

# How Kentucky uses ESRI tools in the public notice process and in communicating the Integrated Report



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Maps and apps



A place to collaborate



Capture data & input



Tools for innovation

# ESRI ArcGIS Hub

- Environmental Systems Research Institute (ESRI) ArcGIS (Geographic Information System) Hub is “an easy-to-configure community engagement platform that organizes people, data, and tools through information-driven initiatives”.
- Used to organize and display interactive online maps, ArcGIS dashboards, and narrative story maps about the 305(b) and 303(d) programs
  - All maps and/or apps use representational state transfer (REST) services to ensure live data
- Cabinet has 3 ESRI administrators who have publishing rights, but many can create content
- For Kentucky, main benefits include
  - Easily aggregate and share open data
  - Create unlimited websites
  - “Off the shelf” ESRI products are easier and cheaper to maintain
- 3 examples: Water Health Portal, Public Notice Hub Site, and Integrated Report Hub Site

Home Gallery Map Scene Groups **Content** Organization



Katie McKone (EEC)  
Katie\_McKone\_kygis

Content

My Content

My Favorites

My Groups

My Organization

Living Atlas

+ New item

☰ Create app

🔍 Search Katie\_McKone\_kygis



Table



Date Modified

⌵ Filter

# Water Health Portal

- Effective July 1, 2014, Kentucky state legislation [KRS 224.70-150](#) passed
  - Cabinet to maintain on its web site a listing of waters defined as impaired by federal law
  - Total maximum daily loads
  - A detailed summary, in plain and unambiguous words, of the basis for the listing
  - Sources of information utilized, sources and methods of data collection and analysis, and the age of the data utilized
  - To enhance compliance with applicable water quality standards

**224.70-150 Cabinet to maintain on its Web site a listing of waters defined as impaired by federal law -- Requirement for notice and opportunity for hearing to interested persons before submission to the Environmental Protection Agency of an impaired water designation for any new waters -- Cabinet's duty to provide notice and opportunity for public review and input in addition to federal notice requirements -- Cabinet's duty to remove from impaired listing waters which now meet water quality standards.**

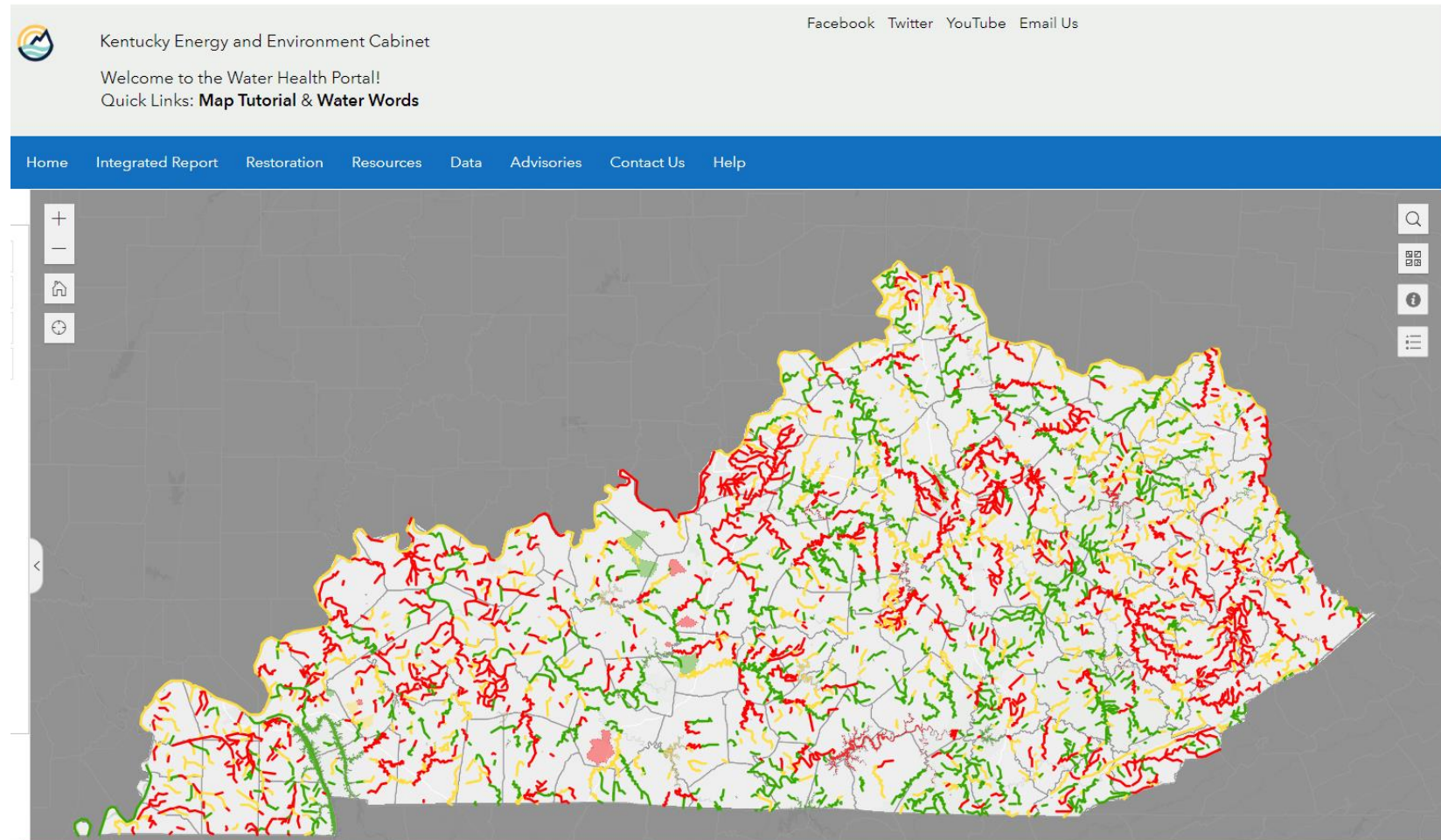
- (1) (a) Beginning on July 1, 2014, the cabinet shall maintain on its Web site a listing of:
  1. All waters or portion thereof in the Commonwealth identified pursuant to 33 U.S.C. sec. 1313(d);
  2. Total maximum daily loads established after June 25, 2013; and
  3. All waters or portion thereof in the Commonwealth for which notice is provided pursuant to subsection (2) of this section.
- (b) The listing required by this subsection shall include:
  1. A detailed summary, in plain and unambiguous words that are easily understood by laymen, of the basis for the listing. The summary shall identify the location of all available data, in reasonably accessible form, utilized in the cabinet's identification of the waters or portion thereof and establishment of the total maximum daily load; and
  2. Sources of information utilized, sources and methods of data collection and analysis, and the age of the data utilized.
- (c) The cabinet shall maintain on its Web site a listing of local, state, and federal resources, along with contact information, available to communities in efforts to enhance compliance with applicable water quality standards.

# Water Health Portal

- Main resource to which we direct the general public
- Historically, we worked with a contractor to maintain and update the Water Health Portal

In 2022, we switched the [Water Health Portal](#) to a Hub Site

- Cheaper and easier to maintain and update
- REST services instead of static data
- Searchable by AU ID, waterbody name, and county
- Displays assessment results, waters with TMDLs, and waters designated as outstanding state resource waters



Search

Integrated Report



### Nonpoint Source Watershed Implementation Summary

- AU Name: Lake Cumberland
- AU ID: KY-584
- HUC 12: 051301040701
- County: Pulaski, Russell, Wayne

319 PROGRAM + MATCH INVESTMENT



\$280,950

NITROGEN REDUCTION ('07-'20)



16 pounds per year

PHOSPHORUS REDUCTION ('07-'20)



3 pounds per year

SEDIMENT REDUCTION ('07-'20)



NA tons per year

A \$280,950 319 grant was awarded in 2006 to perform wastewater improvements, and develop a Big South Fork watershed plan with the McCreary County Water District and Tennessee partners.

Zoom to

Lake Cumberland - Pulaski,Russell,Wayne

County(s)

Waterbody Name: Lake Cumberland  
 Assessment Unit ID: KY-584  
 County: Pulaski,Russell,Wayne  
 Basin: Upper Cumberland River

[Assessment Summary](#)  
[Basin Coordinator Page](#)  
[Implementation Summary](#)

# Water Health Portal

The other tabs of the Hub Site meet the other requirements of [KRS 224.70-150](#)

The image displays four overlapping screenshots of the Water Health Portal website's navigation menu. Each screenshot shows a different tab highlighted in green within the blue header:

- Restoration:** The first screenshot shows the 'Restoration' tab highlighted. Below the header, a large image of a river with the text 'How's Informing the' is visible.
- Resources:** The second screenshot shows the 'Resources' tab highlighted. Below the header, a large image of a river with autumn foliage is visible.
- Advisories:** The third screenshot shows the 'Advisories' tab highlighted. Below the header, a large image of a person fishing in a river is visible.
- Resources (second instance):** The fourth screenshot shows the 'Resources' tab highlighted. Below the header, a large image of a river with autumn foliage is visible.

## Fish Consumption Advisory

The Kentucky Departments for Environmental Protection, Public Health and Fish and Wildlife Resources jointly issue fish consumption advisories to the public when fish are found with trace contaminants of mercury, polychlorinated biphenyls (PCBs) and chlordane. Visit Kentucky Division of Water's [Fish Consumption Advisories page](#) to learn more about fish consumption advisories in Kentucky.

Photo Credit - KY Fish & Wildlife

## Harmful Algal Bloom Advisories

For Harmful Algal Bloom (HAB) detection, the Kentucky Division of Water utilizes remote sensing, reports from the public or other agencies, and a new volunteer monitoring network initiated in 2017 to identify lakes with potential HABs. Current HAB advisories can be located using the [Harmful Algal Bloom Viewer](#). If you suspect that you have seen a HAB, please report the bloom to the Kentucky DOW by calling 502- 564-3410 or emailing [water@ky.gov](mailto:water@ky.gov). After hours and on weekends, you may contact the 24-hour hotline at 502-564-2380 or 1-800-928-2380. Blooms can also be reported using the [Bloom Watch app](#).

# Public Notice Hub Site

- In the past (prior to 2014 cycle), we shared the 305(b) list, the 303(d) list, and GIS Shapefiles when we public noticed the 303(d) list
- In 2014 and 2016, we used the Water Health Portal to public notice – but this was confusing because it was supposed to display “final data”, which we define as EPA approved

Starting with the 2018/2020 cycle, we began using a [dedicated Hub Site](#) to public notice

- Same URL each cycle
- Update REST service to the appropriate cycle
- Searchable by AU ID, waterbody name, and county
- Spreadsheet with “official” information
- Video tutorials

The screenshot displays the 'KY 2022 Public Notice - New Listings' page. At the top, there is a navigation bar with links for 'Welcome', 'How to Comment', '303(d)', 'New Listings', 'Delistings', 'TMDLs', '305(b)', and 'Learn More'. Below the navigation bar, a search bar is visible with a dropdown menu showing '2022 New Listings Streams', '2022 New Listings Lakes/Reservoirs', '2022 New Listings Springs', and 'Counties'. The main content area features a map of Kentucky with various water bodies highlighted in red and yellow. The map is surrounded by a dark blue border with navigation controls. At the bottom of the page, there is a footer with the text 'City of Bardstown, Nelson County, Esri, HERE, Garmin, FAO, NOAA, USGS, EPA, NPS' and 'Powered by Esri'.

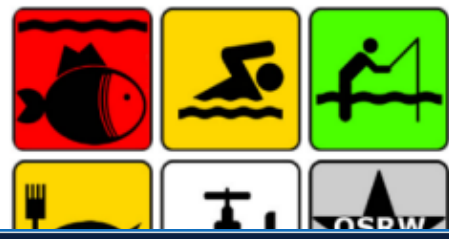
Search

Search

### Assessment Unit Summary

- **Unit Name:** Kentucky River 52.7 to 66.3
- **AU ID:** KY-2311
- **Description:** Elkhorn Creek to just below Lock and Dam Number 4
- **County:** Franklin

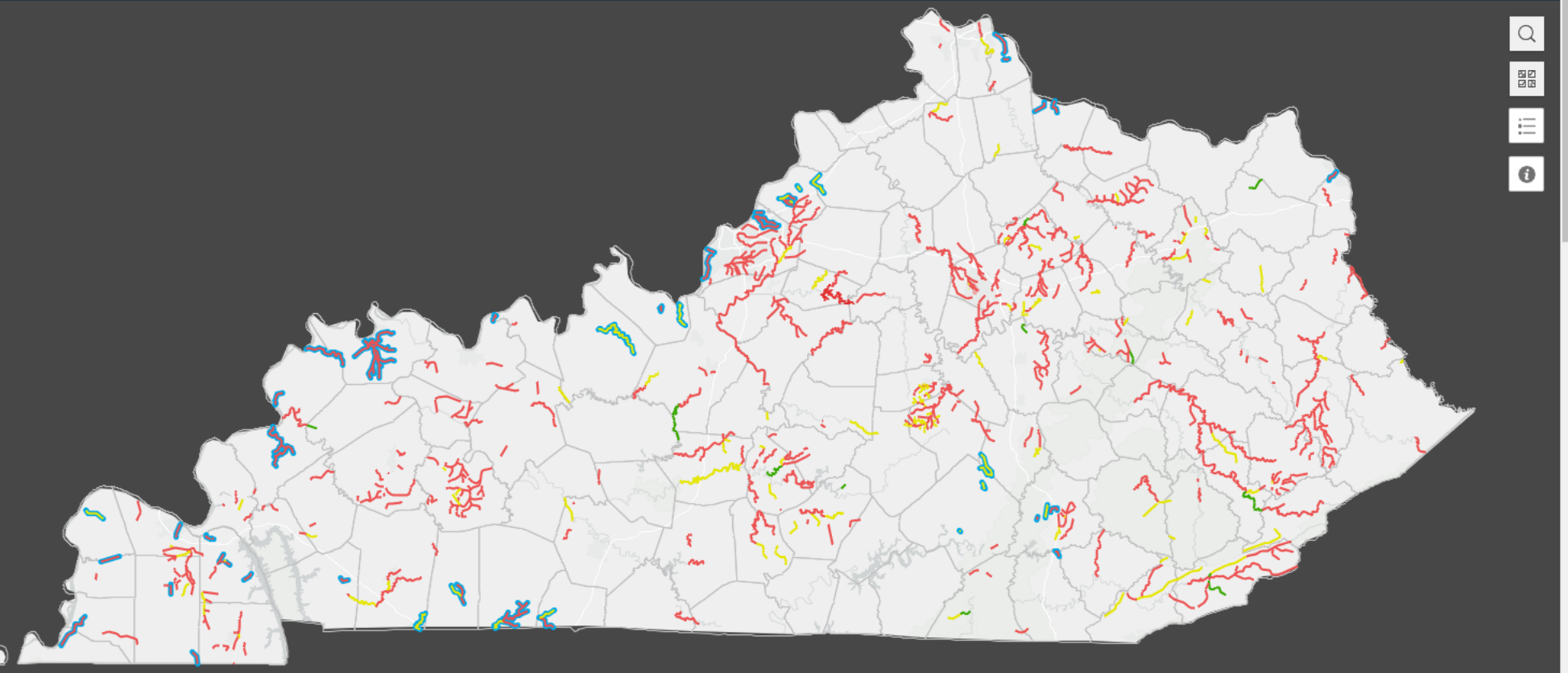
2022 Reporting Cycle



Search

Search

- 2022 TMDL Streams >
- 2022 TMDL Lakes/Reservoirs >
- 2022 TMDL Springs >
- Counties >





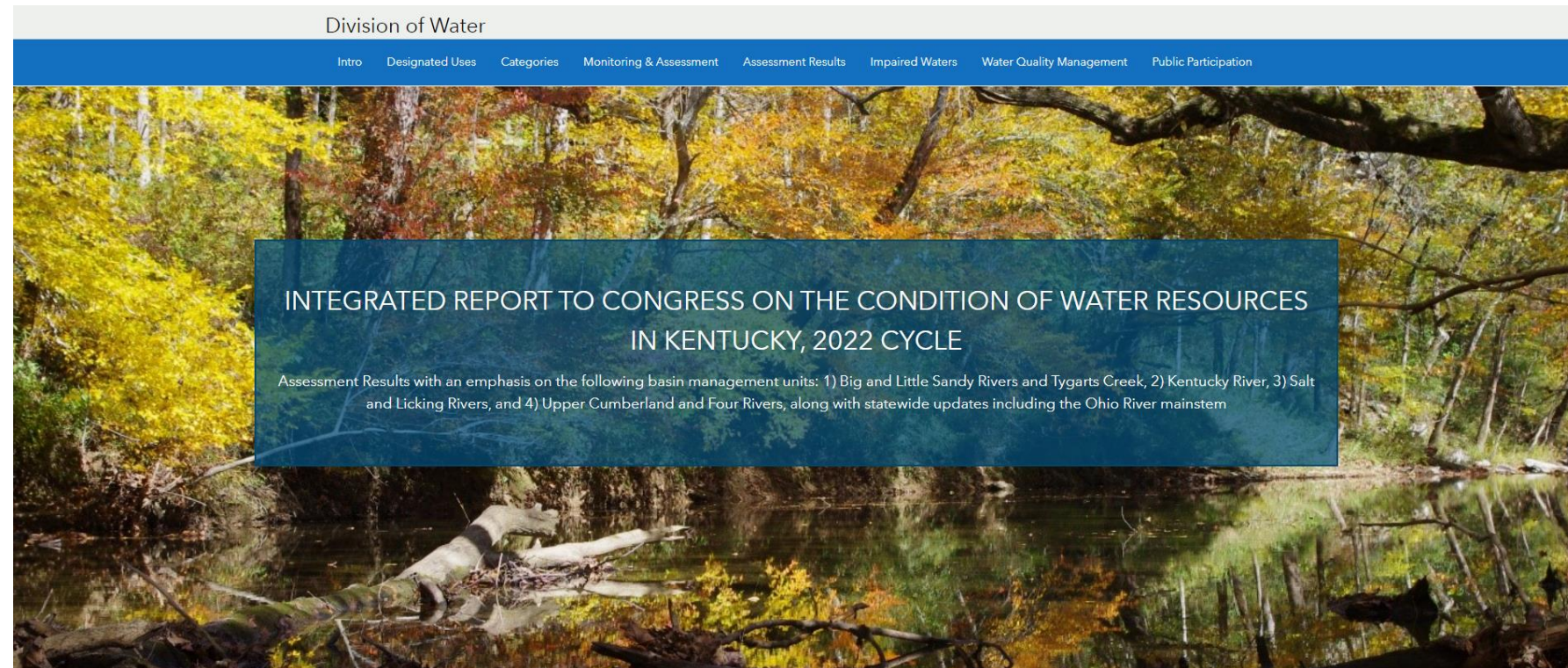
# Integrated Report Hub Site

- In conjunction with Integrated Report document, Division of Water maintains an [Integrated Report Hub Site](#)
- Compilation of story maps, dashboards, and interactive maps to share information about the 305(b)/303(d) programs and assessment results
  - Each piece of content has its own URL, making it easy to share
- IR Hub Site linked from the Water Health Portal and DOW IR Website – “advanced user”

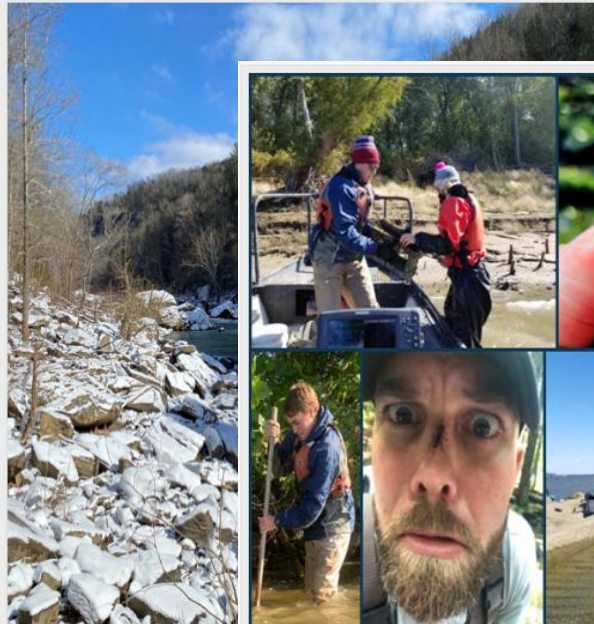
Story Maps about Designated Uses and Reporting Categories

Monitoring programs, data types, and assessment methods

Dashboards that display results in ways that users have asked for (without having to filter or query the data)



# Program Dashboard



## Ambient Rivers Program

Following enactment of the Clean Water Act (e.g. KRS 224.10), the Division of Water Quality initiated long-term monitoring in 1979. The program collects samples (approximately 100 per year), with the goals of detecting changes in larger streams throughout the state. In 1998, the network was expanded to include smaller streams. The sampling strategy is based on a management unit approach, with samples collected during each management unit study year. These stations are monitored on a regular basis.

[Ambient Rivers Program](#)



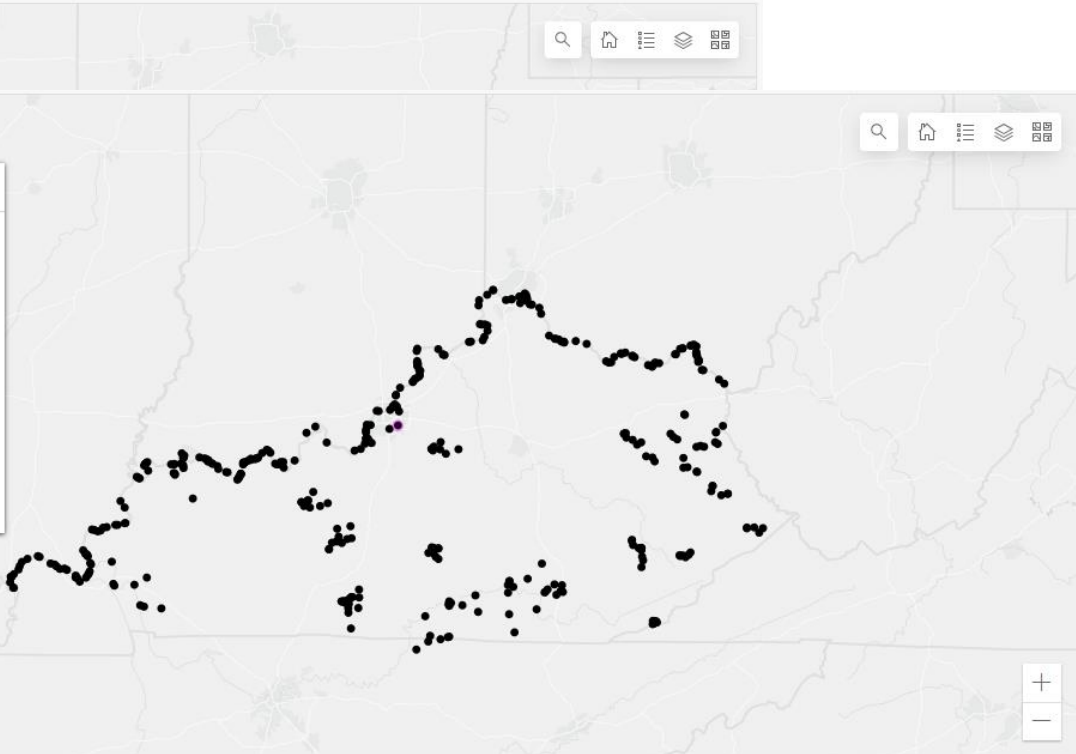
## Outside Agencies

The Kentucky DOW uses data collected by outside agencies, such as Louisville Metropolitan Sewer District (MSD), United States Army Corps of Engineers (USACE), and the Ohio River Valley Water Sanitation Commission (ORSANCO). External data is acquired through a data solicitation process, or through routine communication and collaboration with data partners. If your agency collects water quality data or aquatic community information, or is interested in collecting data for 305(b) reporting purposes, please contact the Water Quality Branch at the Kentucky Division of Water by emailing the [Assessment Coordinator](#).

Zoom to Pan 1 of 2

### Outside Agencies

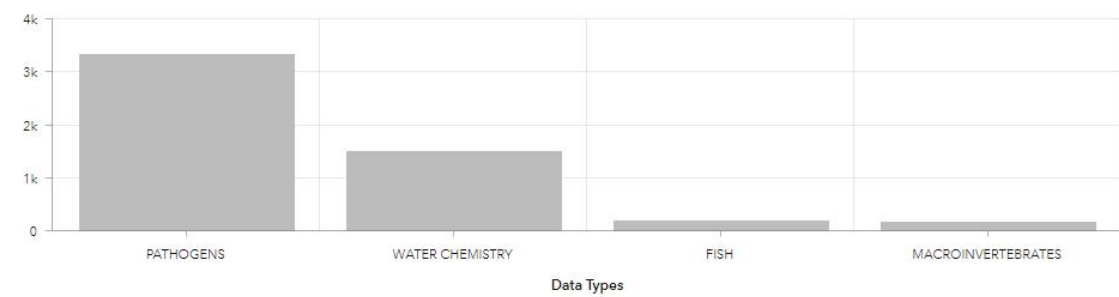
STATION ID	MSD-EPCFC001
PATHOGENS	162
CHLOROPHYLL-A	
WATER CHEMISTRY	
TISSUE LAB ANALYSIS	
FISH	
MACROINVERTEBRATES	



Esri, HERE, Garmin, FAO, NOAA, USGS, EPA, NPS

Powered by Esri

Number of Samples Collected by Outside Agencies for Monitoring Locations Visible on the Map



Last update: 2 minutes ago

## Number of Locations Monitored

# 407

# 305(b) Dashboard

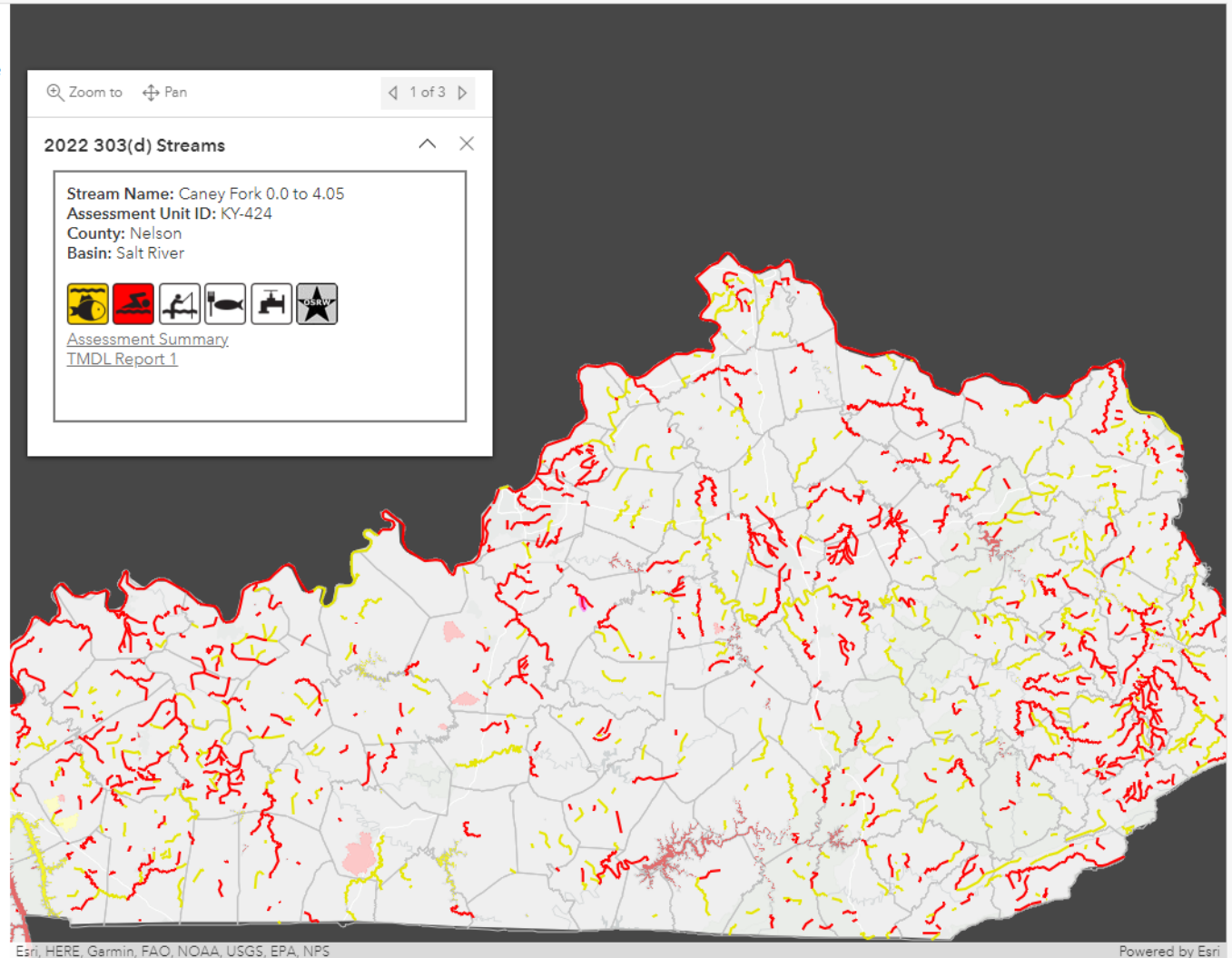
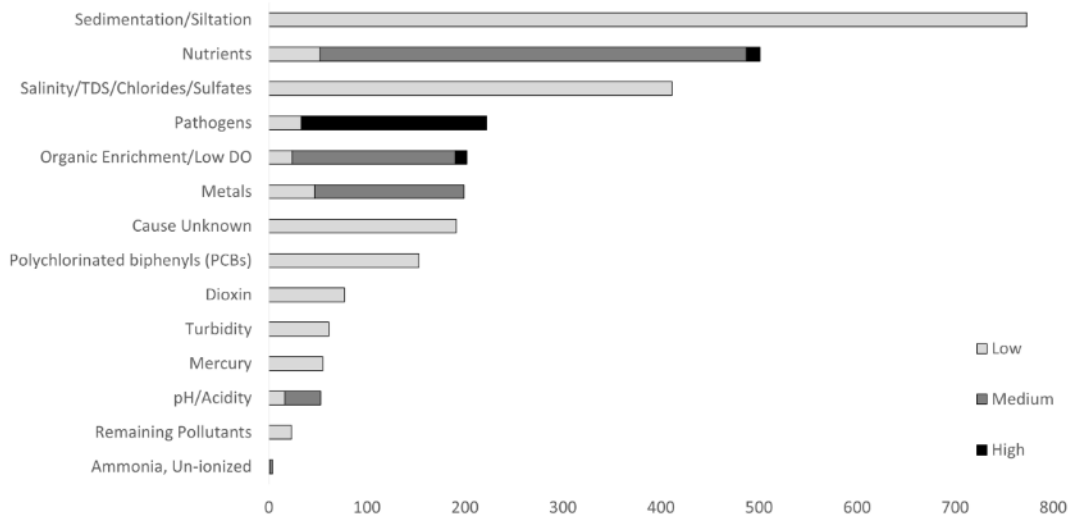
## The 305(b) Dashboard

### The 303(d) List

On the 2022 303(d), there are 2,925 pollutant-waterbody combinations that require a TMDL. Broken down by waterbody type, 1,468 rivers/streams are on the 303(d) list totaling 7,176.4 river miles, 64 lakes/reservoirs are on the 303(d) list totaling 185,717 acres, and nine springs are on the 303(d) list totaling 82,990 springshed acres.

The figure below shows the number of impairments per parameter group that are in need of a TMDL, with the priority per parameter group distinguished by low (light gray), medium (dark gray), and high (black).

The 303(d) tab of the 305(b) spreadsheet has the official information about all pollutant-waterbody combinations that are on the 303(d) list.

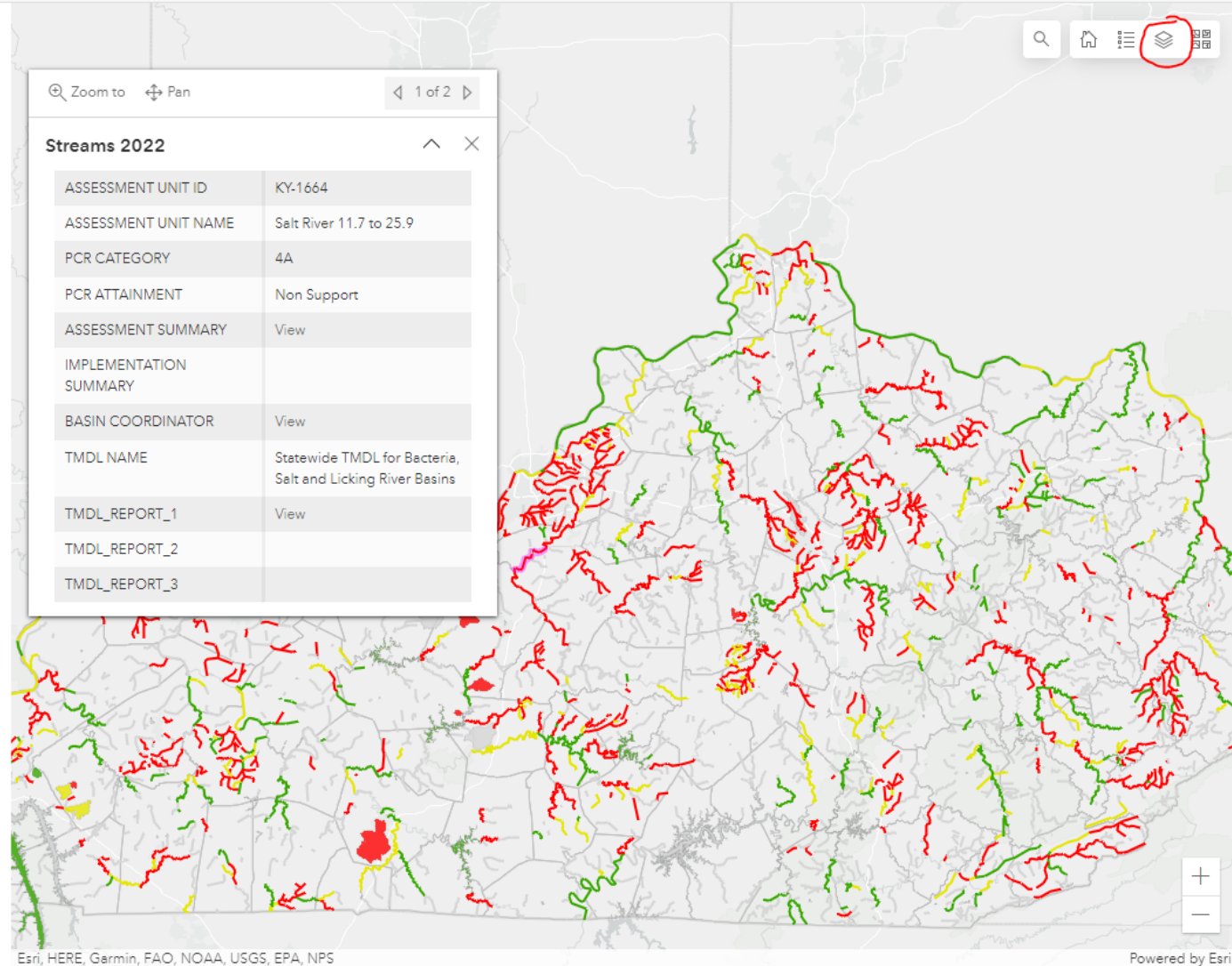


# Fishing & Recreating Dashboard

## Primary Contact Recreation

Primary Contact Recreation (PCR) includes any activity where full body immersion in the water is likely (such as swimming and water skiing), and the risk of ingesting water is increased.

On the 2022 305(b) list, 1,204 assessment units have been assessed for the PCR designated use. Of those assessed, 276 were found to fully support the designated use, while 929 were found to be impaired. River and stream assessment units represent 1,186 of the assessment units, of which 268 are meeting and 918 are impaired for the PCR use. Spring assessment units represent 12 of the assessment units, of which one is meeting and 11 are impaired for the PCR use. Lake and reservoir assessment units represent seven of the assessment units, all of which are meeting the PCR use.



# Impaired Waters Dashboard

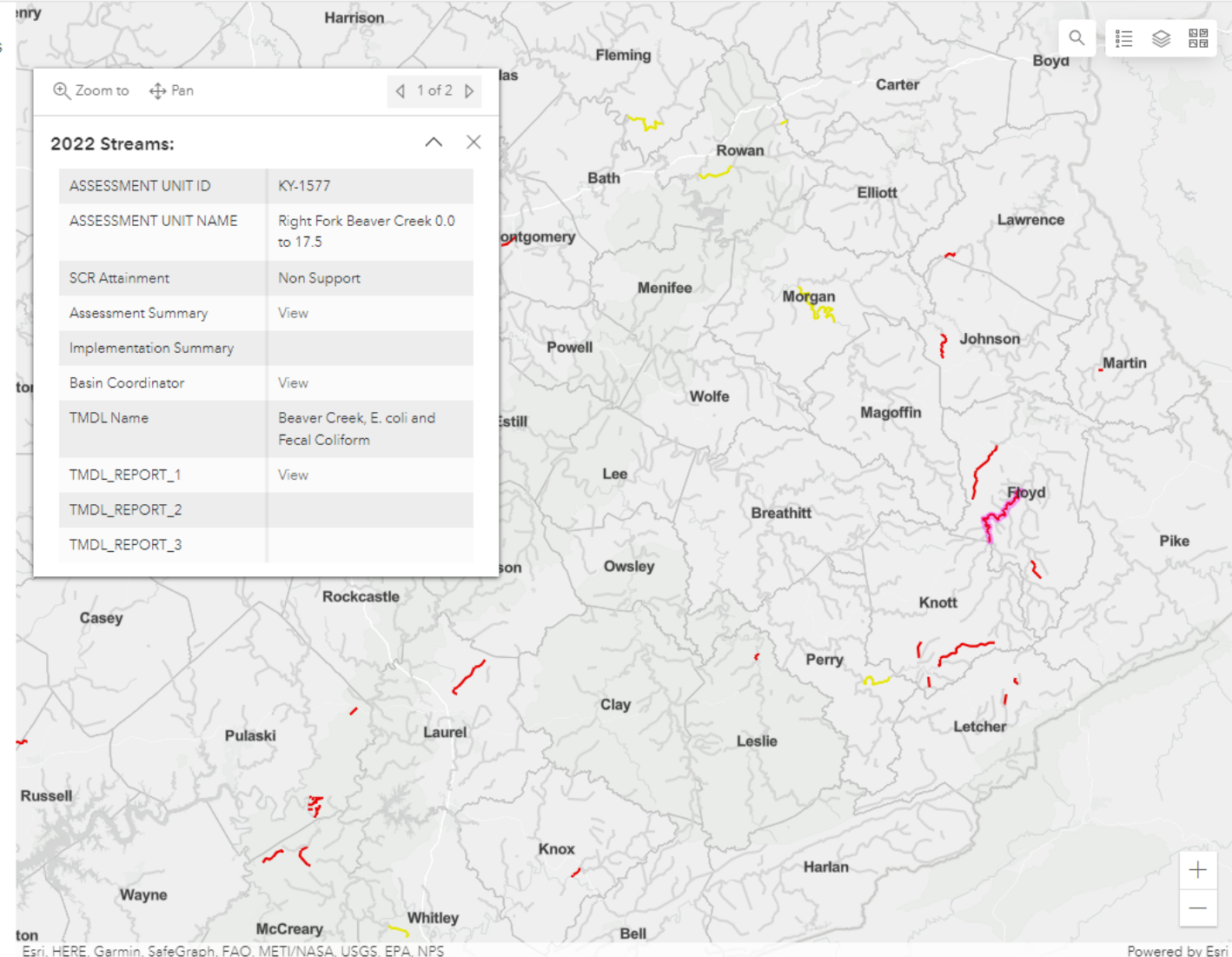
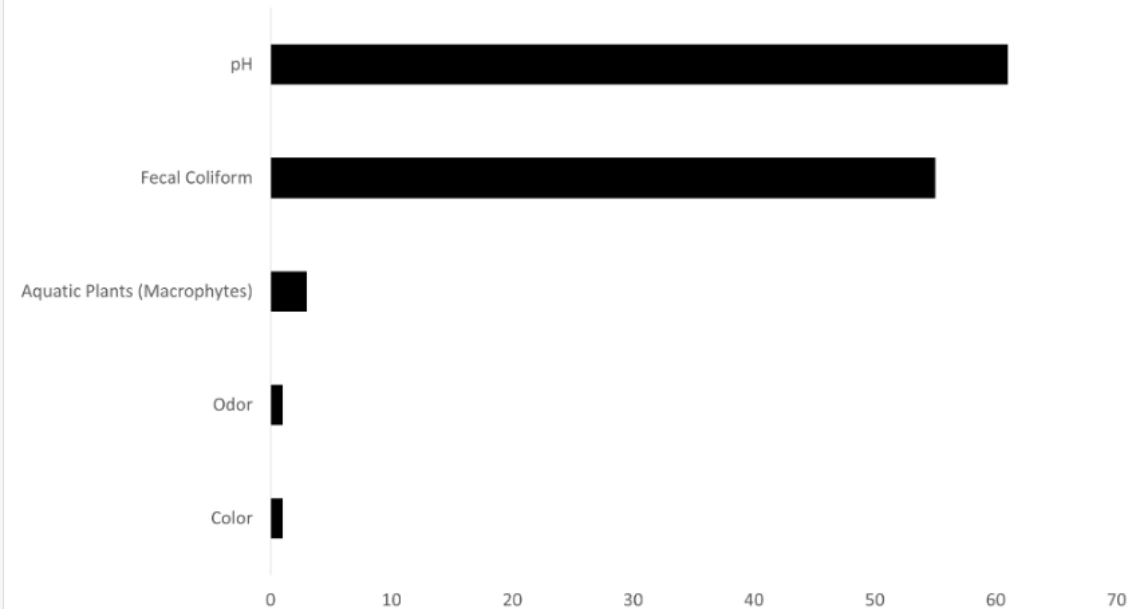
## Secondary Contact Recreation (SCR) - "Boating and Wading"

Secondary Contact Recreation (SCR) includes any activity where full body immersion in the water is unlikely (such as boating and wading), and the risk of ingesting water is reduced. Criteria exist for the protection of human health against pathogenic gastrointestinal illnesses and maintain a safe range for pH year-round.

On the 2022 305(b) list, 357 assessment units have been assessed for the SCR designated use. Of those assessed, 114 are impaired. River and stream assessment units represent 287 of the assessment units, of which 114 are impaired for the SCR use. Lake and reservoir assessment units represent 69 of the assessment units, none of which are impaired for the SCR designated use. The causes of impairments for the SCR use are as follows:

1. pH
2. Fecal coliform
3. Aquatic plants (macrophytes)
4. Pollution
5. Odor
6. Color

For all attainment and parameter information, refer to the [305\(b\) workbook](#).



# Cause of Impairment Dashboard

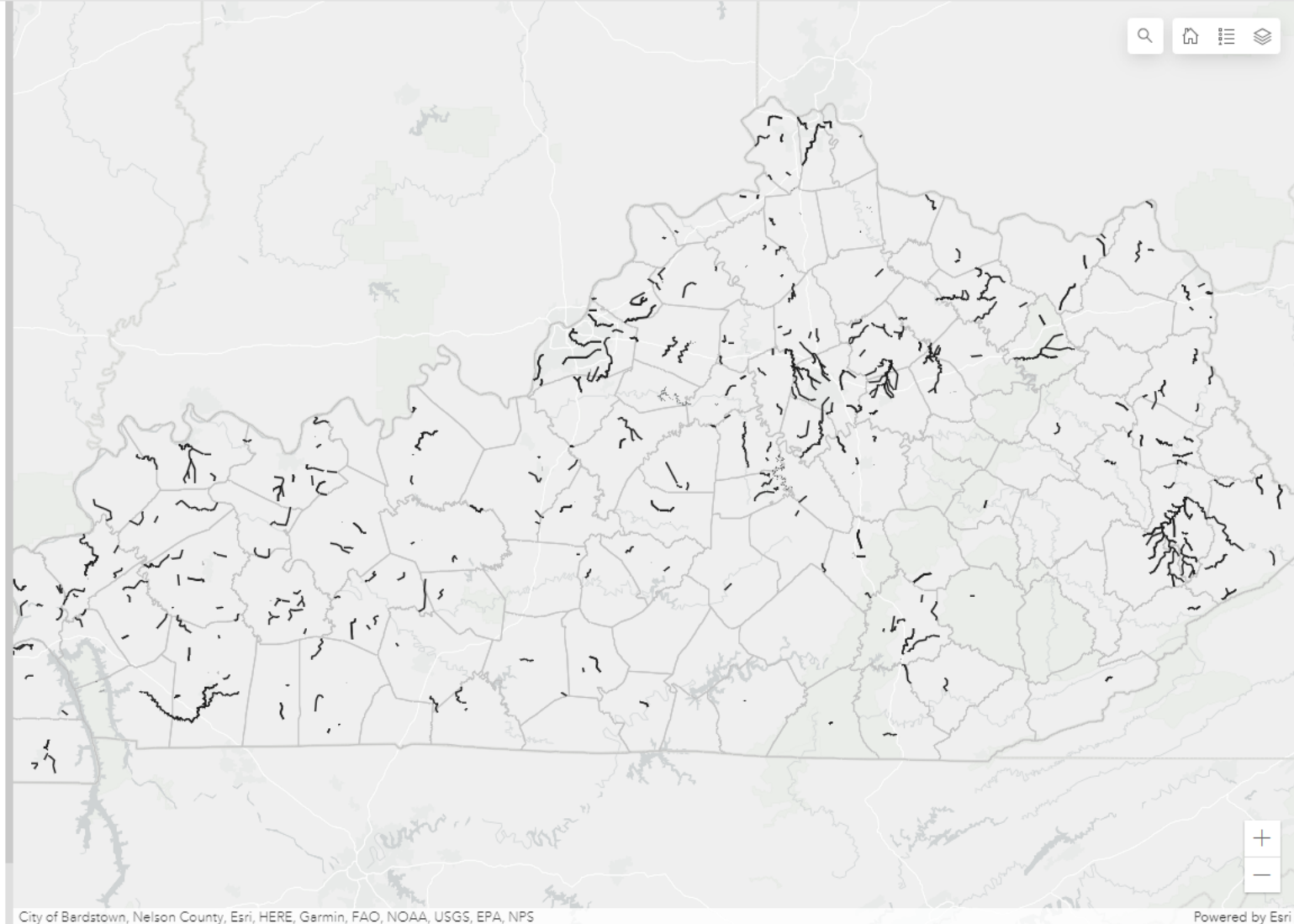
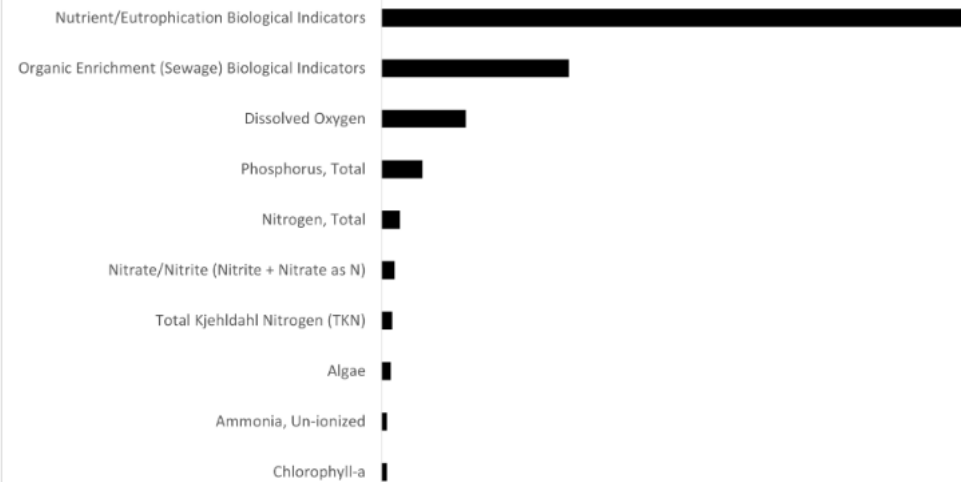
## Nutrients/Organic Enrichment/Dissolved Oxygen

Parameters from the group Nutrients/Organic Enrichment (OE)/Dissolved Oxygen represent 727 impairments on the 2022 305(b). The parameters from this group include:

- Nutrient/Eutrophication Biological Indicators
- Organic Enrichment (Sewage) Biological Indicators
- Dissolved Oxygen
- Phosphorus, Total
- Nitrogen, Total
- Nitrate/Nitrite (Nitrite + Nitrate as N)
- Total Kjeldahl Nitrogen (TKN)
- Algae\*
- Ammonia, Un-ionized
- Chlorophyll-a\*
- Nitrate

Learn more by visiting EPA's water quality fact sheet on [nutrients](#) or [dissolved oxygen](#).

Parameters from this group are either pollutants or pollutions (marked with a \* above). Those that are pollutants are in category 5 when identified as a cause of impairment, or 4a if the parameter has an EPA-approved TMDL. Those that are pollutions are in category 4c when identified as a cause of impairment. For all attainment and parameter information, refer to the [305\(b\) workbook](#).



Biological Integrity/Habitat/Flow

Dioxins/PCBS

Metals and Mercury

**Nutrients/OE/Dissolved Oxygen**

Pathogens

pH/Acidity

Salinity/TDS/Chlorides/Sulfates

Sedimentation/Turbidity



Thank You!  
Questions?

