

Contents

**Executive summary** .....2

**Best management practices (BMPs)** .....2

**Pollutant load reductions** .....2

**Partnerships** .....5

**Watershed Celebration Day** .....6

**Thoughts from the Assistant Director** .....6

**WIB/WVCA staff highlights** .....6

**Executive summary**

In 2018 West Virginia’s NPS Program provided technical and financial support to more than 100 programs and projects ranging from general administration to outreach, planning, monitoring and a wide variety of implementation. Most of the projects focus on priority areas identified within our watershed based plans (WBPs), but other partners and stakeholders implement projects in non-priority areas using their required matching funds, or by taking advantage of [additional grant opportunities](#) (AGOs). *Table 1* provides a summary.

**Table 1.** Project categories

Type	Q	% complete	
§319 Nonpoint grants	17	7	0.41
§319 Watershed grants	42	10	0.24
§319 Additional grants	42	37	0.88
Other grants	7	3	0.43
<b>Totals</b>	<b>108</b>	<b>57</b>	<b>0.53</b>

All 2014 projects were completed on-time, and several were under budget. For fiscal year 2015, 54% of 24 projects are complete; 2016, 35% of 23 projects are complete; 2017, 10% of the 21 projects are complete; and 2018, zero of the 11 projects are complete.

**Best management practices (BMPs)**

BMP implementation and NPS pollutant reduction are the major goals of our watershed projects. The efforts of our dedicated staff, partners and local stakeholders have made significant impacts in restoring and protecting our watersheds impacted and threatened by NPS pollution. In 2018 BMP implementation occurred in 44 different HUC12 watersheds with 50 percent of the implementation occurring in priority watersheds. The remaining are a result of WV Conservation Agency (WVCA) statewide [agriculture enhancement programs](#) (AgE). *Table 2* shows BMP implementation in 2018.

**Table 2.** 2018 BMP implementation

BMPs	Q	U
AMD treatment systems	3	
AMD components	23,839	sqft
Channel stabilization	3,864	ft
Erosion control	1,259.5	ac
Fencing	3,220	ft
Nutrient management	2,713.8	ac
Riparian buffer	10	ac
Septic systems	33	
Water systems	13	
Water system components	4,308	ft
Outreach/education	14,648	

Acid mine drainage (AMD) treatment systems are listed as complete systems and components. The components include vertical flow treatment, limestone channels, limestone beds, upflow well and catchment basins. Septic systems include new installation, repairs and pumping. Fencing includes pasture and streamside. Nutrient management often includes a wide variety of practices specific to the situation. These can include heavy use protection, liming, irrigation etc. Water systems include a variety of alternate water options and their components such as piping and trenches. More specifics can be found in the appendices of this report and in USEPA’s Grant Record Tracking System (GRTS).

**Pollutant load reductions**

In West Virginia bacteria and pollutants associated with AMD are the two largest contributors of nonpoint sources accounting for approximately 70 percent of the impairments. Most of the bacteria loads come from agriculture and failing septics, whereas the AMD pollutants (acidity and heavy metals etc.) are associated with abandoned mining. In addition to the West Virginia priorities, EPA’s National §319 Program promotes the reduction of nutrients and sediment, which are the leading causes of NPS impairment nationwide. Although nutrients and sediment are not our primary focus, we have exceeded our Management Plan (MP) goals prior to the five-year revision schedule. Note: Updates on the MP were provided in the 2017 annual report. The next update will be provided following approved MP revisions, which will be submitted to USEPA spring 2019.

Nutrient reductions are important for restoration of the Chesapeake Bay (CB) watershed, and West Virginia is on track to meet the goals and objectives of its [Watershed Implementation Plan](#) (WIP).

Table 3. Progress towards reducing CB pollutants

Pollutant	Category	Baseline	Progress 2018	Targets 2025	WVWIP-3 (DRAFT)
Nitrogen	Agriculture	3.22	3.13	NS	NS
	Urban Runoff	1.21	1.21		
	Wastewater+CSO	0.70	0.50		
	Septic	0.33	0.33		
	Natural+Deposition	2.60	2.56		
	<b>All Sources</b>	<b>8.06</b>	<b>7.72</b>		
Phosphorus	Agriculture	0.13	0.12	NS	NS
	Urban Runoff	0.06	0.06		
	Wastewater+CSO	0.14	0.04		
	Septic	0.00	0.00		
	Natural+Deposition	0.21	0.20		
	<b>All Sources</b>	<b>0.56</b>	<b>0.43</b>		

Units: millions lbs/year

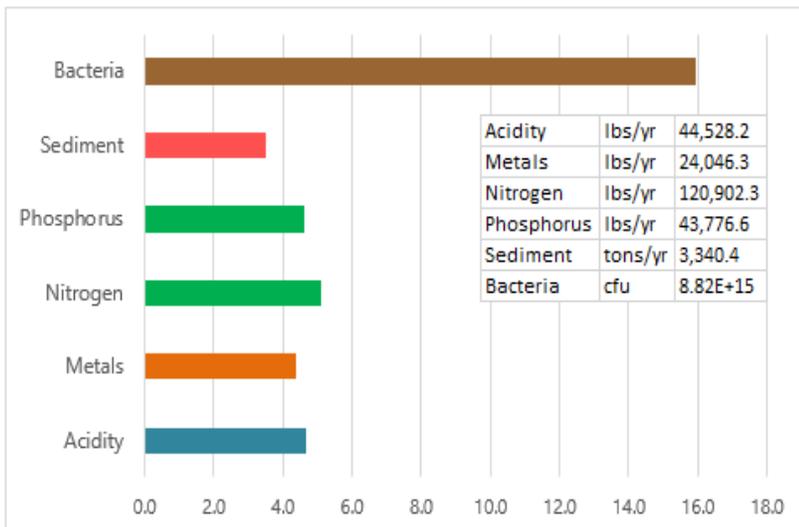
NS: Not specified

USEPA’s [midpoint assessment](#) of the Chesapeake Bay TMDL report recognized West Virginia as being on-track through 2017.

Throughout 2018, WV’s Tributary Team partners developed much of the Phase 3 WIP. They gathered input from local governments, watershed groups, and many other stakeholders to identify strategies that will contribute to local goals while also reducing nitrogen and phosphorus loads in waterways. Table 3 shows historic, recent and 2025 target loads of nutrient pollutants.

Uncertainties like climate change and expected decisions about the Conowingo Dam led WV’s Tributary Team to aim for smaller loads than those prescribed by the CB Program Partnership. WV’s WIP 3 will prescribe many nonpoint source actions including stream restoration, livestock exclusion with riparian buffers, and stormwater management practices.

Figure 1. Pollutant reductions in 2018

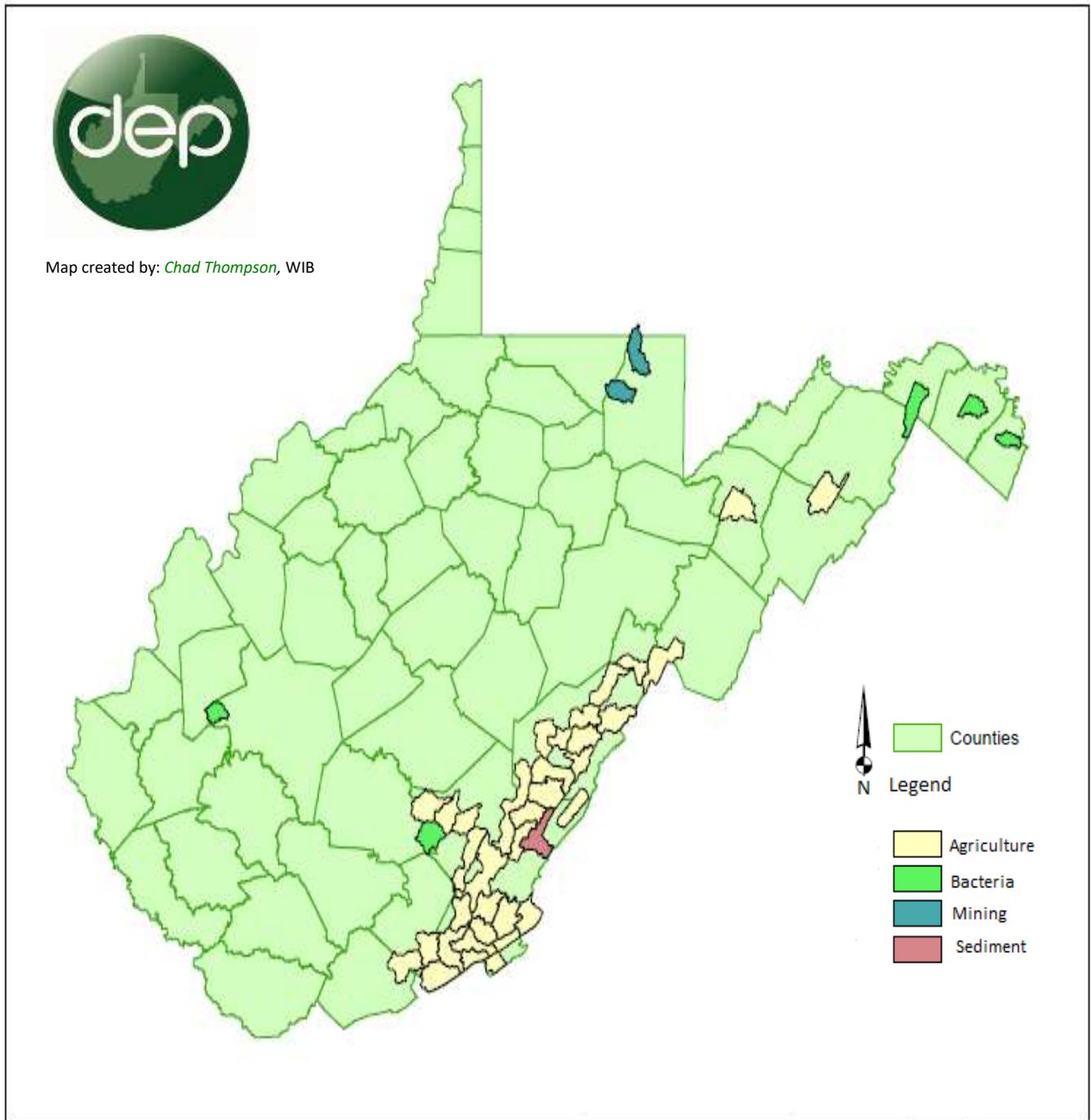


These reductions are a result of projects in 44 watersheds, 23 in priority areas and an additional 21 are a result of WVCA’s agriculture enhancement program.

Figure 2 on the next page provides a map of the HUC12 watersheds where BMPs were implemented and pollution reductions occurred. [Appendix 2](#) provides additional details.

Figure 1 provides a snapshot of §319 and AgE pollutant reductions from projects completed in 2018. The bar graph compares the amount of reduction from each major category. A log scale was used to normalize the data for this comparison.

Figure 2. BMPs and load reductions in priority and non-priority basins



**Alphabetized list of HUC12 implementation:** Browns Creek-Coal River, Brush Run-Greenbrier River, Burnside Branch, Clover Creek-Greenbrier River, Elks Run, Headwaters Deckers Creek, Headwaters Lunice Creek, Laurel Fork-North Fork South Branch, Laurel Run-Greenbrier River, Lick Creek-Bluestone Lake, Little Clear Creek, Locust Creek-Greenbrier River, Lower Anthony Creek, Lower Big Sandy Creek, Lower Indian Creek, Lower Second Creek, Meadow Creek-Meadow River, Meadow Run-North River, Middle Indian Creek, Middle Second Creek, Mill Creek-Meadow River, Mill Creek-Opequon Creek, Milligan Creek-Greenbrier River, Muddy Creek, Outlet East Fork Greenbrier River, Outlet Knapp Creek, Outlet Spring Creek, Rich Creek, Rock Camp Creek, Sewell Creek, Slabcamp Run-Greenbrier River, South Fork Potts Creek, Stamping Creek-Greenbrier River, Stitlington Creek, Stoney Creek, Sweet Springs Creek-Cove Creek, Thorny Creek-Greenbrier River, Tuscarora Creek, Upper Anthony Creek, Upper Indian Creek, Upper Second Creek, Upper Sleepy Creek, Upper Williams River, Wolf Creek

## Partnerships

Partners are the KEY to past, current and future success of West Virginia’s Nonpoint Source (NPS) Program. Without their dedication the majority of project implementation is not possible. Below is a summary from state agencies and just a few of our 2018 partners.

[WV Department of Environmental Protection](#) as the lead agency, WVDEP-WIB, §319 Program manages and coordinates the statewide activities. They are guided by adherence to the stated goals, objectives and schedules included in the program’s [MP](#). The administration and coordination involve a concentrated effort on the part of the lead agency and partner agencies, as well as volunteers, colleges and universities and a variety of others. See [Appendix 3](#) for more on WIB staff activities.

[WVCA](#) remains the primary entity responsible for the implementation of the West Virginia agriculture and construction components of the §319 Program, and for coordinating and implementing watershed projects. In 2018 WVCA implemented BMPs through their statewide programs and in priority watersheds. WVCA completed additional phases of Sleepy Creek and Sewell Creek. Other active projects include: Elks Run, Back Creek, Indian Creek and Second Creek. WVCA also completed AGOs in Anthony Creek (a future watershed protection plan) and Howards Creek. See [Appendix 3](#) for more on WVCA’s staff activities.

WV University (WVU) [National Minelands Reclamation Center](#) (NMLRC) is a major partner for implementing AMD projects in the Monongahela, West Fork and Tygart basins. NMLRC project managers coordinate with local watershed groups to secure [Office of Surface Mine](#) (OSM) funding, which provides match and additional construction funding in 2018.

NMLRC made progress in Herods and Swamp Run, Cane Fork and Roaring Creek. They also completed revisions to Lamberts Run WBP, which is currently being reviewed by WVDEP.

[Friends of the Cheat](#) (FOC) is one of the most advanced watershed groups in West Virginia. Their progress for reducing AMD impacts in the Lower Cheat has been well documented with multiple success and 2018 is no different. FOC completed projects in Greens and Sovern Run and have on-going projects in Muddy Creek where significant improvements have occurred through partnerships with WVDEP’s Office of Special Reclamation (OSR) More on this story later. FOC is also working on three new watershed based plans (WBPs).

[Friends of Deckers Creek](#) (FODC) focuses on AMD projects in the Deckers Creek watershed. Their efforts have made a major contribution to the quality of Deckers Creek, and the once dead stream has come to life again. Fishing, kayaking, hiking and other recreational pursuits have returned to the watershed. In 2018 FODC completed two projects in the headwaters. They have three active projects, Sandy Run, Hartman Run and Dillan Creek. The Natural Resource Conservation Service (NRCS) and WVDEP’s Abandoned Minelands (AML) Program plan to invest significant funding to restore Richard Mine, a major AMD pollution source in the lower watershed. This effort was brought to bear by FODC’s activities and voice in the basin.

WVDEP’s [Watershed Pilot Program](#) received additional funding support and awarded grants to four watershed groups in 2018. These include [Coal River Group](#) (CRG), [Morris Creek Watershed Association](#) (MCWA), [Piney Creek Watershed Association](#) (PCWA), and [Save the Tygart Watershed Association](#) (STTWA). These groups have six active §319 projects and are planning future proposals. WPP staffing support has provided a significant boost for §319, enabling local project management that may not have been possible before. The WPP was the brainchild of and is managed by the NPS Coordinator with assistance from three regional Basin Coordinators (BCs).

[WV Rivers Coalition](#) (WVRC) takes an active/lead role in the protection of source water in West Virginia. WVRC received and completed multiple §319-AGOs focusing on [shale gas monitoring](#) and source water protection. They also applied for and received §319 funding for the first ever effort to integrate source water protection and watershed planning and was funded for a second phase in 2017. The focus is integrating these plans in two priority watersheds; Elk Run and Cacapon/Lost River. Both projects are on-going.

There are many more state and federal agency partners, Non-governmental organizations (NGOs), local citizen groups and landowners that are dedicated to the mission of the NPS Program, and work to promote a better understanding of their local issues. *It’s all about volunteering...*

## Watershed Celebration Day

WIB's NBC demonstrates Fourpole Watershed Association's [watershed sandbox](#).

2018 was the 20<sup>th</sup> Anniversary of Watershed Celebration Day (WCD). The logistics of the event came together because of the team led by the WIB's Western Basin Coordinator. The team consisted of representatives from WVDEP's [Environmental Advocate Office](#), WVRC, OSM, WIB's Northern Basin Coordinator, Southern Basin Coordinator, NPS Coordinator, and several watershed groups. Because of the team's hard work, funds were raised through grants and multiple sponsors. The result was an excellent venue, free meals, lodging and travel scholarships, speakers, and watershed - outdoor related door prizes that were distributed during day-two's ceremonies.



Day-one of WCD consisted of workshops, project site visits and several outdoor events such as zip-lining, hiking, and even whitewater rafting opportunities. Day-two was all about West Virginia's watershed groups who were honored for their accomplishments. The day included presentations, networking and an award ceremony. The groups received a total of \$7,000 in monetary awards for their efforts, with FOC winning the Watershed of the Year award and \$5,000 prize. To learn more visit: <https://dep.wv.gov/news/Pages/Citizen-Groups-Honored-at-Annual-Watershed-Celebration-Day.aspx>

## Thoughts from the Assistant Director



WIB staff visit a Kitchen Creek farm as part of a 2018 staff meeting. WIB partnered with WVCA to conduct a fish survey in a tributary to Kitchen Creek.

Partnership – Synonyms include cooperation, collaboration, coalition, alliance. That is what West Virginia's Nonpoint Source Program is built around and that is what makes the effort successful. Over the past year, collaboration with and between watershed associations, local, state and federal government, other nonprofit partners and private businesses and landowners has resulted in the completion of watershed projects across the state. From the eastern panhandle to the state capital, the Greenbrier Valley and the southern coalfields, WVDEP-WIB has relied on partnerships to protect and restore our waters. We thank you for your efforts and look forward to new and expanding alliances including working closely with WVDEP-AML to realize greater gains in water quality improvement. – *Teresa Koon*, Assistant Director

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**WIB/WVCA staff highlights**

**Potomac Basin – Alana Hartman, Sebastian Donner and Chad Thompson**

*PBC checked the condition of permeable pavers at the Shanghai public access site on Back Creek after intense flood events. All was well as of June 2018.*



WVDEP's *Potomac Basin Coordinator* (PBC) supervised two summer interns who made great progress assessing the streambanks of Back Creek's tributaries and identifying future project opportunities such as riparian buffer plantings and streambank restoration. The PBC continued to co-facilitate Tuscarora Creek project meetings and participate in *Safe Water Harpers Ferry* (Elks Run watershed) and Safe Water Baker (Lost River watershed) efforts. She served as a project liaison for a tree planting day at Augusta Elementary School and shared NPS reduction activities at Hampshire County 4-H camp. The PBC facilitated meetings of the CB Tributary Team and coordinated the annual submittal of BMP data to the CB Program. She hosted two training sessions for the Tributary Team on the Chesapeake Assessment Scenario Tool (*CAST*), which enters comprehensive wastewater and BMP scenarios into the CB Model to refine a state nutrient reduction strategy. The PBC also co-presented a session on marketing of river trails at River Rally.

WVDEP's *Stormwater Specialists* (SWS) worked with local government, developers, engineers, Home Owner Associations, and interested parties on implementing BMPs to treat stormwater runoff with the goal is to improve the water quality by reducing pollutants and quantity from developed lands. While assisting statewide, their primary service area is the Potomac watershed. Being funded through the CB program, SWS tries to leverage local investments with CB grant funding for implementation efforts in the Potomac watershed. The SWS and PBC meet often to coordinate efforts and plan/organize future activities. In addition to technical assistance the SWS positions are responsible for stormwater outreach in the CB region of West Virginia. Examples include presentations and demonstrations for multiple schools and at events such as the annual Discovery Day at Seneca Rocks with more than 200 in attendance. SWS also partnered with WVRC to teach 500+ Mineral County students source water and stormwater concepts. A portable stream table was developed and built and is a popular hands-on tool for stormwater and overall watershed concepts. Two MS4 workshops were conducted. The workshops discussed West Virginia's MS4 permit requirements, appropriate stormwater BMPs for the region, and the goals of the *CB TMDL*.

**Northern Basin – Martin Christ**

WVDEP's *Northern Basin Coordinator* (NBC) participated in all phases of project development and watershed planning. He reviewed and improved three watershed based plans. He assisted with water monitoring by participating, finding new more monitoring sites, or designing monitoring plans. He reviewed and improved project proposals, assisted with engineer procurement, reviewed engineering designs for projects, and visited projects during construction to coordinate and evaluate work. He entered project progress information into GRTS and added water quality data to the WQXweb system. He participated in outreach through rain barrel presentations and helped watershed associations prepare contingency plans for mine drainage projects.

One notable pleasure for the NBC was sending a database of water quality data to staff of STTWA. While the NBC had been maintaining these data, the watershed staff now have that capacity.

**Western Basin – Tomi Bergstrom**



WVDEP's *Western Basin Coordinator* (WBC) had three watershed projects in full swing, the Browns Creek Septic Remediation Project with CRG, Restoration Project and Road/Stream Restoration Project with MCWA, and Cane Fork AMD Passive Treatment Project 1 with Cane Fork Watershed Association and West Virginia Water Research Institute. Additionally, there are two AGO grants, one focuses on water quality baseline monitoring and one with installing a lavender field as a sediment BMP. Each will be submitting final reports in 2019.

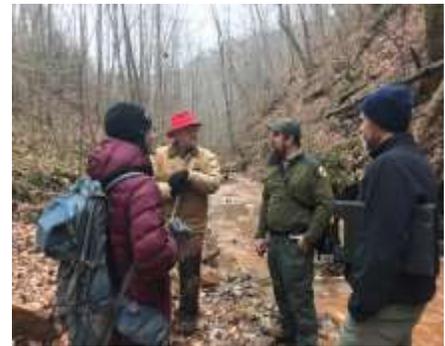
The WBC was involved in many outreach components including the following events: WVDEP's Earth Day, Black Diamond Girl Scouts summer camp and conference, Point Harmony Outdoor Day, Mill Creek Adventure Day, Discover Forks of Coal Day, Forest Fun Day, water festivals for MCWA, Nicholas County, Grandview, St. Albans, Marshall University and CRG. The WBC also worked with Osher Lifelong Learning Institute (OLLI) to present on the impacts of plastics. Partnering with the City of Charleston Stormwater Department, the WBC hosted five rain barrel

workshops, sharing stormwater education with over 120 citizens of the Kanawha Valley. A two-day [stormwater exhibit](#) was hosted at Charleston's FestivALL event.

**Southern Basin – Jennifer Liddle**

Upon being re-hired in October 2018, WVDEP's *Southern Basin Coordinator* (SBC) focused on the areas watershed associations and other partners learning about their current projects. A major priority was to help PAN, plan and gather partners for next phases of the Summerlee project. The NBC, SBC and SOS coordinator came together to complete pre-construction monitoring at several Summerlee sites. Meetings with partners were held to discuss the design for the next phase, responsible parties and the future of Summerlee. The SBC conducted outreach activities in the region, attended trainings on sampling, Project WET, grant writing and Project Learning Tree. Planning for future water festivals with assistance from Project WET coordinator and National Park Service have begun. The SBC worked with PCWA to identify next steps for sustaining the organization and developing future projects.

*Cane Fork project team plan their monitoring*



*Morris Creek water festival*

**Project WET – Tomi Bergstrom**

West Virginia's *Project WET* (Water Education for Teachers) had a productive year attending over 15 outreach events and reaching around 2,100 West Virginians across the state. The Coordinator hosted and assisted with 11 water festivals in Kanawha, Cabell, Nicholas, Ritchie, Fayette, and Raleigh counties that reached over 2,800 students. Project WET Educator Workshops were held in 14 counties, certifying 217 educators with the Project WET Curriculum Guide on water education.

### **Save Our Streams** – Glenn Nelson

WV **Save Our Streams** (SOS) **Coordinator** completed 25% more than the minimum number of required monitoring workshops and other outreach through the course of the year. Workshops were provided to watershed groups, Trout Unlimited chapters, WVCA, WVRC, schools and more. Additionally, the Coordinator participated in 18 water festivals, where live benthic macroinvertebrates were presented. This approach engages the students understanding of stream integrity. By partnering with WVCA, multiple bio-surveys were completed on Deer and Anthony Creeks. The team documenting stream health and biology relating to the candy darter and brook trout. The data was also used for the Anthony Creek WPP. SOS remained an aquatic instructor for Envirothon as well as technical advisor and presenter for statewide events like Folkwater Fest and Seneca Discover Day. SOS deployed temperature monitors to distinguish cold water fisheries from that of warmer, non-trout waters for Trout on the Classroom releases. SOS organizing WIB's 2018 staff meeting agenda, tour and study. More than 3,400 participated in SOS workshops and outreach events.

### **WV Conservation Agency**

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WVCA provides a significant amount of services to agricultural (Ag) communities, watershed groups, academia and the public through agricultural enhancement (AgE) programs, outreach and \$319 project management. 2018 highlights are provided here.

1. AgE programs are a major tool for improving agricultural landscapes and providing technical assistance statewide. AgE efforts are managed through local Conservation Districts, and all participate to some degree; however, Greenbrier Conservation District was the most active in 2018. AgE programs helped 121 producers implement a variety of BMPs - the major focus to improve nutrient management. AgE specialist also provided technical assistance for another 284 producers. These activities are the primary source of state match for WVCA's annual \$319 request, which is part of WVDEP's Nonpoint Program grant.
2. WVCA commits significant time and effort to outreach/education focusing on sustainable and high-quality Ag programs, nonpoint source information, water quality etc. In 2018 outreach was provided to 11,431 participants. This included presentations, school activities, special events/programs, camps, Envirothon, Ag field days, Soil Tunnel demonstrations and more. WVCA partners with WVDEP and other agencies and NGOs to support the **Stream Partners** Program and WCD. They also participated in planning and organizing workshops for West Virginia's annual Construction **EXPO** and the **Mid-Atlantic Erosion Control** Association's conference.
3. WVCA is dedicated to improving watersheds impacted by Ag-related NPS pollution. In 2018 WVCA specialist provided project management support for 13-\$319 watershed projects. These activities include planning, developing and writing project proposals and WBPs, reporting, technical assistance, right-of-entry agreements, contracts/bids, tracking, monitoring etc.

To learn more contact **Pam Russell** and visit: <http://www.wvca.us/>