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ATLANTIC COAST OBSERVER NETWORK, MD / DE / DC CHAPTER WITH DATA FROM NEARBY AREAS

FLOODING TROPICAL RAINS IN MARYLAND FROM REMNANTS OF TROPICAL STORM LEE

The following was taken from the report of **Jeff Stoudt of Laurel 2 E**: “*The extreme wetness of August intensified even further as two low pressure systems parked west of the area for stretches of several days each allowing plumes of tropical moisture to overwhelm the area which at times manifested as trains of heavy showers and thunderstorms. The frequent rains and soggy grounds helped to check temperature as late summer heat was absent, though early autumn coolness was limited also.*”

September began with near normal temperatures. The first four days were dry in Delaware and Southern Maryland but showers and thundershowers occurred west of the I-95 corridor. The greatest amounts fell in Western Maryland where **Greg Latta of Frostburg** recorded 1.31” and **Nate Mullins of LaVale** 0.81”.

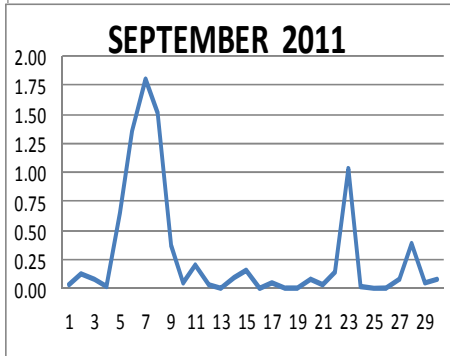
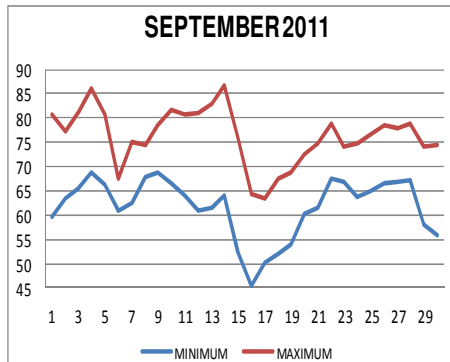
The day before Labor day, the 4th, saw temperatures rise into the mid to upper 80’s making it one of the two warmest days of the month. The other warmest day this month was the 14th.

The first of two extended periods with precipitation occurred from the 5th to the 11th. A cold front stalled in the region on the 5th. Areas of low pressure moved north bringing heavy rains on the 5th and 6th. Tropical Storm Lee very slowly made landfall in Louisiana on the 3rd and 4th and then became a remnant low in southeastern Louisiana on the 5th. The surface remnants slowly moved NNE along the stalled frontal system as the upper level low slowly moved up just west of the Appalachian Mountains. The upper level low reached the Ohio Valley on the 8th and then retrograded westwards to the mid Mississippi Valley by the 10th and dissipated by the 12th.

Prior to the arrival of Lee’s moisture upwards of 3 plus inches of rain fell in portions of Maryland and Delaware. Lee’s moisture reached the region on the

7th and continued on the 8th. The heaviest rains fell on the 7th. The greatest amounts fell in a north-south band west of the Chesapeake Bay northwards into the Susquehanna River Valley in Pennsyl-

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ACON MD/DE Network

Daily average temperatures and precipitation based on observation times, not calendar days.

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EXTREMES REPORTED BY

ACON OBSERVERS

MAXIMUM TEMPERATURE

LaVale	91
Baltimore 2 SE	91
Westminster 4 SSE	91
Glenmont 1 NNE	91
Forest Glen	91
Smithsburg 3 NE	90

MINIMUM TEMPERATURE

Davis 3 SE WV	33
Frostburg	36
LaVale	40
Manchester 1 SW	40
Smithsburg 1.5 SW	40
Smithsburg 3 NE	40

WARMEST AVG. TEMP.

Baltimore 2 SE	74.1
Ridge	72.5
DEOS Rehoboth Beach	70.7
Bryans Road 2 ESE	70.7

COLDEST AVG. TEMP.

Davis 3 SE WV	59.3
Frostburg	62.4
LaVale	65.4
Manchester 1 SW	65.9

MAXIMUM PRECIPITATION

Emmitsburg 2 SE	16.46
Reisterstown	12.53
Manchester 1 SW	12.20
Gaithersburg 2 WNW	12.10

MINIMUM PRECIPITATION

DEOS Rehoboth Beach	1.78
DEOS Harbeson 8 S DE	3.36
Hollywood 3 ENE	3.78
DEOS Georgetown 5 SW	4.46

OBSERVER COMMENTS FOR SEPTEMBER 2011

Gary Gallaher of Bear 2 SW, DE

Cloudy, humid month. Numerous days with rain, thunder, and dense fog. Record number of days (20) with \geq Trace of precipitation. Old record 18 set in 1977.

26.91" of rain the past three months (July - September) broke the old record for any three consecutive months just set month last month (24.45" June - August 2011).

Nate Mullins of LaVale

Second wettest September with 9.35". Wettest is 9.87" set in 1996. Temperatures were quite unremarkable, with little diurnal variations and a lack of extremes due to all of the clouds and rain. It was the 8th consecutive month with above normal temperatures, which were a result, once again, of well above normal minimums.

Jeff Stoudt of Laurel 2 E

During 17 years of not quite continuous records, only four calendar months reached or exceeded 10.00", two of them this August and September. September 11.88" fell very slightly short of the September 1999 mark of 11.97" for the wettest month.

Ray Muller of Reisterstown

Well above normal rainfall brought terrific flooding.

Marty Sharrow of Owings Mills

September featured copious amounts of rainfall. There were 16 days with measurable rainfall. On the 7th, 3.96" of rain fell, followed by another 1.62" on the 8th. Flooding was widespread, especially on area streams. Flooding along the Jones Falls in Stevenson, MD, 3 miles east of my house, resulted in a swift water rescue.

Joe Manfre of Baltimore 2SE

1st - Partly cloudy, warm, humid.

14th - Partly cloudy, hot, humid.

Ralph Hartsock of Westminster 4 SSE

6th to 8th - Heavy rain, widespread flooding, some historic.

16th - Cold morning, sunny.

Bobby Miller of Millers 4 NE

September was the second wettest month (11.64") behind July 2005 (12.69"). First half 10.84" with tropical downpours, second half only 0.80" with a lot of light rain, drizzle, and fog. 22 days with measurable is a new monthly record.

6th to 8th - I don't recall having 3 consecutive days with 1" plus precipitation let alone 3 in a row with 2" plus!

Marty Brumback of Bryans Road 2 ESE

5th to 9th - 9.05" of rain. CoCoRaHs rainfall amounts in Charles County ranged from 9.05" to 13.84" at Waldorf 2.2 E.

Eric Glass of Emmitsburg 2 SE

Seven days with over 1" of rain.

22nd & 23rd - Over 2" of rain each day.

Rich Giannola of Laurel JHU/APL

Maximum barometric pressure: 30.40" on the 17th

Minimum barometric pressure : 29.67" on the 30th

Rob Cohen of Potomac 4 N

18 days with measurable rain is one day short of the record set in May 2003. Mushroom crop is doing just fine.

8th - 4.52" of rain, heavy at times, occasional thunder.

Richard Holden of Clarksburg 2 ENE

Second wettest September (11.98") in 25 years of records. Wettest September is 12.38" set in 1999.

Stan Rossen of Glenmont 1 NNE

5th wettest September (8.43"). Wettest September is 1999 when 12.26" fell.

8th - Periods of heavy rain along with some thunder.

21st - Dense early morning fog visibility 1/8 mile

23rd - Dense early morning fog visibility 1/10 mile

Kevin Shaw of Gaithersburg 2 WNW

Many significant records for this month - an incredible month. It was my wettest September (12.10") in my 33 years of records and second wettest of all time only surpassed by 15.15" which fell in June 2006. Old September record was 11.54" in 1999. Average minimum temperature of 61.8° was the first time that the minimums averaged above 60° in September in 33 years of records.

5th to 9th - 10.22" of rain that fell was amazing.

Joe Terry of Forest Glen

5th to 9th - Frequent periods of rain and rather cool. Rain was generally not that heavy but was very persistent.

16th - 43° daily record low and also the lowest temperature so early in the season in 17 year station history.

21st - Dense AM fog still observed up to 10 AM.

John Zyla of Ridge

13th & 14th - Light AM fog.

25th - Partial clearing and higher humidity in afternoon.

Max Hutto of Smithsburg 1.5 SW

4th - Mostly cloudy, very warm, humid, PM thunderstorm.

30th - Mostly sunny, cooler, windy.

Greg Keefer of Hagerstown 1 E

14th - Line of thunderstorms moves through the area between 6-7 PM produced 0.19" if rain and wind gusts to 33 MPH. Storm splits just as it arrived near my station and one severe area went to NW and N and the other area went to the south.

Jim Vaughn of Smithsburg 2 NE

September was cooler and much wetter than normal although no new monthly records were set.

15th - This weather hobby is getting expensive! The 33 foot pole holding my weather equipment was struck by lightning. I lost my main weather station and both anemometers. Backup weather station was used till the 29th.

Compiled by Gary Gallaher, MD/DE ACON Data Collector and Report Writer, from data received from dedicated observers. Without your observations each month this report will not be possible.

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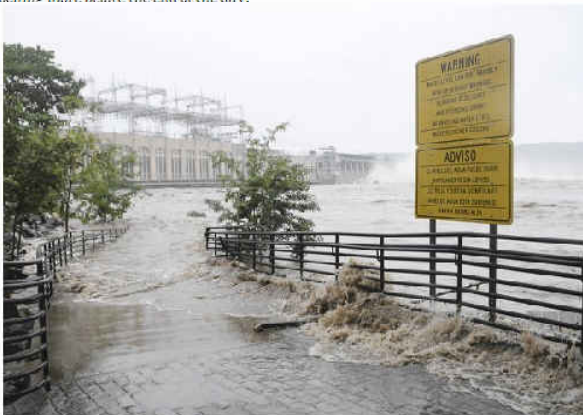


A Baltimore County worker clings to a telephone pole after escaping the disabled dump truck caught in a surge of floodwater. This photo looks south on Stevenson Road, just south of Greenspring Valley Road.
©Pikesville Patch, 9/08/2011 Credit Max Wolfthal

Photo above supplied by Marty Sharrow



Susquehanna floods Friday
(NICOLE MUNCHEL AEGIS STAFF, Patuxent Homestead / September 7, 2011)
The Conowingo Dam had 43 gates open as of 10:30 a.m. Friday morning and anticipated opening more before the end of the day.



Susquehanna floods Friday
(NICOLE MUNCHEL AEGIS STAFF, Patuxent Homestead / September 9, 2011)
Flood waters wash over a walkway at the bottom of the Conowingo Dam Friday morning.

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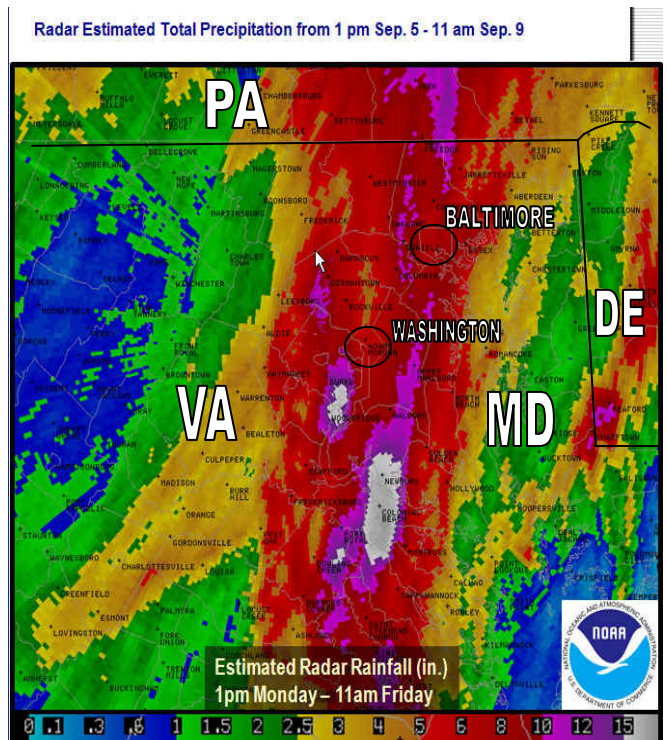
vania. The flooding that occurred rivaled flooding from Tropical Storm Agnes in 1972. Rainfall amounts for the period from the 5th to the 11th are included in the table on page 4.

Hurricane Katia moved northeast (~ 5+ degrees longitude east of the MD/DE coast) on the 8th. Katia had little effect on our weather.

Temperatures rose into the mid 80's to near 90 on the 14th. A strong cold front moved through the region on the 15th ushering in the coolest air of the month. This front ushered in the only minimums in the 40°s, 30°s in the mountains, this month. The last third of the month (20th to 30th) was wet as low pressure stalled west of the region. Heavy rains were not as widespread as it was during the 5th to the 11th. The wettest day was the 23rd when over 1 inch fell in scattered locations around the two state region. **Joe Manfre of Baltimore 2 SE** reported 3.01", **UofD DEOS at Townsend DE** 2.52", **Brian Smith of Oxon Hill** 2.29".

Flooding occurred in Frederick County as a result of the heavy rains of the 22nd and 23rd. **Eric Glass of Emmitsburg** reported 4.40". For rainfall amounts for the period from the 20th to the 30th see the table on page 4.

Doppler Estimated Rainfall map below was supplied by Marty Brumback. Editor added references and state borders.



The two pictures on the left are of the Conowingo Dam. Photo © www.theaegis.com Bel Air, MD newspaper

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The table below summarizes the precipitation that fell during the two extended wet periods, from 5th to the 12th and the 20th to the 30th. An additional column summarizes the precipitation that fell as a result of the remnants of Tropical Storm Lee on the 7th and 8th. The table is sorted on the 5th to 12th amounts. Note totals are for observation days, not calendar days.

<u>OBSERVER</u>	<u>STATION</u>	<u>5th-12th</u>	<u>7th & 8th</u>	<u>20th-30th</u>
MULLER	REISTERSTOWN	10.84	7.95	1.30
SHAW	GAITHERSBURG 2WNW	10.57	6.89	0.80
MILLER	MILLERS 4NE	9.88	6.97	0.75
STOUDT	LAUREL 2 E	9.32	6.68	2.42
NWS ASOS	BWI	9.22	4.84	3.81
HOLDEN	CLARKSBURG 2ENE	9.07	5.01	0.99
BRUMBACK	BRYANS ROAD 2 ESE	9.05	6.15	2.37
CLOSE	MANCHESTER 1SW	8.90	6.38	1.40
COHEN	POTOMAC 4N	8.87	5.90	0.92
GIANNOLA	LAUREL JHU / APL	8.35	5.21	2.29
SHARROW	OWINGS MILLS 2SE	8.34	5.58	1.14
MANFRE	BALTIMORE 2SE	8.12	4.40	3.35
GLASS	EMMITSBURG 2 SE	8.10	3.22	7.40
SMITH	OXON HILL	7.98	4.74	3.10
HANSON	PASADENA 2N	7.56	3.22	2.64
HARTSOCK	WESTMINSTER 4 SSE	7.42	4.58	1.21
NWS MD SCIENCE CTR	BALT INNER HARBOR	7.36	4.40	3.36
NWS ASOS	WASH NATIONAL	6.95	4.21	1.70
NWS ASOS	WASH DULLES	6.70	3.38	1.02
GIANNOLA	OLNEY 1 S	6.52	3.98	1.08
HUTTO	SMITHSBURG 1.5 SW	6.49	1.64	0.83
BERGER	NORBECK 1 SE	6.38	4.17	1.83
SCAFIDE	BETHESDA	6.28	4.66	1.61
MULLINS	LAVALE	6.18	0.79	1.33
ROSSEN	GLENMONT 1NNE	5.56	3.71	2.12
TERRY	FOREST GLEN	5.53	3.93	2.07
LATTA	FROSTBURG	5.10	3.22	0.60
KEEFER	HAGERSTOWN 1E	5.02	1.18	0.66
U OF DE DEOS	NEWARK AG FARM, DE	4.41	0.72	2.31
LESHER	DAVIS 3 SE WV	4.32	2.62	0.87
VAUGHN	SMITHSBURG 3 NE	4.26	1.23	1.46
NWS NEW CASTLE CO APT	WILMINGTON , DE	3.61	0.57	2.30
GALLAHER	BEAR 2 SW, DE	3.58	0.70	2.82
LEGATES	MIDDLETOWN 6 N, DE	3.43	0.54	2.58
U of D REC DEOS	TOWNSEND 4 W, DE	3.10	0.57	3.05
U of D REC DEOS	GEORGETOWN 5 SW, DE	2.97	2.61	1.23
GLEASON	HOLLYWOOD 3 ENE	2.57	0.92	1.19
ZYLA	RIDGE	2.40	0.67	2.26
NWS WICOMICO CO APT	SALISBURY	2.08	1.95	2.23
NWS SUSSEX CO APT	GEORGETOWN, DE	1.82	1.59	1.18
U OF D REC DEOS	HARBESON 8 S, DE	1.21	0.86	1.69
U OF D REC DEOS	REHOBOTH BEACH BWK, DE	0.33	0.06	0.94

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The following article was written by Eric Glass of Emmitsburg. It helps explain the stress his crops endured during the 2011 growing season.

Respiration and Transpiration – As I see it!

By: Eric E. Glass

My father told me a long, long time ago – “boy, we need warm nights to make our crops grow!” Maybe dad never heard of respiration!? Maybe he was thinking of tomatoes – as he once had a field of 9 acres of tomatoes.

I could never tell my dad he was wrong - so this article is for my late father.

Respiration (often mistaken with breathing) is defined as the transport of oxygen from the outside air to the cells within tissues, and the transport of carbon dioxide in the opposite direction.

Respiration does not depend on light, so it occurs at night as well as during the day.

High daytime and night time temperatures can put stress on corn plants that limit the yield. The sugars produced by the corn plant during photosynthesis are used by the plant for cell growth, but they are also consumed by the plant at night. The sugars produced during photosynthesis and subtract the sugars that are consumed during dark respiration; the sugars left over are used for grain filling.

If daytime temp exceed 86 degrees, photosynthesis starts to decline and fewer sugars are produced.

If night time temps are in the mid 70's or warmer, the plant consumes more of the sugars just to maintain cellular activity. This leaves fewer sugars for grain filling.

Bottom line, excessively high temps during the day and again at night can limit the plant's yield potential.

Hot temp with adequate moisture can result in good corn yields.

The worst scenario of course would be if the high day and night temps were accompanied by a lack of moisture.

Normally a day or two above 95 degrees is not a reason for concern as long as soil moisture levels are adequate; but several days above 90 degrees can cause yields to drop 1-% per day. A week or more of this type of weather and yields could decline more rapidly.

Thus, the common belief that high heat and humidity are ideal for corn growth are false. In reality, high temps, especially high night time temps, can reduce yields greatly by increasing respiration.

Recap; temps above 86F during the day reduce the amount of sugar produced. Night time temps above 70 degrees require higher rates of dark respiration. More sugars are consumed leaving less available for cell growth. The net result is less available sugar for building more complex molecules such as starches, which are ultimately stored in the grain.

High temperatures are not good for corn growth, especially during the critical grain fill period. High night time temps are particularly troublesome because the corn plant is using more of the manufactured sugars for cell maintenance and less for dry matter deposition.

This will lead to less than optimum yield and lower test weights.

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Respiration and Transpiration – As I see it! Continued from Page 5

So here we enter the problem with the 2011 growing season.

	Excessive Highs	Excessive Lows	Rain Fall
May	2	0	3.73"
June	6	2	1.08"
July	22	7	3.98"
August	7	4	4.30"
September	<u>0</u>	<u>0</u>	16.46"
	37	13	

May – No problem

June – Even though we had only a few highs and lows-the rainfall was inadequate.

July – 22 highs-(13 consecutive), 7 lows but a fair rainfall.

August – 7 highs, 4 lows, fair rainfall- but the damage was already done.

September – Zero highs and lows-but too much rain!

In summary, the low rainfall in June with the extremely hot days and nights in July did us in.

We have found that any time we have 7 or 8 consecutive highs or lows-our problem of low yields start to manifest.

June-with the low rainfall-also effected transpiration of the corn. Transpiration is the evaporation of water from plants. It occurs chiefly during photosynthesis.

Transpiration is not simply a hazard of plant life – It is the “engine” that pulls water up from the roots to:

- Supply photosynthesis (1%-2% of the total)
- Bring minerals from the roots for biosynthesis within the leaf

Cool the leaf

These environmental factors affect the rate of transpiration.

1. Light – plants transpire more rapidly in light than dark
2. Temperature – plants transpire more rapidly at higher temperatures because water evaporates more rapidly.
3. Humidity – when the surrounding air is dry, diffusion of water out of the leaf goes on more rapidly.
4. Wind – with no breeze, the air surrounding a leaf becomes increasingly humid thus reducing the rate of transpiration.
5. Soil water – a plant cannot continue to transpire rapidly if its water loss is not made up by replacement from the soil. Thus-with reduced transpiration-reduced photosynthesis as well.

It has been estimated that over the growing season, one acre of corn plants may transpire 400,000 gallons of water.

As we go to press, our harvest has not started. We sampled some ears of corn–counted the rows of kernels and then the number of kernels. This math gives us an estimate of yield – and this year it's off about 40% from normal.

Eric E. Glass is an Emmitsburg, MD farmer operating under Oakridge Farms, raising Red Angus cattle, Belted Galloway cattle and corn and soybean crops.

Eric is a Master Gardener of Gettysburg, Adams County of Penn State and a Weather Observer for Emmitsburg for NOAA.