



Southern



New England

July 2019

Our flag on July 4th, 1819, had 21 stars, after admitting Illinois to the nation nearly 7 months earlier. This flag only lasted a year as Alabama and Maine were admitted to the nation within the 12 months that followed.

We broke single month records with Hail Reports and Condition Monitoring Reports. Our National Weather Service customers were pleased with our Hail Reports and the Significant Weather Reports with the June 29-30 event.

Starting off with the Grand List, with several breaking through this week. Then on to Observer Tips, that started off slowly and finished strongly and with more details. More of a mention of Evapotranspiration (ET). We have had ET observers in our locale for years, but this year we have even more. So, this month and August, and maybe even September, we want to point out what it is that these ET observers are finding as their precipitation reports and their ET reports are used to compute Water Balance. Water Resource monitoring done by our observers.

Plenty more about your reports for the month of June.

Let's get into it.

The “Grand” List

Congratulations to all of these observers from our three states who have recently passed a milestone of 1000 Daily Reports.

1000 Daily Reports

CT-WN-10	South Windham 1.3 NNE
CT-FR-39	Stamford 4.2 S
CT-NL-19	Mystic 0.9 W
MA-BA-52	Truro 0.8 E
MA-WR-22	Fitchburg 2.0 NNE

Observer Tips

Extreme Rain In a given month, having one day with a daily precip amount of more than 1" is normal for our locale. But what if it is 2" or more? That can happen 2 or 3 times a year, and you have entered the realm of extreme rain.

Extreme rain is nothing more complicated than any other of the hundreds of rain events we experience each year. The measuring takes more time, stop before it gets to the top, use your ears, and becomes more like measuring the melted amount of the snowpack in the winter months.

Taking a during-the-day, or before-sunset, or before-darkness measurement, emptying the inner cylinder and refilling the inner cylinder, can help. Be certain your memory and arithmetic do not fail you and write down all measurements, add all measurements, for your normal daily report.

If you have a 2nd outer cylinder, changing the outer cylinder during the rain event can help. Again, keep track of the measurements from both outer cylinders for your normal daily report.

If you are one for weighing snow in the winter, you can weigh extreme rain as well. Just be certain that have the tare weights for the outer cylinder **AND** you **do not include the weight of** the inner cylinder and funnel.

For a good **estimation**, before you start the cycle of emptying and refilling the inner cylinder and writing measurements down and adding those measurements together, an equation for those of you that are mathematically inclined.

Estimation of the Total precipitation amount = (8.8 times the depth against the inner cylinder) + 1.0.

Example: Inner cylinder is up to the 1.00" mark. Outer cylinder is up to the 0.23" mark against the inner cylinder. **Estimation** of Total precipitation amount = $(8.8 * 0.23) + 1.0 = 3.02$ "

Credit to the [local Coordinator](#) from the Houston Texas area, where extreme rain is more commonplace.

Significant Weather Reports for those rainfall amounts where your **daily** total is 2" or more, please. Whenever you have 2", or more, **for the day**, please submit a Significant Weather Report for that real time alert, then submit your Daily Report at your regular time.

Comments, Observation Notes, a text narrative with your report, describing the rain event, clarifying and verifying your reported total, does give greater meaning and understanding to your reported value. Please type something to tell all of us that the amount is not submitted in error.



Training Animations. YouTube Videos Our website has changed slightly with the addition of this image that links to the [training animations](#) on [YouTube](#). Whether you are a seasoned observer or new to the crew, take some time this summer to

play and review the videos that CoCoRaHS has prepared. Most of these videos are less than 2 minutes. The longest is less than 6:30 minutes.

My favorite video is [this one](#), part of the promotional series of videos. Summertime is upon us. The anniversary of the Spring Creek Flood, that started this network, is approaching this month. Take some time to play and review any or many of these videos.

4" diameter rain gauges. Fresh from Nolan's message this week, a few more details about another manufacturer of 4" diameter rain gauges. This topic is more so for the new observers who recently bought a rain gauge to get started with us, rather than the more established observers who bought their gauges months and years ago.

Another manufacturer has entered the rain gauge marketplace, selling 4" diameter plastic rain gauges, called **Outback Blue**. Using amazon.com as a retail outlet, these Outback Blue gauges can generate interest and exposure in the marketplace. After some testing, it has been determined that the Outback Blue gauge **measures less** than our established Stratus

gauge, particularly with the inner cylinder. After our wet spring, how often have we all used our inner cylinders? Accuracy matters.

The Outback Blue gauge looks similar, so is the cost, but the inner cylinder accuracy is not. Please do not buy this Outback Blue rain gauge for CoCoRaHS purposes. Look for, buy, and use the **Stratus rain gauge instead**.

This network requires that everyone who participates use the same rain gauge, the Stratus 4" diameter clear plastic rain gauge.

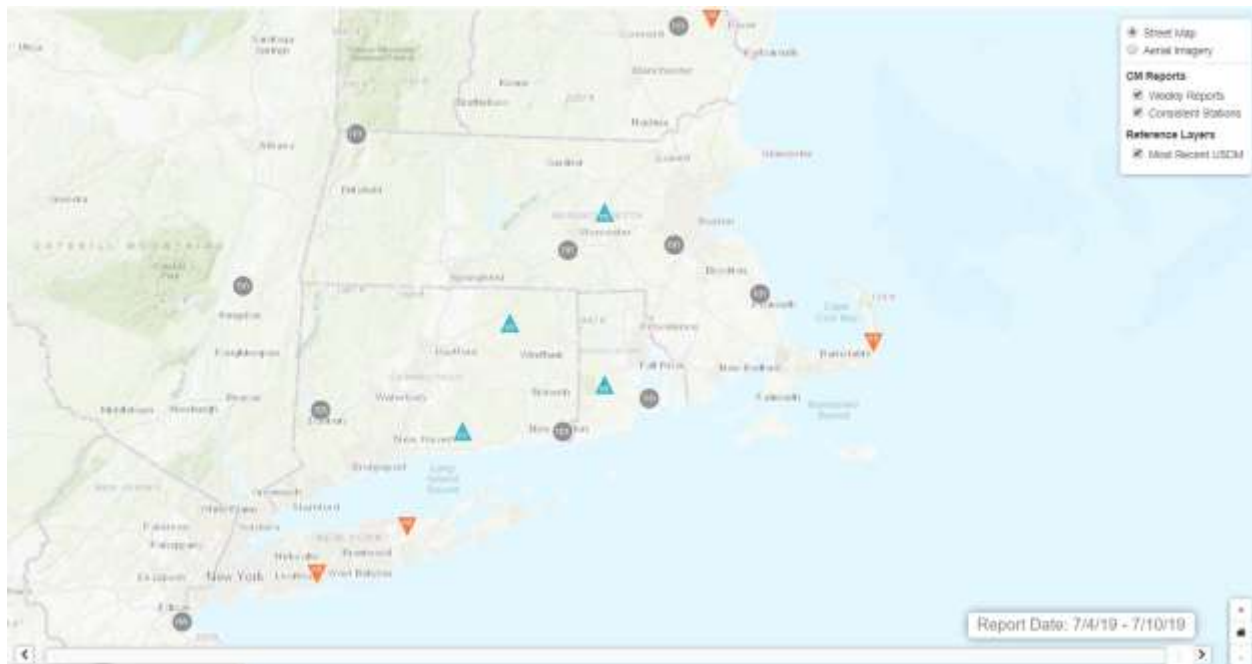
Any questions? Please ask a Coordinator.

Not for CoCoRaHS Use!



Condition Monitoring Reports: Great to see yet another single month record broken of these reports in June. The drying weather is upon us and the zeros are piling up. Keep up the reporting of Conditions in the months to come. One report a week is all that we seek. Develop a reputation of being a Consistent Station.

Our current map of Condition Monitoring Reports



Evapotranspiration (ET_0)

We are pleased with having 7 observers in our 3 states who are actively taking referential evapotranspiration (ET_0) measurements, in addition to their regular daily precipitation measurements.

Those observers are

CT-FR-29	Ridgefield 1.9 SSE
MA-BA-65	Chatham 0.2 SSE
MA-BR-23	Attleboro 0.9 ENE
MA-FR-17	Buckland 1.8 ESE
MA-MD-119	Watertown 1.1 W
MA-WR-23	Berlin 1.3 WSW
RI-WS-1	Hope Valley 3.7 S



EVAPOTRANSPIRATION GAUGE

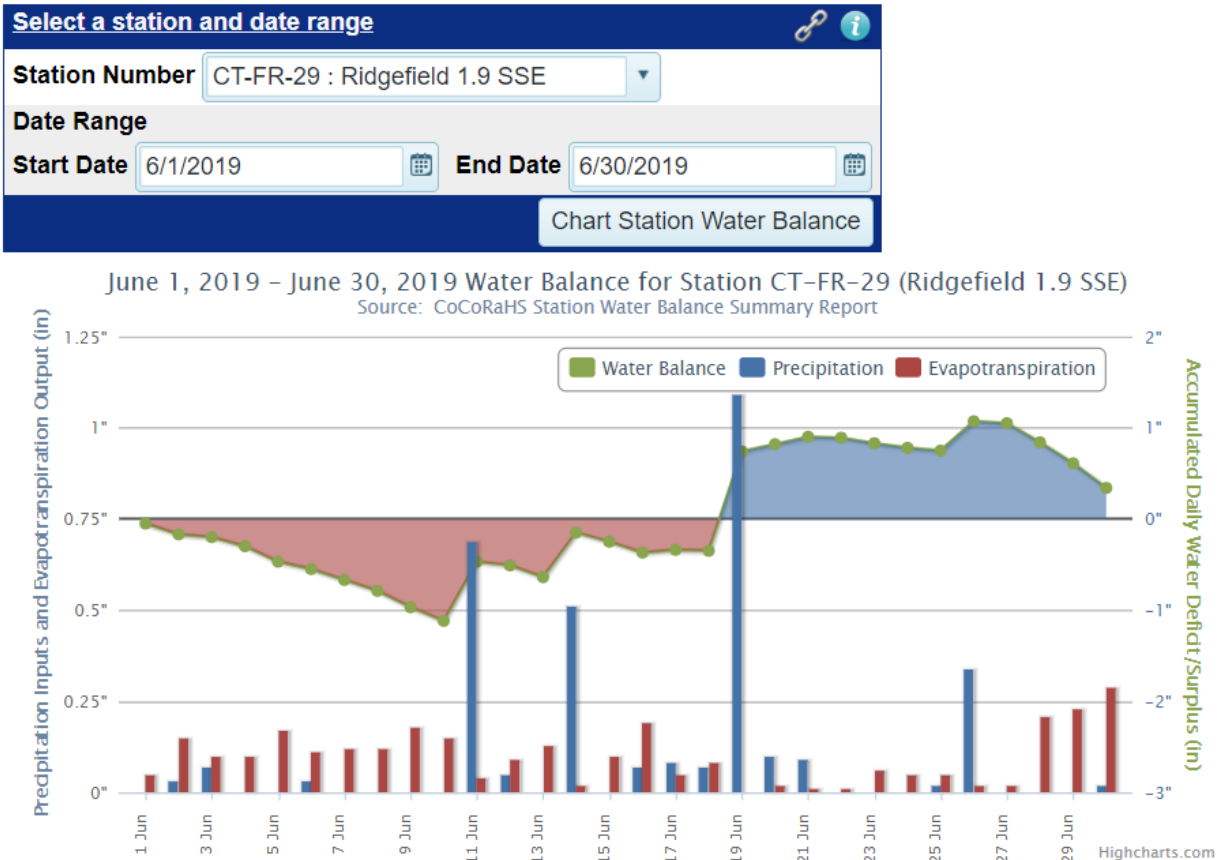
Evapotranspiration measures the amount of water lost, or the “up” side of the water cycle. Our 4” diameter rain gauges measure precipitation, the “down” side of the water cycle. Put the two together, over weeks and months during the growing season, and we can determine water balance. Are we getting more or less water from the sky than we are losing?

It may not have the same appeal as seeing dots on precipitation maps, but it does have nationwide interest. The Midwest Regional Climate Center has latched on to our reports and has generated [a map](#) of their own. Dots on these maps require morning reporting. When going beyond 1 day, no missing reports over a range of days

matters.

From the CoCoRaHS website, a look at some of our area's [Water Balance Charts](#) from the month of June. Difficulty viewing these charts from the website? Try a different web browser.

Station Water Balance Charts



Explanation: Blue and Red bars refer to the scale on the left. The green dots of Water Balance refer to the scale on the right.

The red bars are the ET calculation for the day. The observer reports a water level in the ET gauge each day. CoCoRaHS does the arithmetic subtracting one value from the other. A rough average ET loss for our locale is about 0.15"-0.20" per day. The blue bars are the reported precipitation amounts. We know all about reporting precipitation.

Commentary: See how important that 1"+ rainfall amount on June 19 is for keeping Water Balance near 0? Always look for the 1"+ daily rainfall amount *each month*.

Station Water Balance Charts

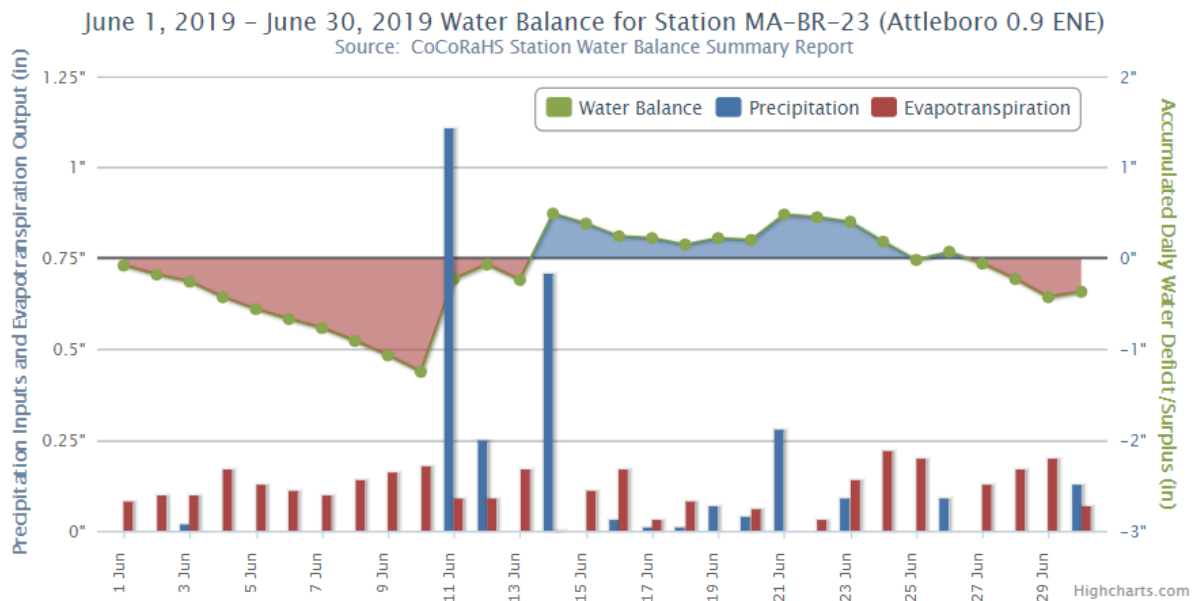
Select a station and date range

Station Number
MA-BR-23 : Attleboro 0.9 ENE

Date Range

Start Date
6/1/2019
End Date
6/30/2019

Chart Station Water Balance



Explanation: Because the distilled water in the ET gauge can freeze, our locale's season of ET reporting goes from May/June – September/October. There are over 100 observers throughout the entire network making ET reports, and in locales with a longer growing season.

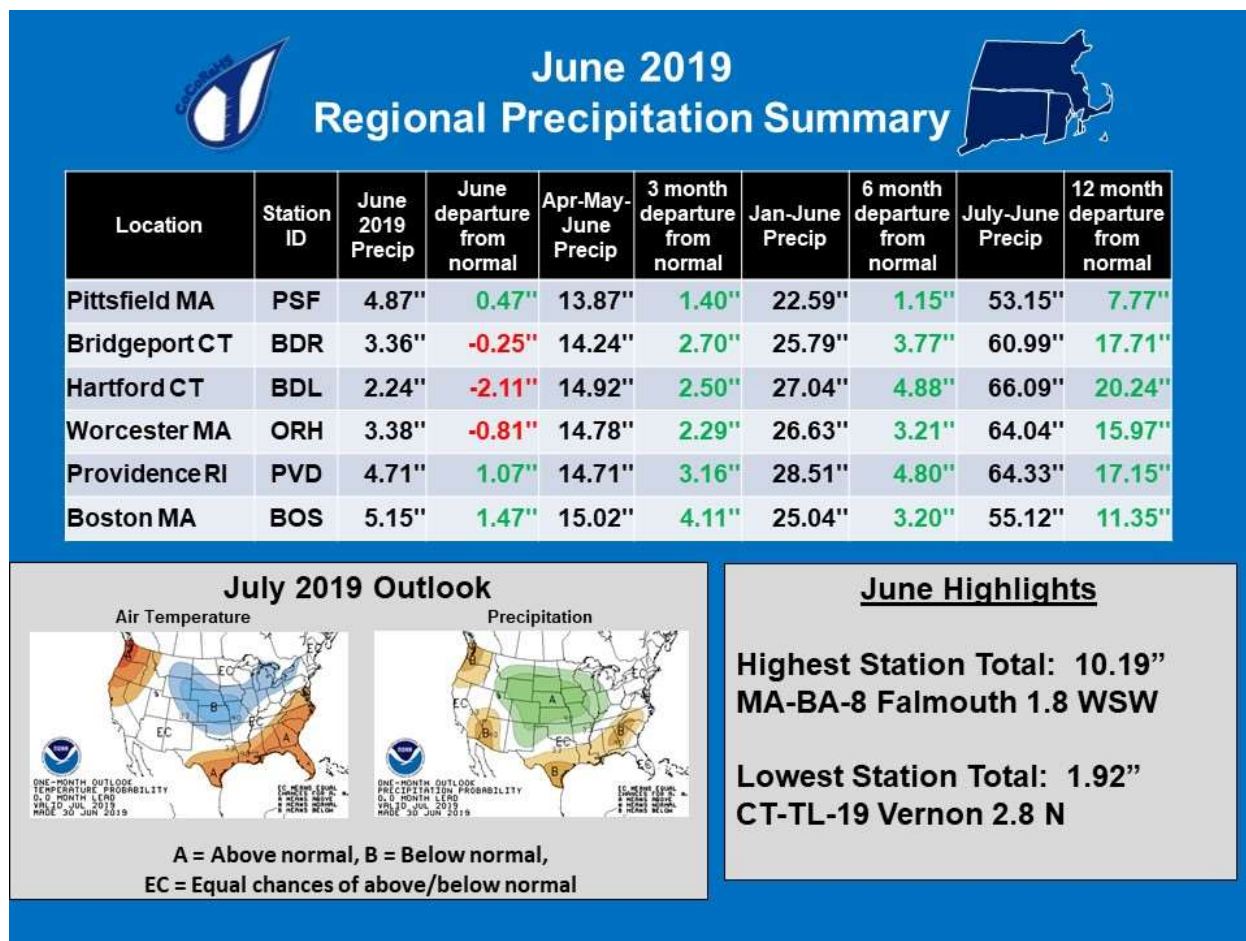
Commentary: See how important that 1"+ rainfall amount on June 11 is for keeping Water Balance near 0? Always look for the 1"+ daily rainfall amount *each month*.

Within next month's newsletter, we will show another set of station's Water Balance Charts. These charts, used during the growing season, can indicate drought, wet, or anything in between.

For now, we are about neutral with Water Balance. July is another month, yet to come.

Detail and Summary for June 2019

From the National Weather Service (NWS) Climate sites for June 2019.

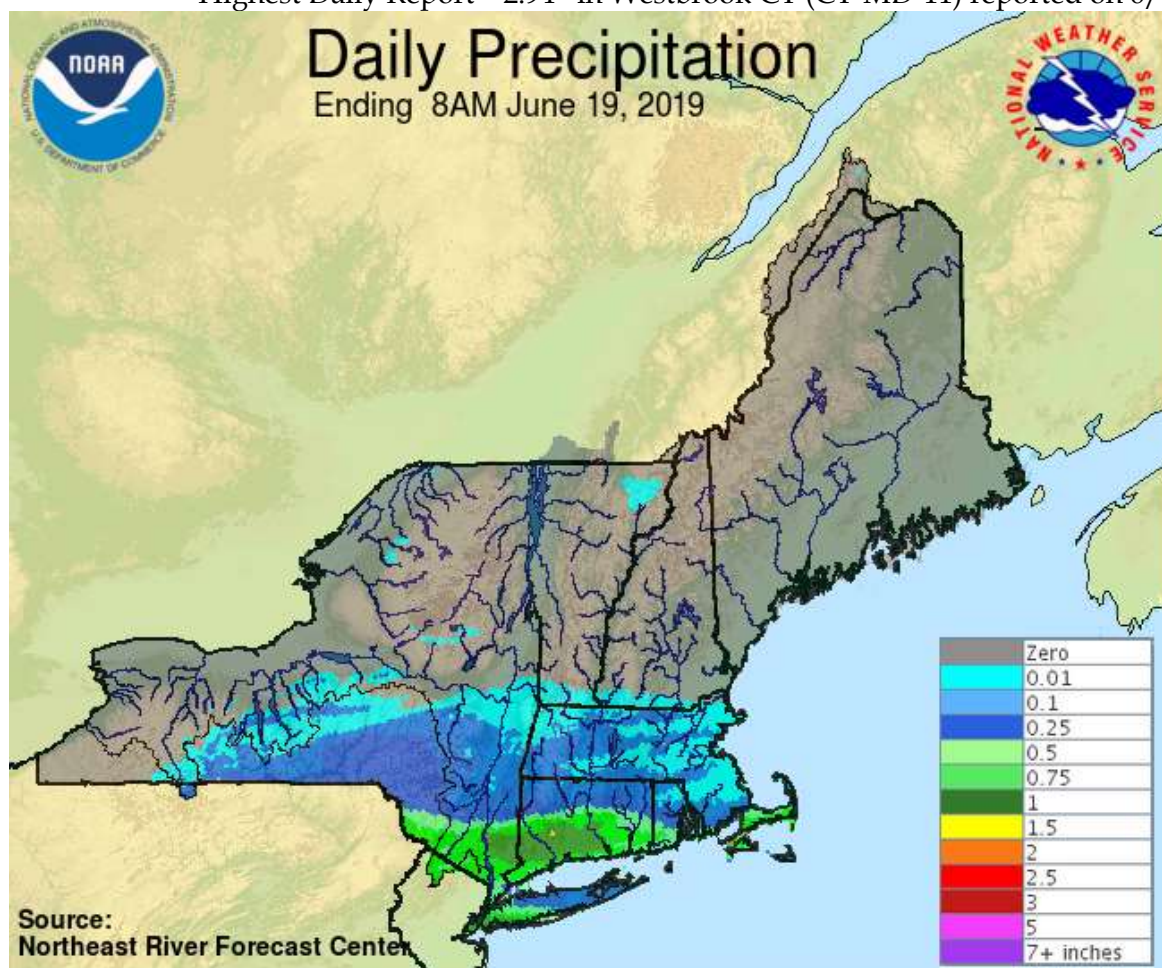


June started with rain in northern sections reported on the 3rd, and again on the 6th. Our first widespread rain was reported on the 11th and 12th, heaviest in Rhode Island. More on the 14th, with MA-BA-51 submitting Significant Weather Reports as the main part of the rain passed over the east end of Cape Cod. More rain in northern sections for the 17th. A larger event on the 19th noted by the map on the next page. 15 Hail Reports for the 22nd. Western Cape Cod heaviest on the 22nd, and along the shoreline of eastern CT and Rhode Island on the 26th. Thunderstorms and heavy downpours on the 29th and 30th, noted by your Significant Weather Reports and even more Hail Reports, totaling a record 22 for the month.

Take in the next section with appreciation of your efforts.

From your reports for June 2019

Observers reporting	397
Reported all 30 days	184
Completed by Multi-Day Reports	52
Missing 1 or 2 reports	61
Daily Reports	9873
Zero Reports	4529
Non-Zero Reports	5344
Daily Comments	1729
Multi-Day Reports	228
Condition Monitoring Reports	62
Significant Weather Reports	19
Hail Reports	22
Snowfall Reports	4665
Snow Depth Reports	2540
Highest Daily Report	2.94" in Westbrook CT (CT-MD-11) reported on 6/26



The transition from June 30 to July 1 caused much effort to see which stations have and have not a representative total. Over 18 stations excluded from this list below, primarily because of a Multi-Day Report that ended on July 1 or later and we all had rain to report on July 1.

Take in this lengthy list. Strive not to miss any days, not covered by a Daily Report or a Multi-Day Report.

Watershed	Watershed Name	Station Number	Station Name	Precip
01070004	Nashua			
0107000401	North Nashua River	MA-WR-44	Westminster 0.6 WSW	4.83"
0107000401	North Nashua River	MA-WR-8	Fitchburg 1.6 SSW	4.60"
0107000401	North Nashua River	MA-WR-22	Fitchburg 2.0 NNE	5.35"
0107000402	Headwaters Nashua River	MA-WR-56	Sterling 4.3 NW	5.19"
0107000402	Headwaters Nashua River	MA-MD-25	Ayer 0.1 SW	4.15"
0107000403	Squannacook River	MA-MD-47	West Townsend 0.5 W	4.58"
0107000403	Squannacook River	MA-MD-36	Townsend 2.6 S	5.27"
01070005	Concord			
0107000501	Sudbury River	MA-MD-156	Marlborough 2.8 ENE	3.82"
0107000501	Sudbury River	MA-MD-89	Sudbury 3.6 W	4.27"
0107000502	Concord River	MA-WR-28	Berlin 1.3 WSW	3.97"
0107000502	Concord River	MA-WR-42	Northborough 2.3 N	3.62"
0107000502	Concord River	MA-MD-115	Hudson 1.4 NW	3.78"
0107000502	Concord River	MA-MD-12	Acton 1.3 SW	4.35"
0107000502	Concord River	MA-MD-51	Maynard 0.7 ESE	4.33"
0107000502	Concord River	MA-MD-62	Chelmsford 1.2 E	5.10"
0107000502	Concord River	MA-MD-34	Chelmsford 2.0 ENE	5.69"
01070006	Merrimack River			
0107000611	Spicket River	MA-ES-38	Methuen 1.6 NNE	4.79"
0107000612	Stony Brook - Merrimack River	MA-MD-104	Littleton 2.8 NNW	4.26"
0107000612	Stony Brook - Merrimack River	MA-MD-105	Littleton 0.9 WSW	4.52"
0107000613	Shawsheen River	MA-MD-96	Lexington 0.3 NE	4.35"
0107000613	Shawsheen River	MA-ES-48	Andover 0.6 E	5.17"
0107000614	Powwow River - Merrimack River	MA-ES-20	Haverhill 0.7 N	5.14"
0107000614	Powwow River - Merrimack River	MA-ES-4	Groveland 0.5 WSW	5.25"
0107000614	Powwow River - Merrimack River	MA-ES-55	Groveland 0.8 S	5.46"
0107000614	Powwow River - Merrimack River	MA-ES-59	Amesbury 1.2 N	5.39"

01080201	Middle Connecticut			
0108020106	Manhan River - Connecticut River	MA-HS-2	Westhampton 1.8 SW	2.41"
0108020106	Manhan River - Connecticut River	MA-HS-8	Williamsburg 1.2 WSW	3.70"
0108020106	Manhan River - Connecticut River	MA-FR-12	Sunderland 1.3 SE	3.99"
0108020107	Batchelor Brook - Connecticut River	MA-HD-13	Springfield 4.1 W	2.15"
0108020107	Batchelor Brook - Connecticut River	MA-HD-23	Springfield 2.5 WNW	2.18"
01080202	Miller			
0108020201	Upper Millers River	NH-CH-20	Rindge 3.2 ESE	6.14"
01080203	Deerfield			
0108020303	North River	MA-FR-31	Colrain 3.7 WNW	5.05"
0108020303	North River	MA-FR-29	Colrain 0.8 WNW	4.32"
0108020305	Lower Deerfield River	MA-FR-22	Ashfield 1.4 NE	4.55"
0108020305	Lower Deerfield River	MA-FR-17	Buckland 1.8 ESE	4.64"
0108020305	Lower Deerfield River	MA-FR-13	Conway 2.9 NW	4.51"
0108020305	Lower Deerfield River	MA-FR-25	Conway 2.7 NW	4.57"
0108020305	Lower Deerfield River	MA-FR-10	Conway 0.9 SW	4.23"
01080204	Chicopee			
0108020402	Ware River	MA-WR-54	Barre 1.4 NNE	3.88"
0108020403	Quaboag River	MA-WR-75	Warren 2.4 WSW	3.17"
0108020404	Chicopee River	MA-HD-25	Ludlow 2.3 SW	2.18"
01080205	Lower Connecticut			
0108020501	Mill River - Connecticut River	CT-HR-82	Suffield 0.5 NNE	2.51"
0108020501	Mill River - Connecticut River	CT-HR-57	Suffield Depot 3.3 NNE	2.10"
0108020502	Scantic River	CT-TL-15	Central Somers 0.3 N	2.26"
0108020503	Park River	CT-HR-39	Farmington 1.6 SW	3.34"
0108020504	Hockanum River	CT-HR-52	Central Manchester 0.8 N	2.22"
0108020504	Hockanum River	CT-TL-19	Vernon 2.8 N	1.92"
0108020505	Roaring Brook - Connecticut River	CT-HR-6	Wethersfield 1.2 WSW	2.87"
0108020505	Roaring Brook - Connecticut River	CT-HR-45	Wethersfield 1.9 SSW	3.51"
0108020505	Roaring Brook - Connecticut River	CT-HR-68	Rocky Hill 1.3 E	3.13"
0108020505	Roaring Brook - Connecticut River	CT-HR-22	East Hartford 1.3 E	2.33"
0108020505	Roaring Brook - Connecticut River	CT-HR-7	Central Manchester 2.7 SW	2.58"
0108020506	Mattabesset River	CT-HR-15	Southington 3.0 E	3.56"
0108020506	Mattabesset River	CT-HR-80	Kensington 0.7 WSW	3.29"
0108020506	Mattabesset River	CT-HR-65	Newington 1.9 SSW	3.06"
0108020506	Mattabesset River	CT-MD-25	Middlefield 0.6 SE	4.14"
0108020507	Higganum Creek - Connecticut River	CT-MD-23	Higganum 0.7 N	4.09"
0108020507	Higganum Creek - Connecticut River	CT-MD-26	Higganum 0.8 NE	3.58"
0108020508	Salmon River	CT-TL-29	Hebron 1.6 SW	4.23"
01080206	Westfield			
0108020601	Headwaters Westfield River	MA-HS-14	Plainfield 2.4 ESE	4.79"

01080207	Farmington			
0108020701	Still River	CT-LT-15	Colebrook 1.0 NE	2.46"
0108020702	West Branch Farmington River	MA-BE-4	Becket 5.6 SSW	3.10"
0108020702	West Branch Farmington River	CT-LT-18	New Hartford Center 1.5 N	2.47"
0108020704	Headwaters Farmington River	CT-LT-9	New Hartford Center 3.2 SW	2.86"
0108020704	Headwaters Farmington River	CT-HR-70	Canton 1.5 W	2.72"
0108020704	Headwaters Farmington River	CT-HR-28	North Canton 0.8 SSW	2.46"
0108020705	Salmon Brook	CT-HR-60	North Granby 0.7 N	2.62"
0108020705	Salmon Brook	CT-HR-8	North Granby 1.3 ENE	2.64"
01090001	Charles			
0109000101	Plum Island Sound - Frontal Atlantic Ocean	MA-ES-46	Georgetown 1.3 ENE	5.51"
0109000101	Plum Island Sound - Frontal Atlantic Ocean	MA-ES-24	Newburyport 0.8 SW	5.14"
0109000102	Ipswich River	MA-MD-85	Wilmington 2.2 WNW	5.78"
0109000102	Ipswich River	MA-MD-125	Tewksbury 3.6 SSE	5.60"
0109000102	Ipswich River	MA-MD-45	Wilmington 1.5 NE	5.69"
0109000102	Ipswich River	MA-ES-58	Middleton 1.4 SSW	5.49"
0109000102	Ipswich River	MA-ES-12	Boxford 2.4 S	6.00"
0109000102	Ipswich River	MA-ES-2	Beverly 2.8 NW	4.55"
0109000103	Essex River - Frontal Atlantic Ocean	MA-ES-41	Danvers 0.8 ESE	4.19"
0109000104	Saugus River - Frontal Broad Sound	MA-MD-126	Melrose 0.5 NE	4.11"
0109000104	Saugus River - Frontal Broad Sound	MA-ES-8	Marblehead 0.8 SW	3.28"
0109000105	Mystic River - Frontal Boston Harbor	MA-MD-123	Lexington 1.3 SE	4.34"
0109000105	Mystic River - Frontal Boston Harbor	MA-MD-7	Winchester 0.7 SE	4.66"
0109000105	Mystic River - Frontal Boston Harbor	MA-MD-44	Medford 1.2 W	4.24"
0109000105	Mystic River - Frontal Boston Harbor	MA-MD-11	Cambridge 0.9 NNW	4.70"
0109000105	Mystic River - Frontal Boston Harbor	MA-SF-10	Chelsea 0.8 N	4.45"
0109000106	Upper Charles River	MA-MD-106	Holliston 2.4 W	3.88"
0109000106	Upper Charles River	MA-MD-55	Holliston 0.7 W	3.79"
0109000106	Upper Charles River	MA-NF-11	Millis 2.0 SW	5.03"
0109000106	Upper Charles River	MA-NF-50	Millis 1.4 ENE	3.54"
0109000107	Lower Charles River - Frontal Boston Harbor	MA-MD-120	Natick 1.9 NNE	4.60"
0109000107	Lower Charles River - Frontal Boston Harbor	MA-MD-71	Newton 2.2 NNW	3.99"
0109000108	Neponset River - Frontal Boston Harbor	MA-NF-1	Norwood 1.3 NW	3.18"
0109000109	Whitmans Pond - Frontal Boston Harbor	MA-NF-36	Weymouth 2.8 NW	4.06"
0109000109	Whitmans Pond - Frontal Boston Harbor	MA-NF-39	Weymouth 2.3 N	4.64"
0109000109	Whitmans Pond - Frontal Boston Harbor	MA-PL-36	Hingham 0.8 ESE	4.25"
01090002	Cape Cod			
0109000201	North River - Frontal Massachusetts Bay	MA-PL-5	Kingston 3.3 WNW	5.22"
0109000201	North River - Frontal Massachusetts Bay	MA-PL-47	Plymouth 1.1 NNW	5.28"
0109000202	Cape Cod	MA-BA-8	Falmouth 1.8 WSW	10.19"
0109000202	Cape Cod	MA-BA-2	Falmouth 3.1 NNW	6.54"

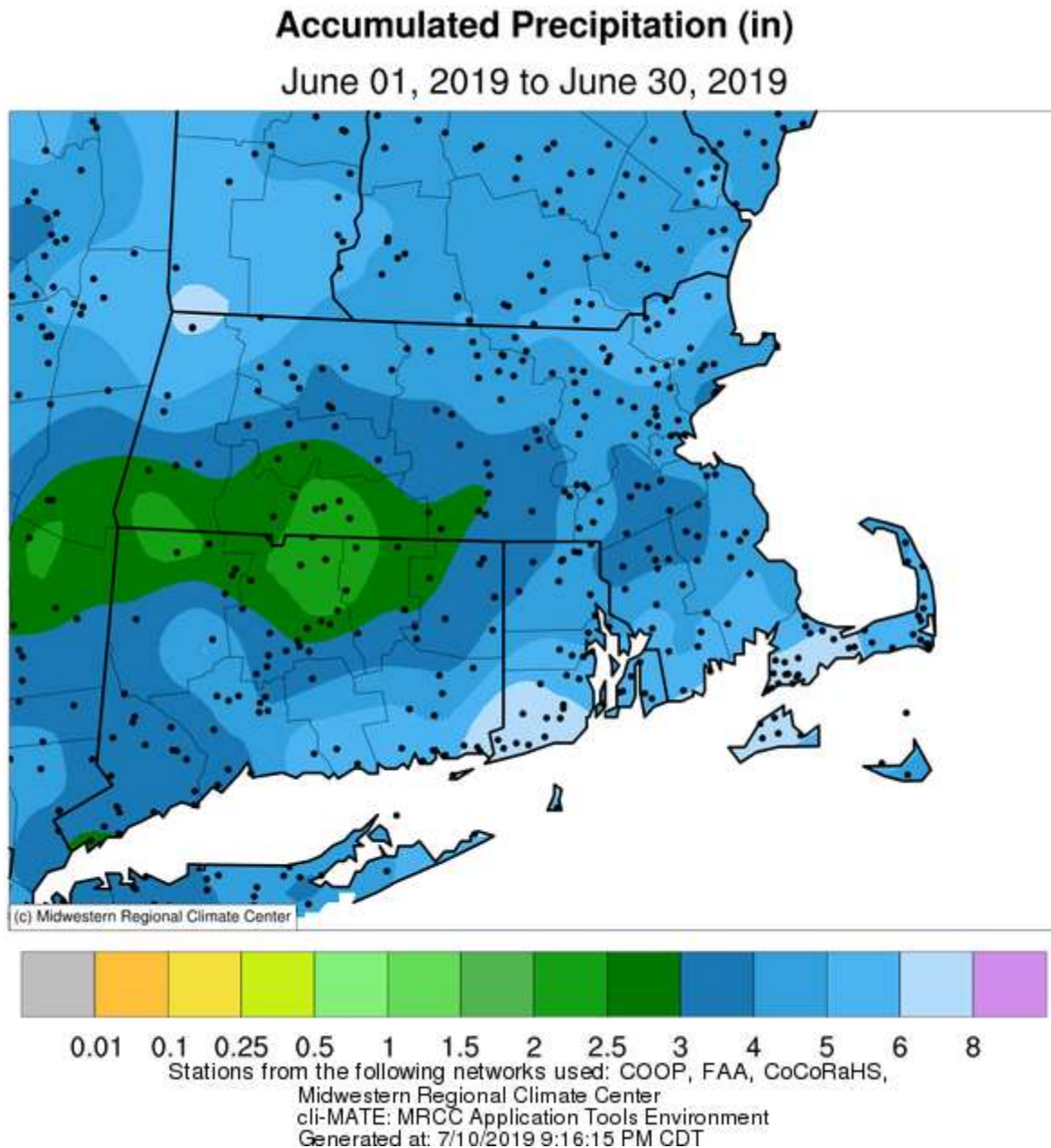
0109000202	Cape Cod	MA-BA-57	Falmouth 5.7 N	5.95"
0109000202	Cape Cod	MA-BA-13	Falmouth 0.6 NNW	6.49"
0109000202	Cape Cod	MA-BA-17	East Falmouth 1.2 WNW	6.26"
0109000202	Cape Cod	MA-BA-19	East Falmouth 0.7 NW	7.04"
0109000202	Cape Cod	MA-BA-3	Falmouth 3.0 E	6.24"
0109000202	Cape Cod	MA-BA-18	Waquoit 0.6 SSW	6.55"
0109000202	Cape Cod	MA-BA-45	Sandwich 0.9 NNE	4.46"
0109000202	Cape Cod	MA-BA-79	Mashpee 0.8 SSW	6.89"
0109000202	Cape Cod	MA-BA-78	Mashpee 4.6 S	6.38"
0109000202	Cape Cod	MA-BA-10	East Sandwich 2.3 SE	5.97"
0109000202	Cape Cod	MA-BA-59	Barnstable 3.6 W	7.27"
0109000202	Cape Cod	MA-BA-76	Barnstable 0.7 NE	6.12"
0109000202	Cape Cod	MA-BA-72	Yarmouth 2.0 S	5.86"
0109000202	Cape Cod	MA-BA-74	Yarmouth 3.4 SSE	5.41"
0109000202	Cape Cod	MA-BA-77	South Dennis 1.0 NW	6.04"
0109000202	Cape Cod	MA-BA-52	Truro 0.8 E	4.83"
0109000202	Cape Cod	MA-BA-27	Wellfleet 0.7 NW	4.55"
0109000202	Cape Cod	MA-BA-36	Harwich 2.6 ENE	5.20"
0109000202	Cape Cod	MA-BA-37	Orleans 0.8 W	4.72"
0109000202	Cape Cod	MA-BA-51	Orleans 3.0 S	6.37"
0109000202	Cape Cod	MA-BA-12	Orleans 1.1 E	5.87"
0109000202	Cape Cod	MA-BA-30	Eastham 0.6 SW	5.93"
0109000202	Cape Cod	MA-BA-43	Chatham 0.4 WSW	6.28"
0109000202	Cape Cod	MA-BA-65	Chatham 0.2 SSE	5.89"
0109000203	Mattapoisett River - Frontal Buzzards Bay	MA-PL-19	Rochester 1.2 NNW	5.24"
0109000203	Mattapoisett River - Frontal Buzzards Bay	MA-BA-64	Sandwich 1.5 SSE	5.11"
0109000204	Paskamanset River - Frontal Buzzards Bay	MA-BR-14	Dartmouth 2.5 SSW	6.06"
0109000204	Paskamanset River - Frontal Buzzards Bay	MA-BR-52	New Bedford 4.3 N	5.33"
0109000205	Sakonnet Point - Frontal Rhode Island Sound	RI-NW-5	Little Compton 1.7 NW	5.98"
0109000205	Sakonnet Point - Frontal Rhode Island Sound	RI-NW-17	Tiverton 4.4 SSE	5.44"
0109000205	Sakonnet Point - Frontal Rhode Island Sound	RI-NW-7	Little Compton 0.6 E	5.78"
0109000205	Sakonnet Point - Frontal Rhode Island Sound	MA-BR-37	Westport 0.9 ESE	5.20"
0109000206	Elizabeth Islands - Marthas Vineyard	MA-DK-5	West Tisbury 2.9 N	7.13"
0109000206	Elizabeth Islands - Marthas Vineyard	MA-DK-9	West Tisbury 0.4 S	6.83"
0109000206	Elizabeth Islands - Marthas Vineyard	MA-DK-2	Vineyard Haven 0.8 WSW	6.67"
0109000207	Nantucket Island	MA-NT-1	Nantucket 3.8 WNW	5.36"
01090003	Blackstone			
0109000301	Upper Blackstone River	MA-WR-43	Leicester 2.4 ESE	2.84"
0109000301	Upper Blackstone River	MA-WR-70	Grafton 1.5 W	3.06"
0109000302	Lower Blackstone River	RI-PR-50	Harrisville 1.2 SSE	4.04"
0109000302	Lower Blackstone River	RI-PR-28	North Smithfield 0.7 SE	3.70"

0109000302	Lower Blackstone River	MA-NF-26	Bellingham 2.4 S	4.54"
0109000302	Lower Blackstone River	RI-PR-59	Cumberland Hill 0.9 NW	4.35"
0109000302	Lower Blackstone River	RI-PR-55	Cumberland Hill 3.6 NNE	4.23"
01090004	Narragansett			
0109000401	Upper Taunton River	MA-BR-30	Taunton 3.9 N	4.05"
0109000401	Upper Taunton River	MA-NF-31	Stoughton 1.2 E	3.28"
0109000401	Upper Taunton River	MA-PL-22	East Bridgewater 0.3 WSW	3.58"
0109000401	Upper Taunton River	MA-PL-23	Pembroke 2.8 SW	4.30"
0109000403	Threemile River	MA-NF-19	Foxborough 1.8 SSW	3.71"
0109000403	Threemile River	MA-BR-55	NWS Boston/Norton 2.5 ESE	3.71"
0109000403	Threemile River	MA-BR-9	Taunton 2.6 NW	3.83"
0109000404	Ten Mile River	MA-BR-23	Attleboro 0.9 ENE	2.84"
0109000405	Wonnasquatucket River-Moshassuck River	RI-PR-33	Greenville 0.7 NNW	4.28"
0109000405	Woonasquatucket River-Moshassuck River	RI-PR-51	North Smithfield 0.6 S	3.87"
0109000405	Woonasquatucket River-Moshassuck River	RI-PR-53	Providence 1.7 N	4.74"
0109000406	Pawtuxet River	RI-PR-20	West Glocester 3.4 SE	4.12"
0109000406	Pawtuxet River	RI-KN-21	Coventry 1.9 NE	5.87"
0109000406	Pawtuxet River	RI-PR-57	Cranston 1.2 SSE	4.61"
0109000406	Pawtuxet River	RI-PR-17	Cranston 4.1 E	4.17"
0109000406	Pawtuxet River	RI-PR-44	Cranston 4.2 ENE	4.01"
0109000407	Palmer River	MA-BR-2	Rehoboth 2.1 N	3.98"
0109000408	Lower Taunton River - Frontal Mount Hope Bay	MA-BR-3	Norton 1.8 NNE	3.30"
0109000408	Lower Taunton River - Frontal Mount Hope Bay	MA-BR-16	Somerset 0.4 SSE	5.42"
0109000408	Lower Taunton River - Frontal Mount Hope Bay	MA-BR-58	Dighton 3.3 NNW	3.95"
0109000408	Lower Taunton River - Frontal Mount Hope Bay	MA-BR-8	Dighton 1.1 WSW	5.53"
0109000409	Narragansett Bay	RI-KN-17	East Greenwich 1.2 NNE	4.91"
0109000409	Narragansett Bay	RI-WS-54	North Kingstown 2.7 WSW	6.14"
0109000409	Narragansett Bay	RI-WS-44	North Kingston 1.5 SSW	6.44"
0109000409	Narragansett Bay	RI-KN-2	East Greenwich 2.3 ESE	5.60"
0109000409	Narragansett Bay	RI-KN-23	Warwick 3.2 NNE	4.14"
0109000409	Narragansett Bay	RI-NW-18	Jamestown 0.3 SSE	6.10"
0109000409	Narragansett Bay	RI-BR-5	Barrington 1.3 WNW	4.17"
0109000409	Narragansett Bay	RI-NW-16	Portsmouth 1.3 S	5.75"
0109000409	Narragansett Bay	RI-NW-20	Tiverton 1.0 SSW	4.87"
01090005	Pawcatuck-Wood			
0109000501	Wood River	RI-WS-1	Hope Valley 3.7 S	7.64"
0109000502	Upper Pawcatuck River	RI-WS-51	Richmond 2.4 SSE	6.20"
0109000502	Upper Pawcatuck River	RI-WS-42	Richmond 4.6 NNE	6.26"
0109000502	Upper Pawcatuck River	RI-WS-37	Kingston 2.4 SW	6.40"
0109000503	Lower Pawcatuck River	CT-NL-40	Pawcatuck 1.8 SSE	7.39"
0109000503	Lower Pawcatuck River	RI-WS-30	Westerly 2.4 NNW	7.35"

0109000503	Lower Pawcatuck River	RI-WS-47	Westerly 0.8 WNW	7.93"
0109000504	Frontal Block Island Sound	RI-WS-36	Charlestown 3.0 WSW	7.71"
01100001	Quinebaug			
0110000102	French River	MA-WR-68	Oxford 0.9 SSW	3.21"
0110000103	Fivemile River	CT-WN-4	East Killingly 1.3 SW	3.95"
0110000105	Moosup River	CT-WN-8	Moosup 1.7 NE	3.93"
0110000106	Pachaug River	CT-NL-21	Griswold 0.9 N	3.76"
01100002	Shetucket			
0110000201	Willimantic River	CT-TL-18	Hebron 5.3 NW	3.06"
0110000201	Willimantic River	CT-TL-28	South Coventry 1.2 NNW	2.75"
0110000201	Willimantic River	CT-TL-2	Staffordville 0.4 NNW	2.57"
0110000202	Natchaug River	CT-TL-27	Willington 2.7 SE	2.67"
0110000202	Natchaug River	CT-TL-30	Mansfield Center 2.7 NE	3.33"
0110000203	Shetucket River	CT-NL-10	Norwich 2.5 NNE	4.18"
01100003	Thames			
0110000302	Thames River-Frontal New London Harbor	CT-NL-5	Oakdale 2.6 WNW	5.37"
0110000302	Thames River-Frontal New London Harbor	CT-NL-6	New London 1.0 NNW	5.78"
0110000303	Mystic River - Frontal Fishers Island Sound	CT-NL-38	Old Lyme 3.4 ESE	5.23"
0110000303	Mystic River - Frontal Fishers Island Sound	CT-NL-29	East Lyme 0.5 SW	5.52"
0110000303	Mystic River - Frontal Fishers Island Sound	CT-NL-22	Central Waterford 2.7 SSW	5.36"
0110000303	Mystic River - Frontal Fishers Island Sound	CT-NL-24	Stonington 1.4 NNW	6.32"
0110000303	Mystic River - Frontal Fishers Island Sound	CT-NL-18	Stonington 0.5 NNE	6.70"
01100004	Quinnipiac			
0110000401	Quinnipiac River	CT-NH-14	Prospect 1.9 ENE	5.68"
0110000401	Quinnipiac River	CT-HR-55	Southington 1.7 WNW	3.70"
0110000401	Quinnipiac River	CT-HR-23	Southington 0.9 SSE	3.68"
0110000401	Quinnipiac River	CT-HR-76	Southington 1.0 ENE	3.61"
0110000401	Quinnipiac River	CT-NH-44	Wallingford Center 1.9 WNW	4.19"
0110000401	Quinnipiac River	CT-NH-43	Wallingford Center 3.3 NNW	4.68"
0110000401	Quinnipiac River	CT-NH-42	Wallingford Center 1.1 N	4.14"
0110000402	Hammonasset River - Frontal Long Island Sound	CT-NH-50	Madison Center 4.1 N	6.11"
0110000402	Hammonasset River - Frontal Long Island Sound	CT-MD-21	Killingworth 2.6 ESE	5.96"
0110000402	Hammonasset River - Frontal Long Island Sound	CT-MD-27	Clinton 3.7 N	5.95"
0110000402	Hammonasset River - Frontal Long Island Sound	CT-MD-11	Westbrook Center 1.5 NE	6.24"
0110000403	Mill River - Frontal Long Island Sound	CT-NH-16	Milford 1.8 E	3.13"
0110000403	Mill River - Frontal Long Island Sound	CT-NH-57	New Haven 2.9 NNW	4.99"
01100005	Housatonic			
0110000501	Headwaters Housatonic River	MA-BE-11	Great Barrington 3.0 N	2.52"
0110000501	Headwaters Housatonic River	MA-BE-10	Pittsfield 2.0 NNW	5.49"
0110000501	Headwaters Housatonic River	MA-BE-20	Lee 3.7 SE	2.54"
0110000504	Macedonia Brook - Housatonic River	CT-LT-20	Warren 2.4 WNW	3.13"

0110000506	Candlewood Lake-Housatonic River	CT-LT-22	New Milford 5.3 SSW	3.86"
0110000508	Still River - Housatonic River	CT-FR-41	Bethel 3.5 NNE	2.95"
0110000508	Still River - Housatonic River	CT-FR-9	Brookfield 3.3 SSE	3.25"
0110000512	Outlet Naugatuck River	CT-NH-47	Seymour 1.5 NE	3.92"
0110000512	Outlet Naugatuck River	CT-NH-45	Naugatuck 1.7 NNE	3.81"
0110000512	Outlet Naugatuck River	CT-NH-22	Prospect 0.5 SW	3.96"
0110000513	Housatonic River - Frontal Long Island Sound	CT-FR-42	Monroe 0.1 SE	3.48"
0110000513	Housatonic River - Frontal Long Island Sound	CT-FR-23	Shelton 1.3 W	4.05"
0110000513	Housatonic River - Frontal Long Island Sound	CT-FR-46	Stratford 0.2 ESE	3.19"
01100006	Saugatuck			
0110000601	Saugatuck River - Frontal Long Island Sound	CT-FR-58	Ridgefield 3.6 N	3.41"
0110000601	Saugatuck River - Frontal Long Island Sound	CT-FR-31	Newtown 4.6 SSW	3.65"
0110000602	Norwalk River - Frontal Norwalk Harbor	CT-FR-59	New Canaan 3.8 N	3.55"
0110000602	Norwalk River - Frontal Norwalk Harbor	CT-FR-29	Ridgefield 1.9 SSE	3.26"
0110000602	Norwalk River - Frontal Norwalk Harbor	CT-FR-3	New Canaan 1.9 ENE	3.77"
0110000602	Norwalk River - Frontal Norwalk Harbor	CT-FR-25	Norwalk 2.9 NNW	3.80"
0110000603	Pequonnock River - Frontal Long Island Sound	CT-FR-60	Fairfield 1.5 NE	3.79"
0110000603	Pequonnock River - Frontal Long Island Sound	CT-FR-57	Trumbull 0.9 W	2.43"
0110000603	Pequonnock River - Frontal Long Island Sound	CT-FR-32	Monroe 0.8 W	3.86"
0110000603	Pequonnock River - Frontal Long Island Sound	CT-FR-26	Stratford 0.9 W	3.19"
0110000604	Mianus River-Rippowam River	CT-FR-39	Stamford 4.2 S	2.35"
0110000604	Mianus River-Rippowam River	CT-FR-50	Darien 2.8 NW	3.27"
02020003	Hudson-Hoosic			
0202000306	Upper Hoosic River	MA-BE-18	North Adams 3.0 WNW	6.80"
02020006	Middle Hudson			
0202000603	Wynants Kill - Hudson River	NY-AB-21	NWS Albany	5.09"
02030203	Long Island Sound			
0203020300	Long Island Sound	NY-SF-114	Fishers Island 0.5 NE	5.29"

A strange looking map with that slice of green, indicating less than 3" along the CT/MA border. Above normal monthly totals on either side of that line.



“We do not live at the airport”

Do compare your monthly total to one of these airports, closest to you.

Our network does not use automated gauges. And we do not live at the airport!

Location	Station ID	June 2019 Precip	June departure from normal	Apr-May-June Precip	3 month departure from normal	Jan-June Precip	6 month departure from normal	Jul-June Precip	12 month departure from normal
White Plains NY	HPN	2.77"	-1.48"	14.47"	1.70"	24.26"	0.13"	62.60"	13.25"
Danbury CT	DXR	3.66"	-0.82"	14.44"	1.28"	23.70"	0.69"	57.96"	8.09"
New Haven CT	HVN	3.53"	-0.49"	15.57"	2.94"	24.56"	1.97"	56.20"	9.09"
Meriden CT	MMK	2.80"	-1.22"	13.94"	1.31"	26.45"	3.86"	61.43"	14.32"
Hartford CT	HFD	2.49"	-1.50"	13.63"	1.87"	23.67"	3.18"	58.24"	14.64"
Willimantic CT	IJD	2.63"	-1.42"	12.74"	0.27"	23.03"	-0.49"	56.18"	7.76"
New London CT	GON	5.41"	1.30"	16.16"	3.79"	28.17"	5.89"	50.31"	3.82"
Westerly RI	WST	7.86"	4.18"	19.02"	6.91"	31.78"	8.37"	62.42"	15.03"
Newport RI	UUU	6.45"	2.63"	15.27"	3.38"	27.48"	4.35"	58.42"	12.09"
New Bedford MA	EWB	3.46"	-0.49"	8.04"	-4.10"	19.25"	-5.39"	48.29"	-0.07"
Hyannis MA	HYA	5.74"	2.19"	14.07"	2.51"	26.32"	1.51"	51.01"	3.32"
Nantucket MA	ACK	4.76"	1.27"	14.70"	4.05"	24.99"	3.45"	45.08"	0.66"
Marthas Vineyard MA	MVY	5.98"	2.66"	14.24"	3.77"	25.57"	3.43"	51.38"	6.22"
Taunton MA	TAN	4.28"	0.65"	14.08"	2.25"	24.94"	-0.23"	59.15"	9.41"
Plymouth MA	PYM	5.50"	1.55"	14.83"	2.55"	26.99"	1.73"	59.81"	10.66"
Norwood MA	OWD	2.23"	-1.72"	13.67"	1.85"	22.89"	-0.19"	53.40"	6.34"
Bedford MA	BED	3.77"	-0.15"	12.48"	0.62"	20.91"	-1.44"	49.46"	3.75"
Beverly MA	BVY	4.73"	1.09"	14.01"	2.20"	23.79"	1.06"	56.05"	9.87"
Lawrence MA	LWM	5.74"	1.67"	11.54"	-0.11"	17.01"	-3.48"	42.07"	-1.09"
Fitchburg MA	FIT	5.56"	1.31"	15.39"	2.96"	23.72"	1.09"	62.19"	15.05"
Orange MA	ORE	4.36"	-0.07"	13.98"	2.39"	21.93"	2.71"	59.63"	17.08"
Westfield MA	BAF	2.76"	-1.59"	13.45"	0.29"	22.18"	-0.25"	61.63"	13.24"
North Adams MA	AQW	6.06"	1.10"	12.51"	-0.39"	18.47"	-1.63"	47.77"	1.16"

Rulers of the Snow

A listing of all observers that reported precip, snow fall, and snow depth for all 30 daily reports this month. No NA's.

We are the Rulers of the Snow. 52 stations for the month of June. Make a snow fall and snow depth measurement, if you can safely do so, ***all year round***.

Station	Name	June 2019 Snowfall	Station	Name	June 2019 Snowfall
MA-BE-4	Becket 5.6 SSW	0.0"	MA-WR-54	Barre 1.4 NNE	0.0"
MA-BE-18	North Adams 3.0 WNW	0.0"	CT-NL-40	Pawcatuck 1.8 SSE	0.0"
CT-LT-15	Colebrook 1.0 NE	0.0"	CT-NL-21	Griswold 0.9 N	0.0"
CT-FR-9	Brookfield 3.3 SSE	0.0"	CT-NL-29	East Lyme 0.5 SW	0.0"
CT-FR-23	Shelton 1.3 W	0.0"	RI-PR-28	North Smithfield 0.7 SE	0.0"
CT-FR-29	Ridgefield 1.9 SSE	0.0"	RI-WS-42	Richmond 4.6 NNE	0.0"
CT-FR-3	New Canaan 1.9 ENE	0.0"	RI-WS-37	Kingston 2.4 SW	0.0"
CT-FR-25	Norwalk 2.9 NNW	0.0"	RI-NW-7	Little Compton 0.6 E	0.0"
CT-NH-43	Wallingford Center 3.3 NNW	0.0"	RI-NW-18	Jamestown 0.3 SSE	0.0"
CT-NH-45	Naugatuck 1.7 NNE	0.0"	MA-BR-30	Taunton 3.9 N	0.0"
MA-FR-31	Colrain 3.7 WNW	0.0"	MA-BR-55	NWS Boston/Norton 2.5 ESE	0.0"
MA-FR-17	Buckland 1.8 ESE	0.0"	MA-BR-23	Attleboro 0.9 ENE	0.0"
MA-FR-13	Conway 2.9 NW	0.0"	MA-MD-156	Marlborough 2.8 ENE	0.0"
MA-FR-10	Conway 0.9 SW	0.0"	MA-MD-12	Acton 1.3 SW	0.0"
MA-HD-25	Ludlow 2.3 SW	0.0"	MA-MD-51	Maynard 0.7 ESE	0.0"
CT-HR-57	Suffield Depot 3.3 NNE	0.0"	MA-MD-104	Littleton 2.8 NNW	0.0"
CT-HR-22	East Hartford 1.3 E	0.0"	MA-MD-125	Tewksbury 3.6 SSE	0.0"
CT-HR-8	North Granby 1.3 ENE	0.0"	MA-MD-7	Winchester 0.7 SE	0.0"
CT-TL-18	Hebron 5.3 NW	0.0"	MA-ES-48	Andover 0.6 E	0.0"
CT-TL-2	Staffordville 0.4 NNW	0.0"	MA-ES-12	Boxford 2.4 S	0.0"
CT-TL-27	Willington 2.7 SE	0.0"	MA-ES-41	Danvers 0.8 ESE	0.0"
CT-MD-23	Higginum 0.7 N	0.0"	MA-NF-11	Millis 2.0 SW	0.0"
CT-MD-21	Killingworth 2.6 ESE	0.0"	MA-NF-1	Norwood 1.3 NW	0.0"
MA-WR-44	Westminster 0.6 WSW	0.0"	MA-BA-3	Falmouth 3.0 E	0.0"
MA-WR-8	Fitchburg 1.6 SSW	0.0"	MA-BA-76	Barnstable 0.7 NE	0.0"
MA-WR-42	Northborough 2.3 N	0.0"	MA-BA-12	Orleans 1.1 E	0.0"

June 2019 as a calendar. A count of your Daily Reports by Date. Magenta colors are for the highest counts. Lime green color for the lowest counts. A single day record of 366 Daily Reports on the 11th.

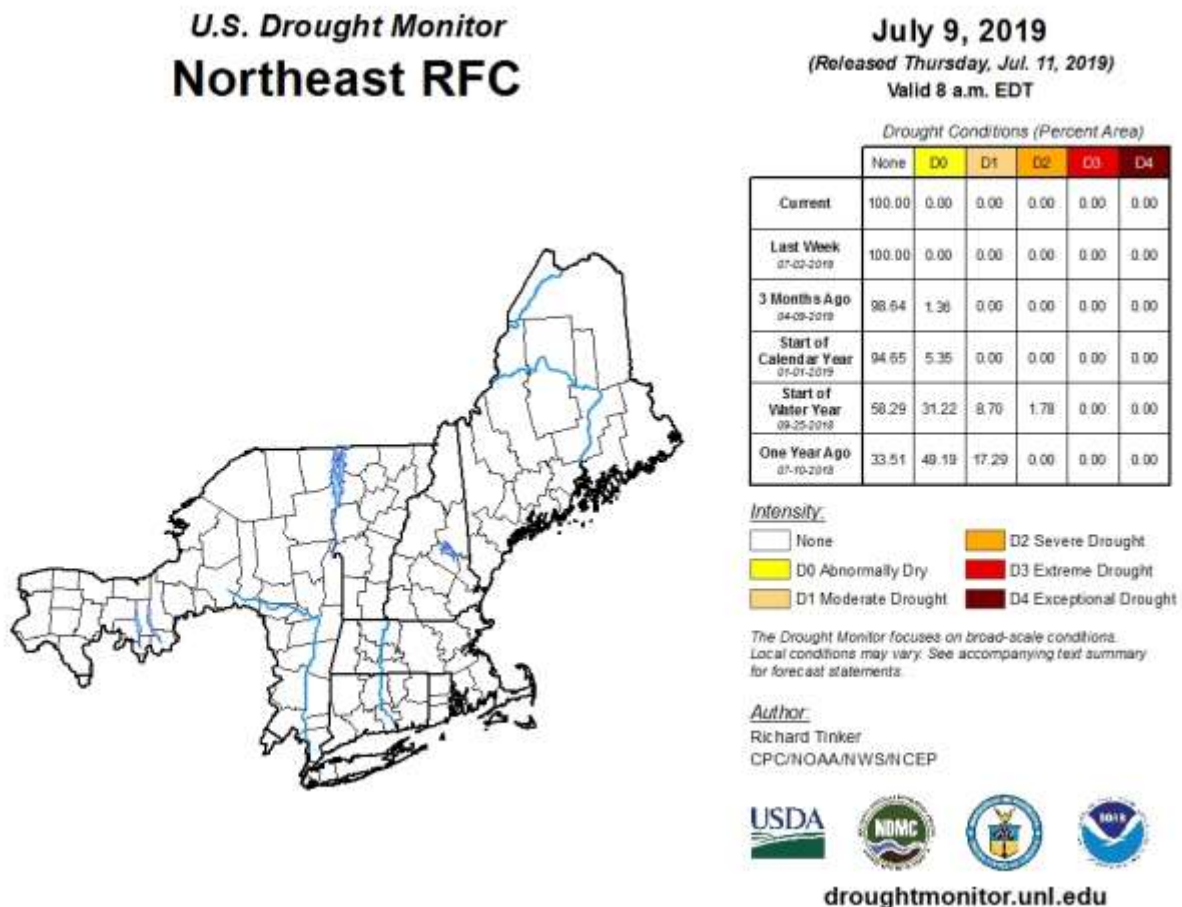
Our average was down slightly from the wet month of May, 329 Daily Reports per day.

June 2019						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
						317 ¹
315 ²	334 ³	340 ⁴	345 ⁵	357 ⁶	337 ⁷	320 ⁸
324 ⁹	323 ¹⁰	366 ¹¹	336 ¹²	345 ¹³	350 ¹⁴	315 ¹⁵
327 ¹⁶	327 ¹⁷	333 ¹⁸	339 ¹⁹	327 ²⁰	336 ²¹	318 ²²
316 ²³	316 ²⁴	319 ²⁵	343 ²⁶	322 ²⁷	308 ²⁸	313 ²⁹
305 ³⁰						

From the Drought Monitor comes this [tutorial page](#). Not all drought is created equally, or even called the same.

Scroll down on that tutorial page for two additional videos from one of the Drought Monitor co-founders, Dr. Mark Svoboda. Lots to read and view from a total of 3 videos: The Overview of the US Drought Monitor. The Beginnings of the US Drought Monitor. The Evolution of the US Drought Monitor.

Every drop counts and zeros do too!



For a viewing explanation on the Drought Monitor, the CoCoRaHS animated video is on [YouTube](#).

Wrap up

July 28th will mark the 22st year since the Spring Creek Flood in Fort Collins Colorado, the significant event that gave CoCoRaHS its start.

Clear skies day and night, reports of “T” for trace or 0.01” do stand out like a sore thumb. If you are new to the crew, know what to do about dew when you see dew on the gauge at your morning observation. Check for confirming cues of wet pavement, cloud cover, larger droplets on the funnel, or passing showers before reporting that small amount of liquid found in your inner cylinder. If you have your doubts or uncertainties about what fell from the sky or from dew, write them out in a Comment.

This Newsletter concludes the 4th year of Monthly Newsletters. On we go to a 5th year of Monthly Newsletters.

Thank you for all that you do for CoCoRaHS, whether in the past, present and in the days to come.