

# Public Education, Outreach and Engagement Efforts in NH and RI

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Jeff Schloss & Linda Green

Northeast States & Caribbean Islands Regional  
Water Program



# Presentation Overview

- 💧 Why volunteer monitoring (VM) makes sense
- 💧 Volunteer monitoring program introduction:
  - New Hampshire Lakes Lay Monitoring Program (LLMP)
  - URI Watershed Watch Program (URIWW)
- 💧 Resources to support VM programs

# Through trained volunteers, citizen water quality monitoring programs:

- 🔹 Educate local residents about water quality and the science behind watershed protection;
- 🔹 Provide valuable data
  - Baseline conditions & trends
  - Target for additional monitoring/efforts
- 🔹 Engage the community and build awareness
- 🔹 Assist researchers & agencies
  - Innovative monitoring methods,
  - BMP effectiveness
  - Model development



# The Continuum of Volunteer Monitoring Data Use

Education /  
Awareness



Assess  
Impairment



Legal &  
Regulatory



Increasing Time - Rigor - QA - Expense \$\$

# Essential Ingredients

- 💧 Science-based
- 💧 Bottom-up approach
- 💧 Involve the public
- 💧 Educational, not regulatory
- 💧 Provide good, useful information
- 💧 Stable funding

# NH Lakes Lay Monitoring Program (LLMP - Jeff Schloss)



Over 30 Years of Collaboration  
between UNH and NH Communities (1978)

Monitoring 100s of lake, tributary and outlet  
sites each year

A Model of  
“Participatory Research”  
and Community Empowerment



UNIVERSITY of NEW HAMPSHIRE  
COOPERATIVE EXTENSION

# LLMP Objectives

- Baseline monitoring for long-term trend detection.
- Locate problem areas and “hotspots”.
- Provide unbiased data for informed watershed management decision.
- Develop protocols for citizen monitoring.
- Conduct participatory research that addresses the concerns of participants.

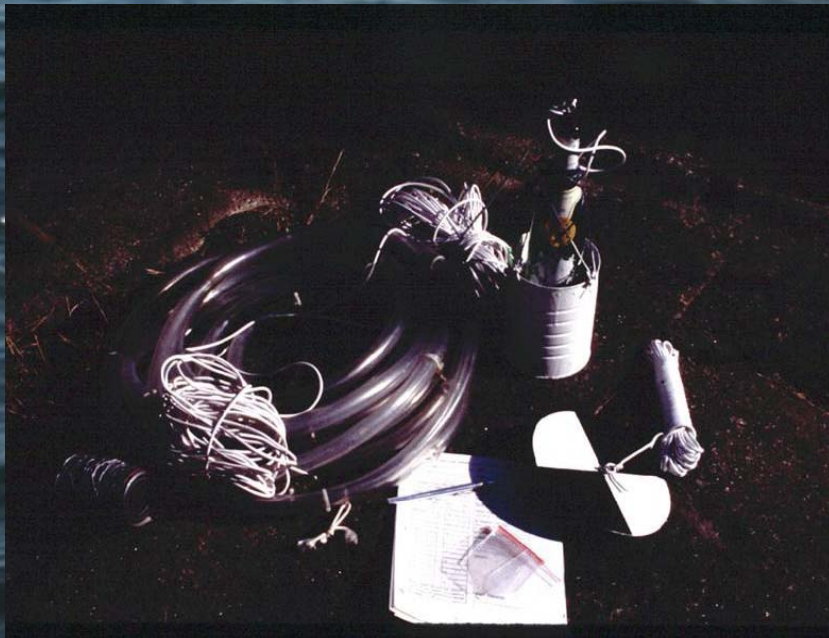
# LLMP 1979-2009

- 108 Lakes
- 380+ Lake Sites Monitored
- Over 27,000 lake site trips!
- 360+ Stream sites
- 4,900 stream trips
- 8 Watershed Nutrient/  
Water Budgets
  - TMDL determination
  - High Quality Water Desig.
  - Land Use Change





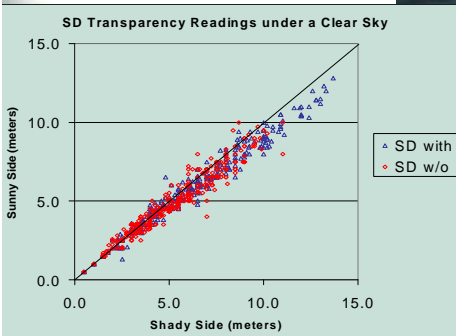
# Low Tech Data Gathering Approach



With access to UNH Center for Freshwater Biology Lab resources

# Volunteer Monitoring and Participatory Science

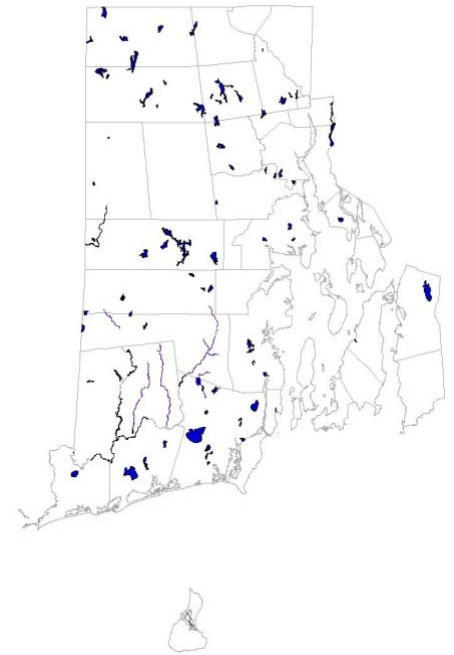
- Motorboat impact studies
- Fish Condition/Water Quality
- Resource Economics of Water Clarity
- Determination of nutrient export coefficients
- Option to subsample CHL filters and collect whole water samples for microcystin toxin analysis
- Use of mussels for integrating microcystin toxin monitoring



# URI Watershed Watch (URIWW)

- 💧 Begun in 1988 with 14 lakes
- 💧 Now monitors +270 sites on ~100 waterbodies with +400 volunteers
- 💧 Provides ~90% of RI's lake multi-year baseline data

*~ 10 lakes with +20 years of data*



# Many Program Sponsors (40)

## Base Funding:

URI Cooperative Extension

## Program Specific Annual Grant:

RI DEM

## Local Sponsorship (per site per year)

Watershed & Environmental Organizations,  
Municipal Conservation Commissions,  
Narragansett Indian Tribe,  
Lake associations,  
Businesses/Industry

**Local sponsors pay an annual fee per location**

A photograph showing a group of people in small, dark-colored boats on a body of water. The people are wearing various clothing, including jackets and hats, suggesting a cool or overcast day. The boats are scattered across the water, and the overall scene appears to be a water quality monitoring or sampling activity. The background is slightly blurred, focusing attention on the people and their boats.

# Cornerstone of Cooperative Extension (CE) Water Quality Program

**2 fulltime staff, 4 - 5 students**

**Dedicated staff essential  
to support the volunteers**

# Combination of Field & Lab

## Field monitoring

- Secchi
- Temperature
- Chlorophyll
- Diss. Oxygen
- Salinity
- Recent weather
- Stream height / lake depth

## Laboratory

- pH & alkalinity
- Bacteria
  - Enterococci
  - Fecal coliform
- Nutrients (P, N, CI)
- Chlorophyll analysis

URIWW lab state-certified since 2006

UNIVERSITY OF  
Rhode Island

**URI WATERSHED WATCH**  
*revised*  
**Lake and Pond Monitoring Manual**

Written by: Linda T. Green  
Elizabeth M. Herron  
Arthur J. Gold

**URI WATERSHED WATCH**  
**2007 WATER QUALITY MONITORING SCHEDULE**  
**LAKES, RESERVOIRS, AND PONDS**

Week Ending	Secchi & Temp Only	Secchi, temperature, chlorophyll, D.O. (deep locations)	WATER COLLECTION DATES
April 28		X	
May 5	X		
May 12		X	FIRST TRISEASON: May 10 - 12 CHLOROPHYLL QC CHECK
May 19	X		
May 26		X	MEMORIAL DAY IS MAY 28
June 2	X		
June 9		X	New England Chapter of NALMS Lakes Conference June 8 & 9, 2007 - UConn - Storrs, CT Please consider attending!
June 16	X		June 16 - optional lake water collection day Scheduled river collection day
June 23		X	Narrow River Swim - Come support the NRPAL!
June 30	X		
July 7		X	Participate in '07 Great American Secchi Dip-In
July 14	X		
July 21		X	SECOND TRISEASON: July 19 - 21 D.O. QC CHECK
July 28	X		Bring DO Kit to URI
August 4		X	
August 11	X		AUGUST 13 IS VICTORY DAY
August 18		X	Aug. 18 - optional lake water collection day Scheduled river collection day
August 25	X		
September 1		X	SEPTEMBER 3 IS LABOR DAY
September 8	X		
September 15		X	Sept 15 - optional lake water collection day Scheduled river collection day
September 22	X		
September 29		X	
October 6	X		OCTOBER 8 IS COLUMBUS DAY
October 13		X	THIRD TRI-SEASON: Oct. 18 - 20 Chlorophyll QC check
October 20		X	Return all supplies Scheduled river collection day

Weather permitting, monitor on the same day each week, between 10 AM and 2 PM. Please mail your postcards after each monitoring session. Water temperature, chlorophyll and dissolved oxygen can be monitored weekly if you choose. For TRI-SEASONS water samples may be collected and delivered on any of the three days, Thursday & Friday (10 AM - 2 PM), Saturday (10 AM - 3 PM). It is better to collect the water samples earlier during that time period than later. After collection immediately bring the water samples and all accumulated chlorophyll filters in a cooler with ice to the Watershed Watch Labs in Room 002, Coastal Institute in Kingston, URI. The laboratory phone number is 401-874-2905, e-mail unww@etal.uri.edu. Please notify us at least 1 day in advance if you must reschedule delivery of water samples to a different date. An earlier date is much preferable to one after the designated collection period. Have a great season and remember to monitor safely!



Classroom & field training

No specific volunteer certification

- QC checks in lab
- We own monitoring supplies

No monitoring tiers

Monitoring season May - October

THE  
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COLLEGE OF  
THE ENVIRONMENT  
AND LIFE SCIENCES



**URI Watershed Watch**  
COOPERATIVE EXTENSION @URI

[PROGRAMS](#)

[RESEARCH](#)

[RESOURCE CENTERS](#)

[PUBLICATIONS](#)

[CALENDAR](#)

[HOME](#)

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[URIWW Home](#)

[Online Data Entry](#)

[Program Contacts](#)

[Program Information](#)

[Monitoring Overview](#)

[What's Monitored](#)

[Becoming a Citizen Scientist  
\(Training\)](#)

[Monitoring Schedules](#)

**Current Monitoring Sites -  
Including Station #**

[- Lakes, Ponds & Reservoirs](#)

[- Rivers & streams](#)

[- Bays, salt ponds & harbors](#)

[Participating Communities](#)

[Program Partners](#)

[Monitoring Manuals](#) and  
[Quality Assurance](#)  
[Project Plans \(QAPPs\)](#)

## Welcome to URI Watershed Watch

The URI Watershed Watch program works with local communities to assess water quality, and provide information for more effective management of critical water resources. URI Watershed Watch helps local governments, watershed, tribal and other organizations to recruit and train volunteers to become citizen scientists gathering detailed, quality assured monitoring data. Our comprehensive watershed-based program

**All data and monitoring materials can be found at [www.uri.edu/ce/wq/ww/](http://www.uri.edu/ce/wq/ww/)**

[Click here](#) to learn more about bacterial monitoring.

[Click here](#) to learn more about managing your wastewater, a major source of bacteria to our waterway.

Infiltration of storm water runoff allows not only bacteria, but excess nutrients to be filtered out of polluted water. [Click here](#) to learn more about local research on enhanced infiltration techniques.

***New volunteer training begins Sunday  
April 17th (first classroom session) and  
repeated Tuesday April 26th. Anyone  
who thinks that they might like to***





# Volunteer Water Quality Monitoring National Facilitation Project

A Partnership of USDA CSREES & the Land Grant System



This Volunteer Water Quality Monitoring National Facilitation Project is designed to build a comprehensive support system for Extension volunteer water quality monitoring efforts across the country. The goal is to expand and strengthen the capacity of existing Extension volunteer monitoring programs and support development of new groups.

Volunteer Monitoring National Facilitation Project



Guide for Growing Programs

Getting Started (914 K pdf)

[www.usawaterquality.org/volunteer](http://www.usawaterquality.org/volunteer)

Online Databases

**Extension Volunteer Monitoring Programs**

Program Listings

Programs' Achievements

Current Highlight: **Great Bay Coast Watch** **NEW!**

Highlighted Program Archives

Job postings

**Related Research and Educational Efforts**

Researching Volunteer Monitoring

Select Archives of Volunteer Monitoring Listserv Discussions

Publications



Monitoring Strategy (1.6 M pdf)

Monitoring Matrix (80 K pdf)

Effective Training (986 K pdf)

Monitoring Equipment Suppliers (437 KB pdf)

Direct Links to Monitoring Programs' Manuals (online)

Building Credibility (1.5 M pdf)

Sharing Information Through Internet Exchanges (1 M pdf)

Volunteer Management (7 M pdf)

Planning Your Program's Data Management System (6 M pdf)

Outreach Tools

Locating Support and Funding

**Special Topics**

# *Guide for Growing Programs*

- **Why Volunteer Water Quality Monitoring Makes Sense**
- **Designing Your Monitoring Strategy**
  - Matrix of Monitoring Activities
- **Effective Training Techniques**
  - Additional Resources – equipment and supplies
  - Direct Links to On-line manuals
- **Building Credibility: Vol. Mon. QA/QC**
- **Volunteer Management and Support**
- **Planning Your Data Management System**
- **Outreach tools**
- **Support and funding**





December 2004  
 Factsheet VI  
 (Updated July 2008)



**Building Credibility:  
 Quality Assurance and Quality Control for Volunteer Monitoring Programs**

University of Rhode Island

University of Wisconsin

*Elizabeth Hemon, Linda Green, Kris Stepenuck and Kelly Addy*

The ultimate goal of most volunteer monitoring programs is to ensure that well-trained volunteers collect high quality data and that the data are used. Despite decades of demonstrating that volunteers can and do collect representative data, government agencies, scientists and often the general public are sometimes reluctant to use data not collected by "experts". Therefore volunteer water quality monitoring programs must work especially hard to build and maintain credibility – some have even said, "twice as hard for half the recognition." This factsheet provides an overview of quality assurance and quality control issues and provides examples of methods used by Cooperative Extension and other volunteer monitoring programs to substantiate the credibility of their data.

Water quality monitoring data are typically gathered to support decision-making, whether it is for encouraging waterfront residents to convert lawns into vegetated buffers, for enacting local ordinances to strengthen wetlands protection or storm water management, or for regulatory action. In order to be useful, monitoring data must provide relevant information - if the concern is potential bacterial contamination, measuring turbidity or dissolved oxygen won't help much. And the data must be credible, which usually means that it is documented and defensible. Data of unknown quality are essentially useless, and useless data can potentially corrupt the decision-making process. Therefore incorporating a Quality System into your monitoring program is necessary for generating useful data.

**Quality System Components:  
 Assurance, Control and Assessment**

Generating reliable data requires adherence to an overall quality policy or system, but what exactly makes up that system? The **Quality System** can most easily be thought of in terms of what you need to do *Before*, *During* and *After* your monitoring effort (Table 1). Three elements combine to form the Quality System: Quality assurance, control and assessment<sup>2</sup>. Developing your Quality System should be an iterative process and focused on how you intend for the data to be used. This system should be incorporated into every aspect of your monitoring program - the bedrock upon which your program is based.



**Table 1. Data Quality System**

Before - Plan	During - Implement	After - Assess
Quality Assurance	Quality Control	Quality Assessment
Study design Quality Assurance Project Plan Develop training program and materials	Training Follow the written monitoring manual Follow standard operating procedures (SOPs) Document changes Proficiency testing	Data proofing/review Outside performance evaluation Reconcile data with objectives Revise SOPs as needed

This is the sixth in a series of factsheet modules which comprise the Guide for Growing CSREES Volunteer Monitoring Programs, part of the National Facilitation of Cooperative State Research Education Extension Service (CSREES) Volunteer Monitoring Efforts project. Funded through the USDA CSREES, the purpose of this four-year project is to build a comprehensive support system for Extension volunteer water quality monitoring efforts nationally. The goal is to expand and strengthen the capacity of existing Extension volunteer monitoring programs and support development of new groups. Please see <http://www.usawaterquality.org/volunteer/> for more information.

- ◆ Quality System components
- ◆ Planning – Quality Assurance
- ◆ Data Quality Objectives
- ◆ Data Quality Terms
- ◆ QAPP's
  - On-line QAPP resources
- ◆ Monitor Training & Certification
- ◆ Implementing - Quality Control
  - Internal QC
  - External QC Glossary of QC checks
- ◆ Quality Assessment

All factsheet modules have MANY active regularly updated links

# Additional Resources

## 💧 US EPA

- *The Volunteer Monitor* - National newsletter
- Monitoring manuals and guidance documents
- VolMon listserve: Program coordinators
- National Water Quality Monitoring Council biennial conference

## 💧 Secchi Dip-in website ([www.secchidipin.org](http://www.secchidipin.org))

## 💧 LaMotte/Hach kits and catalogs

## 💧 New England Regional Monitoring Collaborative ([www.umass.edu/tei/mwwp/nermc/](http://www.umass.edu/tei/mwwp/nermc/))

**NOTICE OF PUBLIC MEETING**

Property Owner  
Recreation  
The

**WARNING**

The Shickashaen Watershed is being contaminated by algae blooms dangerous to animals & human life.

We need your help. . . town, state & federal officials are present to respond. PLEASE ATTEND THIS PUBLIC MEETING!

**Oct. 2nd • 7:30 p.m.**  
**Memorial Auditorium**  
Rhode Island Campus  
Upper College Road  
off to White Auditorium  
Phone: 401-863-1000 • Fax: 401-863-1001





THANKS!

