2017 Chesapeake Watershed Forum
Poster Session

Poster Abstracts

Welcome to the Seventh Annual Chesapeake Watershed Forum's Poster Session! We invite you to peruse the posters throughout the conference, and to attend the poster session Saturday evening to mingle with poster presenters. At Saturday's poster session, you are invited to vote for the People's Choice Poster Award (please use form below), and through your vote, enter to win a raffle prize. Posters will be judged both by you (the People's Choice Award) and by a panel of professional evaluators (Best Poster Award.) Poster prize winners will receive free registration to the 2018 Chesapeake Watershed Forum.

Poster topics:

Poster Contest – People's Choice Poster Award Form

By submitting this form, you are submitting ONE vote for the People's Choice Poster Award and entering to win the voter's raffle. Poster awards and voter raffle award will be announced at the conclusion of the poster session. You do not need to be present to win the voter raffle.

YOUR VOTE:

Poster # _____ Author/Presenter Name:_____

Voter Name:

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Voter Email:

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Poster #	Presenters	Affiliation	Title and Abstract
Restoration – Forestry, Oysters, Wetlands, and More			
1	Burton, Connor	Environmental Concern	**Living Shorelines at Myrtle Grove: Talbot County, MD** Myrtle Grove is a private estate located along the Miles River on the Eastern Shore of Maryland. Environmental Concern began the process of building a living shoreline for the property in 2014 and completed it this past October (2017). The project included spraying phragmites, grading the previously eroding shoreline, and installing and planting the living shoreline and slopes. Once the construction was completed, the shoreline was divided into sections for planting. The section that was (based on results from surveying) considered low marsh was planted with *Spartina alterniflora* and what was determined to be high marsh was planted with Spartina patens. Additionally to the living shoreline, EC created and planted a bioretention area. The implementation of the restoration practices mentioned above, as well as others spread throughout the property, has helped transform this estate into a stable and productive piece of the Chesapeake Bay watershed.
2	Collins, Erin	U.S. Fish and Wildlife Service	**Conversion of Carroll Park Golf Course into meadow habitat for pollinators and educational retreat** Carroll Park is located in the southwestern curve of the Baltimore Greenway Trails Network, which also includes Gwynns Falls/Leakin Park. Currently, Carroll Park offers no area for local residents to experience the beauty of a natural habitat. It dedicates approximately half of its 117-acres to turf fields and paved courts for miscellaneous recreation and half to a 9-hole golf course. In 1993, the course was expanded into a 3-acre section pinched between the Gwynns Falls streams, but this area has since been closed and remains unmanaged. This project seeks to transform this area into a 3-acre sanctuary for diverse wildlife species to thrive as well as a learning and observation ground for local communities and passersby. Nearby residents would be enlisted in the re-design and installation of a meadow habitat for native pollinator and bird species. Buffer strips installed along the adjacent waterbodies would enhance the filtration of runoff and reduce erosion, which is often exacerbated by the golf course turf. Pathways and informational bilingual signage would also create an educational spur trail, connecting residents to the larger Baltimore Greenway Trails Network.
3	Denby, Rachel	MD Dept of Natural Resources MBSS	**Blackbanded Sunfish Conservation** Of the 15,000 plant and animal species native to Maryland, about 1,200 of them are labeled as rare, uncommon, or declining. The Blackbanded Sunfish, an inhabitant of acidic swamps and streams on Maryland's eastern shore, is one of the rarest and most endangered fish species in the state. Similar to other rare or declining species, this fish has also declined due to competition with non-native predators, habitat degradation, and global climate change. However, the Maryland Department of Natural Resources (DNR) has conducted conservation efforts to try to protect this species over the past eight to ten years. Conservation efforts have included developing a Conservation Action Strategy, which highlights short and long-term strategies to ensure the survival of Blackbanded Sunfish. Within the past year, the Maryland DNR has continued to implement these strategies through capturing Blackbanded Sunfish by seining for propagation efforts, establishing partnerships, and raising awareness about this beautiful species.
4	El-Amin, Maryam	City of Greenbelt Department of Public Works	**Greenbelt Food Forest** A food forest is an area of edible plants designed to mimic a natural, diverse garden ecosystem. A good food forest has many layers, just like a regular forest including ground cover, roots, herbaceous plants, shrubs, understory trees, and overstory trees. Growing plants with different sizes and niches allows more plants in an area without causing too much competition. The Greenbelt Food Forest is located behind Springhill Lake Community Center. It was designed by Forested LLC, planted by the non-profit CHEARS in collaboration with Greenbelt Public Works, and sponsored by a Chesapeake Bay Trust grant. Since its founding in 2012, it currently faces some challenges, such as overgrowth of the highly aggressive invasive porcelain-berry vine and a shortage of volunteers to regularly maintain and monitor it. By making this my Capstone project, I plan to hold

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			more regular volunteer events to nurture the Food Forest and re-plant some of the plants that were lost. Working closely with CHEARS, I hope to restore and revitalize the Greenbelt Food Forest with the goal of educating and providing nutritious food sources for the community.
5	Garmoe, Zachary	Maryland Coastal Bays Program	**Oyster Castles as Erosion Mitigation for Colonial Bird Habitat in Maryland's Coastal Bays** Black skimmers, common terns, and royal terns are critically endangered within the state of Maryland, with all three species of colonial nesting birds seeing heavy declines over the course of the last 25 years. This decline is largely due to the lack of ideal habitat in the Coastal Bays, the only location in Maryland where these species' breed. Sea level rise and erosion have rapidly deteriorated the islands which constitute the best breeding habitat for the colonial waterbirds. The islands in the Coastal Bays are an intricate combination of natural and anthropogenic accretion. Most recently, in 2014, dredge spoil material was used to expand many islands and create six more. Yet erosion continually outpaces natural deposits. To limit the attrition of ideal bird habitat, oyster castles were installed on a single dredge island in Sinepuxent Bay in the fall of 2017. Year old oysters were added to the castles to further bolster the shoreline and test the waters for regional reintroduction. Drone Imagery indicates that moderate sand accumulation has occurred on the south side of the island where the first round of castles was placed, yet not enough time has elapsed to conclusively determine the success of the project.
6	Haley, Anna	Arlington Echo Outdoor Education Center	**Maintaining Erosion Control Systems** Two years ago, a former Chesapeake Conservation Corps Volunteer, Anna Youngk, who also worked with Arlington Echo Outdoor Education Center's Kindergarten Environmental Literacy Program, implemented best management practices (BMP) to slow down and redirect storm water at Camp Woodlands. Erosion control is a primary focus of the property in Annapolis, MD since it begins off a main road and stretches down to Broad Creek's shoreline. On the dirt road through camp, water continues to freely rush down the sloped path carving channels out of the ground. The previously constructed berms and swale have filled up and become worn. While this indicates that the initial goals of redirection and containment of flow were achieved, the systems are no longer functioning effectively. My capstone project will focus on maintenance of the BMP techniques as well as making additions. This refurbishment will include digging out pools, reinforcing dams, lining trail with logs, and planting. Aside from reconstruction, I will involve kindergarteners from AACPS and The Girl Scouts Central Maryland to take part in action projects to help my efforts and teach about erosion control. Through photo and video documentation I will track my progress and use as a reference for future management.
7	Hamovit, Nora	The Nature Conservancy	**Assessing Current, and Targeting Future, Atlantic White Cedar Restoration Sites** Atlantic white cedars, and cedar swamps, have steadily disappeared from the landscape of Maryland's eastern shore. A decline that was initially due to over-logging has been exasperated by the steady drainage of land and overall changes in natural hydrology that Atlantic white cedars are dependent on. For over a decade The Nature Conservancy has worked alongside the National Aquarium and local Middle Schools to restore this natural habitat by planting over 15,000 Atlantic white cedars at its 10,000 acre Nassawango Creek Preserve. The Nature Conservancy subsequently hopes to improve hydrology and water quality in Nassawango Creek and downstream water bodies. Assessments of the planting sites though have revealed a variance in survivorship among these trees, leaving the question, what are the ideal planting conditions for Atlantic white cedar restoration? This study aims to answer this question by relating high resolution elevation, hydrology, and soil type GIS data to tree survivorship data at the planting sites. By interpreting this information we then hope to assess what might have impacted previous survivorship, to target future sites for restoration, and to build a model that might streamline overall Atlantic white cedar restoration efforts at this preserve and other sites around the region.

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8	Heidarian, Humon	ECO City Farms	**ECO City Farms Food Forest** Over the past 50 years permaculture and urban agriculture have become increasingly important ways of farming in response to rapid population growth and the resulting rapid urbanization of land and human demand for food. These techniques mitigate these issues by efficiently using space, conserving land and minimizing the human carbon footprint due to land usage. Food forests are an effective permaculture practice that can be scaled to meet the land constraints of an urban farm. It is a low-maintenance form of agriculture based on the principles of agroforestry and mimics woodlands ecosystems. Typically these environments have an incorporated layered structure of plants mimicking existing undisturbed ecosystems. The proposed food forest project on the Bladensburg Farm was originally developed by a former CCC Member, Dietrich Epp Schmidt, in 2013. The food forest already has the upper level of trees and some shrubs but more plants must be added in order for the space to fully function and thrive. The project will be completed over the course of the one year program by following appropriate planting seasons according to the design and plan. This food forest will serve as food access, land restoration and as an educational tool.
9	Hofmann, Bryan	Friends of the Rappahannock	**Eastern Brook Trout Fish Passage Prioritization Model** This poster will show the results of a collaborative effort funded by a NFWF Technical Assistance Grant to create a Multi Criterion Decision Making Tool focused on the restoration of eastern brook trout habitat. This tool was created to assist several partner groups in prioritizing fish passage and stream restoration projects in the upper Rappahannock River watershed. One of our organizations had previously surveyed 133 stream crossings with fish passage blockages. There are currently 4 restoration projects in various stages of construction. This tool will prioritize future projects based on a wide range of variables grounded in science and is ultimately transferable to other regions.
10	Jackson, Aaron	Town Of Forest Heights	**Town of Forest Heights Garden and Rain Barrels** My project involves the creation of a garden for the Town of Forest Heights. The garden will also feature rain barrels for the collection of rain water. Community gardens foster a sense of community and team work. They help raise the identity of an area and provide opportunities for neighbors to interact and become involved in the neighborhood. Community gardens are a pivotal aspect for community organizing. While, rain barrels reduce the amount of storm water runoff; streaming to a collection container and storing the runoff water for future use. Both the garden and the rain barrels are excellent and relatively easy methods of green techniques.
11	Jackson, Christopher	Blue Water Baltimore	**Rain Gardens and Birdhouses** This project deals with the implementation of a rain garden as well as installing birdhouses and native shrubs to attract butterflies and native birds to a local elementary/middle school in locust point. This was all made possible through the collaboration of partnership with Blue Water Baltimore, the school and neighboring organizations to make this project a success. The overall purpose was to create an outdoor classroom for the students so they can learn beyond the four walls of their school. The purpose of this project was to mediate the amount of storm water runoff and making inroads of attracting native birds to the area with the 3D printed birdhouses made by students. These things are achieved through the effectiveness of partnership with Blue Water performing most of the construction efforts throughout as well as providing the native plants to use. The main focus of this project is to make an experimental learning environment for the students as well as give ownership to the community for their work This project took a lot of preparation to implement the garden with the help of the environmental Construction Team prepping and removing sod to make way for the plants. There was also time set aside to make the tree pits for the ball and burlap trees being planted. There were a lot of moving parts in this planting that took months of planning and implantation in stages to bring this project through fruition. A lot of the initial work was done through Blue Water Baltimore like planting the trees and prepping the soil for the installation of the birdhouses.

12	Ketchum, Suzanne	Maryland Department of the Environment	**Using GIS for NPDES stormwater data collation, management, and assessment in the state of Maryland** As development increases, impervious area increases, and ecological systems, like the Chesapeake Bay watershed, are increasingly impacted by polluted runoff. Stormwater management reduces runoff and improves water quality, which is critical to Bay restoration. The National Pollutant Discharge Elimination System (NPDES), a joint federal and State permit, regulates the discharge of stormwater runoff from larger municipal separate storm sewer systems (MS4) in Maryland. Using geographic information systems (GIS), the Maryland Department of the Environment (MDE) has developed a MS4 geodatabase for reporting data required by the NPDES stormwater permits. A GIS application, StormwaterPrint, has also been developed to provide and display data for stakeholders and the public. Data evaluation using the MS4 geodatabase and StormwaterPrint helps to assess the effectiveness of existing programs and provides input into requirements of future permits. This project highlights efforts of the State, counties, and municipalities to control urban stormwater pollution and their importance to Chesapeake Bay restoration. It provides a snapshot of the permit program's progress and the potential for GIS analyses to further improve stormwater management in the State. One possible analysis involves how the water quality improvements associated with local stream restoration practices impact the health of the Bay and its watershed.
13	Rieger, Joe	The Elizabeth River Project	**Oyster Restoration in the Lafayette River - A Model for the Chesapeake Bay** The Lafayette branch of the Elizabeth River, in Southeastern Virginia, is now closer than any other Virginia tributary to meeting Chesapeake Bay metrics for full restoration of meeting the Bay metric of "fully restored" for the native oyster. The non-profit Elizabeth River Project, after constructing the majority of restored reefs in the Lafayette over the last six years. Beginning in 2012, Elizabeth River Project began creating sanctuary oyster reefs from the mouth to the upper reaches of the Lafayette River. To date, Elizabeth River Project has constructed 10 reefs in the river, accounting for over 7 acres of new oyster reef providing habitat for not only oyster expansion throughout the Lafayette but also habitat for fin fish, crabs, mussels, and feeding grounds for birds. Oyster reefs add a natural transition from open water to soft living shorelines and help guard against shoreline erosion. Elizabeth River Project is using new designs for reefs which use gaps and stripes of substrate to encourage oyster restoration. This poster with discuss past oyster restoration methods, cost saving ideas, and new design.
14	Steiner, Blake	Adkins Arboretum	**Establishing a Phenology Project at Adkins Arboretum to Assess Climate Change Impacts** Nine planetary boundaries have been established worldwide by scientists. Of these nine, climate change has received notable attention. Recently, research in climate change has led to connecting it with phenology, the study of recurring and seasonal biological occurrences in plants and animals. A recent study had combined historic and modern observations of Japanese cherry blossoms' first bloom date in Kyoto, Japan; an unprecedented phenological record of a 1,200 years. It had shown that since the late 1800's, there was a significant early blossoming trend. Research has also shown how phenology interacts with complex biotic and abiotic systems. This has led to health, natural resource management, and agricultural questions. Thus, this project aims to help piece together this shifting, chronological puzzle, starting with Adkins Arboretum and the United States National Phenology Network's methodology. By monitoring plant and animal timings, the Chesapeake Bay Watershed community can better foresee changes in its complex system and define better solutions.
15	Tam, Jennifer	Maryland Department of Natural Resources	**Freshwater Mussel Restoration in the Patapsco River** Mussel restoration via propagation and reintroduction is an important, yet often overlooked conservation tool in Chesapeake Bay drainage streams. Mussels provide food and habitat for other organisms along with ecosystem services, such as particle filtration, nutrient cycling and streambed stabilization. Distribution and abundance of Eastern Elliptio *(Elliptio complanata*), the most common mussel in Maryland, has been reduced in some Chesapeake Bay tributaries. This decline was likely caused by multiple factors including degraded water quality and habitat. In addition, the construction of dams restrict

			the movement of *E. complanata's* host-fish the American eel (*Anguilla rostrata*). Recent studies suggest that conditions in the Patapsco River may facilitate restoration of *E. complanata* as American eel passage has seemingly improved with dam removal and eel ladder construction and water quality has improved after the implementation of the Clean Water Act. The Maryland Department of Natural Resources is proposing to restore *E. complanata* in the Patapsco River as part of larger watershed restoration efforts. Key points of this poster will focus on techniques required for planning and implementing mussel restoration suitability tests, reintroduction, propagation, and monitoring surveys.

Outreach, Community Engagement, Stewardship and Volunteerism			
16	Black, Carolyn	National Park Service Chesapeake Bay	**Building Relevancy through Partnerships** With the 2016 National Park Service Centennial and Find Your Park Campaign, many park designations have transformed their practices of community engagement and public visitation. The Captain John Smith Chesapeake National Historic Trail has achieved tangible outcomes towards the agency's centennial mission to be more relevant to the American public and to better serve communities. The Trail has fulfilled this mission through partnerships and community engagement in a wide range of ecosystems and populations throughout the Chesapeake Bay. This poster presentation features some of the strategies employed by a small federal office to provide opportunities for public recreation, stewardship, and educational programming throughout a 3,000 mile water trail.
17	Black, Heather	Izaak Walton League of America	**Protecting Urban Waterways through Monofilament Recycling and Community Stream Cleanup Opportunities** Each year, several tons of trash is removed from local waterways. The debris collected often includes Styrofoam containers, plastic bags, cigarette butts, and fishing line. Several counties throughout the United States have established regulations to help eliminate some of this debris from entering waterways – the banning of Styrofoam take-out containers and the 5 cent charge for plastic bags in Montgomery County, Maryland are just two examples. However, there is still more that can be done to further reduce our impact on the environment. The first step in changing behavior is through education. An excellent opportunity to not only educate the public, but to engage them is through a stream cleanup. Community members get the opportunity to see the positive impact they can have on their community, along with learning about simple solutions to pollution problems. One such example is fishing line. Fishing line left near waterways can lead to the entanglement or even death of wildlife. A way to reduce its impact on the environment is through monofilament recycling stations. Specialized recycling receptacles are placed at convenient locations for fisherman to dispose of their line, then collected and shipped to factories that can repurpose the waste.
18	Bumpers, Linn	National Wildlife Federation- Mid Atlantic Regional Center	**Option One: Still specific + more Broad info** Baltimore may not be the first place that comes to mind when thinking about wildlife habitat, but the city of 'Birdland' has been working to bring back birds as well as other native wildlife species. Over the past five years, National Wildlife Federation (NWF), in partnership with Baltimore residents, community leaders, neighborhood organizations, and schools, has implemented projects that increase the amount of green space while simultaneously improving water quality, providing wildlife habitat, and beautifying Baltimore's neighborhoods. Not only do these projects improve environmental quality and reduce nuisance flooding, they also encourage residents to engage in greening their community and promote fellowship among neighbors. NWF has led large-scale restoration projects in the neighborhoods of McElderry Park and Reservoir Hill and partnered with the Maryland Stadium Authority and Baltimore Orioles to install a 10,000 square foot demonstration native plant garden at Camden Yards that will provide habitat for pollinators such as birds, bees, and butterflies. In order to reach the youngest residents and inspire them to become environmental stewards, NWF is also installing pollinator gardens at 10 Baltimore city schools in the Gwynns Falls Watershed that will ultimately be used as outdoor classrooms. These efforts, combined with those of our key partners like the National Aquarium, have set Baltimore up to become the largest National Wildlife Federation Community Wildlife Habitat in the Chesapeake Bay watershed.
19	Clark, Diamonique	Stevenson University	**Leave Steve Green** Leave Steve Green is Stevenson University's (SU) campus- wide food and clothing drive targeted at the week- long, end of semester student move- out periods. This program started as the vision of Diamonique Clark, student assistant of SU's Center for Environmental Stewardship, who aimed to divert donate-able waste from going directly to landfills. Since its pilot run in December 2015, Leave Steve Green has served as a cornerstone program to bridge the initiatives of campus sustainability and the residential curriculum by empowering students to exemplify citizenship in serving their local and

			global community. Supported by several campus offices and outside organizations, the Stevenson community has donated approximately 13,000 lbs of clothes, dorm furniture, bedding, etc. and 3000lbs of non-perishable food to the Baltimore City/County areas.
20	Cohen, Natalie	Amazing Grace Lutheran Church	**Healing Environmentalism at The Amazing Port Street Commons** In the community of McElderry Park in East Baltimore, The Amazing Port Street Commons is a part of the Charm City Land Trust comprised of 18 lots on the 600 block of Port Street. The land trust is an example of community-controlled land use which is improving the quality of life in this disinvested and underserved neighborhood. The Amazing Port Street Commons is a place of peace, healing, land stewardship/conservation, and community events. As the only true green space in McElderry Park, the Commons provides neighbors with the opportunities to learn, play, relax, and grow food which ultimately brings healing to the community. The Commons boasts a rain garden addressing stormwater issues, native pollinator gardens where neighbors can de-stress and relax, a labyrinth for meditation and prayer, as well as an organic garden providing fresh produce. At a time when Baltimore City faces a magnitude of environmental issues, a surplus of vacant homes, intentional urban decay, and unjust development; The Amazing Port Street Commons is a sustainable and just alternative revealing how land trusts can be used for equitable development and community wellness.
21	Dantzker, Heather	Dantzker Consulting, LLC	**Get Talking! Insights from an Evaluation of NFWF's Innovative Nutrient and Sediment Reduction (INSR) Program** Dantzker Consulting, LLC, and its partners conducted a third-party evaluation of the National Fish and Wildlife Foundation's INSR Program. One goal of the multifaceted project was to examine how information about INSR projects has been shared across the Bay community and to what extent INSR-funded practices and approaches have been adopted by others. The project also examined what effect clustering of INSR-funded projects in targeted areas may have had on further dissemination and adoption. The evaluation team used phone interviews, two online surveys with NFWF grantees and other Bay watershed partners, and geographical analyses. We measured a total of 568 reported instances of adoption of INSR-funded nutrient and sediment reduction approaches elsewhere in the watershed. Nearly all (95%) INSR-funded approaches (grant years 2009-2015) have been adopted by others, with most (82%) now fully implemented and/or sustained. Technical- and cost-effectiveness are primary drivers of adoption. We found that lessons learned about project costs and implementation are most often shared via formal meeting presentations or professional conferences. Yet adopters cited informal communication—such as one-on-one conversations or small group discussions afforded by networking forums—as their most preferred means of receiving such information. One takeaway for Forum-goers: Get talking!
22	Denton, Haley	Watershed Stewards Academy	**Mapping WSA Restoration: An Application for Collaboration** Organizations across the Eastern Seaboard are working together to recover lost habitats and biodiversity in the Chesapeake Bay. With that being said, stormwater remains the biggest threat to water quality. As suburban populations increase, there is a growing need to combat impervious surfaces. At the Watershed Stewards Academy, we have over 180 certified Master Watershed Stewards in the Anne Arundel County community who are taking action to reduce stormwater runoff. Since 2009, 651,152 sf of new restoration has been put into the ground and 9,945 gallons of stormwater runoff has been captured by rain barrels and cisterns. While WSA's current inventory contains over 700 installed projects, these projects have yet to be conveyed in a manner that is open and comprehensible to the public. By creating an online map, we will be able to highlight working models and provide prospective communities the confidence and momentum they need to get started by creating a user friendly platform for our partners to collaborate and share information on "best management practices", implementation processes, and maintenance procedures. Future map collaborations could include, but are not limited to, water quality data, oyster populations, and bay grass abundance.

23	Dirmeyer, Brandt	Patapsco Heritage Greenway	**Community Stewardship Efforts After July 2016 Flood of Ellicott City** My poster will display the metrics/deliverables and photos from my past year as part of the Chesapeake Conservation Corps working with Patapsco Heritage Greenway to restore the Patapsco River watershed and subwatersheds after the 1/1000 year flood that occurred in Ellicott City on 30 July 2016. From stream cleanups and invasive species removals with community organizations and corporations to tree plantings and maintenance in Patapsco State Park, my year with the corps will be on display. I will also have a short paragraph informing onlookers on my new job with Howard EcoWorks, where I am designing, implementing, and maintaining stormwater BMP's (mostly conservation landscapes and stormwater gardens).
24	Donovan, Caroline	UMCES	**Creating a Matrix for Cross-Goal Collaboration** The Chesapeake Monitoring Cooperative is a group of leading organizations that provide technical, programmatic, and outreach support in order to integrate volunteer-based and non-traditional water quality and macroinvertebrate monitoring data into the Chesapeake Bay Program partnership. An indicator matrix has been developed that demonstrates the overlapping objectives between the Chesapeake Bay Program's Management Strategies and volunteer monitoring groups. The primary outcome of the matrix is enhanced monitoring and understanding which will be used for restoration across all Bay Program goals (i.e., clean water, abundant life, conserved lands, and engaged communities). Case studies will be used to demonstrate the usability of the matrix by both the volunteer monitoring community and the Bay Program.
25	Everett, Kelsey	National Park Service	**Interpretive Signage Database** The goal of this project is to conduct inventory and condition assessment of Chesapeake Bay Gateways Network interpretive signage throughout the Chesapeake Bay Watershed. Some of the signage was placed more than ten years ago and significant deterioration may warrant replacement. Each sign will be examined on the condition of its base and the clarity of the sign's face. These signs are important for public interpretation of the significance of sites throughout the Chesapeake Bay Watershed. The data that is collected for each wayside site includes coordinates, approximate street address, and condition of hardware and sign clarity. This data, including relevant images will be incorporated into a geodatabase for access going forward. This project fills a need for the National Park Service, Chesapeake Bay office as they do not currently have a database with such information.
26	Ewalt, Rachel	Brookside Nature Center	**Firefly Festival** The firefly is an organism that has become symbolically synonymous with summer and childhood wonder, in both North America and in Asia. Yet several populations are under threat due to loss of habitat, disrupted communication from light pollution, overharvesting, and pesticides. My capstone project will be to organize a festival at Brookside Nature Center on July 1st centered around fireflies, and then, from July 16th to July 20th, I will lead a summer camp about fireflies, as well as other organisms and minerals that are naturally luminous. The goal of the festival and the summer camp is to convey both the science behind and the cultural significance of fireflies and other luminous bodies in nature, engage creativity through crafts and lightshows, and generate interest in citizen science, such as the Firefly Watch, and concrete actions to protect local populations of fireflies, such as making their lawn wildlife friendly and reducing the light pollution their community creates.
27	Fisher, Jaclyn	South River Federation	**Cleaning Up Crab Creek** There is a tremendous amount of trash washing down Crab Creek into the South River. The Federation has been doing stream clean-ups on this stretch for years, but without access to the public housing property where most of the trash originates; our clean-up efforts are a band-aid not a solution. Thus, on June 30, 2017 Federation staff and volunteers constructed a steel and plastic trash trap in a freshwater stream leading to Crab Creek near Wagon Trail Road in Annapolis. We are hoping by scientifically quantifying the volume of trash litter as well as providing startling visual documentation, it will aid in our efforts to advocate for more effective waste control and environmental protection. This particular stream collects the runoff from parts of Forest Drive, as well as the

			Newtowne 20 Public Housing community, and has historically suffered from large amounts of garbage flowing downstream. Since its construction, hundreds of pounds of garbage have been washed downstream into the trash trap during every rain event.
28	Gansel, Mariah	Susquehanna Heritage	**Self-Guided Interpretive Programs** The Zimmerman Center for Heritage has established programs that focus on the heritage, inspiration, and ecology of the Susquehanna river. Our program, Native Lands, brings visitors to Native Lands County Park, where visitors learn of the last community of Susquehannock's. A brochure was created that walks visitors through the trail to give history and insight of the area, but is not utilized if visitors start elsewhere on the trail. A digital form will be implemented to receive this information and bring visitors down to the facility to learn more information on the Susquehannock's. An existing website will be utilized that will showcase our other programs and invite people to attend them. Our Inspiring Susquehanna program showcases our art collection created by artisans that were influenced by the river. A brochure will be created for visitors to follow along with each art piece and lead them to walk down to our dock to be equally inspired. In addition, a laminated packet will be placed at the dock near the river that will walk visitors through the ecology of the river and how people have altered it throughout the years for our Natural Susquehanna program.
29	Glomset, Marcus	Environmental Finance Center at UMD	**Turn It Off: Incentivizing Efficiency Upgrades for Maryland Restaurants** Restaurants are energy-intensive businesses due to the high associated energy costs of appliances that prepare and store food, maintain hygiene, and provide customer comfort. Additionally, restaurants frequently operate on very slim profit margins; according to Energy Star, a restaurant can save $450 in utility costs by just turning off a broiler for an hour a day, the same as selling $9,000 in food sales at a 5% profit margin. In an effort to reduce county energy needs, Montgomery County (MoCo) is partnering with local utility companies like Pepco to offer on-bill financing incentives for restaurants to make efficiency upgrades. While this program has existed for several years, most restaurants in MoCo have not participated; to discover why, the EFC has been contracted to survey county restaurant owners on their knowledge and stances on efficiency upgrades. At the completion of this project, I will create a comprehensive and accessible document that explains the advantages of high-efficiency appliances and details the financing programs available to restaurants; I hope that this document will be used as a guide by restaurants to improve their efficiency and profitability. I will also craft a Restaurant Efficiency action item that municipalities can use toward Sustainable Maryland certification.
30	Hubbs. John	Carroll County Master Gardeners	**How Does Your Landscape Measure Up?** The poster will display all pages of the UMd Extension Bay-Wise Yardstick; many copies will be available to take home. The Yardstick is a simple checklist-type tool homeowners can use to determine how well they implement best management practices (BMPS) to improve water quality. The 61 actions homeowners can employ are grouped in eight environmentally sound approaches: Controlling Stormwater Runoff, Encouraging Wildlife, Protecting the Waterfront, Mowing Properly & Watering Efficiently, Managing Yard Pests with Integrated Pest Management (IPM), Mulching & Recycling, Fertilizing Wisely, and Planting Wisely.
31	Leizear, Jacob	National Parks Service	**Conservation is a Collaboration Discipline: Using Data to Support Partnerships** In the conservation field there are various forms of collaboration, ranging in formality, participants and purposes. Building the right type of partnership requires reflection and dialogue, as well as attention to relationship building and communication. To maximize the benefits of a partnership, more and more conservation organizations have started to use high-level geospatial data to influence their goals and inform their work. I will be using this poster to highlight three different real-world examples of partnerships utilizing data to further their missions at a county, state, and watershed scale. By examining different data driven initiatives such as Restoration Reports, Envision the Susquehanna and the Chesapeake Conservation Partnership's mapping effort, the practical applications and benefits of using geospatial data for existing partnerships and their collaborative goals can be identified and furthered expounded upon. Conservation goals and missions cannot

			be completed in solitude, they must be achieved in solidarity with cooperation at all scales throughout the watershed.
32	McMahon, Eileen	Waterfront Partnership, Healthy Harbor Initiative	**Showcasing the invisible: using art as a tool to visualize water quality data while captivating and informing a broad audience** Although Mr. TrashWheel has mostly eradicated the trash pollution problem in Baltimore's inner harbor, residents regularly express skepticism about Healthy Harbor's goal of a swimmable and fishable harbor. Healthy Harbor aims to demonstrate changes in water quality metrics that would otherwise be invisible to the public. Showcasing unseen metrics is the next step in Healthy Harbor's efforts to grow the base of citizens willing to believe and invest in a clean harbor. As part of the EPA's Village Blue project, a sensor placed near mouth of the Jones Falls continuously collects water quality data including dissolved oxygen and nitrogen concentrations. Healthy Harbor is working with local and national artists to creatively represent this data in near real-time. By bringing a reactive sculpture to life in the Inner Harbor, passersby can discover water quality changes as they happen. The project will include an awareness campaign highlighting the many partners and projects improving water quality in Baltimore watersheds, and emphasizing how citizens can join in on solutions. We hope to reach groups that otherwise would not seek out information on conservation issues by offering an innovative and captivating experience.
33	Nugent, Leah	Chesapeake Center for Youth Development	**Made In Brooklyn: Facilitating Community-Driven Revitalization in Garrett Park** Garrett Park is a 7.5-acre greenspace located in Brooklyn, Baltimore. Despite its dilapidated state, the park presents a unique opportunity to revitalize one of the area's only public greenspaces. Revitalization is especially important for Brooklyn, where 45% of children live below the poverty line. Garrett Park is centrally located within a nexus of community resources, including a public library, health center, Boys and Girls Club, and elementary/middle school, which serve over eight hundred people. The goal of the Garrett Park Revitalization Project is to create a healthier, safer, and more enjoyable place for residents to live and play. To this end, the revitalization project is engaging community members in the design and implementation of a multi-year improvement plan. Based on local feedback, the project has mapped a variety of park features that residents identified as top priorities. Features range from community gardens to crosswalks that allow for safer park access. The project's next steps include creating a timeline for project implementation and involving residents in the planning and installation of prioritized park features. By collaborating with local residents at all stages of the revitalization process, the improvement project can meet the social, recreational, and environmental needs of Brooklyn's underserved neighborhoods.
34	Pavuluri, Yash	City of Frederick	**Increasing Residential Tree Canopy Through Community Outreach** The city of Frederick currently has about 20% urban tree canopy cover, half of the recommended amount. A tree canopy report conducted in 2016 showed that residential areas in the city had the highest existing tree cover and the highest potential for even more tree cover. In order to take advantage this potential, the Tree Frederick plan is being developed to encourage residents to plant more trees on their property. With this plan we hope to inform residents about the benefits of tree canopy and to help residents overcome obstacles for planting trees, such as choosing appropriate trees and planting sites. The plan will also address some common concerns that residents might have about planting and maintaining trees. Along with providing information, Tree Frederick will also offer tree coupons from Maryland DNR to city residents. The City already is planting out parks and streets, but will also need residents to plant about five trees per person on private property or HOA common spaces to reach 40% tree canopy cover.
35	Pownall, Malia	Waterfront Partnership, Healthy Harbor Initiative	**Baltimore Litter Letter Project** The purpose of the Baltimore Litter Letter Project was to foster a connection to natural waterways and increase civic awareness and responsibility in Baltimore City residents, as well as expand the conversation around trash that will lead to behavioral change. YouthWorks is a summer program based in Baltimore that employs youth ages 14—21 for a five-week duration. Non-profits may apply to become a host site for a YouthWorks cohort, and employees are assigned to the host organizations based on their interests. This

			past summer, the Healthy Harbor Initiative of the Waterfront Partnership of Baltimore partnered with the South East Community Development Corporation (SECDC) and took on thirty youth employees. The YouthWorkers' work plan consisted of neighborhood cleanups, gardening, and painting and these activities were paired with environmental education and outdoor excursions. Their final project—a temporary art installation comprised of trash—was an extension of the Litter Letter Project, a community based project that was started in Louisiana and has expanded to multiple states and countries. The youth conceptualized and constructed the project, which was made up of metal frames that were shaped to spell "BMORE" and filled with trash that they collected over their term.
36	Troutman, Gabby	Potomac Conservancy	**Volunteer Leadership Team** Potomac Conservancy engages communities across the DC Metro in the fight for clean water through volunteer stewardship events. As the organization grows, we aim to expand our reach and engage more citizens with limited staff and resources. As my Chesapeake Conservation Corps capstone project, I plan to work towards this goal through the creation of a volunteer leadership team. This new opportunity will empower dedicated volunteers to receive training and lead stewardship events at both established and newly selected sites within their communities. Participants will develop leadership skills while gaining first-hand experience in volunteer coordination. This model will shift the responsibility for smaller-scale cleanup events from Conservancy staff to volunteers, allowing for staff time to be maximized as we continue to improve and expand upon existing Community Conservation efforts.

Science, Methods, Monitoring, and Evaluation

37	Basenback, Nicole	University of Maryland Center for Environmental Science Chesapeake Biological Lab	**Phenology of Estuarine Response to Anthropogenic and Climate Drivers** The effects of elevated nutrient loading on estuaries is well-studied due to the multitude of negative water quality, ecosystem, and economic impacts that have been attributed to the presence of excess nitrogen and phosphorous. Few studies have investigated how climatic changes may impact the seasonal timing of both physical processes and human adaptive behaviors, where warmer early season temperatures lead to alterations of farm fertilization given earlier crop cycle planning. Each of these climate change consequences will directly and indirectly affect the phenology of estuarine biogeochemical cycles. The objective of this study was to investigate relationships between nutrient load timing, and magnitude associated with potential future watershed changes and the impact of these changes on hypoxic volume, the timing of hypoxia onset/breakup, and hypoxia duration. A coupled hydrologic-biogeochemical model (ROMS-RCA) was used to simulate the spatial and temporal response to nutrient loading changes within the Chesapeake Bay. We found that subtle changes in nutrient concentrations of inflowing water may be masked by high variability in river discharge. Our preliminary results also highlight the complex feedbacks and interactions of biogeochemical processes in estuarine systems, and the significant need for further modeling studies of climate change.
38	Blanco, Nicole	Center for Coastal and Watershed Studies at Hood College Hudson Science & Technology Center	**Monitoring the recovery of Lake Anita Louise** Lake Anita Louise is a small lake near Frederick, MD that turned pink due to a massive *Planktothrix rubescens* bloom in the winter of 2015. *Planktothrix* is a species of filamentous cyanobacteria that can produce a harmful toxin called microsystin. This toxin can potentially cause sickness and liver damage in humans exposed to the chemical through the mouth or skin from drinking or swimming in contaminated water. This poses a serious threat to local residents who recreationally use Anita Louise as well as the larger lake it feeds into, Lake Linganore. Since the large bloom, Lakes Anita Louise and Linganore have been monitored for water quality and bacteria content. A hydrogen peroxide treatment of Lake Anita Louise lessened the population of *Planktothrix* in the last year. Due to this treatment, the lake seems to be recovering; however continued monitoring is needed to ensure the harmful bloom does not return.
39	Cameron, William	Environmental Finance Center, University of Maryland	**Sustainable Maryland Certified (SMC)- Phase 2** Sustainable Maryland Certified is an initiative designed to support Maryland's local municipal governments as they look for cost-effective, sustainable strategies to revitalize their communities. Phase 2 of the program will focus on expanding the current scope of the certification through the addition of new municipal action items, a streamlined application process and online resource center, and the introduction of a new award level. The requirements for this new Silver level will provide municipal green teams with a roadmap for action past the initial Bronze level certification, and lay the foundation for introducing additional award levels in the future. Ultimately, the purpose of Phase 2 is to improve upon the existing SMC platform to increase incentives and decrease barriers to sustainable practices for local municipal governments in Maryland.
40	Devlin, Bernard	Metropolitan Washington Council of Governments	**Restoration of the Anacostia streams and their impact on the greater Chesapeake Bay Watershed** For the past 6 months, I have worked with the Metropolitan Washington Council of Governments. During my internship there, I have assisted with several environmental monitoring projects, including the stream restoration project, consisting of the collection of trash and pollution data in the Anacostia watershed, along with fish, bugs, and water quality data. This information is collected several times over the course of a year, and the findings are recorded in a yearly report assembled by the Council of Governments. Over the past 6 months, I have learned valuable skills such as how to perform longitudinal and cross-sectional studies, carry out large scale tree-plantings, and many other tasks.

41	Dodds, Jessica; Ela, Julia	Rivanna Conservation Alliance	**Benthic and Bacteria Monitoring in the Rivanna Watershed** The Rivanna Conservation Alliance (RCA) is completing its Level III Certification for its bacteria monitoring program. By the end of August 2017 RCA will be the only Virginia nonprofit to be certified at the highest level for both its bacteria and benthic monitoring programs. Our poster will show the map of the watershed, the locations where RCA monitors for benthic and the bacteria monitoring sites. RCA's mapping system will be on display along with samples of aquatic macro invertebrates and bacteria samples in petri dishes.
42	Domanski, Tammy	Anne Arundel Community College Environmental Center	**Molecular Characterization of Enterococci Sources in the Anne Arundel County Region** Enterococci have been historically characterized as non-harmful, but over the last decade the emergence of hospital-associated enterococcal infections carrying antibiotic resistances, and the movement of similar strains to community populations have increased significantly. This may suggest an increased risk of illness to exposed individuals, a risk above that already determined by earlier correlation studies. In this study, human, canine, and bird fecal DNA samples were analyzed with primer sets previously designed to amplify targets specific to enterococcal species with the goal of verifying their ability to identify the specific fecal source. Interestingly, sequences previously associated mainly with virulent strains of enterococci found in human clinical strains were found in multiple canine DNA samples collected in the Anne Arundel County region. The implications of these findings for humans, dogs, and other natural animal populations is further analyzed and illustrates the need for region-specific source typing primers.
43	Hughes, Sarah	Maryland Department of Natural Resources	**Water Quality Assessment and How It Affects AIS** Through my poster, I want to layout my plan to establish a system for monitoring water quality at state lakes in Western Maryland. I will include a section on my meter and the factors that I am evaluating, a section on tributary water quality and core sampling to establish historical water quality, and a section on AIS in the lake including Hydrilla and Zebra Mussels – how they spread, what conditions to look for, and how climate change/changing water quality may affect them in the future. My poster with showcase the overall health of the western state lakes and developing a protocol for improvement.
44	Hollberg, Coalter	Anne Arundel County	**Assessing Possible Impact of Land Cover Changes on Baseflow Conditions Observed in Three Non-tidal Streams, Anne Arundel County, Md.** Urban development concerns resource managers due to adverse effects on stream quality and resulting downstream pollution. From 1999-2013, Anne Arundel County's Surface Water Monitoring Program evaluated baseflow conditions in three streams before and after development. Chemical parameters including Nitrogen, Phosphorus and various trace metals were analyzed using standard EPA methods while physiochemical parameters (pH, Dissolved Oxygen, Specific Conductance, and Temperature) were determined using a handheld multimeter. Two tailed t-tests were performed to determine significant difference ($\alpha = 0.05$). An evaluation of land cover in each watershed was performed in ArcGIS using detailed land coverages created in 2004, 2007 and 2011. Metal concentrations peaked between 1999 and 2001, while Nitrogen decreased over time. Observed land cover categories did not vary significantly over this timeframe due to lack of new development. Additionally, changes in data collection methods affiliated with land cover shapefile creation may have confounded this analysis. Overall annual baseflow concentrations did not correlate with land cover changes, indicative of possible other drivers associated with baseflow water quality conditions.
45	Lee, Sam	Maryland Environmental Service	**Thermal Impact Monitoring of Stormwater Management Practices** This project involved monitoring effluent temperature for two best management practices currently in use in Maryland and surrounding states, submerged gravel wetlands and wet ponds. Monitoring was conducted during the summer at sites to look at the impacts stormwater discharge has on the stream temperatures and how this will impact temperature sensitive aquatic species. This study found significantly lower temperatures effluents for submerged gravel wetlands in both cold and warm water streams. This confirms the pond limitations set in place in Maryland and provides information for future stormwater management construction decisions.

46	Lepine, Christine	The Conservation Fund's Freshwater Institute	**Woodchip Bioreactors as Nitrogen Remediation for Land-based Aquacultural Production Facilities** An innovative land-based fish farming method, recirculating aquaculture systems (RAS), aims to provide a local way to farm healthy fish that's good for people and the environment. The systems provide a highly efficient water recycle method that reduces water consumption through collection and transformation of waste products. However, this method also results in high concentrations of dissolved nutrients in wastewater, particularly that of nitrate, a contributor to coastal eutrophication. Many aquacultural facilities are a point-source and therefore regulated for annual nitrogen (N) species loading, but cost-prohibitive N remediation technology could restrain RAS industry growth. One possible solution is that of low-cost denitrifying woodchip bioreactors, an accepted N removal technology currently used to treat agricultural runoff and tile drainage. Recent studies have demonstrated the feasibility of woodchip bioreactors for treating aquacultural wastewater. Because this technology is relatively new, particularly for aquaculture applications, lifetime cost-efficiency has not been fully assessed. A cost-estimate of N removal over a one- to five-year anticipated lifespan was obtained by estimating initial capital expenditures of a theoretical full-scale bioreactor system, designed specifically for a RAS production facility, and observing nitrate removal rates in a pilot-scale system treating aquacultural effluent.
47	Murphy, Rebecca	Midshore Riverkeeper Conservancy	**Midshore Riverkeeper Conservancy's Submerged Aquatic Vegetation Monitoring Program** Submerged aquatic vegetation (SAV) abundance acts as a key indicator to the health of the Chesapeake Bay, signaling changes in water quality and pollution along shoreline ecosystems. Midshore Riverkeeper Conservancy's SAV Monitoring Program aims to track SAV in rivers along the Eastern Shore with help from the local community through citizen science. Acting to verify information collected by Virginia Institute of Marine Science using aerial surveys, volunteers use kayaks and powerboats to identify SAV species, estimate the size of vegetation beds, and note the surrounding characteristics of the shoreline. Using smaller boats and kayaks provides a more detailed analysis of SAV beds in smaller creeks as well as a better record of plant species that may not be in season during the annual aerial surveys. By tracking SAV with local volunteers, the program will provide a better picture of existing SAV populations and help to determine where improvements could be made in water quality and SAV restoration, while also engaging the community to improve the condition of Eastern Shore rivers.
48	Roswall, Taylor	American Chestnut Land Trust (ACLT)	**A Comparative Analysis of Agricultural Effects on Stream Health** Sustainable farming methods have been shown to improve the quality of water affected by conventional agriculture. The American Chestnut Land Trust (ACLT) recently purchased a 60-acre farm that has used conventional agricultural practices for over 70 years. ACLT aims to integrate more sustainable agricultural practices on the farm and assess how the surrounding aquatic ecosystems respond. Thorough baseline sampling will be conducted on six tributaries to assess stream health and guide stewardship strategies. This baseline data will also be used to track changes that might occur during the switch to sustainable agriculture. The goals of this project are to (1) gather baseline water chemistry and macroinvertebrate data of six tributaries surrounding Holly Hill Farm, (2) identify any priority sites with inadequate health, and (3) use data in conjunction with future data to assess how sustainable agriculture improves water quality. To determine macroinvertebrate health, one location along each tributary will be sampled in March. Water quality parameters that give a holistic picture of non-tidal stream health will be sampled once per month from March until July at three locations along each tributary. This study provides pertinent data on stream health and the benefit of sustainable agriculture practices on aquatic ecosystems.
49	Schneider, Lilian	U.S. Fish and Wildlife Service	**Survey of Butterfly Species at Poplar Island and Masonville Cove** Butterfly and other pollinator populations are declining due to habitat loss from development, agriculture and pesticide use. Suitable pollinator habitat is essential for healthy ecosystems. Plants that stabilize the soil and clean the air depend on pollination to thrive, reproduce and produce food. This project will focus on two important Port of

			Baltimore habitat restoration projects: Poplar Island in the Chesapeake Bay and Masonville Cove in the Patapsco River near South Baltimore. The goal of this project is to identify the butterfly species present and correlate that information with the plants these species require during their different life stages. I will perform species richness and abundance surveys and compare my findings to local species lists. Through this process, I will determine whether there is adequate butterfly habitat at both sites and propose a native seed mix to attract more butterflies. As an outreach component, I will reach out to project partners to organize plantings. In addition, I will create a field guide or educational panel for Poplar Island and Masonville Cove which will include naturalist drawings of the butterfly species and teach visitors about the importance of butterflies as pollinators that benefit the Chesapeake Bay region.
50	Wall, Jennifer	Patuxent Wildlife Research Center	**Utilizing Aerial Imagery to Digitize Land Cover on Poplar Island** Poplar Island (38o46'01"N, 76o22'54"W), a remote habitat island in the Chesapeake Bay, is the site of an ongoing restoration project that utilizes clean dredge material from the Baltimore harbor. Poplar Island provides habitat for over 200 bird species annually, including the Common tern (*Sterna hirundo*), a Maryland state listed species. Over the past several years, researchers with USGS have documented the nesting behavior of Common terns and other waterbirds on Poplar Island. This project focuses on utilizing aerial imagery obtained through flight transects to analyze land cover changes over the past 15 years, with the potential to analyze the impact of land cover change on observed nesting behavior of the Common terns on Poplar Island. Imagery will be digitized within ArcGIS, with land cover delineated into categories based on major land cover types. Digitizing land cover on Poplar Island will provide insight into land cover changes and may enhance our understanding of recent patterns of shorebird habitat use and nesting behavior.
51	Woytowitz, Ellen	USGS MD-DE-DC Water Science Center	Baltimore Urban Waters Partnership stakeholders identified that factors influencing water quality trends in urban streams are not well understood at the watershed scale, despite regulatory requirements and investments in gray and green infrastructure. To address this gap, long-term water quality trends and proposed factors of influence were examined in the Gwynns Falls watershed over the Baltimore Ecosystem Study timeframe. Land cover and climate variability can mask signals in water quality improvements and present challenges for meeting regulatory goals. Analyses of watershed land cover from 2001-2011 indicated minimal change, suggesting it is likely not a factor influencing water quality change. However, annual and winter precipitation increased in the region; changes which may exacerbate inflow and infiltration to gray infrastructure and reduce green infrastructure effectiveness. Sanitary sewer overflows (SSOs) and best management practices (BMPs) were identified as factors influencing water quality change. Increased SSO number, volume, and duration were correlated to an increase in annual loads of nutrients and bacteria. Increased BMP number, storage volume, and drainage area were correlated to a decline in annual loads of phosphate, sulfate, and total suspended solids. Results suggest that continued investments in both gray and green infrastructure are necessary for urban water quality improvement.

Environmental Education

52	Alexander, Maya	Arlington Echo Outdoor Education Center	**Increasing Diversity in MAEOE's Green School Program** I plan on showing the progress I have made thus far with my goal to expand the Maryland Association for Environmental & Outdoor Education (MAEOE) Green School initiative by encouraging more schools in Anne Arundel County to become a part of the program. This program allows schools throughout Maryland to apply to become more sustainable by providing teachers, students, and the surrounding community with the necessary resources to learn the importance of maintaining a sustainable environment. I would like to focus on public elementary schools in Anne Arundel County where the student population is predominantly from lower socioeconomic status. My goal is to ensure that we do not forget to recognize underprivileged children in the efforts towards becoming more environmentally-friendly.
53	Alvey, Samantha	Environmental Concern	**Mid – Atlantic Monarch Initiative (MAMI)** Over the last four years, Environmental Concern (EC) has been witnessing the declining population of the Monarch butterfly. In 2015, EC founded the Mid – Atlantic Monarch Initiative (MAMI). The mission of this initiative is to foster collaboration and activate conservation initiatives through shared physical and educational resources to increase Monarch habitat in the Mid-Atlantic region of the United States. MAMI achieves this through education on the importance of the creation and preservation of Monarch habitats. The success of MAMI is dependent on the open exchange of ideas with other organizations with related goals and objectives. By identifying and mapping local milkweed populations, seeds can be collected and utilized in future restoration efforts. These seeds can also be distributed among other local organizations dedicated to increasing the available habitat for the Monarch butterfly.
54	Dionna Bucci	M-NCPPC, Montgomery Parks, Meadowside Nature Center	**Nature on Wheels: Using a "Pop-up" Program Cart in Environmental Education** Meadowside Nature Center, part of the Montgomery County Parks system, offers a variety of educational nature programs to the public. However, not all nature center visitors can or choose to take full advantage of these programs. Therefore, Meadowside seeks to expand its existing programming to engage community members with nature in a new and hands-on way. To meet this goal, the center is planning the construction and implementation of an educational "pop-up" program cart. The cart will contain biofacts, games, and crafts related to various nature topics and be used for impromptu on and offsite programming. The adaptability of the educational program cart will allow Meadowside to maximize the number of people they educate, create offsite community connections with places such as libraries, and produce new educational volunteer opportunities.
55	Cross, Shelby	Jug Bay Wetlands Sanctuary	**Nature Discovery Area** Nature discovery areas are important to any user, particularly children, for three main reasons: (1) to foment cognitive, physical, social, and emotional development; (2) to build environmental stewards from an early age; (3) and to provide a nature-based setting for physical and creative play. The nature discovery area we plan to build will be focused to serve children and will be located in the Jug Bay Wetlands Sanctuary Nature Preserve at Waysons Corner, in Southern Anne Arundel County, Maryland. The Waysons Corner and adjacent communities are peculiarly impoverished areas with limited public play areas, particularly those that are nature-based. This will be the second of its kind in this part of the County fulfilling a much needed gap. The nature discovery area will be built with the input and support of the local community to instill a sense of ownership. Different features may include a musical instrument made from bamboo, wooden balance beams, wooden stepping stones, and many more. Materials used will be nature-based or recyclables from the local area.
56	Harper, Caroline	Arlington Echo Outdoor Education Center	**Educating the Future about Climate Change** I plan to develop a series of climate change lessons as part of Arlington Echo's fourth grade environmental education program. This program services fourth graders in the Anne Arundel County public school system and encourages students to learn about their environment and what they can do to maintain and take care of the Chesapeake Bay area.

			My climate change lessons will be implemented as part of the fourth marking period in spring of 2018. As part of the lessons, the students will play games and complete simulations to help them understand the process of climate change. They will also learn why climate change is a problem, why humans need to take informed action to mitigate climate change, and how they can share their knowledge with others. Additionally, they will collect climate data and contribute to a database of Arlington Echo weather data that they will be able to access online in the future to see how weather patterns turn into climate trends over time. Ultimately, the students will leave Arlington Echo with an understanding of global and local climate change and, ideally, with a desire to take action to mitigate this process.
57	Jones, Morgan	Chesapeake Bay Foundation	**The Islands of the Chesapeake Bay: An Authentic Education Experience** The Chesapeake Bay Foundation (CBF) offers educational field programs for students all over the watershed. School groups come from near and far to learn about the culture, history, and ecology of the charming Chesapeake Bay. For three days and two nights, students have the opportunity to stay at one of CBF's four magical island education centers. The four island centers consist of Fox Island, Port Isobel, Smith Island, and the Karen Noonan Center. From setting crab pots, dredging for oysters, or canoeing, to talking to island locals, star gazing, or sitting around a bonfire, the possibilities are endless. Not only do students make memories at these island centers, but they also learn about ways to decrease their environmental footprint and, ultimately, save the bay. Food waste is composted, electricity is used at a minimum, students use Clivus Multrum composting toilets, and showering is not available in an effort to save water. After their stay at an island center, students leave with a passionate connection to the bay and a deeper awareness of how their behaviors can affect the environment as a whole. Perhaps an authentic, hands-on education experience is the key to opening the minds of future generations of bay-savers.
58	Lindsay, Gabriel	Latin American Youth Center - Montgomery County Conservation Corps	**Creating Conservation with the Montgomery County Conservation Corps** The Montgomery County Conservation Corps, a program operated by the Latin American Youth Center in Silver Spring, MD, combines conservation work experience with GED classes for participating youth. Youth aged 17-24 participate in a wide variety of conservation-focused work with various partner organizations, including NPS, MNCPPC, Maryland State Parks, and other organizations. They remove invasive plants, construct trails and bridges, build compost bins, plant pollinator gardens, and participate in other work projects on behalf of the partner organization. Participation in this program prepares youth for work in green collar jobs, and empowers them in pursuing social and environmental change in their communities, while also meeting the growing need for green labor in Maryland and Washington, DC.
59	Moorman, Thomas	Patterson Park Audubon Center	**Extending Audubon's Wingspan to Cover 4th and 5th Grade Students in Baltimore** Patterson Park Audubon Center is in the unique position of providing recurring environmental education opportunities to multiple schools, connecting city children with nature in Patterson Park, Baltimore's best backyard. Because some schools do not address science standards until later grades, Patterson Park Audubon Center's curriculum is critically important in introducing young learners to science. However, under the center's current capacity, our reach is limited to students in Pre-K through 3rd grade. After this, the children have a more limited access to Audubon activities through service learning and volunteer opportunities, and the schools must find a different source for their student's environmental education. I intend to create 4th and 5th grade curriculum for Patterson Park Audubon Center. This will this allow for greater educational impact by building upon prior years' content and allowing students to continue their beneficial interaction with Audubon during their formative elementary years. This curriculum will address Next Generation Science Standards and Common Core requirements, finding the intersection between National Audubon Society's Core Values, Patterson Park Audubon Center's mission, and the state of Maryland's science education goals.

60	Parr, Kyle	Arlington Echo Outdoor Education Center	**Storm Water Management at Arlington Echo Outdoor Education Center** Arlington Echo is the environmental literacy office for Anne Arundel County Public Schools, and acts as an outdoor education center. The site is located on Indian Creek, a branch off the headwaters of the Severn river. The parking lot of Arlington Echo has led to erosion during rain events. A bioretention area was constructed to prevent further erosion of the area. The project contained over 100 native plants, coir log berms, and stone berms. The construction of the project was implemented in Arlington Echo's fourth grade "take action" lesson, allowing students, parents, and volunteers to assist in invasive species removal, planting native plants, and installing berms. This experience gave participants a hands on meaningful watershed experience.
61	Roessler, Connor	Cacapon Institute	**Make it a MWEE! Teaching Meaningful Watershed Educational Experiences in the Mountain State** Cacapon Institute's PHLOW (Potomac Headwaters Leaders of Watersheds) program is emerging as the largest MWEE (Meaningful Watershed Educational Experience) program in West Virginia's portion of the Chesapeake Bay watershed. While West Virginia is a signatory to the Chesapeake Bay Agreement, West Virginia did not "sign onto" the Environmental Literacy goals, leaving a need to pursue MWEE in West Virginia's Potomac Basin within the Chesapeake Bay watershed. With Experience Learning and WV DEP as partners, Cacapon Institute will expand outreach and develop in-classroom and extracurricular activities to promote project-based and STEM learning opportunities for MWEE. This project will focus on evaluation and improvement of the existing PHLOW education program and use new strategies to work with West Virginia County education services to expand MWEE as systemic, curriculum-based learning for students. The three-year goal will be to provide MWEE to all of the approximately 9,000 intermediate age students in the Bay watershed before the completion of fifth grade. With NOAA B-WET grant funding focused on improving the education side of PHLOW, efforts can be redoubled to make a more robust regional MWEE possible.
62	Urbanski, Katie	Sultana Education Foundation	**Revitalizing the Chester and Sassafras Rivers on the Captain John Smith Chesapeake National Historic Trail** In 1608, Captain John Smith led two expeditions of the Chesapeake Bay and its tributaries, exploring more than 3,000 miles of the region. 400 years after Smith's voyages, his journey is still accessible to modern adventurers on the Captain John Smith Chesapeake National Historic Trail. The trail stretches over dozens of tributaries, two of which are the Chester and Sassafras Rivers. The Sultana Education Foundation oversees these trails, having mapped the accessible areas of each river and having previously hosted a website for each. However, with the websites currently inactive, the Chester and Sassafras Trails are ill-advertised to paddlers. To rebrand and revitalize the trails, SEF has partnered with the National Park Service and the Chesapeake Conservancy to host them on a new site at findyourchesapeake.com. Merging our information with this site's infrastructure means curious individuals can interact with each river before even seeing it. Choosing from different skill levels and interests, visitors can pinpoint their perfect paddling location, read up on an area's history, and view hazards and tips before getting outside. Our hope is to connect more people to their rivers, trails, and ultimately their bay in a more meaningful, educational, and exciting way than before.