

Proposal Form for St. Lawrence River Research and Education Fund

December 30, 2015

1. Applicant's Information

- a) Primary Contact: Dr. Erika Barthelmess
- b) Organization: St. Lawrence University – Nature Up North
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2. Type of Project

- Environmental Research
- Environmental Education

3. Project Name and Description

MOW the Grasse – Monitoring Our Water on the Grasse River A Pilot Citizen Science Project

Nature Up North is a community-based environmental education and outreach initiative based at St. Lawrence University. Since launching Nature Up North in 2012, we have focused on integrating hands-on outdoor learning, citizen science projects, and an online “virtual nature center” to foster understanding and appreciation of the Northern New York environment. A major project goal is to engage local residents in monitoring the local environment by training them to collect and share images, accounts, and data from local ecosystems via our project website, natureupnorth.org. For example, Nature Up North has a proven track record of engaging community members and K-12 students through our Monitor My Maple project, through which more than 400 students in five St. Lawrence County school districts have contributed data on the phenology of maple trees since 2013. With this proposal, we now seek SLRREF funding to develop and pilot test a water quality monitoring program called *MOW the Grasse – Monitoring Our Water on the Grasse River* – in collaboration with our project partners, Grasse River Heritage, the St. Lawrence Land Trust, and the Massena Nature Center.

Worldwide, citizen science projects that engage community members in water quality monitoring have proliferated as a way to identify problems and support resource management decisions. The National Volunteer Water Quality Monitoring Council reports that in 2014, 1,720 groups across the USA were conducting volunteer monitoring and associated activities.¹ In fact, volunteer water monitoring is the oldest volunteer program supported by Environmental Protection Agency.² In St. Lawrence County, rivers connect local communities and provide diverse benefits including recreation, wildlife habitat, and hydropower. Despite the cultural, historical, and ecological significance of local rivers, little baseline data exists on critical measures of water quality within local waterways, and community members remain relatively unaware of factors that influence water quality. According to the New York State Department of Environmental Conservation, in the Saint Lawrence Watershed, only about 40% of river/stream miles have been assessed.³ **No regular monitoring programs exist in St.**

Lawrence County to measure temperature, turbidity, conductivity, nutrient inputs, bacteria, and macroinvertebrate diversity in local rivers. With the current lack of data, we have little understanding of how local land use practices affect our freshwater resources. A community-based water monitoring program will not only help to fill the data gap, but will also build community capacity for studying water quality and build awareness of the ecosystem services provided by healthy watersheds.

The goals of the *MOW the Grasse* Project are:

1. Develop and test a system for engaging citizens in water quality monitoring in the North Country.
2. Provide, and make available to the public, high quality baseline data on water quality that can be used to inform local management decisions regarding aquatic resources.
3. Strengthen networks of non-profit organizations involved in environmental education, community development, and conservation.

In the pilot phase of this project we will focus on the Grasse River. Working with our partners, we will establish four monitoring sites, including: the Hart's Falls property in Pyrites, managed by the St. Lawrence Land Trust; the St. Lawrence University campus in Canton; Falls Island Canton, managed by Grasse River Heritage; and an as-yet-undetermined site in Massena, to be monitored by the Massena Nature Center. By developing multiple monitoring sites along a single waterway, we create the potential to identify both point and non-point source pollution.

Community partnerships will be vital to the success of this initiative. Each partner organization will be responsible for monitoring a different site along the Grasse River with its respective constituents, with Nature Up North serving as the principal facilitator, responsible for protocol development, staff and volunteer training, and data management. We will employ a combination of strategies to ensure participation and data quality including volunteer training sessions, public water monitoring events led by partner organizations, and twice-yearly meetings of project collaborators to discuss results and best practices.

Partner organizations will be provided with a water testing kit including tools to collect data on water temperature, dissolved oxygen, transparency, phosphorous, nitrate, coliform bacteria, and aquatic macroinvertebrates. Each site will be monitored by trained volunteers from each partner organization once monthly between April and October for dissolved oxygen, temperature, and transparency. In May and September, a more advanced protocol including testing for nitrogen and phosphorous, coliforms, and macroinvertebrate sampling, will be employed. We will use the New York State DEC WAVE program lists of Most and Least wanted aquatic macroinvertebrates as indicators of water quality⁴. All samples will be collected and data will be recorded in the field, with the exception of coliform testing, which requires a 48-hour lab incubation. Coliform bacteria have been shown to adversely affect water quality in local rivers⁵, making this a particularly important measure in the proposed study. Our focus in this pilot project will be to develop and test a monitoring protocol that is well-suited to adoption by community volunteers.

Natureupnorth.org will serve as the data interface for this project. Doing so will require an improved data entry, storage, and visualization infrastructure for our website. Data from each monitoring site will be posted for free public access on the website. The extent to which citizen science data is available to the public, and presented in user-friendly ways, will determine its utility for the community. Working with DJ Case & Associates, a web development firm

specializing in environmental communication, we will develop a mobile-friendly online data entry form, and features that enable participants to retrieve reports from the database.

Making data available to the public will significantly increase the value of water monitoring projects for educators and municipalities. It will also enable our community partners, such as the St. Lawrence Land Trust, to communicate issues involving water quality to landowners considering preserving their land for conservation. After protocols have been tested and refined, the program may be expanded to include additional partners (including local schools) and monitoring sites on the Grasse, as well as the Raquette and Oswegatchie Rivers. The *MOW the Grasse* Project integrates SLRREF’s dual objectives of promoting both research and education on the St. Lawrence River ecosystem. By providing public training workshops, engaging volunteers in data collection, and disseminating project results via natureupnorth.org, partner websites, and social media, we will spread awareness about the status of our local aquatic resources and empower citizens with the skills and tools to monitor them. We also plan to share project information with the St. Lawrence County Planning Office and other interested agencies. The data collected as a result of this project will allow municipalities, resource management agencies, and individuals to better understand how land use decisions impact water quality within the watershed.

4. Budget (attach a more detailed budget breakdown, if necessary). The Board reserves the right to request additional information, as needed.

Salaries \$4,835

\$4,835 is requested to support 10% of the Nature Up North Project Manager’s annual salary and benefits. The Project Manager will be responsible for facilitating partner meetings, developing data collection protocols, purchasing supplies, interfacing with the web development contractor to develop the data entry infrastructure, promoting the project via social media, and leading public water quality monitoring events, managing the database, and disseminating results.

Labor/Contractors \$5,000

\$5,000 is requested for online data infrastructure development, to be contracted with DJ Case & Associates, a firm specializing in web development for conservation organizations and government agencies. The total cost of these web features is estimated to be \$10,000 – Nature Up North/St. Lawrence University will match the balance through other funding.

Equipment/Material \$4,943

\$4,943 is requested for water monitoring equipment. See table below for line-item breakdown. Some project supplies will be furnished using matching funds.

Item	Cost/Item	Quantity	Total
YSI 550a DO Meter	\$831.25	4	\$3325
60 CM Transparency/Turbidity Tube	\$42.95	4	\$171.8
Conductivity Pen	\$60.50	4	\$242

Open Reel Measuring Tape	\$21.95	4	\$87.8
Sampling Nets	\$121.00	4	\$484
3M Petrifil Coliform Test Plates	\$85.17	4	\$340.68
Non-Mercury Thermometers	\$11.95	4	\$47.8
Ice Cube Trays	\$3.00	8	\$24
5 Gallon Bucket	\$5.00	4	\$20
Sterilite 30 Quart Plastic Container	\$8.00	4	\$32
125mL polypropylene bottles	\$42	4	\$168
	Materials and Supplies Total:		\$4943.08

Other NA

Subtotal \$14,778

Matching Funds \$8,611

St. Lawrence University will provide \$8,611 in matching funds, consisting of \$500 in transportation to monitoring sites and partner meetings, \$500 in copying/printing costs for data sheet and protocols, \$200 for paid project promotion via Facebook, \$5,000 in web development costs for the citizen science data platform, \$2,911 in project materials and supplies including pipettors, lab incubator, chest waders, and Lamotte™ Water Pollution detection kits.

Total proposal amount \$23,389

SLRREF contribution requested
(Total cost minus matching funds) \$14,778

Contingency (not to exceed 10% of Equipment/Material + Other)

5. Schedule

Start date April 2016

Completion date March 2017

Dates	Actions
April 2016	<ul style="list-style-type: none"> Convene meeting of project partners to develop protocols, participant recruitment strategy, and monitoring schedule. Purchase water monitoring equipment Consult with DJ Case & Associates to build online data entry, visualization, and retrieval interface Collect first samples at monitoring sites
May-October 2016	<ul style="list-style-type: none"> Hold training sessions for volunteer water monitors Host monitoring sessions at each site including nutrient and

	macroinvertebrate sampling
October 2016-March 2017	<ul style="list-style-type: none"> • Analyze and disseminate Year One results • Partner meeting to discuss Year One monitoring and best practices • Refine protocols as needed • Begin recruiting new project partners, including local K-12 teachers, to begin conducting monitoring at new sites. • Seek funding to continue water monitoring as a long-term project.

References

¹ National Water Quality Monitoring Council, Volunteer Monitoring, <http://acwi.gov/monitoring/vm/>

² U.S. Environmental Protection Agency, Citizen Science, <http://www3.epa.gov/citizenscience/water.html>

³ New York State Department of Environmental Conservation, Water Quality in The Saint Lawrence River Watershed <http://www.dec.ny.gov/lands/48021.html>

⁴ New York State Department of Environmental Conservation Water Assessment by Volunteer Evaluators (WAVE) program. <http://www.dec.ny.gov/chemical/92237.html>

⁵ Twiss, M.R., Langen, T.A., Giroux, M.G., Johns, S.M., Liddle, N.E., Snyder, A.R., Zeleznock, D.P., Wojcik, J. 2006. Land use influence on water quality in the St. Regis River. *Adirondack Journal of Environmental Studies* 13(1): 26-32.

PROPOSAL ATTACHMENTS:

- Letter from Grasse River Heritage
- Letter from St. Lawrence Land Trust



1 Main Street, Suite 102
Canton, New York 13617

December 22, 2015

Cindy Brady
New York Power Authority
123 Main Street
White Plains, NY 10601

Dear Ms. Brady,

I write in strong support of the proposed St. Lawrence River Watershed Monitoring Network and of the grant application to the St. Lawrence River Research and Education Fund from Nature Up North to enable that project. It has the full endorsement of the Grasse River Heritage Area Development Corporation, one of the partners in the project, of which I am President.

Grasse River Heritage is a private, not-for-profit organization formed in 1999 for the purpose of preserving and improving the Grasse River corridor in the Town of Canton as a recreational and educational resource for the community. Our earliest and most ambitious undertaking to date is the development of Heritage Park on two islands in the river in the Village of Canton, including Falls Island, one of the proposed monitoring sites. As we intended, the park is today a much-used space for educational programming by GRH, area schools and colleges, and other local groups.

One of those groups is Nature Up North, whose mission is closely aligned with our own. During the past year our two organizations have been actively planning several programs, including the proposed water-monitoring project, that would combine our respective resources in beneficial ways. Falls Island lends itself especially well to this project, because its physical characteristics are well suited to the scientific goals and activities involved, because it is designed in a way to provide optimal public access for such activities, and because it is already identified in the minds of our neighbors as a natural outdoor classroom and laboratory.

Grasse River Heritage is the sole owner and manager of the Falls Island property and of the properties that provide access to it and is pleased to grant permission to Nature Up North to conduct the proposed project on those properties. Further, we intend to participate in that project by encouraging our many members in the community to attend training sessions hosted by Nature Up North and by jointly hosting public monitoring activities at Falls Island.

I urge the SLRREF to approve this worthy proposal. Thank you for your consideration.

Sincerely,

A handwritten signature in blue ink, appearing to read "Louis Tremaine", is written over a light blue circular stamp.

Louis Tremaine, GRH President



St. Lawrence Land Trust

PO Box 684
Canton NY 13617

*Dedicated to the voluntary conservation of privately owned open space in the
Northern Adirondacks – St. Lawrence Valley region of New York State.*

December 30, 2015

Dear Members of the Review Committee, St. Lawrence River Research & Education Fund,

I am writing on behalf of the St. Lawrence Land Trust (StLLT) to state its support of Nature Up North's (NUN) effort to implement a network of water monitoring stations along the Grasse River. StLLT sees this initiative as both beneficial to the entire region and an effective approach to engaging local residents in this pressing environmental concern.

The mission of the StLLT is to protect privately-owned space through voluntary means, with a specific focus on the rivers crossing St. Lawrence County. To this end, we work with willing landowners to design easements that will conserve the environmental, cultural, and recreational values of a parcel of land for the public good, while maintaining a landowner's rights to enjoy and use the land in beneficial ways.

This year, the StLLT acquired by donation a 40 acre parcel on the Grasse River at Harts Falls, near the village of Pyrites. StLLT, partnering with Grasse River Heritage, is currently developing this area as a public access park called the Hart's Falls Preserve; the Preserve has high aesthetic, historical, recreational, and natural resource conservation values. The organization is committed to partnering with NUN to monitor water quality at the Hart's Falls Preserve and do public outreach activities on water quality, water quality monitoring, causes of impairment, and ways to avoid or mitigate impaired water quality. This is a very opportune time to do this – St. Lawrence County is developing a Blueway Trail on the Grasse River, and Hart's Falls will be one of the major access points of the trail. Partnering with NUN will further our educational goals on the property, but also provide needed information for managing the Hart's Falls Preserve.

A second project of the StLLT is the Friends of the Watershed Initiative, which integrates landowner outreach, a river stewardship program, and riparian (river-bank) conservation easements. We are focusing our efforts on the Grasse River and Little River watersheds in the Town of Canton, New York, upstream from the village of Canton. NUN's Grasse River water quality monitoring stations would be an ideal complement to this initiative, allowing us to involve landowners in the process of working to conserve or restore the water quality on their land—to the benefit of both individuals and the St. Lawrence County community.

Additionally, the updated interface would make communicating issues with water quality to landowners and public entities much easier. We at the StLLT are convinced that publically available citizen science data on water quality will be a great educational and motivational resource for community members to engage in conserving the water quality of our rivers. We welcome the chance to work with NUN on this project and look forward to collaborating on more in the future.

Sincerely,

Tom Langen
Board President
St. Lawrence Land Trust