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:

- 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:

- 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) x P(W/D) - 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 2ⁿ 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

S1	D	D	D	$P(D) \propto P(D/D) \propto P(D/D) =$	(.671) (.760) (.760)	= .388
S2	W	D	D	$P(W) \ge P(D/W) \ge P(D/D) =$	(.329) (.490) (.760)	= .122
S3	D	W	D	$P(D) \ge P(W/D) \ge P(D/W) =$	(.671) (.240) (.490)	=.079
S ₄	D	D	W	$P(D) \ge P(D/D) \ge P(W/D) =$	(.671) (.760) (.240)	= .122
S ₅	W	W	D	$P(W) \ge P(W/W) \ge P(D/W) =$	(. 329) (. 510) (. 490)	= .082
S ₆	W	D	W	$P(W) \ge P(D/W) \ge P(W/D) =$	(. 329) (. 490) (. 240)	=.039
S7	D	W	W	$P(D) \ge P(W/D) \ge P(W/W) =$	(.671) (.240) (.510)	=.082
S8	W	W	W	$P(W) \ge P(W/W) \ge P(W/W) =$	(.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.

To compute 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:

$$(.900)^4$$
 $(.891)^5 = .464$

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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:

S	equ	enc	ces	Probability	Expected Attendance
S_1	D	D	D	(. 886) (. 912) (. 912) = . 737	15,000
S2	D	D	W	(.886) (.912) (.088) = .071	12,000
S3	D	W	D	(.886) (.088) (.684) = .053	12,000
S_4	D	W	W	(.886) (.088) (.316) = .025	9,000
S5	W	D	D	(.114) (.684) (.912) = .071	12,000
S ₆	W	D	W	(.114) $(.684)$ $(.088) = .007$	9,000
S7	W	W	D	(.114) (.316) (.684) = .025	9,000
Sg	W	W	W	(.114) (.316) (.316) = .011	6,000
0				1.000	

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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 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 probabilities can help to evaluate the uncertainty surrounding events, and thus help in making decisions.

REFERENCES

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- 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.
- 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

		h / - 2				
Period Of	Dry	tial 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	521	160
Ian 20 Eab	678	200	-762	027	• / 51	100
Toh 5 Foh 11	.010	• 522	• [05	-231	• JUI	•499
Feb.) - Feb. II	.001	• 319	• (24	.240	• 7<7	•4(2
Feb. 12 - Feb. 10	.013	• 34 1	• (20	·2/2	.500	.440
reb. 19 = reb. 25	.040	• 354	. 706	.294	•232	.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 $13 - May 10$.776	-224	.826	.174	.600	.400
May SO May 26	.753	247	.813	187	-570	.430
May 20 - May 20	• 175	2/10	805	195	-590	.410
May 21 - June 2	· ()1	056	701	206	500	401
June 3 - June 9	• (44	.270	• (94	•200	•) 9 9	1116
June 10 - June 16	. 705	•295	• (00	•232	• 224	120
June 17 - June 23	•715	.205	• ((4	.220	• 200	•432
June 24 - June 30	•739	.261	. 780	.220	·022	•310
July 1July 7	.707	.293	• 770	.230	• 554	•440
July 8 - July 14	.686	.314	•777	.223	.487	•513
July 15 - July 21	.674	.326	•774	.226	.40 (•233
July 22July 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
Sen. 2 - Sen. 8	.762	.238	.822	.178	.571	.429
Sen. 9 - Sen. 15	.757	.243	.821	.179	.558	.442
Sen 16 - Sen 22	.786	.214	.841	.159	.584	.416
Sep. 10 - Sep. 22	805	.195	-862	.138	.568	.432
Sep. 23 - Sep. 29	803	107	.877	.123	.501	.499
Sep. 30 = 000. 0	810	181	890	.110	400	-501
Oct. (- Oct. 13	.019	.101	800	110	602	398
Oct. 14 - Oct. 20	.047	•177	857	1/12	602	- 308
Oct. 21 - Oct. 27	.020	.1/2	.077	.145	661	326
Oct. 28 - Nov. 3	•794	.206	.020	*112	-004 601	• 3 30
Nov. 4 - Nov. 10	.775	.225	.025	•1()	.004	. 390
Nov. 11 - Nov. 17	.750	.250	.013	.10(• 702	•430
Nov. 18 - Nov. 24	.743	.257	•797	.203	.501	.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
D 16 D 00	730	.270	.776	.224	.604	.396
Dec. To - Dec. 22	.150	200	757	-243	.560	.440
Dec. 23 - Dec. 29	.698	.302	• 121 -	.245	.,	

Dry Day - .01 inches or less

TABLE 2.

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

Dry Day - .10 inches or less

	Ini	tial	Transition			
Period of	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	.744	.643	.357
May 13 - May 19	820	161	876	124	645	- 355
May $20 = May 26$	825	175	867	.133	.626	374
May 27 - June 2	824	176	856	<u>روب</u>	-675	325
June 3 - June 9	814	186	840	.151	-661	.339
June 10 - June 16	768	.100	821	.170	.591	409
Tune 17 - June 23	* (00	226	802	177	605	395
Tune 24 - June 30	*11*	107	825	165	673	- 327
July 1 - July 7	.005	191	818	182	606	.304
July 8 - July 14	* 109	•C)T	812	187	553	· 594
Tuly 15 July 21	* 140	•272	816	184		400
July 22 - July 28	* 10)	212	821	176	.650	- 350
Tuly 20 Aug h	*107	183	.849	.151	.671	329
Aug 5 - Aug 11	827	173	-860	.140	.670	. 330
Aug.) - Aug. 19	820	180	848	.152	.695	.304
Aug. 12 - Aug. 10	.830	.161	.859	.141	.735	.265
Aug. 19 = Aug. 2)	863	137	.885	.115	.722	.278
Aug. 20 = Sep. 1	855	.145	.879	.121	.713	.287
Sep. 2 = Sep. 0	927	262	861	126	606	304
Sep. 9 - Sep. 1)	.031	.103	875	105	601	306
Sep. 10 - Sep. 22	*040 945	.172	.019	110	705	.205
Sep. 23 = Sep. 29	*007	*137	.090	107	606	374
Sep. 30 = 0ct. 0	.073	+141	•093	.101	554	.446
Oct. (- Oct. 13	•079	*141	.909	076	508	402
Oct. 14 = Oct. 20	,000	.113	.924	108	. 730	268
Oct. 21 - Oct. 21	*0(L	.129	.092	.146	.737	.263
Oct. 20 - Nov. 3	.034	177	852	148	.685	.315
NOV. 4 - NOV. 10	814	186	.853	147	644	.356
NOV. II - NOV. I'	.014	188	845	155	667	. 333
Nov. 18 - Nov. 24	916	195	821	166	.731	-269
Nov. 25 - Dec. 1	.015	208	808	.102	.730	.270
Dec. 2 - Dec. 8	• (92	.200	807	103	.702	.298
Dec. 9 - Dec. 15	* (04	.210	810	190	.717	283
Dec. 16 - Dec. 22	. 190	.210	.010	.190	700	208
Dec. 23 - Dec. 29	.767	.233	.700	.214	. 102	.290

TABLE 3.

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

	Ini	tial	Transition			
Period of	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	705	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. 0 - Apr. 14	- 840	160	851	149	.786	.214
Apr. 22 Apr. 28	827	163	861	.130	.715	-285
Apr. 22 - Apr. 20	821	176	865	135	.632	.368
Apr. 29 - May 9	855	1)15	881	116	684	.316
May 0 - May 12	875	125	.004	100	701	. 200
May 13 May 19	.01)	11.2	-900	100	650	3/18
May 20 - May 20	.07(• 140	880	.109	602	307
May 21 June 2	·002	.130	.009	111	708	• Jo1
June 3 - June 9	*004	.130	.009	120	650	218
June 10 - June 16	.033	.107	.010	.130	.072	• 340
June 17 - June 23	.040	.100	+0(1 0mr	.129	.000	. 320
June 24 - June 30	.001	.139	.015	-127	• (()	.22)
July 1 July 7	.833	.167	.852	•140	• (3)	.203
July 8 - July 14	.824	.176	.856	.144	.672	• 320
July 15 - July 21	.839	.161	.871	.129	.073	+ 321
July 22 - July 28	.849	.151	.872	.128	• 719	.201
July 29 - Aug. 4	.863	.137	.882	.118	. (46	.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	.1/1
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. 10 - Nov. 24	848	.152	.862	.138	.769	.231
Dec 2) = Dec. 1	.832	-168	.843	.157	.779	.221
Dec. 2 - Dec. 0	827	.173	.844	.156	.745	.255
Dec. 9 - Dec. 1)	820	.161	.852	.148	.774	226
Dec. 10Dec. 22	821	196	824	.176	.772	.228
Dec. 23 - Dec. 29	.014	• 100	.024	.10	• 1 1 4	

Dry Day - .20 inches or less

TABLE 4.

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

Dry Day - .50 inches or less

$\begin{array}{ c c c c c c c c c c c c c c c c c c c$		Initial		Transition			
$ \begin{array}{llllllllllllllllllllllllllllllllllll$	Period of	Dry	Wet	Dry/Dry	Wet/Dry	Dry/Wet	Wet/Wet
$ \begin{array}{llllllllllllllllllllllllllllllllllll$	Jan. 1 - Jan. 7	.871	.129	.884	.116	.785	.215
$ \begin{array}{llllllllllllllllllllllllllllllllllll$	Jan. 8 - Jan. 14	.883	.117	.894	.106	.802	.198
$ \begin{array}{llllllllllllllllllllllllllllllllllll$	Jan. 15 - Jan. 21	.876	.124	.887	.113	.797	.203
$ \begin{array}{llllllllllllllllllllllllllllllllllll$	Jan. 22 - Jan. 28	.869	.131	.888	.112	744	.256
Feb. 5 Feb. 11 .883 .117 .966 .094 .715 .285 Feb. 12 Feb. 18 .875 .125 .883 .112 .786 .214 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. 13 .662 .138 .870 .130 .810 .190 Apr. 1 .4pr. 7 .876 .124 .884 .113 .855 .145 Apr. 1 .4pr. 21 .896 .102 .912 .088 .772 .228 Apr. 12 .896 .102 .912 .088 .772 .228 May 13 May 13 .931 .006 .933 .067 .721 .228 May 13 .949 .97 .063 .675 .225 .983 .067 .721 .278	Jan. 29 - Feb. 4	.868	.132	.895	.105	.687	.313
Peb. 12 Peb. 18 .075 .125 .0868 .112 .766 .214 Feb. 19 - Feb. 25 .861 .119 .873 .127 .787 .213 Feb. 26 .Mar. 13 .883 .117 .895 .102 .826 .174 Mar. 11 .Mar. 17 .875 .125 .881 .119 .835 .165 Mar. 12 .Mar. 13 .862 .138 .868 .132 .823 .177 Mar. 13 .Apr. 7 .876 .124 .884 .116 .821 .199 Apr. 1 .Apr. 7 .876 .124 .884 .113 .855 .145 Apr. 15 .Apr. 21 .896 .104 .897 .103 .853 .145 Apr. 22 .Apr. 21 .896 .104 .897 .103 .855 .145 Apr. 22 .Apr. 23 .921 .066 .929 .071 .822 .175 Apr. 29 .May 19 .932 .068 .914 .056 .672 .228	Feb. 5 - Feb. 11	.883	.117	-906	.094	.715	-285
Peb. 19 Peb. 25 .061 .139 .873 .127 .787 .213 Feb. 26, Mar. 3 .0833 .117 .895 .105 .798 .202 Mar. 4 Mar. 10 .890 .102 .826 .174 Mar. 11 Mar. 21 .875 .125 .881 .119 .835 .165 Mar. 25 Mar. 31 .662 .138 .870 .130 .810 .190 Apr. 1 Apr. 7 .876 .124 .884 .113 .855 .145 Apr. 1 .893 .107 .887 .113 .855 .145 Apr. 1 .896 .104 .897 .103 .893 .107 Apr. 22 .0may 5 .896 .102 .912 .088 .772 .228 May 10 .932 .066 .944 .056 .762 .238 May 27 .0ma 2 .915 .065 .933 .067 .721 .279 June 3 .910 .910 .910 .932 .068	Feb. 12 - Feb. 18	.875	.125	-888	.112	.786	214
Feb. 26 , Mar. 3 .883 .117 .895 .105 .796 .202 Mar. 4 - Mar. 10 .890 .110 .895 .102 .826 .174 Mar. 11 Mar. 12 .805 .112 .831 .119 .835 .165 Mar. 18 Mar. 24 .862 .138 .870 .130 .810 .177 Mar. 25 Mar. 31 .862 .138 .870 .130 .853 .147 Apr. 1 Apr. 7 .876 .124 .884 .116 .821 .179 Apr. 1 .893 .117 .887 .113 .855 .145 Apr. 15 .092 .909 .909 .909 .909 .901 .825 .175 Apr. 22 Apr. 3 .988 .102 .912 .063 .677 .228 May 10 .932 .068 .944 .056 .675 .225 May 20 .944 .056 .933 .067 .721 .279 June 3 .9427 .0149 .9	Feb. 10 - Feb. 25	861	130	873	127	787	.213
Here, Loby, Park, Symposition Loos Loos <thloos< th=""> Loos Loos <</thloos<>	Feb 26 - Mar 3	.883	.117	.805	105	.798	202
Mar. 11 Mar. 11 Mar. 11 Mar. 11 Mar. 12 Mar. 125 Mal. 119 Mar. 135 Mar. 146 Mar. 25 Mar. 31 .662 .138 .868 .132 .823 .117 Mar. 25 Mar. 31 .662 .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. 28 .901 .099 .909 .091 .825 .175 Apr. 29 May 19 .932 .068 .929 .071 .822 .178 May 10 .932 .068 .944 .056 .721 .279 June 3 June 9 .933 .067 .933 .067 .721 .279 June 10 June 9 .933 .067 .933 .066 .383 .117 June 10 June 23 .927 .073 .932 .068 .133 <td< td=""><td>Mar h Mar 10</td><td>.800</td><td>.110</td><td>.898</td><td>.102</td><td>.826</td><td>.174</td></td<>	Mar h Mar 10	.800	.110	.898	.102	.826	.174
$ \begin{array}{llllllllllllllllllllllllllllllllllll$	Man 11 Man 17	875	125	881	110	835	.165
Mar. 25 Mar. 27 Mar. 27 Mar. 27 Mar. 27 Mar. 27 Mar. 27 Jur. 20 Mar. 23 Mar. 27 Jur. 27 Jur. 27 <t< td=""><td>Mar 18 Mar Oh</td><td>862</td><td>128</td><td>868</td><td>132</td><td>823</td><td>.177</td></t<>	Mar 18 Mar Oh	862	128	868	132	823	.177
$ \begin{array}{llllllllllllllllllllllllllllllllllll$	Mar. 10 - Mar. 24	.002	128	870	120	810	100
Apr.11Apr.11 <td>Mar. 2) - Mar. 31</td> <td>876</td> <td>100</td> <td>88)</td> <td>116</td> <td>821</td> <td>170</td>	Mar. 2) - Mar. 31	876	100	88)	116	821	170
Apr. 6Apr. 12Apr. 403 $.117$ $.007$ $.113$ $.007$ $.113$ $.0057$ $.117$ Apr. 15Apr. 21Apr. 21 $.096$ $.104$ $.097$ $.103$ $.893$ $.107$ Apr. 22Apr. 28 $.901$ $.099$ $.909$ $.991$ $.825$ $.175$ Apr. 29May 5 $.698$ $.102$ $.912$ $.088$ $.772$ $.228$ May 13May 19 $.932$ $.068$ $.929$ $.071$ $.822$ $.178$ May 20May 24 $.914$ $.086$ $.937$ $.063$ $.675$ $.325$ May 27June 2 $.915$ $.085$ $.933$ $.067$ $.721$ $.279$ June 3June 9 $.933$ $.067$ $.939$ $.061$ $.852$ $.148$ June 10June 16 $.926$ $.074$ $.930$ $.070$ $.883$ $.117$ June 17June 23 $.927$ $.073$ $.932$ $.068$ $.866$ $.135$ Jule 24June 30 $.931$ $.069$ $.934$ $.066$ $.888$ $.112$ July 1July 7 $.902$ $.098$ $.911$ $.089$ $.822$ $.178$ July 25July 21 $.906$ $.094$ $.923$ $.077$ $.740$ $.260$ July 29Aug. 10 $.937$ $.063$ $.937$ $.063$ $.937$ $.063$ $.928$ $.072$ July 29Aug. 12 $.906$ $.094$ $.923$ $.077$ $.740$ $.260$ <t< td=""><td>Apr. 1 - Apr. (</td><td>.010</td><td>• 124</td><td>a004</td><td>.110</td><td>955</td><td>-119</td></t<>	Apr. 1 - Apr. (.010	• 124	a004	.110	955	-119
Apr. 15Apr. 21Apr. 28Apr. 20Apr. 29Apr. 28Apr. 29Apr. 20Apr. 29Apr. 20Apr. 20Apr. 20<	Apr. 0 - Apr. 14	.003	•11(1000	.113	.077	•147
Apr. 22Apr. 25Apr. 25Apr. 29Apr. 22Apr. 27Apr. 27Apr. 29Apr. 29Apr. 27Apr. 29Apr. 29Apr. 27Apr. 27Apr. 29Apr. 27Apr. 27Apr. 29Apr. 29Apr. 29Apr. 29Apr. 27Apr. 21Apr. 279Apr. 279Apr. 29Apr. 29Apr. 29Apr. 29Apr. 29Apr. 29Apr. 29Apr. 20Apr. 277Apr. 213Apr. 279Apr. 217Apr. 217Apr. 213Apr. 217Apr. 217Apr. 213Apr. 217Apr. 217	Apr. 15 - Apr. 21	.896	.104	.091	.103	•093	.101
Apr. 29May5.898.102.912.086.772.226May13- May12.920.080.929.071.822.178May13- May19.932.068.937.063.675.325May20- May26.914.086.937.063.675.325May27- June9.933.067.733.952.148June10- June 16.926.074.939.061.852.148June10- June 16.926.074.930.070.883.117June 17- June 23.927.073.932.066.888.112July1- July7.902.098.911.069.888.112July1- July7.902.098.911.089.822.176July8- July14.892.108.909.081.746.254July9- July19.906.094.923.077.740.260July22- July28.917.083.928.072.787.213July29Aug.4.930.070.937.063.928.072July29Aug.4.930.077.943.057.946.054Aug.26.589.1.05	Apr. 22 - Apr. 28	.901	.099	.909	.091	.025	.1/5
May $6 - May$ 12 $.920$ $.080$ $.929$ $.071$ $.022$ $.176$ May $13 - May$ 19 $.932$ $.066$ $.944$ $.056$ $.762$ $.238$ May $20 - May$ 26 $.914$ $.086$ $.937$ $.067$ $.721$ $.279$ June $3 - June$ 2 $.915$ $.085$ $.933$ $.067$ $.721$ $.279$ June $3 - June$ 2 $.915$ $.085$ $.933$ $.067$ $.721$ $.279$ June $3 - June$ 2 $.915$ $.085$ $.933$ $.067$ $.723$ $.932$ $.068$ $.655$ $.117$ June $1 - June$ 23 $.927$ $.073$ $.932$ $.068$ $.665$ $.112$ July $1 - July$ 7 $.902$ $.098$ $.911$ $.089$ $.622$ $.178$ July $1 - July$ 7 $.902$ $.098$ $.911$ $.089$ $.622$ $.178$ July $1 - July$ 7 $.902$ $.098$ $.911$ $.089$ $.622$ $.178$ July $2 - July$ 28 $.917$ $.063$ $.923$ $.077$ $.740$ $.223$ July $2 - Aug$ 18 $.936$ $.064$ $.933$ $.067$ $.633$ $.939$ $.161$ Aug. $2 - Aug$ 18 $.936$ $.064$ $.933$ $.067$ $.946$ $.054$ Aug. $2 - Sep$ $.952$ $.044$ $.955$ $.045$ $.869$ $.1$	Apr. 29 - May 5	.898	.102	.912	.088	• ((2	.220
$\begin{array}{llllllllllllllllllllllllllllllllllll$	May 6 - May 12	.920	.080	.929	.071	.822	°1.(9
$\begin{array}{llllllllllllllllllllllllllllllllllll$	May 13 - May 19	.932	.068	•944	.056	.762	.238
$\begin{array}{llllllllllllllllllllllllllllllllllll$	MAy 20 - May 26	.914	.086	•937	.063	.675	· 325
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 .839 .161 Aug. 12 - Aug. 18 .936 .064 .933 .067 .981 .019 Aug. 19 - Aug. 25 .943 .057 .943 .057 .946 .054 Aug. 26 .589 .1 .951 .049 .955 .045 .869 .131 Sep. 2 .589 .8952 .048 .956 .044 .884 .116 Sep. 9 .589 .15 .953 .047 .953 .047 .958 .042 Sep. 16 .589 .22 .953 .047 .953 .047 .958 .042 Sep. 16 .589 .22 .953 .047 .954 .046 .941 .059 Sep. 30 .0ct .6 .951 .049 .953 .047 .958 .042 Sep. 16 .589 .22 .953 .047 .954 .046 .941 .059 Sep. 30 .0ct .6 .951 .049 .953 .047 .958 .042 Sep. 16 .589 .22 .953 .047 .954 .046 .941 .059 Sep. 30 .0ct .6 .951 .049 .953 .047 .958 .042 Sep. 16 .589 .22 .953 .047 .954 .046 .941 .059 Sep. 30 .0ct .6 .951 .049 .953 .047 .958 .042 Sep. 16 .589 .22 .953 .047 .954 .046 .941 .059 Sep. 30 .0ct .6 .951 .049 .953 .047 .958 .042 Sep. 30 .0ct .6 .951 .049 .953 .047 .958 .042 Sep. 30 .0ct .6 .951 .049 .953 .047 .958 .042 Sep. 30 .0ct .6 .951 .049 .953 .047 .959 Sot .14 .0ct .20 .958 .042 .962 .038 .880 .120 Oct .21 .0ct .27 .940 .060 .941 .059 .937 .063 Oct .28 .Nov .3 .930 .070 .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 . 9 . Dec .15 .902 .098 .913 .087 .804 .196 Dec .9 .Dec .15 .902 .098 .913 .087 .804 .196 Dec .9 .Dec .15 .902 .098 .913 .087 .804 .196 Dec .9 .Dec .15 .902 .098 .913 .087 .804 .196 Dec .16 .Dec .22 .889 .111 .899 .101 .813 .087 Dec .16 .Dec .22 .889 .111 .899 .101 .813 .087	May 27 - June 2	.915	.085	•933	.067	.721	.279
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 .953 .047 .958 .042 Sep. 16 - Sep. 22 .953 .047 .953 .047 .958 .042 Sep. 16 - Sep. 22 .953 .047 .954 .046 .941 .059 Sep. 30 - Oct. 6 .951 .049 .955 .047 .958 .042 Sep. 10 - Sep. 29 .950 .050 .953 .047 .920 .080 Oct. 7 - Oct. 13 .961 .039 .963 .037 .905 .045 Oct. 14 - Oct. 20 .958 .042 .962 .038 .880 .120 Oct. 21 - Oct. 27 .940 .060 .941 .059 .937 Nov. 18 - Nov. 10 .921 .079 .929 .071 .944 .056 Nov. 4 - Nov. 10 .921	June 3 - June 9	•933	.067	.939	.061	.852	.148
June $17 - June$ $23 - 927 - 0.073 - 932 - 0.668 - 865 - 1.35$ June $24 - June$ $30 - 931 - 0.69 - 9.34 - 0.66 - 8888 - 1.12$ July $1 - July$ $7 - 902 - 0.98 - 911 - 0.89 - 822 - 1.78$ July $8 - July$ $14 - 892 - 1.08 - 909 - 0.81 - 746 - 2.54$ July $15 - July$ $21 - 906 - 0.94 - 923 - 0.077 - 740 - 2.60$ July $22 - July$ $28 - 917 - 0.83 - 928 - 0.072 - 787 - 2.13$ July $29 - Aug. 4 - 930 - 0.070 - 9.37 - 0.63 - 8.39 - 1.61$ Aug. $5 - Aug. 11 - 9.37 - 0.63 - 9.37 - 0.63 - 8.39 - 1.61$ Aug. $5 - Aug. 11 - 9.37 - 0.63 - 9.37 - 0.63 - 9.28 - 0.072$ Aug. $12 - Aug. 18 - 9.36 - 0.054 - 9.33 - 0.057 - 9.46 - 0.54$ Aug. $26 - Sep. 1 - 9.51 - 0.49 - 9.55 - 0.45 - 8.69 - 1.31$ Sep. $2 - Sep. 8 - 9.52 - 0.48 - 9.56 - 0.044 - 8.84 - 1.16$ Sep. $9 - Sep. 15 - 9.53 - 0.47 - 9.53 - 0.47 - 9.58 - 0.42$ Sep. 16 - Sep. 22 - 9.53 - 0.47 - 9.53 - 0.47 - 9.58 - 0.42Sep. 30 - 0.021 - 6 - 9.51 - 0.49 - 9.55 - 0.46 - 9.41 - 0.59Sep. 30 - 0.021 - 6 - 9.51 - 0.49 - 9.53 - 0.47 - 8.95 - 1.05Sep. 30 - 0.021 - 6 - 9.51 - 0.49 - 9.53 - 0.47 - 8.95 - 0.050Oct. 7 - 0.21 - 13 - 9.61 - 0.39 - 9.63 - 0.37 - 9.05 - 0.955Oct. 14 - 0.22 - 9.58 - 0.44 - 9.29 - 0.71 - 9.44 - 0.56Nov. 14 - Nov. 10 - 9.21 - 0.79 - 9.29 - 0.71 - 9.44 - 0.56Nov. 4 - Nov. 10 - 9.21 - 0.79 - 9.29 - 0.71 - 9.44 - 0.56Nov. 18 - Nov. 24 - 9.04 - 0.96 - 9.07 - 0.93 - 8.77 - 0.63Nov. 18 - Nov. 24 - 9.04 - 0.96 - 9.07 - 0.93 - 8.77 - 0.63Nov. 18 - Nov. 24 - 9.04 - 0.96 - 9.07 - 0.93 - 8.77 - 0.63Dec.	June 10 - June 16	.926	.074	.930	.070	.883	.117
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	June 17 - June 23	.927	.073	.932	.068	.865	.135
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	June 24 - June 30	.931	.069	•934	.066	.888	.112
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	July 1 - July 7	.902	.098	.911	.089	.822	.178
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	July 8 - July 14	.892	.108	.909	.081	.746	.254
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	July 15 - July 21	.906	.094	.923	.077	.740	.260
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	July 22 - July 28	.917	.083	.928	.072	.787	.213
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. 30 - Oct. 6 .951 .049 .953 .047 .920 .080 Oct. 7 - Oct. 13 .961 .039 .963 .037 .905 .095 Oct. 14 .0ct. 27 .940 .060 .941 .059 .937 .063 Oct. 28 .Nov. 3 .930 .070 .929 .071 .826 .174 <	July 29 - Aug. 4	.930	.070	.937	.063	.839	.161
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 .953 .047 .958 .042 Sep. 16 - Sep. 22 .953 .047 .953 .047 .958 .042 Sep. 30 - Oct. 6 .951 .049 .953 .047 .920 .080 Oct. 7 - Oct. 13 .961 .039 .963 .037 .905 .095 Oct. 21 - Oct. 27 .940 .060 .941 .059 .937 .063 Oct. 28 - Nov. 3 .930 .070 .929 .071 .944 .056 Nov. 14 - Nov. 17 .906 .094 .920 .080 .773 <	Aug. $5 = Aug. 11$.937	.063	•937	.063	.928	.072
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. 30 Oct. 6 .951 .049 .953 .047 .958 .042 Sep. 30 Oct. 6 .951 .049 .953 .047 .920 .080 Oct. 7 .0ct. 13 .961 .039 .963 .037 .920 .080 Oct. 21 .0ct. 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	Aug. 12 - Aug. 18	-936	.064	.933	.067	.981	.019
Aug. 19 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 .953 .047 .958 .042 Sep. 16 Sep. 29 .950 .050 .953 .047 .958 .042 Sep. 30 Oct. 6 .951 .049 .953 .047 .920 .080 Oct. 7 Oct. 13 .961 .039 .963 .037 .905 .095 Oct. 14 .0ct. 20 .958 .042 .962 .038 .880 .120 Oct. 21 .0ct. 27 .940 .060 .941 .059 .937 .063 Oct. 28 .Nov. 3 .930 .070 .929 .071 .944 .056 Nov. 14 .Nov. 17 .906 .094 .920 .080 .773 .227	Aug. 10 - Aug. 25	. OL 3	-057	.943	.057	.946	.054
Aug. 200 = Sep. 1 .991 .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. 14 = Nov. 10 .921 .079 .929 .071 .826 .174 Nov. 18 = Nov. 24 .904 .096 .907 .093 .871 .129 Nov. 18 = Nov. 24 .904 .096 .907 .093 .871	Aug. 19 - Aug. 2)	.051	-040	-955	.045	.869	.131
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	Aug. 20 - Sep. 1	052	.048	.956	-044	.884	.116
Sep. 9 - Sep. 19 $\cdot 973$ $\cdot 041$ $\cdot 974$ $\cdot 046$ $\cdot 941$ $\cdot 059$ Sep. 16 - Sep. 22 $\cdot 953$ $\cdot 047$ $\cdot 954$ $\cdot 046$ $\cdot 941$ $\cdot 059$ Sep. 23 - Sep. 29 $\cdot 950$ $\cdot 050$ $\cdot 953$ $\cdot 047$ $\cdot 895$ $\cdot 105$ Sep. 30 - Oct. 6 $\cdot 951$ $\cdot 049$ $\cdot 953$ $\cdot 047$ $\cdot 920$ $\cdot 080$ Oct. 7 - Oct. 13 $\cdot 961$ $\cdot 039$ $\cdot 963$ $\cdot 037$ $\cdot 905$ $\cdot 095$ Oct. 14 - Oct. 20 $\cdot 958$ $\cdot 042$ $\cdot 962$ $\cdot 038$ $\cdot 880$ $\cdot 120$ Oct. 21 - Oct. 27 $\cdot 940$ $\cdot 060$ $\cdot 941$ $\cdot 059$ $\cdot 937$ $\cdot 063$ Oct. 28 - Nov. 3 $\cdot 930$ $\cdot 070$ $\cdot 929$ $\cdot 071$ $\cdot 944$ $\cdot 056$ Nov. 4 - Nov. 10 $\cdot 921$ $\cdot 079$ $\cdot 929$ $\cdot 071$ $\cdot 826$ $\cdot 174$ Nov. 11 - Nov. 17 $\cdot 906$ $\cdot 0944$ $\cdot 920$ $\cdot 080$ $\cdot 773$ $\cdot 227$ Nov. 18 - Nov. 24 $\cdot 904$ $\cdot 096$ $\cdot 907$ $\cdot 093$ $\cdot 871$ $\cdot 129$ Nov. 25 - Dec. 1 $\cdot 911$ $\cdot 089$ $\cdot 908$ $\cdot 092$ $\cdot 937$ $\cdot 063$ Dec. 2 - Dec. 8 $\cdot 906$ $\cdot 094$ $\cdot 911$ $\cdot 089$ $\cdot 859$ $\cdot 141$ Dec. 9 - Dec. 15 $\cdot 902$ $\cdot 098$ $\cdot 913$ $\cdot 087$ $\cdot 804$ $\cdot 196$ Dec. 16 - Dec. 22 $\cdot 889$ $\cdot 111$ $\cdot 899$ $\cdot 101$ $\cdot 813$ $\cdot 087$ Dec. 23 - Dec. 29 $\cdot 864$ $\cdot 136$ $\cdot 875$ <	Sep. 2 = Sep. 0	052	047	.953	-047	.958	.042
Sep. 16 - Sep. 22 $\cdot 975$ $\cdot 047$ $\cdot 974$ $\cdot 040$ $\cdot 974$ $\cdot 195$ Sep. 23 - Sep. 29 $\cdot 950$ $\cdot 050$ $\cdot 953$ $\cdot 047$ $\cdot 895$ $\cdot 105$ Sep. 30 - Oct. 6 $\cdot 951$ $\cdot 049$ $\cdot 953$ $\cdot 047$ $\cdot 920$ $\cdot 080$ Oct. 7 - Oct. 13 $\cdot 961$ $\cdot 039$ $\cdot 963$ $\cdot 037$ $\cdot 905$ $\cdot 095$ Oct. 14 - Oct. 20 $\cdot 958$ $\cdot 042$ $\cdot 962$ $\cdot 038$ $\cdot 880$ $\cdot 120$ Oct. 21 - Oct. 27 $\cdot 940$ $\cdot 060$ $\cdot 941$ $\cdot 059$ $\cdot 937$ $\cdot 063$ Oct. 28 - Nov. 3 $\cdot 930$ $\cdot 070$ $\cdot 929$ $\cdot 071$ $\cdot 944$ $\cdot 056$ Nov. 4 - Nov. 10 $\cdot 921$ $\cdot 079$ $\cdot 929$ $\cdot 071$ $\cdot 826$ $\cdot 174$ Nov. 11 - Nov. 17 $\cdot 906$ $\cdot 0944$ $\cdot 920$ $\cdot 080$ $\cdot 773$ $\cdot 227$ Nov. 18 - Nov. 24 $\cdot 904$ $\cdot 096$ $\cdot 907$ $\cdot 093$ $\cdot 871$ $\cdot 129$ Nov. 25 - Dec. 1 $\cdot 911$ $\cdot 089$ $\cdot 908$ $\cdot 092$ $\cdot 937$ $\cdot 063$ Dec. 2 - Dec. 8 $\cdot 906$ $\cdot 094$ $\cdot 911$ $\cdot 089$ $\cdot 859$ $\cdot 141$ Dec. 9 - Dec. 15 $\cdot 902$ $\cdot 098$ $\cdot 913$ $\cdot 087$ $\cdot 804$ $\cdot 196$ Dec. 16 - Dec. 22 $\cdot 889$ $\cdot 111$ $\cdot 899$ $\cdot 101$ $\cdot 813$ $\cdot 087$ Dec. 23 - Dec. 29 $\cdot 864$ $\cdot 136$ $\cdot 875$ $\cdot 125$ $\cdot 794$ $\cdot 206$	Sep. 9 = Sep. 19	•975	017	054	046	-941	.059
Sep. 23 - Sep. 29.990.090.993.047.920.080Sep. 30 - Oct. 6.951.049.953.047.920.080Oct. 7 - Oct. 13.961.039.963.037.905.095Oct. 14 - Oct. 20.958.042.962.038.880.120Oct. 21 - Oct. 27.940.060.941.059.937.063Oct. 28 - Nov. 3.930.070.929.071.944.056Nov. 4 - Nov. 10.921.079.929.071.826.174Nov. 11 - Nov. 17.906.094.920.080.773.227Nov. 18 - Nov. 24.904.096.907.093.871.129Nov. 25 - Dec. 1.911.089.908.092.937.063Dec. 2 - Dec. 8.906.094.911.089.859.141Dec. 9 - Dec. 15.902.098.913.087.804.196Dec. 16 - Dec. 22.889.111.899.101.813.087Dec. 23 - Dec. 29.864.136.875.125.794.206	Sep. 10 - Sep. 22	•975	050	053	047	895	105
Sep. $30 - 0$ ct. 6 .991.049.993.041.920.003Oct. $7 - 0$ ct. 13 .961.039.963.037.905.095Oct. $14 - 0$ ct. 20 .958.042.962.038.880.120Oct. $21 - 0$ ct. 27 .940.060.941.059.937.063Oct. $28 - Nov. 3$.930.070.929.071.944.056Nov. $4 - Nov. 10$.921.079.929.071.826.174Nov. $11 - Nov. 17$.906.094.920.080.773.227Nov. $18 - Nov. 24$.904.096.907.093.871.129Nov. $25 - Dec. 1$.911.089.908.092.937.063Dec. $2 - Dec. 8$.906.094.911.089.859.141Dec. 9 - Dec. 15.902.098.913.087.804.196Dec. 16 - Dec. 22.889.111.899.101.813.087Dec. 23 - Dec. 29.864.136.875.125.794.206	Sep. 23 - Sep. 29	.950	.0)0	• 975	047	.020	-080
Oct.7 - Oct.13.901.039.903.031.909.120Oct.14 - Oct.20.958.042.962.038.880.120Oct.21 - Oct.27.940.060.941.059.937.063Oct.28 - Nov.3.930.070.929.071.944.056Nov.4 - Nov.10.921.079.929.071.826.174Nov.11 - Nov.17.906.094.920.080.773.227Nov.18 - Nov.24.904.096.907.093.871.129Nov.25 - Dec.1.911.089.908.092.937.063Dec.2 - Dec.8.906.094.911.089.859.141Dec.9 - Dec.15.902.098.913.087.804.196Dec.16 - Dec22.889.111.899.101.813.087Dec.23 - Dec29.864.136.875.125.794.206	Sep. 30 - Oct. 6	•951	.049	• 975	027	005	.095
Oct. 14 - Oct. 20.958.042.962.036.000.120Oct. 21 - Oct. 27.940.060.941.059.937.063Oct. 28 - Nov. 3.930.070.929.071.944.056Nov. 4 - Nov. 10.921.079.929.071.826.174Nov. 11 - Nov. 17.906.094.920.080.773.227Nov. 18 - Nov. 24.904.096.907.093.871.129Nov. 25 - Dec. 1.911.089.908.092.937.063Dec. 2 - Dec. 8.906.094.911.089.859.141Dec. 9 - Dec. 15.902.098.913.087.804.196Dec. 16 - Dec. 22.889.111.899.101.813.087Dec. 23 - Dec. 29.864.136.875.125.794.206	Oct. 7 - Oct. 13	.961	.039	.903	.031	880	.120
Oct. 21 - Oct. 27.940.060.941.059.951.003 $Oct. 28 - Nov. 3$.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	Oct. 14 - Oct. 20	.958	.042	.902	.030	.000	063
Oct. $28 - Nov. 3$.930.070.929.071.944.096Nov. 4 - Nov. 10.921.079.929.071.826.174Nov. 11 - Nov. 17.906.094.920.080.773.227Nov. 18 - Nov. 24.904.096.907.093.871.129Nov. 25 - Dec. 1.911.089.908.092.937.063Dec. 2 - Dec. 8.906.094.911.089.859.141Dec. 9 - Dec. 15.902.098.913.087.804.196Dec. 16 - Dec. 22.889.111.899.101.813.087Dec. 23 - Dec. 29.864.136.875.125.794.206	Oct. 21 - Oct. 27	.940	.060	.941	.059	•951	.005
Nov. 4 - Nov. 10 .921 .079 .929 .071 .620 .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	Oct. 28 - Nov. 3	.930	.070	.929	110.	.944	.050
Nov. 11 - Nov. 17 .906 .094 .920 .080 .(73 .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	Nov. 4 - Nov. 10	.921	.079	•929	.071	.020	•1/4
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	Nov. 11 - Nov. 17	.906	.094	.920	.080	• (13	.221
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	Nov. 18 - Nov. 24	.904	.096	.907	.093	.871	.129
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	Nov. 25 - Dec. 1	.911	.089	.908	.092	•937	.063
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	Dec. 2 - Dec. 8	.906	.094	.911	.089	.859	.141
Dec. 16 - Dec. 22 .889 .111 .899 .101 .813 .087 Dec. 23 - Dec. 29 .864 .136 .875 .125 .794 .206	Dec. 9 - Dec. 15	.902	.098	.913	.087	.804	.196
Dec 23 - Dec 29 .864 .136 .875 .125 .794 .206	Dec. 16 - Dec. 22	.889	.111	.899	.101	.813	.087
	Dec 22 Dec 20	-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

	Ini	tial	Transition			
Period of	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. 1)	.956	044	.963	.037	.807	.193
Dec. To - Dec. 55	olio	.060	.945	.055	.865	.135
Dec. 23 = Dec. 29	. 740					