




2015 Annual Report

Commonwealth of Kentucky
Energy and Environment Cabinet
Department for Environmental Protection
Kentucky Division of Water
water.ky.gov

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EXECUTIVE SUMMARY



Dear Reader,

The Kentucky Division of Water (KDOW) is pleased to provide its Annual Report for Fiscal Year 2015 (FY2015). The Annual Report summarizes the work of the KDOW's scientists, specialists, and administrative staff towards reaching the division's mission of managing, protecting, and enhancing the water resources of the Commonwealth. This mission is largely carried out by implementing four strategic objectives: 1. Protect, manage and restore water resources; 2. Conduct effective water resources planning; 3. Meet federal and state program requirements; and 4. Promote better management and communication of data. The Annual Report highlights the progress being made in achieving these strategic objectives.

KDOW pursued water quality preservation and restoration through several initiatives. A partnership with the United States Army Corps of Engineers enables more comprehensive monitoring and examination of Harmful Algal Blooms (HABs) with the most recent satellite imaging technology. KDOW also convened meetings of the HAB Advisory Workgroup which facilitates communication and consistency among several agencies regarding any threats to water recreation or consumption should a HAB be detected.

Kentucky's Nutrient Reduction Strategy is a science and technology-based approach to reducing the effects that nitrogen, phosphorus, and other harmful nutrients have on waters of the Commonwealth and, ultimately, the Gulf of Mexico. The Kentucky Nutrient Reduction Strategy consolidates and builds upon existing efforts regarding nutrient management in Kentucky, as well as providing a broad review of ongoing and future activities. The strategy describes voluntary practices and regulatory initiatives, and identifies areas needing further development. The primary goal of this strategy is to reduce the nutrients (primarily nitrogen and phosphorus) being lost from point and non-point sources which are having harmful effects on Kentucky's waters.

Ongoing biological inventories and habitat management initiatives in select watersheds and Wild Rivers corridors contribute to preserving and restoring natural habitats, and provide ecological and economic benefit to the Commonwealth. Water quality monitoring of Kentucky's various river basins provides

benchmarks to evaluate water impairment and restoration activities, and results can now be found online at KDOW's website.

Public water systems in the Commonwealth continue producing excellent quality water and maintain the downward trend in violations, with faster responses to correct the presence of any contaminants. Amendments to the state drinking water regulations will result in better sampling techniques, corrective action requirements, aligned bottled water standards, and limited lead content in drinking water plumbing materials.

KDOW assisted several municipalities and public water systems, including the city of Fleming-Neon, Carrolton Utilities, and Louisville Water Company, in achieving protection of their source water. The Source Water Protection Assistance grant projects will bring many improvements so that these systems can continue providing dependable water to Kentucky citizens.

Kentucky leads the nation in the number of permit users submitting Discharge Monitoring Reports (DMRs) through the online NetDMR system. This facilitates exceptional transparency because the public can access all DMR data through the United States Environmental Protection Agency (USEPA) website. KDOW was able to reduce its permit application backlog by 9.6%, and approve 95% of new applications within the required timeframe, even though applications nearly doubled in FY2015. KDOW also issued seven General Permits in FY2015, which included separate coal mining discharge permits for the eastern and western portions of the state.

Wastewater systems continue to make progress minimizing the impacts from discharges of untreated wastewater. KDOW provided assistance to several systems for development of new wastewater facilities, while many communities are in the process of eliminating or reducing combined sewer and sanitary sewer overflows.

KDOW personnel conducted over 5,000 inspections and responded to more than 1,500 complaints in FY2015, and facilitated communication and responses to emergencies during the unusually harsh winter conditions of February and March, 2015. Their efforts helped make certain that water resources remained safe and accessible for consumers.

KDOW expanded its online Water Maps Portal with the addition of the Water Health Portal and several mapping tools, such as Risk MAP and the Watershed Viewer, designed to make information about the waters, watersheds, and floodplains of the Commonwealth more easily accessible and understandable to the user. Imaging technology and more robust data makes it possible to better predict risks from such emergencies as dam failures or floods.

I invite you to read more about the activities of the Division of Water, its accomplishments in monitoring and improving the waters of the Commonwealth, and its ongoing efforts to manage and protect these important resources for the benefit and enjoyment of the citizens of Kentucky.

Peter T. Goodmann, Director
Kentucky Division of Water

MISSION



The mission of the Kentucky Division of Water is to manage, protect, and enhance the quality and quantity of the Commonwealth's water resources for present and future generations through voluntary, regulatory, and educational programs.



Big South Fork Wild River

DOW Staff Photo

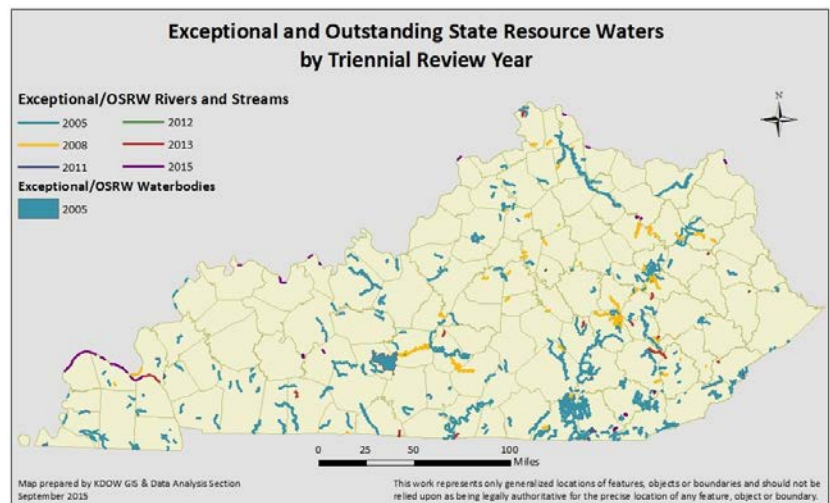
WATER QUALITY

Water Quality Standards – 2015 Triennial Review

The federal Clean Water Act gave states the responsibility of establishing objectives to manage, maintain, and enhance water quality. One element of these objectives are state Water Quality Standards (WQS). The Clean Water Act requires states to develop and adopt WQS as a means to preserve and protect water quality. Kentucky's WQS regulations are established in 401 KAR Chapter 10. The Clean Water Act requires the states to review and hold a public comment session regarding, state WQS every three years. This process is called the "Triennial Review".

In an effort to encourage and facilitate broader public participation across the state, KDOW hosted three Triennial Review public comment sessions across the state: one in London on May 12, 2015, Bowling Green on May 21, 2015, and in Frankfort on May 28, 2015. KDOW also received and reviewed written comments submitted by citizens from April 15 through June 1, 2015. Comments were received on Specific Substances (such as ammonia, metals, nutrients and selenium), Water Quality Criteria Litigation, and Other Issues (such as anitidegradation, assessment methodology, definitions, designations of uses, fracking, mixing zones, and primary contact recreation). All comments were taken into consideration during this triennial review. However, some suggested regulation amendments required further review and will be considered during the next triennial review.

KDOW filed with the Legislative Research Commission the proposed amendments to its WQS regulations in August 2015 following the administrative process established in KRS Chapter 13A.



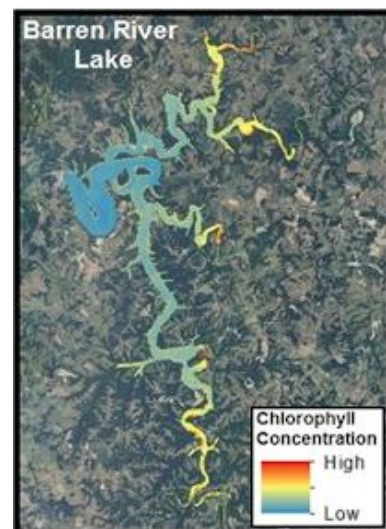
Harmful Algal Blooms (HABs)

Harmful Algal Blooms (HABs) are the rapid growth of blue-green algae, or cyanobacteria, in a water body which are called “algal blooms.” A combination of sunlight, warm water temperatures, low turbulence, and elevated nutrient levels, primarily nitrogen and phosphorus from various sources, including wastewater treatment plants and agricultural, urban, and industrial stormwater run-off, give rise to algal blooms. HABs occur when an algal bloom produces toxins at levels that can have serious health effects on humans and animals. Excess algal growth can also negatively impact aquatic habitat. Proper identification of HABs and toxin levels, effective communication, avoidance of risk, and appropriate treatment of affected waters are essential to protecting public health and the environment.

HABs have become an emerging and important issue for Kentucky. When Toledo, Ohio had to shut down its drinking water supply for over 400,000 people, KDOW was awakened to the potential for a similar event occurring in Kentucky. In response to the emerging HAB issue, KDOW developed several strategies designed to monitor HABs, work with other agencies and public water systems to notify the public of HAB conditions and risks and properly manage HABs but to address the larger and more comprehensive issues created by excess nutrients found in local, state, and interstate waters.

Over the past few years, KDOW and the United States Army Corps of Engineers (USACE) have monitored water bodies across the Commonwealth for indications of HABs.

Continuous HAB monitoring with traditional sampling is costly and time-intensive. Since 2013, KDOW has used remote sensing via Landsat satellite imagery to assess Kentucky’s water bodies for excess algal growth. Landsat was created in 1972 through the collaborative efforts of the United States Geological Survey (USGS) and the National Aeronautics and Space Administration (NASA). HABs can be predicted using models that compare satellite imagery with water quality measurements. KDOW personnel and other cooperating agencies have conducted monitoring of waterbodies to verify the presence of a HAB when remote sensing detects a potential bloom. KDOW is exploring other options to obtain remote sensing information when atmospheric conditions, such as thick cloud cover, prevent the use of satellite imagery. The figure



represents modeled Barren River Lake chlorophyll concentrations. As you can see, certain tributaries have an increased probability of a HAB (Landsat image from September 25, 2014).

KDOW began convening meetings of the HAB Advisory Workgroup in June 2013. The group consists of representatives from multiple agencies including the Department of Environmental Protection, Department of Public Health, the Department of Parks, and the Kentucky Department of Fish and Wildlife Resources, and the Tourism and Heritage Cabinet, as well as the federal USACE and USGS. This workgroup has developed protocols for determining conditions that prompt water sampling, standardized test methods, determinations of when to issue recreational advisories, signage and advisory language consistent with those in surrounding states, and improved timeliness and availability of information to the public. The workgroup continues to meet as they finalize protocols and operating policies.

KDOW is also developing protocols for managing HABs with public water systems, including providing guidance and technical assistance regarding treatment of HAB-contaminated water, monitoring raw and finished/treated water, and working with public water systems regarding the issuance of consumption advisories, if needed.

Kentucky Nutrient Reduction Strategy

Excess levels of nutrients (primarily nitrogen and phosphorus from various sources, including wastewater treatment plants and agricultural, urban, and industrial stormwater run-off) can result in the impairment of aquatic habitat, are associated with HABs, as well as eutrophication of lakes and streams (an overgrowth of aquatic plant life that depletes dissolved oxygen and prevents animal life from using the water as habitat). Excess nutrients are the third most common cause of impairment of Kentucky waters. In addition, excess nutrients contribute to hypoxic conditions, or “dead” zones, in coastal waters such as the Gulf of Mexico.

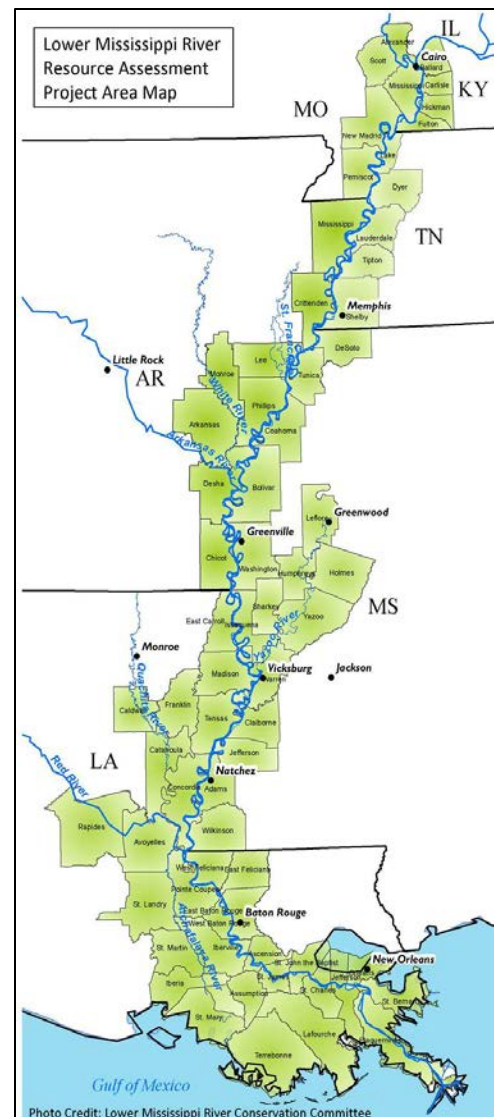
Kentucky and eleven other states in the Mississippi River Basin participate in the Mississippi River/Gulf of Mexico Watershed Nutrient Task Force which approved the Gulf Hypoxia Action Plan 2008 to coordinate efforts towards reducing nutrients in the river basin and the Gulf. As part of Kentucky’s participation KDOW is in the processing of finalizing a Kentucky Nutrient Reduction Strategy. The 2008 Action Plan recommended eight elements for each state to incorporate into its corresponding strategy to lower nutrient levels in waters within state borders.

KDOW, along with twelve other state agencies in Arkansas, Kentucky, Louisiana, Mississippi, Missouri, and Tennessee also participates in the Lower Mississippi River Conservation Committee (LMRCC). The LMRCC is dedicated to conserving the natural resources of the lower Mississippi River and focuses on habitat restoration, water quality, the River's impact on the Gulf of Mexico, and nature-based economic development. The LMRCC plans to develop a cooperative monitoring network to elicit additional water quality data to facilitate its mission and identify impacts on the Gulf of Mexico.

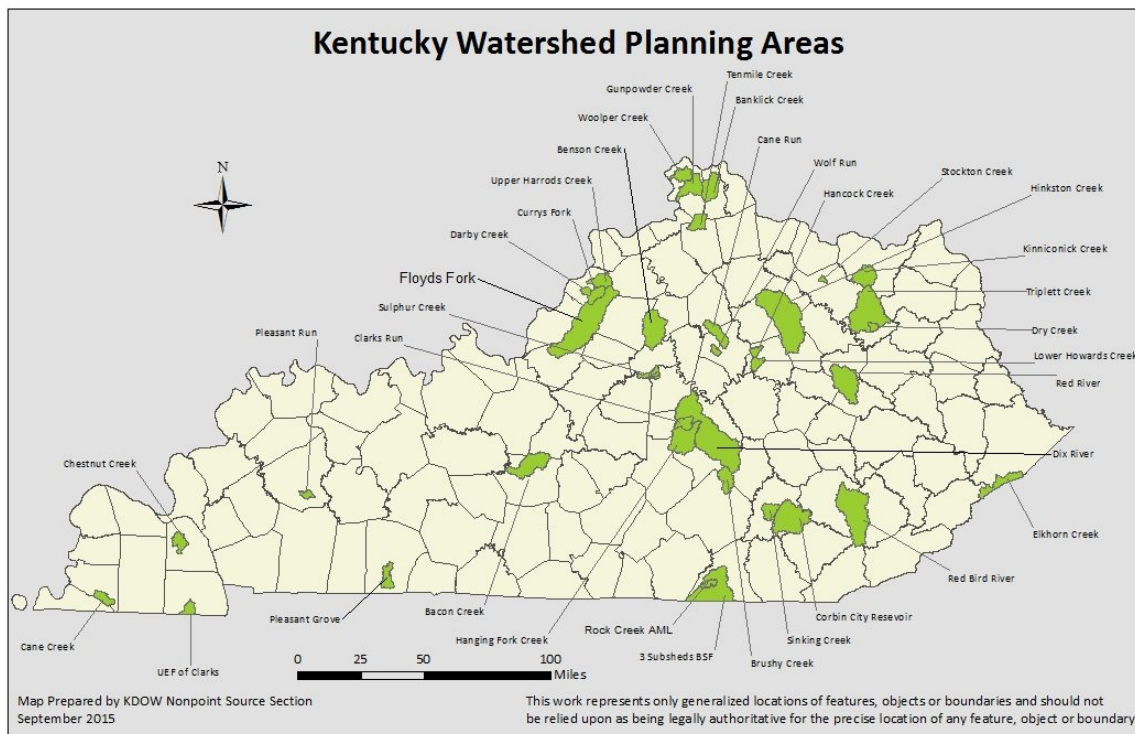
The Kentucky Nutrient Reduction Strategy provides a broad range of ongoing and future activities that are designed to reduce nutrient inputs into Kentucky waters as a means to reduce the negative impacts on Kentucky waters and ultimately, the Gulf of Mexico. Kentucky's plan is a science and technology-based approach that identifies sources of nutrients, builds on programs already in place, and necessarily involves the ongoing efforts of individuals, industry, environmentalists, agri-business, and local, state, and federal governments in finding cost-effective, flexible, and multi-faceted means to reduce nutrient loads in Kentucky waters. Contributions from stakeholder groups have been incorporated whenever appropriate and possible. As this strategy evolves and tasks are completed, the Nutrient Reduction Strategy will remain dynamic and is a crucial effort in improving the waters of the Commonwealth and downstream waters.

Watershed Improvement Efforts

Pollution resulting from nonpoint source runoff is the primary source of pollution affecting water quality in Kentucky. KDOW is annually awarded Clean Water Act Section 319(h) federal grant funds from the USEPA for the purpose of addressing problems associated with nonpoint source pollution. KDOW works at both a watershed and statewide scale to protect surface water and groundwater from nonpoint source pollution, to abate pollution threats, and to restore degraded waters so water quality standards



are met and designated uses are supported. The program works with federal, state, local and private partners to promote complementary, regulatory and nonpoint source pollution control initiatives.



Work is currently underway across the state on 24 watershed plans which are either under development or being implemented. These watershed plans describe conditions in the watershed, identify any causes and sources of impairment, and explain how best management practices can be used to improve water quality conditions and ultimately meet water quality standards. Implementation of watershed plans typically involves local watershed coordinators. Watershed coordinators work with stakeholders to conduct education and outreach, and to manage the implementation of on-the-ground best management practices to reduce pollution coming from urban stormwater, failing on-site wastewater systems, agriculture, and the loss of riparian zones around waterbodies. KDOW considers education a key element to raising awareness, changing attitudes and affecting action by empowering and encouraging individuals to take an interest and responsibility in their community watersheds. In FY2015, KDOW watershed coordinators taught a variety of stakeholders about the importance of water resources, watersheds, nonpoint source pollution and sustainable water management at community events, organizational conferences, school programs, governor's initiatives and continuing education courses.



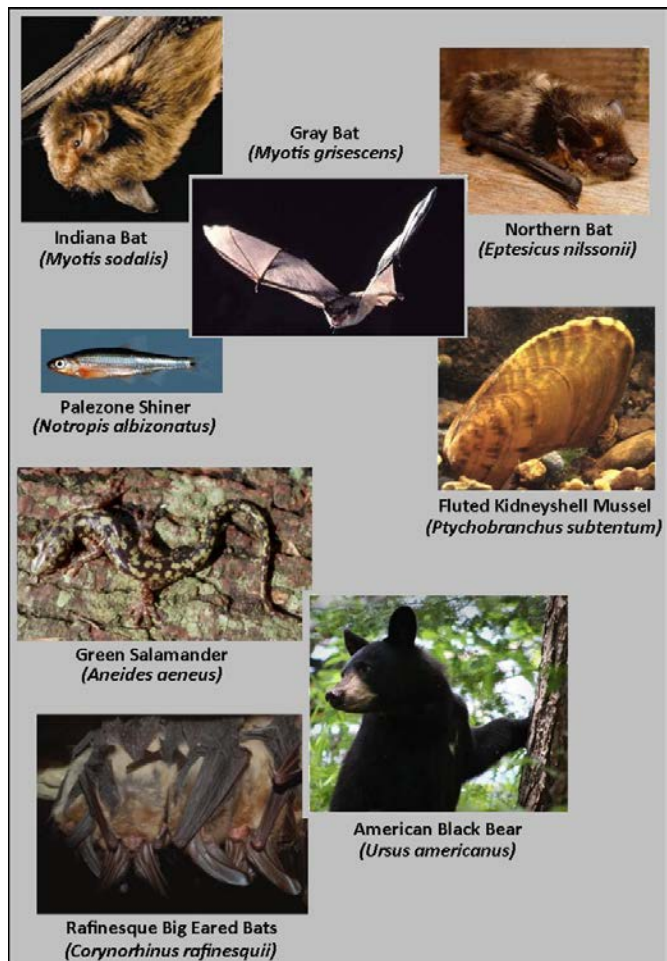
Riparian buffer at the Kentucky Horse Park, in Cane Run Watershed of the Kentucky River Basin, Fayette County, before and after implementation of best management practices outlined in the Cane Run Watershed Plan.

Wild Rivers

Resource managers of Kentucky's Wild Rivers Program use land acquisition to assist in species protection, address problems with aquatic systems located within the Wild River watersheds, and manage aquatic and terrestrial resources. The process of restoring natural habitats and providing ecological benefit to wildlife and aquatic species begins with an inventory of native species environmental data collected on site. In FY2015, the Wild Rivers personnel at KDOW started biological inventories on several tracts of land.

Biological Inventories

Biological inventories provide valuable data on threatened or endangered species residing on the tract, the locations of exotic/invasive species and severity of infestation, and the presence of species of public interest (birds, wildflowers, game species etc.). From FY2013 through FY2015, Wild Rivers personnel were assisted by other KDOW employees and agency partners to conduct terrestrial and aquatic fauna surveys on the John and Karen Burnett Watershed and Wildlife Conservation Area along the Little South Fork of the Cumberland River in Wayne and McCreary counties. Surveys focused on herpetofauna (amphibians and reptiles), mammals, and freshwater mussels, and documented five federally listed endangered species: the Indiana bat, gray bat, northern bat, palezone shiner, and fluted kidneyshell mussel. Additionally, green salamanders (a species currently being considered for addition to the list of Endangered Species), Rafinesque big eared bats, and American black bears (both species of Special Concern in Kentucky) have been observed on the property. Annual monitoring of these species by live capture, acoustics, and remote sensing will continue in FY2016.



Habitat Management

Efforts are currently underway to convert approximately eighty acres of fescue pasture to an upland hardwood forest via managed succession at the Red River Watershed and Wildlife Conservation Area in Wolfe County. In April, KDOW staff, along with researchers from Transylvania University and the Kentucky Heritage Land Conservation Fund Board, began a multiyear study to identify an effective method of eradicating fescue and promoting the growth of native vegetation. Monitoring vegetation response to controlled burns and herbicide treatments provides valuable information that can be used for future transformation of abandoned fields into native habitats.

Water Quality Monitoring

Surface Water Monitoring

KDOW spent more than \$1.7M to monitor streams, rivers, and lakes to assess water quality, habitat, and assess whether these waters are meeting water quality standards. All of the monitoring and assessment efforts by KDOW lead to greater understanding of the condition of Kentucky's water resources. KDOW manages numerous monitoring programs to determine the water quality conditions of the Commonwealth's streams, rivers, springs, lakes and reservoirs.

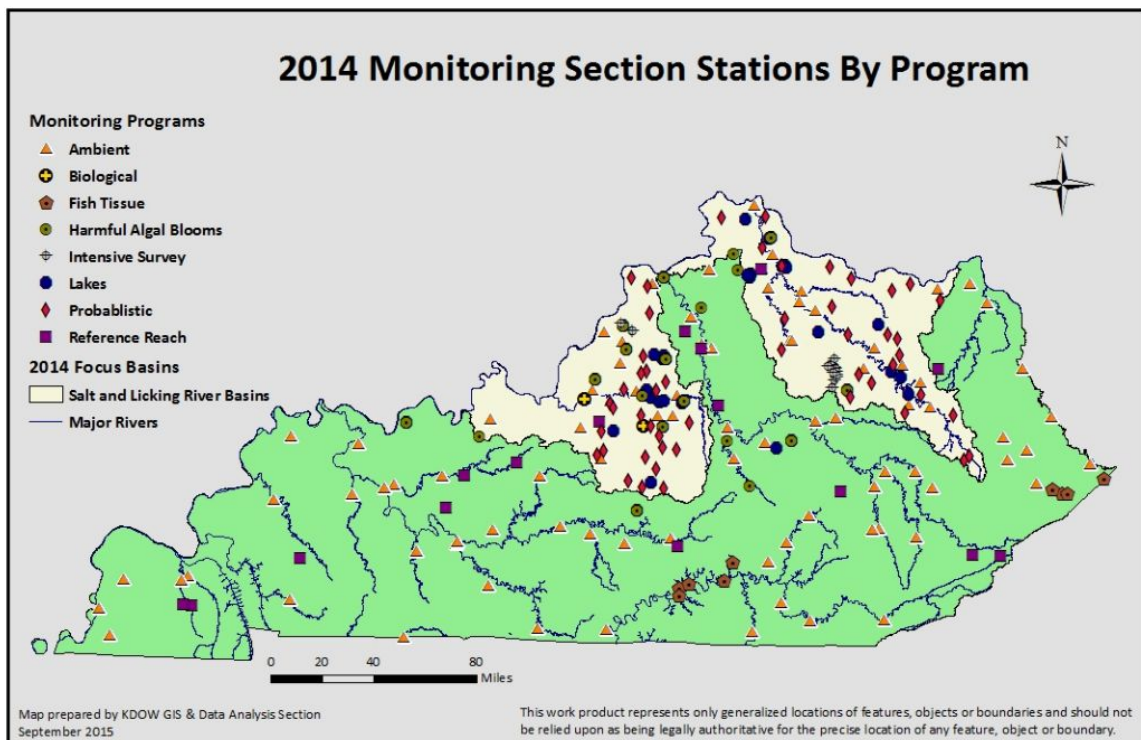


Big Caney Creek DOW Staff Photo

These monitoring programs generally align with three broad strategies:

1. Monitor streams, rivers, reservoirs and lakes to assess water quality. This includes monitoring waterbodies with high quality aquatic habitats; monitoring Reference Reach water bodies to detect trends in water quality; targeting watersheds to investigate emerging water quality concerns or issues; monitoring fish tissue and drinking water supplies for human health consumption; and monitoring to determine the effectiveness of watershed projects implemented to control pollution problems.
2. Monitor stream health through random (probabilistic) aquatic biological surveys. The probabilistic program results provide statistical data to enable the agency to extrapolate current aquatic conditions across a given river basin or region.

3. Conduct focused water quality monitoring in watersheds that require a total maximum daily load (TMDL) be developed for pollutants. TMDL monitoring identifies specific sources of the pollutants causing the stream to be impaired (not meeting one or more designated uses). These studies generate data to enable KDOW to determine how much pollutant load a waterbody can receive and meet its designated uses and identify pollutant loading reductions necessary to restore a waterbody such that it meets its designated uses.



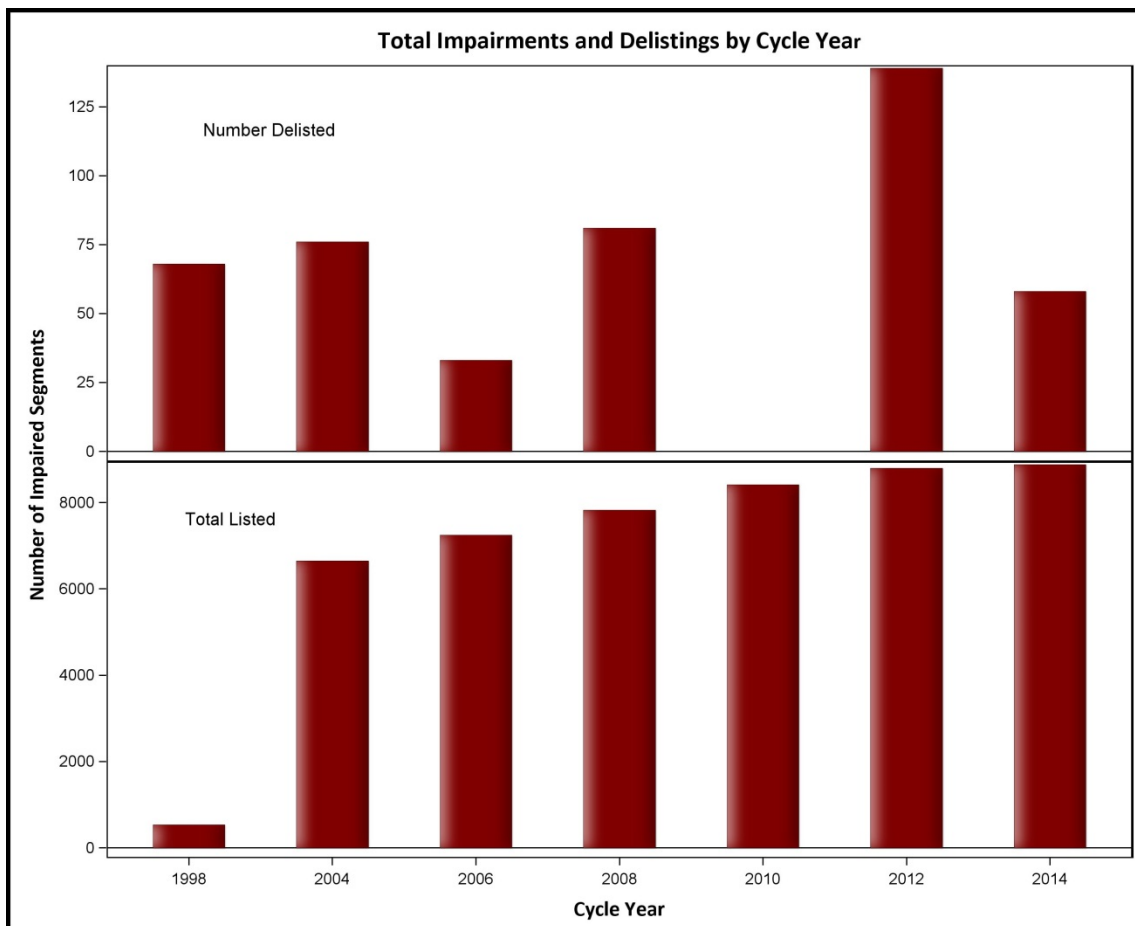
Kentucky uses a five-year Basin Management Unit (BMU) rotation cycle for monitoring. Water quality monitoring during the majority of FY2015 took place during the sampling season of May 2014 through October 2014 and focused largely on the Salt and Licking River Basin.

For a more detailed description of KDOW’s monitoring programs, please visit our website at: <http://water.ky.gov/waterquality/Pages/WQMonitoring.aspx>.

Data generated by these various monitoring programs are used to make assessments as to whether the waterbodies monitored are meeting their designated uses. The assessment results are compiled into an Integrated Report on water quality. This biennial report is required of states by the Clean Water Act as a

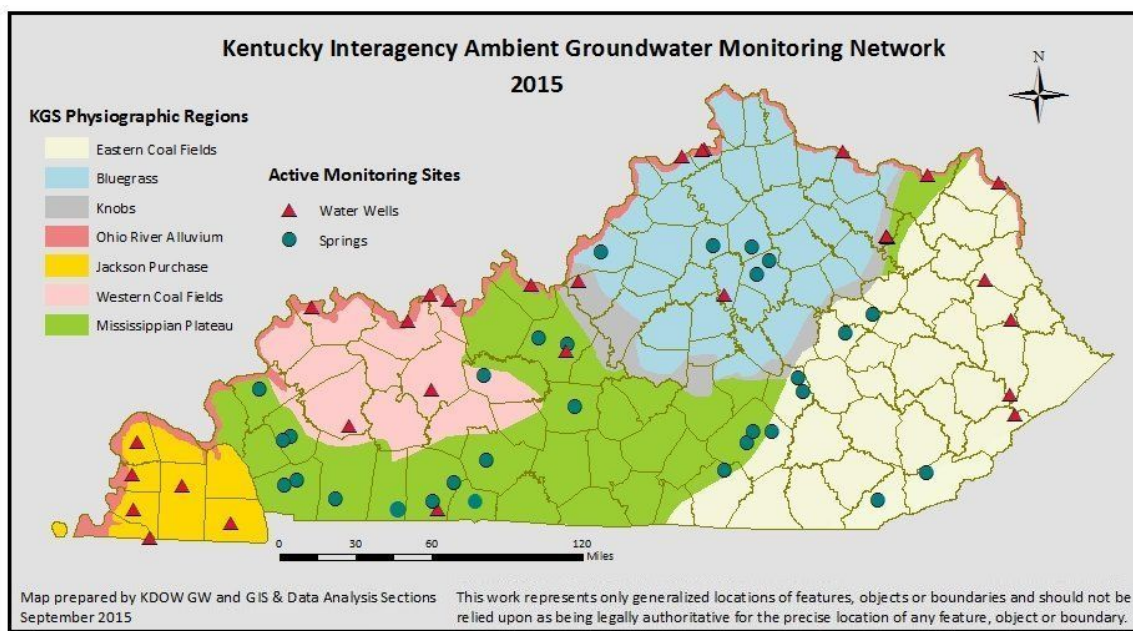
means to communicate the conditions of each state’s water resources. The assessment results reflect, to some degree, the effectiveness of the implementation of water quality standards adopted by the Commonwealth to maintain healthy water bodies for fishing, swimming, boating, fish consumption, and to provide safe drinking water. Waterbodies that fail to meet one or more designated uses are compiled on the impaired waters (303(d)) list.

KDOW is proposing in the Draft 2014 Clean Water Act Section 303(d) list to remove from the impaired waters list 60 waterbodies and stream segments that are now meeting water quality standards. Of which, 26 stream segments are from the Ohio River that are now meeting the methylmercury fish tissue standard. Since 2008, KDOW has determined that 284 waterbodies and stream segments previously listed as “impaired” are subsequently meeting water quality standards.



Groundwater Monitoring

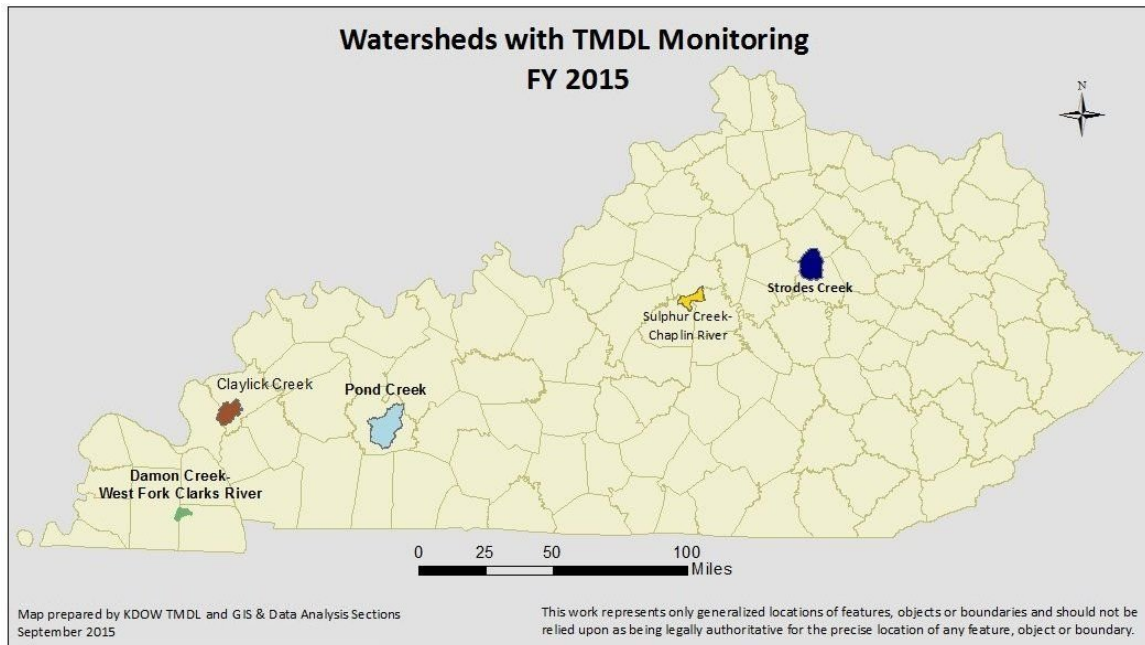
Groundwater is the water found beneath the earth's surface. Groundwater is widely used to supply public and private drinking water, and also supplies significant industrial process water, water for agriculture irrigation, and provides all the non-stormwater recharge for streams. Groundwater also is an important resource for industrial and domestic heating and cooling. KDOW conducts groundwater monitoring to characterize the ambient water quality conditions of this important resource throughout the state. The ambient groundwater monitoring network is the principal program used to meet these requirements. This endeavor is augmented with complaint-driven groundwater sampling and groundwater assessment projects. Monitoring sites are chosen to represent all of the physiographic provinces, major watersheds and aquifer types in Kentucky. Priority is given to groundwater sources providing water for public or domestic water supplies. Samples are analyzed for basic water chemistry, major inorganic ions, metals, nutrients, pesticides and volatile organic compounds. Active ambient groundwater monitoring sites are shown in the figure below. Since the inception of the groundwater monitoring program in 1995, approximately 16,000 samples have been collected from over 10,000 groundwater sources across Kentucky. In FY2015, 159 samples were collected from 73 sites (42 wells and 31 springs) across the state. Groundwater quality data are provided to individuals through information requests and through the Kentucky Groundwater Data Repository via the Kentucky Geological Survey (KGS) website (<http://www.uky.edu/KGS/>). Data were also included in statistical analyses for regional and watershed-based groundwater assessments.



Total Maximum Daily Loads

The required Total Maximum Daily Load (TMDL) is a calculation of the maximum amount of a pollutant that a waterbody can naturally assimilate and still maintain its designated use(s) based on data collected for each pollutant/waterbody combination. A TMDL must be calculated for each pollutant impairing a lake, reservoir, or specific reach of stream. The TMDL reports undergo internal preliminary review, a 30-day public comment period, and approval by the USEPA. The TMDL reports contain load allocations for both point and nonpoint sources for the pollutant identified as causing the impairment so that a waterbody can be brought back to full support of its designated uses.

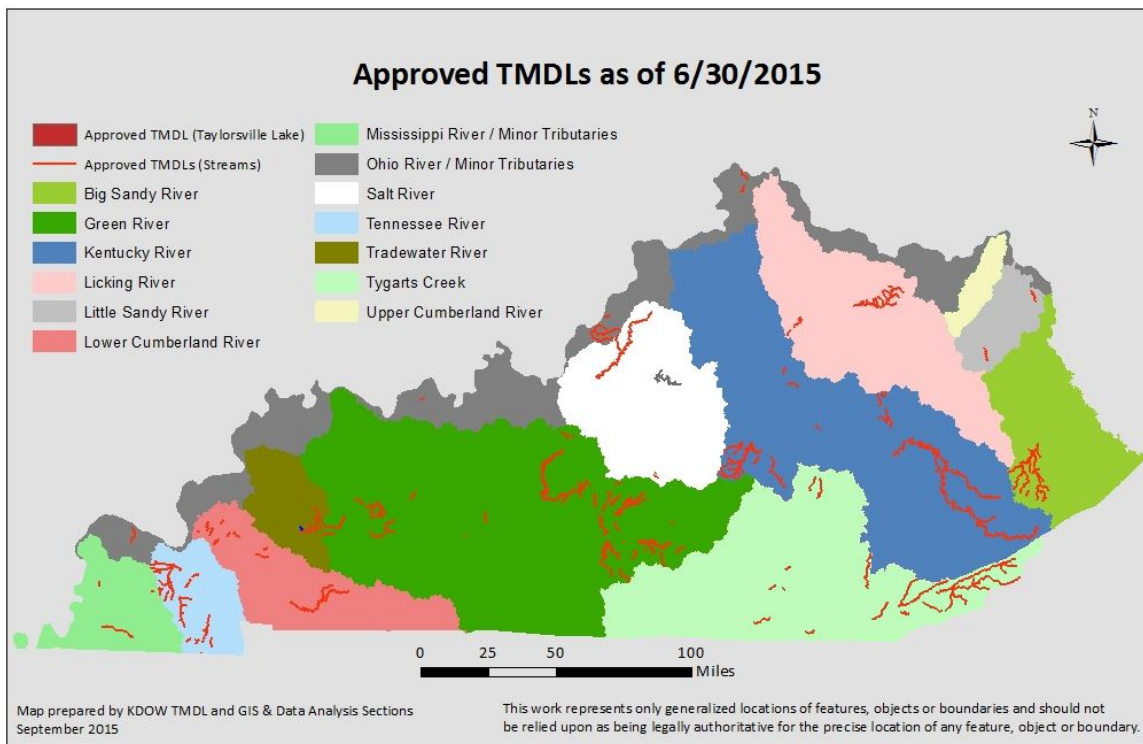
The development of a TMDL begins with monitoring stream segments in areas that have identified impairments. Most TMDL water chemistry monitoring sites are visited monthly over the course of one year, and TMDL bacteriological monitoring sites are visited at least ten times during the primary contact recreation season.



In FY2015, KDOW personnel monitored the Strodes Creek watershed, the Sulfur Creek watershed, and the Damon Creek watershed, for the development of a watershed plan. KDOW personnel also developed, wrote, and submitted a completed TMDL to the USEPA for stream segments in the Hurricane Creek, Copper Creek, and Caney Creek watersheds impaired by pH and metals in Hopkins County. Other

TMDLs under development during FY2015 include the Ohio River Bacteria TMDL and the Pond Creek metals, pH, and bacteria TMDL.

KDOW recently published the Draft 2014 Clean Water Act Section 303(d) list for public comment. The Clean Water Act Section 303(d) obligates KDOW to develop a TMDL for each waterbody and each pollutant for which the waterbody is not meeting its designated use. There are currently 2,597 pollutant/waterbody combinations for which KDOW must develop TMDLs or use alternative methods to restore the water quality in that waterbody.



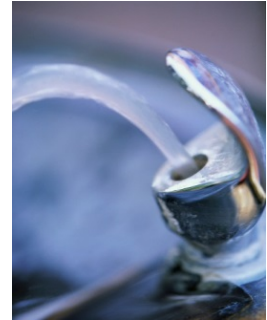
Water bodies that do not support one or more designated uses may be monitored at a later date to determine if land-use changes, facility upgrades, or projects implemented to abate sources of pollutants have effectively restored water quality. If one or more pollutants that had previously failed to meet water quality standards now meet the standards, KDOW provides the data and technical rationale that supports removing the pollutant or designated use of a waterbody segment from the 303(d) list. The number of waterbodies that have been removed from the 303(d) list is another indicator of water quality improvement.

DRINKING WATER



Compliance

The Commonwealth of Kentucky is served by 445 public water systems that draw from the abundant water resources of the State. These public water systems provide high-quality drinking water to over 95 percent of the residents of the Commonwealth. Most of these public water systems are small systems; more than half of the public water systems in Kentucky serve less than 3,000 customers each. These small systems face significant challenges, especially in regard to making water affordable to their communities while operating effectively and maintaining an aging, extensive infrastructure. Despite these challenges Kentucky's public water systems continue to provide safe, reliable drinking water.



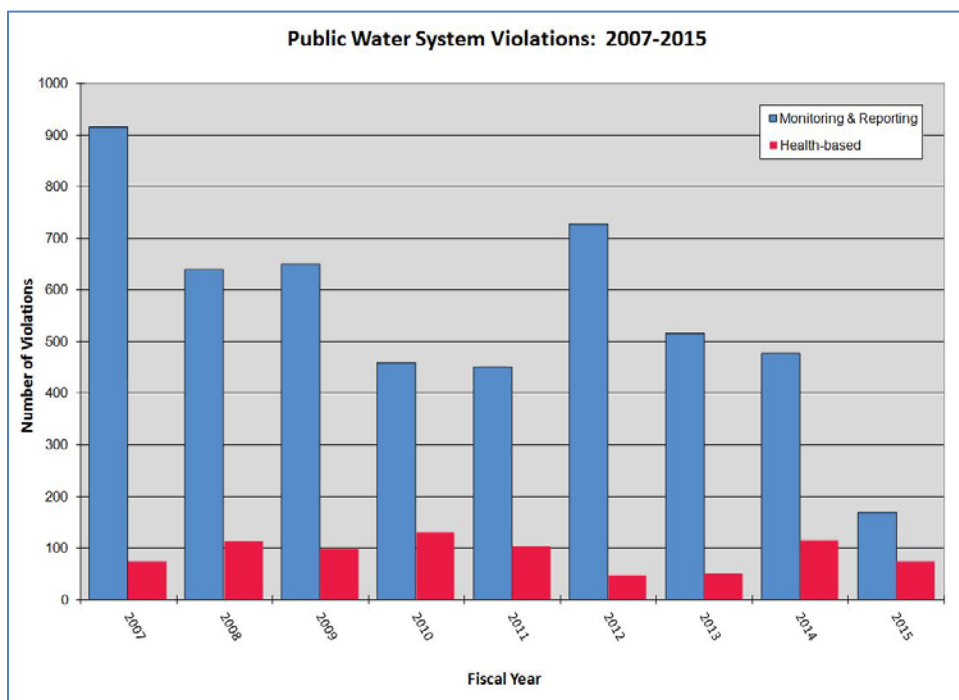
The Federal Safe Drinking Water Act (SDWA) requires Kentucky's public water systems to regularly test produced water for more than 100 contaminants such as bacteria, nitrates, and other chemicals. A water system must take corrective action and notify its customers when water samples exceed the limit for a contaminant. KDOW reviews the results and issues an annual report which summarizes public water system monitoring and compliance data.

Data from Kentucky's 446 public water systems in 2014 demonstrates consistent production of excellent quality water and very high rates of compliance with the SDWA requirements. These data show that most violations were administrative in nature and most involved monitoring and reporting issues. Kentucky's public water systems continue to show improvement in this area with a 250-violation annual decrease over the past two years. Data for previous years also shows a progressive decline in the number of health-based violations.

The USEPA periodically reviews and makes revision to the requirements of the SDWA to make sure that they continue to provide appropriate protection of public health. With the implementation of Stage 2 of the Disinfection Byproducts Rule, the rule now applies to those public water systems which purchase water from other public water systems (consecutive systems) which can be more susceptible to the development of disinfection by-products. With the expansion of the Disinfection Byproducts Rule to

consecutive systems, the number of health-based violations increased from 52 violations in 2013 to 115 violations in 2014, as anticipated. These 115 health-based violations constitute only a small portion, 0.14 percent, of more than 82,000 test results evaluated each year.

Disinfection byproducts (DPBs) are a class of contaminants that result from the interaction of disinfection chemicals, such as chlorine, with other chemicals in the water. DBPs are “chronic” contaminants meaning that the health risks associated with DBPs result from exposure to these chemicals over many years. While the number of health based violations may be increased over a short period of years, the identification and correction of the issues behind the elevated results will ultimately provide a higher water quality for the entire Commonwealth. KDOW and the Public Water Systems are devoted to identifying the underlying causes for the formation of these contaminants and to bring these levels back within the acceptable range.



Regulations

On July 15, 2014, KDOW filed amendments to some of the regulations that govern drinking water; 401 KAR 8:200 (Microbiological testing), 8:300 (Lead and copper), and 8:700 (Bottled water).

Amendments to the microbiological testing regulation (401 KAR 8:200) adopted the federal Revised Total Coliform Rule (40 C.F.R. 141.851 – 861) which will provide improvements to public health by

strengthening public water systems' resiliency to microbiologic contamination by implementing a "find and fix" strategy of assessments and corrective actions when sanitary problems are identified. The amendments maintain the current *E. coli* maximum contaminant levels, clarified reporting requirements, and increased flexibility and accuracy for public water systems in determining "population served".

The amended lead and copper regulation (401 KAR 8:300) adopted the federal Reduction of Lead in Drinking Water Act of 2011 (42 U.S.C. §300g-6) which became effective on January 4, 2014. This regulation limits lead content in plumbing materials and fixtures used for drinking water distribution.

The changes to the bottled water regulation (401 KAR 8:700) reorganized the regulation for clarity and aligned the source, sampling, testing, treatment, and processing of bottled water with federal drinking water standards. The amendments placed specific limits on contaminants for bottled water systems.

After proceeding through the regulation promulgation requirements of KRS Chapter 13A, the amended regulations took effect on November 6, 2014. Based on these amendments and other information submitted by KDOW, the USEPA gave preliminary approval to KDOW's drinking water primacy package for these related federal rules, which enables Kentucky to continue its authority over the Commonwealth's drinking water sources and processes, in January 2015. KDOW anticipates final approval by the end of 2015.

Source Water Protection Assistance Program

The protection of source water resources, including the streams, lakes, reservoirs and underground aquifers that are used to provide drinking water is critical to the economic resilience and the environmental and public health of Kentucky and its citizens. Source water protection safeguards human health and ensures adequate supply of water now and in the future. Protecting the quality of our source waters is also important because conventional water treatment methods cannot remove all contaminants and is very costly to treat water contaminated by some pollutants to make it safe for drinking. More than 95% of Kentuckians rely on public water systems to provide safe water for drinking, food production, and manufacturing. By protecting water at the source we ensure our citizens have a safe and healthy source of drinking water.

Many activities occurring within source water protection areas have the potential to negatively impact drinking water quality or quantity. When managed correctly using BMPs and other source water protection strategies, most of the activities will not affect drinking water. However, it can be commonly difficult for a water system or local government to ensure that these potential contaminant sources are being properly managed, as the water system and local government commonly do not have jurisdictional authority over those sources. In addition, implementation of various source water protection management strategies can require financial assistance. KDOW's Wellhead Protection Program developed a Source Water Protection Assistance Program (SWPAP), which provides funding to public water systems that work on projects with local landowners, local media, watershed groups, and many others to achieve their source water protection goals. The SWPAP makes available SDWA State Revolving set-aside funds to public water systems and municipalities that use either surface or groundwater sources for drinking water supplies to employ protection strategies.

In the first year (FY2014) of the program, the SWPAP awarded funding to four projects totaling approximately \$83,000. All projects are on pace for successful completion of their proposed objectives:

- Carrollton Utilities: \$33,200 to address concerns regarding abandoned residential drinking water wells, potentially converting those wells to monitoring sites when possible, and public education about source water protection in partnership with Carroll County High School.
- Louisville Water Company: \$31,850 to partner with the U.S. Geological Survey to identify and properly plug unused drinking water wells, inventory unused septic systems, and develop a public education program regarding the importance of properly servicing and closing these systems.
- City of Augusta: \$13,620 to contract with a certified well driller for proper plugging of four unused drinking water wells.
- City of Wingo: \$4,500 to contract with a certified well driller for proper plugging of one unused drinking water well.

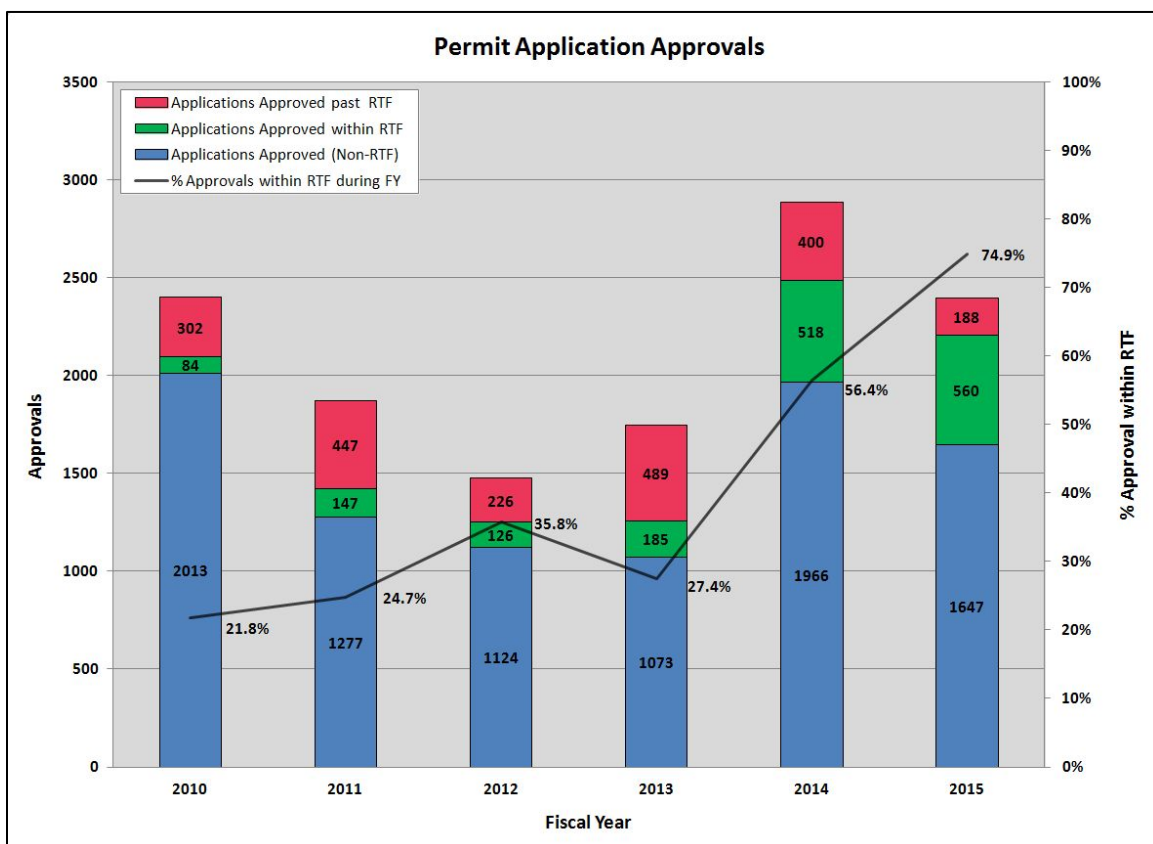
The program announced total project funding for FY2015 at \$130,000, with a single project cap of \$60,000 (same as FY2014). Five projects received funding for FY2015. The projects cover a range of strategies similar to those of FY2014, and additionally will implement Best Management Practices, develop hazard mapping, and perform soil sampling. Contracts with the selected recipients were finalized by August 15, 2015.

Program details are available at <http://water.ky.gov/groundwater/Pages/SWPAssistanceProgram.aspx>.

PERMITTING

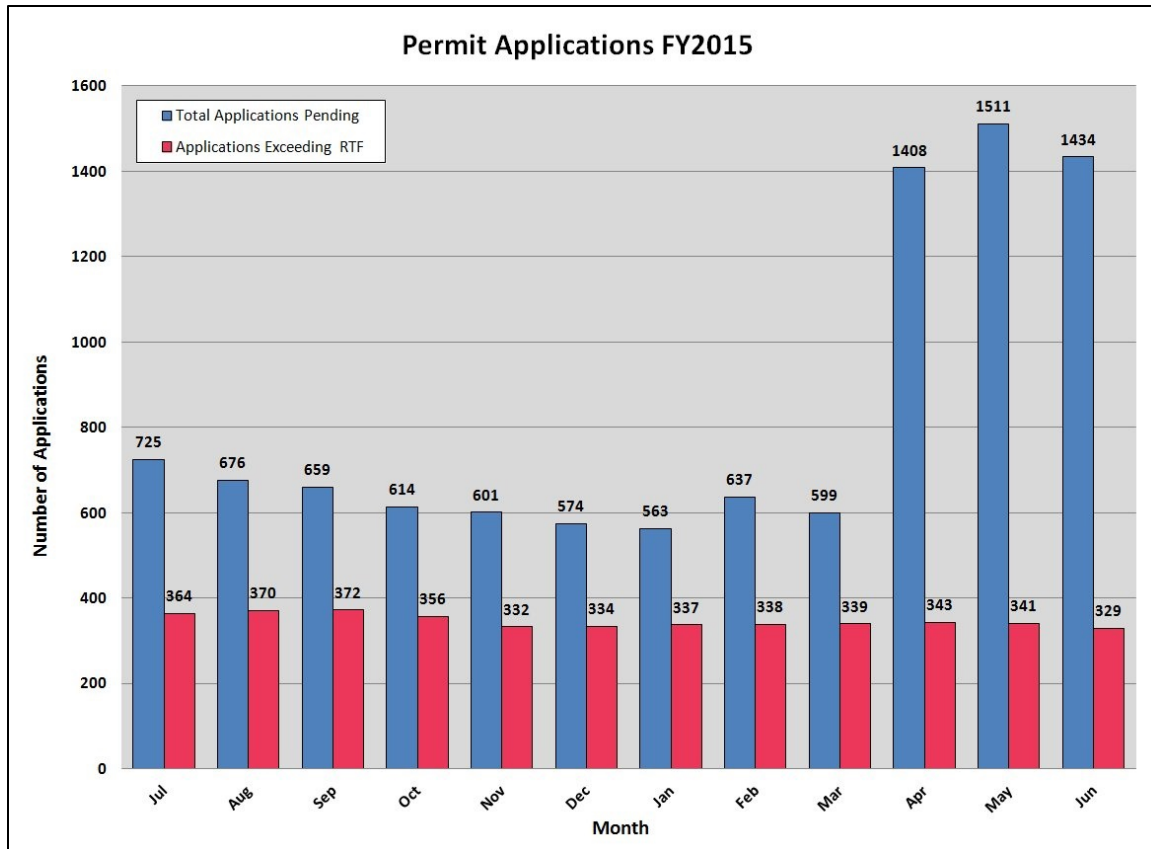
Permit Issuance

Discharges into the waters of the Commonwealth require a permit through the Kentucky Pollution Discharge Elimination System (KPDES). During FY2015 the KPDES permit application backlog decreased by 9.6%, from 364 to 329. Concurrently, the overall number of permit applications under review by KDOW increased from 725 to 1,434, due to receiving over 1,000 coal mining general permit Notices of Intent in March and early April of 2015.



Since FY2010, the number of KPDES permit applications received and subsequent approvals issued have increased dramatically. From FY2010 through FY2013, KDOW approved an annual average of 1,873 KPDES permit applications. From FY2014 through FY2015, that number increased to an annual average of 2,640 approvals. Despite the increased number of permit applications, KDOW dramatically increased the number of permit approvals completed within the regulatory timeframe (RTF) from 21.8% in FY2010 to 74.9% in FY2015. Of the 748 approvals issued during FY2015, 580 were within the RTF.

KDOW has dramatically decreased permit review times, reduced the number of new applications exceeding the RTF upon approval, and continues to successfully reduce the overall KPDES backlog. Additionally, a larger number of applications for “major” facilities were processed in FY2015 than were in the four previous years (increased from an average of 6 per year from FY2011 through FY2014 to 26 in FY2015). Applications for major facilities are generally much more complex and major permits require controls for waste streams that are potentially more toxic than those at other facilities.



New and Reissued General Permits

In addition to processing renewals and new individual permit applications, KDOW issued seven general permits in FY2015, summarized in the table below. KDOW issues general permits to cover groups of facilities that conduct activities which are sufficiently similar to allow a general set of requirements to apply to the entire group. General permits streamline the permitting process and shorten wait times for permittees because KDOW can grant coverage for each facility rather than issue thousands of individual permits.

New and Reissued General Permits			
KPDES Number	Activities Covered by Permit	Effective Date	Number Issued in SFY15
KYG15	General Aviation Facilities including civil aviation operations other than scheduled air services and nonscheduled air transportation operations*	09/01/2014	Unknown
KYGE4	Coal mining, processing and associated activities conducted in the Eastern Kentucky Coal Field	10/01/2014	226
KYGW4	Coal mining, processing and associated activities conducted in the Western Kentucky Coal Field	10/01/2014	26
KYR10	Stormwater discharges associated with construction activities	12/01/2014	890
KYG11	Concrete products, asphalt paving and ready-mixed concrete operations	02/01/2015	175
KYG84	Non-Coal Mineral mining and on-site processing activities	02/01/2015	8
KYG12	Post remediation Orphan Landfills** that discharge treated leachate to Waters of the Commonwealth	04/01/2015	Unknown
<p>* KYG15 does not require submission of an eNOI or issuance of a coverage letter. The Division grants automatic coverage to all eligible facilities on the effective date.</p> <p>** Orphan landfills refer to more than 600 solid waste disposal facilities that stopped operating prior to July 1, 1992 and do not meet current protective standards. The Divisions of Water and Waste Management collaborate to bring these facilities up to current standards and ensure they receive the proper permits.</p>			

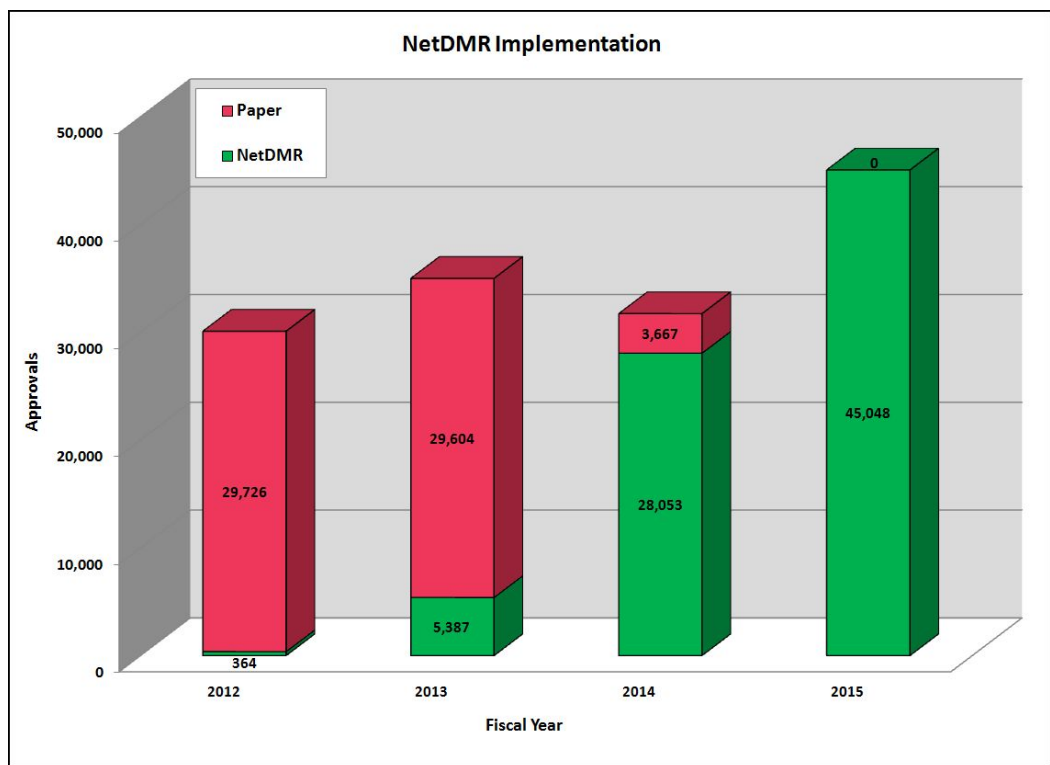
Most notably of these new general permits, the two new general coal mining discharge permits, which replaced the previous general permit, represent the culmination of years of negotiation between KDOW, USEPA, and stakeholders. These two general permits for coal mining include several new, more protective permit requirements:

- Limitations for Whole Effluent Toxicity (WET) and selenium, including fish tissue testing requirements to check for compliance with water quality requirements for selenium.
- In-stream biological monitoring and limitations.
- In-stream chemical trend analysis to determine the effect that a mining operation is having on the receiving water.
- Limitations for iron and manganese, and monitoring and reporting requirements for specific conductivity and sulfate.
- Requirements to conduct adaptive management of Best Management Practices and implement modifications as a result of performance triggers for in-stream biological score, in-stream water quality trend analysis, and whole effluent toxicity results.

Additionally, these general permits are intended to facilitate resolution of EPA's objections to previously proposed permits for coal mining in 2010 and 2011.

NetDMR

Kentucky's Discharge Monitoring Report (DMR) program transition from paper-based to electronic reporting using USEPA's NetDMR program was initiated in mid-2012 and was completed in mid-2015 for all KPDES permits requiring DMR submission. NetDMR is a web-based application that allows NPDES permit users to enter and electronically submit DMR data to USEPA's Integrated Compliance Information System (ICIS). This eDMR transition has saved KDOE approximately 400 staff days and \$15,000 in printing and mailing costs per year since 2013. NetDMR has increased data accuracy by shifting data entry from KDOE personnel to permittees, and allowing permittees the ability to review and correct their DMR data within NetDMR. The transition to NetDMR has significantly increased public accessibility to DMR data since a higher percentage of DMR data are available for review and download through USEPA's ECHO website. The electronic reporting transition has also changed KDOE's focus from data entry to data steward and DMR compliance, allowing the program to increase DMR submission/ICIS data entry rates for all required DMRs from 77.8% in FFY 2011 to 95.2% in FFY 2014 based on ICIS data.



Kentucky leads the nation in number of permittees utilizing NetDMR (33.9% of permittees nationwide per June 2015 USEPA statistics), is 2nd in the nation in total DMRs submitted through NetDMR to date, and currently exceeds 95% compliance with the transition to NetDMR. Kentucky will complete the transition to NetDMR for all permittees as coverages under the recently effective KYGE40000 and KYGW40000 coal general permits are issued.

With the paper-based DMR system, review of 100,000 DMRs by KDOW personnel required approximately two years to complete. KDOW's eDMR program coupled with ICIS database and reporting capabilities allows automated review of DMR data for compliance with permit requirements and provides the opportunity for automating the enforcement actions for DMR violations.

DRINKING WATER AND WASTEWATER PLANNING

Wastewater Planning

The Clean Water Act, passed in 1972, was monumental in moving the nation towards the improvement in the water quality of our lakes, rivers, and streams. Compliance with the Act has been achieved through the advance of technology and building of infrastructure such as wastewater treatment facilities and collection systems. These systems, made of clay and plastic pipe, steel, concrete, and mechanical parts, are now advancing in age. Most systems have a design-life of approximately 30 years. Many of these critical parts of our infrastructure are now well beyond that design life. Meeting the needs of current customers and developing a strategy for meeting future needs, including repair and replacement of aging wastewater infrastructure, is one of the most critical water-related challenges facing Kentucky over the next decade and is the realm of wastewater planning. KDOW reviews and approves Regional Facility Plans (“Plans”) for municipal wastewater collection, conveyance, and treatment systems. The Plans provide reviews of existing wastewater systems, evaluate alternatives, and establish recommendations for the next 20-year period. KDOW personnel provided assistance to several systems for development of comprehensive plans for new wastewater facilities, and to small systems with the asset inventory process.

Since 2011, KDOW sent notice to ninety-three wastewater systems of the requirement to complete either a Facility Plan or Asset Inventory Report. During FY2015, KDOW received sixty-one Asset Inventory Reports, reviewed and approved twenty-five of those reports, and currently has twelve reports under review. KDOW also conducted and prepared environmental assessments for thirty-two projects which are funded through the Clean Water and Drinking Water State Revolving Fund (CWSRF). Review of this information informs KDOW of the variety of infrastructure, financial and managerial needs of the regulated community in the Commonwealth.

Water Infrastructure Needs		
	Wastewater	Drinking Water
Kentucky	\$2,117	\$6,228.60
United States	\$298,121	\$375,994.70
KIA Approved	\$85	\$31.50

In Millions of Dollars

KDOW uses the information gathered within the facility planning and asset inventory process to help target funding. The CWSRF is awarded with the assistance of partners within the government, such as Kentucky

Infrastructure Authority (KIA) which assists in administering these funds. In FY2015, twenty-eight projects received financial assistance from the CWSRF, totaling nearly \$112 million dollars.

Capacity Development

As with wastewater infrastructure, public drinking water systems (PWSs) are facing significant challenges maintaining an aging, extensive infrastructure of water treatment plants, distribution systems lines, tanks and pumps. In addition, PWSs are faced with increasingly more stringent rules and high expectations of the public regarding drinking water.

The Strategy

The Capacity Development Strategy provides a guideline for the implementation and maintenance of the Capacity Development Program; it addresses the five elements established by Section 1420(c) of the SDWA.

- ◆ The methods or criteria the EEC will use to identify and prioritize the PWSs most in need of improving technical, managerial, and financial capacity;
- ◆ A description of the institutional, regulatory, financial, tax or legal factors at the federal, state or local level that encourage or impair capacity development;
- ◆ A description of how the EEC will use the authorities and resources of the SDWA as amended by PL 104-182, or other means, to assist public water systems in complying with national drinking water regulations; encourage the development of partnerships between PWSs to enhance the system capacity of PWSs; and assist PWSs in the training and certification of operators;
- ◆ A description of how the EEC will establish a baseline against which to measure improvements in system capacity with respect to national primary drinking water regulations, this chapter, KRS 224:10-110, and administrative regulations promulgated there under; and
- ◆ An identification of the persons having an interest in and are involved in the development and implementation of the system capacity development strategy, including all appropriate agencies of federal, state and local governments, private and nonprofit PWSs and PWS customers.

KDOW works with PWSs to ensure these systems have adequate technical, financial, and managerial capacity for consistent delivery of safe drinking water to consumers. KDOW conducts on-site reviews of PWS's water source, facilities, equipment, operation, maintenance, and management. These "sanitary surveys" are used to assess a PWS's capabilities and identify any technical, managerial, or financial capacity concerns. KDOW's Capacity Development program works with those systems to improve the system's overall capacity in order that the system is sustainable and resilient. Every community water system must meet the same water quality standards using approved treatment processes and chemicals regardless of plant size, age, or the number of customers served. KDOW personnel conduct the Drinking Water Infrastructure Needs Survey and administer the sanction process.

Since its inception, the Capacity Development Program has proven successful in its mission to improve technical, managerial, and financial capabilities through the sanitary survey process and various methods of assistance (e.g., guidance documents, templates, operations spreadsheets, direct on-site assistance). In past years, sanitary surveys have resulted in the issuance of Notices of Violation (NOVs) due to lack of response to deficiencies, both significant and non-significant. NOVs that were not addressed by public water systems led to further enforcement action.

In FY2011, DOW personnel began tracking the NOVs issued based on the sanitary survey evaluation; significant improvements in the tracking process were made the following year. The adjacent figures regarding these NOVs and enforcement actions illustrate the positive effects of the Capacity Development program, decreasing from a total of 22 NOVs related to sanitary survey noncompliance issued in FY2012 to zero NOVs issued in FY2014.

No enforcement actions have been required since FY2011. This trend indicates a better understanding of the program requirements and of the SDWA in general, as assistance has been provided to PWSs and system operators and managers have become better educated and more aware of current issues.

Another method of evaluating the effectiveness of the Capacity Development Program is by comparing the results of the initial, baseline survey results to subsequent surveys. This comparison is based on whether a system possesses or lacks one, two, or all three of the capacity parameters (technical, managerial, or financial) based on responses to the survey questions.

The first baseline surveys were completed in FY2009. Of the 88 systems surveyed that year, 11 percent were found to possess full capability to operate and manage their PWSs. Three years later the same

systems again were similarly surveyed and 36 percent found to possess full capability to operate and manage their PWSs.

A second round of comparisons revealed similar results; 8 percent having full capacity in the initial surveys compared to 31 percent after three years. A third comparison round will be completed at the end of the current federal fiscal year.

Both of these comparisons reveal significant improvements in managerial and financial capacity; primary concerns of the Capacity Development Program.

Barlow, Kentucky

In 2011, the City of Barlow had problems. A water loss of between 25-30% was reported during their sanitary survey and they had a badly deteriorated clear well with no redundancy. This situation presented technical, managerial, and financial difficulties for the city. The city needed to repair the clear well to ensure proper operation and water quality, and their storage tank and water meters needed work to address water loss. These problems caused not only significant management difficulties, but also resulted in considerable lost revenue for the system.



Barlow began a program to replace water meters while applying for funding through the Drinking Water State Revolving Fund (DWSRF) to make major repairs. The 2011 DWSRF loan program funded a project to replace the old clear well with a new dual system to allow them to perform maintenance without disrupting production. Additionally, the leaking and rusty storage tank was refurbished and repainted to meet regulatory standards.

These projects have successfully served to reduce managerial stress in how to operate the system and achieve compliance, as well as saving money. The most recent sanitary survey reported water loss of 24-28%. Barlow is not yet where they want to be, but progress is being made thanks to financial assistance from the DWSRF.

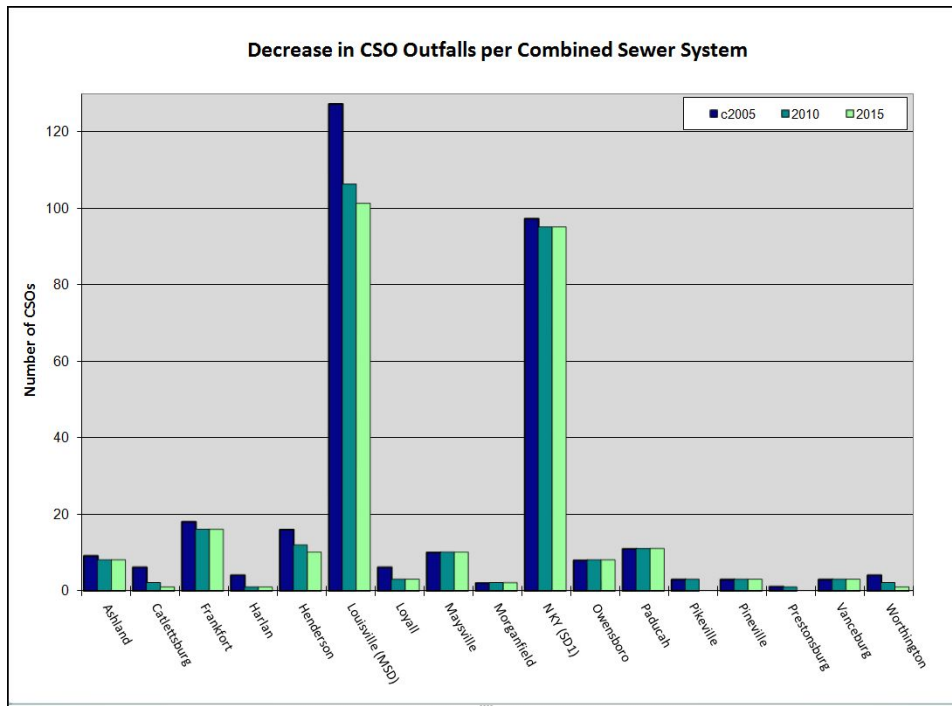
Combined and Separate Sewer Systems

Numerous Kentucky communities continue to make progress minimizing impacts to water quality from discharges of untreated wastewater through combined sewer overflows (CSOs) and sanitary sewer overflows (SSOs). A CSO is a discharge of sanitary wastewater and stormwater from a combined sewer system through permitted discharge points. An SSO is an unpermitted discharge of sanitary wastewater from a sewer collection system. KDOW personnel conduct inspections to monitor compliance with permit requirements that are intended to reduce impacts from CSOs and SSOs.

Nineteen Kentucky communities were under consent orders to provide schedules for elimination of SSOs, and to bring CSOs into compliance with Section 402(q) of the Clean Water Act. Consent orders for CSOs include remedial measures such as Nine Minimum Control reports and Long Term Control Plans (LTCPs) to reduce the frequency and impacts of CSOs. Consent orders for SSOs include remedial measures for Sanitary Sewer Overflow Plans to eliminate known SSOs, as well as capacity, management, and operation and maintenance programs to prevent future SSOs.

As of the beginning of FY2015, only eighteen communities remained under the consent orders. Pikeville entered into a Consent Judgment with the Energy and Environment Cabinet on October 25, 2007. The Consent Judgment required identification of locations where storm water entered the sewer systems, completion of a Capacity, Management, Operation, and Maintenance self-assessment, documentation of compliance with the Nine Minimum Controls of the 1994 CSO Policy, and complete sewer separation. Pikeville eliminated their three CSO outfalls in 2012 and met all remedial measures. In June of 2014 Franklin Circuit Court ordered that the Consent Judgment be terminated. The Pikeville sewer system is now classified as a separate sewer system and future KPDES permits will not include any permitted CSO outfalls.

Six additional CSO communities intend to completely separate their sanitary sewers from the storm sewers and eliminate all of their CSOs. The city of Prestonsburg completed sewer separation and eliminated all outfalls in spite of a need for alternative projects due to a lack of funding for a large planned separation project. The final steps prior to termination of their consent judgment are in process. Two others successfully eliminated more than half of their CSOs. Progress toward the goal continues with complete separation expected within the next three years for all six communities.



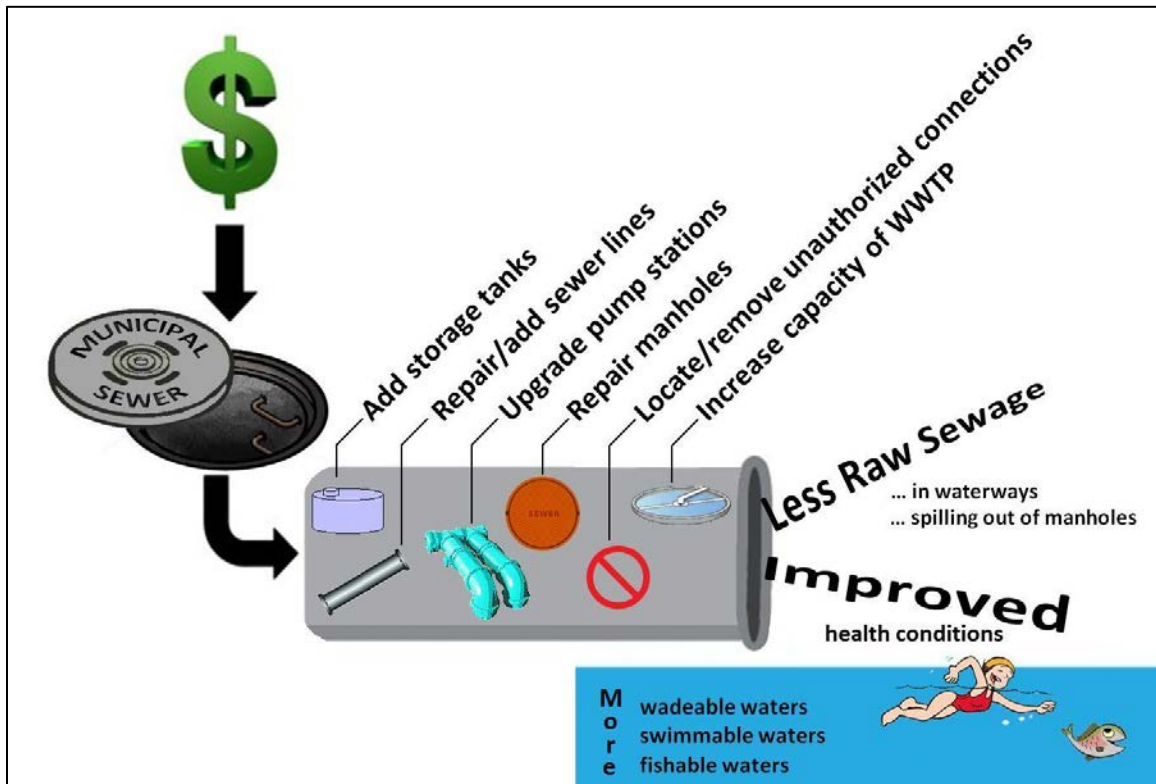
Elimination of CSOs is not the only measure of success. Ten communities will retain combined sewer systems with permitted CSOs after all projects in the LTCPs are completed. These communities continue to implement remedial projects. Projects commonly include repairing sewer lines, separating stormwater and reducing inflow and infiltration, as well as increasing the amount of sewage stored in the sewer system (*e.g.*, tunnels, tanks, and stabilization basins) for processing at a later time at the wastewater treatment plant. Final completion dates for implementing LTCPs vary depending upon the scope of work and financial considerations.

One successful remedial project in FY2015 was the construction of a 10-million gallon wet weather detention tank by the Frankfort Sewer Department. Wet weather flows in the combined sewer system are directed to the tank. When wet weather flows subside, wastewater stored in the tank during will go to the WWTP for full treatment rather than flowing untreated directly into the Kentucky River.



Success is also apparent in the city of Henderson where most of the projects proposed in the LTCP are complete. The city has now reduced annual overflow volume from 645 million gallons (in FY2008) to approximately 212 million gallons while eliminating five of their initial fifteen CSOs.

Another example of successful remediation comes from the Louisville and Jefferson County Metropolitan Sewer District (MSD). MSD spent in excess of \$4.5 million on their sewer system in FY2015. This effort allowed improvements to six pump stations, installation of additional flow control devices, elimination of a small wastewater plant and the addition of wastewater storage. The projects addressed eleven SSOs and provided additional wastewater storage and pump capacity. These efforts include the planned elimination of older, small wastewater treatment plants in favor of more efficient regional facilities, which provides more control over and improved treatment of the wastewater, leads to fewer discharges of untreated sewage, and improves overall water quality of receiving streams.



The completion of CSO and SSO remedial projects results in fewer overflows of raw sewage into public streets, parks, yards and streams yielding health benefits to citizens of the community. These efforts also result in reduced quantities of pollutants such as microbial pathogens, nutrients, and other toxics into waters of the Commonwealth which results in improved water quality, and a healthier environment for aquatic life and human recreation. The partnership between federal, state and local governments provides a positive return on the investment of billions of dollars and other public resources utilized in addressing the problem of sewer overflows in Kentucky.

Municipal Separate Storm Sewer Systems (MS4)

Stormwater runoff from developed urban and suburban areas contributes significant pollution to Kentucky waters and contributes to downstream flooding. The purpose of the Municipal Separate Storm Sewer System (MS4) program is to reduce the pollution to Kentucky's streams, rivers, lakes and groundwater from urban stormwater runoff by requiring communities with significant population density to develop a stormwater management program. The MS4 stormwater management program is based around the six Minimum Control Measures shown below. Parties responsible for implementing MS4 programs include local communities, state departments of transportation, universities, local sewer districts, hospitals, military bases and prisons.

The type of MS4 permit issued depends on the population and population density. KDW MS4 personnel provide technical assistance to MS4 communities and monitor permit compliance through review of annual reports and inspections.

In FY2015, the Lexington-Fayette Urban County Government Phase I MS4 permit was reissued effective June 01, 2015. The other main focus for the MS4 program in FY2015 was the general Phase II permit which expired on March 31, 2015. After monthly meetings with stakeholders conducted between March 2014 and January 2015, the new permit is in final draft form and will go to public notice in September, 2015.

MS4 Minimum Control Measures

- Public education and outreach
- Public participation and involvement
- Illicit discharge detection and elimination
- Construction site runoff controls
- Post-construction site runoff controls
- Facility good housekeeping and pollution prevention
- Monitoring
- Reporting and program assessment

MS4 Categories

- Large – 250,000+ population (2 large MS4s covered under 2 Phase I permits)
- Medium – 100,000 – 249,999 population (none in KY)
- Small – 10,000 + population with a density of 1,000 per square mile, OR smaller population within an urbanized area, or

Contiguous to another MS4 (103 Phase II MS4s covered under 52 permits)

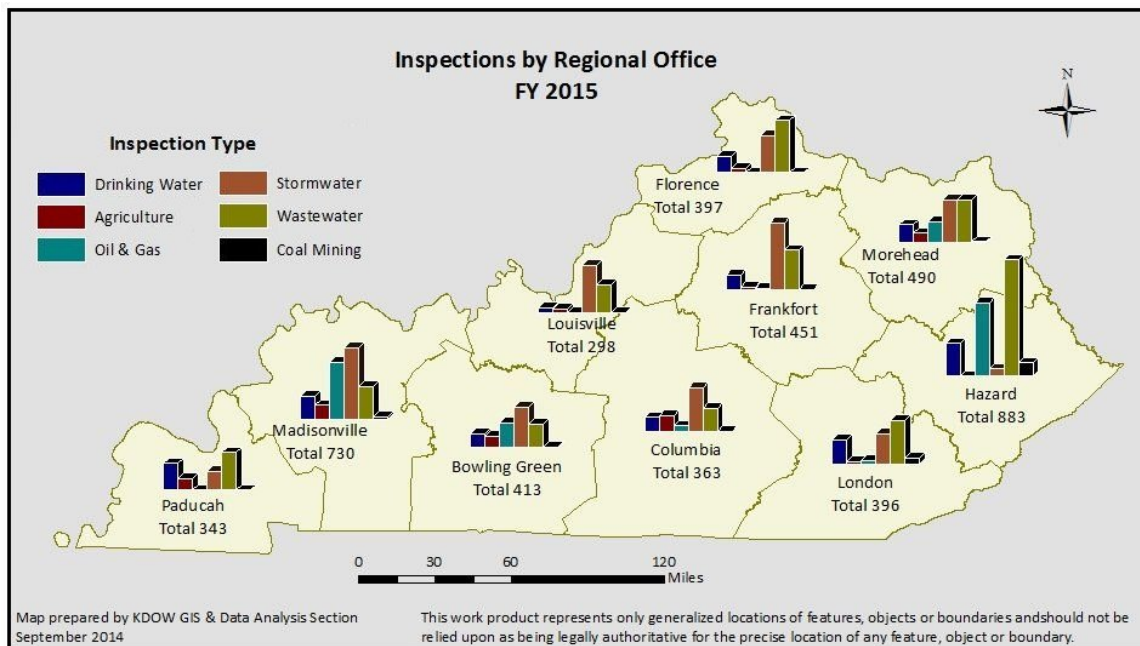
COMPLIANCE AND TECHNICAL ASSISTANCE

Inspections

Compliance inspections ensure that wastewater, stormwater and drinking water facilities are meeting regulatory and permit requirement, but are also a main vehicle for KDOW to provide technical assistance to facility operators. Not surprisingly, the number of inspections corresponds well with the compliance rates of permitted facilities.

KDOW's Compliance and Technical Assistance Branch (CTAB) oversees the majority of KDOW's compliance monitoring. KDOW has ten regional offices located throughout the state and additional personnel within the central office who provide technical assistance as well as compliance monitoring. The ten regional offices conduct inspections and investigations in order to monitor permit compliance and other circumstances which could result in violations of the Clean Water Act. Inspectors also conduct inspections at all public drinking water systems to ensure compliance with the SDWA.

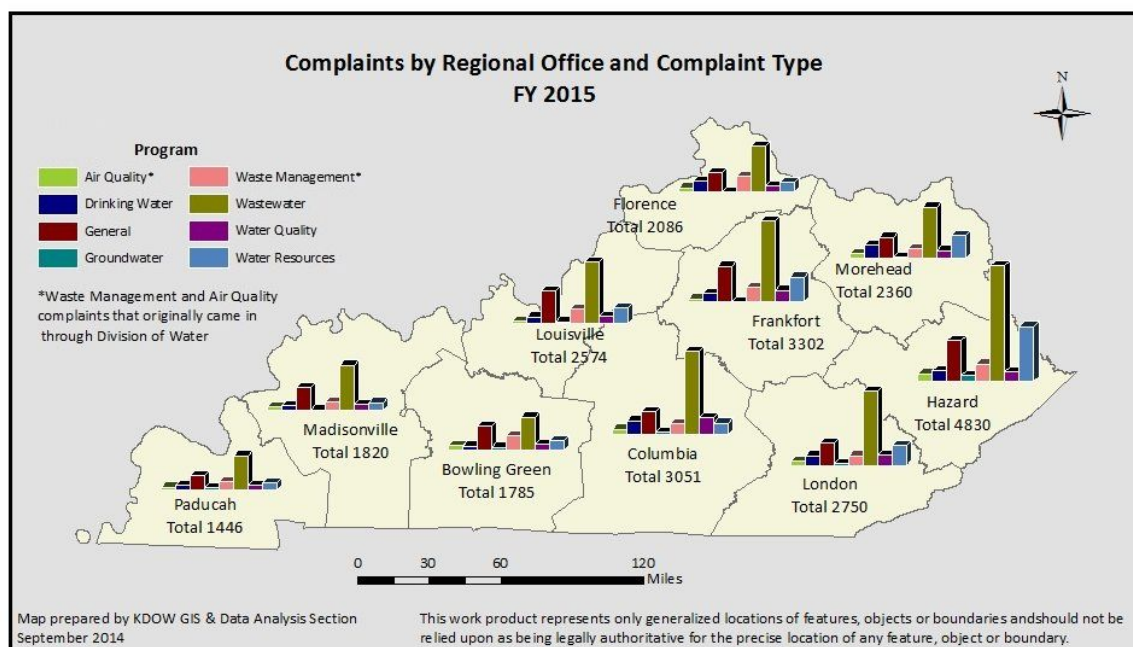
Forty-two KDOW inspectors are responsible for compliance monitoring for more than 10,000 KPDES-permitted facilities and 446 public water systems. In FY2015 inspectors conducted 4,797 inspections to



determine whether or not permitted entities were in compliance. The number of inspections conducted increased more than 5% in FY2015 and represents the highest number of inspections conducted in a single year for the previous seven years. Approximately 60% of all inspections were conducted for wastewater and stormwater permits. Inspections in the drinking water, oil and gas, agriculture and coal mining sectors represent 40% of the inspections conducted.

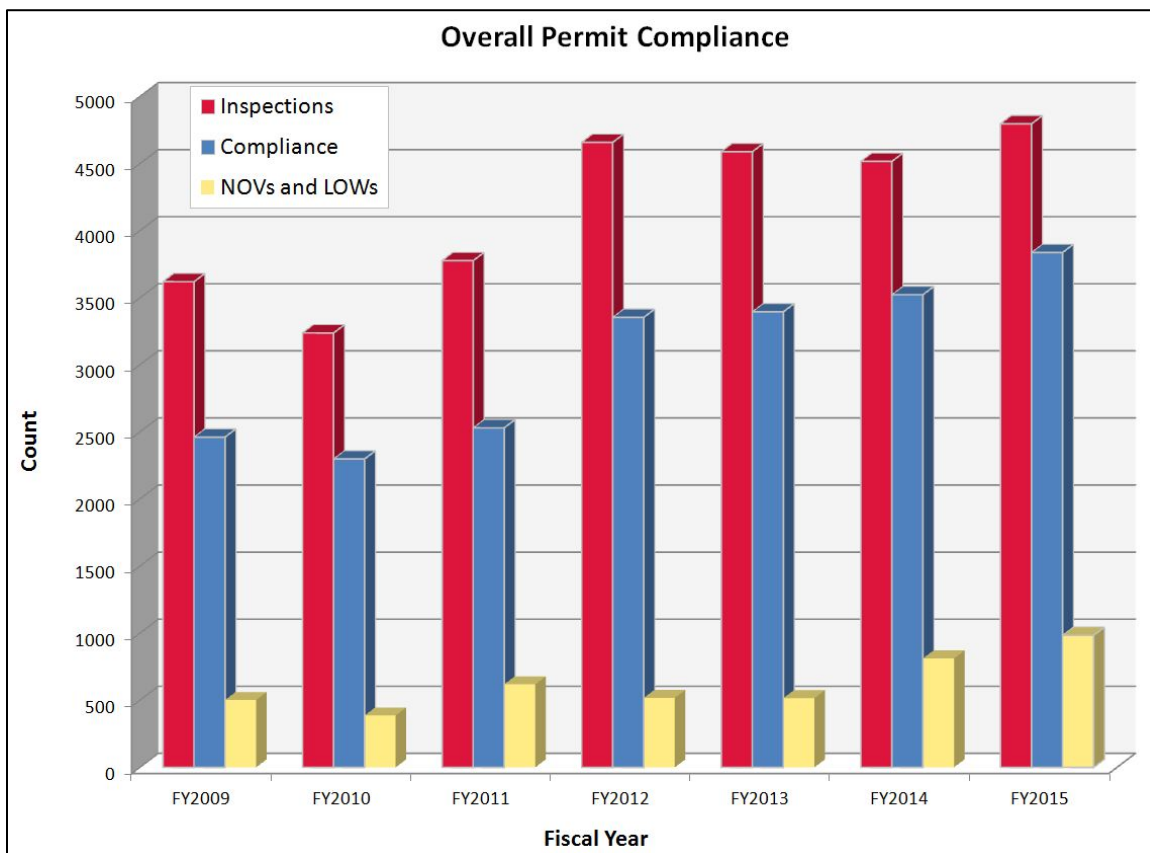
Inspection results show that permitted facilities had an overall compliance rate of 80% in FY2015, which is a 2% increase over the previous year. Based on available compliance data, this marks the fifth consecutive year that overall permit compliance has increased and the highest compliance rate recorded. Overall, compliance has increased 23% since 2011!

In addition to compliance inspections, KDOW regional office personnel are responsible for recording and responding to complaints received by KDOW. Regional office inspectors responded to 1,567 complaints during FY2015 and performed investigations most complaints. The data show that the number of complaints decreased this year continuing the trend of a six-year decline in the number of complaints. KDOW staff inspected or responded to complaints for 6,364 facilities or incidents in FY2015, at a rate of approximately 150 per inspector.



The increased number of inspections together with increasing compliance rates and declining citizen complaints is a strong indication of the effectiveness of KDOW's regional field offices in assuring and facilitating compliance. The presence of inspectors in the field and their valuable relationships with the

regulated community are important factors for regulatory compliance. While enforcement action is sometimes necessary, KDOW inspectors and other personnel provide necessary technical assistance to support the regulated community in order to prevent violations, resolve existing violations and optimize the performance of wastewater and drinking water facilities. The number of NOVs and Letters of Warning (LOW) issued decreased during FY2015, which correlates with the increase in compliance and reduction of complaints during the year. The direct relationship between the number of inspections conducted and the rate of compliance can be attributed to the accountability the inspection requires, but also reflects the significant technical and compliance assistance provided to those facilities by KDOW the inspectors and other personnel. Ultimately, there is a direct relationship between compliance rates and water quality, which is a primary objective of KDOW.



KDOW has a specialized group of technical assistance providers who work exclusively with Kentucky's 446 public drinking water systems. These five individuals work closely with systems, many of which are identified by the Capacity Development program, that require assistance to improve performance and technical capacity so that safe drinking water is consistently provided to customers.

These technical assistance providers also oversee the Kentucky Area Wide Optimization Program (AWOP) that challenges drinking water systems to produce drinking water that is of even greater quality than regulations require. AWOP has historically focused largely on reducing turbidities in drinking water because of the improved quality of the water associated with reduced turbidities. AWOP is shifting its focus significantly toward optimizing treatment and distribution system management to reduce DPBs. In addition, the AWOP personnel are increasingly providing technical assistance to those systems that are dealing with HABs issues.

Laboratory Certification Program

The goal of KDOW’s Drinking Water and Wastewater Laboratory Certification programs is to ensure that Kentucky’s drinking water and wastewater lab produce data of a known and useable quality that is achievable by all facilities. In doing so the Laboratory Certification program’s efforts tie directly into the Division’s strategic objective to maintain and improve data quality

2015 marks the final year of the two-year tiered implementation of the new Wastewater Laboratory Certification regulation. This regulation was established to create uniform, high quality data for use within the KPDES program. As a result of this regulation, many laboratories and permitted facilities are on a challenging learning curve as they work toward complying with federal and state data quality requirements. In an effort to ensure compliance with the Laboratory Certification regulation, program personnel have made a concerted effort to provide labs and facilities the necessary guidance and technical assistance.

2015 Drinking Water Program Certifications		
Program	In-State	Out-of-State
Chemistry Labs	13	27
Microbiology Labs	46	3
Cryptosporidium	1	3
Radionuclides	0	8
Dioxin	0	6
Asbestos	1	3
PCBs (EPA508A)	0	2

2015 Wastewater Program Certifications		
Program	In-State	Out-of-State
Chemistry Labs	13	27
Microbiology Labs	46	3
W.E.T. Labs	7	13
General Labs	84	48
Field-only Labs	73	1

Laboratory Certification personnel conducted numerous trainings during FY2015, including those sponsored by partners such as the Kentucky Rural Water Association and the Kentucky Water and Wastewater Operator Association. These trainings were conducted to assist laboratory facilities with complying with the new certification program requirements.

The Laboratory Certification program also reworked its website in order to make it more user-friendly and to serve as a portal to convenient reference material. The new Laboratory Certification website updates include six templates and thirteen technical assistance documents. The goal was to create a one-stop shop where facilities can find all of the information they need to meet the new certification requirements.

DAM SAFETY AND FLOODPLAIN MANAGEMENT



Based on average yearly damages, flooding is Kentucky's greatest natural hazard risk. Consequently, proper management of flood risk is vital to the safety, sustainability and economic resilience of communities across the Commonwealth. KDOW has strategically aligned its flood hazard-related programs to enhance hazard identification, regulatory activities and hazard mitigation activities. In doing so, KDOW regularly collaborates with stakeholders representing federal, regional, and local agencies, state and national associations and the private sector. These efforts promote post-disaster community resilience and long-term community sustainability by utilizing tools and processes that effectively communicate risk, protect critical infrastructure, and manage current and future risks.

Risk MAP

KDOW is a Cooperating Technical Partner (CTP) in the FEMA Risk MAP program. Risk MAP combines flood hazard identification (mapping), flood risk assessments and hazard mitigation planning activities to create a holistic view of flood risks in communities across the Commonwealth. Over the past year, KDOW completed its first watershed-based Risk MAP projects which resulted in enhanced flood risk products for community use. Risk MAP, as opposed to previous flood hazard mapping programs, assesses flood risks at a watershed (8-digit HUC) perspective instead of on a county or other basis. In addition to Flood Insurance Rate Maps (FIRMs), products such as flood depth grids, percent chance of flooding during a 30-year period, and areas of mitigation interest are produced. These products provide valuable flood risk information for local officials, emergency managers, lending institutions, businesses and individual citizens.

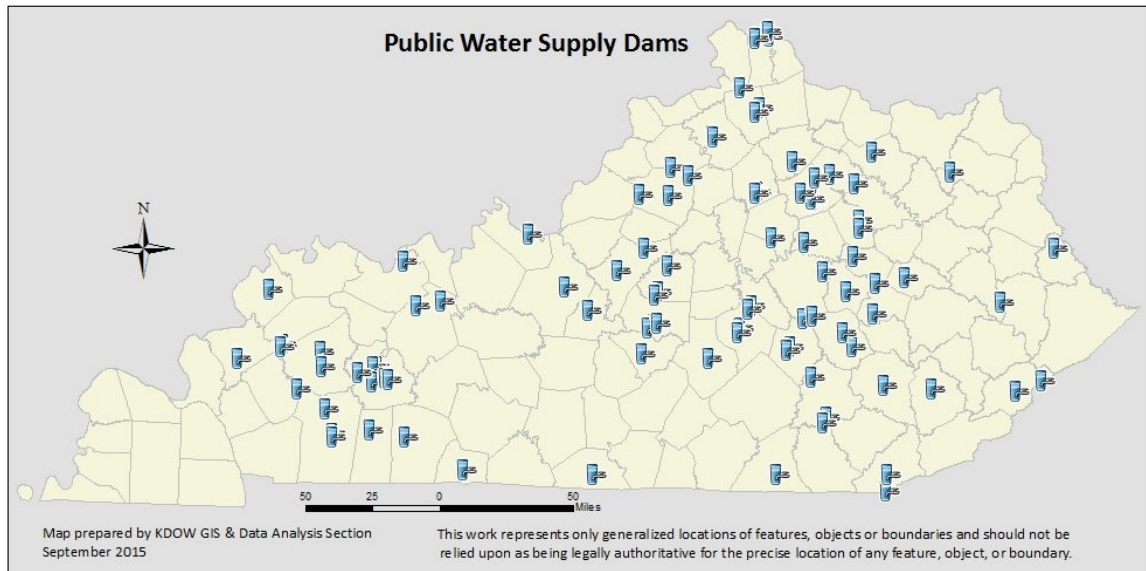
The first Risk MAP products in the Commonwealth were created in the Upper Cumberland, Lower Levisa, and Tug Fork watersheds. Kentucky collaborated with Tennessee, West Virginia, Virginia, and FEMA Regions III and IV to more efficiently utilize limited funding available for Risk MAP. Additional Risk MAP studies continue in watersheds with high populations and resulting flood risks.

Using the flood risk products created through Risk MAP, KDOW provided direct technical assistance to the cities of Prestonsburg in Floyd County, and Coal Run Village in Pike County, which enabled each city to actively pursue FEMA mitigation funds. As a result, approximately \$300,000 will be awarded to each

city to mitigate repetitive flooding issues that have damaged residences, businesses and critical infrastructure.

Dam Safety Program

Kentucky dams play an integral role in managing the Commonwealth's water resources. KDOW's inventory includes 966 dams, of which 78 provide the reservoir capacity and primary source water for nearly 100 public water systems.



Dams also support communities by:

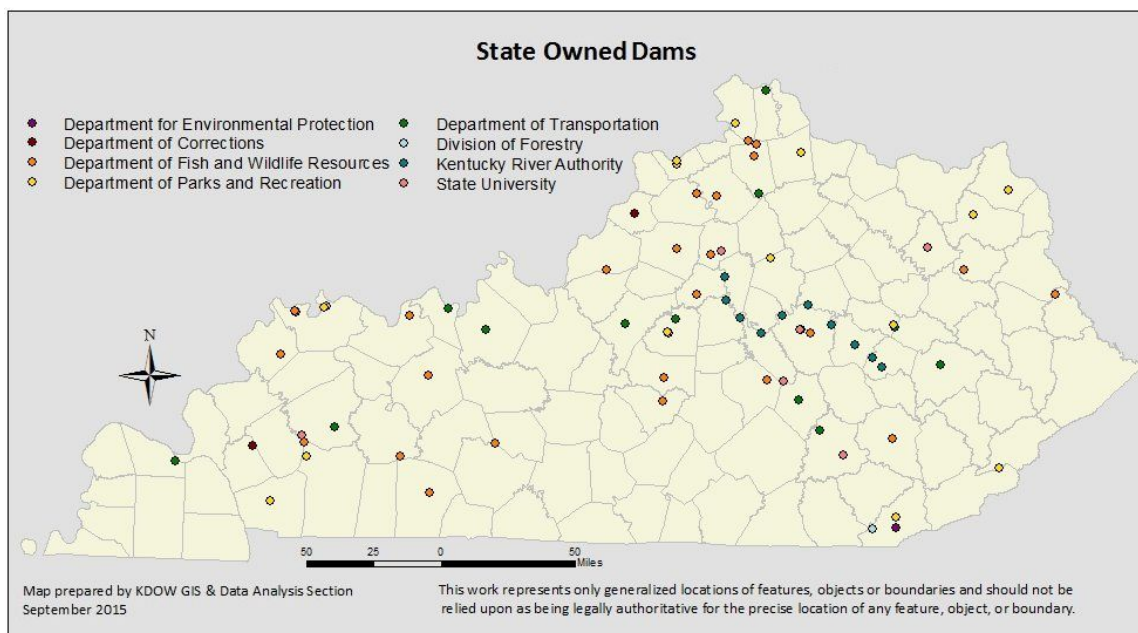
- Providing flood control, protecting lives and properties downstream of dams and reducing flooding of agricultural lands;
- Delivering water for crop irrigation and livestock watering;
- Generating electrical power;
- Providing recreational opportunities, including fishing, boating, swimming, and hunting.

However, dams also pose significant risks to life and property should a failure of the dam occur from lack of maintenance or natural disaster. In light of these benefits and risks, KDOW actively engages dam owners, local communities, and private property owners to properly maintain these important assets and to manage the risks of dam failures. Established over sixty years ago, Kentucky's Dam Safety Program protects public safety through regulatory processes, inspections, stakeholder engagement, and various mitigation measures. With the exception of dams owned and operated by USACE and those

permitted by the Division of Mine Reclamation and Enforcement, KDOW personnel monitor active dams in the Commonwealth. State and local government agencies own approximately two hundred dams; the majority of Kentucky's dams are privately owned.

The program requires that dam owners maintain the structures, which may include improvements repairs, or retrofitting the dam to ensure safety and minimization of risk. Regular inspections ensure that dams are safely maintained and operated. Changes in the condition of the dam are noted and maintenance needs are communicated to dam owners.

KDOW also manages the State Owned Dam Repair (SODR) program which has invested capital construction and mitigation dollars for state-owned dams. SODR ensures that state-owned dams are constructed to regulatory specifications. Through SODR, KDOW has proactively acquired at-risk properties and has collaborated with local communities to restrict development downstream of dams. This approach has saved millions of dollars that otherwise would have been spent on upgrading dam structures because of the change in risk class resulting from downstream development. The savings realized by mitigating downstream risks are directed to high priority SODR projects that require significant construction.



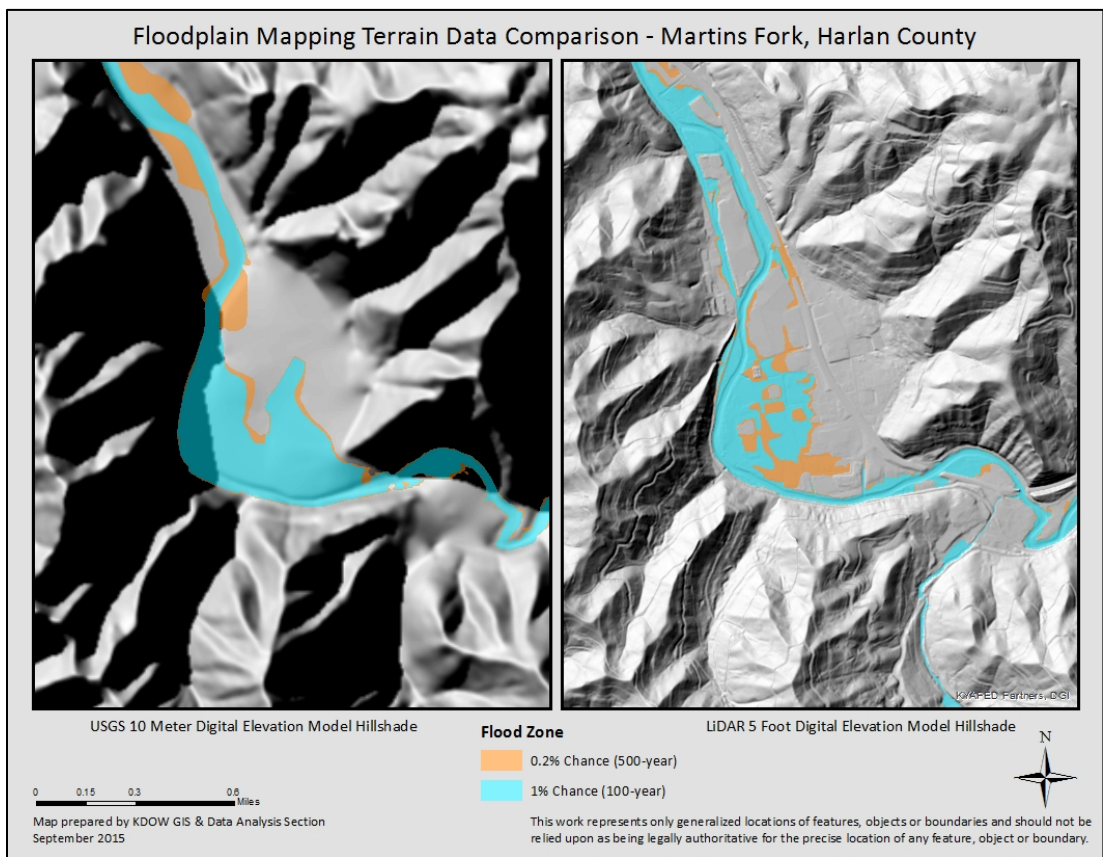
Floodplain Management

KDOW's Floodplain Management program promotes community and personal safety through regulatory processes, technical assistance, and regular communication with local officials and individual

stakeholders. Kentucky is one of the few states that require state permits for floodplain development, which adds an extra level of safety and, in particular, technical capacity to local floodplain permitting activities conducted pursuant to the National Flood Insurance Program (NFIP). In the past year, over 800 floodplain construction permits were issued for development in the Commonwealth's 1% annual chance (100-year) floodplains. KDOW also administers the NFIP for over 350 communities across the Commonwealth, providing community officials technical expertise and support for local floodplain management programs.

Process Development and Efficiencies

KDOW regularly seeks innovative ways to better identify and mitigate flood-related risks by embracing the use of enhanced modeling techniques, mobile applications and terrain data. Light Detection and Ranging (LiDAR) data, which very accurately identifies terrain attributes, is used in modeling and mapping processes to identify floodplains, create precise dam inundation maps, and determine the potential impact, sustainability, and safety of permitted projects.



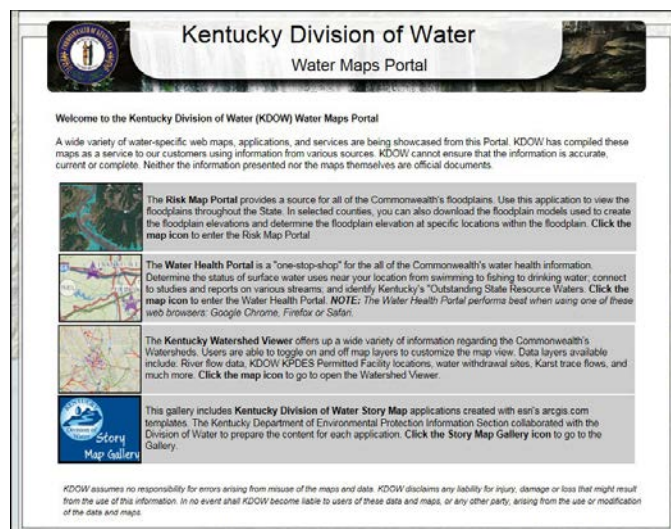
The Dam Safety Program is modernizing its processes by modernizing its data management and creating mobile applications to support dam inspections and communication with dam owners. Emergency Action Plans (EAPs) are developed to inform downstream communities, agencies, and stakeholders what actions to take if a dam failure or breach occurs. While EAPs are in place for a number of dams, KDOW personnel continue to work with dam owners and local emergency officials in developing new EAPs and conducting exercises to prepare and protect communities in the event of potential problems.

KDOW and FEMA have partnered to use Risk MAP program tools to identify, manage, and prevent potential flood risks. By using better modeling tools in combination with LiDAR data, unsteady state and 2-dimensional models are being developed to more accurately route riverine characteristics during times of high flow. The enhanced models incorporate potential stormwater and surface water flooding, dam and levee breach, and sediment and debris flows. Using enhanced modeling techniques, KDOW is more accurately evaluating the risks associated with flooding and dam failure. Subsequently, the risk classification for several dams has been reevaluated and reclassified to reflect their true risk potential.

WATER MAPS PORTAL

Over the past several years, the Kentucky KDOW has had requests from the public for improved transparency and greater availability of data that KDOW collects and information it generates. KDOW has responded to this feedback by working with Division of Environmental Program Support (DEPS) to create a number of water-related electronic map products that are now available to the public. In an attempt to improve communication with, and customer service to the public, in FY2015 KDOW created a repository for these new electronic mapping products called the Water Maps Portal. The new map products available to the public through KDOW's Water Maps Portal provide information on the health of streams across the Commonwealth, detailed information on floodplains, information at the watershed-scale, and maps that tell stories through a series of photos. The Water Maps Portal can be accessed here:

<http://watermaps.ky.gov/>.



Water Health Portal and Water Health Guide

KDOW made it easier for Kentuckians to discover what the quality of the water is at their favorite spot on the water. An interactive Web-based map application called the "Kentucky Water Health Portal" provides information about the health of the streams across the Commonwealth based on scientific examination of the water bodies, fish and wildlife habitat, and water samples. The interaction of these various components gives a more comprehensive picture of the waters' health.

KDOW developed the Water Health Portal in response to legislation enacted in 2013. The legislation called for more transparency to KDOW's process for assessing the quality of Kentucky's waters and the Integrated Report, a comprehensive document that assesses the health of Kentucky waters and is compiled and submitted to Congress biannually. Required by the federal Clean Water Act, the Integrated Report contains technical information about the health of all surface waters assessed, including those waters assessed as impaired. The Water Health Portal presents this information in a

format that enables the use and understanding of a wider audience. With the Water Health Portal anyone can simply visit the website, type in the area of interest and with a few clicks of the mouse can learn about the water quality of your favorite spot on the water. The Water Health Portal can be accessed from: <http://watermaps.ky.gov/>.

Water Health Status

Stream Name: **Blackford Creek 10.15 to 18.1**
 Assessed Date: 5/30/2013
 County: Hancock Co
 Basin: Ohio River

Rollover each icon to see what each one means (text here changes based on rollover).

[Assessment Summary](#)
[More Basin Information](#)

Use	Cause of Impairment	Suspected Source(s) of Impairment	Basis for Listing	Data Collection and Analysis Methods ^{1,2,3}
	Sedimentation/Siltation	Channelization, Loss of Riparian Habitat, Streambank Modifications/destabilization	Sediment deposition is negatively affecting the aquatic community (e.g. habitat smothering) and/or recreation	Biological Monitoring, Habitat Assessment

¹Data locations: Physical/chemical monitoring data and pathogen data can be found on the EPA Water Quality Portal, chemical monitoring data for regulated facilities (e.g. wastewater and drinking water) can be found in the EPA ECHO database (online), biological monitoring summary scores and habitat assessment scores can be found in the EPA STORET database (online), and raw community species data and fish tissue analysis data are available on request through KDOH Open Records (requested in STORET 2015).
²Data Source(s): KDOH
³Data Collection Date(s): 8/23/2011

KDOH cannot ensure that this information is accurate, current, or complete. The information provided in this document is for informational purposes only, is subject to revision or correction at anytime and cannot be relied upon for regulatory or other purposes. This is not an official document. For questions or comments contact KDOH at water@ky.gov or 502-564-3410

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Division of Water Watershed Planning Green and Tradewater Rivers Basin

Division of Water
 Green and Tradewater Rivers Basin

Green and Tradewater Rivers Basin Coordinator
 Kentucky Watershed Management activities in the Green and Tradewater Rivers Basin are managed by a basin coordinator. The coordinator serves as a facilitator for agency activities and as a point of contact for local organizations interested in addressing clean water issues. For more information contact the basin coordinator.

Joanna Ashford
 Director of Water
 200 Far Oaks Lane
 Frankfort, KY 40601
 Phone: 502-564-3410
 Email: Joanna.Ashford@ky.gov

Upcoming Events

29th Annual Green River Lake Volunteer Lakeshore Cleanup
 Sept. 15, 2015: 29th Annual Green River Lake Volunteer Lakeshore Cleanup.
 Come help us clean up the shoreline. Registration sites will be at the Site 1 Boat Ramp, state park, South Ridge Boat Ramp, Holmes Bend Boat Ramp, and Wilson Creek. Registration is free and a free lunch will be provided for all those who help out. Prize drawing to follow. Lunch will be held at the state park picnic shelter at 12 noon EST.

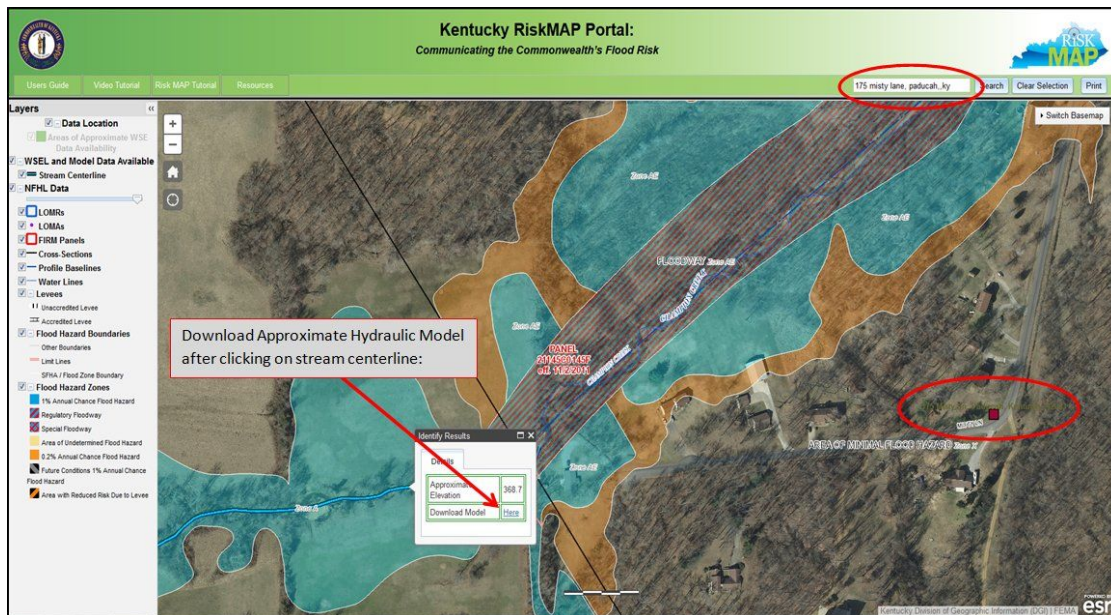
While viewing the Water Health Portal, some questions may arise, like: “What exactly is a TMDL?” Or maybe you are wondering about the purple star icon with OSRW inside. These questions, along with many others are answered in the recently produced document called Kentucky’s Water Health Guide. The guide breaks down the technical jargon and presents the technical aspects of water quality in a manner that the average citizen can understand. The Water Health Guide can be accessed from the Water Health Portal, but can also be found on KDOH’s website here:

<http://water.ky.gov/watershed/Documents/Kentucky%27s%20Water%20Health%20Guide%20-%20Online%20Version.pdf>.

Risk MAP Portal

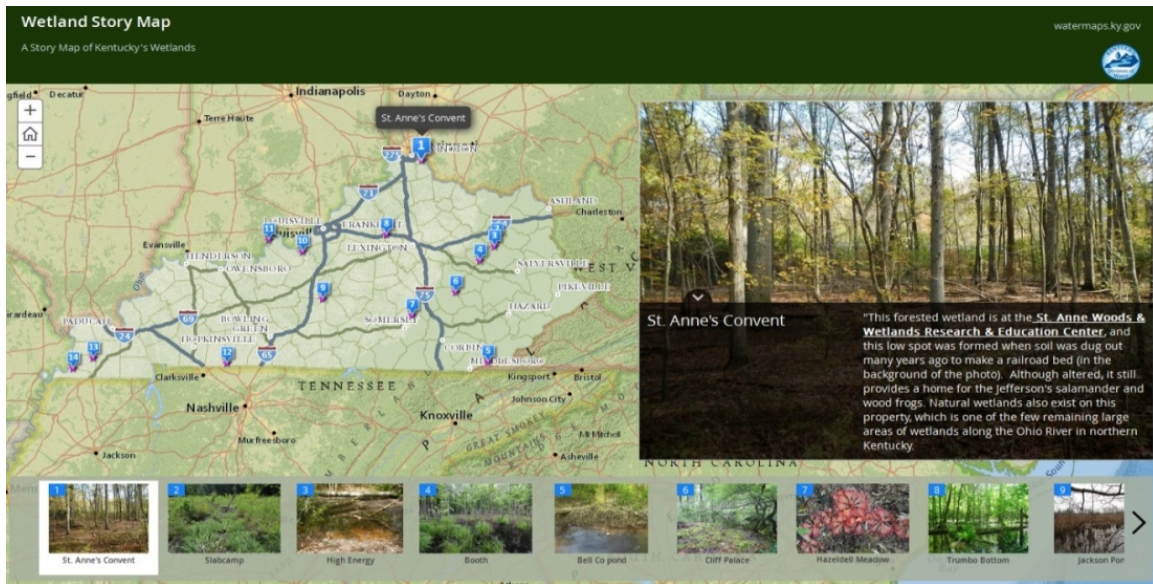
For purposes of mitigation-planning, emergency response and management, and flood insurance concerns, stakeholders are commonly interested in knowing what properties have been mapped within a regulatory floodplain, what elevation is depicted by the floodplain boundary on a Flood Insurance Rate Map, or “How high is the water going to be during a 1% annual chance (100-year) flood?” Previously these data were only publicly available for detailed studies through the Federal Emergency Management Agency (FEMA); and stakeholders had to request the model information for approximate studies from KDOW. KDOW is developing a Web-based tool - the Risk MAP Portal - to allow public open access to this information.

Although KDOW always openly shares this data when requested, the Flood Risk Portal will enable enhanced access to flood hazard information in a user-friendly format. By selecting an area of interest on the Flood Risk Portal, flood elevations and links to associated engineering data for download will be available.



In 2016, KDOW plans to complete Phase 2 of the Flood Risk Portal which will allow users to obtain flood hazard information for all of the approximate studies that KDOW has access to. As a placeholder, an interactive Web-based map application of Kentucky floodplains can be accessed from:

<http://watermaps.ky.gov/>.



The **Kentucky Wetland Story Map** explores the great diversity of wetlands in our Commonwealth and how humans and animals derive benefit from them. The map highlights unique features of each wetland, such as the dwarf sundew plant (shown below), found only in Hazeldell Meadow.



Dwarf sundew, *Drosera Brevifolia*



Big South Fork Cumberland River

The **Kentucky Wild Rivers Story Map** showcases the scenic, biological, geological, cultural, and recreational value of these rivers of exceptional character, designated as Kentucky Wild Rivers. The Kentucky Wild Rivers Act of 1972 designated segments of nine rivers in the Commonwealth as Wild Rivers to protect the natural attributes of the rivers and surrounding land. KDW's Wild Rivers Program oversees 114 miles of river and 26,382 acres of land. The "Story Maps" will enable the public to access in-depth information regarding these unique areas. The map provides the opportunity for a self-guided tour of some of the most picturesque locations in Kentucky, including short video segments at each stop.



Quadrule Falls, Martins Fork Wild River, Harlan Co

DOW Staff Photo

Commonwealth of Kentucky

Steven L. Beshear, Governor

Energy and Environment Cabinet

Leonard K. Peters, Secretary

Kentucky Department for Environmental Protection

R. Bruce Scott, PE, Commissioner

Aaron Keatley, Deputy Commissioner

Kentucky KDOW

Peter Goodmann, Director

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