

# Centre County Senior Environmental Corps Newsletter March 2020

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## Why is it important to evaluate benthic macroinvertebrates?

Benthic (refers to the bottom of a body of water) macroinvertebrates are commonly used as indicators of the biological condition of waterbodies. They are reliable indicators because they spend all or most of their lives in water, are relatively easy to divided into broad groups (mayflies, caddisflies, snails, crayfish, etc.) to collect and differ in their tolerance to pollution.

Macroinvertebrates respond to human disturbance in fairly predictable ways, are relatively easy to identify in the laboratory, often live for more than a year and, unlike fish, have limited mobility. In fact, because they cannot escape pollution, macroinvertebrates have the capacity to integrate the effects of the stressors to which they are exposed, in combination and over time. Biologists have been studying the health and composition of benthic macroinvertebrate communities for decades.

## What do benthic macroinvertebrates tell us about the condition of water?

Evaluating the abundance and variety of benthic macroinvertebrates in a waterbody gives us an indication of the biological condition of that waterbody. Generally, waterbodies in healthy biological condition support a wide variety and high number of macroinvertebrate taxa, including many that are intolerant of

pollution. Samples yielding only pollution-tolerant species or very little diversity or abundance may indicate a less healthy waterbody. Biological condition is the most comprehensive indicator of waterbody health. When the biology of a waterbody is healthy, the chemical and physical components of the waterbody are also typically in good condition. In addition to benthic macroinvertebrates, scientists also evaluate algae and fish populations to come up with robust estimates of biological condition.

<https://www.epa.gov/national-aquatic-resource-surveys/indicators-benthic-macroinvertebrates>

## PSU Treatment Wetland Research

Several research projects have focused on nutrient cycling and transformations within constructed wetlands designed to treat a variety of wastes.

These investigations include field and laboratory studies of wetlands constructed to remove nitrogen, phosphorus, and organic matter from domestic, food processing, and agricultural waste. In the full-scale subsurface flow wetland shown below, the wetlands are effectively removing BOD (biological oxygen demand; an indication of the amount of organic matter available for breakdown by microbes), nitrogen and phosphorus from domestic waste. Yet, the processes by which this removal occurs are imperfectly understood, and research on the mechanisms for treatment within wetlands will lead to better design criteria for these systems. PSU research looks at the role of vegetation and alterations to the flow of waste to determine how nitrification/denitrification processes are affected. Treatment wetlands are also designed and constructed to treat waste with different characteristics than typical domestic waste.

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For example, vegetable and fruit processing waste is typically low in nitrogen and phosphorus, and can vary dramatically in organic matter composition, depending on the commodity processed. PSU conducted greenhouse experiments with cannery waste to determine the effectiveness of subsurface flow wetlands in removing BOD under low nutrient conditions.

<https://abe.psu.edu/>

## Nomination and election of new officers:

Lou asked for nominations for new officers. No nominations were made. Viqui made a motion for the current officers to continue. Dave seconded the motion and all approved. Officers are: President Lou Mayer; Vice-president Carolyn Hatley; Treasurer Rob Fugate; and Secretary Pat DeLotto

## Happenings

### Rain Barrel Workshop March 29 Alpha Fire Co. Patton Station

This workshop will explain the importance of using rain barrels for storm water control, give instructions for installing rain barrels and provide all the materials, instructions and assistance in building a rain barrel to take home. Participants will take home a finished 55-gallon rain barrel.

Registration is by household.

The \$35 fee is a per-household fee. Each paid registrant is invited to bring up to four people to take part in the event. Space is limited. Register today to secure your barrel!

## Pennsylvania Environmental Council (PEC) April 30

April 30, 8:00am – 5:00pm, Lycoming College, One College Pl, Williamsport, PA 17701

## Conservation District Week May 3-9



The Pennsylvania State Senate and House of Representatives have declared May 3-9, 2020, as "Conservation District Week."

To join us: Please call the Centre County RSVP

(Retired and Senior Volunteer Program)  
Monday – Friday 8:30 am - 5:00 pm

Phone (814) 355-6816

The CCPaSEC newsletter is published quarterly except for special events. To contribute news articles, or corrections please Contact Ken Johnson via our CCPaSEC website.

## "Using statistics to understand how the world worked was to understand the mind of God" Florence Nightingale

*Nature Abounds™ was the primary sponsor and provider of equipment and supplies for CCPaSEC. The ClearWater Conservancy and Centre County RSVP are major supporters. The following have provided additional support funding for special equipment for one field kit: Financial support for this grant is provided by the Dominion Energy Charitable Foundation which is dedicated to the economic, physical, and social health of the communities served by Dominion Energy companies. Western Pennsylvania Conservancy: This grant program was administered by the Western Pennsylvania Conservancy in commitment to its core mission of conserving Pennsylvania's diverse ecosystems through science-based strategy, leadership, and collaboration, Patagonia for the protection of water resources in Centre County, PIG Difference, a charitable initiative to salute our customers' passion for protecting habitats and preserving wildlife and our many individual contributors through Centre Gives.*