



Volunteer Monitoring News

A news update for – and by – the volunteer monitoring community



Issue No. 3

March 2013

In this issue....

Special Topic

Preparing for Cataclysmic Weather Events (an interview) (p. 2)

What's New?

New Macroinvertebrate Indices for NJ Volunteer Program (p. 4)

Measuring Lake Turnover Using iButton Temperature Data Loggers (p. 4)

Winter A-salt on Urban Streams (p. 6)

Sustainable Programs

Growth of Lakes of Missouri Volunteer Program (p. 7)

Streamkeepers of Clallam County under Contract with City to Perform Sampling (p. 7)

Apps, videos, and new releases

Charles River App (p. 8)

Rain Garden App (p. 9)

Georgia River Network Guidebook Series (p. 9)

Evaluating Your Volunteer Water Quality Monitoring Program (p. 10)

Upcoming events (p. 10)

About this Newsletter

Welcome to *Volunteer Monitoring News*, an electronic newsletter written for – and by – the volunteer monitoring community. This newsletter will be constantly evolving and improving as it attempts to meet the networking and information exchange needs of volunteer monitoring programs from coast-to-coast. It will only succeed if you, the reader, submit calendar entries, articles and ideas for articles, highlights from your program activities, photos, and anything else you would like to share with your colleagues in the field.

Volunteer Monitoring News is intended to be brief, news-oriented, and issued electronically three times a year, with direct input solicited from your newsletters, websites, or Facebook pages – whatever you use to get the word out about your program. We are looking for stories with national applicability.

Contact Alice Mayo at mayio.alice@epa.gov to submit articles, photos or calendar entries for the next newsletter.

The contents of this document do not necessarily reflect the views and policies of the editors, nor does mention of trade names of commercial products constitute endorsement or recommendation of use.

Special Topic: Preparing for Cataclysmic Weather Events

What follows is an abridged and paraphrased version of an interview VMN (Thomas Tisue) conducted by telephone with Prof. Susan Libes of Coastal Carolina University in late December 2012.

VolMonNews (VMN): In addition to your position as Professor of Marine Science, you also manage an extensive network of volunteers that monitors a large watershed extending from the Atlantic Coast back into the coastal plain. We understand that the focus of this effort is on point and nonpoint source inputs whose signatures include fecal indicator bacteria.

This focus must give added importance to monitoring in the wake of major, or even severe, precipitation events, even though those events often complicate operations and may put personnel and equipment at risk.

How do you prepare for dealing with such events in terms of training, risk management, and continuity of operations?

Prof. Susan Libes (SL): Our monitoring teams operate largely autonomously according to written policy guidelines and procedural protocols. The SOP for inclement weather, for example, is implemented by each team's leaders following consultation with the team members. The SOP calls for the team leader to reschedule sampling to a date as soon after the originally planned date as possible. The decision to delay or potentially cancel sampling is made to ensure safe operations and to avoid risking damage or loss of equipment.



Volunteers sign waivers in compliance with Coastal Carolina University's risk management procedures.

With regard to equipment damage, our program's budget includes an amortization line item that generates sufficient revenue to allow equipment to be replaced on a five-year rotation, or sooner if need be. In addition, the University has an equipment insurance policy that extends to cover in situ devices and this really works.

VMN: With your network's emphasis on storm-water runoff from municipal and agricultural operations, are special arrangements in place to capture data during and just after large precipitation events, when untreated effluents are most likely to enter watercourses?

SL: Sampling is done on a fixed schedule, but because rain is random, this works out in the long run. We undertake no event-chasing, even though this means truly exceptional events may be missed.

Rain is usually patchy and affects the entire basin unequally. In our experience, dogged adherence to twice monthly sampling, year in and year out, seems to be the best plan under

our circumstances. Matching event sampling to the storm hydrograph for multiple stations over a large area is daunting at best. Water travel times from the headwaters to the river mouths might be on the order of many days, for example. This greatly complicates assessing the impact of storm events on the river by means of directed, event-driven sampling.

VMN: To summarize, continuity is crucial to this approach, and your success in achieving it is impressive. Have you ever had to deal with the disruptions caused by a cataclysmic event such as a hurricane? If not, what are your thoughts about dealing with the costs and complexities of the aftermath of such a disaster?

SL: We have not been that unlucky to date. However, disruption of communications by itself would not disable our network entirely. Monitoring teams have sufficient supplies to operate autonomously without contact with HQ for a time, although they are warned not go too far “off the reservation” in order to preserve conformity with QC/QA criteria.

Because much of the sampling is done from boat docks and bridges, however, a storm event that seriously damaged or destroyed this kind of infrastructure would result in interruptions and perhaps necessitate changes to the sampling site plan.

It is important to keep in mind that the dilution effect associated with cataclysmic rainfall events greatly reduces the impact of what gets transported by the river, and the effects thereof on biota.



NASA photo of Hurricane Sandy

VMN: Would you favor having a separate sampling protocol in place to deal with catastrophic events?

SL: In general, I would say no, for the reason that alterations to sampling sites and timelines leaves one without a context for interpreting observations. But the real reason is that there is little likelihood that such big events would have major negative impacts in terms of non-point source pollution, as I mentioned.

VMN: This is an important insight. What would you like to add to the information already covered?

SL: Declining budgets at the State level have had the effect of enhancing the importance of volunteer monitoring programs like ours. A few intrepid folks in South Carolina are seeking to set up a statewide association to promulgate such efforts, in concert with the National Water Quality Monitoring Council. We are grateful for this organization's involvement.

Readers with follow-up questions are encouraged to contact Dr. Libes via email at vmwq@coastal.edu.

~~~~~

## What's New?

### New Macroinvertebrate Indices for NJ Volunteer Program



(Photo courtesy of State Hygienic Lab, U. of Iowa)

Traditionally, volunteer monitoring programs in New Jersey have relied on general assessment tools that have not been specifically calibrated for each of the ecoregions of the State. NJ includes diverse ecoregions such as Pinelands, Coastal Plains and High Gradient/Piedmont. The NJ Department of Environmental Protection (NJDEP) worked with a contractor to review and refine volunteer assessment tools in order to:

1) evaluate the effectiveness of the current volunteer water quality index at both reference monitoring sites and stressed monitoring sites around the state; and 2) develop valid, order-level multi-metric indices for each unique ecoregion.

NJDEP found that the current volunteer macroinvertebrate protocol worked well in the High Gradient Piedmont region, but performed poorly in the Coastal Plain (22% agreement with NJDEP staff protocols) and Pinelands Regions (2% agreement). Through this effort, we now have a more statically valid multi-metric indices for both the Pinelands (56% agreement) and the Coastal Plains (62% agreement).

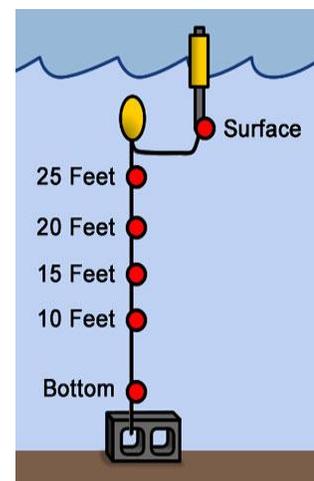
For more information, contact Danielle Donkersloot at [danielle.donkersloot@dep.state.nj.us](mailto:danielle.donkersloot@dep.state.nj.us) or visit <http://www.state.nj.us/dep/wms/bwqsa/vm/biomon.html>

### Measuring Lake Turnover Using iButton Temperature Data Loggers

In many lake monitoring programs, temperature measurements are taken at different depths, using either expensive equipment or an inexhaustible supply of student or volunteer labor. Howard Webb, a volunteer with the Lakes of Missouri Volunteer Program (LMVP), has developed a method to deploy small, inexpensive Thermochron © iButton temperature data loggers to record temperature continuously at multiple depths. The whole setup costs less than \$200 and requires minimal labor to deploy and retrieve. Data are retrieved from the units using a computer-connected device purchased with the iButton readers.

The iButtons are attached to a rope with a float at one end and a cinder block at the other. This determines their distance from the bottom of the lake. An additional rope with a float at the end is attached near the top of the anchored rope (see figure, right). The additional rope ensures that the apparatus can be retrieved in high water and allows for a surface reading regardless of the water level.

Waterproofing and protecting the iButtons was a challenging task. Originally, they were deployed inside a plastic bag inside a plastic

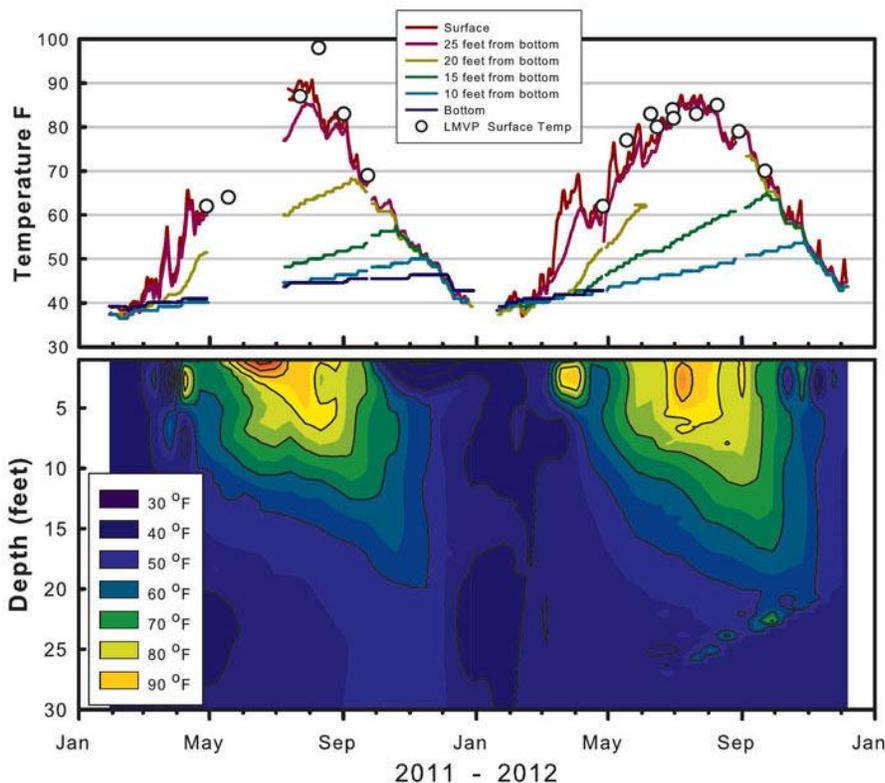




bottle. Unfortunately, hungry lake muskrats mistook the algae-covered bottles for food and gnawed through them. Through trial and error, the newest design involves putting the iButton inside a plastic bottle inside a length of PVC pipe (photo, left) which will hopefully prove muskrat-proof.

The iButton data loggers were first deployed in Whitecliff Quarry Lake in St. Louis. The data show that stratification began around the beginning of March in both 2011 and 2012. As expected, the surface temperature varied considerably from day to day as the lake warmed, while the lower strata warmed slowly. Surface temperatures peaked around the end of July. Interestingly, deeper water continued warming, even as the surface was cooling. The deepest water continued warming until December, when the lake finally mixed from top to bottom.

Several volunteer-monitored Missouri lakes are suspected to mix during the summer, and are likely to have issues with sediment resuspension. LMVP hopes to deploy temperature monitoring units in these lakes to find out for sure. Thanks to Howard, LMVP will be able to do it inexpensively and keep their student workers in the lab where they belong.



*Average daily temperatures in Whitecliff Quarry Lake, St. Louis, Missouri. TOP: Temperature changes over time recorded by each iButton, as well as temperature measurements reported during grab sampling. BOTTOM: An isopleth showing changes in temperature at different depths over time.*

Adapted from “Measuring turnover in Whitecliff Quarry Lake” from *The Water Line*, Volume 15, Number 2, 2012, [www.lmvp.org/Waterline/volume15num2/](http://www.lmvp.org/Waterline/volume15num2/). For more information, contact Tony Thorpe at [tony@LMVP.org](mailto:tony@LMVP.org)

## Winter A-salt on Urban Streams

Missouri Stream Team volunteers in the St. Louis region want their communities to know that winter sleet and snow bring more than treacherous driving conditions; winter storms bring trucks that dump tremendous loads of salt onto streets and commercial parking lots. If the road salt would stay on the pavement to be picked up the next time a street-sweeper came through, that might be fine. Unfortunately, most of the salt travels quickly into the stormwater system with snow melt or the next rainfall.

This winter, 23 volunteers began weekly monitoring at over 35 sites in the St. Louis area to track the amount of salt that is reaching urban and suburban streams. In past winters, individual Stream Team volunteers have reported high conductivity levels and chloride concentrations that are of concern for aquatic life. Said volunteer Claire Schosser, “I noticed two patterns that seemed connected: conductivity higher than the meter could register during winter chemical monitoring trips, and lower numbers and types of macroinvertebrates during spring biological monitoring than during fall monitoring.”



*(Photo by Danielle Haake)*

Preliminary results submitted through the end of January show that chloride concentrations exceeded the State of Missouri’s acute toxicity threshold of 860 ppm at 6 sites and the chronic toxicity threshold of 230 ppm at 5 additional sites; 6 sites remained below the thresholds. At some locations, the acute toxicity threshold has been exceeded for weeks at a time.

What will become of these data? The volunteers leading the project intend to compile data from all of the sites and create a report to share with local municipal leaders, stormwater management agencies, environmental groups, and state government organizations like the Department of Natural Resources and Department of Transportation. What response will they receive? Only time will tell...

*For more information, including protocols, results, and equipment inquiries, contact Danelle Haake at [danelle.haake@mobot.org](mailto:danelle.haake@mobot.org).*

~~~~~

Sustainable Programs

Growth of Lakes of Missouri Volunteer Program (LMVP)

Since 1992, the Lakes of Missouri Volunteer Program (LMVP) has monitored water clarity, nutrients, chlorophyll, and suspended solids in Missouri reservoirs. Eight times each season, volunteers collect and process samples which are then stored frozen. The samples are later gathered by LMVP staff for laboratory analyses at the University of Missouri. The high cost of training, equipment, and laboratory analyses has forced the program to consider costs at every step. Managing program growth and volunteer retention are instrumental.

At first, LMVP grew only by “word of mouth” and monitored 7 lakes in its first year. In 2003, the program expanded beyond its word of mouth and initiated a letter-writing and phone calling campaign to recruit data users to the program. This resulted in the largest single-year increase of volunteers to date. The biggest gain was in public drinking water reservoirs, particularly those involved in the Conservation Reserve Enhancement Program (CREP). (The CREP is a program that retires farmland in the watersheds of sensitive drinking water supply reservoirs.) Not only are more lakes being monitored as a result of the campaign, but the rate at which new lakes are added each year has increased since 2003. The campaign was so successful that LMVP has returned to word of mouth recruiting to keep its growth rate more manageable. Currently, LMVP volunteers monitor 63 lakes at 126 sites.

The program has also found that the cost per sample can be reduced by having a single volunteer monitor at more than one site. Sometimes new volunteers will be so excited to participate that they want to sample several locations. While their enthusiasm is appreciated, it comes with the risk that they will become overwhelmed and stop sampling entirely. Therefore, LMVP encourages all volunteers to sample at one or two locations that they enjoy visiting. Once they understand the time commitment, they may add more locations.

Careful growth and high volunteer retention simultaneously ensure the continuity of LMVP’s long-term data sets and keep cost per sample low. This formula has worked for the past 21 years and will hopefully continue for another 20 years.

For more information, contact Tony Thorpe at tony@lmvp.org.

Streamkeepers of Clallam County under Contract with City to Perform Sampling

In 1999, Washington’s Streamkeepers of Clallam County began performing quarterly water-quality and bacterial testing and annual invertebrate sampling (B-IBI) on urbanized streams, and the data qualified many of those streams for 303(d) listings under the Clean Water Act. Faced with data demonstrating impairment, in 2001 the City of Port Angeles began contracting with

Streamkeepers to perform additional sampling on streams and stormwater conveyances to better understand the problems and identify sources of pollution. Streamkeepers has continued to perform sampling for the City every year since then, and recently signed a 5-year contract to perform sampling through 2016, with a \$15,000 limit for 2013 and a \$20,000 limit for subsequent years. The funding will pay for lab work (bacteria and invertebrates), but also for processing bug samples for the B-IBI stream-health index. This is a sign of a continuing, mutually beneficial partnership between Streamkeepers and the City, and of the City's confidence that Streamkeepers will continue collecting reliable data long into the future.

For more information, visit www.clallam.net/streamkeepers or contact Ed Chadd, program coordinator, at streamkeepers@co.clallam.wa.us.



Apps, Videos and New Releases

Charles River App Project

The Charles River Watershed Association (CRWA) is working with a local technology firm to develop a smart phone application (app) that allows its volunteer monitors to submit data to an online database directly from their monitoring sites using their smart phones.

The app, which is currently only compatible with the Android platform, allows volunteer monitors to upload temperature and depth readings, site observations and descriptions, and geo-located photos directly to an online database. Data submission via the Charles River App will replace the paper datasheets which the volunteers currently use. Volunteers can also use the app to report and upload information about suspicious or unusual river conditions or interesting wildlife sightings.

CRWA is presently piloting the app with a small group of volunteers but hopes it will be adopted broadly over the coming year. The ultimate goal is for the app to be widely used by the Charles River recreational community to report river observations directly to CRWA scientists, vastly increasing CRWA's powers of observation across its 308-square mile watershed. Additionally, CRWA is partnering with a local school to develop an interactive website that allows students to easily view, analyze, and create reports with data collected through the app.



Volunteer submitting data to an online database using the Charles River App. (Photo courtesy CRWA)

The Charles River is a vital asset to the metropolitan Boston area and surrounding communities, providing numerous ecosystem and economic benefits. However, despite a notable cleanup

effort led by CRWA and a dramatic decrease in bacterial pollution, the Charles River still faces many threats which are challenging to understand, address, and communicate to the general public. The Charles River is currently threatened by nutrient pollution, which alters the natural ecosystem balance and increases the risk of harmful algal blooms; this is exacerbated by deteriorating infrastructure and the effects of climate change. The Charles River App should serve as a valuable communication tool in addressing these threats by engaging the community in scientific study and information sharing.

For more information, contact Julie Wood, Senior Scientist, Charles River Watershed Association, at jwood@crwa.org.

Rain Garden App

The University of Connecticut Center for Land Use Education and Research (CLEAR) has developed a Rain Garden smart phone app that is now available for download from iTunes. The app is targeted to homeowners and contractors, and leads the user through the proper siting, sizing, construction, planting, and maintenance of a rain garden. It includes tools to help the user figure out the proper size of the garden, find out about local soil conditions, get a handle on the price of construction, and customize a plant list that will delight the eye while soaking up stormwater. In addition, there are six short video segments explaining various aspects of rain garden care and feeding.

The app is only for iPhones at the moment, but an Android version will be out soon. Also, while the imagery and plants are currently specific to Connecticut, work is underway on a national version that will have extensive databases for each area of the country. (If you are interested in helping expand these tools, please contact clear@uconn.edu.)

For more information about the app, visit <http://nemo.uconn.edu/tools/app/raingarden.htm>.

Georgia River Network Guidebook Series

The Georgia River Network (GRN) has recently announced the Georgia River Network Guidebooks series. The first guidebook in the series, *The Etowah River User's Guide* by Joe Cook, will be published this spring by UGA Press in partnership with GRN. This 184-page book with 159 color photos and 17 maps is printed on waterproof paper and dedicated to river enthusiasts who wish to enhance their on-river experiences. The series will include an overview of the river, detailed maps and notes on river access and points of interest, a fish primer, and a brief natural history of species of interest.

To learn about obtaining a copy of this publication, contact info@qarivers.org or go to www.qarivers.org.

Evaluating Your Volunteer Water Quality Monitoring Program (fact sheet)

The Extension Volunteer Monitoring Network has recently posted its latest fact sheet, “Evaluating Your Volunteer Water Quality Monitoring Program.” The eight-page fact sheet is full of new information, advice and examples as well as links to many valuable resources that help you evaluate your program in a more systematic way than over a cup of coffee or in a staff meeting. Two professional evaluators, Jennifer Kushner and Jenna Klink from University of Wisconsin Extension, took the lead in writing this fact sheet, along with other experienced volunteer coordinators.

Find this fact sheet at

<http://www.usawaterquality.org/volunteer/pdf/GuideBook/EvaluationXVI.pdf>.

~~~~~

## Upcoming Events

### April 2013

**Project Clean Stream**, April 6, 2012. Volunteers in all six Chesapeake Bay states remove trash and debris from streams. Project Clean Stream focuses on a larger message of the entire Chesapeake Bay watershed: to promote and reinforce the direct relationship between cleaner, litter-free streams and woodlands and a healthier, more beautiful Chesapeake Bay. For more information, visit [www.allianceforthebay.org](http://www.allianceforthebay.org)

**Michigan Lake and Stream Associations Annual Conference.** April 26 - 27, 2013 Doubletree Bay City –Riverfront, Bay City, Michigan. The MLSA Annual Conference is the site of the annual volunteer training for Michigan’s Cooperative Lake Monitoring Program. Attendance at the CLMP training sessions is free; conference registration is not required. For more information, visit [www.mymlsa.org/mlsa-52nd-annual-conference](http://www.mymlsa.org/mlsa-52nd-annual-conference). For more information about the CLMP, visit [www.micorps.net](http://www.micorps.net).

**Missouri Stream Team - Introductory Level Training** - 5 dates and locations across Missouri from April 6 to May 4, 2013. Visit [www.mostreamteam.org](http://www.mostreamteam.org) for a complete schedule and on-line registration for this free, six-hour workshop to introduce participants to macroinvertebrate monitoring and to the Missouri Stream Team.

### May 2013

**River Rally 2013.** May 17 - 20, 2013, St. Louis, Missouri. Over 500 river advocates come together for lively interactive sessions with more than 80 educational speakers, a celebratory River Heroes banquet, field tours and many networking opportunities. For more information, visit [www.riverrally.org](http://www.riverrally.org).

**Society for Freshwater Science (formerly NABS), Annual Meeting, 2013 Energy Production and Aquatic Biodiversity: Understanding the Threats, Planning for Ecosystem Management.** May 19-23, 2012, Jacksonville, FL. For more information, visit <http://www.freshwater-science.org/Annual-Meeting/2013-Jacksonville.aspx>.

### June 2013

**Mid Atlantic Volunteer Monitoring Conference**, June 7-8, 2013 in Shepherdstown, WV at the National Conservation Training Center. Registration \$144 (includes food and lodging). From Chesapeake Bay watershed implementation plans to monitoring emerging issues, this conference is a wonderful opportunity for volunteer monitoring organizations to come together celebrate achievements and share ideas. For more information, contact Tim Craddock at [Timothy.D.Craddock@wv.gov](mailto:Timothy.D.Craddock@wv.gov).

**Paddle Georgia 2013**, June 15 – 21. Water enthusiasts will take to the water to paddle 106 miles of Georgia's Lower Flint River. Enjoy the scenery as the river meanders through willow thickets, participate in chemical and bacteria water quality monitoring opportunities, and tour historic sites and industrial facilities along this unique stretch of the Flint between Warwick and Bainbridge. Registration opened February 14, 2013. See [www.garivers.org/paddle\\_georgia](http://www.garivers.org/paddle_georgia) for more information.

### July 2013

**Project AWARE, A Watershed Awareness River Expedition (11th Annual)** July 6-13, 2013, Des Moines River (Algona to Lehigh) Iowa. Project AWARE, which stands for A Watershed Awareness River Expedition, involves hundreds of volunteers who spend their vacations working as aquatic garbage collectors - cleaning up, learning about, and exploring Iowa's rivers. Visit [www.iowaprojectaware.com](http://www.iowaprojectaware.com) for more information.

*If you would like to list your upcoming volunteer monitoring-related event in this newsletter, please provide the date, location, and a brief description to [mayio.alice@epa.gov](mailto:mayio.alice@epa.gov).*

**Volunteer Monitoring News** is a free publication produced three times a year and distributed electronically. It is posted on the Web at [http://acwi.gov/monitoring/vm/newsletters.html#anchor\\_current\\_news](http://acwi.gov/monitoring/vm/newsletters.html#anchor_current_news).

Members of the editorial board: Dan Boward, Maryland Department of Natural Resources; Danielle Donkersloot, New Jersey Department of Environmental Protection; Jackie Gautsch, Iowa Department of Natural Resources; Renee Gracon, Georgia Adopt-A-Stream; Linda Green, University of Rhode Island Watershed Watch; Danelle Haake, Missouri Botanic Garden; Elizabeth Herron, University of Rhode Island Watershed Watch; Barb Horn, Colorado Department of Parks and Wildlife; Rebecca Kauten, University of Northern Iowa; Jo Latimore, Michigan State University Department of Fisheries and Wildlife; Alice Mayo, U.S. Environmental Protection Agency; Kelly Stettner, Black River Action Team; Thomas Tissue, Michigan Clean Water Corps; and Julie Vastine, Alliance for Aquatic Resource Monitoring.

Contributions of articles, photos, and announcements from volunteer monitoring organizations are encouraged but their inclusion in future editions cannot be guaranteed. All contributions must include contributor's name, address, affiliation, email, and phone number. Contributions and subscription inquiries should be submitted to [mayio.alice@epa.gov](mailto:mayio.alice@epa.gov).

*The contents of this publication do not necessarily reflect the views and policies of the editors, nor does mention of trade names of commercial products constitute endorsement or recommendation of use.*