

# Volunteer Monitoring: Starting Strong



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National Water Quality Monitoring Council



# Agenda:

- Volunteer Monitoring Models
- Key tools
- Study Design
- QAPPs



# ALLARM Background

ALLARM educates communities how to use science as a tool to investigate the health of their streams and to use the data they generate for aquatic protection and restoration efforts.



[www.dickinson.edu/allarm](http://www.dickinson.edu/allarm)

Dickinson

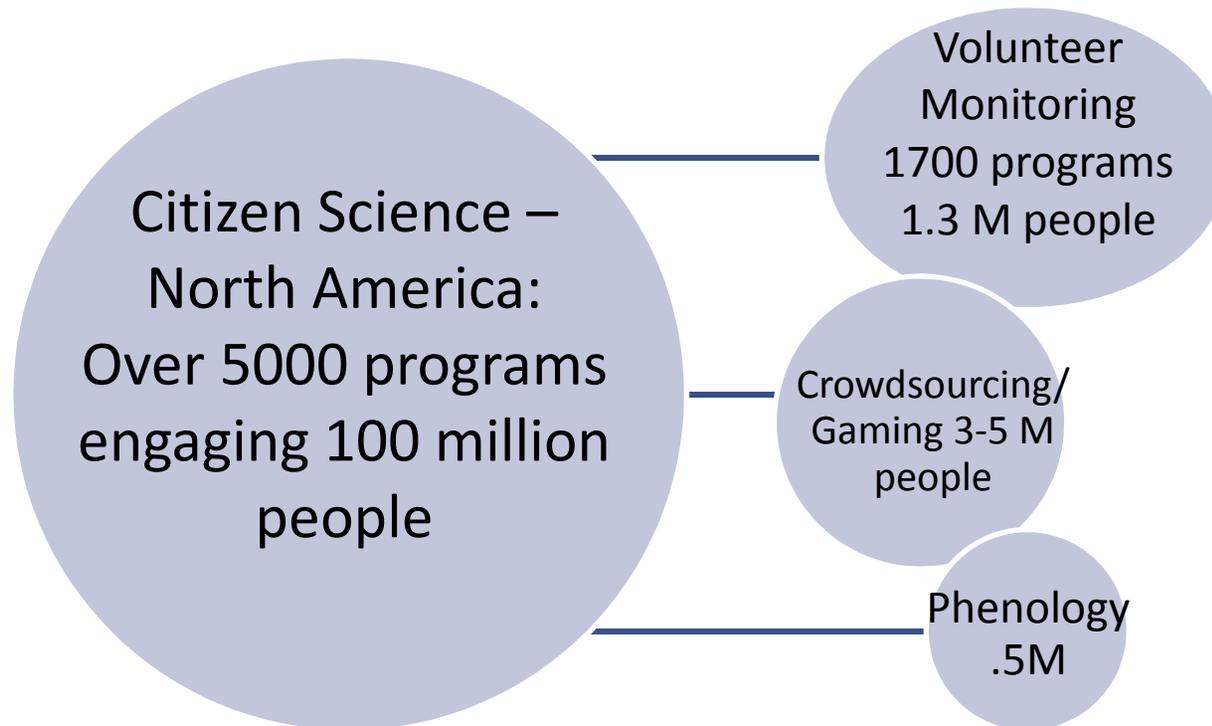
# Izaak Walton League of America



A conservation organization interested in protecting natural resources and promoting outdoor recreation.



# Citizen Science (umbrella of networks) & Volunteer Monitoring (pillar network)



**Shared Goal: Collect data that make an impact.**

# Big picture – National Volunteer Monitoring

- Citizens involved in data collection
- US: 1968 – 2017
- 48 out of 50 states have active programs
- Over 1,700 programs
- 1.3 M people

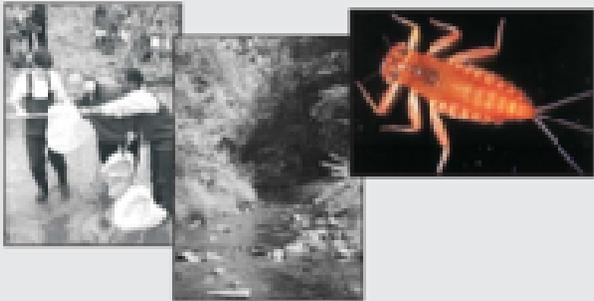


# Models of Volunteer Monitoring



# Streams & Rivers – Collectors Model

**MARYLAND STREAM WADERS  
VOLUNTEER  
STREAM MONITORING MANUAL**



**MARYLAND DEPARTMENT OF NATURAL RESOURCES  
MONITORING AND NON-TIDAL ASSESSMENT DIVISION**

**1-877-620-8DNR x8623  
email [streamwaders@dnr.state.md.us](mailto:streamwaders@dnr.state.md.us)**

**MARYLAND** DEPARTMENT OF NATURAL RESOURCES  
CHESAPEAKE BAY AND WATERSHED PROGRAMS  
MONITORING AND NON-TIDAL ASSESSMENT

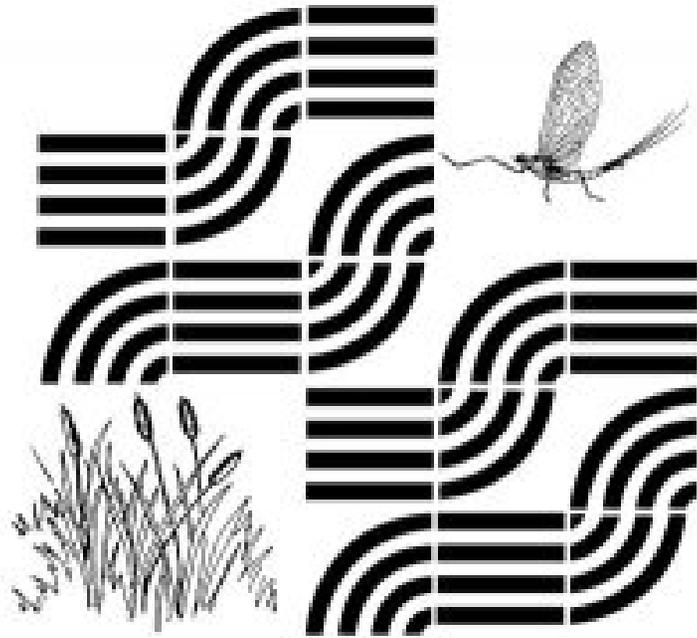
Revised January 2008



Phosphorus Monitoring Program

# Streams & Rivers – Standardized Programs

Volunteers collect samples and analyze

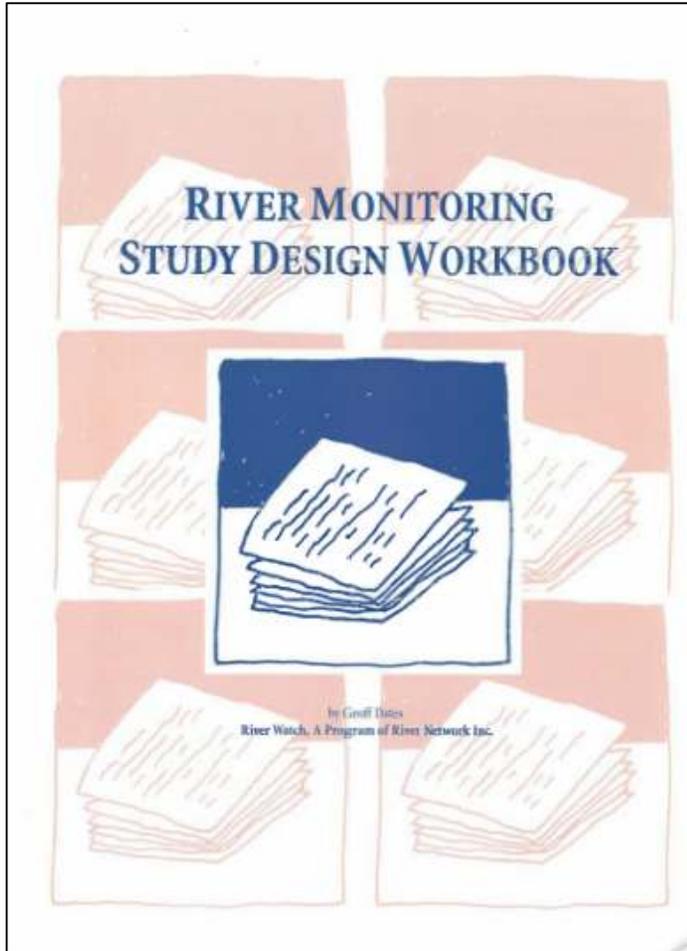


**Georgia Adopt-A-Stream**



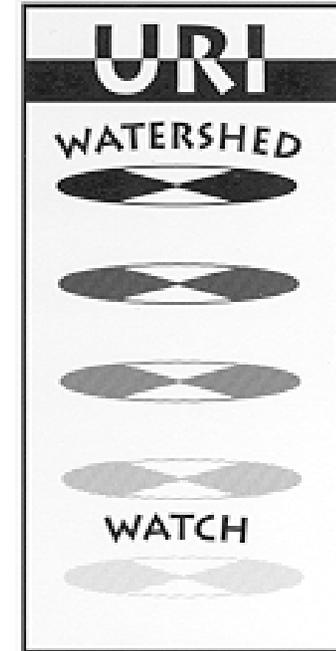
# Streams & Rivers – Co-Created Approach

## Volunteers do all steps of scientific process



<https://www.rivernetwork.org/resource/river-monitoring-study-design-workbook/>

# Lakes, Estuaries, Oceans – Hybrid Field and Certified Lab



# Program Structure– Role of Service Provider

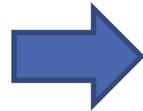
- State agency coordinator
- State contracted/funded coordinators
- Extension
- NGO Service Providers



# Technical Support Model



Community Concern



Technical Assistance -  
Study Design/QAPP



Monitoring trainings



Data collection &  
quality verification

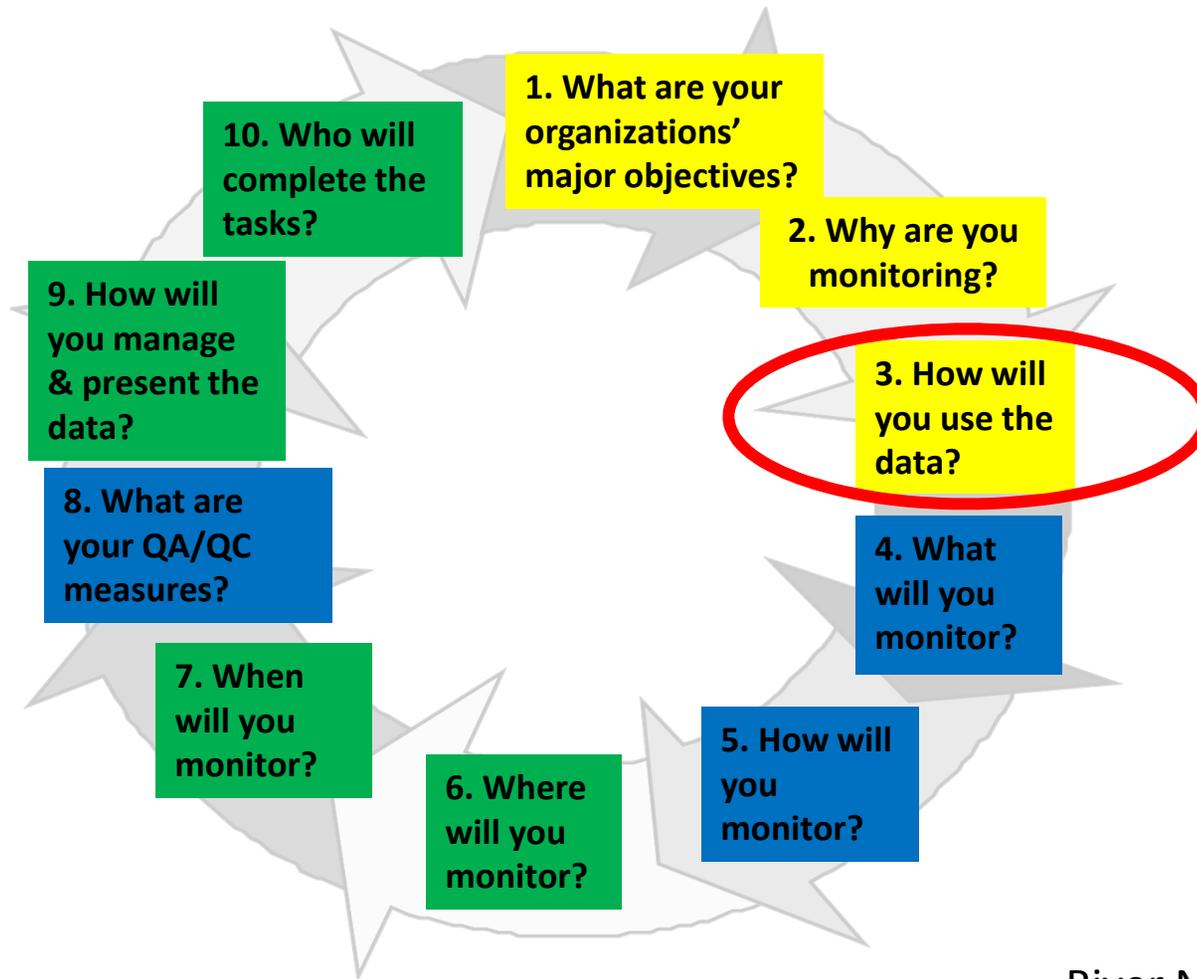


Data interpretation



Communities use data to  
protect and restore  
waterways

# Tools - Study Design Process



# Monitoring Mantras

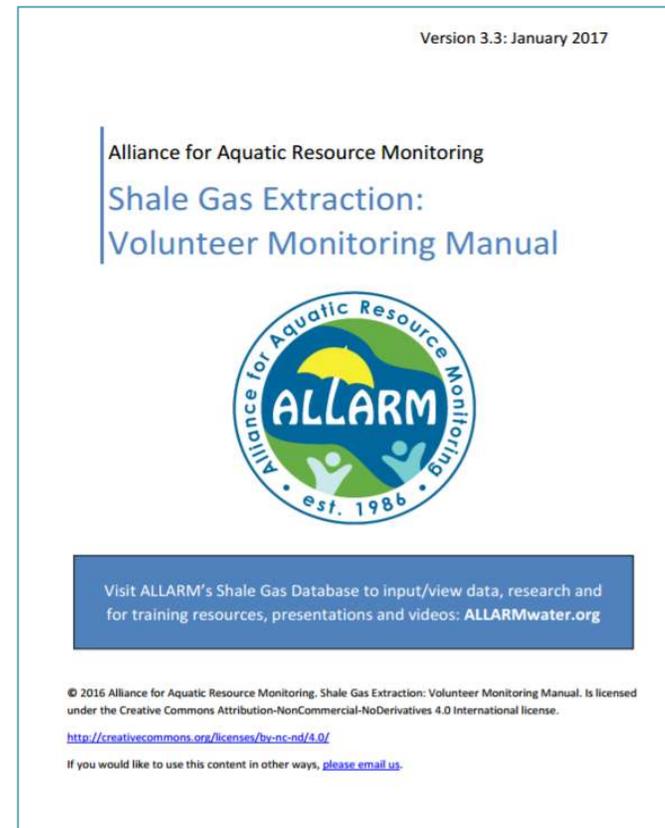
- All data of known quality have use
- Must match intended use with quality of data collected



# What is a study design?

- A written document that describes the choices you make about monitoring
- Most important step of monitoring!

[ALLARM Monitoring Resources](#)



# Why is a study design needed?

- Scientific process
- Focus
- Clearly articulated methods
- QA/QC
- Continuity



# Lessons Learned in PA

- 1996 PA DEP CVMP created
- 2000 Growing Greener
- 2001 Formation of C-SAW
- 2002 Standardized study design manual



# 1) What are your organization's major objectives?

- Mission
- Major programs



- How does monitoring help you achieve your organizational goals?

## 2) Why are you monitoring?

- Prioritize concerns
- What questions will monitoring help answer?



[http://news.bbc.co.uk/olmedia/167000/images/\\_1672207\\_sewage2.jpg](http://news.bbc.co.uk/olmedia/167000/images/_1672207_sewage2.jpg)



### 3) How will you use the data collected?

- What action will you take with data – will inform quality needed
- Remember: how will data fit in with objectives



## 4) What will you monitor?

- Watershed indicators that will help answer your question (biological, chemical, physical characteristics)
- Practical considerations:
  - Do you have the human & financial resources to measure it?
  - How difficult is it to monitor?
  - Does it help you understand a major component of the ecosystem?
  - Is it understandable and explainable to the target audience?



## 5) How will you monitor?

- Determining appropriate analytical methods that meet your data objectives.



- Examples:
  - Accuracy & Precision – LaMotte/HACH kits vs. lab analysis
  - Grab samples, integrated samples, direct measurement samples
  - Qualitative net collection or semi-quantitative net collection
  - Maximum holding times, reporting units, transport to lab

## 6) Where will you monitor?

Consider safety & accessibility, potential water quality impacts, reference locations, stream designated uses.

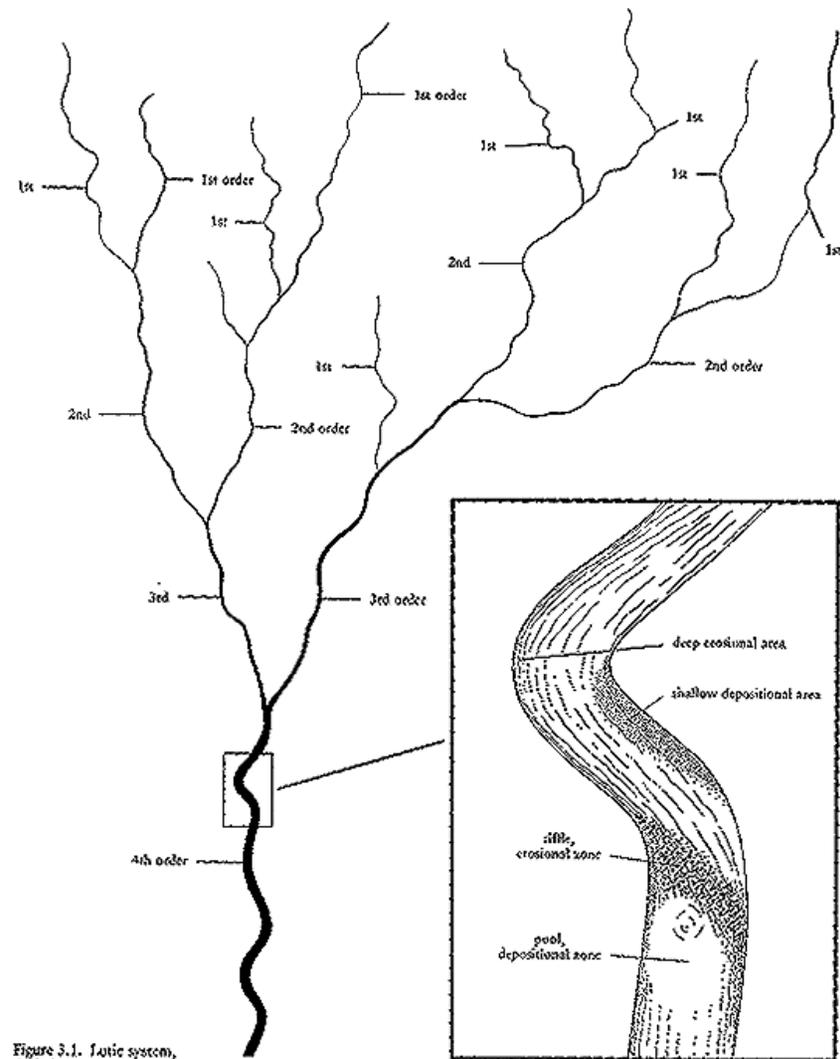


Figure 3.1. Lotic system, depicting stream orders and lotic zonation.

## 7) When will you monitor?

- What time of year?
- What time of day?
- Special weather conditions – storm events, drought, etc.?
- Frequency of sampling? Consider resources and data requirements.



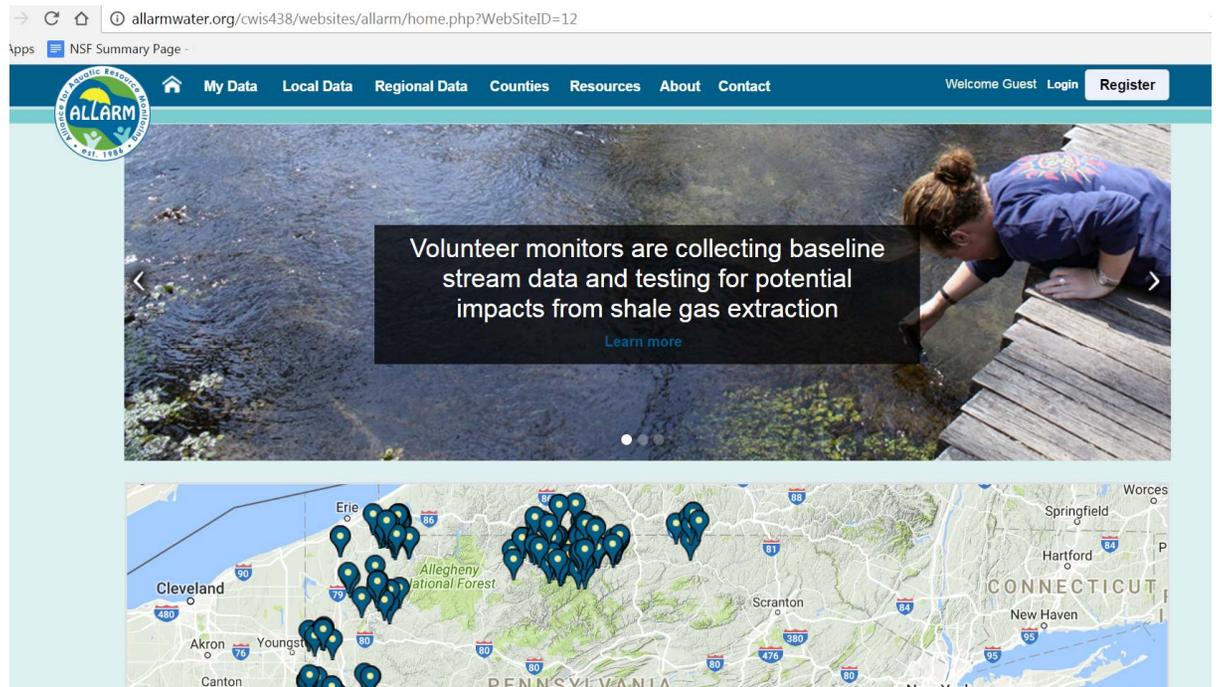
## 8) What are your Quality Assurance measures?

- Crucial piece!
- Training
- Equipment care and calibration
- How do you ensure the data are credible.
- Documentation, documentation, documentation – Study Design to data sheets.



## 9) How will you manage and present the data?

- Management
- Interpretation
- Communication



## 10) What are the tasks and who will do them?

Develop job description for volunteer positions.

- Program Coordinator
- Quality assurance
- Purchase equipment
- Analyze data
- Recruit and organize volunteers
- Report findings
- Train field and lab volunteers
- Monitoring
- Evaluate your study design



# Continuum of VolMon Data Use

Education/  
Awareness



Assess  
Impairment



Legal &  
Regulatory

Increasing Time | Rigor | QA | Expense \$\$

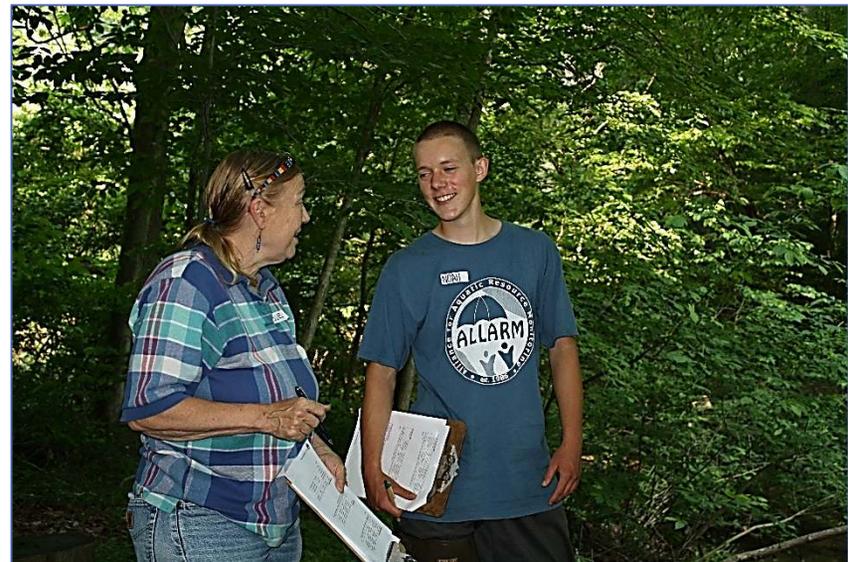
# Barriers to Data Use

*“...some government scientists have a lingering bias against volunteer data. We have come a long way and this is a non-issue in some states, but it remains a significant constraint in other states...”*

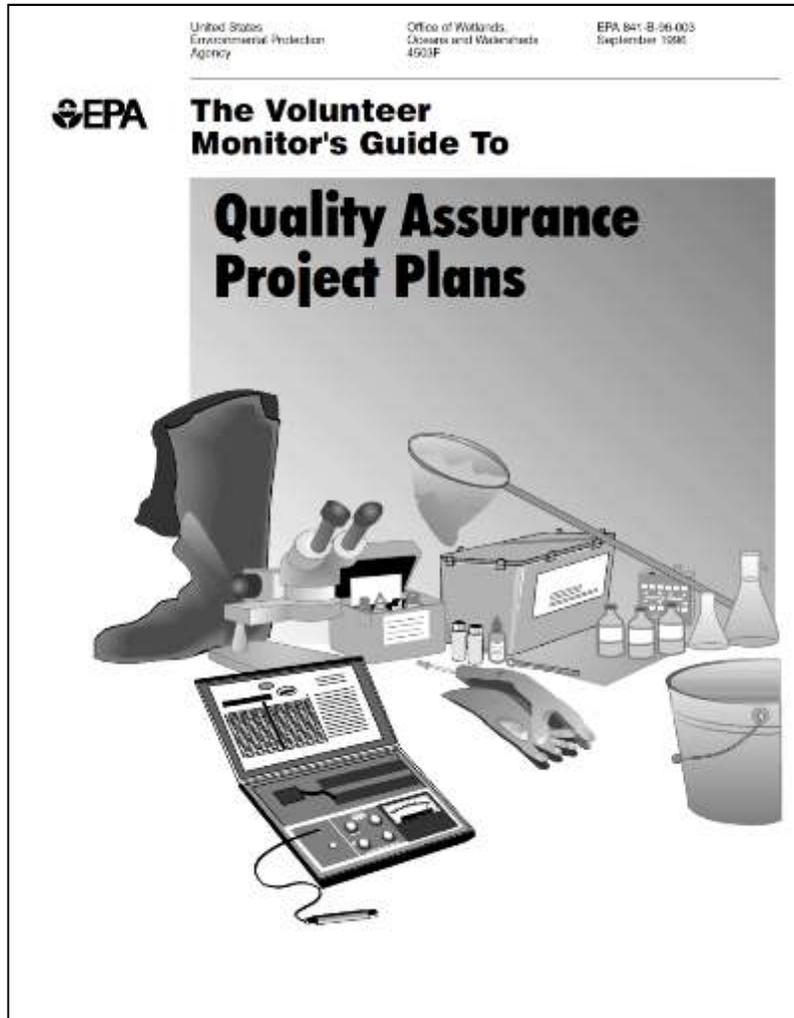


# Setting the Stage for Your Program

- Why do you want to monitor?
- What do you want the data to be used for?
- Who are your data users?



# Tools – EPA VolMon QAPP





# Study Design & Quality Assurance Project Plan

- Study Design
  - Objectives
  - Data Users
  - Design Rational
    - Why you are doing the study
    - Why you are picking certain sites
- QAPP
  - Analytical Methods
  - Data Quality Requirements
  - Corrective Actions for Errors
  - Chain of Custody
  - Certified Labs
  - Data Storage
  - Data Validation

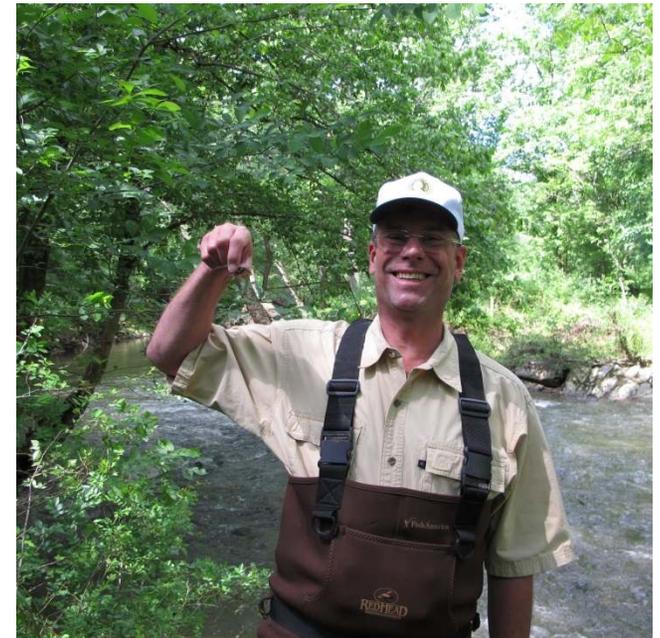
# Taking Ownership of YOUR Data



# Volunteers and Biological Monitoring

## Original Save Our Streams Protocol

- Solely based on presences/absences of taxa
  - 35% of the samples were not in agreement
  - Oversimplified numeric analysis
- Recommended Standardized Quantitative Methods



*“Volunteer Biological Monitoring: Can it Accurately Assess the Ecological Conditions of Streams”*  
Voshell, J. R. & Sarah R. Engel 2002

# VA SOS—over 280 monitoring locations

- Approved VA DEQ QAPP
- User Friendly Stream Side Assessment
- Multimetric Index



# Getting Started Advice....

Start small,  
start simple,  
seek out help,  
ask a lot of questions,  
see what others are doing  
go to workshops/conferences



*Advice from Linda Green, URI, Watershed Watch*

# Starting Out Strong

- We plan our programs through study designed
- We document quality through QAPPs
- Data use at community, state, and national levels



# Moving Beyond the Numbers

- Being the voice of the river
- Protecting our communities
- Sharing our passion



# Resources

- **National Water Quality Monitoring Council**
  - <https://acwi.gov/monitoring/vm/resources.html>
- **USA Volunteer Water Monitoring Network**
  - <http://volunteermonitoring.org/>
- **Listserve:**
  - The EPA volunteer monitoring listserve: To subscribe, send a blank email message to [volmonitor-subscribe@lists.epa.gov](mailto:volmonitor-subscribe@lists.epa.gov)
  - The extension listserve: <https://list.uvm.edu/cgi-bin/wa?SUBED1=EXTVOLMONNETWORK&A=1>
  - Citizen Science Association: <http://citizenscience.org/elist/>



**National Water Quality Monitoring Council**

Working together for clean water



# Next Webinar: State Use of VolMon Data

- Tuesday June 13 2pm EST
- Speakers:
  - Jody Arthur, Indiana Department of Environmental Management
  - James Beckley, Virginia Department of Environmental Quality
  - Jo Latimore, Michigan State University Department of Fisheries and Wildlife



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# Questions?

