

2016

Benthic Macroinvertebrates
Watershed Newsletter
Issue 4



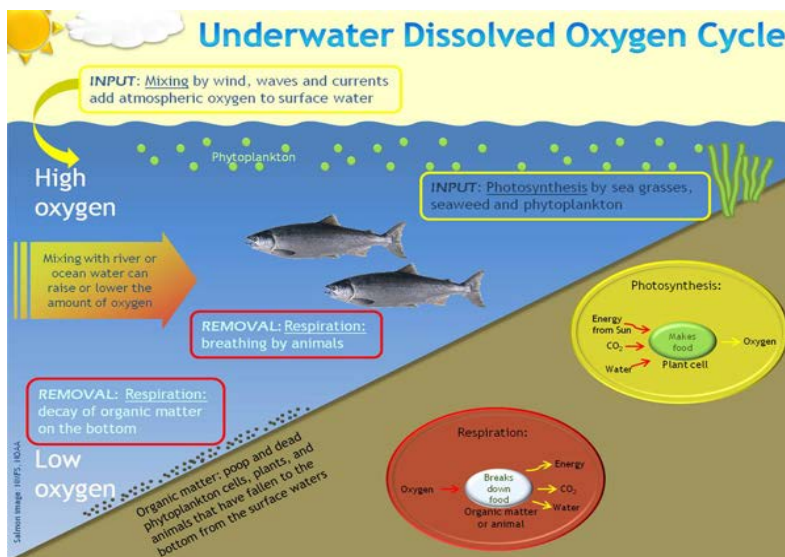
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SWCD

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Introduction:

When you go to your favorite stream or river you will notice the tranquility as you hear the water rushing over the rocks, but under the same rocks is constant life struggle for some tiny insects called Benthic Macroinvertebrates. These insects spend most of their lives hiding from predators under rocks and plants. Each Macroinvertebrate lives in a distinct river habitat. For example, a Dobsonfly Larvae lives in the riffles (a shallow part of the river), while a Dragonfly larvae lives in the pools (a deep part of the river). These bugs are not like their terrestrial cousins, they are very elusive and you can only catch them by using two special nets, called a D-Net and a Kick Seine. A D-Net is a net that a person jabs into the river bottom to collect insects buried underneath the sediment. A Kick Seine is a net that a person will place in the riffle and disturb the rocks in front of him/her. The insects will try to escape, but will be carried by the current into the net. After doing both of these sampling procedures, he/she will be able to calculate the water quality by calculating the diversity of the insects caught in the nets.

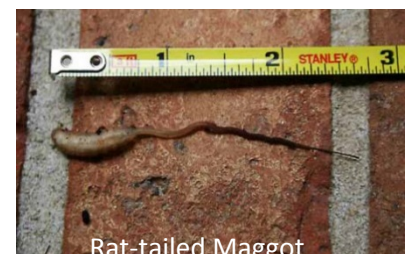


Water Quality Indicators

These insects are used as water quality indicators because they cannot quickly escape from a polluted area. They are also sensitive to the amount of oxygen in the water. Some insects prefer to live in polluted or poorly oxygenated waters, while some of them prefer to live in highly oxygenated waters. If the water's oxygen level goes down to a certain level some of the macroinvertebrates will die. Only the species that have adapted to the poorly oxygenated waters will thrive.

How is oxygen introduced into a river?

There are two ways that oxygen is introduced into a river. One way oxygen is produced is from aquatic plants through a process known as, Photosynthesis which will convert Carbon Dioxide into Oxygen. If a river does not have enough vegetation in or around it the Oxygen level will go down. Oxygen is also introduced by creating waves or a disturbance in the water. A good analogy of this process is a surfer riding a wave. Let's pretend that the surfer is an oxygen molecule. When a surfer rides a wave he rides in the void or the tube of the wave. If he does not escape through the tube before the wave crashes, the surfer or oxygen will get incorporated into the ocean. Rivers work in the same



way, but in a smaller scale. In a riffle or rapid there is a lot of disturbance or waves created. When these waves collapse the oxygen gas in the air will be introduced into the water, just like the surfer. Without this process the chances for underwater life to exist would be very slim.

How does the oxygen become low or depleted? Algae is the main problem in the depletion of oxygen in our rivers, streams, and lakes. Algae is a type of plant that floats on top of the water. This poses a problem because it does not allow aquatic plants below to absorb the sunlight, so they will not be able to photosynthesize to produce oxygen. Since the plants will not be able to photosynthesize they will start to die. When plants and animals die in the water, decomposition will go through a process called respiration, which turns Oxygen into Carbon Dioxide. This Carbon Dioxide will suffocate the fish and other wildlife that lives in the river.

Why are these insects so important?

These insects do not live their entire lives in the water, but go through a process called metamorphosis. There are two different types of metamorphosis, complete and incomplete metamorphosis. For example, a caddisfly will go through a complete metamorphosis where it will start as an egg, hatch into a larvae, then the larvae will cocoon itself into a pupa, and finally emerge as an adult caddisfly.

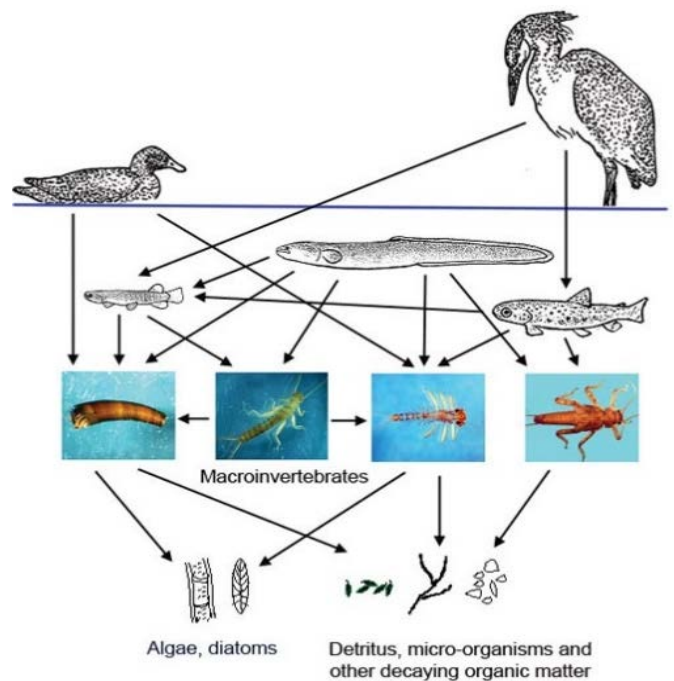
Life Cycle of a Caddisfly

Complete Metamorphosis



A dragonfly will go through incomplete metamorphosis where it will start as an egg, hatch into a nymph, and then molt into an adult dragonfly.

Incomplete Metamorphosis



These insects serve as an important foundation for both aquatic and terrestrial environments. The eggs, nymphs, larvae, and pupa and adults provide food for fish and other animals. If we continue to destroy the quality of our rivers and streams by allowing excess nutrients and pesticides to runoff into our rivers and streams, this could result in the downfall of our ecosystem.

Hoosier Riverwatch

Are you interested in the conditions of our local streams and rivers or do you want to help make a difference to not only with your community, but all of the communities downstream? There is an organization called Hoosier Riverwatch, which will teach you the basics of our rivers and streams. They will also train you how to test the water quality of our Indiana Rivers and Streams. Once you become trained you can borrow the Wayne County SWCD Hoosier Riverwatch Kit and do your own water quality testing. If you are interested in obtaining more information, you can find it by going to www.hoosierriverwatch.com or contact Zach Lee, Watershed Coordinator, by calling 765-966-0191 Ext 3.

Pictures of Macroinvertebrates

