

THE 'FUNOLOGY' NEWSLETTER

for the Great Smoky Mountains National Park Adopt-a-Plot Phenology Program



From Your Smokies Staff



OUT WITH THE OLD (LEAVES) AND IN WITH THE COLD

It's that time of year again! Nearly all the trees have shed their leaves, signifying the end to the 2021 phenology season. We are so thankful for all the time and dedication everyone has put in in this past year. We quite literally could not have done it without all of you and are so appreciative to your commitment to this program!

To ring in the holiday season, we wanted to take the time to thank you for all you've done, and share some of the "fruits" of your labor that we've been observing.

That being said, we can't wait to see you all again for the 2022 season!

Nature's Notebook

We've been looking at the data that you've collected over the years and would like to share some of the results with you.

HOW QUIRKY ARE OUR QUERCUS'?

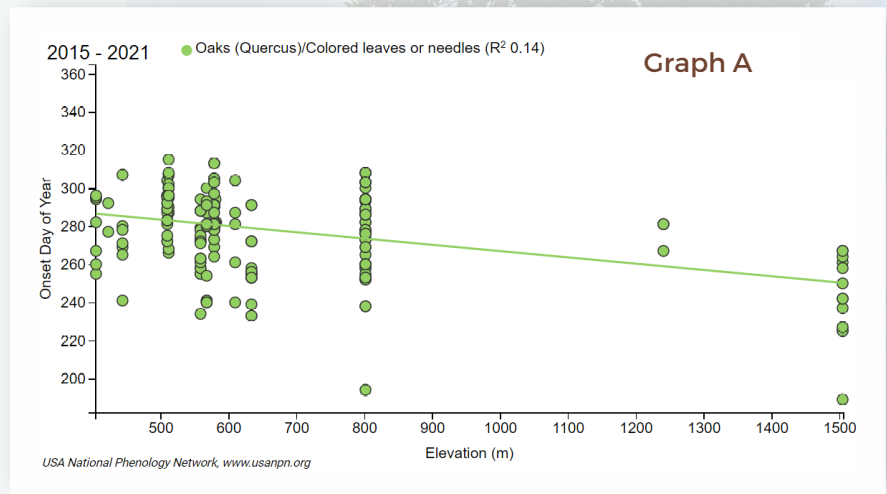
RECENT DATA SHOWS THEY MIGHT BE UP TO SOMETHING.



As seen in these scatter plots, we've compiled data on all of our oaks throughout the park and compared the day of the year that we first observed a leaf color change with the tree's elevation.

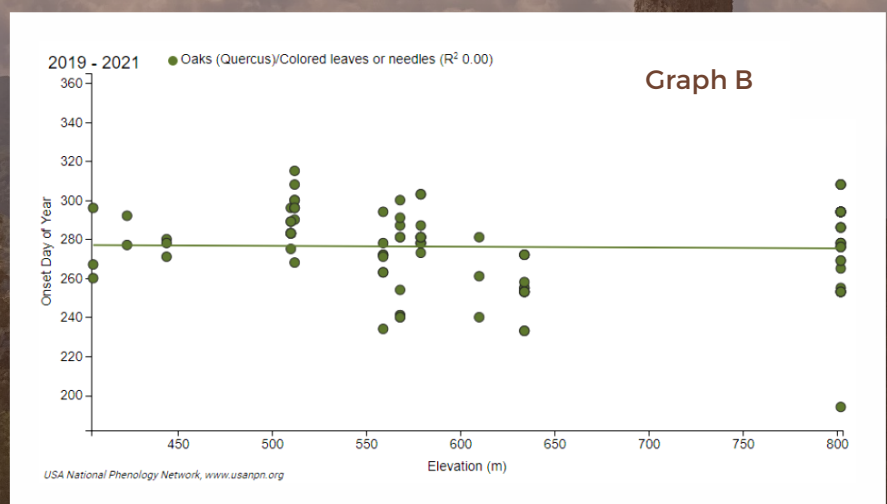
Looking at Graph A, there is a clear negative trend in the data. This is exactly what we would expect, because it indicates that we see leaves changing colors at higher elevations sooner than we see them change at lower elevations.

However, if you look at Graph B, you might notice that the trend line is significantly flatter, indicating that



color change is being observed around the same time, regardless of elevation.

Following this trend, the graphs also show that our oaks at lower elevations, on average, are changing colors approximately a week or two earlier than we've observed in past years. Similarly, our high elevation oaks seem to be averaging a color change roughly two weeks later than we've previously recorded. While we recognize this data is not very statistically significant (we'd prefer our R value to be MUCH closer to 1), it's interesting to observe these subtle seasonal changes and see how they may progress over the years.



Need more proof?

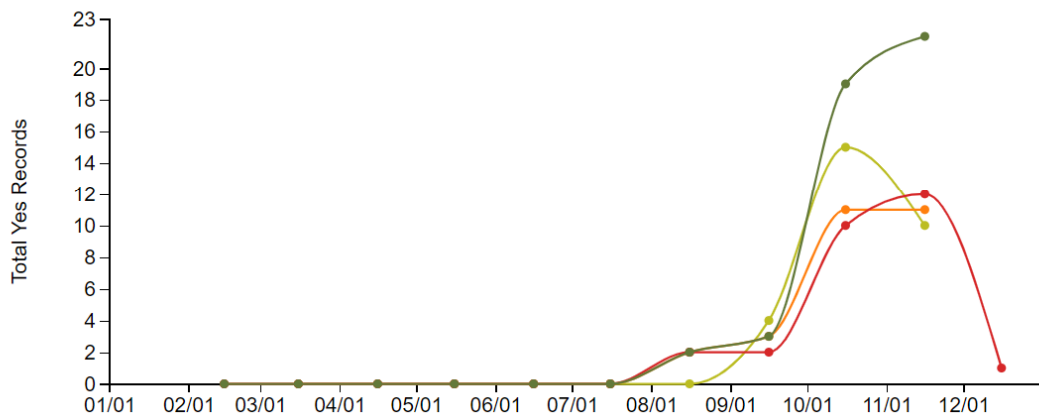
The Activity Curves graph below shows the total number of times that you've recorded "yes" to seeing colored leaves on our plots' Northern Red Oak trees in relation to what month it was when you made your observation. According to this data, it looks like we are seeing a peak color change of Northern Red Oaks about a month later in recent years than we have in the past.

Another notable attribute of this graph is that you can see how our data has remained consistent between 2019 and 2021. A lot may have changed in 2020, but the dedication of our volunteers did not.



Activity Curves

- 2015: Northern red oak - Colored leaves or needles
- 2017: Northern red oak - Colored leaves or needles
- 2019: Northern red oak - Colored leaves or needles
- 2021: Northern red oak - Colored leaves or needles

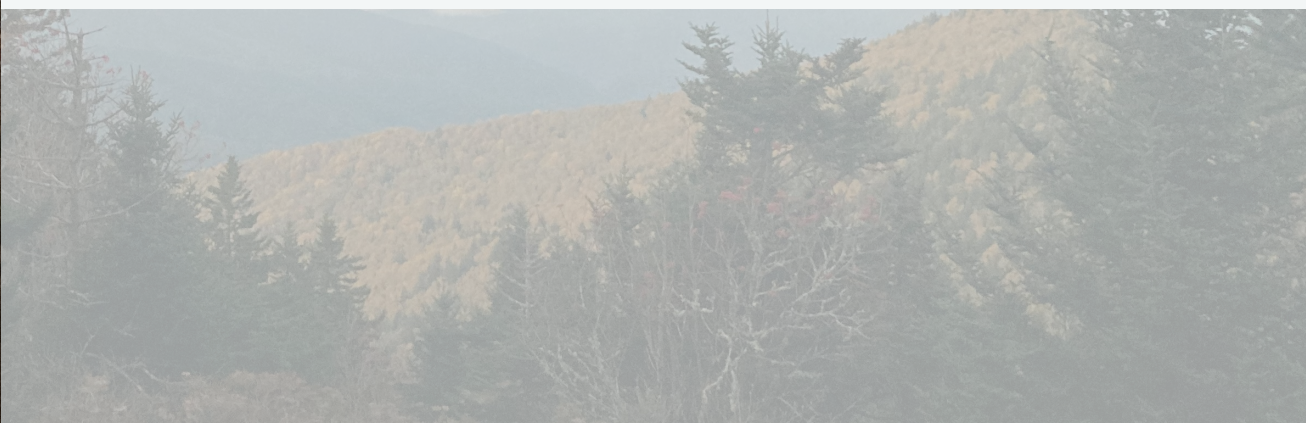


USA National Phenology Network, www.usanpn.org



Lastly, check out the record breaking number of volunteers that participated this past year. Our data has grown considerably with the addition of our new members and it really shows when looking at the graph!

Without your diligent observations we would not be able to accomplish this and we can't thank you enough!



YOUR WORK AT WORK

Your data isn't only important to us. In the article "Nature's Notebook Observations are Key to Interpreting Information Collected by Satellites and Aircraft", found on the USA NPN [website](https://www.usanpn.org/node/36762), the importance of your on-the-ground data collection is highlighted.

Article Link: <https://www.usanpn.org/node/36762>

The images produced from satellites provide a broad view of what is going on over a large area, but tell us very little about what is happening in smaller cross sections. For example, many scientists use these images to track "green-up and brown-down", meaning this tool is used to observe the broad phenological changes that mostly pertain to looking at canopy cover and

making inferences about when these changes are likely occurring based on the amount of "greenness".

The data you collect is then cross-referenced with satellite imagery to help scientists more accurately estimate the start of seasons. Without your observations in categories such as breaking leaf buds, leaf out, and color change this could not be accomplished. As stated in the article, "Over the past decade, nearly two dozen studies have used Nature's Notebook observations to validate and interpret imagery collected from sensors aboard satellites and aircraft, which is used in a wide range of applications including wildfire management, agriculture production, reforestation efforts, and lots more."



2021: Red maple - Colored leaves or needles



2021: American beech - Colored leaves or needles



2021: Northern red oak - Colored leaves or needles



Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

USA National Phenology Network, www.usanpn.org

Additionally, your negative data is just as important as your positive data.

The calendar above shows three species observed in our plots and catalogs the "yes" and "no" data you've collected throughout the year. The negative data is displayed in grey and the positive data is color coded per species. With a record of every time you've not observed a specific phenophase, we can more accurately pinpoint the start of each phenophases and more accurately predict seasonal changes.

Updates

Because there is always something new going on in the park

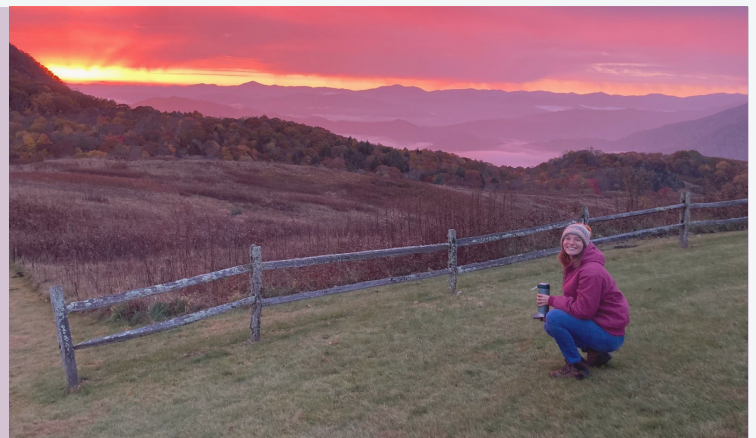
STAFF UPDATES

Callia Johnson, your 2020-21 AmeriCorps Phenology Program Coordinator, has been hired in a permanent position on the Tennessee side of the Park! You've likely met Callia in person or virtually as she's helped manage the phenology program since last spring. While she won't be working with the phenology program anymore, we're happy to have her as part of the park's full time staff. Congrats Callia!

Our new AmeriCorps member, **Sarah Dickinson**, will be helping to manage the phenology program this coming spring. Sarah is originally from New Jersey, and has served two other AmeriCorps service terms with both the New York-New Jersey Trail Conference and The Nature Conservancy in South Carolina. She is an avid hiker and plant enthusiast. Welcome to the team Sarah!

MORE PHENOLOGY FUN

Your budding friendship with phenology doesn't have to end just because we're entering the off-season. Nature's Notebook offers a variety of modules and video recordings to keep you binocular's focused year round! Go to **USA-NPN - YouTube** or copy and paste this link: <https://www.youtube.com/user/USANPN1/featured>



PARK UPDATES

Clingmans Dome Road and Purchase Knob are officially closed for the season until April, but you can still virtually visit using our webcam!

Click **here** to view or copy and paste this link: <https://www.nps.gov/grsm/learn/photosmultimedia/webcams.htm>



VOLUNTEER OPPORTUNITIES

Looking other ways to get involved? We can always use help with administrative assistance, newsletter writing, training and more. Email us if you're looking for ways to branch out!

Interested in other volunteer opportunities to add to your resume? Our partner organization, Discover life in America, offers a variety of volunteer opportunities throughout the year. Check out their webpage **here**, or copy and paste this link:

<https://dlia.org/volunteering/>



“Seen in the Field” Stories

See what's going on at the other plots around the park

SUPRISE VISITORS AT MINGUS MILL

“I went to the Mingus Mill phenology plot today and as I walked through the cemetery something stood up, blocking my path. I first thought that I could head through the brush to get around, but after a few steps, I realized that the large herd was resting in the plot. I nearly wanted to mark “1 person looking for animals “ LOL, but instead headed for home.”

-Lorna Luketin



HAVE A STORY YOU'D LIKE TO SHARE?

We'd love to learn more about all of you! If you're interested in sharing some of your story, please drop us a line with a photo, your “elevator speech about yourself”, why you've become a volunteer, something you've seen in the field, or favorite park place.

You can also share your phenology or plot photos! Special wildlife sightings (safely of course), sunrises or sunsets, wildflowers, special time with family and friends, other crew members; We'd love to see your shot and share your short story!



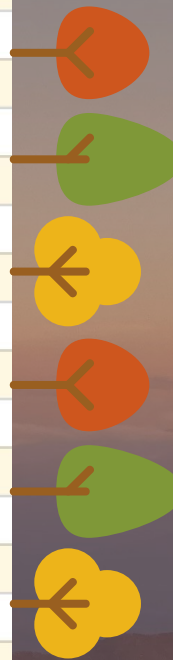
PHOTO BY LORNA LUKETIN

2021 Volunteer Leaderboard

Ever wonder how your observations stack up against the other volunteers? Check out our 2021 leaderboard!

The sun may be setting on this phenology season, but there's always next year!

RANK	USERNAME	NUMBER OF RECORDS
1	wmpost	5869
2	tw865	4048
3	scojay12	4031
4	TerryMU	3888
5	aldigo	3825
6	rpearson	3795
7	Mweingartz	3223
8	kookSteve Higdon	2580
9	juletay	2225
10	Donnapatroni	1992
11	metcalfmom	1872
12	wspheno	1674
13	Shiloh1862	1666
14	CherylObserver	1488
15	Rbmountain	1313
16	Walter D. Hedge	1279
17	Catharine	1257
18	M. V. Corn	1202
19	Luketin	1160
19	Linda K	1160
20	Sunshinetrees2019	1150
21	millerll	934
22	Parlettsofsylva	924
23	RavenHawk	847
24	PESuper	784
25	Pamela J Winn	760



Shout out to Luketin and Linda K for being tied at #19