



# Environment and Natural Resources Trust Fund

## 2021 Request for Proposal

### General Information

**Proposal ID:** 2021-086

**Proposal Title:** Boreal Observatory at Chik-Wauk on the Gunflint

### Project Manager Information

**Name:** Joel Halvorson

**Organization:** Gunflint Trail Historical Society

**Office Telephone:** (218) 388-9915

**Email:** halvor@boreal.org

### Project Basic Information

**Project Summary:** The Boreal Observatory is a public education initiative of Chik-Wauk Museum and Nature Center. It is maintained through an Affiliation Agreement with the University of Minnesota Duluth (UMD)

**Funds Requested:** \$545,000

**Proposed Project Completion:** 2024-06-30

**LCCMR Funding Category:** Environmental Education (C)

### Project Location

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

Region(s): NE

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

Region(s): NE

**When will the work impact occur?**

During the Project and In the Future

## Narrative

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

Near the end of the Gunflint Trail and surrounded by the Boundary Waters Canoe Area Wilderness sits Chik-Wauk Museum and Nature Center. Recognizing a growing need to help the public interpret this unique natural environment, the University of Minnesota Duluth initiated the Boreal Observatory. This partnership leverages the research and expertise of the University to create unique place-based learning experiences that enhance the public's understanding of all things boreal: sky, earth, water, flora, fauna, and culture.

The Boundary Waters is the most visited Wilderness in the country. It also sits under the only level 1 dark sky in the eastern half of the US. (meaning no light pollution). This dark sky straddles; an international border, three protected wilderness zones, public lands managed by state, federal, and provincial governments, and is primarily within the transboundary watershed of the Rainy River. This common boreal environment and shared water system guides the development of Boreal Observatory programming. Chik-Wauk's location provides a unique forest-based venue within this region for the creation of outreach programming that serves the needs of local and regional communities. This project will support binational efforts to establish an International Dark Sky Preserve over the region.

### **What is your proposed solution to the problem or opportunity discussed above? i.e. What are you seeking funding to do? You will be asked to expand on this in Activities and Milestones.**

In 2018, UMD launched a Dark Sky Caravan as an initial public engagement effort. UMD students and staff took their portable planetarium and telescopes on the road. Starting in Duluth and ending at Chik-Wauk. This was followed in December by a Dark Sky Festival in Grand Marais. Following recommendations from the LCCMR committee, this outreach was expanded to support similar needs in partnership with Voyageurs National Park. These seemingly remote events have drawn capacity crowds in both winter and summer.

The Boreal Observatory extends the learning to include all things boreal. Within UMD this project pairs the research and content expertise of the Swenson College of Science and Engineering, with that of the College of Education and Human Service Professionals, specifically the Center for Environmental Education. Collectively, these colleges are preparing Minnesota's future scientists, engineers, environmental educators, and leaders.

Funding will be used to create site-based learning experiences that include formal presentations, hands-on activities, web and social media resources, site-specific tours, and mobile programs. In turn, this project provides UMD students a working model for how they might, in their future careers, engage with communities toward the shared goal of conservation and stewardship of our natural resources.

### **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?**

People are naturally attracted to dark skies, which are an important component of conservation and the ecological integrity of protected areas. As the National Park Service slogan states: Half the Park is After Dark. Many adults have memories of star-filled night skies. Today 80% of the developed world is unable to see the Milky Way. Much of the work to encourage stewardship of natural resources focuses on "grounded" nature, not the sky. Encounters with the sky, in conjunction with the boreal water, flora, fauna, and culture, encourage sustainable tourism and help protect and conserve the entire boreal ecosystem.

## Activities and Milestones

### Activity 1: Identify Boreal Forest Program Themes for Development

**Activity Budget:** \$175,000

**Activity Description:**

To help define and refine the program elements of this project, UMD students and staff will work under contract to Chik-Wauk to support summer 2020 programming. This includes staffing the nature center and scheduling public programs. In addition to helping administer existing programs, an ad hoc committee of university and community partners, will identify candidate topics for future development through this project. This will include identifying key faculty experts to guide program development, defining media and educational elements necessary for development, and identifying critical outside organizations or agencies important to the topic. Project staff will work with UMD faculty and community partners, to identify boreal forest topics for program development. University faculty experts will be identified and enlisted as content advisors. Program outlines will be developed for review. Programs will be designed to create a global to local perspective and feature first person insights of UMD and community experts, and geographic locales that the public can visit to reinforce place-based learning. E.g. programming about Minnesota’s moose, would include an understanding of the global distribution, the people behind the research of Minnesota’s declining moose populations, cultural relevance, how and where to see moose while visiting, moose artifacts, and activities, etc.

**Activity Milestones:**

Description	Completion Date
Based on summer 2020 UMD pilot, topics selected and tested during the summer of 2021	2021-09-30
Informed by formative evaluation, program topics refined, and new or refined elements selected for inclusion	2022-03-31
New and improved program experiences tested during the summer of 2022	2022-09-30
Informed by formative evaluation, program topics refined, and new or refined elements selected for inclusion	2023-03-31
New and improved program experiences tested during the summer of 2023	2023-09-30
Informed by formative evaluation, program topics refined, and final versions completed	2024-03-31
Transitional post project funding plan implemented. Summer programming implemented and supported through other TBD sources.	2024-06-30

### Activity 2: Production of Place-based Learning Experiences

**Activity Budget:** \$215,000

**Activity Description:**

Develop content elements for public programs. Write narrative scripts, collect and integrate data and digital content for use in an immersive display. Collect artifacts, develop manipulatives, and craft hands-on activities. Create the technical structure that will allow presenters to interactively deliver programs. Create multi-modal versions of presenter lead programs. This includes print, radio, social media, and web-based versions to support self-guided Boreal Tours and/or for use by others.

**Activity Milestones:**

Description	Completion Date
Based on 2020 UMD pilot, refine programs to include new content and mixed media delivery.	2021-09-30
Draft outline, script, and production plan reviewed and approved by community partners (each November)	2021-11-30
Completed learning experience pilot tested at UMD with students and staff (each March)	2022-03-31
Informed by formative evaluation, program elements refined and print and digital versions completed (each May)	2022-05-31

### Activity 3: Public Engagement and Evaluation

**Activity Budget:** \$155,000

**Activity Description:**

Develop an outreach schedule for the year that includes full-time summer programming at Chik-Wauk and off-site opportunities at resorts, camps, parks, and community events. This includes continued support of the International Dark Sky Caravan, Dark Sky Festivals, and Grand Portage Voyage of Discovery. While the bulk of the programming will take place in the summer, there will be selected fall, winter, and spring events that will be supported in consultation with community partners.

Work with UMD evaluator to establish a formative assessment schedule to inform the development and refinement of programming content. Evaluation will also include an assessment of the efficacy of developing public engagement activities as an integrated part of students’ academic coursework or independent study.

**Activity Milestones:**

Description	Completion Date
Work with community partners to identify selected community events to provide programming (each July)	2021-07-31
Design program schedules for the summer. Identify appropriate times for evaluation of programming (each April)	2022-04-30
Complete and submit final project evaluation results to the LCCMR.	2024-06-30

## Project Partners and Collaborators

Name	Organization	Role	Receiving Funds
Dr. Julie Ernst	University of Minnesota Duluth	Julie is a professor in the Center for Environmental Education. She teaches graduate coursework in educational research, environmental education program evaluation, and quantitative statistical analysis. She has co-authored a text for environmental education program evaluation and has conducted numerous evaluations. Julie will conduct the formal evaluation of the project.	Yes
Dr. Ken Gilbertson	University of Minnesota Duluth	Ken is a professor and Department Head for the Center for Environmental Education. His interests include outdoor and environmental education in non-formal settings, wilderness education and interpretation, resource management and planning, and sustainability of nature-based tourism in protected areas. Ken will be the faculty advisor for the UMD students participants	No
Dr. Marc Seigar	University of Minnesota Duluth	Marc is a professor and Chair of the Department of Physics & Astronomy and served as Associate Dean of the Swenson College of Science and Engineering. His research includes Extragalactic Astrophysics, Galaxy Dynamics and Structure, Dark Matter, and Black Holes. Marc will act as a science content advisor to the project.	Yes
Ryan Blaisdell	Superior National Forest	Ryan is the Recreation and Special Uses Specialist in the Gunflint Ranger District. Chik-Wauk is located within the Superior National Forest and operates through a special use permit. Ryan will be the Forest Service point of contact for project related program planning within the Superior.	No
Joe Friedrichs	WTIP Community Radio	Joe is the news director for WTIP. He holds a degree in journalism from the University of Montana. He also works as a freelance journalist, reporting on a variety of North Shore topics. Joe will assist in producing Boreal Observatory radio segments and some content production	No
Marne Kaeske	1854 Treaty Authority	Marne is the Cultural Preservation Specialist at the 1854 Treaty Authority. She will help to: define cultural elements to feature, identify community experts, and integrate culturally relevant resources.	No
Travis Novitsky	Grand Portage State Park	Travis is the Park Manager and a nature and wildlife photographer, specializing in night sky photography. He is a lifelong resident and citizen of the Grand Portage Anishinabe Nation. Travis will be a community resource expert. He will coordinate Boreal Observatory programming at Grand Portage SP and other area sites.	No
Bob DeGross	Voyageurs National Park	Bob is the Park Superintendent and is a 25-year veteran of the National Park Service. Prior to Voyageurs, Bob was the Chief of Interpretation and Public Affairs at Big Cypress National Preserve in Florida. Bob or a designee will coordinate Boreal Observatory program activities within Voyageurs National Park.	No
Christina Hausman Rhode	Voyageurs National Park Association	Christina is the executive director of the Voyageurs National Park Association. She holds a bachelor's degree in biology and political science, and a minor in journalism from Augustana University in Sioux Falls, SD. Christina will coordinate Boreal Observatory program activities in and around Voyageurs National Park.	No

## 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 be funded?**

The programs developed will become integrated components of Chik-Wauk Museum and Nature Center, and will remain

available on-line and throughout the region. Programs will increase the awareness of the boreal forest and the issues that impact stewardship regionally. These programs will leave a sustainable structure in place that benefits UMD students and the communities served. Place matters, people matter, and by harnessing our shared intellectual capital, we can sustain these special places and experiences for generations to come. We estimate reaching over 40,000 visitors over three years of funding.

## Project Manager and Organization Qualifications

**Project Manager Name:** Joel Halvorson

**Job Title:** Science Communications Consultant

### **Provide description of the project manager's qualifications to manage the proposed project.**

Joel Halvorson - Science Communications Consultant has spent the past 36 years working in formal and informal education settings. He has worked for the Science Museum of Minnesota, the new Bell Museum, and numerous national and international collaborators. Over the past three years, Halvorson worked for the Swenson College of Science and Engineering at the University of Minnesota Duluth to develop enhanced public engagement strategies and programs. This includes a long-term vision for the planetarium, the Dark Sky Caravan, the Dark Sky Festival in Grand Marais, and the pilot phase of the Boreal Observatory at Chik-Wauk Museum and Nature Center. Now a UMD Person of Interest (POI), Halvorson is a designated External Service Provider, supporting the University's public engagement efforts. He is working with UMD and community partners to develop enhanced place-based learning experiences that support the establishment of an International Dark Sky Sanctuary over the Minnesota-Ontario border region. Halvorson is a seasonal resident of the Gunflint Trail and a member of the Gunflint Trail Historical Society Programming Committee.

**Organization:** Gunflint Trail Historical Society

### **Organization Description:**

Near the end of the Gunflint Trail and surrounded by the Boundary Waters Canoe Area Wilderness sits Chik-Wauk Museum and Nature Center. Occupying the site of a 1930s vintage resort that is listed on the national registry of historic places. Recognizing a growing need for a place to help the public interpret this unique natural environment, members of the local community working with the USDA Forest Service, conceived and developed the museum which opened in 2010. In 2018 the University of Minnesota Duluth initiated a partnership with Chik-Wauk to establish the Boreal Observatory. Through an Agreement of Institutional and Program Affiliation, this partnership leverages the research and expertise of the University to create unique place-based learning experiences that enhance the public's understanding of all things boreal: sky, earth, water, flora, fauna, and culture. The site is managed by the Gunflint Trail Historical Society under a special use permit from the USDA Forest Service.

## Budget Summary

Category / Name	Subcategory or Type	Description	Purpose	Gen. Ineligible	% Benefits	# FTE	Classified Staff?	\$ Amount
<b>Personnel</b>								
Joel Halvorson, Principal Investigator		Project Manager			26%	1.8		\$160,455
Chik-Wauk Museum Support Staff		Program support, facilities prep, and clerical support			26%	0.3		\$42,000
							<b>Sub Total</b>	<b>\$202,455</b>
<b>Contracts and Services</b>								
University of Minnesota Duluth	Sub award	Julie Ernst - CEE - 10% FTE - Evaluation - \$52,802 Marc Seigar - SCSE - 3.75% FTE - Content Advisor - \$26,673 GSR - 50% FTE - \$132,332 2 - UGR - 50% FTE - \$41,740 Travel - \$3,067 Supplies - \$1,545				3.42		\$258,159
WTIP Community Radio	Sub award	Production support and use of studio to support program development. WTIP studio rate is \$75/hr				0.87		\$13,500
							<b>Sub Total</b>	<b>\$271,659</b>
<b>Equipment, Tools, and Supplies</b>								
	Equipment	DSLR Camera with fisheye lens \$4,500	This camera will be used to acquire visual content for programs					\$4,500
	Equipment	Aerial drone octocopter with camera mount	Drone will be used to acquire visual content for programs					\$3,500
	Equipment	Production workstation	Computer workstation used to produce, manage, and create program content					\$3,500
	Equipment	Laptop Computer	Computer used to present program content					\$1,800

	Tools and Supplies	Production software	Adobe suite of production software for creation of program content					\$2,008
	Tools and Supplies	Duplication/Photocopying	Creating printed support materials					\$1,545
							<b>Sub Total</b>	<b>\$16,853</b>
<b>Capital Expenditures</b>								
		Portable Panoramic immersive display screen	Portable immersive display system to display program content.					\$15,000
		4k projector with fisheye lens	Require to project content on to panoramic immersive display					\$12,000
		Fulldome video camera	Capture content that can be displayed in an immersive display or planetarium					\$6,000
							<b>Sub Total</b>	<b>\$33,000</b>
<b>Acquisitions and Stewardship</b>								
							<b>Sub Total</b>	-
<b>Travel In Minnesota</b>								
	Miles/ Meals/ Lodging	Travel related to presentations and program development: \$6,000 24 Days ~ \$250/day)	Portable programming around the Arrowhead and travel related to program production					\$6,000
							<b>Sub Total</b>	<b>\$6,000</b>
<b>Travel Outside Minnesota</b>								
							<b>Sub Total</b>	-
<b>Printing and Publication</b>								
							<b>Sub Total</b>	-
<b>Other Expenses</b>								



		Stipends	To reimburse guest presenters for their time and travel					\$15,033
							<b>Sub Total</b>	<b>\$15,033</b>
							<b>Grand Total</b>	<b>\$545,000</b>

## Classified Staff or Generally Ineligible Expenses

Category/Name	Subcategory or Type	Description	Justification Ineligible Expense or Classified Staff Request
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## Non ENRTF Funds

Category	Specific Source	Use	Status	Amount
<b>State</b>				
In-Kind	University of Minnesota Duluth	Because the project is overhead free, space, electricity, and other facilities/adminstrative costs are provided in-kind. This includes use of UMD campus during the academic year and use of the UMD portable GeoDome planetarium, telescopes, computers and related equipment.	Secured	\$143,185
			<b>State Sub Total</b>	<b>\$143,185</b>
<b>Non-State</b>				
In-Kind	Gunflint Trail Historical Society	Use of the Chik-Wauk Museum, office space, electricity, water, and other facilities/administrative costs	Secured	\$36,000
			<b>Non State Sub Total</b>	<b>\$36,000</b>
			<b>Funds Total</b>	<b>\$179,185</b>

## Attachments

### Required Attachments

#### *Visual Component*

File: [012fd7cf-8a0.pdf](#)

#### *Alternate Text for Visual Component*

The Boreal Observatory at Chik-Wauk on the Gunflint is a resubmission of the 2020 proposal #128-C selected to present to the LCCMR committee.

This diagram shows examples of current Boreal Observatory programming supported through an Affiliation Agreement with the University of Minnesota Duluth

#### *Financial Capacity*

File: [ab3bf200-cac.pdf](#)

#### *Board Resolution or Letter*

Title	File
GTHS Board Resolution supporting application to LCCMR	<a href="#">e62addab-29c.pdf</a>

### Optional Attachments

#### *Support Letter or Other*

Title	File
Affiliation Agreement between the GTHS and UMD	<a href="#">e891d2ed-be6.pdf</a>
UMD Subaward approval	<a href="#">47b1611d-a42.pdf</a>
UMD Subaward budget approved by UMN SPA	<a href="#">eaf67664-e07.pdf</a>
Media links to Boreal Observatory program examples from the 2019 Dark Sky Festival in Grand Marais	<a href="#">cca4f75-c7d.pdf</a>

## Administrative Use

**Does your project include restoration or acquisition of land rights?**

No

**Does your project have patent, royalties, or revenue potential?**

No

**Does your project include research?**

No

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

No

**The Boreal Observatory at Chik-Wauk on the Gunflint is a resubmission of the 2020 proposal #128-C selected to present to the LCCMR committee.**

**Chik-Wauk Museum and Nature Center is a partnership of the Gunflint Trail Historical Society and Superior National Forest, Gunflint Ranger District**



