REPORT OF THE SECRETARY OF NATURAL RESOURCES

FY 2015 CHESAPEAKE BAY AND VIRGINIA WATERS CLEAN-UP PLAN

TO THE GOVERNOR AND THE CHAIRMEN OF THE SENATE AGRICULTURE, CONSERVATION AND NATURAL RESOURCES COMMITTEE; THE HOUSE AGRICULTURE, CHESAPEAKE AND NATURAL RESOURCES COMMITTEE; THE SENATE COMMITTEE ON FINANCE; AND THE HOUSE COMMITTEE ON APPROPRIATIONS

COMMONWEALTH OF VIRGINIA
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Contents

Executive Summary

This report was developed to comply with consolidated water quality reporting requirements set forth in §62.1-44.118 of the *Code of Virginia*. This section requires the Secretary of Natural Resources to submit a progress report on implementing the impaired waters clean-up plan as described in §62.1-44.117 of the *Code of Virginia*. This consolidated report also includes the *"Annual Report on the Water Quality Improvement Fund"* by the Department of Conservation and Recreation (DCR) and Department of Environmental Quality (DEQ) pursuant to § 10.1-2134 of the *Code of Virginia* and incorporates the report on "*Cooperative Nonpoint Source Pollution Programs"* required in subsection D of § 10.1-2127 of the *Code of Virginia*. The report also encompasses the Department of Conservation and Recreation's report of *"Annual Funding Needs for Effective Implementation of Agricultural Best Management Practices"* pursuant to subsection C of § 10.1-2128.1 of the *Code of Virginia*.

Water Quality Improvement Fund and Cooperative Nonpoint Source Pollution Programs

For FY 2015, DCR allocated over $28.5 million in agricultural cost-share funds to Soil and Water Conservation Districts. This included $800,000 in Conservation Reserve Enhancement Program (CREP) cost-share funds to be disbursed by Districts as state match for completed projects. Of the $28.5 million, approximately $25 million was distributed to farmers through the Virginia Agricultural Cost-share Program (VACS) for implementation of best management practices (BMPs) including an earmark of $3 million for the VACS stream exclusion with grazing land management practice (SL-6) commitments. The funding for FY2015 was generated from recordation fees on deeds filed and from state surplus general funds deposited to the Virginia Natural Resources Commitment Fund (VNRCF). Practices installed on farms during FY2015 will result in estimated edge of field nitrogen reductions of approximately 2.55 million pounds, phosphorus reductions of approximately 574 thousand pounds, and sediment reductions of approximately 472 thousand tons.

Under the Water Quality Improvement Fund (WQIF) Point Source Program, DEQ currently has 65 signed agreements which obligated $767.4 million in state grants ranging from 35% to 90% cost-share, for design and installation of nutrient reduction technology at Bay watershed point source discharges. Within this total number of projects receiving cost-share, 57 have been completed and 8 are active in either the design or construction stage. For calendar year 2014, facilities registered under the Chesapeake Bay Watershed Nutrient Discharge General Permit reported discharged loads that, in aggregate, were significantly below the total Waste Load Allocations for all Bay tributary basins. Tables of discharged and delivered loads for each individual facility and basin totals are available at this DEQ webpage: http://www.deq.virginia.gov/Portals/0/DEQ/Water/PollutionDischargeElimination/PublishedLoads2014.pdf.

Funding Needs for Effective Implementation of Agricultural Best Management Practices

Funding projections for the Chesapeake Bay were developed in coordination with stakeholders based on a detailed analysis of practices in the Chesapeake Bay Phase II Watershed Implementation Plan (WIP). This included a review of 2014 progress in implementing the WIP and the inclusion of reductions projected from $120 million of stream exclusion practices statewide that either have been recently

installed ($50 million, including $27 million in the Bay watershed), or await funding ($72 million, including $37 million in the Bay watershed). The WIP implementation schedule focuses on full implementation by 2025, recognizing that based on 2014 progress and with the exception of sediment, the existing level of effort is currently on track for achieving the Commonwealth's commitment to reducing agricultural loads. For the fiscal years 2017 – 2022, an estimate of $1.15 billion may be required from state and federal funds as well as farmer financial contributions to meet statewide water quality goals. Approximately 50% of this total could be needed from State sources, the vast majority of which is direct funding provided through the Virginia Agricultural Cost-Share Program. The Southern Rivers needs projections were based on the funding split prescribed in the Virginia Natural Resources Commitment Fund.

Actual FY2016 allocations from state sources for implementation of agricultural best management practices had the following breakdown:

FY 2016 (Program Name – agency subprogram code – amount)

- VACS Cost-Share program funding (50323) - $21.8 million
- District Technical Assistance (50322) - $2.8 million
- District Financial Assistance (50320) - $6.8 million

FY2016 support figures exclude engineering support via DCR staff, IT support, and training assistance (e.g. Resource Management Plan Technical Review Committee training).

Projected funding needs from state sources for implementation of agricultural best management practices through the FY17-FY18 biennium are estimated in the 2015 Ag Needs Assessment Table on page16. With the exception of sediment reductions, current funding levels will likely provide the estimated funding necessary to achieve 60% of the Chesapeake Bay agricultural implementation by 2017 as was indicated in Table 5.4-4 of Virginia's Phase I WIP. It is anticipated that progress towards the Commonwealth's 2017 Bay goals will be furthered by over-achievement in other sectors, specifically wastewater treatment plants. Improved tracking of voluntarily installed practices, technological improvements in practices, program efficiency, other cost reduction strategies, and changes to improve the Bay Model are difficult to quantify, but all are expected to further reduce overall costs and enhance progress towards the 2017 goals. .

Chesapeake Bay and Virginia Waters Clean-Up Plan Report

During FY 2015, many strategies were implemented to reduce pollutants entering the Chesapeake Bay tributaries and Southern Rivers basins. Significant progress was made in reducing point source discharges from sewage treatment plants, installing agricultural best management practices with a continuing focus on livestock exclusion practices, and implementing revised Stormwater Management Regulations. The implementation of Virginia's Phase II Watershed Implementation Plan (WIP) continues. Virginia agencies successfully completed most of the 2014-2015 WIP milestones, and are beginning to develop the 2016-2017 milestones.

In FY 2015, DEQ developed 57 new Total Maximum Daily Load (TMDL) equations for small watersheds and completed 6 TMDL implementation plans covering 81 impaired waterbody segments. A

total of 41 small TMDL Implementation Watersheds saw BMP activity resulting in a total of 803 BMPs installed using a total of $9,790,177 of Federal and State funds and landowner contributions.

Chapter 1 - Annual Report on Water Quality Improvement Fund Grants

The purpose of the Virginia Water Quality Improvement Act of 1997 (the "Act") is "to restore and improve the quality of state waters and to protect them from impairment and destruction for the benefit of current and future citizens of the Commonwealth" (§10.1-2118 of the *Code of Virginia*). The Act was amended in 2005 and 2008. The Act created the Water Quality Improvement Fund; its purpose is "to provide Water Quality Improvement Grants to local governments, soil and water conservation districts, institutions of higher education and individuals for point and nonpoint source pollution prevention, reduction and control programs" (§10.1-2128.B. of the *Code of Virginia*). In 2008, the General Assembly created a sub-fund of the WQIF called the Virginia Natural Resources Commitment Fund (§10.1-2128.1) that is to be used for agricultural best management practices and associated technical assistance.

During the 2013 General Assembly session, legislation was passed (Chapters 756 and 793 of the 2013 Acts of Assembly) which designated, effective July 1, 2013, the Virginia Department of Environmental Quality as the lead agency for nonpoint source programs in the Commonwealth in addition to its responsibility for point source programs. As such, DEQ has the responsibility to provide technical and financial assistance to local governments, institutions of higher education, and individuals for point and nonpoint source pollution prevention, reduction, and control programs. The Department of Conservation and Recreation plays a role, providing technical and financial assistance to Soil and Water Conservation Districts, institutions of higher education, and individuals for nonpoint source pollution controls. Because of the nature of nonpoint source pollution controls, DEQ sought the assistance and support of other state agencies to provide the necessary expertise and resources to properly implement the nonpoint source elements of the Act. DCR and DEQ continue to jointly work on nonpoint source water quality initiatives.

This report section fulfills a legislative requirement under §10.1– 2134 of the Act for DEQ and DCR to report on the WQIF. Specifically, the mandate is for an annual report to be submitted to the Governor and the General Assembly specifying the amounts and recipients of grants made from the WQIF and pollution reduction achievements from these grants. Information on WQIF grants awarded is provided in this report, along with available data on pollutant reductions achieved and estimated pollutant reductions to be achieved from recently funded grant projects.

WQIF & VNRCF Nonpoint Source Programs

The WQIF and its sub-funds have served as the principal funding source for nonpoint source pollution control projects in Virginia. The goal of the nonpoint source grant component of the WQIF is to improve water quality throughout the Commonwealth and in the Chesapeake Bay by reducing nonpoint source pollution. Nonpoint source pollution is a significant cause of degradation of state waters throughout the Commonwealth. Within the Chesapeake Bay watershed, the immediate priority is to implement the Bay TMDL Watershed Implementation Plans (WIP) developed by the Commonwealth and approved by the U.S. Environmental Protection Agency (EPA) in 2010 and 2012.

For watersheds outside of the Chesapeake Bay, the goal is to achieve measurable improvements in water quality, which can include nutrient and sediment reductions, as well as reduction of other pollutants

including bacterial contamination. Other uses of grant funds may include providing protection or restoration of other priority waters such as those containing critical habitat, serving as water supplies, or that target acid mine drainage or other nonpoint pollution problems. As an example, the Ely Creek and Puckett Creek Sub-watersheds project involves mined land reclamation in the ecologically sensitive Powell River basin.

DCR distributes the nonpoint WQIF and VNRCF funds pursuant to § 10.1-2132 of the *Code of Virginia.* This included managing the allocation of funding to the Agricultural Cost-Share Program and the federally-funded Conservation Reserve Enhancement Program. These funding sources also provided cost-share funds to Virginia Agricultural Cost-Share program participants to fund 100% of the cost of implementing qualifying livestock stream exclusion BMPs. Accordingly, in 2015, DCR allocated $3 million to fund the implementation of backlogged "Outside the Chesapeake Bay" 2014 Stream Exclusion SL-6 Pending VACS cost-share applications. DEQ was responsible for soliciting applications for Water Quality Initiative grants and Cooperative Nonpoint Source Pollution Program Projects with local governments and managing the distribution of those nonpoint WQIF grants.

Agricultural Best Management Practices Cost-Share Program

Agricultural best management practices (BMP) that are most effective in reducing excess nutrients and sediment from agricultural lands are implemented through the Virginia Agricultural Cost-Share (VACS) program managed by DCR under the Virginia Soil and Water Conservation Board's (VSWCB) allocation policy and guidance. BMPs installed through the program must be implemented in accordance with the Virginia Agricultural BMP Manual. Virginia's 47 Soil and Water Conservation Districts (SWCDs or Districts) administer the local implementation of the VACS program with funding from DCR to cover the cost-share expenditures, the technical assistance to administer the program, and essential funding for district operations.

Conservation Reserve Enhancement Program

WQIF and VNRCF funds support Virginia's commitment for participation in the U.S. Department of Agriculture's (USDA) Conservation Reserve Enhancement Program. Under the USDA-administered CREP program, which is implemented through the SWCDs, eligible landowners may receive cost-share incentives for eligible BMPs for establishment of riparian buffers and wetland restorations, as well as rental payments (up to 15 years) for removing environmentally sensitive land from agricultural production and planting grasses or trees that will improve water quality and waterfowl and wildlife habitat. DCR and the USDA Farm Service Agency are currently working to update the Chesapeake Bay and Southern Rivers CREP agreements to reflect a doubling of Virginia's cost-share contributions for the restoration of forested riparian buffers adjacent to both pastureland and cropland. This programmatic change took effect July 1, 2015 and supports the USDA Riparian Forest Buffer Initiative in Virginia.

Water Quality Initiatives

In FY 2014, DEQ became the lead nonpoint source (NPS) agency in the Commonwealth. DEQ and DCR work collaboratively to fund water quality initiatives to manage other NPS pollution priority needs. These projects focus on priority, cost effective, and innovative initiatives which further advance

Virginia's NPS programs and provide for measurable water quality improvements. These include initiatives with other state agencies, Soil and Water Conservation Districts, planning district commissions, local governments, educational institutions, and individuals on nonpoint source pollution reduction, education, research, and other NPS reduction activities such as acid mine land reclamation and nutrient management.

Nonpoint Source Pollution Program Projects with Local Governments

In accordance with §10.1-2127.B and C of the *Code of Virginia*, DEQ works cooperatively with local governments to provide matching funds to locally administer identified solutions for nonpoint source runoff that causes or contributes to water quality problems, such as impairments of other state waters outside the local jurisdiction. Funding to localities for development of their stormwater management programs is an example of these cooperative efforts. During FY15, DCR and DEQ jointly developed and managed cooperative nonpoint source pollution projects with local governments.

2015 WQIF & VNRCF Nonpoint Source Program Funds

Agricultural Cost-Share Allocations

DCR's emphasis for agricultural BMP implementation focuses on efficient nutrient and sediment reduction including identified priority practices such as cover crops, conservation tillage, nutrient management, livestock exclusion from streams, and the establishment of vegetative riparian buffers. Historical, annual cost-share totals are summarized below.

Annual state cost-share allocations are based upon the Agricultural Nonpoint Source Assessment and Virginia Soil and Water Conservation Board policy. Hydrologic units with the highest potential to contribute agricultural NPS pollution to surface and ground waters receive the highest amounts of cost-share funds. SWCDs then rank cost-share applications and fund those applications that will provide the greatest amount of local water quality benefit.

Historical Cost Data for Agricultural BMPs Completed by Program Year

Fiscal Year	Actual BMP Cost	Total Cost-Share Paid	State Cost-Share Paid	Non-State Cost-Share Paid	Other Funding Amount	Farmer Cost Before Tax Credit	Tax Credit Amount Issued
1998	$6,534,828.27	$4,063,645.84	$3,119,585.67	$944,060.17	$329,583.37	$2,141,599.06	$416,228.26
1999	$5,914,234.56	$4,439,154.30	$4,026,364.92	$412,789.38	$213,063.44	$1,262,016.82	$350,507.40
2000	$13,670,369.56	$8,307,891.08	$8,247,145.15	$60,745.93	$906,150.61	$4,456,327.87	$826,214.15
2001	$16,010,977.47	$8,088,249.69	$6,714,930.68	$1,373,319.01	$2,575,618.08	$5,347,109.70	$815,816.63
2002	$23,263,067.57	$8,375,730.49	$6,590,103.33	$1,785,627.16	$6,603,096.74	$8,284,240.34	$903,880.05
2003	$13,901,431.54	$3,217,772.88	$2,372,051.63	$845,721.25	$5,034,617.95	$5,649,040.71	$995,224.35
2004	$10,201,591.85	$2,794,389.49	$2,414,937.33	$379,452.16	$3,438,421.92	$3,968,780.44	$542,624.01
2005	$11,283,817.92	$4,360,259.29	$3,723,122.42	$637,136.87	$2,211,960.41	$4,711,598.22	$609,178.38
2006	$19,481,080.38	$9,698,503.26	$8,956,684.15	$741,819.11	$2,867,528.94	$6,915,048.18	$865,246.17
2007	$24,900,268.88	$15,394,922.20	$14,276,334.67	$1,118,587.53	$3,638,152.24	$5,867,194.44	$951,292.97
2008	$24,644,208.65	$14,021,770.37	$12,976,639.51	$1,045,130.86	$3,177,626.66	$7,444,811.62	$1,074,960.76
2009	$31,541,243.85	$16,139,264.10	$15,256,955.26	$882,308.84	$5,893,706.63	$9,508,273.12	$1,340,869.91
2010	$37,163,034.60	$23,525,656.63	$22,542,130.93	$983,525.70	$4,158,980.71	$9,478,397.26	$1,450,260.32
2011	$17,846,990.64	$10,791,380.40	$10,343,449.38	$447,931.02	$1,933,530.72	$5,122,079.52	$981,519.17
2012	$32,472,795.56	$21,657,922.96	$21,447,079.59	$210,843.37	$2,887,203.84	$7,927,668.76	$1,394,555.40
2013	$37,207,946.60	$28,297,836.32	$27,976,915.48	$320,920.84	$3,987,118.97	$4,922,991.31	$1,075,043.53
2014	$33,640,911.35	$25,975,052.68	$24,295,757.21	$1,679,295.47	$2,894,510.87	$4,771,347.80	$883,246.22
2015*	$18,367,173.96	$12,811,640.24	$12,504,852.49	$306,787.75	$1,397,679.13	$4,157,854.59	$642,645.59
State Totals	$378,045,973.21	$221,961,042.22	$207,785,039.80	$14,176,002.42	$54,148,551.23	$101,936,379.76	$16,119,313.27

*** 2015 figures do not include approved BMPs carried forward into FY16 that are awaiting completion.**

Conservation Reserve Enhancement Program

The Virginia CREP program is divided into two regions. The Chesapeake Bay CREP targets Virginia's entire Chesapeake Bay watershed and is aiming to restore 22,000 acres of riparian buffers and filter strips as well as 3,000 acres of wetlands. The Southern Rivers CREP aims to restore 13,500 acres of riparian buffers and filter strips and 1,500 acres of wetland restoration. A summary of Virginia CREP cost-share assistance to farmers during the period from July 2000 to June 2015 is provided in the following table.

CREP Summary FY 2001-2015 by Drainage by FY

Drainage	Fiscal Year	Total Cost Share Payment	Acres Buffer Restored	Miles Stream Bank Protected
Chesapeake Bay	2001	$321,247.50	1,325.90	50.76
Chesapeake Bay	2002	$1,466,710.96	5,032.10	255.82
Chesapeake Bay	2003	$603,862.88	1,716.10	162.09
Chesapeake Bay	2004	$338,338.07	1,988.80	102.58
Chesapeake Bay	2005	$219,240.64	1,130.50	77.93
Chesapeake Bay	2006	$237,233.72	1,617.74	85.68
Chesapeake Bay	2007	$227,018.64	545.20	49.43
Chesapeake Bay	2008	$358,723.72	1,465.54	92.62
Chesapeake Bay	2009	$467,225.79	1,411.70	97.26
Chesapeake Bay	2010	$644,275.12	1,437.40	78.58
Chesapeake Bay	2011	$444,625.29	575.50	50.67
Chesapeake Bay	2012	$473,341.06	439.30	50.94
Chesapeake Bay	2013	$129,214.22	159.00	11.65
Chesapeake Bay	2014	$105,884.97	152.60	6.45
Chesapeake Bay	2015	$28,231.79	13.74	3.19
Chesapeake Bay Totals:		**$6,065,174.57**	**19,011.12**	**1,175.65**
Southern Rivers	2001	$276,348.84	606.80	41.98
Southern Rivers	2002	$1,012,283.88	2,649.60	184.75
Southern Rivers	2003	$382,666.67	1,970.50	102.79
Southern Rivers	2004	$393,054.84	1,670.20	124.94
Southern Rivers	2005	$346,430.06	2,207.90	145.27
Southern Rivers	2006	$226,869.70	1,519.36	121.84
Southern Rivers	2007	$197,376.55	541.50	154.63
Southern Rivers	2008	$268,288.17	846.60	203.61
Southern Rivers	2009	$256,993.21	1,788.06	98.09
Southern Rivers	2010	$389,093.99	444.20	42.59
Southern Rivers	2011	$343,089.67	295.70	28.56
Southern Rivers	2012	$416,070.09	536.10	33.65
Southern Rivers	2013	$271,355.39	516.18	23.53
Southern Rivers	2014	$227,281.11	148.80	25.20
Southern Rivers	2015	$124,043.37	139.20	14.26
Southern Rivers Totals:		**$5,131,245.54**	**15,881.20**	**1,345.69**
Statewide Totals:		**$11,196,420.11**	**34,892.32**	**2,521.34**

Cooperative Nonpoint Source Pollution Programs with Local Governments and Strategic Nonpoint Source Water Quality Initiatives Grants

In FY 2012 and FY 2013, DEQ managed two WQIF competitive grant programs related to stormwater initiatives. Awards were intended to reduce pollution through partnerships with local governments, Soil and Water Conservation Districts and regional planning district commissions. The General Assembly appropriated $1 million in Water Quality Reserve Funds in FY12 and $1 million in Water Quality Improvement Funds in FY13 to provide funds to localities to establish stormwater management programs. As a direct result of these state investments, fortified by more than $3 million in Federal grant funds, 95 localities have developed and adopted local stormwater programs that include ordinances, funding and staffing plans and policies. During its 2014 session, the General Assembly made various programmatic changes to the Virginia Stormwater Management Act, which required the regional and local grantees to make amendments to their local stormwater programs. Both grant programs are now final and closed.

Strategic Water Quality Initiatives:

Virginia Coal-based Acid Mine Drainage Remediation

The Daniel Boone Soil and Water Conservation District coordinated the evaluation, design, construction, inspection, and water testing activities among partners for 11 different acid mine drainage remediation sites in the Ely, Puckett and Straight Creek watersheds in the North Fork of the Powell River of Lee County. As of June 30, 2015, this project has been completed and the final project report was provided August 2015. Project management staff conducted final inspections in June to find all sites completed, functioning, and well-vegetated. Water quality improvements were evident. Pollution reduction calculations are under way by the project sponsor and will be provided in the final report. A total of $727,436 in grant funding plus $2,529,711 in partner matching funds brings the project investment to $3,257,147. The following is a project summary:

Project Sponsor	Project Title	WQIF Award Amount	Match Amount	TOTAL Project
Daniel Boone SWCD	Ely Creek, Puckett Creek & Straight Creek Sub-watersheds Project	Original $935,736, Expended $727,436	Original $1,419,760, Expended $2,529,711	Original $2,355,496, Expended $3,257,147

Project Abstract: Several acid mine drainage (AMD) sites have been identified in the North Fork Powell River Watershed. Many AMD sites located in the Ely Creek and Puckett Creek subwatersheds have been remediated by various federal and state agencies in recent years. The objective of this project is to remediate the remaining AMD sites located in these two sub-watersheds. The completion of this project should make great progress in helping aquatic ecosystems in the area to recover from years of degradation related to past coal mining practices. Improving these sub-watersheds will also improve the downstream habitat in the main stem of the Powell River thereby improving the chances of survival for 29 threatened or endangered freshwater mussel species. Aesthetic values should improve in the area leading to improved socioeconomic conditions.

- *Completed Davis Wetland Site*- Acid mine drainage discharge emanates from a small underground mine along the western descending toe of the slope. AMD runs along an unnamed tributary and discharges into Big Branch before entering Puckett Creek. The proposed treatment system is construction of one successive

alkalinity producing system (SAPS) pond and one anaerobic wetland. The estimated benefits of this system, taken from the watershed plan, are 0.06 pH increase, 0.18 stream miles of water quality improvement, and 0.78 stream miles of potential fishery recovered.

- *Completed Triple R Mine-* separate open limestone channels, each one draining into a separately constructed sediment pond. The estimated benefits of this system, taken from the watershed plan, are 0.24 pH increases, 0.28 stream miles of water quality improvement, and 0.76 stream miles of potential fishery recovered.
- *Dean Site*- Design work was 75% complete when complications developed with a landowner. If land rights issues are resolved, the Department of Mines, Minerals and Energy will use other funding to complete construction. Seeps have been located at the toe of the slope along abandoned mine works. These seeps discharge into Ely Creek and into beaver ponds adjoining the creek. The proposed treatment system will bring the AMD through approximately 100 feet of open limestone channel and discharge it into a constructed anaerobic wetland. According to the Ely Creek watershed plan the completion of this final site along the main stem should increase pH by 0.74, increase water quality improvements associated with critical erosion for 0.40 stream miles, and increase potential fishery recovery for 0.62 stream miles.
- *Completed Baker Mine Site*- Acid mine drainage discharges from a high wall into an unnamed tributary of Ely Creek. The proposed treatment system is construction of an open limestone channel to bring the AMD to a natural wetland downstream from the seep. The estimated benefit for this system, taken from the watershed plan, is 0.49 pH increase.
- *Completed Penhook Site-*Acid mine drainage from mine portals discharges into an unnamed tributary before entering Straight Creek. The planned treatment system is to capture AMD from three portals and seeps and to bring it through a constructed Successive Alkalinity-Producing Systems (SAPS) pond and anaerobic wetland. The Virginia Department of Mines, Minerals & Energy, Division of Mine Land Reclamation (DMME-DMLR) has provided an in-depth analysis on projected site conditions and stream quality benefits after completion of construction. Effluent values in pH, acidity, Total Iron, Manganese, and Aluminum are projected to be near target values for optimum stream quality.
- Additional project construction was completed using most of the match funding at the following sites: Deadman's Curve Landslide, Derby Gob Pile, Brady Drainage, Long Landslide, Petry Portal and Big Branch Portal.

Nutrient Management Plan Development for Unpermitted Animal Operations in Virginia

A Request for Proposals was issued in 2014 soliciting applications to establish agreements through competitive negotiation for the writing of nutrient management plans for animal waste and poultry waste permits. Funding was targeted for development of nutrient management plans on unpermitted confined animal operations. Successful applicants had to be Virginia Certified Nutrient Management Planners certified in the agricultural category. Three grants were awarded for a total of $92,840, with the intent to develop plans for 25,460 acres. The result was a total of 71 nutrient management plans written on unpermitted operations covering 14,392 acres.

Livestock Stream Exclusion in Virginia

Through June 30, 2015, DCR offered 100% of the cost for the SL-6 (Stream Exclusion with Grazing Land Management) practice for cost-share applicants. All participant enrollments received since January 2013 (a 2.5-year period) will be honored as cost-share funds become available to address these fiscal commitments. As of August 2015, approximately $50 million had been paid or obligated by SWCDs in support of the one hundred percent reimbursement of SL-6 livestock exclusion BMPs throughout the Commonwealth. As a result of the commitment made, an additional $68 million dollars worth of pending SL-6 cost-share applications are waiting to receive funding. It is anticipated that this focus on livestock

exclusion from surface waters will result in dramatic reductions in nutrient and bacteriologic contamination as these practices are funded and implemented.

Virginia Land Cover Database Project

The 2014 General Assembly authorized funding from the Water Quality Improvement Fund to update the Commonwealth's statewide digital orthography, to improve land coverage data necessary to assist local governments in planning and implementing their stormwater management programs. DEQ worked jointly with the Virginia Information Technologies Agency (VITA) to issue a request for proposals under a Statement of Requirements for this project, and selected WorldView Solutions as the contractor. The project will identify land cover for the entire state, down to a 1-meter resolution, for 13 land cover classifications (and water):

Land Cover		Minimum Mapping Unit	Accuracy
Pervious	Turf Grass	Less than 1 acre	85%
Impervious	Buildings, drive-ways, parking lots, etc	Match resolution	95%
	Roads	Road centerline dependent	95%
Forest	Forest	1 acre w/ min width restrictions	95%
	Tree	Less than 1 acre	95%
	Harvested/Disturbed Forest	1 acre w/ min width restrictions	85%
Scrub/Shrub	Scrub/Shrub	1 acre w/ min width restrictions	85%
Agriculture	Cropland	1 acre w/ min width restrictions	85%
	Pastureland	1 acre w/ min width restrictions	85%
Wetlands	Emergent Wetlands	As defined by NWI and TMI	85%
	Woody Wetlands	As defined by NWI and TMI	85%
	Mudflats	As defined by NWI and TMI	85%
Barren	Barren	Higher than the resolution	85%
Water	Water	Higher than the resolution	95%

Work commenced in July 2015, with a priority for development of the land cover database for the Chesapeake Bay watershed first (by the end of April 2016), followed by the remainder of the state (due by the end of December 2016). WorldView is now working on draft pilot areas to test the accuracy of their methods, and a second contractor will soon be selected to provide quality assurance/quality control oversight for the duration of the project. The resulting database will be made publicly available through VITA and will also incorporate data provided by the localities themselves.

Working first on the Bay watershed will allow the most recent land cover data to be used in upgrading of the Chesapeake Bay Program's (CBP) Watershed Model, used to estimate nutrient and sediment loads that serve as input to the CBP Time-Variable Water Quality Model. This is important for the 2017 reevaluation of the Bay TMDL, checking progress toward 60% achievement of the control actions needed under the TMDL, and drafting Virginia's Phase 3 Watershed Implementation Plan.

WQIF Point Source Program

There are currently 65 signed point source WQIF grant agreements obligating $767.4 million. The State construction project grants range from 35% to 90% cost-share, for design and installation of nutrient reduction technology at Bay watershed point source discharges. The WQIF point source grants provide critical support for compliance with the nutrient discharge control regulations and achieving Chesapeake Bay nitrogen and phosphorus waste load allocations. 57 of the projects have been completed and are operational. A summary of active construction grant projects is accessible via the DEQ WQIF webpage at the following web address: http://www.deq.virginia.gov/Programs/Water/CleanWaterFinancingAssistance/WaterQualityImprovementFund/WaterQualityImprovementFundList.aspx.

Since its formation in 1998, the WQIF Point Source Program has received a total of $850.3 million in appropriations, bond proceeds, monetary assessments and accrued interest. Part of that total was in the General Assembly's most recent WQIF point source commitment in FY14; authorization was given for up to $106 million in bonds to be issued to support point source nutrient reduction projects in the Chesapeake Bay watershed. There were no appropriations to the WQIF point source program in FY 2015 or 2016. Approximately $95.3 million of the $850.3 million total funding was used for 24 grants prior to the adoption of nutrient discharge control regulations in late 2005. A total of $4.01 million was awarded for 39 technical assistance grants, including Basis of Design Reports, Interim Optimization Plans, and startup support for the Nutrient Credit Exchange Association; all have been completed. In 2011, $3 million was set aside for the James River Chlorophyll Study, which is currently ongoing, and being conducted by a consortium of universities and contractors. An additional $250,000 was awarded in 2013 through a Technical Assistance grant to Chesapeake Environmental Communications to expand the James River Modeling framework by incorporating water quality data collected from 2011 to 2013.

The balance of the WQIF grants have been awarded for the design and installation of nutrient reduction technology needed to meet the waste load allocations assigned to the significant dischargers in the Chesapeake Bay watershed under the EPA–adopted Chesapeake Bay TMDL. As of August 17, 2015, the grant amount owed under existing, signed WQIF agreements was $87,324,599. It is projected that reimbursement requests for ongoing projects and several new and modified agreements expected to be signed over the next year can be covered with available funding up to FY16. However, additional funding of $59 million for point source grant obligations will be necessary before FY 2016 to fully fund all agreements to completion. This over-obligation of the WQIF is due to the statutory requirement for DEQ to enter into funding agreements with all eligible applicants, except if the project is deferred based on the cost-effectiveness or the viability of nutrient trading in-lieu of nutrient reduction technology installation.

The over-obligation can be managed with additional funding to capitalize the WQIF, which may be provided by the General Assembly through the state budget process, and also with unused funds returned to the WQIF as projects are completed. It should be noted that all grantees are obligated to complete their projects regardless of the amount of grant funds received, while the Commonwealth commits to fully fund all projects, subject to the availability of funds.

WQIF & Virginia Natural Resources Commitment Fund Nutrient Reductions

Estimated Nutrient Reductions from Nonpoint Source WQIF-Funded Projects

During FY 2015, WQIF and VNRCF funding supported agricultural BMPs that are expected to reduce edge of field nutrient and sediment losses by almost 2.6million pounds of nitrogen, 574,473 pounds of phosphorus, and 472,174 tons of sediment. CREP implementation is included in the above reductions. Due to a high demand for technical assistance, including engineering support, many BMPs were carried forward for completion in FY 2015. A table of nutrient and sediment reductions resulting from the implementation of agricultural BMPs is provided below.

Historic Edge of Field Nutrient/Sediment Reductions Resulting from Agricultural BMP Implementation by Fiscal Year - State Funding Only

Fiscal Year	Total N Reduction	Total P Reduction	Total Soil Loss Reduction
1998	1,324,471.34	292,177.89	245,268.60
1999	765,068.08	144,671.63	145,329.12
2000	2,301,033.20	447,058.68	428,440.42
2001	1,225,504.04	245,162.36	240,854.33
2002	1,569,948.74	314,600.29	290,774.12
2003	1,012,937.47	201,904.22	186,364.74
2004	535,689.50	107,205.71	98,833.44
2005	1,078,627.27	219,600.45	199,094.63
2006	1,902,293.55	398,126.80	350,932.36
2007	2,573,780.62	518,294.74	474,950.33
2008	4,543,339.11	925,908.36	836,245.86
2009	3,308,593.40	638,079.52	608,489.91
2010	4,116,037.51	829,568.84	757,061.74
2011	4,557,208.17	1,109,314.14	837,738.49
2012	7,082,513.41	1,754,085.13	1,302,232.21
2013	7,550,133.89	1,829,482.36	1,388,454.46
2014	3,876,358.38	882,613.78	712,852.48
2015	2,559,860.67	574,472.95	472,173.72

Estimated Nutrient Reductions from Point Source WQIF-Funded Projects

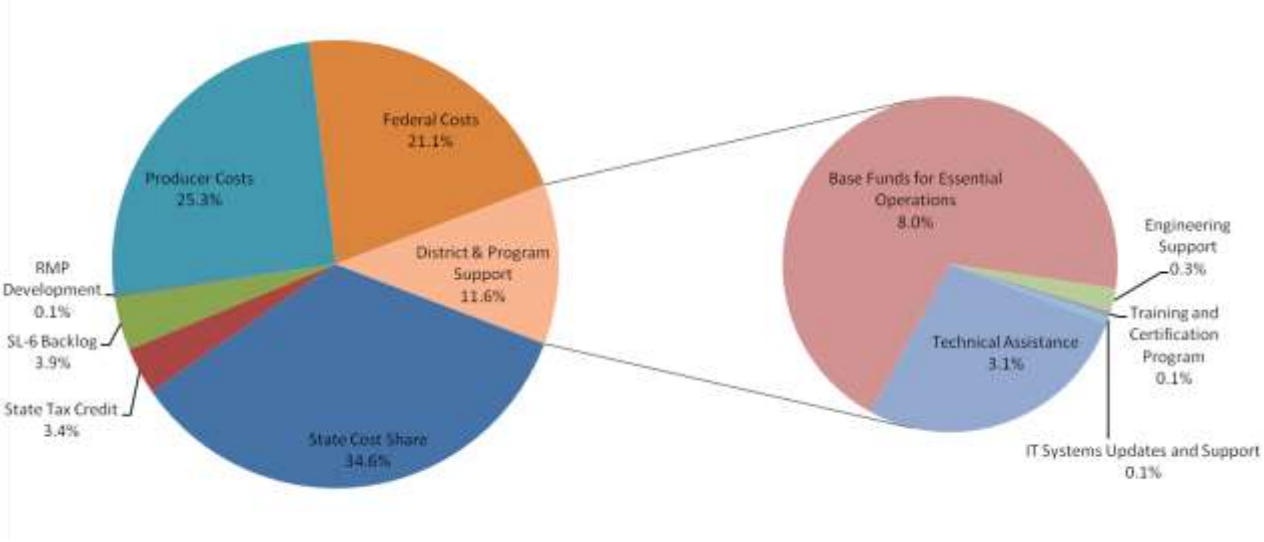
To date, 57 of the 65 construction projects with signed grant agreements for the installation of nutrient reduction technology have initiated operation. With these projects coming on-line, annual nutrient loads discharged from wastewater plants in the Bay watershed have declined dramatically. From 2009 to 2015, annual nitrogen discharges were reduced by about 7,996,196 pounds; phosphorus annual loads were reduced by almost 641,653 pounds, exceeding the milestone commitments set in Virginia's Watershed Implementation Plan for both nutrients. As a result of these ongoing nutrient control upgrades, point source loads continue to be well below the allocations called for in the WIP and TMDL.

Chapter 2 - Annual Funding Needs for Effective Implementation of Agricultural Best Management Practices

In accordance with subsection C of §10.1-2128.1 of the Water Quality Improvement Act, the Department of Conservation and Recreation (DCR) in consultation with a stakeholder advisory group (SAG), including representatives of the agricultural community, the conservation community, and the Soil and Water Conservation Districts, has determined the annual funding needs for effective Soil and Water Conservation District technical assistance and implementation of agricultural best management practices. Pursuant to §2.2-1504 of the *Code of Virginia*, DCR must provide to the Governor the annual funding amount needed for each year of the ensuing biennial period. For the fiscal years 2017 – 2025, the final scheduled year of the Chesapeake Bay Watershed Implementation Plan (WIP), an estimate of $1.74 billion may be required from state and federal funds as well as farmer financial contributions to meet water quality goals. Approximately 49% of this total ($855 million) could be needed from State sources, the vast majority of which is direct funding of the Virginia Agricultural Cost-Share (VACS) Program and support for Soil and Water Conservation Districts who implement the VACS program.

2015 Agricultural Needs Assessment
Total Costs 2017 - 2025

Estimate = $1,740,118,697



The methodology for the Agricultural Needs Assessment was revised in 2015, due to the livestock stream exclusion initiative that DCR, the Virginia Soil and Water Conservation Board, and Soil and Water Conservation Districts began implementing. From late 2012 through June 2015, livestock producers were guaranteed 100% funding for committing to implement SL-6 (Stream Exclusion with Grazing Land Management), requiring installation of a permanent fence, a minimum 35 foot vegetated buffer along streams, alternative watering systems, and other features. Over $53 million has either been expensed or obligated statewide for the SL-6 practice, yet an additional $68 million worth of these practices were awaiting available funding as of September 1, 2015.

The $121 million livestock stream initiative includes $64 million within Virginia's Chesapeake Bay watershed. The pollution reduction contribution towards year 2025 WIP goals of the approximately 5.7

million linear feet of stream bank protected and 72,000 animal units in the Chesapeake Bay watershed that will be excluded (statewide, the impact would be almost 10 million linear feet of stream bank protected and 131,000 animal units excluded) once all of the pending SL-6 practices have been installed. The pollution reduction benefits for the Bay SL-6 implementation was estimated using the Virginia Assessment and Scenario Tool (VAST) . The SL-6 pollution reduction benefits were then combined with 2014 WIP progress and the remaining reductions needed to reach the 2025 WIP goals were recalculated and funding needs were then revised.

SL-6 practices awaiting funding were assumed to be installed between FY2017 – FY2019. As a result, there was an increased, then fairly consistent funding need year to year through 2025, despite a 2% inflation factor for cost-share. The following table shows the funding needs, including SL-6 practices currently awaiting funding, through 2025. Footnotes referenced in the table are shown on the following page.

2015 Agricultural Needs Assessment

Biennial Needs Summary

Estimated Costs	**Budget**	**2017 - 2018 Biennium**		**2019 - 2020 Biennium**		**2021-2022 Biennium**		**2023-2024 Biennium**		**2025 Target Year**	
FY2017 - FY2025	**Code**	2017	2018	2019	2020	2021	2022	2023	2024	2025	**Totals:**
Chesapeake Bay Cost-Share[1]	50323	$28,457,701	$29,026,855	$29,607,392	$30,199,540	$30,803,531	$31,419,601	$32,047,993	$32,688,953	$33,342,732	**$277,594,299**
Chesapeake Bay SL-6 Backlog[2]	50323	$11,300,000	$11,300,000	$11,300,000							**$33,900,000**
Chesapeake Bay Annual BMP Cost Share[3]	50323	$8,585,154	$8,756,857	$8,931,994	$9,110,634	$9,292,846	$9,478,703	$9,668,277	$9,861,643	$10,058,876	**$83,744,984**
Chesapeake Bay Tax Credit		$3,613,937	$3,686,216	$3,759,940	$3,835,139	$3,911,842	$3,990,079	$4,069,880	$4,151,278	$4,234,303	**$35,252,613**
Chesapeake Bay Producer Portion[4]		$27,104,528	$27,646,618	$28,199,551	$28,763,542	$29,338,813	$29,925,589	$30,524,101	$31,134,583	$31,757,274	**$264,394,597**
Chesapeake Bay Federal Portion		$22,587,106	$23,038,849	$23,499,626	$23,969,618	$24,449,010	$24,937,991	$25,436,750	$25,945,485	$26,464,395	**$220,328,831**
Chesapeake Bay Technical Assistance[5]	50322	$4,137,662	$4,238,688	$4,341,734	$2,905,933	$3,013,142	$3,122,496	$3,234,037	$3,347,809	$3,463,856	**$31,805,357**
Chesapeake Bay RMP Development	50301	$200,000	$200,000	$200,000	$200,000	$200,000	$200,000	$200,000	$200,000	$200,000	**$1,800,000**
Southern Rivers Cost-Share[1]	50323	$18,971,801	$19,351,237	$19,738,261	$20,133,027	$20,535,687	$20,946,401	$21,365,329	$21,792,635	$22,228,488	**$185,062,866**
Southern Rivers SL-6 Backlog[2]	50323	$11,300,000	$11,300,000	$11,300,000							**$33,900,000**
Southern Rivers Annual BMP Cost Share[3]	50323	$5,723,436	$5,837,905	$5,954,663	$6,073,756	$6,195,231	$6,319,136	$6,445,518	$6,574,429	$6,705,917	**$55,829,989**
Southern Rivers Tax Credit		$2,409,291	$2,457,477	$2,506,627	$2,556,759	$2,607,894	$2,660,052	$2,713,253	$2,767,518	$2,822,869	**$23,501,742**
Southern Rivers Producer Portion[4]		$18,069,685	$18,431,079	$18,799,700	$19,175,694	$19,559,208	$19,950,393	$20,349,400	$20,756,388	$21,171,516	**$176,263,065**
Southern Rivers Federal Portion		$15,058,071	$15,359,232	$15,666,417	$15,979,745	$16,299,340	$16,625,327	$16,957,834	$17,296,990	$17,642,930	**$146,885,887**
Southern Rivers Technical Assistance[5]	50322	$3,272,078	$3,339,428	$3,408,126	$1,937,289	$2,008,762	$2,081,664	$2,156,025	$2,231,872	$2,309,237	**$22,744,480**
Southern Rivers RMP Development	50323	$50,000	$50,000	$50,000	$50,000	$50,000	$50,000	$50,000	$50,000	$50,000	**$450,000**
Base Funds for Essential Operations[6]	50320	$15,520,554	$15,520,554	$15,520,554	$15,520,554	$15,520,554	$15,520,554	$15,520,554	$15,520,554	$15,520,554	**$139,684,986**
Engineering Support[7]	50301	$500,000	$500,000	$500,000	$500,000	$500,000	$500,000	$500,000	$500,000	$500,000	**$4,500,000**
Training and Certification Program[8]	50301	$125,000	$125,000	$125,000	$125,000	$125,000	$125,000	$125,000	$125,000	$125,000	**$1,125,000**
IT Systems Updates and Support	50301/ 50320	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	**$1,350,000**
	Totals:	$197,136,004	$200,315,994	$203,559,585	$181,186,229	$184,560,861	$188,002,985	$191,513,952	$195,095,138	$198,747,948	**$1,740,118,697**

Footnotes:
[1] Includes all BMPs with a lifespan greater than 1 year as well as Resource Management Plan Implementation after plan development.
[2] Backlog from FY15 signup under 100% SL-6 (livestock stream exclusion practice) funding guarantee spread across three years.
[3] Includes annual cover crop and nutrient management BMPs.
[4] Includes producers inputs from installation of 100% voluntary BMPs and 25% or cost share BMPs.
[5] Technical assistance reflects both the transfer of a significant portion into Base Funds for Operational Support and specific needs due to livestock stream exclusion and other structural best management practices.
[6] This amount represents SWCD budget template submissions and decoupling the majority of technical assistance from cost share.
[7] In the face of expanding program needs for engineering support, this funding builds capacity within DCR to provide engineering support to provide job approval authority to SWCD staff.
[8] Training and Certification funding to develop an internal DCR-SWCD training and certification program to further build SWCD technical capacity.

For the Southern Rivers areas, the needs assessment is based on the Chesapeake Bay annual cost estimates and the legislative mandate in §10.1-2128.1 of the *Code of Virginia* for Virginia Natural Resources Commitment Fund funds to be split 60% to the Chesapeake Bay watershed and 40% to lands outside of the Bay watershed (the Southern Rivers watershed). The funding needs calculated using the 60% Chesapeake Bay/40% Southern Rivers split were compared with the estimated cost of implementing agricultural best management practices according to existing TMDL implementation plans for impaired streams in the Southern Rivers region (approximately 5,109 square miles) and extrapolating those costs to the entire Southern Rivers area (approximately 18,821 square miles). Recognizing that implementation in the Southern Rivers is not affected by the 2025 deadline associated with the Chesapeake Bay TMDL, the comparison showed that using the 60/40 split as an approximation of the long term Southern Rivers implementation needs is sufficient. As additional TMDL implementation plans are developed in the Southern Rivers area, this analysis will be reevaluated.

To complete the implementation cost estimate, an additional 5% of the total cost for each year is added to account for other BMPs that are supportive of WIP practices but not explicitly quantified. Then a 2% per year inflation factor is applied to the BMP costs for 2017 -2025. The total annual implementation costs are then divided between the various funding sources: Federal (25.5% [assumed]), State (49%) and Agricultural Producer (25.5%). The BMP unit costs, supportive BMP percentage, and funding distribution percentages are based on data captured in the VACS Tracking Database.

It should be noted that the Stakeholder Advisory Group concurred with the concept, also previously supported by the study committee established pursuant to the FY12 and FY13 Appropriation Act, that in order to provide for stable funding and program delivery by the Districts, what is currently considered "technical assistance funding" should be added to the administrative and operational funding support and the total amount should be supported by the General Fund as base funding for the Districts. Consequently, once the State Cost-Share portion was determined for each year from FY2017 - 2025, the technical assistance needs to implement the Cost-Share program were calculated then most of it was converted into and added to existing (re-benchmarked) General Fund Operational Support levels for Districts.

This "re-benchmarked" Operational Support for Districts has been recalculated at approximately $15.5 million per year and includes funding at a level appropriate to deliver a $30 million annual cost-share

program as indicated in the District budget template. This amount would also include Directors' travel, resource management plan support, targeted TMDLs, dam maintenance, and DCR managed contracts. The cost of resource management plan development, using contractors, is estimated at $200,000 per year in the Chesapeake Bay watershed and $50,000 per year in the Southern Rivers (those watersheds

If District Operational Support can be re-benchmarked at the recommended amount, Technical Assistance, calculated at 12%, would then only be needed for special initiatives, such as SL-6, and to implement increases in state cost-share over the $30 million per year benchmark.

The SAG also identified engineering support as a factor that could limit the ability of Soil and Water Conservation Districts to deliver expanding cost share funding to farmers. NRCS has historically provided the engineering support for SWCD staff. In the face of expanding program needs for engineering support, the SAG recognized the need to build internal capacity within DCR to provide engineering support. DCR hired one Professional Engineer (PE) in FY15 and will hire one Engineering Specialist in FY16 to assist SWCDs and farmers. Additional engineering support at an annual cost of $500,000 will be needed to hire additional engineers and engineering specialists in order to ensure coverage statewide. To provide facilities, supplies, equipment, travel expenses, etc. for SWCD staff to receive engineering training from DCR an estimated $25,000 annually will also be needed.

Another potential bottleneck in program delivery identified by the SAG is in information systems and technology. Soil and Water Conservation Districts are operating using outdated computers, old software, and a database that needs improvements to address the expanding role of districts in tracking voluntary practices and implementing Resource Management Plans. A minimum of $150,000 in additional annual support is needed.

Chapter 3 - Chesapeake Bay and Virginia Waters Clean-up Plan Report

This chapter is submitted to fulfill the progress reporting requirements of §§62.1-44.117 and 62.1-44.118 of the *Code of Virginia* which calls on the Secretary of Natural Resources to plan for the cleanup of the Chesapeake Bay and Virginia's waters designated as impaired by the U.S. Environmental Protection Agency. This chapter also includes information necessary to report annually to EPA relative to the Commonwealth's §319 Nonpoint Source Pollution implementation grant. This progress report is organized to report the status of implementation of goals and objectives contained within the Chesapeake Bay and Virginia Waters Clean-up Plan. As such, it contains the detailed goals and objectives within each subsection, however, it does not repeat the detailed strategies and background information that can be found in the original Chesapeake Bay and Virginia Waters Clean-up Plan prepared in 2008.

Upgrades to wastewater treatment facilities in the Chesapeake Bay watershed

2015 Progress Report

Nutrient load reductions from the point source sector have been the most reliable reductions achieved under the Chesapeake Bay TMDL. Significant dischargers are regulated under the Chesapeake Bay Watershed General Permit. The general permit includes wasteload allocations and schedules of compliance when necessary to phase in the necessary treatment facility upgrades. The general permit also allows point sources to trade nutrient credits so that facility upgrades can be phased in over a number of years while still meeting TMDL nutrient reduction goals. The permit was first issued on January 1, 2007 and reissued as of January 1, 2012. Upgrades implemented to date have reduced the annual point source nutrient load delivered to the Bay and tidal rivers by approximately 6.9 million pounds of nitrogen (34% reduction) and 575,000 pounds of phosphorus (42% reduction) compared to the 2009 loads.

The current Chesapeake Bay Watershed General Permit includes additional nutrient reductions for significant dischargers in the York basin (phosphorus) and James basin (nitrogen and phosphorus) as required by the Chesapeake Bay TMDL. Point source nutrient loads are dominated by the James River facilities which accounted for 73% of the point source nitrogen loads and 70% of the point source phosphorus loads in 2009. Reductions from the James River facilities are being phased in accordance with Appendix X of the TMDL (Staged Implementation Approach for Wastewater Treatment Facilities in the Virginia James River Basin). Appendix X requires two phases of nitrogen and phosphorus reductions to meet dissolved oxygen criteria in the James River followed by a third phase of reductions to meet chlorophyll-a criteria. Final, chlorophyll-a based wasteload allocations will not be assigned to the individual wastewater treatment facilities until completion of a 4-year James River chlorophyll study scheduled for completion in late 2015. In all basins, with the exception of the James, wastewater facilities remain below the waste load allocations contained in the Chesapeake Bay TMDL. Point source nutrient reductions in the James basin have been significant, accounting for 65% of the statewide point source nitrogen and 57% of the statewide phosphorus reductions despite the absence of final chlorophyll-a based wasteload allocations. Final chlorophyll-a based wasteload allocations must be met by 2023. The Commonwealth exceeded its 2013 milestone for this sector and is on track to meet the 2017 goals of the TMDL.

TMDL development and implementation for waters impacted by toxic contamination

2015 Progress Report:

Bluestone: West Virginia plans to join Virginia in the development of an interstate polychlorinated biphenyl (PCB) TMDL for the Bluestone River. The Virginia portion of the watershed has impairments for PCBs in fish and the water column. High PCB concentrations in the water column found during Virginia and West Virginia's collaborative TMDL data acquisition phase triggered an EPA study and a cleanup effort. A former Superfund site, Lin Electric facility, was remediated for extremely high levels of PCBs in sediment/sludge. The EPA Superfund program has been conducting additional remedial activities within Beaver Pond Creek tributary near Bluefield, West Virginia.

Elizabeth/tidal James River: As a crucial part of TMDL development a PCB source investigation study is nearly complete in these water bodies. PCB point source monitoring was requested from those Virginia Pollutant Discharge Elimination System (VPDES) permittees identified as possible contributors to fish impairments. A more accurate accounting of regulated stormwater has also been included as part of the study. Lastly, existing information from PCB contaminated sites and other prospective sources has been compiled. The available information generated from this study is to be used in the development of PCB loadings. The TMDL, which is scheduled to be completed in 2017, will establish PCB reductions needed to attain the fish consumption use of these impairments.

Roanoke (Staunton): This PCB TMDL was completed in early 2010. The Roanoke TMDL monitoring identified two significant PCB sources. TMDL implementation has continued and includes monitoring requirements for an extensive list of VPDES permits. A growing number of Pollutant Minimization Plans (PMPs) to address identified contamination have been submitted to DEQ from known, active point sources and will be required for newly identified facilities that discharge unsafe levels of PCBs.

Levisa Fork: This PCB TMDL was completed in April 2010. Since TMDL monitoring had not revealed a viable source(s) of the contaminant, this particular TMDL was submitted to EPA as a phased TMDL. The Virginia Department of Mines, Minerals and Energy developed an EPA-approved monitoring plan to evaluate PCBs, total suspended solids (TSS) and total dissolved solids (TDS). Funding to support monitoring was limited and PCB monitoring was de-prioritized to concentrate efforts on monitoring of TSS and TDS for completion of the phased TMDL. Existing monitoring results for instream concentrations suggest focusing future PCB monitoring on Dismal Creek and Slate Creek will aid in TMDL implementation. More recently certain VPDES facilities have been identified as prospective contributors for which Pollutant Minimization Plans may be required.

New River: The New River, beginning at the I-77 Bridge and extending to the West Virginia line, has been the focus of an extensive PCB source investigation study. The study was initiated in 2010 and has included several iterations of ambient river PCB monitoring within the impairment. Large tributaries such as Peak Creek have also been investigated. In addition, PCB monitoring of permitted VPDES facilities has occurred and data are now available to develop PCB loadings and to set reduction targets. A PCB TMDL is scheduled for completion in 2017.

North Fork Holston River: This mercury TMDL was completed in 2011. A fish consumption advisory for mercury extends approximately 81 miles from Saltville, Virginia to the Tennessee state line. While most of the mercury in the river originated from the Olin plant site, this contaminant has been distributed

throughout the floodplain downstream. The TMDL identified that most of the current mercury loadings come from the watershed and floodplain with lesser amounts from the former plant site. In order to meet the TMDL loadings, mercury reductions will be needed from all contributors.

Potomac River: A multi-jurisdictional PCB TMDL was completed in 2007. TMDL implementation activities have been on-going within the Virginia embayments. The VPDES municipal wastewater treatment facilities that discharge to the embayments have been monitored for the presence of PCBs. Reductions will be necessary in those situations where the assigned TMDL loads are exceeded.

South and Shenandoah Rivers: This mercury TMDL was completed in 2010. The South River has a fish consumption advisory that extends about 150 miles from Waynesboro to the West Virginia state line via the South River, the South Fork Shenandoah River, and the mainstem Shenandoah River. The primary source of mercury deposited in the river and floodplain was from releases that occurred during the 21 years that DuPont used mercury at the facility (1929-1950) in Waynesboro. Atmospheric deposition was not identified as a significant mercury source. Fish tissue data from a reference site upstream of the former DuPont plant site shows safe mercury levels, while fish tissue samples below the plant contain elevated amounts of mercury. Unfortunately, mercury levels in fish tissue from this portion of the river have not shown a decline since the mercury was discovered in the river in 1976. Remediation and restoration efforts continue through DEQ's TMDL and Resource Conservation and Recovery Act and Natural Resource Damage Assessment regulatory programs, and a significant nonregulatory science-based initiative through the South River Science Team has been in place since 2000.

Dan River Coal Ash Spill and State Response

On February 2, 2014, security staff at the Duke Energy Dan River Facility in Eden, NC, observed liquefied coal ash leaking from their primary ash storage pond into the Dan River. A sinkhole had formed inside the primary ash pond due to a break in a 48-inch diameter stormwater pipe that ran underneath. Coal ash is the residue generated from burning coal, and is generally stored at power plants or placed in landfills. Coal ash has a large variety of ingredients – mostly silicon oxide, iron oxide and aluminum oxide, with trace amounts of arsenic, selenium, mercury, boron, thallium, cadmium, chlorides, bromine, magnesium, chromium, copper, nickel, and other metals. It was estimated that about 39,000 tons of coal ash and 27 million gallons of pond water were released into the Dan River. A second, 36-inch stormwater drain pipe discharging arsenic-contaminated water was also identified during this period and subsequently plugged by February 21st.

Emergency response and environmental monitoring was conducted over the next 10-12 months by EPA, DEQ, U.S. Fish and Wildlife Service (USFWS), North Carolina Department of Environment and Natural Resources (NCDENR) and Duke Energy. Analytical results for water samples taken by DEQ staff at 4 river stations and 2 reservoir stations located in Virginia's portion of the river showed no violations of water quality standards for the protection of aquatic life. Sediment samples taken from the same locations showed some relatively elevated levels of trace metals, but not above any freshwater ecological screening levels that DEQ uses to indicate potential concerns. In addition to the emergency response environmental monitoring, to protect human health the Virginia Department of Health was involved in finished drinking water testing with the localities that draw their water from the Dan River (Danville, South Boston and Clarksville). All finished water met state and federal drinking water standards throughout the emergency, while the localities ensured compliance by increasing chemical precipitation and segregating the solids removed for proper disposal.

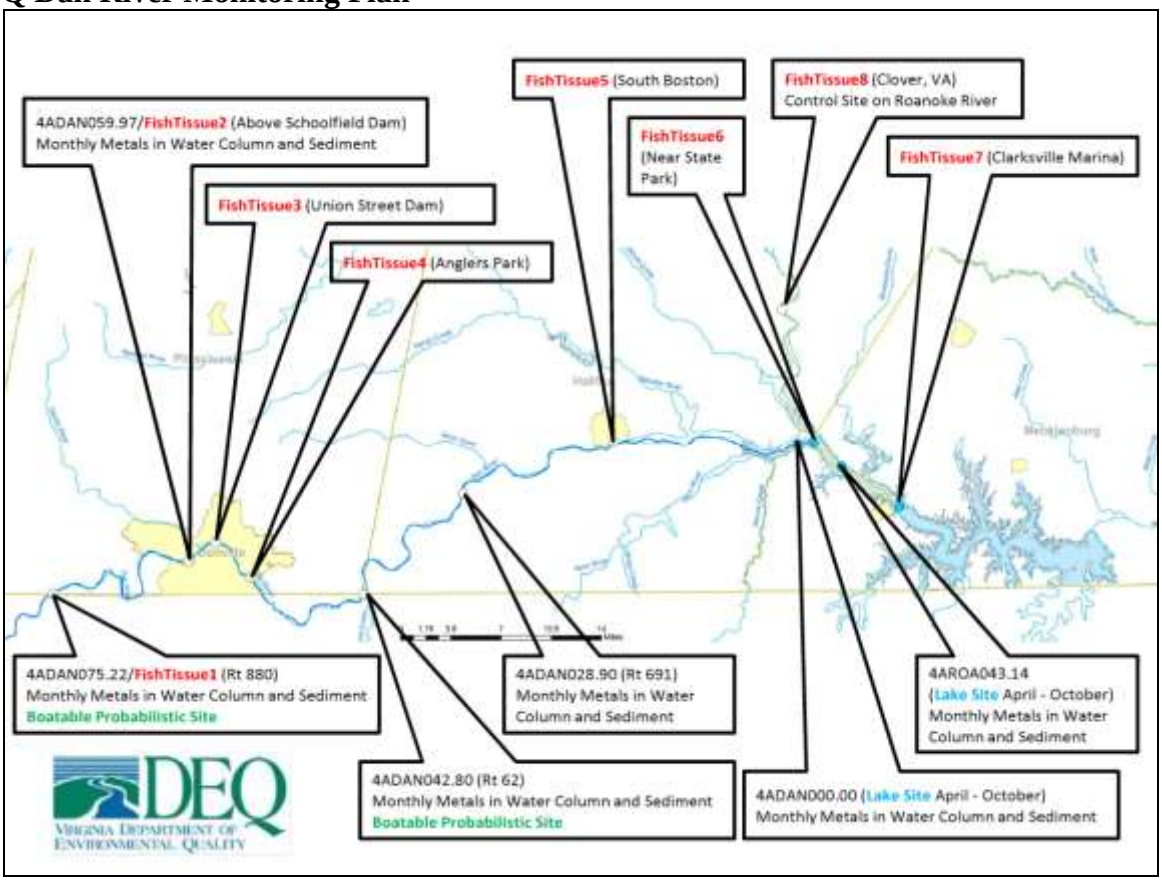
During 2014, 160 fish tissue samples were collected from 7 sites in Virginia's portion of the Dan River and 1 control station in the Bannister River for analysis of metals levels associated with coal ash in the edible portion that may have been accumulated. To date, analytical results have been provided for 72 samples and the remainder should be processed by October 2015. The entire 2014 fish tissue metals database will be released after all samples have been processed.

State and federal agencies, along with Duke Energy, continue to monitor the Dan River for potential ecological impacts. DEQ continues implementing its long-term (3 to 5 years) monitoring plan composed of several elements (see map below):

- Monthly water column and sediment sampling at 4 river stations and 2 Kerr Reservoir stations.
- Fish tissue collection at 8 sites, once at each location annually, during the period September - October.
- "Boatable Probabilistic" monitoring (habitat, macroinvertebrates, fish community structure, and expanded chemical testing) at 2 stations; sampling done annually in late summer.

Data collected is being used as part of a basinwide Natural Resources Damage Assessment and Restoration (NRDAR) process being lead by USFWS. A group composed of state and federal natural resources "trustees" has finalized an early-restoration plan and solicited public input on specific projects that Duke Energy can undertake for environmental improvement and enhancement in the Dan River basin. At their June 25, 2015 meeting, the State Water Control Board approved an enforcement Consent Order negotiated with Duke Energy that included a $2.5 million settlement. Under the Order, Duke Energy has agreed to undertake $2.25 million in environmental projects that benefit Virginia localities affected by the spill. The remaining $250,000 will be placed in the fund DEQ uses to respond to environmental emergencies.

DEQ Dan River Monitoring Plan



Regulation and Management of Coal Ash Impoundments in Virginia

In response to the Eden, North Carolina coal ash release into the Dan River, DEQ conducted a review of coal ash impoundment operations along Virginia's waterways. The EPA had previously concluded a review of the structural integrity of Virginia's coal ash impoundments in 2013. None of the units were found to have an unsatisfactory rating. For additional information: http://www3.epa.gov/epawaste/nonhaz/industrial/special/fossil/surveys2/.

There are currently 13 active coal ash impoundments located at 8 facilities. The map below identifies the locations and owner/operators of these units. Three of these impoundments are undergoing decommissioning and have or will cease operations by 2016. DEQ shares regulatory oversight with the Virginia Department of Conservation and Recreation, with DCR having statutory authority over the permitting, operation, maintenance and decommissioning of impoundment berms under its Dam Safety Program.

The impoundments operating throughout Virginia generally are constructed with a natural clay liner. Ash is sluiced from the point of generation into the impoundments and may include fly ash, bottom ash and Flue Gas Desulfurization (FGD) by-products. Impounding structures are used to settle solids while the clarified overflow water is discharged to surface waters under a VPDES permit. Permits include monitoring requirements with discharge limits for a variety of pollutants including oil & grease, total suspended solids and, depending upon the specific discharge, heavy metals. DEQ and DCR conduct routine inspections under both the VPDES permit and Dam Safety programs.

Coal Ash Impoundments in Virginia

No Discharge Zone (NDZ) designations

2015 Progress Report:

Federal Law prohibits the discharge of untreated sewage from vessels within all navigable waters. A "No Discharge Zone" (NDZ) is an area in which both treated and untreated sewage discharges from vessels are prohibited. In 2014, DEQ transmitted four NDZ applications for Virginia's Northern Neck (the peninsula of land separating the tidal Potomac and Rappahannock Rivers) to Virginia's Secretary of Natural Resources (SNR) for review. The SNR concurred with the applications and submitted them to EPA - the federal agency with the authority to designate NDZs per §312 of the Clean Water Act and enabling regulations at 40 CFR Part 140. EPA has since completed a review of the applications and provided DEQ with preliminary comments. DEQ and the Northern Neck Planning District Commission are working together to address these. Once EPA receives Virginia's responses, their determination process will continue. Three other initiatives to address boating discharges are in progress. The Go-Green Committee of Gloucester County and the Virginia Institute of Marine Science are working together to develop NDZ applications for the Sarah and Perrin creeks in Gloucester County. DEQ is providing support in this effort and will be involved in the public meetings and receiving public comments prior to consideration for an NDZ application transmittal to the SNR for review. An NDZ application for Owl Creek and Rudee Inlet in Virginia Beach is currently in abeyance at EPA pending construction of a year-round pump-out facility accessible to larger vessels. The City of Virginia Beach plans to have a construction contract in place in Fall 2015 with construction beginning shortly thereafter. Once construction is completed, EPA will be asked to review the NDZ application. The Elizabeth River Project, an independent non-profit organization, has created a task force to achieve increased pump-out compliance by addressing education and accessibility issues.

On-site septic systems

2015 Progress Report:

The Virginia Department of Health (VDH) database, the Virginia Environmental Information System (VENIS), is the main record keeping tool for the agency's environmental health programs. From July 1,

2012 through June 30, 2013, VDH issued 3,454 repair permits statewide; about 290 required installation of an alternative onsite sewage system (AOSS). From July 1, 2013 through June 30, 2014, VDH issued 4,014 repair permits statewide; about 310 were an AOSS. Repair permits include component replacements or complete system replacements. An AOSS always disperses secondary or better effluent, and sometimes includes disinfection or pressure distribution. On December 7, 2013, VDH required all new and repair AOSS to reduce nitrogen by 50% as compared to a conventional sewage system.

VDH revised VENIS and reporting policies to capture additional information about AOSS. VDH can now identify BMPs for onsite sewage systems recognized by the Chesapeake Bay Model. Previously, VDH could only report those AOSS that reduced nitrogen by 50%. VENIS can now report all nitrogen removal from AOSS, including septic tank pump-outs (5% nitrogen reduction), and onsite sewage systems connected to municipal wastewater collection systems (100% nitrogen reduction). Virginia participated in the multi-state Bay Program workgroup that recommended new BMPs for the Bay model in the onsite sector for 20%, 38%, and 69% nitrogen reduction. As new BMPs are adopted, VENIS will be updated accordingly to facilitate and improve reporting.

The Chesapeake Bay Innovative Nutrient and Sediment Reduction Grant through the National Fish and Wildlife Foundation (NFWF) provided financial incentives to encourage property owners to install AOSS to reduce nutrient and biological pollution to the Chesapeake Bay. The grant program targeted properties in the Three Rivers Health District, an area comprising ten counties located on the Middle Peninsula (between the York and James Rivers). The grant award was $399,595 and will close by December, 2015.

The grant initially assisted owners who had waived treatment and nitrogen reduction pursuant to a state law (§ 32.1-164.1:1 of the *Code of Virginia*), which allows repairs without treatment or pressure dosing. Systems repaired with a waiver comply with regulatory requirements until the property is transferred. Although waivers generally work against efforts to reduce nutrient and biological pollution to the Chesapeake Bay, they do provide needed economic relief to owners who cannot afford to reduce nitrogen and biological pollution from a failing onsite sewage system. A property owner can spend more than $10,000 to reduce pollution from his or her onsite sewage system.

VDH helped or will help 48 home owners reduce nitrogen by at least 50% through the NFWF grant. VDH has a waiting list of more than 15 owners who could not receive funding because all funds have now been obligated. The waiting list for financial help continues to grow. Finding ongoing funding to help reduce nitrogen and biological pollution from onsite sewage systems is high priority for VDH. VDH will search for ways to help low and moderate income families reduce nitrogen and biological pollution when failing sewage systems are repaired.

Through the NFWF grant, VDH garnered significant interest from owners who had failing sewage systems, but were afraid to come forward because they could not afford to reduce nitrogen or other pollutants. Working with partners like the Middle Peninsula Planning District Commission, the Southeast Rural Community Assistance Project, and private consulting firms, VDH fully utilized grant funding and found innovative solutions, which can be used again when additional funding is found.

DEQ Grant funding for repairing/replacing failing on-site septic systems and straight-pipes

2015 Progress Report:

DEQ continues to work with organizations and localities across Virginia to fund projects that correct failing septic systems or straight-pipes. A majority of these projects are part of larger watershed restoration and implementation efforts in TMDL implementation areas. During FY15, DEQ provided funding to pump-out septic systems, repair or replace failing septic systems or remove straight pipes from at least 272 homes using $343,787 from Federal Section 319(h) funding and landowner contributions.

Residential Septic Program - Grant Funded BMPs 7/1/2014-6/30/2015

Name of BMP	BMP Practice Code	Number of BMPs Installed	Pounds of Nitrogen Reduced	CFU of Bacteria Reduced	Total Amount of Cost-share Provide	Landowner contributions or other match
Septic Tank Pump-out	RB-1	227	622	1.106E+12	$ 31,836	$ 34,888
Connection to Public Sewer	RB-2	-	-	0.000E+00	$ -	$ -
Septic Tank Repair	RB-3	23	532	8.579E+11	$ 27,957	$ 25,361
Septic Tank Replacement/Installation	RB-4	17	393	6.341E+11	$ 54,232	$ 54,953
Septic Tank Replacement or Installation with Pump	RB-4P	3	69	1.119E+11	$ 13,000	$ 23,750
Alternative Septic System	RB-5	2	46	7.460E+10	$ 20,000	$ 57,810
Total Installed		**272**	**1,662**	**2.784E+12**	**$ 147,025**	**$196,762**

The grant funds distributed by DEQ that were active in FY15 were distributed within 10 basins and 17 counties throughout Virginia, generally through Soil and Water Conservation Districts, however in a few cases not-for-profits, planning district commissions and localities assisted with the TMDL implementation projects.

319H Funded Residential Septic BMPs: July 1, 2014 thru June 30, 2015 by Basin

Watershed	Basin	# of BMPs	Section 319H $ Funds provided by DEQ	$ Other funds or homeowner Contribution (Match)	Bacteria Reductions CFU	Nitrogen Reduction Lbs/Year
Waters outside the Chesapeake Bay Watershed	Big Sandy	2	$ 4,118	$ 4,117	4.228E+10	26
	Roanoke-Dan	5	$3,760	$ 1,840	5.722E+10	34
	Tennessee-Clinch	10	$2,075	$ 1,700	9.208E+10	54
	Tennessee-Holston	3	$4,250	$ 4,550	3.730E+10	23
Waters inside the Chesapeake Bay Watershed	Middle James	50	$33,732	$ 32,655	5.399E+11	323
	Potomac-Shenandoah	96	$45,349	$ 80,572	8.386E+11	495
	Rappahannock	53	$29,235	$ 33,202	6.195E+11	372
	Upper James	3	$3,769	$ 3,984	4.726E+10	29
	Upper Potomac	1	$100	$ 100	4.980E+09	3
	York	49	$20,638	$ 34,043	5.349E+11	320
TOTAL		**272**	**$147,025**	**$ 196,762**	**2.784E+12**	**1,662**

Adoption of cost-effective agricultural best management practices

2015 Progress Report: Agricultural Cost-Share Programs

DCR administers funds for conservation programs that Soil and Water Conservation Districts deliver to the agricultural community. Some of these programs include the Virginia Agricultural Best Management Practices Cost-Share, Tax Credit, and Conservation Reserve Enhancement Programs. Details on cost-share allocations to Soil and Water Conservation Districts are summarized in Chapter 2 of this report.

Through funding provided by the General Assembly, Virginia developed a computerized BMP tracking program to record the implementation and financial data associated with all implemented practices. During the last fiscal year, DCR upgraded this application to include functionality for the development of Resource Management Plans and Conservation Plans. These two new modules are integrated with the original BMP tracking portion of the application to allow for the collection of BMP data associated with plans. This program continues to be maintained by DCR.

2015 Progress Report: Agricultural Stewardship Act Program

The Agricultural Stewardship Act (ASA) Program is a complaint based program by which the Commissioner of Agriculture and Consumer Services receives information alleging water pollution from agricultural activities. During the program year April 1, 2014, through March 31, 2015, the Virginia Department of Agriculture and Consumer Services (VDACS) received more than 120 inquiries regarding possible agricultural pollution. Sixty-three of these cases became official complaints. The official complaints fell into 10 categories according to the type of agricultural activity: beef (23), land conversion (13), cropland (9), equine (6), swine (4), poultry (3), dairy (2), sheep (1), beef/goat/sheep (1), and vineyard (1).

There were also nine different categories based on the types of pollution: sediment only (19); sediment and nutrient (16); nutrient only (12); sediment, nutrient, and bacteria (8); sediment, nutrient, and toxins (3); sediment, nutrient, bacteria, and toxins (2); nutrient and bacteria (1); bacteria only (1); and sediment and toxins (1).

During the program year, 27 (42 percent) of the 63 official complaints were determined to be founded, and Agricultural Stewardship Plans were required to address pollution problems. In each founded case, there was sufficient evidence to support the allegations that the agricultural activities were causing or would cause water pollution.

Twenty (31 percent) of the complaints received during the program year were determined to be unfounded because there was insufficient or no evidence of water pollution. In some instances, farmers involved in unfounded complaints voluntarily incorporated best management practices into their operations to prevent more complaints or to prevent potential problems from becoming founded complaints.

Sixteen (27 percent) of the complaints received during the program year were dismissed for various reasons. Many of the complaints that were dismissed were situations where a water quality concern existed but was remedied prior to the official investigation. Others were cases in which the ASA program had no jurisdiction and was forwarded to the proper authority. Some cases were dismissed because insufficient information was provided by the complainant.

Overall, farmers involved in the complaint and correction process were cooperative in meeting the deadlines set by the ASA, and it was not necessary to assess any civil penalties. Under the ASA, the

Commissioner issues a corrective order when an owner or operator fails to submit and complete implementation of the Agricultural Stewardship Plan based on the findings of a conference held to receive the facts on a case. Although several warnings of enforcement action were sent throughout the year, no corrective orders were issued during the 2014-2015 program year.

Compared to the previous program year, the ASA program experienced a 21 percent decrease in official complaints, from 80 to 63. Although there was a significant decrease in total official complaints, there was only a slight decrease in founded complaints requiring plans, from 32 to 27. Unfounded complaints decreased by 4 cases, from 24 to 20, while the overall percentage of unfounded complaints slightly increased from 30 percent to 32 percent. There was also a decrease in dismissed complaints, from 24 to 16, a decrease of 33 percent.

Of the founded complaints, 44 percent involved beef operations (12 founded complaints), 30 percent involved land conversion (8 founded complaints), 11 percent involved equine operations (3 founded complaints), 7 percent involved dairy operations (2 founded complaints), 4 percent involved swine (1 founded complaint), and 4 percent involved sheep (1 founded complaint).

Department of Forestry Implementation of Silvicultural Regulation and Strategic Water Quality and Watershed Protection Initiatives

2015 Progress Report:

The mission of the Virginia Department of Forestry (VDOF) is protecting and managing healthy, sustainable resources for all Virginians. Managing the state forests and working with private forest owners and communities to assure that the forests of the Commonwealth are major contributors to water quality and healthy watersheds aligns with the Department's core mission, with its current strategic plan, and with its Forest Action Plan. Forests provide superior watershed benefits over nearly every other land use. Silvicultural water quality enforcement, fire suppression, riparian buffers, conserving forested headwaters, providing for adequate water supplies to downstream communities, land conservation, restoring Longleaf and Shortleaf pine and American chestnut, wildlife habitat management, prescribed fire, urban and community forestry, and conservation education are key VDOF programs.

Silvicultural Water Quality Law Enforcement Actions

In July 1993, the General Assembly of Virginia – with the support of the forest industry – enacted the Virginia Silvicultural Water Quality Law, §10-1-1181.1 through §10.1-1181.7. The law authorizes the State Forester to assess civil penalties to owners and operators who fail to protect water quality in their forestry operations. Virginia is the only state in the southeastern United States that grants enforcement authority under such a law to a state's forestry agency. In FY 2015, the VDOF was involved in 195 water quality actions initiated under the Silvicultural Law. This represents a decrease of 41 percent from FY 2014 and is due to the increase in logger awareness of water quality protection and implementation of harvesting Best Management Practices that VDOF has been educating and reinforcing with the loggers since the 1990's. Of these actions, three resulted in Special Orders being issued for violations of the law, and three involved issuance of an Emergency Special Order (Stop Work Order). None of the actions proceeded to the issuance of a civil penalty.

Forestry Best Management Practices (BMPs) for Water Quality

The Virginia Department of Forestry has been a leader in the protection of forested watersheds since the early 1970s when it published its first set of Forestry Best Management Practices for Water Quality. The fifth and current edition of those guidelines came out in 2011. A statewide audit system has been in place since 1993 to track trends in BMP implementation and effectiveness. The entire BMP Implementation Monitoring effort has also been automated to be compatible with VDOF's IFRIS (Integrated Forest Resource Information System) enterprise database system. The information compiled serves as the basis for VDOF reporting under Virginia's WIP. In 2014, 93.6 percent of the timber harvest acres in Virginia conducted within the boundaries of the Bay Watershed was under Best Management Practices. The audit also showed that 98.3 percent of the sites visited had no active sedimentation present after the close-out of a harvesting operation. The goal for implementation under WIP II is 90 percent of timber harvest acres under BMPs by 2017 and 95 percent by 2025.

Harvest Inspection Program

The Department's harvest inspection program begun in the mid-'80s, provides VDOF an opportunity to educate forestland owners and operators about BMPs and water quality protection techniques. In FY 2015, VDOF field personnel inspected 5,458 timber harvest sites across Virginia on 245,749 acres.

Cost Share Assistance

VDOF offers cost-share assistance to timber harvest operators through a program funded by the Commonwealth's Water Quality Improvement Fund. This program shares the cost of the installation of forestry BMPs on timber harvest sites by harvest contractors. 29 stream protection projects were funded in FY 2015 that are using portable bridges to provide stream crossing protection across the site during and after harvesting.

Environmental Impact Reviews

In its role as a reviewing agency for the Department of Environmental Quality's and Virginia Department of Transportation's environmental impact review processes, VDOF offers to sponsors who are proposing to develop large public infrastructures projects, planning, design and project footprint site recommendations that incorporate best management practices and stewardship planning to conserve forests and mitigate unavoidable disturbances or impacts to Virginia's forests. VDOF reviewed over 200 project proposals in CY 2014 through the DEQ and Virginia Department of Transportation (VDOT) environmental impact review processes. These reviews have resulted in the modification of project footprints to avoid forest loss and to commitments by project sponsors to follow VDOF Forestry BMPs for Water Quality in numerous cases. DEQ has also included special forestland mitigation guidance to project sponsors that was developed by VDOF in its environmental impact review instructions.

Logger Education

VDOF was involved in ten Logger education programs in FY15 educating 258 timber harvesting professionals through the Virginia SHARP Logger Program in cooperation with Virginia Tech and the Sustainable Forestry Initiative (SFI®) State Implementation Committee. This program has enabled VDOF to assist in training 7,700 harvesting professionals in 253 programs relating to water quality protection since its inception.

Virginia Trees for Clean Water

Through its Virginia Trees for Clean Water program, VDOF is improving water quality across the Commonwealth by promoting on-the-ground tree planting efforts. To date, VDOF has assisted 63

projects resulting in more than 18,600 trees being planted in Virginia communities, including special projects such as: riparian buffer tree planting, a Turf to Trees program, and community and neighborhood tree plantings.

Project Learning Tree

In FY 2015 VDOF hosted a week-long Biology II/Ecology Institute for high school ecology teachers from across the Commonwealth using Project Learning Tree as the basis for instruction. Teachers received educational training at False Cape State Park, Back Bay National Wildlife Refuge, Little Island Park, New Kent Forestry Center, York River State Park, WestRock Paper Mill and at a vernal pool. Participants were able to create classroom curriculum that isn't offered in high schools in Virginia. Institute cooperators included the Virginia Department of Education and Virginia Commonwealth University (VCU). Funding for the institute was from a grant awarded to VDOF.

Riparian Forest Buffers Technical Assistance

Protecting water quality in Virginia through the creation and protection of riparian forest buffers is very important, not only to the VDOF, but also to other state and federal conservation agencies, including the Virginia Department of Conservation and Recreation, the USDA Farm Service Agency (FSA) and the Natural Resources Conservation Service (NRCS). While these agencies can provide funding to landowners for creating riparian forest buffers, the VDOF provides the technical forestry expertise in the planning and creation of riparian forest buffers.

For FY 2015, there was a total of 28 riparian buffer establishment projects reported by the VDOF for 281 acres within the Chesapeake Bay watershed. These are projects where the VDOF was directly involved by providing planning, oversight and certification of project completion.

Riparian Forest Buffer Tax Credits

For Tax Year 2014, VDOF issued Riparian Forest Buffer tax credits on 61 applications covering 910 acres of retained forested buffers. The tax benefit to forest landowners was $334,614.55 on timber valued at $1,363,490.41.

Easement Program

The Virginia Department of Forestry administers a conservation easement program to enable forest landowners to make certain their land is available for forest management in perpetuity. Today, the Department holds more than 100 conservation easements that permanently protect more than 35,000 acres of vital forestland – making VDOF the second largest holder of conservation easements in Virginia. In 2014 VDOF's easement program recorded 10 new easements on 2,542 acres, 2,406 of which are forested, ensuring permanent riparian buffers on 62,310 feet of watercourses.

Forest Stewardship Program

Virginia's Forest Stewardship Program is a cooperative effort of the Department of Forestry and the U. S. Forest Service, and Private Forestry, to assist non-industrial private landowners to improve the management of private non-industrial forestlands for multiple resources, including wildlife, water, recreation and forest products.

Virginia's state forests owned by the Department of Forestry serve as demonstration sites for "best practices" in forestry including activities from tree planting to harvesting, and environmental considerations for water quality, aesthetics and wildlife. Management of vital streamside habitat focuses

on a continuous source of clean water, travel corridors for wildlife, and diversity of plant and animal species.

Urban Tree Canopy Program

VDOF is encouraging communities to complete Urban Tree Canopy assessments, using sub-meter resolution infrared enhanced imagery, to develop urban tree canopy goals and implementation plans specifically tied to their communities' urban forest. Such urban tree canopy assessments can be an integral component to green infrastructure planning on a city, county or regional basis, which is vital for identifying and conserving urban/suburban forest lands. Using sub meter resolution imagery now will also make it easier for reporting TMDL progress for 2017 and beyond, when the Bay model will be revised.

Healthy Watershed Forest/TMDL Project

In 2015, VDOF began leading a project in partnership with the Virginia Department of Environmental Quality, the Chesapeake Bay Commission, the Rappahannock River Basin Commission, the George Washington Regional Commission, The Nature Conservancy and the Water Resource Research Center at Virginia Tech to demonstrate the value of retaining forestland in the Chesapeake Bay watershed. The goal is to determine if forest retention actions by localities, private landowners and others will decrease actual loads over 2025 Chesapeake Bay TMDL projected loads and, if the answer is "yes," determine approaches to credit forestland retention through the Chesapeake Bay Model.

Assessments of Forestland Change

VDOF is compiling and incorporating assessments of forestland change from other agencies, states, universities and conservation groups to better inform urban forestry policies, including state forest resources assessments, wildlife action plans and eco-regional assessments.

Vital Habitat

VDOF has established a six-acre longleaf pine orchard at its New Kent Forestry Center near Providence Forge, VA. With use of improved grafting techniques, cone-bearing trees are expected by 2020, and seed production is planned to eventually provide an annual crop of 250,000 seedlings. A longleaf pine time-of-planting study at Suffolk's Lone Star Lakes Park has been evaluated and current survival rates are 87 percent to 100 percent. One-year-old containerized seedlings were planted each month from October 2014 until May 2015. The study will continue to be evaluated and will be duplicated for the 2015-16 planting season.

Implementation of Nutrient Management

2015 Progress Report:

In FY 2015, DCR staff prepared nutrient management plans on 24,713 new acres and revised plans for 49,800 acres. As indicated in the following table, private nutrient management planners have developed or revised nutrient management plans statewide for nearly 351,000 acres.

DCR Nutrient Management Planning							
New or Revised	**Sum Of Cropland**	**Sum Of Hayland**	**Sum Of Pasture**	**Sum Of Specialty**	**Sum of Turf**	**Sum of Non-Ag**	**Total**
New	14,970.3	4,366	5,358	17.4			24,713
Revised	25,599.4	11,746	12,412	42			49,800
Private Nutrient Management Planning							
New or Revised	**Sum Of Cropland**	**Sum Of Hayland**	**Sum Of Pasture**	**Sum Of Specialty**	**Sum of Turf**	**Sum of Non-Ag**	**Total**
New	18,942	225	3,744	199	11,520	838.4	45,136.4
Revised	269,934	446	4,790	1,595	1,798	939	305,453
Grand Total	288,876	641	5,164	1,794	13,319	1,777.4	350,589.4

DCR continues to contract with several private planners and now has 120 golf courses with nutrient management plans totaling nearly 13,000 acres. DCR anticipates having close to 200 golf courses with nutrient management plans by July 2016. Total urban areas with nutrient management now exceed 35,000 acres. Because of reporting/data collection limitations, the total urban acres with nutrient management is not reflective of the actual amount of urban acres with nutrient management. The actual acreage is much higher. Section 3.2-3602.1 of the *Code of Virginia* applies to the application of regulated products (fertilizer) to nonagricultural property. It calls for training requirements, establishment of proper nutrient management practices (according to Virginia's Nutrient Management Standards and Criteria), and reporting requirements for contract-applicators who apply fertilizer to more than 100 acres as well as for employees, representatives, or agents of state agencies, localities, or other governmental entities who apply fertilizer to nonagricultural lands. The acreage reported to VDACS is not currently reflected in the total urban acres with nutrient management. DCR estimates the additional acreage is roughly between 50,000-75,000. The VDACS acreage combined with the acreage reported through DCR nutrient-management-planner-annual-activity reports for required nutrient management plans on golf courses, localities with DEQ municipal separate storm sewer system (MS4s) permits, and state-owned land, covers the majority of fertilization of nonagricultural land in the state that is managed by professionals.

DCR, through a joint program with the Virginia Poultry Federation, has paid for the shipment of approximately 2,610 tons of poultry litter out of the Chesapeake Bay watershed. DCR is working with the Virginia Poultry Federation and turkey integrators to incorporate actual turkey production data into the Phase 6 Chesapeake Bay Model. Once complete, this data set will help more accurately reflect turkey litter volume produced, turkey population, and nutrients generated via turkey litter in the Bay watershed.

A large portion of the remaining urban acreage that could come under nutrient management is owned by private landowners. In order to continue progress toward meeting goals for the Chesapeake Bay WIP,

funding support is needed to help expand the existing and developing Virginia Cooperative Extension Master Gardener (MG) Programs that have a homeowner/private landowner nutrient management focus. Since January 2014, six MG programs have written nutrient management plans for over 1,000 homeowners totaling 375 acres. Three additional Virginia Cooperative Extension offices in urbanizing areas are looking into starting a nutrient management focused program as well. The acreage reached by the MG programs will likely expand as DCR develops criteria for lower levels of urban nutrient management that still achieve nutrient reductions, but do not require a Virginia certified nutrient management planner. Currently, DCR has a grant to assist the Virginia Cooperative Extension in implementing the MG programs by providing funds for copies, pamphlets, and field supplies using a small amount of federal Chesapeake Bay grant funds. Future funding for this program is uncertain.

In order to continue to progress toward meeting goals for the Chesapeake Bay TMDL, funding support is also needed to allow for contracting of private sector planners to continue to write nutrient management plans for unpermitted animal operations (i.e., those that do not require a Confined Animal Feeding Operation permit due to their relatively smaller size and number of animals). There are 556 unpermitted dairies in Virginia of which 73 have nutrient management plans as of the date of this report. DCR is working to assess the number of unpermitted confined beef operations in the Commonwealth. At the current time, there are 5 with nutrient management plans. Approximately $150,000 per year in funding is needed to expand existing contracting with the private sector plan writers for these unpermitted animal operations.

Implementation of and compliance with erosion and sediment control programs

2015 Progress Report:

Effective July 1, 2013, the Erosion and Sediment Control Program transferred to DEQ and the State Water Control Board. During the reporting period, the main focus of DEQ central and regional office staff has been assisting local governments with the implementation of their newly adopted local stormwater management programs, which includes addressing erosion and sediment control in a manner that is consistent with the Erosion and Sediment Control Law and attendant regulations. DEQ regional office staff continued to visit small and large construction activities to perform site inspections for compliance with the 2014 Construction General Permit, which includes addressing erosion and sediment control in a manner that is consistent with the Erosion and Sediment Control Law and attendant regulations.

Implementation of stormwater management program

2015 Progress Report:

From July 2014 through June 2015, 3 local governments received approval of their local stormwater management programs. In addition, 92 local governments continued to implement their previously approved local stormwater management programs with the assistance of DEQ central and regional office staff. During the reporting period, DEQ central office staff developed and implemented enhancements to the previously released Stormwater Construction General Permit System. This online system enables local stormwater management programs to continue to coordinate their efforts with DEQ's issuance, modification, transfer, and termination of Construction General Permit coverage. From July 2014 through June 2014, DEQ central office staff issued new (i.e., first-time) coverage under the 2014 Construction General Permit to 739 land-disturbing activities. DEQ central office staff also reissued coverage under the 2014 Construction General Permit to 4211 previously permitted land-disturbing activities. DEQ regional office staff continued to visit small and large construction activities to perform site inspections for compliance with the 2014 Construction General Permit.

Authorization of SLAF Project Funding List

In order to reduce nonpoint source pollution from stormwater runoff, the Virginia General Assembly included Item 360 in Chapter 860 of the Acts of Assembly (the Commonwealth's 2013-2014 Budget) which created and set forth specific parameters for the administration of the Stormwater Local Assistance Fund (SLAF). The purpose of the Fund is to provide matching grants to local governments for the planning, design, and implementation of stormwater best management practices that address cost efficiency and commitments related to reducing pollutant loads to the state's surface waters. In accordance with that legislation, the State Water Control Board approved Guidelines for the implementation of the SLAF program. The Guidelines call for an annual solicitation of applications, an application review and ranking process, and the authorization of a Project Funding List (PFL) by the DEQ Director.

The General Assembly provided $35 million in bond funds for SLAF in FY 2014 and $20 million more in FY 2015. In the first cycle of SLAF funding, DEQ funded 71 projects in 31 localities totaling $22,937,158. In the second cycle of SLAF funding, DEQ authorized funding for 64 projects in 25 localities totaling $21,488,776. The remaining funds were carried over to be combined with the additional $5 million in appropriations provided by the General Assembly in FY 2016 for another solicitation in FY 2016, allowing time for localities to identify projects that are more cost effective and/or better align with their TMDL Stormwater Management Action Plans.

From the two funding cycles of SLAF grants, 10 localities have taken the next step and signed grant agreements to implement 16 projects, totaling $4,611,131 in cost-share. Additionally, 10 projects authorized for funding from the solicitations (nine from the first cycle and one from the second) have been withdrawn by the localities.

Local government compliance with requirements of the Chesapeake Bay Preservation Act

2015 Progress Report:

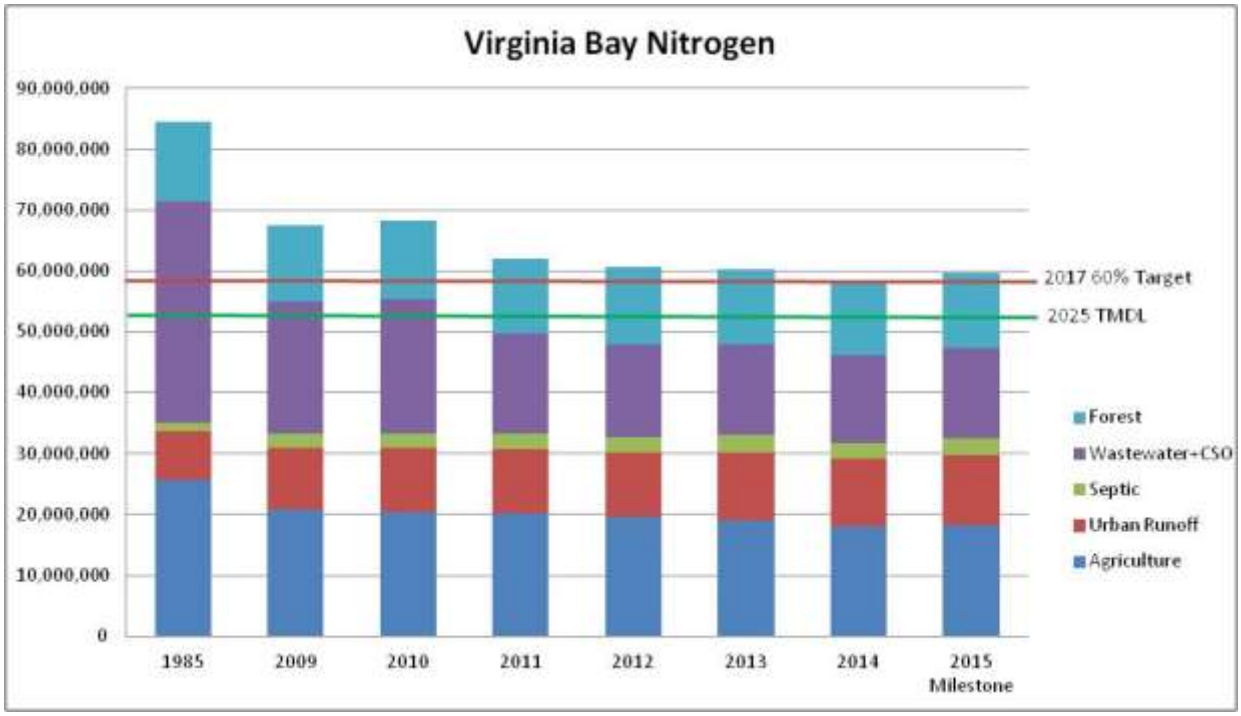
From July 2014 through July of 2015, no new compliance reviews were initiated due to DEQ's focus on assisting localities with the development of their stormwater management programs pursuant to 2012 and 2014 legislation. Prior to that, local compliance reviews were completed for 21 of the 84 Bay Act localities. These compliance reviews included an assessment of the localities' implementation and enforcement of the septic pump out program. Twenty of the twenty one localities were fully implementing the pump outs. One locality had ceased the pump out program, but was assessed a compliance condition to restart the program and is now doing so. Compliance reviews were reinitiated beginning in September 2015 targeting 14 localities in the coming year.

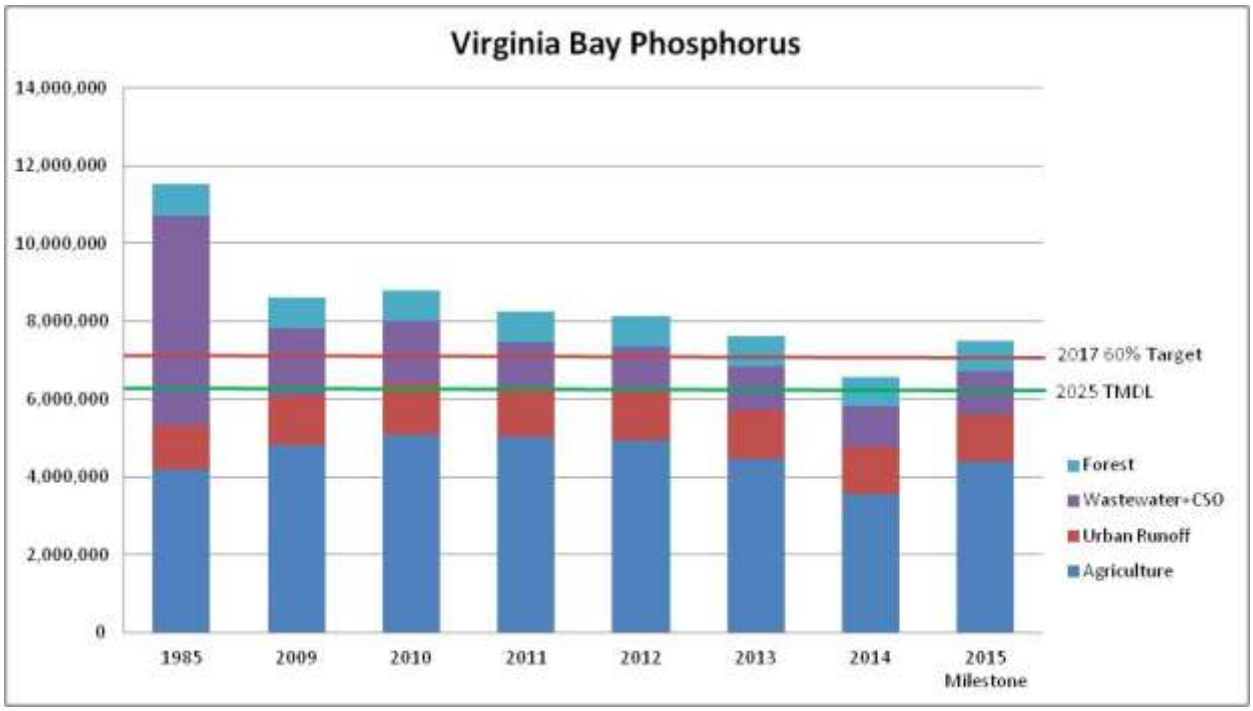
Chesapeake Bay Total Maximum Daily Load implementation

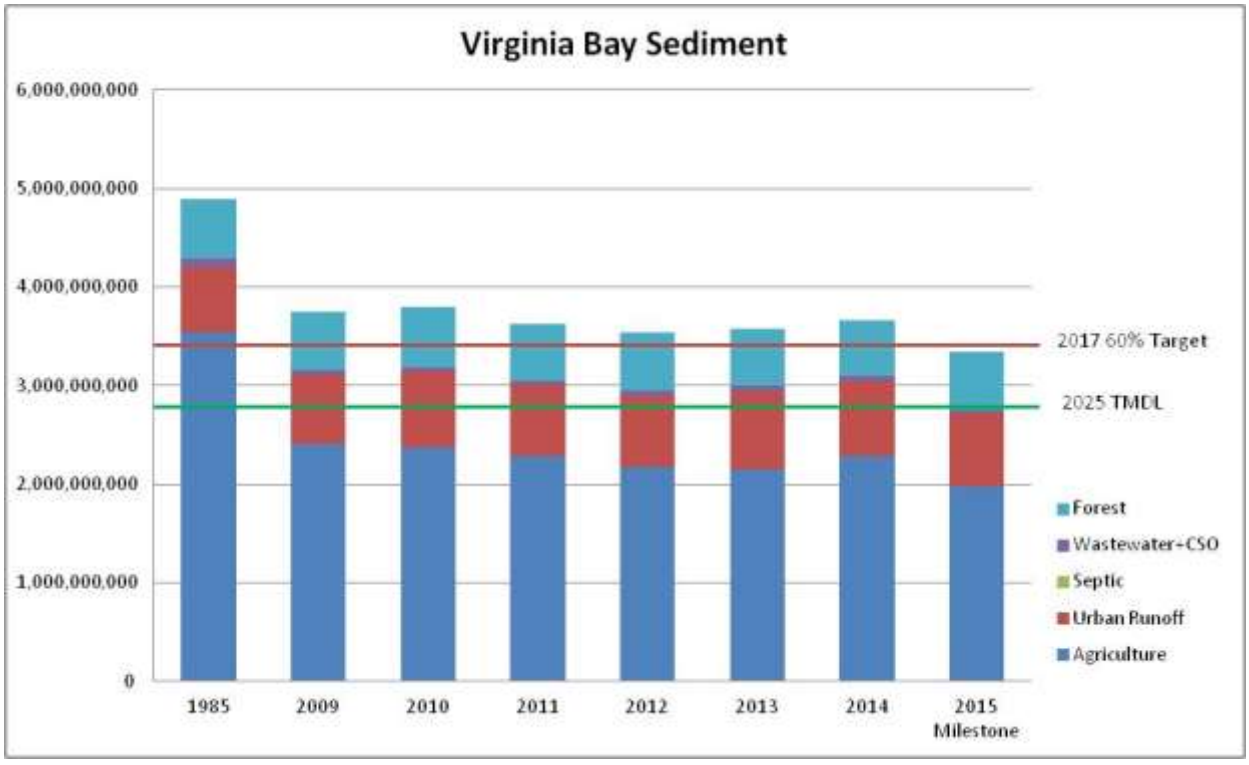
2015 Progress Report:

A review of Chesapeake Bay TMDL implementation progress through 2014 shows that Virginia is on track to meet its 2015 milestone targets for nitrogen, phosphorus and sediment reductions. Additionally, model results suggest that Virginia is on track to meet the 2017 target for achieving 60% of the required pollutant reductions.

As called for in the Phase II WIP and Virginia's Milestones, the Resource Management Plan program for agriculture is underway at DCR; regulations that update and expand the Nutrient Credit programs in Virginia have completed the public comment process and are being revised accordingly; permits consistent with the Bay TMDL have been issued or drafted for all MS4s; and, the study of the James River chlorophyll-a water quality criteria is progressing.







For additional information on the Chesapeake Bay TMDL, associated implementation efforts and progress, please visit the following websites:

DEQ: http://www.deq.virginia.gov/Programs/Water/ChesapeakeBay.aspx.

ChesapeakeStat: http://stat.chesapeakebay.net/?q=node/130&quicktabs_10=4.

Development of TMDL reports, implementation plans, and implementation projects

2015 Progress Report: Development of Total Maximum Daily Load Reports

As of September 2015, 36 TMDL equations have been EPA approved in 2015 and another 21 are complete and will be submitted to EPA following State Water Control Board approval.

Based on the 2012 Integrated Report, Virginia estimates that over 1000 impaired waters will require TMDL development in the coming years. To maintain a robust pace of TMDL development with level funding, Virginia has developed several strategies including:

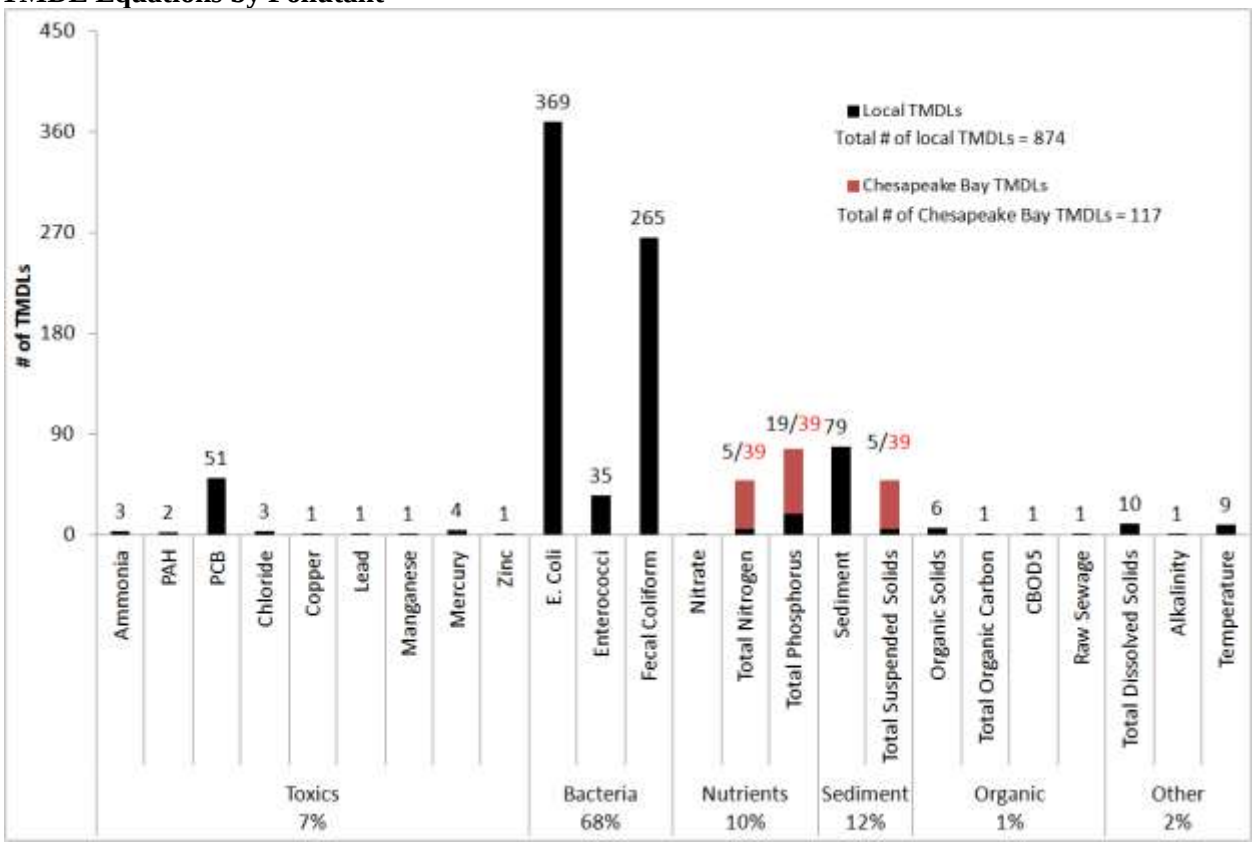
a) Developing TMDLs using a watershed approach to address multiple impairments in watersheds with similar characteristics;
b) Developing TMDLs in-house;
c) Identifying non-TMDL solutions, such as straight to implementation, to address impairments;
d) Developing TMDLs that are more easily implemented.

Virginia continues to explore tools and options for restoring and protecting water quality, both for environmental benefit and efficient program management.

Starting in the winter of 2014, states, including Virginia, began prioritizing impaired waters for TMDL or TMDL alternative development for the approaching six year window (2016-2022). DEQ embarked on data analysis to identify high priority watersheds, particularly those that appear to be valued for the impaired designated use. All of the prioritized watersheds for TMDL or TMDL alternative development were reviewed by field staff based on practical considerations such as existing monitoring plans, watershed characteristics, and stakeholder participation. The impairments prioritized totaled 355 aquatic life use impairments, 313 recreational use impairments, 16 shellfishing use impairments, and 224 fish consumption use impairments (due to PCB). These priorities were public noticed on July 27, 2015 with the public comment period lasting 30 days.

The figure below shows the number of TMDL equations by pollutant set across Virginia since the inception of the TMDL program. Watersheds are prioritized for TMDL development based on risk, public interest, available monitoring, regional input, and available funding. TMDL development schedules are developed about every two years, and posted on Virginia's TMDL website: http://www.deq.virginia.gov/Programs/Water/WaterQualityInformationTMDLs/TMDL/TMDLDevelopment.aspx.

TMDL Equations by Pollutant[1]



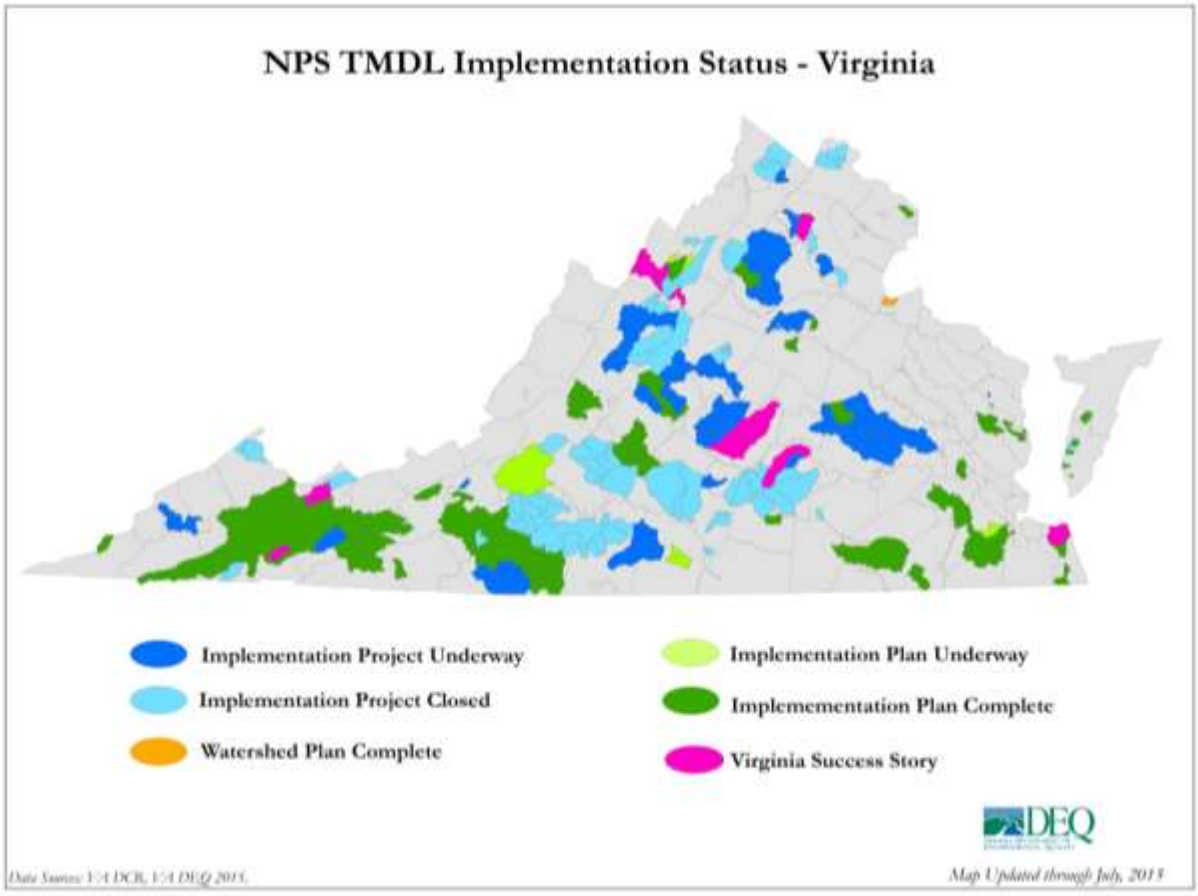
2015 Progress Report: Development of TMDL Implementation Plans

Once a TMDL is developed the study report is submitted to EPA for approval. Virginia law (1997 Water Quality Monitoring, Information, and Restoration Act, §§ 62.1- 44.19:4 through 19:8 of the *Code of Virginia*, or WQMIRA) requires the development of a TMDL implementation plan (IP) after a TMDL is developed and approved. There is no mandated schedule for IP development; however, local or state agencies, as well as community watershed groups, can take the lead in developing TMDL implementation plans. The IP describes the measures that must be taken to reduce pollutant levels in the stream and includes a schedule of actions, costs, and monitoring. DEQ, along with other agency and non-agency partners, continues to develop TMDL implementation plans and to execute these plans throughout Virginia. In FY 2015, DEQ and other partners developed 6 IPs covering 81 impaired segments. In addition, 7 IPs covering 27 impairments were under development, but were not completed or approved by the end of the fiscal year. Since 2000, Virginia has completed 78 IPs, addressing 435 impairments.

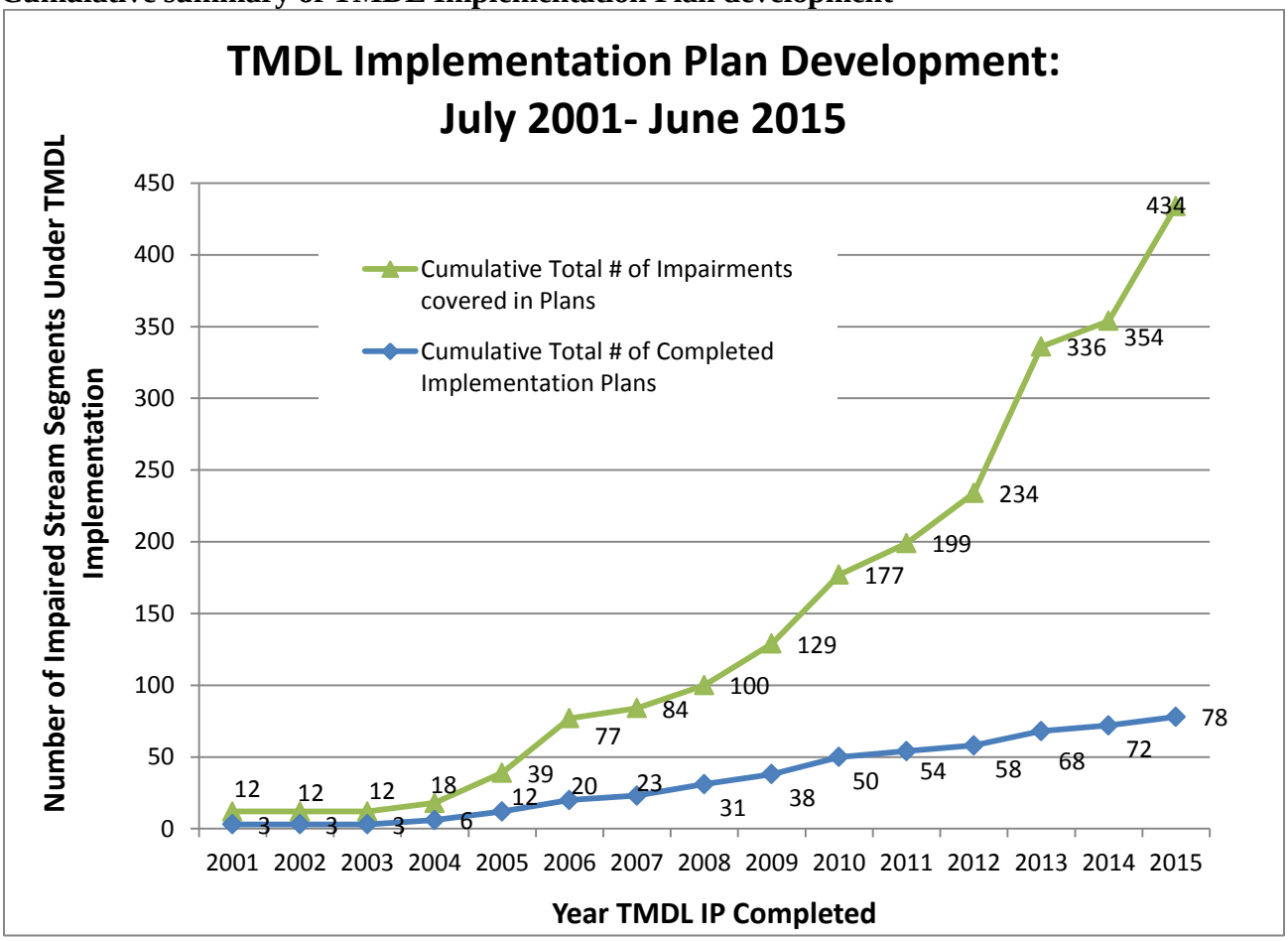
The map below shows the location of TMDL implementation planning and projects by watershed in Virginia since 2001, while the graph below summarizes implementation planning progress since 2001. A summary of completed TMDL implementation plans is provided in the table below.

[1] The graph includes TMDL equations reported previously and newly adopted equations, as well as corrections. The corrections reflect an internal review of the Water Quality Management Planning Regulation (9 VAC 25-720) that occurred in December, which resulted in changes to the number of TMDL equations by pollutant (e.g. PCBs, E. coli).

Status of NPS TMDL Implementation Planning by Watershed in Virginia as of June 2015



Cumulative summary of TMDL Implementation Plan development



Completed TMDL Implementation Plans, January 2001- June 2015

Watershed (# of impairments / # of impaired segments)	Location (county or city)	Impairment	Lead	Completion date
Middle Fork Holston (3/3)	Washington	Bc	DCR	2001
North River (Muddy, Lower Dry, Pleasant, and Mill Creek) (5/4)	Rockingham	Bc, Be	DCR	2001
Upper Blackwater River (4/4)	Franklin	Bc	DCR	2001
Catoctin Creek (4/4)	Loudoun	Bc	DCR	2004
Holmans Creek (2/2)	Shenandoah	Bc, Be	DCR	2004
Four Mile Run (1/1)	Arlington, Alexandria	Bc	DEQ	2004
Willis River (1/1)	Cumberland, Buckingham	Bc	DCR	2005
Chowan Study Area (9/9)	Multiple Counties	Bc	DEQ	2005
Moores Creek (1/1)	Charlottesville, Albemarle	Bc	DEQ	2005
Guest River (5/5)	Wise, Scott, Dickenson	Be	DEQ	2005
Lower Blackwater, Maggoddee and Gills Creek (3/3)	Franklin	Bc	DCR	2005
Lynnhaven (shellfish) (2/2)	VA Beach	Bc	DEQ	2005
Cooks Creek and Blacks Run (6/2)	Rockingham, Harrisonburg	Bc, Be	DCR	2006
Thumb, Deep, Carter and Great Runs (4/4)	Fauquier, Stafford	Bc	DCR	2006
Big Otter (8/8)	Bedford, Campbell	Bc	DCR	2006
Mill and Dodd Creeks (2/2)	Floyd, Montgomery	Bc	DCR	2006
Little and Beaver Creek (3/2)	Bristol, Washington	Bc, Be	DCR	2006
Stroubles Creek (1/1)	Montgomery	Be	DEQ	2006
Back Creek (2/1)	Pulaski	Bc, Be	DEQ	2006
Abrams and Opequon Creek (8/5)	Frederick, Winchester	Bc, Be	DEQ	2006
Knox and PawPaw Creek (4/2)	Buchanan	Bc, Be	DEQ	2007
Hawksbill and Mill Creek (2/2)	Page	Bc	DCR	2007
Looney Creek (1/1)	Botetourt	Bc	DCR	2007
Upper Clinch River (1/1)	Tazewell	Be	DCR	2008
Occahannock Creek (shellfish) (1/1)	Accomack	Bc	DCR	2008
Falling River (1/1)	Campbell, Appomattox	Bc	DCR	2008
Dumps Creek (2/1)	Russell	TSS, TDS	DEQ	2008
Bluestone River (1/2)	Tazewell, Bluefield	Bc, Be (sed)	DCR	2008
Smith Creek (1/2)	Rockingham, Shenandoah	Bc, Be (sed)	DEQ	2008
Appomattox River – Spring Creek, Briery Creek, Bush River, Little Sandy River and Saylers Creek (5/5)	Prince Edward, Amelia	Bc	DCR	2008
Appomattox River – Flat, Nibbs, Deep and West Creeks (4/4)	Amelia, Nottoway	Bc	DCR	2008
Straight Creek, Stone Creek and Tributaries (3/3)	Lee	Bc, Be (sed)	DEQ	2009
Long Glade Run, Mossy Creek and Naked Creek (5/3)	Augusta, Rockingham	Bc, Be (sed)	DCR	2009
Back Bay Watershed (1/1)	City of Virginia Beach	Bc	DEQ	2009
North Landing Watershed (4/4)	City of Virginia Beach	Bc	DEQ	2009
Pigg River and Old Womans Creek (8/8)	Franklin, Pittsylvania	Bc	DEQ	2009
Cub, Turnip, Buffalo and UT Buffalo Creeks (4/4)	Appomattox, Charlotte	Bc	DCR	2009
Hazel River Watershed (4/4)	Culpeper, Madison, Rappahannock	Bc	DCR	2009
Greenvale Creek, Paynes Creek and Beach Creek (shellfish)(3/2)	Lancaster	Bc	DCR	2010
Ash Camp and Twitty's Creek (2/2)	Charlotte	Be (sed)	DCR	2010
Upper & Lower Middle River, Moffett Creek & Polecat Draft (7/5)	Augusta	Bc, Be (sed)	DCR	2010
Mill and Powhatan Creek (2/2)	James City County	Bc	DEQ	2010
Lewis Creek (1/1)	Russell	Be (sed)	DCR	2010

Watershed (# of impairments / # of impaired segments)	Location (county or city)	Impairment	Lead	Completion date
Browns, Craig and Marsh Runs (3/3)	Fauquier	Bc	DCR	2010
Little Dark Run and Robinson River (3/3)	Culpeper & Madison	Bc	DCR	2010
Rock Island, Austin, Frisby, Troublesome Creeks, North and Slate Rivers (6/6)	Buckingham	Bc	DCR	2010
Hays, Moffatts, Otts and Walker Creeks (4/4)	Augusta & Rockbridge	Bc	DCR	2010
Christians Creek and South River (6/3)	Augusta & Waynesboro	Bc, Be (sed)	DCR	2010
South James River, Ivy, Tomahawk, Burton, Judith, Fishing, Blackwater and Beaver Creeks (8/8)	Campbell, Bedford, Amherst, Lynchburg	Bc	DEQ	2010
Nansemond River, Shingle Creek (3/3)	Suffolk	Bc	DEQ	2010
Cherrystone Inlet, Kings Creek (shellfish) (1/1)	Northampton	Bc	DCR	2011
Roanoke River Watersheds – Upper Banister River and Stinking River, Bearskin, Cherrystone and Whitethorn Creeks (5/5)	Pittsylvania	Bc	DCR	2011
York Basin Watersheds – Beaver Creek, Goldmine Creek, Mountain Run, Pamunkey Creek, Plentiful Creek, Terry's Run (6/6)	Louisa, Orange, Spotsylvania	Bc	DCR	2011
James River Watersheds- James River and Bernards, Powhite Reedy, Gilles, Almond, Goode, Falling and Noname Creeks (10/10)	Chesterfield, Powatan, Henrico, Richmond	Bc	DEQ	2011
Little River Watershed – Little River, Meadow Run, Pine, West Fork Dodd, Dodd, Meadow, Brush, Laurel, Big Indian Creeks (26/26)	Montgomery & Floyd	Bc, Be (sed), Temp	DEQ	2012
Clinch River; Coal, Middle, and Plum Creeks (7/7)	Tazewell	Bc, Be (sed)	DEQ	2012
Hoffler Creek (1/1)	Suffolk & Portsmouth	Bc	DEQ	2012
Mill Creek (1/1)	Northampton	Be (DO, pH)	DEQ	2012
Lower Banister River, Polecat Creek and Sandy Creek (3/3)	Halifax, Pittsylvania	Bc	DCR	2013
Middle Fork Holston River & Wolf Creek (8/6)	Abingdon, Smyth, Washington, Wythe	Bc, Be (sed)	DCR	2013
Spout Run (4/3)	Clarke	Bc, Be (sed)	DCR	2013
Piankatank River, Milford Haven, Gwynns Island (17/16)	Matthews, Middlesex, Gloucester	Bc	DCR	2013
Mill Creek, Cove Creek, Miller Creek, Stony Fork, Tate Run, S.F. Reed Creek, Reed Creek (9/9)	Wythe	Bc	DEQ	2013
Beaverdam, Boatswain Creek, Chickahominy River, Collins Run, Stony Run (5/5)	Hanover, Henrico, Charles City, Richmond	Bc	DEQ	2013
Rockfish River (4/4)	Nelson	Bc, Be (sed)	DEQ	2013
South Fork Mayo River, North Fork Mayo River, Blackberry Creek, Smith Creek, Marrowbone Creek, Leatherwood Creek (8/8)	Henry, Patrick, and City of Martinsville	Bc	DEQ	2013
Darden Mill Run, Mill Swamp, Three Creek (9)	Brunswick, Greensville & Southampton	Bc	DEQ	2013
North Fork Holston River (35/35)	Scott, Washington, Smyth, Russell, Bland, Tazewell	BC, Temp	DEQ	2013
Linville Creek (2/1)	Rockingham, Broadway	Bc, Be (sed)	DEQ	2014
Wards Creek, Upper Chippokes Creek, Western Run, Crewes Channel, West Run, James River (6/6)	Charles City, Henrico & Hanover	Bc	DEQ	2014
Elk and Cripple Creek (2/2)	Grayson & Wythe	Bc	DEQ	2014
Tye River, Hat Creek, Rucker Run, Piney River, Mill Creek, Turner Creek, Rutledge Creek, Buffalo River (8/8)	Amherst, Nelson	Bc,	DEQ	2014
Roanoke River Watersheds – South Fork, Smith Creek,	Botetourt, Montgomery,	Bc, Be (sed)	DEQ	2015

Watershed (# of impairments / # of impaired segments)	Location (county or city)	Impairment	Lead	Completion date
Bradshaw, North Fork, Wilson Creek, Mud Lick Creek, Mason Creek, Murray Run, Ore Branch, Perters Creek, Roanoke River, Carvin Creek, Glade Creek, Laymantown Creek, Tinker Creek, Back Creek (55)	Roanoke, Roanoke City, Salem, Town of Vinton			
Mattawoman, Hungars, UT-Hungars, Barlow, Jacobus, The Gulf (6/6)	Northampton	Bc	DEQ	2015
Colliers Creek, North Fork Buffalo Creek, South Fork Buffalo Creek, Buffalo Creek, Cedar Creek (5/5)	Rockbridge	Bc	DEQ	2015
Crab Creek (2/1)	Town of Christiansburg, Montgomery County	Bc, Be (sed)	DEQ	2015
Fairview Beach (1/1)	King George	Bc	DEQ	2015
Chestnut Creek (2/2)	Carroll & Grayson, Town of Galax	Bc, Be (sed)	DEQ	2015
Turley Creek, Long Meadow (2/2)	Rockingham	Be (sed)	DEQ	UD
Moore's Creek, Lodge Creek, Meadows Creek and Schenks Branch (4/4)	Albemarle and Charlottesville	Be (sed)	DEQ	UD
Chuckatuck Creek, Brewers Creek (2/2)	Suffolk	Bc	DEQ	UD
Banister River, Winn Creek (3/3), Terrible Creek	Town of Halifax, Halifax	Bc	DEQ	UD
Roanoke River Watersheds – North Fork Roanoke River, South Fork Roanoke River, Bradshaw Creek, Wilson Creek (4/4)	Floyd, Montgomery, Roanoke	Bc, Be (sed)	DEQ	UD
Hardware River (2/2)	Albemarle, Fluvanna	Bc	DEQ	UD
Upper Rapidan River Watersheds - Garth Run, UT Rapidan River, Rapidan River, Beautiful Run, Rapidan River, UT Rapidan River, Poplar Run, Blue Run, Marsh Run, Rippin Run (10/10).	Albemarle, Greene, Madison. Orange	Bc	DEQ	UD
Total IPs Completed: 78 Plans, 425 Impairments; Total IPs Under Development (UD): 8 IPs,37 impairments. *Impairment types: Bc = bacteria, Be = Benthic, TSS = Total suspended solids, TDS = Total dissolved solids, Sed = sediment*				

2015 Progress Report: Watershed Restoration and TMDL Implementation

The goal of the TMDL Implementation Program is to implement targeted, on-the-ground activities, identified in TMDL implementation plans, which will result in water quality improvements and subsequent delisting of impaired streams. Virginia uses a staged approach that provides opportunities for periodic evaluation of the effectiveness of the implementation actions and adjustment of efforts to achieve water quality objectives in a timely and cost-effective manner. Virginia's TMDL Implementation Program was developed by DCR in 2001 and has been funded by a mix of federal and state funds. In June 2013 the responsibility for program administration was moved to DEQ. Since 2001 the program has provided federal and state resources to 48 watersheds with TMDL implementation plans.

From July 1, 2014 through June 30, 2015, DEQ and DCR managed 27 implementation projects supported by federal EPA §319(h) grants, and/or state VNRCF. Collectively these projects spent $2,604,763 on 373 BMPs installed in TMDL watersheds. In addition DCR administered federal EPA Chesapeake Bay Implementation Grants (CBIG) and Virginia Agricultural Cost Share funds to install 430 additional BMPs in 34 TMDL Watersheds (15 new watersheds and 19 watersheds with existing TMDL projects). In Fiscal Year 2015 a total of 41 TMDL Implementation Watersheds saw BMP activity resulting in a total of 803 BMPs installed for a total of $9,790,177 of Federal and State funds and landowner contributions.

Summary of Targeted TMDL Implementation Projects in Virginia: July 2005-June 2015

Watershed Area	TMDL Segment	Years of Implementation and Funding
27 Projects in 2015 that actively receiving targeted TMDL funds either from Federal §319(h) (19 projects), or only State WQIF/VNRCF (8 projects) for both BMP installation and technical assistance		
Willis River	VAC-H36R	§319(h): 2005-2015
Thumb, Great, Carter and Deep Runs	VAN-E01R, E02R & E10R	§319(h):2006-2015, VNRCF: 2011-2015)
Upper Hazel River	VAN-E03- 05R	§319(h):2009-2015, VNRCF: 2011-2015), WQIF RFP: 2007-2009
Craig Run, Browns Run and Marsh Run	VAN-E08R	§319(h)/VNRCF:2012-2015:, VNRCF-CBLEI (2011)
Smith Creek	VAV-1347R	§319(h) (2012-2015), NRCS (2008+)
Slate River and Rock Island Creek		§319(h): 2010-2015
Guest River	VAS-P11R	§319(h)/VNRCF: 2012-2015:
Lewis Creek	VAS-P04R	§319(h)/VNRCF: 2012-2015:
Upper York River	VAN-F06R, F07R	§319(h): 2012-2015,VNRCF: 2012-2015:
Hays, Moffats, Otts, and Walker Creeks	VAN-I34R	§319(h): 2012-2015,VNRCF: 2012-2015:
Knox and Pawpaw Creek	VAS-Q03R	§319(h)/VNRCF: 2012-2014:
Rockfish River	VAV-H09-10R, H13R	§319(h): 2013-2015
Spout Run	VAV-B57R	§319(h): 2014-2015
South Mayo River and North Fork Mayo River	VAW-L43R	§319(h)(2014+), VNRCF (2012-2015)
Lower Banister River	VAC-L67R, L70R, L71R	§319(h)(2014+), VNRCF (2012-2015)
James River	VAP-G01R, H39R	§319(h): 2014-2015
Middle Fork Holston River	VAS-O03R	§319(h): 2014-2015
Stroubles Creek	VAW-N22R	§319(h)(2014-2015), WQIF RFP: (2006-2008):
Greenvale, Payne and Beach Creeks	VAN-E25R	§319(h): 2014-2015
Falling River	VAW-L34R	WQIF/VNRCF: 2007-2015 – Agriculture only
Cub, Turnip and Buffalo Creeks	VAC-L36R, L37R,	WQIF/VNRCF: 2007-2015– Agriculture only
Pigg River	VAW-L13R- L18R	WQIF/VNRCF: 2007-2015– Agriculture only
Flat, Nibbs, Deep and West Creeks	VAP-J08-09R, J11R	WQIF/VNRCF: 2007-2015– Agriculture only
Moffett Creek, Middle River, Polecat Draft	VAV-B10, B13, B15	WQIF/VNRCF: 2007-2015– Agriculture only
Christians Creek and South River	VAV-B14, B30	WQIF/VNRCF: 2007-2015– Agriculture only
Briery, Little Sandy, Spring, Saylers Creeks and Bush River	VAC-J02- J06R	WQIF/VNRCF: 2007-2015– Agriculture only
Upper Bannister River	VAC-L65, L66, L68, L69	VNRCF: 2012-2015– Agriculture only
Federal EPA Nonpoint Source Implementation Grant (319h); Watershed Improvement Fund Request for Proposals (WQIF RFP), State Virginia Natural Resources Commitment Fund (VNRCF), Virginia Natural Resources Commitment Fund - Chesapeake Bay Livestock Exclusion Initiative (VNRCF- CBLEI)		

Aside from the 27 TMDL implementation projects that received targeted TMDL funding in FY15, there are 14 TMDL implementation watershed areas that historically received funding and continued to implement agricultural BMPs funded through the DCR's Virginia Agricultural Cost-share Program.

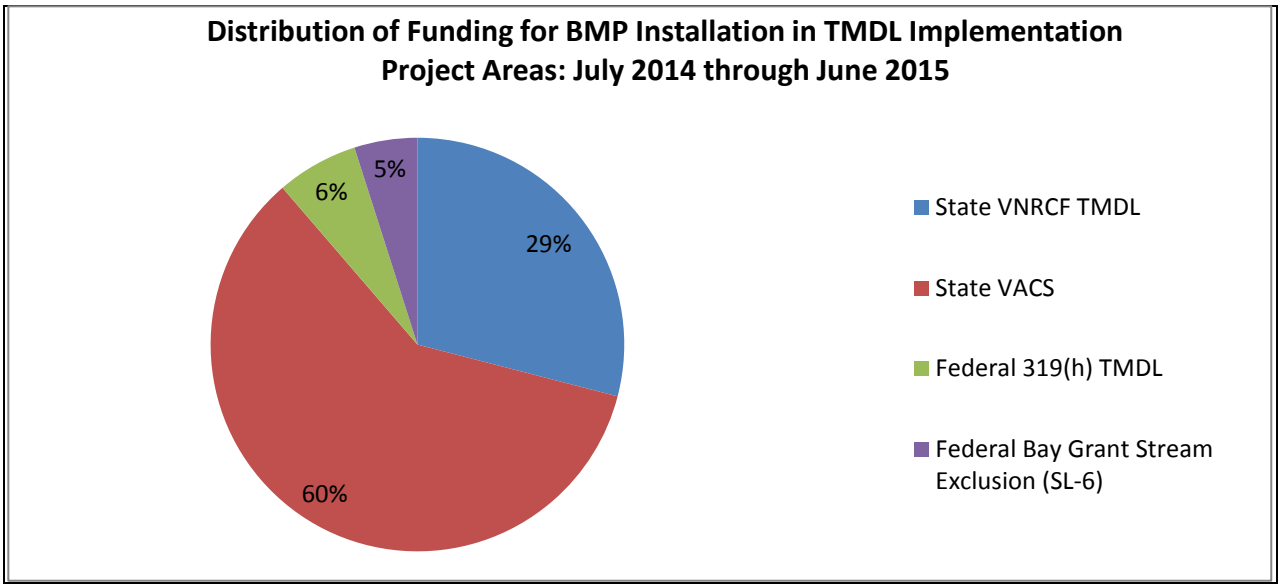
Past TMDL Implementation Projects with Continued Implementation Activity during FY15

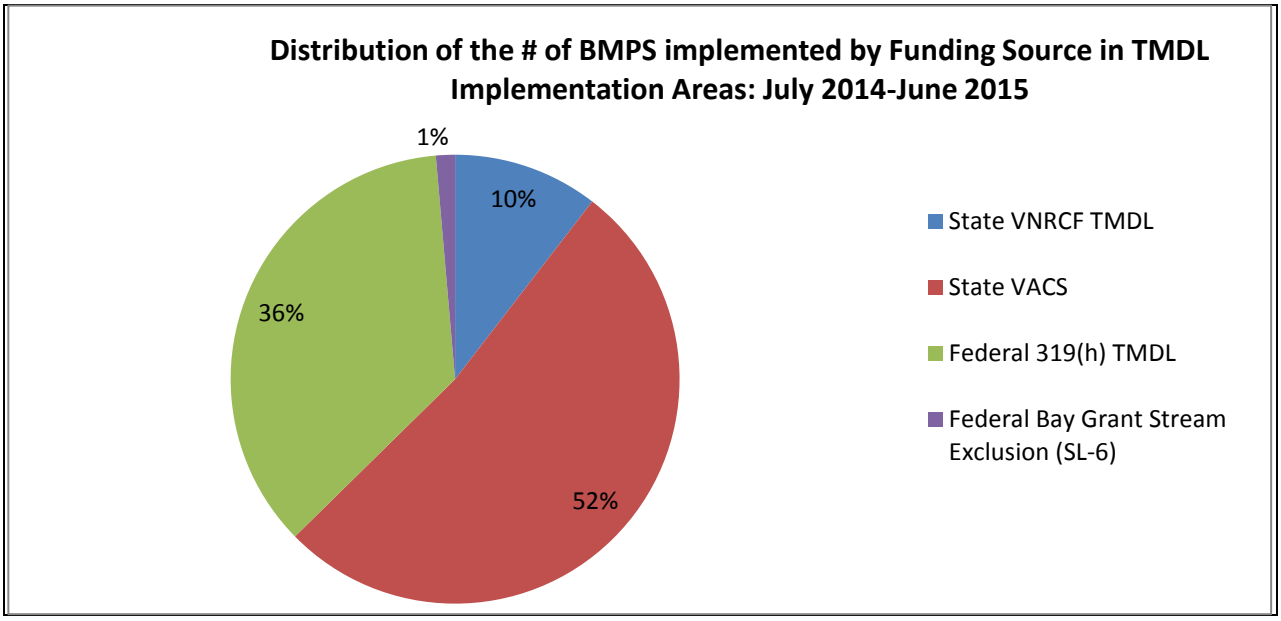
Funding of Implementation

As the agency taking the lead in nonpoint TMDL watershed implementation during FY15, DEQ utilizes both federal 319(h) and Chesapeake Bay Implementation Grant Program grant funds to pay for DEQ regional staff that provides project management and technical support to watershed stakeholders implementing these projects. In addition, Virginia runs a comprehensive cost-share program for BMP implementation utilizing both federal (§319(h) and CBIG) grants and state resources (from the Water Quality Improvement Fund, the Virginia Natural Resources Commitment Fund and the Virginia Agricultural Cost-Share program). A summary of funding for BMP implementation in TMDL Watershed areas expended in FY15 is provided below.

Summary of BMP implementation funding in TMDL Watersheds: July 2014 – June 2015

Funding Source	# of BMPs Installed	$ of Cost-share Paid	$ of Landowner contribution and/or match
State VNRCF TMDL	84	$ 2,135,428	$ 335,280
State VACS	419	$ 4,388,439	$ 1,766,379
Federal 319(h) TMDL	289	$ 469,335	$ 318,785
Federal Bay Grant Stream Exclusion (SL-6)	11	$ 362,505	$ 14,026
TOTALS	**803**	**7,355,706**	**$ 2,434,471**
Chesapeake Bay Watershed	607	$ 3,189,426	$41,609,646
Waters Outside the Chesapeake Bay Watershed	196	$4,166,280	$824,825
TOTALS	**803**	**$ 7,355,706**	**$ 2,434,471**


Distribution of Funding for BMP Installation in TMDL Implementation Project Areas: July 2014 through June 2015
29%
60%
6%
5%
State VNRCF TMDL
State VACS
Federal 319(h) TMDL
Federal Bay Grant Stream Exclusion (SL-6)


Distribution of the # of BMPS implemented by Funding Source in TMDL Implementation Areas: July 2014-June 2015
10%
52%
36%
1%
State VNRCF TMDL
State VACS
Federal 319(h) TMDL
Federal Bay Grant Stream Exclusion (SL-6)

Summary of cost-share funds spent on implementation by TMDL watershed: July 2014 – June 2015

TMDL Implementation Project Areas	# of BMPs	Amount of Cost-share Paid[1]	Match (Landowner or Other)
Beaver Creek and Little Creek[2]	9	$ 6,410	$ -
Big Otter River Watershed[2]	19	$ 1,244,733	$ 329,218
Blackwater River[2]	7	$ 196,475	$ 5,583
Carter Run, Great Run, Deep Run and Thumb Run	11	$ 168,841	$ 45,885
Catoctin Creek[2]	8	$ 94,717	$ 2,521
Christians Creek and South River Watersheds	26	$ 172,110	$ 18,917
Clinch River - Bacteria	13	$ 612,963	$ 54,331
Cooks Creek and Blacks Run[2]	18	$ 11,134	$ 7,642
Craig Run, Marsh Run and Browns Run	13	$ 196,645	$ 26,647
Cub Creek, Turnip Creek, Buffalo Creek and UT to Buffalo Creek	6	$ 181,135	$ 9,458
Falling River	7	$ 231,724	$ 817
Flat, Nibbs, Deep and West Creeks	16	$ 250,455	$ 55,944
Greenvale and Beach Creeks	8	$ 2,935	$ -
Guest River	12	$ 65,997	$ 1,721
Hawksbill Creek and Mill Creek[2]	18	$ 34,358	$ 132,089
Hays and Moffatts Creeks	18	$ 107,752	$ 17,430
Holmans Creek[2]	4	$ 340,329	$ 249,619
James River (Slate River) Watershed	17	$ 49,256	$ 24,593
Knox Creek and Pawpaw Creek	2	$ 4,118	$ 4,117
Lewis Creek	6	$ 299,192	$ 51,516
Looney Creek[2]	2	$ 86,497	$ -
Lower Banister above Banister Lake in Halifax County	6	$ 136,114	$ 6,682
Lower Blackwater River, Maggodee and Gills Creek	6	$ 332,755	$ 183,869
Middle Fork Holston River Watershed	66	$ 235,239	$ 23,150
Middle River and Moffett Creek	41	$ 295,084	$ 95,407
Moores Creek[2]	2	$ 78,238	$ 2,815
Mossy Creek, Naked Creek and Long Glade Run[2]	27	$ 74,320	$ 17,655
North and South Fork Mayo River in Patrick County	18	$ 115,069	$ 80,942
North River Watershed, Mill Creek, Pleasant Run and Dry[2]	49	$ 98,396	$ 76,391
Pigg River and Old Womans Creek Watersheds	11	$ 269,338	$ 71,992
Robinson River, Little Dark Run[2]	15	$ 228,131	$ 5,242
Rockfish River Watershed	23	$ 59,036	$ 36,939
Smith Creek Watershed	130	$ 126,022	$ 369,607
Spout Run and Page Brook	7	$ 27,147	$ 84,074
Spring Creek, Briery Creek, Bush River, Little Sandy River and	9	$ 113,292	$ 75,746
Upper Banister River Watershed	7	$ 219,562	$ 1,430
Upper Clinch River[2]	1	$ 15,455	$ -
Upper Hazel River	60	$ 142,940	$ 63,884
Upper York River Basin	67	$ 393,895	$ 180,982
Willis River Watershed	18	$ 37,895	$ 19,619
Totals	**803**	**$ 7,355,706**	**$ 2,434,471**

1- Funds are a combination from DEQ (Federal Section 319(h) and Chesapeake Bay Implementation Grant, CBIG) and DCR (State Water Quality Improvement Fund-Virginia Natural Resource Commitment Fund)
2- Project is closed relative to 319(h) funding, however additional implementation continued this reporting cycle through VACS or CBIG funding.

BMP Implementation and Pollutant Reductions

Tracking both BMP implementation and water quality improvements in TMDL watersheds is critical in measuring success of the TMDL program. BMPs are effective and practical ways to prevent or reduce pollutants from nonpoint sources to protect and restore water quality. While highly effective BMP tracking programs are in place to account for BMPs installed using state or federal cost share funds, tracking BMPs installed voluntarily (without government assistance) has proven challenging. DEQ, along with partner agencies, are planning mechanisms by which voluntary practices can be accounted for; however, BMP implementation and associated pollutant reductions reported to date are mostly practices installed with government cost share funds.

From January 1, 2014 through June 30, 2015, there were 40 watershed implementation plan project areas where 803 BMPs were installed. Of these projects, there were 27 active TMDL implementation projects supported by federal EPA §319(h) funding and/or state TMDL funding. Collectively these projects implemented 373 agricultural and residential septic BMPs. In addition funding from the Federal EPA CBIG program and the state funded Virginia Agricultural Cost-share program installed 430 agricultural BMPs. These actions resulted in over 656,171 linear feet of stream exclusion, and the reduction of 418,151 pounds of nitrogen, 85,985 pounds of phosphorous, 76,558 tons of sediment, and 2.966E+16 colony forming units (CFU) of fecal coliform bacteria.

The tables below provides a summary the pollutant reductions achieved and associated funding source for BMPs installed in TMDL watersheds as well as a distribution of the type of BMPs installed.

Summary of Pollutants Reduced from 7/1/2014 - 6/30/2015 through TMDL Implementation

Data	Federal 319(h)	State VNRCF	State VACS	Federal CBIG	Grand Total
Number of BMPS Installed	289	84	419	11	**803**
Total Pounds Nitrogen Reduced	6,614	23,951	385,431	2,155	**418,151**
Total Pounds Phosphorus Reduced	831	4,680	80,121	353	**85,985**
Total Tons Sediment Reduced	907	4,403	70,851	396	**76,558**
Total of Bacteria Reduced (cfu)	3.018E+15	8.306E+15	1.751E+16	8.230E+14	**2.966E+16**

Summary of BMP Implementation for TMDL Projects from 7/1/14-6/30/15

Practice	Practice Description	# of BMPs	Extent of BMP Installed	Units
FR-1	Aforestation of erodible crop and pastureland	7	54	Acres
FR-3	Woodland buffer filter area	3	2	Acres
LE-1T	Livestock Exclusion with Riparian Buffers for TMDL Imp.	8	12,320	Lin. Feet
LE-2/LE-2T	Livestock Exclusion with Reduced Setback	4	14,000	Lin. Feet
RB-1	Septic Tank Pumpout	227	228	System
RB-3	Septic System Repair	23	23	System
RB-4	Septic System Replacement	17	17	System
RB-4P	Septic System Installation/Replacement with Pump	3	3	System
RB-5	Installation of Alternative Onsite Sewage System	2	2	System
SL-1	Long Term Vegetative Cover on Cropland	35	550	Acres
SL-10T	Pasture Management	5	196	Acres
SL-6/SL-6T	Stream Exclusion With Grazing Land Management	179	624,056	Lin. Feet

SL-8B	Small Grain and Mixed Cover Crop for Nutrient Management and Residue Management	163	6,481	Acres
SL-8H	Harvestable Cover Crop	111	4,041	Acres
WP-2/WP-2T	Streambank protection (fencing)	4	5,075	Lin. Feet
WP-2A	Streambank Stabilization	1	720	Lin. Feet
WP-4	Animal waste control facilities	9	9	System
WP-4B	Loafing lot management system	2	2	System
Grand Total		**803**	**n/a**	
Total of Linear Feet of Stream Exclusion or Streambank protection		**196**	**656,171**	**Linear feet**

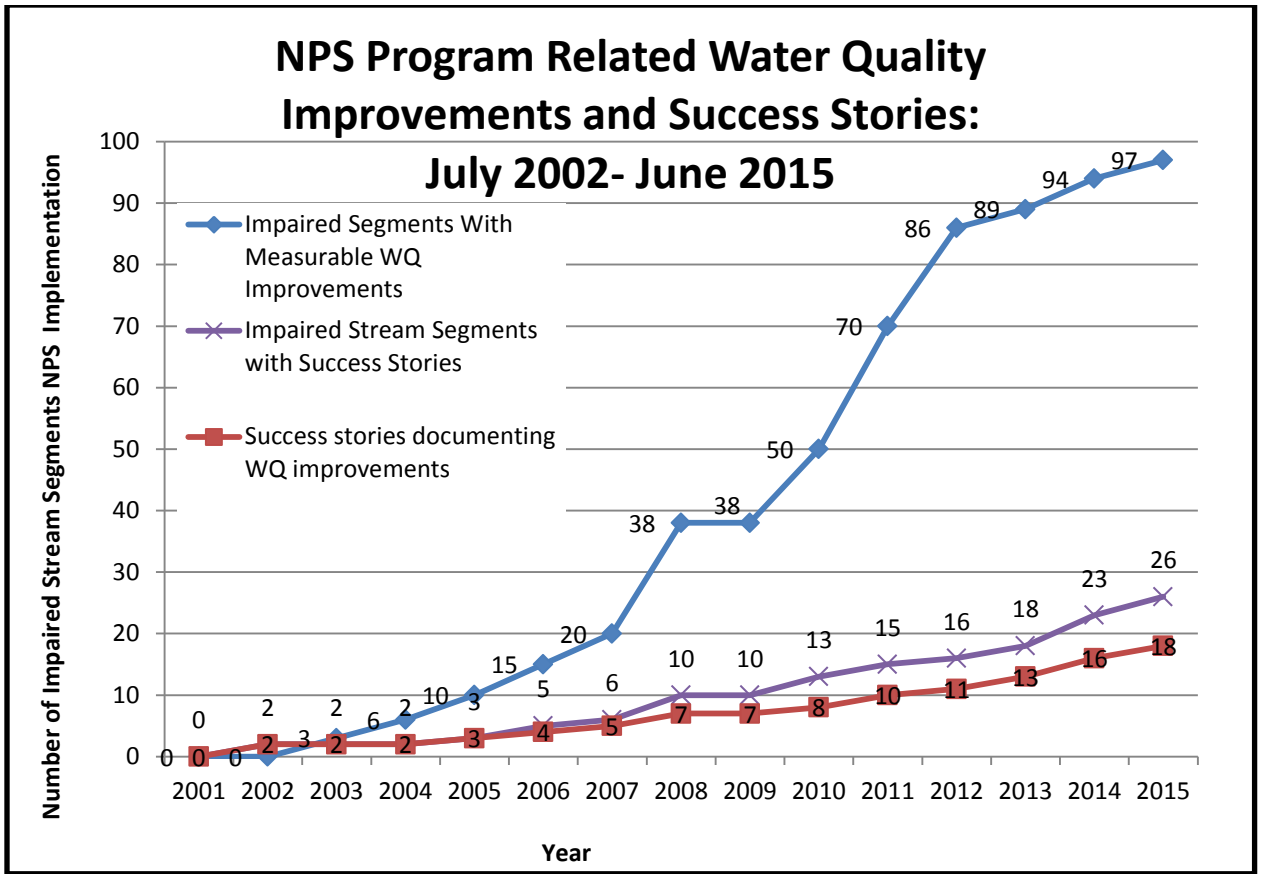
Virginia Water Quality Improvements and Success Stories

The success of Virginia's Nonpoint Source Management Program and the TMDL Implementation Program is also documented by describing improving water quality conditions via NPS Success Stories. Through Section 319 Nonpoint Source Success Stories, EPA and DEQ document progress of partially or fully restoring waterbodies associated with NPS implementation actions.

Since 2002 Virginia's Nonpoint Source Management Program and associated TMDL Implementation Program and its partners have written 18 success stories that address delisting and/or water quality improvement of 26 impaired stream segments. These stories are classified into two types: Type 1 stories are related to partial or full restoration (delisting of impairments), Type 2 indicates significant water quality improvement.

Type	*# Segments delisted or WQ improved*	*Name of Success Story*	*Year*	*Topic*
2	1	Cabin Branch Mine Orphaned Land Project	2001	Mining
2	1	Toncrae Mine Orphaned Land Project	2002	Mining
2	1	Middle Fork Holston River (Three Creeks)	2005	TMDL Implementation
2	2	Muddy Creek and Lower Dry River	2006	TMDL Implementation
1	1	Batie Creek	2007	Karst Program
1	3	Lynnhaven, Broad and Linkhorn Bays	2008	Shellfish
2	1	Valzinco Mine Orphaned Land Project	2008	Mining
1	3	Willis River	2010	TMDL Implementation
1	1	Middle Creek	2011	Mining
2	1	Black Creek	2011	Mining
1	1	Muddy Creek	2012	TMDL Implementation
2	1	Carter Run	2013	TMDL Implementation
2	1	Flat Creek	2013	TMDL Implementation
1	1	Clinch River (Published 2015)	2014	TMDL Implementation
1	2	Cub Creek (Published 2015)	2014	TMDL Implementation
1	2	Byers and Hutton Creeks (Published 2015)	2014	TMDL Implementation
1	1	Little Sandy Creek	2015	TMDL Implementation
1	2	Blackwater River (submitted)	2015	TMDL Implementation
Total	26			


Virginia Success Stories 2002 - Present
DEQ
August 2015



2015 Progress Report: Healthy Waters Strategy

The Commonwealth of Virginia defines ecologically healthy watersheds as those that maintain high ecological integrity when viewed in a holistic assessment approach that addresses in-stream habitat, stormwater inputs, invasive species and natural flows. The role of Virginia's Department of Conservation and Recreation, Division of Natural Heritage (DNH) is the identification and protection of aquatic and terrestrial communities and rare plant and animal species that contribute important ecosystem services or represent significant ecological resources. Virginia is a member of the NatureServe Natural Heritage Network, which draws upon resources throughout the Western Hemisphere to advance biodiversity conservation and shares Virginia conservation information and successes throughout the Hemisphere. Virginia has a well established record of identifying and achieving protection for rare species and terrestrial communities. The Healthy Waters Program (HWP) at DNH, in collaboration with Virginia Commonwealth University, is an important step in aquatic community identification and conservation. The challenges associated with these important efforts, specifically as they relate to aquatic communities, include:

1) Development and application of objective, quantitative, and diagnostic stream assessment protocols;
2) Defining a set of measurable and appropriate stream conditions, based on empirical data, as goals for protection efforts; developing consistent statewide assessments to identify communities with intact aquatic integrity; and developing a resampling protocol and schedule for assessing existing resources to identify long term changes and track trends in protection and identification of ecologically healthy resources.

These challenges are dependent on an understanding of, and comparison to, relevant reference conditions that describe accurately and quantitatively the ecological potential of streams and rivers within a specific region.

Traditionally, water quality based programs have emphasized the assessment of streams to determine if water bodies meet water quality standards with a subsequent restoration plan to improve degraded surface waters. While this is a critical activity to provide the Commonwealth a healthy ecosystem it is equally as important to seek viable opportunities for best management practices to protect streams that are already considered to have high aquatic, ecological integrity. It is economically and ecologically preferable to conserve and protect healthy ecosystems than to restore them after they have been damaged. Agricultural BMPs may serve a key role in the protection of healthy waters and healthy watersheds. The health of streams is tightly linked to the watersheds of which they are a part. There is a direct relationship between land cover, key watershed processes and the health of streams.

Virginia has more than 400 ecologically healthy streams, creeks and rivers throughout the state, and there are more to be identified. Healthy streams are identified by factors that include: high numbers of native species and a broad diversity of species, few or no non-native species, few generalist species that are tolerant of degraded water quality, high numbers of native predators, migratory species whose presence indicates that river or stream systems are not blocked by dams or other impediments, and low incidence of disease or parasites. The Healthy Waters Program uses high-quality archival data, combined with extensive, new data collected by the VCU stream assessment team, to develop a broad suite of georeferenced databases of aquatic resources, including fish and macroinvertebrate communities, instream and riparian habitat, and geomorphological data to provide the basis for community level identification and protection of critical resources. Healthy streams in Virginia have been identified and ranked through a stream ecological integrity assessment known as the **In**teractive **St**ream **A**ssessment **R**esource (INSTAR), http://instar.vcu.edu/ as "outstanding", "healthy", or "restoration candidate". INSTAR was originally designed to assist individuals with planning and land use decisions by identifying healthy streams in their communities and encouraging their protection.

The Healthy Waters Program has included a multiagency partnership from its inception. The Virginia Department of Conservation and Recreation, Division of Natural Heritage manages the Healthy Waters Program and provides program administration, data management, field data collection, oversight, and coordination with land trusts, local governments and others toward conservation of identified Healthy Waters. The Department of Environmental Quality has provided significant data and funding to support the Program and new partnerships with the Virginia Department of Forestry are being explored to broaden the applicability of the Program. Virginia Commonwealth University has provided significant technical, field data collection, model development and data management services. This partnership continues to grow a comprehensive aquatic resource assessment program to identify and protect the most biologically diverse and valuable aquatic resources in the Commonwealth.

The Virginia HWP has continued to represent the Commonwealth in the Chesapeake Bay Program Goal Implementation Team Four (GIT4; Healthy Watersheds). This working group has brought together the various state Healthy Waters programs in the Chesapeake Bay watershed and lead discussions to improve communication materials illustrating the location of identified healthy resources and to develop strategies to advance resource protection in the Chesapeake Bay. Additionally, the GIT4 provided guidance on the Goals for the Chesapeake Bay Agreement to meet the protection of Healthy Waters.

The HWP partnered with DEQ, VCU, EPA, the Albemarle-Pamlico National Estuary Program, the Nature Conservancy, and the North Carolina Department of Natural Resources to finalize the identification of areas for conservation in the Chowan basin. Using the INSTAR protocol, streams within these sub-basins were assessed and ranked based on ecological integrity by VCU, Center for Environmental Studies. A key component of the success of this pilot is the strong stakeholder network that has been engaged to both raise awareness about the presence of ecologically healthy waters in the region and the opportunities to protect these resources. The successful completion of the Chowan Healthy Waters Project provided an example demonstrating that a Protection strategy following the Restoration Strategy and Process is a means to long term protection for Virginia. This project includes resource identification through a stream ecological integrity assessment and development of watershed based implementation plans to conserve identified healthy waters using a strong stakeholder based approach. A draft A-I Criteria for watershed protection based on an aquatic community analysis was developed, as opposed to a water-quality based approach. Typically, the A-I Criteria is used as part of a watershed restoration strategy identifying the following points:

A. Identify and quantify causes and sources of impairments
B. Estimate expected load reductions
C. ID BMPs and critical areas to achieve load reductions
D. Estimate needed technical and financial resources
E. Provide info, education and public participation component
F. Include schedule for implementing NPS management measures
G. ID interim measurable milestones for implementation
H. Establish criteria to determine if load reductions are achieved
I. Provide a monitoring component to evaluate effectiveness

The Ccriteria for watershed protection, being referred to as the *Criteria for Ecologically Healthy Watershed Conservation* is under review with the EPA and the DEQ Water Division. This iterative approach resulted in the following A-I Elements that were applied in developing the watershed based plans in the Chowan Basin, referred to as the A-I *Criteria for Ecologically Healthy Watershed Conservation:*

A. Quantify and verify the empirical basis for aquatic communities identified with high ecological integrity
B. Identify conditions needed to maintain existing ecological integrity (e.g., sediment loadings)
C. Identify best management practices and other preventative actions to achieve and maintain the system with high ecological integrity
D. Estimate needed technical and financial resources
E. Provide information, education and public participation component
F. Include schedule for implementing NPS management measures
G. Identify interim measurable milestones for implementation
H. Establish criteria to determine high ecological integrity is maintained (e.g. land cover as related to sediment)
I. Provide a monitoring component to evaluate effectiveness

The Healthy Waters Program is continually self evaluating to fine tune the direction of the Program. While the Chesapeake Bay Basin has been and continues to be a priority, statewide data collection is absolutely necessary for the Program to make a long lasting impact on the natural resources of the Commonwealth. A revision of the Watershed Integrity Model is underway to improve the functionality of the model when conducting a comprehensive survey of statewide resources. Additionally, a modification of the existing INSTAR point data is underway to identify Healthy Catchments, a

clarification is being made to improve the identification of Healthy Waters*heds* and updates to the DCR DNH Biotics is being made with new Stream Conservation Units and Ecological Occurrences.

Protecting and maintaining the ecological integrity of identified ecologically healthy waters in Virginia is the overarching measure of success for this program. Expansion and identification of new Healthy Waters data is critical to the success of the Healthy Waters Program. Additionally, a continual cycle of re-assessment of those waterbodies identified as Healthy is essential to the longterm success of protection of valuable aquatic resources in the Commonwealth. With the Program residing in DNH, the juncture of both aquatic and terrestrial resource protection lays the foundation for long term identification, prioritization and protection of resources that will benefit future generations.

For the long term, the DNH is completing a statewide resource threat assessment to be completed by the end of 2015. When overlaying these data with those areas identified by the Healthy Waters Program and other terrestrial data at the DNH, those areas most likely to be lost will be identified. DNH has a long history of successfully working with private and public partners to share information and gain protection for Virginia's most important biological resources. This now includes the Healthy Waters Program and priorities to protect these special places will be established to best appropriate the resources (voluntary agreements, easements, acquisitions, buffers, etc.) to protect Virginia's Healthy Waters for the future.

Specific goals and actions have been identified internally to advance the continued development of the program to meet the objectives of maintaining those systems that have high ecological integrity. This effort has been advanced through the placement of the program in the Division of Natural Heritage but requires the following actions for continued implementation:

- Advance Healthy Waters Program geo-referenced data sets. Continue to update 10-year old (or older) data in Bay Watershed and develop an on-going maintenance and continuous monitoring and assessment plan
- Complete detailed INSTAR assessments in the Southern River Basins including the Clinch, Powell, New, Big Sandy, Yadkin and Roanoke basins.
- Improve Healthy Waters Program capacity by developing consistent funding to support the acquisition of new data and support a full time Healthy Waters Program Manager at DNH, including additional staff at DNH, as necessary
- Work toward the identification and development of strategies to achieve the 2025 goal of: *100% of state-identified currently healthy water and watersheds remain healthy* (2014 Chesapeake Bay Watershed Agreement Goal)

Glossary of Acronyms and Abbreviations

AMD – Acid Mine Drainage
AOSS – Alternative Onsite Sewage System
ASA – Agricultural Stewardship Act
Bc – Bacteria
Be – Benthic
BMP – Best Management Practice
CBIG – Chesapeake Bay Implementation Grant
CBLEI – Chesapeake Bay Livestock Exclusion Initiative
CBP – Chesapeake Bay Program
CD – Consent Decree
CFR – Code of Federal Regulations
CFU – Colony Forming Unit (bacteria)
CREP – Conservation Reserve Enhancement Program
CSO – Combined Sewer Overflow
DCR – Department of Conservation and Recreation
DEQ – Department of Environmental Quality
DMLR – Division of Mine Land Reclamation
DMME – Department of Mines, Minerals and Energy
DNH – Division of Natural Heritage
EIT – Engineer in Training
EPA – United States Environmental Protection Agency
FGD – Flue Gas Desulfurization
FSA – farm Service Agency
FY – Fiscal Year (Virginia, July 1 – June 30)
GIS – Geographic Information System
GIT4 – Chesapeake Bay Program Goal Implementation Team Four
HWP – Healthy Waters Program
IFRIS – Integrated Forest Resource Information System
INSTAR – Interactive Stream Assessment Resource
IP – Implementation Plan
IT – Information Technology
MG – Master Gardner
MTD – Manufactured Treatment Device
NCDENR – North Carolina Department of Environment and Natural Resources
NDZ – No Discharge Zone
NFWF – National Fish and Wildlife Foundation
NPS – Nonpoint Source
NRCS – Natural Resources Conservation Service
NRDAR – Natural Resources Damage Assessment and Restoration
ODU – Old Dominion University
PCB – Polychlorinated Biphenyl
PDC – Planning District Commission
PE – Professional Engineer
PFL – Project Funding List
PMP – Pollutant Minimization Plans
R3 – Environmental Protection Agency Region 3
RFP – Request for Proposals
SAG – Stakeholder Advisory Group

SAPS – Successive Alkalinity Producing System
Sed – Sediment
SFI – Sustainable Forestry Initiative
SHARP – Sustainable Harvesting and Resource Professional
SLAF – Stormwater Local Assistance Fund
SNR – Secretary of Natural Resources
SR – Southern Rivers
SWCD – Soil and Water Conservation District
TDS – Total Dissolved Solids
TMDL – Total Maximum Daily Load
TSS – Total Suspended Solids
UD – Under Development
USDA – United States Department of Agriculture
USFWS – United States Fish and Wildlife Service
VA – Virginia
VAC – Virginia Administrative Code
VACS – Virginia Agricultural Cost Share Program
VCU – Virginia Commonwealth University
VDACS – Virginia Department of Agriculture and Consumer Services
VDH – Virginia Department of Health
VDOF – Virginia Department of Forestry
VDOT – Virginia Department of Transportation
VECI – Virginia Enhanced Conservation Initiative
VENIS - Virginia Environmental Information System
VIMS – Virginia Institute of Marine Science
VITA- Virginia Information Technology Agency
VNRCF – Virginia Natural Resources Commitment Fund
VPA –Virginia Pollution Abatement (permit)
VPDES –Virginia Pollutant Discharge Elimination System (permit)
VSMP – Virginia Stormwater Management Program
VSWCB- Virginia Soil and Water Conservation Board
WIP – Watershed Implementation Plan
WQIA – Water Quality Improvement Act
WQIF – Water Quality Improvement Fund
WQMIRA – Water Quality Monitoring, Information, and Restoration Act