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WINDswept

The Bulletin of the Non-Profit Mount Washington Observatory

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Mount Washington Observatory is a private, nonprofit, member-supported institution with a mission to advance understanding of the natural systems that create Earth's weather and climate. It serves this mission by maintaining a weather station on the summit of Mount Washington, performing weather and climate research, conducting innovative science education programs, and interpreting the heritage of the Mount Washington region.

Membership in the Observatory is open to all. Members receive: an annual subscription to *Windswept: The Bulletin of the Mount Washington Observatory;* a 20 percent purchase discount at Observatory shops; Observatory tours; free admission to more than 300 science centers through ASTC Passport Program; free admission to Extreme Mount Washington; exclusive content on MountWashington.org; and an opportunity to be an Observatory volunteer. Members are encouraged to help support the Observatory, attend its Annual Meetings and visit the Observatory and Extreme Mount Washington.

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Adaptation Can Lead to Opportunity

Windswept *Editor Marty Basch*

BY **MARTY BASCH,** EDITOR

The Observatory staff has been inundated by change and adaptations because of the coronavirus pandemic. More is expected and the staff is standing up to the challenges.

One such reorganization was the tough decision to close the Weather Discovery Center located in the same building that houses the Observatory's administrative offices. When a new home was found for the vast majority of the hands-on exhibits, it was up to staff to haul out everything and prepare it for passage to Concord's McAuliffe-Shepard Discovery Center. It wasn't easy. Also not easy was cleaning out the lower floor of the building which is now a clinic for North Conway's Memorial Hospital.

The passing of Marty, the Observatory's summit icon for more than a decade, had a wide-ranging impact across the organization from members to supporters to staff and beyond. Marty's long-casting spell, possibly due to his social media paw print, had him as quite the influencer. The news of his unexpected death was like hearing of a colleague, friend or family member dying. Leave it to someone who knew him well to say goodbye in these pages. Observer Ryan Knapp has not only penned a piece about Marty Kitty but also shared several photographs he took of his four-footed model who would often grudgingly pose, both inside and outside.

The summit is also where the Huntington-Hitchcock Expedition found itself during the winter of 1870-71 some 150 years ago. Curator Peter Crane shares his insights on what it must have been like for that crew, the first winter the summit was occupied. There's a saying that wood warms you three times—when you cut it, when you stack it and when you burn it. That must have been a comfort to those guys.

Much has been written about Darby Field and his groundbreaking ascent of Mount Washington in 1642. Volunteer and member Bill Ofsiany has often wondered what that was like. So he leaned on his creative side and came up with a fictional account of Field's climb all those years ago.

But we also look ahead now, to a return to normalcy, Seek the Peak in what form it will be and the continued support of our members.

Opportunities Await for Science and Research

Interim Executive Director Donna Dunn

BY **DONNA DUNN,**
INTERIM EXECUTIVE DIRECTOR

Each time I consider the words I will put in *Windswept*, it occurs to me that the future comes fast and furious—much like the weather on the summit of Mount Washington. We do our best to predict what will happen, but we've learned to expect the unexpected. High winds look to be a certainty, and we're all disappointed when the peak gust is only 82 mph. Wind gusts predicted at around 130 mph surprise us when the peak gust is 157 mph.

The decision by the Mount Washington Observatory Board of Trustees to close the North Conway Weather Discovery Center was based on great information, deliberate debate, and thoughtful consideration. The decision included an expected outcome of revenue from leased space and a refocus on science and research.

We didn't expect to expand our educational reach, but that is what happened. Our exhibits found new homes. Two of the exhibits and some really interesting panoramic maps moved to the New Hampshire State Park Sherman Adams Building, and to our Extreme Mount Washington museum on the summit. We are moving exhibits to the Scenic Vista in Intervale. The space in that center looks directly at Mount Washington, so visitors can see the summit and learn about our work there at the same time, even if they don't travel to the top.

The majority of the exhibits are now being installed at the McAuliffe-Shepard Discovery Center in Concord. Part of the McAuliffe-Shepard mission is education on earth science, and weather certainly is part of that mission. From our boat pond, where children and families learn about the effects of wind while trying to dock a small wooden boat, to the twister simulator, to imagining yourself as a TV weather person, our exhibits have a wonderful new home and reach many new people and education communities. Our beloved Shaky Shack—our interpretation of the space and conditions on the summit when the 231 mph world record was recorded— is being rebuilt at McAuliffe-Shepard. A new home and new outreach for the Observatory is an exciting result of a critical decision.

Our focus on science and research resulted in expanded research and science opportunities. Our team recently completed work, taking more than a year, to complete a review of our data set and compile a standardized daily temperature maximum and minimum for the past 82 years. The work on the temperature dataset led directly to additional funding that we are using to evaluate our

historical visibility record. We already know from the initial work reviewing visibility data is that we have more questions than answers. That means more research. For example, we know that visibility has increased over the past 20 years. That's the fact. What we don't know is why visibility has increased. What are the factors affecting visibility on Mount Washington? How does visibility correlate with temperature and wind? What geologic and atmospheric changes correlate with changes in visibility. These are exciting topics to explore. And resources are needed to make this research happen.

Our focus on science and research resulted in expanded research and science opportunities. Our team recently completed work, taking more than a year, to complete a review of our data set and compile a standardized daily temperature maximum and minimum for the past 82 years.

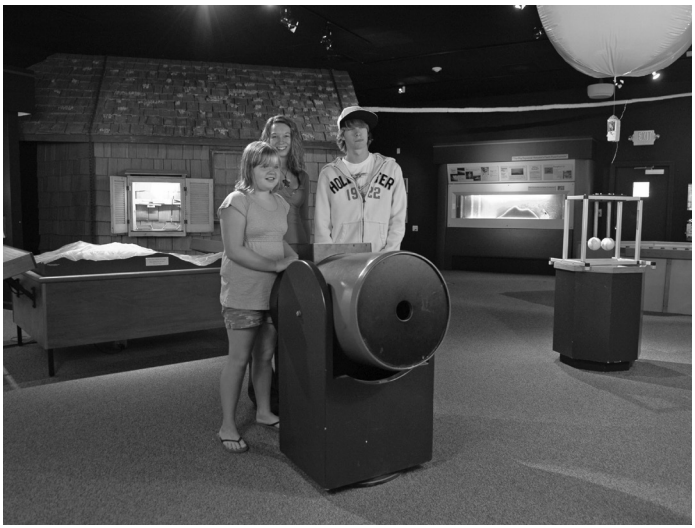
We are aware of other potential research funding opportunities. These are exciting opportunities, but we are constrained by our current resources. We know that many of you are "weather geeks" and "mountain geeks." Your support of our science funding initiative will help us move our research agenda forward. I hope you'll consider donating to science as we work to develop the financial and other resources to grow our research and science arena.

Elsewhere in *Windswept* you'll learn about the Huntington-Hitchcock expedition – the first scientific exploration where people spent the winter on the summit. This expedition was 150 years ago. I can't even begin to imagine the preparation, the way they had to consider unknown conditions in order to prepare for their winter time on the summit. I'm certain they did their best to prepare. They tried to anticipate and expect the unexpected. I'm also certain that there were many surprises throughout their time on the summit.

From Huntington-Hitchcock to now, we know we need to anticipate the unexpected. We know that we can prepare, we can forecast, and we will still be surprised at what happens. For the Mount Washington Observatory, we were surprised by our opportunities to share educational exhibits about weather and expand our reach. We are surprised at the questions each piece of research raises. And we anticipate the opportunities to expand our science and research efforts through grants and through the generosity of our members.

Thank you for your support of the Mount Washington Observatory.

Weather Discovery Center Exhibits Find New Homes



Many of the exhibits from the former Weather Discovery Center are now housed in the McAuliffe-Shepard Discovery Center in Concord.

Most of the exhibits from the recently closed Weather Discovery Center have been moved to the McAuliffe-Shepard Discovery Center in Concord while a handful of them are in the Observatory's summit museum.

In December of 2020, the Observatory and the McAuliffe-Shepard Discovery Center announced a partnership to increase access to meteorological and atmospheric sciences for New Hampshire families and visitors to the Granite State.

While a few exhibits moved to the Observatory's museum on top of the mountain, 80 percent of the exhibits were relocated to the McAuliffe-Shepard Discovery Center —including the "Shaky Shack", the replica of the 1930s-era Observatory staff's mountain-top cabin in which the highest human-observed surface wind speed on Earth was recorded in 1934. In order to incorporate these exhibits into the Center, and to complete a major upgrade of its planetarium system, the McAuliffe-Shepard Discovery Center closed for about six weeks.

"The Mount Washington Observatory is an eminent science organization with which we are proud to be associated", said McAuliffe-Shepard Discovery Center's Executive Director Jeanne Gerulskis. "We are glad that these very cool weather exhibits will have a new home, where hundreds of thousands of children and lifelong learners will be able to dive into the science of weather and understand more about the role the Mount Washington Observatory plays in our understanding of climate, weather and arctic systems. As both organiza-

The replica of the summit staff quarters during the 1934 record wind called the Shaky Shack is a popular exhibit.

tions are NH Space Grant Affiliate Institutions, we have worked together in the past, but this expanded partnership will take us to a whole new level."

Donna Dunn, Interim Executive Director of the Mount Washington Observatory concurred, noting that, "We are delighted to work with McAuliffe-Shepard to expand the reach of the Observatory, and to provide access to interactive weather exhibits to new audiences."

In October of 2020, the Observatory's Board of Trustees announced the Weather Discovery Center's closure saying it has taken significant steps in recent months to evaluate and refocus its core work and program offerings with an emphasis on its mission of performing weather observation and climate research. One outcome of this plan is the shuttering of the WDC in North Conway.

"In March of 2020 the Board initiated steps to reevaluate MWOs offerings and focus with the intention of getting back to our core mission. We started the process with the appointment of Donna Dunn as Interim Executive Director who specializes in restructuring and strategically positioning organizations," said Board Chairman Gary MacDonald. "We were a few weeks in to this process when the pandemic set in and created an added urgency for change and reinforced a need for the realignment of the organization."

Although the WDC is closed, the other entities housed at the 2779 White Mountain Highway building will remain operational including MWOs Gladys Brooks Memorial Library, MWO Administrative Staff offices and The Citizen's Bank.

"It was a very difficult decision to close the WDC because of its history and educational value, but ultimately it was not sustainable and not aligned with our strengths. We have a dedicated and eager staff that is excited to hone in on our core work and expand our research utilizing our nearly 90-year data set, which also fuels our educational content and work with other scientists performing research in climate science," said Dunn. "We've recently completed a critical review and analysis of our data set providing a new research grade data set that will allow us to give great access to researchers both internally and externally."

The property will be reconfigured and a portion has been subletted. Other exhibits will be moved to the Scenic Vista in Intervale on Route 16.

Marty the Summit Cat Dies

Marty on the summit.

After twelve years of living on Mount Washington, Marty the summit cat died on Nov. 7, 2020. Marty was beloved by Mount Washington Observatory staff, Mount Washington State Park staff as well as thousands of visitors from around the world.

"It is with an incredibly heavy heart that we have to share the news of Marty's passing due to an unforeseen illness," said Summit Operations Manager Rebecca Scholand. "Marty was a special companion, entertainer and so incredibly loved and will be sadly missed."

Marty was adopted from the Conway Area Humane Society and moved to the summit of Mount Washington in January of 2008. Marty achieved his lofty perch by winning a 2008 cat primary, garnering the most votes in an election that saw more than 8,000 votes tabulated on the Observatory's website.

"We would like to extend a special thank you to the Conway Veterinary Hospital

who has cared for Marty over the years and to Dr. Kate Battenfelder and Vet Technician Leah Perez of True North Veterinary Hospital who assisted us with this emergency," said Scholand. He died of an unexpected illness at the age of 14 or 15.

Marty's obituary was well-received in the mainstream media with stories published in newspapers like The New York Times, The Boston Globe and New York Post.

Scholand was even quoted in the Times.

"There were days when he would want to rub up against your leg and sit in your lap when you were doing your work," she told the paper. Other times, she added, he would greet people "with his tail up in the air, just flaunting the fact that he was the highest cat in New England."

Marty was named in honor of Marty Engstrom, a Fryeburg, Maine Channel 8 TV engineer turned weather reporter who worked on the summit between 1964-2002.

The Observatory staff have had the comfort of a feline presence on the summit of Mount Washington since its founding in 1932. Plans are already underway to identify Marty's successor given that the summit staff had already been planning his retirement for early 2021.

Ruth Innes
1941-2021

Ruth Starratt Innes, 79, of Littleton, N.H., passed away January 10, 2021 after a short illness.

She was born August 6, 1941, the daughter of the late Howard and Mabel Starratt of Clarksburg, Mass.

A graduate of Drury High School in North Adams, Mass., she attended North Adams State College and earned advanced degrees from the University of Massachusetts and Nova University, including a PhD in Psychology.

Ruth married the late John Innes, who predeceased her on October 12, 1986.

Ruth Innes

She was Director of Guidance and Counseling at Shorecrest Preparatory school in St. Petersburg, Fla. Dr. Innes was a Clinical Psychologist in a private practice and also for the state of Massachusetts. Her accomplishments included being a PSIA Level II certified Alpine Instructor at Brodie Mountain and Jiminy Peak. In recent years, she worked as an adjunct professor at White Mountains Community College and instructed tai chi and yoga at the Omni Mt. Washington Hotel and the Appalachian Mountain Club. Ruth was also a summit volunteer at the Mount Washington Observatory weather station and an Observatory Volunteer of the Year in 2017.

She played the violin at local community musical groups. Ruth loved to travel and had the opportunity to visit many countries around the world. Ruth enjoyed all outdoor activities, including hiking, paddling, and skiing. She completed the New Hampshire 48 4,000 footers and the 52 with a View list over the age of 70. Ruth's enthusiasm was infectious, and she enjoyed a full life. Ruth was one of a kind and made friends everywhere she went. She touched many lives and will be missed by all who knew her.

Ruth was predeceased by her brother Frank Howard Starratt.

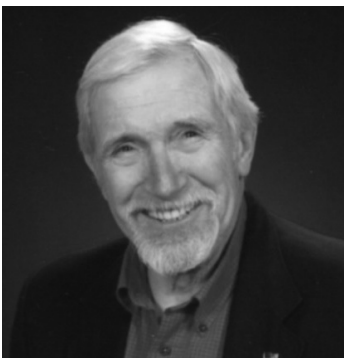
She is survived by her son, Michael Innes, and his wife Lori Innes, and her "granddog" Pemi, who Ruth loved dearly; her sister, Nancy Lorenzo-Deleys of Buffalo, NY; nieces Donna Lorenzo and Joanne Lorenzo and nephews Joseph Lorenzo and Angelo Lorenzo.

In lieu of flowers, memorial contributions may be made in Ruth's name to the Mount Washington Observatory: mountwashington.thankyou4caring.org/giving.

Philip Gravink
1935-2020

Philip Ton Gravink, 85, of Saco, Maine, died Oct. 9, 2020.
Phil was born to Maybelle and William Gravink on their dairy farm in Clymer, N.Y., in 1935. He graduated from Clymer Central School in 1953, then attended Cornell University. Later Phil attended several short courses at Harvard Business School.

At Cornell, Phil stroked the crew to four National Championships and won the Brand Challenge Cup gold medal at the Henley Royal Regatta in England as well as the European International Regatta in Lucerne, Switzerland. The crew was named to the Helms Foundation National Hall of Fame for Amateur Athletes and the National Rowing Hall of Fame. In 1978, Phil was named to the Cornell Athletics Hall of Fame and was inducted into the Chautauqua Sportsman's Hall of Fame. After college, Phil and his wife Shirley returned to Clymer and partnered with his father on the family dairy farm.



Philip Gravink

In 1963, Phil co-founded Peek'n Peak Ski Area, a few miles from their farm, where he served as general manager until 1976. He then became the general manager of Gore Mountain in the Adirondacks. A year later, Sherman Adams named him president and general manager of Loon Mountain in Lincoln, N.H., where he remained until 1991. He consulted for Sno Engineering, then was appointed director of skiing for the State of New Hampshire, overseeing operations at Mount Sunapee and Cannon Mountain. Soon thereafter, Phil became president and chief executive officer of Attitash. He also oversaw operations at Cranmore Mountain for one year.

Throughout his career, Phil served as director and officer of numerous trade organizations including presidential terms for Ski Areas of New York, Ski New Hampshire, National Ski Areas Association and The American Ski Federation. For his service, he was awarded the NSAA Lifetime Achievement award, NSAA Sherman Adams Award, BEWI Service to the Ski Industry Award, Mount Washington Valley Treasure Award and the Bob Morrell Award. In 2012, Phil was inducted into the National Ski and Snowboard Hall of Fame.

Phil sincerely believed that community service was an obligation of those who could give and served on several boards,

including Jackson Ski Touring, NH Alpine Racing Association, Friends of Tuckerman Ravine and the New England Ski Museum. He was a Mount Washington Observatory Lifetime Trustee.

Phil served terms as moderator, treasurer and chairman of the building committee for the Jackson Community Church. After his retirement in 1999, he and his wife Shirley joined the group Odyssey 2000 and spent a year biking around the world, covering 15,000 miles and 48 countries and were able to raise over $70,000 for Northeast Passage, a rehabilitation organization through sports, founded by their daughter Jill and for the New England Ski Museum.

Phil is survived by his wife Shirley Damon Gravink of Saco, Maine; son, Bradley Gravink of Clymer, N.Y., his two children, stepson and one grandchild; daughter, Brenda Dimick (husband Todd) of Plymouth, N.H, their four children and two grandchildren and daughter Jill Gravink (wife Cathy Clermont) of Nottingham, N.H.

POEM

Springtime on the Rockpile

BY **BILL OFSIANY**

Spring on the Rockpile's fickle,
With high warm sun and bright snow.
But the cold, strong winds of
winter are here,
That push wind chills to twenty below.

It seems that whoever makes weather
Isn't sure which direction to go.
Some days are calm, warm and sunny.
Just as often, there're low temps and snow.

But those days get fewer and fewer,
And winter ice gets transformed into slush,
And rivers of meltwater flow
down the trails,
Turning bare spots to boot-sucking mush.

The cold is still in control here.
Those wet days freeze up without sun,
Turning snowfield back to glare ice
that is smooth.
Spring advances up here are hard won.

March comes in like a lion,
Like it does in the towns nearby.
But here at the top, it goes out
that way, too,
Cause we're a mile high up in the sky.

The Snowcat gets parked,
higher up each week,
As Spring moves up high, where it's steep.
And the road crew works on Cragway Drift,
Where the snow can be 20 feet deep.

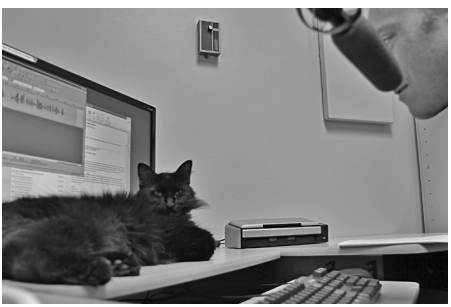
Soon all will be back in summer mode,
The crowds, the bugs and the heat,
And we'll miss the bite of the wind
on our cheek
And the ice crunching under our feet.

Memories of Marty

BY RYAN KNAPP

This is one of the hardest things I've had to write in my 15 years here. Since I was here for the entirety of Marty Kitty's life, I was asked to compose a tribute. It wasn't easy. But here goes.

When I started working on the summit in December 2005, the resident cat was a white cat with black blotches named Nin. He loved attention, food and snuggling. By 2007 we were preparing for his retirement. He was 17 or 18 and ended up going home to Diane Holmes and Mike Pelchat, both rangers at Mount Washington State Park at the time, just after Christmas.



Marty was a constant companion to those working on the summit.

With plans underway for a feline replacement to continue our tradition of summit house cats, we decided to have a cat primary as a real human election was approaching in January 2008. We reached out to the Conway Area Humane Society who provided us with three candidates—a white and splotched short-haired kitty named Sarah, an orange and white short-hair called Wilson and a black with hints of dark brown long-haired kitty dubbed Marty.

It was fun, with the cat candidates releasing campaign videos and posters on our website. On election day 8,000 people voted! Marty won the popular vote in a landslide, and our electoral college later voted him in.

Marty, named after legendary WMTW Channel 8 TV engineer/reporter Marty Engstrom who worked on the summit from 1964-2002, made his inaugural ride to the summit aptly in a snowcat on January 16. The vet figured Marty was two. He was high energy darting in and out of rooms, somewhat mature and had us rubbing his belly in no time. He demanded it!

He was a hiker too.

Marty loved water. He splashed around in all he could find from summer rain's puddles to overturned bowls and buckets. He would even turn them over to play! That water turned him into a spiked furry kitty ready for an appearance on MTV's "Jersey Shore." But bathe in it? No way. He balked. That was unfortunate as we learned he had a genetic disorder that caused his teeth to rot. When he groomed, he stunk. Eventually, he lost his teeth. But he was able to groom and not smell. As a result, the bath times we gave Marty were luckily short-lived.

Marty peers out upon his summit kingdom.

While he was toothless, that didn't stop him from being a mouser. What he lacked in the teeth department, he made up for in the claw department. He loved to catch and bring us various "gifts." Sometimes his gifts were alive and he'd toy around with them in front of us leaving us to dispose of the present. Sometimes his gifts were dead. Other times he would get distracted and the gifts would scurry back to temporary safety.

In his time on the summit he met, but never befriended, plenty of dogs. He met a camel that came up during the Mt. Washington Auto Road's "Hump Day." You should have seen the look on Marty's face! He met a skunk but avoided getting sprayed. He once chased down a fox and marveled at the ravens through the weather station windows.

He loved to follow his friends/co-workers around. During the mornings, he eventually learned our routines and would wait for us. At night, he would follow us out to and from the precipitation can. During fair weather, he would follow us around the deck on weather observations. He even made it up our ladders to the parapet a few times. He loved going outside and somehow always knew when it was safe to go out; not sure if it was the noise or pressure or what, but during fair weather he would bound up the stairs and wait to go outside, play around for hours then return to the same door to come in. In summer when we had doors and windows open, he roamed as he pleased.

In his early years with us, he was quite the hiker and once even followed us down to Lakes of the Clouds. I remember he followed us to Mount Clay and even joined us on a hike to the Alpine Garden. Usually he would start to follow us back up to the summit but got tuckered and just lay down. So we would make a makeshift cat carrier with our daypacks or cradle him as we slowly walked back up together as he slept or lazily looked around.

He was difficult to photograph. Sometimes he would cooperate and strike pose after pose with great lighting.

Marty was a mile-high model.

Other times though, if it wasn't a particularly bright scene, he would easily become a giant blur or smudge. Other times he would tease you; he'd pose and dart off just before the shutter clicked. We have posted several great shots over the years, but those were after countless ones that were right-clicked into oblivion.

Marty was quiet for several years, but eventually found his voice and we couldn't get him to stop his meowing and purring. He wasn't a fan of strangers most days. Some days they could pet and photograph him. Other days he'd dart away from unfamiliar faces. He was the same way with staff at first but eventually he warmed up to us and would leap into our laps.

He would frequently sleep in the weather room. Most of the time he would choose to sleep in his bed but he would also sleep on our arms while we typed or sleep between us and the keyboard, or on the keyboard. He also knew where his treat drawer was located and would frequently sit on the desk above it trying to use some Jedi-mind tricks on us to get us to open the drawer for him.

On his vet visits, it was always fun to watch him stare out the windows at the trees and views from the valley. Having lived the bulk of his life above treeline, seeing such leafy objects was probably pretty interesting as were the noises and scents. He was a good patient, but about two years ago I started seeing the impact on age with him as he seemed more laid back. He'd hesitate leaping about and spent more time in the "lap cat life." Like Nin, we started talking retirement and decided to have one last Christmas with Marty in 2020.

That wasn't to be. I remember when Summit Operations Manager Rebecca Scholand called to tell me Marty passed. I was startled. Wasn't it just the other day he snuggled up to me? Now he was gone. It was surreal then and is surreal now. I returned to the summit from my break and several times I caught myself seeking out Marty—when I arrived, when I first woke up in the afternoon, at dinner, and during my overnight shifts. Each time I was met with silence. No kitty.

Marty wasn't my first summit cat while working at MWO, but he was the one I bonded with most. With our work schedule and living alone, I am unable to have a pet during my off-summit time. So Marty was my work pet, my little buddy. We'd hang out. I watched him grow up. I helped care for him. Marty was a constant for so many years, longer than the stints of many of my colleagues.

He will always be in my heart and his memories will live on through those lucky enough to have met him in his time here with us.

Weather Observer Ryan Knapp looks forward to meeting the next summit cat. This piece was condensed from a November blog post on the Observatory's website.

Right: Marty will be missed.

Reflections On a Bold Endeavor

BY **PETER CRANE**

As we celebrate the 150th anniversary of the Huntington-Hitchcock Expedition, and reflect on the accomplishments of that first winter occupation of the summit of Mount Washington in 1870-1871, certain attributes of that pioneer summit crew come to our attention.

The members of the Expedition were (l-r) Sgt. Theodore Smith, S.A. Nelson, H.A. Kimball, Amos Clough, J.H. Huntington; C.H. Hitchcock is not present.

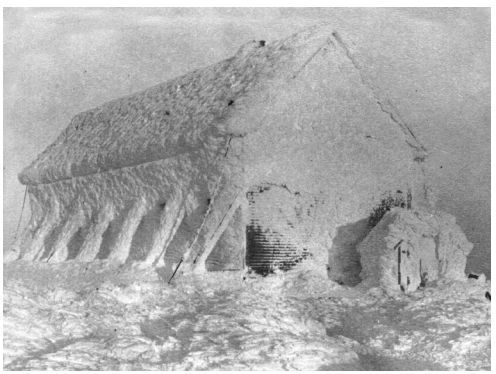
Foremost is their remarkable courage. In their winter foray to the top of the highest peak of the Northeast, they were setting out to do something no one had done before, into conditions which were essentially unknown. Though by 1870 summer-time conditions on the mountain were well understood, winter experience of the summit's fury was scanty indeed. While early records are murky, by the time that Joshua Huntington and Charles Hitchcock established a summit weather station there had been hardly any documented ascents of Mount Washington in winter. The first so-called winter ascent was a one-day climb by two men on December 7, 1858, and in February of 1862, three men climbed the mountain and spent two nights in the Summit House. While it seems likely that some other snow-season ascents occurred between 1852 and 1870, they have apparently escaped the historical record.

How cold could it get on the summit? How strong could the winds blow? How could a small crew in a tiny weather station get along for days on end, in tight quarters in such hostile conditions? Could they be helped in an emergency? Could they—or their station—survive through a long summit winter? Only the crew's coming experience would answer

Clough, Smith, and Nelson at the entrance to the weather station —not a door that could be frozen shut by rime and snow, or could be damaged by wind, but a heavy cloth over a small opening in the side of the building.

these questions. To risk their well-being, and indeed their lives, for the cause of science took great bravery.

The organization and operation of the Expedition also demonstrates enormous dedication from all the participants. Perhaps first in their roster of organizational challenges was funding. Even if the crew were to volunteer for such difficult duty, there would be food to buy, fuel to purchase, equipment to procure, and communications to establish—having a telegraph to connect to the outside world was critical, if weather observations were to be disseminated in a timely manner. Many of their attempts to enlist support came to naught. But Huntington and Hitchcock persisted, aided by other members of the crew— S.A. Nelson particularly devoted himself to raising the needed monies. Even before setting foot on the mountain, this difficult task, which at times must have seemed unsurmountable, was met and accomplished with the determination of the Expedition members.



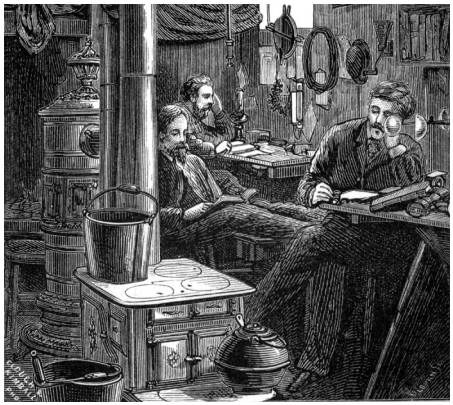
Mount Washington's first summit weather station was a small room built into the new summit depot of the Cog Railway, here shown covered by rime ice. It was a large building, not yet tested by fierce winter winds. It blew down a few years later.

On the mountain, there were other challenges which tested these early observers. On their first ascent to the summit in late November, photographers Amos Clough and Howard Kimball found stormy conditions with winds of seventy miles an hour and a temperature of 7°. Kimball almost succumbed to the elements, but Clough practically man-hauled him to the summit. As the Expedition narrative, "Mount Washington in Winter," recalls, "(Kimball) called to the others to leave him and save themselves if possible. The noble and emphatic "Never" uttered by the manly Clough, whose sturdy muscle was found ample to back his will, aroused him to another effort."

On numerous occasions, too, the vital telegraph wire, which extended from the summit down the Cog Railway tracks, the sole connection to the world below, developed breaks, and members of the crew had to struggle through the drifts, in wind and cold, to find and repair those flaws in the line. Time and again they accomplished this miserable task.

Perhaps the depth of the dedication of the weather station crew is best illustrated by Huntington's words, very early in the occupation, when he was the sole resident of the station. After describing the weather, with its frozen mist and deep snow, he wrote, "I am here alone, but should have come if I had known that I had to stay alone all winter."

Another attribute of the first winter crew, shown time and again in the journal of their exploits, is their humor. At times in its organization, the Expedition must have seemed like a comedy of errors. For



The cramped and crowded quarters of the 1870-1871 weather station. "They all complain that it is the easiest place to lose anything they ever saw."

a "practice run" they were offered use of a building on Mount Moosilauke—but due to poor handwriting, they thought for the longest time that they would be heading to Mount Monadnock. In their seeking of funds, likely sources of support were like wills of the wisp—surely the next potential source would prove to be the needed one. And when a good source of support was found—a New York newspaper offered funding if it could have exclusive access to summit weather observations—it had to be turned down, since the all-important telegraph was supplied by the U.S. Army Signal Service, which required that all information sent out be available to the public. They could not have surmounted these critical preliminary hurdles without a sense of humor.

The frustrations of organization, though, gave way to more comedic times on the mountain. They were serious scientists, but they did not take themselves too seriously. With their telegraph apparatus and their telegrapher (Sgt. Theodore Smith) supplied by the U.S. Army Signal Service Bureau of Telegrams and Reports for the Benefit of Commerce, "For the Benefit of Commerce" became their catch-phrase. So much of what they did, down to smoking their pipes, was done, they quipped, "For the Benefit of Commerce." In their narrative, noting inaccurate press reports of and humorous references to their work, they were evidently pleased to include a remarkable tale of a resident Professor who was flattened against a summit building by the wind; his body was pried loose, hammered back into shape, and there followed the reading of a paper about "The Malleability of Scientific Persons." As Charles Hitchcock wrote, " ... we have been favored with a very large proportion of articles of an amusing character, whose perusal has raised our spirits during some of the dull days, when all was disagreeable without and dark within."

Sgt. Smith, holding on to the anemometer, measures the wind at 88 miles per hour. Quite a difference from today's equipment, technology, and technique!

Courage, dedication, and humor—worthy traits which helped make the first winter occupation of Mount Washington possible, and which continue to serve as worthwhile examples for Observatory staff a century and a half later.

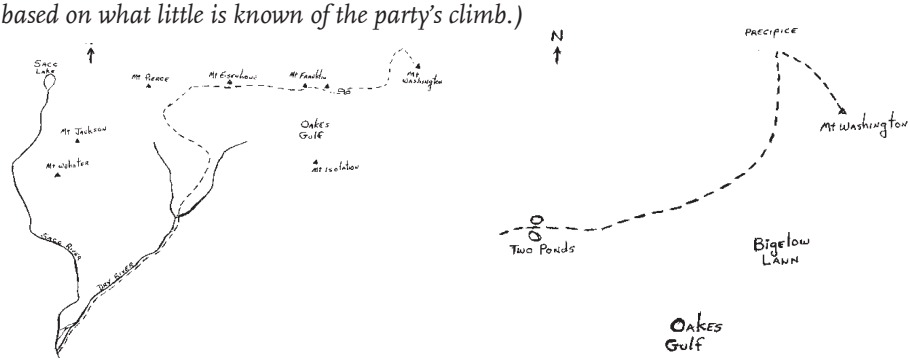
Peter Crane is the curator of the Observatory's Gladys Brooks Memorial Library.

Seeking His Peak

A fictional story of Darby Field's historic 1642 climb up Agiocochook

BY **BILL OFSIANY**

(From the author: In June,1642, explorer Darby Field and a Native American companion travelled to the mouth of the Saco River, in what is now Maine, and began an eighteen day journey to an Abenaki village in the vicinity of what would become Glen, N.H. In the village they found two men who were familiar with the valley of the Saco, further up what we now call Crawford Notch. They agreed to accompany the Field party. The general route is believed to fit descriptions in the few documents that exist about the climb. In this story, the things that they saw and what they experienced are fictional but were based on places they noted, conditions in the area, the ecology of old growth forests, krumholz, alpine flowers, topography, and above treeline navigation. What follows is historical fiction done in a first person narrative from Field's perspective, based on what little is known of the party's climb.)



The routes taken during the ascent. Drawings by Bill Ofsiany.

The river, so deep and wide at the start of our trip was now much shallower, and moving faster. Game trails and foot paths followed the shore of the river. About a day's travel north of the village, a riverbed came into the Saco from the east. The water flowing from this river was far colder than the main river. The banks of this river were lined with large rocks and logs and showed evidence of very high water at times. We turned right and followed this new river, through forests of very large evergreens whose bases were as thick as a man was tall. These trees blocked out much of the sun. Travel up this new valley was more open than the areas we travelled from the coast. The darkness didn't allow much plant growth on the forest floor. Our direction of travel was a little east of north. This new river ran between two high ridges on both sides. About two miles from the junction with the Saco, a small stream joined the river from the left. Here our guides turned north, away from the river and started climbing. Soon the sound of both rivers was far behind. The higher we climbed, the steeper the slope became, until

travel straight up was not possible. We moved left, then right, walking further, but making progress, as the land around us became steeper.

After several miles, the trees began getting shorter, as if stunted by some force. Clouds surrounded us now and mist fell from above, and moisture on the ever shortening trees, soaked us. The trees gave way to plants that looked like trees, but grew so thick, it seemed like they grew sideways, rather than straight up. They made a ground cover as high as our chests, that was almost too thick to walk through. Very little of what lay ahead was visible because of the cloud on top of us. The roar of the wind could be heard close ahead of us in the fog. It was here that our guides from the village became fearful and refused to go further into this strange place. They retreated to the shelter of the taller trees below, telling us before they left, that we would die if we continued on. My original companion and I continued climbing. The area of thick, low growing trees gave way to very low growing plants, many with tiny leaves. Some were densely covered in tiny white flowers with yellow centers. These grew in tight mounds, like pillows.

The terrain was daunting.

Walking became much easier as we left the vegetation behind us and began walking on very sharp rocks. A green crust-like plant was found on these rocks, but did not cover them completely. The darkness of climbing in the cloud that covered us for several hours lightened a little. Soon we were above the cloud and in bright sunshine. To the northeast was a bare dome of a mountain, covered with rocks, and beyond it, the ridge to another peak, slightly higher. All these were dwarfed by a much higher peak a few miles further east. When we reached the end of the ridge we were on, two small ponds could be seen in the valley between the tall peak and the ridge where we stood. We descended to the ponds and walked between them. One was stained black.

Once past the ponds the ground was mostly rock. Even grasses were rare here and large plant life was far below. To the west, north and south the view was unobstructed by other peaks nearby. Ahead of us, we would see a peak against the sky, but when we climbed up to it, there would be another high point further ahead of us, higher still. This repeated many times, as the mountain seemed to go on and on, with no top. We moved further to the north to lessen the steepness, and still more high points seemed to remain ahead of us. Soon the ground was less steep and we came to a very steep precipice, that fell away to the valley floor far below. A line of peaks stretched to the northwest and around to the north. All had no trees

on the summits, and were lower than the mountain we were on. From the precipice, the peak we were climbing rose up in a gentle slope, that was quickly climbed. The wind was strongest here and knocked us down several times. The temperature of the air here felt more like March than June.

Finally there was no more to climb. The top, about twenty feet across, now sloped down in all directions. We were at the top.

(From the author: A month later, Field returned with a few other settlers. Crystals and minerals he had collected turned out to be quartz and mica. There were no treasures to be found on the high peaks. It would be 142 years before the mountain named Agiocochook, [also called Kodaak Widjo which translates to The Hidden Mountain], would be re-named for a Revolutionary War general who later became president and become known as Mount Washington. The Crawford Path would be cut 177 years after Field's climb to get travelers to the summit from Crawford Notch, ushering mountain tourism into the region, that continues to the present. It would be 290 years before a group of four would think it was a good idea to set up a weather station on the summit, and collect hourly weather data, year around; and the Mount Washington Observatory would be born.)

Longtime member and volunteer Bill Ofsiany spent many years as a teacher.

EDUCATION

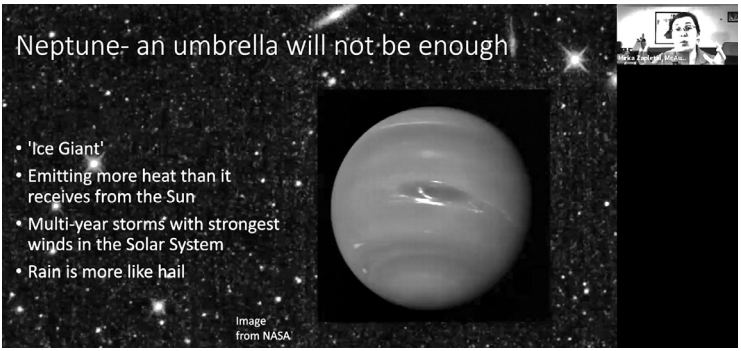
High Demand for Observatory's Virtual Programs

BY **BRIAN FITZGERALD**

As the Observatory and the country approached nearly one year of the COVID-19 pandemic, restrictions to in-person programming remained a significant challenge to fulfilling MWO's mission to develop and offer innovative educational programs (at least in the in-person sense, that is). Virtual programming however has remained in exceptionally high demand with MWO staff participating in a number of different outlets.

At the time of this writing, MWO's shift of Science in the Mountains to a virtual, once a month format has set a high standard for virtual lectures and engagement in weather and climate topics. Since the program's transition in July of 2020, the Observatory has offered eight programs through early January 2021, with an average of more than 200 attendees per program and a total viewership of more than 1,700 (not counting recorded program views). Based on survey feedback, topics and speakers such as Mirka Zapletal's talk on "Extreme Extraterrestrial Weather" and "Winter Weather in a Warming World" presented by Dr. Liz Burakowski have been standouts, along with programs about MWO's suite of weather instrumentation and thunderstorm and lightning science and safety. In the months ahead we hope to have you join us for a program if you haven't been participating already, and if you can't make a live program, you can always watch the recording at

mountwashington.org/sitm where you can register for each upcoming program.



McAuliffe-Shepard Discovery Center's Director of Education Mirka Zapletal presents on the "Ice Giant" Neptune during a Science in the Mountains lecture.

This past October, the Observatory's education department debuted its virtual classroom series presented as the newest rendition of Home of the World's Worst Weather Live. Each episode is geared towards supplementing middle school science curricula and features a different topic in climate and meteorology aired on a weekly basis. Education Specialists Nicole Tallman and Nate Iannuccillo host the episodes from the summit where they present connections between the summit environment and the wide worlds of climatology and meteorology. With the series beginning in early October, the back half of 2020 has been mostly focused on concepts in weather, but transitioning into 2021, the virtual classroom has shifted its scope towards climatology with lessons examining Earth's climate system and climate change. We have many engaging programs in store as we move into the remaining months of the school year, and we're very excited to continue to connect with all of our enthusiastic classrooms and viewers! Visit mountwashington.org/classroom for more information about the virtual classroom program, including how to register and watch past programs.

As we've mentioned in previous *Windswept* editions, the National Science Foundation-funded "WeatherX" project continues to be one of the most significant MWO curriculum development ef-forts in recent history. With the end of 2020-2021 school year, the project will enter the third and final year of the award, though the pandemic may likely challenge that timeline. As some may recall, the goal of the WeatherX project is to advance the knowledge of strategies that promote interest in data science among rural middle school students through an immersion in MWO and local-to-students weather and climate data. The WeatherX materials by project's end will be two units that will have students investigate local and Mount Washington data respectively, with both units tested in several classrooms throughout northern New Hampshire and western Maine. Project researchers and evaluators at Education Development Center, Concord Consortium, the University of Southern Maine, the University of Washington and the University of Maine, along with MWO, have teamed up with teachers to test the materials in classrooms in Gorham, Northumberland and Stratford, New Hampshire thus far, with more testing to come. If you know a rural middle school science teacher in the region that might be interested in bringing these materials into their classroom, don't hesitate to spread the word!

Summer/Fall 2020 Weather Data

	AUG.	SEPT.	OCT.	NOV.
Temperature (°F)				
Average	48.3	43.2	31.4	26.3
Departure	+0.2	+1.6	+1.2	+5.6
Maximum	66	63	50	50
Date(s)	11th	9th	10th	8th, 10th, 12th
Minimum	29	20	8	-5
Date(s)	26th	19th, 20th	30th	18th
Precipitation (inches)				
Monthly	6.17	3.89	9.11	5.54
Departure	-2.15	-4.14	-0.16	-4.31
24-hour Maximum	2.53	2.53	2.83	1.52
Date(s)	4th/5th	29th/30th	16th/17th	30th
Snowfall (inches)				
Monthly	0.0	0.0	21.3	21.4
Departure	-0.1	-2.2	+3.7	-16.4
24-hour Maximum	0.0	0.0	14.0	4.5
Date(s)	N/A	N/A	16th/17th	2nd/3rd
Season Total	0.2	0.2	21.5	42.9
Departure	+0.1	-2.1	+1.6	-14.8
Wind (mph)				
Average	30.8	32.5	35.8	45.3
Departure	+6.8	+3.9	+1.2	+0.4
Peak Gust/Direction	147* SE	114 S	119 NW	115 SE
Date(s)	4th	30th	8th	30th
Days 73+	8	9	13	19
Days 100+	4	0	3	3
Other				
% Sunshine	23	44	30	30
Clear Days	0	0	1	2
Partly Cloudy Days	5	9	3	6
Cloudy Days	26	21	27	22
Days with Fog	30	24	28	25
Days with Rain	20	16	18	10
Days with Snow	0	0	13	17

** New August Wind Gust Record Of 147 Mph; Previous Record Of 142 Mph Set On August 31, 1954.*

August Sees Record Wind Gust

BY **RYAN KNAPP**

An active hurricane season resulted in an active pattern for fall. However, a large ridge provided a stretch of fair weather and warmth. In the end though, snow finally returned to the summit, albeit, a bit later than most years.

August 2020

High pressure provided fair weather on the first. Fog and rain showers returned on the second as a warm front approached for the third. The remnants of Tropical Storm Isaias moved north along the coast on the fourth and tracked to the west overnight with gusts reaching 147 mph setting a new August wind gust record. The passing low dropped about 2.5 inches of rain on the fourth/fifth. Partial clearing returned on the sixth then cleared on the seventh as high pressure built in. The ridge slid east on the eighth and convective showers and thunderstorms popped up around the White Mountains. A southwesterly flow pumped moisture into the region as a couple surface lows passed providing scattered rain showers from the ninth through the twelfth. Intermittent clearing set up on the thirteenth as high pressure built back over the region. The ridge provided fair weather conditions on the fourteenth/fifteenth with a moist onshore flow providing undercast conditions late on the fifteenth. The ridge departed on the sixteenth and the moist flow rose in elevation resulting in fog with pockets of drizzle. Low pressure approached from the west on the seventeenth dragging a cold front through early on the eighteenth providing light to moderate rainfall. Showers tapered early on the nineteenth however, an upper level trough resulted in lingering fog. High pressure on the twentieth allowed for clearing and dampened winds. A warm front late on the twentieth and into the twenty-first returned fog, winds, and rain showers. The front stalled overnight and into the twenty-second providing additional fog and showers. A couple weak surface lows tracked up the stalled front on the twenty-third providing additional light rain and cloudy conditions. A ridge quickly passed on the twenty-fourth prior to another front stalling overhead overnight as a low approached from the west for the twenty-fifth/twenty-sixth. As the low exited on the twenty-sixth, it dragged the cold front eastward allowing showers to taper. Cold air overnight and into the twenty-seventh dropped temperatures to below freezing but rebounded as high pressure returned during the day. The ridge remained for the twenty-eighth then slid offshore as the remnants of Hurricane Laura moved in for the twenty-ninth. The passing low brought fog, gusts topping out at 109 mph, and just over an inch of rain

by the time things wound down on the thirtieth. A ridge on the thirty-first cleared the summits as winds dramatically decreased providing fair weather conditions for the day.

September 2020

A frontal boundary to the west returned fog for the first. Rain showers and drizzle spread over the region on the second/third as the front slowly passed through. As the front slid east, summits cleared revealing several cloud layers above and below the summit on the third/fourth. A cold front on the fourth returned fog briefly prior to clearing late. The fifth had intermittent fog give way to partly sunny skies as weak high pressure crested. A zonal flow on the sixth provided cool, dry conditions. A Hudson Bay low on the seventh resulted in a passing cold front providing light rainfall. A weak low on the eighth kept the summit foggy into early on the ninth when clearing returned with a building ridge. Fair weather early on the tenth gave way to a passing cold front, which provided light rain that lingered into the eleventh. High pressure and drier conditions returned for the twelfth/thirteenth. An upper level trough later on the thirteenth provided a moist flow with fog and showers which lingered into the fourteenth when a cold front passed. High pressure returned for the fifteenth/sixteenth with wildfire smoke from the west providing hazy skies overhead.

A cold front on the seventeenth returned fog as the remnants of Hurricane Sally passed offshore on the eighteenth. The moist onshore flow from Sally provided summits with fog and drizzle. High pressure cleared summits on the nineteenth as a northerly flow dropped temperatures below freezing. Clear and cool conditions lingered into the twentieth as the ridge slid east. A milder return flow set up for the twenty-first/twenty-second. The twenty-third saw the remnants of Hurricane Teddy pass offshore resulting in increased winds, fog, and some light rain showers. A weak cold front brought another round of light showers on the twenty-fourth. A moist flow continued fog on the twenty-fifth and a warm front on the twenty-sixth provided a few light rain showers followed by clearing as the front exited. An upper level trough provided fog and light rain showers on the twenty-seventh/twenty-eighth. A cold front stalled to our west as a secondary low raced north along the coast on the twenty-ninth/thirtieth, which resulted in 2.5-plus inches of rain and a peak gust of 114 mph.

October 2020

A weak ridge on the first provided mostly cloudy skies then a low from the west on the second would provide a wintry mix to the summit. An upper level trough resulted in upslope snow showers on the third/fourth. A weak low traversed the international border on the fifth resulting in light rain showers. A weak ridge provided clearing on the sixth. A strong low from the west on the seventh/eighth resulted in a wintry mix and gusts approaching 120 mph. A moist flow kept summits foggy on the ninth. A strong cold front on the tenth resulted in thunderstorms, downdrafts up to 114 mph and heavy rainfall with 1.32" collected. High pressure built behind the front allowing for clearing on the eleventh/twelfth. The remnants of Hurricane Delta fed into a low from the north on the thirteenth/fourteenth resulting in another round of heavy rainfall.

Clearing on the fifteenth gave way to fog as a cold front approached from the west. The sixteenth saw a wintry mix turning to snow as the front passed and then stalled to our east. The seventeenth had a coastal low track northward dumping 13.8 inches of snow prior to tapering overnight. High pressure on the eighteenth provided sunny skies and average temperatures. A cold front on the nineteenth returned fog and light rain. The front stalled to our west resulting in drizzle and rain showers for the twentieth/twenty-first. A weak upper level trough provided light rain for the twenty-second/twenty-third. A low passed through Quebec on the twenty-fourth dragging a cold front through the region resulting in rain transitioning to snow prior to tapering. Fair weather briefly returned on the twenty-fifth. Then low pressure from the west on the twenty-sixth resulted in a wintry mix. A cold front on the twenty-seventh transitioned rain to snow. Upslope snow showers lingered into the twenty-eighth. The remnants of Hurricane Zeta passed on the twenty-ninth resulting in 4.1 inches of snow. Snow tapered on the thirtieth as clear but cold and blustery conditions set up with high pressure on the thirtieth/thirty-first.

November 2020

A warm front on the first resulted in sleet that later transitioned to snow. As low pressure passed on the second, it dragged a cold front through with a secondary low following close on its heels for the third/fourth. By the time snow tapered, 8 inches of snow fell on the summit. High pressure crested over the region on the fourth/fifth as a weak low over the Great Lakes lifted a warm front across the region late on the fifth. A large ridge built over the eastern U.S. from the sixth through early on the eleventh providing fair weather conditions and record warmth with daily record highs being equaled or broken for the eighth through the twelfth. A low brought fog and rain overnight on the eleventh/twelfth. A ridge on the twelfth cleared skies as a northerly flow dropped temperatures back to seasonal readings. Low pressure on the thirteenth provided light snow with upslope snow showers lingering into the fourteenth.

A deepening low approached from the west on the fifteenth lifting a warm front northward providing a wintry mix that transitioned to snow on the sixteenth as a cold front passed. A secondary cold front on the seventeenth provided continued snow showers that lingered into early on the eighteenth. High pressure then built in later on the eighteenth then slid east on the nineteenth. A weak front brought light rain late on the twentieth and then slid offshore on the twenty-first as high pressure briefly built back in. Low pressure from the south-west on the twenty-second provided a wintry mix that continued into the twenty-third. A cold front late on the twenty-third transitioned precipitation back to snow by the twenty-fourth. A warm front on the twenty-fifth provided additional light snow showers. A low to the south on the twenty-sixth provided light rain. Upslope flow on the twenty-seventh resulted in drizzle that then transitioned to snow, which lingered into the twenty-eighth. High pressure provided brief clearing on the twenty-ninth. A warm front ended the month with mixed precipitation turning to rain along with winds gusting to 115 mph.

5:21 PM Wed. Aug. 5, 2020

What an evening we had yesterday! For my first real storm/wind event of my Observatory career I got an exciting one with a record-breaking summit wind gust.

During the afternoon hours leading up to the closest passage of the storm, we patiently waited and monitored the progress as Tropical Storm Isaias battered its way through southern New England.

The storm drew closer as we neared the evening hours, with the center track being west of the summit, traveling north through the middle of Vermont. Winds quickly climbed to 70, 80, then 90 mph smashing through my personal record of 77 mph on the summit and amazing me with the rate of increase in speeds due to Isaias being such a fast mover. During the 6 o'clock hour we crested 100 mph, and I was able to go outside and experience the mayhem. It was a humbling experience being pushed around, although I was told the southeast winds we were experiencing are generally less menacing out on the observation deck since we are situated on the northwest side of the summit. A short while later a gust of 123 mph made quite the roar. At about the same time, heavier bands of rain started passing through which dumped an appreciable amount of rain in a short period. I was downstairs cooking some dinner when suddenly the stove vent water drain bottle overflowed all over the counter, with the feed tube having a steady stream of water exiting it. My engineering mind rushed to find some hose so that the drain could feed right to the sink. Normally the drain bottle could be emptied every once in a while but the heavy rain bands overwhelmed the system at the time. I was happy to be able to find a solution to the problem quickly or the bottle would have had to be emptied every 5 minutes it seemed, which would have taken away my opportunity to storm watch with the crew!

The winds started to decrease a bit, with the peak gust still remaining at 123 and it looked like it was trending downwards. Was the heaviest part of the storm over? Nearing the 8 o'clock hour David Decou, our shift night observer, came in from taking an observation and said it felt like the winds were getting stronger again. Our usual wind speed recording device, the famous Hays Chart, was unfortunately not in service so sadly we could not watch the red ink line to observe the trends. Luckily, we were able to pull up a computer program that mimics the chart so we had the next best thing to view and check the spikes from strong gusts. Suddenly at 8 p.m. sharp, the chart spiked showing a gust of 147 mph! The wind database was cross referenced and sure enough, it showed a peak gust of 146.7 mph from the southeast! Our crew celebrated the feat as it set

all of our personal records and we then shared the news with the state park crew who also had a few new personal records set. We soon discovered that besides personal records, it also set a new all-time wind record for the month of August! The previous record was 142 mph set back in August of 1954.

—Sam Robinson, Weather Observer/ Engineer

8:26 AM Thurs. Sept. 3

I think it is safe to say that many people have experienced a change in their 2020 habits and plans. I feel like my day to day schedule can vary so wildly that even my best laid out plans change quickly and unexpectedly. As spring came into focus the beginning of April, I was excited to pack away my Oboz insulated Bridger boots for something lighter and more breathable. I had every intention to spend quite a bit of time exploring the local trails around me as quarantine was still in its infancy. Because of this I decided to lace up with a pair Oboz Aretes. I choose both a low waterproof and mid non-waterproof, as I wanted variety in my day to day. Little did I know this choice was about to knock itself out of the park when it came to versatility.

Amidst my time living in the Mount Washington Valley and working on the summit of Mount Washington I have been running around quite a bit over the past few months and on a fairly tight schedule. I have struggled to adjust to the new pace of life and still find time for myself outside. Often times when I do get out it isn't expected, but having a shoe that crosses

over all aspects of my life helps. The Aretes offer a durable, comfortable, and stable shoe that doesn't look bad either. I can put them on in the morning and take on whatever outdoor wandering or relaxing I get into without needing to change.

Because of our partnership between the Observatory and Oboz, our staff, including myself, are fortunate to be prepared for whatever is thrown our way at work. It's a bonus to have the same comfort and durability follow us into our personal lives too.

—Rebecca Scholand, Summit Operations Manager

6:32 AM Wed. Oct. 14

October 13 began as a beautiful morning with another striking sunrise. There were not many clouds aloft. We could tell that cloud cover was increasing and there was certainly some moisture

to the southeast, marked by lower visibility. Winds were southerly and they appeared to be southeasterly in the valley as we watched the undercast roll over the Carters and Wildcat towards the northwest. A little higher up and several hundred feet above the Northern Presidentials were constantly changing wispy lenticular clouds with intersecting flows creating these intricate cloud formations. Naturally, we snapped some photos.

The morning radio call, where we call out the weather to the AMC and RMC huts, and other listeners, was at 0700EDT. As I came in to prepare for the radio call, I noticed the beginnings of a rainbow forming over Mounts Willey and Field. I went up to the parapet to briefly snap a couple of photos before the radio call.

During the call, I was watching the rainbow continue to develop. It usually takes about 10 to 15 minutes to go through all the relevant data and forecast information. That can be the entire life span of a rainbow; they are finicky things really. About halfway through, I noticed another rainbow what looked to be coming out of the Great Gulf. I looked back towards the west at Mounts Tom, Field, and Willey and saw a double rainbow. Nuts! Maybe it's just me and I'm not claiming this to be true all the time, but in my almost 2 years here, I've seen the aurora borealis more than I've seen rainbows, and here I am looking at 3. I did mention it on the radio, just in case any of them could see it too. Even my co-worker Nate Iannuccillo came in to tell me how awesome it was up on the observation deck.

Once finished with the radio call I headed up to the observation deck and proceeded to take many pictures. The first thing I noticed was the upslope rain showers. The skies were becoming increasingly cloudy with the clouds below the summits moving ever closer from the south. The air was extremely dry ahead of the rain. The lower level clouds sitting around 4000 feet almost completely evaporated into the air on the approach to the summit before I headed into the weather room for the radio call earlier. Now, moisture was lifting up over the summit and

compressing, condensing, and spitting out some rain. As the winds picked up a bit, those wispy lenticulars were now forming over the summit.

The next thing I noticed was all the lenticulars around. They were everywhere and made the sky look like it was a massive mountain range covered in snow similar to the Alps or Rockies, except in the sky. Then to top it all off, those three rainbows I saw earlier were actually all part of the same one. A near 200° colorful display of shimmering, reflecting, refracting, and dispersing light from the oncoming moisture wave rose out of the Great Gulf over Willey and Field, stretching up into the sky as the lenticulars flowed through. A secondary one had formed a bit further south down route 302 but faded along the upward curve. Anyone of these three events or phenomena were quite spectacular on their own. Witnessing all three around the same time was almost too much emotion to handle.

—Jay Broccolo, Weather Observer/ Meteorologist

2:16 PM Mon. Nov. 2

Halloween was much different this year for everyone, including myself who has never experienced the holiday in such a remote place! The weather conditions for the day were not spooky at all, rather they were perfect with clear skies, mild winds but crisp cool temperatures. I had packed my costume and kept it a secret until that morning when I walked upstairs to the Weather Room wearing Ms. Frizzle's dress! As a former middle school science teacher and now Observatory Education Specialist I felt this character was very fitting! I always strive to be someone who excites others about science and the fascinating things that occur around them, just like Ms. Frizzle. Unfortunately, I did not have an education program to run on Halloween so I could not truly be Ms. Frizzle then. However, I channel my Ms. Frizzle energy every Monday at 11:15 a.m. when I (and my counterpart on the other shift, Nate Iannuccillo) host our virtual classroom series from the summit!

Later that evening once the sun was fully down, we went outside to find a dark sky brightened only by the full moon in the sky and The Great Summit Pumpkin propped up by the summit sign. This of course made all of us smile! Celebrating the holidays away from home can be a bummer, but the summit crew really knows how to make this place feel like a home away from home.

—Nicole Tallman, Weather Observer/ Education Specialist

Snowflakes and Regional Snowpack

BY NATE IANNUCCILLO

Recently, after giving a distance learning presentation on winter weather, someone asked me if we see certain types of snowflakes more commonly in specific parts of the country. After answering to the best of my ability, I thought that this would be a good launching point for a deep dive into snow science and snowflake formation, and how climate affects the prevalence of different types of snowflakes.

In understanding this science, like many things in meteorology, we can make the jump from microcosm to macrocosm when we connect regional climate to the development of an individual snow crystal.

Snow begins with the presence of ice nuclei that allows for the formation of an ice crystal when supercooled water freezes onto the nucleus. Ice nuclei are different types of particulates in the atmosphere, some natural, and some man-made. Examples of different ice nuclei include pollen, dust, soot, ash, bacteria, and other organic matter.

With our ice crystal beginning to aggregate onto the nucleus, the potential snowflake grows from the deposition of water vapor onto the ice crystal. Freezing water molecules naturally organize into a basic hexagonal structure and the majority of snowflakes maintain this basic geometrical framework as they continue to grow, even if the hexagon branches into a more dendritic shape. In rare cases, snow crystals can also take on the form of triangles and dodecagrams (a twelve-pointed star).

Branching occurs because water vapor deposits more readily onto the points of the crystal. Depending on the amount of water vapor in the air as well as the temperature immediately surrounding the snow crystal, the growth rate of the branches and the crystal on the whole will vary significantly. This growth is extremely sensitive to these differences on the smallest scale, and as a result, this sensitivity leads to the development of unique snow crystals forming as they encounter changing conditions on a microscopic level as they move through the atmosphere. As a result, each snowflake is a reflection of its trajectory through the atmosphere and the conditions encountered along the way. This is why it is said that no two snowflakes are alike.

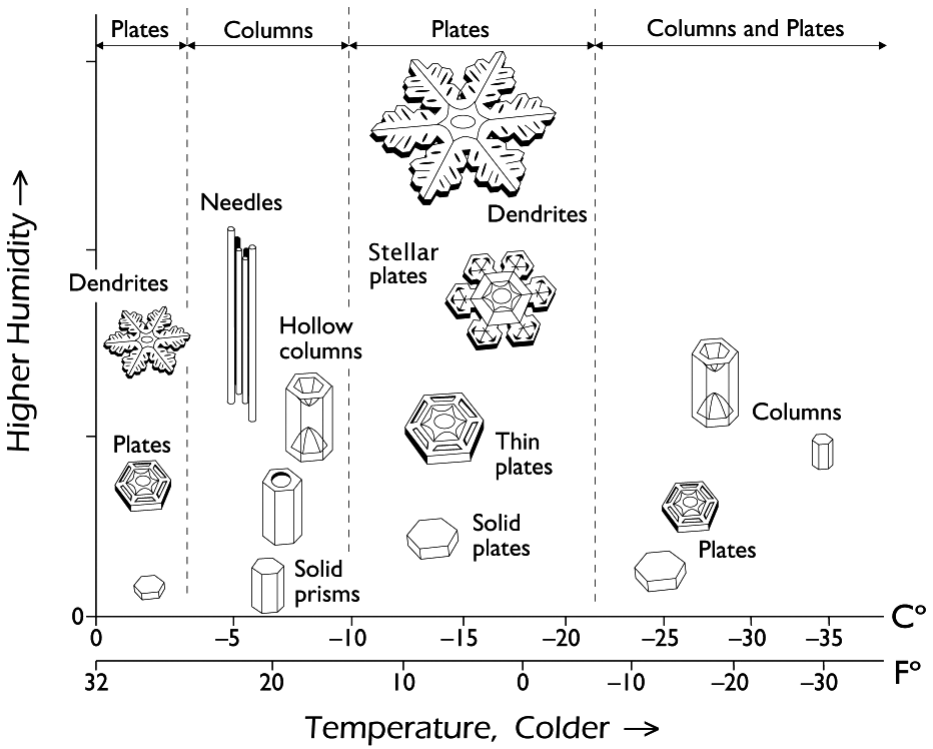
Dendrites are observed on Mount Washington.

As a result, the different types of snowflakes are primarily dependent on temperatures and humidity, so it makes sense that in different climates, we might see more of certain types of snowflakes and less of others. In the United States, stark contrasts are noted between the maritime snowpack of the Sierra Nevada and the Cascades when compared with the continental snowpack of the Rockies. Not so surprisingly, the continental snowpack is much drier and colder than the maritime snowpack.

When we look at a the snow crystal morphology diagram, it can be easily inferred that these maritime climates we're referring to are more likely to see snowflakes that are representative of the relatively warmer and more humid conditions whereas the colder and drier continental climates would see a somewhat different sampling. For example, throughout a season of snowfall in a maritime climate, we might be more apt to see a higher frequency of dendrites than we would in a continental climate. On the flip side, we might see a higher frequency of plates falling in a continental climate than we would in a maritime climate.

Here in New Hampshire, we get storms that make our climate a sort of hybrid between these two types of snowpack. We get the relatively cold, dry, "Alberta Clipper" systems that track through continental Canada, but we also get warmer systems with considerable moisture that track up the coast. We sometimes call these storms "Nor'easters." Of course, none of these types of snow crystals are restricted to any one climate, and as the age old saying goes, "Climate is what we expect, and weather is what we get."

Diagram from snowcrystals.com



2020 Was Quite the Year

BY **REBECCA SCHOLAND**

The summit crew shows its social distancing prowess.

It's the dead horse and the elephant in the room at the same time—COVID-19. The Observatory and the Summit Team are weathering one heck of a proverbial storm. I am proud of their dedication, tenacity and flexibility. Observers Ryan Knapp, Jay Broccolo, David DeCou, Nicole Tallman, Nate Iannuccillo, and Sam Robinson are MVPs and deserve a standing ovation!

As we close in on one year since the pandemic began altering our operations on the summit, it is overwhelming to reflect back on the events of change. First we needed to cancel the remaining winter trips, spring volunteers, and end winter internships early. Simultaneously we were designing and implementing our own summit protocol. Looking over all our operational details from transportation, grocery shopping, sleeping arrangements, and assessing what ifs. Shortly thereafter Jay joined Ryan as a senior observer while David continued to learn his night routine and we welcomed three new day observers. It was all hands on deck to help train and prepare David, Nicole, Nate, and Sam for their upcoming METAR exam with the National Weather Service.

Summer began with further cancelation of our volunteer program through mid-fall as well as forgoing the summer Internship program. The Observatory's summit museum and gift shop were assessed for safe opening but ultimately remained closed for the 2020 season while the New Hampshire State Park's Sherman Adams Building delayed its opening and implemented a reservation system to safely manage guests in the building. Brian Fitzgerald and I made many trips to the summit to help train new staff not only in summit operations and observations, but with our educational programs and systems as well. Ryan and Jay postponed and cancelled vacation time to ensure their expertise wasn't missed on the summit. Seek the Peak moved forward but in a very different fashion. Supporters got outside in their own communities and helped us with a successful event.

Brian and the education team, Nicole and Nate, rolled out new programs in new formats. Science in the Mountains moved to an online virtual setting and Home of The World's Worst Weather Live programs reached classrooms weekly with the start of the school year. It was no simple task to build and implement these programs for the first time. On the flip side Ryan, Jay, David, and Sam worked to complete a Synoptic Temperature Dataset project that would

make your eyes cross with all the data they reviewed from our archives. The Synoptic Temperature Dataset project's completion opened an opportunity to expand to a separate, but new set of parameters, Historic Visibility, that is currently being worked on.

Fall began with more cancellations—volunteers, interns and winter trips. Observers cautiously took some much-needed vacation time. The closure of the Weather Discovery Center was soon announced. The valley staff began with a major clean up and reorganization of the basement level of the building to make room for new lease tenants. While the summit staff wasn't directly involved, my absence while valley needs shifted was covered by the summit team ensuring all ran smoothly.

Nicole Tallman (l-r), Sam Robinson and Rebecca Scholand put the chains on the van for a trip to the top.

We also focused on winter transportation. Pete Gagne, Keith Garrett, and I worked on scheduled maintenance and replacement of six of ten belts on the snowcat tracks. Approximately 1500 bolts and corresponding nuts needed to be dissembled and reassembled on the new tracks, torqued, and inspected. Once this was complete the tracks were wrestled back onto the snowcat with some help from the Mount Washington Auto Road. Ready for the season, the snowcat was trucked up the Auto Road and staged for the first snow of the season. The 4x4 van and truck also received their seasonal once overs to make sure all chain sets were in working order and the plow was put back on the truck.

Another major adjustment for everyone was Marty's unexpected passing. Marty was a companion to all who worked, volunteered, and visited over the years leaving behind some big paws to fill. Volunteers were cancelled through the winter and we moved forward with the winter Internship program welcoming Intern Jackie Bellefontaine. The valley staff continued to work on readying the WDC museum exhibits for transfer to Concord's McAuliffe-Shepard Discovery Center, the Scenic Vista in Intervale, and the summit. This was an exceptional task as many of the WDC exhibits had been built in house by John Mitchell over the years.

With lower than average snow, transportation to the summit this winter has been complicated. More than once we have had to move the snowcat up and down the road to stage it at various locations. We have used the snowcat from base to summit one week and the next driven up with the van and truck. The summit staff has accepted the challenge each week to coordinate and adapt.

It is for all these reasons and for ones I know I am forgetting that we all should be proud of the summit team. As the days get longer in spring I hope our daily challenges become less and we are able to settle back into a more normal routine.

Time for An Update On Our Mesonet Sites

BY **PETER GAGNE**

I get questions from many members through our website about the state of the mesonet, so I thought it's a good time to update everyone.

We have a contract with the National Weather Service to provide hourly observations from the summit observatory and are contractually obligated to provide weather date from our sixteen mesonet sites. The NWS uses this data in their complex modeling calculations to hone their forecasts. We strive for 100 percent uptime on each station, but the weather elements on Mount Washington make it a constant challenge.

On the Mount Washington Regional Mesonet page of our website, we use a Google Maps insert to provide a graphic display of the mesonet sites. As it states in the legend, the icon is green if data has been received within two hours of the current time, and red if it has been more than two hours. Some sites are not programmed to transmit data constantly, and at least one we have no control over it.

The six (counting the 1,600' station at the Auto Road base) Auto Road Vertical Profile sites essentially serve as a permanent weather balloon, and are constantly transmitting. All of the sites except 4,300' beam data to the summit observatory via a repeater station at the Wildcat Ski Area. Because 4,300' is the only ARVP site with line-of-sight to our maintenance garage at the Auto Road base, we decided to redirect it there. Therefore, if the Wildcat link were to go down, weather data from mid-mountain is still transmitted to the summit via the garage.

Replacing the batteries in the Wildcat mesonet site makes the station more efficient.

As for the other sites, here are updates by station:

Attitash: Operational, 12volt dc solar array. Since the webcam failed, it has been very difficult to find network cameras that operate on 12volt dc. Note that this site beams data through the Jackson and Cranmore sites, so it is very reliant on both of them.

Bartlett: This site was decommissioned when the land and old LIDAR building was sold to Believe in Books.

Bretton Woods: Operational, operates on line power. Still located at the Latitude 44° restaurant, the webcam was replaced this past fall, but there are interface inconsistencies causing the various views to get scrambled. The radio link is also scheduled for an upgrade. The two Cog sites, as well as Lakes of the Clouds, repeat through this station.

Cannon: Operational, runs on line power. Data is transmitted to the summit through a separate radio link, along with the Highland Center, so whenever you see both of these sites down, it most likely is massive ice accumulation on the summit radio dish.

Cog Sites: These sites were taken offline as the Cog is undergoing infrastructure changes. The Base site was removed in order for them to construct a new maintenance shop. We hope to reinstall the sites and bring them back online once their improvements have completed, along with the upgraded radios to repeater site Bretton Woods.

Cranmore: Operational, runs on line power. This site was relocated from the roof of the Meister Hut to one of the Quad lift-towers in 2019 at the request of Cranmore Mountain.

Highland Center: Operational, runs on line power.

Jackson: Operational, but currently having power problems with the solar array. If this site is down, the downstream sites at Attitash and Mizpah Springs will also be down. The webcam failed last year and has been replaced with a fixed-position, wide-angle camera temporarily.

Lakes of the Clouds: Operational, but offline. We are dependent on the AMC's solar array, and although we are provided 12volts dc during the winter, our radio has not been able to connect to the radio at Bretton Woods. We are planning to upgrade the entire western mesonet network with new Ubiquiti 5.8Ghz units this spring.

Mizpah Springs: Operational, reliant on AMC 24volt dc array. The datalogger program enables the radio at short intervals during the day and does not transmit at night when battery power is at its lowest. Also reliant on repeater sites.

Tucks/Hermit Lake: Operational, reliant on AMC 12volt array. Data transmission is controlled by the caretakers via an on/off switch in order to conserve power. Also repeats through Wildcat.

Wildcat: Operational, runs on 24volt dc solar array. We replaced all eight solar batteries in 2019 at a cost of $5,300, and it has been worth it! The voltage is extremely stable now, and changing the station from 12volts to 24volts five years ago also reduced the amount of current draw, making the station more efficient. Wildcat is such a critical site, not only because the ARVP and Hermit Lake sites repeat through it, but the Ravines-Cam webpage with stills and time-lapse videos are our second most visited page after the main page.

As always thanks for your support and feel free to contact us through mount-washington.org.

It's All About the Metadata

BY **BRIAN FITZGERALD**

In one of my last undergraduate courses, one focused on Geographic Information Systems (GIS), we had the definition of one term drilled into us: metadata. For the longest time, all I could say about metadata was that it is "data about the data." Out of context that meant very little to me, but in the context of Mount Washington Observatory's weather and climate data, it's taken on a whole new meaning.

When researchers, both internal or external to the organization, attempt to analyze or draw conclusions from data, there is always a question about the quality of the data they are working with. Was this data collected using the same standard operating procedure (SOP)? Was the same type of thermometer always used? Did observers always calibrate instruments, and if so to what standard, and how frequently? What happened when data had to be estimated, or instruments temporarily failed?

Trying to draw conclusions from data is certainly challenging enough, but for researchers and the readers of their work to have any confidence in their findings, scientists need as much "data about the data" as possible to build confidence and reduce uncertainty. In the case of the Temperature Database project that was recently completed in the Fall of 2020, the process of creating a "research-grade" dataset meant that MWO staff needed to compile as much metadata as was possible to add to the quality and confidence of future research. MWO researchers and staff not only reviewed over one million temperature values in the project effort, but they also compiled as many temperature SOPs, instrument log book notes and station history data as they could into a metadata spreadsheet that could serve as a singular document for researchers to use in conjunction with raw data. This effort took considerable time and also represents one of the largest metadata gathering efforts since Grant et al. 2005, when researchers examined the summit's temperature record for evidence of warming over time. Since weather observing and climate reporting continues on the summit, metadata will continue to be logged into this MWO metadata clearinghouse.

As we transition from the investigation into temperature values and the production of a "research-grade" temperature dataset, MWO Weather Observers Jay Broccolo and Sam Robinson have taken on a new investigation exploring and analyzing another one of the summit weather station's long-term variables: visibility. To the best of our knowledge summit horizontal visibility is a param-

eter that does not appear to have been closely researched within or outside of MWO, and with support from Synoptic Data Corp., Jay and Sam have been on a fact-finding mission to explore and understand available visibility data over MWO's occupation of the summit. A large part of this fact-finding mission motivates the gathering of metadata once again to help Jay and Sam document the story beyond the data values themselves.

One of the most basic, but critical findings thus far is the acknowledgment and documentation of what visibility data has been collected over time on the summit. Since roughly 1942, visibility has been reported hourly from the summit of Mount Washington with few gaps and is largely broken down into two different values: prevailing visibility on the horizon, and the lowest horizontal visibility reported in the last hour. Although both variables are recorded each hour, only lowest visibility has been digitized throughout the entire record (thanks in part to a massive effort to digitize the hourly B-16 form years ago), with prevailing visibility existing in paper records and only digitally from 2008 to present, and on paper from 1942-2007. Although not critical to this initial data exploration and analysis project, digitizing hourly prevailing visibility values (in addition to a host of other desirable variables) is a rote, but important task that MWO will aim to complete in the future.

In comparison to temperature from 1935 to present, visibility thankfully does not require such a robust collection of metadata to document critical procedural or instrument changes over time. That said, documenting the basics, such as any changes or updates to visual aids or training, changes in points of observation on the summit, and any other relevant information is still being collected. With the compilation of this metadata along with initial analyses of any long-term trends or anomaly, MWO aims to establish a baseline for future studies that may examine relationships such as those between visibility and air quality over time. Stay tuned for findings and preliminary conclusions in future updates.

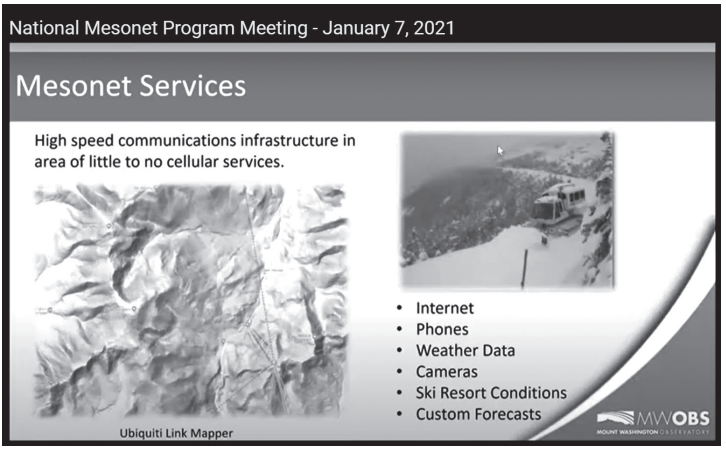
Beyond the realm of original research projects and the never-ending documentation of metadata, hosted research and product testing work continues at MWO. As mentioned last fall/winter, the evaluation of anemometer performance in heavy icing and high wind conditions continues for the FAA in order to capture a full icing-season worth of data. The results of this evaluation will inform on-going monitoring at the Juneau Airport Wind System (JAWS)

I	K	M	O	Q	S	U
StationInstrumentationAndMainten	ObservingPractices List	DataProcessing List	HistoricalEvents List	Communications List	Reporter Li	Status
Type of Instrument	Observer Information	Units	Daylight Savings Used In Obs	General Correspondence	Sample Name	Not Started
Instrument Comparisons	Observer Level Of Training	Special Codes	Changes in Station Context			In Progress
Start/end date of instrument	List of Observed Elements	Calculations				Completed
Condition of instrument	Observing Times	Algorithms				
Instrument sheltering and mounting	Units Used	QC Applied				
Type of recording	Observation Instructions	Homogenization Applied				
Calibration Results	Routine Maintenance Operation	Data Recovery				
Special Maintenance/Faults	Disposable Items Displacement	Treatment of Redundant Data				
Modifications	Corrections Made By Observer					
Barometer Height						

The MWO metadata template was created during the "Temperature Database Project" to log

that utilizes weather stations that incur frequent heavy icing events.

Finally, MWO staff and former Observer Taylor Regan were invited to the National Mesonet Program's annual meeting on January 7th, where Taylor offered a presentation to the "network of networks" about the Observatory's Mount Washington Regional Mesonet and methods for resolving long-term data records. Participants who represented groups such as the Oklahoma and New York State Mesonets were in attendance to learn about some of the history, services and challenges related to operating the Observatory's mesonet stations in remote and rugged locations.



Former MWO Observer Taylor Regan's presented to the National Mesonet Program about the Mount Washington Regional Mesonet.

Limited Volunteers Show Resolve During Pandemic

BY **LINDA AND HANK DRESCH**

Peter Fisk (l-r), Linda Dresch, Bill Ofsiany and Barbara Althen get started on sprucing up the grounds

We always like it when snow falls in the North Country and appreciate the much-needed snow. We are hoping there will be many snowy days before you read this *Windswept* article. The trails and slopes were looking incredibly sad in early January, but we have survived many similar holiday seasons with the knowledge that snow will come. Patience is the key.

The pandemic. What an impact it has made on our lives and our relationships. As much as we want to resume our normal Valley Volunteer activities of monthly membership mailings, projects around the Observatory's Administrative Offices, and planning for the next Seek the Peak, our chances of unintentionally spreading the virus to the staff (particularly the summit crews) is too great to risk. We couldn't begin to speculate what might happen if any of the crew on the summit tested positive. But it would be interesting. Perhaps old timers like Ken Rancourt and Peter Crane might have to come out of retirement. There also might be a few others who would welcome the opportunity (jump at the chance?) to return to the summit for a shift or two. Now with the vaccine, our wait will hopefully not be much longer.

Although we do appreciate the offers of help we have received from our volunteers, the past few membership mailings have again been handled by your coordinators (Peter Fisk did help us in November when the numbers of letters exceeded 1,000.) We do appreciate the multiple offers from our volunteers, but we just do not want to create a situation in which COVID-19 is spread.

Donna Gray (l-r), Brenda Sullivan, Donna Dunn, Linda Dresch, and Gary MacDonald take a break.

Fall clean-up of the office grounds occurred the first week in November and we were ably assisted in the endeavor by Barbara Althen, Peter Fisk, Karen Franke, Donna Gray, Gary MacDonald, and Bill Ofsiany. In addition, staff members Peter Crane, Donna Dunn, Brian Fitzgerald, Krissy Fraser, and Brenda Sullivan supplemented our efforts. Thanks to all.

We dearly miss our Valley Volunteers and sincerely hope you are all staying safe and well. We will meet again some "sunny" day!

Linda Dresch (l-r) and Karen Franke rake away.

Valley Volunteer Coordinators Linda and Hank Dresch can be reached at hankandlinda@mountwashington.org or by phone: 603-356-2137 ext. 208.

UPCOMING EVENTS

21ST SEEK THE PEAK JULY 16-17

There's a new theme to the Observatory's largest annual fundraiser: From any summit to any valley or waterway! Climb, hike, paddle, or bike. It's all good as you seek your peak to raise money for the Observatory's important work. If all goes well, we'll convene at the base of Mount Washington at Great Glen Trails on July 17 for registration, the expo and of course the after party. Raise a minimum of $300 and receive Seek the Peak backpack, t-shirt and get entered to win other super prizes. We'll also be making event adjustments along the way to be safe. To learn more about becoming an event participant, sponsor, or volunteer, go to seekthepeak.org.

HOME OF WORLD'S WORST WEATHER VIRTUAL CLASSROOM

Connect with the Observatory's live on Zoom on Mondays at 11:15 a.m. through May thanks to support from MathWorks and The Ham Foundation. Observers focus on a specific topic each week and target the programs to grades 6-8 though all weather fans will find the segments interesting. Following about a 20-minute presentation, there is a question and answer session. The programs will be uploaded to the Observatory's YouTube page as well at the website at www.mountwashington.org/classroom/.

SCIENCE IN THE MOUNTAINS

Science in the Mountains, supported by MathWorks, is the Observatory's free virtual year-round lecture series. Learn about the climate, weather and other amazing topics from home. Observatory staff, along with experts, allow you to expand your scientific knowledge through lectures that encourage questions from participants. All programs start at 7 p.m. and use both Zoom and a live stream from the Observatory's Facebook page. Can't make one? That's okay because they are recorded and available the next day on the Observatory's YouTube channel. Registration is recommended. Find out the schedule on the Observatory's web site mountwashington.org/sitm.

SUMMIT TRIPS

Due to the COVID-19 pandemic, trips to the summit— both day and overnight EduTrips—are not being offered. Neither are partner-led climbing trips. Please check the Observatory's web site mountwashington.org for updates.

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David Collinson ..... In Memory of Dean Collinson

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Lori Gesing ..... In Memory of Don Discenzo
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Michael Drury ..... In Memory of Ginger Drury
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Robert Fain ..... In Memory of Mary Fain
Megan Hinckley ..... In Honor of Karen Franke
Megan Williams ..... In Honor of Keith Garrett
Matthew Gieseting ..... In Honor of Luna Giesting
Dennis P. Marrotte ..... In Memory of John Howe
Kristy Duris ..... In Memory of Ruth Innes
Kimberly Morris ..... In Memory of Ruth Innes
Amy Patenaude ..... In Memory of Ruth Innes
Holly Pierce ..... In Memory of Ruth Innes
Keith Rodney ..... In Memory of Ruth Innes
David Smaldone ..... In Memory of Ruth Innes
Erin Sweeney ..... In Memory of Ruth Innes
Sallie K. Gilman ..... In Memory of Laurie Kinne
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which has a link to the online shop, SmugMug prints, Washburn gallery and more

Member Milestones —25 Years

BY STEPHANIE FITZGERALD

Gratitude for every member inspires our work at MWO. We'd like to highlight those who've renewed their support for 25 consecutive years, offering our sincere appreciation and congratulations!

This group of Observatory devotees includes John W. Lund, former Observer John Lingel, Walter and Kristen Tipert and others who've gone above and beyond as continuous members for a quarter-century. These folks have been staff, volunteers and visitors at our summit weather station, some compelled to return year after year (and who we missed seeing this past winter!)

Last but not least, our gratitude goes out to Rob C. Kirsch who, like many, learned of the Observatory through hiking and climbing in the Whites. In January 1978 he interned at the Observatory, and worked as an observer when not attending college or law school between '78 and '81. Rob has been supporting MWO since first joining the board in '85 and we are so grateful for his work as the Vice Chair of the Board the last 2 years.

Continuous weather observation depends on continuous support. Every time you renew your membership, you help keep our observers working on the summit, ensuring a window to understanding one of Earth's most extreme and beautiful environments at 6288 feet. To all of our 25-year members, thank you! Questions about your membership? Email me at membership@mountwashington.org.

25 Years...

Gary Becker
James S. Bernotas
George H. Bouret
David Colglazier
Edward M. Cook Jr.
Douglas Cote
Roger J. Cyr Jr.
Tom DeFusco
Thomas Dwyer
William Fadden
David Field
Everett R. Frizzell
Colleen Gendron
Earl Gillette
Dan C. Hanson
Catherine Henn
Rob C. Kirsch
Paul Klee
David Landaeta
Diana Lees
Daniel Lentz
Jonathan Lingel
Mark A. Long
Jay Luff
John W. Lund
Margaret S. Moreau
Dianne M. Murphy
Thomas L. Nutting
Priscilla Page
William Rising
Peter Salwa
Meg Schoenemann
Mr. & Mrs. Christopher W. Smiles
Doug Steward
Kevin & Melissa Thomas
Walter & Christen Tipert
Brian Wiedle
Staunton Williams Jr.
Douglas Wyman Sr.
Carlson's Lodge

GREEN FLASH

Moon Shots

The last penumbral lunar eclipse of 2020 took place Nov. 29-30 making the moon look darker than it normally. This occurs when the moon moves into Earth's outer shadow called the penumbra. Weather Observer Ryan Knapp caught the eclipse from the summit from most people were sleeping. The left is the moon before entering the penumbra and the right was at peak where clouds softened the view. The moon entered the penumbra at 0229 ET and left at 0656 ET. The peak of the eclipse was at 0442 ET.

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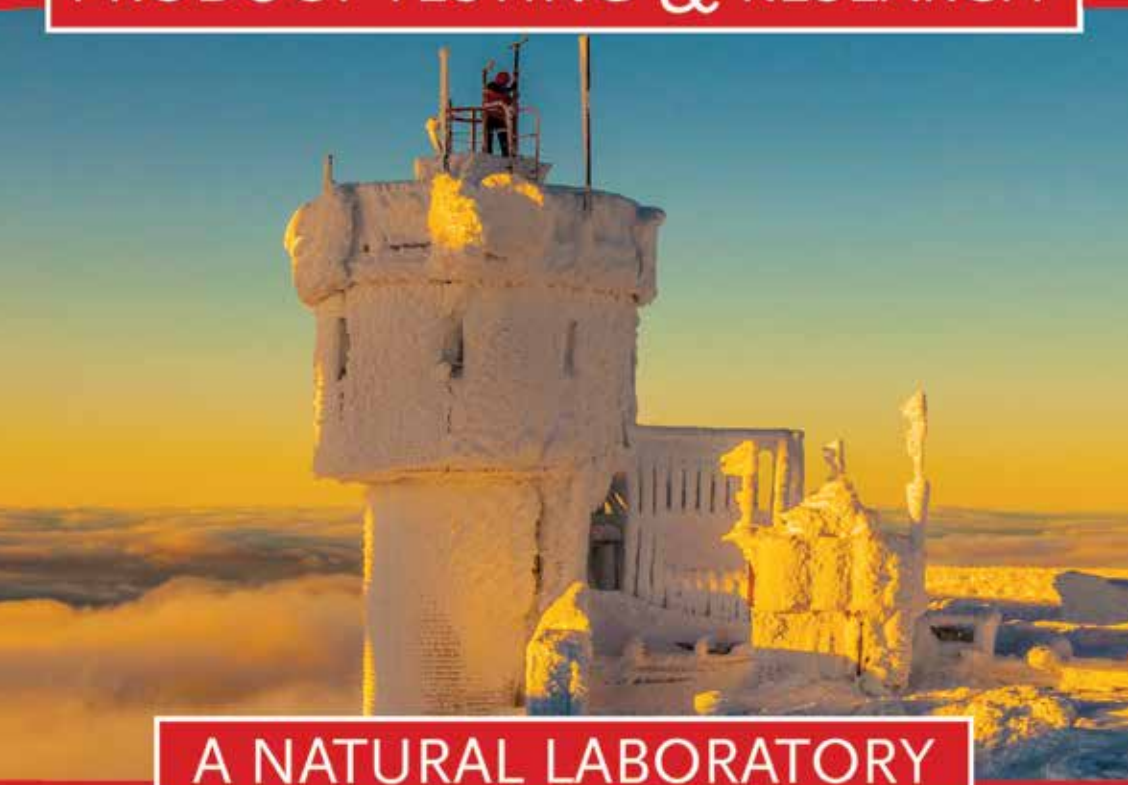

A NATURAL LABORATORY

Each project has unique requirements that will incur varying costs as purpose, collaboration and expectations are identified.

~ CONTACT US TO LEARN MORE ~

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  kgarrett@mountwashington.org 603-356-2137 x 230

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