
1966	5.91	4.95	1.47	2.38	4.65	8.02	6.23	6.97	6.31	2.23	0.31	1.25	50.68
1967	0.87	3.86	0.68	0.04	1.19	9.93	9.68	9.60	4.35	1.34	0.22	2.46	44.22
1968	0.57	2.10	1.10	0.64	6.44	14.81	8.54	6.10	5.64	4.05	2.78	0.43	53.20
1969	1.26	1.56	7.43	1.79	4.19	12.21	6.09	5.99	9.65	8.40	2.69	2.83	64.09
1970	4.78	3.57	8.85	0.19	4.97	8.62	8.94	4.24	4.93	3.16	0.12	0.31	52.68
1971	0.57	1.80	1.06	0.08	2.42	7.89	5.79	9.06	7.22	3.20	1.28	1.08	41.45
1972	0.25	2.99	0.78	5.90	2.25	10.53	3.90	5.35	4.27	3.35	3.52	1.97	45.06
1973	5.11	2.86	2.93	4.90	4.41	5.47	8.27	6.43	9.97	3.47	0.29	2.39	56.50
1974	0.33	1.09	0.05	1.41	5.39	14.12	16.89	10.23	4.87	0.56	0.53	2.93	58.40
1975	0.13	0.49	1.04	1.81	6.97	8.63	8.76	5.84	5.55	3.07	0.13	0.60	43.02
1976	0.08	0.76	2.45	1.88	4.98	9.75	6.50	7.65	6.61	3.42	1.75	1.19	47.02
1977	1.91	0.53	1.02	0.69	6.53	6.60	4.68	9.17	9.87	3.29	4.17	4.90	53.36
1978	1.81	2.38	3.16	0.43	7.00	9.04	10.00	7.71	4.24	3.63	1.76	4.16	55.32
1979	7.91	1.09	2.21	1.37	4.81	1.70	10.58	12.76	14.15	0.96	0.90	2.45	60.89
1980	3.72	1.65	1.47	3.90	3.90	2.40	6.64	4.71	3.71	0.40	3.21	1.34	37.05
1981	0.36	3.46	1.24	0.16	2.82	10.38	7.50	10.54	6.02	0.98	1.35	0.22	45.03
1982	1.16	2.06	6.52	4.15	6.96	11.14	7.79	5.97	10.65	2.59	1.57	0.51	61.07
1983	4.41	10.85	4.83	2.63	1.01	5.44	7.31	6.74	2.37	5.18	1.84	2.45	55.06
1984	0.45	2.93	6.42	2.75	5.09	7.39	13.09	2.71	3.70	0.13	3.13	0.61	48.40
1985	0.40	0.76	2.29	3.47	2.77	7.20	7.10	4.93	6.46	4.37	2.62	1.60	43.97
1986	1.33	0.78	6.03	0.21	1.56	15.85	7.75	8.14	5.06	4.05	0.08	3.35	54.19
1987	3.10	1.14	6.61	0.52	2.44	3.27	4.52	3.50	9.92	6.63	5.94	1.23	48.82
1988	2.39	2.37	6.21	1.47	2.90	3.01	9.29	10.20	2.41	1.81	3.80	1.73	47.59
1989	2.03	0.33	4.11	2.98	2.21	4.79	7.60	7.80	8.10	4.35	0.97	2.54	47.81
1990	2.21	3.27	1.79	1.34	1.72	9.20	10.89	9.40	3.88	0.53	0.45	1.01	45.69
1991	5.17	1.48	4.61	2.03	5.87	7.37	8.66	7.39	4.70	2.98	0.86	0.88	52.00
1992	0.36	4.73	2.26	4.91	3.84	15.77	4.67	12.12	6.71	1.91	4.37	0.58	62.23
1993	5.12	3.07	5.74	2.78	1.23	4.96	11.03	4.28	4.63	6.95	0.82	1.32	51.93
1994	3.82	1.84	3.49	2.00	4.30	11.35	3.64	9.03	8.31	2.57	4.16	3.83	58.34
1995	2.89	2.99	4.72	3.27	2.05	8.35	7.56	8.15	6.92	7.15	1.20	0.68	55.93
1996	2.42	1.71	4.76	1.16	7.61	8.32	5.57	6.03	0.70	3.72	0.20	1.64	43.84
1997	1.19	3.02	1.67	5.47	4.98	6.76	6.29	4.40	9.16	0.68	4.46	7.60	55.68
1998	5.65	8.28	5.39	0.95	3.94	0.90	7.08	6.22	8.73	2.90	5.16	0.94	56.14
1999	2.29	0.27	0.76	3.48	6.52	10.89	5.34	14.31	8.93	3.86	1.19	2.26	60.10
2000	1.15	0.37	2.00	1.92	1.17	3.76	5.06	1.94	7.95	1.37	0.24	0.38	27.31
Mean	2.35	2.54	3.37	2.13	3.92	8.17	7.77	7.26	6.45	3.14	1.92	1.89	50.91

Table D-4. Monthly and Mean Rainfall (inches) at Brooks Rainfall Station.

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	SUM
1963	2.41	7.67	2.03	0.63	8.05	7.71	3.15	5.19	3.35	1.20	9.69	2.63	53.71
1964	4.85	3.86	3.38	1.23	2.67	5.03	9.55	5.87	6.28	2.88	0.97	1.26	47.83
1965	1.64	5.42	1.44	1.75	0.36	9.56	11.21	7.41	7.42	3.21	0.68	2.74	52.84
1966	5.95	6.90	0.75	1.36	5.40	8.86	3.46	5.03	9.73	0.69	0.32	1.21	49.66
1967	2.02	3.57	1.07	0.00	0.18	5.76	11.38	9.97	6.54	0.46	0.04	2.84	43.83
1968	0.19	2.36	1.34	0.54	5.88	19.87	4.72	3.23	4.56	3.46	3.26	0.38	49.79
1969	4.65	1.38	5.93	1.99	2.09	4.45	7.67	9.03	5.60	5.64	1.77	4.98	55.18
1970	2.61	2.73	5.76	0.73	5.49	3.03	9.34	2.06	4.54	2.24	0.24	0.91	39.68
1971	0.17	3.83	1.65	0.88	2.93	5.46	6.34	5.24	1.92	6.01	2.13	2.36	38.92
1972	1.48	4.42	2.68	2.17	3.27	11.22	7.20	10.10	0.59	0.87	2.44	2.24	48.68
1973	3.41	2.74	2.40	1.83	5.03	2.95	5.08	4.74	9.28	3.86	0.75	2.01	44.08
1974	0.25	0.57	1.21	0.82	3.25	15.05	15.74	9.27	9.42	0.86	0.14	1.86	58.44
1975	0.93	1.79	0.70	1.30	7.57	4.41	8.19	3.34	7.25	1.41	0.95	0.63	38.47
1976	0.43	0.51	2.20	1.97	6.06	11.51	3.28	8.89	8.20	2.71	0.66	2.94	49.36
1977	2.58	1.94	0.78	0.26	1.52	1.85	9.36	10.03	5.92	1.65	2.26	2.99	41.14
1978	2.69	4.98	1.92	0.17	2.68	7.65	7.95	6.81	2.89	2.06	0.77	3.75	44.32
1979	6.22	1.13	1.93	1.37	6.46	3.59	6.45	8.32	12.68	1.64	2.02	1.36	53.17
1980	2.48	2.44	1.66	2.52	8.30	2.13	4.34	4.55	5.87	1.23	2.33	3.31	41.16
1981	0.50	4.85	2.02	0.24	3.20	10.49	6.12	10.89	5.88	3.74	3.89	2.20	54.02
1982	1.73	1.37	5.70	3.23	4.68	12.93	11.02	7.22	8.04	1.34	1.20	1.71	60.17
1983	2.06	9.47	5.41	3.19	1.34	9.10	5.08	4.46	5.00	5.47	2.05	5.27	57.90
1984	1.22	3.99	1.09	3.52	5.31	5.77	12.20	2.31	6.01	0.85	2.86	0.31	45.44
1985	0.63	0.70	3.53	2.31	2.61	6.35	5.83	8.58	6.56	1.28	1.17	3.30	42.85
1986	4.83	2.89	2.61	0.35	2.14	6.47	6.46	9.42	3.71	2.89	1.67	3.59	47.03
1987	3.55	2.51	11.62	0.18	4.45	2.87	8.24	0.75	6.64	4.66	8.89	0.00	54.36
1988	3.83	1.61	9.12	0.55	2.87	2.21	0.00	8.54	6.00	1.82	5.85	1.02	43.42
1989	3.96	0.04	2.51	2.44	3.39	10.33	5.58	10.51	4.77	1.93	2.36	5.48	53.30
1990	0.12	4.54	1.99	1.48	3.25	3.71	8.76	5.73	1.95	4.14	3.15	0.72	39.54
1991	1.89	0.48	4.83	6.61	7.39	4.90	6.35	4.96	4.70	3.63	0.16	0.03	45.93
1992	1.00	3.86	1.75	5.75	0.93	14.05	5.04	8.61	6.60	2.48	4.40	0.48	54.95
1993	7.02	0.57	4.21	2.37	0.00	3.52	8.09	4.03	5.96	1.49	2.30	0.96	40.52
1994	5.10	5.22	2.23	5.66	6.85	9.37	6.46	9.06	8.91	6.42	7.23	2.92	75.43
1995	1.44	1.08	1.18	2.40	3.58	6.76	9.76	16.08	5.05	5.85	1.71	0.58	55.47
Mean	2.54	3.07	2.99	1.87	3.91	7.24	7.25	6.98	5.99	2.73	2.43	2.09	49.11

Table D-5. Monthly and Mean Rainfall (inches) at Fort Drum Rainfall Station.

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	SUM
1965	0.38	3.55	4.71	0.64	0.05	4.55	8.13	5.72	5.94	7.77	0.69	1.61	43.74
1966	4.34	4.10	0.85	2.01	7.37	8.24	4.59	6.95	5.71	3.29	0.82	0.39	48.66
1967	0.31	3.88	1.10	0.00	0.47	8.98	12.18	5.13	6.31	1.30	0.77	2.20	42.63
1968	0.93	1.82	0.63	0.25	3.63	14.21	12.68	2.28	2.36	7.46	2.27	0.46	48.98
1969	2.63	1.46	7.11	3.84	4.89	2.42	3.88	10.72	4.00	11.09	2.89	2.08	57.01
1970	4.74	3.52	4.93	0.07	2.21	3.62	4.82	3.51	4.57	2.96	0.11	0.86	35.92
1971	0.11	3.38	1.62	0.53	5.28	12.60	10.44	5.14	6.90	4.27	0.41	1.40	52.08
1972	1.09	4.59	3.17	1.60	6.95	8.66	4.41	9.02	2.09	1.73	3.10	1.68	48.09
1973	4.97	2.52	2.83	2.24	6.41	10.40	13.83	7.07	7.81	2.89	1.24	1.70	63.91
1974	1.02	1.83	0.08	2.50	3.63	10.63	10.54	10.90	8.09	2.46	0.78	1.48	53.94
1975	0.18	1.89	2.22	1.24	10.66	4.71	15.95	4.22	6.39	5.43	1.31	1.00	55.20
1976	0.35	0.62	1.08	3.03	14.52	7.05	7.39	4.44	10.16	0.65	1.48	3.49	54.26
1977	1.10	1.23	0.53	0.55	3.14	6.41	6.24	8.62	7.13	0.84	5.00	4.29	45.08
1978	1.19	2.80	3.34	0.14	6.36	12.09	9.98	5.34	7.96	1.83	2.83	3.34	57.20
1979	6.82	0.77	0.98	2.91	14.33	1.74	5.69	3.80	22.40	0.77	0.89	1.80	62.89
1980	2.52	2.92	3.89	3.36	2.76	6.13	4.38	3.18	2.92	0.79	2.66	2.02	37.53
1981	0.33	3.35	1.85	0.20	1.54	4.29	4.08	8.82	3.54	2.43	1.52	0.79	32.74
1982	1.12	2.92	6.86	5.47	5.55	8.42	8.80	9.20	5.76	2.44	2.93	1.79	61.26
1983	4.02	7.60	5.20	1.15	1.48	10.85	7.20	10.68	4.65	4.46	2.38	4.62	64.29
1984	0.45	4.24	2.41	1.78	5.23	4.53	9.35	9.08	5.63	0.57	3.81	1.52	48.60
1985	0.53	0.40	2.99	2.49	1.75	5.11	7.48	7.38	14.89	2.38	1.17	1.18	47.75
1986	2.97	0.46	2.92	0.00	1.94	12.48	8.15	5.63	2.99	9.09	0.98	2.63	50.23
1987	4.82	0.68	11.61	0.38	3.79	6.82	5.20	1.66	8.14	3.45	6.77	0.01	53.34
1988	2.95	2.98	4.86	1.10	1.81	8.05	7.33	6.52	2.00	0.84	2.95	0.60	41.99
1989	2.98	1.05	5.27	3.22	1.07	6.96	3.16	9.58	9.12	8.25	1.10	3.06	54.83
1990	0.00	4.35	1.10	2.02	4.20	10.65	10.93	6.97	6.37	5.07	0.00	0.00	51.67
1991	4.86	3.27	5.73	9.60	7.55	14.26	13.17	6.43	6.13	2.62	0.00	0.00	73.62
1992	2.31	3.49	1.34	3.87	0.33	23.50	6.10	11.79	6.26	5.33	5.12	2.17	71.60
1993	8.75	2.19	9.00	3.78	4.30	4.68	5.59	6.60	3.94	10.24	2.80	3.60	65.46
1994	4.35	4.61	0.82	7.07	1.50	10.69	4.79	8.22	7.00	2.57	6.43	3.53	61.60
1995	4.15	4.24	5.13	3.10	2.85	6.55	10.04	14.31	8.35	9.11	1.20	0.67	69.70
1996	4.56	1.90	17.96	2.41	9.32	8.78	5.16	14.02	1.65	6.85	1.26	2.68	76.55
1997	3.98	0.75	1.90	6.67	4.45	11.20	5.80	13.91	7.23	1.73	2.70	7.92	68.23
1998	4.35	5.88	10.18	3.00	1.78	2.05	17.22	8.85	10.69	5.39	6.75	0.30	76.45
1999	2.15	1.15	0.25	2.55	6.94	13.49	4.02	9.69	8.62	13.88	1.90	0.70	65.35
2000	3.50	0.30	1.52	3.52	0.30	3.27	6.80	8.74	4.92	1.90	0.00	0.93	35.70
Mean	2.66	2.69	3.83	2.45	4.45	8.31	7.93	7.61	6.63	4.28	2.19	1.90	54.95

Table D-6. Monthly and Mean Rainfall (inches) at Kissimmee Rainfall Station.

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	SUM
1965	1.69	4.62	2.20	1.05	0.00	8.40	8.47	4.15	4.72	2.11	0.93	2.62	40.96
1966	5.16	7.07	0.45	1.93	4.39	9.82	5.11	7.04	6.10	2.25	0.12	1.68	51.12
1967	0.78	4.14	0.55	0.04	0.45	9.71	10.68	6.41	7.08	0.25	0.08	2.90	43.07
1968	0.27	3.10	0.88	0.47	5.02	15.42	9.38	4.74	3.56	3.12	2.65	0.31	48.92
1969	2.20	1.89	5.76	2.73	3.00	3.69	4.57	6.59	13.07	6.21	1.75	4.59	56.05
1970	2.73	3.09	5.59	1.09	4.43	4.95	9.04	3.89	2.97	2.07	0.82	1.21	41.88
1971	0.40	4.10	3.25	0.82	3.37	3.12	3.97	6.67	3.21	8.05	1.13	1.37	39.46
1972	0.88	3.90	1.22	1.65	2.64	7.44	5.08	8.59	0.96	2.13	3.90	2.45	40.84
1973	4.89	2.38	2.42	2.19	4.39	6.42	8.20	7.99	11.65	0.98	0.70	1.90	54.11
1974	0.32	1.23	2.10	0.67	2.48	11.93	6.62	4.07	4.22	0.38	1.06	1.63	36.71
1975	0.76	1.48	0.88	3.28	7.56	7.86	6.79	5.27	9.18	5.87	0.72	0.42	50.07
1976	0.20	0.40	2.26	1.43	7.70	5.89	4.09	6.80	4.52	0.94	1.77	4.08	40.08
1977	1.64	2.01	2.06	0.23	2.15	3.03	5.69	12.69	7.47	1.96	4.38	5.04	48.35
1978	3.02	3.36	1.69	0.25	2.63	9.01	10.20	6.77	1.20	1.90	0.26	3.19	43.48
1979	6.42	1.57	2.48	1.92	10.91	2.85	3.29	7.32	12.52	0.12	1.71	1.45	52.56
1980	2.22	2.51	2.33	3.43	5.85	1.48	3.86	2.99	1.32	0.58	3.94	0.45	30.96
1981	0.22	5.08	1.59	0.11	3.34	9.51	2.91	8.71	6.15	4.47	1.73	3.07	46.89
1982	1.75	1.53	5.81	3.28	4.04	2.60	9.34	4.33	8.28	2.41	0.70	1.03	45.10
1983	1.92	9.62	6.11	2.45	1.94	7.57	8.58	5.32	5.48	8.84	1.44	4.64	63.91
1984	2.20	3.22	1.70	1.15	5.50	2.88	10.53	8.96	3.09	1.11	2.12	0.15	42.61
1985	1.17	0.96	4.15	0.73	4.32	6.32	7.06	6.68	7.99	2.87	0.86	2.62	45.73
1986	4.44	1.94	3.08	0.45	0.56	6.00	4.63	8.36	3.15	3.99	0.84	3.20	40.64
1987	2.92	1.91	12.11	0.53	2.65	4.87	5.98	4.01	6.06	4.09	10.26	0.44	55.83
1988	2.95	1.99	3.56	1.05	3.23	5.15	15.73	10.55	4.79	0.89	8.29	1.06	59.24
1989	3.10	0.07	2.39	1.84	2.89	6.29	6.93	8.39	7.22	2.57	1.69	6.96	50.34
1990	1.49	5.45	1.91	1.81	0.99	5.29	8.19	7.65	6.44	4.47	0.74	0.81	45.24
1991	1.87	0.41	6.12	5.09	8.58	6.96	10.13	6.11	4.88	2.72	0.25	0.37	53.49
1992	1.36	3.09	2.01	5.65	3.30	7.91	2.75	10.73	9.91	3.85	3.19	0.53	54.28
1993	3.63	1.81	6.41	3.08	1.36	5.66	2.74	1.67	4.94	5.79	0.26	0.94	38.29
1994	4.41	3.78	1.34	5.97	5.05	11.49	6.84	8.78	11.29	3.68	7.25	3.13	73.01
1995	1.78	1.75	1.46	2.91	0.99	6.52	9.66	9.91	7.94	4.93	0.96	0.75	49.56
1996	6.97	2.97	9.85	1.83	2.91	9.19	2.77	7.37	7.08	2.48	0.62	2.75	56.79
1997	2.42	2.65	1.77	4.41	2.05	5.72	9.81	10.76	2.58	5.39	5.96	10.01	63.53
1998	1.91	7.84	6.13	1.09	1.30	2.18	5.99	5.08	7.69	0.79	2.39	0.87	43.26
1999	2.72	1.99	0.78	2.34	8.37	8.41	2.22	11.04	5.52	5.57	2.46	0.85	52.27
2000	1.79	0.9	0.53	1.11	2.1	7	9.24	6.6	5.92	1.2	0.88	1.0746	38.345
Mean	2.35	2.94	3.19	1.95	3.68	6.63	6.86	7.03	6.12	3.08	2.19	2.24	48.25

Table D-7. Monthly and Mean Rainfall (inches) at DeSoto City Rainfall Station.

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	SUM
1965	1.29	0.46	2.25	4.88	0.18	8.79	5.88	2.43	9.19	4.11	1.13	0.96	41.55
1966	2.94	8.22	0.87	0.04	2.97	4.25	2.20	5.93	13.75	1.69	0.16	0.08	43.11
1967	0.63	2.01	0.31	0.00	0.00	10.36	3.43	5.78	1.78	1.36	0.46	3.28	29.40
1968	0.16	1.35	0.12	0.00	4.27	15.31	4.26	1.56	1.31	3.94	3.06	0.16	35.50
1969	0.58	1.64	8.60	1.50	1.74	4.55	1.63	12.68	10.33	4.87	1.89	3.53	53.54
1970	7.85	3.41	7.61	0.00	1.62	7.34	6.06	1.69	4.77	2.47	0.00	0.31	43.13
1971	0.52	2.66	4.32	1.17	4.95	5.09	5.68	9.45	6.77	4.70	1.39	1.50	48.20
1972	2.23	3.34	4.60	0.64	3.94	10.01	8.43	8.26	0.41	3.38	5.55	2.08	52.87
1973	6.85	1.35	2.06	2.86	3.11	6.74	6.50	10.09	6.36	1.28	1.80	1.54	50.54
1974	0.59	2.17	0.26	0.44	6.66	13.89	9.69	7.42	5.99	0.28	0.60	2.47	50.46
1975	0.48	1.38	1.11	1.91	8.98	10.56	6.45	8.54	9.36	1.86	0.49	0.46	51.58
1976	0.31	1.78	1.39	1.19	5.93	11.04	11.30	7.63	11.08	1.65	2.93	1.45	57.68
1977	1.69	1.06	1.51	0.70	1.02	4.10	8.99	4.99	5.57	1.59	4.35	3.69	39.26
1978	2.20	3.45	2.66	0.21	4.60	5.88	15.17	2.87	1.89	4.08	1.25	2.48	46.74
1979	9.40	1.38	2.19	2.53	5.20	6.79	6.74	7.99	13.35	0.18	1.29	1.83	58.87
1980	3.76	2.53	2.14	3.54	5.21	2.40	6.38	1.52	3.64	3.05	3.08	1.19	38.45
1981	0.27	4.42	0.97	0.35	3.54	4.50	3.49	12.75	6.98	1.43	1.76	0.17	40.63
1982	1.74	1.97	7.09	3.71	6.47	18.54	13.64	6.24	6.97	1.15	1.81	1.09	70.42
1983	3.01	10.54	4.85	2.48	1.13	8.08	4.55	4.40	3.13	3.27	2.23	4.31	51.98
1984	0.50	3.93	4.44	2.61	7.77	5.11	8.96	5.32	4.11	0.27	3.46	0.77	47.25
1985	0.65	0.54	2.24	2.23	2.14	7.24	7.66	7.62	9.28	2.66	2.00	0.77	45.03
1986	1.66	1.82	6.96	0.24	1.66	14.15	3.41	4.86	7.06	1.93	1.67	1.76	47.18
1987	3.77	1.06	6.23	0.18	0.81	5.24	5.11	3.53	6.38	5.97	4.17	1.06	43.51
1988	3.41	2.76	4.20	0.17	3.71	5.75	7.18	3.47	4.67	0.40	3.47	1.15	40.34
1989	2.25	0.92	2.71	3.65	2.55	4.65	4.81	10.85	8.24	4.65	0.69	2.88	48.85
1990	0.33	4.05	3.14	2.30	1.52	7.52	6.83	11.74	3.36	1.04	0.68	1.14	43.65
1991	4.42	1.94	3.05	3.10	4.94	11.43	10.22	6.39	2.91	3.19	1.32	0.45	53.36
1992	0.76	4.53	2.50	3.81	0.55	13.56	3.95	12.12	2.59	1.71	3.97	0.60	50.65
1993	6.70	3.85	5.21	4.14	1.56	8.55	6.03	7.25	7.89	5.59	0.42	0.90	58.09
1994	2.83	1.73	1.49	4.17	2.19	9.75	4.74	7.28	11.65	2.44	2.27	3.11	53.65
1995	2.26	2.25	1.93	4.09	1.13	8.22	5.76	7.99	6.73	8.90	1.75	0.52	51.53
1996	3.13	0.83	3.55	0.84	5.88	8.24	2.45	3.27	4.05	3.86	0.59	0.88	37.56
1997	1.58	0.94	1.87	8.42	3.10	9.16	8.25	7.02	7.47	0.71	7.76	6.25	62.53
1998	3.87	6.54	9.53	2.54	3.99	2.60	8.59	6.85	12.77	0.73	8.05	0.39	66.44
1999	2.71	0.96	1.44	1.57	5.69	16.37	5.41	11.28	4.98	5.96	1.07	1.33	58.77
2000	1.30	0.31	1.27	3.74	0.29	4.77	5.36	2.92	11.47	1.54	0.67	0.77	34.41
Mean	2.46	2.61	3.24	2.11	3.36	8.35	6.53	6.72	6.62	2.72	2.20	1.59	48.52

Table D-8. Monthly and Mean Rainfall (inches) at Moore Haven Rainfall Station.

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	SUM
1965	0.42	3.59	3.16	1.76	1.11	10.16	5.57	2.78	4.71	9.06	0.34	1.89	44.55
1966	5.47	3.67	0.42	3.01	5.97	9.26	10.93	11.19	6.76	2.62	0.11	0.40	59.81
1967	0.84	1.69	0.24	0.14	2.58	11.27	7.02	3.74	8.53	3.37	0.08	1.95	41.45
1968	0.58	1.72	1.03	0.85	8.64	10.73	7.13	4.23	6.81	3.21	2.25	0.21	47.39
1969	1.76	2.28	6.19	0.69	4.10	10.09	3.68	10.04	8.49	11.75	1.46	3.82	64.35
1970	3.55	2.40	12.63	0.02	2.98	8.74	5.91	7.35	3.46	4.70	0.13	0.28	52.15
1971	0.25	0.51	0.37	0.14	1.50	13.86	7.28	8.29	7.18	6.35	0.90	1.20	47.83
1972	0.30	1.55	2.24	2.34	7.52	10.50	2.77	6.40	0.93	0.40	2.21	1.39	38.55
1973	2.72	2.73	3.34	1.02	5.88	10.48	8.01	5.58	8.43	1.38	0.03	1.52	51.12
1974	0.14	1.36	0.08	0.97	3.00	14.91	18.56	7.99	5.91	1.35	1.64	1.71	57.62
1975	0.20	1.95	0.74	1.22	4.89	5.29	7.00	3.13	11.11	4.88	0.27	0.38	41.06
1976	0.65	1.41	1.59	1.81	4.43	3.10	9.98	12.31	5.74	0.80	1.88	1.55	45.25
1977	4.87	1.38	1.12	0.20	5.17	3.74	6.19	5.51	6.29	1.01	5.33	4.74	45.55
1978	1.78	1.39	2.64	2.06	8.38	5.43	9.32	2.67	6.40	2.23	2.13	4.39	48.82
1979	5.83	0.23	2.30	0.84	7.64	1.09	1.45	5.66	17.69	2.06	1.83	1.96	48.58
1980	2.76	1.08	2.32	5.29	2.23	3.10	7.58	7.61	6.88	1.47	2.20	0.62	43.14
1981	0.87	1.52	1.28	0.38	2.06	3.33	3.70	10.29	4.54	0.24	1.27	0.15	29.63
1982	0.55	2.81	6.70	3.04	10.13	11.07	10.81	3.09	4.70	5.38	0.26	0.76	59.30
1983	4.22	8.04	5.57	1.75	0.38	7.46	4.36	5.95	3.36	4.29	1.61	2.78	49.77
1984	0.33	4.06	5.20	2.63	6.50	4.92	11.34	6.32	2.84	0.46	2.97	0.09	47.66
1985	0.54	0.41	2.11	7.04	1.11	4.51	8.52	5.34	6.17	1.88	1.41	3.25	42.29
1986	2.34	1.07	6.36	0.24	1.59	12.04	3.59	7.89	6.29	4.91	0.41	2.41	49.14
1987	3.65	1.94	6.59	0.00	1.33	4.18	6.42	3.77	9.91	6.06	8.53	0.59	52.97
1988	1.52	2.57	2.92	0.76	1.54	2.87	6.35	5.81	1.62	0.80	4.15	0.72	31.63
1989	1.62	0.10	2.76	5.02	1.62	5.76	6.45	3.01	8.33	2.93	0.35	2.19	40.14
1990	0.04	2.79	0.68	3.03	2.57	5.47	9.23	10.82	2.77	3.02	0.88	0.39	41.69
1991	5.57	0.90	3.93	4.47	6.58	6.18	6.93	8.02	3.05	4.90	1.85	0.33	52.71
1992	1.06	3.73	3.55	1.45	0.71	24.10	2.40	9.47	1.41	1.31	1.63	0.61	51.43
1993	4.72	2.01	2.54	2.15	2.38	3.98	3.19	5.28	5.60	5.05	1.01	1.04	38.95
1994	3.32	3.12	3.37	2.23	5.26	6.99	5.07	3.91	12.38	3.70	3.79	4.99	58.13
1995	2.97	2.89	5.52	3.57	2.23	7.56	15.02	7.33	4.72	10.69	0.24	0.30	63.04
1996	3.04	0.87	3.53	0.92	7.45	7.60	3.89	6.27	0.75	3.19	0.38	0.73	38.62
1997	0.92	1.05	1.88	6.32	4.22	3.69	4.32	10.28	8.10	0.38	2.24	5.04	48.44
1998	1.02	7.59	4.59	0.24	1.13	4.15	2.86	14.22	8.37	2.18	4.15	1.68	52.18
1999	3.75	0.20	0.19	1.51	3.15	14.57	7.10	6.96	13.05	4.20	0.48	1.07	56.23
2000	0.74	0.78	1.67	2.57	0.62	7.62	5.77	0.40	8.08	2.87	0.24	0.57	31.93
Mean	2.08	2.15	3.09	1.99	3.85	7.77	6.82	6.64	6.43	3.47	1.68	1.60	47.59

Table D-9. Monthly and Mean Rainfall (inches) at Mountain Lake Rainfall Station.

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	SUM
1965	2.01	4.39	2.82	2.26	0.13	9.75	10.34	4.48	5.26	3.59	0.48	2.03	47.54
1966	7.16	5.60	1.71	2.79	6.43	6.44	4.55	10.84	5.84	0.54	0.02	2.30	54.22
1967	0.84	3.91	1.16	0.00	0.38	11.11	6.86	14.22	3.58	0.76	0.23	2.94	45.99
1968	0.47	1.98	0.84	0.45	7.53	13.24	7.65	6.18	6.91	2.11	2.74	0.12	50.22
1969	5.26	1.53	6.43	0.90	2.53	6.58	5.06	6.93	5.91	6.32	2.85	4.15	54.45
1970	2.89	2.08	5.74	0.48	4.14	5.52	9.17	5.82	3.94	1.32	0.48	1.11	42.69
1971	0.13	4.48	1.76	0.82	3.42	4.42	8.27	4.62	2.53	5.55	2.13	1.33	39.47
1972	1.09	5.26	2.64	1.69	3.25	6.72	4.63	7.37	1.86	1.89	2.07	2.84	41.31
1973	7.15	2.35	5.72	4.41	4.42	4.96	14.76	7.72	9.65	1.16	1.45	1.65	65.40
1974	0.29	1.20	0.56	0.86	2.07	11.84	11.97	6.74	8.21	0.09	0.18	1.80	45.81
1975	0.76	2.04	0.93	0.85	4.08	5.55	5.94	12.02	6.32	5.63	0.99	0.49	45.60
1976	0.29	0.85	1.16	2.30	9.65	10.91	5.76	8.90	9.18	1.20	3.25	2.59	56.04
1977	2.22	1.68	1.59	0.20	2.28	5.50	9.60	10.20	4.69	1.95	2.38	3.34	45.63
1978	2.73	3.65	2.77	0.67	7.62	10.09	9.95	3.78	2.78	1.05	0.50	3.42	49.01
1979	6.51	1.05	1.92	1.41	11.99	8.56	4.04	7.54	15.80	0.04	2.58	1.91	63.35
1980	3.87	2.65	1.96	1.57	6.65	3.04	6.44	4.77	2.41	1.57	3.89	1.11	39.93
1981	0.36	3.78	1.02	0.00	2.26	3.86	6.84	5.73	6.01	0.34	0.95	1.62	32.77
1982	1.31	1.03	7.73	3.90	8.44	11.93	9.50	6.03	8.34	1.21	0.33	1.02	60.77
1983	2.83	9.39	6.37	2.37	1.71	8.51	7.41	3.78	4.72	4.94	4.33	7.80	64.16
1984	0.75	3.32	2.80	1.33	5.52	3.66	11.16	4.65	3.51	0.41	1.61	0.25	38.97
1985	0.75	0.53	2.28	2.36	3.11	8.39	7.72	7.43	8.26	2.30	1.44	1.07	45.64
1986	2.86	1.80	5.52	0.52	0.45	18.65	5.72	8.36	3.22	3.77	0.14	5.80	56.81
1987	2.36	1.49	9.05	1.05	2.85	5.91	4.71	5.39	6.49	5.25	8.98	0.10	53.63
1988	2.60	1.73	5.31	1.02	3.17	4.67	8.99	8.31	4.94	0.80	4.40	0.90	46.84
1989	2.72	0.04	2.77	2.06	3.11	4.99	8.22	5.15	5.10	2.19	3.75	3.84	43.94
1990	0.16	3.57	1.32	2.15	4.68	6.37	8.21	5.00	2.69	4.55	1.65	1.25	41.60
1991	2.03	1.06	4.43	5.02	8.28	6.54	9.31	5.41	1.27	4.52	1.04	0.68	49.59
1992	1.31	3.81	0.84	4.57	3.03	9.08	3.20	11.79	7.00	4.45	3.50	0.76	53.35
1993	5.78	3.55	4.56	4.20	2.36	3.29	5.85	3.82	6.75	3.37	0.31	1.03	44.86
1994	4.20	2.33	2.28	1.84	1.97	12.19	6.06	4.32	11.42	4.04	3.99	3.31	57.95
1995	2.14	2.03	1.43	4.26	1.35	9.56	9.20	8.54	10.90	3.07	2.40	0.41	55.29
1996	5.61	0.45	5.72	1.69	2.22	12.60	5.02	8.61	4.08	3.33	0.90	2.90	53.13
1997	1.33	0.93	2.82	5.21	2.65	6.09	9.29	6.84	3.16	2.88	3.54	6.50	51.24
1998	2.95	6.55	4.81	0.33	0.89	0.20	6.37	5.13	7.38	0.28	2.08	1.06	38.03
1999	3.34	0.50	0.62	1.69	4.31	10.86	3.18	4.44	3.20	4.88	1.27	2.17	40.46
2000	0.88	0.24	1.10	0.72	0.02	6.39	7.22	6.78	4.47	0.85	0.73	0.13	29.53
Mean	2.50	2.58	3.12	1.89	3.86	7.72	7.45	6.88	5.77	2.56	2.04	2.10	48.48

Table D-10. Monthly and Mean Rainfall (inches) at Okeechobee Rainfall Station.

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	SUM
1965	0.34	4.99	2.89	2.03	0.84	6.37	5.20	5.71	3.75	6.22	1.10	0.95	40.39
1966	4.32	3.83	1.56	3.38	3.16	12.93	8.74	7.55	7.04	4.71	0.28	0.51	58.01
1967	1.22	2.64	0.30	0.17	0.17	7.19	7.27	4.39	4.77	3.82	0.07	1.13	33.14
1968	0.46	2.01	0.85	0.29	6.75	16.47	6.99	2.81	7.32	5.07	1.57	0.00	50.59
1969	3.82	1.43	5.08	1.98	6.69	4.08	6.64	5.20	3.71	7.83	3.41	2.87	52.74
1970	4.92	3.14	7.21	0.00	4.83	8.48	7.21	7.12	5.10	7.72	0.04	0.87	56.64
1971	0.32	0.95	2.29	0.48	2.49	8.01	6.95	6.44	6.27	5.24	1.73	2.28	43.44
1972	1.24	4.06	2.82	3.52	5.41	9.34	5.26	6.72	2.42	2.92	3.98	2.09	49.76
1973	4.91	2.82	3.01	2.87	5.18	7.33	9.10	6.99	8.39	3.87	1.06	2.02	57.55
1974	1.16	1.31	0.97	1.76	4.10	11.46	11.08	7.35	5.70	2.02	0.79	1.97	49.66
1975	0.25	3.30	0.55	0.58	5.79	2.25	6.63	1.60	4.47	1.16	1.09	0.21	27.88
1976	0.20	1.32	0.59	1.70	6.14	5.62	3.54	6.52	5.32	1.02	2.08	2.00	36.05
1977	2.01	0.60	0.69	1.02	1.34	5.30	4.24	4.75	3.08	1.35	4.24	3.09	31.71
1978	1.90	1.31	3.18	1.87	1.73	5.58	6.35	7.81	6.82	3.04	1.69	4.71	45.99
1979	5.00	0.32	2.45	1.51	12.95	1.29	6.15	8.18	14.10	1.60	1.93	1.87	57.35
1980	3.28	1.49	2.22	6.71	5.28	4.84	6.90	7.32	5.60	2.10	3.92	1.41	51.08
1981	0.99	2.45	0.79	0.50	2.37	2.70	2.92	11.58	8.88	0.97	1.86	0.13	36.14
1982	0.80	2.72	9.23	4.69	4.38	6.09	3.94	10.20	7.42	3.81	3.78	0.76	57.82
1983	4.02	7.78	3.82	1.58	3.01	6.09	6.71	5.66	4.48	8.92	1.39	2.88	56.34
1984	0.14	2.59	3.00	3.10	5.15	4.92	10.60	3.94	4.46	1.36	3.03	0.60	42.89
1985	0.23	0.15	2.77	2.78	0.78	5.99	7.92	7.01	5.24	1.93	0.78	2.01	37.59
1986	1.02	0.35	3.50	0.09	3.22	7.52	5.74	5.82	7.18	4.47	2.75	2.90	44.56
1987	3.46	1.61	4.68	0.50	3.57	7.93	5.77	1.47	5.48	5.37	7.35	0.96	48.15
1988	3.29	3.46	3.39	0.65	5.28	6.89	7.19	8.78	1.68	1.55	3.22	1.10	46.48
1989	1.30	0.53	2.92	3.61	0.83	1.52	6.86	6.87	6.68	6.99	0.95	2.97	42.03
1990	0.58	1.90	0.35	2.67	4.04	4.62	11.37	9.74	3.78	6.09	1.16	0.48	46.78
1991	4.87	1.38	4.95	6.37	3.72	5.15	8.06	7.93	7.78	1.80	2.67	1.25	55.93
1992	1.35	3.25	1.83	2.53	1.06	18.82	4.09	7.49	4.27	2.49	3.32	0.69	51.19
1993	8.41	2.92	6.04	1.15	1.54	4.59	2.00	6.50	5.45	4.73	1.92	0.83	46.08
1994	3.15	4.43	2.61	6.22	3.98	3.81	4.97	11.53	6.50	4.25	4.92	4.49	60.86
1995	2.68	1.45	3.55	2.25	2.14	10.58	5.64	7.00	8.15	12.80	0.41	0.69	57.33
1996	3.83	1.37	10.64	1.74	6.31	7.83	4.92	6.52	4.19	5.95	1.07	2.24	56.60
1997	2.94	1.79	2.60	6.84	13.17	7.70	5.26	4.55	6.75	2.19	5.80	5.55	65.15
1998	3.06	6.02	4.85	1.73	2.25	3.22	8.09	9.47	7.30	4.62	5.27	1.05	56.93
1999	2.92	0.56	1.03	3.96	5.82	13.73	6.47	3.46	7.40	4.65	1.33	1.42	52.74
2000	1.12	0.97	1.29	3.05	0.11	2.82	3.52	2.51	8.76	0.66	0.12	0.50	25.43
Mean	2.38	2.31	3.07	2.39	4.04	6.92	6.40	6.51	5.99	4.04	2.28	1.71	48.03

Table D-11. Monthly and Mean Rainfall (inches) at Orlando Rainfall Station.

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	SUM
1965	1.85	4.34	2.84	1.32	0.35	8.11	9.83	6.25	4.48	3.81	0.97	2.50	46.65
1966	4.69	5.61	1.49	2.57	5.08	10.86	5.76	7.01	7.81	2.20	0.35	1.24	54.68
1967	1.27	4.31	0.83	0.08	1.69	8.98	9.67	10.10	5.63	0.73	0.16	2.41	45.87
1968	0.58	2.59	1.66	0.57	4.92	14.91	7.56	6.90	4.02	5.32	3.04	1.03	53.10
1969	2.15	2.61	5.73	1.97	2.90	4.18	6.36	8.58	8.52	8.22	2.02	4.81	58.04
1970	3.92	3.87	5.22	1.23	3.92	4.86	7.00	5.91	4.39	3.09	0.81	1.21	45.41
1971	1.17	4.87	2.31	1.50	3.65	5.27	6.91	6.68	4.13	5.86	1.77	2.21	46.34
1972	1.46	4.74	4.43	1.58	4.37	6.84	5.00	9.79	1.83	3.14	5.46	2.38	51.01
1973	4.84	2.47	3.83	2.95	4.33	4.99	8.41	7.20	8.76	1.82	0.93	3.19	53.74
1974	0.35	0.63	3.67	1.17	2.69	15.28	6.01	6.56	5.78	0.48	0.31	1.62	44.55
1975	0.98	1.49	1.10	1.36	7.52	9.70	9.26	4.75	4.97	4.74	0.66	0.51	47.04
1976	0.37	0.83	1.72	2.16	10.36	9.93	7.05	3.25	5.87	0.74	2.03	2.77	47.08
1977	1.81	1.76	1.82	0.14	1.47	4.47	6.61	6.28	7.03	0.43	2.60	3.70	38.12
1978	2.49	5.45	2.14	0.61	3.16	10.00	11.92	5.13	4.31	1.51	0.18	3.69	50.59
1979	6.48	1.45	3.24	1.08	7.66	4.00	7.95	5.88	9.19	0.43	1.93	0.94	50.23
1980	2.45	1.64	1.51	4.07	6.96	5.25	5.14	2.92	3.70	0.55	6.55	0.47	41.21
1981	0.21	4.36	1.85	0.18	2.02	12.49	3.53	5.60	8.26	3.13	2.50	2.97	47.10
1982	1.72	1.34	4.85	6.27	5.29	6.06	11.81	5.03	6.96	0.74	0.53	1.01	51.61
1983	2.08	8.32	5.37	3.21	1.77	7.82	6.49	4.83	5.16	3.78	1.36	5.33	55.52
1984	2.01	2.73	1.85	6.21	3.20	5.32	6.19	7.89	6.19	0.56	2.10	0.19	44.44
1985	0.91	1.27	4.59	1.69	3.00	4.54	7.28	11.63	5.45	2.55	0.82	3.46	47.19
1986	7.23	1.84	2.63	0.49	0.88	9.50	5.85	5.99	4.50	5.63	1.69	3.60	49.83
1987	1.27	1.74	11.38	0.59	1.40	3.54	7.95	6.07	8.64	3.41	10.29	0.51	56.79
1988	3.12	1.38	6.07	2.02	2.82	4.17	9.44	7.94	5.67	1.42	7.44	1.00	52.49
1989	3.80	0.15	1.35	2.28	2.38	6.79	4.74	6.20	10.29	1.75	1.44	4.49	45.66
1990	0.23	4.13	1.92	1.73	0.55	6.22	6.68	3.78	2.46	2.10	1.05	0.83	31.68
1991	2.37	0.98	6.66	7.72	9.48	5.98	10.78	7.13	4.53	4.76	0.27	0.24	60.90
1992	1.35	2.42	3.67	9.10	1.19	8.68	2.60	8.03	7.13	5.17	2.74	0.88	52.96
1993	4.89	1.48	6.26	1.78	2.32	4.47	6.49	5.95	5.35	4.61	0.17	0.76	44.53
1994	4.00	3.58	1.21	3.03	2.87	10.28	13.27	6.23	7.84	5.18	7.32	3.04	67.85
1995	1.50	1.13	2.12	0.81	4.24	8.23	5.10	9.48	3.59	4.35	1.74	0.76	43.05
1996	5.39	1.52	9.87	0.68	5.12	6.51	4.06	11.33	6.04	3.28	0.72	2.14	56.66
1997	1.13	2.44	3.46	4.02	3.17	8.20	11.51	7.99	2.59	4.22	3.15	12.63	64.51
1998	1.99	8.74	5.26	0.52	3.17	1.58	8.61	5.59	5.36	0.64	1.67	0.62	43.75
1999	2.99	0.36	0.56	2.40	5.43	13.84	5.14	4.50	6.40	8.40	2.13	2.65	54.80
2000	1.23	0.36	0.45	2.22	1.00	6.19	4.07	4.48	6.37	1.33	1.10	1.58	30.38
Mean	2.40	2.75	3.47	2.26	3.68	7.45	7.28	6.63	5.81	3.06	2.22	2.32	49.32

Table D-12. Monthly and Mean Rainfall (inches) at S-65 Rainfall Station.

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	SUM
1965	1.15	3.56	4.10	2.05	1.28	8.14	12.11	4.95	5.97	4.81	0.91	2.46	51.48
1966	5.56	5.82	1.69	1.49	4.58	5.29	6.87	4.86	4.67	3.14	0.08	0.89	44.94
1967	1.33	2.70	0.22	0.00	0.38	6.61	7.00	7.25	6.65	0.46	0.13	1.89	34.62
1968	0.60	2.03	1.31	0.33	9.16	14.64	5.30	2.98	5.71	7.45	2.39	0.20	52.10
1969	1.85	1.34	7.81	1.89	1.89	6.92	8.32	6.67	9.64	10.17	3.17	3.66	63.33
1970	2.34	2.20	5.41	0.79	3.58	5.60	8.79	3.79	2.48	6.05	0.34	1.00	42.37
1971	0.00	4.77	1.15	0.38	1.07	8.34	8.24	5.41	2.31	5.79	0.41	1.39	39.26
1972	2.99	4.21	2.79	2.47	5.52	8.02	2.74	4.46	0.66	1.37	5.58	3.16	43.97
1973	5.23	1.58	2.58	7.26	5.22	4.42	7.98	6.44	7.05	3.86	0.08	1.69	53.39
1974	0.40	1.86	0.08	3.40	8.17	13.98	20.28	10.97	6.84	0.47	0.32	4.69	71.46
1975	1.08	2.71	2.10	2.38	10.18	5.65	9.00	8.27	7.68	5.19	0.85	0.58	55.65
1976	0.57	0.33	0.94	1.40	5.67	11.65	5.08	14.37	7.13	2.70	1.30	2.99	54.13
1977	2.78	1.48	1.42	0.82	10.18	5.65	9.00	7.17	5.28	1.49	4.01	3.42	52.71
1978	2.30	3.60	2.76	0.29	6.74	13.41	10.14	7.89	6.98	4.98	1.24	3.36	63.69
1979	5.45	1.47	1.52	2.26	10.57	3.94	2.50	7.16	19.52	0.52	1.21	1.33	57.45
1980	2.75	5.29	2.60	3.24	5.02	10.32	6.54	10.41	3.88	1.86	7.96	1.36	61.23
1981	0.49	3.51	1.47	0.30	2.61	6.26	6.66	10.13	11.20	1.16	1.58	0.29	45.66
1982	2.15	3.23	6.43	7.47	7.06	8.68	8.05	2.60	7.97	4.60	0.95	1.49	60.68
1983	4.47	8.08	4.77	2.36	1.96	9.52	3.74	3.74	4.79	4.51	1.90	4.15	53.99
1984	0.77	2.52	2.15	2.35	6.36	4.51	8.88	5.64	2.91	1.10	3.99	0.56	41.74
1985	0.69	0.69	1.45	1.92	3.45	7.21	6.72	5.89	4.16	1.26	3.00	1.69	38.13
1986	2.46	1.52	5.15	0.30	0.97	8.93	6.55	5.92	5.57	1.59	1.46	2.32	42.74
1987	2.80	1.92	8.34	0.26	1.38	7.41	5.72	1.81	8.74	6.70	10.39	0.12	55.59
1988	2.16	2.96	6.31	0.44	1.85	5.36	13.09	8.88	4.76	1.07	2.92	1.82	51.62
1989	3.39	0.60	4.47	2.08	4.68	7.28	5.06	3.46	7.81	1.66	2.04	3.39	45.92
1990	0.38	5.14	0.38	1.13	1.18	7.31	9.55	9.00	4.75	2.66	0.88	0.72	43.08
1991	2.63	1.23	5.68	4.16	6.61	4.71	7.15	7.24	4.25	8.26	0.27	0.82	53.01
1992	0.22	2.80	1.35	4.05	2.06	12.87	8.91	12.00	2.85	2.01	0.75	0.53	50.40
1993	4.15	2.44	4.17	3.39	2.97	0.72	3.17	8.01	5.96	4.00	1.17	0.71	40.86
1994	1.44	3.05	1.48	3.17	1.54	13.34	11.68	4.54	10.44	4.75	4.46	2.63	62.52
1995	1.71	3.61	4.47	3.97	2.18	8.93	4.23	9.60	5.41	5.57	2.88	0.26	52.82
1996	4.67	0.67	5.29	0.97	7.47	7.93	1.59	5.67	3.46	4.38	0.37	2.82	45.29
1997	2.08	1.12	3.48	5.01	5.35	5.05	11.49	9.23	5.99	1.81	10.17	7.44	68.22
1998	4.89	6.70	7.31	0.85	2.47	0.98	9.93	6.09	9.51	1.17	3.06	1.21	54.17
1999	2.58	1.12	1.09	5.12	3.03	7.87	4.07	8.40	7.95	7.98	2.11	2.14	53.46
2000	0.83	0.75	1.82	1.51	2.69	5.79	8.35	3.78	4.42	0.55	0.41	1.13	32.03
Mean	2.26	2.74	3.21	2.26	4.36	7.59	7.62	6.80	6.26	3.53	2.35	1.95	50.94

FREQUENCY ANALYSIS

1-in-10 Year Drought Event

Water supply needs of existing and future reasonable-beneficial uses are estimated based upon demand requirements during a 1-in-10 year drought event (Section 373.0361, (2)(a)1 F.S.). A 1-in-10 year drought event is defined as rainfall with a probability of exceedance of 90 percent for a 12-month period. This means that there is only a 10 percent chance that such a small amount of rain will fall in any given year.

Statistical Method

Because of correlations between rainfall amounts in different months, the sum of the twelve monthly 1-in-10 rainfall events will not equal the annual 1-in-10 rainfall event; in almost all cases a one-in-ten annual drought will be less severe (have more rainfall) than twelve successive monthly one-in-ten rainfall droughts. Attempts to reconcile these 1-in-10 concepts depend upon the assumptions, which one makes with respect to starting month and patterns of serial correlation in rainfall. Based on the results of Abtew and Ali, the gamma distribution was used to estimate 1-in-10 drought levels of rainfall. For more on the use of gamma distribution in engineering statistical analysis, see the Engineering Statistics Handbook, Section 1.3.6.6.11 available from: http://www.itl.nist.gov/div898/handbook/eda/section3/eda366b.htm.

The sum of the monthly 1-in-10 drought rainfalls in all cases was less than the annual 1-in-10 drought rainfall. Each monthly 1-in-10 rainfall was scaled up by a factor, which would ensure that, the sum of the adjusted 1-in-10 monthly rainfalls ….

Maximum likelihood estimates of monthly and annual 1-in-10 drought rainfall based on the two-parameter gamma distribution was conducted using Number Cruncher Statistical System™ software. This method consists of finding the values of the distribution parameters that maximize the log-likelihood of the data values. These parameter values maximize the probability that the current set of data values will occur. For a discussion of maximum likelihood estimation, see "Maximum Likelihood Estimation" by S. Purcell of the Statistical Genetics Group at Kings College, London.

Figure D-3 shows the statistical 1-in-10 year drought event plots for the rainfall stations and **Table D-13** lists the values for 1-in-10 year drought events**.**

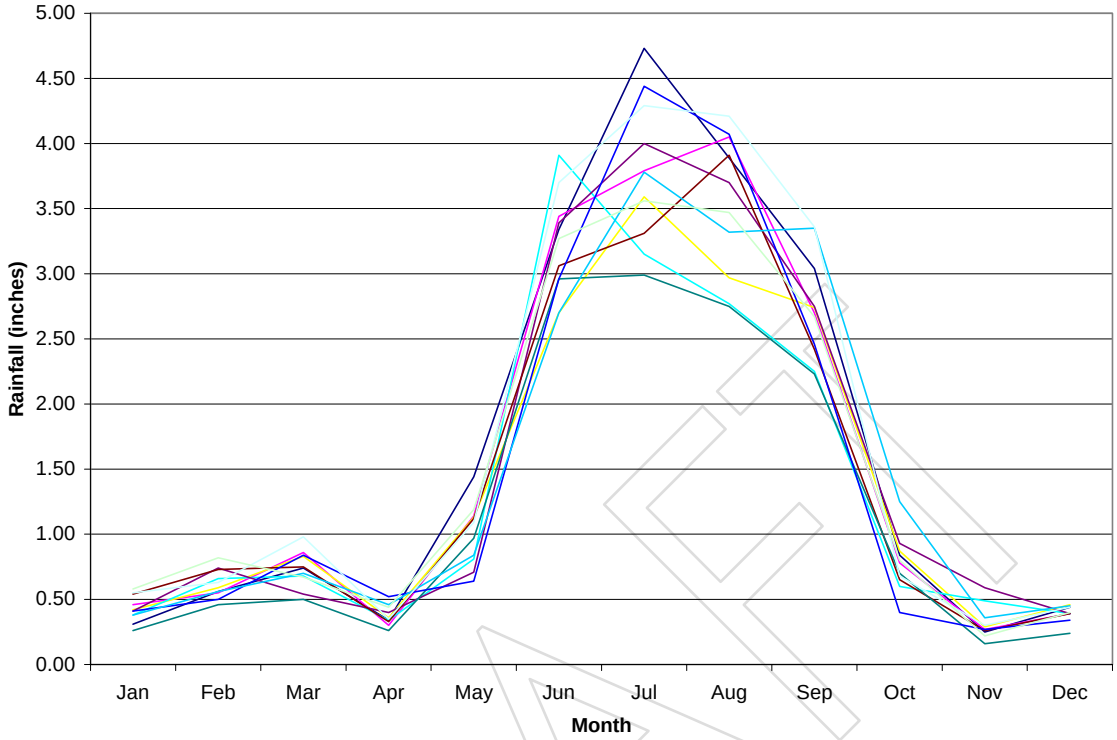

Figure D-3. Statistical 1-in-10 Year Drought Event for Rainfall Stations in the KB Planning Area.

Table D-13. Statistical 1-in-10 Rainfall (in inches) for Stations in the KB Planning Area.

Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Sum	Annual
Archbold	0.3	0.6	0.7	0.3	1.4	3.3	4.7	3.9	3.0	0.8	0.3	0.4	19.9	40.9
Avon Park	0.3	0.6	0.7	0.3	1.3	3.4	4.7	3.9	3.0	0.8	0.2	0.5	19.7	40.9
Brooks Property	0.4	0.6	0.8	0.4	1.1	2.7	3.6	3.0	2.7	0.9	0.3	0.5	17.0	39.8
Fort Drum	0.4	0.7	0.5	0.4	0.7	3.4	4.0	3.7	2.8	0.9	0.6	0.4	18.6	40.5
Lake Placid	0.4	0.7	0.7	0.3	0.8	3.9	3.2	2.8	2.3	0.6	0.5	0.4	16.4	37.4
Kissimmee	0.5	0.7	0.8	0.3	1.1	3.1	3.3	3.9	2.4	0.7	0.3	0.4	17.5	37.8
Moore Haven	0.3	0.5	0.5	0.3	1.0	3.0	3.0	2.8	2.2	0.7	0.2	0.2	14.5	37.0
Mountain Lake	0.4	0.5	0.8	0.5	0.6	3.0	4.4	4.1	2.5	0.4	0.3	0.3	17.9	37.9
Okeechobee	0.4	0.6	0.7	0.5	0.8	2.7	3.8	3.3	3.4	1.3	0.4	0.5	18.2	35.5
Orlando	0.6	0.6	1.0	0.4	1.1	3.7	4.3	4.2	3.4	0.7	0.3	0.4	20.6	39.5
S-65	0.6	0.8	0.7	0.4	1.2	3.3	3.6	3.5	2.7	0.8	0.2	0.4	18.1	39.5

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REFERENCES CITED

Ali, A. and W. Abtew. 1999. Regional Rainfall Frequency Analysis for Central and South Florida. Technical Publication WRE-380. South Florida Water Management District, West Palm Beach, FL. vari. pag.

National Institute of Standards and Technology. 2004. *NIST /SEMATECH e-Handbook of Statistical Methods.* Available from: http://www.itl.nist.gov/div898/handbook/.

Purcell, S. 2000. Maximum Likelihood Estimation. Statistical Genetics Group at Kings College, London. Available from: http://statgen.iop.kcl.ac.uk/bgim/mle/sslike_1.html.

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