

# Quincy Bog Notes

Conserving Land, Connecting People with Nature

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## Embracing the Dark – Preserving the Wonders of Natural Night

Rachelle Lyons

Life on Earth evolved under predictable cycles of light and darkness that shaped the rhythms of activity and rest. For millions of years, these natural patterns guided human and wildlife behavior alike. With the advent of electric lighting, however, nighttime environments changed in an evolutionary blink of an eye. The rapid and widespread expansion of outdoor lighting, especially the growth of LED fixtures and illuminated commercial signage, represents one of the most dramatic environmental shifts of the modern era.



City lights from North America, photographed from the International Space Station on January 10th, 2024. Source: [images.nasa.gov/iss070e062746](https://images.nasa.gov/iss070e062746)

Astronomers were among the first to raise alarm as excessive lighting washed out starscapes, but the consequences extend far beyond obscured star visibility. Light pollution wastes energy and money, disrupts human health, and threatens biodiversity on a global scale. Today, artificial light at night reaches roughly 80 percent of the planet, and its footprint continues to grow. Over the past decade alone, light pollution has increased by more than 10% annually, a trend likely to persist as development and urbanization expand.

Beyond astronomy, the ills of light pollution have largely gone under-recognized. Artificial light can disrupt nearly every aspect of plant and animal behavior, including migration, dispersal, reproduction, foraging, and communication. From an evolutionary perspective, this change has swept across ecosystems with lightning speed, leaving little time for adaptation.

A growing body of evidence documents the ecological toll of artificial light at night, identifying it as a serious threat to animals such as fireflies, butterflies, frogs, turtles, and migratory birds. Research shows that songbirds sense longer days, which leads to premature breeding and altered migration patterns. Birds that rely on darkness for migration—nearly 80% of species—become disoriented by bright city lights, resulting in exhaustion from flying too long or death from building collisions. Some evidence suggests the reproduction of New Hampshire's endangered Karner Blue Butterfly may be "particularly vulnerable" to light pollution. Fireflies, a much-loved part of summer evenings, are faced with "potentially catastrophic outcomes" according to the Xerces Society.

Unsurprisingly, negative impacts of artificial light are also documented in the plant kingdom. For example, under the influence of light pollution trees shift the timing of important seasonal behaviors such as bud setting, leaf drop, and levels of sugar production. Plants also experience indirect impacts of light pollution when animals who pollinate or assist with dispersing seeds change their foraging behaviors.

The consequences of excessive lighting extend to people. Exposure to unwanted light at night carries real health risks, including increased rates of insomnia, depression, cardiovascular disease, and some cancers. Our biological clocks are finely tuned to the natural day/night cycle, which regulates sleep, metabolism, and immune function. Recent studies indicate that circadian rhythms influence 10 to 15 percent of our genes, meaning that disruption of these cycles can have wide-ranging health consequences.

The illumination of the landscape arose from a coupling of technology and policy, accompanied by a lack of environmental awareness. In the late 1800s Thomas Edison patented, popularized, and commercialized the incandescent light bulb. This 'freed people from the limitations of days end'. Widespread adoption of the incandescent light bulb was made possible through policy. The Rural Electrification Act of 1936 advanced development in rural communities by providing power for refrigeration, telecommunications, and illumination. This policy changed the ways that people lived, worked, played, and rested. In less than a century conditions shifted from consistent day/night patterns to near constant illumination.

A common misconception is that light improves safety, but more light is not necessarily better. Poorly designed or excessively bright lighting can create glare and light trespass, reducing visibility and undermining safety. While reverting to total darkness is not a realistic goal, a thoughtful approach of targeted and intentional lighting—the right light, in the right place, when needed, with appropriate intensity and color—can reduce the negative effects of light pollution.

### Five Lighting Principles for Responsible Outdoor Lighting

DarkSky Illuminating

Responsible outdoor lighting is	<b>1 Useful</b>	<b>Use light only if it is needed</b> All light should have a clear purpose. Consider how the use of light will impact the area, including wildlife and their habitats.	
	<b>2 Targeted</b>	<b>Direct light so it falls only where it is needed</b> Use shielding and careful aiming to target the direction of the light beam so that it points downward and does not spill beyond where it is needed.	
	<b>3 Low Level</b>	<b>Light should be no brighter than necessary</b> Use the lowest light level required. Be mindful of surface conditions, as some surfaces may reflect more light into the night sky than intended.	
	<b>4 Controlled</b>	<b>Use light only when it is needed</b> Use controls such as timers or motion detectors to ensure that light is available when it is needed, dimmed when possible, and turned off when not needed.	
	<b>5 Warm-colored</b>	<b>Use warmer color lights where possible</b> Limit the amount of shorter wavelength (blue-violet) light to the least amount needed.	

Guidelines from DarkSky, an international non-profit organization working to reduce light pollution and promote responsible outdoor lighting. Source: [darksky.org](https://darksky.org)

(Continued on page 4)

## President's Perspective

Marguerite St. Laurent-Crowell

Bonne Année! Happy New Year!

Each year, I journey north with family and friends to our neighboring Québec province. I feel a deep emotional and cultural connection there. The name "Québec" comes from the Algonquin word Kébec meaning "where the river narrows". The river is, of course, the St. Lawrence River or le Fleuve Saint-Laurent. You see the connection!

Mont-Mégantic is a mountain in the Eastern Townships (Cantons-de-l'Est) of Québec. It is the location of the Mont-Mégantic International Dark Sky Reserve, the world's first reserve of this type. Located within the Provincial Park of Mount Mégantic, it's a year-round, outdoor destination and it's quite impressive! It covers approximately 50 km of radius around Mont Mégantic.

Across the Provincial Park is a model of our Solar System accurately scaled by size and distance. At the top of the mountain is an observatory that houses a 1.6-meter Ritchey-Chrétien reflecting telescope. In the model, the observatory represents the sun. Five of the planets are spread out below the mountain top along Summit Drive. The remaining planets are distributed further out across the region, and as far as the city of Sherbrooke. In this Solar System model, the closest star, at this scale, would be further than the Moon. Also, within the park is the ASTROLab, an indoor astronomy activity center that is open from May through October.

But the real 'stars' of the show are seen at night. Thanks to strict lighting regulations, including replacement of thousands of fixtures in the region, natural darkness is preserved. The Milky Way is seen stretching clearly from horizon to horizon, and it's so dark that subtle color and dust lanes are visible. Truly stunning! By protecting the night sky, Mont-Mégantic sets a global example of how communities can balance development with environmental responsibility, ensuring that future generations can still experience the wonder of a star-filled sky. I hope you'll consider venturing north to see for yourself. It will be well worth the trip!

Marguerite St. Laurent-Crowell spent several years giving planetarium shows and educating the public about constellations, stars, and beyond.

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## Reflection on My Internship at Quincy Bog

Ari Tulk

Working at Quincy Bog over the summer and fall was an enlightening and deeply inspiring experience. I've had the opportunity to witness a group of passionate people, each with busy lives and many commitments, pour their heart and soul, and every spare moment, into protecting and nurturing this place.

What struck me most is the quiet bravery and determination with which everyone here continues their work. In a time when environmental protections are under threat, the people of Quincy Bog don't spend their energy lamenting political challenges. Instead, they simply keep showing up with grit, focus, and fearlessness to do the work of protecting the land they love. Each person involved brings unique expertise and perspective, and together they form a remarkable ecosystem of people as diverse and interdependent as the Bog itself. Decisions are made democratically, through respectful, thoughtful discussion, and everyone contributes equally to the many tasks, large and small, that keep the organization thriving.

What makes Quincy Bog so effective, I've realized, is that its work is profoundly personal. Its strength lies in the relationships it fosters, with the community, among board members, and between volunteers and visitors. While working at the Bog, I met many regular visitors who not only knew the people who cared for the land but clearly felt a personal connection to them. People who experience the Bog often find themselves inspired to contribute whether through volunteering, donating, creating art from, or simply spreading their love of this natural space. These human connections are the foundation of the Bog's success. They are more enduring and powerful than any social media campaign or digital outreach. For over fifty years, these personal relationships have held the project together and allowed it to flourish.

Before I began volunteering, I felt discouraged about the state of the environment and unsure how individuals could make a real difference. I imagined that only full-time professionals at large, well-funded organizations could have a meaningful impact. But my time at Quincy Bog completely changed that belief. I've learned that even a small group of dedicated people, no matter

how busy, no matter how limited their resources, can achieve extraordinary things when they share passion, commitment, and community.

Getting an insider's perspective into countless hours of volunteer labor that have gone into every trail, boardwalk, and bridge has given me a new appreciation for the invisible work behind conserved lands everywhere. It has also renewed my hope. I now understand that creating lasting environmental change doesn't require huge amounts of money or thousands of people, it requires deep relationships, shared purpose, and persistence.

My time at Quincy Bog has shown me what collective care looks like in action. Through the dedication of a few, the vision has grown into something that now lives in the heart of an entire community. I am so immensely grateful to have witnessed, and been a small part of, this living example of what true conservation means.

Ari Tulk, seen below posting a conservation property boundary sign, graduated from high school in June 2025 and then served as an intern in the summer and fall. She has just moved to Ireland with her family.



# Junior Naturalist Corner

Sarah Dunham-Miliotis

## Go on a Night Walk!

We all love hiking and exploring during the day, but what about after dark? Too scary? Think again - there's a whole exciting world out there just waiting to be discovered! Taking a walk at night can be a fascinating experience that ignites your senses and gives you a new perspective on the natural world.



Where to start? Choose a familiar trail, dress for the weather and cooler night temperatures, and head out just before dark (with an adult, of course!). Many animals are most active in the transition time between light and dark - like bats and owls heading out for their nightly hunt or, in the spring, peepers and wood frogs starting up their songs. Move slowly and listen carefully for movement and sounds that you might not hear during the day. Try calling an owl and see if you get a response!

As darkness sets in, let your eyes adjust naturally - bring a flashlight just in case, but challenge yourself to keep it turned off. Our human eyes definitely see better in the daylight, but you'll be amazed at how much you can see with your night vision!



Try this: once your eyes are adjusted, cover one eye to preserve your night vision and turn on your flashlight for a few seconds. Look at the light with one eye, then shut it off. Switch your hand back and forth between your two eyes to see how different your vision now is between your two eyes! (Supposedly this is why pirates wore eye patches - to preserve their night vision in one eye so they could more effectively attack a ship under cover of darkness!)

Lastly, don't forget to look up! On a clear night, especially in an area with dark skies, you'll be able to see billions of stars, find some constellations and even spot a few planets.



Be brave, use your senses and have fun out there!

Books to inspire your Night Walk:

- ◆ *The Night Walk* by Marie Dorléans
- ◆ *Owl Moon* by Jane Yolen
- ◆ *Backpack Explorer: Night Walk* (Storey Publishing)

Sarah Dunham-Miliotis loves experiencing nature in all times and seasons! She is the School Programs Coordinator for Quincy Bog.

## New Annual Almanac Chronicles Climate and Ecological Shifts in New Hampshire's White Mountains

Ellen Estabrook

November 2025 marked the release of The White Mountains Almanac, a first-of-its-kind publication created by Mount Washington Observatory and partners at the Appalachian Mountain Club (AMC) and Hubbard Brook Research Foundation. With funding support from the Cabot Family Charitable Trust, The Nature Conservancy of New Hampshire, Stephen Walker and Diane DeLuca, and the Hartford Foundation for Public Giving, this richly illustrated almanac offers a comprehensive, year-in-review exploration of ecological and climatological changes observed in the White Mountains region, serving as both a valuable resource for researchers and a compelling guide for nature enthusiasts, educators, and policymakers, as well as the general public.

With contributions from local scientists, naturalists, and community supporters, graduate student Frank Vazzano compiled the data and authored the work during his five-month internship with the three partner nonprofits. The Almanac, he shares, will introduce the reader "to the climatological character of these wonderful mountains, how and where it is changing, and how these changes interact with spheres ranging from ecology to econo-

my, and severe weather to outdoor recreation."

Data from three study sites (the Mount Washington Observatory at 6,288', AMC's Pinkham Notch Visitor Center at 2,032', and the Hubbard Brook Experimental Forest at 825') was compiled (in addition to North Conway's cooperative weather station in some highlights). The data used in the studies dates back to 1935 for MWOBS and the AMC and 1957 for Hubbard Brook and North Conway, providing a robust period of record for research. Along with the monthly themes highlighted above, the Almanac also features an appendix of Averages and Extremes for tem-



Almanac Author Frank Vazzano on the summit of Mount Washington

perature, precipitation, snowfall/snow depth, and wind across locations.

Twelve chapters (one for each month of the year) feature vivid illustrations, data visualizations, and field observations, documenting the intricate relationships among weather, recreation, wilderness, and the landscape over time, providing a unique look at the region's evolving climate, ecology, and natural beauty.

"Each month is a journey into a seasonal setting, giving you a true sense of place for the White Mountains through a historical, science-driven lens. Not just words, but data we've gathered over decades tell the tale of the region, helping us understand, protect, and enjoy these mountains for generations to come. We were fortunate to have Frank as our skilled guide," says Georgia Murray, AMC Senior Scientist who provided input on AMC's long-term datasets and analysis.

View the almanac online here: [mountwashington.org/research/the-white-mountains-almanac/](http://mountwashington.org/research/the-white-mountains-almanac/)

Ellen Estabrook, Communications Manager at the Mount Washington Observatory, has strong interests in sustainability, conservation, and the environmental impacts of climate.

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*Quincy Bog Notes is a twice-yearly newsletter of information, announcements, and news about the Quincy Bog Natural Area and Pemi-Baker Land Trust.*

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## Quincy Bog Notes

*(Continued from page 1, Lyons)*

Without intervention, light pollution will continue to degrade local sky quality, an important asset for wildlife and local residents. If ecological and human health considerations are not enough of a call to action, let's consider the cultural and economic benefits of preventing and remediating light pollution. With an ever-increasing share of the population living in urbanized areas, interest in astrotourism is projected to grow even as opportunities for night sky watching are diminished. Preserving dark skies can bring more tourism dollars to rural regions in every season, for eclipse viewing, star gazing, or catching the elusive Northern Lights, a great complement to daytime activities. Furthermore, encounters with the magic of nature can inspire more environmental stewardship.



A starry view over Campton, captured by local astrophotographer Cathie LeBlanc

Protecting nighttime environments requires thoughtful, community-centered action. Cultivating local stewardship can deliver eco-

logical, economic, and human health benefits. Policy paved the way for the proliferation of artificial light at night, and policy will be essential in wisely managing future use to avoid ever-increasing loss of darkness. For those interested in advocating for the preservation of natural nighttime environments, consider developing or improving a local light and sign ordinance and adding provisions in your planning board's site plan review and subdivision rules to mitigate the impact of light pollution in your community.

While municipal, state, and federal efforts may take time, individuals can make immediate and meaningful contributions by evaluating the design and use of outdoor light on their own property. Sometimes, protecting the natural world begins with something as simple as flipping a switch.

**Dr. Rachele Lyons** is an Assistant Professor of Environmental Science and Policy at Plymouth State University, a dedicated dark sky advocate, and member of the Campus SHINE Working Group of the American Astronomical Society's Committee for the Protection of Astronomy and the Space Environment (COMPASSE) - an initiative focused on improving responsible nighttime illumination.

### Calling All Friends of the Bog

Each new year brings us new opportunities for *conserving land and connecting people with nature*. But we can't do it without you! If you believe in the value of protecting and experiencing natural places, please consider supporting our mission with a donation to Rumney Ecological Systems.



We've enclosed an envelope for your convenience, or visit [quincybog.org](http://quincybog.org) to donate online via PayPal. Thanks from all of us at the Bog!