

Durham Soil and Water
Conservation District

**ANNUAL
REPORT
2018-2019**

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Soil & Water

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Board

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Mission Statement

To conserve, enhance, promote the natural resources of Durham County by providing technical assistance, environmental education information, and economic incentives to County citizens and by exhibiting a diversified program to meet its changing needs.

Staff

Eddie Culberson, Director
Lisa Marochak, Senior Administrative Officer
Mike Dupree, Agribusiness & Environmental Services Manager
Jessica Perrin, Watershed Conservationist
Kyle Gentry, Natural Resources Conservationist
Cherri Smith, Contracted Services Employee
Elizabeth Zander- Project Manager, Piedmont Conservation Council
Diana Irizarry, USDA/NRCS

STREAM RESTORATION PROJECTS

Walker Project Completed



Northern High School students planting buffer

This spring the Durham Soil and Water Conservation District completed a stream restoration project with landowners Aaron and Emily Walker. The Walkers own a cattle operation in eastern Durham. The stream was located on a sediment-impaired unnamed tributary (UT) to Little Lick Creek near the headwaters of Falls Lake. The project was funded through a Clean Water Management Trust Fund Grant (\$400,000). The completed work restored this section of the stream using natural channel design techniques from the design plans provided by Civil and Environmental Consultants out of Ohio. The project's construction was provided by Land Mechanic Design of Willow Spring, North Carolina who restored 2,218 LF of the stream. A vegetative buffer with a minimum width of 50 feet on both sides of the stream

was also established throughout the project. Northern High School students were hired to grow some of the trees located in the buffer and to plant the trees as well. A permanent conservation easement (5.29 acres) surrounding the project was recorded in Durham County with the Soil and Water District providing monitoring in perpetuity. The easement boundary was also pinned on the ground for easy locating. All necessary permits were originally obtained July 10, 2018, during the design phase.

Since the completion of the project, water quality benefits are already starting to be apparent with over-bank flooding. The new stream channel has had a few bankfull events where the floodwaters were able to spread onto the floodplain and reduce stresses inside the channel. Expected stream restoration benefits include improved riffle and pool habitat along the project reach and ~98 percent reduction in sediment load from the stream banks resulting in an annual sediment reduction of 473 tons per year into Little Lick Creek and eventually the Falls Lake Reservoir. The project will also reduce 383 pounds of total nitrogen and 25 pounds of total phosphorus from entering Falls Lake each year.



before



after

Marbrey-Jackson Project Underway



Construction phase

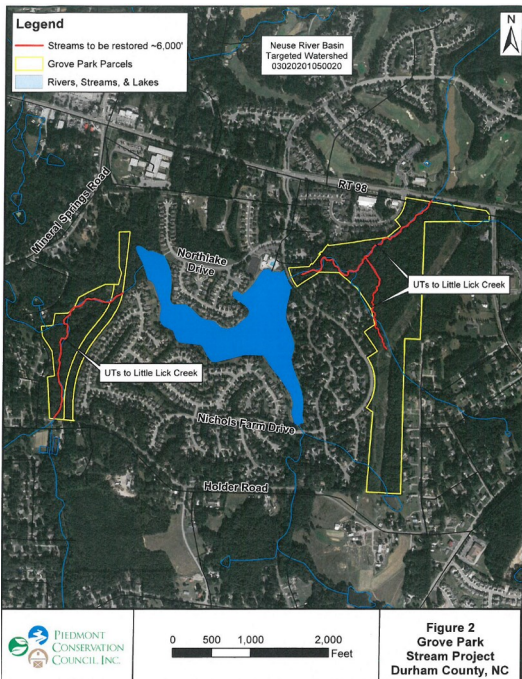
In early May of this year, the Soil and Water Conservation District began construction of the Marbrey Jackson stream restoration project. Jason Marbrey and Betty Jackson are neighbors whose properties join and together they own this 4,000 LF reach of stream. This project is located on the sediment-impaired Panther Creek. Panther Creek drains a portion of eastern Durham County in a relatively undeveloped section of Durham County. The District is partnering with Piedmont Conservation Council to conduct this much-needed stream restoration project which lies in the

headwaters of Falls Lake. The project is being funded by a Division of Water Resources Grant (\$200,000), a Clean Water Management Trust Fund Grant (\$450,000) and the Upper Neuse Clean Water Initiative Program (\$110,000). When completed, the District will hold and monitor a permanent conservation easement approximately 8 acres in size. Southern High school students will receive \$5,000 of grant funds to propagate and plant trees within the buffer zone of the creek. The project will generate a reduction of 901 tons of sediment, 529 pounds of total nitrogen and 34 pounds of total phosphorus from entering Falls Lake each year.



before

Grove Park Project-Planning Phase



The Soil and Water Conservation District is working in conjunction with Grove Park Homeowners Association (HOA) and Piedmont Conservation Council (PCC) to conduct a stream restoration project located on the HOA property. The plans include 6,000 linear feet of stream restoration on the sediment-impaired Unnamed Tributary (UT) to Little Lick Creek in the Falls Lake. This UT to Little Lick Creek drains a portion of eastern Durham County in a relatively undeveloped section of the county. Channelization and straightening of the stream channel, as well as upstream suburban develop-



Existing conditions of stream

opment and past timbering, have resulted in a deeply incised stream bed with eroding vertical banks. Urban development in this now vulnerable stream's watershed threatens to worsen sediment pollution in Falls Lake. Falls Lake is listed on the State's Clean Water Act Section 303(d) list of impaired waters. Due to the \$1.4 million estimated cost, the project has been broken down as Phase I and Phase II. Thus far, the District has received a DWR grant along with Grove Park HOA funds and has submitted applications to UNCWI and CWMTF.

STORMWATER PROJECT

Riverside High School Stormwater Project

A NCSU & District Project

The Soil and Water Conservation District is partnering with NC State University to conduct a research stormwater study at this Riverside High School. The research question will be to determine if there is a water quality benefit to converting existing dilapidated ponds to wetlands. This is a relevant question given the multitude of stormwater ponds in N.C. and beyond that are comparable to as these two ponds.

The site has two failing sediment ponds present from the construction phase at Riverside High School years ago. The purpose of



this project is to capture the first 1 -1.5" of stormwater runoff from the high school campus while measuring the water quality benefits of a paired study of retrofitting stormwater BMPs. With the two sediment ponds side-by-side with similar drainage areas and development, DSWCD and NC State plan to do a paired study comparing approaches for retrofitting dilapidated sediment ponds into stormwater BMPs. The retrofits include a stormwater wetland and detention pond with numerous enhancements (i.e., littoral shelf with lots of wetland plants, forebay, and water reuse). The plan is to measure both sediment ponds simultaneously and compare the benefits of these BMPs, using before restoration and post-restoration monitoring.

The project hopes to engage and educate students, teachers, and the community while reducing stormwater runoff and nutrients from entering the Eno River, Eno River State Park, and Falls Lake Reservoir. The project will reduce nutrient pollution to a nutrient-sensitive watershed and reduce sediment loading downstream to the 303(d) listed Falls Lake Reservoir. Riverside and many areas surrounding the school were listed in the Eno River Watershed Plan as needing stormwater controls. This project would retrofit the old and breached sediment basins configurations into the proposed BMPs to collect rainwater that will be used to water athletic fields and greenhouses, while reducing potable water use for the school. Thus far, the District has received a \$200,000 grant from DWR and has submitted an additional grant to CWMTF for \$382,000.

COST SHARE PROGRAMS

Community Conservation Assistance (CCAP)

The Community Conservation Assistance Program is a voluntary program that provides landowners with technical assistance and cost-share reimbursement to install best management practices (BMPs) on urban and suburban land. On-site consultations are provided to Durham County residents to address erosion, drainage, and water quality concerns along with evaluating which best management practices may be suitable for a site. Staff also host community outreach meetings with homeowner's associations and local groups to discuss water quality improvement in Durham County.

BMPs that are available through CCAP include rain gardens/bioretention cells, grass swales, cisterns, critical area plantings, and streambank stabilization projects. The primary mission of CCAP is to reduce the amount of sediment and nutrients from reaching our streams, due to their negative impact on water quality and aquatic habitat. During the summer of 2019, CCAP also worked closely with the BETC program to utilize the summer interns to install BMPs.



cistern

FY19 CCAP Measurable Achievements*	
173	Technical Assistance Consultations
16	Applications for Assistance Received
19	Contracts Approved (including rollovers)
21	Stormwater BMPs Installed
4.65	Acres treated by BMPs
50.4	Pollution Removed: Lbs of Nitrogen over 10 yrs
5.8	Pollution Removed: Lbs of Phosphorous over 10 yrs
5.59	Tons of Soil Saved
\$140,000	Grant Funds Received for Future Projects
\$52,792	Landowner Cost-share Reimbursement (Source: Outside Grant Funds)
*ISIP achievements are listed separately in this report. See page 7	



Pictured left: CCAP, Impervious Surface Conversion, after

Pictured right: ISIP, before



Impaired Stream Improvement Program (ISIP)

The Impaired Stream Improvement Program (ISIP) seeks to implement conservation best management practices on impaired streams in low income neighborhoods. The selected projects target stream sites where the amount of sediment and/or nutrients entering the stream can be reduced using best management practices (BMPs). Several different conservation BMPs can be implemented to improve the health of these urban streams, including: streambank stabilization, critical area planting, rain gardens, and riparian buffers.

ISIP provides landowners who self-certify as low income with 100% cost-share for BMP installations on their property in cases where water quality concerns are identified. A 'Limited Resource Self-Certification' form has been created and updated for use with this program based on the FY 2018 Income Limits for Durham-Chapel Hill, NC HUD Metro FMR Area (U.S. Department of Housing and Urban Development).

During fiscal year 2018-2019, the District entered into two contracts with qualifying landowners. The contracts specify 5-year maintenance requirements that landowners must abide by for all installed practices, beginning once construction is completed. The Durham District contracted with CFB Contracting, LLC - a certified, insured environmental contractor - to implement the best management practices designed by Durham SWCD staff for a total cost of \$20,000.

The projects were installed at the following locations:

1. Riverdale Drive, Eno River, Neuse River Basin
2. Southgate Street, Ellerbe Creek, Neuse River Basin

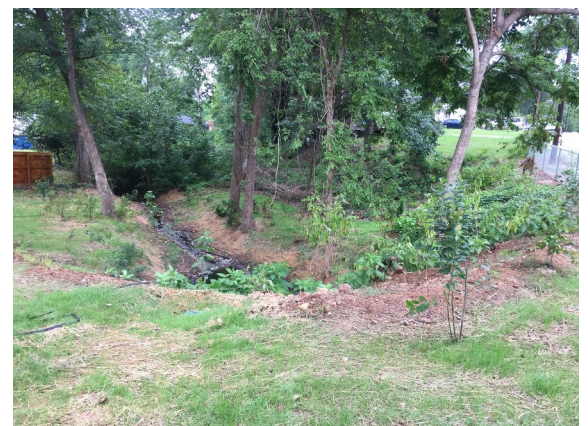
The two projects stabilized 185' of streambank and enhanced the streams with 3900 square feet of riparian buffer. These BMPs reduce nutrient and sediment delivery and increase the amount of wildlife habitat and forage due to the native plants installed. Reductions are listed in the table below.

Category	Reductions
Total Soil Loss (tons/year)	10.74
Nitrogen Reduced (pounds/year)	0.39
Phosphorus Reduced (pounds/year)	0.04
Acres Treated with New BMP	114.2



Pictured left: ISIP, Rain Garden, after

Pictured right: ISIP, Rain Garden, after



Agricultural Cost Share Program (ACSP)

The Agriculture Cost Share Assistance Program (ACSP) is a voluntary program for qualifying farmers and agricultural landowners to address natural resource concerns on the land and nonpoint source pollution from agricultural activities. The program provides technical, educational and financial assistance for the installation of conservation best management practices (BMPs) to address water quality issues found on the farm. The ACSP has been putting conservation on the ground across NC since the mid-1980s. In Durham County, the program is administered by the Durham Soil and Water Conservation District.



Field Border install

The program is 100% voluntary on the part of the producer/landowner to help them improve the natural resources on their property by utilizing/installing conservation BMPs. Participants can be reimbursed up to 75% of a predetermined average cost for each BMP installed. The applicant is responsible for the remaining 25% of the costs. *In some situations, new or limited resource farmers can be eligible for up to 90% cost share.*



The Durham County Agriculture Cost Share Assistance Program (ACSP) received \$45,777 from state appropriations for the conservation best management practices in fiscal year 2019. Of the state appropriated funds, 100% were allocated to local Durham County producers/landowners for the following conservation BMPs: 2,820 square feet of roof top management, 1,300 ft of livestock exclusion fencing, one manure application system and one manure composting facility. The BMPs will mitigate or prevent future losses of nutrients and soil from the farms and nearby streams, thereby improving overall water quality in Durham County. Estimated reductions expected once the BMPs are installed are 63.4 pounds per year of nitrogen saved, 14 pounds per year of phosphorus saved and 15.6 tons per year of soil saved.



Grassed Waterway

The District staff will be working closely with these producers over the next couple of years to provide technical assistance during the installation of the BMPs. Once completed, the District will monitor the BMPs for 10 years to ensure their function and continued use.

Also, during FY 19, Durham staff provided contract management and construction oversight on cost share contracts from fiscal years 17, 18, & 19. District staff worked to assist producers with the construction and completion of 12 ACSP best management practices that were contracted in FY 17, 18, or 19. They are as follows: two ag wells with pipeline for livestock alternate watering systems, five livestock waterers, one livestock heavy use area, one well repair, and one waste application system for manure management.

Hurricane Agricultural Disaster Programs

Durham county farmers and landowners alike felt the effects of both Hurricane Florence and Hurricane Michael. The heavy rainfall in such a short time and wind gusts caused several types of damage to fields, fences, barns, crops, farm roads, and streams. To help, several emergency programs were funded through federal, state, and private sources. North Carolina Department of Agriculture and Consumer Services Hurricane Florence Agricultural Disaster Program of 2018 was funded by the North Carolina General Assembly with a \$240 million bill to provide direct payments to farmers that reported crop loss. The North Carolina Division of Soil and Water awarded the Durham Soil and Water Conservation District \$22,500 out of a requested \$43,500 to provide cost share assistance with three farm road repair contracts. The Natural Resource Conservation Service received funding through FEMA to provide cost share assistance with stream debris removal. The Pasture Renovation and Cover crop seed initiative, provided Durham County farmers with 1000 pounds of free seed for reseeding pastures or winter cover on crop fields. The initiative was made possible with funding from state Farm Bureaus around the country and Duke Energy.

COST SHARE PROGRAMS-CONTINUED

Agricultural Water Resources Program



Established in 2012, the NC Agricultural Water Resources Assistance Program (AgWRAP) is available to assist the Durham County agriculture community with water resource needs. Instead of being water quality driven like ACSP, the AgWRAP program is strictly water quantity based to help address water resource concerns/needs on farms. AgWRAP is intended to: identify opportunities to increase water use efficiency, availability and storage; implement best management practices (BMPs) to conserve and protect water resources; Increase water use efficiency; and Increase water storage and availability for agricultural purposes.



AgWRAP Pond Sediment Survey

The state legislated appropriation for AgWRAP is considerably smaller than ACSP, therefore the District allocation is much smaller than the ACSP. In FY 2019 the Durham District received \$7,500 and that entire amount was allocated to a Durham County farmer for the installation of a new “ag-only” well for irrigation purposes. The new well will provide much needed water for a new/beginning farm family in Durham County that are growing 2+ acres of vegetables, berries and fruit. With no streams, ponds, or wells on the newly established farm, the farmers were collecting rain water to supplement crop irrigation needs. The new ag well will help ensure the success of their crop in times of drought and enable them to expand their production.

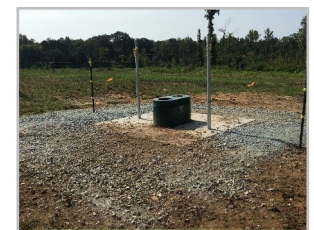
Similar to the NC ACSP, once an AgWRAP contract has been signed and approved, the producer has 2 to 3 years to complete the installation of all BMPs. [During FY 2019, District staff worked to assist producers with the construction and completion of one AgWRAP best management practices that were contracted in FY 18. A total of two ag wells for crop irrigation were installed in FY19.]

ACSP & AgWRAP Spot Checks

Most ACSP & AgWRAP BMPs have a required 10 year maintenance period once installed and during that time can be subject to random inspections by the Durham Soil & Water Conservation District. As such the Durham District is required to conduct annual spot checks on 5% of all Agricultural Cost Share Program (ACSP) and Agriculture Water Resources Assistance Program (AgWRAP) contracts.



Heavy Use Area



Livestock Drinker

During the FY 19 Spot Checks, 10% of ACSP and 22% AgWRAP contracts still under maintenance by the participating applicants or landowners were visited and evaluated on April 4, 2019. District staff were accompanied by District Board Supervisors, Talmage Layton, David Harris, Danielle Adams and Natalie Murdock. During the spot checks it was determined that all sites were in compliance with all NC Cost Share Commission and USDA NRCS standards & rules.

AG FIELD DAYS

Novel Endophyte Fescue Field Day

The District coordinated the Novel Endophyte Field Day on April 25th, 2019 in partnership with the Person Soil & Water Conservation District and Orange Soil & Water Conservation District. This field day was funded through a North Carolina Foundation for Soil and Water Conservation grant. The purpose of the grant was to support an improving pasture management program by providing funds for a demonstration to be used to educate producers on pasture and hayland management techniques to ensure a greater number of acres are drought resilient. The event was held at



Caywood Farm outside of Rougemont in northern Durham County. Participants heard from NC State University Professors and Cooperative Extension experts on numerous topics such as the dangers of toxic endophyte, renovating old pastures, establishing novel endophyte fescue, grazing management, weed control and more. The audience also heard from the local farmer on his experience with establishing the novel endophyte fescue demonstration plot. Over 30 interested livestock and hay producers from Durham County and beyond attended the event with positive feedback and desire for more field days. For more information regarding upcoming field days contact the Durham Soil & Water. Sponsors of the event included the NC Foundation for Soil and Water Conservation, Person Soil and Water, Orange Soil and Water, NCSU, Amazing Grazing, NC Cattlemen's Association, NC Association of Soil and Water Conservation Districts, NC ADIP Trust Fund, and NC Horse Council.



2018 Tri-County Pasture Field Day



Durham SWCD continues to see a need for more outreach and information on issues relating to livestock production and pasture management. The District coordinated the second annual Pasture & Livestock Management Field Day on September 27th, 2018 in partnership with the Person Soil & Water Conservation District, Orange Soil & Water Conservation District, the Orange County Cooperative Extension Service, the Person County Cooperative Extension Service and the Durham County Cooperative Extension Service. The event was



held at Rogers Cattle Company outside of Roxboro in northern Person County. Participants heard from industry experts on numerous topics such as pasture management, sprayer calibration, chemical safety, hay storage, multi-species grazing, energy efficiency and more. The audience also saw a drone demonstration on ways to best use modern technology on the farm. Over 100 interested livestock producers from Durham, Orange, Person and beyond attended the event with positive feedback on surveys taken afterwards. The third annual event will take place on September 26, 2019. For more information contact Durham Soil & Water. Sponsors of the event included First Hand Foods, the Durham-Orange Cattlemen's Association, Person Cattlemen's Association, Durham Farm Bureau, Person Farm Bureau, NCSU, Amazing Grazing, Hurdle Mills Farm Supply, Camp Chemical Corporation, NC Cattlemen's Association, NC Forage & Grassland Council, Southern States, Pasture Management Systems Inc., Carolina Farm Credit, and Bio-Zyme.



WATERSHED

Agricultural Compliance with the Falls Lake Rules



Livestock Exclusion

The Durham Local Advisory Committee met on February 21, 2019 for the annual review of crop data and discussed the Local Nutrient Control Strategy as outlined by Falls Lake Reservoir Nutrient Management Strategies. Durham farmers reported 335 acres of corn, 1,008 acres of soybeans, 613 acres of tall fescue, 61 acres of orchard grass and 172 acres of tobacco for a total of 2,189 acres of crop land in crop year 2017. The Nitrogen Loss Estimate Worksheet (NLEW) that was compiled has shown nitrogen losses of 74% from the baseline in 2006. Durham farmers have continued to exceed the 20 percent reduction according to the Phase I mandate.

HYDRILLA UPDATE



The Soil and Water Department represents Durham County on the Eno River Hydrilla Management Task Force to actively manage Hydrilla in the Eno River. Hydrilla was first discovered in the Eno River watershed in the early 1990s in Lake Orange, which is located upstream of Hillsborough. In 2009, biologists confirmed Hydrilla in another upstream reservoir, West Fork Eno Reservoir. Hydrilla crowds out native vegetation as it grows, reduces recreational opportunities, and can harm fish and bird species. Dense Hydrilla beds can create a toxin that is known to lead to death in waterfowl. The plant can also clog intakes where rivers and reservoirs are used for drinking water supplies and irrigation. Biologists say that since Hydrilla grows quickly and can form new plants from tiny fragments, it could become a nuisance to recreation and water supply at Falls Lake. The following is a 4 year summary of the treatment.

2018 herbicide treatment summary: An herbicide treatment started on May 24th and continued through August 15th. The section of the Eno that was treated was defined by the Lake Ben Johnson dam in Hillsborough and downstream to the Roxboro Street bridge in Durham. The herbicide (fluridone) was applied by two injection systems. Water samples pulled from the treatment area on August 28th were analyzed for herbicide levels and all samples were found to have <1 part per billion (ug/L) fluridone. This is equivalent to 'no detect' levels.

2017 herbicide treatment summary: An herbicide treatment started on June 30th and continued through August 15th. The area that was treated in 2015-2016 was included in the treatment. The change in 2017 was that the treatment area was expanded upstream to just below the Lake Ben Johnson dam.

2016 herbicide treatment summary: The treatment area and herbicide product remained consistent with the 2015 treatment. The herbicide product was metered into the river using two injector systems. The addition of a second injector system (located approximately midway through the treatment area) allowed for better control of the target concentration and allowed for a reduction in the total quantity of herbicide needed. The herbicide treatment did not prohibit, or impact in any way, recreational activities such as wading and swimming nor did it impact fishing or fish consumption.

2015 herbicide treatment summary:

An aquatic-use herbicide was used to treat a section of the Eno. A liquid formulation of fluridone was metered into the water at a single location. The treatment began in June and ended in August. The treatment effectively controlled the growth of Hydrilla throughout the ~16 mile long stretch. The treatment area defined as the Lawrence Road bridge (just downstream of Hillsborough) and down to N. Roxboro Street (north of Durham).

AG ECONOMIC DEVELOPMENT

Agricultural Economic Dev. Grant Program

The Durham County Board of County Commissioners Agricultural Economic Development Grant Program has allocated \$50,000 for the fiscal year. The program purpose is to offer cost share and financial support to farms, new and beginning entrepreneurs, and to support agriculture education in schools.

In FY 2019, thirteen farmers submitted request, for a total of \$58,325 and four schools submitted requests for \$4,000.

The Agricultural Economic Development Grant Subcommittee is made up of seven members from the farming community and government agencies. Each year they evaluate applications using the approved criteria and make recommendations for funding to the Durham Soil & Water Conservation District Board.

This year four schools were funded to install the following projects. WG Pearson Elementary School requested funding to start a poultry operation on the campus, the DPS Hub Farm requested funding for supplies to expand the livestock operation, Northern High School requested funding for equipment and supplies for an animal judging project, and Jordan High School requested funding for fencing supplies for the lamb project.

Eleven farms were awarded cost share contracts that will help expand their businesses and will allow producers to expand market opportunities including wholesale readiness. Below are a few projects that were funded that have been completed.

- Carolina Farmhouse Dairy requested funding for marketing and a trailer to haul milk safely.
- Dandies Farm requested funding to upgrade a kitchen in order to obtain health department certification for their value-added products.
- Tierra Negra Farm requested funding to transport a donated high tunnel house and to purchase greenhouse supplies to make the high tunnel operational.
- Raelene Teasley requested funding to install concrete in their hay barn in order to comply with new state rules for hay storage.
- The Microgreenery requested funding to expand the number of growing tables and install automated irrigation.



Winter Storm

The winter storm on Sunday December 9th had a devastating impact on two Durham farmers. The accumulation of 12 inches of snow and ice collapsed three high tunnel houses that were being used to grow lettuce. One grower was converting to a hydroponic operation.

Both farms are owned by socially disadvantaged farmers that received grant funding to expand their operations to become Good Agricultural Practice (GAP) certified. They both plan to rebuild and continue their pathway toward GAP certification and sell produce to Durham Public schools.



Farmland Protection Advisory Board (FPAB) Breakfast Series

Each winter the FPAB hosts monthly breakfast and information session for famers. This winter the topics included:

On November 14, 2018 Durham County Tax office staff discussed the reporting requirements for Present Use Taxation and filing Business Personal Use Tax forms.



December 6, 2018

Also, Durham Soil and Water staff talked about the Voluntary Agricultural District Program (VAD).

On December 6, 2018 the guest speaker was April Bauer with the Plant Industry

Section of the NCDA & CS. She updated the group on Fire Ants and the Quarantine requirements for hay growers. State regulations require the inspection of hay that is being transported out of the fire quarantine zone. Also, there are new rules for storing hay that is intended to be sold and transported out of the quarantine zone.



November 14, 2018

On January 10, 2019 Sarah Blacklin with NC Choices and Chris Hirni with the NC Forest Service discussed silviculture and beef cattle production and forest management.



February 20, 2019

Celebrating Minorities in the Local Food System- On February 20, 2019 from 8am to 11am 58 people met at the Durham Public Schools Staff Development Center on Hillandale Rd. in Durham to hear from minority farmers, restaurant owners, students, retailers, community gardeners discuss ways to increase opportunities for minorities to participate in the local food system. This event was sponsored by the Durham County Farmland Preservation Advisory Board and the Land Loss Prevention Project. County Commissioner Heid Carter opened the meeting and thanked the participants for participating in the event and for the networking to improve the food security issues in Durham.



January 10, 2019

Bionomic Education Training Center (BETC)



The Bionomic Education Training Center (BETC) is a curricula-based workforce-development training program that teaches students how to design and install stormwater management projects like rain gardens and cisterns, while also teaching students bionomics or the relationship between oneself and the environment. The partnership between the Durham Soil & Water Conservation District and Durham Public Schools has resulted in a sustainable business model in which students experience real-life lessons in the environment, science, technology, engineering, and math (E-STEM) via the BETC curriculum. The students also install stormwater management projects, earn service hours towards graduation, and develop green infrastructure job skills.

The BETC Summer Green Infrastructure program was implemented from June 17, 2018 through July 26, 2018. A team of six Durham Public Schools teachers and 23 interns from the City-County YouthWork Internship Program, Durham Public School Maintenance staff, and Soil & Water staff collaborated to install twelve best management practices (BMPs) to improve water quality. The team worked at five elementary schools installing cisterns, rain gardens, and critical area plantings. These projects were funded by the Durham Soil & Water Conservation District EPA 319 grant and the Community Conservation Assistance Program (CCAP) along with a Duke Energy STEM grant that was received by Durham Public Schools and provided funding for teachers, transportation and supplies.

While best management practice (installation and maintenance is the focus of most of the work each summer, the student interns and teachers also spend time working with farmers in the community. A typical week includes two mornings working on the Durham Public Schools Hub Farm and at local livestock and produce operations. The program also has a classroom component. Due to the nature of the summer program design, staff teach the skills, knowledge, and theory behind the BMPs, then have the students and teachers implement their learning during the fieldwork component. Finally, students learn about how “real-world” financial and time management skills are used to solve stormwater runoff challenges.



Each afternoon the students are required to record a reflection on the morning's activities in their journal. The students learn and use new vocabulary words, such as “aeration,” “BMPs,” “cisterns,” and “sediment.” The students’ reflections help them understand the importance of their work, and give them time to practice their writing skills, providing them with some fun memorabilia of their summer experiences.



BETC Curriculum Workshops

BETC Curriculum Workshops

An E-STEM training workshop was conducted on August 22, 2018 for 21 teachers from Durham Public Schools. The workshop focused on the BETC program stormwater curriculum that was created for the State of North Carolina Department of Public Instruction. The curriculum introduces the engineering principles of designing and installing rain gardens and cisterns as a mechanism for strengthening science literacy.

The BETC program curriculum was highlighted at the 2018 National Science Teachers Association meeting in Charlotte, NC on Friday, November 30, 2018. The program was selected out of the hundreds of case studies received and was identified as meeting the highest criteria and highest overall ratings for the conference.

Durham BETC program is shared at the Wake Green Schools Symposium

The Durham County BETC program was shared with 78 members of the Triangle. The Green Schools Symposium goal was to bring various stakeholders from around the Triangle and state together to facilitate a partnership for green schools in Wake County. This symposium convened all levels of state and local government, a myriad of nonprofits, and representatives of schools around Wake County.

<https://efc.sog.unc.edu/event/green-schools-symposium>

Alliance for Innovation Webinar

The Alliance for Innovation hosted a live webinar featuring the BETC program. The program was shared with 27 people from across the country. The title of the program is *Bringing Agri-Science & Social Entrepreneurship to the Forefront: Enhancing Community through Environmental Education*. You can watch the webinar at: <https://www.transformgov.org/multimedias>

PIEDMONT CONSERVATION COUNCIL



PCC is a regional nonprofit organization started in 1967 under the Resource Conservation and Development program through the USDA. PCC serves ten counties, including Durham County, implementing projects that further our communities' sustainability.

This past fiscal year, PCC has continued to partner with Durham SWCD on a stream restoration project along Panther Creek with a \$450,000 grant received from the Clean Water Management Trust Fund (CWMTF) and a \$110,000 grant received from the Upper Neuse Clean Water Initiative. The project is currently under construction and is expected to be completed this year.

To expand Durham's Bionomic Education Training Center (BETC) program to all ten of its counties, PCC was awarded a \$150,000 grant from the National Institute of Food & Agriculture (NIFA). This three-year project will provide training and support to 38 teachers and over \$70,000 to install stormwater best management practices.

PCC has submitted two additional grant applications on behalf of Durham County, including an application to the CWMTF on behalf of a stream restoration project in the Grove Park Durham Community along Lick Creek and an application to NIFA for further expansion of the BETC program in Durham.



PCC had a booth on the BETC Program expansion during the 2019 NC Association of Soil and Water Conservation Districts Annual Meeting

LEADERSHIP ACADEMY



Lisa Marochak, an employee with Durham County Soil and Water, took part in a nine-month leadership training January 2018-September 2018 that was hosted by Durham County Human Resources. The 2018 motto for the training was “You Can Lead From Anywhere.” The graduation for the 2018 class was held on October 9th, at the Durham Convention Center. The graduates received their certificates of completion in the company of past graduates, the County's executive leaders, friends, and family. NC State Representative Marcia Morey was the graduation speaker. Congratulations to Lisa and the rest of the 2018 Durham County Leadership Academy class.

graduation speaker. Congratulations to Lisa and the rest of the 2018 Durham County Leadership Academy class.

USDA/NRCS

During Fiscal Year 2018-2019, the following practices were installed through the Environmental Quality Incentive Program (EQIP):



- ◆ High Tunnel System (three Hoop Houses) (\$27,737.88)

The Natural Resources Conservation Service completed another year of EQIP signup for FY 2019. One application for a High Tunnel System (hoop houses) was funded for a total of \$9,954. This high tunnel will extend the typical growing season allowing a producer to begin planting earlier and harvesting later than what is typically feasible in a growing season. High tunnels provide excellent controlled environments that promote healthier plant growth and higher yields by regulating air and soil temperatures, maintaining soil moisture levels, reducing pests and pesticide use, and protection from extreme weather.



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CONTRACTED SERVICES EMPLOYEE

Durham County Soil and Water’s contract employee, Cheri Smith, has continued to work for the department inventorying streams on agricultural lands and assisting in the field with riparian buffer determinations. As the survey is conducted, these data are entered in Practice Keeper software. So far, over 5,000 acres of agricultural lands in Durham County have been surveyed on the ground.



Pictured right: Cheri Smith inventorying streams at a local farm

EDUCATION

2018 Durham Big Sweep Clean-up



Throughout the months of September and October of 2018, 539 volunteers from across the Triangle came out to help clean up the Durham area. 2018 was a huge success with 16,975 pounds of litter cleaned up. Cleanup sites varied from busy intersections to quiet parks and streams.

Durham Big Sweep is an annual environmental service event targeting litter and improperly disposed of trash. The Durham SWCD has been sponsoring the event for over 19 years now. The event's "official" day is the 1st Saturday each October, but groups can participate in the day of their choice throughout the months of September and October to allow for more flexibility with scheduling.

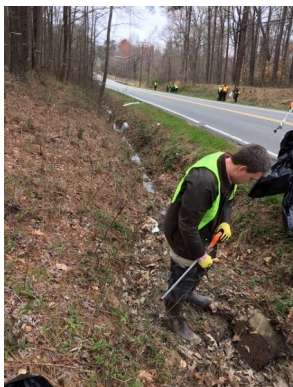
Volunteers that participated in the 2018 event included local citizens, Boy Scout troops, City & County employees, neighborhood groups, and students. The 2018 Durham Big Sweep was coordinated by the Durham County Soil and Water Conservation District, Keep Durham Beautiful, Inc and the City of Durham Public Works Department Stormwater and GIS Services Division. The Durham County Department of General Services and the City of Durham Neighborhood Improvement Services Team provided support in choosing sites and picking up trash and recyclables at each cleanup site.

Learn more about 2019 Durham Big Sweep at www.DurhamBigSweep.org or call Lisa Marochak at 919-560-0558 or email her at Lmarochak@dconc.gov

The Durham Soil and Water thanks all the volunteers and partners that helped to coordinate the clean-ups and for their dedication and commitment to our community.



2019 Durham CreekWeek



Durham Soil and Water Conservation District partnered with Keep Durham Beautiful and the City of Durham during Creek Week 2019 to host a City/County Clean-up on March 20th. The site selected for the clean-up was a stretch of well-traveled road on Camden Avenue and a section of Goose Creek nearby. The volunteer group was comprised of eleven Durham County employees, including Jessica Perrin and Kyle Gentry, along with three City of Durham employees. Within a few hours, the volunteer group was able to collect

11 bags of trash, three tires, one plastic tote, fencing, and three bags of recycling!



EDUCATION

2018-2019 Envirothon

The Envirothon is a hands-on, natural science academic event that challenges and engages middle and high school students on natural resources categories of soils/land use, wildlife, forestry, aquatics, and current environmental issues. Teams come from public, private, or home school groups. The Durham Soil & Water Conservation District is active in the Envirothon program locally, regionally, statewide and nationally.

During FY19, Durham staff worked with local teams during the school year training the students. Hands-on skills the students learned, such as tree height measurements, NC wildlife identification, and macroinvertebrate sampling to determine water quality, are all skills that resource professionals use in the field each day to perform their jobs.



On March 21, 2019, the Envirothon teams from Durham competed in the 2019 Area IV Envirothon competition at the Satterwhite Glasshouse in Henderson, NC. Seventy-six teams of students from across the Piedmont region attended.

Durham was represented at the Area IV Envirothon by five high school teams and one middle school team. Of the six teams, two of them placed in the top seven (earning them a spot at the statewide competition in May). The Mighty Mussels team from the NC School of Science and Mathematics placed 4th overall, and the Killer Kudzu team from the NC School of Science and Mathematics placed 7th. The other three high school teams were the Hellgramites, also from the NC School of Science and Mathematics, along with the EnviroKnights and the NightHawks from Northern High School. The middle school team, a homeschool team, was the Bullfrogs.

At the 2019 NC Envirothon statewide competition on May 3-4 the Mighty Mussels and the Killer Kudzu teams, competed against 49 other teams from across NC.

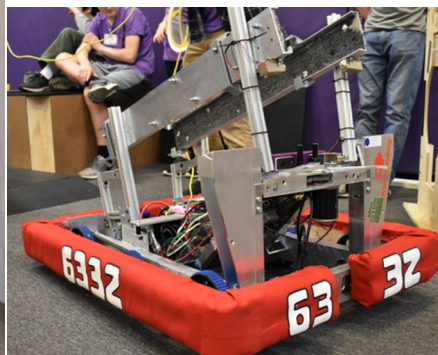
Durham District staff and Supervisors were on hand at the NC Envirothon event to lend support to Durham's teams. Durham staff and Supervisors volunteered as test graders, team guides, photographers and more, helping to coordinate and run the two-day event.



Donation to Riverside High School Robotics Team



On February 15, 2019 Associate Supervisor, Mark Dewitt presented a donation from Durham Soil and Water Conservation District to support the Riverside High School "Bull City Robotics Team."



EDUCATION

Resource Conservation Workshop

The Resource Conservation Workshop (RCW) is a weeklong camp for students who are interested in conservation, the environment and/or our state's natural resources. Held June 23-28, 2019 at NC State University, the RCW targets hopeful future environmental professionals by giving students a first-hand look at a wide array of conservation careers that they may not know about.

The Durham Soil and Water Conservation District Board of Supervisors sponsored one Durham County student delegate this year: Ms. Jasmina Galanter, a rising senior at Riverside High School who is interested in biology & wildlife.

Jasmina spent the week hearing from research scientists, foresters, biologists, wetland specialists, wildlife experts, engineers and others about their experiences in their chosen profession. She also received information and insight into college degrees and careers in natural resource management firsthand from students at NCSU.



Pictured left to right:
Chairman Talmage Layton, RCW student
Jasmina Galanter, and Director Eddie Culberson

Study locations for the workshop included N.C. State University and the University's Lake Wheeler Research Farms, Clemmons Educational State Forest and Falls Lake State Recreation Area.

Each day of the camp focused on a different discipline of natural resources: 'Soil Science', 'Water, Wildlife, Recreation & Fish Management', 'Forestry & Forest management' and 'Soil and Water'. The Durham Soil & Water Conservation District participated in 'Soil and Water' day with several staff from other local Soil & Water Districts near Raleigh. Eddie Culberson and Kyle Gentry led a surveying station to teach students about surveying techniques and their importance in conservation planning.

Jasmina attended the Durham Soil and Water Conservation District Board meeting after the camp to thank the board for sponsoring her to attend camp. Also, she discussed what the RCW meant to her and her future goals.

FY19 Conservation Store



Moby Rain
Barrel
Sold 2



Ivy Rain
Barrel
Sold 1



Tree Seedlings
Sold 187



Wildflower
Seeds
Sold 4



Bird Boxes
Sold 3



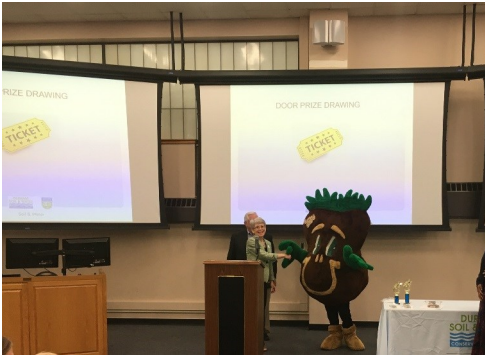
No Till- Drill Rental

The rental rate for the drill is \$12 per acre with a \$100 deposit.

Interested renters can contact the District today to inquire about renting.

EDUCATION


2019 Annual Awards Celebration

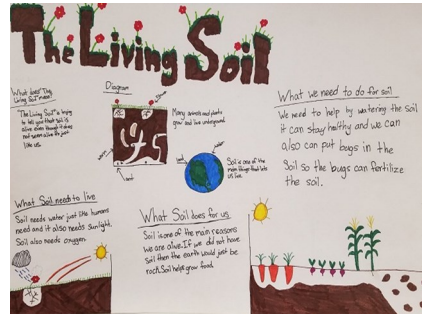
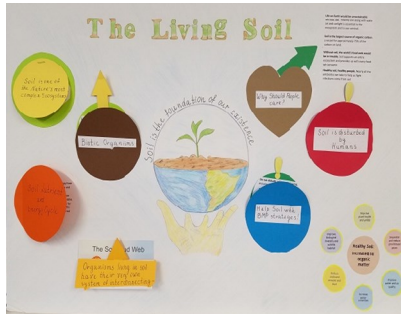


The 2019 Annual Awards Celebration was held on May 9, 2019, at the Durham Public Schools Staff Development Center. We honored educators, students, and landowners who promoted conservation education in the classroom and landowners who put conservation on the ground. This year's theme for the poster, essay, and slideshow was "THE LIVING SOIL." The theme for the bookmark contest was "THINGS FOUND ON A FARM." Below is a list of the awards presented by the Durham Soil and Water Conservation District Board.

Pictured above:
Durham Co. Commissioner, Ellen Reckhow posed for a picture with Durham Soil and Water's mascot, Sammy Soil.



5 th Grade Poster	6 th Grade Poster	6 th Grade Essay	6 th Grade Slide Show
1 st place– Chase Smith , Mangum Elementary	1 st place– Victor Brown , Triangle Day School 2 nd place– Max Shearer , Sherwood Githens 3 rd place– Sofia Cutlip , Sherwood Githens	1 st place– Eva Nettey-Marbell , Voyager Academy 2 nd place– Calista Robinson , Voyager Academy 3 rd place– Hana Sato , Sherwood Githens	1 st place– Harper Smith , Sherwood Githens School 2 nd place– Molly Glienke , Sherwood Githens School 3 rd place– Sam Garber , Sherwood Githens
Kindergarten Bookmark	First Grade Bookmark	Second Grade Bookmark	
1 st place– Amy Gonzalez-Jimenez , WG Pearson Elem. 2 nd place– Jalen Boulware , WG Pearson Elementary	1 st place– Hattie True , Creekside Elementary 2 nd place– Vera Lee , Creekside Elementary 3 rd place– Jeilin Mendez , Creekside Elementary	1 st place– Mason Cairns , Creekside Elementary 2 nd place– Jackson Grady , Easley Elementary 3 rd place– Corrie Doherty , Easley Elementary	



The 1st place winners received a trophy and \$50. 2nd place winners received a trophy and \$25. Teachers of 1st place winners also received a cash reward for their participation. These contests are part of a statewide event sponsored by the NC Association of Soil and Water Conservation Districts. First place winners from Durham advanced to an area-level contest, where 6th grader, Harper Smith's entry, placed second at the area competition. She received a prize and a certificate. Durham Soil and Water would like to thank all the students and teachers that participated in our 2018-2019 contest!

EDUCATION

Teacher of the Year

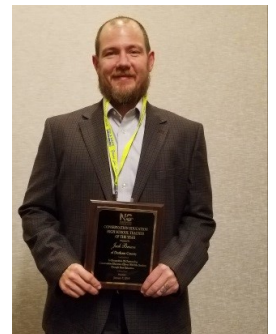
Each year the District Board recognizes outstanding efforts in conservation education by awarding a Conservation Education Teacher of the Year award to deserving teachers in Elementary, Middle or High School. Teachers, or teams of teachers who have used a conservation education program in their class may be recognized.

At the 2019 Durham District Annual Awards Celebration, Karena Bond from Lowe's Grove Middle School was recognized for her outstanding achievement in conservation education. The following is a testimonial about Korena's teaching:

"Karena discusses the importance of clean water through the clean-up and restoration of a small creek located on the school's campus. Also, her classes have created three small pond habitats in order to attract native dragonfly and amphibian species, as well as create and enhance native pollination and milkweed gardens to help support pollinators and migrating monarchs." The District will be submitting Ms. Bond for consideration for the NC Outstanding Conservation Teacher of the Year. If awarded, Ms. Bond will be presented the award at the Associations Annual Meeting on January 6, 2020.



Durham Teacher Named NC Outstanding Conservation Education High School Teacher of the Year! Jack Brown from Northern High School received the 2018 High School Teacher of the Year Award from the Durham Soil and Water Conservation District. His application was submitted for the state award, and on January 7, 2019 Mr. Brown received the 2019 NC Outstanding Conservation Education High School Teacher of the Year Award from the NC Association of Soil and Water Conservation Districts. Congratulations!



Urban Conservationist of the Year

Durham SWCD presented the 2019 Urban Conservationist Award to Woodlake HOA on May 9. Woodlake HOA received this award because this organization is a dedicated, environmentally conscious group that has done an outstanding job to educate themselves and others. They consistently encourage landowners within the community to become better stewards of their urban land to improve their watershed. Their leadership has also engaged directly in conservation in numerous ways. The organization has promoted the installation of CCAP BMP's in the community. They have participated in the cost-share program to install streambank and shoreline protection, critical area plantings, riparian buffers, and rain gardens to reduce erosion and sediment delivery to the lake. Often the HOA seeks technical assistance from the Soil & Water Conservation District staff to develop solutions to drainage and erosion issues without pursuing cost share.



BEFORE



AFTER

EDUCATION

Pond Clinic

On Saturday, May 18, 2019, the Durham & Orange Soil and Water Conservation Districts held their annual pond clinic at the beautiful Blackwood Farm Park in Orange County. We kicked off the event with a catch and release fishing tournament for adults and kids. Approximately 58 people attended this session to gain more knowledge on pond construction and structural management, aquatic weed management, fish production, and wildlife found around a pond. Those in attendance also learned about the vital role ponds play in water quality and how they qualify as a best management practice (BMP). The highlight of the event was the shock boat demonstration that analyzed the pond to check the health and population balance of the fish in it.



Foster Lake and Pond Management, Biscuitville of Mebane, Walmart of Hillsborough, Durham Soil & Water Conservation District, Orange Soil & Water Conservation District and Orange County DEPR (Department of Environment, Agriculture, Park, and Recreation) helped sponsor the event. Both district's received positive feedback from everyone in attendance.

Field Days

Each year the Durham SWCD Board and staff sponsor a Durham County Environmental Field Days event for 3rd graders. One hundred twenty students spend the day learning about the environment and the world around them from resource professionals and hands-on presentations. Typically held in October of each year in Bahama, the 2018 event didn't take place due to wet weather. Instead, the SWCD staff and Board organized mini-field day events at each participating school during October and November.



Pictured left: District staff and various presenters did a mini-field day at WG Pearson Elementary School

Classroom Trainings & Booths

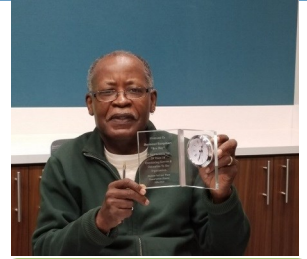
Throughout the school year, the District staff is asked to present various natural resource topics to schools and children's groups from grade levels pre-K to 12th grade. Classroom presentations range from a variety of topics. Some of the more popular ones from the last school year included: fruits and vegetables, recycling, composting, vermicomposting, soils, wetlands, animal identification skills, Earth Day bracelets, life cycles, salamanders, and insects. Staff also does several booths throughout the year at local events. Soil and Water Staff reached 1527 students in FY19.



DISTRICT BOARD AND STAFF HIGHLIGHTS

Length of Service Awards

Durham SWCD Supervisor, Raymond Eurquhart received his 25 years of service award from the NC Association of Soil & Water Conservation Districts. The award was presented to him during the Area IV Fall meeting on November 15, 2018. Ray Eurquhart stepped down the end of October as an elected Supervisor for the Durham Soil & Water Conservation District Board, but he is now an Associate Supervisor on the board.



Ray Eurquhart receiving his gift from the Durham SWCD Board and staff)



Pictured left to right: Eddie Culberson, Danielle Adams & Talmage Layton

Durham SWCD Supervisor, Danielle Adams received her 10 years of service award from the NC Association of Soil & Water Conservation Districts. The award was presented to her during the Durham Soil and Water Conservation District Board meeting on December 11, 2018. Thank you Danielle for your years of service!

Durham Soil and Water Director, Eddie Culberson received 30 years of service award from Durham County Government. The award was presented to Eddie during the Durham County Government Service Recognition Event on December 4, 2018. Thank you Eddie for your years of service!



Pictured above: Eddie Culberson being recognized at the Length of Service Event

Employee Awards



On January 8, 2019, Mike Dupree and Lisa Marochak were recognized for completing a new level toward the Professional District Employees Program (PDEP) from the NC Conservation District Employees Association. They were recognized during a luncheon at the Sheraton Imperial in Durham. Mike Dupree received his Master III level award, and Lisa Marochak received her Master IV and has now completed all of the achievement levels. Congratulations to Mike and Lisa!

Supervisor Election & Reappointment



On December 11, 2018, appointed Supervisor, Talmage Layton was sworn into office. The Honorable Doretta L. Walker, District Court Judge 14th Judicial District, administered the Oath of Office to Chairman, Talmage Layton. He has been a Supervisor with Durham Soil and Water Conservation District Board for 17 years. Talmage is now serving as the Chairman. Congratulations to Talmage on his reappointment!



On December 3, 2018, elected Supervisor, David Harris was sworn into office. David Harris has been a Supervisor with Durham Soil and Water Conservation District Board since May of 2017. Before serving as an elected Supervisor on the Board, he served as an Associate Supervisor. David is now serving as the Financial Officer. Congratulations!



On December 3, 2018, newly elected Supervisor, Natalie Murdock was sworn into office. Natalie served as an Associate Supervisor on the Durham SWCD Board since August of 2017 before being elected. Congratulations Natalie!