

Start with the End in Mind: Key Ingredients for Effectively Putting Your Data to Use

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Workshop Overview

Part I

- Introductions
- Key Ingredients for Program Design
- Defining Data Uses and Users
- Designing Tiered Approaches- the NJ way
- Discussion


Workshop Overview

Part II

- Re-cap part I
- Tips, Do's & Don'ts for Presenting Data Effectively
- Indexes Illuminate and Educate
- Examples from the Volunteer Monitoring World
- Discussion
- Evaluation

Introductions

- Who are you?
- Where are you from?
- Are you currently involved with volunteer monitoring
- In *less than* thirty seconds tell us
what is your main reason for taking this workshop?



Key Ingredients for Program Design

Successful Volunteer Water Quality Monitoring Programs are. . .

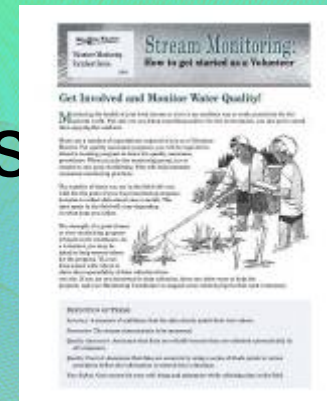
- Well-organized
- Sound scientific basis
- Strong institutional support
- Report results
- Make a difference

Well Organized ...

- Clear purpose
- Develop strong partnerships
 - steering committee
- Good relations with decision-makers
- Strong leadership and coordination
- Clear staff, board, and volunteer roles

A Sound Scientific Basis means

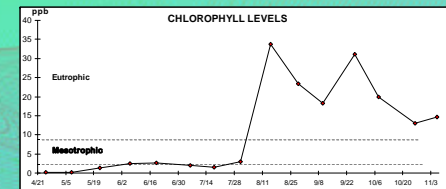
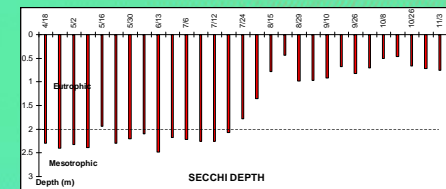
- Clear monitoring goals and questions
- Written study design
- Clear documentation of instructions all monitoring activities
- Monitoring scope and complexity appropriate to group's capabilities
- QA appropriate to data use



Successful Programs

Report and Use Their Results

- Data are turned into a story
- Results and the story are reviewed by data users and resource people
- Results are reported in various ways tailored to the audience
- Information is turned into action
- Monitoring is used to assess progress



But...

before you decide *what* to monitor...

***Think hard about
Why*** you are starting a program

- Learn about the WQ in Stonington Harbor
- We want kids to safely swim in Deep Lake
- To catch trout in Sparkling Stream (again)

Goals and Objectives

- **Goal – where do you want to go?**
 - Learn about the WQ in Stonington Harbor
 - I want my kids to swim in Deep Lake
 - To catch trout in Sparkling Stream
- **Objectives – Specific and measurable**
 - Chl, DO, temp, nutrients, salinity, bacteria in Ston. Harbor
 - To reduce bacteria in Deep Lake to meet state standards
 - Temperature, DO, benthic community in Sparkling Str.
- **Revise as needed to reflect successes, changes in priorities, or program expansion**

Program (or Monitoring or Study) Design

It is the *What, When, Who and How* for your monitoring program. It describes the rationale for, and specific approaches of your monitoring efforts.

- Should flow out of the vision, goals and objectives
- Should objectively reflect resources
- Good design is critical for success!

Getting Started Compile Information

- About the resource
- About the goals of the organization/community
- About current & past monitoring or research efforts
- About volunteer monitoring



Compiling Information

Important Questions to Consider

- What water environment? –lake, stream, wetland
- Why do you want to monitor it?
- Who will use the data?
- How will the data be used?
- How good do the data need to be?
- What variables will you monitor?
- What resources are available?
- Who can help you with your program?
- Has this monitoring ever been done before?



Modified from EPA Volunteer Stream Monitoring Methods

Main Uses of Volunteer Data

- Water Quality or Watershed Education
- Document Existing Conditions
- Problem Identification
- Local Decisions

Assess What is Possible

Consider

- Skills and knowledge
- Potential data uses and users
- Level of commitment
- Financial resources



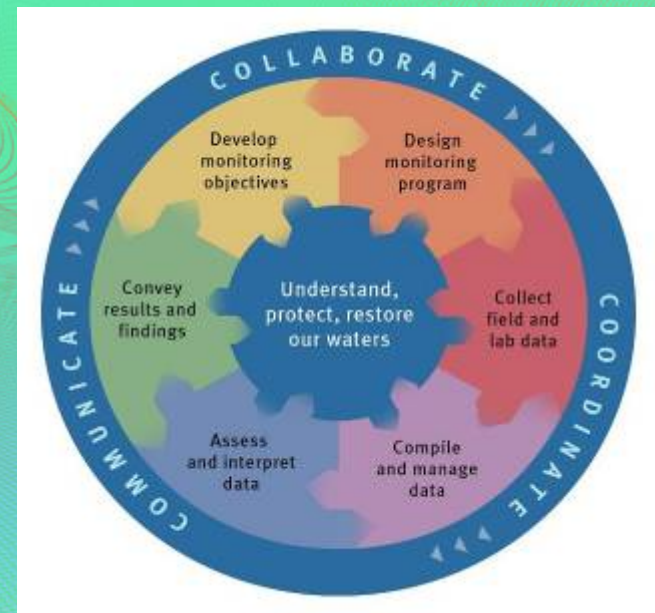
The Continuum of Monitoring Data Use



Increasing Time - Rigor - QA - Expense \$\$

Program Planning: The Framework for Monitoring

- **Assess the need**
- **Develop objectives**
- **Design your program**
- **Collect the data**
- **Compile and manage data**
- **Assess and interpret data**
- **Convey results and findings**
- **Evaluate your program**



National Water Quality Monitoring Council "A Framework for Monitoring"-

Program Planning: *Matrix of Monitoring Activities* summarizes

- Data objectives
- Equipment and supplies
- Education and training
- Frequency of monitoring
- QA/QC level and standards
- Duration of Monitoring
- Intensity of analysis/Complexity of approach

Matrix of Monitoring Activities

The following table describes in broad terms some of the monitoring activities typically performed by volunteers. This matrix is intended to help direct the selection of monitoring activities according to data objectives and available resources. The table is arranged with the monitoring activities that generally require less effort and resources at the top, increasing in complexity toward the bottom. Within each monitoring activity, there is also often a range of data objectives and resources needed, with more intensive data objectives requiring more resources.

Monitoring Activity	Data Objectives	Examples of Activities	Equipment & Supplies	Education & Training	Frequency of Monitoring	QA/QC Level & Standards
Stream Survey	Streamflow, general water/temperature, debris problem, identification of streamflow, Reporting data, Tagging sites for additional study	Field observations, streamflow, water temperature, debris problem, identification of streamflow, Reporting data, Tagging sites for additional study	Map of waterbody, field data sheets, Coliform, Census, GPS and other	Understanding of maps and features of stream. Can be self-taught or training on how to complete maps and data sheets	Monthly	See formal QA/QC procedures on standard forms.
Streambed Assessment	Streambed, General assessment, Debris problem, identification of streamflow, Reporting data, Tagging sites for additional study	Field observations, water/temperature, debris problem, identification of streamflow, Reporting data, Tagging sites for additional study	Map of waterbody, field data sheets, Coliform, Census, GPS and other	Understanding of maps and features of stream. Can be self-taught or training on how to complete maps and data sheets	Monthly or less often	See formal QA/QC procedures on standard forms.
Stream Assessment	Educational, general assessment, Streamflow, identification of streamflow, Reporting data, Tagging sites for additional study, Reporting data, Tagging sites for additional study, Reporting data, Tagging sites for additional study	Visual Assessment of critical habitat, Streamflow, water/temperature, debris problem, identification of streamflow, Reporting data, Tagging sites for additional study, Reporting data, Tagging sites for additional study, Reporting data, Tagging sites for additional study	Map of waterbody, field data sheets, measuring stick, Coliform, Census, GPS and other	Understanding of maps and features of stream. Training in evaluating habitat features and in how to complete maps and data sheets	Monthly or less often	Basic, without data assessment, outdoor, streamflow, sites, and schedules.

Page 1
U.S.O. National Facilitation of C.R.E.E.S. (Water Quality Effects Research) (<http://www.waterwithing.com/>)

Top Parameters Monitored by Volunteers

Lakes

- Secchi trans.
- Water Temp.
- Phosphorus
- Diss. Oxygen
- Chlorophyll
- pH

River/Streams

- Water Temp.
- pH
- Benthic Bugs
- Diss. Oxygen
- Nitrogen
- Flow/water level

at that time bacteria monitoring ranked #11 overall

Start small,
start simple



Sources for Methods

- EPA Guidance Manuals
- *The Volunteer Monitor* newsletter
- LaMotte/Hach kits and catalog
- Secchi Dip-In website (<http://dipin.kent.edu/>)
- CSREES Volunteer Monitoring website www.usawaterquality.org/volunteer
- Conferences
- Listservs
- Standard Methods for the Examination of Water and Wastewater
- NEMI (<http://www.nemi.gov/>)



Program Management Design

Should evolve from your study design and vision – although often developed concurrently. Implements the study design.

- **Training and monitoring program development**
- **Technical and logistical support**
- **Data management, interpretation and reporting**
- **Budget management**
- **Staff and volunteer management**
- **Maintain relationships with partners, sponsors and data users**

Match the Method to the Goals



**Education/
Awareness**



**Problem ID,
Assess
Impairment,
Local
Decisions**



**Legal &
Regulatory**

Increasing Time - Rigor - QA - Expense \$\$

Program Management Design

- All volunteer, paid staff or combo
 - Dedicated staff is critical to success
- Home organization
 - Tribe
 - Agency (state, county, local)
 - Non Governmental Organization
 - University
 - County Extension



Program Design: Umbrella vs. direct management

Umbrella – acts as a service provider

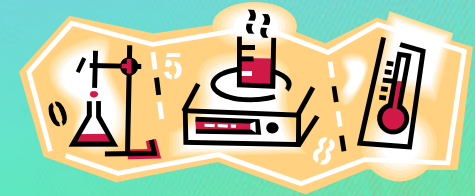
- Training
- Equipment
- Analytical support
- Data interpretation

Direct management – provides all of the umbrella services *plus*

- Volunteer recruitment and management
- Data reporting and presentation
- Budgeting and financial management



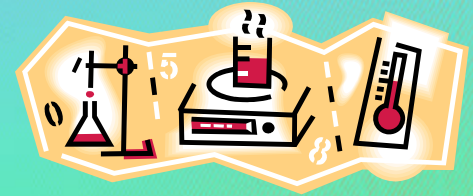
Program Design: In house vs. contract lab



In house – program has own equipment and analysts

- Resource intensive - requires physical space, equipment and expertise
- Convenient – especially for re-sampling
- Allows the program full control of QA/QC
- Can be limited by what you already have available or can purchase
- Agency certification required?

Program Design: In house vs. contract lab



Contract – samples sent to an established lab

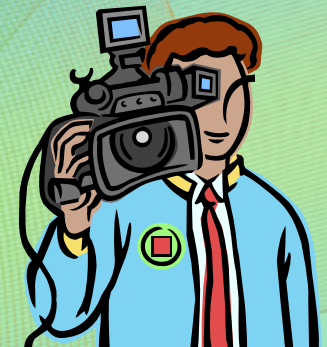
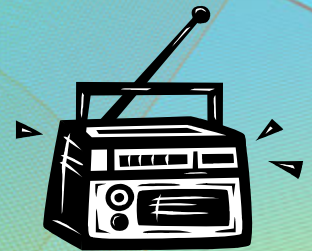
- 💧 Less resource intensive – but can be expensive on a per sample basis
- 💧 Easier – little technical knowledge needed
- 💧 Depend upon the lab for QA/QC
 - 💧 Watch for detection limits!
- 💧 Sometimes viewed as more credible

Recruiting & Training Volunteers



Recruiting Volunteers

- Articles in newspapers/newsletters
- TV, radio interviews
- Community organizations
 - Churches
 - Schools
 - Youth groups, Scouts, FFA
- Shoreline/watershed residents
- Sporting/environ. organizations
- Fairs, festivals, community events
- Inserts in utility bills
- Word of mouth
- Community websites, blogs



Training is a Process that Flows Throughout the Program

Effective volunteer training is *essential* for

- 💧 Program success
- 💧 Volunteer success

“Well-run volunteer programs recruit automatically. Build a better program and the volunteers will beat a path to your door.”

101 Ways to Recruit Volunteers, S. McCurley and S. Vineyard, Heritage Arts Publishing Co., 1986

Training is a Process that Flows Throughout the Program

- Orientation (classroom)
- Monitoring Skills (class & field)
- Field visits by staff (field)
- QA/QC testing (lab or field)
- Annual refresher / re-certification
- Advanced training

Off-water Training Topics

- Purpose, goals and objectives of program
- Basic ecosystem ecology
- Condition of the waterbody(ies) being monitored
- Parameters to monitor the condition
- Procedures to measure the parameters
- Role of volunteers
- Data use – how and by whom
- Reporting Results

Field Training

- Briefly review what these parameters tell about the resource
- Review the procedures
- Demonstrate the procedures
- Volunteers practice the procedures until they are comfortable
- Discuss how to report their data
- Send equipment home so volunteers can start monitoring immediately

Group versus One-on-One

Group:

- Saves time and money
- Volunteers can learn from others
- Can not address unique problems or characteristics of individual waterbodies

One-on-One:

- Time consuming and expensive
- Procedures learned under actual conditions the volunteer will encounter
- Can account for unique situations

Training Tips

- Avoid learning overload
 - Break topics into manageable chunks
 - Repeat information through multiple sessions
- Make use of experts/practioners
 - Provides new perspective
 - Change in style and voice
- Provide on-site assistance
 - Builds confidence
 - Assures technical proficiency

Resources Available for Monitoring Programs:

You aren't alone



River Network Mission



To help people collect, understand and use information about the health of their rivers and the people who depend on them

River Network

Program Support-Nationwide

- EPA (<http://www.epa.gov/owow/>)
 - Volunteer Monitoring Methods manuals
 - *Volunteer Monitor* Newsletter
 - List serve
 - 1997 Nat'l Directory of Volunteer Monitoring Programs
- EPA regions
 - Volunteer monitoring coordinators
 - Equipment loan programs
 - QAPP guidance



Program Support-Nationwide

- CSREES Volunteer Water Quality Monitoring Project

– www.usawaterquality.org/volunteer

- Extension program contact information
- Links to Monitoring Manuals
- Links to Quality assurance project plans
- *Guide for Growing Programs*
- Education and outreach materials
- Guidance on data management systems
- Current research with / about volunteers
- List serve postings archive



Guidebook Modules

- 💧 Types of monitoring activities available
- 💧 Effective training techniques
- 💧 Quality assurance issues
- 💧 Successful approaches to overcoming barriers to local data sharing and networking
- 💧 Volunteer management and support ideas
- 💧 Outreach tools
- 💧 Fund raising

Scroll over web addresses for active links

CSREES
Volunteer Water
Quality Monitoring
National Facilitation Project

June 2003
Factsheet IV

USDA
RURAL
DEVELOPMENT

Designing Your Monitoring Strategy: Basic Questions and Resources to Help Guide You

University of Rhode Island University of Wisconsin

Elizabeth Herron, Kris Stepenuck, Linda Green and Kelly Addy

Getting Started in Volunteer Water Quality Monitoring?

This factsheet focuses on helping new program coordinators get their programs up and running. Our goal is to provide you with questions to consider, steps to follow, examples of what's worked and direct you to some of the many resources available to assist you in your monitoring efforts.

There are numerous potential monitoring program goals and monitoring activities available to meet those goals. It is essential to accurately identify what you want your volunteer monitoring to accomplish and how you want your data to be used before you consider specifically what and how you want to monitor. In fact, the first step in determining WHAT to monitor is deciding WHY you want to monitor.

Why Extension Volunteer Water Quality Monitoring Programs Got Started

Volunteer water quality monitoring encompasses a wide range of activities, meeting a diversity of needs. Replies to a recent inquiry of Extension-based volunteer monitoring programs provided a variety of reasons for starting a program. They included:

- To create a long term, credible, data set (address need for data), often due to a lack of watershed monitoring by state or other agencies;
- To educate the public about water quality issues;
- To develop and educate youth (school-based and other youth programs);
- To create consistency in methods, data management, and coordinated use of data between basins, volunteer groups, and agencies;
- To address public interest about why and how monitoring is done and what the results mean;
- To foster community involvement with water resources;
- To respond to a crisis in the shellfish industry caused by poor water quality conditions;
- To address concerns about drinking water quality in private wells.

The program design process discussed in this module includes several basic components:

1. defining the question(s) to answer (e.g. is the water safe for swimming?);
2. characterizing how the data will be used (e.g., education or regulatory compliance), and
3. identifying the resources available for accomplishing your goals.



This is the fourth in a series of factsheet modules which comprise the **Guide to Designing CSREES Volunteer Monitoring Programs**, part of the National Facilitation of Cooperative State Research Extension Service (CSREES) Volunteer Monitoring Efforts project. Funded through the U.S.D.A. CSREES, the purpose of this four-year project is to build a comprehensive support system for Extension volunteer water quality monitoring efforts nationally. The goal is to expand and strengthen the capacity of existing Extension volunteer monitoring programs and support development of new groups. Please see <http://www.usawaterquality.org/volunteer/> for more information.

Methods: Other Programs

- 💧 Alabama Water Watch
- 💧 Hoosier Riverwatch
- 💧 IOWATER
- 💧 North Carolina Watershed Watch
- 💧 Oklahoma Blue Thumb
- 💧 UNH Lakes Lay Monitoring Program
- 💧 URI Watershed Watch
- 💧 WI Water Action Volunteers

All are directly linked to at

www.usawaterquality.org/volunteer

Volunteer Monitoring List Serves

- volmonlists@epa.gov
- csreesvolmon@lists.uwex.edu
- exchanges archived at
www.usawaterquality.org/volunteer



Program Support-State and Local

- Cooperative Extension
- University & High School Departments
- State Natural Resources Departments
- Tribal, State, County or Municipal Agencies
- Soil and Water Conservation Districts
- Non-profit Organizations
- Interest Groups
- Other volunteer monitoring programs

Equipment:

Determining What You Need

- Equipment selected must allow for collected data to meet your previously defined data quality standards



- ✓ Use other programs' written methods to determine your equipment needs
- ✓ Waterwatch Tasmania Equipment Guide
- ✓ Other resources as mentioned

Equipment: Borrowing/Sharing

- Local municipal water districts
- Sewage treatment plants
- Schools
- Tribal, Federal, State agencies
- Soil and Water Conservation Districts
- Irrigation Districts
- Watershed councils
- Other volunteer monitoring programs

Equipment: Purchasing

- Acom Naturalists
- Ben Meadows
- BioQuip
- CHEMetrics
- Cole-Palmer Instruments
- Fisher Scientific
- Forestry Suppliers
- GREEN / Earth Force
- Hach
- LaMotte
- NASCO
- Thomas Scientific
- Wards Natural Science Establishment
- Water Monitoring Equipment & Supply

Volunteer Monitoring: Cost Effective – Not Cost Free

- Staff (incredibly hard-working, usually underpaid)
- Field and lab equipment and supplies
- Laboratory space or analytical services
- Office supplies
- Communication and mailing
- Publications
- Conferences / workshops
- Transportation (personnel or samples)
- Insurance
- Special events / volunteer recognition



Consider Charging for Services

- Greater value often placed on things with a cost
- Supports the program
- Provides stability – which can attract additional funds
- Can be used for match
- Can enhance perception of credibility

Volunteer Effort As Match

Volunteer time can often be used as match

- Document effort
 - Start/end time on data sheets
 - Survey average time per sampling event
- Identify acceptable 'hourly rate' equivalent
 - Independent Sector
(www.IndependentSector.org)
Currently \$18.04 (2005)
 - Minimum wage

Keys to Success

- Whoever is using the monitoring data – whether it's a government agency, university or community – should be helping pay for it.
- In-kind support, such as donations of technical expertise, equipment or laboratory analysis can really help keep a program going!

More Keys to Success

- The more different funding sources you tap into, the more secure your financial base will be.
- Ongoing support is harder to find than start-up funding. But monitoring by nature is long-term, so funding needs to be long-term – keep focused.

Summary

- Start by addressing the tough questions
- Determine objectives
- Develop a written plan
- Form partnerships/involve partners
- Educate in classroom and field
- Seek varied sources of funding
- Use all available resources
- Present your results
- Evaluate your program, re-tool
- Applaud your volunteers!

Successful Programs Make A Difference

- 💧 Involve people in real science
- 💧 Raise awareness
- 💧 Create an informed constituency
- 💧 Promote individual actions for water quality protection
- 💧 Provide information on places where no one else is looking
- 💧 Identify & solve problems locally

