

Bradford County Lake and Pond Newsletter

Volume 1, Issue 1

Spring 2017

Bradford County Conservation District

Additional Resources:

Penn State Extension:
www.extension.psu.edu/natural-resources/water

PA Lake Management Society: www.palakes.org

National Association of Lake Management Society:
www.nalms.org

- Environmental Protection Agency: www.epa.gov

Inside this issue:

Fish Kills in PA	1
Lake Stratification and Turnover	1
Shoreline Buffers	2
C-SAW	2
Crossword	3
Membership Application	4
PA SWLM Program	6

Fish Kills in Pennsylvania

Imagine this; it's an early spring morning, the sun is shining and most of the snow has melted. You decide to take a walk down to your pond and see if the ice has melted off. You're enjoying your walk, the warm sun softening the crisp of the morning air. As you approach your pond, you take in the light sparkling off the water.

YAY!! The ice is off, time to start casting a line out and see what you catch. You're cruising the edge of your pond when you notice a dead sunfish... A little more walking... a dead largemouth bass. You look up and notice

that the shoreline of your pond is littered with dead fish!! It's then that it hits you in the gut..... FISH KILL!!!

Although winter fish kills



are not common in Pennsylvania, they do occur when presented with a harsh winter, most frequently in shallow ponds with an abundance of aquatic plants. The fish most likely die in the late

winter, but aren't noticed until the ice has melted off. In winter months, when there are prolonged periods of ice and snow cover, fish have to compete with plants for oxygen. During low levels of sunlight and at night, plants actually use more oxygen than they produce, therefore competing with the fish. This is not suggesting that if you remove all the plants in your pond, you will never have a fish kill. Decomposing plant material and mucky bottoms also use up dissolved oxygen. Aquatic plants are beneficial to waterbodies because they do produce oxygen through photosynthesis. (Continue on Page 2)

Lake Stratification and Turnover

39.2°F. What is the significance of this temperature? We hear "32°F" and automatically think, "Ah, yes, that's when water freezes". So, why is 39.2°F so unique? You may be aware that as water cools, it becomes denser and less dense when it warms. A practical example of this

would be if you've ever tried to see how deep you can swim down in a lake on a hot summer's day. You can feel the temperature change from warmer to cooler as you dive deeper. In winter, however, once water reaches the temperature of 39.2°F, its molecules actually start to

expand and become lighter again, sitting on top of the warmer water!! At this point, the water can continue to cool to 32°F and turn to ice. If you are a pond or lake owner, the following facts will help you begin to understand why, during certain times of the year, your pond (Continued on page 5)

(Fish Kill, continued from page 1)

If your pond does have an abundance of aquatic vegetation, it may be beneficial to control them in the summer months to prevent them from using too much oxygen during a harsh winter. Removing any snow covering the ice will also allow sunlight to shine through and aquatic plants to photosynthesize. Drilling holes in the ice can allow air to reach the water surface and oxygen to dissolve into the water-body.

Summer fish kills are a more common occurrence in Pennsylvania, most often happening in late July and early August. When presented with hot, dry weather conditions, ponds with a low flushing rate (the amount of time it takes for water to enter and leave a waterbody) tend to develop algal blooms. Large-scale blooms and the subsequent death of algae will result in the loss of dissolved oxygen in the water-body. If there is a large enough fish population, this lack in dissolved oxygen could result in a fish kill. A few dead fish is not cause for alarm, but a large number of fish of all species and sizes is when there is a problem. Fish gulping at the water surface or snails and crayfish leaving the water and congregating around the water's edge are signs that a water-body is being affected by low dissolved oxygen levels. Treating and reducing algae growth in the early summer is one way to prevent large blooms from occurring. Aeration devices, although pricey, can supply a constant source of dissolved oxygen to a water body, cutting down on algae blooms and therefore keeping your fish alive.

Taking the time to observe and preform some preventative maintenance on your pond could save you the headache of losing your fishery in the future.

Five Reasons Why Shoreline Buffers Are Awesome:

1. Decrease shoreline erosion
2. Act as a filter for sediments and nutrients carried from runoff
3. Barrier to nuisance wildlife
4. Function as habitat for desired wildlife
5. Growing buffers cuts down on time and money spent mowing



SAVE THE DATES!!

1. Pond Construction Workshop on **May 16th from 6pm-8pm**
2. Pond Biology and Ecology Workshop on **October 3rd from 6pm-8pm**

Are you interested in getting:

- Watershed-Specific Technical Assistance
- Mentoring for Monitoring, Protection, and Restoration Plans
- Quality Control for Water Quality and Macroinvertebrate Monitoring

Then you should look into the **Consortium for Scientific Assistance to Watersheds**.

C-SAW is a team of specialists available to provide **FREE** organizational and technical assistance to PA-based watershed groups.

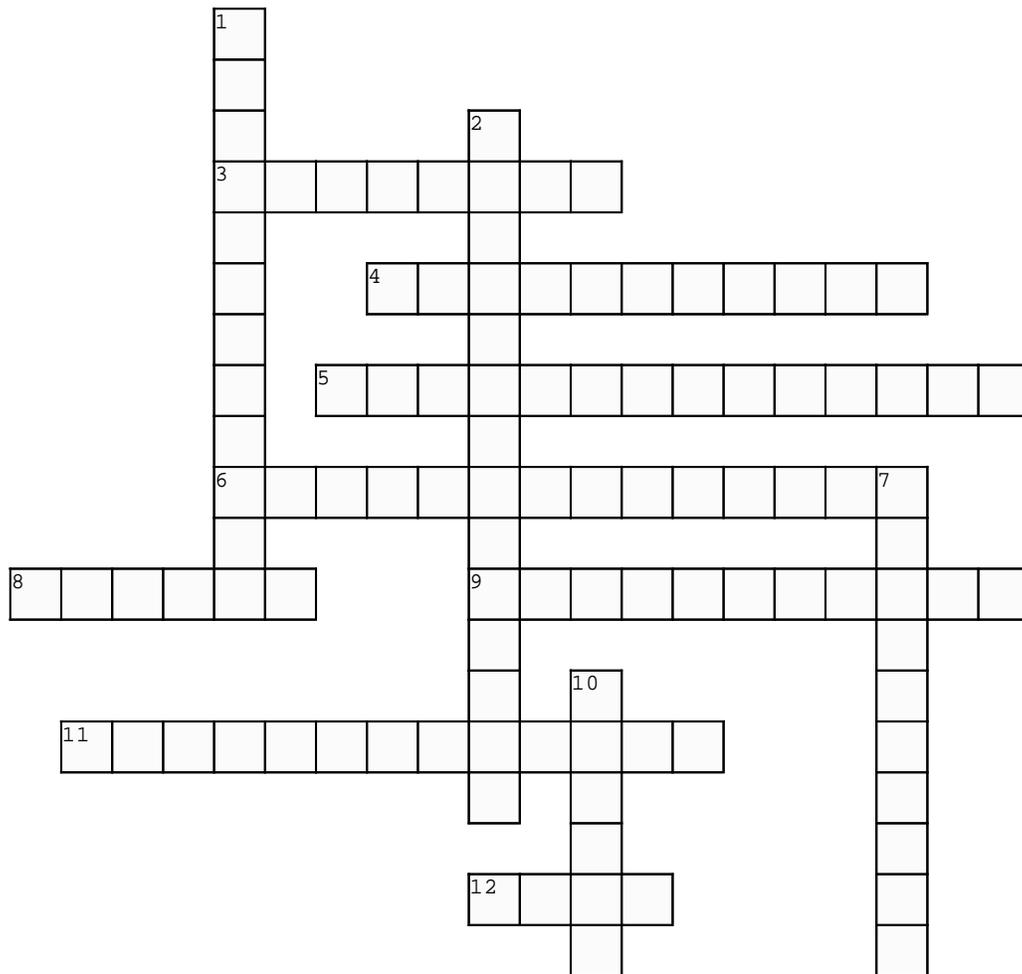
To learn more about **C-SAW** check out the website

<http://c-saw.info/>

For further assistance contact the **BCCD** office

Lake and Pond Crossword

Answers can be found in newsletter articles



Created with TheTeachersCorner.net [Crossword Puzzle Generator](#)

Across

3. Separation into distinct layers
4. Also known as the thermocline
5. The filling in of a waterbody with sediment and nutrients
6. Supplies constant source of dissolved oxygen to a waterbody
8. Decreases shoreline erosion
9. Bottom layer in a waterbody
11. Beneficial to waterbodies because they produce oxygen through photosynthesis
12. Lakes Appreciation Month

Down

1. The amount of time it takes for water to enter and leave a waterbody
2. Not common in Pennsylvania
7. Where photosynthesis occurs in a waterbody
10. Congregate around the water's edge in presence of low dissolved oxygen

Bradford County Lake/Pond Management Organization: A Private Lake/Pond Owner Network

ABOUT THE PROGRAM

Anyone who currently owns a pond or lake or currently has property on one, certainly appreciates the value of that resource. The quality of water, and the way the pond or lake is managed can either enhance or detract from the value of your property. Yet management is not simply constructing a dam and letting the basin fill, or adding herbicide as needed for weed growth. Issues such as where to locate the pond or lake and, once it exists, fisheries management, fish stocking water quality, plant management, rules and regulations, etc. all involve a systems approach. These systems require an understanding of the dynamics of the pond or lake under consideration. With the extremely limited amount of public help for private pond/lake management, the owners are often left to themselves or private consultants. And while consultants are extremely valuable, much of the initial work can be done by the owner with a little guidance or direction.

GOALS AND OBJECTIVES

- Deliver informational, educational and technical assistance to private lake and pond owners in Bradford County
- Assist private lake/pond owners in developing management objectives and plans for their waterbodies
- Provide coordination assistance to communities living around County lakes/ponds in organizing and developing management associations

DIRECT BENEFITS FROM JOINING

- Discounts on informational workshops on current lake/pond management topics
- Informational newsletters
- Training on analytical testing equipment
- Technical assistance in identifying management goals and objectives
- Technical assistance in developing and carrying out management plan

DETATCH AND RETURN WITH PAYMENT

2017 ANNUAL MEMBERSHIP APPLICATION

NAME: _____

ADDRESS: _____

PHONE: _____

LAKE/POND NAME: _____ SIZE: _____

TYPE OF MEMBERSHIP [] \$15.00 Private [] \$30.00 Consultant/Professional

MAKE CHECK PAYABLE TO: Bradford County Conservation District

RETURN TO: Stoll Natural Resource Center

200 Lake Road, Suite E

Towanda, PA 18848

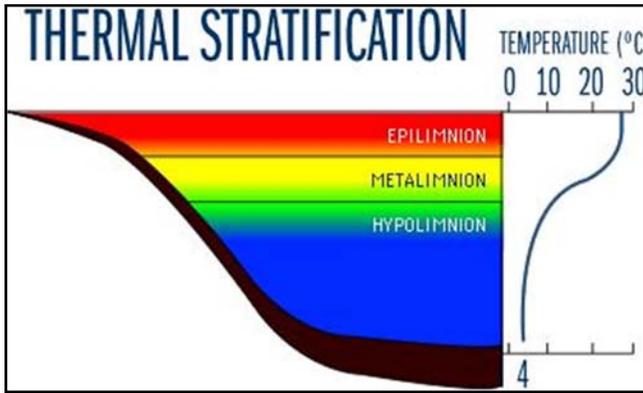


Fig. 2

(Stratification, continued from page. 1) goes from crystal clear to cloudy and brown in a matter of days. In lakes and ponds with sufficient depth, when surface waters warm and become more buoyant in the spring and over the course of the summer, vertical differences in water temperature can cause the water column to stratify, or separate into distinct layers (Fig. 2). The top layer, known as the epilimnion, consists of warmer water and is generally where photosynthesis occurs. The bottom layer, or hypolimnion, usually consists of cooler, heavier water that can become depleted of dissolved oxygen by the end of summer. The metalimnion, also known as the thermocline, is a transition zone and acts as a barrier between the epilimnion and the hypolimnion keeping them from mixing. As the season changes from summer to fall, the warm, more oxygenated surface waters begin to cool, making them denser. When the epilimnion and

the hypolimnion reach an equal density, the waters mix, or “turn over” (Fig. 1), bringing much needed oxygen to the bottom waters and allowing fish to return to deeper waters where they will spend the winter. When mixing occurs, the water in the lake

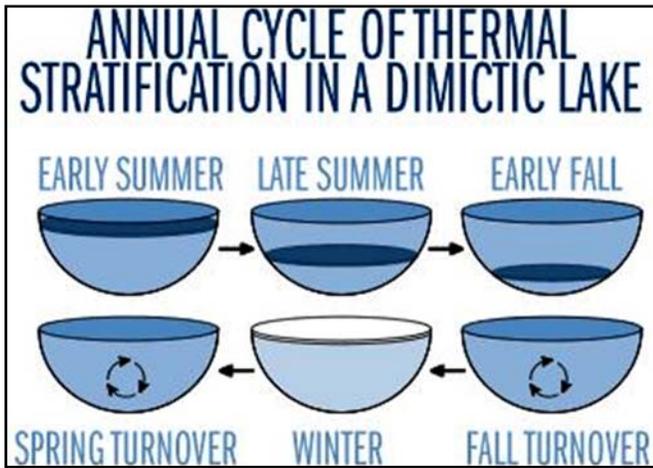


Fig. 1

may help you get a better idea when fall and spring turnover will take place.

reaches an approximate uniform temperature throughout the water column. When the surface waters eventually reach 32°F and cap the waterbody with ice, everything beneath the surface of the ice never gets any colder than 39°F. During the winter months, stratification similar to that of the summer months will occur, but not to as great an extent. Because of the smaller temperature difference in the water column when spring approaches, the melting of the ice layer, winds, and storms are able to create spring turnover with little difficulty. Shallow ponds and lakes may never stratify and turnover because winds keep the waters circulating throughout the year. Deeper lakes will appear clear during late summer, early fall, and early spring. As water temperatures change and turnover occurs, the waterbody will appear murky or dirty. This is because the sediment on the bottom of the lake has been disturbed by turnover and distributed throughout the water column. Monitoring the water temperature as well as the air temperature throughout the seasons

JULY IS LAKES APPRECIATION MONTH

If you'd like to discover ideas on how you can participate in Lake Appreciation Month, please contact the BCCD office or check out these websites!!



www.nalms.org
www.epa.gov/lakes
www.palakes.org





Bradford County Conservation District

Stoll Natural Resource Center
200 Lake Road, Suite E
Towanda, PA 18848
Phone: 570-265-5539 ext. 6



Organization

THE MISSION of the Bradford County Conservation District is *to lead, educate, and empower people to manage resources wisely.*

Check out our website:
<http://bccdpa.com>

PA's Statewide Lake Monitoring Program



Since 2007, the Bradford County Conservation District has been working with the Pennsylvania Department of Environmental Protection to assist with their Statewide Lake Monitoring (SWLM) Program. Funded by an EPA Section 319 grant, Pennsylvania's SWLM Program aims to gather water quality data on public and private lakes throughout the Commonwealth. Monitoring, which includes collecting water samples for lab analysis and gathering field data typically takes place three times a year (spring, summer, and fall) on a given lake. Water samples are analyzed for nutrients, heavy metals, chlorophyll a, and plankton and field data

includes dissolved oxygen concentration, pH, specific conductivity and temperature.

Ultimately, the goal of the program is to determine the relative age or the Eutrophic state of lakes. Eutrophication, which is a natural process, occurs at different rates in relation to how quickly nutrients and sediments make their way into a waterbody. Lakes are often grouped into 4 different categories of eutrophication: Oligotrophic - lakes that are characteristically cool, clear, deep, and nutrient poor; Mesotrophic - lakes that are relatively clear, have submerged aquatic plants, and contain

moderate nutrient levels; Eutrophic - lakes that have excessive nutrients and high biological productivity; and Hypereutrophic - lakes that are highly nutrient rich, suffer frequent algal blooms, and have poor transparency.

Pennsylvania's SWLM Program aims to document areas where human influence plays a role in the eutrophication of lakes (cultural eutrophication) and, in some cases, come up with solutions to help slow down the lake aging process.