Vermont Department of Environmental Conservation
Watershed Management Division

Volunteer Water Quality Monitoring
LaRosa Analytical Services Partnerships for 2016
February 16, 2016

Requests for Proposals

The Vermont Department of Environmental Conservation (VTDEC), through the Vermont Agency of Agriculture /Environmental Laboratory (VAEL) - aka LaRosa Laboratory, is pleased to make available to interested lake, river, and watershed associations sample analysis partnerships for the upcoming 2016 field season. The purpose of this program is to help volunteer watershed associations, and monitoring groups implement new and/or ongoing surface water monitoring projects for waters in need of water quality assessment. Groups are encouraged to present an action plan that will highlight anticipated outcomes of their monitoring results.

What are laboratory services?

Laboratory analysis is one of the most expensive elements of a monitoring program, and VTDEC recognizes that analytical costs hinder the widespread application of volunteer surface water quality monitoring in Vermont. Analytical services provided under this partnership program are essentially 'slots' for tests to be run at the LaRosa Laboratory, free of charge to participants. The LaRosa Laboratory is a full-service analytical facility with capabilities for routine water quality monitoring tests. Examples of such tests include phosphorus, nitrogen, chlorophyll-a, total suspended solids, *E. coli*, turbidity, alkalinity, conductivity, pH, priority pollutants and other metals, and numerous other compounds. More information about the LaRosa Laboratory's services are available online at http://www.anr.state.vt.us/dec/lab/index.htm.

Who is eligible?

Volunteer associations across Vermont are eligible for analytical partnerships. Such associations include river, lake, watershed groups, and water quality and conservation committees associated with local municipalities. Post-secondary academic institutions and not for profit non-governmental organizations are eligible provided that one of the following criteria are met: 1) the project is designed jointly with a local association to assess current water quality conditions or diagnose a known water quality problem of interest to the local association; or, 2) the project assesses the extent of, or diagnoses the cause of, a water quality problem of statewide importance. Educators from elementary, middle, or high-schools who are interested in water quality monitoring are encouraged to coordinate with the University of Vermont's Watershed Alliance (http://www.uvm.edu/~watershd/), or the EPSCoR Vermont Streams Project (http://www.uvm.edu/~streams/).

What are the eligible project types?
Many project types are eligible for this program. Waters under evaluation should be of significant interest to the local association sponsoring the project, and to VTDEC-MAPP. Waters of interest to VTDEC-MAPP include those listed as stressed or impaired, state priority waters, potential reference waters, waters on which minimal or no monitoring has been performed in the past, waters with significant public swimming use, waters where a suspected water quality problem needs to be further documented, and/or waters where a known problems remain undiagnosed. Please review the accompanying table of projects and monitoring categories we have supported in the past. This table will be especially useful as you consider the projects goals and proceed with overall sample design. Preference will be given to those proposals that have an implementation plan to address water quality issues to state waters. Proposals for new or existing multi-year projects will be accepted. *However, continuation of existing multi-year projects is subject to availability of laboratory capacity, continuing need for the data, new modifications to account for prior lessons learned, and project performance and reporting during prior years.* Projects that have already determined that water quality issues exist need to demonstrate direct steps being initiated and community resources available to solve the problem in partnership with VTDEC-MAPP.

The Vermont Surface Water Management Strategy recognizes the tremendous importance of volunteer-based monitoring. With that, the strategy and has two monitoring goals.

- To monitor and assess the physical, chemical and biological condition of Vermont's surface waters to maintain, protect, enhance and restore their integrity and uses.
- To interpret, analyze and communicate monitoring and assessment results within the Agency of Natural Resources and outside groups to support the development of good management decisions for Vermont's surface waters.

The Agency of Natural Resources recognizes that the citizen science, and citizen led monitoring through the LaRosa Partnership, is an excellent means to accomplish these goals.

Pre-scheduling of sampling events will be necessary in order to optimize capacity at the LaRosa Laboratory. Requests for *E. coli* tests should be made only for waters that are documented to have swimming use.

Activities not eligible under this grant program:
Applicants should note that no funds are disbursed through this program. Partners will be allocated a specified number of laboratory analyses, to be performed by the LaRosa Laboratory free-of-charge. The program will provide sample bottles and/or preservatives that are required for the intended tests. Transportation of samples to the LaRosa Laboratory currently on the UVM Campus in Burlington, as well as costs associated with sample collection (e.g., field personnel or vehicle/boat costs), equipment (e.g.,

Kemmerer, VanDorn, or suspended sediment samplers), and other project functions are ***not*** eligible under this program.

How to apply:
This is a competitive partnership program. Proposals will be evaluated based on project need and pollution abatement/implementation plans, technical merit, integration with other local or watershed-based efforts, integration with statewide needs, aggregate request, and prior Partnership performance. Refer to Section 1 of the Vermont Volunteer Surface Water Monitoring Guide (link below), as it provides a checklist/form that can help guide the development of your program. Applicants should use this form as guidance in preparing their project proposal. You should also confer with the VTDEC Watershed Coordinator working in the basin of interest. Your regional Watershed Coordinators are your initial contacts. Please send inquiries and proposals to them. Here is a list of VTDEC's Watershed Coordinators:

Ethan Swift Watershed Coordinator Office: Rutland 802.786.2503 ethan.swift@vermont.gov	Watershed planning and watershed restoration projects in the Poultney Mettowee watershed, Batten Kill, Hoosic, Wallomsac and Otter Creek watershed.
Karen Bates Watershed Coordinator Office: Essex 802.879.2339 karen.bates@vermont.gov	Watershed planning and watershed restoration projects in the Missisquoi, Winooski River Basin and the northern Lake Champlain watershed.
Marie Levesque Caduto Watershed Coordinator Office: Springfield 802.885.8958 marie.caduto@vermont.gov	Watershed planning and watershed restoration projects in the West, Williams and Saxtons Rivers, the Ottauquechee and Black Rivers, the Deerfield and the Lower Connecticut River.
Ben Copans Watershed Coordinator Office: St. Johnsbury 802.751.2610 ben.copans@vermont.gov	Watershed planning and watershed restoration projects in the Passumpsic, Upper Direct Connecticut, Stevens, Waits, Wells and Ompompanoosuc watershed, and Lake Memphremagog watershed.
Danielle Owczarski Watershed Coordinator Office: Montpelier 802.476.0132 danielle.owczarski@vermont.gov	Watershed planning and watershed restoration projects in the Lamoille River watershed, and White River watershed.

Proposals should not exceed four pages in length. Please include the address, telephone number and email address of a project contact, and identify the project coordinator who

will interact regularly with VTDEC. Projects selected to participate in the LaRosa Analytical Services Partnerships will need to prepare a USEPA-approvable quality assurance project plan (QAPP), as described below.

Project proposals must include:

1) A description of the project waters;
2) Needs for the data and intended data usage;
3) Sample collection methods, locations, analytical tests, and numbers and timing of samples. Specificity is necessary here. State how many samples and how many stations are being requested.
4) A description of how the resulting data will be summarized and reported;
5) Anticipated outcomes and efforts to inform the local public of project results;
6) Implementation plans leading to beneficial improvement in project waters, and,
7) Parties involved and project contact(s), including address, telephone, and email.

Timeline and application deadline:

Please provide an electronic copy of proposal to your Watershed Coordinators by the close of business March 15, 2016. The Watershed Coordinators will review the applications within their respective watersheds and then send these to the Jim Kellogg at the Watershed Management Division by March 18, 2016. Successful applicants will submit their quality assurance project plan at least two weeks prior to the beginning of field work. All successful applicant must attend a training session at the Jeffords Building on the UVM Campus in May of 2016, prior to commencing sampling unless other arrangements have been made. For existing, re-approved projects with approved QAPPs, earlier start dates are possible by prior arrangement.

Information regarding quality assurance project plans:

USEPA regulations require that environmental monitoring data collected and/or analyzed in part or whole using EPA funds must be collected in accordance with an approved Quality Assurance Project Plan (QAPP). QAPPs are documents that describe in detail how a project is to be carried out, including project design, type and timing of sampling and analytical procedures, and quality assurance procedures. For projects participating in the Laboratory Analytical Services Grants Program, a pre-established and pre-approved "generic" QAPP is available that covers the majority of activities likely to be carried out under the program. Successful applicants are provided with copies of this document to fill out and return to VTDEC prior to beginning their field sampling. Additional information regarding the purpose of QAPPs and how to prepare them is provided online (see below).

Questions:
Please direct all inquiries/proposals to your local watershed coordinator listed above.

Please direct all completed QAPPs to:
Jim Kellogg (jim.kellogg@vermont.gov) - Environmental Scientist
Department of Environmental Conservation
Watershed Management Division
Monitoring, Assessment and Planning Program
Biomonitoring and Aquatic Studies Section
1 National Life Drive - Main Building, 2cd Floor
Montpelier, VT 05602-35221
(802) 490-6146

Additional proposal and QAPP preparation resources:

"Vermont's Volunteer Surface Water Monitoring Guide":
http://www.vtwaterquality.org/lakes/htm/lp_monitoringguide.htm

"The Volunteer Monitor's Guide to Quality Assurance Project Plans"
http://www.epa.gov/sites/production/files/2015-06/documents/vol_qapp.pdf

EPA's Office of Water and a link to Vermont's Water Quality Standards:
http://www.epa.gov/owow/monitoring/volunteer/qappcovr.htm

Vermont's List of Impaired and Priority Waters:
http://www.watershedmanagement.vt.gov/mapp/docs/mapp_303d_2014.pdf

Vermont's 2014 Water Quality Integrated Assessment Report
http://www.vtwaterquality.org/mapp/docs/305b/mp_305b-2014.pdf

Vermont's Surface Water Management Strategy
http://www.anr.state.vt.us/dec/waterq/swms.html - Also a link to Vermont's Integrated Watershed System (IWIS) which houses the WSMD database of monitoring sites.

Vermont's Assessment and Listing Methodology

Vermont's Assessment Page - with list of Stressed and Impaired waters, basin assessment reports.

Vermont's ANR Atlas - Mapping program that has links to existing chemical and biological monitoring sites and stressed and impaired waters.

Monitoring Categories for the LaRosa Analytical Services Projects

Monitoring Category	Monitoring Goal	Geographic Targeting	Parameters	Frequency and Duration	Flow Targeting	Example LaRosa Partners
Baseline Monitoring/ Stressor ID	To understand existing conditions and trends, to identify reference waters, or to identify or confirm stressors impacting stressed or impaired waters.	Streams or lakes in a watershed that have not been previously sampled or sampled recently, potential reference waters, and stressed or impaired waters where the stressors are not determined.	Total Phosphorus Total Nitrogen Turbidity Conductivity Alkalinity Chloride (in developed areas) Total Metals (below known potential sources) Also consider: Temperature Dissolved Oxygen (DO) pH	Biweekly or monthly for 1-3 years, or as needed to meet VT assessment and listing methodology Generally targeting June - October.	If monthly, target high and low flow conditions, if possible	Black River Action Team (BRAT) Addison County River Watch Collaborative (ACRWC) Friends of Winooski River (FWR) (including: Chittenden County Stream Team, Winooski Headwaters and Four Rivers) Southeastern VT Watershed Alliance (SeVWA) Poultney-Mettowee Monitoring Project (P-M NRCD) Allen Brook Monitoring Project (Williston Conservation Commission) Friends of the Mad River Missisquoi River Basin Association (MRBA)
	Waste Water Treatment Facility (WWTF) to determine reasonable potential analysis.*	Above and below a WWTF; groups will need to work with VTDEC-MAPP and WWTF operators to ensure sampling occurs during active discharge periods and is appropriately situated below the facilities mixing authorized zone.	Total Phosphorus Total Nitrogen Ammonia Turbidity Metals (as specified in a permit) Also consider: Temperature DO pH	Generally the last 2 years of a WWTF National Pollutant Discharge Elimination System (NPDES) permit cycle	Low median monthly flows or below	South Chittenden River Watch (SCRW) FWR BRAT SeVWA Ottauquechee River Group

Monitoring Category	Monitoring Goal	Geographic Targeting	Parameters	Frequency and Duration	Flow Targeting	Example LaRosa Partners
Source ID	To identify source(s) of pollutants and parameters not focused on loading or high flow events.	Sites are selected each year upstream of where elevated levels have been found previously to bracket potential sources or sample tributaries. Monitoring can be continued at sites after project implementation to evaluate remediation. Sites may include intermittent streams and drainage swales.	Total Phosphorus (nutrient stressed stream) *E. coli* Total Nitrogen Turbidity Specific total metals Chloride Also consider: Temperature DO pH	Biweekly or monthly targeting high and low flow conditions	Targeting flows not necessary	Ompompanoosuc (White River NRCD) Franklin Watershed Group Upper Otter Monitoring Project – Rutland NRCD White River Partnership Huntington River Conservation Commission (HRCC)
	To identify source(s) for parameters where loading is the focus or high flow targeting is essential.		Total Phosphorus or Nitrogen (related to lakes where loading is a primary concern) Turbidity Total Suspended Solids (TSS)	Monthly or biweekly plus targeting high flow conditions.	Targeting high flow conditions when runoff is occurring.	Memphremagog Watershed Association Lake Seymour Tributary Monitoring Stevens River ACRWC and SCRW - programs sampled high flow events
Swimming Hole Monitoring	To let people know when conditions are safe to swim.	Active swimming hole sites where there is none or limited data on *E. coli* monitoring or where there is a history of elevated *E. coli* levels.	*E. coli* Temperature	Weekly Generally targeting June - September.	Flows at which swimming use is likely.	SeVWA Friends of the Mad River BRAT HRCC
Experimental Sampling Programs	To test a specific experimental question of importance to WSMD (e.g. the effectiveness of a treatment).	Variable; often involves sampling off stream (e.g. discharge or drainage).	Variable	Variable	Variable	Green Wind Farms Project Friends of Northern Lake Champlain

*Reasonable Potential Analysis assesses the status of the receiving waters upstream and downstream of permitted or proposed discharges to determine if there is a *reasonable potential* for the discharge to cause or contribute to a water quality violation.

The table includes information on the four typical LaRosa Partnership monitoring designs that have been conducted over the years. The goal is to provide additional guidance for volunteer water quality monitoring groups and recommend a more standardized approach to sampling design. This will support meeting the Vermont DEC's Watershed Management Division (WSMD) monitoring goals and the goals for local watershed groups. Many sampling programs may be able to achieve multiple goals though their programs.

Baseline monitoring/Stressor ID - has the goal of identifying the conditions of waters across a basin or related to a specific stressed, high quality water, or waters above and below a WWTF. Sampling programs can target more than one of these goals and can serve to engage watershed groups in understanding water quality issues. Monitoring can be done on a regular schedule and does not require the targeting of high flow events although such sampling could be helpful to understand some pollutants generally tied to runoff (phosphorus/sediment). On the other hand, WWTF sampling can only be conducted during base flow periods. Monitoring can be done for one to three years to document existing conditions. This can be repeated in the future timed with the VTDEC-MAPP assessment phase of the planning cycle or changes in watershed that might increase loading.

Source ID monitoring to identify sources of pollution - has the goal of identifying sources of pollution impacting downstream waters. Monitoring can be broken down into parameters and water quality issues where targeting high flow events is not necessary and where targeting high flow events is strongly recommended for effectively identifying source areas. As a first cut, the areas where monitoring high flows is essential are those where the goal is to identify sources of phosphorus loading impacting lakes, sediment sources, and to a lesser degree nitrogen loading to Long Island Sound. The key to identifying pollutant sources is an iterative approach working upstream from waterbodies that have known elevated levels to bracket potential sources on larger streams and to sample smaller tributaries to narrow down the location of primary source areas. Through this iterative approach monitoring can be an ongoing effort over many years including sampling to measure impact of project implementation to determine success in reducing pollutant levels.

Swimming Hole monitoring for public safety - has the goal of monitoring active swimming holes to provide the public information as to when it's safe to swim. This is a priority for swimming holes where sampling has not been done, is limited or have ongoing elevated levels of *E. coli.* Sampling is generally done weekly and the results are posted on-site at the swimming hole and through other means to notify the public.

Experimental studies – The LaRosa Partnership Program supports scientific studies conducted by, or in partnership with volunteer watershed groups. These studies have focused on the effectiveness of implementation practices at improving water quality, but other studies could be considered if they are of significant interest and importance in helping the Watershed Management Division with our monitoring goals.

Important Links: