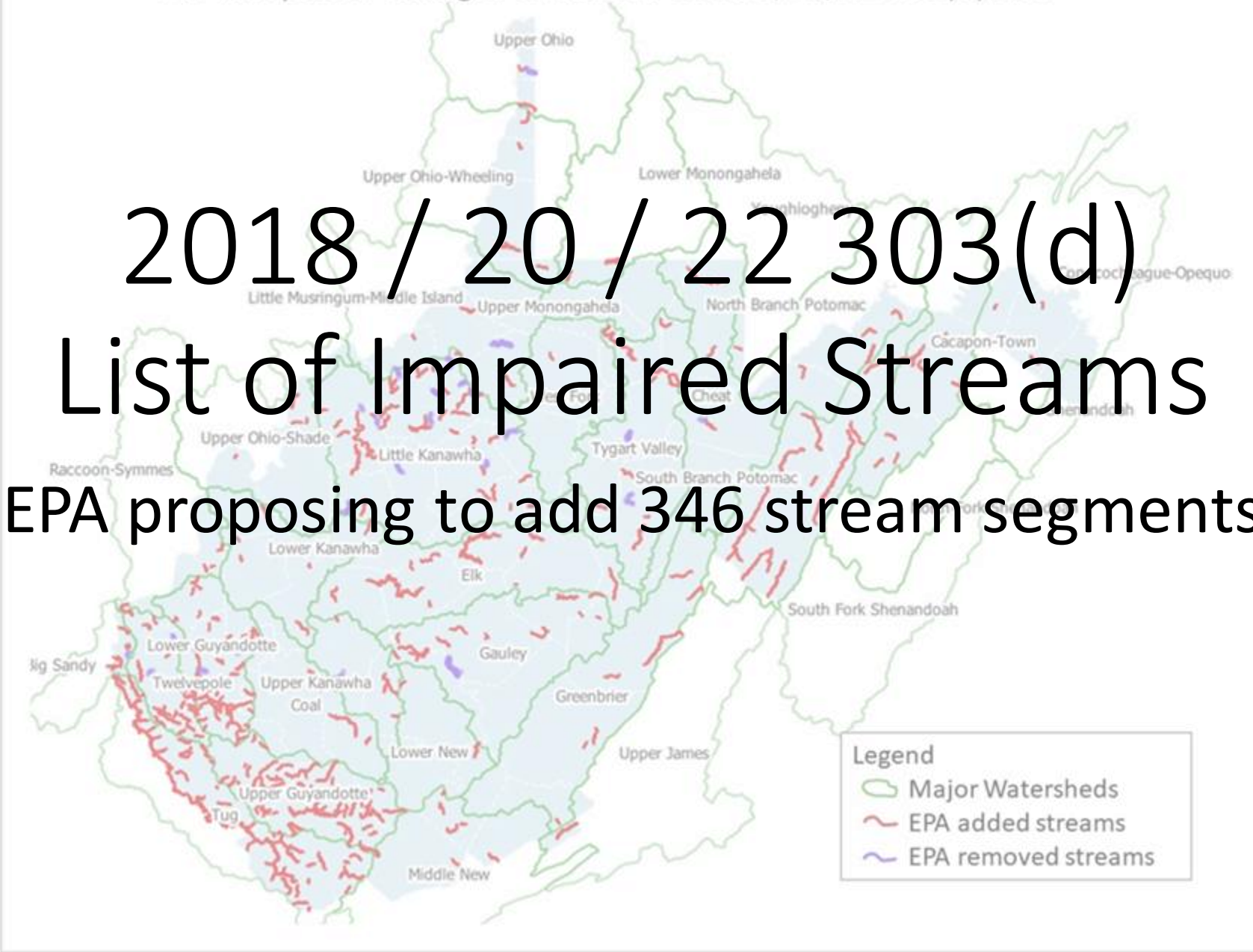


EPA Proposed changes to WVDEP's 2018/20/22 303(d) List

2018 / 20 / 22 303(d) List of Impaired Streams EPA proposing to add 346 stream segments



EPA Proposed changes to WVDEP's 2018/20/22 303(d) List

Background

Designated Uses

Assessing Uses and 303(d) list

Aquatic Life Use

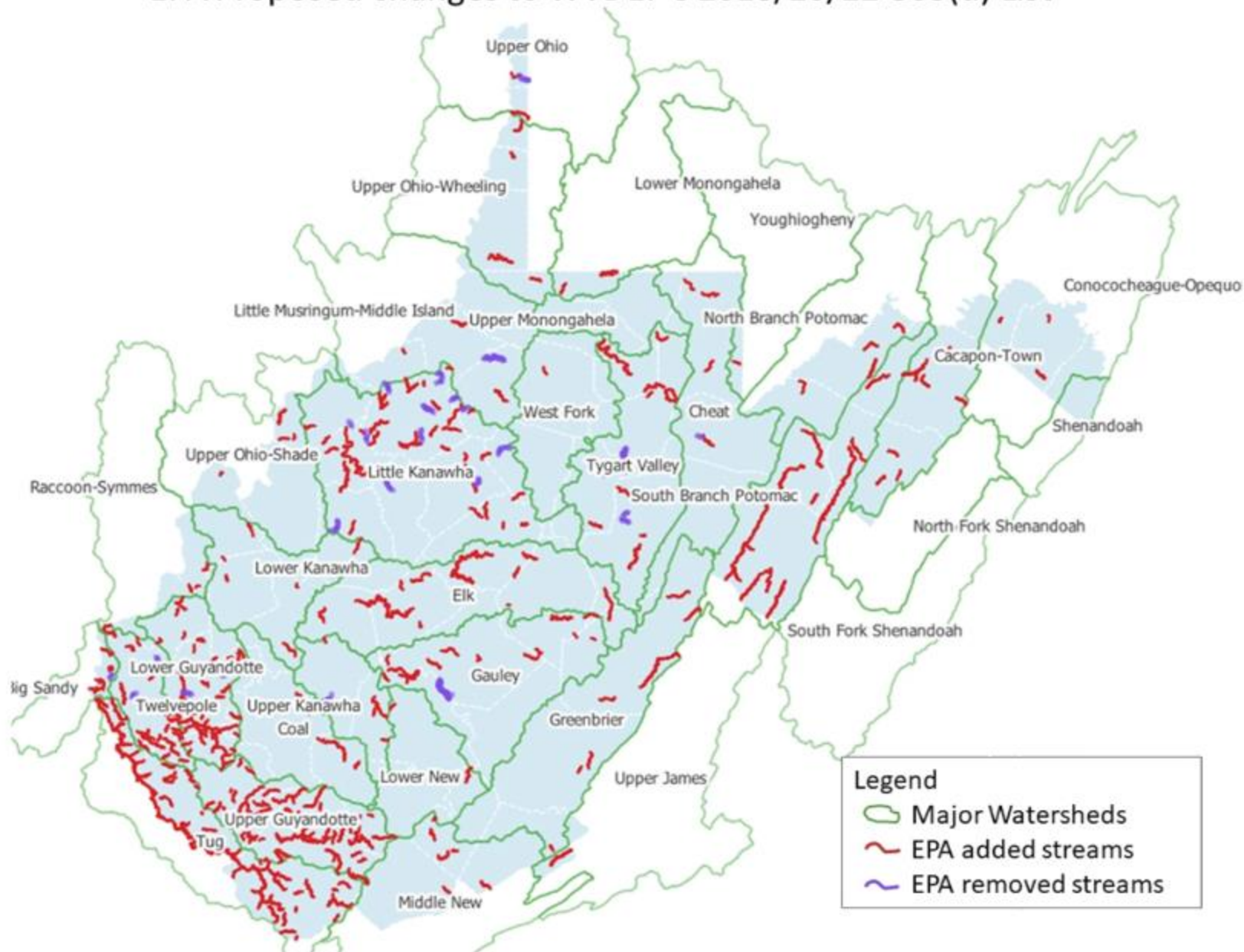
Methods for Assessing AQL

Development of WVSCI

Development of GLIMPSS

47CSR2B -
AQL Assessment Methodology
never finalized

Assessment Methodology



Designated Uses

WV's Code of State Rules

TITLE 47
LEGISLATIVE RULE
DEPARTMENT OF ENVIRONMENTAL PROTECTION
WATER RESOURCES

SERIES 2
REQUIREMENTS GOVERNING WATER QUALITY STANDARDS

[Link to rule](#)

2.4. "Designated uses" are those uses specified in water quality standards for each water or segment whether or not they are being attained. (See sections 6.2 - 6.6, herein)

§47-2-6. Water Use Categories.

6.2. Category A -- Water Supply, Public

6.3. Category B -- Propagation and maintenance of fish and other aquatic life - aka **“Aquatic Life Use”**

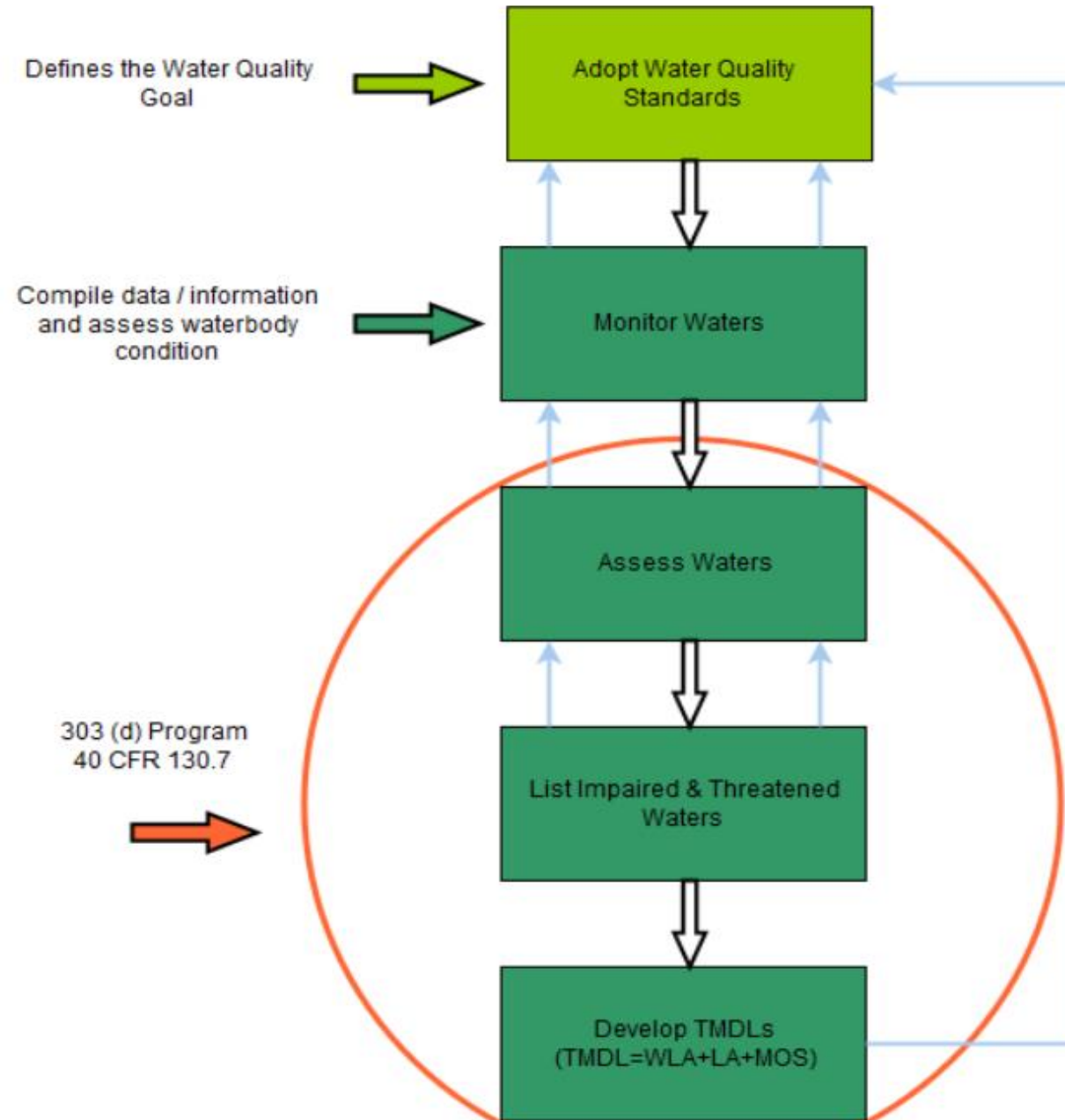
6.4. Category C -- Water contact recreation

6.5. Category D. -- Agriculture and wildlife uses

6.6. Category E -- Water supply industrial, water transport, cooling and power

Unless otherwise designated by these rules, at a minimum **all waters of the State are designated for the Propagation and Maintenance of Fish and Other Aquatic Life (Category B)** and for Water Contact Recreation (Category C) consistent with Federal Act goals.

Water Quality-Based Approach of the Clean Water Act



§47-2-3. Conditions Not Allowable In State Waters.

3.1. Certain characteristics of sewage, industrial wastes and other wastes cause pollution and are objectionable in all waters of the state. Therefore, the Secretary does hereby proclaim that **the following general conditions are not to be allowed in any of the waters of the state.**

3.2. No sewage, industrial wastes or other wastes present in any of the waters of the state shall cause therein or materially contribute to any of the following conditions thereof:

3.2.a. Distinctly visible floating or settleable solids, suspended solids, scum, foam or oily slicks;

3.2.b. Deposits or sludge banks on the bottom;

3.2.c. Odors in the vicinity of the waters;

3.2.d. Taste or odor that would adversely affect the designated uses of the affected waters;

3.2.e. Materials in concentrations which are harmful, hazardous or toxic to man, animal or aquatic life;

3.2.f. Distinctly visible color;

3.2.g. Algae blooms or concentrations of bacteria which may impair or interfere with the designated uses of the affected waters;

3.2.h. Requiring an unreasonable degree of treatment for the production of potable water by modern water treatment processes as commonly employed; and

3.2.i. **Any other condition, including radiological exposure, which adversely alters the integrity of the waters of the State including wetlands; no significant adverse impact to the chemical, physical, hydrologic, or biological components of aquatic ecosystems shall be allowed.**

Use of Benthic Macroinvertebrates To Assess Aquatic Life Use



WV's History of using Benthic Macroinvertebrates to Assess Aquatic Life Use

1998 – First use of benthic macroinvertebrate data for 303(d) listing. Used what DEP simply called the **Biological Condition**. Six metrics were used in evaluating biologic data in 1996 studies. They are taxa richness, modified Hilsenhoff biotic index, EPT Taxa, % dominant taxa, scrapers/filtering collectors ratio, and EPT/ Chironomidae, plus EPT ratio.

2000 – No 303(d) list was developed

2002 – First use of WVSCI

https://dep.wv.gov/WWE/watershed/bio_fish/Documents/WVSCI.pdf

WVSCI

Prepared by:

Tetra Tech, Inc.
10045 Red Run Boulevard
Suite 110
Owings Mills, MD 21117

March 28, 2000 (Revised July 21, 2000)



A STREAM CONDITION INDEX FOR WEST VIRGINIA WADEABLE STREAMS



Prepared for:

U.S. EPA Region 3 Environmental Services Division,
and U.S. EPA Office of Science and Technology, Office of Water

Work Assignment Managers:
James Green (Region 3) and William Swietlik (OST)

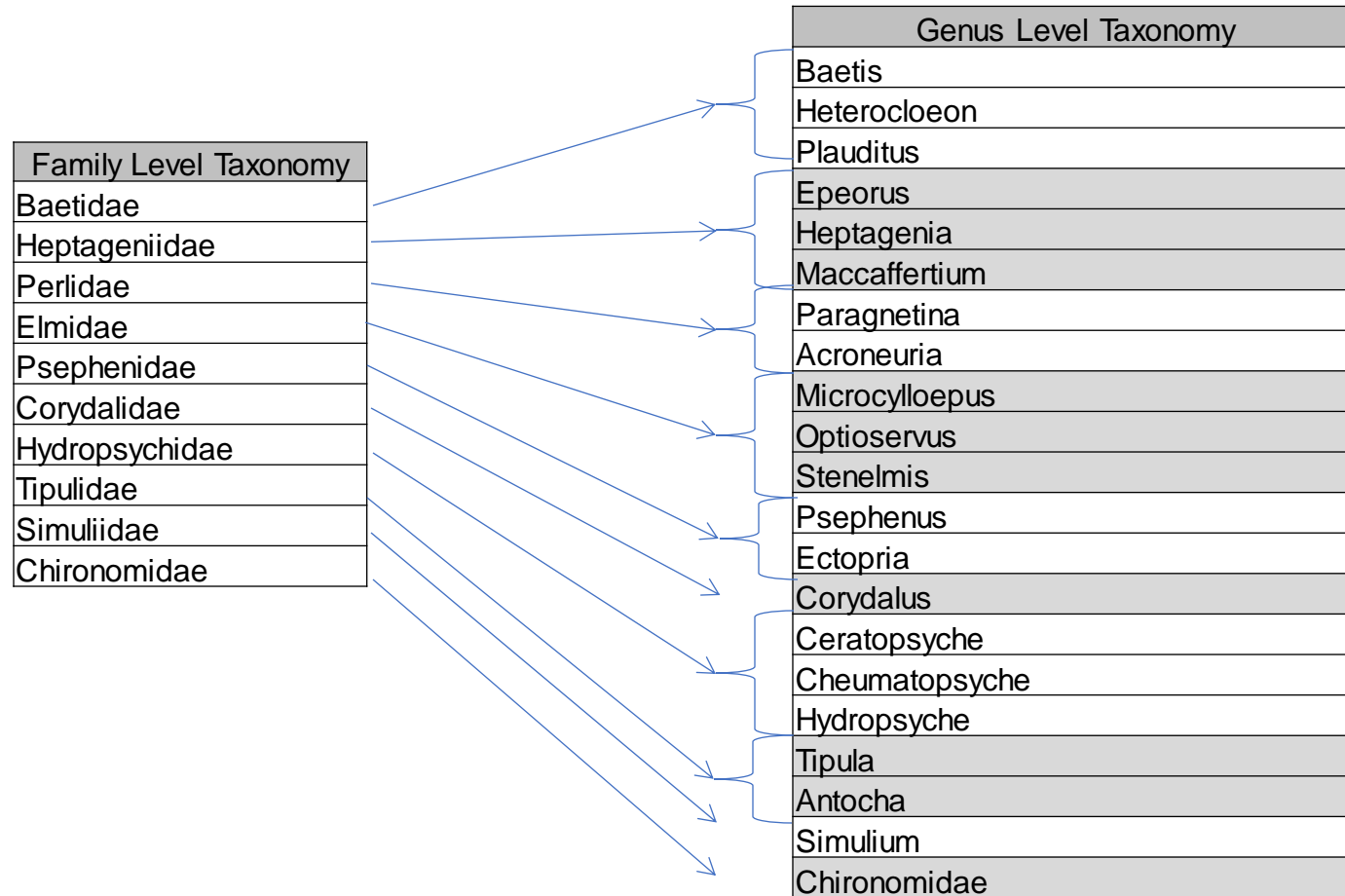
1998 - WVDEP Watershed Assessment Program expands. Increase in number of benthic samples, need to contract out the processing and identification.

WAB begins identifying benthic macroinvertebrate samples to genus level in **1998 – 25 years ago!**

So much more information gained with little additional cost.

Same benthic subsample.

One family level taxonomy, the other genus (except Chironomidae)

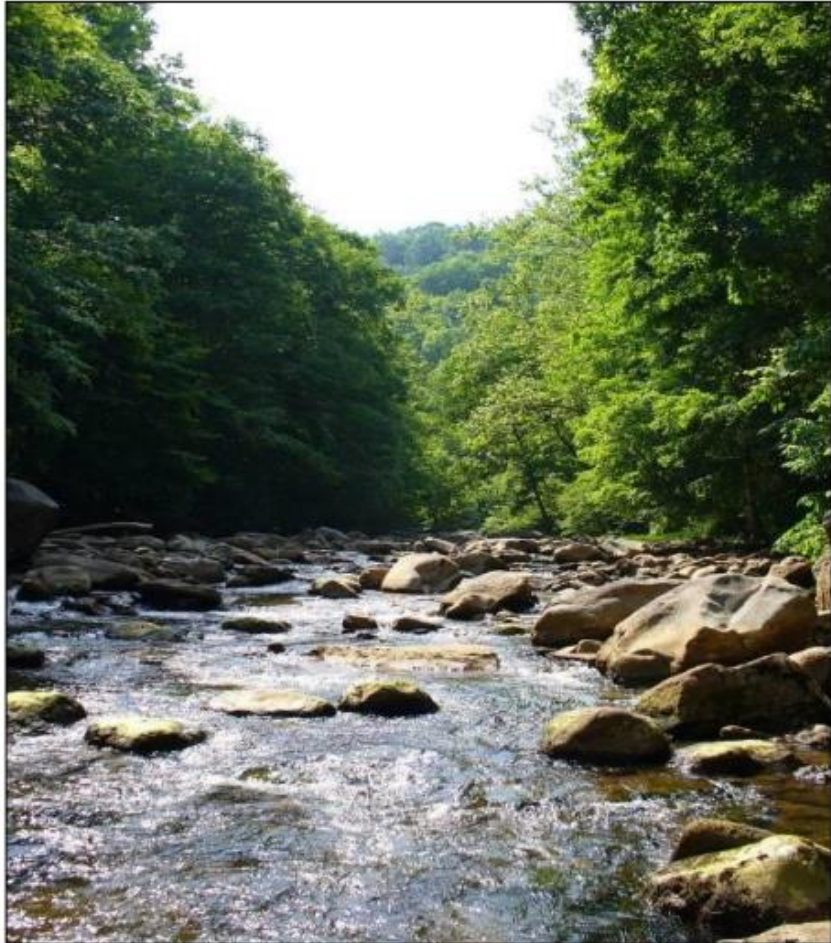


Simply a lot more information with genus level data to make assessment decisions

The West Virginia GLIMPSS

Genus Level Index of Most Probable Stream Status

A Benthic Macroinvertebrate Index of Biotic Integrity for West Virginia's Wadeable Streams



Prepared by:

Gregory J. Pond

U.S. EPA Region III
Environmental Assessment and Innovation Division
Office of Monitoring and Assessment
Wheeling, WV

Jeffrey E. Bailey
and
Benjamin Lowman
and
Michael J. Whitman

West Virginia Department of Environmental Protection
Division of Water and Waste Management
Watershed Assessment Branch
Charleston, WV

WV Stream Condition Index or WVSCI

The WVSCI consists of six benthic community metrics combined into a single multimetric index. The WVSCI was developed by Tetra Tech Inc. (2000) using DEP & EPA data collected from riffle habitats in wadeable streams.

WVSCI Scoring Criteria
> 68.0 Unimpaired
> 60.6 to 68 "Gray Zone"
≤ 60.6 Impaired

In general terms, all metric values were converted to a standard 0 (worst) to 100 (best) point scale. The six standardized metric scores were then averaged for each benthic sample site to come up with a final index score ranging from 0.0 to 100. Using the distribution of scores from all sites that are considered reference sites, an impairment threshold of 68.0 was established. If a stream site received a WVSCI score greater than 68.0, it was considered to be unimpaired. Initially, a site that received a WVSCI score equal to or less than 68.0 was considered impaired. However, because the final WVSCI score can be affected by a number of factors (collector, micro-habitat variables, subsampling, etc.), agency personnel sampled sites in duplicate to determine the precision of the scoring.

Following an analysis of the duplicate data, agency personnel determined the precision estimate to be 7.4 WVSCI points for a single sample. This value (7.4) was then subtracted from the impaired threshold score of 68.0 and generated what is termed the "gray zone" that ranges from 60.6 to 68.0. If a site had a WVSCI score within the gray zone, a single kick sample was considered insufficient for classifying it as impaired. If a site received a WVSCI score less than 60.6, the agency was highly confident that the site was truly biologically impaired based on that benthic macroinvertebrate sample.

WVSCI was used for 303(d) listing in

- 2002
- 2004
- 2006
- 2008
- 2010 – “EPA expects WV to use genus level by 2012”
- 2012 - SB562, DEP doesn't list based on biodata – EPA “overlists” based on WVSCI with no grey zone.
- 2014 – EPA overlists based on GLIMPSS – stating the requirement to use all available data
- 2016 – Change in federal administrative oversight, EPA defers to WVDEP's use of WVSCI.
- 2018/20/22 – another change in federal administration

From February 2011 '**2010 303(d) Approval Letter**' from EPA to DEP

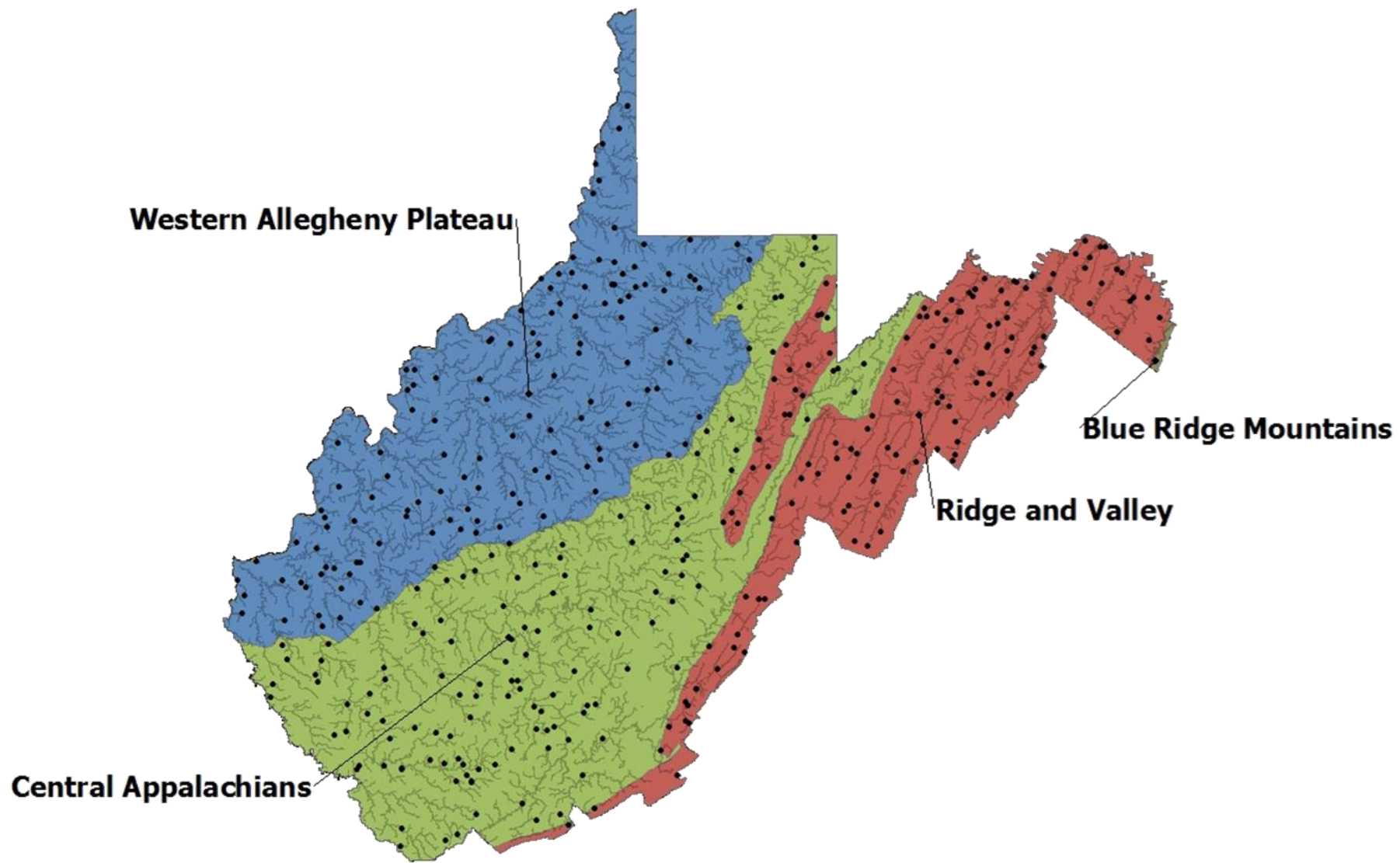
EPA notes that West Virginia has been a regional leader in monitoring its waters and has collected 10 years' worth of genus-level data. Because a final version of GLIMPSS became available during summer of 2010., and thus after the public comment period for the 2010 Section 303(d) list, EPA is approving the Section 2010 list based upon use of the family-level WVSCI analysis. However, EPA expects that West Virginia will match the high quality of its monitoring program by moving to a genus-level analysis for its 2012 Section 303(d) List.

WVSCI Problems that GLIMPSS Addresses

GLIMPSS is Region Specific

Problem Statement: Cannot reasonably compare a stream benthic sample from the plateau with reference conditions mostly from the mountains. In other words, the WVSCI should not have been developed for statewide use.

Action/Improvement: GLIMPSS was regionalized with reference conditions appropriate to the local area and “region”.



WVSCI Problems that GLIMPSS Addresses

Multiple Seasons / Index Periods

Problem Statement: The WVSCI index period is too long and causes what some would argue as extreme variability in final WVSCI scores, especially comparing April and Oct samples.

Action/Improvement: GLIMPSS was developed with the seasonal aspect as a primary classification variable. There are now Spring, Summer, and Winter seasons with distinct reference conditions for each.

WVSCI Problems that GLIMPSS Addresses

Extended Sampling Period

Problem: The WVSCI Index period does not include the months for which most permits historically collected benthic samples (March and November).

Action/Improvement: The GLIMPSS allows for a longer sampling period including some of December and January for winter and the early spring months of Feb and March. November is not included in the GLIMPSS index period and there are many negatives to sampling during this time of year anyway such as excessive leaf packs in the sample, potential of low flow/dry streams being sampled following the fall rains, or high yield winter stoneflies in the sample, etc.

WVSCI Problems that GLIMPSS Addresses

More Specific Taxonomy

Problem: During the development of the WVSCI and into the first couple of years of use, it was suggested that we look towards genus level identification for the future. This was the stimulus for us to start paying for genus level identification and start planning for the future and a genus level IBI.

Action/Improvement: GLIMPSS is genus level where most of states have moved towards, or are moving towards, with benthic macroinvertebrate IBI's.

WVSCI Problems that GLIMPSS Addresses

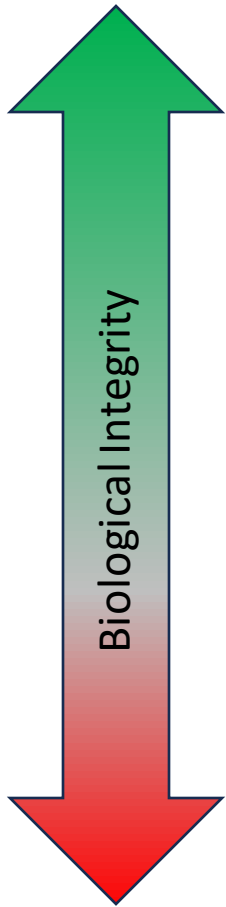
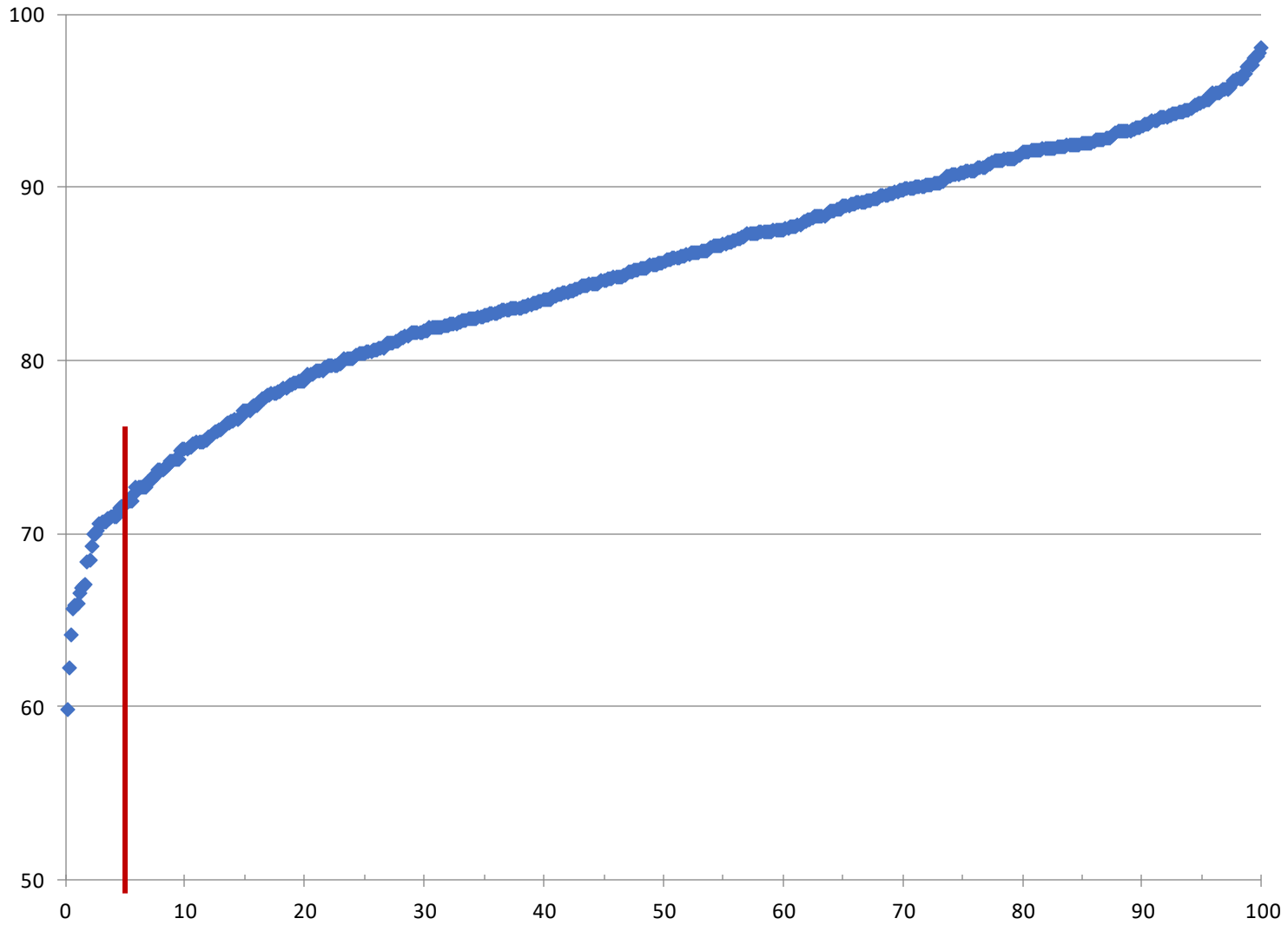
GLIMPSS appropriate for large streams

Problem: There were questions and comments regarding the use of WVSCI on large streams since most of our reference sites were from small order streams.

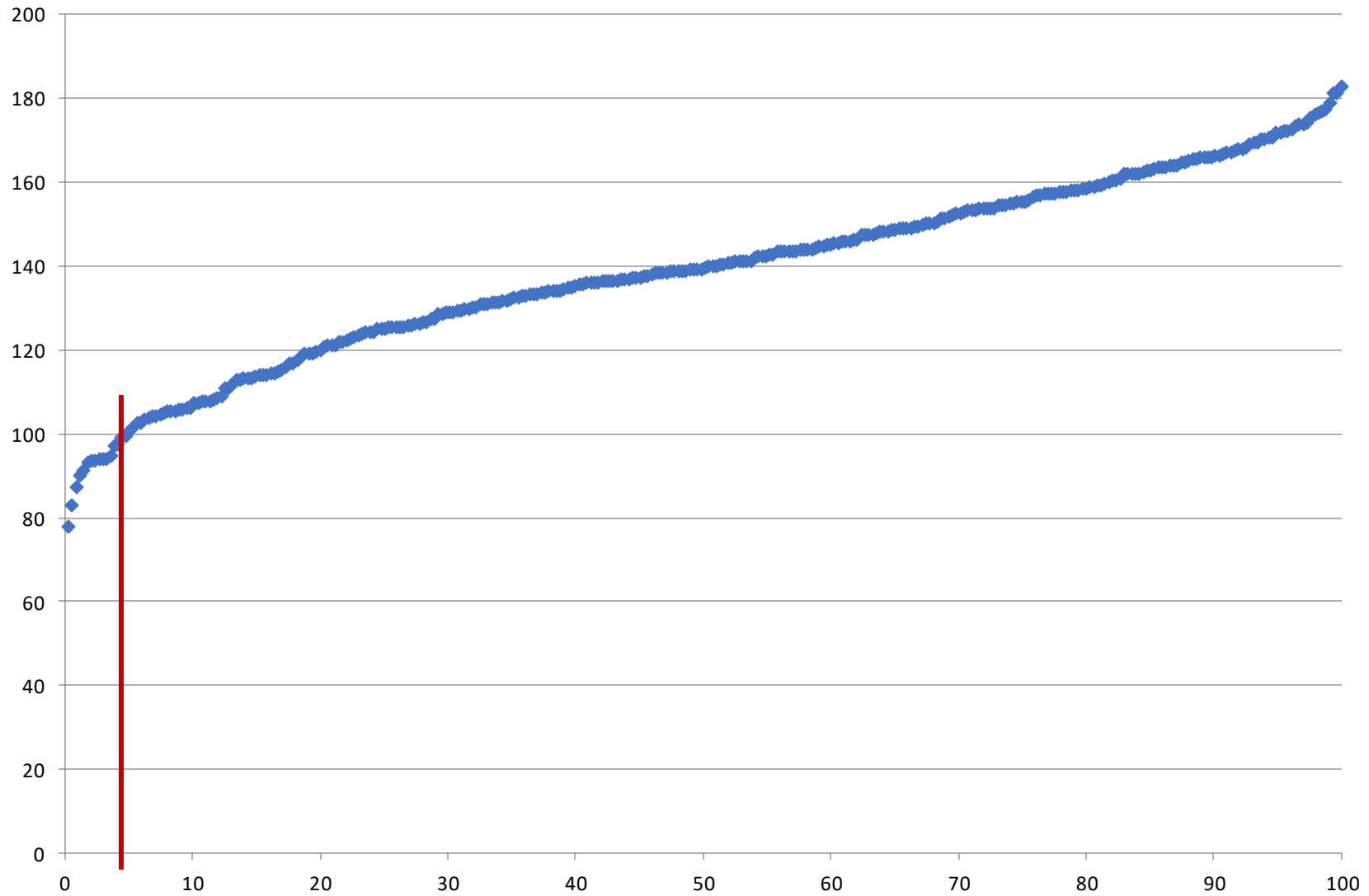
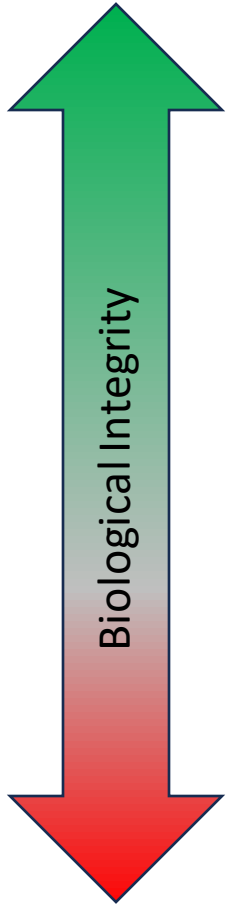
Action/Improvement: GLIMPSS included an investigation of stream size and now includes a seagion* >60 square miles in mountain region that seems to work well, and it has watershed-size appropriate reference conditions.

*Seagion = season + region

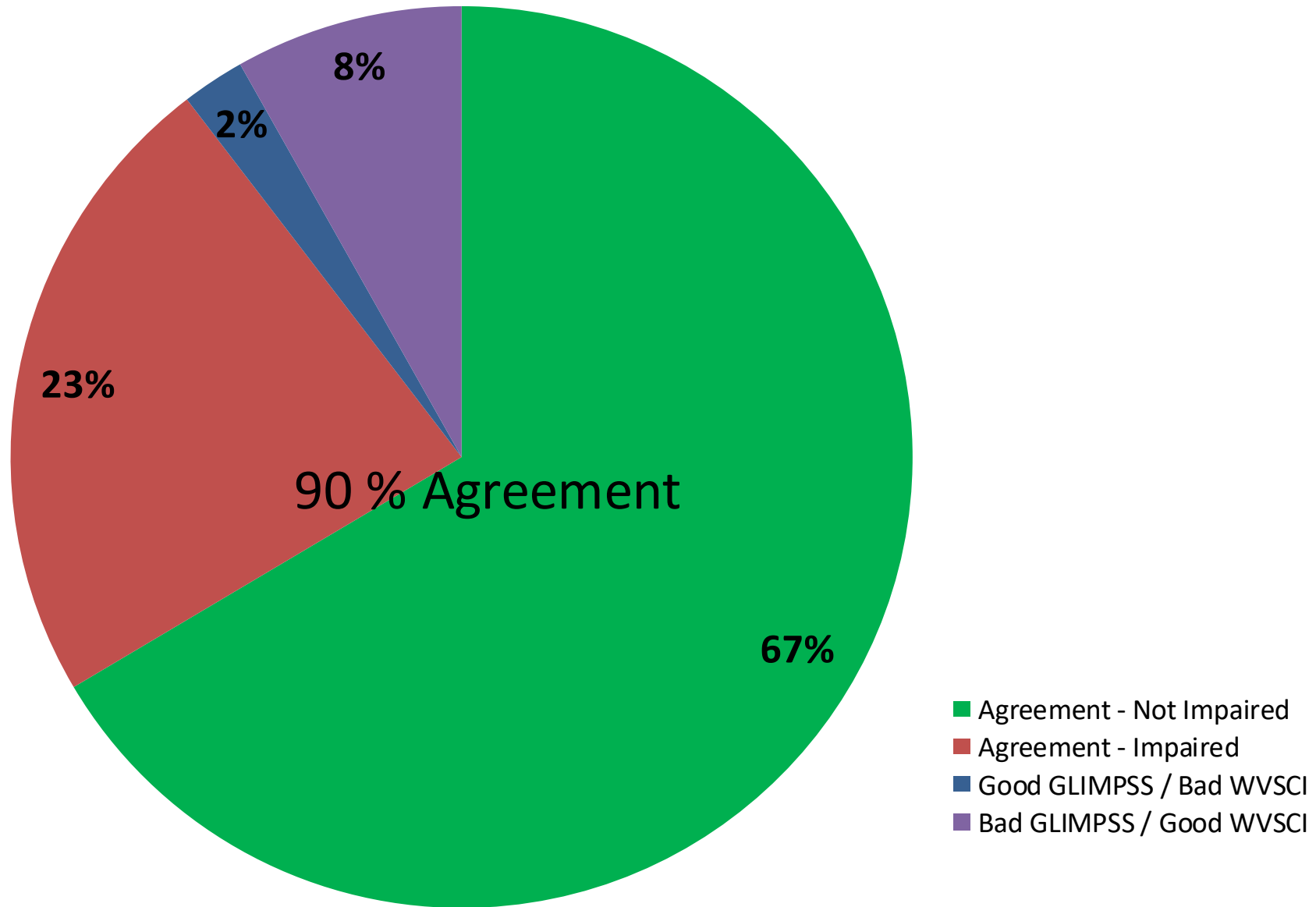
Distribution of Reference Site Scores - WVSCI



Distribution of Reference Site Scores - GLIMPSS



Comparison of Recent Benthic Macroinvertebrate IBIs



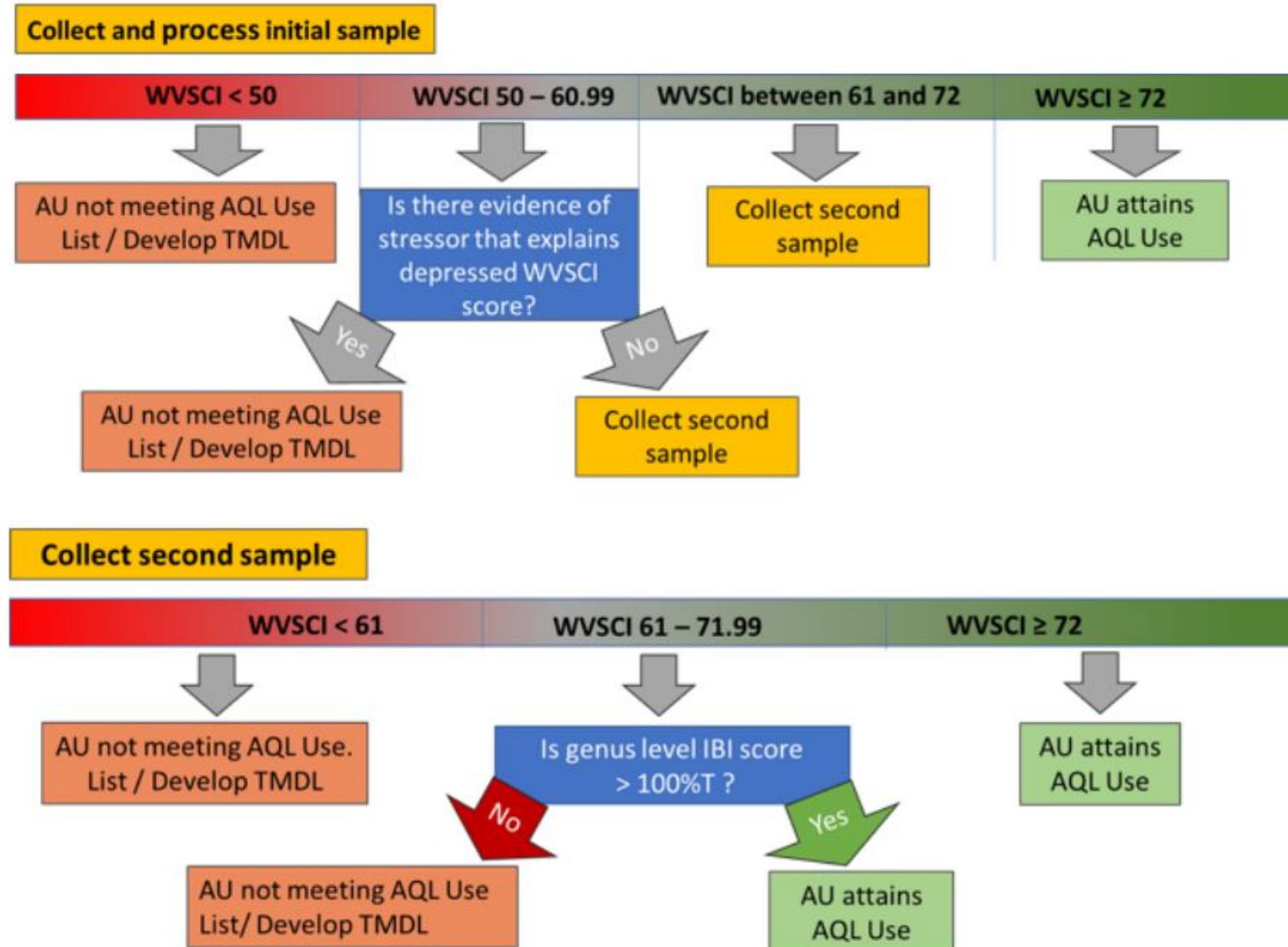
The **benthic macroinvertebrates should be assessed via GLIMPSS**, not WVSCI. Shelving the genus level IBI is not defensible considering its improved diagnostic abilities, season and region (and drainage area) specificity, minimal extra cost for genus level identifications, increased flexibility in sampling dates, and current availability. GLIMPSS has been peer reviewed – both by a diverse group of WV experts and by the reviewers of the journal that published it.

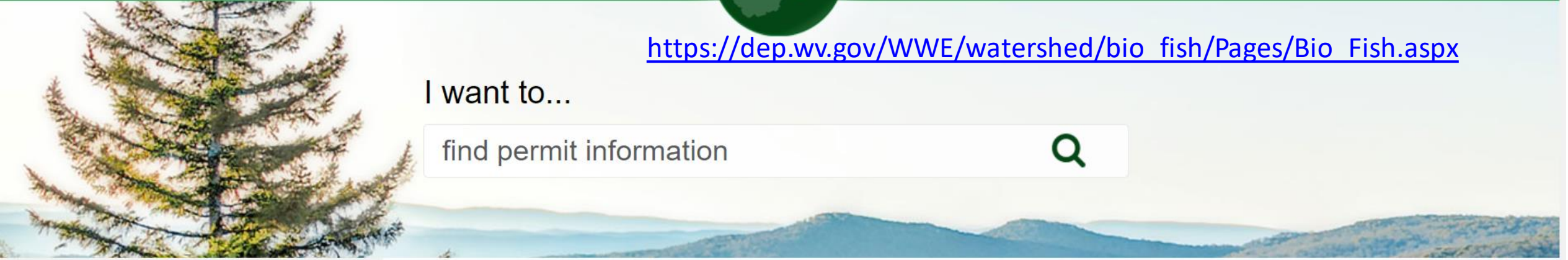
GLIMPSS was developed to address the criticisms and flaws of the WVSCI presented to us over the years by a variety of interested parties, including industry, environmental groups, EPA, academia, WVDNR, consultants, and personnel from within WVDEP.

Aquatic Life Use Assessment and Biological Stressor Identification Procedures

August 2021

Aquatic Life Use – Assessment Decision Flowchart





https://dep.wv.gov/WWE/watershed/bio_fish/Pages/Bio_Fish.aspx

I want to...

find permit information 🔍

✕ Home > Division of Water and Waste Management > Watershed Management > Biological Monitoring

Division of Water and Waste Management

- Contact Information
- Data
- + Environmental Enforcement
- Industry Training
- + Permitting
- + Programs
- Regulations
- + Resources and Education

Biological Monitoring

In 1995, the West Virginia Department of Environmental Protection (DEP) established the Watershed Assessment Program to assess and report on the water quality of the State's streams and lakes. Following a period of restructuring within the agency, the program's name was changed to the Watershed Assessment Branch (WAB). The WAB is comprised of a staff of biologists and environmental scientists who measure and assess the chemical and physical properties of water, assess habitat conditions, and collect biological samples in the form of benthic macroinvertebrates and fish from streams and lakes throughout the state. As of 2020, WAB has collected 10,598 benthic macroinvertebrate samples at 6,847 stations, from 3,896 different streams. About 560 fish community samples have been collected at 501 stations, from 406 different streams. Since 1998, WAB has used the benthic macroinvertebrate data to measure the biological health of West Virginia streams. Fish community sampling in streams has been part of WAB biological monitoring since 2006.



Additional Information

 **WAB Benthic Macroinvertebrate Data Quality Reporting Tool**



Water Quality Data Report - Benthic

County	Watershed	
Kanawha ▾	Lower Kanawha ▾	Display Report
Recent data should be considered provisional and subject to revision		

[Link to data tool](#)

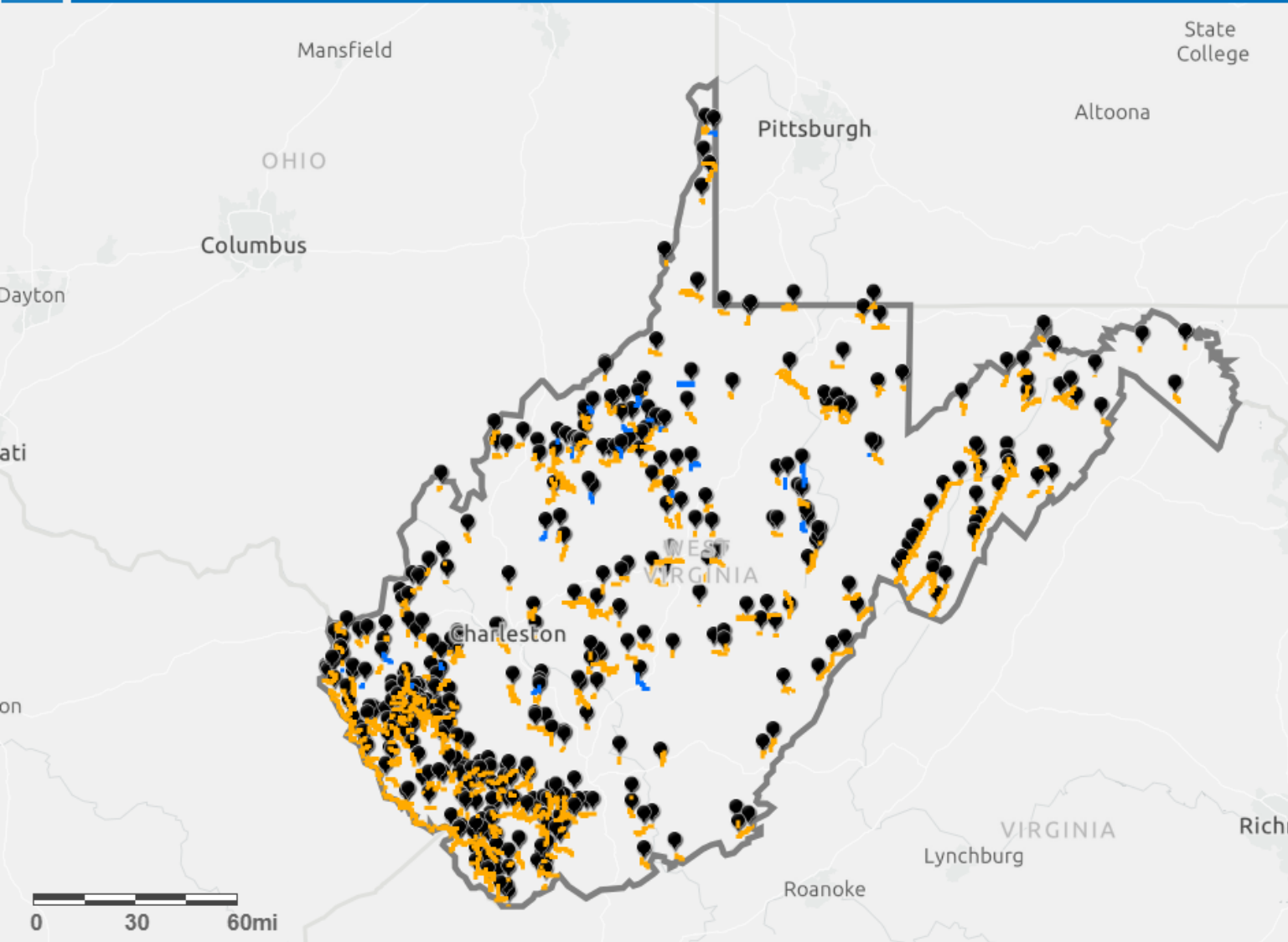
Microsoft Excel

The file format and extension of 'WVDEPBENTHIC (3).xls' don't match. The file could be corrupted or unsafe. Unless you trust its source, don't open it. Do you want to open it anyway?

Water Quality Data Report - Benthic

(Watershed: Lower Guyandotte) (County: Lincoln)

Stream Name	Stream Code	Mile Point	Watershed	County	Sample Date	IBI	Seagion	WVSCI											
								% 2 Dominant Taxa	% Chironomidae	% EPT	HBI Score	# EPT Taxa	# Total Taxa	WVSCI	# Total Taxa	# Intol Taxa <3	# Intol Taxa <4	# EPT Taxa	# Ephemeroptera Taxa
Bear Creek	WVOG-18	0.3	Lower Guyandotte	Lincoln	5/30/2018	WVSCI/GLIMPSS	Spring Plateau	74.16	29.67	22.49	5.5	4	11	47.52	13	1	2	5	2
Twomile Creek	WVOG-20	0.4	Lower Guyandotte	Lincoln	5/31/2018	WVSCI/GLIMPSS	Spring Plateau	79.91	62.62	20.56	5.59	3	11	38.62	13	0	1	5	3
Falls Creek	WVOG-22	0.2	Lower Guyandotte	Lincoln	6/5/2018	WVSCI/GLIMPSS	Summer Plateau	67.15	43	45.41	5.02	5	10	52.96	13	2	3	8	5
UNT/Guyandotte River RM 33.39	WVOG-23.8		Lower Guyandotte	Lincoln	5/22/1998	WVSCI	Spring Plateau	82.79	63.26	5.12	6.28	3	8	30.79					
Twomile Creek	WVOG-24	0.5	Lower Guyandotte	Lincoln	4/30/2018	WVSCI/GLIMPSS	Spring Plateau	86.54	52.4	40.87	5.03	8	13	51.3	18	1	4	12	7
Twomile Creek	WVOG-24	0.8	Lower Guyandotte	Lincoln	5/4/2005	WVSCI/GLIMPSS	Spring Plateau	83.49	60.85	34.43	5.2	8	12	48.28	20	2	5	15	10
Fourmile Creek	WVOG-27	0.34	Lower Guyandotte	Lincoln	9/17/2003	WVSCI/GLIMPSS	Summer Plateau	69.28	33.99	38.56	5.16	4	12	52.7	15	0	2	5	4
Fourmile Creek	WVOG-27	0.34	Lower Guyandotte	Lincoln	5/1/2018	WVSCI/GLIMPSS	Spring Plateau	83.25	61.93	23.35	5.3	3	11	39.08	13	0	1	4	4
Fourmile Creek	WVOG-27	5.2	Lower Guyandotte	Lincoln	9/11/2017	WVSCI/GLIMPSS	Summer Plateau	46.15	7.24	74.21	4.35	12	24	88.60	20	0	1	14	8



Legend

- Waters Identified by EPA for Addition to West Virginia's 2022 List of Impaired Waters
- Waters on West Virginia's 2022 List of Impaired Waters that EPA would consider to be meeting applicable water quality standards based on GLIMPSS methodology
- Water Quality Monitoring Stations

[Link to EPA's Map](#)

<https://www.epa.gov/tmdl/wv-303d-list-public-notice>

How to Comment

Comments Due: October 18th, 2023

You may send written comments to Mr. Gregory Voigt by the following methods:

- Electronic mail: voigt.gregory@epa.gov. Include 'FRL-10978-01-R3 comment' in the subject line of the message. Electronic mail submissions including body text and attachments are limited to 25 megabytes. EPA cannot receive electronic mail attachments in ZIP format (.zip).
- Mail: Mr. Gregory Voigt, Mail Code 3WD42, U.S. Environmental Protection Agency Region 3 Water Division, Four Penn Center 1600 John F. Kennedy Blvd. Philadelphia, PA 19103-2852.

Questions?

Contact Information

John Wirts jwirts@wvrivers.org

Or

Jenna Dodson jdodson@wvrivers.org