PROBABILITIES OF SEQUENCES OF WET AND DRY DAYS AT STATE COLLEGE, MISSISSIPPI

by

J. C. McWhorter and B. P. Brooks, Jr.
Professor and Research Associate
Agricultural Engineering Department
Mississippi State University

INTRODUCTION

Precipitation events are of particular interest to us in the planning and decision-making relative to our day to day operations. We are interested in whether a day will be dry or wet and we rely on the short range forecast to provide this information for operations that will be performed tomorrow or the next day. There are situations when we must make a choice relative to the timing of an event well in advance of its occurrence. In order to bring our best knowledge to bear on this problem we apply a statistical treatment to the long-term records of daily events to determine the probability of occurrence of various rainfall amounts. It is also possible to determine the probability of sequences of wet and dry days. (1)

This type of information gives us a better understanding of our environment and enables us to plan future operations in order to minimize the adverse effects of precipitation and to take full advantage of the favorable aspects of precipitation.

The purpose of this paper is to present daily precipitation probabilities in order to answer questions such as:

1. What is the probability that a given day of the year will be dry (wet)?

2. What is the probability that a given day will be dry if the preceding day was dry?

3. And the probability of other sequences of wet and dry days.

The notation used to describe the several probabilities is as follows:

P(D) = Probability that a given day will be dry.
P(W) = Probability that a given day will be wet.

P(D/D) = Probability that a given day will be dry provided the preceding day was dry.
P(W/D) = Probability that a given day will be wet provided the preceding day was dry.
P(D/W) = Probability that a given day will be dry provided the preceding day was wet.
P(W/W) = Probability that a given day will be wet provided the preceding day was wet.

It is anticipated that these findings will be of value in evaluating costs and benefits relative to field drying of hay, germination of seeds, applying insecticides and herbicides, determining equipment and labor requirements, time limitations for various projects or operations, and optimum time for operations.

The procedures used in this study were similiar to those used by Feyerherm and Bark (2) in their analysis of Kansas precipitation.

In order to conserve space, probability values for each day are not listed. Instead values are given for each week of the year with the value for a week being representative of any day of that week.

PROCEDURE

In computing the probabilities presented in this paper, only the daily weather records for the State College, Mississippi, station covering the thirty year period 1934-1963 were used.

The procedure for computing the daily precipitation values is as follows:

1. For each definition of dry and for each day of the year compute the probability of that day's being dry by dividing the number of times that day was dry by the number of years of record. For example, if we define a dry day as one with .01 inches of rain or less, and look at January 11, we see that January 11 was a dry day for 23 of the 30 years of record. Thus, the probability that January 11 will be dry is 23/30 or .766.

2. The probability that a given day will be dry provided the previous day is dry P(D/D) is then calculated for each day of the year and for each definition of dry. For a given day of the year, the number of times that day was dry when the day before was dry is divided by the total number of times the day before was dry. For example, during the thirty year

period, January 10 was dry (dry = .01) 19 times. January 11 was dry 15 times when the day before was also dry. Thus, P(D/D) is 15/19 or .790.

3. The daily values of P(D) and P(D/D) are averaged into weekly values for each definition of dry.

4. These weekly values are smoothed by averaging three weeks together with double weight on the middle week.

5. The values for P(W), P(W/D), P(D/W), and P(W/W) are computed by the following formulas, using the smoothed weekly values for P(D) and P(D/D):

$$P(W) = 1-P(D)$$
$$P(W/D) = 1-P(D/D)$$
$$P(D/W) = P(D) \times P(W/D) \div P(W)$$
$$P(W/W) = 1-P(D/W).$$

In using Feyerherm and Bark's procedure, the four probabilities determined in step 5 are secured by assuming that probabilities of sequences of wet and dry days can be adequately represented by a Markov chain probability model. (3, 4)

USING THE TABLES

Notice that there are 5 tables presented here, each representing a difference definition of a dry day. For each week shown in the left hand column, there is a single row of entries. These are daily, not weekly values. In order to conserve space, and also due to the fact that there is little difference in day-to-day probabilities, it was decided to present only one value for each week, which can be used for any day in that week.

If you wish to find the probability that a day will be wet or dry, read the value directly from the table. However, a large number of problems involve periods of more than just one day, and a different procedure is used. For example, suppose we are interested in probabilities concerning the three day interval January 1-3, with a dry day defined as .01 or less. There are 8 possible 3-day sequences of wet and drys. (There are always 2^n sequences where n is the number of days.) The probability for any one of the sequences is computed by multiplying the appropriate initial probability and the two transitional probabilities obtained from the table.

Specifically, the probabilities of the various sequences are:

Sequence				Probability				
S_1	D	D	D	P(D) x P(D/D) x P(D/D)	=	(.671) (.760) (.760)	=	.388
S_2	W	D	D	P(W) x P(D/W) x P(D/D)	=	(.329) (.490) (.760)	=	.122
S_3	D	W	D	P(D) x P(W/D) x P(D/W)	=	(.671) (.240) (.490)	=	.079
S_4	D	D	W	P(D) x P(D/D) x P(W/D)	=	(.671) (.760) (.240)	=	.122
S_5	W	W	D	P(W) x P(W/W) x P(D/W)	=	(.329) (.510) (.490)	=	.082
S_6	W	D	W	P(W) x P(D/W) x P(W/D)	=	(.329) (.490) (.240)	=	.039
S_7	D	W	W	P(D) x P(W/D) x P(W/W)	=	(.671) (.240) (.510)	=	.082
S_8	W	W	W	P(W) x P(W/W) x P(W/W)	=	(.329) (.510) (.510)	=	.086

Note that the sum of the above probabilities is 1.000. This must be the case since one of the events must happen, but two cannot occur.

Tocompute the probability that at least two of the three days are dry, for example, just add the probabilities of the sequences which have two or more dry days, and we get .388 + .122 + .079 + .122 = .711. A similar procedure can be used to compute the probabilities of at least two wet days, one wet day, etc.

EXAMPLES AND CONCLUSIONS

The following examples are presented in order to suggest the type of problems that might be solved when the probability of daily precipitation events is known.

1. In Northeast Mississippi cotton is generally planted between April 15 and May 15. It is desirable for a shower to occur shortly after planting. Using the probability values developed in this study, let us compute the probability of no rains exceeding .20 inches per day occurring in the week following planting.

   We will solve the problem using Table 3. We will assume the seed was planted on a dry day, so we will use the Dry/Dry values for each of the seven days. If the seed is planted on April 15, the probability that the next seven days are dry is:

   $$(.861)\ (.851)^6 = .327$$

   If the seed is planted on May 15, the probability that the next seven days are dry is:

   $$(.900)^4\ (.891)^3 = .464$$

Thus, we see that from about a third to half the time there will be no rainfall exceeding .20 inches per day following cotton planting.

2. In Northeast Mississippi hay is cut several times during the summer. For proper curing, two dry days are needed after cutting to allow the hay to dry before baling. Let us suppose, for example, that hay is cut in mid-July, and let us then compute the probability that .01 inches or less of rainfall occurred on each of the two days following cutting.

   Table 1 will be used for this problem. We will assume that the hay was cut on about July 15, and that the day of the cutting was dry. We will then use the dry/dry values to compute the probability. The probability that the two days following cutting are dry is:

   $$(.774)\ (.774) = .599$$

   So we see that we will have two consequetive dry days after hay cutting in mid-July about 60% of the time.

3. Let us suppose that the Oktibbeha County Fair is a three day event occurring during the first week of October. Let us also suppose that past experience has shown that on a dry day (less than .20 inches) about 5,000 persons will attend the fair, while on a rainy day only about 2,000 will attend. Let us then compute the attendance which can be expected, on the average, at the Oktibbeha County Fair.

   First, we see that the following sequences of wet and dry days are possible for a three day event:

Sequences				Probability	Expected Attendance
S_1	D	D	D	(.886) (.912) (.912) = .737	15,000
S_2	D	D	W	(.886) (.912) (.088) = .071	12,000
S_3	D	W	D	(.886) (.088) (.684) = .053	12,000
S_4	D	W	W	(.886) (.088) (.316) = .025	9,000
S_5	W	D	D	(.114) (.684) (.912) = .071	12,000
S_6	W	D	W	(.114) (.684) (.088) = .007	9,000
S_7	W	W	D	(.114) (.316) (.684) = .025	9,000
S_8	W	W	W	(.114) (.316) (.316) = .011	6,000
				1.000	

The total expected attendance is then $P(S_1)\ E(S_1) + P(S_2)\ E(S_2) + \ldots + P(S_8)\ E(S_8)$ where $P(S_1)$ is the probability of the occurrence of sequences S_1, and $E(S_1)$ is the expected attendance of sequence S_1. The expected attendance then is:

$$(.737)\ (15,000) + (.071)\ (12,000) + (.053)\ (12,000) + (.025)\ (9,000) + (.071)\ (12,000) + (.007)\ (9,000) + (.025)\ (9,000) + (.011)\ (6,000) = 13,974.$$

Thus, the attendance at the fair will generally average around 14,000.

All of these examples tend to oversimplify the real situation. Attendance at a fair is dependent on many factors other than just rainfall. Also, a rain of .20 in the morning, followed by bright sunshine, might not appreciably affect attendance. This oversimplification is generally necessary in most applications; however, despite this shortcoming, a knowledge of precipitation probabilitiescan help to evaluate the uncertainty surrounding events, and thus help in making decisions.

REFERENCES

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3. Gabriel, K. R. and J. Neumann, "A Markov Chain Model for Daily Rainfall Occurrence at Tel Aviv." Quarterly Journal of the Royal Meteorological Siciety, Vol. 88, No. 375., January, 1962.

4. Weiss, L. L., "Sequences of Wet or Dry Days Described by a Markov Chain Probability Model." Monthly Weather Review, Vol. 92, No. 4, April 1964.

TABLE 1.

PROBABILITY THAT A GIVEN DAY WILL BE WET OR DRY
STATE COLLEGE

Dry Day - .01 inches or less

Period Of	Initial		Transition			
	Dry	Wet	Dry/Dry	Wet/Dry	Dry/Wet	Wet/Wet
Jan. 1 - Jan. 7	.671	.329	.760	.240	.490	.510
Jan. 8 - Jan. 14	.673	.327	.754	.246	.506	.494
Jan. 15 - Jan. 21	.675	.325	.738	.262	.544	.456
Jan. 22 - Jan. 28	.680	.320	.750	.250	.531	.469
Jan. 29 - Feb. 4	.678	.322	.763	.237	.501	.499
Feb. 5 - Feb. 11	.681	.319	.754	.246	.525	.475
Feb. 12 - Feb. 18	.673	.327	.728	.272	.560	.440
Feb. 19 - Feb. 25	.646	.354	.706	.294	.535	.465
Feb. 26 - Mar. 3	.646	.354	.709	.291	.533	.467
Mar. 4 - Mar. 10	.679	.321	.724	.276	.585	.415
Mar. 11 - Mar. 17	.690	.310	.731	.269	.600	.400
Mar. 18 - Mar. 24	.676	.324	.725	.275	.574	.426
Mar. 25 - Mar. 31	.690	.310	.732	.268	.598	.402
Apr. 1 - Apr. 7	.728	.272	.760	.240	.643	.357
Apr. 8 - Apr. 14	.745	.255	.780	.220	.644	.356
Apr. 15 - Apr. 21	.757	.243	.796	.204	.637	.363
Apr. 22 --Apr. 28	.751	.249	.806	.194	.587	.413
Apr. 29 - May 5	.733	.267	.800	.200	.549	.451
May 6 - May 12	.759	.241	.812	.188	.592	.408
May 13 - May 19	.776	.224	.826	.174	.600	.400
May 20 - May 26	.753	.247	.813	.187	.570	.430
May 27 - June 2	.751	.249	.805	.195	.590	.410
June 3 - June 9	.744	.256	.794	.206	.599	.401
June 10 - June 16	.705	.295	.768	.232	.554	.446
June 17 - June 23	.715	.285	.774	.226	.568	.432
June 24 - June 30	.739	.261	.780	.220	.622	.378
July 1 --July 7	.707	.293	.770	.230	.554	.446
July 8 - July 14	.686	.314	.777	.223	.487	.513
July 15 - July 21	.674	.326	.774	.226	.467	.533
July 22 --July 28	.677	.323	.772	.228	.479	.521
July 29 - Aug. 4	.725	.275	.788	.212	.560	.440
Aug. 5 - Aug. 11	.751	.249	.792	.208	.629	.371
Aug. 12 - Aug. 18	.745	.255	.782	.218	.638	.362
Aug. 19 - Aug. 25	.765	.235	.806	.194	.633	.367
Aug. 26 - Sep. 1	.783	.217	.832	.168	.605	.395
Sep. 2 - Sep. 8	.762	.238	.822	.178	.571	.429
Sep. 9 - Sep. 15	.757	.243	.821	.179	.558	.442
Sep. 16 - Sep. 22	.786	.214	.841	.159	.584	.416
Sep. 23 - Sep. 29	.805	.195	.862	.138	.568	.432
Sep. 30 - Oct. 6	.803	.197	.877	.123	.501	.499
Oct. 7 - Oct. 13	.819	.181	.890	.110	.499	.501
Oct. 14 - Oct. 20	.845	.155	.890	.110	.602	.398
Oct. 21 - Oct. 27	.828	.172	.857	.143	.692	.308
Oct. 28 - Nov. 3	.794	.206	.828	.172	.664	.336
Nov. 4 - Nov. 10	.775	.225	.825	.175	.604	.396
Nov. 11 - Nov. 17	.750	.250	.813	.187	.562	.438
Nov. 18 - Nov. 24	.743	.257	.797	.203	.587	.413
Nov. 25 - Dec. 1	.740	.260	.783	.217	.618	.382
Dec. 2 - Dec. 8	.708	.292	.763	.237	.575	.425
Dec. 9 - Dec. 15	.711	.289	.771	.229	.563	.437
Dec. 16 - Dec. 22	.730	.270	.776	.224	.604	.396
Dec. 23 - Dec. 29	.698	.302	.757	.243	.560	.440

TABLE 2.

PROBABILITY THAT A GIVEN DAY WILL BE WET OR DRY
STATE COLLEGE

Dry Day - .10 inches or less

Period of	Initial		Transition			
	Dry	Wet	Dry/Dry	Wet/Dry	Dry/Wet	Wet/Wet
Jan. 1 - Jan. 7	.753	.247	.786	.214	.655	.345
Jan. 8 - Jan. 14	.749	.251	.790	.210	.626	.374
Jan. 15 - Jan. 21	.753	.247	.793	.207	.633	.367
Jan. 22 - Jan. 28	.770	.230	.812	.188	.630	.370
Jan. 29 - Feb. 4	.767	.233	.820	.180	.592	.408
Feb. 5 - Feb. 11	.762	.238	.812	.188	.602	.398
Feb. 12 - Feb. 18	.749	.251	.787	.213	.636	.364
Feb. 19 - Feb. 25	.730	.270	.760	.240	.648	.352
Feb. 26 - Mar. 3	.748	.252	.774	.226	.671	.329
Mar. 4 - Mar. 10	.775	.225	.799	.201	.693	.307
Mar. 11 - Mar. 17	.764	.236	.791	.209	.679	.321
Mar. 18 - Mar. 24	.737	.263	.770	.230	.644	.356
Mar. 25 - Mar. 31	.749	.251	.779	.221	.659	.341
Apr. 1 - Apr. 7	.787	.213	.807	.193	.712	.288
Apr. 8 - Apr. 14	.802	.198	.822	.178	.720	.280
Apr. 15 - Apr. 21	.813	.187	.832	.168	.729	.271
Apr. 22 - Apr. 28	.805	.195	.837	.163	.670	.330
Apr. 29 - May 5	.788	.212	.838	.162	.602	.398
May 6 - May 12	.817	.183	.856	.144	.643	.357
May 13 - May 19	.839	.161	.876	.124	.645	.355
May 20 - May 26	.825	.175	.867	.133	.626	.374
May 27 - June 2	.824	.176	.856	.144	.675	.325
June 3 - June 9	.814	.186	.849	.151	.661	.339
June 10 - June 16	.768	.232	.821	.179	.591	.409
June 17 - June 23	.774	.226	.823	.177	.605	.395
June 24 - June 30	.803	.197	.835	.165	.673	.327
July 1 - July 7	.769	.231	.818	.182	.606	.394
July 8 - July 14	.748	.252	.813	.187	.553	.447
July 15 - July 21	.765	.235	.816	.184	.600	.400
July 22 - July 28	.787	.213	.824	.176	.650	.350
July 29 - Aug. 4	.817	.183	.849	.151	.671	.329
Aug. 5 - Aug. 11	.827	.173	.860	.140	.670	.330
Aug. 12 - Aug. 18	.820	.180	.848	.152	.695	.304
Aug. 19 - Aug. 25	.839	.161	.859	.141	.735	.265
Aug. 26 - Sep. 1	.863	.137	.885	.115	.722	.278
Sep. 2 - Sep. 8	.855	.145	.879	.121	.713	.287
Sep. 9 - Sep. 15	.837	.163	.864	.136	.696	.304
Sep. 16 - Sep. 22	.848	.152	.875	.125	.694	.306
Sep. 23 - Sep. 29	.865	.135	.890	.110	.705	.295
Sep. 30 - Oct. 6	.853	.147	.893	.107	.626	.374
Oct. 7 - Oct. 13	.859	.141	.909	.091	.554	.446
Oct. 14 - Oct. 20	.887	.113	.924	.076	.598	.402
Oct. 21 - Oct. 27	.871	.129	.892	.108	.732	.268
Oct. 28 - Nov. 3	.834	.166	.854	.146	.737	.263
Nov. 4 - Nov. 10	.823	.177	.852	.148	.685	.315
Nov. 11 - Nov. 17	.814	.186	.853	.147	.644	.356
Nov. 18 - Nov. 24	.812	.188	.845	.155	.667	.333
Nov. 25 - Dec. 1	.815	.185	.834	.166	.731	.269
Dec. 2 - Dec. 8	.792	.208	.808	.192	.730	.270
Dec. 9 - Dec. 15	.784	.216	.807	.193	.702	.298
Dec. 16 - Dec. 22	.790	.210	.810	.190	.717	.283
Dec. 23 - Dec. 29	.767	.233	.786	.214	.702	.298

TABLE 3.

PROBABILITY THAT A GIVEN DAY WILL BE WET OR DRY
STATE COLLEGE

Dry Day - .20 inches or less

Period of	Initial		Transition			
	Dry	Wet	Dry/Dry	Wet/Dry	Dry/Wet	Wet/Wet
Jan. 1 - Jan. 7	.796	.204	.816	.184	.720	.280
Jan. 8 - Jan. 14	.802	.198	.829	.171	.693	.307
Jan. 15 - Jan. 21	.811	.189	.837	.163	.698	.302
Jan. 22 --Jan. 28	.815	.185	.841	.159	.701	.299
Jan. 29 - Feb. 4	.802	.198	.835	.165	.668	.332
Feb. 5 - Feb. 11	.798	.202	.829	.171	.675	.325
Feb. 12 - Feb. 18	.786	.214	.806	.194	.710	.290
Feb. 19 - Feb. 25	.773	.227	.793	.207	.703	.297
Feb. 26 - Mar. 3	.799	.201	.820	.180	.716	.284
Mar. 4 - Mar. 10	.821	.179	.837	.163	.751	.249
Mar. 11 - Mar. 17	.808	.192	.823	.177	.744	.256
Mar. 18 - Mar. 24	.788	.212	.812	.188	.698	.302
Mar. 25 - Mar. 31	.795	.205	.824	.176	.684	.316
Apr. 1 - Apr. 7	.821	.179	.840	.160	.736	.264
Apr. 8 - Apr. 14	.831	.169	.843	.157	.771	.229
Apr. 15 --Apr. 21	.840	.160	.851	.149	.786	.214
Apr. 22 - Apr. 28	.837	.163	.861	.139	.715	.285
Apr. 29 - May 5	.824	.176	.865	.135	.632	.368
May 6 - May 12	.855	.145	.884	.116	.684	.316
May 13 --May 19	.875	.125	.900	.100	.701	.299
May 20 - May 26	.857	.143	.891	.109	.652	.348
May 27 --June 2	.862	.138	.889	.111	.693	.307
June 3 - June 9	.864	.136	.889	.111	.708	.292
June 10 - June 16	.833	.167	.870	.130	.652	.348
June 17 - June 23	.840	.160	.871	.129	.680	.320
June 24 - June 30	.861	.139	.875	.125	.775	.225
July 1 --July 7	.833	.167	.852	.148	.737	.263
July 8 - July 14	.824	.176	.856	.144	.672	.328
July 15 - July 21	.839	.161	.871	.129	.673	.327
July 22 - July 28	.849	.151	.872	.128	.719	.281
July 29 - Aug. 4	.863	.137	.882	.118	.746	.254
Aug. 5 - Aug. 11	.861	.139	.876	.124	.767	.233
Aug. 12 - Aug. 18	.855	.145	.861	.139	.816	.184
Aug. 19 - Aug. 25	.877	.123	.884	.116	.829	.171
Aug. 26 - Sep. 1	.893	.107	.908	.092	.765	.235
Sep. 2 - Sep. 8	.886	.114	.901	.099	.767	.233
Sep. 9 - Sep. 15	.880	.120	.894	.106	.778	.222
Sep. 16 - Sep. 22	.884	.116	.899	.101	.770	.230
Sep. 23 - Sep. 29	.892	.108	.907	.093	.763	.237
Sep. 30 - Oct. 6	.886	.114	.912	.088	.684	.316
Oct. 7 - Oct. 13	.889	.111	.929	.071	.571	.429
Oct. 14 - Oct. 20	.906	.094	.939	.061	.585	.415
Oct. 21 - Oct. 27	.896	.104	.912	.088	.760	.240
Oct. 28 - Nov. 3	.870	.130	.882	.118	.793	.207
Nov. 4 - Nov. 10	.857	.143	.880	.120	.722	.278
Nov. 11 - Nov. 17	.844	.156	.876	.124	.669	.331
Nov. 18 - Nov. 24	.839	.161	.867	.133	.695	.305
Nov. 25 - Dec. 1	.848	.152	.862	.138	.769	.231
Dec. 2 - Dec. 8	.832	.168	.843	.157	.779	.221
Dec. 9 - Dec. 15	.827	.173	.844	.156	.745	.255
Dec. 16 --Dec. 22	.839	.161	.852	.148	.774	.226
Dec. 23 - Dec. 29	.814	.186	.824	.176	.772	.228

TABLE 4.

PROBABILITY THAT A GIVEN DAY WILL BE WET OR DRY
STATE COLLEGE

Dry Day - .50 inches or less

Period of	Initial		Transition			
	Dry	Wet	Dry/Dry	Wet/Dry	Dry/Wet	Wet/Wet
Jan. 1 - Jan. 7	.871	.129	.884	.116	.785	.215
Jan. 8 - Jan. 14	.883	.117	.894	.106	.802	.198
Jan. 15 - Jan. 21	.876	.124	.887	.113	.797	.203
Jan. 22 - Jan. 28	.869	.131	.888	.112	.744	.256
Jan. 29 - Feb. 4	.868	.132	.895	.105	.687	.313
Feb. 5 - Feb. 11	.883	.117	.906	.094	.715	.285
Feb. 12 - Feb. 18	.875	.125	.888	.112	.786	.214
Feb. 19 - Feb. 25	.861	.139	.873	.127	.787	.213
Feb. 26 - Mar. 3	.883	.117	.895	.105	.798	.202
Mar. 4 - Mar. 10	.890	.110	.898	.102	.826	.174
Mar. 11 - Mar. 17	.875	.125	.881	.119	.835	.165
Mar. 18 - Mar. 24	.862	.138	.868	.132	.823	.177
Mar. 25 - Mar. 31	.862	.138	.870	.130	.810	.190
Apr. 1 - Apr. 7	.876	.124	.884	.116	.821	.179
Apr. 8 - Apr. 14	.883	.117	.887	.113	.855	.145
Apr. 15 - Apr. 21	.896	.104	.897	.103	.893	.107
Apr. 22 - Apr. 28	.901	.099	.909	.091	.825	.175
Apr. 29 - May 5	.898	.102	.912	.088	.772	.228
May 6 - May 12	.920	.080	.929	.071	.822	.178
May 13 - May 19	.932	.068	.944	.056	.762	.238
MAy 20 - May 26	.914	.086	.937	.063	.675	.325
May 27 - June 2	.915	.085	.933	.067	.721	.279
June 3 - June 9	.933	.067	.939	.061	.852	.148
June 10 - June 16	.926	.074	.930	.070	.883	.117
June 17 - June 23	.927	.073	.932	.068	.865	.135
June 24 - June 30	.931	.069	.934	.066	.888	.112
July 1 - July 7	.902	.098	.911	.089	.822	.178
July 8 - July 14	.892	.108	.909	.081	.746	.254
July 15 - July 21	.906	.094	.923	.077	.740	.260
July 22 - July 28	.917	.083	.928	.072	.787	.213
July 29 - Aug. 4	.930	.070	.937	.063	.839	.161
Aug. 5 - Aug. 11	.937	.063	.937	.063	.928	.072
Aug. 12 - Aug. 18	.936	.064	.933	.067	.981	.019
Aug. 19 - Aug. 25	.943	.057	.943	.057	.946	.054
Aug. 26 - Sep. 1	.951	.049	.955	.045	.869	.131
Sep. 2 - Sep. 8	.952	.048	.956	.044	.884	.116
Sep. 9 - Sep. 15	.953	.047	.953	.047	.958	.042
Sep. 16 - Sep. 22	.953	.047	.954	.046	.941	.059
Sep. 23 - Sep. 29	.950	.050	.953	.047	.895	.105
Sep. 30 - Oct. 6	.951	.049	.953	.047	.920	.080
Oct. 7 - Oct. 13	.961	.039	.963	.037	.905	.095
Oct. 14 - Oct. 20	.958	.042	.962	.038	.880	.120
Oct. 21 - Oct. 27	.940	.060	.941	.059	.937	.063
Oct. 28 - Nov. 3	.930	.070	.929	.071	.944	.056
Nov. 4 - Nov. 10	.921	.079	.929	.071	.826	.174
Nov. 11 - Nov. 17	.906	.094	.920	.080	.773	.227
Nov. 18 - Nov. 24	.904	.096	.907	.093	.871	.129
Nov. 25 - Dec. 1	.911	.089	.908	.092	.937	.063
Dec. 2 - Dec. 8	.906	.094	.911	.089	.859	.141
Dec. 9 - Dec. 15	.902	.098	.913	.087	.804	.196
Dec. 16 - Dec. 22	.889	.111	.899	.101	.813	.087
Dec. 23 - Dec. 29	.864	.136	.875	.125	.794	.206

TABLE 5.

PROBABILITY THAT A GIVEN DAY WILL BE WET OR DRY
STATE COLLEGE

Dry Day - 1.00 inch or less

Period of	Initial		Transition			
	Dry	Wet	Dry/Dry	Wet/Dry	Dry/Wet	Wet/Wet
Jan. 1 - Jan. 7	.934	.066	.939	.061	.865	.135
Jan. 8 - Jan. 14	.948	.052	.952	.048	.872	.128
Jan. 15 - Jan. 21	.957	.043	.959	.041	.908	.092
Jan. 22 - Jan. 28	.955	.045	.959	.041	.860	.140
Jan. 29 - Feb. 4	.940	.060	.948	.052	.816	.184
Feb. 5 - Feb. 11	.932	.068	.938	.062	.854	.146
Feb. 12 - Feb. 18	.931	.069	.937	.063	.853	.147
Feb. 19 - Feb. 25	.941	.059	.949	.051	.809	.191
Feb. 26 - Mar. 3	.957	.043	.963	.037	.820	.180
Mar. 4 - Mar. 10	.953	.047	.955	.045	.910	.090
Mar. 11 - Mar. 17	.946	.054	.945	.055	.976	.024
Mar. 18 - Mar. 24	.940	.060	.939	.061	.961	.039
Mar. 25 - Mar. 31	.936	.064	.938	.062	.902	.098
Apr. 1 - Apr. 7	.949	.051	.951	.049	.908	.092
Apr. 8 - Apr. 14	.959	.041	.959	.041	.971	.029
Apr. 15 - Apr. 21	.959	.041	.958	.042	.992	.008
Apr. 22 - Apr. 28	.953	.047	.955	.045	.917	.083
Apr. 29 - May 5	.951	.049	.956	.044	.856	.144
May 6 - May 12	.965	.035	.969	.031	.871	.129
May 13 - May 19	.974	.026	.977	.023	.870	.130
May 20 - May 26	.963	.037	.967	.033	.869	.131
May 27 - June 2	.961	.039	.963	.037	.905	.095
June 3 - June 9	.975	.025	.976	.024	.944	.056
June 10 - June 16	.977	.023	.977	.023	.994	.006
June 17 - June 23	.974	.026	.973	.027	.999	.001
June 24 - June 30	.967	.033	.969	.031	.897	.103
July 1 - July 7	.948	.052	.956	.044	.794	.206
July 8 - July 14	.946	.054	.955	.045	.793	.207
July 15 - July 21	.962	.038	.964	.036	.901	.099
July 22 - July 28	.970	.030	.971	.029	.954	.046
July 29 - Aug. 4	.974	.026	.976	.024	.943	.057
Aug. 5 - Aug. 11	.977	.023	.978	.022	.943	.057
Aug. 12 - Aug. 18	.978	.022	.978	.022	.992	.008
Aug. 19 - Aug. 25	.977	.023	.977	.023	.994	.006
Aug. 26 - Sep. 1	.971	.029	.972	.028	.954	.046
Sep. 2 - Sep. 8	.974	.026	.976	.024	.907	.093
Sep. 9 - Sep. 15	.986	.014	.987	.013	.911	.089
Sep. 16 - Sep. 22	.988	.012	.988	.012	.988	.012
Sep. 23 - Sep. 29	.983	.017	.983	.017	.989	.011
Sep. 30 - Oct. 6	.978	.022	.978	.022	.988	.012
Oct. 7 - Oct. 13	.981	.019	.981	.019	.991	.009
Oct. 14 - Oct. 20	.986	.014	.986	.014	.992	.008
Oct. 21 - Oct. 27	.982	.018	.982	.018	.987	.013
Oct. 28 - Nov. 3	.976	.024	.976	.024	.992	.008
Nov. 4 - Nov. 10	.968	.032	.971	.029	.884	.116
Nov. 11 - Nov. 17	.958	.042	.966	.034	.770	.230
Nov. 18 - Nov. 24	.957	.043	.964	.046	.806	.194
Nov. 25 - Dec. 1	.961	.039	.963	.037	.907	.093
Dec. 2 - Dec. 8	.959	.041	.963	.047	.881	.119
Dec. 9 - Dec. 15	.958	.042	.965	.035	.798	.202
Dec. 16 - Dec. 22	.956	.044	.963	.037	.807	.193
Dec. 23 - Dec. 29	.940	.060	.945	.055	.865	.135