



STORMWATER steward

A Stormwater SMART publication

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PIEDMONT TRIAD REGIONAL COUNCIL

SMOKING AND THE WATER POLLUTION CONNECTION

What's the Connection?

Cigarette smoking has long been associated with health risks for smokers and people around second hand smoke but the impact goes beyond that. When people are asked what litter they see thrown out car windows, cigarette butts are usually in the top ten answers provided. That is because cigarette butts are cast out of cars onto the roadside, the sidewalk, and the parking lot a regular basis. These paved surfaces are connected to the rivers, streams and lakes of NC by stormdrains and rain-fall runoff. While a cigarette butt is small, when considered cumulatively

they can have a very large effect on the environment.

What Pollution Comes from Cigarettes?

Filtered cigarettes are designed to remove toxic chemicals from the cigarette. These filters absorb chemical additives, which may include arsenic, formaldehyde, chromium and other known human carcinogens. When the filters end up in rain runoff or waterways, these toxins can leach out of the littered filter and end up in our waters or our food chain. The filters themselves are also made of a combination of paper and cellulose acetate (a plastic) and stay in the environment for up to 75 years before being fully biodegraded.

FAST FACTS:

- More cigarette butts are removed from litter removal efforts than any other single item.
- It can take close to 75 years for a cigarette to decompose.
- It takes approximately one whole tree to make 300 cigarettes.

What Can be Done About It?

In 2013 NC Big Sweep of Randolph County started an annual event focused on picking up cigarette butts in Downtown Asheboro. In 2014 the high school students involved in the event, picked up over 10,000 cigarette butts

TOP 10 ITEMS COLLECTED



Ocean Conservancy

which equals 500 packs of cigarette butts littered in Downtown Asheboro. Event organizers collected 123 small 6"x3" Zip Lock Bags full of cigarette butts from the volunteers. NC Big Sweep Coordinator Bob Langston sent those butts to be recycled at a company that removes the cellulose acetate from the filter and uses it to make paving stones.

For more information on how to organize a litter clean-up in your area contact Joy Fields with Stormwater SMART at: jfields@ptrc.org or 336-904-0300.

Did you Know?

Cyanobacteria (blue-green algae) can cause skin irritation or respiratory irritation in people who get into the water or handle the algae during an algae bloom.



Human's can prevent algae blooms by not fertilizing or being conservative with fertilizer use and choosing to fertilize when it is not supposed to rain for 48 hrs.



NC has an average of 8 algal blooms a year



There is close to 300,000 herbarium specimens of algae in the United States.



When algae dies the decomposition process removes oxygen from the water.

RUNOFF RUNDOWN: ALGAE MENACE OR ESSENTIAL?

Algae:

Algae are photosynthetic plant-like organisms that occur in most habitats on land and in water.

Algae is Essential in our Waters:

Algae is a natural part of our aquatic ecosystems and provides oxygen through photosynthesis for other aquatic life in ponds, rivers, and streams of North Carolina.

Algae is a necessary part of the food chain when it is growing in small amounts. Common Carp,

and Shad are two common fish that eat algae as part of their diet which also includes invertebrates, crustaceans and other small fish. The tadpoles of the Southern Leopard Frog also eat algae along with invertebrates. The fishing industry relies on algae to provide the necessary nutrients for the fish.

Algae as a Menace in our Waters:

As excess fertilizer runs off lawns or farm fields and enters our waters, it is added to nutrients leaching from dog waste and malfunctioning sewer pipes. All of these nutrient sources increase algal



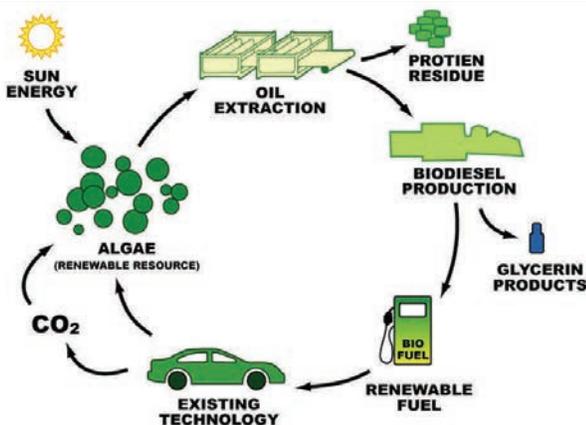
Algae spots: Joy Fields

growth in our streams rivers and lakes. If algae over multiplies it results in an algal "bloom". As algae grows out of control humans have to keep a close eye on it to ensure that the algae is not the toxic blue-green algae that can compromise our water sources. In this circumstance algae is a menace. Luckily, our drinking water sources are closely monitored for safety and odor and toxins from algae can be removed through the water filtration process.



Algae over growth: Joy Fields

ALGAE SUPER FUEL



Because algae contains a lot of lipid oil it has been studied as an alternative fuel since 1978.

- Algae biodiesel burns cleaner and more efficiently than petroleum.
- Algae can be grown quickly and in almost limitless amounts restricted only by space.
- If algae is produced in large enough amounts it could replace fossil fuels for heating our homes and powering our cars.
- An emerging sewage treatment method is to use algae to remove the nutrients and solids. The algae is then harvested to become fuel.

CITIZEN SCIENCE: DRAGONFLY SWARM PROJECT

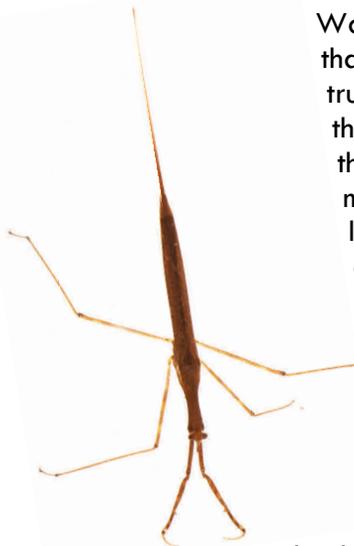


<http://thedragonflywoman.com/dsp/>

Dragonflies help control pests like mosquitos so they are very beneficial to have around. Since Dragonflies spend a period of their life living in our streams and rivers keep your eyes out for these beautiful creatures as you explore our waters. Dragonfly swarms occur when a group of dragonflies are feeding together in a cloud of insects or as a migratory swarm with hundreds to millions flying in a single direction. Not much is known about the migratory dragonfly swarms because they only last for a short period of time and

you have to be in the right place to see the swarm. Although these events take place all over the world very little is known about them. To find out more about the swarms an aquatic entomologist started the Dragonfly Swarm Project to collect data from normal citizens all over the world. The dragonflywoman has been collecting this citizen data for over five years now and has gathered reports on thousands of Dragonfly swarms. To learn more visit: <http://thedragonflywoman.com/dsp/>

CITIZEN SCIENCE: WADING FOR WATERSTICKS



Water Sticks are true bugs that have a long tube protruding from the back end that they stick up out of the water to breathe atmospheric oxygen while living in the water. Because they breathe air and do not use the water to get oxygen, they can survive in very polluted water.

These insects have long thin legs with the front pair folding back like a praying mantis.

Water Sticks are poor swimmers that sit on aquatic vegetation and wait for their prey to come swimming by. Sometimes these organisms sit in groups with up to a thousand individuals in one area.

The goal of the Wading for Water Sticks project is to use citizens to answer questions about their preferred habitats, and where they are found in North Carolina. As you enjoy our rivers and creeks keep your eyes out for these insects and report any observations to: <http://ncwatersticks.com/project-overview/>

GET INVOLVED: FISH IN THE CLASSROOM

Davidson County
Randolph County
Rockingham County
Archdale
Asheboro
Burlington
Elon
Gibsonville
Graham
Green Level
Haw River
Lexington
Mebane
Oak Ridge
Summerfield
Randleman
Reidsville
Thomasville
Trinity

Shad in the Classroom—is a program similar to Trout in the Classroom but instead of using a trout which can only be released in cold waters found in limited regions of NC, Shad is the fish of consequence and is released in the Neuse River Basin at the Eno River or other access point.

The American shad is a migratory fish that used to be prevalent in all river systems in North Carolina. The fish spawns in freshwaters and lives most of its life in the ocean. It is a very important part of the food web in North Carolina and played a significant role in the survival of the indigenous people, and the first European settlers to the New World.

Through the Shad in the Classroom Project, both teachers and students embark on a wonderful adventure in conservation science! Participating classrooms construct a tank, monitor water quality, and raise and release tiny fry (juvenile fish) for two weeks in partnership with real fisheries biologists from the NC Wildlife Resources Commission and the U.S. Fish and Wildlife



School of American Shad Photo: Natural sciences.org

Service.

Whether one American shad fry (juvenile) or 1,000 are released students will have hands-on activities that will help them learn about food webs, river basins, mapping activities, water quality, and river flow rates. There are several extension activities where students can expand their learning and earn a certificate, or find their ecological footprint.

For more information visit: <http://naturalsciences.org/education/for-educators/shad>

LOOK FOR STORMWATER SMART AT A EVENT NEAR YOU.

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| 3/22/2015 | World Water Day |
| 4/18/2015 | Earth Day at the Zoo - Asheboro |
| 4/25/2015 | High Rock Lake Outdoor Education Event - Davidson County |
| 4/25/2015 | Mebane Dogwood Festival - Mebane |



Stormwater SMART was created by the Piedmont Triad Regional Council (formerly Piedmont Triad Council of Governments) to help Phase II communities comply with National Pollution Discharge Elimination System (NPDES) and Jordan Lake Public Education and Outreach requirements. Stormwater SMART is supported through dues paid by member governments.



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