Rough Waters Ahead

The Impact of the Trump Administration's EPA Budget Cuts on the Three Rivers Basin

PennEnvironment
RESEARCH & POLICY CENTER

FRONTIER GROUP

Rough Waters Ahead

The Impact of the Trump Administration's EPA Budget Cuts on the Three Rivers Basin

Written by:

Katherine Eshel, Frontier Group

Adam Garber and Stephanie Wein, PennEnvironment Research & Policy Center

November 2017

Acknowledgments

PennEnvironment Research & Policy Center thanks Veronica Coptis of the Center for Coalfield Justice, Eric Schaeffer and Lisa Hallowell of Environmental Integrity Project, Aly Shaw of Pittsburgh United, Ezra Thrush of PennFuture and others for their review of drafts of this document, as well as their insights and suggestions. Thanks also to Tony Dutzik and Elizabeth Berg of Frontier Group for editorial support.

PennEnvironment Research & Policy Center thanks the Foundation for Pennsylvania Watersheds and the Colcom Foundation for making this report possible. The authors bear responsibility for any factual errors. The recommendations are those of Environment America Research & Policy Center. The views expressed in this report are those of the authors and do not necessarily reflect the views of our funders or those who provided review.

The PennEnvironment Research & Policy Center is a 501(c)(3) organization focused on protecting our environment and providing the people of Pennsylvania a voice in the environmental debate. Drawing on more than 30 years of experience, our professional staff combines independent research, practical ideas and effective educational campaigns to overcome the opposition of special interests and win real results for Pennsylvania's environment. For more information about PennEnvironment Research & Policy Center or for additional copies of this report, please visit www.pennenvironmentcenter.org.

FRONTIER GROUP

Frontier Group provides information and ideas to help citizens build a cleaner, healthier, fairer and more democratic America. Our experts and writers deliver timely research and analysis that is accessible to the public, applying insights gleaned from a variety of disciplines to arrive at new ideas for solving pressing problems. For more information about Frontier Group, please visit www.frontiergroup.org.

Layout: To The Point Publications, tothepointpublications.com

Cover photo: Kayaking near Crull's Island in the Allegheny River, Piper VanOrd, Allegheny Outfitters

Table of Contents

Executive Summary

Western Pennsylvania's Three Rivers – the Allegheny, Monongahela and Ohio – are critical to the health and welfare of our families, communities, and wildlife. Approximately 3.5 million people reside in the Pennsylvania portion of the Ohio River basin and its headwaters, a region that also at-tracts at least 18 million travelers each year.[1]

Clean water in the Three Rivers is vital for wildlife, drinking water safety, recreation, and agriculture. Yet, for generations, the rivers have been polluted by industry, mining and urban runoff.

The U.S. Environmental Protection Agency (EPA) has been essential to efforts to clean up the Three Rivers and restore the watershed to health – supporting and working with state and local efforts to keep pollution out of our waterways, hold polluters accountable, restore degraded waterways to health, and study and monitor waterways to ensure their future health and safety.

That progress is now in jeopardy. The Trump administration has proposed deep and devastating cuts to the EPA's budget. Even if the president's proposed cuts are scaled back by Congress, they would still have profound negative impacts on the agency's ability to deter pollution from industrial facilities, agriculture, sewage treatment plants, runoff and other sources, while undercutting efforts to restore the Three Rivers.

America should not go back to the bad old days, when whole stretches of river in the Three Rivers basin were so polluted as to be considered biologically dead.[2] We need a strong EPA with sufficient resources to support local cleanup efforts and partner with states and communities to protect and restore the Three Rivers.

The Three Rivers are being protected and restored to health with funding and effort from the EPA. The EPA has worked to:

- **Limit bacteria pollution in Allegheny County's Pine Creek and North Park Lake:** In 2008, the Pennsylvania Department of Environmental Protection (PA DEP) found Pine Creek and its tributaries, including North Park Lake, were so polluted with bacteria that they could not be considered safe for recreation.[3] The EPA worked with the state to develop a "pollution diet" for the Pine Creek watershed, which was finalized in March 2013.[4] Thanks to the cleanup plan, the Pine Creek watershed should achieve water quality standards —unless budget cuts undermine the "diet."[5]

- **Support the development of green infrastructure in Pittsburgh:** The City of Pittsburgh and its partners are working to address the city's flash flooding and sewer overflow problems by developing "green stormwater infrastructure," features that mimic the natural environment to absorb rainfall.[6] The EPA provided technical assistance from 2012 to 2015 to help develop design guidelines for green stormwater infrastructure.[7] This work helped give rise to new installations like a rain garden at the Crescent Early Childhood Center.[8]

- **Hold Consol Energy accountable for water pollution:** Consol Energy illegally dumped mining

wastewater from the Bailey mine complex to Ohio River tributaries in Greene and Washington counties from 2005 to 2012.[9] The EPA, the state and the U.S. Department of Justice required Consol Energy to pay $3 million in penalties in a 2016 settlement.[10] Consol Energy also agreed to $5.3 million in system improvements that will cut discharges of dissolved coal mining pollutants by more than 2.5 million pounds per year.[11]

- **Clean up legacy mining pollution on the Little Conemaugh Creek in Cambria County:** An abandoned mine located near St. Michael in Cambria County discharged 3,000 gallons of mine drainage each minute to the Little Conemaugh River from the 1960s until recently.[12] When Rosebud Mining Co. requested a permit to mine underlying reserves, the EPA worked with PA DEP to develop a permit that included a cleanup project that cut iron loads to the creek by 98 percent, aluminum loads by 100 percent, and manganese loads by more than 50 percent.[13]
- **Clean up the Osborne Landfill Superfund site in Mercer County:** The state closed the Osborne Landfill in Mercer County in the 1970s for accepting industrial waste without a permit. Shortly afterward, the EPA and state investigators found that toxic substances were leaching from the landfill to nearby soil and surface water, as well as a nearby fishing stream.[14] The EPA added the site to the Superfund list of national cleanup priorities

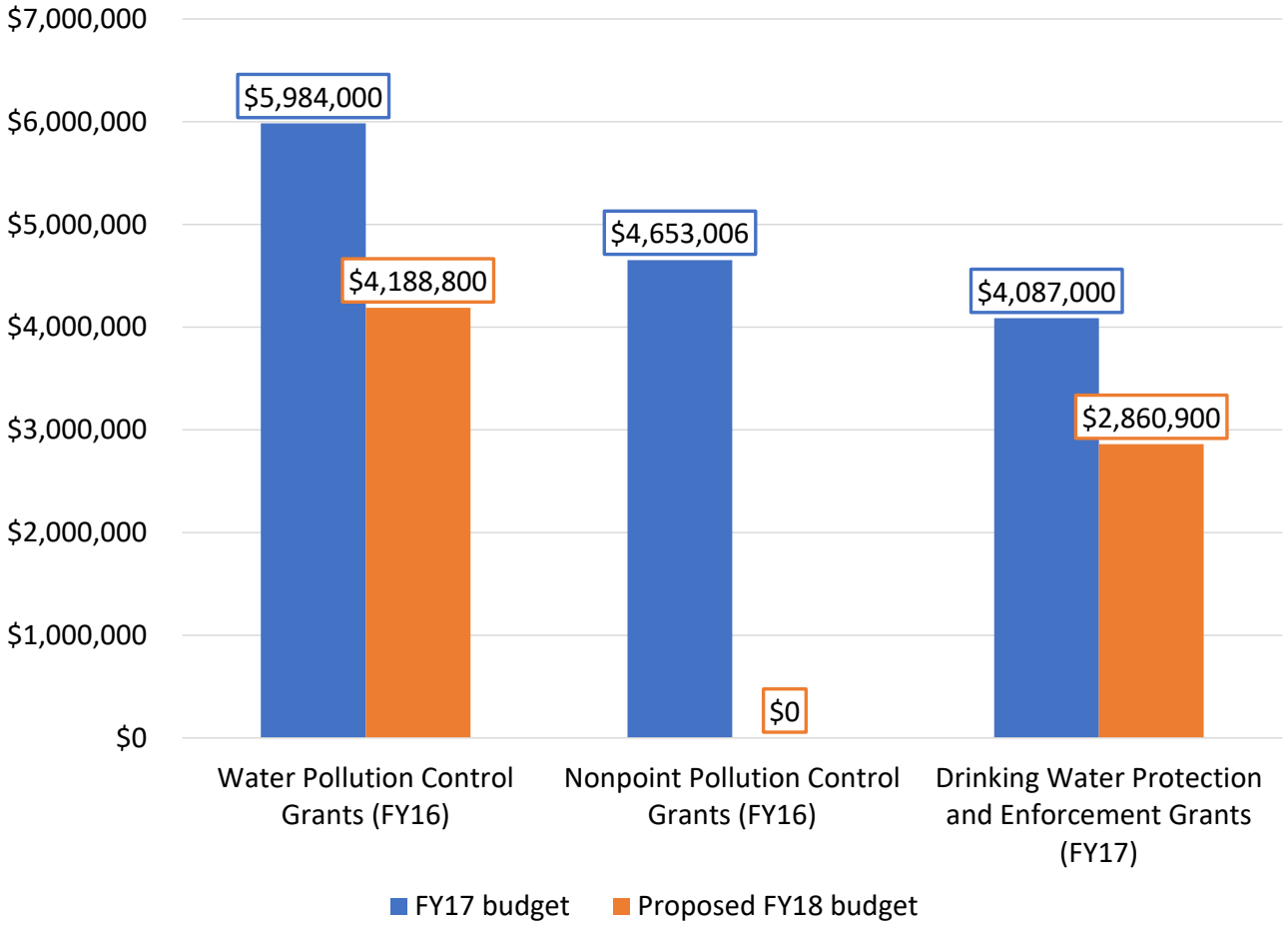
Table ES-1. Clean Water in the Three Rivers Depends on the EPA

The Three Rivers Are Cleaner Because the EPA:	The EPA Continues to Protect Clean Water by:
Set limits on bacterial pollution to the Pine Creek watershed in Allegheny County	Supervising pollution control across the basin
Funded the development of design criteria for green infrastructure in Pittsburgh	Funding pollution prevention measures in municipalities
Ordered Consol Energy to improve water management and monitoring to correct its violations of the Clean Water Act	Ensuring compliance with pollution standards to limit releases of mining wastewater to waterways
Developing an innovative permit that cleaned up legacy mining pollution in Little Conemaugh River in Cambria County	Supervising and enforcing pollution discharge permits across the state
Supervised cleanup at the Osborne Landfill Superfund site in Mercer County	Funding and overseeing 65 ongoing Superfund cleanups
Researched the effects of fracking wastewater disposal and coal-fired power plants on public drinking water sources on the Allegheny River	Conducting and supporting research into the effects of water pollution on human health and into new pollution control methods
Funded a program that provides students and teachers with equipment, training and assistance to study local water chemistry in Western Pennsylvania	Supporting environmental literacy and increasing the public's understanding of the impact of human activity on waterways

in 1983, leading to removal of hazardous waste and extension of a municipal water line to secure nearby residents' access to safe drinking water.[15] After decades of cleanup, the site was ready for reuse in 2010 and most of the nearby waterways are now healthy enough to support aquatic life.[16]

- **Support research to understand the link between resource extraction and water contamination in the Allegheny River watershed:** EPA researchers investigated the source of bromide pollution in the Allegheny River that was giving rise to the formation of trihalomethanes, chemicals associated with cancer; similar pollution in the Monongahela River forced state environmental officials to repeatedly issue drinking water advisories for 325,000 residents in the Pittsburgh area in 2008 and 2009.[17] The EPA found that treatment facilities that accepted fracking wastewater, as well as coal power plants with flue-gas desulfurization, contributed most of the bromide contamination on the Allegheny River and its tributary, Blacklick Creek.[18]

Figure ES-1. Estimated EPA Grant Funding Losses to Pennsylvania if Trump Administration's Proposed Budget Is Enacted (Figure Shows Cuts to Selected Programs Based on Most Recent Year for Which Data Are Available)



Note: Estimates are calculated assuming EPA budget cuts affect states by the same percentage. Reductions are based on grants from most recent fiscal year. "Water pollution control grants" are Section 106 grants, slated for a 30 percent cut. "Nonpoint pollution control grants" are Section 319 grants, cut entirely in the administration's proposed budget. "Drinking water protection and enforcement grants" are Public Water System Supervision grants, cut by 30 percent.

- **Provide students and teachers the opportunity to learn about their local watersheds:** Each year, more than 40 schools in Western Pennsylvania, such as Titusville Middle School, Seneca Valley Senior High School and the West Mifflin Area High School, participate in the Creek Connections project of Allegheny College, which provides equipment, training and assistance for middle and secondary schools in western Pennsylvania to study local water chemistry.[19] Allegheny College received an $80,668 environmental education grant from the EPA, through a program that the Trump administration has proposed to eliminate, to improve their water quality monitoring protocol and strengthen the program.[20]

The Trump administration's proposed cuts to the EPA budget put these and other critical functions in danger – threatening the future health of the Three Rivers.

- Under the administration's proposal, water-related programs run directly by the EPA would be slashed by 34 percent, hobbling efforts to prevent runoff pollution, monitor water quality, establish pollution limits, protect watersheds and wetlands, and pursue polluters.[21]
- In addition, many federal grants from the EPA to state governments for clean water would be slashed by 30 percent or more – making it more difficult for already cash-strapped state agencies to do their jobs and delaying important locally led cleanup efforts. For example, the proposed budget would end grants to state governments and tribal agencies to address pollution from farms, stormwater runoff and other dispersed sources.[22]
- Research and development funding would be cut by 47 percent, limiting support for scientists, residents and local communities trying to understand the ever-changing threats facing their waterways.[23] For instance, the EPA's Safe and Sustainable Water Resources research program, which supports science and technology research to protect drinking water, would be cut by a third.[24]
- Overall, the EPA budget would be reduced by 31 percent.[25]

Even if Congress makes some of these budget cuts less drastic, the Three Rivers will still suffer without full funding of EPA programs.

The job of cleaning up and protecting the Three Rivers is not finished. Continuing pollution from agricultural, industrial and mining sources – along with the emergence of new pollution threats from new classes of industrial and household chemicals – call for continued vigilance and action. Only a well-funded EPA can continue the region's legacy of progress in cleaning up the Three Rivers and ensure that its streams and rivers are healthy and safe for us and future generations to enjoy.

The Three Rivers Provide Drinking Water and Recreation Opportunities to Millions of Pennsylvanians

The Allegheny River, the Monongahela River and the Ohio River are the three major waterways of Western Pennsylvania, known collectively as "the Three Rivers." The Allegheny and the Monongahela Rivers meet in Pittsburgh to form the Ohio River. The Three Rivers are some of the state's most diverse waterways, containing 49 out of 65 freshwater mussel species and 18 out of 21 darter fish species that may be found in Pennsylvania.[26]

The health of the Three Rivers is important for both Pennsylvanians and for all those who live downstream. Approximately 3.5 million people in Pennsylvania reside within the Three Rivers basin.[27] More than 30 million people, or 10 percent of the U.S. population, reside in the Ohio River basin, and 5 million people rely on the Ohio River for drinking water.[28]

The Three Rivers are also used for recreation and navigation. Allegheny County is already home to

Photo: John Skodak via Flickr, CC-BY-NC-ND 2.0.

The Allegheny and the Monongahela Rivers meet in Pittsburgh to form the Ohio River.

approximately 24,000 recreational boats, with water sports, boating and sport fishing growing in popularity as the rivers' water quality improves.[29] Scenic waterways in the Three Rivers watershed, such as Ten Mile Creek and the Youghiogheny River, attract paddlers, while riverside attractions like the Allegheny River Trail draw bicyclists, walkers and others to enjoy the outdoors. These and other recreational assets along the Three Rivers contribute to Western Pennsylvania's tourism industry, which attracts at least 18 million travelers each year.[30]

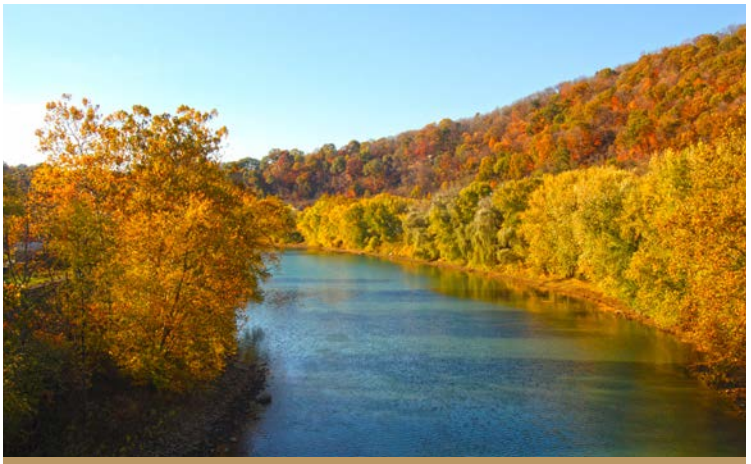
Despite the importance of the Three Rivers for drinking water, agriculture, transportation and tourism, the rivers and their watersheds have historically suffered – and continue to suffer – serious damage.

Although water quality problems in the region have somewhat lessened, in 2016 roughly 20 percent of stream-miles in the Three Rivers watershed assessed for aquatic life failed to support that use.[31] Important sources of impairment in the Three Rivers basin include abandoned mine drainage, runoff from roads, storm sewers and urban and suburban areas, as well as agriculture.[32]

These impairments represent a real risk for residents who depend on the waterways for drinking water or recreation. For example, residents are recommended to avoid swimming in the Ohio River due to pathogen contamination. PA DEP recommends that residents limit their consumption of fish caught in the rivers due to PCB and mercury contamination.[33]

The creation of the EPA in 1970, the passage of the Clean Water Act in 1972, and the adoption of the Superfund law in 1980 enabled efforts to protect and clean up the Three Rivers. The EPA was granted tools, funding and enforcement authority to compel industrial, agricultural and municipal polluters to reduce pollution. The EPA also seeks to protect water quality by cleaning up mining sites, ensuring polluters clean up hazardous waste sites, and implementing regulations and best management practices in upstream watersheds to limit runoff pollution. The EPA has used its authority to restore water quality and protect the natural environment and the families of Pennsylvania. As a result, some of Western Pennsylvania's most polluted rivers, such as the Kiskiminetas River, which was considered biologically dead in 1980, have been restored to health.[34]

Photo: Mark Plummer via Flickr, CC-BY-NC-ND 2.0.



Since the passage of the Clean Water Act, some of the Three Rivers basin's most polluted waterways, like the Kiskiminetas River, have been restored to health.

But, despite incremental improvements in water quality, the Ohio River and its tributaries are still some of some of the nation's most polluted waterways. Thousands of miles of the basin's rivers and streams are too polluted to be used for fishing, swim-ming or drinking water.[35] The EPA budget proposed by the Trump administration would cut funding for clean water protection, enforcement, restoration and research in Pennsylvania, impeding the ability of local, state and federal officials to prevent pollution and restore the Three Rivers and other Pennsylvanian waterways to health.

Budget Cuts Would Hobble the EPA's Work to Protect Our Waterways

The Trump administration's proposed fiscal year 2018 budget, released in May 2017, cuts funding for the Environmental Protection Agency by 31 percent, from $8.2 billion in fiscal year 2017 to $5.7 billion in fiscal year 2018.[36] That would return the agency's budget to 1970s levels, adjusted for inflation, despite the EPA's vastly expanded congressionally mandated responsibilities and the continued severe threats facing our waterways.[37]

In September 2017, the House of Representatives passed its own version of an EPA spending bill, H.R. 3354, which proposes to slash the agency's budget by 7 percent, taking it back to 2006 spending levels.[38] The Senate will likely modify the House's budget, but, even if proposed cuts are scaled back, they could still have disastrous impacts on the EPA's ability to protect our waterways.

The Environmental Protection Agency plays a vital role in ensuring that the nation has clean water for drinking and recreation, and for sustaining fish, plants and wildlife. The EPA works directly to ensure that the requirements of the Clean Water Act, the Safe Drinking Water Act and other laws protecting water quality are met, and also supports the work of states in implementing and enforcing those laws. The budget cuts proposed by the Trump administration would weaken the EPA's efforts on both fronts.

Cuts Would Slow Efforts to Prevent Pollution and Clean Up Contamination

The Trump administration's budget cuts would limit the EPA's support for the work that state and local governments do to protect water quality. Many state assistance grants for clean water are slated to be reduced by 30 percent or more.[39]

The Trump administration's proposed budget eliminates entire programs that have helped states to protect water quality. The budget would:

- End grants to state governments and tribal agencies to address pollution from farms, stormwater runoff and other dispersed sources.[40]
- End grants that help local governments identify and clean up underground storage tanks that may be leaking oil or other hazardous pollutants into groundwater.[41]
- End regional programs to address pollution problems in Chesapeake Bay, Puget Sound, the Great Lakes, the Gulf of Mexico, and other large water bodies.

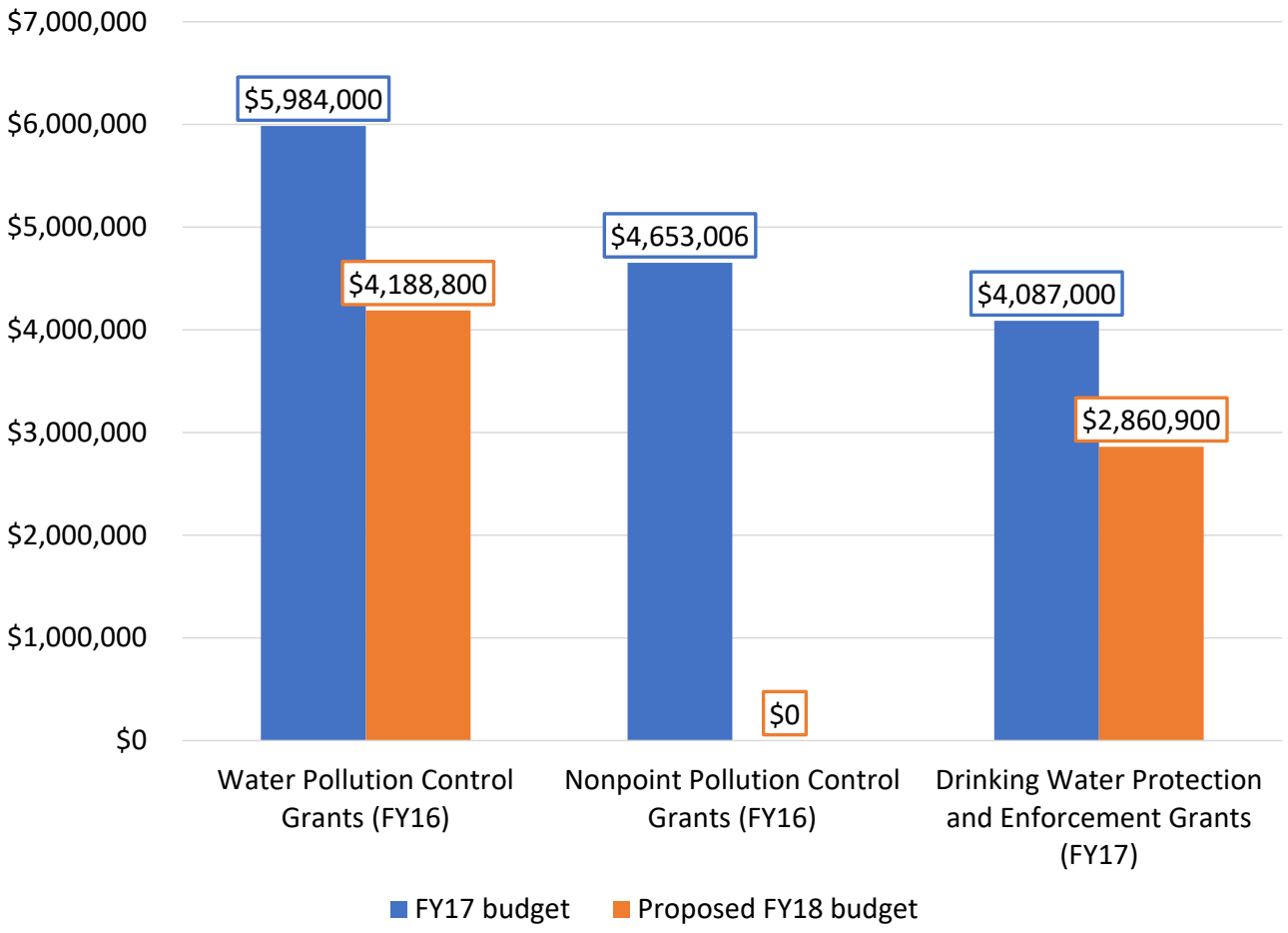
Other aspects of EPA's budget that affect water quality are also slated for cuts. For example, funding for

efforts to clean up hazardous waste sites, which have the potential to pollute water, is in jeopardy. Figure 1 shows potential funding losses in Pennsylvania for selected programs.

Unlike the Delaware River basin and the Susquehanna River basin, the Three Rivers do not have a river basin commission, so the EPA's Pennsylvania presence is essential to guide water resource management and acts as a backstop in the Three Rivers basin. These budget cuts to EPA's national work and its support of state and local action would harm water quality in the Three Rivers and their watersheds.

The September 2017 House spending bill, while less drastic than the Trump administration's May 2017 proposal, would still severely affect the EPA's ability to function. The House bill would cut state and tribal assistance grants by 9 percent, rather than 30 percent, and does not eliminate all of the EPA's waterway-specific programs. Funding for those programs, however, comes at the expense of the EPA's core staff and functions.[43] In the House plan, the EPA's environmental programs and management – which covers two-thirds of the agency's workforce and supports the agency's core functions – would

Figure 1. Estimated EPA Grant Funding Losses to Pennsylvania if Trump Administration's Proposed Budget Is Enacted (Figure Shows Cuts to Selected Programs Based on Most Recent Year for Which Data Are Available)[42]



Note: Estimates are calculated assuming EPA budget cuts affect all states by the same percentage. Reductions are based on grants from most recent fiscal year.

be cut by 27 percent.[44] The EPA has already lost more than one-eighth of its workforce since 2014, but the House's proposal would force the agency to choose between funding critical state and regional programs and preserving its own essential functions of regulation development, monitoring, oversight and enforcement.[45]

Cuts Would Affect Human Health and Hamper Scientific Research

Dramatic budget cuts also mean that the EPA would be less able to protect clean water and hold polluters accountable across the country. The Trump administration's proposed budget indicates that the EPA would need to reduce its staff by nearly one-quarter.[46]

Environmental programs run by the EPA and related to water are slated for a 34 percent reduction.[47] This would make it harder for the EPA to reduce runoff pollution, monitor waterways for contamination, and protect watershed lands and wetlands that are critical to keeping our waterways clean and healthy. The EPA's resources for pursuing polluters and enforcing water quality protections would also be slashed, with a proposed 24 percent budget cut.[48]

Funding for research and development by the EPA is slated for a 47 percent reduction, a larger research and development cut than for any other agency.[49] Budget cuts proposed for the Office of Science and Technology that would harm water quality include:

- A 36 percent budget cut for the Safe and Sustainable Water Resources program, which provides the science and technological research to protect water for drinking and wildlife.[50]
- A 40 percent cut in funding for the Human Health Risk Assessment program, which seeks to understand how environmental contaminants affect human health.[51]
- A 31 percent cut for the Chemical Safety for Sustainability program, which studies the potential health and environmental impacts of manufac-tured chemicals throughout their lifecycle and seeks to develop faster analytical tools to more quickly identify risks.[52]
- A 61 percent cut to the Sustainable and Healthy Communities program's research in support of better cleanup technologies for Superfund sites.[53]
- A 38 percent cut to the Homeland Security Research Program, which includes efforts to understand how to decontaminate water supplies in the event of a chemical, biological or radiological attack.[54]
- A 23 percent cut to the Forensics Support program, which documents sources and types of pollution to help EPA's enforcement actions against polluters.[55]

The House bill, which does not detail program-specific cuts, would slash funding for science and technology, including research and development activities, by 16 percent.[56]

Proposed Budget Cuts Threaten Water Quality in the Three Rivers Basin

The EPA plays a critical role in protecting clean water in the Three Rivers and their watersheds. The EPA works with the state to establish and enforce limits on pollution, clean up pollution and restore damaged streams and rivers, identify parties responsible for pollution and compel their participation in remediation, and pursue research to better understand threats to clean water. The budget cuts proposed by the Trump administration will greatly weaken the EPA's ability to ensure that water in the Three Rivers is clean enough for drinking, swimming and fishing.

More Pollution in the Three Rivers Basin

The most important task in protecting the Three Rivers is preventing pollution from reaching and contaminating the waterways, both by setting limits on what polluters can release to the rivers and their tributaries and by improving infrastructure to stop pollution from reaching waterways.

The EPA Set Limits on Bacterial Pollution in the Pine Creek Watershed

In the 2000s, bacteria concentrations in the Pine Creek watershed, located in the North Hills area of Allegheny County, grew unacceptably high, reaching as high as 100 times federal standards.[57] These harmful bacteria such as *E. coli* and fecal coliforms – which come from sewer overflows, stormwater runoff and septic systems – can endanger people's health, potentially causing illnesses like diarrhea, pneumonia, bronchitis, eye infections or hepatitis.[58] The contamination led the Pennsylvania

Photo: Via Tsuji via Flickr, CC-BY-NC-ND 2.0.

The EPA helped develop a "pollution diet" to clean up bacteria pollution in the Pine Creek watershed in Allegheny County, which includes North Park Lake, a popular destination for boating, fishing and recreation.

DEP to list nearly all of Pine Creek and its tributaries as "impaired" for recreational use in 2008, which means the North Park and Marshall lakes and all of the watershed's rivers, except Willow Run, have high enough levels of bacteria that they fail to support activities like swimming.[59]

The EPA worked with PA DEP to develop a "pollution diet" (known as a "total daily maximum load" or TMDL) for the Pine Creek watershed to address bacteria contamination.[60] The new cleanup plan was finalized in March 2013 and cover all 128 miles of streams of the Pine Creek watershed.[61] The TMDL will help the state and the EPA to set more protective limits on pollution in future permits to achieve water quality standards across the watershed.[62]

The Trump administration has proposed to cut 12.5 percent of funding for the EPA program that supports stronger surface water protections and develops TMDLs.[63]

EPA Technical Assistance Supports Green Infrastructure Development in Pittsburgh

Pittsburgh has a wet weather problem. As a result of sprawling development, an increasing portion of the Pittsburgh area are impervious, meaning that instead of filtering into the ground, rainfall runs off roads and into waterways.[64] During heavy rain events, the city suffers from sewer overflows and flash floods, when excess stormwater overloads the sewer system and raw sewage flows into its rivers and streams.[65] Sewage overflows can expose people to health risks, such as stomach cramps, diarrhea, hepatitis, gastroenteritis and norovirus. Since the Allegheny County Sanitary Authority (ALCOSAN) reached a settlement with the EPA in 2007 for Clean Water Act violations from combined sewer overflows, ALCOSAN, the City of Pittsburgh and their partners are working to reduce excess flow, notably by using installing "green infrastructure" to capture rain where it falls and prevent overflows.[66]

Green stormwater infrastructure features are installations that mimic the natural environment and absorb rainfall.[67] For example, traditional roofs may be replaced with green roofs, traditional paved roads with permeable ones, or portions of mowed lawns with rain gardens. Studies have shown that green stormwater systems can trap between 45 and 99 percent of solid pollutants in stormwater, and can absorb between 50 percent and 90 percent of rainfall.[68] Construction costs for green stormwater infrastructure are also 5 to 30 percent lower than the expense of building new "gray" infrastructure

Photo: Theresa Muehlbauer/Nine Mile Run Watershed Association.

EPA technical assistance helped produce design guidelines for green stormwater infrastructure projects in the Pittsburgh area, contributing to the implementation of projects like the rain garden at the Crescent Early Childhood Center in Rosedale.

consisting of traditional man-made storm drains and sewer systems.[69]

From 2012 to 2015, the EPA provided technical assistance to the City of Pittsburgh and its partner, 3 Rivers Wet Weather, a nonprofit organization that supports Allegheny County municipalities and the City of Pittsburgh as they work to address the wet weather overflow challenge, to develop green infrastructure at three sites.[70] The collaboration produced a report for each of the sites proposing conceptual designs and feasibility for green infrastructure.

The design techniques developed through that exercise have been applied to a variety of other sites.[71] For instance, the Pittsburgh Water and Sewer Authority collaborated with the Nine Mile Run Watershed Association to implement green stormwater infrastructure projects over a 1.15 square mile area in the watershed, which contributed 25 million gallons of sewer overflows to the Allegheny River each year.[72] In 2016, the partners built bioswales, underground storage systems, stormwater tree pits, rain gardens at the intersections of Oakwood and Batavia streets and Frankstown Avenue and Wheeler Street, as well as the Crescent Early Childhood Center. These installations will capture at least 1.7 million gallons of stormwater runoff each year.[73] The Nine Mile Run Watershed Association is monitoring the projects to verify their effectiveness, and continues to deploy other green stormwater infrastructure features, including stormwater tree planters, free rain barrels and residential and commercial rain gardens.[74]

Through the three site-specific reports, the four white papers and informal technical assistance, the EPA has supplied local government, utilities and organizations with invaluable expert knowledge to implement green stormwater infrastructure and help address Pittsburgh's wet weather problems.[75]

The Allegheny County Sanitation Authority has proposed to spend $2 billion over the next decade to address combined sewer overflows. The EPA has assisted the City of Pittsburgh and its partners in developing green stormwater infrastructure solutions. Continued EPA oversight is critical as ALCOSAN works to address its combined sewer overflow problems in accordance with the 2007 settlement agreement.

Impacts of EPA Budget Cuts

The Trump administration has proposed cutting funding for programs like those that have helped protect water quality in the Three Rivers. For example:

- State and tribal assistance grants would be cut by 19 percent in the proposed budget.[76]
- The administration proposes to cut grants for state public water system supervision programs by 30 percent.[77]
- Grant programs for pollution prevention, which received almost $4.8 million in FY17, would also be eliminated.[78]
- Programs to detect and prevent leaks from underground storage tanks of petroleum products and hazardous substances would be cut by half.[79]

The EPA delegates implementation and enforcement of the Clean Water Act and the Safe Drinking Water Act to states. To help with implementation of these federal laws, PA DEP receives a third of its funding from the EPA.[80] Slashing EPA support undermines PA DEP's ability to address existing and emerging threats and to ensure Pennsylvanians living in the Three Rivers watershed have access to clean water.

Less Accountability for Polluters

Ensuring clean water depends on limiting the amount of much pollution that is released into our waterways and making sure that everyone is playing by the rules. Enforcing federal laws that

protect clean water means keeping an eye on pollution levels, inspecting sites to check that polluters are abiding by the conditions of their pollution discharge permits, and enforcing those conditions when polluters fail to meet them. The EPA, PA DEP and local partners work together to enforce clean water laws, prevent pollution from reaching dangerous levels, and keep communities and the environment safe from harm.

EPA Enforcement Requires Coal Producer to Make Upgrades to Protect Ohio River Tributaries

In 1984, Consol Energy began operations at the Bailey Mine Complex, the largest underground mine in the U.S.[81] The coal mine, located in southwestern Pennsylvania in Greene and Washington counties, can produce 28.5 million tons of coal per year, but also produces large quantities of contaminated wastewater.[82] From 2005 to 2012, the Bailey Mine coal washing operations and slurry ponds discharged mining wastewater to Ohio River tributaries with contaminant levels that far exceeded Consol Energy's permit limits.[83] Mining pollution can foul streams and make them dangerous for aquatic wildlife.[84]

Photo: Center for Coalfield Justice.

Community members, indigenous representatives, grassroots and environmental organizations visit the Bailey Mine processing plant in May 2016. The EPA and PA DEP reached a settlement with Consol Energy to clamp down on mining wastewater discharges and improve water management at the mining complex in 2016.

In 2016, the EPA, the U.S. Department of Justice and PA DEP fined Consol Energy $3 million, split evenly between the federal and state governments, for its contaminated mining wastewater discharges.[85] In the 2016 settlement, Consol Energy also agreed to $5.3 million in water management and monitoring improvements to prevent discharges.[86] The relief measures should cut dissolved coal mining pollutant discharges by more than 2.5 million pounds per year.[87] The environmental management system will also develop inspection, treatment and emergency response protocols and train staff on environmental issues to ensure compliance with the Clean Water Act.[88]

Impacts of EPA Budget Cuts

The Trump administration has proposed slashing a fifth of the EPA's environmental enforcement activities, severely curtailing EPA's ability to enforce the law and to investigate and address violations that threaten drinking water and aquatic environments in the Three Rivers watershed.[89] If the EPA has less funding for monitoring pollution levels and enforcing limits, unscrupulous actors may choose to violate their permits and pollute waterways.

Compounding the problem, the Trump administration has shown that even when its EPA does take action against a polluter, it is less diligent in seeking penalties that hold that polluter accountable and discourage others. Over the first six months of the Trump administration, the EPA has collected 60 percent less in civil penalties than had previous administrations.[90] The EPA will not be able to carry out its critical monitoring and enforcement responsibilities

as effectively with a fifth of its enforcement budget slashed, preventing it from taking decisive action against polluters and cleaning up the watershed.

Stalled Restoration of Polluted Waterways

After centuries of development and pollution, restoring the Three Rivers is key to ensuring that they will be able to continue to provide communities with safe drinking water and recreational opportunities. Restoration work can mean cleaning up the most polluted areas. It can also mean taking steps to restore the land and watershed to prevent pollution in the future. The EPA helps restore water quality in the Three Rivers watershed by supervising Superfund cleanups and working with the state to clean up legacy mining pollution.

The EPA Worked with the State and a Mining Company to Clean Up Legacy Pollution on the Little Conemaugh River

From the early 1960s until recently, an abandoned mine shaft, located in St. Michael in Cambria County, discharged 3,000 gallons of mining drainage each minute to the Little Conemaugh River.[91] Because the mine's operations pre-dated the 1977 federal law that regulates the environmental impacts of coal mining, the new regulations did not cover the mine.[92] As a result, the abandoned mine has dumped enough acid mine drainage into the creek since the 1960s to fill a football stadium more than 100 times over.[93]

When Rosebud Mining Co. requested a permit to mine deeper reserves in the St. Michael Shaft, the EPA worked with the state to develop a permit that would grant the company access to the reserves, while cleaning up the river.[94] In the 2012 permit, Rosebud Mining Co. agreed to pump and treat water from the contaminated mine seeps.[95] Under a related consent order, the company also built a $15 million wastewater treatment plant in 2013 to treat the polluted mine water and set aside funds to ensure the plant continues to operate even after the company ceases to mine the shaft.[96] After 50 years of uninterrupted pollution, the cleanup project stopped the discharges to the Little Conemaugh River, cutting iron loads by 98 percent, aluminum loads by 100 percent, and manganese loads by more than 50 percent.[97]

The EPA continues to work on developing permitting tools and new ways to treat legacy mining

Photo: daveynin via Flickr, CC BY 2.0.

Acid mine drainage is the single-largest cause of impairment in the Three Rivers, discharging highly acidic wastewater charged with heavy metals that makes waterways lethal to aquatic life.

Photo: EPA, open domain.

The EPA monitors groundwater quality using wells located around the Osborne Landfill Superfund site to verify the continued success of cleanup solutions.

pollution, beyond grant programs and dwindling reclamation funds.[98]

The EPA Supervised Cleanup at the Osborne Landfill in Mercer County

The Osborne Landfill, located near Grove City in Pine Township, Mercer County, operated from the 1950s to the 1970s, until the state closed the landfill for accepting industrial wastes without a permit.[99] EPA and state site investigations found a variety of toxic substances in the soil and surface water around the site, including in a nearby swamp that drains to Swamp Run, a fishing stream. Some of the hazardous substances found at the site, such as lead, arsenic, cadmium and benzene, can have dangerous health effects, potentially contributing to brain, nerve and kidney damage, as well as cancer.[100]

Due to the potential for contamination of groundwater, which supplied more than 8,000 residents in Grove City who live within one mile of the dump with drinking water, the Osborne Landfill was declared to be a Superfund toxic site in September 1983, and was added to the EPA's national priorities list for cleanup.[101] In 1983, the EPA identified Cooper Industries as a potential responsible party, and ordered the company to build a security fence around the site to prevent accidental contamination, and to remove 83 drums of hazardous waste, 460 empty drums, and 45 cubic yards (between three and five dump trucks' worth) of contaminated soil.[102] Cooper Industries also extended a municipal water line so that residents living close to the site could be supplied with uncontaminated water, after finding high levels of contamination in a resident's well.[103] However, in 1988, Cooper Industries refused to comply with the state's conditions to continue cleaning up the site, and the state requested the EPA take over the investigation and cleanup supervision.[104]

The EPA ordered Cooper Industries to contain the contamination and install a treatment system in March 1991, and settled with General Electric, another potentially responsible party, for reimbursement of past cleanup costs.[105] Since the water treatment system was completed in 1997, the EPA has monitored groundwater quality in local aquifers and conducted reviews every five years to verify that the cleanup solutions continue to hold.[106] In its last five-year review, conducted in August 2015, the EPA found that the remedy continues to be protective of human health and the environment.[107] The site has been ready for reuse and redevelopment since 2010, and many stretches of Swamp Run and Wolf Creek are now deemed healthy enough to support aquatic life, and therefore safe for use for drinking water and recreation.[108]

Impacts of EPA Budget Cuts

The Trump administration's proposed budget cuts would limit the EPA's ability to support the efforts of state, regional and local actors working to restore the Three Rivers. The Superfund cleanup budget, which helps to ensure cleanup of the most contaminated sites in Pennsylvania, would shrink by nearly 30 percent.[109]

In spite of hard-won successes in cleaning up some of the Three Rivers watershed's most polluted sites, only 30 Pennsylvania Superfund sites have been removed from the EPA's list of most contaminated sites in the U.S, while 95 still remain.[110] Slashing EPA budgets will slow down cleanup and restoration of these toxic sites in the Three Rivers watershed.

Less Research and Education on Water Quality Threats

Emerging threats pose new challenges to restoring the Three Rivers watershed. Research generates knowledge and tools that help water agencies and treatment plant operators to understand the impacts of various threats to water and develop new strategies and tools to effectively safeguard this precious natural resource. Proposed budget cuts would eliminate important research programs and limit research grants that support clean water in the Three Rivers watershed for drinking, fishing and recreation.

EPA Researchers Determined Fracking Wastewater Disposal and Coal Plants Pollute Drinking Water from the Allegheny River

Beginning in 2010, shortly after the beginning of the fracking boom, drinking water surveys from water suppliers that draw from the Allegheny River started indicating high levels of trihalomethanes, a range of chemical compounds that may cause cancer and are by-products of chlorine disinfection.[111] In at least once case, trihalomethane levels exceeded federal drinking water standards.[112] Similar pollution in the Monongahela River had forced state environmental officials to issue a drinking water advisory for roughly 325,000 residents in the Pittsburgh area in 2008 and 2009.[113]

Water utilities, like the Pittsburgh Water and Sewer Authority and the Wilkinsburg-Penn Joint Water Authority, determined that the spike in trihalomethanes was due to higher levels of bromide in the river,

Fracking generates large quantities of wastewater, which can contaminate public drinking water sources even after treatment.

Photo: The Downstream Project/Skytruth/Lighthawk.

which contributes to the formation of trihalomethanes in drinking water. Although treatment plants are capable of treating bromides to ensure safe drinking water, the technologies that allow them do so are very expensive.[114] Identifying and addressing the pollution source was key to ensuring safe drinking water throughout the Allegheny River watershed.

EPA researchers and regional staff conducted a study to determine the source of the bromide contamination in public drinking water intakes, investigating drilling and fracking wastewater treatment facilities, municipal wastewater treatment plants and coal-fired plants with flue gas desulfurization (a technology used to remove sulfur dioxide from exhaust gases).[115] To do so, the research team studied two facilities that treat and discharge fracking wastewater to surface water on the Allegheny River and its tributary Blacklick Creek in Indiana County, and which are located upstream from drinking water intakes.[116] The study, published in 2015, found that the fracking wastewater treatment facilities were indeed major sources of bromide at public drinking water intakes; wastewaters discharged from the two treatment facilities contributed 89 percent of bromide measured at the first intake and 37 percent at the second intake, where coal power plants with flue-gas desulfurization contributed nearly half of measured bromide.[117] By demonstrating a link between fracking wastewater treatment, coal-fired power plant emissions and contamination in drinking water intakes, EPA research flagged a public health threat.

In 2011, DEP requested that local sewage authorities voluntarily cease to accept shale gas wastewater.[118] The voluntary ban proved effective, as bromide levels have generally fallen throughout the Allegheny River watershed.[119] However, bromide pollution in Blacklick Creek has persisted, and bromide discharges from coal-fired power plants could increase as they seek to comply with new mercury emissions standards (bromide is often added to coal to control mercury).[120] By continuing to research the relationship between fracking wastewater disposal, coal-fired power plant emissions and public drinking water supplies, the EPA produces knowledge necessary to improve protections for clean water in our rivers and streams and safe drinking water in our taps.

EPA-Supported Program Provides Students and Teachers Watershed Field and Laboratory Research Experiences in Southwestern Pennsylvania

The Creek Connections project of Allegheny College provides equipment, training and assistance for middle and secondary schools in Western Pennsylvania to study local water chemistry.[121] Creek Connections gives students and teachers field and research experiences in their own watershed.[122] More than 40 schools in Western Pennsylvania, such as Titusville Middle School, Seneca Valley Senior High School and the West Mifflin Area High School, benefit from this program each year.[123]

In 2011, the EPA granted Allegheny College $80,668 for the Creek Connections project to improve their water quality monitoring protocol.[124] Although Creek Connections seeks mainly to improve environmental literacy, all the water quality monitoring data collected by participating schools is made available on the project website.[125] A range of actors make use of the data, including 3 Rivers QUEST, a West Virginia Water Research Institute project that collects water quality information from across the Three Rivers for display on a single website.[126] Government agencies also use data collected through the Creek Connections project as a baseline for comparison in watersheds with limited historical data on water quality.[127]

An EPA grant allowed the Creek Connections project at Allegheny College to improve its water quality monitoring methodology, supporting a program that has provided hundreds of students and teachers with hands-on natural science experiences within their regional watersheds.

Photo: Creek Connections, Allegheny College.

The EPA environmental education grant helped to build a program that develops environmental literacy and the public's understanding of how human activity affects the health of waterways in southwestern Pennsylvania.[128] The budget proposed by the Trump administration would eliminate funding for environmental education grants that support programs like Creek Connections and inspire the natural scientist and water resource managers of tomorrow.[129]

Impacts of EPA Budget Cuts

The administration's budget proposal slashes the EPA's overall research and development budget by nearly half.[130] The Safe and Sustainable Water Resources research program would lose a third of its funding.[131] The key grant program under which the EPA supports university research programs for better environmental science and management, called "Extramural Science to Achieve Results," would not receive any funding.[132]

Reducing research and education limits the capacity of the EPA to support scientific research programs adapted to the needs of the Three Rivers watershed. The administration's budget proposal jeopardizes water quality and health by delaying the development of innovative tools to preserve water quality and preparing for the future to ensure clean water for all.

The Health of the Three Rivers Basin Depends on a Strong EPA

Water quality in the Three Rivers has improved in recent years. The EPA – along with state and local government, citizens, academics, and philanthropic and business partners – has been critical to this effort. The EPA has established and enforced limits on pollution, helped to restore waterways, and supported research and education about the threats to the Three Rivers and solutions that can return them to health.

The job is not done, however. Existing sources of pollution – from mining runoff to sewage treatment plants – continue to imperil water quality and human health, requiring continued vigilance and action. New threats and sources of pollution, meanwhile, may add to the region's water quality problems.

Now is not the time to hobble the essential work of protecting and restoring the Three Rivers. To build on the progress of recent decades and ensure that our waterways are safe for swimming, fishing and other uses, funding for the EPA and the state and local efforts it supports should be *increased*, not cut. For example, aging drinking water and sewage infrastructure across the nation are in need of replacement, at a cost of $600 billion over the next 20 years.[133]

Continued progress in cleaning up existing sources of pollution and addressing new sources of contamination requires increased funding for the EPA's clean water efforts. The agency needs resources to establish pollution limits that protect human health and to make sure that polluters abide by those pollution standards. The agency needs money to continue its critical role in supporting cleanup of past pollution and restoring damaged rivers and streams so that they can provide clean water. The EPA also needs funding to help it identify and respond to future threats to clean water. Ensuring that people who live, work and play in and around the Three Rivers have access to clean water requires full funding for the EPA.

Notes

1. 3.5 million people: Pennsylvania Department of Conservation and Natural Resources, *Ohio River Basin Facts,* archived 3 November 2017 at web.archive.org/web/20171103170230/http://www.docs.dcnr.pa.gov/cs/groups/public/documents/document/dcnr_20031262.pdf; 18 million travelers: Visitors to Pittsburgh and its countryside: Longwoods International, Pennsylvania Tourism Office, *Pennsylvania Annual Travel Profile 2015 Travel Year* (presentation), archived 3 November 2017 at web.archive.org/web/20171103171530/http://visitpa.com/sites/default/master/files/pdfs/2015_PA_Annual_Travel_Profile_FINAL.pdf.

2. Pennsylvania Department of Conservation and Natural Resources, *Ohio River Basin Facts,* archived 3 November 2017 at web.archive.org/web/20171103170230/http://www.docs.dcnr.pa.gov/cs/groups/public/documents/document/dcnr_20031262.pdf.

3. U.S. Environmental Protection Agency, *EPA Sets Water Quality Improvement Plan for Pine Creek Watershed in Western Pennsylvania* (news release), 11 March 2013, archived 13 November 2017 at web.archive.org/web/20171113182255/yosemite.epa.gov/opa/admpress.nsf/8b770facf5edf6f185257359003fb69e/6cd906bea40918ec85257b2b005fab53!OpenDocument.

4. Ibid.

5. U.S. Environmental Protection Agency, Bacteria TMDLs to Address the Recreation Use Impairment in the Pine Creek Watershed, Allegheny County, Pennsylvania, February 2013.

6. PGH_2O, *Going Green,* archived 13 November 2017 at web.archive.org/web/20171113182428/http://www.pgh2o.com/going-green; U.S. Environmental Protection Agency, *What Is EPA Doing to Support Green Infrastructure?* accessed 19 October 2017 at www.epa.gov/green-infrastructure/what-epa-doing-support-green-infrastructure-0.

7. U.S. Environmental Protection Agency, *What Is EPA Doingto Support Green Infrastructure?* accessed 19 October 2017 at www.epa.gov/green-infrastructure/what-epa-doing-support-green-infrastructure-0.

8. James Stitt, Sustainability Manager, Pittsburgh Water and Sewer Authority, personal communication, 27 October 2017.

9. U.S. Environmental Protection Agency, *Consol Energylnc., CNX Coal Resources LP, and Consol Pennsylvania Coal Company LLC Clean Water Settlement*, accessed 19 October 2017 at www.epa.gov/enforcement/consol-energy-inc-cnx-coal-resources-lp-and-consol-pennsylvania-coal-company-llc-clean.

10. Ibid.

11. Ibid.

12. U.S. Environmental Protection Agency, *EPA in Pennsylvania: Actions Eliminate Long-Time, Major Acid Mine Discharge,* accessed 19 October 2017 at www.epa.gov/pa/actions-eliminate-long-time-major-acid-mine-discharge.

13. U.S. Environmental Protection Agency, *Actions Eliminate Long-Time, Major Acid Mine Discharge* (fact sheet), 3 September 2015, accessed 19 October 2017 at www.epa.gov/sites/production/files/2016-09/documents/pa_progress_-_long_time_acid_mine_drainage_halted_-_20150903.pdf.

14. U.S. Environmental Protection Agency, *NPL Site Narrative for Osborne Landfill,* accessed 19 October 2017 at https://semspub.epa.gov/work/03/900312.pdf.

15. U.S. Environmental Protection Agency, *Osborne Landfill, Grove City, PA, Cleanup Activities,* accessed 19 October 2017 at https://cumulis.epa.gov/supercpad/SiteProfiles/index.cfm?fuseaction=second.Cleanup&id=0301541#Involve.

16. Ready for reuse: U.S. Environmental Protection Agency, *Osborne Landfill, Grove City, PA, Cleanup Activities,* accessed 19 October 2017 at https://cumulis.epa.gov/supercpad/SiteProfiles/index.cfm?fuseaction=second.Cleanup&id=0301541#Involve; aquatic life beneficial use restored: U.S. Environmental Protection Agency, *2016 Integrated Water Quality Report – Integrated Report Viewer* (online map), accessed 19 October 2017 at www.depgis.state.pa.us/integratedreport/index.html.

17. Allegheny River pollution: Mary Ann Thomas, "Survey: Allegheny River water quality holds steady," *TribLive,* 12 September 2015, available at http://triblive.com/neighborhoods/yourallekiskivalley/yourallekiskivalleymore/8937723-74/allegheny-river-drinking#axzz3liUMceP6; Monongahela River pollution: Maya K. van Rossum and Tracy Carluccio, Delaware Riverkeeper Network, *Re: Draft Supplemental Generic Environmental Impact Statement on the Oil, Gas, and Solution Mining Regulatory Program (the "Draft")* (public comment), 30 December 2009, available at www.riverkeeper.org/wp-content/uploads/2010/01/DL-RvK-written-comment-Draft-SGEIS-12.09fnldocx.pdf.

18. U.S. Environmental Protection Agency, *Sources contributing Inorganic Species to Drinking Water Intakes During Low Flow Conditions on the Allegheny River in Western Pennsylvania,* May 2015, archived 11 October 2017 at web.archive.org/web/20171012153104/www.epa.gov/sites/production/files/2015-05/documents/epa_source_apportionment_rpt_final_07may2015_508_km.pdf.

19. Allegheny College, *Creek Connections,* archived 3 November 2017 at web.archive.org/web/20171103175014/http://sites.allegheny.edu/creekconnections/.

20. Grant: U.S. Environmental Protection Agency, *Profiles of Environmental Education Grants Awarded to Organizations in Pennsylvania,* available at www.epa.gov/education/profiles-environmental-education-grants-awarded-organizations-pennsylvania#2011; cut: U.S. Environmental Protection Agency, *FY 2018 EPA Budget in Brief,* May 2017, p. 62.

21. Office of Management and Budget, *Appendix: Budget of the U.S. Government, Fiscal Year 2018*, 2017.

22. U.S. Environmental Protection Agency, *FY 2018 Budget in Brief*, May 2017, p. 43.

23. Office of Management and Budget, *Analytical Perspectives: Budget of the U.S. Government, Fiscal Year 2018*, 2017, Table 18-1.

24. See note 22, p. 68.

25. Office of Management and Budget, *Budget of the U.S. Government: A New Foundation for American Greatness, Fiscal Year 2018*, 2017.

26. 18 darter species in Ohio River Basin: see note 2; 21 PA species: Andrew L. Shiels, Pennsylvania Fish & Boat Commission, *Pennsylvania's Dynamic Darters,* accessed 23 November 2017 at http://www.fishandboat.com/LearningCenter/EducationResourceCatalog/Fish/Documents/DynamicDarters.pdf; mussels: see note 2.

27. Ibid.

28. Ohio River Valley Sanitation Commission, *The State of the Ohio River*, April 2017.

29. Port of Pittsburgh Commission, *The Registered Boat Ranking Myth*, archived 23 November 2017 at https://web.archive.org/web/20171123131304/http://www.port.pittsburgh.pa.us/index.aspx?page=231.

30. Visitors to Pittsburgh and its countryside: Longwoods International, Pennsylvania Tourism Office, *Pennsylvania Annual Travel Profile 2015 Travel Year* (presentation), archived 3 November 2017 at web.archive.org/web/20171103171530/http://visitpa.com/sites/default/master/files/pdfs/2015_PA_Annual_Travel_Profile_FINAL.pdf.

31. Improvement in watershed health: Committee on Water Quality Improvement for the Pittsburgh Region, National Academy of Sciences, *Report in Brief: Water Quality Improvement in Southwestern Pennsylvania,* 2004, available at dels.nas.edu/resources/static-assets/materials-based-on-reports/reports-in-brief/sw_penn.pdf; percentage of stream-miles impaired for aquatic use based on Pennsylvania Department of Environmental Protection, Integrated List Attaining (GIS Layer), 2017, and Pennsylvania Department of Environmental Protection, Integrated List Non-Attaining (GIS Layer), 2017, both accessed from Pennsylvania Spatial Data Access at http://www.pasda.psu.edu/. Streams in the Three Rivers basin were identified as those in the Ohio River basin (HUC2="05"), with stream length calculated in ArcGIS.

32. Based on Pennsylvania Department of Environmental Protection, Integrated List Non-Attaining (GIS Layer), 2017, accessed from Pennsylvania Spatial Data Access at http://www.pasda.psu.edu/.

33. Pennsylvania Fish and Boat Commission, *Commonwealth of Pennsylvania Public Health Advisory: 2017 Fish at Consumption,* archived 3 November 2017 at web.archive.org/web/20171103170140/http://pfbc.pa.gov/fishpub/summaryad/sumconsumption.pdf.

34. See note 2.

35. Pennsylvania Department of Environmental Protection, Integrated List Non-Attaining (GIS Layer), 2017, accessed from Pennsylvania Spatial Data Access at http://www.pasda.psu.edu/.

36. Office of Management and Budget, *Budget of the U.S. Government: A New Foundation for American Greatness, Fiscal Year 2018*, 2017.

37. 1970s levels: Environmental Protection Network, *Analysis of Trump Administration Proposals for FY 2018 Budget for the Environmental Protection* Agency, 22 March 2017.

38. Nicole Ogrysko, "Civilian Agency Cuts in House Spending Bill Are Deep, Not as Drastic as Trump's Proposal," *Federal News Radio,* 14 September 2017.

39. See note 22, p.43

40. Section 319 grants, ibid.

41. Underground Storage Tank funding, ibid.

42. Estimated losses to individual states are based on the assumption that EPA budget cuts will affect all states by the same percentage. That percentage cut was applied to grant funding for each state in the most recent fiscal year for which data were available. "Water pollution control grants" are Section 106 grants, slated for a 30 percent cut. "Nonpoint pollution control grants" are Section 319 grants, cut entirely in the administration's proposed budget. "Drinking water protection and enforcement grants" are Public Water System Supervision grants, cut by 30 percent. Information on proposed cuts comes from U.S. Environmental Protection Agency, *FY 2018 Budget in Brief*, May 2017, 39 and 43. Lost funding by state is based on most recent funding levels for each program: FY 2016 for Section 106, per U.S. EPA, *FINAL Section 106 FY2016 Funding Targets with Rescission*, 29 December 2015, archived at web.archive.org/web/20170727210615/https://www.epa.gov/sites/production/files/2017-04/documents/final_fy_16_section_106_with_rescission_standard.pdf. FY 2016 for Section 319, per U.S. EPA, Grants Reporting and Tracking System, accessed 9 August 2017, at ofmpub.epa.gov/apex/grts/f?p=109:9118:::NO:::. FY 2017 for PWSS grants, per Memorandum from Anita M. Thompson, Director, Drinking Water Protection Division, U.S. Environmental Protection Agency, to Regional Drinking Water Programs Managers, *Final Allotments for the FY2017 Public Water System Supervision (PWSS) State and Tribal Support Grants*, 30 May 2017, archived at http://web.archive.org/web/20170727210933/https://www.epa.gov/sites/production/files/2017-06/documents/wsg_202_pwss_fy17_allotments.pdf.

43. Environmental Protection Network, *House Appropriation for EPA Cuts Core Programs 27 Percent - Even More Deeply than Trump Requested,* 2017, available at https://docs.wixstatic.com/ugd/dfb365_da2a150d87a148f686257a1619c5c6c3.pdf.

44. Ibid.

45. U.S. Environmental Protection Agency, *EPA's Budget and Spending,* archived 14 January 2017 at https://web.archive.org/web/20170114052726/https://www.epa.gov/planandbudget/budget.

46. Office of Management and Budget, *Analytical Perspectives: Budget of the U.S. Government, Fiscal Year 2018*, 2017, Table 7-1.

47. Office of Management and Budget, *Appendix: Budget of the U.S. Government, Fiscal Year 2018*, 2017.

48. Office of Management and Budget, *Major Savings and Reforms: Budget of the U.S. Government, Fiscal Year 2018*, 2017.

49. See note 23.

50. U.S. Environmental Protection Agency, *FY 2018 Budget in Brief*, May 2017, p. 68.

51. Ibid.

52. Ibid.

53. Ibid.

54. 38 percent represents the budget cut for all homeland security activities in the Office of Science and Technology, per U.S. Environmental Protection Agency, *FY 2018 Budget in Brief*, May 2017.

55. See note 50.

56. See note 43.

57. U.S. Environmental Protection Agency, *EPA Sets Water Quality Improvement Plan for Pine Creek Watershed in Western Pennsylvania* (news release), 11 March 2013, available at yosemite.epa.gov/opa/admpress.nsf/8b770facf5edf6f185257359003fb69e/6cd906bea40918ec85257b2b005fab53!OpenDocument.

58. Ibid.

59. Ibid.

60. Ibid.

61. March 2013: U.S. Environmental Protection Agency, *EPA Sets Water Quality Improvement Plan for Pine Creek Watershed in Western Pennsylvania* (news release), 11 March 2013, available at yosemite.epa.gov/opa/admpress.nsf/8b770facf5edf6f185257359003fb69e/6cd906bea40918ec85257b2b005fab53!OpenDocument; 128 stream miles: Pennsylvania Environmental Council, *Pine Creek Watershed Implementation Plan,* October 2009, available at files.dep.state.pa.us/Water/BWEW/Watershed%20Management/WatershedPortalFiles/NonpointSourceManagement/ProgramInitiatives/ImplementationPlans/Pine%20Creek%20Watershed%20Implementation%20Plan%20Final%20October%202009.pdf.

62. U.S. Environmental Protection Agency, *Bacteria TMDLs to Address the Recreation Use Impairment in the Pine Creek Watershed, Allegheny County, Pennsylvania,* February 2013.

63. U.S. Environmental Protection Agency, *FY 2018 Budget in Brief*, May 2017, p. 36.

64. Carol Howe, ForEvaSolutions, *Pittsburgh Region: A Regional Scale Analysis of a One Water Approach,* 2015, available at www.waterrf.org/resources/Lists/PublicCaseStudiesList/Attachments/32/In%20Depth_Pittsburgh%20Case%20 Study.pdf.

65. Ibid.

66. Settlement: U.S. Environmental Protection Agency, *Allegheny County Sanitary Authority (ALCOSAN) Settlement* (news release), 31 May 2007, accessed 13 November 2017 at www.epa.gov/enforcement/allegheny-county-sanitary-authority-alcosan-settlement; green infrastructure: PGH $_2$O, *Going Green,* accessed 19 October 2017 at www.pgh2o.com/going-green.

67. Elizabeth Berg, Frontier Group, Luke Metzger and Brian Zabcik, Environment Texas Research & Policy Cen-

ter, *Catching the Rain: How Green Infrastructure Can Reduce Flooding and Improve Water Quality in Texas*, 2017, available at frontiergroup.org/sites/default/files/reports/Frontier%20Group%20-%20Catching%20the%20Rain%20-%20Feb%202017.pdf.

68. William J. Taylor, Taylor Aquatic Science and Policy, *White Paper for Stormwater Management Program Effectiveness Literature Review: Low Impact Development Techniques*, April 2013, archived at web.archive.org/web/20170110230133/http://www.ecy.wa.gov/programs/wq/psmonitoring/ps_monitoring_docs/SWworkgroupDOCS/LIDWhitePaperFinalApril2013.pdf.

69. Claudia Copeland, Congressional Research Service, *Green Infrastructure and Issues in Managing Urban Stormwater*, 2 May 2016, archived at web.archive.org/web/20170110230231/fas.org/sgp/crs/misc/R43131.pdf, 2.

70. U.S. Environmental Protection Agency, *What Is EPA Doing to Support Green Infrastructure?* accessed 19 October 2017 at www.epa.gov/green-infrastructure/what-epa-doing-support-green-infrastructure-0.

71. See note 8.

72. Pittsburgh Water and Sewer Authority, *What We're Doing to Help Our Rivers,* accessed 27 October 2017 at ninemilerun.org/our-work/green-infrastructure/rosedale-runoff-reduction-project/.

73. Rosedale Runoff Reduction Project, *Project Components,* accessed 27 October 2017 at www.rosedalerain.com/project-components/#1467136525135-9e3120c2-02a2.

74. Ibid.

75. James Stitt, Sustainability Manager, Pittsburgh Water and Sewer Authority, personal communication, 27 October 2017.

76. U.S. Environmental Protection Agency, *FY 2018 EPA Budget in Brief*, May 2017, p. 40.

77. See note 48.

78. U.S. Environmental Protection Agency, *FY 2018 EPA Budget in Brief*, May 2017, p. 43.

79. Ibid, p. 35 and p. 38.

80. Kara Holsopple, "Federal Cuts at EPA Will Trickle Down to Pennsylvania," *Allegheny Front,* 8 March 2017, available at www.alleghenyfront.org/your-environment-update-for-march-8-2017/.

81. CNX Coal Resources, *About CNX Coal Resources,* accessed 19 October 2017 at www.cnxlp.com/our-company/about.

82. CNX Coal Resources, *About CNX Coal Resources,* accessed 19 October 2017 at www.cnxlp.com/our-company/about.

83. See note 9.

84. Ibid.

85. Ibid.

86. Ibid.

87. Ibid.

88. U.S. Environmental Protection Agency, *U.S. and PA DEP v. Consol Energy, Civil Action No. 16-1178, Consent Decree,* accessed 19 October 2017 at www.epa.gov/sites/production/files/2016-08/documents/consol-cd.pdf.

89. The proposed cut is 23.5 percent.

90. Eric Schaeffer, Environmental Integrity Project, *Environmental Enforcement under Trump: Records Show 60 Percent Drop in Civil Penalties against Polluters During President's First Six Months,* 10 August 2017, archived 16 August 2017 at web.archive.org/web/20170816173622/http://www.environmentalintegrity.org/wp-content/uploads/2017/08/Enforcement-Report.pdf.

91. See note 12.

92. Bette Conway, NPDES Mining Permits, EPA Region 3, personal communication, 19 October 2017.

93. See note 13.

94. Ibid.

95. Ibid.

96. Ibid.

97. See note 13.

98. See note 92.

99. See note 14.

100. Ibid.

101. Residents in Grove City: Grove City Historical Society, *Grove City 1970-1979,* 2014, archived 3 November 2017 at web.archive.org/web/20171103174430/http://www.grovecityhistoricalsociety.org/wp-content/uploads/2014/05/Grove-City-1970-1979r.compressed.pdf.

102. U.S. Environmental Protection Agency, *Osborne Landfill, Grove City, PA, Cleanup Activities,* archived 3 November 2017 at web.archive.org/web/20171103174541/cumulis.epa.gov/supercpad/SiteProfiles/index.cfm?fuseaction=second.Cleanup&id=0301541.

103. Ibid.

104. Ibid.

105. Cooper Industries order and General Electric settlement: U.S. Environmental Protection Agency, *Osborne Landfill, Grove City, PA, Cleanup Activities,* archived 3 November 2017 at web.archive.org/web/20171103174541/cumulis.epa.gov/supercpad/SiteProfiles/index.cfm?fuseaction=second.Cleanup&id=0301541; General Electric identified as potentially responsible party: U.S. Environmental Protection Agency, *Third Five Year Review Report Osborne Landfill Superfund Site, Pine Township, Mercer County, Pennsylvania*, 8 September 2010, available at semspub.epa.gov/work/03/2120691.pdf, p. 32.

106. See note 102.

107. Ibid.

108. Ready for reuse: U.S. Environmental Protection Agency, *Osborne Landfill, Grove City, PA, Cleanup Activities,* archived 3 November 2017 at web.archive.org/web/20171103174541/cumulis.epa.gov/supercpad/SiteProfiles/index.cfm?fuseaction=second.Cleanup&id=0301541; aquatic life use supported: U.S. Environmental Protection Agency, *2016 Integrated Water Quality Report – Integrated Report Viewer* (online map), accessed 19 October 2017 at www.depgis.state.pa.us/integratedreport/index.html.

109. U.S. Environmental Protection Agency, *FY 2018 EPA Budget in Brief,* May 2017, p. 41.

110. U.S. Environmental Protection Agency, *Deleted National Priorities List (NPL) Sites – by State,* accessed 18 October 2017 at www.epa.gov/superfund/deleted-national-priorities-list-npl-sites-state#PA.

111. 2010 bromide detection: Mary Ann Thomas, "Survey: Allegheny River Water Quality Holds Steady," *TribLive,* 12 September 2015, archived 3 November 2017 at web.archive.org/web/20171103174755/http://triblive.com/neighborhoods/yourallekiskivalley/yourallekiskivalleymore/8937723-74/allegheny-river-drinking; health effects: Centers for Disease Control and Prevention, *Disinfection By-Products,* archived 12 October 2017 at web.archive.org/web/20171012153136/www.cdc.gov/safewater/chlorination-byproducts.html.

112. Mary Ann Thomas, "Survey: Allegheny River Water Quality Holds Steady," *TribLive,* 12 September 2015, archived 3 November 2017 at web.archive.org/web/20171103174755/http://triblive.com/neighborhoods/yourallekiskivalley/yourallekiskivalleymore/8937723-74/allegheny-river-drinking.

113. Maya K. van Rossum and Tracy Carluccio, Delaware Riverkeeper Network, *Re: Draft Supplemental Generic Environmental Impact Statement on the Oil, Gas, and Solution Mining Regulatory Program (the "Draft")* (public comment), 30 December 2009, available at www.riverkeeper.org/wp-content/uploads/2010/01/DL-RvK-written-comment-Draft-SGEIS-12.09fnldocx.pdf.

114. John Hurdle, "EPA's Waste Water Treatment Rule Splits Environmentalists, Industry," *StateImpact*

NPR, 16 July 2015, available at stateimpact.npr.org/pennsylvania/2015/07/16/epas-waste-water-treatment-rule-splits-environmentalists-industry/.

115. See note 18.

116. Ibid.

117. Ibid.

118. Kevin Begos, "Bromide Pollution Persists in Allegheny River in Western Pa.," *Associated Press,* 13 November 2012, available at www.record-courier.com/news/20121113/bromide-pollution-persists-in-allegheny-river-in-western-pa.

119. See note 112.

120. Blacklick Creek: Mary Ann Thomas, "Survey: Allegheny River Water Quality Holds Steady," *TribLive,* 12 September 2015, archived 3 November 2017 at web.archive.org/web/20171103174755/http://triblive.com/neighborhoods/yourallekiskivalley/yourallekiskivalleymore/8937723-74/allegheny-river-drinking; coal plant discharges: Kelly D. Good and Jeanne M. VanBriesen, "Current and Potential Future Bromide Loads from Coal-Fired Power Plants in the Allegheny River Basin and Their Effects on Downstream Concentrations," *Environmental Science & Technology,* 50: 9078-9088, 2016, available at pubs.acs.org/doi/pdf/10.1021/acs.est.6b01770.

121. See note 19.

122. U.S. Environmental Protection Agency, *Profiles of Environmental Education Grants Awarded to Organizations in Pennsylvania,* available at www.epa.gov/education/profiles-environmental-education-grants-awarded-organizations-pennsylvania#2011.

123. Allegheny College, *Creek Connections: Participating Schools,* available at sites.allegheny.edu/creekconnections/water-quality-data-2/schools/.

124. EPA grant: U.S. Environmental Protection Agency, *Profiles of Environmental Education Grants Awarded to Organizations in Pennsylvania,* available at www.epa.gov/education/profiles-environmental-education-grants-awarded-organizations-pennsylvania#2011; grant deliverable: Wendy Kedzierski, Creek Connections Project Director, Allegheny College, personal communication, 18 October 2017.

125. Wendy Kedzierski, Creek Connections Project Director, Allegheny College, personal communication, 18 October 2017.

126. Ibid.

127. Ibid.

128. See note 122.

129. U.S. Environmental Protection Agency, *FY 2018 EPA Budget in Brief*, May 2017, p. 62.

130. Ibid, p. 24.

131. Ibid.

132. See note 48.

133. U.S. Environmental Protection Agency, *About the Water Infrastructure and Resiliency Finance Center*, accessed 27 July 2017, archived at web.archive.org/web/20170727232236/www.epa.gov/waterfinancecenter/about-water-infrastructure-and-resiliency-finance-center.