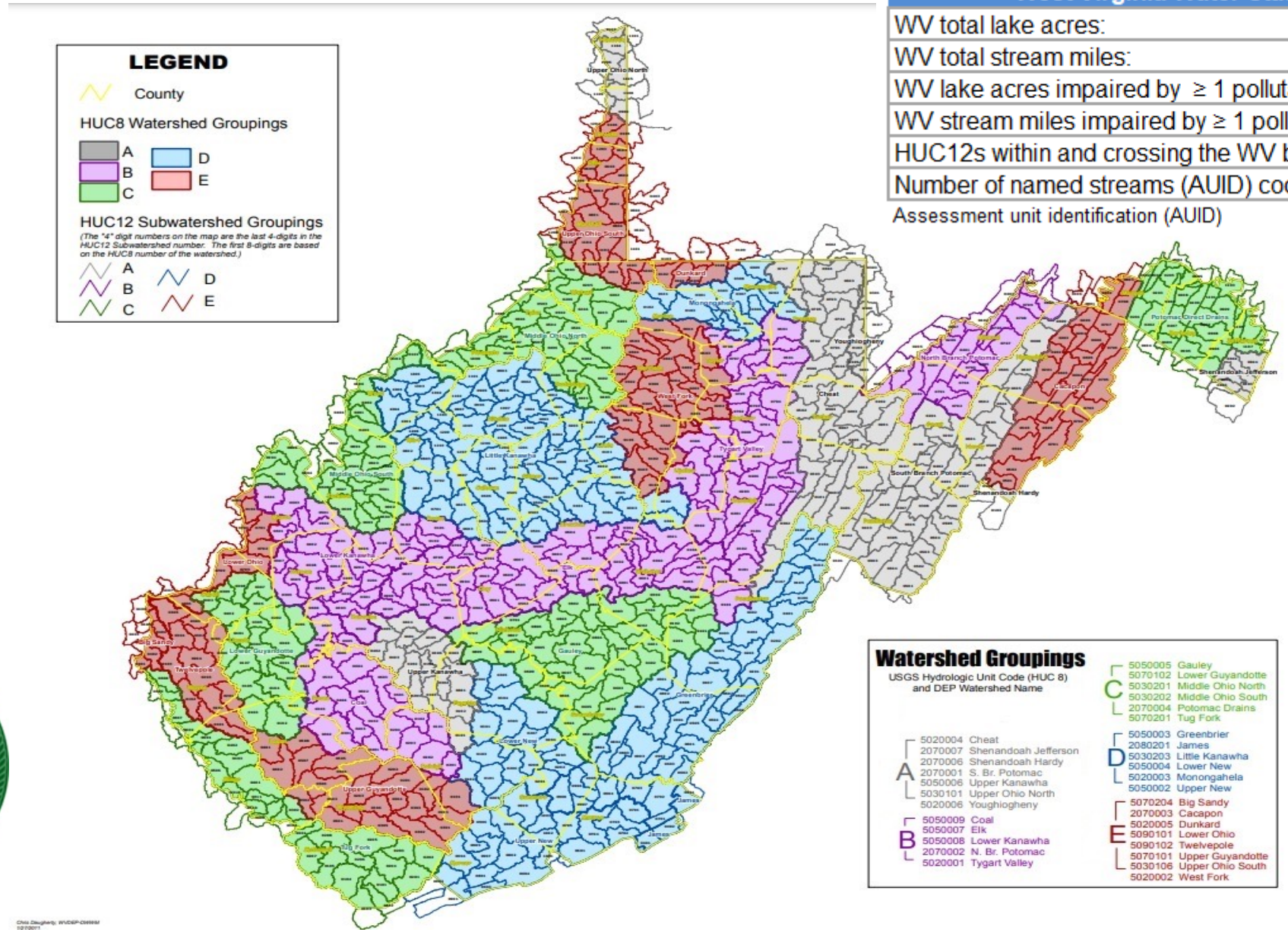
West Virginia and 50-years of the Clean Water Act

How have we done, and what are we doing to improve water quality? And… a little about West Virginia's TMDL, NPDES, and §319 Programs. Plus, more!

West Virginia is a water rich state

West Virginia Water Statistics	
WV total lake acres:	24,864
WV total stream miles:	53,747
WV lake acres impaired by ≥ 1 pollutant:	11,716
WV stream miles impaired by ≥ 1 pollutant:	16,904
HUC12s within and crossing the WV border:	775
Number of named streams (AUID) codes:	10,714

Assessment unit identification (AUID)

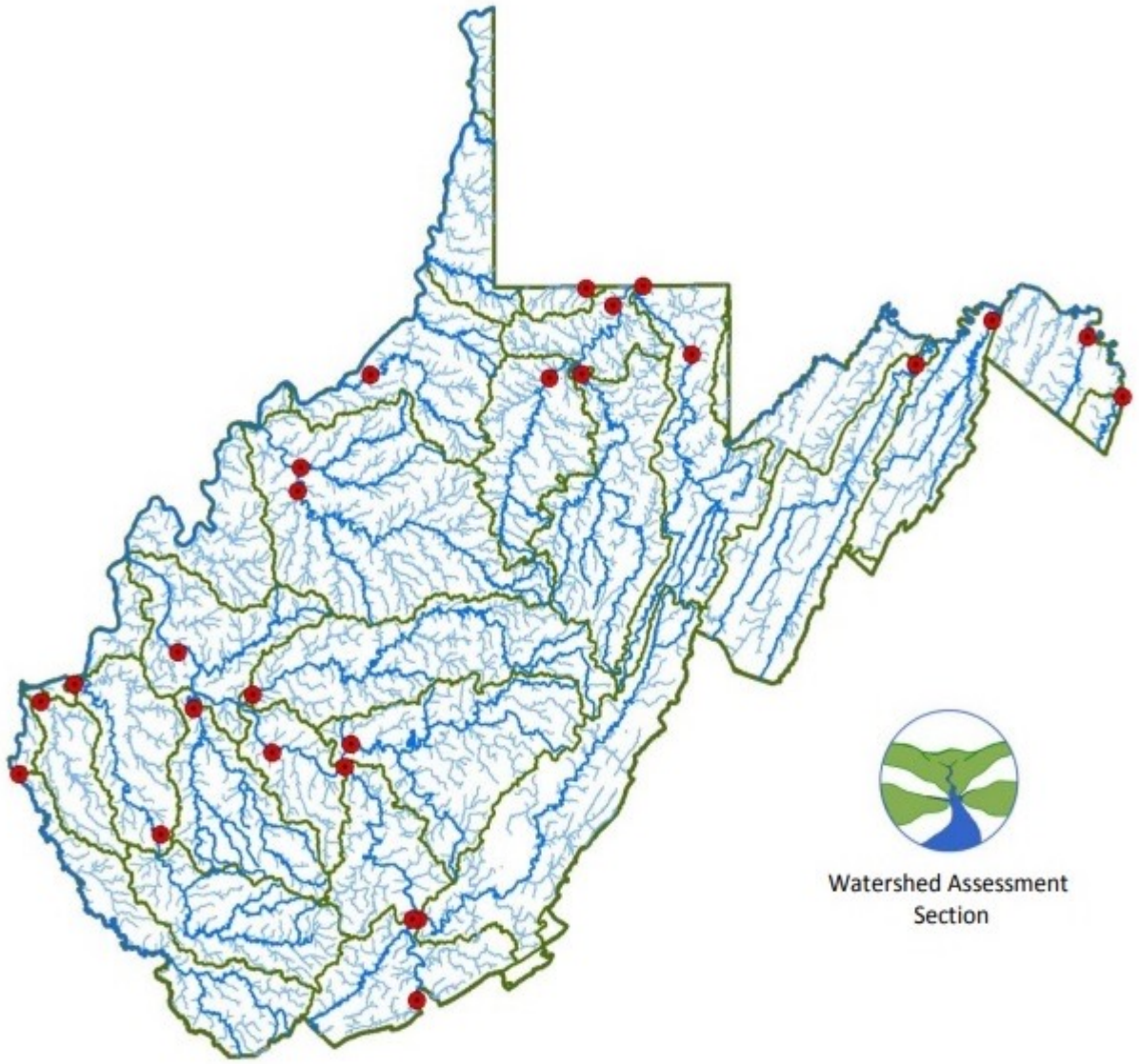


Watershed Groupings

USGS Hydrologic Unit Code (HUC 8) and DEP Watershed Name

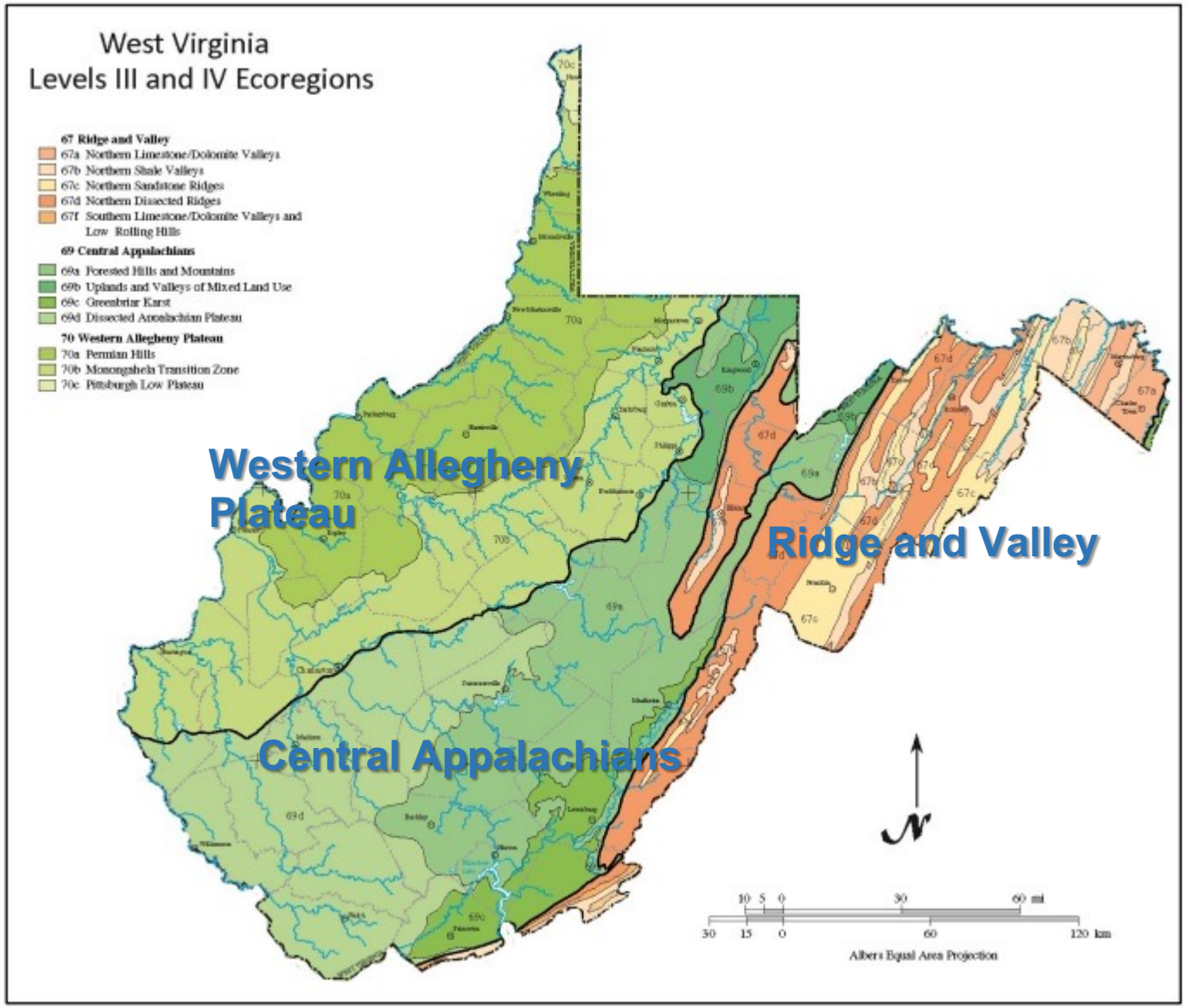
A	5020004	Cheat
	2070007	Shenandoah Jefferson
	2070006	Shenandoah Hardy
	2070001	S. Br. Potomac
	5050006	Upper Kanawha
	5030101	Upper Ohio North
	5020006	Youghiogheny
B	5050009	Coal
	5050007	Elk
	5050008	Lower Kanawha
	2070002	N. Br. Potomac
	5020001	Tygart Valley
C	5050005	Gauley
	5070102	Lower Guyandotte
	5030201	Middle Ohio North
	5030202	Middle Ohio South
	2070004	Potomac Drains
	5070201	Tug Fork
D	5050003	Greenbrier
	2080201	James
	5030203	Little Kanawha
	5050004	Lower New
	5020003	Monongahela
	5050002	Upper New
E	5070204	Big Sandy
	2070003	Cacapon
	5020005	Dunkard
	5090101	Lower Ohio
	5090102	Twelvepole
	5070101	Upper Guyandotte
	5030106	Upper Ohio South
	5020002	West Fork

Do we really know how we're doing?



A study of WV Department of Environmental Protection (WVDEP) – Watershed Assessment Branch (WAB) Ambient Water Quality Monitoring (AWQM) stations was published in April 2015. It examined long-term and short term-trends at all 26 AWQM stations. Let's look at the results…

Ecoregional Trends

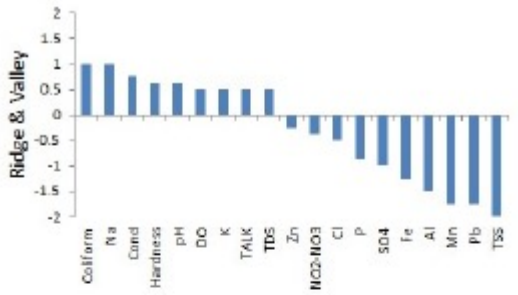


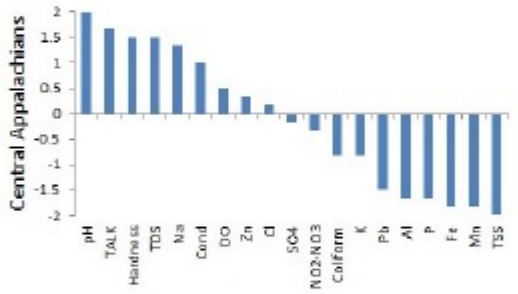
At almost all monitoring stations, long-term trends increased for alkalinity and pH and decreased for total phosphorus, total suspended solids and most metals (i.e., aluminum, iron, manganese and lead). Short-term trends in hardness and to a lesser extent dissolved oxygen increased statewide whereas long-term trends were mixed. Fecal coliform increased in some regions but decreased in others. Others, such as chlorides and nitrogen showed no significant changes.

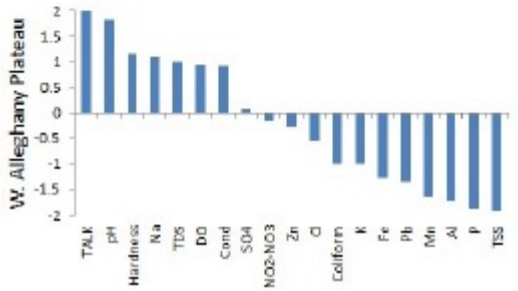
More trends and statistics

Ecoreg.	Station	StreamName	Type	Not Adjusted for Flow: Recent Trend	Not Adjusted for Flow: Recent Slope	Not Adjusted for Flow: Long-term Trend	Not Adjusted for Flow: Long-term Slope	Flow Adjusted: Recent Trend	Flow Adjusted: Long-term Trend	2009-2012: Min	2009-2012: Median	2009-2012: Max
Western Allegheny Plateau	MC-00001-3.5	Cheat River	IIIa	ns		-				70	105.5	166
	KC-00001-11.6	Coal River	Ia	▲	9.20E+00	▲	8.70E+00	ƒ ▲	ƒ ▲	295	696.5	1230
	ML-00001-20.6	Dunkard Creek	IIa	▲	1.76E+01	▲		ƒ ▲	ƒ ▲	250	683	2558
	KE-00001-4.3	Elk River	Ia	▲	3.18E+00	▲	2.15E+00	ƒ ▲	ƒ ▲	90	155	402
	OGL-00001-2.8	Guyandotte River (Lower)	Ia	ns		ns				188	330	633
	LK-00025-1.5	Hughes River	IIa	ns		ns				96	148	281
	KL-00001-31.7	Kanawha River (Lower)	Ia	ns		▲	8.82E-01	ƒ ns	ƒ ▲	148	226	398
	LK-00001-28.9	Little Kanawha River	Ia	ns		ns		ƒ ns	ƒ ns	79	114	179
	OMN-00006-12.3	Middle Island Creek	IIa	ns		ns		ƒ ns	ƒ ns	111	154	263
	MU-00001-99.4	Monongahela River (Upper)	Ia	▲	7.50E+00	▲	1.75E+00			156	366	788
	BST-00001-0.15	Tug Fork	Ia	ns		▲	5.56E+00	ƒ ▲	ƒ ▲	337	649	1010
	OT-00001-8.8	Twelvepole Creek	IIIa	▲	4.00E+00	-				137	207	326
	MT-00001-6.2	Tygart Valley River	Ia	ns		▲	6.36E-01	ƒ ns	ƒ ▲	78	133	188
	MW-00001-12	West Fork River	Ia	ns		▽	-5.55E+00	ƒ ns	ƒ ▽	265	699	1057
Central Appalachians	MC-00001-30	Cheat River	Ia	ns		▽	-5.00E-01	ƒ ns		56	86.5	133
	KG-00001-8.25	Gauley River	Ia	ns		▲	5.79E-01	ƒ ^	ƒ ▲	67	87.5	167
	KNG-00001-1.6	Greenbrier River	Ia	ns		ns		ƒ ns	ƒ ▽	93	133	230
	OGL-00001-74.1	Guyandotte River (Lower)	IIIa	ns		-		ƒ ns		226	397	780
	KU-00001-74.1	Kanawha River (Upper)	Ia	▲	2.56E+00	▲	1.23E+00	ƒ ▲	ƒ ▲	30	192	257
	KNL-00001-1.2	New River (Lower)	Ia	ns		▲	4.60E-01	ƒ ns	ƒ ▲	118	166	215
	KNU-00001-67.4	New River (Upper)	IIa	ns		▲		ƒ ns	ƒ ▲	135	162	240
	KNU-00001-96.2	New River (Upper)	IIa	▲	1.38E+00	▲		ƒ ^	ƒ ▲	106	170	215
Ridge & Valley	PU-00010-6.1	Cacapon River	Ia	▲	1.85E+00	ns		ƒ ▲	ƒ ▲	102	153	203
	PL-00014-2.2	Opequon Creek	IIa	▲	6.33E+00	▲		ƒ ▲	ƒ ▲	368	673.5	790
	PSB-00001-13.4	South Branch Potomac River	Ia	^	1.82E+00	▲	1.00E+00	ƒ ns	ƒ ▲	158	208.5	301
	PS-00001-0.9	Shenandoah River	Ia	▲	4.92E+00	▽	-1.50E+00	ƒ ▲	ƒ ▽	235	334	403

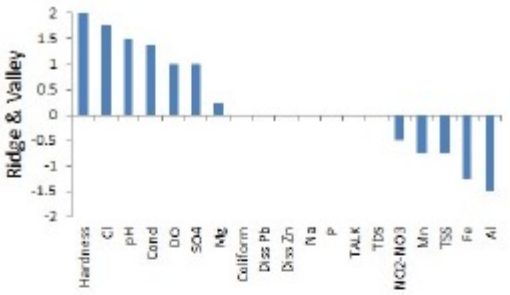
Report table - Conductivity

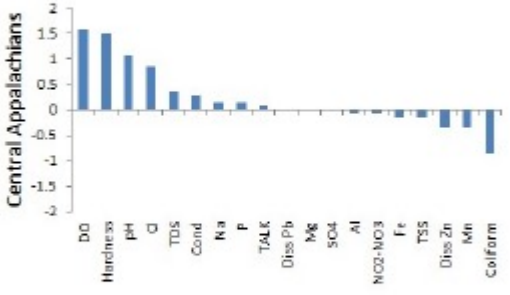


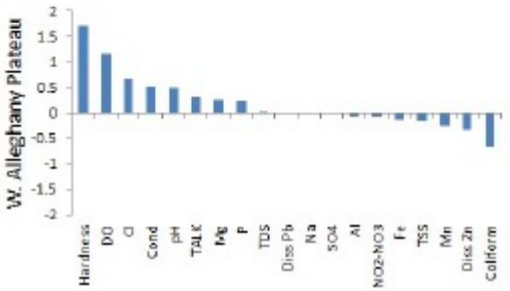




Long-term ecoregions







Short-term ecoregions

What else are we doing? Well, there are TMDLs and lots of monitoring…

West Virginia's Monitoring and Data Sources

- Ambient Water Quality Monitoring (some data as far back as the 1940's)
- Fish community assessments and fish tissue studies (some data as far back as the 1970's)
- Benthic macroinvertebrate surveys (since the late 1990's)
- Reference stream monitoring and assessments (since 1996)
- Probabilistic assessment sampling (since 1997)
- Pre-TMDL monitoring and source tracking (since 1999)
- Continuous instream water quality monitoring [Hourly time series data] (since 2004)
- Lake's assessments (since 2004)
- Stormwater sampling on streams (since 2005)
- Trout surveys (since 2007)
- Long-Term biology and habitat monitoring stations (since 2007)
- AMD impacted stream restoration monitoring and assessments (since 2009)
- Harmful algal bloom response plans and trend analysis (since 2016)
- Filamentous algae sampling (since 2012)
- Wetland monitoring and assessment
- Citizen Science and third-party data (Both legacy and ongoing)

Here is a map, plus a little history lesson.

TMDL Timeline

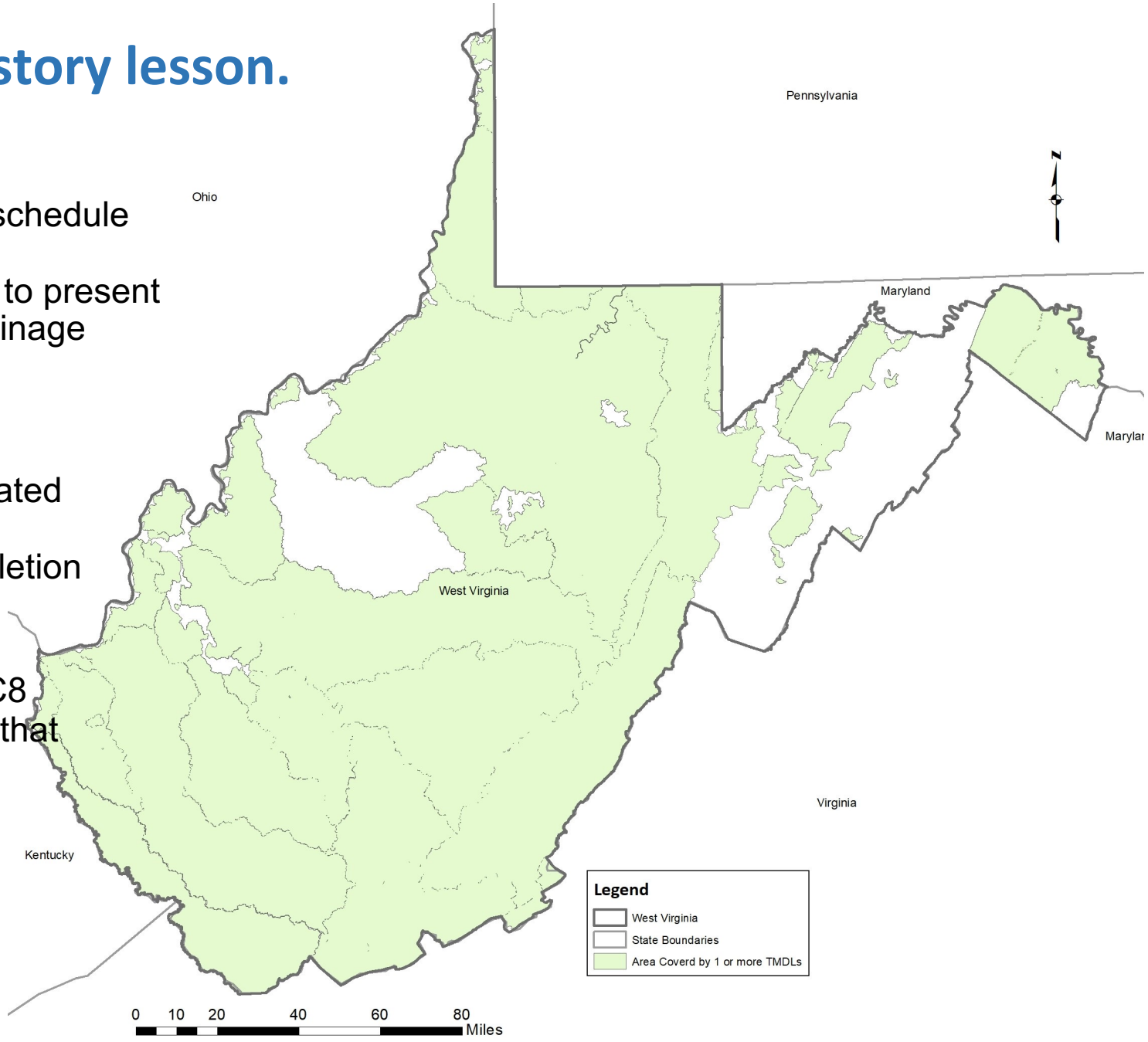
- Consent Decree – all demands met on schedule
- EPA created WV TMDLs prior to 2001
- WV facilitates TMDL preparation - 2004 to present
  - Initially addressing remaining mine drainage impairments
- 9,343 TMDLs completed to date

Current Progress - HUC8 scale

- Tug Fork Watershed - completion estimated February 2023
- Little Kanawha River Watershed - completion estimated August 2023

Future Plans

- Cacapon River Watershed – Entire HUC8
- Back Creek and Potomac Direct Drains that will Include citizen monitoring data
- Upper Elk River – above Sutton Dam



West Virginia's NPDES Program

National **P**ollutant **D**ischarge **E**limination **S**ystem

- Control water pollution by regulating point sources that discharge pollutants into waters of the United States
- West Virginia was granted primacy to implement the NPDES and Pretreatment Programs in 1982
- WV/NPDES Permits are both a State Permit (WV Water Pollution Control) and Federal Permit (NPDES).

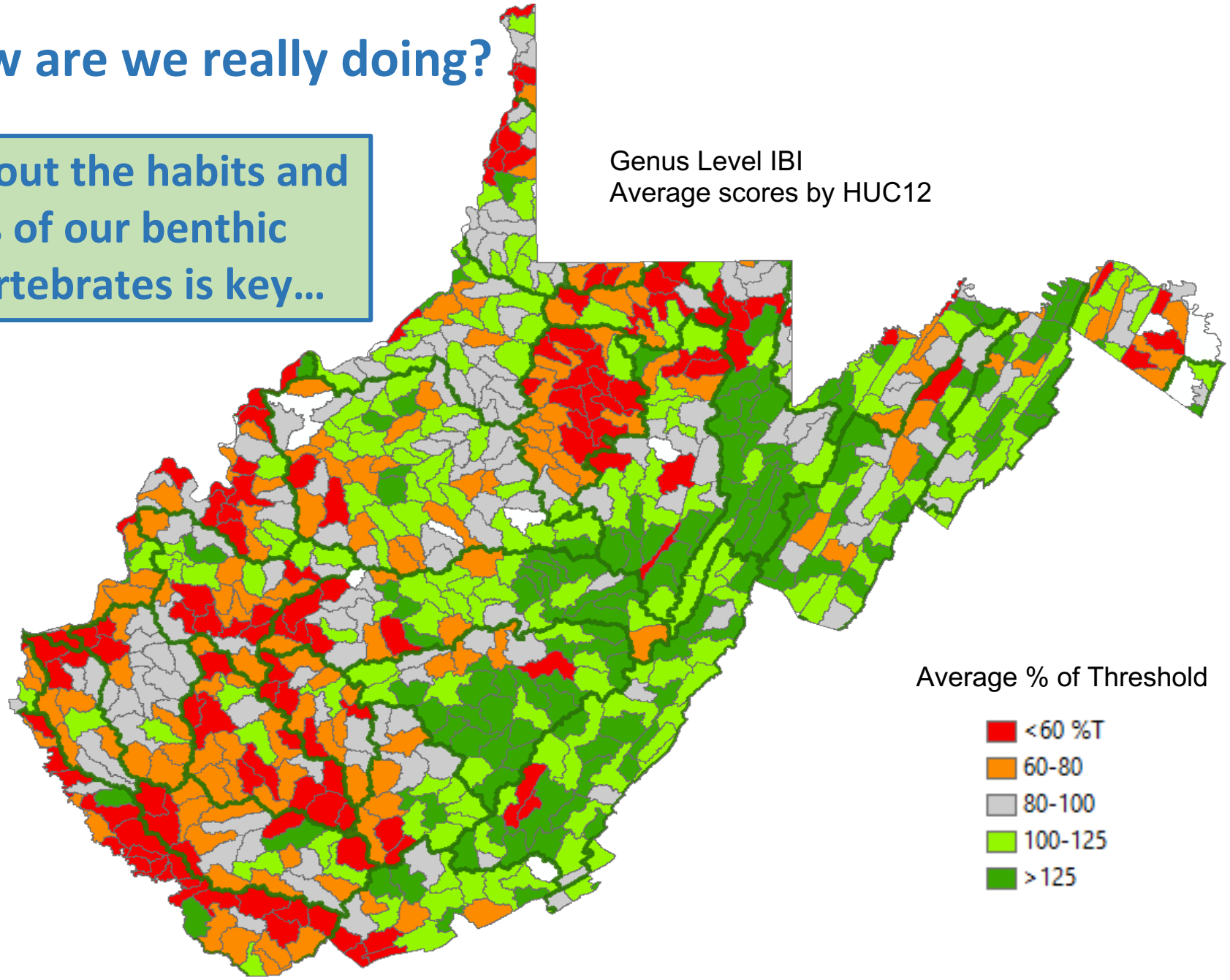
The Permit Team

- Cover all industrial and sewage facilities in state
- Does not include landfills or mining
- Approximately 460 total individual permits
- 89 – Majors and 371 – Minors

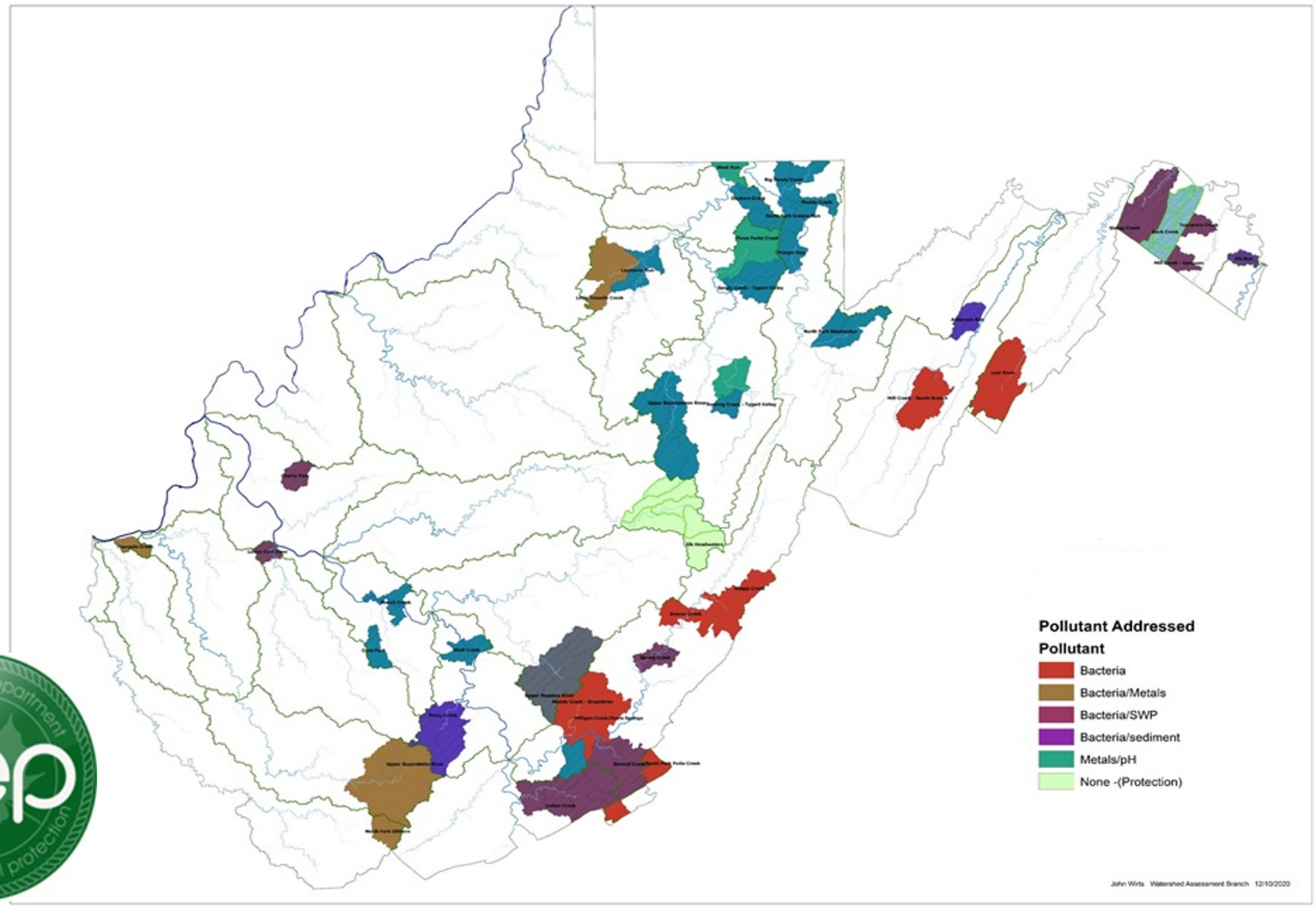
We do not live in a box! Here are just a few interactions: **Environmental Enforcement** [Site inspections, administrative/consent orders, Discussion of permit requirements]. **Watershed Assessment Branch** [TMDLs and stream impairments, Stream data, Stream biological integrity determinations]. **Office of Legal Services** [EQB Permit appeals]. **ITO** [ePermitting, ERIS, eDMR]. **Water Quality Standards** [Variances, site specific criteria, revisions to Standards]. **State Revolving Fund** [POTW construction/upgrades]. **Lab Certification** [Appropriate analytical methods and detection levels]

Okay, now. How are we really doing?

Knowing about the habits and struggles of our benthic macroinvertebrates is key…



Our efforts include both regulatory and non-regulatory, which means voluntary action, local involvement and much more. There are tools to help – let's look.



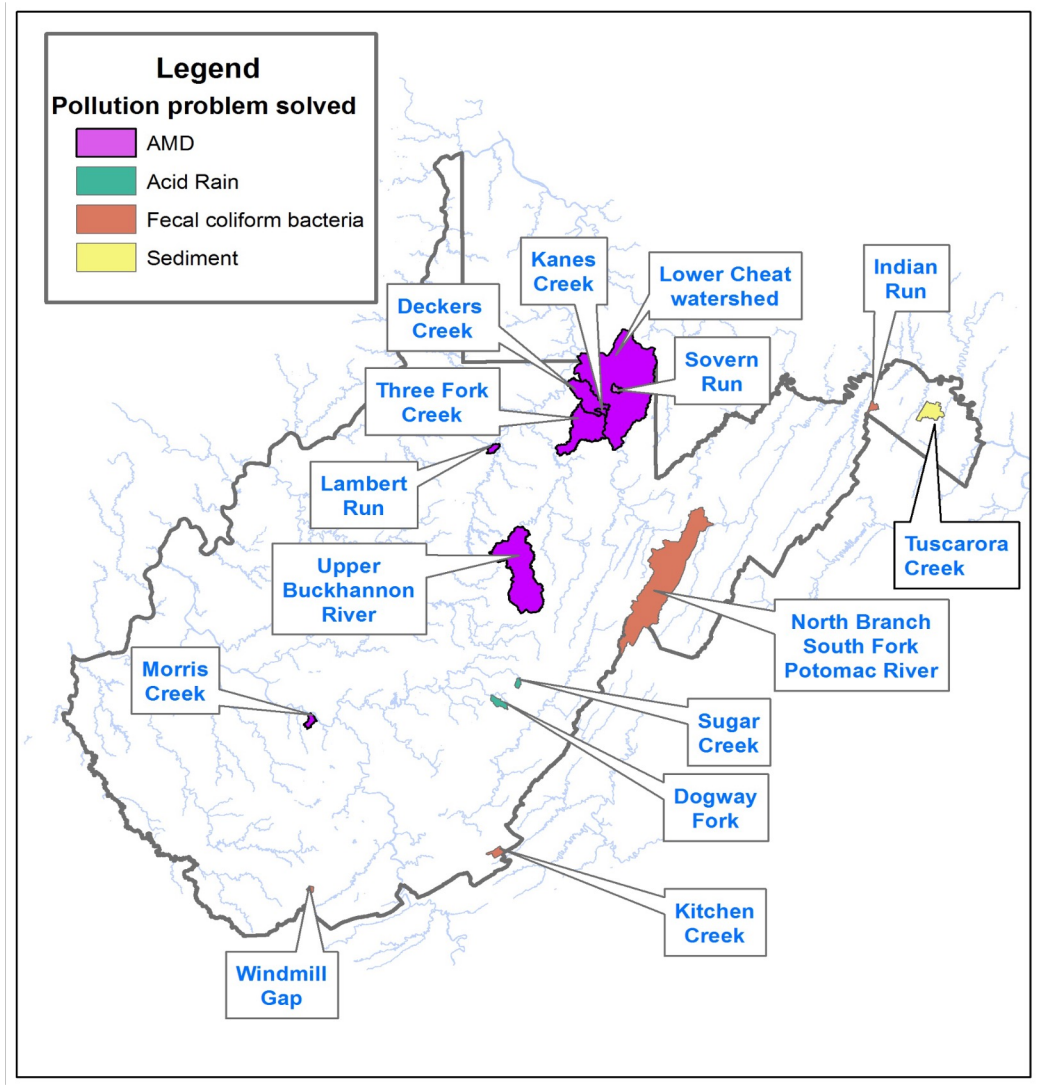
Watershed-Based Plans

47% of the watershed-based plans address legacy coal mine issues (mostly AMD) and/or other metals.

53% address bacteria primarily from agricultural sources but also in rural/urban/suburban areas.

There are currently 44 plans. 75% are active.

There are years of planning, project implementation and sometimes success!



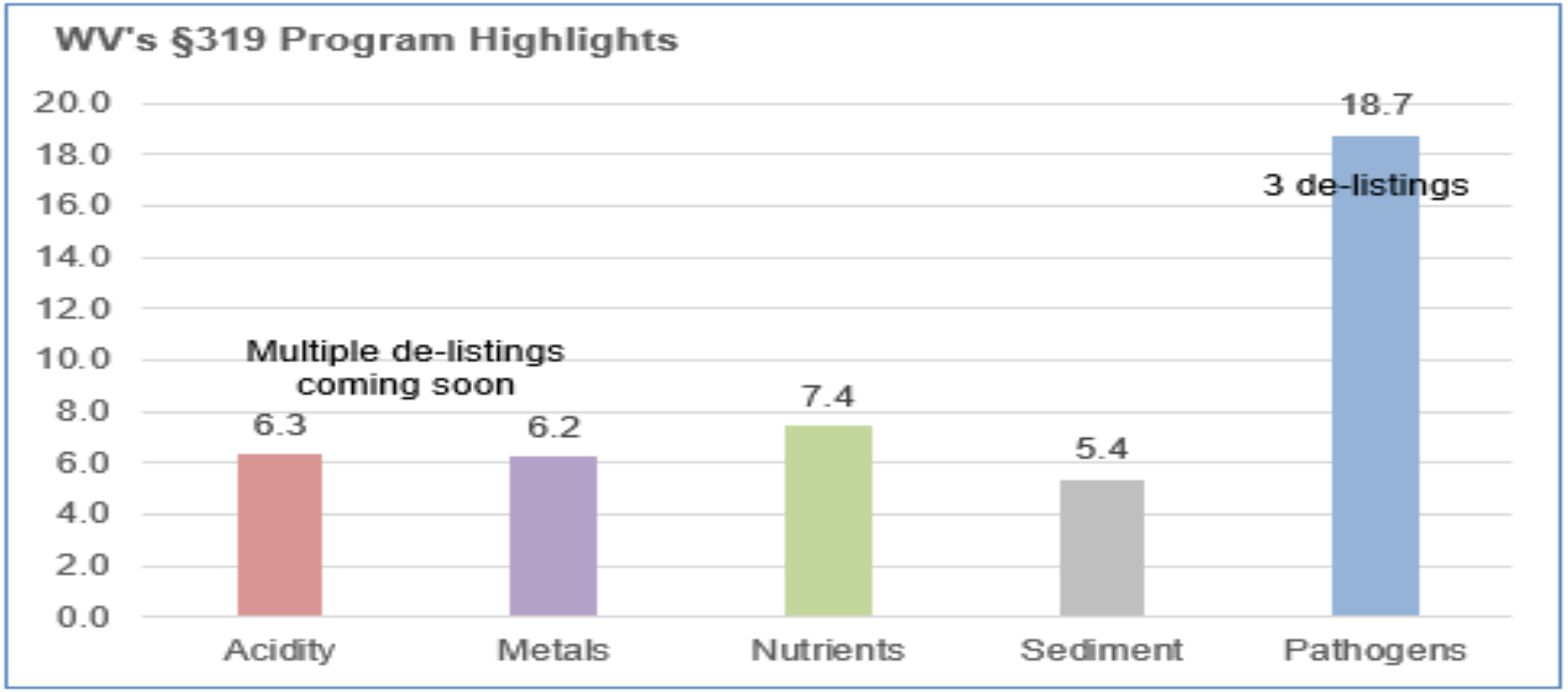
EPA approved §319 Success Stories

- FY21 - Muddy Creek restoration
- FY22 - Re-birth of the Lower Cheat River
- FY23 - Woodrow Wilson wetland restoration

More success

- West Virginia's Watershed Pilot Program
- WV Rivers capacity building and source water and watershed planning integration
- Second Creek socio-economic survey (EPA Task Order)
- Cypress funded projects

Snap-shot of nearly 30 years - West Virginia's §319 Program



Pollutant	Reduction	Unit	Log(N)
Acidity	2,175,344	lbs/yr	6.3
Metals	1,649,150	lbs/yr	6.2
Nutrients	25,826,489	lbs/yr	7.4
Sediment	233,229	lbs/yr	5.4
Pathogens	5.30E+18	CFU	18.7

Highlights: 19 soon to be 20 success stories primarily focused on water quality and ecological improvements. Since the program's inception in 1994 §319 partners have implemented ~ 413 projects - not including AGOs. The average cost/project is $140,000 and WV's average annual allocation is $1,800,000.

Nothing happens without active locally based stakeholders of all kinds!

The WORK of Watershed Associations

What do watershed associations do? Should you get involved? Watershed associations do many kinds of work, and a well-run group has a place for all kinds of work and all kinds of people.

UNIFYING THE COMMUNITY TO RESTORE, PROTECT, AND CELEBRATE ITS WATER IS THE MOST IMPORTANT MISSION

Resources:

Existing citizens' organizations, as well as local, state and federal agencies have resources—information, advice, and money—to help with the work of watershed associations.

River Network (RiverNetwork.org) is a national organization for grassroots organizations protecting water. They have training for building an effective organization and a national network of groups in solidarity with watershed groups.

West Virginia Department of Environmental Protection (WVDEP), **Watershed Improvement Branch** (go.wv.gov/wib) has basin coordinators for each part of the state, seed grant and project funds.

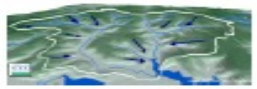
West Virginia Conservation Agency WV Watershed Resource Center (www.wvca.us/wvwrc) hosts the West Virginia Watershed Network, with many informative publications and a newsletter for watershed activists.

The **West Virginia Rivers Coalition** (www.WVRivers.org) is a partner to all groups working for clean rivers and streams.

The **West Virginia Nonprofit Association** (WVNPA.org) supports nonprofits. Membership benefits include access to fundraising databases, training, and expert advice.

Education: Let everyone know—

Where is your watershed?



What is a watershed?

Not for filling with waste!

Streams are for living things. . .

Vigilance and protection

Help enforce environmental laws.

Speak out!

Watch for and comment on possibly dangerous permits

Community will-power and resources

Fix the problems!

Build an AMD treatment project

Repair eroded stream banks.

Get rid of the trash!

Celebration and fun

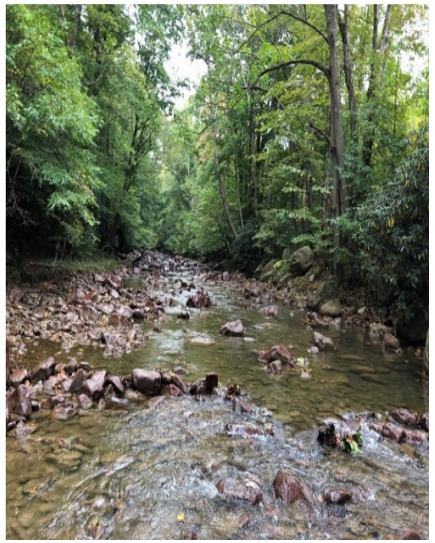
Establish greenspace and stream access..

GO swimming.

Go boating.

A few feel-good photos…

Before and After



How do we create a water-life that's better for all?

- We want to know what you think.
- We want to learn from your experiences.
- We want YOU to be involved.

Note: While preparing this presentation I have collected a wide variety of resources. If you would like a packet that includes a summary of the 2015 AWQM station study, WVDEPs water quality resources and much more. Send an email request to timothy.d.craddock@.wv.gov.

- We want to learn how to be better.
- We want to do more, sometimes with less.
- How can you help us protect and restore our abundant water resources?

https://go.wv.gov/wib