

USA **nppn**   
National Phenology Network

# 2024 Annual Report



# USA-NPN Annual Report | Letter from the Director

Greetings! There's no denying that the start of 2025 has been filled with challenges for science and its supporters. I've been amazed and humbled by how people are coming together, supporting one another, and continuing to work for what they value. We feel it here at the USA-NPN; I wish to express huge gratitude for the continued engagement among you - our data contributors, data users, partners, and friends.

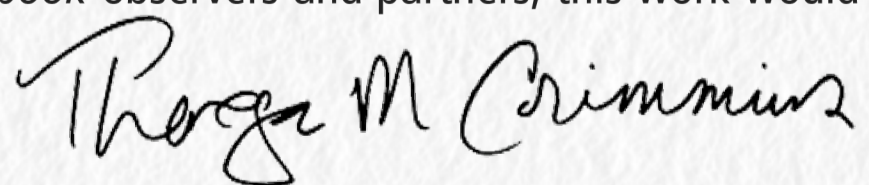
We had some big successes in 2024, including winning a large grant from the National Science Foundation that is allowing us to make major changes and improvements to the *Nature's Notebook* mobile app. We are slated to release a wholly redesigned app and observing experience next spring and I promise you, it's going to be great!

We also released our Phenophase Primer for Flowering Plants at the tail end of 2024. This incredible document has been in the making for about ten years, started by our former team botanist, Patty Guertin, and brought across the line by our long-time team member, Ellen Denny. We are so happy to honor Patty by bringing her work into the hands of so many others. Do check it out, it is truly an impressive resource and a real treat for your eyes.

Finally, I'm thrilled to share that Erin Zylstra, a wildlife ecologist and statistician, joined the USA-NPN team this past year. Erin is playing a critical role in helping us interpret the 16(!) years of phenology observations that *Nature's Notebook* participants have contributed, to share insights with observers and Local Phenology Programs, advance our understanding of how phenology is changing, and sharpen our data collection.

Since its establishment, the USA-NPN has been supported through various forms of federal support, including federal appropriations, agreements, and grants from the National Science Foundation, US Geological Survey, and agencies under DOI and USDA. As such, the long-term continuance of the program is vulnerable. We are doing everything we can to keep *Nature's Notebook* running and will keep you abreast of any anticipated changes to our operations.

Thank you for your continued efforts as *Nature's Notebook* observers and partners; this work would not be possible without you!



Theresa Crimmins, USA-NPN Director

# 3,016

Active

## Nature's Notebook Observers

30,455



# 3.85 M

## Phenology Records

40 M

# 1

## New Data Product Created - Spotted Lanternfly Pheno Forecast

102



# 25

## Publications using contemporary data, models, and data products

166

# 204

## Local Phenology Programs Submitting Observations

568



# 24

## Local Phenology Leaders Certified

242

# USA-NPN Annual Report | Advancing Science

The USA-NPN offers data, models, tools, and resources that lead to advances in understanding of patterns and drivers to plant and animal phenology.

The timing of spring activity is clearly advancing in the Northeast U.S. However, whether understory plants are shifting their activity to a greater extent than overstory trees is unclear; recent studies have reported conflicting results. A greater rate of advancement among understory plants would benefit this group, offering greater access to sunlight and opportunity to sequester nutrients and further their life cycles. The opposite pattern would be bad news for plants inhabiting the forest understory.

Using nearly twenty years of phenology observations contributed by participants in *Nature's Notebook*, iNaturalist, and the Appalachian Mountain Club's Mountain Watch program, a team of scientists evaluated the different plants' sensitivity to spring temperature along the 2,190 mile length of the Appalachian Trail. Their findings were good news for the understory plants, predicting a greater rate of advancement for this group than among overstory trees, at least in the northern reaches of the AT.

**The study was possible only because of the efforts of the many volunteers faithfully documenting phenology in the region. And yet, the researchers' conclude with a plea for even more data to more fully disentangle and understand the complexities of this system.**

Tourville et al. 2024, [doi.org/10.1002/ecy.4403](https://doi.org/10.1002/ecy.4403)

# USA-NPN Annual Report | Informing Decisions

The USA-NPN provides relevant, timely phenological information to support decision-making in a wide range of applications based on needs expressed by various user groups.

Researchers' use of the phenology data maintained by the USA-NPN is clear evidence that those observations are valuable to science. Decision and policy makers' subsequent use of those scientific studies is even better, demonstrating broader societal impact of the phenology data and information collected and maintained by the USA-NPN.

**Twenty percent of the scientific publications using USA-NPN data or information products have been referenced by US government agencies and international agencies in reports or policy documents.** In contrast, in general, research studies are cited in policy documents less than 4% of the time. The most frequent use of USA-NPN data is in scientific and technical reports such as the recent Fifth National Climate Assessment. The publications were also referenced internationally by the United Nations Environment Programme and the Intergovernmental Panel on Climate Change. Research studies leveraging USA-NPN data have also informed state wildlife action plans, species recovery plans, and water use plans.

Bornmann et al. 2016. [doi.org/10.1007/s11192-016-2115-y](https://doi.org/10.1007/s11192-016-2115-y).

Fang et al. 2020. [arxiv.org/pdf/2407.09854](https://arxiv.org/pdf/2407.09854)

# USA-NPN Annual Report | Communicating & Connecting

The USA-NPN supports a greater understanding and appreciation for phenology among all inhabitants of the country.

Linda Loring Nature Foundation is a non-profit land trust on Nantucket Island in Massachusetts. They are dedicated to research, stewardship, and education around native biodiversity. Led by Sarah Bois, they have collected phenology data since 2014 on a diversity of species including common, native shrubs that are signature species of the landscape such as northern bayberry, black huckleberry, and bear oak.

Linda Loring Nature Foundation was awarded the USA-NPN Pheno Champion Award in 2023. We recognize them for their consistent phenology data collection spanning nine years and generating over 15,000 records, their dedication to teaching 7th grade students about phenology, and their engagement of the public in learning about climate change impacts. Congratulations and thank you for your efforts, Linda Loring Nature Foundation phenology observers!



# USA-NPN Annual Report | Growing an Equitable & Inclusive Network

The USA-NPN listens to diverse stakeholders, leading to a stronger network and an improved understanding and application of phenological information. The benefits of USA-NPN programs, tools, products and partnerships accrue to people from all backgrounds reflected in the US population.

The USA-NPN aims to have the diversity of the U.S. population reflected in *Nature's Notebook* participants. This representation leads to a more complete and robust dataset, enabling us to more fully understand the impact of global change on species and ecosystems. **Our *Nature's Notebook* mobile app revamp project, started in September 2024, is increasing the USA-NPN's capacity to support the largest and most diverse community of volunteer data collectors and researchers possible.**

A key component of this project is our Mobile App Working Group, an advisory group composed of current and new audiences including youth, educators, and communities underrepresented in the sciences. This group brings valuable expertise and is consulting with the app development team throughout the project. They are providing important input to lower barriers to entry and create a welcoming experience for everyone tracking and learning about phenology.