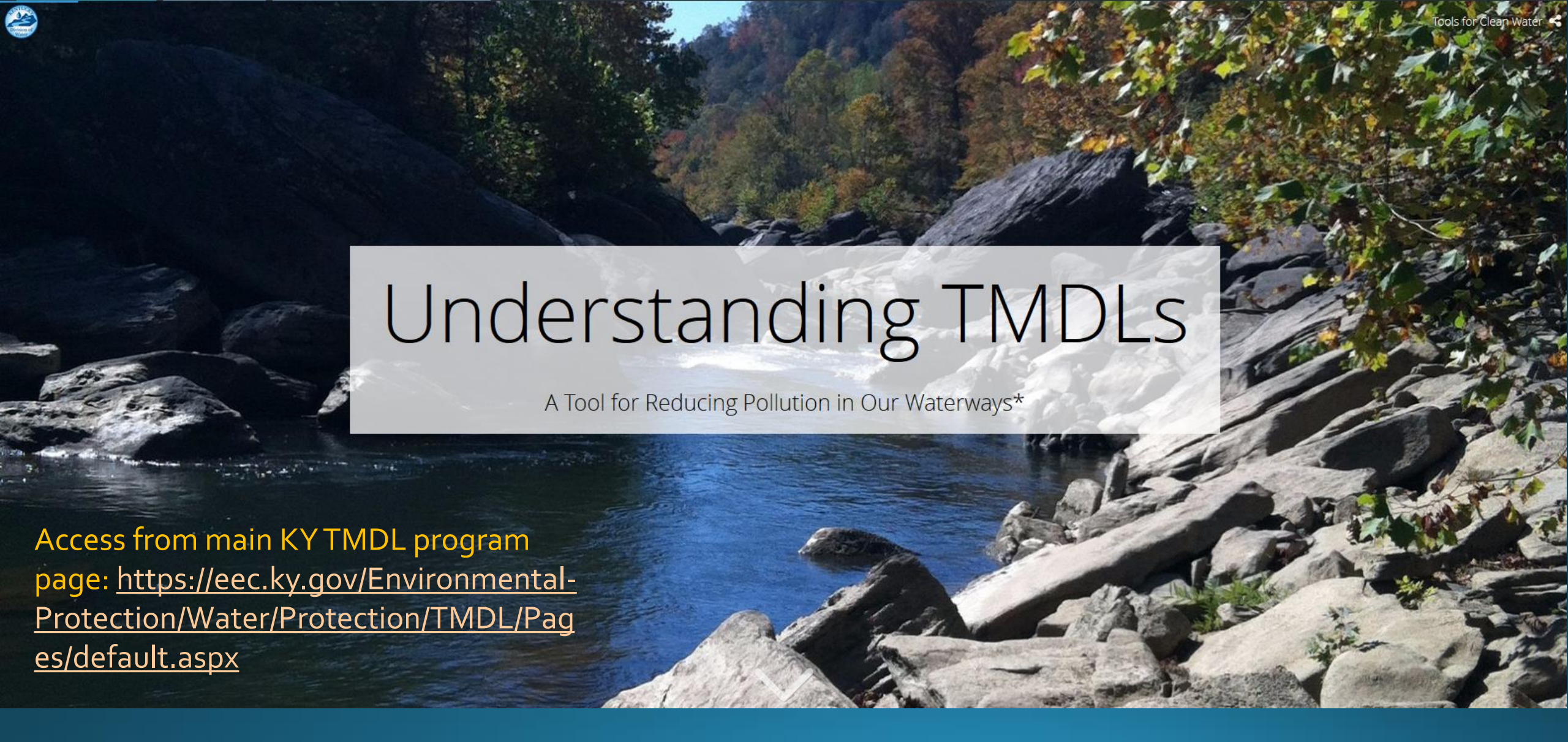


Kentucky TMDL Program
National TMDL/303(d) Workshop
Communication Tools
May 28th 2020

Kentucky's Understanding TMDLs Story Map



Understanding TMDLs

A Tool for Reducing Pollution in Our Waterways*

Access from main KY TMDL program page: <https://eec.ky.gov/Environmental-Protection/Water/Protection/TMDL/Pages/default.aspx>

What's the story?

Kentucky Statewide Total Maximum Daily Load for *Bacteria* Impaired Waters



Final
December 2018



Submitted to:
United States Environmental
Protection Agency
Region IV
Atlanta Federal Building
61 Forsyth Street SW
Atlanta, GA 30303-1534

Prepared by:
Kentucky Department for
Environmental Protection
Division of Water
300 Sower Blvd.
Frankfort, KY 40601



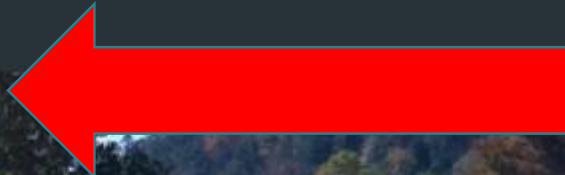
Public comment sought on bacteria TMDL document using new statewide method for 39 stream segments in the Green and Tradewater river basins *Comment period ends June 11, 2018*

FRANKFORT, Ky. (March 14, 2018) – The Energy and Environment Cabinet is seeking public comment until June 11, 2018 on a draft report addressing bacteria impairments in surface waters throughout Kentucky. The report includes a new, streamlined method for developing Total Maximum Daily Loads (TMDLs) for the impairments.

“Total Maximum Daily Load” is a term used to describe the amount of pollution a water body can receive and still meet water quality standards. These standards protect beneficial uses of the water, or “designated uses.” Standards for *E. coli* and fecal coliform bacteria are intended to protect the health of those using surface water for swimming, wading, boating, and other recreation.

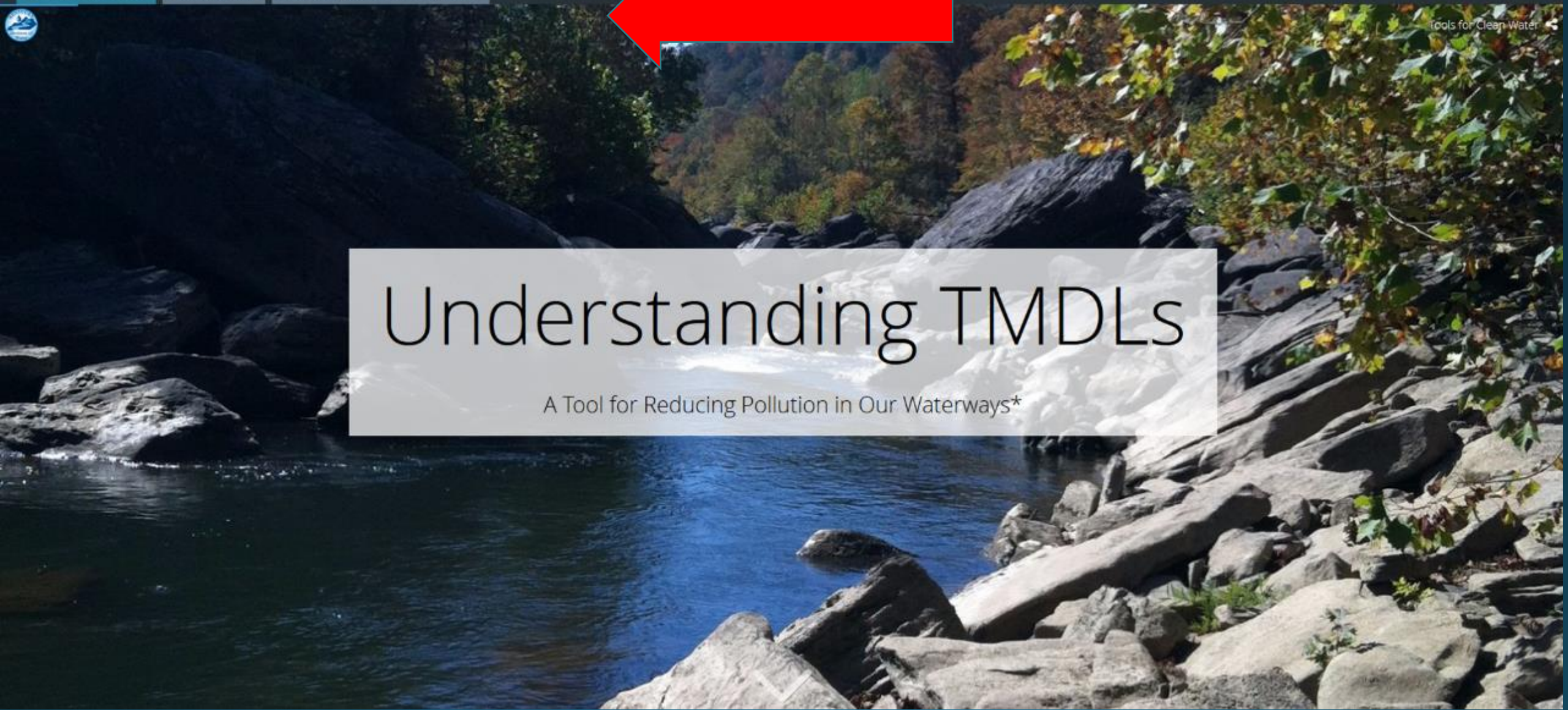
The Clean Water Act requires each state to periodically identify specific waters where designated uses are not being met and water quality impairments exist. The state is also required to prioritize the list of impaired waters, calculate a TMDL of pollutants for those waters, and devise plans to improve the water quality.

The report, prepared by the Division of Water, discusses bacteria sources that occur in Kentucky, how bacteria enter surface water, and what stakeholders can do to improve water quality.



Understanding TMDLs

A Tool for Reducing Pollution in Our Waterways*



A TMDL (or Total Maximum Daily Load) is the maximum amount of a pollutant that a waterbody can receive and continue to meet water quality standards.



A TMDL is a tool that allows communities to identify pollution sources, and curb excess pollution when a waterway is unable to support designated uses like safe swimming, fishing, and drinking water.

A TMDL is not a regulation.

A TMDL is not a regulation.

		Uses					
		Swimming (Primary Contact Recreation-PCR)	Fishing, Wading, Boating (Secondary Contact Recreation-SCR)	Drinking Water (Domestic Water Supply-DWS)	Animals That Live in Water (Aquatic Life-AQ)	Safety of Eating Fish (Fish Consumption-FC)	Outstanding State Resource Water (OSRW)
Ratings	Nonsupport of Use (red)						
	Partial Support of Use (Yellow)						
	Full Support of Use (green)						
	Non Evaluated/Not Assessed (White)						

The Kentucky Division of Water monitors water quality to determine if our water is drinkable, swimmable, and fishable. The information they collect determines the rating for a designated use.

The [Clean Water Act](#) requires states to develop a list of impaired waterbodies. This list is called the [303\(d\)](#). When a stream does not meet water quality standards, it is added to the impaired waters list, and the Kentucky Division of Water is required to develop a TMDL.



Parts of a TMDL

How Do You Calculate Pollution Limits?

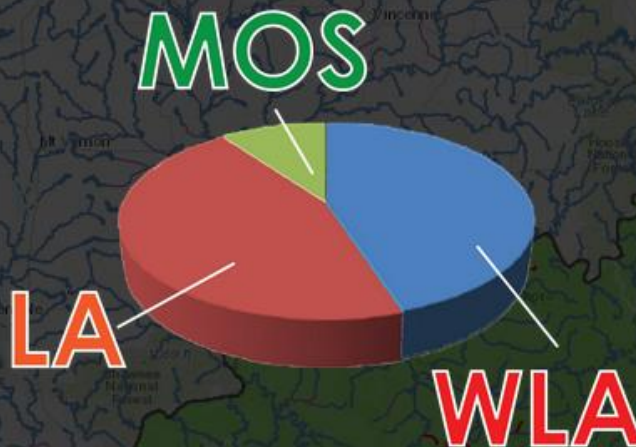
A TMDL for an impaired water is a calculation of the daily amount of a pollutant that can be added to the waterbody while still allowing it to meet water quality standards.

A TMDL can provide insight into the scope of the problem and a foundation for putting solutions into action.

The three parts that make up the calculation are Point Source Pollution, Nonpoint Source Pollution, and a **Margin of Safety (MOS)**. Point source pollution is also called a **Wasteload Allocation (WLA)**, and nonpoint source pollution is also called a **Load Allocation (LA)**.



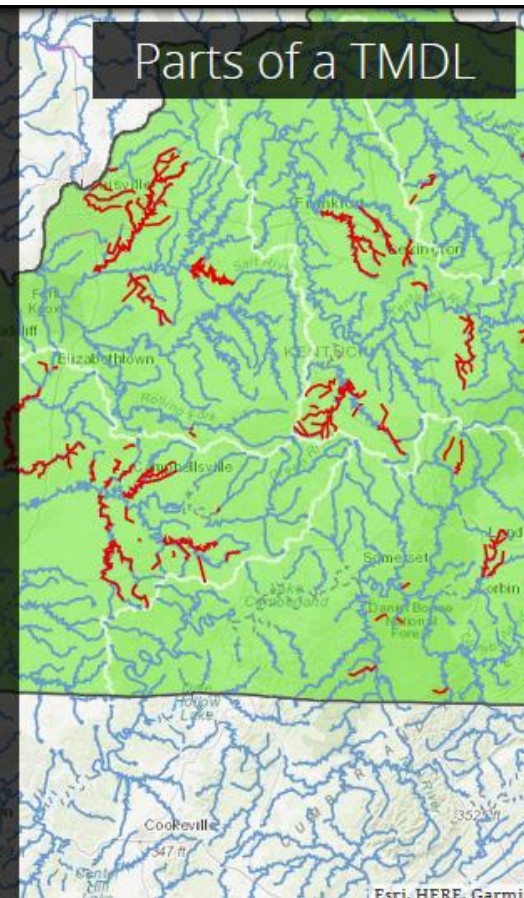
Industrial discharge into a river (rivernetwork.org)



Point Source Pollution (WLA)

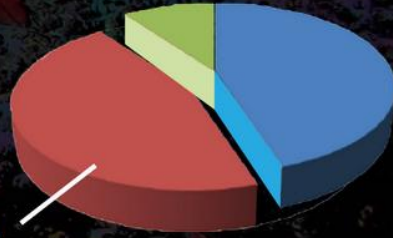
When most people think of pollution, they imagine a pipe dumping waste into a stream. This is known as Point Source Pollution: a stationary source of pollution that can be measured fairly easily (something you can "point" to). The pollutant sources that make up this part of the TMDL are referred to as the **Wasteload Allocation (WLA)**.

Parts of a TMDL



Parts of a TMDL

Nonpoint Source Pollution



LA

Load Allocation

Nonpoint source pollutants are contaminants that come from many different sources, mainly as a result of land runoff after snow melt or rainfall. Nonpoint source pollution is difficult to trace because everyone contributes to it. We cannot “point” to the specific source. It is often called **runoff pollution**, because as runoff moves it picks up and carries away pollutants, eventually depositing them into lakes, rivers, wetlands, streams and

Parts of a TMDL

In the TMDL calculation, this portion is referred to as the **Load Allocation (LA)**.



Runoff pollution from multiple sources wash directly into creeks

Common types of nonpoint source pollution include:

- Excess fertilizers
- Herbicides and insecticides from agricultural lands and residential areas
- Oil, grease and toxic chemicals from urban runoff and energy production
- Sediment from improperly managed construction sites, crop and forest lands, and eroding stream banks
- Salt from irrigation practices
- Acid drainage from abandoned mines
- Bacteria and nutrients from livestock, pet wastes and faulty septic systems



Acid mine drainage, litter, sediment, and chemical runoff



How Will A TMDL Affect My Community?

TMDLs are guides that help regulators determine how best to protect water health, and a tool that helps communities learn how they are impacting their local water. A TMDL does not create new laws or regulations; it reinforces those already in place.

Permitted Sources: Regulatory Action

In the state of Kentucky, point sources of pollution are issued a Kentucky Pollutant Discharge System (KPDES) permit. These point sources may include wastewater treatment plants, combined sewer overflows, and factories.

If the calculations show that permitted sources must reduce pollution discharges, regulators will adapt the permit to reflect the allowable loads from these sources, such that water health is protected and the designated uses for the stream (swimming, fishing, and drinking) are fully supported.



Regulatory actions may only be taken to control [point source pollution](#) through permitting and monitoring.

Non-permitted Sources: Voluntary Action

Non-permitted sources of pollution are not issued KPDES permits. This includes nonpoint sources of pollution which are not regulated in the state of Kentucky. Nonpoint source pollution is the number one contributor to water pollution in our state and accounts for two-thirds of the water quality impairments in our waterways. A TMDL calculates pollutant load allocations for nonpoint sources. This information can then be used by communities and individual landowners to implement Best Management Practices (BMPs) to help the stream meet its designated uses. Implementation of BMPs are voluntary.



Riparian zone planting, permeable pavers, and planting trees are all Best Management Practices that help to reduce nonpoint source pollution in waterways

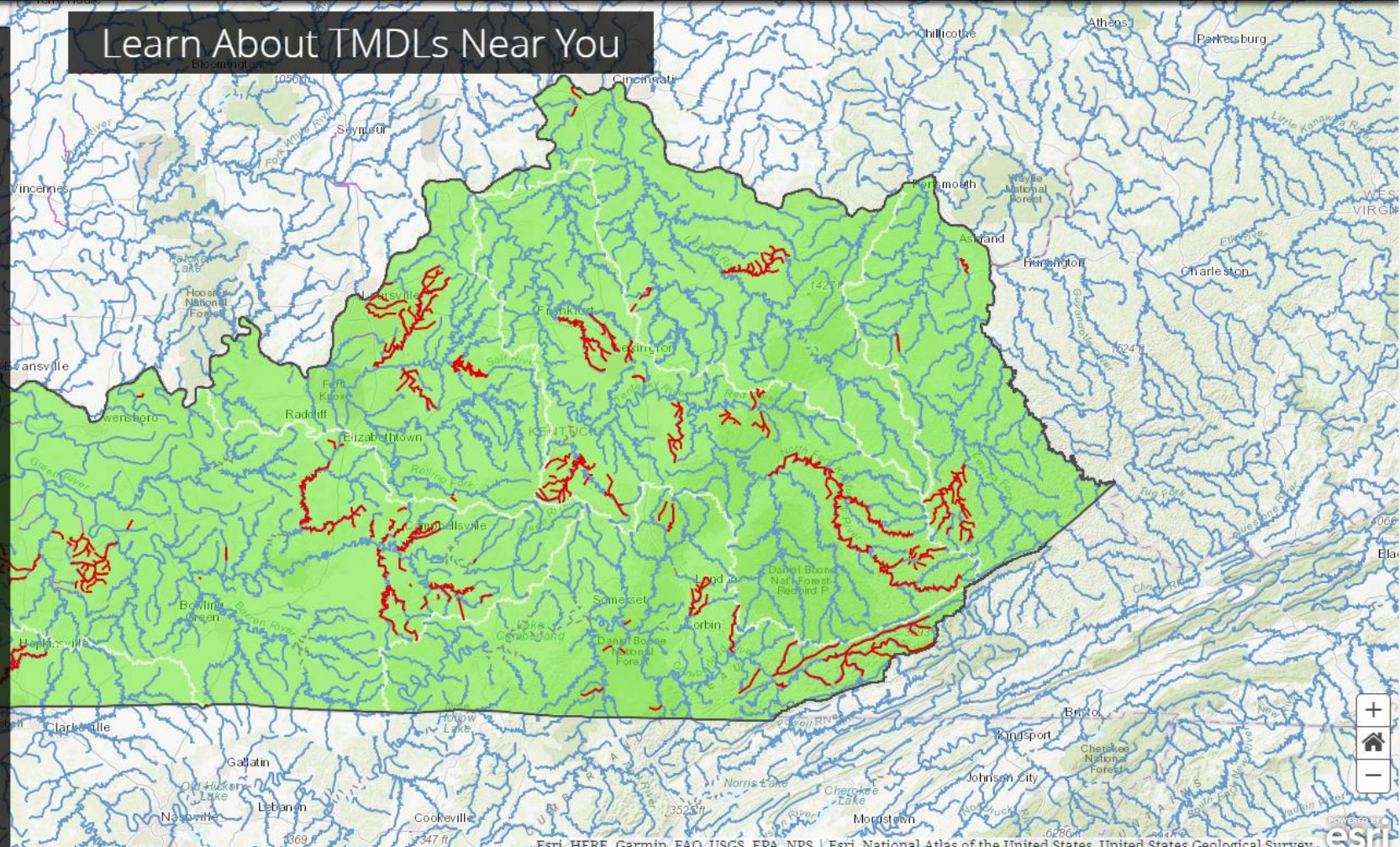
Understanding TMDLs

Zoom in on the map to see existing TMDLs in the state of Kentucky, or visit the [KY Water Health Portal](#) to learn more about water quality in your stream!

Red lines indicate an existing TMDL. Click on a stream to display information about its condition.

Scroll down in the information window and you can see what impairment each stream is listed for and find links for the actual TMDL documents.

Learn About TMDLs Near You



Click on a **RED** stream to learn more about the TMDL. Select the TMDL URL to read the TMDL documentation.

What the stream is listed for

TMDL info	
Waterbody	Nolin River 37.6 to 88.2
Impairment	Fecal Coliform
County	Hardin
Watershed	Green/Tradewater
Basin	Green River
TMDL Title	Total Maximum Daily Load for 15 Fecal Coliform Impaired Stream Segments in the Upper Green River USGS Hydrologic Unit 05110001
TMDL URL	More info

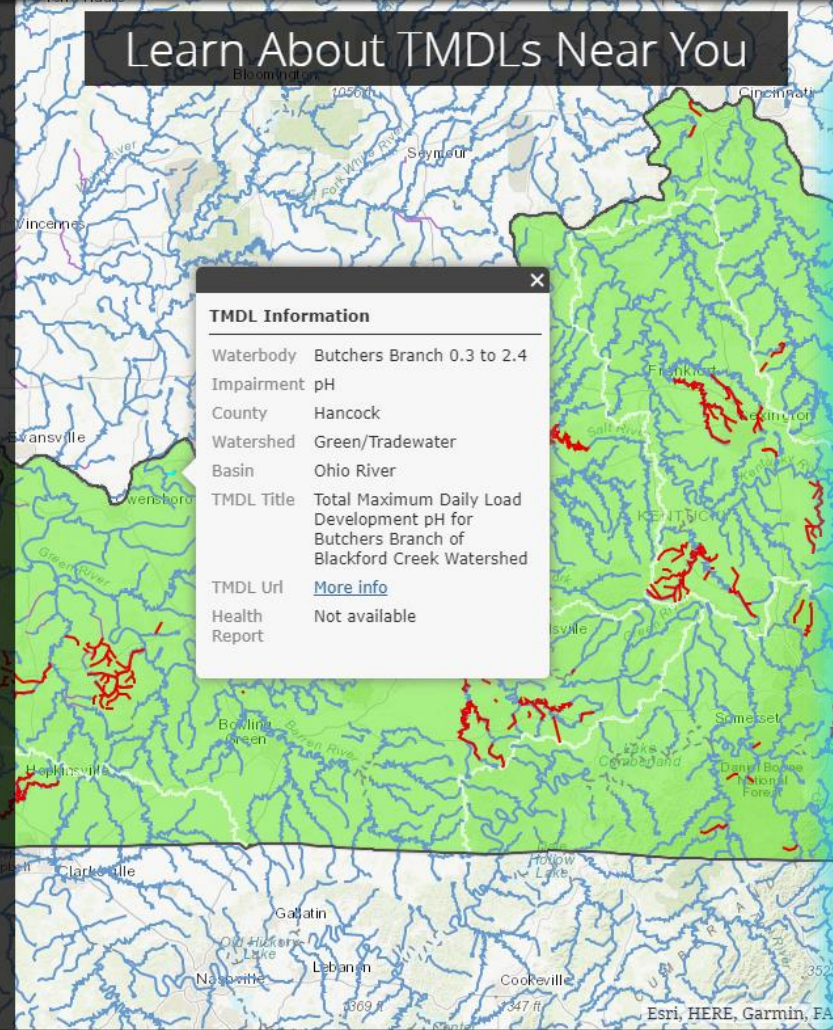
A link to the actual TMDL document

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**Final
pH (H⁺ Ion Mass)
Total Maximum Daily Load (TMDL)
for
Butchers Branch of Blackford Creek Watershed
(Hancock County, Kentucky)**

Kentucky Department for Environmental Protection
Division of Water
Frankfort, Kentucky
January 2006



Bacteria TMDLs

1 How Clean is Your Water?

Bacteria-impaired waters occur throughout Kentucky and are one of the issues that can be addressed using a TMDL. In its 2014 Integrated Water Quality Report to Congress, the Kentucky Division of Water (KDOW) identified 331 waterbodies that are impaired due to bacteria. Specifically, these waters have exceeded the state water quality standards for *E. coli* and/or fecal coliform. These types of bacteria indicate the likelihood that these waters contain pathogens, or disease-causing agents, associated with contamination from human or animal wastes. The *E. coli* and fecal coliform standards are intended to protect the health of those using waterbodies for swimming, wading, boating and other recreation.

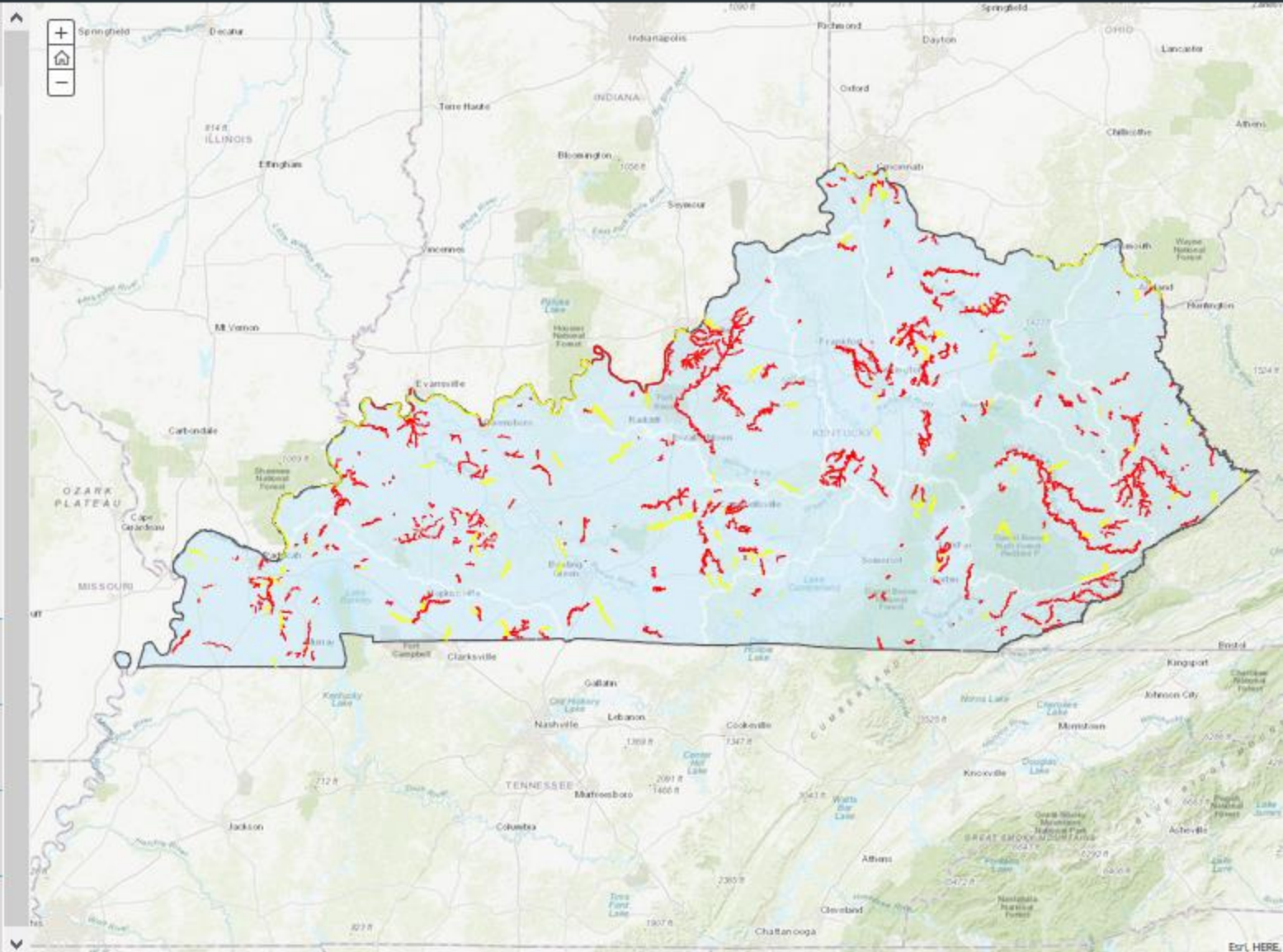


2 Human Sources of Bacteria

3 Animal Sources of Bacteria

4 Where Are There Bacteria TMDLs Now?

5 Future Bacteria TMDLs



Understanding TMDLs

Bacteria TMDLs

Best Management Practices in Action

Bacteria TMDLs

1 How Clean is Your Water?

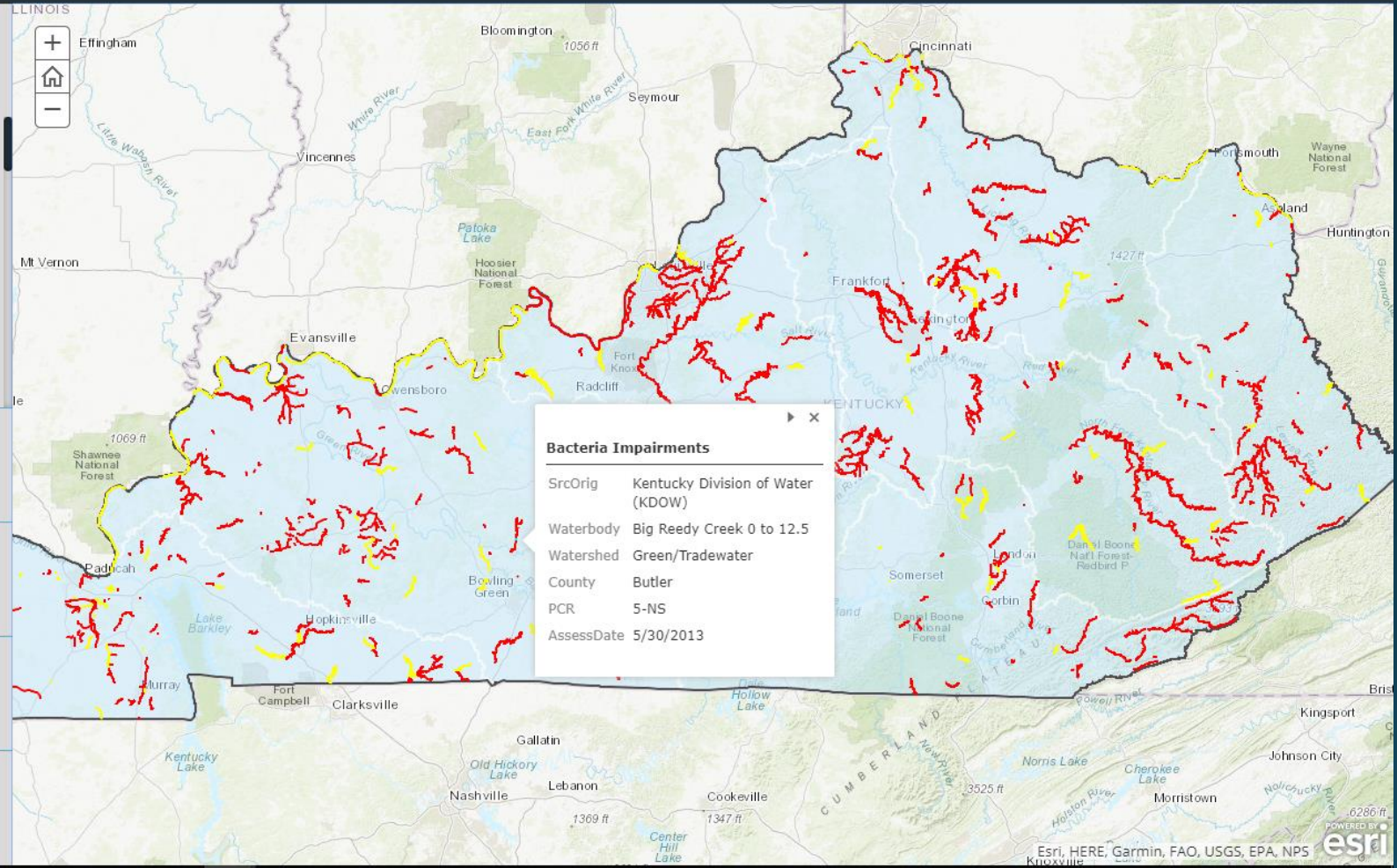
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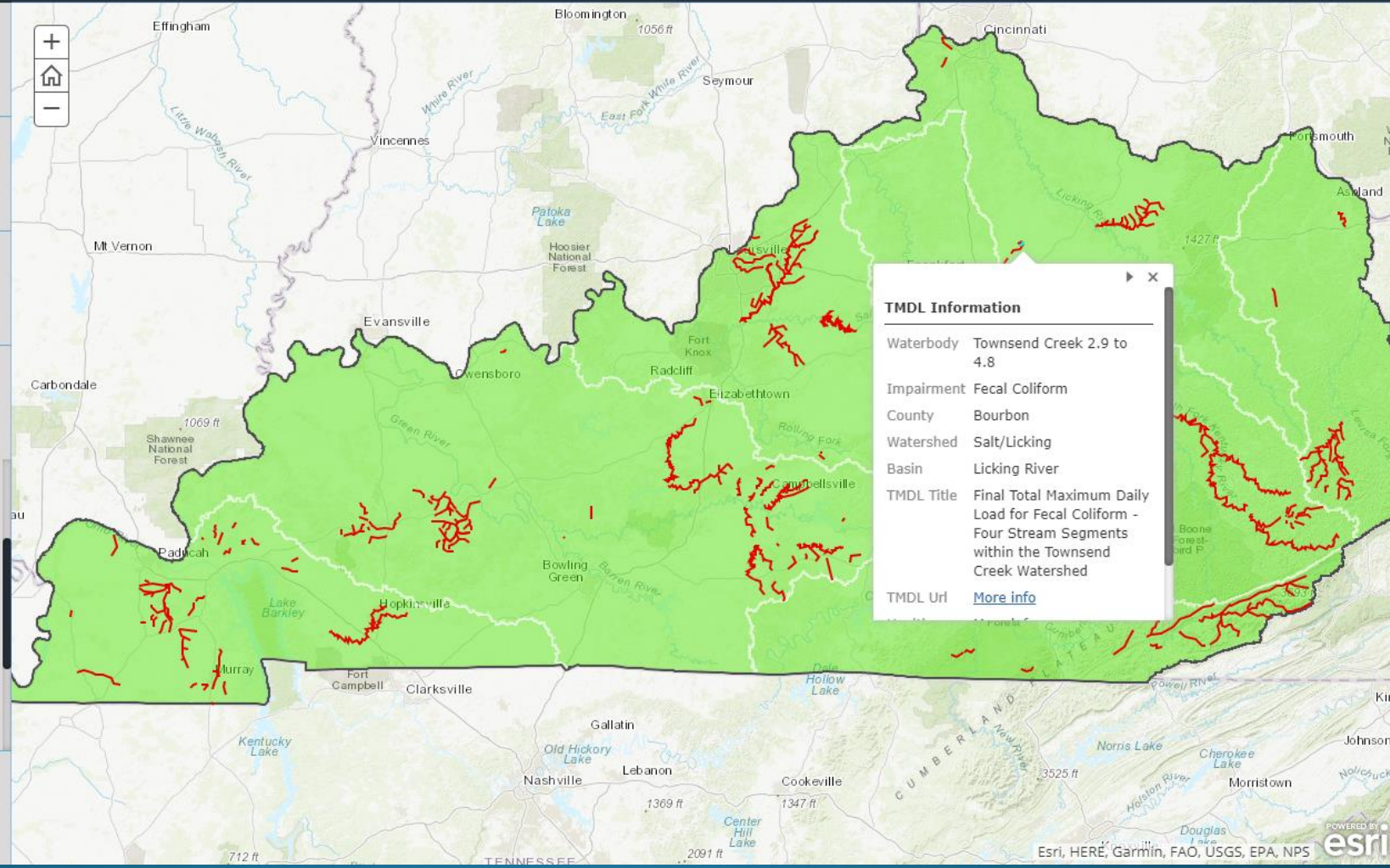
5 Future Bacteria TMDLs



- Understanding TMDLs
- Bacteria TMDLs
- Best Management Practices in Action

Bacteria TMDLs

- 1 How Clean is Your Water?
- 2 Human Sources of Bacteria
- 3 Animal Sources of Bacteria
- 4 Where Are There Bacteria TMDLs Now?



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- 5 Future Bacteria TMDLs

Bacteria TMDLs
















- ▶ **1** How Clean is Your Water?
- ▶ **2** Human Sources of Bacteria
- ▶ **3** Animal Sources of Bacteria
- ▶ **4** Where Are There Bacteria TMDLs Now?
- ▶ **5** Future Bacteria TMDLs

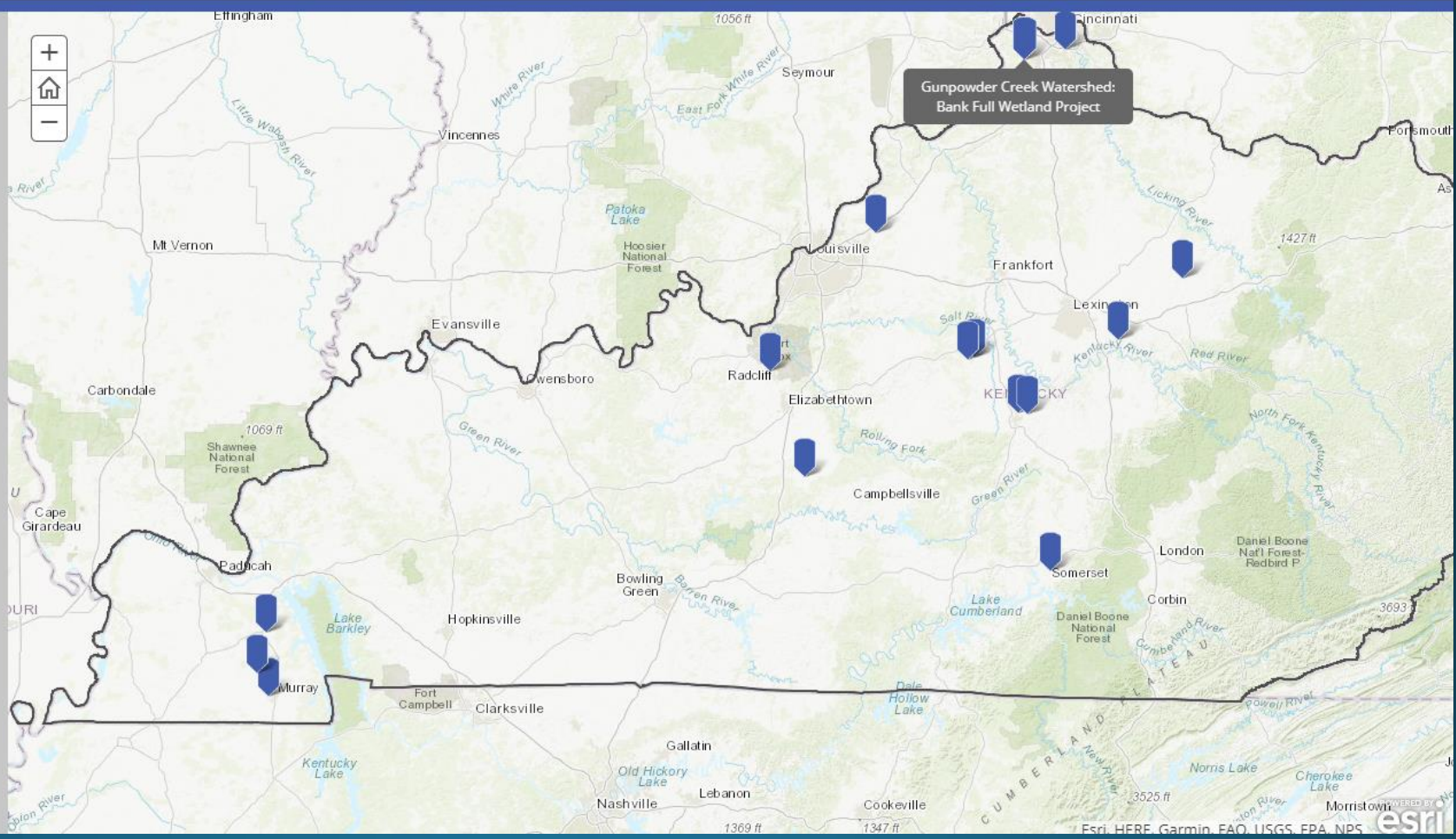
While past bacteria TMDL reports were written at the watershed scale, the Kentucky Division of Water has developed a statewide method to help streamline the process. While functionally similar to the original method, the statewide approach broadens the scope of the TMDL report. This will help communities by enabling them to more quickly create pollution plans to clean up problem areas and support healthy water. To learn more about the statewide method, visit the [Statewide TMDL Reports](#) section of the [TMDL website](#).



Kentucky Communities Respond To Water Quality Issues

To address bacteria levels in streams, communities across Kentucky are using best management practices (BMPs) designed to reduce the amount of bacteria entering their waterways. Many programs exist to assist landowners and communities fund and implement these practices. Explore the map below to see what projects are going on in your area and get ideas for how your community might address its own local water issues.

 <p>Dix River Watershed: Septic System Education and...</p>	 <p>Dix River Watershed: Agricultural BMPs</p>	 <p>Sulphur Creek Watershed: Pasture Renovation</p>	 <p>Sulphur Creek Watershed: Septic Reclamation Program</p>
 <p>City of Radcliff: Green Infrastructure and...</p>	 <p>Banklick Watershed: Riparian Zone Restoration</p>	 <p>Gunpowder Creek Watershed: Bank Full...</p>	 <p>Curry's Fork Watershed: Stream Restoration</p>
 <p>Lower Howards Creek Watershed: Agricultural...</p>	 <p>Bacon Creek Watershed: Agricultural and Septic BMPs</p>	 <p>Brushy Creek Watershed: Agricultural BMPs</p>	 <p>Hinkston Creek Watershed: Agricultural BMPs</p>
 <p>City of Benton: Green Infrastructure for Storm...</p>	 <p>Clarks River Watershed: Equine Waste Storage...</p>	 <p>Clarks River Watershed: Septic Replacement Program</p>	



Clean Water 101: Using TMDLs to Restore Kentucky's Water

Understanding TMDLs

Bacteria TMDLs

Best Management Practices in Action

Kentucky Communities Respond To Water Quality Issues

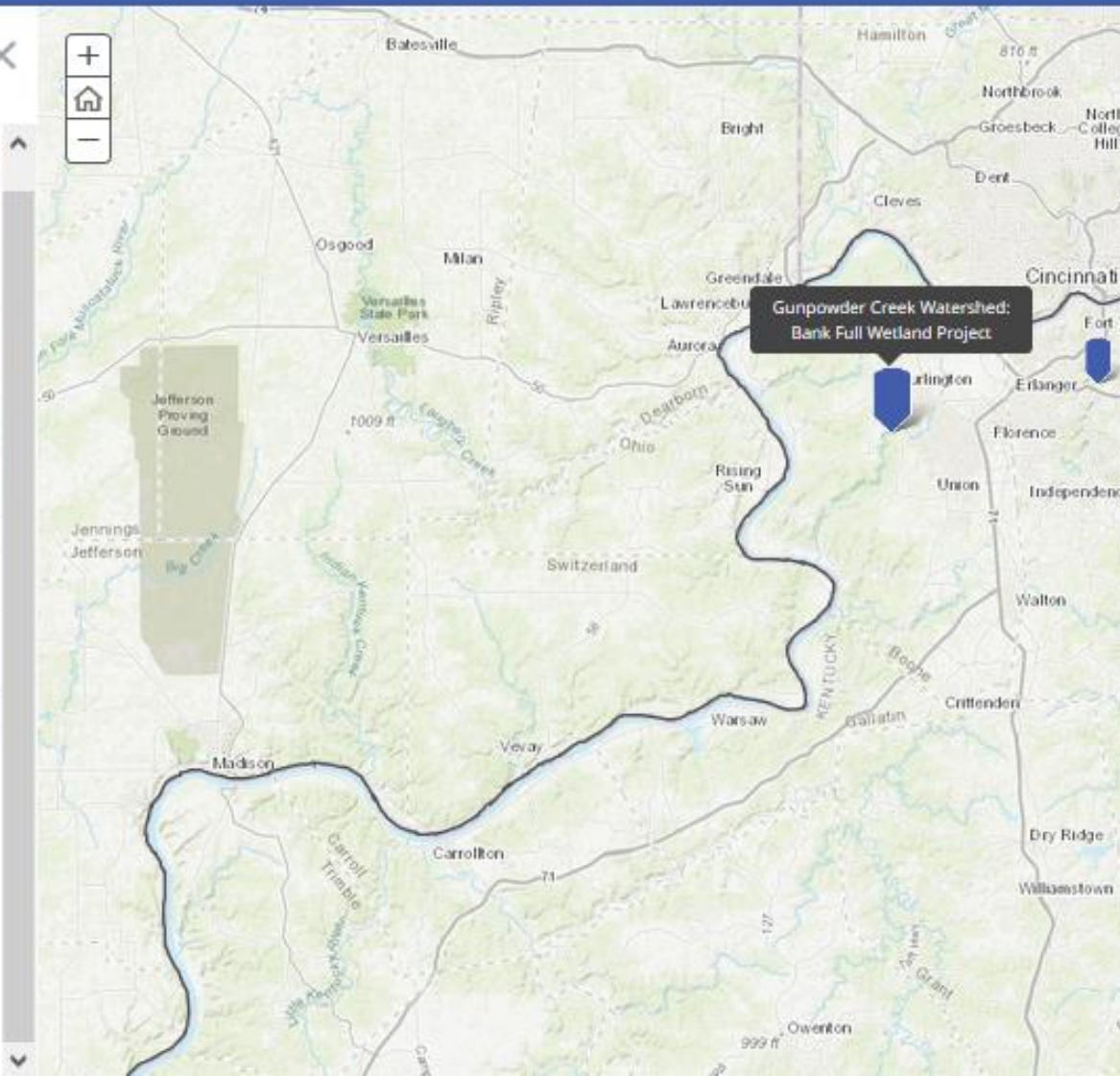
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Gunpowder Creek Watershed: Bank Full Wetland Project < > X



Wetlands are nature's sponges. When creeks flow through a wetland, the water slows down and has the chance to soak into the soil. This allows fine sediment to settle to the bottom of the creek and allows plants to filter out harmful chemicals.

In Boone County, Gunpowder Creek is listed as impaired for sediment, bacteria, and nutrients. To address these issues, the Gunpowder Creek Watershed Initiative was developed by the Boone County Conservation District (BCCD) using federal **319(h) grant funding**. Partnering with the YMCA, the BCCD is constructing a bank full wetland project on the YMCA's Camp Ernst property. The wetland is designed to capture excess sediment and nutrients and allow the natural decay of bacteria, which will result in cleaner water entering Gunpowder Creek.



Other Story Maps: Kentucky Division of Water

Go to
watermaps.ky.gov

And click on the Story Maps
Gallery

KY Division of Water Story Map Gallery

The Kentucky Division of Water Story Map Gallery. Current and future story maps will be featured from this gallery.

Search maps



Wild Rivers Story Map

Web Mapping Application by Melissa_Miracle_kygis. Last Modified 1/8/20.

The Kentucky Wild Rivers Story Map highlights the unique scenic, biological, geological, cultural and recreational values of its most pristine rivers. The Wild Rivers program was established by the Kentucky Wild Rivers Act of 1972 and is administered



Wetland Story Map

Web Mapping Application by Melissa_Miracle_kygis. Last Modified 1/7/20.

The Kentucky Wetland Story Map explores the great diversity of wetlands in Kentucky and discusses the good things they do for humans and animals, as well as some of the more interesting things you will find there.



The Licking River Watershed

Web Mapping Application by mahtaab.bagherzadeh_kygis. Last Modified 5/14/20.

The Licking River Basin is full of opportunities to improve and protect the water we fish in, swim in, and drink. The Basin's project areas are shown on this Story Map.



Source Water Protection in Kentucky

Web Mapping Application by Caroline_Chan_kygis. Last Modified 8/1/19.

Learn about how Kentucky's Source Water Protection programs are supporting public drinking water supplies in the Commonwealth.



Runoff Pollution

Web Mapping Application by dale.booth_kygis. Last Modified 2/6/20.

A brief introduction to Runoff Pollution and where it comes from.



KDOW Story Map Gallery

This gallery includes Kentucky Division of Water Story Map and Map Tour applications created with esri's arcgis.com templates. The Kentucky Department of Environmental Protection Information Section collaborated with the Division of Water to prepare the content for each application. Use these applications to explore the Waters of the Commonwealth!

[Other KDOW Viewers](#)