The Weather Eye

A Southern New England
Cooperative Weather Observer Newsletter

April 2012 ***Editor: Kimberly Buttrick***

NO BLANK FIELDS ON THE B91

Please ensure you fill in all your required fields on the B91 form throughout the year. Whether you fill in the B91 manually or via WxCoder, do not leave blank entries. The climate centers (both regional and national) interpret a blank entry as missing data. Some of you report only precipitation. In this case, don't worry about filling in the temperature fields. For precipitation reports, all 3 fields require an entry: precipitation, snowfall and snow on the ground. If a precipitation field is zero, then note as such. If you have a field that is truly missing then put a capital "M" for missing in that field. Please follow these simple guidelines throughout the year. This ensures that the climate centers provide a consistent interpretation of zero vs. missing.

REMINDER ABOUT SNOW DEPTH

Please carry a snow depth (SD) on your B91 as long as there is snow on the ground. Even if there is only a trace on the ground, carry a capital "T" for trace in the SD column. For IV-ROCS users, you will be prompted to enter a snow depth (including T) until your depth goes to zero.

Anytime you report snowfall, you should not only report a liquid precipitation measurement, but also a snow depth measurement. With the no blank field ruling, whether you fill in the B91 manually or via WxCoder, all 3 precipitation fields require an entry, even if 0.

WHERE'S THE TRACE?

This winter it seemed as if we couldn't buy ourselves a snowflake! Despite this fact, there were occurrences when an observer observed flurries during their 24 hour observation period and/or observed flurries at the time of their observation, yet they would not carry anything for snowfall (SF) let alone precipitation. If you observe snow, you must carry at least a trace for SF and at least a trace for precipitation. Here's an example: You observe flurries but they melt upon contact with the ground. You would enter the following for the 3 precipitation fields:

Pcpn	**SF**	**SD**
T	T	0

Now that summer is approaching, you may have an instance when a thunderstorm

moves over your weather station and deposits not only heavy rainfall but hail as well. Hail is considered frozen precipitation therefore you would need to indicate a measurement in the SF column. Typically a capital "T" for trace would suffice, but you could possibly observe an inch worth of hail that falls and accumulates at your station. In this case you would indicate 1.0 inch in the SF column. At the time of your observation, if no hail remains on the ground, you would indicate "0" for snow depth.

SNOW MEASUREMENT HAS GONE VIRAL!

For those of you that have been provided with the Measuring Snow DVD, a portion of this presentation has been placed on YouTube. For your yearly seasonal snow review on snow measurement please refer to your DVD or go to this website:

http://www.erh.noaa.gov/gsp/coop/snow_measurement_guide.htm

SUM IT UP WITH "S"

Besides "M" for missing and "T" for trace, we now have another letter of the alphabet that can be used on the B91: "S" for accumulated precipitation (subsequent) or in other words a multi-day precipitation measurement.

There are times when observers miss a few days of observing or a few days of measuring melted snow from their overflow can because of other obligations. Upon return, the contents of the rain gauge are dumped without measuring it.

Every rain drop and every snow flake that falls into your rain gauge should be represented on your climate record. What falls into your rain gauge is part of your yearly precipitation total whether it was measured over 24 hours or 24 days. If the contents of the rain gauge are dumped without being measured, your climate record won't reflect the true precipitation amount for a given month or year.

So in the future, you should note "S" in the liquid precipitation column on missed days. Then on the day you return to measure the rain gauge contents, record this amount on the B91. In the remarks section, note how many days worth of precipitation is in the rain gauge.

Here are more specifics:

For WxCoder users: Open the Monthly Form. For an accumulated amount of rain or melted snow in your rain gauge due to missing days, enter a capital "S" in the precipitation column for those missing days. On the day you measure the accumulated total, enter your multi-day total in the current day precipitation column and use the drop-down menu under "Accum" to note the number of days with no report plus one (you need to include the current day). Also note in the remarks section your multi-day precipitation amount. Example: "2-day pcpn total."

For IV-ROCS users: Just follow the voice prompts on the phone. You add value to the climate record by noting the specifics on the manual form.

For Manual B91 users: For an accumulated amount of rain or melted snow in your rain gauge due to missing days, enter a capital "S" in the precipitation column for those missing days. On the day you measure the accumulated total, enter your multi-day total in the current day precipitation column. In

the remarks section, note the number of days with no report plus one (you need to include the current day). Example: "2-day pcpn total."

One of our observers recently had knee surgery. She could not find a back-up observer to take her precipitation measurements during and after surgery. When the observer was well enough to take a precipitation measurement, she measured a 22-day precipitation total of 4.65 inches in the rain gauge! In this instance, "S" would be noted in the liquid precipitation column for the missing days. On the day of measurement, the observer entered 4.65 inches in the liquid precipitation column of the B91 and noted "22-day pcpn total" in the remarks section of the B91.

What if my multi-day amount is zero? Nothing in the rain gauge should have representation in your climate record. A multi-day measurement of zero is good information to know so follow the procedures as noted above.

WXCODER USER'S GUIDE

For WxCoder users: The WxCoder User's Guide has been updated. You can access the new guide, dated February 2012, via your WxCoder account. Under the Welcome sign is the latest news dated March 13, 2012. From there is a link to the new User's Guide.

RAIN GAUGE TIDBITS

It is good practice to check your innertube and overflow can for leaks from time to time. As a suggestion, check for leaks at the beginning and at the end of the winter season.

Now that summer is soon approaching, remember to place the innertube into the overflow can with the funnel atop.

The innertube holds exactly 2.00 inches of water. If you ever measure that exact amount, be sure to check your overflow can for any additional rainfall that could have overflowed into the overflow can – thus the name "overflow can!"

The overflow can holds 20 inches of water. Thus if you receive more than 2.00 inches of rainfall, know that it will take a lot of overflow to fill up your rain gauge!

OBSERVATION PERIOD WEATHER

(Fog, Hail, Ice Pellets, Damaging Wind, Glaze and/or Thunderstorm)

aka WEATHER (Calendar Day)
aka WEATHER (Observation Day)

Seem confusing just reading the title? It is. This section is to clarify what is meant by Calendar Day Weather versus Observation Period Weather.

The historical data for Weather (Fog, Hail, Ice Pellets, Damaging Wind, Glaze and/or Thunderstorm) were collected based on the *calendar day* – the day it occurred. Now with the electronic ingest (WxCoder and IV-ROCS), Weather (Fog, Hail, Ice Pellets, Damaging Wind, Glaze and/or Thunderstorm) has been converted to an *observation day* report – the 24 hour time frame ending at the time of your observation.

If you look at a WS FORM B-91 from the booklet, you'll see the column for Weather is for *calendar day*. If you look at a WxCoder B91 form, you'll see the column for Weather is for *observation day*.

What is the difference again? *Calendar day* is based on the day it occurred. *Observation day* is the 24 hour period ending at the time of your observation.

Eventually all observers will be converted to the electronic format; thus in time all observers will be on the same page with reporting Weather (Fog, Hail, Ice Pellets, Damaging Wind, Glaze and/or Thunderstorm) based on the *observation day.* Until then, if you manually fill out a B91, continue on as you have been instructed to do. If you are a WxCoder user, follow the WxCoder User's Guide which instructs to check the appropriate box when Fog, Hail, Ice Pellets, Damaging Wind, Glaze and/or Thunderstorm occur within your reporting period – the *observation day* – the 24 hour time frame ending at the time of your observation. For IV-ROCS users, follow the phone prompts for Observation Period Weather after reporting precipitation.

TORNADO – June 1, 2011

On June 2, 2011, the National Weather Service in Taunton, MA sent 2 storm survey teams, comprised of 7 meteorologists, to investigate the damage from the tornadoes that occurred on June 1, 2011 in the area from Westfield to near Sturbridge. The goal was to assess the path length, path width and Enhanced Fujita (EF) Scale ranking. Due to the large areal extent of damage, the survey took 2 days and was comprised of a land based investigation and aerial survey.

The EF Scale ranges from EF0 to EF5. The scale has 28 damage indicators which describe the type of construction of a building and for each one there are varying descriptors for degrees of damage. Based on these indicators an estimate of wind speeds can be derived and the EF rating determined.

For reference, the EF Scale classifies tornadoes into the following categories:

EF0...wind speeds 65 to 85 mph.
EF1...wind speeds 86 to 110 mph.
EF2...wind speeds 111 to 135 mph.
EF3...wind speeds 136 to 165 mph.
EF4...wind speeds 166 to 200 mph.
EF5...wind speeds greater than 200 mph.

Following is a Public Information Statement that was issued by the National Weather Service in Taunton. This statement was compiled by the survey teams after the storm survey was completed:

...Three Tornadoes Confirmed on June 1, 2011 in Massachusetts...

...EF3 Tornado Confirmed from Westfield to Charlton...

Location: Westfield to Charlton in Hampden and Worcester Counties
Date: June 1, 2011
Estimated time: 417 pm to 527 pm EDT
Maximum EF-Scale rating: EF3
Estimated maximum wind speed: 160 mph
Maximum path width: one half mile
Path length: 39.0 miles
Beginning lat/lon: 42.10N / 72.75W
Ending lat/lon: 42.10N / 71.99W
Fatalities: 3 as confirmed by MA EMA
Injuries: 200 as confirmed by MA EMA

...Summary...
The National Weather Service in Taunton Massachusetts has confirmed an EF3 tornado occurred from Westfield to Charlton Massachusetts on June 1, 2011.

A supercell thunderstorm developed over western Massachusetts Wednesday afternoon. This storm strengthened and produced a long lived, very significant tornado that did extensive damage across southwest and south central Massachusetts.

This storm will be noted not only for its intensity, but also for the length of the continuous damage path, approximately 39 miles. The tornado was also very wide at some points, reaching a maximum width of one-half mile.

The tornado first touched down in the Munger Hill section of Westfield with damage mainly limited to trees, many uprooted and snapped. The roof of Munger Hill Elementary School was also damaged. The tornado rapidly intensified as it moved into West Springfield. The tornado caused extensive damage to industrial buildings and homes. Several buildings had their roofs removed by the tornado, a few structures collapsed and several multi-story buildings lost their upper stories.

The tornado then crossed the Connecticut River at the Memorial Avenue Bridge and moved into the city of Springfield. Here the tornado produced extensive damage to the south side of the downtown area where many homes were destroyed. In addition, commercial brick buildings sustained major damage. Roofs were removed from many of these large commercial structures. The tornado also produced severe structural damage to town homes and apartments near Springfield College. The tornado continued moving east into the Island Pond section of Springfield, where Cathedral High School sustained significant damage, and many homes in this part of the city were completely destroyed.

The tornado continued to move east through Wilbraham near the Wilbraham-Hampden town line producing nearly complete deforestation and significant damage to nearby structures.

The tornado then continued directly through the middle of the town of Monson. In Monson, widespread damage occurred to commercial and residential buildings, with many homes completely destroyed. The roof of Monson High School was destroyed. Forested parts of town experienced nearly complete deforestation and in some locations the bark was stripped from tree trunks.

The tornado moved across the Brimfield State Forest where it reached its maximum width of approximately one-half mile. Additional significant damage occurred both to structures and forested areas for many miles before the tornado reached the Southbridge Municipal Airport. Here numerous aircraft were lifted off the ground and blown into the woods east of the airport.

The tornado then moved east before lifting in the southwest part of Charlton.

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...EF1 Tornado Confirmed in Wilbraham...

Location: Wilbraham in Hampden County
Date: June 1, 2011
Estimated time: 632 pm to 640 pm EDT
Maximum EF Scale rating: EF1
Estimated maximum wind speed: 90 mph
Maximum path width: 200 yards
Path length: 3.6 miles
Beginning lat/lon: 42.14N / 72.48W
Ending lat/lon: 42.15N / 72.40W
Fatalities: 0
Injuries: 0

...Summary...
The National Weather Service in Taunton Massachusetts has confirmed an EF1 tornado in Wilbraham on June 1, 2011.

A National Weather Service survey team confirmed that an EF1 tornado touched down in the northwest corner of Wilbraham. The tornado continued east crossing Main Street and Mountain Road, but remained south of Route 20. Most of the damage was to trees with large limbs snapped off, as well as numerous trees downed. Several trees were uprooted.

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...EF1 Tornado Confirmed in North Brimfield...

Location: North Brimfield in Hampden County

Date: June 1, 2011
Estimated time: 654 pm to 657 pm EDT
Maximum EF Scale rating: EF1
Estimated maximum wind speed: 90 mph
Maximum path width: 100 yards
Path length: 1.3 miles
Beginning lat/lon: 42.14N / 72.23W
Ending lat/lon: 42.15N / 72.20W
Fatalities: 0
Injuries: 0

...Summary...
The National Weather Service in Taunton Massachusetts has confirmed an EF1 tornado in North Brimfield on June 1, 2011.

A National Weather Service survey team confirmed that a second EF1 tornado touched down north of Brimfield west of Route 19. This tornado crossed Route 19 and lifted near Tower Hill Road. The damage was surveyed on the ground and by aircraft. The damage consisted of trees with large limbs snapped off, as well as numerous trees downed - a few of which were uprooted. This tornado is from the same parent thunderstorm that produced the tornado in North Wilbraham.

The National Weather Service would like to thank the various state and local agencies and the Civil Air Patrol for all of their assistance in completing these storm surveys.

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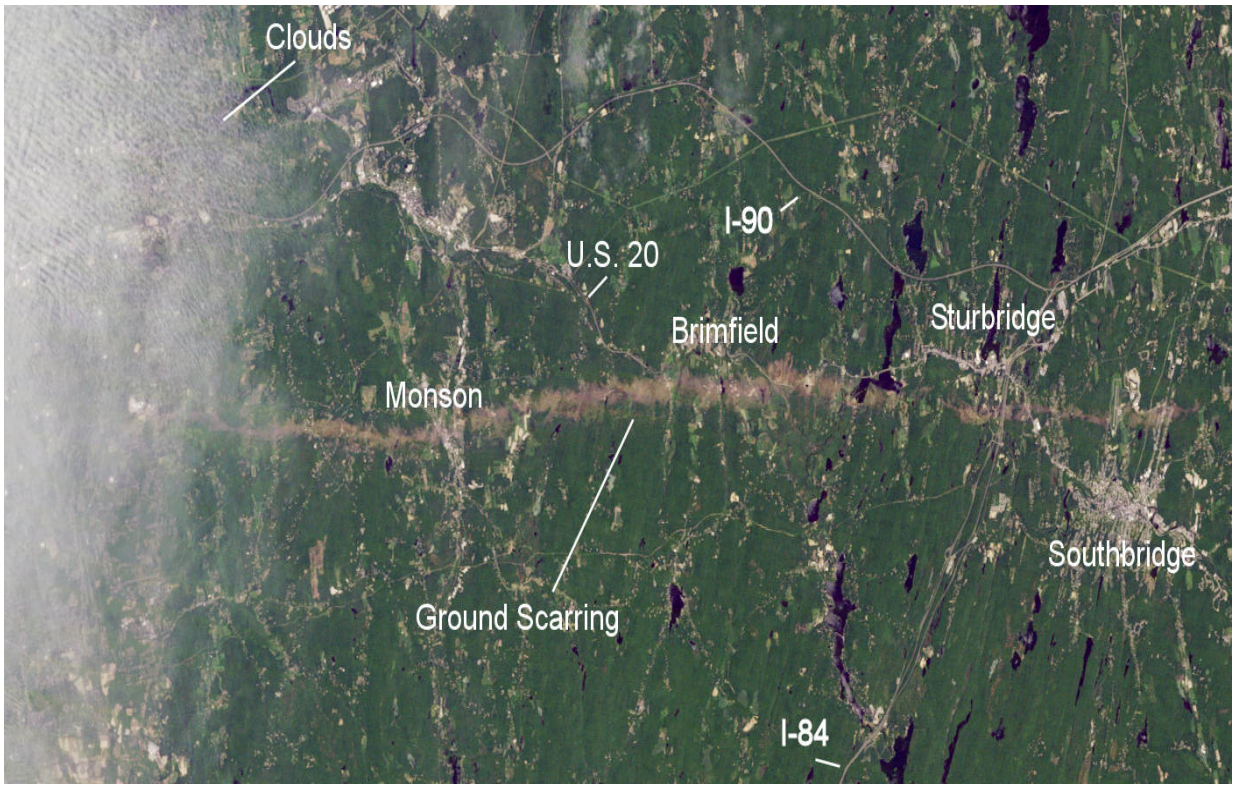
Storm Survey Team:
Thompson/Manning/Dellicarpini/Dunham/ Doody/Vallier-Talbot/McCormick

After the initial storm survey, an additional tornado was confirmed. This 4th tornado was confirmed and rated as an EFO in the Fiskdale and Glen Grove areas of Worcester County. This tornado touched down briefly from the same thunderstorm that produced the Wilbraham and North Brimfield tornadoes. It touched down in Wells State Park at 710 pm EDT and then continued on across Walker Pond Road and Podunk Road, lifting up just west of Route 49 at 713 pm EDT. Damage was generally limited to downed trees, but one of these fell onto a house on Walker Pond Road.



Above: June 1, 2011 tornado track across Massachusetts as seen from space. Photo courtesy of NASA.

HURRICANE IRENE
– August 27-28, 2011

From the desk of Joseph Dellicarpini
- *Science and Operations Officer at NWS Taunton*

Irene's Impacts on Southern New England

Hurricane Irene, which weakened to a Tropical Storm as it reached New England, brought strong winds and torrential rainfall to the region on August 27 and 28, 2011 resulting in widespread wind damage and record flooding. Irene tracked from southeastern New York into western Connecticut, western Massachusetts and southern Vermont. As with most tropical systems in New England, damaging winds were confined to the east of the center, mainly across Rhode Island and southeast Massachusetts, while the heaviest rains were focused along and to the west across much of interior New England.

Wind gusts of 50 to 60 mph were reported from southern and eastern Connecticut across Rhode Island and into much of central and eastern Massachusetts. This resulted in widespread tree damage and power outages to roughly two million customers, some of whom did not get their power restored until a week later.

Rain bands ahead of Irene on Saturday, August 27th produced a quick 2 to 4 inches of rainfall across parts of eastern

Massachusetts. More substantial rains reached the area during the overnight hours on Saturday into the morning of Sunday, August 28th. The heaviest rainfall was focused in western Massachusetts and western and central Connecticut, where as much as 6 to 10 inches of rain was reported. Farther to the east, somewhat lesser amounts of 3 to 6 inches were reported in much of southwest New Hampshire, central Massachusetts, and northeast Connecticut and totals of 1 to 3 inches were observed across Rhode Island and eastern Massachusetts.

Freshwater flooding from Irene affected much of the Northeast. In Southern New England, the hardest hit areas included the east slopes of the Berkshires into Hartford County, Connecticut. Several river gauges maintained by the USGS set new records, including the Deerfield River which crested 6 feet higher than its previous flood of record.

Major flooding occurred in northwest Massachusetts where there were numerous evacuations and a number of homes that were flooded and others condemned. One building in Shelburne Falls was moved quite a distance downstream of its foundation. Another home was reported to have been washed away in Leyden on the Green River. Many highways and main roadways were affected by flooding including Interstate 91 and Routes 2, 5, 20 and 112. Large swaths of farmland were inundated along the Deerfield River. On the Greenfield River in Greenfield, the Eunice Williams covered bridge was dislodged from its abutments and river scouring was so severe the river diverted itself around the bridge.

Flooding also occurred in Hampshire and Hampden Counties in western Massachusetts along the Westfield River as well as along its uncontrolled tributaries. Hartford County in Connecticut was also affected by significant flooding. In Bristol, the Pequabuck River overflowed its banks onto Main Street. Two people went canoeing in the flood waters before their canoe was overturned. One person drowned and the other person was rescued. In Burlington, Bunnell Brook reached its 3rd worst flood on record (dating back to the 1930s).

Since heavy rain fell throughout the entire Connecticut River Basin, significant flooding affected much of the middle and lower reaches of the Connecticut River. Gauges at Montague, Northampton, Holyoke, Thompsonville, Hartford and Middletown all experienced their highest crests since the 1980s. In North Walpole, NH the river crested at its highest level since 1938.

Irene was a strong reminder that impacts from tropical storms and hurricanes are not limited to the coastline. These systems can produce damaging winds and torrential rainfall far inland, creating devastating flooding if conditions are favorable.

YOUR COOP RAINFALL TOTALS FROM IRENE

MA

Amherst	3.67
Ashburnham	4.09
Ashburnham North	4.81
Barre Falls Dam	5.34
Belchertown	4.25
Beverly	1.70
Birch Hill Dam	3.92
Blue Hill	1.98
Bridgewater	1.48
Brockton	1.00

Buffumville Lake	5.97
Chatham	0.06
East Brimfield	5.95
East Sandwich	0.13
East Wareham	0.29
Edgartown	0.09
Foxboro	2.66
Franklin	3.10
Granville Dam	**7.68**
Greenfield	***.**
Groveland	2.01
Hardwick	5.57
Haverhill	2.48
Hingham	1.58
Hyannis	T
Jamaica Plain	2.97
Lawrence	2.44
Leverett	4.25
Lowell	5.34
Marblehead	1.56
Maynard	3.62
Middleboro	1.34
Middleton	3.00
Milford	5.88
Natick	5.15
Newburyport	1.62
Northbridge	6.02
Norton	2.24
Plymouth/Kingston	0.70
Reading	2.65
Rochester	0.76
Southbridge	5.80
Sunderland	3.56
Taunton NWS	2.11
Tully Lake	4.34
Walpole	3.26
Ware	5.08
Westfield	5.88
Woods Hole	0.24
Worthington	6.45

NH

East Milford	3.54
Fitzwilliam	4.40
Francestown	**5.95**
Greenville	4.58
Hudson	3.88
Jaffrey Silver Ranch Arpt	4.17
Keene	3.56
MacDowell Lake	4.43
Marlow	4.70
Massabesic Lake	1.98
Nashua	3.63
Otter Brook Lake	3.51
Surry Mountain	3.12
Walpole	4.00

CT

Barkhamsted	7.31
Burlington	**9.50**
Hampton	4.25
Shuttle Meadow Rsvr	6.15
Staffordville	5.28
Storrs	4.38
West Thompson Lake	3.61

RI

Coventry	2.24
Kingston	1.37
North Foster	**3.85**
Tiverton	1.59
Woonsocket	3.32

***.** Our Greenfield, MA site, located at the Greenfield Water Pollution Control Facility, was the only coop station casualty from the wrath of Irene. Greenfield is located in Franklin County which is in the northwest part of the state. On Sunday morning, August 28, Greenfield reported 1.15 inches of rainfall. Irene had a lot more rain to deposit during the day on Sunday. Come Monday morning, Greenfield had no report because their rain gauge got swept away in flood waters. The Greenfield station is located within a quarter mile of the confluence of the Green and Deerfield Rivers – both of which came well out of their banks Sunday afternoon inundating the Greenfield facility. Additionally, 1 mile away, the confluence of the Deerfield and Connecticut Rivers also came well out of

their banks. Our Skywarn Spotters from western Franklin County reported storm total rainfall of 7.50 to nearly 10.00 inches from Irene! It took our Greenfield station over a month to recover from the flood damage.

SNOWTOBER – October 29-30, 2011

The winter season of 2011-2012 arrived early. In fact, winter weather revealed itself just before Halloween. Despite the fact that we ended up with a lack luster winter, the late October Nor'easter of 2011 provided quite a punch to Southern New England and will forever be known to weather buffs as Snowtober. Snowtober arrived near the 20th anniversary of another famous Nor'easter – the Halloween Nor'easter of October 31, 1991, also known as the Perfect Storm.

Snowtober will be remembered for a couple of key highlights: Several flights full of passengers that were left on the tarmac at Bradley International Airport for over 7 hours; the amount of snow deposited on the region; but the main highlight was downed trees and power lines resulting in the loss of power measured in days if not weeks for portions of Connecticut, Massachusetts and southern New Hampshire.

For every severe weather event that occurs, the specifics of that storm get documented and archived at the National Climatic Data Center (NCDC). What follows is a storm summary of Snowtober which is now part of the storm data archive at NCDC.

From the desk of Rebecca Gould
- *Forecaster at NWS Taunton*

A rare and historic October Nor'easter brought very heavy snow to portions of Southern New England on Saturday October 29, 2011. Low pressure tracked northeast from the North Carolina coast Saturday morning, rapidly strengthening as it passed well south of Nantucket Saturday evening. As the storm intensified, colder air from aloft was drawn into New England resulting in heavy snow in the interior. Snowfall accumulations of one to two feet were common in the Monadnocks, Berkshires, Connecticut Valley, and higher elevations in central Massachusetts. Up to 31 inches of snow was reported at Jaffrey, New Hampshire and Plainfield, Massachusetts. Minor accumulations were even reported down to the south coast as the rain changed to a period of snow late Saturday night before ending. The accumulation of the heavy wet snow on trees and power lines resulted in widespread tree damage and power outages across many communities in central and western Massachusetts, southern New Hampshire, and northeastern Connecticut. This resulted in school closures and numerous towns cancelled or rescheduled Halloween and trick-or-treating activities.

The precipitation started as mainly snow early Saturday afternoon across the interior of Southern New England, although a brief period of rain at the onset was common across the lower elevations. Several hours of heavy snow occurred from mid afternoon through late evening on Saturday October 29th. Snowfall rates reached 3 inches per hour for several hours in the Berkshires and Monadnocks as a nearly stationary band of heavy snow set up across this region.

The snow tapered off just after midnight Saturday night in western New England with the last of the precipitation exiting eastern New England Sunday morning.

This storm also brought damaging winds to Cape Cod and the islands with wind gusts up to 70 mph occurring early Sunday morning October 30th as well as minor to moderate coastal flooding to east coastal Massachusetts during the high tide early Sunday morning.

CT:
At the peak of the storm, 830,000 customers in Connecticut were without power. Throughout Connecticut, 164 AT&T cell phone towers were damaged resulting in degraded cell phone service until towers could be repaired and power restored. Air travel in and around the Hartford area was disrupted when numerous flights were diverted to Bradley International Airport (BDL) from the New York City metro area and then power outages affected the BDL airport. Several airplanes were not able to allow their passengers to disembark for seven hours or more.

A motorist in Hebron died in a car accident believed to be the result of the weather conditions.

MA:
At the peak of the storm, 665,000 customers in Massachusetts were without power. Seventy-seven shelters were opened and sheltered over 2000 residents across the state. All shelters were closed by the evening of November 6th. A State of Emergency was declared by Governor Patrick on October 29th and he declared an end to the State of Emergency on November 6th.

Six fatalities occurred during and in the aftermath of the storm. They are not included in the Storm Data statistics due to their very indirect nature. Further descriptions of these fatalities are as follows: Four people died from carbon monoxide poisoning from improperly ventilated generators, including a 47 year old Worcester man and a 49 year old Hatfield woman. A Lunenberg resident died in a fire. A 20 year old Springfield man died after walking into an area of downed power lines and stepping on or touching an electrified metal guardrail.

NH:
At the peak, 300,000 customers in New Hampshire were without power.

YOUR COOP SNOWFALL TOTALS FROM THE SNOWTOBER STORM

MA

Amherst	6.5
Ashburnham	21.0
Ashburnham North	19.0
Barre Falls Dam	9.0
Belchertown	5.0
Beverly	1.7
Birch Hill Dam	18.0
Blue Hill	6.0
Bridgewater	2.5
Buffumville Lake	9.4
Chatham	0.0
East Brimfield	7.0
East Sandwich	T
East Wareham	T
Edgartown	0
Foxboro	3.5
Franklin	4.5
Granville Dam	4.0
Groveland	5.9

Hardwick	14.0
Haverhill	3.0
Hingham	T
Jamaica Plain	2.0
Lawrence	1.0
Leverett	10.0
Lowell	4.3
Marblehead	1.5
Maynard	3.0
Middleboro	1.3
Middleton	0.5
Milford	2.5
Natick	1.5
Newburyport	4.0
Northbridge	3.5
Norton	2.5
Plymouth/Kingston	0
Reading	5.0
Rochester	T
Southbridge	5.0
Sunderland	12.6
Taunton NWS	2.3
Tully Lake	12.0
Walpole	4.4
Ware	12.5
Westfield	11.7
Woods Hole	0
Worthington	**21.7**

NH

East Milford	11.5
Fitzwilliam	23.0
Francestown	20.0
Greenville	22.0
Hudson	10.3
Jaffrey Silver Ranch Arpk	**31.4**
Keene	18.1
MacDowell Lake	16.5
Marlow	14.0
Massabesic Lake	6.0
Nashua	5.0
Surry Mountain	8.0
Walpole	12.0

CT

Barkhamsted	**15.0**
Burlington	**15.0**
Hampton	6.0
Shuttle Meadow Reservoir	**15.0**
Staffordville	8.0
Storrs	7.6
West Thompson Lake	2.0

RI

Kingston	0.5
North Foster	**6.5**
Tiverton	T
Woonsocket	2.0

THE CLIMATE PENDULUM

A little over a year ago in March 2011, much of our region was doused with above normal precipitation in the form of both rain and snow. In addition, March 2011 was preceded by a winter with above normal snowfall. For early 2012, our region has experienced below normal rainfall and anomalously above normal temperatures. And this was preceded by a winter with below normal snowfall. What a difference a year can make!

For a comparison of what a difference a year can make, here is a list of monthly precipitation totals from March 2011 compared to those from February and March 2012. Keep in mind that spring 2011 was abundant with precipitation from not only March but the eventual snow melt from the snow pack. In comparison, spring 2012 had little to no snow pack atop below normal precipitation for February and March.

MA	***3/11***	***2/12***	***3/12***
Amherst	5.33	0.79	1.45
Ashburnham	5.70	0.83	2.22
Ashburnham North	6.16	0.89	1.99
Barre Falls Dam	4.59	0.80	1.57
Belchertown	4.33	0.89	1.29
Beverly	2.52	1.09	1.95
Birch Hill Dam	5.74	0.89	1.48
Blue Hill	2.69	0.70	2.11
Bridgewater	2.22	0.76	1.80
Brockton	2.12	1.29	1.36
Buffumville Lake	4.11	0.82	1.69
Chatham	1.82	1.68	1.52
East Brimfield	4.91	0.71	2.11
East Sandwich	2.78	1.44	2.12
East Wareham	2.25	0.96	1.81
Edgartown	1.86	2.06	1.75
Foxboro	2.71	0.57	1.94
Franklin	2.78	0.60	1.80
Granville Dam	7.32	1.28	2.08
Greenfield	5.91	0.74	1.68
Groveland	2.63	1.13	2.41
Hardwick	5.15	0.85	1.75
Haverhill	3.42	1.05	2.20
Hingham	1.89	0.95	1.98
Hyannis	2.15	2.33	1.65
Jamaica Plain	2.88	0.68	1.99
Leverett	5.57	0.94	1.68
Lowell	4.87	0.97	2.27
Marblehead	1.93	1.11	1.69
Maynard	3.07	1.00	2.11
Middleboro	2.62	1.00	1.70
Middleton	2.42	0.85	1.60
Milford	2.23	0.56	1.69
Natick	2.67	0.65	1.80
Newburyport	3.59	1.12	2.98
Northbridge	3.37	0.63	1.94
Norton	2.54	0.93	1.85
Plymouth/Kingston	2.78	1.75	2.12
Reading	2.85	1.25	1.67
Rochester	2.76	1.04	1.63
Southbridge	5.34	0.81	2.14
Sunderland	5.54	0.77	1.66
Taunton NWS	2.47	0.81	1.82
Tully Lake	5.90	0.82	1.49
Walpole	2.74	0.72	1.95
Ware	5.37	0.89	1.79
Westfield	7.54	1.13	2.46
Worthington	5.94	0.87	2.03

NH	***3/11***	***2/12***	***3/12***
East Milford	5.28	1.08	2.41
Fitzwilliam	4.32	1.11	1.92
Hudson	5.26	1.07	2.01
Keene	5.33	0.96	1.56
MacDowell Lake	5.50	1.04	2.16
Massabesic Lake	4.19	1.12	1.55
Nashua	5.26	0.68	2.34
Otter Brook Lake	4.78	0.97	1.50
Surry Mountain	4.84	0.72	1.45
Walpole	5.19	0.59	1.52

CT	***3/11***	***2/12***	***3/12***
Barkhamsted	6.91	0.89	2.27
Burlington	7.10	0.71	1.89
Hampton	4.19	0.92	1.91
Shuttle Meadow Rsvr	4.66	0.63	1.45
Staffordville	5.15	0.73	1.93
Storrs	3.87	0.46	1.14
West Thompson Lake	3.79	1.14	1.99

RI	***3/11***	***2/12***	***3/12***
Kingston	2.11	1.34	1.75
North Foster	3.30	1.46	1.50
Tiverton	2.54	1.37	1.87
Woonsocket	2.90	0.62	2.01

Comparing last year to this year, last year we had above normal snowfall in the winter that led to a spring with above normal precipitation. This year we had below normal snowfall in winter followed by below normal rainfall in early spring.

The below normal snowfall and rainfall from this past winter through March 2012 caused a myriad of issues for our region through mid April. The response in rivers and streams (hydrologic response) was strong, with unusually low river and stream levels for early April. Fire danger was high,

as noted by the number of days with Red Flag Warnings in early April and soil was unusually dry. Ground water began to fall below normal across much of the area. Yet despite the dryness, reservoirs were generally close to normal.

As of this writing our region was in a moderate to severe meteorological drought. Despite the meteorological drought by mid April, there were no drought declarations by any of the states in Southern New England, including New Hampshire. There are multiple factors that go into a state drought declaration, including not only precipitation and stream flows, but also water supply, agriculture, and drought indices such as the Palmer Drought Index and Crop Moisture Index. Greenup has only begun, and the vast majority of water suppliers in Southern New England have normal or above normal water supply. In some areas, ground water is still within a normal range for this time of year, although it was falling

Thus the climate pendulum and its variability bring extremes to our region as noted by Winter/Spring 2011 compared to Winter/Spring 2012. The extremes are always noteworthy and get headline news. But the story behind the story is what is in the middle and that is what is called the norm. It is the norm that we base our explanations of above versus below normal levels.

NEW CLIMATE NORMALS 1981-2010

Climate normals are simply 30 year averages of a climate element such as precipitation or temperature. As you know, the National Climatic Data Center (NCDC) archives all of your weather data. From this data climate normals are computed. The current 30 year normals include the years from 1981 to 2010. This data has been published by NCDC. You can check out NCDC's website for the latest publication of normals, but for easier viewing and interpretation of the data, check out the following web links for normals across our Nation. If your weather station is not included, it could be that 30 years of continuous data from your site was not reported.

http://ggweather.com/normals/

or

http://www.atmos.washington.edu/marka/normals/50states_normals.2010.html

NCDC LINK

If you ever need weather data from your station or another location, you can find the data at the National Climatic Data Center's website:

http://www.ncdc.noaa.gov/oa/ncdc.html

Click on the far right box titled, Weather/Climate Events, Information & Assessments…click on Data and Products...then click on a desired link.

SWE REPORTS ARE SWELL!

From the desk of Nicole Belk

- *Service Hydrologist at NWS Taunton*

As you know, this past winter season brought a lack of snowpack, in stark contrast to last winter of 2010 to 2011. That being said, for those of you set up to provide us snow depth and for some of you even snow water equivalent (SWE) during the wintertime, we appreciate your efforts! No

doubt we'll have upcoming winters with plenty of snow. The 2010 to 2011 winter was a great example of how SWE measurements were able to help us assess flood threat. Your SWE measurements were used to contribute to a national map, the local Northeast River Forecast Center snow depth map, SWE map and river flood modeling, and our own local briefings to federal, state and local officials. This past winter, even reports of "zero" inch snow depth helped us assess the situation, which was ultimately a below normal flood threat for the winter/early spring season. That being said, it doesn't always take snowmelt to produce flooding (although it certainly contributes to the risk!) Significant rain events like those in March 2010 can be enough to produce significant flooding without snowmelt. But during other events, such as those from last February and March 2011 and April 2007, snowmelt played a role in the degree of flooding. So to sum up, we really appreciate your snow depth and SWE measurements, and will look forward to receiving them again next winter. Thank you!

For those who report SWE, please also jot down your measurement in the remarks section of your B91 (eg: SWE = x.x)

POSH TRIVIA

Many years ago, sailing across the Atlantic Ocean was the preferred method (if not the only method) of travel. Passengers who could afford the journey from Europe to the Americas favored the sun at their portholes, thus they would book "Port Out and Starboard Home" (P.O.S.H.). It was the elite passengers who could afford such accommodations, thus the acronym POSH has evolved to become a current day adjective meaning, classy, stylish, noble etc.

If you ever take a cruise, you too may want to book posh accommodations. Travel in style and class like the aristocrats and nobles did many years ago and book a stateroom with a balcony and perhaps extra square footage!

COOP PAGE REMINDER

A Coop Page is located on Taunton's National Weather Service web site. To access the Coop Page go to:

http://www.erh.noaa.gov/box/officePrograms/Coop.shtml

There are some informative links to access, such as the history of the Coop Program, the National Cooperative Observer Newsletter, snow measurement guidelines, and current and past copies of *The Weather Eye*!

DAVIS WIND SYSTEMS

Are you an observer with a Davis Wind System at your site? If so, our office would be interested in your wind data. During high wind events, your NWS in Taunton would value your reports. We also would appreciate it if you could take a picture of the Davis wind sensor location and email to:

Kimberly.Buttrick@noaa.gov

Forecasters at our office issue Wind Advisories when they expect the following criteria to be met:

31-39 mph (27-34 kts) sustained and/or
46-57 mph (40-49 kts) gusts

High Wind Warnings are issued when the following criteria are expected to be met:

≥ 40 mph (35 kts) sustained and/or
≥ 58 mph (50 kts) gusts

If your Davis Wind System measures wind that meets or exceeds the above criteria, we ask that you call this information into our office.

Please call: 800-243-1686

You can also enter your data on-line. Go to our website…

www.weather.gov/boston

On the left, look for the yellow highlighted ***Current Hazards*** and underneath you will see a link ***"Send Us Your Report."***

MONTHLY B91 DEADLINE REMINDER

For those who submit manual copies of the B91, please try to mail your form within the first week of the month. If you submit your B91 form through WxCoder, please edit and close out your form by the 5th of the month. Sooner is better than later. Your timely reports speed up the quality control process.

WE WELCOME

A new Cooperative Weather Observing station has been established in Coventry, RI. The Town of Coventry Public Works Department began taking daily precipitation measurements June 1, 2011. The Coventry Public Works Department is located near the headwaters of the Pawtuxet River – South Branch. It is very beneficial to have daily precipitation measurements from this site as the data assists the Northeast River Forecast Center with river stage forecasts and flood crests along the Pawtuxet River.

The National Weather Service in Taunton, MA is now an official Cooperative Weather Observing station as of January 1, 2012. Our office has over 10 years of weather data collected at our station so it seemed appropriate to make our site "official!"

WE SAY GOODBYE

Charles Strickland, our long standing observer from Marlow, NH has retired at age 85. Charles put in many years as an observer from his community, starting in 1977. We wish you all the best Charles!

Steven Sauter, our observer from Ashfield, MA decided to move on last year due to pressing family matters. Since 1995 we have appreciated Steve's daily observations from the Northwest Territory of Massachusetts.

Ann Mastroianni, our observer from the Town of Barnstable Department of Public Works, Water Pollution Control Division, located in Hyannis, MA passed away last year. She lost her battle to cancer. May you rest in peace Ann.

WE RECOGNIZE

Thanks to all of you for your dedication and interest in weather data collection. Your daily efforts are much appreciated. When it comes to weather, you are the eyes and ears of your community. Look ahead to view a number of fellow Coop Observers that have received length of service awards over the past 16 months.

Those not pictured but who received awards are as follows:

William Kerwin
Danvers Water Treatment Plant
– Middleton, MA
-35 year Length of Service award

Bob Lavergne
Woonsocket Water Treatment Plant
– Woonsocket, RI
-30 year Length of Service award

Ed Engelsen
Town of Barnstable Department of Public Works, Water Pollution Control Division
– Hyannis, MA
-30 year Length of Service award

Duane Klimczyk
Amherst Waste Water Treatment Plant
– Amherst, MA
-30 year Length of Service award

John Morin
Town of Barnstable Department of Public Works, Water Pollution Control Division
– Hyannis, MA
-20 year Length of Service award

Ann Mastroianni
Town of Barnstable Department of Public Works, Water Pollution Control Division
– Hyannis, MA
-20 year Length of Service award

Louis Moreau
Danvers Water Treatment Plant
– Middleton, MA
-20 year Length of Service award

John Bradshaw
Marblehead Water Department
– Marblehead, MA
-15 year Length of Service award

Don Timpson
University of Rhode Island
Department of Plant Sciences
– Kingston, RI
-15 year Length of Service award

Peter Ho
Town of Barnstable Department of Public Works, Water Pollution Control Division
– Hyannis, MA
-5 year Certificate of Recognition

Kathleen Woods
– Beverly, MA
-5 year Certificate of Recognition

Matt Coleman
U.S. Army Corps of Engineers
– East Brimfield Lake, MA
-5 year Certificate of Recognition

Jim Jordan, pictured left, is a Senior Operator at the Amherst Waste Water Treatment Plant in Massachusetts. Jim received a Certificate of Recognition for 5 years of weather observing.

Amherst is a notable site for weather observing with records that date back to 1836! Amherst is part of our Nation's Historical Climate Network.

Edward Capone, center, receives a 35 year Length of Service award for weather observing from his home in Norton, MA. For his full time job, Ed is a Service Coordination Hydrologist with the Northeast River Forecast Center (NERFC) which is co-located with Taunton's Weather Forecast Office. For this milestone award, Ed was recognized by his peers from left to right,
Joseph Dellicarpini – Science and Operations Officer, NWS Taunton,
David Vallee – Hydrologist-in-Charge, NERFC, Ed Capone receiving his award,
Alan Dunham – Observation Program Leader, NWS Taunton and
Robert M. Thompson – Meteorologist-in-Charge, NWS Taunton.

Pictured left is Raymond Whitley of Newburyport, MA receiving a 25 year Length of Service Award.

Weather records from Newburyport date back to 1931. Thank you to Ray for continuing the tradition!

Bob Rochefort, an Operator at the Woonsocket Water Treatment Plant, RI received a 20 year Length of Service Award. Behind Bob and just beyond the fence is the Blackstone River. Bob is part of a long tradition of weather observing from Woonsocket as employees of Woonsocket Water have been taking weather observations since 1931.

Pictured right is Fintan P. Moore, Jr. of Keene, NH receiving a 10 year Length of Service Award.

Fintan is part of a long tradition of observing as Keene weather records date back to 1892! Keene is part of our Nation's Historical Climate Network with over 100 years of data.

The U.S. Army Corps of Engineers – East Brimfield Lake, MA receives an Honored Institution Award for 50 years of service. Receiving this honored award are Park Rangers Pat Tetreault (left) and Keith Beecher (right). Additionally, Pat received a 30 year Length of Service award and Keith received a 20 year Length of Service award.

Thanks to all of You!

CONTACT INFORMATION

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445 Myles Standish Blvd.
Taunton, MA 02780

508-823-2262 or 508-823-1983 or
800-243-1686
Fax: 508-823-2321

Email: **Kimberly.Buttrick@noaa.gov**

William.Simpson@noaa.gov

Web: **www.weather.gov/boston**