

# Final Abstract

Final Report Approved on September 3, 2024

## M.L. 2020 Project Abstract

For the Period Ending June 30, 2024

**Project Title:** Engaging Minnesotans With Phenology: Radio, Podcasts, Citizen Science

**Project Manager:** Sarah Bignall

**Affiliation:** Northern Community Radio, Inc.

**Mailing Address:** 260 NE 2nd St

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**Website:** <https://www.kaxe.org/#stream/0>

**Funding Source:**

**Fiscal Year:**

**Legal Citation:** M.L. 2021, First Special Session, Chp. 6, Art. 5, Sec. 2, Subd. 05h

**Appropriation Amount:** \$198,000

**Amount Spent:** \$198,000

**Amount Remaining:** -

### Sound bite of Project Outcomes and Results

The Engaging Minnesotans with Phenology project empowered over 89 educators and 2,500 students to connect deeply with nature. By airing 749 student reports and producing weekly podcasts, we inspired communities to engage with the outdoors, fostering a new generation of conservationists and strengthening Minnesotans' connection to their natural environment.

### Overall Project Outcome and Results

The Engaging Minnesotans with Phenology project aimed to deepen Minnesotans' connection to the natural environment through education and community engagement. Phenology, the study of seasonal changes in plants and animals, is a powerful tool to foster environmental awareness and stewardship. This project sought to inspire a broader understanding of phenology, particularly among educators, students, and the general public, with the ultimate goal of cultivating a new generation of conservation-minded citizens and strengthening community ties to the environment.

To achieve this, the project trained over 89 educators through 15 workshops and 13 follow-up visits. These workshops, led by experts John Latimer, Stephan Carlson, and Charlie Mitchell, provided educators with the tools and knowledge to

incorporate phenology into their curriculum. Approximately half of these workshops were day-long events, while the rest were shorter sessions integrated into larger environmental conferences. The workshops received overwhelmingly positive feedback, and as a result, an estimated 2,500 students and 15 additional schools are now benefiting from these lessons. This number is expected to grow as more teachers continue to incorporate phenology into their classrooms.

KAXE, a community radio station, played a pivotal role in promoting and expanding the project's reach. The station aired 749 student reports on phenology across 119 weekly episodes, along with 48 interviews with environmental scientists and 156 other phenology-related episodes. These segments, hosted by Heidi Holtan and John Latimer, were also made available through the Phenology podcast and the KAXE website.

Additionally, the project developed an interactive website in collaboration with the University of Minnesota. This platform, along with 5,000 phenology calendars were distributed to K-12 teachers and community members, provided valuable resources for observing and understanding seasonal changes.

Overall, this project successfully engaged thousands of Minnesotans in phenology, fostering a deeper connection to the environment and promoting long-term environmental stewardship.

### **Project Results Use and Dissemination**

During this project, we launched the Season Watch Newsletter, featuring Phenology Podcast episodes, local news, nature guides, learning resources, and updates from the KAXE-KBXE Season Watch Facebook group. Over 100 editions were released, growing from 164 to 635 subscribers, with a 66% open rate and 16% click rate. The University of Minnesota's Season Watch website also launched at [seasonwatch.umn.edu](http://seasonwatch.umn.edu), offering extensive local phenological data and resources. Additionally, over 5,000 phenology calendars were distributed to K-12 students and community members, and phenology reports aired on KAXE, streamed online, and were made available as podcasts.



## Environment and Natural Resources Trust Fund

M.L. 2020 Approved Final Report

### General Information

**Date:** November 18, 2024

**ID Number:** 2020-021

**Staff Lead:** Mike Campana

**Project Title:** Engaging Minnesotans With Phenology: Radio, Podcasts, Citizen Science

**Project Budget:** \$198,000

### Project Manager Information

**Name:** Sarah Bignall

**Organization:** Northern Community Radio, Inc.

**Office Telephone:** (218) 326-1234

**Email:** sbignall@kaxe.org

**Web Address:** <https://www.kaxe.org/#stream/0>

### Project Reporting

**Final Report Approved:** September 3, 2024

**Reporting Status:** Project Completed

**Date of Last Action:** September 3, 2024

**Project Completion:** June 30, 2024

### Legal Information

**Legal Citation:** M.L. 2021, First Special Session, Chp. 6, Art. 5, Sec. 2, Subd. 05h

**Appropriation Language:** \$198,000 the second year is from the trust fund to the commissioner of natural resources for an agreement with Northern Community Radio, Inc., in partnership with the Board of Regents of the University of Minnesota to build the next generation of conservationists using phenology, radio broadcasts, podcasts, and an online, interactive map interface to inspire teachers, students, and the public to get outside and experience nature.

**Appropriation End Date:** June 30, 2024

## Narrative

**Project Summary:** This education project will build the next generation of conservationists in Minnesota by engaging youth and adults in science and outdoor learning through radio, podcasts, citizen science and schoolyard exploration.

**Describe the opportunity or problem your proposal seeks to address. Include any relevant background information.**

For more than thirty years, John Latimer has led the Phenology Show at Northern Community Radio, KAXE/KBXE, based in Grand Rapids, MN, inspiring 1000s of people in to pay attention to what's happening in nature in their backyards and woodlots and share it with others. Every Tuesday morning, John gathers his phenology data and reports his findings in the weekly Phenology Report. Every week in Phenology Talkback we hear from Minnesota school kids and regular listeners as they call or email us with their nature observations. Bobcat tracks, downy woodpeckers, a snowdrift covering a classroom window (which a hero-custodian cleared away), a close study of layers of snow and much more are included in these phenology reports.

Phenology is an important tool for creating personal connection to places. We know that "place connection" is a key component of pro-environmental and conservation behavior. Our project builds on John's legacy by developing new programs that strengthen place connection and inspire the next generation of conservationists in Minnesota.

**What is your proposed solution to the problem or opportunity discussed above? Introduce us to the work you are seeking funding to do. You will be asked to expand on this proposed solution in Activities & Milestones.**

At a time when outdoor engagement is dropping (e.g., statewide reductions in hunting and fishing), our project uses technology to draw people outdoors. We will do this by:

- developing new radio programming and podcasts that inspire listeners to engage with the outdoors and share their experiences
- expanding current partnership programs between KAXE and K-12 schools by offering workshops statewide that train teachers and 4-H leaders in existing phenology curricula, developing radio reports from schools, and supporting participating schools with follow-ups
- creating an online map based interface that will allow anyone – adult radio listeners, teachers and kids in school programs – to compare what they are seeing with others in Minnesota and with historical data compiled by the Minnesota Phenology Network.

In summary, this project will result in a set of tools equally accessible to the public, teachers and school kids that deliver science content and inspire people to get outdoors and build community around the environment through radio, podcasts, web-based data collection and nature exploration

**What are the specific project outcomes as they relate to the public purpose of protection, conservation, preservation, and enhancement of the state's natural resources?**

"Alexa, play the KAXE phenology school reports"

Deliver engaging environmental programming to Northern Minnesota through radio and podcasts.

Create a statewide program for school kids combining phenology observation with radio broadcasting.

Build interactive digital map of statewide phenology data and regional phenology calendars.

## Project Location

**What is the best scale for describing where your work will take place?**

Statewide

**What is the best scale to describe the area impacted by your work?**

Statewide

**When will the work impact occur?**

During the Project and In the Future

## Activities and Milestones

### Activity 1: Deliver engaging environmental programming to Northern Minnesota through radio and podcasts

**Activity Budget:** \$70,456

**Activity Description:**

Description: We will expand our current portfolio by developing three new programs: monthly interviews with environmental scientists, podcasts related to the seasons of the year, and monthly radio segments about statewide phenology that will be made available to other public radio stations in Minnesota. These public radio broadcasts and podcasts will educate and engage people in northern MN—and elsewhere around the state—about environmental science and its relationship to observable nature.

**Activity Milestones:**

Description	Approximate Completion Date
24 radio segments that present interviews with scientists (approx 12 segments/year)	June 30, 2024
24 short radio segments of statewide phenology happenings shared with other MN noncommercial radio stations	June 30, 2024
8 podcasts created and available online (spring, summer, fall, winter each year)	June 30, 2024

### Activity 2: Create a statewide program for school kids combining phenology observation with radio broadcasting

**Activity Budget:** \$40,251

**Activity Description:**

expand existing school partnerships in environmental education statewide and also work with county 4-H programs. With UMN extension support, we will offer teachers and 4-H leaders training in our phenology and radio curriculum once per season for two years (8 workshops) rotating the location around the state (NE, NW, SE, SW). The curriculum involves basic phenology observations combined with developing short school phenology reports for radio broadcast. We will offer a helpline, pair teachers and 4-H leaders with a Master Naturalist and provide 1-1 follow-up meetings to ensure strong support of classroom implementation. Further, we will develop easy data input for school reports that supports the map of observations in Activity 3.

**Activity Milestones:**

Description	Approximate Completion Date
8 workshops that train teachers who engage 2400 students (4 workshops per year)	June 30, 2024
360 radio segments created by kids in school programs (approximately 160 radio segments/year)	June 30, 2024

### Activity 3: Build an interactive digital map of statewide phenology data and regional phenology calendars

**Activity Budget:** \$87,293

**Activity Description:**

create an online map interface for comparing current observations to others and to the past. Users will click on their location and search for earliest, latest and average time of a phenological event such as lilac blooming or sandhill crane return. In addition, they can view what others in the state are seeing. This interactive web application will allow people

to place their personal observations in a broader context and build community and awareness. In addition, we'll create regional phenology calendars available online and in print form that serve as guides to what to look for each month as well as personal journals.

**Activity Milestones:**

Description	Approximate Completion Date
Online release of the interactiv digital map of phenology date	December 31, 2023
Web tool to compare current observations to past and to others in the state goeslive	December 31, 2023
Online and print regional phenology calendars - 3681 print copies distributed	December 31, 2023

## Project Partners and Collaborators

Name	Organization	Role	Receiving Funds
Rebecca Montgomery	University of Minnesota	We will subcontract with Rebecca Montgomery and the University of MN Department of Forest Resources for part of the services we hope to provide through this proposal	No
Stephan Carlson	University of Minnesota	Stephan Carlson is an Adjunct Professor in Forestry at the U of MN who will assist with providing teacher trainings and other services through this proposed project.	Yes

## Dissemination

**Describe your plans for dissemination, presentation, documentation, or sharing of data, results, samples, physical collections, and other products and how they will follow ENRTF Acknowledgement Requirements and Guidelines.**

This entire project is about dissemination: the act of carrying out the project creates educational programs that disseminate what we know about and can learn from phenology. In addition, we will share the monthly interviews with environmental scientists, podcasts related to the seasons of the year, and monthly radio segments about statewide phenology with other radio stations and online on the KAXE website. Materials from Activity 2 will be available through the MnPN website. The online map interface will be publically available through the University of Minnesota. We will work with local media outlets to raise awareness about our programming.

The Minnesota Environment and Natural Resources Trust Fund (ENRTF) will be acknowledged through use of the trust fund logo or attribution language on project print and electronic media, publications, signage, and other communications per the ENRTF Acknowledgement Guidelines.

## Long-Term Implementation and Funding

**Describe how the results will be implemented and how any ongoing effort will be funded. If not already addressed as part of the project, how will findings, results, and products developed be implemented after project completion? If additional work is needed, how will this work be funded?**

Long term: Web map will be hosted by University of Minnesota. Radio broadcasts and podcasts will be available through KAXE website.

## Other ENRTF Appropriations Awarded in the Last Six Years

Name	Appropriation	Amount Awarded
Assessing Species Vulnerability to Climate Change Using Phenology	M.L. 2014, Chp. 226, Sec. 2, Subd. 05e	\$175,000



## Budget Summary

Category / Name	Subcategory or Type	Description	Purpose	Gen. Ineligible	% Benefits	# FTE	Classified Staff?	\$ Amount	\$ Amount Spent	\$ Amount Remaining
<b>Personnel</b>										
Production supervisor		Work with producer to train, coordinate, and assist with all aspects of radio production			45%	0.1		\$6,656	-	-
Administration		Coordinate and administer the grant to be sure outcomes are achieved, bills are paid, reporting is accomplished			40%	0.06		\$4,200	-	-
Phenologist		conduct teacher trainings and followups			20%	0.08		\$4,600	-	-
							<b>Sub Total</b>	<b>\$15,456</b>	<b>\$15,456</b>	-
<b>Contracts and Services</b>										
University of Minnesota	Sub award	Phenology data interpretation; digital Arts, Science, and Humanities mapping; teacher training sessions. The entity is a co-collaborator on this project				1.2		\$102,222	\$102,222	-
This is Folly	Professional or Technical Service Contract	Graphic design for phenology calendars per state contracting rules.		X		0.04		\$4,000	\$4,000	-
Contract Producer	Professional or Technical Service Contract	Produce 24 statewide phenology episodes. Identify and set up interviews, enter data from schools, produce web stories and interfaces, share information on social media, newspapers, etc				1.08		\$62,400	\$62,400	-
							<b>Sub Total</b>	<b>\$168,622</b>	<b>\$168,622</b>	-
<b>Equipment, Tools, and Supplies</b>										
							<b>Sub Total</b>	-	-	-
<b>Capital Expenditures</b>										
							<b>Sub Total</b>	-	-	-

<b>Acquisitions and Stewardship</b>										
							<b>Sub Total</b>	-	-	-
<b>Travel In Minnesota</b>										
	Miles/ Meals/ Lodging	8 training sessions @ 500 miles/session, 1 person @ .545/mile; 30 follow-up sessions, 250 miles/session, 1 person @ .545/mile; per commissioner's plan for lodging, 8 sessions, 1 person @ \$94/night; per commissioner's plan for food, 8 sessions, 1 person @ \$46/day	teacher training and teacher follow-up training					\$8,400	\$8,400	-
							<b>Sub Total</b>	<b>\$8,400</b>	<b>\$8,400</b>	-
<b>Travel Outside Minnesota</b>										
							<b>Sub Total</b>	-	-	-
<b>Printing and Publication</b>										
	Printing	calendars (3681 @ 1.50/calendar)	phenology calendars for distribution to students and others to track nature sightings					\$5,522	\$5,522	-
							<b>Sub Total</b>	<b>\$5,522</b>	<b>\$5,522</b>	-
<b>Other Expenses</b>										
							<b>Sub Total</b>	-	-	-
							<b>Grand Total</b>	<b>\$198,000</b>	<b>\$198,000</b>	-

## Classified Staff or Generally Ineligible Expenses

Category/Name	Subcategory or Type	Description	Justification Ineligible Expense or Classified Staff Request
<b>Contracts and Services</b> - This is Folly	Professional or Technical Service Contract	Graphic design for phenology calendars per state contracting rules.	This is Folly has designed and printed phenology calendars for a related project led by Rebecca Montgomery. As such the majority of the graphic design is complete. The current existing design would be modified for our specific project. Modification of existing work is much easier and lower cost than beginning a phenology calendar design from scratch with a new service provider.

## Non ENRTF Funds

Category	Specific Source	Use	Status	\$ Amount	\$ Amount Spent	\$ Amount Remaining
<b>State</b>						
In-Kind	UMN unrecovered ICR @ 52% (\$103,203); R. Montgomery, in-kind salary, 0.04 FTE for two years (\$11,000)	Project collaborator	Secured	\$114,203	\$114,203	-
			<b>State Sub Total</b>	<b>\$114,203</b>	<b>\$114,203</b>	-
<b>Non-State</b>						
In-Kind	Northern Community Radio (KAXE)	In-kind Salary for work above and beyond grant (\$9,100 in KAXE staff time & \$26,900 in outside contractor expenses)	Secured	\$36,000	\$36,000	-
			<b>Non State Sub Total</b>	<b>\$36,000</b>	<b>\$36,000</b>	-
			<b>Funds Total</b>	<b>\$150,203</b>	<b>\$150,203</b>	-

## Attachments

### Required Attachments

#### *Visual Component*

File: [c58c7363-879.pdf](#)

#### *Alternate Text for Visual Component*

Overarching Goal: to build the next generation of conservationists in Minnesota though through radio programming, podcasts, digital media, citizen science and schoolyard exploration

Photo: John Latimer, staff phenologist at KAXE/KBXE; Caption: Develop new radio programs and podcasts that inspire people to get outside and enjoy nature

Photo: Teacher with students outside; Caption: Expand schoolyard program statewide

Photo: Map with choices to enter bird sightings; Caption: View historical dat...

#### *Financial Capacity*

File: [487c107f-0a9.pdf](#)

#### *Board Resolution or Letter*

Title	File
Northern Community Radio Board Resolution	<a href="#">19229113-3e1.pdf</a>

### Supplemental Attachments

#### *Capital Project Questionnaire, Budget Supplements, Support Letter, Photos, Media, Other*

Title	File
Background Check Certification	<a href="#">0ec95dd7-831.pdf</a>

#### *Media Links*

Title	Link
Season Watch	<a href="https://seasonwatch.umn.edu/">https://seasonwatch.umn.edu/</a>
KAXE Phenology Podcast	<a href="https://www.kaxe.org/podcast/phenology">https://www.kaxe.org/podcast/phenology</a>

## Difference between Proposal and Work Plan

### *Describe changes from Proposal to Work Plan Stage*

We provided justification for a single source contract for \$4000. We revised the 'Contract or Service Type' to the University of Minnesota to a 'sub award.' There was a change to the job title of one of the project collaborators, Stephan Carlson.

## Additional Acknowledgements and Conditions:

The following are acknowledgements and conditions beyond those already included in the above workplan:

**Do you understand and acknowledge the ENRTF repayment requirements if the use of capital equipment changes?**

N/A

**Do you agree travel expenses must follow the "Commissioner's Plan" promulgated by the Commissioner of Management of Budget or, for University of Minnesota projects, the University of Minnesota plan?**

Yes, I understand the Commissioner's Plan applies.

**Does your project have potential for royalties, copyrights, patents, sale of products and assets, or revenue generation?**

No

**Do you understand and acknowledge IP and revenue-return and sharing requirements in 116P.10?**

N/A

**Do you wish to request reinvestment of any revenues into your project instead of returning revenue to the ENRTF?**

N/A

**Does your project include original, hypothesis-driven research?**

No

**Does the organization have a fiscal agent for this project?**

No

## Work Plan Amendments

Amendment ID	Request Type	Changes made on the following pages	Explanation & justification for Amendment Request (word limit 75)	Date Submitted	Approved	Date of LCCMR Action
1	Amendment Request	<ul style="list-style-type: none"> <li>• Budget - Professional / Technical Contracts</li> <li>• Budget - Travel and Conferences</li> <li>• Budget - Printing and Publication</li> </ul>	I need to move the \$46,800 for the producer from personnel to contract. We have the same contract employee doing the work. We did not realize they were separate line items.	January 23, 2023	Yes	January 24, 2023
2	Amendment Request	<ul style="list-style-type: none"> <li>• Budget - Non-ENRTF Funds Contributed</li> </ul>	In the original budget, KAXE contribution was not accounted for. I have updated the budget to reflect the funds that KAXE contributed to this project above and beyond the grant funds.	July 11, 2024	Yes	July 17, 2024

# Status Update Reporting

## Final Status Update August 14, 2024

**Date Submitted:** July 16, 2024

**Date Approved:** July 17, 2024

### Overall Update

John Latimer, Stephan Carlson, and Charlie (Sarah) Mitchell led 15 workshops and 13 follow-up visits. There were a total of 89 participants in KAXE-led workshops, and their event feedback was overwhelmingly positive\*. Other workshops were part of larger conferences (e.g. Minnesota Association for Environmental Education's annual conference). When provided by the conference organizer, reviews for these workshops were also overwhelmingly positive. We estimate that 2,500 students are already benefiting from the workshops, and we have received student reports from 15 additional schools. We expect this number to increase over time as teachers have had time to create and prepare phenology lesson plans. Additionally, KAXE has aired 749 student reports thus far, which are shared on our website and phenology podcast. Heidi Holtan and John Latimer host the on-air portions, and Charlie Mitchell edits the reports and posts them to the website and the phenology podcast.

### Activity 1

During the course of this project, 15-20 new classrooms were added to the program, introducing 225-600 new students to phenology. In addition to airing on the radio, 2-4 podcast episodes were released each week featuring student reports, phenology expert John Latimer's observations, and interviews with local scientists. The Phenology Podcast can be accessed at [kaxe.org/phenology](http://kaxe.org/phenology), or through common podcasting platforms.

The totals for each are as follows:

Phenology Talkback Segments: 119 episodes featuring 749 student reports

Phenology Reports: 136 episodes

Scientist interviews: 48

Statewide phenology happenings: 20 (5 only podcast)

*(This activity marked as complete as of this status update)*

### Activity 2

Since our last update, We had one additional workshop that we hosted that had 6 attendees. We also participated in four other workshops that were hosted by others or were part of larger conferences/events - we weren't given participation lists. Combining those workshops, we'd estimate about 125-150 folks attended our workshops during those events. One event was at Wolf Ridge, two were held at Long Lake Conservation Center and one in Eden Prairie.

*(This activity marked as complete as of this status update)*

### Activity 3

This activity was previously marked complete.

*(This activity marked as complete as of this status update)*

### Dissemination

We launched the Season Watch Newsletter. This weekly e-newsletter connects subscribers to weekly episodes of the Phenology Podcast, relevant articles from our local news team, a weekly guide of what to look for in nature each week, resources for additional learning, and highlights of observations recorded in the KAXE-KBXE Season Watch Facebook group. Thus far, over 100 editions of the Season Watch Newsletter have been released. It has grown from 164 subscribers to 635, boasting an average open rate of 66% and click rate of 16%. (Industry average is 34% and 4%, respectively.)



The University of Minnesota's Season Watch website successfully launched, providing visitors with access to a wide range of local phenological data, information, and related resources. Visitors can explore the site through multiple different avenues, including by season, region, or area of interest. [seasonwatch.umn.edu](http://seasonwatch.umn.edu)

# Status Update Reporting

## Status Update April 1, 2024

**Date Submitted:** July 16, 2024

**Date Approved:** July 17, 2024

### Overall Update

Not to sounds like a broken record, but we continue to see success with this grant. We continue to see 8-15 classrooms sharing weekly reports. It has been fun to see the students remarking on the unseasonably warm winter we had. We have continued to handout out the phenology calendars. In fact, we placed an order for 1000 more booklets. People really love them. The science interviews and weekly phenology segments continue to get positive feedback. We had a phenology celebration in November and we had amazing turn out for that. We had several former phenology students who have gone into the natural sciences come to the celebration.

### Activity 1

Over the past year, we have completed 22 Scientist interviews which were distributed on-air and online via a podcast. We had 8 season-specific phenology episodes, distributed on-air and via online/podcast. We have received 327 student and listener reports (AKA Talkbacks), those are available via radio and online/podcast. Finally since 2022, we had produced 120 statewide phenology reports, available via radio and online/podcast. Additionally, KAXE has aired 693 student reports thus far, which are shared on our website and phenology podcast. Heidi Holtan and John Latimer host the on-air portions, and Charlie Mitchell edits the reports and posts them to the website and the phenology podcast. We have 677 newsletter subscribers we continue to have an open rate of 69.54%.

### Activity 2

John Latimer, Stephan Carlson, and Charlie (Sarah) Mitchell led 13 workshops and 10 follow-up visits. There were a total of 83 participants in KAXE-led workshops, and their event feedback was overwhelmingly positive. Other workshops were part of larger conferences (e.g. Minnesota Association for Environmental Education's annual conference). When provided by the conference organizer, reviews for these workshops were also overwhelmingly positive. We estimate that 2,500 students are already benefiting from the workshops, and we have received student reports from 15 additional schools. We expect this number to increase over time as teachers have had time to create and prepare phenology lesson plans.

### Activity 3

This activity was previously marked complete.  
*(This activity marked as complete as of this status update)*

### Dissemination

We air student phenology reports on-air at KAXE/KBXE and stream online at [kaxe.org](http://kaxe.org), we have a weekly phenology newsletter. The newsletter has 677 subscribers with over a 69% open rate. Scientist interviews can be found at [KAXE.org](http://KAXE.org). The phenology podcast can be found here: <https://www.kaxe.org/podcast/phenology>

# Status Update Reporting

## Status Update October 1, 2023

**Date Submitted:** October 19, 2023

**Date Approved:** December 14, 2023

### Overall Update

We continue to see success with this grant. We are seeing 8-15 classrooms sharing weekly phenology reports we have received wonderful feedback from listeners and from the teachers themselves. We have continued to handout out the phenology calendars. People really love these handy notebooks to jot down their nature observations. Students are also been getting copies of these to use that their homes. The science interviews and weekly phenology segments continue to get positive feedback. It's wonderful to hear stories of how people are exploring nature!

### Activity 1

Progress includes airing and online distribution of 44 interviews with scientists, 86 radio segments of statewide phenology happenings, and 5 episodes of the Season Watch Podcast. Heidi Holtan and John Latimer conduct on-air interviews and phenology segments, and Sarah Mitchell uploads and summarizes episodes to the website. With input from John Latimer and Heidi Holtan, Sarah has voiced, edited, and recorded the Season Watch Podcast. In addition, we have launched a phenology-centered weekly newsletter titled Season Watch (41 issues) with 553 subscribers and we have maintained an over a 60% open rate!

### Activity 2

John Latimer, Stephan Carlson, and Sarah Mitchell led 10 teacher workshops and 9 follow-up visits. There were a total of 83 participants, and their event feedback was overwhelmingly positive. We estimate that 1660 students are already benefiting from the workshops, and we have received student reports from 11 additional schools. We expect this number to increase over time as teachers have had time to create and plan phenology walks. Additionally, KAXE has aired 461 student reports thus far, which are shared on our website. Heidi Holtan and John Latimer host the on-air portions, and Sarah Mitchell edits the reports, summarizes them, and posts them to the website.

### Activity 3

This activity was previously marked complete.

*(This activity marked as complete as of this status update)*

### Dissemination

In addition to airing student phenology reports on-air at KAXE/KBXE and streaming online at [kaxe.org](https://www.kaxe.org), we have a weekly phenology newsletter that can found here: <https://www.kaxe.org/science-nature/2023-10-14/read-the-season-watch-newsletter-for-oct-14-2023>. The newsletter has 553 subscribers with over a 60% open rate. This newsletter is also available at [kaxe.org](https://www.kaxe.org). The phenology podcast can be found here: <https://www.kaxe.org/podcast/phenology>

# Status Update Reporting

## Status Update April 1, 2023

**Date Submitted:** April 11, 2023

**Date Approved:** April 11, 2023

### Overall Update

Lots of progress have been made. We continue to see a good turnout and interest in our teacher workshops. Our Season Watch Newsletter is growing and we have improved our open rate to 65%! The Phenology calendars have been printed and they are being distributed at training and schools. We have had positive feedback on the calendars' look and how easy they are to use. The University of Minnesota has completed the interactive website and map.

Our on-air phenology content and scientist interviews continue to be well-received and frequently reach the top-ten weekly list of most-read articles on our website. We need to submit payment for our staff time. We plan on doing that in April.

### Activity 1

Activity 1's progress includes the airing and online distribution of 31 interviews with scientists, 58 radio segments of statewide phenology happenings, and the creation of the Season Watch Podcast. Heidi Holtan and John Latimer conduct the on-air interviews and phenology segments, and Sarah Mitchell uploads and summarizes episodes to the website. Heidi, John, and Sarah are working together to plan the podcast. In addition, we have launched a phenology-centered weekly newsletter titled Season Watch (41 issues). We currently have 488 subscribers and continue to average a 65% open rate!

### Activity 2

John Latimer, Stephan Carlson, and Sarah Mitchell led 10 teacher workshops. The four most recent workshops took place in Waubon, West St. Paul, Bemidji and Pine River. There were a total of 75 participants, and their event feedback was overwhelmingly positive. We estimate that 1500 students are already benefiting from the workshops, and we have received student reports from 9 additional schools. We expect this number to increase over time as teachers have had time to create and plan phenology walks. Additionally, KAXE has aired 325 student reports thus far, which are shared on our website. Heidi Holtan and John Latimer host the on-air portions, and Sarah Mitchell edits the reports, summarizes them, and posts them to the website.

### Activity 3

Abbie Anderson, with her partners from the University of Minnesota and guidance from the KAXE team, created an online educational environment for the place- and context-based discovery on the topic of phenology. Starting from a variety of themed entry points, users access species profiles featuring text, images, sound, and historical phenology data. Byju Govindan and Rebecca Montgomery summarized historical data to communicate the earliest, latest, and average dates of phenological events, such as lilac blooming or sandhill crane return. Audio annotations have been added to select graphs to promote user understanding and scientific literacy. This interactive website inspires people to observe phenology and enables them to place their personal observations in a broader context, thus promoting community engagement and awareness.

In addition, we created phenology calendars that recommend phenological changes to look for each month and provide space for users to journal about seasonal nature observations. These calendars have been made available to K-12 teachers through our Phenology in the Classroom program, community members involved in KAXE's coverage, and to phenology workshop participants.

*(This activity marked as complete as of this status update)*

**Dissemination**

The ENRTF logo is located on the footer of our website ([kaxe.org](http://kaxe.org)) and links to the LCCMR webpage. Acknowledgement of the grant is read during phenology segments live on-air and in podcasts. Acknowledgement is made at the teacher training. The logo and credit are listed on the printed calendar and are on the website that the UofM is working on ([seasonwatch.umn.edu](http://seasonwatch.umn.edu)). There is also an acknowledgement block that has been added to the phenology podcast page and phenology articles. The logo and credit have been prominently added to the Season Watch Newsletter.

# Status Update Reporting

## Status Update October 1, 2022

**Date Submitted:** January 23, 2023

**Date Approved:** January 24, 2023

### Overall Update

Overall, the project is going along really well. We have seen good turn out and interest in our teacher workshops. We have been getting in a nice mix of student phenology reports. We launched a Newsletter since our last update with has a distribution list of almost 400 and has had an incredible open rate average of 60+%!!! We have been planning the launch of the podcast and plan to have that start in January. The Phenology calendars have been created and are currently at the printers. We will be able to start distributing them prior to the beginning of the new year. Good progress has been made on the interactive map. We have not submitted a request for reimbursement yet. We are waiting for a handful of invoices from the teacher trainings in particular that took place over the summer. We have entered in what we have paid out so far. We have also created a plan to stay on top of the invoicing from contractors so we don't fall so far behind going forward. With the funds that we have paid out so far, we are on track. All in all things are going great!

### Activity 1

Activity 1's progress includes the airing and online distribution of 16 interviews with scientists, 34 radio segments of statewide phenology happenings, and the creation of podcast engagement goals, content ideas, and a training and distribution plan. Heidi Holtan and John Latimer conduct the on-air interviews and phenology segments, and Sarah Mitchell uploads and summarizes episodes to the website. Heidi, John, and Sarah are working together to plan the podcast. In addition, we have launched a phenology-centered weekly newsletter titled Season Watch.

### Activity 2

For Activity 2, John Latimer, Stephan Carlson, and Sarah Mitchell led six teacher workshops. Workshops took place at Pike Lake Elementary School in Duluth, Prairie Creek Community School in Northfield, Tamarack National Wildlife Refuge, Wolf Ridge Environmental Learning Center, Long Lake Conservation Center and one virtual. There were a total of fifty participants, and their event feedback was overwhelmingly positive. We estimate that 1200 students are already benefiting from the workshops, and we have received student reports from 8 additional schools. We expect this number to increase over time as teachers have had time to create and plan phenology walks. Additionally, KAXE has aired 177 student reports thus far, which are shared on our website. Heidi Holtan and John Latimer host the on-air portions, and Sarah Mitchell edits the reports, summarizes them, and posts them to the website.

### Activity 3

The team explored 12 historical datasets, a key resource for this project, to identify nearly 500 species-phenophase combinations for which we have  $\geq 20$  years of data. The team is curating that list using quantitative (e.g., years of data), qualitative (e.g., species attributes) and anecdotal factors. A list of 37 species, subject to expansion, is being explored in depth. For example, we generated  $>100$  scatterplots and are reviewing how to refine and interpret them for end-users.

The team has developed UX options for an educational website to publish phenology data and subject matter. As of this report, the site's UX includes a homepage with 8 search portals, including a map (choose a place), a calendar (choose a month), and a "tree of life" (choose a group such as trees or insects). End-users browse organism "vignettes," pages that describe the organism and its lifecycle, annotate graphs, list resources for (new) observers, and explain how organisms are connected to the environment, climate and people. We have solicited feedback from the public by sharing drafts of sample web pages.

**Dissemination**

The ENRTF logo is located on the footer of our website ([kaxe.org](http://kaxe.org)) and links to the LCCMR webpage. Acknowledgement of the grant is read during interviews live on-air. Acknowledgement has been made at the teacher trainings. The logo and credit is listed on the printed calendar and will be on the website that the UofM is working on. There is also an acknowledgement block that has been added to the phenology talkbacks and scientists conversations that were part of this grant. The logo and credit has been added to the Season Watch Newsletter.

# Additional Status Update Reporting

## Additional Status Update May 12, 2022

**Date Submitted:** November 1, 2022

**Date Approved:** November 2, 2022

### **Overall Update**

1

### **Activity 1**

1

### **Activity 2**

1

### **Activity 3**

1

### **Dissemination**

1



# Status Update Reporting

## Status Update April 1, 2022

**Date Submitted:** April 29, 2022

**Date Approved:** May 2, 2022

### Overall Update

Work on this grant is well underway. Some of our highlights over the past couple months: We have hired a part-time phenology coordinator. We have hosted 3 of the teacher training sessions. The website design is underway as well as the interactive map. The printed phenology guide is also in the works. We expect to start rolling out the website in the next couple of months. All in all, things are going smoothly.

### Activity 1

Activity 1's progress includes the airing and online distribution of five interviews with scientists, ten radio segments of statewide phenology happenings, and the creation of podcast engagement goals, content ideas, and a distribution plan. Heidi Holtan and John Latimer conduct the on-air interviews and phenology segments, and Sarah Mitchell uploads and summarizes episodes to the website. Heidi, John, and Sarah are working together to plan the podcast.

### Activity 2

For Activity 2, John Latimer, Stephan Carlson, and Sarah Mitchell led three teacher workshops. There were a total of fifty participants, and their event feedback was overwhelmingly positive. We estimate that 600-800 students are already benefiting from the workshops, and we have received student reports from 4 additional schools. We expect this number to increase over the fall semester after teachers have had time to create and plan phenology walks. Additionally, KAXE has aired 63 student reports thus far, which are shared on our website. Heidi Holtan and John Latimer host the on-air portions, and Sarah Mitchell edits the reports, summarizes them, and posts them to the website.

### Activity 3

For Activity 3, The passport/notebook are in the development phase looking at what organisms and phenophases to summarize and describe. Layout and look of the passports is close to being decided. Data Visualization (scatter plots) are underway on the interactive map the UMN team is working on this portion of the project. There were several issues that have been resolved. The website template has been completed, information is continued to be compiled by Sarah Mitchell and the KAXE team. Launch date

### Dissemination

The content that has been created to date in phase 1 and 2 has aired on KAXE/KBXE's airwaves. It is also has been uploaded to kaxe.org and available to MNPN and Ampers stations as well. Once the podcast has been developed the reach of the audio content will be increased.