

2015 WEATHER SUMMARY

West Henrico Co. - Glen Allen, VA

MOST UNUSUAL RECORDS

The Warmest December on Record in Richmond

December was the warmest and second wettest on record at Glen Allen as the monthly mean temperature was 52.8°F, a +11.2°F departure from the eight year average. December had its highest maximum of 76.2°F on December 12th with eight days of ≥70°F and 12 days of ≥65°F both being new records. On only 6 days did the minimum reach freezing or below which was a new record for December. The lowest temperature was 25°F occurring on the 20th; only 2011 equaled this and no other Decembers had a higher value. The cold February offset by the very warm December in part accounted for the year's average being near normal.

Heavy Electrical Thunderstorm

On June 25, 2015 a thunderstorm started at 2119 hours and was the worst electrical storm since June 3, 2009. This was the first thunderstorm given the top rating of five out of five on June 25, 2012 but this storm was rated 5 because of wind damage. There was also a storm on July 3, 2011 that damaged much of my weather equipment that was caused by one close lightning strike; however, the storm wasn't so electrically severe. The June 25th thunderstorm ended by 1710 hours and gave a total of 1.10 inches precipitation in one hour. It also gave two strikes near our house. One strike threw the circuit breaker. It could have been a coincidence but the hard drive of my website computer failed on the same night and had to be replaced. Rating thunderstorms one to five in severity was started in 2012.

The Threat of a Hurricane

Early Wednesday, September 30, 2015, when I checked the models to see the projected track of hurricane Joaquin I was very surprised to see the GFS model had the hurricane coming up the Chesapeake Bay. This was much like the August 23, 1933 hurricane that took a similar path and caused great destruction in Virginia. The 1933 hurricane was the worst hurricane since September 29, 1896 for Richmond. It really looked ominous for Virginia if you believed the models and of course I was concerned. In checking the models later that morning the Nam model had the hurricane doing a loop over North Carolina and giving a little over 30 inches of rain in one part of interior North Carolina.

The only model that showed the hurricane going out to sea was the European model. It was very fortunate for Virginia that the hurricane took the European model track. However, the southeastern Mid-Atlantic States still had to deal with a very deep negatively tilted trough and the formation of a strong Northeaster that was being blocked to the north by high pressure. The Nam model seemed ridiculous forecasting 30 inches of rain in North Carolina but as it turned out South Carolina had some reports of more than 22 inches. Otherwise it was a very quiet hurricane season on the east coast.

Thunderstorms

Thunder was heard on 33 days in 2015 at Glen Allen. The average is 35.5 days per year. 2013 and 2015 set the record low number of 31 thunderstorms. June had 8 thunder days which was the greatest for one month in 2015 and most weren't that strong. Most were weak as 22 of the 33 were rated as category one the weakest.

22 (Cat. 1), 2 (Cat. 2), 7 (Cat. 3), 1 (Cat. 4), 1 (Cat. 5)

Temperature

YEAR- The mean temperature for 2015 at Glen Allen was 59.1°F which was positive departure of 0.2°F. This was the warmest year at Glen Allen since 2012 with an average of 60.5°F which is the Glen Allen record. The Richmond International Airport with a mean of 59.9°F had the warmest year since 2012 when the annual mean was 61.1°F. Glen Allen had only 33 days that the maximum temperature was $\geq 90^{\circ}\text{F}$ which was 11 days below the normal. The Airport had 42 days of $\geq 90^{\circ}\text{F}$ which equaled their normal. The maximum temperature at Glen Allen was $\leq 32^{\circ}\text{F}$ for the maximum temperature nine times and 6 of these were in February. Glen Allen had 72 days which the low temperature was $\leq 32^{\circ}\text{F}$. Glen Allen's lowest record was 63 days with the minimum temperature of $\leq 32^{\circ}\text{F}$ days in 2012. The Airport had 68 days that the low temperature was $\leq 32^{\circ}\text{F}$ which was 5.5 days less than their average. The lowest minimum temperature of 2015 at Glen Allen was -1°F on February 20th.

MONTH- The coldest month for 2015 was February with a mean temperature of 30.7°F. February and January also had the greatest number of days (25)

with the minimum temperature $\leq 32^{\circ}\text{F}$. February had the greatest negative departure from normal -10.3°F . March had the second greatest negative departure of -2.9°F . December had the greatest positive departure of $+11.2^{\circ}\text{F}$.

June had 12 days with the maximum temperature $\geq 90^{\circ}\text{F}$ which was the greatest number for any month. June had 14 nights that the temperature was 70°F or more. The warmest minimum temperature for the year was 76°F on July 8th. The number of days that the minimum temperature was $\geq 70^{\circ}\text{F}$ in 2015 was 39 days and the average is 46.3 at Glen Allen. December had the greatest positive departure of 11.2°F . November's maximum of 79°F set a new monthly high temperature for the month at Glen Allen.

DAY- The hottest temperature of 2015 in Glen Allen occurred on June 16th with a maximum temperature of 96°F . The average highest annual high temperature for Glen Allen is 99.7°F . The hottest day was June 16th with a daily mean of 84.9°F and the coldest day of the year occurred on February 20th with the daily mean temperature of 10.9°F . The lowest minimum temperature at Glen Allen was -1°F recorded on February 20, 2015.

RANGE- The greatest temperature range for the year at Glen Allen was 37.1°F , which occurred on March 7, 2015 with a high temperature of 53.2°F and a low temperature of 16.1°F . November 15, 2015 with a 66.4°F high and 29.5°F low temperature gave a temperature range of 36.9°F that was very similar.

The smallest temperature range for the year at Glen Allen was 3.2°F , which occurred on June 3, 2015 with a high temperature of 61.7°F and a low temperature of 58.5°F during a day with rain and drizzle.

PRECIPITATION

YEAR- The total number of days this year with measurable precipitation at Glen Allen was 136 days and the total precipitation for 2015 at Glen Allen was 50.93 inches. The average annual precipitation for Glen Allen is 45.15 inches or a positive departure 5.78 inches. The total precipitation for 2015 for the Airport was 49.21 inches. The average annual precipitation for the Richmond Airport is 43.60 inches or a positive departure of 5.61 inches.

MONTH- June had 16 days with measurable precipitation, which was the most of any of the months of 2015 and tied the most on record for June. There were 91 days with a daily precipitation amount ≤ 0.10 inches. There were 13 days with daily precipitation amount ≥ 1.00 inch. June was the wettest month with 8.35 inches and set a new record for the wettest June with a +4.96 inch departure. August with only 1.83 inches was the driest month of 2015 at Glen Allen and set a record for the driest August with a -2.91 inch departure.

CALENDAR- The most precipitation recorded in a day occurred on November 9, 2015 with 2.72 inches. The daily record for Glen Allen is 3.75 inches, which occurred on August 27, 2011 during Hurricane Irene.

24-HOUR PERIOD- The maximum precipitation in a 24 -hour period for 2015 was 3.07 inches on November 9-10, 2015. The record for Glen Allen is 3.83 inches that occurred on August 27-28, 2011 during Hurricane Irene.

HOOR- The greatest one-hour rainfall intensity during 2015 was 1.40 inches on July 4th that also set a new record rainfall intensity record for July. The record one-hour precipitation intensity for the Glen Allen weather station is 2.13 inches which was set on June 3, 2009.

FIVE-MINUTES- The greatest five-minute precipitation rate for 2015 was 0.37 inches, which fell on June 1, 2015 during a thunderstorm. The record for the most intense five-minute precipitation at Glen Allen was 0.67 inches, which occurred on August 10th 2013. Only June of 2015 set new monthly record five minute precipitation amounts.

DROUGHT- The driest part of 2015 was October 11th to October 24th with no measurable precipitation in 14 days. The 2nd longest d r y period with only 0.01 inches measurable precipitation was from July 14th to July 26th, a period of 12 days. Six months of the year were below average but they were not consecutive months like 2014 when Glen Allen had seven consecutive months with below average precipitation.

WIND

YEAR- The highest wind gust for the year was 41 mph from the SSW that occurred on March 31, 2015 at 1545 hours preceding a strong cold front. This was the highest wind since 2-21-2014 when a gust to 45 mph occurred.

MONTH- The windiest month was February with a wind run of 2,322.5 miles. This was the 6th windiest month ever recorded at the Glen Allen station.

DAY- The windiest day for 2015 was on October 4th with a wind run of 207.1 miles. This was also the highest daily wind run recorded at Glen Allen since November 24, 2014 when 209.9 miles was recorded. The second windiest day was October 2, 2015 when a wind run of 206.8 miles was recorded. The third windiest day was on October 3 when a wind run of 203.8 was recorded. This windy period in October was caused by a high pressure in Canada and a deep low in the SE United States. The record wind run for Glen Allen during a calendar day was 284.1 miles set during Hurricane Irene on August 27th 2011.

SNOW

YEAR- The 2015 Glen Allen total snowfall for the winter (2014-2015) was 14.7 inches. The total snow for the year was 14.7 inches and was the same as no measurable snow fell in December 2014. There were 10 days during 2015 that Glen Allen had measurable snowfall and most were very light except one snow on February 16, 2015 of 5.3 inches. There were 13 days (average is 10.4 days) in 2015 with more than a trace of snow on the ground at sunset, eleven of these occurring in February. The maximum snow on the ground at sunset during 2015 was 5.2 inches on February 17th. The Airport recorded 12.8 inches of snow for the year which was a departure of +2.5 inches.

MONTH- The greatest monthly snowfall total for Glen Allen in 2015 was 11.2 inches in the month of February which averages 4.0 inches.

STORM- The most snow to fall in any one storm was 6.2 inches that occurred on February 16th and 17th. The greatest snow in a calendar day in 2015 was 5.3 inches on February 16th.

BAROMETRIC PRESSURE

YEAR- The highest barometric pressure recorded for the year was 30.87 inches of mercury on February 28, 2015 which was a new record for the month of February and a new record for the Glen Allen Station; the previous record was 30.71 inches. The lowest barometric pressure for the year was 29.34 inches of mercury which was recorded on February 9th.

MONTH- November had the highest average barometric pressure of any month in 2015 which was 30.22 inches. This was the highest average pressure ever recorded at Glen Allen. The high pressure ridge over the eastern US in November made November the warmest on record here and the 13th warmest for Richmond since 1897. July had the lowest average barometer reading of any month at 29.95 inches making July the second wettest July on record at Glen Allen.

RELATIVE HUMIDITY

YEAR- February's average relative humidity of 54.4 percent was the lowest for any month of 2015. It was also the lowest ever recorded for Glen Allen because of the very cold dry polar air masses that affected the area in February. The highest relative humidity was recorded in December with an average relative humidity of 80.2 percent which is a new record for Glen Allen. The lowest daily relative humidity for the year was 18 percent recorded on January 18, 28 and February 7, and March 15, 18. February set a new record low relative humidity for the month and December set a new record high of 80.1% for the month. The summer of 2015 was the second most humid summer on record and was only 1.8 percent lower than the summer's highest relative humidity average.

SKY COVER

The cloudiness average value is based on (0 as clear), (1 as partly cloudy), and (2 as cloudy).

MONTH- March and December with (1.31) were the cloudiest months of 2015. May with (0.85) was the clearest and had the greatest departure of -0.37 units from average. The cloudiest season was the winter of 2014-2015 with the average of the three months being 1.13.

SEASON RECORDS

WINTER – DECEMBER 2014 to FEBRUARY 2015

The winter was -3.1°F cooler than average and 0.19 inches drier than normal. December 2014's mean temperature was +11.5°F warmer than normal. February had the lowest temperature on record at Glen Allen with -1°F below zero. It was not only the coldest February on record and the coldest month on record at Glen Allen and had a -10° mean temperature departure from average. February was the 5th coldest on record for Richmond since 1897. If December wasn't above average, this winter would have been the coldest winter as it missed this title by 0.4 °F. December 2014 had only a trace of snow and January had only 2 inches but February had 11.2 inches of snow of the 14.7 inch total for the winter season 2014-2015.

SPRING – MARCH to MAY 2015

Spring was only -0.1°F cooler than average and the first 90° day didn't come until May 18th. Spring 2015 was also the driest on record with a season total of only 8.92 inches precipitation. All 3 months of the season were below average in precipitation. The spring season had 1.5 inches of snow in March which was -0.8 inches below the average. March tied for the cloudiest month of 2015 and the cloudiest March on record. March also had the highest wind gust with a 41 mph gust that preceded a strong cold front.

SUMMER – JUNE to AUGUST 2015

Summer was -0.7° cooler than average and the wettest summer on Glen Allen's records. June had a new record amount of rainfall with a departure of almost 5 inches. July had the second greatest rainfall amount and only August was below average. The summer had 26 of the years thirty-three 90° days and had 10 less than the season average of 36 days. June had twelve of the 90°F days and the most for any month of 2015. This was the second most humid summer; only 2013 was more humid. This summer's average relative humidity had a +3.3% departure from average.

AUTUMN – SEPTEMBER to NOVEMBER 2015

The fall was +1.5° above average mean temperature and departure of +2.68 inches in precipitation with all 3 months above average. The season had 6 precipitation days more than average and was only the third fall season without a trace of snow. November was the 13th warmest in Richmond since 1897. October was the wettest on record with a departure of +1.40 inches and November was the second wettest November on record with a +1.07 inch departure.

Annual Records

2015 was the second wettest year on record at Glen Allen with a total of 50.93 inches, a +5.78 inch departure. The Richmond International Airport had 49.21 inches and was much drier than Glen Allen with a +5.61 inch departure based on the 30 year average of 43.60 inches and the wettest year since 2013 when 53.68 inches was recorded.

Glen Allen's 2015 annual temperature average was 59.1°F which was a +0.12°F departure from the seven-year average and the warmest year since 2012. The Richmond International Airport's 2015 annual temperature average was 59.9°F with a +1.0°F departure based on the 30 year average of 58.9°F.

Glen Allen 2015 had the fourth least snowfall on record with 14.7 inches. The seven year average is 17.0 inches or a departure of -2.3 inches for 2015. The most on record is 36.7 inches in 2010 and the least is 1.8 inches in 2011. There was no hail observed during 2015. The Richmond International Airport had 12.8 inches of snow in 2015 and its 30 year average is 10.3 inches for a departure of +2.5 inches.

2015 at Glen Allen with a wind run of 20,777 miles was the fifth windiest year in the past seven years. The average annual wind run is 19276.4 miles.

During the Year 2015 at Glen Allen there were a total of:

4 Days with Glaze	37 Days with Fog
4 Days with Sleet	166 Days with Dew
14 Days with Snow	42 Days with Frost
33 Days with Thunder	0 Days with Hail