Environment and Natural Resources Trust Fund
2019 Request for Proposals (RFP)

Project Title: **ENRTF ID: 127-C**

1000 Citizen Scientists Collect Phenological Data Statewide

Category: C. Environmental Education

Sub-Category:

Total Project Budget: $ 224,000

Proposed Project Time Period for the Funding Requested: June 30, 2021 (2 yrs)

Summary:

Students lack real data to make STEM learning relevant. Partnering with nature centers and schools, this project expands a network of 1000 student citizen science observer's using local phenology data.

Name: Stephan Carlson

Sponsoring Organization: U of MN Extension

Title: Professor/Extension Educator

Department: Fish Wildlife Conservation Education

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St. Paul MN 55108

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Web Address

Location

Region: Statewide

County Name: Anoka, Becker, Dakota, Hennepin, Murray, Polk, Ramsey, St. Louis, Stearns, Wright

City / Township:

Alternate Text for Visual:

Visual includes a state map to show the location of the 10 partnering nature centers and project goals, expand 10 fold the phenology observation network in MN by working with nature centers

_____ Funding Priorities	_____ Multiple Benefits	_____ Outcomes	_____ Knowledge Base
_____ Extent of Impact	_____ Innovation	_____ Scientific/Tech Basis	_____ Urgency
_____ Capacity Readiness	_____ Leverage	_____ TOTAL	_____%
____ If under $200,000, waive presentation?			

PROJECT TITLE: 1000 citizen scientists collect phenological data statewide

I. PROJECT STATEMENT

The goal of this Environmental Education, Phase II phenology project, is outreach and education. It will build on Rebecca Montgomery's 2014 LCCMR project, "Assessing Species Vulnerability to Climate Change using Phenology," that created the Minnesota Phenology Network database and established protocols for collecting local phenological data. Phase II will focus on education and outreach by **partnering with ten nature centers to build phenology trails and provide citizen science and phenology training and resources to a minimum of fifty teachers.** The teachers will then be poised to engage a minimum of 1000 youth, their parents, families and communities in the collection of phenological data across the State of Minnesota.

This project will expand, tenfold, Minnesota's existing observer network. The data collected will provide critical information about timing of biological events to resource managers, scientists, businesses and individuals to improve understanding of local species' vulnerabilities (e.g., pollinator declines, pest outbreaks). Teachers will improve STEM skills and incorporate 'big data' in lessons. Students will use inquiry and data visualization tools to answer phenology questions, strengthen STEM skills, gain hands-on field experience using scientific methods, learn about healthy biodiverse communities and prepare to become tomorrow's environmental stewards.

Phenology studies the timing of seasonal biological events such as budburst, flowering, bird migration and leaf coloring. Phenology is critical as it determines growing season length, allergy season timing and intensity, pest outbreaks and pollination success.

In addition, the ten nature center partners on this project will host spring and fall gatherings for communities to share program successes and observe seasonal plants, insects, reptiles, birds, invasive species and interactions between species. Data will be shared monthly via a MnPN podcast and weekly with KAXE's Phenology Talkback show.

II. PROJECT ACTIVITIES AND OUTCOMES

Activity 1: Customize citizen science phenology training at 10 nature centers

We will work with 10 nature centers across the State (listed as Partners) to customize citizen science phenology training, using train the trainer, Driven 2 Discover, and USA-NPN curricula. Each nature center will in turn train a minimum of five teachers each who have the potential to reach 20 students in a given year (20 x 5 X 10 = 1000). The result is a minimum of 1000 youth and their families engaged as citizen scientists in recording seasonal observations in the online USA -National Phenology Network's (USA-NPN), *Nature's Notebook* citizen science database and data entry tool. We will also develop an online tutorial for teachers and students.

ENRTF BUDGET: $54,000

Outcome	Completion Date
2. 10 nature centers equipped with materials and website tools to offer phenology trainings to teachers (lesson plans, hand-outs, data sheets & species protocols)	September 2020
3. Ten 2 minute teaching tutorials on data entry, blogging and using social media to promote phenology events for each nature center, published on the MnPN website	June 2021

Activity 2: Train the trainer workshops for 50 teachers and after school professionals

We will recruit teachers and offer five 6-hour workshops each year at five separate nature centers. Workshops will prepare participants to collect citizen science data and develop phenology projects in their communities such as leaf out, flowering calendars or bird migration events. Participants will not be compensated to attend trainings but will be provided resources to deliver the curriculum at their schools and after school programs.

ENRTF BUDGET: $120,000

Outcome	Completion Date
1. 50 teachers, after school staff and volunteer master naturalists receive 6-hour training	June 2021
2. 50 teachers teach up to 20 students each	June 2021
3. 1000 students collect data and contribute to the Minnesota Phenology Network database and incorporated into school STEM curriculum	June 2021

Activity 3: Develop phenology trails, phenology events and adaptive strategies

We will design and implement half mile (8 to 10 stops), phenology trails at 10 nature centers with community involvement and resources from the project. Trail development includes signage, interpretative and data collection materials. In addition, nature centers will host events that bring families and students together to celebrate seasonal cycles and share results at key seasonal times (e.g., leaf peeping, spring frog calling, budburst festivals). Sites will blog about the adaptation strategies that reflect climate variability and share phenological information for podcasts and with KAXE's John Latimer's Phenology Talkback show.

ENRTF BUDGET: $50,000

Outcome	Completion Date
1. 20 Seasonal phenology events at local nature centers and community	June 2021
2. 10 phenology trails for nature center visitors to join the citizen science effort	June 2021
3. 40 podcasts on phenology in Minnesota	June 2021

III. PROJECT PARTNERS:

A. Partners receiving ENRTF funding N/A

B. Partners NOT receiving ENRTF funding

Name	Affiliation	Role
Josh Leonard	Belwin Outdoor Science	Partner
John Geissler	St John's Outdoor University	Partner
Suzanne Trapp	MN Valley Wildlife Refuge	Partner
Meagan Keefe	Dakota County Parks	Partner
Ryan Barth	Three Rivers Parks	Partner
Katie Chapman	Shetek Environmental Program	Partner
Kelley Blackledge	Tamarac USWF, Detroit Lakes	Partner
Benjamin Walker	Rydell USFW, Bagley	Partner
Pete Cleary	Dodge Nature Center	Partner
Brad Harrington	Ney Nature Center, Wright County Parks	Partner
John Latimer	KAXE Radio Station: John Latimer's Phenology Talkback Show	Partner
Ryan Huffmeier	Boulder Lake ELC, Duluth	Partner

IV. LONG-TERM- IMPLEMENTATION AND FUNDING: Schools will continue the partnership with the nature centers, building long-term observations that can contribute to understanding of local species vulnerabilities (e.g., pollinator declines, pest outbreaks). Nature center trainers will be equipped to train more teachers as part of site level programming beyond the grant period. Data and materials will be shared on the MnPN website. Data will also be curated by the USA-NPN as part of a national database.

V. TIME LINE REQUIREMENTS: This project will require 24 months of funding. The school year works well for collecting phenology data as the critical times are at the beginning and ends of the growing season, fall and spring. Teachers will be trained during the summer, prior to the school year.

University of Minnesota
Funder: Legislative-Citizen Commission on MN Resources (LCCMR) **INTERNAL BUDGET**
Title: Students using Local Phenology contribute to Citizen Science
PI: Stephan Carlson
Dates of Project: 7/1/2019 - 6/30/2021

		Year 1	Year 2			7/1/19 - 6/30/20	7/1/20 - 6/30/21		
Key Personnel	**No. of Hours per Week**	**FTE**	**FTE**	**Salary as of 7/1/19**	**Salary as of 7/1/20**	**Year 1**	**Year 2**	**2-Year Total**	**Funder**
Stephen Carlson, PI	8	0.20	0.20	$85,012	$87,138	17,002	17,428	**34,430**	34,430
Rebecca Montgomery, co-PI	2	0.05	0.05	$128,420	$131,631	6,421	6,582	**13,003**	13,003
Program Coordinator - TBD	31	0.79	0.79	$45,760	$46,904	35,979	36,878	**72,857**	72,857
Total Key Personnel						**59,402**	**60,888**	**120,290**	**120,290**

Fringe - Key Personnel	**Fringe**	**Year 1**	**Year 2**	**2-Year Total**	**Funder**
Stephen Carlson, PI	33.50%	5,696	5,838	**11,534**	11,534
Rebecca Montgomery, co-PI	33.50%	2,151	2,205	**4,356**	4,356
Program Coordinator - TBD	33.50%	12,053	12,354	**24,407**	24,407
Total Fringe - Key Personnel		**19,900**	**20,397**	**40,297**	**40,297**
Total Salary		59,402	60,888	120,290	120,290
Total Fringe		19,900	20,397	40,297	40,297
Total Key Personnel and Other Staff		**79,302**	**81,285**	**160,587**	**160,587**

Tools, Equip & Supplies	**Year 1**	**Year 2**	**2-Year Total**	**Funder**
IT rental @ $125 x 10 sites: Booster, etc	1,250	1,250	2,500	**2,500**
Training materials @ $75/teacher x 25 teachers/year x 2 years	1,875	1,875	3,750	3,750
Signage for Phenology trail @ each Nature Center (10)	19,000	19,000	38,000	38,000
Community Festival Nature Center events @ 10 Nature Centers: tents, podcasts	2,000	2,000	4,000	4,000
	0	0	**0**	0
Total Supplies	**24,125**	**24,125**	**48,250**	**48,250**

Travel ($0.545/mile)	**Year 1**	**Year 2**	**2-Year Total**	**Funder**
5 trainings/year @ 400 miles/training x 0.545	1,090	1,090	**2,180**	**2,180**
Lodging @ $93/day x 5 staff x 5 trainings	2,325	2,325	**4,650**	**4,650**
Meals @ 51/day x 5 x 5 trainings	1,275	1,275	**2,550**	**2,550**
Participant travel to attend trainings: $100/participant x 25 participants/yr x 2 years	2,500	2,500	**5,000**	**5,000**
	0	**0**	**0**	0
Total Travel	**7,190**	**7,190**	**14,380**	**14,380**

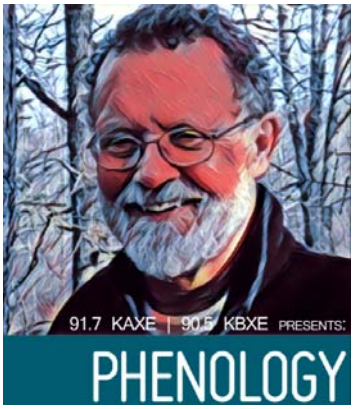
Other Direct Costs	**Year 1**	**Year 2**	**2-Year Total**	**Funder**
Conference Presentation @	0	500	500	**500**
	0	0	**0**	0
Total Other Direct Costs	**0**	**500**	**500**	**500**

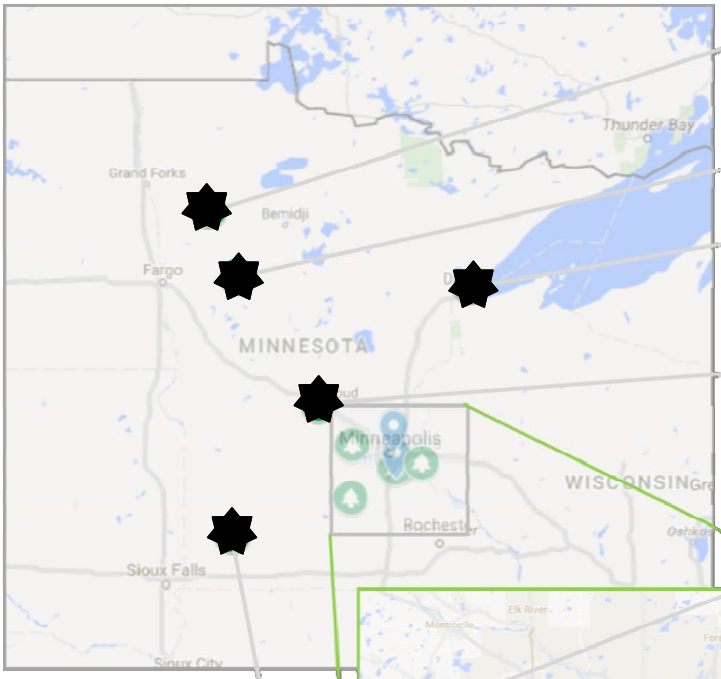
Total Direct Expenses	110,617	113,100	223,717	223,717
Total Indirect Costs not allowed per RFP, page 7	0	0	0	0
Total Project Costs	**110,617**	**113,100**	**223,717**	**223,717**

Goals:

(1) Expand, 10-fold the phenology observer network in MN
(2) Provide tools to 50 teachers that inspire K-12 students in STEM education
(3) Develop phenology trails and events that engage the public

To accomplish our goals we will engage diverse partners across the state





MnPN
Minnesota Phenology Network

Rydell & Glacial Ridge National Wildlife Refuges

Tamarac National Wildlife Refuge

Boulder Lake Environmental Learning Center

Saint John's Outdoor University

Wright County Minnesota

ThreeRivers Park District

Belwin Outdoor Science

Dodge Nature Center

shetek environmental learning center

University of Minnesota Extension

Minnesota Valley National Wildlife Refuge

Project Manager Qualifications and Organization Description

Dr. Stephan Carlson is the U of MN Extension's Fish, Wildlife and Conservation Education professor. He works to build the capacity of community-led innovation in environmental education by connecting community innovators to education, research, and outreach resources available at the University of Minnesota. Stephan is on the leadership team and manages outreach projects with the MN Master Naturalist Volunteer program. He also teaches courses at the University undergraduate and graduate levels in environmental education and environmental interpretation. He trains the next generation of environmental educators and naturalists. His outreached has focused on phenology workshops with Master Naturalists and Natural Resource Managers. This current LCCMR proposal is in response to a number of requests from teachers to bring phenological citizen science data collection and analysis into the classroom. Other stakeholders have been the nature centers that wanted to develop phenology trails and systems to collect ongoing phenological data in greater Minnesota

University of Minnesota Extension

The Fish, Wildlife and Conservation Education is a program of the University of Minnesota Extension that connects Greater Minnesota communities to the University in order to identify new opportunities and solve problems in sustainability. Fish, Wildlife and Conservation Education leverages University knowledge and seed funding with local talent and resources in four areas: agriculture and food systems, tourism and resilient communities, natural resources, and clean energy. Fish, Wildlife and Conservation Education is composed of a statewide office and four staff working in Greater Minnesota.