



USA **nphn** 
National Phenology Network

2020 ANNUAL REPORT



USA-NPN 2020 Annual Report | FROM THE DIRECTOR

Greetings! As I reflect on all that 2020 brought us, I am filled with a mix of sadness and gratitude. The last year was so very challenging to all of us as individuals as well as for our organization. I am saddened that in 2020 several members of our team moved on to new adventures due to a reduction in funds for our program. I am so thankful for the continued support and engagement by so many in the USA-NPN. Despite COVID-related closures of schools, parks, and public spaces, *Nature's Notebook* participants contributed observations from more sites than in any previous year.

Despite the challenges that 2020 kept dishing out, we pulled off some noteworthy accomplishments that we are excited to share:

- The release of our R package, *rnnpn*, which greatly increases the efficiency with which researchers can access phenology data.
- The release of our Spring Index Return Interval data product, which provides important context for our popular Spring Index anomaly products.
- The launch of a new *Nature's Notebook* campaign, Pesky Plant Trackers, focused on wild parsnip and Japanese knotweed. In the first year, 31 observers tracked 49 plants.

We are excited by the prospects of the coming year and feel positive that phenology data and monitoring will continue to be appreciated by many. We look forward to continuing to work with you and thank you for your continued involvement. Looking forward to sharing more updates over the course of 2021!

Warmly,



Theresa Crimmins

Director, USA National Phenology Network



USA-NPN 2020 Annual Report | BY THE NUMBERS

3,406

Active
Nature's Notebook
Observers
19,443 all time



2.8 M

Phenology
Records
23.8 M all time

175

Active Local
Phenology Programs
394 all time



2

Data products
released
95 all time



18

Publications using
contemporary
data, models, data
products
96 all time

17

Local Phenology
Leaders Certified
144 all time

USA-NPN 2020 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.

Invasive shrubs, which tend to leaf out weeks earlier in the spring and retain their leaves longer in the fall compared to native shrubs, are becoming increasingly abundant in eastern North American forests. This extended period of present leaves leads to decreased native tree seedling success, pollination, and understory plant diversity as well as changes to litter decomposition and nutrient cycling. However, reports from various locations revealed inconsistent findings, challenging the use of the information in invasive plant management.

Through a collaboration with USA-NPN, researchers at Penn State University clearly documented that invasive shrubs leaf out up to 11 weeks earlier than native shrubs at low latitudes, and at high latitudes, leaf-out is nearly concurrent among the groups of plants. Participants in *Nature's Notebook* contributed over 1,500 observations of leaf phenology to enable this discovery. This information can help managers to anticipate the optimal time to undertake invasive plant control activities.



"I never would have been able to collect high-quality data across this large region on my own! The amazing efforts of citizen scientists revealed regional patterns in the differences between native and invasive shrubs that would have otherwise been impossible."
— Erynn Maynard-Bean, Penn State

Maynard-Bean et al. 2020, <https://doi.org/10.1007/s10530-020-02326-1>

USA-NPN 2020 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.

Changing climate conditions are anticipated to affect not only the timing of events like leaf out and flowering in plants, but also where they are found. Little is known about how plants that are valued by Indigenous communities might be affected in future decades.

Using phenology observations contributed to *Nature's Notebook* and from other sources, researchers examined potential changes in phenology and distribution of three shrubs of value to Indigenous communities in the Pacific Northwest: beaked hazelnut, Oregon grape, and salal. Without dramatic reductions in global emissions, the plants are anticipated to undergo flowering and fruit ripening several weeks earlier by mid-century and to shift their distributions northward and up in elevation. This information is valuable for climate change adaptation planning and restoration activities.



"Publicly-available observations, such as those from USA-NPN, provide some of the only phenology records we could find for these understudied species - and thus were invaluable for creating our phenology predictions." — Janet Prevey, USGS and lead author



USA-NPN 2020 Annual Report | COMMUNICATING & CONNECTING

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

Though COVID-19 changed how members of the Earthwise Aware Naturalist Program contributed observations to *Nature's Notebook*, it did little to slow down the efforts of these dedicated naturalists. Members of this Massachusetts-based group contributed over 50,000 records of phenology to *Nature's Notebook* in 2020 for dozens of species of plants, birds, reptiles, and arthropods.

The USA-NPN is thrilled to celebrate Earthwise Aware's exemplary efforts with the 2019 PhenoChampion Award. Earthwise Aware "is dedicated to bringing biodiversity knowledge, ecological ethics and environmental leadership to the daily life of people."



"One of EwA's mottos is 'Nature Conservation as a Way of Life.' I believe in that. I am an amateur naturalist, and at EwA, I have met like-minded curious naturalists, with the mission to collect biodiversity evidence for national data platforms."
— Kathy McGlathery



USA-NPN 2020 Annual Report | GROWING AN EQUITABLE & INCLUSIVE NETWORK

The diverse stakeholder voices shaping the USA-NPN lead 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 U.S. population.

One of the USA-NPN's commitments toward Growing an Equitable and Inclusive Network is to collaborate with like-minded organizations to advance diversity, equity and inclusion in the fields in which we operate, including citizen science, ecology, natural resources.

Early in 2020, the USA-NPN partnered with the US Fish & Wildlife Service's National Conservation Training Center to offer a webinar series. The series featured both Indigenous and Western approaches to understanding shifting seasons, invasive species management, animal migration, and climate adaptation.

Over 100 people attended each session, and the discussions were active and rich. Many non-indigenous resource managers engaged with questions around good relationships, listening, Traditional Ecological Knowledge, and native approaches to conservation.



Recordings from the webinar series are available at: training.fws.gov/topic/online-training/webinars/phenology.html

Photos: Brian Miller (left), Tom Grey (right)

