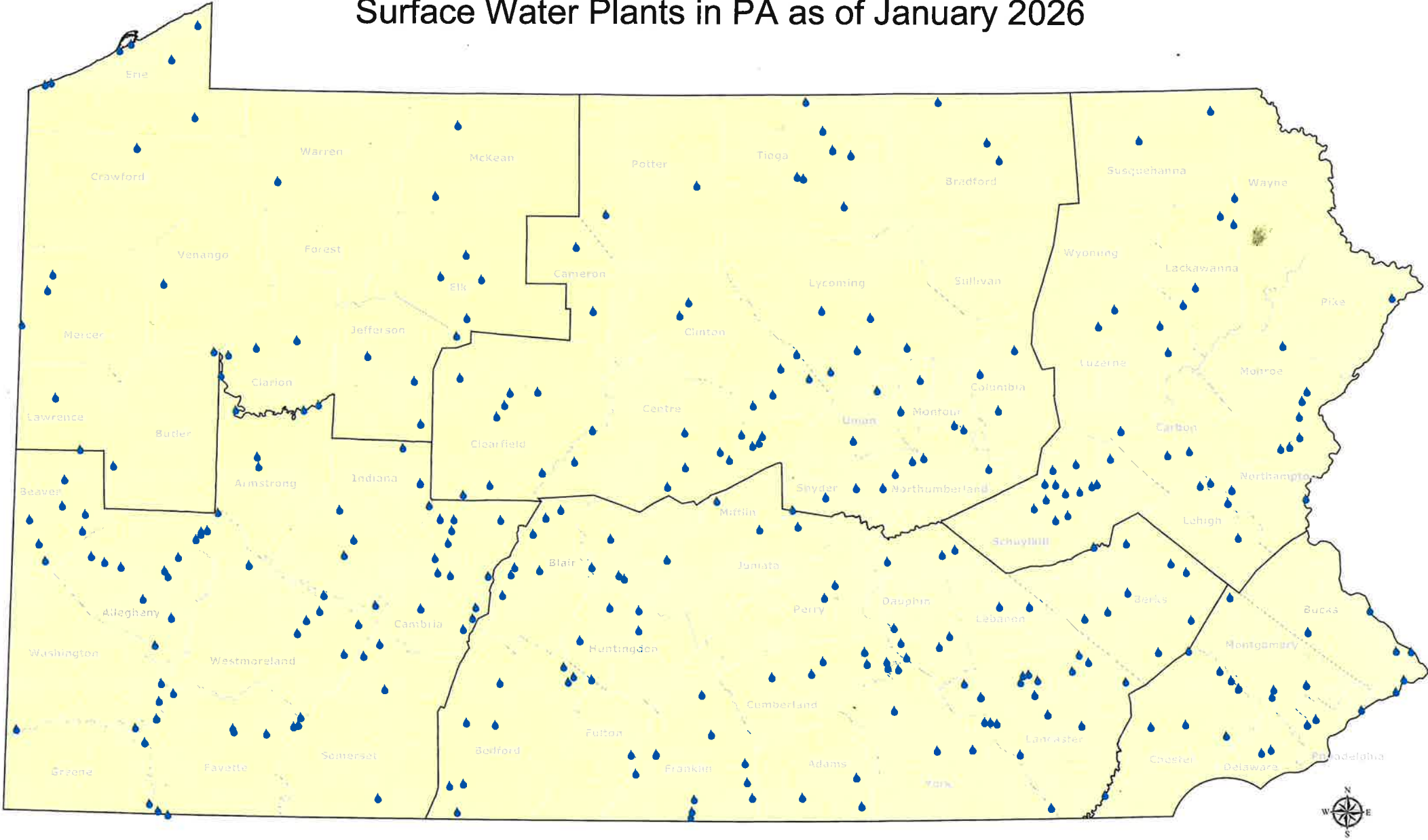





Surface Water Plants in PA as of January 2026



 Filter Plants

 DEP Regions

 PA Counties

PA's Growing Greener Grants

Who is eligible?

- Counties, municipalities, and municipal authorities
- County conservation districts
- Watershed organizations
- Councils of governments
- Educational institutions
- Other authorized organizations involved in water resource restoration and protection

How much funding is available?

The maximum Growing Greener grant request amount is \$500,000.

When are applications accepted?

The Growing Greener Grants Program usually opens in the Spring. Grant awards are typically made the following December or January.

How do I get started?

Visit the Department's website at www.dep.pa.gov and search "Growing Greener" for more information.



Rain Garden, Reform Congregation Keneseth Israel



OUR STORMWATER RETENTION PROJECT ENABLED US TO MAKE A POSITIVE IMPACT ON THE ENVIRONMENT AND PROVIDED AN EXCELLENT OPPORTUNITY FOR EDUCATION ON THE IMPORTANCE OF BEING GOOD CARETAKERS OF THE EARTH AND GOOD NEIGHBORS.

- Brian Rissinger, Executive Director, Reform Congregation Keneseth Israel

More Information

For more information on the Growing Greener Grants Program, visit the Department's website: www.dep.pa.gov (Search "Growing Greener").



Visit the Bureau of Watershed Restoration and Nonpoint Source Management (BWRNSM) online to learn more about clean water projects and funding opportunities across PA.



Pennsylvania
Department of
Environmental Protection
3320-BO-DEP5907



Pennsylvania
Department of
Environmental Protection



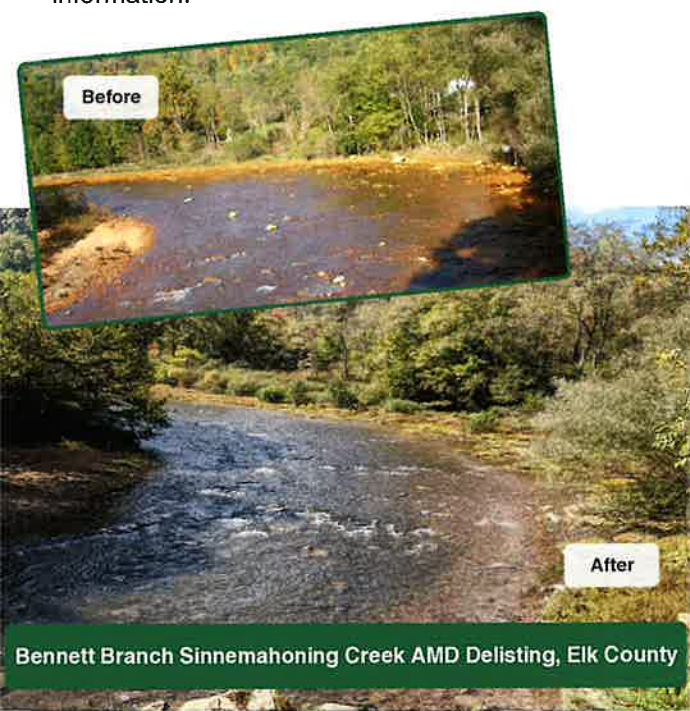
GROWING GREENER GRANTS PROGRAM

The Growing Greener Grants program supports projects that reduce nonpoint source pollution in Pennsylvania waters from:

- Agricultural activities
- Abandoned mine drainage (AMD)
- Stormwater runoff
- Energy resource extraction
- Streambank and shoreline degradation



East Branch Briar Creek Restoration, Columbia County



Before

After

Bennett Branch Sinnemahoning Creek AMD Delisting, Elk County

Little Cacoosing Creek Watershed Restoration, Berks County

After

Before

After

What kinds of projects can be funded?

Growing Greener funds projects that improve or protect Pennsylvania's waters from nonpoint source pollution. Eligible project types are divided into the following categories:

- Planning
- Education and Outreach
- Design and/or Construction
- Operation, Maintenance and Repair/Replacement
- Technical Assistance
- Evaluation, Assessment and Monitoring Tools for Watershed Management
- Watershed Group Organization/Support
- Healthy Waters Initiative
- Growing Greener Watershed Renaissance Initiative

After

Before

Stormwater Mitigation BMPs Longs Park, Lancaster County

Sample Projects

Stream Restoration and Stabilization



Before: Eroded banks.



After: Stabilized banks.

Wetland Restoration



The restoration of Longs pond wetland prevents flooding in Long's Park and an adjacent roadway.



Floodplain Restoration



Mid-construction :Swatara Creek floodplain.



After: Swatara Creek Floodplain.

Riparian Buffers



Before: Eroded creek.



After: Buffer planted.

Cover Crop Incentive Programs



Cumberland County's cover crop program is a model for improving soil health and reducing runoff.



Little Lehigh Creek Riparian Buffer, Lehigh County

Priority Project Examples

- Watershed Restoration
 - Agricultural, stormwater, and/or urban BMPs that reduce nitrogen, phosphorus, and sediment.
 - Projects that reduce AMD-related iron, aluminum, acidity, and sedimentation.
 - Floodplain restoration to reduce flooding.
 - Innovative BMP projects in MS4 communities.
 - Restore or protect designated uses of water.
- Planning
 - Agricultural erosion and sediment control or nutrient and manure management plans.
- Watershed Protection
 - Healthy Waters Initiative projects that curtail threats to a healthy waterbody or watershed.
 - Watershed Renaissance Initiative projects that reduce nutrient and sediment impairments in agriculturally-impaired waterways.
- Technical Assistance Projects
 - Regional or statewide projects that feature public-private partnerships that expedite on-the-ground BMP implementation.

Cover Crop Program, Cambria County

Aquatic Resource Impacts Due to Legacy Land and Water Use Practices

Ben Lorson, Pennsylvania Fish and Boat Commission
Statewide Water Resources Committee, 21 July 2021



The mission of the Fish & Boat Commission is to protect, conserve and enhance the Commonwealth's aquatic resources and provide fishing and boating opportunities.



Presentation Overview

- PA Fish and Boat Commission (PFBC)
- Legacy impact examples
- Aquatic habitat fragmentation and acid mine drainage (AMD) impacts



PA Fish and Boat Commission

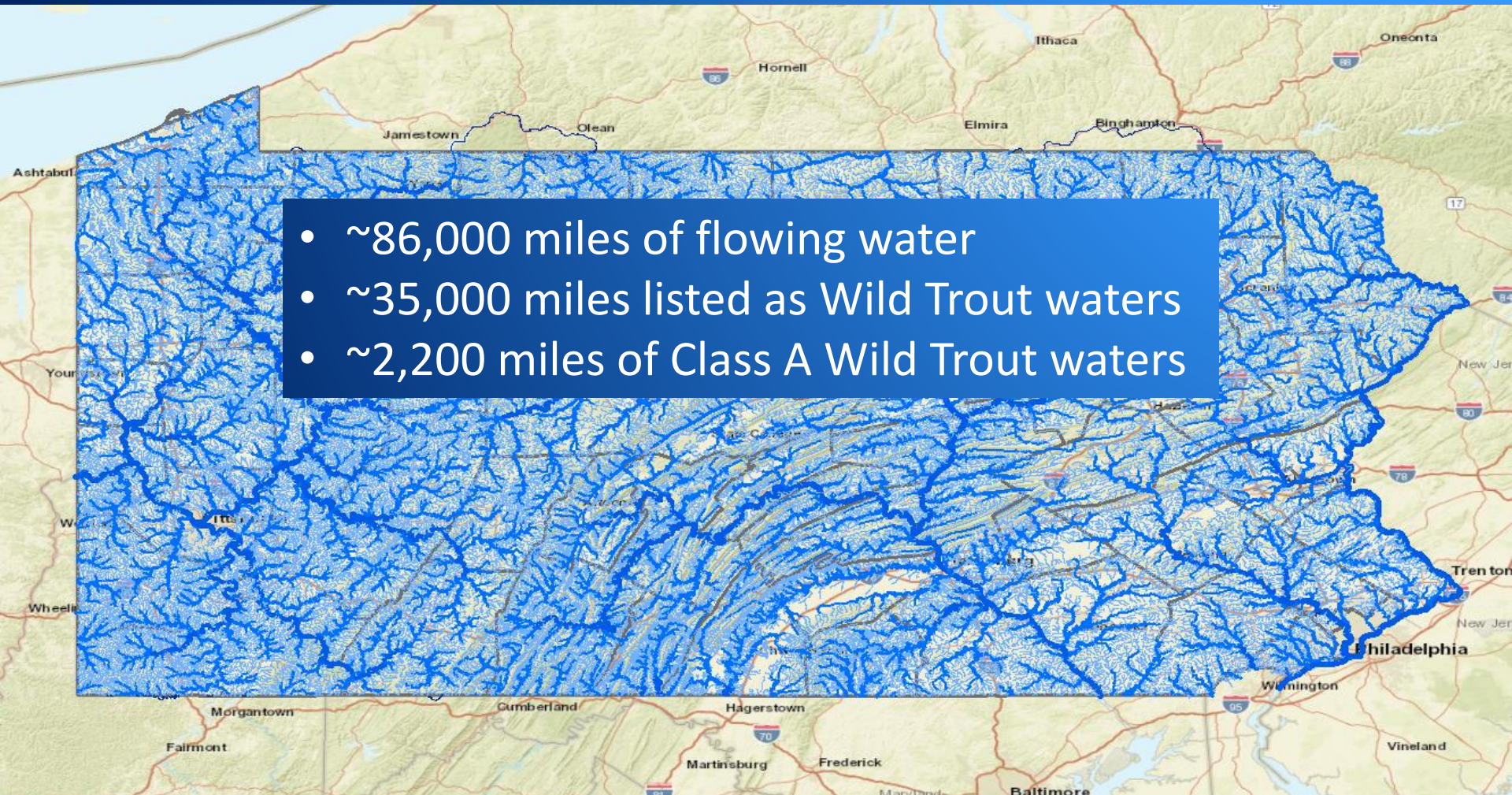
- *The mission of the PA Fish & Boat Commission is to protect, conserve and enhance the Commonwealth's aquatic resources and provide fishing and boating opportunities.*
- Does not operate from the State General Fund
- Fisheries Management, Habitat Management, Environmental Services

Also -

- Hatcheries
- Law Enforcement & Boating
- Outreach & Education
- Property Services
- Engineering – Const./Maint.



PA stream network

- 
- A map of Pennsylvania with a dense network of blue lines representing streams. The map includes labels for various cities and towns such as Jamestown, Olean, Hornell, Elmira, Binghamton, Ithaca, Oneonta, Ashtabula, Youngstown, Wheeling, Morgantown, Fairmont, Cumberland, Hagerstown, Martinsburg, Frederick, Baltimore, Philadelphia, Trenton, New Jersey, Vineland, and Wilmington. Major highways like I-80, I-78, I-95, I-70, and I-81 are also marked.
- ~86,000 miles of flowing water
 - ~35,000 miles listed as Wild Trout waters
 - ~2,200 miles of Class A Wild Trout waters



Status of PA Waters

- Past land use practices have severely degraded our aquatic resources
- Recovery is ongoing via natural processes
- Also correcting legacy impacts actively via human intervention
- Many waters still have a way to go
- We also need to continue preventing further degradation to our healthy resources.

How does this relate to the State Water Plan????

- Water Quantity
- Water Quality
- Connected Healthy Habitat
- Fish and other aquatic organisms need all three to thrive
- We need to meet human demands of our available water resources while ensuring sufficient quantity and quality of water and enough connected healthy habitat to support our aquatic biota

Logging

- Sedimentation
- Splash dams/log drives
- Rail systems



Credit: Pittsburgh City Paper



LOG RAFTS IN THE SUSQUEHANNA RIVER AT LOCK HAVEN, PA.

Credit: Wikimedia Commons

Agriculture

- Nutrients/sedimentation
- Habitat degradation
- Dams/legacy sediment

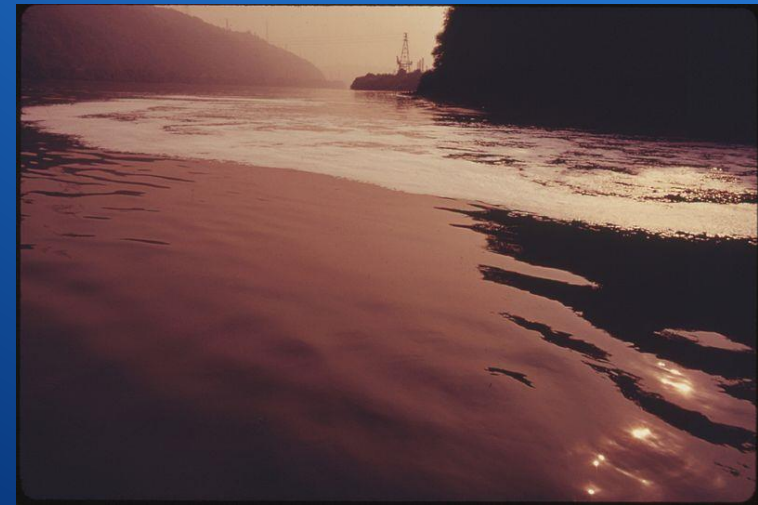


Credit: www.stacker.com



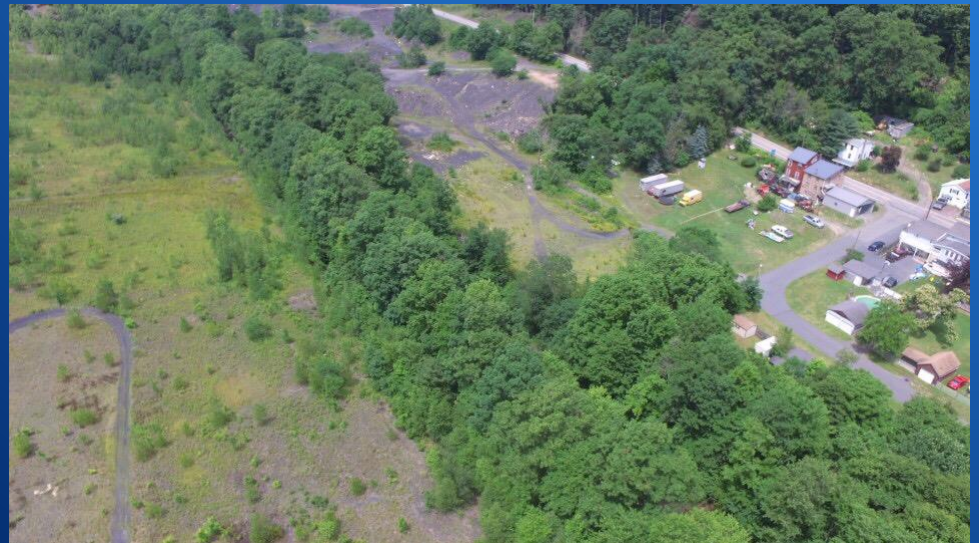
Water Supply/Discharges

- Sewage discharges, industrial uses, power plants, tanneries, etc.
- Waterways historically viewed as dumping grounds
- Water quantity + water quality impacts



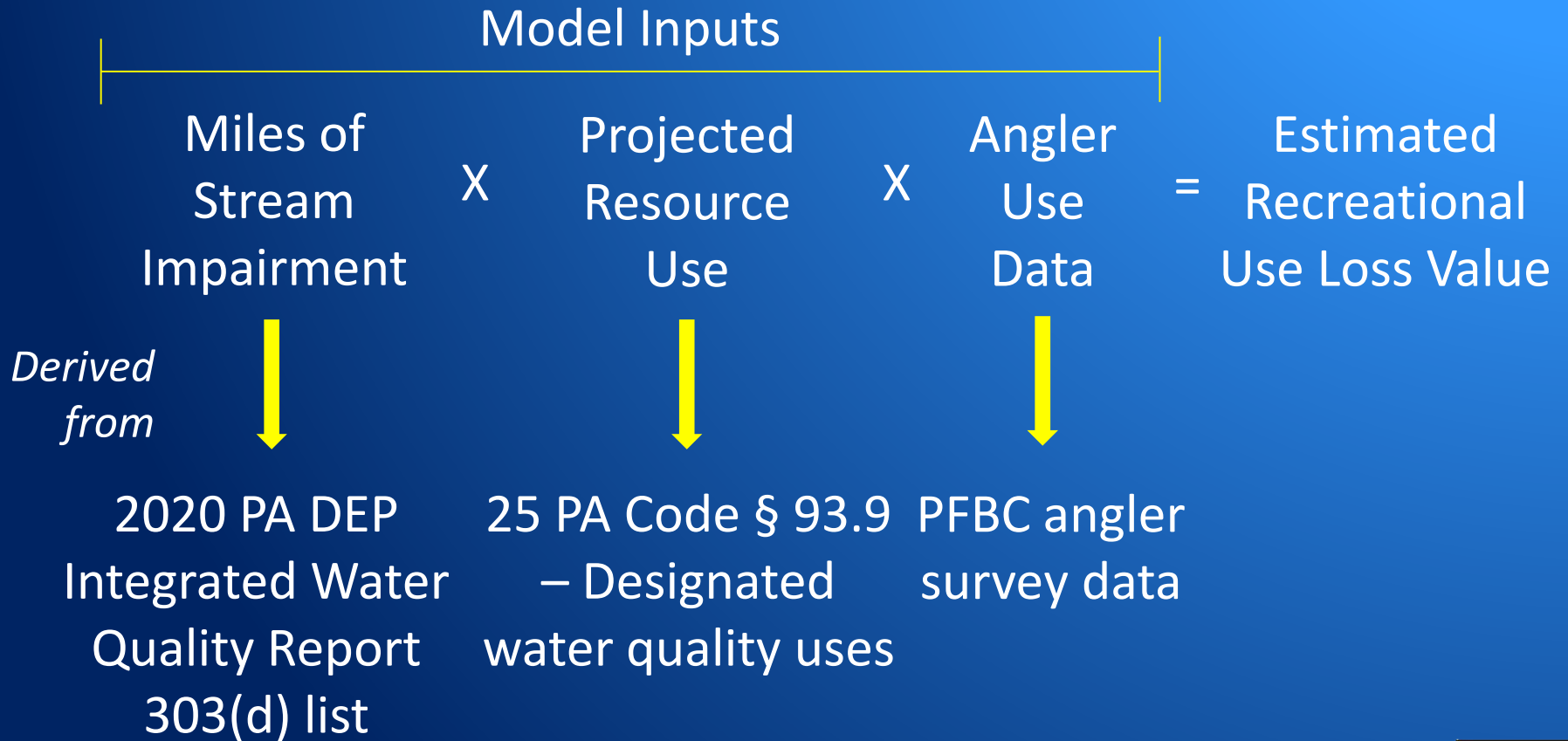
Mining/Resource Extraction

- Coal mining, oil & gas, aggregate, etc.
- Extractive process and getting product to market
- AMD, coal refuse piles, dams, canals, pipelines, etc.



Recreational Use Loss Values (RULV)

- Basic model:



AMD Stream Impairment

All 303(d) stream impairments in
Commonwealth (25,468 mi)



AMD impairments to aquatic life (5,559 mi)

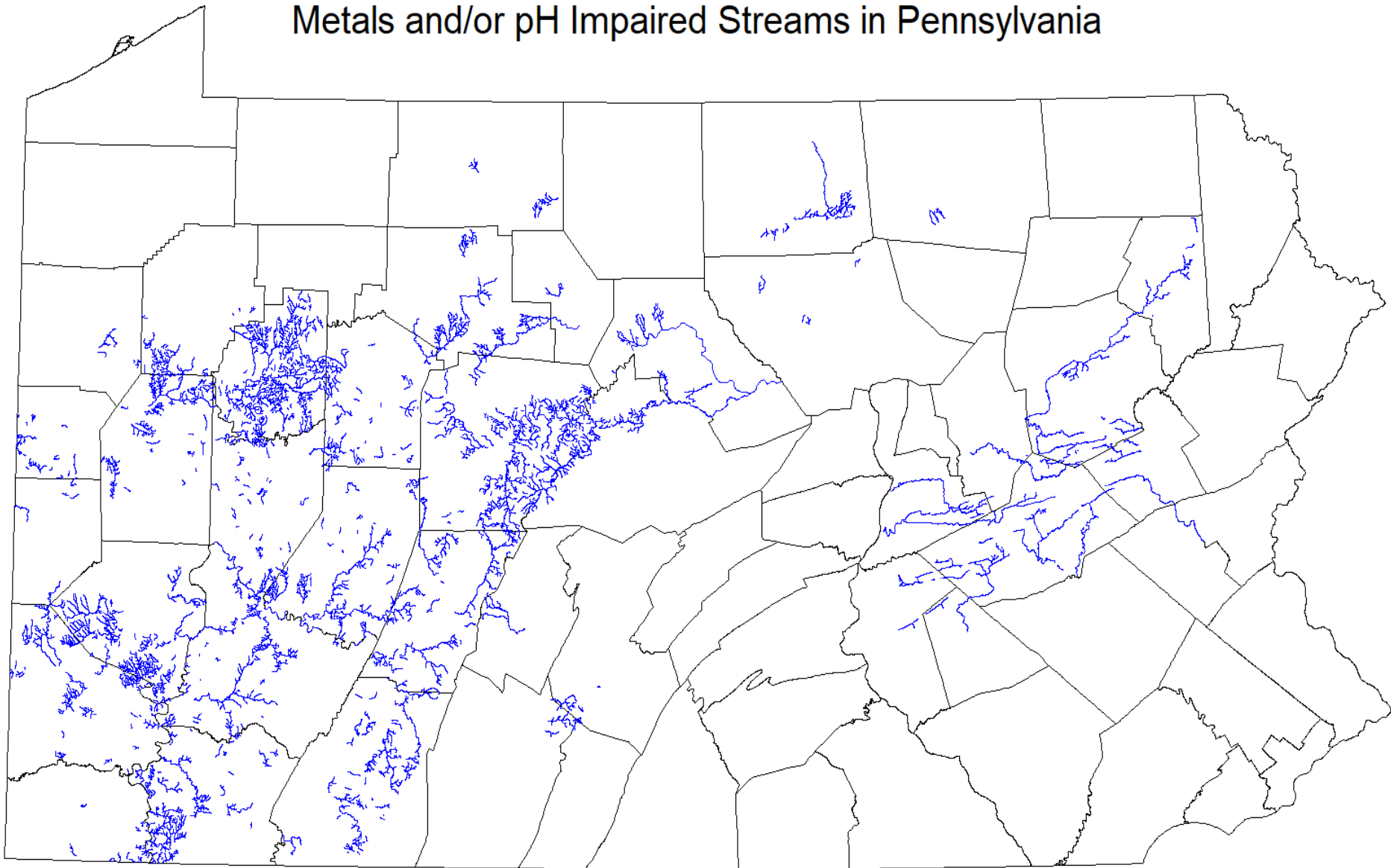


AMD impairments to aquatic life by metals
and/or pH (5,166 mi)



Miles of Stream Impairment - AMD

Metals and/or pH Impaired Streams in Pennsylvania



Input: Projected Resource Use

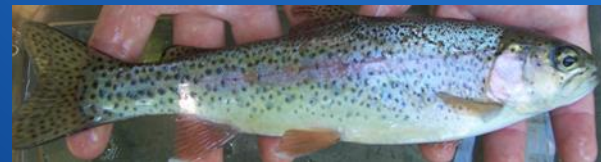
Chp. 93 protection classes correlated to recreational angling

<u>Projected Resource Use</u>	<u>Mileage</u>
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Cold Water Fishes	3078
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Trout Stocking	532
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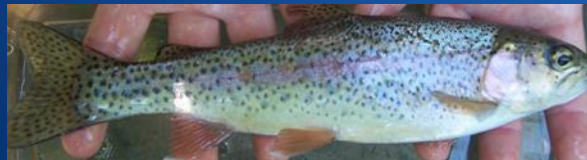
Warm Water Fishes	1556
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Input: Angler Use Data

- PFBC angler use data used to estimate expenditures for different types of angling

	Trips/mi/yr (low)	Trips/mi/yr (mean)	Trips/mi/yr (high)	Expenditures/Trip (adjusted to 2020)
Wild trout angling	21	29	40	\$61.06
Stocked trout angling	346	404	471	\$82.25
Warm water angling	56	63	70	\$63.45



Results: Recreational Use Loss Values

- Two different approaches - all impaired streams in a watershed vs. only the named streams in a watershed
- \$19 M (\$16 M - \$23 M)
- \$29 M (\$24 M - \$35 M)
- Values are based on an annual basis
- Predicts angler generated revenue if fishery is restored
- List of RULV estimates provided as technical guidance by PFBC upon request

<http://2020.treatminewater.com/presentations/>



Aquatic Connectivity – Transportation networks

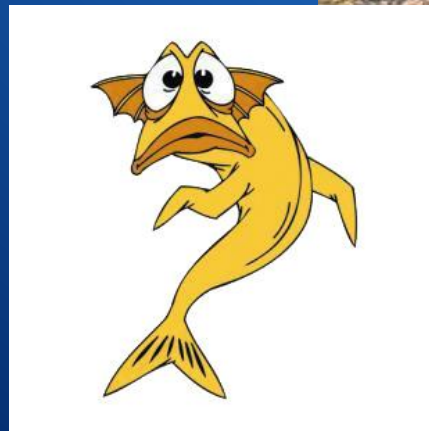
- Waterways = impediments to human travel
- Roads = can be impediments to aquatic travel
- Historical perspective: get people and goods over the water
- Current perspective: get people over the water while maintaining physical, chemical and biological connectivity under the road
- Waterways also used as transportation network → Dams

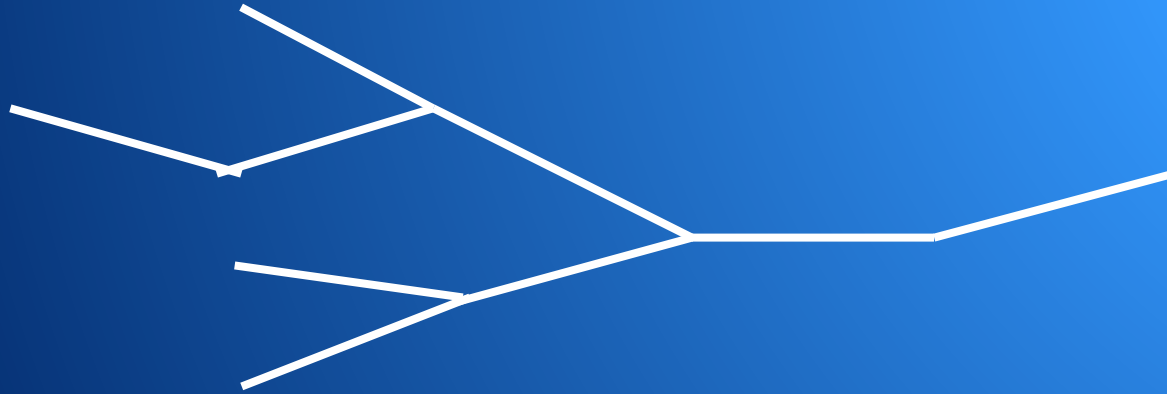
Why is fish passage important??

- Fish live in a linear world

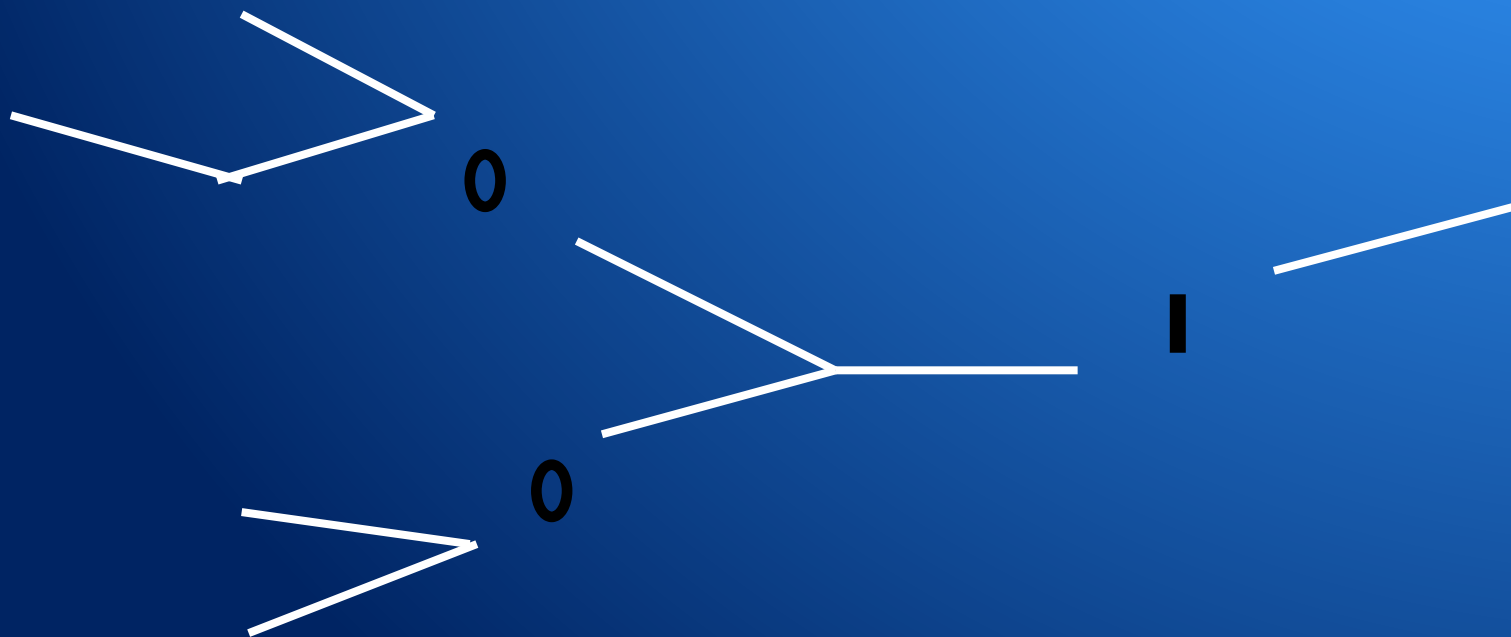
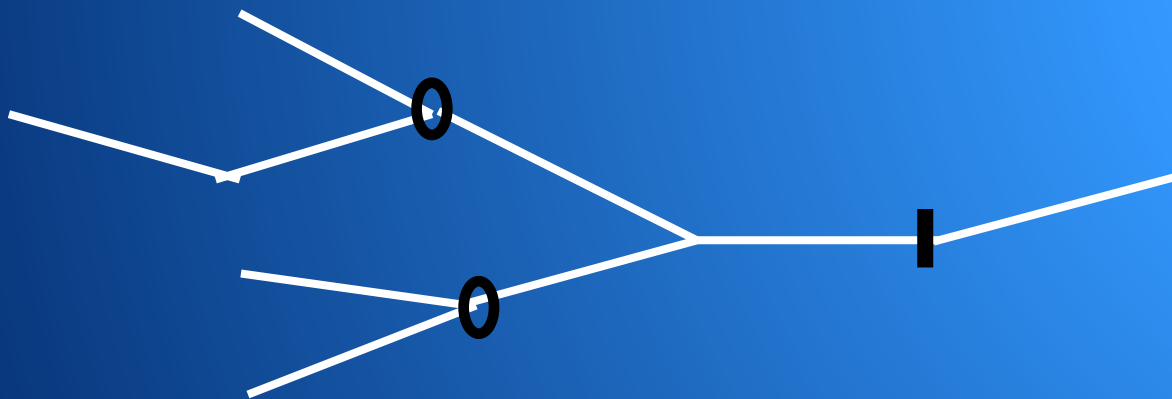


- Inability to deviate from aquatic corridor



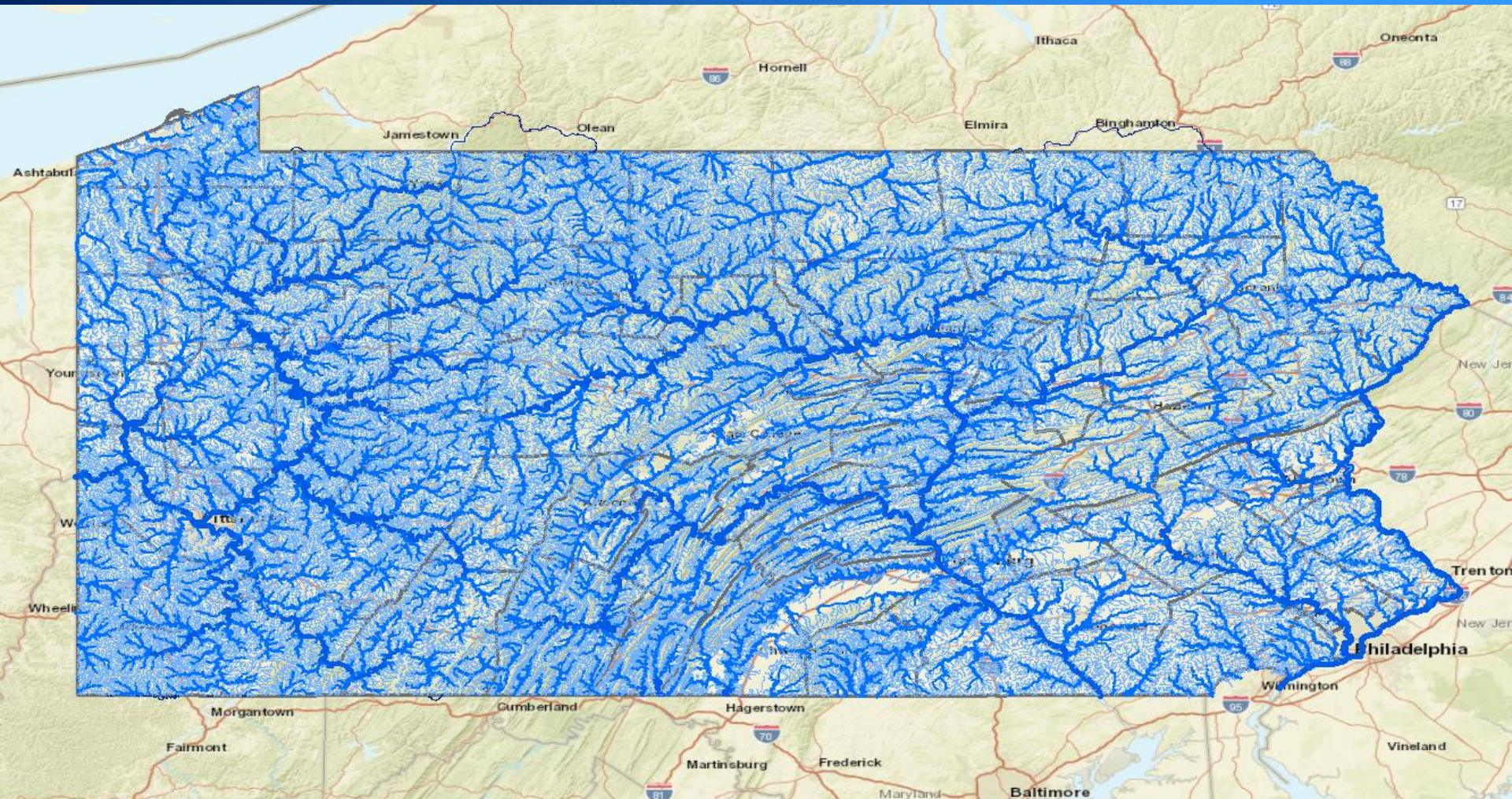


- Fish move to satisfy various life history needs:
 - Spawning
 - Seasonal habitat – winter vs. summer, floods, droughts
 - Escape competitive or predatory pressure
 - WQ issues – temp, pH, DO, pollution event



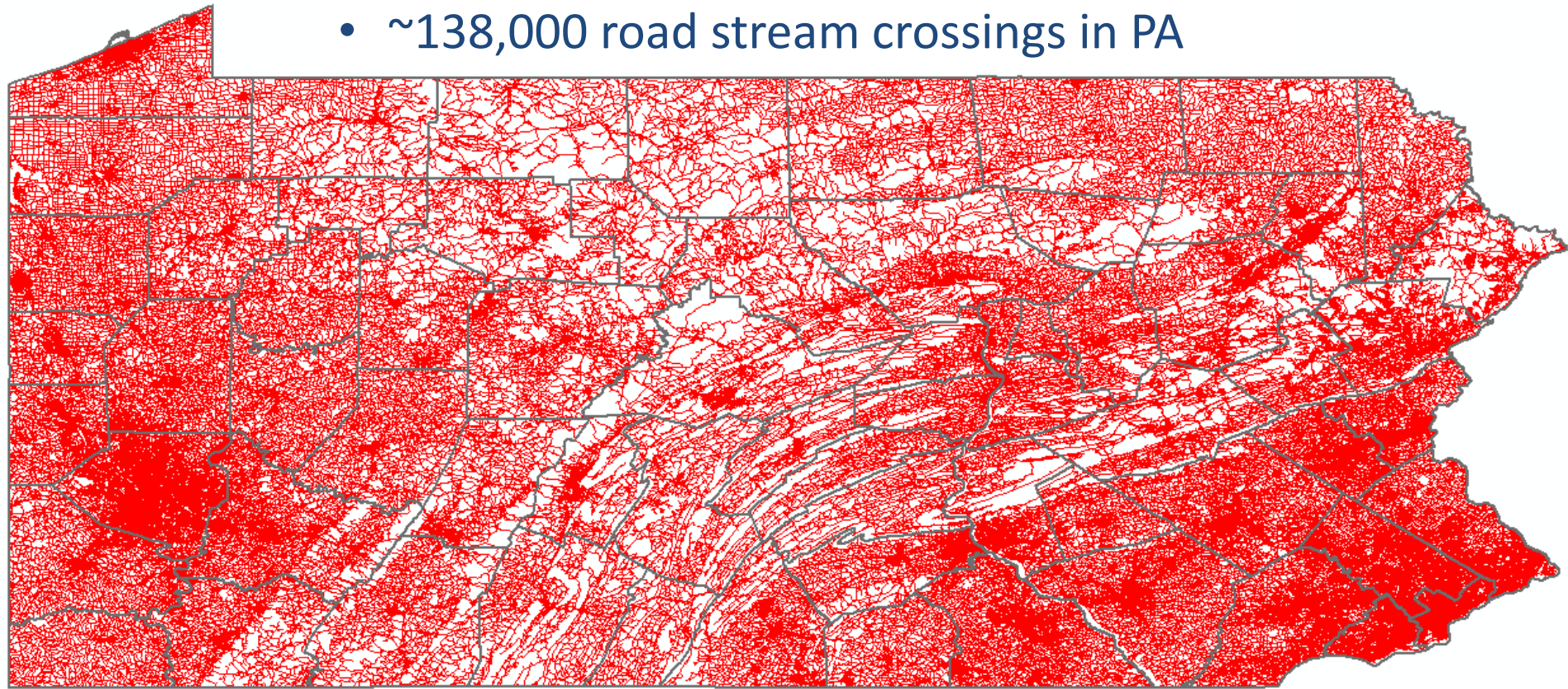
- Fragmentation → Compartmentalization
 - fish seek best available habitat rather than optimal habitat
 - Can lead to a lack of genetic diversity
- Connectivity → Resiliency
 - Maintain genetic diversity, occupy best habitat, move to deal with stressors, dispersal

PA stream network



PA Road Network

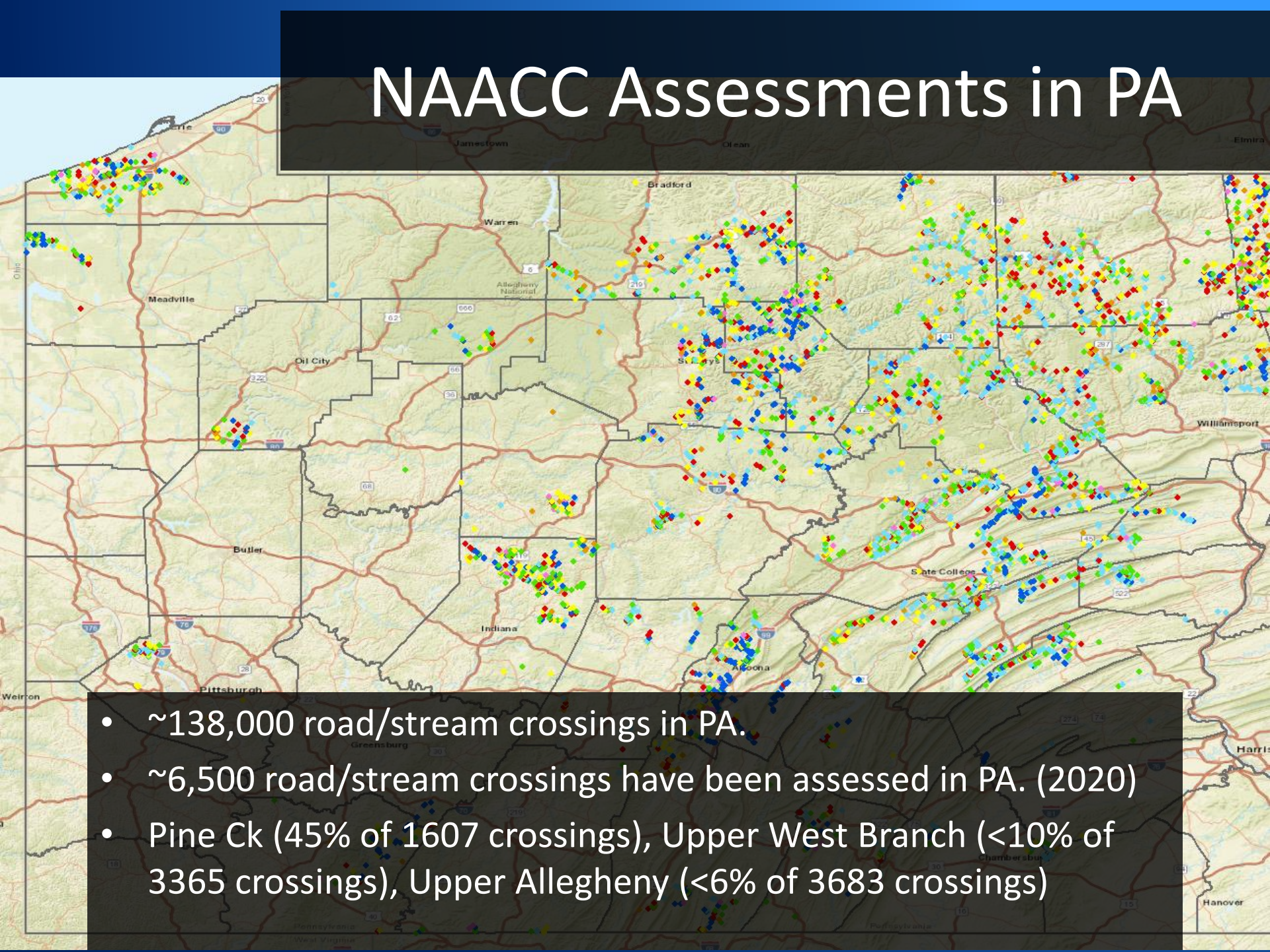
- ~138,000 road stream crossings in PA



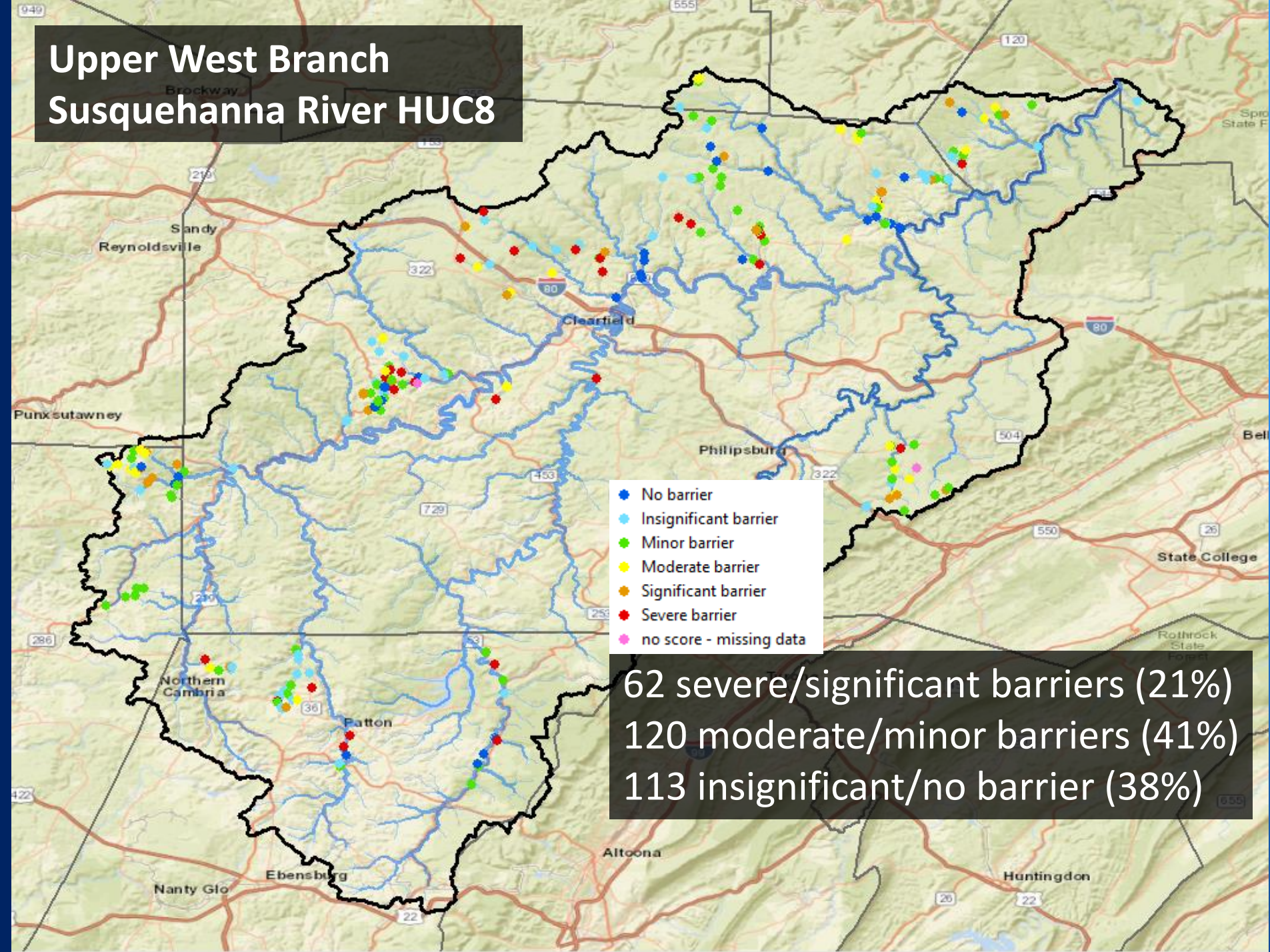
Jump barriers
Depth barriers
Velocity barriers



NAACC Assessments in PA

- 
- A map of Pennsylvania with numerous small, multi-colored diamond markers scattered across the state, representing road/stream crossings. Major cities like Erie, Meadville, Oil City, Warren, Bradford, St. Marys, Williamsport, State College, Altoona, and Pittsburgh are labeled. Major highways like I-90, I-76, and I-80 are also shown. The markers are concentrated in the western and central parts of the state.
- ~138,000 road/stream crossings in PA.
 - ~6,500 road/stream crossings have been assessed in PA. (2020)
 - Pine Ck (45% of 1607 crossings), Upper West Branch (<10% of 3365 crossings), Upper Allegheny (<6% of 3683 crossings)

Upper West Branch Susquehanna River HUC8



62 severe/significant barriers (21%)
120 moderate/minor barriers (41%)
113 insignificant/no barrier (38%)

How is PFBC involved in AOP

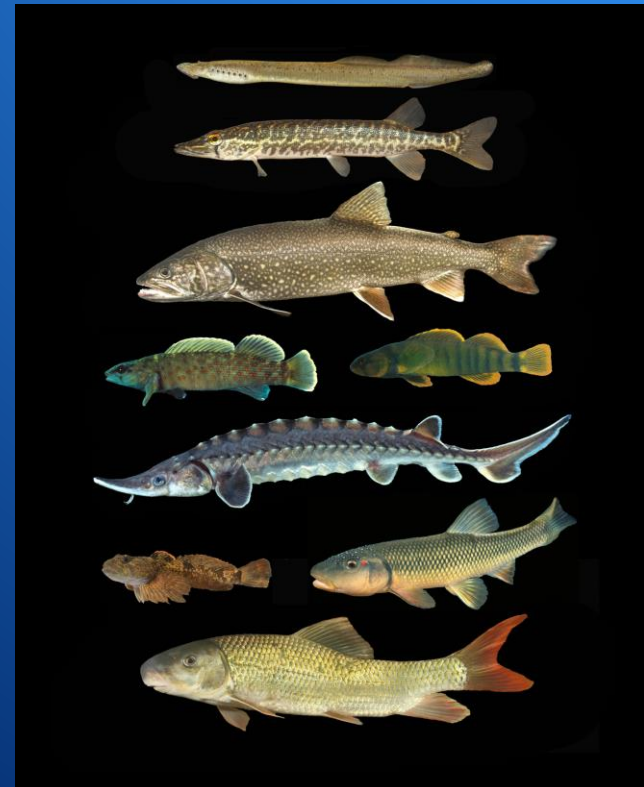
- Maximizing linear nature of our flowing systems
 - Permit review
 - Project facilitation
 - Sharing data to help guide decision making
 - Various technical and policy committees
 - Participation in statewide dam removal program

Summary

- We all need to continue to work towards restoring degraded waters from legacy impacts
- At the same time, we need to continue to work to prevent further degradation to our waters
- Water quantity + water quality + connected healthy habitat

Questions?

- belorson@pa.gov
- 814-359-5228 or 814-470-5274



Robert E. “Bobby” Hughes

183 Harris Hill Road
Shavertown, PA 18708
570-239-3909

Education:

B. S. in Environmental Resource Management
Technical Area: Water Pollution Control
The Pennsylvania State University - May 1995
Diploma with Honors-E.L. Meyers HS –June 1991

Current Employment:

Executive Director (6-09 to present)

Eastern PA Coalition for Abandoned Mine Reclamation (EPCAMR); www.epcamr.org
101 S. Main Street, Ashley, PA 18706

- Coordinates and manages water pollution and abandoned mine land reclamation and watershed restoration projects throughout a 16-county service area of Northeastern and Northcentral PA
- Developing the first innovative 3D Modeling of the entire Anthracite Coal Region's underground abandoned mine pools in partnership with the Susquehanna River Basin Commission and an Anthracite Strategy for AMD Remediation
- Provides outdoor environmental education programs and experiences to underserved coalfield school districts and has developed a sustainable funding opportunity for those programs through the recovery of iron oxides from AMD treatment systems and AMD discharges
- *Co-authored the Mine Water Resources of the Anthracite Coal Fields of Eastern PA Technical Report* (2012) with the USGS PA Water Science Center, Roger J. Hornberger, P.G., LLC (posthumously), Susquehanna River Basin Commission Dauphin County Conservation District, Ian C. Palmer-Researcher, PA Department of Environmental Protection- Bureau of Abandoned Mine Reclamation, Bureau of Deep Mine Safety, & Pottsville District Mining Office
- Assisted the Susquehanna River Basin Commission in the development of the *Anthracite Region Mine Drainage Remediation Strategy Technical Report* (2009)

Previous Employment:

Abandoned Mine Reclamation Program Mgr. & Regional Coordinator (1-01 to 6-09)
Luzerne Conservation District (Office Transfer from Schuylkill County CD)
Eastern PA Coalition for Abandoned Mine Reclamation
325 Smith Pond Road, Shavertown, PA 18708

Regional Coordinator (5-97 to 12-00)

Schuylkill County Conservation District-sponsor of PA DEP Section 319 Grant
Eastern PA Coalition for Abandoned Mine Reclamation

Project Manager before promotion to **Assistant Director** (8-95 to 5-97)
Pennsylvania Environmental Council, NE Regional Office

Early Career Business Accomplishments:

Eastern Pennsylvania Coalition for Abandoned Mine Reclamation - Recording Secretary-PEC NE Office (1996-1997)

Brownfields Forum: Re-use of Industrial Sites - Co-organizer- Publicist- Project Manager-PEC NE Office (1996)

Islands and Issues Teacher Training Project - Guest Speaker- Assistant Project Manager-PEC NE Office (1996)

Greater Wyoming Valley Greenways Coalition - Assistant Project Manager-PEC NE Office (1995)

Acid Mine Drainage & Abandoned Mine Lands Conferences; Co-organizer-Presenter-Conference Coordinator

- 1st Anthracite Regional AMD/AML Conference at Wilkes University-1996
- 27 State-wide AMD/AML Watershed Conferences (www.treatminewater.com)
- 7th Annual Mine Water Treatment Conference, Pittsburgh, PA-2005
- Schuylkill River AMD Watershed Congress-Penn-State Schuylkill Haven Campus-1997
- Schuylkill County 2-Day Teacher Training Workshop/Field Tour on AMD/AML-1997
- Council for Research and Reclamation of Disturbed Land in PA Annual Meeting-2001, 2002
- 2001 PA Watershed Conference-Presenter on AMD (OLD) Passive Treatment System on the Oneida #1 Mine Tunnel
- Luzerne County 2-Day Teacher Training Workshop/Field Tour on AMD/AML-2002
- 24th Annual National Association of Abandoned Mine Lands Program- Presenter-Park City, UT-September 2002

International Training Program on Waste Minimization - *Honorary Guest Speaker* (1997)

- Informed 21 Ukrainian ambassadors from the Donetsk region of the former Soviet Union of how a grassroots coalition groups gets started, in particular, the Eastern PA Coalition for Abandoned Mine Reclamation
- Provided a resource list, current research material, and synopses of the June 1997 AML-AMD Conference, in order for them to combat their coal mining and related coke, metallurgical, and chemical industries
- Educated the Ukrainian ambassadors on how to find and network with technical experts, funding operators, resource personnel, and government officials, at all levels from the bottom up

Related Work Experience:**PA DEP, Hawk Run District Mining Office, - Hydrogeological Intern (5-94 to 4-95)**

- Assisted in determining violations of environmental safety laws and rules based on data compiled through site inspections, investigations, lab analyses, and other observations
- Collected and monitored water samples from surface and groundwater sources related to mining activities, identified sampling points from topographic maps, and recorded water quality data in to spreadsheets and other graphic displays
- Prepared and composed hydrogeologic investigations relative to selected complaints of diminution and/or degradation of water quality filed by private citizens or the DEP against current and past mining operations

Pennsylvania Environmental Council, NE Regional Office- Activities & Volunteer Program Assistant- (3-93 to 6-93)

- Assisted in overseeing all children's events, including electroshocking of fish, field trips through the riverfront parks, folk singers, a fun run, and canoe trips up and down the Susquehanna River
- Coordinated the Annual Susquehanna River Sojourn's Canoe Trip that promoted environmental awareness, education, and protection along the riverfront parks, in partnership with the EDCNP, Procter & Gamble Paper Products Company, Inc., the Luzerne County Conservation District, and other grassroots environmental organizations

PA DEP, Bureau of Abandoned Mine Reclamation, - Science/Tech Intern (5-93 to 8-93)

- Collected water samples of acid mine discharges and small water treatment facilities utilizing pH meters, conductivity meters, weirs, and other flow devices for lab analyses
- Prepared project development documents such as eligibility determinations, environmental assessments, and PA Natural Diversity Inventory (PANDI) reports
- Installed, updated, and recorded over 4000 inquiry investigations (Jan. 73 to Aug. 93) into the Bureau's new computer abandoned mine land inventory system database created by myself in Microsoft Windows 6.1 that was a pre-cursor to the EPCAMR Reclaimed Abandoned Mine Land Inventory System (RAMLIS) Geographic Information System Tool

W-B Area School District, Coughlin High School-Jr. High Head Coach, Varsity Asst. Coach (Nov. -Mar of 2010-2011)

- Coached and directed the entire 7 & 8th Grade Plains-Solomon Boys Program and the Freshmen Team

W-B Area School District, E.L. Meyers High School - Jr. High Head Coach (Nov. - Mar. of 95-96)**W-B Area School District, E.L. Meyers High School - Volunteer Jr. High Assistant Coach (Nov. - Mar. 1991, 1992)**

- Coached and taught 58 kids how to play and learn the game of basketball
- Emphasized that the game is played as a team sport
- Coached and advised players on keeping athletics and academics hand in hand

Related Work Experience:**E.L. Meyers High School, PA- Career Day- *Guest Speaker* (Nov. of 95-96-97)**

- Presented an overhead series on "How To Get An Environmental Job In The 90's" to the junior and senior class
- Published and handed out a career packet to over 30 students on how to get a job in the environmental field, what approaches to take to get one, where the jobs are, environmental ethics, and the pros and cons to different types of jobs in the field

Wyoming Valley Drug and Alcohol Association- *Volunteer Peer Counselor Assistant* (6-91 to 9-91)

- Counseled and talked to over 30 inner-city, low-income housed kids daily on the adverse effects of drugs and alcohol
- Tutored and helped kids with homework at the John B. McGlynn Learning Center in the Boulevard Townhomes, W-B
- Listened to the kids and talked about their everyday hopes and fears and served as a positive role model for the kids in my surrounding community; Alcohol on College Campuses Program- Guest Speaker at Lake-Lehman High School

Community Service/Involvement/Professional Memberships

PA Governor Appointed Chesapeake Bay Stakeholders' Advisory Committee-Member (2024-present)
PA Department of Conservation and Natural Resources-Volunteer (2024-present)
The Climate Reality Project-NE PA Chapter Volunteer (2023-present)
PA SolarCorps-Volunteer (2023-present)
PA Academic Science & Technology, Environment & Ecology Standards Content Committee Volunteer-(2020-present)-PA Department of Education
Kingston Township Planning Commission, Kingston Township, Luzerne County, PA; Commissioner and Vice-Chair (2021-present)
Free & Accepted Masons, Wilkes-Barre Lodge No. 61-(2015-present); Member, Senior Master of Ceremonies, PA Youth Foundation Representative, Trustee to the Masonic Temple Association (Vice-President-2019; President-2020-present), Member of the Committee on Masonic Education, Level II Certified Masonic Scholar-Academy of Masonic Knowledge, Raise A Reader Program (2016-2018)-Coordinator for the Wyoming Valley's Wilkes-Barre Area School District
United Way of the Wyoming Valley-Real Men Read Educator – (2018-present); Youth Mentor and Guest Reader
PA Council of Trout Unlimited-Board Member and NE Regional Vice President (2017-Fall 2019); Board Member and Eastern Regional Vice President (September 2019-2021)
US Global Leadership Coalition-PA Advisory Committee Member-(2021-present)
Commonwealth Charter Academy-Ambassador (2021-present)
PA Trout Unlimited-Stanley Cooper Sr. Chapter -Member (2014-present)
PAEE State Consortia EE Capacity-Member (2014-2019)
PAEE State Consortia Community of Learners- Leadership Team (2014-2019)
ARIPPA-Reciprocal Swap Affiliate Member (1996-present)
PA Department of Environmental Protection's Environmental Justice Advisory Committee-Member (Jan. 2022-present)
PA Department of Environmental Protection's Aggregate Advisory Board-Member (Nov. 2014-present)
PA Association of Environmental Educators (PAEE) Board- Member and NE Regional Director (2015-2019)
PA Association of Environmental Educators (PAEE) Advisory Board-Member (2009-2014)
Non-Profit Community Assistance Center (NCAC)-Member (2009-present)
PA Anthracite Section—Society for Mining, Metallurgy, & Exploration-Member (2011-Present); **Board Member** (2015-2020)
PA Department of Environmental Protection's Mining & Reclamation Advisory Board- Member (1997-present)
PA Department of Conservation and Natural Resources-Conservation Volunteer (2010-present)
PA Fish & Boat Commission-Volunteer and Fishing Skills Instructor-Volunteer (2005-present)
PA EnviroThon-Presenter to 300+ high school students from across the country on AMD & Career Development (2013)
PA Council of Professional Geologists-Member (2012)
Luzerne County Lightning AAU Basketball Program-Boys Director, 5 & 6th grade Head Coach (2011-2012)
Nanticoke Jr. Trojans Football Program-Coach, Head Coach (C, B, & A Levels) (2006-2013); Head Coach and Board Member (D Level) (2016); Assistant Coach and Board Member (B Level) (2017)
Anthracite Living History Group-Vice Chair (2005); Chair (2006-2010); Volunteer Member (2011-present)
The Pennsylvania State University College of Agricultural Alumni Society-Associate Director & Board Member (2006)
Leadership Wilkes-Barre-Member & Graduate of the Class of 2006
PA Association of Resource Conservation & Development Councils-At Large Member & Parliamentarian (2005-2008)
The Pennsylvania State University College of Agriculture (ERM) Alumni Interest Group-Member (2003); Vice President (2004-2006); President (2006-May 2007)
The Pennsylvania State University's Commonwealth Council of Student Government's Alumni Interest Group-Member (2004-2006); Treasurer and Executive Committee (2006)
Pocono NE RC & D-Member (1997-2005); Board of Directors (2003-2009)
Susquehanna River Cleanup-Volunteer Community Coordinator- during National River Cleanup Week (May 2004)
Boston Creek Stream Cleanup with Wilkes University Freshman Class & Luzerne Conservation District-Volunteer Coordinator (2003)
Mid-Atlantic Biosolids Association-Associate Member (2002-2017)
Gr. Nanticoke Youth Soccer League Association-Volunteer Assistant Soccer Coach (U-8)-2003 (U-9)-2004
Newport Township Biddy Basketball PG-Volunteer Head Coach (C Team, 1-3 Grade Girls)-2002-2005; (B Team, 4-6 Grade Girls)-2005-2008; (B Team, 4-6 Grade Boys [2008-2009]); (A Team, 5-6 Grade Boys [2011])
Plymouth Township Planning Commission-Member- 2002-2003; Vice Chair-2004; Chair-2005-2009
Avondale Hill Abandoned Mine Lands Cleanup with Wilkes University Freshman Class & Luzerne Conservation District-Volunteer Coordinator (2002-2003-2004)
Avondale Hill Abandoned Mine Lands Cleanup with LCCC Science Club- Volunteer Coordinator (2004)
Luzerne County Streamside Cleanup-Volunteer Coordinator (2002)
PA Farm Bureau-Member (2001-2007)

Community Service/Involvement/Professional Memberships

Annual Make A Difference Day Community Project: Avondale Hill Roadside Clean Up in Plymouth Twp. (2001-2002)
Centralia Cleanup-Volunteer Coordinator (2014-present)
Ocean Conservancy's International Coastal Cleanup- Participant (2013-present)
Wilkes University Streamside Cleanup-Volunteer Coordinator (2001)
Luzerne County Streamside Cleanup-Volunteer Coordinator (2001)
Eastern Coal Region Roundtable-Member (2001-2010)
10,000 Friends of PA-Member (2001-2010)
American Rivers-River Ambassador (2017)
Valley Santa-Fundraiser (2013)
Tom Murphy Annual Golf Tournament Fundraiser for Cancer Recipients-Committee Member (2012-2011-2010)
The Pennsylvania State University College of Agriculture (ERM) Alumni Society-Member (2001-2007)
Huber Breaker Preservation Society-Member; CleanUp Project Participant (2001-2006); **Board Member** (2007-2010); **Volunteer** (2011-present)
Tioga River Watershed Reclamation Projects, Inc.-Honorary Member (2001-2003)
PA Organization of Watersheds and Rivers-Member (1999-present)
National Watershed Coalition, National Coalition for Abandoned Mine Reclamation -Member (1998-2003)
River Network-Member (1998-2005)
Council for the Research and Reclamation of Disturbed Land in PA- Member (1998-2000); **Secretary/Treasurer** (2000-2005); **General Member** (2006-2012)
PA DEP Citizens Volunteer Monitoring Program Panel- Member (1998-2000)
Delaware RiverKeeper Network-Member (1998-2003); **Schuylkill RiverKeeper-Advisory Board Member** (1998-2002)
Citizens Coal Council-Member (1998-2004)
PA Environmental Council-Member (1995-2003); **Reciprocal Member** through EPCAMR (2004-present)
Annual Make A Difference Day Community Project: Parks Clean Up in St. Clair Borough Volunteer Coordinator (1999)
PA DEP Non-Point Source Workgroup; Resource Extraction SubCommittee- Member (1997-2005); **Chair**-(2002-2008)
PA DEP Water-based Trading Simulation Workgroup- Member (1999)
Wyoming Valley Reach Task Force for the Delaware & Lehigh National Heritage Corridor- Volunteer (1996)

Achievements, Committees, and Awards

- Recipient of The Interdependence Hexagon Project Community Partnership Award (2019)
- Dorothy Deming Scholarship Award-The Deming Institute (2019)
- Ocean Conservancy Certificate of Appreciation (2018, 2019)
- Certificate of Recognition from The Nature Conservancy (2019)
- SRBC Water Quality Advisory Committee-Member (1999-present)
- NEPA Alliance & NCAC 1st Place-Environmental Action Award for the Construction of the first ever Solar-Powered Mobile Kiln for processing and recycling oxides from abandoned mine drainage Off-grid-(2015)
- *Certificate of Appreciation* from the Plymouth Historical Society for supporting the construction and creation of the Avondale Mine Site Bat Gate and Trailhead in Plymouth Township, PA (May 2014)
- Luzerne Conservation District's Watershed Stewardship Award- *Recipient* (March 2014)
- SRBC Appreciation Award for Contributions towards the **SRBC Comprehensive Basin Report**-October 2010
- Selected as a PA iCon by the PA Department of Conservation and Natural Resources-March 2010
- 40 Under 40 Professional Recognition Award by the Times Leader-March 2010
- **Happenings Magazine** Green Team-Selected as Leaders of Northeast PA's Environmental Movement-July 2009
- William Jeanes Environmental Excellence Award Recipient- Susquehanna River Basin Commission (March 2009)
- NEPA Alliance & NCAC Ted G Daniels Community Development Award-2007
- Luzerne County Historical Society-Historic Preservation Award-2007
- Winner of the PA Association for Environmental Professionals' Karl Mason Award-2005
- Jefferson Award Winner-1st Place-Sponsored by the Times Leader and the American Institute for Public Service-2005
- Acid Drainage Technology Initiative Resource Committee-Member (2001-2006)
- Certificate of Appreciation-from the Anthracite Living History Group & the Avondale Mine Disaster Site Preservation Committee-for the Coordination of the 136th Commemoration and Memorial Service of the Avondale Mine Disaster Program, Plymouth Township (September, 2005)
- Advanced Integration of GeoSpatial Technologies in Mining and Reclamation Conference, Atlanta, GA -Office of Surface Mining Travel Scholarship Recipient-December 2004

Achievements, Committees, and Awards

- Certificate of Recognition from State Representative John T. Yudichak-119th Legislative District-for Volunteer Environmental Cleanup Coordination Work during the Great PA Cleanup on Avondale Hill, Plymouth Township-2004
- PSU Local Governments and GIS Conference 2004, State College, PA League of Women Voters Citizen Education Fund Water Resources Education Fund Scholarship Recipient-2004
- PA Association of Environmental Professionals-2004-2005
- Certificate of Appreciation-from the PA DCNR, Bureau of State Parks & NEIU 18/19 Curriculum Alliance-for Program Support to the Community Connections to Our Watershed: Student Environmental Forum (2003)
- Pocono Northeast Development Fund & PO-NE PA Alliance 2002 PO-NE Environmental Action Award-1st Place
- American Water Resources Association 2002 Conference, Philadelphia, PA League of Women Voters Citizen Education Fund Water Resources Education Fund Scholarship Recipient-2002
- Susquehanna River Basin Commission Teamwork Award for the Upper Tioga Watershed AMD Assessment & Remediation Project-July 2002
- 2002 Governor's Award for Watershed Stewardship-April 2002
- Pennsylvania Association of Conservation Districts, Inc. Conservation Organization of the Year Award-March 2002
- Lackawanna River Corridor Association's River Stewardship Award Winner-Plaque Received-January 2002
- Department of Environmental Protection-Greenworks for PA Watershed Hero Nomination-Winner for December 2001
- Mid-Atlantic Regional Watershed Roundtable, Doylestown, PA Scholarship Recipient-2001
- Pocono Northeast Development Fund, EDCNP & PO-NE PA Alliance 2001 PO-NE Environmental Action Award-1st Place
- National Watershed Forum, Crystal City, VA Meridian Institute Scholarship Recipient-2001
- 2001-2002 Luzerne County Stream-side CleanUp Planning Committee-(2000-2002)
- 2001 Luzerne County Stream-side CleanUp Dirtiest Volunteer Award-May 2001
- Schuylkill County Leadership 2000 Program-Member of the Graduating Class of 2000
- Make A Difference Day 1999 Outstanding Appreciation Community Volunteer Service Award- 1999
- Pennsylvania Environmental Council's Northeastern PA Environmental Partnership Award- Recipient- 1999
- National Mine Land Reclamation Center, Roanoke, VA AMD Conference Scholarship Recipient- 1999
- Schuylkill County Drought Emergency Task Force –Appointed by Schuylkill County Board of Commissioners –1999
- PA GIS Consortium Partner-1999-2006
- Northeast PA ARCVIEW Users Group Member-1999-2006
- Schuylkill River Watershed Rivers Conservation Plan Technical Advisory Committee Member-1998-2003
- Shamokin Creek Watershed Rivers Conservation Plan Advisory Committee Member-1999-2000
- Upper-Susq.-Lackawanna Watershed: American Heritage Rivers Initiative Steering Committee Member –1998-2003
- PA Environmental Council's NE Environmental Partnership Awards- Honorary Reception Committee Member- 1998
- National Mine Land Reclamation Center, Knoxville, TN AMD Conference Scholarship Recipient- 1998
- The Upper Delaware Heritage Alliance Certificate of Recognition- Delaware River Sojourn Steering Committee Member- 1996
- The Delaware River Greenway Partnership Award- Delaware River Sojourn Steering Committee Member- 1995
- The Upper Delaware Council's Recreation Achievement Award- Delaware River Sojourn Steering Committee Member- 1995

Completed Training Workshops and Certifications

- Passive Treatment Special Session (PAS-SS20232) from the National Technical Training Program [24 hrs] from the U.S. Department of the Interior (2024)
- Aloft Air Control Deep Dive Certificate from the Pilot Institute (2024)
- Project WET: Climate, Water, & Resilience Virtual Educator Workshop with a MWEE Flair-PA Bureau of State Parks (2024)
- Meaningful Watershed Education Experience (MWEE) 101 Online (8hrs) Course Certificate through the Chesapeake Bay Program (2024)
- Certified Interpretive Host Certification with the National Association for Interpreters -(2024)
- The Professional Standards and Practices Commission-Teacher Track - Educator Discipline Act 126 Certificate Mandatory Report Training (non-facilitated in 2024)
- The Climate Reality Project-Climate Reality Leadership Corps Training Certificate (2024)
- The Pilot Institute Part 107 UAS Remote Drone Pilot Certification (2024-present)
- FAA Safety Team Aviation Learning Center Online Course SUAS Safety & Risk Mitigation-Federal Aviation Administration (2022)

Completed Training Workshops and Certifications

- 1800Wxbrief The Best Of The Future Of Flight Service Certificate of Achievement-Federal Aviation Administration (2022)
- AOPA Air Safety Institute Say It Right Mastering Radio Communications Certificate of Completion-Federal Aviation Administration (2022)
- Airspace, Special Use Airspace & Temporary Federal Restricted Spaces Certificate of Achievement-Federal Aviation Administration (2022)
- Certificate of Achievement-Part 107 Night Training Module-Federal Aviation Administration (2022)
- FAA Safety Team Aviation Learning Center Online Course P3 Drone Law & Regulations Update Certificate of Achievement-Federal Aviation Administration (2022)
- FAA Safety Team Aviation Learning Center Online Course Commercial Drone Pilot: Part 107 Explained Certificate of Achievement (2022)
- Pilot Institute Certificate of Graduation for Recreational Flying Made Easy (2022)
- SUAS Crew Resource Management Certification (2022)-Federal Aviation Administration
- SUAS Night Operations, Best Practices Course Certificate of Achievement (2022)-Federal Aviation Administration
- 10 Decision-Making Concepts For UAS Pilots Certificate of Achievement-(2022)-Federal Aviation Administration
- Airman Certification Standards Certificate of Achievement-(2022)-Federal Aviation Administration
- DPA FFA Part 107 Bootcamp Training Certificate of Gradation (2022)-Drone Pro Academy (2022)
- SUAS: Regulations, Laws, Airspace Ownership & FAA Enforcement Certificate of Achievement-(2022)-Federal Aviation Administration
- The Recreational UAS Safety Test (TRUST) Completion Certificate-Drone Launch Academy (2022)
- Ultimate Drone Pilot Guide Certificate of Graduation-The Pilot Institute (2022)
- QGIS for Hydrological Applications (12 hrs)-Septima (2021)
- PA Department of Education and American Institute for Research Berks County Intermediate Unit #14 (BCIU) Certificate (2020)
- Network Climate Action: Scaling Up Your Impact (25 hrs of professional development) (2020)-Cornell University
- Earth Day 50 Professional Development- Centered on Climate Change & Climate Change Education-(2020)-National Wildlife Federation
- Economic Ecology(TM) Certificate-(2020)-University of Maryland
- 41st Annual NAAMLTP Technical Conference completion of Professional Development Certificate (18.5 hrs) (2019)
- Certificate of Completion on "Climate Change Education, Science, and Action in partnership with Cornell University (2019)
- PA Council of Professional Geologists Certification of Continuing Education (3 hrs) (2019)
- Co-author-*Grassroots to Global: Broader Impacts of Civic Ecology Book (Chapter 4)*-Cornell University Press (2018)
- PA Fish & Boat Commission Fishing Skills Instructor Certificate-Instructor #0097 (2018)
- American Institute of Professional Geologists Abandoned Mine Reclamation Meeting/Workshop Presenter Continuing Education Certificate (7 hrs) (2018)
- Expert Certificate of Completion on "Urban Environmental Education" in partnership with Cornell University (2017)
- Certificate of Completion on "Urban Environmental Education" in partnership with Cornell University (2017)
- Expert Certificate of Completion on "Environmental Education-Transdisciplinary Approaches to Addressing Wicked Problems" in partnership with Cornell University (2016)
- Project Learning Tree-Certification of Professional Development for Early Childhood Development (2016)
- Growing Up Wild Certification of Professional Development for Growing Up Wild Early Childhood Development (2016)
- North Atlantic Aquatic Connectivity Collaborative and University of Massachusetts Protocol Training Certificate (2016)
- Co-Authoring an "Urban Environmental Education Book" (ISBN 978-0-692-34957-1) in partnership with Cornell University, North American Association for Environmental Education, and EECapacity (144 hours) (2014)
- Certificate of Completion on "The Environment, Health, and Well-Being: A Neighborhood Perspective" in partnership with Cornell University, North American Association for Environmental Education, & EECapacity (Oct 2013; 15 hrs)
- Natural Teacher Participant in the Children & Nature Network; Certified in October 2010 as a member-(2011-present)
- PA Council of Professional Geologists Certification of Applied Geology/Professional Practice of Geology (16 hrs) (2012)
- 3-D and 2-D Modeler Certification in EarthVision from the Office of Surface Mining through TIPS (24 hrs)
- Project Learning Tree Certification (6hrs); Project WET Certification (6 hrs) (2003)
- Trout Stream Habitat Restoration: Principles and Processes; Trout in the Classroom (8 hrs)
- Natural Channel Design and Geo-Fluvial Morphology Training: Principles and Processes (8 hrs)
- Dirt and Gravel Road Maintenance Training Certification
- North American Aquatic Connectivity Consortium (NAACC) Leader Observer and Aquatic Organism Passage Protocol Training and Certification (2017-present); Lead Coordinator 1 (2019-present)
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Completed Training Workshops and Certifications

- PA Trout in the Classroom Certified Educator-PA Fish & Boat Commission and PA Council of Trout Unlimited (2015-present)
- Penn State University Master Well Owner Certification-*Master Well Owner Educator* (2010-recertified in 2012)
- Penn State University Master Well Owner Certification-*Master Well Owner Educator (2004)*
- Citizen Volunteer Water Quality Monitoring Training Certification-dealing with Abandoned Mine Drainage (AMD)
- "Local Motion" National Association of Conservation Districts (NACD) Leadership Training
- NRCS Hydraulics, Weir Installation and Flow Measurements Training
- Army Corps of Engineers Basic Wetlands Identification and Atypical Soils & Problem Areas Field Training (40 hrs)
- EPA Watershed Academy: Web-based Watershed Management Training Certification
- Alliance for Justice: Lobbying Rules Workshop for 501 (c)(3) Non-Profit Organizations (8 hrs)
- Natural Resources Conservation Service-Cultural Resources Training (12 hrs)
- US Army Corps of Engineers Regulatory IV Inter-Agency Wetland Delineation and Identification Course (40 hrs)
- Introductory Overview of Stream Classification and Natural Stream Design as described by Dave Rosgen (2 days)
- PA DEP-Freshwater Fish Identification in PA Workshop (3 hrs)
- Center for Local Government Services, PA Historical & Museum Commission, PA State Association of Township Supervisors sponsored Preserving Your Community's Historic Resources Training (8 hrs)
- Fishing Skills Instructor Workshop with the PA Fish & Boat Commission (8 hrs)
- Introduction to ArcGIS I (v8.2) Training (16 hours); Advance Use of ArcGIS II (v8.3) Training (16 hours); ArcView GIS 3.2 Training (16 hrs)
- Volunteer for the PA Fish & Boat Commission-Certified SMART Angler Program Fishing Skills Instructor (10 hours)
- Certificate of Achievement for Completing a 3-Day Workshop on Non-Profit Management for RC & D Councils (24 hrs)
- Primary and Secondary Education Teacher Training Workshop on AMD, St. Vincent College (16 hrs)
- Out of the Rock Mineral Resources Education Training Workshop, St. Vincent College (8hrs)
- Information MAPPING Seminar on Developing Usable Content & Documentation (24hrs)
- Level 1 Rosgen Stream Classification Field Training Course (5 days-75 hours)- Blackwater Falls, WV
- Pennsylvania Easements: Rights of Way and Other Encumbrances Certificate from PESI (8 hrs)-Allentown, PA

Collegiate & High School Activities and Awards

College of Agricultural Sciences-ERM Program Alumni Society-2002-2005;
Penn-State Club of the Wyoming Valley-2004
Environmental Resource Management Club- Member- 1995-1994-1993

The Pennsylvania State University, Commonwealth Council of Student Governments, Exec. Board & Treasurer-1995-1994

The Pennsylvania State University, Wilkes-Barre Campus, Student Government Association
Exec. Board & Treasurer-1993-1992

- Organized & sponsored a Community Easter Egg Hunt for Low-income housing projects in the Wyoming Valley
- Organizer and Fund Raising Coordinator for Project M.O.M. Campaign
- The Pennsylvania State University, College of Agricultural Sciences, Alumni Society Internship Award- 1995
- The Pennsylvania State University, Commonwealth Council of Student Governments, Treasurer's Award-1995
- The Commission of Economic Opportunity, F.W. Remington 4-year Scholarship Award- 1991-1995
- The Pennsylvania State University, Eric A. and Josephine Walker Award- Finalist – 1992; Lion's Pride Award- 1992
- Intercollegiate Leadership Wilkes-Barre Award-1992
- The Pennsylvania State University, Wilkes-Barre Campus, Advisory Board Scholarship Award-1991
- Wyoming Valley Drug and Alcohol Association, Outstanding Volunteer Peer Award- 1991
- E.L. Meyers HS National Honor Society, French National Honor Society-1989-1991
- STAND TALL Drug Free Program- Founding President- 1991
- Who's Who In High School Athletics-1991
- Division II P.I.A.A. Scholar-Athlete Award-1991; Division II P.I.A.A. East's All-Star Basketball Team- Member- 1991

Collegiate & High School Activities and Awards

The Pennsylvania State University, Wilkes-Barre Campus:

- Student Activities Committee- Member- 1993-1992-1991
- Minority Ethnic and Cultural Association- 1993-1992-1991
- Student Health Club- Volunteer- 1993-1992-1991
- Campus Ecology Committee- Member- 1993-1992-1991
- Campus Appeals Board, Campus Hearing Board, Faculty Senate- Member- 1993-1992
- Orientation Leader-1993-1992; Inter-Collegiate Leadership Wilkes-Barre Partnership- 1993-1992
- Alumni Annual Fund Phon-a-thon- Volunteer- 1993-1992-1991
- Campus Environment Team- 1992-1991
- Susquehanna River Watch- Volunteer- 1992-1991; Club T.U.F.F. Program- Volunteer- 1992-1991
- Project R.E.M.A.I.N.- Volunteer-1991-1990; Project S.H.A.R.E.- Volunteer-1991