

CHAPTER 7.9 DEQ WATER QUALITY REGIONAL INITIATIVES

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VALLEY REGIONAL OFFICE (VRO)

South River Mercury.

Mercury was used in a manufacturing process at the DuPont plant in Waynesboro, VA from 1929-1950. Mercury losses and resulting contamination to the river and floodplain from that process resulted in a legacy problem that continues today. In a 1984 settlement between DuPont and the State Water Control Board, a fund was established to support monitoring of water, sediments, and fish tissue in the river system for a projected 100-year period. More recently, in 2006, DEQ established a full-time position in the Valley Regional Office to focus on this serious environmental issue. Specific activities in this program area that occurred during 2014-2015 are outlined below.

- a) **Water Sample Collection and Analysis for Mercury in the South River and South Fork Shenandoah River, Virginia.** This monitoring project focuses on water column concentrations of dissolved and total mercury in the South River and South Fork Shenandoah River. Monitoring through the 1990s rarely detected measurable amounts of mercury in water, due to analytical constraints. With the development of more sensitive techniques ("clean" metals sampling and analyses) during the 1990s, quantifiable levels are now routinely recorded. Since 2001, DEQ staff has collected total and dissolved mercury samples from multiple sites on the South River and South Fork Shenandoah River on a bimonthly frequency.
- b) **South River Science Team.** DEQ staff members continue to coordinate with members of the South River Science Team on a number of surveys and studies in which data are gathered for water, sediments, floodplain soils, and biota in and along the South River. The South River Science team is comprised of representatives from industry, academic institutions, state and federal agencies, environmental groups and independent researchers. This group meets quarterly to coordinate efforts, collaborate on future work, and communicate results. Ongoing studies address mercury source identification, fate and transport, methylation processes, and ecological processes. Information on the activities of the South River Science Team can be found at <http://www.southernriverscienceteam.org/>.
- c) **Natural Resources Damage Assessment (NRDA) for South River and South Fork Shenandoah River.** DEQ is working with other state partners (as the state trustee) and the US Fish & Wildlife Service (as federal trustee) to continue assessment of damages to aquatic and terrestrial life in and along these rivers. Studies by South River Science Team partners and contractors will serve as the basis for damage assessment and will also help identify opportunities for restoration and mitigation. Final settlement, expected in 2016 or 2017, is intended to address restoration of numerous resources and services, including fish, birds, amphibians, and recreational fishing.

BLUE RIDGE REGIONAL OFFICE – LYNCHBURG (BRRO-L)

Total Maximum Daily Load (TMDL) Studies

There are currently three (3) TMDL studies being conducted or been completed by BRRO-L water staff. There are currently two (2) Implementation Plans either being conducted or have been completed in BRRO-L over the past two years. The projects are listed in detail below.

Kits Creek

The TMDL study was completed and approved by EPA and is awaiting approval from the Virginia SWCB. The project addressed benthic impairment in Kits Creek. A public meeting was held to discuss the TMDL process and the sources of sediment and phosphorus unique to Kits Creek watershed.

Kerr Reservoir Tributaries

The TMDL study is currently underway with a public comment period on the draft report ending February 27, 2017. The project addresses bacteria impairments in several tributaries to Kerr Reservoir including, Little Bluestone Creek, Bluestone Creek, Allen Creek, unnamed tributary, Allen Creek, Cotton Creek, Kettles Creek, Smith Creek, and Lizard Creek. A public meeting was held to discuss the TMDL process and the sources of bacteria unique to the Kerr reservoir Tributaries.

James River Basin

The TMDL re-development study was started in 2013. The project addresses bacteria impairments in the James River as well as several tributaries including, Ivy Creek, Tomahawk Creek, Burton Creek, UT Burton Creek, Judith Creek, Fishing Creek, Blackwater Creek, beaver Creek, Harris Creek, Dreaming Creek, Opossum Creek, Williams Run, Graham Creek, and Pedlar River. A public meeting was held to discuss the TMDL process and the sources of bacteria unique to the James River basin. DEQ is currently formulating responses to public comments received.

Ash Camp Creek and Twittys Creek Implementation Plan

The project addressed benthic impairments in Ash Camp Creek and Twittys Creek watershed. A public meeting was held to discuss the Implementation Plan process and the sources of bacteria unique to the watershed. The final report was approved by the Virginia SWCB on 02/25/2016.

Banister River and Winn Creek Implementation Plan

The project addressed bacteria impairments in Banister River and Winn Creek Watershed. A public meeting was held to discuss the Implementation Plan process and the sources of bacteria unique to the watershed. . The final report was approved by the Virginia SWCB on 02/25/2016.

Dan River Watershed Implementation Plan

The project addresses bacteria impairments in the Dan River Watershed, including the Dan River, Birch Creek, Byrds Branch, Doubles Creek, Fall Creek and Sandy Creek. The project start date is February 2017.

Environmental Pollution Response

Dan River Coal Ash Spill

On February 2, 2014 a broken stormwater pipe beneath a Duke Energy coal ash retention pond located next to the Dan River near Eden, NC was reported. Approximately 38,000 tons of coal ash spilled into the Dan River. Coal ash contains heavy metals and can be harmful to human health. Monitoring for metals in the water and sediment at eight Dan River sites and two Kerr Reservoir sites began in February 2014 and continued monthly through 2016. Bi-monthly monitoring has begun in 2017. In addition, two boatable probabilistic sites on the Dan River will be sampled in the spring and fall on an annual basis for benthic macroinvertebrates, fish, algae, water chemistry, and habitat quality.

Public Outreach

Watershed Educator Institute

Regional Biologist, Kelly Hazlegrove, provided an overview of DEQ biomonitoring and assessment to the Watershed Educator Institute held in Charlottesville, Virginia on April 12, 2016. The Watershed Educators Institute is a series of one and two day workshops offered from October 2015 through June 2016 for those desiring to be formally recognized as leaders in watershed education in the Commonwealth of Virginia.

Franklin County Fair

Monitoring and TMDL staff from BRRO-L presented a storm water education program to over 300 5th grade students on September 16, 2016. The table allows for a hand on demonstration of the impacts of storm water on forest land, farm land and urban settings.

BLUE RIDGE REGIONAL OFFICE (BRRO-ROANOKE)

TMDL and Implementation Planning Activities in the BRRO-Roanoke

BRRO-Roanoke's TMDL staff assisted in the completion of Implementation Plans on the Upper Roanoke River watershed, Crab Creek, and Smith and Mayo Rivers. DCR was the lead agency on all of the aforementioned TMDL Implementation Plans except for Roanoke River and Crab Creek.

BRRO-Roanoke TMDL staff took the lead on the Implementation Plan for the Upper Roanoke River. The kick-off meeting for this project occurred in the form of a watershed open house featuring a series of presentations and informational booths for visitors to peruse. Due to the size of the watershed, implementation plan development was divided into two parts. Throughout 2013 and 2014, the Part I government, residential, agricultural, and business working groups met two times to discuss and select appropriate best management practices. Part I and Part II Implementation Planning continued beyond 2014.

In addition, BRRO-Roanoke TMDL Staff led Implementation Plan development for Pigg River watershed, and Little River Watershed TMDL and Implementation Plan, and ultimately the Crab Creek Implementation Plan. DCR and local stakeholders like the Blue Ridge Soil and Water Conservation District and Skyline Soil and Water Conservation District assisted with the projects. A watershed tour, agricultural and residential working group meetings, and public meetings encouraged public involvement in the projects. Presentations about the Pigg River Watershed Implementation Plan were given at the Franklin County Cattlemen's Association and the Roanoke River Currents Conference.

Special studies related to TMDLs included water column PCB sampling in the Roanoke River and New River watersheds, diurnal dissolved oxygen studies in the Smith River and Jackson River (Smith River included temperature data). In addition, TMDL staff made presentations to permittees in the Roanoke River regarding PCBs and PCB TMDL development.

BRRO-Roanoke Community Involvement

The BRRO-Roanoke Water Monitoring Group (monitoring, TMDL, and assessment staff) participated in numerous outreach events during 2009-2014. Staff taught area students and teachers about biological monitoring at events such as the Clean Valley Council's Earth Summit, Fall Waterways Cleanup, Smith Mountain Lake State Park's Junior Rangers program, Bedford Elementary "Camp Bees" day camp, and Roanoke area Cub Scouts at "Bug Scouts" day camps. The group had displays at Earth Day Celebration, 18th Annual Salem Fall Home Show, and Philpott Reservoir Environmental Expo. Staff also made presentations on water pollution, monitoring, and restoration at the following events: Friends of Claytor Lake meetings, Roanoke River Currents Conference, Smith River Trout Unlimited Chapter meeting, Southern Rivers Grant Project leaders gathering in Radford, 2012 Citizens Stormwater Committee Meeting, National Water Quality Monitoring Conference (Cincinnati, OH), Jackson River Preservation Association meetings, Isaak Walton League (Covington-Alleghany Chapter) meetings, meetings with Roanoke City Stormwater staff, and a Radford University Environmental Regulations class. DEQ hosted a booth at the Christiansburg High School Environmental Expo with information about water quality monitoring, biomonitoring and watershed stewardship.

BRRO-Roanoke Water Permitting, Waste and TMDL staff partnered with the Western Virginia Water Authority and worked with local Girl Scout troops to educate them about environmental issues. The girls learned about aquatic insects, water quality monitoring, watersheds and landfills. They collected water

quality data including pH, dissolved oxygen, and turbidity from Carvins Cove Reservoir. Troops also toured the water treatment plant in Roanoke.

Regional Monitoring Networks (RMNs) to Detect Changing Baselines in Freshwater Wadeable Streams

The United States Environmental Protection Agency (U.S. EPA) is working with its regional offices, states, tribes, and other entities to establish Regional Monitoring Networks (RMNs). The RMNs will help EPA and their partners collect current, baseline biological, thermal, and hydrologic data from freshwater wadeable streams. This information will be used to help quantify and detect long-term changes in conditions of high-quality streams. Project discussion began in 2013 with data collection beginning in 2014 and is ongoing. DEQ monitoring staff coordinates and conducts deployment and maintenance of temperature monitoring equipment.

Stream Flow Modification Monitoring

In 2013 and 2014, DEQ water monitoring staff began using Biological Monitoring (benthic macroinvertebrates and fish) and streamflow measurements to determine the ecological impacts of stream flow interruption by a small hydropower facility. This effort began as a result of complaints made to DEQ by downstream landowners and ultimately included site visits by multiple state agencies. Biologists collected and analyzed samples Spring and Fall of 2013 and 2014. Due to above-normal precipitation resulting in higher than normal flows in addition to maintenance on the hydropower facilities yielding less stream flow interruptions, the sampling effort will continue beyond 2014.

Stressor Identification in Virginia

BRRO and SWRO led an effort to improve the stressor identification process for benthic macroinvertebrate community (aquatic life use) impairments in the Commonwealth. The DEQ assesses aquatic invertebrate communities in order to evaluate whether or not Virginia's aquatic life use standard is being met. The root cause of an aquatic community shift is rarely obvious even though changes in the composition and/or abundance of the benthic macroinvertebrate community are distinct. DEQ utilizes EPA's recommended method, stressor analysis, to systematically characterize the cause of an aquatic community shift. The goal of the stressor analysis process is to apply a weight-of-evidence approach to define a/the most probable stressor(s) that explain(s) the shift in the benthic macroinvertebrate community. Aquatic community stressors encompass a wide array of parameters that have varying degrees of synergistic interactions, further complicating the stressor analysis process. Recognizing these challenges, stressor thresholds were developed utilizing ten years of data collected through DEQ's Freshwater Probabilistic Monitoring Program. Stressor thresholds are concentration/measured ranges linked to varying levels of stress to aquatic life that present context for stressor analyses reviewers and developers to evaluate water quality datasets and relate them to aquatic community outcomes. Statewide, ecoregion-, basin-, and stream order-specific context is presented in relation to the following common aquatic stressors: dissolved oxygen, pH, total phosphorus, total nitrogen, ionic strength (specific conductivity, TDS, and dissolved sulfate, chloride, sodium, and potassium), dissolved metals cumulative criterion unit, total habitat and relative bed stability. Specifically, thresholds ranging from no stress to aquatic life to high probability of stress aquatic life were developed and integrated into a web-based application for better understanding stressors.

Livability Initiatives

The Livability Initiatives provided multiple forums for residents to discuss housing, transportation, energy, natural resource, economic development, community health, and arts and cultural heritage factors that affect quality of life now and in the future. BRRO-Roanoke staff participated in Livability Initiative working groups in both the Roanoke and New River Valleys.

Jackson River Restoration and the Gathright Dam Water Control Plan

The Virginia Department of Environmental Quality's monitoring and assessment data and Jackson River benthic Total Maximum Daily Load (TMDL) development (DEQ 2010) has documented that low flow conditions in the fall represent the most stressed water quality conditions in the Jackson River. The Jackson River benthic TMDL study established nitrogen and phosphorous reduction targets in the Jackson River and called for restoring natural flow variability during the growing season (defined in the TMDL study as June 1st to October 31st). To assess flow variability impacts on water quality habitat and biology, DEQ asked the U.S. Army Corps of Engineers (ACE) to perform a 216 study that could result in permanent flow modifications in the Jackson River. The 216 Study was later changed to the Gathright Dam Water Control Plan. As part of the study and later the plan, the ACE performed test pulses during the following dates: August 17, 2010, September 28, 2011, and October 3, 2012. In 2010 thru 2014, DEQ collected an extensive suite of field data, water chemistry, habitat, and biological parameters in order to document baseline conditions and evaluate effects of the test pulses. DEQ is committed to extensive water quality monitoring in the Jackson River throughout the development of the Water Control Plan project and during the implementation of the recommended hydrologic changes. DEQ published the following reports which summarize existing water quality conditions and document results of the pulse events: *Characterization of 2010 Base Flow and Pulse Flow Water Quality in the Jackson River* and *Characterization of Jackson River Base Flow and Pulse Flow Water Quality: 2011 and 2012*. DEQ continues to monitor and evaluate water quality on the Jackson River.

PCB Source Investigations in the New River VDH Fish Consumption Advisory Area

From 2002 – 2004, an intense search for PCB sources was conducted in the New River watershed from Claytor Lake Dam to the Virginia-West Virginia State line near Glen Lyn. The investigation involved extensive review of VA DEQ agency records, interviews of local officials, citizens, industry representatives, and information provided by the New River PCB Source Study Citizen's Committee. Based on these interviews and follow-up onsite inspections, DEQ teams sampled soil and sediment from multiple areas in the New River Valley in the fall of 2003. The investigation incorporated approximately 50 sites of sediment and soil samples. DEQ initiated additional source investigation and pre-TMDL PCB monitoring in 2010 and continues to collect fish tissue, sediment and water column PCB data.

James River Fishkill Monitoring

During the spring and summer periods of 2007 – 2010, BRRO-Roanoke staff has assisted with the investigation of fish kills of unknown causes in the upper James River system. Predominantly smallmouth bass and sunfish are the affected species and have been observed with skin lesions and other health problems during the spring and early summer. During 2007 staff monitored and confirmed citizen reports of distressed and dead fish in the James River, monitored environmental conditions and assisted VDGIF biologists with fish collection for health analyses by USGS and university scientists. In 2008, staff continued to track citizen reports and collected multiple parameters (physical/environmental conditions, metals, organics, nutrients, and pesticides) on the James River and a reference site on the New River, as well as assisted with the collection of fish during pre-kill, within kill, and post-kill periods on both rivers. During spring and summer 2009 and 2010, staff collected weekly bacteria samples for *Aeromonas salmonicida* at ten stations on the upper James River and several tributaries. Staff also assisted with fish collection on the James River and tributaries and deployed temperature loggers at multiple locations to monitor daily water temperatures.

Mudlick Creek Stream Restoration Project

BRRO-Roanoke water monitoring and VWP staff assisted Roanoke County with a stream restoration project at Garst Mill Park from 2007 to 2009. Pre-restoration activity included monitoring the benthic macroinvertebrate community, monitoring turbidity during storm events, and measuring stream bank erosion in several sections of Mudlick Creek. Staff also provided technical guidance with restoration and design plans for County officials, DCR staff, and consultants that produced the design and supervised the project. Staff attended informational meetings held at the park to inform citizens of the project and its benefits to water quality. Post-restoration monitoring will include assisting the county with biological monitoring bank erosion surveys.

SOUTHWEST REGIONAL OFFICE (SWRO)

Coeburn-Norton-Wise Regional Wastewater Treatment Plant

Additional hydraulic capacity was created within the existing WWTP without building additional secondary treatment structures. The existing site is built out and the ability to increase hydraulic capacity via typical methods, i.e., build new tanks and increase volume, was not an available option. Hydraulic capacity was increased from 5.0 MGD to 6.5 MGD by improving the existing treatment scheme, particularly the secondary treatment process, and by adding tertiary filtration. Sludge processes were improved and capacity increased via covered tanks and heat addition to speed up the aerobic digestion process. The WWTP reliability was also improved through the addition of an emergency generator. Additionally, the WWTP upgrade included a septage receiving station and treatment unit that enables the CNWRWTA to accept septage from on-site systems throughout the region, and gives septic haulers a place to legally dispose of septic tank wastewater. The total project cost was approximately \$15,000,000.00 and should serve the area for the next 20-25 years.

This project was unique because CNW serves four communities who own capacity in the regional WWTP. CNW does not collect wastewater, but only transports and treats. Each member community has a unique collection system that they are responsible for. CNW does not have any effective regulatory authority over the communities' systems. Each system is subject to I/I and flow to the WWTP reflects impact due to rainfall-induced inflow/infiltration. As a result, CNW was experiencing permit violations due to hydraulic overloading, especially during significant precipitation events.

Tazewell County PSA—Tazewell to Divides Collection System (Phase I)

Construction has begun on a force main/gravity sewer system from Tazewell to the landfill near the Divides. This is Phase I of a multi-phase project and will provide the spine or interceptor that will initially take leachate flow from the landfill site and transport it to the Town of Tazewell collection system with ultimate treatment at the Tazewell WWTP. Subsequent phases will provide collection systems to built-up areas along Route 460 between Tazewell and the Divides. Currently the landfill leachate is trucked to area wastewater treatment plants for treatment. Realization of this project will eliminate the expense of trucking and the dangers associated with trucking along routes where T&E waters are present, and also significantly eliminate potential for leachate to migrate to the headwaters of the North Fork Clinch River. The project cost is \$4,678,659.

NORTHERN REGIONAL OFFICE (NRO)

The summary of regional initiatives focuses on updates and/or new activities since the publication of the 2014 Integrated Report. Accordingly, updates are primarily highlighted for 2013 and 2014.

Biological Monitoring:

Probabilistic Biomonitoring and Chemical Monitoring Program in Virginia Non-Tidal Streams

NRO has participated in DEQ's Probabilistic Monitoring Program for non-tidal streams since its inception in the spring of 2000. This program consists of three sampling components: a thorough examination of the benthic macroinvertebrate community utilizing the EPA's Rapid Bioassessment Protocols, sampling a full suite of water chemical parameters, and a physical habitat evaluation at each station. The stations are biologically and chemically sampled twice a year, once each in the spring and fall, while a single, extensive, physical habitat evaluation is conducted in the fall. In 2013, NRO sampled eight probabilistic monitoring stations and another nine stations in 2014.

Genus Virginia Stream Condition Index (VSCI) and Coastal Plain Macroinvertebrate Index (CPMI) Development Sampling

NRO has been participating since 2009 through 2014 in the development of both a family-level and a genus-level benthic macroinvertebrate index to refine the assessment of Coastal Plain and Southeastern Plains, defined-channel streams. The monitoring effort included biologically and chemically sampling in at both excellent-condition and stressed-condition streams.

Citizen Monitoring Requests:

Ambient Monitoring

In 2013, citizens of Virginia requested that 3 streams (Wolftrap Run, Bull Run and an Unnamed tributary to the Occoquan River) be monitored by NRO for chemical parameters, of which all 3 were honored/ Monitoring of two streams of the three requested streams (Wolftrap Run and Bull Run) continued to be sampled in 2014. No requests from citizens for monitoring of chemical parameters were received in 2014.

Biological Monitoring

In 2013, citizens of Virginia requested that 3 streams (Ballywhack aka Tanyard Creek, Bull Run, and Wolf Trap Run/Old Courthouse Branch) be biologically monitored by NRO, of which all 3 were honored. Similarly, 4 streams (South Fork Catoctin, Sycolin Creek, Goose Creek and Bull Run) were requested by citizens in 2014, of which DEQ was able to honor the request for 2 (Goose Creek and Bull Run) out of the 4 streams. All of the locations were sampled twice in one year, once each in the spring and the fall.

Special Studies:

Quantico Creek

NRO initiated a special study monitoring program in 2014 in the tidal embayment and the free-flowing, riverine portion of Quantico Creek. This special study was initiated as a follow-up from the aquatic life use impairment first listed in 2001 for a portion of the Quantico Creek embayment. The study involved collecting metals data from sediment and water samples at six monitoring stations in the watershed.

Potomac Creek

NRO conducted follow-up sediment sampling in Potomac Creek in 2014 due to elevated concentrations of various constituents in sediment from the Estuarine/Coastal Probabilistic Monitoring Program sampling completed in previous years.

Harmful Algae Bloom (HAB) Monitoring

In 2013, the NRO investigated two reports of algae bloom and collected seven samples following Harmful Algae Bloom (HAB) protocols. There were two sampling events on upper portions of Lake Anna and one in Potomac Creek. In 2014, NRO investigated three reports of algae bloom and collected 5 samples following the HAB protocols. There were sampling events on the hot side of Lake Anna, Potomac Creek and Quantico Creek.

Total Maximum Daily Load Monitoring:

In 2013 and 2014, NRO devoted a significant amount of their monitoring efforts to collecting data for the Total Maximum Daily Load (TMDL) Program. Monitoring was conducted for the purpose of TMDL development and TMDL Implementation Plan follow-up.

TMDL Development Monitoring

In 2013 and 2014, NRO collected ambient monitoring data to support anticipated development of TMDLs to address aquatic life use and recreational use impairments in the following streams: North Fork Catoctin Creek, Jefferies Branch, South Fork Broad Run, Broad Run, Horsepen Run, Indian Creek, Beaverdam Run, Pohick Creek, South Run, Middle Run, Summerduck Run, Northeast Creek and an unnamed tributary to Northeast Creek (at Route 659), Music Branch, Arnolds Creek, Mountain Run, Flat Run, and Jonas Run.

Additionally, NRO collected water and sediment PCBs samples in 2013 and 2014 to support anticipated TMDL development to address fish consumption use impairments in the Mountain Run watershed (RA19) in the vicinity of Culpeper, Virginia.

TMDL Implementation Plan Follow-Up Monitoring

In 2013 and 2014, NRO collected ambient monitoring data as follow-up to TMDL implementation plans developed for the following streams: Thumb Run, Carter Run, Deep Run, Marsh Run watershed (Brown Run, Craig Run and Marsh Run), Hazel River, Catoctin Creek, Upper Hazel, Hughes River, Rush River, Beaver Creek, Mountain Run, Terrys Run, Northeast Creek watershed (Music Branch, Arnolds Creek unnamed tributary to Northeast Creek and Northeast Creek), Pamunkey Creek, Blue Run, Beautiful Run, Rapidan River and unnamed tributaries to the Rapidan River (at Routes 621 and 634), and Wilderness Run.

TMDL Studies:

Development of bacteria TMDLs were initiated in late 2014 in the Mattaponi River Watershed for the following streams: Brock Run, Chapel Creek, Doctors Creek, Glady Run, Maracossic Creek, Mat River, Matta River, Mattaponi River, Motto River, Po River, Polecat Creek, Poni River, Reedy Creek, and Root Swamp. The TMDL study was completed in early 2016 and approved by EPA in July 2016.

Development of sediment and chloride TMDLs are currently under way for the Accotink Creek watershed to address the benthic impairment in the following streams: Upper Accotink Creek (above Lake Accotink), Lower Accotink Creek (below Lake Accotink) and Long Branch. The study began with a stressor analysis, initiated in 2014, which identified chlorides and sediment as the most probable stressors. The TMDL reports are scheduled to be completed Summer 2017.

TMDL Implementation Plan Projects:

Development of an implementation plan for the Upper York River watershed was initiated in 2011 and completed in 2013 for the following streams: Beaver Creek, Goldmine Creek, Mountain Run, Pamunkey Creek, Plentiful Creek and Terrys Run. In the implementation plan development process, major emphasis is placed on discussing best management practices (BMPs), locations of control measures, education, technical assistance, monitoring, and funding.

PIEDMONT REGIONAL OFFICE (PRO)

James River PCB Studies

Due to the presence of PCBs, the VDH has issued a fish consumption advisory for the James River from the I-95 Bridge in Richmond downstream to the Hampton Roads Bridge Tunnel and the tidal portion of the following tributaries: Appomattox River up to Lake Chesdin Dam, Bailey Creek up to Rt. 630, Poythress Run, Bailey Bay, and the Chickahominy River up to Walkers Dam. The advisory recommends that adults do not eat gizzard shad, carp, or blue- and flathead catfish >32 inches long. It also recommends that adults eat no more than two meals/month of blue and flathead catfish <32 inches long, channel catfish, white catfish, largemouth bass, bluegill sunfish, American eel, quillback carpsucker, smallmouth bass, creek chub, yellow bullhead catfish, white perch, striped bass, bluefish, croaker, spot, blueback herring, Final 2016

and hickory shad.

In preparation for development of the Tidal James River PCB TMDL, DEQ initiated a study of PCBs in ambient water in the James River using a high resolution/low detection method (EPA Method 1668A). During mid-to late 2011, one-time samples were collected at four stations between Hopewell and the Chickahominy River. In addition, monthly samples were collected at the James River near Jordan Point (Rt. 156 bridge station 2-JMS074.44). DEQ also collected PCB samples in multiple watersheds where biosolids had been applied. The data is being used to support development of a model for the James River TMDL.

Mercury Water Column Studies in the Chickahominy, Pamunkey, Mattaponi, Nottoway-, Meherrin-, and Rappahannock Rivers

The Virginia Department of Health issues fish consumption advisories when fish tissue contaminant levels exceed guidelines. (<http://www.vdh.virginia.gov/environmental-epidemiology/public-health-toxicology/fish-consumption-advisories/>) The fish tissue monitoring program is conducted by the DEQ. The Chickahominy-, Pamunkey, Mattaponi-, Nottoway-, and Meherrin-, and Rappahannock Rivers, among others, are all currently under advisories due to elevated mercury levels. The sources of mercury are considered unknown, but can include atmospheric deposition or industrial discharges. The Piedmont Regional Office has been collecting mercury water column samples in preparation for development of Total Maximum Daily Loads (TMDLs) in those river systems. The sampling is designed to further delineate the extent of the impairments, identify any potential sources or hot spots within the watershed, and quantify levels for future water quality improvement efforts.

Total Maximum Daily Load (TMDL) Studies

During 2009-2016, the Piedmont Regional Office (PRO) completed TMDLs for the following waterbodies:

Chickahominy River and Tributaries - bacterial TMDL
Chickahominy River - benthic (sediment) TMDL
Turkey Island Creek and James River Westover to Claremont Watershed - bacterial TMDL
Pamunkey River and Tributaries - bacterial TMDL
Lower Chickahominy River Watershed - bacterial TMDL (draft)

In addition, PRO is assisting with the development of the Tidal James River PCB TMDL, which is currently under development.

TIDEWATER REGIONAL OFFICE (TRO)

Harmful Algal Blooms Monitoring

The Department of Environmental Quality and the Department of Health, including the Division of Shellfish Sanitation, work together to respond to potentially harmful algal blooms (HABs). Samples from algal blooms and fish kill sites are sent to Old Dominion University and the Virginia Institute of Marine Science for a detailed evaluation for potential harmful algae species. Additional information can be found at <http://www.vdh.virginia.gov/environmental-epidemiology/harmful-algal-blooms-habs/>.

Coastal 2000 Initiative

The Tidewater Regional Office has been involved with the Coastal 2000 Program as part of the EPA National Coastal Assessments Program. Data has been collected during summer months from 2001 through 2016 at randomly selected sites. For additional information contact the project manager, Dr. Don Smith at donald.smith@deq.virginia.gov.