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
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)

Citizen Science – North America: Over 5000 programs engaging 100 million people

Volunteer Monitoring
1700 programs
1.3 M people

Crowdsourcing/Gaming
3-5 M people

Phenology
.5M

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 – Standardized Programs
Volunteers collect samples and analyze.
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

1. **Community Concern**
   - Technical Support Model

2. **Technical Assistance** - Study Design/QAPP
   - Monitoring trainings

3. **Data collection & quality verification**
   - Data interpretation

4. **Communities use data to protect and restore waterways**
Tools - Study Design Process

1. What are your organizations’ major objectives?
2. Why are you monitoring?
3. How will you use the data?
4. What will you monitor?
5. How will you monitor?
6. Where will you monitor?
7. When will you monitor?
8. What are your QA/QC measures?
9. How will you manage & present the data?
10. Who will complete the tasks?
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?
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.
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/

• Listserves:
  – The EPA volunteer monitoring listserve: To subscribe, send a blank email message to 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/
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
Questions?