





Vol. 16 | November 2020

THE RIPPLE EFFECT

The Annual Newsletter of WaterWays

Reflecting on the past year:



-  A new outdoor classroom and natural area at Enterprise South Nature Park (pg. 1)
-  Our mission to inspire the next generation of young organic gardeners in St. Lucia (pg. 2)
-  Our work is making a splash! WaterWays recognized by the B.R.I.C. Awards for our collaborative work in Mountain Creek. (pg. 4)
-  Uncovering the environmental legacy of mining Signal Mountain, and our efforts to protect its future (pg. 5)

Our mission is to empower kids and their communities to protect and restore their water where they live, work, and play.



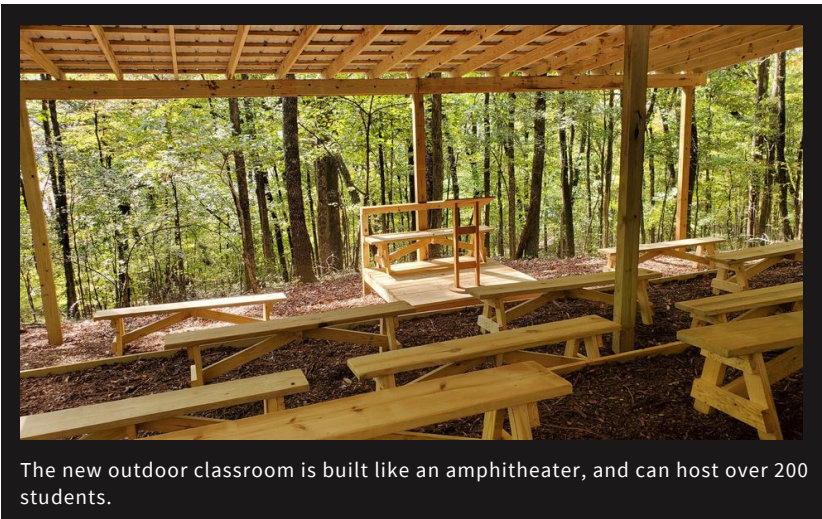
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Big Plans for Nature Programming at Enterprise South Nature Park

Last year, **WaterWays** was thrilled to be awarded the **Volkswagen Community Grant**, administered by **The Conservation Fund**! This grant of **\$50,000** is awarded to organizations to advance efforts in providing environmental learning and leadership opportunities for local youth, help keep rivers and waterways within the Cherokee National Forest clean, and provide current recreational access information for outdoor lovers in the region. Our funding was used for the construction of an **outdoor classroom** and **interpretive nature trail** in **Enterprise South Nature Park**. The area is now known as the **Summit Wetlands Area** which includes an outdoor classroom, wetland access, interpretive signs, and the **Summit Wetlands Nature Trail**.



The new outdoor classroom is built like an amphitheater, and can host over 200 students.

This grant was awarded to **WaterWays** in partnership with **Enterprise South Nature Park**, **Hamilton County**, and **Volkswagen of Chattanooga**. The **Summit Wetlands** area will be the hub of future school events that include outdoor and environmental education programs. Hopefully, this spring we will have the opportunity to utilize the area and hold field trips with local **Hamilton County schools**. These programs will be a test run for future uses of the outdoor classroom and provide evidence of the benefits of outdoor learning and education. It is our hope that we find that the students attending these programs at the park will be empowered by their outdoor experiences and have improved scientific observational skills. **Waterways** will continue to work with **Hamilton County Parks** to develop outdoor education experiences for every student in **Hamilton County**.



A young volunteer takes a break from trail work to explore the wetland. A system of beaver dams has created this incredible natural area, spanning over 36 acres.

Having opportunities such as these fosters appreciation and ownership of our natural spaces which leads to informed future generations! This initiative continues **WaterWays'** mission of providing experiences that connect people to the outdoors.



(above) Members of our **monthly homeschool group** observe a flock of geese flying over the wetland with our **new binoculars!**

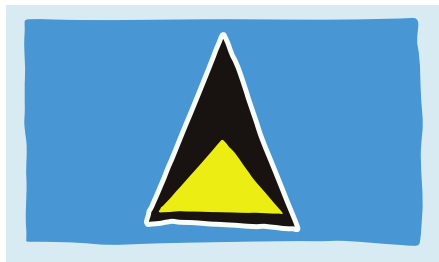


(left) Homeschoolers search for tadpoles, minnows, frogs, and macroinvertebrates in the **Summit Knobs wetland**.

This project was made possible by the incredible crew at Enterprise South, as well as the hard work of our dedicated volunteers.



Notes from Saint Lucia



Caribbean SEA (Student Environmental Alliance) was originally founded in **St. Lucia** in 2004, and subsequently expanded to address water quality issues in the **Southeastern United States**. In the spring of 2019, the US branch rebranded to **WaterWays**, and soon the **Caribbean** division will follow as **WaterWays Caribbean!**

School organic gardening project

Three schools in the **Soufriere watershed** in **St. Lucia** expressed interest in reestablishing gardens to supply their respective school feeding programs. **Caribbean SEA** received a grant from the **Caribbean Aqua Terrestrial Solutions Programme** of the **German Agency for International Cooperation, GIZ**, to implement the **Organic School Gardening Project** in **Soufriere, St. Lucia**.

The project aims are as follows:

- Educate the students about the benefits of organic farming and impact of farming practices on environmental and public health.
- Sustainability is fostered through continuous organic farming at all three school kitchen gardens, which will be promoted publicly and used as models for other schools as well as small scale and backyard farmers
- Support Goal 2 of the Sustainable Development Goals, ZERO Hunger by a reduction in child hunger at all three schools through the supply on nutritious organic farm produce in the school feeding program cuisine



Nadia Cazaubon (left), Caribbean Programme Director, shows off seedlings on their way to the greenhouse.



(above) Davis Poleon preparing water grass fertilizer



guava



soursop



tamarind

To achieve these goals, teachers and caretakers were trained in **organic farming practices, composting, and greenhouse and farm management**, and they are now responsible for crop production in the greenhouse! Two of the three schools now have greenhouses installed and all three have compost stations built and producing compost. They are also **harvesting rainwater for irrigation**. IWEco donated over **30 fruit trees** to **Soufriere Infant** and **Soufriere Primary Schools** including avocado, soursop, mango, guava, tamarind and several different citrus trees to provided students fruit and juices.

During the lockdown, the project management team brilliantly adapted by redirecting funding to supply students with over three hundred seedlings and over a thousand seeds to start planting backyard or container gardens so they could grow food over the lockdown and summer break! A **greenhouse and school garden plan**, a **green waste management plan**, and an **organic crop production manual** were developed for the schools, but have been made available for farmers and others via our website!

In addition to the new infrastructure and programming, a hugely successful exhibition for **World Food Day** was held to promote organic farming and environmental sustainability! Each school held an exhibition where students, staff, and parents got to sample food prepared using local produce. **Soufriere Infant School** collaborated with leading chefs in **Soufriere** who prepared tasty dishes with produce that is typically prepared bland and students do not enjoy. **Soufriere Primary School** included a demonstration booth to teach students and parents how to blend fruits to make nutritious smoothies. **Fond St. Jacques Primary School** also held a cooking demonstration. The principals expressed their sincere gratitude to **Caribbean SEA** for assisting them reestablish school gardens!

In observance of **World Environment Day 2020**, **Nadia**, our **Program Director**, presented webinars on the **St. Lucia environment** and called on all participants to step up and become stewards of their hometown. She also did a live demonstration of setting up a **compost bin** at home!



Our green vision for 2020 and beyond

2020 may have slowed our roll, but it couldn't stop our **vision!** Despite interruptions to our projects and programs, WaterWays has continued to push forward on a number of plans and receive grant funding for future endeavors. Here's what we've got going on:

our grants

- **319 Non-point Source Pollution Grant** to address water quality issues in Shoal Creek and Middle Creek on Signal Mountain, including abandoned mine land and septic system remediation
- **Volkswagen Community Grant** administered through the Conservation Fund with our partner Enterprise South Nature Park
- **REI Grant** for work on the Mountain Creek Greenway
- **Tennessee American Water Company Grant** to support the collaboration between Red Bank Elementary and High School
- **Tennessee Clean Water Network Grant** for technological support during COVID-19
- **Tennessee Aquatic Stream Cleanup Grant** from TWRA
- **GIZ Grant** for organic gardening efforts in schools in Soufriere, St. Lucia
- **UNGEF Grant** for addressing water quality issues in a microwatershed in Ravine Claire, St. Lucia

our awards

- **Tennessee River Basin Network Award for Communications and Outreach** which included a \$5,000 prize
- **Building Recognition in Chattanooga (BRIC) Awards:** with our partner Propex, we were awarded the **green | spaces Sustainability Award** and the **Collaboration Award**



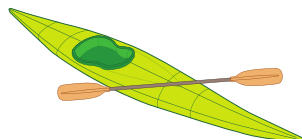
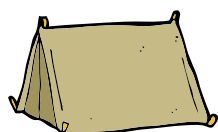
WaterWays and Propex were recognized for innovation and collaboration on the Mountain Creek Streambank Restoration.

The Gear Closet



The Gear Closet has had a crazy year! Due to temporary closures and reduced hours, The Gear Closet has had a tough fiscal season. We were so fortunate to receive government assistance as well as ample gear donations and consignments from our patrons! At this time, The Gear Closet will maintain hours Thursday - Sunday through the Holiday season. We are hoping to host a series of outdoor talks that will be open to the public. Keep an eye out on our monthly newsletter and to follow us on Facebook for store updates and antics!

The Gear Closet is a part of **WaterWays**, which means that it operates to serve the community and ultimately have a positive impact on the environment! Thank you for your continued support!



New store policy: We have updated our consignor policy to include a 60% store credit offer as well as the 50% cash option.



Photo by Chad Madden via Unsplash

Restoring Signal Mountain Streams

Decades before it was a destination for outdoor enthusiasts from around the country, Signal Mountain attracted an entirely different crowd-- coal miners. Their legacy riddles the mountain with a patchwork of old excavation sites, some long since buried, but others still resembling the original open pits. This past year, the WaterWays team has collaborated with local watershed experts to devise a three-year, three-step plan to identify, map, and remediate the abandoned mines. Our incredible interns, Rosy and Grey, have spent most of 2020 mapping and testing hundreds of sites for factors like temperature, pH, and E. coli levels.

They've trekked into the middle of the woods and onto front porches (sometimes the mines are in someone's backyard!), successfully laying the groundwork for our remediation efforts. These mines pose a threat to the Middle Creek watershed, since water that flows through them emerges with a lower pH and a much higher chance to release toxic metals like lead, copper, zinc, and aluminum. The change in pH can also impact the growth of native plants and animals, in turn changing the makeup of the entire ecosystem.

It's not just Signal Mountain's past that's causing problems in the Middle Creek watershed; Bee Branch, Stanley Branch, Short Creek, and Fruedenberg Creek have all made the Tennessee Department of Environment and Conservation (TDEC) 303(d) list of impaired or polluted streams. While Stanley Branch and Fruedenberg Creek suffer from the legacy of abandoned mines, Short Creek and Bee Branch are contaminated with sewage leaching from the septic systems that service much of the development on the mountain. Faulty septic systems leach bacteria into the water, which travels easily across the rocky landscape. These feeder creeks ultimately flow into Middle Creek, which then empties into the Tennessee River.



Watershed Coordinator Hunter Terrell and WaterWays' Executive Director Mary Beth Sutton investigate abandoned mines on a preliminary testing trip to Fruedenberg Creek.



Pollution from heavy metals and faulty septic not only harms the aquatic ecosystem, but also poses a threat to our own well-being! Much of our drinking water comes from the Tennessee River, and we all pay the price as it grows more contaminated-- literally. Middle Creek and the Tennessee River both also offer exceptional recreational opportunities, from rock hopping to swimming to paddling to fishing. The better we take care of our creeks and streams, the better we care for each other!



Photo by AIS Global

Acid mine drainage can often be identified by its distinct orange and yellow coloration, called "yellow boy." This is caused by a lowered pH, which reacts with iron elements in the rock.

Passive remediation systems, like the one below, rely on a combination of natural vegetation and man-made buffers to collect and filter acid mine drainage.



Photo by West Virginia University

Outreach and education efforts began before the testing even started, with area **Stream Teams** learning about the effects of polluted stormwater and implementing best practices to manage it on their own campuses. We've established partnerships with landowners who have abandoned mines on their property, so those areas may be surveyed and passive remediation systems (wetlands, etc.) installed. Septic system rehabilitation is also a priority, with twelve major repairs expected to be completed by the end of year two.

Homeowners can play a role in stemming the impact of residential development by actively imposing stormwater management practices in their own backyards. Tips, tricks, and more information about our creek-friendly yards award program can be found on our website under the **My Tennessee: Clean Water Starts Here** tab. Those who use septic should regularly ensure that the system is working properly with no leaks, keeping E. coli and other harmful bacteria from entering the water. And if you or someone you know has a mysterious hole on their property that resembles an abandoned mine... give us a call! We'd love to check it out. **We look forward to getting all of Signal's streams clean and healthy again soon!**

Notes from the field | ROSY HARPE

By the looks of it you'd never guess that many neighborhoods of Signal Mountain were built around a complex of abandoned coal mine sites. These sites have existed since the 1850s and their presence is largely unknown or disregarded, but their ecological effects are apparent, and worsening to this day. Since May we've had the chance to bushwhack through the woods of Signal Mountain to assess the current state of these old mining sites. We've seen numerous open pits with piles of coal and shale close by, and holes opening up into the Earth farther than the eye can see. We've seen acidic water exuding from the ground as low as 3.33 pH— a level that could prove disastrous for downslope creeks, rivers, and all their inhabitants if not managed properly. So where's the silver lining? With this WaterWays grant not only were we able to survey all of these sites for acid mine drainage and safety concerns, but we are now honing in on a group of them to remediate in the near future to restore health to our local watersheds. Stay tuned for updates!



Since early 2020, Rosy has stepped up to every challenge we've thrown her way, including locating and testing hundreds of sites on Signal Mountain for the effects of acid mine drainage. Her efforts have resulted in a more complete map of the issues that have been ongoing for decades, and bring us much closer to our goal of remediation.

Programming update from Brooke

Since joining the WaterWays team last September, I have had the privilege to meet some wonderful people and students that are ready to take action in their community.

Stream Teams, a program dedicated to watershed education and stewardship, is taking off! **Silverdale Baptist Academy** joined the program last fall and added four teams with their entire pre-k, 3rd grade, 6th grade, and 9th grade students. This past fall, **Calvin Donaldson's 4th and 2nd grade Stream Team** explored their campus and brainstormed solutions to their schools stormwater problems. **Red Bank Elementary and High School** have great plans to collaborate and construct a stream access bridge and plan an invasive species removal day alongside their creek for their program projects. We were also fortunate to program and/or plan future watershed initiatives with **Hardy Elementary School, CSAS Elementary School, Ivy Academy, Hixson Middle and High School, Wauhatchie Forest School, Dalewood Middle School Bridge program, Lakeside Academy, East Lake Academy, Ooltewah Middle School, and Harrison Elementary School**. Our staff can't wait to see our teams and continue their projects this semester and in the spring. We hope to continue expanding our outreach and educational programs! If you are interested in sponsoring Stream Teams or education outreach go to our website's donation page and check out our in-kind donations.



The more life jackets, rain boots, and nets we collect the more students have a chance to connect with their local stream. That connection fosters senses of responsibility for their local environment, and we can't get enough of that!



Program with us!

WaterWays is available to lead programs for homeschool groups, clubs, and classes! From **watershed demonstrations** to **wetland explorations**, we can facilitate a range of experiences from the classroom to the field. For more information on scheduling your program, contact **Brooke** at brooke@mywaterways.org.

Expanding our outreach

Every student body we get to work in is a privilege, and we feel lucky to have grown our outreach to include **over twenty schools** in the Hamilton County area. Over the past several years we have been honored to work with the following schools and institutions:



Executive Director **Mary Beth Sutton** identifies macroinvertebrates with a member of Red Bank Elementary School's 2019-20 **Stream Team**.

Calvin Donaldson Elementary
CSAS Middle/Elementary
Dalewood Middle School
Dalewood Bridge Program
Hamilton Homeschool Co-op
Hardy Elementary School
Harrison Elementary School
Heritage High School
Hixson High School
Hixson Middle School
Ivy Academy

Lakeside Elementary School
Nolan Elementary
Ooltewah Middle School
Red Bank Elementary
Red Bank High School
Signal Mountain Bible School
Signal Mountain High School
Silverdale Baptist Academy
Skyuka Hall
Thrasher Elementary
Wauhatchie Forest School

Mountain Creek Projects

Mountain Creek Watershed, which runs from **Walden** near **St. Augustine Church** and up the **Mountain Creek Valley**, continues to be a focal point for our efforts to protect our local waterways. We are looking for groups and businesses to adopt sections of the creek, joining **North Chickamauga Creek Conservancy**, **Barge Design**, **Red Bank High School**, **Red Bank Elementary School**, and **Mountain Creek Church of Christ** in doing stewardship projects to protect this creek! Our partnership with **Mountain Creek Church of Christ** expanded this year with an enormous effort last November to install a **bioswale** on their property. Church members and other volunteers planted hundreds of native perennials and trees in hopes of soaking up some of the stormwater which floods their property and flows to the creek., along with a **pollinator garden** of native plants. Next steps include stream restoration to slow down the erosion of their stream bank. The restoration project at the **Spring Valley Neighborhood** recreation area is currently receiving bids and work will begin on that soon!



Our dedicated volunteers planted over 2,000 native plants and trees from Overhill Gardens. Within the year, the bioswale was thriving and in full bloom!

Other efforts in the watershed included adding native plants to riparian zones at several private homes, our collaboration with the Oxford development on a **greenway trail** and **riparian zone restoration**, and a new partnership with **Quail Hollow Condominiums**. The **Red Bank High engineering class mentorship** of the **Red Bank Elementary Stream Team** is on hold due to COVID, but we hope to see that move forward in the spring.

We are especially proud of **Stephen Hamill**, an **Eagle Scout candidate**, for his persistence in securing just the right project to protect HIS creek, **Mountain Creek**. He has learned many skills already in this process and we are sure he will be a future leader in conservation efforts. Our ultimate goal is to clean up **Mountain Creek** so it can be removed from the **303d list** of impaired streams. The **City of Chattanooga Water Quality department** has been an incredible partner in this effort!

Become a friend of Red Bank Streams!

WATER REPORTER
Join our team of citizen scientists monitoring watershed health across Tennessee.

Download the **Water Reporter** app on your smartphone.

Sign up and **create an account**.

Join the **WaterWays group** to share photos of what's happening in our watersheds!

Friends of Red Bank Streams (FORBS) are taking action in **Stringers Branch** and **Mountain Creek**! Through **litter clean-ups**, **stream restorations**, and **community action**, our waterways are getting cleaner and healthier every day. If your home or business would like to get involved in stewardship efforts, check out the FORBS group on Facebook or contact harmony@mywaterways.org



Big Frog Brewing Co. showed their love of Red Bank streams by adopting a section of **Stringer's Branch**!



Get Involved with WaterWays' Community Programs!

We provide education on local watershed issues and offer community-led solutions. Through partnerships with local government, businesses, and homeowners, WaterWays empowers community members to improve their local water quality. Programs like **My Tennessee** and **Adopt-A-Waterway** are geared towards individuals and groups who are passionate about making a difference in their watersheds!

My Tennessee

CLEAN WATER STARTS HERE



(above) Staff and volunteers dig a rain garden at a Brainerd home.



This sign would look great in your yard!

For many members of our community, this past year has been filled with an unprecedented amount of time spent at home. We've filled the days learning new recipes, picking up hobbies, and perhaps, getting around to those home improvements that've been marinating on our lists for a while. At least that's what the lines at Lowe's make it seem like.

If you're one of the many that's found yourself in a transition phase with your home, we'd like to encourage you do it with your whole community in mind. **My Tennessee: Clean Water Starts Here** is our certification program that rewards homeowners for implementing "**creek-friendly practices**" in and around their homes-- and we'd love to add you to our list of neighborhood stewards!

Adopt-a-Waterway

Our **Adopt-a-Waterway program**, co-sponsored by the **City of Chattanooga and Hamilton County Water Quality Programs**, encourages individuals and groups to take action in their communities by "adopting" a section of river or stream! Throughout their two-year commitment, at least two acts of **stewardship** will be performed, which can come in the form of a litter clean-up, a restoration project, or a native planting. Despite the challenges that COVID has presented, many amazing groups have adopted with us already and we've got more in the works! Altogether, this year groups have removed more than **30 bags of trash** and **30 tires** from area creeks. A big thank you to everyone who has helped to clean up our waterways this past year!

Thank you to all our adopters!

- Barge Design
- Big Frog Brewing Company
- Boy Scout Troop 116
- Girl Scouts of the Southern Appalachians
- Ivy Academy
- McCallie School National Conservation Guild
- Mountain Creek Church of Christ
- Our House Studios
- Red Bank Elementary School Stream Team
- Red Bank High School Interact Club
- REI of Chattanooga
- Tennessee Valley Canoe Club
- Wild Trails

Meet our team!

Our international team is made up of passionate individuals with a shared vision of a clean and healthy global environment.

Mary Beth Sutton | Executive Director



Mary Beth holds Environmental Science and Education degrees from the University of Tennessee at Chattanooga and UNC Chapel Hill, and continues to learn more about our natural world and how to protect it every day. When she's not in the creek, she's likely out on the trails backpacking the Southeast.

Nadia Cazaubon | Caribbean Program Director



Nadia Cazaubon's job and passion is to connect with the Caribbean communities and teach them how to test and take care of their local waterways. She loves all nature; especially the sea. Her favorite moments are witnessing kids discover and experience nature at its best.

Randal Hale | Gear Closet Manager



Randal Hale holds a degree in geology from the University of Tennessee Chattanooga. He has gone on to create a wonderful career as a GIS technician and consultant. Randal is an avid outdoorsman and enjoys spending time paddling, grilling, and heckling folks on facebook.



Lillian Moore | Outreach Coordinator

Lillian is a recent graduate of UT Chattanooga with a degree in Environmental Science: Policy & Planning. After a year of Americorps VISTA Service with WaterWays, Lillian joined our team as a full-time staff member. She looks forward to learning more about the Tennessee Valley Watershed, and educating others on how to protect it.



Brooke Fleeman | Program Coordinator

Brooke is a passionate environmental educator and former Park Naturalist. She graduated from LMU with a degree in environmental science and played DII court and sand volleyball. Her role as Program Coordinator allows her to get out in the creek teaching and inspiring! Her spare time is spent on the lake and hanging out with family and friends!



Rosy Harpe | Intern

Rosy Harpe wears many hats for WaterWays! Rosy, a Signal Mt. native, graduated from the University of Knoxville with a degree in ecology and evolutionary biology with honors. Rosy works in the Gear Closet, helps with education programs, performs field work for our acid mine remediation project, and is our go-to landscaper for all projects! Rosy spends her free time foraging for tasty mushrooms!



Harmony Paulus | Americorps VISTA

Harmony feels most at home in the great outdoors and loves practicing environmental consciousness! With a B.S. in Biology and a minor in Anthropology, she is excited to help our local communities strengthen their connection to the natural world. We can't wait to see what she accomplishes during her term!

A special thanks to our Young Professionals!

Looking for ways to help support WaterWays? We are recruiting members for our Young Professional's Boards. Our YP Boards are made up of professionals across multiple disciplines, who promote and support our conservation work in the Southeast and Caribbean. They provide guidance and support to further us in our mission, and also have a lot of fun! Meetings these days are often carried out via Zoom, but typically gather at local bars and restaurants to discuss collaborative projects and events and enjoy the company of environmentally-minded professionals. If you are interested please reach out to the current Presidents **Meghan Ploch (US)** at meghanploch@gmail.com and **Neige Simpson (Caribbean)** at simpson.neige@gmail.com. We would love to have you onboard!



A note from our director | MARY BETH SUTTON

What a wacky 2020, right? When we had to close the **Gear Closet** in March, it was scary. What would we do? It is a good income stream for us. Made me realize how fragile everything is, everyone is. Our **Stream Team** and school programs were cancelled. Our camps were cancelled across the Chattanooga area and the Caribbean. BUT! **WaterWays** is emerging stronger as we move through this pandemic, because our **staff**, our **board**, our **young professionals**, our **volunteers**, our **partners**... WOW!! Our entire team is incredible and we've worked together both virtually and in the field to continue the work **WaterWays** is focused on-- **protecting and restoring our water!**

Our little staff has become so strong and bonded even more tightly... together we have planned, laughed, gotten stressed, cried, made videos, snorkeled with Casper, and literally dug in the dirt as we planted pollinator gardens, built outdoor classrooms, and dug and planted rain gardens. This staff team. I cannot say enough about them. This wonderful group works every day to provide healthier waters for everyone... they have made **WaterWays** stronger through this crazy time, and all the time! Add in our **Board of Directors**, an eclectic mix of dedicated individuals from across the USA and the Caribbean... WOW again! They are energized and committed to making **WaterWays** succeed, and it uplifts the staff to see our **BOARD** stronger than ever! Our **Young Professionals Boards** in **St. Lucia** and **Tennessee** add another dose of energy and enthusiasm to the equation.

Our volunteers also include folks like **Nick** and **Jenny**, **Larry**, **Kristina**, and **Jim** and all the volunteers who constructed our outdoor classroom and rain garden at **Hardy Elementary**. Partners like **Allison and her team** at **Enterprise South**, **Kaye** and our friends at **VW**, and **TC** and **Rachael** at **GroundScape Concepts** prove the fact that synergy happens when we work together. Our enthusiastic volunteers who came to help build the trail at the new outdoor classroom at Enterprise South or dig a demonstration **rain garden** in **East Brainerd** or volunteered to paint a dragonfly on our building, or adopt a section of their favorite stream show us the strength of community in action. The incredible generosity in our communities... that's what brings us together and makes us stronger.

You **ALL** make the world a better place. **Thank you.**



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WaterWays
clean water • healthy communities