Developing a Framework for Use of External Water Quality Monitoring Data for SCDHEC

Christopher Case
University of South Carolina
School of the Environment
MEERMS-AWNES Candidate
Background

- Clean Water Act - attain a level of water quality that “provides for the protection and propagation of fish, shellfish, and wildlife, and provides for recreation in and on the water”
  - Purpose of Monitoring

- Utilize untapped monitoring resource

Overview

- Goals of the model framework
- Varying framework structures
  - National Pollutant Discharge Elimination System
  - Citizen Monitoring
    - Tiered Data
    - Non-Tiered Data
    - Certification
  - Model Variables
- Water Quality Monitoring Council

Goals of the Framework

- Obtain water quality data from outside of the current monitoring framework
- Utilize groups that are already monitoring the water
- Put this data to use in a manner valuable to the Department
  - Regulatory applications
Data Uses

- **Regulatory purposes**
  - 303(d) listing
  - TMDL development
  - Setting permit limits (NPDES)
  - Water quality modeling

- **Non-regulatory purposes**
  - Baseline condition documentation
  - Assessing BMP
  - Public education and awareness purposes

http://www.strom.clemson.edu/SC WRC/
National Pollutant Discharge Elimination System, NPDES

- Requires permits for water pollution discharges
  - Monitor effluent
  - May require instream monitoring
    - Ensure water quality standard is not exceeded
North Carolina’s Monitoring Coalition Program

- NPDES permits require instream monitoring
- Permittees form a voluntary coalition
  - Create MOA with Department
    - Permit-based instream monitoring not required
- Monitoring locations determined in conjunction with the Department

K. Stecker, Personal Communication, February 2, 2011
North Carolina’s Monitoring Coalition Program

- Beneficial to the permittees as well as the Department
  - Department receives water quality data
  - Permittees save money
  - Obtain data important to the permittees

- Implementing in South Carolina
  - Would require adding instream monitoring on permits

K. Stecker, Personal Communication, February 2, 2011
Citizen Monitoring

- Consist of
  - Academia
  - Watershed associations
  - Riverkeepers
  - Conservancy groups
  - Concerned citizen groups

- Work in conjunction with SCDHEC
  - Quality Assurance needs
Implementing Organization

- SCDHEC
  - Implemented and funded within the Department

- Organization(s) outside of Department
  - Academia
    - Greatest Potential
  - Conservancy Groups
  - NGOs (among others)
  - Responsible for overseeing and implementing program
  - SCDHEC’s role
Quality Assurance

- Quality Assurance Project Plan, QAPP
  - Ensure integrity of collected data
  - Includes:
    - Quality objectives, locations to be sampled, sample parameters, any limits on data usage
    - SCDHEC approval is necessary prior to sampling

<www.dhec.sc.gov/environment/envserv/qapp.htm>
Training – One Approach

● Train the trainer
  – How and why of monitoring
  – Proficiency test
● Annual initial training
● Annual refresher course
● Can be held at a geographically accessible location

http://www.westchestergov.com/CVM P/photogallery/CVMP_5.htm
Staff

- One full time and one part time staff member
  - Collaborate with the citizen groups
  - Data Management
  - Create and update QA methods manual
  - Coordinate training sessions

- Funding option
  - Grant research
  - Charity/fundraising events
Substructure One: Data Tiering

- **Tiers 1-3**
  - 1: Introductory
  - 2: Additional sampling methods
  - 3: Approved methodologies

- Only third tier data will be accepted for regulatory purposes
  - QAPP

- Tier one and two data can be accepted for non regulatory purposes
Substructure One: Tiered Training

- **Tier 1**
  - Half day in class
  - Half day in field

- **Tier 2**
  - Additional day of training
  - Additional monitoring methods

- **Tier 3**
  - Additional day of training
  - Emphasis on proper methods and QA
  - Sampling in the same manner as SCDHEC employees
# Data Tiers

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<tr>
<th>Tier</th>
<th>Uses</th>
<th>QA Needs</th>
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| 1    | Public education and awareness | No DHEC approved QAPP needed, yet certain methodologies are encouraged  
|      |      | No need for maintenance of calibration logs, current SOPs, or Chain Of Custody |
| 2    | Track performance of TMDL implementation  
|      | Raise red flags for follow up by a SCDHEC employee  
|      | Baseline creation | Utilize SCDEHC approved sampling methodologies  
|      | | There may exist deviations; such as sampling frequency or utilizing a laboratory that is not certified  
|      | | No need for maintenance of calibration logs, current SOPs, or Chain Of Custody |
| 3    | Listing of water on the 303(d) list  
|      | Use with TMDL development  
|      | Used for WQ modeling | SCDHEC pre-approved QAPP  
|      | | Utilization of a certified laboratory  
|      | | Calibration logs, current SOPs, and proper Chain Of Custody must be maintained |
Substructure Two: Non-Tiering System

- Only data collected with a QAPP will be accepted.
- Training will be to the level needed to collect regulatory data.
  - Same as SCDHEC employee.
- Only citizen groups with the goal of meeting these requirements will participate in the program.
Pros and Cons of Data Tiering

**Pros**
- Citizen involvement
  - Less pressure on volunteers
  - More flexibility of commitment
- Additional uses of the data
- Ensure experienced volunteers

**Cons**
- Data cannot be directly compared between tiers
- Less dedicated volunteers
- Volunteers take responsibilities too lightly
- Goes against SCDHEC’s true purpose of program
Substructure Three: Certification

- Volunteer are certified to collect data for differing parameters
  1. Introduction/Transparency methods
  2. Chemistry and nutrient sampling
  3. Physical parameters
  4. Biological monitoring

- All certifications are for regulatory quality data
Substructure Three: Pros and Cons of Certification

**Pros**
- Citizen involvement
- Data can be used for regulatory purposes
- Comparable data
- Ensure experienced volunteers

**Cons**
- Not becoming certified past the introductory certification
- More complicated system
Model Variables

- Organizational division
  - Region
  - Water body type

- Umbrella QAPP for the program

- Funding
  - Clean Water Act
  - USDA Grants
  - NRCS
  - SC Grants

- Data submittal format

http://www.epa.gov/ne/lab/reportsdocumented/wadeable/equipment/sondes.html
Water Quality Monitoring Council

- Collaboration organization
  - Potential to implementing volunteer training sessions
  - Communication network
  - Leveraging resource and knowledge
  - Work towards uniformity
    - Training and SOPs
  - Data sharing network
- Help to organize program

http://diagoal.blogspot.com/
Water Quality Monitoring Council

Structure

- Composed
  - Federal, state, and local agencies, conservation groups, academia, and concerned citizen groups
- Formal Vs Non Formal
- Funding
  - Grants
  - Membership fees/donations
- Database can be used to avoid duplicate efforts
Advice

- Program structure is dynamic
- Create good working relationship with citizen groups
- Work to address skepticism
- Budgeting issues

http://extension.usu.edu/waterquality/html/citizen_monitoring/
Deliverable

- Document of the Potential Frameworks
  - Two major model structures
  - Three citizen monitoring sub structures
    - Pros and Cons
    - Variables of each
  - Water Quality Monitoring Council structure
- Listing of potentially interested organizations
References

Personal Communications with:
Lynn Sisk
Jon Marshack
Shakoora Azimi-Gaylan
Barb Horn
Mike Beauchene
John Schneider
Ed Whereat
Gail Sloan
Elizabeth Booth
Harold Harbert
Jason Pappani
Gregg Good
Jody Arthur
Mary Skopec
Amy Stewart
Dave Courtemanch
Scott Williams
Matt Stover
Dan Boward
Arthur Johnson
Gary Kohlhepp
Laurie Sovell
Natalie Segrest
John Ford
Stephen Fernandez
Robert Ray
Ken Edwardson
Sarah Steiner
Ted Walsh
Leslie McGeorge
Bill Andrews
Kathy Stecker
Grant Neuharth
Gary Bracht
Jeff Reynolds
Tony Shaw
Rodney Kime
Connie Carey
Linda Green
Shannon Minerich
Jim Harris
Neil Kamman
Jim Kellog
James Beckely
Chris French
David Waterstreet
David Chestnut

• United States. 39° 16’ 13.73” N 97° 17’ 03.70” W. Google Earth. March 24, 2011.