

Stream of Consciousness



2023

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The publication *Stream of Consciousness* is made possible by the generous support of the Charles Merrill Kurtz Fund, which was established by Betty Puzak in memory of her father, Charles M. Kurtz, Dickinson Class of 1907.

Alliance for Aquatic Resource Monitoring

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Members of ALLARM, Lori Glace, and Kristen Saacke Blunck posing for a photo after testing the restoration monitoring instructions at Stuart Park in June 2022.

Stream Restoration Monitoring – Development and Field Testing

By: Nickolas Bradbury '23

The Alliance for Aquatic Resource Monitoring (ALLARM), the Chesapeake Monitoring Cooperative (Alliance for the Chesapeake Bay and the Izaak Walton League), and the Stroud Water Research Center have been collaborating to develop a community-based restoration monitoring program, an effort funded by the National Fish and Wildlife Foundation (NFWF). Launched in 2021, the goals of this first project phase have been to research other existing restoration monitoring protocols, develop a comprehensive study design and community-based protocol, and begin initial field testing to assess the impact of restoration implementation. Restoration projects can have many different faces; some sites have in-stream restoration, while others are focused on the creation of best management practices (BMPs). The Team is using the umbrella term “restoration” to describe several stream best management practices including riparian plantings, dirt and gravel road projects, stream bank restoration, stream-floodplain connection, and exclusion fencing. The restoration protocol will evaluate the status of the projects to help track successes (or challenges) over time and help target maintenance, as needed. The protocol, which targets order 1-3 streams,

assesses the restoration practices over a multi-year period, all while integrating a volunteer-friendly approach.

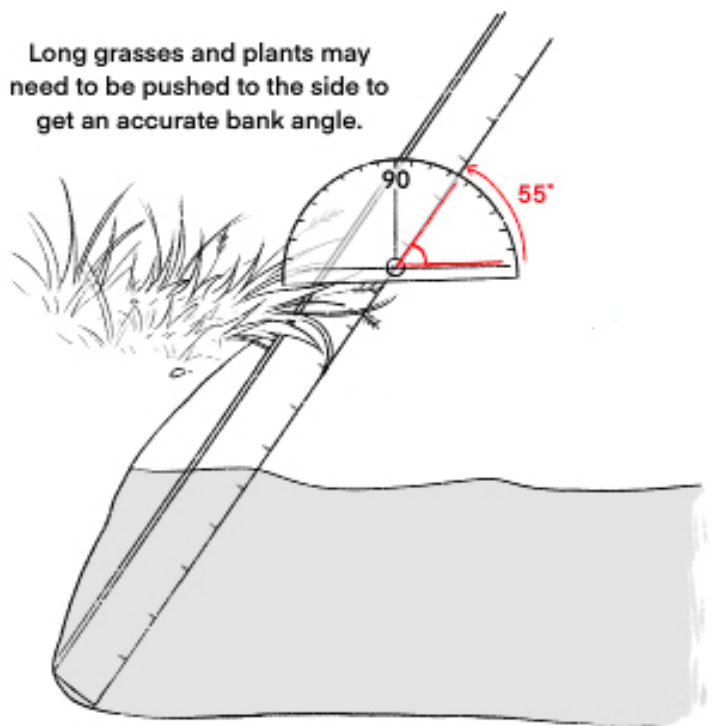
The restoration protocol uses four approaches to assess practices: photos, physical-visual indicators, physical water quality parameters, and macroinvertebrates. Initially, ALLARM turned to the United States Department of Agriculture (USDA) Stream Visual Assessment Protocol (a qualitative visual assessment tool) for a possible template. However, in conversations with Stroud, the team decided to integrate quantitative techniques to assess the physical status of streams. This new protocol in its entirety will cover a monitoring period of seven years. The first two years will focus on pre-restoration monitoring and then documenting the restoration intervention. The five years after the intervention would involve annual monitoring to assess the status of the projects and the potential impact of the restoration on the site over time. While the protocol itself is nearing final development, the process to get to this point has been full of field testing and revisions. The past 1.5 years have been dedicated to ensuring that the methods are rooted in strong science and that the techniques are accessible to volunteers.

Summer and fall 2022, ALLARM developed the first draft of the protocol and conducted field testing with the CMC and partners to confirm that the protocol is both applicable for a wide variety of BMPs and accessible to volunteers who would be monitoring these sites over the years. With each successive field test, the protocol improved and became more nuanced. All participating partners would provide feedback, and these suggestions would often result in ALLARM's Outreach Manager, Phoebe Galione, creating revised illustrations to help increase accessibility of the protocol.

To further explain this cyclical process, we can look at how the protocol's methods for measuring stream bank angle has changed over time. The purpose of measuring bank angle is to help determine how the stream's geomorphology, or physical and geological features, changes. In June 2022, I had the opportunity to help at one of these field tests at Stuart Park in Dickinson Township, Pennsylvania. For this field test, NFWF Representative Kristen

Saacke Blunk and Lori Glace, Cumberland County's Watershed Specialist (at the time) accompanied the ALLARM summer staff. While at Stuart Park, we tested some of the measurements for the very first time. When it was time to measure the angle of the streambanks, we used a gage stick and a protractor to determine the angle. We quickly realized that the current version of the protocol was unclear on whether we measure the outer protractor angle from the bank or the inner angle towards the stream. ALLARM Director Jules Vastine and Phoebe Galione made sure to edit the instructions so that volunteers could more accurately and consistently record measurements.

Later a field test with members of the Izaak Walton League of America (IWLA), another CMC partner, showed that further refinement to the protocol was needed. While trying to apply the lessons learned from previous tests, the team noticed that long grasses growing in the water and on the bank made difficult to determine the bank angle with the existing instructions.



Left: Liz Chudoba (Alliance for the Chesapeake Bay) and Jules Vastine (ALLARM) troubleshoot measuring bank angle in the presence of emergent grasses.
Right: Illustration created by ALLARM Outreach Manager, Phoebe Galione, to reflect this in-field troubleshooting.

And so, Phoebe Galione created another illustration to highlight a scenario with long grass and what to do. Each of these measurements have similarly been tinkered with to ensure that the protocol in its entirety is scientifically sound and accessible to volunteers.

The next phase of the protocol will see additional trial runs of the protocol in preparation for long-term site monitoring, as well as finding answers to questions around data storage and future analysis. The trial run of the protocol will

invite known collaborators, such as ALLARM collaborators and/or volunteer scientists from other ALLARM programs, to take part and evaluate the protocol's readability.

Up to this point and as we look forward to future development, it is thanks to pooled resources and collaborative field testing that this comprehensive protocol has been created while still meeting its goals of scientific accuracy and accessibility to future volunteers.

Bringing Back Macroinvertebrate Workshops

By: Amaya Hamilton '24

In the fall of 2022, ALLARM had the opportunity to bring back our long-awaited macroinvertebrate workshops. Due to the COVID-19 pandemic, we had postponed many of our in-person trainings for two years. During this period of time, we transitioned to new workshop methods—virtually, of course. ALLARM held several online monthly monitoring trainings where we shared tips and tricks for water sample collection and assessment which allowed new volunteers to be onboarded while refreshing the skills of current volunteers. We were also able to host an extended webinar on macroinvertebrate importance and identification. However, we all still longed to be able to get in a stream and collect some macroinvertebrates together in person.

In September, we held our first macroinvertebrate workshop since 2019 at Stuart Park in Dickinson Township. This was my very first ALLARM event as a watershed coordinator and I was very excited. Volunteers from several counties, including Cumberland, attended this workshop, eager to get into the water and see what we would find in the stream. We first did a dry-run demonstration on land, explaining how to hold the net and disturb the streambed so that the macroinvertebrates would be swept into the net. We then split into groups and went down to the stream, collecting multiple samples which we could take back up to the pavilion and transition to identification. Using dichotomous keys, magnifying lenses, and microscopes,

the volunteers worked to identify and sort the macroinvertebrate we found, primarily to order level. We explained key features of certain macroinvertebrates, such as gill location, and helped guide volunteers towards the right identification if they were uncertain.



ALLARM watershed coordinators practice a macro kick with Stream Team volunteers at Stuart Park.



Nick Bradbury '23 helps carry the kick net after a successful sample collection during our second macroinvertebrate workshop of the year.

Not only did the volunteers complete this workshop with a better understanding of how to collect and identify macroinvertebrates, but I also felt as if I learned a lot, not only about macroinvertebrates but about ALLARM's mission. It was an incredible experience to meet volunteers with the common interest of monitoring the health of our local waterways. To be able to get to know people's individual backgrounds and reasons for participating in community science, as well as share my own experiences, made the experience that much more worthwhile.

Nick Bradbury '23, who I spoke with later, shared that he carried similar takeaways as I did. Nick participated in the later October macroinvertebrate workshop at Hillside Farms in Trucksville, PA. Despite Nick being one of our most seasoned ALLARMies, he says he is still learning and refining his knowledge at every macroinvertebrate workshop. He enjoys engaging with volunteers and says they are always so enthusiastic and eager to take part in the workshops no matter their prior knowledge on the subject. As long as the volunteers walk away from the workshop knowing the main differences between macroinvertebrate orders and understand the importance of these organisms on a biological scale, Nick considers

the workshop successful.

Stephanie Letourneau, our Community Science Manager, put a lot of planning into these two workshops. Because the effects of COVID have not gone away, Stephanie was careful in selecting the locations at which ALLARM held its workshops, specifically choosing locations that allow as much outdoor space for collection and identification as possible. Accessibility is always a priority of hers as well, making sure parking is available and the stream is manageable to enter and exit. Through her years at ALLARM, she has learned that not all volunteers can be taught or participate in the same way. When preparing for our macroinvertebrate workshops, she focuses on reaching our volunteers where they are. Though virtual meetings were a convenient way to connect with volunteers during the pandemic, Stephanie finds that the in-person workshops are the best way to engage with individual community members.

Bringing back macroinvertebrate workshops was a great achievement of 2022 for ALLARM. It provided us an opportunity to meet again with volunteers who have worked with us before, as well as meet new community members with an interest in water monitoring. We are eager for the next workshop already!

Partner Spotlight: Master Watershed Stewards

By: Prerana Patil '24

"Entering a new community is not something ALLARM does lightly." This is a refrain often repeated in meetings or when describing the genesis of a new ALLARM project. So when the ALLARM team was deliberating how to pilot Stream Team, they were looking for regional partners who understood the needs of a location and a community to help develop an effective monitoring program. In conversations with the Lower Susquehanna Riverkeeper, Ted Evgeniadis, whom ALLARM was working with at the time, he recommended the Penn State Extension Master Watershed Stewards (MWS) in York County. The MWS in the area were a substantial group doing synergistic work, and so a relationship was struck between the two organizations.

Stream Team was piloted in York County in partnership with Lower Susquehanna Riverkeeper Ted Evgeniadis and York County Master Watershed Steward coordinator Jodi Sulpizio in the fall of 2018.

The Master Watershed Stewards are a group of volunteers trained by Penn State

extension in watershed management. The MWS program provides training to volunteers in counties all over the commonwealth of Pennsylvania in an effort to strengthen local capacity for management and the protection of watersheds. As part of their training, Master Watershed Stewards learn about groundwater, stream ecology, wetlands, invasive species, water recreation and stormwater management. These volunteers then educate their community about watershed stewardship through educational events, stream restoration, water quality/stream assessments, stream cleanups and habitat restoration. The stewards are required to complete 20 hours of volunteering annually after their initial training. These volunteer hours are where the interconnectedness with ALLARM begins.

In my conversation with ALLARM Community Science Manager, Stephanie Letourneau, she explained to me that the relationship between ALLARM and the MWS program is "very symbiotic."



Members of the York County Master Watershed Stewards Program pose together after their February Awards Ceremony.

ALLARM's Stream Team Program provides volunteer opportunities while the MWS program provides a well-prepared volunteer demographic for ALLARM. York County MWS coordinator, Jodi Sulpizio, agreed. When asked about the topic, Sulpizio highlighted the sharing of resources between the two organizations and attributed the success of the program to how well the ALLARM team communicates and works to train volunteers.

Stephanie Letourneau had a similar comment about the MWS teams – emphasizing their ability to work together and communicate well. The relationship is collaborative in so many more ways! Each county has a MWS coordinator and each year they train a new batch of volunteers. Furthermore, Jodi and other coordinators can help ALLARM find meeting space, get supplies to people and help with QC by being a centralized location for drop offs. They also help from a volunteer management perspective by having two sets of eyes and hands looking out for people and keeping track of needs. In turn, ALLARM can provide stipends to partnering organizations through a Campbell Foundation grant, supporting the MWS program in a direct way. Jodi noted that a friendship had formed over the years on top of the ALLARM-MWS working relationship and that the two are brought together by the desire for informed communities connected to watershed work. That sentiment was echoed in my interview with Jodi Sulpizio who said aptly, “We both want to protect our watersheds!”

The effectiveness of the ALLARM-MWS partnership is exemplified by steward Cindi Pizziketti's monitoring of Kreutz Creek. Cindi observed discoloration and high nitrate-nitrogen levels at her Stream Team monitoring site and decided to alert Lower Susquehanna Riverkeeper Ted Evgeniadis. This all led to the determination of extremely high PFAS levels in

Kreutz Creek which resulted in a lawsuit and now a 23 million dollar upgrade of Modern Landfill for their pollution. This was all borne of a passionate volunteer and the resources that Stream Team could provide!

Over the years the two organizations have worked on more than Stream Team. They've collaborated on the committee to plan the Pennsylvania Organization for Watersheds and Rivers State Watershed Conference in 2021 and the relationship has also led to ALLARM partners outside the Chesapeake Bay watershed with Westmoreland and PLEWA (Pennsylvania Lake Erie Watershed Association).

Furthermore, the two organizations have similar desires to address diversity, equity and justice (DEIJ) issues within their communities and are able to coordinate and tackle them together.

I asked Jules, Stephanie and Jodi their favorite memories from ALLARM-MWS collaborations and got some wonderful answers. Jules had a hard time choosing a favorite memory citing that “every event was a new canvas for a favorite memory,” but ended up landing on the open calls. They loved how much connection and innovation there was within the open call environment and gushed about the passion and dedication of the stewards, exclaiming “What a gift!” Stephanie's favorite memory was the first time the Susquehanna county MWS cohort got to see each other in person. She noted the camaraderie in the air and how well everyone worked with each other. Jodi highlighted how cool Cindi's find was and how amazing that it got to the level of significance that it did.

The York County Master Watershed Stewards remain a vibrant group of volunteers for Stream Team and the group makes up around half of ALLARM's Stream Team volunteers across all counties.

For more information, check out:
<https://extension.psu.edu/programs/watershed-stewards>

Partner Spotlight: Lower and Middle Susquehanna Riverkeepers

By: Grace Messimer '23

An important partnership to the Alliance for Aquatic Resource Monitoring (ALLARM) is with both the Lower and Middle Susquehanna Riverkeeper Associations. Stream Team is a partnership program between ALLARM and both Riverkeeper Associations, and thus these organizations work together to assess the health of the Susquehanna watershed. The Lower and Middle Susquehanna Riverkeeper Associations are not only essential partnerships to ALLARM but are also important advocates for the river and work to hold polluters and government agencies accountable to the Clean Water Act.

Meet the Riverkeepers

Every Riverkeeper has unique goals and methods for doing their work, but do so with the shared goal of protecting their waterways. The work that a Riverkeeper does varies, but it is done with the intent to educate the public, enforce the Clean Water Act, and protect the rights to clean water. The Waterkeeper Alliance “ensures that the world’s Waterkeeper groups are as connected to each other as they are to their local waters, organizing the fight for clean water into a coordinated global movement” (“Who We Are”). This includes using community science, activism, and legal advocacy to enforce water policies and work to protect the right to clean water. The Waterkeeper Alliance also promotes supporting diversity, equity, inclusion, and justice in their values and goals. The Waterkeeper Alliance is a global organization with thousands of Riverkeepers working to protect their waterways.

ALLARM works with both the Middle and Lower Susquehanna Riverkeepers who cover different regions of the Susquehanna River in Pennsylvania. Both are licensed by the Waterkeeper Alliance as advocates for the Susquehanna watershed. Ted Evgeniadis is the Riverkeeper and executive director of the Lower Susquehanna Riverkeeper Association. John Zaktansky is the Riverkeeper and executive director of the Middle Susquehanna Riverkeeper Association.



Image modified from:
<https://lowersusquehannariverkeeper.org/ted-evgeniadis/>

Lower Susquehanna Riverkeeper

Ted Evgeniadis began volunteering with the Lower Susquehanna Riverkeeper Association while a student at York College, and after graduating with a finance degree, joined the board of directors for the association as the treasurer. He stayed in this role until April 2017, when his predecessor asked him to take over the role of Lower Susquehanna Riverkeeper. For almost six years, Ted has served as the Lower Susquehanna Riverkeeper and the executive director of the Lower Susquehanna Riverkeeper Association (LSRA). As the Lower Susquehanna Riverkeeper, he partakes in fieldwork, communications, lobbying, and helping in litigation cases; as the executive director of the LSRA, Ted is also responsible for nonprofit fundraising, community events, and other administrative tasks.

The LSRA refers to Ted as “an alliance builder, diplomat, and educator, but also, when the situation calls for it, an unrelenting defender and advocate for our right and the river’s right to be healthy and prosperous” (LSRA). Ted is focused on enforcing environmental regulations and holding polluters in the Lower Susquehanna, as well as environmental agencies, accountable.

As the Lower Susquehanna Riverkeeper, Ted has advocated for clean water and enforcement of clean water policies in numerous cases through his region of the Susquehanna. This currently includes being an involved party in a lawsuit between the EPA and PADEP against Capitol Region Water in Harrisburg. This lawsuit began after bacteria including e. coli was found in ten sampling sites along Paxton Creek and the Susquehanna near Harrisburg due to combined sewage overflow from Capitol Region Water, Harrisburg’s water utility company. LSRA has been involved in this issue since it was recognized in 2015, and as the Riverkeeper, Ted has taken part in reports, press conferences, and through joining the lawsuit in 2021. LSRA joined the lawsuit after the EPA did not approve Capitol Region Water’s long-term control plan; through their intervention, Ted is able to provide recommendations for engineering practices and for actions that could correct violations to enforce the Clean Water Act. Currently, there is a plan in place between LSRA, Harrisburg, EPA, and PADEP for the Capitol Region Water to meet a new consent decree by December of 2024 to reduce the combined sewage overflow. Ted continues to work with these agencies to reach Clean Water Act compliance for Capitol Region water; he said in an interview that he applauds the next steps, but remains concerned about if the consent decree will be reached expeditiously. His work as the Riverkeeper has allowed him to play a vital role in advocating for enforcing the Clean Water Act through the lower Susquehanna region. Ted is dedicated to enforcing environmental regulations and stepping in to advocate for the river whenever necessary.

Middle Susquehanna Riverkeeper

ALLARM also worked with our partner, the Middle Susquehanna Riverkeeper Association (MSRKA), to create Stream Team. Stream Team planning began in 2018, when Carol Parenzan, the founding Middle Susquehanna Riverkeeper,

was in the position. Carol acted as Middle Susquehanna Riverkeeper from 2015 through 2019 and focused on finding environmental solutions using an engineering perspective. She worked towards meeting the Chesapeake Bay goals for this region of the Susquehanna and raised awareness for the public’s understanding of clean water in the Susquehanna. In late 2019, Carol stepped away from the position, and it was filled by John Zaktansky, who is the current Middle Susquehanna Riverkeeper.

Before becoming the Riverkeeper, John worked as a journalist for The Daily Item for over a decade, and believes that his journalism work prepared him for connecting to the community even during a pandemic, as he was well versed in livestreamed events and blogposts already. John considers himself “the Lorax of the greater watershed” – a voice for the Susquehanna who works to raise awareness of environmental protection. John also states that he sees himself as “an environmentalist, engineer, educator, and entrepreneur” and that his first focus is always the health of the river (Middle Susquehanna Riverkeeper Association).

Much of his work is focused on education and working with environmental groups, and he does so with the goal of reconnecting people to nature and natural resources.



Image modified from:
<https://www.middlesusquehannariverkeeper.org/about-us.html>

John has worked on strengthening the relationship between the public and the Susquehanna. He values environmental education and connecting the next generation to nature and waterways, and being able to give a voice to people who feel powerless in overwhelming situations. The MSRKA is also launching an environmental education leadership program for high school students interested in pursuing environmental education in the future, and has a summer program for children to fish and kayak with the MSRKA.

Importance of Community Partnerships

Community partnerships are vital to ALLARM. Working with both the Lower and Middle Susquehanna Riverkeeper Associations has been instrumental to the success of our Stream Team program. Ted Evgeniadis stated that he views ALLARM and the LSRK partnership as filling a need to embrace community science

and data collection – it is mutually beneficial, and working together allows for more action and work to be done as a unified group than either may have been able to reach separately. Riverkeeper Associations often have a small staff and cover a large area of a watershed, meaning that support from community scientists, volunteers, and the public are essential to their success. John Zaktansky shared that the MSRKA relies on trusted partners like ALLARM to handle issues over such a large watershed, and that the data collected by Stream Team can help identify issues that he can work on as the Riverkeeper. ALLARM and the Middle and Lower Susquehanna Riverkeeper Associations have built a stable network of people invested in water quality and protecting local watersheds. Through working together, ALLARM and the Susquehanna Riverkeepers are able to collect credible water quality data and face issues that the Susquehanna is facing.

Thank you Ted and John for your contributions to this article and for your dedication to the greater watershed!

Work Cited:

Lower Susquehanna Riverkeeper Association. (n.d.) Meet our Team. <https://lowersusquehannariverkeeper.org/>
Middle Susquehanna Riverkeeper Association. (n.d.) Meet Your Riverkeeper: John Zaktansky. <https://www.middlesusquehannariverkeeper.org/>

New Community Collaborations: Susquehanna County Stream Team

By: Dipseka Timsina '25

In 2022, Susquehanna County officially joined the Master Watershed Steward Program with assistance from the Susquehanna County Conservation District and ALLARM.

The Master Watershed Steward Program (MWS) works with communities and volunteers, building capacity to improve the health of neighboring streams, rivers, and other natural resources. It empowers and educates volunteers to protect environmental resources and promotes scientific learning. As part of MWS, volunteers are required to dedicate a number of hours to participate in training experiences promoting the values of the program. As a volunteer project, collaborative efforts between MWS and ALLARM's Stream Team program have formed, where Stewards become trained Stream Team volunteers and monitor a local

stream. Through Stream Team, MWS volunteers learn to collect scientific data that helps inform methods to improve the health of neighboring watersheds and contribute to regional Chesapeake Bay data collection efforts

Stephanie Letourneau, ALLARM's Community Science Manager, recalled her first experience meeting the Susquehanna County volunteers for training, along with other ALLARM staff and student watershed coordinators. The trip to and training in Susquehanna County started with a presentation led by Stephanie and Jules Vastine, ALLARM's Director. They taught the volunteers about Stream Team parameters and goals before breaking into smaller groups where watershed coordinators, Charlotte Kratovil-Lavelle '24 and Michelle Cao '25, waked them through the Stream Team manual. This run-



Michelle Cao '25 works through the tips and tricks of monitoring with Susquehanna Stream Team volunteers.

through was followed by another presentation by Jules, who led a training on visual assessment. This process was aimed at getting the volunteers prepared for data collection and to give them a better baseline for understanding their streams.

To get hands-on training, the ALLARM team and MWS volunteers went out and practiced monitoring in the Woodbourne Forest and Wildlife Preserve, practicing additional Stream Team skills including how to collect water samples, measure stage, and assess water clarity which are best done in-field. Additionally, the volunteers had the opportunity to put the visual assessment lesson to use at the stream, giving them nuanced in-field context for each of the indicators.

At the end the day, the volunteers were introduced to monitoring benthic macroinvertebrates, which they enjoyed very much. Spending the day with ALLARM, learning about Stream Team and getting hands-on training was very important to the Susquehanna County volunteers as they were able to experience and build Stream Team skills.

Jeremy Leaidicker's Experience:

I also had the opportunity to speak with Jeremy Leaidicker, the Master Watershed Coordinator for Susquehanna County. Jeremy expressed the passion his volunteers have and how working with them is his favorite part of his

job. He loves the excitement he gets from his volunteers and wants to continue to build a better relationship with them. As much as he enjoys working with volunteers, he mentioned the struggles of volunteer recruitment. They have been actively trying to get more volunteers through volunteer recruitment initiatives, and by spreading the word through social media, news, and hosting informational sessions.

As the Master Watershed Stewards and ALLARM's relationships continue to grow, Jeremy is looking forward to more of ALLARM's monitoring programs and would like to see them implemented in all four of his counties: Bradford, Sullivan, Susquehanna, and Wyoming. In the future, Jeremy also wants to continue to build more awareness and have a good volunteer base in the area.

Martha Steed's Experience:

I also had the opportunity to talk to Martha Steed, a Susquehanna County steward, who was part of ALLARM's Stream Team training. She talked about how interesting and enjoyable the whole experience was; going out into the field, collecting benthic macroinvertebrates, and getting the chance to connect with the ALLARM staff.

Martha mentioned that she saw an article in a community newspaper and joined the Master Watershed Steward program, hoping to do meaningful volunteer work.

Living near Quaker Lake, the health of the lake and its water quality were very important to her. Through the Stream Team, Martha was able to ensure that the quality of neighboring lakes and streams continues to be in good health and thrive. Overall, Martha said she is really looking forward to more volunteering opportunities and participating in more work!

It was very exciting to learn more about the Susquehanna County Stream Team, and to hear and learn about Jeremy and Martha's experiences. I look forward to seeing their future accomplishments and working with them through ALLARM.

Thank you to Jeremy Leaidicker and Martha Steed for your contributions to this article and for your dedication to monitoring!

Bringing Stream Team to the Loyalhanna Watershed: Spotlight on Westmoreland Volunteers

By: Charlotte Kratovil-Lavelle '24

As a child growing up in the suburbs of Philadelphia in the 1950s, Wilma Light enjoyed walking through the woods and along Darby Creek, turning over rocks in search of crayfish. Though Wilma was grateful to have had this experience, she also remembers the smell and sight of sewage polluting the creek's banks. As she put it in our interview, "you didn't need a class to know something was wrong."

Wilma's experience as a child along Darby Creek helped to spark her interest in water quality and environmental health, interests that would follow her through her life and into her retirement. Wilma earned her B.S in chemistry from Bucknell University and studied medicine at Thomas Jefferson University in Philadelphia before going on to work as an allergist. Wilma has been a Master Gardener with Penn State Extension since 2004 and has been working with the Loyalhanna Watershed Association for the past five years. She is also involved in Salt Watch with the Izaak Walton League of America. Wilma became a Master Watershed Steward in Westmoreland County three years ago, and it was through this program that she became a part of Stream Team with ALLARM.

On February 9, 2023, I had the pleasure of talking with Wilma Light along with Justin Mansberger, Extension Educator and Master Watershed Steward Coordinator of Westmoreland County to discuss their backgrounds in water

quality and their Stream Team experience thus far. Justin is also a Pennsylvania native, having spent all his childhood in Mechanicsburg before graduating from Penn State in 2016 with a degree in Ecology. While working as an undergraduate teaching assistant, and later as a park ranger, Justin found his love for hands-on teaching and working with volunteers. After college, Justin moved to Pittsburg, where he graduated with a degree in environmental science and management from Duquesne University. It was during his graduate studies that he became interested in water quality issues, with a particular focus on stormwater, urbanization, and the loss of permeable ground.

In March of 2020, Justin established the Master Watershed Steward program in Westmoreland County with the goal of educating residents about water quality issues. During his first year with the program, Justin observed the collaboration of other steward programs with ALLARM, whom he noted spoke highly of the Stream Team program. Stream Team is designed to be a flexible program that works with our volunteers' schedules, fits their goals and needs, and delegates the choice of which stream to monitor to them. These criteria, along with the interest in stream monitoring expressed by his volunteers, led Justin to reach out to Jules Vastine, director of ALLARM, in 2021 to initiate a collaboration.

At first, Justin was not sure if becoming involved with Stream Team was a possibility, given that Westmoreland is outside of the Chesapeake Bay Watershed. Fortunately, through the Consortium for Scientific Assistance to Watersheds, (C-SAW) and donor support, ALLARM had the resources necessary to expand the program, and on June 22 of 2022 the ALLARM summer team piled into the Stream Machine (our trusty van) and embarked upon the three-hour trek to Westmoreland for the volunteer training.

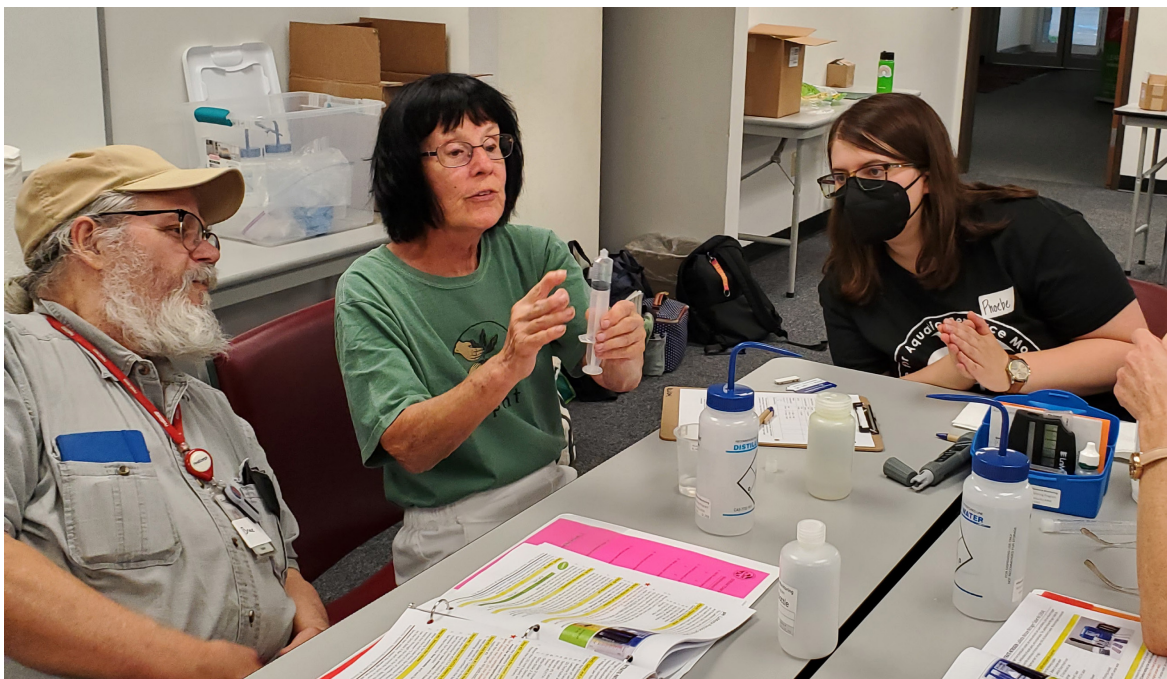
I received positive reactions from both Wilma and Justin in response to this meeting. Justin recalled from the experience that he appreciated our “dedication to providing [his] volunteers with a great training and extending the program out here.” Wilma expressed that she felt that the meeting fostered a kind and supportive atmosphere, something that I was thrilled to hear.

Justin said that he has been pleased thus far with their participation in Stream Team, noting that the thing he really appreciates is the community ALLARM has built within the state. “I still feel that our program is connected,” he said in our interview. “I really appreciate that you guys welcome us into the Chesapeake Bay region and make us feel like a part of Stream Team.” Justin looks forward to being able to utilize the data his volunteers have been collecting, saying “most of [his volunteers] are monitoring local streams that they have some sort

of investment or emotional tie to, so they are definitely eager to get sharing the data.” Wilma echoed this sentiment, telling me she was looking forward to sharing the data with her partners at the Loyalhanna Watershed Association.

Wilma currently monitors Mill Creek, where she has been going for years. Wilma believes that people tend to be more concerned with the places that they can see, one reason that it is beneficial for volunteers to choose their monitoring location. During her five years working in and around streams, Wilma is an adamant believer that “hands on is always better” and that “being out there, around there, around our ecosystem is an excellent way to teach.” In a county affected by pesticide use, runoff, sediment deposition, and flooding, she affirms that we must look to solutions such as education, wetland restoration, and riparian buffer creation. Wilma believes that the more we know about the issues, the more likely we are to do something about it.

Working in the field, Wilma has witnessed the diversity of organisms that make up her local ecosystem: owls, honeybees, squirrels, turtles, ducks, amphibians, and plants, to name a few. Both above and below the water, she tells me, there is a complex array of life and activity. From the bald eagle flying high in the air, to the crawfish nestled underneath a rock, “you need the whole spectrum to appreciate it.”



Thank you to Wilma Light and Justin Mansburger for their contributions to this article. ALLARM is grateful for all the work you do!

Wilma and other Westmoreland Volunteers work through the Stream Team protocol with ALLARM guidance.



Isabel enjoys visiting the local LeTort Spring Run, and relaxing in a stream upon returning to ALLARM!

Welcome Back, Isabel Ruff! ALLARM's New Volunteer Monitoring Specialist

By: Nickolas Bradbury '23

This Spring, ALLARM welcomed Isabel Ruff '21 back as the organization's new Volunteer Monitoring Specialist. Isabel got her start in the environmental field at ALLARM as a Student Watershed Coordinator for three semesters, graduating from Dickinson College with a bachelor's degree in Environmental Science.

Isabel first joined ALLARM as an undergraduate student because of her growing passion for the environment. Her role at ALLARM was shaped by the COVID-19 pandemic, as she began her time at ALLARM as a student watershed coordinator in the spring of 2020. During this chaotic period, Isabel worked with the rest of the ALLARM staff to develop virtual trainings and meetings that could still prepare volunteers for their stream monitoring experiences. Her favorite event as a Student Watershed Coordinator was a data interpretation workshop. Isabel loved hearing volunteers talk about what they've noticed about their streams and what sort of stories their data tell. She has always loved learning about the backgrounds of the volunteers and what sorts of

additional knowledge they are bringing with them to monitoring.

After graduating, she followed her passion for environmental education and worked for Arlington County Parks and Recreation as a Park Naturalist at Long Branch and Gulf Branch Nature centers. Her role included leading programs about natural history for community members of all ages, caring for local animal ambassadors, and providing opportunities for people to learn more about their local environment.

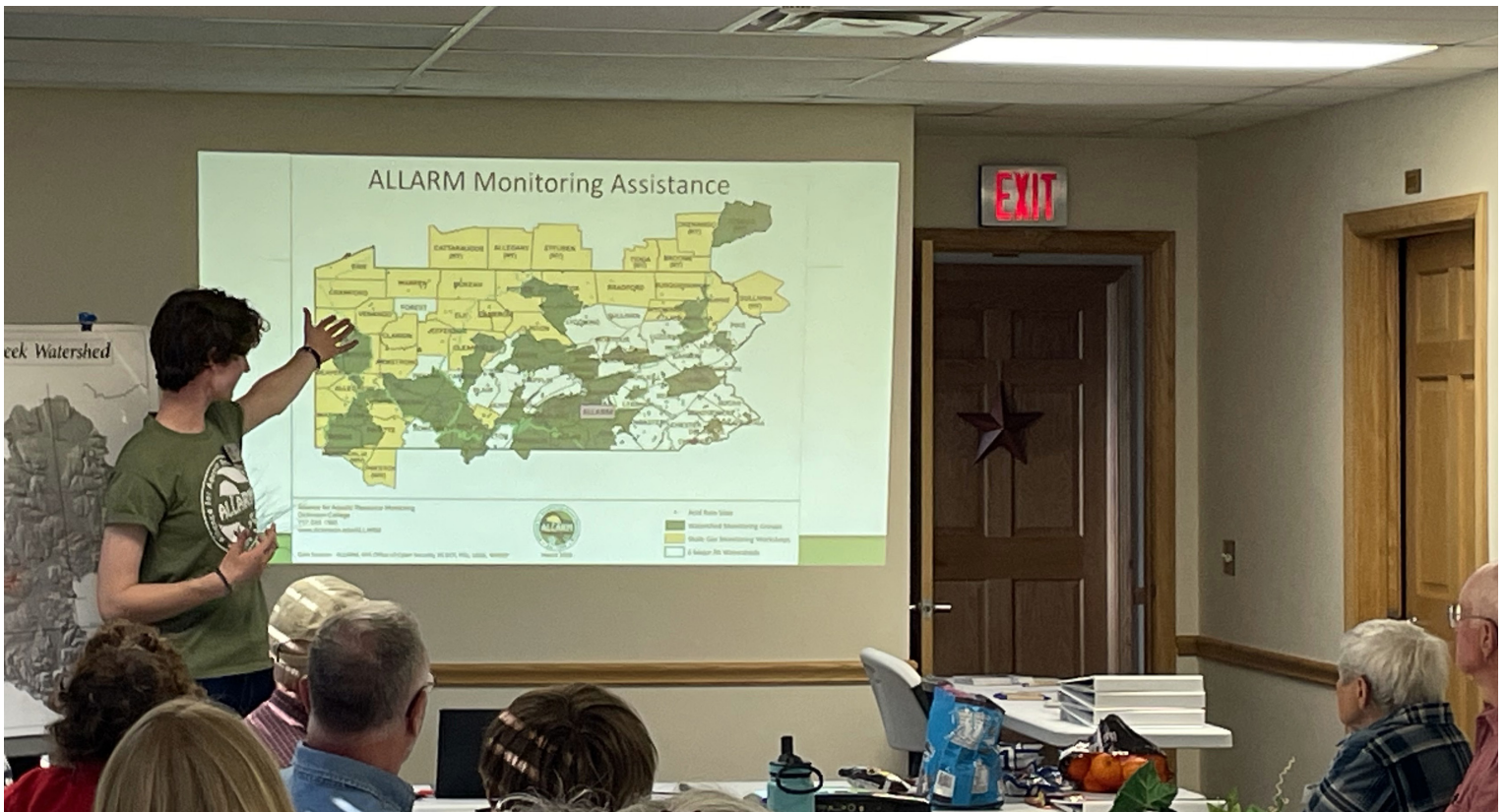
In her new full-time position, Isabel will be co-managing Stream Team, as well as reconnecting with and supporting ALLARM's partners in New York. In this role, Isabel will be meeting volunteers needs with supplies and equipment, planning workshops and trainings, and supporting volunteer data entry and upload as needed. Because of her prior experiences with ALLARM, Isabel is particularly looking forward to working with the Stream Team volunteers in person.

In addition to all the important work that Isabel has been doing with Stream Team, Isabel has been spearheading the team's work with Geographic Information Systems (GIS), a computer software used to create maps. She had begun working with this software during her time as a student and is excited for her newly expanded role. With this task comes file organization, tutorial creation, and the updating of maps created using older software to the newest and most polished versions of ArcGIS. These sorts of tasks often go unseen but contribute to a smooth and productive time for the rest of ALLARM's staff.

Isabel also expressed her support of community science. She loves the role that ALLARM has in building the capacity of volunteers. She discussed how ALLARM can support and encourage communities, and the flexibility built into that sort of relationship. Isabel noted that volunteers can ask the questions that they want to ask about their own local environment, giving them agency over their own monitoring experience. While some other models of

community science might engage volunteers in collecting data to answer the researcher's question, ALLARM's model truly puts volunteers in the driver's seat. Isabel is looking forward to her role in the community science process and amplify the voices of volunteers across the Susquehanna River Watershed!

Outside of ALLARM, Isabel is a hiker, a climber, and isn't afraid of trying new things! As an undergraduate, she was a resident of the sustainable living house, joined theater tech for a year, and often found herself exploring whatever opportunities came her way. This also led to her spending a semester in Australia with the School for Field Studies (SFS). Isabel wants to continue to explore and travel more abroad, ranging from Iceland to an adventure throughout South America. Despite these grand adventures, Isabel has been enjoying being back in Carlisle, as she gets to explore what the town has to offer as a resident rather than as an undergraduate student. The ALLARM community is thrilled to welcome Isabel back and looks forward to what she accomplishes next!



Isabel explains the historical coverage of ALLARM support throughout Pennsylvania and southern New York to the Conewango Creek Watershed Association.



Lindsay VanFossen leads an equipment training with the Conewango Creek Watershed Association.

Meet Our New Water Quality Technician: Lindsay VanFossen!

By: Amelia Harper '25

In the spring of 2023, the Alliance for Aquatic Resource Monitoring welcomed Lindsay VanFossen as the new Water Quality Technician. As the academic year goes on, she is settling into the new role and is adapting quickly to the ALLARM workplace.

Lindsay grew up in the Philadelphia area, and graduated from the University of Vermont in 2022 with a degree in Environmental Science, concentrating in Water Resources. During her time there, she worked in the Vermont Limnology Laboratory studying phytoplankton community dynamics, and also did summer lab work for Vermont's Department of Environmental Conservation identifying cyanobacteria samples. These experiences solidified her love for lab work related to watershed stewardship. Additionally, she worked as a Watershed Educator for Lake Champlain Sea Grant, helping with environmental education for K-12 students in the Lake Champlain Basin watershed community. After graduation, Lindsay had the incredible opportunity to spend the summer of 2022 as a Streams Technician for the Arctic Long Term Ecological Monitor-

ing Network at Toolik Field Station, a remote research station in the arctic circle of Alaska. Here she gained valuable experience with stream sampling and analysis after spending much of her undergraduate studies out on Lake Champlain. She speaks very fondly of her time in the Arctic. After returning home in the fall of 2022, her combined experience with lab and field research, and community outreach and education, made her a perfect fit for the new position of Water Quality Technician. Lindsay is enjoying "the research, the education, and community involvement, all intertwined" at ALLARM. (L. VanFossen, private interview, 2023)

In her role as Water Quality Technician, Lindsay primarily manages ALLARM's Community Aquatic Research Laboratory—coordinating lab activities, ensuring compliance with the Quality Assurance Project Plan (QAPP), managing and troubleshooting equipment, and looking for ways to streamline procedures. Additionally, she assists with administrative responsibilities like ordering supplies and keeping track of equipment that is loaned out.

At the time of this article's writing, she has spent most of her time getting oriented to ALLARM and the lab, and recently helped conduct quality control for the first time! As time goes on, she will also be involved in Stream Team and partnership trainings. She looks forward to getting more involved with community outreach and working with ALLARM's volunteers at training events in the future.

Outside of ALLARM, Lindsay is a freelance photographer, and she particularly loves hiking up to beautiful views for landscape photography. She has experience with event photography but gravitates toward photographing landscapes when she has access to good locations for it. She says that her summer work in Alaska helped to solidify her love for the outdoors, hiking and travel, and she is excited to explore differing landscapes when the opportunity arises. Lindsay is a wonderful colleague and lab partner, and we at ALLARM can't wait to see what she does next!



Lindsay takes a break in a stream between collecting macroinvertebrate samples.

A Week in the Life of an ALLARMie

By: Kailey Sipe '25

I was nervous walking into my first ALLARM staff meeting at the prospect of meeting my fellow student watershed coordinators (ALLARMies) and the ALLARM full-time staff for the first time. As I opened the door, however, I was greeted with warm smiles and positivity, plus food from ALLARM's favorite local restaurant. As I reflect back on this first experience with ALLARM, it is crazy to believe that I was nervous, knowing now how inclusive and inviting the atmosphere is. This environment that ALLARM continues to foster is important as it emphasizes that I, and the work that I do, are of value.

One of the first experiences that we all shared as a team was our weekly occurring staff meetings, which happen every Monday during the semester. They are a way for the full-time staff and watershed coordinators to come together and learn about what each member is currently working on, as we all have unique projects and may not overlap otherwise in the

office. After our weekly staff meeting ends, we ALLARMies go to the cafeteria for dinner, to catch up and get to know one another better on a more personal level.

One aspect of ALLARM office culture that fosters greater connection is Warm and Fuzzies. Warm and Fuzzies, which have an entire station dedicated to them in the office, are where each member of the ALLARM team can write a positive note to someone else and put it in a uniquely decorated envelope. At the middle and end of the semester (coinciding with the hardest parts of the semester), these envelopes are distributed to each member. Warm and fuzzies are an important part of ALLARM office culture, as they promote positivity and kindness within the office.

Another aspect that attracted me to ALLARM was the focus on valuing every accomplishment, no matter how small. An important aspect of office culture is to refrain from

using belittling language. For example, we avoid using words like “just” or “little” when talking about our work and ourselves, as these terms undervalue our efforts. By doing so, we are recognizing that our contributions are significant regardless of perceived value.

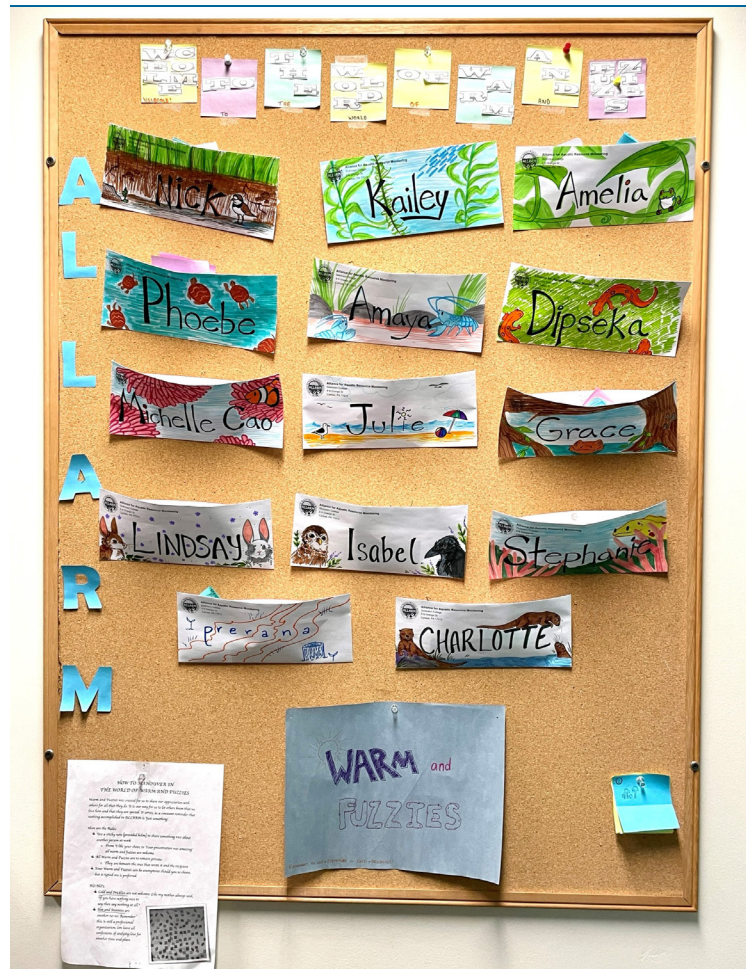
Feeling safe to not only be your best self, but simply being yourself regardless of the day, is an additional key aspect that ALLARM cultivates. There is definite emphasis on taking care of one’s mental/physical health. In the office, there are sticky notes on the walls that promote taking breaks and checking in on yourself. Further – the 119 office is stocked with different types of teas for office comfort and connecting with our fellow staff members. By taking breaks, we at ALLARM encourage and cultivate a safe and comforting environment.

What does the week look like?

As previously stated, student watershed coordinators throughout the week are all working on different projects or prepping for different events. I spoke to a couple of my fellow ALLARMies to get a taste of what their role and week at ALLARM looks like:

Research: While working on research at ALLARM, Grace Messimer '23 said that they “primarily focus on water policy issues and community science as a field.” Outside of ALLARM, Grace has been able to apply what they do at ALLARM to the classroom. For example, Grace is currently working on their Political Science Honors Thesis, with a focus on the “water crisis and community advocacy.”

Lab: Charlotte Kratovil-Lavelle '24 often works in the lab where she “conducts analysis of [ALLARM's] baseline water quality parameters,” as well as “performs quality control analysis,” for Stream Team, led by Community Science Specialist Stephanie Letourneau. By working at ALLARM, you gain a lot of insight on the difference of skills beyond science and the lab setting. For example, during her time at ALLARM, Charlotte has been able to “use lab equipment, write newsletters and blogposts,” and work on her communication skills with “colleagues and volunteers.”



Outreach: I am personally part of the Outreach Team. Phoebe Galione is the full-time Outreach Manager in the office, and leads the Outreach Team. During my time in outreach, I have been able to create/post social media materials, attend campus events and more recently, write newsletters and blog posts. While not primarily outreach, the flexibility of our roles also allow me to participate in volunteer training opportunities. By working at ALLARM, I have been able to build better connections with volunteers and my fellow ALLARMies.

At ALLARM, we cultivate an inclusive workspace that allows staff members to have the ability to be flexible, and more importantly, grow over time. The culture that ALLARM creates has helped me to become a better advocate for not only the environment, but for myself and others. This ability to work in a diverse workspace, coupled with a supporting office dynamic, is what makes being an ALLARMie so special.



Left Page Top: The ALLARM Warm and Fuzzy Wall is covered in envelopes for each student watershed coordinator and full time staff member; Left Page Bottom: Watershed coordinators from different project areas work together at collaborative events like the ALLARM Open House

Above: Students and full-time staff alike share their accomplishments from the previous week at weekly Staff Meetings.

Senior Reflections from the Class of 2023

Grace Messimer

My time at ALLARM has run parallel to my time at Dickinson. I began working here the fall semester of my first year in October 2019 and have spent countless hours at work since then through seven semesters and two summers. It is difficult for me to illustrate exactly what this experience has meant to me – it has been the most constant part of my life at Dickinson, and it is strange to think that after graduating I won't be returning to work in the fall. However, I know that I am taking so many things that I have learned at ALLARM into my future. Community science was a new topic to me when I began at ALLARM but has become something that I value so much as I have worked through every step of the process here. I am grateful that I have had this space to explore new things and learn where my interests are. ALLARM has taught me a lot about valuing my work and taking ownership over it. Being in an environment that supports this has allowed me to feel confident and capable of accomplishing tasks I set out to do. Finally, I cannot overstate how much I value the relationships I have formed at ALLARM. Many of my favorite memories from working here are from conversations I've had between tasks or in car rides to Stream Team meetings; they are a wonderful mix of meaningful and silly moments. I am so thankful for the full-time staff and the watershed coordinators I have worked with through the past few years. I have felt supported through everything I have done both in the office and outside of it and have made lasting connections with so many other ALLARMies. I am so appreciative that everybody works to make this space inclusive and welcoming, and hope that I have been able to add to this dynamic in my time here. After nearly four years, I will miss coming into the office every week. However, I feel confident that I will continue relationships I have made here and that I will carry values I have learned at ALLARM into my career. Following graduation, I have decided to pursue at J.D. at Cardozo School of Law in New York City with a plan to pursue public interest law. I know that my interest in doing this has been aided by my time at ALLARM, and I hope to continue doing meaningful community work through this.



Left: Grace Messimer '23 holds a small crayfish on their finger after completing a macro collection.

Right: Grace Messimer '23 explains the importance of monitoring to a group of Dickinson College students.



Left: Nick Bradbury '23 teaches volunteers in Erie County how to reset their meters, a trickier but important troubleshooting method. Right: Nick Bradbury '23 stands in a stream, holding ALLARM's new stream viewers which allow for a clear view of the streambed.

Nick Bradbury

When I first started working at ALLARM in the fall of 2021, I did not realize how varied my work would be and how great of an impact that it would have on both my interests and my character. I have worked at ALLARM for three semesters and had the opportunity to work for ALLARM during the summer as well. Initially I thought that my role would be limited to research projects and some volunteer outreach, but I quickly learned that at ALLARM, everyone wears many hats. I was encouraged to try new things throughout my time here, ranging from testing quality control samples and identifying macroinvertebrates to driving all the way to Erie, Pennsylvania with Director Jules Vastine to drop-off equipment for a new monitoring group. The fulltime staff and other students at ALLARM are what make this sort of diverse workload possible. ALLARM strives to be inclusive and build the capacity of anyone working there. For me that meant that I was able to feel comfortable enough to step out of my comfort zone and tackle challenges that I never realized could be within my skillset. Most importantly, ALLARM has expanded my ability to be aware. An awareness for streams and how we can determine their health, an awareness for the time and unforgettable effort made by the volunteers, and finally a newfound self-awareness of my own abilities and role in and out of the workplace. I want to thank both the full-time staff and student watershed coordinators for cultivating such an incredible work experience. The lessons and skills that I have built at ALLARM will go with me wherever I go next, as well as the friendships made over the past two years. Due to my time at ALLARM, I am pursuing an MPA in Environmental Policy at the University of Washington, with the hopes of working to protect water quality through policy wherever I eventually end up.

ALLARM in Pictures

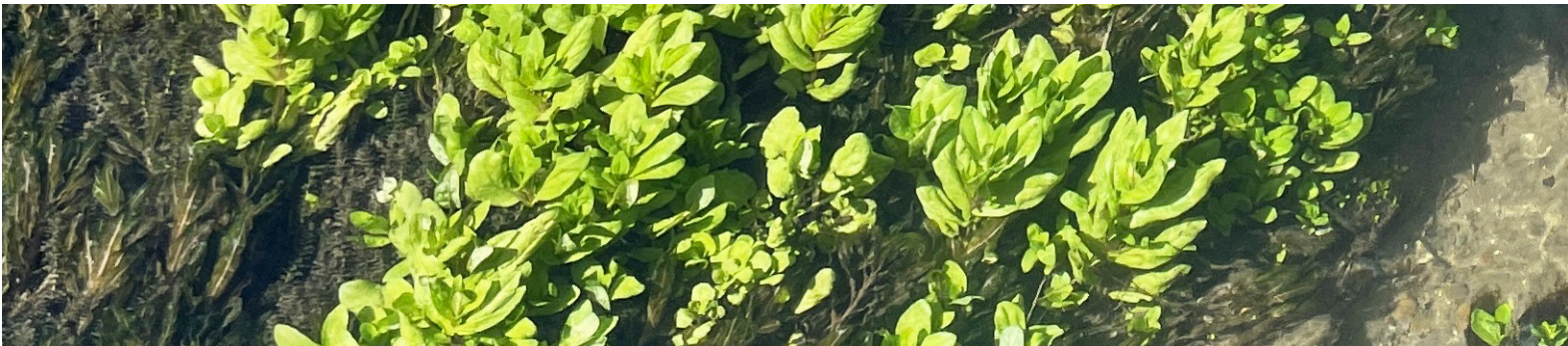


The Spring 2023 ALLARMies stand together for an end of semester photo. Top: Kailey Sipe, Dipseka Timsina, Amelia Harper, Grace Messimer, Lindsay VanFossen, Jules Vastine; Bottom: Prerana Patil, Michelle Cao, Stephanie Letourneau, Isabel Ruff, Nick Bradbury, Charlotte Kratovil-Lavelle, Phoebe Galione



Left: York County Stream Team Volunteer, Jeff Gleim, joins Stephanie Letorneau and CMC partners to present at the Chesapeake Watershed Forum.

Right: Michelle Hom '24 and Michelle Cao '25 prepare the lab for quality control testing.





Left: Volunteers, with the assistance of ALLARM watershed coordinators, pick through a kick net sample for macroinvertebrate identification; Right: Members of the CMC, including ALLARM, pose together after a successful morning testing the Community Accessible Restoration Monitoring Protocol.



Left: Cumberland County Stream Team volunteers test their skills with a new parameter - water clarity! Right: ALLARMies pose by the confluence of the LeTort Spring Run into the Conodoguinet Creek during LeTort Monitoring.

THANK YOU



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Dickinson

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