



A LOOK AT THE LAKE

THE NEWSLETTER OF THE BURT LAKE PRESERVATION ASSOCIATION

WINTER

2024

What's in Store for Twentyfour

Jim Burke, President

We're going to complete the landscaping for the sturgeon sculpture. Finally. We've been screwing around trying to figure out how to get irrigation water to the site for way too long. BLPA and the Indian River Women's Club have joined forces – and the DDA too – and we have a plan. Jane McGinnis talks about that in this newsletter.

We're following and supporting HB 4479 in the Michigan Legislature. It's all about a statewide septic inspection code that allocates funding and resources to actually do it. We're working with our representatives. There are two vacated seats in the House that will be filled by a special election in April. Until then, our Legislature is at a standstill. Yeah, I know what you're feeling right now. We'll talk about this in detail in our Spring newsletter.

Here's the big thing: We have a Goby problem. It's not just us; it's nearly every lake in Michigan and everything connected to the Great Lakes. So what's the big deal, and why aren't other lake associations addressing it? As to the latter, I don't know and I can't speak for them. As to the former, we think that Bass nest predation by Gobies is about to crash Michigan's Bass ecosystem. Presently, the Inland Waterway is a world class Bass fishery, having produced a state record Smallmouth a few years ago. Anecdotally, we're not seeing many little ones. Dave Steenstra's article in this newsletter lays out the specifics for you.

So, What's "The Big Thing"?

Our local MDNR tells us that this is beyond their scope of authority because it's a statewide issue.

You've heard me talk about collaboration before. This time we're taking collaboration to a whole new level. We've already begun the conversation with the Natural Resources Commission, who is responsible for statewide fishing regulations. We're taking a plan to them to move the Bass season opener to a few weeks later so as to allow the youngsters to swim on their own and have a fighting chance against the foraging Gobies. It isn't just us at BLPA; we're engaging all of the major lake associations in Northern Michigan – and other significant organizations – to bring about meaningful change for the future of the Bass fishery.

What else is in store for Twentyfour? I don't know. We'll have to put fresh batteries in the crystal ball. Be assured that whatever it is, we'll get out in front of it and do what needs to be done.

Meanwhile, Get outside and enjoy this great state of Michigan.

"Friends don't let friends play in the snow alone."

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A Look back at 2023

Gina Burke, Secretary

In December the BLPA Board of Trustees held their last meeting of the 2023 calendar year. One of the big things that we address at the year-end meeting is the election of officers for the upcoming year, renewal of terms of office for board members that are willing to extend their terms, and welcoming new members to the board. Those board members returning for an additional three year term are: Jane McGinnis, Katie Parker and Dave Steenstra. Beginning in 2024, we have four new additions to our board: Dale Meyer, Tom North, Sheryl Kendrick and Dawn Webb. Look for their photos and bios in the newsletter.

The election of officers that will serve a one year term was held and the officers are as follows for the 2024 calendar year:

President	Jim Burke
Vice President	Charlie Gano
Treasurer	Mike Cherveney
Secretary	Gina Burke

This time of year we reflect back upon the activities that we were involved with throughout 2023 and begin initial planning for 2024. We have a regular list of organizations that we support financially so that their projects and ours continue:

- Tip of the Mitt Watershed Council (TOMWC)
- Burt Township’s “Big Dump Day” cleanup
- Sturgeon for Tomorrow
- Little Traverse Conservancy
- Wildwood Ski Trails
- Coalition to Protect Michigan Resources

Beyond organizational support, BLPA maintains our own list of projects that the board, committees and membership stay active with throughout the year.

Community Affairs Committee worked with Cheboygan County Health Department to talk about the importance of maintaining septic systems and the impact poor performing systems have on the overall watershed.

Environment and Land Use Committee worked with Tip of the Mitt Watershed Council (TOMWC) as they assembled all the data from the 2021 Burt Lake shoreline survey and made it available to shoreline property owners. BLPA continued to participate with

TOMWC as a member of the Burt Lake Watershed Advisory Committee. More information about this project can be found on the TOMWC web site. Their address is: www.watershedcouncil.org

Marketing and Communications Committee

continued to do great job of inspiring board members and various other individuals to write articles with information and updates for our newsletters which are sent to the membership. It is this same committee that does a great job in publishing the calendar and directories that are made available annually to the membership. The most exciting project that was done this year was an overhaul of the BLPA web site. Be sure to go in and check it out.

Membership Committee rejuvenated the Adopt-A-Road Program, which covers 25 miles of road throughout Cheboygan County in the Burt Lake Watershed. The committee worked on a survey of questions that will be sent out during the winter 2024. The purpose of the survey is to look at programs and potential educational information that would be of benefit to our membership. Watch for that in your email.

Waterway Use and Safety Committee continued to collaborate with the Cheboygan County Marine Sheriff to ensure that there is adequate patrol on Burt Lake during the recreational boating season. The Burt Lake Sturgeon Club, which is a subcommittee, chaired by Dave Steenstra continues to monitor sturgeon activity; especially during the spring spawning period. Please feel free to contact us to report sightings. Another project is the Inland Lakes Sturgeon in the Classroom. This year there are two sturgeons being raised at Inland Lakes by Jenny VanDaele’s kids.

The Finance and Governance committees stay busy throughout the year with projects and operational tasks. These are the two committees that keep us in focus with projects and procedures.

Your BLPA Board of Directors volunteer their personal time to BLPA as well as a variety of other organizations or boards:

- Coalition to Protect Michigan Resources
- Sturgeon Advisory Council
- Northern Inland Lakes Fish Advisory Council
- Tip of the Mitt Watershed Council
- Little Traverse Conservancy
- Burt Township Board
- Harbor-Petoskey Foundation
- Cheboygan County Planning Commission
- Habitat for Humanity



It is evident that our board members give their time willingly and stay active with topics and issues that concern Burt Lake. We always welcome suggestions for other topics to pursue.

The annual meeting for 2024 will be July 13, 2024 and held at the Tuscarora Township Cooperation Park.

Mark your calendars and plan to attend whether rain or shine. Watch for updates in upcoming newsletters or

various mailings as time gets closer to the meeting.

BLPA always welcomes volunteers to serve on a committee that compliments the interests or skills of any member. Please feel free to contact BLPA through our web site if you are interested in volunteering. These are the ways that you can contact us: the web site is www.BLPA.org, our phone number is 231.238.2177 or email is cindyfisherblpa@yahoo.com.

Board Member Profile: Sheryl Kendrick



My husband (Bob) and I have enjoyed sunsets from the eastern shore of Burt Lake since 1984. Now we spend about six months out of the year traveling overseas and chasing the sun, usually in the western U.S.

I owned a promotional products franchise business in Saginaw where Bob practiced law until we sold our home and moved to the lake ten years ago. Our boy/girl twins have been coming to the “cottage” since they were ten days old in 1986.

I am an artist and enjoy volunteering at the Crooked Tree Art Center. Other interests include swimming in beautiful Burt Lake, boating, biking, walking, reading and playing bridge. I am also the Secretary for the East Burt Lake Association.

Preservation of our lake has been of utmost importance to our entire family which resulted in our becoming a charter member of the BLPA many years ago.

BLPA has been a fantastic success, but we can't rest on our laurels. I hope to volunteer my time in various BLPA projects to help ensure the quality of our lake for future generations.

BLPA Adopt-a-Road Program

Jayne Handelman

You might have wondered about the Adopt-a-Road signs that you see during your travels in Michigan. In our area, some of the signs refer to the Burt Lake Preservation Association (BLPA). As some of you may know, the BLPA has been collaborating with the Cheboygan County Road Commission (CCRC) for more than 20 years in an effort to keep the roads around Burt Lake free from trash. As part of that collaboration, BLPA agreed to provide volunteers to pick up trash along designated roads twice per year, once in the spring and once in the fall and CCRC agreed to provide vests and plastic bags for volunteers to use, as well as dumpsters in which to deposit the filled bags.

While some dedicated members of our community have continued to fulfill their commitments to the Adopt-a-Road program over more than the last two decades, in recent years the overall program has been relatively quiet. We are trying to reinvigorate and expand the program and the BLPA Board has graciously agreed to support our efforts. Working with the Shoreline Reps and others, we initially focused on trying to recruit volunteers to pick up trash twice a year, with one date selected for the fall of 2023 and another to be selected for the spring of 2024. The East Burt Lake Association (EBLA) signed up at the BLPA Annual Breakfast for a date in October. Jeff Shutnick led a group of 10-12 volunteers as they picked up trash on October 23, 2023 (see photo). In addition, Dave and Linda Steenstra collected 12 bags of trash on November 12, 2023, covering a wide geographic area. They clearly had a system that worked well for them!

Although picking up trash twice a year is helpful, we realized that trash needs to be picked up on an ongoing basis in order to keep our lake and the surrounding areas beautiful. Also, the more we thought about how to grow the Adopt-a-Road program, it occurred to us that we might have more success if volunteers were able to select their own dates and times for trash collection. We also knew that they would need supplies to do so safely. With the support of the BLPA Board, we initiated the “Roadside Champions” program. Volunteers agree to monitor specific roads around Burt Lake and to pick up trash as necessary. For example, my husband and I, with the help of a few others, are responsible for East Burt Lake Road. During the fall months, we picked up trash on several occasions, some just days apart, and we found





new trash every time. Due to the generosity of the BLPA Board, each “Roadside Champion” is supplied with vinyl gloves, large plastic bags, a pick-up tool with a grabber, and a bright green reflective vest.



Thank you so much to each of our volunteers for the work you have already done to beautify our community! We hope to recruit additional volunteers for the BLPA Adopt-a-Road program. If you think you might be interested or want additional information, please contact Jaynee Handelsman at jaynee@umich.edu or 734-678-8898.

Sturgeon Sculpture Project

Dawn Webb and Jane McGinnis

Since that day over two years ago, when we welcomed our sturgeon to town, Sturgeon Corner has grown and developed with lighting and three educational kiosks. Now BLPA has partnered with the Indian River Women’s Club and Tuscarora Township DDA to create a landscaping plan worthy of the Entryway into Indian River. BLPA has agreed to match the Women’s Club up to \$15,000.

The story of how the sturgeon came to Indian River

Jim Burke, Dave Steenstra and Mike Ridley were in the barbershop one morning talking to Dave Driskill about the DDA streetscape project and how DDA wanted to put something at the corner in the MDOT right of way. The DDA had discussed a fountain, a clock, a labyrinth and a very tall flag pole. Dave the barber mentioned that Tom Moran wanted to sell the sculpture of the sturgeon that sat in downtown Onaway. Mike called Tom later that morning, and he said yes, he'd sell it. Tom said "I've got about \$45k into it but I'll take \$25k." Mike told him it was going to be the entryway into downtown Indian River. He said, "Cool! I'll take \$20,000 for it, delivery included." Mike let Dave and Jim know and within a few weeks, mostly from BLPA members, the money was raised. BLPA delivered the check to Tom Moran and he immediately donated the

money to the Iron One Foundation. He delivered and set the sculpture a short time later. One heckuva guy!

The challenge to finish the project

Others were before us.... Among them, donations from the Nivelt family covered the cost to extend electrical power under US27 to the sculpture. Archambo Electric covered installing the lighting that lights up our sturgeon, and Ramsby Well Drilling is patiently waiting to install the well to help with irrigation, although that part is complicated and we most likely won't take them up on their generous offer.

Draft Proposal



The Tuscarora Township DDA stepped up and provided funding for a landscape design plan. North by Nature, a BLPA member, provided a design that allowed everyone to visualize the potential of the site. The design incorporated hardscape and native plants to really bring the sturgeon sculpture to life.

A landscape design committee was formed with representatives from the Women’s Club and BLPA. Dawn Webb created a detailed request for proposal and the project is currently out for bid. The committee is working with the landscape professionals on the design elements to stay within the budget and space allowed and is on track for shovels in the ground this spring.

When finished, Sturgeon Corner will provide an exceptional opportunity to educate the public on how important the sturgeon is to the Inland Waterway ecosystem.

If you are interested in participating in this landscaping project, you can donate to help BLPA meet their match by sending a tax-deductible contribution to BLPA and mark it “sturgeon landscape”

or make a donation online at www.blpa.org.

Our mailing address is: Burt Lake Preservation Association, P. O. Box 632, Indian River, MI 49749.



Does Yet Another Pestilence Befall Us?

David Steenstra

Pestilence. We do not use this word in normal, every-day language, but it may be appropriate for this story. This is a very old word found in several different chapters in the Old Testament. In most Biblical references, pestilence was included with famine, wars, and plagues. It was not a good thing. The first time I heard the word, I was in Sunday School – probably 7 years old. I still remember and respect this frightful word to this day.

So what is it this time? PFAS? Algae? Eurasian Milfoil? Yeah, they are all bad dudes. They are on our watch list for sure. But the pestilence of which we now speak is the Round Goby. The Round Goby (*Neogobius melanostomus*) is a euryhaline benthic fish native to the Caspian Sea region of Eastern Europe that was introduced into the Great Lakes in 1990. (Jude, 1992). It is likely the Round Goby got here through water ballasts in Ocean Freighters entering the Great Lakes by way of the St. Lawrence Seaway. Gobies are prolific reproducers, and within a decade, this invasive species made it to the inland waterways. Today, there are millions of Gobies in Burt Lake.

The impact from the Round Goby's expansion throughout the inland waterways include competition with and decline of native benthic species such as sculpins, darters, and logperch, and also the predation on eggs and larvae of multiple nest spawning species (Claramunt). For the nest-building species in Burt Lake, Males are the nest protectors once the eggs have been laid and fertilized. The risk of nest failure caused by egg predation is accentuated if guarding males are removed by angling. Smallmouth Bass in particular are commonly targeted by anglers during the nesting season. The impact of Round Goby as a predator of Smallmouth Bass nest likely involves similar affinity

to preferred nesting habits of both species (Miller).

What is BLPA Doing About This?

We have had conversations with the Natural Resource Commission and the DNR. We have also begun conversations with the University of Michigan Bio Station and with the Fresh Water Center at Lake Superior State University. Right now, we do not have many answers. It is likely this will be a multi-year process of discovery. We really do not know for sure that the Goby is Pestilence to Burt Lake. We think it is, but we need more information; facts. Anecdotally, we do know they are eating Smallmouth Bass larvae when the adult male is removed from their nest. We do know that Walleye fishing has not been good and suspect the Goby may have a hand in that. But we are not sure right now. In some instances, our native species have discovered that Gobies taste pretty good. Lake Trout are devouring them, and some anglers would argue that Lake Trout are much tastier than years ago. Not as greasy. Let's find out.

Stay tuned for more information about this possible pestilence. Rest assured, BLPA is on this topic and we will be relentless in getting some meaningful answers.

Meanwhile, please look at the video produced by Kim Stricker from "Hook n' Look". The video expresses Kim's concern about taking Smallmouth Bass off their nests and the possible impact it may have in the future, right here in the Inland Waterways.

<https://www.youtube.com>
search SMALLMOUTH BASS RECRUITMENT CONCERN

Board Member Profile: Dale Meyer



Born and raised in Northern Michigan, I have spent many years on the local inland lakes. Starting with Walloon Lake during the earlier years at my folk's cottage through young adulthood to purchasing my own cottage on Burt Lake some 35

years ago. I have grown to appreciate the wonderful natural resource that we have here in our community.

I graduated from Petoskey High School in 1972 and moved on to Michigan State University to get a degree in accounting. During that time, I met and married Betsy, my wife of 48 years. After completing our time at MSU we moved back to Petoskey with Betsy securing a position teaching at PHS while I went into the generational business with my twin brother David. Meyer Ace Hardware has been my home for employment for forty-seven plus years. We have expanded the business from a small one store independent retailer to what is now five stores serving

northwest Michigan from St Ignace to Gaylord with Harbor Springs and Petoskey in between under the ACE label.

During those years I have been involved in numerous social and governmental activities. Have served as President of the local Lions club, President of the Tip of the Mitt MSU Alumni Association, President and board member of the Petoskey Regional Chamber of Commerce, member of the United Methodist Church, member of the Petoskey Bayview Country Club, Chairman of the Petoskey Downtown Management Board and also the Downtown Development Authority as well as Mayor of the City of Petoskey.

I like to fish, play golf (poorly), hunt and ride my bike, all of which get me outdoors. Betsy and I have three adult children Kristin, Andrew and Matthew with 9 grandchildren that love to visit Burt Lake in the summer.

As I am entering semi-retirement, I appreciate the opportunity to serve on the BLPA board to help maintain and improve all aspects of Burt Lake as well as strengthen the association to meet future issues.



WE WANT TO HEAR FROM YOU!

Patricia Craig

First BLPA Membership Survey!

The BLPA Board would like input from their members. This survey is important to help us improve our organization, communication and meet the needs of our membership.

You will be receiving the survey in your email soon after receiving the winter newsletter. Please take the time to answer the questions and complete them by the end of March 2024. There is only one mandatory question. It is a performance metric that tells us how well we are doing. You don't need to answer all the questions, and you can go back to a question while taking the survey. There is the ability to provide comments, please do so. Your answers are confidential. However, you can provide your email if you would like us to get back with you regarding a comment.

General topics include feedback on committee activities/

projects, annual meeting held in July, boater/PWC safety & classes, Adopt-A-Road and member social interests. Social interest questions were asked because we understand community is important and people feel connected when they do activities they enjoy together. If there is enough interest, we will disseminate that information in future communications. Since Burt Lake is physically large, we ask which shoreline community you reside in, to help us analyze/consolidate the responses by area as well as the entire lake.

We are proud to announce that 2023 was the best year for BLPA Membership. We have continued to grow every year! Every community around the lake is represented by a "shoreline" representative.

Thank you and we are looking forward to hearing your input!

Your Membership Committee

Helpful Boating Hints

Dave Steenstra, Waterways Committee

Like many of you, I pulled my boat out of the water last Fall. I always wait until the very last minute because fishing is so much better in the Fall. When I pull my boat, I stop for a few minutes on the sloping boat launch – providing there are no other boaters waiting to use the launch. This allows the water to drain off. This is also a good time to pull the plugs. This is not just a good idea, it is actually the law. As I watched all the water drain from the bilge and live well, one of my fishing buddies reminded me of some protocols that need to be followed.

If you trailer your boat and take it in and out rather than park it all summer on a boat lift, you should be aware of DNR requirements.

Prior to transporting any watercraft over land, boaters are required to do all of the following:

- Remove all drain plugs from bilges, ballast tanks, and live wells.
- Drain all water from any live wells and bilges.
- Don't put your plugs back in until you return to the boat launch to put your boat back in.

So even if you leave your boat on the lift all summer,

you should follow these protocols when you put your boat in, and when you take it out.

Michigan law also requires that a person remove all aquatic plants from watercraft, watercraft equipment, and trailers before placing these into Michigan waters.

Violation of the law is a state civil infraction and violators may be subject to fines up to \$100.

For more information, contact the Michigan DNR, or visit their web site.

Board Member Profile: Tom North

I have owned a home on Burt Lake since 1988, currently my primary residence. I served a term as president of Burt Township Association and was on its Board for a few other years, before BLPA was started. Lifelong Michigan resident. Served as Probate Judge for Mackinac and Luce Counties, 1992-2007, and practiced law in Cheboygan prior to that.





USPS Forwarding Requirements

Gina Burke, Secretary

Did you know that the US Postal Service implemented a new mail forwarding procedure?

In the past, a change of address was all that needed to be completed. Their policy still requires you to submit a temporary change of address request. In addition, you have to provide proper identification at the post office at the time of the request. If you don't, you will receive a letter in the mail. The letter directs you to finalize your identity validation either online or in person at the post office before mail will be forwarded. This process then activates USPS to begin forwarding your mail. If the validation isn't completed there is no forwarding address on record, and the mail either is returned to sender (first class mail) or falls into a dark hole and goes nowhere; meaning it probably gets thrown out.

We try our best to ensure that things are getting to the correct delivery location. Just because you have a

secondary address listed with us doesn't automatically mean that this is where we begin sending mail to. Please notify us if will be gone and have a secondary address that you will be using. If you don't and haven't set up a forwarding address with the post office the mailings come back to us since our mail goes out first class. We then have to take the time to verify the address and resend it out. If your mail is going somewhere else, we then incur the cost for postage again. For example, our calendar mailing is six bucks apiece.

What can you do to help with this? Make sure you have implemented the forwarding procedure set down by the USPS. You can do this at your home base post office or it can be done online with a validation fee charged via the web. Here is the link to read more about this: <https://www.usps.com/manage/forward>

Crooked River Lock update

*Reprinted with permission, Chuck Kneese
Pickerel-Crooked Lakes Association board
member, 12/23/2023 email*

At a meeting in December 2023, an Emmet County representative indicated that repairs necessitated by a mechanical breakdown that resulted in the lock closing in late August 2023 should be completed by March 2024, and the lock should be operational for the upcoming boating season.

While the lock remained closed for the rest of the 2023 boating season and repairs were not completed before the end of the boating season, the lock was opened Fall 2023 enabling the seasonal lowering of the lakes for the winter months.

It was also pointed out at the meeting that looking back at the 2022 season the amount of revenue from the selling of lock passes was down and the trend continued in 2023. In part, the 2023 revenue was down because the lock was closed for 44 days during the boating season due to the mechanical issues. However, based on the two-year numbers, revenue to support the lock has declined. It is likely the cost of lock passes will increase in 2024.

The good news is the lock should be operational for the 2024 boating season. The funding obtained will provide some upgrades over the next several years to support the unique experience of navigation through the Inland Waterway.

Board Member Profile: Dawn Webb



My husband Jeff and I started coming to Indian River in the early 70's as campers. We fell in love with the area and introduced Jeff's parents to Indian River when they decided to retire "up north". They became permanent residents of the Township in 1990 and like many families, we followed. We purchased a home in Chippewa Beach, sold our home downstate and became

permanent residents in 2017. I continued to work retiring from General Motors in February 2019 ending a year and a half of long commutes. Jeff and I have two grown married sons and four grandkids ranging from ages 2 to 8 years old who all spend their vacations on Burt Lake.

I've always been actively involved in the communities I've lived in and that didn't change with the move to Indian River. I joined, regularly attend BLPA meetings and recently began serving on BLPA's Septic Committee. I'm also serving as a Cheboygan County Planning Commissioner and am an active member of the Indian River Women's Club.

Education:

Baker College - Bachelor of Business Administration:
Baker College Center for Graduate Studies - MBA
(International Business)

Work Experience:

Veit's Video Inc.- Small Business Owner (Video Rental/Retail) (1985-1993)

General Motors Global Purchasing – Sr. Global Commodity Buyer/Team Lead. (1994 – 2019)



What are Windrows and “Soap Suds” on Mullett Lake?

Reprinted with permission, John E. Gannon, Mullett Area Preservation Society Board Member, MAPS Fall 2023 Newsletter

Although this article is about a phenomenon on Mullett Lake, it applies to Burt Lake and many other deep water lakes.

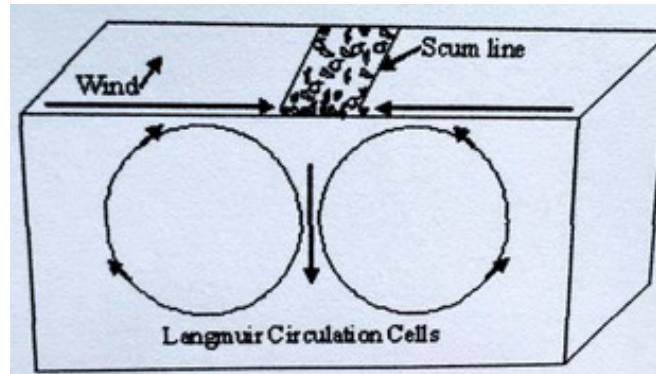
When I was a kid in the 1950s spending summers on Mullett Lake at my grandparent’s cabin, I had a 12-foot plywood rowboat. I loved that rowboat and the lake. My grandparents and parents would sometimes take day excursions to nearby towns and Mackinac Island, but I rarely joined them. Nothing could lure me away from the lake and the lakeshore. I did a lot of rowing along the lakeshore, but got my “wings” so to speak when I was about 12-years old when my grandfather bought a 3-hp outboard motor for my boat. I fished a lot, but also liked to just go boating and ride the waves. I got my kicks out of playing on the waves in my little boat and its little outboard motor, but I suppose that sounds strange to folks today who prefer to be zipping along on wave runners.

Early on, I remember noticing during windy conditions that lines of bubbles and foam gathered in parallel lines in the direction of the wind. Debris, such as aquatic plants that became uprooted from the bottom and dead insects, would also accumulate in those parallel rows. Have you ever noticed that? After the wind died down, the foam accumulated on the shoreline and kind of looked like soap suds. I bet you have noticed that from time to time. I was always curious about it.

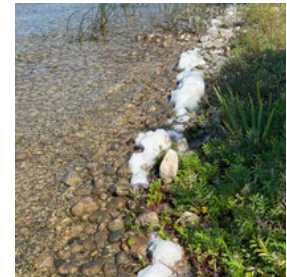
The Science of Windrows. Flash forward to my college days, and my senior year in 1964 when I first attended the University of Michigan Biological Station. One of the courses I took was limnology, the freshwater equivalent of oceanography. Bingo! I learned that bubbles, foam and debris form in parallel rows perpendicular to the wind direction and are common in all lakes with deep water and oceans and are known as “windrows.” Windrows are defined as: “A streak of foam or floating debris, aligned in the prevailing wind direction, formed on the surface of a lake or ocean. Where wind blows across a water surface, vertical circulation cells are set up in near-surface waters” (<http://www.encyclopedia.com>).

This phenomenon is known as Langmuir circulation after Irving Langmuir who noticed the windrows while aboard a ship in 1927 while traversing the Sargasso Sea in the Atlantic Ocean. The windrows in parallel rows were especially visible there because of the large accumulation of the macro-algae, Sargassum. He described the mechanism for this phenomenon in a 1938 scientific paper that now bears his name, “Langmuir Circulation.”

The physics of Langmuir Circulation is illustrated in this figure. A large lake like Mullett Lake is one of the best places



Windrow of foam, etc. (called “scum line” in the diagram) that forms where currents in adjacent cells converge by downwelling. In the lake, everywhere you see foam lines is the downwelling zone and in between foam lines is the upwelling zone of numerous pairs of spiraling cells of currents moving downstream in the direction the wind is blowing. Source: SciencePrimer.com.



Photos of windrows of foam (left) on Mullett Lake during windy weather and foam accumulated on the shore (right) after the wind had died down (Photos by the author).

to observe this phenomenon of lake physics because it is deep and the fetch (i.e., the distance the wind travels over open water) is long. The combination of wave action and shear stress between wind and water causes spiraling horizontal currents to form under the lake surface. Adjacent cells rotate counter to one another, creating areas of alternating upwelling and downwelling. It is where the rotating cells of moving water converge (downwelling) near the surface that bubbles, foam and debris (called “scum” in the diagram) accumulate into windrows. If you position your boat on a windrow, the water beneath you will be moving downward and down wind; as you move your boat between windrows, the water will be moving upward and down wind. As the wind eventually dies down, the foam and debris in the windrows pile up at the water’s edge.

Why It Matters. The only visible evidence we see of Langmuir Circulation is the accumulated bubbles, foam and debris in windrows. Beneath the surface, the spiraling cells



are a significant feature of lake circulation. In general, the stronger the wind, the wider the windrows are apart from each other, and the deeper the downwind spiral circulation occurs below the surface in the water, mixing and distributing nutrients. Buoyant materials such as uprooted aquatic plants, minute plants and animals (plankton) and dead animals are concentrated in high numbers in windrows because they are unable to be pushed downward by the downwelling current. Some fish are attracted by the concentration of food in windrows. In turn, some fishers are aware of this phenomenon and fish along windrows. I recall some years ago hearing a presentation at a scientific meeting about food habits of siscowet, a deep-dwelling strain of lake trout in Lake Superior. The biologist was surprised to find stomach contents included dead birds. He saw dead birds occasionally in windrows on the lake while sampling and surmised the siscowet were cruising the windrows for food.

What else may be important to the lake's ecology related to Langmuir Circulation? Flash forward once again to 1972 when I returned to the UM Biological Station and became the first year-round scientist there (Previously, since its founding in 1909, it was a summer-only teaching and research facility). With the assistance of research assistants and students, I initiated water quality studies on 40 inland lakes in Emmet and Cheboygan counties in 1974-75. The Tip of the Mitt Watershed Council continues annual water quality monitoring that we initiated to this day. I gave presentations in the 70s to lake property owners associations and county commissioners on water quality issues of the lakes we studied, including Mullett Lake. So, I would sometimes receive phone calls from citizens and officials with water quality questions. The two questions I received the most were about mayflies and foam on the shoreline; both having relevance to Langmuir circulation.

Mayflies There are different kinds of mayflies living in Mullett Lake. Some live on and under rocks and among aquatic plants, but by far most abundant and visible to lakeshore residents is the burrowing mayfly, *Hexagenia*. Its immature stage, called a nymph, lives in a U-shaped burrow in the soft, bottom muds throughout the lake most of the year. In early summer, the mayfly nymphs leave their burrows and swim to the surface of the lake. At the surface, the back of the nymph opens like a zipper, the adult climbs out onto the nymphal "skin," called an exuvia, unfolds and dries its wings and the sub-adult flies away. They don't fly very far from the lake, molt once into a sexually mature adult and mate in huge swarms over the lake. The females lay their eggs in the lake by repeatedly dipping down and depositing the eggs just under water surface. The eggs slowly sink to the bottom, hatch into nymphs, thereby repeating the life cycle.

It's those exuviae that accumulate in rows and make the windrows more prominent than even bubbles and foam. I got questions from the public about what those things were in rows on the lake. Even more so, I received complaints when

the exuviae piled up on their beach and began to decompose and stink. I reminded the callers that mayflies are extremely important to the lake's health, and that the inconvenience of their accumulated mass and smell did not last long. The adults are without biting mouthparts and are completely harmless to humans. In fact, the adults simply are breeding "machines," that have no digestive system, and only live about 48 hours. Furthermore, the nymph and adults are an important food source for lots of kinds of fish in our lake, and one of the best indicators of the health of the lake ecosystem.

Foam Most callers were puzzled and concerned about what they called "soap suds" on their shoreline. I assured them that the foam was not soap suds; rather, the foam is a naturally occurring byproduct of decomposition of plants and animals in lakes and oceans. You see the same thing in rivers below rapids, waterfalls and dams. After an organism dies, bacteria breakdown tissues and cells into elemental substances including carbohydrates, fats and proteins. It's the latter that gets frothed up by waves and turbulence during windy conditions, just like what you see after beating egg whites (proteins) with a mixer. Bubbles form first and coalesce into foam as the wind and waves persist. After the wind dies down, that's when the foam accumulates on the shore and has the appearance of soap suds. State natural resource managers still must get calls about "soap suds" like I did because the Michigan Department of Environment, Great Lakes and Energy (EGLE) has a fact sheet on their website, "Foam: A Naturally Occurring Phenomenon." I did, however, suggest to parents that children should not put the foam in their mouths just as they should not purposely drink lake water because of the possible presence of harmful pathogens.

So, now you can tell your family and friends what those parallel lines of foam are on our lake and what causes them. And when you see the foam on your shore, it's not soap suds.



Photos of the adult (left) and immature (right) burrowing mayfly. It is the "skins" called exuviae of the immature mayflies that accumulate in easily visible windrows and pile up on beaches in large numbers after they emerge as adults in early summer. Sources: Adult photo by the author and immature mayfly from: depositphotos.com.



U-M Biological Station Activates Snowpack Sensor to Study Changing Winters

*Chrissy Billau, Communications Specialist
University of Michigan Biological Station*

Across the state of Michigan and the region, the growing number of rain-on-snow events is reducing snowpack and washing away nutrients from soils to our streams and lakes.

This winter, researchers at the University of Michigan Biological Station along Douglas Lake are strengthening their snow science with new technology to track the snowpack at an hourly rate and get a deeper understanding of the complexities of global environmental change. The lab of Dr. Aimée Classen, director of UMBS and a professor in the U-M Department of Ecology and Evolutionary Biology, installed a high-frequency snow-depth sensor at the 10,000-acre research and teaching campus at the end of November. “Winters are changing, and those changes will impact forest productivity and aquatic water quality,” Classen said. “We are working on a high-tech scale-up of our ongoing, on-the-ground, manual monitoring so we can explore how winters are changing across Michigan and the Midwest.”

Snow discreetly helps regulate the flow of nutrients throughout the ecosystem by providing an insulating layer — a warm blanket — so the soil and root systems underneath do not freeze very deeply, allowing microorganisms to do their important winter chores that later feed plants in the spring and summer.

For 44 years, scientists at the field station have been manually measuring snow depth and accumulation at 8 o’clock every morning as part of long-term daily precipitation data. UMBS data show between 1980 and today that total annual snowpack has been shrinking as daily average temperatures have risen. UMBS has now automated and intensified the snow measuring process. Anyone curious about how much snow is on the ground at UMBS can access the Classen Lab’s live hourly data on the Snowpack Dashboard.

Karin Rand, a researcher in and manager of the Classen Lab, is using the new instrumentation for critical research that aims to capture the nuances and important patterns that may be masked in annual trends and could better explain the impact that declining snowpack has on ecosystem response. “Weather can change importantly from morning to noon to night,” Rand said. “This sensor will give us a much higher frequency of snow measurements so we understand how quickly snow can accumulate or deteriorate throughout the day.”

The simple setup uses a low-cost sonic rangefinder to monitor the distance between the bottom of the sensor and the ground beneath it. As snow accumulates, that distance will decrease — giving the snow-depth data. The sensor is powered by a small solar panel and takes measurements hourly. The sensor node was designed by the Digital Water Lab in the U-M College of Engineering led by Dr. Branko Kerkez to monitor river depth in watersheds across the state.

A decline in snowpack can have cascading effects because microorganisms that live in the soil are active when there’s a thick blanket of snow on the ground. “This insulation provides enough warmth for soil microorganisms — microbes — to be active in the soil while most plants have halted their growth for winter,” Rand said. “This gives microbes time to eat with no competition from plants. When spring arrives, microbes have converted all sorts of nutrients in the soil into new forms that can be useful to plants, just in time for plants to start taking them up in the spring and summer.”

If there is no snow or the snow turns to rain, soil microbial activity can slow or stop because the microbes are too cold to operate in frozen soil — “leaving our soils with fewer nutrients come springtime when the plants are ready to take those nutrients up for growth.” Rand said that as winter rain-on-snow and flooding events increase, nutrients are at risk of getting flooded right out of the soil and washed from forests, meadows and agricultural fields into water systems when stream communities are dormant, getting lost from the terrestrial ecosystem and potentially leading to a decline in plant productivity. “We want to understand the patterns of nutrient flow because that’s essential to our whole growing season, thinking about our food supply, thinking about forests, thinking about our natural communities and those ecosystems that plants and trees and all of those things support,” Rand said.

This is only the beginning. The Classen Lab is aiming to grow a statewide network of sensors like the one at the Biological Station. “If these sensors work, we hope to deploy them all across the state of Michigan and the Midwest to see how increasing rain-on-snow events and winter flooding are impacting forest and agricultural productivity and water quality,” Classen said. “Ultimately, we would like to pair this with other sensors that will help automate precipitation measurements, specifically rain events. Monitoring rainfall and snow depth at an hourly scale can help us get a clearer picture of how frequent these events occur at the Biological Station,” Rand said.

Watch a video about the snowpack sensor on the UMBS YouTube website



Memorials

The Burt Lake Preservation Association is a community of members and friends. As an organization we are united by the common theme of preservation and protection of Burt Lake and its watershed. As a community we are also united by common attitudes and interests, celebrations, and sorrows. Thank you to the following donors who chose to remember neighbors, friends and family through a donation to the Burt Lake Preservation Association.

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