

GAPS Information Session

Generating Awareness for Project Success (GAPS) is supported through the Foundation for Pennsylvania Watersheds (FPW) with funding from the Colcom Foundation.



Foundation for Pennsylvania Watersheds

Colcom Foundation



Agenda

1. Brief background on 3RQ and free tools available for your use
 - WATERS database
 - 3RQ Mapping Tool
2. GAPS program information
3. Q & A session

The background of the slide is a solid teal color with a subtle, wavy texture that resembles water or a stylized landscape. The waves are horizontal and flow from left to right, creating a sense of movement. The color is a deep, muted teal, and the overall effect is calm and professional.

Three Rivers QUEST

Melissa O'Neal, Lisa Barreiro, Melissa Shafer, Rachel Spirnak

What is 3RQ?

- Collaborative network of universities and grassroots groups collecting water quality data in the Upper Ohio River Basin led by the West Virginia Water Research Institute (WVWRI).
- Routine monitoring since 2009 focusing on total dissolved solids.
- Supports and collaborates with other groups collecting data in tributaries and headwaters.
- Expanded to include other chemicals and biologicals.

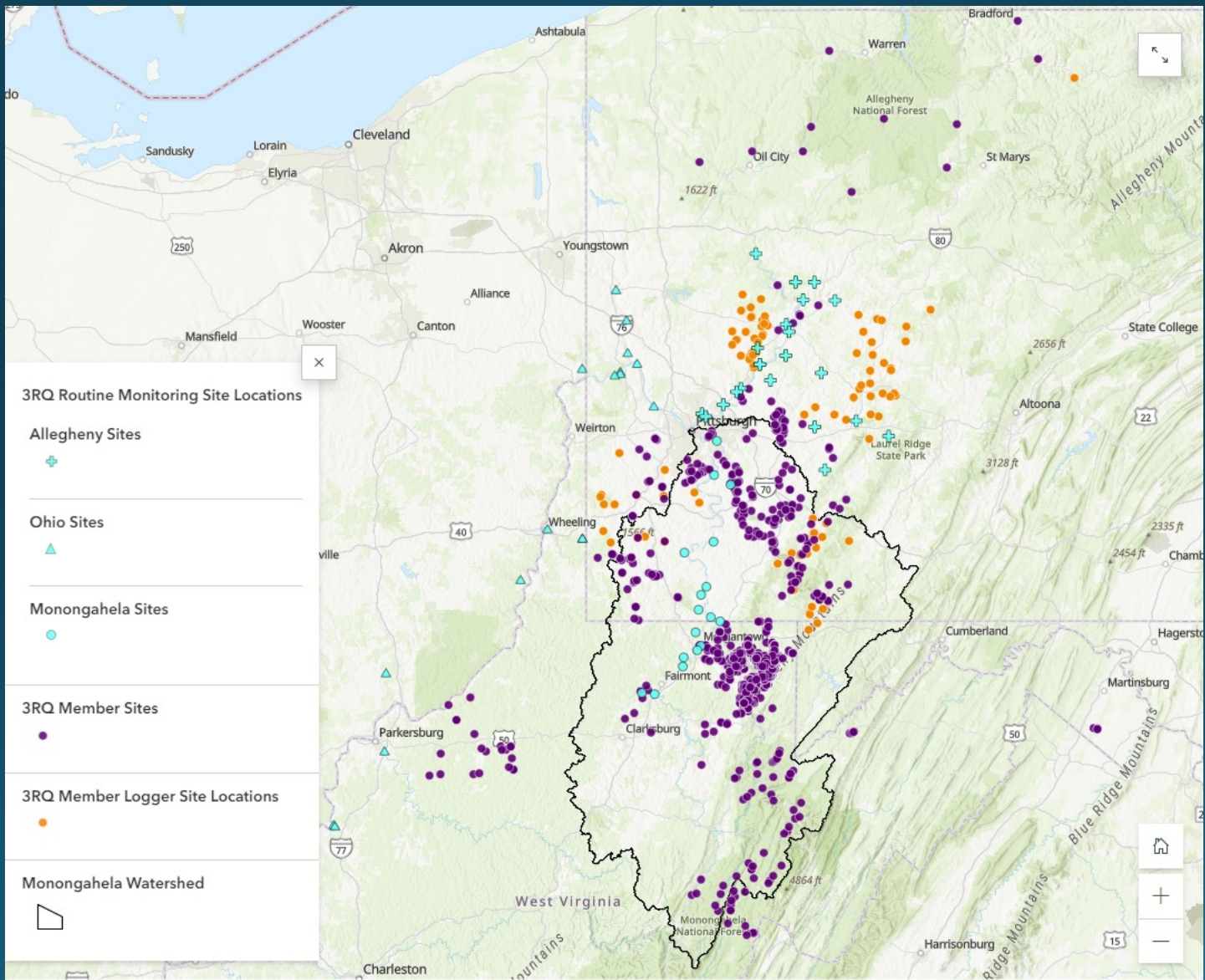


What does 3RQ do?

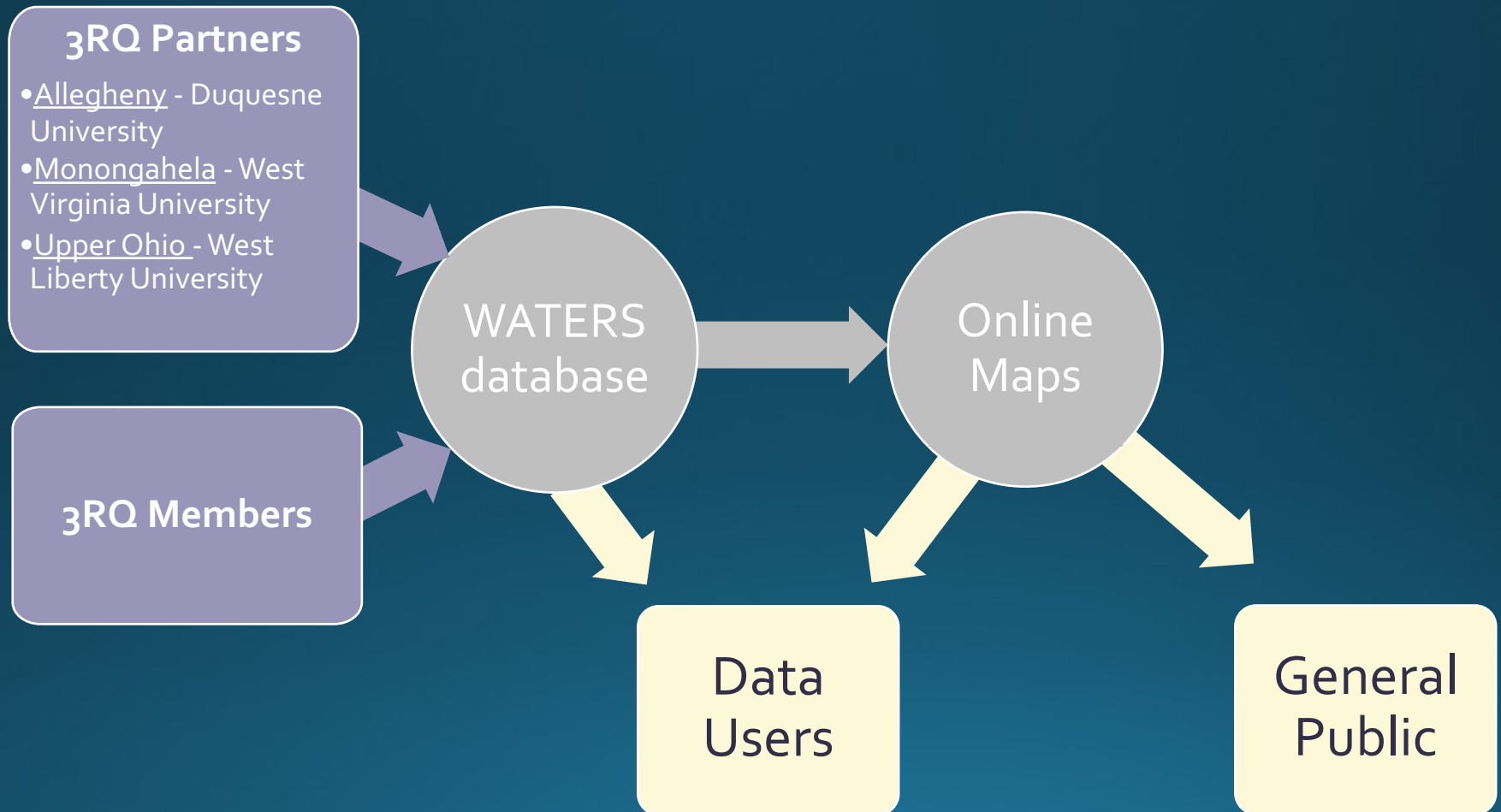
- Routine Monitoring
- Targeted studies
- Provide data to government agencies
- Discussion groups (SWPAWQN, ORBA, ORSANCO)
- Data warehousing & mapping
- Roundtable hosting
- Student support



Where do we monitor?



3RQ Data Generation & Usage



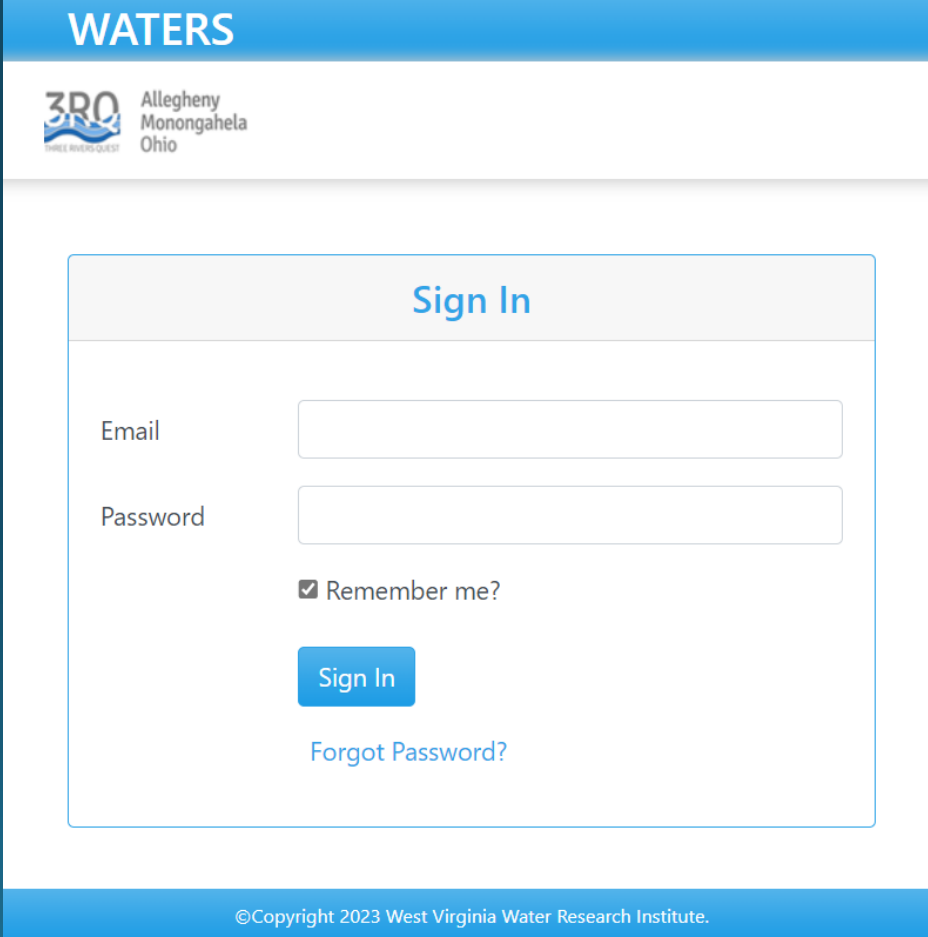


WATERS Database

Watershed Assessment Tool for Education and Research Studies

What is WATERS?

- WATERS is a cloud-based database for water quality parameters.
- Any organization can use WATERS for **free**.



The screenshot shows the WATERS Sign In interface. At the top, there is a blue header with the word "WATERS" in white. Below the header, on the left, is the "3RQ" logo with the text "THREE RIVERS QUALITY" underneath it. To the right of the logo, the text "Allegheny Monongahela Ohio" is displayed. The main content area is a white box with a light blue border. Inside this box, at the top, is a light blue header with the text "Sign In". Below this header, there are two input fields: "Email" and "Password". Below the "Password" field, there is a checkbox labeled "Remember me?". Below the checkbox, there is a blue button with the text "Sign In". Below the button, there is a link that says "Forgot Password?". At the bottom of the page, there is a blue footer with the text "©Copyright 2023 West Virginia Water Research Institute."

WATERS

3RQ
THREE RIVERS QUALITY

Allegheny
Monongahela
Ohio

Sign In

Email

Password

☒ Remember me?

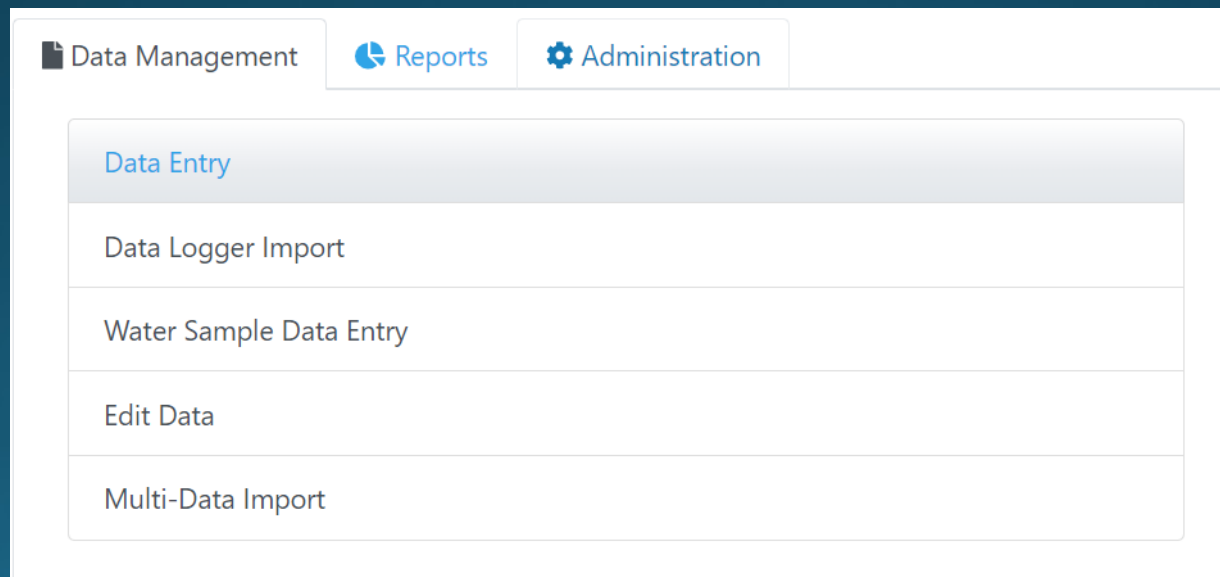
Sign In

[Forgot Password?](#)

©Copyright 2023 West Virginia Water Research Institute.

WATERS Highlights

- Can be viewed on Android, iPhone, and iPad; allowing data upload in the field.
- Warehouses (easy Import/Export)
 - Visualizations (Graphs/Reports)
 - Filters data
- Routinely upgraded; specific modifications can be requested by users (funding-dependent).



Current Parameters

- Accepts lab and field values, including sonde data.
 - General WQ indicators
 - Metals
 - Halogens
 - Nutrients
 - Algae, diatoms, & bacteria

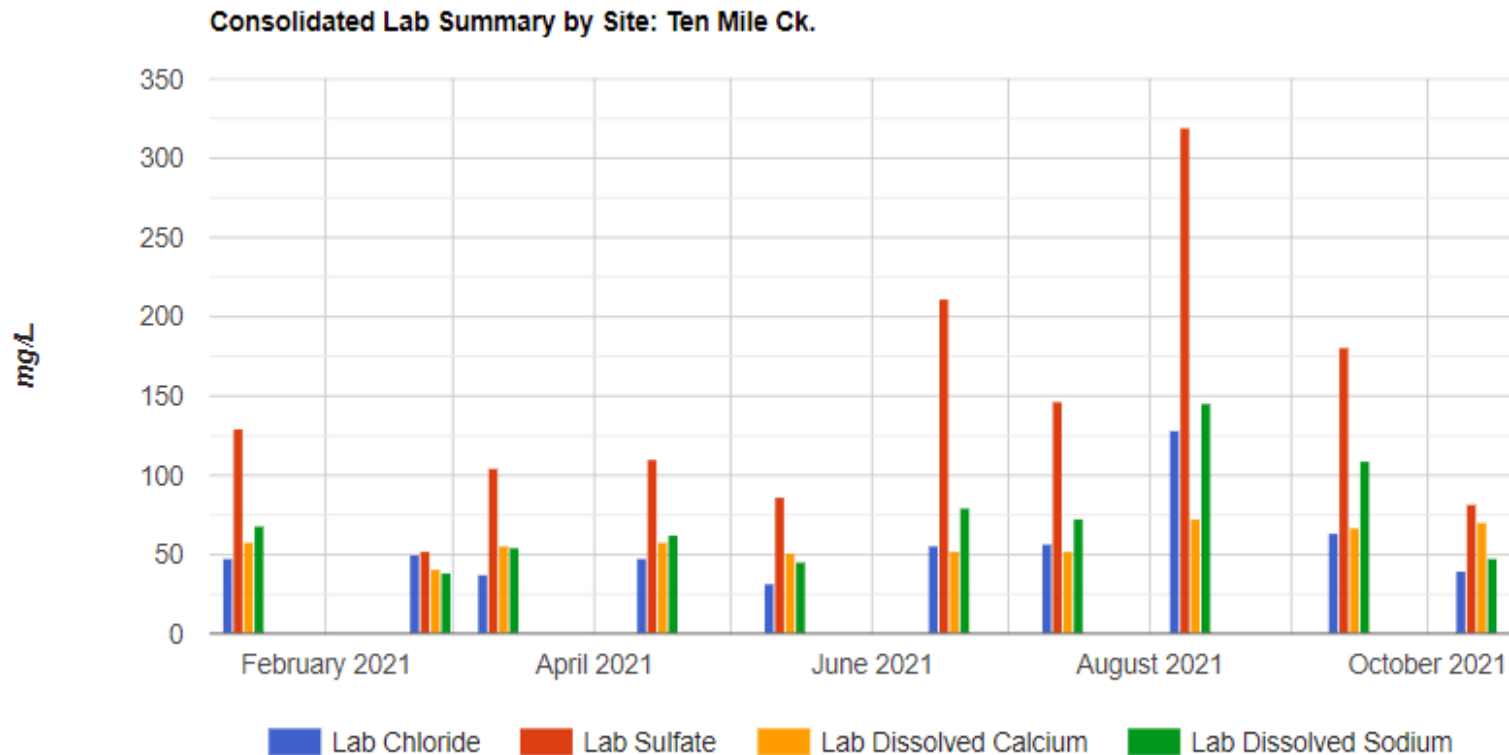


Data Organization

- Query data falling within specified values (e.g., pH between 2 and 6) and date ranges of your choosing.
- Data outputs can be viewed online or exported to Excel.
- Generates statistical summary of requested data.

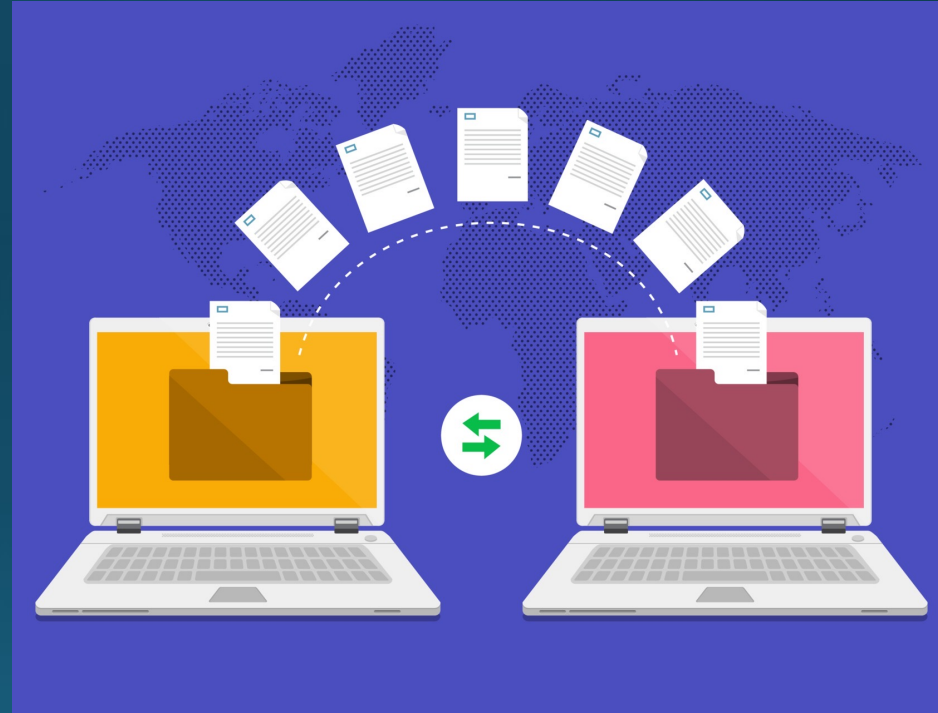
	Minimum	Average	Maximum
Lab Chloride	31.6	55.95	128
Lab Sulfate	52	142.24	319
Lab Dissolved Calcium	40.6	57.94	72.2
Lab Dissolved Sodium	38.1	72.42	146

Data Visualization



Data Sharing

- 3RQ believes in connecting data generators to data users.
 - With the data generator's permission, access can be granted to allow other users to view and download their data in WATERS.
- All data uploaded to WATERS is shared publicly through online maps.



The background of the slide is a photograph of a river with gentle ripples on its surface. A semi-transparent teal overlay covers the entire image, creating a monochromatic effect.

3RQ Maps

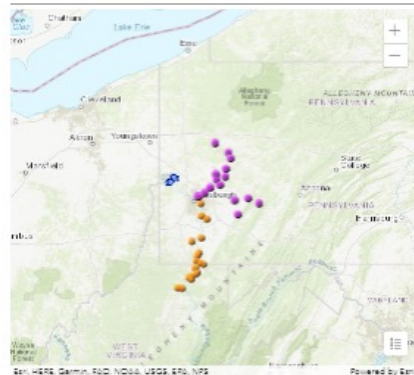
<https://three-rivers-quest-wvu.hub.arcgis.com>

Map Hub

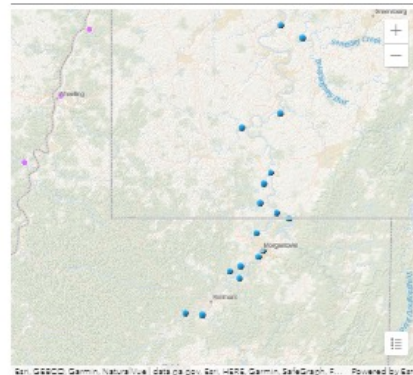
Routine Monitoring

The heart of the 3RQ program is monthly water quality sampling within the Monongahela, Allegheny, and Upper Ohio River Basins. Sampling is led by the West Virginia Water Research Institute at West Virginia University, as well as partners at Duquesne University and West Liberty University. Samples are analyzed by a commercial laboratory for a suite of parameters including TDS, sulfate, metals, halogens, and more. The resultant long-term water chemistry dataset has proven valuable for researchers and watershed managers. Monthly 3RQ data dates back to 2009 for the Monongahela and 2013 for the Allegheny and Upper Ohio. Click on the points below to view data.

2022-2023 Monthly Data



2009-2022 Yearly Averages

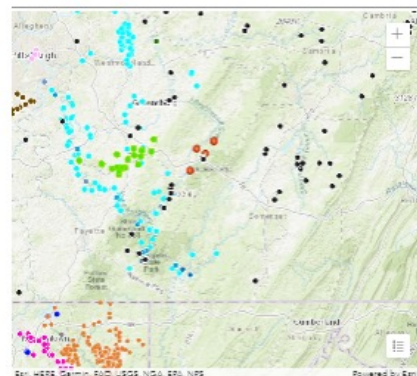


Member Data

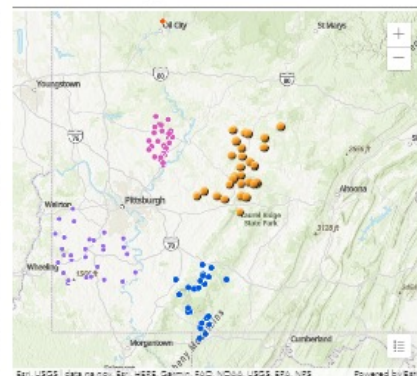
3RQ provides local watershed-based groups with data management tools and networking opportunities. These groups provide water quality data they are already collecting for display on the below maps to open up possibilities for collaboration. To view data, click on the points below. Map legends can be viewed by clicking the icon in the bottom right corner of each map.

3RQ strives to build connections between data providers and data users. If you are interested in obtaining datasets, please contact threeiversquest@gmail.com.

Member Data



Continuous Data Loggers



Data uploaded to
WATERS is
displayed visually
through 3RQ
Maps.

3RQ Maps are:

Available to the public
User-friendly
Interactive
Easy to share

StoryMaps


StoryMaps dive deeper into 3RQ's targeted studies.

- Combines text with photos, interactive maps, and more.


Targeted Studies

3RQ's Targeted Studies provide the ability for researchers to immediately respond to citizen concerns, develop focused studies, and expand monitoring to include additional parameters. As gas exploration and other water quality threats increase throughout the Upper Ohio River Basin, water quality changes can be monitored through targeted studies to provide a fast response when a potential issue arises. Learn more about several 3RQ Targeted Studies below.


Allegheny



Northern Allegheny
Sampling extension of 3RQ




Pine Creek
Targeted Study

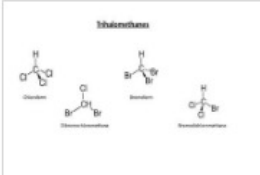


Pithole Creek
Targeted Study


Monongahela



TDS Trends in the Monongahela River Basin, 2009-2022
A story of water quality improvements in the Monongahela River and key tributaries shown through 3RQ monitoring data.




Trihalomethanes (THMs) in the Mon River Basin
Targeted Study




Tenmile Creek
Targeted Study


Ohio




E. Coli Monitoring in Upper Ohio River Valley...
A 3RQ Targeted Study in Big Wheeling Creek, Little Wheeling Creek, & Long Run



Summer Water Chemistry Trends, Upper Ohio Riv...
Targeted Study



Seasonal differences in chloride, conductivity,...
A study of changes in the Upper Ohio River Valley



Captina Creek
Targeted Study

Beta Mapping Tool

- Includes layers from various sources all in one convenient place.
- Crosses state lines within the Upper Ohio River Basin.
- Provides a useful tool to the public and other organizations.

How does it work?

- Created with ArcGIS Online.
 - No downloads or logins needed.
- Nearly 40 different data sources:
 - State agencies
 - Federal agencies
 - NGOs
 - 3RQ
- Data is owned and maintained by its creator.
 - Updated automatically in the tool.
 - Credit is given to data sources.

Data Sources

The following data sources were utilized to add layers to the 3RQ Mapping Tool. Data layers are owned and maintained by the individual data sources and are updated automatically in the tool if the owner updates the layer.

[3RQ - Three Rivers QUEST](#)

[ACJV - Atlantic Coast Joint Venture](#)

[AMJV - Appalachian Mountains Joint Venture](#)

[Audubon](#)

[Carnegie Museum of Natural History](#)

[Datasheds](#)

[UDC - West Virginia Infrastructure and Jobs Development Council](#)

[iMapInvasives](#)

[MD iMAP - Maryland Mapping and GIS Data Portal](#)

[MDDNR - Maryland Division of Natural Resources](#)

[MDE - Maryland Department of the Environment](#)

[NBAC - Northern Brownfields Assistance Center](#)

[NRCS - Natural Resources Conservation Service](#)

[ODNR - Ohio Department of Natural Resources](#)

[Ohio Department of Agriculture](#)

[Ohio EPA - Ohio Environmental Protection Agency](#)

[PADNCR - Pennsylvania Department of Conservation and Natural Resources](#)

[PADEP - Pennsylvania Department of Environmental Protection](#)

[PASDA - Pennsylvania Spatial Data Access](#)

[PFBC - Pennsylvania Fish and Boat Commission](#)

[PGC - Pennsylvania Game Commission](#)

[POWR - Pennsylvania Organization for Watersheds and Rivers](#)

[PNHP - Pennsylvania Natural Heritage Program](#)

[Southwestern Pennsylvania Water Network](#)

[TNC - The Nature Conservancy](#)

[TU - Trout Unlimited](#)

[URI - University of Rhode Island](#)

[USACE - United States Army Corp of Engineers](#)

[USEPA - United States Environmental Protection Agency](#)

[USFS - United States Forest Service](#)

[USGS - United States Geological Survey](#)

[USFWS - United States Fish and Wildlife Service](#)

[WeConservePA](#)

[WVDEP - West Virginia Department of Environmental Protection](#)

[WVDNR - West Virginia Division of Natural Resources](#)

[WVDOT - West Virginia Division of Highways](#)

[WVGISTC - West Virginia Geographic Information System Technical Center](#)

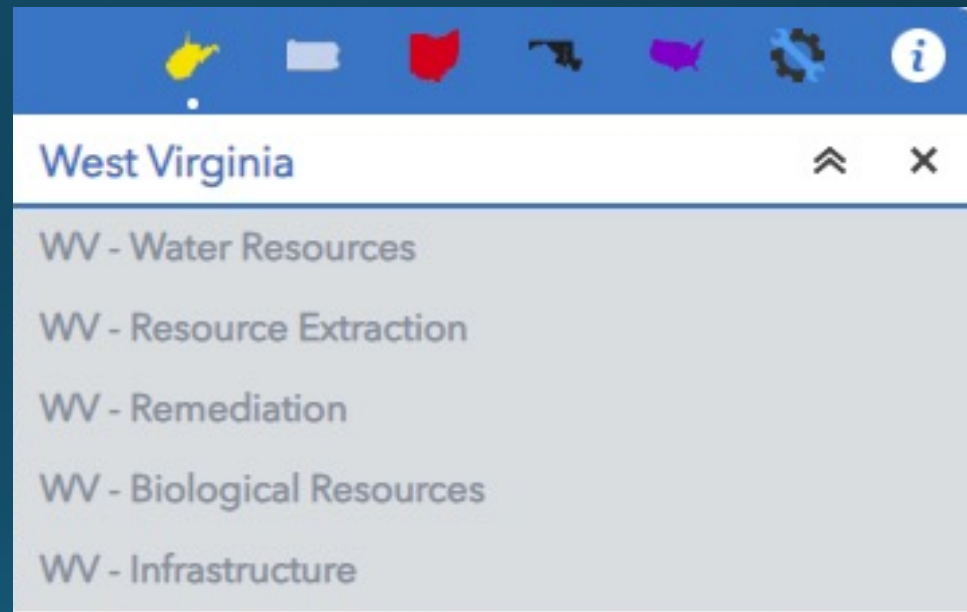
[WWDA - West Virginia Water Development Authority](#)

[WWRI - West Virginia Water Research Institute](#)

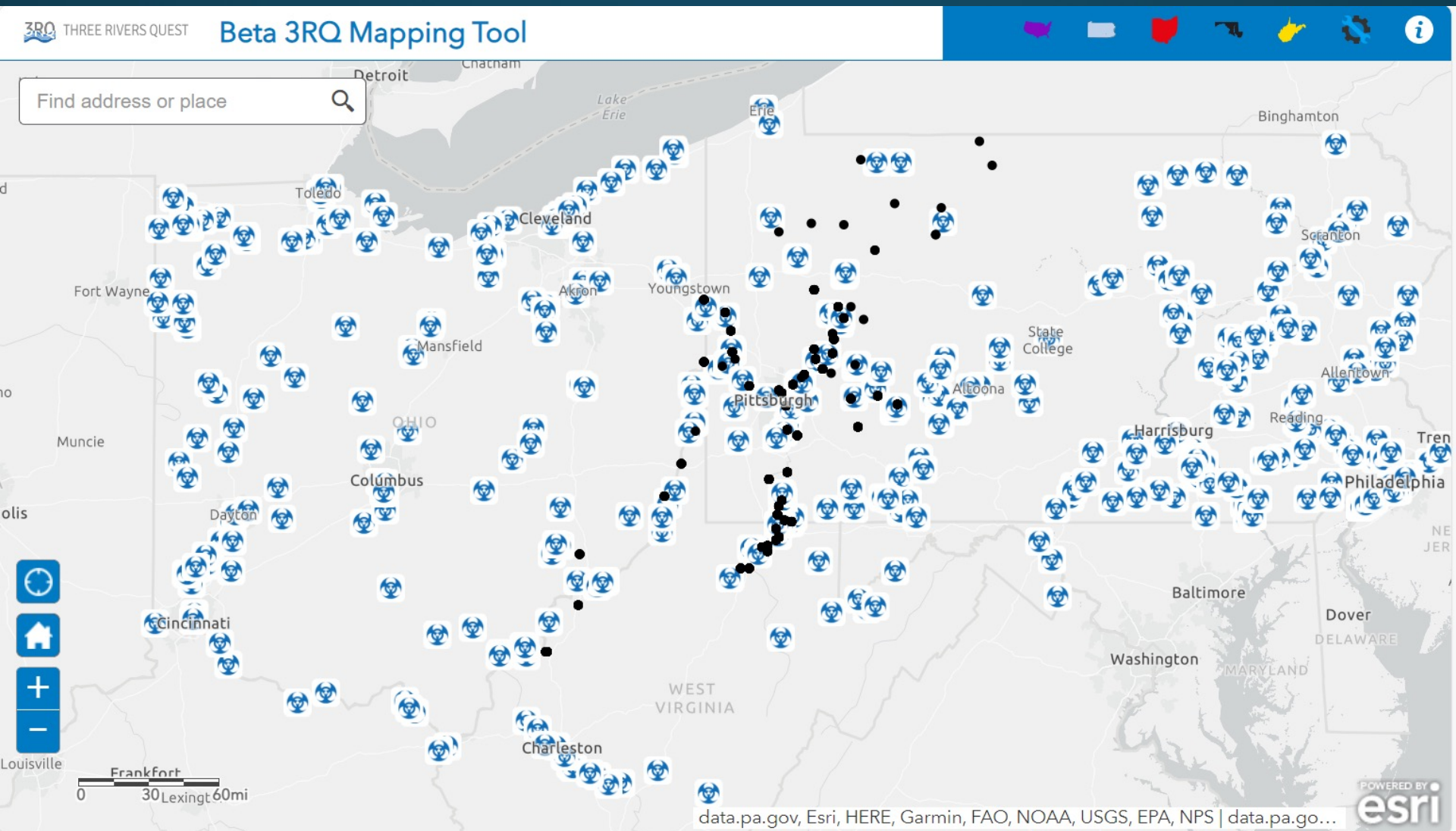
Data Layers

- Includes layers in WV, PA, OH, MD, and national datasets organized into the following categories:

- Water Resources
- Resource Extraction
- Remediation
- Biological Resources
- Infrastructure



Focuses on Upper Ohio R. Basin



Includes National Datasets

Beta 3RQ Mapping Tool

Find address or place

Map showing the United States with various data points (circles) overlaid, indicating locations of interest. The map includes labels for major cities (e.g., Seattle, San Francisco, Los Angeles, Dallas, Houston, Miami, Washington, Philadelphia, New York, Boston, Toronto, Montreal, Chicago, Detroit, St. Louis, Denver, Vancouver, Edmonton, Calgary, Monterrey, Guadalajara, Havana, Mexico City) and geographical features (e.g., Lake Superior, Atlantic Ocean). The map is overlaid with a purple and blue color scheme, likely representing water resources or land cover.

Nationwide

- ☐ WaterWatch Stream Gauges - USGS
- ☒ PFAS Concentrations (ng/L) - USGS

Nationwide - Remediation

- ☐ Wastewater Treatment Plants - US EPA
- ☐ Superfund: National Priorities List - US EPA

Nationwide - Biological Resources

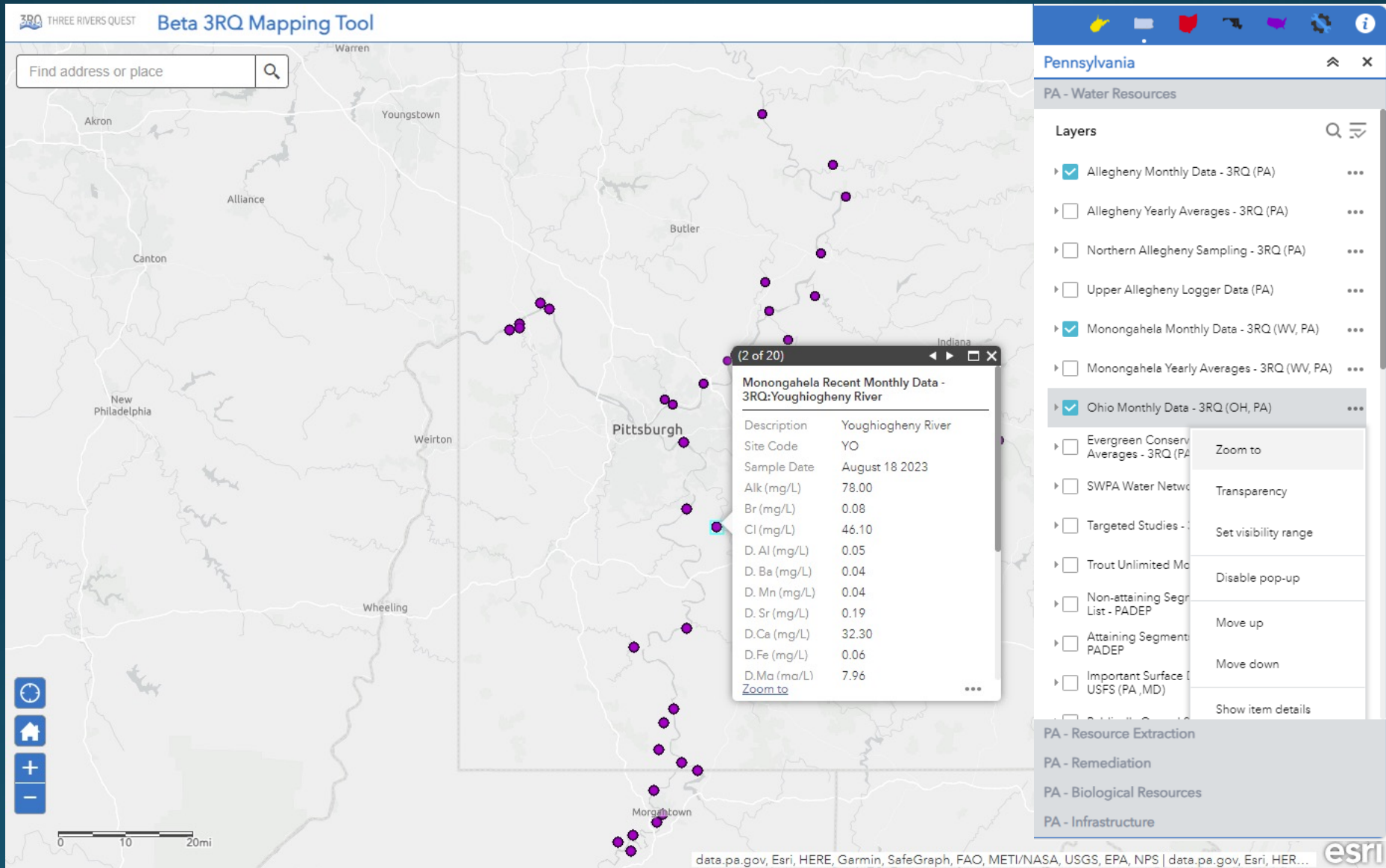
- ☐ Harmful Algal Blooms - US EPA
- ☒ Percent Natural Landcover - US EPA

Nationwide - Infrastructure

- ☐ U.S. EPA PFAS Sources - USGS
- ☐ Wind Turbines - USGS

Esri, Garmin, FAO, NOAA, USGS, EPA

Interactive



Tools - Measure

The screenshot displays the 'Beta 3RQ Mapping Tool' interface. The main map area shows a portion of Cincinnati, Ohio, with the Ohio River at the bottom. Key locations labeled include White Oak, Reading, Bond Hill, Norwood, Corryville, Cincinnati, Ludlow, Newport, Covington, and Mt. Carmel. Water features include Mill Creek, Congress Run, West Fork Mill Creek, and the Ohio River. A scale bar at the bottom left indicates 0 to 2 miles. A search bar at the top left contains the text 'Find address or place'. A vertical toolbar on the left side includes icons for a compass, home, and zoom controls. The right sidebar contains a 'Tools' section with a 'Measurement' tool active, showing a result of '0.67 Miles'. Below the measurement result is a 'Clear' button and a note 'Press CTRL to enable snapping'. At the bottom of the sidebar are links for 'Legend', 'Basemap Gallery', 'Add Data', and 'Print'.

Tools – Basemap Gallery

3RQ THREE RIVERS QUEST

Beta 3RQ Mapping Tool

Find address or place



IM-1363

60012

60010

60011

IM-0226



0 0.1 0.2mi



Tools



Measurement

Legend

Basemap Gallery



Enhanced
Contrast Dark



Enhanced
Contrast Map



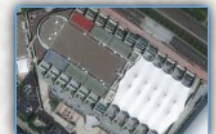
Firefly Imagery
Hybrid



Human
Geography Dark



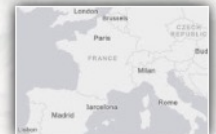
Human
Geography Map



Imagery



Imagery Hybrid



Light Gray Canvas

Add Data

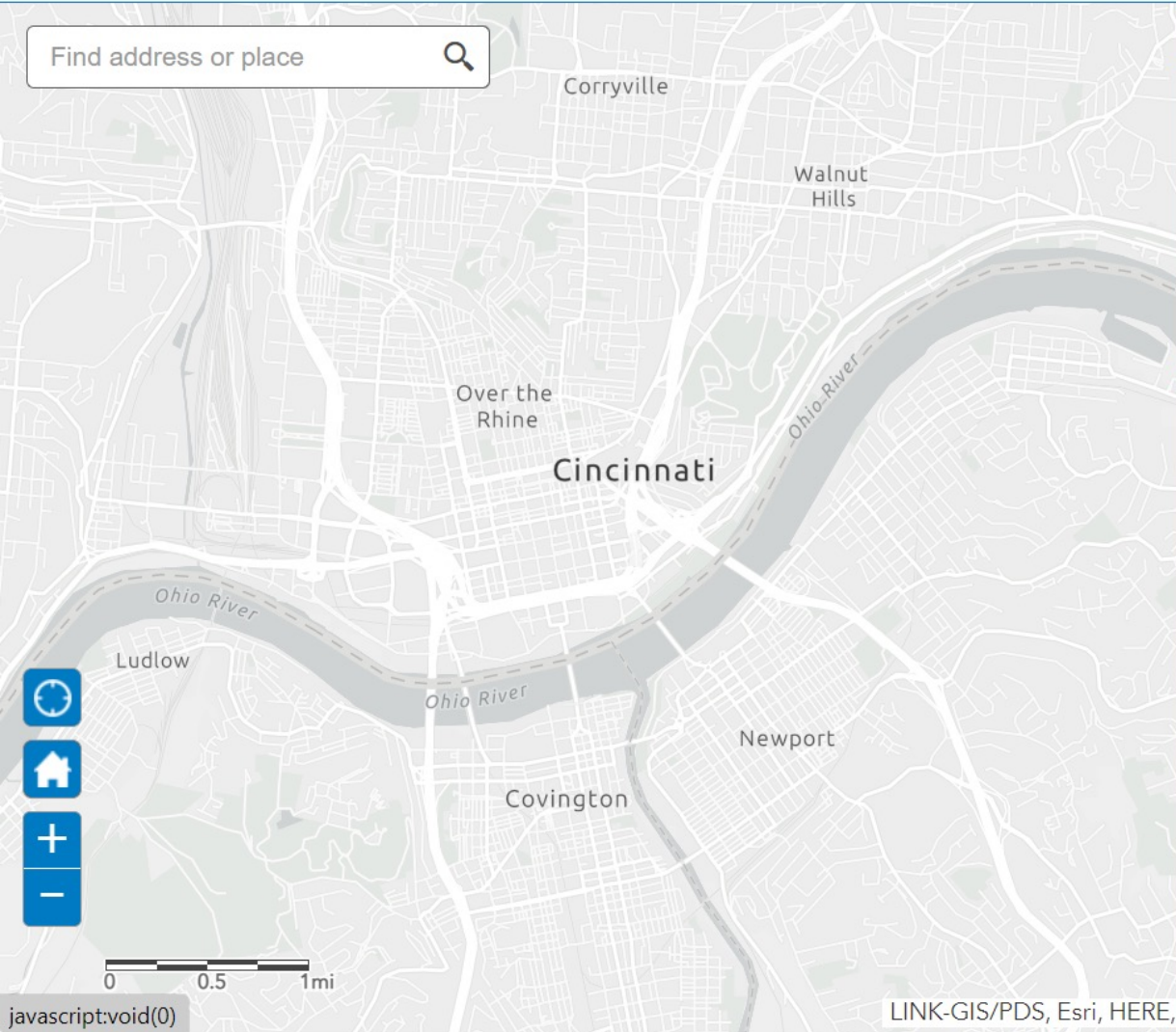
Print

Tools – Add Data

3RQ THREE RIVERS QUEST

Beta 3RQ Mapping Tool

Find address or place



Tools

Measurement

Legend

Basemap Gallery

Add Data

Search

URL

File

ArcGIS Online

river access

☒ Within map...

Type

Relevance

River Access and Hazards

Feature Service by ohiodnr7

ADD DETAILS

FORD

River Fords - Public

Feature Service by michael.fletcher@wmk.govt.nz_W

ADD DETAILS

Shoreline Access Inventory

Feature Service by adrian.laufer_dlcd

<< < 1 > >>

8,094 Items

LAYERS

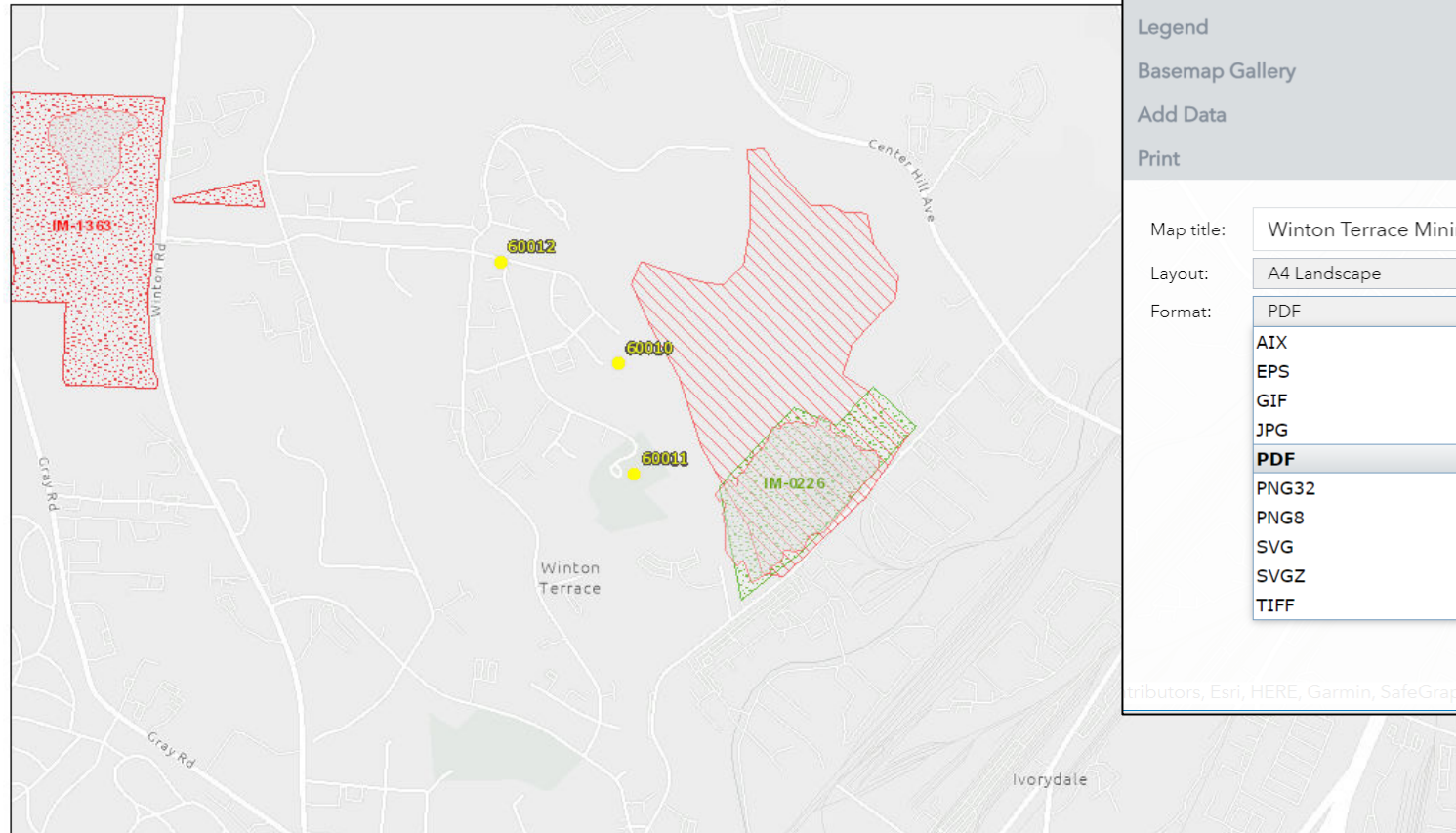
Print

javascript:void(0)

LINK-GIS/PDS, Esri, HERE,

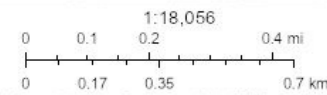
Tools - Print

Winton Terrace Mining and Oil & Gas



10/4/2023, 11:35:03 AM

- | | | | | | |
|-------------------------|-----------|-----------------------|------------------------|-------------------|--------------------------|
| Directional Line | Drilling | Dry and Abandoned | Horizontal Bottom Hole | Producing | Storage Well |
| Directional Bottom Hole | Producing | Storage Well | Permitted | Plugged | Horizontal Well Head |
| Permitted | Plugged | Directional Well Head | Active Injection | Inactive | Wells by Status (Active) |
| Active Injection | Inactive | Horizontal Line | Drilling | Dry and Abandoned | Permitted |



Esri, Community Maps Contributors, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc., METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA

ArcGIS Web AppBuilder

Tools

- Measurement
- Legend
- Basemap Gallery
- Add Data
- Print

Map title: Winton Terrace Mining and Oil & G.

Layout: A4 Landscape

Format: PDF

- AIX
- EPS
- GIF
- JPG
- PDF**
- PNG32
- PNG8
- SVG
- SVGZ
- TIFF

Contributors, Esri, HERE, Garmin, SafeGraph, Ge...

Applications

- Creating high quality maps for proposals, reports, etc.
- Engaging the public in local waterways.
- Identifying spatial trends.
- Investigating potential sources of water quality issues.

Legend

Monongahela Monthly Data - 3RQ (WV, PA)



WaterWatch Stream Gauges - USGS



High



>90 Much above normal



76-90 Above normal



25-75 Normal



10-24 Below normal



<10 Much below normal



Low



Not-ranked

Unconventional Natural Gas Wells - PADEP



Producing



Drilled



Permitted



Permit Expired



Unknown

Coal Underground Mine - PADEP



Coal Surface Mine - PADEP



Beta Version

- Ready to be used and shared.
- Seeking feedback and additional layers to add.



Allegheny
Monongahela
Ohio

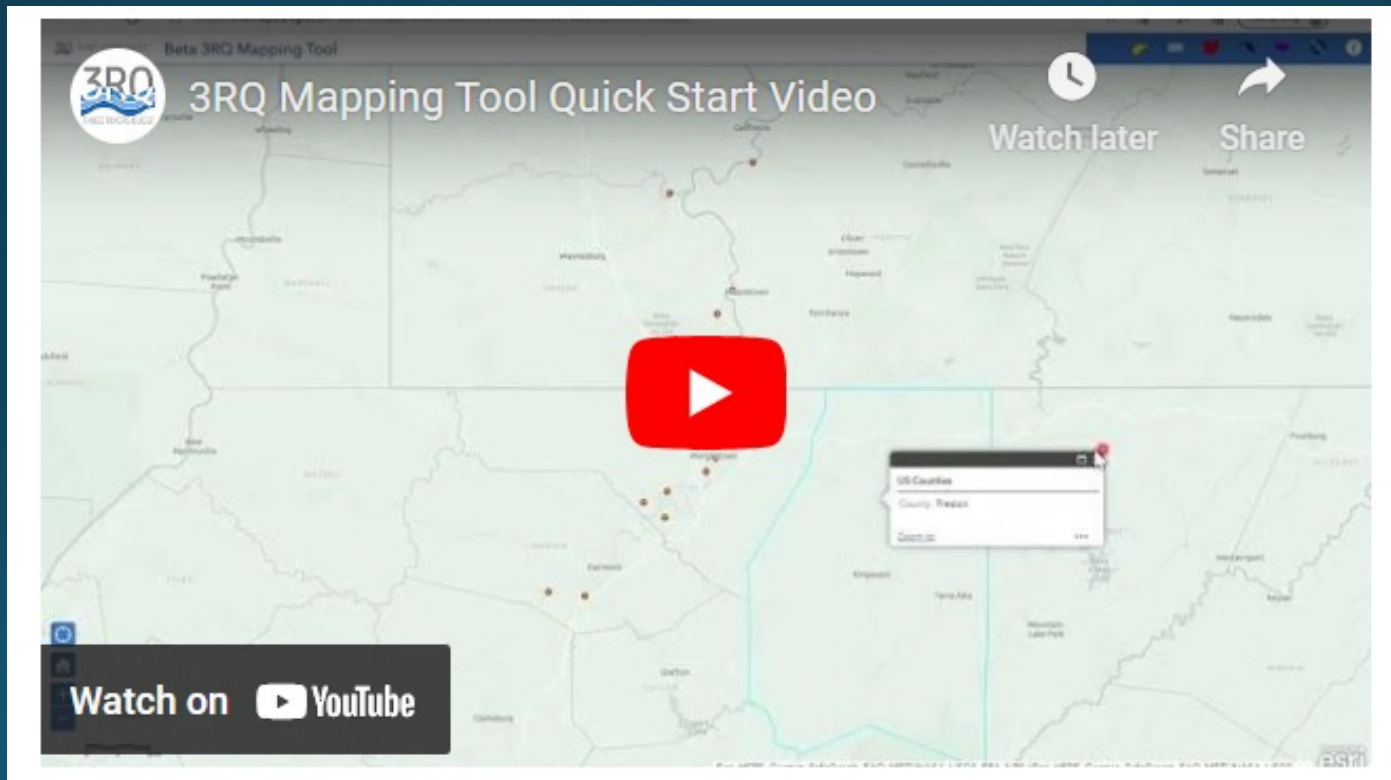
Please upload the layer(s) service URL(s) below. Please note that the layer must be made publicly accessible.

Please include contact information so we may acknowledge the layer(s) source.



More Information

<https://3riversquest.wvu.edu/resources/3rq-mapping-tool>



Generating Awareness for Project Success

GAPS

What is GAPS?

- Assistance program for grassroots organizations and small colleges.
 - 2023: Focused on grassroots organizations.
 - 2024: Focus on small colleges/universities.
- Fills gap in funding to prepare for federal, state, and/or private grants.
- Geared toward nonpoint source issues: acid mine drainage, sedimentation, etc.

Where does GAPS come in?

Typical Grant Preparation Process



```
graph TD; A[Typical Grant Preparation Process] --> B[Create a Watershed Based Plan/Watershed Implementation Plan.]; B --> C[Identify restoration project.]; C --> D[Collect representative data on pollution source/stream impacts.]; D --> E[Create rough pre-engineering plans and budget.]; E --> F[Apply for funding.];
```

The flowchart illustrates the typical grant preparation process, starting with a title box and followed by six sequential steps connected by downward arrows. The fourth step, 'Collect representative data on pollution source/stream impacts.', is highlighted with a yellow border.

Create a Watershed Based Plan/Watershed Implementation Plan.

Identify restoration project.

Collect representative data on pollution source/stream impacts.

Create rough pre-engineering plans and budget.

Apply for funding.

**Good data is
critical for
successful
projects!**

Services Available

- Services will vary for each awardee based on the needs of the specific project.
- Direct services may include:
 - Field Assistance or Training
 - Grab sample and flow measurement collection
 - Installation and management of in-stream data loggers
 - Coordination with analytical laboratory
 - Data management
 - Grant searching and preparation
- Funding may include:
 - Analytical costs, travel, students
 - **Maximum** ask: \$10,000

Additional Benefits

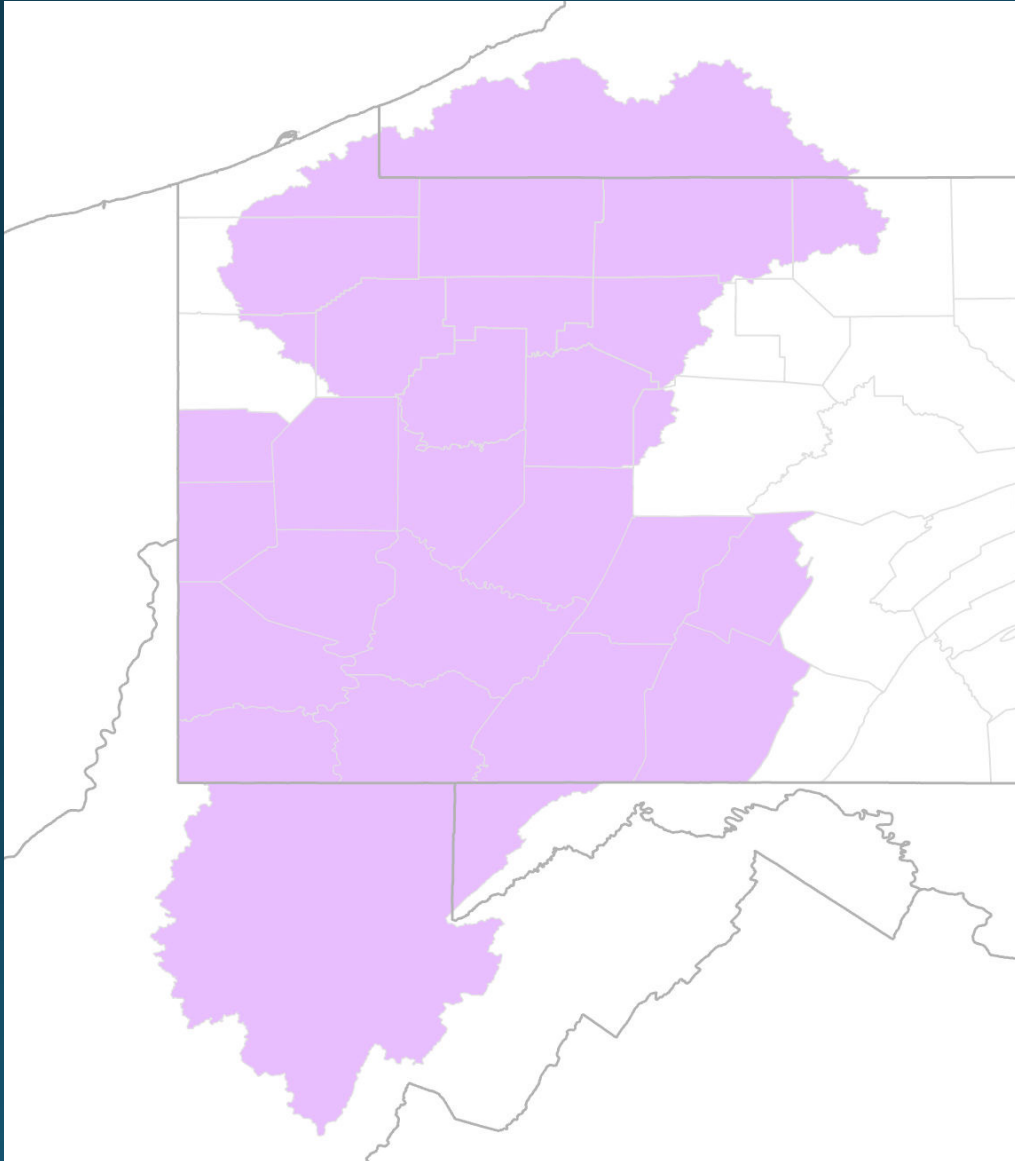
- Data
 - Uploaded to WATERS for long-term storage.
 - Published to online maps.
- 3RQ & FPW will facilitate connections with state/federal agencies, researchers, and students.

2023 GAPS Projects Include:

- Bank erosion monitoring
- Flood monitoring
- AMD source characterization and prioritization
- Pollutant monitoring in river systems



Eligibility



- Project must be within:
 - Monongahela River Basin;
 - Allegheny River Basin; or
 - Southwestern PA counties highlighted

Simple Application

➤ <https://forms.gle/vwQvT726DGTKSntZA>

Please provide a brief description of your proposed project, including goals and objectives. *

Long answer text

Please describe the collaborative aspect of your proposed project, including proposed partners. *

Long answer text

Please describe any previous collaborative research or remediation successes you've had in the watershed. *

Long answer text

Which of the following categories does the project fall under? *

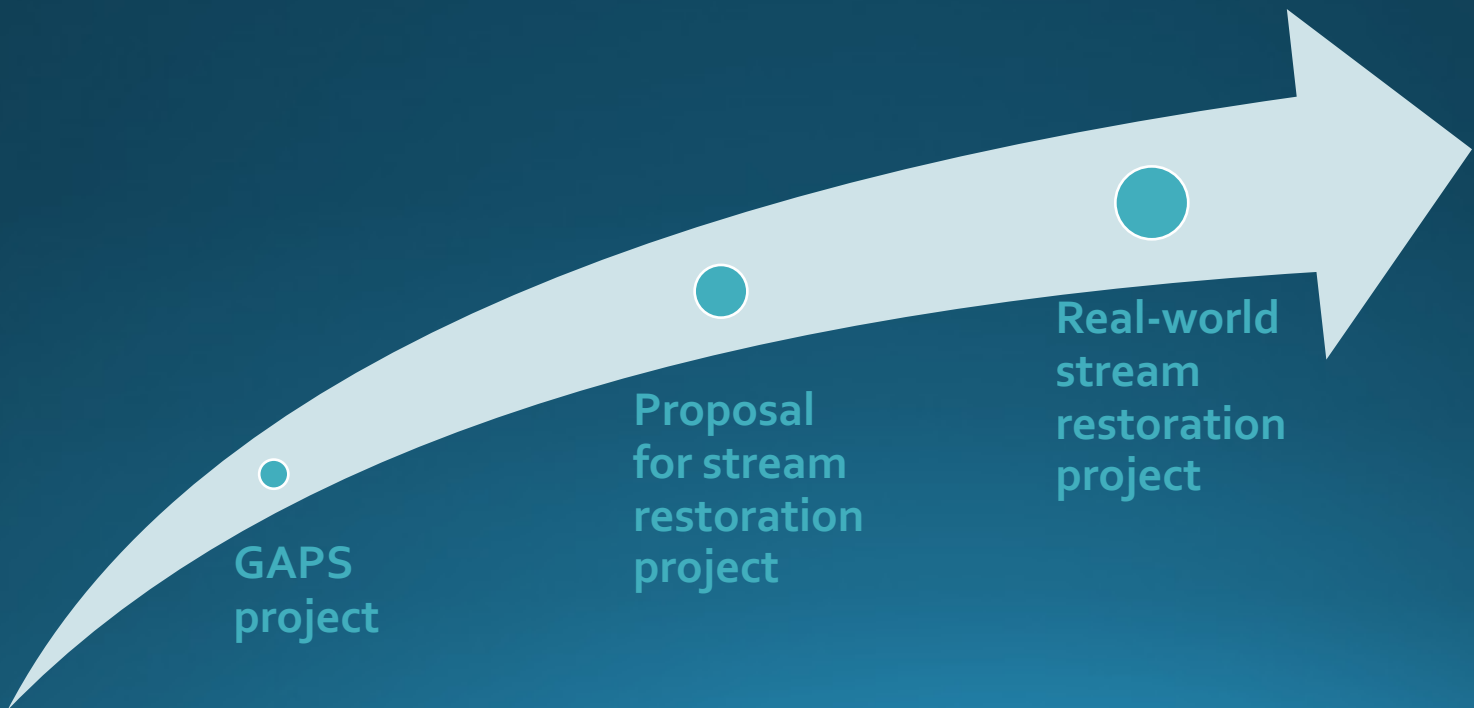
- ☐ Abandoned mine drainage (AMD)
- ☐ Nutrients
- ☐ Stormwater
- ☐ Streambank restoration
- ☐ In-stream habitat enhancement
- ☐ Other...

What is the nearest town to your proposed project location? *

Short answer text

Application Evaluation

- Based on project readiness and potential to leverage future funds.
- Applications accepted on rolling basis; first come first serve.
- We anticipate funding 2-4 projects.



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Biweekly E-newsletter

<https://3riversquest.wvu.edu/news/rivers-run-through-this>

Funded by



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Q & A Session

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