



Macroinvertebrate Monitoring: Is It Good for the Stream?

Benthic macroinvertebrate sampling (or “bug” sampling) is the cornerstone of many volunteer stream monitoring programs, including MiCorps. The large variety of insect larvae and other invertebrates that live in running waters have a range of sensitivity to sources of stream degradation such as sedimentation, water

pollution, and habitat loss. As a result, a sample of the macroinvertebrate community at a stream site can reveal much about the condition of the stream. Benthic macroinvertebrate sampling is particularly suitable for volunteer monitoring programs because the organisms are abundant and most of them are easy to find.

The equipment and expertise needed to collect stream macroinverte-

brates is fairly basic and inexpensive, and the organisms are relatively easy to identify to ecologically meaningful levels. These attributes, combined with the fact that a collection of bugs is far more fascinating to observe than a water sample, make bug monitoring an ideal activity for volunteer stream monitors.

MiCorps has established uniform monitoring procedures for volunteer programs across the state. The MiCorps procedure for stream bug sampling recommends col-

lecting over a 300-foot stream reach twice a year. The volunteer places a long-handled net against the stream bed and uses his or her feet to disturb the bottom and stir up any bugs, which will then drift into the net. The net can also be used to collect bugs from submerged vegetation, wood, and other structures. On the stream bank,



Kay Edly (MDEQ) and Terry Stilson, Muskegon River Watershed Assembly, at the first MiCorps training session for volunteer monitors. *Photo: GLC*

volunteers pick the bugs from the collected material and add them to their collection. While coarse levels of taxonomic identification can be made at streamside with live bugs, MiCorps quality assurance standards require that the specimens (or a representative subsample of around 100 individuals) be preserved in alcohol so that identifications can be made or confirmed in a laboratory

setting, and so each monitoring program has an archived record of their data.

Are we harming the stream we’re trying to protect?

Some volunteers may be concerned that they are doing the stream community more harm than good by disturbing the stream habitat and removing a jarful of macroinvertebrates for monitoring purposes. Why would we want to kick up the streambed and make the water muddy? Why should we spend a half-hour searching intensely

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About the MiCorps Monitor

The *MiCorps Monitor* newsletter is a semiannual publication aimed at facilitating the exchange of information and ideas among volunteer monitoring program leaders, volunteers, and resource professionals on volunteer monitoring issues specific to Michigan.

Contact the Editor

For information about the MiCorps program or the MiCorps Monitor newsletter, or to submit items for future newsletter issues, please contact Elizabeth Johnson of the Great Lakes Commission at ejohnson@glc.org

Back Issues

Archived issues of this newsletter can be downloaded from the MiCorps web site at www.micorps.net/newsletter

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Monitoring (cont. from page 1)

for a sensitive stonefly or caddisfly, only to preserve it in a jar of alcohol?

Fortunately, stream ecosystems are well-adapted to disturbance. Natural storm events, floods, and droughts disturb the stream bed and habitat far more intensely and thoroughly than any volunteer bug collector could! Similarly, stream life is well-adapted to cope with, or recover from, disturbances. Most stream invertebrates are highly mobile and can avoid being stepped upon, or reside below the stream bed in the sediments where they are relatively safe. Their life cycles also are adapted to efficiently repopulate a stream after a major disturbance.

Of course, it is wise to avoid unnecessary disturbance while collecting. For example, limiting the number of volunteers who actually enter the

stream to collect invertebrates to one or two people will minimize stream bed and bank disturbance. There are many roles for volunteers at streamside that do not require wading, such as picking through the stream sample for macroinvertebrates and completing data forms. For tiny streams, collectors could consider using a smaller framed net, like an aquarium net, and “kicking” the streambed with their hands or fingers.

Do we really need to preserve our collections?

It is unlikely that removing 100 bugs from a 300-foot stream reach would deplete the local macroinvertebrate community, even for rarer species. A recent intensive scientific study of a northern Indiana stream of fair quality reported macroinvertebrate densities of 40 to 1400 individuals

per square foot. Consider, then, a typical small Michigan stream averaging five feet across. The sampled reach would cover about 1500 square feet of stream, which translates to a possible 60,000 to 2,100,000 macroinvertebrates in a MiCorps monitoring site! Even at the low end, 100 individuals amounts to less than two-tenths of one percent of the total community.

The most important justification for preserving macroinvertebrate samples is the necessity of quality assurance procedures in any monitoring program that is focused on collecting reliable and defensible data, like MiCorps. The Michigan Department of Environmental Quality, which sponsors

MiCorps, requires quality assurance of all data it uses, whether collected by volunteers or professionals. Specimen collections are the only safeguard against misidentification. Identifications

can be confirmed at a later date if a question is raised about their accuracy. This is especially important for volunteer programs. If there is interest in further taxonomic resolution (such as identifying to family or genus), the specimens can be re-examined by trained volunteers or professionals.

All in all, the benefits gained from stream macroinvertebrate monitoring by MiCorps volunteers, including an understanding of stream quality, education of the local community, and good management of local water resources, far outweigh the minor and temporary impacts to stream ecosystems that result from sampling activities.

For more information, contact Jo Latimore at the Huron River Watershed Council, jlatimore@hrwc.org, 734-769-5123

The benefits gained from stream macroinvertebrate monitoring far outweigh the minor and temporary impacts to stream ecosystems.

First Annual MiCorps Conference

MiCorps held its first annual conference on October 29, 2005 at the Ralph A. MacMullan Conference Center on Higgins Lake. The one-day conference brought together volunteer monitoring program leaders, citizen volunteers, water resource professionals, and others interested in water quality issues to discuss efforts to protect and manage Michigan's lakes and streams, and to learn about the new MiCorps program.

"The MiCorps Conference offered volunteers the opportunity to share their knowledge and experience with each other and to be recognized for their hard work, dedication and commitment to our rivers, lakes and streams," said Ric Lawson, MiCorps Project Manager with the Great Lakes Commission.

Staff from MiCorps and the Michigan Department of Environmental Quality (DEQ) provided hands-on training on a wide array of topics, including stream macroinvertebrate ecology and identification; managing volunteer monitoring data; simple data analysis techniques; ideas for creating engaging reports appropriate for various stakeholders; fundraising and recruitment; and the MiCorps Data

Exchange Network. Participants were also shown how volunteers could use their data to support local water quality protection efforts. In addition, DEQ staff reviewed trends in water quality in Michigan's lakes and rivers and discussed how the state uses

volunteer water monitoring data.

The conference was an excellent opportunity for those involved with volunteer water quality monitoring to network with other resource professionals, citizen volunteers, state leaders in the volunteer monitoring community, and MiCorps and DEQ staff. Nearly 100 people attended the conference, representing more than 60 agencies and local volunteer monitoring programs from across the state of Michigan.

Presentations and training materials presented at the conference are available on the MiCorps web site at www.micorps.net/conference. For more information, contact Matt Doss at the Great Lakes

Commission, mdoss@glc.org, 734-971-9135.



Elwin Coll, MiCorps Steering Committee Chair, and Ralph Bednarz, MDEQ, present a MiCorps Recognition award to the Muskegon River Watershed Assembly. *Photo: MDEQ*



Lindsay Abraham of the Tuscola Conservation District stands before his display at the First Annual MiCorps Conference. *Photo: GLC*

Steering Committee

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Mr. Kevin Cronk
Tip of the Mitt Watershed Council

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Michigan State University Extension

Dr. Joan Martin
Huron River Watershed Council

Ms. Marilyn Shy
Michigan Association of Conservation Districts

Upcoming Events

5th National Monitoring Conference - Monitoring Networks: Connecting for Clean Water

May 7-11, 2006

San Jose, California

www.tetrattech-ffx.com/nwqmc06/

45th Annual Michigan Lake and Stream Associations Conference

April 28-30, 2006

Big Rapids, MI

www.mlsa.org

Details on page 8

Lake Monitoring Gears Up For 2006

The Cooperative Lakes Monitoring Program (CLMP) recently released results from the 2005 sampling season and made plans to prepare for the 2006 season – its

second year

u n d e r

MiCorps.

Each year

the CLMP

Steering

Committee

compiles and

analyzes the

monitoring

results from

volunteers

and delivers

them directly

to member

lake associations

and in summary

form to the general public.

These annual reports are posted on the MiCorps website at www.micorps.net/lakereports.html for 1998 - 2005.

Now that the 2005 results are out and the ice is breaking on the lakes, it is time to get ready for another year of sampling in 2006.

The Michigan Lake & Stream Associations (MLSA) has been accepting applications for 2006 sampling and has planned for volunteer training to be conducted during

their 45th

A n n u a l

C o n f e r e n c e .

This year the

c o n f e r e n c e

is set for April

28 - 30 at the Holi-

day Inn in Big Rapids.

The C L M P

training is

scheduled for the

28th, with

a q u a t i c

plant training completing the training on the morning of the 29th. The remainder of the conference agenda includes a diverse range of speakers with topics ranging from marine safety and shoreline management to loon preservation and fly tying. This conference is always well-attended and numerous social activities allow lake association members to interact and learn from each other about ways to improve management of their lakes.

If you are interested in becoming a CLMP volunteer monitor, or attending the Annual Conference or CLMP training, please visit the MLSA web site, www.mlsa.org, for more information.



A CLMP volunteer uses a Secchi disk to measure the depth of light penetration in a lake. Photo: MLSA

MiCorps Stream Monitoring Programs Make Progress

MiCorps provides grants for water quality monitoring in wadable streams and rivers through its Volunteer Stream Monitoring Program (VSMP). The monitoring primarily includes an evaluation of benthic invertebrate communities and stream habitat. MiCorps provides training and support to grantees to ensure that they are collecting reliable, high-quality data. Each funded monitoring group is trained on establishing clear goals and objectives and standard data collection and management, reporting, and quality assurance procedures.

Each year, at least \$50,000 is available for volunteer stream monitoring grant awards. In 2005, funded projects included: 1) Muskegon River Water Monitoring Program - Muskegon River Watershed Assembly; 2) Volunteer Stream Monitoring Program - Tip of the Mitt Wa-

tershed Council; 3) Grand Traverse Stream Search - The Watershed Center Grand Traverse Bay; and 4) Citizen Science Vol-

unteer Stream Monitoring for the St. Mary's River and its Sault Sainte Marie Watershed - Lake Superior State University.

For 2006, ten volunteer grant applications were received, requesting a total of over \$106,000 in grant funds, while proposing additional match funding of another \$107,000. The DEQ is currently reviewing final funding recommendations and decisions about proposals to be funded will be available soon.

For more information please contact Ric Lawson, Great Lakes Commission, rlawson@glc.org, 734-971-9135, or visit the VSMP web site at

www.micorps.net/streamoverview.



Huron River Watershed Council volunteers collect macroinvertebrates in Fleming Creek in the April River RoundUp. Photo: John Cramer



Volunteer Sue Schuler, Tip of the Mitt Watershed Council, and Tracie Beasley, Clinton River Watershed Council, examine specimens gathered during a monitoring exercise last summer. Photo: GLC

Become a MiCorps Member

Volunteer monitoring organizations which meet quality assurance and operating procedure criteria are eligible to become MiCorps member organizations. MiCorps member organizations represent a select group of monitoring programs in Michigan and receive a variety of benefits as members, including permission to enter data into the online database which can be accessed by the monitoring community and the general public. The data will also be used by the DEQ as a screening and as supplemental data for its water resources management programs. If you're interested in registering your organization as a MiCorps member, please visit the MiCorps web site at www.micorps.net/register.html

Grand Traverse Stream Search

On October 15, 2005, 15 volunteers of all ages turned out on a chilly, blustery morning to help The Watershed Center Grand Traverse Bay with its Fall 2005 Grand Traverse Stream Search event.

Made possible through a grant from the MiCorps Program, teams of volunteers, led by a trained volunteer team leader, took an inventory of aquatic insects and assessed the surrounding habitat at 10 sites on six streams in the Grand Traverse Bay region. The presence of various types of these insects is a good indicator of water quality. The information gathered during sampling provides water quality data and a "snapshot" of stream health. By reviewing this data over time, significant changes in stream health can be tracked and identified.

Streams sampled include: Acme Creek, Brewers Creek, Cedar Creek, Hines Creek, Kid's Creek, Mitchell Creek, and Ptobego

Creek. Of the 10 sites sampled, three sites ranked poor, seven ranked fair, and none was ranked good or excellent. Sites ranked poor were located on Mitchell and Acme creeks. Many factors contributed to these results, but the most common reason for a lower site ranking was sand in the stream bed, which creates a poor environment for

aquatic insects and reduces spawning areas for fish. Results from Stream Search are included on the Center's website: www.gtbbay.org/stream-summary.

The Watershed Center advocates for clean water in the Grand Traverse Bay and acts to protect and preserve the Bay's watershed. The Center utilizes funding from the MiCorps program to fund its Stream Search program (www.gtbbay.org/streamsearch). For more information, contact Sarah U'Ren, The Watershed Center Grand Traverse Bay, suren@gtbbay.org, 231-935-1514, or visit the Center's website: www.gtbbay.org.



A volunteer identifies insects during the Fall 2005 Grand Traverse Stream Search Event. Photo: The Watershed Center Grand Traverse Bay

Muskegon River Watershed Volunteers Go "Buggy"

In October, eight volunteers, clad in waders and carrying nets, invaded an assortment of Mecosta County streams to collect macroinvertebrates. They put the bugs into jars of alcohol and took them home. They then examined the bugs under a magnifying glass to determine what kinds were

in that particular stream. They wrote their findings down on special forms and sent the information and bugs to the Muskegon River Watershed Assembly (MRWA).

Crazy? No! These volunteers were trained at the first training session of the Muske-

Muskegon (cont. from page 6)

gon River Water Monitoring Program held in Mecosta County on September 24. The training session was conducted by Ferris State University instructor Cynthia Fitzwilliams-Heck and MRWA Program Coordinator Terry Stilson.

Volunteers were given instruction on benthic invertebrate evaluation, habitat classification, watershed information and hands-on collection of macroinvertebrates. To complete the training, volunteers had to pass a written macroinvertebrate identification exam with a score of 96 percent or better. Each volunteer also had to satisfactorily demonstrate the correct method of collecting macroinvertebrates while in a stream.



Bill and Nancy Burmeister, collect macroinvertebrates in Ryan Creek in Mecosta County. Photo: MRWA

Why go through all the trouble? The MRWA and volunteers would like to see how healthy Muskegon River Watershed streams are. Collecting and identifying these bugs is one way of discovering this.

The MRWA received a 2005 grant through the Michigan Clean Water Corps (MiCorps) to purchase equipment and train volunteers to assist the Department of Environmental Quality in collecting and sharing water quality data. The MRWA will conduct at least three more training sessions in different counties of the Muskegon River Watershed during the duration of the MiCorps grant. For more information, contact Terry Stilson, MRWA, mrwa@ferris.edu, 231-591-2324, or visit MRWA's website: www.mrwa.org.

Tip of the Mitt Volunteer Stream Monitoring

In early 2005, Tip of the Mitt Watershed Council applied for and was awarded a two-year grant from MiCorps to kick-start a new volunteer stream monitoring program. For several months after receiving the grant award Watershed Council staff busied themselves with structuring the program, developing a Quality Assurance Protection Plan, purchasing necessary equipment, and recruiting volunteers -- all in preparation for monitoring activities. By September, 2005 everything was in place and volunteers began their maiden voyage into

stream ecosystems by first receiving a training provided by Watershed Council staff at the Freshwater Center in Petoskey and then going into the field to collect data.

Volunteers collected aquatic macroinvertebrates (insects, crustaceans and other small aquatic animals) to look at community diversity and the presence of sensitive species. There is strength in diversity -- the more diversity found, the healthier the stream. In addition, certain types of macroinvertebrates are more susceptible

MiCorps Members

Cooperative Lakes Monitoring Program

Michigan Lake and Stream Associations, Inc.

Muskegon River Water Monitoring Program-

Muskegon River Watershed Assembly

Volunteer Stream Monitoring Program

Tip of the Mitt Watershed Council

Grand Traverse Stream Search

The Watershed Center Grand Traverse Bay

Citizen Science Volunteer Stream Monitoring for the St. Mary's River and its Sault Sainte Marie Watershed

Lake Superior State University

MiCorps Partners



Michigan Department of Environmental Quality Team Members

Mr. Ralph Bednarz

Mr. Gary Kohlhepp

Ms. Kay Edly



Great Lakes Commission Team Members

Mr. Ric Lawson

Ms. Elizabeth Johnson

Ms. Anne Sturm



Huron River Watershed Council Team Members

Dr. Joan Martin

Dr. Jo Latimore



Michigan Lake & Stream Associations Team Members

Ms. Pearl Bonnell

Mr. Don Winne



Michigan State University Extension Team Member

Mr. Howard Wandell

Tip of the Mitt (cont. from page 7)

to pollution than others and thus, the presence or absence of these sensitive species also helps rate water quality. With the help of experts, specimens were identified to the family level, resulting in an impressive total of 65 different macroinvertebrate families among all streams. It appears that most streams being monitored are in great shape, but at least three years of data are needed to accurately assess stream health and make comparisons.

Presently, the program focuses on seven streams that flow into Mullet Lake, Lake

Charlevoix and Torch Lake. These represent only a small fraction of the streams found in the Watershed Council service area, but include streams that have potential water quality issues or areas of concern as expressed by local residents. As the program's foundation strengthens, it will be expanded to include more of the 2500+ miles of streams that crisscross the tip of the mitt. For more information, contact Kevin Cronk, Tip of the Mitt Watershed Council, kevin@watershedcouncil.org, 231-347-1181 or visit the Council's website: www.watershedcouncil.org.

Upcoming Events

5th National Monitoring Conference - Monitoring Networks: Connecting for Clean Water

May 7-11, 2006

San Jose, California

www.tetrattech-ffx.com/nwqmc06/

This year's theme, Monitoring Networks: Connecting for Clean Water, will highlight the human, technological, and programmatic networks that connect everyone who is working for clean water. Collaborative monitoring efforts, information exchanges, and Internet portals are all examples of networks that encourage the communication and coordination so essential to understanding our water resources through monitoring.

This conference is an outstanding opportunity to share successes, strategies, and lessons learned with a diverse group of monitoring practitioners representing community-based, state, tribal, national, and international monitoring programs. The agenda features over 300 oral presentations, 16 free workshops and short

courses, plenary and discussion sessions, posters, and exhibits – all designed to promote networking and enhance our technical knowledge.

45th Michigan Lake and Stream Associations Conference

April 28-30, 2006

Big Rapids, MI

www.mlsna.org

This three-day conference will feature workshops, training sessions, scientific information, legal issues, lake and stream management tips, web site development training, and fly tying, as well as addressing issues such as exotic species and zoning. One unique Q&A session is titled "Ask the Almost-World-Famous MLSA Open Forum Experts." There also will be an opportunity for groups and individuals to learn how to take part in protecting lakes and streams through a variety of volunteer programs. Anyone is welcome to attend. Visit the conference web site for registration information.