The Four Seasons

National Weather Service Burlington, VT

VOLUME VII, ISSUE II

SUMMER 2021

Table of Contents

Letter from the Editors

Welcome to the Summer (or end of) Edition of the Newsletter! This issue we cover the severe weather outbreak from July 20th followed by the new 30-year averages for the hurricane season along with options for weather observing in our area. We round out the newsletter with a focus on our NWS Burlington Family, by bidding a fond farewell to our ASA, taking some time to meet a meteorologist and then welcoming the two newest members to the family! Perhaps a look at two future weather forecasters?

We are also recognizing the 10th anniversary of Tropical Storm Irene with a Story Map narrative of how the event unfolded from our perspective. Look for the link on our website and social media!

Severe Weather Outbreak on July 20th

by Eric Evenson

Strong to severe thunderstorms moved across much of northern New York and Vermont during the afternoon and evening hours on Tuesday, July 20th, 2021. There were many reports of trees and powerlines down (resulting in numerous power outages), along with a couple of hail reports, a funnel cloud, and flooding in the form of washed out roads.

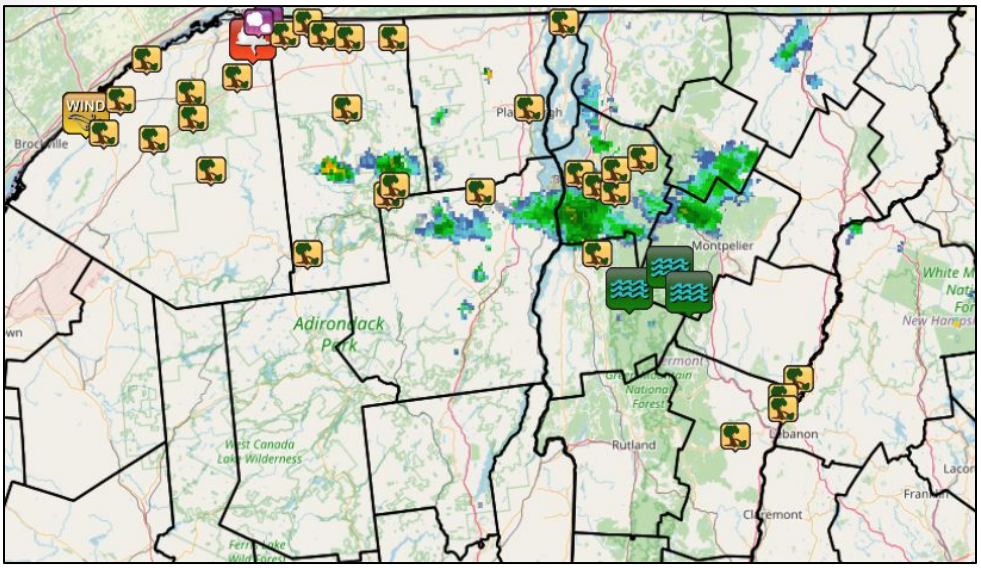
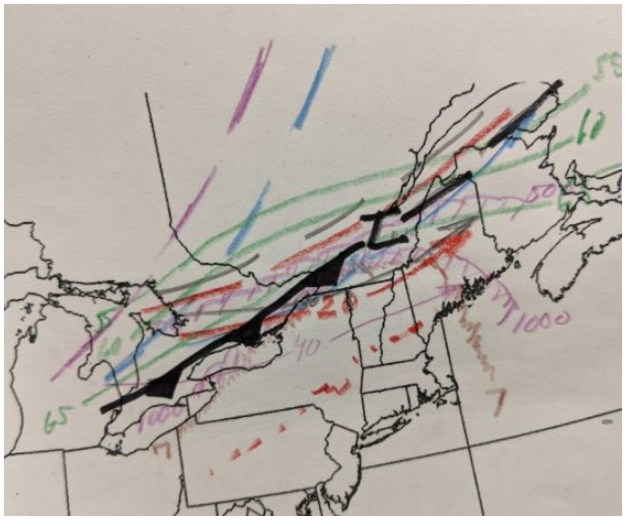


Figure 1: Map of severe weather reports, showing downed trees, observed high winds, a funnel cloud, large hail, and washed out roads.

...Continued from Page 1

Meteorological Overview:

Forecasters identified several favorable meteorological parameters leading up to the event. A composite analysis was created before the event (Figure 2) showing several of the parameters overlaid. The main feature was a surface cold front (in black) that would be dropping southward through the day and provide the focus for storms to develop. Ahead of the front, CAPE (Convective Available Potential Energy) values of at least 1000 J/kg were noted, along with steep lapse rates from the surface to 700 mb. High CAPE values and steep lapse rates are ingredients that we look for to indicate that the atmosphere is unstable, which favors thunderstorm development.



Also of note was the line of storms with a history of damaging winds that eventually moved across our area. The storms had maintained themselves for a very long time as the system moved across Ontario, Canada, and were now about to move into a more unstable environment over our BTV forecast area.

Figure 2 (left): Hand drawn composite analysis created before the event.

Radar Imagery:

The majority of severe weather during this event was associated with a line of strong to severe thunderstorms that moved through as the cold front traversed the area. Some of the most notable damage occurred in northern Saint Lawrence County, NY, in the vicinity of the Brasher Falls State Forest (area circled in Figure 3a). Velocity radar imagery (not shown) supported the idea of strong, straight-line winds in this area that resulted in multiple downed trees and straight-line wind damage.

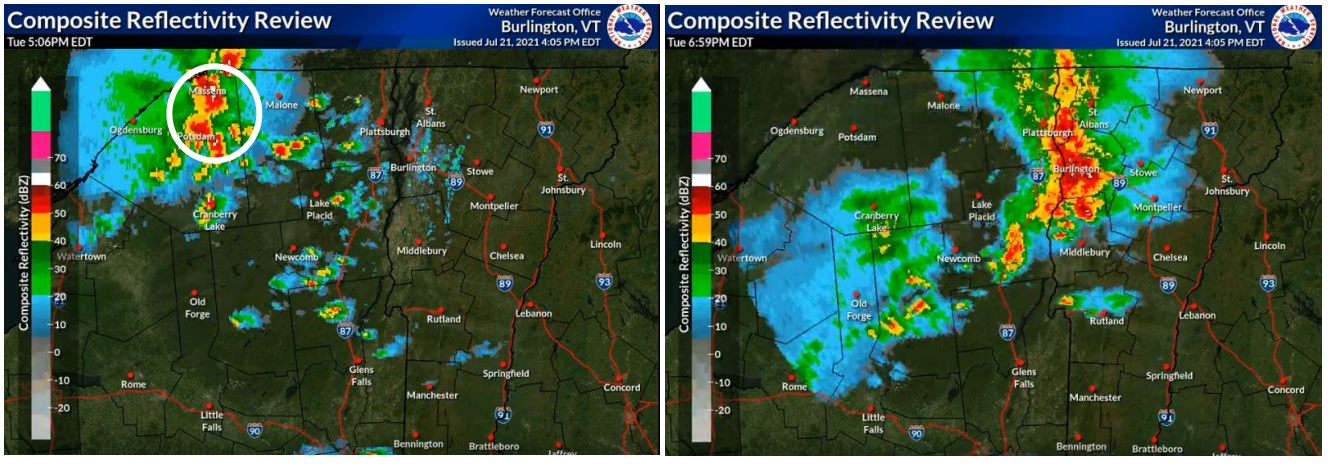


Figure 3: Radar imagery showing thunderstorms on July 20th, 2020 at (a) 5:06 PM EDT (b) 6:59 PM EDT.

...Continued from Page 2

A funnel cloud was also filmed in this area, although a subsequent NWS damage survey conducted by NWS Burlington determined that the funnel cloud never reached the surface. The damage survey indicated only pockets of wind damage and trees down in the same direction with no evidence of any tornadoes found.

Between about 6:20 PM and 7:30 PM, it was the Champlain Valley's turn to see strong, straight-line winds and heavy rain (Figure 3b, previous page). Tree and power line damage was quite widespread during this period, ranging north-south from Alburgh to Monkton and west-east from Au Sable Forks, NY, to Underhill, VT. Although not shown here, a similar scenario occurred in the Upper Valley as the line of thunderstorms moved southeastward. The most significant damage reported was numerous uprooted trees two miles north of the Norwich, VT, town center. Between about 7:10 PM and 8:10 PM, torrential rainfall in the vicinity of the central Green Mountains associated with individual cell mergers within the main line caused rainfall exceeding an inch in well under an hour. As a result, numerous washouts were reported in Lincoln, Waitsfield (Figure 4), and Roxbury, Vermont.

Figure 4: Road washout in Waitsfield, VT. Courtesy of Waitsfield Emergency Management.

Storm total rainfall was a good approximation to where the hardest hit areas for severe weather were during this event (Figure 5). Many such locations saw between 1.25 and 1.75 inches of rainfall, part of a memorably wet month of July 2021.

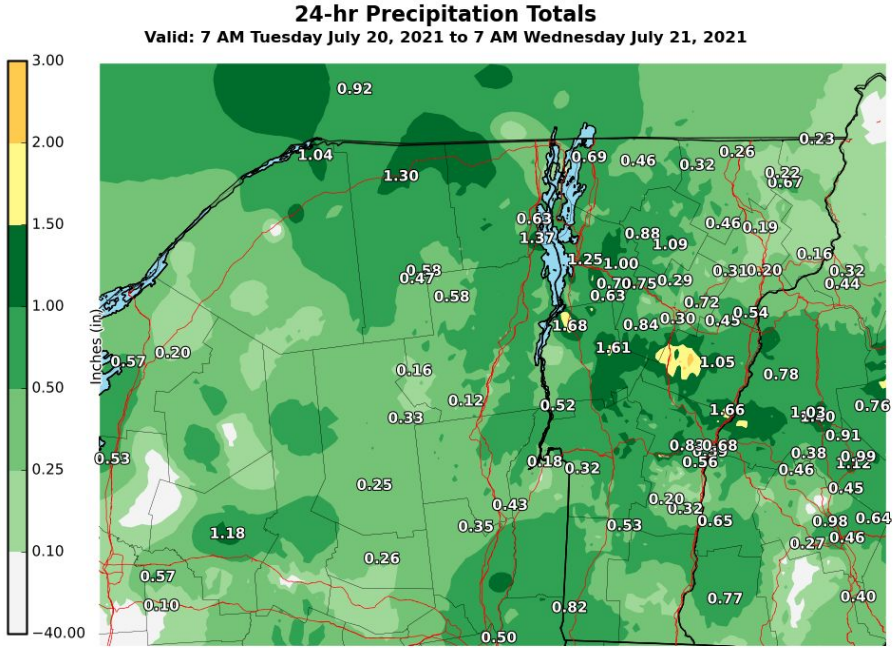


Figure 5: 24 Hour Precipitation Totals from the July 20th storms.

New 30-year Averages for Hurricane Season

Questions and Answers

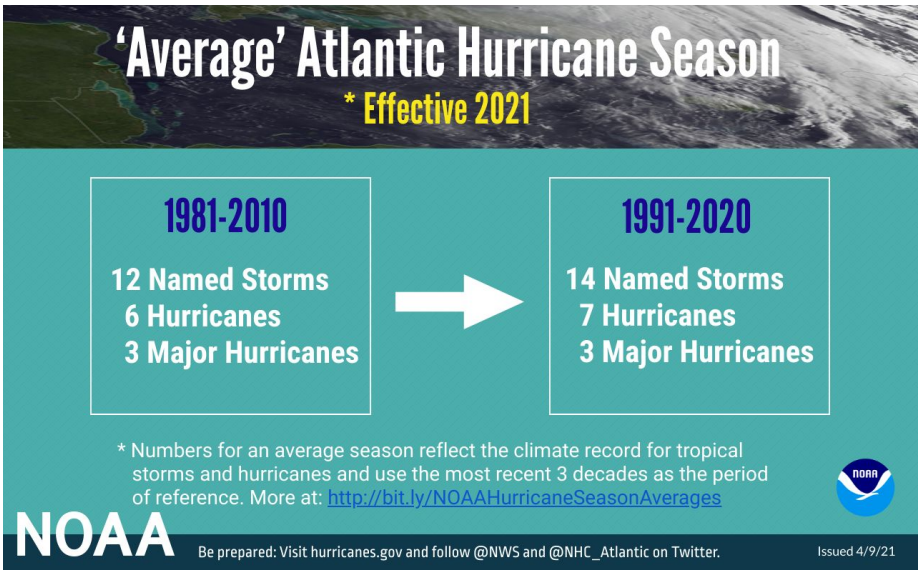
NOAA is updating the set of statistics that will be used to determine when a hurricane season is above-, near-, or below-average relative to the climate record. For the 2021 hurricane season outlook, NOAA's Climate Prediction Center (CPC) is now using 1991 - 2020 as the 30-year period of record (while the 2020 season used 1981 - 2010 as the 30-year period of record). Establishing a new set of climate "averages" for the hurricane season every decade ensures the latest science and data are factored into the hurricane season outlooks for the Atlantic, Eastern Pacific, and Central Pacific basins.

Questions and Answers

What are the new average numbers expected for Atlantic hurricane season?
Moving forward, an average Atlantic hurricane season will have 14 named storms, with 7 hurricanes, and 3 major hurricanes. The previous averages included 12 named storms, and 6 hurricanes. The number of major hurricanes remains the same at 3.

How are they different from the previous decade's averages?
The average number of named storms, hurricanes, and major hurricanes in the Atlantic has increased slightly. For major hurricanes we do not reflect a change since we round to a whole number; however, there is a small increase from 2.7 to 3.2 in the averages.

Why does NOAA update the climate average every decade?
Updating the climate averages every ten years is a regular part of our process to ensure NOAA's information for seasonal hurricane outlooks is reflective of the latest data and period of record. This allows our outlooks and analyses to also benefit from the latest advancements in observations and computing technologies that continue to provide more detailed environmental information.



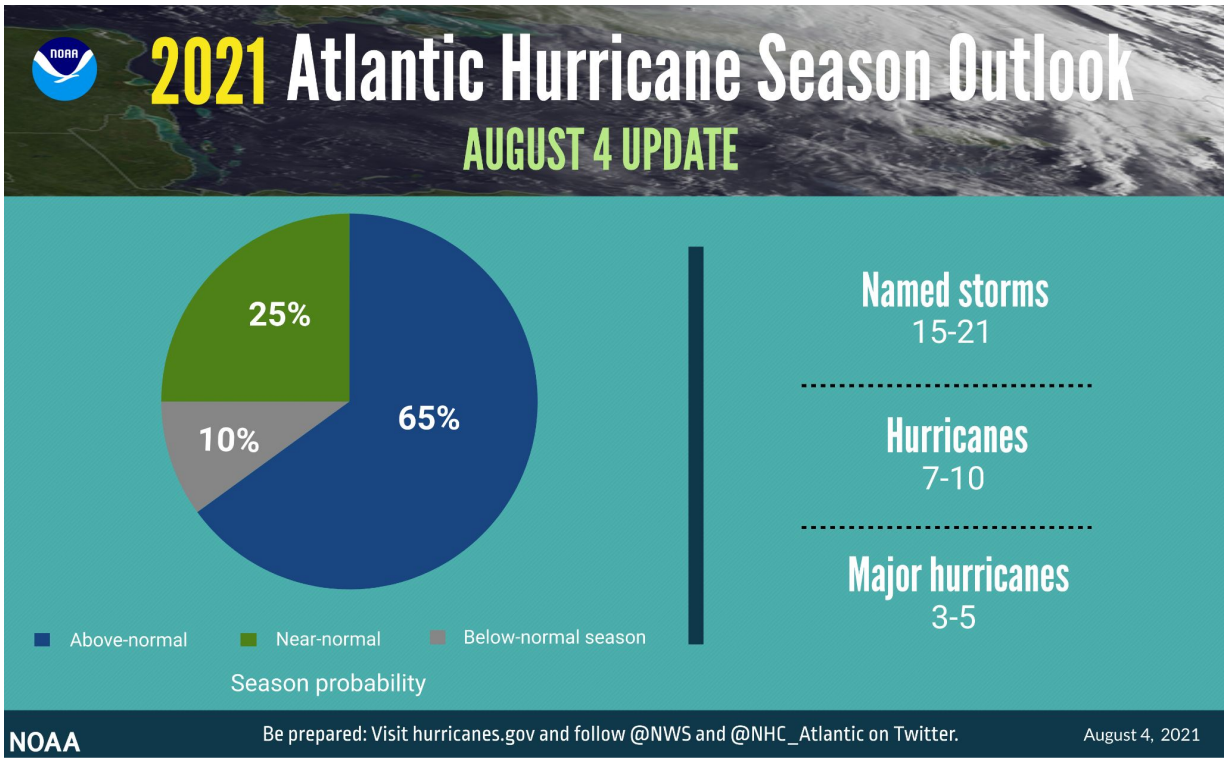
How should people interpret the new numbers since "average" this year was "above average" last year?
The new numbers represent a very basic analysis of the data over the past 30 years, which considers many of the years during the on-going high activity era. These numbers can be used as a baseline estimate for potential activity in the coming years, though NOAA will release our outlooks based on the latest technologies and methods available.

...Continued from Page 5

What is causing the increased averages?
The increase in the averages may be attributed to the overall improvement in observing platforms, including NOAA's fleet of next-generation environmental satellites and continued hurricane reconnaissance. It may also be due to the warming ocean and atmosphere which are influenced by climate change. The update also reflects a very busy period over the last 30 years, which includes many years of a positive Atlantic Multi-decadal Oscillation, which can increase Atlantic hurricane activity.

What is the outlook for this hurricane season?
The 2021 Atlantic hurricane season is well underway, and atmospheric and oceanic conditions remain conducive for an above-average hurricane season, according to the annual mid-season update issued by NOAA's Climate Prediction Center, a division of the National Weather Service. The latest outlook reflects that the number of expected named storms (winds of 39 mph or greater) is 15-21, including 7-10 hurricanes (winds of 74 mph or greater), of which 3-5 could become major hurricanes (Category 3, 4, or 5 with winds 111 mph or greater). NOAA scientists predict that the likelihood of an above-normal 2021 Atlantic hurricane season is 65%. There is a 25% chance of a near-normal season and a 10% chance of a below-normal season.

"A mix of competing oceanic and atmospheric conditions generally favor above-average activity for the remainder of the Atlantic hurricane season, including the potential return of La Nina in the months ahead," said Matthew Rosencrans, lead seasonal hurricane forecaster at NOAA's Climate Prediction Center. Atlantic sea surface temperatures are not expected to be as warm as they were during the record-breaking 2020 season; however, reduced vertical wind shear and an enhanced west Africa monsoon all contribute to the current conditions that can increase seasonal hurricane activity. These conditions are set against the backdrop of the ongoing warm phase of the Atlantic Multi-Decadal Oscillation, which has been favoring more active hurricane seasons since 1995.



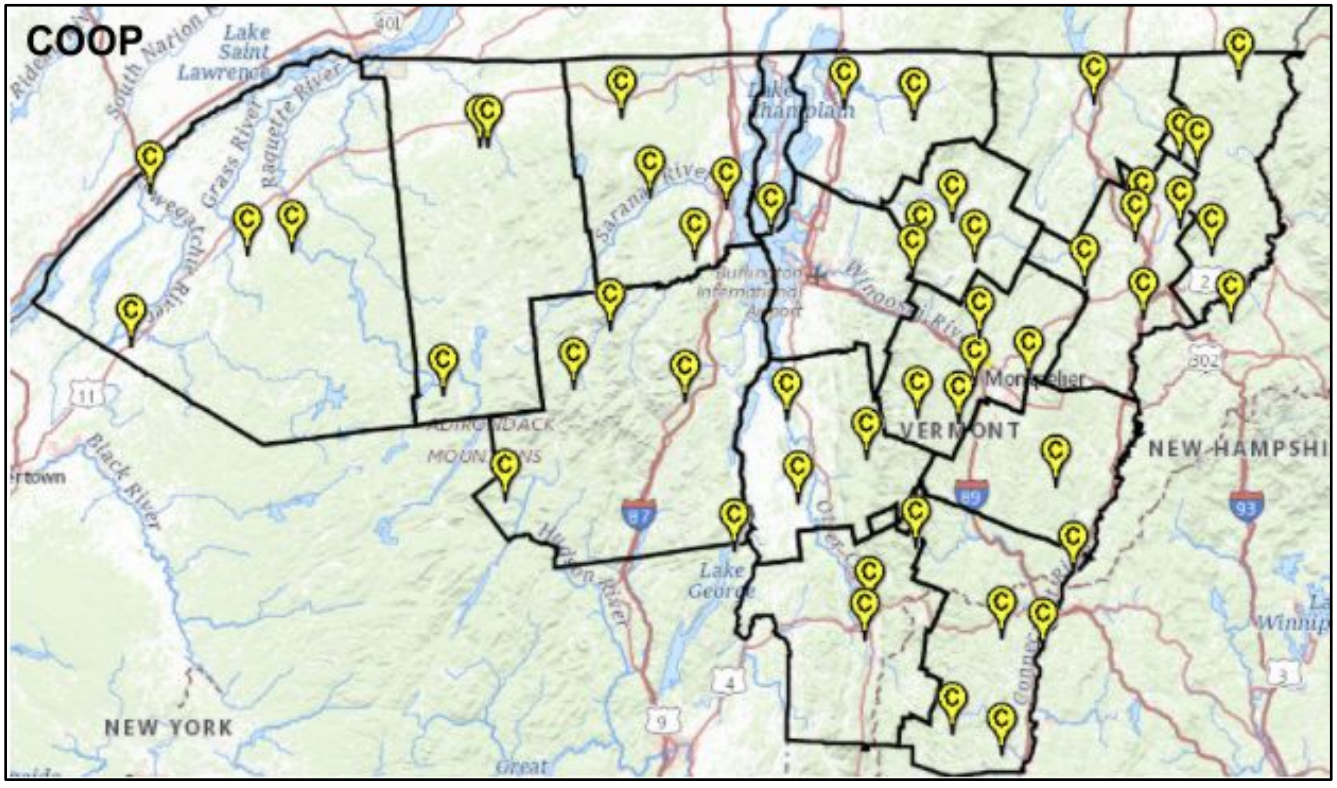
Options for Weather Observing

by Seth Kutikoff

When we have hazardous weather, timely ground truth from our community is helpful for local meteorologists. Our NWS office puts extra stock in the reports from our trained spotters and observers. These citizen scientists fall under three categories:

	Storm Spotter (SKYWARN)	**Daily Weather Observer (COOP)**	**Precipitation Reporter (CoCoRaHS & mPING)**
What you do	Observe all hazardous weather conditions	Record weather conditions at your home on long-term basis	Measure and report precipitation, including rain, snow, and hail
How you report	Spotter hotline, social media, or storm report page	Via website	Via apps
How to get trained	NWS spotter talks	NWS Observing Program Leader will train you and install and maintain equipment	Online materials

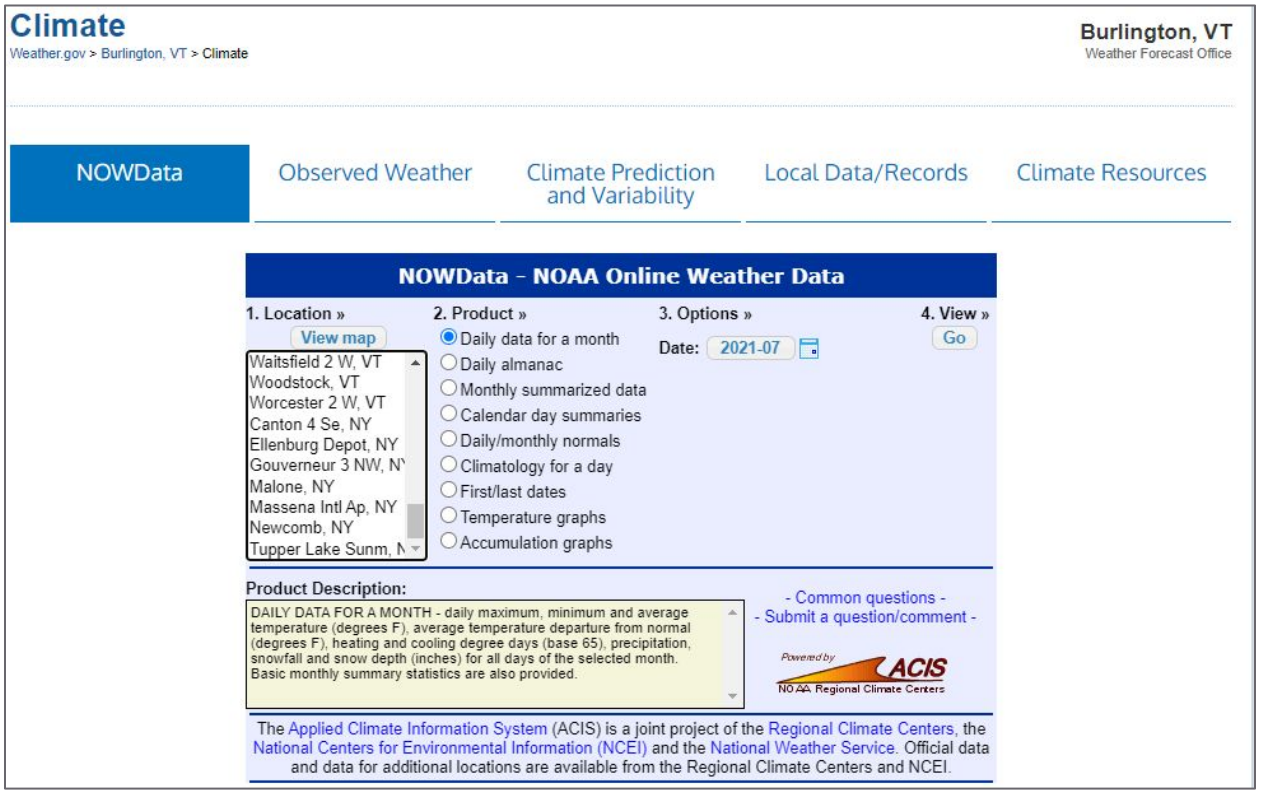
Some ambitious individuals fill multiple roles encompassing more than one category of observers. For instance, some COOP observers also are part of the CoCoRaHS network. Many storm spotters will also report precipitation through mPING (a free weather reporting app through NOAA).



…Continued from Page 6

Cooperative Observer Program (COOP)

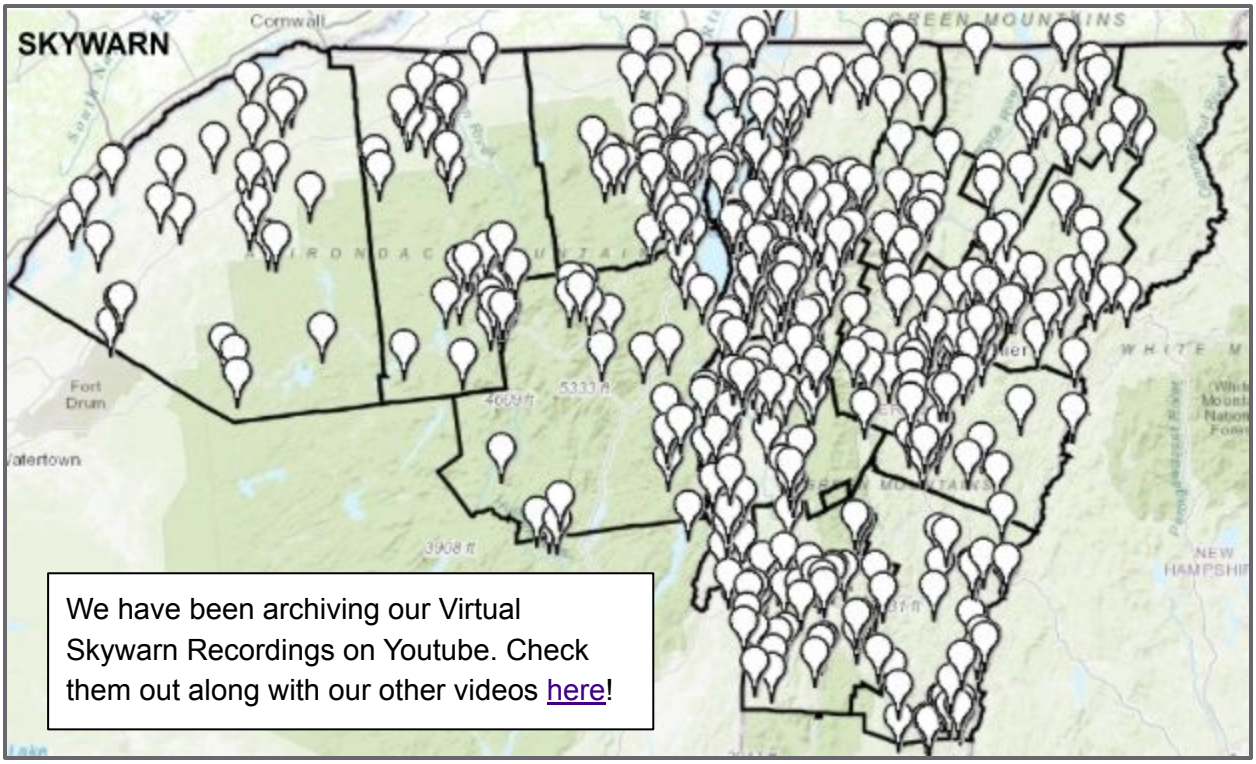
This prestigious network of traditional weather observers goes back to the late 19th century. As seen in the map on page 6, over 60 observers are currently established here in the North Country. Because they are trained by an NWS Observing Program Leader, who supplies and regularly maintains standardized equipment to measure temperature and precipitation, these data are treated as official in the US climatology. Our new climate page features these COOP sites:



Observers have the option to submit daily observations, such as through the website wxcoder.org, or mail in a B-91 Daily Observation Form at the end of each month. These observations include maximum temperature, minimum temperature, temperature at time of observation, 24 hour rainfall or snowfall, snow depth, present weather, and past weather, such as fog, thunder, and damaging winds. Observers will often add additional comments about the weather to add color to their report. For instance, one of our observers measured a trace of rain during the 24 hour period ending 8 AM on August 27 and described that they were on the northern edge of strong storm cells that led to significant rainfall just a few miles to the south.

Observers are presented with a Length of Service award, beginning at 10 years, that recognize service to the United States. National newsletters are found here, with our very own Stephen Maleski featured on page 1 of the Summer 2020 issue.

...Continued from Page 7

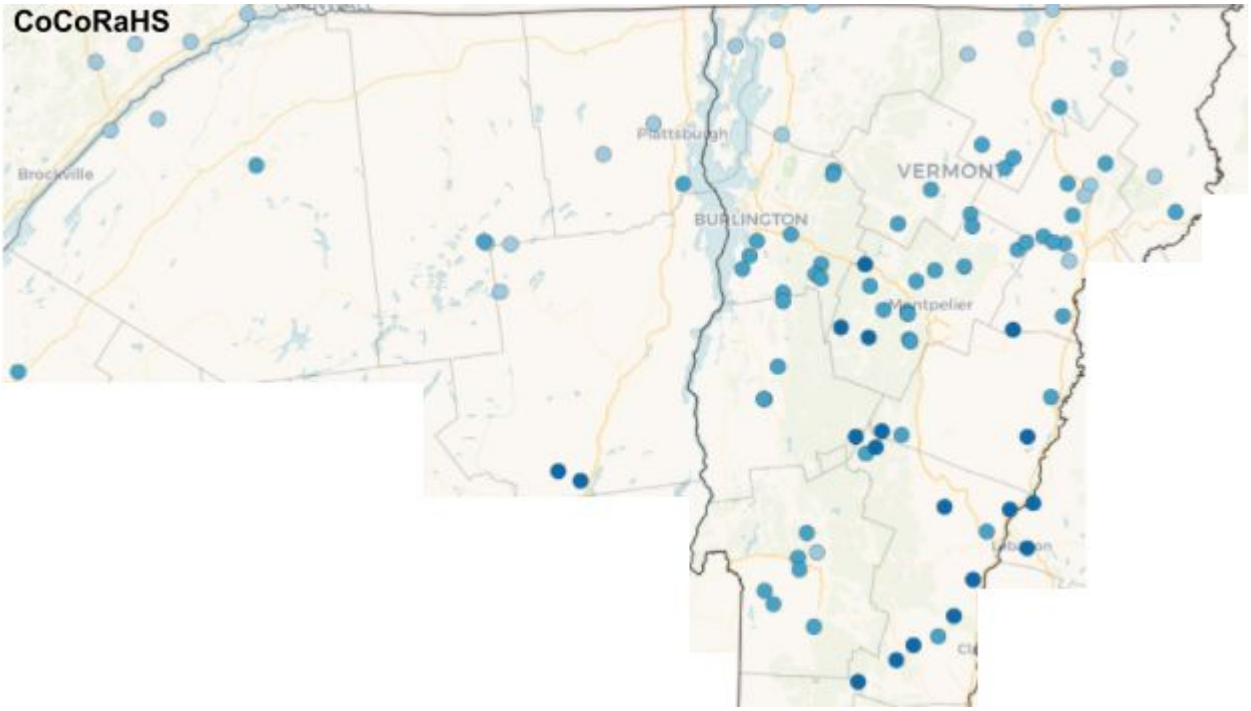


SKYWARN Storm Spotter Program

Our SKYWARN program is the core spotter volunteer program of the NWS. The map above shows all of the locations where spotters have sent us reports over the years. Here's what they report:

EVENT TYPE	THINGS TO REPORT
TORNADO	Observed on the ground or sustained, rotating wall cloud/funnel cloud. Is there a waterspout? What damage has occurred? If safe, can you see where it is headed?
HAIL	Measure the largest hailstone or compare to common objects. Quarter size hail is considered severe. For a detailed table click here.
WIND DAMAGE/GUSTS	Report downed trees/powerlines or use an instrument to measure. Wind gusts over 58 mph are considered severe.
FLOODING	Report flooded roadways, rivers at or over bank full. Is it standing or flowing water? Is it rising or falling? Is there any damage? Is there water in businesses/homes? Is it an ice jam?
HEAVY SNOW	Snowfall rates > 1"/hour or a storm total amount. Are there white out conditions?
ICE	Report sleet or freezing rain. Check here for how to measure ice accretion. Report hazardous road conditions or damage.
OTHER	Unusually frequent lightning or any lightning damage. Changes in precipitation type, especially if not forecasted. Report blowing snow.

…Continued from Page 8



Community Collaborative Rain, Hail & Snow Network (CoCoRaHS)

This non-profit program was established in Colorado back in the late 1990s. It quickly expanded into a state by state network, including northern New York and Vermont in the 2008-2009 time frame. The growing volunteer base is located throughout the North Country as shown in the map above. Observers record rainfall or snowfall collected in a gauge located in a backyard or other open and elevated area. The NWS is a co-sponsor of CoCoRaHS and forecasters use the daily precipitation data to validate forecasts and further inform precipitation forecasts. We are always looking for more help and the barrier to entry is low. The application is here.

The CoCoRaHS website has a trove of information, including a great new mapping program.

Meteorological Phenomena Identification Near the Ground (mPING)

This program was established by the National Severe Storms Laboratory in Oklahoma in the early 2010s. As the name implies, users of the app anonymously report what they see, which can range from fair weather conditions to severe thunderstorm damage. It is crowdsourced weather information that can confirm a meteorologist's suspicions on what is happening or push us to make needed adjustments to a forecast.

The geo-tagged and time-stamped data are a novel way to record high resolution weather data.

Congratulations and Happy Retirement to June Plankey!

This Newsletter, we bid farewell to June Plankey, our Administrative Assistant (ASA) who retired at the end of July after almost 6 years here at NWS Burlington. While June did not deal with the weather, she was the backbone of the office handling a wide range of administrative functions for the office staff and management team; this included all administrative programs and activities for the office related to budget, procurement, travel, time and attendance, training, personnel actions, facilitating meetings and office supplies/equipment. She was instrumental in revamping the training program for ASAs across the Eastern Region of the NWS by creating a ASA Smartbook to assist all new ASA in common administrative tasks that are essential to running the 24 NWS offices in Eastern Region.

Born and raised in Winooski, Vermont, June is a lifelong Vermonter. Before working with the NWS, June had a long and varied career working as a Marketing Manager for Lockheed Martin, a Corporate Human Resources Trainer for KeyBank, the former owner of Silver Threads in Downtown Burlington and a Lead Manufacturing Facilitator for Vermont Tech at IBM. She is also a Professional Speaker on Negotiations with the National Council of Negotiations as well as a Realtor with Century 21 The One, which she will continue to do post NWS Retirement. June says her favorite job of all has been being mother to her daughter and son.

June plans to remain in the area to continue public speaking and working as a realtor, but most importantly, to spend more time with her grandchildren! From all of us here at NWS Burlington, we wish you the best June, you will be missed in the office. If you see her out and about, say hello and wish her a happy retirement!

Meet a Meteorologist

Scott Whittier - *Warning Coordination Meteorologist*

1. What made you want to become a meteorologist?

Like a very large majority in this profession, it started as a kid. I grew up in southern New Hampshire, which was part of the Boston media market and was fascinated by snowstorms and thunderstorms. It was the February Blizzard of 1978 that got me hooked, with feet of snowfall accumulation, additional feet in snow drifts and devastating coastal flooding. The impacts from that storm were extreme and far reaching across much of southern New England, including schools being closed for weeks. In addition, there were several iconic TV meteorologists in Boston that got me hooked; Don Kent, Bruce Schwoegler, Dick Albert and Bob Copeland.

2. Where and how did you start with the NWS? Which offices have you worked at?

I was fortunate enough to get a summer internship, between my junior and senior year (Lyndon State College - Northern VT University) at NWS Anchorage, AK. That was a super opportunity with a different and wildly diverse climate compared to New England during the summer. Immediately after school, I briefly worked for a private meteorology company (1988) that provided forecasts for dozens of radio stations, utilities, companies such as the Boston Red Sox and newspapers, including the USA Today. In 1989, I started my NWS career at NWS Hartford, CT WSO. The responsibilities of an employee at a WSO (Weather Service Office) back then were taking surface and radar observations, localizing the forecast from the larger WFO (Weather Forecast Office), issuing severe and tornado warnings and manually recording forecasts on NOAA Weather Radio. In April 1993, I became a forecaster at NWS Burlington, VT and was the program leader for the WSR-88D (Doppler Radar) and NWS warnings and verification. In 1998, I was promoted to a lead forecaster at NWS Burlington and in 2008 I was promoted to my current position as Warning Coordination Meteorologist (WCM). I love seeing the entire forecast process of working with partners/customers (prior, during and after an event), the evolving weather models, the forecasts and how all that we do supports local preparations and actions.

...Continued from Page 11

3. What are some of your most notable forecasting events?

In Hartford, it was the 1993 Superstorm-Storm of the Century. I worked 32 straight hours as this storm paralyzed travel across much of the country. Although we got 1-2 feet of snow, most of the precipitation actually fell as sleet, otherwise we could have easily doubled those accumulations. At NWS Burlington, it still has to be the January 1998 Ice Storm due to duration, magnitude and relative success in forecasting this event despite the forecast models. Local knowledge of climatology and the difficulties of forecast models in certain situations were key for the NWS BTV forecasters. Tropical Storm IRENE in 2011 is right up there as well. Although the proximity to the tropics and frequency of these events in VT/NY may be low, they can still occur and have tremendous impacts. In fact, 2011 was the Year of the Floods with flash flooding, snowmelt and record flooding on Lake Champlain. Two other winter events include the Valentine's Day Storm of 2007 and the March 2017 "Pi Day" storm where snowfall rates up to 5 inches per hour occurred at times.

4. What can you be found doing outside of work?

I love spending time with my two girls and exercising. I enjoy the great outdoors, including biking and landscaping around the house and the occasional "hacking" up a golf course.

New Additions to BTV...future meteorologists???

Otto joined the BTV Family in February weighing 6 lbs 12 oz. His family is looking forward to watching him learn and grow. He's already a big Florida State Seminoles fan and soon will be speaking Spanish better than his mom, meteorologist Andrea LaRocca!

Korey joined the BTV Family in spring. His parents, Matt and Rebecca, are both meteorologists at NWS Burlington, so we're eager to see if he's inherited our love for all things weather!

The Four Seasons

Volume VI, Issue III

Contributors:

Eric Evenson, Lead Meteorologist
Seth Kutikoff, Meteorologist
Scott Whittier, Warning Coordination Meteorologist

Editors:

Rebecca Duell, Meteorologist
Seth Kutikoff , Meteorologist
Andrea LaRocca, Meteorologist
Marlon Verasamy, Observing Program Leader

We Need Your Storm Reports!

Please report snowfall, flooding, damaging winds, hail, and tornadoes. When doing so, please try, to the best of your ability, to measure snowfall, estimate hail size, and be specific as to what damage occurred and when. We also love pictures!

For reports, please call:
(802) 863-4279
Or visit:
http://www.weather.gov/btv/stormreport

National Weather Service Burlington, VT
Burlington International Airport
1200 Airport Drive
South Burlington, VT 05403
Phone: (802) 862 2475
www.weather.gov/btv
Email: btv.webmaster@noaa.gov

Follow us on Facebook and Twitter!
Check out our YouTube Channel!

US National Weather Service Burlington, VT

@NWSBurlington

ww.youtube.com/user/NWSBurlington