Ask Eartha

I've heard a lot about blue-green algae in ponds and lakes. Are algae blooms harmful? Can we do anything to stop them?

– Darlene O., Bristol

Cyanobacteria, also called blue-green algae, are an important part of the natural life cycle of rivers and lakes. They are the base of their ecosystem's food chain and through photosynthesis produce oxygen that the other organisms in the lake depend on.

However too much algae can cause problems. Algal blooms have become more frequent as a result of eutrophication, when an excess of nutrients in the lake causes an explosion of algae growth. Blooms can cover large sections of the water's surface, blocking sunlight from bottom-dwelling plants. These plants can no longer produce oxygen or food, and as they die and decay actually use up more oxygen from the water. Decomposition of the algae also decreases oxygen levels which can cause die-offs of plants, fish, and other aquatic organisms. **Climate change** is contributing to the increased frequency of algal blooms as well.

Cyanobacteria have also been known to form **Harmful Algal Blooms**, or HABs, as certain types can produce toxins that are unsafe in high quantities. Though the National Ocean Service estimates that less than one percent of algal blooms are HABs, it is difficult to determine whether a bloom is harmful just by looking at it. Frequently, communities and lake associations don't have the resources to determine if an algal bloom is toxic or not. Because of that, many lakes, ponds, and beaches may be closed if an algal bloom has grown big enough to be a possible risk. Once a bloom occurs, there is not much that can be done to easily get rid of it.

Excess nutrients that can cause a bloom find their way into the water from runoff carrying fertilizers, animal waste, and seepage from failing septic systems. The good news is that you can help to prevent algal blooms by maintaining your property in an environmentally-sound way.

One of the major nutrients contributing to algal blooms is phosphorous, often found in commercial fertilizers. In Connecticut, it is against the law to use a fertilizer containing phosphorous unless you are establishing new grass, or a test was done on the soil confirming it lacks phosphorous (**Spring 2013** *P2 View*). As a general rule, don't fertilize your yard if you are expecting a heavy rainfall and leave a buffer zone between the fertilized ground and the water's edge if you live on a stream, river, or lake. Follow the instructions on your fertilizer and don't over-fertilize your garden or lawn — less is more! Lawn clippings left behind after mowing can reduce the need to fertilize your lawn, but can also be washed into storm drains and surface water, so try not to mow your lawn before a rainstorm. Taking care of your septic system and throwing your pet's waste in the trash will also help to reduce nitrogen, another nutrient that contributes to algal blooms (**Winter 2016** *P2 View*).

If you do notice an algal bloom in your area, you should call your **local health department** to report it. Algal blooms can make the water appear cloudy or thick, like pea soup. They can also form a mat of scum or foam on the water's surface as if someone had spilled paint in it. It is best to avoid entering the water until the proper authorities have investigated the bloom. Don't let your dogs drink from the water, or any nearby connecting streams if you are unsure if the bloom is a HAB. And be sure to pay attention to any warning signs. For more information, visit **www.ct.gov/deep/bluegreenalgae**.

Eartha

Eartha answers selected environmental questions. Email your question to **judith.prill@ct.gov** and watch future issues for your answer.

Wait 'til 8 to use energy intensive appliances like washing machines, dryers and dishwashers. It will help control peak demand and have a positive impact on air quality and the cost of electricity.

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For a free subscription, please contact Judy Prill at 860-424-3694 or **judith.prill@ct.gov**. Save postage and paper by signing up to receive *P2 View* electronically at **www.ct.gov/deep/p2view**.

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Please consider the environment before printing out this newsletter.

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- **The National Science Teachers Association (NSTA)** promotes ***"Better Professional Safety Practices"*** that should be followed to help schools avoid problems.
- Federal and CT OSHA have requirements for schools, including training and carrying out a **Hazard Communication Standard and Laboratory Standard** to make it a safer work place.
- Schools can take action and begin to **Rehab the Lab** using a database of chemicals, safety hazards and environmental toxicity, and a collection of least-toxic chemistry for use by K-12 schools. Some of the most popular lab experiments have been revised to include micro-scale techniques and substitute least-toxic chemicals for hazardous ones.

Parents can also play a role by finding out what your child's school is doing to prevent pollution from chemicals and who has been designated as the school's chemical hygiene officer. They can remind their children to follow all classroom safety procedures and discuss what these are.

How schools can minimize risks:

1. Get OSHA required safety training.
2. Use a safer, less hazardous chemical or experiment.
3. Use demonstration videos and computer simulations to avoid large amounts of toxic chemicals.
4. Use micro-scale experiments and only purchase the amount needed. Make sure the budget allows for the appropriate and legal disposal of any leftover chemicals.
5. Read labels and know what the hazards are for each chemical; store all chemicals in their original container with a label and date.
6. Conduct an inventory of the chemicals on-site and use up as much as safely possible.
7. Dispose of all **hazardous wastes** properly.

Environmental Wins from 2016 Legislative Session

The legislative session wrapped up with some "wins" for pollution prevention:

Pollinator Health: **Public Act 16-17** restricts the use of pesticides that are particularly devastating to bees and other pollinators. This law will reduce the spraying of neonicotinoids and will put in place a program to protect and increase pollinator habitats.

Packaging Reduction: **Special Act 16-6** tackles the growing problem of waste from consumer packaging. This law establishes a task force made up of members with expertise in the packaging industry and in solid waste management, as well as with public and private sector partnerships that have resulted in a reduction of waste and an increase in recycling.

Energy:

Public Act 16-135 sets the framework to improve electric rates for EV charging and help ensure that EV parking spaces will not be occupied by non-EV vehicles and are available for use when needed by EV owners. The Act also takes important steps toward removing obstacles to the introduction of hydrogen electric vehicles — helping Connecticut stay at the forefront of emerging vehicle technologies.

Public Act 16-216 expands the virtual net metering program by $6 million for municipalities that were in the process of developing solar and other renewable energy projects. The program allows local governments to allocate the power to municipally-owned facilities.

Public Act 16-116 cleared the way so that Connecticut's Shared Clean Energy Facility Pilot program can get started. The program will allow electric customers who can't install solar panels on their homes (due to site conditions or because they don't own the home) to subscribe to a larger, shared clean energy facility, like a solar farm or fuel cell.

For a summary of environmental bills by the CT League of Conservation Voters, visit **http://www.ctlcv.org/**.

CT Manufacturer Banks on Solar

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ways to reduce the amount of energy they use. For example, it has replaced the exterior lights with more efficient LEDs, and plans to upgrade the interior lighting as well. DACRUZ is also looking for more energy efficient equipment such as air compressors and air dryers. The company is ISO 9001 certified and was a 2016 **GreenCircle** Sustainability Awards finalist.

If you are interested in installing renewable power at your business, contact the Connecticut Green Bank at **www.ctgreenbank.com**.

Rehabbing the School Lab

Hands-on science education is a valuable piece of the learning process. When students participate in laboratory experiments, they learn first-hand about reactions, materials, and equipment and build problem-solving and critical-thinking skills. However, chemicals, equipment and supplies used in science and technology labs, as well as in art and vocational-technical (vo-tech) programs, can pose health and environmental risks.

Over the years, there has been a push to reduce hazardous chemicals in school labs. Micro-scale chemistry, which uses very small quantities of chemicals (milligrams instead of grams), has been adopted by several schools in Connecticut. Still, many local middle and high schools continue to purchase larger quantities than needed and use certain chemicals and experiments when less hazardous alternatives exist. Stockpiles of unneeded chemicals have the potential to spill and injure staff, students and teachers, emit harmful air emissions inside the school building, and cause fires and explosions.

Common hazardous materials found in school labs include metals such as mercury and arsenic, various acids (nitric acid and picric acid), and bases (sodium hydroxide and bleach). Aerosol paints, fixatives, glazes and silica dust from dry clay are found in art classrooms; and solvents, varnishes, and cyanides (for electroplating and metalwork) may be in vo-tech shops. Even 3D printers emit volatile organic compounds (VOCs) and Ultra-Fine Particles (UFPs), which without appropriate ventilation can be a potential health risk to teachers and students.

Totally eliminating hazardous chemicals from schools would be impossible. What *is* possible is to increase overall awareness, require training, and improve purchasing practices, storage, use, and disposal. OSHA requires all school districts to have a trained individual designated as the Chemical Hygiene Officer to manage school chemicals and promote safer operations in classrooms and labs. Some key questions that teachers and school administrators need to ask include: *Should I be using this?, What are the hazards and risks?, Are there safer alternatives?, How much should be purchased so we don't end up with more than we need?,* and *How should we store and get rid of any excess?* Here are some resources that can help provide Connecticut's schools with the answers.

- The **CT Science Safety Network** meets monthly at Wesleyan University and has training throughout the year; the **2016-17 workshops** feature topics for custodial staff, administrators, and art, science and vo-tech teachers on developing a management plan, legal requirements and safety procedures.

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VOLUME 16, ISSUE 3 POLLUTION PREVENTION VIEW SUMMER 2016

NEWSLETTER FROM THE CONNECTICUT DEPARTMENT OF ENERGY & ENVIRONMENTAL PROTECTION

CT Manufacturer Banks on Solar

Thanks to the nation's first green bank, a Bristol, Connecticut manufacturer was able to install 922 rooftop solar panels that will produce approximately 235 KWH of renewable power per year in an economical way. DACRUZ Manufacturing has always strived for efficiency as a contract manufacturer of precision, machined components serving various industries such as fluid control, automotive, dental, firearms, and lock and hardware industries. However, switching to solar power "can be a daunting task," says Betty DaCruz, co-owner with her husband, Victor, "We would not have been able to do it without the assistance gained through the Connecticut Green Bank."

Victor and Betty DaCruz at their manufacturing facility.

There were many vendors to choose from, and many options on how to add renewable power to their facility. The goal was to reduce the amount of energy purchased by 40% and replace it with renewables. The owners met with a few different vendors and chose one based on their comfort with the vendor's knowledge of the solar industry and on the incentives that could be part of deal.

DACRUZ Manufacturing found the recipe for success using a combination of incentives. The Eversource Zero Emission Renewable Energy Credit (ZREC) program provides the company with a payment of $85 per MWH generated for the next 15 years. In addition to the ZREC payment, the company is reaping savings from having to buy less power, a 30% federal tax credit for the cost of the solar project, and the ability to depreciate the cost of the project over the next 5 years. Like they did for DACRUZ, the Connecticut Green Bank helps businesses structure deals that make renewable energy systems economical.

At DACRUZ sustainability is an integral part of its operation, including making sure to recycle oil, cardboard, batteries, lamps, and many other items. In addition to using renewable energy, the company is also finding

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