

Duration of Summer Season in South Florida

Introduction

Southeast Florida is characterized by two predominant seasons-- summer and winter. The summer season is characterized by warm, humid conditions with frequent showers and thunderstorms. The winter season has cooler temperatures, lower humidities and less frequent precipitation. The two missing seasons-- autumn and spring-- are included in the winter season because these two transition periods are drier and cooler than the summer season.

Each year the starting and ending of the summer season is a topic of interest in southeast Florida. The rains which help to signal the beginning of the summer season and put an end to the late winter dryness, and the all-too-frequent water-use restrictions, are always welcomed. Then when the day-after-day high temperatures and humidities of the summer have lasted for what seems to be an eternity, the first period of lower humidities and slightly cooler temperatures are greatly anticipated by all.

To my knowledge, no one has ever investigated the climatological records to determine the beginning and ending dates of this important annual climatological event.

Data

The focus of the investigation was southeast Florida. Monthly climatological records for Miami International Airport Weather Service Meteorological Observatory were available for the period 1956 through 1997. These *Monthly Climatological Data Monthly Summary (LCD)* sheets for Miami International Airport were the sole data base of this study.

Definition of Summer Season

As stated above, the summer season is characterized by warm temperatures. Daily Maxima average in the upper 80s but more significantly, the daily minima average in the middle 70s. Low temperatures rarely lower below the 70 degree level during the summer months. In addition to warm temperatures, high humidities prevail throughout the summer. The dew-point temperature is the best measure of moisture levels in Florida. During the summer period, the dew-point temperature remains in the lower to middle 70s. In addition, convection in the form of showers and thunderstorms is almost a daily occurrence during the summer. In an easterly wind regime, the precipitation occurs as late night and morning showers or thunderstorms over the coastal areas, and afternoon thunderstorms over the interior sections. In a westerly wind regime, afternoon thunderstorms affect interior and coastal areas alike. In light wind conditions, afternoon thunderstorms again develop over southeast Florida and affect most areas. Overall, the best indicators of summer season in southeast Florida are dew-point temperatures and minimum temperatures remaining in the 70s, and frequent daily rainfall.

Methods of Determination

Each year from 1956 through October 1997, the monthly climatological sheets for Miami for the months April, May, and June were examined for the beginning date.. and September, October and November were examined for the ending date of the summer season. The three meteorological parameters-- daily minimum temperatures, daily average dew-point temperature, and 24-hour precipitation amounts-- were examined to establish the beginning and ending dates of the summer season for each year. These data were available on the LCDs for Miami beginning in 1965. From 1956 through 1965, only daily minimum temperatures and 24-hour precipitation amounts were available.

For the more recent 33 years (1965-1997) when all three parameters were available, they were used in the following manner to determine the beginning of the summer season. The average daily dew point temperature was first examined to determine when it rose above and remained above 70°F. Of course, from this time on, the daily minimum temperatures remained above the 70°F level. The date when this took place was designated as the beginning of the summer season. In nearly all years, the summer rains began on or soon

after that date.

For that same period of time, the end of the summer season and the beginning of the winter season was determined in like manner. The average dew point temperature was first examined to determine the date when it first fell below 70°F. Many times this was very noticeable with a drop in dew point temperature to at least the lower 60s. This coincided with the daily minimum temperature dropping below 70°F for the first time since the beginning of the summer season. A sharp decrease in the frequency of daily rainfall was also observed with the temperature and humidity change. However, on occasion, the apparent end of the daily rainfall became masked by a period of rainfall occurring in northeasterly low level winds to the north of a stalled front south of the Florida peninsula. The end of the summer season in these cases was related to the dew point temperature and minimum temperature changes.

Prior to 1965, only the daily minimum temperature and 24-hour precipitation amounts were available. For determining the beginning (or ending) of the summer season, more weight was placed on the minimum temperatures remaining above (or below) 70°F than on the occurrence of precipitation. Most often, the beginning (ending) of the rains occurred on or just a few days after (before) the date when the minimum temperatures ceased to fall (fell) below 70°F. This was also true in the later years of the study.

Facts Revealed

During the 42 complete years, the earliest date for the beginning of the summer season was April 16 and the latest was June 3. This is a variation of 49 days. the median date for the onset of the summer season during these 42 years was May 21st.

The earliest date that the summer season ended was September 24, and the latest was November 1. This is a range of 39 days. The median date for the end of the summer season was October 17.

Based on these dates the average duration of the summer season was 152 days, or just less than 5 months. The shortest summer season was only 118 days in 1983 which was the year that had the earliest ending date. The longest summer season was 195 days which occurred in 1995.

Precipitation totals during these established summer seasons ranged from the least amount of 24.75 inches in 1987 to the greatest amount of 74.85 inches in 1968. The average amount was 40.86 inches.

These summer season precipitation totals were compared to the annual rain amounts each year to arrive at the percentage of the annual precipitation total that occurred during the summer season. On the average, 69% of the annual precipitation totals occurred during the summer season which average slightly less than 5 months.

Conclusion

A study of climatological records from Miami International Airport was made for the years 1956 through 1997 to determine the beginning and ending dates of the summer season in southeast Florida. While in real-time it is frequently difficult to know exactly when the summer season begins or ends, looking back at climatological records makes the determination much easier.

Three meteorological parameters found in the LCD-- average daily dew point temperature, daily minimum temperature, and 24-hour rainfall amounts-- were subjectively examined to determine the beginning and ending dates of the summer season in southeast Florida. The median date of the beginning was found to be May 21st, and October 17th for the ending of the summer season. The average summer season had a duration of 152 days producing 69% of the annual precipitation at Miami International Airport.

Summary Table

SEASONS IN SOUTHEAST FLORIDA

YEAR	WET SEASON BEGINNING DATE	DRY SEASON BEGINNING DATE	DURATION WET SEASON DAYS	WET SEASON TOTAL RAIN	PERCENT ANNUAL RAIN
1956	April 24	October 15	175	30.46	82
1957	April 16	October 25	193	56.38	80
1958	May 11	October 19	162	46.73	65
1959	May 10	October 25	169	63.14	71
1960	May 19	November 1	166	41.82	60
1961	May 17	October 19	156	27.61	66
1962	May 28	October 17	143	31.28	74
1963	May 18	October 17	153	31.79	69
1964	May 12	October 15	157	40.13	67
1965	May 29	October 23	148	41.37	71
1966	May 21	October 26	159	61.41	75
1967	May 28	October 18	144	47.59	72
1968	May 5	October 25	174	74.85	90
1969	May 12	October 31	173	52.91	74
1970	May 24	October 22	152	35.83	80
1971	June 3	October 25	145	36.77	72
1972	May 6	October 6	154	44.41	70
1973	May 22	October 23	155	39.66	74
1974	May 6	October 17	165	35.62	73
1975	May 6	October 22	170	32.27	83
1976	May 8	October 1	147	36.90	66
1977	May 25	October 4	132	34.41	53
1978	May 17	October 15	152	25.42	55
1979	May 28	October 6	132	31.08	52
1980	May 14	October 24	164	36.61	64
1981	May 26	October 13	141	36.73	72
1982	May 21	October 12	145	39.48	59
1983	May 30	September 24	118	27.39	48
1984	May 22	October 1	133	40.51	67
1985	May 30	October 29	153	43.20	77
1986	May 21	October 15	148	35.73	54
1987	May 30	October 3	127	24.75	49
1988	May 27	October 7	134	37.20	83
1989	May 23	October 19	150	35.77	84
1990	May 23	October 24	155	36.88	71
1991	May 15	October 15	154	53.74	75
1992	June 1	October 4	126	31.65	55
1993	May 28	September 30	126	32.45	52
1994	May 26	October 15	143	45.55	57
1995	April 25	November 5	195	64.78	82
1996	May 19	October 19	154	46.65	81
1997	May 17	October 3	152	47.04	67
1998					

MEDIAN DATE	MEDIAN DATE	AVERAGE DURATION	AVERAGE AMOUNT	AVERAGE PERCENT
May 21	October 17	152 Days	40.86"	69%
RANGE	RANGE	RANGE	RANGE	RANGE
April 6 to June 3	September 24 to November 5	118 to 195 Days	24.75" to 63.14"	49% to 90%