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Butler County Stream Team

November News - 2013



Volunteer Stream Monitoring in Southwest Ohio

Next Sampling Day - Nov 9th

Thank you for your response last month! We had 17 people who helped in lab, despite Miami's fall break and some other things going on for some of our partners. You're awesome!!

Cooler pick-ups are 10:30 for most coolers, 10:00 for West Chester Presbyterian Church

Who knew?

Another way you can help your streams, lakes and oceans

Did you know up to 25% of the earth's surface, in 5 Pacific and Atlantic gyres (swirling currents) is covered with a layer of plastic soup? Did you know that similar areas have recently been discovered in the Great Lakes?

And, more importantly, did you know that scientists agree the only way to change this is by us - yep, you and me and everybody we know - becoming educated consumers? If not, or even if you thought you knew it all, read on!

Our aquatic garbage patches:

Years ago, I heard about the [Great Pacific Garbage Patch](#) and was aghast at the thought of all those plastics floating around in the Pacific.

Sampling Summary - October 2013

We have decided to try to summarize your sampling effort each month - another way to show you how much Stream Team can do with the help of all you wonderful volunteers! So ... thanks to you all!

# of samples analyzed	139
# sites too low to sample	19
# volunteers sampling	30
# volunteers in lab	17

This past month we had 139 samples, so it looks like we are back up around "normal" flow conditions after our seasonal dry months. Another sign of this - we had only 19 sites at which the flow was too low to collect a sample this month, as compared to 42 last month!

What else can I do?

Color Runs

THE GREAT PACIFIC GARBAGE PATCH

Ocean currents collect floating garbage for thousands of miles and drop it into the North Pacific Subtropical Gyre, one of several major ocean vortices around the world. Eventually the trash is packed into a convergence zone that links two eastern and western garbage patches, collectively forming the Great Pacific Garbage Patch.



(From MNN)

So I became more adamant about using reusable grocery bags, picked up plastic litter, told my students about the danger of plastics to the sea turtles they see on our field courses, and figured there was little else I could do, especially since I live in Ohio - not exactly a shoreline contributor! Anyway, I knew much of the plastic in the 5 oceanic gyres comes from "nurdles", small beads used to make plastics that are delivered around the world by shipping crates, and I could do little about that.

However, this environmental problem recently hit a bit closer to home. In the summer of 2012, on a hunch, a group of scientists collected samples in Lake Superior, Huron, and Erie



(Hogue 2013). Cruising the lakes while trolling nets with 0.33 mm openings (~0.013 inch), the scientists found particles galore.

Although they were not surprised to find plastic in the lakes, they were a bit surprised at the size, makeup and quantity of the particles.

In oceanic gyres scientists have found a predominance of larger debris, from plastic

A new phenomenon came up recently that I had never imagined - color runs! What a joyous event, it looks like!



And indeed, that's what the Color Run company aspires to - it was founded in January of 2012 as "an event to promote healthiness and happiness by bringing the community together to participate in the 'Happiest 5K on the Planet'". And since then the Color Run has hosted more than 170 events in more than 30 countries.

The basic idea is that you wear a white t-shirt at the starting line and by the end of the race your white t-shirt is white no



more! There are color stations throughout the race where you are powdered with a

rainbow of colors.

However, color runs cause some concerns for storm water districts. The powdered colors, though they are made of cornstarch, contain dyes that are not biodegradable. Unless they are cleaned up properly, these can wind up in our streams and rivers. These dyes can change the aquatic environment in a negative way for critters that live there.

Dyes and wash water are prohibited discharges for storm water districts. With the explosion of color runs, this has become such a concern that the King County Stormwater Services Section in Seattle, WA, has come up with a BMP (best management practice) procedure for use around the country.

It is not too hard - mostly making sure the

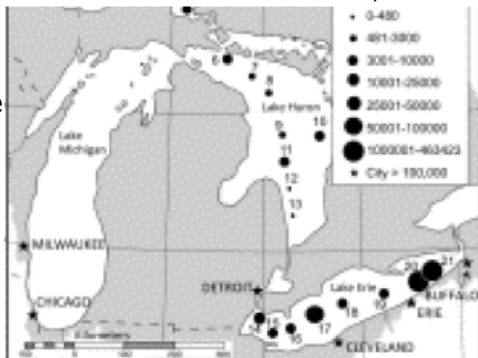
bags and bottles to particles like nurdles that are 1-5 mm in size. But when scientists sorted the Great Lakes debris into size classes, they found that about 80% of them were less than 1 mm long. To visualize how small <1mm is, see the picture below - many



hundreds of particles would fit on a penny. The particles all were originally thought to be microplastics,

but after microscopic examination (yes, of thousands of particles!) about 20% of them were found to be aluminum silicate from coal ash from coal-burning power plants - only 80% were microplastics! The average number of microbeads per square kilometer was about 43,000, but at two locations downstream from two major cities on Lake Erie's shores, the concentration was 10 times that - 466,000

pieces / square km! In the image at right, the size of the dot shows the



concentration of microbeads. The higher concentrations in much of Lake Erie (bottom right) are not surprising, since Lake Erie is the shallowest and is downstream of Lake Huron and Superior. And, in retrospect, the extremely high concentrations downstream of major cities also are not surprising, given the sources of the particles - personal care products and coal-fired power plants.

Why are microbeads harmful?

Right about now you may be wondering why this plastic "soup" is a problem. Currently, that's not entirely known. One fact of concern is that most particles in the Great Lakes are <1mm, but mostly larger particles are found in the oceanic gyres. Somewhere between the lakes and the oceans the smallest particles

color run sponsors and community file a pollution prevention plan and follow it, to make sure the colors are cleaned up in a way that keeps them out of storm sewers and streams. That can be done by putting large tarps out at coloring stations, covering storm drains, keeping powders away from nearby streamsides, and similar measures.

So, what can you do? If you plan to run in a color run - which sounds like a LOT of fun! - check early with the event's sponsors to be sure they are following appropriate storm water protection practices.

What else can I do? Don't be in a FOG, take care of your turkey!

This is a repeat of earlier newsletters, but appropriate timing ... for more information, check out the Dec. 2010 or 2012 issues of the newsletter, under Monthly E-news tab, here.

As the holidays approach we all think of the wonderful meals coming up - turkey, ham, gravy, mmmmm!

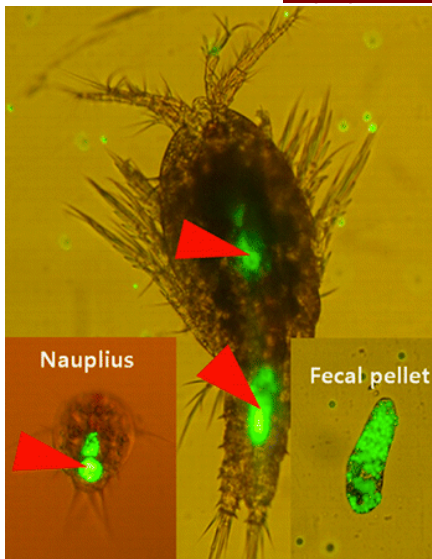


(pic source) But as you cook - and clean up - this year, remember your streams. Fats, oils and grease (FOG) that go down your drain are bad news! They can build up over time and clog drains in your home, in sewer lines, or at the wastewater treatment plant.

Clogged drains are costly, inconvenient and can lead to property and environmental damage. Clogged lines in your home lead to plumbers ... the price of Thanksgiving dinner just went up, when that happens.! When sewer lines back up they can cause unsightly and

disappear. They may be washing up on shorelines or may be eaten by tiny organisms in the water. These organisms are then food for larger organisms, which are food for larger organisms, and so on. That is, these particles are likely entering the aquatic food web and making their way into fish and even humans.

Animal consumption of plastics, including microbeads, has been shown in many studies - [Lee et al.](#), [Moos et al.](#), [Bond et al.](#), and [Codina-Garcia et al.](#) each examined ingestion of the beads by animals ranging from crustaceans like the [copepod at left](#) with



fluorescent particles it has engulfed, to mussels, to seabirds. They also each found that these particles had significant effects on the health of the organisms that ate them. What is unknown currently is exactly how the particles affect the larger organisms, whether by mechanical obstruction or absorption of toxins.

Toxins may leach from the particles themselves; plastics are made from petrochemicals, after all. Many plastics contain dyes and chemicals like bisphenol-A that are known to be linked to health problems ([MNN](#)). Or the toxins might be POPs, persistent organic pollutants, that bind to the particles in the water and then are digested once ingested by the larger organism. Or the toxins may be breakdown products from being exposed to sunlight. Regardless, these toxins often lodge in the fat of organisms that eat them and bioaccumulate - as one organism eats another, which eats another, right on up the food chain, the concentration of toxin gets higher and higher. Bioaccumulation of toxins poses health risks to anything that eats

dangerous overflows into storm drains, with the sewage eventually being washed into our streams and rivers.

Even if lines don't get clogged, FOGs cause lots of problems at wastewater treatment plants. When they go through the first filtering step, they build up on the filters, increasing maintenance and operations costs. Once they get through the filters, they float on top of the water, rather than sinking so they can be removed in the sludge. So some amount of FOG goes all the way through the plant and into our surface waters.

The cool thing is, those FOGs don't have to be thrown away so quickly. Some might be reused or recycled - contact your storm water district to see if anyone in your area makes biofuels from old FOGs. Or what about your dog ... a few drops of turkey drippings make that dry food taste great! If they are going to be thrown away, try scraping them into a tin can and waiting for them to solidify, then throwing them into the garbage.

So here's the same message again - what WE do matters!

[Volunteer Spotlight](#)

[Great Miami River Cleanup](#)

Although I am unsure if any Stream Team volunteers were involved, I just thought I'd show a little of what some other volunteers do for "our" river. The Great Miami River Cleanup was last Saturday. Data on how many pounds of trash were collected along the river banks will be coming later, but it looks like a lot was accomplished! Three cheers to all our water oriented volunteers!

Groups ranged in size at different locations, from a couple dozen at Woodsdale (1st pic below) to a couple handfuls at Trenton (2nd pic below).

organisms higher in the food chain, including humans, as was found with the pesticide DDT.

That's why the recommendation for eating fish that are top predators, like walleye, is often more restrictive than eating fish that are omnivores, like crappie.

Where do microbeads come from?

The next question you may be asking is where these microbeads come from - they're plastic, so they obviously come from us, humans, since plastics don't exist in the natural world. It turns out that the size of the microbeads in the Great lakes points to something most of us use - personal care products like toothpaste, facial and body scrubs, household cleaners and soaps. How do these particles end up in the lakes and oceans? Right down the drain!

Unfortunately, our wastewater treatment plants are not equipped to remove microbeads. The articles are too small to be filtered out by the screens used in treatment plants. And since they are plastic, they float, so they are not removed by compounds added to wastewater later to make particles clump together and sink. So most of them go right on through our treatment plants and into our surface waters. Since these waterways lead to lakes and oceans, that's where your (and my) personal hygiene products wind up.

So what can I do??

Scientists agree that it is impossible to clean up our aquatic garbage patches - they are too large, too patchy and constantly moving. It would take 68 ships, collecting 10 hours a day, a year to cover just a small portion of the northern Pacific gyre (3 degrees of latitude) ([NOAA](#)). The expense would be immense with no real solution - the garbage would just keep coming. Because of the impossibility of clean-up, the conclusion was reached very early on that "Identifying and reducing that pollution at its sources upstream is the only way to reduce it" ([Marcus Eriksen](#)).

And this is where the good news comes in for the Great Lakes. Even before the Great Lakes



But regardless of the size of the group, they all managed to collect a lot of garbage! According to Lynn, a few weird items turned up, ice cream scoops, soccer goals, and a deer skull, complete with antlers. Thanks Bob and Lynn for the pictures!



Coming up ...

study was published, the scientists involved provided US companies that make personal care products with the data. And lo and behold, the companies have been responding. According to [C&EN](#), Johnson & Johnson, O'Real, and Procter & Gamble have all pledged to take plastics out of their skin cleansers. Due to pressure from environmental groups, Europe had led the way earlier. U.K.-based Unilever is planning to eliminate plastic microbeads in the next 3 years and according to the [5 Gyres Institute](#), Colgate-Palmolive has pledged to phase out microbeads from its toothpaste and other products. The power of their customers - that's you and me and our friends - has made these companies realize that once the information is out there, they will have to change or lose business.

The Great Lakes and St. Lawrence Cities Initiative, a coalition of more than 100 cities US and Canadian cities, have joined the fight against microbeads. It has urged companies to stop the use of microbeads and governments to enforce their removal.

A [grant to William and Mary University](#) was announced last week that will fund a partnership to study how to make biodegradable microbeads. These particles would be made from "biopolyesters", or PHAs, that are produced by soil bacteria. PHAs seem to be well-suited to replacing plastics in personal care products. They provide the gritty feel of facial cleansers or shower gels.

They also are slightly heavier than plastic microbeads, so they may sink in our wastewater treatment plants and be removed in the sludge. Even if they are not removed, the hope is that they would biodegrade in septic tanks, water treatment plants and small streams long before they cause a problem in our lakes and oceans

Meanwhile, we have alternatives even now. We can each do our part by checking the labels of products and buying only products with no microbeads in them. Grape and apricot seeds are natural products that do the

One more Webinar at Butler Storm Water District

Just like last year, the Butler Storm Water District will be hosting the Center for Watershed Protection's webcasts having to do with stormwater management.

When: 12 to 2 pm

Where: Butler County Engineers Office, 1921 Fairgrove Avenue, Hamilton, Ohio 45011

Cost: FREE !!!

[November 20 - Stormwater Utilities: Reckoning the Cost Side of the Equation?](#)

Getting a good read on the actual costs of developing and operating an effective stormwater utility is sometimes difficult. How can a program developing or modifying a stormwater utility do a better job of honing actual costs, both today and into the future?

This webcast will provide resources and case studies on this topic.

For more information on what's included in each webcast, click [here](#)

Butler Soil and Water's Annual Open House

Join Lynn, Amy, and other district staff at their annual open house that includes a free hog roast! The Open House will be on Tuesday, November 12 from 3 pm - 7 pm. An awards ceremony to recognize the outstanding efforts of several local individuals will begin at 7 pm.

[Lending Library Titles](#)

We all have lots of books that we would love to share with someone who has similar interests. So we thought this might be a way to share them with people we know like streams! If you have books, DVDs or other things - especially about water - that you would like to contribute, feel free to bring them along anytime. Or, if there are particular books you would like us to buy, let us know and once a year or so we can add a few to our collection.

Here's our list to date:

*[A Guide to Common Freshwater](#)

[Invertebrates of North America](#)

*[A Guide to Ohio Streams](#)

*[After the Storm](#) - DVD

*[An Introduction to the World's Oceans](#)

*[Bugs of the Underworld](#): a fly fisher's guide to the natural history of aquatic insects (DVD - available on request)

same thing as microbeads. The [International Business Times](#) recommends a smart phone app, called "[Beat the Micro-bead](#)", that will let you know whether the product you're buying contains microbeads. You simply scan the barcode of an item and check the colour of the response - red means it contains microbeads, orange that it contains them but the company has pledged to phase them out, and green that it does not contain microbeads.

As Sherri Mason, the lead scientist in the Great Lakes study, says, "The best cure is to find ways to reduce plastic use. We're all part of the problem and that means we'r all part of the solution. If we change our consumer habits, we change what's in the water." ([Ecowatch](#))

[River Reflections](#)

I put on a "genius mix" of folks songs this week to listen to and heard this gem. Then I found a version on the web [here](#). Sorry it's on the topic of rivers again! It's accompanied by a U-tube video of slides from the 1937 Mississippi River floods and sung by Singin' Sam, who has a beautiful baritone voice that makes me want to play it again and again!

Starting where you hear the lyrics below, he just sounds like he is talking to the river itself! Captivating!

These lyrics, that start about halfway through the U-tube video, are where it all comes together for me:

You're just a lonely little river.
But I have heard somebody say
That someday you may
Sweep my home away.

So roll along you lonely river
and find your way out to the sea.
i don't bother you,
Don't you bother me.

You keep going your way.
i'll keep going my way.
River, stay away from my door.

i just got a cabin.
You don't need my cabin.

*[Exploring the World Ocean](#)

*[Fostering Sustainable Behavior](#): An introduction to community-based social marketing

*[Guide to Aquatic Insects & Crustaceans](#)

*[Gulf Hypoxia: Action plan 2008](#)

*[Handbook for Developing Watershed Plans](#) to Restore and Protect Our Waters

*[Introductory Oceanography](#)

*[Life in the Soil](#): A guide for naturalists and gardeners

*Marine Ecology

*[Migratory Shore and Upland Game Bird Management](#) in North America

*[Monitoring Guidance for Determining the Effectiveness of Nonpoint Source Controls](#)

*Oceanography

*[Ohio Vernal Pools: Diamonds in the Rough](#) (DVD - available on request)

*[Our Waters, Our Health](#)

*[Pond and Brook: A guide to nature in freshwater environments](#)

*[River of Words](#)

*[Stemming the Tide of Coastal Fish Habitat Loss](#)

*[Swamp and Bog](#): Trees, shrubs, and wildflowers of eastern freshwater wetlands

*[The Colorado](#): A river at risk

*[The Evolution of North America](#)

*The Face of the Deep

*[The Mill Creek: An Unnatural History of an Urban Stream](#)

*[Watersheds: A Practical Handbook for Healthy Water](#)

[Crisis Spot](#)

As you are out sampling or just out for a walk along the waterways and see something wrong, email us. We always want to hear from our volunteers, especially if there is a problem that can be corrected.

You are our eyes in the field, the first line of defense for streams in Butler County. Once a problem has been reported to us, we can pass it along to the appropriate agencies. For instance, when a sampler noted a VERY LARGE sycamore trunk had been washed up against a bridge in Wet Chester, we notified the Soil and Water District and they took care of it.

Thanks again for all you do for Butler County Stream Team!

Crisis Spot emails can be sent to Donna McCollum at mccollds@miamioh.edu.

River, stay away from my door.

Don't come up any higher.

i'm so all alone.

Leave my bed and my fire,

That's all I own.

i ain't breaking your heart.

Don't start breaking my heart.

River, stay away from my door.

Words by Mort Dixon

Musice by Harry Woods

Sung by Singin' Sam (Harry Frankel)

Recorded Dec. 17, 1931

[If you have any comments, concerns, or suggestions, please contact us at \[mccollds@miamioh.edu\]\(mailto:mccollds@miamioh.edu\).](#)

Butler County Stream Team Monthly Newsletter

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