

Northwest Conservation District

NCD works to conserve local natural resources by delivering technical services and educational programs.

We focus on sustainable resource and energy use, promote ecosystem planning, watershed and open space protection and lower impact development techniques. We serve 34 communities in northwest Connecticut.

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2016 NCD Annual Meeting Celebrates Conservation

Nestled in the western hills in Bantam, Connecticut's newest micro-distillery, the Litchfield Distillery, was host to our annual meeting, Tuesday, October 18th. Jack and Pam Baker, distillery proprietors, treated our guests to a lively tour of the facility followed by tastes of the distillery's five distilled premium spirits hand-crafted from locally harvested grains.

Following the tour and brief annual meeting, four 2016 Conservation Award winners were honored. Retiring state Representative Roberta Willis was presented with a Certificate of Appreciation for her 16 years of unwavering support for the Connecticut Conservation Districts and dedication to environmental conservation and community stewardship in her district. The 2016 Conservation Volunteer Award was presented to

Mary Silks, a Woodbury and lake-front Salisbury resident, in recognition of her extraordinary and selfless dedication to protecting and preserving natural resources through example and advocacy. The 2016 Conservation Award was presented to retiring Watertown town engineer Charles "Chuck" Berger for his advocacy for storm water designs in Watertown's municipal projects that provide long-term environmental benefits for northwestern Connecticut's natural resources. Cornwall First Selectman Gordon Ridgway was presented with the 2016 Conservation Leader Award for his support for sustainable agricultural practices, energy conservation, and environmental stewardship in Cornwall and the Housatonic River watershed corridor.

Following the awards, Litchfield native Scott Tilden, packager and editor of "America's Great National Forest, Wildernesses and Grasslands," shared images and stories from the book's illustrated history of some of the country's greatest national forests. Scott spoke about the challenges in creating his book and those encountered by the federal government in establishing and operating the National Forest System. The Hickory Stick Bookshop provided copies for signing.

The District thanks the Bakers for their welcoming and warm hospitality, Scott for his informative and thoughtful presentation, and all of our District friends and partners that made our annual meeting a success.



L to R: Gordon, Roberta,
and NCD's Sean Hayden

2016 has been a challenging year for NCD and I personally want to thank every one who has supported us. Environmental conservation is only successful when we recognize the value of our natural resources and work together to protect their function and the vital services they provide that make our part of Connecticut such a great place to live. Sean Hayden, NCD Executive Director

2016 - A Wake-Up Call for the Protection of Our Natural Water Resources

On August 20th, the third annual Bantam Lake Day, sponsored by the Bantam Lake Protective Association (BLPA) at the Morris Town Beach, was held despite the mandated beach closure due to the ongoing blue-green algae bloom. This lake-front event has become the BLPA's annual educational "fun day" to draw attention to growing concerns regarding Bantam Lake, the state's largest natural lake. Attendees learned from BLPA environmental partners, including NCD, about lake issues - water quality protection, lake-smart practices, storm water management, Low Impact Development (LID), and invasive aquatic plants and other marine life. This was the 11th year in BLPA's ongoing lake vegetation management program, now under the guidance of limnologist and principal of Aquatic Control Technology Dr. George Knoecklein, to manage nuisance aquatic vegetation and address mid- to late-summer algae blooms common at the lake.

NCD is partnering with BLPA and the Town of Morris to implement LID into the town's land-use regulatory process for better lakefront and water quality protection as part of a CIRCA grant. (See page 5.) These regulatory changes, in combination with the ongoing management programs and efforts by the BLPA to educate its lake community, **WILL** result in lake improvements. For more information on the BLMA's mission and work, visit bantamlakect.com.



So, you ask, what is blue-green algae?

Blue-green algae, or "cyanobacteria," are relatively simple, primitive life forms closely related to bacteria. Called cyanobacteria after the blue-green pigments they produce, blue-green algae and other types of algae blooms can form surface scums up to several inches thick, especially along the shoreline of nutrient rich lakes. Blue-green algae's main nutrient source, phosphorus, is found in a lake's surface water. Phosphorus is directly related to uncontrolled and untreated runoff from septic systems, lawns, houses, farms, and roads in a lake's watershed. In addition, blooms can be triggered by varying uncontrollable climate factors, including low-flow or low-water conditions due to lack of rainfall, sunlight, and warmer than normal temperatures — all descriptive of the summer of 2016. This year's blooms brought additional concern since cyanobacteria, unlike other algae types, may produce toxins. The toxins can harm fish and other organisms as well as sicken people, pets, or livestock if consumed or ingested in large quantities, and can cause rashes or other allergic reactions.



Concerns over algae blooms are nothing new to other western Connecticut lake communities.

In 1975, the Lake Waramaug Task Force (LWTF) was founded by a group of concerned lake residents in response to growing concerns about the lake's decline. Waramaug showed signs of slow decline in the '50s, and the decline accelerated dramatically through the '60s. At the lowest point, continuous algae blooms left the lake so clouded that visibility was only 2 to 4 feet. In response, through the dedicated efforts of volunteers, the task force prepared a lake watershed management plan in 1978 to arrest the inflow of nutrients feeding algae and weed growth. Raising substantial funds from federal, state and private sources to support scientific

research in limnology (the study of lakes), Robert W. Kortmann, Ph.D., a noted limnologist was retained in 1980 to help the task force develop an in-lake program to arrest Lake Waramaug's alarming decline. Since then, Lake Waramaug has been a leader in implementing cutting-edge technology and educational outreach to arrest algae growth in the lake. As a result, in 2016, water clarity was up to 8 to 10 feet, phosphorus readings were at a new low, algae blooms of any type have been very limited, and there are relatively few invasive plant species. For more information on the task force's mission and work, visit lwtf.org.



In the early part of the 20th century, as part of the Housatonic River Hydro Project P-2576, five generating stations were constructed to impound large sections of the Housatonic River and its watershed to drive the industrial revolution. Three of the generating stations built to generate power also created the lakes that we know as Candlewood Lake, Lake Lillinonah and Lake Zoar. These man-made lakes are a source of green renewable energy generation under a Federal Energy Regulatory Commission (FERC) license issued to FirstLight Power Resources. These impoundments, the largest source of green hydro power in the state, have created three growing, diverse lake communities in parts of Bridgewater, Brookfield, Danbury, Monroe, New Fairfield, New Milford, Newtown, Oxford, Roxbury, Sherman and Southbury. These communities are experiencing tremendous growth and increased pressure for both residential and commercial

uses on and around the lakes. Similar to the Bantam and Waramaug lakes, these man-made lakes are not immune from algae growth and overall water quality decline.

As part of its relicensing criteria, FERC requires each of its hydroelectric licensees, including FirstLight, to develop a Shoreline Management Plan (SMP) and accompanying SMM (Shoreline Management Manual) for the use of hydro project lands and water in a fashion protective of the environment and water quality. FirstLight's 2014 SMM, available online, contains key components and requirements for the preservation and re-establishment of vegetated riparian buffers and the use of alternate types of lake shoreline stabilization. Other emerging issues in the manual address the importance of a lake's littoral zone to habitat and the detrimental impacts of seawalls on a lake littoral zone. (See box below.) Complete with design and implementation criteria, including LID

measures and native riparian plant listings, the guiding principles of the SMM can help not only protect but enhance the scenic, recreational and environmental values of all lake front properties but reduce the effects of polluted stormwater run-off to all downstream water resources in any lake's receiving watershed.

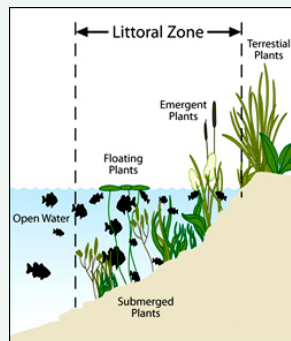
As part of ongoing NCD's educational initiatives with town staff and commissions as well as many environmental partners in our 34 towns, NCD's list of many recent lake, river and watershed environmental initiatives include:

- Lake Washinee, Salisbury. Review of lakeside family compound development with buffer enhancements.
- Lake Wononscopomuc, Salisbury. Consultation on design of two bioretention cells.
- Lake Waramaug, Washington and Warren. Partnership with the LWTF for lakeside land use change proposals.
- West Hill Lake, New Hartford. Support for lakefront zoning regulation changes.
- Hartland Pond, Hartland. Review of road drainage retrofits.

So you ask "what can I do? When asked "what can be done" to help Bantam Lake at the 2016 Bantam Lake Day, Dr. Knocklein's response, as recorded in the Litchfield County Times, was simple. "It's a long-term issue that will need a lot of collaboration between various parties, including homeowners on the lake, to solve. I like to borrow from John F. Kennedy's famous quote and tell people around the lake that it isn't what the lake can do for them, it is what they can do for the lake. We need a change in thinking. Every little thing someone does will help make the lake better and cleaner, and the faster we understand that, the better."

A lake littoral zone begins in the lake at the depth to which sunlight penetrates the surface to lakebed sediments. It contains the habitat for both aquatic and emergent vegetation and continues up onto the land immediately adjacent to the waterbody with shrubs and herbaceous plant. This zone is a key ecotone (region of transition between two biological communities) that in nature contains aquatic plants that absorb natural wave driven energy and provide shoreline soil stabilization. It is considered an important food, shelter and resource area for aquatic organisms including insects, fish, reptiles, mammals and birds, Shoreline shrubs in the zone provide shade and detritus and anchor large natural wood debris at the water's edge. This shallow water ecotone environment is the engine of a lake where the majority of both plant and animal life interact. The health and diversity within this community establish the energy flow dynamics of the deeper water environments. If you envision this buffer zone as the skin of the lake, the next zone, the riparian buffer zone, is the hair on the top of the skin

Excerpts from the FirstLight SMM
www.h2opower.ca/.../Shoreline_Management_Manual_A_Homeowner_s_Guide_to_...
 FirstLight Vegetated Buffer Zones



Environmental Partnership

A Winning Combination

Over the past year, I've been fortunate to work with a number of amazing professionals in the construction of a bioswale on the Northwestern Connecticut Community College (NCCC) campus in Winsted. The Farmington River Watershed Association (FRWA), NCCC, and the Northwest Conservation District (NCD) previously partnered in 2011 and 2013 to create two riparian buffers and two rain gardens that also filter stormwater runoff in two additional areas of the NCCC campus that are adjacent to the Still River. In keeping with this tradition, and by utilizing grants from the Alcoa Foundation, Northwest Connecticut Community Foundation, CT Department of Energy and Environmental Protection, and the Farmington River Coordinating Committee, we were able to begin planning and engineering in mid-2015, and construction was complete in May of 2016.

Because stormwater runoff can be the leading cause of river pollution if not properly managed, NCCC wanted to host this important project to reduce our footprint on the river, listed as "impaired" by the EPA. Working with the existing drainage system, the new bioswale installed at the Arts and Sciences Building (ASB) captures the runoff from a large student parking lot into two water forebays, then directs the water and other runoff into a soil-, microbe-, and plant-based filtration system to break down pollutants. The final result is properly treated, clean water entering the Still River.

After the construction was complete, it was important to stabilize the banks of the bioswale and the check dams. On June 14th, 20 volunteers from the college and community completed the bioswale project by planting 150 plants acquired from the NCD Earth Day Plant Sale and funded by the Northwest Connecticut Community Foundation. The root systems of these beautiful native shrubs and trees further filter the surface water runoff before it reaches the Still River. While we haven't had much rain this summer, the stormwater that has fallen on the parking lot, roof, sidewalks, and neighborhood of the ASB portion of our campus is now filtered through the bioswale before it enters the river.



This project will be used in our ecology, botany, and other biology courses at NCCC. In ecology, students will compare the results with 14 years of previous data from the Still River acquired by NCCC students; they will also monitor and compare water quality entering and leaving the bioswale as well as upstream and downstream of the site. In other courses, students will collect data on the growth and health of the plants in the bioswale over time.

This project was a true partnership: Each organization and member brought expertise, funding, or volunteers to solve the ecological problem they knew could be solved by an installation of a properly engineered bioswale. Eileen Fielding, bioswale project manager and executive director of FRWA, had the grant writing experience to acquire funding from several organizations in the area. Sean Hayden, NCD executive director, had the expertise and experience to supervise and implement the project. Jean Cronauer, NCD development director, used her many years of grant writing to develop funding sources for the project. Steven Trinkaus P.E. of Trinkaus Engineering, LLC, designed the project, and Kevin Greene of 4Evergreen, LLC, of Thomaston did the construction.

Author Tara Jo Holmberg is a biology and environmental science professor at NCCC and a NCD Board member. Tara Jo, named 2016 Community Engaged Educator by Connecticut Campus Compact, was recognized for her role in creating and furthering a culture of engagement through working with campus leadership, supporting faculty/staff engagement, and fostering meaningful community partnerships.



Volunteer and new NCD board member Rusty Warner



Why the Change to Low Impact “Sustainable” Development?

NCD, in partnership with the Northwest Hills Council of Governments (NHCOG) and the Connecticut Institute for Resilience and Climate Adaptation (CIRCA), is working to increase awareness why the change from traditional stormwater management to Low Impact Development (LID) is needed and how to accomplish it. The following is the third part of a five-part series written by Steven Trinkaus, PE, design professional and long-time LID advocate working with NCD as part of this initiative. While the initial focus of LID was on stormwater management, the idea of identifying, evaluating, and preserving the more sensitive natural resources gained traction as this approach would lead to creating sustainable development patterns. Therefore, a more appropriate name for this approach is Low Impact Sustainable Development (LISD).

What Is Low Impact “Sustainable” Development (LISD)?

LISD is an ecologically friendly approach to site development and stormwater management that aims to mitigate development impacts on the land, water, and air. The LISD approach emphasizes the integration of site design and planning techniques that conserve the natural systems and hydrologic function on a site. LISD also embraces the philosophy that rainfall is a resource to be reused and recycled in the environment and not something to be gotten rid of.

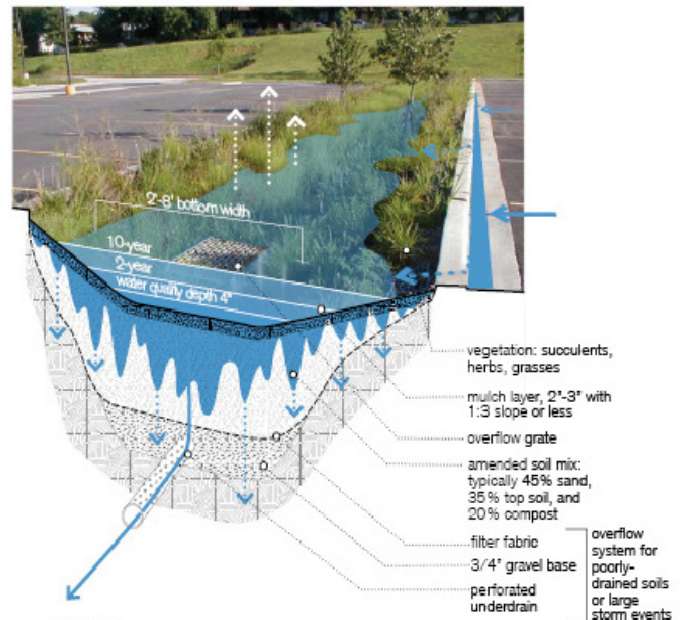
LISD works to manage rainfall at the source using uniformly distributed, decentralized, micro-scale controls. The primary goal of LISD is to mimic a site’s pre-development hydrology by using design techniques that infiltrate, filter, store, evaporate, and detain runoff close to its source, thus creating a site that demonstrates “hydrologic transparency.” Hydrologic transparency is defined as “the use of LISD design strategies and stormwater treatment systems for a development scenario that yields hydrologic conditions matching or in extremely close proximity to the hydrologic conditions of the natural site prior to development.”

In the past 25 years, the concept of LISD and the various types of treatment systems have been the subject of research at Villanova University (<http://www3.villanova.edu/VUSP/>) under the direction of Dr. Robert Traver; North Carolina State University (<http://www.bae.ncsu.edu/stormwater/>) under the direction of Dr. Bill Hunt; and the University of New Hampshire Stormwater Center (<http://www.unh.edu/unhsc/>) under the leadership of Dr. Tom Ballestero and the former director Dr. Robert Roseen, to name a few of the predominant research facilities.

The research conducted by these institutions not only has proved that the concept of LISD works but has refined the design standards and processes for the treatment systems to ensure long-term functionality.

In addition to addressing stormwater quality and volume for small, frequent rainfall events, LISD also includes strategies to minimize impacts of development on the natural land form. There are five tools in the LISD toolbox to address development patterns:

- Encourage conservation measures.
- Reduce impervious areas.
- Slow runoff by using landscape features.
- Use multiple measures to reduce and clean post-development stormwater runoff.
- Prevent pollution.



Bioswale graphic from “LID - a design manual for urban areas”/University of Arkansas Community Design Center

25 YEARS - CT Envirothon

In 2016, CT Envirothon celebrated its 25th year of providing high school students with a yearlong competitive problem solving natural resource event. CT Envirothon provides in-class curriculum and hands-on field experience in core categories of forestry, aquatic ecology, wildlife, and soils. Envirothon, originally called Environmental Olympics, traces its roots to Pennsylvania, where in 1979, state Conservation Districts created the "Olympics" as a way to encourage high school students to become interested in natural resource conservation and environmental issues and careers. In 1991, a newly formed CT Envirothon sent its first team to the national competition. In 2016, 43 schools, including Housatonic Valley Regional, Marvelwood School, Nonnewaug, Northwest Regional 7, and Wamago High Schools, participated in a statewide field day competition at Indian Rock Preserve in Bristol.

Housatonic Valley Agriscience took first place overall, with a stellar presentation on Japanese Knot Weed, as relating to the current issue, "Invasives, a Challenge to the Environment, Economy and Society." Representing Connecticut, the team traveled to Ontario in July to participate in the North American Envirothon. At that weeklong gathering, 52 states and provinces competed for the top spot, with Housatonic placing 15th overall and 6th in the



oral presentation, which had students develop a management plan to address the intrusion of silver carp into a local ecosystem.

This year's current topic, "Agricultural Soil and Water Conservation," is especially compelling to us as we work with agricultural partners in our 34 towns to support them in being environmentally sustainable as well as attracting and retaining young people to live and work in our communities.

In salute to Envirothon alumni, NCD recognizes Cornwall's Brian Saccardi. A 2007 Long Island transplant, Brian joined the Housatonic Agriscience team, a winning team that represented CT at the 2013 annual event in "big sky" Montana and placing in the top 10 North America teams for the second year in a row. Currently enrolled at UConn, Brian has spent his summers interning with Peter Picone, Sessions Woods DEEP wildlife biologist, and Mike Jastremski, HVA Watershed Conservation Director. Brian is often seen with current Housy teams at workshops, mentoring team members with encouragement, as well as working in his hometown community for environmental and agricultural education.

NRCS Financial Assistance Opportunities in Connecticut

The Natural Resource Conservation Service (NRCS) provides financial and technical assistance to agricultural producers through several ongoing programs. NRCS CT has identified water quality, soil health, soil erosion, forestry, and livestock production limitations as state priorities.

NRCS's most popular program, authorized through the Agricultural Act of 2014, is EQIP (Environmental Quality Incentives Program). The program's goal is to address natural resource concerns and deliver environmental benefits such as improved water and air quality,

conserved ground and surface water, reduced soil erosion and sedimentation, or improved or created



wildlife habitat. Additional conservation activities can also be adopted through the Conservation Stewardship Program (CSP).

A second program, AMA (Agricultural Management Assistance Program), helps agricultural producers use conservation to manage risk and address natural resource issues through natural resource conservation. Eligible producers can receive technical and financial assistance to construct or improve water management or irrigation structures, and implement practices to improve soil health and control soil erosion.

For more information regarding these programs, contact your local USDA-NRCS service center. In Litchfield County: 860-626-8258 or on line at www.nrcs.usda.gov.

Renewable Energy and Climate Change Adaptation



I was asked recently to join a panel presenting views on this topic for the Northwest Hills Council of Governments. My chief observation, based on my experience as a solar PV installer, was rather simple: Private residences and profitable businesses in Connecticut are well served by state,

federal, and utility programs supporting solar. Less well served are public and municipal buildings, including town halls, firehouses, and schools; hospitals; and not-for-profits such as water districts, neighborhood clinics, visiting nurses, and food banks, etc.

These, however, are precisely the organizations we would want to see prepared and functioning during any disaster, whether a severe weather event or attack on the grid. If fitted with battery storage, they could operate as independent microgrids to provide refuge for those in need and a base of operations for first responders. This is neither a new idea nor my own; experts on both energy and the environment agree that such “distributed generation” scenarios are the key to energy security. Why then should there be less incentive for these organizations to become energy independent?

For the Connecticut homeowner, solar installation makes great sense due to the cost of electricity (our state consistently ranks among the top three most expensive), coupled with the 30% federal investment tax credit (ITC). Since all costs for both generation and delivery (except the flat meter charge, now \$19.25) are combined in the residential billing rate, every kilowatt-hour produced by a solar PV system is credited at full value.

Unfortunately, solar makes less sense for the public and municipal organizations listed above. Since they are not-for-profits, tax breaks aren’t useful, and their commercial rates, which bill demand charges separately, make the return from solar investment poorer: With non-residential electrical billing, solar lowers the cost of only the generation portion of the bill (the actual cost of the electricity) but does little for demand charges, which are levied on the maximum power a facility uses in a given period. And it should come as no surprise that to lessen any adverse financial impact from solar, our utili-

ties have been raising their demand charges (35% over the past three years) even while the generation rate has fallen (by 45%). This has made solar installation increasingly less attractive for these facilities.

Why are we making it harder for our town halls, schools, and hospitals to benefit from solar, whether to save money or in preparation for becoming emergency microgrids? It seems to be a simple case of the right hand not knowing what the left is doing, well-meaning but independent bureaucracies failing to identify a common goal. And the choice may not be easy. A recent article by Joel N. Gordes of the Center for Energy Security Solutions points out that, “However well intentioned, some energy-related mitigation actions currently being taken or contemplated may not consider how they could negatively impact equally important energy-related climate change adaptation options.”

As an example Gordes cites the “Northern Pass,” a 1.3-billion-dollar plan for a transmission line to bring in hydropower from Canada. Although this would boost CT’s percentage of clean power (contributing to our mandated Renewable Portfolio Standard) and thus could support climate change mitigation, it is likely not the best plan for climate change adaptation, for which we must assume a grid disruption. In case of a cataclysmic weather event or cyber attack on the grid, are we better off sheltered in a school or town hall that is energy independent through on-site renewable energy, or hunkered down with a 900-mile extension cord? Where is that \$1.3 billion best spent?

To see how the powers that be are thinking about this problem, I turned to the Connecticut Climate Change Preparedness Plan, a 2011 report by the Governor’s Steering Committee on Climate Change (GC3). The potential conflict—that what mitigates climate change may not be a successful adaptation strategy—is indeed noted (p. 89) in a bulleted point encouraging construction of alternative energy sources to reduce emissions. This is the single mention of solar energy in the entire plan. Even more alarming is only a single mention of “distributed generation,” and that under “Long-term Strategies” in Appendix A (p. 105). This does not inspire confidence that we have charted a clear path to incorporating renewable energy sources into plans for climate change adaptation.

Author Ray Furse manages the sales and marketing for Litchfield Hills Solar. Ray established the Warren Clean Energy Task Force and serves on the board of directors of Solar Connecticut and NCD. Source of logo - Milton Glaser and Itsnotwarming.com

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Conservation Calendar

www.conservect.org 860-626-7222

December 13th - 16th Annual Connecticut League of Conservation Voters (CTLCV) Environmental Summit, Riverfront Boathouse, Hartford. To register, visit www.ctlcv.org.

December 17th - March 9, 2017. Shepaug Eagle Observation at FirstLight Shepaug Hydro Station, Southbury. For reservations, call 800-368-8954 or visit www.ctaudubon.org.



SAVE THE DATE: April 22 - 24. NCD's 35th Annual Earth Day Plant Sale at the Goshen Fairgrounds. For order forms, available March 1, 2017, call 860-626-7222, email us at ncd@conservect.org, or order online at nwcd.org.

Blue-green Algae - A Wake-up Call



What's wrong with this bucolic photo of Bantam Lake on the front page of the Register Citizen August 16, 2016?

Accompanying this front page photo, was the "wake-up call" description written by reporter Ben Lambert, warning that "Clear skies and cooler temperatures on Wednesday didn't help the condition of the waters of Bantam Lake, which remains closed this week because of a toxic bloom of algae. Litchfield's town beach, Morris town beach and Sandy Beach, also in Litchfield, stayed closed to swimmers, after a directive from the Torrington Area Health District."



The answer is the toxic bloom of blue-green algae as shown above. See pages 2 and 3 for how we can all work together to be part of the solution.