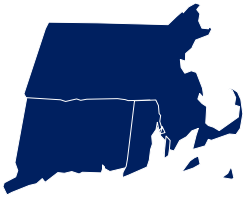
Community Collaborative Rain, Hail & Snow Network

# Southern



# New England

**November 2016**

Thank you for looking at our monthly newsletter. We are part of a network of volunteer precipitation observers for the Community Collaborative Rain Hail and Snow Network (CoCoRaHS).

Whether we are experiencing a stretch of sunny dry days, or any kind of precipitation throughout the year, our network's reports are put to use to determine the severity of droughts or floods, drinking water supplies, snow pack measurements and river flows. They can even be put to use by you, the observer, answering a basic question of how wet did you get.

Within Southern New England, we are growing in number of observers and reports. Consider joining our network and look at our work on the www.cocorahs.org site

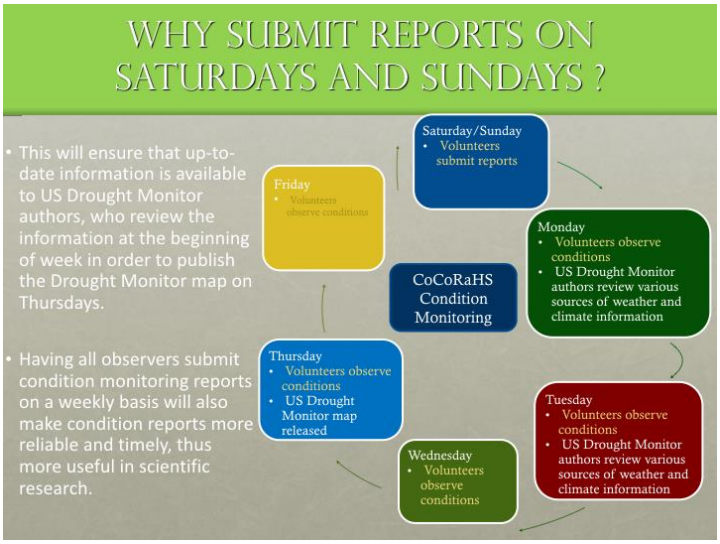
Please, continue reading and enjoying our monthly newsletter.

# ***Condition Monitoring Reports***

A change to our former Drought Impact Reports was made during October. Instead of commenting about Drought conditions, comments can be made about all conditions; wet, normal or dry.

You know your locale best. As you're outside, looking at stream, pond or river levels; as you see soil, grass or crop conditions, whether the conditions are dry, normal or wet, go to our website, fill out and submit a Condition Monitoring Report.

The form does a good job explaining the details about the report. Be honest and accurate. Express your Condition *relative to normal* at the time of the year. The strong summer sun does dry out the ground, a spring thaw does make the ground muddy, winter snows accompany slow stream flows and frozen ponds, and the day after we get roughly 1" of rain, the rivers and streams come alive and the ground is a little soft and mushy. Think *relative to normal* at the time of the year. Our normal is 1" of precipitation per week, 4" per month, and so on.




These Condition Monitoring Reports can serve as a way for you to journal your conditions. They also serve as a way to send a message directly to the Drought Monitor team as they gather data each week, so look at and understand the "Cycle" in the diagram (left). The day of week that you submit your report can impact how far your report reaches. We publish our monthly newsletter on Thursday so we can get the latest Drought Monitor update.

Our local observers have jumped in and used Condition Monitoring Reports to submit their weekly, monthly or longer rainfall totals along with their

observations of soil, pond or stream conditions. Join in, if you have not yet begun.

The concept of Condition Monitoring Reports started in the Carolinas. Which one? Both! Home of 1300 active CoCoRaHS observers between North and South Carolina. Kirsten Lackstrom, from the University of South Carolina, said "Condition Monitoring Reports not only gives us information about all types of conditions (dry-normal-wet) but also a better baseline understanding of local conditions so that drought onset, intensification, and recovery can be identified."

CoCoRaHS has a map of precipitation reports. We all know what that map looks like. The Carolinas Integrated Sciences & Assessments (CISA) has a map of Condition Monitoring Reports. Click on the dots on this map to see the reporting details.

CoCoRaHS has prepared more details about these Condition Monitoring Reports.

To further understand the background of this new feature, read this article from the National Drought Monitor Center.

And to see more information from CISA, their article on Condition Monitoring Reports.

# ***Snow Measuring***

Before we get into our annual refresher of Snow Measuring, a message towards Observer Safety. None of this is worth getting injured or worse over. Your safety and overall well-being is important to us and we understand if you skip, delay or omit values in the Daily Report during the upcoming winter season.

Nobody does it as good as you do. This goes to the "why" snow measuring is important and valued by many. A ruler in the snow, measuring snow fall or snow depth, and its liquid equivalent, is of high value during the winter months. We have a few tips to pass on to do that as accurately as possible. You can also view a 2 ½ minute video .

- Remove your funnel and inner cylinder from your CoCoRaHS gauge when the temperatures are below freezing. Only if you are certain you will receive all rain should you return your funnel and inner cylinder.
- Have a ruler to measure the depth of new and old snow. The 12" ruler of your school days may work for smaller amounts. Yard sticks work well for deeper amounts. Metal retractable tape measures may not be the best if snow piles up to the bottom metal clip of the tape measure. Some of these rulers may not measure easily when an icy layer develops on top of or at a lower layer within the snow pack. A metal ruler, in 0.1" increments, is like the hot knife through butter.
- A snow measuring board, measuring nearly 2' x 2' x ½" plywood, painted white, is helpful to measure new snow on top of a snow pack. Snow measuring boards are helpful to measure a snow pack, in case your grass is tall and thick before the snow fell.
- A marker, a stick, or a thin pole are helpful to locate near your snow measuring board(s).
- A 2nd outer cylinder, or a kitchen pot, is helpful during measurements of a snow event to change or empty the snow core to bring indoors.
- A spatula or something thin and metal that you can slide under your gauge when taking a core sample.

Never take a ruler to the side of your outer cylinder to measure the snow within the cylinder.

New snow. We work. We sleep. We have other activities. Measure new snow and take a core sample immediately after the snow ends or changes form to sleet/freezing rain/rain. Do the best that you can. We work. We sleep. We have other activities. Measure new snow in 6 hour intervals. Snow does settle slightly over time.

Measure new snow to the nearest 0.1". Measure snow depth of the snow pack to the nearest ½". Take multiple (3) measurements away from trees, buildings, drifts, warm pavement, car roofs and car hoods, picnic tables and back decks. Average those measurements.

It takes a complete coating of snow to measure 0.1". Any snow less than that, is just a Trace. Snow that melts on impact, is reported as a Trace. Trace amounts of snow can occur over 5 times in a season.

It is snowing or it has snowed. You're dressed and ready to go outside. How do we do this?

Go to your gauge. Any snow on or near the gauge, sweep away from the gauge opening. Change the gauge with a 2nd outer cylinder, if you have one. Empty the contents of the gauge into a kitchen pot.

Ruler to the snow measuring boards. Measure in multiple (3) locations your new snow, to the nearest 0.1". Find the spot that has the average. Take an empty outer cylinder, turn upside down, press down into the snow and cut a core. Use a spatula or something thin and metal to slide under the bottom of the core. Wipe off the remaining snow from your snow measuring board. Reposition your snow measuring board flush to the top of the snow pack.

Bring it all indoors. Be ready to write numbers down. Use your funnel and inner cylinder to add a measured amount of hot tap water. For new snow less than 5", I add about 0.50" of hot tap water. For more than 5" of snow, I add about 1.00" of hot tap water. Write down the measured amount of hot tap water.

Pour the hot tap water into the outer cylinder with the snow core. Slosh around until the snow core is completely melted. Pour out the liquid from the outer cylinder into your funnel and inner cylinder. Be careful not to spill out more than 1". Write that measurement down. Subtract the hot water amount from your total amount. That is your liquid equivalent, to the nearest 0.01". Save that number and your new snow depth number to the nearest 0.1".

You can repeat this process to the snow found in your gauge, if you want the additional experience, or if you have a mix of precipitation types occuring. You may find that the core sample and the gauge sample are close in amounts. The core sample from your snow measuring board is a more representative amount as to what fell on the ground.

Repeat these steps until the snow event ends or for your morning observation time. Total all of your measurements for your Daily Report.

For your daily observation time, measure the snow depth. Ruler to measure the snow depth. Measure in multiple (3) locations. Average to

the nearest ½". You would be surprised how valuable a snow depth measurement is during the days in between snow events. We define where the snow is and where it is not. If many of us measure and report a snow depth, as many days as possible, and it only has to be the nearest ½", even if it is zero or a trace, what a valuable composite map we make.

For Monday's Daily Report, we encourage your participation in our network's custom "SWE Mondays." Find the location of your average snow depth and cut a core sample with an empty outer cylinder. Use a spatula or something thin and metal to hold the bottom of the core. And follow the previous instructions about adding hot tap water, writing down, pouring out, and subtracting to obtain the snow water equivalent (SWE). If there is no snow on the ground, this is easy, be a hero and report a zero for total snow and ice on the ground, depth and liquid equivalent.

Have patches of snow not completely covering the ground? Take an average. Have no snow on the ground? Be a hero and report a zero! We define where the snow is and where it is not.

Next month, snow reporting will be mentioned; which values to put into which places. Avoid *the* most common mistake: Entering a snow depth value (2.30") where the liquid equivalent (0.22") is to be entered. Look at your State page off the CoCoRaHS site to see more about snow reporting.

Our low cost rulers and gauges have a high value impact. Your snow reports have far reaching destinations. Look at www.nohrsc.noaa.gov In the text box labelled "Observations near", enter your town and state. Press Enter or click "Go". CoCoRaHS reports should appear. After 7pm, the date advances. You may need to set the day back. Very new observers may need to wait 2-3 weeks to have their station appearing on this site, but all other stations should be there.

While the snow stays away, you ALL are encouraged to submit snow values of zero with every Daily Report. 4 additional zeros with every Daily Report. Be a hero and report your snow zeros. There are no zeros like snow zeros. Change those values of NA. When the snow returns, avoid submitting false zeros.

Nolan would tell you all to marvel at the beauty of snow. When you're outside, take a few moments to enjoy it.

# ***No Drought from you!***

By Nicole Belk – Senior Service Hydrologist, NWS Taunton MA

Your precipitation reports, including all of those reports of 0.00", have been and continue to be incredibly helpful throughout this drought. The more precipitation data that is available, the better we can help assess drought conditions across the region. It was amazing to check the CoCoRaHS website during late morning of October 31st and see how many of you had already completed your reports for the entire month!

We've been in drought conditions for quite some time now. In fact, you have to go back to the May 31st rendition of the US Drought Monitor to find all of MA, CT and RI *not* in Drought-designated areas on the US Drought Monitor (mapped as having D1 "Moderate Drought" conditions or worse). Here is a link to the latest US Drought Monitor map for the northeast US.

October was a month of extremes. RI, eastern MA and eastern CT received substantial rainfall, in some cases to the point of flooding. During the evening of Friday October 21st, we received numerous reports of urban flash flooding, especially in the Worcester area. One portion of Cambridge Street in Worcester was reported to be flooded with water 7 feet deep! Also in Worcester, an underpass bridge on MLK Boulevard was flooded all the way up to the base of the bridge overhead. The CoCoRaHS observers that had the most rainfall for this single event included MA-WR-43 Leicester 2.4 ESE, with 4.47", MA-WR-38 Worcester 2.7 S, at 4.23", and MA-WR-25 Holden 2.0 ESE, with 4.06", most of this occurring in under 2 hours.

In contrast, the western half of MA and central to western CT received far less rainfall over the course of the month. MA-HD-23 Springfield 2.5 WNW had only 2.02" of rainfall for the entire month, with 22 days of 0.00". CT-HR-36 West Hartford 1.1 W had only 2.27" of rainfall for the month, with 21 days of 0.00".

As we continue through this drought, your precipitation data continues to be utilized in reports and summaries that we provide to the States of Massachusetts, Connecticut and Rhode Island. These summaries in turn help the States in determining their drought declarations. Thank you for your rainfall reports, and thank you for ALL of your zeroes!!!

# ***Detail and Summary for October 2016***

From the National Weather Service (NWS) Climate sites for Oct 2016.

| Location | Station ID | Oct 2016 Precip | Oct departure from normal | Aug-Sep-Oct Precip | 3 month departure from normal | May-Oct Precip | 6 month departure from normal |
|---|---|---|---|---|---|---|---|
| Pittsfield MA | PSF | 3.85'' | -0.86'' | 8.34'' | -4.42'' | 18.97'' | -6.65'' |
| Bridgeport CT | BDR | 4.25'' | 0.61'' | 10.14'' | -0.94'' | 19.70'' | -2.25'' |
| Hartford CT | BDL | 2.17'' | -2.20'' | 8.78'' | -3.40'' | 15.46'' | -9.60'' |
| Worcester MA | ORH | 6.57'' | 1.89'' | 13.80'' | 1.48'' | 19.73'' | -5.20'' |
| Providence RI | PVD | 4.83'' | 0.90'' | 10.28'' | -1.17'' | 18.46'' | -3.47'' |
| Boston MA | BOS | 5.46'' | 1.52'' | 8.56'' | -2.17'' | 13.59'' | -7.74'' |

At last, monthly values greater than 4” and some positive variances.

October started off with a rainy weekend. Our attention turned towards the tropics as Hurricane Matthew came through Haiti and the Bahamas, towards Florida and the Carolinas. Our southeastern areas saw some wind and rainfall as Matthew exited east during Columbus Day weekend. A dry middle of the month. The next significant rain came on the 21st ahead a front as rain streamed from the south, dropping large amounts from New London towards Portland Maine. Our first snow occurred on the 27th before it changed to rain in some areas and eventually melted.

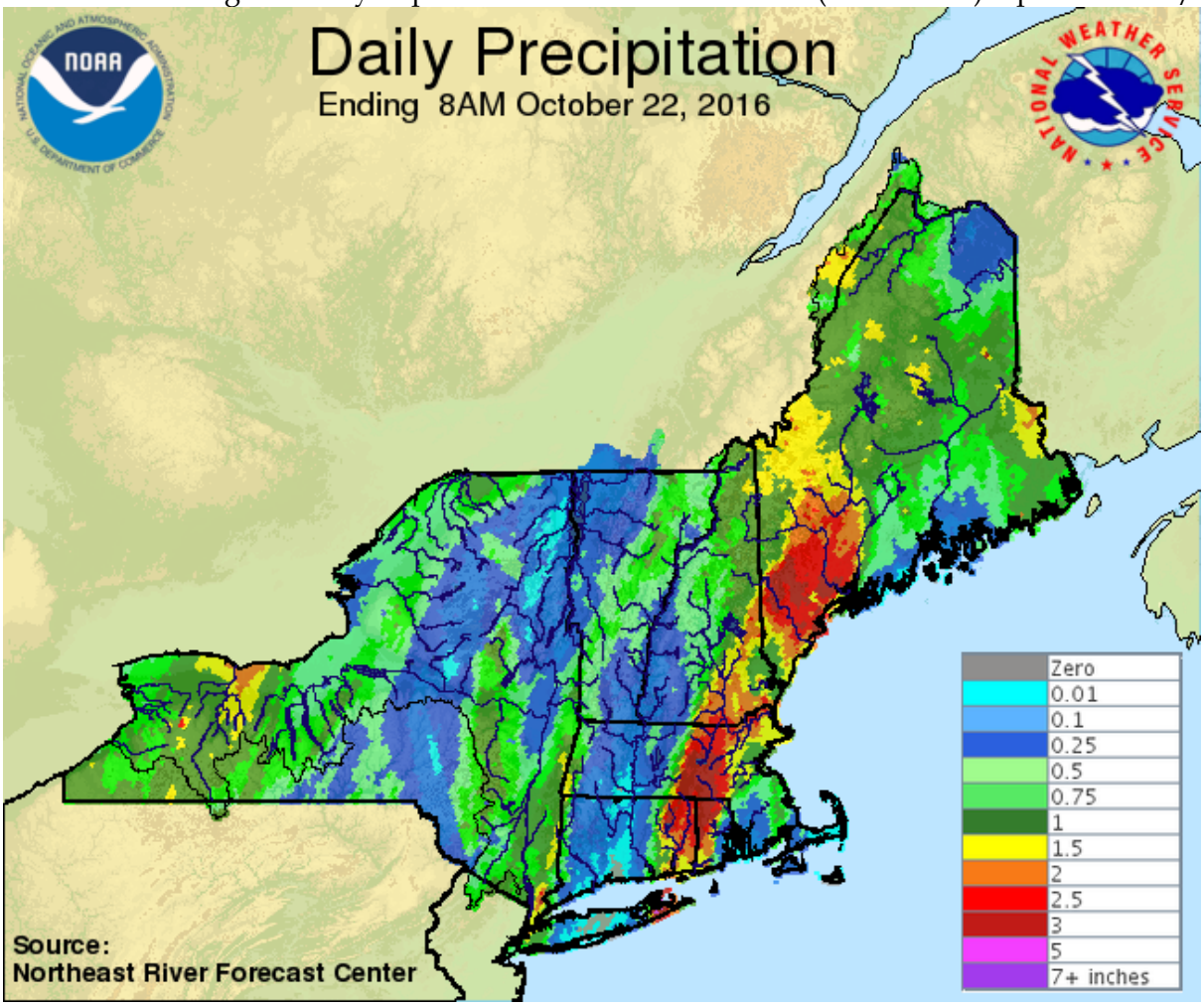
A tale of two sides of our region. Below normal precipitation around the Connecticut and Housatonic Rivers. Above normal precipitation along the Connecticut shoreline and east of New London and Worcester.

We were so close to achieving 7000 Daily Reports, so perhaps, we will reach that milestone in December. Last October, we had 3832 Daily Reports. Our 3811 reports of zero was also close to being able to say that our zeros surpassed last year’s monthly total, one more time.

We broke through 1000 comments in a month for the first time and strive to go even higher than that. The most notable record that was broken was 135 stations that reported all 31 days of October, and 50 stations completed their station totals with a record amount of Multi-Day Reports.

## From your reports for October 2016

| | |
|---|---|
| Observers reporting | 290 |
| Reported all 31 days | 135 |
| Completed by Multi-Day Reports | 50 |
| Missing 1 or 2 reports | 13 ** Email reminders, help! |
| Daily Reports | 6981 |
| Zero Reports | 3811 |
| Non-Zero Reports | 3170 |
| Daily Comments | 1199 |
| Multi-Day Reports | 174 |
| Condition Monitoring Reports | 56 |
| Significant Weather Reports | 27 |
| Hail Reports | 0 |
| Snowfall Reports | 3217 |
| Snow Depth Reports | 738 |
| Highest Daily Report | 4.47″ from Leicester MA (MA-WR-43) reported on 10/22 |



Something different coming next. The next section would normally have 150+ stations with complete data for the month. The sort sequence of stations is something I developed last year by taking counties and connecting them as the rivers would likely flow. The sort would start with Berkshire, Litchfield, Fairfield, wrap north-to-south while going east towards Cape Cod and the Islands. Looking back at it, it is impressive to see some of the newsletters last year with 50 or so complete stations, to today where the total stands at nearly 190 complete stations.

Towards the end of July's newsletter, Watersheds were mentioned. CoCoRaHS released an animated video on the topic. A map from the USGS was provided for you to find your hydrologic address to 8 places.

Recently, Coordinators were asked to evaluate a tool about Watersheds. A street address could be entered, or a lat/long address for those with PO Box's, and a watershed, with surrounding watersheds could be displayed.

That tool was evaluated on ALL of the recently reporting stations in our three states. A Watershed and your Station ID is within a spreadsheet that is used each month in conjunction with this newsletter.

We absolutely want your feedback on this next section. Take a look at your complete stations sorted by Watershed. We're very certain we have the correct county for each station, but slightly less certain which Watershed you are located in. Perhaps the tool we are evaluating does not work well on your street, or perhaps we have the wrong lat/long address for your station. There are about two stations we need to know where you have your gauge, because the dividing line is that close: Little Compton RI, Monroe CT, Prospect CT, Lexington MA are have multiple watersheds.

Think. Pause. Reflect. Don't be too quick in sending us your feedback. Coastline stations may be within a "Frontal" watershed name so we understand that you have no river near your station.

This is how the rivers flow. These are your hydrologic addresses. Take a look beyond your county or state borders. Your complete station data for the month of October sorted by Watershed, and grouped by sub-basin. Give it some thought. Let us know your opinions on this. A record 189 stations, from 185 + 4 given some generosity with their Multi-Day reporting over a month end. Enjoy it!

| Watershed | Watershed Name | Station | Station Name | Precip |
|---|---|---|---|---|
| 01070004 | Nashua | | | |
| 0107000401 | North Nashua River | MA-WR-44 | Westminster 0.6 WSW | 4.17'' |
| 0107000401 | North Nashua River | MA-WR-8 | Fitchburg 1.6 SSW | 5.88'' |
| 0107000401 | North Nashua River | MA-WR-13 | Leominster 1.5 S | 6.54'' |
| 0107000402 | Headwaters Nashua River | MA-MD-25 | Ayer 0.1 SW | 6.48'' |
| 0107000403 | Squannacook River | MA-MD-47 | West Townsend 0.5 W | 6.15'' |
| 01070005 | Concord | | | |
| 0107000502 | Concord River | MA-WR-30 | Shrewsbury 1.6 NNE | 6.99'' |
| 0107000502 | Concord River | MA-WR-28 | Berlin 1.3 WSW | 7.28'' |
| 0107000502 | Concord River | MA-WR-18 | Northborough 0.6 SSE | 7.19'' |
| 0107000502 | Concord River | MA-WR-42 | Northborough 2.3 N | 6.83'' |
| 0107000502 | Concord River | MA-WR-47 | Northborough 1.0 NE | 7.37'' |
| 0107000502 | Concord River | MA-MD-61 | Stow 2.3 NW | 6.36'' |
| 0107000502 | Concord River | MA-MD-12 | Acton 1.3 SW | 7.03'' |
| 0107000502 | Concord River | MA-MD-51 | Maynard 0.7 ESE | 8.25'' |
| 0107000502 | Concord River | MA-MD-53 | Acton 4.0 ENE | 6.57'' |
| 0107000502 | Concord River | MA-MD-62 | Chelmsford 1.2 E | 5.97'' |
| 0107000502 | Concord River | MA-MD-60 | Billerica 2.0 W | 6.04'' |
| 01070006 | Merrimack River | | | |
| 0107000613 | Shawsheen River | MA-MD-52 | Lexington 0.6 SW | 5.87'' |
| 0107000614 | Powwow River - Merrimack River | MA-ES-3 | Haverhill 3.6 WNW | 7.41'' |
| 0107000614 | Powwow River - Merrimack River | MA-ES-29 | North Andover 1.9 SSE | 7.60'' |
| 0107000614 | Powwow River - Merrimack River | MA-ES-20 | Haverhill 0.7 N | 7.12'' |
| 0107000614 | Powwow River - Merrimack River | MA-ES-27 | Amesbury 1.2 ENE | 7.75'' |
| 01080201 | Middle Connecticut | | | |
| 0108020106 | Manhan River - Connecticut River | MA-HS-2 | Westhampton 1.8 SW | 3.00'' |
| 0108020106 | Manhan River - Connecticut River | MA-HS-8 | Williamsburg 1.2 WSW | 2.56'' |
| 0108020106 | Manhan River - Connecticut River | MA-HS-10 | Northampton 1.6 NE | 2.39'' |
| 0108020106 | Manhan River - Connecticut River | MA-FR-12 | Sunderland 1.3 SE | 2.54'' |
| 0108020107 | Batchelor Brook - Connecticut River | MA-HD-13 | Springfield 4.1 W | 2.39'' |
| 0108020107 | Batchelor Brook - Connecticut River | MA-HD-23 | Springfield 2.5 WNW | 2.02'' |
| 01080202 | Miller | | | |
| 0108020202 | Lower Millers River | MA-WR-39 | Gardner 1.2 SW | 3.37'' |
| 0108020202 | Lower Millers River | MA-WR-40 | Gardner 1.4 SSW | 2.83'' |
| 01080203 | Deerfield | | | |
| 0108020305 | Lower Deerfield River | MA-FR-17 | Buckland 1.8 ESE | 3.30'' |
| 0108020305 | Lower Deerfield River | MA-FR-13 | Conway 2.9 NW | 2.87'' |
| 0108020305 | Lower Deerfield River | MA-FR-10 | Conway 0.9 SW | 2.09'' |

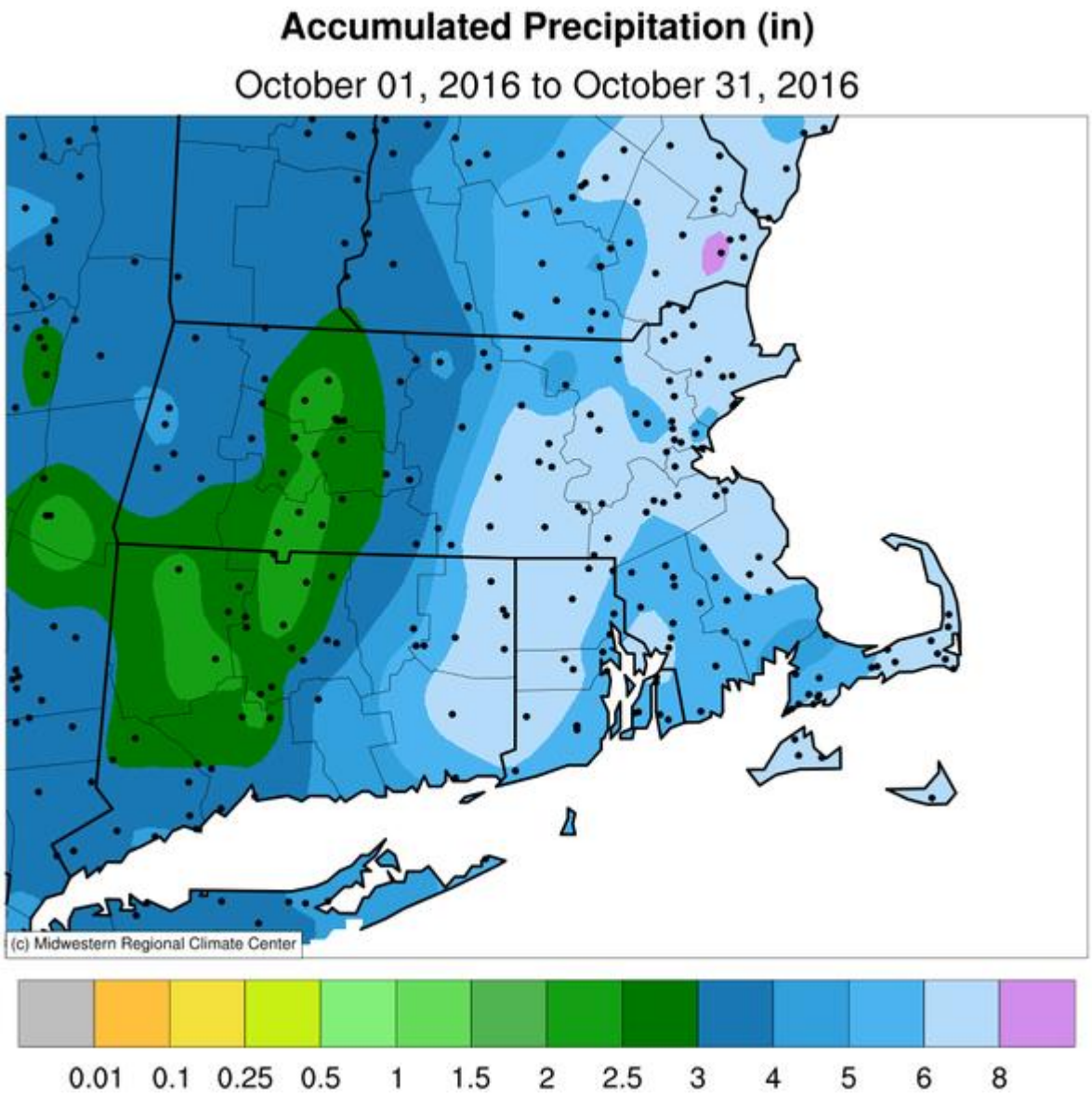
| | | | | |
|---|---|---|---|---|
| 01080205 | Lower Connecticut | | | |
| 0108020501 | Mill River - Connecticut River | CT-HR-5 | Enfield 1.5 SE | 2.77'' |
| 0108020502 | Scantic River | MA-HD-20 | Wilbraham 3.7 SSW | 2.29'' |
| 0108020502 | Scantic River | CT-TL-15 | Central Somers 0.3 N | 2.85'' |
| 0108020503 | Park River | CT-HR-9 | West Hartford 2.7 NNW | 2.61'' |
| 0108020503 | Park River | CT-HR-36 | West Hartford 1.1 W | 2.27'' |
| 0108020503 | Park River | CT-HR-11 | West Hartford 2.7 SSE | 2.40'' |
| 0108020504 | Hockanum River | CT-TL-16 | Vernon 3.5 NNE | 2.96'' |
| 0108020505 | Roaring Brook - Connecticut River | CT-HR-6 | Wethersfield 1.2 WSW | 2.85'' |
| 0108020505 | Roaring Brook - Connecticut River | CT-HR-22 | East Hartford 1.3 E | 3.04'' |
| 0108020505 | Roaring Brook - Connecticut River | CT-HR-7 | Central Manchester 2.7 SW | 3.01'' |
| 0108020505 | Roaring Brook - Connecticut River | CT-HR-40 | Glastonbury Center 4.0 ENE | 3.56'' |
| 0108020506 | Mattabesset River | CT-HR-15 | Southington 3.0 E | 2.97'' |
| 0108020506 | Mattabesset River | CT-HR-18 | Berlin 2.4 SSE | 3.05'' |
| 0108020507 | Higganum Creek - Connecticut River | CT-MD-2 | Portland 0.9 S | 4.28'' |
| 01080206 | Westfield | | | |
| 0108020603 | Outlet Westfield River | MA-HD-15 | Westfield 1.5 SW | 2.82'' |
| 01080207 | Farmington | | | |
| 0108020701 | Still River | CT-LT-15 | Colebrook 1.0 NE | 2.80'' |
| 0108020702 | West Branch Farmington River | MA-BE-4 | Becket 5.6 SSW | 2.95'' |
| 0108020704 | Headwaters Farmington River | CT-LT-9 | New Hartford Center 3.2 SW | 2.91'' |
| 0108020704 | Headwaters Farmington River | CT-HR-24 | Collinsville 0.9 NW | 2.78'' |
| 0108020704 | Headwaters Farmington River | CT-HR-28 | North Canton 0.8 SSW | 2.83'' |
| 0108020705 | Salmon Brook | CT-HR-8 | North Granby 1.3 ENE | 2.32'' |
| 0108020706 | Outlet Farmington River | CT-HR-35 | Weatogue 0.7 E | 2.97'' |
| 01090001 | Charles | | | |
| 0109000101 | Plum Island Sound - Frontal Atlantic Ocean | MA-ES-24 | Newburyport 0.8 SW | 7.31'' |
| 0109000102 | Ipswich River | MA-MD-45 | Wilmington 1.5 NE | 6.48'' |
| 0109000102 | Ipswich River | MA-ES-12 | Boxford 2.4 S | 6.61'' |
| 0109000102 | Ipswich River | MA-ES-2 | Beverly 2.8 NW | 6.65'' |
| 0109000103 | Essex River - Frontal Atlantic Ocean | MA-ES-28 | Beverly 1.5 NE | 6.99'' |
| 0109000104 | Saugus River - Frontal Broad Sound | MA-SF-2 | Winthrop 0.2 N | 5.91'' |
| 0109000104 | Saugus River - Frontal Broad Sound | MA-ES-8 | Marblehead 0.8 SW | 6.05'' |
| 0109000105 | Mystic River - Frontal Boston Harbor | MA-MD-67 | Lexington 2.3 SE | 6.11'' |
| 0109000105 | Mystic River - Frontal Boston Harbor | MA-MD-54 | Belmont 0.3 SE | 6.02'' |
| 0109000105 | Mystic River - Frontal Boston Harbor | MA-MD-7 | Winchester 0.7 SE | 6.05'' |
| 0109000105 | Mystic River - Frontal Boston Harbor | MA-MD-79 | Woburn 1.2 ESE | 6.19'' |
| 0109000105 | Mystic River - Frontal Boston Harbor | MA-MD-44 | Medford 1.2 W | 5.71'' |
| 0109000105 | Mystic River - Frontal Boston Harbor | MA-MD-11 | Cambridge 0.9 NNW | 5.98'' |
| 0109000105 | Mystic River - Frontal Boston Harbor | MA-SF-10 | Chelsea 0.8 N | 6.27'' |
| 0109000106 | Upper Charles River | MA-WR-1 | Milford 2.3 NNW | 7.87'' |

| | | | | |
|---|---|---|---|---|
| 0109000106 | Upper Charles River | MA-MD-55 | Holliston 0.7 W | 7.60'' |
| 0109000106 | Upper Charles River | MA-MD-42 | Holliston 0.8 S | 7.74'' |
| 0109000106 | Upper Charles River | MA-NF-11 | Millis 2.0 SW | 8.18'' |
| 0109000107 | Lower Charles River - Frontal Boston Harbor | MA-SF-4 | Brighton 0.5 W | 6.42'' |
| 0109000107 | Lower Charles River - Frontal Boston Harbor | MA-MD-43 | Somerville 0.8 SSE | 6.22'' |
| 0109000107 | Lower Charles River - Frontal Boston Harbor | MA-MD-74 | Somerville 0.7 SSE | 4.68'' |
| 0109000107 | Lower Charles River - Frontal Boston Harbor | MA-SF-1 | Boston 0.5 WSW | 5.21'' |
| 0109000108 | Neponset River - Frontal Boston Harbor | MA-NF-1 | Norwood 1.3 NW | 6.23'' |
| 0109000109 | Whitmans Pond - Frontal Boston Harbor | MA-NF-27 | Quincy 1.5 SW | 7.04'' |
| 0109000109 | Whitmans Pond - Frontal Boston Harbor | MA-NF-5 | Weymouth 0.5 NW | 7.34'' |
| 01090002 | Cape Cod | | | |
| 0109000201 | North River - Frontal Massachusetts Bay | MA-PL-5 | Kingston 3.3 WNW | 7.47'' |
| 0109000201 | North River - Frontal Massachusetts Bay | MA-PL-2 | Sagamore Beach 1.0 NW | 6.17'' |
| 010900020206 | Cape Cod - Wequaquet Lake | MA-BA-8 | Falmouth 1.8 WSW | 5.16'' |
| 010900020206 | Cape Cod - Wequaquet Lake | MA-BA-14 | North Falmouth 0.5 ENE | 4.09'' |
| 010900020206 | Cape Cod - Wequaquet Lake | MA-BA-13 | Falmouth 0.6 NNW | 5.62'' |
| 010900020206 | Cape Cod - Wequaquet Lake | MA-BA-50 | Falmouth 5.4 NNE | 4.62'' |
| 010900020206 | Cape Cod - Wequaquet Lake | MA-BA-19 | East Falmouth 0.7 NW | 5.96'' |
| 010900020206 | Cape Cod - Wequaquet Lake | MA-BA-3 | Falmouth 3.0 E | 6.50'' |
| 010900020206 | Cape Cod - Wequaquet Lake | MA-BA-11 | East Falmouth 1.4 ESE | 5.44'' |
| 010900020206 | Cape Cod - Wequaquet Lake | MA-BA-18 | Waquoit 0.6 SSW | 6.21'' |
| 010900020206 | Cape Cod - Wequaquet Lake | MA-BA-47 | Mashpee 2.4 WSW | 5.93'' |
| 010900020206 | Cape Cod - Wequaquet Lake | MA-BA-45 | Sandwich 0.9 NNE | 5.18'' |
| 010900020206 | Cape Cod - Wequaquet Lake | MA-BA-49 | Sandwich 3.5 SSE | 8.09'' |
| 010900020206 | Cape Cod - Wequaquet Lake | MA-BA-22 | Yarmouth 0.9 NNW | 6.03'' |
| 010900020205 | Cape Cod - Wequaquet Lake | MA-BA-1 | Yarmouth 2.3 SSE | 6.74'' |
| 010900020205 | Cape Cod - Long Pond | MA-BA-36 | Harwich 2.6 ENE | 7.54'' |
| 010900020205 | Cape Cod - Long Pond | MA-BA-37 | Orleans 0.8 W | 7.49'' |
| 010900020205 | Cape Cod - Long Pond | MA-BA-51 | Orleans 3.0 S | 8.56'' |
| 010900020205 | Cape Cod - Long Pond | MA-BA-12 | Orleans 1.1 E | 6.52'' |
| 010900020204 | Cape Cod - Nauset Bay | MA-BA-30 | Eastham 0.6 SW | 7.17'' |
| 0109000203 | Mattapoisett River - Frontal Buzzards Bay | MA-PL-19 | Rochester 1.2 NNW | 5.35'' |
| 0109000203 | Mattapoisett River - Frontal Buzzards Bay | MA-PL-6 | Middleborough 5.5 E | 5.31'' |
| 0109000204 | Paskamanset River - Frontal Buzzards Bay | MA-BR-14 | Dartmouth 2.5 SSW | 5.71'' |
| 0109000204 | Paskamanset River - Frontal Buzzards Bay | MA-BR-32 | Acushnet 1.8 SSE | 5.13'' |
| 0109000205 | Skonnet Point - Frontal Rhode Island Sound | RI-NW-7 | Little Compton 0.6 E | 6.00'' |
| 0109000206 | Elizabeth Islands - Marthas Vineyard | MA-DK-5 | West Tisbury 2.9 N | 7.96'' |
| 0109000206 | Elizabeth Islands - Marthas Vineyard | MA-DK-9 | West Tisbury 0.4 S | 7.62'' |
| 0109000206 | Elizabeth Islands - Marthas Vineyard | MA-DK-2 | Vineyard Haven 0.8 WSW | 6.81'' |
| 0109000207 | Nantucket Island | MA-NT-1 | Nantucket 3.8 WNW | 6.58'' |
| 01090003 | Blackstone | | | |

| | | | | |
|---|---|---|---|---|
| 0109000301 | Upper Blackstone River | MA-WR-41 | Auburn 2.6 SW | 7.69'' |
| 0109000301 | Upper Blackstone River | MA-WR-48 | Uxbridge 1.9 WSW | 7.11'' |
| 0109000302 | Lower Blackstone River | MA-NF-26 | Bellingham 2.4 S | 8.17'' |
| 0109000302 | Lower Blackstone River | MA-NF-16 | Bellingham 4.7 S | 7.76'' |
| 0109000302 | Lower Blackstone River | RI-PR-35 | Cumberland Hill 3.7 E | 5.68'' |
| 01090004 | Narragansett | | | |
| 0109000401 | Upper Taunton River | MA-BR-30 | Taunton 3.9 N | 5.34'' |
| 0109000401 | Upper Taunton River | MA-PL-22 | East Bridgewater 0.3 WSW | 5.97'' |
| 0109000401 | Upper Taunton River | MA-PL-24 | Whitman 1.1 WSW | 5.76'' |
| 0109000401 | Upper Taunton River | MA-PL-15 | Abington 1.2 NNE | 4.96'' |
| 0109000401 | Upper Taunton River | MA-PL-28 | Whitman 0.1 SSW | 5.77'' |
| 0109000401 | Upper Taunton River | MA-PL-23 | Pembroke 2.8 SW | 6.23'' |
| 0109000403 | Threemile River | MA-NF-19 | Foxborough 1.8 SSW | 5.05'' |
| 0109000403 | Threemile River | MA-BR-33 | Taunton 2.4 W | 6.09'' |
| 0109000403 | Threemile River | MA-BR-9 | Taunton 2.6 NW | 5.98'' |
| 0109000404 | Ten Mile River | MA-BR-17 | North Attleboro 0.8 E | 5.34'' |
| 0109000404 | Ten Mile River | MA-BR-23 | Attleboro 0.9 ENE | 5.24'' |
| 0109000405 | Wonnasquatucket River-Moshassuck River | RI-PR-33 | Greenville 0.7 NNW | 7.58'' |
| 0109000405 | Wonnasquatucket River-Moshassuck River | RI-PR-48 | Providence 1.2 NNW | 5.64'' |
| 0109000406 | Pawtuxet River | RI-PR-17 | Cranston 4.1 E | 5.61'' |
| 0109000407 | Palmer River | MA-BR-2 | Rehoboth 2.1 N | 6.08'' |
| 0109000407 | Palmer River | MA-BR-35 | Swansea 4.6 WNW | 5.77'' |
| 0109000408 | Lower Taunton River - Frontal Mount Hope Bay | MA-BR-3 | Norton 1.8 NNE | 5.37'' |
| 0109000408 | Lower Taunton River - Frontal Mount Hope Bay | MA-BR-16 | Somerset 0.4 SSE | 6.66'' |
| 0109000408 | Lower Taunton River - Frontal Mount Hope Bay | MA-BR-8 | Dighton 1.1 WSW | 6.13'' |
| 0109000409 | Narragansett Bay | RI-KN-9 | Warwick 2.4 SW | 4.87'' |
| 0109000409 | Narragansett Bay | RI-KN-2 | East Greenwich 2.3 ESE | 6.04'' |
| 0109000409 | Narragansett Bay | RI-PR-32 | Providence 2.3 NE | 4.98'' |
| 0109000409 | Narragansett Bay | RI-NW-4 | Middletown 1.1 SW | 4.61'' |
| 0109000409 | Narragansett Bay | RI-NW-11 | Tiverton 0.8 SSW | 6.72'' |
| 0109000409 | Narragansett Bay | RI-NW-5 | Little Compton 1.7 NW | 5.69'' |
| 01090005 | Pawcatuck-Wood | | | |
| 0109000501 | Wood River | RI-WS-25 | Rockville 0.4 E | 7.59'' |
| 0109000502 | Upper Pawcatuck River | RI-WS-32 | Kingston 6.9 NNW | 6.12'' |
| 01100001 | Quinebaug | | | |
| 0110000101 | Upper Quinebaug River | MA-HD-16 | Wales 0.4 SSW | 3.26'' |
| 0110000103 | Fivemile River | CT-WN-6 | Dayville 2.0 ENE | 6.83'' |
| 0110000103 | Fivemile River | CT-WN-4 | East Killingly 1.3 SW | 6.94'' |
| 0110000105 | Mossup River | CT-WN-8 | Moosup 1.7 NE | 7.64'' |
| 0110000106 | Pachaug River | CT-NL-21 | Griswold 0.9 N | 6.65'' |
| 01100002 | Shetucket River | | | |

| | | | | |
|---|---|---|---|---|
| 0110000201 | Willimantic River | CT-TL-2 | Staffordville 0.4 NNW | 2.90'' |
| 0110000201 | Willimantic River | CT-TL-18 | Hebron 5.3 NW | 4.17'' |
| 0110000202 | Natchaug River | CT-TL-4 | Mansfield Center 1.9 SW | 5.55'' |
| 0110000203 | Shetucket River | CT-WN-10 | South Windham 1.3 NNE | 5.86'' |
| 0110000203 | Shetucket River | CT-WN-11 | Scotland 2.3 SSW | 6.10'' |
| 0110000203 | Shetucket River | CT-NL-10 | Norwich 2.5 NNE | 7.06'' |
| 01100003 | Thames | | | |
| 0110000302 | Thames River-Frontal New London Harbor | CT-NL-7 | Uncasville-Oxoboxo Valley 5.6 W | 6.39'' |
| 0110000302 | Thames River-Frontal New London Harbor | CT-NL-5 | Oakdale 2.6 WNW | 7.21'' |
| 0110000302 | Thames River-Frontal New London Harbor | CT-NL-17 | Waterford 2.2 N | 8.61'' |
| 0110000302 | Thames River-Frontal New London Harbor | CT-NL-6 | New London 1.0 NNW | 8.19'' |
| 0110000302 | Thames River-Frontal New London Harbor | CT-NL-8 | Uncasville-Oxoboxo Valley 1.6 ENE | 7.98'' |
| 0110000303 | Mystic River - Frontal Fishers Island Sound | CT-NL-22 | Central Waterford 2.7 SSW | 7.34'' |
| 0110000303 | Mystic River - Frontal Fishers Island Sound | CT-NL-23 | Mystic 1.4 W | 6.55'' |
| 0110000303 | Mystic River - Frontal Fishers Island Sound | CT-NL-19 | Mystic 0.9 W | 6.46'' |
| 0110000303 | Mystic River - Frontal Fishers Island Sound | CT-NL-18 | Stonington 0.5 NNE | 6.55'' |
| 01100004 | Quinnipiac | | | |
| 0110000401 | Quinnipiac River | CT-NH-14 | Prospect 1.9 ENE | 2.89'' |
| 0110000401 | Quinnipiac River | CT-NH-30 | Cheshire Village 2.2 SE | 2.57'' |
| 0110000401 | Quinnipiac River | CT-HR-23 | Southington 0.9 SSE | 2.87'' |
| 0110000402 | Hammonasset River - Frontal Long Island Sound | CT-NH-21 | East Haven 3.5 SSW | 5.48'' |
| 0110000402 | Hammonasset River - Frontal Long Island Sound | CT-MD-5 | Westbrook Center 1.1 N | 5.92'' |
| 0110000402 | Hammonasset River - Frontal Long Island Sound | CT-MD-11 | Westbrook Center 1.5 NE | 5.72'' |
| 0110000403 | Mill River - Frontal Long Island Sound | CT-NH-16 | Milford 1.8 E | 4.56'' |
| 0110000403 | Mill River - Frontal Long Island Sound | CT-NH-29 | Hamden 3.0 WSW | 3.56'' |
| 01100005 | Housatonic | | | |
| 0110000501 | Headwaters Housatonic River | MA-BE-11 | Great Barrington 3.0 N | 4.30'' |
| 0110000501 | Headwaters Housatonic River | MA-BE-3 | Stockbridge .2 NNE | 4.10'' |
| 0110000501 | Headwaters Housatonic River | MA-BE-10 | Pittsfield 2.0 NNW | 4.57'' |
| 0110000508 | Still River - Housatonic River | CT-FR-43 | Bethel 0.5 E | 3.02'' |
| 0110000508 | Still River - Housatonic River | CT-FR-41 | Bethel 3.5 NNE | 2.67'' |
| 0110000508 | Still River - Housatonic River | CT-FR-9 | Brookfield 3.3 SSE | 2.57'' |
| 0110000510 | Eightmile Brook - Housatonic River | CT-NH-15 | Seymour 3.6 SW | 2.86'' |
| 0110000511 | Headwaters Naugatuck River | CT-LT-7 | Litchfield 2.3 NNE | 2.33'' |
| 0110000512 | Outlet Naugatuck River | CT-LT-14 | Watertown 0.5 S | 2.87'' |
| 0110000512 | Outlet Naugatuck River | CT-NH-26 | Prospect 1.5 NW | 3.07'' |
| 0110000512 | Outlet Naugatuck River | CT-NH-22 | Prospect 0.5 SW | 3.55'' |
| 0110000513 | Housatonic River - Frontal Long Island Sound | CT-FR-42 | Monroe 0.1 SE | 3.20'' |
| 0110000513 | Housatonic River - Frontal Long Island Sound | CT-FR-23 | Shelton 1.3 W | 3.14'' |
| 01100006 | Saugatuck | | | |
| 0110000601 | Saugatuck River - Frontal Long Island Sound | CT-FR-31 | Newtown 4.6 SSW | 2.87'' |

| | | | | |
|---|---|---|---|---|
| 0110000602 | Norwalk River - Frontal Norwalk Harbor | CT-FR-29 | Ridgefield 1.9 SSE | 3.46'' |
| 0110000602 | Norwalk River - Frontal Norwalk Harbor | CT-FR-3 | New Canaan 1.9 ENE | 4.01'' |
| 0110000602 | Norwalk River - Frontal Norwalk Harbor | CT-FR-25 | Norwalk 2.9 NNW | 3.81'' |
| 0110000603 | Pequonnock River - Frontal Long Island Sound | CT-FR-32 | Monroe 0.8 W | 3.34'' |
| 0110000604 | Mianus River-Rippowam River | CT-FR-37 | Stamford 0.4 WNW | 4.43'' |
| 0110000604 | Mianus River-Rippowam River | CT-FR-35 | Darien 1.8 ENE | 4.49'' |

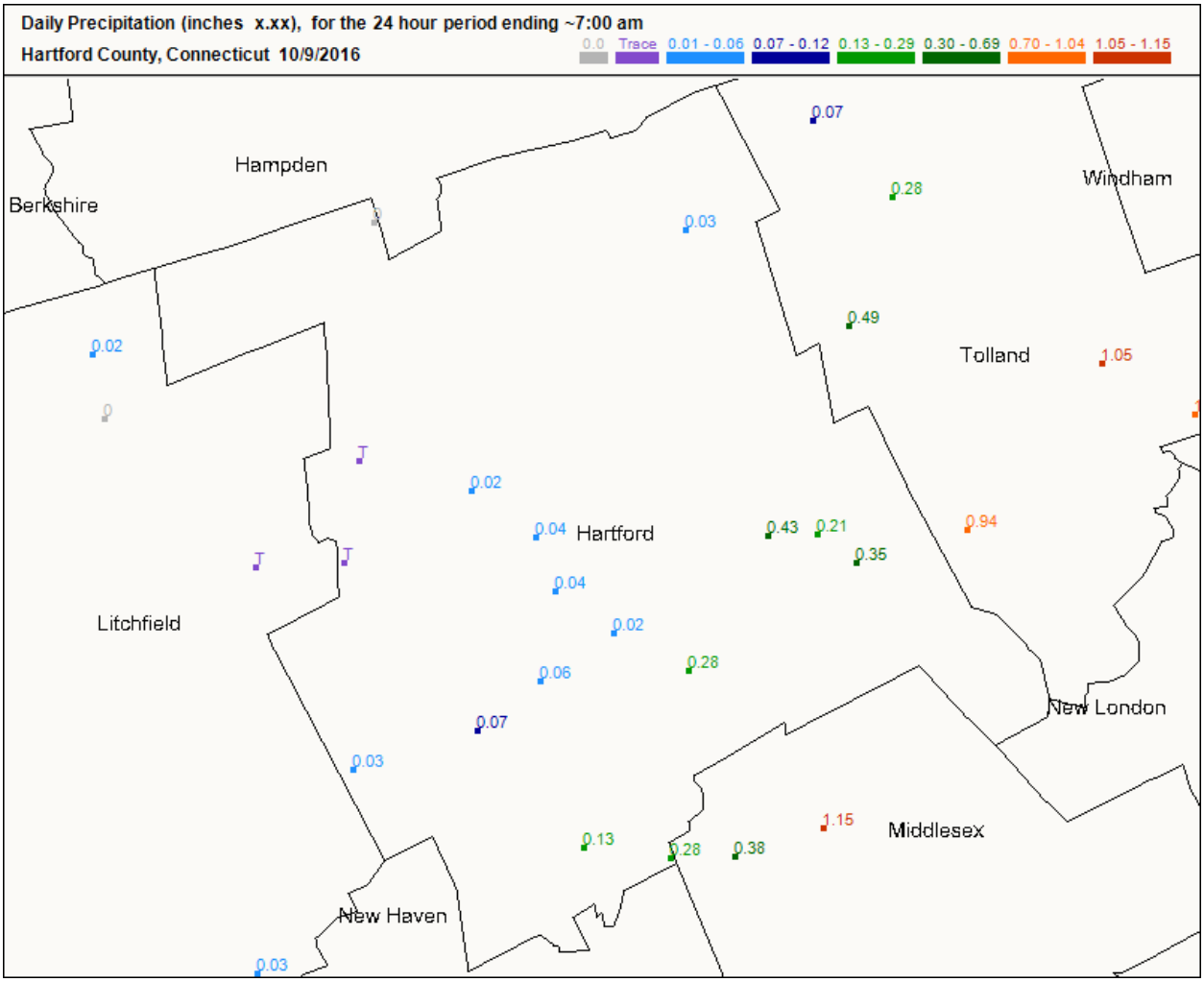


## ***Map of the Month – Hartford County CT***

Hartford is the capital of Connecticut and the county is home to nearly 900,000 residents on over 700 square miles of land. The Connecticut River valley in this county grows a unique crop, shade leaf tobacco.

Towards the northwest part of this county, the Farmington River valley contains two reservoirs. Barkhamsted Reservoir holds 30 billion gallons of water, the largest single reservoir in CT, and the Nepaug Reservoir holds 9.5 billion gallons. Together, these two reservoirs provide 50 million gallons drinking water per day to over 400,000 residents along the Connecticut River from Windsor to Portland.

Over 15 reporting observers in Hartford County may seem plenty, but there are plenty of gaps to be filled in. If you know of someone who might be interested, ask them to join CoCoRaHS.

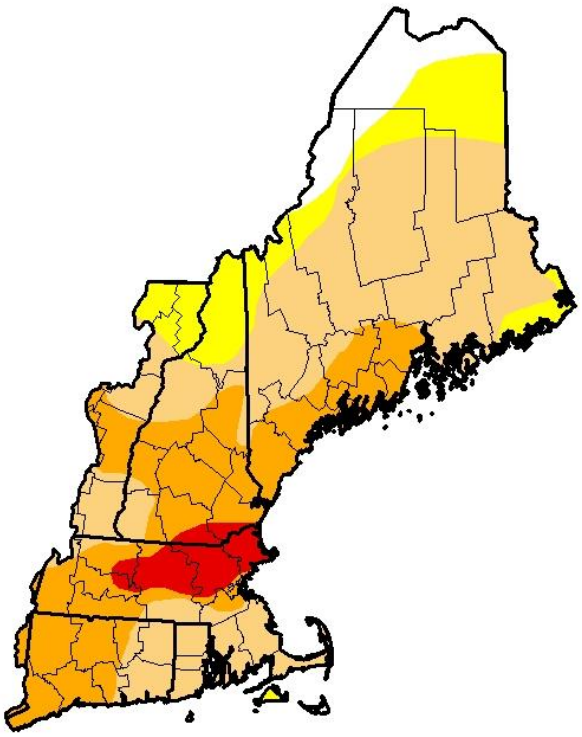


From the Drought Monitor.

The short term drought has been eased in eastern CT, RI and southeast MA, but a long term drought remains.  Every drop counts and zeros do too!

***U.S. Drought Monitor***

## New England Watershed



**November 8, 2016**

***(Released Thursday, Nov. 10, 2016)***

Valid 7 a.m. EST

*Drought Conditions (Percent Area)*

| | None | D0 | D1 | D2 | D3 | D4 |
|---|---|---|---|---|---|---|
| **Current** | 6.77 | 14.55 | 46.34 | 27.74 | 4.60 | 0.00 |
| **Last Week** *11/1/2016* | 7.68 | 13.64 | 46.34 | 27.74 | 4.60 | 0.00 |
| **3 Months Ago** *8/9/2016* | 34.57 | 28.37 | 22.78 | 13.79 | 0.49 | 0.00 |
| **Start of Calendar Year** *12/29/2015* | 55.73 | 28.42 | 15.85 | 0.00 | 0.00 | 0.00 |
| **Start of Water Year** *9/27/2016* | 26.52 | 15.24 | 18.41 | 25.39 | 14.44 | 0.00 |
| **One Year Ago** *11/10/2015* | 71.61 | 12.96 | 15.42 | 0.00 | 0.00 | 0.00 |

*Intensity:*

- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

*The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.*

**Author:**
*Deborah Bathke*
*National Drought Mitigation Center*

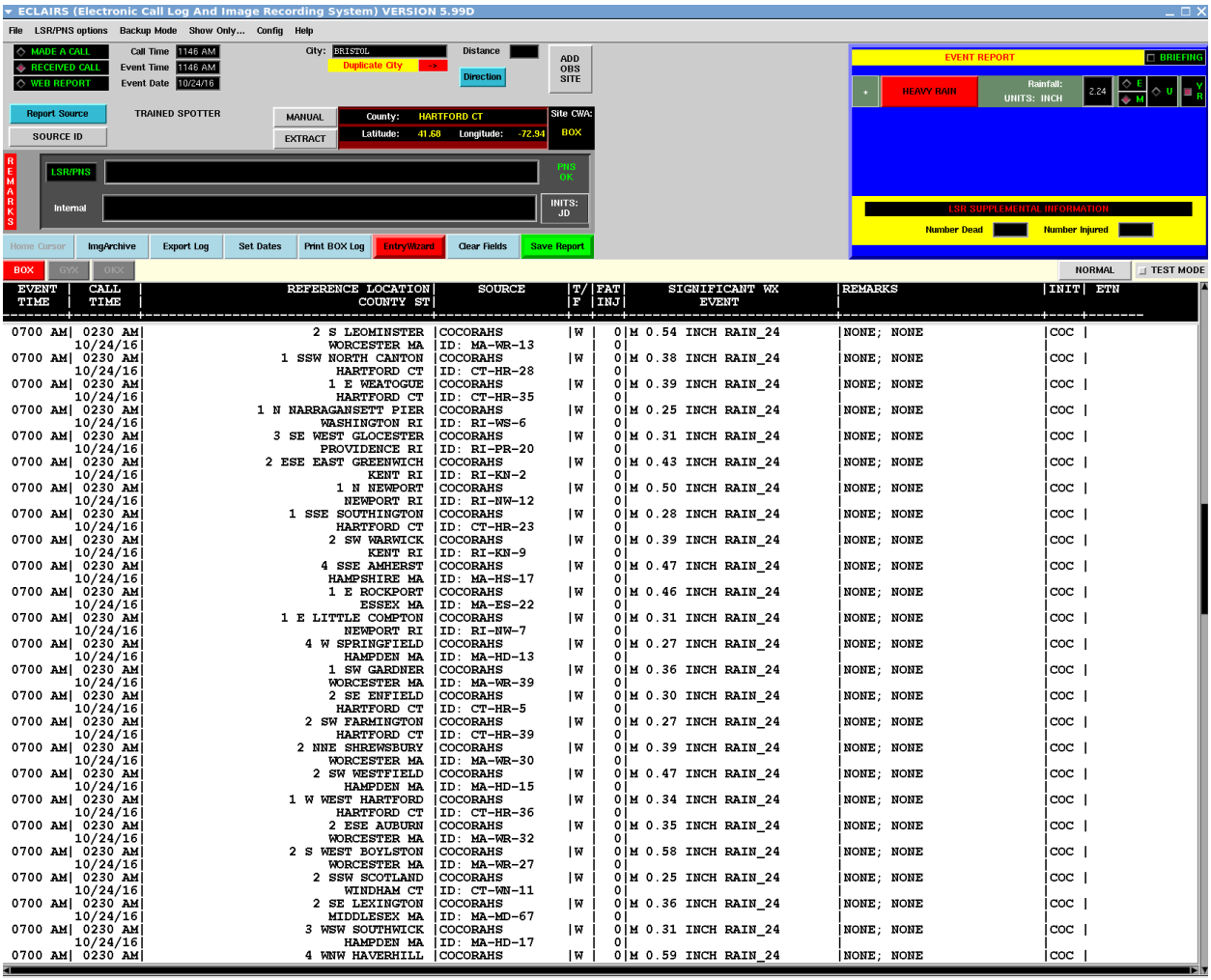
**http://droughtmonitor.unl.edu/**

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

# ***Who looks at CoCoRaHS data? Your NWS Forecast Office does!***

It's a common question asked by the volunteer observers in our network. "Does anyone look at or see my/our reports?" Part of the determined effort as Editor of this newsletter is to find where your reports end up, and show all of you what is found.

A visit was made to the NWS Forecast Office in Taunton MA. These are the CoCoRaHS reports submitted on Sunday October 23 by observers within its County Warning Area (CWA).




| EVENT TIME | CALL TIME | REFERENCE LOCATION COUNTY ST | SOURCE | T/F | FAT INJ | SIGNIFICANT WX EVENT | REMARKS | INIT | ETN |
|---|---|---|---|---|---|---|---|---|---|
| 0700 AM | 0230 AM 10/24/16 | 2 S LEOMINSTER WORCESTER MA | COCORAHS ID: MA-WR-13 | W | 0 0 | M 0.54 INCH RAIN_24 | NONE; NONE | COC | |
| 0700 AM | 0230 AM 10/24/16 | 1 SSW NORTH CANTON HARTFORD CT | COCORAHS ID: CT-HR-28 | W | 0 0 | M 0.38 INCH RAIN_24 | NONE; NONE | COC | |
| 0700 AM | 0230 AM 10/24/16 | 1 E WEATOGUE HARTFORD CT | COCORAHS ID: CT-HR-35 | W | 0 0 | M 0.39 INCH RAIN_24 | NONE; NONE | COC | |
| 0700 AM | 0230 AM 10/24/16 | 1 N NARRAGANSETT PIER WASHINGTON RI | COCORAHS ID: RI-WS-6 | W | 0 0 | M 0.25 INCH RAIN_24 | NONE; NONE | COC | |
| 0700 AM | 0230 AM 10/24/16 | 3 SE WEST GLOCESTER PROVIDENCE RI | COCORAHS ID: RI-PR-20 | W | 0 0 | M 0.31 INCH RAIN_24 | NONE; NONE | COC | |
| 0700 AM | 0230 AM 10/24/16 | 2 ESE EAST GREENWICH KENT RI | COCORAHS ID: RI-KN-2 | W | 0 0 | M 0.43 INCH RAIN_24 | NONE; NONE | COC | |
| 0700 AM | 0230 AM 10/24/16 | 1 N NEWPORT NEWPORT RI | COCORAHS ID: RI-NW-12 | W | 0 0 | M 0.50 INCH RAIN_24 | NONE; NONE | COC | |
| 0700 AM | 0230 AM 10/24/16 | 1 SSE SOUTHINGTON HARTFORD CT | COCORAHS ID: CT-HR-23 | W | 0 0 | M 0.28 INCH RAIN_24 | NONE; NONE | COC | |
| 0700 AM | 0230 AM 10/24/16 | 2 SW WARWICK KENT RI | COCORAHS ID: RI-KN-9 | W | 0 0 | M 0.39 INCH RAIN_24 | NONE; NONE | COC | |
| 0700 AM | 0230 AM 10/24/16 | 4 SSE AMHERST HAMPSHIRE MA | COCORAHS ID: MA-HS-17 | W | 0 0 | M 0.47 INCH RAIN_24 | NONE; NONE | COC | |
| 0700 AM | 0230 AM 10/24/16 | 1 E ROCKPORT ESSEX MA | COCORAHS ID: MA-ES-22 | W | 0 0 | M 0.46 INCH RAIN_24 | NONE; NONE | COC | |
| 0700 AM | 0230 AM 10/24/16 | 1 E LITTLE COMPTON NEWPORT RI | COCORAHS ID: RI-NW-7 | W | 0 0 | M 0.31 INCH RAIN_24 | NONE; NONE | COC | |
| 0700 AM | 0230 AM 10/24/16 | 4 W SPRINGFIELD HAMPDEN MA | COCORAHS ID: MA-HD-13 | W | 0 0 | M 0.27 INCH RAIN_24 | NONE; NONE | COC | |
| 0700 AM | 0230 AM 10/24/16 | 1 SW GARDNER WORCESTER MA | COCORAHS ID: MA-WR-39 | W | 0 0 | M 0.36 INCH RAIN_24 | NONE; NONE | COC | |
| 0700 AM | 0230 AM 10/24/16 | 2 SE ENFIELD HARTFORD CT | COCORAHS ID: CT-HR-5 | W | 0 0 | M 0.30 INCH RAIN_24 | NONE; NONE | COC | |
| 0700 AM | 0230 AM 10/24/16 | 2 SW FARMINGTON HARTFORD CT | COCORAHS ID: CT-HR-39 | W | 0 0 | M 0.27 INCH RAIN_24 | NONE; NONE | COC | |
| 0700 AM | 0230 AM 10/24/16 | 2 NNE SHREWSBURY WORCESTER MA | COCORAHS ID: MA-WR-30 | W | 0 0 | M 0.39 INCH RAIN_24 | NONE; NONE | COC | |
| 0700 AM | 0230 AM 10/24/16 | 2 SW WESTFIELD HAMPDEN MA | COCORAHS ID: MA-HD-15 | W | 0 0 | M 0.47 INCH RAIN_24 | NONE; NONE | COC | |
| 0700 AM | 0230 AM 10/24/16 | 1 W WEST HARTFORD HARTFORD CT | COCORAHS ID: CT-HR-36 | W | 0 0 | M 0.34 INCH RAIN_24 | NONE; NONE | COC | |
| 0700 AM | 0230 AM 10/24/16 | 2 ESE AUBURN WORCESTER MA | COCORAHS ID: MA-WR-32 | W | 0 0 | M 0.35 INCH RAIN_24 | NONE; NONE | COC | |
| 0700 AM | 0230 AM 10/24/16 | 2 S WEST BOYLSTON WORCESTER MA | COCORAHS ID: MA-WR-27 | W | 0 0 | M 0.58 INCH RAIN_24 | NONE; NONE | COC | |
| 0700 AM | 0230 AM 10/24/16 | 2 SSW SCOTLAND WINDHAM CT | COCORAHS ID: CT-WN-11 | W | 0 0 | M 0.25 INCH RAIN_24 | NONE; NONE | COC | |
| 0700 AM | 0230 AM 10/24/16 | 2 SE LEXINGTON MIDDLESEX MA | COCORAHS ID: MA-MD-67 | W | 0 0 | M 0.36 INCH RAIN_24 | NONE; NONE | COC | |
| 0700 AM | 0230 AM 10/24/16 | 3 WSW SOUTHWICK HAMPDEN MA | COCORAHS ID: MA-HD-17 | W | 0 0 | M 0.31 INCH RAIN_24 | NONE; NONE | COC | |
| 0700 AM | 0230 AM | 4 WNW HAVERHILL | COCORAHS | W | 0 | M 0.59 INCH RAIN_24 | NONE; NONE | COC | |

Take those same Daily Reports, from October 23, and with the click of a few buttons, all of your CoCoRaHS reports *can be* turned into a statement for all to see, called a Public Information Statement (PNS).

PNS Text Content Preview (header appended in transmission)

PNS Narrative (editable)

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THE FOLLOWING ARE UNOFFICIAL OBSERVATIONS TAKEN DURING THE PAST 36
HOURS FOR THE STORM THAT HAS BEEN AFFECTING OUR REGION. APPRECIATION
IS EXTENDED TO SKYWARN SPOTTERS...COOPERATIVE OBSERVERS...COCOCRAHS
OBSERVERS...MEDIA AND HIGHWAY DEPARTMENTS FOR THESE REPORTS. THIS
SUMMARY IS ALSO AVAILABLE ON OUR HOME PAGE AT WEATHER.GOV/BOSTON


**********************24 HOUR RAINFALL**********************

LOCATION                 24 HOUR     TIME/DATE   COMMENTS
                        RAINFALL          OF
                        /INCHES/   MEASUREMENT

CONNECTICUT

...HARTFORD COUNTY...
   1 NW COLLINSVILLE      0.44   700 AM 10/23  COCORAHS
   1 WSW WETHERSFIELD     0.41   900 AM 10/23  COCORAHS
   1 E WEATOGUE           0.39   700 AM 10/23  COCORAHS
   1 SSW NORTH CANTON     0.38   700 AM 10/23  COCORAHS
   1 W WEST HARTFORD      0.34   700 AM 10/23  COCORAHS
   1 ENE NORTH GRANBY     0.33   700 AM 10/23  COCORAHS
   2 SE ENFIELD           0.30   700 AM 10/23  COCORAHS
   1 SSE SOUTHINGTON      0.28   700 AM 10/23  COCORAHS
   2 SW FARMINGTON        0.27   700 AM 10/23  COCORAHS
   4 ENE BRISTOL          0.25   900 AM 10/23  COCORAHS

...TOLLAND COUNTY...
   1 W CRYSTAL LAKE       0.37   800 AM 10/23  COCORAHS

...WINDHAM COUNTY...
   2 ENE DAYVILLE         0.26   900 AM 10/23  COCORAHS
   2 SSW SCOTLAND         0.25   700 AM 10/23  COCORAHS

MASSACHUSETTS

...BRISTOL COUNTY...
   3 SSW DARTMOUTH        0.27   700 AM 10/23  COCORAHS

...DUKES COUNTY...
   2 WSW VINEYARD HAVEN   0.32   700 AM 10/24  COCORAHS
   1 WSW VINEYARD HAVEN   0.31   700 AM 10/24  COCORAHS

...ESSEX COUNTY...
   4 WNW HAVERHILL        0.59   700 AM 10/23  COCORAHS
   2 W ANDOVER            0.49   700 AM 10/23  COCORAHS
   1 E ROCKPORT           0.46   700 AM 10/23  COCORAHS

...HAMPDEN COUNTY...
   2 SW WESTFIELD         0.47   700 AM 10/23  COCORAHS
   3 WSW SOUTHWICK        0.31   700 AM 10/23  COCORAHS
   4 W SPRINGFIELD        0.27   700 AM 10/23  COCORAHS

...HAMPSHIRE COUNTY...
   2 SW PLAINFIELD        0.59   600 AM 10/23  COCORAHS
```

CLOSE | COPY ALL | COPY SELECTION | RRM ONLY | WRKPNS | TRANSMIT

Here is the trail of a Significant Weather Report.

From CoCoRaHS…..

**Significant Weather Report**

| | |
|---|---|
| Station Number: | MA-MD-74 |
| Station Name: | Somerville 0.7 SSE |
| Date: | 10/21/2016 11:30 PM |
| Submitted | 10/21/2016 11:40 PM |
| Notes: | Rain has mostly stopped, standing water in the yard is gone except in isolated puddles. |
| Taken at Registered Location: | True |
| Precip Duration Minutes: | 60 |
| New Precip Amount: | 0.28 in. |
| Total Precip Amount: | 1.77 in. |
| New Snow Depth: | NA |
| Total Snow Depth: | NA |
| Flooding: | |

To the Forecast Office. It only took a minute to arrive there! Maybe less!

Text 1: DENCCRAHS

File Edit Options Version Tools Scripts Products

AFOS Browser | Load History | WMO Search | Enter Editor | Accum | Update Obs | Clear

AFOS Cmd: WMO TTAAii CCCC: AWIPS ID:

```
NZUS45 KBOU 220341
CCRAHS

intense rain report from CoCoRAHS spotter:

10/21/2016 11:30 PM local time
County: Middlesex MA
Somerville 0.7 SSE (number MA-MD-74)
Latitude:
Longitude:
1.77 inches so far, with 0.28 inches in the past 60 mins
Flooding:
Comments: Rain has mostly stopped, standing water in the yard is gone
except in isolated puddles

Received NWS Boulder Fri Oct 21 21:41:19 2016 MDT
Sent to WFOs: BOX

All of today's CoCoRAHS observations are in WRKCCR (Boulder and Pueblo only)
Or at http://www.cocorahs.org (click on reports)
```

22nd of the month, 03:41 International time = 11:41PM EDT of the 21st of the month.

Removed by Editor

21:41:19 MDT = 11:41:19PM EDT

Who looks at CoCoRaHS data? Look back at previous newsletters and find…...

- You do!
- The River Forecast Center does!
- The National Operational Hydrologic Remote Sensing Center (NOHRSC) does!

And now, add one more to the list.

- Your NWS Forecast Office does!

# ***We Dare to Compare***

In previous newsletters, we dared to compare your nearby stations to their nearby airports' Automated Surface Observation Stations (ASOS) and uncovered differences in precipitation totals.

In this newsletter, we dare to compare your states' reporting numbers with other states in our network. We have grown tremendously this past year. Compared with other states of similar population and similar square mileage, we have more growing to do, and when our March recruiting drive returns, so will our recruiting efforts. Look towards Wake County in North Carolina to see the reporting density around a state capital, or Cook County in Illinois and its surrounding counties, and Hennepin County in Minnesota and its surrounding counties to see the reporting density with a large city.

October is a good month to do this comparison with reports. It is a month with no summer vacations, no holiday weekends, no impact from March recruiting, neutral climate to other states because winter reporting does have a negative impact in states with colder climates.

The values that you are about to see were gathered on November 5. It is understood and accepted that observers continue to fill in missing reports for weeks after a month has ended, however, those differences should not amount to much more than 1%-3% of what is displayed here.

Out of all of the reporting statistics that can be looked at, the one that was omitted was the one of "Completed by Multi-Day Reports." That statistic takes a manual and individual effort, looking through one station at a time that made a Multi-Day report to see if there are any other missing reports.

Compare Connecticut with other states with similar number of observers and similar reporting totals.

| | Connecticut | New Hampshire | Vermont | Maine | Louisiana | Utah | Idaho |
|---|---|---|---|---|---|---|---|
| Observers reporting | 86 | 89 | 108 | 120 | 104 | 77 | 93 |
| Reported all 31 days | 50 | 31 | 27 | 43 | 43 | 31 | 35 |
| Daily Reports | 2171 | 2043 | 2469 | 2718 | 2492 | 1851 | 2301 |
| Zero Reports | 1282 | 872 | 984 | 1305 | 2281 | 1236 | 854 |
| Non-Zero Reports | 889 | 1171 | 1485 | 1413 | 211 | 615 | 1447 |
| Daily Comments | 247 | 570 | 505 | 820 | 133 | 254 | 433 |
| Multi-Day Reports | 45 | 59 | 50 | 60 | 28 | 18 | 59 |
| Condition Monitoring Reports | 33 | 20 | 19 | 23 | 16 | 2 | 2 |
| Significant Weather Reports | 7 | 3 | 0 | 2 | 0 | 1 | 0 |
| Snow Fall Reports | 1099 | 1024 | 1474 | 1435 | 1664 | 1173 | 945 |
| Snow Depth Reports | 287 | 344 | 846 | 416 | 30 | 155 | 236 |
| | | | | | | | |
| Zero Reports:Non Zero | 1.4 | 0.7 | 0.7 | 0.9 | 10.8 | 2.0 | 0.6 |
| Daily Reports / Observer | 25.2 | 23.0 | 22.9 | 22.7 | 24.0 | 24.0 | 24.7 |
| Reports:Comments | 8.8 | 3.6 | 4.9 | 3.3 | 18.7 | 7.3 | 5.3 |
| Complete Stations % | 58% | 35% | 25% | 36% | 41% | 40% | 38% |

You are welcome to go through all 50 states, the District of Columbia, Puerto Rico, the Virgin Islands, Bahamas and all of the provinces of Canada. If you can find another area where Complete Stations % is greater than 50%, even with the laborious process of looking at Multi-Day reporting, and where Daily Reports / Observer is greater than 25, while taking on new observers, let us know.

***The*** most counterintuitive part of our network is the emphasis of zeros. We mention zeros every month. The difference between Complete Station reporting and Incomplete Station reporting involves Daily Reports of zeros.

Needing improvement are Daily Comments, Snow Fall and Snow Depth reports.

Rhode Island. Competed with Delaware, per capita, during March Madness 2016. During October, Rhode Island has added 7 reporting observers.

| | Rhode Island | Puerto Rico | Delaware |
|---|---|---|---|
| Observers reporting | 31 | 31 | 56 |
| Reported all 31 days | 13 | 8 | 14 |
| Daily Reports | 707 | 815 | 1287 |
| Zero Reports | 416 | 268 | 864 |
| Non-Zero Reports | 291 | 547 | 423 |
| Daily Comments | 180 | 120 | 133 |
| Multi-Day Reports | 4 | 1 | 29 |
| Condition Monitoring Reports | 3 | 1 | 9 |
| Significant Weather Reports | 3 | 0 | 1 |
| Snow Fall Reports | 321 | 172 | 666 |
| Snow Depth Reports | 86 | 0 | 0 |
| | | | |
| Zero Reports:Non Zero | 1.4 | 0.5 | 2.0 |
| Daily Reports / Observer | 22.8 | 26.3 | 23.0 |
| Reports:Comments | 3.9 | 6.8 | 9.7 |
| Complete Stations % | 42% | 26% | 25% |

All of Rhode Island's municipal drinking water comes from its inland reservoirs. Water is a big deal in Rhode Island. We do need as many observers to report as many days as possible.

A strong number of Daily Comments. While making Daily Comments, clarify your reports of precipitation with a duration, timing, additional details of the event, or repeat the value.

Snow Fall Reports … from Puerto Rico and Delaware? We can and will do better. Right, everyone?

Massachusetts. The one and only state that has grown slowly and steadily since its introduction to CoCoRaHS in 2009, always experiencing year-over-year increases in reporting and observers.

| | Massachusetts | Maryland | Montana | Iowa | Oklahoma | South Dakota |
|---|---|---|---|---|---|---|
| Observers reporting | 173 | 167 | 179 | 176 | 194 | 306 |
| Reported all 31 days | 71 | 53 | 61 | 51 | 66 | 66 |
| Daily Reports | 4099 | 3734 | 3971 | 3612 | 4006 | 4486 |
| Zero Reports | 2111 | 2620 | 1750 | 2398 | 3189 | 2928 |
| Non-Zero Reports | 1988 | 1114 | 2221 | 1214 | 817 | 1558 |
| Daily Comments | 772 | 596 | 1166 | 385 | 245 | 516 |
| Multi-Day Reports | 125 | 61 | 87 | 58 | 43 | 49 |
| Condition Monitoring Reports | 20 | 18 | 25 | 28 | 12 | 14 |
| Significant Weather Reports | 17 | 1 | 5 | 0 | 0 | 0 |
| Snow Fall Reports | 1794 | 2340 | 2071 | 2048 | 2485 | 2704 |
| Snow Depth Reports | 364 | 355 | 385 | 385 | 87 | 392 |
| | | | | | | |
| Zero Reports:Non Zero | 1.1 | 2.4 | 0.8 | 2.0 | 3.9 | 1.9 |
| Daily Reports / Observer | 23.7 | 22.4 | 22.2 | 20.5 | 20.6 | 14.7 |
| Reports:Comments | 5.3 | 6.3 | 3.4 | 9.4 | 16.4 | 8.7 |
| Complete Stations % | 41% | 32% | 34% | 29% | 34% | 22% |

Highest value of Reported all 31 days and Daily Reports / Observer in this grouping. All of the monthly newsletters and email messages do serve a purpose. Highest value of Multi-Day Reports, as well.

Last month's message about Significant Weather Reports, really made an impression upon the Massachusetts observers.

Needing improvement is Snow Fall Reports. And, of course, more comments that clarify and verify your precipitation report.

The Grand Conclusion. How do our three states in total compare? Southern New England = CT MA RI. Northern New England = VT NH ME.

| | Southern New England | Northern New England | Georgia | New York |
|---|---|---|---|---|
| Observers reporting | 290 | 317 | 345 | 351 |
| Reported all 31 days | 134 | 101 | 115 | 124 |
| Daily Reports | 6977 | 7230 | 7448 | 8513 |
| Zero Reports | 3809 | 3161 | 6824 | 3748 |
| Non-Zero Reports | 3168 | 4069 | 624 | 4765 |
| Daily Comments | 1199 | 1895 | 690 | 1983 |
| Multi-Day Reports | 174 | 169 | 121 | 171 |
| Condition Monitoring Reports | 56 | 62 | 69 | 83 |
| Significant Weather Reports | 27 | 5 | 3 | 22 |
| Snow Fall Reports | 3214 | 3933 | 5458 | 3877 |
| Snow Depth Reports | 737 | 1606 | 125 | 1016 |
| | | | | |
| Zero Reports:Non Zero | 1.2 | 0.8 | 10.9 | 0.8 |
| Daily Reports / Observer | 24.1 | 22.8 | 21.6 | 24.3 |
| Reports:Comments | 5.8 | 3.8 | 10.8 | 4.3 |
| Complete Stations % | 46% | 32% | 33% | 35% |

We added 26 reporting observers in October, and look forward to seeing that increase translate to an additional 700 Daily Reports when we get to December. Your emphasis of zeros and not missing any Daily Reports puts your state ahead of all others, picking 15 other similar states shown here with Reported all 31 days and Daily Reports / Observer.

We emphasize Daily Comments to clarify and verify your reports of precipitation, large or small. We emphasize Snow Fall and Snow Depth reports because we define where there is snow and where it is not. We jump into something new with Condition Monitoring Reports.

We will grow and then compare ourselves to a different group of states. We believe that precipitation is important and highly variable. We stand on the threshold of experiencing the strongest group of observers…. ever!

# ***Wrap up***

Thanksgiving is a unique holiday, a day in which we pause to give thanks.

Thanks to you, the volunteer observers of this Southern New England region. You continue to amaze others, grow by leaps and bounds, and do something special every day, every month, every season and every year. You capture the variability of precipitation like no other network ever built. You watch the weather. You define the climate.

This past year, our gauges may have been empty and our rulers may not have gotten much work, but that did not stop you from growing in numbers, in reports, in complete stations each month, and in your commitment to why we do what we do.

The staff at Headquarters would like to express their thanks, at this time of the year, to the observers who reported from October 2015 to September 2016. Login in to your account on the website and access My Account . Towards the upper right, within your 2016 Water Year, click on the link for Certificate. That action will download a pdf file containing your Certificate of Appreciation, where you can view or print it. Please pass on your feedback about this Certificate to the team at Headquarters at info@cocorahs.org

Every newsletter concludes with a word of thanks and this Thanksgiving feast of information concludes in the same way. Thank you for all that you do for CoCoRaHS, whether in the past, present and in the days to come.