

Volunteer Monitoring: A Tool for Change



Julie Vastine

Michigan Clean Water Corps Conference

October 28, 2014

Dickinson

Volunteer Monitoring: A Tool for Change



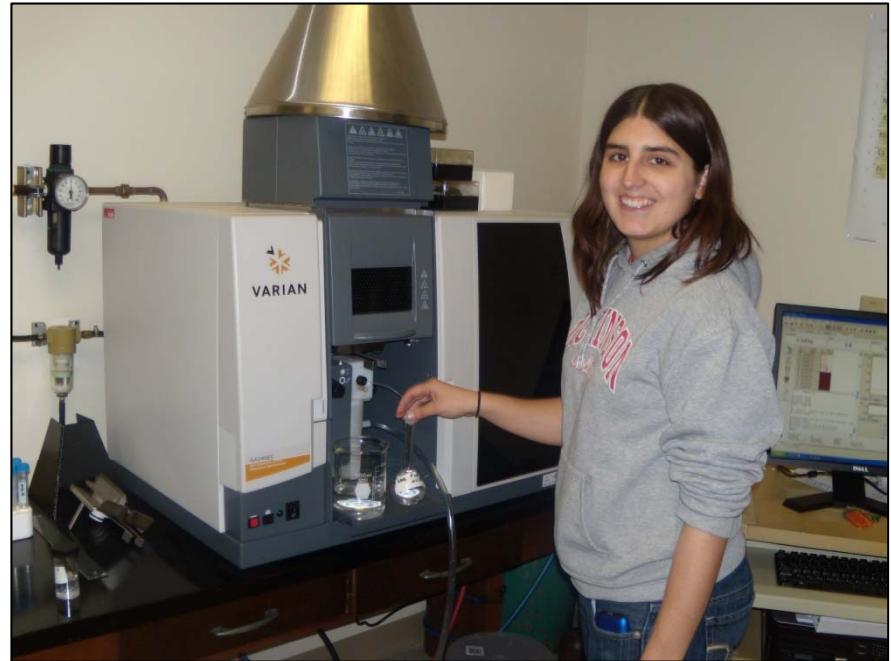
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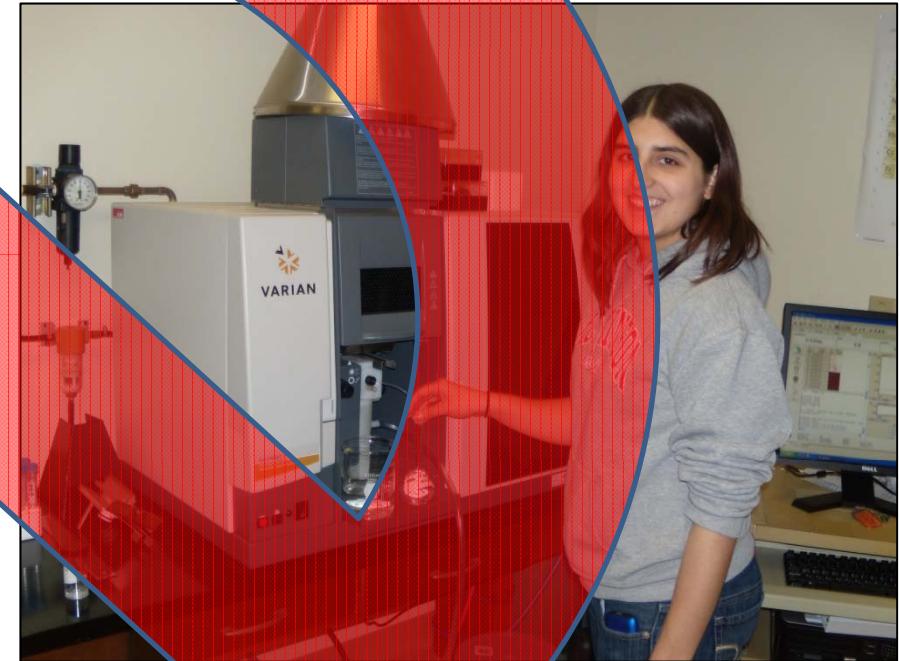
Give Chemistry a Second Chance!



Julie Vastine
Michigan Clean Water Corps Conference
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Give Chemistry a Second Chance!



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Game Plan

- Intros
- Theme
- VolMon Big Picture
- VolMon Outcomes
- Examples from PA
 - GOAL: OVERWHELM YOU with examples
- Tips



Introductions

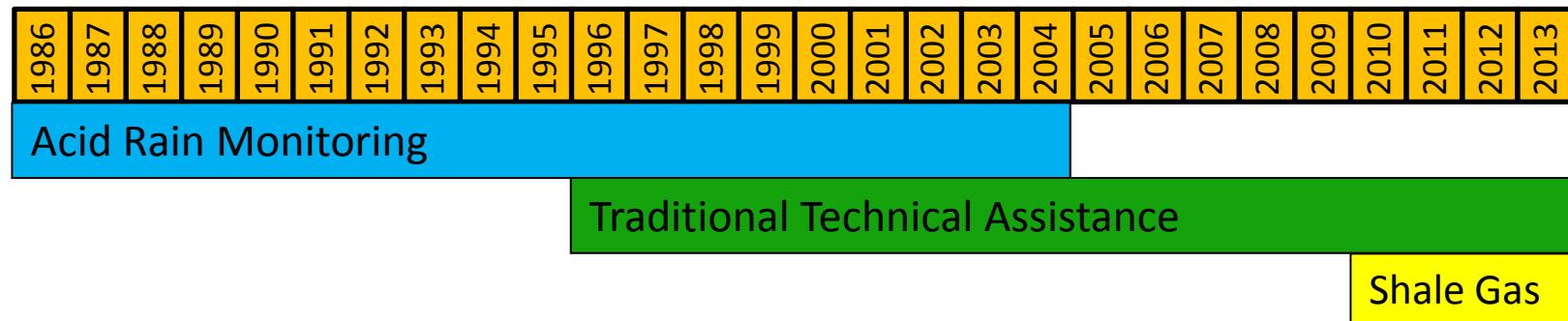


About ALLARM



- Director: Julie Vastine
- Assistant Directors: Jinnie Monismith & ??? Currently Hiring...
- Science Advisor/Founder: Candie Wilderman
- Dickinson College Students
- Based out of the Environmental Studies/Science Department
- 50% supported by the college, 50% funded by federal, state, family foundation grants

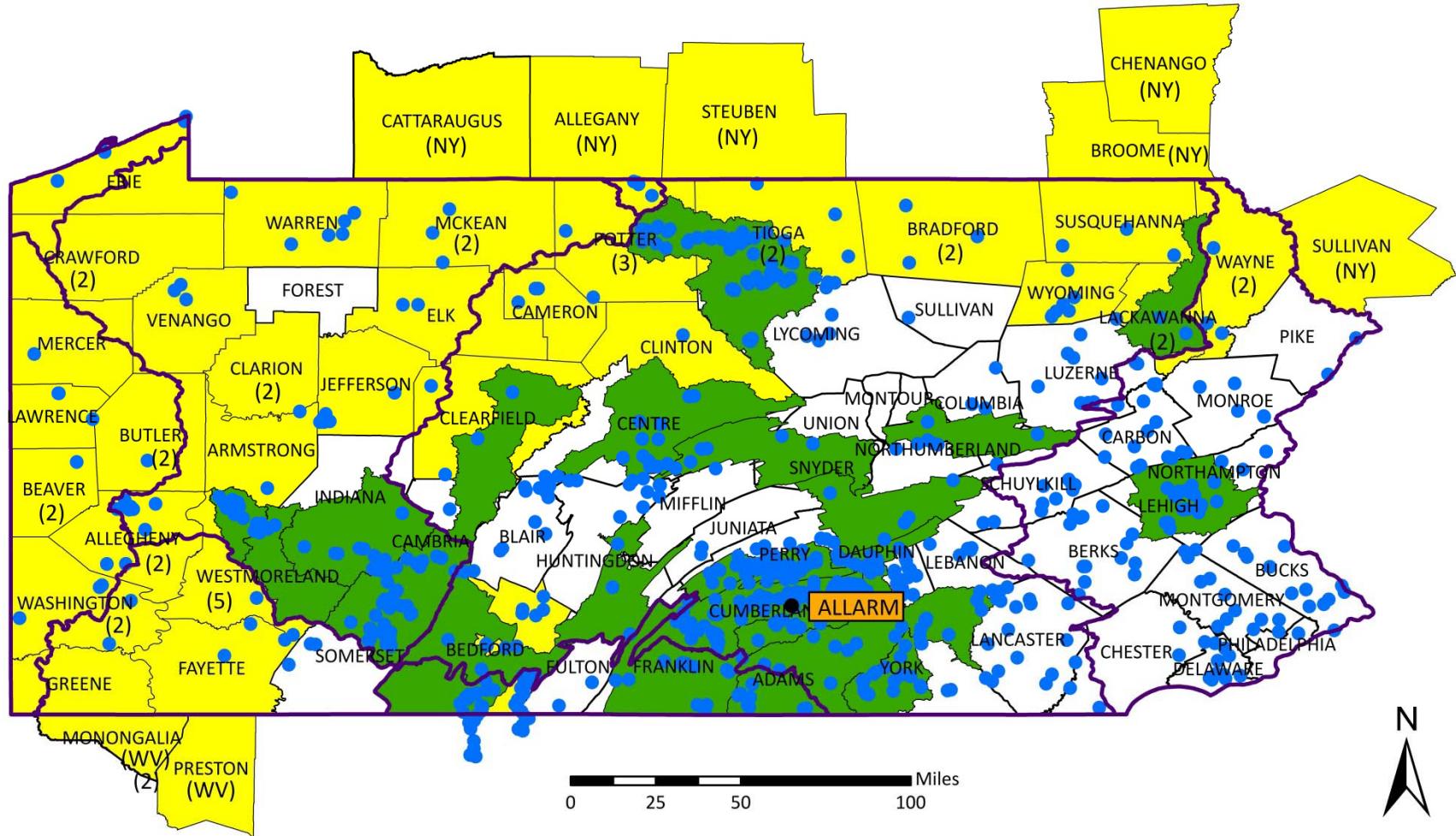
ALLARM History



Monitoring Program	Region	Volunteers	CitSci Model
Acid Rain	Statewide	Individuals	Contributory
Watershed Technical Assistance	Southcentral PA	Groups	Co-Created
Shale Gas Technical Assistance	Marcellus & Utica	Groups & Individuals	Collaborative

Empower communities to use scientific tools
to monitor, protect, and restore waterways.

ALLARM Monitoring Assistance



Alliance for Aquatic Resource Monitoring
Environmental Studies Department
Dickinson College
P.O. Box 1773
Carlisle, PA 17013-2896

www.dickinson.edu/ALLARM
ALLARM@dickinson.edu
717.245.1565

Data Sources: ALLARM, NYS Office of Cyber Security, PA DOT, PSU, USGS, WVDEP



March 2014

ALLARM Areas of Assistance

Technical

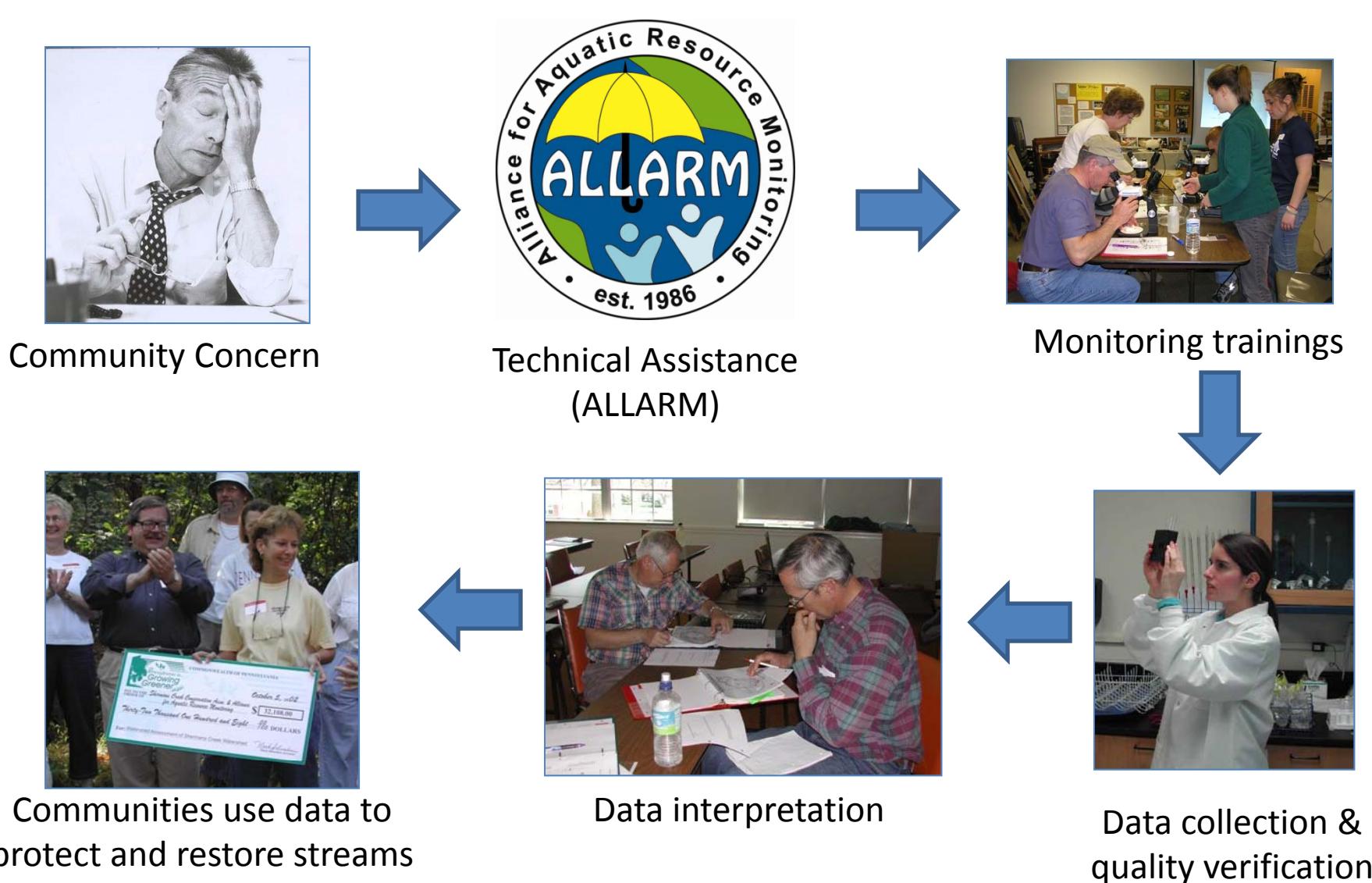
- Study design creation
- Chemical monitoring
- Macroinvertebrate monitoring
- Visual assessment
- Data interpretation and communication
- Shale-gas monitoring

Programmatic

- Strategic planning
- Volunteer recruitment and retention



ALLARM Technical Assistance Approach



PA Volunteer Stream Monitoring

Rich history – 1980s



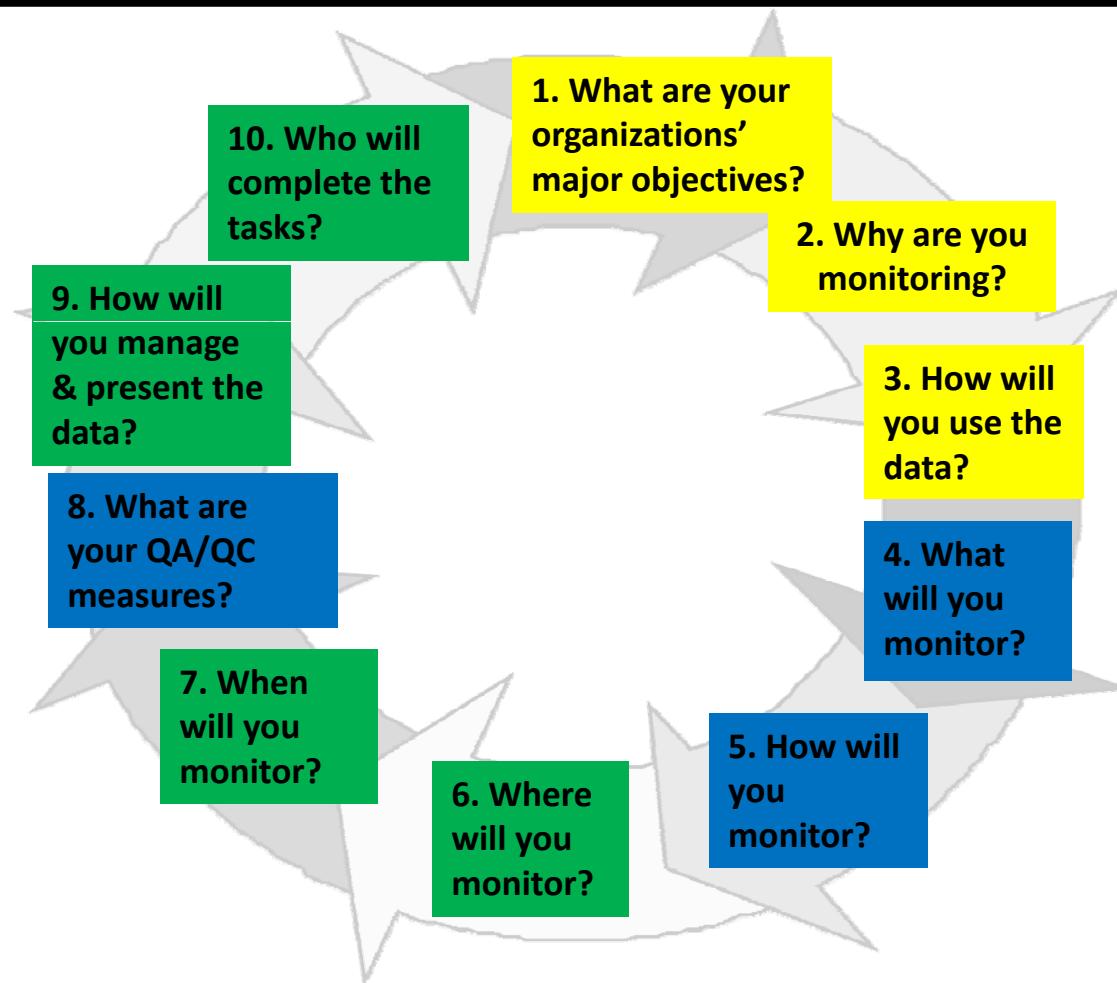
Over 85,000 miles of streams and rivers in Pennsylvania.

PA History

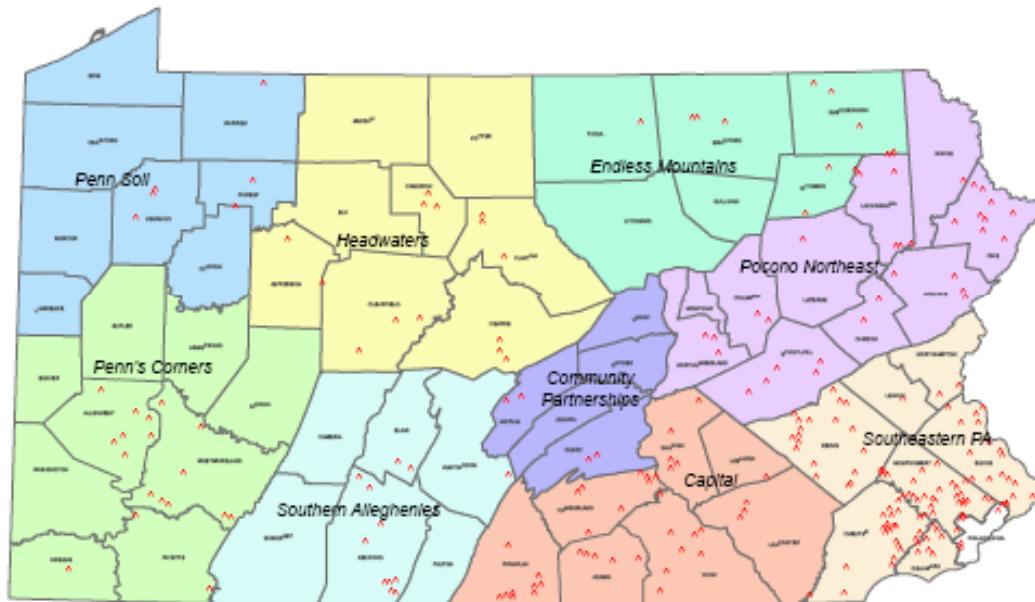
- 1986 ALLARM formed
- 1996 PA DEP CVMP created – 125 groups
- 2000 Growing Greener funding
- 2001 Formation of C-SAW (network of service providers)
- 2002 Standardized study design manual
- 2005 Study over 580 watershed groups
- 2006-2009 ebb & flow of groups
- 2010 Shale Gas monitoring
- 2014 renewed interest in watershed baseline monitoring



Study Design Process



Consortium for Scientific Assistance to Watersheds



- PA DEP – Growing Greener Stewardship Program
- CVMP closed in 2009



Data – Policy Action

- US Clean Water Act (Federal) ->
 - States have agencies (PA Department of Environmental Protection) to develop stream standards (chemical and biological)
- States most monitor waterways every 5 years
- PA – 83,000 stream miles
- Role for citizen collected data?
 - Quality field tests versus
 - Certified lab analysis



The Theme... Tool for Change

- Connecting data to action!
 - Building off yesterday's conversation
 - Connecting to a national theme...



Big Picture: US Aquatic Based Citizen Science aka “Volunteer Monitoring”

- Citizens involved in data collection
- US: 1970 – 2013
- 48 out of 50 states have active programs
- Over 1,200 programs



NJ Watershed Watch Network

TEXAS STREAM TEAM



Big Picture, continued...

NWQMC - Volunteer Mon x

acwi.gov/monitoring/vm/programs/vm_map.html

Apps D Dickinson College D Gateway

Publications

Webinars

Partners

Volunteer Monitoring

State and Regional Councils

Success Stories

Meetings

Meeting minutes

ACWI meeting schedule

Other meetings of interest

Members

Calendar

Sharepoint

COLLABORATE

Develop monitoring objectives

Understand, protect, restore our waters

Collect field and lab data

Assess and interpret data

Communicate results and findings

Design monitoring program

Compile and manage data

2. The US EPA's [National Directory of Volunteer Monitoring Programs](#). Please consider listing or updating your group's information in this EPA directory by contacting [Alice Mayio](#).

The MAP LEGEND is in the top, left corner of the map. There you will find the ORANGE circles represent monitoring programs and the GREEN diamonds represent monitoring subprograms.

Legend

+ -

Map showing monitoring programs and subprograms across North America. Labels include: Vancouver, Seattle, San Francisco, Los Angeles, Dallas, Houston, Atlanta, Miami, Chicago, Detroit, Philadelphia, New York, Boston, Montreal, and various locations in the United States.

View Larger Map

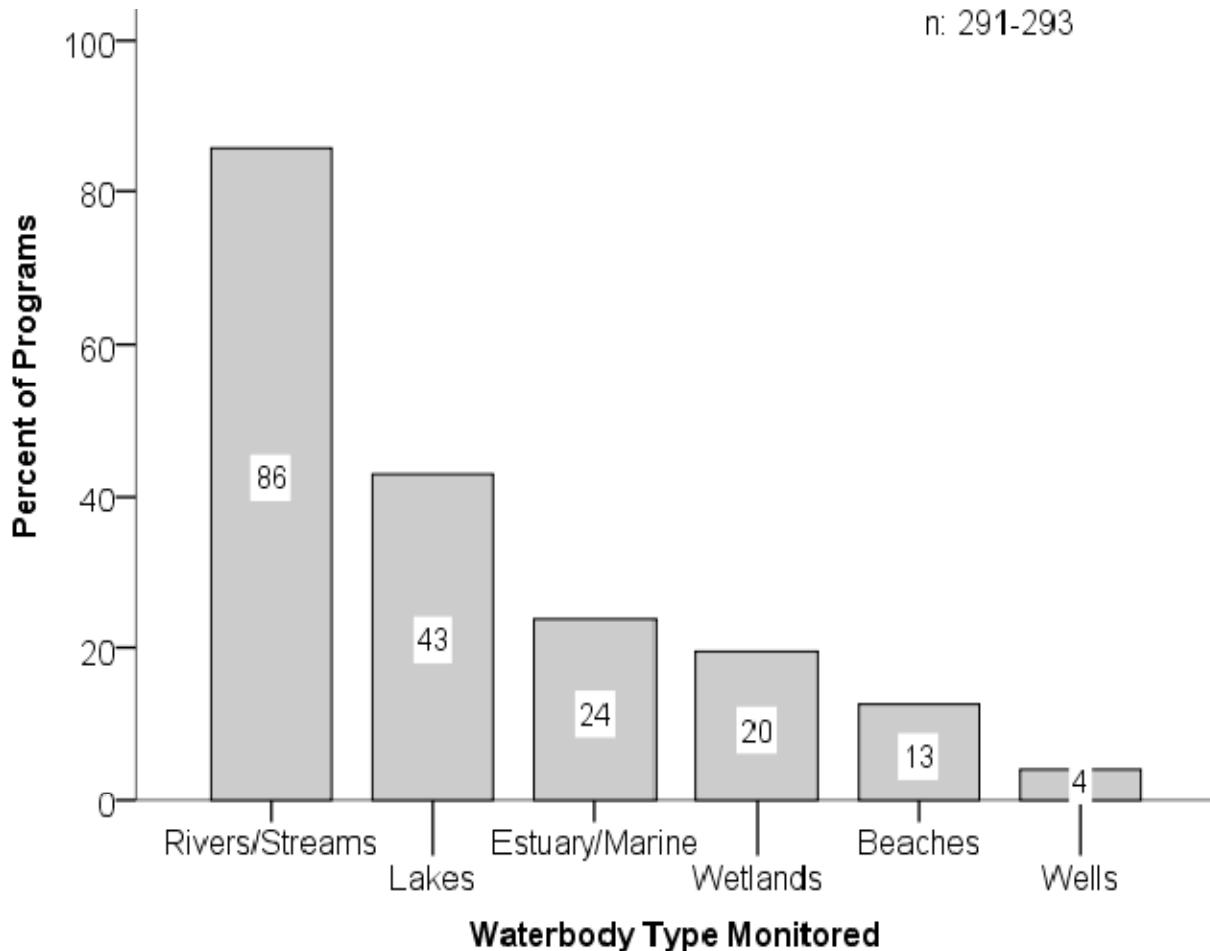
POWERED BY esri, DeLorme | Esri, DeLorme

National VolMon Research

Thank you Kris Stepenuck (University of Wisconsin)! She surveyed over 380 programs nationwide!

Type of waterbody monitored

Most monitor rivers/streams and lakes.

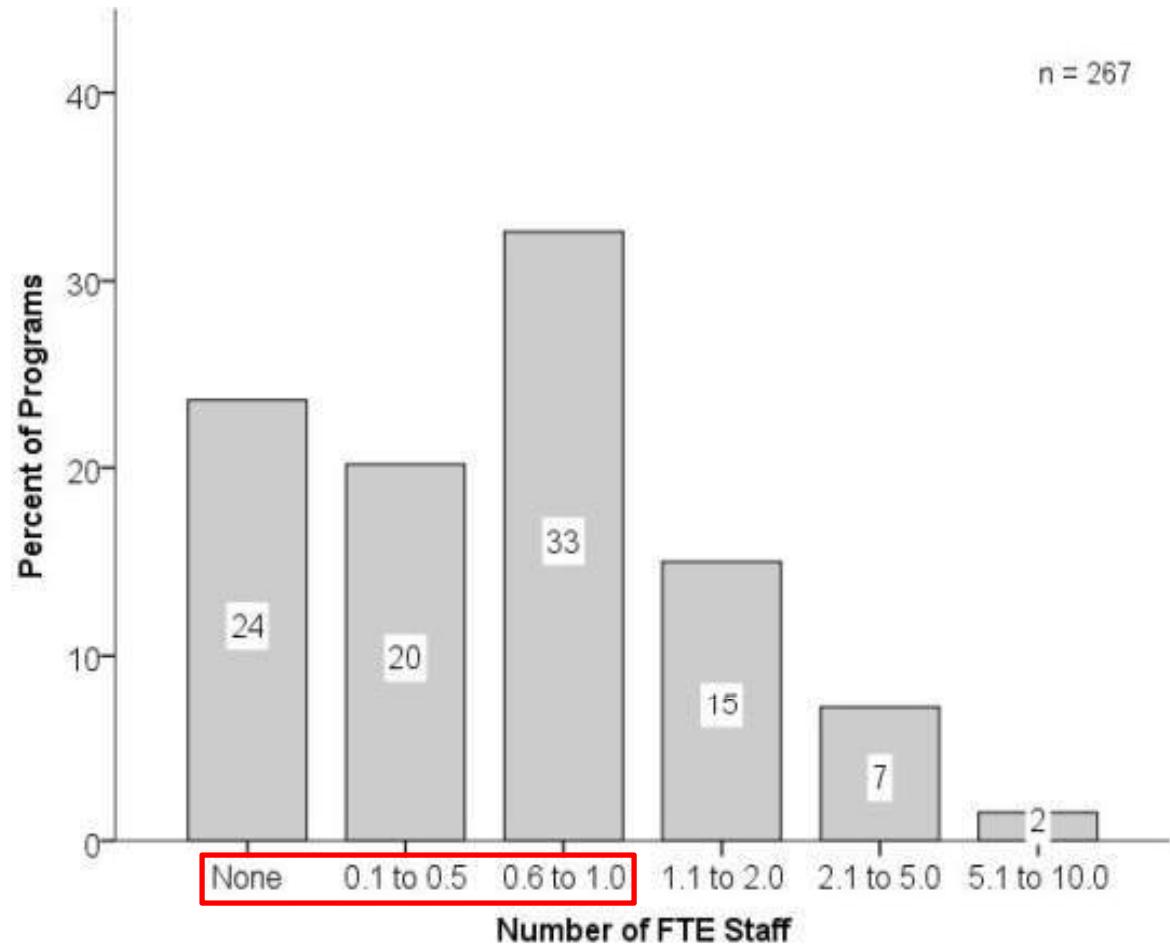


Images: Kris Stepenuck and Joanna Griffin

Kristine Stepenuck, PhD

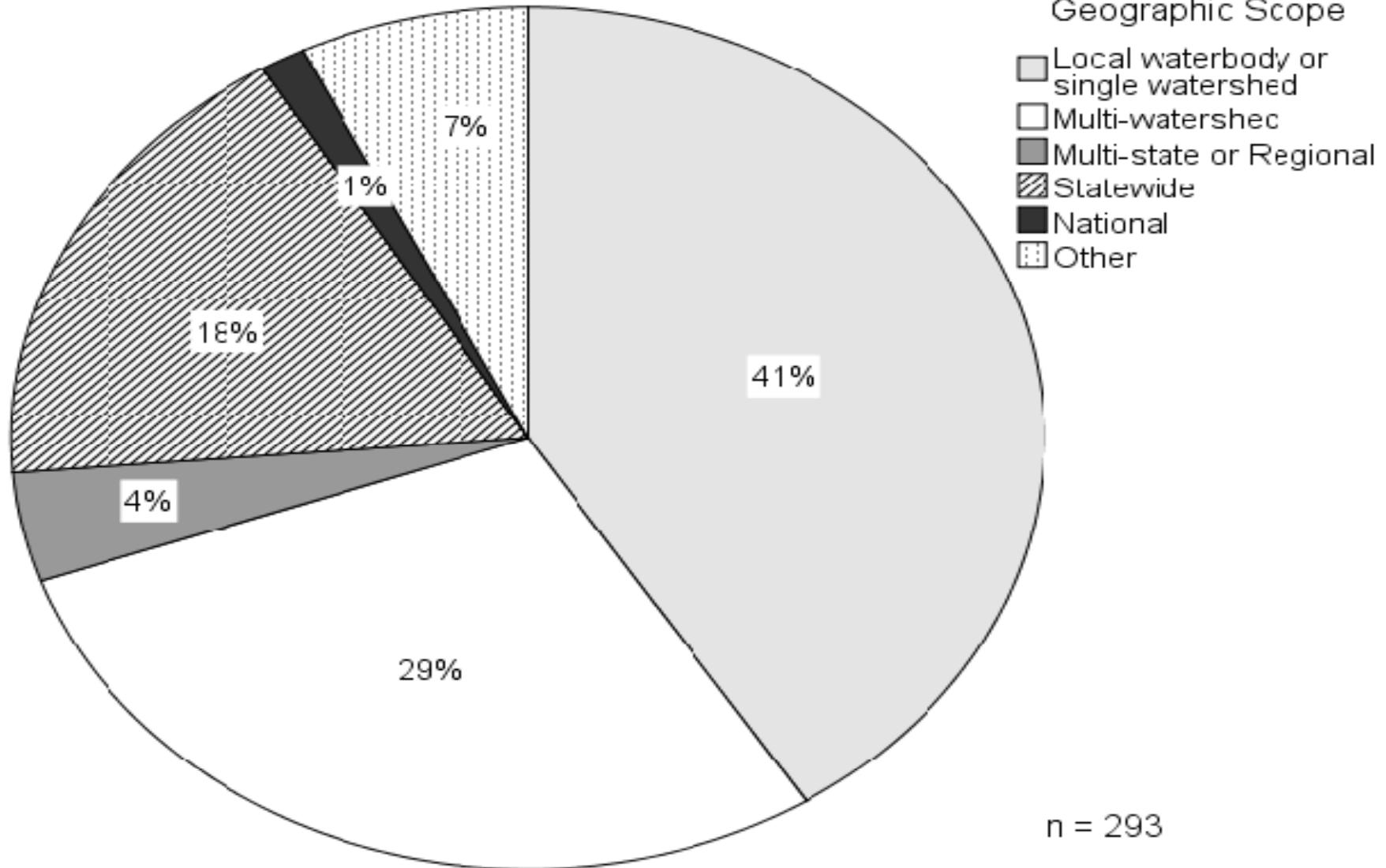
Program size

- Support >1300 sub-programs
- Huge range of sizes
 - 1-5500 sites (114 sites on average)
 - 2-10,000 volunteers/year (377 on average)
 - 1-10 full time staff (1 on average)



Kristine Stepenuck, PhD

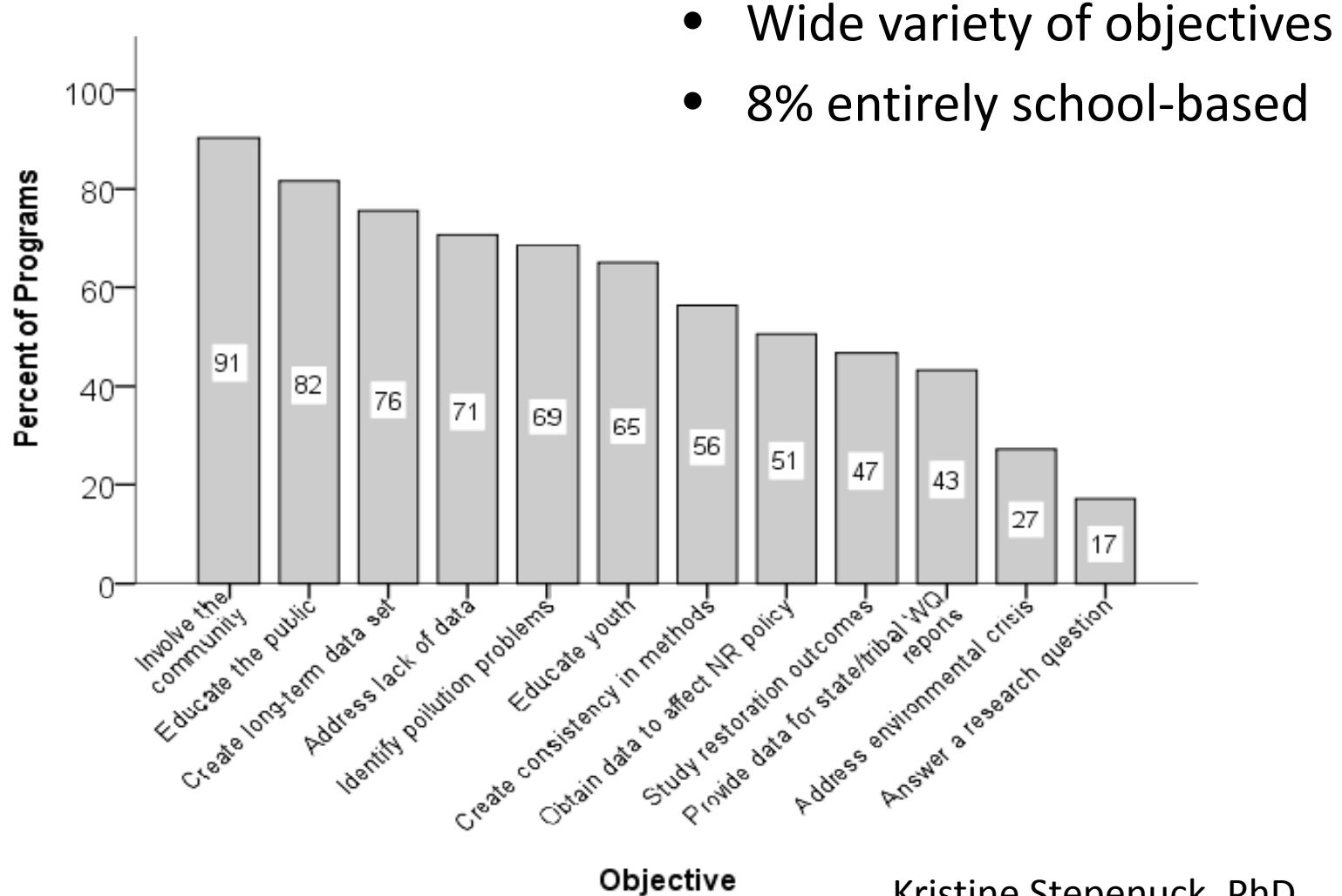
Geographic scope



Most operate in a single watershed

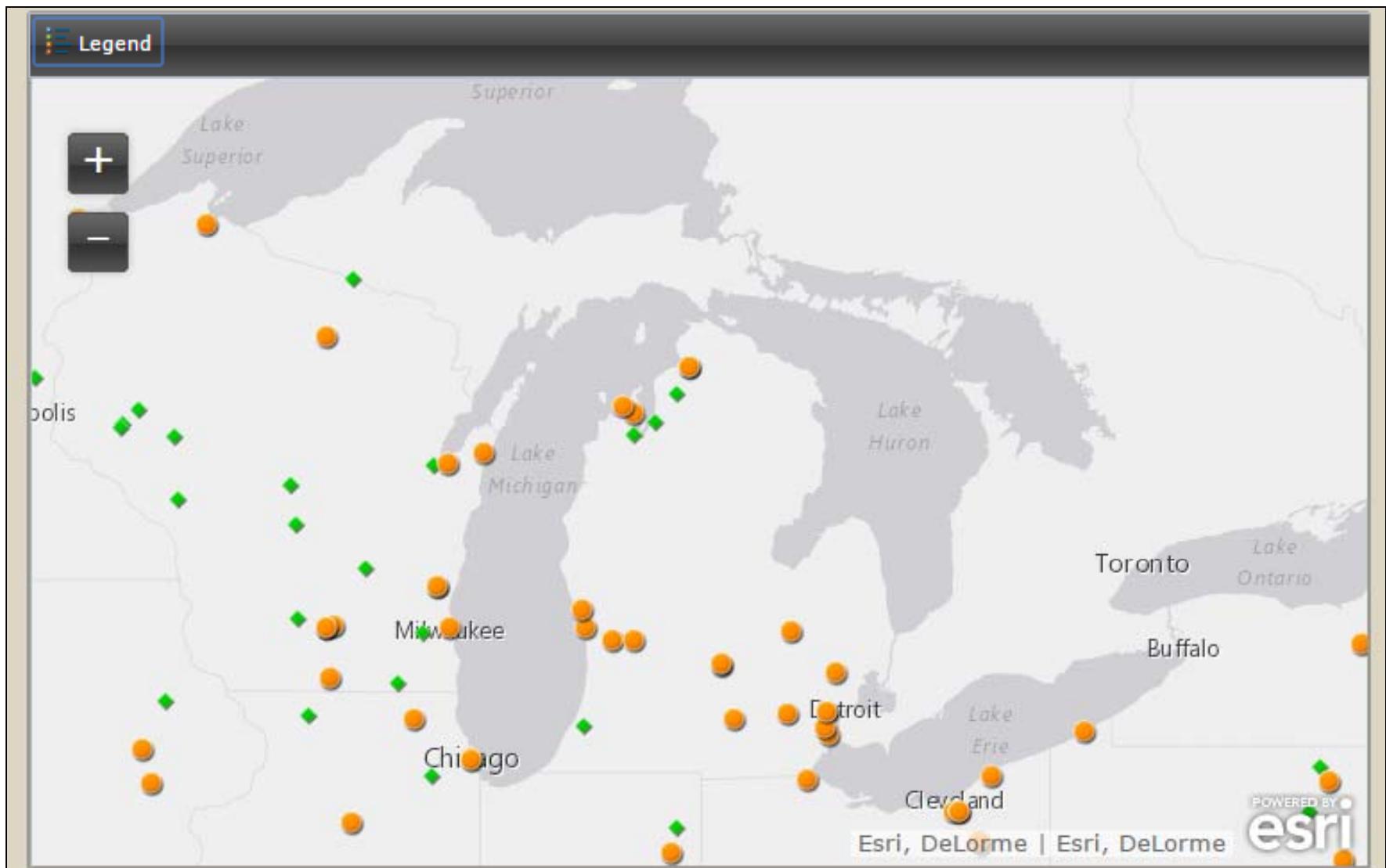
Kristine Stepenuck, PhD

Program objectives



Kristine Stepenuck, PhD

Michigan



Outcomes... VolMon = Change

- Education
- Personal behavior change
- Increased civic engagement
- Community education
- Local/county government
- Strengthened collaborations
- State/federal agency data use



Fun Theory – Behavior Change

- [http://www.youtube.com/watch?v=2lXh2n0a
Pyw](http://www.youtube.com/watch?v=2lXh2n0aPyw)

Personal → Community education

The screenshot shows a web browser displaying an article from cumberlink.com/sports/outdoors/water-works-beauty-and-efficiency-of-rain-gardens/article_19ccac33-0f2d-53e0-8a2a-00f8a9a0a200.html. The page has a pink header with the title "The Sentinel CUMBERLINK.COM" and "PENNSYLVANIA'S BEST HOMEPAGE 2013". It features a weather forecast of 58° Clear and a weekly forecast link. The main content is an article titled "Water Works: Beauty and efficiency of rain gardens" by Meghan Newell Reedy, published on October 05, 2014 at 12:30 pm. The article discusses how rainwater management systems like rain gardens help manage stormwater runoff in downtown Carlisle, eventually reaching the Chesapeake Bay.

Water Works: Beauty and efficiency of rain gardens

October 05, 2014 12:30 pm • By Meghan Newell Reedy, For The Sentinel

Where does all that water go when it rains?

In downtown Carlisle, where I live, much of the water rushes across parking lots and roadways and splashes into storm drains that carry it to the Muddy Grub and LeTort Spring Run. From there, it is carried to the Conodoguinet Creek, then into the old, wide Susquehanna River and on down to the Chesapeake Bay, where it slips into the Atlantic Ocean.

But not all of the rainwater goes that far that fast. Rainwater that falls on gardens and forests and fields and meadows has a chance to sink into the soil where plants use it and clean it. Then some of the water trickles slowly toward streams, and some filters down and down and down into our

Civic Engagement



Baltimore Sun

A screenshot of the official website for the City of York, Pennsylvania. The URL in the address bar is yorkcity.org/michael-helfrich. The page features the city's logo and a banner image of the York skyline at sunset. The main content area is titled "Michael Ray Helfrich, Member of York City Council". It includes his contact information: Office of York City Council, 101 S. George St., York, PA 17401; Mailing Address: P.O. Box 509, York, PA 17405; Phone: (717) 849-2246; Fax: (717) 812-0557; Mobile: (717) 779-7915; Email: Michael.Ray.Helfrich@gmail.com. To the right is a portrait photo of Michael Ray Helfrich, a man with short brown hair, wearing a suit and tie. Below the contact info is a section titled "Background" with a brief bio.

Member x
yorkcity.org/michael-helfrich
Con College D Gateway

CITY OF
york
PENNSYLVANIA

{ Live, work, play in York. }

Michael Ray Helfrich, Member of York City Council

Office of York City Council
101 S. George St.
York, PA 17401
Mailing Address:
P.O. Box 509
York, PA 17405

Phone: (717) 849-2246
Fax: (717) 812-0557
Mobile: (717) 779-7915
Email: Michael.Ray.Helfrich@gmail.com

Background

Michael Ray Helfrich, a Democrat, was first elected to York City Council in November 2011 and was sworn into office on January 3, 2012. He serves as the Chair of the Business Administration Committee of Council, and is a member of the Police, Fire, Economic & Community Development, and Public, and Vacant Property Review Committees of Council.

Born the son of Kenneth R. Helfrich from Girard Avenue in the City of York and Christine Hartmann from Frankfurt, Germany. Michael grew up in West York but spent a lot of his time in the City of York in his youth. Michael graduated from the

Codorus Creek Improvement Project

Goal – Get people out on the water, pollution monitoring

- Boat parade – York Fair
- Oil spill



Civic Engagement



Baltimore Sun

A screenshot of the official website for the City of York, Pennsylvania. The page features the city's logo and a banner image of the city skyline at sunset. The main content area is titled "Michael Ray Helfrich, Member of York City Council". It includes contact information such as address, phone number, fax, mobile, and email. A portrait photo of Michael Ray Helfrich is displayed on the right. Below the main bio, there is a section titled "Background" with a brief summary of his political career and family history.

Member x

yorkcity.org/michael-helfrich

on College Gateway

CITY OF
york
PENNSYLVANIA

{ Live, work, play in York. }

Michael Ray Helfrich, Member of York City Council

Office of York City Council
101 S. George St.
York, PA 17401
Mailing Address:
P.O. Box 509
York, PA 17405

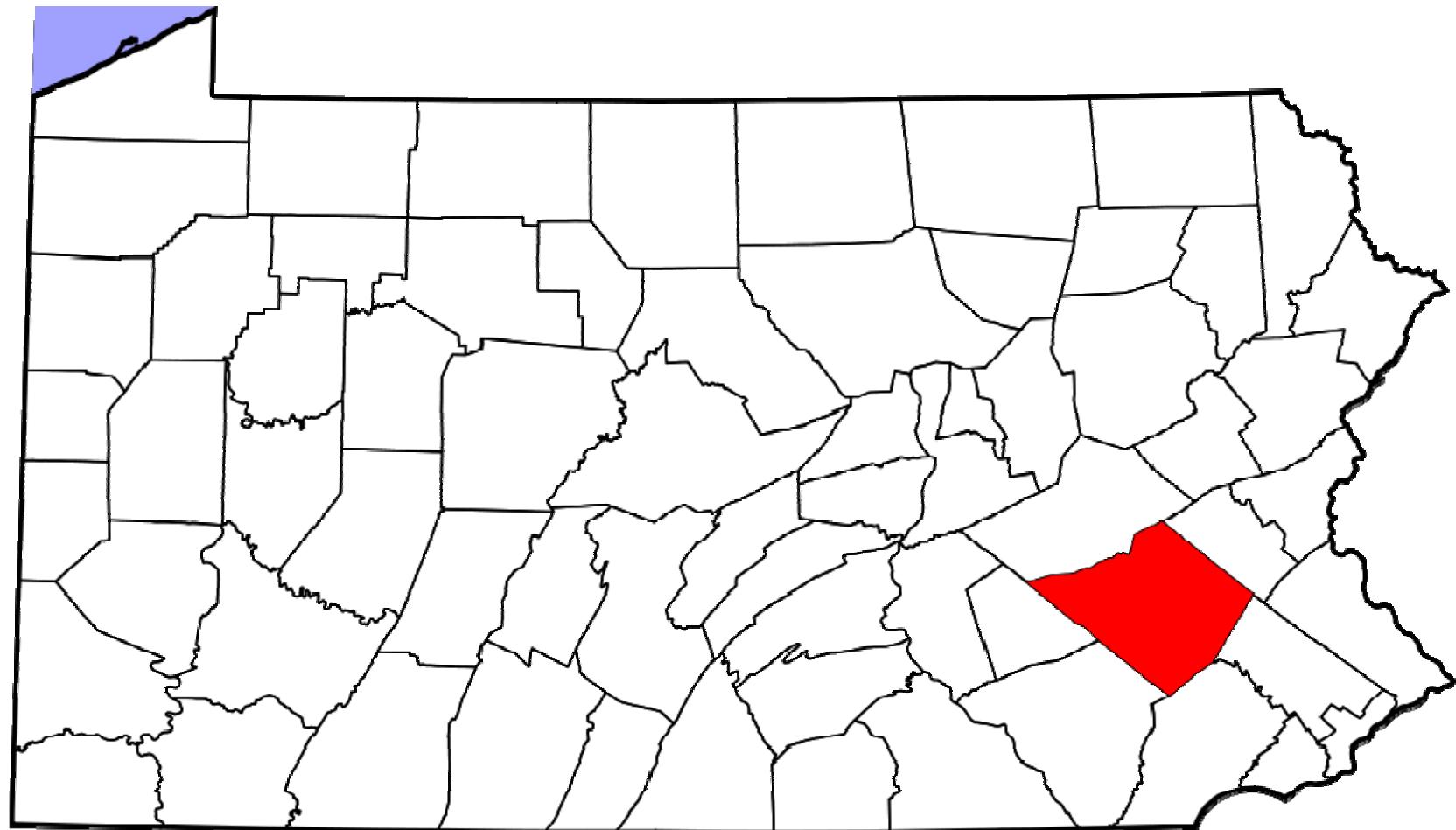
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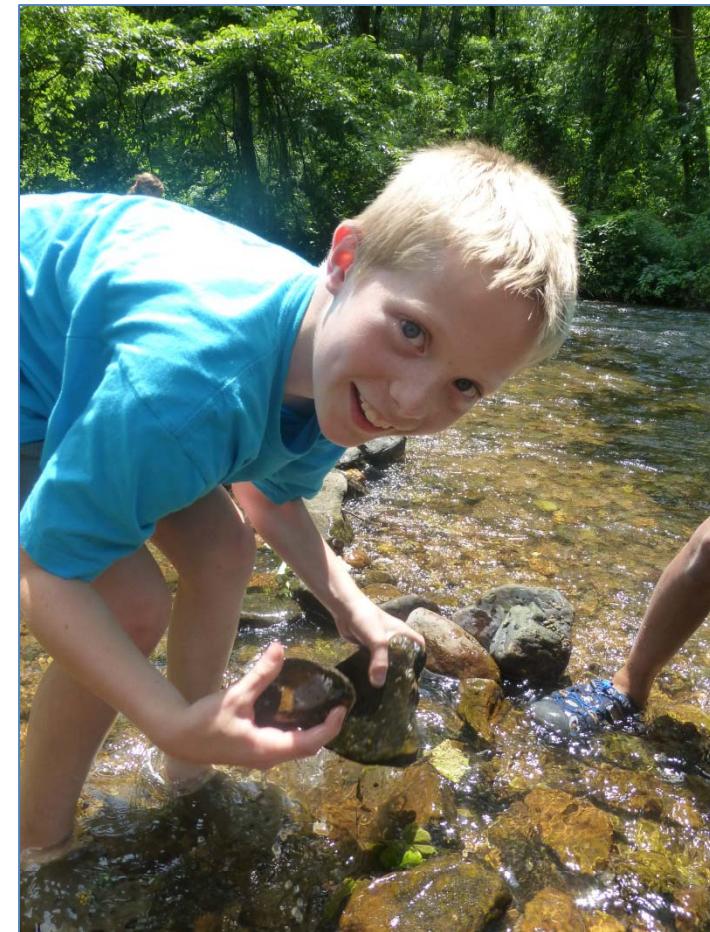
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Little Swatara – Berks County



Watershed → EAC → Youth Education

- Little Swatara Watershed Association
- Bethel Township Environmental Advisory County
- Youth Education



Connecting data to action!



PA: Acid Rain Monitoring Program

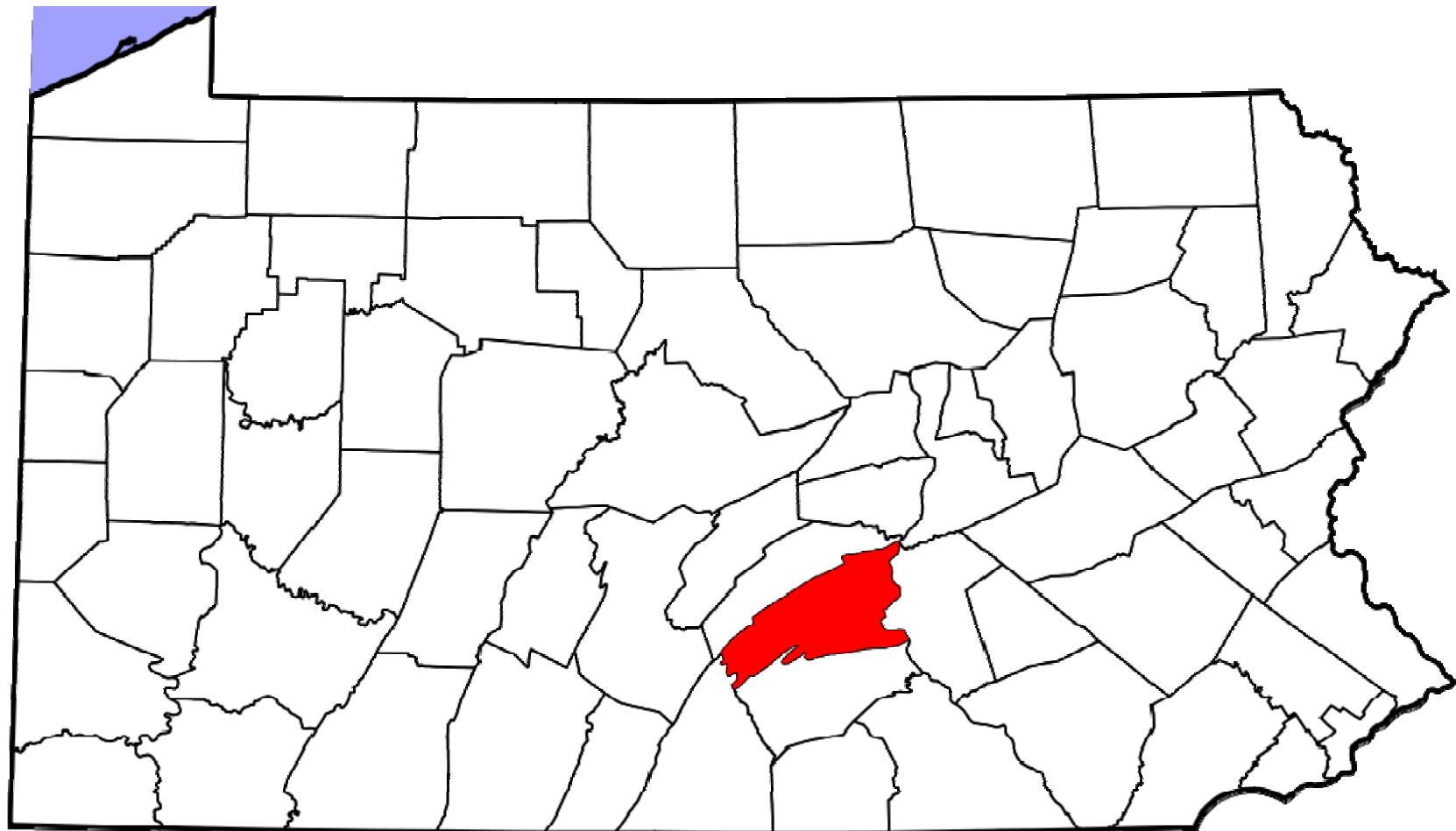
Goal – document effects
of acid rain.



1990 PA Clean Air Act
Amendments



Shermans Creek – Perry County



Community Awareness → Informed Decision Making

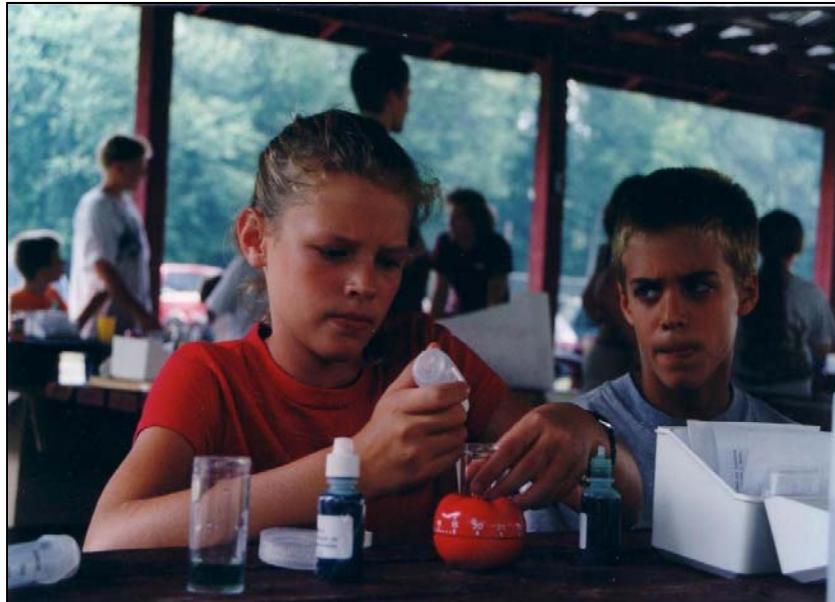
- Shermans Creek Conservation Association formed in 2000
- Power Plant Fight



SCCA – Many Outcomes

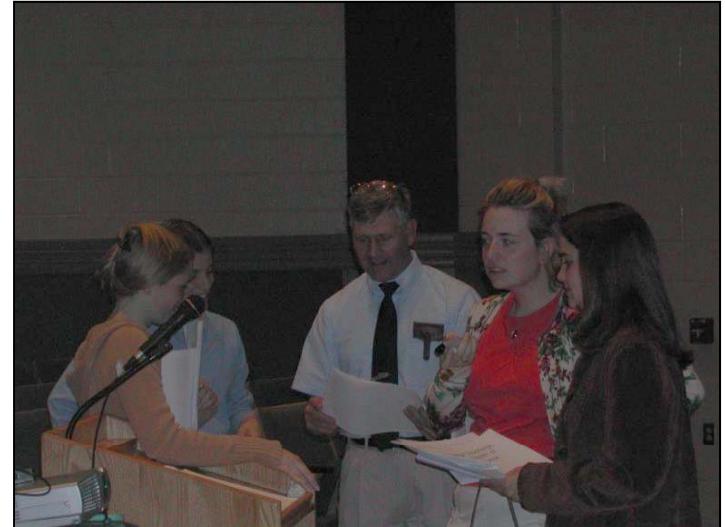
Goal: Baseline monitoring, use data for protection and restoration

- Youth Education
- Rivers Conservation Plan
- Stream Upgrade Petition
- Stream Clean Ups

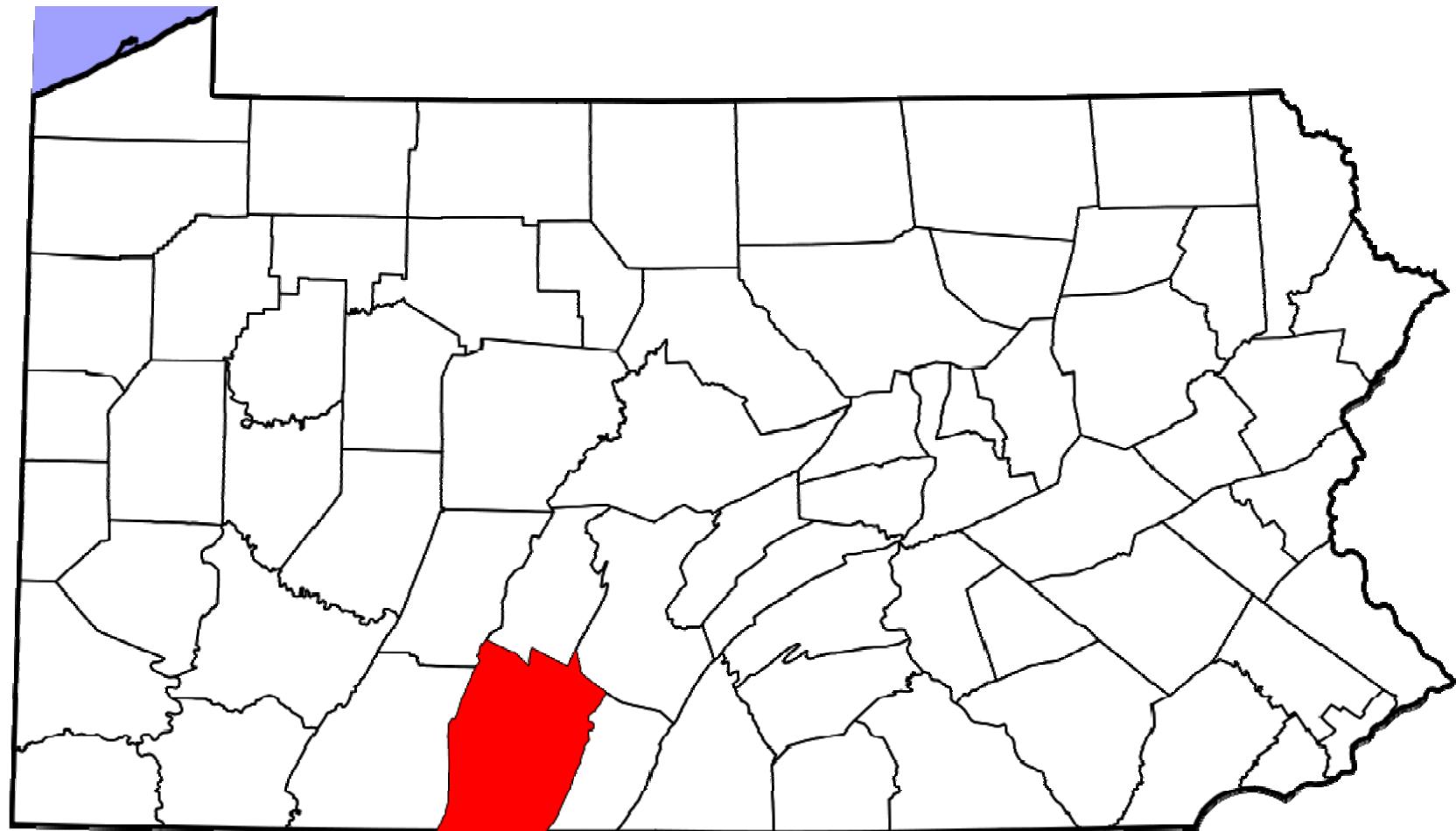


High School Collaboration

- EPA grant...
- Science fair projects
- Oral history club



Ridge & Valley – Bedford County



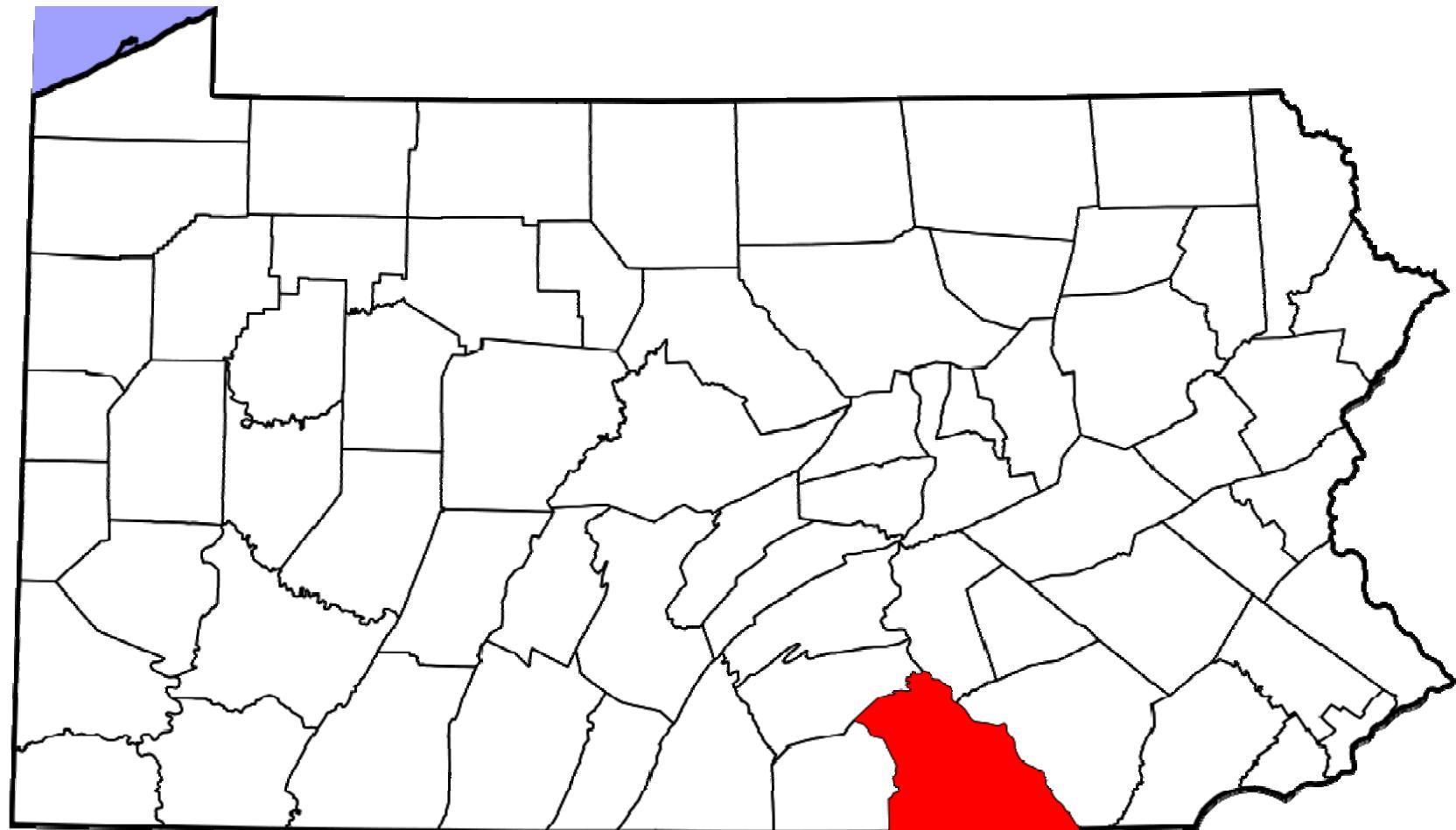
Ridge & Valley Streamkeepers

Goal – protect pristine watershed

- Baseline monitoring
- Data interpretation
- Municipal presentations
- Zoning



Codorus Creek – York County



Codorus Creek Watershed Association

- Formed in 1998
- Glatfelter Paper Plant—discharges around 14 million gallons of wastewater daily into Codorous Creek
- “The Inky Stinky” (hydrogen sulfide & tannins)

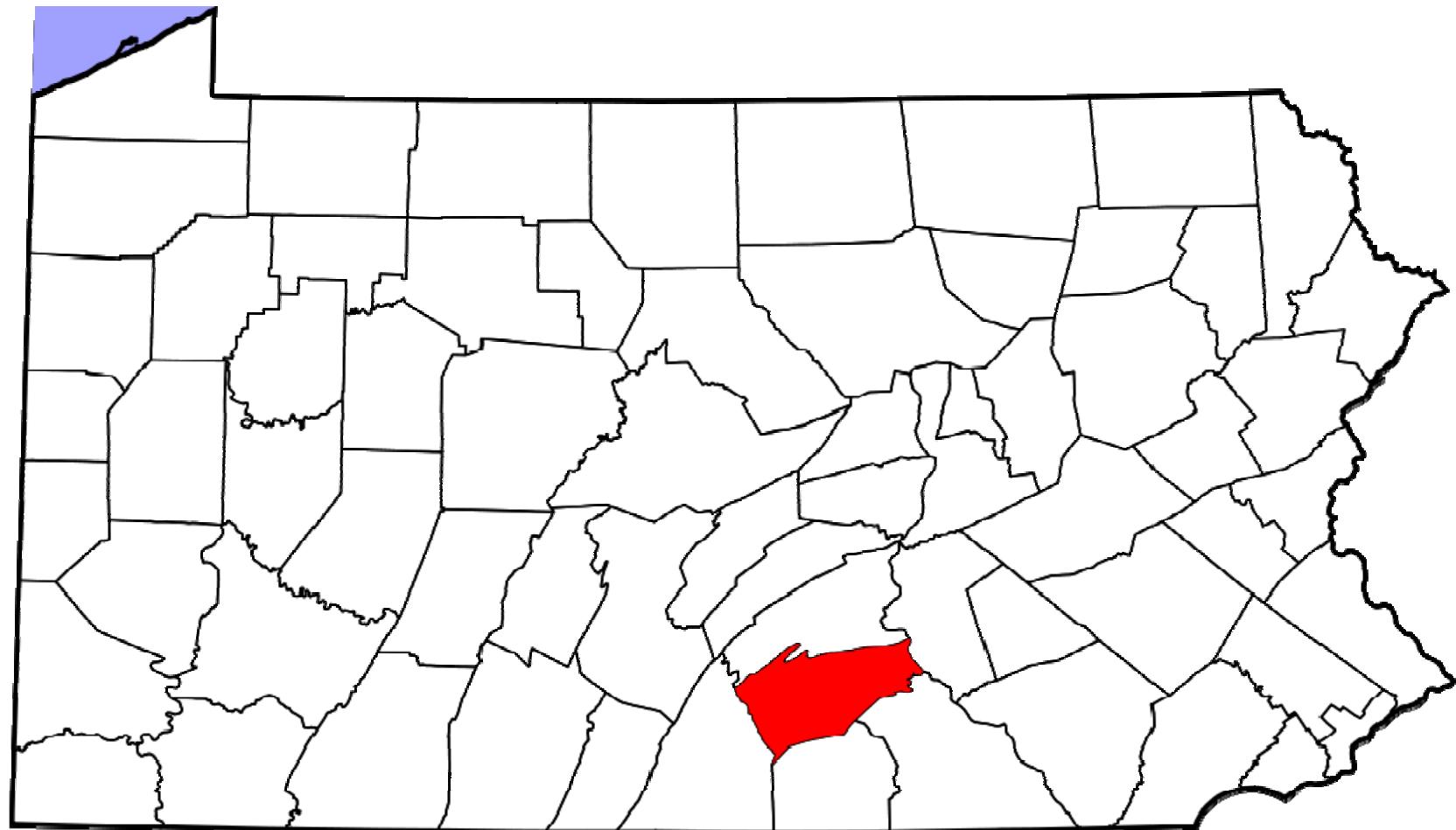


CCWA Data Uses

- CCWA filed a lawsuit in 1999 against Glatfelter for violating CWA and their NPDES permit
- Settlement in 2001:
 - \$2 million endowment fund for environmental improvement projects
 - \$2.5 million in penalties
 - installed \$32 million worth of new equipment to improve clarity of discharge
- Watershed report 2005



Middle Spring – Cumberland County

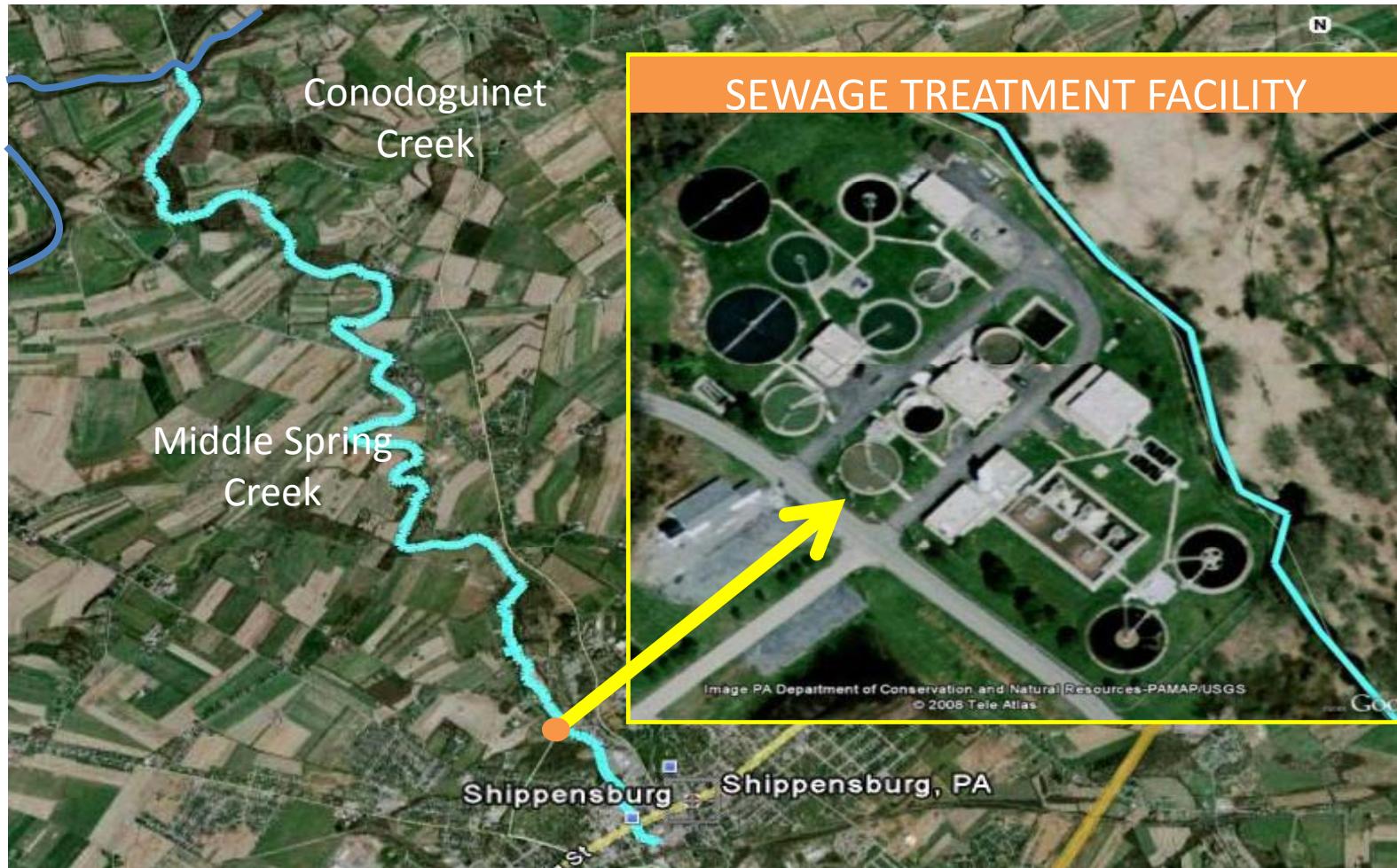


Middle Spring Watershed Association

Watershed Issue



Using Data in the Community



MSWA – 3 Types of Monitoring

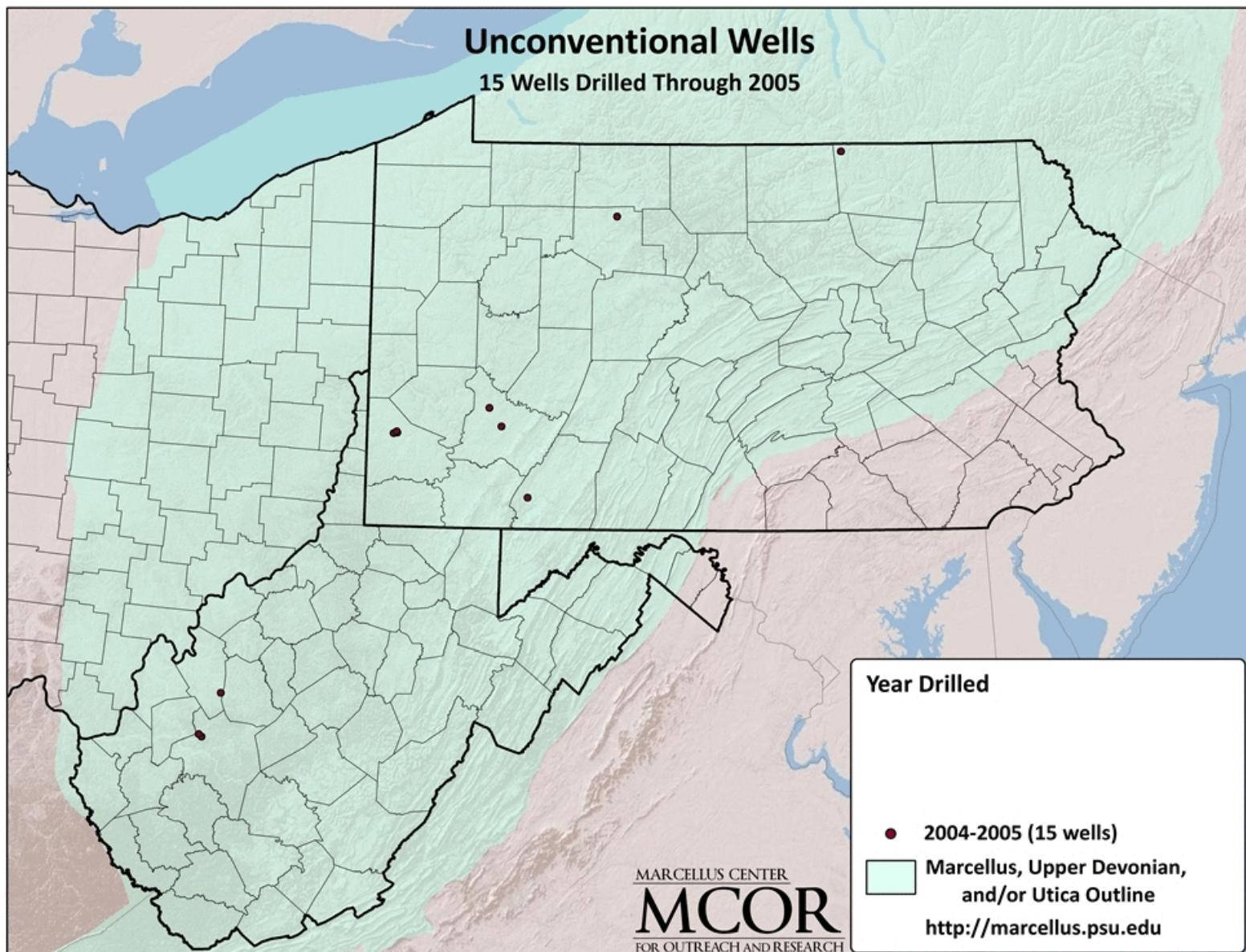


MSWA Data Use Examples

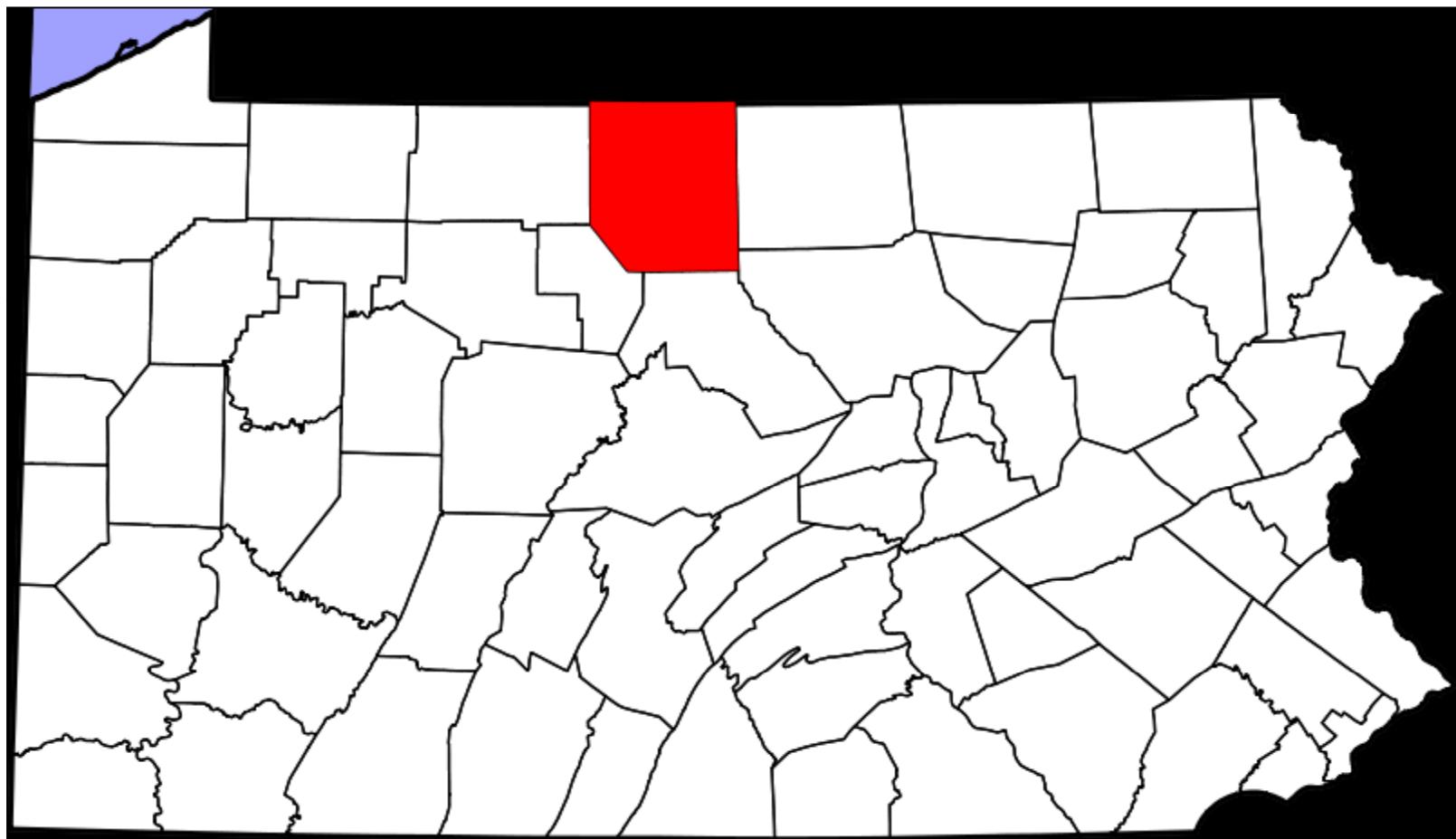


- STP proposal was dropped in 2009
- Group removed a dam in 2010
- Did riparian plantings 2011-2013

Shale Gas Wells in Region



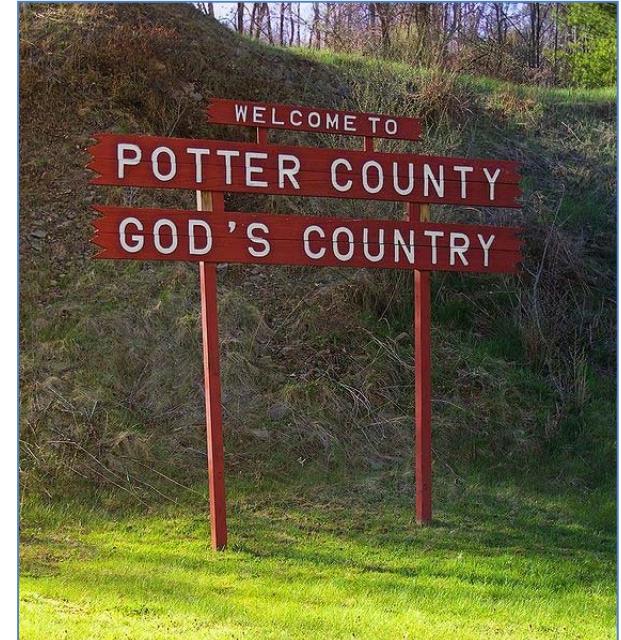
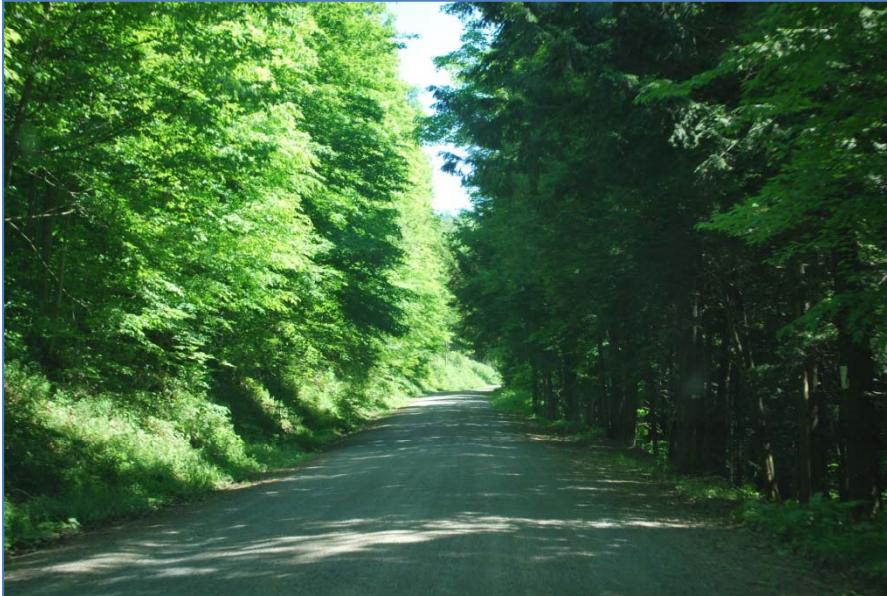
Potter County –aka “God’s Country”



http://en.wikipedia.org/wiki/File:Map_of_Pennsylvania_highlighting_Potter_County.svg

Potter Background

- Rural – 18,000 people
- Heavily forested
- Triple Divide – Allegheny, Genessee, Susquehanna



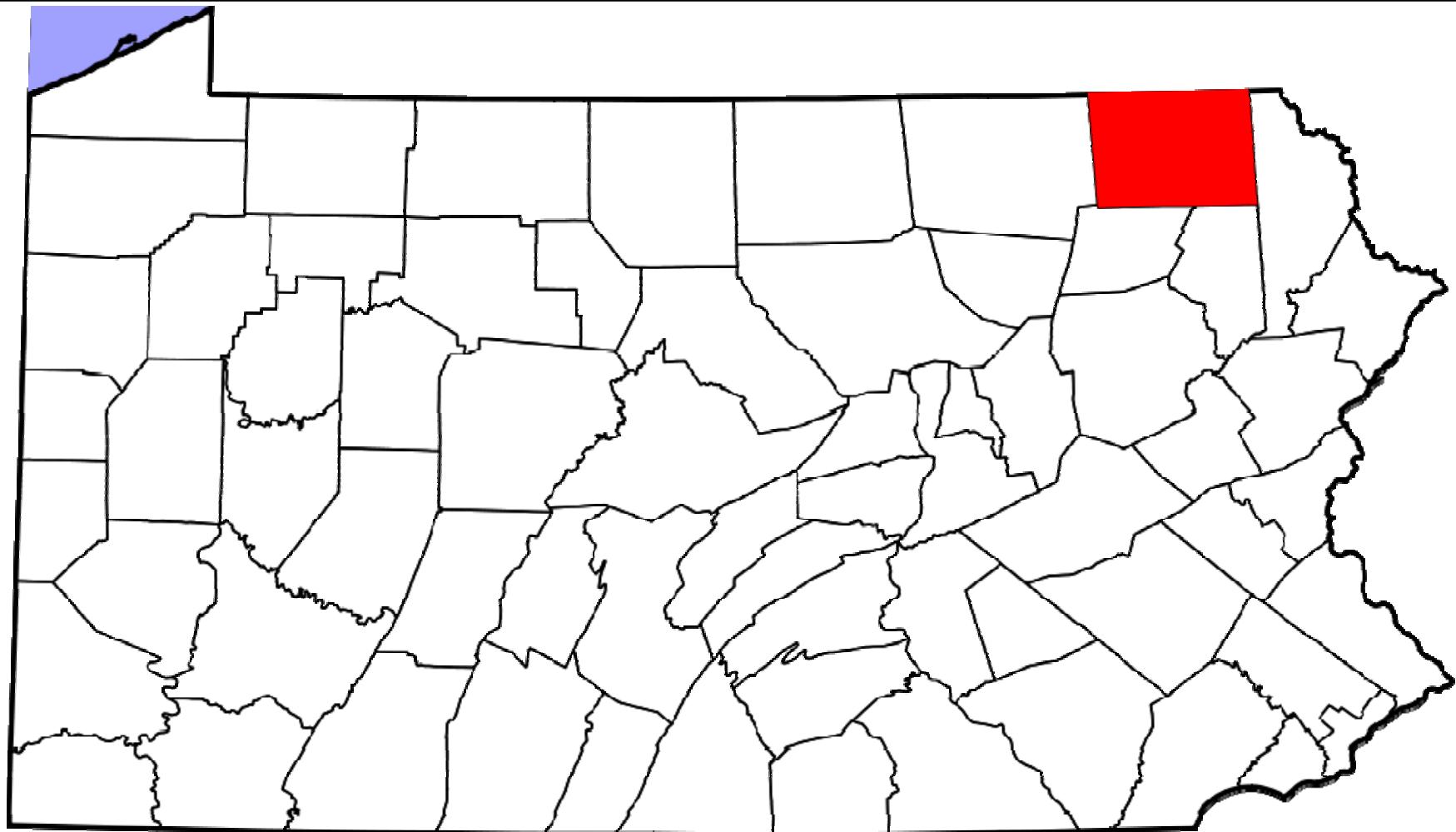
http://en.wikipedia.org/wiki/File:Pike_Township_Enter.jpg

Goal: Red flag monitoring

- Sediment Plumes
- Fast response
- 8 violations reported



Susquehanna County – Red Flag Monitoring



Success story – Frack fluid spill caught

Photo courtesy of Delaware Riverkeeper Network



Photo courtesy of Delaware Riverkeeper Network



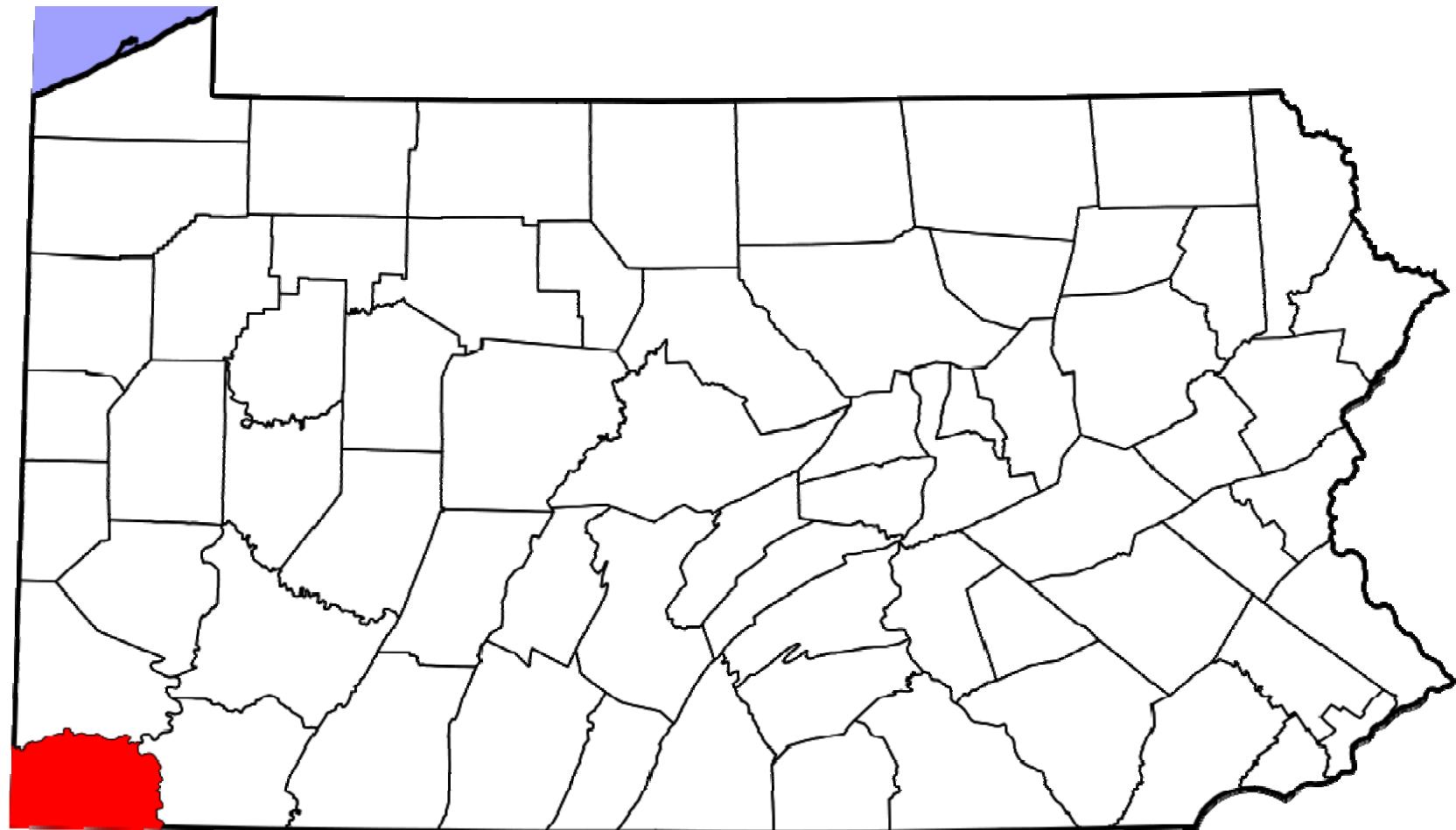
Drilling fluid spill at Cabot site
Dimock, PA
September 2009



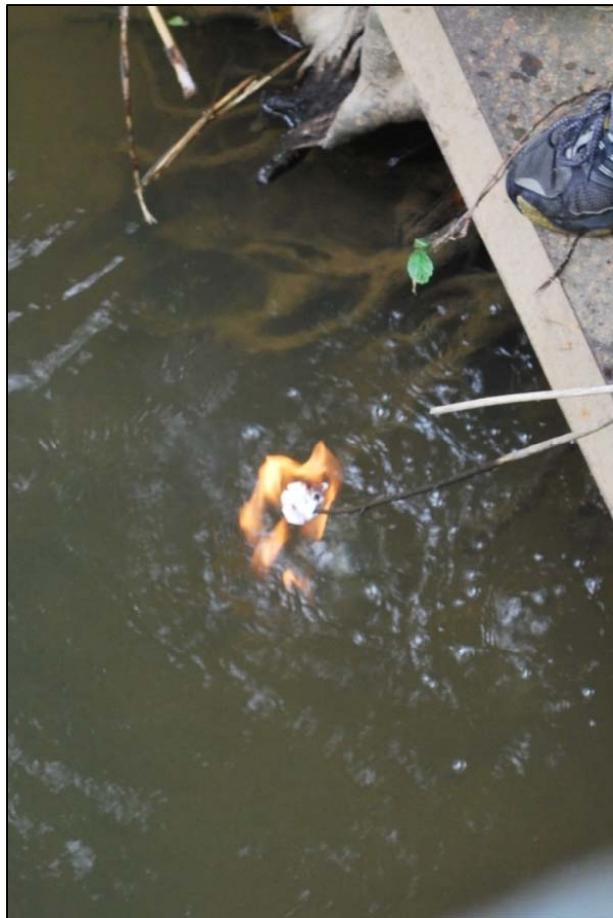
Photo courtesy of Delaware Riverkeeper Network

Photo courtesy of Delaware Riverkeeper Network

Red Flag Monitoring – Greene County



IWL Chapter – Gas Migration



Key Ingredients

- Strong question driven monitoring
- Verify the quality of your data (QAPPs)
- Jump over the data interpretation hurdle
- Communicate your story



Monitoring mantras

- All data of a known quality has a use.
- The quality of data collected needs to meet the intended use.
- Programs need to have clearly documented and used Quality Assurance/Quality Control measures.



Resources

<http://acwi.gov/monitoring/vm/>

The screenshot shows a web browser window with the URL <http://acwi.gov/monitoring/vm/resources.htm> in the address bar. The page title is "NWQMC - Volu...". The main content area features a banner with the text "Working Together for Clean Water". On the left, there is a vertical sidebar menu with the following categories and links:

- About Us
- Home
- Advisory Committee on Water Information
- Workgroups**
 - Workgroups Overview
 - Collaboration and Outreach
 - Methods and Data Comparability Board
 - National Monitoring Network
 - Water Information Strategies
- Products**
 - Newsletter
 - Framework
 - National Monitoring Conference
 - National Environmental Methods Index (NEMI)
 - Publications
 - Webinars
- Partners**
 - Volunteer Monitoring
 - State and Regional Councils
 - Success Stories
- Meetings**
 - Meeting minutes
 - Presentations
 - ACWI meeting schedule
 - Other meetings of interest
- Members**
 - Calendar
 - Sharepoint

The "Resources" link in the top navigation bar is highlighted in orange. Below it, the "Resources for Volunteer Water Quality Monitoring" section is displayed. This section includes a heading "List Services for Discussion and Support" and two numbered items:

- 1. USEPA Volunteer Monitoring LISTSERV**
The [Volmonitor Listserv](#)
Join this community network to ask questions, solicit input, and provide information on any volunteer monitoring program or administrative topic. To subscribe to the LISTSERV, send a blank email message to: volmonitor-subscribe@lists.epa.gov.
- 2. Extension Volunteer Monitoring Network**
The University of Wisconsin-Extension has created a LISTSERV to exchange information with water quality and monitoring program coordinators. To join or unsubscribe from this email list service, use the form at <https://lists.uwex.edu/mailman/listinfo/extvolmonnet>. They also have an extensive archive of select interactions to help ensure that the knowledge shared through them can reach as wide an audience as possible.

Publications

Newsletters

Interested in volunteer monitoring? The National Volunteer Monitoring newsletter may meet your interests. It covers a wide variety of topics, ranging from Algae to Zebra Mussels. Check out the newsletter site by clicking on the image below.

Guides for Establishing Your Own Volunteer Monitoring Program [PDF](#)

These resources will help ANY Volunteer Monitoring Program and serve as quick guides for specific program areas. The Extension Volunteer Monitoring Network has created a comprehensive support system for Extension volunteer water quality monitoring and citizen science efforts across the country. The goal is to expand and strengthen the capacity of the existing Extension Volunteer Monitoring Network and to support development of new programs. The PDF's are downloadable here (see below) or at <http://www.usawaterquality.org/volunteer> along with other resources.

1. [Getting Started](#)

www.usawaterquality.org/volunteer/

http://www.usawaterquality.org/volunteer/

Google Custom Search

 Applying knowledge to improve water quality
Volunteer Water Quality Monitoring
National Water Resource Project
A Partnership of USDA NIFA
& Land Grant Colleges and Universities

 VOLUNTEER WATER QUALITY MONITORING
National Water Resource Project

Home of the Extension Volunteer Monitoring Network

Volunteer Monitoring
National Water Resource Project

[Project Description](#) (382 K pdf file)
[Nationwide Inquiry Results](#) NEW!
[Outreach Materials and Activities](#)
[Online Databases](#)
[Training Modules](#)

Extension Volunteer Monitoring Network Programs

[National Volunteer Water Monitoring Program Directory](#)
[Extension-connected Programs](#)
[Master Naturalist Programs](#)
[Job postings](#)

Researching and Validating Volunteer Monitoring

[Validation Studies](#)
[Other Volunteer Monitoring Research](#)

Related Research and Educational Efforts

[Select Archives of Volunteer Monitoring Listserv Discussions](#)
[Publications](#)

Tribal Initiatives



Upcoming Events ➤

Guide for Growing Programs

[Getting Started](#) (234 K pdf)
[Why Monitoring Makes Sense](#) (582 K pdf)
[Designing Your Monitoring Strategy](#) (1.6 M pdf)
[Monitoring Matrix](#) (80 K pdf)
[Effective Training](#) (866 K pdf)
[Monitoring Equipment Suppliers](#) (437 KB pdf)
[Direct Links to Monitoring Programs' Manuals \(online\)](#)
[Building Credibility](#) (942 K pdf)
[Sharing Information Through Internet Exchanges](#) (127 K pdf)
[Volunteer Management](#) (1 M pdf)
[Planning Your Program's Data Management System](#) (560 K pdf)
[Tips and Tools for Effective Presentations](#) (541 K pdf)
[Outreach Tools](#) (464 K pdf)
[Fundraising](#) (590 K pdf)
[Bacteria Monitoring Intro](#) (468 K pdf)
[Methods for Monitoring Bacteria in Surface Waters](#) (916 K pdf)
[Presenting Bacteria Monitoring Data Effectively](#) (522 K pdf)
[Evaluating Your Volunteer Monitoring Program](#) (404 KB pdf)

Of Special Interest

ALLARM Contact Information

Alliance for Aquatic Resource Monitoring (ALLARM)

Dickinson College

P.O. Box 1773

Carlisle, Pennsylvania, United States 17013

717.245.1565

allarm@dickinson.edu

www.dickinson.edu/allarm

<http://blogs.dickinson.edu/marcellusmonitoring/>