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**Key Words:**  
**Climate**  
**Change**

**Retention:**  
**#Permanent#**

**TRENDS IN ATMOSPHERIC CLIMATE PARAMETERS MEASURED  
AT SRS 1964-2013**

**Author: Stephen Weinbeck**

**REPORT DATE 4/20/2016**

Savannah River National Laboratory  
Savannah River Nuclear Solutions  
Aiken, SC 29808

**Prepared for the U.S. Department of Energy Under  
Contract Number DE-AC09-08SR22470**



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## LIST OF ACRONYMS

CDD	Cooling Degree Days
DOE	Department of Energy
HDD	Heating Degree Days
Norm's	Climate Normal (30-years)
RH	Relative Humidity
SE US	Southeast United States
SRS	Savannah River Site
T	Temperature



## 1.0 EXECUTIVE SUMMARY

Meteorological data collected at SRS since the mid-1960's have been analyzed for trends in minimum and maximum temperature, heating and cooling degree days, precipitation and relative humidity. The trends in meteorological data collected have been relatively small compared to the interannual variability that is observed. The observed increases, while small, appear to be real (statistically significant). Overnight low temperatures (3.1°F) have increased over twice as fast as the increases in daytime highs (1.4°F). Similarly, there are statistically significant increases in the number of cooling degree days as well. There has been a similar decrease in the number of HDD and freezing days, consistent with the overall increase in overnight low temperatures.

A companion study (Werth, 2016) will extend the analysis to future years as part of a DOE initiative to examine the impact of climate change on SRS operations.

## 2.0 INTRODUCTION

Since the 1950's, the Savannah River Site (SRS) has conducted meteorological monitoring as well as providing day to day operational support. In light of concerns of sustainability of future operations at SRS due to climate change, an analysis of the historic data provides context to the current climate conditions how it could continue to change, in the future.

At SRS, three variables have long term records: daily maximum and minimum values (temperature, precipitation and relative humidity). These quantities were analyzed in order to better understand the changes, if any, which may have occurred at SRS during the period of record. The primary goal is to understand any trends that have occurred, as well as establishing how relevant these may be. In this way, SRS can undertake informed decision making when planning for future operations, as well as better understand the climate at SRS.

The Glossary of Meteorology (2015) defines climate change as “Any systematic change in the long-term statistics of climate elements (such as temperature, pressure, or winds) sustained over several decades or longer.” The obvious implication of the definition is that, year to year variability is always present in the time series, which, by definition implies, the climate will always change to some degree.

The convention in the climate studies is to calculate normal's (hereafter refer to as “norms”) using 30-year (non-weighted) averages, and while these are only required to be recalculated every 30-years, most World Meteorological Organization member countries recalculate their norms every 10-years (Arguez and Vose, 2011). As is implied by the constant re-calculating of climate norms, the average values of these quantities is expected to change with time, or else, there would be no need to recalculate the norms. This implies a certain degree of weak non-stationary behavior is a normal condition in the atmosphere.

It is worth noting that while the term “climate change” within the popular press usually evokes discussions of greenhouse gases and climate forcing, the scope of this work is not to determine the cause of the changes at SRS. The relevancy of the changes is to better understand the observations made at SRS to support day to day operations and the operational implications that a changing climate might have to, regardless of the forcing mechanism.

## 3.0 DISCUSSION

### 3.1 DATA

Complicating the process of calculating climate parameters is that the year to year variability is usually much larger than the long term trends. The use of the concept of a norm does make it difficult to find trends, since many station periods of record only allow a few 30-year periods to be calculated making it difficult to determine any sort of trend.

Since the objective of this study is to determine trends, long period of record for these data sets was considered preferable to the shorter periods. So, despite the fact that the onsite data from a network of SRS towers is available at higher temporal resolution and greater digital precision, those datasets were not considered since the area tower data collection only dates back to 1973 (Parker and Addis, 1993), and is not available digitally for the entire period. A somewhat different approach will be used for the study. Temperature, relative humidity and rainfall data were collected manually in A-Area (SRNL) since the 1960s. Both temperature (T) and precipitation data will be analyzed from 1964 to 2013, giving a continuous 50-year period of record. In addition to the full 50-years for the period of record, relative humidity was examined. The period of record for relative humidity (RH) at SRS is 1968 to 2012 (46-years).

Since SRS lies in a relatively homogeneous region, with only small changes in elevation, it is reasonable to assume that the conditions for these observations should be reasonably representative of the site as a whole. Furthermore, the immediate exposure around the data collection (i.e. buildings, parking lots, vegetation) has not changed dramatically since the data collection began.

### 3.2 DAILY VALUES

Daily extremes of maximum and minimum temperature often drive much of the decision making, particularly in terms of engineering design and operations of processes and facilities. So, while many climatological studies examine average daily values of temperature and relative humidity, these averages of daily values were not analyzed in detail for this study. Since the average daily values consist of averaging only two values, there is no additional insight provided if both the maximum and minimum values are already being examined.

In addition to the measured quantities for temperature, it was desirable to examine quantities that were not the product of averaging. The difficulty associated with using only the product of averaging, is that extremes tend to be removed by the very process of averaging, masking the extremes in the signal being analyzed.

For example, using a temperature threshold of 65 degree Fahrenheit, heating and cooling degree days were calculated. By convention, for every degree above or below the 65 degree mean temperature, a cooling degree day (CDD) or heating degree day (HDD) is accumulated. For a day with a 77°F mean temperature, that day would contribute 12 heating degree days to the time period. These values for heating and cooling, based on rules of thumb related to human comfort, were then summed for various periods, and the monthly or seasonal sums were plotted.

Similar to the use of CDD/HDD, the number of sweltering days (maximum  $>90^{\circ}\text{F}$ ) or freezing days (minimum  $<32^{\circ}\text{F}$ ), represent a useful measure of change in the climate at SRS, without resorting to averaging, which masks the extremes in maximums and minimums that are of particular interest.

### 3.3 MONTHLY VALUES

In the case of maximum temperature, minimum temperature, and relative humidity, the daily values are averaged by month (giving the average maximum/minimum temperature of the month). For sweltering/freezing days and heating/cooling degree days, they are summed for the entire month. So, for the entire period of record, where available, there are computed monthly values. It is the monthly values that can then be averaged to various time periods.

Four sets of averages were computed for SRS. First, the averages were computed for the entire period of record (see Table 1). This gives a baseline for the period of record, but does not provide any temporal insights. Second, averages were computed for each possible normal period. Each average was performed over a 30-year period, but since norms are updated every decade, there are 3 norms calculated, overlapping the adjacent norm by 20 of the 30-years (Table 2). Additionally, five period averages, each consisting of a 10-year period were also calculated (see Table 3). Each of these 10-year periods is long enough to provide some stability, in that they are averaged over a sufficiently long period to not fluctuate greatly between adjacent periods, but is short enough to allow for temporal changes to be viewed given the overall 50-year period of record.

As would be expected, the overlapping norms do not demonstrate much change from one to another. There is a warming trend evident in most quantities. The mean daily maximums increase for each period, both for the individual months, and annually. The average mean daily minimum temperature increased both from '64-'93 (Table 2c) to '74-'04 (Table 2b) and then again to the '84-'13 periods (Table 2a). There were fewer HDD and more CDD in the later time periods than in the earlier norms, along with more sweltering days, and fewer freezing days. The most dramatic changes are in January, and February where the increases in the mean daily maximums, mean daily minimums, average temperature, HDD and CDD changed the most. The summer season showed the second largest change in the values, while the transitional seasons in spring and fall showed relatively smaller changes.

While it was not surprising to see these trends, the longer averaging period makes it more difficult to detect such signals, since a larger change must accumulate to overcome the division over the longer time period. The general warming trend is somewhat more evident when only a single decade is present (Table 3). The magnitude of the changes in the values are larger than those in the norms (Table 2 vs Table 3), but the trend is consistently visible over the entire period. Average mean daily maximums and mean daily minimums both increase over the period, and the HDD and CDD, as well as the number of sweltering and freezing days all show warming.

The exception to the warming trend is for December. Prior to 2004-2013, many of the values for mean daily maximum, minimum, average, and CDD all decreased, rather than show an increasing trend. The number of heating degree days increased. When coupled with the number of freezing days decreasing from 1984-1993 (Table 3c) and again from –1994-2003 (Table 3b), the implication is that there are fewer cold days, but the days that are cold are colder on average than in the 1964-1973 period (Table 3e). This can be seen somewhat in that the extreme minimums in (Tables 2b, and 3b-e) are all colder in December than in the initial 30- and 10-year climate periods (Tables 2c and 3e). In Tables 2a, 3a, the December temperature is slightly warmer than the temperature in the base climate (1964-1994 of the 30-year period, and 1964-1974 for the 10-year period), however, the increases represent 2 of the smaller monthly increases for these respective periods.

Table 1. Maximum and Minimum Temperatures and Selected Averages for SRS Period of Record.

1964-2013										
Mon	Highest Maximum Temperature (°F)	Mean Monthly Maximum Temperature (°F)	Lowest Minimum Temperature (°F)	Mean monthly Minimum Temperature (°F)	Average Temperature (°F)	HDD (average degree days)	CDD (average degree days)	Sweltering (days >90°F)	Freezing (days <32°F)	Rain (in)
Jan	86	57.9	-3	36.7	46.6	573	2	0.0	9.8	4.2
Feb	86	60.1	12	38.8	49.5	442	4	0.0	6.7	4.2
Mar	90	68.6	11	45.7	57.2	269	26	0.0	2.1	4.8
Apr	99	77.1	29	53.0	65.1	90	93	0.9	0.1	3.1
May	99	84.0	38	61.4	72.7	13	251	5.1	0.0	3.6
Jun	108	89.7	48	68.5	79.1	1	424	14.1	0.0	5.0
Jul	107	92.0	58	71.7	81.9	0	523	19.8	0.0	5.3
Aug	107	90.5	56	70.9	80.7	0	487	16.5	0.0	5.1
Sep	104	85.6	41	65.8	75.7	4	324	7.0	0.0	3.9
Oct	96	76.4	28	54.7	65.6	84	102	0.5	0.1	2.9
Nov	89	67.5	18	45.2	56.4	279	20	0.0	2.2	2.8
Dec	82	59.3	7	39.1	49.2	496	6	0.0	7.4	3.7
Annual	108	75.7	-3	54	65.0	2250	2261	63.9	28.4	48.5

Table 2a. Maximum and Minimum Temperatures and Selected Averages for SRS Normal (1984-2013).

1984-2013										
Mon	Highest Maximum (°F)	Mean Monthly Maximum (°F)	Lowest Minimum (°F)	Mean monthly Minimum (°F)	Average (°F)	HDD (average degree days)	CDD (average degree days)	Sweltering (days >90°F)	Freezing (days <32°F)	Rain (in)
Jan	82	57.9	-3	38.1	48.0	530	3	0.0	7.9	4.0
Feb	86	61.3	12	40.6	51.0	402	6	0.0	4.8	4.0
Mar	90	69.0	16	46.7	57.8	251	29	0.0	1.4	4.3
Apr	99	77.3	29	53.4	65.4	88	99	1.0	0.1	2.7
May	99	84.4	38	62.2	73.3	11	268	5.7	0.0	2.9
Jun	108	90.1	49	69.4	79.8	0	443	14.9	0.0	5.3
Jul	107	92.5	58	72.5	82.5	0	541	21.0	0.0	5.0
Aug	107	90.8	56	71.6	81.2	0	502	17.0	0.0	4.8
Sep	104	85.7	46	66.6	76.2	3	338	7.2	0.0	3.9
Oct	96	76.4	31	55.6	66.0	77	108	0.5	0.0	3.1
Nov	86	67.7	24	46.3	57.0	262	22	0.0	1.5	3.0
Dec	82	59.1	14	39.4	49.3	493	6	0.0	6.7	3.6
Annual	108	76.0	-3	55.2	65.6	2118	2365	67.2	22.5	46.6

Table 2b (cont.). Maximum and Minimum Temperatures and Selected Averages for SRS Normal (1974-2003).

1974-2003										
Mon	Highest Maximum (°F)	Mean Monthly Maximum (°F)	Lowest Minimum (°F)	Mean monthly Minimum (°F)	Average (°F)	HDD (average degree days)	CDD (average degree days)	Sweltering (days >90°F)	Freezing (days <32°F)	Rain (in)
Jan	86	56.1	-3	36.3	46.2	586	2	0.0	9.9	4.5
Feb	86	61.3	12	39.9	50.6	412	5	0.0	6.0	4.2
Mar	90	68.7	11	46.1	57.4	261	26	0.0	2.1	4.9
Apr	99	76.8	29	52.9	64.8	94	89	0.9	0.1	3.2
May	99	83.9	38	61.2	72.6	14	249	5.0	0.0	3.7
Jun	105	89.6	48	68.5	79.0	0	422	13.4	0.0	4.6
Jul	107	92.3	59	72.0	82.2	0	532	21.0	0.0	5.4
Aug	107	90.8	56	70.9	80.8	0	491	16.8	0.0	4.9
Sep	104	85.4	46	66.1	75.7	4	326	6.9	0.0	4.3
Oct	96	76.5	28	54.9	65.7	84	105	0.7	0.1	3.2
Nov	86	67.7	19	46.2	57.0	266	25	0.0	2.1	3.0
Dec	82	58.6	7	38.7	48.7	513	7	0.0	7.7	3.3
Annual	107	75.6	-3	54.5	65.1	2236	2280	64.7	27.9	49.2



Table 2c (cont.). Maximum and Minimum Temperatures and Selected Averages for SRS Normal (1964-1993).

1964-1993										
Mon	Highest Maximum (°F)	Mean Monthly Maximum (°F)	Lowest Minimum (°F)	Mean monthly Minimum (°F)	Average (°F)	HDD (average degree days)	CDD (average degree days)	Sweltering (days >90°F)	Freezing (days <32°F)	Rain (in)
Jan	86	55.7	-3	35.9	45.8	597	2	0.0	10.8	4.4
Feb	86	59.8	13	38.0	48.9	458	4	0.0	7.9	4.3
Mar	90	68.4	11	45.2	56.8	279	23	0.0	2.6	5.2
Apr	99	77.0	29	52.4	64.7	98	88	1.0	0.1	3.2
May	99	83.5	38	60.6	72.1	15	234	4.3	0.0	4.1
Jun	105	89.4	48	67.6	78.5	2	406	13.3	0.0	4.5
Jul	107	92.2	58	71.3	81.7	0	519	19.9	0.0	5.6
Aug	107	90.3	56	70.5	80.4	0	478	16.2	0.0	5.5
Sep	104	85.6	41	65.5	75.5	4	320	7.6	0.0	3.7
Oct	96	76.6	28	54.2	65.4	87	100	0.7	0.1	3.0
Nov	89	67.5	18	45.0	56.2	284	21	0.0	2.7	2.8
Dec	82	59.2	7	38.8	49.0	502	7	0.0	7.9	3.5
Annual	107	75.4	-3	53.7	64.6	2327.1	2202.5	63.0	32.1	49.8

Table 3a. Maximum and Minimum Temperatures and Selected Averages for SRS by Decade.

2004-2013										
Mon	Highest Maximum (°F)	Mean Monthly Maximum (°F)	Lowest Minimum (°F)	Mean monthly Minimum (°F)	Average (°F)	HDD (average degree days)	CDD (average degree days)	Sweltering (days >90°F)	Freezing (days <32°F)	Rain (in)
Jan	81	58.5	16	38.3	48.4	519	4	0.0	8.0	2.7
Feb	82	60.5	18	39.1	49.8	431	3	0.0	5.9	3.8
Mar	90	68.7	24	46.2	57.5	263	29	0.0	1.4	3.7
Apr	93	77.7	30	53.5	65.6	80	97	0.9	0.1	2.8
May	98	84.0	46	62.1	73.0	10	258	5.2	0.0	3.2
Jun	108	91.0	58	70.1	80.5	0	465	17.2	0.0	5.2
Jul	103	92.2	58	72.4	82.3	0	537	19.9	0.0	4.1
Aug	107	91.5	61	72.4	81.9	0	525	18.7	0.0	4.2
Sep	99	87.1	50	66.6	76.9	0	356	9.7	0.0	2.6
Oct	92	76.6	33	55.3	66.0	79	109	0.3	0.0	2.3
Nov	86	67.4	25	44.3	55.8	283	8	0.0	1.8	2.9
Dec	81	60.6	17	39.9	50.2	463	6	0.0	6.4	4.9
Annual	108	76.3	16	55.0	65.7	2127	2396	71.9	23.7	42.5

Table 3b (cont.). Maximum and Minimum Temperatures and Selected Averages for SRS by Decade.

1994-2003										
Mon	Highest Maximum (°F)	Mean Monthly Maximum (°F)	Lowest Minimum (°F)	Mean monthly Minimum (°F)	Average (°F)	HDD (average degree days)	CDD (average degree days)	Sweltering (days >90°F)	Freezing (days <32°F)	Rain (in)
Jan	82	58.1	14	38.6	48.4	520	4	0.0	7.6	4.5
Feb	83	62.2	12	41.5	51.8	376	5	0.0	3.6	4.2
Mar	90	68.4	16	47.0	57.7	256	29	0.0	1.9	4.9
Apr	94	76.6	35	54.4	65.5	83	98	0.7	0.0	3.2
May	99	85.0	43	62.7	73.8	10	283	6.4	0.0	3.7
Jun	104	88.6	54	68.7	78.7	1	411	11.4	0.0	4.6
Jul	102	91.6	62	72.1	81.9	0	523	19.8	0.0	5.4
Aug	103	90.4	58	70.7	80.6	0	483	15.6	0.0	4.9
Sep	98	84.2	46	65.7	74.9	5	303	4.4	0.0	4.3
Oct	92	76.4	31	55.2	65.8	79	104	0.1	0.1	3.2
Nov	86	66.9	26	45.6	56.2	285	22	0.0	1.6	3.0
Dec	82	58.1	17	38.4	48.2	526	6	0.0	7.6	3.3
Annual	104	75.5	12	55.0	65.3	2140	2268	58.4	22.2	49.2

Table 3c (cont.). Maximum and Minimum Temperatures and Selected Averages for SRS by Decade.

1984-1993										
Mon	Highest Maximum (°F)	Mean Monthly Maximum (°F)	Lowest Minimum (°F)	Mean monthly Minimum (°F)	Average (°F)	HDD (average degree days)	CDD (average degree days)	Sweltering (days >90°F)	Freezing (days <32°F)	Rain (in)
Jan	79	57.8	-3	38.4	48.1	526	2	0.0	7.1	4.4
Feb	86	62.1	17	41.5	51.8	383	9	0.0	4.9	4.1
Mar	88	69.0	23	46.6	57.8	250	28	0.0	1.3	4.5
Apr	99	77.0	29	52.3	64.6	108	96	1.4	0.1	2.5
May	99	84.1	38	61.4	72.8	14	255	5.2	0.0	2.6
Jun	105	90.4	49	68.9	79.7	0	440	15.2	0.0	4.4
Jul	107	93.6	59	72.7	83.1	0	563	23.3	0.0	5.7
Aug	103	90.8	56	71.8	81.3	1	506	17.3	0.0	6.1
Sep	104	86.2	49	67.1	76.6	4	354	8.8	0.0	3.7
Oct	96	76.3	34	55.4	65.8	83	109	1.1	0.0	4.7
Nov	86	68.3	24	48.1	58.2	236	33	0.0	1.4	3.6
Dec	80	58.5	14	39.5	49.0	503	7	0.0	6.7	3.0
Annual	107	76.2	-3	55.3	65.7	2109	2400	72.4	21.6	49.2

Table 3d (cont.). Maximum and Minimum Temperatures and Selected Averages for SRS by Decade.

1974-1983										
Mon	Highest Maximum (°F)	Mean Monthly Maximum (°F)	Lowest Minimum (°F)	Mean monthly Minimum (°F)	Average (°F)	HDD (average degree days)	CDD (average degree days)	Sweltering (days >90°F)	Freezing (days <32°F)	Rain (in)
Jan	86	53.1	4	32.5	42.8	691	2	0.0	14.4	4.5
Feb	81	59.6	13	36.6	48.1	479	1	0.0	9.3	4.3
Mar	87	68.2	11	44.8	56.5	285	22	0.0	3.1	5.3
Apr	92	76.6	29	51.8	64.2	96	73	0.6	0.2	3.7
May	98	82.8	41	59.9	71.4	18	215	3.6	0.0	5.0
Jun	105	89.2	54	67.5	78.3	1	401	12.2	0.0	3.7
Jul	106	92.2	59	71.3	81.7	0	519	20.8	0.0	5.2
Aug	107	91.2	59	70.1	80.6	0	484	17.8	0.0	4.4
Sep	102	85.6	46	65.6	75.6	5	322	7.4	0.0	4.5
Oct	92	75.9	28	52.9	64.4	103	84	0.3	0.1	2.6
Nov	85	67.6	19	44.9	56.3	281	20	0.0	3.0	3.1
Dec	80	57.9	7	36.9	47.4	552	7	0.0	10.0	3.9
Annual	107	75.0	4	52.9	63.9	2509	2148	62.7	40.2	50.3

Table 3e (cont.). Maximum and Minimum Temperatures and Selected Averages for SRS by Decade.

1964-1973										
Mon	Highest Maximum (°F)	Mean Monthly Maximum (°F)	Lowest Minimum (°F)	Mean monthly Minimum (°F)	Average (°F)	HDD (average degree days)	CDD (average degree days)	Sweltering (days >90°F)	Freezing (days <32°F)	Rain (in)
Jan	77	55.0	4	35.1	45.1	618	0	0.0	9.9	4.6
Feb	80	57.1	14	35.7	46.4	527	1	0.0	6.0	3.9
Mar	87	67.2	24	43.6	55.4	315	17	0.0	2.1	6.0
Apr	95	77.6	33	52.9	65.2	89	97	1.0	0.1	2.7
May	99	83.2	41	60.3	71.8	13	223	3.3	0.0	4.0
Jun	105	88.2	49	66.5	77.4	5	376	12.1	0.0	5.7
Jul	102	91.1	58	69.9	80.5	0	481	16.8	0.0	5.9
Aug	104	89.1	56	69.4	79.2	0	441	13.8	0.0	6.0
Sep	99	85.2	41	63.9	74.6	4	291	5.8	0.0	3.3
Oct	92	76.3	30	54.1	65.2	83	91	0.1	0.1	2.5
Nov	84	66.5	18	42.6	54.5	326	11	0.0	2.1	2.0
Dec	82	60.2	20	39.3	49.7	480	7	0.0	7.7	3.7
Annual	105	74.7	4	52.8	63.8	2461	2036	52.9	27.9	50.3

### 3.4 SEASONAL AND ANNUAL VALUES

Seasonal trends are examined in this section. Winter was defined as December, January and February; Spring as March, April, May; Summer as June, July and August and Fall as September, October, and November. Since the period of record extends 50-calendar years (Jan-Dec), there are 49 complete winter seasons, along with a January and Feb from the winter of 1950, and the December of 2013 giving two partial seasons. The partial seasons from opposite ends of the period were removed. Seasonal means for 49 winter seasons were computed, along with 50 seasons for spring, summer and fall. In addition to the 4 seasons, annual values were computed.

From the seasonal/annual values, time history plots were performed for each variable.

- Figures 1 to 5 – Seasonal & Annual Averaged Daily Maximum and Daily Minimum Temperatures
- Figures 6 to 10 – Seasonal & Annual Heating and Cooling Degree Days
- Figures 11 to 15 – Seasonal & Annual Sweltering and Freezing Days
- Figures 16 to 20 – Seasonal & Annual Precipitation
- Figures 21 to 25- Seasonal & Annual Averaged Daily Maximum and Daily Minimum Relative Humidity

A least square linear regression was performed on each set of seasonal and annual data, and the resulting best fit line computed, with the corresponding equations plotted for the period of record. For all the figures, the most obvious quality present in all the figures is that the interannual variability is much greater than the changes that have occurred over the period of record. While it is obvious that more extreme trendline slopes are of greater significance to SRS (due to the potential for extreme changes in the climate), the large magnitude of the variations in the year to year climate make the evaluation of the slope difficult. Because of this quality, F-statistics are calculated for each time series in order to determine whether the trend is statistically significant at the 95% confidence level (F-statistic of 0.05 or less).

The importance of calculating the statistical significance is that with large year to year variability, it can be difficult to determine if the trend is large enough to be an important change in the variable, when inspecting a slope visually. Since less extreme slopes have little or no statistical relevancy (significance), it can be concluded the slopes are not different then what might be randomly introduced by the noise in the signal. A larger slope (either in the positive or negative sense) would stand out, and show a trend that would be large enough to be separated from the extremely noisy signal, and demonstrates that the changes are not due to random variations in the time series but part of a meaningful trend.

### 3.4.1 Maximum and Minimum Temperatures

Figures 1 to 4 are plots of the seasonal averaged maximum and minimum temperatures for the period of record. Figure 5 is the same plot for annual averaged maximum and minimum temperature. The mean daily maximum and mean daily minimum temperatures have trendlines that are increasing. For each case, the mean minimum temperature is increasing faster than the average maximum temperatures. The slopes are less pronounced in the spring and fall (transitional seasons) than in the winter, summer and annually. This result is consistent with the findings of other studies, where increases in the mean temperatures are due mainly to the nighttime lows (Dia, Trenberth and Karl, 1999; Powell and Keim, 2015).

The regression equations were used to determine an estimate of the magnitude of increased or decreased over the period since data collection began at SRS. Those values are summarized in Table 4, along with the significance of the change as indicated by with the F-statistic. Winter and summer seasons show the greatest increase in the mean daily maximum temperatures (2.9°F and 1.7°F, respectively), but only the winter value was found to be statistically significant. The mean minimum temperatures increased by 3.7°F and 3.4°F for the winter and summer, with all 4 seasonal values found to be statistically significant. Both annual values were found to be statistically significant with increases of +1.4 degrees for the mean maximum, and +3.1 degrees for the minimum.

These results verify the results from Powell and Keim (2015), which found that there is a statistically significant decrease in the number of cool nights for the SE US, in general.



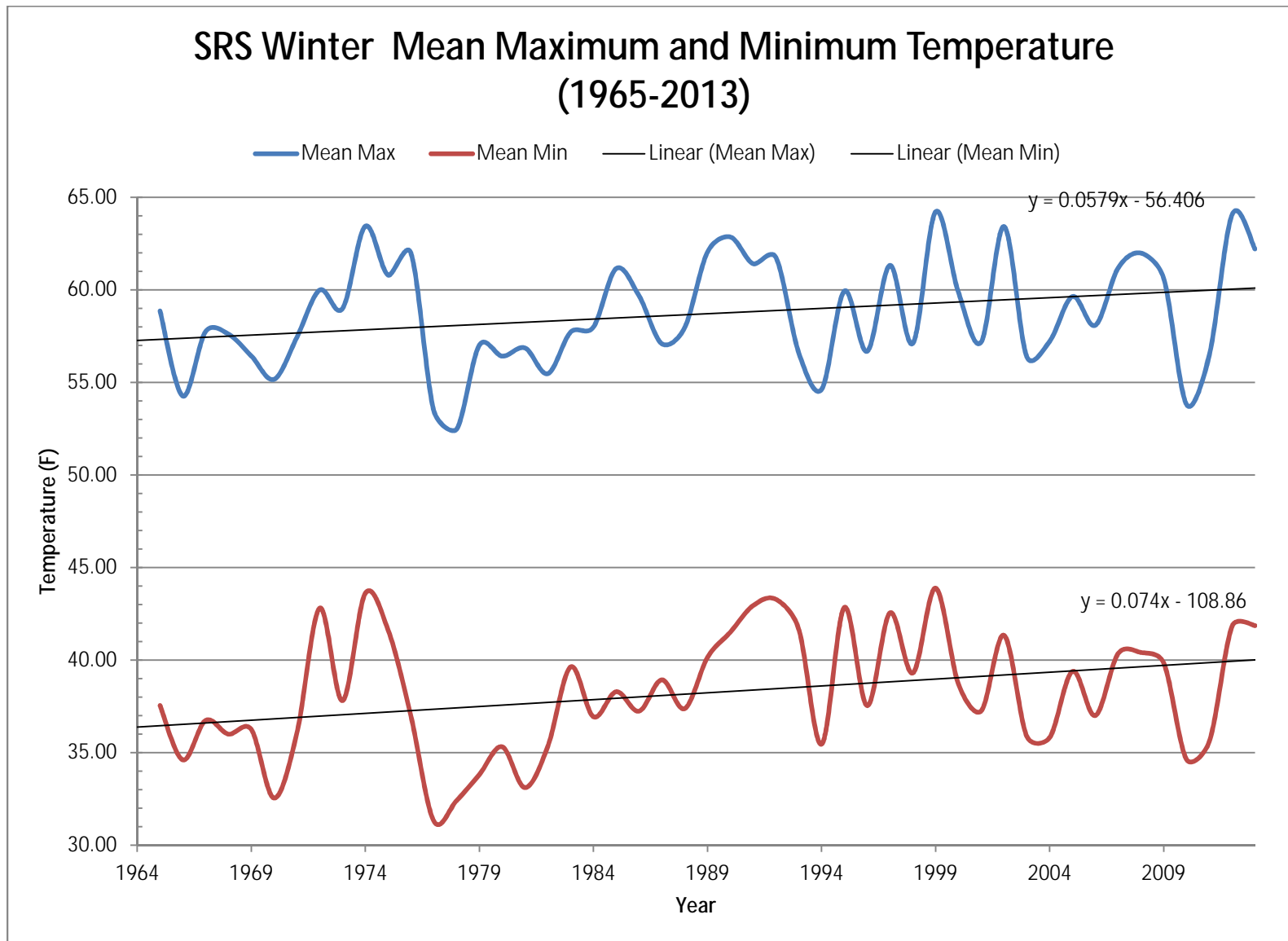


Figure 1. Savannah River Site Winter Mean Maximum and Minimum Temperatures (1965-2013).

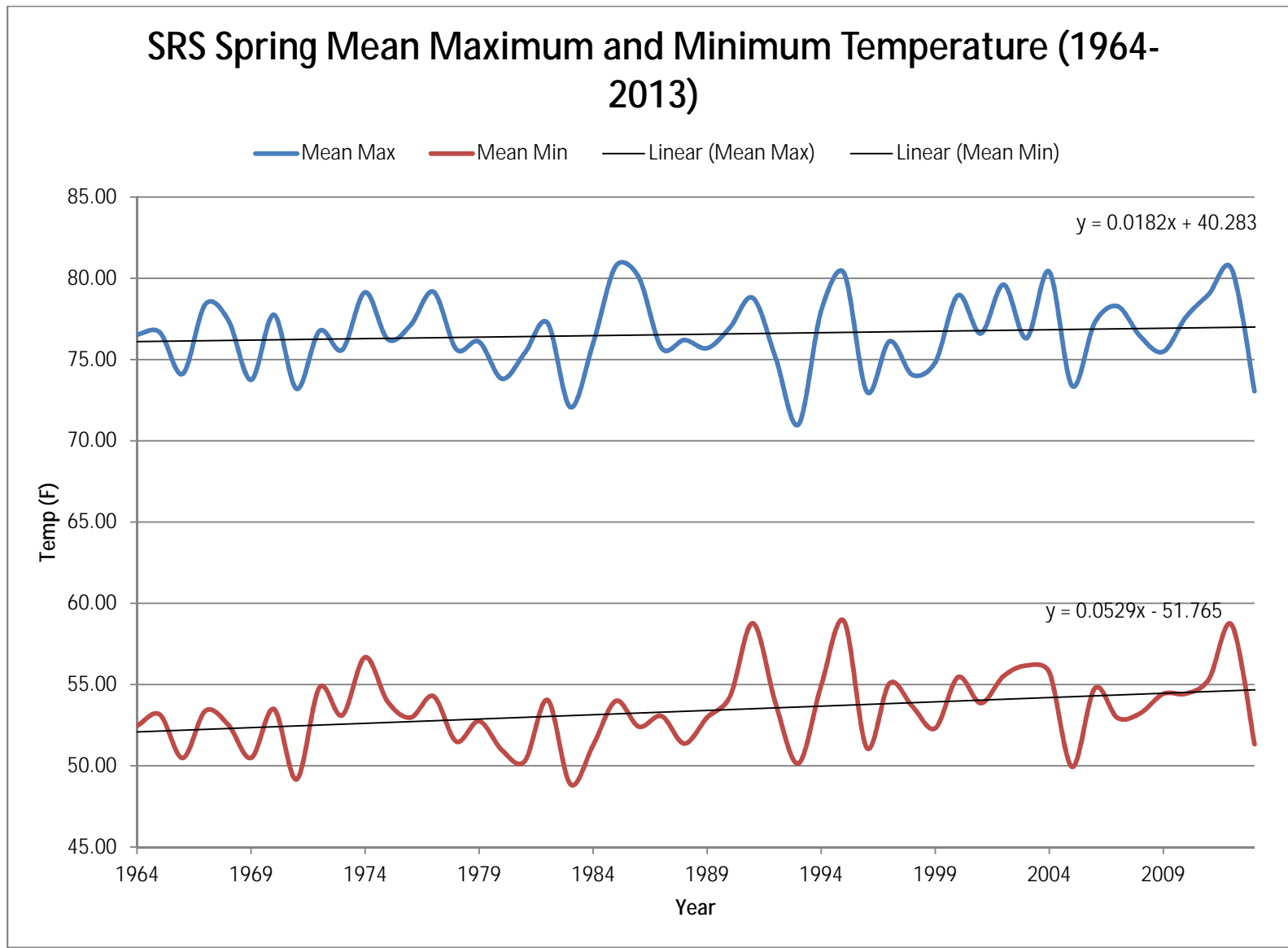


Figure 2. Savannah River Site Spring Mean Maximum and Minimum Temperatures (1964-2013).

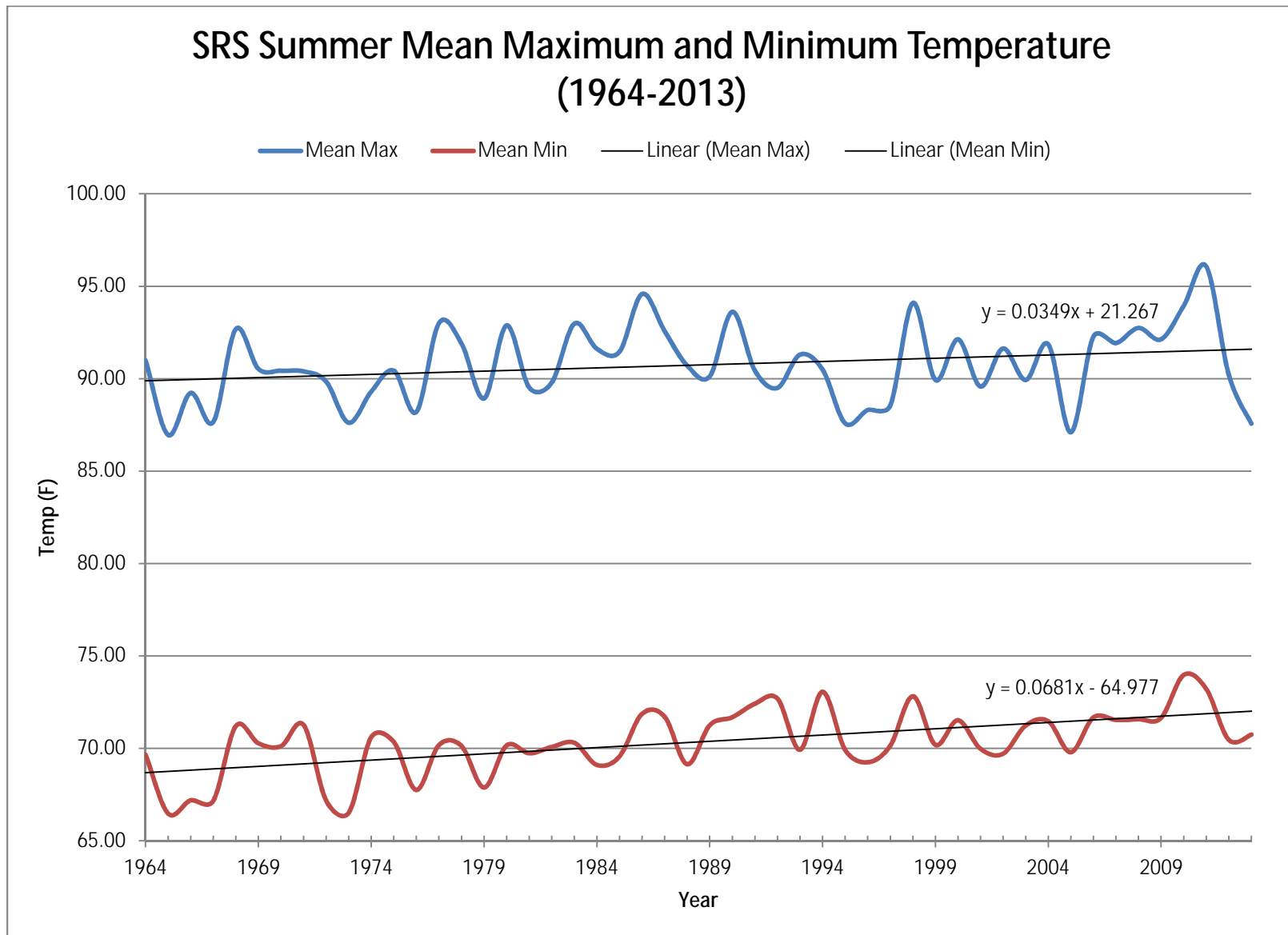


Figure 3. Savannah River Site Summer Mean Maximum and Minimum Temperatures (1964-2013).

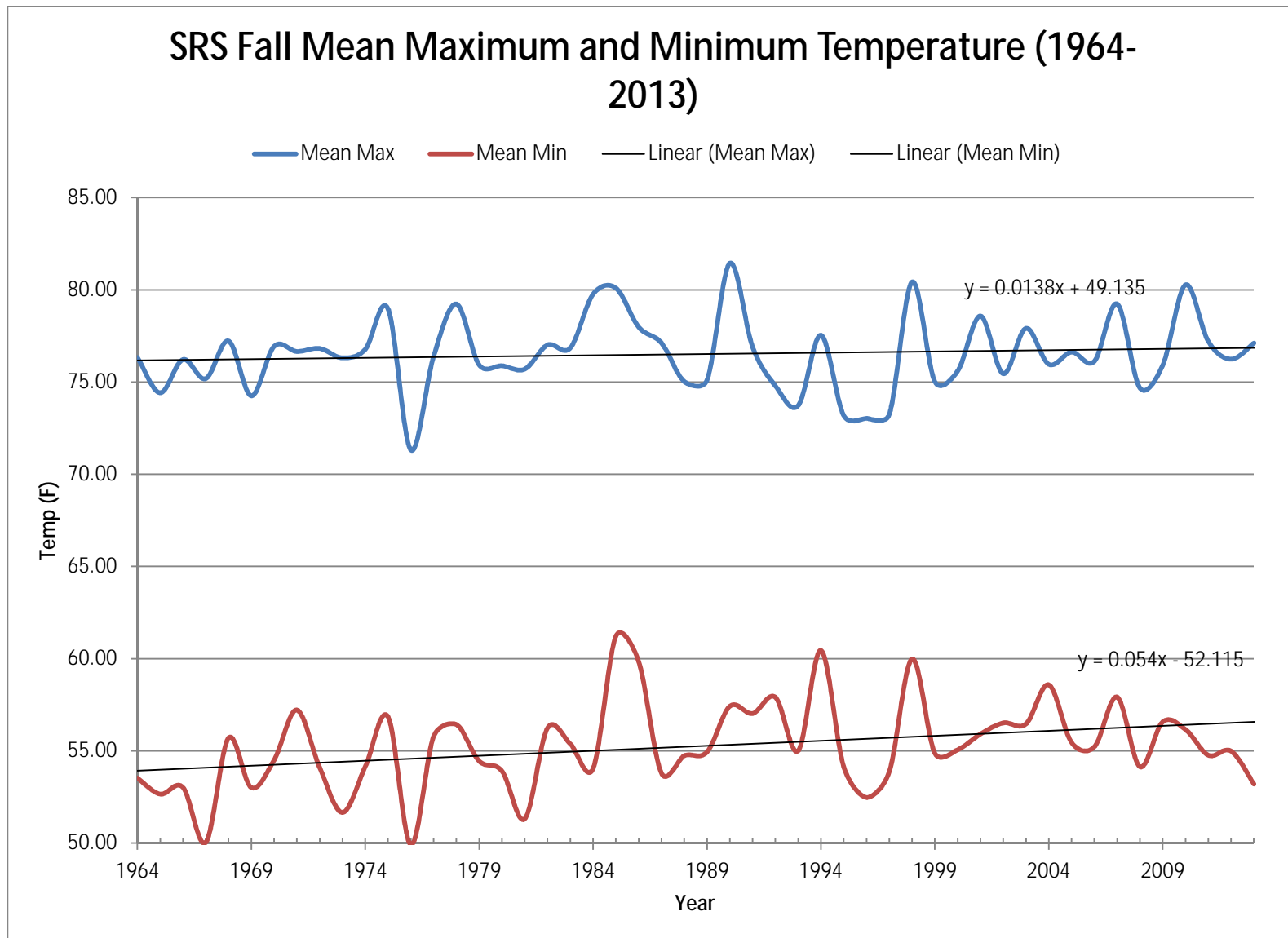


Figure 4. Savannah River Site Fall Mean Maximum and Minimum Temperatures (1964-2013).

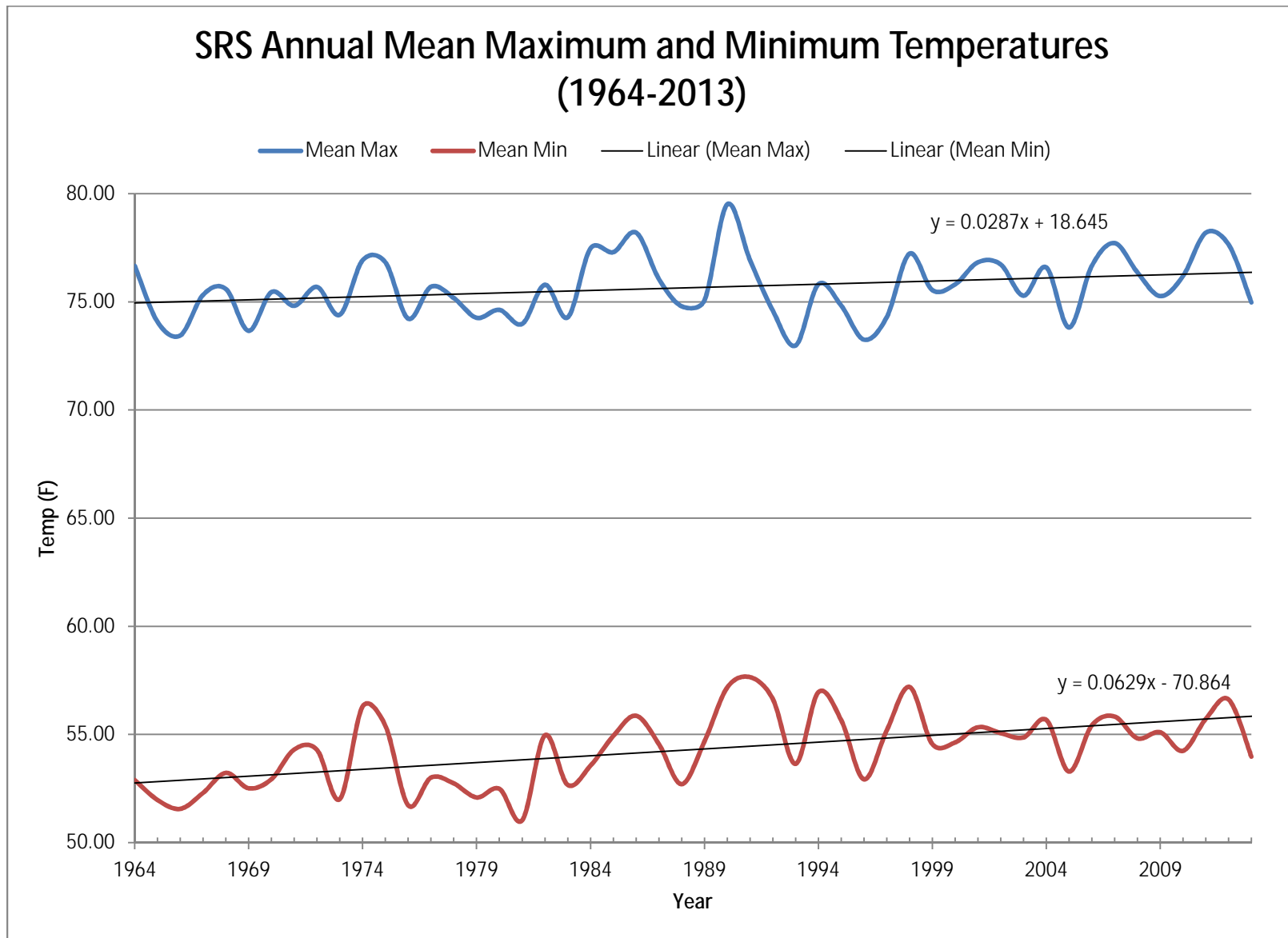


Figure 5. Savannah River Site Annual Mean Maximum and Minimum Temperatures (1964-2013).

### 3.4.2 Heating and Cooling Degree Days

The graphs presented in figures 6 through 10 represent the time series of seasonal and annual HDD and CDD. The HDD and CDD were not calculated for the summer and winter months, respectively, due to the infrequent number of occurrences during these seasons. As with the temperature trends, a general warming is apparent in all the heating/cooling degree days data, with the trends being strongest in the winter and summer. More mild trends are observed in the transitional seasons and annually, but are present in all the data.

The neither the spring nor fall was found to have a statistically significant trend line. The slopes of the trendlines are small, relative to the HDD/CDD present, so the significance of the trends is questionable (less than 95%). The significance in the HDD and CDD annual time series is driven by predominant season (summer for CDD, winter for HDD), since that is where the majority of the change is occurring (see Table 4). This does not imply that individual seasons might not have dramatic changes, since averaging would remove these changes, and it is the large interannual variability that is causing the failure of the significance test.

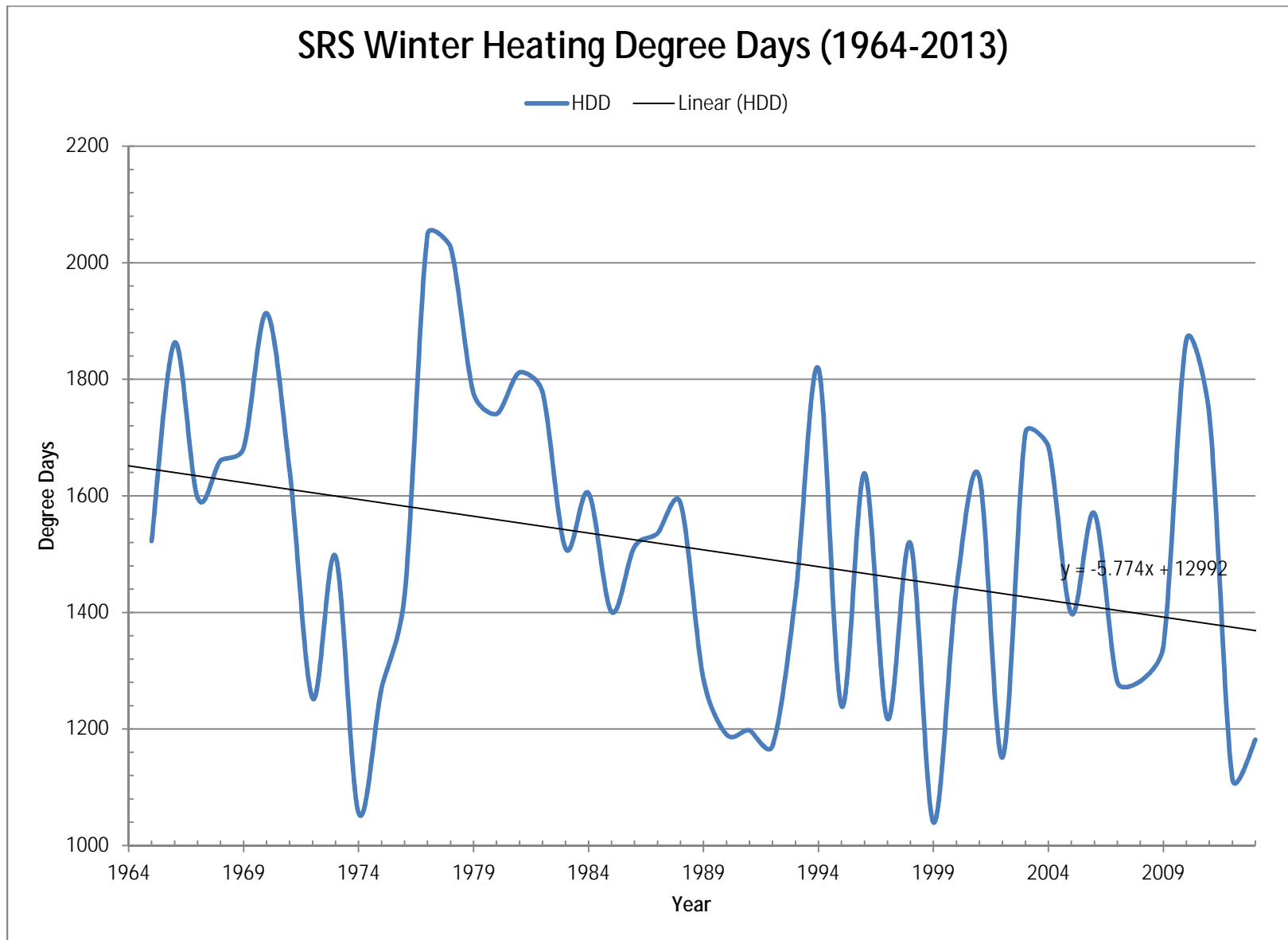


Figure 6. Savannah River Site Winter Heating Degree Days (1965-2013).

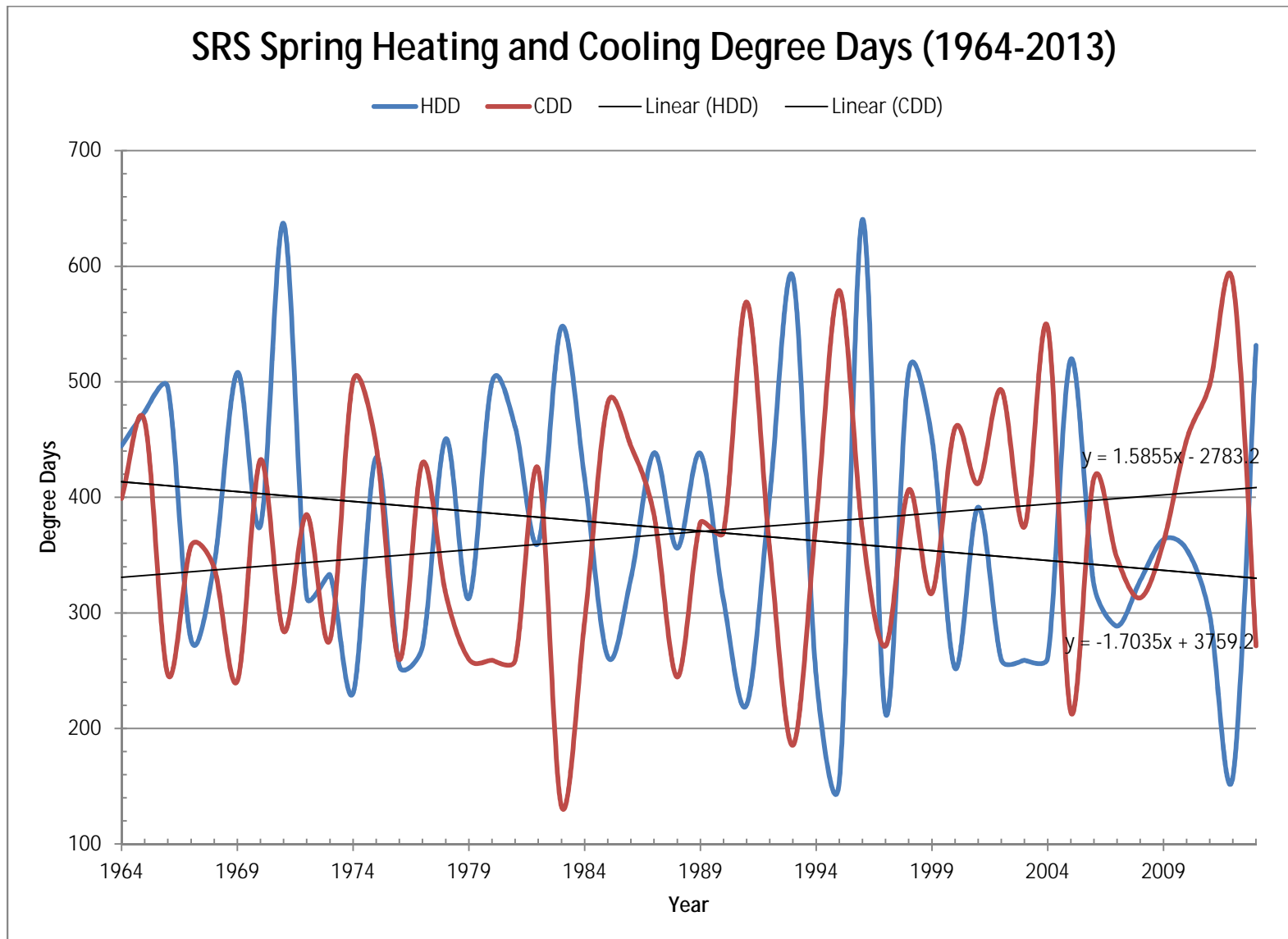


Figure 7. Savannah River Site Spring Heating and Cooling Degree Days (1964-2013).



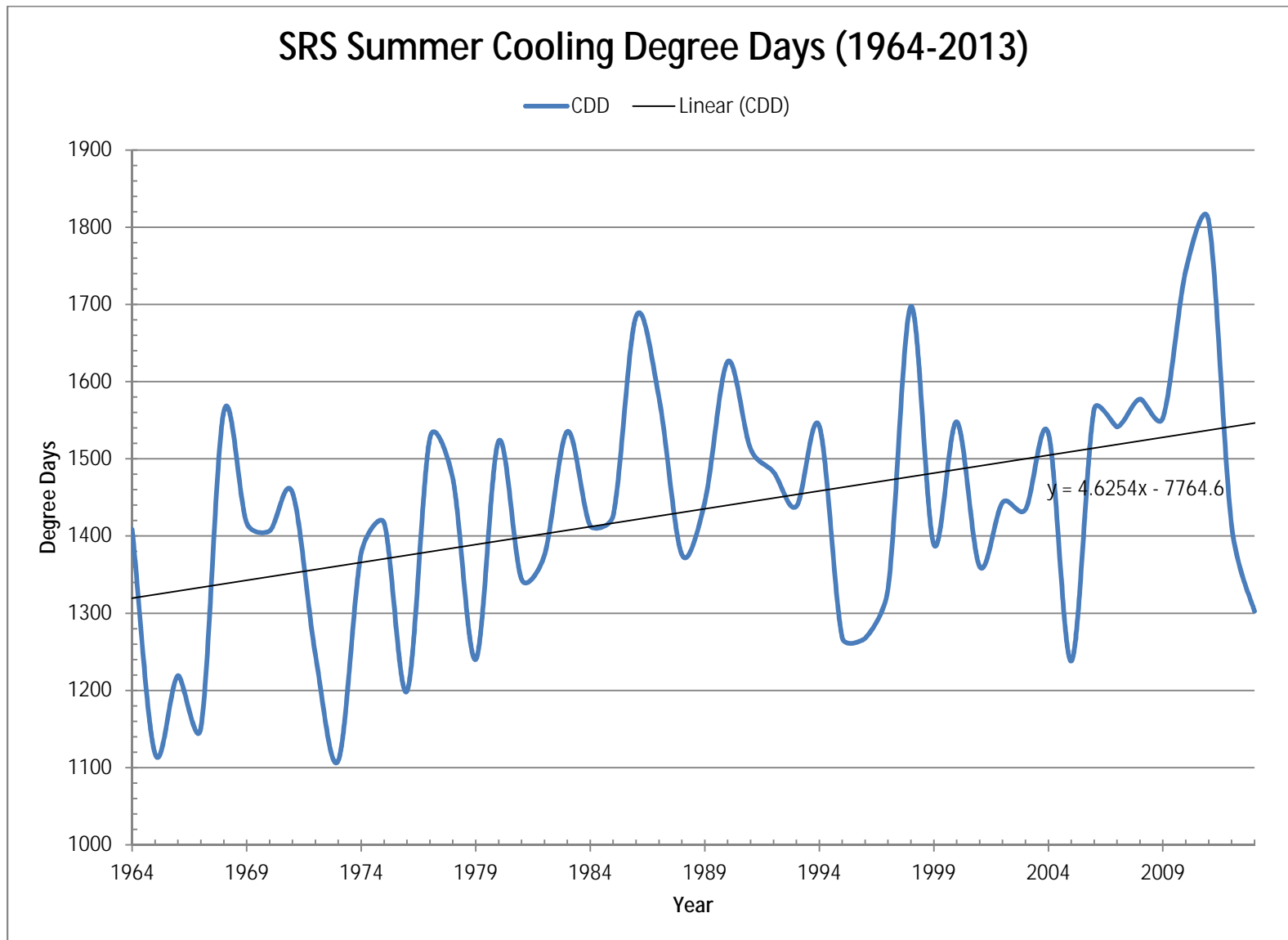


Figure 8. Savannah River Site Summer Cooling Degree Days (1964-2013).

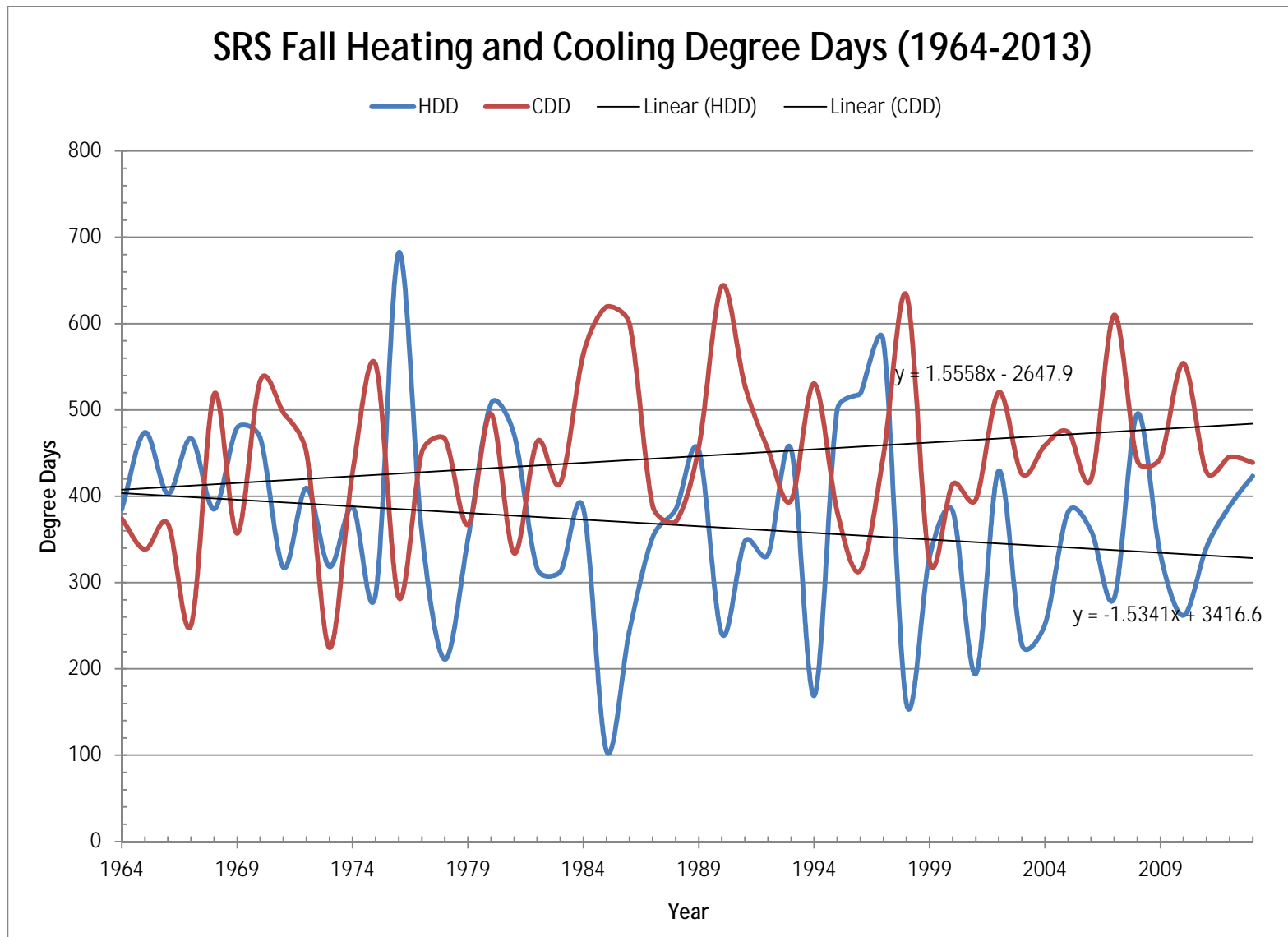


Figure 9. Savannah River Site Fall Heating and Cooling Degree Days (1964-2013).

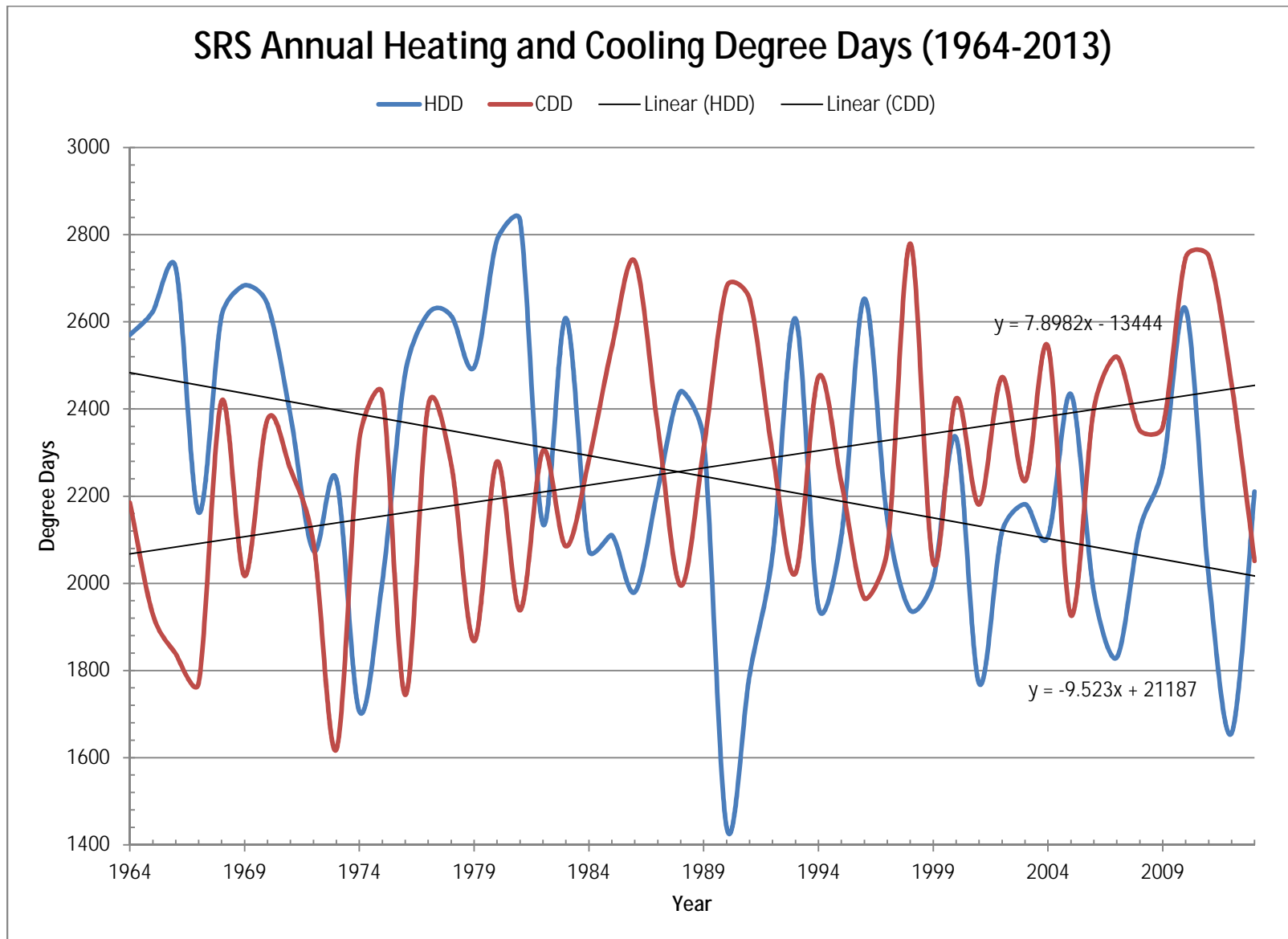


Figure 10. Savannah River Site Annual Heating and Cooling Degree Days (1964-2013).

### 3.4.3 Freezing and Sweltering Days

Figures 11 through 15 show the 50-year trend for freezing days (daily minimum temperature below 32 degrees F) and sweltering days (days where the maximum temperature is above 90 degrees F). As with HDD, the number of freezing days was not calculated for the summer season, and the number of sweltering days was not calculated for the winter seasons.

The interannual variability of the transition seasons is quite large for both freezing and sweltering days. The magnitude of the interannual variations is large during the predominant seasons as well. The trend indicates that the number of sweltering days is increasing for all the seasons and annually, while the opposite occurs for the number of freezing days. Both indicate that the climate is getting warmer (more hot and fewer cold days). The trend is most pronounced in the summer and winter seasons.

The trend to fewer freezing days was found to be significant for all seasons and annually (with the exception of summer), insignificant for the sweltering days for any season (Table 4). This result is probably of little overall importance in the statistical sense, as the number of freezing days is being limited as it approaches zero, particularly in the spring and fall. It was somewhat surprising that the number of sweltering days has not increased to the point where any of the seasonal trends is statistically significant. Despite the obvious visible trend, the large interannual variability appears to be increasing along with the trend.

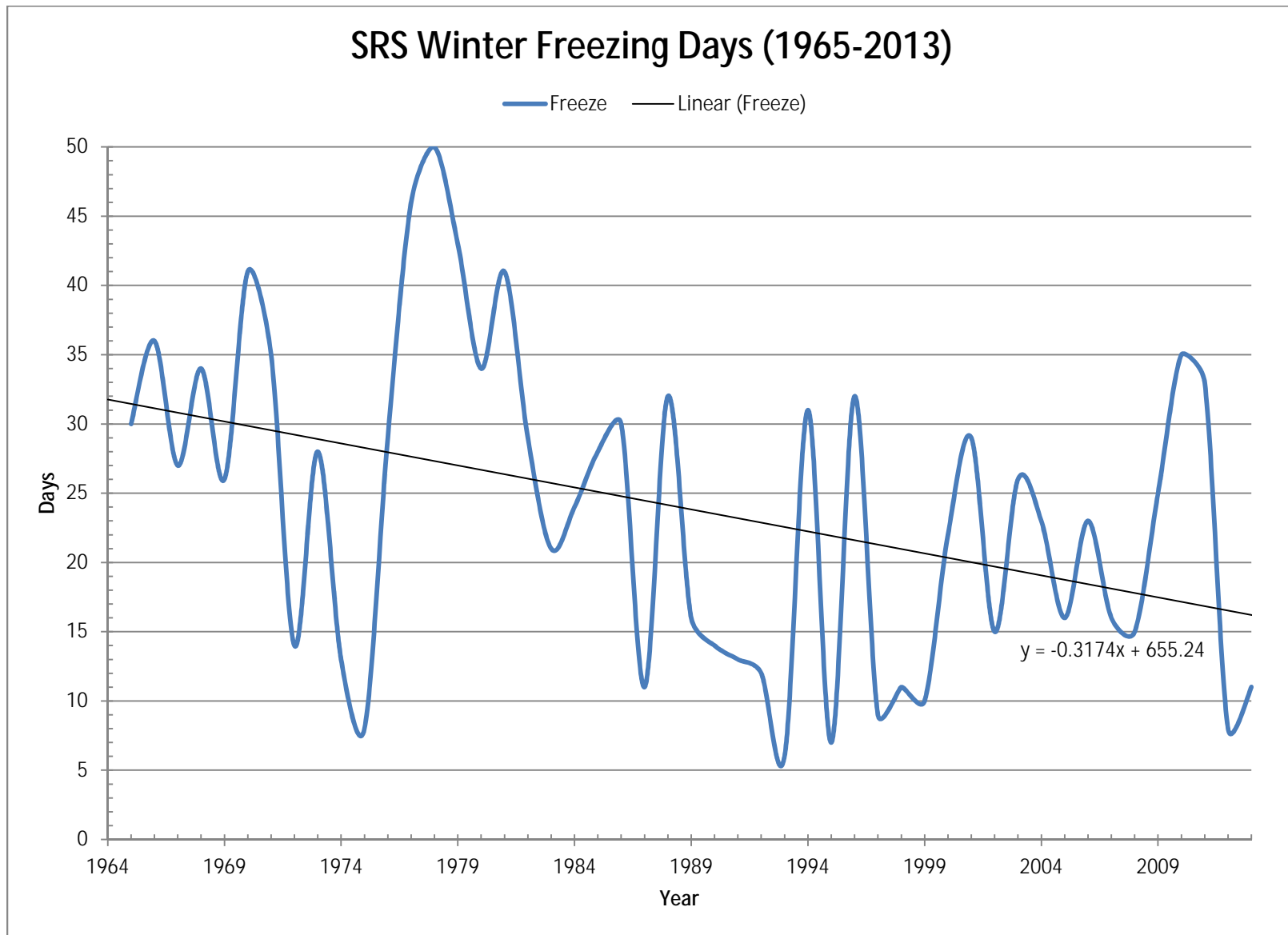


Figure 11. Savannah River Site Winter Freezing Days (1965-2013).

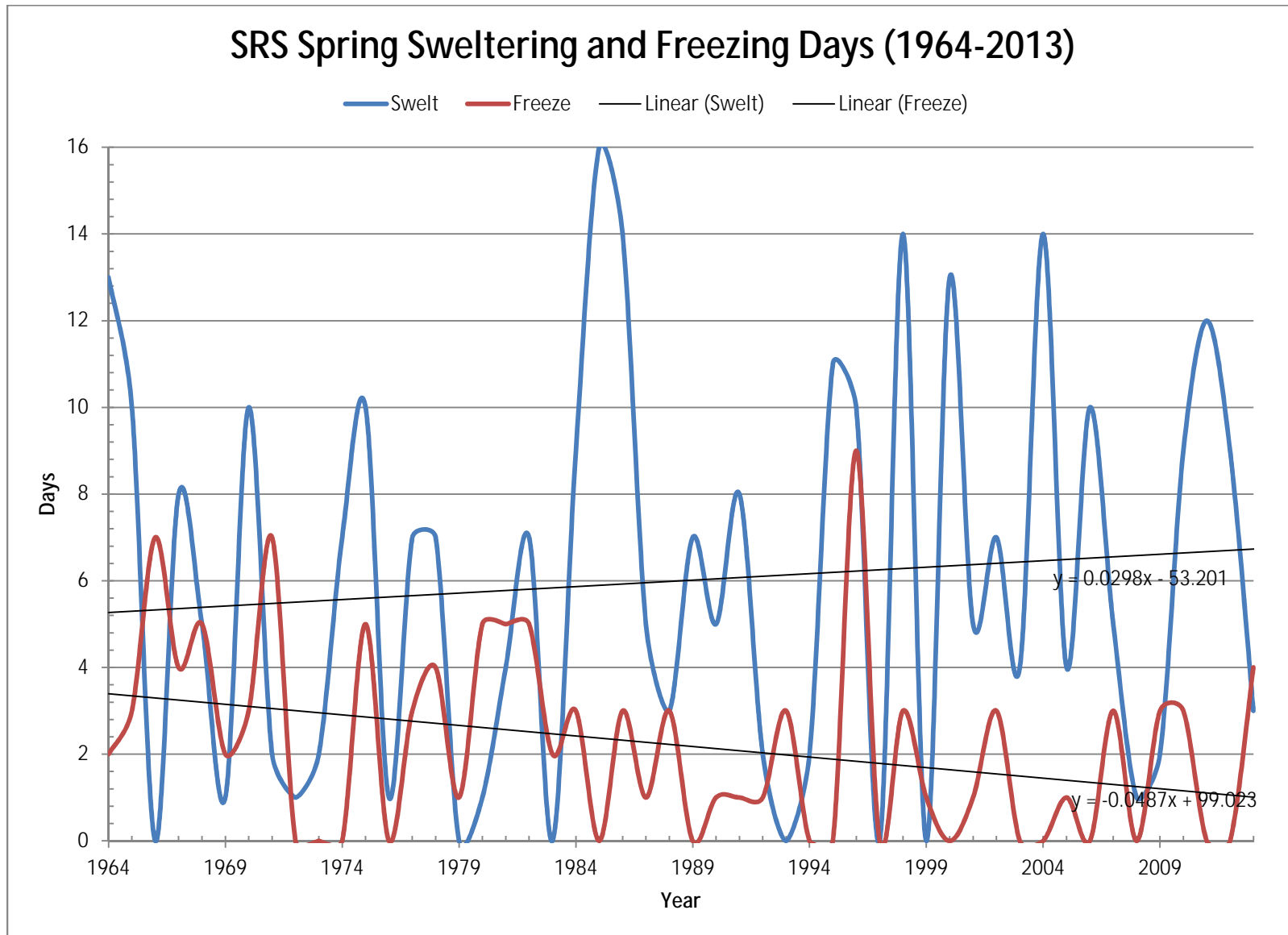


Figure 12. Savannah River Site Spring Sweltering and Freezing Days (1964-2013).

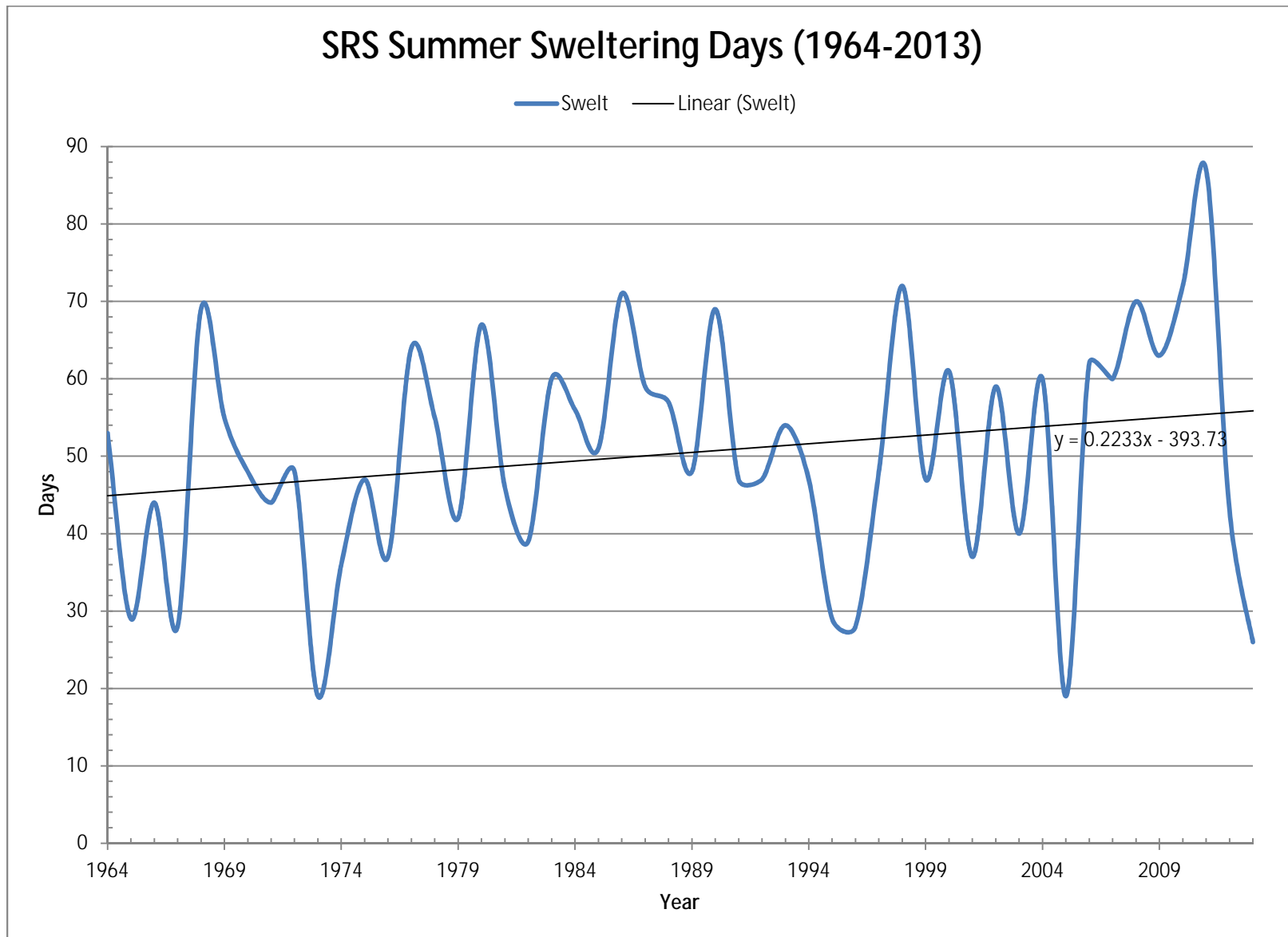


Figure 13. Savannah River Site Summer Sweltering and Freezing Days (1964-2013).

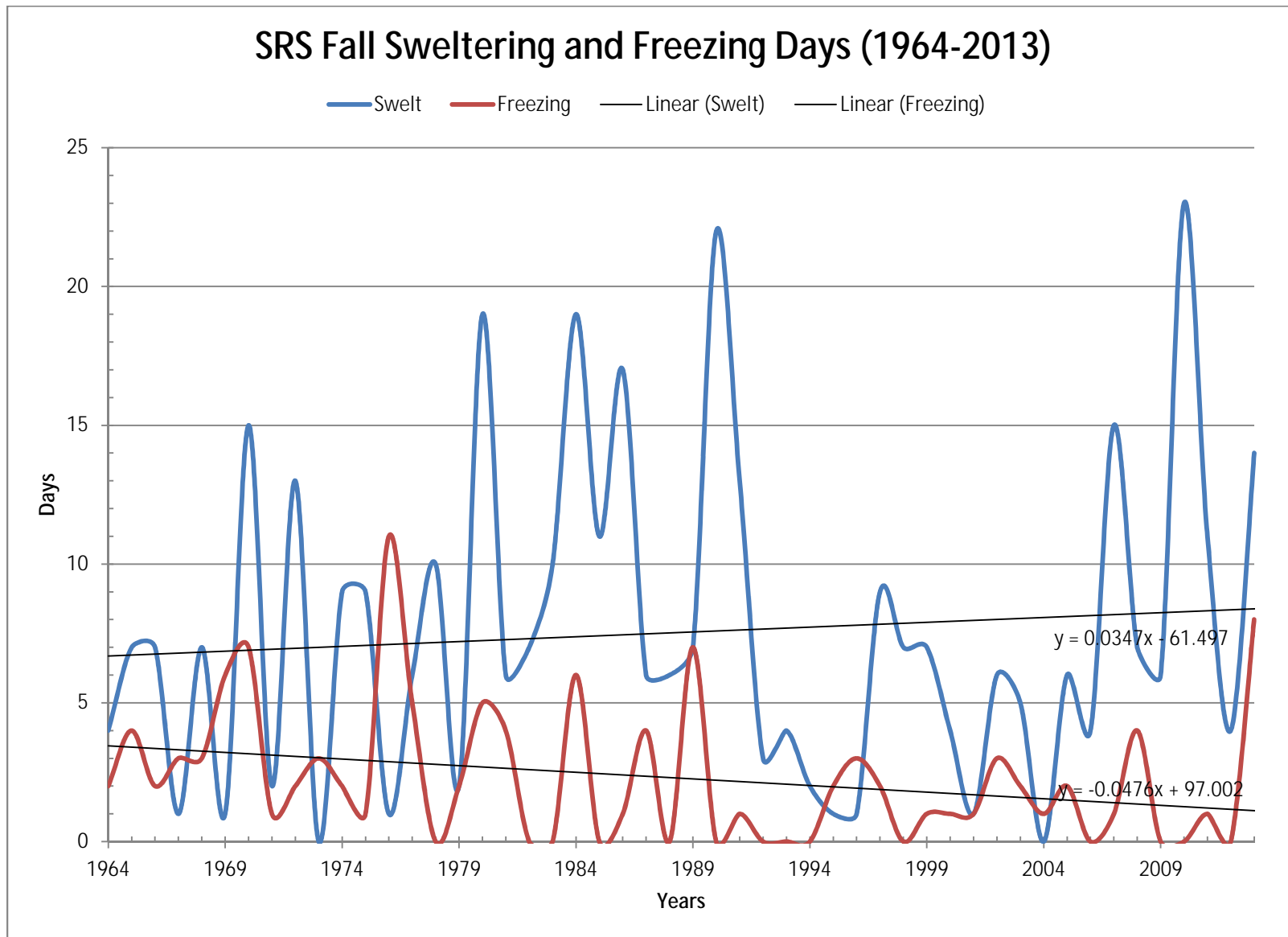


Figure 14. Savannah River Site Fall Sweltering and Freezing Days (1964-2013).



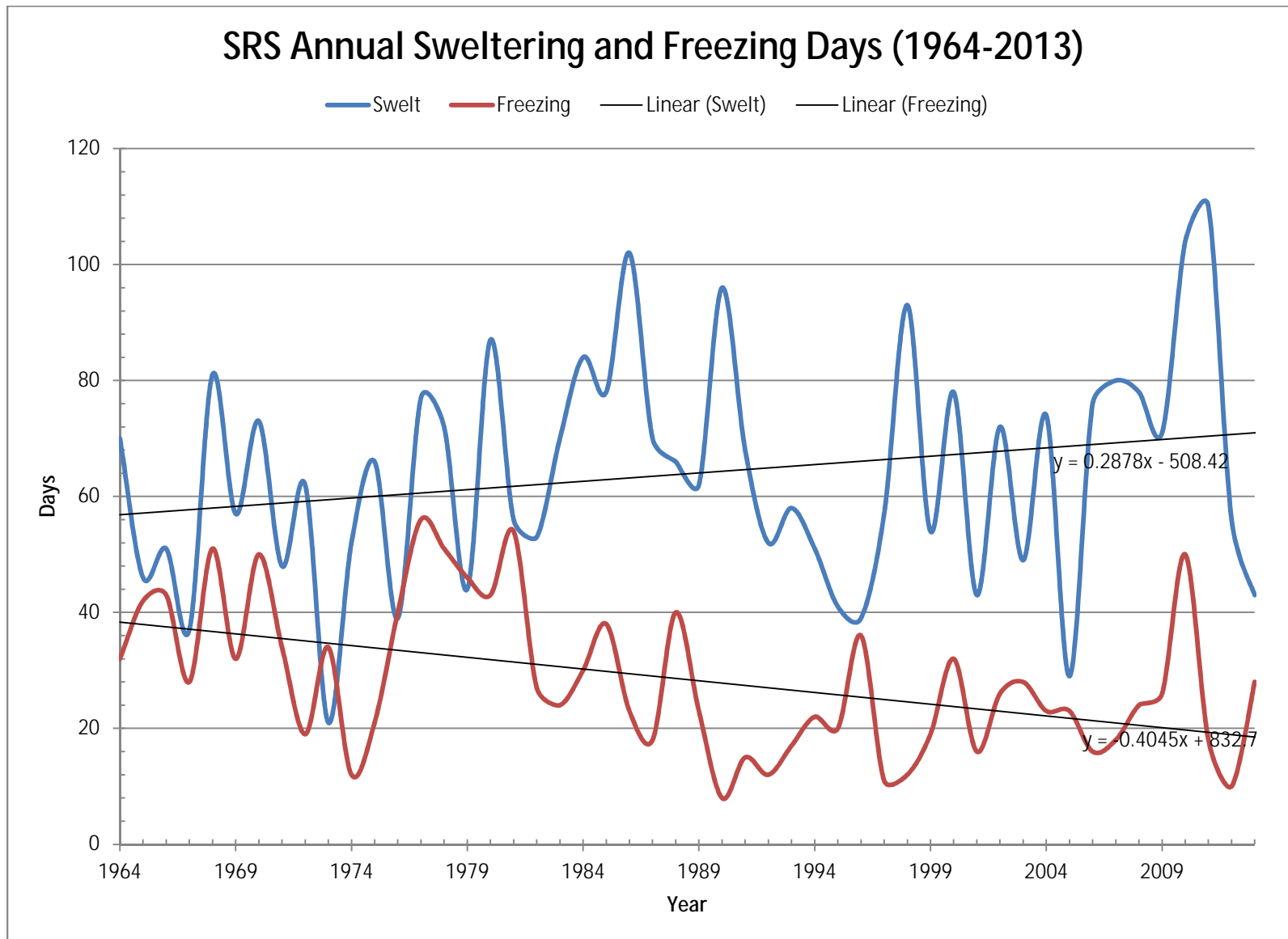


Figure 15. Savannah River Site Annual Sweltering and Freezing Days (1964-2013).

### 3.4.4 Rainfall

Figures 16-20 show that seasonal and annual rainfall for SRS has been declining for all seasons (and annually) except for the fall, although none of the trends is statistically significant at the 95% level except for the spring season (Table 4).

The fall season has a very slight upward trend, although this is largely due to the extremely high precipitation that occurred in the fall of 1990. It was during this fall there was a consecutive 3-day precipitation total of over 15 inches at SRS (out of a seasonal total of 21.65 inches). This single event was associated with the passage of the remnants of tropical storm Marco. This single 3-day period had a rainfall greater than all but two other fall seasons (1992 and 2009).

Looking further at the occurrences of tropical storms passing near the site (within 50 nautical miles of Jackson SC), only 10 tropical storms (or their remnants) have passed by SRS (NOAA-Coastal Services Center, 2015). It is interesting to note that while 10 events passed near SRS, these significant events did little to influence the seasonal totals. Of the six tropical cyclones during the summer season, only Allison (June of 1995) was during a season with precipitation that was greater than the trendline (above average). Of the fall storms, while all the events occurred in seasons that had above average rainfall (greater than the trendline), only the 1990 Marco event was significantly above the trendline.

Storm	Year
Cleo <sup>2</sup>	1964
Unnamed <sup>1</sup>	1965
Abby <sup>1</sup>	1968
Agnes <sup>1</sup>	1972
Chris <sup>1</sup>	1988
Marco <sup>2</sup>	1990
Allison <sup>1</sup>	1995
Earl <sup>2</sup>	1998
Helene <sup>2</sup>	2000
Alberto <sup>1</sup>	2006

<sup>1</sup> Occurred in the summer season

<sup>2</sup> Occurred in the fall season

(Data from NOAA-Coastal Services Center, 2015)

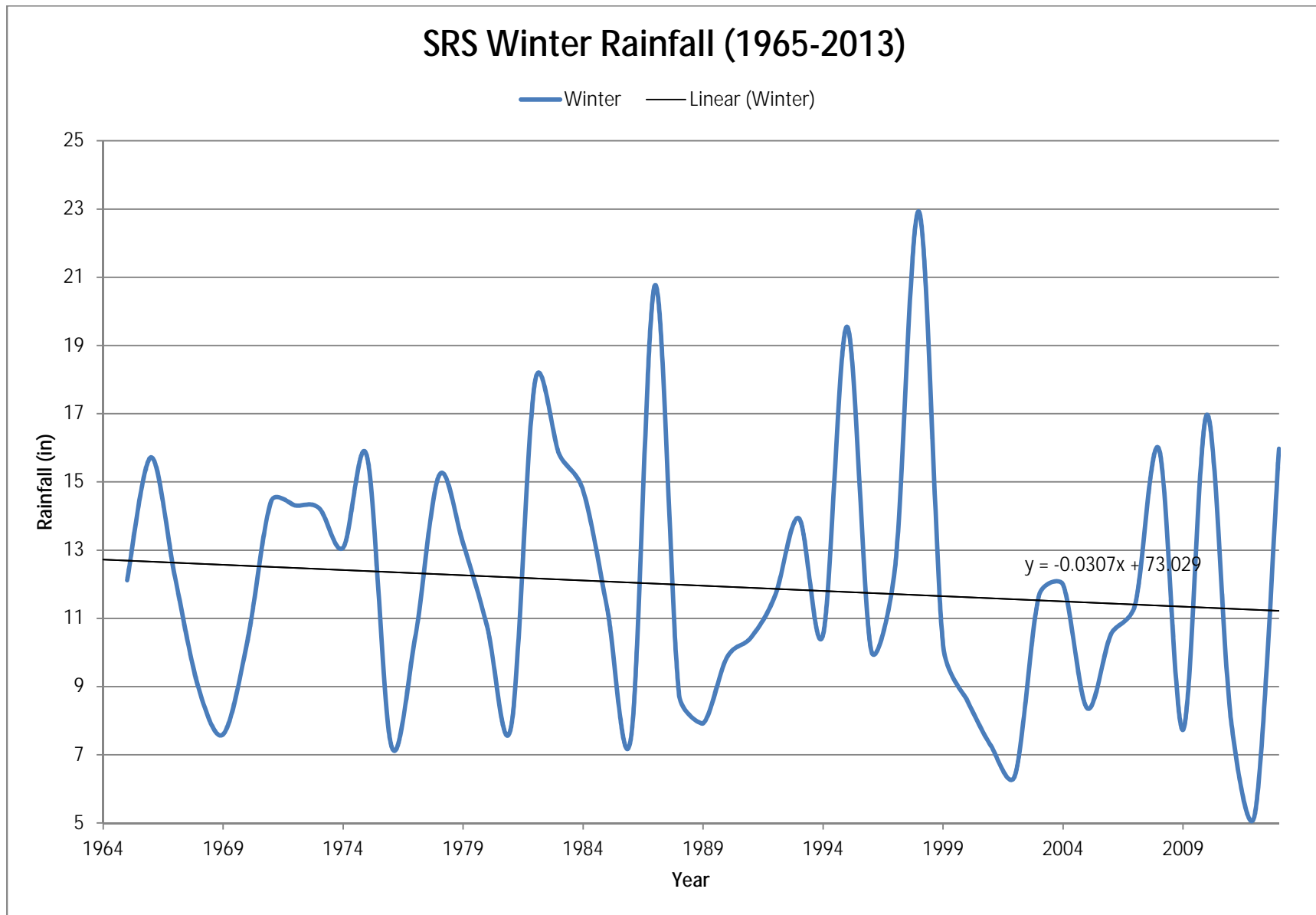


Figure 16. Savannah River Site Winter Rainfall (1964-2013).

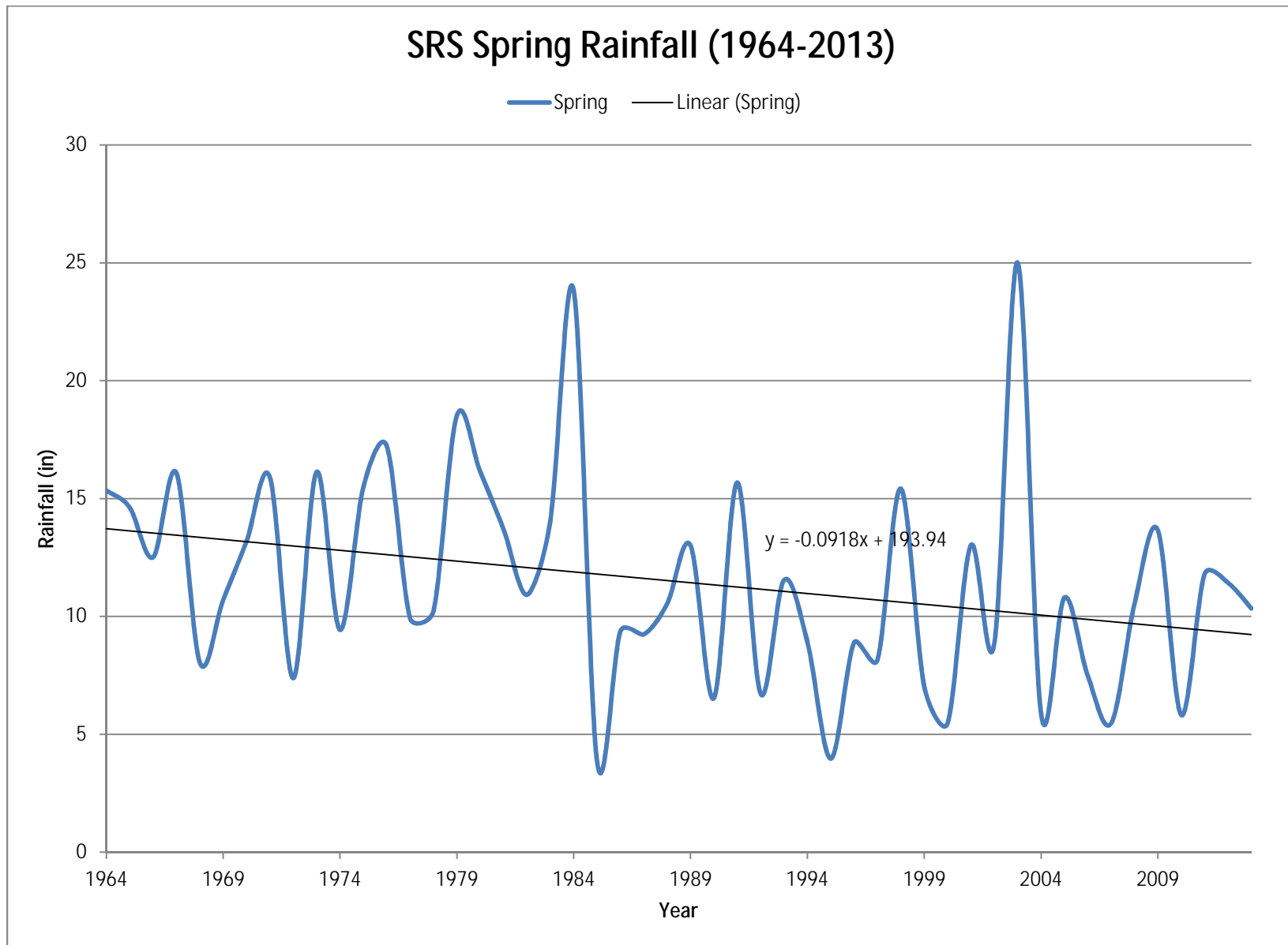


Figure 17. Savannah River Site Spring Rainfall (1964-2013).

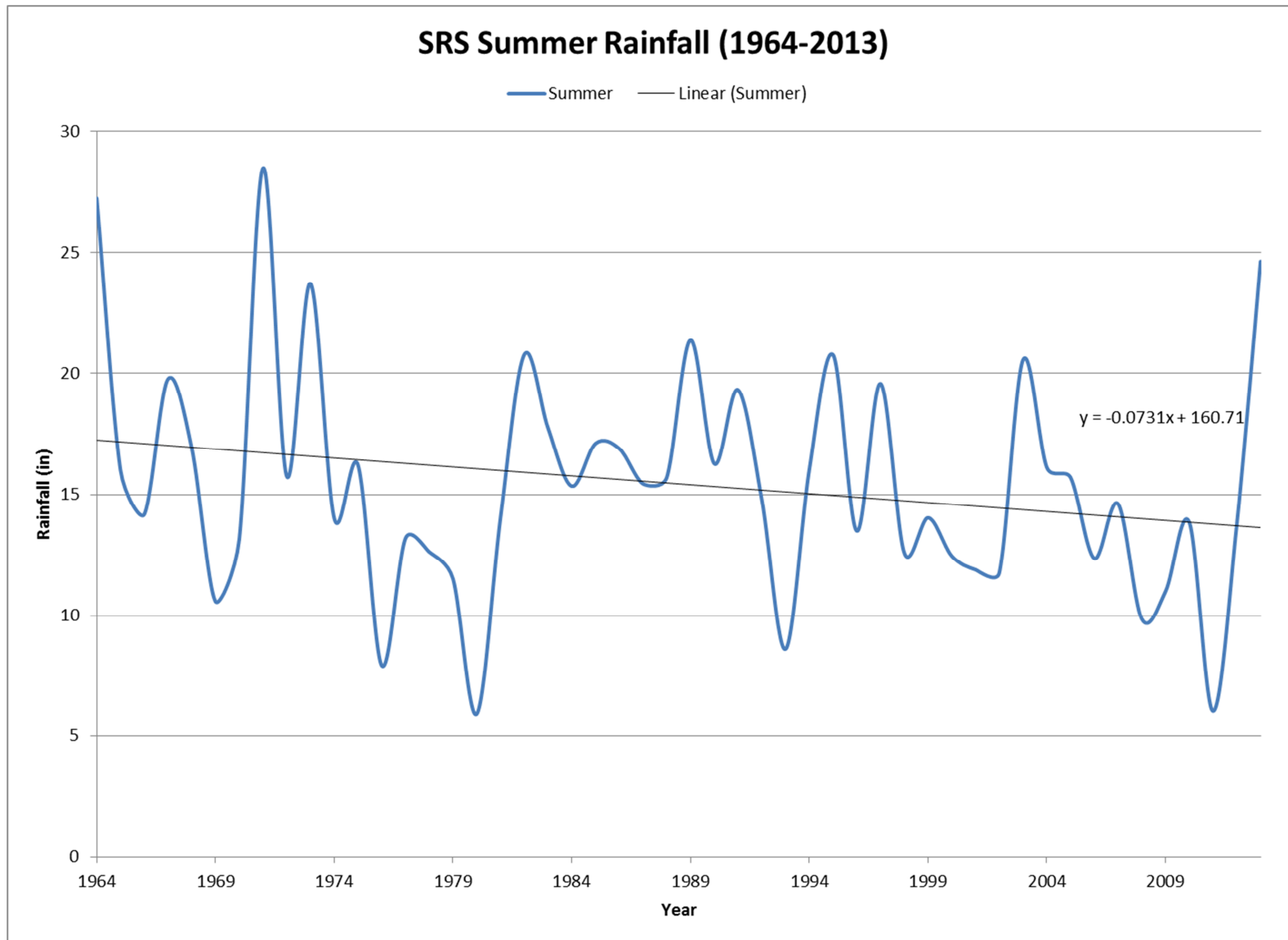


Figure 18. Savannah River Site Summer Rainfall (1964-2013).

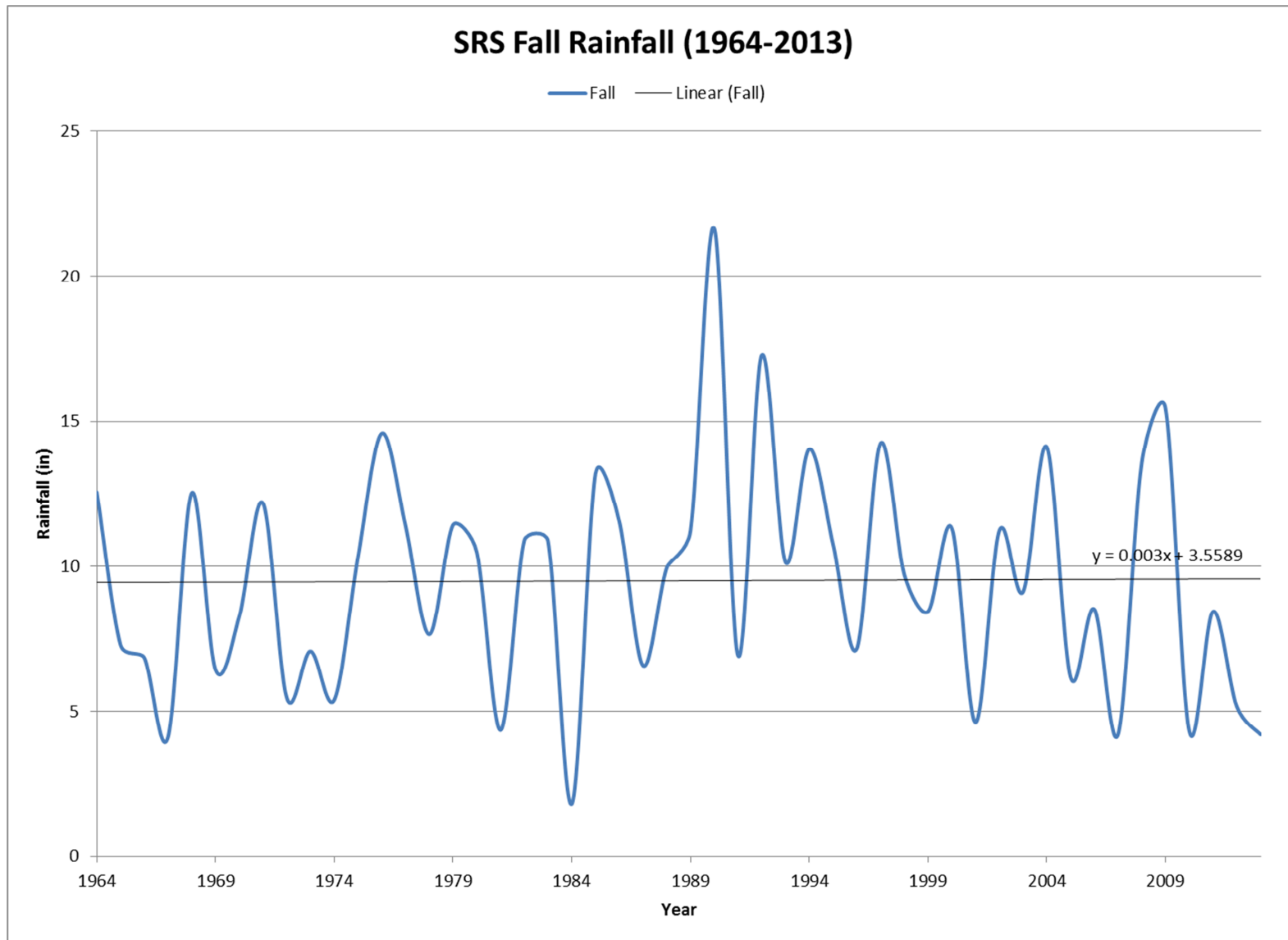


Figure 19. Savannah River Site Fall Rainfall (1964-2013).

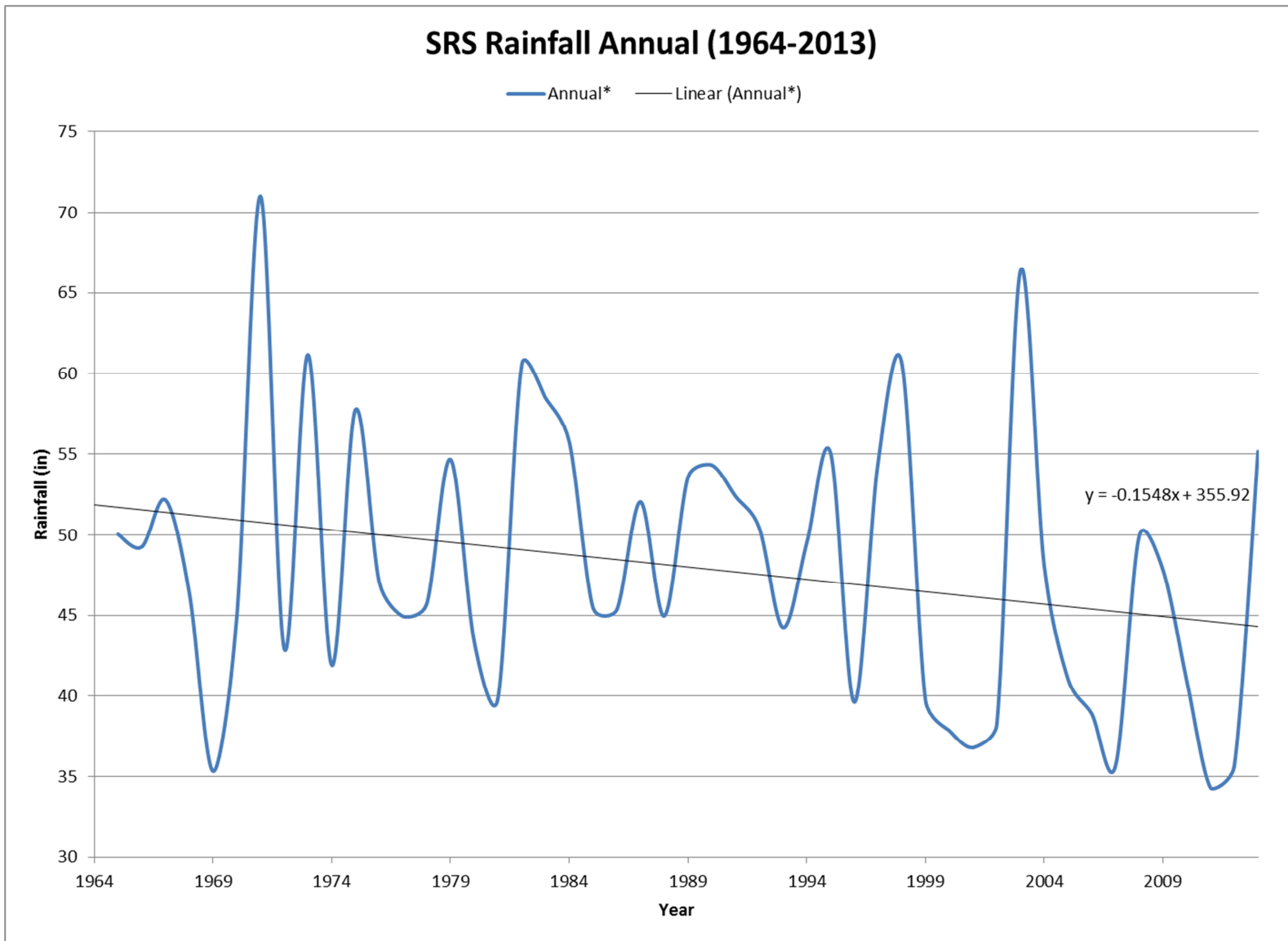


Figure 20. Savannah River Site Annual Rainfall (1964-2013).

### 3.4.5 Relative Humidity

The maximum and minimum relative humidity is somewhat more difficult to interpret. Since relative humidity is a measure of how close air is to saturation, a given relative humidity does not uniquely describe the water vapor content of the air. For a given moisture content, relative humidity is inversely proportionate to temperature. That is, the maximum relative humidity, shown in Figures 21 – 25, roughly corresponds to the overnight periods, when the minimum temperatures occur most frequently. The daytime maximum in temperature results in a minimum in the relative humidity

For the spring, summer and fall seasons, the maximum and minimum relative humidity trendlines converge over the period of record. This results in a decrease in the diurnal range of difference in the relative humidity, meaning that the atmospheric moisture at SRS is increasing. It should also be noted that only the summer and fall maximum trendlines were statistically significant (Table 4). Given that the maximum and minimum temperatures are both increasing over the same time period, it is safe to assume that the overall humidity is increasing. The implication is that some of the additional thermal energy available in the atmosphere is being transferred to bodies of water, which in turn leads to greater evaporation, and hence greater ambient humidity. It is interesting that while the humidity, appears to be increasing, precipitation for all but the fall season (Figures 16 through 18 and 20), is decreasing. While humidity is an important factor in precipitation formation, along with available energy (temperature), there are conditions that can allow hot and humid conditions to persist. While this study is too general to specifically credit these, it has been suggested that the location of the Bermuda High (Powell and Keim, 2015) is a possible cause. The subsidence and thermodynamic capping provided by extended periods of the Bermuda High present over the region around SRS would limit or prevent convective precipitation. In addition, it would also allow for shallow, boundary layer cumulus (convection) to develop, limiting the increase in daytime high temperatures, without impacting the night time high temperatures. Since increases in vapor content cause the specific heat of unsaturated air to increase, this further supports the increasing nighttime temperatures, as radiative cooling would be unable to remove enough heat to cool the atmosphere around SRS.

For winter relative humidity, a different pattern emerges. The trendlines for the maximum and minimum relative humidity diverge over the period of record. Since the temperatures are both increasing (and at the greatest rates of any of the seasonal rates), the air appears to be generally drying out at SRS during the winter months. Larger separation between the maximum and minimum relative humidity trendlines indicates that the atmosphere is less humid overall. Not only is the trend for the winter maximum relative humidity statistically significant, but the trend for winter minimum relative humidity is statistically significant (Table 4) as well. This is consistent with the precipitation trend, given in Figure 16, which shows the amount of precipitation decreasing.



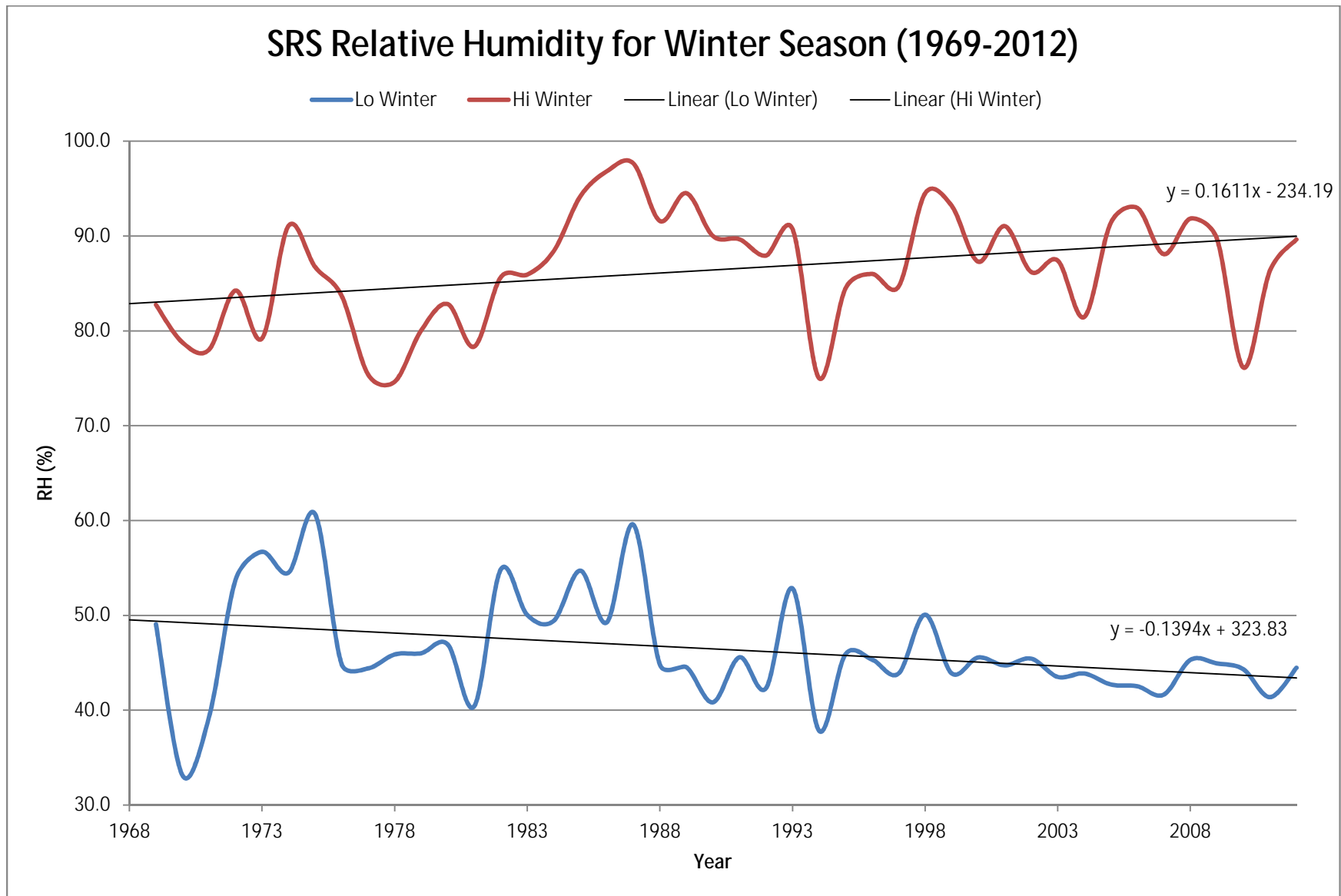


Figure 21. Savannah River Site Winter Relative Humidity (1969-2012).

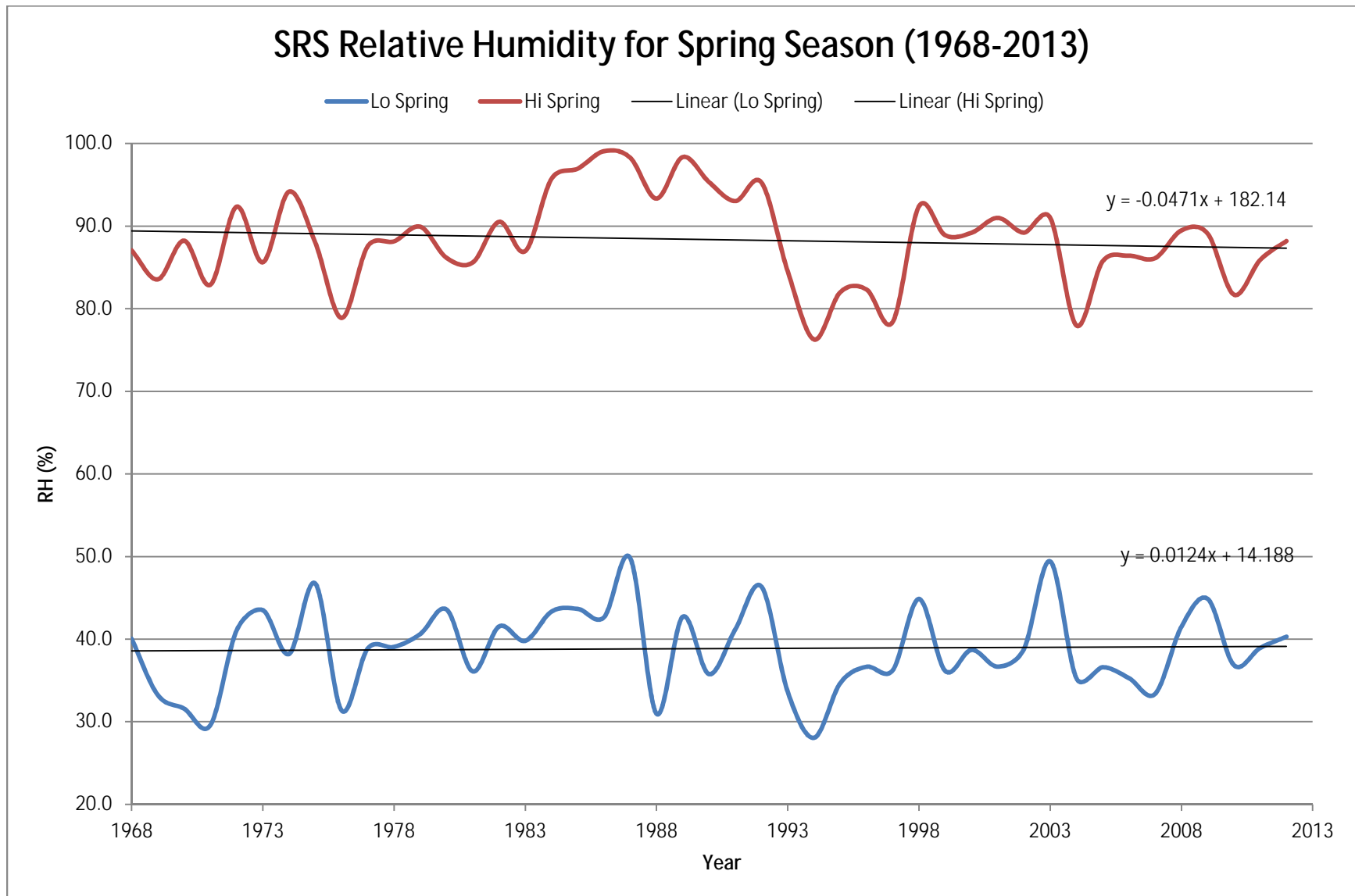


Figure 22. Savannah River Site Spring Relative Humidity (1968-2012).

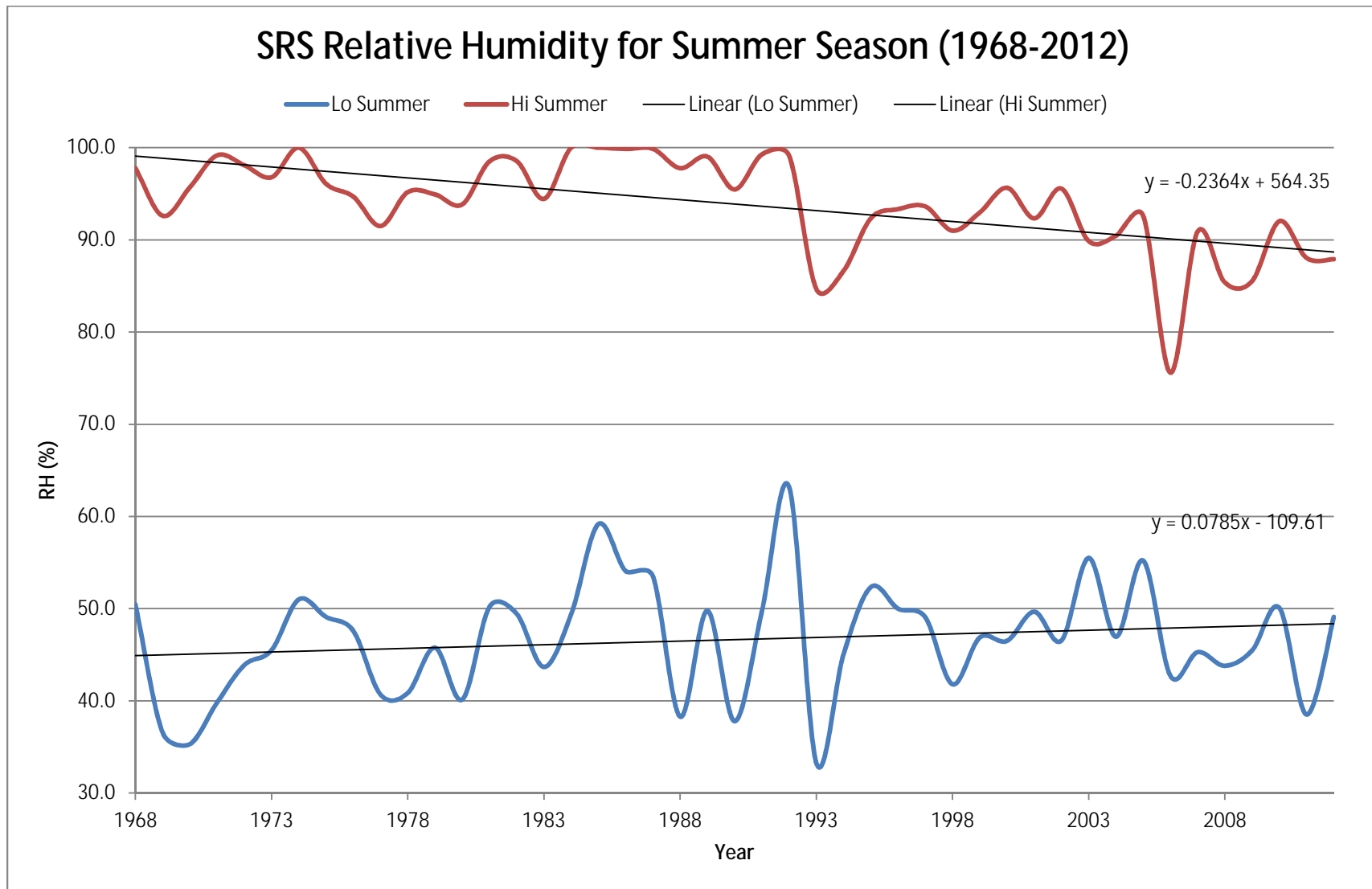


Figure 23. Savannah River Site Summer Relative Humidity (1968-2012).

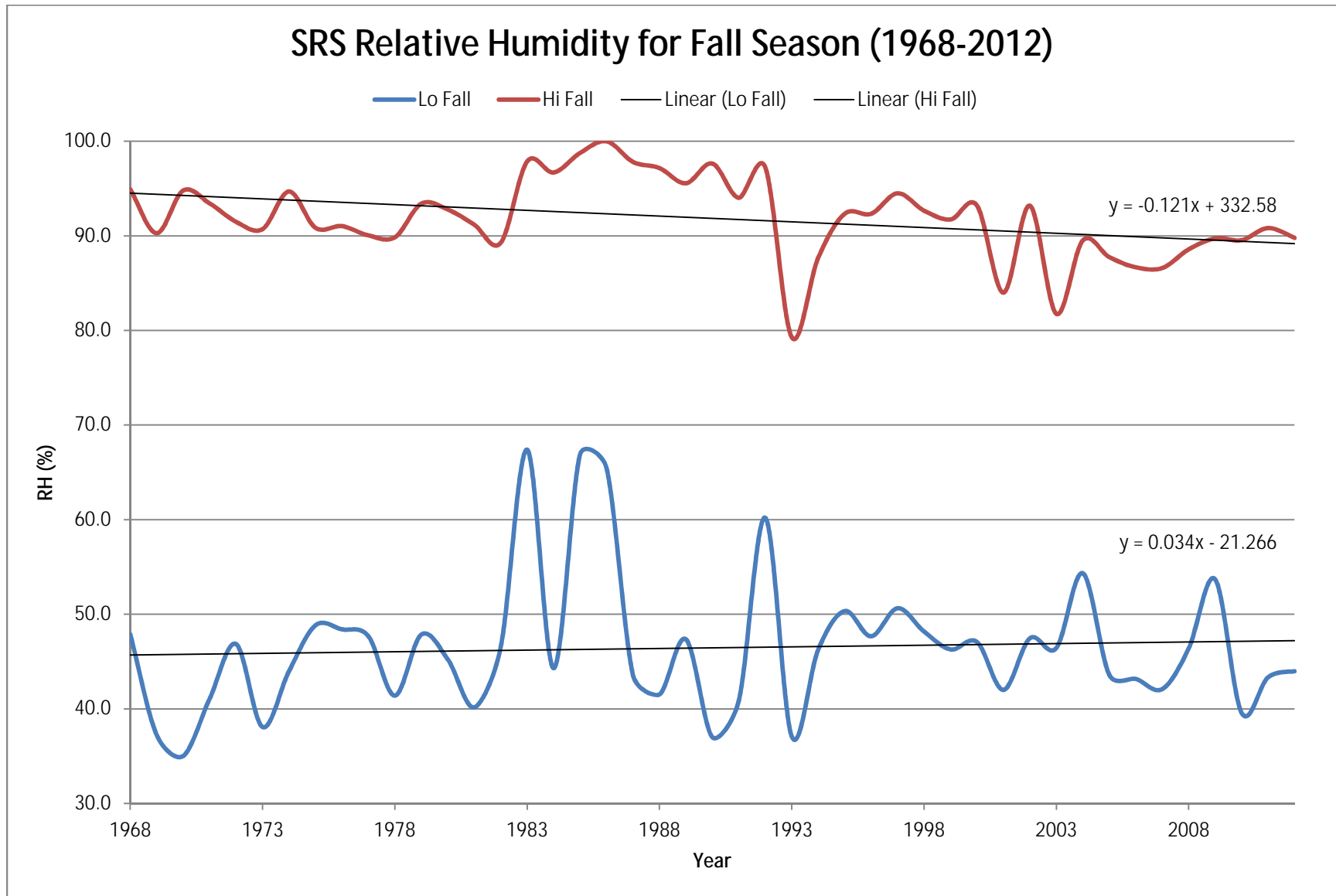


Figure 24. Savannah River Site Summer Relative Humidity (1968-2012).

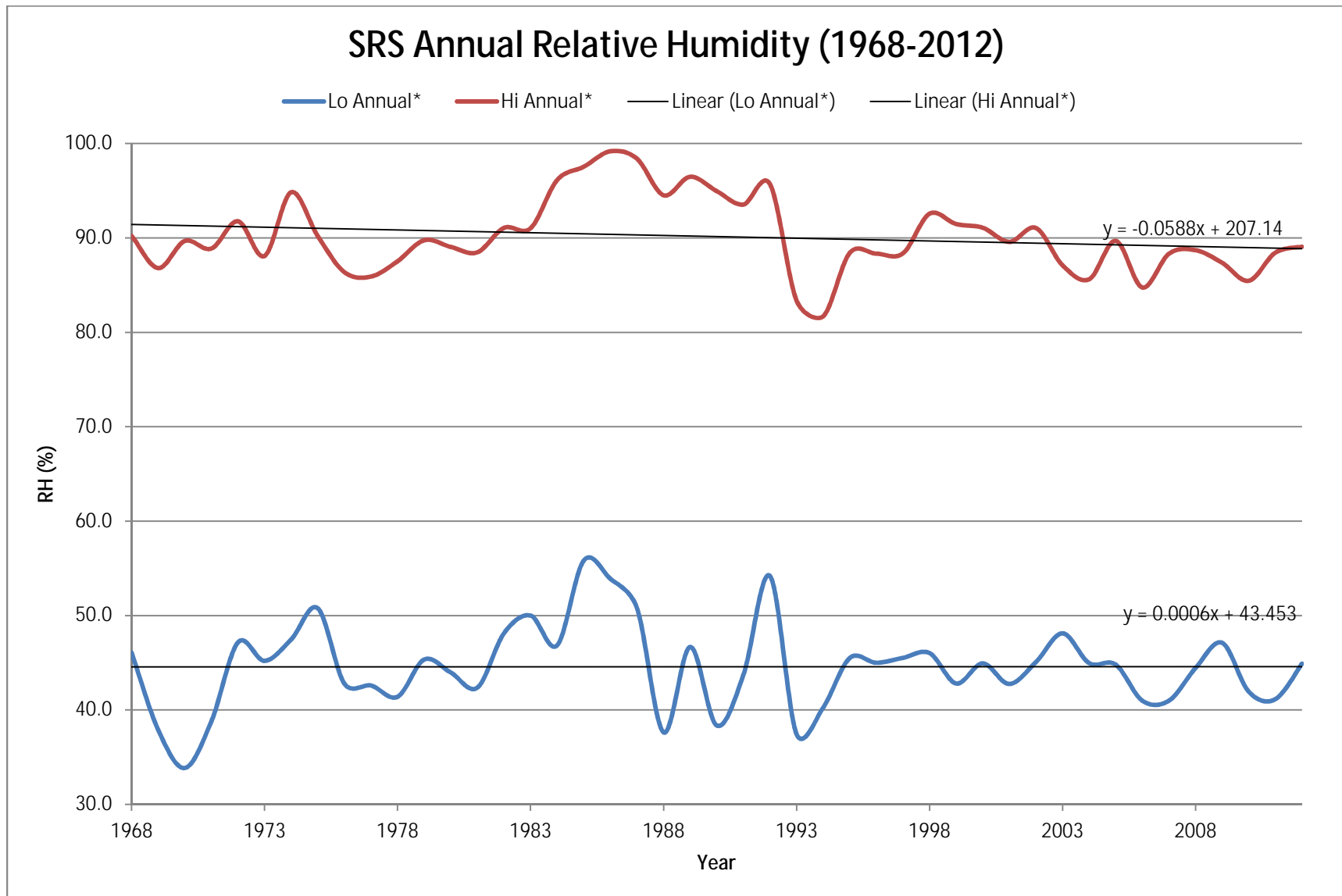


Figure 25. Savannah River Site Annual Relative Humidity (1968-2012).

Table 4. Difference over 50-year Period of Record based on slope of regression line

Season	Ave Max T (°F)	F-test	Ave Min T (°F)	F-test	HDD (degree days)	F-test	CDD (degree days)	F-test	Freezing (day<32°F)	F-test
Winter	2.9	0.0445	3.7	0.0239	-288.7	0.0242	NA		-15.9	0.0055
Spring	0.9	0.4207	2.6	0.0198	-85.2	0.1829	79.3	0.1001	-2.4	0.0185
Summer	1.7	0.0749	3.4	0.0000	NA		231.3	0.0015	NA	
Fall	0.7	0.5053	2.7	0.0290	-76.7	0.1685	77.8	0.1315	-2.4	0.0408
Annual	1.4	0.0219	3.1	0.0001	-476.2	0.0039	394.9	0.0033	-20.2	0.0008
Season	Sweltering (day>90°F)	F-test	Rain (in)	F-test	RH Max (%)	F-test	RH Min (%)	F-test		
Winter	NA		-1.5	0.4407	8.06	0.0227	-6.97	0.0348		
Spring	1.5	0.2824	-4.6	0.0385	-2.36	0.4654	6.20	0.8339		
Summer	11.2	0.1079	-3.7	0.1181	-11.82	0.0000	3.93	0.2764		
Fall	1.7	0.6393	0.2	0.9391	-6.05	0.0131	1.70	0.6886		
Annual	14.4	0.1071	-7.7	0.0707	-2.94	0.1980	0.03	0.9914		

Highlighting indicates regression equations that were NOT statistically significant at the 95% level.

## 4.0 CONCLUSIONS

Overall, the data suggests that temperatures at SRS have increased over the past 50-years. Increases in mean maximum and mean minimum temperatures have been occurring in all seasons for the period. Additionally, the mean minimum temperature is increasing at a faster rate than the mean daily maximum temperatures for all seasons. Trends representing the overall change of the mean seasonal temperatures over the previous 50-years are presented in Table 4. The most striking change occurs for the increase in nocturnal daily average minimum temperatures, which have increased by 3.1°F over the period. Of similar interest, is that while the extent of the warming varies by season and parameter, all variables examined suggest that the climate at SRS is becoming warmer, both seasonally and annually, with the warming more pronounced in the summer and winter. The findings at SRS in this study are consistent with the findings of other studies.

## 5.0 SUMMARY

In general, the observed changes to the SRS climate have not had a large impact to date. Over the past 50-years the trends have been relatively small compared to the interannual variability that is observed. However, the observed increases to date, while small, appear to be real (statistically significant). In the future, it can be imagined that the increases will start to have impact operations at the site. Overnight cooling costs, as indicated by both the CDD and mean daily minimum temperature would presumably increase. Additionally, the numbers of freezing days and HDD have continued to decrease, which would improve energy expenditures at the site somewhat, during the winter season.



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**Attachment A - SRS Monthly Average Values for Study for 1964-2013**

Month	High Max (°F)	Mean Monthly Max (°F)	Lowest Min (°F)	Mean Monthly Min (°F)	Ave (°F)	HDD (degree days)	CDD (degree days)	Swelt (days)	Freeze (days)	Ave Max RH (%)	Ave Min RH (%)	Precip (in)
Jan-64	70	75.7	14	33.7	43.6	664.5	0	0	11			7.79
Feb-64	63	53.1	25	33.9	43.5	602.5	0	0	10			6.00
Mar-64	81	66.6	28	43.2	54.9	331.5	18.5	0	2			5.79
Apr-64	91	75.9	37	53.3	64.6	99	87.5	1	0			5.94
May-64	99	87.1	52	60.9	74.0	14	293	12	0			3.62
Jun-64	101	94.1	50	69.1	81.6	0	497.5	23	0			4.50
Jul-64	96	88.5	62	70.3	79.4	0	446	11	0			10.42
Aug-64	97	90.4	61	69.6	80.0	0	465	19	0			12.34
Sep-64	94	86.1	53	64.1	75.1	3	306.5	4	0			5.43
Oct-64	84	72.1	36	49.6	60.8	174	44.5	0	0			6.53
Nov-64	84	70.8	27	46.9	58.8	208	23	0	2			0.60
Dec-64	76	59.6	20	40.1	49.8	473.5	3.5	0	7			4.10
Jan-65	75	58.1	20	34.6	46.4	578	0	0	12			1.83
Feb-65	80	59.0	22	37.9	48.4	471	7	0	11			6.19
Mar-65	79	63.3	25	42.3	52.8	392	12.5	0	3			10.18
Apr-65	94	77.3	40	54.4	65.9	82	108.5	1	0			2.81
May-65	96	89.5	52	62.8	76.1	0	344.5	9	0			1.63
Jun-65	95	81.6	56	64.1	72.9	36.5	272	3	0			5.14
Jul-65	96	88.6	62	67.5	78.1	0	405.5	9	0			9.57
Aug-65	98	90.6	58	67.8	79.2	0	440.5	17	0			1.29
Sep-65	93	84.7	55	64.8	74.7	3	295	7	0			2.36
Oct-65	86	72.4	30	50.3	61.3	157	43.5	0	2			2.95
Nov-65	78	66.1	27	42.9	54.5	314	0	0	2			1.99
Dec-65	72	57.7	23	34.2	46.0	590	0	0	12			1.69
Jan-66	73	47.2	6	30.6	38.9	809.5	0	0	17			7.81

Month	High Max (°F)	Mean Monthly Max (°F)	Lowest Min (°F)	Mean Monthly Min (°F)	Ave (°F)	HDD (degree days)	CDD (degree days)	Swelt (days)	Freeze (days)	Ave Max RH (%)	Ave Min RH (%)	Precip (in)
Feb-66	72	57.9	19	39.0	48.4	463.5	0	0	7			6.22
Mar-66	81	66.3	27	41.2	53.7	351	1.5	0	7			4.30
Apr-66	86	75.6	35	50.0	62.8	128.5	63.5	0	0			2.93
May-66	90	80.5	43	60.2	70.4	15.5	181.5	0	0			5.28
Jun-66	95	86.2	52	62.7	74.4	0	282.5	7	0			4.81
Jul-66	101	92.3	61	70.2	81.2	0	503.5	21	0			3.52
Aug-66	96	89.2	59	68.7	79.0	0	433	16	0			5.84
Sep-66	96	85.4	54	63.4	74.4	0	282	7	0			3.98
Oct-66	88	76.2	40	52.6	64.4	93	75.5	0	0			1.51
Nov-66	80	67.0	29	43.0	55.0	310	10.5	0	2			1.37
Dec-66	78	57.6	22	37.0	47.3	553	4.5	0	10			3.85
Jan-67	77	60.0	25	38.0	49.0	496.5	0	0	7			3.91
Feb-67	74	55.6	15	35.3	45.4	547.5	0	0	10			4.43
Mar-67	86	72.9	26	46.9	59.9	202.5	44.5	0	4			7.54
Apr-67	92	80.9	41	54.9	67.9	34	121	1	0			2.60
May-67	96	81.5	47	58.3	69.9	40.5	192.5	7	0			5.94
Jun-67	94	86.1	54	65.0	75.6	8	325	8	0			4.06
Jul-67	93	88.7	59	68.2	78.5	0	417	10	0			7.23
Aug-67	95	88.1	60	68.3	78.2	0	409.5	10	0			8.48
Sep-67	91	82.3	41	58.9	70.6	19.5	187.5	1	0			0.99
Oct-67	88	77.4	36	50.6	64.0	92.5	61.5	0	0			0.31
Nov-67	77	65.9	28	40.6	53.2	355	1.5	0	3			2.81
Dec-67	81	64.5	26	42.6	53.5	366.5	11.5	0	4			3.37
Jan-68	73	53.4	23	33.6	43.5	667	0	0	15	56.9	87.4	4.56
Feb-68	65	55.0	21	31.8	43.4	627	0	0	15	31.8	72.3	0.97
Mar-68	87	71.1	28	43.2	57.1	273.5	29.5	0	5	32.3	78.2	1.58

Month	High Max (°F)	Mean Monthly Max (°F)	Lowest Min (°F)	Mean Monthly Min (°F)	Ave (°F)	HDD (degree days)	CDD (degree days)	Swelt (days)	Freeze (days)	Ave Max RH (%)	Ave Min RH (%)	Precip (in)
Apr-68	92	78.7	40	54.3	66.5	61.5	107	3	0	41.8	88.2	2.23
May-68	94	82.5	48	60.1	71.3	7	202.5	2	0	46.0	94.8	4.24
Jun-68	98	90.8	60	69.2	80.0	0	449	20	0	51.4	97.9	5.28
Jul-68	100	93.6	69	72.5	83.0	0	559.5	25	0	51.5	98.4	3.58
Aug-68	104	93.7	59	71.9	82.8	0	552.5	24	0	48.5	97.1	8.05
Sep-68	93	88.4	58	65.5	77.0	0	358.5	7	0	42.4	96.9	5.06
Oct-68	90	77.6	37	56.5	67.0	81.5	144.5	0	0	50.7	93.7	3.33
Nov-68	82	65.7	29	45.1	55.4	303.5	15.5	0	3	50.6	94.2	4.14
Dec-68	72	56.8	23	35.0	45.9	593	0	0	13	49.0	83.6	2.93
Jan-69	73	56.4	17	36.7	46.5	573	0	0	10	51.6	80.5	2.20
Feb-69	72	56.2	27	37.1	46.6	516	2	0	3	46.5	84.1	2.47
Mar-69	81	62.8	28	40.1	51.5	422	2	0	2	32.8	70.0	3.42
Apr-69	88	76.5	41	52.5	64.5	77.5	61.5	0	0	34.2	91.6	4.71
May-69	91	82.0	41	58.9	70.5	8.5	177.5	1	0	32.6	89.1	2.57
Jun-69	99	91.3	55	69.2	80.3	0	458.5	20	0	34.7	91.4	4.26
Jul-69	102	94.2	68	72.5	83.3	0	568.5	24	0	33.1	91.9	1.94
Aug-69	94	86.1	60	69.1	77.6	0	390	11	0	41.9	94.5	4.38
Sep-69	91	81.7	54	63.9	72.8	6	239.5	1	0	44.0	95.3	4.05
Oct-69	89	76.5	39	55.5	66.0	83.5	116	0	0	37.9	87.2	2.00
Nov-69	76	64.5	23	39.6	52.1	390	1.5	0	6	29.9	88.3	0.40
Dec-69	71	55.8	24	35.0	45.4	607.5	0	0	11	35.6	77.7	4.42
Jan-70	77	49.4	4	28.5	39.0	807	0.5	0	18	35.8	78.8	3.12
Feb-70	74	60.3	14	34.1	47.2	499	0	0	12	28.0	79.8	2.75
Mar-70	82	67.6	27	44.2	55.9	288.5	6.5	0	3	37.5	83.0	7.90
Apr-70	95	79.2	36	54.5	66.8	79.5	134.5	2	0	28.2	88.4	1.28
May-70	99	86.5	48	61.8	74.2	7.5	291.5	8	0	29.1	93.3	4.01

Month	High Max (°F)	Mean Monthly Max (°F)	Lowest Min (°F)	Mean Monthly Min (°F)	Ave (°F)	HDD (degree days)	CDD (degree days)	Swelt (days)	Freeze (days)	Ave Max RH (%)	Ave Min RH (%)	Precip (in)
Jun-70	105	90.0	57	68.0	79.0	0	420	14	0	30.2	92.1	4.68
Jul-70	100	91.9	60	70.2	81.0	0	497.5	18	0	34.9	97.5	4.69
Aug-70	99	89.4	66	72.2	80.8	0	489	16	0	40.8	97.6	3.78
Sep-70	98	89.6	46	67.7	78.6	6	415	15	0	29.4	97.7	2.75
Oct-70	90	76.9	34	57.1	67.0	57	118	0	0	38.1	94.7	4.02
Nov-70	79	64.3	18	38.8	51.6	404.5	1	0	7	37.5	92.0	1.50
Dec-70	77	60.4	23	38.2	49.3	491	3	0	10	36.7	81.3	5.62
Jan-71	69	54.3	16	34.9	44.6	632	0	0	13	42.2	74.0	5.01
Feb-71	74	57.6	15	35.1	46.4	521.5	0	0	12	38.9	78.8	3.80
Mar-71	78	60.6	24	38.3	49.5	484.5	2.5	0	7	30.8	75.1	9.71
Apr-71	92	76.9	33	49.9	63.4	132.5	85	1	0	24.5	80.4	2.57
May-71	93	82.1	42	59.3	70.7	20	196.5	1	0	33.4	93.2	3.62
Jun-71	100	92.7	56	69.9	81.3	0	490	22	0	32.3	98.7	4.81
Jul-71	96	89.8	66	71.6	80.7	0	487.5	12	0	41.3	99.7	13.71
Aug-71	96	88.6	69	72.2	80.4	0	478.5	10	0	45.8	99.1	9.98
Sep-71	92	84.5	56	65.9	75.2	0	306	1	0	39.6	99.7	4.74
Oct-71	92	78.7	43	61.6	70.1	12	171.5	1	0	51.1	97.5	5.27
Nov-71	82	66.8	30	44.2	55.5	305.5	19.5	0	1	32.5	83.2	2.16
Dec-71	79	65.1	28	48.6	56.9	276.5	24.5	0	1	53.1	87.2	2.79
Jan-72	74	60.6	14	42.7	51.7	413.5	1	0	5	54.3	83.8	7.81
Feb-72	80	54.2	20	37.0	45.6	562.5	1	0	8	53.9	81.7	3.71
Mar-72	80	69.4	32	45.9	57.6	239	10	0	0	38.7	84.8	2.68
Apr-72	92	79.4	36	55.4	67.4	72.5	145	1	0	37.7	92.6	0.60
May-72	88	81.5	54	63.2	72.4	2	230	0	0	46.7	99.7	4.10
Jun-72	98	86.9	49	63.6	75.3	0	307.5	8	0	39.8	96.6	5.64
Jul-72	99	91.3	58	68.0	79.7	0	454.5	20	0	43.7	99.0	1.92

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Aug-72	99	91.3	66	70.0	80.6	0	484.5	20	0	48.2	98.7	8.19
Sep-72	99	89.2	55	65.2	77.2	0	367	13	0	42.5	98.0	1.52
Oct-72	89	76.1	34	53.4	64.8	74.5	67.5	0	0	45.5	89.4	1.03
Nov-72	82	65.1	26	43.6	54.4	335	16	0	2	52.5	87.1	2.92
Dec-72	82	63.1	20	43.3	53.2	375.5	9.5	0	4	62.4	89.9	4.26
Jan-73	70	56.0	19	36.2	46.1	586.5	0	0	12	59.7	80.0	5.50
Feb-73	71	57.9	14	34.0	45.9	534	0	0	12	48.1	67.8	4.47
Mar-73	87	70.7	33	50.6	60.7	178.5	44.5	0	0	55.5	86.5	6.67
Apr-73	84	73.5	34	50.4	61.9	135.5	43.5	0	0	38.4	81.8	4.55
May-73	93	82.6	44	58.3	70.5	19	188.5	2	0	36.7	88.6	4.91
Jun-73	96	88.2	60	67.1	77.7	0	380.5	7	0	46.1	95.4	12.97
Jul-73	95	89.7	66	68.4	79.0	0	435.5	12	0	45.1	97.6	6.86
Aug-73	90	84.9	56	64.0	74.5	0	293	0	0	45.3	97.4	3.90
Sep-73	90	81.0	52	60.1	70.5	3	169	0	0	43.1	96.1	4.38
Oct-73	87	75.2	39	49.7	62.4	99	19.5	0	0	33.1	91.0	1.72
Nov-73	84	72.8	23	45.2	59.0	216.5	36	0	3	38.0	85.0	0.98
Dec-73	78	60.4	20	40.1	50.3	466	9	0	7	53.4	89.9	3.99
Jan-74	79	67.5	33	51.6	59.6	186	17.5	0	0	68.8	93.3	2.42
Feb-74	78	62.4	18	39.1	50.8	404	5	0	6	41.3	90.0	6.66
Mar-74	90	74.1	34	50.3	62.2	154	67	0	0	38.3	91.7	3.03
Apr-74	89	77.5	38	54.9	66.2	74.5	111	0	0	34.0	93.6	3.05
May-74	95	85.8	52	64.8	75.3	2	322.5	7	0	42.4	97.3	3.35
Jun-74	96	87.9	61	67.1	77.5	0	374	9	0	43.1	100.0	2.80
Jul-74	98	90.8	66	72.2	81.5	0	511.5	14	0	51.8	100.0	4.44
Aug-74	98	89.2	69	72.6	80.9	0	492.5	13	0	58.1	100.0	6.77
Sep-74	93	83.8	52	66.9	75.3	7.5	317.5	9	0	58.6	99.1	3.32

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Oct-74	88	78.3	34	50.6	64.5	94	77	0	0	30.2	94.0	0.09
Nov-74	89	68.3	29	44.9	56.6	286	33.5	0	2	43.1	91.0	1.99
Dec-74	74	57.5	24	40.5	49.0	498	1	0	4	59.9	88.2	4.11
Jan-75	86	61.4	25	41.5	51.4	435.5	15	0	2	64.1	86.5	4.98
Feb-75	79	63.5	24	42.9	53.2	336	6.5	0	2	58.0	85.5	6.64
Mar-75	84	67.3	22	44.3	55.8	312	26	0	5	47.3	82.9	5.92
Apr-75	91	75.3	34	52.5	63.9	122.5	89	1	0	44.8	86.7	4.42
May-75	98	86.2	53	65.1	75.6	0	329	9	0	48.1	94.3	5.15
Jun-75	97	89.4	62	68.7	79.1	0	421.5	12	0	45.4	95.4	3.83
Jul-75	97	88.9	66	70.5	79.7	0	456.5	13	0	53.6	96.3	8.55
Aug-75	103	93.0	68	71.8	82.4	0	539	22	0	48.3	96.5	3.83
Sep-75	100	85.0	53	66.4	75.7	1.5	323	8	0	53.6	93.4	5.18
Oct-75	92	80.6	41	56.9	68.7	48.5	164.5	1	0	45.4	88.9	1.74
Nov-75	85	71.3	29	47.2	59.3	237	65	0	1	47.5	90.3	3.41
Dec-75	76	60.0	16	37.0	48.5	511	0	0	11	53.3	85.6	2.03
Jan-76	72	56.2	17	32.2	44.2	644	0	0	14	45.2	79.4	4.18
Feb-76	81	69.7	25	41.6	55.7	273.5	3	0	4	36.1	86.1	1.08
Mar-76	85	73.0	32	49.9	61.5	153.5	44.5	0	0	34.5	80.4	3.83
Apr-76	92	78.8	38	50.9	64.8	78	73	1	0	22.4	73.8	2.50
May-76	88	79.6	44	58.1	68.9	22.5	142	0	0	37.2	82.5	10.90
Jun-76	94	85.6	55	65.5	75.6	3	319.5	6	0	47.6	92.0	4.35
Jul-76	98	91.1	64	69.6	80.4	0	476	19	0	46.7	97.2	1.95
Aug-76	95	87.9	62	68.1	78.0	0	403.5	12	0	48.6	94.9	1.64
Sep-76	92	82.9	51	63.3	73.1	1	244.5	1	0	51.5	94.2	5.48
Oct-76	84	71.1	28	49.0	60.1	191	38	0	1	45.9	88.9	4.92
Nov-76	77	59.9	23	37.4	48.7	490.5	0	0	10	47.8	89.9	4.19

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Dec-76	71	54.8	17	34.9	44.8	625	0	0	11	50.1	77.2	5.08
Jan-77	56	44.7	10	25.8	35.3	921.5	0	0	22	49.5	74.1	3.72
Feb-77	81	61.0	19	33.2	47.1	502	0	0	13	33.6	74.9	1.62
Mar-77	87	71.5	28	48.4	60.0	203	46.5	0	3	40.3	84.8	6.86
Apr-77	89	80.3	37	53.5	66.9	62.5	120.5	0	0	38.4	87.7	1.27
May-77	95	85.7	46	60.9	73.3	5.5	263	7	0	37.9	90.2	1.79
Jun-77	100	93.2	55	68.0	80.6	0	467.5	22	0	36.6	88.0	2.47
Jul-77	103	95.0	64	72.2	83.6	0	576.5	25	0	38.8	91.0	3.42
Aug-77	99	90.9	65	70.3	80.6	0	483	17	0	46.7	95.5	7.30
Sep-77	93	87.8	58	68.0	77.9	0	386.5	6	0	47.3	94.5	5.50
Oct-77	87	73.0	35	51.3	62.1	127.5	38.5	0	0	46.6	90.1	4.27
Nov-77	80	68.3	24	48.1	58.2	229.5	26	0	5	49.2	85.5	1.63
Dec-77	77	57.1	19	36.3	46.7	568	0	0	13	46.3	74.5	3.86
Jan-78	69	49.1	14	29.6	39.3	795.5	0	0	20	48.6	72.7	10.02
Feb-78	71	51.3	15	31.3	41.3	663.5	0	0	17	42.8	76.8	1.31
Mar-78	83	66.4	25	42.0	54.2	346	10	0	4	40.5	87.3	3.06
Apr-78	91	79.0	33	52.3	65.7	78	98	1	0	34.3	85.3	3.53
May-78	93	81.5	47	60.2	70.9	26.5	209	6	0	42.4	91.8	3.64
Jun-78	105	90.9	60	68.5	79.7	0	440.5	14	0	39.3	93.8	3.42
Jul-78	100	92.9	65	71.4	82.1	0	531	22	0	41.1	95.0	4.11
Aug-78	99	91.9	64	70.5	81.2	0	503	19	0	42.2	96.8	5.10
Sep-78	98	87.6	55	66.7	77.1	3	367	10	0	43.1	95.0	4.06
Oct-78	90	78.9	37	52.4	65.6	64	83.5	0	0	33.8	87.9	0.06
Nov-78	82	71.2	39	50.3	60.7	144	16	0	0	47.2	86.7	3.54
Dec-78	80	61.5	24	37.7	49.6	493.5	16	0	10	41.5	81.5	1.87
Jan-79	73	54.0	15	30.1	42.0	711.5	0	0	20	48.3	72.3	3.59



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Feb-79	75	55.6	18	33.6	44.6	571	0	0	13	48.2	86.4	7.74
Mar-79	83	69.9	29	45.1	57.5	246	13.5	0	1	38.4	87.4	3.09
Apr-79	84	76.5	38	52.5	64.5	55.5	40.5	0	0	39.6	88.2	6.49
May-79	90	81.9	44	60.7	71.3	11	206	0	0	43.9	94.2	8.94
Jun-79	98	85.3	55	65.0	75.1	3.5	307	4	0	46.9	93.7	1.54
Jul-79	100	89.6	59	69.5	79.6	0	451.5	17	0	47.7	95.7	7.85
Aug-79	99	91.9	60	69.1	80.5	0	481.5	21	0	42.8	95.4	2.12
Sep-79	93	80.6	59	66.1	73.4	8	259.5	2	0	62.6	97.1	6.13
Oct-79	87	77.6	39	51.9	64.8	86	78.5	0	0	38.9	93.9	1.35
Nov-79	79	69.5	19	45.3	57.4	256.5	29	0	2	42.1	89.2	3.95
Dec-79	76	58.7	19	36.0	47.4	547	0.5	0	10	44.9	83.6	2.17
Jan-80	71	54.5	22	37.4	45.9	591.5	0	0	6	58.2	88.5	5.12
Feb-80	78	56.1	13	32.6	44.3	602	2	0	18	37.8	76.4	3.48
Mar-80	76	62.8	11	42.3	52.5	386.5	0.5	0	5	51.8	81.2	10.96
Apr-80	92	75.8	39	51.2	63.5	98	52.5	1	0	37.4	82.1	1.69
May-80	89	82.9	44	59.5	71.2	15	206	0	0	41.6	95.2	3.49
Jun-80	96	89.0	59	67.5	78.3	0	398.5	13	0	42.4	91.1	2.99
Jul-80	106	95.2	68	72.4	83.8	0	582.5	29	0	39.4	95.7	0.90
Aug-80	103	94.5	61	70.5	82.5	0	542	25	0	38.7	94.7	2.03
Sep-80	102	90.4	56	68.1	79.2	13.5	440	19	0	42.8	97.3	5.86
Oct-80	88	73.5	37	51.8	62.7	127.5	55.5	0	0	46.0	94.1	2.14
Nov-80	78	63.8	29	41.8	52.8	366.5	0	0	5	46.9	87.0	2.50
Dec-80	74	57.3	21	34.8	46.0	588	0	0	9	44.7	85.3	1.91
Jan-81	67	52.2	12	28.6	40.4	762.5	0	0	21	33.6	79.3	0.89
Feb-81	81	61.1	15	35.9	48.5	461.5	0	0	11	42.9	70.4	5.02
Mar-81	84	65.6	30	40.4	53.0	378.5	6.5	0	5	31.8	78.7	4.72

Month	High Max (°F)	Mean Monthly Max (°F)	Lowest Min (°F)	Mean Monthly Min (°F)	Ave (°F)	HDD (degree days)	CDD (degree days)	Swelt (days)	Freeze (days)	Ave Max RH (%)	Ave Min RH (%)	Precip (in)
Apr-81	92	79.3	42	54.6	67.0	52.5	111	1	0	38.9	90.3	2.07
May-81	94	81.3	45	55.9	68.6	30	141.5	3	0	37.6	87.8	6.90
Jun-81	99	92.4	59	70.2	81.3	0	488.5	18	0	42.1	97.3	4.29
Jul-81	100	91.4	64	71.1	81.3	0	504	23	0	50.1	98.6	3.96
Aug-81	92	84.8	60	67.9	76.3	0	351.5	5	0	58.4	99.6	5.79
Sep-81	93	86.3	46	61.7	74.0	4.5	274.5	4	0	38.3	95.6	0.54
Oct-81	92	73.8	35	50.4	62.1	142	51.5	2	0	44.3	91.7	2.81
Nov-81	79	67.0	26	41.9	54.4	325	8	0	4	37.9	86.2	1.00
Dec-81	74	52.6	13	33.8	43.2	677	1	0	13	52.6	86.2	9.55
Jan-82	74	53.7	4	32.3	43.0	682	0	0	14	60.0	80.7	3.94
Feb-82	80	60.1	30	39.9	50.0	419	0	0	2	51.9	90.0	4.46
Mar-82	85	70.7	28	47.2	58.9	223.5	35	0	4	41.1	90.0	2.51
Apr-82	86	73.5	30	51.2	62.4	136.5	57	0	1	43.3	86.4	5.68
May-82	94	87.6	49	63.8	75.7	0.5	332.5	7	0	40.2	95.1	2.73
Jun-82	97	89.3	62	68.2	78.8	0	413.5	12	0	47.6	99.3	4.28
Jul-82	98	90.2	69	71.7	80.9	0	494	13	0	52.9	99.6	11.49
Aug-82	96	89.8	62	70.3	80.1	0	467.5	14	0	47.8	96.7	5.02
Sep-82	95	85.0	50	65.0	75.0	3	303	7	0	46.1	95.4	4.62
Oct-82	88	76.8	41	55.6	66.2	93.5	130.5	0	0	45.3	87.7	3.87
Nov-82	85	69.2	34	48.2	58.7	219.5	30	0	0	48.1	84.7	2.41
Dec-82	80	63.5	26	46.1	54.8	358	41.5	0	6	53.1	87.0	4.85
Jan-83	66	52.0	18	34.5	43.3	674	0	0	11	52.6	89.1	3.75
Feb-83	70	57.7	25	38.3	48.0	478	1.5	0	4	44.4	81.7	7.22
Mar-83	79	66.6	31	44.0	55.3	313	12.5	0	1	42.1	85.0	6.62
Apr-83	86	71.2	29	47.5	59.4	184.5	15.5	0	1	40.1	83.1	5.77
May-83	89	78.4	41	55.2	66.8	50	104.5	0	0	37.1	92.9	1.67

Month	High Max (°F)	Mean Monthly Max (°F)	Lowest Min (°F)	Mean Monthly Min (°F)	Ave (°F)	HDD (degree days)	CDD (degree days)	Swelt (days)	Freeze (days)	Ave Max RH (%)	Ave Min RH (%)	Precip (in)
Jun-83	97	87.6	54	65.8	76.7	0	351	9	0	42.9	96.4	6.57
Jul-83	105	95.6	59	73.0	84.3	0	598	26	0	41.9	91.5	4.85
Aug-83	107	95.7	59	72.1	83.9	0	586.5	25	0	46.2	95.4	6.32
Sep-83	97	84.5	49	65.1	74.8	6	300	10	0	66.2	98.2	3.56
Oct-83	89	77.5	41	56.9	67.2	43.5	111.5	0	0	68.7	97.7	1.92
Nov-83	79	68.5	32	44.2	56.4	263	3.5	0	0	67.3	97.8	5.39
Dec-83	75	56.0	7	35.5	45.8	596.5	0.5	0	7	50.4	83.7	4.15
Jan-84	70	54.7	20	35.2	45.0	621	0	0	11	52.6	89.1	3.51
Feb-84	75	63.2	20	40.1	51.7	387	0	0	6	44.4	81.7	7.09
Mar-84	85	69.1	28	43.8	56.5	278.5	14.5	0	3	42.1	85.0	6.05
Apr-84	91	74.0	41	51.1	62.6	125.5	52	1	0	40.1	83.1	8.00
May-84	96	84.9	44	58.8	71.9	12.5	226	8	0	37.1	92.9	9.79
Jun-84	105	93.1	48	67.2	80.1	0	454	22	0	42.9	96.4	2.54
Jul-84	100	90.1	66	70.1	80.1	0	468	16	0	41.9	91.5	7.28
Aug-84	98	91.6	65	70.0	80.8	0	491	18	0	46.2	95.4	5.52
Sep-84	101	85.7	48	62.3	74.0	7	276.5	12	0	66.2	98.2	0.60
Oct-84	95	86.2	42	60.6	73.4	12.5	272	7	0	68.7	97.7	0.31
Nov-84	83	67.4	28	39.3	53.4	366	16.5	0	6	67.3	97.8	0.90
Dec-84	82	69.6	20	44.1	56.9	265.5	13	0	4	50.4	83.7	1.38
Jan-85	77	54.0	-3	31.7	42.9	696	9.5	0	14	54.7	91.8	3.01
Feb-85	80	59.9	21	39.0	49.5	439.5	4.5	0	10	43.2	89.8	6.92
Mar-85	88	73.0	32	47.4	60.2	195	45	0	0	39.8	94.2	1.31
Apr-85	96	82.1	35	53.0	67.5	64	140	5	0	46.1	96.2	0.84
May-85	99	87.3	46	61.6	74.5	3	296.5	11	0	44.1	96.8	1.70
Jun-85	105	93.3	56	68.2	80.8	0	472.5	19	0	40.4	100.0	4.62
Jul-85	99	91.7	64	70.5	81.1	0	499.5	19	0	55.7	100.0	8.10

Month	High Max (°F)	Mean Monthly Max (°F)	Lowest Min (°F)	Mean Monthly Min (°F)	Ave (°F)	HDD (degree days)	CDD (degree days)	Swelt (days)	Freeze (days)	Ave Max RH (%)	Ave Min RH (%)	Precip (in)
Aug-85	97	89.3	62	70.0	79.7	0	454.5	13	0	52.0	100.0	4.38
Sep-85	99	87.2	49	64.1	75.7	5	325.5	9	0	46.0	96.0	0.49
Oct-85	91	79.5	46	62.2	70.8	22.5	202.5	2	0	42.2	98.2	6.34
Nov-85	83	73.6	39	57.3	65.5	77.5	91.5	0	0	44.7	95.9	6.36
Dec-85	74	56.7	14	34.1	45.4	608	0	0	14	53.2	94.7	2.48
Jan-86	75	56.9	1	33.9	45.4	607.5	0	0	11	53.1	92.7	1.46
Feb-86	80	65.5	26	43.7	54.6	297	5.5	0	5	57.8	95.2	3.58
Mar-86	88	70.8	25	45.0	57.9	243.5	24	0	3	44.5	92.8	4.08
Apr-86	99	82.2	35	50.6	66.4	81.5	124	5	0	37.8	98.1	1.45
May-86	98	87.2	45	61.6	74.4	5	296.5	9	0	48.7	99.9	3.84
Jun-86	103	94.1	66	71.3	82.7	0	531.5	23	0	52.0	100.0	3.03
Jul-86	107	99.6	69	74.1	86.9	0	678	30	0	59.7	100.0	2.96
Aug-86	103	90.0	56	70.2	80.1	7.5	475	18	0	65.9	100.0	10.90
Sep-86	96	88.2	61	68.6	78.4	0	401.5	12	0	53.0	98.0	1.54
Oct-86	96	77.3	39	57.0	67.1	67.5	133	5	0	70.8	98.7	4.19
Nov-86	84	68.5	29	54.0	61.3	177.5	65	0	1	76.8	99.7	5.82
Dec-86	78	58.2	28	40.3	49.3	493	5	0	3	49.9	95.4	5.83
Jan-87	73	55.2	27	37.3	46.2	582	0	0	6	44.8	95.6	7.39
Feb-87	76	57.9	25	39.2	48.6	460.5	0	0	2	53.1	99.5	7.55
Mar-87	80	66.9	32	46.0	56.5	281.5	16.5	0	0	45.6	97.8	4.97
Apr-87	93	74.7	29	49.8	62.3	154	72	1	1	34.6	100.0	0.70
May-87	91	85.5	50	63.4	74.5	3	296	4	0	47.7	99.5	3.57
Jun-87	98	89.7	61	70.0	79.9	0	445.5	11	0	52.1	100.0	5.64
Jul-87	100	93.8	63	71.7	82.8	0	550.5	26	0	45.6	99.6	4.87
Aug-87	102	94.2	68	73.5	83.8	0	583.5	22	0	64.5	100.0	4.93
Sep-87	93	86.0	55	67.1	76.6	0	346.5	6	0	60.2	100.0	3.56

Month	High Max (°F)	Mean Monthly Max (°F)	Lowest Min (°F)	Mean Monthly Min (°F)	Ave (°F)	HDD (degree days)	CDD (degree days)	Swelt (days)	Freeze (days)	Ave Max RH (%)	Ave Min RH (%)	Precip (in)
Oct-87	86	74.4	34	47.0	60.7	147.5	14	0	0	59.0	100.0	0.29
Nov-87	86	71.0	27	47.2	59.1	205	28.5	0	4	77.2	100.0	2.74
Dec-87	77	63.4	26	42.5	52.9	381	7	0	5	62.3	98.3	1.42
Jan-88	68	51.3	20	33.3	42.3	703.5	0	0	17	60.5	98.5	4.15
Feb-88	76	59.1	21	36.4	47.8	503	3	0	10	55.9	96.1	3.19
Mar-88	82	68.9	24	44.7	56.8	259.5	5	0	3	52.2	99.7	2.91
Apr-88	90	76.5	40	51.8	64.2	83.5	58.5	0	0	44.1	95.6	4.78
May-88	94	83.2	48	57.6	70.4	13	181	3	0	53.2	99.5	2.85
Jun-88	100	89.6	49	64.0	76.8	0	353	16	0	58.1	100.0	7.12
Jul-88	99	91.8	59	71.5	81.6	0	515	21	0	52.0	100.0	1.78
Aug-88	97	90.8	65	72.0	81.4	0	508	20	0	50.5	99.6	6.80
Sep-88	94	83.6	58	67.2	75.4	1.5	314	6	0	52.4	100.0	4.40
Oct-88	86	72.4	34	50.0	61.2	157.5	40	0	0	32.2	97.1	3.39
Nov-88	80	69.1	32	46.9	58.0	226	16.5	0	0	46.1	96.3	2.17
Dec-88	75	61.3	20	37.0	49.1	493	1	0	10	52.6	98.1	2.91
Jan-89	79	62.6	32	41.7	52.2	402.5	5	0	0	47.0	90.5	1.42
Feb-89	86	62.3	21	41.7	52.0	390	25.5	0	6	34.9	86.1	3.59
Mar-89	86	68.7	32	47.9	58.3	257	49.5	0	0	33.9	90.6	5.52
Apr-89	93	75.9	35	52.5	64.2	143.5	119	2	0	29.7	93.6	4.89
May-89	97	82.5	38	58.5	70.5	37.5	209.5	5	0	29.3	95.8	2.60
Jun-89	98	89.5	66	70.1	79.8	0	444.5	15	0	31.6	95.9	6.67
Jul-89	99	90.8	64	71.9	81.4	0	507.5	15	0	38.2	97.7	11.46
Aug-89	99	90.1	64	71.7	80.9	0	492	18	0	45.0	99.7	3.27
Sep-89	97	83.1	56	67.5	75.3	8.5	318.5	7	0	51.2	99.3	4.87
Oct-89	90	78.0	35	56.6	67.3	65.5	137	0	0	35.6	96.1	3.36
Nov-89	81	64.2	24	40.6	52.4	379	1.5	0	7	37.8	96.2	3.00

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Dec-89	74	53.2	18	35.1	44.1	646.5	0	0	10	37.4	92.7	4.41
Jan-90	79	66.6	30	43.2	54.9	314	0	0	2	43.8	93.1	3.07
Feb-90	80	68.8	29	46.3	57.5	230	21	0	2	52.4	97.7	2.38
Mar-90	87	70.5	31	49.6	60.0	199.5	45.5	0	1	52.6	98.9	2.37
Apr-90	90	76.3	36	51.6	64.0	105.5	74	0	0	38.6	97.8	1.21
May-90	94	84.2	48	61.6	72.9	6	250.5	5	0	36.9	98.4	2.95
Jun-90	103	92.4	61	68.6	80.5	0	465.5	19	0	47.0	98.7	0.89
Jul-90	103	94.2	66	73.1	83.6	0	578	23	0	52.1	99.1	7.31
Aug-90	102	94.2	68	73.4	83.8	0	582.5	27	0	50.2	99.2	8.07
Sep-90	104	91.0	49	67.0	79.0	2	421	19	0	55.1	97.4	0.62
Oct-90	91	80.4	40	58.5	69.4	64.5	202	3	0	43.6	95.0	19.62
Nov-90	83	72.9	33	46.8	59.9	174	20.5	0	0	43.4	94.3	1.41
Dec-90	79	62.6	28	46.5	54.5	344.5	20.5	0	3	44.4	88.0	1.57
Jan-91	73	56.1	26	39.7	47.9	530	0	0	6	42.6	93.5	7.03
Feb-91	82	65.5	17	42.6	54.1	323	17.5	0	4	35.5	88.5	1.84
Mar-91	86	71.6	30	48.9	60.3	193	46.5	0	1	41.7	96.0	7.89
Apr-91	90	78.9	45	59.5	69.2	24.5	151	0	0	31.1	93.3	4.73
May-91	96	85.9	54	67.9	76.9	3	371.5	8	0	34.5	96.7	3.06
Jun-91	95	89.4	55	69.5	79.5	0	433.5	14	0	32.5	94.0	2.17
Jul-91	100	92.4	70	74.8	83.6	0	577.5	21	0	38.5	92.9	7.89
Aug-91	97	89.5	58	72.9	81.2	0	502	12	0	42.4	99.6	9.26
Sep-91	98	87.3	54	67.5	77.4	2	374.5	13	0	36.3	97.3	4.40
Oct-91	86	78.3	46	57.9	68.1	33	128	0	0	42.5	98.3	0.99
Nov-91	80	65.1	31	45.7	55.4	313	25.5	0	1	32.2	97.4	1.55
Dec-91	80	63.2	27	44.7	54.0	367.5	25	0	3	50.5	92.1	3.32
Jan-92	77	58.5	24	40.5	49.5	481	0	0	7	54.7	94.6	4.45

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Feb-92	76	63.6	31	44.7	54.1	322.5	7	0	2	31.6	82.3	3.89
Mar-92	81	68.3	30	46.1	57.2	256.5	15.5	0	1	32.6	89.3	2.98
Apr-92	89	75.6	36	54.4	65.0	111.5	112	0	0	43.3	92.2	2.40
May-92	96	81.5	49	61.0	71.2	34	227	2	0	47.7	97.6	1.34
Jun-92	98	87.3	60	70.5	78.9	0	416	12	0	42.5	98.5	6.27
Jul-92	100	92.9	60	74.5	83.7	0	579	26	0	53.4	99.8	3.69
Aug-92	98	88.3	66	73.2	80.7	0	488	9	0	53.2	99.6	4.83
Sep-92	97	84.4	56	69.5	76.9	9.5	367	3	0	41.1	95.5	6.38
Oct-92	82	74.6	42	55.5	65.0	60.5	61.5	0	0	40.6	96.0	3.11
Nov-92	78	65.4	33	48.8	57.1	262.5	25.5	0	0	40.9	90.6	7.78
Dec-92	70	54.8	29	41.1	48.0	528.5	0	0	2	43.1	86.6	2.86
Jan-93	76	59.1	30	44.3	51.7	416.5	4	0	1	44.2	90.9	7.45
Feb-93	69	55.9	20	39.6	47.8	482.5	0	0	3	39.7	86.2	3.62
Mar-93	80	62.6	23	43.7	53.2	367	0	0	3	43.2	92.7	8.37
Apr-93	85	70.5	33	47.3	58.9	200.5	17.5	0	0	45.3	96.4	1.74
May-93	89	79.9	46	59.5	69.7	23	168	0	0	50.6	96.7	1.43
Jun-93	98	88.7	62	67.7	78.2	0	396	8	0	62.7	99.5	3.27
Jul-93	99	94.7	67	72.5	83.6	0	577.5	29	0	61.5	98.5	3.12
Aug-93	97	90.5	64	69.5	80.0	0	465	17	0	65.4	99.4	2.23
Sep-93	95	85.0	49	65.3	75.2	9	314	4	0	69.9	98.6	7.29
Oct-93	85	71.8	35	53.8	62.8	132	63	0	0	56.8	98.1	0.99
Nov-93	80	64.4	32	45.9	55.2	313.5	18	0	0	53.8	95.0	1.87
Dec-93	70	52.7	20	34.5	43.6	663.5	0	0	10	57.2	96.2	1.81
Jan-94	70	51.8	10	31.2	41.5	729.5	0	0	14	57.8	91.5	4.80
Feb-94	76	59.4	27	40.7	50.1	425.5	7	0	7	43.5	84.5	3.91
Mar-94	87	72.3	32	48.1	60.2	184	36	0	0	40.3	87.2	6.42

Month	High Max (°F)	Mean Monthly Max (°F)	Lowest Min (°F)	Mean Monthly Min (°F)	Ave (°F)	HDD (degree days)	CDD (degree days)	Swelt (days)	Freeze (days)	Ave Max RH (%)	Ave Min RH (%)	Precip (in)
Apr-94	91	80.5	39	55.5	68.0	34.5	125	1	0	26.2	79.8	1.05
May-94	92	81.2	50	61.2	71.2	27	219	1	0	34.4	86.6	1.45
Jun-94	98	91.4	70	73.2	82.3	0	520	17	0	33.5	86.9	5.08
Jul-94	96	90.6	69	73.1	81.8	0	522	17	0	31.1	83.7	7.47
Aug-94	98	89.5	65	72.8	81.1	0	500.5	13	0	35.3	83.5	3.47
Sep-94	96	86.0	60	68.9	77.4	0	372.5	2	0	36.3	81.2	0.99
Oct-94	88	75.3	46	59.2	67.2	40.5	109.5	0	0	41.0	81.0	10.01
Nov-94	82	71.4	36	53.3	62.3	128.5	48.5	0	0	33.9	75.7	3.05
Dec-94	77	60.5	29	46.2	53.3	375.5	13.5	0	1	36.2	78.9	4.62
Jan-95	73	59.2	28	40.6	49.9	468	0	0	3	39.9	79.3	6.96
Feb-95	79	60.1	20	41.8	50.9	396	2.5	0	3	37.5	66.8	7.97
Mar-95	90	72.8	35	52.2	62.5	126	48	0	0	26.4	71.0	0.92
Apr-95	91	80.8	45	58.5	69.6	26.5	165.5	1	0	27.3	79.5	1.28
May-95	98	87.4	51	66.1	76.7	1.5	365.5	10	0	30.6	78.3	1.77
Jun-95	94	84.4	57	66.1	75.3	0	307.5	4	0	44.5	86.8	8.15
Jul-95	101	91.4	68	72.0	81.7	0	516.5	17	0	44.9	86.5	5.71
Aug-95	98	87.0	66	71.6	79.3	0	444.5	8	0	45.7	86.7	6.92
Sep-95	91	80.5	49	64.6	72.6	18.5	245	1	0	41.9	89.3	5.75
Oct-95	85	76.5	42	57.5	67.0	67.5	130	0	0	50.6	90.0	2.64
Nov-95	78	62.5	30	40.4	51.4	414.5	7	0	2	46.3	83.8	2.38
Dec-95	74	55.3	24	36.6	46.0	589.5	0	0	12	47.7	82.5	4.47
Jan-96	70	55.5	21	36.5	46.0	589	0	0	11	47.0	86.0	3.18
Feb-96	81	59.3	12	39.4	49.3	460	6	0	9	43.0	85.0	2.43
Mar-96	74	58.7	16	38.9	48.8	501.5	0	0	9	37.0	80.0	6.24
Apr-96	86	74.5	37	51.3	62.9	124.5	61.5	0	0	31.0	79.0	1.42
May-96	96	85.9	48	63.1	74.5	14.5	309	10	0	36.0	87.0	1.23



Month	High Max (°F)	Mean Monthly Max (°F)	Lowest Min (°F)	Mean Monthly Min (°F)	Ave (°F)	HDD (degree days)	CDD (degree days)	Swelt (days)	Freeze (days)	Ave Max RH (%)	Ave Min RH (%)	Precip (in)
Jun-96	101	89.2	54	67.9	78.5	0	406	12	0	53.0	92.0	3.46
Jul-96	102	90.0	68	71.9	80.9	0	494	16	0	50.0	92.0	5.20
Aug-96	90	85.7	64	68.0	76.9	0	367.5	0	0	54.0	93.0	4.83
Sep-96	92	83.1	52	64.7	73.9	8	275	1	0	57.0	93.0	4.05
Oct-96	82	73.3	40	51.8	62.5	111	35	0	0	48.0	90.0	1.95
Nov-96	77	62.7	29	40.9	51.8	400	4	0	3	46.0	94.0	1.17
Dec-96	79	61.2	22	40.6	50.9	444.5	7.5	0	4	44.0	90.0	2.70
Jan-97	75	58.9	24	41.7	50.3	461.5	6	0	5	49.0	86.0	4.42
Feb-97	83	63.9	32	45.3	54.6	311.5	20.5	0	0	43.0	82.0	5.35
Mar-97	86	74.8	40	54.3	64.5	87	72.5	0	0	40.0	82.0	2.88
Apr-97	83	73.5	38	51.8	62.7	105.5	35	0	0	31.0	80.0	3.05
May-97	90	80.1	43	59.2	69.6	20	164	0	0	39.0	85.0	2.23
Jun-97	93	83.0	57	67.6	75.3	7.5	317.5	6	0	44.0	92.0	9.58
Jul-97	100	91.7	62	72.6	82.2	0	532	23	0	49.0	92.0	6.00
Aug-97	98	90.9	62	70.2	80.5	0	482	19	0	57.0	96.0	4.00
Sep-97	98	86.3	56	67.0	76.6	0	349	9	0	51.0	96.0	5.59
Oct-97	88	72.9	36	53.0	63.0	161.5	98.5	0	0	49.0	94.0	3.90
Nov-97	72	60.6	26	41.6	51.1	418	0	0	2	43.0	87.0	4.76
Dec-97	68	54.9	28	37.9	46.4	575.5	0	0	4	45.0	88.0	7.91
Jan-98	74	56.9	24	39.4	48.2	523.5	1.5	0	5	41.9	81.9	7.83
Feb-98	75	59.5	28	40.6	50.0	419.5	0	0	2	44.7	84.1	7.18
Mar-98	84	63.2	22	42.7	53.0	391	18.5	0	3	35.6	77.2	5.61
Apr-98	84	71.5	40	52.1	61.8	118.5	22.5	0	0	33.5	71.3	6.28
May-98	96	87.4	52	66.2	76.8	0	365.5	14	0	39.6	86.7	3.53
Jun-98	104	95.0	62	73.1	84.0	0	571	24	0	52.9	92.5	3.76
Jul-98	101	94.8	68	74.4	84.6	0	608	28	0	51.4	94.9	4.49

Month	High Max (°F)	Mean Monthly Max (°F)	Lowest Min (°F)	Mean Monthly Min (°F)	Ave (°F)	HDD (degree days)	CDD (degree days)	Swelt (days)	Freeze (days)	Ave Max RH (%)	Ave Min RH (%)	Precip (in)
Aug-98	101	92.5	60	71.0	81.7	0	518.5	20	0	42.9	93.5	4.34
Sep-98	94	87.8	56	69.5	78.6	0	409	7	0	46.3	92.1	8.43
Oct-98	90	81.9	42	58.7	70.3	22.5	186.5	0	0	55.4	95.4	0.52
Nov-98	84	71.6	38	51.8	61.7	137	37.5	0	0	50.2	96.0	0.77
Dec-98	82	64.6	29	47.0	55.8	326	41	0	2	51.8	94.8	1.76
Jan-99	80	64.2	19	42.5	53.4	372	11.5	0	3	53.4	96.6	5.71
Feb-99	79	63.8	27	42.1	53.0	341.5	5	0	5	45.0	92.1	2.75
Mar-99	78	65.4	30	41.7	53.5	355.5	0	0	1	44.7	89.1	2.55
Apr-99	90	77.6	42	56.4	67.0	79	138.5	0	0	45.5	93.1	1.66
May-99	88	81.5	48	58.9	70.2	17	178.5	0	0	44.4	95.0	2.82
Jun-99	94	86.2	60	66.6	76.4	0	341.5	7	0	39.3	91.5	5.21
Jul-99	99	90.0	63	72.0	81.0	0	496.5	17	0	44.3	91.9	4.97
Aug-99	103	93.5	58	72.0	82.8	0	551	23	0	41.8	89.6	3.86
Sep-99	98	83.6	46	62.6	73.1	9.5	253.5	7	0	52.4	94.0	5.02
Oct-99	86	73.3	36	54.7	64.0	92.5	62	0	0	43.2	91.9	2.38
Nov-99	80	68.1	30	47.3	57.7	228	9	0	1	48.9	92.1	1.04
Dec-99	73	59.2	24	37.8	48.5	512	0	0	9	49.4	93.9	1.47
Jan-00	76	54.4	23	37.5	45.9	593	1.5	0	8	43.3	93.9	6.53
Feb-00	78	66.1	25	40.9	53.5	335	0.5	0	5	38.9	91.8	0.61
Mar-00	84	72.5	37	50.0	61.2	140	23	0	0	30.8	88.4	3.84
Apr-00	85	74.6	35	50.7	62.7	112	42	0	0	39.8	87.6	1.43
May-00	99	89.8	52	65.7	77.7	0	395	13	0	37.8	90.7	0.20
Jun-00	100	93.0	60	70.2	81.6	0	498	23	0	47.7	93.7	4.86
Jul-00	101	93.2	68	72.7	83.0	0	557	23	0	52.7	95.6	2.49
Aug-00	99	90.1	66	71.7	80.9	0	493	15	0	40.2	89.6	5.11
Sep-00	92	82.2	53	66.2	74.2	2	277	4	0	43.4	88.4	7.82

Month	High Max (°F)	Mean Monthly Max (°F)	Lowest Min (°F)	Mean Monthly Min (°F)	Ave (°F)	HDD (degree days)	CDD (degree days)	Swelt (days)	Freeze (days)	Ave Max RH (%)	Ave Min RH (%)	Precip (in)
Oct-00	89	79.3	36	53.9	66.6	56	105	0	0	53.3	93.9	0.00
Nov-00	84	65.3	28	45.1	55.2	325	32	0	1	42.2	93.0	3.50
Dec-00	67	49.2	17	31.1	40.1	771	0	0	18	43.5	91.2	1.94
Jan-01	78	57.4	20	36.2	46.8	567.5	3	0	10	49.8	86.2	2.80
Feb-01	79	65.0	28	44.5	54.8	293.5	6.5	0	1	43.4	84.5	2.52
Mar-01	77	65.7	30	44.6	55.2	308	3	0	1	40.4	87.0	7.27
Apr-01	92	77.9	36	55.2	66.6	83.5	130	1	0	35.9	87.9	0.96
May-01	96	86.2	52	61.8	74.0	0	279	4	0	39.9	92.7	4.79
Jun-01	93	87.3	62	69.2	78.3	0	398	3	0	43.7	95.0	4.87
Jul-01	96	89.6	64	70.0	79.8	0	459.5	13	0	46.7	95.7	5.42
Aug-01	98	91.8	65	70.7	81.2	0	503	21	0	49.1	96.3	1.60
Sep-01	92	83.2	50	63.5	73.4	5.5	256	1	0	49.0	95.7	3.34
Oct-01	88	77.7	31	52.3	65.0	97.5	97.5	0	1	45.3	93.2	0.12
Nov-01	84	74.8	33	51.9	63.4	91	42.5	0	0	46.9	90.7	1.16
Dec-01	79	65.3	28	44.1	54.7	323.5	3	0	3	49.2	88.1	1.20
Jan-02	82	62.5	21	40.2	51.3	436.5	12	0	7	40.0	93.0	2.97
Feb-02	78	62.6	15	39.8	51.2	391	4	0	5	45.0	92.0	2.23
Mar-02	86	72.9	19	48.2	60.5	204	66	0	3	38.0	91.0	3.88
Apr-02	94	82.4	44	59.4	70.9	25	202	4	0	38.0	92.0	2.10
May-02	94	83.5	47	59.0	71.3	30.5	225	3	0	34.0	90.0	2.87
Jun-02	104	89.9	59	68.0	78.9	0	418	14	0	51.0	93.0	3.25
Jul-02	100	94.0	67	71.7	82.8	0	552.5	26	0	52.0	93.0	3.92
Aug-02	100	91.1	60	69.5	80.3	0	473	19	0	46.0	91.0	4.59
Sep-02	98	86.4	65	68.1	77.3	0	367.5	5	0	51.0	90.0	3.88
Oct-02	92	76.1	44	58.9	67.5	68	146	1	0	36.0	83.0	2.62
Nov-02	76	63.9	28	42.5	53.2	361.5	7	0	3	39.0	79.0	4.73

Month	High Max (°F)	Mean Monthly Max (°F)	Lowest Min (°F)	Mean Monthly Min (°F)	Ave (°F)	HDD (degree days)	CDD (degree days)	Swelt (days)	Freeze (days)	Ave Max RH (%)	Ave Min RH (%)	Precip (in)
Dec-02	68	55.6	25	35.5	45.6	602	0	0	8	43.0	88.0	4.32
Jan-03	71	53.9	14	33.0	43.5	667	0	0	16	49.9	86.3	2.32
Feb-03	77	59.6	30	39.1	49.3	439	0	0	2	43.4	84.3	5.03
Mar-03	82	69.5	36	49.9	59.7	189	26	0	0	40.4	87.0	8.65
Apr-03	90	76.7	42	54.4	65.6	68	84.5	0	0	35.8	87.8	9.19
May-03	93	82.7	56	64.2	73.5	2	264	4	0	40.2	92.9	7.17
Jun-03	95	89.4	60	69.7	79.6	0	437	10	0	43.8	94.8	9.47
Jul-03	96	89.5	68	71.9	80.7	0	487.5	15	0	46.8	95.7	5.94
Aug-03	96	90.8	68	72.1	81.5	0	510	15	0	49.0	96.2	5.16
Sep-03	92	84.7	54	65.1	74.9	1	297.5	5	0	49.1	95.6	4.29
Oct-03	84	76.6	46	55.7	66.2	35	71	0	0	46.3	93.3	3.31
Nov-03	86	72.4	26	48.6	60.5	192	57.5	0	2	47.0	90.6	1.52
Dec-03	70	57.5	21	34.6	46.0	588.5	0	0	8	49.1	88.1	1.92
Jan-04	77	57.8	22	35.5	46.7	570.5	2	0	11	36.3	83.4	3.79
Feb-04	72	56.4	28	37.3	46.9	525.5	0	0	4	45.1	90.7	6.28
Mar-04	84	72.6	33	48.2	60.4	178.5	36	0	0	51.9	91.0	1.44
Apr-04	92	79.6	36	52.4	66.0	82	112	1	0	45.2	90.8	1.94
May-04	98	89.1	52	66.6	77.9	0.5	399.5	13	0	51.1	91.3	2.50
Jun-04	102	91.9	66	71.4	81.7	0	499.5	19	0	51.1	92.8	8.71
Jul-04	100	94.4	68	73.1	83.7	0	581	26	0	60.2	90.3	4.66
Aug-04	96	89.3	56	69.9	79.6	0	452.5	15	0	55.2	86.5	2.74
Sep-04	89	82.8	56	67.4	75.1	0	302.5	0	0	47.4	82.8	8.72
Oct-04	88	76.5	48	59.8	68.1	21.5	118.5	0	0	47.1	82.6	0.66
Nov-04	84	68.6	31	48.6	58.6	230	38	0	1	44.7	79.9	4.74
Dec-04	77	60.2	23	37.7	49.0	498.5	2	0	7	41.9	83.2	1.72
Jan-05	75	59.0	16	39.4	49.2	490	0	0	8	43.1	78.8	1.78

Month	High Max (°F)	Mean Monthly Max (°F)	Lowest Min (°F)	Mean Monthly Min (°F)	Ave (°F)	HDD (degree days)	CDD (degree days)	Swelt (days)	Freeze (days)	Ave Max RH (%)	Ave Min RH (%)	Precip (in)
Feb-05	77	59.7	29	41.0	50.4	409.5	0	0	1	46.6	82.4	4.87
Mar-05	82	64.9	30	42.2	53.5	356	1	0	1	33.0	73.3	5.42
Apr-05	85	72.5	37	48.5	60.5	153.5	19	0	0	31.2	77.4	2.16
May-05	92	82.7	48	59.1	70.9	10	194	4	0	41.6	83.3	3.22
Jun-05	97	86.1	62	68.4	77.3	0	367.5	5	0	47.3	91.6	5.56
Jul-05	95	88.1	65	71.1	79.6	0	452	8	0	46.2	89.9	6.28
Aug-05	96	87.1	65	69.9	78.5	0	418.5	6	0	47.3	89.9	3.86
Sep-05	96	88.3	63	66.5	77.4	0	372	6	0	56.6	88.2	0.05
Oct-05	84	73.7	35	55.3	64.5	112.5	96.5	0	0	57.5	91.8	3.35
Nov-05	80	67.9	28	44.5	56.2	269	6	0	2	48.9	88.6	2.79
Dec-05	73	55.7	22	33.4	44.6	633.5	0	0	11	40.3	92.5	4.77
Jan-06	70	61.4	28	40.3	50.8	440	0	0	5	44.2	89.2	2.94
Feb-06	73	57.2	24	37.4	47.3	496.5	0	0	7	43.6	92.5	2.83
Mar-06	87	67.9	33	46.5	57.2	268.5	27	0	0	37.3	87.8	2.90
Apr-06	91	80.6	42	57.0	68.8	37	151	1	0	33.8	83.8	2.98
May-06	96	83.4	48	60.8	72.1	18.5	238.5	9	0	38.7	85.6	1.60
Jun-06	99	89.5	58	68.5	79.0	0	419	14	0	55.6	92.2	7.23
Jul-06	102	94.1	63	72.4	83.2	0	565	24	0	55.8	93.2	2.59
Aug-06	103	93.3	68	74.2	83.7	0	580.5	24	0	54.3	92.4	2.54
Sep-06	92	84.8	50	65.7	75.3	0	308	3	0	40.3	84.1	2.43
Oct-06	91	75.7	36	53.9	64.8	107.5	100.5	1	0	49.7	89.8	3.48
Nov-06	82	67.9	35	46.0	57.0	252.5	11.5	0	0	40.8	89.4	2.61
Dec-06	76	64.4	20	42.4	53.4	359.5	0	0	4	43.6	96.3	5.03
Jan-07	75	59.5	25	40.9	50.2	465.5	5.5	0	4	44.7	91.9	3.66
Feb-07	75	59.7	26	37.8	48.7	455.5	0	0	8	39.3	90.7	2.70
Mar-07	90	73.7	30	48.7	61.2	159.5	42.5	0	2	34.5	86.3	2.14

Month	High Max (°F)	Mean Monthly Max (°F)	Lowest Min (°F)	Mean Monthly Min (°F)	Ave (°F)	HDD (degree days)	CDD (degree days)	Swelt (days)	Freeze (days)	Ave Max RH (%)	Ave Min RH (%)	Precip (in)
Apr-07	90	76.7	30	51.1	63.9	123.5	89.5	0	1	33.3	89.2	2.29
May-07	93	84.5	46	59.0	71.8	5.5	215	5	0	38.0	83.7	1.04
Jun-07	98	89.9	62	69.0	79.4	0	433	19	0	40.5	73.1	5.04
Jul-07	97	89.3	62	70.7	80.0	0	465	13	0	39.9	74.9	5.49
Aug-07	107	96.5	71	75.0	85.8	0	643.5	28	0	47.7	78.8	4.08
Sep-07	95	88.0	56	67.9	77.9	0	387.5	13	0	44.8	88.3	2.30
Oct-07	92	80.8	45	61.5	71.1	21.5	211.5	2	0	40.0	85.7	1.42
Nov-07	82	68.9	31	44.4	56.7	260.5	11	0	1	44.7	86.0	0.48
Dec-07	81	65.1	24	44.1	54.6	338.5	16	0	2	44.2	88.4	8.05
Jan-08	73	55.7	18	36.6	46.2	585.5	2.5	0	9	45.4	88.0	3.81
Feb-08	80	65.1	23	40.5	52.8	358	4.5	0	4	35.3	87.9	4.10
Mar-08	79	69.6	32	45.5	57.6	240.5	10	0	0	35.8	88.4	3.74
Apr-08	85	75.4	39	53.0	64.2	87	62	0	0	30.2	83.3	3.58
May-08	93	84.3	50	61.3	72.8	0.5	241	1	0	34.2	86.7	3.22
Jun-08	102	95.2	59	71.3	83.3	0	548.5	27	0	44.6	91.5	0.46
Jul-08	100	92.3	58	71.6	81.9	0	524.5	26	0	47.2	91.4	4.37
Aug-08	103	90.7	67	71.8	81.3	0	504.5	17	0	44.0	89.8	5.03
Sep-08	96	85.4	58	67.5	76.5	0.5	344.5	7	0	43.6	85.5	2.63
Oct-08	87	75.0	33	52.8	63.9	131	96.5	0	0	46.9	85.8	4.59
Nov-08	78	63.6	25	42.1	52.9	364	0	0	4	35.7	88.4	6.37
Dec-08	79	64.0	26	43.8	53.9	356.5	12.5	0	7	48.9	93.1	3.60
Jan-09	73	56.5	18	37.1	46.8	565	1	0	10	46.5	90.5	2.19
Feb-09	76	61.4	18	38.6	50.0	420.5	0	0	8	40.5	91.9	1.94
Mar-09	86	68.4	24	46.3	57.4	261	24.5	0	3	38.4	89.6	4.58
Apr-09	92	75.9	34	52.4	64.2	91.5	66	1	0	44.4	91.0	4.17
May-09	93	82.2	50	64.5	73.4	11	270.5	1	0	41.7	87.9	4.90

Month	High Max (°F)	Mean Monthly Max (°F)	Lowest Min (°F)	Mean Monthly Min (°F)	Ave (°F)	HDD (degree days)	CDD (degree days)	Swelt (days)	Freeze (days)	Ave Max RH (%)	Ave Min RH (%)	Precip (in)
Jun-09	101	93.0	66	72.1	82.5	0	526	23	0	35.1	84.8	4.11
Jul-09	100	92.2	64	71.2	81.7	0	518	20	0	45.3	84.8	4.16
Aug-09	100	91.2	64	71.6	81.4	0	509	20	0	51.0	86.6	2.73
Sep-09	93	86.2	51	67.0	76.6	1.5	349	6	0	51.7	88.4	5.18
Oct-09	88	74.2	38	55.5	64.8	95.5	89.5	0	0	42.7	86.9	3.66
Nov-09	78	67.4	35	47.3	57.3	235.5	5.5	0	0	44.7	90.4	6.59
Dec-09	77	54.8	26	37.5	46.1	585	0	0	5	51.3	91.8	10.30
Jan-10	72	53.5	19	32.9	43.2	675	0	0	17	46.4	90.9	4.54
Feb-10	69	53.1	25	33.5	43.3	607.5	0	0	13	37.1	86.5	2.13
Mar-10	81	65.3	30	43.5	54.4	329.5	0	0	3	42.7	90.9	2.49
Apr-10	92	81.2	45	54.0	67.6	25	103	2	0	40.3	88.2	1.14
May-10	94	86.5	53	65.8	76.2	0.5	346.5	7	0	51.6	88.1	2.19
Jun-10	102	94.0	67	73.0	83.5	0	555	25	0	43.9	87.4	7.33
Jul-10	103	95.5	64	74.4	84.9	0	617.5	26	0	43.3	81.4	2.81
Aug-10	98	92.3	67	74.5	83.4	0	571.5	21	0	49.3	87.8	3.70
Sep-10	99	91.2	58	68.1	79.6	0	439	23	0	47.6	85.9	1.72
Oct-10	90	80.4	44	54.9	67.6	27.5	108.5	0	0	57.7	90.0	0.53
Nov-10	79	69.3	34	45.5	57.4	234.5	6.5	0	0	55.8	93.3	2.06
Dec-10	72	52.2	17	30.7	41.5	730	0	0	17	49.7	77.9	1.47
Jan-11	75	53.0	20	33.6	43.3	671.5	0	0	12	40.8	69.0	2.08
Feb-11	82	64.3	29	42.4	53.4	337	11	0	4	42.4	81.4	4.47
Mar-11	88	69.4	34	47.2	58.3	238	31	0	0	37.1	78.0	6.38
Apr-11	91	81.6	40	56.3	69.0	42.5	161.5	1	0	30.2	76.1	2.54
May-11	98	86.1	46	62.5	74.3	17.5	305	11	0	43.2	91.0	2.88
Jun-11	102	95.9	66	71.6	83.8	0	562.5	30	0	47.3	91.5	1.85
Jul-11	103	96.3	69	74.5	85.4	0	631	28	0	47.2	91.5	1.66

Month	High Max (°F)	Mean Monthly Max (°F)	Lowest Min (°F)	Mean Monthly Min (°F)	Ave (°F)	HDD (degree days)	CDD (degree days)	Swelt (days)	Freeze (days)	Ave Max RH (%)	Ave Min RH (%)	Precip (in)
Aug-11	105	96.1	69	73.5	84.8	0	614.5	29	0	55.7	93.1	2.53
Sep-11	97	87.7	56	66.1	76.9	0	357	11	0	40.8	89.8	4.33
Oct-11	87	74.4	38	52.5	63.4	97	48.5	0	0	37.3	91.2	2.00
Nov-11	82	69.5	31	45.7	57.6	244	22.5	0	1	40.6	87.6	2.11
Dec-11	76	64.1	29	42.5	53.3	368	6.5	0	1	40.4	85.3	1.81
Jan-12	75	63.0	21	40.0	51.5	417.5	0	0	4	43.5	88.6	2.02
Feb-12	81	65.1	22	42.9	54.0	329.5	10.5	0	3	40.2	85.1	1.45
Mar-12	87	76.7	35	55.5	66.1	84.5	119.5	0	0	42.7	84.7	2.53
Apr-12	93	79.5	36	55.4	67.5	73.5	147.5	3	0	35.8	86.1	1.53
May-12	96	85.5	56	65.1	75.3	0	319	6	0	38.3	86.9	7.37
Jun-12	108	87.4	59	66.5	77.0	0	358.5	6	0	34.1	87.1	3.65
Jul-12	103	94.7	70	74.1	84.4	0	602	26	0	41.5	88.9	3.00
Aug-12	96	88.5	64	70.8	79.6	0	453.5	11	0	39.9	88.1	7.13
Sep-12	95	85.6	54	66.0	75.8	0	324.5	4	0	42.7	89.9	2.88
Oct-12	87	77.5	43	56.2	66.9	57	115	0	0	42.6	90.6	0.64
Nov-12	83	65.6	33	42.7	54.2	331.5	6	0	0	44.6	92.0	1.65
Dec-12	77	62.6	29	44.0	53.3	362.5	1	0	3	47.7	93.3	5.06
Jan-13	81	65.0	28	43.5	54.3	357.5	24.5	0	3	42.6	87.7	1.28
Feb-13	73	59.0	24	38.0	48.5	461.5	0	0	5	43.1	87.9	9.63
Mar-13	79	62.7	26	40.2	51.4	426	5.5	0	4	42.1	88.1	3.21
Apr-13	86	75.9	39	53.5	64.7	83.5	74	0	0	36.9	86.9	4.74
May-13	91	80.6	50	60.4	70.5	22	192	3	0	41.9	89.6	2.39
Jun-13	96	87.6	64	70.2	78.9	0	417.5	6	0	41.3	82.3	11.64
Jul-13	93	87.5	69	72.0	79.7	0	456.5	8	0	49.0	88.4	6.50
Aug-13	95	87.6	61	70.0	78.8	0	428.5	12	0	57.0	93.0	6.51
Sep-13	95	87.1	55	64.3	75.7	0	321.5	14	0	49.8	91.5	1.52



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Oct-13	90	78.1	36	55.1	66.6	64	113.5	0	0	41.6	87.9	0.93
Nov-13	86	66.1	25	40.2	53.2	359.5	4	0	8	40.5	89.9	1.75
Dec-13	80	62.5	28	40.3	51.4	436.5	14	0	8	53.1	95.5	4.37