

HEADWATERS

PUBLICATION OF MARYLAND SEA GRANT EXTENSION WATERSHED EDUCATORS

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COVID-19 has changed our daily lives - how we go to the store, how we work, even how we interact with other people. With additions to our lexicon including phrases like social distancing, positivity rate, and flatten the curve, it's no wonder we are looking for familiar things and seeking a sense of normalcy. We hope this issue of Headwaters is a little of that normalcy that you're looking for. Inside you'll find out how to deal with stormwater runoff from a neighbor, information about the ABC's of CECs, ideas for stormwater art, suggestions on how to help the environment if you're a renter, and how plants help deal with stormwater.

As always, if you are interested in more information about a particular topic or about our program, we'd love to hear from you, so please don't hesitate to contact us.

Sincerely,

The Maryland Sea Grant Extension Watershed Educators Team





Stormwater Sleuthing

+ JENNIFER DINDINGER

My telework office is my dining room. From my chair I have a good view of the rain garden in my backyard. One day during a fairly normal rainstorm I looked outside and half my backyard was flooded. I got up to investigate. Turns out the overflow pipe in the rain garden was clogged with mulch, which I thought was strange because the garden was sized for a normal storm and had been empty the day before.



At the same time, I noticed a distinct sediment plume in the flooded garden. It was coming from the direction of the fence separating my yard from my neighbor's yard...and his recent garage construction project.





“...the main takeaway about managing stormwater between neighbors is that dialogue between the parties is the best way to get ahead of major issues before they start.”



What next? I knew what I had to do but I was not excited about it. Our team published a fact sheet last year about this very topic, “[Stormwater Runoff: What to do when it impact you.](#)” and the main takeaway about managing stormwater between neighbors is that dialogue between the parties is the best way to get ahead of major issues before they start. However, I’m an introvert and the idea of calling my neighbor to bring this up was really uncomfortable.

I decided to wait. It rained again, my yard flooded again, and I knew I had to make the call.

Guess what? It worked! We had a good conversation, the neighbor apologized for the mess, and in the next week I saw a lot of activity in his yard getting the landscaping finished. The next time it rained the difference was noticeable...my garden didn’t overflow and the yard didn’t flood.

I am so glad I made that call!

All images courtesy of Jennifer Dindinger.





Watershed Health and Invasive Species

+ ERIC BUEHL

A healthy watershed, one with a diversity of plant size and types and relatively intact ecosystem processes such as water and nutrient cycling, generally has the ability to rebound from events such as fires or storms, but invasive species bring a new dimension of disturbance that makes recovery more difficult. For instance, not long after a fire, new plants begin to sprout to replace some of what was lost in the fire. If strong winds from a storm knock down several large trees, the opening, now flooded with sunlight, is filled with growth that will soon fill the opening in the canopy. I was recently cc'd on an email about monitoring various invasive insect species in Maryland's forests and started thinking about the devastation Gypsy Moths (*Lymantria dispar*) did to Maryland's forests back in the late 1980s. I was in the upper Midwest last summer and saw the devastating impact of the Emerald Ash Borer (*Agrilus planipennis*) and began to wonder how we would fare from this and other current invasions.



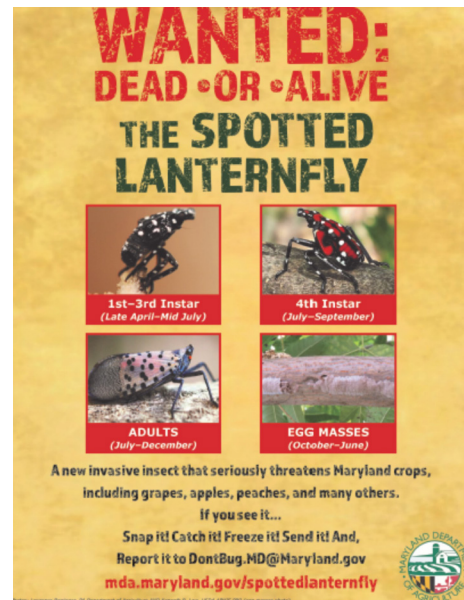
Despite being late summer in eastern Michigan, this winter-like scene was created by the Emerald Ash Borer. Source: Eric Buehl





“The newest pest on the block is the Spotted Lanternfly, which is threatening a number of native and commercially-grown plants in the northeast and mid-Atlantic region”

Non-native invasive insect species like the Gypsy Moth can defoliate most deciduous trees in an area, and if repeated enough times, results in the death of a wide variety of trees of all sizes, many of which serve as the host for particular insects or animals. The Emerald Ash Borer, which has a penchant for Ash trees (*Fraxinus spp.*), does its work out-of-sight and under the bark. Depending on the size of the Ash trees, it can kill most of them in an area in about three years. And like many of our native tree species, Ash serve as host to a number of larval butterflies and moths. The newest pest on the block is the Spotted Lanternfly (*Lycorma delicatula*), which is threatening a number of native and commercially-grown plants in the northeast and mid-Atlantic region and has some states invoking quarantine or transport restrictions from infested areas.



Posters like this are effective ways to share information on how to identify, report, and kill the Spotted Lanternfly. Source: MD Department of Agriculture.



“the Spotted Lanternfly was first sighted in Pennsylvania in 2014 and feeds on a variety of fruit, ornamental, and woody trees and is also a threat to vineyards and orchards.”

According to USDA Animal and Plant Health Inspection Service, Gypsy Moths first appeared in Massachusetts in 1869 and feed on more than 300 species of trees and shrubs, the Emerald Ash Borer was found in southeastern Michigan in 2002 and threatens 16 species of Ash trees. The Spotted Lanternfly was first sighted in Pennsylvania in 2014 and feeds on a variety of fruit, ornamental, and woody trees and is also a threat to vineyards and orchards. As these invasive insects and other invasive plants put added stress on our forests, it makes them less resilient to droughts, floods, and otherwise less-than-lethal pests, resulting in loss of plant diversity, nutrient and water cycling, and an overall decrease in watershed health.

So what can we do to slow the spread of these and other invasive species that are impacting the health of our forests and local watersheds. Learning about various pests in your area is a good start. Following recommendations on reducing the potential to transport these pests to other areas is important as well. Great resources for learning more about non-native invasive species include the [Maryland Invasive Species Council](#) and the [National Invasive Species Information Center](#).





Water: An Alphabet Soup?

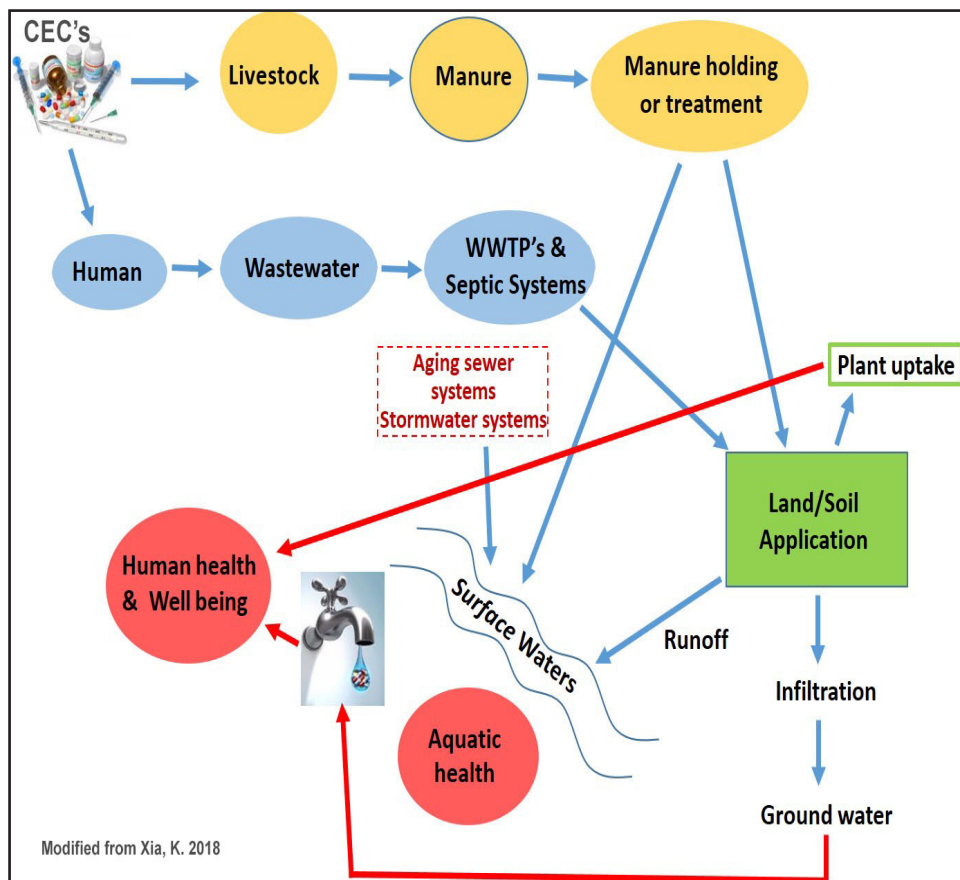
+ ANDY LAZUR

Perhaps you recall stories of major pollution events such as use of DDT and decline of wildlife, Love Canal or other industrial toxic waste spills, the Cuyahoga River in Ohio catching fire due to petroleum buildup, or more recently, the Flint River lead crisis and the Deep Horizon oil spill. There are dozens of such calamitous events that have serious implications on environmental and public health. These may seem like distant issues that may not directly influence our lives, yet, there is a closer to home, inconspicuous, and gradually building threat to water quality that deserves our attention.

Consider the multitude of chemicals that we use daily - beauty products, cleaners, cosmetics, over the counter and prescription drugs, fire retardants, food packaging, flame-retardants, hormones, nutraceuticals, pesticides, petroleum products, sunscreens, and stain repellents and numerous others. These enter our waters by a variety of ways (see figure below), and certainly influence the ecosystem and water quality. Heard of the hormones in wastewater inducing feminization of male fish thereby influencing reproduction? This is but one example of the subtle impacts these contaminants have.



"There are hundreds, possible thousands of compounds known as contaminants of emerging concern"

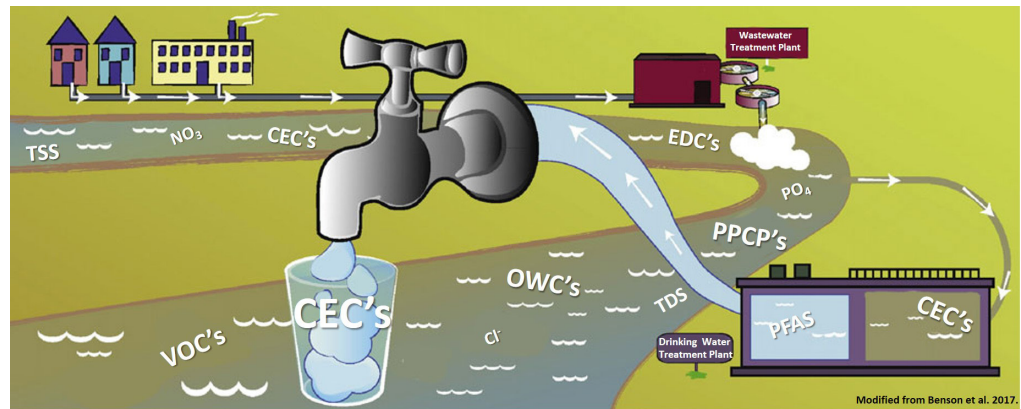


The pathways that contaminants use to reach our surface and groundwater vary widely.

There are hundreds, possibly thousands of compounds known as contaminants of emerging concern (CEC). They are grouped into major categories - endocrine disrupting compounds (EDC), organic wastewater compounds (OWC), pharmaceuticals and personal care products (PPCP), polyfluorinated alkyl substances (PFAS), and volatile organic compounds (VOC), and others. This variety leads to a diverse mixture in our waters resembling an alphabet soup of contaminants, of which we play a part as “cooks.”



"US EPA and US Geological Survey, and numerous scientists have been investigating CECs for years, yet there remains much that we do not know."



The US EPA and US Geological Survey, and numerous scientists have been investigating CECs for years, yet there remains much that we do not know. Some CECs have been researched more intensively than others have. For example, the USGS sampled 139 streams in 30 states for 95 contaminants and found one or more of these chemicals in 80% of the streams. Further, half of the streams contained seven or more, and one-third contained 10 or more of these contaminants. Related to drinking water, EPA and USGS scientists' sampled 29 drinking water plants and their source water for 210 different pharmaceuticals, OWCs, and PFASs. Of them, 148 were detected at least once in the source water and 121 were detected at least once in the treated drinking water.

Some of the pharmaceuticals and OWC's were observed to be more easily removed during treatment, whereas PFASs were more frequently detected and more resistant to treatment.





"Continued discharge of these compounds will contribute to environmental accumulation, and possible synergistic effects increasing the risks"

Concentrations of these CEC tended to be relatively small, in parts per trillion, however, a few are approaching levels of concern due to known toxicity. Continued discharge of these compounds will contribute to environmental accumulation, and possible synergistic effects, increasing the risks to both environmental and public health.

This article is the first of a series to raise awareness of these lesser known and understood contaminants. Future articles will explore each category of contaminants, their risks, treatment, and individual stewardship practices to mitigate impacts.





Art and Water

+ AMANDA ROCKLER

Find yourself feeling unbalanced or having trouble concentrating during this season of pandemic? Have a stormwater issue on your property? Well you are in luck, stormwater art can be a great way to address two birds with one stone!

Create a rain chain, beautify some rain barrels, write some haikus, take pictures or videos of a rainstorm, the sky is the limit. There is no one way to do art and we have not had a shortage of rain storms, in fact, April was the 7th wettest April on record. So get outside and let your creativity fly.

If you are seeking inspiration, please check out the following; Chesapeake Stormwater Network's, Watershed Hacker webinars, specifically the one on stormwater and art. The link can be found [here](#). Another great site for inspiration is the Water in Cities conversation with Artists <https://www.thenatureofcities.com/2018/07/14/artists-conversation-water/>

Here are a few Haikus from our team to help get you started. If you feel inspired to create some stormwater art, we would love to see it!

Feel free to send me an email arockler@umd.edu





“Stormwater from sky
spring splashes, flowers
bloom bright
birds sing in delight”

Rain cloud drip drip drop
To the drain, stormwater flows
Slow and soak it up
-Nicole Basenback

Stormwater from sky
spring splashes, flowers bloom bright
Birds sing in delight
-Amanda Rockler

Clouds cleared, pollen high
Snow is gone, replaced with rain
Happy, washed away
-Eric Buehl



Biking after the Storm, Yard of the Yard, www.cultivateprojects.net





Flamingo Family, Yard of the Yard, www.cultivateprojects.net





What to do When You Don't Have a Yard to Improve

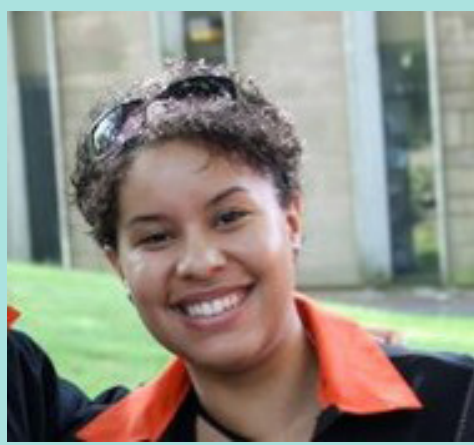
+ KELSEY BROOKS

Self-isolating in my Baltimore City apartment has left me thinking more and more about my life as a renter. While renters may be supportive of clean water efforts, they are usually unable to implement the small scale practices we most frequently promote (i.e. rain barrels, rain gardens, or conservation landscaping). So what can these residents do to support healthier streams? Some options:

- 1) Informally Adopt a Storm Drain: Both renters and non-renters can help maintain the function of nearby storm drains. Anything that is removed from a storm drain and disposed of can help keep pollution out of waterbodies. Keeping storm drains clear and free of debris can also reduce localized flooding.



Adopting a storm drain can help keep local waterways cleaner. Source: Kelsey Brooks





"While renters may be supportive of clean water efforts, they are usually unable to implement the small scale practices we most frequently promote."

- 2) Plant Where You Can: Although not as ideal as finding ways to get water into the ground, the addition of potted native plants or container gardens to stoops or rooftops is a non-permanent option that can still help reduce peak flows and support pollinator populations in urbanized areas.
- 3) Pick Up Litter/Pet Waste: Picking up litter "upstream" of the storm sewer system will have a similar impact to removing trash and debris directly from the inlet. If you live near an existing public stormwater practice, removing trash from bioretentions can also help them function properly. If you have a dog, picking up and properly disposing of pet waste will reduce bacterial pollution in waterways.
- 4) Educate others: While education alone may not change behavior, it is difficult to address a problem you do not know exists. Letting your loved ones know that they can have a positive impact on the health of waterbodies through simple actions (and modeling those actions as best you can), is another way to contribute to improving the health of local streams and the Chesapeake Bay.

Once we return to social life, volunteering is also a great option. From tree plantings to cleanups there are plenty of ways to support healthier streams that are accessible to renters.



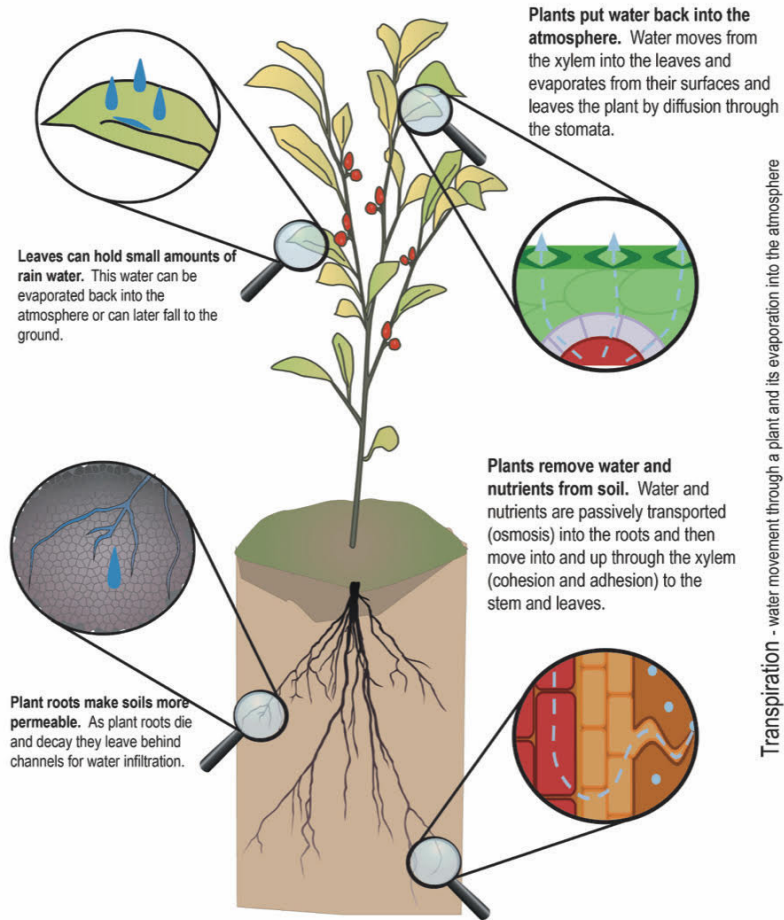


Nature's Stormwater System

+ JACKIE TAKACS

Despite the beauty we seen in them and the value pollinators put in them, did you know that plants can be part of a stormwater treatment system? Not only do they utilize nutrients before they can enter a local waterbody, they can also help to decrease the amount of runoff. Check out this graphic that describes how plants can help to manage stormwater runoff.

How Plants Manage Stormwater



Transpiration - water movement through a plant and its evaporation into the atmosphere

Graphic designed & created by J.Takacs using images from UMCES-IAN graphic library and wikipedia





CBLP Level 1 Training this Fall

The Chesapeake Bay Landscape Professional Program is holding another round of Level 1 training sessions this fall. For more information, go to www.cblpro.org.

CHESAPEAKE BAY LANDSCAPE PROFESSIONAL LEVEL 1 TRAINING



CBLP FOCUS:

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Active learning environment

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Headwaters is a publication providing information and resources for Extension and watershed protection professionals. It is a joint production of the University of Maryland Extension and Maryland Sea Grant Program. If you have any comments, questions, or ideas for Headwaters, please contact the Editor: Eric Buehl ebuehl@umd.edu

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