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SUMMER 2025 | VOL 66 NO 2

WINDswept

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WINDswept

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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 who donate at least $60/year or $5/month receive: Tours of our famous mountaintop weather station (generally mid-May through mid-October); a one-year subscription to *Windswept™: The Bulletin of the Mount Washington Observatory*; meteorology and climate research news from the summit of Mount Washington, straight to your inbox; free admission to *Extreme Mount Washington*™ museum; advanced notice of special events; a 15% discount on all purchases in our museum and online shop; and free admission to more than 300 science centers through the ASTC Passport Program (restrictions apply, please see the ASTC website for details).

Members will receive the three issues of *Windswept* for the year following the quarter in which they join. Please make checks payable to the Mount Washington Observatory and send to: Mount Washington Observatory, PO Box 2310, North Conway, NH 03860-2310, or join at mountwashington.org.

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WINDswept

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Cover Image: Hikers on the summit during 2024's Seek the Peak. Photo by Stephen Wentworth

IN MY VIEW

Seeking Peak Experiences on Mount Washington and Beyond

Ellen Estabrook

BY **ELLEN ESTABROOK,** WINDSWEPT EDITOR

On the opening day of Mount Washington State Park on May 23, the summit received just over four inches of snow, enveloping the rockpile in glaze and rime ice, fog, and below-freezing temperatures. Season's Greetings from Mount Washington!

Summer is prime time for experiencing the Home of the World's Worst Weather. Whether you arrive via the Auto Road, Cog Railway or White Mountain National Forest trail system, your visit is sure to be otherworldly as you step into weather patterns experienced daily by the staff at Mount Washington Observatory and Mount Washington State Park.

In this issue, we'll share stories of both weather and history as we continue two traditions: An over 90-year weather dataset collected on the summit of Mount Washington, and the now 25-year custom of Seek the Peak, the Observatory's largest annual fundraiser. Our title feature, "From Trailheads to Friendships," (pg. 27) takes us from Seek the Peak's humble beginnings to the now over-500 participant strong celebration in its 25th year.

In the spirit of looking back, MWOBS curator Dr. Peter Crane brings the Observatory's Gladys Brooks Memorial Library to the page in sharing select materials like stereoviews, maps, photos, and other assorted curios (pg. 32). These images not only reflect the Observatory's illustrious history, but also mark an exciting and integral pilot project in the digitization of the Observatory's ephemera, allowing the public free online access to selections from the organization's vast archives.

Science Writer Gabriella Gurney takes us to the alpine zone to admire the season's high altitude blooms and shares ways we can help protect plant life in mountainous environments through citizen science (pg. 42). Thanks to research by Weather Observer Charlie Peachey and his team (pg. 38), we can now glean insights into the effects of these events—like avalanches and flooding— and future implications for the region.

As a friend of the Mount Washington Observatory, you are an integral part of its living history and the research, stewardship, and community that color its mission. As you seek your own peak experiences in the White Mountains and beyond this summer, we hope that this publication serves as an affirmation of your support and stewardship in action.
With gratitude,

Ellen

Celebrating 25 Years of Recreation in the White Mountains of New Hampshire

Drew Bush

BY **DREW BUSH,** EXECUTIVE DIRECTOR

Twenty-five years. It's hard to believe that we have been welcoming the recreational community to celebrate Mount Washington and the White Mountains for a quarter century with our annual Seek the Peak hiking event. This year's event will mark the occasion spectacularly.

For the first time since I've been here, we'll play host to a bevy of new partners who will add fun and excitement to every aspect of the event. They include New Hampshire Scouting joining us with physical activities for families to compliment our rock climbing wall, the Appalachian Trail Conservancy contributing unique brain teasers to mark our anniversary along with the trail's own centennial celebration, Granite Outdoor Alliance organizing an innovative section at our Après Hike Expo for New Hampshire companies, and learning for all ages with an Expo section devoted to our nonprofit partners.

For you, our hikers, we've added top tier fundraising and raffle prizes from new gear sponsors that now include L.L. Bean, Garmin, Helly Hansen, Arc'teryx, Terracea, Burgeon Outdoor, and NEMO Equipment along with many of our previous generous sponsors. And I'm particularly excited, myself, about our new caterer who will supply us with a fantastic BBQ feast. Our staff has even been brainstorming on how those who might wish can mark the anniversary with memorials for anyone who once took part in the event and can no longer be with us.

Seek the Peak is integral to our financial sustainability. All of the funds raised directly support our forecasting, research, and educational programs.

I can't emphasize how important this year's event will be to our financial sustainability. All of the funds raised directly support our forecasting, research, and educational programs. While we can't predict (as of my writing this col-

umn) how changes in Washington, D.C. may impact our finances, we hope you will join us at this year's event to add financial stability to our work. And, if you are so inclined, please reach out to your friends and family to do the same.

There will be much to celebrate. Our educational programs have grown by leaps and bounds, with 22 schools calling themselves members who have students learning with our team year-round. Our daily forecasts keep communities across Vermont and New Hampshire safe—with more to come on air and on our website by the time you read this. Our research programs have led to new partnerships with multiple universities, the United States Air Force, and the United States Army Corps of Engineers. We'll even be working with partners at the Appalachian Mountain Club and Hubbard Brook Ecosystem Study to publish a new annual almanac of the climatology and ecology of the White Mountains after Seek the Peak concludes—which will be interpreted by the New England artist our review panel selects.

Whether you're a weather aficionado, scientific researcher, proud parent of a student, outdoor enthusiast, hiker, young student, skier, White Mountains historian, New England resident, or are just simply interested in our work, there is no better time to join us than this year's 25th anniversary celebration. We need you now more than ever. I look forward to seeing each of you on July 19 at Great Glen Trails Outdoor Center.

Nimbus' Spring Meow-sings: In Purr-suit of the Purr-fect Rock

TRANSLATED BY **MEES FRANSSEN**

Greetings from the summit, Nimbus here—Mount Washington's official meow-teorologist and only full-time resident.

After a long, snowy, and windy winter of dramatic weather, I'm purr-leased to report: spring has finally sprung. The snow and ice is beginning to melt, the sun is sticking around longer, and I've emerged from my favorite spot on the couch with one very important mission…

Find the purr-fect rock for summer.

You see, every spring I search for a fresh sun-warmed stone to claim as my seasonal throne. It needs to have just the right amount of sunlight, shelter from the wind, and a surface soft enough for a proper loaf—but firm enough to show I'm a true mountain cat.

This morning, after thoroughly annoying the observers during breakfast and a few indoor zoomies, I headed outside for my first official rock inspection of the season. The snow's still hanging on in places—classic overachiever—but I spotted a few promising candidates poking through.

- One by the observation deck? Way too many Paw-parazzi when the summer tourists come visit.

Can you spot the cat?

- A ledge below the tower? Too cold and not enough sunshine.
- But a sun-soaked slab near Goofer Point? Just right.

I tested it with a good ol' dramatic flop and stayed put until the humans started pointing and taking photos (as they should). I think this might be the one.

There's something magical about spring on the summit. The observers get excited about melting snow and thunderstorm. I just care about sunbeams, snacks (especially chicken pâté), and snuggly naps. But even I have to admit, it feels special. Like we made it through something big. And now it's time to loaf.

So wherever you are, find your favorite rock. Claim your sunspot. Stretch, soak it in, and remember: sometimes the best view comes with whiskers.

Purrs and pawprints,
Nimbus
Summit Cat & Supreme Loafer

New Trustees Join Observatory Board

At the Observatory's 2025 Annual Meeting, held May 31 at the McAuliffe-Shepherd Discovery Center in Concord, NH, the Board of Trustees welcomed Ty Gagne and Jeb Bradley as new Trustees.

Ty Gagne

The Chief Executive Officer of Primex3, Gagne lives in Hampton, NH and is the author of three books, "The Last Traverse," "Where You'll Find Me," and "The Lions of Winter." He holds a Master of Public Administration from the University of New Hampshire and a Bachelor of Science from Granite State College. He is a member of the Leadership NH Class of 2013, and he completed the program for Senior Executives in State and Local Government at Harvard University's Kennedy School of Government. Gagne also holds the Associate in Risk Pool Management (ARPM) and the Associate in Risk Management for Public Entities (ARM-P) designations.

Jeb Bradley

Bradley served in New Hampshire's State Senate from 2009 to 2024. Previously, he was a member of the New Hampshire House of Representatives from 1990 to 2002, and then served as the United States Representative for New Hampshire's 1st congressional district from 2003 to 2007. Bradley was Majority Leader of the State Senate from 2010 to 2018 and again from 2020 to 2022. From 2020 to 2024, he served as Chair of the Mount Washington Commission. He has owned and operated Evergrain Natural Foods since 1982. Bradley is the 49th person to have completed the New Hampshire Grid, climbing all 48 of NH's 4,000-foot mountains in every month. Bradley lives in Wolfeboro, NH. He holds a BA from Tufts University.

WINTER 2024/SPRING 2025 WEATHER DATA

	DEC	JAN	FEB	MAR
Temperature (°F)				
Average	14.4	1.6	4.6	18.0
Departure	+2.6	-4.2	-1.3	+5.1
Maximum	41	29	28	44
Date(s)	11th	1st	25th	31st
Minimum	-15	-22	-18	-20
Date(s)	22nd	30th	18th	2nd
Precipitation (inches)				
Monthly	9.43	4.20	5.15	6.82
Departure	+2.08	-1.54	-0.30	+0.10
24-hour Maximum	2.77	0.71	1.04	1.46
Date(s)	11th/12th	1st/2nd	16th	16th/17th
Snowfall (inches)				
Monthly	42.5	46.6	57.4	38.0
Departure	-5.2	+5.2	+14.1	-8.2
24-hour Maximum	7.1	5.6	11.1	5.3
Date(s)	5th/6th	1st/2nd	16th	26th/27th
Season Total	111.7	158.3	215.7	253.7
Departure	+8.1	+13.3	+27.4	+19.2
Wind (mph)				
Average	37.8	50.3	50.1	46.0
Departure	-6.2	+4.7	+5.5	+6.2
Peak Gust/Direction	116 NW	142 W	161 W	138 W
Date(s)	6th	2nd	17th	7th
Days 73+	18	21	24	18
Days 100+	2	13	8	5
Other				
% Sunshine	29	21	27	32
Clear Days	3	1	1	1
Partly Cloudy Days	3	3	6	4
Cloudy Days	25	27	21	26
Days with Fog	27	31	28	27
Days with Rain	8	1	1	6
Days with Snow	21	27	25	22

Winter 2024/ Spring 2025 Overview

BY **RYAN KNAPP**

December brought a mix of cold and warm weather but December 31st through March 4th, the summits would remain below freezing allowing the snowpack to build. March would then see spring and winter weather seesawing through the month.

December 2024

An upper-level trough provided fog, cold, and snowy conditions from the 1st through the morning of the 4th. After briefly clearing, late on the 4th, a Clipper approached from the west as a secondary low formed along the coast. The double-barreled setup provided fog, snow, and high winds through the 6th. A low provided additional snowfall overnight into the 7th. A Clipper on the 8th/9th provided another round of snowfall and winds shy of 100 mph. High pressure briefly provided clearing on the 9th before a warm front returned fog and snow overnight. A southerly flow resulted in a transition to a wintery mix on the 10th and rain on the 11th. Warm fog and rain reduced the snowpack from 25 to 8 inches. A strong cold front overnight and into the 12th returned cold temperatures and transitioned summits to snow. Snow continued for the 13th, then high pressure provided clearing on the 14th/15th.

A cold front approached for the 16th, providing a wintery mix that lingered into the 17th before colder temperatures allowed for snow. High pressure provided clearing on the 18th, but clouds and fog returned overnight as a low approached from the west and a secondary low formed along the coast—the double-barreled setup provided snow through the 19th. A Clipper provided additional snow on the 20th/21st. High pressure provided fair weather during the day on the 22nd. Clouds returned overnight, then a weak low late on the 23rd and into the 24th returned fog and snow. Fair weather conditions returned for the 25th/26th. High clouds moved in on the 27th ahead of a warm front that provided freezing rain and drizzle on the 28th. Rain returned on the 29th and lingered into the 30th, reducing the snowpack from 12 to 3 inches. A cold front passed late on the 30th, causing water-logged snow to freeze into bulletproof ice for the 31st.

January 2025

A trough on the 1st provided snow and freezing drizzle. The low deepened as it departed, boosting gusts to 142 mph on the 2nd as snow lingered. The low then stalled over the Canadian Maritimes, resulting in continued cold, fog, snow, and triple-digit gusts through the morning of the 6th. High pressure provided brief clearing on the 6th. Another low moved into and then stalled over the Canadian Maritimes, providing another period of snow and high winds from the 7th through the 9th. High pressure on the 10th provided clearing, milder temperatures, and lower winds. A pair of lows on the 11th returned snowfall, which fell vertically due to the low winds. High pressure returned for the 12th, then a broad trough returned fog and 7.6 inches of snow for the 13th through the 15th.

High pressure built at the surface, but an upper-level trough moved overhead, resulting in intermittent fog and scattered snow for the 16th/17th. An approaching cold front on the 18th returned fog and steadier snowfall. Partial clearing returned on the 19th before low pressure returned fog and snow overnight into the 20th. Arctic air returned plunging temperatures below zero on the 20th and continuing until the 22nd. Favorable upslope flow provided continued snow showers and fog through the arctic blast. Brief clearing on the 22nd ended as fog returned overnight as low pressure approached from the west. A warm front on the 23rd provided light snow and temperatures just above 0°F. A cold front overnight into the 24th provided additional light snow and a return of subzero temperatures. Brief clearing on the 25th ended by the overnight as an approaching low returned snow and fog. The passing low continued snow on the 26th, t with upslope snow lingering into the 27th. A cold front on the 28th provided snow and subzero temperatures in its wake. A Clipper on the 29th allowed temperatures to rebound to above zero as snow lingered. A trailing cold front on the 30th brought snow and another round of subzero temperatures. A low from the SW on the 31st provided additional snow as temperatures rose to above 0°F.

February 2025

Canadian high pressure on the 1st allowed for clearing as subzero temperatures returned. Fair skies gave way to clouds/fog and snow on the 2nd as a warm front swung north. A cold front followed for the 3rd with continued snowfall. Upslope snow lingered on the 4th as arctic air returned subzero temperatures. High pressure provided clearing and improving temperatures on the 5th. A pair of lows returned snow on the 6th/7th, with gusts peaking at 114 mph on the 7th. Upslope snow lingered until early on the 8th, and then brief clearing gave way to fog and snow overnight as a low passed to our south. The low tracked up the coast and strengthened, providing 6.1 inches of snow on the 9th. Upslope snow lingered for the 10th, and then a weak Clipper on the 11th provided some additional light snowfall. Partial clearing returned early on the 12th, but fog and a wintery mix returned overnight into the 13th as a low moved into NE from the Ohio River Valley. Snow lingered on the backside of the low, and as the low deepened, it provided a peak gust of 131 mph on the 14th. Partial clear-

ing returned on the 15th before another low from the Ohio River Valley returned fog and snow overnight.

A secondary low formed along the coast, continuing snow on the 16th. As the pair of lows exited, snow lingered, and as they converged and deepened, they provided a daily average wind speed of 108.7 mph and a peak gust of 161 mph on the 17th. Triple-digit gusts lingered into the 18th before easing late as the low exited. High pressure provided fair weather conditions on the 19th. Fair skies in the morning gave way to clouds, fog, and snow late on the 20th as a coastal low passed. Upslope snow on the 21st tapered late as high pressure built, providing fair weather skies by the 22nd. A trough passed on the 23rd, producing 3.1 inches of snow. A Clipper continued snow for the 24th/25th. Another low provided 5.0 inches of snow on the 25th/26th. A pair of lows, one north and the other south, squeezed the state on the 27th, providing light snow. As they phased over the Canadian Maritimes, the now singular low deepened, providing gusts up to 103 mph and light snowfall for the 28th.

March 2025

A passing Clipper provided snowfall along with subzero temperatures for the 1st. High pressure built in on the 2nd, with clearing arriving on the 3rd. A low over the central US swung a warm front overnight and into the 4th, providing fog, sleet, and snow. As temperatures rose, the wintery mix turned to rain on the 5th and remained until the 6th. A cold front passed with a weak low trailing on the 7th, returning snow to the summits. As the low entered the Gulf of Maine, it deepened, resulting in gusts of 138 mph on the 7th, 132 mph on the 8th, and 123 mph on the 9th. Upslope snow lingered for the 8th/9th, and a passing trough continued snow into the 10th. High pressure provided clearing on the 11th, then a cold front returned fog and light snow overnight. After brief clearing on the 12th, fog and snow returned overnight into the 13th as a jet streak moved overhead. High pressure off the eastern seaboard provided clearing for late on the 13th and lingered through the 15th as southern air boosted temperatures to 40F.

A warm front early and a cold front late on the 16th provided drizzle and rain that lingered into the 17th. As cold air trailed the passing front, a wintery mix gave way to snow late on the 17th. High pressure provided clearing for the 18th/19th. Clouds and eventually fog returned on the 20th ahead of a cold front that passed on the 21st, providing 4.7 inches of snow. Another cold front on the 22nd provided an additional 2.4 inches of snow. Upslope snow lingered into the 23rd before tapering overnight. Clearing early on the 24th gave way to clouds, fog, and snow as a warm front swung northeast. A passing low on the 25th provided continued snowfall. Clearing early on the 26th gave way to a shortwave that provided 5.4 inches of snow by the time it tapered on the 27th. A cold front provided another shot of snow on the 28th. A back door cold front provided an additional 4.2 inches of snow on the 29th. The front returned northward as a warm front on the 30th, providing a wintery mix before warming enough to transition to drizzle and rain by the 31st.

Weather 101: The Making of Nor'easters

BY **PETER EDWARDS**, SUMMIT INTERN

Why didn't the Northeast experience any major snowstorms this year?

It's the million-dollar question meteorologists and snow lovers alike have been asking. On paper, it looked like we had plenty of opportunities for a Nor'easter to develop. The eastern U.S. experienced several sustained intrusions of bitter Arctic air and deep longwave troughs during the climatological peak for snowstorms (December through February). When these troughs drop into the mid-latitudes, they often set the stage for the development of extratropical cyclones and more specifically, Nor'easters.

Numerous snowstorms developed over the eastern U.S., but instead of burying the Northeast, several systems dumped more snow on parts of the Mid-South, Southeast, Gulf Coast, and Mid-Atlantic than on New England. In some cases, areas like Tennessee, northern Georgia, and even Louisiana and Florida saw higher single-day snow totals than areas up north.

So, what went wrong?

The answer lies mostly in the orientation and behavior of the Polar Jet Stream, and how it directed storm tracks away from New England this winter.

The Role of the Jet Stream

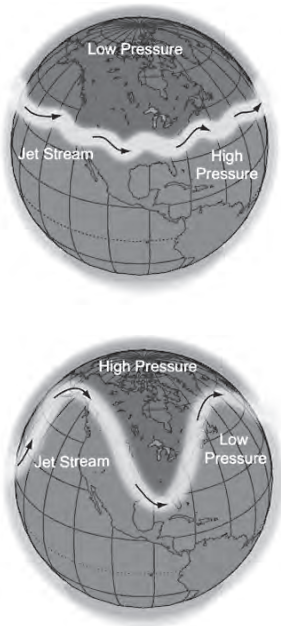
The Polar Jet Stream is a fast, narrow current of air in the upper troposphere (~30,000 feet above sea level) that separates cold Arctic air from warm subtropical air. Think of it as a high-speed atmospheric highway that guides the movement of weather systems across the mid-latitudes.

The jet stream usually flows from west to east in a relatively straight line, called a *zonal* flow. In this regime, cold air is mostly confined to the poles, and milder air dominates the mid-latitudes. But when it becomes more amplified or wavier, large ridges and troughs form. These undulations allow cold air to spill south and are crucial for major winter storms: a classic setup for a Nor'easter.

This winter, we *did* see a wavy jet but it wasn't wavy in the right places. The result? Cold air in place but no storm phasing. A season of near misses.

Case Study: 1/20/25 Miss vs. 1/29/22 Nor'easter

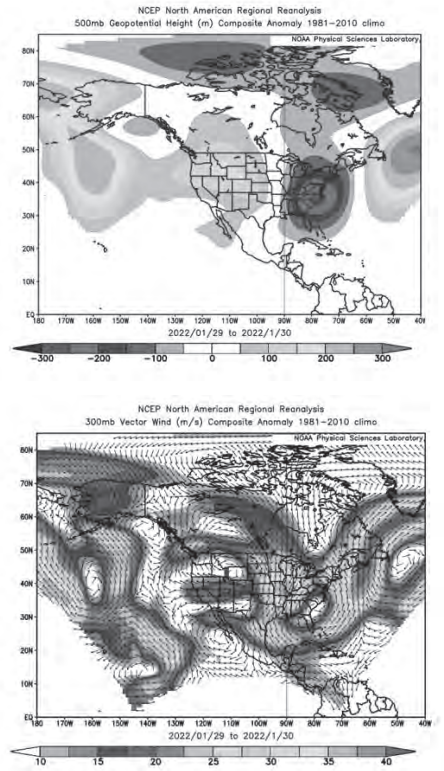
To better understand this, let's compare a classic Nor'easter setup from January 29, 2022, with a near miss from this past winter on January 20, 2025.



(Figure 1) The image on top is an example of the polar jet stream while it is in zonal flow, and bottom is when it is in meridional flow. The dips in the jet stream represent troughs and the arches represent the ridges. (Source: Unknown)

Looking at the pressure patterns (Figure 1) in the upper atmosphere, we can see a large ridge of high pressure in the lighter shading that built over the Western U.S. and the deep trough over the Eastern U.S. in darker shadings. That ridge forced the trough and the cold air it brought with it to dig more sharply south into the eastern U.S.

Next, we can examine the pattern in the jet stream. By tracing up and around the ridge then down along and around the bottom of the trough we can actually sketch a rough outline. With the ridge placement centered over the western U.S., undulation in the jet stream forced a meridional flow out east (Figure 2). This allows the storms to move south to north along the coast which gives them more time to strengthen in a favorable environment.



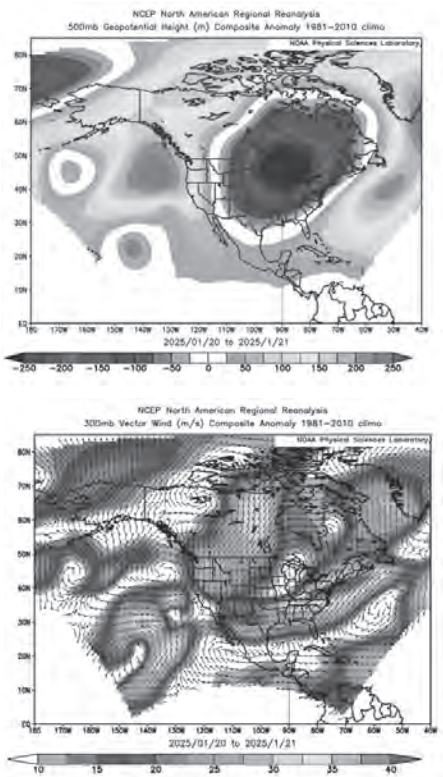
(Figure 2) Top Image: On the western half of the U.S., we can see the ridge in the lighter shading centered over Idaho and Wyoming. In the Eastern U.S., the trough is shaded darker. Bottom Image: Off the east coast, a strong south to north or meridional flow of the jet stream is illustrated by the darker shading. (Source: NOAA Physical Sciences Laboratory)

The result was an area of low pressure forming off the southeast coast that strengthened into a powerful cyclone with a central pressure of 975mb as it climbed the coast, blanketing New England in snow.

Now that we've discussed what a favorable pattern for storm development looks like, we can examine the

differences in this year's pattern. What stands out is that the ridge is not over the western U.S., but instead, over the Pacific Ocean (Figure 3). This pattern is great at dropping a trough and cold air into the U.S., but without a ridge dominating the Western half of the country, the trough gets displaced further west and is much broader.

Having reviewed an example of this year's upper-level pressure patterns, we can now analyze the Jet Stream further and reach a conclusion. The biggest difference is that the jet stream orientation was tilted southwest to northeast (Figure 3). This guided the storms out to sea well to our south while giving them little time to strengthen. Looking out west, instead of weak anticyclonic flow in the first example, strong northerly upper-level winds dominated the western half of the U.S.



This setup caused record snowfall along much of the Gulf Coast. Even though this setup was the most extreme, the rest of the winter exhibited similar behavior. The area of low pressure in this case started in the western Gulf of Mexico before moving over Florida and out to sea, remaining quite weak.

Looking Ahead to Next Winter

While, much to the joy of ice climbers, New England did see bitterly cold temperatures this winter, other winter lovers were left to ski whatever snow our region received, even if none of that came from Nor'easters. The deeper question is: Why did the pattern persist?

The answer lies in the El Niño Southern Oscillation and other global climate drivers and forcing mechanisms, like the North Atlantic Oscillation, Madden Julian Oscillation, and others. These long-term patterns influence the position and strength of the jet stream and set winter's stage. While it's certainly too soon to predict what next winter will bring, keep your eyes peeled for any winter outlooks we may produce come stick season.

To read the full version of this article, visit mountwashington.org/journal.

(Figure 3) Top Image: Upper air pressure patterns for January 20th, 2025. This setup produced record snowfall amounts in multiple states along the Gulf Coast. Bottom Image: The orientation of the jet stream was tilted southwest to northeast. A jet stream that sets up this way is unfavorable for snowstorms in the northeast.

Broadening Geography and Community

BY **MIKE CARMON**

Our summit meteorologists are part of a larger community of scientists across the region, country, and globe. As we rode the ups-and-downs of our winter season, we engaged with that community at various times throughout. It's a particularly meaningful experience for summit observers who spend much of their time geographically isolated at Mount Washington's otherworldly summit. Though the reasons for these connections were operationally driven, with every touch point I was reminded of the distinctiveness of this wider community of scientists.

Trips and Milestones

While the summit largely shuts down to the general public in the winter, our station thrives as we usher guests to the summit in our snow tractor. Winter is the headline-grabbing season, and naturally there's no shortage of folks who want to experience above-treeline winter conditions. Our staff and volunteers hosted hundreds of guests across the winter season, giving them a brief taste of the notorious extreme weather.

One such extreme winter day came on February 17th, where a rapidly strengthening low pressure system gave rise to a significant cold snap and windstorm across the higher summits. As temperatures plummeted to near 20 below zero, summit observers recorded a maximum wind speed of 161 mph on that day. This is Category 5 hurricane strength, and the fastest gust recorded since 2019!

Any time I'm lucky enough to experience winds in excess of 100 mph at the summit, it's a literal in-your-face reminder of the resilience of the 1934 crew that recorded the world-record 231 mph gust. On April 12th, the Observatory celebrated the 91st anniversary of this incredible "Big Wind Day" moment.

Across the Airwaves

Events like February 17th, which also caused significant disruptions in the valley, are a reminder to all of the relevance of the work we do—whether above or below the treeline. And as of April, listeners over an even broader geographic region have heard regular updates from the summit weather station. Summit weather observers are now providing statewide forecasts for both New Hampshire and Vermont. New Hampshire forecasts can be heard on New Hampshire Public Ra-

Transferring gear from Snow Cat to truck on bare pavement—a sure sign of spring!

dio (NHPR), while Vermont forecasts are across the Connecticut River on the airwaves of Radio Vermont Group stations.

The expertise of our summit meteorologists is deep, and we are excited to serve a wider audience with that knowledge. Our summit team connected with several meteorologists and radio broadcasters on both sides of the river over the last few months. These professionals provided our team with invaluable tips, tricks, techniques, and best practices as they push forward with these new radio broadcasts.

Other Connections

The data and weather forecasts the summit provides are a critical resource for many, but we also strive to continually widen access to those resources. A forecast only serves its purpose further when placed in front of more eyes. We have continued to strengthen our partnership ties with the Mount Washington Avalanche Center (MWAC), providing cross-training opportunities with our respective teams. We've also partnered with MWAC and the local search-and-rescue communities to facilitate several educational offerings across the winter. This has provided more opportunity to inform the wider backcountry community and eliminate any gates to our forecasting resources.

Spring Transitions

No matter the capricious ups and downs of winter, spring is always dependable in its eventual arrival. This means winding down winter operations mode and gearing up for another season. This happens a little later than in lower elevations, but transitions to spring gain momentum in April. Some of the biggest changes perhaps take place on the Mount Washington Auto Road, where Snow Tractor travel from base to summit is replaced by a combination of tractor, trucks, vans, and chains. Certain stretches of the road melt

out faster than others, and it is seldom "in order" from base to summit.

As the summit begins its long, winding road towards melt out, planning for the summer schedule is already in full swing. Our summer interns are hired, weather station tours are being booked, special trips are filling up the calendar, and spring cleaning of the summit facility has commenced.

We also evaluate our instrumentation after enduring another season of winter's wrath, and make plans for a summertime of more in-depth maintenance. It takes more than torquing a few bolts and screws. In fact, it takes a community of staff and volunteers to support the long-term health of the weather station, both on and off the summit.

RESEARCH VIEWS

Science and Research at the Observatory: Winter into Spring 2025

BY **JAY BROCCOLO**

The past four months have brought steady progress across the Observatory's science and research programs. From expanding our high-elevation mesonet and preparing for advanced LiDAR deployment, to student-led climatological studies and growing partnerships, the season has been defined by continuity, collaboration, and capacity-building. These efforts strengthen our role in mountain meteorology and keep the Observatory at the forefront of applied atmospheric science.

Driving Science Forward

Our long-term strategy continues to emphasize applied mountain meteorology, observational infrastructure, and student-driven research. With support from the Science Committee, we've expanded student mentorship, refined research priorities, and reviewed new proposals. This model helps ensure our science remains rigorous, collaborative, and relevant, not just to our region, but to national and academic partners as well.

Building on Our Research Foundations

Our five-station mesonet along the Mount Washington Cog Railway is now fully built, significantly improving

observational resolution across complex terrain. Each station is equipped with wind, pressure, and temperature sensors, and we are preparing to deploy RM Young's SNOWDAR sensors for snow depth at these sites this summer. These additions will further enhance our ability to monitor winter conditions across the mountain. One site, Skyline, suffered structural failure during the winter and will be rebuilt ahead of the next snow season.

Supporting this growing data network, the summit received a new research workstation this winter to handle observational analysis and visualization. We also took delivery of the WindCube Scanning Doppler LiDAR, which will be deployed this summer. The LiDAR will provide detailed wind structure and flow observations across the Presidential Range, enhancing forecast support and expanding our foundational dataset for current and future research.

Collaborative Research and Intern Projects

This winter's intern cohort advanced several key climatological studies. Peter Edwards completed a 20-year climatology of upslope snowfall events on Mount Washington. His analysis identified over 250 events from 2005-2025, defined by post-frontal low-level northwesterly flow and no major synoptic support. The study revealed modest increases in both event frequency and intensity, with ERA5 composites characterizing the atmospheric setup for these localized snowfalls.

Mees Franssen and Marin MacDonald analyzed snow-to-liquid ratios (SLR) on Mount Washington from 1980–2024. Their findings confirmed that summit SLRs vary significantly from the default

Frank Vazzano and Brian Fitzgerald present some of Frank's key climatological findings along with weather and safety resources at NHPR's ByDegrees Climate Summit on May 2.

10:1 ratio, particularly in shoulder seasons. They also found SLR correlates with temperature but not wind, helping to refine how snow forecasts are interpreted in complex terrain.

Frank Vazzano contributed to the foundation of the White Mountains Climate Almanac, a joint initiative between MWOBS, the Appalachian Mountain Club, and Hubbard Brook Experimental Forest. The almanac aims to link atmospheric conditions to ecological changes across the region, providing an integrated view of climate in New England's highest terrain.

These projects highlight the Observatory's role in advancing mountain meteorology through student-led research and mentorship. They also contribute to a growing body of work that informs everything from avalanche forecasting to regional climate planning.

Looking Ahead

We're preparing for a busy field season as we scale up the Observatory's research capabilities. With the mesonet build-out along the Cog Railway complete and one station slated for repairs, we've increased spatial resolution of our terrain monitoring in ways that support both daily operations and long-term studies.

We're also deploying the WindCube Doppler LiDAR, part of our Congressionally Directed Spending package, which will add an entirely new dimension to our observational capabilities. The system will generate high-resolution profiles of wind flow in complex terrain, expanding our research base, supporting forecasting tools, and enabling a wide range of graduate and post-graduate research (including my own).

Our Undergraduate and Graduate Adventures program continues to grow, offering hands-on research experiences during off-peak periods. Institutions including the University of Maine and the University of Delaware are exploring long-term partnerships to support student engagement on the summit.

In parallel, we're advancing new proposals with NOAA's Weather Program Office, the University of Maine, the Roux Institute, and United States Army Corps of Engineers Cold Regions Research and Engineering Laboratory (CRREL). These efforts align the Observatory's expertise with regional and national priorities, from improving hazard communication and visualizing forecast uncertainty with AI, to testing instrumentation and modeling weather in extreme, complex terrain. Together, these collaborations extend our impact beyond Mount Washington and contribute to scientific readiness, operational forecasting, and climate resilience.

As always, our work is made possible by a community of collaborators, supporters, and staff who believe in the Observatory's mission. With winter behind us and the summit thawing, we're entering a season of opportunity, driven by data, research, and the growing reach of high-elevation science.

Ramping Up

BY **KEITH GARRETT**

The snow is melting from the higher summits, leaves are emerging on the trees in the valleys, spring ephemerals are beginning their floral displays, and these consistent spring showers will hopefully bring about a decent flush of morels for our granite-laden area. This fine spring weather signifies the continuation of our weather data gathering apparatus build-out, and what I expect to be a fruitful and challenging summer season of new weather station deployments. From the Canadian border to the north, south to Mount Moosilauke, and possibly even the shores of the Atlantic, weather stations will be appearing in similar fashion to those spring ephemerals I so look forward to seeing, appearing seemingly overnight, and with proper planning and a bit of luck will not be quite so ephemeral.

Most are familiar with your standard off-the-shelf personal home weather station, usually consisting of one piece of outdoor mounted equipment that takes your standard weather measurements- wind, temperature, and relative humidity- too often mounted in a sheltered area, or directly on top of a shingled roof where those measurements are likely to be inaccurate. The other component is usually a nice little display mounted somewhere in your home, or possibly an application (app) that requires an internet connection to view the temperature right outside your door, maybe even a monthly subscription. After installing an app, and hopefully a quick climb up a good ladder, you are up and running.

It is possible to buy 'research grade' all-in-one stations, minus the fancy display or app. However they are not truly designed for the conditions and myriad of measurements that we will record. Each mesonet station we build is comprised of discrete components, each specifically engineered to do its task as accurately and efficiently as possible. A quick overview of the primary components: The datalogger is the control system of the station. This piece of equipment collects measurements from each device at pre-defined intervals and stores the information, performing processing on any measurements that require it. The wind sensor is an RM Young propeller-based anemometer for wind speed and direction. Barometric pressure is measured by these little modular chips that look a lot like SD cards. Temperature and relative humidity come from one single probe, with a temperature only probe for

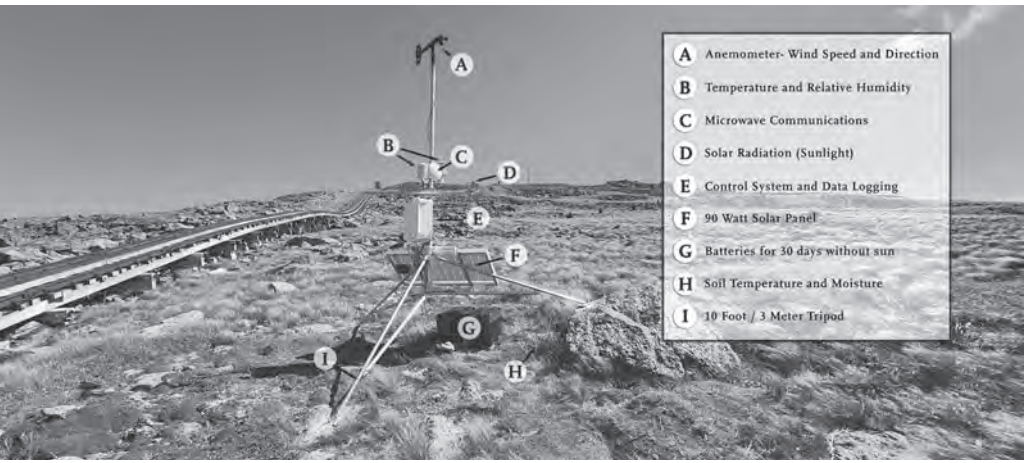
sanity checks and backup. A small solar radiation sensor measures the sun's solar output. A sensor buried in the ground measures soil moisture and temperature. A solar panel and large capacity battery bank generate and store enough energy to run the equipment. Communications equipment varies depending upon the location and available infrastructure of the specific location. All of this is mounted to a 10-foot-tall tripod; several will be on 30-foot towers in locations with more moderate conditions.

Most locations do not have wi-fi, and some do not even have cellular network access. We use a mixture of wi-fi, point-to-point microwave, and cellular devices to communicate with these stations for data acquisition and software maintenance.

The following is a high-level overview of the process of deploying a new station. First, a location of scientific importance must be selected- either a unique topographical area, or a gap in coverage. An open field at a lower elevation may get a tower to mount the equipment load, whereas a remote ridgeline will get a small tripod. Power requirements are calculated based upon the exposure of the location. Is it mostly shaded? Full sun? Will it be covered in ice for long time frames during the winter? How high are the winds expected to be? Answering these questions can help determine the battery capacity, as well as solar panel size to use at each location. Large solar panels and high winds do not mix well. Our typical battery weighs in at 157lbs, and each normal station has two. Several of our remote hike-in stations are getting much smaller batteries that typically weigh around 40lbs. A smaller battery size; requires some compromises in both solar panel size, as well as communications protocols. Stations can be programmed to communicate constantly, or at pre-defined intervals such as every 15 minutes.

Testing is performed on each piece of equipment to generate accurate predictions of power draw. The datalogger is programmed to control timing sequences and communications, while the solar charge controllers we deploy manage

Weather Station at Skyline.



Mesonet infographic.

the batteries and their state of charge far better than those currently deployed on our existing stations. Once we have determined the proper equipment for each location, it takes a day or two to prepare and build the control systems for deployment, and 3 to 6 hours to assemble in the field.

Once a station is online and the data looks good, it is manually added to our ingest system. This is far more complicated than it should be. A button to 'add new station' is in the works that will automatically set up everything in our multiple databases, add the correct error checking, and create the dataflow paths out to our own cloud services and websites as well as third parties such as NOAA/NWS.

With our goal of adding at least 30 new stations to our capabilities, part of this build-out requires new software that we are writing in-house to streamline management, ingest, metadata, and assets. The current system works well, but is a bit tedious when it comes to adding something as simple as a single new measurement, let alone dozens per station.

During this shoulder season, days are a mix of refining processes, exploring new tech and methods of data storage and transfer, as well as building the tools this much larger network will need in order to operate over at least the next few decades. Thirty years from now, fifty years from now, I want the scientists to be happy that these data were consistently and accurately recorded.

We are ramping up the logistics and equipment orders to try to deploy as many of these new stations as possible this summer. Last year's deployment of the Cog vertical profile went well, and a few lessons learned will carry over to this year's builds- specifically a certain charge controller setting that shut off one station, and re-enforcement or orientation of the datalogger enclosure due to Sky-line station's failure. As ephemeral as we humans are in the age of the universe, I hope that we can build out this network with enough foresight to have an abundance of data useful to future generations.

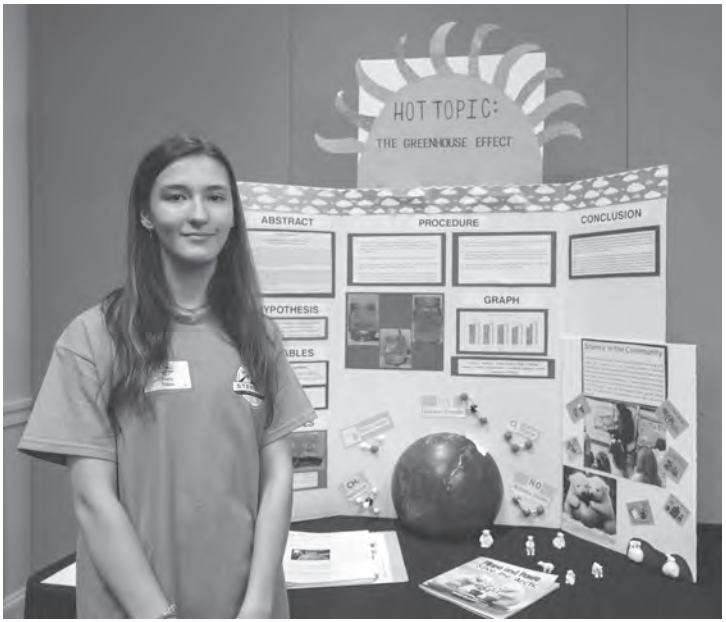
Hands-On Learning at 6,288 Feet: MWOBS Summer Education Opportunities

BY **BRIAN FITZGERALD**

Summer is here and learning opportunities abound for students of all ages at Mount Washington Observatory (MWOBS). The opening of the Sherman Adams State Park building this past May means summer is knocking on the doorstep of Mount Washington, where hundreds of thousands of visitors will come to learn about and experience the Northeast's highest peak.

For adult and family audiences, it's been another busy season of engagement through the *Science in the Mountains* lecture series. Speakers have taken on topics from the unique role of Forensic Meteorologists in the legal world, to current research projects at MWOBS, to the history of the Mount Washington Carriage Road and Glen Houses. Current research updates presented by summit-based interns were particularly impressive as they shared out three different high-quality projects examining different elements of weather and climate phenomena in our region, leading one survey respondent to share, "Awesome presentations, good information in [a] clearly understood format. Kudos to these young researchers." Stay tuned for more *Science in the Mountains* programs in the coming months and look for a shift toward even more in-person and hybrid programs in a location near you!

As we look to this summer season, we are excited to offer weather station tours once again to both MWOBS members and the general public. A record 260 tours were offered to at least 1,732 people last year-to members, the public, visiting researchers, members of the media, and special school and other groups. In addition to tours, a Medical Overnight Training Program for Youth Educators will return in partnership with Maine Health's Memorial Hospital and Stonehearth Open Learning Opportunities (SOLO) following overwhelming demand last summer. Last but not least, more improvements to the summit visitor experience are underway in conjunction with an undergraduate student program at Worcester Polytechnic Institute (WPI) and summit partners. Students from WPI will help MWOBS staff develop a 360-degree virtual tour and virtual interpretative guides for the summit of Mount Washington to enhance both the learning experience, and access to visitors from afar. Furthermore, K-12 students participating in the



MWOBS Emerging Scientist Awardee Emily Fields with her presentation "Hot Topic: The Greenhouse Effect" at this year's Mount Washington Valley STEM Expo on March 19. The Observatory is proud to partner with this event to inspire the next generation of innovators from elementary school to high school, and even had staff and volunteers support as judges. Photo by DiVision Media.

Observatory's field trip programs can use these materials to help prepare for their learning adventures before ever stepping foot on the Rockpile.

Speaking of field trips, the end of the school year has brought an incredible number of K-12 students and their teachers to the Northeast's highest peak to learn with MWOBS educators and scientists. More than 25 field trips supported over 600 children from our region who were able to learn alongside our staff in just a span of roughly three weeks (last fiscal year, Observatory educators carried out 24 total field trip programs). For many students, their summit visits were a culminating event after learning with MWOBS educators throughout the school year as part of our School Member program. A total of 21 schools signed on as members this past school year whereby teachers in an individual school can sign up for a bulk number of programming hours in which they can choose from a menu of school day, afterschool, virtual, and field trip options to suit their needs. With discounted programs, and grant support from the New Hampshire Charitable Foundation's Neil and Louise Tillotson Fund and the Kendal and Anna Ham Foundation, among other funders, schools in need have found ways to make exciting and relevant science learning for their students happen.

In addition to the youth field trips closer to home, a new partnership with the University of Maine's Upward Bound program has resulted in a pilot overnight program at MWOBS this past May. The Upward Bound programs prepare high school students from low-income families and from homes in which neither parent holds a bachelor's degree

Upward Bound students enjoy 50 mph wind on the Sherman Adams Summit Building observation deck. Photo by Erin Towns.

for college entrance. Seven high school students enrolled in the Upward Bound program joined MWOBS educators and Upward Bound faculty in an overnight experience featuring hands on instrumentation demonstrations, 3D modeling work, and remote sensing skill development using LiDAR and drones. With one program under our belt, MWOBS and UMaine Upward Bound programs are excited to establish year-round opportunities for more students throughout Maine and beyond.

Finally, our Storm Scouts: Extreme Weather Camp for youth and the Peak Perspectives professional development for K-12 teachers are set to return after their inaugural year in 2024. The Storm Scouts day camp, run in partnership with Conway School District's Project SUCCEED will once again be offered in two separate sessions from August 11th to 15th and August 18th to 25th for up to 15 campers in each session. Storms Scouts is open to all rising fourth through eighth graders, with a base camp at the Observatory's offices in North Conway Village and trips to Mount Washington on three of five days. Campers will learn about all things extreme weather, weather preparedness, and how conditions are tracked and forecasted at the "Home of the World's Worst Weather."

In addition to welcoming registrations for Storm Scouts, all K-12 teachers are welcome to apply for one of two overnight sessions of the Peak Perspectives professional development program. Building on last year's successes, MWOBS educators and scientists will host up to eight teachers per session to learn first-hand about weather instrumentation, data collection, and current research. Additionally, teachers will explore data and curricular resources meant to develop their student's data literacy and analysis skills.

Whether it's Peak Perspectives, public weather station tours, virtual lectures, or guided field trips, we hope you'll join us for at least one learning experience this summer. For more information reach out to education@mountwashington.org or visit with our education staff in North Conway or at 6,288 feet. Happy summer learning!

From Trailheads to Friendships: How 25 Years of Seek the Peak Built a Community

BY **MWOBS STAFF**

From Humble Trails to Towering Triumphs

In 2001, a small team with a big vision launched a hike that would change everything. Mount Washington Observatory (MWOBS) then staff members Scot Henley and Kimberly Clarke created ***Seek the Peak***—a way for outdoor enthusiasts to support the nonprofit Observatory by doing what they love: climbing the Northeast's tallest peak.

That first year, hikers hit the trails with purpose, raising over $11,000 from their families and friends. The event was simple but powerful—T-shirts, goody bags, and a celebratory BBQ under a small tent that left participants inspired and ready to return. The climb wasn't just about reaching the summit—it was about connecting with something greater.

Climbing Higher: A Growing Community

By year two, word was spreading. 125 hikers raised $18,000, and by the third year, 200 hikers brought in $45,000 to support MWOBS's work in mountain forecasting, education, and research.

But more than numbers, Seek the Peak has turned out to be about more than just numbers. It is about building community where summit selfies turned into friendships, and the trail felt more like a reunion than a race. As the event grew, so did its heart. Partnerships with ***Leave No Trace*** and ***Appalachian Mountain Club*** emphasized stewardship and safety. Nashville's ***Blue County*** played a surprise acoustic set under the post-hike tent, where hikers shared laughter, stories, and the joy of the climb.

—Development and Membership—

Seek the Peak!

by Scot Henley

Eager hikers hit the trail.

On a picture-perfect summer day, nearly 100 hikers and mountain enthusiasts from across the Northeast turned out in support of the Mount Washington Observatory's *Seek the Peak* hike-a-thon, held Saturday, July 28, on Mount Washington. Presented by Subaru of America, *Seek the Peak* raised over $11,000 in support of the Observatory's public service activities.

Over $11,000 Raised at First Annual "Seek the Peak" Hike-A-Thon!

The Appalachian Mountain Club (AMC) provided event support throughout the day. AMC outreach staff educated *Seek the Peak* hikers on outdoor ethics and how to minimize their impact while enjoying the outdoors. Experienced AMC hiking staff helped participants of all abilities select appropriate hiking trails, ranging from a nature walk in the Pinkham Notch area to strenuous ascents to the summit of Mount Washington.

Hikers who reached the 6,288-foot summit of Mount Washington were treat-

Windswept Magazine, the quarterly bulletin of MWOBS, announces 1st Annual Seek the Peak results.

Reflecting on the magic of the mountain and the meaning behind the climb, Steve Hughes of Pennsylvania shared, "Sometimes we forget how special Mount Washington is. But the excitement of this event made us all stop and appreciate what's right in front of us."

Expanding Horizons: New Heights and Big Celebrations

By 2004, 250 hikers raised nearly $55,000, and the event became a full celebration. Wildcat Ski Area hosted the BBQ, featuring chair massages, gondola rides, a bluegrass concert, and wildlife exhibits from Squam Lakes Science Center. It echoed the energy of Mount Washington itself—vibrant, wild, and unforgettable.

In 2005, ***Seek the Peak*** raised more than $150,000, doubling the previous year's total. Over 150 local businesses also helped in the effort through the Rally the Valley Campaign, each donating between $100 and $250. Sharon Hirsch from New Haven, CT, hiked in a long skirt and heavy wool coat to honor Lizzie Bourne, who tragically died near the summit in 1855. Her tribute reminded everyone of the courage, sacrifice, and stories carried up the mountain—threads that wove a deeper meaning into each step.

That spirit continued into the following year. By 2006, over 150 hikers raised $210,000. With new fundraising pages and grand prizes, the event was growing—but the reward remained the same: that view above the tree line, and the feeling of being part of something bigger.

In 2005, Sharon Hirsch hiked in a skirt and wool coat in honor of the 150th anniversary of Lizzie Bourne's death in 1855.

"We rounded a bend, and suddenly the trees opened like cathedral doors. There it was—the world above the tree line. This is why people love this mountain," shared one hiker that year who found themselves awestruck by the mountain's majesty. The climb wasn't just about reaching the summit; it was about experiencing the breathtaking beauty of the journey itself.

Reaching Together: 2007–2012

Seek the Peak gained national attention as hikers from Alabama to Colorado joined in. By 2010, the 10th anniversary welcomed more than 500 hikers and nearly $200,000 raised. In total, the first decade brought in almost $700,000—and even more priceless memories. In the years that followed, hikers overcame weather, distance, and personal challenges to show up for the Observatory. The community expanded, the impact deepened.

In 2012, MWOBS Weather Observer and Meteorologist Ryan Knapp described it in his blog entry '***What Seek the Peak Means to Me***' as "like Thanksgiving and Christmas all wrapped up in one." Volunteers bake cookies for the summit, adding warmth and whimsy to the alpine challenge.

Seek Your Peak, Wherever You Are: 2013

For longtime supporter Dan Poor, Seek the Peak has never been about reach-

ing one particular summit. It has been about finding meaning in the journey, wherever that may lead. In 2013, Dan and his wife Rickey were unsure if they'd have time to summit Mount Washington and return for the hiker dinner. A reassuring conversation with MWOBS Life Trustee Gail Paine reminded them that it wasn't about the summit—it was about the spirit of participation. That year, they turned back a mile from the top and started their own tradition of "seeking their peak" in whatever way worked best.

Some years, that has meant hiking the Randolph Trail System. Other years, it's been kayaking on Lake Champlain, biking, or walking a favorite local trail. "Every summer, Seek Your Peak became my way of doing it," Dan said.

And with that, the event took on new life. 2013 marked the year the Observatory officially embraced the Seek Your Peak message—encouraging participants to take on a personal outdoor challenge anytime, anywhere, in any way that suited them. While Mount Washington remains a beloved focal point, the event's reach has expanded far beyond the White Mountains, inviting people of all abilities to be part of the movement.

Though the format evolved, the heart of Seek the Peak remained rooted in community and personal meaning.

A Mountain of Meaning

There were teams like the plaid-clad Kilted Hikers and individuals like Christopher Nichols, who raised over $6,500 in 2017. In 2018, hikers honored legacies, like Navy veteran Marty Eckhart who dreamed of sharing the summit with his granddaughter, and Amy Koski, who married atop Mount Washington in memory of her uncle, Mike.

But beyond the activities were the connections—casual hikers becoming lifelong friends, strangers bonded by shared steps and sweeping views. As John Donovan from Rhode Island put it: "There's something about the challenge of Mount Washington that unites us all. Whether you're a seasoned hiker or brand new to the mountain, you feel that connection."

In 2012, John Donovan of Cranston, RI declared Seek the Peak was the perfect challenge to help him lose 67 pounds and a perfect fit with his weather and hiking interests.

A Spirit That Endures: 2020–2024

When the pandemic hit in 2020, Seek the Peak went virtual—but the spirit never wavered. Participants hiked solo or with family, connected from afar, and still raised over $105,000. The mountain, even when out of reach, remained at the heart of the community.

As in-person events returned, so did the energy and excitement. In 2023, hiker and outdoor advocate Kally Abrams jumped in mid-season through her role as Sponsor Minus33 brand ambassador. Despite the late start in early July, she embraced the challenge with enthusiasm—raising funds, joining the climb, and soaking in every moment, from the weather station tour to the Après Hike Expo, complete with live music, local bites, and Tuckerman Brewing Company's beer. Inspired by the experience, she

Sponsor Minus33's Brand Ambassador Kally Abrams embraced the challenge with enthusiasm in 2023.

vowed to return in 2024 and encouraged others to hike with purpose.

That 2024 event marked a new milestone—more than $228,000 raised and over 600 people joining in. MWOBS Executive Director Drew Bush called the weekend "electric," fueled by the kind of energy that only happens when people come together with shared purpose, open hearts, and a love for the mountain.

The Heart Behind the Hike: People Who Make the Peak Possible

Behind every dollar raised and summit reached are the people who made it happen. Volunteers like Sandy and Joan Kurtz, who greet hikers with smiles and kind words year after year as they check in hikers at table S-Z. Summit cookie bakers. Trail angels. Registration-table regulars. The dedicated volunteers like them remind us that support doesn't always look like a hike—sometimes it looks like replacing a lost meal voucher, heartfelt encouragement, or providing a better fitting T-shirt. And then there's Dr. Peter Crane—a visionary who helped spark this journey and has been a constant at every single Seek the Peak for almost 25 years. Through his many roles at the Observatory—from weather observer to program director—Peter's presence quietly shaped the heart of this event. Now overseeing the Gladys Brooks Memorial Library, he continues to preserve the stories, history, and spirit of Mount Washington. His steady leadership and lifelong dedication to the mountain have inspired generations of hikers, volunteers, and supporters—embodying the very essence of commitment and community.

Each year, Seek the Peak is reminder of the power of one person to inspire another, of shared effort to build something lasting. It's in the lives touched—those who climb, those who support, and those who show up, year after year, because this mountain and this mission matter.

Volunteer Joan Kurtz (right), pictured with MWOBS Development Officer Wendy Almeida, celebrates a milestone year at the 2024 Après Hike party—raising an incredible $10,169.40 as Seek the Peak's top fundraiser.

2024 Seek the Peak hikers.
Photo Credit: Stephen Wentworth

25 Year of Celebrating: A Community United by the Mountain

And now, here we are—25 years strong. Seek the Peak has grown from a grassroots effort into a cherished tradition.

To mark this milestone year, Mount Washington Observatory has set its sights on a new summit: raising $250,000 in honor of 25 years. It's an ambitious goal, but one fueled by the same spirit that has carried this event through two and a half decades of weather, wonder, and unwavering support.

As we gather for the 25th anniversary, we honor the thousands of footsteps that brought us here—and look forward to the many more to come.

Hike your hike. Share the journey. Fuel the future.

Be Part of the Legacy

For 25 years, ***Seek the Peak*** has been more than a hike—it's been a movement powered by passion, purpose, and people like you. Whether you lace up your boots, rally your friends to donate, or simply cheer others on, every step supports the vital work of Mount Washington Observatory.

Register or donate today, as we climb higher together, year after year. Because the view is always better when it's shared.

Today, that legacy continues. Join us in celebrating the 25th Anniversary of this incredible event!Whether you hike Mount Washington or pick a peak of your own, on any day or on **Saturday, July 19**, you're part of something special.

Join the celebration:

Friday, July 18 – Kickoff Party at Tuckerman Brewing Company

Saturday, July 19
10:00 AM – 2:00 PM | Observatory Weather Station Tours
4:00 – 7:00 PM | Après Hike Expo at Great Glen Trails

Be part of the legacy.

Register or donate today, and climb higher with us. Because the view is always better when it's shared. Join at ***seekthepeak.org!***

FEATURE

Digital Preservation of Our Past, Atop Mount Washington

BY **PETER CRANE** WITH **KAREN MACDONALD**

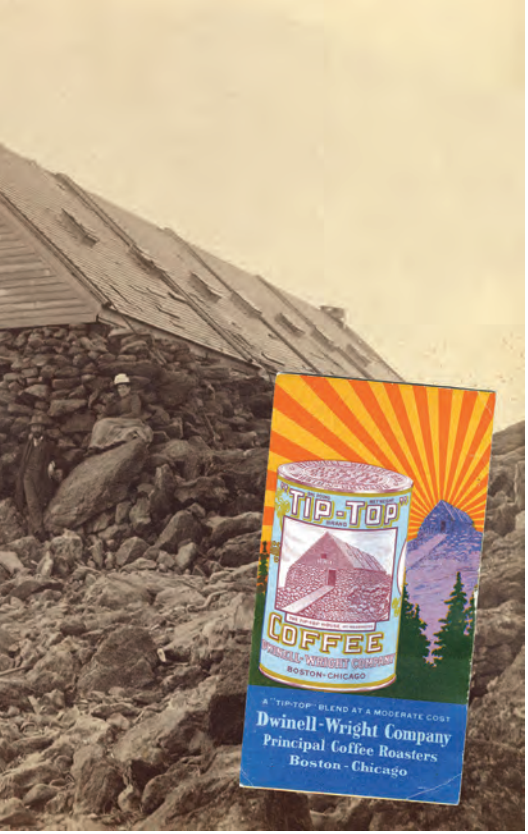
This article was originally published in the Spring 2025 edition of Mt Washington Valley Vibe, a unique, outdoor-focused, seasonally -printed publication in the Mt. Washington Valley of New Hampshire. To view the full digital spread, visit mwvvibe.com/vibe-online.

The Mount Washington Observatory has the privilege of maintaining the Gladys Brooks Memorial Library, which includes books, archival material, and museum artifacts, with a principal subject focus of Mount Washington and the White Mountains. The collection includes books, guidebooks, maps, engravings, stereoviews, postcards, photos, motion pictures, and many other materials—some historical, some scientific. Included are the institutional archives of the Observatory, including some materials dating to the Observatory's 19th century forebears, the 1870-1871 Hitchcock-Huntington Expedition and the soldier-observers of the U.S. Army Signal Service. The library is located at the Observatory's Valley Office in North Conway village, and is accessible to the public.

Looking for original Mount Washington weather records from the late 1800s?

The Tip-Top House was a hotel built on the summit of Mount Washington in 1853, and remains today. It was well known enough back then to even inspire its own brand of coffee.

You'll find some here, in the handwriting of early U.S. Army Signal Service soldiers. The original logbook in which summit weather observer Salvatore Pagliuca recorded the fateful events of April 12, 1934, the day on which a world-record wind of 231 miles per hour blew over Mount Washington is here, too. Personal books and papers of Joe Dodge, who helped establish the Observatory in 1932, are also on the library's shelves. A special feature of the collection is comprised of photos, negatives, and other materials from renowned White Mountains photographer Guy Shorey, who flourished in the first half



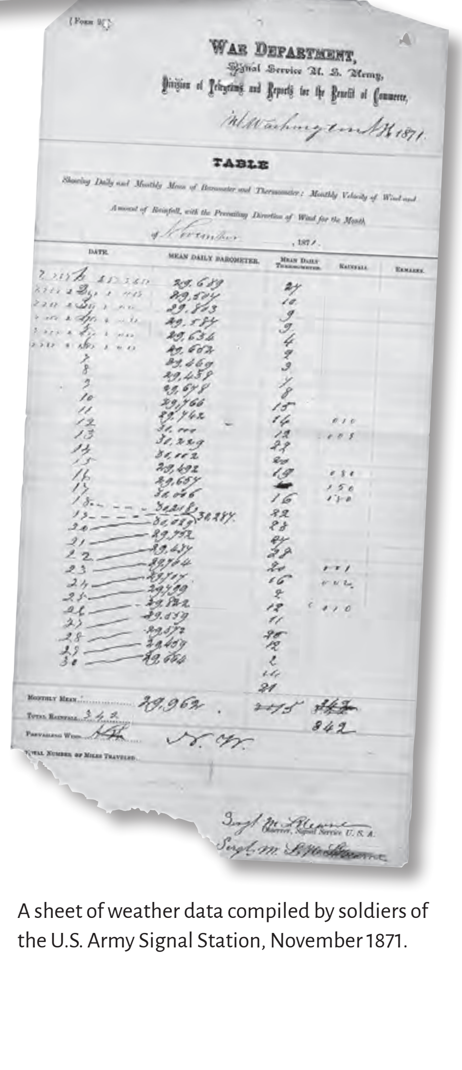
of the 20th century.

The Observatory recently initiated a pilot digitization project, funded, in part, through the generosity of the Henney Historical Fund. This project focuses on some of the most iconic items in the Observatory's collection, with a goal to make many images available to the public via the internet. Providing such expanded access will assist historical researchers and will accommodate those with an interest in the area for personal enrichment. Having the materials digitized will also spare the original, sometimes fragile, items from unnecessary wear and tear.

Presented within are a few of the images that have been digitized. These images illustrate the long and colorful history of Mount Washington, and help chronicle the fascinating stories of human endeavor on the mountain, the loftiest peak in the Northeastern United States. We consider not just the Observatory and its predecessors, but other activities that have a rich heritage on the mountain, such as the Mt. Washington Auto Road, The Mount Washington Cog Railway, and various summit buildings that have come and gone over the years. Many of the earliest photographic images of the summit are from stereoviews, which were very popular in the last half of the 19th century. Placed in a simple viewer, the stereoviews allowed the two similar photos to be combined into a 3D image.

In 1861, the Carriage Road from The Glen was completed, allowing horse-drawn carriages to reach the summit. It later became the Mt. Washington Auto Road.

The simple wooden shack that housed soldiers of the U.S. Army Signal Station, 1874-1890.


[Form 9]

WAR DEPARTMENT,
Signal Service U. S. Army,
Division of Telegrams and Reports for the Benefit of Commerce,
Mt Washington N.H. 1871.

TABLE

Showing Daily and Monthly Mean of Barometer and Thermometer; Monthly Velocity of Wind and Amount of Rainfall, with the Prevailing Direction of Wind for the Month of November, 1871.

Date. | Mean Daily Barometer. | Mean Daily Thermometer. | Rainfall. | Remarks.

Monthly Mean 29.962
Total Rainfall 3.42 — 342
Prevailing Wind N.W.
Total Number of Miles Traveled

Observer, Signal Service U. S. A.

A sheet of weather data compiled by soldiers of the U.S. Army Signal Station, November 1871.

These images are just a tiny selection from the Observatory's extensive library and archive.

The Guy Shorey collection alone comprises more than 9,000 photos and negatives! The Observatory staff and volunteers will continue to preserve illustrative material and documents in a digital format, to make this important Mount Washington material more readily available to researchers and to the general public, and to help safeguard the sometimes century-old source material.

Interested in learning more? Get in touch—a mountain of historical material awaits! Mount Washington Observatory is a nonprofit 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. Get additional information at *www.mountwashington.org*.

Above: There was once a very different Observatory atop Mount Washington, a tower for surveying that stood from 1880 to 1902.

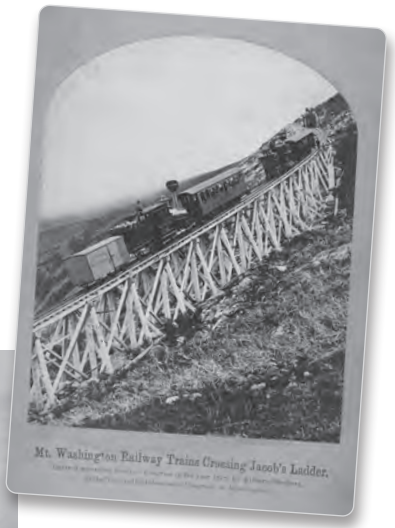
Above left: The Mount Washington Summit Road Company generously allowed the Observatory to use the Summit Stage Office for its home from 1932 to 1937.

Right: In 1937, The Mount Washington Cog Railway built a special structure for the Observatory's use. some called it the strongest wooden building on Earth! Its stand-alone instrument tower was replaced by an attached tower in 1941.

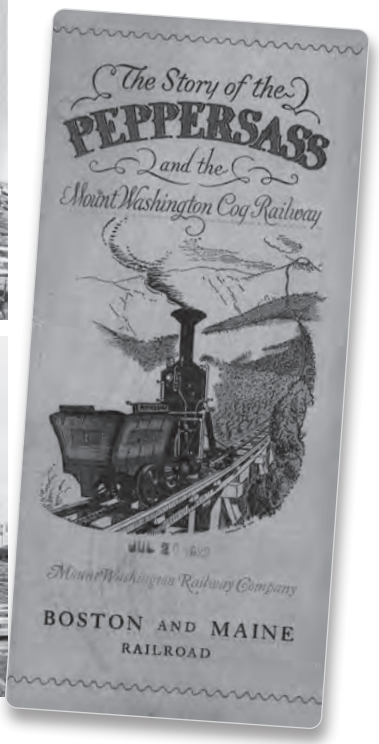
Below top: The first Summit House, 1852-1885. This simple hotel was the first building of substance on the summit.

Below middle: The second Summit House, a stately hotel, was opened in 1874 and burned in 1908.

Below bottom: The third and final Summit House hotel was opened in 1915, and taken down in 1980.



Above: The number of overnight visitors to the Summit House required that the Cog Railway have a baggage car for the guests' steamer trunks. Below: Brochures, tickets, and business cards of the Cog Railway are a small but significant part of the Observatory's collections.



Guy Shorey loaned a camera to 1932-1933 summit weather observer Bob Monahan, who took photos that would later be featured on postcards.

Among the Clouds

MAGAZINE NUMBER. THIRTY-SECOND YEAR. PRICE 10 CENTS

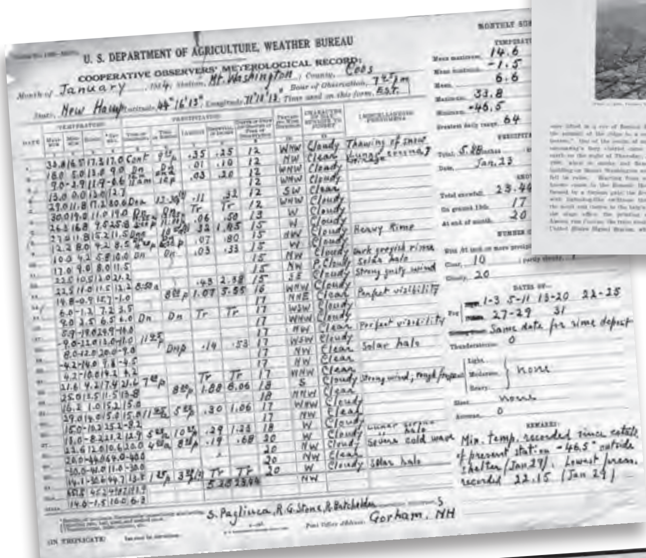
Mount Washington, N. H., Season of 1908.

THE FIRE ON MOUNT WASHINGTON

BURNING OF THE SUMMIT HOUSE, OFFICE OF AMONG THE CLOUDS AND OTHER BUILDINGS, JUNE 18, 1908

REMINISCENCES RELATING TO THE OLD HOUSES, THEIR HISTORY, AND PEOPLE ASSOCIATED WITH THEM

Above: *Among the Clouds* was a summer newspaper published on Mount Washington from 1877 to 1917. This special issue told the sad tale of the 1908 summit fire.



U. S. DEPARTMENT OF AGRICULTURE, WEATHER BUREAU

COOPERATIVE OBSERVERS' METEOROLOGICAL RECORD:

Month of January, 1934, Station, Mt. Washington, County, Coos. Hour of Observation, 7:45 pm. Time used on this form, E.S.T.

State, New Hamp. Latitude, 44° 16' 13". Longitude, 71° 18' 13".

MONTHLY SUMMARY

Mean maximum, 14.6
Mean minimum, -1.5
Mean, 6.6
Maximum, 33.8
Minimum, -46.5
Greatest daily range, 64

Total, 5.88 inches
Date, Jan. 23

Total snowfall, 23.46
On ground 15th, 17
At end of month, 20

Clear, 10
Cloudy, 20

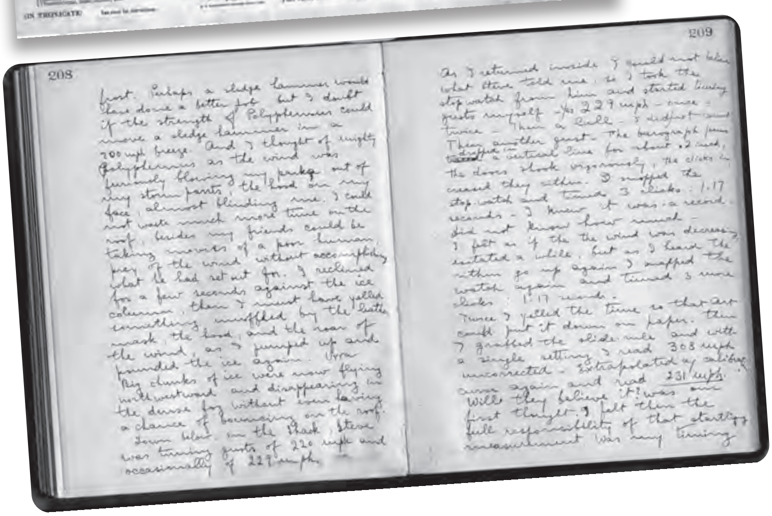
DATES OF—
Fog: 1-3 5-11 13-20 22-25 27-29 31
Same date for rime deposit
Thunderstorms, 0
Light, Moderate, Heavy: None
Sleet, None
Auroras, 0

REMARKS:
Min. temp. recorded since establ. of present station -46.5° outside shelter (Jan 29). Lowest pressure recorded 22.15 (Jan 29)

S. Pagliuca, R. G. Stone, R. Batchelder
Post Office address: Gorham, NH

(IN TRIPLICATE)

Left: This data sheet included the record-low temperature of -46.5 degrees F experienced on Mount Washington on January 29, 1934.



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first. Perhaps a sledge hammer would
have done a better job but I doubt
if the strength of Polyphemus could
move a sledge hammer in a
200 mph breeze. And I thought of mighty
Polyphemus as the wind was
furiously blowing my parka out of
my storm pants, the hood on my
face, almost blinding me. I could
not waste much more time on the
roof, besides my friends could be
taking movies of a poor human
prey of the wind without accomplishing
what he had set out for. I reclined
for a few seconds against the ice
column, then I must have yelled
something, muffled by the leather
mask, the hood, and the roar of
the wind, as I jumped up and
pounded the ice again. Very
big chunks of ice were now flying
northwestward and disappearing in
the dense fog without even having
a chance of bouncing on the roof.
Down below in the shack, Steve
was timing gusts of 220 mph and
occasionally of 229 mph.

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As I returned inside I could not believe
what Steve told me, so I took the
stop watch from him and started timing
gusts myself - 229 mph - once -
twice - Then a lull - I did just [illegible]
Then another gust. The barograph pen
dropped in a vertical line for about .2 inch,
the doors shook vigorously, the clicks in-
creased their rhythm. I snapped the
stop-watch and timed 3 clicks: 1.17
seconds - I knew it was a record -
did not know how much -
I felt as if the wind was decreasing
[illegible] a while, but as I heard the
rhythm go up again I snapped the
watch again and timed 3 more
clicks: 1.17 seconds.
Twice I yelled the time so that Art
could put it down on paper. then
I grabbed the slide rule and with
a single setting I read 303 mph
uncorrected - Extrapolated my calibrat[ion]
curve again and read 231 mph.
Will they believe it? was our
first thought. I felt then the
full responsibility of that startling
measurement. Was my timing

Below Left: This Observatory log book features Sal Pagliuca's first-hand account of clocking the world-record wind on April 12, 1934.

FEATURE

Rain-on-Snow Events on Mount Washington

BY **CHARLIE PEACHEY**

Mount Washington is no stranger to extremes. Known as the "Home of the World's Worst Weather," the Observatory is in a prime location for studying the impacts of winter storms. One phenomenon that caught meteorologists' attention at the Observatory was Rain-on-Snow events, or ROS. These are storms where rain falls on top of an existing snowpack. While they might sound harmless, ROS events can have significant consequences—on everything from snow stability and avalanches to flooding and winter tourism.

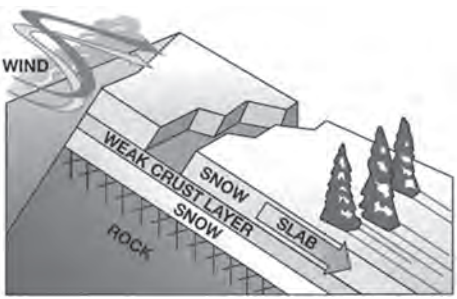

Figure #1: A diagram of how the weak crust layer produced by a ROS event can lead to increased avalanche risk

Over the past few winters, several interns and I began paying closer attention to ROS events on Mount Washington and across the White Mountains to start understanding their prevalence on the summit. We wanted to better understand how common these events are, what weather patterns bring them, and what their impacts might be in the future. Our study focused on the past 40 years of ROS events at the Mount Washington Observatory.

What is a Rain-on-Snow Event?

A Rain-on-Snow event occurs when liquid rain arrives at the same time that snow is still on the ground, typically while it's above freezing near the summit. That combination can melt snow quickly and saturate it with water, increasing the risk of avalanches in steep terrain once it re-freezes and potential flooding downhill. In mountainous regions like the Whites, where skiing and tourism are a mainstay in the winter, that matters—a lot.

At higher elevations, like the summit of Mount Washington, these events are even more complex. The snowpack tends to be colder and more persistent, and the terrain is steep and rugged. Add strong winds and fast-changing weather, and you've got a recipe for sudden and dangerous conditions.

How We Studied ROS on Mount Washington

To get a clearer picture of ROS events, we looked at 40 years' worth of data from the

Mount Washington Observatory, focusing on October through May. We identified 1,708 ROS days during that time. To qualify, each event had to meet three criteria:

There had to be at least 1 inch of snow on the ground.

- At least 0.1" of liquid equivalent precipitation had to be measured during the day.
- Liquid precipitation types were defined as: rain, freezing rain, drizzle, freezing drizzle, hail, and ice pellets.
- Hail and ice pellets were included as "liquid" despite being solid due to the similar effects they can have on de-stabilizing snow packs, leading to enhanced avalanche risk.

This ensured that we looked at events that could affect the snowpack—not just a few minutes of drizzle or solid precipitation.

Key Findings

1. ROS Events Are Common—Especially in Spring

As seen in Fig. #2, ROS events most commonly occur in April, when temperatures begin to rise, but snow is still present. In fact, nearly 30% of all ROS events happened during April.

2. ROS has become more variable and prevalent during recent years

After splitting all our data by decade, several more patterns emerged. The first one is that the only decade of the four with a local peak in ROS events during December was the most recent one (2011-2020). It indicates that the start of winter has been warmer in recent decades, making the ROS events more prevalent later into the winter. This leads to several real-world issues due to how reliant the Northern NH economy is on the winter tourism industry. Furthermore, the most recent decade in our data set also experienced over 40% more ROS days than the first decade (1981-1990) in our data set did.

3. Not All ROS Events Are Equal

Most ROS events are brief and relatively mild, lasting for an average of around 1.7 days. Others are longer, more intense, and more likely to cause significant snowmelt or instability in the snowpack. We further analyzed our daily data by clumping together multiple days where a ROS day was recorded. This helped us see the overall characteristics of the storm that produced the ROS days recorded in our data set, as well as if there have been any notable changes to the characteristics of ROS events over time

The main conclusion drawn from this new data set in Table #1 is that ROS

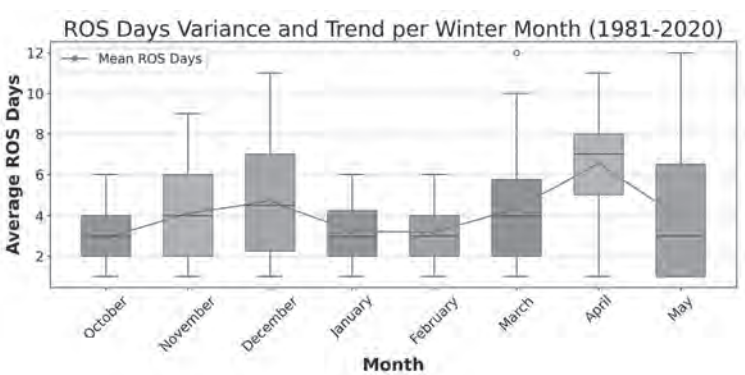

Figure #2: The average number of ROS days per month from 1981 to 2020 is plotted above. The variance associated with each month is also plotted in box and whisker graphs directly above the month's label.

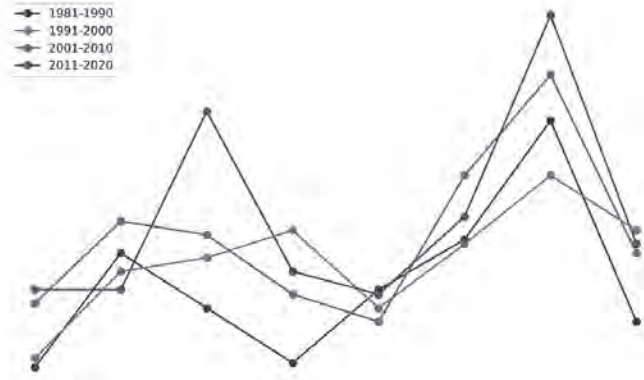

Figure #3: Total amount of ROS days per winter year for each decade from 1981 to 2010. To view full color versions of these graphs, please visit the digital version of this article at *mountwashington.org/windswept*.

Decade		Duration_(days)	Max Snow Depth	min_snow_depth	total_snow_fall	total_precipitation
1981-2020	Average	1.7	7.3"	6.3"	3"	1.06"

Table #1: Statistics averages for all ROS events for each decade from 1981-2020

Time Range		Duration (Days)	Maximum Snow Depth (in)	Minimum Snow Depth (in)	Total Snowfall (in)	Total Precipitation (in)
1981-2020	Average - + Standard Deviation	1.7 + - 0.91	7.3 + - 6.4	6.3 + - 6.01	3 + - 4.28	1.06 + - 1.22
1981-1990	Average - + Standard Deviation	1.7 + - 0.88	6.3 + - 4.8	5.4 + - 4.56	3 + - 4.36	1.33 + - 1.41
1991-2000	Average - + Standard Deviation	1.6 + - 0.78	4.4 + - 3.36	3.9 + - 3.14	2.6 + - 4.5	1.03 + - 1.36
2001-2010	Average - + Standard Deviation	1.7 + - 0.89	8.2 + - 6.58	7.1 + - 6.16	3.2 + - 4.61	1.06 + - 1.29
2011-2020	Average - + Standard Deviation	1.8 + - 1.05	9.8 + - 7.95	8.2 + - 7.67	3 + - 3.65	0.87 + - 0.78

events occur with an increasingly deeper pre-existing snowpack over time. Therefore, it lends evidence that these events are starting to happen later in the winter, while there has been more snow on the ground in recent decades.

Why It Matters

Understanding ROS events isn't just an academic exercise. These events have real-world impacts. For hikers, skiers, and climbers, a sudden ROS event can change trail conditions fast, turning packed snow

into slush or triggering avalanches in backcountry zones days after an event. For communities downstream, melting snow combined with heavy rain can mean flooded roads and rising rivers.

For example, during the ROS event on December 18-19, 2023, the White Mountains received one of the most devastating floods in recorded history due to the incredible amount of rain that fell and snow that melted during the event, contributing to a rapid increase in most of the nearby streams. In fact, the event was so devastating that it ended up being a once in nearly 800-year flooding event, proving the real-world consequences of these events during recent years.

Figure #4: A picture of Plymouth State University's flooded lower campus due to the flooding produced by the December 18-19, 2023 ROS Event

As winter weather patterns continue to change, we may see more frequent or more intense ROS events in the future. Warmer air can lead to more mid-winter rain, especially at higher elevations that used to stay frozen all winter long. That makes studies like this even more important—to understand what's happening now and prepare for what's next.

Our research adds to a growing body of work examining how mountain weather is changing—and what that means for the people, ecosystems, and infrastructure that rely on these landscapes.

Conclusions

Rain-on-snow events are a powerful reminder of how quickly conditions can change in the mountains. By better understanding when and why these events happen, we can help improve forecasts, prepare outdoor users, and protect vulnerable areas from their worst impacts.

Mount Washington has always demanded respect. The more we learn about its weather, the better we can adapt and stay safe in its wild and beautiful environment. Therefore, continuing research on such projects is critical to understanding the unique environment surrounding the summit. And with recent changes in federal funding sources for this type of research, it is more crucial than ever to have the support of all of our members.

FEATURE

Mount Washington's Alpine Zone in Bloom

BY **GABRIELLA GURNEY**

Wind whips across the summit of Mount Washington, while dense, heavy fog soaks through hiker's hats and gloves. Short, stunted trees eke out a living with roots curled over lichen-covered rocks, clinging to small pockets of soil. The temperature is about fifty degrees Fahrenheit. This is summer in New Hampshire's alpine zone.

Alpine zones are unique ecosystems that occur above treeline and below snow lines on temperate or tropical mountains. These zones encompass plants and animals that don't just survive in cold, tough climates, they depend on them to grow and thrive. Trees, mostly balsam fir with occasional red and white spruce, grow gnarled and stunted, referred to as krummholz, or "crooked wood." Alpine shrubs, such as heaths, azaleas, and blueberry grow smaller than their counterparts in the foothills, hugging the ground in attempts to keep safe from the harsh winds. Weather works differently here compared with sea level: Winds rising up and over the peaks, combined with moisture in the air, keep it cool year-round. In the western United States, the alpine zone begins around 9,500 feet in elevation. In the Northeast, the alpine starts at about 4,400 feet, making it an especially unique ecological feature.[1]

Mount Washington's alpine zone. Image: G. Gurney, June 2024

There are only 13 square miles of alpine zone in the Northeastern U.S., and half of it is found in New Hampshire. The White Mountains are home to 8 miles of alpine zone, the largest amount of alpine that can be found east of the Rocky Mountains. According to the New Hampshire Division of Forests and Lands, the alpine plant community is most similar to plants found in the Canadian Arctic: constant extreme weather exposure means frigid growing conditions such as "high winds, a short growing season, low temperatures, heavy cloud cover, high precipitation, and fog interception,"[2] according to a published

brochure. However, these tough plants are surprisingly fragile. While they can grow in one of the harshest climates in the Northeast, most can't stand being stepped on. Once a plant is trampled – usually by a hiker's misstep – it takes an achingly long time to grow back, with experts estimating somewhere between five and twenty years for full plant recovery, depending on how much trampling has occurred.[3]

Despite harsh growing conditions and their vulnerability to physical trampling, alpine plants still find a way to bloom. Some plants can take 25 years to bloom for the first time, and flowers are small and usually only visible for a month or so – most often late June to late July. Summer in the alpine zone provides a unique opportunity to catch a glimpse of these fleeting blooms – and for scientists, a chance to unravel some of the alpine zone's secrets.

The Appalachian Mountain Club (AMC), Adirondack Mountain Club (ADK), Green Mountain Club (GMC), and Baxter State Park (BSP) are using iNaturalist, a community science photo-sharing and plant and animal ID app, to conduct the Northeast Alpine Flower Watch project. This initiative was launched off AMC's Mountain Watch program, which relies on hikers, volunteers, and staff to monitor plants in the White Mountains[4]. Mountain Watch started in 2004, making it a long-running project with over 20 years of observations.

The Northeast Alpine Flower Watch aims to document the flowering times of alpine plants. When hikers or volunteers are in the alpine zone and see a flowering plant, they can snap a photo, upload it to iNaturalist with a geotagged location, and have the plant identified by experts. Then, the photo goes into an open-source database. This database stores location and date alongside the photos, so scientists can use the data to see when and where flowers are blooming. This is phenology work – research that seeks to understand the timing of biological events, like when plants develop leaves, bloom, or create fruits.

"The more photos that are posted, the more we can capture the large variability that is inherent in mountain environments across space and time in the northeastern United States. This data will be merged with our ongoing plant phenology studies and used to discover long-term trends in mountain ecosystems,"[5] the iNaturalist website explains. While all plant photos are welcome, certain species are areas of key focus: Bigelow's sedge, Diapensia, and Eastern Mountain Avens, to name a few[6] . Of particular interest to scientists is understanding how climate change may be impacting alpine plants.

As the climate warms, temperature changes allow trees to move further upslope than in the past, changing the mountain ecosystems. Alpine species are survivors from our last ice age, and are specially

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[1] This paragraph was originally published in *Appalachia* Summer/Fall 2024 by the author.

[2] New Hampshire Natural Heritage Bureau, "Franconia Ridge Alpine Zone," https://www.nhdfl.dncr.nh.gov/sites/g/files/ehbemt866/files/documents/franconia-ridge-brochure.pdf.

[3] Willard B.E. & Marr J.W. (1971) Recovery of alpine tundra under protection after damage by human activities in the rocky mountains of Colorado. *Biological Conservation*, 3, 181-190.

[4] Murray, Georgia, et a., "Appalachian Mountain Club's Mountain Watch Program: Evolving with the NPN," https://ui.adsabs.harvard.edu/abs/2018AGUFM.B51H2039M/abstract

[5] iNaturalist, "The Northeast Alpine Flower Watch," https://www.inaturalist.org/projects/northeast-alpine-flower-watch

[6] For a full list of species of interest, see https://www.inaturalist.org/lists/1571895-Northeast-Alpine-Flower-Watchs-Check-List?rank=species

adapted to cold temperatures. Trees and warmer-weather plants can displace them, and alpine species can't move further upslope, as they're already at their ecological limit – there's simply no more mountain to climb. As trees move up and temperatures warm, their habitat is rapidly shrinking. Scientists want to learn how fast the alpine zone is changing, and if certain species are more resilient than others.

Other threats to alpine plants include trampling and invasive species. Slow-growing alpine species are vulnerable to being crushed, and with over 3.1 million visitors to the White Mountain National Forest each year[7], that's a lot of potential for trampling – even if every step is an accident. That's why it's so important for hikers to stay on marked trails and leave vegetation undisturbed. This is also good for the critters that rely on alpine plants, like the rare alpine butterflies which feed on them and lay their eggs nearby[8]. Invasive species like dandelions are also an alpine threat: tracked in on hiker shoes and car tires, dandelions grow quickly and crowd out native plants. Luckily, they're being actively managed, with the White Mountain National Forest, New Hampshire Fish and Game, New Hampshire State Parks, and the Appalachian Mountain Club hosting yearly dandelion digs overseen by plant experts and worked by volunteers. In 2024, the dig removed 90 pounds of invasive dandelions from the alpine zone near the Lakes of the Clouds hut[9].

The White Mountains' alpine zone is a rare and special place. Despite year-round cold and wind, plants and animals are able to find a foothold and eke out a living, defying the odds and proving that nature is tough and resilient. While this unique ecosystem faces a slew of threats from climate change, human impacts, and invasive species, scientists, volunteers, hikers, and visitors are all able to contribute to learning and doing more to protect it, whether by snapping photos with iNaturalist, staying on the trail, participating in supervised volunteer days, or just telling their friends more about the alpine zone. This summer, the alpine zone will be in bloom once more, offering up tough yet fragile blossoms to enjoy should we take the time to stop and look.

Diapensia lapponica on Mount Washington. G. Gurney, June 2024

Gabriella Gurney is a conservation science writer who has been featured in Appalachia, Maine Policy Review, Adirondack Explorer Magazine, and more. She covers ecology, climate change, and conservation work along the East Coast of the U.S. and is currently based in Alexandria, VA.

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[7] White Mountain National Forest, "Visitor Use Report," https://apps.fs.usda.gov/nvum/results/ReportCache/2015_A09022_Master_Report.pdf

[8] Gurney, Gabriella, "New Hampshire's Arctic Butterflies," *Appalachia* Summer/Fall 2024.

[9] Appalachian Mountain Club via Instagram, https://www.instagram.com/appalachianmountainclub/p/C9nNV0TPQon/?img_index=1

The Cog Railway

In our previous installment of "As The Cog Gear Turns" (thanks Andy!) we left MWOBS School Programs Coordinator Jackie Bellefontaine stopped in her car at the top of a long, snowy hill on Base Station Road, phone in hand. She was calling to tell us that the bus carrying a school group she was bringing to the Railway had turned around in Crawford Notch due to treacherous road conditions, and she would be doing the same. She promised to reschedule their visit once the weather settled down.

True to her word, a few weeks later Jackie was back at Marshfield Base Station accompanied by colleagues Olivia

Dodge (School Programs Educator) and Lead School Programs Educator Misha Leyfer. They were here to work with several dozen excited 6th, 7th and 8th graders from the Maine Environmental Science Academy (MESA). MESA is an experiential learning program helping students "increase academic achievement, expand their appreciation for the natural world, and develop a heightened commitment to serving as active, contributing citizens." The Mount Washington Observatory offers member schools access to weather curriculum and personnel through classroom visits and streamed content with weather observers and meteorologists. It all culminates with rides on The Cog up to Waumbek in the winter, and all the way to the summit for Observatory tours in the warmer months. State and federal grants and specially discounted train tickets help to offset some or all of the costs to the schools.

As requested, the students and their chaperones arrived almost an hour before their train was scheduled to depart, but the Obs educators never let any grass grow under their young charges' feet. After instruction in how to use hand-held instruments to evaluate wind speed, temperature, barometric pressure, and depth of the snow pack, students took readings from around the Base Station (2700'). They would then compare those data to identical readings they'd be taking and recording at Waumbek (4000') using special log sheets that each student could refer to when the learning continued back in the classroom.

Right on schedule, our straight-out-of-central-casting brakeman Terry Burton bellowed out the "ALL ABOARD" call everyone had been waiting for. Students, chaperones, Obs educators, and regular ticket holders lined up and climbed aboard what Jackie likes to refer to as "the magic school bus". Any apprehension those regular ticket holders might have had at the prospect of riding along with a grammar school field trip vanished once the train was under way. As students hung their anemometers out the coach windows, Jackie took over the microphone for much of the quick run up to Waumbek. Her weather-centric narration about the mountain's flora, fauna and unique microclimate added true value to our guests' enjoyment of the trip.

That's always one of the many aspects of these school trips that we really love– how everyone benefits from listening to and interacting with Observatory staff. Another is how, despite the jam-packed lesson plan, the kids still have some time to be kids. Once at Waumbek, and in between barometric pressure readings and yardsticks shoved in the snow, marshmallows were toasted, snowballs were thrown, and angels in the snow left undeniable proof of MESA's spot-on teaching philosophy: "the best classroom is not in a school."

For more information, visit us at *www.thecog.com*.

Mt. Washington Auto Road

We all know that every visit to Mount Washington is unique thanks to the ever-changing weather. Visitors who want to expand their experiences and appreciation of the mountain can now do so via special tours through the Mt. Washington Auto Road. Choose between a guided tour, drive-yourself experience, or both!

The Mt. Washington Discovery Tour is three hours of guided history, weather, and ecology of the tallest peak in the northeast. This in-depth immersive experience is offered only 4 times this summer: July 5th & 26th and August 9th & 23rd. This is our only tour with the exclusive experience of spending 20 minutes with the Mount Washington Observatory. Designed by Stage Coach Manager Tim Godin, the Discovery Tour offers a unique opportunity to learn the true nature and history of Mt. Washington. Our Stage Coach Drivers have extensive experience on the Auto Road and in the local area. They are part geologists, historians, and entertainers. With Mt. Washington Auto Road guides, you get intimate, first-hand knowledge of the White Mountains, along with stories and anecdotes about the people who have lived, adventured and recreated here. Guests will not only tour the Mount Washington Observatory and explore the summit, but also make stops along the way down to some of the most historic and beautiful spots along the Mt. Washington Auto Road. Possible historical sights along the journey: Alpine Zone, Littleton Formation, Signal Corps, Halfway House, and The Red Barn Museum.

The Discovery Tour will be making multiple stops throughout the duration of the tour on possible uneven surfaces; proper footwear recommended. This Tour is recommended for visitors ages 10 and up. Advance reservations are advised. To book, visit: mt-washington.com/guided-tours/discovery-tour/.

Experience the Auto Road in a new

light this summer with a Sunrise and Sunset drive. Mark your calendars now as these opportunities are limited: Sunrise Drive is limited to one Saturday: August 23, 2025. Sunset Drives are limited to four Saturdays: July 5th & 19th and August 9th & 30th. Watch the sunrise or sunset from the highest peak in the northeast with two options: let us do the driving with a Guided Tour, or Drive Yourself! Our drivers know the prime spots to view, have access to safe "VIP" parking where other cars would not be able to park, and will tell their tales on the ascent and descent. You can be sure the lighting on the mountains will make for incredible and unforgettable scenes. Although you are riding in a heated van, you should dress warmly as you will have an opportunity to get out of the van for pictures and to experience the weather on Mt. Washington. This tour may run over 2 hours depending on weather and from where we watch the sunset.

If you prefer to drive your own vehicle, be sure to check the Road Status for the most up-to-date operating information. There is an additional $3 fee per adult for the Sunrise & Sunset drive above our standard Toll House rates. We encourage all to book online in advance: mt-washington.com.

Hope to see you on the rockpile!

A Bronze Find in the Curio Cabinet

BY **PETER CRANE**

Among the unusual artifacts found in the Observatory's archives is a bronze model of the U.S. Army Signal Station which once stood on Mount Washington's summit. The Signal Station housed the summit weather station from the year it was built, 1874, until the station closed, at the end of the summer of 1892. It stood derelict on the top of the mountain until the great fire of June 18, 1908, which turned the Signal Station and almost all the summit buildings into windblown ash.

The model is about four inches by four inches by 2 ½ inches high. A paper label on the underside of the model indicates that it was marketed as a paperweight by E.F. Hall, Littleton N.H. Hall worked in Littleton from about 1883 to about 1887.

The label notes, "At the U.S. Signal Station, Mt. Washington, N.H., (of which this paper weight is a miniature), is recorded the lowest average temperature of any place in the United States. The signal station was opened Nov. 2d, 1870, from which time observations have been regularly made. In summer two observers, and in winter two observers and a cook, comprise its working force. The average temperature is 26 degrees. The lowest temperature recorded is 50 degrees below zero on January 22d 1885; the highest temperature 74 degrees Fahrenheit on Aug. 9th, 1872. The maximum velocity of wind recorded is 186 miles an hour on Jan'y 11th 1878, which is greater than has ever been registered at any other station."

(The 1870 date refers to the work of the private Hitchcock-Huntington expedition, which was the direct precursor to the U.S. Army Signal Service occupation of the summit.)

What a remarkable little item, memorializing our weather predecessors on Mount Washington!

Stereoview by the Kilburn Brothers

Our Volunteer Community in Action

BY **WENDY ALMEIDA**

If you've admired the blooming landscape around the Mount Washington Observatory's North Conway office this spring, you've seen the handiwork of longtime volunteers **Bill Ofsiany, Barbara Althen** and **Donna Gray**. They've quietly shaped the valley office gardens with color, care, and determination to make each year better than the last. Stop by the valley office this summer (and fall) to see all the colors they've been cultivating for each season!

Monthly Membership Mailing Crew

Our monthly mailing volunteers may be "retired," but you wouldn't know it by how busy they are—volunteering across the valley and still making time to help us each month. They tackle folding, stuffing, and sealing with efficiency and plenty of laughs, helping us get our monthly mailing out the door on schedule. We're so grateful for their ongoing support.

Summit Deep Cleaning Volunteers

Some summit projects fall into the "when we have time" category—until some volunteers step in to make them happen. Many thanks to **Linda and Hank Dresch**, and **Shelby Peavey** for lending their time (and elbow grease) to tackle some much-needed deep cleaning in the living quarters. Every pantry shelf was cleared, scrubbed, and restocked; the freezer de-iced; bunkroom mattresses removed to clean bed frames; and the shower drain… well, let's just say there was a photo taken of the hair removed that's not fit for publication.

We're grateful for these extra hands (and good humor!) for helping the summit team check off the kind of tasks that don't always make it to the top of the weekly cleaning list.

Summit Gift Shop Support

Our summit museum gift shop was prepped for the summer season with help from volunteer, **Michelle Drenski**, who tagged, folded, and helped our retail manager organize the inventory that made its way to the summit ahead of opening day.

Barbara Althen (left) and Bill Ofsiany in the North Conway garden.

Spreading the Word at Community Events

This spring, volunteers helped us connect with local communities during two Dine to Donate fundraisers—one at Flatbread Company in Portland and another at Black Cap Grille in North Conway. Many thanks to **Kim Henry, Linda Dennis, Erica Valez**, and MWOBS Board President **Erica Broman** for chatting up diners at Flatbread in March, and to **Karen MacDonald** and MWOBS trustee **Gary MacDonald** for lending a hand at Black Cap in April. We're grateful to these volunteers for making the community events feel both welcoming and fun to all who attended. And a special shout-out to **Rose Lundy** for helping to paint the banner for the Flatbread event.

Seek the Peak Event Volunteers

This year's Seek the Peak (July 18-19) is powered by more than 60 dedicated volunteers. This group is taking on everything from hiker check-in and guest support to parking, concessions, vendor coordination, supporting the climbing wall and running the beer tent. Many are juggling their own hikes while helping out at the Après Hike Expo—and we're deeply grateful for their time, energy, and commitment. Their efforts are a big part of what makes our largest community event of the year run smoothly.

> *"We like being productive and busy, and like being able to support the Observatory in this (gardening) way."*
>
> *—Barbara Althen*

New Summit and Remote Volunteer Opportunities

We've had an overwhelming response from people interested in volunteering at the summit this summer—thank you to everyone who reached out! While not everyone could be given a weekly assignment on the summit, we're continuing to develop new volunteer opportunities. One example is our new summit museum docent pilot, where a small group of volunteers help visitors engage with the Observatory's work through short interpretive programs. We're also expanding opportunities in the valley and from-home options—like membership outreach and offering event and project support from wherever you live.

Where Our Volunteers Call Home

Number of U.S. states represented by current volunteers: 19

List of States:

California
Connecticut
District of Columbia
Delaware
Florida
Massachusetts
Maryland
Maine
Michigan
North Carolina
New Hampshire
New Jersey
New York
Pennsylvania
Rhode Island
South Carolina
Texas
Virginia
Vermont

A Lasting Legacy of Service: Celebrating Linda and Hank Dresch

BY **WENDY ALMEIDA**

Over the past two decades, Linda and Hank Dresch have become familiar faces to many involved with the Mount Washington Observatory—whether through Seek the Peak, a community event, or lending a hand at a monthly mailing. Now, the Dresches are stepping back from their official roles—but they're far from saying goodbye.

Linda and Hank have helped shape the spirit of volunteerism at the Observatory during their tenure. Their approach has always been simple: show up, dive in, and connect with the community. "The first thing you do, if you want to meet the locals, is you get in and you volunteer," Linda shares. "Whatever is your passion, whatever you enjoy doing."

Linda's connection to the Observatory runs deep, having grown up in the Monahan family. Her father, Bob Monahan, an Observatory co-founder and early co-observer with Joe Dodge, instilled a lifelong sense of stewardship. When she was in fifth grade, she spent several summer weekends at the summit while her father managed the hotel there. Her brothers worked in the Appalachian Mountain Club huts, and she would often hike out to visit them. These early experiences shaped her deep appreciation for the mountain and the community it fosters.

"I feel that volunteering is a kind of fulfillment—carrying through what my father had gone through to get things started. He knew how to stretch every dollar," she explains. "I would hate to have had the Observatory not get the money that was needed to continue."

After spending years traveling during Hank's career with the Coast Guard, he retired in 1997. The couple moved full-time to Mount Washington Valley in 2005 and began volunteering with the Observatory, encouraged to get involved by Paul and Claire Bouffard. They later took over the valley volunteer coordinator role in 2007 when the Bouffards stepped back from it. From coordinating events to representing the Observatory at outreach programs across New England, they've done it all. Hank has also volunteered on the summit, while Linda prefers to keep things humming in the Valley. "Retirement is so active here, and it energizes you to be involved and volunteer."

(Left to right) Hank and Linda Dresch.

Hank points to the mission of the Observatory as his motivation for more than 20 years of service to the organization. "It is a very vital resource for the whole Northeast community because of the weather observations and reports they provide to people utilizing the mountains," he says. "The mission is just so very important that it's a pleasure to be a volunteer."

"We had trouble **not** volunteering when we first moved to the Valley," Linda laughs. "Local organizations really need your help and are very appreciative."

Their roots in service stretch beyond the Observatory. Linda and Hank have volunteered throughout the Valley for numerous organizations, including Tin Mountain Conservation Center and the Bill Koch Junior Ski program at Great Glen Trails. They also supported the former Newton's Revenge bike race, which once benefitted the Observatory, and coordinated volunteers for the U.S. Geological Society's regional meetings at the Mount Washington Hotel. Beyond Mount Washington Valley, they continue to serve as volunteer head ushers at Portland's City Hall Auditorium for 25 years—these are just a few examples of their long-standing commitment to community service.

While stepping back from their role as volunteer coordinators for the Observatory, the Dresches won't be strangers. When they're not traveling the globe to cheer on their grandchildren—one of whom competes internationally in biathlon—they'll still lend a hand with membership mailings and support the Observatory's largest annual fundraiser, **Seek the Peak**, held each July.

Their legacy is more than hours logged or events managed—it's a lasting commitment to the Observatory community. Through their spirit of connection and care, they've inspired others to deepen their involvement in the work of the Observatory.

And for that, we are deeply grateful for their many years of service.

Purpose at Every Elevation: Emory Prescott Reflects on 10 Years of Membership

BY **WENDY ALMEIDA**

For Emory Prescott, being a Mount Washington Observatory member for the past 10 years isn't just about weather. It's about purpose and the kind of research that helps people better understand the natural world.

Emory Prescott (left) and Greg Martin.

Emory was first introduced to the mountain — not through hiking or winter sports — but by her partner Greg Martin, an accomplished hang glider from New Hampshire who became the third person ever to fly off the summit of Mount Washington (a feat that is no longer permitted to attempt). His deep connection to the mountain sparked her own curiosity. "I didn't even know Mount Washington existed," she notes. "Greg told me about the 'world's worst weather' and that led me to the Observatory."

That early introduction inspired Emory to look more closely at the mountain and the weather research being done there. "That's when I became very

interested in the studies that were being done," she explains. "I have always been fascinated with research-based information."

Emory spent more than two decades as a speech pathologist specializing in trauma and neurological conditions before earning her Ph.D. in herbal medicine and writing *The Herbal Brain*. Her career has been guided by a deep commitment to helping others through rigorous, evidence-based work. That's part of what drew her to the Observatory.

"What Mount Washington Observatory offers is not just a glimpse of New Hampshire weather, but global weather," she reflects. "And the way the organization is tied into other meteorological stations around the globe is impressive."

Her ongoing support is rooted in a belief that the Observatory's work has far-reaching importance and scientific longevity. "[Observers] are doing work that is diligent and so necessary for us to understand weather patterns around the world," she explains. "The staff dedicates their time to documenting what might seem mundane to others, but the collective research that's taking place is so vital for our understanding of our world."

The collective research that's taking place is so vital for our understanding of our world.

For Emory, the Observatory is part of a broader commitment to helping others and advancing scientific knowledge—whether about people, animals, or the planet. "I believe strongly that a purpose-driven life is fundamental."

To our 10-year members, thank you for your continued commitment. Like Emory, you recognize the importance of long-term research and the value of advancing weather science. Your support helps keep the Observatory's work going strong on the summit and beyond. Thank you.

~ 10 years ~

Allan Ames
Betty Arsenault
Joseph Aveni
Stephen Baker
Charles Bauroth
Heather J. Blease
Jeff Bodeur
Eugene Boullain
Ray Brady Jr.
Thomas Brooks
Debra Calhoun
Arline Cochrane
Edward Crocker
Janet Damiano
Jennifer Desmarais
Kent Drummond
Mel Elam
Robert Elmes
Linda Fairchild
Alexander Falk
Todd Robson Foisy
Elizabeth Fraser
Thomas Goodwin
Joe Gray
Donna Gray
Arthur James Harris
Karen Harrison
Annie Hickey
William Hoffman
Deborah Holtorf
Geoffrey Hopper
Kenneth Allen Horn
Elizabeth Hryniewich
Werner Kanner
Penny Kenyon
Glenn Kiedaisch
Joseph Kubiak
Caroline Kuhl
Ingrid Kvam
Zach LaRue
Richard Leonard
Sau-Mei Leung
Joe Massery
AJ Mastrangelo
Donald Maurer
Brenda J. McCartney
Christine Mclaren
Caroline and Bob Newkirk
Robert Nichols
Lyn Norris-Baker
Elizabeth Norton
Carolyn Parsons
Alexander Perkins
Jared Poor
Jillian Powers
Emory E Prescott
Joseph Prior
Ayla Queiroga
Dennis Reeves
Donald Reny
Matthew Reynolds
Jillian Reynolds
John R Scala
Robert Scala
Donald Schoengold
April Shaw
Laurel Smith
Susan Spousta
Robert St Pierre
Lawrence Steere
Herrika Stevenson
Cynthia Louise Stoss
Rebecca Sykes
David Unger
Judith Waters
Eric Weinrieb
B Owen Williams
Thomas Zabek
Zoe Zaloudek
Kristina Zuidema

...Thank you!

IN-KIND GIFTS

Squam Lakes Natural Science Center
Believe In Books
Peter J. Fisk
North Country Fair Jewelers
Castle in the Clouds
Children's Museum of New Hampshire
LL Bean
Vail Resorts
Ayla Queiroga
David J. MacKenzie
David Raizen

UPCOMING EVENTS

25th Anniversary Seek the Peak

Seek the Peak has reached the quarter-century mark, and we're celebrating big this year! Our Après Hike Expo will be taking place on July 19 from 4:00 to 7:00 PM at Great Glen Trails, featuring live music, great food, outdoor vendors, nonprofit partners, and lots of fun and games for all ages.

We invite you to hit the trails- any time, any day leading up to or on July 19– to help raise vital funds for weather observation and forecasting in the White Mountains of New Hampshire. We'll also be hosting a hiker registration Kick-off Party on Friday, July 18 with our partners at Tuckerman Brewing to get the party started. To learn more and register, visit seekthepeak.org.

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Burgeon OUTDOOR

TERRACEA

VAIL RESORTS EXPERIENCE OF A LIFETIME

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TRIBUTES & MEMORIAL GIFTS

Amit & Snigdha Mitra ..... In Memory of Tanya Mitrz
Tyler Whipple..... In Memory of Robert G Miller
Erica Velez ..... In Honor of Prince Oliver
Evan Gross ..... Happy Birthday Nimbus!!!
Victoria Wormell ..... In Memory of Magellan aka Jellycat
Jayne Stevenson..... In Memory of Thomas W. Jurczak
Jessica Bryan ..... In Memory of Samuel Gawel
Fran Wray ..... In Memory of Matt Wray
The Edmund & Betsy Cabot Charitable Foundation ..... In Memory of Brad and Barbara Washburn
Joseph & Anne Olivari Revocable Trust..... In Memory of Florence Ann Schumann
Jessica, Ramon and Ooma Gawel .....In Memory of Sam Gawel
Dave Bellew .....In Memory of Andy Angle
Jason A Dubrow .....In Memory of Andy Angle
Kara Morgan.....In Memory of Sam Gawel
Chris Gregorchik .....In Memory of Sam Gawel
Neil Emerson..... In Memory of Samuel Gawel
Brenda Daly ..... In Memory of Pat Daly
William Piel ..... In Memory of Florence Ann Schumann
Nancy Nichols ..... In Memory of Stan and Geoffrey Nichols
Susan J. Polk .....In Honor of All of the Observers
Cheryl Schoen ..... In Honor of Ryan Shepard
Kent Drummond..... In Memory of Taydie Drummond
Susan Hadlock ..... In Memory of Barbara (Danny) Parker (Hadlock)
Robin Hadlock Seeley..... In Memory of Barbara Parker Hadlock
Martha Parker.....In Memory of Pauline Parker
Annette Lawlor .....In Memory of Bob Coleman
Michael John Knapp ..... In Memory of Ken Dalton
George Piel ..... In Memory of Florence Ann Schumann
Elliott & Eveline Lapan ..... In Memory of Belle the Yorkie Champion Hiker

Are You Interested in Learning about Planned Giving?

By naming Mount Washington Observatory in your will or estate plan,
you can continue supporting our mission for future generations.
For more information, please email giving@mountwashington.org.

CORPORATE SUPPORT

GREEN FLASH

Seth Campbell, Associate Professor at UMaine Orono's School of Earth and Climate Sciences and Climate Change Institute, teaches participants how to analyze and use GPR data during an EduTrip this past March.

CORPORATE SUPPORT (Con't)

MINUS 33 MERINO WOOL

MT. WASHINGTON AUTO ROAD

EMS EASTERN MOUNTAIN SPORTS EST. 1967

APPALACHIAN MOUNTAIN CLUB AMC

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