

the
WATER  COLUMN

The Newsletter of the Maine Volunteer Lake Monitoring Program

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Celebrating the Work of Maine's Certified Citizen Lake Scientists

Fall 2016



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Steve Mortimer	Development Director
Jonnie Maloney	Program Coordinator
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Steve Lambert	Development Assistant

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Cover Photo: Jordan Pond in Acadia National Park, by Jonnie Maloney



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Scott Williams	Steve Mortimer
Roberta Hill	Christine Guerette
Jonnie Maloney, Layout	Steve Lambert

To Contact Us

24 Maple Hill Road, Auburn, Maine 04210
 www.MaineVLMP.org (207) 783-7733 vlmp@mainevlmp.org



President's Message

Bill Monagle
 President, VLMP Board of Directors

In the past, my contributions to *the Water Column* have been representative of what a president's message should be, or so I'd like to think. This year, with most of the southern and central areas of Maine having experienced severe to extreme drought conditions, I believe it has made for some interesting observations on our lakes and ponds. I am channeling my inner lake manager to share some of my thoughts in presenting my message.

As you all well know, the central hallmark of the Maine VLMP is the collection of credible water quality data by certified volunteer lake monitors, who act as citizen scientists keeping a watchful eye on the health of our lakes. Over time, VLMP data has been used largely to assess the current conditions of Maine's lakes and ponds, and whether or not, they are remaining stable, or are improving or declining. This year, Mother Nature has offered us a rather unique opportunity. With stormwater runoff being greatly reduced due to the severe drought, lake watersheds, and nonpoint-source phosphorus pollution (NPS) from stormwater runoff, has to some extent been removed from the nutrient budget equation, thereby allowing us to observe the behavior of individual lakes with minimal external (watershed) influence.

At the Cobbossee Watershed District in south-central Maine where I perform my day job, a cursory review of Secchi disk transparency (SDT) data collected by the CWD staff, as well as VLMP

certified lake monitors from several of our lakes, was somewhat revealing. For instance, a couple of our lakes that regularly suffer significant late summer and early fall algae blooms, driven to a large extent by internal loading of phosphorus from bottom sediments, bloomed again this year, but only after a relatively clear stretch. Other lakes that tend to suffer similar algae blooms, but with the suspected driving influence being NPS pollution from their respective watersheds, experienced unusually good water clarity throughout the summer. And finally, several lakes that generally have relatively undeveloped watersheds and typically exhibit very good water clarity throughout the summer behaved normally this season.

As I mentioned above, I've only glossed over the data from this year, but I believe the data collected under these unusual circumstances could provide insight into the degree that watershed-based phosphorus pollution influences water clarity in individual lakes, thereby guiding strategic support for prescribing appropriate actions for lake management.

My point being that data collected by volunteer monitors, I believe, in some cases may prove invaluable in the decision-making process when progressing from the lake monitoring stage to successful lake management.

For a broader discussion on how the lakes of Maine responded to the drought conditions this past summer, I invite you to check out Scott Williams' article on page 16. ☘

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Lakeside Notes

Reminiscing

It feels as if only a few years have passed since the VLMP went through the transformation from being a program in state government (Maine DEP) to a nonprofit organization. In 1996, I was asked by a transition committee to consider leading the process, and agreed to do so with some trepidation. I wasn't confident that my background in lake science was the best fit for nonprofit management. Fortunately, my colleagues and many of you, have provided invaluable guidance and support, and two decades later, I find myself still here writing this column!

During the past twenty years, the VLMP has grown substantially, in the number of certified volunteer lake monitors (approaching 1,400), the number of Maine lakes being monitored (about 450), and the scope of the work of the organization, which has expanded to include more comprehensive water quality monitoring, invasive aquatic species screening and prevention, lake watershed assessment, and

participating in research projects that have helped us learn more about Maine's lakes.

From day one (1971), the VLMP has been a grassroots initiative, and so it remains today. My role with this organization has been largely that of a facilitator – simply guiding an inevitable process, thanks to all of you. Whether you see yourselves as volunteer monitors, citizen scientists, lake stewards, or all three, the powerful force that has driven the growth and effectiveness of the VLMP is *your* passion and determination, and the powerful conservation ethic that defines your work. *You inspire all of us to support your efforts!*

All of us here feel privileged to work on your behalf. Speaking from personal experience, what has so strongly motivated me from day one has been the many opportunities that I have had to interact with you: at workshops, getting to know and discussing your lakes, helping you work through equipment challenges, finding easier and more cost-effective ways to access



By Scott Williams
VLMP Executive Director

information, and making sure that you receive recognition for what you have done on behalf of our clear, clean lakes.

In addition to being the longest-standing statewide citizen lake monitoring program in the nation, Maine's VLMP is now an internationally recognized entity, known for its unique partnerships and collaborations that encompass nonprofits, local, state, regional and national agencies and organizations and hundreds of lakes. If you think this sounds impressive, remember that the VLMP is where it is today thanks to all of you. So, give yourself a good pat on the back, and keep up the good work! 🍷

Enter Secchi Disk Readings Directly from Your Cell Phone or PC!

Two years ago, we created a website to enable VLMP certified lake monitors to enter Secchi disk readings and observations on a web page that is accessible to the general public. The web page was developed as a preliminary quality assurance step for more comprehensive online data entry in the future. However, the site also allows the general public to learn about current conditions in Maine lakes throughout the monitoring season. *Last summer, the site averaged more than 5,000 visits/month!*

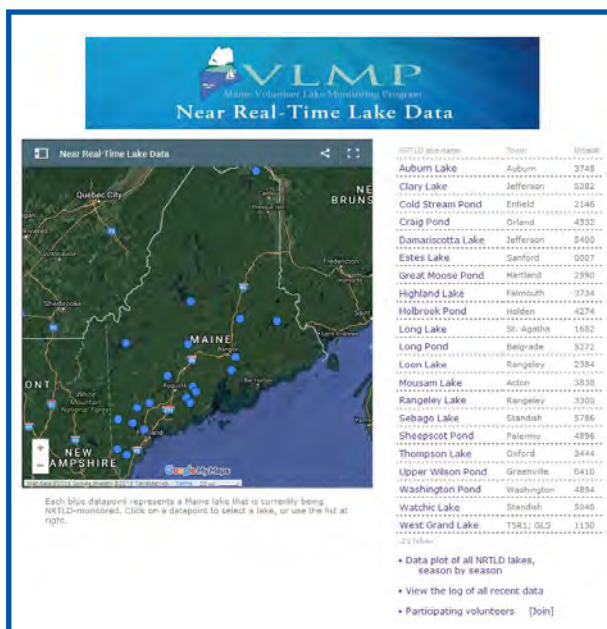
The website shows the location of all participating lakes on the opening page, and there is a separate page for each lake, which shows each reading entered, the date that

the reading was taken, and any comments/observations from the lake monitor, whose photo is included on the lake page, as well. *An automated graphic program tracks the*

readings over time, and displays the image along with the data for all participating lakes. Historical data for each lake can be accessed from the lake pages, as well. In addition to Secchi readings, ice-out dates for your lake can be entered on the website.

All that it takes to enter a Secchi reading is a cell phone or PC, and a password. Or, if preferred, readings can be phoned in to the VLMP, and we will enter your data. We are hoping to expand the number of participating monitors and their lakes in 2017. You can sign up and activate your lake page any time by contacting us via email or phone. You will then receive your password, and your account will be activated when we receive your first Secchi reading next summer. To view the NRTLTD website and map, please visit www.mainevlmp.org/near-real-time-lake-data/, and click on the blue NRTLTD banner.

We look forward to hearing from you! 🍷



Littorally Speaking



by Roberta Hill

VLMP Invasive Species Program Director

Invasive Plant Patrol Jump-Start on the Waters of Acadia



With a surface area of nearly 1000 acres, and roughly fifteen miles of shoreline, Great Long Pond in Mount Desert, is MDI's largest lake, as well as one of its most popular tourist destinations. The 2016 Acadia Jump-start team conducted a complete level-3 IAP screening survey on Great Long Pond, Somes Pond, and Echo Lake. We are very pleased to report . . . **no aquatic invaders were found.**

Passionate concern for the lakes of Maine . . . a deep connection to nature . . . the enjoyment of spending time outdoors (especially on lakes) . . . a natural bent toward lifelong learning . . . the desire to work as part of a team to achieve something that would be difficult—if not impossible—to accomplish alone . . . the chance to spend quality time with friends, family and others doing something valuable and purposeful . . . These are just some of the reasons people tell us that they decide to get involved with Maine's Invasive Plant Patrol. During our recent IPP Jump-Start experience on Mount Desert Island, all of the above and much, much more came together spectacularly, in the form of our 2016 Acadia Jump-Start Team. The Acadia Jump-Start expedition—a mission carried out primarily by trained volunteers including many of Maine's most experience patrollers—exceeded expectations on every front!

The goal of the IPP Jump-Start is to promote and support citizen-based early detection efforts in areas of the state where such activities are currently lacking. The VLMP works to accomplish this through: 1) organizing a survey team—comprised primarily of seasoned volunteer Invasive Plant Patrollers, supported by VLMP staff—to conduct a comprehensive aquatic

plant screening survey and native plant inventory on one or more target waterbodies; and 2) helping to “jump-start” a locally sustainable citizen-based monitoring program in the region through outreach, training, and direct interaction with the host community. IPP Jump-Start was piloted in 2008 on Maine's largest lake—Moosehead. *(To learn more about Jump-start and the Moosehead project, please check out the VLMP's short 8.5-minute documentary, **The Hunt for Aquatic Invaders**, online at www.mainevlmp.org/hunt-aquatic-invaders.)*

Having accomplished the survey at Moosehead Lake, the team began considering our next undertaking. The answer came early in 2016 when we were approached by Jesse Wheeler (Acadia National Park) and Billy Helprin (Somes-Meynell Wildlife Sanctuary). Jesse and Billy—partners on a number of conservation and education efforts in and around the Park—had heard about the Jump-start program and the success of the Moosehead project, and were wondering if the VLMP team would be willing to take on one (or more) of Acadia's most vulnerable lakes while helping to activate a local volunteer IPP effort. Given their excellent water quality and pristine ecological health on one side, and their higher-than-average vulnerability due to tourism pressure on

the other, the lakes of Acadia had been on our short list of possible projects for years. Our response to Jesse and Billy was a swift and enthusiastic—*yes!*

A call went out, the team was assembled, four days in mid-September were set aside for the expedition, and—after much planning and preparation—the team set out for Acadia. Other than a brief bout of thunderstorms and an occasional troublesome wind, the weather conditions could not have been more amenable to the task at hand. We thoroughly enjoyed the gracious accommodations that had been arranged for us by our hosts, and found ourselves repeatedly in awe of the breathtaking environs. We made many new friends in the community, and had great fun as a team—working together, sharing our discoveries, and—when time allowed—simply hanging out in spirit of comradery. All this, while accomplishing way more than we had ever hoped to. *The 2016 Acadia Jump-Start mission was, in other words, a fabulously successful venture!* Here is just a brief glimpse of some of the accomplishments:

~ Comprehensive (Level 3) Invasive Aquatic Plant screening surveys were



The Echo Lake survey team was comprised of ANP staff members (L-R) Shannon Wiggin, Shari Latulippe, Jim Burka, Alex Fetgatter, Adam Thime, and Jesse Wheeler; in addition to Billy Helprin (SMWS), Bunny Wescott, Bob French, Sibyl French, Sherry Pettyjohn, Ellie White, Lea Stabinski, Dennis Roberge, Willis White, and Roberta Hill (taking the photo). Team members not pictured here are Sue Carrington, Tom Larned, Toni Pied, Ross Wescott, Mark Whiting, Katherine Whiting and Keith Williams.

“We are very thankful for the experienced ‘IPPers’ who came from all over the state to help kick off a local IPP effort on MDI. Great people, great results, great fun!”

**Billy Helprin ~ Director
Somes-Meynell Wildlife Sanctuary**

completed on three MDI waterbodies: Great Long Pond, Somes Pond, and Echo Lake. **NO AQUATIC INVADERS WERE FOUND!**

~ Native plant inventories were completed on all target waterbodies. The team found several native aquatic plant species that had not previously been recorded on these waterbodies (during earlier surveys—it



Attendees of the IPP Plant Paddle at Somes-Meynell Wildlife Sanctuary, study and sort the aquatic plants they and others had collected during the paddle, learning how to determine if a plant is “suspicious,” and what to do if a suspicious plant is found.

must be said—that were conducted by highly skilled, professional botanists). Team members Dennis Roberge and Keith Williams may also have found an arrowhead species that has never even been recorded in Maine! (We are planning to collect a second voucher specimen from the colony in 2017 to confirm this finding; we’ll keep you posted!)

~ The Plant Paddle at Somes-Meynell Wildlife Sanctuary on Saturday was very well-attended and received. As a result of this event, a number of new local Invasive Plant Patrollers were trained and activated. Some attendees liked what they experienced so much, they enthusiastically joined the team, lending their watchful eyes and newfound plant identification skills to the surveys.

~ Volunteer team members got a chance to work closely with professional Park and Sanctuary staff, affording a unique opportunity for a lively exchange of knowledge and experience, in which much gained on both sides.

~ In addition to having some of Maine’s most experienced volunteer aquatic plant surveyors (and Moosehead Jump Start team veterans) lending their experience and expertise to the effort, additional experienced Patrollers from around the state came forward to join the 2016 team. The result was truly awe-inspiring, and may very well go down on record as one



Plant Paddles provide a fun, on-lake learning experience for people of all ages.

of the most competent, effective, and efficient citizen-based scientific research expeditions in Maine history!

I once again find myself tremendously heartened and grateful to have been part of something that proves without doubt, all that can be accomplished when people come together to protect what they love.

What’s next? We have already begun to explore the possibility of returning to Acadia next year to survey some additional lakes, and to continue to build upon the local IPP momentum. If it looks like this project is going to move forward in earnest, we will certainly need all the IPP help we can get. Perhaps even YOU will decide to join us! So please stay tuned! 🌿

2016 VLMP Workshop Season at a Glance



WQ Stats

- 3: Water Quality Training Workshops
- 2: DO & Temperature Workshops
- 14: Re-certification Workshops
- 106: Secchi Simulator Re-certs
- 129: In-person Re-certs
- 68: New WQ Volunteers
- 19: Added Lakes



IPP Stats:

- 385 people attended 1 or more:
- 6: IPP Plant Paddles
- 5: IPP 101s (44 certified)
- 2: IAP Manual Control
- 1: IPP Field Methods
- 1: How to Conduct a Plant Paddle
- 1: Courtesy Boat Inspection Demo
- 1: Advance Aquatic Plant ID
- 1: IPP Leaders' Roundtable



QUALITY COUNTS!



Blooming Onion, Blooming Flower, Blooming Lake???

We need your help. Many years ago, DEP posted lakes with reported algal blooms on their website. Over the past decade or so, the number of lakes posted has gone from 12-15 down to zero! Unfortunately I'm well aware that we have yet to eliminate algal blooms in Maine lakes, although I wish I could say otherwise. After thinking about it, I suspect that the loosely organized 'system' that somewhat worked...for a while...is in dire need of replacement. This is where you can help!

I brought this up to Scott Williams, and as a result we have decided that it is time to eliminate the middle-person and empower our competent volunteers. In 2017, we envision that a volunteer will be able to go to the VLMP website and enter the name and MIDAS number (lake ID), date and 'offending' Secchi disk reading (below 2 meters) into a table that would be available for viewing by any lake enthusiast. It wouldn't take very long to enter that information and we would be guaranteed that it would not be lost enroute. To

prevent malicious entering of transparency readings, we will come up with a password-protected means for you to do this.

Attention: Dissolved Oxygen Meter Owners

Snow is about to fly! Lakes are about to freeze! Loons are rafting, readying to depart! Time to protect your investment. Remember the discomfort when writing the check to purchase your meter? Perhaps you were thinking... 'this is expensive'...and wondering, 'will it work'... 'will it last'...

I have good news! If you properly winterize your meter, you will extend the life of your fragile device. **FIRST**– Remove the batteries (use them up in a flashlight or remote); plan to install new batteries in the spring. **SECOND**– Winterize the probe. To do this, 1) gently unscrew the protective cage from the probe, 2) carefully remove and discard the membrane, 3) drain the electrolyte, 4) rinse the probe with distilled or deionized water (tap water is the last resort), 5) lightly blot the probe dry, then 6) loosely place the probe and detached cage

by Linda Bacon
VLMP Quality Assurance Officer;
Aquatic Biologist, Maine Department of
Environmental Protection

into a baggie to keep dust off it (by storing disassembled there will be no question that a new membrane must be installed come spring). **THIRD**– Place the meter back into its case for winter storage. Choose a warm, dry location for storage because storage in any other location will promote condensation on sensitive electronic components during the wide temperature swings we experience during the colder Maine months. And **LAST**– breathe a sigh of relief. You have been a good steward of your device. Rest assured that the likelihood of it working properly when all emerge from hibernation has been increased considerably! 🍀

Grant Funding Available to Lake Groups for Conducting Watershed Surveys

The VLMP has received grant funding to support a limited number of Maine lake communities that are interested in organizing and conducting a volunteer citizen lake watershed survey. The funding is available on a competitive grant basis through the VLMP for surveys conducted during the next two years.

Lake watershed surveys conducted by community volunteers can be a very effective tool for identifying and resolving land use problems that may be having a negative influence on lake water quality. Another benefit of watershed surveys is an increase in overall public awareness about threats to lake health. Citizen surveys of lake watersheds have been successfully conducted for many Maine lakes during the past three decades. The surveys

typically identify significant numbers of relatively easy-to-detect and resolve problems associated with soil erosion. Details concerning the process of conducting a survey can be viewed at: www.maine.gov/dep/land/watershed/materials/lakewatersurveyguide.pdf.

Watershed surveys can be a very effective way of building community support for lake protection by bringing together people with diverse ecological, economic, recreational and social perspectives, thereby enhancing the long-term stewardship potential for a lake. Interested individuals representing lake communities (lake associations, conservation commissions, road associations, etc.) should contact Scott Williams at the VLMP for additional information. 🍀



Concerned citizens on Sabbathday Lake pose for a group photo before heading out into the watershed to conduct their survey.

Spiny waterflea, an invasive zooplankton, continues to spread eastward from the Great Lakes where they arrived in ballast water from Europe and Asia. This tiny crustacean now occurs in New York and Vermont (in Lake Champlain). Most recently, a new population was detected in Indian Lake in the Adirondacks. Up until this detection, Indian Lake was considered to be the Adirondack's largest invasive-species-free lake. An angler, who was fishing in a deeper section of the lake, collected the spiny waterflea on his fishing line. The long spine of these tiny creatures are easily caught on fishing line, especially on down-rigor lines used to fish in deep water.



Spiny waterflea (*Bythotrephes longimanus*). Photo courtesy of Dave Brenner, Michigan Sea Grant College Program.

Spiny waterfleas range in size from 1/4 to 5/8 inch long as adults (about the width of a pencil). They feed on other native zooplankton that young fish rely on for food. This can lead to less food for sport fish such as lake trout and salmon. Because their long spines make them both difficult to consume and digest, spiny waterfleas do not make a good replacement food for young fish. In addition, spiny waterfleas can pose a nuisance to anglers who constantly have to remove them from fishing lines and the clogged eyelets of their fishing rods. Often, this ability to attach to fishing line and boating equipment, is what allows spiny waterfleas to hitch a ride to new lakes. The species can also be



Two adult spiny waterfleas on the tip of a pinky finger. The specimen on the left has offspring in the brood pouch on its back. Photo courtesy of APIPP.

Under the Hand Lens:



Adapted from a press release

issued August 23, 2016 by the Adirondack Park Invasive Plant Program (APIPP).

easily transported in the standing water of boats and bait buckets. Even out of water, a spiny waterflea and the small eggs located on its back can survive for several hours, the time it would take a boat from the Adirondacks to travel to Maine. 🌿



Hundreds of adult spiny waterfleas clumped together on fishing line. Photo courtesy of APIPP.

To prevent the spread of spiny waterflea and other hard to detect invasive aquatic species, it's important to follow these simple steps:

Clean: Whenever leaving a waterway, inspect watercraft and gear and remove aquatic plants and animals, mud, algae and any foreign debris dispose of away from the shoreline. After leaving the launch area wash all gear with high pressure and soap to kill and remove any microscopic hitchhikers.

Drain: Drain on shore all water from live-wells, bait buckets, bilges and other reservoirs.

Dry: Allow boats and equipment to completely dry for at least five days.

For more information on Spiny Waterflea:

Northeast Aquatic Nuisance Species Panel (NEANS) Fact Sheet
www.northeastans.org/online-guide/guide.html?GuideID=335&quick=1

NEANS Species Card
www.northeastans.org/online-guide/ake-card.php?SpeciesID=17



by Steve Mortimer
VLMP Development Director

Mowing Lakes??

My wife Alice and I had long wanted to live on a lake, but in New Jersey, water clarity is often measured in inches, not meters. In fact, some lakes are “mowed” in order to allow swimming and kayaking. *No kidding!!*

Imagine our delight ten years ago when we saw the pristine waters of Upper Range Pond while on a visit. Our decision to move to Maine was an instant and easy one, and we’ve congratulated ourselves for it ever since!

I enjoyed meeting many of you this summer at the workshops. It’s inspiring to see you pursuing your passion for Maine’s lakes. And your stories about protecting our lakes, in many cases for decades? Remarkable and moving.

Also scary, when I consider what would happen if VLMP didn’t exist. Invasive aquatic plant infestations cause habitat disruption, loss of native plant and animal communities, reduced property values, impaired fishing, degradation of recreational experiences, and enormous, ongoing control costs. Scary indeed. Thank you for doing all that you can to ensure VLMP’s sustainability!

Thanks to the generosity of people like you, VLMP volunteers are protecting nearly 500 of Maine’s 6,000 lakes. That’s a lot, but we can and must do more. I have every confidence that, together, we



www.ausenviro.com.au

can expand our protection of Maine lakes to thousands more in the coming years. We must.

Finally, as many of you know, the necessity to monitor never ends. Constant vigilance is critical. I hope that you also know that you, by far, play the most vital role in this effort. In addition to monitoring, you play a key role in funding the tools, materials, training, and technical support needed to keep our mission viable.

Thank you so very much for all that you do. I look forward to working with you to ensure that our beautiful lakes and ponds are here for our children and grandchildren!

PS: Please write me when you have a minute and tell me your favorite VLMP-related story: steve.mortimer@mainevlmp.org.

Welcome New VLMP Advisory Board Member: Roy Bouchard



Roy retired in 2012 from the Maine Department of Environmental Protection after nearly three decades of working on freshwater protection, most of which has been involved with assessment and protection of Maine’s lakes. As Biologist III, Roy oversaw the Lake Assessment Program at DEP for a number of years, which also included the Invasive Species Program for aquatic plants. While the Lakes Program focused on promoting volunteer action, especially water quality monitoring, it also had an emphasis on habitat protection, applied research in collaboration with several colleges, and such diverse topics as the economics of lakes, watershed protection and shoreline evaluation.

After acquiring an MS in Water Resources Management from the University of Wisconsin-Madison, Roy moved to Belgrade with his wife Susan, where they lived for the last thirty years. Major pastimes include travel, camping, hiking and winter trekking, kayaking, and canoeing along with continued involvement in the Belgrade Regional Conservation Alliance.



National Science Foundation Grant Supports Lake Vulnerability Research Project

For the past two years, the VLMP has partnered with the University of Maine, University of Southern Maine, and the Maine DEP in a research project focused on enhancing Maine's Index of Lake Vulnerability. The project has focused on gathering both physical and social science data, and integrating the two with other known attributes of individual lakes, including hydrology and water quality data. The resulting information is expected to lead to a more refined model for characterizing a lake's sensitivity to a decline in water quality over time.

Year 3 of the project will be funded by a major grant from the National Science Foundation. The project team includes: Aria Amirbahman, Steve Norton and Kacie Fitzgibbon (University of Maine); Firooza Pavri (University of Southern Maine); Linda Bacon (Maine DEP) and Scott Williams and participating lake monitors (Maine VLMP). The NSF found the focus of this multi-year investigating to be compelling and worthy of funding to continue exploring the inter-relationships between physical and social science.



VLMP lake monitors and lake association representatives meet with project leaders to discuss the preliminary Year 1 findings of the Lake Vulnerability Index Study.

For more information on the preliminary social science findings, see Firooza Pavri's article on page 12. ➔

An Evolving Relationship with the VLMP

I love being on the water, feeling the immensity of the sky, the sense of eternity that an undeveloped shoreline conveys to me, the immediacy of the hunt of the osprey or eagle as they patrol the water in search of food, or simply the silence of a morning mist. It does not matter whether it is blowing or calm, I experience a sense of peace on the water that I experience nowhere else, a deep feeling of relationship, of belonging. That is what being on the water means to me. That is why I seek it out.

I first encountered the VLMP several years ago while researching a lake my wife, Lo, and I were interested in. That first encounter led to an opportunity for me to contribute meaningful service and effort to what I saw as important work, even as my encroaching blindness was slowly robbing me of my ability to contribute, at least in the ways I had always been accustomed to.

It meant a lot to me to work collaboratively with the staff, whether helping with mailings, doing light construction work, or just doing whatever I could do to make a difference. I especially enjoyed the ongoing learning about the essence and value of the work done by the VLMP, and meeting the so many wonderful people associated with their efforts. It was not long before I began to feel like a part of the organization, a process that was a natural one, given the open arms with which the staff welcomed any and all of my ideas, whether they made sense or not. I was not just appreciated for what I could do, but for who I was. That meant a lot.

I can no longer drive myself to lakes, to paddle my favorite old haunts, trolling with artificial lures in search of the elusive salmonids I once pursued with great relish. I must find my joy in other pursuits. I can still, however, feel that special connection to the earth, to everything, afforded me by my experience on



by Steve Lambert
VLMP Development Assistant
(Pictured with his Seeing Eye Dog, Razz)

the water. That sense of connection to and through lakes, which I imagine is shared by most people, is what compels me to be a part of the VLMP. So now, as a part-time staff member, I continue to count myself very fortunate for having found the Maine Volunteer Lake Monitoring Program, where most of my current exploits have to do with helping find resources to support our important work of keeping tabs on the pulse of as many Maine lakes as we can, so that we can be poised to move quickly, if and when any water quality degradation occurs, or if an invasive plant rears its ugly head in any of our precious waters. ➔

Save the Date!

The 2017 VLMP Annual Conference is Scheduled for Saturday, July 29th!

Invasive Plant Patrol

Notes from the Front Lines

This issue of the Water Column features several stories that make clear the critical role that VLMP Invasive Plant Patrollers are playing in the effort to protect Maine waters from the threat of aquatic invaders. What is your story? What is the status of early detection in your community? Your IPP experience may be invaluable to your fellow patrollers, as well as those considering getting involved. Please share your stories with us, so we can pass them along! Thank you all for helping to build one of the nation's most comprehensive invasive aquatic plant early detection programs. 🌿

Middle School Students Are Leading the Way!

A team of students at **Spruce Mountain Middle School** (Jay Maine) decided to take on the “LEGO League Challenge,” a friendly competition in which students choose and solve real-world problems. With this year’s challenge exploring ways in which people interact with animals, the Jedi Jaguars (Lily Bailey, Jacob Bryant, Ashley Chicoine, Owen Dow, Evan Farmer, and Aden Richard) decided to focus their attention on some critters that are causing problems for people here in Maine—invasive Chinese Mystery Snails. With the help of their teacher/coach, Rob Taylor, the team started visiting local waterbodies in search of the walnut-sized snails. Imagine their surprise when they did



Jedi Jaguars team member, Evan Farmer, searches for Chinese Mystery Snails in Brettun’s Pond.

indeed find exactly what they were looking for! Researching the known locations of CMS in Maine on the VLMP Lakes of Maine website (www.lakesofmaine.org), the team determined that the snails

they had found in Brettuns Pond in Livermore, had not yet been reported. In accordance with VLMP protocols, the students recorded GPS coordinates for the sighting location, and took a series of voucher photos which they submitted to the VLMP for confirmation. The data they collected confirming Maine’s newest CMS sighting, has now been added to the statewide database and will be added to the Lakes of Maine website soon. In the meantime, the study of CMS continues in the classroom where the team has set up an observation aquarium. The first finding of note is that the snails apparently *love* to eat blanched broccoli. Who knew? *Way to go, Jedi Jaguars!* 🌿

Under the guidance and encouragement of their teacher, Patrick Parent, and Chris Taylor, a local engineer volunteering his time and expertise, students at **Massabesic Middle School** have designed and constructed two distinctly different Remote Operated Vehicles (ROV’s). The ROV’s are currently in the testing phase, being evaluated for their effectiveness in milfoil detection and sampling. The

submersibles, equipped with buoyancy control and underwater cameras, seem especially promising with respect to early-season monitoring. Stems of variable water-milfoil, typically survive the winter by laying down upon the sediments, where they can be hard to detect from a boat at the surface. Rather than having to wait until the water has warmed enough for divers to survey, (when the plants—fully restored to their former vigor—are once more standing erect) this technology allows surveyors to scan areas at depth in search of the ‘resting’ milfoil plants; and when something suspicious is found, to collect a sample.

In addition to ROV development, Pat Parent’s students now regularly participate in IPP 101 training with their lake association member counterparts; create poster-sized depth maps of area lakes for their lake association partners, and host a daylong Invasive Aquatic Species Forum where they present research findings



Massabesic Middle School students have created poster-sized depth maps for area lakes, with IPP survey areas (littoral zones) highlighted.

on a wide array of invasive species, alongside expert presenters and exhibitors from across the state. In addition to informing teachers, students and parents/grandparents about the threat of aquatic invaders in Maine, the Forum is attended by over a hundred additional members of the community. Thanks to Patrick Parent and his students, the future of Maine’s Invasive Plant Patrol in York County is in very good hands, indeed! 🌿



Students Wyatt Johnson (L) and Jeremiah Van Tassel (R) of Massabesic Middle School in East Waterboro demonstrate one of their remote operated vehicles (ROVs).

Invasive Plant Patrol

Toddy Pond Now Has its Own Native Plant Guide

By Lucy Leaf, Certified IPP, Toddy Pond

It started with a few photos. “I took them for my own benefit,” my camp neighbor Linda Jellison told me. For close to a decade, Linda has been a plant patroller for Toddy Pond, a nine-mile-long lake in the mid-coast region. If a plant remotely resembled an invasive, she placed it in a plastic bag and took it to Hancock County Soil & Water Conservation District (HCSWCD) for further evaluation. Once each plant was identified, (thankfully they were all natives) Linda took a photo of the plant and labeled it, so she could remember it for the next year. Eventually, she began sharing her Toddy Pond ‘native plant photo album’ with fellow plant patrollers around the lake.

I’d been patrolling for invasives for the last five years, but I was somewhat stuck at the level of being able to identify only seven or eight native plants. Even those few required review every summer because I usually forgot them one year to the next. I found Linda’s booklet provided a very helpful annual refresher, and with it, my proficiency has increased to the point where I can now identify more than fifteen plants with confidence. There has been another important component to my growing confidence as well. When I first

began patrolling with Linda, she seemed like a paddling encyclopedia to me; her knowledge and enthusiasm got me studying emergent flowers and underwater structures alike, using a magnifying glass to look for serrated edges, noticing various leaf arrangements. With Linda’s companionship and mentoring, plant patrol really started getting FUN; and along the way, I became a better plant patroller!

Toddy Pond IPP team leader and Harvard educator, Bob Levine, was fast to recognize the value of patrollers becoming familiar with the common native plants in our lake. By becoming more familiar with what is native to our lake, we will more readily be able to spot a newcomer. Bob was so impressed with Linda’s photos, he made color copies of the complete album (at his own expense), offering an album to everyone who signed up to help with the surveys. To ensure each team member would also know how to spot invasive plants if/when they encountered them, Bob also purchased a set of VLMP Aquatic Species ID Cards for each participant.

The next step, according to Bob, was to formally publish a booklet; and suddenly things got more serious! If we were going to print the booklet, it had to be absolutely right. Linda claims she is an amateur



Toddy Pond plant patroller and plant guide photographer, Linda Jellison, getting a close-up of pipewort in flower.

photographer with minimal computer savvy; she “simply likes to take pictures of plants.” I have even less talent in either department, but, since my fridge fills up with plants every summer—a sure warning sign of addiction—we decided I was qualified to be the “editor.” Fortunately, other members have the technical skills to get the booklet to the publisher ready to go. With the technical assistance from VLMP staff who provided the final QA/QC check on all of our plant identifications, we have made some adjustments and added some close-up photos of key features.

Soon I will be thumbing my way through my own copy of the *Native Plants of Toddy Pond*, and thinking ahead to next summer’s paddles with Linda. It will be fun to see all of our familiar lake plants, and more fun yet if we discover a new native plant to add to the next edition! 🌿

Tips for Forming an Active Invasive Plant Patrol (IPP) Team

Adapted from Mike Cloutier’s recent VLMP Annual Conference presentation. Mike is a Certified IPP, and the IPP Team Leader for Sabbathday Lake Association.

1. Someone needs to lead the effort. The team leader helps recruit team members, organizes the survey team, provides local technical support, and more. Who should lead your IPP team? If you are reading this, YOU are a likely candidate! If you don’t think you can take this on, on your own, find someone around the lake that feels as you do, and share the duties as co-leaders!

2. Everyone in your community needs to understand the threat. Spread the

word about the threat of aquatic invaders to any and all groups that use the lake, road associations, at all lake functions, to EVERYONE you speak to! The VLMP’s



Sabbathday Lake IPP Team Leader, Mike Cloutier, sharing his tips and enthusiasm with an appreciative audience at this year’s VLMP Lake Monitoring Conference.

short (8.5-minute) documentary *The Hunt for Aquatic Invaders*—available on-line and in DVD format—provides an excellent overview of the issue. The VLMP website www.mainevlmp.org is also a great place to find adaptable PR materials and other helpful resources.

3. Ask for help! When it comes to aquatic invaders, the more eyes on the water, the better. Seek out like-minded (lake-minded) individuals and ask them to join your team effort. Let them know that they can obtain free training and technical support from the VLMP, and that you and other team

...continued on page 23



By Firooza Pavri
VLMP Advisory Board
Director, Muskie School of Public Service
University of Southern Maine

Fostering Citizen Stewardship for Maine's Freshwater Lakes

Citizen science research engages the public in data collection efforts that contribute to the scientific endeavor. Members of the Maine Volunteer Lake Monitoring Program exemplify such work, contributing time and resources to collect systematic data on environmental conditions that affect Maine's lakes. *Beyond data collection and the scientific contributions they make, such citizen commitment can foster a conservation stewardship ethic across local communities.*

Our current project, which includes a partnership between the University of Southern Maine, the University of Maine, the VLMP and the Maine Department of Environmental Protection, seeks to assess the vulnerability of Maine lakes to water quality decline. As part of this study, the University of Southern Maine and the VLMP engaged in a survey of lake associations and VLMP monitors across a study sample of twenty four lakes to examine their role in data collection, monitoring, and conservation management vis-à-vis lake stewardship. These data enable us to build a profile of our citizen stewards. Moreover, we are able to elaborate on the factors that influence their involvement in lake protection and conservation activities and detail the elements they consider important for lake stewardship and citizen participation. *These data will help us assess ways in which engaged public involvement influences the long-term success of conservation strategies and provide insights into how more effective, long-lasting partnerships between citizen conservation groups and scientists can be developed.*

During the summer and fall of 2015 survey data were collected from 342 VLMP members across our study sample

of twenty four lakes. The largest number of respondents (73 percent) were from the sixty years or older age group and 60 percent of those responding were retired. Nearly 80 percent of all respondents had either a Bachelors or graduate degree and 67 percent had an annual income of over \$50,000. When asked to reflect on a description of the work they engage in, respondents favored the terms environmental stewardship (74%), data collection (40%), volunteerism (36%) and community service (21%) over necessarily calling themselves citizen scientists (20%). *The identification of these terms suggests that individuals engaged in such collaborative projects think of themselves as stewards first and foremost, which may also help explain their long-term involvement with VLMP.*

The motivations of volunteers to engage in lake stewardship and monitoring activities is varied and multi-faceted. *While concern for lake health and its future ranks high, equally important to many who responded is a deep sense of personal attachment to the lake and its surrounding and personal satisfaction from contributing to a cause. One of the highest responses received on the question of motivation was a strong belief in, and commitment to, VLMP's mission.* Repeat volunteers build long-term relationships between their peers. The rapport of trust and communication built between them and VLMP also facilitates a sense of community that keeps bringing them back.

Many volunteers live in the vicinity of lakes or are also long-term residents of the lakes they monitor. As such, their insights into lake health can provide valuable historical data. Respondents in our survey are most concerned with negative water quality trends and invasive species affecting their lakes. In addition to these biophysical considerations, concerns over shorefront and watershed development activities and increased lake usage ranked a close second, while concerns over climate change impacts on lakes ranked third. *Given these*

concerns, the focused data collection efforts by VLMP on water quality and invasive species monitoring, watershed surveys, and ice-in/ice-out tracking all contribute to our long-term scientific understanding of the changes our lakes experience.

Long-term VLMP members also have the historical benefit of observing the efficacy of stewardship activities and their first-hand knowledge can help resource managers and decision-makers understand strategies that work and are worth pursuing. Our survey provided some key insights on this front. *Education, communication and outreach to property owners and the general public are identified as key contributors to sustaining stewardship practices and fostering a long-term conservation ethic around Maine lakes.* Encouraging the greater involvement of the younger generation through engaging Youth Conservation Corps and schools by "learning through doing" is also emphasized as important to assist the work of VLMP. Building social capital, or relationships between people and organizations, nested at different scales and involvement levels is identified as critical to maintaining long-term conservation efforts. Finally, respondents identified networks, with supporting institutions like land trusts, the Department of Environmental Protection, Soil and Water Conservation Districts, town and county offices and municipalities, as vital to the longer-term success of lake stewardship.

The insights provided by these survey data enable us to assess citizen engagement and shed light on strategies that can encourage positive conservation stewardship outcomes for Maine lakes. Currently, we are expanding the implementation of our survey to additional Maine lakes. *Eventually our aim is to incorporate these social data with physical science data on lakes to arrive at a more comprehensive understanding of both the social and physical variables that contribute to the vulnerability of Maine lakes to negative water quality trends.* 🌱

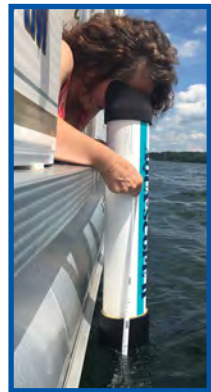
Welcome, New Lake Monitors!

New Volunteer Lake Monitors Certified in 2016

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Lorraine Boston, Bauneag Beg Lake
Charlie Bradbury, Crescent Lake
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James Brogan, Tilton Pond
Jennifer Brown, Androscoggin Lake

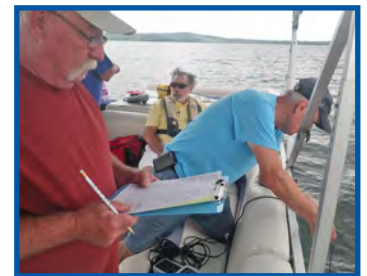


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Arnold Rosario, Little Sebago Lake
Donald Rycroft, Great Pond
Debbie Scialdone, Bauneag Beg Lake
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In Memory Of

*Arthur McCubrey;
from Dale & Bruce McCubrey*

In Kind

And for those of you who have donated your time, expertise, and dedication to the work of the VLMP in the past year—many thanks!

The 2016 Drought, and its Effect on Maine's Lakes

by Scott Williams

Weather and climate have a significant bearing on both short and long-term indicators of lake water quality. Over time, the up and down nature of weather can have varying effects on different lakes, and can be a confounding factor in identifying trends in lake water quality. Extreme weather associated with climate change isn't making the process of trend analysis any easier! But all indications are that, over time, climate change is likely to have an overall negative effect on Maine's lakes.

We tend to think of extreme weather in terms of intense precipitation and temperature swings. *But drought is considered to be an extreme weather event, and climatologists are in general agreement that droughts are increasing in frequency and severity in many regions of the world as a result of climate change.*

According to the National Weather Service, the U.S. Geological Survey, and Maine's Drought Task Force, as of early October, 2016, drought conditions ranged from moderate to severe throughout the State of Maine. Factors influencing this condition accelerated during the past several months. Precipitation was below average in May, June, July, August and September, which, according to the National Weather Service, was the driest September since 1978, and the 12th driest month on record for the southern part of the state. "The drought is expected to continue and expand," said Tom Hawley, of the National Weather Service in Gray. "September rainfall was well below average for the entire state. Many locations in southern Maine received less than one inch for the month."

According to Nicholas Stasulis, Data Section Chief, U.S.G.S., *groundwater levels in some areas of southern and southwestern Maine were the lowest on record for July*

and August, going back 15-35 years. Many streams that normally flow throughout the year have been completely dry for months, and *as of mid-October, three of Maine's largest rivers were at the lowest flow conditions on record.*

National Weather Service records indicate that much of southern and central Maine experienced a relatively warm winter with below normal snowfall. This was followed by warm late winter-early spring conditions that led to the *earliest ice-out conditions on record for many lakes in southern and central Maine.* Ambient temperatures throughout much of Maine were above normal from July through September, which combined

days, which caused Secchi disk readings to drop substantially.

The ways in which drought and other climate-related influences affect lakes can be divided into short and long-term effects, as well as recreational and ecological impacts. The specific attributes of individual lakes (bathymetry, natural flushing rate, watershed development, existing water quality conditions, and more) have a strong bearing on the nature and extent of the ways in which each responds to weather and climate.

One of the most profound ways in which a warming climate is likely to influence lakes is through a shortening of the period of ice cover. Reliable historical "ice-out" data for lakes throughout New England (<https://pubs.usgs.gov/fs/2005/3002/pdf/fs2005-3002.pdf>) document that lakes are free of ice earlier in the spring than they were a century ago. However, the Hodgins study looks only at ice-out dates (because of abundant historical data), and does not take into account the fact that unusually warm weather during the fall/winter period has likely resulted in later

formation of ice cover during that period. Maine weather was unusually warm from September through the end of 2015. The combined effect was a dramatic reduction in the period of ice cover for many Maine lakes, especially in southern Maine. And as many who enjoy skating and fishing on ice will recall, the thickness of the ice was only marginally safe for recreation last winter!

By the middle of March, VLMP lake monitors (and others) started reporting ice-out conditions in southern Maine – up to one month earlier than the historical average for many lakes. These observations

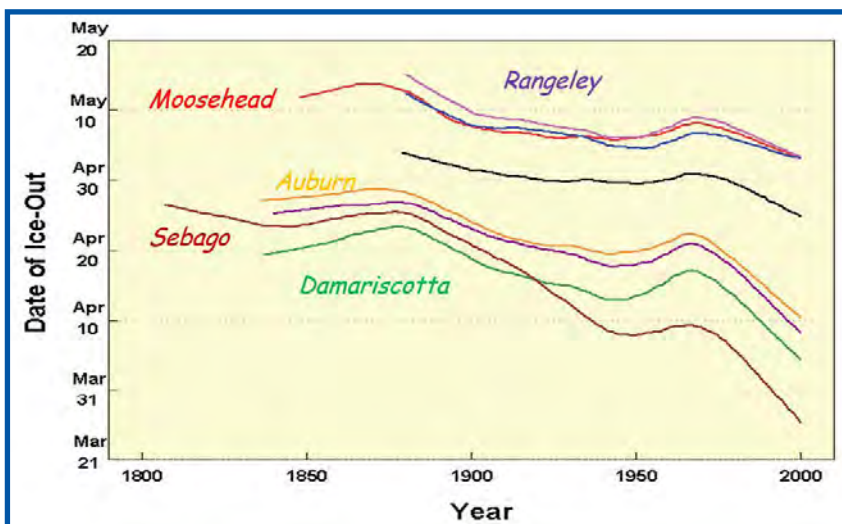


Figure 1: Smoothed lines of ice-out dates over time for the eight lakes in New England with the longest periods of record. The top four lines represent lakes in northern and western Maine and the bottom four lines represent lakes in southern Maine. Source: Hodgins, G.A., James, I.C., and Huntington, T.G., 2002, Historical changes in lake ice-out dates as indicators of climate change in New England, 1850-2000: International Journal of Climatology, v. 22, p. 1819-1827.

with below normal precipitation, led to very dry conditions.

A number of more isolated instances of extreme weather also occurred during the summer months, including highly localized heavy rain events, such as the thunderstorm on June 28 that produced 8 inches of rain over a period of 4-6 hours in Parlin Pond Township, according to Certified Lake Monitor, Dave Drouin. Such events can cause severe soil erosion and flooding, and dramatic swings in indicators of water quality. Dave indicated that Parlin Pond turned "brown" for several

winter snow melt and spring rain, followed by early ice-out. The effects of lower-than-average lake water level vary, depending on the slope of the lake bottom along shoreline areas. **The photo at right**, taken by Bill Baxter on Swan Lake in July clearly illustrates the effect of low water level in lakeshore areas where the bottom is relatively shallow. The impact of drought upon recreation is evident in this photo.



During the course of the summer, lake monitors and lake shoreline communities reported concerns over what many referred to as “more green cotton-candy algae (metaphyton) than they had observed in the past.” Public awareness, and concern over metaphyton during the past decade suggests that there has been an overall increase in the abundance of this type of littoral algae in Maine lakes. Nearly all of the information on metaphyton abundance in Maine lakes is anecdotal/observational. However, when many individuals representing numerous bodies of water report similar observations, it is not unreasonable to assume that they accurately reflect the occurrence of a phenomenon such as this one.

The ecology of metaphyton in lakes is not well understood. Based once again on qualitative observation, there appears to be a relationship between the annual/seasonal abundance of metaphyton in lakes, and early ice-out, which generally results in earlier sunlight and warming of littoral (shallow) areas. If that relationship does exist, the early melting of lake ice in March could be related to widespread greater abundance in metaphyton last summer. An increase



“Clouds” of metaphyton in a shallow cove.

in metaphyton may be linked to changing conditions associated with climate change.

Drought, and associated prolonged low lake water level can result in the exposure of large littoral areas that support native aquatic plants (aka: macrophytes) to drying and freezing conditions, threatening the health of many beneficial ecosystem functions supported by native lake plants. Rooted lake plants physically stabilize lake-bottom sediments, reducing turbidity from wind and wave action. They also tie-up nutrients that could otherwise be available to less desirable cyanobacteria (aka blue-green algae). Lake plants also protect shoreline areas from the erosive effects of wind and wave action, and they provide structural habitat and food for fish and aquatic insects. Extended periods of low lake water level can cause negative short and long-term effects for beneficial lake plants.

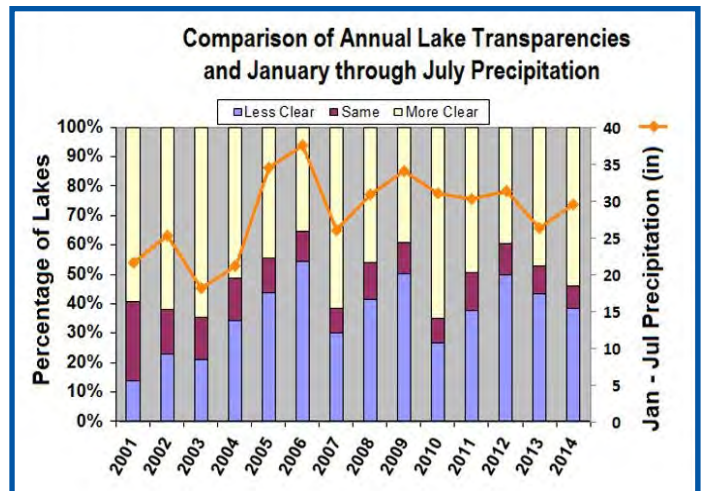
Low lake levels caused by drought can also “de-water” wetlands adjacent to lakes, impacting the many benefits that they provide to healthy lake ecosystems.

The effects of drought on lake water quality vary over time, and from one lake to the next. In the short-term, many lakes may become clearer, because lack of precipitation means less

stormwater runoff, and runoff is the “vehicle” that transports pollutants, such as the nutrient phosphorus, eroded soil particles (and much more) to lakes from their watersheds.

Figure 2 illustrates the relationship between annual precipitation from January through July, and lake water clarity (Secchi transparency) for several hundred Maine lakes from 2001-2014. The chart suggests that many (but not all) lakes tend to be clearer during dry years, and less clear during years of greater precipitation during the period from January through July.

Last summer, many certified lake monitors reported unusually deep Secchi readings for their lakes. Volunteer lake data are still coming in, and it will be



several weeks before we know how the 2016 data compare to previous years. However, given the intensity of the drought prior to and throughout the summer, it is likely that a relatively high percentage of Maine lakes will be shown to have been clearer than their historical average during the past several months. Algal growth in this group of lakes is most strongly influenced by external (watershed) sources of phosphorus. They are typically lakes that have relatively low concentrations of phosphorus, and are therefore easily influenced by incoming sources from the watershed.

However, Figure 2 also shows that while a majority of lakes are generally clearer during dry years, some are not. Lack of precipitation is often associated with

...continued on page 26

2016 LAKE MONITORING CONFERENCE



The 2016 VLMP Lake Monitoring Conference was a great success! With attendance topping out at nearly 130, we once again filled the hall to near capacity. With its charming camp-style meeting hall, well-appointed kitchen, and ready access to the Pleasant Pond waterfront, *The Great Outdoors* has become a preferred venue for these annual VLMP events.



Kudos to 15-Year Lake Monitors Mary Jane Dillingham (L), Adrienne Rollo (R), and accepting the award on behalf of Jack Holland is fellow monitor David Hodson (C).



Lea Stabinski was thrilled to learn she was the the Invasive Plant Patroller of the Year!



Steve Mortimer, the VLMP's new Development Director, spoke to the group on the importance of protecting our natural resources.



Receiving their awards for 10 Years of Service are Lea Stabinski (L), Ken Stabinski (C), and Ellie White (R).



Angi Johnson showed off her "Tattooed Snail" crafts using Chinese Mystery Snails.



Congratulations go to Wilson Lake monitor, Mary Ryan, for 30 years of hard work!



Field Peterson, Auburn Water District's summer intern, shared 2016 plant management practices for the Lake Auburn Watershed Protection Commission.



Long-time lake monitors Keith Williams (L) and Steve O'Bryan received their service awards for 25 years of dedication!



Many thanks to *Old Town Canoes & Kayaks* and our other generous sponsors for such wonderful prizes!



Scott Williams presented findings on the Lake Vulnerability Index Study.



Many thanks to the hard-working "kitchen crew" this year! Pictured are Emily McAlpine (L), VLMP board member Sibyl French (C), and former VLMP board member Phoebe Hardesty (R).

2016 LAKE MONITORING CONFERENCE



Charlie Turner (R) is congratulated for 40 Years of Service on his beloved Raymond and Panther Ponds. Way to go, Charlie!



Dennis Roberge received special recognition for surveying 40 lakes during the 2016 season!



Congratulations go to Willis White, Kennebago Lake monitor, for winning the much-coveted kayak!



Steve Underwood, VLMP's official videographer and creator of Pakpod, is captured on *this* side of the lens!



Lake Monitor Rob Crosby provided information on how to build PVC tubes for monofilament fishing line recycling. *Please see back cover for information on how to participate in his survey.*



Invasive Plant Patrol Team of the Year goes to the Tacoma Lakes IPP Team! Pictured (L-R) are certified Invasive Plant Patrollers Buffy DeMatteis, Diane Clay and Millie Donahue.



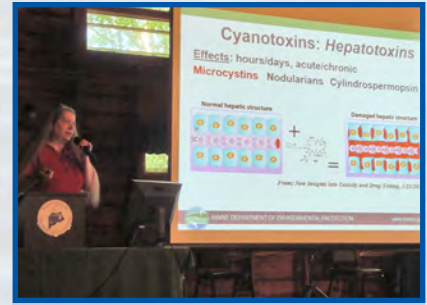
Sonja Behmel of the Université Laval, Québec shared her case-study findings on Integrative Watershed Management.



Maggie Shannon (R) of the *Maine Lakes Society* discusses the LakeSmart Program with Whitney Pond lake monitor, Sylvia Wilson (L).



5-Year Service Award recipients are (L-R) Sandy Muller, Wynn Muller, Roger Cady, Bill Cotter and Brian Friedmann.



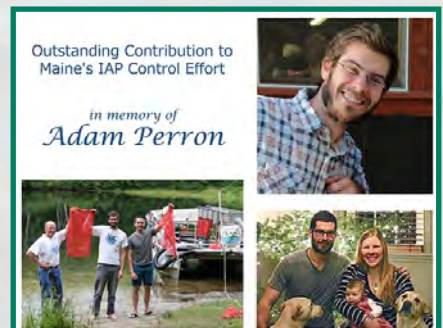
Maine DEP Lakes Program's Linda Bacon discusses cyanotoxins and the health risks they pose to Maine lakes.



The VLMP staff garnered a round of applause for a job well done!



Conference attendees were riveted and inspired by *The Cool Little Culvert* video, contributed by monitors Phine Ewing, Noreen Blaiklock, and Karen Robbins. Well done, everyone!



Outstanding Contribution to
Maine's IAP Control Effort

in memory of
Adam Perron

Remembering and Honoring our Friend and Colleague, Adam Perron.

2016 VLMP INTERNS



Belle Hutchins and Matt Marcus

This past spring, the VLMP was fortunate to have two interns from Bates College: Belle Hutchins and Matt Marcus. Matt and Belle spent several weeks working closely with VLMP staff during the Bates

College short-term. They assisted with the many diverse tasks involved in “gearing-up” for the oncoming summer workshop season, including everything from preparing workshop packets to constructing “bucket scopes” for VLMP Invasive Plant Patrollers. It was a pleasure to work with them, and we wish them well in all their future endeavors! 🌱

This summer, the VLMP learned of an opportunity to acquire a Fall intern through the USM Canis Major Internships Program (MEIF Funded). We applied and were successful in acquiring the services

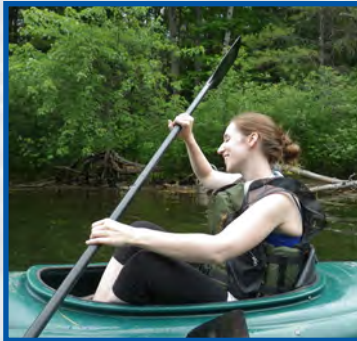


Katia Westcott

of an intern, primarily to help us with our data entry. The help we will receive will have a significant positive impact on our lake data entry process.

Katia Westcott is a senior at the University of Southern Maine, majoring in Environmental Planning & Policy. She's doing a work study with Professor Karen Wilson, dissecting alewives for on-going research. She is the mother of an 8-year-old son, and enjoys outdoor activities including hiking and camping, and is an artist on the side. 🌱

I graduated from McGill University this past spring with an honors degree in International Development Studies. I took an interdisciplinary approach to my education; I focused my studies on economics and environmental development, honing in on the intersection between our economic systems and our ecological landscapes. My educational journey takes me to law school in the fall at the University of New Brunswick where I hope to learn about humanitarian and ecological legal avenues.



Colleen Thrasher

This summer I had the unique pleasure of interning with the Volunteer Lake Monitoring Program where I saw so many of my academic interests come to life within the workplace. For instance, while presenting the introductory invasive plant slideshow at our IPP 101 workshops, I was reminded of the grave environmental and economic consequences of aquatic

invaders— and consequently, I was reminded of how lucky I have been to participate in an internship which has aligned with my academic interests.

My internship with the VLMP has also provided me with some wonderful and life-changing skills. I developed plant identifying abilities that continue to surprise me, gained public speaking experience, and most importantly, I continued to learn how to participate in and actively contribute to a

team – the VLMP is a team of hardworking staff members and volunteers whose dedicated efforts allow the VLMP to thrive. I was privileged to play a supportive role in the healthy functioning of this admirable organization, and I give my sincerest thanks to all those incredible volunteers and staff members who continue to strive to protect Maine lakes, one day at a time! 🌱



Spencer Harriman

This fall I will be returning to Clark University to start my junior year. Although I am excited to return, I have begun to feel as though I will miss it here; the clear night skies, fresh air and the still tranquility of Maine brings about feelings that nowhere else could. As I return to Clark I will resume my studies in geography and biology. I

hope in the future to possibly continue doing work to help in the prevention and control of invasive species. I am filled with gratitude and appreciation for having had the opportunity to be a part of the Maine Volunteer Lake Monitoring Program. I have not until now had the incredible chance to work for such a passionate and devoted organization that has a team of dedicated, hardworking and incredible people. Being a part of the VLMP this summer has been great experience that I am truly grateful for having been a part of. 🌱

The VLMP Model Continues to Spread Around the Globe

¡Holá Bolivia!

by Roberta Hill

Maine's Volunteer Lake Monitoring Program, the oldest and one of the largest citizen lake monitoring programs in the nation, has long been on the forefront of citizen lake science. Over the nearly five decades the VLMP has been in operation, our winning strategy for protecting water resources through direct citizen engagement has been adopted by governments, non-governmental organizations (NGO's), and other lake-oriented groups across the US. We have been pleased and honored to share 'lessons learned' and resources to help to ensure the success of these, our sister lake monitoring programs. More recently, called upon to help our counterparts in three Canadian provinces, the VLMP model of effectiveness and efficiency went international. As a result, many key VLMP resources (protocols, training and reference materials, etc.) have now been translated to French!



the transformation of deeply-rooted social conflict, with a historical focus on environmental issues.) Adam, a US and Bolivian citizen with a keen interest in water resource issues, was introduced to the VLMP by one of our certified monitors.

As Adam learned about the VLMP, (exploring our website, and eventually attending three different VLMP trainings), a grand idea began to form.

As in many places of the world where the impacts of a changing climate, unchecked resource extraction, and long-term drought are already in stark evidence, the people of Bolivia are facing unprecedented environmental challenges. Formidable among these challenges, are the issues pertaining to water. One of the most troubling of these was recently featured on the front cover of the *New York Times World* section: in 2015, Lake Poopó, Bolivia's second largest lake, and vital fishing resource for local communities, essentially dried up. Disappearance of this relatively shallow but vast waterbody (formerly spanning an area of roughly 1,200 square miles) is largely blamed on recurrent drought, and the diversion of the lake's water sources for mining and agriculture. Water scarcity on such a scale is not only alarming; it is environmentally, economically, and socially calamitous.

This summer, our international scope began its migration to the south when we had the good fortune to meet Adam Zemans, Director of the Climate Change and Human Security Program at the Institute for Multi-Track Diplomacy. (IMTD is an international organization whose mission is to *promote a systems-based approach to peacebuilding and to facilitate*

In his Bolivian home city of Cochabamba, Adam is experiencing the effects of water scarcity firsthand. According to Adam, water in his apartment is rationed at between four and six hours a days, water fees are increasing rapidly, and "political unrest akin to that depicted in the award winning 2010 film, *Even the Rain*, is on the rise."

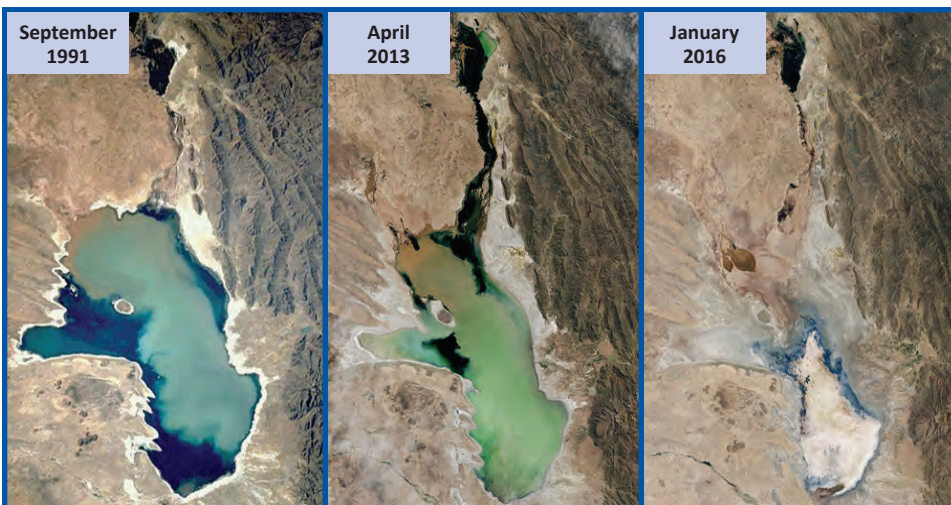


Forced off of their land by the Incas hundreds of years ago, the region's indigenous Uro-Murato people use the totora reed—once plentiful along the edges of area lakes—to build the floating islands upon which they live, as well as Kon-Tiki-like fishing boats (pictured here), and more. Since the die-off of Lake Poopó's fish in 2014, the Uro-Murato have largely lost their way of life, cultural heritage, and economic stability.

And this is where—in Adam's vision—the VLMP model comes in. As local water resources in some parts of the county become scarcer, the need to protect the water quality of these resources becomes ever more critical, and the need to safeguard the dwindling water supply in Bolivia has never been more acute. Local and national governments can, and must, play a role in such an endeavor. However, as Adam learned from his experience with us here in Maine this summer, one of the most highly effective models for protecting water resources over time is one in which grassroots stakeholders also play an active and meaningful role in the monitoring and care of those resources.

The VLMP has been helping to protect lakes through widespread citizen participation in the gathering and dissemination of credible scientific information pertaining to lake health since 1971. Adam became intrigued by the idea that well-trained and properly supported citizen lake

...continued on page 25



Lake Poopó—once Bolivia's second-largest lake and an important fishing resource for local communities—has essentially dried up. News reports blame recurrent drought and the diversion of the lake's water sources for mining and agriculture. Photos courtesy of NASA's Earth Observatory.

Encouraging Environmental Stewardship for the Future

by Bruce Wilson

Whitney Pond Lake Monitor

The mission of VLMP is to “help protect Maine lakes through widespread citizen participation in the gathering and dissemination of credible scientific information pertaining to lake health.” To paraphrase, we use data to insure that our treasured lakes will still be as pristine when our grandchildren’s children come for summer visits.



My lake water clarity tools – a Secchi disk and water viewscope – sit prominently in a corner of our camp porch. Each summer when our grandchildren come for a visit they ask questions about those curious looking implements. This year the two oldest wanted to see them in action. So on one of my measurement trips, my son Nick, his 6-year-old son Brayden, and his cousin, Ella (also 6), joined me in a canoe paddle to the deepest part of the lake. On the way we talked about the importance of regularly collecting information about the health of the lake, the need to sample data from the same spot each time, and trying to take readings at similar times in the day throughout the season. Arriving at the spot, they helped me anchor the canoe and eagerly watched as I showed them the 5-foot marks on the anchor rope. They quickly calculated the depth of the lake.

Next I began to drop the Secchi disk with its metric tape and they peered over the edge as the Secchi disk slowly descended into the depths of the pond. I explained how I could see the disk more clearly if I used my scope and then tested that idea by first having them note how deep it was when the Secchi disk disappeared from bare eyesight. I took my reading and without letting them



Bruce Wilson (L) shows his grandchildren Brayden Doss and Ella Wilson the finer points of taking a Secchi disk reading, along with his son Nick (R).

know my measurement I had each of them use the scope to see what their readings were. Their first attempts didn’t come close to my reading, but with some additional coaching about how to look for even a fuzzy image of the disk, they quickly got the hand of it and each produced a reading within 25-30 cm of mine.

Ella and Brayden were abuzz with excitement when they came back to the camp and told their parents about their adventure, talking about how they helped “make science and how we need to keep the water in the lake clean.” Our wish, as their grandparents, is that one day they will bring their children and grandchildren to our pond and have the same clear water to enjoy and perhaps even carry on the family tradition of testing for water clarity. 🌐

Seeking Candidates for the VLMP Board of Directors

The VLMP is seeking to fill several positions on our Board of Directors. Ideal candidates will have some experience with nonprofit organizations; a basic understanding of the work of the VLMP; and share our belief in the importance of the VLMP’s mission. We are particularly interested in bringing on new board members who have knowledge and experience in the areas of marketing, fundraising and program development. These are volunteer positions.

The VLMP Board of Directors meets 4-6 times annually at the VLMP Lakes Center in Auburn,



Image from www.gias.org

Maine. Meetings typically take place on a weekday morning, and may last until early afternoon. Committee meetings often are scheduled for the same day. Members of the Board of Directors agree to be active in at least one subcommittee.

Please contact VLMP Executive Director, Scott Williams, if you are interested in a position on the VLMP Board, or if you have questions. Following an initial discussion, candidates will be screened and interviewed by the Board of Directors, who will act upon all applications. 🌐

SAVE THE DATE!

2017 VLMP ANNUAL LAKE MONITORING CONFERENCE WILL BE HELD ON SATURDAY, JULY 29TH

~Tips for Forming... continued from page 11

members will be there to help them every step of the way as well. Paddling around the most biologically rich parts of the lake on a sunny summer day, looking for something you hope never to find is fun, edifying, and—if enough people participate—not in the least onerous. It's more like recreation, but with a purpose! As one who has been a salesman much of my professional life, I can tell you with confidence that this is a pretty easy sell. Many people do not just step up to help unless they are asked. *So ask!*

4. Tap into the experience of successful IPP Team Leaders – All of the IPP leaders I have met have been more than happy to share their knowledge and experience. Give one or more of them a call and ask questions. Find out when they have

their meetings and ask if you can attend. Show your community what can be done, and how other volunteers are doing it by inviting experienced IPP leaders to do a presentation at a local community event or lake association meeting. The VLMP can provide you with a list of IPP Leader contacts. Better yet, attend the next IPP Leaders' Roundtable (generally held in early spring) and meet lots of great people who are successfully accomplishing all that you may aspire to. For more information on the VLMP roundtable event, please contact the VLMP.

5. Be consistent, committed, and share your enthusiasm! Once you get going, you will discover resources to support your efforts may be found everywhere you look: from the VLMP, from the Maine

Department of Environmental Protection, from fellow IPP leaders, from your team-members, and from members of your community—many of whom you will get to know through this process. And best of all, you will find that the work—though at times challenging—is interesting, uplifting, often great fun, and enormously satisfying on many levels.

If our lakes are to fend off the threat of aquatic invaders, they need all of the help they can get. *So please join us in this worthy endeavor!* Perhaps I'll see you at the next IPP Leaders Roundtable. Until then, best of luck!!

If you would like to contact Mike, please go to, www.sabbathdaylakeassoc.org and click 'contact,' enter your information, and he will be happy to respond. 🍃

Maine's Latest Early Detection ~ European naiad (*Najas minor*) in Spaulding Pond, Lebanon

By Laurie Callahan, York County Invasive Aquatic Species Project (YCIASP), Founder & Coordinator

*F*irst a bit of background. Spaulding Pond is a fairly small impoundment (slightly over 100 acres in size) along the main stem of the Salmon Falls River, the waterway that defines part of the ME/NH border in York County. Maine's most prevalent invasive aquatic plant, variable water-milfoil (*Myriophyllum heterophyllum*), has been known to occur in Spaulding Pond since 2008. Variable water-milfoil has also been documented at several locations along the Salmon Falls River below Spaulding Pond, all the way down to South Berwick. Last year, another aquatic invader, European naiad (*Najas minor*) was found just upstream, in the Milton Three Ponds system in Lebanon, a situation which begged the question: was *N. minor* also present downstream, in Spaulding Pond? Answering this question by conducting a survey was one of YCIASP's goals for 2016.

Members of the York County Collaborative IPP team were invited to join me to survey on September 22, but in the end were not able to due to other commitments. So, on that morning, with survey gear on board, I launched my kayak onto Spaulding Pond. The conditions were perfect—sunny, warm and calm—and it

was an easy paddle up to the north end, where the Salmon Falls River and Great Brook enter the pond. Having surveyed the pond in the past, I know this area of the pond has abundant aquatic plant growth. A number of different aquatic plant species intermingle here, including variable water-milfoil.



Author, Laurie Callahan, surveys Spaulding Pond in search of European naiad (*Najas minor*). Laurie's early detection, followed by a swift response by the DEP, has greatly enhanced the probability that this invader will not become well-established in the pond.

I continued up the Salmon Falls River, and had paddled upstream about ¼ mile when, to my dismay, I spotted what I was quite sure was European naiad. (This plant is somewhat tricky to distinguish from our native naiads, but after my experience becoming familiar with the species in the Connecticut River since 2004, and at Milton Three Ponds since last September, I have learned to readily recognize it.) Though I was troubled by my find, I was

somewhat relieved that it appeared the growth in this area was limited to two very small patches. I carefully collected specimens, noted the lat/long coordinates for the infested sites, and headed back into Spaulding Pond to return to the launch. On the edge of a stand of pickerel weed, along the northwest (New Hampshire) shore, I noticed another, larger patch of *N. minor* (approximately 100 square feet). Again, a sample was carefully collected, coordinates recorded and a buoy marker placed at the location.

Two weeks later, with the species identification confirmed, a survey team led by Maine DEP staff and comprised of experienced surveyors—all with extensive recent exposure to *N. minor* in Milton Three Ponds—gathered to conduct a more thorough (Level 3) survey of Spaulding Pond. In addition to myself, the team included Karen Hahnel and Denise Blanchette (DEP), Dennis Roberge (VLMP IPP & YCIASP volunteer), and Missy Brandt (York County Soil & Water Conservation District). The weather was once again perfect, and we completed the survey in a few hours, finding just four additional infested locations (each a single plant only), and all occurring on the NH side of the pond. Our findings suggest that the *N. minor* infestation was found within two or three years of its initial

...continued on page 25

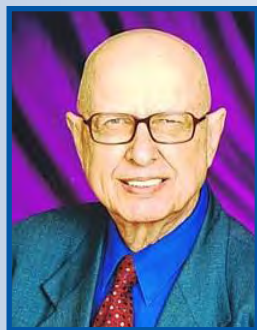
Passings

David Brainard grew up in Westbrook, and graduated from Northeastern University with a B.S. in Physics. He later married Edith Everts and they had a son, David Jr. After having worked for the Navy as a sonar analyst, he started a successful contracting and masonry company in Connecticut. In 1999, he and his wife moved to Twitchell Pond, in Greenwood.



David Brainard

David joined the VLMP in 2002, and was a lake monitor for over a decade. He and his wife enjoyed traveling, sailing, and being surrounded by family and friends.



Charles Chapman

Charlie Chapman passed away at age 77, survived by his wife, JoAnn, their children, and a large extended family. He was extremely active in many organizations and associations, including radio, civic, sports and alumni groups, and was also a ham radio operator. He enjoyed sports, coached youth baseball teams, and was a big fan of the Boston Red Sox. Charlie was the water quality monitor on

his beloved Raymond Pond for nearly 20 years, and will be missed by family, friends, and his community.

Don Collins dedicated his life to his family and friends, and to making the community a better place for all. He grew up in Rumford, graduated from Dixfield High School, and received a degree in Agriculture Resource Economics from the University of Maine in 1973. He was employed by the United States Department of Agriculture, and later became the Resource Conservation District coordinator for Aroostook County, until his retirement in 2009. Don joined the VLMP in 2015, and was the water quality monitor for Nickerson Lake in New Limerick.



Don Collins

We care deeply about Maine's volunteer lake monitors. If you would like to share news of a monitor's passing, please contact us.

Joe Emerson was a VLMP lake water quality monitor for 40 years, and worked closely with the Cobbossee Watershed District on Narrows Pond in Winthrop. Joe was committed, reliable and always very humble about his long-term achievement. Very few individuals have reached such a historic milestone in the history of monitoring the health of Maine's lakes.



Joe Emerson



BJ Kittredge

Barbara J. Kittredge graduated from Bates College in 1978 with a BS in Physics. She worked for AT&T in NJ for 25 years, and accumulated 20 patents with the company. BJ and her husband, Paul Faustine, moved back to Maine in 2002, and in 2005 she joined Bath Iron Works as Principal Engineer, and worked on the new Zumwalt-class DDG1000.

In 2013, BJ and Paul moved to Echo Lake in Mount Vernon, where she became the water quality monitor for the VLMP.

Bob Lord was a VLMP water quality monitor on Damariscotta Lake for several years. Always reliable, and a stickler for details and accuracy, he was personable and eager to understand how his work benefited the lake that he and his family had enjoyed time together on for many years.



Bob Lord

He delighted in bird watching, studying nature, and sailing on Damariscotta Lake. He was also an active volunteer with the Damariscotta Lake Watershed Association.



Heather Walton

Heather Walton was born and lived in NJ, until she and her husband William moved to northeastern Maine in 2006. Before moving to Maine, she was a registered nurse, and later joined the advertising staff of the *Asbury Park Press*. In 2007, she became the VLMP water quality monitor on East Grand Lake in

Weston. In 2011, she took up painting with acrylics and was an accomplished landscape painter.

~The VLMP Model... continued from page 21

scientists can not only gather the essential information needed to understand and protect lakes, but also—often quite naturally in the process of learning how to gather this vital data—become increasingly active and knowledgeable stewards and key leaders in their lake communities, providing incalculable additional benefit. And he started wondering, “Can a Maine Volunteer Lake Monitoring Program-like initiative work in Bolivia? If so, what would it look like?”



Adam Zemans (L) and the co-proprietor of the Palla Khasa Ecological Hotel, on Island of the Sun, Lake Titicaca. Palla Khasa is one of several lakeside eco-lodges that are interested in participating in Bolivia’s new citizen lake science initiative.

Adam identified two key regions as most urgently in need—the drought stricken area surrounding Cochabamba, and the catchment of Bolivia’s largest lake, Lake Titicaca. Working with VLMP staff, Adam translated materials gleaned from his recent VLMP training experience into Spanish, and set about putting his provocative questions to the test. The first step, taken this September, was to give his VLMP-based Water Quality Monitor training talk in Cochabamba to interested undergraduate environmental engineering and philosophy students at Universidad Catolica. At the conclusion of the talk, ALL in attendance expressed their eagerness to learn more, and their desire to become Bolivia’s very first ‘citizen lake scientists.’ Next, Adam began to meet with local government and NGO officials, leading Lake Titicaca scientists, community leaders and others. To his delight, he found widespread support for both “increasing grassroots participation in these regions as a means to help ensure future of Bolivia’s water supply, and for moving forward with the development of VLMP-type program in some form.” New,

unexpected, ideas have emerged from these talks as well. One particularly exciting prospect envisions a citizen led (VLMP-type) program serving as stepping stone to achieving broader “climate change resilience” goals in the Bolivia.

Though at this early stage it is hard to say just where Adam’s initiative will lead; what we do know, is that movement in the direction of change in the Lake Titicaca region is now well underway, and we stand by to help our youngest ‘sister’ program in any way we can! To our new VLMP amigos in Bolivia . . . ¡la mejor de las suertes! To all of our Maine-based VLMP friends, please stay tuned: there just may be an opportunity for all of us to participate in this promising and exciting new international exchange! 🌱



Adam Zemans presents his VLMP-based Water Quality Monitor training talk to his philosophy and environmental engineering students at Universidad Catolica, Cochabamba, Bolivia.

All photos are courtesy of the Institute for Multi-Track Diplomacy, unless otherwise indicated.

Want to learn more? Please check out these links:

- ◆ Institute of Multi-Track Diplomacy (IMTD): <http://imtd.org/>
- ◆ IMTD’s Climate Change & Human Security Program (CCHS), where Adam Zemans serves as Latin America Director and CCHS Team Leader: <http://imtd.org/programs/173-climate-change-human-security-program>
- ◆ New York Times August 2016 Article “Climate Change Claims a Lake and an Identity”: <http://nyti.ms/29oTHCg>

~Maine’s Latest Early..., continued from page 23

introduction into Spaulding Pond. Several days later, DEP staff and divers returned to Spaulding Pond to carefully remove the invasive plants by hand.

Discussions will be ongoing over the winter and spring to determine next steps with regard to Maine’s newest infestation. One goal for next year will be conducting an IAP survey of the river segment between Milton Three Ponds outlet dam and

Spaulding Pond. And of course, in 2017 Spaulding Pond will be surveyed again and any *N. minor* found will be removed. In spite of the well-established variable milfoil population, the pond will need to be closely monitored for years to come, not only for European naiad, an annual plant that produces many seeds during the growing season, but for other aquatic invaders as well. A 2017 goal for YCIASP will be to assist with building an IPP team

to focus on Spaulding Pond, or that region of the Salmon Falls River watershed.

I feel fortunate that this *N. minor* occurrence was found early, before it had become widespread in the pond. This experience, and my involvement in YCIASP and VLMP’s IPP program since 2004, makes me more appreciative than ever of the work of the VLMP, and for all who are keeping an eye on the health of Maine Lakes! 🌿

WANTED:

Volunteer Water Quality Regional & Data Coordinators

Help with activities such as scheduling re-certification workshops, communicating with volunteers, and lake data entry. For more information, please contact us at vlmp@mainevlmp.org or 207-783-7733.

REMINDER TO ALL VLMP LAKE MONITORS:
Help ensure the 2016 Maine Lakes Report will be complete by sending in any late data today!

~The 2016 Drought... continued from page 17

warm air and water temperatures. And early ice-loss, higher lake water temperatures, and lower water levels can result in an increase in the duration of the period of thermal stratification. This can result in lower summer dissolved oxygen levels in the deepest thermal layer of lakes, which in turn can trigger the release of phosphorus from bottom sediments in some lakes, leading to a phenomenon known as “internal phosphorus recycling.” *Lakes that have existing moderate concentrations of phosphorus, and resulting low Secchi readings, due to the internal release of phosphorus may be less clear during dry years, because even though stormwater runoff from the watersheds of this group of lakes contains phosphorus, the concentration is lower than what already exists in the lake, and flushing from stormwater runoff tends to lower the in-lake concentration through dilution.*

Another negative influence of the lack of precipitation is reduced natural flushing, resulting in an increase water residence time and greater evaporation which can concentrate any existing pollutants in all lakes.

Moderate phosphorus levels and warmer water temperatures associated with drought can also facilitate a shift in the balance of algae in lake water toward cyanobacteria (aka bluegreen algae), which may be associated with the release of toxins. “Harmful algal blooms” (HAB’s) are more

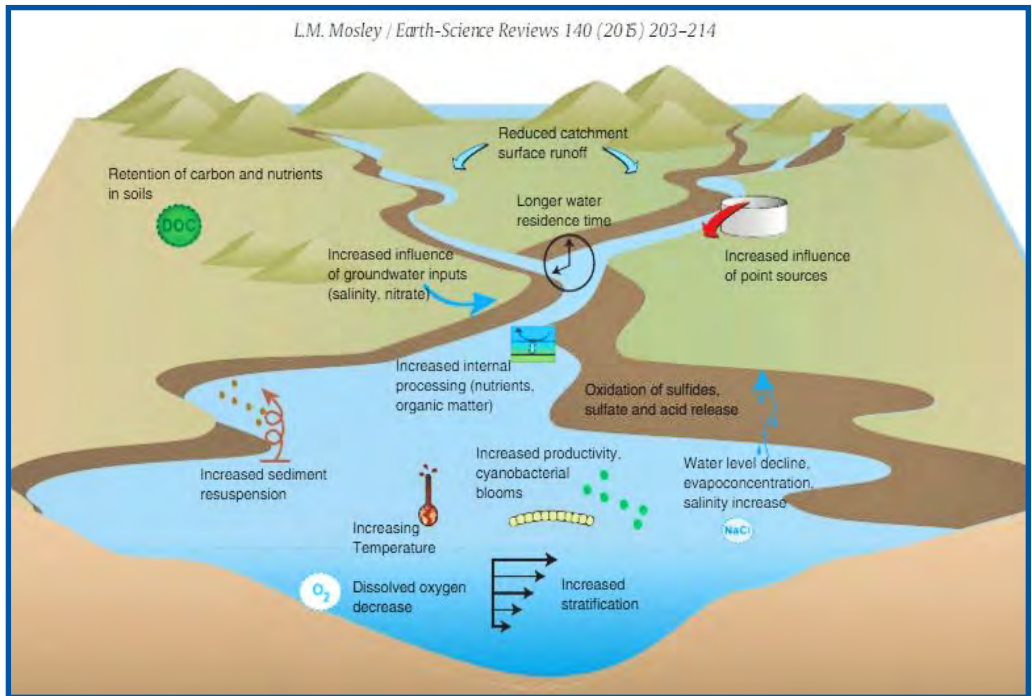


Illustration Source: Drought impacts on the water quality of freshwater systems; review and integration; 2015; Luke M. Mosley; Water Quality Science, PO Box 310, Belair, SA 5052, Australia.

likely to occur from warming in general, and may or may not be associated with drought or excess runoff.

In his *President’s Message* column, Bill Monagle addresses some of the management implications for lakes, based on what we are learning from severe weather events. *Drought offers us a vision of possible clearer lakes, if we are able to effectively protect them from watershed pollutants— especially phosphorus and sediment. But the effects of prolonged drought on wetlands and beneficial native plant communities is less certain, and remains to be seen.*

Roberta Hill’s article on page 21 looks at the effects of drought associated with climate change on a lake in South America, and leaves speculating on whether or not such a scenario could occur here in the future.

Water quality summary data for more than 450 lakes monitored by VLMP citizen lake scientists last summer will be available in early 2017, and will be published in the VLMP *Maine Lakes Report*.

The above sketch is a conceptual representation that summarizes common processes that influence water quality during drought. ☺

Remember to Document Your Lake's Ice Cover

The winter season is upon us, so please be sure to document your lake's ice cover. The VLMP acts as a state repository for ice-in and ice-out records, some stretching as far back as the mid-1800's. Your lake's ice cover data, when paired with water quality



data, may improve our understanding of the relationship between the duration of ice cover and water quality. You can report ice-in/out dates via e-mail directly to Christine@mainevlmp.org, or you can report by phone at 207-783-7733.

SAVE THE DATE!

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Please help in our efforts to complete a statewide survey of monofilament fishing line recycling efforts along the ponds, lakes, rivers and streams of Maine (*such as the PVC tube, shown above*). You may respond by sending this completed form in the mail to the VLMP at 24 Maple Hill Road, Auburn, ME, 04210, or online at www.mainevtmp.org/monosurvey/.

Thank you for your participation!

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Your E-mail Address: _____ Your phone number (____) _____ - _____

Are recycling tubes in use? No Yes Unsure Where are they located? _____

To learn more about this important issue, or how you can build your own recycling tube, please contact Volunteer Lake Monitor Rob Crosby at rcrosby257@roadrunner.com. Results will be published online, and in a future issue of this newsletter.